DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
KLP	6	STP 2013 (597) MM		FM 3097
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
KLP	TEXAS	DALLAS	ROCKWALL	1
CHECK	CONTROL	SECTION	JOB	
JBR	3148	01	006	
CHECK				
RRH				

FINAL PLANS

NAME OF CONTRACTOR: ED BELL CONSTRUCTION COMPANY

DATE OF LETTING: 07/09/2014

DATE WORK BEGAN: 01/19/2016

DATE WORK COMPLETED: 05/07/2018

DATE WORK ACCEPTED: 05/29/2018

SUMMARY OF CHANGE ORDERS:

C.O. # DESCRIPTION	DAYS ADDED
1. ADDING SP 000-249	N/A
2. ADDING MOWING	
3. ADDING TURBIDITY BARRIER	N/A
4. ADDING MESSAGE BOARDS	N/A
5. CONCRETE CAP FOR FORCE MAIN (15A, 126A, 127A, 131A)	9
6. UPSTREAM WINGWALL AT BROCKWAY BRANCH (15B, 16A, 126B, 127B, 129B, 130A, 131B, 157A, 158A)	N/A
7. REMOVING MANHOLES AND FIRE STATION SIGNALS	N/A
8. 15 INCH MILLING	N/A
9. DOWNSTREAM WINGWALL AT BROCKWAY BRANCH (159A)	N/A
10. REMOB FOR WYLIE DRILLING	N/A
11. REVISION TO TRAFFIC CONTROL (37-38A, 42A, 44A, 45A, 45AA, 45BA, 48A)	N/A
12. ADDITIONAL WORK SOUNDWALL DRILL SHAFT	N/A
13. ADDED STORM DRAIN	2
14. SURFACE PREP AND SEALER FOR STRIPING	2
15. MODIFYING TRAFFIC SIGNALS (15C, 18A, 81A, 89A, 94A, 114A, 177A, 180A, 182A, 183A, 185A, 205A, 210A)	N/A
16. ADDING MAILBOX (112AA, 112BA, 112CA)	N/A
17. ADJUSTING QUANTITIES FOR OVERRUNS	N/A
ORIGINAL BID DAYS	362
TOTAL DAYS	375

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT
STP 2013 (597) MM
CSJ: 3148-01-006

FM 3097
ROCKWALL COUNTY

DESIGN SPEED:
FM 3097 = 40 MPH
CROSS STREETS = 30 MPH
ADT:
24,700 (2010)
39,900 (2030)
CLASSIFICATION: URBAN COLLECTOR

NOTE:
SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, JUNE 1, 2004, AND THE CONTRACT PROVISIONS LISTED AND DATED AS FOLLOWS SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 1, 2012)

LIMITS: FROM FM 740
TO EAST OF TUBBS ROAD

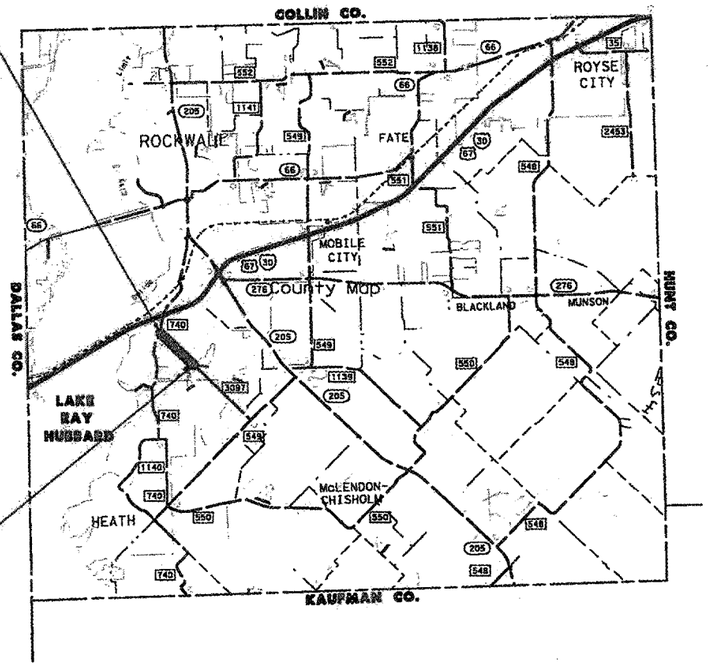
TOTAL LENGTH OF PROJECT =

ROADWAY	= 4,747.00 FT.	=	0.899 MI.
BRIDGE CLASS CULVERT	= 36.00 FT	=	0.007 MI.
TOTAL	= 4,783.00 FT.	=	0.906 MI.

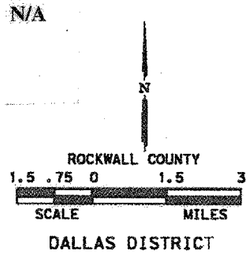
Registered Accessibility Specialist (RAS) Inspection Required. TDLR No.: 3461447

TYPE OF WORK: FOR THE RECONSTRUCTION AND WIDEN 2 LANE UNDIVIDED TO 4 LANE DIVIDED CONSISTING OF: GRADING, PAVING, DRAINAGE, REMOVALS, BRIDGE CLASS CULVERT, RETAINING WALLS, NOISE WALLS, SIGNALIZATION, STORM WATER POLLUTION PREVENTION PLANS, SIGNING, PAVEMENT MARKINGS, AND LANDSCAPING.

BEGIN PROJECT
CSJ 3148-01-006
STA 00+00.00
TRM 604-0.039



END PROJECT
CSJ 3148-01-006
STA 47+83.00
TRM 604+0.867



DALLAS DISTRICT

EQUATIONS: NONE
EXCEPTIONS: NONE
RAILROAD CROSSINGS: NONE

Texas Department of Transportation

CP&Y
FIRM REGISTRATION No. F-1741

SUBMITTED FOR LETTING 4/30 2014
, P.E.
CONSULTANT DESIGN ENGINEER OR PROJECT MANAGER

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER
4/30/14

CITY OF ROCKWALL

CONCURRENCE: 5/5 2014
CITY MANAGER, CITY OF ROCKWALL

STATE OF TEXAS
JEFFREY A. BUSH
99352
LICENSED PROFESSIONAL ENGINEER

WORK WAS COMPLETED ACCORDING TO THE PLANS AND CONTRACT.

, P.E. 9/7/18
Signature of Registrant Date

TEXAS DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR LETTING 5-20 2014
, P.E.
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

RECOMMENDED FOR LETTING 4/30 2014
, P.E.
AREA ENGINEER

APPROVED FOR LETTING: 5/20 2014
, P.E.
DISTRICT ENGINEER

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT

Signature of Registrant, P.E. & Date: 05/02/14

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

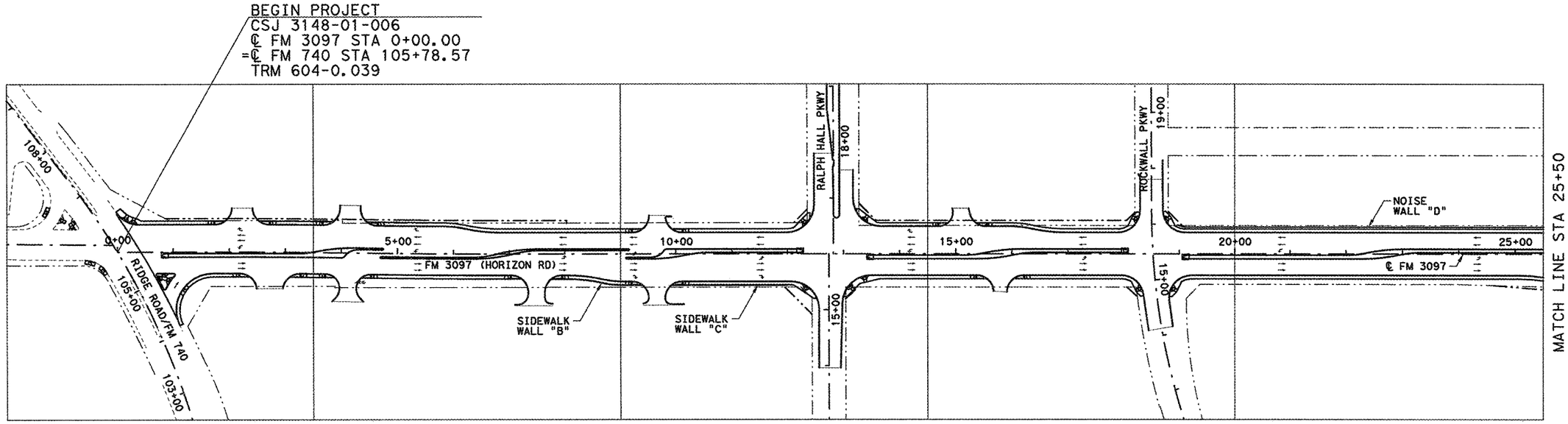
Texas Department of Transportation

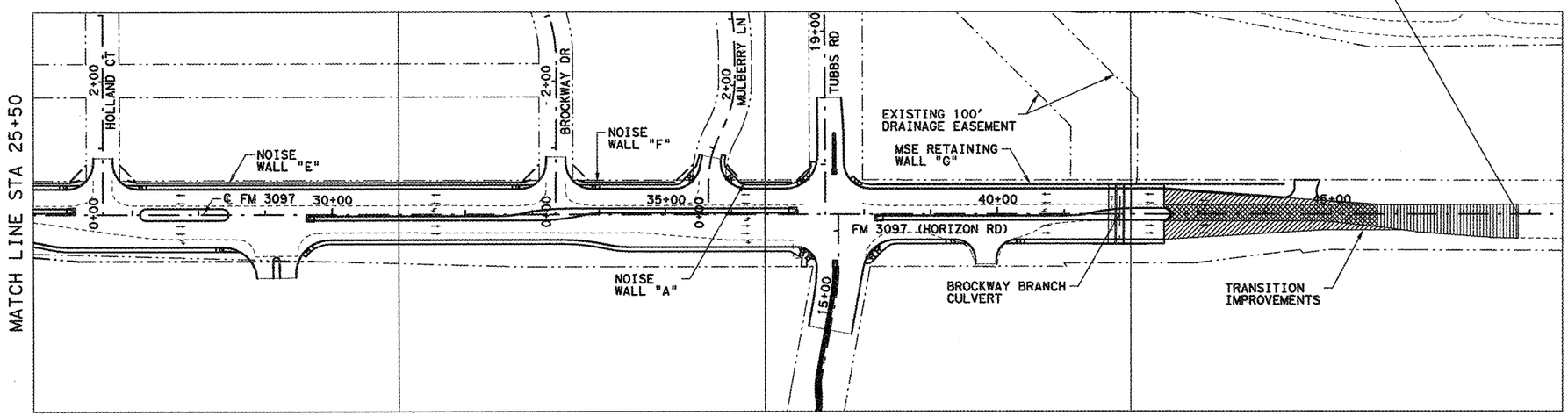
FM 3097
INDEX OF SHEETS

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SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
JBR	6	STP 2013 (597) MM		FM 3097
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
KLP	TEXAS	DALLAS	ROCKWALL	2
CHECK	CONTROL	SECTION	JOB	
JBR	3148	01	006	
CHECK				
RRH				





N

100 50 0 100 200
SCALE FEET

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

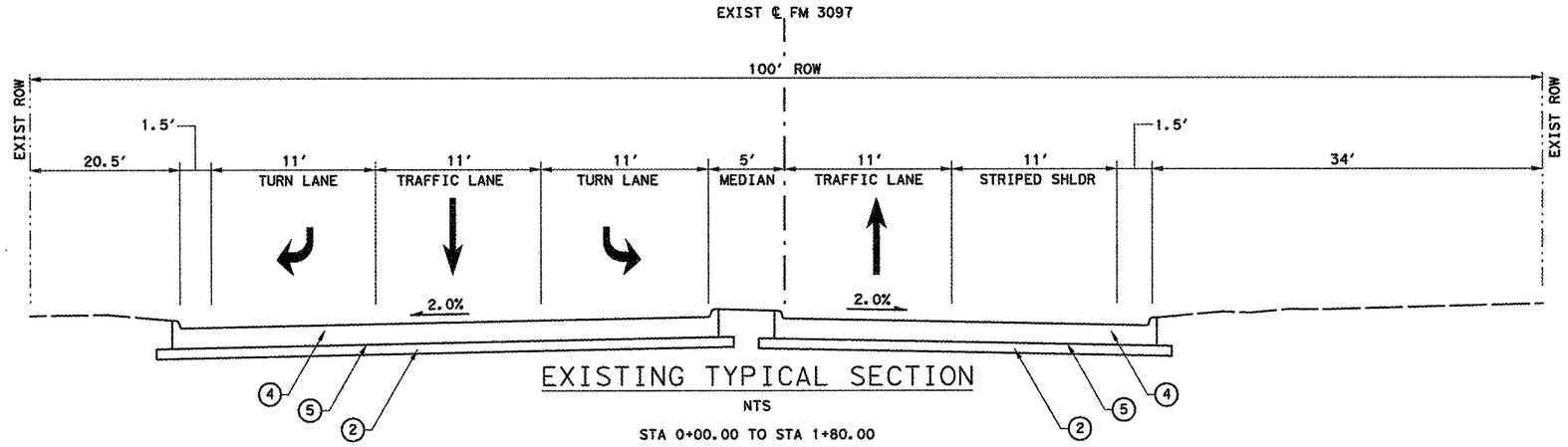
Texas Department of Transportation

FM 3097
PROJECT LAYOUT

Designed: JBR	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: KLP	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn: JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: RRH	DAL	ROCKWALL	3148	01	006		3

SHEET 1 OF 1

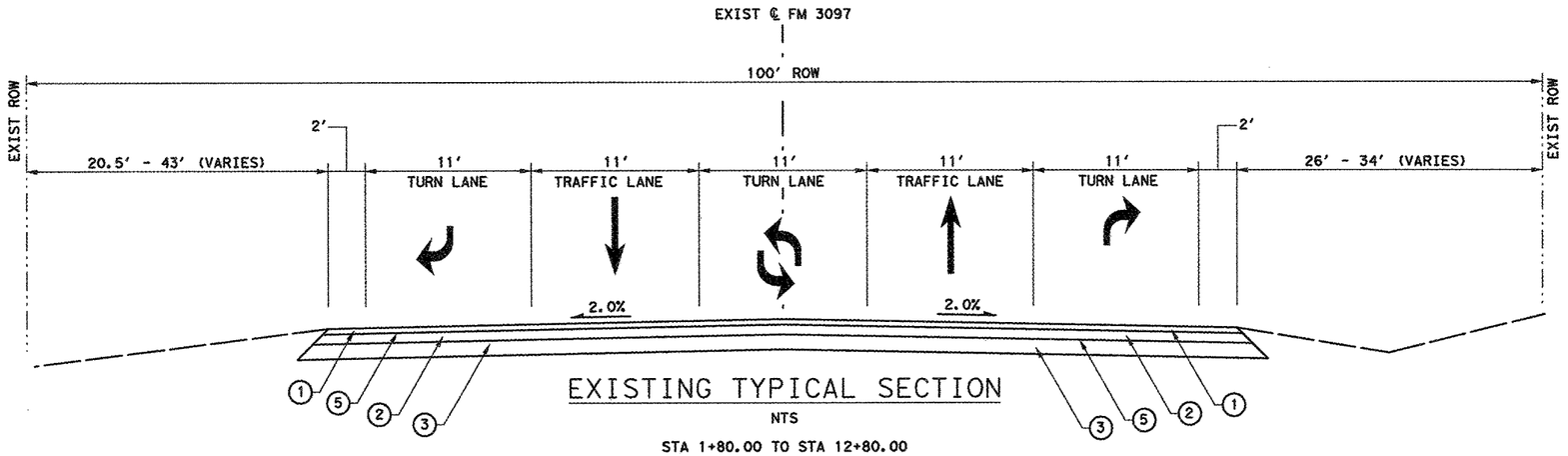
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EXISTING TYPICAL SECTION

NTS

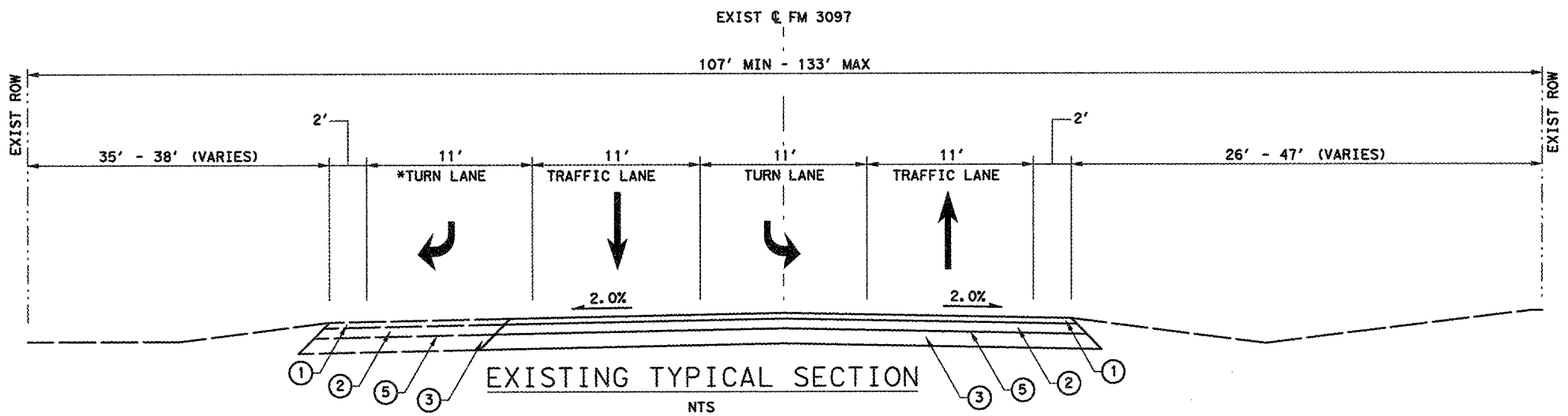
STA 0+00.00 TO STA 1+80.00



EXISTING TYPICAL SECTION

NTS

STA 1+80.00 TO STA 12+80.00



EXISTING TYPICAL SECTION

NTS

* STA 12+90 TO STA 16+20

STA 12+80.00 TO STA 16+20.00
STA 29+15.00 TO STA 31+40.00
STA 37+50.00 TO STA 41+55.00

LEGEND

1. 2" - 4" TYPE C HMAC
2. 4" - 9" TYPE B HMAC
3. 6" FLEX BASE
4. CONC PVMT (8")
5. PRIME COAT

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

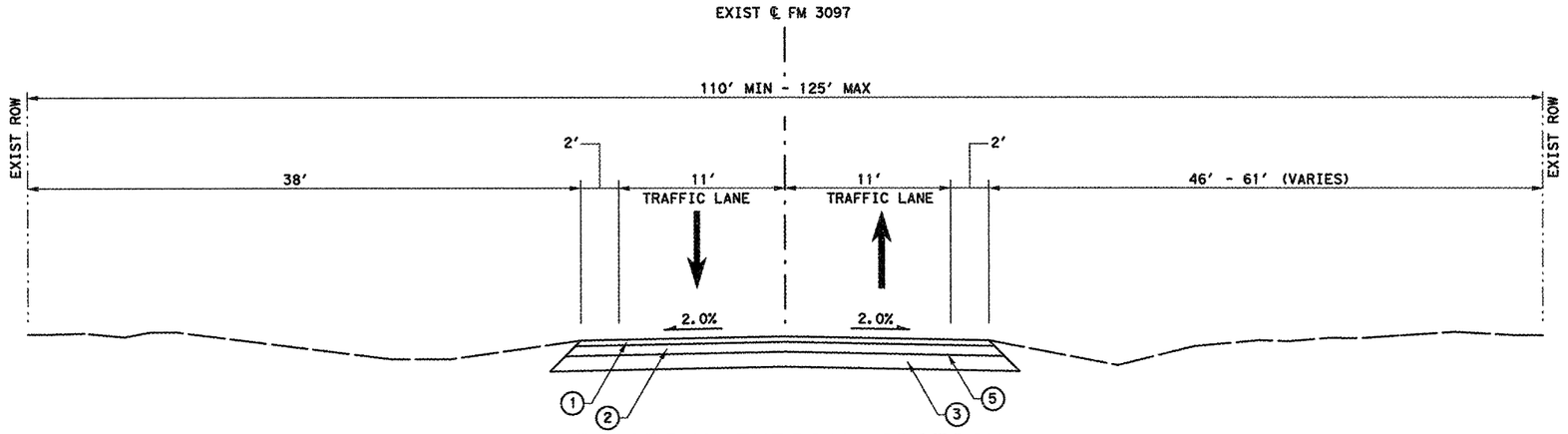
Texas Department of Transportation

FM 3097
TYPICAL SECTIONS

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Drawn: IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	3148	01	006	4

SHEET 1 OF 7

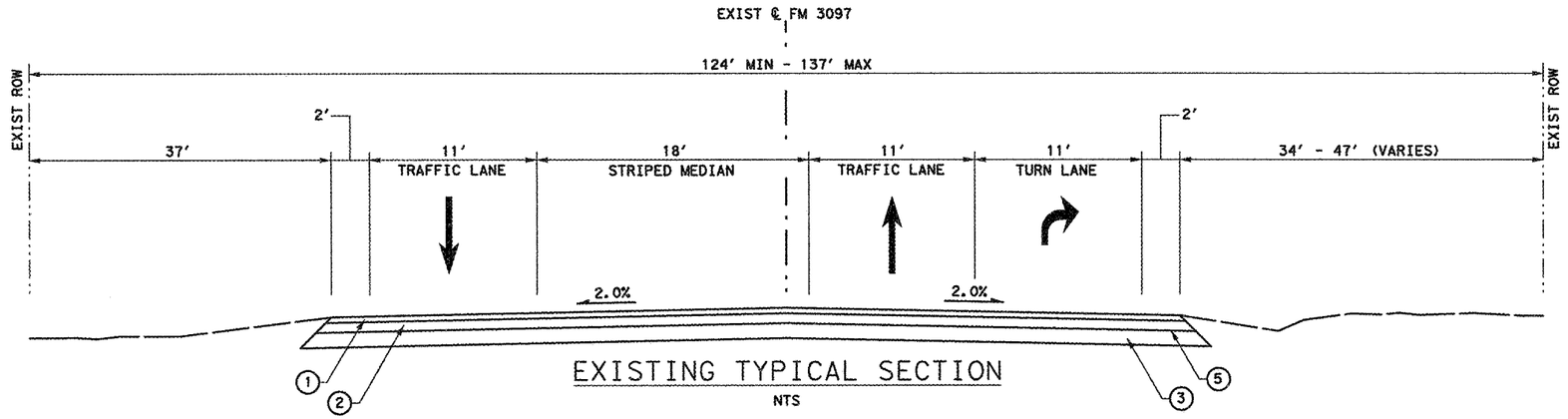
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EXISTING TYPICAL SECTION

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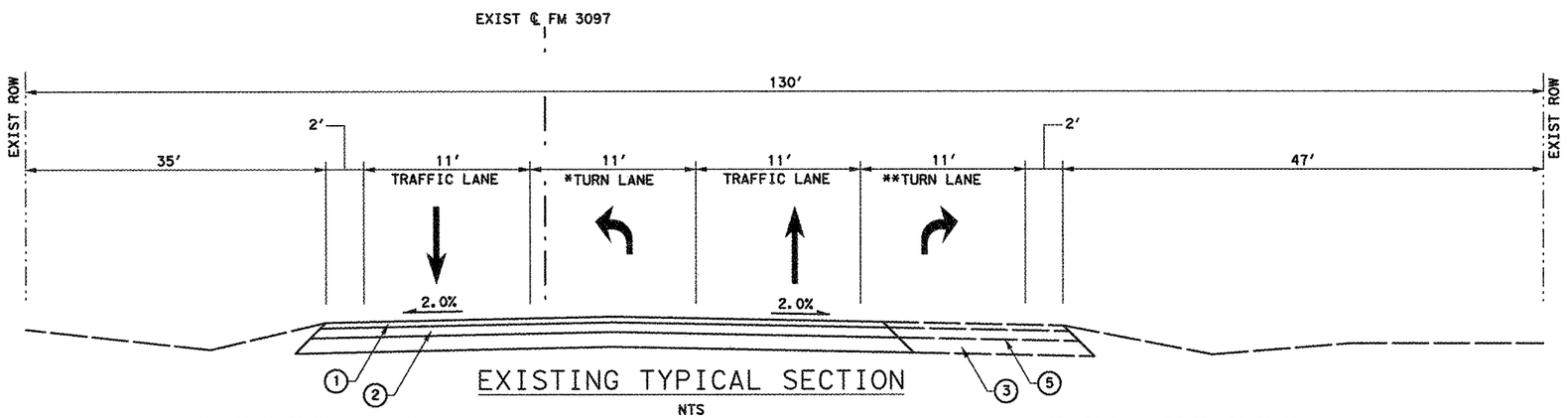
STA 16+20.00 TO STA 25+40.00
STA 41+55.00 TO STA 45+00.00



EXISTING TYPICAL SECTION

NTS

STA 25+40.00 TO STA 29+15.00



EXISTING TYPICAL SECTION

NTS

*STA 32+02.90 TO STA 33+06.37
*STA 35+29.96 TO STA 37+50.00
*STA 45+00.00 TO STA 47+83.00

STA 31+40.00 TO STA 37+50.00
STA 45+00.00 TO STA 47+83.00

**STA 35+81.11 TO STA 37+50.00
**STA 45+00.00 TO STA 47+83.00

LEGEND

1. 2" - 4" TYPE C HMAC
2. 4" - 9" TYPE B HMAC
3. 6" FLEX BASE
4. CONC PVMT (8")
5. PRIME COAT

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM, F-1741

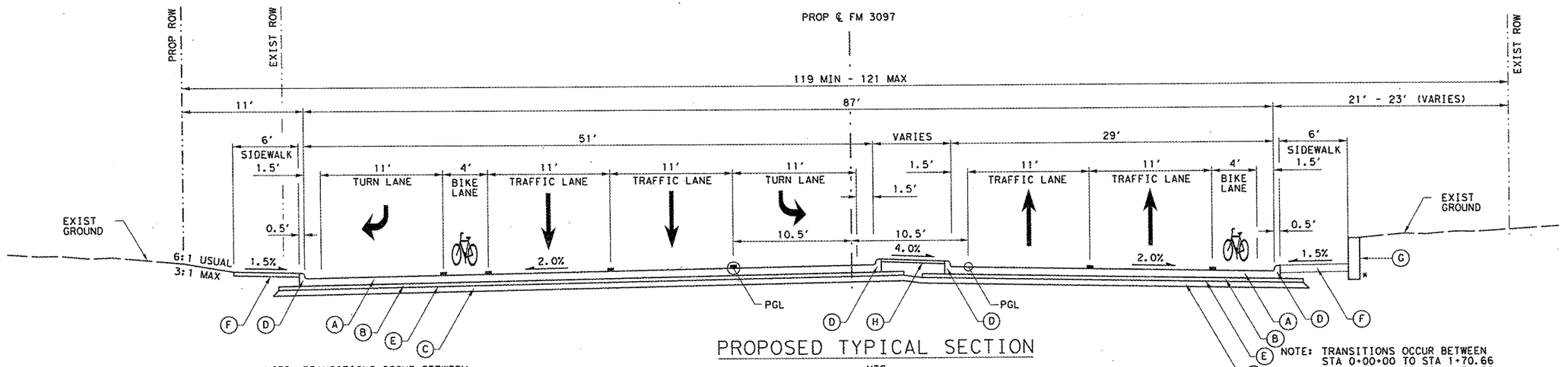
Texas Department of Transportation

FM 3097
TYPICAL SECTIONS

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed	IWM	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn	IWM	DAL	ROCKWALL	3148	01	006	5
Checked	RRH						

SHEET 2 OF 7

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NOTE: TRANSITIONS OCCUR BETWEEN
STA 0+00+00 TO STA 0+91.50
STA 3+21.32 TO STA 9+83.72
STA 15+17.26 TO STA 16+98.21
INTERSECTION
STA 11+97.20 TO STA 13+66.81
VARYING ROADWAY WIDTHS

PROPOSED TYPICAL SECTION

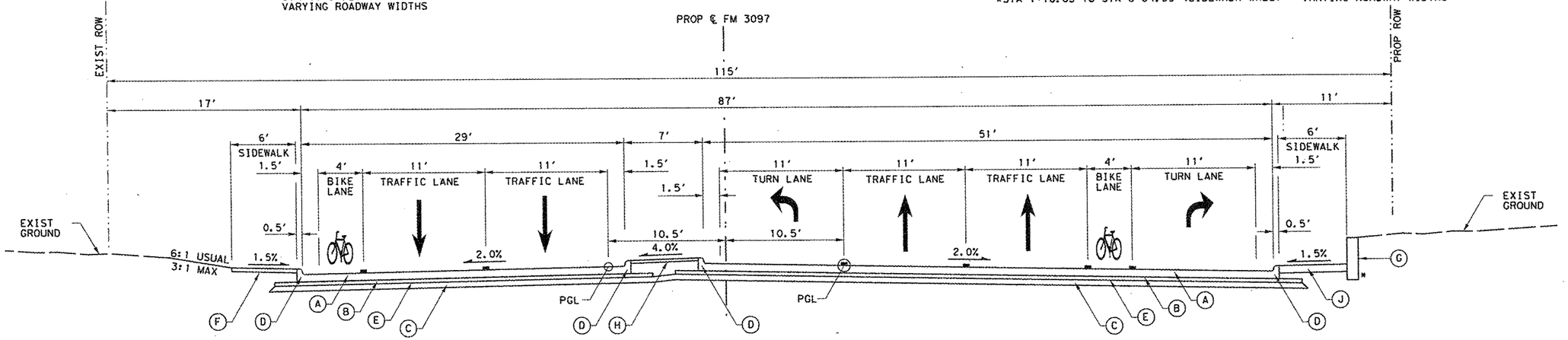
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STA 0+00.00 TO STA 9+83.72
STA 11+97.20 TO STA 16+98.21

STA 0+00.00 TO STA 8+04.09
STA 12+06.28 TO STA 16+38.03

*STA 7+76.03 TO STA 8+04.09 (SIDEWALK WALL)

NOTE: TRANSITIONS OCCUR BETWEEN
STA 0+00+00 TO STA 1+70.66
STA 4+01.28 TO STA 4+71.00
STA 6+35.01 TO STA 8+04.09
STA 15+39.15 TO STA 16+38.03
INTERSECTION
STA 12+06.28 TO STA 13+48.45
VARYING ROADWAY WIDTHS



PROPOSED TYPICAL SECTION

NTS

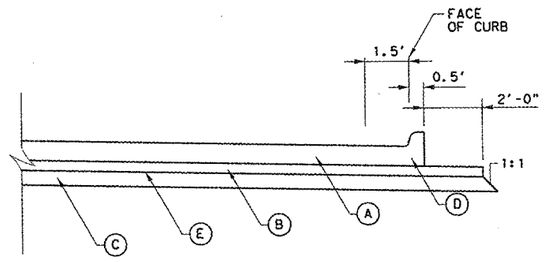
STA 9+83.72 TO STA 11+97.20

STA 8+04.09 TO STA 12+06.28

*STA 8+04.09 TO STA 9+38.88 (SIDEWALK WALL)
*STA 9+92.88 TO STA 12+00.02 (SIDEWALK WALL)

LEGEND

- (A) CONC PVMT (CONT REINF-CRCP) (8")
- (B) D-GR HMA TY-B PG 64-22 (4")
- (C) FL BS (CMP IN PLC) (TY D GR 2) (FNAL POS) (6")
- (D) CONC CURB (MONO) (TY II)
- (E) PRIME COAT (MC-30 OR AE-P)
- (F) CONC SIDEWALKS (4")
- (G) CONCRETE SIDEWALK WALL
- (H) LANDSCAPING
- (I) BLOCK SOD
- (J) CONC SIDEWALKS (6') (6")



END SECTION

NTS

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

07/02/14

Replaced 7/2/2014 A.T.

SHEET 3 OF 7

NO.	REVISION	BY	DATE

CP&Y

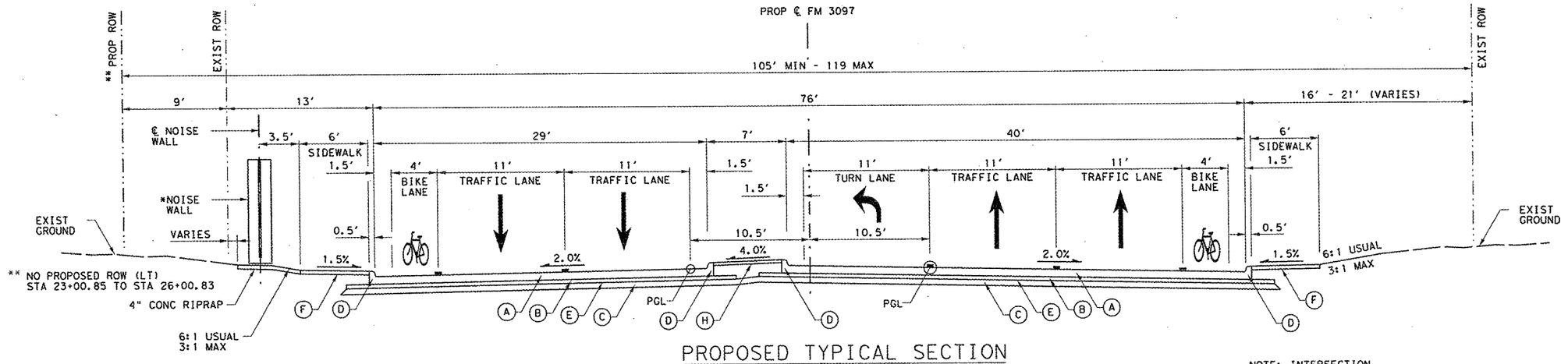
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097
TYPICAL SECTIONS

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.	
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097	
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	RRH	DAL	ROCKWALL	3148	01	006		6	

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PROPOSED TYPICAL SECTION

NTS

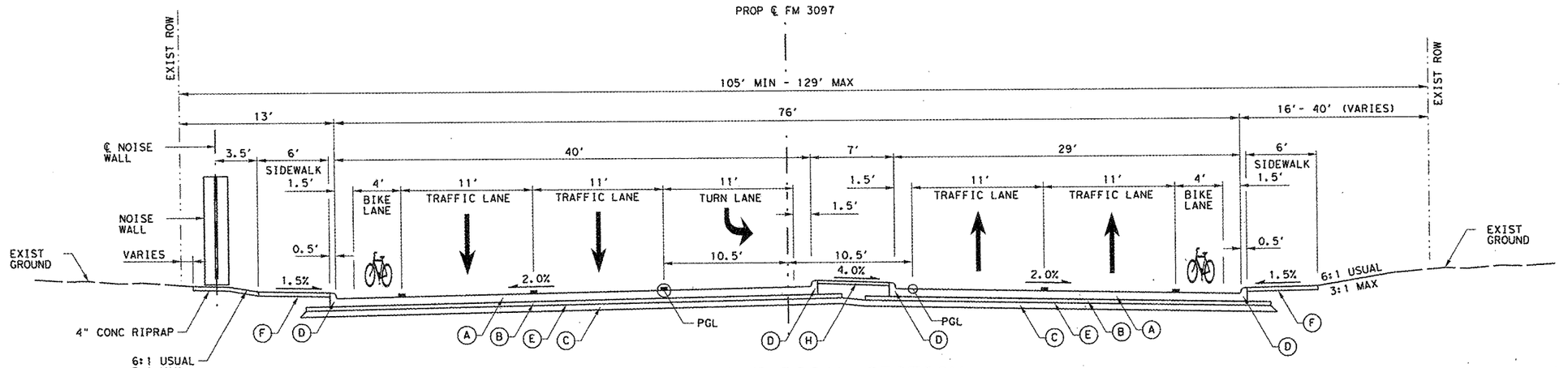
*STA 18+96.47 TO STA 19+11.23 (NOISE WALL)
*STA 22+01.97 TO STA 26+19.51 (NOISE WALL)
*STA 26+93.72 TO STA 29+73.50 (NOISE WALL)

NOTE: INTERSECTION
STA 17+89.44 TO STA 19+11.23
TRANSITIONS OCCUR BETWEEN
STA 26+00.83 TO STA 29+73.50
VARYING ROADWAY WIDTHS

STA 16+98.21 TO STA 19+11.23
STA 23+00.85 TO STA 29+73.50

STA 16+38.03 TO STA 19+22.21
STA 23+27.89 TO STA 29+96.48

NOTE: INTERSECTION
STA 17+95.90 TO STA 19+22.21
TRANSITIONS OCCUR BETWEEN
STA 25+06.09 TO STA 29+96.48
VARYING ROADWAY WIDTHS



PROPOSED TYPICAL SECTION

NTS

NOTE: TRANSITION OCCURS BETWEEN
STA 22+01.97 TO STA 23+00.85
VARYING ROADWAY WIDTHS

STA 19+11.23 TO STA 23+00.85
STA 29+73.50 TO STA 32+52.11

STA 19+22.21 TO STA 23+27.89
STA 29+96.48 TO STA 34+44.98

NOTE: TRANSITION OCCURS BETWEEN
STA 22+29.00 TO STA 23+27.89
STA 33+08.79 TO STA 34+44.98
VARYING ROADWAY WIDTHS

LEGEND

- (A) CONC PVMT (CONT REINF-CRCP) (8")
- (B) D-GR HMA TY-B PG 64-22 (4")
- (C) FL BS (CMP IN PLC) (TY D GR 2) (FNAL POS) (6")
- (D) CONC CURB (MONO) (TY II)
- (E) PRIME COAT (MC-30 OR AE-P)
- (F) CONC SIDEWALKS (4")
- (G) CONCRETE SIDEWALK WALL
- (H) LANDSCAPING
- (I) BLOCK SOD
- (J) CONC SIDEWALKS (6') (6")

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

07/02/14

⚠1 Replaced 7,2,2014 R.T.

NO.	REVISION	BY	DATE

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TEXAS REGISTERED ENGINEERING FIRM, F-1741

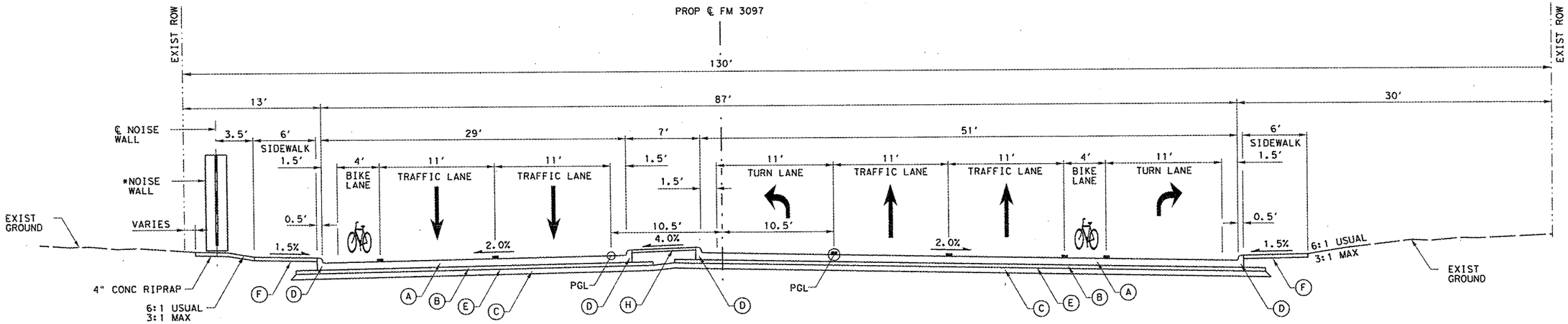
Texas Department of Transportation

FM 3097
TYPICAL SECTIONS

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Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
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SHEET 4 OF 7

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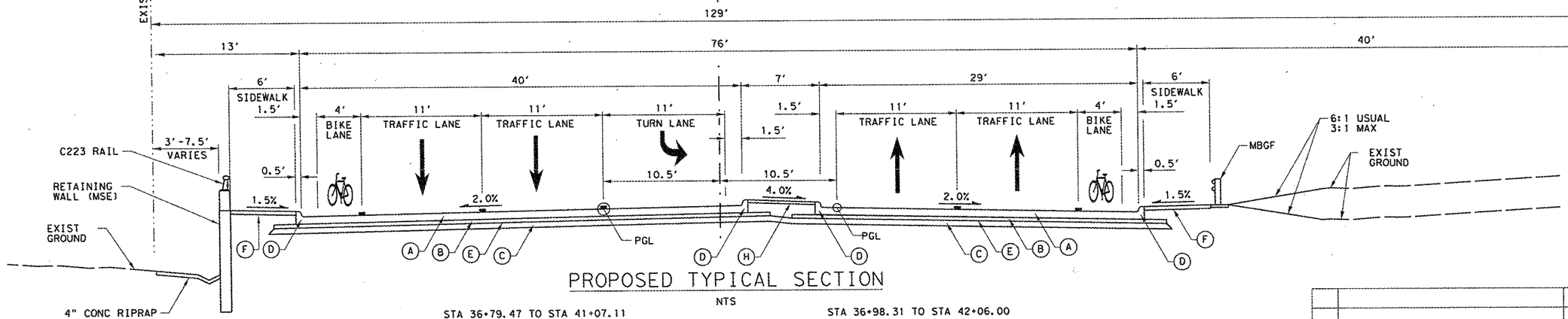
PROPOSED TYPICAL SECTION

NTS

*STA 32+52.11 TO STA 32+96.77 (NOISE WALL)
*STA 33+66.85 TO STA 35+14.33 (NOISE WALL)
*STA 36+14.00 TO STA 36+79.47 (NOISE WALL)
NOTE: TRANSITION OCCURS BETWEEN STA 32+52.11 TO STA 33+51.00 CROSS STREET INTERSECTION

STA 32+52.11 TO STA 36+79.47

STA 34+44.98 TO STA 36+86.29



PROPOSED TYPICAL SECTION

NTS

*STA 36+79.47 TO STA 36+90.00 (NOISE WALL)
*STA 38+20.00 TO STA 41+07.11 (MSE RETAINING WALL)
NOTE: INTERSECTION STA 36+79.47 TO STA 38+09.51 VARYING ROADWAY WIDTH

STA 36+79.47 TO STA 41+07.11

STA 36+98.31 TO STA 42+06.00

NOTE: INTERSECTION STA 36+98.31 TO STA 38+48.28 CROSS STREET INTERSECTION METAL BEAM GUARD FENCE STA 40+55.00 TO STA 41+25.31

LEGEND

- (A) CONC PVMT (CONT REINF-CRCP) (8")
- (B) D-GR HMA TY-B PG 64-22 (4")
- (C) FL BS (CMP IN PLC) (TY D GR 2) (FNAL POS) (6")
- (D) CONC CURB (MONO) (TY II)
- (E) PRIME COAT (MC-30 OR AE-P)
- (F) CONC SIDEWALKS (4")
- (G) CONCRETE SIDEWALK WALL
- (H) LANDSCAPING
- (I) BLOCK SOD
- (J) CONC SIDEWALKS (6') (6")

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

⚠ Replaced 7.2.2014 A.T.

07/02/14
SHEET 5 OF 7

NO.	REVISION	BY	DATE

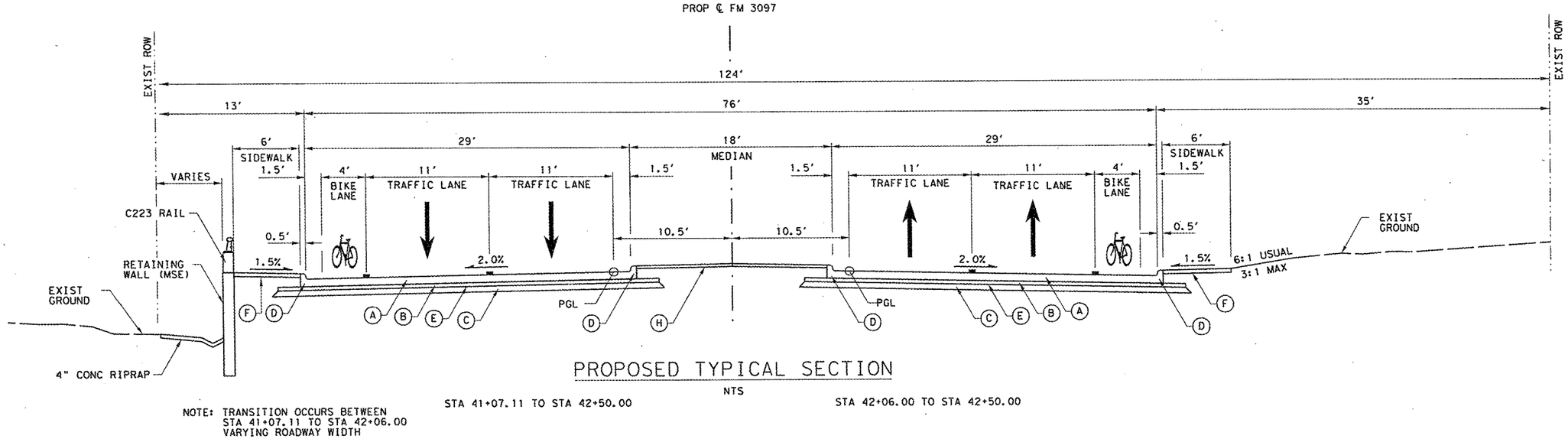
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097
TYPICAL SECTIONS

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		8

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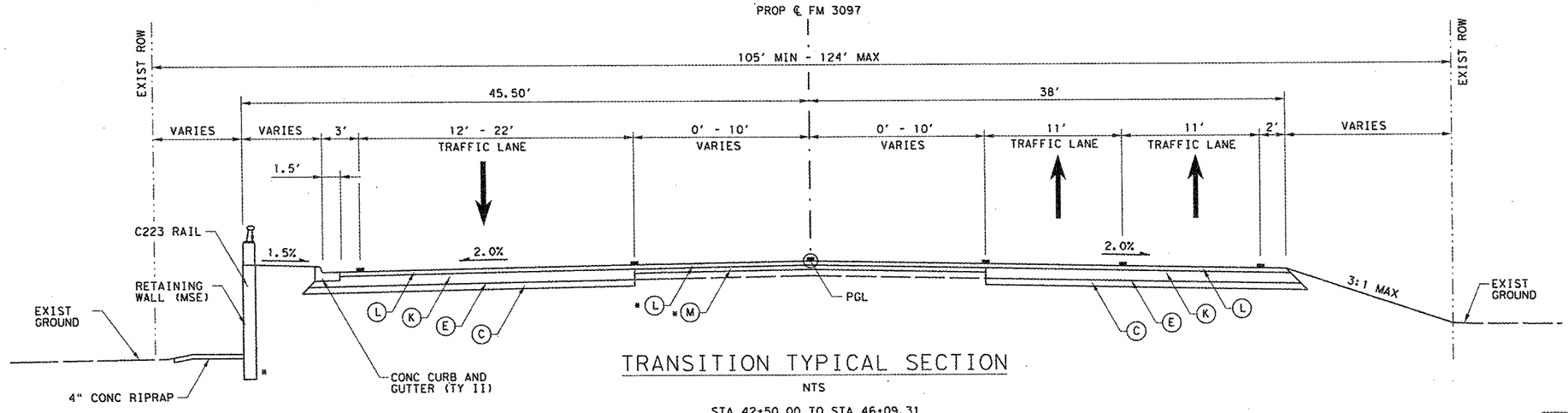
PROPOSED TYPICAL SECTION

NTS

STA 41+07.11 TO STA 42+50.00

STA 42+06.00 TO STA 42+50.00

NOTE: TRANSITION OCCURS BETWEEN STA 41+07.11 TO STA 42+06.00 VARYING ROADWAY WIDTH



TRANSITION TYPICAL SECTION

NTS

STA 42+50.00 TO STA 46+09.31

*STA 42+50.00 TO STA 44+30.00 (MSE RETAINING WALL)

*CONTRACTOR TO MILL OFF TOP 2" OF HMAC. PROVIDE LEVEL-UP PAVEMENT TO MATCH 10" HMA OUTSIDE PAVEMENT. COVER ENTIRE ROADWAY WITH 2" HMA TY-C.

LEGEND

- (A) CONC PVMT (CONT REINF-CRCP) (8")
- (B) D-GR HMA TY-B PG 64-22 (4")
- (C) FL BS (CMP IN PLC) (TY D GR 2) (FNAL POS) (6")
- (D) CONC CURB (MONO) (TY II)
- (E) PRIME COAT (MC-30 OR AE-P)
- (F) CONC SIDEWALKS (4")
- (G) CONCRETE SIDEWALK WALL
- (H) LANDSCAPING
- (I) BLOCK SOD
- (J) CONC SIDEWALKS (6') (6")
- (K) D-GR HMA TY-B PG 64-22 (10")
- (L) D-GR HMA(SQ) TY-C PG 70-22 (2")
- (M) D-GR HMA(SQ) TY-B PG 64-22 (LEVEL-UP)

Δ Replaced. 7/2/2014 A.T.

SHEET 6 OF 7

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

07/02/14

NO.	REVISION	BY	DATE

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TEXAS REGISTERED ENGINEERING FIRM. F-1741

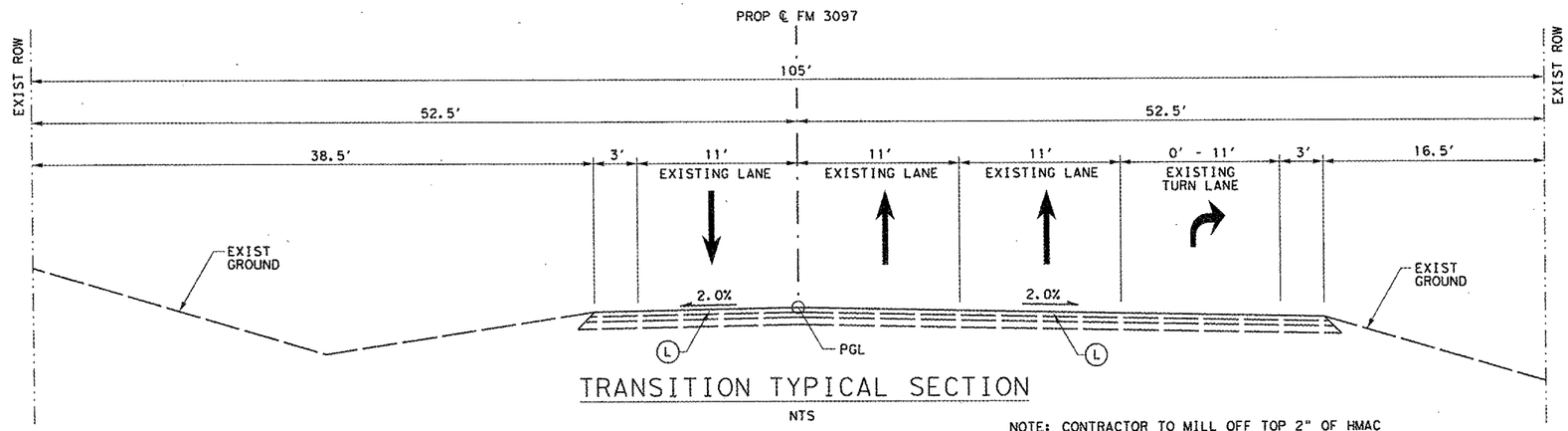
Texas Department of Transportation

FM 3097

TYPICAL SECTIONS

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	IWM	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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Checked:	RRH						

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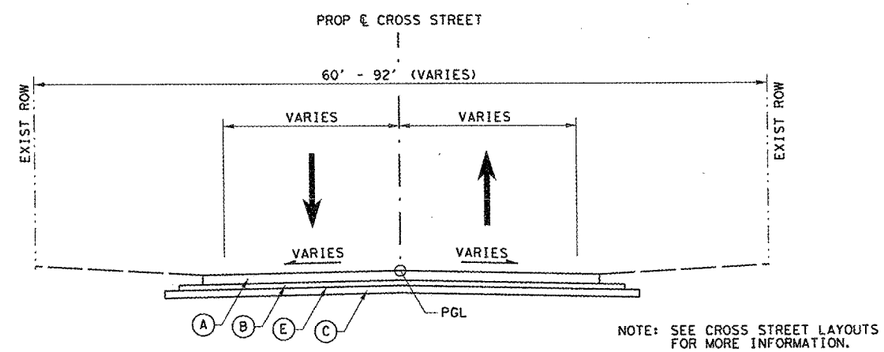


TRANSITION TYPICAL SECTION

NTS

STA 46+09.31 TO STA 47+83.00

NOTE: CONTRACTOR TO MILL OFF TOP 2" OF HMAC AND REPLACE WITH 2" OF D-GR HMA TY-C PG 70-22.



NOTE: SEE CROSS STREET LAYOUTS FOR MORE INFORMATION.

CROSS STREET TYPICAL SECTION

NTS

LEGEND

- (A) CONC PVMT (CONT REINF-CRCP) (8")
- (B) D-GR HMA TY-B PG 64-22 (4")
- (C) FL BS (CMP IN PLC) (TY D GR 2) (FNAL POS) (6")
- (D) CONC CURB (MONO) (TY II)
- (E) PRIME COAT (MC-30 OR AE-P)
- (F) CONC SIDEWALKS (4")
- (G) CONCRETE SIDEWALK WALL
- (H) LANDSCAPING
- (I) BLOCK SOD
- (J) CONC SIDEWALKS (6') (6")
- (K) D-GR HMA TY-B PG 64-22 (10")
- (L) D-GR HMA(SQ) TY-C PG 70-22 (2")
- (M) D-GR HMA(SQ) TY-B PG 64-22 (LEVEL-UP)



07/02/14

NO.	REVISION	BY	DATE

⚠ Replaced 7.2.2014 R.T.

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TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097

TYPICAL SECTIONS

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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SHEET 7 OF 7

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SW3P RESPONSIBILITIES

TxDOT Area of Responsibility

Responsible for the area defined by the limits of the subject project, except for those areas utilized and operated by the contractor. These areas include, though are not limited to, areas used for field offices, equipment and/or material storage, and concrete or asphalt plants.

TxDOT Operational Responsibility

Responsible for seeking coverage under the TPDES Construction General Permit (CGP) and operating the project within the requirements of the CGP for discharging storm water from the subject project and to notify MS4 permit holders of the intent to discharge storm water.

File a Notice of Termination with TCEQ upon completion of the project when the exposed areas have been stabilized with a vegetative cover of at least 70%.

Contractor Area of Responsibility

Responsible for all areas under their direct operational control which includes, though not limited to, areas used for field offices, equipment and/or material storage, and concrete or asphalt plants. These areas may be located on or off the subject project's R.O.W.

Contractor Operational Responsibility

Responsible for seeking coverage under the TPDES Construction General Permit (CGP) and adhering to all requirements of the permit for discharging storm water from the areas under their operational control. Perform regular inspections, prepare a written report of deficiencies, and repair deficiencies within the time frame set forth by the permit. File a Notice of Termination with TCEQ upon completion of the project when the exposed areas have been stabilized with a vegetative cover of at least 70%.

Responsible under contractual obligations to TxDOT to install, clean, repair, replace or remove sediment and erosion control devices as indicated on TxDOT's Inspection Reports, or as required by daily construction practices, within the time frame set forth by the permit.

CSJ: 3148-01-006 Sheet 11 A

County: Rockwall

Highway: FM 3097

SPECIFICATION DATA

Table 1: Soil Constants Requirements

Item	Description	Plasticity Index		Note
		Max	Min	
132	EMBK(FINAL) (DENS CONT) (TY C1)	40	8	1
132	Embk(FINAL) (DENS CONT) (TY C2)	25	10	2

Note 1: Material excavated from the project must meet the PI requirements when used in the top 10 feet of embankment that supports the pavement structure or other locations shown in the plans. Do not use shale and obtain approval to incorporate shaley clay produced by the construction project.

Note 2: Use as a non-select embankment backfill as defined under Item 423.2.C.1. Use as an embankment to backfill behind abutments to the extent of the approach slab or to backfill areas enclosed by an abutment and / or retaining walls or other locations as shown in the plans.

Table 2: Basis of Estimate for Permanent Construction

Item	Description	Thickness	Rate		Quantity
162	Block Sod	4"	N/A	N/A	13664 SY
166 *	Fertilizer (12-6-6)	N/A	500	Lb/Ac	1.66 Ton
168	Vegetative Watering (Warm)**	N/A	720000	Gal/Ac	4725 MG
310	Prime Coat (MC-30 or AE-P)	N/A	0.15	Gal/SY	6939 Gal
3268	D-GR HMA TY-B PG64-22	VARIES	110	LB/SY/IN	10557 Ton
3267	D-GR HMA TY-C PG70-22	VARIES	110	LB/SY/IN	330 Ton
3267	D-GR HMA TY-B PG64-22 (LEVEL-UP)	VARIES	110	LB/SY/IN	334 Ton

*For contractor's information only.
**Adjust for Actual Field Conditions/Temperatures as Necessary. See Vegetation Establishment Sheet for estimated daily rates.

Note: (1) Base material weight based on 1.50 Ton/CY (dry- compacted)
(2) Asphalt weight based on 110 LB/SY/IN
(3) Subgrade weight based on 1.5 Ton/CY (dry-compacted)

Δ Replaced 7/2/14 A.T

Table 3: Basis of Estimate for Temporary Erosion Control Items				
Item	Description	Rate		Quantity
164	Drill Seeding (Temp) (**Warm**)	See Specifications		9050.5 SY
166*	Fertilizer (12-6-6)	500	Lb/Ac	0.83 Ton
164	Drill Seeding (Temp) (**Cool**)	See Specifications		9050.5 SY
166*	Fertilizer (12-6-6)	500	Lb/Ac	0.83 Ton
*For Contractor's Information Only.				

Table 4: Basis of Estimate for Finish Colors (Items 427 & 446) [1]		
Element	Color	Specification Number [2]
Retaining Wall	Dark Beige	20450
Retaining Wall Coping	Light Beige	23717
Concrete Rail Parts	Light Beige	23717
Metal Rail Parts	Green	34108

GENERAL

Access will be provided to all business and residences at all times. Where turning radii are limited during phased construction at intersections, provide all weather surfaces such as RAP or base in turning movements to accommodate and to protect the traffic from edge drop-offs. Materials, labor, maintenance and removal for these temporary accesses and radii will not be paid for directly but will be considered subsidiary to the various bid items.

The construction, operation and maintenance of the proposed project will be consistent with the state implementation plan as prepared by the Texas Commission on Environmental Quality.

The disturbed area for this project, as shown on the plans is 11.22 acres. However, the Total Disturbed Area (TDA) will establish the required authorization for storm water discharges. The TDA of this project will be determined by the sum of the disturbed area in all project locations in the contract, and all disturbed area on all Project-Specific Locations (PSL) located in the project limits and/or within 1 mile of the project limits. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction site as shown on the plans, according to the TDA of the project. The contractor will obtain any required authorization from the TCEQ for the discharge of storm water from any PSL for construction support activities on or off of the project row according to the TDA of the project. When the TDA for the project exceeds 1 acre, provide a copy of the appropriate application of permit (NOI, or Construction Site Notice) to the engineer, for any PSL located in the project

CSJ: 3148-01-006 Sheet 11 B

County: Rockwall

Highway: FM 3097

limits or within 1 mile of the project limits. Follow the directives and adhere to all requirements set forth in the TCEQ, Texas Pollution Discharge Elimination System, Construction General Permit (TPDES, CGP).

This project required permits with environmental resources agencies. There is a high probability that an environmentally sensitive area could be encountered on the contractor designated Project-Specific Locations (PSL) for this project (haul roads, equipment staging areas, borrow pits, disposal sites, field offices, storage areas, parking areas, etc.). Item 7.19.F, "Project-Specific Locations", will provide a listing of regulatory agencies that may need to be contacted regarding this project.

Prior to contract letting, bidders may request electronic earthwork information by email.
Email: hal.stanford@txdot.gov; brenda.callaway@txdot.gov
Earthwork files will be provided by email or by using TxDOT's Dropbox FTP Service.

Bidders may also obtain a free computer diskette that contains earthwork information from the engineer's office. Paper copies of cross-sections may be produced by using the provided free diskette at the bidders' expense and at copying companies. This data is for non-construction purposes only and it is the responsibility of the prospective bidder to validate the enclosed data with appropriate plans, specifications and estimate for the project(s).

Install traffic marking signs prior to sealcoat application and remove within three days after placement of traffic markings.

Leave all right of way areas undisturbed until actual construction is to be performed in said areas.

Place survey monuments, provided by the department, at points indicated and as detailed in the plans or as directed. Furnish surface coordinates and the elevation of the set monument and an azimuth from the monument to some prominent physical feature, preferably another survey monument on the project. This work will not be paid for directly, but will be considered subsidiary to the various bid items.

Use established industry and utility safety practices to erect poles, luminaries, signs or structures near any overhead or underground utility. Consult with the appropriate utility company prior to beginning such work.

Underground utilities owned by the Texas Department of Transportation may be present within the Right-Of-Way on this project. For signal, illumination, surveillance, and communications & control maintained by TxDOT, call the TxDOT Traffic Signal Office (214-320-6682) for locates a minimum of 48 hours in advance of excavation. For irrigation systems, call TxDOT Maintenance Landscape Office (214-320-6205) for locates a minimum of 48 hours in advance of excavation. If city or town owned irrigation facilities are present, call the appropriate department of the local city or town a minimum of 48 hours in advance of excavation. The Contractor is liable for all damages incurred to the above mentioned utilities when working without having the utilities located prior to excavation.
For the project to be deemed complete, permanently stabilize all unpaved disturbed areas of the project with a vegetative cover at a minimum of 70% density for the control of erosion.

Δ Replaced 7/2/14 A.T.

Repair or replace any structures and utilities that might have been damaged by negligence or a failure to have utility locates performed.

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

Consult with appropriate electric company representatives according to their respective area to coordinate electrical services installations.

Meet weekly with the engineer to notify him or her of planned work for the upcoming week.

Provide the engineer with a daily work schedule of planned work.

Submit pre-letting questions, by email only, to the attention of Area Engineer or Assistant Area Engineer.
Email: hal.stanford@txdot.gov; brenda.callaway@txdot.gov
Answers will be provided by email.

An electronic file containing pre-letting questions and TxDOT answers will be provided upon email request.

Material On Hand (MOH) will not be used in calculating partial payments for Mobilization.

Provide the Engineer with a copy of all DBE subcontractor agreements prior to commencing work.

The following standard detail sheets have been modified:

Item 8:
This Project will be a Five-Day Workweek in accordance with Article 8.3.A.1.

Disincentive

Type	Ref	Duration Allowed	Daily Amount
Closure of Ralph Hall Pkwy	SP 008-069	Maximum of 30 calendar days allowed for closure of Ralph Hall Pkwy in Phase 3 Step 1.	SP 000-2332

Item 100:
Remove the existing roadway small signs, delineators and object markers as shown on the plans, or as directed, during construction within the right of way. Small sign, delineator and object marker removals are subsidiary to this Item.

The limits of preparing right of way will be measured from Sta. 0+00.00 to Sta. 47+83.00 along the centerline of construction.

CSJ: 3148-01-006 Sheet 11 C

County: Rockwall

Highway: FM 3097

Item 104:
In those areas where the pavement is not to be overlaid, provide a smooth surface after the curb removal. Planing or grinding is considered an acceptable method at these locations. Measurement and payment is in accordance with this item.

Sawing of concrete is not paid for directly, but is considered subsidiary to this item.

Item 110:
Scarify and loosen the excavated areas, unpaved surface areas, except rock, to a depth of at least 8 inches and compact in accordance with the specifications.

Perform the following test by an approved laboratory on excavated soils when used for roadway embankment: 1- Tex-145-E (Sulfate Content in Soils), 2- Tex-106-E (Plasticity Index). Provide the above-mentioned test results on sources outside of the right of way at no expense to the department. Contact the engineer for a list of approved laboratories. Notify the engineer 72 hours before sampling and testing material. Perform split-sample verification testing with the engineer when directed. The engineer will sample and test soils produced by the construction project for specification requirements or material sources specified in the plans.

Excavated shale is not an acceptable material for embankment.

Items 110 and 132:
Excavation and embankment for driveways, sleeper slabs, alleys and intersections will not be paid for directly, but will be considered subsidiary to these items.

Item 132:
Excavated material from the project site has not been determined to be suitable for embankment. The bidder assumes all risk for the use of excavated materials for embankment and is expected to meet all material requirements for embankment regardless of the source.

Earth embankments Type C1 and C2, are mainly composed of material other than shale. Furnish materials that are free from vegetation or other objectionable materials and that conform to the requirements of Table 1 (Sheet B). If necessary, add lime slurry in accordance with Item 260, "Lime Treatment (Road-Mixed)" in order to meet these requirements. Use Tex-121-E, figure 1, page 5 to calculate the amount of lime required. Furnish materials containing sulfate at or below the threshold of 5000 parts per million (ppm). For material with sulfate levels greater than 3000 ppm, allow the mixture to mellow for at least three days, or as directed. Test soil for sulfate levels in accordance with Tex-145-E. Use an approved laboratory to perform tests for sulfate and plasticity index and provide results on sources outside the right of way to the department. Contact the engineer for a list of approved laboratories. Notify the engineer 48 hours before sampling and testing material. Perform split-sample verification testing with the engineer when directed. The engineer will sample and test material produced by the construction project for specification requirements or material sources specified in the plans. The engineer will test material placed or excavated to a depth of one foot below and laterally to one foot outside the proposed treatment limit. Lime treatment and testing of this material will not be paid for directly, but will be considered subsidiary to this item.

Do not use shaley clays in embankment unless approved in writing.

Δ Replaced 7/2/14

Use embankment material Type C2 described in Table 1 "Soil Constants Requirements" for embankment within limits of MSE retaining wall behind Class D reinforced backfill zone..

Item 160:
Sequence construction operations to salvage topsoil from one location and spread on areas ready to receive topsoil. Keep stockpiling of topsoil to a minimum.
Use fertile clay or loam from the project site not more than two feet below natural grade as topsoil.

Item 169:
For Class 2 Type H soil retention blanket, the work for this section shall consist of furnishing all materials, equipment, and labor necessary for the installation of an Anchor Reinforced Vegetation System as a non-structural erosion control and/or slope protection solution.

Method of Measurement: By the square yard - as indicated in contract documents including seams, overlaps, anchor trenches, and wastage.

A. Basis of Payment: By the square yard installed as shown on the plans.
Anchor Reinforced Vegetation System (ARVS): A soil protection system combining a High Performance Turf Reinforcement Mat (HPTRM,), Securing Pins, and Earth Percussion Anchors. The system protects soil surfaces from two failure mechanisms: surface erosion (non-structural applications) and shallow plane instability (structural applications).

B. *Certificate of Conformance (COC):* An official document certified by an authorized representative within the manufacturer's company that the manufactured synthetic turf reinforcement mat product(s) comply with the testing procedures and requisite results expressly stated within the Manufacturing Quality Control (MQC) program , meet designated property values as manufactured in a facility having achieved ISO 9001:2000 certification, and have been tested in accordance with GAI-LAP procedures.

C. *High Performance Turf Reinforcement Mat (HPTRM):* A long-term, non-degradable RECP composed of UV-stabilized, non-degradable, synthetic fibers, nettings and/or filaments processed into three-dimensional reinforcement matrices designed for permanent and critical hydraulic applications where design discharges exert velocities and shear stresses that exceed the limits of mature natural vegetation. HPTRMs provide sufficient thickness, strength and void space to permit soil filling and/or retention and the development of vegetation within the matrix. The HPTRM MARV tensile strength per ASTM D-6818 is 3000 lbs/ft in the weakest principle direction.

D. *Manufacturing Quality Control (MQC) Program*: A certified and documented program initiated and operated by the manufacturer that outlines the operational techniques and activities which sustain a quality of the synthetic turf reinforcement mat product(s) that will satisfy given needs.

E. *Minimum Average Roll Value (MARV):* Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.

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F. *Percussion Driven Earth Anchor (PDEA):* A device designed to permanently stabilize soil via a metal cleat, flexible or rigid tendon, and load bearing plate. The anchor is driven through the HPTRM to the specified depth, and then tensioned appropriately to load-lock for desired pull-out resistance.

G. *Rolled Erosion Control Product (RECP):* A temporary degradable or long-term non-degradable material manufactured or fabricated into rolls designed to reduce soil erosion and assist in the growth, establishment and protection of vegetation.

H. *Securing Pin:* A device designed to temporarily hold the HPTRM in place while either vegetation establishes, or the installation of the HPTRM occurs. The securing pin offers no long term value to permanent tie-down of the HPTRM in an ARVS.

I. *Trilobal Monofilament Yarn:* A multi-dimensional polymer fiber consisting of a minimum of three points, providing increased surface area and grooves/channels along the fiber to capture additional moisture and sediment to enhance vegetative growth.

J. *Typical Roll Value:* Property value calculated from average or mean obtained from test data.

MATERIAL SUBMITTALS
1) Certification:
   a) The Contractor shall provide the Engineer a certificate of conformance stating the name of the HPTRM manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the HPTRM. The manufacturer's certificate of analysis shall state that the furnished HPTRM meets MARV requirements of the specification as evaluated under the manufacturer's quality control program. The certificate shall be attested to by a person having legal authority to bind the Manufacturer.
   b) The Manufacturer is responsible for establishing and maintaining a Quality Control Program to assure compliance with the requirements of the specification. Documentation describing the quality control program shall be made available prior to the approval of the ARVS System for use on the project.
   c) The Contractor shall establish and maintain a quality control procedure to assure compliance of the ARVS with the requirements of the specification. Documentation describing the quality control procedure shall be provided to the Engineer.
2) Manufacturing Quality Control (MQC) test results shall be provided by the manufacturer for the HPTRM component of the ARVS prior to installation during the duration of the project as material is delivered to the jobsite.
3) Independent Performance Test Results shall be provided upon request.

DELIVERY, STORAGE, AND HANDLING
A. HPTRM labeling, shipment and storage shall follow ASTM D 4873.
B. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.
C. Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.
D. Each HPTRM roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants. (This will be waived for

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HPTRMs having a 90% retention of strength after 6000 hours of exposure per ASTM D-4355.)

E. The protective wrapping shall be maintained during periods of shipment and storage.
F. During storage, HPTRM rolls shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 160 deg F and any other environmental condition that might damage the HPTRM.

QUALITY ASSURANCE SAMPLING, TESTING, AND ACCEPTANCE

A. HPTRM shall be subject to sampling and testing to verify conformance with this specification. Sampling for testing shall be in accordance with ASTM D 4354.
B. Acceptance shall be in accordance with ASTM D 4759 based on testing of either conformance samples obtained using Procedure A of ASTM D 4354, or based on manufacturer's certifications and testing of quality control samples obtained using Procedure B of ASTM D 4354.
C. Quality Assurance Sampling and Testing will be waived for ISO 9001:2000 Certified Manufacturing Facilities. Documentation of ISO 9001:2000 Certification shall be provided upon request.

MANUFACTURERS

All components of the ARVS shall be furnished by a single manufacturer as a complete system.

A. ARVS may be provided by ArmorMax® ARVS as produced by Propex Operating Company, LLC, Chattanooga, TN 37402, USA, Phone (800) 621-1273, or approved equal.
B. Substitutions: For consideration, alternate systems to ArmorMax meeting the material specification must also have a documented history of ARVS installations totaling more than 350,000 square yards and have been in the marketplace for more than three (3) years. Past project documentation will be required for submittal for evaluation to include project name, date of installation, owner's contact information and size of the project.

MATERIALS

A. HPTRM:
1. Three-dimensional, lofty woven polypropylene RECP specially designed for erosion control applications on levees, steep slopes, and vegetated waterways.
2. Matrix composed of Trilobal monofilament yarns woven into uniform configuration of resilient pyramid-like projections that minimize watering requirements while enhancing vegetation establishment.
3. Must be a homogeneous matrix, and not comprised of layers, composites, or discontinuous materials, or otherwise loosely held together by stitched or glued netting.
4. The woven matrix of Trilobal yarns must be heat-set to improve interlock and minimize yarn displacement around anchors and pins, which also results in greater flexibility for improved conformance to uneven surfaces.
5. The HPTRM should meet the following values:

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Property	Test Method	Test Parameters	Units	Property Requirement
Mass Per Unit Area [1]	ASTM D-6566	Minimum	g/m^2 (oz/yd^2)	457.7 (13.5)
Thickness [1]	ASTM D-6525	Minimum	mm (in)	10.2 (0.40)
Light Penetration [1] (% Passing)	ASTM D-6567	Maximum	percent	15
Tensile Strength [1]	ASTM D-6818	Minimum	kN/m (lb/ft)	58.4 x 43.8 (4,000 x 3,000)
Tensile Elongation [1]	ASTM D-6818	Maximum	percent	40 x 35
Resiliency [1]	ASTM D-6524	Minimum	percent	80
Flexibility [2, 3]	ASTM D-6575	Maximum	mg-cm (in-lb)	615,000 (0.534)
UV Resistance [2]	ASTM D-4355	Minimum	percent	90 at 6000 hrs

Note:
1. Minimum Average Roll Value (MARV).
2. Typical Value.
3. A smaller value for flexibility denotes a more flexible material.

6. Performance Properties: In a vegetated state, the HPTRM must demonstrate acceptable performance (as defined by the Engineer) when subjected to at least 0.5 hrs of continuous flow producing the following conditions.

a) Permissible velocity: 7.6 m/sec (25 ft/sec)
b) Permissible tractive force (shear stress): 0.766 kPa (16 psf)
c) Performance may be demonstrated by:
   1) Flume testing at an independent facility under conditions similar to this project provided that the manufacturer can demonstrate that the material tested is functionally equivalent to the material being supplied. This may be demonstrated by providing index property test results (listed in 2.2.A.4) from a GAI-LAP accredited laboratory for both the tested and supplied materials.
   2) A documented case history of successful performance (as defined by the Engineer) at an installation similar to this project where (documented) hydraulic forces met or exceeded the requirements listed above provided that the manufacturer can demonstrate that the case history material is functionally equivalent to the material being supplied. This may be demonstrated by providing index property test results (listed in 2.2.A.4) from a GAI-LAP accredited laboratory for both the case history and supplied materials.

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7. Manufacturing Quality Control: Testing shall be performed at a laboratory accredited by GAI-LAP for tests required for the HPTRM, at frequency exceeding ASTM D-4354, with following minimum acceptable testing frequency:

Property	Test Frequency m^2 (yd^2)
Mass Per Unit Area	1/10,974 (1/13,125)
Thickness	1/10,974 (1/13,125)
Light Penetration (% Passing)	1/10,974 (1/13,125)
Tensile Strength	1/10,974 (1/13,125)
Tensile Elongation	1/10,974 (1/13,125)
Resiliency	1/30,727 (1/36,750)
Flexibility	1/30,727 (1/36,750)
UV Resistance	Annually

ANCHORING DEVICES

A. Securing Pins:
   1. Securing pins should be at least 5 mm (0.20 in.) diameter steel with a 38 mm (1.5 in.) steel washer at the head of the pin. Securing pins should be driven flush to the soil surface.
   2. Length: 300 to 600 mm (12 to 24 inches); sufficient ground penetration to resist pullout.
   3. Placement: The pins provide for temporary tie-down of the HPTRM to the slope to aid with vegetation establishment. Locations of the pins along trenches are at the center of the 0.3 m x 0.3 m (1 ft x 1ft) trench spaced 0.3 m (1 ft) apart. Locations of the pins along the vertical overlaps are spaced 0.3 m (1 ft) apart. HPTRM rolls wider than 3.2 m (10.5 ft) must not have a pin spacing greater than 0.45 m (1.5 ft) in any direction to minimize wrinkling of the material common to wide roll width geosynthetics and the loss of intimate contact beneath the HPTRM.
   4. Heavier metal stakes may be required in rocky soils

B. PDEA:
   1. PDEA with a minimum drive depth of 36 inches are used to provide for permanent tie down of the HPTRM in locations specified in the drawings.
   2. The PDEA components shall be made of materials suitable to resist corrosion and UV degradation particularly at the soil/air interface, and strategically selected to achieve an expected design life of 50 years.
   3. The anchor head shall have smooth edges and shaped in a bullet like configuration with the driving end tapering to a rounded point, minimizing abrasion and installation damage to the HPTRM.
   4. The top load bearing plate shall have openings allowing vegetative growth through the plate and protrude only about 0.2 inches above the

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surface of the mat after installation. The plate shall also include a recessed cavity so that the cable can be cut below the plate surface.

5. For quality control purposes and warranty claims, PDEAs should be delivered to the jobsite fully assembled and ready for installation, and meet the following requirements:

Component	Standard(s)	Material Composition	Physical Properties
Anchor Head (Bullet Nose)	ASTM B-85	Aluminum A383 Alloy (Gravity Die Cast)	Width: 25mm (1.0in.) Length: 84mm (3.3in.) Bearing Area:16cm^2 (1.5in^2) Weight: 45grams (0.1 lb.).
Cable Tendon	ASTM A-1023	Zinc-Aluminum Coated Carbon Steel	Diameter: 3mm (0.12 in.) 1X19 Strand Construction
Load Bearing Plate	ASTM B-240-10	Die Cast Zinc with an Eight (8) Opening Array; Utilizing a Ceramic Roller & Directional Locking Device	Diameter: 108mm (4.25 in.) Thickness: 2.5mm (0.1in.)
Tendon Sleeves	MS51844	Zinc-Aluminum	Length: 15.875mm (5/8") in Wall Thickness: 4.8mm (3/16")

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6. Performance

Performance Property	Value
Cable Tendon Working Load Strength	3.56 kN (0.8 Kips)
Cable Tendon Yield Strength	4.89 kN (1.1 Kips)
Composite Anchor Load Strength*	2.22 kN (0.5 Kips)
Minimum Anchor Drive Depth	0.91m (3.0ft.)
Maximum Anchor Drive Depth	1.52m (5.0 ft.)

* Anchor performance is a function of insitu soil strength and therefore the load range in this specification should be regarded as a guide only. Site specific soil conditions shall be evaluated by a licensed geotechnical engineer to determine the anchor type, depth, and pattern to resist slope instability. Pre construction pull tests may be recommended.

EXECUTION:

PREPARATION

A. Grade and compact areas to be treated with ARVS (compacted as indicated or as directed by Engineer). Subgrade shall be uniform and smooth.
B. Remove large rocks, soil clods, vegetation, and other sharp objects so that the installed mat will have direct contact with the soil surface.
C. Prepare seedbed by loosening 50 to 75 mm (2 to 3 in) of soil above final grade. Select and apply soil amendments, fertilizer, and temporary seeding to scarified surface prior to installation of ARVS. Do not mulch areas where mat is to be placed.
D. Keep areas moist as necessary to establish vegetation. When watering seeded areas, use fine spray to prevent erosion of seeds or soil. If as a result of rain, prepared seedbed becomes crusted or eroded, or if eroded places, ruts, or depressions exist for any reason, rework soil until smooth and reseed such areas.
E. Excavate a Crest of Slope (COS) trench 300 mm (12 in.) wide by 300 mm (12 in.) deep, a minimum of 900 mm (3 ft.) over the crest of the slope. Excavate a Toe of Slope (TOS) trench 300 mm (12 in.) wide by 300 mm (12 in.) deep, a minimum of 900 mm (3 ft.) past the toe of the slope.

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INSTALLATION

A. Install ARVS at elevation and alignment indicated.
B. Beginning at downstream end of the slope, place initial end of first roll of HPTRM into the COS trench and secure with securing pins at 300 mm (12 in) intervals in between PDEAs at 1.2 m (4 ft.) intervals.
C. Unroll the HPTRM down the slope and secure the HPTRM end in the TOS trench with securing pins at 300 mm (12 in) intervals in between PDEAs at 1.2 m (4 ft.) intervals.
D. Position adjacent upstream rolls in same manner, overlapping preceding roll minimum 75 mm (3 in) until the armoring limits are completed securing the overlaps with securing pins at 300 mm (12 in) intervals in between PDEAs at 1.5 m (5 ft.) intervals.
E. Backfill and compact the trenches with specified soil or as directed by Engineer.
F. Secure HPTRM to the slope with securing pins at a frequency of 2.5 pins per square meter (2 pins per square yard) and PDEAs at a frequency of 0.6 anchors per square meter (0.5 anchors per square yard). Increased anchoring frequency may be required if site conditions are such that the Engineer determines it necessary.
G. Alternate installation methods must be approved by Engineer prior to execution.

H. Soil fill and seed the ARVS:
1. Installed ARVS shall be permanently seeded and soil filled.
2. Rubber-tired vehicles must be used, and sharp turns avoided. No heavy and/or tracked equipment or sharp turns are permitted on the installed HPTRM. Avoid ANY traffic over the HPTRM if loose or wet soil conditions exist.
3. Do not place excessive soil above material.
4. Broadcast additional seed above soil-filled mat and irrigate as necessary to establish/maintain vegetation.

Item 247:

Compact to at least 98% of the maximum density determined by Tex-113-E. Construct uniform layer thickness of 12 inches, or less with the required density and moisture content. Triaxial class is required for Grade 1 and 2. Minimum PI is equal to three (3) for all grades.

The use of contractor-owned recycled crushed concrete is allowed provided it meets the Departmental Material Specification, DMS-11000 requirements.

Item 301:

Provide liquid antistripping agents unless otherwise directed. Provide manufacturer's instruction for liquid antistripping agent.
Add the minimum percentage determined by the manufacturer and try subsequent trials at 0.25% increments, unless otherwise instructed by the manufacturer.

Items 305 and 354:

Take possession of recycled asphalt pavement from the project and recycle the material.

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Separate the asphalt pavement from the base material. Stockpile the asphalt pavement at TxDOT provided location. Place the asphalt pavement material in a stockpile that meets the dimensions and requirements designated by the engineer.

Stockpile materials in uniform piles up to 15 feet in height unless otherwise instructed. Furnish adequate equipment at the stockpile to keep and leave the materials in a neat and orderly manner.

Properly dispose of unsalvageable material at your own expense.

Slope longitudinal faces greater than 1 ¼" to a minimum of 1:1 slope at the end of the work period if traffic is able to traverse the joint. Slope transverse tapers to a minimum of 36:1 at the end of the workday. Remove the taper prior to continuing the milling.

For open shoulder sections, plane the asphalt so the flow of water is not impeded at the shoulder edge or across the surface. Added planing up to three feet in width outside the lines and grades of the plans, necessary to provide proper drainage, will be subsidiary to the bid item.

Rap to be stored at TxDOT Stockpile FM 598 in Terrell, TX.

Item 310:
Do not use MC-30 on base courses placed between April 16 and September 15.

Item 320:
Material Transfer Device is required.

The use of windrow pick-up equipment is allowed except on the first course of roadway material placed over the subgrade.

Item 360:
Use of multiple piece tiebars will be required. Provide chairs for multiple piece tiebars, threaded connectors or other adequate devices, used in concrete paving, or tie them to the pavement reinforcing steel. If approved by the engineer for specific areas, in lieu of multiple piece tiebars, drill holes into the pavement and grout straight tiebars in place with epoxy. Use a non-impact, rotary core drill to prevent damage to the pavement unless otherwise directed. Clean the drill holes and then completely fill with epoxy before inserting the tiebar. Do not bend the tiebars or insert them into plastic concrete without the approval of the engineer.

Provide curbs monolithically constructed with the concrete pavement. If continuous monolithic curb has to be temporarily omitted for any reason, provide dowelled curbs in the proposed areas, as detailed in the plans, and apply an approved epoxy resin to the pavement to receive the curb as directed. This work and materials will not be paid for directly, but is considered subsidiary to this item.

If asphalt curing is used, cure the concrete pavement with MS-2.

Stockpile the concrete aggregates at the plant site.

Provide pavement widening joints, as detailed in the plans, at all locations where concrete pavement is placed adjacent to existing concrete pavement. Installation of these joints is not paid for directly, but is considered subsidiary to this item.

Payment for furnishing and installing the pre-molded expansion joint material between the retaining walls and concrete pavement is not paid for directly, but is considered subsidiary to this item.

Provide a curing machine equipped with rubber tires, or other acceptable arrangement, so that the machine will span the pavement and monolithic curb.

Curb transition is paid for as Type II curb.

The installation of curb openings is not paid for directly, but is considered subsidiary to this item.

Place construction, sawed and contraction joints in accordance with the pavement detail sheet and as directed. Joint locations, other than as shown on the plans, are subject to approval. Pavement leaveouts are required on this project as necessary to provide for traffic at driveways and side streets as shown in the plans or as directed. The cost of providing these leaveouts, including the construction of a suitable crossover connection at each site, is not paid for directly but is considered subsidiary to this item.
If a traveling form paver is used, provide one equipped with an electronically operated horizontal control device.

Provide tiebars in longitudinal joints but do not place them within 15 inches of transverse joints.

Use "mechanical steel placing equipment" at the discretion of the engineer.

Provide Class HES concrete. Design Class HES to meet the requirements of Class P and a minimum average flexural strength of 2600 psi in 24 hr.
Contractor personnel performing job-control testing on concrete must be ACI- Certified. Provide a copy of certification paper to the Engineer upon arrival and before testing at job site. Furnish hard copies of calibration reports for testing equipment when non-TxDOT approved equipment is used to test concrete.

The engineer may allow the use of local commercial laboratories under contract to provide these services.

If more than 30% of an area in any 1000-Ft section of roadway requires grinding, action will be taken by the Contractor to make that 1000-Ft full width section uniform without changing ride quality, compromising quality of pavement and decreasing skid resistance. Approved blasting method or other method approved by the Engineer will be performed at the Contractor's expense.

Item 400:
Structural Excavation is not paid for directly but is considered subsidiary to pertinent Items.

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When placing concrete storm drain pipe on slopes of greater than 10 percent, provide cement stabilized backfill to a depth shown on the plans. The aggregate shall conform to the requirements of Article 421.2.E.2.

Item 416:
Provide a minimum of one core per bent, regardless of placement method.

Provide a formed smooth finish for all portions of drill shafts extending above proposed ground. Include cost for this work in the unit bid price for this item.

Traffic signal pole and/or illumination pole foundations will be paid for once regardless of extra work caused by obstructions.

Install a 5/8"x10' copper clad ground rod in each traffic signal pole foundation. The ground rod for each foundation will protrude above the finish grade of the foundation a minimum of 1" and a maximum of 2".

Concrete removal required for installation of drilled shafts will be subsidiary to Item 416.

Item 420:
NATIONAL BRIDGE INVENTORY NUMBERS:
Provide National Bridge Inventory (NBI) numbers on all bridge structures and bridge class culverts.
For Bridge Class Culverts, place National Bridge Inventory numbers at the middle of the downstream headwall using 3" block letters.

For all conditions, use appropriate die cut stencils and black paint for placement. All materials, labor and incidentals associated with placing NBI numbers are subsidiary to the various bid items.

Item 421:
Furnish mix designs to the Engineer in a format compatible to the latest version of the Department's Construction Management System (Site Manager). Mix Design templates will be provided by the Engineer.

Provide High Performance Concrete (HPC) of the class specified for the following bridge components: approach slabs, abutments, bents, columns, slabs, sidewalks and medians.

Provide High Performance Concrete (HPC) of the class specified for all railing and permanent concrete traffic barrier placed on bridges or approach slabs. HPC concrete is not required for portions of rail or concrete traffic barrier not located on a bridge.

Provide sulfate resistant concrete for box culverts and all drilled shafts. At the contractor's option, a sulfate resistant high performance concrete may be used; however, high performance concrete is not considered sulfate resistant concrete when Class C fly ash and Type I cement is used in the mix design.

Strength evaluation using maturity testing, Tex-426-A, may be used for all concrete elements except drilled shafts and mass concrete pours.

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Maturity meters may be used for temperature gradient determination in mass concrete pours.

Provide a digital hydraulic compression testing Machine and accessories. The machine shall have a minimum testing range of 2500 pounds force to 250,000 pounds force with a hydraulic switching valve to allow for rapid advancing, hold, controlled advancing and rapid retracting. The machine shall have a load cell to measure compressive forces within the testing range and shall be calibrated and verified in accordance with ASTM latest version. The Machine can meet or exceed the following when approved by the Engineer:

ELE International ACCU-TEK250 Digital Compression Tester including accessories or Forney F-250EX Standard Compression Machine including accessories or TxDOT approved equal.

Air-entrain all cast-in-place concrete except for Class "B" and concrete used in drilled shafts. For structural concrete, if the air content is more than 1.5% below the required air, follow manufacturer recommendations to add the necessary approved air bags to increase the air content at the job site. Limit the adding of air bags in the field to one trial. For structural concrete in abutments, bents and columns do not reject the load of concrete due to low air content; accept concrete based on strength tests. Structural concrete in approach slabs, slabs, sidewalks, medians and rails shall meet the provisions of the specification. Precast structural members do not require air entrainment.

Item 423:
For Mechanically Stabilized Earth (MSE) walls, provide a system from one of the following approved suppliers:

Reinforced Earth Walls	*The Reinforced Earth Company* *1331 Airport Freeway, Suite 302* *Euless, TX 76040-4150*	*(817) 283-5503*
Reinforced Soil Embankment Walls	*Texas Welded Wire, Inc.* *645 W. Hurst Blvd.* *Hurst, TX 76053*	*(817) 282-4560*
Retained Earth Walls	*Foster Geotechnical* *901 North Highway 77* *Hillsboro, TX 76645*	*(254) 580-9100*
Stabilized Earth Wall	*Vist-A-Wall Systems, LLC* *6800 Manhattan Blvd.* *Suite 304* *Fort Worth, TX 76120*	*(817) 507-0200*
Strengthened Soil Walls	*Lewis Block & Supply Company P.O. Box 480615* *Kansas City, MO 64148*	*(816) 572-6710*

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Structural Embankment, LLC	*Structural Embankment, LLC* *P.O. Box 2200* *Weatherford, TX 76086*	*(817) 599-5700*
Tensar Retaining Wall System	*Tensar Earth Technologies, Inc. 2500* *Northwinds Parkway* *Suite 500* *Alpharetta, GA 30009*	*(770) 344-2090*
Tricon Retained Soil Walls	*Tricon Precast, Ltd.* *15055 Henry Road* *Houston, TX 77060*	*(281) 931-9832*
VP Wall System	*Valley Prestress Products, Inc.* *1520 Calhoun Rd.* *P.O. Box 309* *Eagle Lake, TX 77434*	

All retaining walls will have a uniform texture and appearance.
Unless otherwise noted in the plans, the top of the leveling pad is located 2 feet below the proposed ground.

Square foot surface area of retaining wall is measured from the top of retaining wall to the top of the leveling pad. Footing adjustments made to accommodate the available optional retaining walls are not measured.

Unless otherwise shown on the plans, provide Type A backfill as defined under this item for permanent MSE or concrete block (CB) walls not subject to inundation. Unless otherwise shown on the plans, provide type D backfill as defined under this item for permanent MSE or CB walls subject to inundation.

Supply drainage aggregate meeting the requirements of this item for use as filter material with the retaining wall.

Provide flowable backfill between front face of the wall panel and the culvert wing as shown in the plans.

RAP is not acceptable as backfill for MSE retaining walls.

Unless otherwise noted on the plans, provide flowable backfill meeting the requirements of Item 401 between the back of panels and inlets or drainage pipes where the required compaction can not be achieved. Flowable backfill used for this purpose is subsidiary to this item.

Submit design calculations supporting the details necessary to incorporate coping, railing, inlets, drainage, electrical conduits and any additional necessary features.

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The contractor has the option of constructing any of the types of retaining walls for which details and specifications are included in the plans. Footing adjustments made to accommodate the available optional retaining walls are not measured. Regardless of option or options chosen, use the same fascia pattern throughout the entire project, including cast in place full height retaining walls or retaining wall type abutments.

Submit detailed drawings depicting the patterns and matching of precast with cast-in-place for approval.

At contractor's expense, repair all damage to the precast units (such as chips) as required to match the fascia pattern.
Use Embankment Type C2 as non-select embankment backfill as defined under Item 423.2.C.1.

For non-select embankment fill behind retaining walls provide and install fill in accordance with Item 132, Type C2.

For cut walls, the backfill between the select fill zone and the existing ground shall be either select material as required for the select fill zone or backfill meeting or exceeding the requirements of Item 132, type C2. Place material in accordance with Item 132, Type C2 requirements. If existing ground is laid back (i.e. not vertical), the lay back shall be done as a series of equal height benches so as to prevent the formation of a smooth surface at the material interface.

Avoid distinct vertical joints between select backfill and embankment (Non-Select) backfill as required by Section 423.3.E. This may be conveniently done by providing a zone of material behind the strap zone (1' min width) in which alternating lifts of select and non select materials are interlaced.

Items 423 and 427:
Unless otherwise noted on the plans, provide a striated finish on all retaining walls and retaining wall type bridge abutments. Supply form liners providing a finish similar to that derived from Lithotex Formliner Pattern T-2150, "Fractured Fin-Grooved", by the I. M. Scofield Company, Pattern P/C 30717, "¾ inch deep Fractured Fin", by Simons, Pattern 373 "Fractured Fin", by Greenstreak, "Adams Rib – Pattern 16950" by Fitzgerald or equal. Maximum depth of the striations is ¾ inch.

For cast in place walls, provide an off-the-form finish.

For noise walls, provide aesthetic finish as noted in the plans.

Retaining wall colors are shown in Table 4 "Basis of Estimate for Finish Colors (Items 427 & 446)".

Item 427:
Finish concrete structures surface area I with an opaque sealer of the color(s) shown elsewhere in the plans in accordance Item 427.

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Apply a 4-SF sample of each color on the project surfaces for approval. Adjust color as required by Engineer to compensate for surroundings and natural lighting conditions on the project site.

Ensure that surfaces are free of weak surface material, curing compounds and other surface contaminants prior to coating.

FORM LINER FINISHES: Place architectural concrete treatments as shown. Placement is subsidiary to this item.

Where used, provide fractured fin/ribs/striations that are continuous with no apparent curves or discontinuities. Variations of the fractured ribs from true vertical exceeding ¼" for each 4'-0" of panel height are not acceptable.

Provide form liners that release without leaving pieces of liner material on the concrete and without pulling or breaking concrete from the textured surface. Provide form release agents as recommended by the manufacturer. Replace form liners as directed that have become damaged or worn. Replacement of form liners is considered incidental to the work and no additional compensation is provided.

No horizontal splices in the form liner are permitted. Vertical splices may occur only in valleys between fractured ribs.
Provide sample panels a minimum of ten days in advance of starting construction of the textured concrete surfaces. Construct sample panel(s) in accordance with Item 427.4.B.2.d "Form Liner Finish" using each type of approved form liner. Sample panels must meet the requirements of the plans and specifications and be approved before any construction form liners may be ordered, obtained or used. Provide panels having a textured portion at least 5'-0" by 5'-0" with a representative un-textured surrounding surface. If directed, construct and finish additional test panels until a satisfactory concrete surface texture is obtained.

The approved sample panel is the standard of comparison for the production concrete surface texture. If directed, build a new test panel to demonstrate acceptability of any proposed change in construction method.
Tool or replace areas requiring surface treatment that do no match their associated sample panels. Upon completion, tooled or replaced panels must match the associated sample panel. Tooling or replacement is at the contractor's expense.

Joint reveal details and location may vary slightly from what is shown to match the adjacent MSE walls as directed. No additional compensation will be allowed.

Item 440:
Provide reinforcing steel with epoxy coating meeting the requirements of item 440 for the following bridge components: approach slab, slab, sidewalk, median, concrete traffic barrier, and rail.

Epoxy coated reinforcing is not required for portions of rail or concrete traffic barrier not located on a bridge.

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All ties, chairs and other appurtenances used with epoxy coated reinforcing shall be epoxy coated or non-metallic.

Item 446:
Paint all structural steel using protective "System II" paint in accordance with Item 446. Paint colors are shown elsewhere in the plans.

After all concrete placement has been completed, remove any concrete or other contaminate from the beam by hand cleaning methods so as not to damage the primer and then water blast / wash with a minimum of 2,500 psi pressure.

Items 453 and 542:
Rail elements for Item 453 may be obtained from the guard fence previously removed under Item 542. Upon the removal of the temporary railing, the rail elements used from Item 542 become the property of the contractor for disposal outside the limits of the right of way at his own expense.

Item 464:
The concrete collars and the connections of pipes to existing or proposed concrete boxes or pipe will not be paid for directly but will be considered subsidiary to the various bid items.

At locations where storm drains dead-end, plug with a concrete plug of a thickness equal to 1 ½ inches per foot of diameter of pipe with a minimum thickness of 3 inches. The cost of the plugs shall be included in the unit price bid per foot of the various storm drain pipes.

Item 471:
Tackweld all inlet grates and manhole covers to the frame with two 1-inch welds. Supply un-painted cast iron inlet grate and frame and/or cast iron manhole frame and cover.

Item 479:
Salvage and stockpile all existing inlet grates and manhole covers removed under this item at TxDOT Stockpile 7055 FM 598 in Terrell, TX.

Submit a plan detailing proposed methods of handling phased construction at manholes and water valves.

Payment for the phase construction will be considered subsidiary to this item.

Item 496:
Concrete pavement removed as a result of removing the inlets will not be paid for directly but will be considered as subsidiary to Item 496.

Salvage all existing inlet grates and manhole covers being removed.

Item 502:
The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible

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Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Provide written proposed lane closure information by 1:00 pm on the business day prior to the proposed closures. Do not close lanes when this requirement is not met.

When excavation is required next to a pavement lane carrying traffic and the widening is not completed by the end of the work day, backfill against the edge of the pavement with at least a 3:1 slope using an acceptable material to support vehicular traffic. Carefully remove and dispose of this material when work resumes. Backfilling pavement edges, and the materials required for the work will be subsidiary to this item.

Place barricades and signs in locations that do not obstruct the sight distance of drivers entering the highway from driveways or side streets.
Provide rectangular shape (CW12-2P) Temporary Clearance Signs on all bridges where the existing vertical clearance has changed. Install Signs to the satisfaction of the Engineer prior to opening to traffic. Plywood sign blanks will have minimum dimensions of 84" X 12". Work performed and materials are subsidiary to this item.

Do not commence work on the road before sunrise. Do not operate or park any equipment/machinery closer than 30 feet from the traveled roadway after sunset unless authorized by the engineer.

When moving unlicensed equipment on or across any pavement or public highways, protect the pavement from all damage using an acceptable method.

Provide 1 shadow vehicle equipped with truck mounted attenuators as shown on the traffic control plan.
Limit lane closures along FM 3097 to the hours between 9:00 am and 3:30 pm. Work in other areas of the project is not restricted to this time frame.

Item 504:
Furnish one Field Office and a Laboratory (Type B) at the project site, one Field Laboratory (Type A) at the concrete batch plant and one Asphalt Mix Control Laboratory (Type D) at the asphalt mixing plant.

Provide one local phone line to the field office. Supply one phone jack and one telephone per each room in the field office. The cost of the phone installation and various monthly phone service charges will be the contractor's responsibility.

Chain link fencing will be provided around the field office/laboratory and parking areas.

Provide an all in one printer/scanner/fax/copier with software that is compatible with TxDOT equipment, cost not in excess of $300. This is subsidiary to the various bid items.

Item 508:
Testing of materials used in the construction of a temporary detour may be waived when approved by the Engineer.

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Item 512:
The contractor is to provide the hardware for low profile barrier. Pick-up and stockpile all low profile barrier at TxDOT Stockpile 7055 FM 598 in Terrell, Texas 75160. The contractor is to notify TxDOT Project Manager prior to pick-up and delivery of barrier.

Item 529:
Provide grooved joints at 10-foot intervals and ¾ inch expansion joint material for doweled curb at the same locations as on the existing pavement.

For Curb and Gutter sections, provide grooved joints at 10-foot intervals and ¾ inch expansion joint material at a maximum of 50-foot centers and at all radius points and inlets.

Curb and Gutter transitions will be paid for by the foot at the unit price for the corresponding curb or curb and gutter section.

Saw joints at the same location as on the existing pavement.

Item 536:
Use Class "B" concrete for concrete medians and directional islands.

Item 540:
Furnish one type of post throughout the project except as specifically noted in the plans.

Item 556:
Place bell and spigot type pipe with an open joint of approximately ¾ inch.

The cost of making the connection of underdrain pipe to storm sewer line, inlet, or manhole will be considered subsidiary to various bid items.
The requirements for decantation of filter material are deleted for this project.

Item 585:
Use Surface Test Type A on all intersections and driveways.

Use Surface Test Type B pay adjustment schedule 3 on the travel lanes.

Item 610:
Remove roadway illumination assembly components in accordance with established industry and utility safety practices. Notify the City of Rockwall contact Billy Chaffin at (972) 771-7730 48 hours prior to removing roadway illumination assembly.

Remove transformer bases from transformer poles. Remove luminaires and mast arms from the pole shaft. Stockpile pole shafts, mast arms, and assembly hardware at 1600 Airport Road, Rockwall, TX 75087. Pole shafts, mast arms, and assembly hardware will remain property of the City of Rockwall.

Remove abandoned concrete foundations to a point 2 ft. below final grade. Backfill the hole with material that is equal in composition and density to the surrounding area. Replace surfacing material with similar material to an equivalent condition.

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Ensure pole shafts, mast arms, and assembly hardware remain in a usable condition.

Items 618:
Use materials from prequalified material producers list as shown on the Texas Department of Transportation (TxDOT) - Construction Division's (CST) materials producers list. Category is "Roadway Illumination and Electrical Supplies."

The location of conduits and ground boxes are diagrammatic only and may be shifted to accommodate field conditions as directed.

Secure permission and approval from the proper authority prior to cutting into or removing any sidewalks or curbs for installation of this Item.

Place conduit under existing pavement by an approved boring method. Do not place boring pits closer than 2 feet from the edge of the pavement unless otherwise directed. Do not use water jetting. When conduits are bored, do not exceed 18 inches in the vertical and horizontal tolerances as measured from the intended target point.

Do not use a pneumatically driven device for punching holes beneath the pavement (commonly known as a "missile").

Furnish and install a non-metallic pull rope in conduit runs in excess of 50 feet.

Use a colored cleaner-primer on all PVC to PVC joints before application of PVC cement.

Seal all conduit ends with a permanently soft, non-toxic duct seal. Use a duct seal that does not adversely affect other plastic materials or corrode metals.

Furnish and install non-metallic pull ropes in conduit installed for future use and cap using standard weather-tight conduit caps, as approved. This work will not be paid for directly, but is subsidiary to this Item.

Existing conduit is proposed for reuse in this project. Conduit prep will be paid for under Item 8368 as directed by the Engineer. If the existing conduit cannot be used, repair or replace this conduit as directed.

When using existing conduit, ensure that all conduits have bushings and are cleaned of mud and debris. Restrap conduit that is being relocated to new timber poles as if it were a new installation. This work will not be paid for directly, but is subsidiary to this Item.

Item 620:
The equipment grounding conductor shall be identified by a continuous green colored jacket insulation or bare wire. Grounded conductors (Neutral) shall be identified by a continuous white colored jacket. Ungrounded conductors (Hot) in a 120/240v or 240/480v system shall be identified by each pole or leg. For 240-volt branch circuit fed from 120/240 source and 480-volt branch circuit fed from 240/480 source, ensure one leg is identified by a continuous black colored jacket and the other leg by a continuous red colored jacket.

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Item 624:
Slack conductors required by Standard Sheet ED(2)-03 will be subsidiary to Item 624.

Concrete removal required for installation of ground boxes will be subsidiary to Item 624.

Item 627:
Use the timber pole heights, as shown on the plans and in the material summary, for bidding purposes only. Coordinate pole locations, and make field measurements before construction to ensure a vertical clearance of 17 to 19 feet from the highest point on the roadway surface to the span. In addition, place the signal heads a minimum of 40 feet and a maximum of 180 feet from the stop line. If the nearest signal must be more than 180 feet from the stop line, place a supplemental near-side signal head. Determine the field measurements and elevations from the actual field location of the poles, considering all above and below ground utilities and existing roadway elevations.

Item 628:
Contact the appropriate utility company during the first three weeks of the project lead-time period to allow adequate time for any necessary utility adjustments, transformer installation, etc.

Granite concrete service pole embedment depth shall be 10'.

Label the service enclosures indicating service address as well as all required information as shown on the Electrical Detail (ED) standard sheets. Labeling shall be silk screening or other acceptable method. This work will not be paid for directly, but is subsidiary to this Item.

When concrete for service pole foundations is required, use Class A in accordance with Item 421, "Hydraulic Cement Concrete", except consider the concrete subsidiary to Item 628 for payment purposes. When reinforcing steel for service pole foundations is required, it will be in accordance with Item 440,"Reinforcing Steel", except consider the steel subsidiary to Item 628 for payment purposes.
Use only white insulated wire for neutral wire.

Bill the electrical service power usage for Electrical Service #3 (the irrigation system) to the City of Rockwall. Bill the remaining electrical service power usage to the Texas Department of Transportation.

Item 656:
Form a 3/4-inch chamfer on the top edge of each pedestal pole foundation.

Probe for utilities and underground structures prior to drilling foundations. Foundations shall be paid for once regardless of extra work caused by obstructions.

Item 677:
A water blasting method approved by the Engineer will be the only method allowed for the removal of permanent and temporary pavement markings.

Item 680:
Requirements for this Item include the following work, all of which are subsidiary to this Item:

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1. Notify the District Signal Maintenance Office at (214)320-6682 and Construction Office at (214)320-6694 one week before beginning any work involving traffic signals.
2. Provide submittal literature for all traffic signal equipment before installation.
3. Furnish and install a new eight-phase NEMA TS2 Type 2 controller and cabinet, meeting the requirements of Departmental Materials Specifications DMS-11170. Provide the cabinet with an "A" connector harness for NEMA TS2 Type 2 controller. Provide detector panel toggle switches that additionally permit the user to disconnect the detector. Provide cabinet configuration 4 (16 position load bay) in a TS2 Size 6 cabinet.
4. Deliver the cabinet, controller, and accessories (with all cabinet components completely connected and securely strapped down) to the District Signal Shop, 4777 E Hwy 80, Mesquite, for testing. Notify the District Signal Shop two working days before delivery at (214)320-6682.
5. Install the controller cabinet in an orientation as directed.
6. Connect all field wiring to the controller assembly, including SSR coaxial cable termination into the polyphaser. The District will assist in determining how the detection cables are to be connected, and will also program the controller for operation, hook up the malfunction management unit (MMU) or conflict monitor, detector units, and other equipment, and turn on the controller. Pick up the signal cabinet from District Signal Shop. Have a qualified technician and a representative from the controller supplier on the project site to place the traffic signals in operation.
7. Furnish and install all regulatory sign panels for mounting on signal poles and mast arms. Fabricate the sign panels in accordance with Item 636, and mount with Astro-Sign Brac, Signfix aluminum channel, or equal as approved by the Engineer.
8. Install street name signs furnished by the City of Rockwall
9. Use multi-tap ballasts (120/240 volts) for luminaires on signal poles.
10. Install the emergency vehicle preemption equipment supplied by the City of Rockwall.
11. Use qualified personnel to respond to and diagnose all trouble calls during the thirty-day test period. Repair any malfunction to Contractor-supplied signal equipment. Provide to the Engineer a local telephone number, not subject to frequent changes and available on a 24-hour basis, for reporting trouble calls. Response time to reported calls must be less than 2 hours. Make appropriate repairs within 24 hours. Place a logbook in the controller cabinet and keep a record of each trouble call reported. Notify the Engineer of each trouble call. Do not clear the error log in the conflict monitor or MMU during the thirty-day test period without approval.
12. Prevent any damage to property owner's poles, fences, shrubs, mailboxes, etc. Protect all underground and overhead utilities and repair any damage. Provide access to all driveways during construction.
13. Integrate the proposed traffic signal(s) into the existing closed loop system as shown on the plans. Aries closed loop software, which utilizes Econolite controllers, is currently in use in the Dallas District. Provide controllers on this project that fully communicate with the existing closed loop system.
14. The concrete foundation for the controller as shown on the TS-CF-04 is diagrammatic and the dimensions will be adjusted in the field to fit existing conditions.
15. Relocate Radar Units from temporary signals to permanent signals as shown on plans.

Item 681:
Requirements for this Item include the following work, all of which are subsidiary to this Item:

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1. Re-guy signal heads and re-strap the cable after making adjustments to head locations. Accomplish relocation of signal heads for a phase change during the same day.
2. Bottom tether cable for signal heads and signs will be required.
3. Provide submittal literature for all traffic signal equipment before installation.
4. Furnish and install an eight-phase NEMA TS2 Type 2 controller and cabinet, meeting the requirements of Departmental Materials Specifications DMS-11170. Provide the cabinet with an "A" connector harness for NEMA TS2 Type2 controller. Provide detector panel toggle switches with a fixed position that additionally permit the user to disconnect the detector. Provide cabinet configuration 4 (16 position load bay) in a TS2 Size 6 cabinet. Provide a pole-mounted cabinet that has three brackets for pole mounting.
5. Operate and maintain the temporary signal. Provide a telephone number to the District for trouble calls. Check the signal equipment at least monthly, and within 24 hours in response to complaints, and immediately repair or replace any malfunctioning Contractor-supplied equipment. Notify the Department immediately upon finding malfunctioning Department-supplied equipment.
6. Relocate existing street name signs as shown on plans. New mounting hardware shall be furnished by Contractor.
7. Relocate existing Opticom equipment as shown on plans. New mounting hardware will be furnished by the City of Rockwall.
8. Install Radar Units as shown on plans. Radar cable for temporary signals is subsidiary to Item 681.

Item 682:
Install signal head attachments so that the wiring to each signal head passes from the mast arm through the attachment hardware to the signal head. Do not leave cable or wiring exposed.

Provide signal head attachments that allow for adjustment about the horizontal and vertical axis.

Provide aluminum signal heads and aluminum tubing in the following color: Federal Yellow #13538 of Federal Standard 595. Provide back plates, louvers, and the inside of visors with a flat black finish. Provide vented back plates for all traffic signal heads.
Turn down signal heads or cover with burlap or other material, as approved, until traffic signal is placed in operation.

Mount signal heads level and plumb and aimed as directed.

Notify the City of Rockwall contact Chief Merritt at (972) 772-6428 48 hours prior to commencing signal work.

Item 684:
Provide stranded 14 AWG Type A signal cables.

Provide a separate multi-conductor signal cable (14 AWG) inside pedestal poles and signal poles from the terminal strip to each signal head as shown on the plans.

Identify each cable as shown on the plans (cable 1, etc.) with permanent marking labels (Panduit Type PLM standard single marker tie, Thomas&Betts Type 548M, or equal) at each ground box, pole base, and controller.

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Item 685:
Use Type 24-A (6 LF) drill shaft for foundations. Coordinate with Thomas Nalls Fire Station #2 (920 Rockwall Pkwy) to setup and activate advance warning flasher.

Item 686:
Provide 12 circuit Buchanan Type 112SN, Kulka Type 985-GP-12 CU, or equal terminal strips in the signal pole access compartment. Provide additional terminal strips of 8 circuits each when more than 12 circuits are required. The conductors for the Line and Load side of the terminal strip shall be identified with a plastic label with two straps per tag. The line side shall have each signal head, PED head, and push button identified on the tag.

Mark pole shafts and mast arms with the identification numbers from the plans to facilitate field-assembly. Identify pole shafts and mast arms by intersection for projects with multiple intersections.

Provide nuts on top and bottom (double nuts) of the base plate as shown on the plans.

Set anchor bolts for mast arm signal poles and strain poles so that two are in tension and two are in compression. Obtain approval of anchor bolt placement before placing concrete.

Provide vertical clearance of 17 to 19 feet from the roadway to the lowest point of the signal head or mast arm. Place signal heads 40 feet minimum and 180 feet maximum from the stop line. If the nearest signal is more than 180 feet from the stop line, place a supplemental near-side signal head. Determine the field measurements and elevations from the actual field location of the poles, considering all above and below ground utilities and existing roadway elevations.

Provide vibration dampers for mast arms 28 feet to 48 feet in length. Install as shown on MA-DPD-12.

For existing signal poles, plug any unused openings in existing mast arms and poles with an approved material.

Item 1122:
Take all practicable precautions to prevent debris from being discharged into the Waters of Texas or a designated wetland. Install Best Management Practices before demolition begins and maintain them during the demolition. Remove any debris or construction material that escapes containment devices and are discharged into the restricted areas, before the next rain event or within 24 hours of the discharge.

If temporary construction stream crossings are allowed under a Nationwide Permit, submit in writing for approval the type and location of each temporary stream crossing. Use temporary bridges, timber mats, or other structurally sound and non-eroding material for temporary stream crossings. A temporary culvert crossing will consist of storm sewer pipes and 4- to 8-inch nominal size rock. Temporary stream crossings must not cause more than minimal changes to the hydraulic flow characteristics of the stream, increase flooding, or cause more than minimal degradation of water quality. Remove the temporary stream crossings in their entirety and return the affected areas to their pre-existing elevation. All work and materials use for

temporary construction stream crossings will not be paid for directly but are subsidiary to pertinent Items.

Provide SW3P Signs. Obtain from the Engineer a copy of the project's completed TPDES Storm Water Program Construction Site Notice and signed Contractor Certification Statement. Laminate the sheets and bond with adhesive to 36" X 36" plywood sign blanks. Ensure the sheets remain dry. Apply Type C Blue reflective sheeting as the background and add the text "SW3P" in 5" white lettering, centered at the top. Attach the signs to approved temporary mounts and locate at each of the project limits just inside the right of way line at a readable height or as directed by the Engineer. If the sign cannot be placed outside the clear zone, it must adhere to the TMUTCD. SW3P signs, maintenance, and repostings (for replacement or as needed to ensure readability) will be subsidiary to Item 502.

Item 3267:
Tack Coat is required.

Design for a target Laboratory-molded density of 97.0% when using the TGC (Tex-204-F, Part I).

Use aggregate that meets the Surface Aggregate Classification (SAC) requirement of Class D.

Provide the engineer the opportunity to witness all mixture design tests. The engineer may require a retest if not given the opportunity to witness.

Dilution of tack is not allowed.

Provide PG binder PG64-22 in Type B mixture.
Provide PG binder PG70-22 in Type C mixture.

Item 6006:
Supply one spare antenna and one spare radio for this project.

Install the coaxial cable so that it is not exposed to the outdoor environment.

Ensure yagi antenna installation allows for vertical and horizontal adjustment of the antenna. Provide a PCTEL MYK10 antenna bracket or approved equal for yagi antenna installation.

Provide the latest version of the applicable SSR diagnostic software to the District on CD-ROMs, and ensure that it will operate under Windows 98, 2000, 7, Vista and XP operating systems.

Provide new spread spectrum radios that are compatible with the existing radios in the closed loop system. The 3 existing radios in the system are Encom, and the master radio is located at IH30 and FM 740.

Provide eight (8) hours of operational and maintenance training for all brands of radio provided on this project to designated personnel. Provide this training for a maximum of 10 people, at a time and location approved by the Engineer. Provide training which includes, but not be limited

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to, "hands-on" operation for each type of equipment; explanation of all system commands, functions, and usage; required preventative maintenance procedures; and system "trouble-shooting" or problem identification. Submit an outline of the proposed training material for approval at least 60 days before the training begins.

Item 6007:
Salvage the existing traffic signals at FM 3097 & FM 740, FM 3097 & Ralph Hall Parkway, and FM 3097 & Tubbs Road as shown on the plans. Salvage poles, cabinets, service poles and equipment, exposed conduit, and any other equipment as directed. This equipment remains the property of the Texas Department of Transportation. The material listed above is to be stockpiled at the TxDOT Signal Shop yard, 4777 E US 80, Mesquite, as directed. Contact Mr. Lanny Surratt at 214-320-6682 48 hours in advance of delivery. All other material removed in this project will become the property of the Contractor. Dispose of material off the right of way in accordance with federal, state, and local regulations. Maintain the operation of the existing traffic signal until directed to remove it.

Completely remove timber poles not set in concrete without cutting off the pole. Timber poles set in concrete are considered unsalvageable.

Item 8317:
The BBU will be installed with the controller on the concrete pad paid for under Item 680. If a larger pad is needed to accommodate the BBU, the additional labor and material will be subsidiary to this item.

Item 8835:
If a traffic or pedestrian signal pole includes two APS units, or if the APS units cannot be installed a minimum of 10' apart, speech walk messages shall be used. Each speech walk message shall be programmed to clearly state the name of the roadway to be crossed as a result of activating that particular APS unit.

Verify the location of the push button assemblies and the direction of the arrows on the signs prior to installation.

The list of material below is for the Contractor's information only.
It is the responsibility of the Contractor to verify
all items and quantities listed below.

LIST OF MATERIAL/LABOR
SUBSIDIARY TO ITEM 680

DESCRIPTION	UNIT	QUANTITY
250W HPS LUMINAIRE	EA	5
8 PHASE NEMA CONTROLLER COMPLETE W/ CABINET AND ACCESSORIES	EA	3
TRAFFIC SIGNAL CONTROLLER BASE	EA	3

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INSTALL OPTICOM EQUIPMENT (INTERSECTION)	LS	3
INSTALL STREET NAME SIGN	EA	12
REGULATORY SIGN PANEL (R10-12,R10-17T)	EA	10
CONCRETE FOUNDATION (8'x9'x6", CLASS B)	CY	3,9

LIST OF MATERIAL/LABOR
SUBSIDIARY TO ITEM 681

DESCRIPTION	UNIT	QUANTITY
GROUND ANCHORS	EA	19
YELLOW PLASTIC GUY GUARD	EA	19
CONDT (PVC) (SCHD 40) (2")	LF	130
CONDT (PVC) (SCHD 40) (3")	LF	50
CONDT (RM) (1 1/2")	LF	100
CONDT (RM) (2")	LF	70
CONDT (RM) (3")	LF	30
ELEC CONDR (NO. 6) BARE	LF	60
ELEC CONDR (NO. 6) INSULATED	LF	120
ELEC CONDR (NO. 8) BARE	LF	330
ELEC CONDR (NO. 8) INSULATED	LF	2090
GROUND BOX TY C (162911) W / APRON	EA	2
TIMBER POLE (CL 2) 40 FT	EA	10
BACK PLATE (12 IN) (3 SEC)	EA	11
BACK PLATE (12 IN) (4 SEC)	EA	6
BACK PLATE (12 IN) (5 SEC)	EA	2
VEH SIG SEC (12 IN) LED (GRN ARW)	EA	8
VEH SIG SEC (12 IN) LED (GRN)	EA	19

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VEH SIG SEC (12 IN) LED (YEL ARW)	EA	2
VEH SIG SEC (12 IN) LED (YEL)	EA	19
VEH SIG SEC (12 IN) LED (RED)	EA	19
TRF SIG CBL (TY A) (14 AWG) (5 CONDR)	LF	1360
TRF SIG CBL (TY A) (14 AWG) (7 CONDR)	LF	1585
TRF SIG CBL (TY A) (14 AWG) (16 CONDR)	LF	105
SPAN CABLE (1 / 4")	LF	1280
SPAN CABLE (3 / 8")	LF	5120
CONDUIT (PREPARE)	LF	180
GROUND BOX (PREPARE)	EA	2
POLE MOUNT CONTROLLER & CABINET	EA	2
250 W LUMINAIRE	EA	5
RADAR CABLE	LF	4300
REGULATORY SIGN PANEL (R10-12)	EA	2
REGULATORY SIGN PANEL (R10-11B)	EA	2
REGULATORY SIGN PANEL (R3-1)	EA	1
REGULATORY SIGN PANEL (R3-2)	EA	1
REGULATORY SIGN PANEL (R3-8MOD)	EA	1

LIST OF MATERIAL
FURNISHED BY THE CITY OF ROCKWALL

DESCRIPTION	UNIT	QUANTITY
OPTICOM CABLE	LF	4510
OPTICOM DETECTOR W/MOUNTING BRACKET	EA	12
OPTICOM MODULES (2-CHANNEL)	EA	6
OPTICOM CARD RACK AND HARNESS	EA	3

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OPTICOM CONTROLLER ASSEMBLY COMPLETE WITH CABINET AND ACCESSORIES	EA	3
STREET NAME SIGN	EA	12

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ESTIMATE SUMMARY

				CONTROL 3148-01-006 FM 3097 STP 2013(597)MM			ITEM CODE			DESCRIPTION	UNIT	TOTAL	
EST	FINAL	EST	FINAL	EST	FINAL	EST	FINAL	ALT	ITEM CODE	DESC CODE	SP NO			EST	FINAL
						47.830			100	2002	002	PREPARING ROW	STA	47.830	
						6424.000			104	2001		REMOVING CONC (PAV)	SY	6424.000	
						92.000			104	2009		REMOVING CONC (RIPRAP)	SY	92.000	
						280.000			104	2011		REMOVING CONC (MEDIANS)	SY	280.000	
						381.000			104	2015		REMOVING CONC (SIDEWALKS)	SY	381.000	
						2223.000			104	2017		REMOVING CONC (DRIVEWAYS)	SY	2223.000	
						638.000			104	2021		REMOVING CONC (CURB)	LF	638.000	
						123.000			104	2040		REMOVING CONC (PAVERS)	SY	123.000	
						21730.000			110	2001		EXCAVATION (ROADWAY)	CY	21730.000	
						6590.000			110	2002		EXCAVATION (CHANNEL)	CY	6590.000	
						5932.000			132	2025		EMBANKMENT (FINAL) (DENS CONT) (TY C1)	CY	5932.000	
						2574.000			132	2026		EMBANKMENT (FINAL) (DENS.CONT) (TY C2)	CY	2574.000	
						15494.000			160	2003		FURNISHING AND PLACING TOPSOIL (4")	SY	15494.000	
						13664.000			162	2002		BLOCK SODDING	SY	13664.000	
						18101.000			164	2051	002	DRILL SEED (TEMP)(WARM OR COOL)	SY	18101.000	
						4725.000			168	2001		VEGETATIVE WATERING	MG	4725.000	
						300.000			169	2005	002	SOIL RETENTION BLANKETS (CL 2) (TY E)	SY	300.000	
						890.000			169	2008	002	SOIL RETENTION BLANKETS (CL 2) (TY H)	SY	890.000	
						1.000			170	2001		IRRIGATION SYSTEM	LS	1.000	
						5569.000			192	2002		PLANT MATERIAL (1-GAL)	EA	5569.000	
						388.000			192	2004		PLANT MATERIAL (5-GAL)	EA	388.000	
						39.000			192	2006		PLANT MATERIAL (30-GAL)	EA	39.000	
						11.000			192	2007		PLANT MATERIAL (45-GAL)	EA	11.000	
						141.000			192	2015		LANDSCAPE EDGE	LF	141.000	
						1656.000			192	2016		PLANT BED PREPARATION	SY	1656.000	
						36.000			204	2003		SPRINKLING (DUST CONTROL)	MG	36.000	
						18.000			216	2001		PROOF ROLLING	HR	18.000	
						8013.000			247	2054	033	FL BS (CMP IN PLC)(TY D GR 2)(FNAL POS)	CY	8013.000	
						19446.000			305	2006		SLV, HAUL & STKPL RCL APH PV (8 TO 10")	SY	19446.000	
						6939.000			310	2005		PRIME COAT (MC-30 OR AE-P)	GAL	6939.000	
						1920.000			354	2045		PLANE ASPH CONC PAV (2")	SY	1920.000	
						39779.000			360	2001	013	CONC PVMT (CONT REINF-CRCP)(8")	SY	39779.000	
						1658.000			360	2044	013	CONC PVMT (CONT REINF-CRCP)(HES)(8")	SY	1658.000	
						69.000			401	2001		FLOWABLE BACKFILL	CY	69.000	
						4922.000			402	2001		TRENCH EXCAVATION PROTECTION	LF	4922.000	
						10010.000			403	2001		TEMPORARY SPL SHORING	SF	10010.000	
						2355.000			416	2001	001	DRILL SHAFT (18 IN)	LF	2355.000	
						39.000			416	2032	001	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	39.000	
						132.000			416	2034	001	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	132.000	
						2.000			420	2013	002	CL C CONC (MISC)	CY	2.000	
						5264.000			423	2001		RETAINING WALL (MSE)	SF	5264.000	
						969.000			423	2012		RETAINING WALL (CAST-IN-PLACE)	SF	969.000	
						201.000			432	2019		RIPRAP (STONE PROTECTION)(12 IN)	CY	201.000	
						8.000			432	2048		RIPRAP (CONC)(FLUME)	CY	8.000	
						143.000			432	2084		RIPRAP (CONC) (CL B) (4")	CY	143.000	
						785.000			450	2166	001	RAIL (TY C223)	LF	785.000	
						287.000			462	2032	015	CONC BOX CULV (10 FT X 8 FT)	LF	287.000	
						5706.000			464	2005	006	RC PIPE (CL III)(24 IN)	LF	5706.000	
						1449.000			464	2007	006	RC PIPE (CL III)(30 IN)	LF	1449.000	
						381.000			464	2009	006	RC PIPE (CL III)(36 IN)	LF	381.000	

ESTIMATE & QUANTITY SHEET

DIST	COUNTY	CCSJ	SHEET
18	ROCKWALL	3148-01-006	12 A

Δ Replaced 7/21/14 R.T.

ESTIMATE SUMMARY

EST	FINAL	EST	FINAL	EST	FINAL	CONTROL 3148-01-006 FM 3097 STP 2013(597)MM EST	FINAL	ALT	ITEM CODE	DESC CODE	SP NO	DESCRIPTION	UNIT	TOTAL EST	TOTAL FINAL
						226.000			464	2021	006	RC PIPE (CL IV)(18 IN)	LF	226.000	
						2.000			465	2005	002	MANH (COMPL)(TY M)	EA	2.000	
						53.000			465	2104	002	INLET EXT	EA	53.000	
						28.000			465	2564	002	INLET (COMPL)(CURB&GRATE)(TY I)	EA	28.000	
						1.000			465	2737	002	INLET (COMPL)(TY H WITH LID)	EA	1.000	
						1.000			466	2331		WINGWALL (PW-1)(HW=8 FT)	EA	1.000	
						1.000			466	2333		WINGWALL (PW-1)(HW=10 FT)	EA	1.000	
						1.000			466	2334		WINGWALL (PW-1)(HW=11 FT)	EA	1.000	
						4.000			467	2222		SET (TY II)(18 IN)(RCP)(4:1)(C)	EA	4.000	
						5.000			479	2001		ADJ MANHS	EA	5.000	
						2.000			479	2002		ADJ INLETS	EA	2.000	
						6.000			496	2002		REMOV STR (INLET)	EA	6.000	
						27.000			496	2004		REMOV STR (SET)	EA	27.000	
						3.000			496	2005		REMOV STR (WINGWALL)	EA	3.000	
						2.000			496	2006		REMOV STR (HEADWALL)	EA	2.000	
						2441.000			496	2007		REMOV STR (PIPE)	LF	2441.000	
						82.000			496	2008		REMOV STR (BOX CULVERT)	LF	82.000	
						1.000			500	2001	011	MOBILIZATION	LS	1.000	
						18.000			502	2001	033	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	18.000	
						4288.000			508	2002		CONSTRUCTING DETOURS	SY	4288.000	
						2280.000			512	2017	002	PORT CTB (DES SOURCE)(LOW PROF)(TY 1)	LF	2280.000	
						280.000			512	2018	002	PORT CTB (DES SOURCE)(LOW PROF)(TY 2)	LF	280.000	
						700.000			512	2026	002	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	700.000	
						240.000			512	2027	002	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	240.000	
						2280.000			512	2035	002	PORT CTB (STKPL)(LOW PROF)(TY 1)	LF	2280.000	
						280.000			512	2036	002	PORT CTB (STKPL)(LOW PROF)(TY 2)	LF	280.000	
						844.800			528	2002		COLORED TEXTURED CONC (6")	SY	844.800	
						149.000			528	2004		LANDSCAPE PAVERS	SY	149.000	
						1145.000			529	2004		CONC CURB & GUTTER (TY II)	LF	1145.000	
						16318.000			529	2006		CONC CURB (MONO) (TY II)	LF	16318.000	
						1192.000			529	2007		CONC CURB (DOWEL)	LF	1192.000	
						2309.000			530	2010	006	DRIVEWAYS (CONC)	SY	2309.000	
						24.000			531	2005		CURB RAMPS (TY 1)	EA	24.000	
						7.000			531	2006		CURB RAMPS (TY 2)	EA	7.000	
						4310.000			531	2015		CONC SIDEWALKS (4")	SY	4310.000	
						25.000			531	2041		CURB RAMPS (TY 10)	EA	25.000	
						374.000			531	2082		SIDEWALK (SPL) (12")	LF	374.000	
						121.000			536	2006		CONC MEDIAN (MONO NOSE)	SY	121.000	
						25.000			540	2001	031	MTL W-BEAM GD FEN (TIM POST)	LF	25.000	
						1.000			540	2011	031	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1.000	
						1.000			544	2001		GUARDRAIL END TREATMENT (INSTALL)	EA	1.000	
						5.000			610	2072	015	REMOVE RDWY ILL ASSEM	EA	5.000	
						50.000			618	2018		CONDT (PVC) (SCHD 40) (2")	LF	50.000	
						345.000			618	2022		CONDT (PVC) (SCHD 40) (3")	LF	345.000	
						995.000			618	2023		CONDT (PVC) (SCHD 40) (3") (BORE)	LF	995.000	
						1369.000			618	2024		CONDT (PVC) (SCHD 40) (4")	LF	1369.000	
						70.000			618	2034		CONDT (PVC) (SCHD 80) (2")	LF	70.000	
						80.000			618	2046		CONDT (RM) (1")	LF	80.000	
						330.000			620	2009	001	ELEC CONDR (NO. 6) BARE	LF	330.000	
						690.000			620	2010	001	ELEC CONDR (NO. 6) INSULATED	LF	690.000	

ESTIMATE & QUANTITY SHEET

DIST	COUNTY	CCSJ	SHEET
18	ROCKWALL	3148-01-006	12 B

Δ Replaced 7/2/14 A.T.

ESTIMATE SUMMARY

						CONTROL 3148-01-006 FM 3097 STP 2013(597)MM		ALT	ITEM CODE			DESCRIPTION	UNIT	TOTAL	
EST	FINAL	EST	FINAL	EST	FINAL	EST	FINAL		ITEM CODE	DESC CODE	SP NO			EST	FINAL
						1590.000			620	2011	001	ELEC CONDR (NO. 8) BARE	LF	1590.000	
						1840.000			620	2012	001	ELEC CONDR (NO. 8) INSULATED	LF	1840.000	
						580.000			620	2016	001	ELEC CONDR (NO.12) INSULATED	LF	580.000	
						3.000			624	2008	014	GROUND BOX TY A (122311) W/APRON	EA	3.000	
						10.000			624	2012	014	GROUND BOX TY C (162911) W/APRON	EA	10.000	
						2.000			624	2020	014	GROUND BOX TY BATTERY (162915) W/APRON	EA	2.000	
						2.000			628	2099	003	ELC SRV TY D 120/240 070 (NS)SS(E)GC(O)	EA	2.000	
						1.000			628	2262	003	ELC SRV TY D 120/240 060 (NS)AL(N)PS(U)	EA	1.000	
						40.000			644	2001		IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	40.000	
						4.000			644	2004		IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	4.000	
						2.000			644	2027		IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	2.000	
						33.000			644	2060		REMOVE SM RD SN SUP & AM	EA	33.000	
						8523.000			662	2004		WK ZN PAV MRK NON-REMOV (W) 4" (SLD)	LF	8523.000	
						8069.000			662	2032		WK ZN PAV MRK NON-REMOV (Y) 4" (SLD)	LF	8069.000	
						13259.000			662	2067		WK ZN PAV MRK REMOV (W) 4" (SLD)	LF	13259.000	
						849.000			662	2075		WK ZN PAV MRK REMOV (W) 8" (SLD)	LF	849.000	
						505.000			662	2079		WK ZN PAV MRK REMOV (W) 24" (SLD)	LF	505.000	
						160.000			662	2098		WK ZN PAV MRK REMOV (Y) 4" (DOT)	LF	160.000	
						18502.000			662	2099		WK ZN PAV MRK REMOV (Y) 4" (SLD)	LF	18502.000	
						189.000			666	2029		REFL PAV MRK TY I (W) 8" (DOT)(090MIL)	LF	189.000	
						3659.000			666	2035		REFL PAV MRK TY I (W) 8" (SLD)(090MIL)	LF	3659.000	
						2206.000			666	2041		REFL PAV MRK TY I (W) 12"(SLD)(090MIL)	LF	2206.000	
						493.000			666	2047		REFL PAV MRK TY I (W) 24"(SLD)(090MIL)	LF	493.000	
						36.000			666	2053		REFL PAV MRK TY I (W) (ARROW) (090MIL)	EA	36.000	
						24.000			666	2062		REFL PAV MRK TY I(W)(BIKE SYML)(090MIL)	EA	24.000	
						34.000			666	2095		REFL PAV MRK TY I (W) (WORD) (090MIL)	EA	34.000	
						207.000			666	2122		REFL PAV MRK TY I (Y) 8" (SLD)(090MIL)	LF	207.000	
						189.000			666	2151		REF PAV MRK TY II (W) 8" (DOT)	LF	189.000	
						3659.000			666	2153		REF PAV MRK TY II (W) 8" (SLD)	LF	3659.000	
						2206.000			666	2155		REF PAV MRK TY II (W) 12" (SLD)	LF	2206.000	
						493.000			666	2157		REF PAV MRK TY II (W) 24" (SLD)	LF	493.000	
						36.000			666	2160		REF PAV MRK TY II (W) (ARROW)	EA	36.000	
						24.000			666	2163		REF PAV MRK TY II (W) (BIKE SYMBOL)	EA	24.000	
						34.000			666	2173		REF PAV MRK TY II (W) (WORD)	EA	34.000	
						207.000			666	2182		REF PAV MRK TY II (Y) 8" (SLD)	LF	207.000	
						312.000			672	2012	034	REFL PAV MRKR TY I-C	EA	312.000	
						126.000			672	2015	034	REFL PAV MRKR TY II-A-A	EA	126.000	
						93.000			672	2017	034	REFL PAV MRKR TY II-C-R	EA	93.000	
						116.000			672	2024	034	TRAFFIC BUTTON TY W	EA	116.000	
						15649.000			677	2001		ELIM EXT PAV MRK & MRKS (4")	LF	15649.000	
						2191.000			677	2003		ELIM EXT PAV MRK & MRKS (8")	LF	2191.000	
						291.000			677	2005		ELIM EXT PAV MRK & MRKS (12")	LF	291.000	
						241.000			677	2007		ELIM EXT PAV MRK & MRKS (24")	LF	241.000	
						25.000			677	2008		ELIM EXT PAV MRK & MRKS (ARROW)	EA	25.000	
						13.000			677	2018		ELIM EXT PAV MRK & MRKS (WORD)	EA	13.000	
						625.000			677	2021		ELIM EXT (RAISED PAVEMENT MARKERS)	EA	625.000	
						3.000			680	2002		INSTALL HWY TRF SIG (ISOLATED)	EA	3.000	
						3.000			681	2001	002	TEMP TRAF SIGNALS	EA	3.000	
						24.000			682	2001	003	BACK PLATE (12 IN) (3 SEC)	EA	24.000	
						10.000			682	2003	003	BACK PLATE (12 IN) (5 SEC)	EA	10.000	

ESTIMATE & QUANTITY SHEET

DIST	COUNTY	CCSJ	SHEET
18	ROCKWALL	3148-01-006	12 C

⚠ Replaced. 7/2/14 A.T.

ESTIMATE SUMMARY

						CONTROL 3148-01-006 FM 3097 STP 2013(597)MM		A L T	ITEM CODE			DESCRIPTION	UNIT	TOTAL	
EST	FINAL	EST	FINAL	EST	FINAL	EST	FINAL		ITEM CODE	DESC CODE	SP NO			EST	FINAL
						10.000			682	2022	003	VEH SIG SEC (12 IN) LED (GRN ARW)	EA	10.000	
						28.000			682	2023	003	VEH SIG SEC (12 IN) LED (GRN)	EA	28.000	
						16.000			682	2024	003	VEH SIG SEC (12 IN) LED (YEL ARW)	EA	16.000	
						28.000			682	2025	003	VEH SIG SEC (12 IN) LED (YEL)	EA	28.000	
						10.000			682	2026	003	VEH SIG SEC (12 IN) LED (RED ARW)	EA	10.000	
						28.000			682	2027	003	VEH SIG SEC (12 IN) LED (RED)	EA	28.000	
						24.000			682	2066	003	PED SIG SEC (12 IN) LED (COUNTDOWN)	EA	24.000	
						835.000			684	2031		TRF SIG CBL (TY A) (14 AWG) (5 CONDR)	LF	835.000	
						2005.000			684	2033		TRF SIG CBL (TY A) (14 AWG) (7 CONDR)	LF	2005.000	
						1800.000			684	2042		TRF SIG CBL (TY A) (14 AWG) (16 CONDR)	LF	1800.000	
						3870.000			684	2079		TRF SIG CBL (TY C) (12 AWG) (2 CONDR)	LF	3870.000	
						2.000			685	2005	014	RLCT RDSD FLASH BEACON ASSM(SOLAR PWRD)	EA	2.000	
						1.000			686	2035		INS TRF SIG PL AM(S) 1 ARM (36')	EA	1.000	
						1.000			686	2041		INS TRF SIG PL AM(S) 1 ARM (40') LUM	EA	1.000	
						1.000			686	2049		INS TRF SIG PL AM(S) 1 ARM (48') LUM	EA	1.000	
						2.000			686	2051		INS TRF SIG PL AM(S) 1 ARM (50')	EA	2.000	
						1.000			686	2053		INS TRF SIG PL AM(S) 1 ARM (50') LUM	EA	1.000	
						1.000			686	2057		INS TRF SIG PL AM(S) 1 ARM (55') LUM	EA	1.000	
						1.000			686	2059		INS TRF SIG PL AM(S) 1 ARM (60')	EA	1.000	
						1.000			686	2065		INS TRF SIG PL AM(S) 1 ARM (65') LUM	EA	1.000	
						6.000			687	2001	005	PED POLE ASSEMBLY	EA	6.000	
						66.000			1122	2002	001	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	66.000	
						66.000			1122	2009	001	ROCK FILTER DAMS (REMOVE)	LF	66.000	
						306.000			1122	2016	001	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	306.000	
						306.000			1122	2019	001	CONSTRUCTION EXITS (REMOVE)	SY	306.000	
						11197.000			1122	2037	001	TEMPORARY SEDIMENT CONTROL FENCE INSTLL	LF	11197.000	
						945.000			1122	2049	001	BIOGRD EROSN CONT LOGS (18" DIA)INSTALL	LF	945.000	
						945.000			1122	2056	001	BIODEGRADBLE EROSION CONTROL LOGS REMOV	LF	945.000	
						11197.000			1122	2057	001	TEMPORARY SEDIMENT CONTROL FENCE REMOVE	LF	11197.000	
						330.000			3267	2050		D-GR HMA(SQ) TY-C PG70-22	TON	330.000	
						334.000			3267	2236		D-GR HMA(SQ) TY-B PG64-22 (LEVEL UP)	TON	334.000	
						10557.000			3268	2008		D-GR HMA TY-B PG64-22	TON	10557.000	
						12276.000			5296	2006		NOISE WALL (8 FT)	SF	12276.000	
						4.000			6006	2001		SPREAD SPECTRUM RADIO	EA	4.000	
						180.000			6006	2002		COAXIAL CABLE	LF	180.000	
						4.000			6006	2005		ANTENNA (UNI-DIRECTIONAL)	EA	4.000	
						3.000			6007	2001		REMOVING TRAFFIC SIGNALS	EA	3.000	
						1870.000			8251	2002	005	RE PM W/RET REQ TY I(W)4"(BRK)(090MIL)	LF	1870.000	
						6975.000			8251	2005	005	RE PM W/RET REQ TY I(W)4"(SLD)(090MIL)	LF	6975.000	
						3029.000			8251	2017	005	RE PM W/RET REQ TY I(Y)4"(SLD)(090MIL)	LF	3029.000	
						1870.000			8251	2025	005	RE PM W/RET REQ TY II (W) 4" (BRK)	LF	1870.000	
						6975.000			8251	2026	005	RE PM W/RET REQ TY II (W) 4" (SLD)	LF	6975.000	
						3029.000			8251	2030	005	RE PM W/RET REQ TY II (Y) 4" (SLD)	LF	3029.000	
						600.000			8251	2044		RE PM W/RET REQ TY I(W)4"(DOT)(090MIL)	LF	600.000	
						600.000			8251	2045		RE PM W/RET REQ TY II(W)4"(DOT)	LF	600.000	
						3.000			8317	2001		BBU SYSTEM (EXTERNAL BATT CABINET)	EA	3.000	
						1450.000			8368	2003		CONDUIT (PREPARE)	LF	1450.000	
						13.000			8368	2008		GROUND BOX (PREPARE)	EA	13.000	
						8.000			8615	2001		RADAR ADVANCE DETECTION DEVICE	EA	8.000	
						24.000			8835	2001		ACCESSIBLE PEDESTRIAN SIGNAL UNITS	EA	24.000	

ESTIMATE & QUANTITY SHEET

DIST	COUNTY	CCSJ	SHEET
18	ROCKWALL	3148-01-006	12D

⚠ Replaced 7/2/14 A.T.

ESTIMATE SUMMARY

						CONTROL 3148-01-006 FM 3097 STP 2013(597)MM		ALT	ITEM CODE			DESCRIPTION	UNIT	TOTAL	
EST	FINAL	EST	FINAL	EST	FINAL	EST	FINAL		ITEM CODE	DESC CODE	SP NO			EST	FINAL
						12.000			8941	2001		RADAR PRESENCE DETECTOR	EA	12.000	
												CONTRACTOR FORCE ACCOUNT WORK (PART)			
												SAFETY CONTINGENCY	LS	1.000	
												CONTRACTOR FORCE ACCOUNT WORK (PART)			
												EROSION CONTROL MAINTENANCE	LS	1.000	

ESTIMATE & QUANTITY SHEET

DIST	COUNTY	CCSJ	SHEET
18	ROCKWALL	3148-01-006	12E

20140702135420Z

Δ Replaced 7/2/14 A.T.

SUMMARY OF TRAFFIC CONTROL

	0508	0512	0512	0512	0512	0512	0512	0662	0662	0662	0662	0662	0662	0662
	2002	2017	2018	2026	2027	2035	2036	2004	2032	2067	2075	2079	2098	2099
LOCATION	CONSTRUCTING DETOURS	PORT CTB (DES SOURCE) (LOW PROF) (TY I)	PORT CTB (DES SOURCE) (LOW PROF) (TY 2)	PORT CTB (MOVE) (LOW PROF) (TY I)	PORT CTB (MOVE) (LOW PROF) (TY 2)	PORT CTB (STKPL) (LOW PROF) (TY 1)	PORT CTB (STKPL) (LOW PROF) (TY 2)	WK ZN PAV MRK NON-REMOV (W) 4" (SLD)	WK ZN PAV MRK NON-REMOV (Y) 4" (SLD)	WK ZN PAV MRK REMOV (W) 4" (SLD)	WK ZN PAV MRK REMOV (W) 8" (SLD)	WK ZN PAV MRK REMOV (W) 24" (SLD)	WK ZN PAV MRK REMOV (Y) 4" (DOT)	WK ZN PAV MRK REMOV (Y) 4" (SLD)
	SY	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF
PHASE 1														
SHEET 1	885	0	0	0	0	0	0	0	0	0	0	0	0	0
SHEET 2	1077	0	0	0	0	0	0	0	0	0	0	0	0	0
SHEET 3	1003	460	80	460	80	0	0	0	0	721	0	0	0	717
RALPH HALL	603	0	0	0	0	0	0	0	0	0	0	0	0	0
TUBBS	458	0	0	0	0	0	0	0	0	0	0	0	0	0
PHASE 2														
SHEET 1	0	640	80	0	0	0	0	3599	3730	0	0	71	160	0
SHEET 2	0	880	40	0	0	0	0	4091	4339	0	0	65	0	0
SHEET 3	0	60	0	0	0	0	0	833	730	0	0	0	0	22
RALPH HALL	97	0	0	0	0	0	0	0	0	2106	0	57	0	2534
ROCKWALL	85	100	40	100	40	0	0	0	0	1516	0	59	0	1865
TUBBS	51	140	40	140	40	0	0	0	0	2454	0	50	0	2808
PHASE 3														
SHEET 1	0	0	0	0	0	640	80	0	0	1860	849	61	0	3697
SHEET 2	0	0	0	0	0	1142	80	0	0	2205	0	54	0	4351
SHEET 3	0	0	0	0	0	258	40	0	0	421	0	0	0	802
RALPH HALL	0	0	0	0	0	0	0	0	0	0	0	18	0	119
ROCKWALL	29	0	0	240	80	100	40	0	0	1026	0	70	0	919
TUBBS	0	0	0	0	0	140	40	0	0	1371	0	61	0	1492
PROJECT TOTALS:	4288	2280	280	700	240	2280	280	8523	8069	13259	849	505	160	18502

SUMMARY OF TRAFFIC CONTROL

	0677	0677	0677	0677	0677	0677	0677
	2001	2003	2005	2007	2008	2018	2021
LOCATION	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (12")	ELIM EXT PAV MRK & MRKS (24")	ELIM EXT PAV MRK & MRKS (ARROW)	ELIM EXT PAV MRK & MRKS (WORD)	ELIM EXT (RAISED PAVEMENT MARKERS)
	LF	LF	LF	LF	EA	EA	EA
SHEET 1	5789	864	139	41	16	7	210
SHEET 2	7693	1202	152	200	6	5	250
SHEET 3	1313	20	0	0	0	0	50
RALPH HALL	311	60	0	0	1	1	40
ROCKWALL		20	0	0	0	0	0
TUBBS	543	25	0	0	2	0	75
PROJECT TOTALS:	15649	2191	291	241	25	13	625

SUMMARY OF SHORING

	0403
	2001
LOCATION	TEMPORARY SPL SHORING
	SF
TS1	831
TS2	559
PROJECT TOTALS:	1390

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097

TRAFFIC CONTROL

SUMMARY SHEET

Designed: IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn: IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: RRH	DAL	ROCKWALL	3148	01	006		13

SHEET 1 OF 1

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SUMMARY OF REMOVAL ITEMS

SHEET NO.	LOCATION	0104 2001 REMOVING CONC (PAV)	0104 2009 REMOVING CONC (RIPRAP)	0104 2011 REMOVING CONC (MEDIANS)	0104 2015 REMOVING CONC (SIDEWALKS)	0104 2017 REMOVING CONC (DRIVEWAYS)	0104 2021 REMOVING CONC (CURB)	0104 2040 REMOVING CONC (PAVERS)	0305 2006 SALV, HAUL & STKPL RCL APH PV (8 TO 10")	0354 2045 PLANE ASPH CONC PAV (2")	0496 2002 REMOV STR (INLET)
		SY	SY	SY	SY	SY	LF	SY	SY	SY	EA
1 OF 3	BEGIN TO STA 9+00	1316	0	206	182	1191	0	0	3796	0	1
1 OF 3	STA 9+00 TO STA 20+00	2824	0	25	85	710	638	0	5447	0	2
2 OF 3	STA 20+00 TO STA 31+00	233	29	0	0	183	0	0	4335	0	0
2 OF 3	STA 31+00 TO 42+00	2051	63	49	114	0	0	123	5721	0	3
3 OF 3	STA 42+00 TO 42+50	0	0	0	0	139	0	0	147	1920	0
PROJECT TOTALS:		6424	92	280	381	2223	638	123	19446	1920	6

SUMMARY OF REMOVAL ITEMS CONT.

SHEET NO.	LOCATION	0496 2004 REMOV STR (SET)	0496 2005 REMOV STR (WINGWALL)	0496 2006 REMOV STR (HEADWALL)	0496 2007 REMOV STR (PIPE)	0496 2008 REMOV STR (BOX CULVERT)	0610 2072 REMOVE RDWY ILL ASSEM	0644 2060 REMOVE SM RD SN SUP & AM
		EA	EA	EA	LF	LF	EA	EA
1 OF 3	BEGIN TO STA 9+00	7	0	0	662	0	0	7
1 OF 3	STA 9+00 TO STA 20+00	13	0	0	1085	0	3	11
2 OF 3	STA 20+00 TO STA 31+00	2	0	2	221	0	0	5
2 OF 3	STA 31+00 TO 42+00	5	3	0	473	82	2	9
3 OF 3	STA 42+00 TO 42+50	0	0	0	0	0	0	1
PROJECT TOTALS:		27	3	2	2441	82	5	33

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⚠ REPLACED, 7/2/14 A.T.

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM, F-1741

Texas Department of Transportation

FM 3097

REMOVAL

SUMMARY SHEET

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		14

SUMMARY OF ROADWAY ITEMS

SHEET NO.	LOCATION	0100 2002 PREP ROW	0204 2003 SPRINKLING (DUST CONTROL)	0216 2001 PROOF ROLLING	0247 2054 FL BS (CMP IN PLC) (TY D GR 2) (FNAL POS)	0310 2005 PRIME COAT (MC-30 OR AE-P)	0360 2001 CONC PVMT (CONT REINF-CRCP) (8")	0360 2044 CONC PVMT (CONT REINF-CRCP) (8") (HES)	0432 2039 RIPRAP (CONC) (CL B) (4")	0450 2166 RAIL (TY C223)	0528 2004 LANDSCAPE PAVERS	0529 2004 CONC CURB AND GUTTER (TY II)	0529 2006 CONC CURB (MONO) (TY II)	0529 2007 CONC CURB (DOWEL)	0530 2010 DRIVEWAYS (CONC)	0531 2005 CURB RAMPS (TY 1)	0531 2006 CURB RAMPS (TY 2)	0531 2015 CONC SIDEWALKS (4")	0531 2041 CURB RAMPS (TY 10)	0536 2006 CONC MEDIAN (MONO NOSE)	0540 2001 MTL W-BEAM GD FEN (TIM POST)	0540 2011 MTL BEAM GD FEN TRANS (THRIE-BEAM)
		STA	MG	HR	CY	GAL	SY	SY	CY	LF	SY	LF	LF	LF	SY	EA	EA	SY	EA	SY	LF	EA
1 OF 9	BEGIN TO STA 3+50	3.50	4.00	2	583	507	3081	0	0	0	0	0	1084	0	357	8	4	265	4	12	0	0
2 OF 9	STA 3+50 TO STA 9+00	5.50	4.00	2	900	790	4963	0	0	0	0	0	2246	0	667	0	0	445	6	0	0	0
3 OF 9	STA 9+00 TO STA 14+50	5.50	4.00	2	1283	1115	5204	1658	0	0	0	591	2435	590	355	5	0	420	4	24	0	0
4 OF 9	STA 14+50 TO 20+00	5.50	4.00	2	1064	926	5656	0	0	0	0	45	2070	0	272	5	0	579	4	24	0	0
5 OF 9	STA 20+00 TO 25+50	5.50	4.00	2	836	718	4297	0	0	0	0	0	2202	0	0	0	0	733	0	0	0	0
6 OF 9	STA 25+50 TO STA 31+00	5.50	4.00	2	946	808	5038	0	0	0	0	0	1745	0	363	0	1	551	3	24	0	0
7 OF 9	STA 31+00 TO STA 36+50	5.50	4.00	2	967	830	5029	0	0	0	0	0	2190	0	0	2	0	669	2	0	0	0
8 OF 9	STA 36+50 TO STA 42+00	5.50	4.00	2	1168	1017	6178	0	3	531	149	303	2146	602	172	4	2	580	2	37	25	1
9 OF 9	STA 42+00 TO STA 47+83	5.83	4.00	2	267	229	333	0	2	254	0	206	200	0	122	0	0	67	0	0	0	0
PROJECT TOTALS		47.83	36.00	18	8013	6939	39779	1658	5	785	149	1145	16318	1192	2309	24	7	4310	25	121	25	1

SUMMARY OF ROADWAY ITEMS CONT.

SHEET NO.	LOCATION	0544 2001 GUARDRAIL END TREATMENT (INSTALL)	0624 2020 GROUND BOX TY BATTERY (162915) W/APRON	0685 2005 RLCT RDSD FLASH BEACON ASSM (SOLAR PWRD)	3267 2050 D-GR HMA (SQ) TY-C PG70-22	3267 2236 D-GR HMA (SQ) TY-B PG64-22 (LEVEL-UP)	3268 2008 D-GR HMA TY-B PG64-22
		EA	EA	EA	TON	TON	TON
1 OF 9	BEGIN TO STA 3+50	0	0	0	0	0	743
2 OF 9	STA 3+50 TO STA 9+00	0	0	0	0	0	1159
3 OF 9	STA 9+00 TO STA 14+50	0	0	0	0	0	1635
4 OF 9	STA 14+50 TO 20+00	0	1	1	0	0	1358
5 OF 9	STA 20+00 TO 25+50	0	0	0	0	0	1053
6 OF 9	STA 25+50 TO STA 31+00	0	1	1	0	0	1186
7 OF 9	STA 31+00 TO STA 36+50	0	0	0	0	0	1217
8 OF 9	STA 36+50 TO STA 42+00	1	0	0	0	0	1491
9 OF 9	STA 42+00 TO STA 47+83	0	0	0	330	334	715
PROJECT TOTALS		1	2	2	330	334	10557

WALL SUMMARY

WALL	0132 2026 EMBANKMENT (FINAL) (DENS CONT) (TY C2)	0401 2001 FLOWABLE BACKFILL	0403 2001 TEMPORARY SPL SHORING	0416 2001 DRILL SHAFT (18 IN)	0420 2013 CL C CONC (MISC)	0423 2001 RE-TAINING WALL (MSE)	0423 2012 RETAINING WALL (CAST-IN-PLACE)	0432 2048 RIPRAP (CONC) (FLUME)	0432 2084 RIPRAP (CONC) (CL B) (4")	0531 2082 SIDEWALK (SPL) (12")	5296 2006 NOISE WALL (8 FT)
	CY	CY	SF	LF	CY	SF	SF	CY	CY	LF	SF
SIDEWALK WALL "B"	0	0	0	0	0	0	465	0	0	166	0
SIDEWALK WALL "C"	0	0	0	0	0	0	504	0	0	208	0
NOISE WALL "D"	0	0	0	1,098	0	0	0	0	50	0	5,799
NOISE WALL "E"	0	0	0	877	0	0	0	0	41	0	4,824
NOISE WALL "F"	0	0	0	247	0	0	0	0	10	0	1,119
NOISE WALL "A"	0	0	0	133	0	0	0	0	5	0	534
MSE RETAINING WALL "G"	2,574	69	8,620	0	2	5,264	0	8	32	0	0
PROJECT TOTALS	2,574	69	8,620	2,355	2	5,264	969	8	138	374	12,276

EARTHWORK SUMMARY

LOCATION	110 2001 EXCAVATION (ROADWAY)	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1)
	CY	CY
STATION		
1+00.00	0	0
1+50.00	0	0
1+74.48	15	30
2+22.87	94	37
2+72.50	207	13
3+25.71	282	4
3+50.00	135	3
4+12.48	694	7
4+15.39	48	0
4+63.77	614	0
5+00.00	315	0
5+50.00	422	0
6+00.00	425	0
6+50.00	425	0
7+00.00	406	0
7+48.88	492	0
8+00.00	514	0
8+50.00	407	0
9+00.00	445	0
9+65.88	833	0
10+11.20	556	0
10+50.00	326	0
11+00.00	390	1
11+50.00	350	5
11+97.20	281	11
12+74.18	751	12
13+00.00	336	0
13+70.00	564	3
14+00.00	122	2
14+50.00	212	2
15+11.02	380	4
15+79.25	468	4
16+50.00	224	41
17+00.00	19	70
17+50.00	11	128
17+89.44	12	142
18+50.00	142	112

EARTHWORK SUMMARY CONT.

LOCATION	110 2001 EXCAVATION (ROADWAY)	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1)
	CY	CY
19+25.00	201	57
19+50.00	28	38
20+00.00	66	56
20+50.00	90	25
21+00.00	123	17
21+50.00	154	21
22+00.00	184	24
22+50.00	199	30
23+00.00	207	40
23+50.00	223	45
24+00.00	240	45
24+50.00	262	49
25+00.00	288	52
25+50.00	320	50
26+00.00	339	47
26+55.42	471	51
27+10.00	453	58
27+50.00	230	50
28+00.00	241	70
28+37.75	166	56
29+17.09	418	66
29+50.00	186	6
30+00.00	184	52
30+50.00	119	97
31+00.00	121	108
31+50.00	118	121
32+00.00	113	122
32+50.00	110	122
32+80.61	67	78
33+34.62	194	141
34+00.00	222	201
34+50.00	80	194
35+00.00	61	200
35+64.99	123	224
36+23.49	104	178
36+50.00	21	95
36+76.96	20	87
37+41.83	201	79
37+56.08	58	3

EARTHWORK SUMMARY CONT.

LOCATION	110 2001 EXCAVATION (ROADWAY)	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1)
	CY	CY
38+50.00	186	171
39+00.00	63	131
39+50.00	63	52
39+83.31	74	3
40+00.00	47	0
40+50.00	93	33
41+03.40	68	125
41+50.00	955	80
42+00.00	1088	118
42+49.00	105	266
43+00.00	22	301
43+50.00	16	271
44+00.00	14	273
44+50.00	9	205
45+00.00	4	139
45+50.00	1	69
45+70.00	0	9
PROJECT TOTALS	21730	5932

1 Replaced 7.2.2014 A.T.

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097

ROADWAY AND WALL

SUMMARY SHEET

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		15

SHEET 1 OF 1

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SUMMARY OF ROADWAY ITEMS

SHEET NO.	LOCATION	0100 2002 PREP ROW	0204 2003 SPRINKLING (DUST CONTROL)	0216 2001 PROOF ROLLING	0247 2054 FL BS (CMP IN PLC) (TY D GR 2) (FNAL POS)	0310 2005 PRIME COAT (MC-30 OR AE-P)	0360 2001 CONC PVMT (CONT REINF-CRCP) (8")	0360 2044 CONC PVMT (CONT REINF-CRCP) (8") (HES)	0432 2039 RIPRAP (CONC) (CL B) (4")	0450 2166 RAIL (TY C223)	0528 2004 LANDSCAPE PAVERS	0529 2004 CONC CURB AND GUTTER (TY II)	0529 2006 CONC CURB (MONO) (TY II)	0529 2007 CONC CURB (DOWEL)	0530 2010 DRIVEWAYS (CONC)	0531 2005 CURB RAMPS (TY 1)	0531 2006 CURB RAMPS (TY 2)	0531 2015 CONC SIDEWALKS (4")	0531 2041 CURB RAMPS (TY 10)	0536 2006 CONC MEDIAN (MONO NOSE)	0540 2001 MTL W-BEAM GD FEN (TIM POST)	0540 2011 MTL BEAM GD FEN TRANS (THRIE-BEAM)
		STA	MG	HR	CY	GAL	SY	SY	CY	LF	SY	LF	LF	LF	SY	EA	EA	SY	EA	SY	LF	EA
1 OF 9	BEGIN TO STA 3+50	3.50	4.00	2	583	507	3081	0	0	0	0	0	1084	0	357	8	4	265	4	12	0	0
2 OF 9	STA 3+50 TO STA 9+00	5.50	4.00	2	900	790	4963	0	0	0	0	0	2246	0	667	0	0	445	6	0	0	0
3 OF 9	STA 9+00 TO STA 14+50	5.50	4.00	2	1283	1115	5204	1658	0	0	0	591	2435	590	355	5	0	420	4	24	0	0
4 OF 9	STA 14+50 TO 20+00	5.50	4.00	2	1064	926	5656	0	0	0	0	45	2070	0	272	5	0	579	4	24	0	0
5 OF 9	STA 20+00 TO 25+50	5.50	4.00	2	836	718	4297	0	0	0	0	0	2202	0	0	0	0	733	0	0	0	0
6 OF 9	STA 25+50 TO STA 31+00	5.50	4.00	2	946	808	5038	0	0	0	0	0	1745	0	363	0	1	551	3	24	0	0
7 OF 9	STA 31+00 TO STA 36+50	5.50	4.00	2	967	830	5029	0	0	0	0	0	2190	0	0	2	0	669	2	0	0	0
8 OF 9	STA 36+50 TO STA 42+00	5.50	4.00	2	1168	1017	6178	0	3	531	149	303	2146	602	172	4	2	580	2	37	25	1
9 OF 9	STA 42+00 TO STA 47+83	5.83	4.00	2	267	229	333	0	2	254	0	206	200	0	122	0	0	67	0	0	0	0
PROJECT TOTALS		47.83	36.00	18	8013	6939	39779	1658	5	785	149	1145	16318	1192	2309	24	7	4310	25	121	25	1

SUMMARY OF ROADWAY ITEMS CONT.

SHEET NO.	LOCATION	0544 2001 GUARDRAIL END TREATMENT (INSTALL)	0624 2020 GROUND BOX TY BATTERY (162915) W/APRON	0685 2005 RLCT RDSD FLASH BEACON ASSM (SOLAR PWRD)	3267 2050 D-GR HMA (SQ) TY-C PG70-22	3267 2236 D-GR HMA (SQ) TY-B PG64-22 (LEVEL-UP)	3268 2008 D-GR HMA TY-B PG64-22
		EA	EA	EA	TON	TON	TON
1 OF 9	BEGIN TO STA 3+50	0	0	0	0	0	743
2 OF 9	STA 3+50 TO STA 9+00	0	0	0	0	0	1159
3 OF 9	STA 9+00 TO STA 14+50	0	0	0	0	0	1635
4 OF 9	STA 14+50 TO 20+00	0	1	1	0	0	1358
5 OF 9	STA 20+00 TO 25+50	0	0	0	0	0	1053
6 OF 9	STA 25+50 TO STA 31+00	0	1	1	0	0	1186
7 OF 9	STA 31+00 TO STA 36+50	0	0	0	0	0	1217
8 OF 9	STA 36+50 TO STA 42+00	1	0	0	0	0	1491
9 OF 9	STA 42+00 TO STA 47+83	0	0	0	330	334	715
PROJECT TOTALS		1	2	2	330	334	10557

WALL SUMMARY

WALL	0132 2026 EMBANKMENT (FINAL) (DENS CONT) (TY C2)	0401 2001 FLOWABLE BACKFILL	0403 2001 TEMPORARY SPL SHORING	0416 2001 DRILL SHAFT (18 IN)	0420 2013 CL C CONC (MISC)	0420 6003 CL A CONC (MISC)	0423 2001 RE-TAINING WALL (MSE)	0423 2012 RETAINING WALL (CAST-IN-PLACE)	0432 2048 RIPRAP (CONC) (FLUME)	0432 2084 RIPRAP (CONC) (CL B) (4")	0531 2082 SIDEWALK (SPL) (12")	5296 2006 NOISE WALL (8 FT)
	CY	CY	SF	LF	CY	SY	SF	SF	CY	CY	LF	SF
SIDEWALK WALL "B"	0	0	0	0	0	0	0	465	0	0	166	0
SIDEWALK WALL "C"	0	0	0	0	0	0	0	504	0	0	208	0
NOISE WALL "D"	0	0	0	1,134	0	0	0	0	0	50	0	5,799
NOISE WALL "E"	0	0	0	911	0	0	0	0	0	41	0	4,824
NOISE WALL "F"	0	0	0	285	0	0	0	0	0	10	0	1,119
NOISE WALL "A"	0	0	0	171	0	0	0	0	0	5	0	534
MSE RETAINING WALL "G"	2,574	69	8,620	0	2	848	5,264	0	8	32	0	0
PROJECT TOTALS	2,574	69	8,620	2,501	2	848	5,264	969	8	138	374	12,276

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EARTHWORK SUMMARY

	110 2001 EXCAVATION (ROADWAY)	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1)
STATION	CY	CY
1+00.00	0	0
1+50.00	0	0
1+74.48	15	30
2+22.87	94	37
2+72.50	207	13
3+25.71	282	4
3+50.00	135	3
4+12.48	694	7
4+15.39	48	0
4+63.77	614	0
5+00.00	315	0
5+50.00	422	0
6+00.00	425	0
6+50.00	425	0
7+00.00	406	0
7+48.88	492	0
8+00.00	514	0
8+50.00	407	0
9+00.00	445	0
9+65.88	833	0
10+11.20	556	0
10+50.00	326	0
11+00.00	390	1
11+50.00	350	5
11+97.20	281	11
12+74.18	751	12
13+00.00	336	0
13+70.00	564	3
14+00.00	122	2
14+50.00	212	2
15+11.02	380	4
15+79.25	468	4
16+50.00	224	41
17+00.00	19	70
17+50.00	11	128
17+89.44	12	142
18+50.00	142	112

EARTHWORK SUMMARY CONT.

LOCATION	110 2001 EXCAVATION (ROADWAY)	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1)
	CY	CY
19+25.00	201	57
19+50.00	28	38
20+00.00	66	56
20+50.00	90	25
21+00.00	123	17
21+50.00	154	21
22+00.00	184	24
22+50.00	199	30
23+00.00	207	40
23+50.00	223	45
24+00.00	240	45
24+50.00	262	49
25+00.00	288	52
25+50.00	320	50
26+00.00	339	47
26+55.42	471	51
27+10.00	453	58
27+50.00	230	50
28+00.00	241	70
28+37.75	166	56
29+17.09	418	66
29+50.00	186	6
30+00.00	184	52
30+50.00	119	97
31+00.00	121	108
31+50.00	118	121
32+00.00	113	122
32+50.00	110	122
32+80.61	67	78
33+34.62	194	141
34+00.00	222	201
34+50.00	80	194
35+00.00	61	200
35+64.99	123	224
36+23.49	104	178
36+50.00	21	95
36+76.96	20	87
37+41.83	201	79
37+56.08	58	3

EARTHWORK SUMMARY CONT.

LOCATION	110 2001 EXCAVATION (ROADWAY)	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1)
	CY	CY
38+50.00	186	171
39+00.00	63	131
39+50.00	63	52
39+83.31	74	3
40+00.00	47	0
40+50.00	93	33
41+03.40	68	125
41+50.00	955	80
42+00.00	1088	118
42+49.00	105	266
43+00.00	22	301
43+50.00	16	271
44+00.00	14	273
44+50.00	9	205
45+00.00	4	139
45+50.00	1	69
45+70.00	0	9
PROJECT TOTALS	21730	5932

NO.	REVISION	BY	DATE
5	ADDED CAP SLAB	KH	06/15/16
4	ADDED DRILLED SHAFTS	KH	12/03/15

CP&Y

TEXAS REGISTERED ENGINEERING FIRM, F-1741

Texas Department of Transportation

FM 3097

ROADWAY AND WALL

SUMMARY SHEET

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	IWM	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	IWM	DAL	ROCKWALL	3148	01	006	15A
Checked:	RRH						

SHEET 1 OF 1

pw: Active:\PT\Plan Sheets & Add Sheets\Summary Sheets\Summary Sheets.dgn
6/15/2016 10:19:15 AM kbu

SUMMARY OF ROADWAY ITEMS

SHEET NO.	LOCATION	0100 2002 PREP ROW	0204 2003 SPRINKLING (DUST CONTROL)	0216 2001 PROOF ROLLING	0247 2054 FL BS (CMP IN PLC) (TY D GR 2) (FNAL POS)	0310 2005 PRIME COAT (MC-30 OR AE-P)	0360 2001 CONC PVMT (CONT REINF-CRCP) (8")	0360 2044 CONC PVMT (CONT REINF-CRCP) (8") (HES)	0432 2039 RIPRAP (CONC) (CL B) (4")	0450 2166 RAIL (TY C223)	0528 2004 LANDSCAPE PAVERS	0529 2004 CONC CURB AND GUTTER (TY II)	0529 2006 CONC CURB (MONO) (TY II)	0529 2007 CONC CURB (DOWEL)	0530 2010 DRIVEWAYS (CONC)	0531 2005 CURB RAMPS (TY 1)	0531 2006 CURB RAMPS (TY 2)	0531 2015 CONC SIDEWALKS (4")	0531 2041 CURB RAMPS (TY 10)	0536 2006 CONC MEDIAN (MONO NOSE)	0540 2001 MTL W-BEAM GD FEN (TIM POST)	0540 2011 MTL BEAM GD FEN TRANS (THRIE-BEAM)
		STA	MG	HR	CY	GAL	SY	SY	CY	LF	SY	LF	LF	LF	SY	EA	EA	SY	EA	SY	LF	EA
1 OF 9	BEGIN TO STA 3+50	3.50	4.00	2	583	507	3081	0	0	0	0	0	1084	0	357	8	4	265	4	12	0	0
2 OF 9	STA 3+50 TO STA 9+00	5.50	4.00	2	900	790	4963	0	0	0	0	0	2246	0	667	0	0	445	6	0	0	0
3 OF 9	STA 9+00 TO STA 14+50	5.50	4.00	2	1283	1115	5204	1658	0	0	0	591	2435	590	355	5	0	420	4	24	0	0
4 OF 9	STA 14+50 TO 20+00	5.50	4.00	2	1064	926	5656	0	0	0	0	45	2070	0	272	5	0	579	4	24	0	0
5 OF 9	STA 20+00 TO 25+50	5.50	4.00	2	836	718	4297	0	0	0	0	0	2202	0	0	0	0	733	0	0	0	0
6 OF 9	STA 25+50 TO STA 31+00	5.50	4.00	2	946	808	5038	0	0	0	0	0	1745	0	363	0	1	551	3	24	0	0
7 OF 9	STA 31+00 TO STA 36+50	5.50	4.00	2	967	830	5029	0	0	0	0	0	2190	0	0	2	0	669	2	0	0	0
8 OF 9	STA 36+50 TO STA 42+00	5.50	4.00	2	1168	1017	6178	0	3	531	149	303	2146	602	172	4	2	580	2	37	25	1
9 OF 9	STA 42+00 TO STA 47+83	5.83	4.00	2	267	229	333	0	2	254	0	206	200	0	122	0	0	67	0	0	0	0
	PROJECT TOTALS	47.83	36.00	18	8013	6939	39779	1658	5	785	149	1145	16318	1192	2309	24	7	4310	25	121	25	1

SUMMARY OF ROADWAY ITEMS CONT.

SHEET NO.	LOCATION	0544 2001 GUARDRAIL END TREATMENT (INSTALL)	0624 2020 GROUND BOX TY BATTERY (162915) W/APRON	0685 2005 RLCT RDSD FLASH BEACON ASSM (SOLAR PWRD)	3267 2050 D-GR HMA (SQ) TY-C PG70-22	3267 2236 D-GR HMA (SQ) TY-B PG64-22 (LEVEL-UP)	3268 2008 D-GR HMA TY-B PG64-22
		EA	EA	EA	TON	TON	TON
1 OF 9	BEGIN TO STA 3+50	0	0	0	0	0	743
2 OF 9	STA 3+50 TO STA 9+00	0	0	0	0	0	1159
3 OF 9	STA 9+00 TO STA 14+50	0	0	0	0	0	1635
4 OF 9	STA 14+50 TO 20+00	0	1	1	0	0	1358
5 OF 9	STA 20+00 TO 25+50	0	0	0	0	0	1053
6 OF 9	STA 25+50 TO STA 31+00	0	1	1	0	0	1186
7 OF 9	STA 31+00 TO STA 36+50	0	0	0	0	0	1217
8 OF 9	STA 36+50 TO STA 42+00	1	0	0	0	0	1491
9 OF 9	STA 42+00 TO STA 47+83	0	0	0	330	334	715
	PROJECT TOTALS	1	2	2	330	334	10557

WALL SUMMARY

WALL	0132 2026 EMBANKMENT (FINAL) (DENS CONT) (TY C2)	0401 2001 FLOWABLE BACKFILL	0403 2001 TEMPORARY SPL SHORING	0416 2001 DRILL SHAFT (18 IN)	0420 2013 CL C CONC (MISC)	0420 6003 CL A CONC (MISC)	0423 2001 RE-TAINING WALL (MSE)	0423 2012 RETAINING WALL (CAST-IN-PLACE)	0432 2048 RIPRAP (CONC) (FLUME)	0432 2084 RIPRAP (CONC) (CL B) (4")	0531 2082 SIDEWALK (SPL) (12")	5296 2006 NOISE WALL (8 FT)
	CY	CY	SF	LF	CY	SY	SF	SF	CY	CY	LF	SF
SIDEWALK WALL "B"	0	0	0	0	0	0	0	465	0	0	166	0
SIDEWALK WALL "C"	0	0	0	0	0	0	0	504	0	0	208	0
NOISE WALL "D"	0	0	0	1,134	0	0	0	0	0	50	0	5,799
NOISE WALL "E"	0	0	0	911	0	0	0	0	0	41	0	4,824
NOISE WALL "F"	0	0	0	285	0	0	0	0	0	10	0	1,119
NOISE WALL "A"	0	0	0	171	0	0	0	0	0	5	0	534
MSE RETAINING WALL "G"	2,574	0	8,620	0	0	848	5,128	0	9	35	0	0
PROJECT TOTALS	2,574	0	8,620	2,501	0	848	5,128	969	9	141	374	12,276

EARTHWORK SUMMARY

STATION	110 2001 EXCAVATION (ROADWAY) CY	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1) CY
1+00.00	0	0
1+50.00	0	0
1+74.48	15	30
2+22.87	94	37
2+72.50	207	13
3+25.71	282	4
3+50.00	135	3
4+12.48	594	7
4+15.39	48	0
4+63.77	614	0
5+00.00	315	0
5+50.00	422	0
6+00.00	425	0
6+50.00	425	0
7+00.00	406	0
7+48.88	492	0
8+00.00	514	0
8+50.00	407	0
9+00.00	445	0
9+65.88	833	0
10+11.20	556	0
10+50.00	326	0
11+00.00	390	1
11+50.00	350	5
11+97.20	281	11
12+74.18	751	12
13+00.00	336	0
13+70.00	564	3
14+00.00	122	2
14+50.00	212	2
15+11.02	380	4
15+79.25	468	4
16+50.00	224	41
17+00.00	19	70
17+50.00	11	128
17+89.44	12	142
18+50.00	142	112

EARTHWORK SUMMARY CONT.

LOCATION	110 2001 EXCAVATION (ROADWAY) CY	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1) CY
19+25.00	201	57
19+50.00	28	38
20+00.00	66	56
20+50.00	90	25
21+00.00	123	17
21+50.00	154	21
22+00.00	184	24
22+50.00	199	30
23+00.00	207	40
23+50.00	223	45
24+00.00	240	45
24+50.00	262	49
25+00.00	288	52
25+50.00	320	50
26+00.00	339	47
26+55.42	471	51
27+10.00	453	58
27+50.00	230	50
28+00.00	241	70
28+37.75	166	56
29+17.09	418	66
29+50.00	186	6
30+00.00	184	52
30+50.00	119	97
31+00.00	121	108
31+50.00	118	121
32+00.00	113	122
32+50.00	110	122
32+80.61	67	78
33+34.62	194	141
34+00.00	222	201
34+50.00	80	194
35+00.00	61	200
35+64.99	123	224
36+23.49	104	178
36+50.00	21	95
36+76.96	20	87
37+41.83	201	79
37+56.08	58	3

EARTHWORK SUMMARY CONT.

LOCATION	110 2001 EXCAVATION (ROADWAY) CY	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1) CY
38+50.00	186	171
39+00.00	63	131
39+50.00	63	52
39+83.31	74	3
40+00.00	47	0
40+50.00	93	33
41+03.40	68	125
41+50.00	955	80
42+00.00	1088	118
42+49.00	105	266
43+00.00	22	301
43+50.00	16	271
44+00.00	14	273
44+50.00	9	205
45+00.00	4	139
45+50.00	1	69
45+70.00	0	9
PROJECT TOTALS	21730	5932

NO.	REVISION	BY	DATE
1	REVISED CULVERT RING	RH	07/29/16
2	ADDED CAP SLAB	RH	06/15/16
3	ADDED DRILLED SHAFTS	RH	12/03/15

CP&Y

TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097

ROADWAY AND WALL

SUMMARY SHEET

Designed	IWM	(I) DIST. (O) DIST.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	RRH	DAL	ROCKWALL	3148	01	006	15

SHEET 1 OF 1

SUMMARY OF ROADWAY ITEMS

SHEET NO.	LOCATION	0100 2002 PREP ROW	0204 2003 SPRINKLING (DUST CONTROL)	0216 2001 PROOF ROLLING	0247 2054 FL BS (CMP IN PLC) (TY D GR 2) (FNAL POS)	0310 2005 PRIME COAT (MC-30 OR AE-P)	0360 2001 CONC PVMT (CONT REINF-CRCP) (8")	0360 2044 CONC PVMT (CONT REINF-CRCP) (8") (HES)	0432 2039 RIPRAP (CONC) (CL B) (4")	0450 2166 RAIL (TY C223)	0528 2004 LANDSCAPE PAVERS	0529 2004 CONC CURB AND GUTTER (TY II)	0529 2006 CONC CURB (MONO) (TY II)	0529 2007 CONC CURB (DOWEL)	0530 2010 DRIVEWAYS (CONC)	0531 2005 CURB RAMPS (TY 1)	0531 2006 CURB RAMPS (TY 2)	0531 2015 CONC SIDEWALKS (4")	0531 2041 CURB RAMPS (TY 10)	0536 2006 CONC MEDIAN (MONO NOSE)	0540 2001 MTL W-BEAM GD FEN (TIM POST)	0540 2011 MTL BEAM GD FEN TRANS (THRIE-BEAM)
		STA	MG	HR	CY	GAL	SY	SY	CY	LF	SY	LF	LF	LF	SY	EA	EA	SY	EA	SY	LF	EA
1 OF 9	BEGIN TO STA 3+50	3.50	4.00	2	583	507	3081	0	0	0	0	0	1084	0	357	8	4	265	4	12	0	0
2 OF 9	STA 3+50 TO STA 9+00	5.50	4.00	2	900	790	4963	0	0	0	0	0	2246	0	667	0	0	445	6	0	0	0
3 OF 9	STA 9+00 TO STA 14+50	5.50	4.00	2	1283	1115	5204	1658	0	0	0	591	2435	590	355	3	2	384	4	24	0	0
4 OF 9	STA 14+50 TO 20+00	5.50	4.00	2	1064	926	5656	0	0	0	0	45	2070	0	272	5	0	579 △3	4	24	0	0
5 OF 9	STA 20+00 TO 25+50	5.50	4.00	2	836	718	4297	0	0	0	0	0	2202	0	0	0	0	733	0	0	0	0
6 OF 9	STA 25+50 TO STA 31+00	5.50	4.00	2	946	808	5038	0	0	0	0	0	1745	0	363	0	1	551	3	24	0	0
7 OF 9	STA 31+00 TO STA 36+50	5.50	4.00	2	967	830	5029	0	0	0	0	0	2190	0	0	2	0	669	2	0	0	0
8 OF 9	STA 36+50 TO STA 42+00	5.50	4.00	2	1168	1017	6178	0	3	531	149	303	2146	602	172	4	2	580	2	37	25	1
9 OF 9	STA 42+00 TO STA 47+83	5.83	4.00	2	287	229	333	0	2	254	0	206	200	0	122	0	0	67	0	0	0	0
	PROJECT TOTALS	47.83	36.00	18	8013	6939	39779	1658	5	785	149	1145	16318	1192	2309	22	9	4273 △3	25	121	25	1

SUMMARY OF ROADWAY ITEMS CONT.

SHEET NO.	LOCATION	0544 2001 GUARDRAIL END TREATMENT (INSTALL)	0624 2020 GROUND BOX TY BATTERY (162915) W/APRON	0685 2005 RLCT RDSD FLASH BEACON ASSM (SOLAR PWRD)	3267 2050 D-GR HMA (SQ) TY-C PG70-22	3267 2236 D-GR HMA (SQ) TY-B PG64-22 (LEVEL-UP)	3268 2008 D-GR HMA TY-B PG64-22
		EA	EA	EA	TON	TON	TON
1 OF 9	BEGIN TO STA 3+50	0	0	0	0	0	743
2 OF 9	STA 3+50 TO STA 9+00	0	0	0	0	0	1159
3 OF 9	STA 9+00 TO STA 14+50	0	0	0	0	0	1635
4 OF 9	STA 14+50 TO 20+00	0	1	1	0	0	1358
5 OF 9	STA 20+00 TO 25+50	0	0	0	0	0	1053
6 OF 9	STA 25+50 TO STA 31+00	0	1	1	0	0	1186
7 OF 9	STA 31+00 TO STA 36+50	0	0	0	0	0	1217
8 OF 9	STA 36+50 TO STA 42+00	1	0	0	0	0	1491
9 OF 9	STA 42+00 TO STA 47+83	0	0	0	330	334	715
	PROJECT TOTALS	1	2	2	330	334	10557

WALL SUMMARY

WALL	0132 2026 EMBANKMENT (FINAL) (DENS CONT) (TY C2)	0401 2001 FLOWABLE BACKFILL	0403 2001 TEMPORARY SPL SHORING	0416 2001 DRILL SHAFT (18 IN)	0420 2013 CL C CONC (MISC)	0420 6003 CL A CONC (MISC)	0423 2001 RE-TAINING WALL (MSE)	0423 2012 RETAINING WALL (CAST-IN-PLACE)	0432 2048 RIPRAP (CONC) (FLUME)	0432 2084 RIPRAP (CONC) (CL B) (4")	0531 2082 SIDEWALK (SPL) (12")	5286 2006 NOISE WALL (8 FT)
	CY	CY	SF	LF	CY	SY	SF	SF	CY	CY	LF	SF
SIDEWALK WALL "B"	0	0	0	0	0	0	0	465	0	0	166	0
SIDEWALK WALL "C"	0	0	0	0	0	0	0	504	0	0	208	0
NOISE WALL "D"	0	0	0	1,134	0	0	0	0	0	50	0	5,799
NOISE WALL "E"	0	0	0	911	0	0	0	0	0	41	0	4,824
NOISE WALL "F"	0	0	0	285	0	0	0	0	0	10	0	1,119
NOISE WALL "A"	0	0	0	171	0	0	0	0	0	5	0	534
MSE RETAINING WALL "G"	2,574	0	8,620	0	0	848	5,128	0	9	35	0	0
PROJECT TOTALS	2,574	0	8,620	2,501	0	848	5,128	969	9	141	374	12,276

EARTHWORK SUMMARY

STATION	110 2001 EXCAVATION (ROADWAY) CY	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1) CY
1+00.00	0	0
1+50.00	0	0
1+74.48	15	30
2+22.87	94	37
2+72.50	207	13
3+25.71	282	4
3+50.00	135	3
4+12.48	694	7
4+15.39	48	0
4+63.77	614	0
5+00.00	315	0
5+50.00	422	0
6+00.00	425	0
6+50.00	425	0
7+00.00	406	0
7+48.88	492	0
8+00.00	514	0
8+50.00	407	0
9+00.00	445	0
9+65.88	833	0
10+11.20	556	0
10+50.00	326	0
11+00.00	390	1
11+50.00	350	5
11+97.20	281	11
12+74.18	751	12
13+00.00	336	0
13+70.00	564	3
14+00.00	122	2
14+50.00	212	2
15+11.02	380	4
15+79.25	468	4
16+50.00	224	41
17+00.00	19	70
17+50.00	11	128
17+89.44	12	142
18+50.00	142	112

EARTHWORK SUMMARY CONT.

LOCATION	110 2001 EXCAVATION (ROADWAY) CY	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1) CY
19+25.00	201	57
19+50.00	28	38
20+00.00	66	56
20+50.00	90	25
21+00.00	123	17
21+50.00	154	21
22+00.00	184	24
22+50.00	199	30
23+00.00	207	40
23+50.00	223	45
24+00.00	240	45
24+50.00	262	49
25+00.00	288	52
25+50.00	320	50
26+00.00	339	47
26+55.42	471	51
27+10.00	463	58
27+50.00	230	50
28+00.00	241	70
28+37.75	166	56
29+17.09	418	66
29+50.00	186	6
30+00.00	184	52
30+50.00	119	97
31+00.00	121	108
31+50.00	118	121
32+00.00	113	122
32+50.00	110	122
32+80.61	67	78
33+34.62	194	141
34+00.00	222	201
34+50.00	80	194
35+00.00	61	200
35+64.99	123	224
36+23.49	104	178
36+50.00	21	95
36+76.96	20	87
37+41.83	201	79
37+56.08	58	3

EARTHWORK SUMMARY CONT.

LOCATION	110 2001 EXCAVATION (ROADWAY) CY	132 2025 EMBANKMENT (FINAL) (DENS CONT) (TY C1) CY
38+50.00	186	171
39+00.00	63	131
39+50.00	63	52
39+83.31	74	3
40+00.00	47	0
40+50.00	93	33
41+03.40	68	125
41+50.00	955	80
42+00.00	1088	118
42+49.00	105	266
43+00.00	22	301
43+50.00	16	271
44+00.00	14	273
44+50.00	9	205
45+00.00	4	139
45+50.00	1	69
45+70.00	0	9
PROJECT TOTALS	21730	5932

NO.	REVISION	BY	DATE
△3	CHANGE ORDER #15	KLP	12/15/17
△2	REVISED CULVERT WING	KH	07/28/16
△1	ADDED CAP SLAB	KH	06/15/16
△	ADDED DRILLED SHAFTS	KH	12/03/15

CP&Y

TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097

ROADWAY AND WALL

SUMMARY SHEET

Design	IWM	DIST. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	MRH	DAL	ROCKWALL	3148	01	006	15 C

SHEET 1 OF 1

12/15/2017 12:08:14 PM kperry
Dwl/Active Projects/IYNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.02 Summaries/12004048Dpsum.dgn

DRAINAGE SUMMARY OF QUANTITIES

LINE / CULVERT	FROM	TO		ITEM 402	ITEM 464				ITEM 465				ITEM 466	ITEM 467	ITEM 479	
				2001	2005	2007	2009	2021	2005	2104	2564	2737	2331	2222	2001	2002
				TRENCH EXCAVATION PROTECTION	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL IV) (18 IN)	MANH (COMPL) (TY M)	INLET EXT	INLET (COMPL) (CURB&GRATE) (TY I)	INLET (COMPL) (TY H WITH LID)	WINGWALL (PW-1) (HW=8 FT)	SET (TY II) (18 IN) (RCP) (4:1) (C)	ADJUST MANHS	ADJUST INLETS
				LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
A	A-1	BEND-A11	LINEA15	11	6					2	1					
	BEND-A11	BEND-A12	LINEA14	6	6											
	BEND-A1	A-2	LINEA13	314	314											
	A-2	A-2A	LINEA12	290	285					2	1					
	A-2A	WYE-2B1	LINEA19	276	271					2	1					
	A-2B	BEND-2B1	LINEA21	11	6					2	1					
	BEND-2B1	WYE-2B1	LINEA22	5	5											
	WYE-2B1	WYE-2C1	LINEA23	140	140											
	A-2C	BEND-2C1	LINEA24	11	6					1	1					
	BEND-2C1	WYE-2C1	LINEA25	5	5											
	WYE-2C1	A-3	LINEA20	124	124											
	A-3	A-4	LINEA9	335	330					2	1					
	A-4	A-5	LINEA8	274	269					2	1					
	A-5	A-5A	LINEA7	242	237					2	1					
	A-5A	A-6	LINEA6	385	380					2	1					
	A-6	A-7	LINEA5	250	245					2	1					
	A-7	A-7A	LINEA18	175		250				2	1					
	A-7A	A-8	LINEA4			190				2	1					
	A-8	A-8A	LINEA3			220				2	1					
	A-8A	A-9	LINEA2				165			2	1					
	A-9	OUTFALL-A	LINEA1				108			2	1					
B	B-0	B-1	LINEB17	150	145					1	1					
	B-1	B-1A	LINEB12	321	316					2	1					
	B-1A	MH-B2	LINEB11	506	501					2	1					
	B-2	MH-B2	LINEB16	13	8					2	1					
	MH-B2	B-3	LINEB10	435	576				1							
	B-3	B-4	LINEB9	80	320					2	1					
	B-4	B-4A	LINEB8		365					2	1					
	B-4A	MH-B5	LINEB7	135	345					2	1					
	B-5	MH-B5	LINEB15		7					2	1					
	MH-B5	B-5A	LINEB6	170	445				1							
	B-5A	WYE-B6	LINEB5	100		401				2	1					
	B-6	BEND-B6	LINEB13		6					2	1					
	BEND-B6	WYE-B6	LINEB14		5											
	WYE-B6	B-6A	LINEB4	158		219										
	B-6A	B-7	LINEB2			165				2	1					
	B-7	OUTFALL-B	LINEB1				108			2	1					
C	C-1	OUTFALL-C	LINEC1		38					1	1					
RELOCATE EX. Y INLET STA 36+75						4						1				
TUBBS RD INTERSECTION															5	2
DRIVEWAY W07 CULVERT								160						2		
DRIVEWAY E09 CULVERT								66						2		
EX. 12'X6' RCB AT BROCKWAY BRANCH													1			
TOTAL				4922	5706	1449	381	226	2	53	28	1	1	4	5	2

NOTES:
1. SEE REMOVAL SUMMARY FOR DRAINAGE REMOVALS.

BRIDGE-CLASS CULVERT SUMMARY OF QUANTITIES

LINE / CULVERT	ITEM 110	ITEM 400	ITEM 432	ITEM 462	ITEM 466		ITEM 169	
	2002	2002*	2019	2032	2333	2334	2005	2008
	EXCAVATION (CHANNEL)	STRUCT EXCAV (BOX)*	RIPRAP (STONE PROTECTION) (12 IN)	CONC BOX CULV (10'x8')	WINGWALL (PW-1) (HW=10 FT)	WINGWALL (PW-1) (HW=11 FT)	SOIL RETENTION BLANKETS (CL 2) (TY E)	SOIL RETENTION BLANKETS (CL 2) (TY H)
	CY	CY	CY	LF	EA	EA		SY
BC CULVERT	6590	600	201	287	1	1	300	890
TOTAL	6590	600	201	287	1	1	300	890

NOTES:
1. SEE ROADWAY SUMMARYFOR C402 RAIL ON CULVERT WINGWALL.
2. SEE TCP SUMMARY FOR TEMPORARY SPECIAL SHORING FOR CULVERT CONSTRUCTION.
3. SEE REMOVAL SUMMARY FOR DRAINAGE REMOVALS.
4. ITEM 169-2008 SHALL MEET THE SPECIFICATIONS OF PROPEX ARMORMAX ANCHORED REINFORCED VEGETATION SYSTEM, OR APPROVED EQUAL
* SUBSIDIARY TO ITEM 462, FOR CONTRACTOR'S INFORMATION ONLY.

⚠ Replaced 7/2/2014 R.T.

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097
DRAINAGE
SUMMARY SHEET

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	16

SHEET 1 OF 1

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DRAINAGE SUMMARY OF QUANTITIES

LINE / CULVERT	FROM	TO		ITEM 402	ITEM 464				ITEM 465				ITEM 466	ITEM 467	ITEM 479	
				2001	2005	2007	2009	2021	2005	2104	2564	2737	2331	2222	2001	2002
				TRENCH EXCAVATION PROTECTION	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL IV) (18 IN)	MANH (COMPL) (TY M)	INLET EXT	INLET (COMPL) (CURB&GRATE) (TY I)	INLET (COMPL) (TY H WITH LID)	WINGWALL (PW-1) (HW=8 FT)	SET (TY II) (18 IN) (RCP) (4:1) (C)	ADJUST MANHS	ADJUST INLETS
				LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
A	A-1	BEND-A11	LINEA15	11	6					2	1					
	BEND-A11	BEND-A12	LINEA14	6	6											
	BEND-A1	A-2	LINEA13	314	314											
	A-2	A-2A	LINEA12	290	285					2	1					
	A-2A	WYE-2B1	LINEA19	276	271					2	1					
	A-2B	BEND-2B1	LINEA21	11	6					2	1					
	BEND-2B1	WYE-2B1	LINEA22	5	5											
	WYE-2B1	WYE-2C1	LINEA23	140	140											
	A-2C	BEND-2C1	LINEA24	11	6					1	1					
	BEND-2C1	WYE-2C1	LINEA25	5	5											
	WYE-2C1	A-3	LINEA20	124	124											
	A-3	A-4	LINEA9	335	330					2	1					
	A-4	A-5	LINEA8	274	269					2	1					
	A-5	A-5A	LINEA7	242	237					2	1					
	A-5A	A-6	LINEA6	385	380					2	1					
	A-6	A-7	LINEA5	250	245					2	1					
	A-7	A-7A	LINEA18	175		250				2	1					
	A-7A	A-8	LINEA4			190				2	1					
	A-8	A-8A	LINEA3			220				2	1					
	A-8A	A-9	LINEA2				165			2	1					
	A-9	OUTFALL-A	LINEA1				108			2	1					
B	B-0	B-1	LINEB17	150	145					1	1					
	B-1	B-1A	LINEB12	321	316					2	1					
	B-1A	MH-B2	LINEB11	506	501					2	1					
	B-2	MH-B2	LINEB16	13	8					2	1					
	MH-B2	B-3	LINEB10	435	576				1							
	B-3	B-4	LINEB9	80	320					2	1					
	B-4	B-4A	LINEB8		365					2	1					
	B-4A	MH-B5	LINEB7	135	345					2	1					
	B-5	MH-B5	LINEB15		7					2	1					
	MH-B5	B-5A	LINEB6	170	445				1							
	B-5A	WYE-B6	LINEB5	100		401				2	1					
	B-6	BEND-B6	LINEB13		6					2	1					
	BEND-B6	WYE-B6	LINEB14		5											
	WYE-B6	B-6A	LINEB4	158		219										
	B-6A	B-7	LINEB2			165				2	1					
	B-7	OUTFALL-B	LINEB1				108			2	1					
C	C-1	OUTFALL-C	LINEC1		38					1	1					
RELOCATE EX. Y INLET STA 36+75						4						1				
TU88S RD INTERSECTION															5	2
DRIVEWAY W07 CULVERT								160						2		
DRIVEWAY E09 CULVERT								66						2		
EX. 12'X6' RCB AT BROCKWAY BRANCH													1			
TOTAL				4922	5706	1449	381	226	2	53	28	1	1	4	5	2

NOTES:
1. SEE REMOVAL SUMMARY FOR DRAINAGE REMOVALS.

BRIDGE-CLASS CULVERT SUMMARY OF QUANTITIES

LINE / CULVERT	ITEM 110	ITEM 400	ITEM 432	ITEM 462	ITEM 466		ITEM 169	
	2002	2002#	2019	2032	2333	2334	2005	2008
	EXCAVATION (CHANNEL)	STRUCT EXCAV (BOX) #	RIPRAP (STONE PROTECTION) (12 IN)	CONC BOX CULV (10'x8') (6)	WINGWALL (PW-1) (HW=10 FT) (#)	WINGWALL (PW-1) (HW=11 FT)	SOIL RETENTION BLANKETS (CL 2) (TY E)	SOIL RETENTION BLANKETS (CL 2) (TY H)
	CY	CY	CY	LF	EA	EA		SY
BC CULVERT	6590	600	210	273	1	1	300	890
TOTAL	6590	600	210	273	1	1	300	890

NOTES:
1. SEE ROADWAY SUMMARYFOR C402 RAIL ON CULVERT WINGWALL.
2. SEE TCP SUMMARY FOR TEMPORARY SPECIAL SHORING FOR CULVERT CONSTRUCTION.
3. SEE REMOVAL SUMMARY FOR DRAINAGE REMOVALS.
4. ITEM 169-2008 SHALL MEET THE SPECIFICATIONS OF PROPEX ARMORMAX ANCHORED REINFORCED VEGETATION SYSTEM, OR APPROVED EQUAL

SUBSIDIARY TO ITEM 462, FOR CONTRACTOR'S INFORMATION ONLY.

(6) ## FOOTING ONLY

NO.	REVISION	BY	DATE
(6)	REVISED CULVERT LENGTH AND RIPRAP	KM	7/15/16

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097
DRAINAGE
SUMMARY SHEET

Designed	IMM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn	IMM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	RRH	DAL	ROCKWALL	3148	01	006	16A

SHEET 1 OF 1

SUMMARY OF STORM WATER POLLUTION PREVENTION PLANS

SHEET NO.	PHASE	LOCATION	0160	0162	0164	** 0166	0168	1122	1122	1122	1122	1122	1122	1122	1122
			2003	2002	2051	2002	2001	2002	2009	2016	2019	2037	2049	2056	2057
			FURNISHING AND PLACING TOP SOIL (4")	BLOCK SODDING	DRILL SEED (TEMP) (WARM OR COOL)	FERTILIZER	VEGETATIVE WATERING	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMPORARY SEDIMENT CONTROL FENCE INSTLL	BIOGRD EROSN CONT LOGS (18" DIA) INSTALL	BIODEGRADBLE EROSION CONTROL LOGS REMOV	TEMPORARY SEDIMENT CONTROL FENCE REMOVE
			SY	SY	SY	TON	MG	LF	LF	SY	SY	LF	LF	LF	LF
1 OF 3	PHASE 1	BEGIN TO STA 9+00	0	0	84	0.01	12	0	0	0	0	197	0	0	0
1 OF 3	PHASE 1	STA 9+00 TO STA 20+00	0	0	586	0.03	87	0	0	0	0	678	0	0	0
2 OF 3	PHASE 1	STA 20+00 TO STA 31+00	0	0	505	0.03	75	0	0	0	0	708	0	0	0
2 OF 3	PHASE 1	STA 31+00 TO 42+00	0	0	537	0.03	80	44	0	0	0	436	0	0	0
3 OF 3	*PHASE 1	STA 42+00 TO 42+50	0	0	1775	0.09	264	22	0	0	0	411	0	0	0
1 OF 3	PHASE 2	BEGIN TO STA 9+00	0	0	813	0.04	121	0	0	0	0	805	70	0	0
1 OF 3	PHASE 2	STA 9+00 TO STA 20+00	0	0	1082	0.06	161	0	0	0	0	1055	140	0	0
2 OF 3	PHASE 2	STA 20+00 TO STA 31+00	0	0	862	0.04	128	0	0	0	0	1089	140	0	0
2 OF 3	PHASE 2	STA 31+00 TO 42+00	0	0	1465	0.08	218	0	0	0	0	1206	175	0	0
3 OF 3	PHASE 2	STA 42+00 TO 42+50	0	0	1034	0.05	154	0	0	0	0	418	0	0	0
1 OF 3	PHASE 3	BEGIN TO STA 9+00	2319	2122	1309	0.18	510	0	0	0	0	774	105	175	1776
1 OF 3	PHASE 3	STA 9+00 TO STA 20+00	3084	2563	1481	0.21	602	0	0	0	0	1108	70	210	2841
2 OF 3	PHASE 3	STA 20+00 TO STA 31+00	2688	2471	1609	0.21	607	0	0	0	0	1022	105	245	2819
2 OF 3	PHASE 3	STA 31+00 TO 42+00	4766	4233	3435	0.40	1141	0	66	0	0	917	140	315	2559
3 OF 3	PHASE 3	STA 42+00 TO 42+50	2637	2275	1524	0.20	565	0	0	306	306	373	0	0	1202
TOTAL			15494	13664	18101	1.66	4725	66	66	306	306	11197	945	945	11197

*INCLUDES QUANTITIES FOR PHASE 1A
**FOR CONTRACTORS INFORMATION ONLY

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097

SW3P

SUMMARY SHEET

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.		JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01		006	17

SHEET 1 OF 1

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FM 3097 TRAFFIC SIGNAL QUANTITIES

TXDOT SPECS		DESCRIPTION	UNIT	FM 3097 AND FM 740	FM 3097 AND RALPH HALL PKWY	FM 3097 AND TUBBS RD	SPARE EQUIP.	TOTAL
ITEM NO.	DESC. CODE							
416*	2030	DRILL SHAFT (TRF SIG POLE) (24 IN)	LF	18	6	12		36
416	2032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	0	13	26		39
416	2034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	22	66	44		132
618	2018	CONDT (PVC) (SCHD 40) (2")	LF	10	0	40		50
618	2022	CONDT (PVC) (SCHD 40) (3")	LF	75	110	160		345
618	2023	CONDT (PVC) (SCHD 40) (3") (BORE)	LF	255	380	360		995
618	2024	CONDT (PVC) (SCHD 40) (4")	LF	10	30	20		60
618	2046	CONDT (RM) (1")	LF	0	40	40		80
620	2009	ELEC CONDR (NO. 6) BARE	LF	15	15	300		330
620	2010	ELEC CONDR (NO. 6) INSULATED	LF	30	110	400		540
620	2011	ELEC CONDR (NO. 8) BARE	LF	575	485	510		1570
620	2012	ELEC CONDR (NO. 8) INSULATED	LF	560	620	660		1840
620	2016	ELEC CONDR (NO. 12) INSULATED	LF	180	180	180		540
624	2008	GROUND BOX TY A (122311) W/ APRON	EA	1	1	1		3
624	2012	GROUND BOX TY C (162911) W/ APRON	EA	2	4	4		10
628	2099	ELC SRV TY D 120/240 070 (NS)SS(E)GC(O)	EA	0	1	1		2
680	2002	INSTALL HWY TRF SIG (ISOLATED)	EA	1	1	1		3
**	**	REGULATORY SIGN PANEL (R10-12)	EA	4	0	0		4
**	**	REGULATORY SIGN PANEL (R10-17T)	EA	0	4	2		6
**	**	WIND DAMPNER	EA	0	1	2		3
**	**	250 W LUMINAIRE	EA	1	2	2		5
**	**	TRAFFIC SIGNAL CONTROLLER & CABINET	EA	1	1	1		3
**	**	CONTROLLER FOUNDATION	EA	1	1	1		3
681***	2001	TEMP TRAF SIGNALS	EA	1	1	1		3
682	2001	BACK PLATE (12 IN) (3 SEC)	EA	8	8	8		24
682	2003	BACK PLATE (12 IN) (5 SEC)	EA	4	4	2		10
682	2022	VEH SIG SEC (12 IN) LED (GRN ARW)	EA	4	4	2		10
682	2023	VEH SIG SEC (12 IN) LED (GRN)	EA	12	8	8		28
682	2024	VEH SIG SEC (12 IN) LED (YEL ARW)	EA	4	8	4		16
682	2025	VEH SIG SEC (12 IN) LED (YEL)	EA	12	8	8		28
682	2026	VEH SIG SEC (12 IN) LED (RED ARW)	EA	0	8	2		10
682	2027	VEH SIG SEC (12 IN) LED (RED)	EA	12	8	8		28
682	2066	PED SIG SEC (12 IN) LED (COUNTDOWN)	EA	8	8	8		24
684	2031	TRF SIG CBL (TY A) (14 AWG) (5 CONDR)	LF	280	285	270		835
684	2033	TRF SIG CBL (TY A) (14 AWG) (7 CONDR)	LF	875	540	590		2005
684	2042	TRF SIG CBL (TY A) (14 AWG) (16 CONDR)	LF	565	625	610		1800
684	2079	TRF SIG CBL (TY C) (12 AWG) (2 CONDR)	LF	1195	1360	1315		3870
686	2035	INS TRF SIG PL AM (S) 1 ARM (36')	EA	0	0	1		1
686	2041	INS TRF SIG PL AM (S) 1 ARM (40') LUM	EA	0	1	0		1
686	2049	INS TRF SIG PL AM (S) 1 ARM (48') LUM	EA	0	0	1		1
686	2051	INS TRF SIG PL AM (S) 1 ARM (50')	EA	0	1	1		2
686	2053	INS TRF SIG PL AM (S) 1 ARM (50') LUM	EA	0	0	1		1
686	2057	INS TRF SIG PL AM (S) 1 ARM (55') LUM	EA	0	1	0		1
686	2059	INS TRF SIG PL AM (S) 1 ARM (60')	EA	0	1	0		1
686	2065	INS TRF SIG PL AM (S) 1 ARM (65') LUM	EA	1	0	0		1
687	2001	PED POLE ASSEMBLY	EA	3	1	2		6
6006	2001	SPREAD SPECTRUM RADIO	EA	1	1	1	1	4
6006	2002	COAXIAL CABLE	LF	50	60	70		180
6006	2005	ANTENNA (UNI-DIRECTIONAL)	EA	1	1	1	1	4
6007	2001	REMOVING TRAFFIC SIGNALS	EA	1	1	1		3
****	****	OPTICOM UNITS	EA	4	4	4		12
****	****	OPTICOM CABLE	LF	845	910	880		2635
*****	*****	RADAR CABLE	LF	1780	1355	1355		4490
8317	2001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1	1	1		3
8368	2003	CONDUIT (PREPARE)	LF	350	520	580		1450
8368	2008	GROUND BOX (PREPARE)	EA	3	5	5		13
8615	2001	RADAR ADVANCE DETECTION DEVICE	EA	4	2	2		8
8835	2001	ACCESSIBLE PEDESTRIAN SIGNAL UNITS	EA	8	8	8		24
8941	2001	RADAR PRESENCE DETECTION	EA	4	4	4		12

NOTES

* SUBSIDIARY TO ITEM 687 2001

** SUBSIDIARY TO ITEM 680 2002

*** SEE MAINTENANCE OF TRAFFIC PLANS AND TEMP SIGNAL PLANS.

**** FURNISHED BY CITY OF ROCKWALL

***** SUBSIDIARY TO RADAR UNITS FOR PERMANENT SIGNALS

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER
4.30.19

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097

TRAFFIC SIGNALS

SUMMARY SHEET

Designed:	LDP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KK	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	BC	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	LDP	DAL	ROCKWALL	3148	01	006	18

SHEET 1 OF 1

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FM 3097 TRAFFIC SIGNAL QUANTITIES

TXDOT SPECS ITEM NO.	TXDOT SPECS DESC. CODE	DESCRIPTION	UNIT	FM 3097 AND FM 740	FM 3097 AND RALPH HALL PKWY	FM 3097 AND TUBBS RD	SPARE EQUIP.	TOTAL
416*	2030	DRILL SHAFT (TRF SIG POLE) (24 IN)	LF	18	18	18		54
416	2031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	0	11	0		11
416	2032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	0	0	26		26
416	2034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	22	44	44		110
618	2018	CONDT (PVC) (SCHD 40) (2")	LF	10	0	40		50
618	2022	CONDT (PVC) (SCHD 40) (3")	LF	75	110	180		365
618	2023	CONDT (PVC) (SCHD 40) (3") (BORE)	LF	255	380	360		995
618	2024	CONDT (PVC) (SCHD 40) (4")	LF	10	30	20		60
618	2046	CONDT (RM) (1")	LF	0	40	40		80
620	2009	ELEC CONDR (NO. 6) BARE	LF	15	15	300		330
620	2010	ELEC CONDR (NO. 6) INSULATED	LF	30	110	400		540
620	2011	ELEC CONDR (NO. 8) BARE	LF	575	485	530		1590
620	2012	ELEC CONDR (NO. 8) INSULATED	LF	560	640	660		1860
620	2016	ELEC CONDR (NO. 12) INSULATED	LF	180	270	180		630
624	2008	GROUND BOX TY A (122311) W/ APRON	EA	1	1	1		3
624	2012	GROUND BOX TY C (162911) W/ APRON	EA	2	4	4		10
628	2099	ELC SRV TY D 120/240 070 (NS)SS(E)GC(O)	EA	0	1	1		2
680	2002	INSTALL HWY TRF SIG (ISOLATED)	EA	1	1	1		3
**	**	REGULATORY SIGN PANEL (R10-12)	EA	4	0	0		4
**	**	REGULATORY SIGN PANEL (R10-17T)	EA	0	4	2		6
**	**	WIND DAMPNER	EA	0	1	2		3
**	**	250 W LUMINAIRE	EA	1	3	2		6
**	**	TRAFFIC SIGNAL CONTROLLER & CABINET	EA	1	1	1		3
**	**	CONTROLLER FOUNDATION	EA	1	1	1		3
681***	2001	TEMP TRAF SIGNALS	EA	1	1	1		3
682	2001	BACK PLATE (12 IN) (3 SEC)	EA	8	8	8		24
682	2003	BACK PLATE (12 IN) (5 SEC)	EA	4	4	2		10
682	2022	VEH SIG SEC (12 IN) LED (GRN ARW)	EA	4	4	2		10
682	2023	VEH SIG SEC (12 IN) LED (GRN)	EA	12	8	8		28
682	2024	VEH SIG SEC (12 IN) LED (YEL ARW)	EA	4	8	4		16
682	2025	VEH SIG SEC (12 IN) LED (YEL)	EA	12	8	8		28
682	2026	VEH SIG SEC (12 IN) LED (RED ARW)	EA	0	8	2		10
682	2027	VEH SIG SEC (12 IN) LED (RED)	EA	12	8	8		28
682	2066	PED SIG SEC (12 IN) LED (COUNTDOWN)	EA	8	8	8		24
684	2031	TRF SIG CBL (TY A) (14 AWG) (5 CONDR)	LF	280	270	270		820
684	2033	TRF SIG CBL (TY A) (14 AWG) (7 CONDR)	LF	875	840	590		2305
684	2042	TRF SIG CBL (TY A) (14 AWG) (16 CONDR)	LF	565	615	610		1790
684	2079	TRF SIG CBL (TY C) (12 AWG) (2 CONDR)	LF	1195	1360	1325		3880
686	2035	INS TRF SIG PL AM (S) 1 ARM (36')	EA	0	0	1		1
686	2041	INS TRF SIG PL AM (S) 1 ARM (40') LUM	EA	0	1	0		1
686	2049	INS TRF SIG PL AM (S) 1 ARM (48') LUM	EA	0	0	1		1
686	2051	INS TRF SIG PL AM (S) 1 ARM (50')	EA	0	1	1		2
686	2053	INS TRF SIG PL AM (S) 1 ARM (50') LUM	EA	0	0	1		1
686	2057	INS TRF SIG PL AM (S) 1 ARM (55') LUM	EA	0	1	0		1
686	2059	INS TRF SIG PL AM (S) 1 ARM (60')	EA	0	1	0		1
686	2065	INS TRF SIG PL AM (S) 1 ARM (65') LUM	EA	1	0	0		1
687	2001	PED POLE ASSEMBLY	EA	3	1	2		6
6006	2001	SPREAD SPECTRUM RADIO	EA	1	1	1	1	4
6006	2002	COAXIAL CABLE	LF	50	60	70		180
6006	2005	ANTENNA (UNI-DIRECTIONAL)	EA	1	1	1	1	4
6007	2001	REMOVING TRAFFIC SIGNALS	EA	1	1	1		3
****	****	OPTICOM UNITS	EA	4	4	4		12
****	****	OPTICOM CABLE	LF	845	885	880		2610
*****	*****	RADAR CABLE	LF	1780	1330	1355		4465
8317	2001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1	1	1		3
8368	2003	CONDUIT (PREPARE)	LF	350	520	600		1470
8368	2008	GROUND BOX (PREPARE)	EA	3	5	5		13
8615	2001	RADAR ADVANCE DETECTION DEVICE	EA	4	2	2		8
8835	2001	ACCESSIBLE PEDESTRIAN SIGNAL UNITS	EA	8	8	8		24
8941	2001	RADAR PRESENCE DETECTION	EA	4	4	4		12

NOTES

* SUBSIDIARY TO ITEM 687 2001

** SUBSIDIARY TO ITEM 680 2002

*** SEE MAINTENANCE OF TRAFFIC PLANS AND TEMP SIGNAL PLANS.

**** FURNISHED BY CITY OF ROCKWALL

***** SUBSIDIARY TO RADAR UNITS FOR PERMANENT SIGNALS

Leslie D Pollack

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER

12/20/17

NO.	REVISION	BY	DATE
1	AS-BUILT REVISIONS	LP	12/17

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097

TRAFFIC SIGNALS

SUMMARY SHEET

Designed	LDP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked	KK	6	TEXAS	STP 2013 (597) MM	FM 3097
Drawn	BG	DIST.	COUNTY	CONTROL SECTION JOB	SHEET NO.
Checked	LDP	DAL	ROCKWALL	3148 01 006	18A

SHEET 1 OF 1

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SUMMARY OF PAVEMENT MARKINGS

SHEET NO.	ITEM NO.	ITEM 8251				ITEM 666							
	DESC. CODE	2002	2005	2017	2044	2029	2035	2041	2047	2053	2062	2095	2122
	CENTERLINE STATION LIMITS	RE PM W/RET REQ TY I (W) 4"(BRK) (090 MIL)	RE PM W/RET REQ TY I (W) 4"(SLD) (090 MIL)	RE PM W/RET REQ TY I (Y) 4"(SLD) (090 MIL)	RE PM W/RET REQ TY I (W) 4"(DOT) (090 MIL)	REFL PAV MRK TY I (W) 8"(DOT) (090 MIL)	REFL PAV MRK TY I (W) 8"(SLD) (090 MIL)	REFL PAV MRK TY I (W) 12"(SLD) (090 MIL)	REFL PAV MRK TY I (W) 24"(SLD) (090 MIL)	REFL PAV MRK TY I (W) (ARROW) (090 MIL)	REF PAV MRK TY I (W) (BIKE SYMBOL) (090 MIL)	REFL PAV MRK TY I (W) (WORD) (090 MIL)	REFL PAV MRK TY I (Y) 8"(SLD) (090 MIL)
		LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF
	FM 3097												
1	0+00.00 TO 9+00.00	420	973		300		627	246	56	5	4	5	
2	9+00.00 TO 20+00.00	453	1,408	859	164		1,192	926	188	11	7	11	207
3	20+00.00 TO 31+00.00	527	1,848		56		841	137	54	8	7	6	
4	31+00.00 TO 42+00.00	460	1,578	694	80	42	999	897	195	10	5	10	
5	42+00.00 TO END PROJECT	10	1,168	1,476		147				2	1	2	
	PROJECT TOTALS	1,870	6,975	3,029	600	189	3,659	2,206	493	36	24	34	207

SUMMARY OF PAVEMENT MARKINGS

SHEET NO.	ITEM NO.	ITEM 8251				ITEM 666							
	DESC. CODE	2025	2026	2030	2045	2151	2153	2155	2157	2160	2163	2173	2182
	CENTERLINE STATION LIMITS	RE PM W/RET REQ TY II (W) 4"(BRK)	RE PM W/RET REQ TY II (W) 4"(SLD)	RE PM W/RET REQ TY II (Y) 4"(SLD)	RE PM W/RET REQ TY II (W) 4"(DOT)	REF PAV MRK TY II (W) 8"(DOT)	REF PAV MRK TY II (W) 8"(SLD)	REF PAV MRK TY II (W) 12"(SLD)	REF PAV MRK TY II (W) 24"(SLD)	REF PAV MRK TY II (W) (ARROW)	REF PAV MRK TY II (W) (BIKE SYMBOL)	REF PAV MRK TY II (W) (WORD)	REF PAV MRK TY II (Y) 8"(SLD)
		LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF
	FM 3097												
1	0+00.00 TO 9+00.00	420	973		300		627	246	56	5	4	5	
2	9+00.00 TO 20+00.00	453	1,408	859	164		1,192	926	188	11	7	11	207
3	20+00.00 TO 31+00.00	527	1,848		56		841	137	54	8	7	6	
4	31+00.00 TO 42+00.00	460	1,578	694	80	42	999	897	195	10	5	10	
5	42+00.00 TO END PROJECT	10	1,168	1,476		147				2	1	2	
	PROJECT TOTALS	1,870	6,975	3,029	600	189	3,659	2,206	493	36	24	34	207

SUMMARY OF PAVEMENT MARKINGS

SHEET NO.	ITEM NO.	ITEM 672			
	DESC. CODE	2012	2015	2017	2024
	CENTERLINE STATION LIMITS	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	TRAFFIC BUTTON TY W
		EA	EA	EA	EA
	FM 3097				
1	0+00.00 TO 9+00.00	35		21	
2	9+00.00 TO 20+00.00	78	24	22	88
3	20+00.00 TO 31+00.00	42		27	
4	31+00.00 TO 42+00.00	145	54	23	28
5	42+00.00 TO END PROJECT	12	48		
	PROJECT TOTALS	312	126	93	116

NO.	REVISION	BY	DATE

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #687

Texas Department of Transportation

FM 3097

PAVEMENT MARKING SUMMARY

SHEET 1 OF 1

Designed:	CH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	TSB	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	CH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	TSB	DAL	ROCKWALL	3148	01	006	19

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SUMMARY OF SMALL SIGNS

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

CSJ	PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN TEXT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE C	Post Type (FRP=Fiberglass TWT=Thin Wall 10BWG-10SWG S80=Sch 80)	Posts (1 or 2)	Anchor Type (UA=Univer-Cons UB=Univer-Bolt WS=Wedge-Conc SA=Slip-Conc SB=Slip-Bolt)	Mounting Designation (P=Prefab. "Plain" T=Prefab "T" U=Prefab "U")	Mounting Designation (1EXTor 2EXT=# of Ext. BM=Extruded Wind Beam WC=1.12 #/ft Wing Chan. EXAL=Extruded Alum. Signs)	INS SM RD SN SUP & AM TY 10 BWG (1) SA (P) 0644-2001	INS SM RD SN SUP & AM TY 10 BWG (1) SA (T) 0644-2004	INS SM RD SN SUP & AM TY S80 (1) SA (P) 0644-2022	INS SM RD SN SUP & AM TY S80 (1) SA (T) 0644-2025	INS SM RD SN SUP & AM TY S80 (1) SA (U) 0644-2027	INS SM RD SN SUP & AM TY S80 (2) SA (P) 0644-2042
													EA	EA	EA	EA	EA	EA
	1 OF 3	1	M3-3	SOUTH	24 X 12	X		S80	1	SA	U						1	
			M1-6F	FARM ROAD 740	24 X 24	X												
			M6-1L	(ARROW LEFT)	21 X 15	X												
			M3-1	NORTH	24 X 12	X												
			M1-6F	FARM ROAD 740	24 X 24	X												
			M1-6R	(ARROW RIGHT)	21 X 15	X												
		2	R3-17	BIKE LANE (SYMBOL)	24 X 18	X		10BWG	1	SA	P		1					
			R3-17bP	ENDS	24 X 8	X												
		3	R6-1R	ONE WAY (RIGHT)	36 X 12	X		10BWG	1	SA	P		1					
		4	M4-6	END	24 X 12	X		10BWG	1	SA	P		1					
			M1-6F	FARM ROAD 3097	24 X 24	X												
		5	R4-4	BEG RT TURN LANE YIELD TO BIKES	36 X 30	X		10BWG	1	SA	P		1					
		6	M3-3	SOUTH	24 X 12	X		S80	1	SA	U						1	
			M1-6F	FARM ROAD 740	24 X 24	X												
			M5-1L	(ARROW LEFT AHEAD)	21 X 15	X												
			M3-1	NORTH	24 X 12	X												
			M1-6F	FARM ROAD 740	24 X 24	X												
			M5-1R	(ARROW RIGHT AHEAD)	21 X 15	X												
		7	R4-7	DIVIDED HIGHWAY (SYMBOL)	24 X 30	X		10BWG	1	SA	P		1					
		8	R1-2	YIELD	48 X48 X48	X		10BWG	1	SA	T			1				
		9	R3-17	BIKE LANE (SYMBOL)	24 X 18	X		10BWG	1	SA	P		1					
		10	R6-1R	ONE WAY (RIGHT)	36 X 12	X		10BWG	1	SA	P		1					
		11	R3-2	NO LEFT TURN (SYMBOL)	36 X 36	X		10BWG	1	SA	P		1					
		12	M3-3	SOUTH	24 X 12	X		10BWG	1	SA	P		1					
			M1-6F	FARM ROAD 3097	24 X 24	X												
		13	R2-1	SPEED LIMIT XX	30 X 36	X		10BWG	1	SA	P		1					
		14	R4-4	BEG RT TURN LANE YIELD TO BIKES	36 X 30	X		10BWG	1	SA	P		1					
		15	M2-1	JCT	21 X 15	X		10BWG	1	SA	P		1					
			M1-6F	FARM ROAD 740	24 X 24	X												
		16	R4-7	DIVIDED HIGHWAY (SYMBOL)	24 X 30	X		10BWG	1	SA	P		1					
		17	R4-4	BEG RT TURN LANE YIELD TO BIKES	36 X 30	X		10BWG	1	SA	P		1					
		18	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		1					
		19	R2-1	SPEED LIMIT 30	30 X 36	X		10BWG	1	SA	P		1					
		20	D14-4T	ADOPT A HIGHWAY	48 X 48	X		10BWG	1	SA	T			1				
		21	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		1					
	2 OF 3	1	R2-1	SPEED LIMIT XX	30 X 36	X		10BWG	1	SA	P		1					
		2	M3-1	NORTH	24 X 12			10BWG	1	SA	P		1					
			M1-6F	FARM ROAD 3097	24 X 24													
		3	W11-8	FIRE TRUCK (SYMBOL)	36 X 36	X		10BWG	1	SA	P		1					
		4	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		1					
		5	M3-3	SOUTH	24 X 12			10BWG	1	SA	P		1					
			M1-6F	FARM ROAD 3097	24 X 24													
		6	R2-1	SPEED LIMIT XX	30 X 36	X		10BWG	1	SA	P		1					
		7	R4-4	BEG RT TURN LANE YIELD TO BIKES	36 X 30	X		10BWG	1	SA	P		1					
		8	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		1					
		9	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		1					
		10	R6-1R	ONE WAY (RIGHT)	36 X 12	X		10BWG	1	SA	P		1					
		11	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		1					
		12	R6-1R	ONE WAY (RIGHT)	36 X 12	X		10BWG	1	SA	P		1					
		13	I-2a	(NAME) CITY LIMIT	72 X 24	X		10BWG	1	SA	T			1				
		14	R3-8MR	LANE CONTROL (SYMBOL)	30 X 30	X		10BWG	1	SA	P		1					
		15	R4-7	DIVIDED HIGHWAY (SYMBOL)	24 X 30	X		10BWG	1	SA	P		1					
		16	R4-7	DIVIDED HIGHWAY (SYMBOL)	24 X 30	X		10BWG	1	SA	P		1					
		17	R4-4	BEG RT TURN LANE YIELD TO BIKES	36 X 30	X		10BWG	1	SA	P		1					
		18	R3-8LSR	LANE CONTROL (SYMBOL)	48 X 30	X		10BWG	1	SA	T			1				
		19	W1-4L	REVERSE CURVE (SYMBOL)	36 X 36	X		10BWG	1	SA	P		1					
		20	R3-17	BIKE LANE (SYMBOL)	24 X 18	X		10BWG	1	SA	P		1					
			R3-17bP	ENDS	24 X 8	X												
	3 OF 3	1	R3-17	BIKE LANE (SYMBOL)	24 X 18	X		10BWG	1	SA	P		1					
			R3-17aP	AHEAD	24 X 8	X												
		2	W1-4R	REVERSE CURVE (SYMBOL)	36 X 36	X		10BWG	1	SA	P		1					
		3	W4-1aT	THROUGH TRAFFIC MERGE RIGHT	36 X 36	X		10BWG	1	SA	P		1					
		4	W4-1aT	THROUGH TRAFFIC MERGE RIGHT	36 X 36	X		10BWG	1	SA	P		1					
			R4-7	DIVIDED HIGHWAY (SYMBOL)	24 X 30	X												
		5	R3-7L	LEFT LANE MUST TURN LEFT	36 X 36	X		10BWG	1	SA	P		1					
												PROJECT TOTALS	40	4			2	

SUMMARY OF SIGNAL MOUNTED SIGNS

CSJ	SHEET NO. (SIGNAL SIGNING & PHASING)	SIGN NO.	SIGN NOMENCLATURE	SIGN TEXT	SIGN DIMENSIONS	ALUMINUM TYPE A
	1 OF 3	1	R10-12	LEFT TURN YIELD ON GREEN	30 X 36	X
		2	D3-1	Ridge Rd (CITY SUPPLIED)		
		3	D3-1	Horizon Rd (CITY SUPPLIED)		
		4	D3-1	Horizon Rd (CITY SUPPLIED)		
		5	R10-3eL	PUSH BUTTON TO CROSS	9 X 15	X
		6	R10-3eR	PUSH BUTTON TO CROSS	9 X 15	X
	2 OF 3	1	R10-17T	LT TURN YIELD ON FLASH YEL ARROW	36 X 42	X
		2	D3-1	Ralph Hall Pkwy (CITY SUPPLIED)		
		3	D3-1	Horizon Rd (CITY SUPPLIED)		
		4	D3-1	Ralph Hall Pkwy (CITY SUPPLIED)		
		5	D3-1	Horizon Rd (CITY SUPPLIED)		
		6	R10-3eL	PUSH BUTTON TO CROSS	9 X 15	X
		7	R10-3eR	PUSH BUTTON TO CROSS	9 X 15	X
	3 OF 3	1	R10-17T	LT TURN YIELD ON FLASH YEL ARROW	36 X 42	X
		2	D3-1	Tubbs Rd (CITY SUPPLIED)		
		3	D3-1	Horizon Rd (CITY SUPPLIED)		
		4	D3-1	Tubbs Rd (CITY SUPPLIED)		
		5	D3-1	Horizon Rd (CITY SUPPLIED)		
		6	R10-3eL	PUSH BUTTON TO CROSS	9 X 15	X
		7	R10-3eR	PUSH BUTTON TO CROSS	9 X 15	X

Texas Department of Transportation

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #687

NO.	REVISION	BY	DATE

SUMMARY OF SMALL SIGNS
FM 3097
SHEET 1 OF 1

Designed	Checked	Dsgn	Dsgn	Checked
CH	TSB	CH	6	TSB

DIST.	COUNTY	CONTROL	SECTION	JOB NO.	HIGHWAY NO.
DAL	ROCKWALL	3148	01	006	FM 3097

FED. RD. DIV. NO. 6 | STATE TEXAS | FEDERAL AID PROJECT NO. STP 2013 (597) MM

SHEET NO. 20

LANDSCAPE & HARDSCAPE SUMMARY

UNLESS NOTED, UNITS BELOW ARE BY EACH

	192-2002		192-2003	192-2006	192-2007	192-2015	192-2016		528-2002
SHEET NO.	HAMELN GRASS	REGAL MIST GULF MUHLY	DWARF LORDPETALUM	CRAPE MYRTLE	CEDAR ELM	LANDSCAPE EDGE - LF	PLANTING BED PREP-SY		COLORED TEXTURED CONC. - SY
275	185	364	49	3	-	23	197.2		204.2
276	275	236	59	16	3	24	202.5		163.3
277	275	502	94	5	-	28	320.5		140.0
278	1164	406	50	5	5	16	214.9		84.9
279	461	692	84	7	-	32	399.5		158.6
280	360	649	52	3	3	18	320.8		93.8
PROJECT TOTALS	2720	2849	388	39	11	141	1655.4		844.8

IRRIGATION SUMMARY

	170-2001	618-2024	618-2034	620-2010	620-2011	620-2016	612-2262
SHEET NO.	IRRIGATION SYSTEM-LS	CONDT PVC SCHD 40 4"-LF	CONDT PVC SCHD 80 2"-LF	ELEC CONDR NO. 6 INS-LF	ELEC CONDR NO. 8 BARE-LF	ELEC CONDR NO. 12 INS-LF	ELC SRV TY D - EA
282	.16	570	-	-	-	-	-
283	.16	148	-	-	-	-	-
284	.16	132	-	-	-	-	-
285	.20	306	70	150	20	40	1
286	.16	-	-	-	-	-	-
287	.16	153	-	-	-	-	-
PROJECT TOTALS	1.0	1309	70	150	20	40	1

Texas Department of Transportation
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LANDSCAPING SUMMARY

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(See Title Sheet)		FM 3097
GRAPHICS PJH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK PJH	TEXAS	DALLAS	ROCKWALL	21
CHECK XXX	CONTROL 3148	SECTION 01	JOB 006	

TEMPLATED REVISED: 10-23-02

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TRAFFIC CONTROL PLAN GENERAL NOTES

1. ADVANCED WARNING SIGNS SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF THE PROJECT. CONTRACTOR SHALL ADJUST LOCATION OF SIGNS IN ACCORDANCE WITH APPLICABLE BC STANDARDS AND THE LATEST TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
2. ALL TRAFFIC CONTROL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH THE TMUTCD AND TCP STANDARDS.
3. THE CONTRACTOR IS REQUIRED TO MAINTAIN ACCESS TO PRIVATE PROPERTY AT ALL TIMES.
4. CONTRACTOR TO COORDINATE CLOSURE OF RALPH HALL PKWY WITH THE ENGINEER. THE CONTRACTOR SHALL NOT CLOSE RALPH HALL PKWY UNTIL CONSTRUCTION ACTIVITIES AT THE INTERSECTION ARE READY TO BEGIN. THE CONTRACTOR SHALL SUBMIT ROADWAY CLOSURE SCHEDULE TO THE ENGINEER PRIOR TO RALPH HALL PKWY CLOSURE. THE INTERSECTION CLOSURE SHALL BE LIMITED TO 30 CALENDAR DAYS OR AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL OPEN RALPH HALL PKWY TO TRAFFIC AT THE EARLIEST DATE POSSIBLE.
5. EXISTING SIGNS THAT CONFLICT WITH THE PROPOSED CONSTRUCTION SEQUENCING OR TRAFFIC CONTROL DEVICES SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER. THIS WORK SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.
6. THE CONTRACTOR SHALL PLACE A 3:1 SLOPE BETWEEN THE CONSTRUCTION ZONE AND TRAVELED PAVEMENT AT THE END OF EACH DAY IF DROP-OFF EXCEEDS 2 INCHES.
7. CONTRACTOR SHALL ENSURE ADEQUATE DRAINAGE THROUGHOUT CONSTRUCTION.
8. CONTRACTOR SHALL PROTECT EXIST TREES.
9. ALL LEADING EDGES OF CONCRETE BARRIER SHALL BE PROTECTED WHILE IN THE CLEAR ZONE. WHEN CONNECTING BARRIERS THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A UNIFORM FACE AND ENSURE THAT NO EDGES SHALL PROTRUDE INTO ONCOMING TRAFFIC.

TRAFFIC CONTROL PLAN NARRATIVE

PHASE 1

1. PLACE ALL TRAFFIC CONTROL DEVICES REQUIRED BY TCP AND BC STANDARDS.
2. PLACE ALL PHASE 1 SEDIMENT CONTROL ITEMS AS SHOWN IN SW3P PLANS.
3. CONSTRUCT ALL TEMPORARY DRAINAGE ITEMS NECESSARY AS SHOWN FOR TEMPORARY WIDENING ALONG SOUTHBOUND FM 3097.
4. CONSTRUCT TEMPORARY WIDENING ALONG SOUTHBOUND FM 3097 AND CROSS STREETS AT LOCATIONS SHOWN.
5. CONSTRUCT PHASE 1 OF PROPOSED CULVERT AS SHOWN.
6. CONSTRUCT TEMPORARY WIDENING DETOUR A AT LOCATION SHOWN.

PHASE 2

1. PLACE ALL TRAFFIC CONTROL DEVICES REQUIRED BY TCP AND BC STANDARDS.
2. PLACE PAVEMENT MARKINGS AND SIGNS AS SHOWN.
3. PLACE ALL PHASE 2 SEDIMENT CONTROL ITEMS AS SHOWN IN THE SW3P PLANS.
4. SHIFT EXISTING FM 3097 TRAFFIC TO THE WEST AS NECESSARY USING PREVIOUSLY CONSTRUCTED WIDENING AS SHOWN.
5. CONSTRUCT PHASE 2 OF PROPOSED CULVERT AS SHOWN.
6. CONSTRUCT STORM SEWER AT NORTHBOUND FM 3097 AS SHOWN.
7. CONSTRUCT NOISE WALLS "D","E","F" AND "A" AND RETAINING WALL "G".
8. CONSTRUCT NORTHBOUND FM 3097 AS SHOWN. EXISTING W RALPH HALL PKWY AND TUBBS RD ARE SIGNALIZED INTERCHANGES. TO MAINTAIN ACCESS THE CONTRACTOR SHALL CONSTRUCT THEM IN STEPS AS DETAILED IN THE PLANS. ROCKWALL PKWY IS NOT A SIGNALIZED INTERCHANGE, BUT SHALL ALSO BE CONSTRUCTED IN STEPS AS DETAILED IN THE PLANS. HOLLAND CT, BROCKWAY DR AND MULBERRY LN SHALL BE CONSTRUCTED USING DETOURS AS SHOWN.

PHASE 3

1. PLACE ALL TRAFFIC CONTROL DEVICES REQUIRED BY TCP AND BC STANDARDS.
2. PLACE PAVEMENT MARKINGS AND SIGNS AS SHOWN.
3. PLACE ALL PHASE 3 SEDIMENT CONTROL ITEMS AS SHOWN IN SW3P PLANS.
4. SHIFT NORTHBOUND AND SOUTHBOUND TRAFFIC TO PERMANENT NORTHBOUND PAVEMENT CONSTRUCTED IN PHASE 2 AS SHOWN.
5. CONSTRUCT REMAINDER OF STORM SEWER AS SHOWN.
6. CONSTRUCT REMAINDER OF W RALPH HALL PKWY INTERCHANGE, ROCKWALL PKWY AND AND TUBBS RD IN STEPS AS DETAILED IN THE PLANS.
7. CONSTRUCT THE REMAINDER OF FM 3097, INCLUDING MEDIANS, AND DRIVEWAYS, MAINTAINING ACCESS TO ALL PROPERTIES DURING CONSTRUCTION.
8. CONSTRUCT SIDEWALK WALLS "B" AND "C".
9. TRAFFIC IS TO BE SHIFTED TO FINAL LOCATION UPON COMPLETION OF PROJECT.
10. CONSTRUCT REMAINING CROSS STREET MEDIANS.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

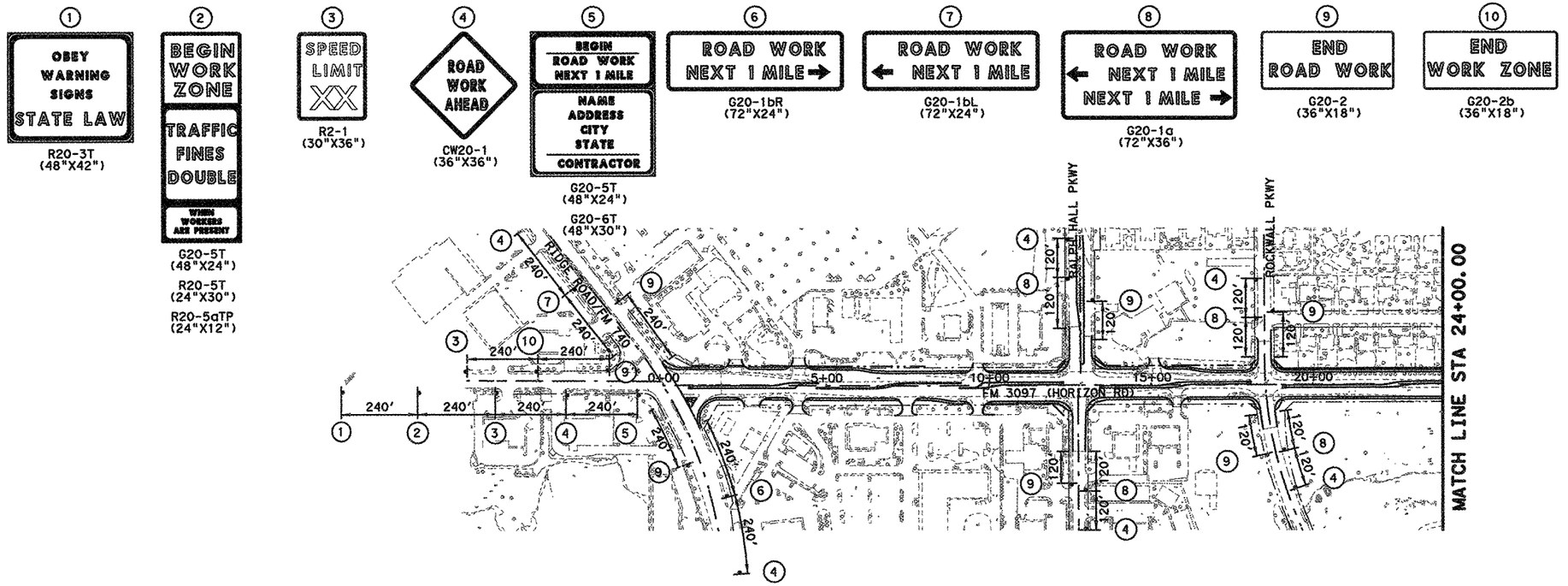
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

TRAFFIC CONTROL NARRATIVE AND GENERAL NOTES

Designed: ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: JBR	DAL	ROCKWALL	3148	01	006	22

SHEET 1 OF 1



STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

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TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

TRAFFIC CONTROL PLAN
FM 3097
ADVANCED WARNING SIGNS

Designed:	ANK	FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	JBR	DAL	ROCKWALL	3148	01	006		23

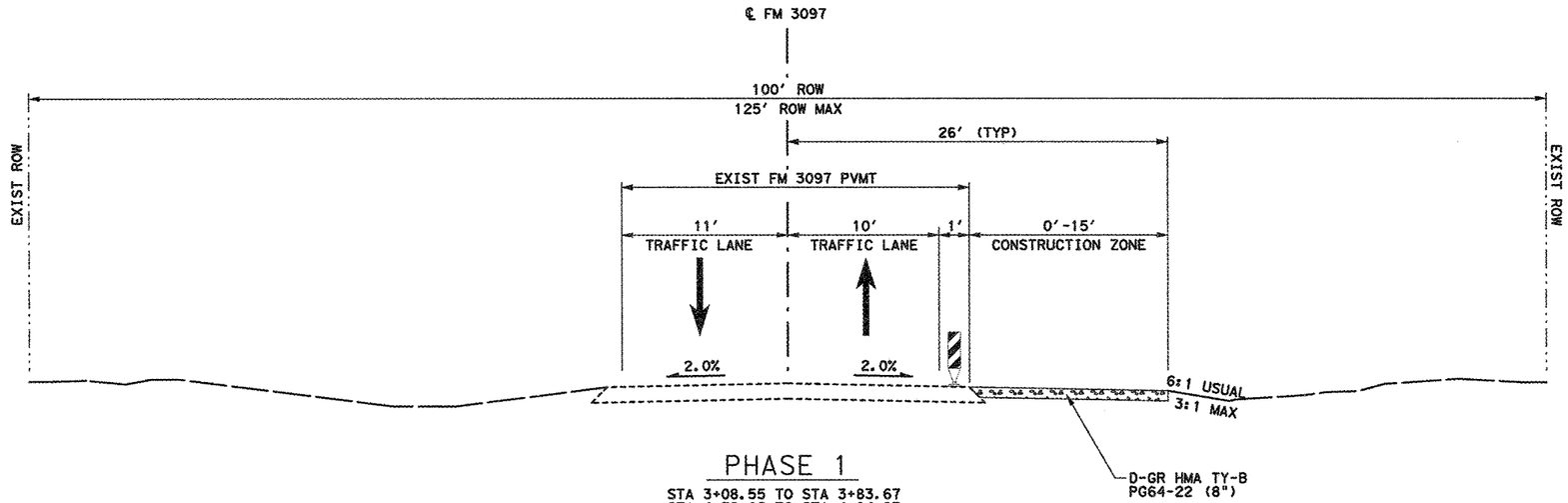
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5/1/2014 3:34:06 PM iroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.03 TCP/1204041Ctyp01.dgn

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- PLASTIC DRUMS
- VERTICAL PANELS



PHASE 1

STA 3+08.55 TO STA 3+83.67
STA 4+52.62 TO STA 4+84.87
STA 12+98.61 TO STA 18+15.57
STA 18+82.23 TO STA 26+53.50
STA 40+55.62 TO STA 45+52.52

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

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TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097

PHASE 1 TYPICAL SECTIONS

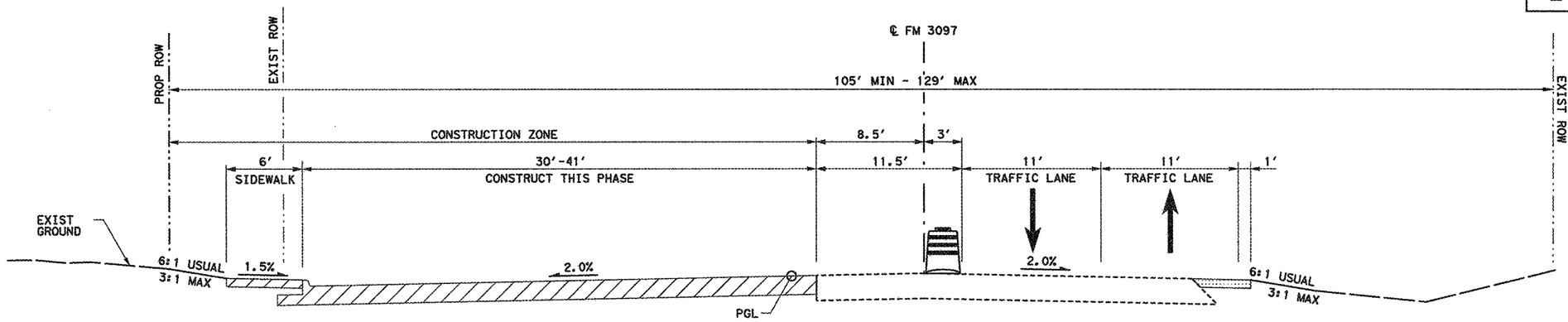
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Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	JBR	DAL	ROCKWALL	3148	01	006		24

SHEET 1 OF 1

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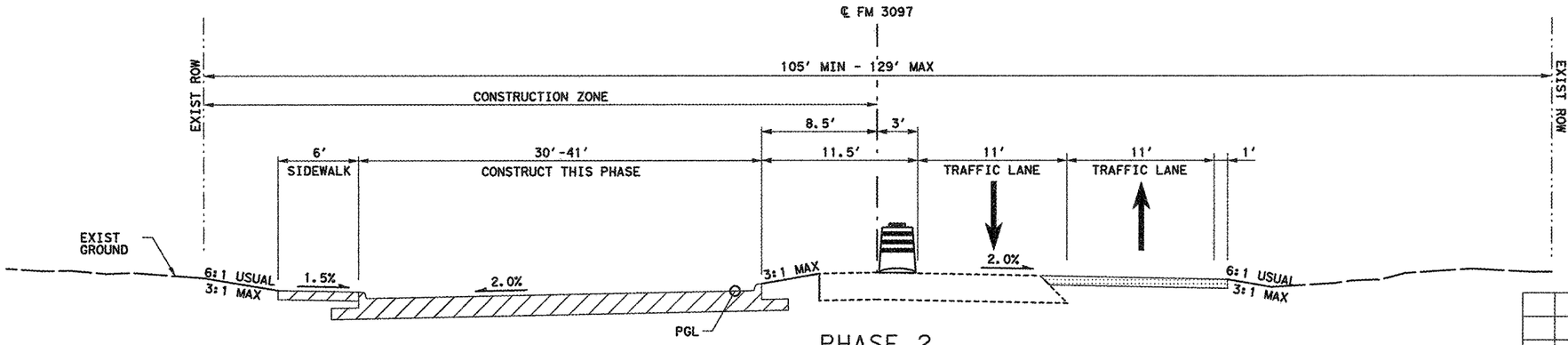
LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- PLASTIC DRUMS
- VERTICAL PANELS



PHASE 2

BEGIN TO STA 4+56
STA 6+93 TO STA 10+60
STA 12+17 TO STA 16+16
STA 17+97 TO STA 23+00
STA 26+02 TO STA 27+20
STA 28+36 TO STA 33+51
STA 36+86 TO STA 42+06



PHASE 2

STA 4+56 TO STA 6+93
STA 10+60 TO STA 12+17
STA 16+16 TO STA 17+97
STA 23+00 TO STA 26+02
STA 27+20 TO STA 28+36
STA 33+51 TO STA 36+86
STA 42+06 TO STA 42+50

STATE OF TEXAS
ROBIN R. HANDEL
86931
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PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

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TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

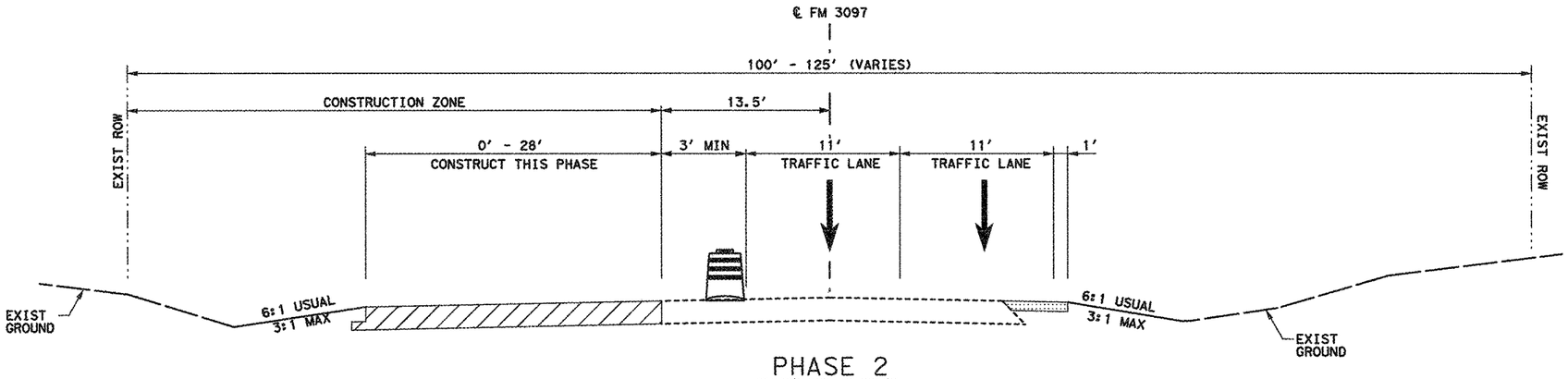
FM 3097
PHASE 2 TYPICAL SECTIONS

Designed:	ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.	
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097	
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
Checked:	JBR	DAL	ROCKWALL	3148	01	006	25	

SHEET 1 OF 2

5/1/2014 3:35:25 PM jroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.03 TCP/120404TCtyp03.dgn

LEGEND
PROPOSED CONSTRUCTION THIS STEP
PROPOSED CONSTRUCTION PREVIOUS STEPS
TEMPORARY PAVEMENT THIS STEP
TEMPORARY PAVEMENT PREVIOUS STEPS
PLASTIC DRUMS
VERTICAL PANELS



PHASE 2

STA 42+50 TO STA 45+70

STATE OF TEXAS
ROBIN R. HANDEL
86931
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PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

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TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097

PHASE 2 TYPICAL SECTIONS

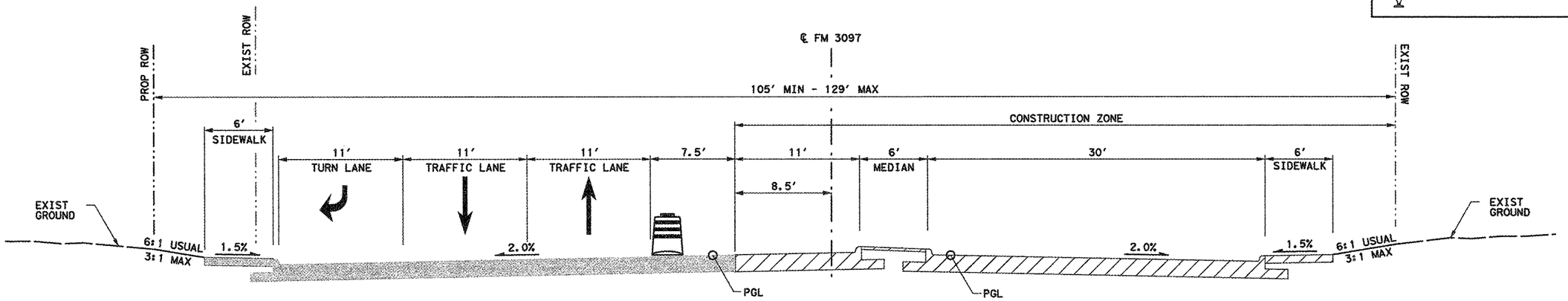
Designed: ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: JBR	DAL	ROCKWALL	3148	01	006	26

SHEET 2 OF 2

5/1/2014 3:36:05 PM irobertson pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.03 TCP/1204041C1vp04.dgn

LEGEND

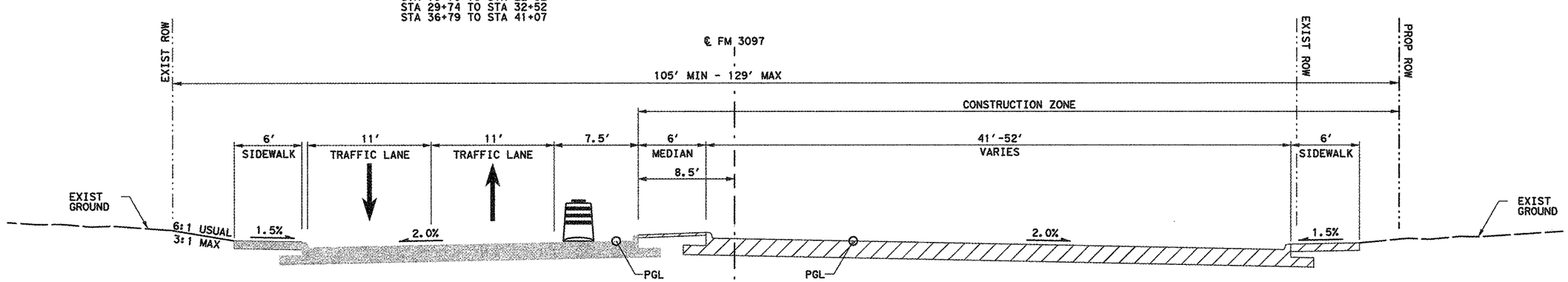
- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- PLASTIC DRUMS
- VERTICAL PANELS



PHASE 3

BEGIN TO STA 9+84
STA 11+97 TO STA 16+98
STA 19+18 TO STA 22+02
STA 29+74 TO STA 32+52
STA 36+79 TO STA 41+07

BEGIN TO STA 8+04
STA 12+06 TO STA 16+38



PHASE 3

STA 9+84 TO STA 11+97
STA 16+98 TO STA 19+18
STA 22+02 TO STA 29+74
STA 32+52 TO STA 36+79

STA 8+04 TO STA 12+06
STA 16+38 TO STA 19+23
STA 23+27 TO STA 29+96
STA 34+45 TO STA 36+86

STATE OF TEXAS
ROBIN R. HANDEL
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05/02/14

NO.	REVISION	BY	DATE

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TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097

PHASE 3 TYPICAL SECTIONS

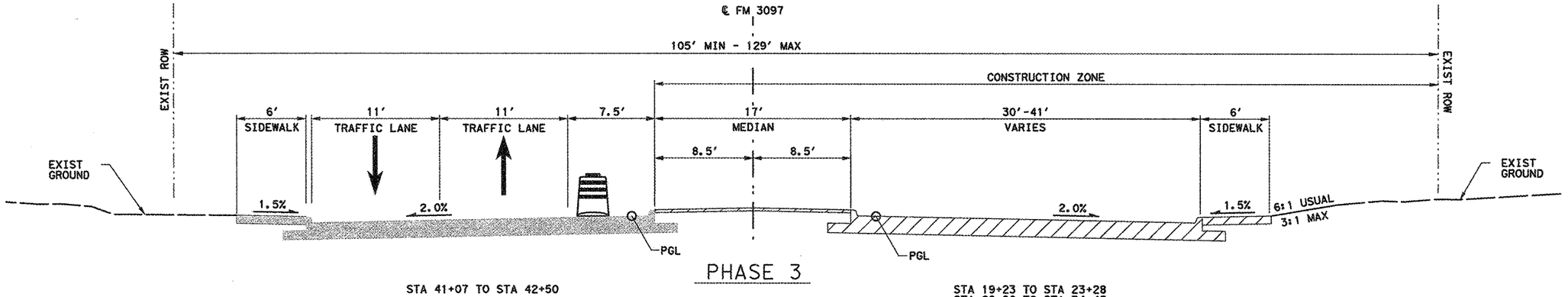
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Checked:	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	ANK	DAL	ROCKWALL	3148	01	006	27
Checked:	JBR						

SHEET 1 OF 2

5/1/2014 3:36:43 PM iroberts dw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.03 TCP/120404ICtyp05.dgn

LEGEND

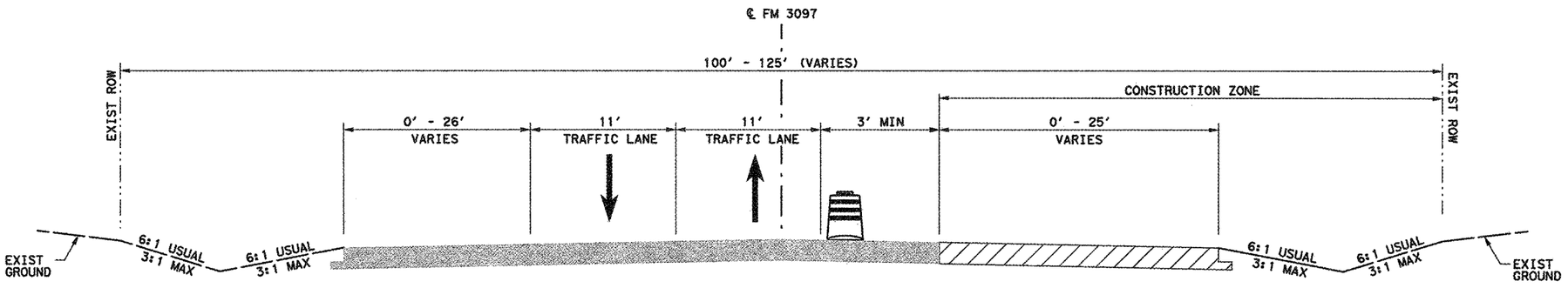
- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- PLASTIC DRUMS
- VERTICAL PANELS



PHASE 3

STA 41+07 TO STA 42+50

STA 19+23 TO STA 23+28
STA 29+96 TO STA 34+45
STA 36+86 TO STA 42+50



PHASE 3

STA 42+50 TO STA 46+09

STATE OF TEXAS
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NO.	REVISION	BY	DATE

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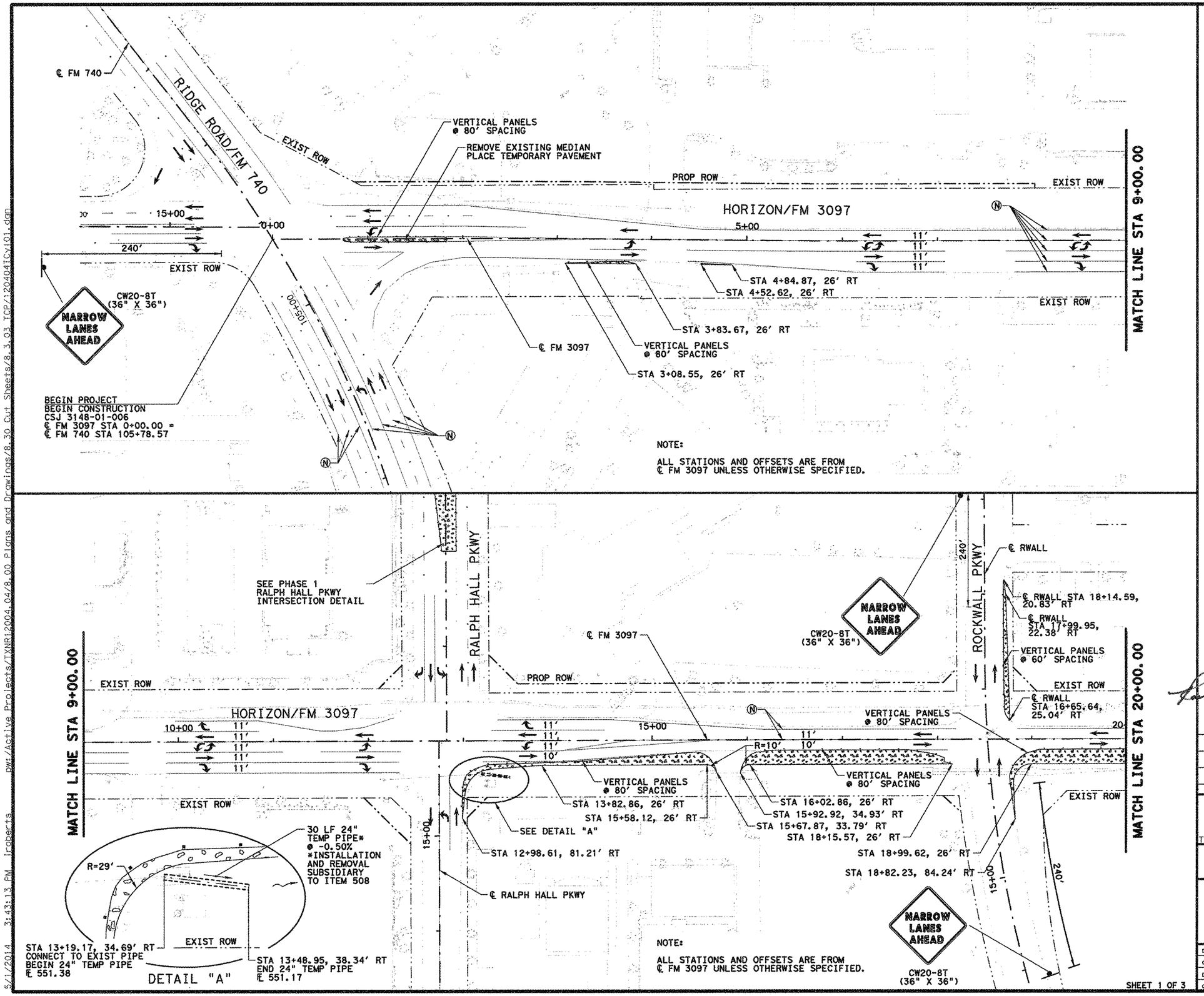
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097
PHASE 3 TYPICAL SECTIONS

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	ANK	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	JBR						
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	JBR	DAL	ROCKWALL	3148	01	006	28

SHEET 2 OF 2



N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- (A) WRK ZN PAV MRK (W)(4")(SLD)(REMOV)
- (B) WRK ZN PAV MRK (W)(4")(BRK)(REMOV)
- (C) WRK ZN PAV MRK (Y)(4")(SLD)(REMOV)
- (D) WRK ZN PAV MRK (W)(8")(SLD)(REMOV)
- (E) WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- (F) WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- (G) WRK ZN PAV MRK (W)(4")(SLD)(NON-REMOV)
- (H) WRK ZN PAV MRK (W)(4")(BRK)(NON-REMOV)
- (I) WRK ZN PAV MRK (Y)(4")(SLD)(NON-REMOV)
- (K) WRK ZN PAV MRK (W)(8")(SLD)(NON-REMOV)
- (L) WRK ZN PAV MRK (Y)(8")(SLD)(NON-REMOV)
- (M) PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- (N) EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

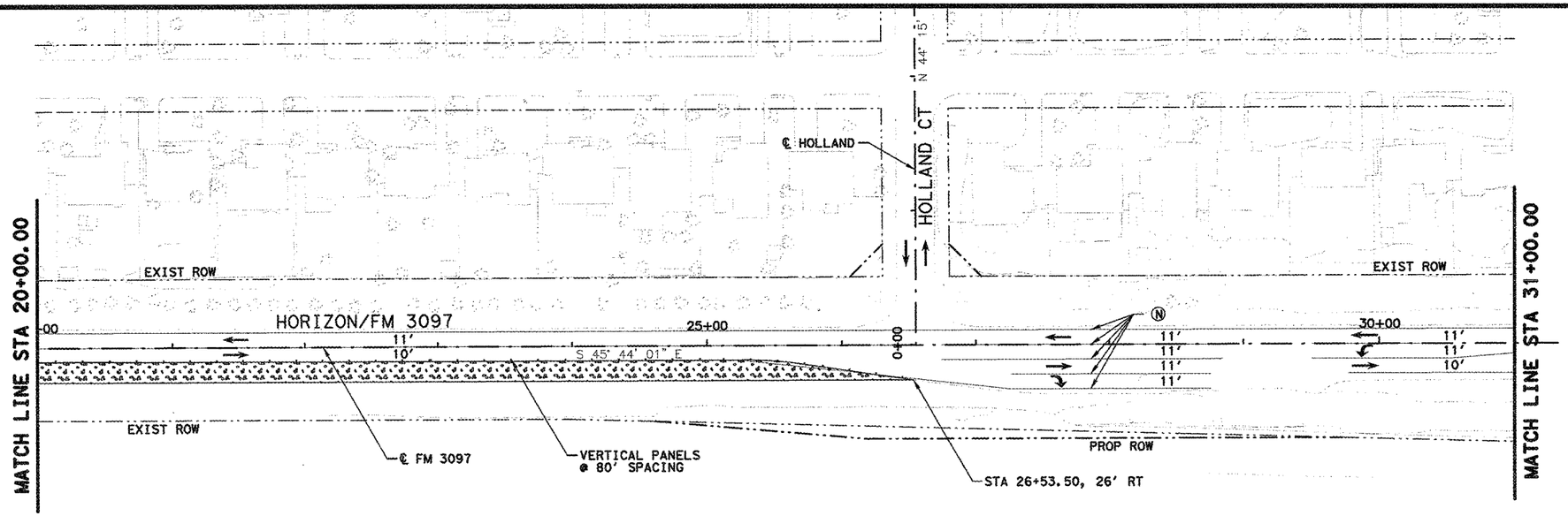
Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 1
STA. 0+00.00 TO STA. 20+00.00

Designed: ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn: ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: JBR	DAL	ROCKWALL	3148	01	006		29

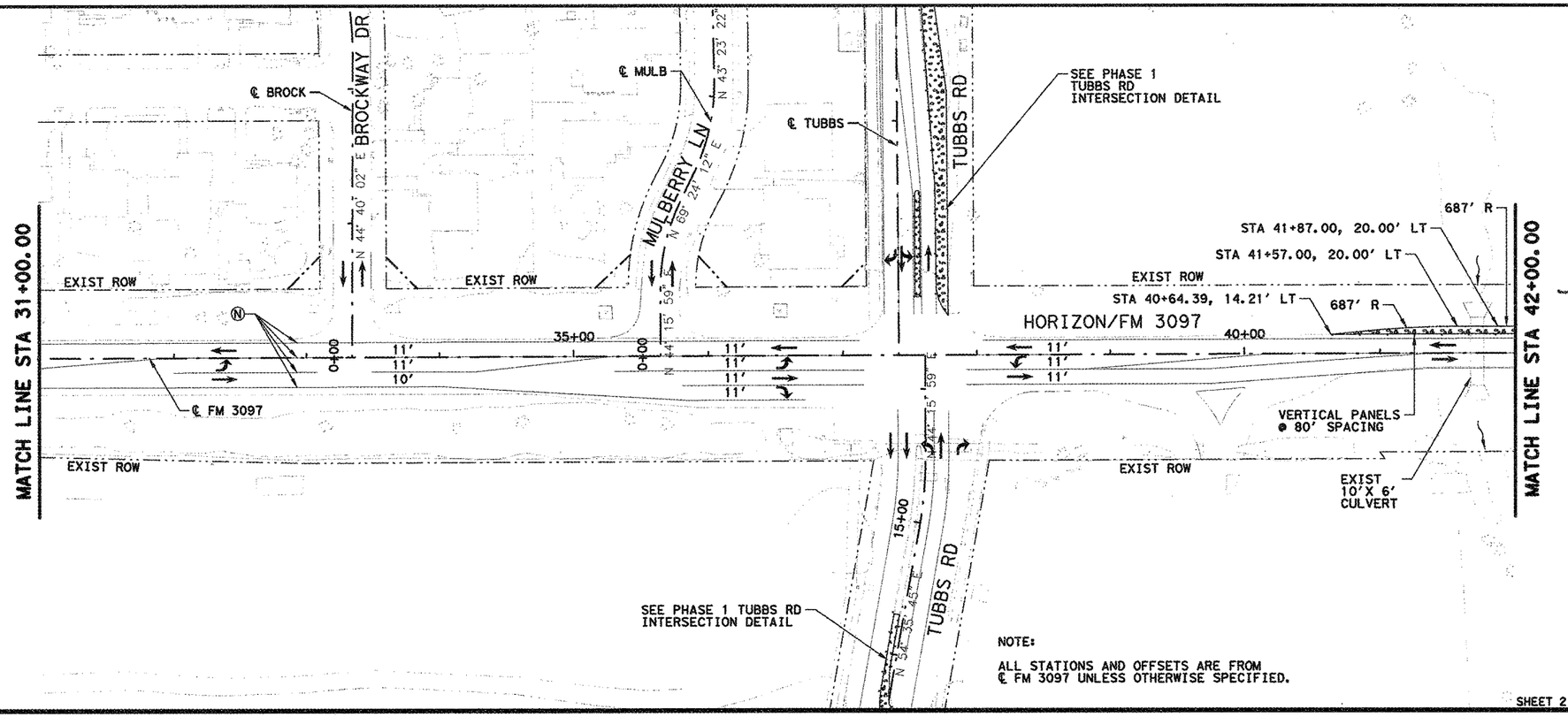
SHEET 1 OF 3

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NOTE:

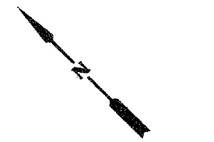
ALL STATIONS AND OFFSETS ARE FROM
℄ FM 3097 UNLESS OTHERWISE SPECIFIED.



NOTE:

ALL STATIONS AND OFFSETS ARE FROM
℄ FM 3097 UNLESS OTHERWISE SPECIFIED.

SHEET 2 OF 3



LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC



05/02/14

NO.	REVISION	BY	DATE

CP&Y

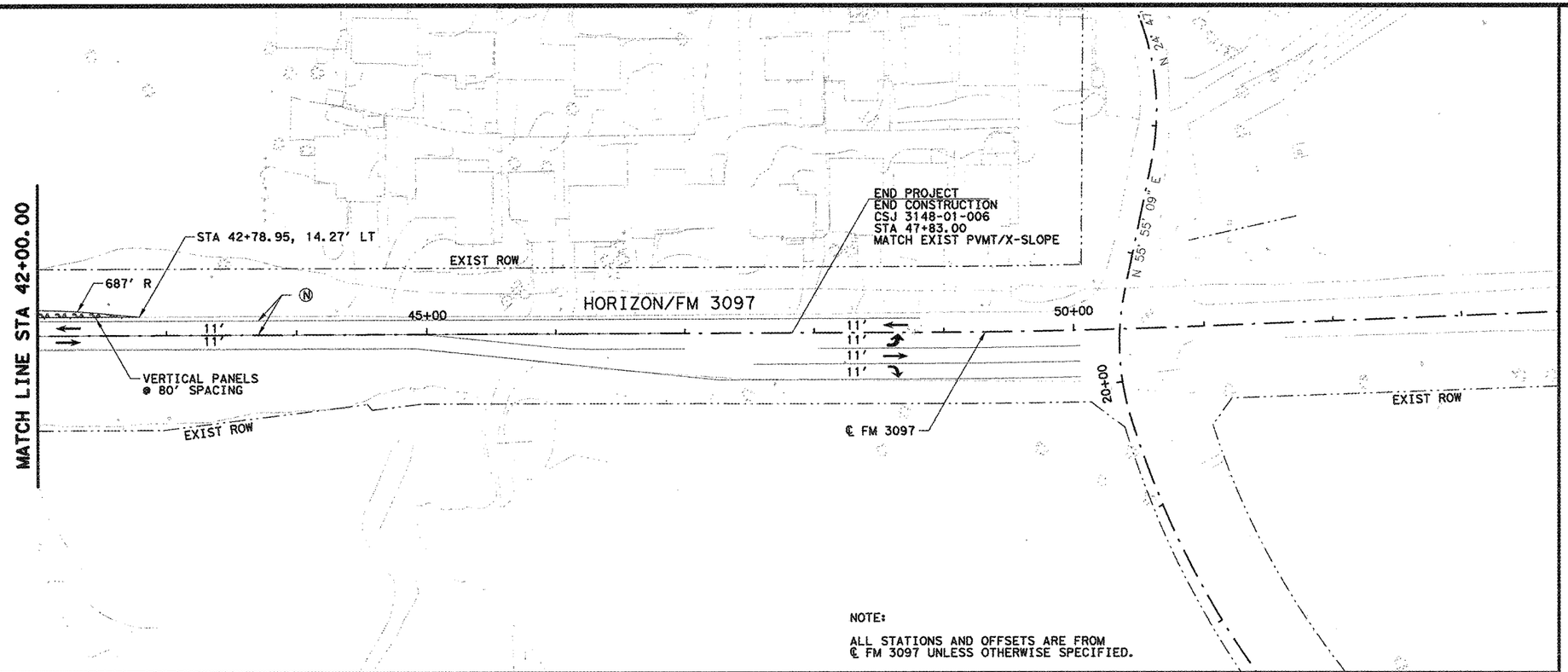
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 1
STA. 20+00.00 TO STA. 42+00.00

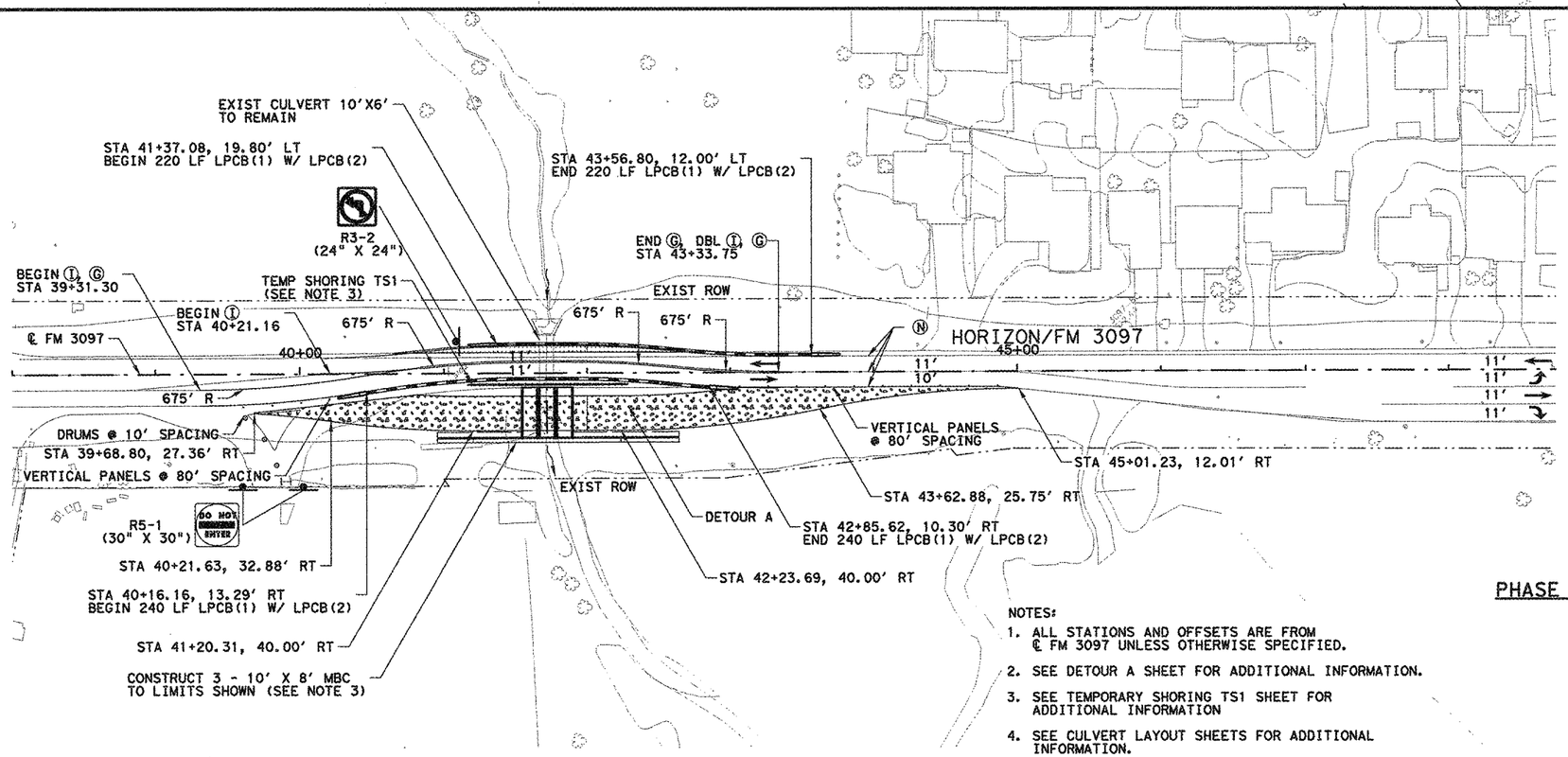
Designed:	ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.		JOB NO.	SHEET NO.
Checked:	JBR	DAL	ROCKWALL	3148	01		006	30

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NOTE:

ALL STATIONS AND OFFSETS ARE FROM
℄ FM 3097 UNLESS OTHERWISE SPECIFIED.



PHASE 1A

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.
2. SEE DETOUR A SHEET FOR ADDITIONAL INFORMATION.
3. SEE TEMPORARY SHORING TS1 SHEET FOR ADDITIONAL INFORMATION
4. SEE CULVERT LAYOUT SHEETS FOR ADDITIONAL INFORMATION.

SHEET 3 OF 3



LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC



05/05/14

NO.	REVISION	BY	DATE

CP&Y

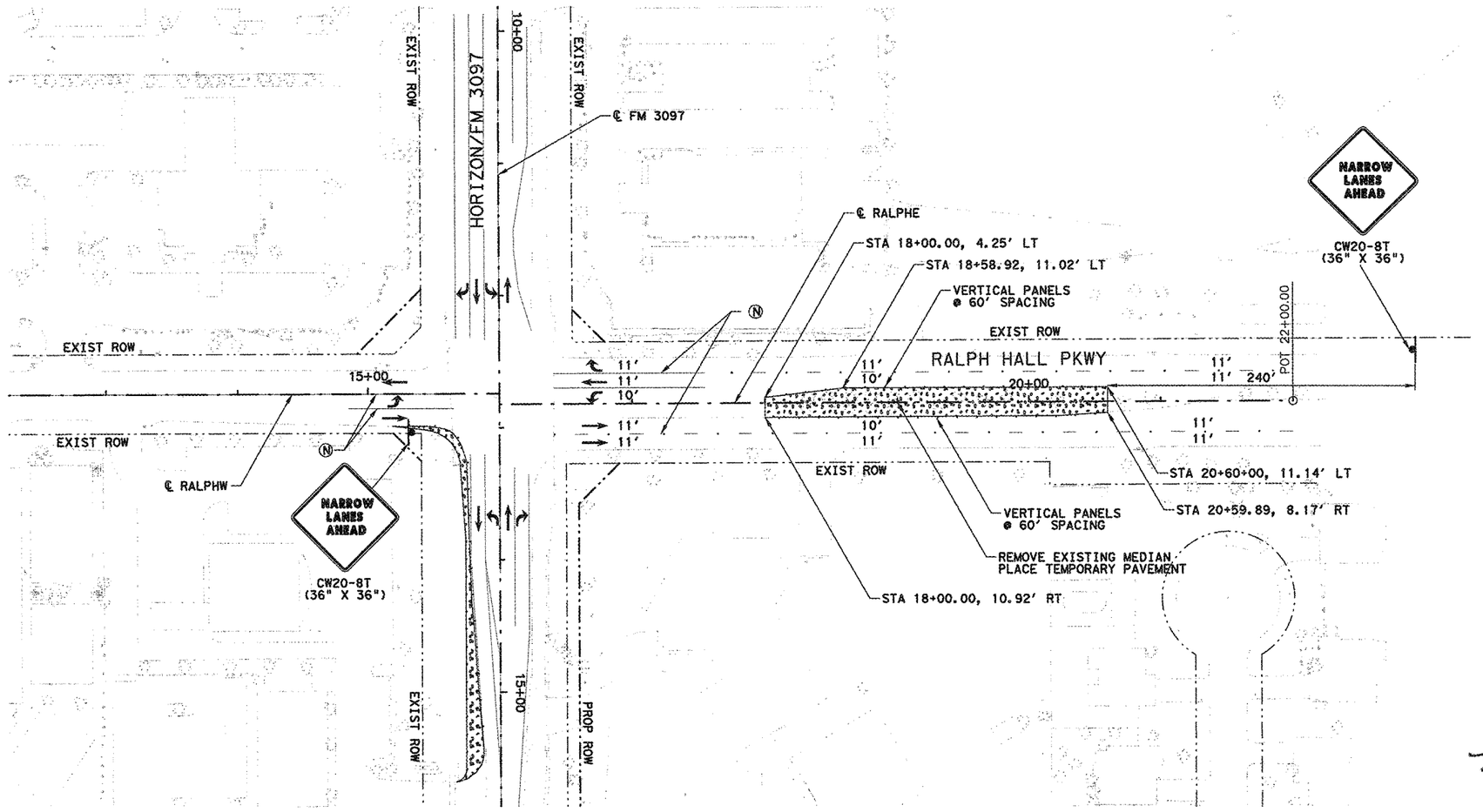
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 1
STA. 42+00.00 TO STA. 45+70.00

Designed:	ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.	
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097	
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	JBR	DAL	ROCKWALL	3148	01	006		31	

5/5/2014 7:56:33 AM oklocinski pw:\Active Projects\TXNR12004.04\8.00 Plans and Drawings\8.30 Cut Sheets\8_3_03_TCP(120404TCy103.dgn



NOTE:

ALL STATIONS AND OFFSETS ARE FROM ℄ RALPHE UNLESS OTHERWISE SPECIFIED.

SHEET 1 OF 1

N

50 25 0 50 100

SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- (A) WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- (B) WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- (C) WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- (D) WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- (E) WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- (F) WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- (G) WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- (H) WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- (I) WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- (K) WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- (L) WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- (M) PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- (N) EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

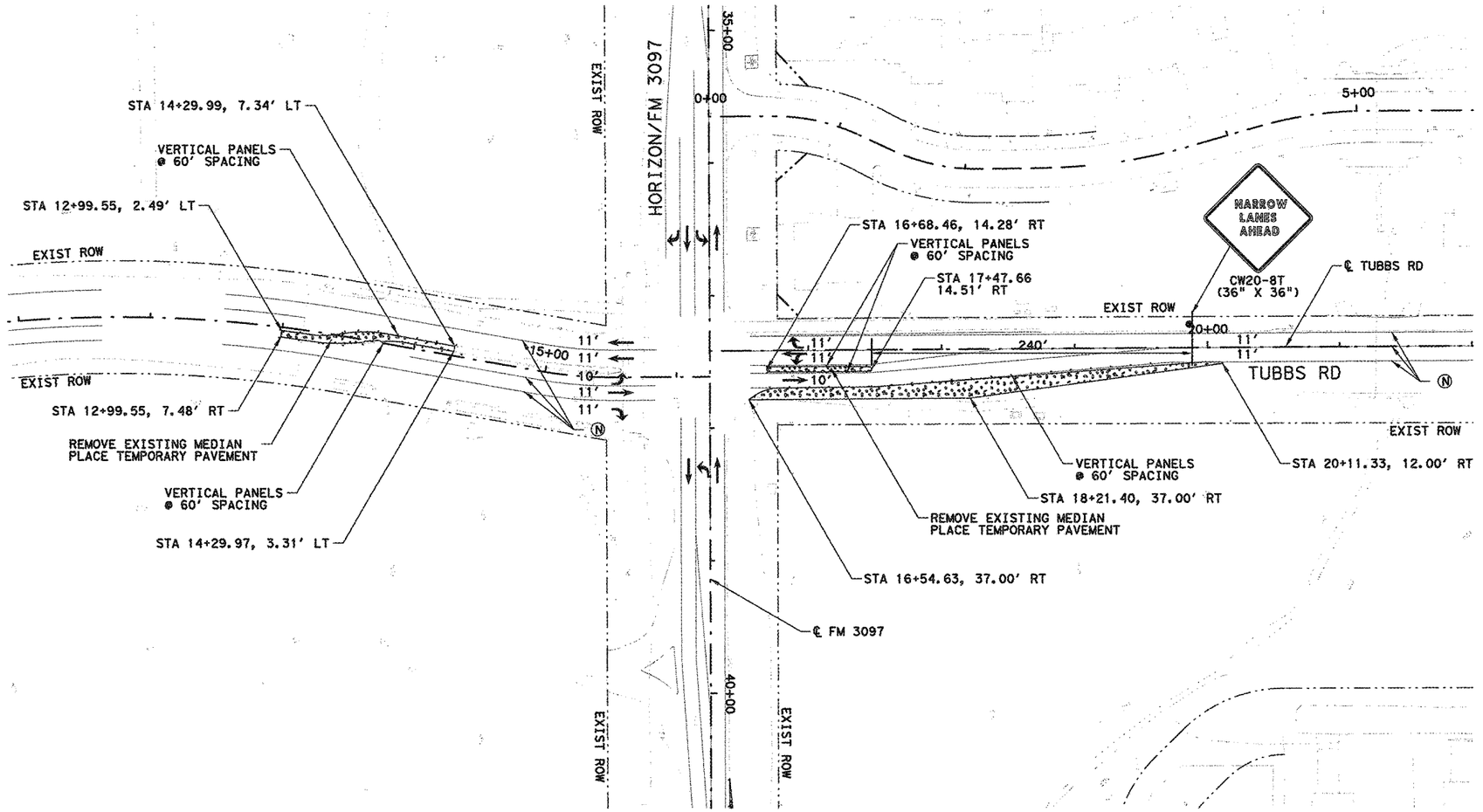
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 1
RALPH HALL PKWY
INTERSECTION DETAIL

Designed: GRB	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.	
Checked: JBR	6	TEXAS	STP 2013 (597) MM				FM 3097	
Drawn: GRB	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked: JBR	DAL	ROCKWALL	3148	01	006		32	

5/1/2014 5:32:00 PM jroberts pw:\Active Projects\TXNR12004.04\8.00 Plans and Prog\8.30 Cut Sheets\8_3_03 TCP\120404TCRH101.dgn



NOTE:

ALL STATIONS AND OFFSETS ARE FROM ℄ TUBBS UNLESS OTHERWISE SPECIFIED.

SHEET 1 OF 1

N

50 25 0 50 100

SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

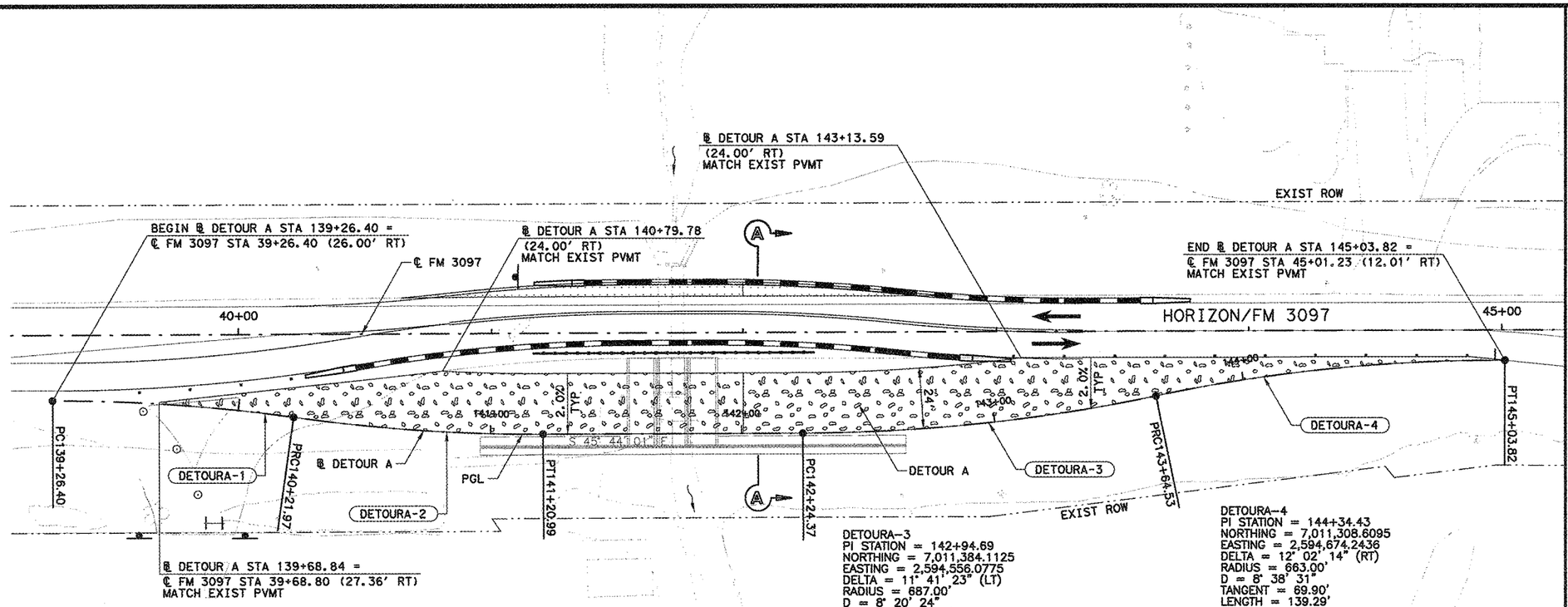
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 1
TUBBS RD INTERSECTION DETAIL

Designed: GRB	FED. DIV. NO.	FED. RD. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: JBR	6		TEXAS	STP 2013 (597) MM				FM 3097
Drawn: GRB	DIST.		COUNTY		CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: JBR	DAL		ROCKWALL		3148	01	006	33

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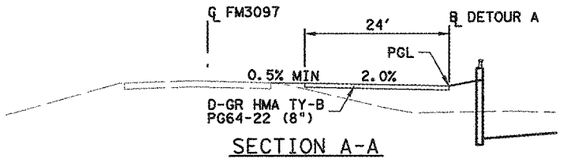


DETOURA-1
PI STATION = 139+74.27
NORTHING = 7,011,617.3247
EASTING = 2,594,336.8739
DELTA = 8° 15' 31" (RT)
RADIUS = 663.00'
D = 8° 38' 31"
TANGENT = 47.87'
LENGTH = 95.57'

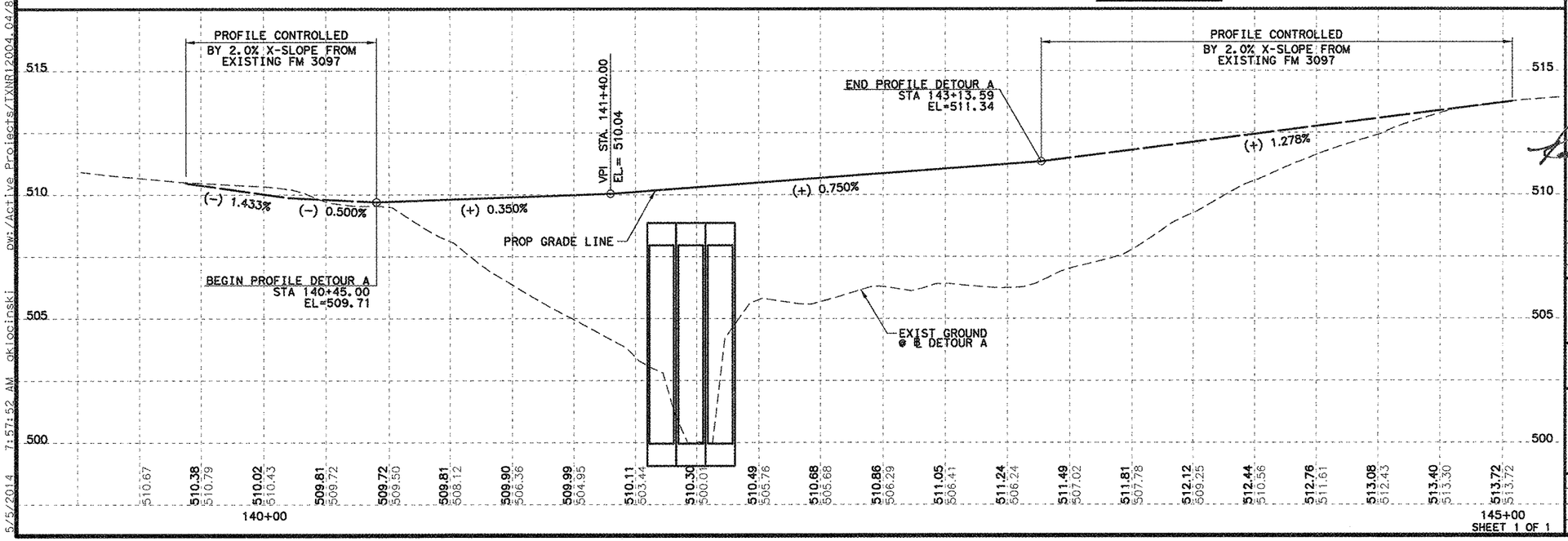
DETOURA-2
PI STATION = 140+71.56
NORTHING = 7,011,539.9751
EASTING = 2,594,396.1723
DELTA = 8° 15' 31" (LT)
RADIUS = 687.00'
D = 8° 20' 24"
TANGENT = 49.60'
LENGTH = 99.03'

DETOURA-3
PI STATION = 142+94.69
NORTHING = 7,011,384.1125
EASTING = 2,594,556.0775
DELTA = 11° 41' 23" (LT)
RADIUS = 687.00'
D = 8° 20' 24"
TANGENT = 70.33'
LENGTH = 140.16'

DETOURA-4
PI STATION = 144+34.43
NORTHING = 7,011,308.6095
EASTING = 2,594,674.2436
DELTA = 12° 02' 14" (RT)
RADIUS = 663.00'
D = 8° 38' 31"
TANGENT = 69.90'
LENGTH = 139.29'



SECTION A-A



SHEET 1 OF 1

25 12.5 0 25 50
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/05/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM, F-1741

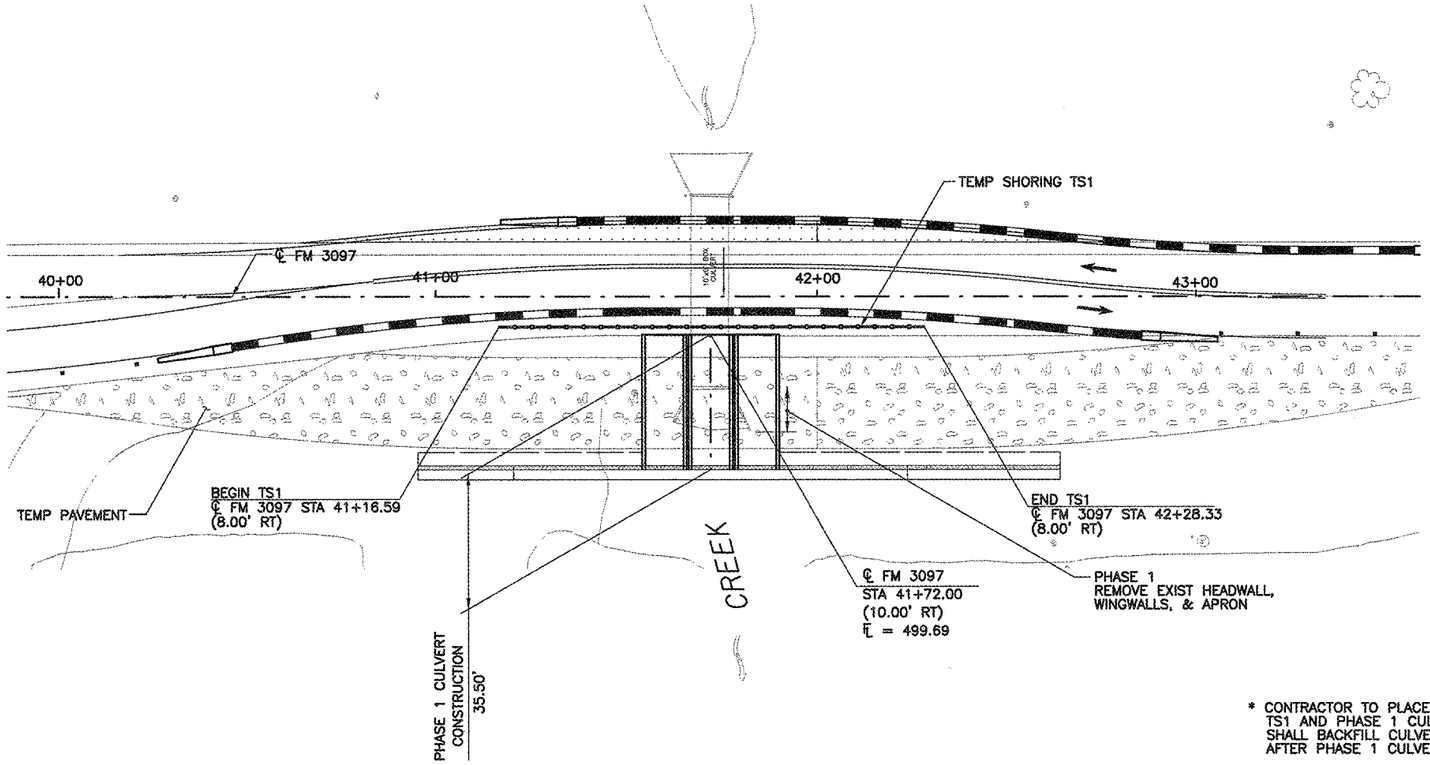
Texas Department of Transportation

TRAFFIC CONTROL PLAN
DETOUR A

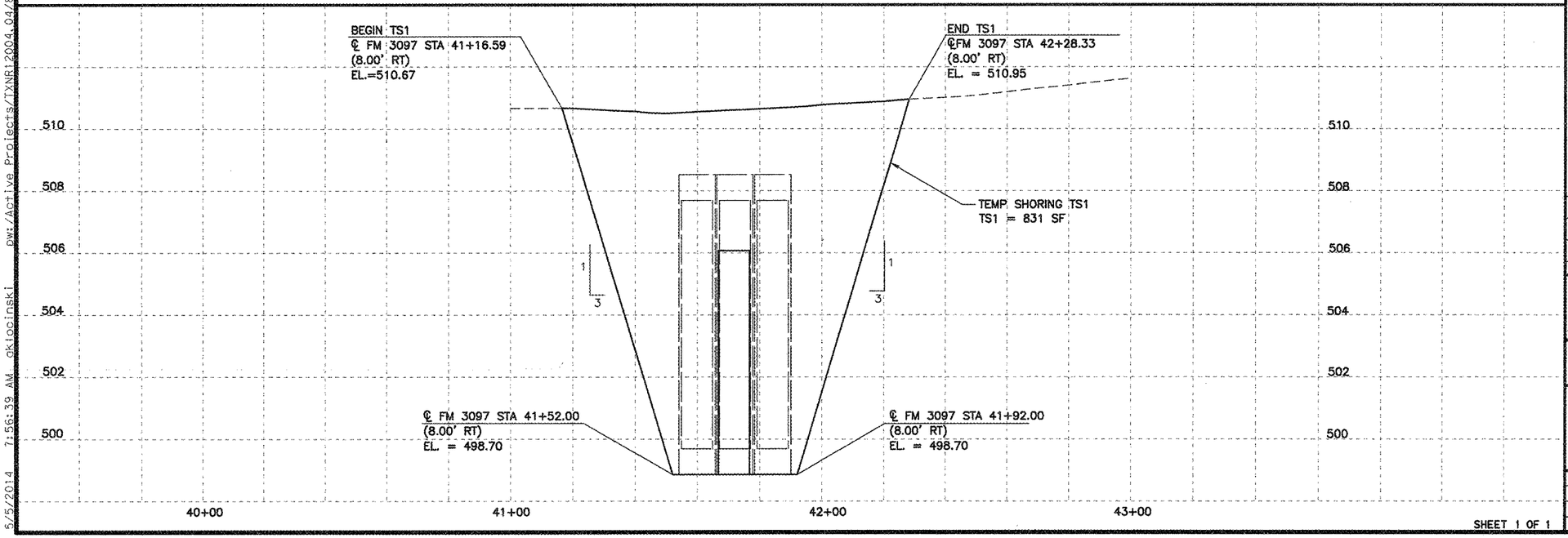
Designed: ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.	
Checked: JBR	6	TEXAS	STP 2013 (597) MM				FM 3097	
Drawn: ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.		JOB NO.	SHEET NO.	
Checked: JBR	DAL	ROCKWALL	3148	01		006	34	

5/5/2014 7:57:52 AM dklocinski

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* CONTRACTOR TO PLACE LPCB PRIOR TO CONSTRUCTION OF TS1 AND PHASE 1 CULVERT CONSTRUCTION. CONTRACTOR SHALL BACKFILL CULVERT, AND CONSTRUCT TEMP PAVEMENT AFTER PHASE 1 CULVERT CONSTRUCTION.



SHEET 1 OF 1

N

20 10 0 20 40
SCALE FEET
HORZ.

2 1 0 2 4
SCALE FEET
VERT.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/05/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

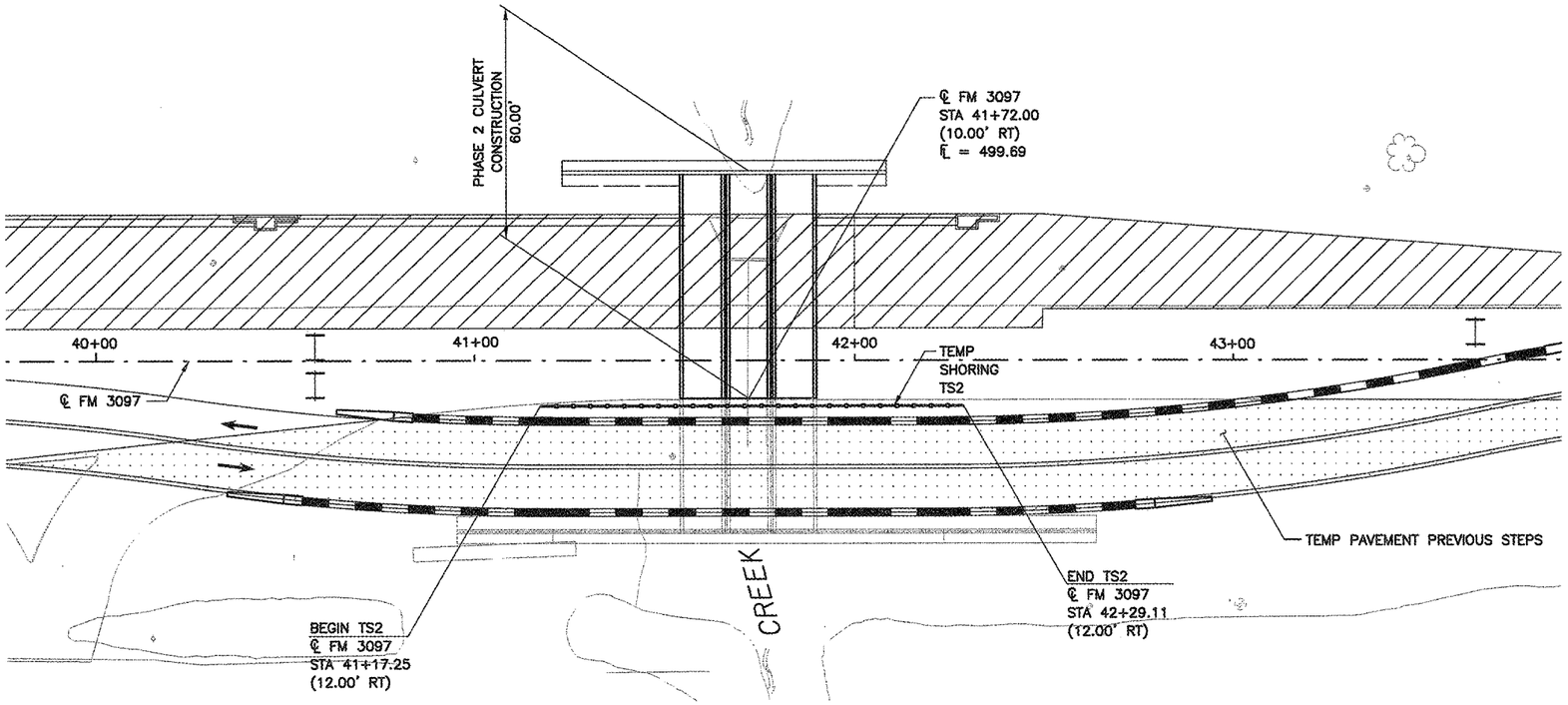
Texas Department of Transportation

FM 3097

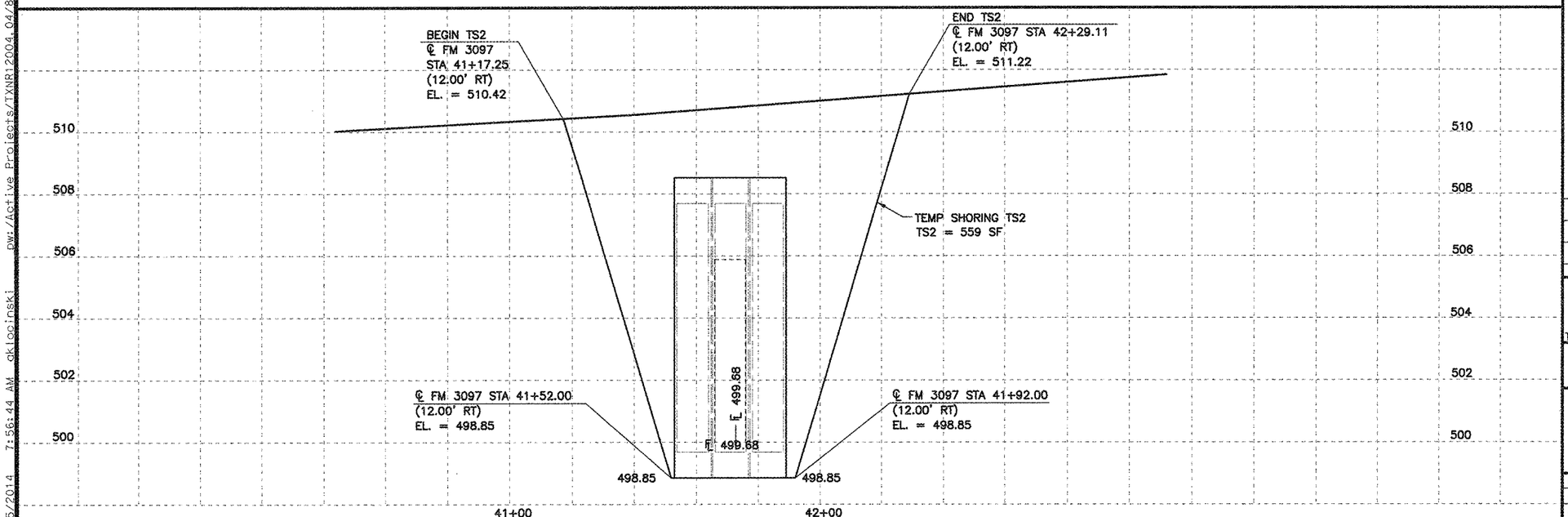
TEMPORARY SHORING TS1

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	GRB	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	GRB	DAL	ROCKWALL	3148	01	006	35
Checked:	JBR						

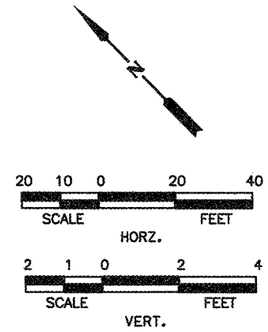
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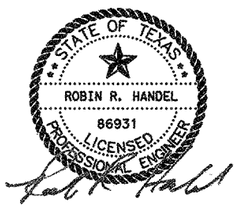


* CONTRACTOR TO CONSTRUCT TS2 DURING BACKFILL OF PHASE 1 CULVERT CONSTRUCTION. CONTRACTOR TO PLACE LPCB PRIOR TO CONSTRUCTION OF PHASE 2 CULVERT CONSTRUCTION.



SHEET 1 OF 1





05/05/14

NO.	REVISION	BY	DATE

CP&Y

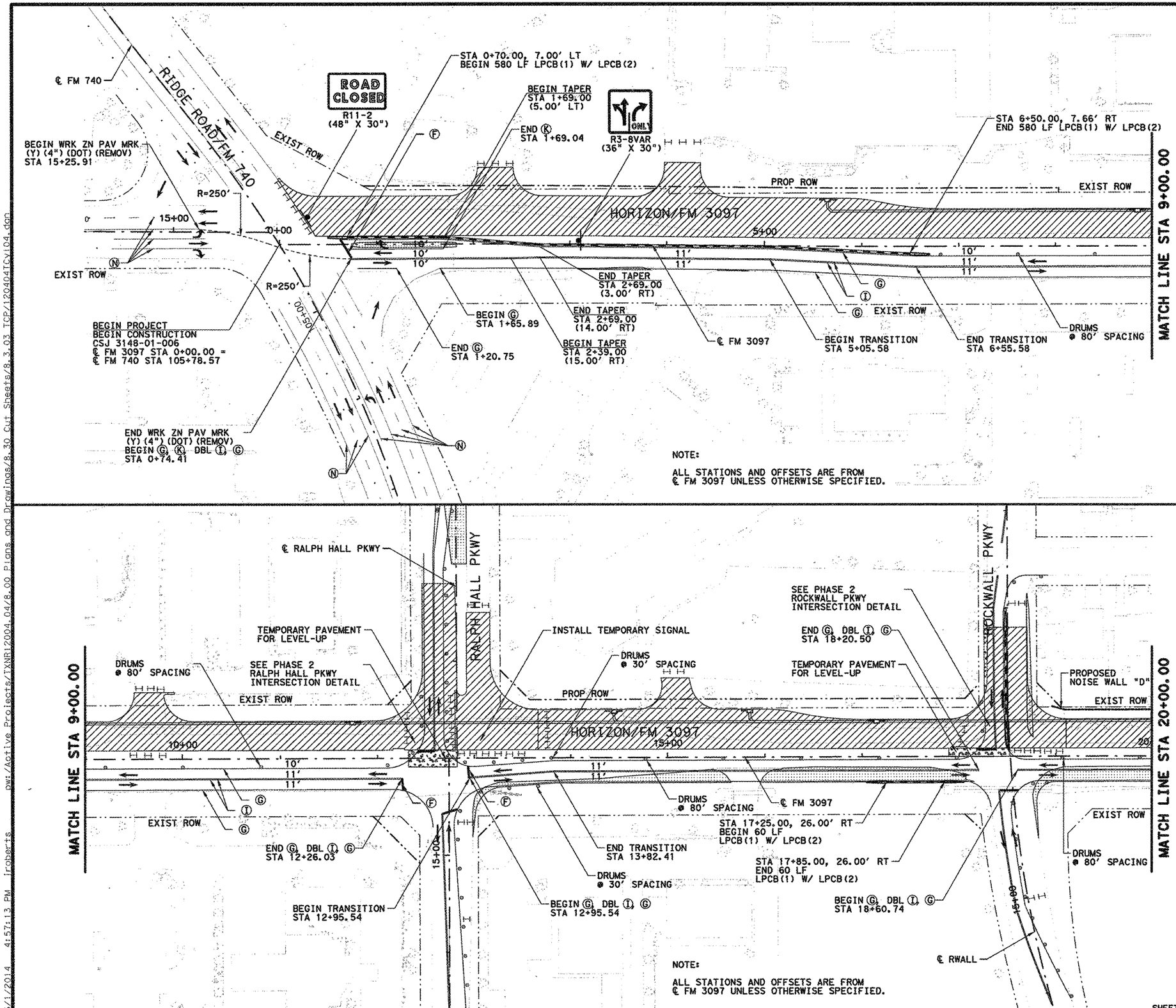
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097
TEMPORARY SHORING TS2

Designed: ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: JBR	DAL	ROCKWALL	3148	01	006	36

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N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

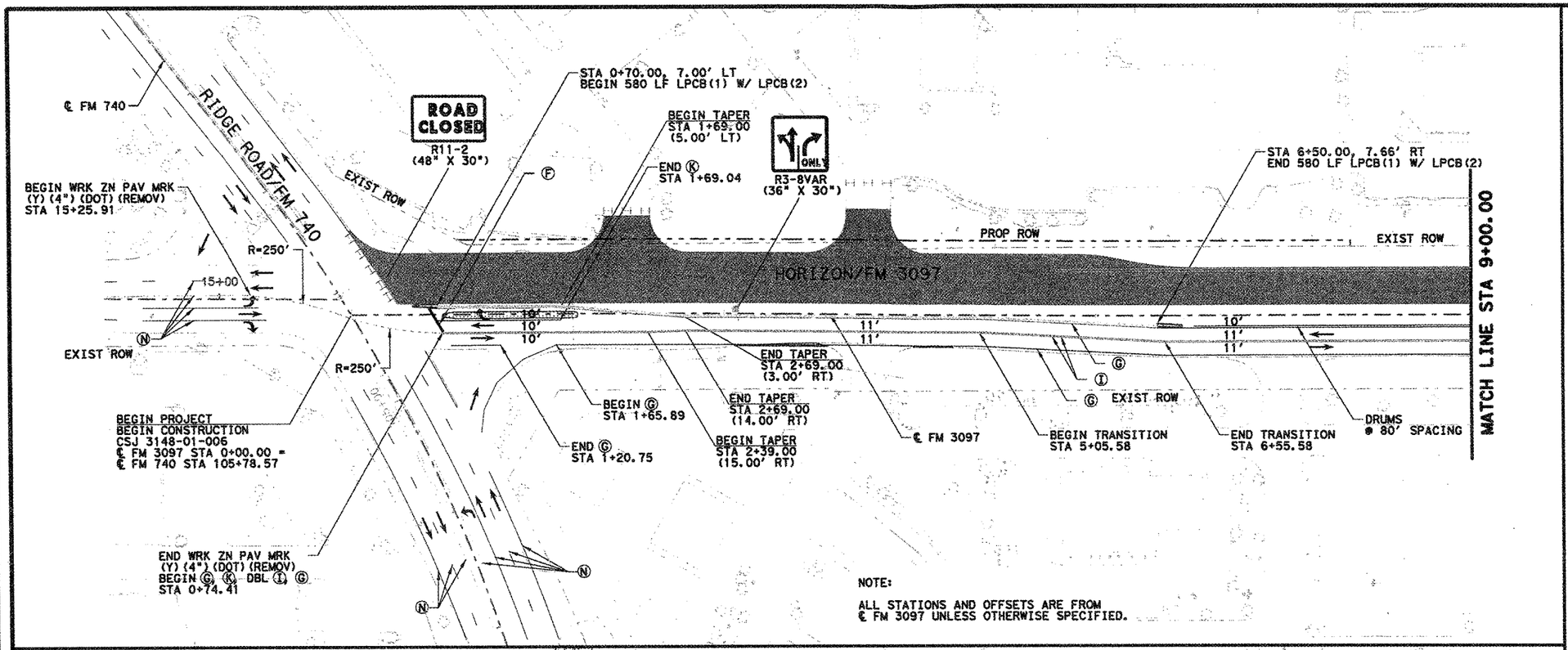
Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 2
STA. 0+00.00 TO STA. 20+00.00

Designed:	ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	JBR	DAL	ROCKWALL	3148	01	006	37

SHEET 1 OF 3

5/1/2014 4:57:13 PM jroberts
d:\Drawings\8.30 Cut Sheets\8.3.03 TCP\1204041Cy104.dgn



N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ADRIAN O. MURPHY
85530
REGISTERED
PROFESSIONAL ENGINEER
3-6-17

NO.	REVISION	BY	DATE

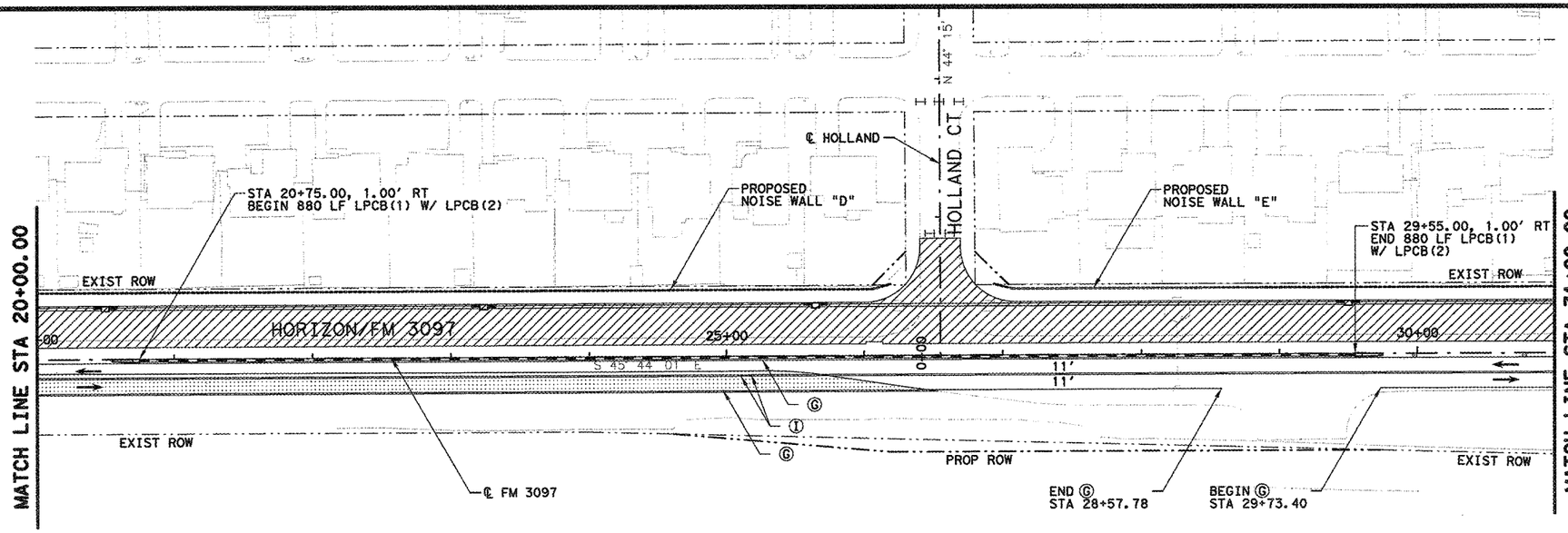
1504 WHITAKER WAY
GLENN HEIGHTS, TX 75154
(214) 985-9630
LEADERSHIP TRAFFIC SERVICES
TEXAS BOARD OF PROFESSIONAL ENGINEERS, F-12534

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 2
STA. 0+00.00 TO STA. 20+00.00

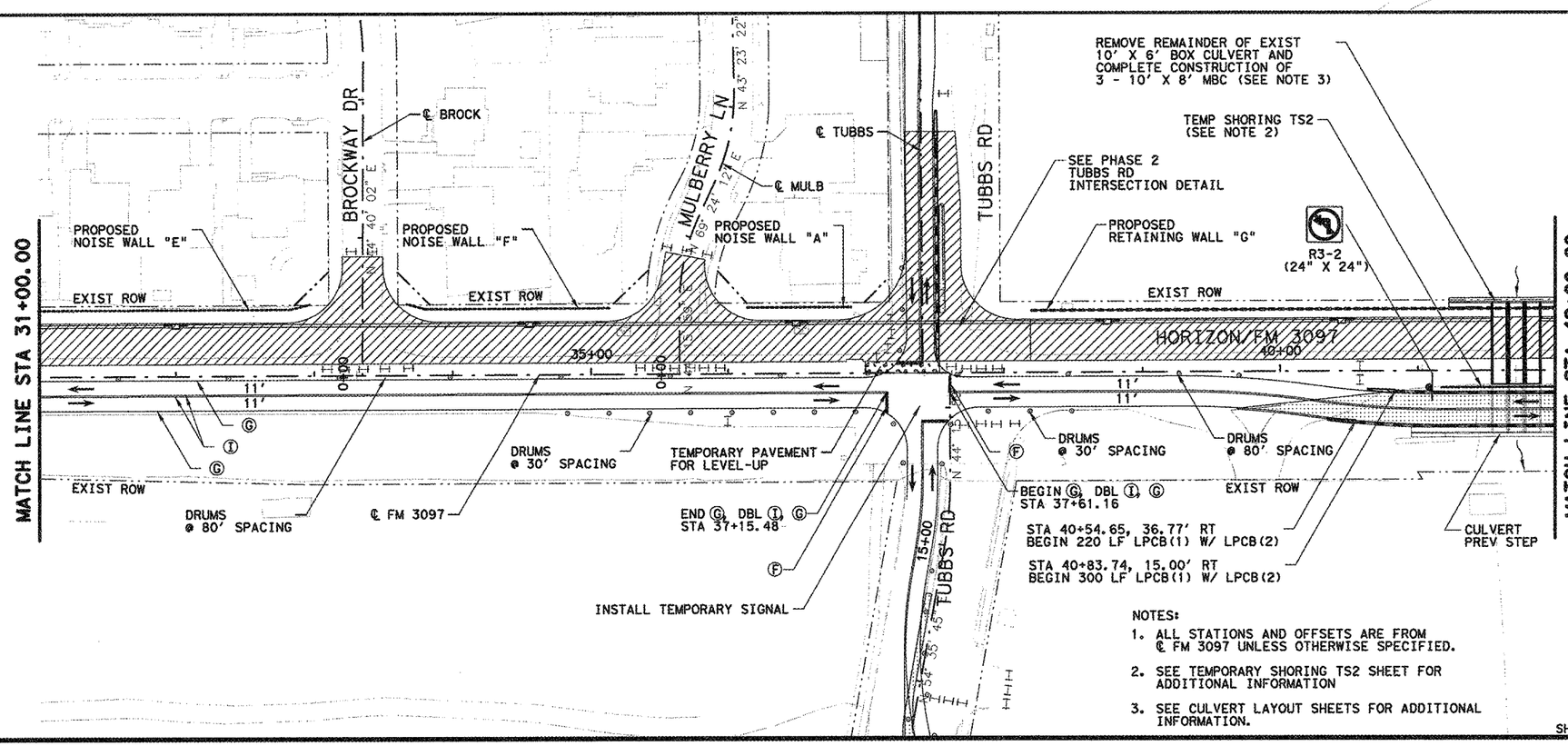
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Checked: $DRWC$	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: DSG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: $DSGC$	DAL	ROCKWALL	3148	01	006	37A

$DATE$ $TIME$ $USERNAME$ $PWFILE$



NOTE:

ALL STATIONS AND OFFSETS ARE FROM
℄ FM 3097 UNLESS OTHERWISE SPECIFIED.



NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.
2. SEE TEMPORARY SHORING TS2 SHEET FOR ADDITIONAL INFORMATION
3. SEE CULVERT LAYOUT SHEETS FOR ADDITIONAL INFORMATION.

SHEET 2 OF 3

50 25 0 50 100
SCALE FEET

LEGEND	
	PROPOSED CONSTRUCTION THIS STEP
	PROPOSED CONSTRUCTION PREVIOUS STEPS
	TEMPORARY PAVEMENT THIS STEP
	TEMPORARY PAVEMENT PREVIOUS STEPS
Ⓐ	WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
Ⓑ	WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
Ⓒ	WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
Ⓓ	WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
Ⓔ	WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
Ⓕ	WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
Ⓖ	WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
Ⓗ	WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
Ⓘ	WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
Ⓚ	WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
Ⓛ	WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
Ⓜ	PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
Ⓝ	EXISTING STRIPING / STRIPING PREV STEP
	TY 3 BARRICADE
	SIGN POST
	LPCB(1)
	LPCB(2) (20 LF)
	PLASTIC DRUMS
	VERTICAL PANELS
	TEMPORARY SHORING
	DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
05/05/14

NO.	REVISION	BY	DATE

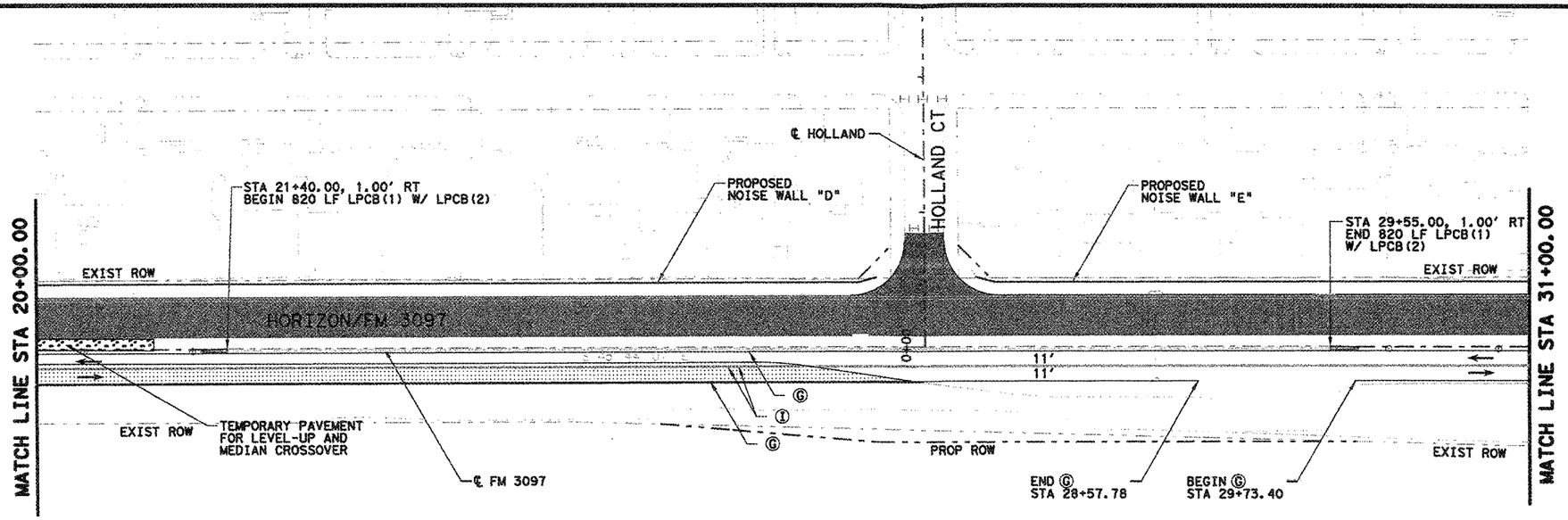
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 2
STA. 20+00.00 TO STA. 42+00.00

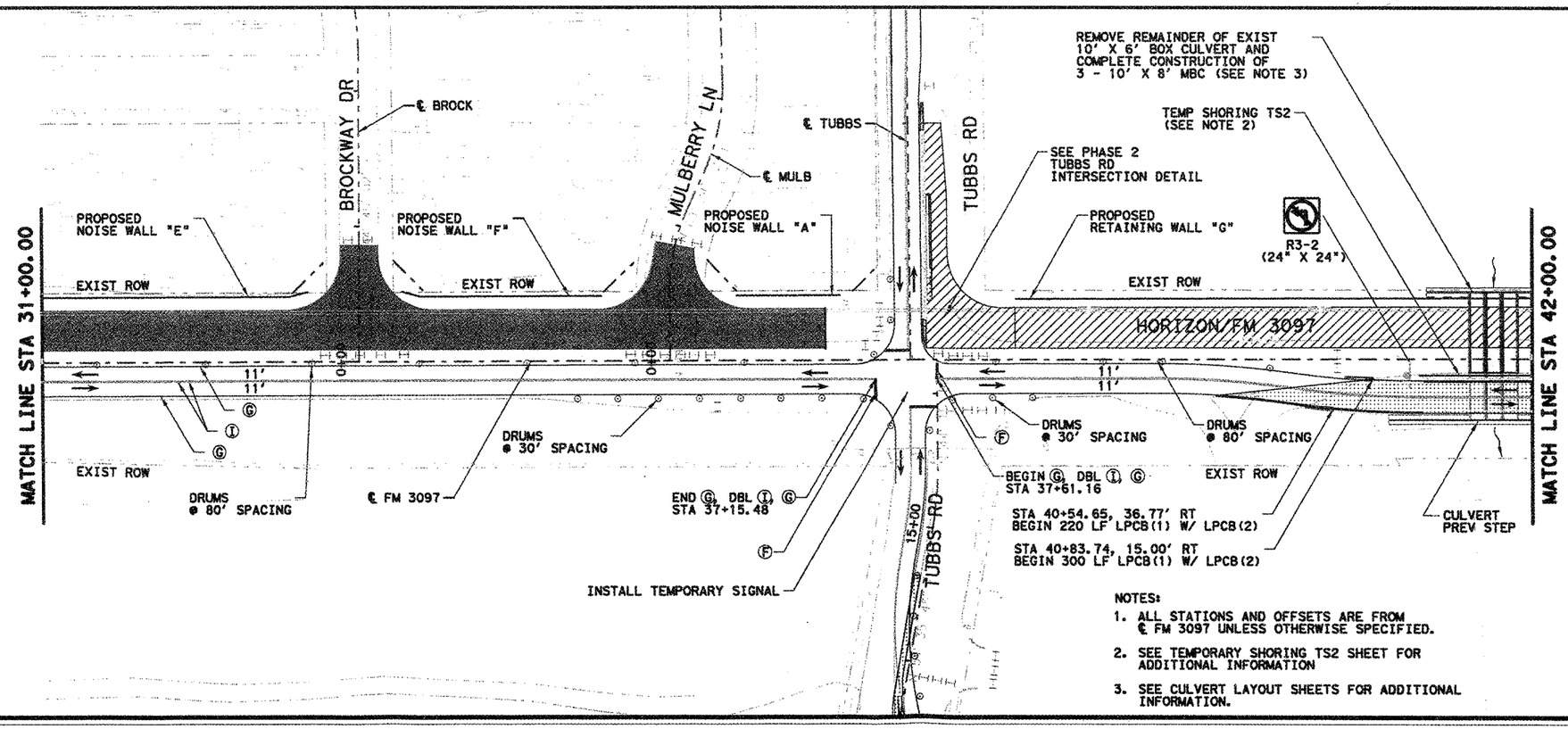
Designed:	ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	JBR	DAL	ROCKWALL	3148	01	006		38

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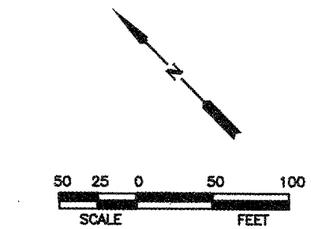
NOTE:

ALL STATIONS AND OFFSETS ARE FROM
℄ FM 3097 UNLESS OTHERWISE SPECIFIED.



NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.
2. SEE TEMPORARY SHORING TS2 SHEET FOR ADDITIONAL INFORMATION
3. SEE CULVERT LAYOUT SHEETS FOR ADDITIONAL INFORMATION.



LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC



NO.	REVISION	BY	DATE

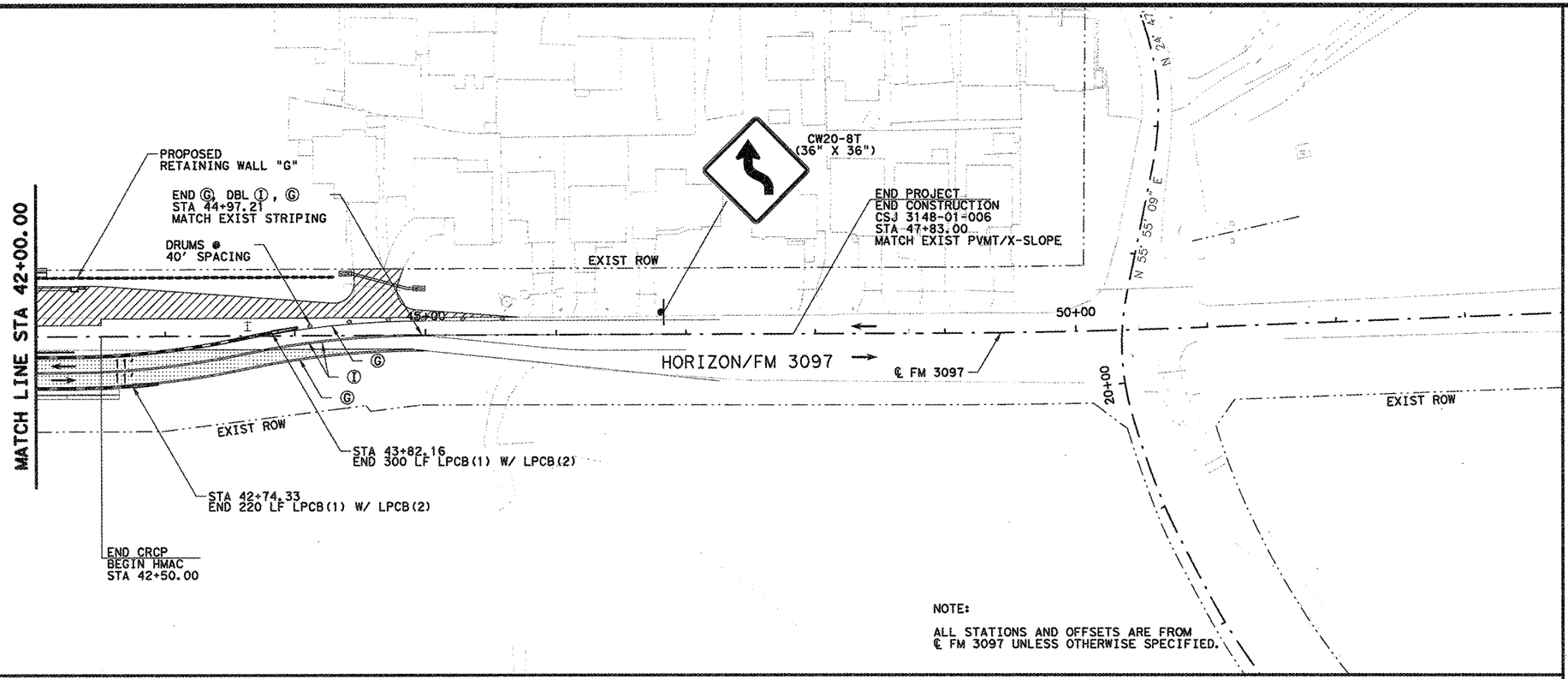
1504 WHITAKER WAY
GLENN HEIGHTS, TX 75154
(214) 985-9630
LEADERSHIP TRAFFIC SERVICES
TEXAS BOARD OF PROFESSIONAL ENGINEERS, F-12534

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 2
STA. 20+00.00 TO STA. 42+00.00

Designed: @DRW@	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: @DRWC@	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: @DSG@	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: @DSGC@	DAL	ROCKWALL	3148	01	006	38A

$DATE$ $TIME$ $USERNAME$ $PWFILE$



N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER
05/05/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

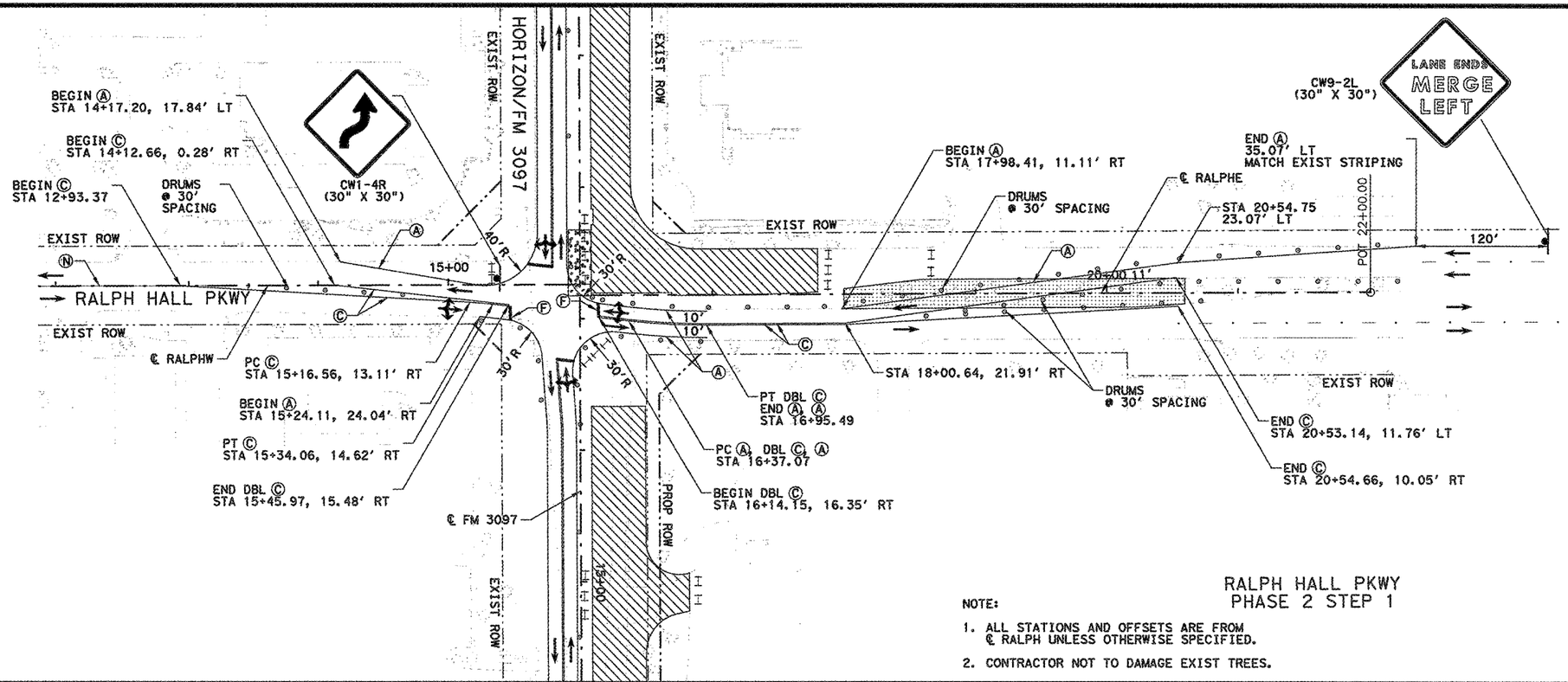
Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 2
STA. 42+00.00 TO STA. 45+70.00

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	ANK	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	JBR	DAL	ROCKWALL	3148	01	006	39

SHEET 3 OF 3

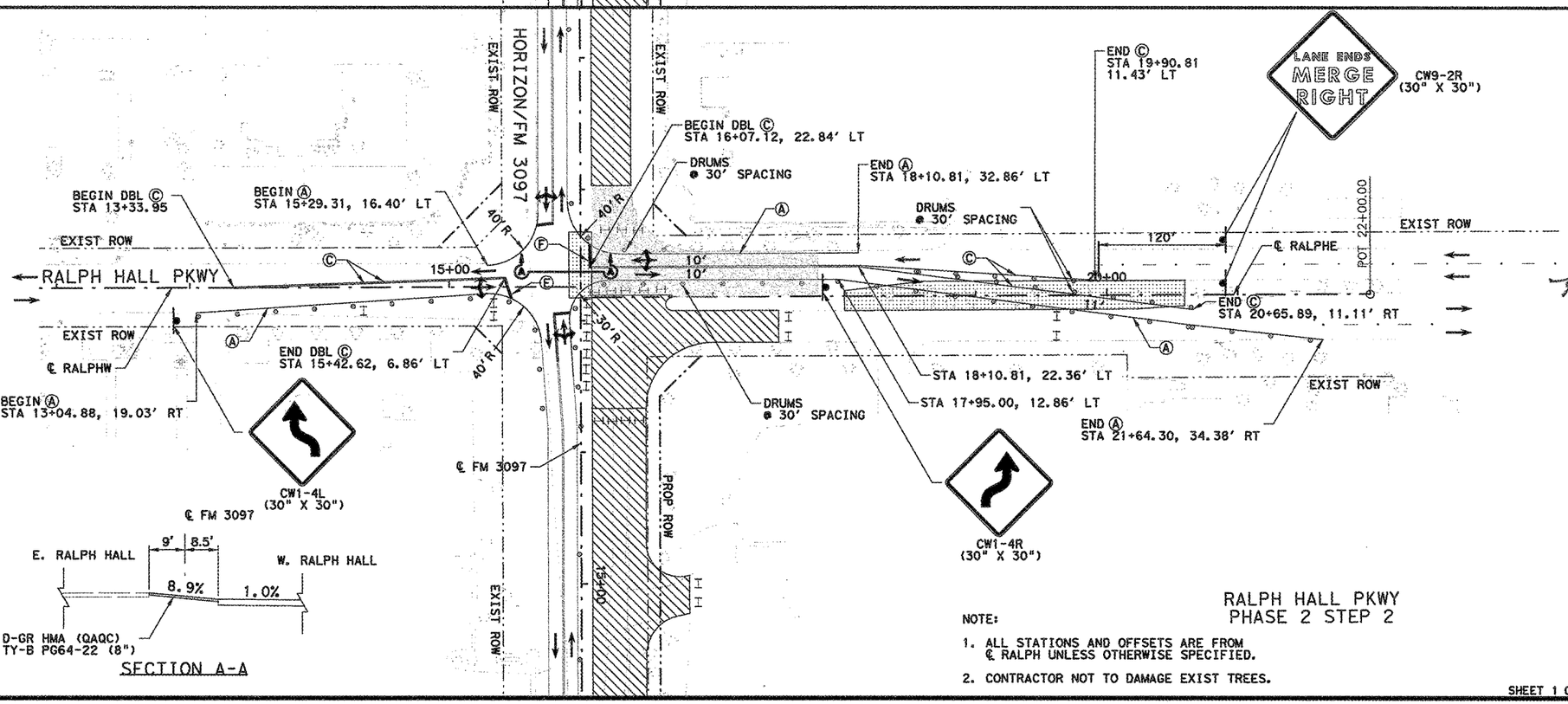
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RALPH HALL PKWY
PHASE 2 STEP 1

NOTE:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ RALPH UNLESS OTHERWISE SPECIFIED.
2. CONTRACTOR NOT TO DAMAGE EXIST TREES.



SECTION A-A

RALPH HALL PKWY
PHASE 2 STEP 2

NOTE:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ RALPH UNLESS OTHERWISE SPECIFIED.
2. CONTRACTOR NOT TO DAMAGE EXIST TREES.

SHEET 1 OF 1

N

50 25 0 50 100
SCALE FEET

LEGEND	
	PROPOSED CONSTRUCTION THIS STEP
	PROPOSED CONSTRUCTION PREVIOUS STEPS
	TEMPORARY PAVEMENT THIS STEP
	TEMPORARY PAVEMENT PREVIOUS STEPS
Ⓐ	WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
Ⓑ	WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
Ⓒ	WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
Ⓓ	WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
Ⓔ	WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
Ⓕ	WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
Ⓖ	WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
Ⓗ	WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
Ⓘ	WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
Ⓚ	WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
Ⓛ	WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
Ⓜ	PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
Ⓝ	EXISTING STRIPING / STRIPING PREV STEP
	TY 3 BARRICADE
	SIGN POST
	LPCB(1)
	LPCB(2) (20 LF)
	PLASTIC DRUMS
	VERTICAL PANELS
	TEMPORARY SHORING
	DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

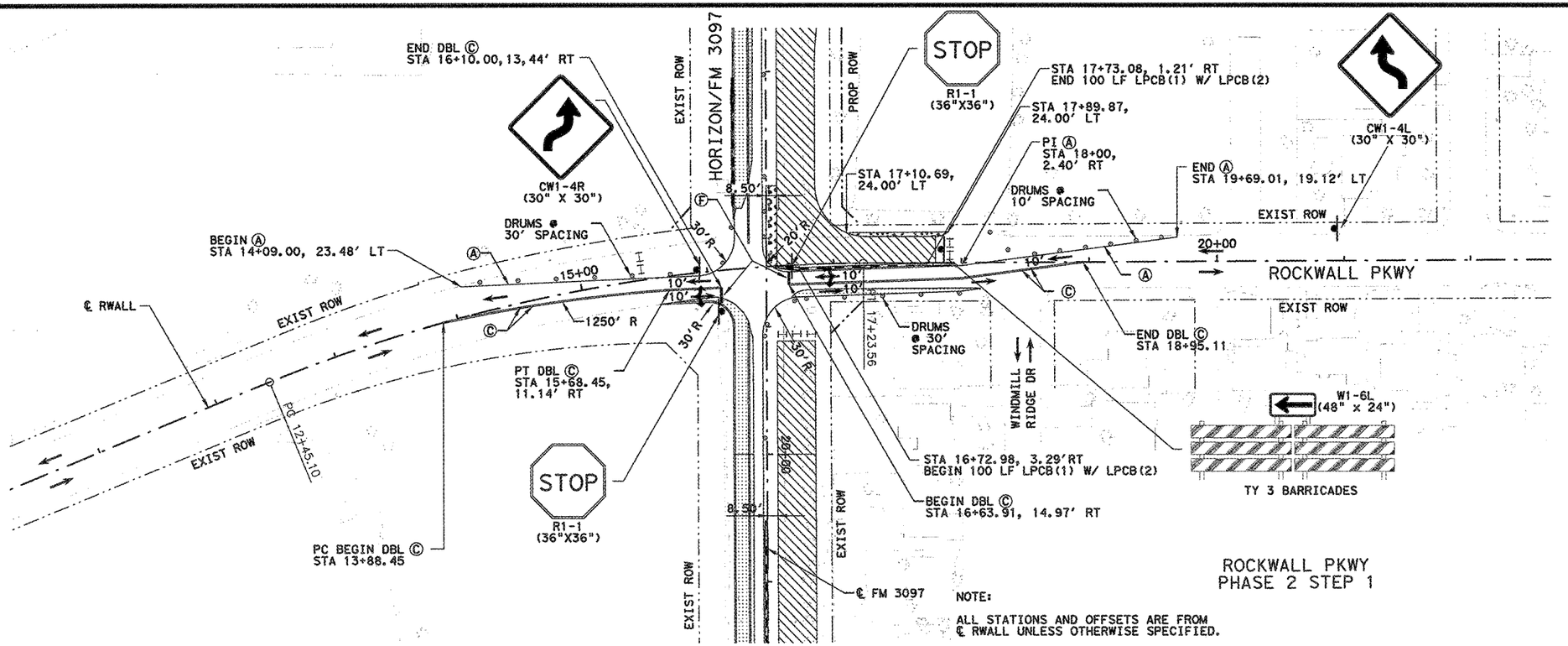
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

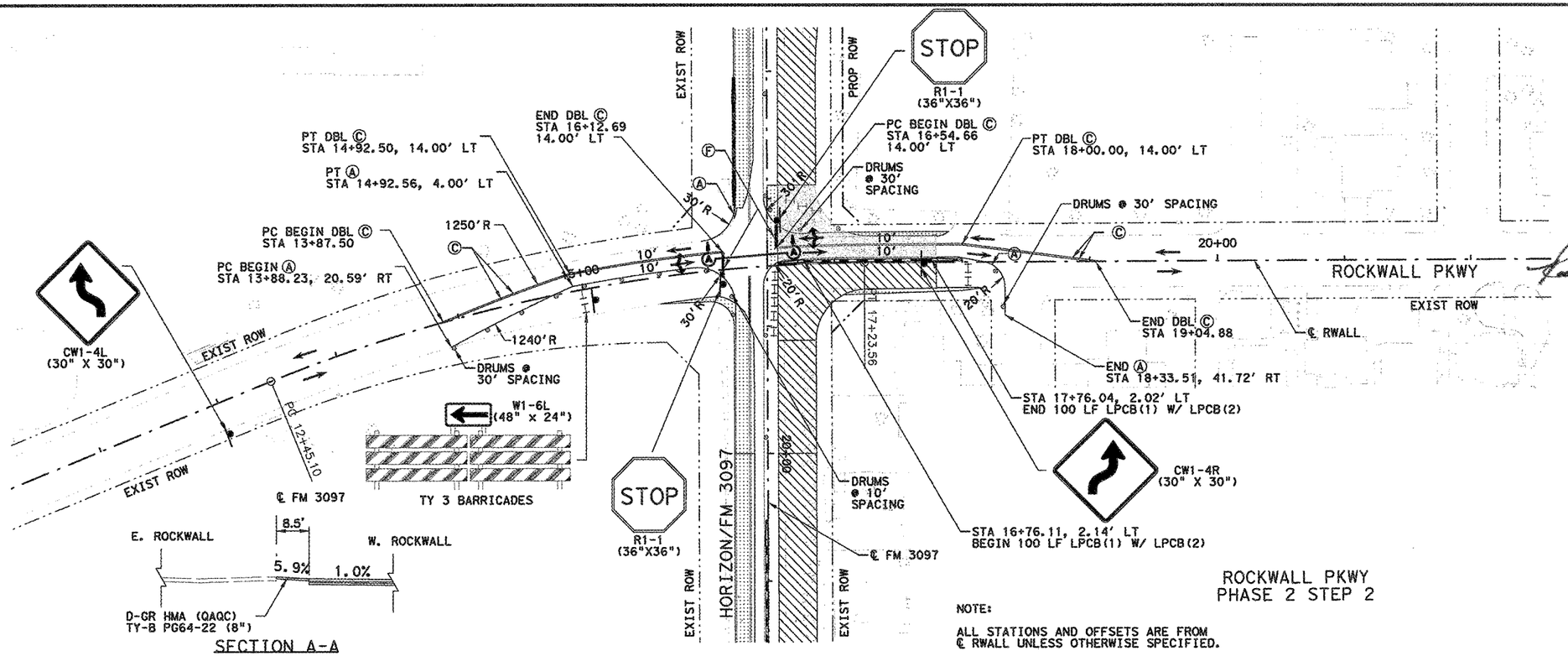
Texas Department of Transportation

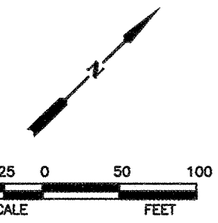
TRAFFIC CONTROL PLAN
PHASE 2
RALPH HALL PKWY
INTERSECTION DETAIL

Designed: GRB	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: GRB	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: JBR	DAL	ROCKWALL	3148	01	006	40

5/1/2014 5:49:56 PM lroberts dwg /Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.03 TCP/1204004TCRH201.dgn







LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

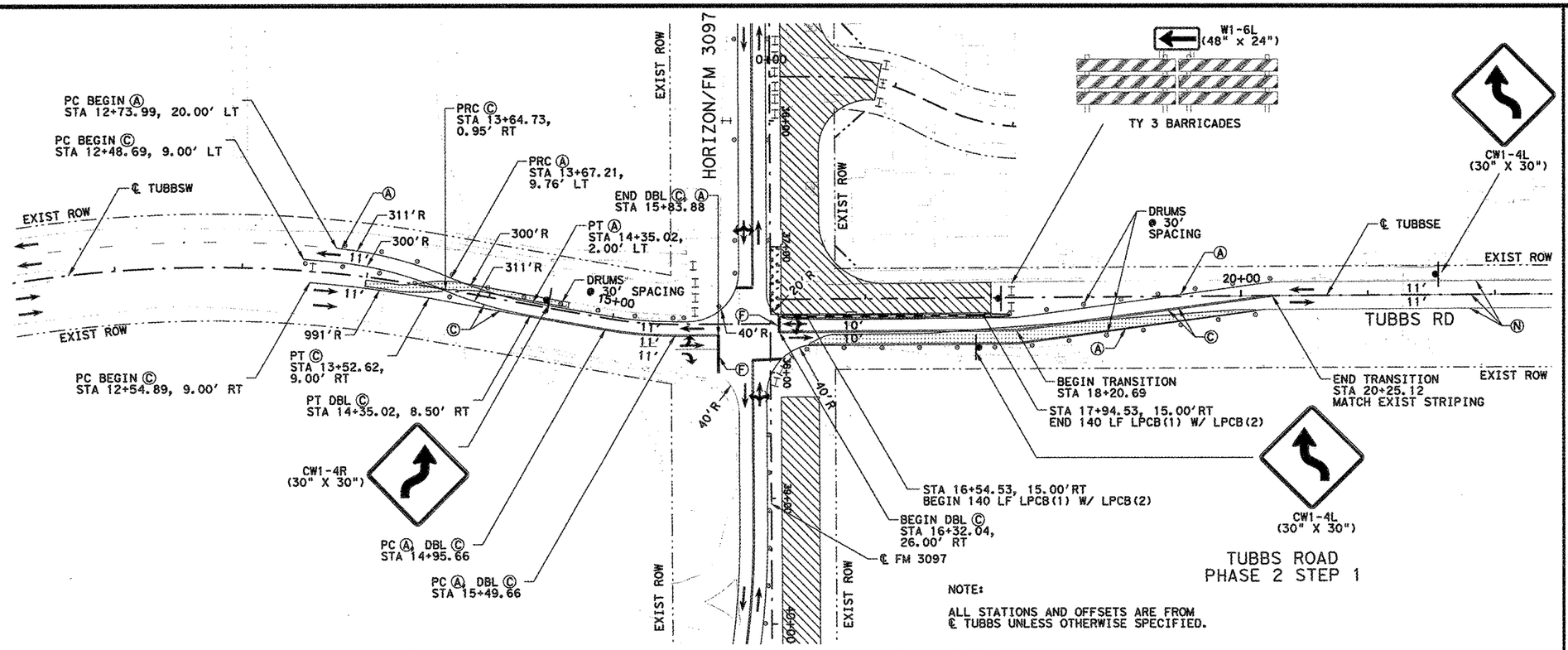
Texas Department of Transportation

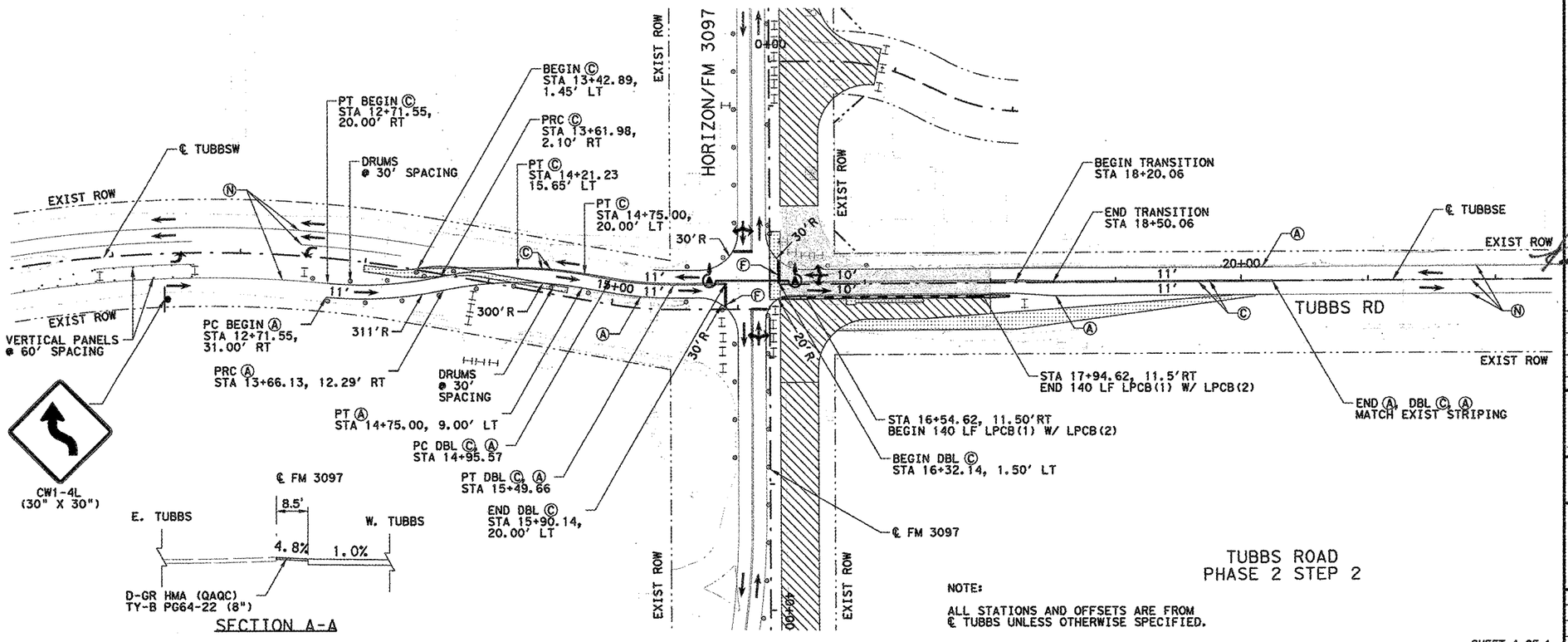
TRAFFIC CONTROL PLAN
PHASE 2
ROCKWALL PKWY INTERSECTION DETAIL

Designed:	GRB	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	GRB	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	JBR	DAL	ROCKWALL	3148	01	006		41

SHEET 1 OF 1

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N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

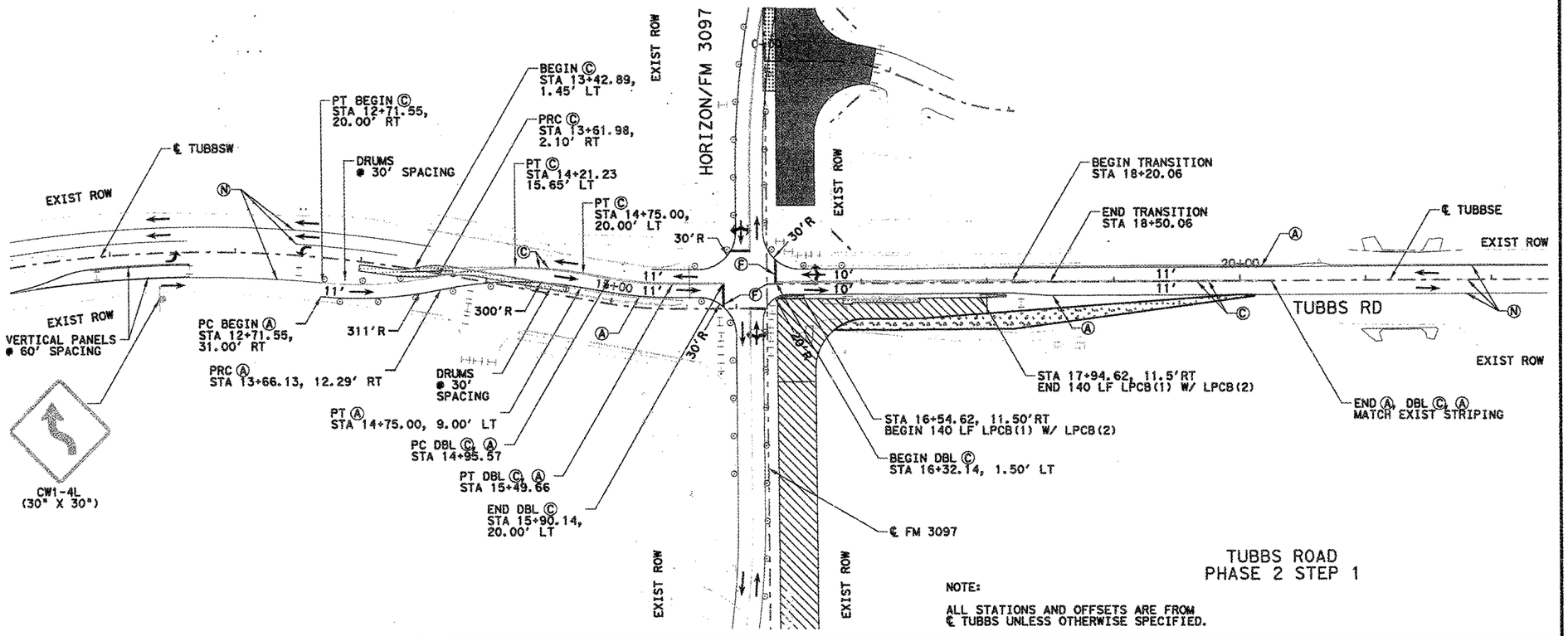
Texas Department of Transportation

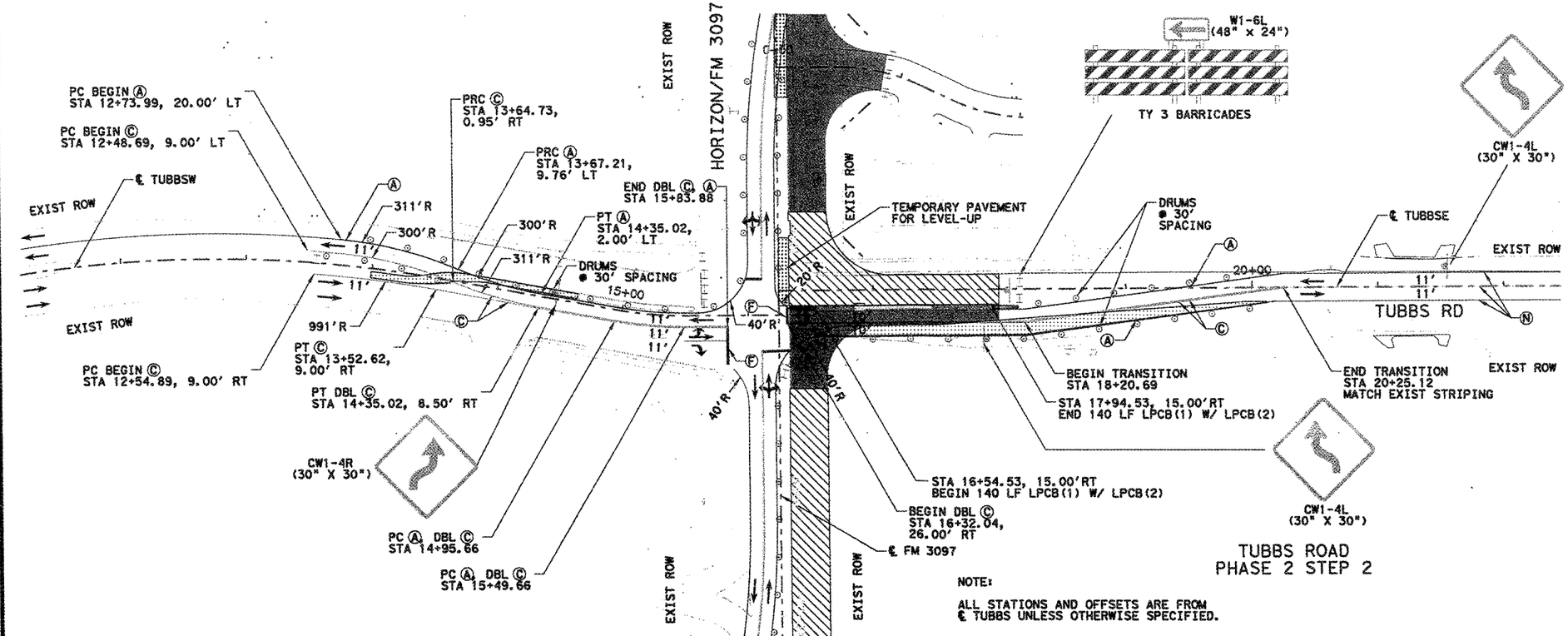
TRAFFIC CONTROL PLAN
PHASE 2
TUBBS RD INTERSECTION DETAIL

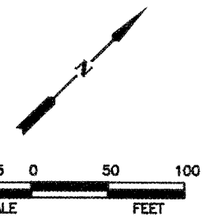
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Checked	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn	GRB	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked	JBR	DAL	ROCKWALL	3148	01	006		42

SHEET 1 OF 1

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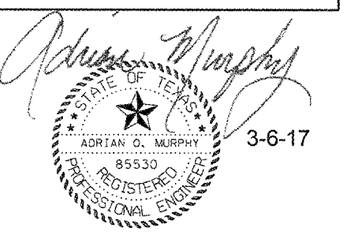






LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
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- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC



NO.	REVISION	BY	DATE

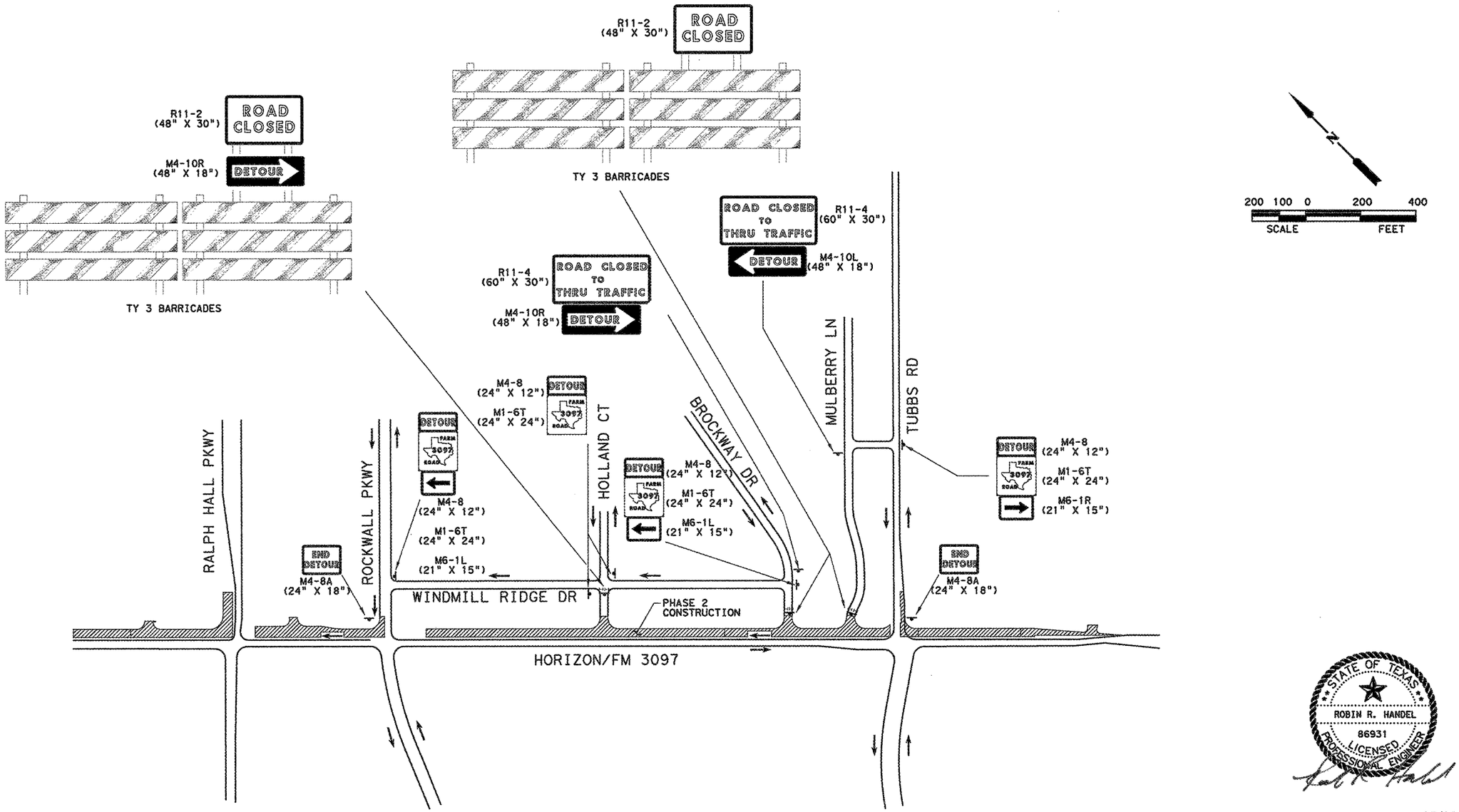
1504 WHITAKER WAY
GLENN HEIGHTS, TX 75154
(214) 985-9630
LEADERSHIP TRAFFIC SERVICES
TEXAS BOARD OF PROFESSIONAL ENGINEERS, F-12934

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 2
TUBBS RD INTERSECTION DETAIL

Designed: DRW	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: $DRWC$	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: DSG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: $DSGC$	DAL	ROCKWALL	3148	01	006	42A

$DATE$ $TIME$ $USERNAME$ $PWFILE$



STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

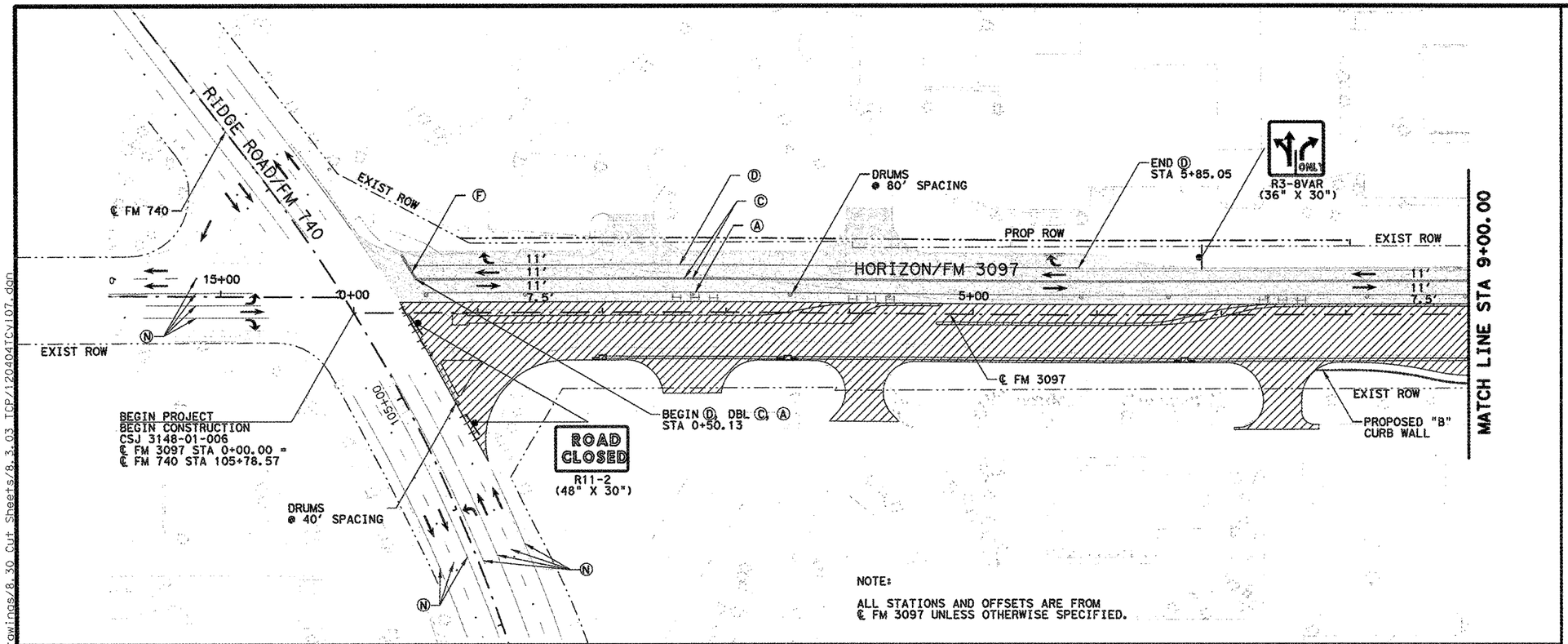
Texas Department of Transportation

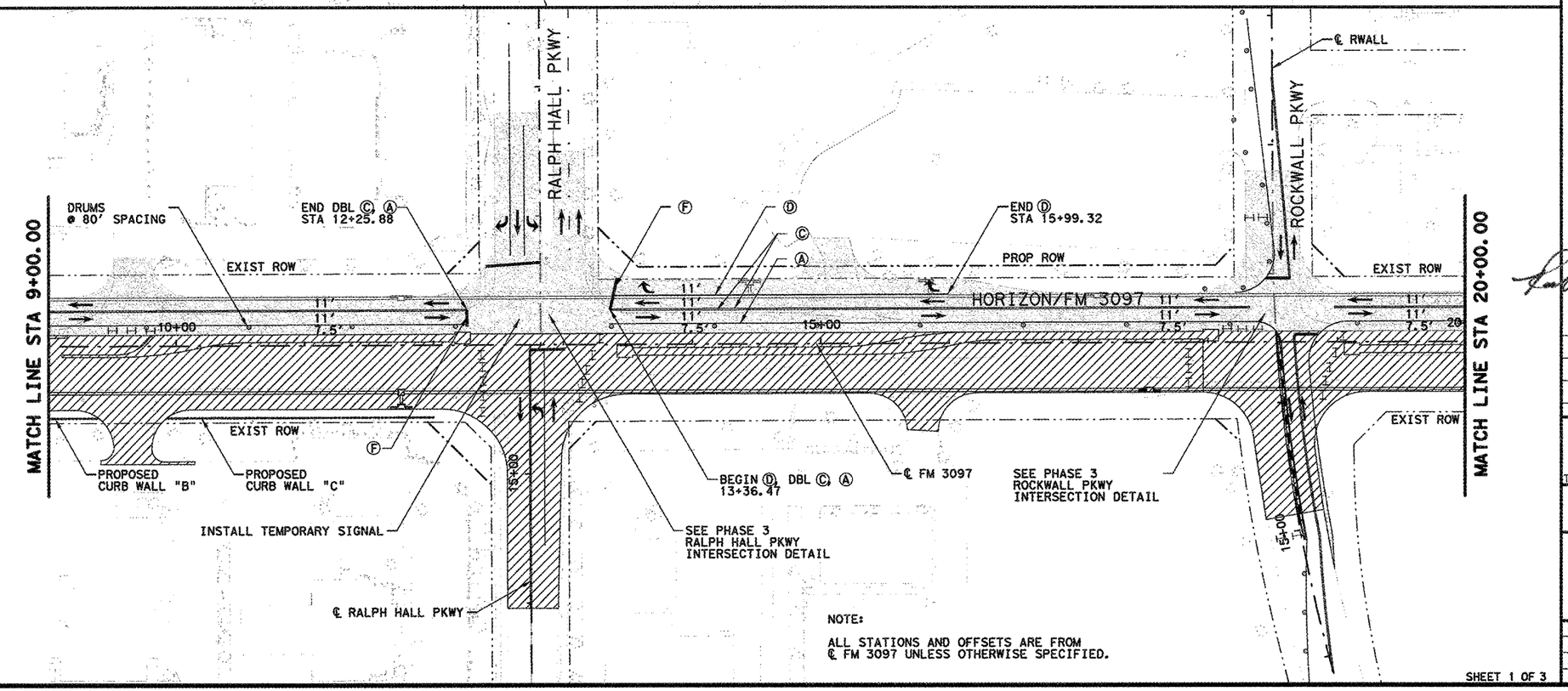
TRAFFIC CONTROL PLAN
FM 3097
PHASE 2 DETOURS

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	ANK	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	ANK	DAL	ROCKWALL	3148	01	006	43
Checked:	JBR						

SHEET 1 OF 1

5/1/2014 5:55:46 PM lroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.03 TCP412040ITCdetschem01.dgn





N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

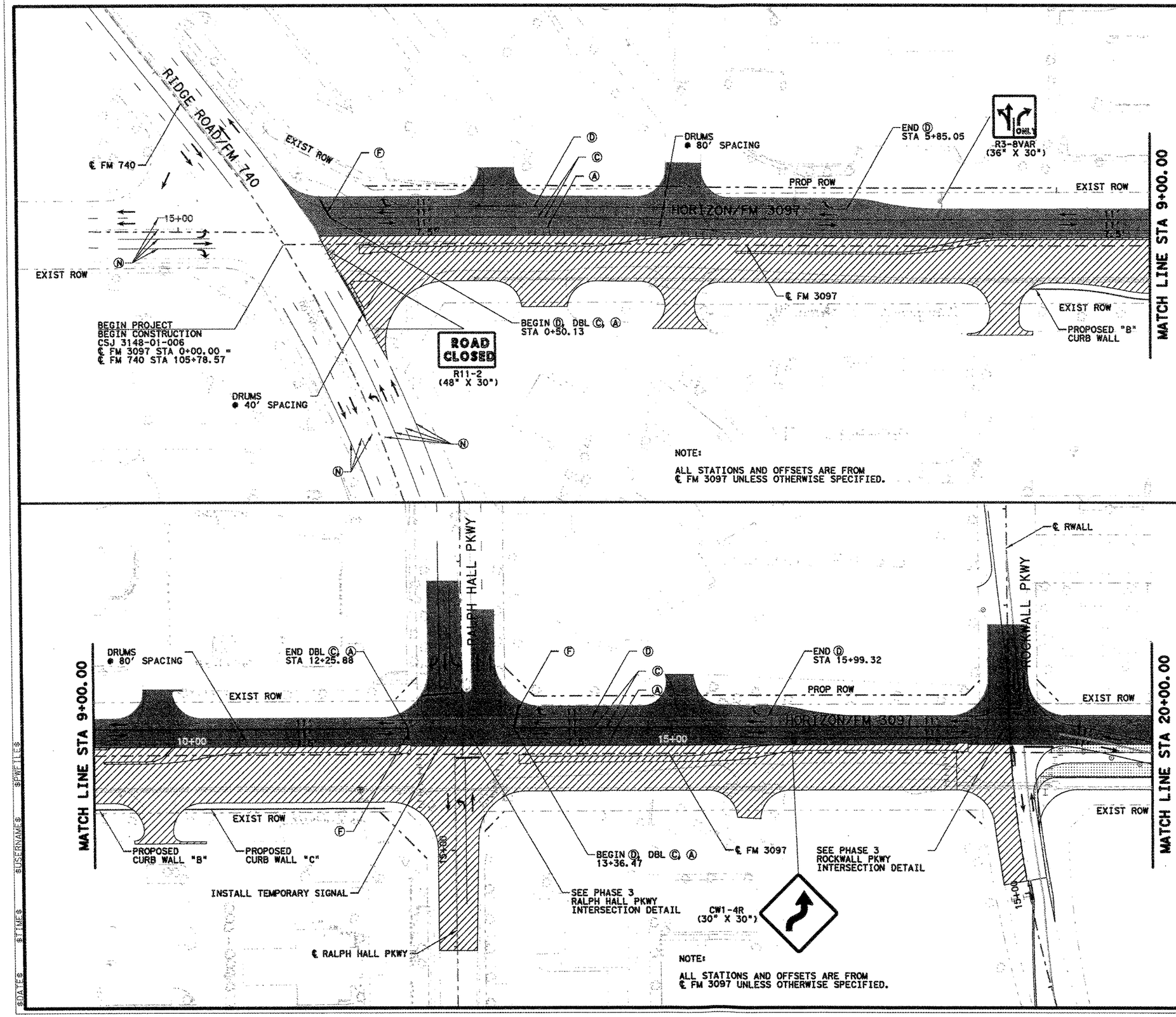
Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 3
STA. 0+00.00 TO STA. 20+00.00

Designed:	ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	JBR	DAL	ROCKWALL	3148	01	006		44

SHEET 1 OF 3

5/1/2014 5:15:45 PM jroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.03 TCP/120404TCv107.dgn



N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ADRIAN O. MURPHY
85530
REGISTERED
PROFESSIONAL ENGINEER
3-6-17

NO.	REVISION	BY	DATE

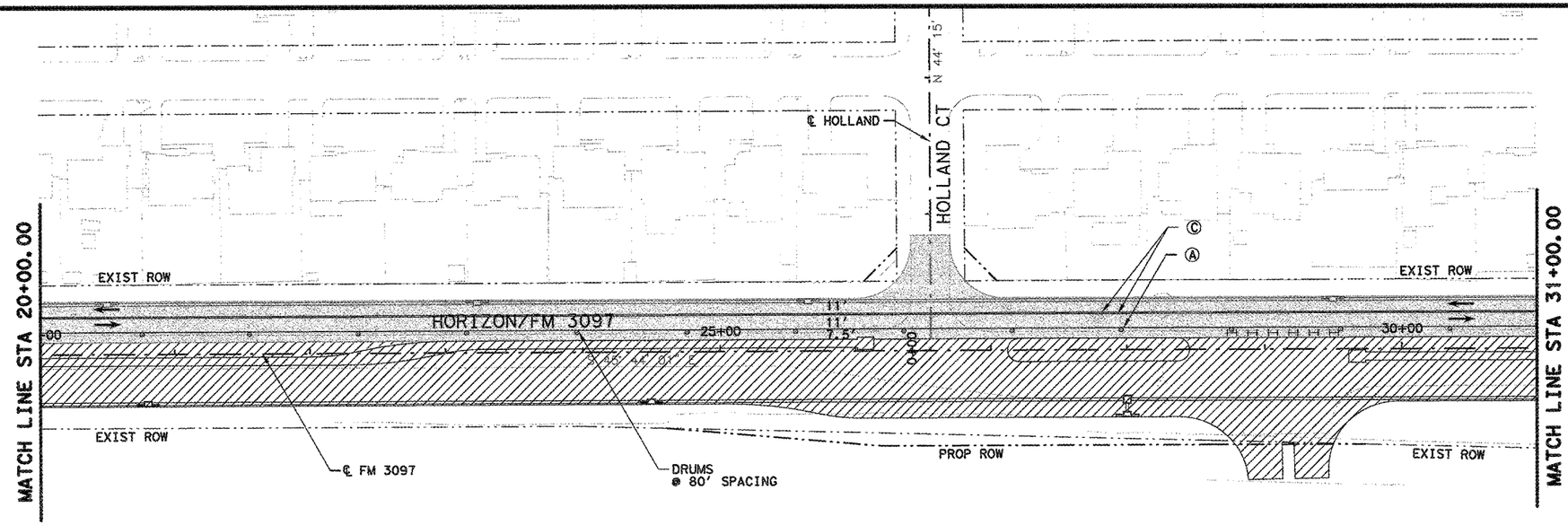
1504 WHITAKER WAY
GLENN HEIGHTS, TX 75154
(214) 985-9630
LEADERSHIP TRAFFIC SERVICES
TEXAS BOARD OF PROFESSIONAL ENGINEERS, F-12534

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 3
STA. 0+00.00 TO STA. 20+00.00

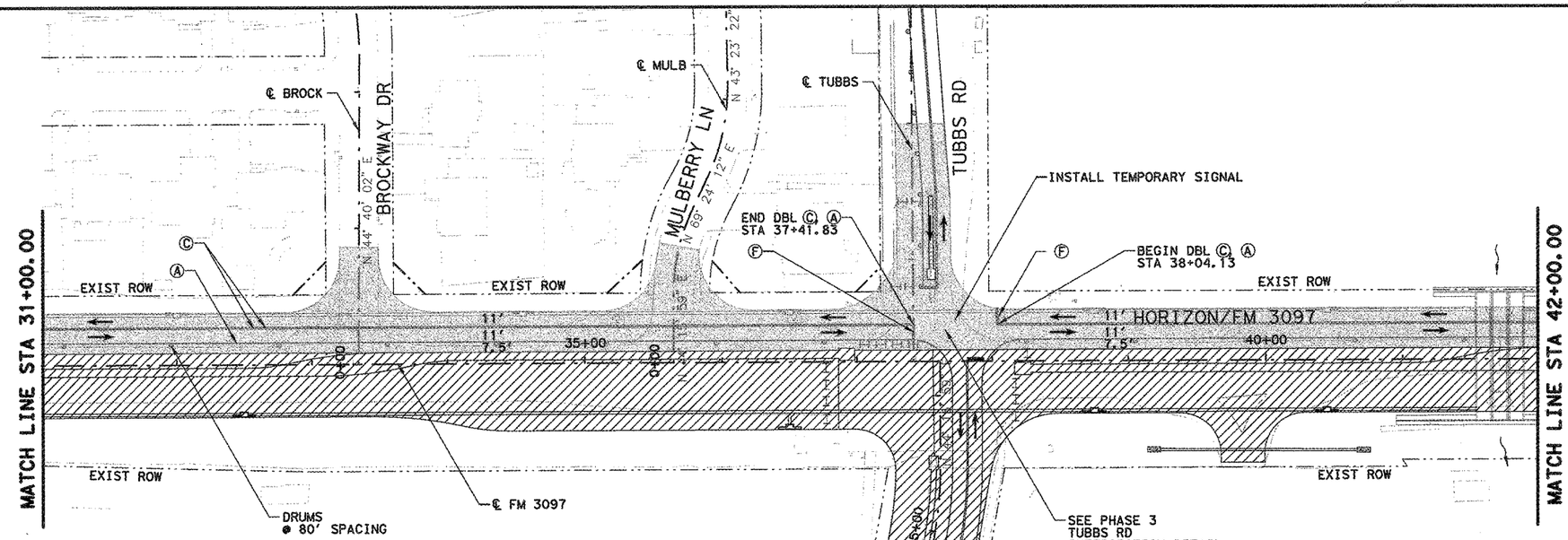
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Checked: $DRWC$	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: DSG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: $DSGC$	DAL	ROCKWALL	3148	01	006	44A

$DATE$ $TIME$ $USERNAME$ $PWFILE$



NOTE:

ALL STATIONS AND OFFSETS ARE FROM
℄ FM 3097 UNLESS OTHERWISE SPECIFIED.



NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.
2. SEE CULVERT LAYOUT SHEETS FOR ADDITIONAL INFORMATION.

SHEET 2 OF 3

N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
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- TY 3 BARRICADE
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- LPCB(1)
- LPCB(2) (20 LF)
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- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
05/05/14

NO.	REVISION	BY	DATE

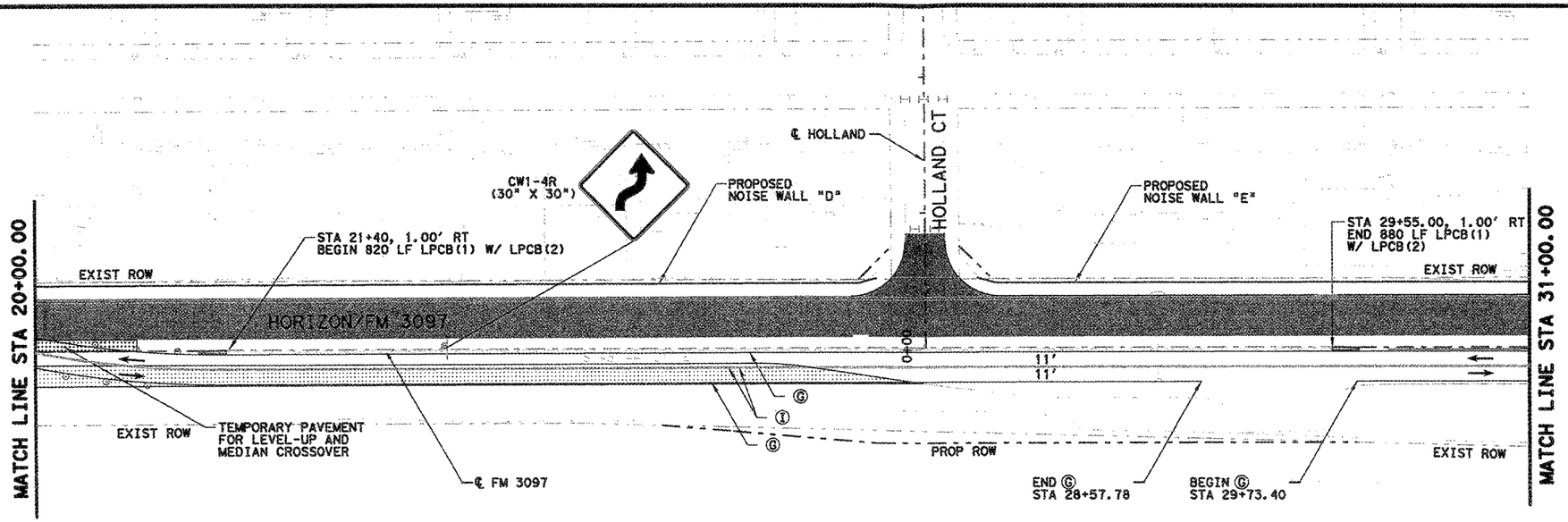
CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 3
STA. 20+00.00 TO STA. 42+00.00

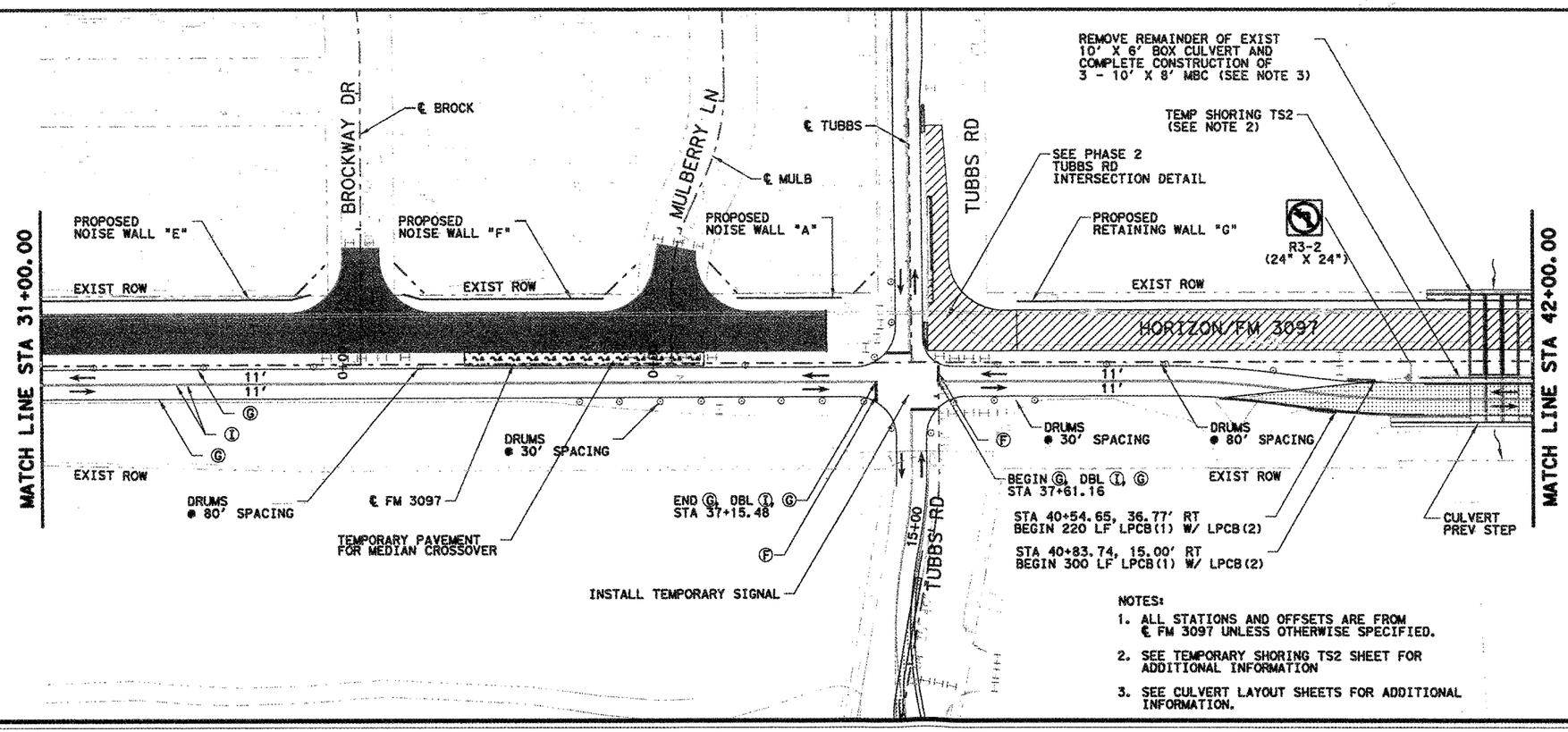
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Designed:	ANK	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	ANK	DAL	ROCKWALL	3148	01	006	45
Checked:	JBR						

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NOTE:

ALL STATIONS AND OFFSETS ARE FROM
℄ FM 3097 UNLESS OTHERWISE SPECIFIED.



NOTES:

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2. SEE TEMPORARY SHORING TS2 SHEET FOR ADDITIONAL INFORMATION
3. SEE CULVERT LAYOUT SHEETS FOR ADDITIONAL INFORMATION.

N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W)(4")(SLD)(REMOV)
- Ⓑ WRK ZN PAV MRK (W)(4")(BRK)(REMOV)
- Ⓒ WRK ZN PAV MRK (Y)(4")(SLD)(REMOV)
- Ⓓ WRK ZN PAV MRK (W)(8")(SLD)(REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W)(4")(SLD)(NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W)(4")(BRK)(NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y)(4")(SLD)(NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W)(8")(SLD)(NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y)(8")(SLD)(NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
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- DIRECTION OF TRAFFIC

STATE OF TEXAS
ADRIAN C. MURPHY
85530
REGISTERED
PROFESSIONAL ENGINEER
3-6-17

NO.	REVISION	BY	DATE

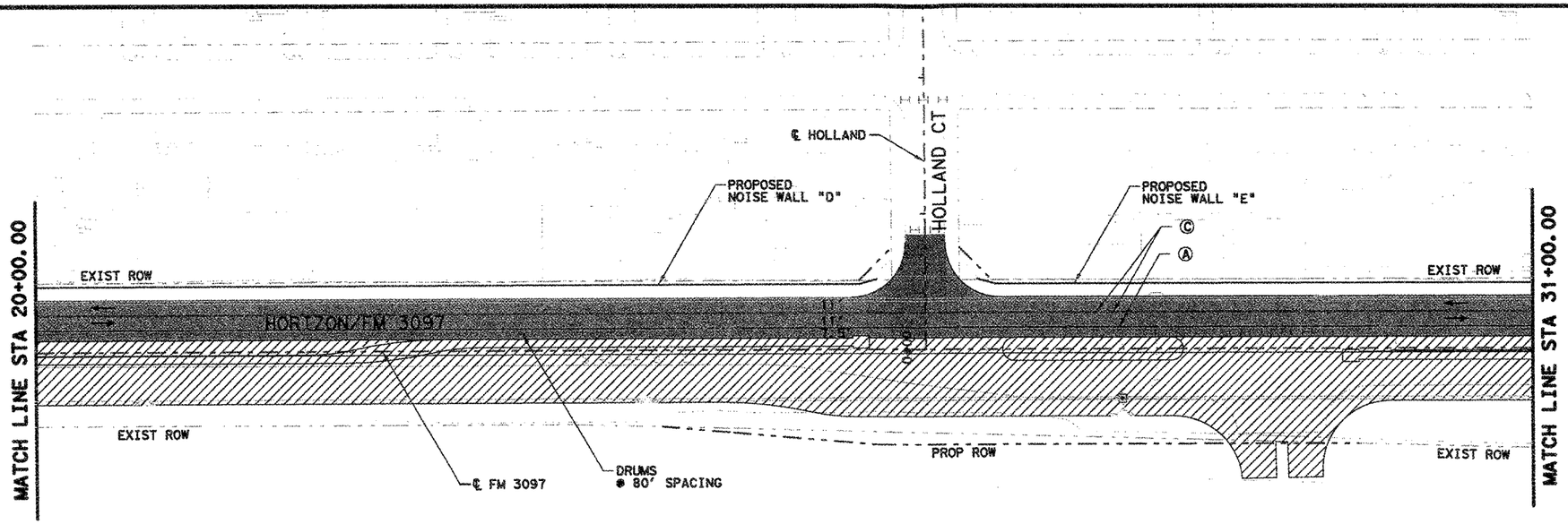
1504 WHITAKER WAY
GLENN HEIGHTS, TX 75154
(214) 985-9630
LEADERSHIP TRAFFIC SERVICES
TEXAS BOARD OF PROFESSIONAL ENGINEERS, F-12534

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 3
STA. 20+00.00 TO STA. 42+00.00

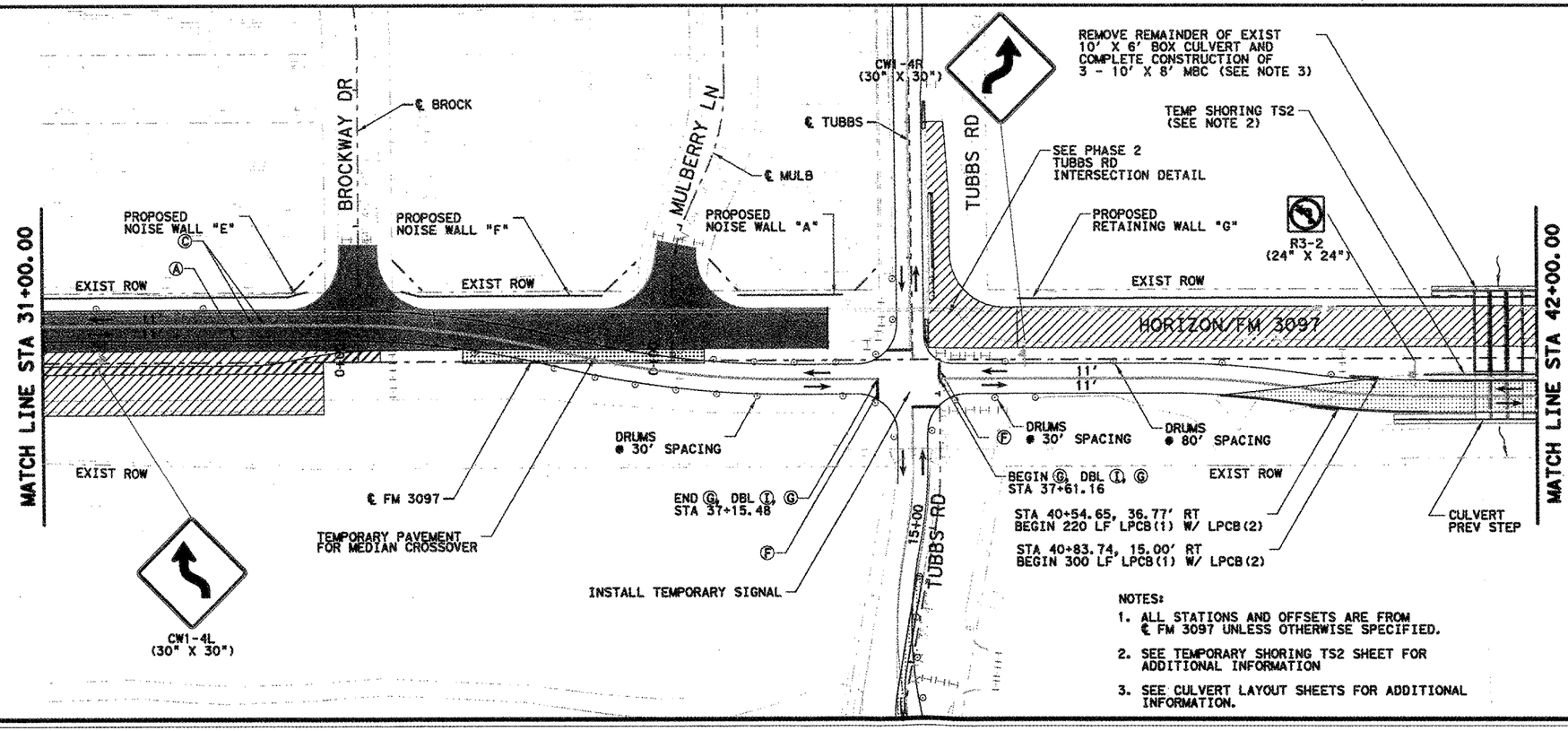
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Checked: $DRWC$	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn: DSG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: $DSGC$	DAL	ROCKWALL	3148	01	006		45A

$DATE$ $TIME$ $USERNAME$ $PWFILE$



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NOTES:

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2. SEE TEMPORARY SHORING TS2 SHEET FOR ADDITIONAL INFORMATION
3. SEE CULVERT LAYOUT SHEETS FOR ADDITIONAL INFORMATION.

N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
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- DIRECTION OF TRAFFIC

STATE OF TEXAS
ADRIAN O. MURPHY
85530
REGISTERED PROFESSIONAL ENGINEER
3-6-17

NO.	REVISION	BY	DATE

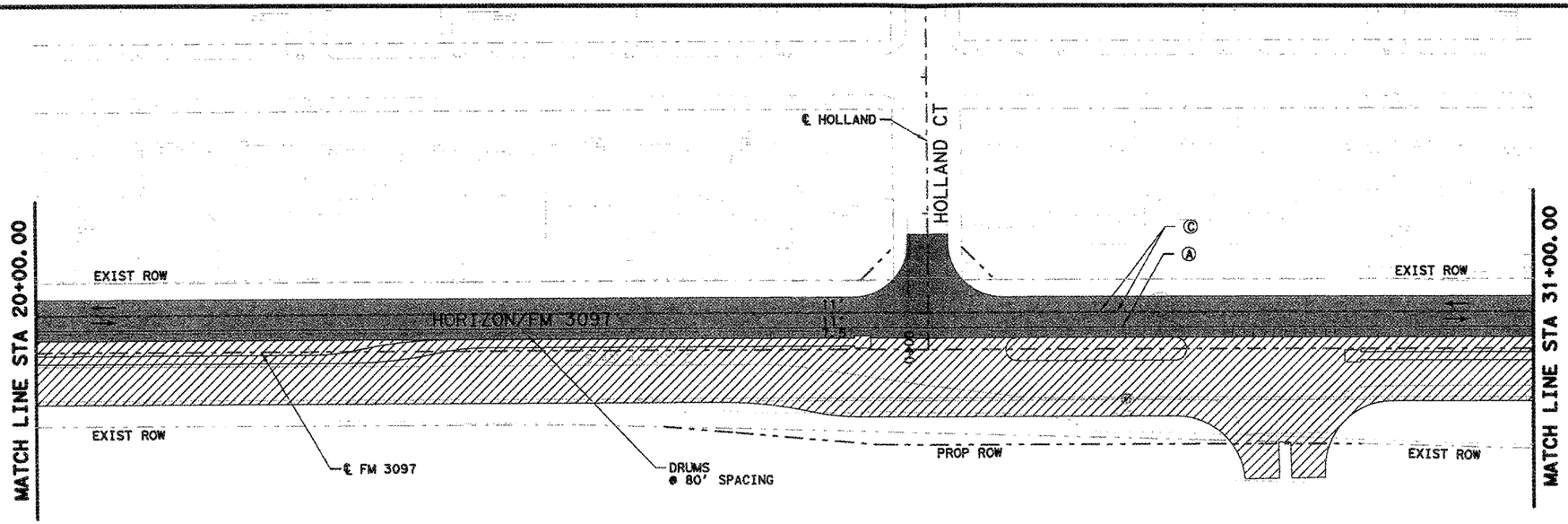
1504 WHITAKER WAY
GLENN HEIGHTS, TX 75154
(214) 985-9630
LEADERSHIP TRAFFIC SERVICES
TEXAS BOARD OF PROFESSIONAL ENGINEERS, F-12534

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 3A
STA. 20+00.00 TO STA. 42+00.00

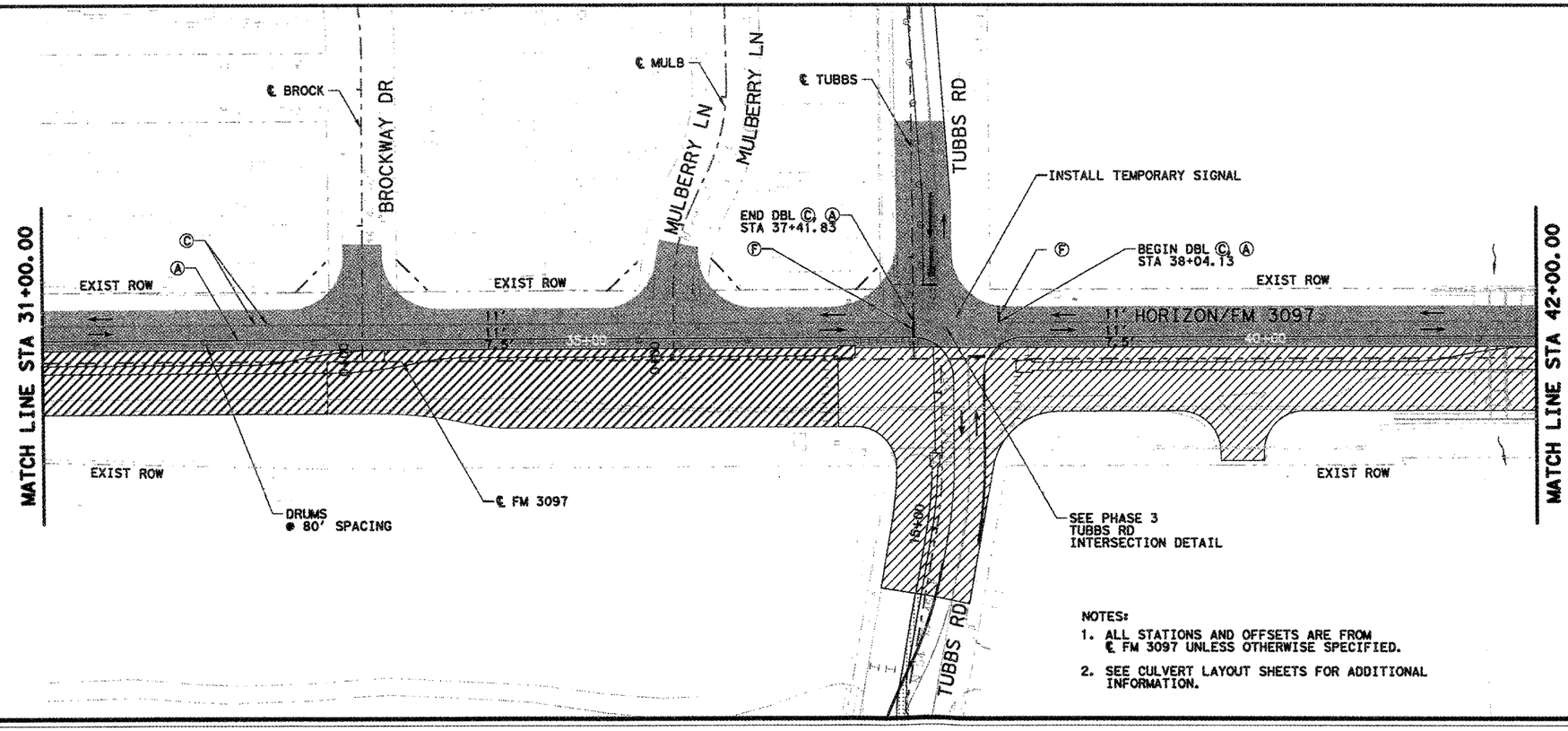
Designed: DRW	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: $DRWC$	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: DSG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: $DSGC$	DAL	ROCKWALL	3148	01	006	45AA

$DATE$ $TIME$ $USERNAME$ $PWFILE$



NOTE:

ALL STATIONS AND OFFSETS ARE FROM
℄ FM 3097 UNLESS OTHERWISE SPECIFIED.



NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.
2. SEE CULVERT LAYOUT SHEETS FOR ADDITIONAL INFORMATION.

N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ADRIAN C. MURPHY
85530
REGISTERED
PROFESSIONAL ENGINEER
3-6-17

NO.	REVISION	BY	DATE

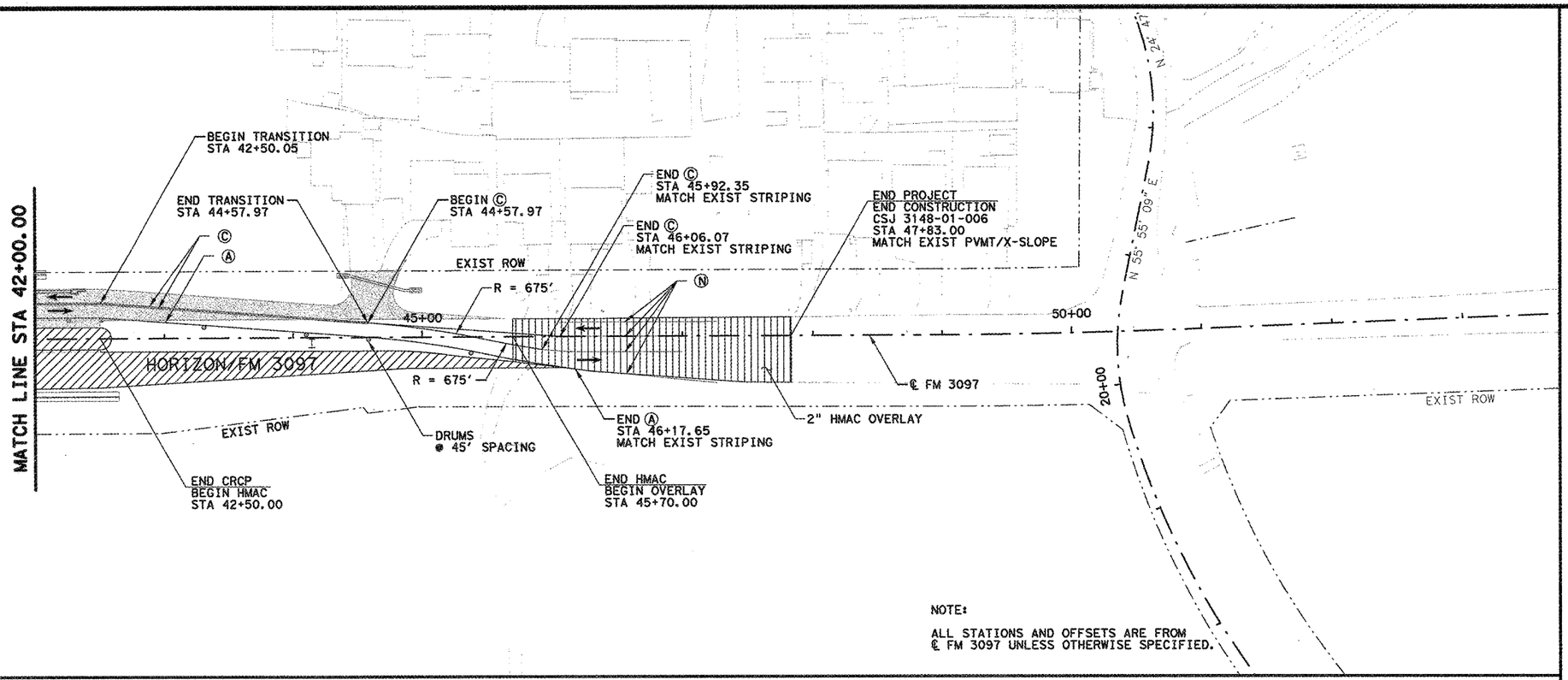
1504 WHITAKER WAY
GLENN HEIGHTS, TX 75154
(214) 985-9630
LEADERSHIP TRAFFIC SERVICES
TEXAS BOARD OF PROFESSIONAL ENGINEERS, F-12534

Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 3B
STA. 20+00.00 TO STA. 42+00.00

Designed DRW	FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked $DRWC$	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn DSG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked $DSGC$	DAL	ROCKWALL	3148	01	006	45

$DATE$ $TIME$ $USERNAME$ $PWFILE$



N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
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- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/05/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

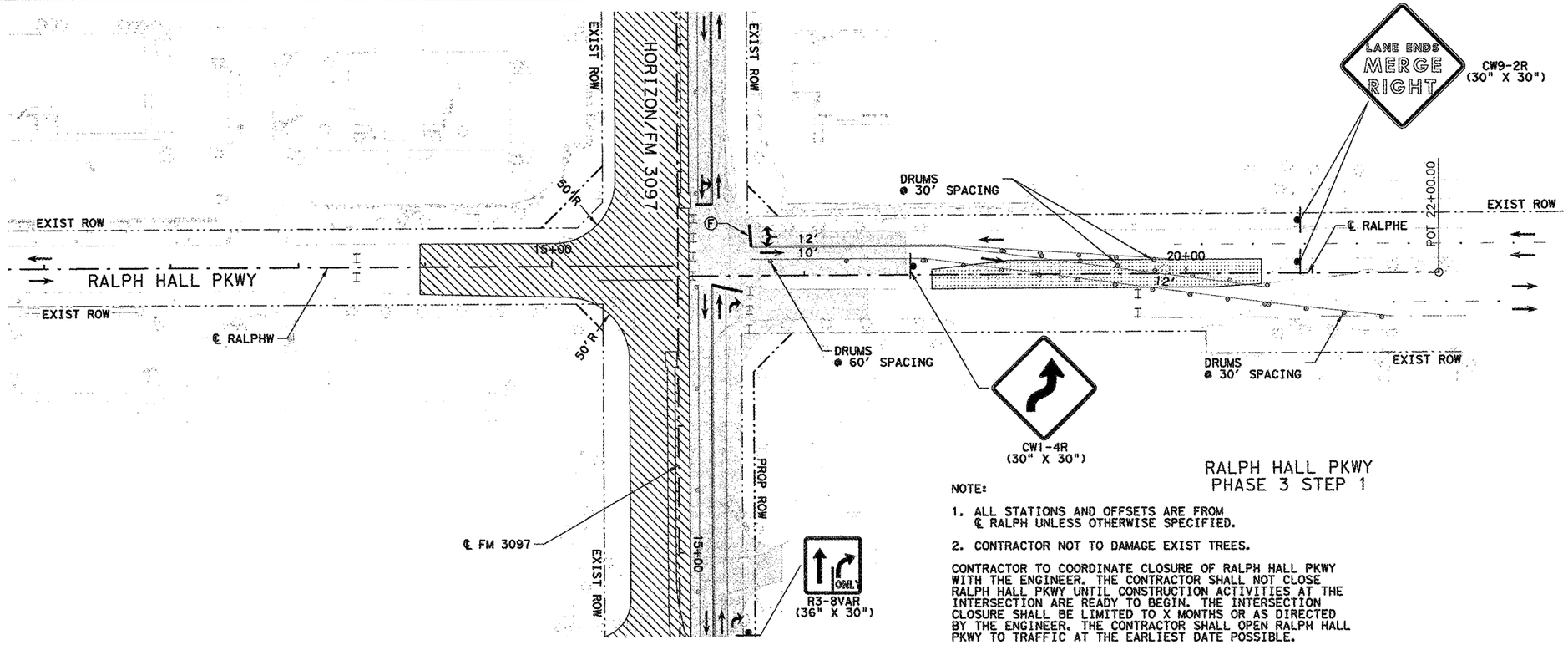
Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 3
STA. 42+00.00 TO STA. 47+83.00

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Designed:	ANK	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	ANK	DAL	ROCKWALL	3148	01	006	46
Checked:	JBR						

SHEET 3 OF 3

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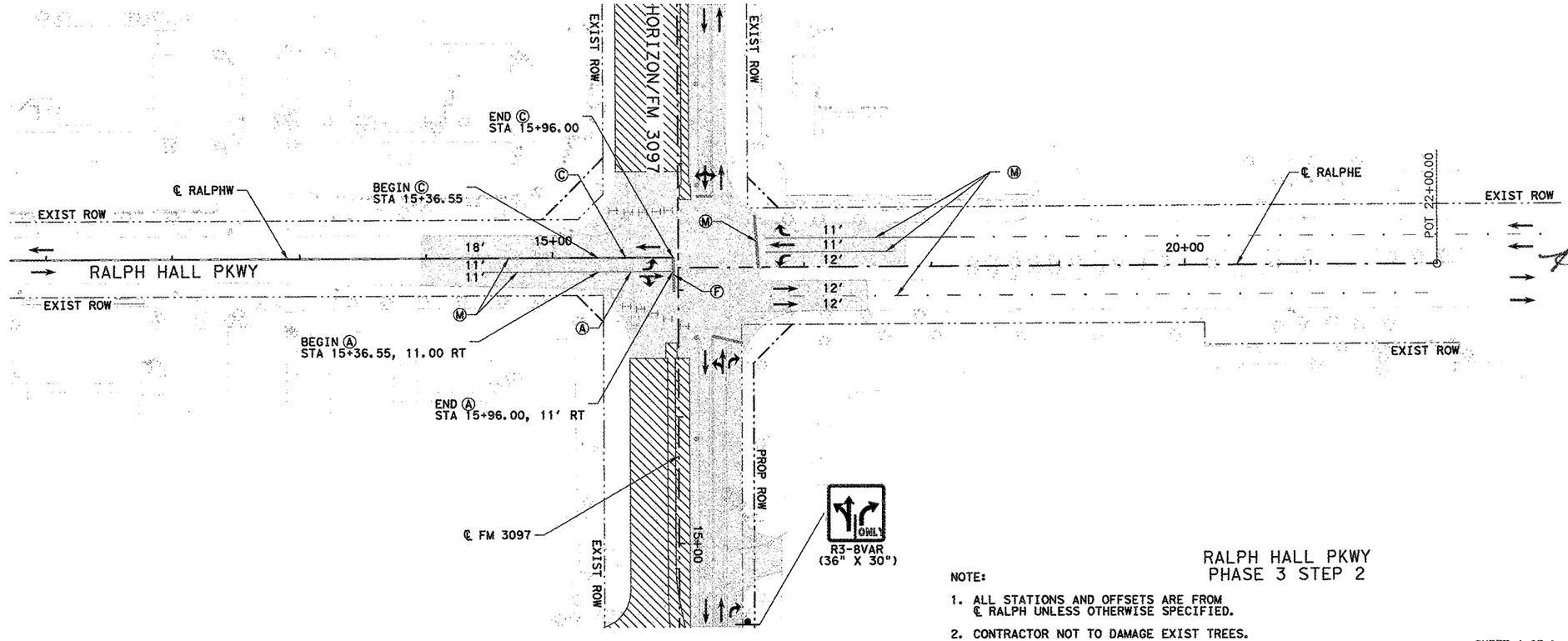


RALPH HALL PKWY
PHASE 3 STEP 1

NOTE:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ RALPH UNLESS OTHERWISE SPECIFIED.
2. CONTRACTOR NOT TO DAMAGE EXIST TREES.

CONTRACTOR TO COORDINATE CLOSURE OF RALPH HALL PKWY WITH THE ENGINEER. THE CONTRACTOR SHALL NOT CLOSE RALPH HALL PKWY UNTIL CONSTRUCTION ACTIVITIES AT THE INTERSECTION ARE READY TO BEGIN. THE INTERSECTION CLOSURE SHALL BE LIMITED TO X MONTHS OR AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL OPEN RALPH HALL PKWY TO TRAFFIC AT THE EARLIEST DATE POSSIBLE.



RALPH HALL PKWY
PHASE 3 STEP 2

NOTE:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ RALPH UNLESS OTHERWISE SPECIFIED.
2. CONTRACTOR NOT TO DAMAGE EXIST TREES.

SHEET 1 OF 1

N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
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- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

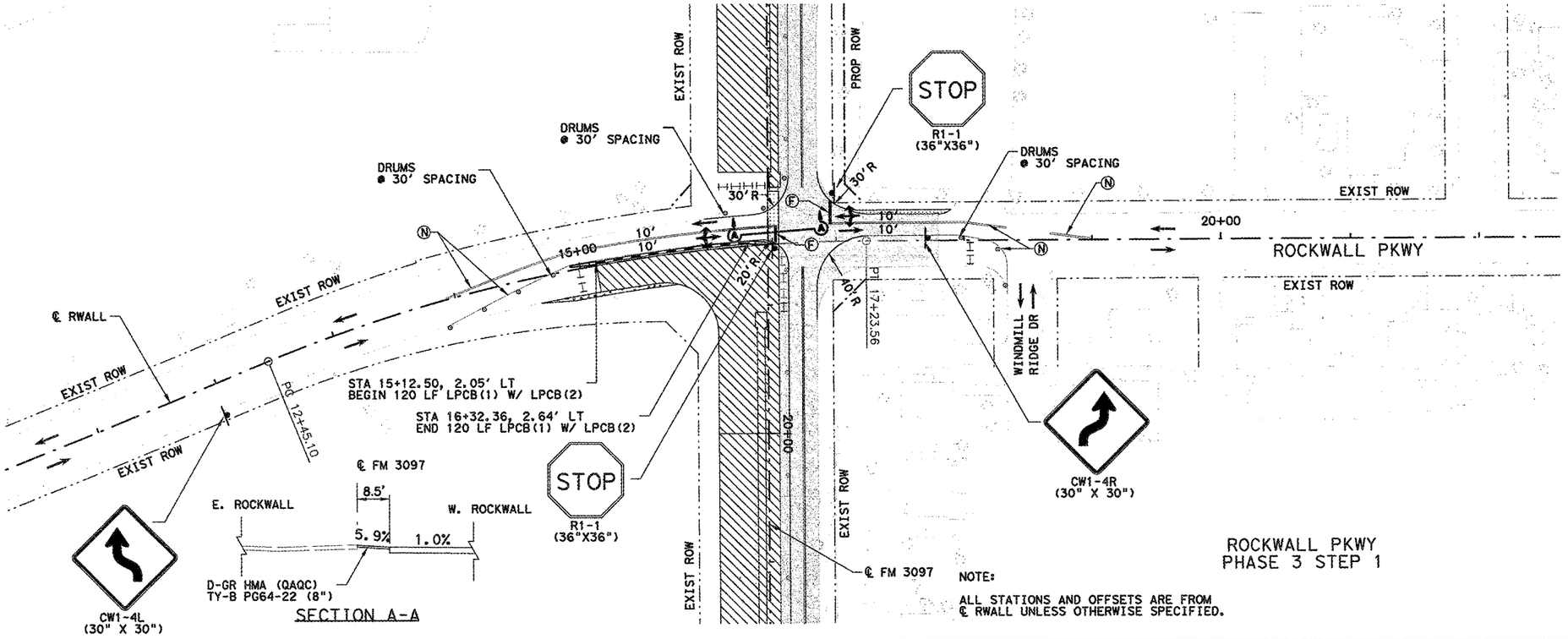
CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

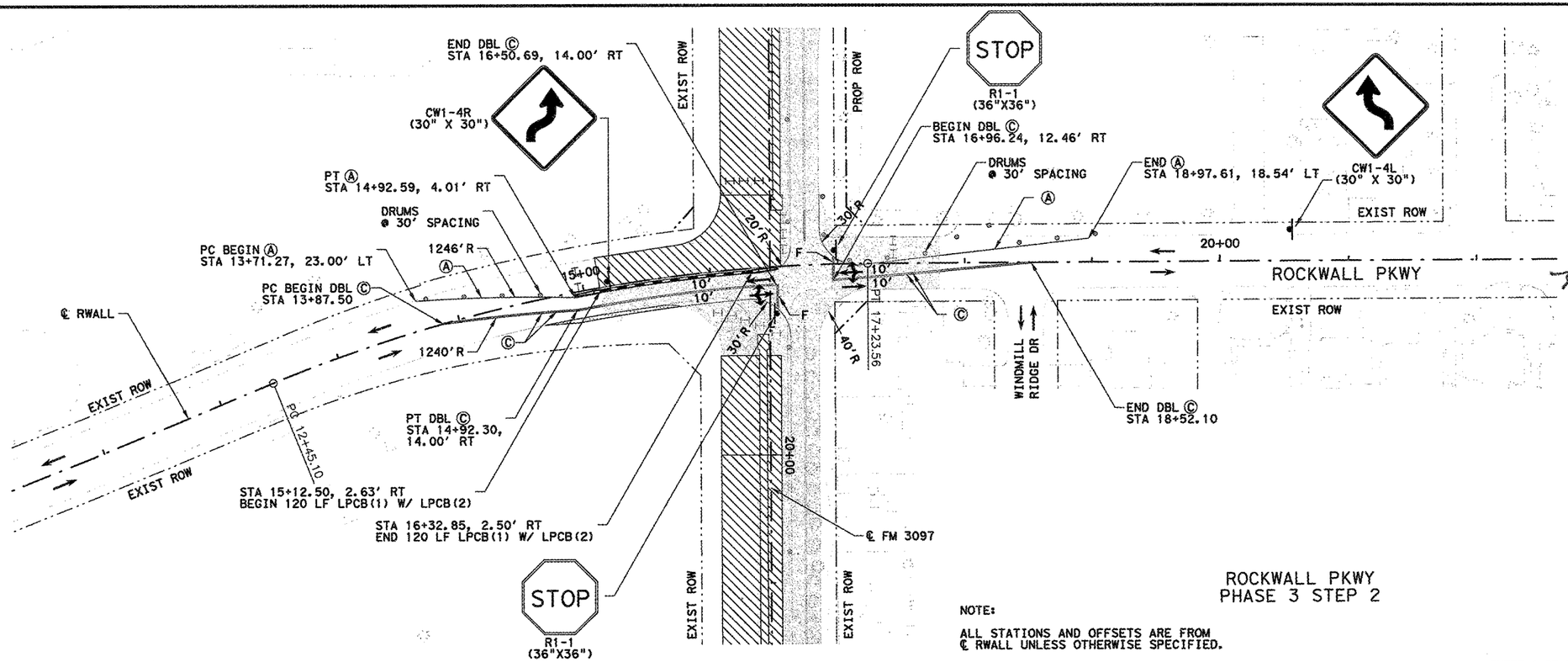
Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 3
RALPH HALL PKWY INTERSECTION DETAIL

Designed:	GRB	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.	
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097	
Drawn:	GRB	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
Checked:	JBR	DAL	ROCKWALL	3148	01	006	47	

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N

50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
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- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

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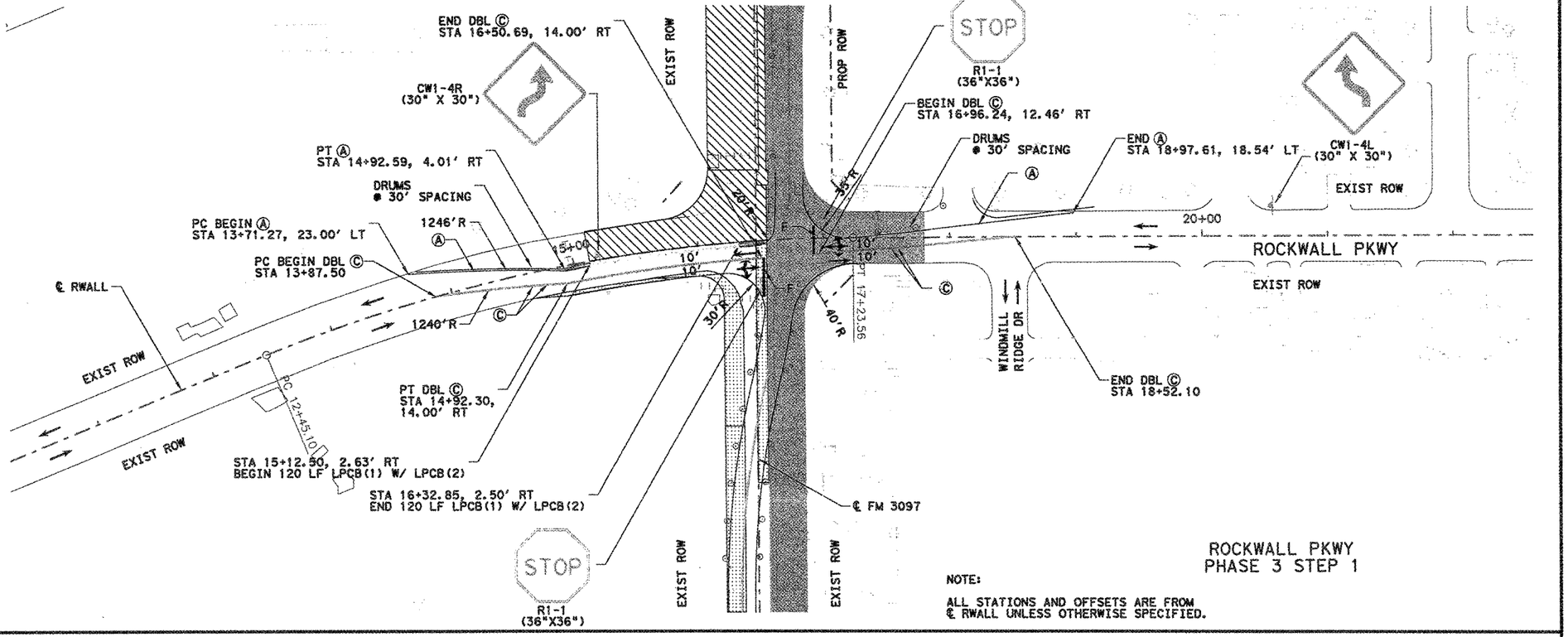
Texas Department of Transportation

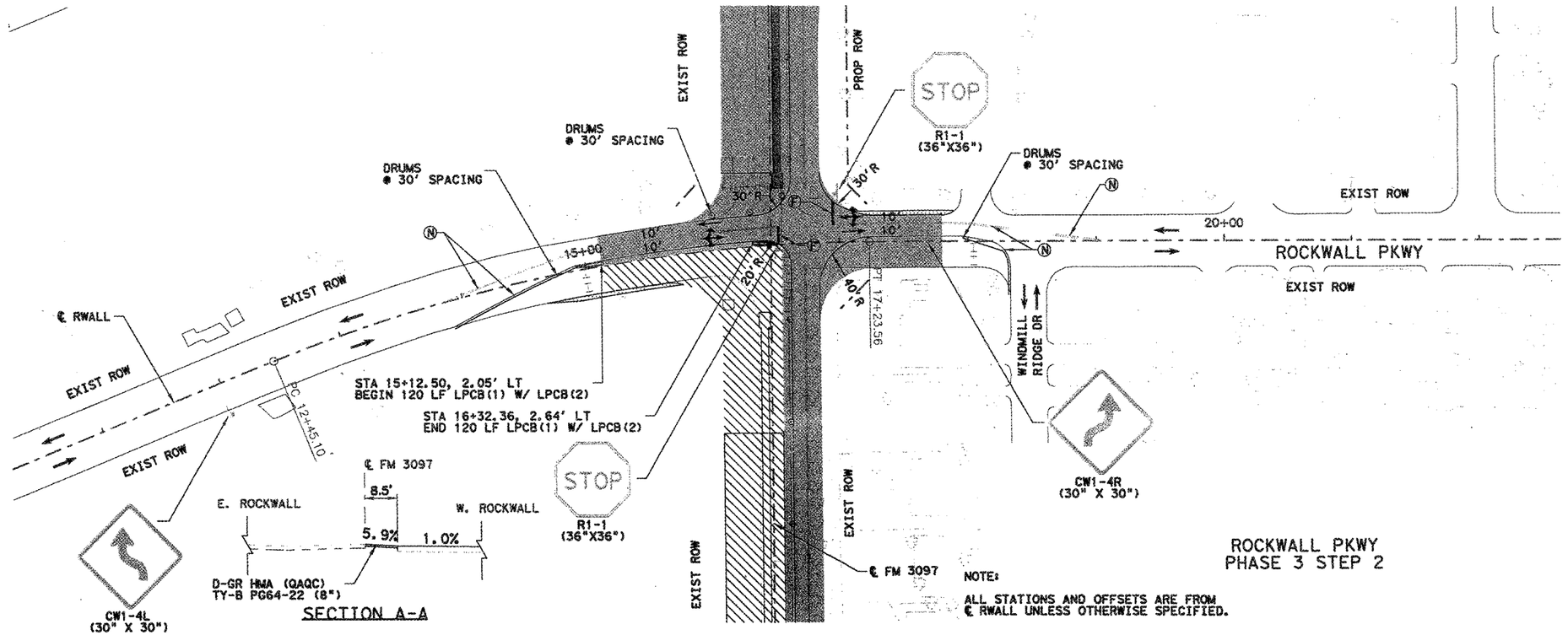
TRAFFIC CONTROL PLAN
PHASE 3
ROCKWALL PKWY INTERSECTION DETAIL

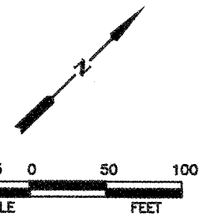
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Checked:	JBR	6		TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	GRB	DIST.		COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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SHEET 1 OF 1

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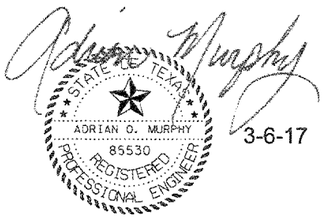






LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
- Ⓐ WRK ZN PAV MRK (W) (4") (SLD) (REMOV)
- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
- LPCB(1)
- LPCB(2) (20 LF)
- PLASTIC DRUMS
- VERTICAL PANELS
- TEMPORARY SHORING
- DIRECTION OF TRAFFIC



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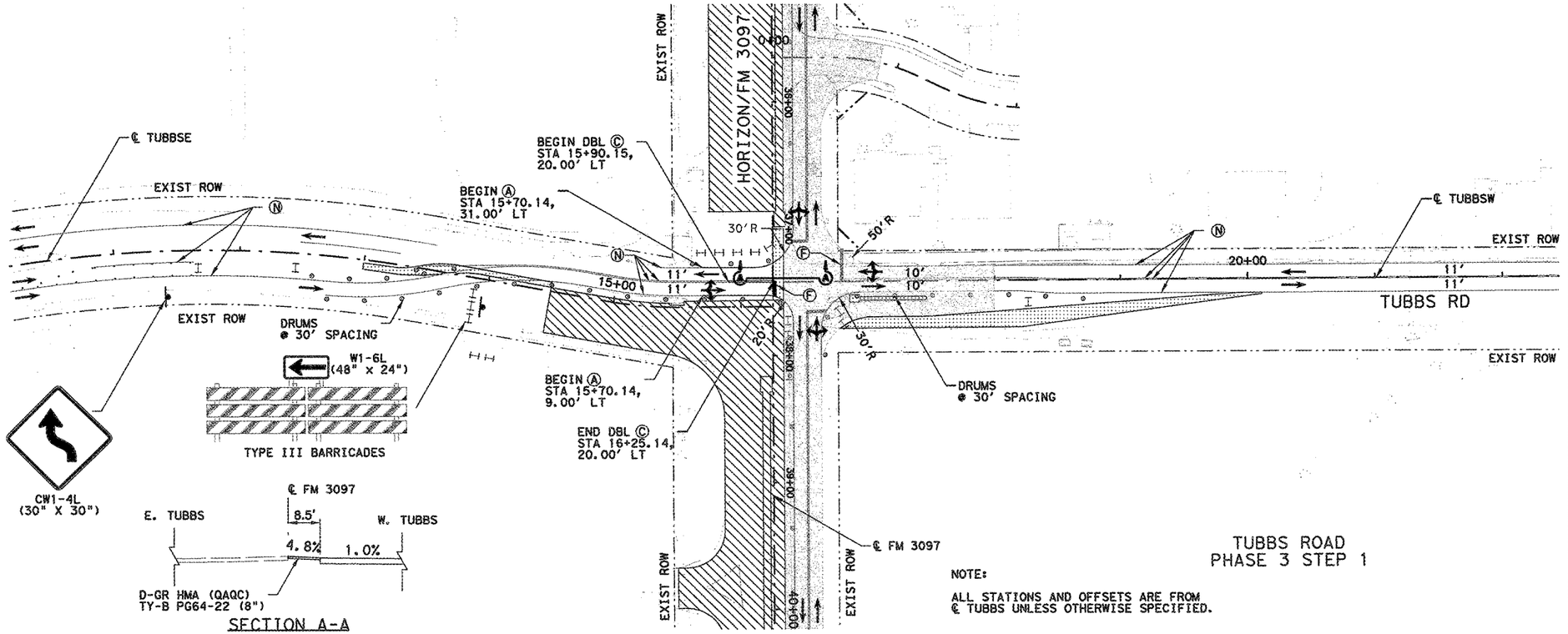
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GLENN HEIGHTS, TX 75154
(214) 985-9630
LEADERSHIP TRAFFIC SERVICES
TEXAS BOARD OF PROFESSIONAL ENGINEERS, F-12534

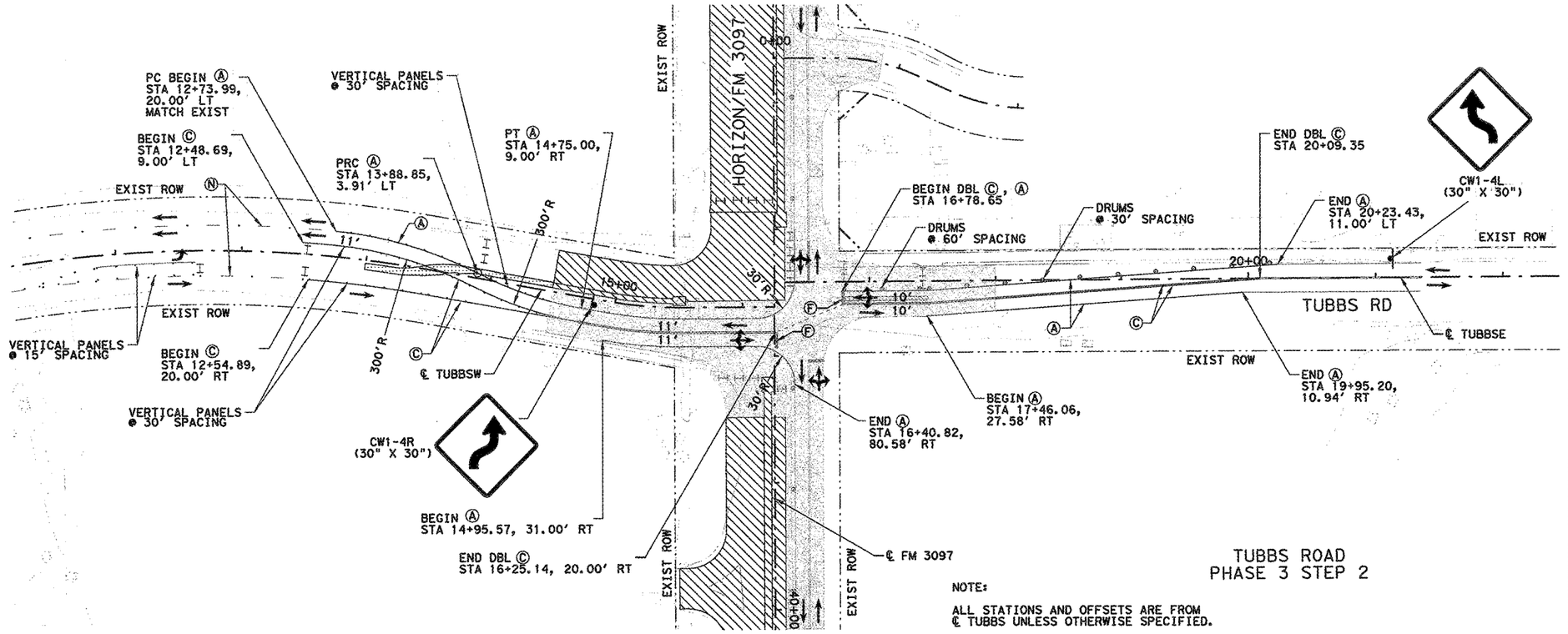
Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 3
ROCKWALL PKWY INTERSECTION DETAIL

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Checked: $DSGC$	DAL	ROCKWALL	3148	01	006		48A

$DATE$ $TIME$ $USERNAME$ $PWFILE$







LEGEND

- PROPOSED CONSTRUCTION THIS STEP
- PROPOSED CONSTRUCTION PREVIOUS STEPS
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEPS
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- Ⓑ WRK ZN PAV MRK (W) (4") (BRK) (REMOV)
- Ⓒ WRK ZN PAV MRK (Y) (4") (SLD) (REMOV)
- Ⓓ WRK ZN PAV MRK (W) (8") (SLD) (REMOV)
- Ⓔ WRK ZN PAV MRK (Y) (8") (SLD) (REMOV)
- Ⓕ WRK ZN PAV MRK (W) (24") (SLD) (REMOV)
- Ⓖ WRK ZN PAV MRK (W) (4") (SLD) (NON-REMOV)
- Ⓗ WRK ZN PAV MRK (W) (4") (BRK) (NON-REMOV)
- Ⓘ WRK ZN PAV MRK (Y) (4") (SLD) (NON-REMOV)
- Ⓚ WRK ZN PAV MRK (W) (8") (SLD) (NON-REMOV)
- Ⓛ WRK ZN PAV MRK (Y) (8") (SLD) (NON-REMOV)
- Ⓜ PERMANENT STRIPING SEE SIGNING AND STRIPING PLANS
- Ⓝ EXISTING STRIPING / STRIPING PREV STEP
- TY 3 BARRICADE
- SIGN POST
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- PLASTIC DRUMS
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- TEMPORARY SHORING
- DIRECTION OF TRAFFIC

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

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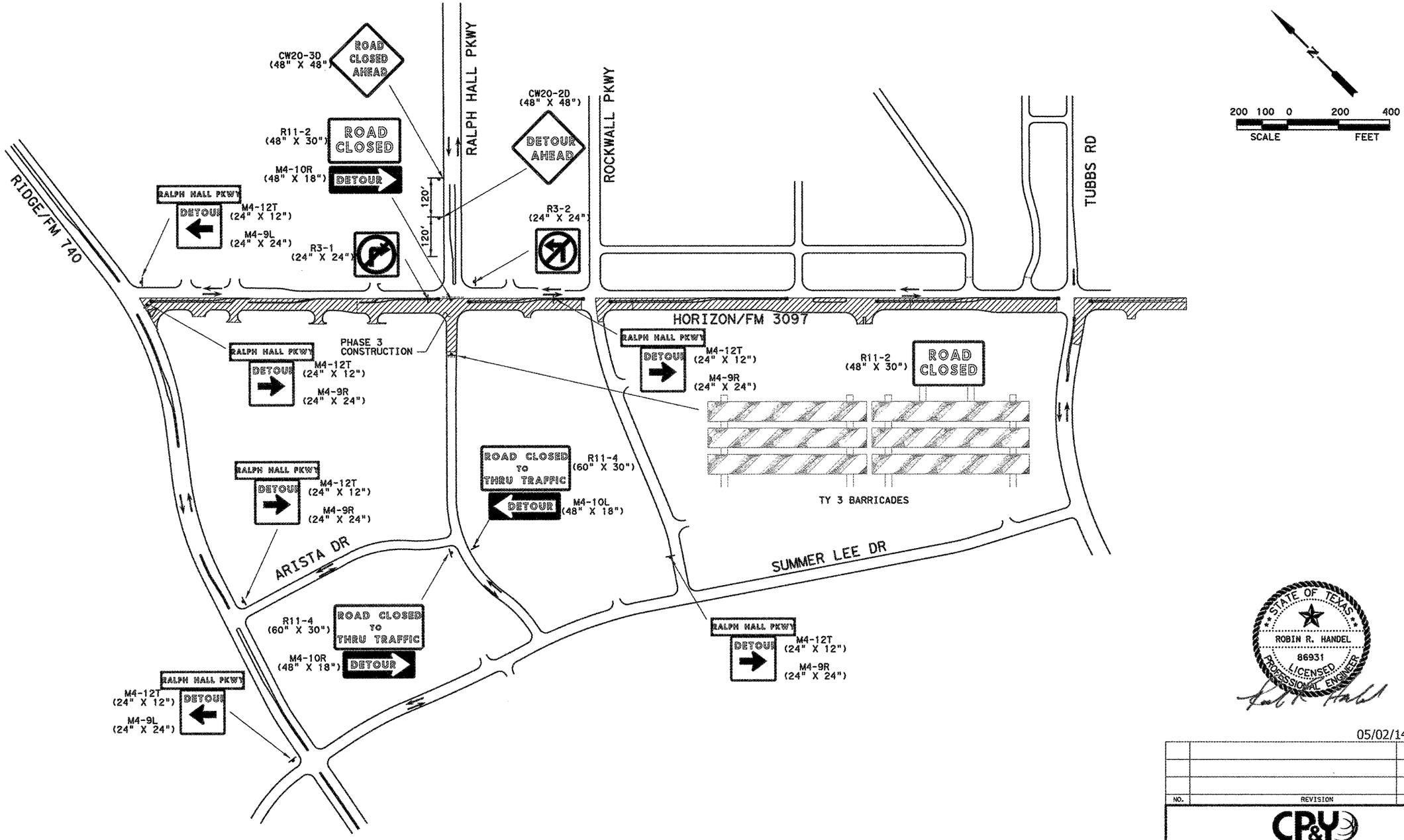
Texas Department of Transportation

TRAFFIC CONTROL PLAN
PHASE 3
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SHEET 1 OF 1

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STATE OF TEXAS
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TEXAS REGISTERED ENGINEERING FIRM. F-1741

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TRAFFIC CONTROL PLAN
FM 3097
PHASE 3 DETOURS

Designed	ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
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SHEET 1 OF 1

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

10. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. 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" labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.

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

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

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

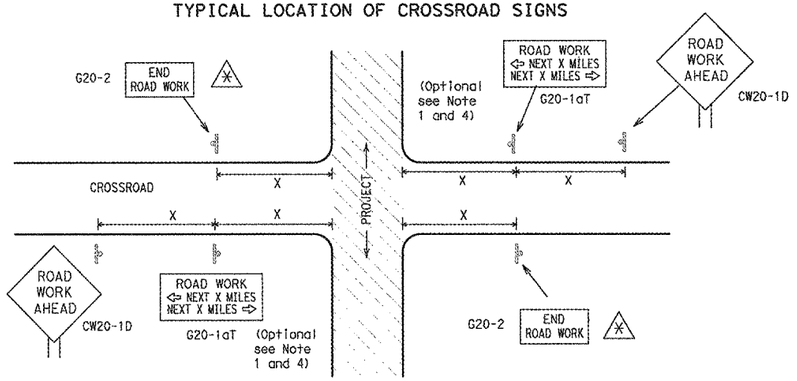
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-13

FILE: bc-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
4-03 5-10	DIST	COUNTY		SHEET NO.
9-07 7-13	DAL	ROCKWALL		51

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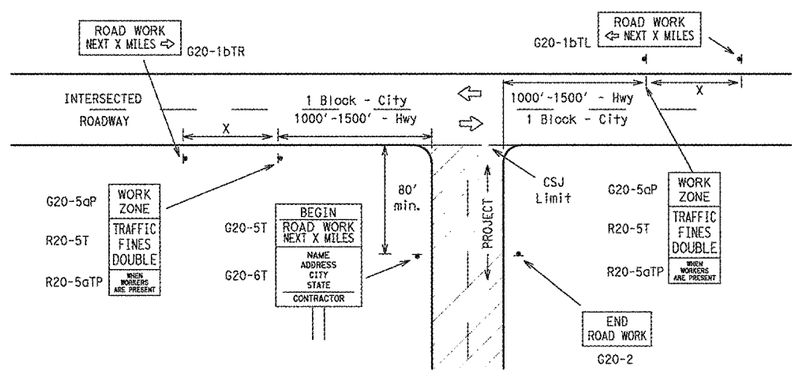
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING [4,5,6]

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]

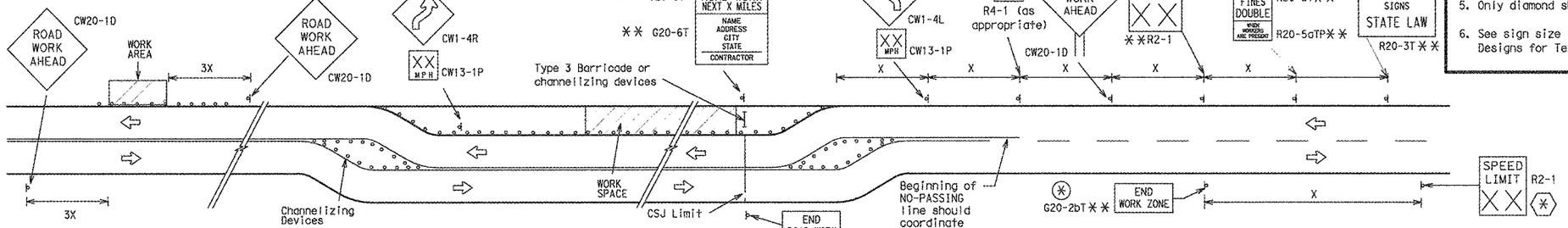
⚹ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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.

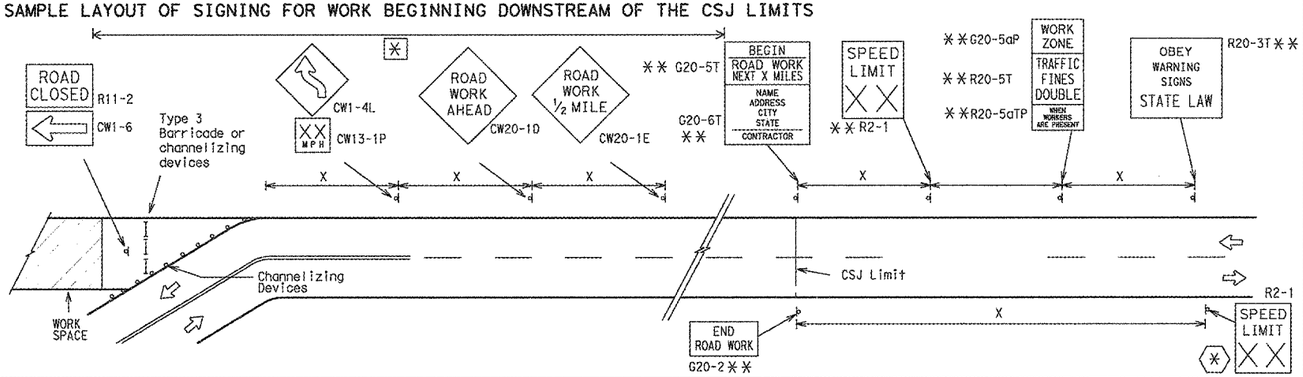
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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 AT THE CSJ LIMITS

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



NOTES

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

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

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

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

⚹ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

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

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-13

FILE: bc-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	3148	01	006	FM 3097
9-07	DIST	COUNTY		SHEET NO.
7-13	DAL	ROCKWALL		52

DATE:
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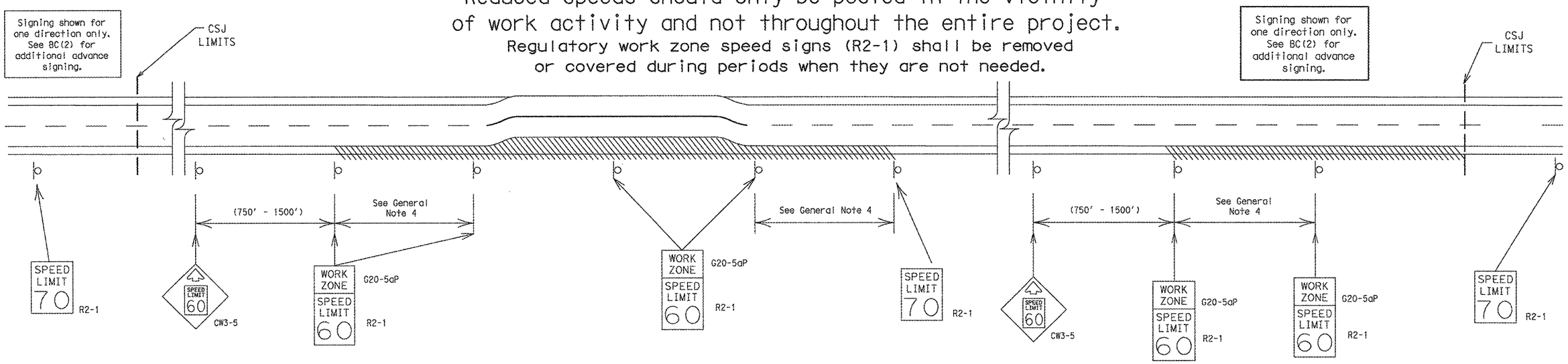
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

BC(3)-13

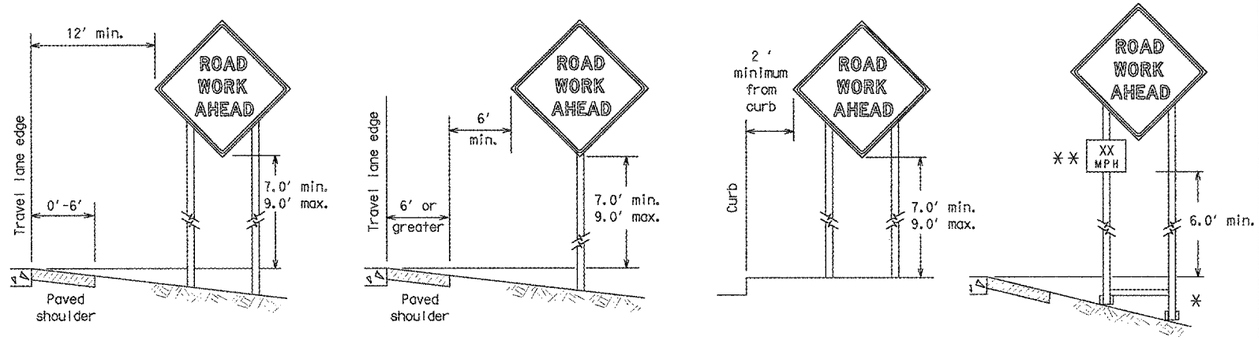
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
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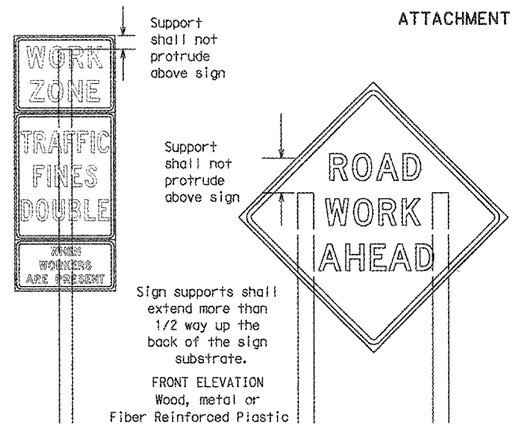
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

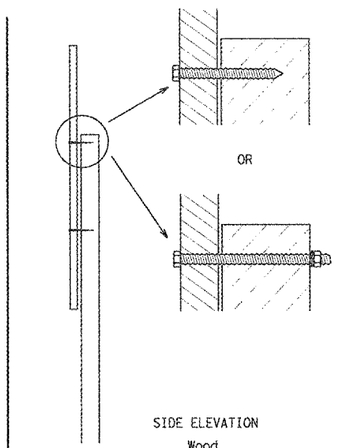
⁎⁎ When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



FRONT ELEVATION
Wood, metal or Fiber Reinforced Plastic

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



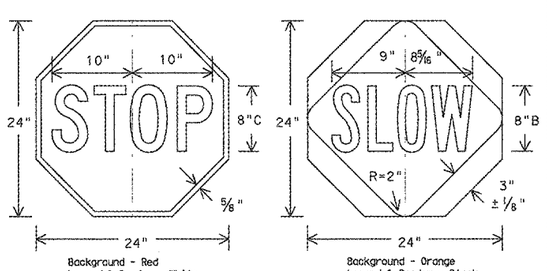
SIDE ELEVATION
Wood

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

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

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

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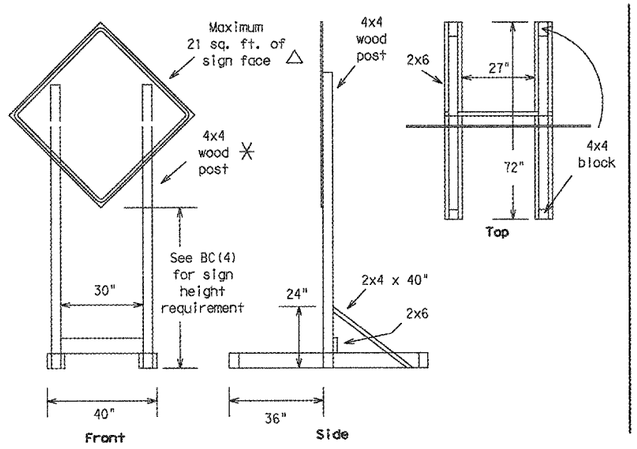
Traffic Operations Division Standard

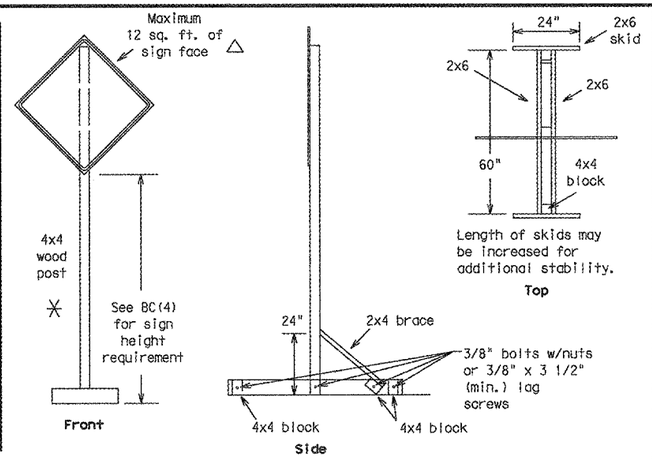
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-13

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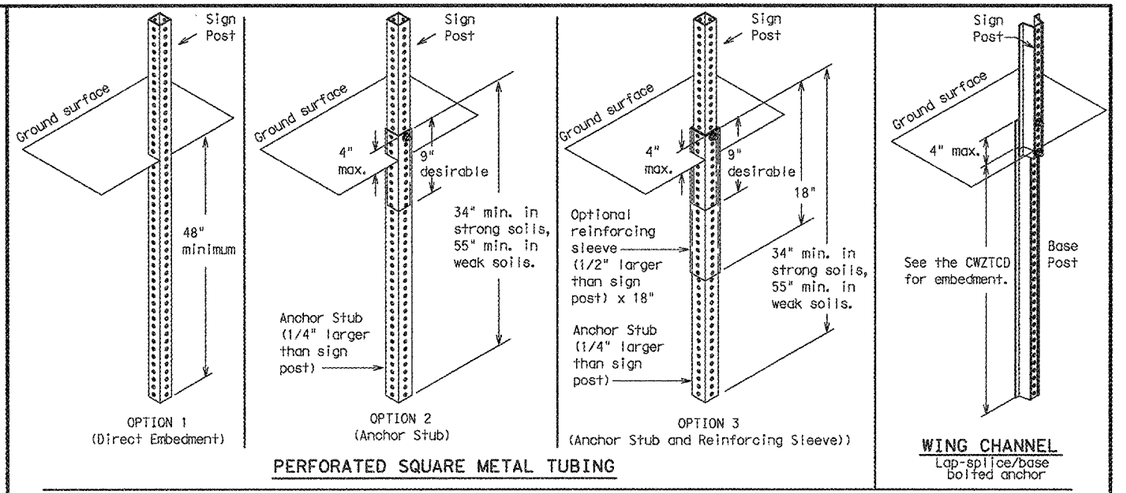
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SKID MOUNTED WOOD SIGN SUPPORTS

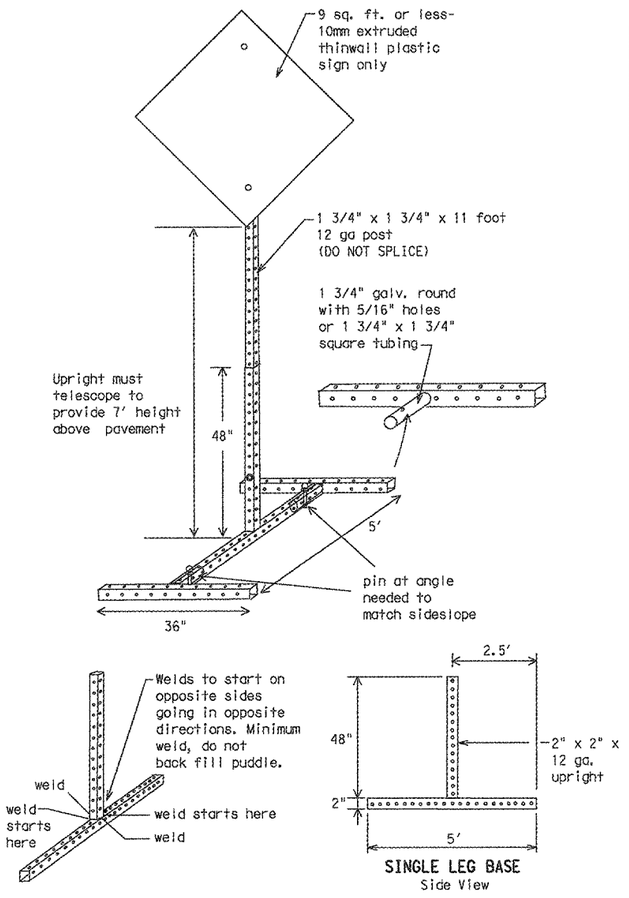
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

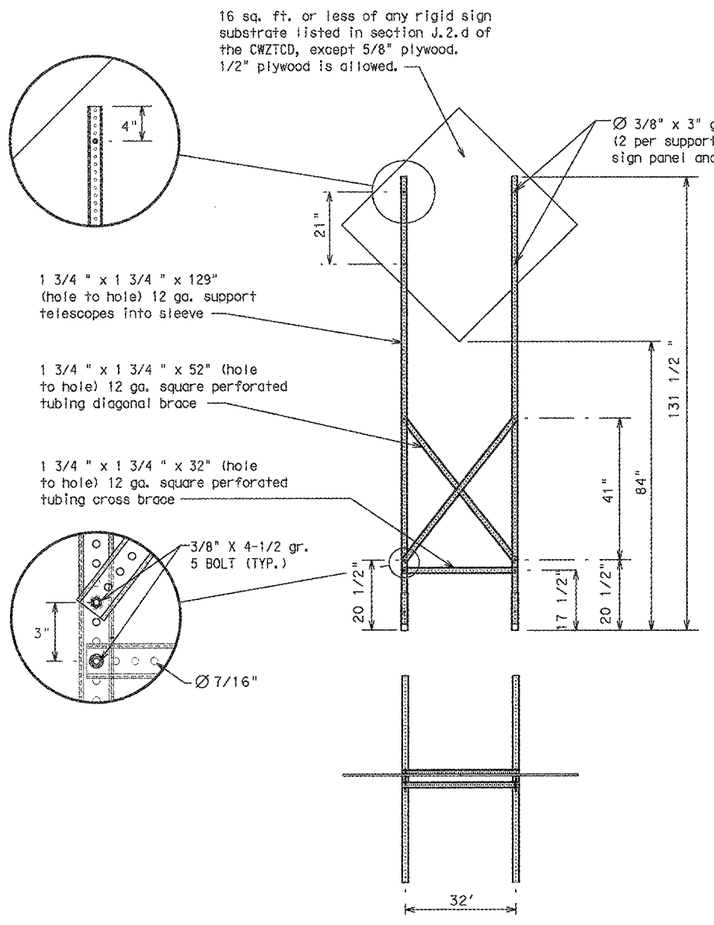


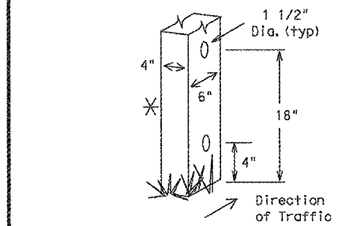
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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

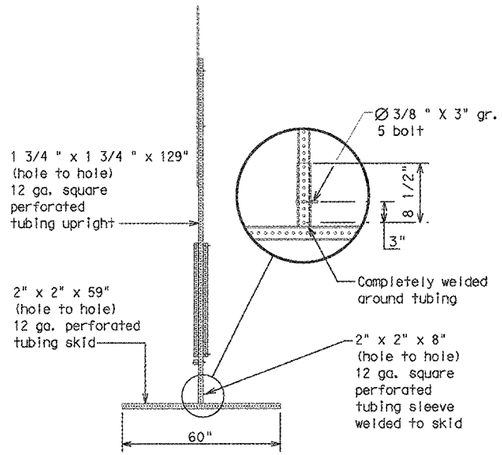






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

WEDGE ANCHORS

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

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)-13

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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 *

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** 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 limted 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)

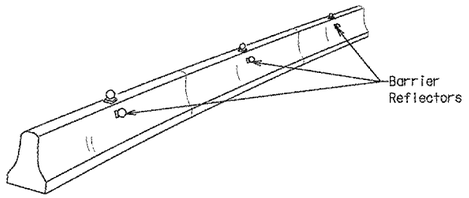
BC(6)-13

FILE: bc-13.dgn	DN:	CK:	DW:	CK:
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
9-07	DIST	COUNTY		SHEET NO.
7-13	DAL	ROCKWALL		56

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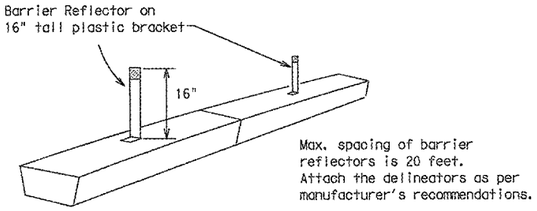
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1. Barrier Reflectors shall be prequalified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors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

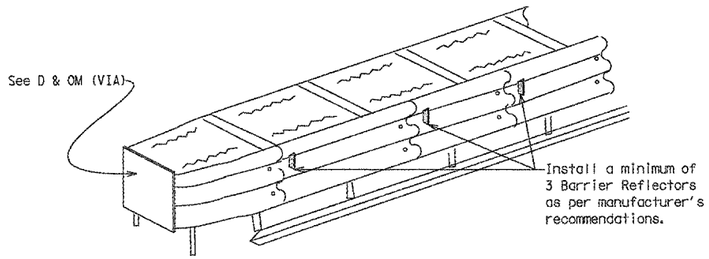


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

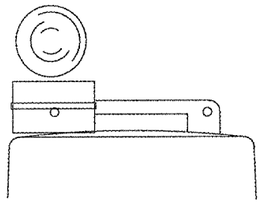


DELINEATION OF END TREATMENTS

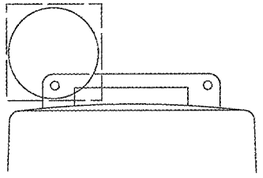
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

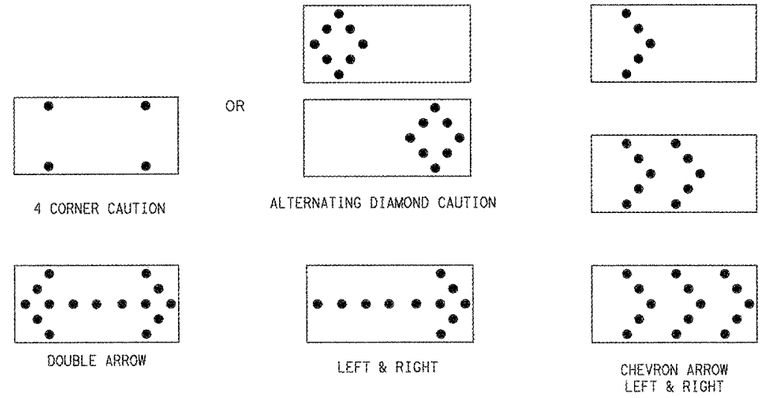
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

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

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Operations Division Standard

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

BC(7)-13

FILE: bc-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
9-07	DIST	COUNTY		SHEET NO.
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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

Prequalified plastic drums shall meet the following requirements:

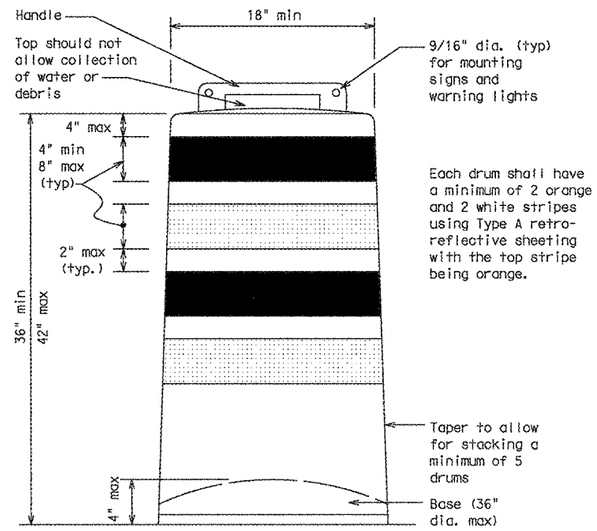
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

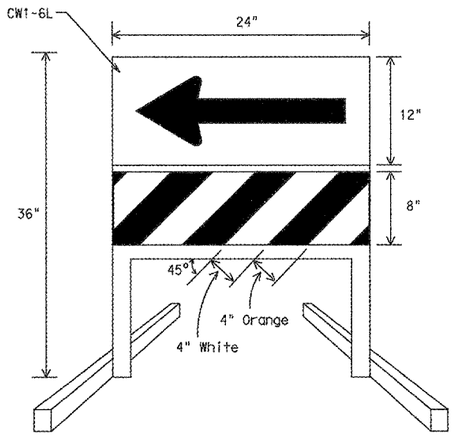
RETROREFLECTIVE SHEETING

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

BALLAST

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

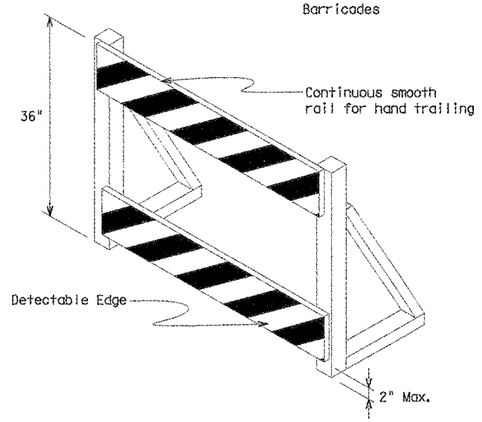




DIRECTION INDICATOR BARRICADE

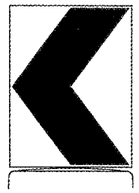
1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3.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

This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades

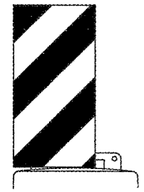


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

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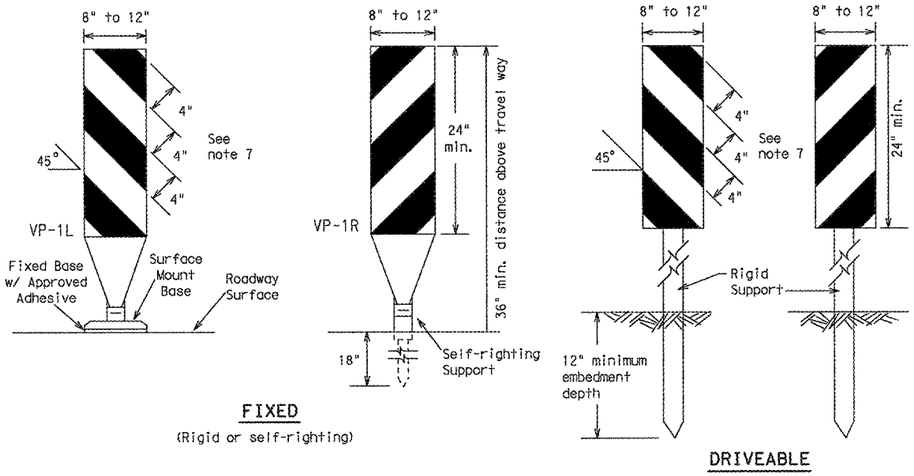
Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-13

FILE: bc-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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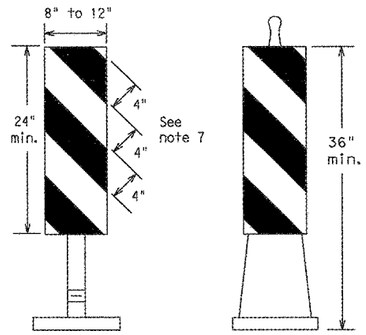
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FIXED

(Rigid or self-righting)

DRIVEABLE

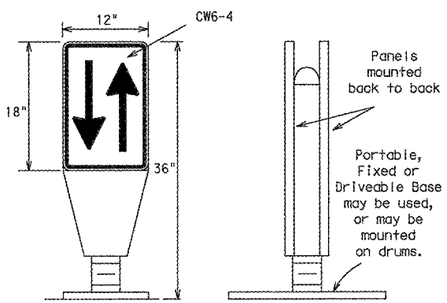


(Rigid or self-righting)

PORTABLE

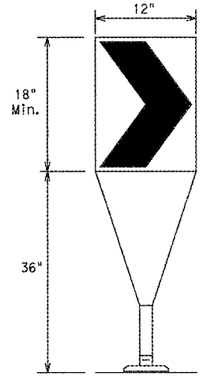
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

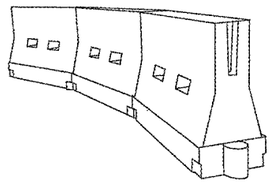
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



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

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

CHEVRONS



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 barrricades 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

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.

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)-13

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	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		59

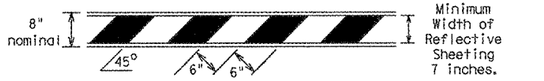
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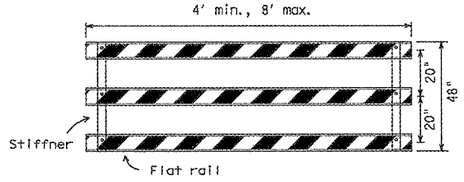
TYPE 3 BARRICADES

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 Specfication DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



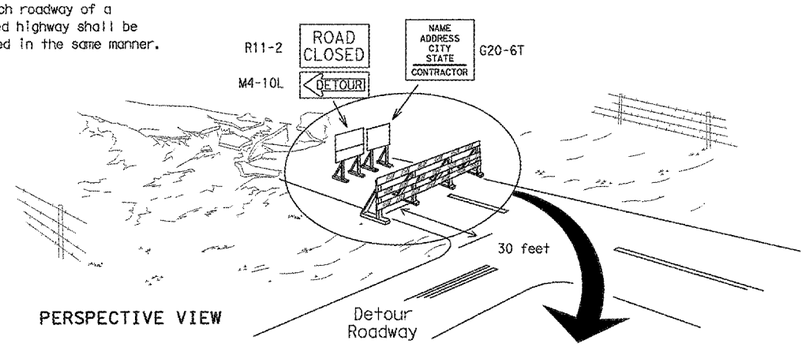
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffner 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

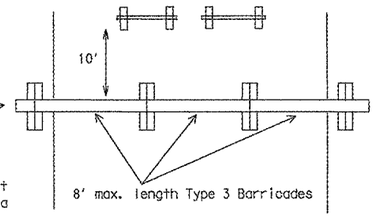
Each roadway of a divided highway shall be barricaded in the same manner.



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.

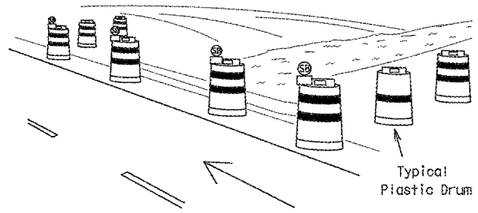
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

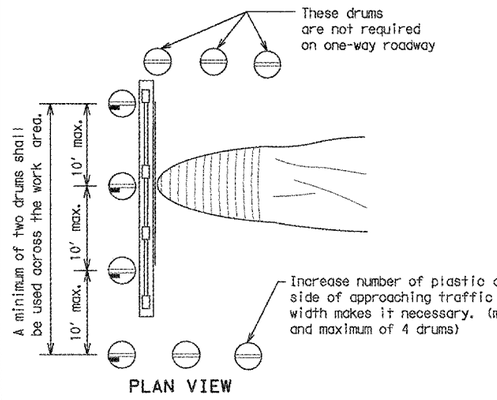
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

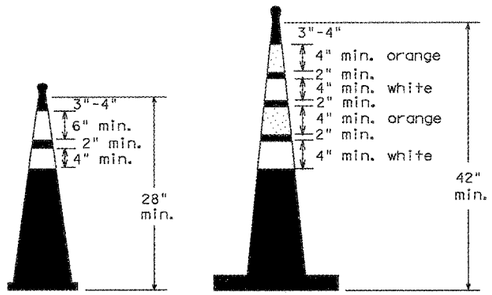
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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

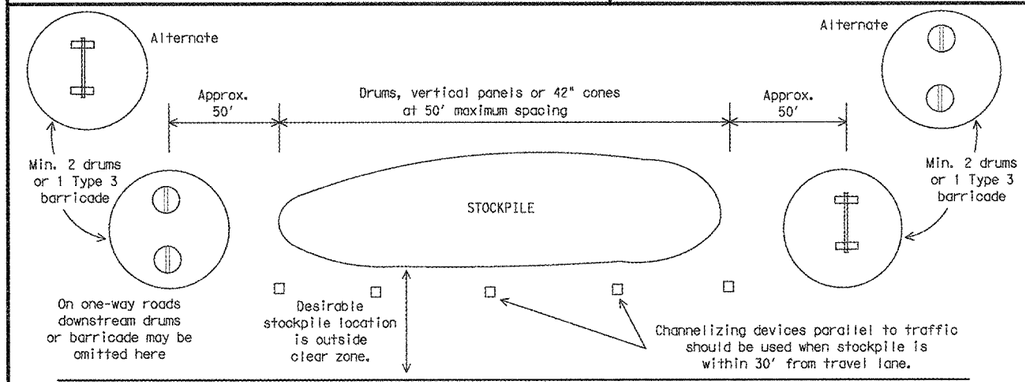
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

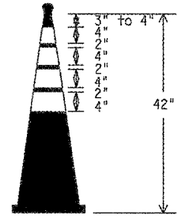
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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)-13

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

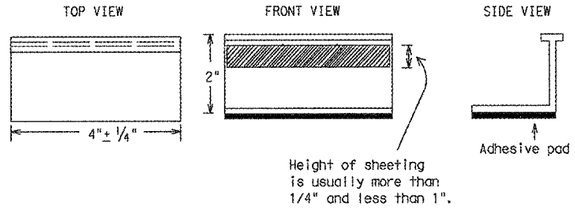
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-13

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1-02 9-07	DAL	ROCKWALL		61

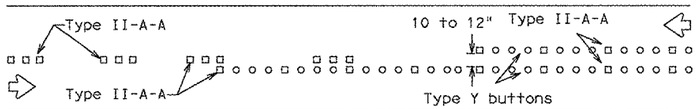
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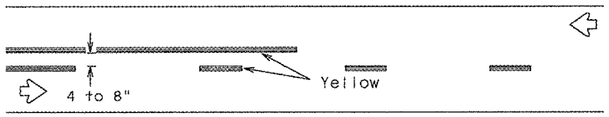
PAVEMENT MARKING PATTERNS



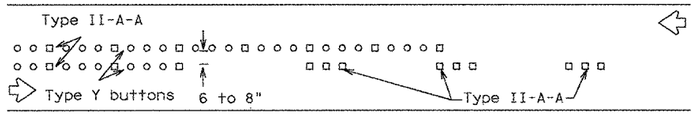
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



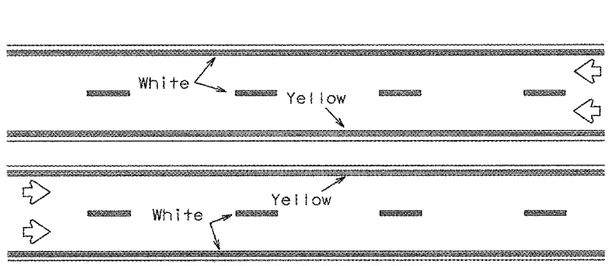
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



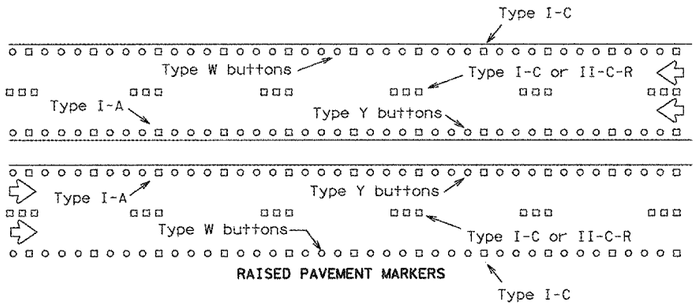
RAISED PAVEMENT MARKERS - PATTERN B

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

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



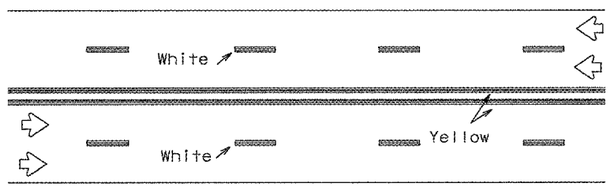
REFLECTORIZED PAVEMENT MARKINGS



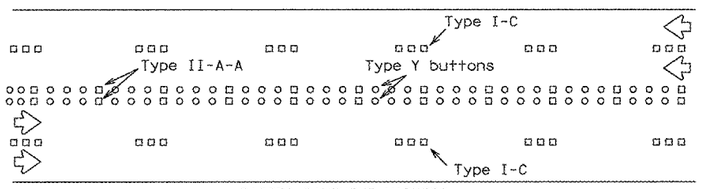
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



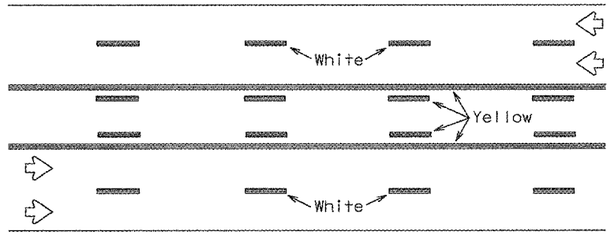
REFLECTORIZED PAVEMENT MARKINGS



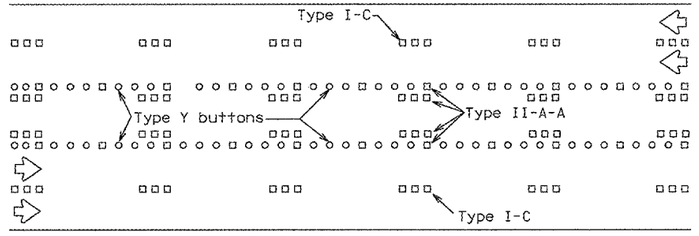
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

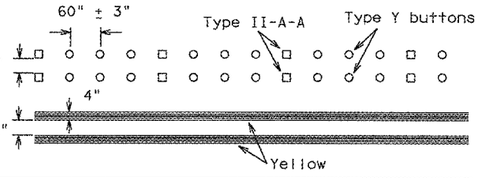
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

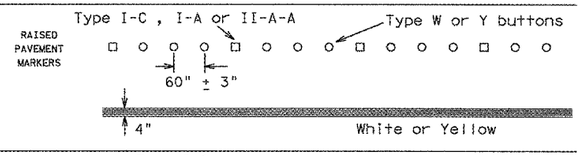
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

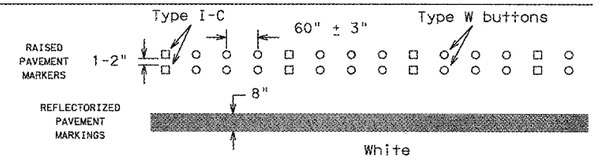


EDGE LINE OR SINGLE NO-PASSING LINE



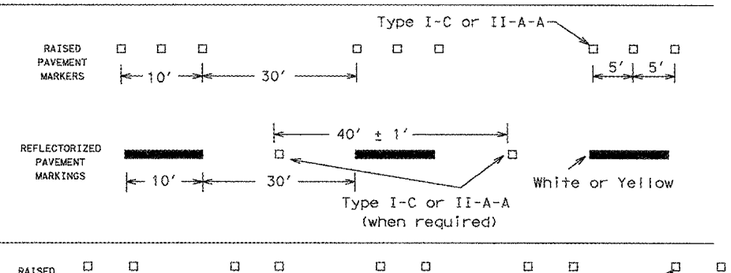
WIDE LINE

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

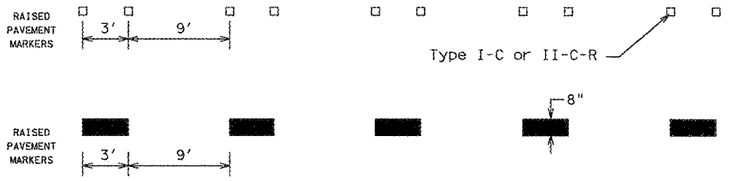


BROKEN LINES

CENTER LINE OR LANE LINE

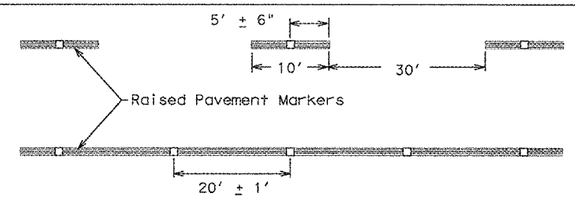


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Operations Division Standard

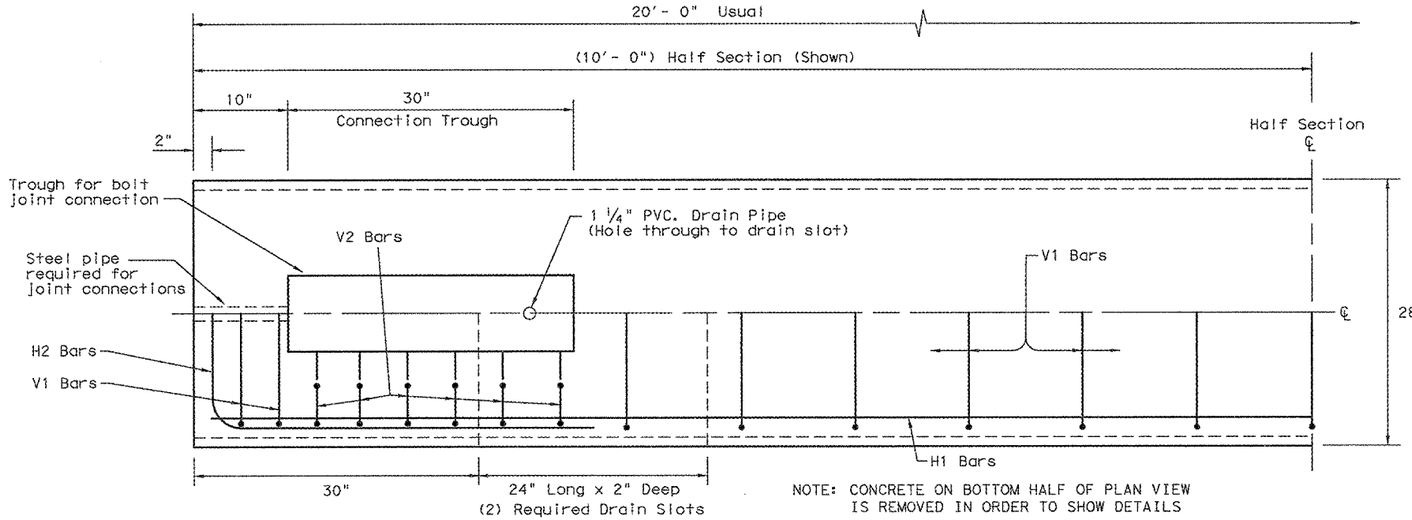
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-13

FILE: bc-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
1-97 11-02 7-13	DIST	COUNTY		SHEET NO.
2-98 9-07	DAL	ROCKWALL		62

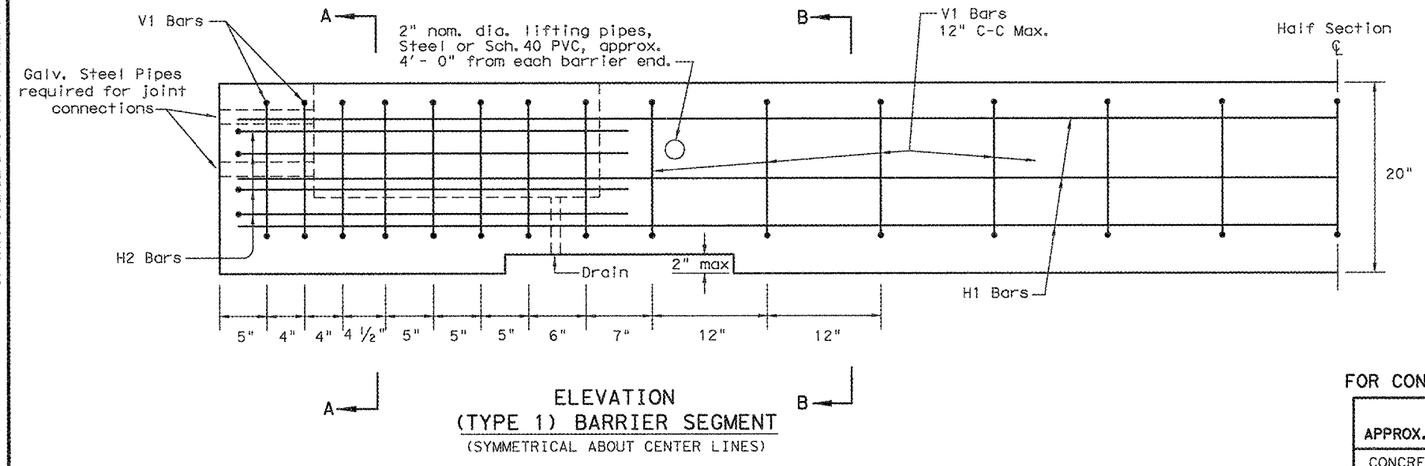
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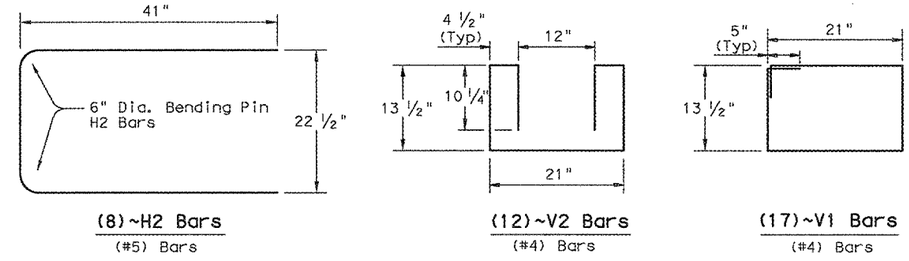


NOTE: CONCRETE ON BOTTOM HALF OF PLAN VIEW IS REMOVED IN ORDER TO SHOW DETAILS

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



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



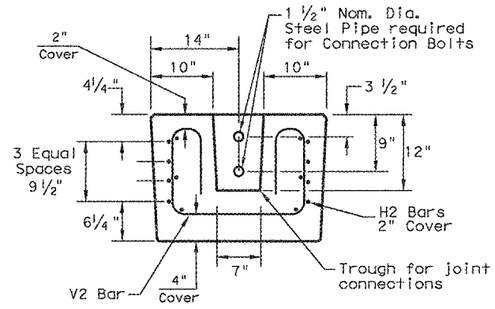
(8)~H2 Bars (#5) Bars

(12)~V2 Bars (#4) Bars

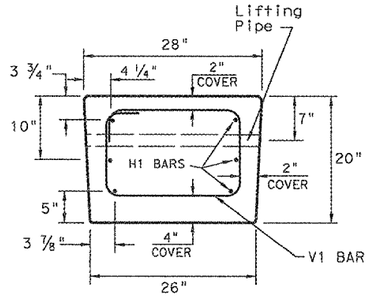
(17)~V1 Bars (#4) Bars

REINFORCING STEEL DETAILS
TYPE 1 - BARRIER SEGMENT

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



SECTION A-A



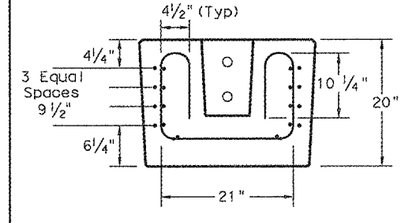
SECTION B-B

GENERAL NOTES

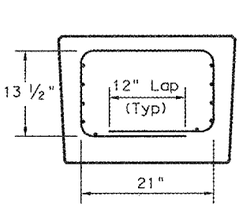
1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform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

FOR CONTRACTORS INFORMATION ONLY

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



SECTION A-A



SECTION B-B

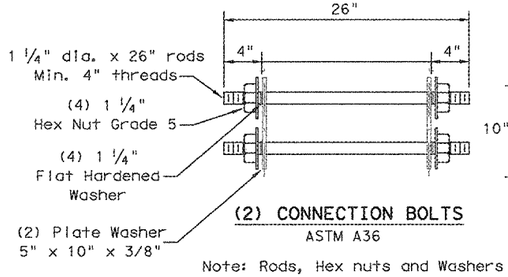
(WWR) GENERAL NOTES

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

REQUIRED (WWR) WIRE DESIGN

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

WELDED WIRE REINFORCEMENT (WWR)- OPTIONAL REINFORCING



(2) CONNECTION BOLTS
ASTM A36

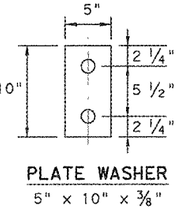


PLATE WASHER
5" x 10" x ⅜"

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

SHEET 1 OF 2

Texas Department of Transportation

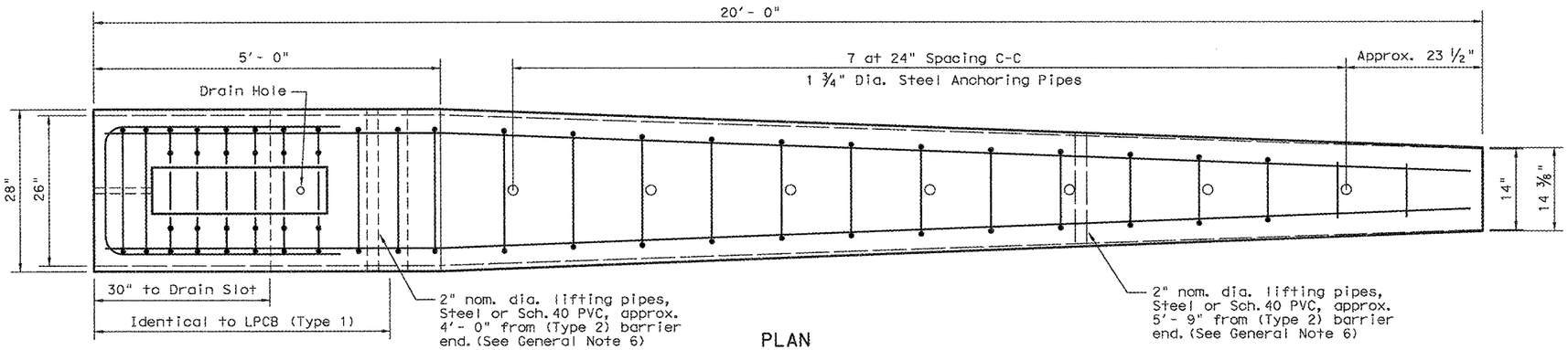
Design Division Standard

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

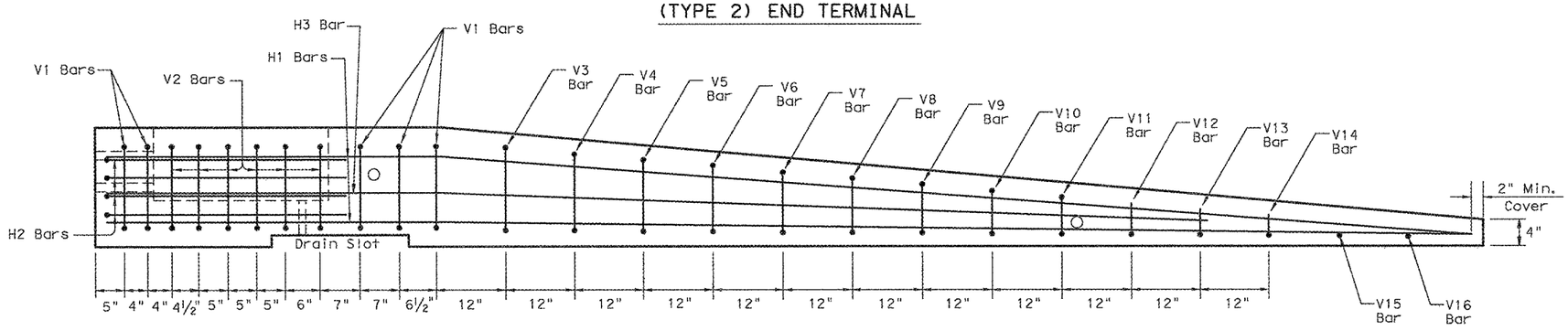
FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		63

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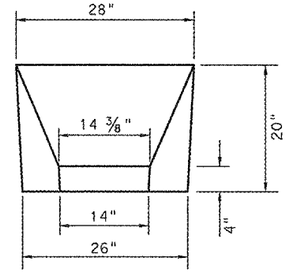
DATE:
FILE:



PLAN
(TYPE 2) END TERMINAL



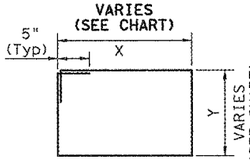
ELEVATION
(TYPE 2) END TERMINAL



APPROACH VIEW

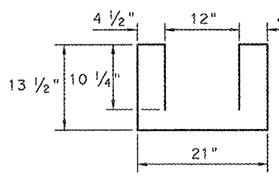
TYPE 2 - NOTES

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

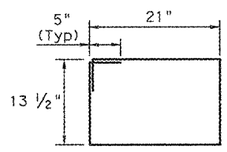


V3-V14 Bars

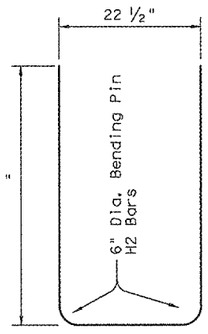
BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 ¼	14 ½
V4 BAR	19 ½	13 ½
V5 BAR	18 ½	12 ¼
V6 BAR	17 ½	11 ¼
V7 BAR	17	10 ¼
V8 BAR	16 ¼	9
V9 BAR	15 ½	8
V10 BAR	14 ½	7
V11 BAR	13 ¾	6



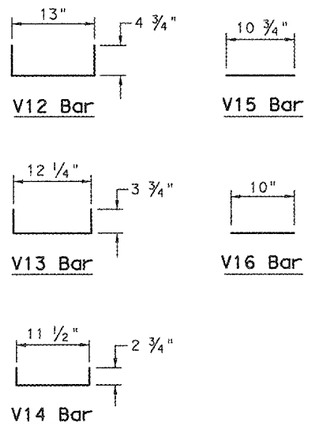
(6)~V2 Bars



(5)~V1 Bars



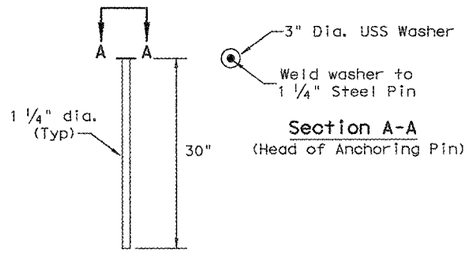
(4)~H2 Bars
(#5) Bars



Note: All V Bars are (#4)

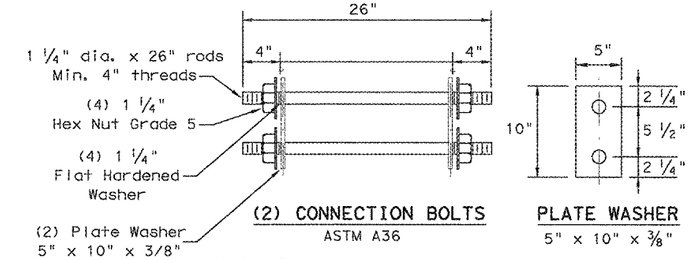
REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL

Note:
Anchoring pipes not shown in Elevation View



Section A-A
(Head of Anchoring Pin)

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

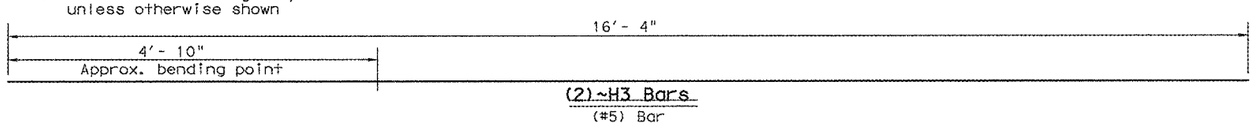


(2) CONNECTION BOLTS
ASTM A36

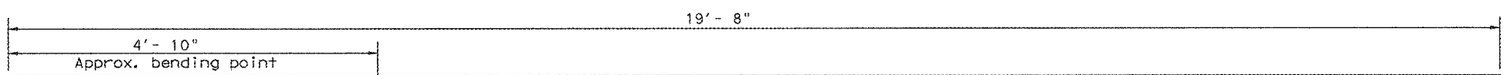
PLATE WASHER
5" x 10" x ⅜"

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

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



(2)~H3 Bars
(#5) Bar



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

(4)~H1 Bars
(#5) Bar

FOR CONTRACTORS INFORMATION ONLY

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

Texas Department of Transportation

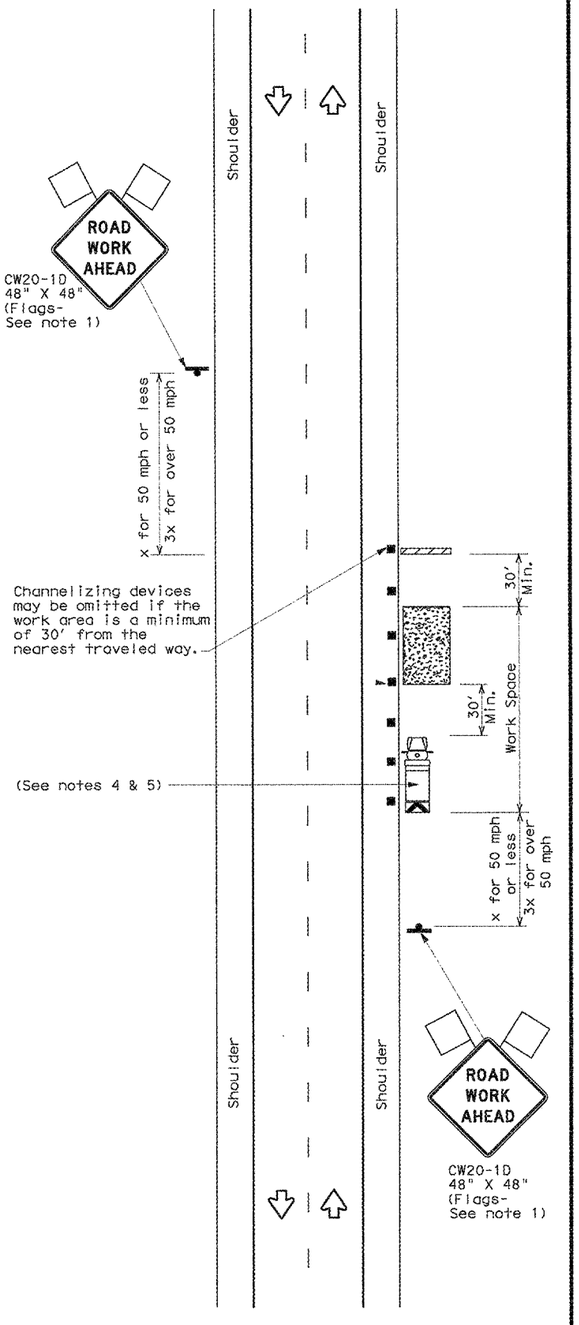
Design Division Standard

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

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		64

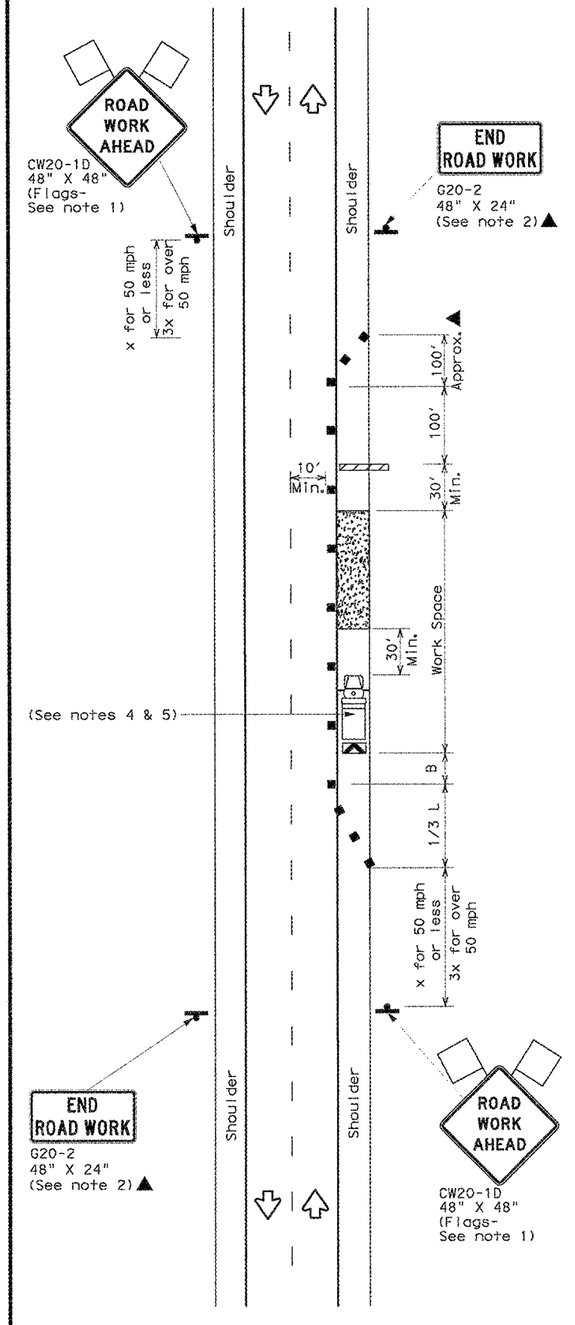
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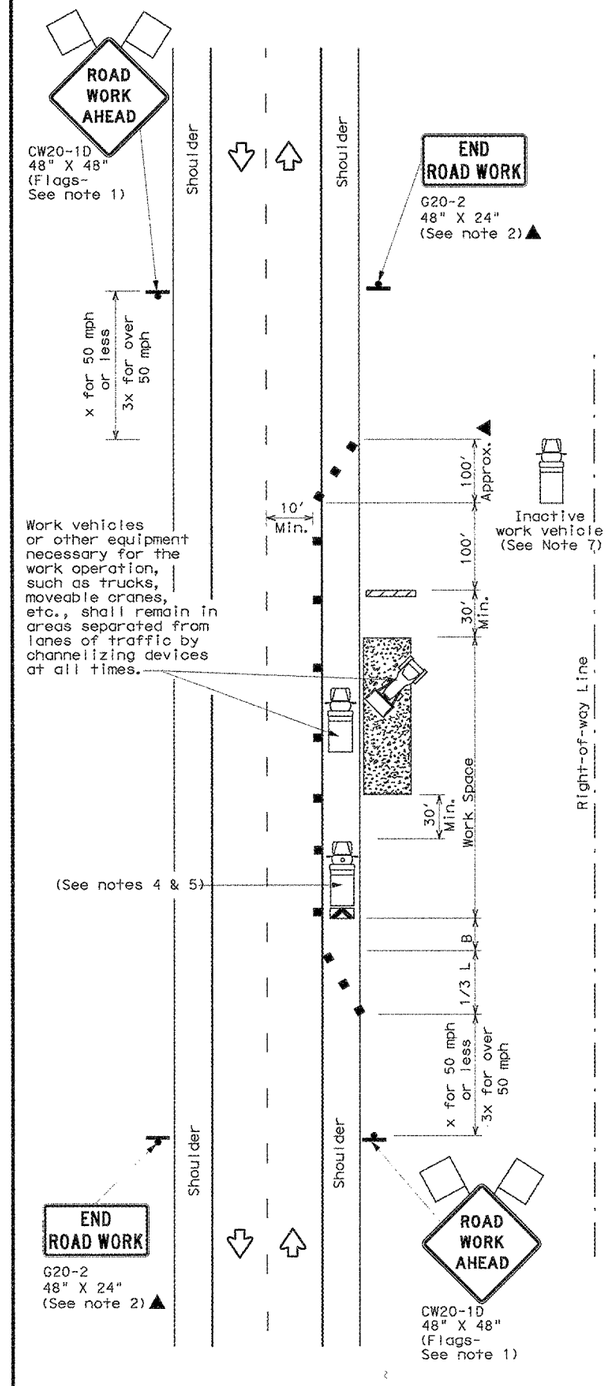
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

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 CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-12

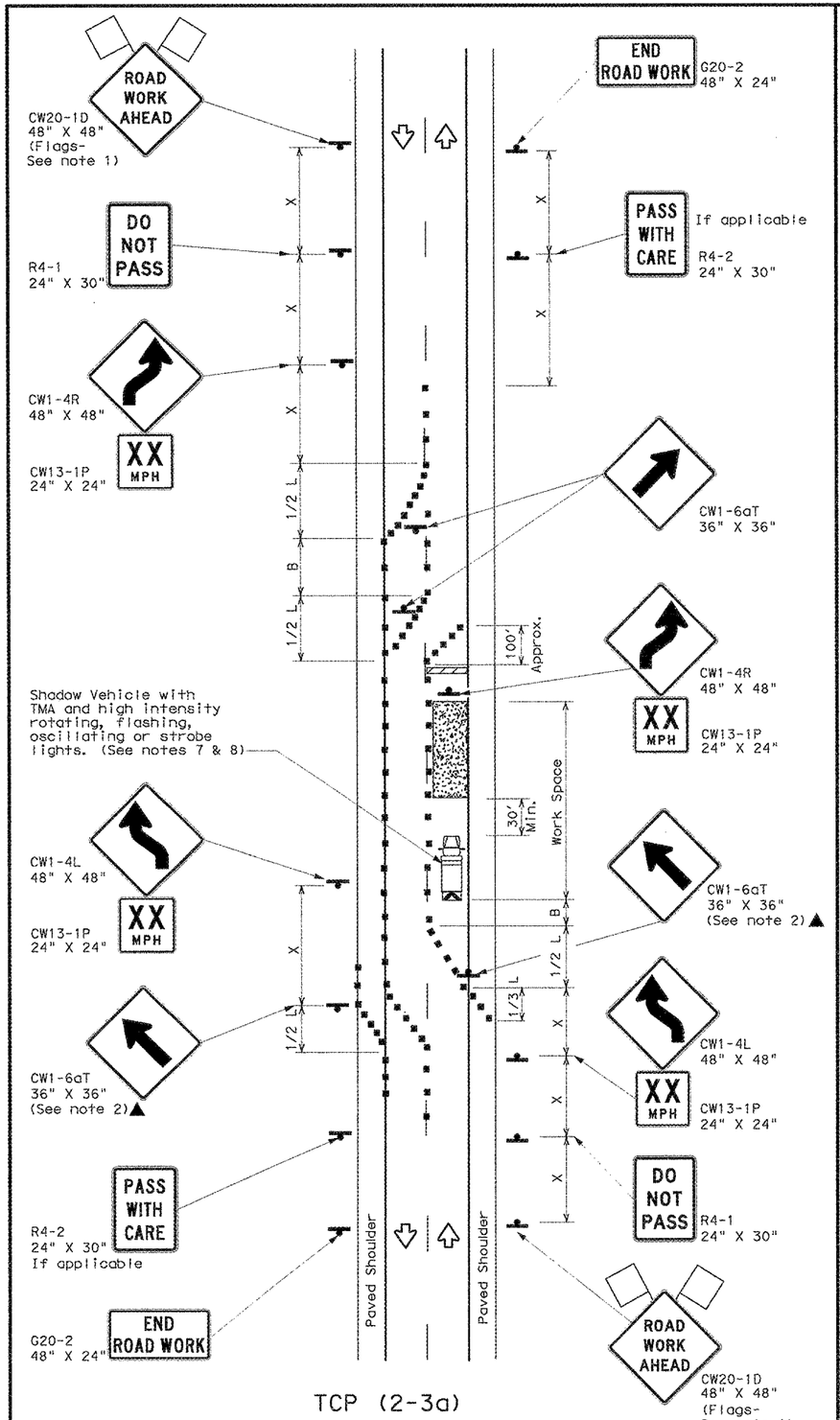
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DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
2-94 2-12	3148	01	006	FM 3097
8-95	DIST	COUNTY		SHEET NO.
1-97	DAL	ROCKWALL		65
4-98				

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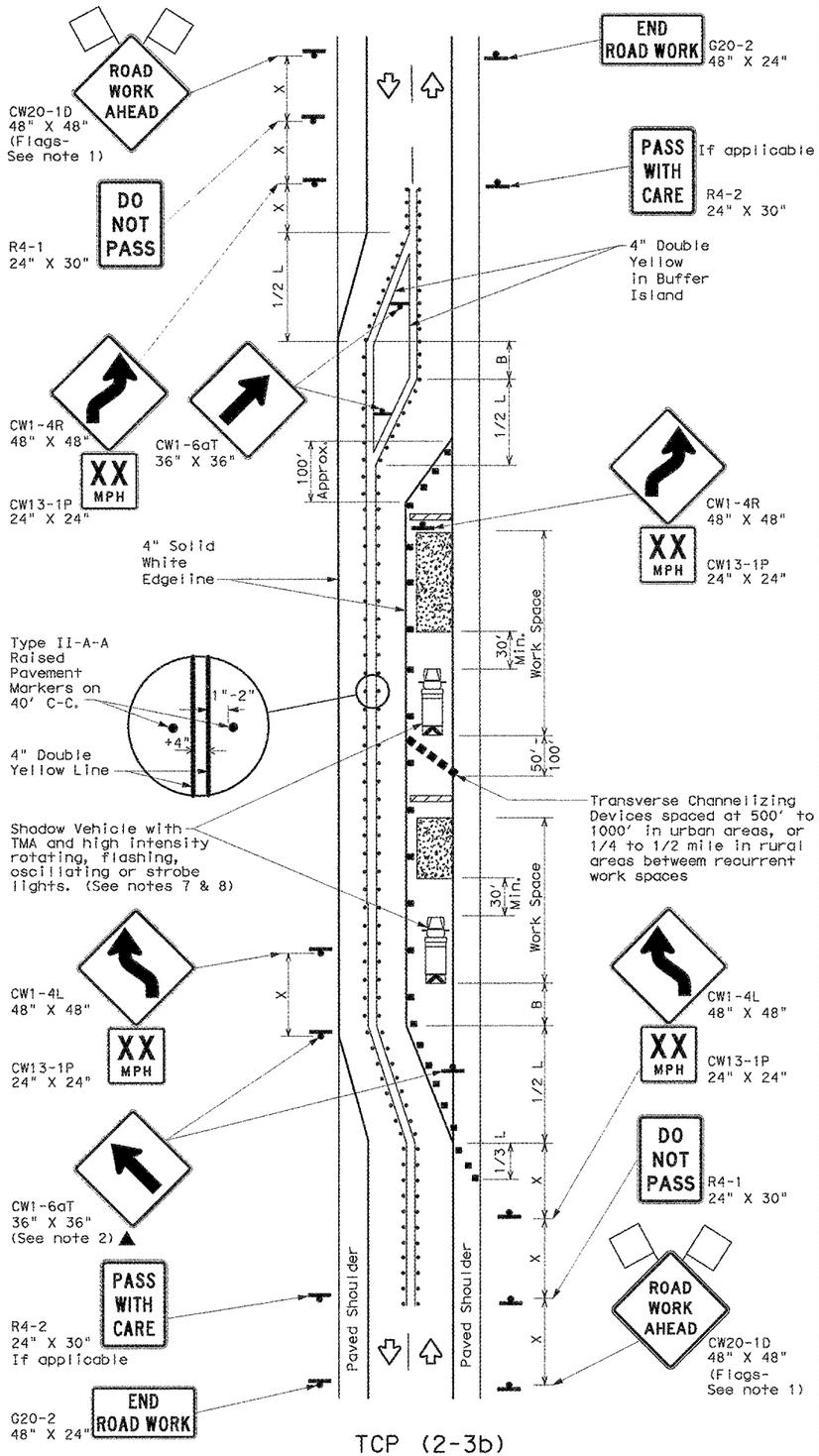


TCP (2-3a)

2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED

ADEQUATE FIELD OF VIEW



TCP (2-3b)

2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED

INADEQUATE FIELD OF VIEW

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
				TCP(2-3b)ONLY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

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

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

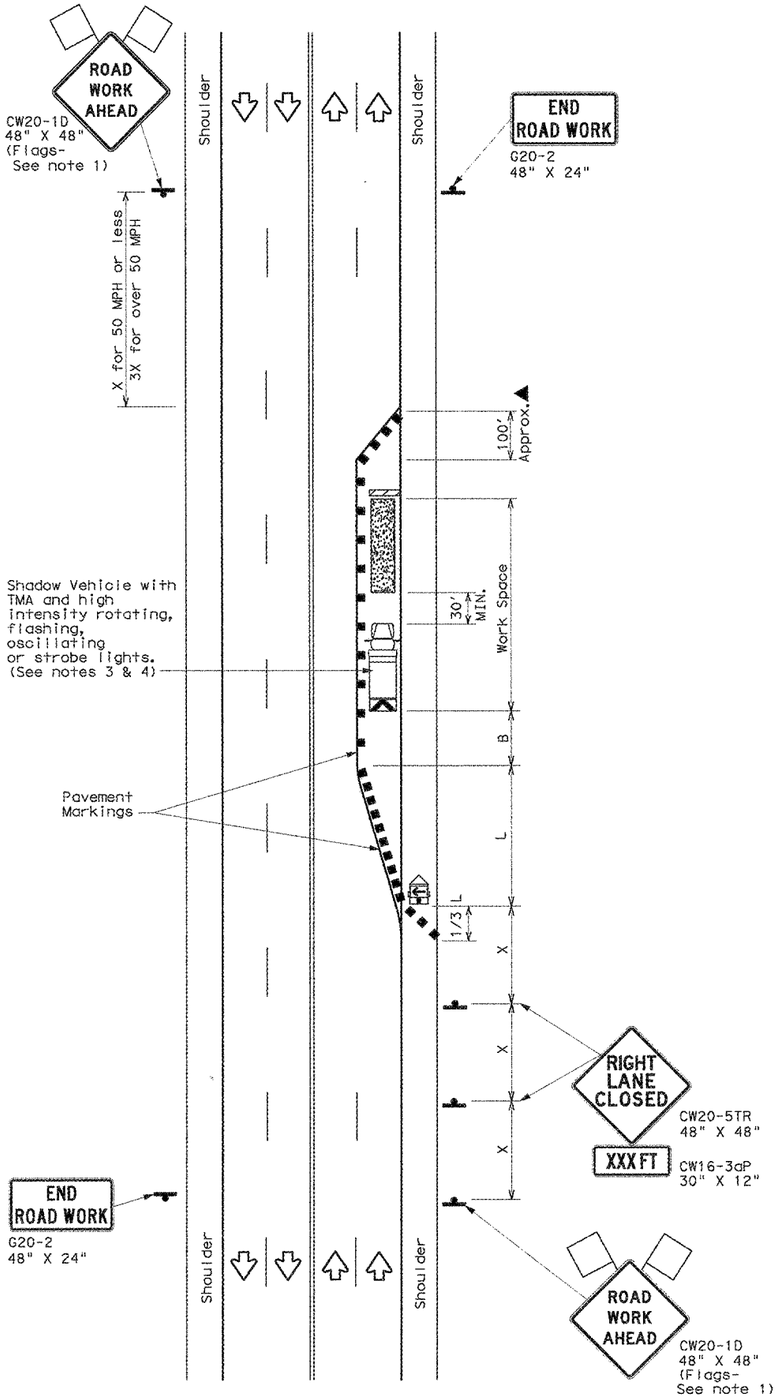
TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-12

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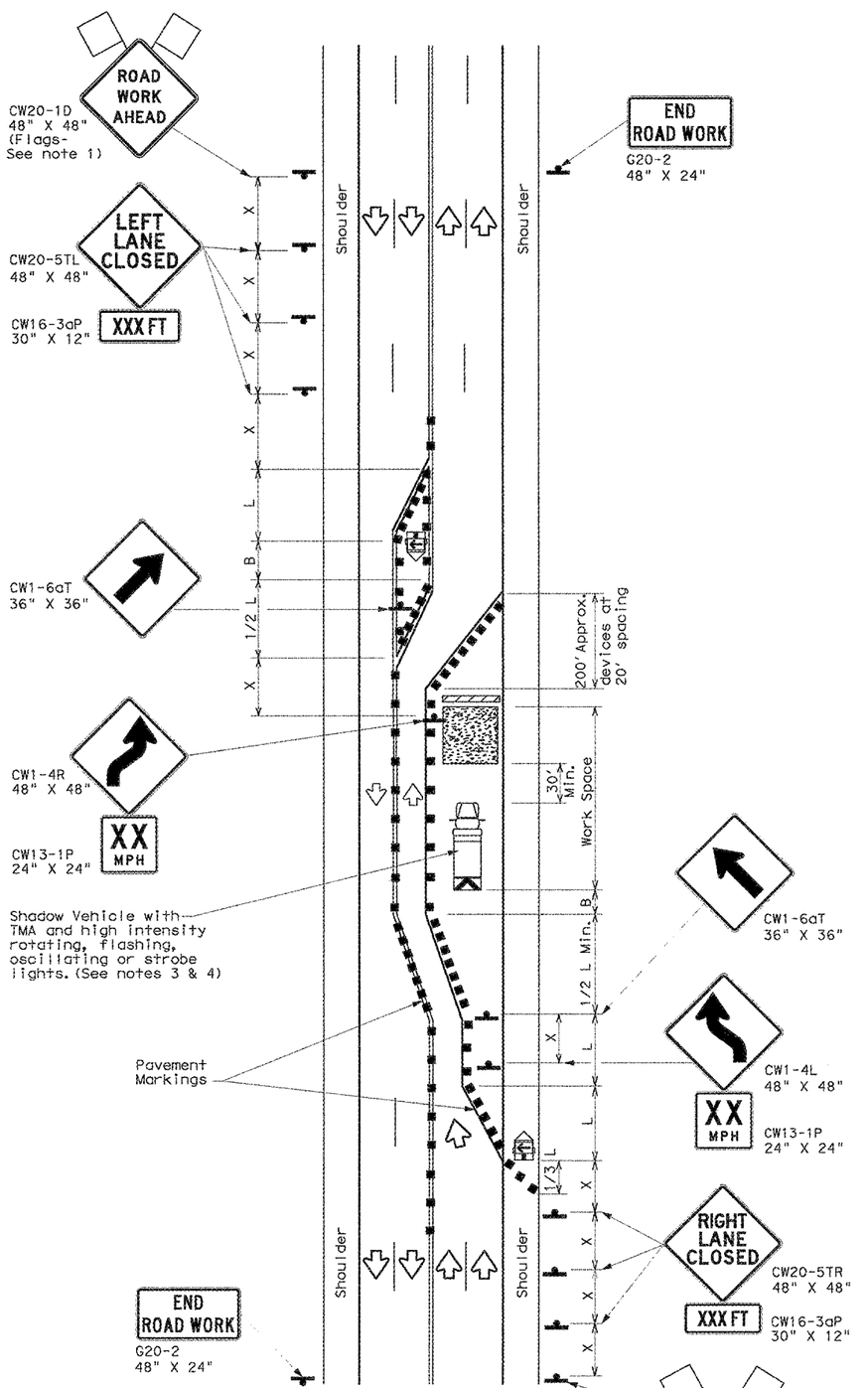
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8-95 2-12	CONT	SECT	JOB	HIGHWAY
1-97	3148	01	006	FM 3097
4-98	DIST	COUNTY		SHEET NO.
3-03	DAL	ROCKWALL		86

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TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. 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.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

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

TCP (2-5b)

7. Conflicting pavement markings shall be removed for long-term projects.

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.

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Traffic Operations Division

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-12

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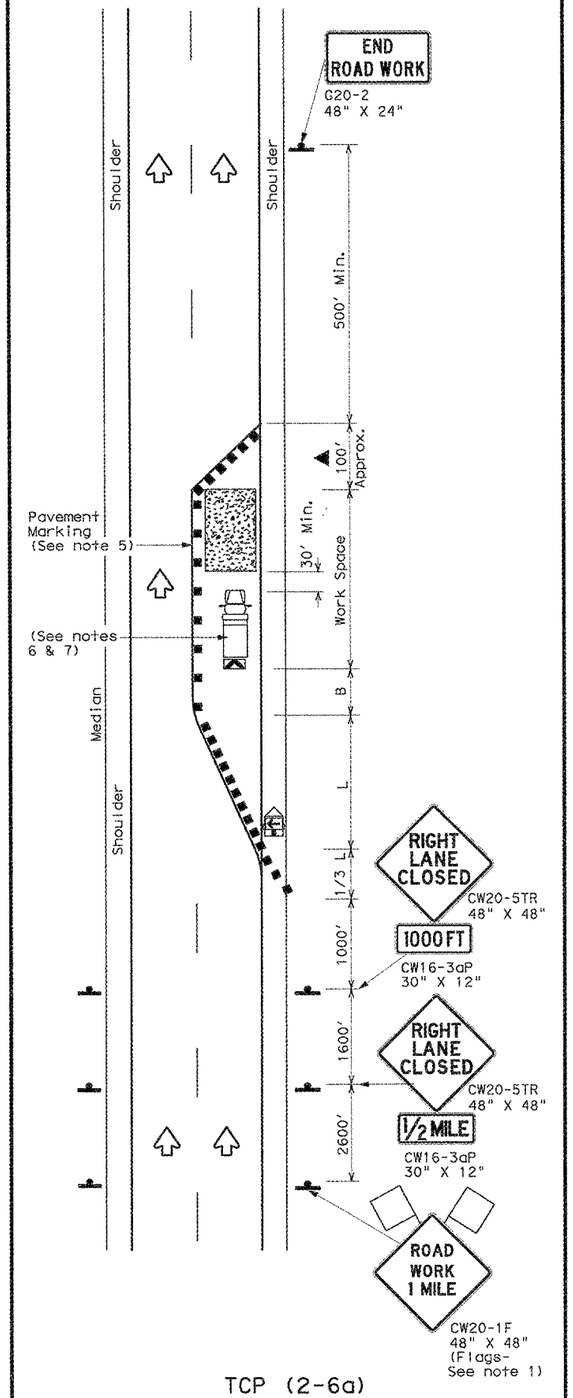
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REVISIONS	CONT	SECT	JOB	HIGHWAY
8-95 2-12	3148	01	006	FM 3097
1-97	DIST	COUNTY		SHEET NO.
4-98	DAL	ROCKWALL		67
3-03				

DATE:
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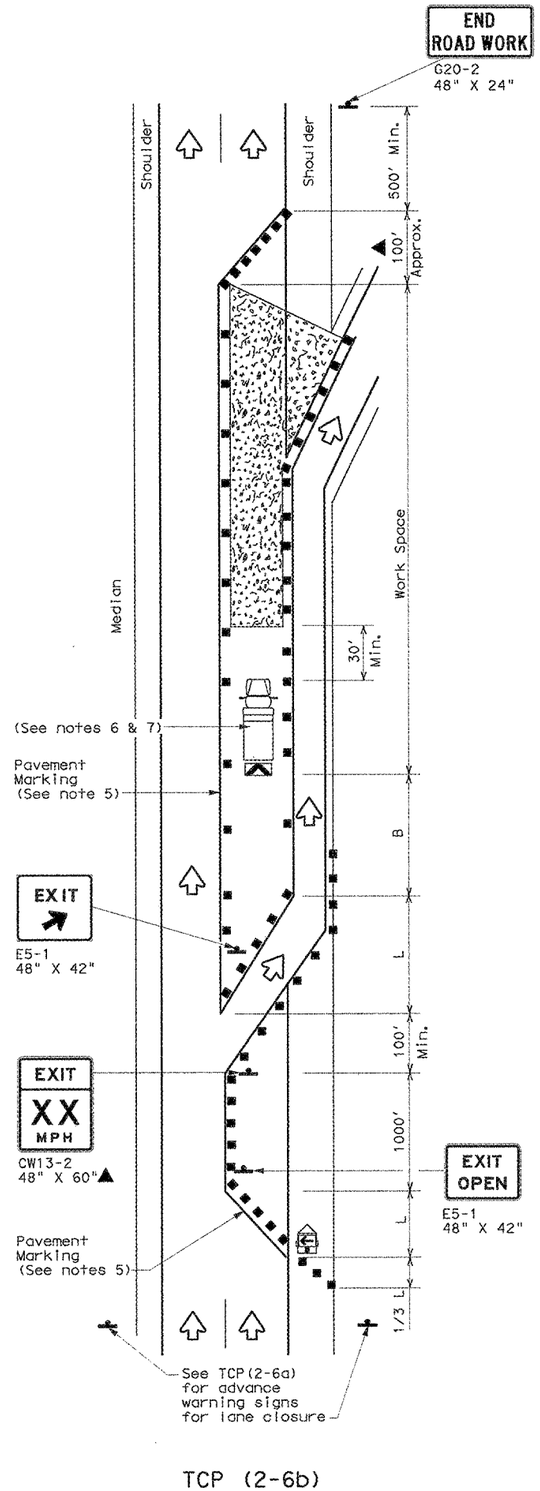
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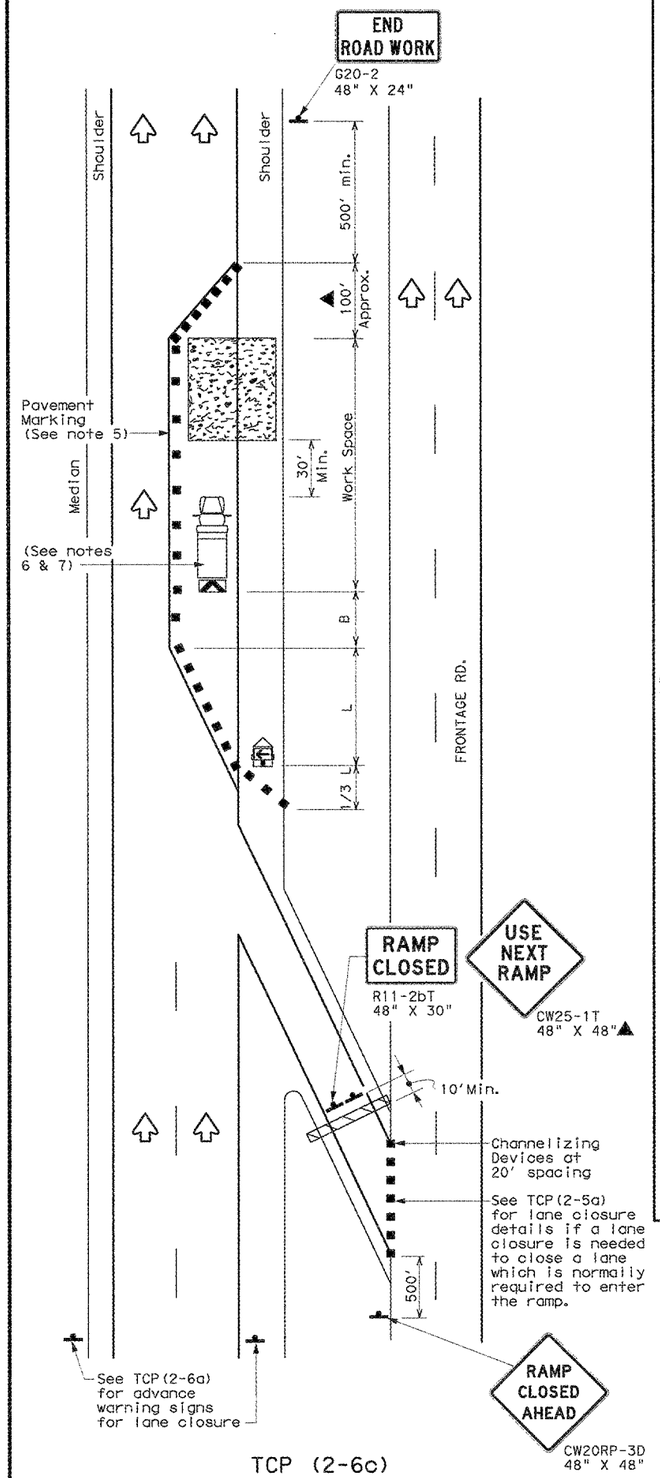
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

LEGEND

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on everyother channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
5. The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
6. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

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 LANE CLOSURES ON DIVIDED HIGHWAYS

TCP(2-6)-12

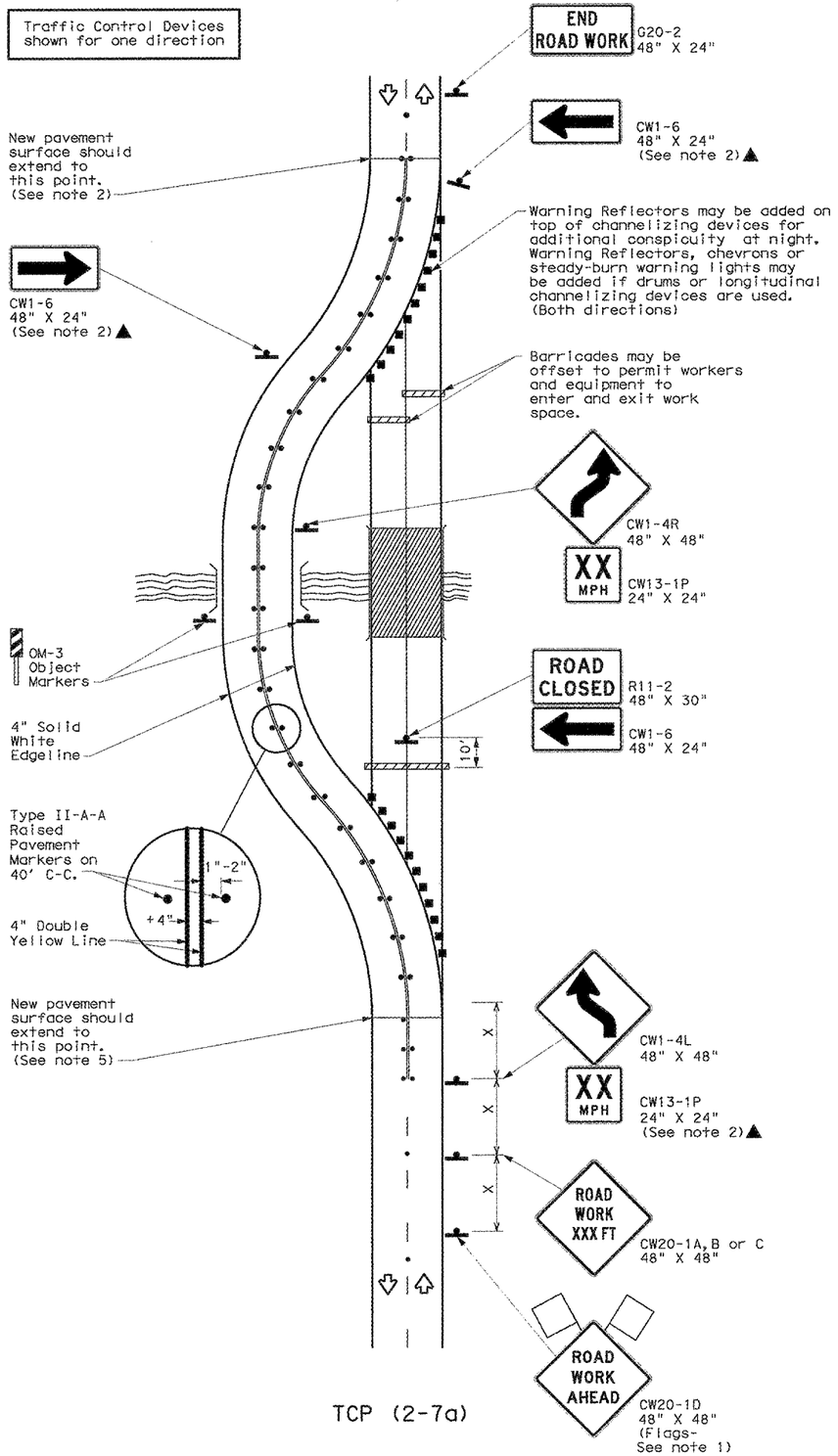
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DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
2-94 2-12	3148	01	006	FM 3097
8-95	DIST	COUNTY		SHEET NO.
1-97	DAL	ROCKWALL		68
4-98				

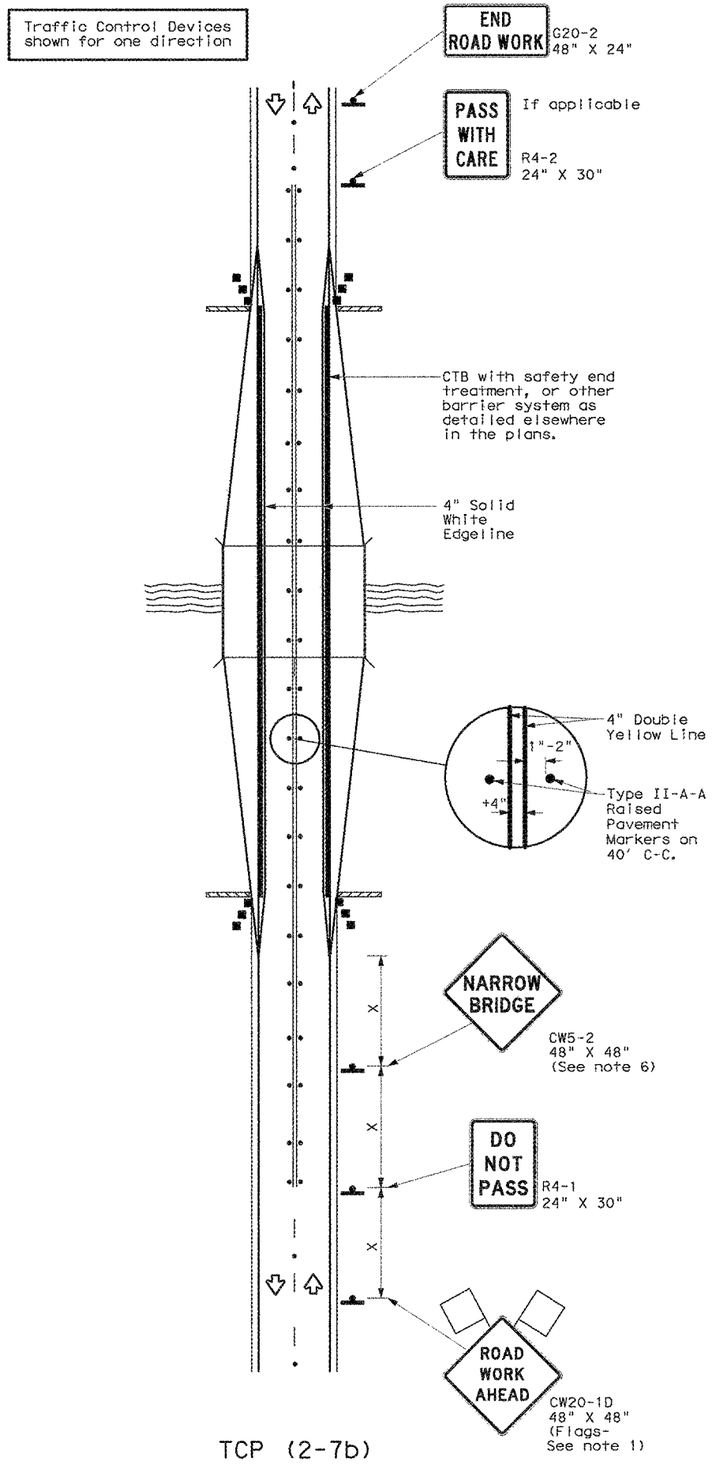
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FILE:



TCP (2-7a)

ROADWAY DIVERSION



TCP (2-7b)

BRIDGE WIDENING

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

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

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.

TCP (2-7a)

3. Raised pavement markers shall be placed 40 feet c-c on centerline throughout project.
4. Roadway diversion design requirements should be based on posted speed limit or prevailing speed.
5. New pavement surface should be extended across existing roadway edge to a point where existing pavement markings left in place during project do not conflict with construction area pavement marking.

TCP (2-7b)

6. The CW5-2 "Narrow Bridge" sign may be omitted if lane and shoulder widths are maintained.

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 DIVERSIONS AND NARROW BRIDGES

TCP(2-7)-12

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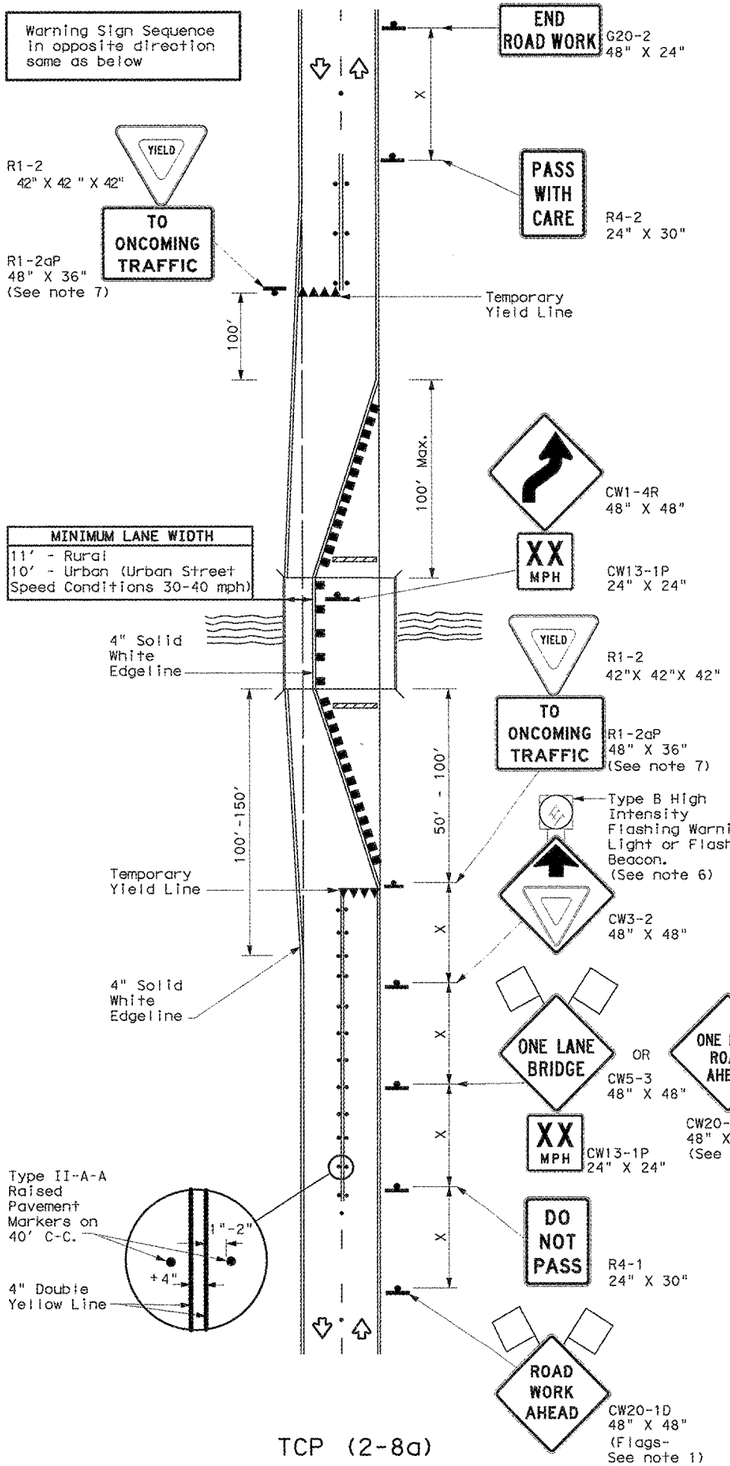
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REVISIONS
8-95 2-12
1-97
4-98
3-03

CONT	SECT	JOB	HIGHWAY
3148	01	006	FM 3097
DIST	COUNTY		SHEET NO.
DAL	ROCKWALL		69

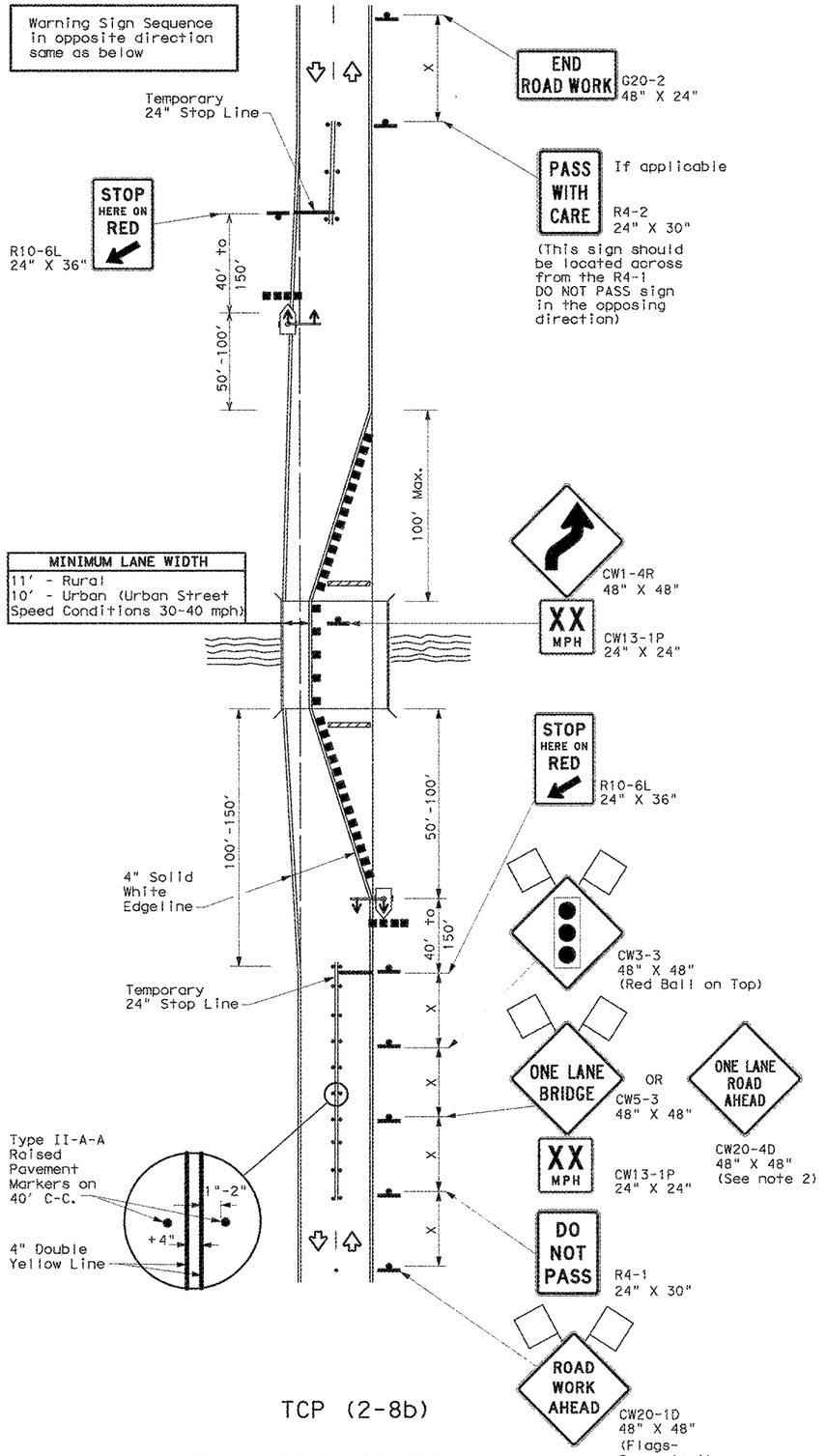
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TCP (2-8a)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH YIELD SIGNS
(Less Than 2000 ADT-See Note 5)



TCP (2-8b)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH TRAFFIC SIGNAL

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Sign		Traffic Flow
	Flag		Flagger
	Raised Pavement Markers Ty II-AA		Temporary or Portable Traffic Signal

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. When this TCP is used at a location which does not involve a bridge, a 48" x 48" CW20-4D "ONE LANE ROAD AHEAD" signs should be used in lieu of the CW5-3 "ONE LANE BRIDGE" signs. The CW13-1P Advisory Speed Plaque is required with either warning sign.
3. Raised pavement markers shall be placed 40 feet c-c on centerline between DO NOT PASS signs and stop or yield lines.
4. For intermediate term situations, when it is not feasible to remove and restore pavement markings, the channelization must be made dominant by using a very close spacing. This is especially important in locations of conflicting information, such as where traffic is directed over a double yellow centerline. In such locations a maximum channelizing device spacing of 20 feet is recommended. The 20 foot channelizing device spacing recommendation is intended for the area of conflicting information and not the entire work zone.

TCP (2-8a)

5. Traffic control by CW3-2 "YIELD AHEAD" symbol signs for one lane two-way traffic control operations should be limited to work spaces less than 400 feet long and roadways with less than 2000 ADT. Otherwise, portable traffic signals should be used.
6. If power is available, a flashing beacon should be attached to the CW3-2 "YIELD AHEAD" symbol sign for emphasis.
7. The R1-2 "YIELD" and R1-2aP "TO ONCOMING TRAFFIC" signs and other regulatory signs shall be installed at 7 foot minimum mounting height.

TCP (2-8b)

8. A list of approved Portable Traffic Signals can be found in the "Compliant Work Zone Traffic Control Devices" list.
9. Portable traffic signals should be located to provide adequate stopping sight distance for approaching motorist (See table above).

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 LONG TERM ONE-LANE TWO-WAY CONTROL

TCP(2-8)-12

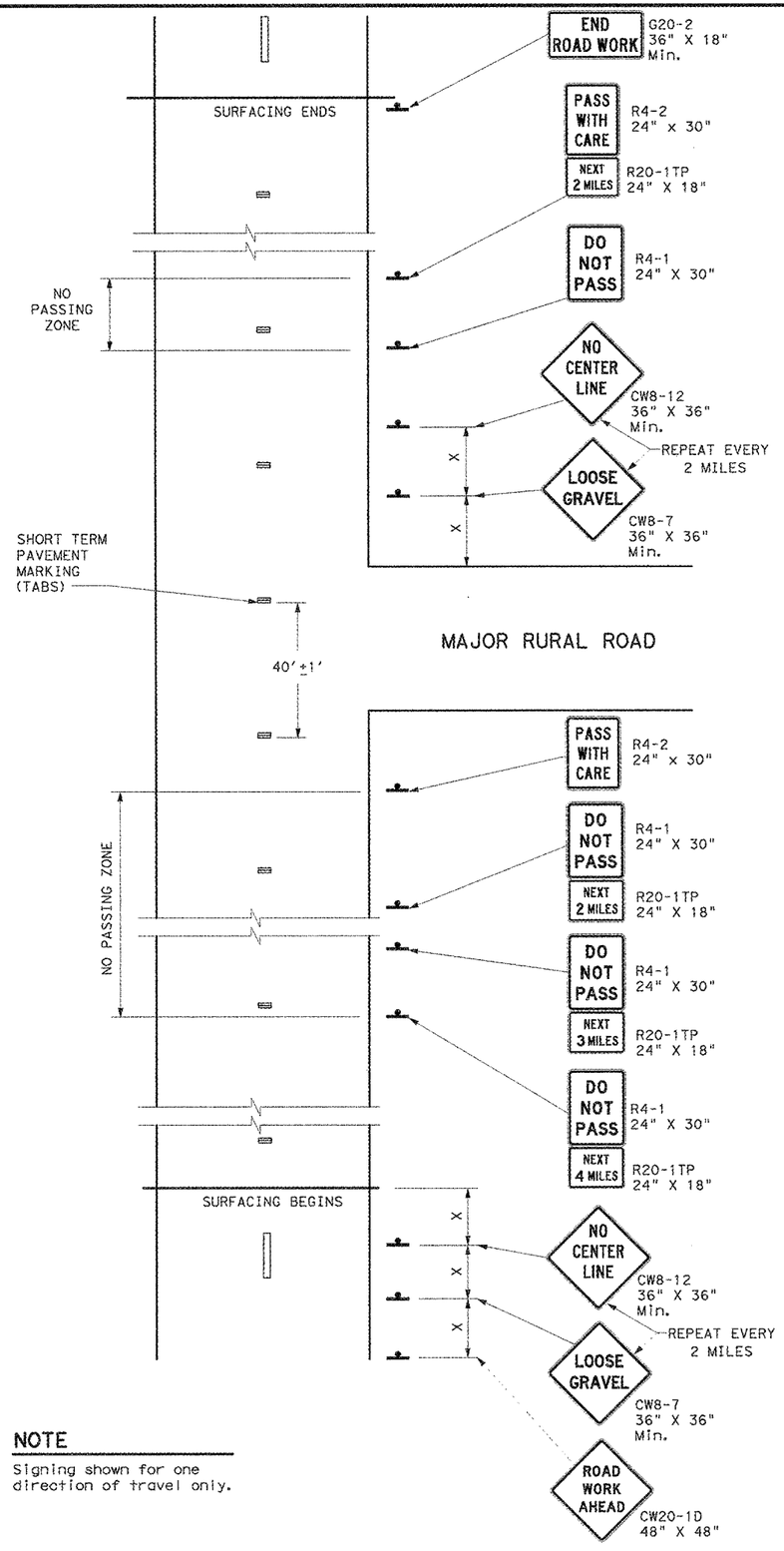
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DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
8-95 2-12	3148	01	006	FM 3097
1-97	DIST	COUNTY		SHEET NO.
4-98	DAL	ROCKWALL		70
3-03				

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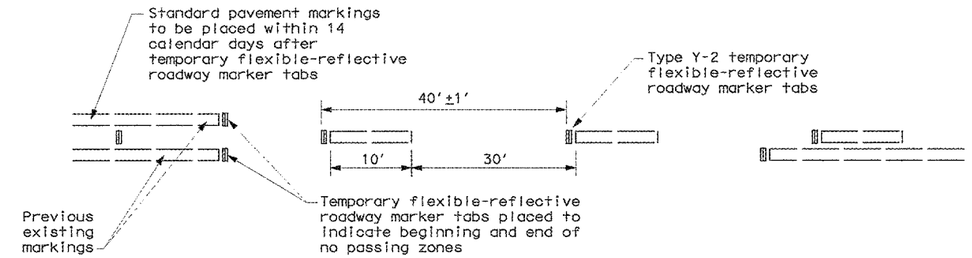
DATE:
FILE:



NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

"DO NOT PASS" SIGN (R4-1) and NO-PASSING ZONES

A. Prior to the beginning of construction, all currently striped no-passing zones shall be signed with the DO NOT PASS (R4-1) signs and PASS WITH CARE (R4-2) signs placed at the beginning and end of each zone for each direction of travel except as otherwise provided herein. Signs marking these individual no-passing zones need not be covered prior to construction if the signs supplement the existing pavement markings.

B. At the discretion of the Engineer, in areas of numerous no-passing zones, several zones may be combined as a single zone. If passing is to be prohibited over one or more lengthy sections, a DO NOT PASS sign and a NEXT XX MILES (R20-1TP) plaque may be used at the beginning of such zones. The DO NOT PASS sign and the NEXT XX MILES plaque should be repeated every mile to the end of the no-passing zone. In areas where there is considerable distance between no-passing zones, the end of the no-passing zone may be signed with a PASS WITH CARE sign and a NEXT XX MILES plaque.

C. Depending on traffic volumes and length of sections, it may be desirable to prohibit passing throughout the project to prevent damage to windshield and lights. The DO NOT PASS sign and NEXT XX MILES plaque should be used and repeated as often as necessary for this purpose. Where several existing zones are to be combined into one idividual no-passing zone, the sign at the beginning of the zone should be covered until the surfacing operation has passed this location so as not to have the DO NOT PASS sign conflict with the existing pavement markings. Also, unless one days operation completes the entire length of such combined zones, appropriate DO NOT PASS and PASS WITH CARE signs should be placed at the beginning and end of the no-passing zones where the surfacing operation has stopped for the day.

D. R4-1 and R4-2 are to remain in place until standard pavement markings are installed.

"NO CENTER LINE" SIGN (CW8-12)

A. Center line markings are yellow pavement markings that delineate the separation of travel lanes that have opposite directions of travel on a roadway. Divided highways do not typically have center line markings.

B. At the time construction activity obliterates the existing center line markings(low volume roads may not have an existing centerline), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately 2 mile intervals within the work area, beyond major intersections and other locations deemed necessary by the Engineer.

C. The NO CENTER LINE signs are to remain in place until standard pavement markings are installed.

"LOOSE GRAVEL" SIGN (CW8-7)

A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately 2 miles in rural areas and closer in urban areas.

B. The LOOSE GRAVEL signs are to remain in place until the condition no longer exists.

PAVEMENT MARKINGS

A. Temporary markings for surfacing projects shall be Temporary Flexible-reflective Roadway Marker Tabs unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement
no more than two (2) days before the surfacing is applied. After the surfacing is rolled and swept, the cover over the reflective strip shall be removed.

B. Tabs shall not be used to simulate edge lines.

C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

COORDINATION OF SIGN LOCATIONS

A. The location of warning signs at the beginning and end of a work area are to be coordinated with other signing typically shown on the Barricade and Construction Standards for project limits to ensure adequate sign spacing.

B. Where possible the ROAD WORK AHEAD (CW20-1D), LOOSE GRAVEL (CW8-7), and NO CENTER LINE (CW8-12) signs should be placed in the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) and the TRAFFIC FINES DOUBLE (R20-5T) sign, and one "X" sign spacing prior to the CONTRACTOR (G20-6T)sign typically located at or near the limits of surfacing. LOOSE GRAVEL and NO CENTER LINE signs will then be repeated as described above.

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

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

GENERAL NOTES

1. The traffic control devices detailed on this sheet will be furnished and erected as directed by the Engineer on sections of roadway where tabs must be placed prior to the surfacing operation which will cover or obliterate the existing pavement markings.
2. The devices shown on this sheet are to be used to supplement those required by the BC Standards or others required elsewhere in the plans.
3. Signs shall be erected as detailed on the BC Standards or the Compliant Work Zone Traffic Control Devices List (CWZTCD) on supports approved for Long-Term / Intermediate-Term Work Zone Sign Supports.
4. When surfacing operations take place on divided highways, freeways or expressways, the size of diamond shaped construction warning signs shall be 48" x 48".
5. Signs on divided highways, freeways and expressways will be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.

Texas Department of Transportation

Traffic Operations Division Standard

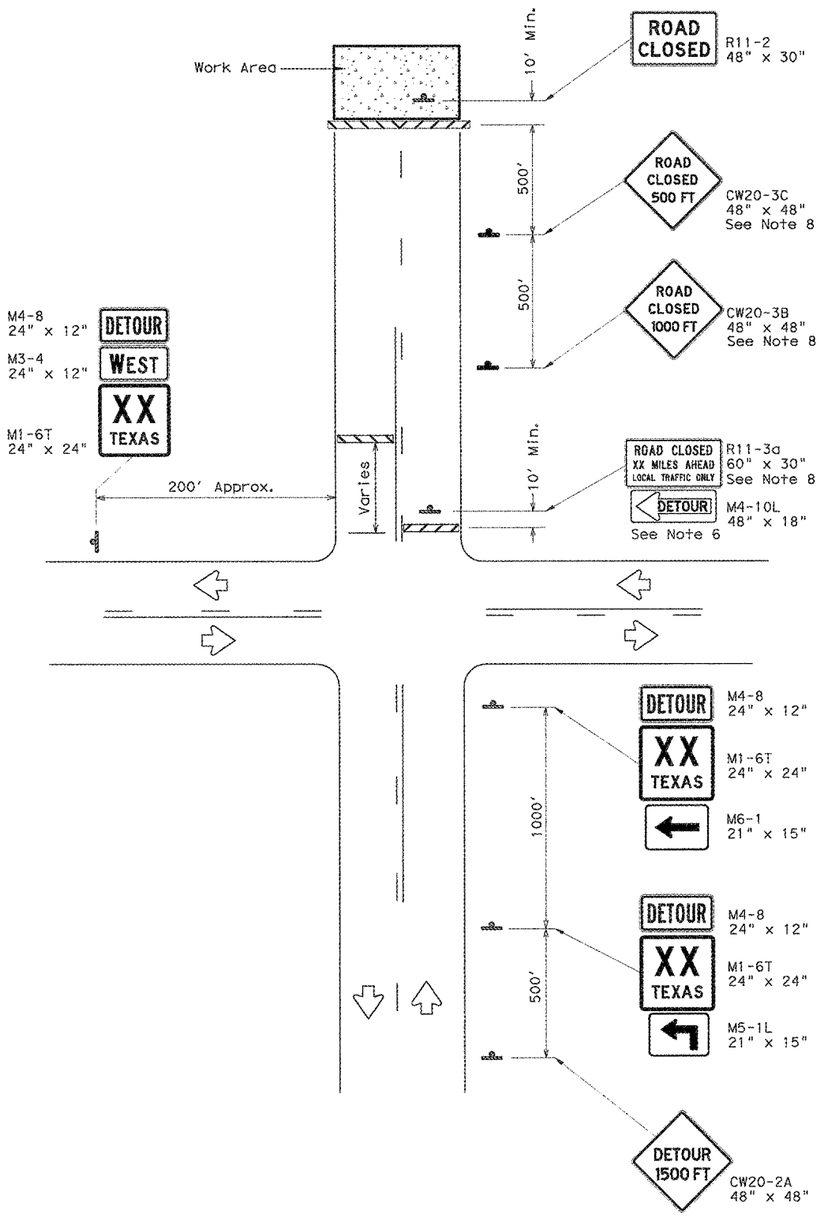
TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

FILE: tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	DAL	ROCKWALL		71

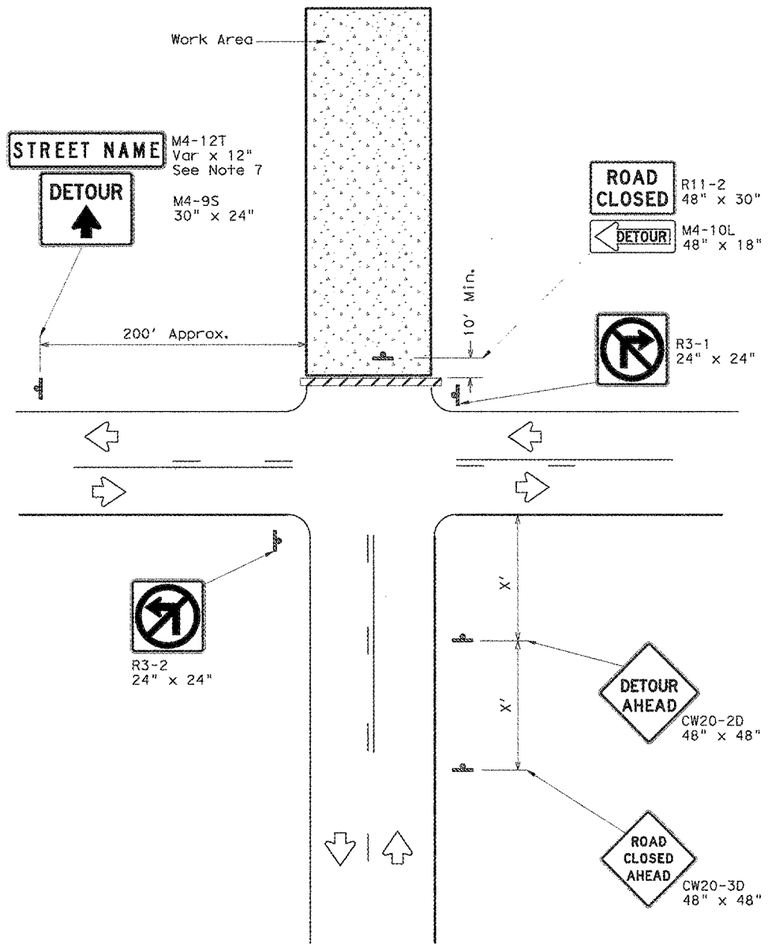
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



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

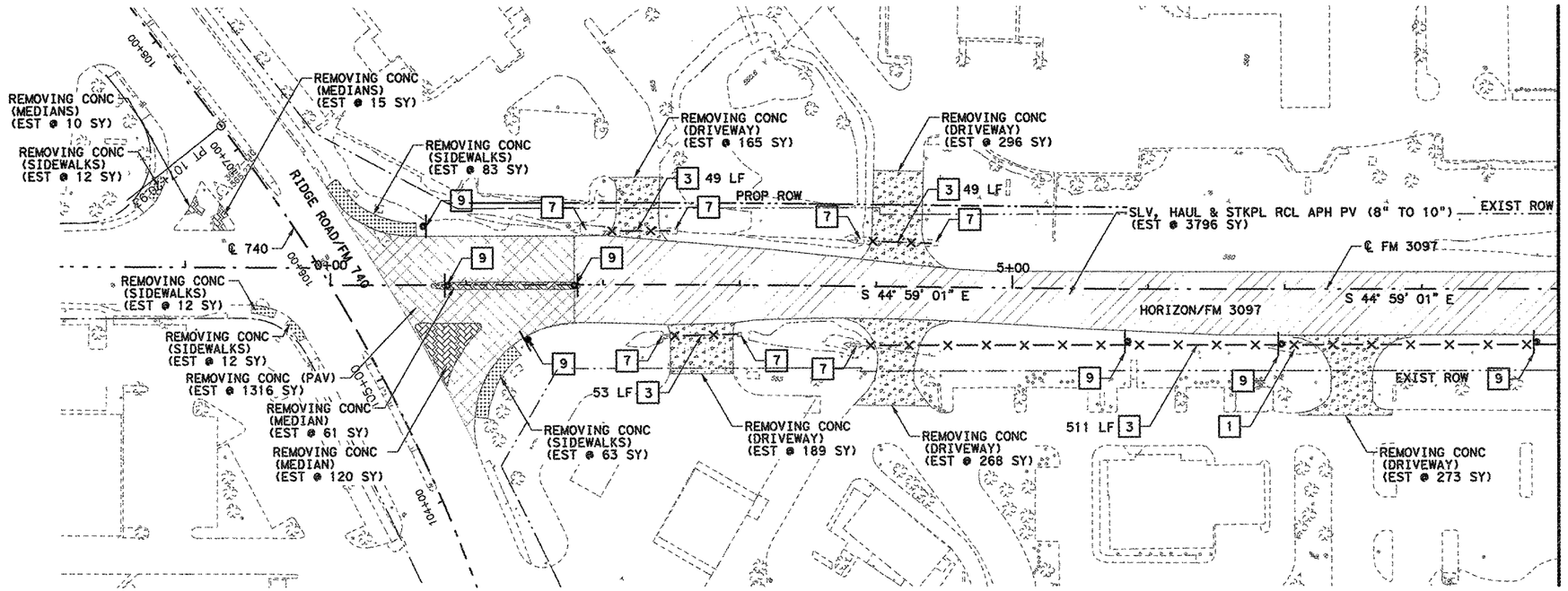
Traffic Operations Division Standard

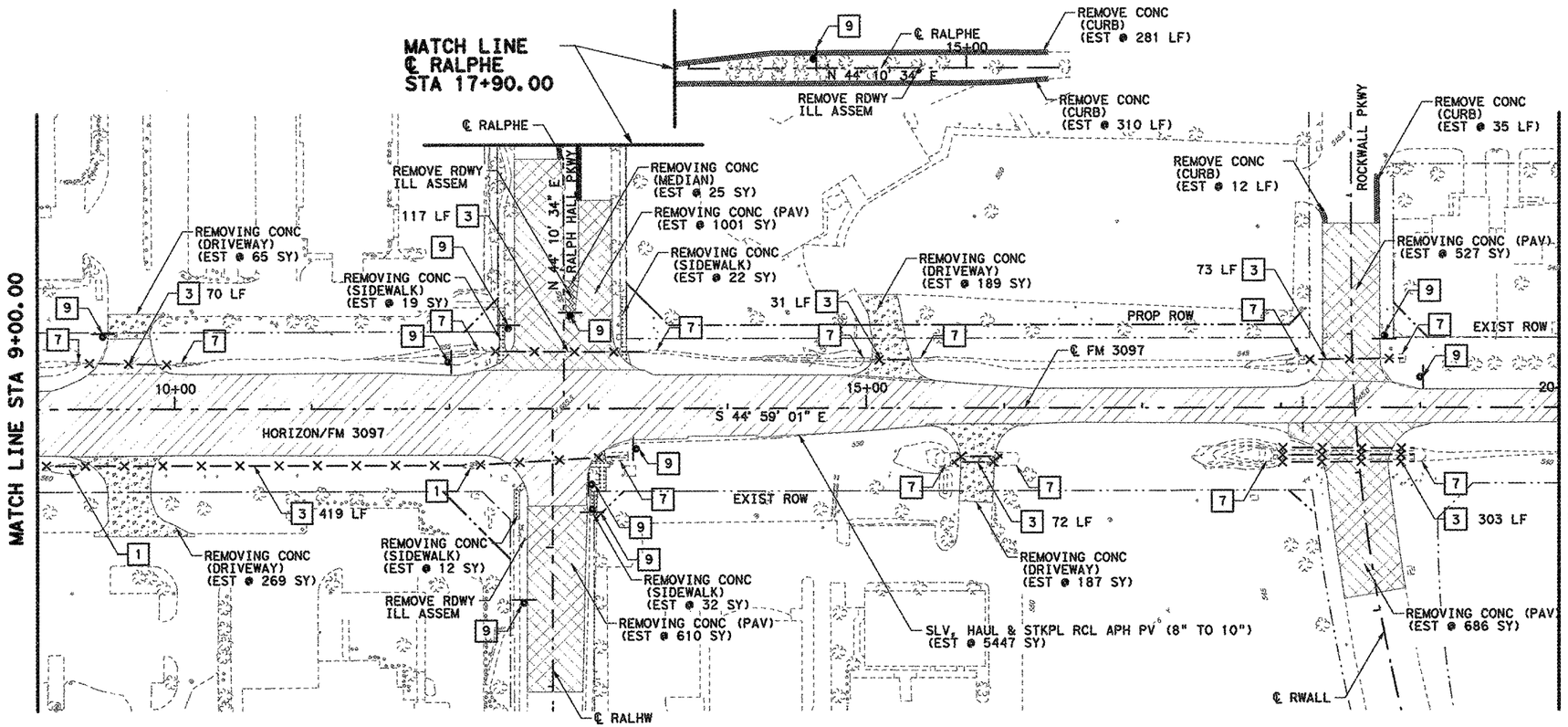
WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
1-97 4-98 7-13	DIST	COUNTY		SHEET NO.
2-98 3-03	DAL	ROCKWALL		72

113







LEGEND

- SLV, HAUL & STKPL RCL APH PV (8 TO 10")
- REMOVING CONC (PAV)
- REMOVING CONC (MEDIANS)
- REMOVING CONC (SIDEWALKS)
- REMOVING CONC (DRIVEWAYS)
- REMOVING CONC (PAVERS)
- PLANE ASPH CONC PAV (2") SY
- 1 REMOV STR (INLET)
- 2 REMOV STR (MANHOLE)
- 3 REMOV STR (PIPE)
- 4 REMOV STR (BOX CULVERT)
- 5 REMOV STR (WINGWALL)
- 6 REMOV STR (HEADWALL)
- 7 REMOV STR (SET)
- 8 REMOVING CONC (RIP RAP)
- *9 REMOVE SM RD SN SUP & AM
- PIPE TO BE REMOVED
- REMOVE CONC (CURB)

*FOR CONTRACTORS INFO ONLY

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

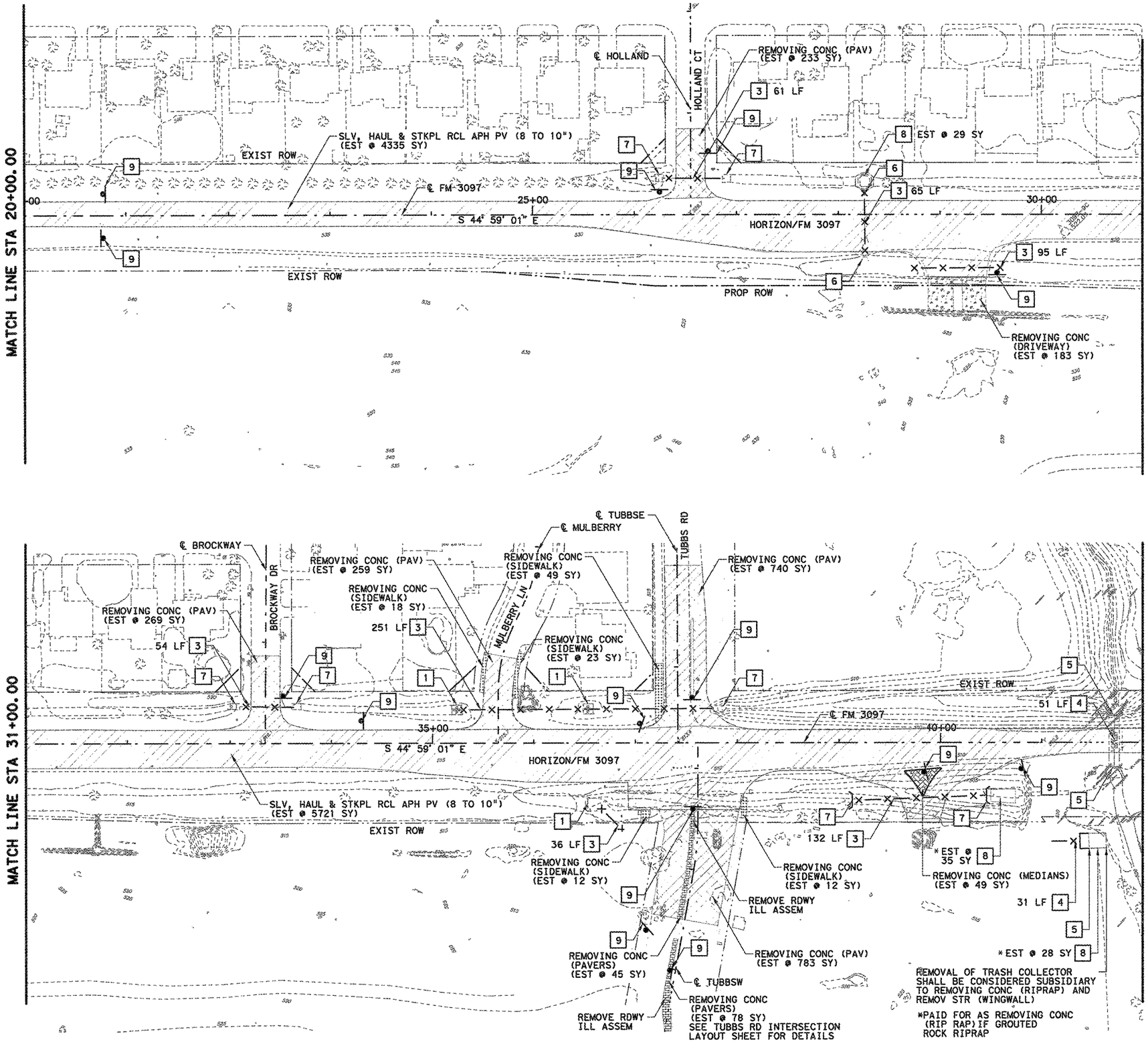
ROADWAY REMOVAL PLAN
FM 3097
STA. 0+00.00 TO STA. 20+00.00

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	73

SHEET 1 OF 3

5/1/2014 6:40:30 PM jroberts pw:Active Projects:TXNG12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDr101.dgn

5/4/2014 7:05:40 PM jroberts Dwt:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404ROr102.dgn



N

50 25 0 50 100
SCALE FEET

LEGEND

- SLV, HAUL & STKPL RCL APH PV (8 TO 10")
- REMOVING CONC (PAV)
- REMOVING CONC (MEDIANS)
- REMOVING CONC (SIDEWALKS)
- REMOVING CONC (DRIVEWAYS)
- REMOVING CONC (PAVERS)
- PLANE ASPH CONC PAV (2") SY
- 1 REMOV STR (INLET)
- 2 REMOV STR (MANHOLE)
- 3 REMOV STR (PIPE)
- 4 REMOV STR (BOX CULVERT)
- 5 REMOV STR (WINGWALL)
- 6 REMOV STR (HEADWALL)
- 7 REMOV STR (SET)
- 8 REMOVING CONC (RIP RAP)
- * 9 REMOVE SM RD SN SUP & AM
- -X—X—X—X—X- PIPE TO BE REMOVED
- REMOVE CONC (CURB)

*FOR CONTRACTORS INFO ONLY

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/05/14

NO.	REVISION	BY	DATE

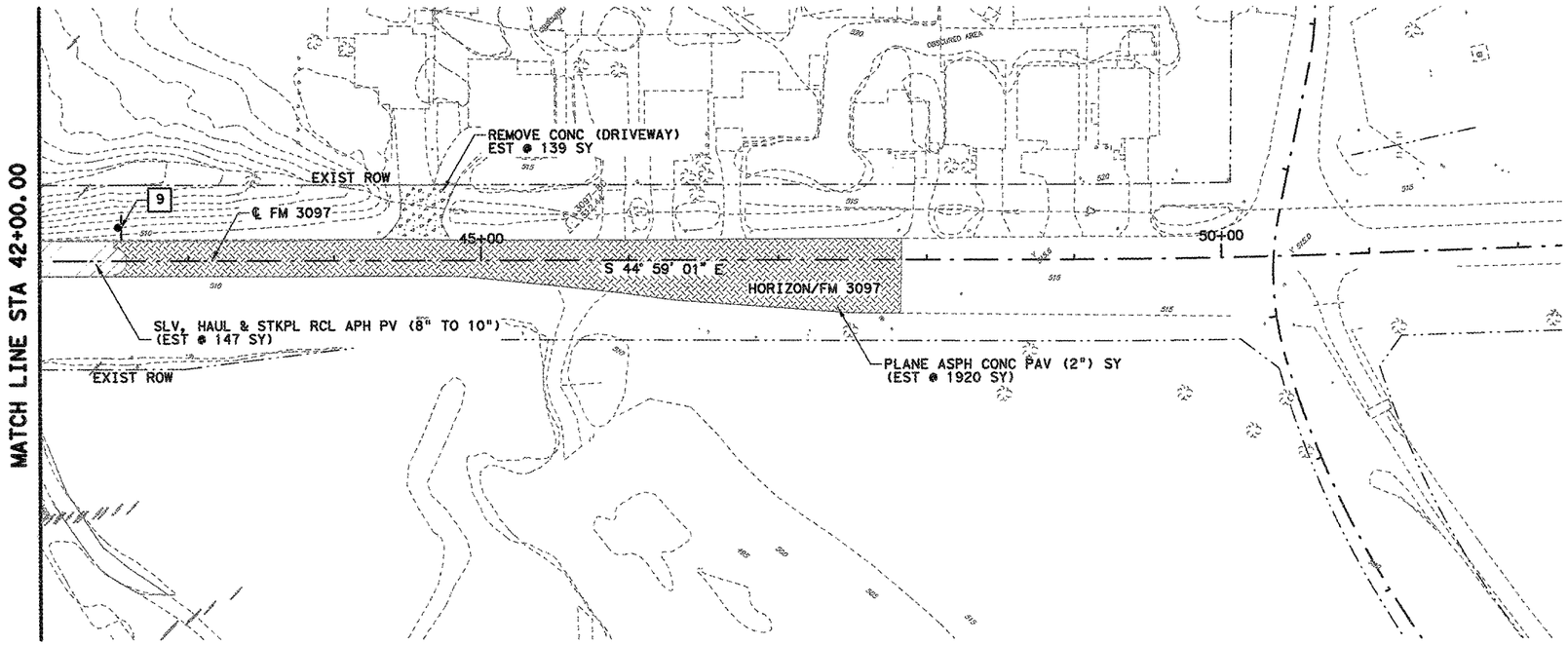
CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

ROADWAY REMOVAL PLAN
FM 3097
STA. 20+00.00 TO STA. 42+00.00

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	74

SHEET 2 OF 3



SIGN REMOVAL CHART		
SIGN TEXT	STATION	OFFSET
FARM ROAD 740	0+68.54	43.06'LT
DIVIDED HIGHWAY (SYMBOL)	0+86.28	0.37'RT
YIELD	1+45.17	40.28'RT
DIVIDED HIGHWAY (SYMBOL)	1+79.10	0.37'RT
FARM ROAD 3097	5+85.32	38.43'RT
LANE CONTROL (SYMBOL)	6+97.48	40.30'RT
SPEED LIMIT 35	8+83.76	38.91'RT
STOP	9+47.31	52.37'LT
FARM ROAD 740	11+99.04	33.76'LT
LANE CONTROL (SYMBOL)	12+42.49	58.10'LT
SPEED LIMIT 30	12+53.75	139.88'RT
LANE CONTROL (SYMBOL)	12+75.04	285.51'LT
LANE CONTROL (SYMBOL)	12+86.79	67.20'LT
HORIZON RD/RALPH HALL PKWY	13+02.06	54.55'RT
LANE CONTROL (SYMBOL)	13+02.56	72.51'RT
ADOPT A HIGHWAY	13+34.09	29.00'RT
SPEED LIMIT 30	18+74.05	51.84'LT
FARM ROAD 3097	18+99.84	22.18'LT

SIGN REMOVAL CHART (CONTINUED)		
SIGN TEXT	STATION	OFFSET
SPEED LIMIT 45	20+77.86	22.03'RT
SPEED LIMIT 35	20+77.87	21.39'LT
STOP	26+24.82	22.53'LT
SPEED LIMIT 30	26+72.32	62.51'LT
STOP	29+56.28	57.27'RT
SPEED LIMIT 30	33+52.30	46.79'LT
NO LITTER SIGN	34+29.61	22.33'LT
ROCKWALL CITY LIMIT	37+04.33	19.16'LT
SPEED LIMIT 30	37+10.22	184.20'RT
ONE WAY (RIGHT)	37+33.68	223.72'RT
DIVIDED HIGHWAY (SYMBOL)	37+55.77	44.68'LT
DIVIDED HIGHWAY (SYMBOL)	37+56.42	65.01'RT
DO NOT ENTER	39+83.77	29.05'RT
DO NOT ENTER	40+79.49	25.72'RT
TEE INTERSECTION SIGN	42+53.08	22.62'LT

N

50 25 0 50 100
SCALE FEET

LEGEND

- SLV, HAUL & STKPL RCL APH PV (8 TO 10")
- REMOVING CONC (PAV)
- REMOVING CONC (MEDIANS)
- REMOVING CONC (SIDEWALKS)
- REMOVING CONC (DRIVEWAYS)
- REMOVING CONC (PAVERS)
- PLANE ASPH CONC PAV (2") SY
- [1] REMOV STR (INLET)
- [2] REMOV STR (MANHOLE)
- [3] REMOV STR (PIPE)
- [4] REMOV STR (BOX CULVERT)
- [5] REMOV STR (WINGWALL)
- [6] REMOV STR (HEADWALL)
- [7] REMOV STR (SET)
- [8] REMOVING CONC (RIP RAP)
- *[9] REMOVE SM RD SN SUP & AM
- -X—X—X—X—X PIPE TO BE REMOVED
- REMOVE CONC (CURB)

*FOR CONTRACTORS INFO ONLY

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

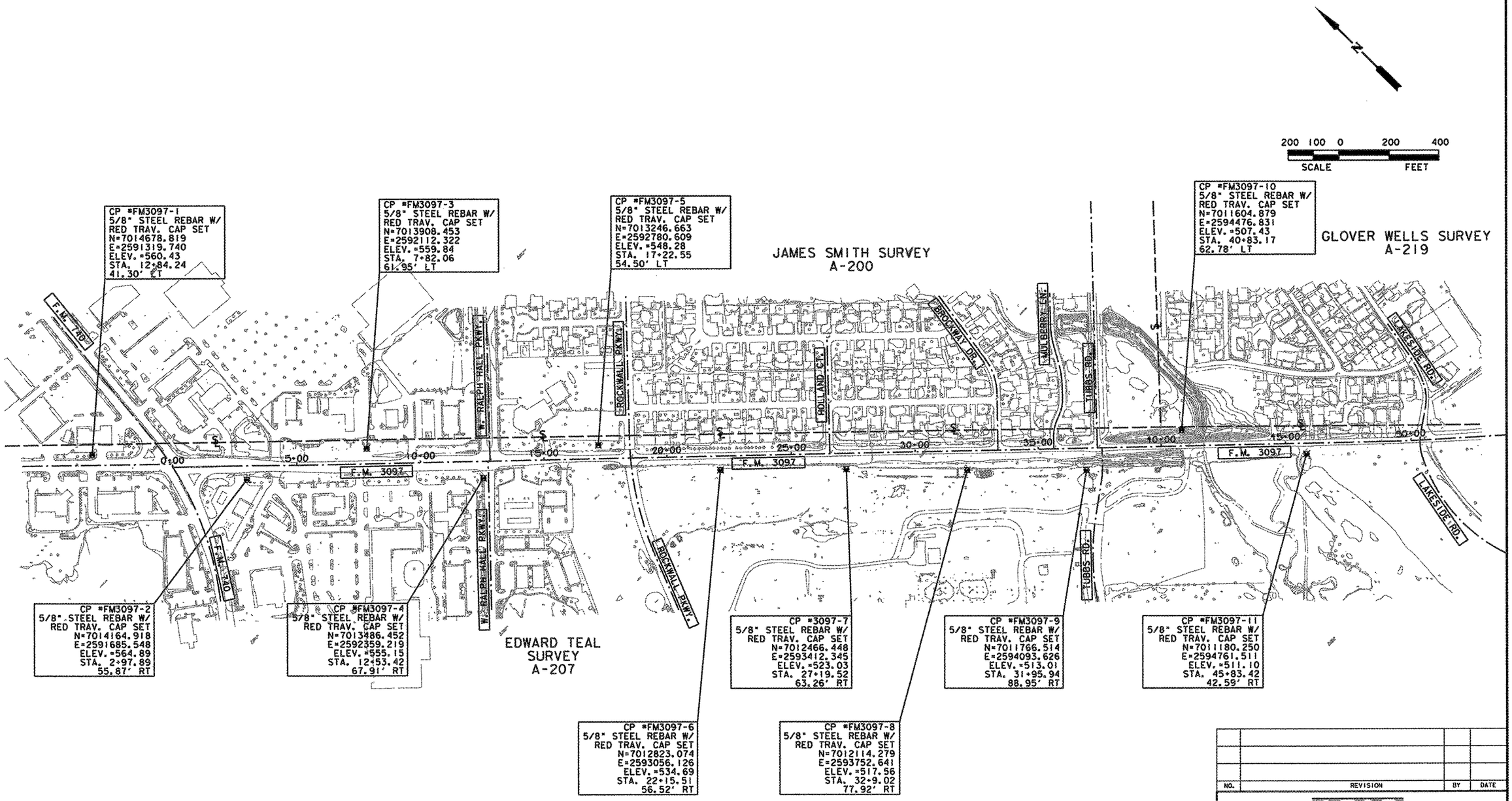
Texas Department of Transportation

ROADWAY REMOVAL PLAN
FM 3097
STA 42+00.00 TO STA 47+83.00

Designed: IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn: IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: RRH	DAL	ROCKWALL	3148	01	006		75

SHEET 3 OF 3

5/1/2014 6:42:23 PM iroberts pw:\Active Projects\TXNR12004.04\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.04 Roadway\120404RDr103.dgn



I, THE UNDERSIGNED, A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THE COORDINATES AND ELEVATIONS SHOWN HEREON WERE DERIVED FROM A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JOSEPH S. BENITEZ
5934
PROFESSIONAL
LAND SURVEYOR

JOSEPH S. BENITEZ
REGISTERED PROFESSIONAL LAND SURVEYOR NO. 5934

04-30-2014

NOTE: ALL COORDINATES SHOWN ARE SURFACE ADJUSTED. TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE 4202, NORTH AMERICAN DATUM 1983 (NAD83), USING GEOIDIZA MODEL, WITH A COMBINED SCALE FACTOR OF 1.000146135 (ROCKWALL COUNTY). ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) BY DIFFERENTIAL LEVELING FROM EXISTING PROJECT CONTROL POINTS C103097 & C113097.

NO.	REVISION	BY	DATE

AZ&B
ARREDONDO, ZEPEDA & BRUNZ, LLC

Texas Department of Transportation

SURVEY CONTROL SHEET

Designed	RME	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked	JSB	6	TEXAS	STP 2013(597)MM			FM 3097
Drawn	RME	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	JSB	DAL	ROCKWALL	3148	01	006	76

SHEET 1 OF 1

S:\TxDot\NR\2012\2130O2.004\CPY\FM3097-Rockwall\Dgn\Control-Sheets\Control*INDEX*400-R2.dgn 4/30/2014

HORIZONTAL ALIGNMENT FOR ℄ FM 3097

Chain CL3097 contains:
1032 CUR CL3097-1 CUR CL3097-2 CUR CL3097-3 CUR CL3097-4 CUR CL3097-5 CUR CL30-97-6 1033

Beginning chain CL3097 description

Point 1032 N 7,014,412.8143 E 2,591,511.8582 Sta 0+00.00

Course from 1032 to PC CL3097-1 S 45° 44' 00.54" E Dist 200.0000

Curve Data					
Curve CL3097-1					
P.I. Station	2+75.00	N	7,014,220.8644	E	2,591,708.7867
Delta =	0° 45' 00.00"	(RT)			
Degree =	0° 30' 00.00"				
Tangent =	75.0011				
Length =	150.0000				
Radius =	11,459.1559				
External =	0.2454				
Long Chord =	149.9989				
Mid. Ord. =	0.2454				
P.C. Station	2+00.00	N	7,014,273.2149	E	2,591,655.0784
P.T. Station	3+50.00	N	7,014,167.8153	E	2,591,761.8052
C.C.		N	7,006,067.3045	E	2,583,656.6230
Back = S 45° 44' 00.54" E					
Ahead = S 44° 59' 00.54" E					
Chord Bear = S 45° 21' 30.54" E					

Course from PT CL3097-1 to PC CL3097-2 S 44° 59' 00.54" E Dist 155.5841

Curve Data					
Curve CL3097-2					
P.I. Station	5+80.59	N	7,014,004.7200	E	2,591,924.8065
Delta =	0° 45' 00.00"	(LT)			
Degree =	0° 30' 00.00"				
Tangent =	75.0011				
Length =	150.0000				
Radius =	11,459.1559				
External =	0.2454				
Long Chord =	149.9989				
Mid. Ord. =	0.2454				
P.C. Station	5+05.58	N	7,014,057.7691	E	2,591,871.7880
P.T. Station	6+55.58	N	7,013,952.3695	E	2,591,978.5148
C.C.		N	7,022,158.2799	E	2,599,976.9702
Back = S 44° 59' 00.54" E					
Ahead = S 45° 44' 00.54" E					
Chord Bear = S 45° 21' 30.54" E					

Course from PT CL3097-2 to PC CL3097-3 S 45° 44' 00.54" E Dist 4,226.0658

Curve Data					
Curve CL3097-3					
P.I. Station	49+90.00	N	7,010,926.9633	E	2,595,082.3906
Delta =	2° 10' 00.00"	(LT)			
Degree =	1° 00' 00.00"				
Tangent =	108.3462				
Length =	216.6667				
Radius =	5,729.5780				
External =	1.0243				
Long Chord =	216.6538				
Mid. Ord. =	1.0241				
P.C. Station	48+81.65	N	7,011,002.5886	E	2,595,004.8038
P.T. Station	50+98.32	N	7,010,854.3253	E	2,595,162.7811
C.C.		N	7,015,105.5438	E	2,599,004.0315
Back = S 45° 44' 00.54" E					
Ahead = S 47° 54' 00.54" E					
Chord Bear = S 46° 49' 00.54" E					

Course from PT CL3097-3 to PC CL3097-4 S 47° 54' 00.54" E Dist 835.3341

Curve Data					
Curve CL3097-4					
P.I. Station	60+50.33	N	7,010,216.0697	E	2,595,869.1563
Delta =	2° 20' 00.00"	(RT)			
Degree =	1° 00' 00.00"				
Tangent =	116.6828				
Length =	233.3333				
Radius =	5,729.5780				
External =	1.1880				
Long Chord =	233.3172				
Mid. Ord. =	1.1878				
P.C. Station	59+33.65	N	7,010,294.2967	E	2,595,782.5803
P.T. Station	61+66.98	N	7,010,134.3828	E	2,595,952.4757
C.C.		N	7,006,043.0782	E	2,591,941.3299
Back = S 47° 54' 00.54" E					
Ahead = S 45° 34' 00.54" E					
Chord Bear = S 46° 44' 00.54" E					

Course from PT CL3097-4 to PC CL3097-5 S 45° 34' 00.54" E Dist 5,325.2636

CONT. HORIZONTAL ALIGNMENT FOR ℄ FM 3097

Curve Data					
Curve CL3097-5					
P.I. Station	116+82.26	N	7,006,273.2613	E	2,599,890.7578
Delta =	1° 54' 00.00"	(RT)			
Degree =	0° 30' 00.00"				
Tangent =	190.0174				
Length =	380.0000				
Radius =	11,459.1559				
External =	1.5753				
Long Chord =	379.9826				
Mid. Ord. =	1.5751				
P.C. Station	114+92.25	N	7,006,406.2882	E	2,599,755.0725
P.T. Station	118+72.25	N	7,006,135.8090	E	2,600,021.9579
C.C.		N	6,998,223.6790	E	2,591,732.7810
Back = S 45° 34' 00.54" E					
Ahead = S 43° 40' 00.54" E					
Chord Bear = S 44° 37' 00.54" E					

Course from PT CL3097-5 to PC CL3097-6 S 43° 40' 00.54" E Dist 182.8563

Curve Data					
Curve CL3097-6					
P.I. Station	122+45.12	N	7,005,866.0844	E	2,600,279.4136
Delta =	1° 54' 00.00"	(LT)			
Degree =	0° 30' 00.00"				
Tangent =	190.0174				
Length =	380.0000				
Radius =	11,459.1559				
External =	1.5753				
Long Chord =	379.9826				
Mid. Ord. =	1.5751				
P.C. Station	120+55.10	N	7,006,003.5368	E	2,600,148.2135
P.T. Station	124+35.10	N	7,005,733.0576	E	2,600,415.0988
C.C.		N	7,013,915.6667	E	2,608,437.3904
Back = S 43° 40' 00.54" E					
Ahead = S 45° 34' 00.54" E					
Chord Bear = S 44° 37' 00.54" E					

Course from PT CL3097-6 to 1033 S 45° 34' 00.54" E Dist 1,124.1124

Point 1033 N 7,004,946.0923 E 2,601,217.7908 Sta 135+59.22

HORIZONTAL ALIGNMENT FOR ℄ HORIZON

Chain XHORIZON contains:
XHORIZON01 XHORIZON02

Beginning chain XHORIZON description

Point XHORIZON01 N 7,014,849.4342 E 2,591,088.6825 Sta 10+00.00

Course from XHORIZON01 to XHORIZON02 S 45° 17' 24.54" E Dist 600.0000

Point XHORIZON02 N 7,014,427.3241 E 2,591,515.0896 Sta 16+00.00

HORIZONTAL ALIGNMENT FOR ℄ FM 740

Chain CL740 contains:
CL74001 CUR CL74001 CL74003

Beginning chain CL740 description

Point CL74001 N 7,013,896.6601 E 2,591,261.4895 Sta 100+00.00

Course from CL74001 to PC CL74001 N 37° 38' 40.00" E Dist 28.4639

Curve Data					
Curve CL74001					
P.I. Station	103+83.49	N	7,014,200.3161	E	2,591,495.7116
Delta =	31° 09' 40.01"	(LT)			
Degree =	4° 30' 00.00"				
Tangent =	355.0292				
Length =	692.4692				
Radius =	1,273.2395				
External =	48.5716				
Long Chord =	683.9663				
Mid. Ord. =	46.7868				
P.C. Station	100+28.46	N	7,013,919.1983	E	2,591,278.8741
P.T. Station	107+20.93	N	7,014,553.0747	E	2,591,535.7994
C.C.		N	7,014,696.8415	E	2,590,270.7025
Back = N 37° 38' 40.00" E					
Ahead = N 6° 28' 59.99" E					
Chord Bear = N 22° 03' 49.99" E					

Course from PT CL74001 to CL74003 N 6° 28' 59.99" E Dist 631.5794

Point CL74003 N 7,015,180.6150 E 2,591,607.1136 Sta 113+52.51

HORIZONTAL ALIGNMENT FOR ℄ RALPH HALL PKWY EAST

Chain XRALPHE contains:
20 21

Beginning chain XRALPHE description

Point 20 N 7,013,514.9651 E 2,592,427.2641 Sta 16+00.00

Course from 20 to 21 N 44° 10' 34.22" E Dist 600.0000

Point 21 N 7,013,945.2854 E 2,592,845.3842 Sta 22+00.00

HORIZONTAL ALIGNMENT FOR ℄ RALPH HALL PKWY WEST

Chain XRALPHW contains:
10 11

Beginning chain XRALPHW description

Point 10 N 7,013,090.9341 E 2,592,002.6905 Sta 10+00.00

Course from 10 to 11 N 44° 16' 01.89" E Dist 600.0000

Point 11 N 7,013,520.5896 E 2,592,421.4937 Sta 16+00.00

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097
HORIZONTAL ALIGNMENT

Designed:	JBR	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KLP	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	77

SHEET 1 OF 2

5/1/2014 7:08:13 PM jroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404R0he01.dgn

HORIZONTAL ALIGNMENT FOR ℄ ROCKWALL PKWY

Chain XRWALL contains:
XCLRWALL01 CUR XCLRWALL01 XCLRWALL03

Beginning chain XRWALL description

Point XCLRWALL01 N 7,012,548.3307 E 2,592,534.7357 Sta 10+00.00

Course from XCLRWALL01 to PC XCLRWALL01 N 22° 12' 43.57" E Dist 245.1025

Curve Data					
Curve XCLRWALL01					
P.I. Station	14+87.29	N	7,012,999.4638	E	2,592,718.9509
Delta =	21° 55' 50.96"	(RT)			
Degree =	4° 35' 01.18"				
Tangent =	242.1924				
Length =	478.4563				
Radius =	1,250.0000				
External =	23.2467				
Long Chord =	475.5409				
Mid. Ord. =	22.8223				
P.C. Station	12+45.10	N	7,012,775.2443	E	2,592,627.3934
P.T. Station	17+23.56	N	7,013,173.2622	E	2,592,887.6259
C.C.		N	7,012,302.6989	E	2,593,784.6318
Back = N	22° 12' 43.57" E				
Ahead = N	44° 08' 34.53" E				
Chord Bear = N	33° 10' 39.05" E				

Course from PT XCLRWALL01 to XCLRWALL03 N 44° 08' 34.53" E Dist 576.4411

Point XCLRWALL03 N 7,013,586.9190 E 2,593,289.0887 Sta 23+00.00

HORIZONTAL ALIGNMENT FOR ℄ HOLLAND

Chain XHOLLAND contains:
XHOLLAND01 XHOLLAND02

Beginning chain XHOLLAND description

Point XHOLLAND01 N 7,012,556.4884 E 2,593,410.6007 Sta 0+00.00

Course from XHOLLAND01 to XHOLLAND02 N 44° 15' 17.79" E Dist 470.9126

Point XHOLLAND02 N 7,012,893.7757 E 2,593,739.2281 Sta 4+70.91

HORIZONTAL ALIGNMENT FOR ℄ BROCKWAY

Chain XBROCK contains:
XBROCK01 CUR XBROCK-1 XBROCK02

Beginning chain XBROCK description

Point XBROCK01 N 7,012,082.4136 E 2,593,896.9715 Sta 0+00.00

Course from XBROCK01 to PC XBROCK-1 N 44° 40' 02.43" E Dist 225.7789

Curve Data					
Curve XBROCK-1					
P.I. Station	3+05.91	N	7,012,299.9742	E	2,594,112.0203
Delta =	35° 32' 32.15"	(LT)			
Degree =	22° 55' 05.92"				
Tangent =	80.1273				
Length =	155.0824				
Radius =	250.0000				
External =	12.5269				
Long Chord =	152.6078				
Mid. Ord. =	11.9292				
P.C. Station	2+25.78	N	7,012,242.9876	E	2,594,055.6916
P.T. Station	3+80.86	N	7,012,379.0874	E	2,594,124.7277
C.C.		N	7,012,418.7350	E	2,593,877.8915
Back = N	44° 40' 02.43" E				
Ahead = N	9° 07' 30.27" E				
Chord Bear = N	26° 53' 46.35" E				

Course from PT XBROCK-1 to XBROCK02 N 9° 07' 30.27" E Dist 313.7325

Point XBROCK02 N 7,012,688.8495 E 2,594,174.4826 Sta 6+94.59

HORIZONTAL ALIGNMENT FOR ℄ TUBBS EAST

Chain XTUBBSE contains:
50 51

Beginning chain XTUBBSE description

Point 50 N 7,011,798.1820 E 2,594,188.5752 Sta 16+25.14

Course from 50 to 51 N 44° 02' 17.22" E Dist 996.8378

Point 51 N 7,012,514.7863 E 2,594,881.5138 Sta 26+21.98

HORIZONTAL ALIGNMENT FOR ℄ MULBERRY

Chain XMULB contains:
XMULB01 CUR XMULB-1 CUR XMULB-2 CUR XMULB-3 CUR XMULB-4 XMULB02

Beginning chain XMULB description

Point XMULB01 N 7,011,921.6072 E 2,594,061.9438 Sta 0+00.00

Course from XMULB01 to PC XMULB-1 N 44° 15' 59.46" E Dist 49.9257

Curve Data					
Curve XMULB-1					
P.I. Station	0+83.37	N	7,011,981.3069	E	2,594,120.1342
Delta =	25° 08' 12.22"	(RT)			
Degree =	38° 11' 49.87"				
Tangent =	33.4420				
Length =	65.8078				
Radius =	150.0000				
External =	3.6827				
Long Chord =	65.2813				
Mid. Ord. =	3.5944				
P.C. Station	0+49.93	N	7,011,957.3590	E	2,594,096.7918
P.T. Station	1+15.73	N	7,011,993.0714	E	2,594,151.4386
C.C.		N	7,011,852.6595	E	2,594,204.2069
Back = N	44° 15' 59.46" E				
Ahead = N	69° 24' 11.68" E				
Chord Bear = N	56° 50' 05.57" E				

Course from PT XMULB-1 to PC XMULB-2 N 69° 24' 11.68" E Dist 27.8919

Curve Data					
Curve XMULB-2					
P.I. Station	1+78.27	N	7,012,015.0727	E	2,594,209.9821
Delta =	26° 00' 49.89"	(LT)			
Degree =	38° 11' 49.87"				
Tangent =	34.6493				
Length =	68.1041				
Radius =	150.0000				
External =	3.9499				
Long Chord =	67.5207				
Mid. Ord. =	3.8486				
P.C. Station	1+43.63	N	7,012,002.8834	E	2,594,177.5476
P.T. Station	2+11.73	N	7,012,040.2524	E	2,594,233.7846
C.C.		N	7,012,143.2954	E	2,594,124.7793
Back = N	69° 24' 11.68" E				
Ahead = N	43° 23' 21.79" E				
Chord Bear = N	56° 23' 46.74" E				

Course from PT XMULB-2 to PC XMULB-3 N 43° 23' 21.79" E Dist 51.1151

Curve Data					
Curve XMULB-3					
P.I. Station	3+15.27	N	7,012,115.4932	E	2,594,304.9098
Delta =	14° 55' 57.89"	(LT)			
Degree =	14° 19' 26.20"				
Tangent =	52.4222				
Length =	104.2502				
Radius =	400.0000				
External =	3.4205				
Long Chord =	103.9554				
Mid. Ord. =	3.3915				
P.C. Station	2+62.84	N	7,012,077.3979	E	2,594,268.8983
P.T. Station	3+67.09	N	7,012,161.5816	E	2,594,329.8887
C.C.		N	7,012,352.1791	E	2,593,978.2175
Back = N	43° 23' 21.79" E				
Ahead = N	28° 27' 23.90" E				
Chord Bear = N	35° 55' 22.85" E				

Course from PT XMULB-3 to PC XMULB-4 N 28° 27' 23.90" E Dist 58.5174

Curve Data					
Curve XMULB-4					
P.I. Station	4+67.10	N	7,012,249.5015	E	2,594,377.5391
Delta =	15° 44' 46.34"	(RT)			
Degree =	19° 05' 54.94"				
Tangent =	41.4849				
Length =	82.4469				
Radius =	300.0000				
External =	2.8547				
Long Chord =	82.1877				
Mid. Ord. =	2.8278				
P.C. Station	4+25.61	N	7,012,213.0289	E	2,594,357.7719
P.T. Station	5+08.06	N	7,012,279.2410	E	2,594,406.4625
C.C.		N	7,012,070.0808	E	2,594,621.5252
Back = N	28° 27' 23.90" E				
Ahead = N	44° 12' 10.25" E				
Chord Bear = N	36° 19' 47.08" E				

Course from PT XMULB-4 to XMULB02 N 44° 12' 10.25" E Dist 133.5749

Point XMULB02 N 7,012,374.9976 E 2,594,499.5910 Sta 6+41.63

HORIZONTAL ALIGNMENT FOR ℄ TUBBS WEST

Chain XTUBBSW contains:
456 CUR XTUBBSW-1 CUR XTUBBSW-2 457

Beginning chain XTUBBSW description

Point 456 N 7,011,362.3291 E 2,593,746.4683 Sta 10+00.00

Curve Data					
Curve XTUBBSW-1					
P.I. Station	11+78.16	N	7,011,509.3453	E	2,593,847.1028
Delta =	20° 12' 13.24"	(RT)			
Degree =	5° 43' 46.48"				
Tangent =	178.1602				
Length =	352.6207				
Radius =	1,000.0000				
External =	15.7466				
Long Chord =	350.7966				
Mid. Ord. =	15.5024				
P.C. Station	10+00.00	N	7,011,362.3291	E	2,593,746.4683
P.T. Station	13+52.62	N	7,011,612.5607	E	2,593,992.3187
C.C.		N	7,010,797.4751	E	2,594,571.6591
Back = N	34° 23' 31.76" E				
Ahead = N	54° 35' 45.00" E				
Chord Bear = N	44° 29' 38.38" E				

Course from PT XTUBBSW-1 to PC XTUBBSW-2 N 54° 35' 45.00" E Dist 142.9538

Curve Data					
Curve XTUBBSW-2					
P.I. Station	15+22.69	N	7,011,711.0888	E	2,594,130.9398
Delta =	10° 19' 45.54"	(LT)			
Degree =	19° 05' 54.94"				
Tangent =	27.1156				
Length =	54.0842				
Radius =	300.0000				
External =	1.2229				
Long Chord =	54.0110				
Mid. Ord. =	1.2180				
P.C. Station	14+95.57	N	7,011,695.3796	E	2,594,108.8383
P.T. Station	15+49.66	N	7,011,730.5063	E	2,594,149.8664
C.C.		N	7,011,939.9053	E	2,593,935.0361
Back = N	54° 35' 45.00" E				
Ahead = N	44° 15' 59.46" E				
Chord Bear = N	49° 25' 52.23" E				

Course from PT XTUBBSW-2 to 457 N 44° 15' 59.46" E Dist 75.4813

Point 457 N 7,011,784.5585 E 2,594,202.5521 Sta 16+25.14



05/02/14

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TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

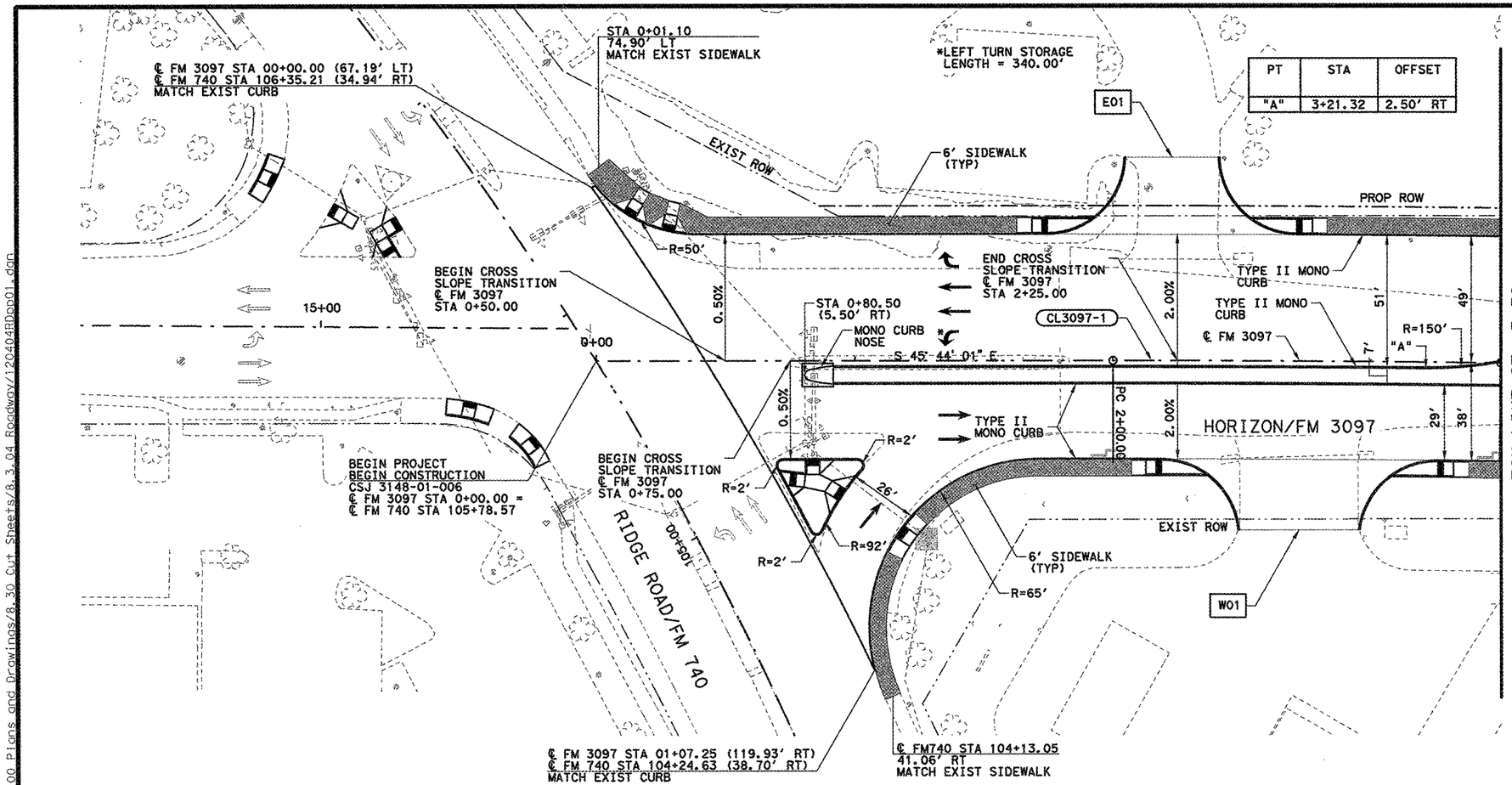
FM 3097

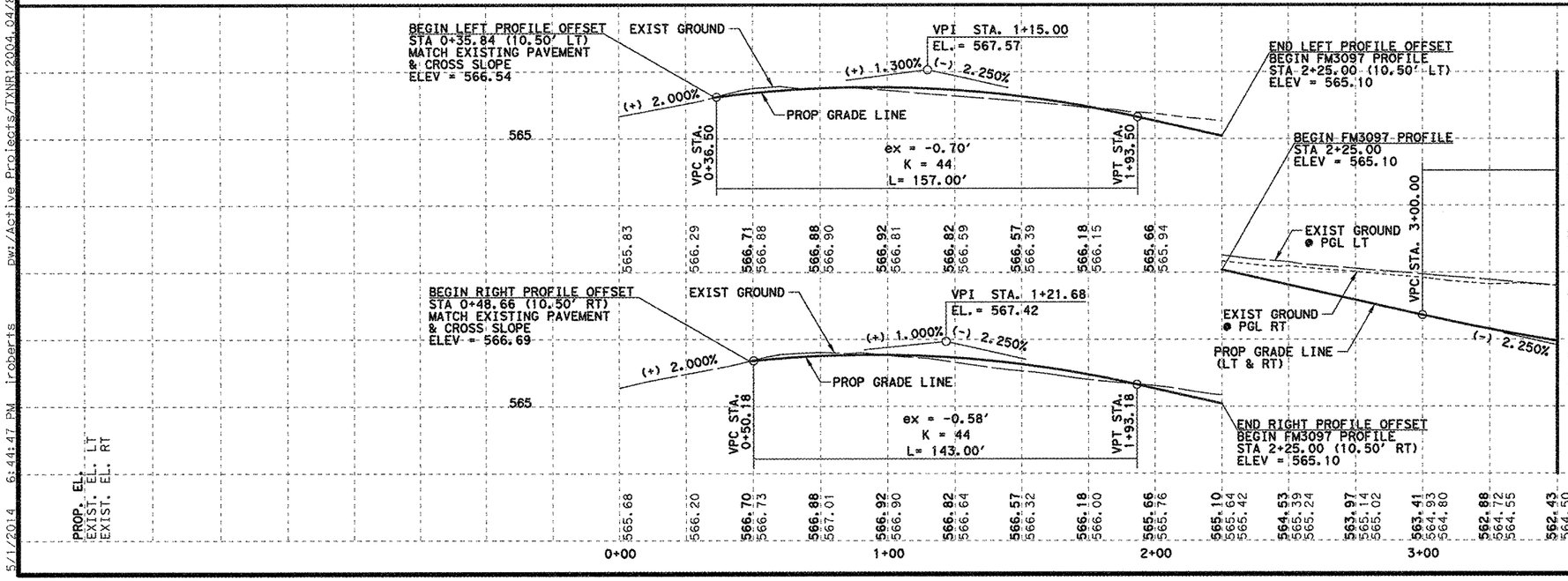
HORIZONTAL ALIGNMENT

Designed: JBR	FED. DIV. NO.: 6	STATE: TEXAS	FEDERAL AID PROJECT NO.: STP 2013 (597) MM	HIGHWAY NO.: FM 3097
Checked: KLP				
Drawn: JBR	DIST.: DAL	COUNTY: ROCKWALL	CONTROL NO.: 3148 / SECTION NO.: 01 / JOB NO.: 006	SHEET NO.: 78
Checked: RRH				

SHEET 2 OF 2

5/1/2014 7:08:53 PM jroberts p:\Active Projects\TXNR12004.04\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.04 Roadway\120404RDhe02.dgn





SHEET 1 OF 9



LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX — DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

NOTES:

1. ALL LINEAR DIMENSIONS ARE TO THE FACE OF CURB.
2. ALL RADII DIMENSIONS ARE TO THE BACK OF CURB.
3. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.
4. SEE LANDSCAPING PLANS FOR MEDIAN INFORMATION AND IRRIGATION INFORMATION PRIOR TO COMMENCING CONSTRUCTION.
5. SEE DRIVEWAY DETAILS SHEET FOR ADDITIONAL DRIVEWAY INFORMATION.
6. SEE INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
7. SEE WALL LAYOUTS FOR ADDITIONAL WALL INFORMATION.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

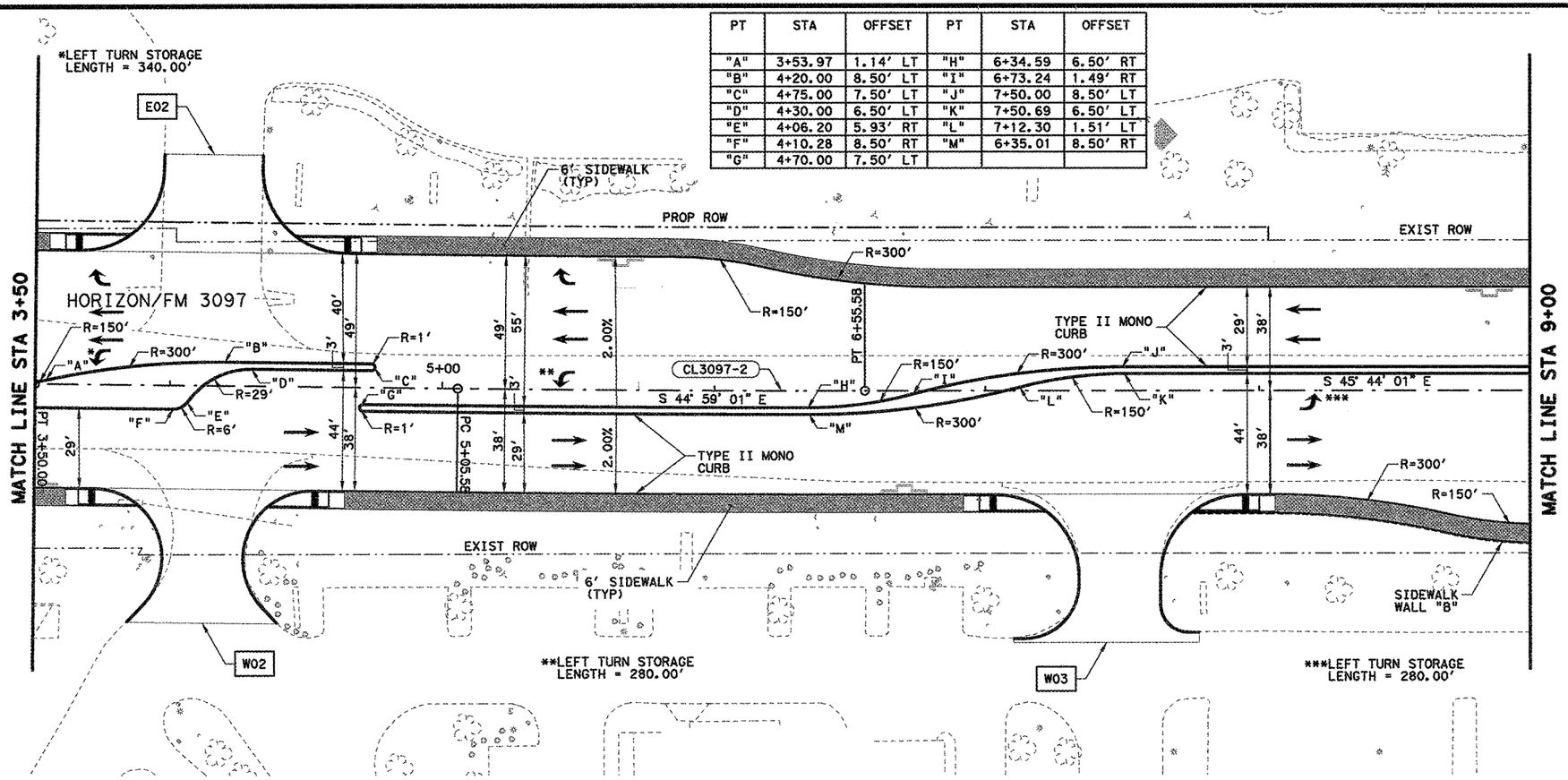
Texas Department of Transportation

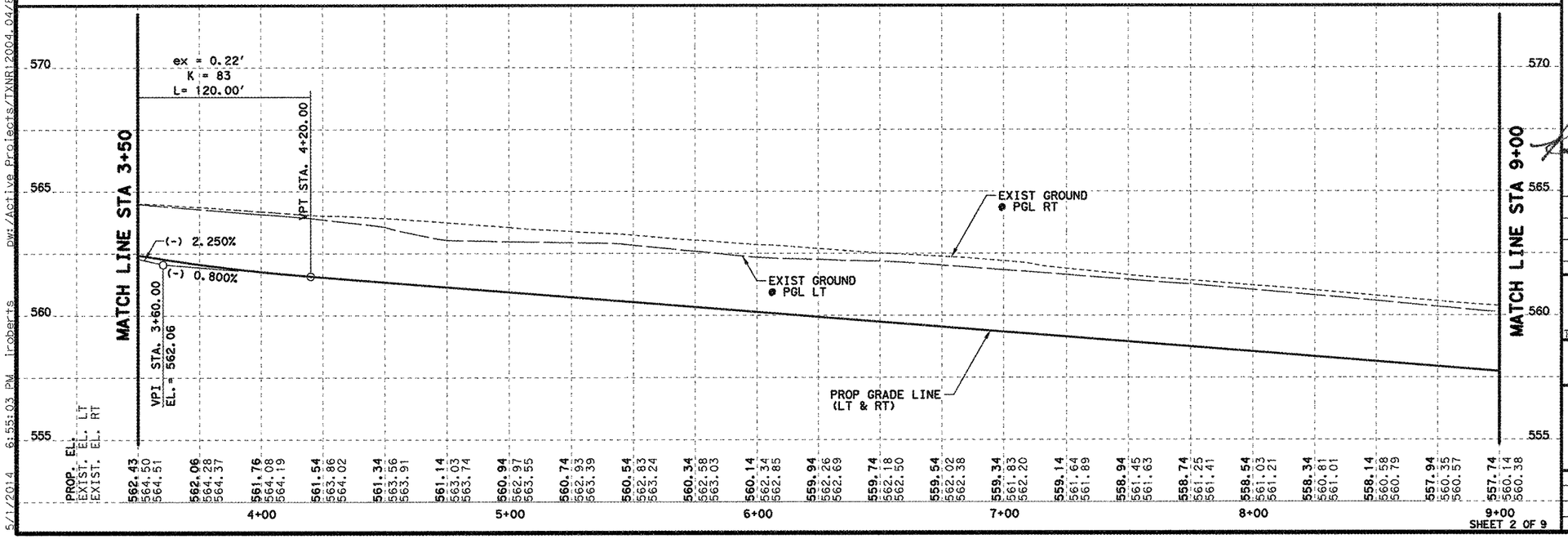
ROADWAY PLAN AND PROFILE
FM 3097
BEGIN PROJECT TO STA 3+50

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Designed:	IWM	6	TEXAS	STP 2013 (597) MM				FM 3097
Checked:	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Drawn:	IWM	DAL	ROCKWALL	3148	01	006		79
Checked:	RRH							

5/1/2014 6:44:47 PM iroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDp01.dgn

PT	STA	OFFSET	PT	STA	OFFSET
"A"	3+53.97	1.14' LT	"H"	6+34.59	6.50' RT
"B"	4+20.00	8.50' LT	"I"	6+73.24	1.49' RT
"C"	4+75.00	7.50' LT	"J"	7+50.00	8.50' LT
"D"	4+30.00	6.50' LT	"K"	7+50.69	6.50' LT
"E"	4+06.20	5.93' RT	"L"	7+12.30	1.51' LT
"F"	4+10.28	8.50' RT	"M"	6+35.01	8.50' RT
"G"	4+70.00	7.50' LT			





25 12.5 0 25 50
SCALE FEET
HORZ.

2.5 0 2.5 5
SCALE FEET
VERT.

LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX — DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

NOTES:

1. ALL LINEAR DIMENSIONS ARE TO THE FACE OF CURB.
2. ALL RADII DIMENSIONS ARE TO THE BACK OF CURB.
3. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.
4. SEE LANDSCAPING PLANS FOR MEDIAN INFORMATION AND IRRIGATION INFORMATION PRIOR TO COMMENCING CONSTRUCTION.
5. SEE DRIVEWAY DETAILS SHEET FOR ADDITIONAL DRIVEWAY INFORMATION.
6. SEE INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
7. SEE WALL LAYOUTS FOR ADDITIONAL WALL INFORMATION.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

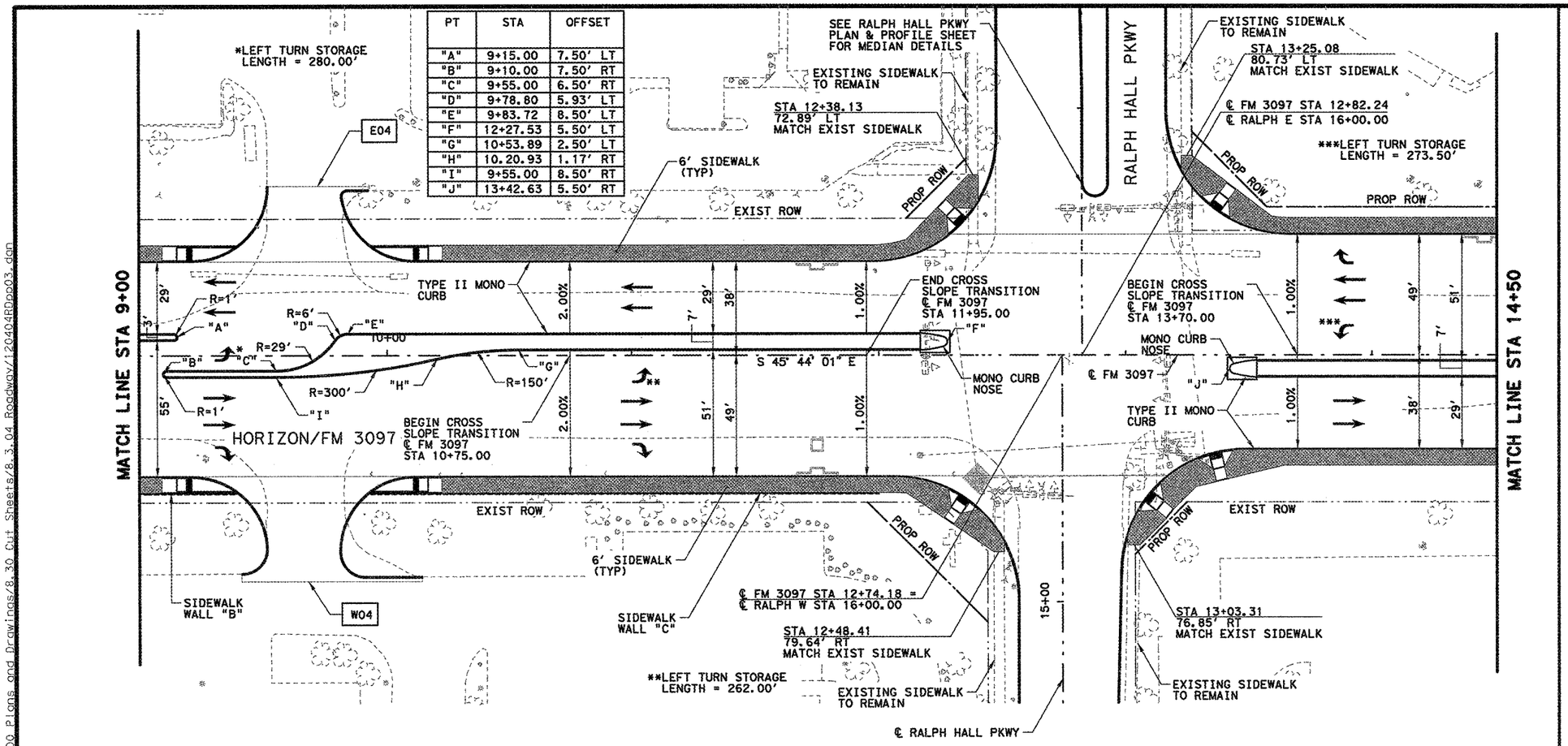
ROADWAY PLAN AND PROFILE
FM 3097
STA. 3+50 TO STA. 9+00

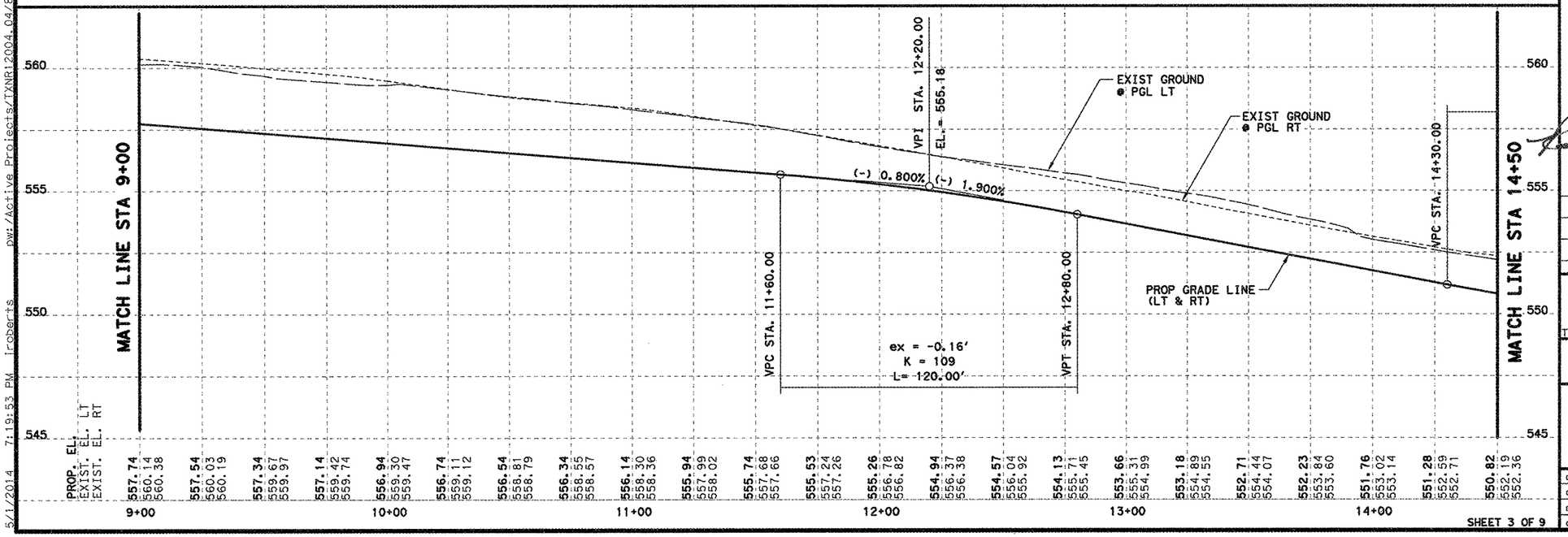
Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	80

SHEET 2 OF 9

5/1/2014 6:55:03 PM lroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDpg02.dgn

PT	STA	OFFSET
"A"	9+15.00	7.50' LT
"B"	9+10.00	7.50' RT
"C"	9+55.00	6.50' RT
"D"	9+78.80	5.93' LT
"E"	9+83.72	8.50' LT
"F"	12+27.53	5.50' LT
"G"	10+53.89	2.50' LT
"H"	10.20.93	1.17' RT
"I"	9+55.00	8.50' RT
"J"	13+42.63	5.50' RT





LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

NOTES:

1. ALL LINEAR DIMENSIONS ARE TO THE FACE OF CURB.
2. ALL RADII DIMENSIONS ARE TO THE BACK OF CURB.
3. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.
4. SEE LANDSCAPING PLANS FOR MEDIAN INFORMATION AND IRRIGATION INFORMATION PRIOR TO COMMENCING CONSTRUCTION.
5. SEE DRIVEWAY DETAILS SHEET FOR ADDITIONAL DRIVEWAY INFORMATION.
6. SEE INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
7. SEE WALL LAYOUTS FOR ADDITIONAL WALL INFORMATION.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

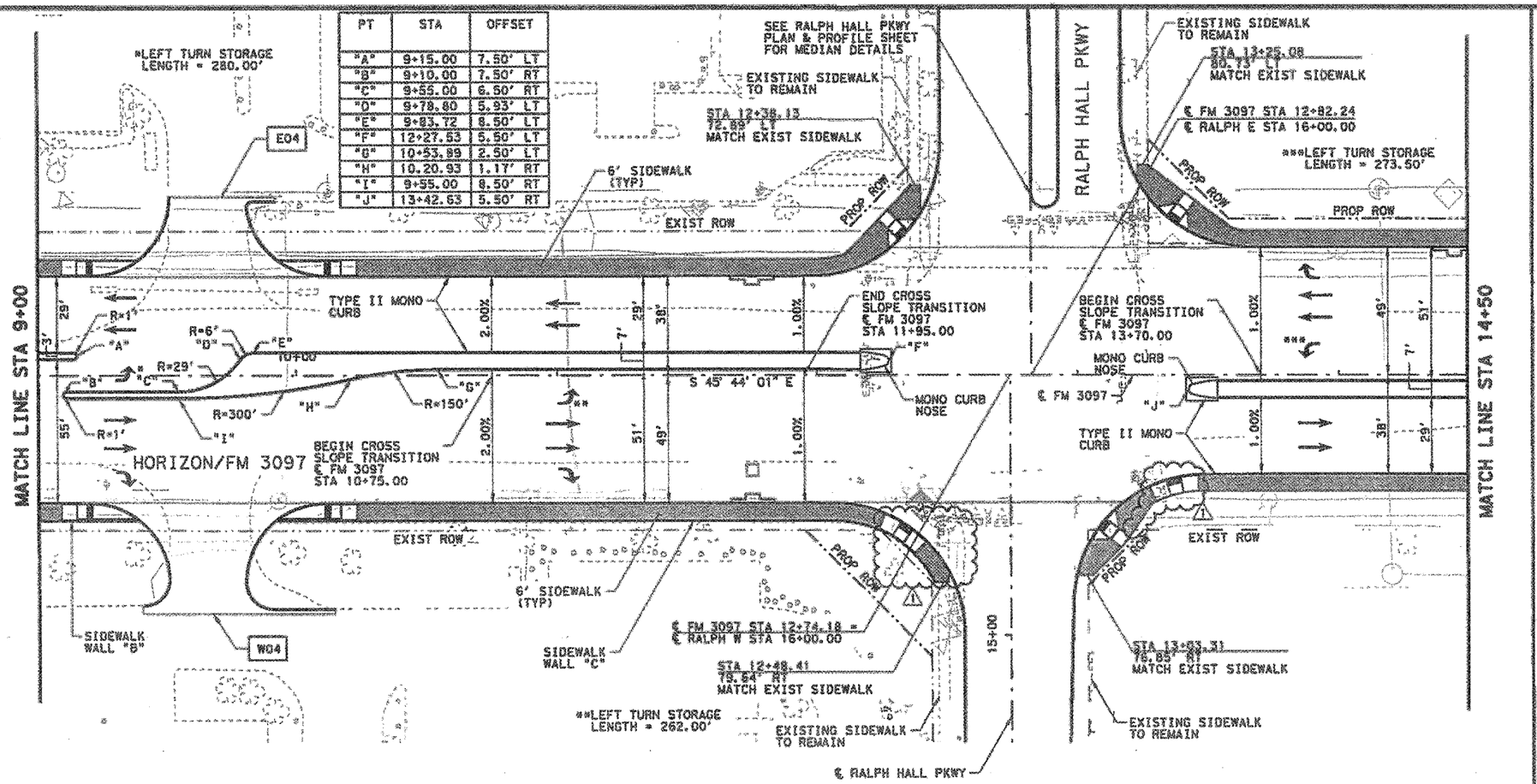
ROADWAY PLAN AND PROFILE
FM 3097
STA. 9+00 TO STA. 14+50

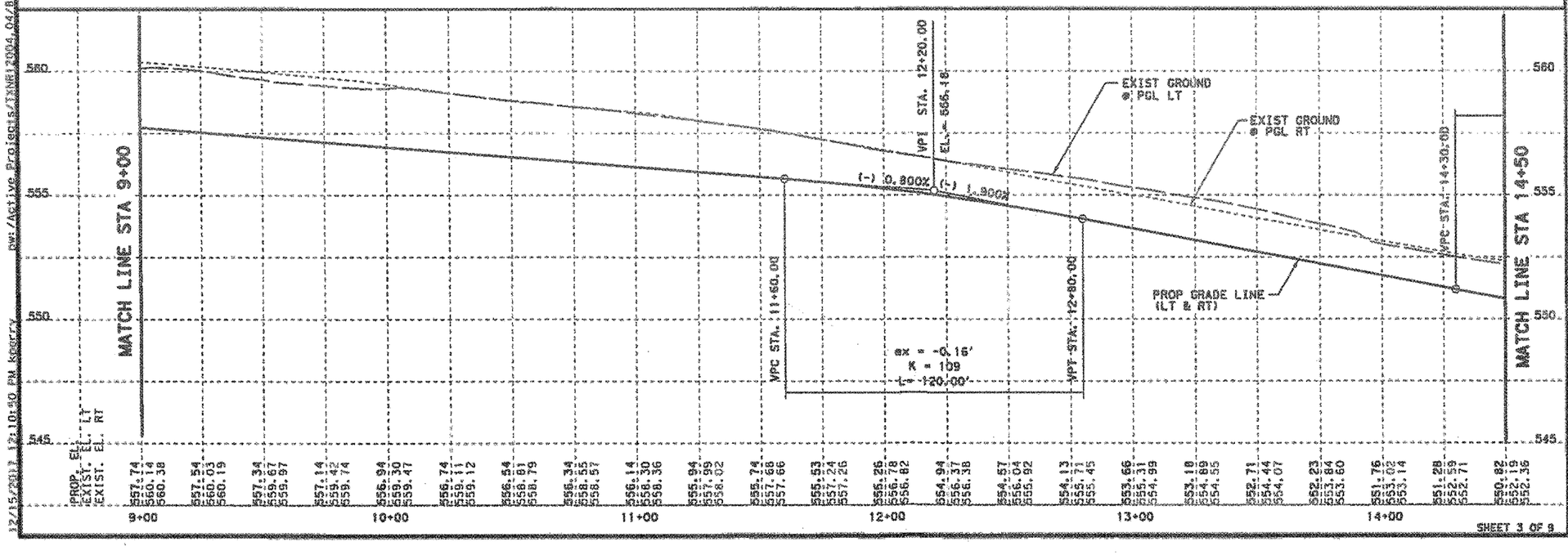
Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	81

SHEET 3 OF 9

5/1/2014 7:19:53 PM iroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDpp03.dgn

PT	STA	OFFSET
"A"	9+15.00	7.50' LT
"B"	9+10.00	7.50' RT
"C"	9+55.00	6.50' RT
"D"	9+78.80	5.93' LT
"E"	9+83.72	8.50' LT
"F"	12+27.63	5.50' LT
"G"	10+53.89	2.50' LT
"H"	10.20.93	1.17' RT
"I"	9+55.00	8.50' RT
"J"	13+42.63	5.50' RT





25 12.5 0 25 50
SCALE FEET
HORZ.

2.5 0 2.5 5
SCALE FEET
VERT.

LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

NOTES:

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5. SEE DRIVEWAY DETAILS SHEET FOR ADDITIONAL DRIVEWAY INFORMATION.
6. SEE INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
7. SEE WALL LAYOUTS FOR ADDITIONAL WALL INFORMATION.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER
12/15/17

NO.	REVISION	BY	DATE
1	CHANGE ORDER #13	AJP	12/15/17

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

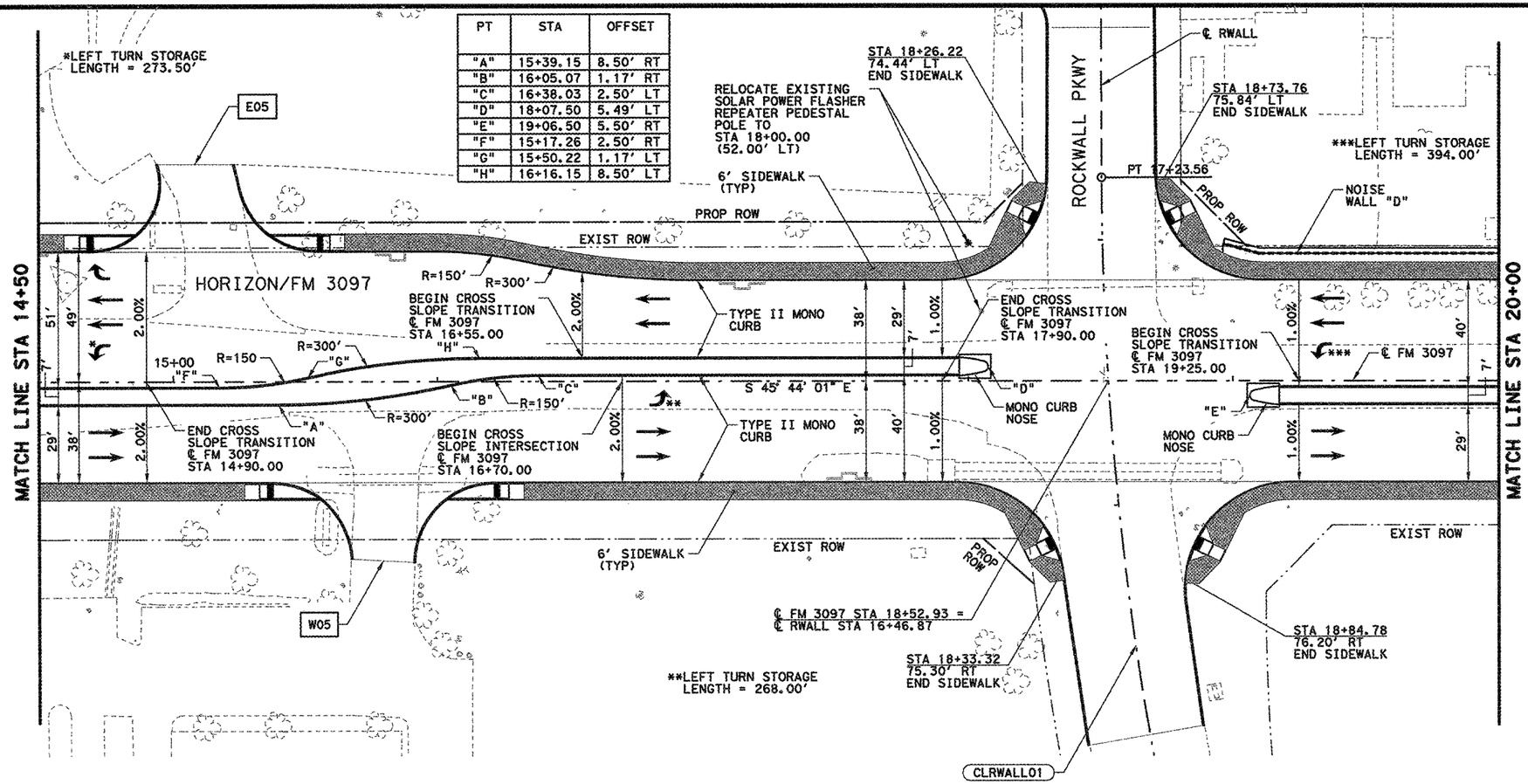
ROADWAY PLAN AND PROFILE
FM 3097
STA. 9+00 TO STA. 14+50

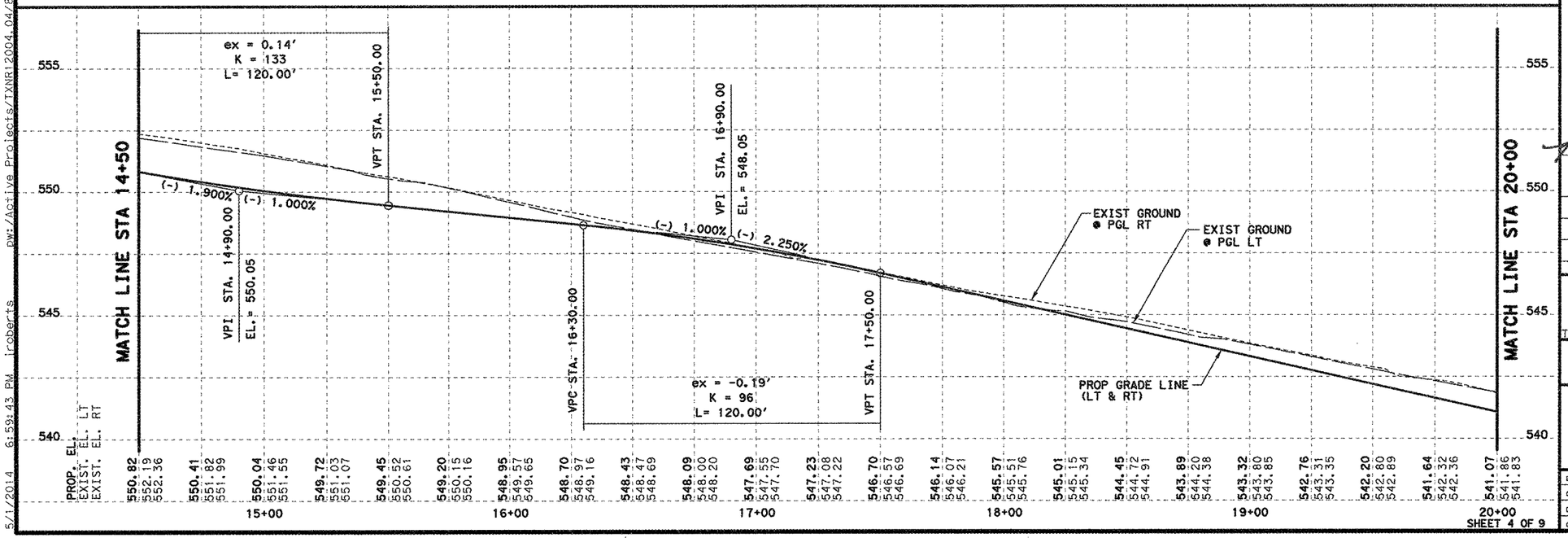
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Checked	JBR	6	TEXAS	STP 2013 (597) NM			FM 3097
Drawn	JWM	DIST.	COUNTY	CONTROL	SECTION	JOB	SHEET NO.
Checked	RRH	DAL	ROCKWALL	3148	01	006	81 A

SHEET 3 OF 9

12/15/2017 12:10:40 PM kperry pw:/Active Projects/TXNE12004.04/8.00 Plans and Drawings/8.30 Cur Sheets/8.3.04 Roadway/12040AR0p03.dgn

PT	STA	OFFSET
"A"	15+39.15	8.50' RT
"B"	16+05.07	1.17' RT
"C"	16+38.03	2.50' LT
"D"	18+07.50	5.49' LT
"E"	19+06.50	5.50' RT
"F"	15+17.26	2.50' RT
"G"	15+50.22	1.17' LT
"H"	16+16.15	8.50' LT







LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

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6. SEE INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
7. SEE WALL LAYOUTS FOR ADDITIONAL WALL INFORMATION.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

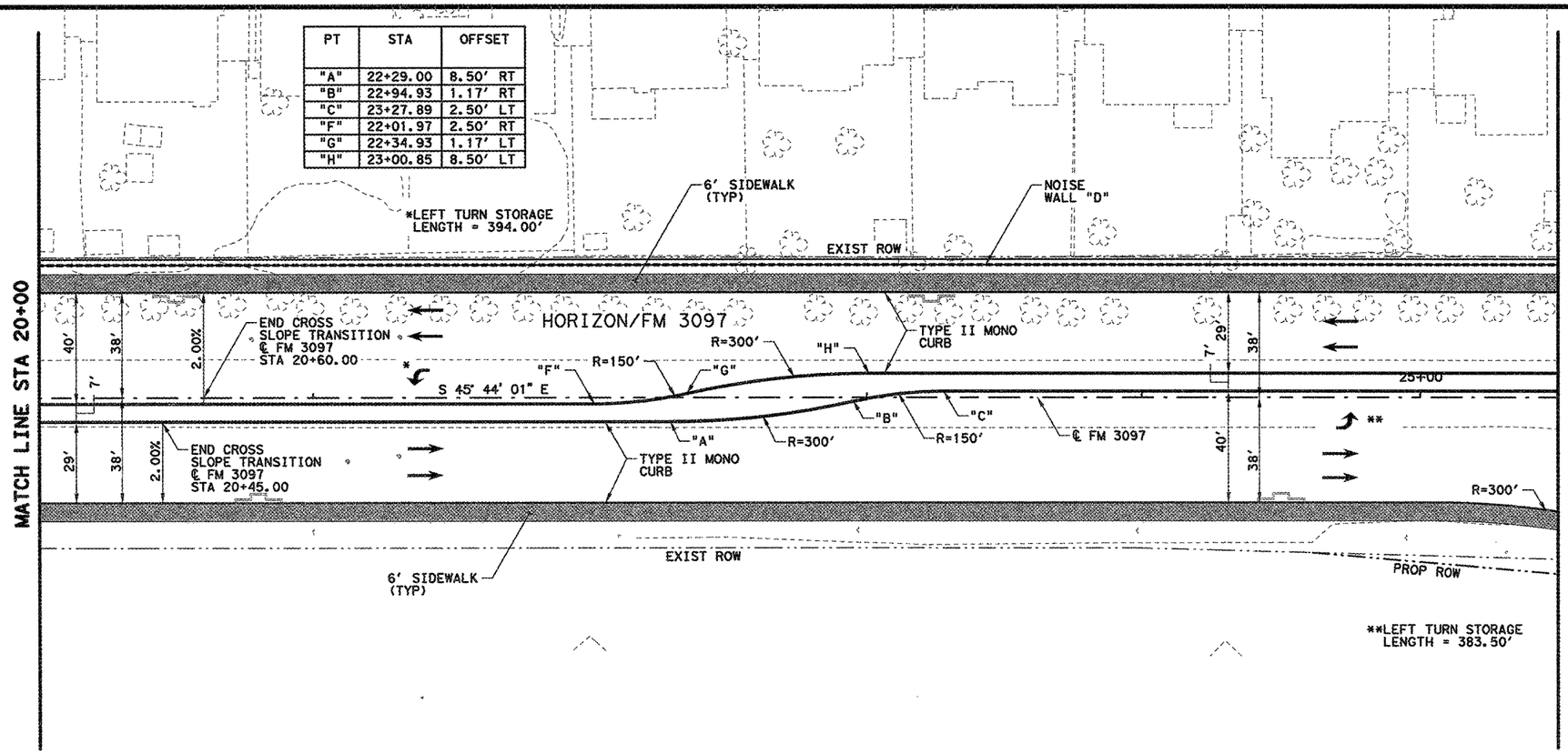
ROADWAY PLAN AND PROFILE
FM 3097
STA. 14+50 TO STA. 20+00

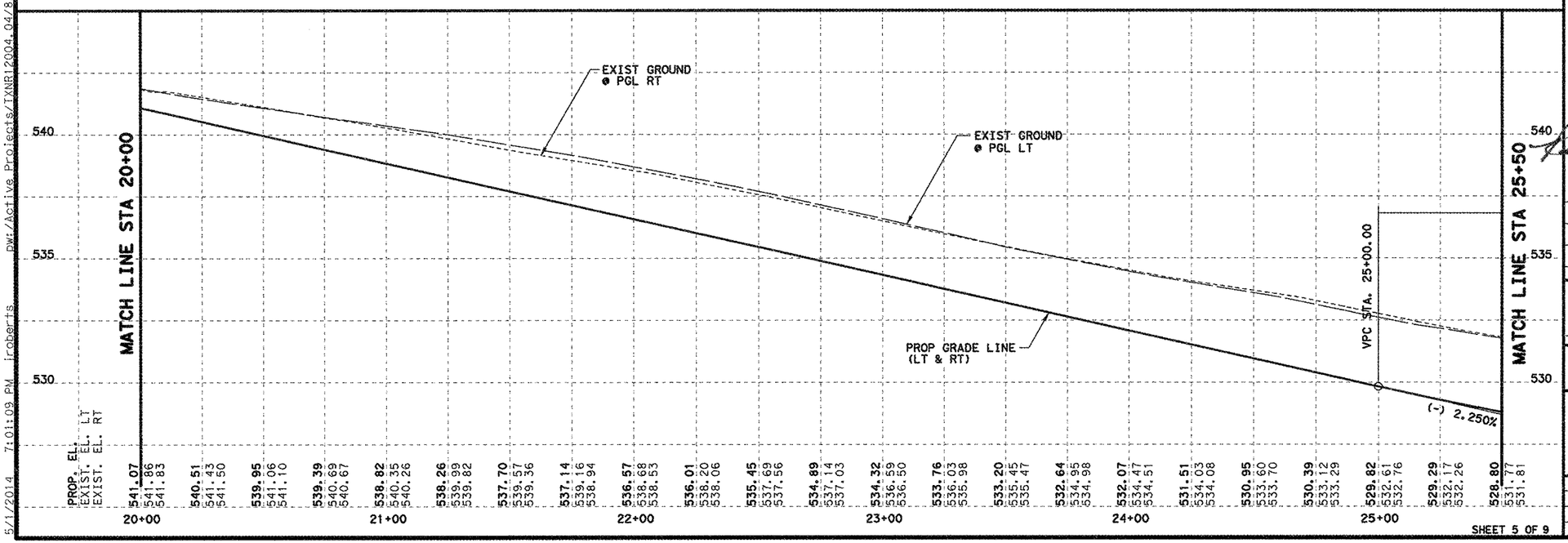
Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	82

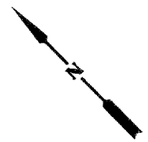
SHEET 4 OF 9

5/1/2014 6:59:43 PM iroberts pw:/Active Projects/TXNR120004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDpp04.dgn

PT	STA	OFFSET
"A"	22+29.00	8.50' RT
"B"	22+94.93	1.17' RT
"C"	23+27.89	2.50' LT
"F"	22+01.97	2.50' RT
"G"	22+34.93	1.17' LT
"H"	23+00.85	8.50' LT







25 12.5 0 25 50
SCALE FEET
HORZ.

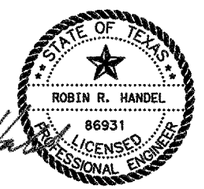
2.5 0 2.5 5
SCALE FEET
VERT.

LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX — DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

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05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

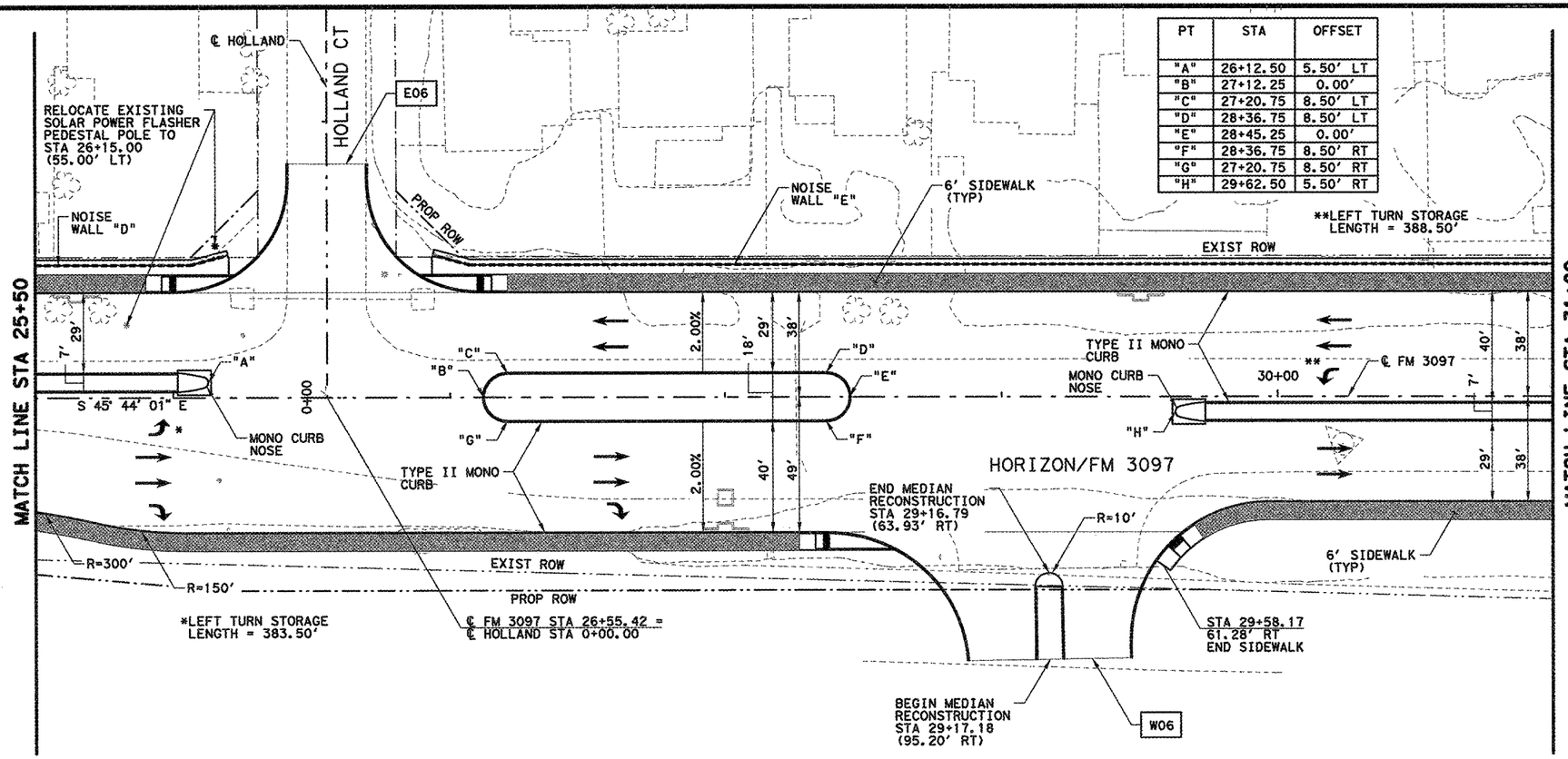
Texas Department of Transportation

ROADWAY PLAN AND PROFILE
FM 3097
STA. 20+00 TO STA. 25+50

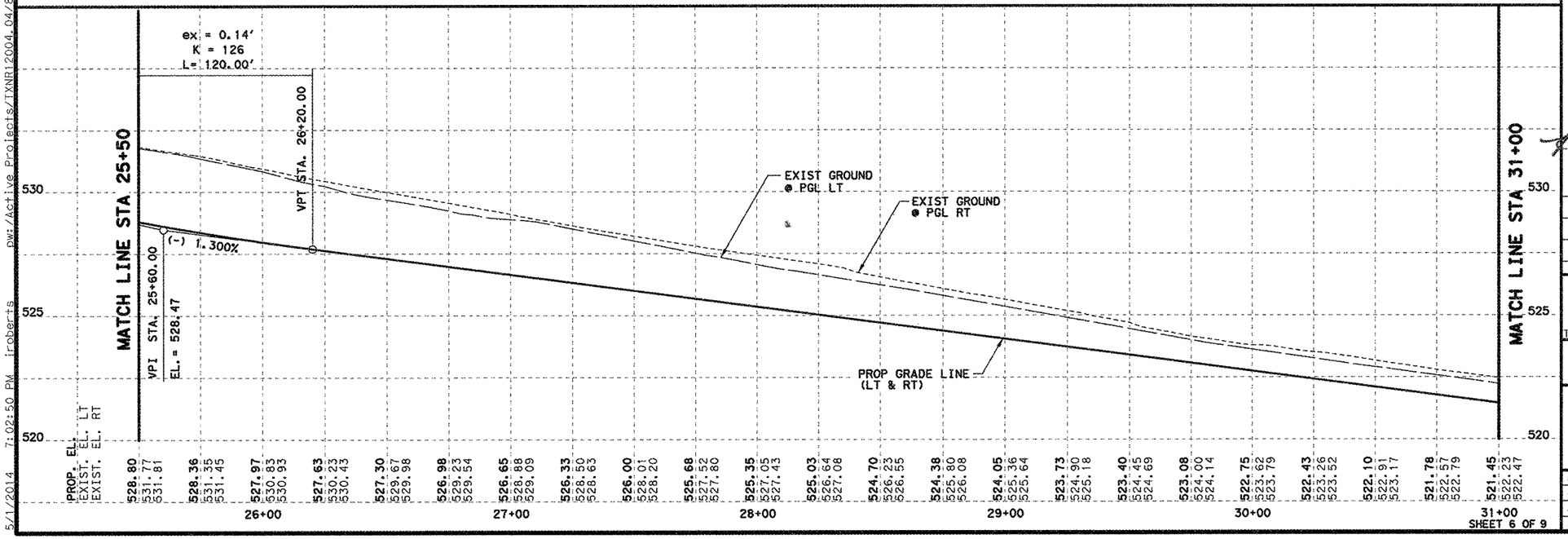
Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		83

SHEET 5 OF 9

5/1/2014 7:01:09 PM lroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDpp05.dgn



PT	STA	OFFSET
"A"	26+12.50	5.50' LT
"B"	27+12.25	0.00'
"C"	27+20.75	8.50' LT
"D"	28+36.75	8.50' LT
"E"	28+45.25	0.00'
"F"	28+36.75	8.50' RT
"G"	27+20.75	8.50' RT
"H"	29+62.50	5.50' RT





25 12.5 0 25 50
SCALE FEET
HORZ.
2.5 0 2.5 5
SCALE FEET
VERT.

LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX DRIVEWAY ID
- CURB RAMP TYPE 1
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- CURB RAMP TYPE 10

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM F-1741

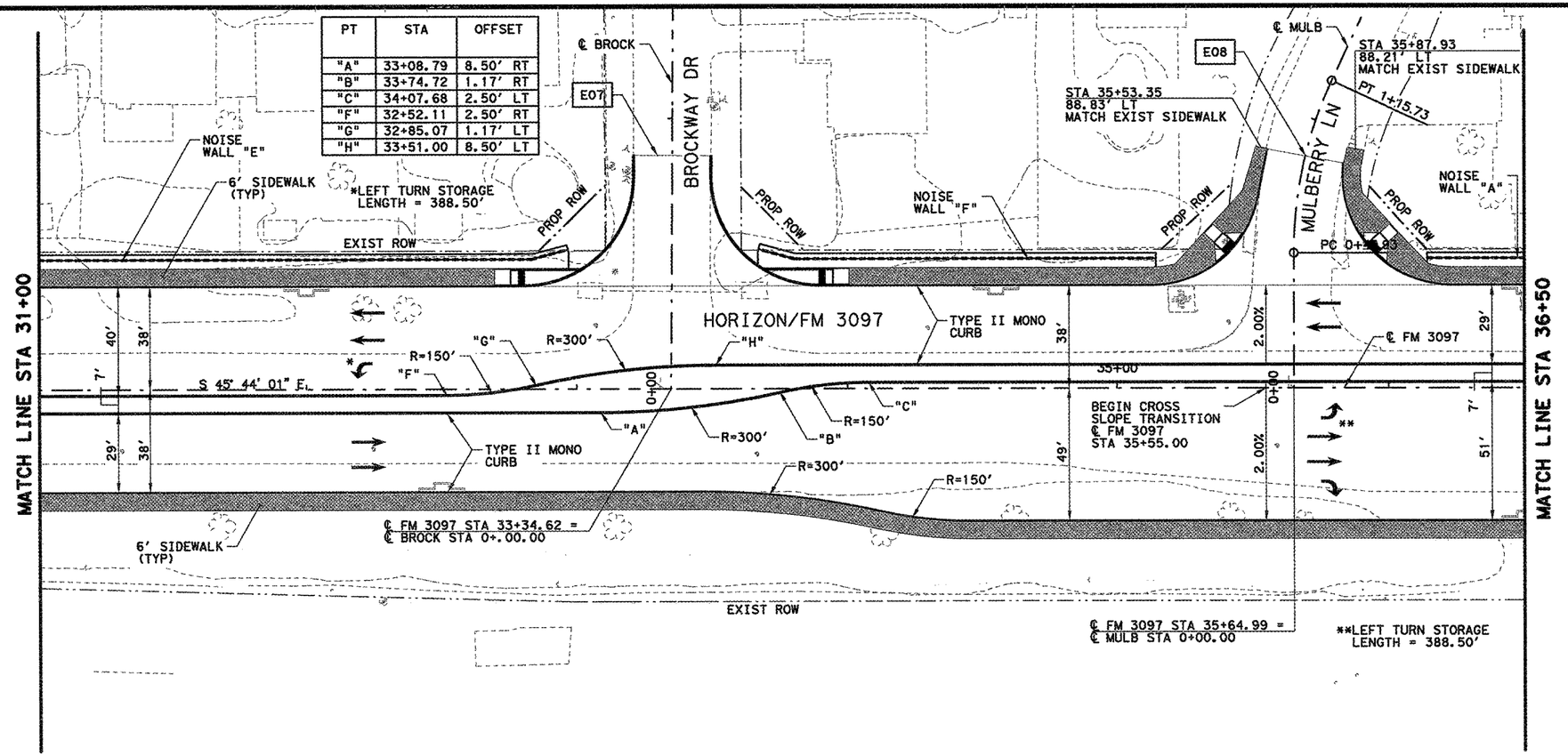
Texas Department of Transportation

ROADWAY PLAN AND PROFILE
FM 3097
STA. 25+50 TO STA. 31+00

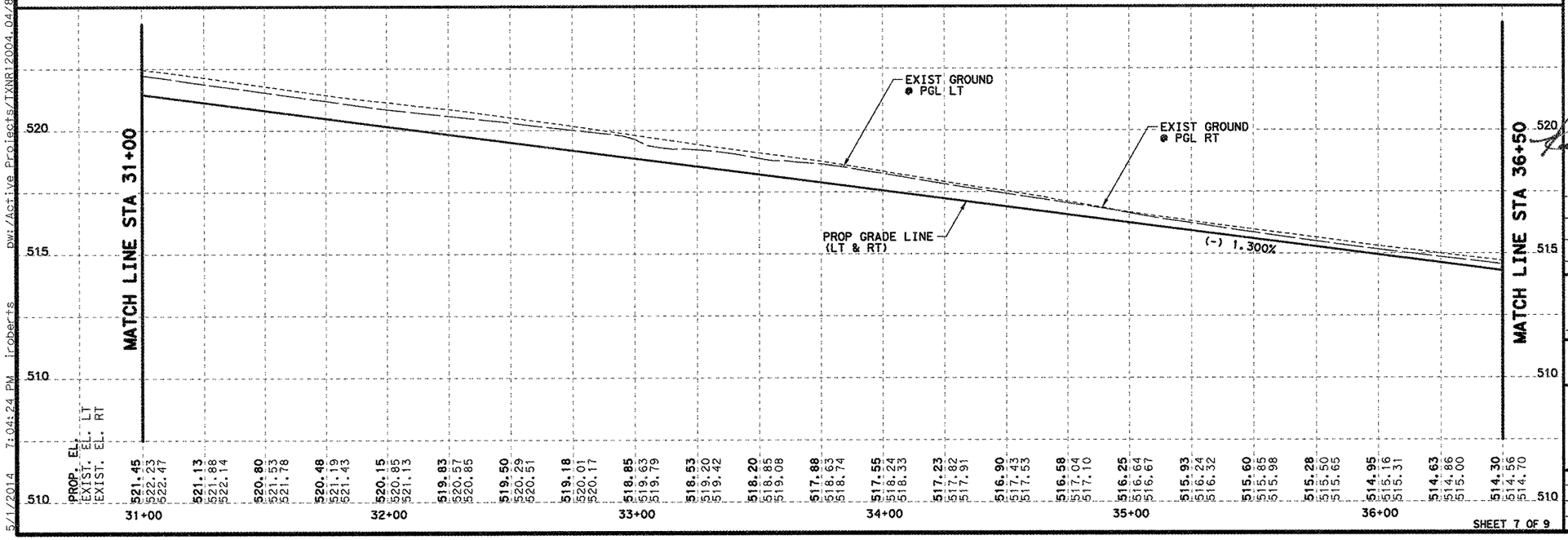
Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	84

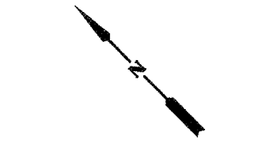
SHEET 6 OF 9

5/1/2014 7:02:50 PM jroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDp06.dgn



PT	STA	OFFSET
"A"	33+08.79	8.50' RT
"B"	33+74.72	1.17' RT
"C"	34+07.68	2.50' LT
"F"	32+52.11	2.50' RT
"G"	32+85.07	1.17' LT
"H"	33+51.00	8.50' LT





LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
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NOTES:

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

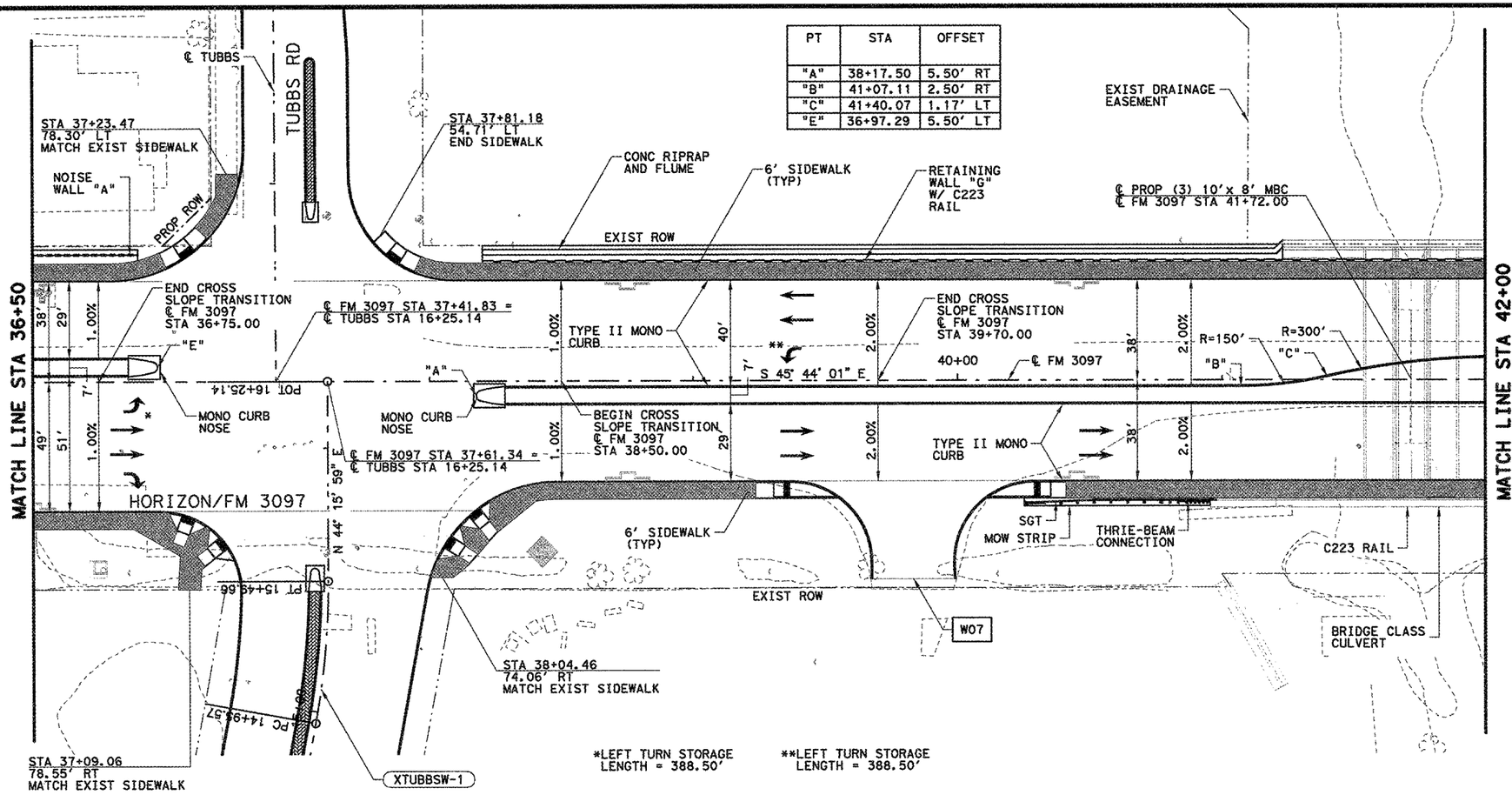
ROADWAY PLAN AND PROFILE
FM 3097
STA. 31+00 TO STA. 36+50

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		85

SHEET 7 OF 9

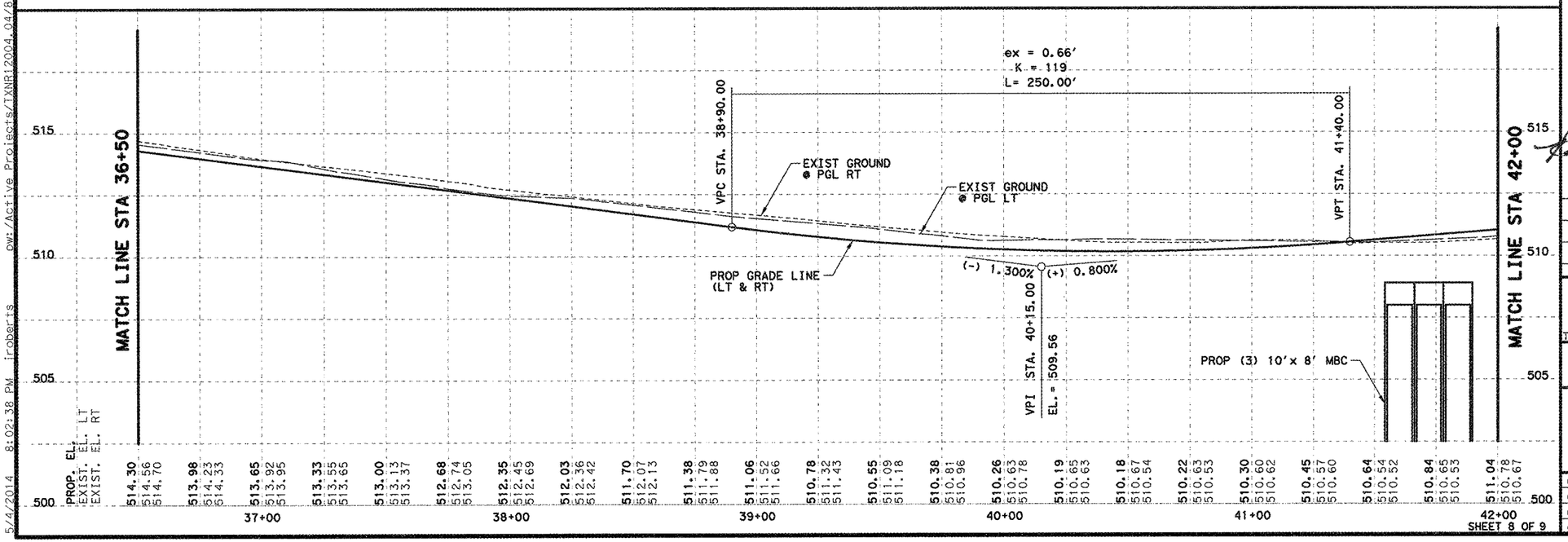
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PT	STA	OFFSET
"A"	38+17.50	5.50' RT
"B"	41+07.11	2.50' RT
"C"	41+40.07	1.17' LT
"E"	36+97.29	5.50' LT



*LEFT TURN STORAGE LENGTH = 388.50'

**LEFT TURN STORAGE LENGTH = 388.50'



SHEET 8 OF 9

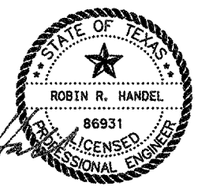


LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

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05/05/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

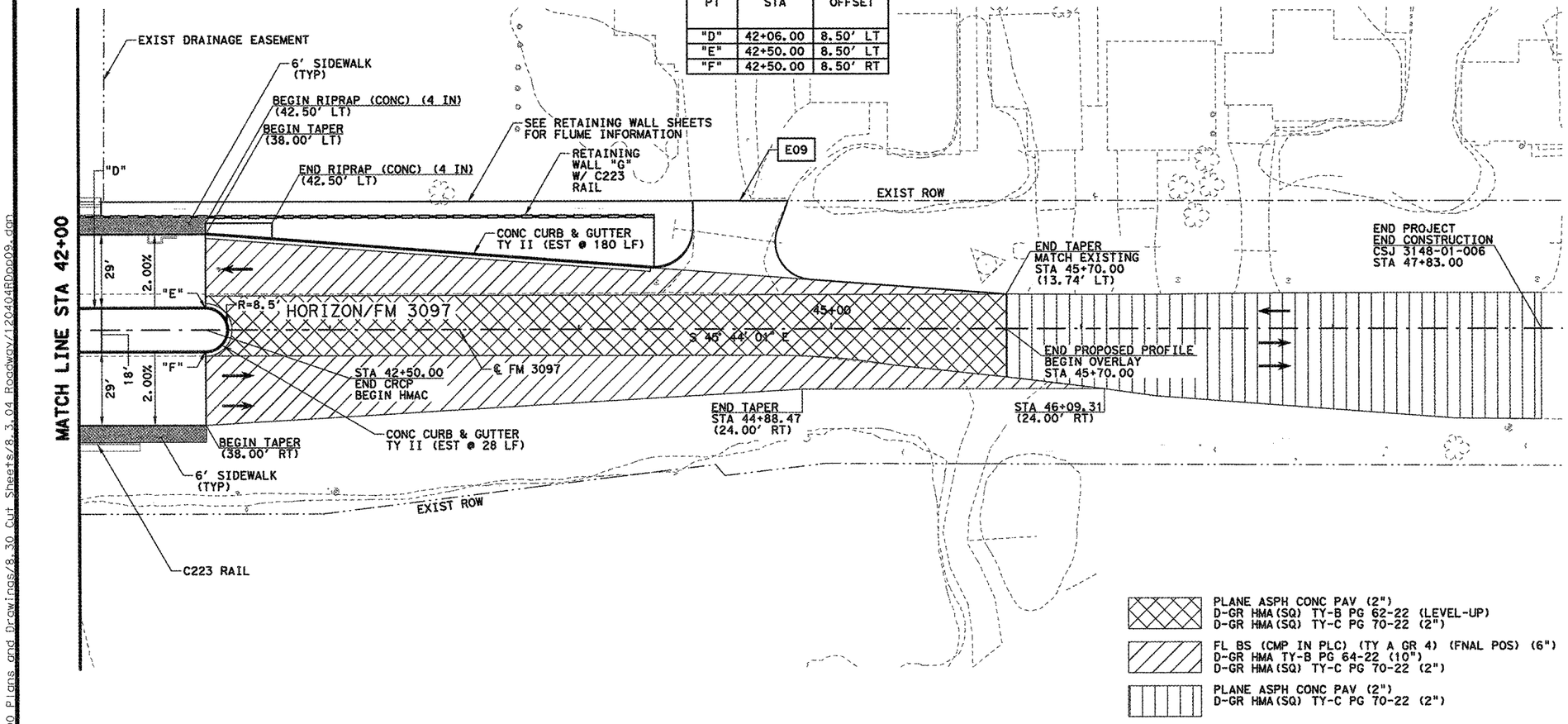
Texas Department of Transportation

ROADWAY PLAN AND PROFILE
FM 3097
STA. 36+50 TO STA. 42+00

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	86

5/4/2014 8:02:38 PM irobertson
ow/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDpp08.dgn

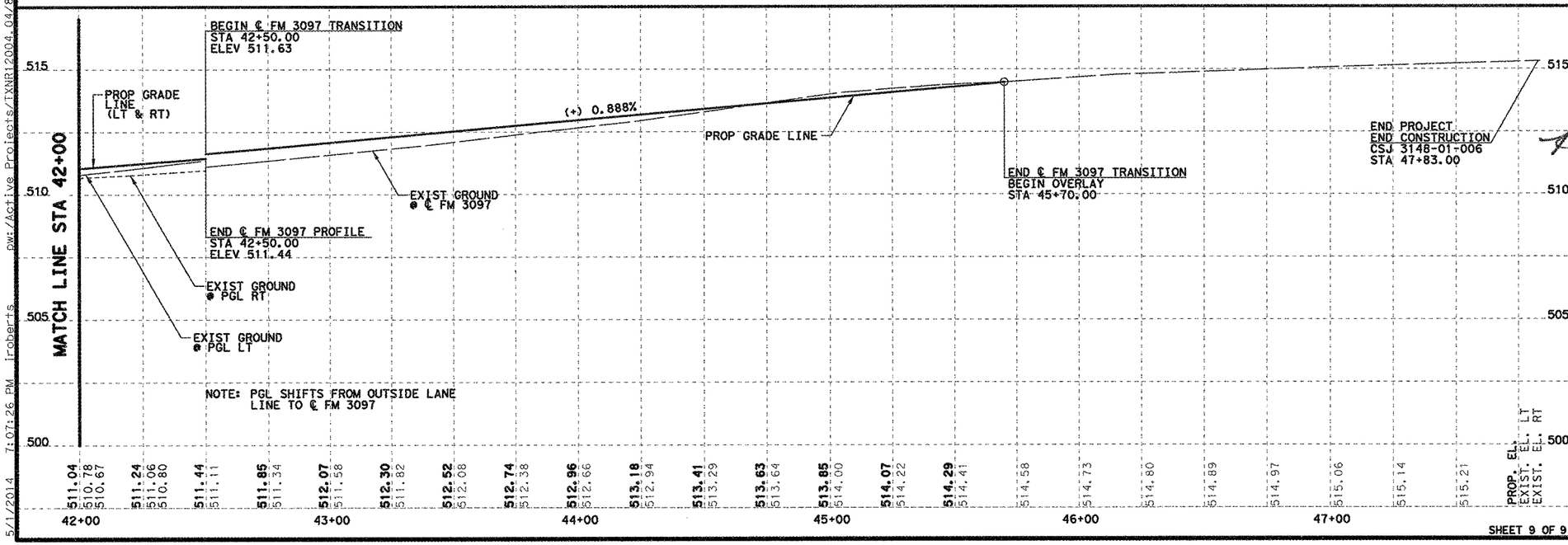
PT	STA	OFFSET
"D"	42+06.00	8.50' LT
"E"	42+50.00	8.50' LT
"F"	42+50.00	8.50' RT



PLANE ASPH CONC PAV (2")
D-GR HMA(SQ) TY-B PG 62-22 (LEVEL-UP)
D-GR HMA(SQ) TY-C PG 70-22 (2")

FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS) (6")
D-GR HMA TY-B PG 64-22 (10")
D-GR HMA(SQ) TY-C PG 70-22 (2")

PLANE ASPH CONC PAV (2")
D-GR HMA(SQ) TY-C PG 70-22 (2")



SHEET 9 OF 9

N

25 12.5 0 25 50
SCALE FEET
HORZ.

2.5 0 2.5 5
SCALE FEET
VERT.

LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

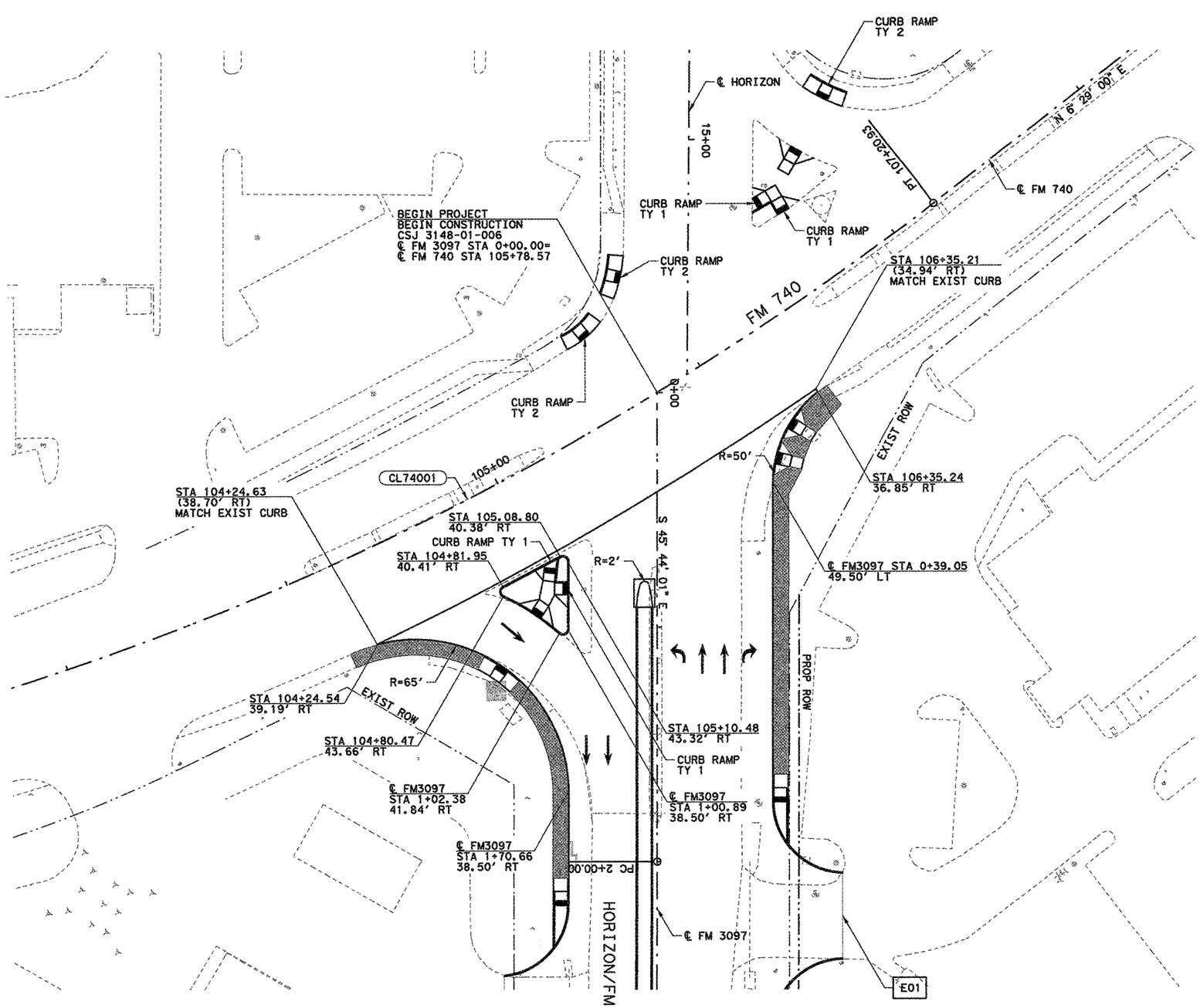
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

ROADWAY PLAN AND PROFILE
FM 3097
STA. 42+00 TO END PROJECT

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	87

5/1/2014 7:07:26 PM iroberts pw:Active Projects:TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDpg09.dgn



25 12.5 0 25 50
SCALE FEET
HORZ.

LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX — DRIVEWAY ID
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- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

NOTES:

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3. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 740 UNLESS OTHERWISE SPECIFIED.
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5. SEE INTERSECTION GRADING SHEETS FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

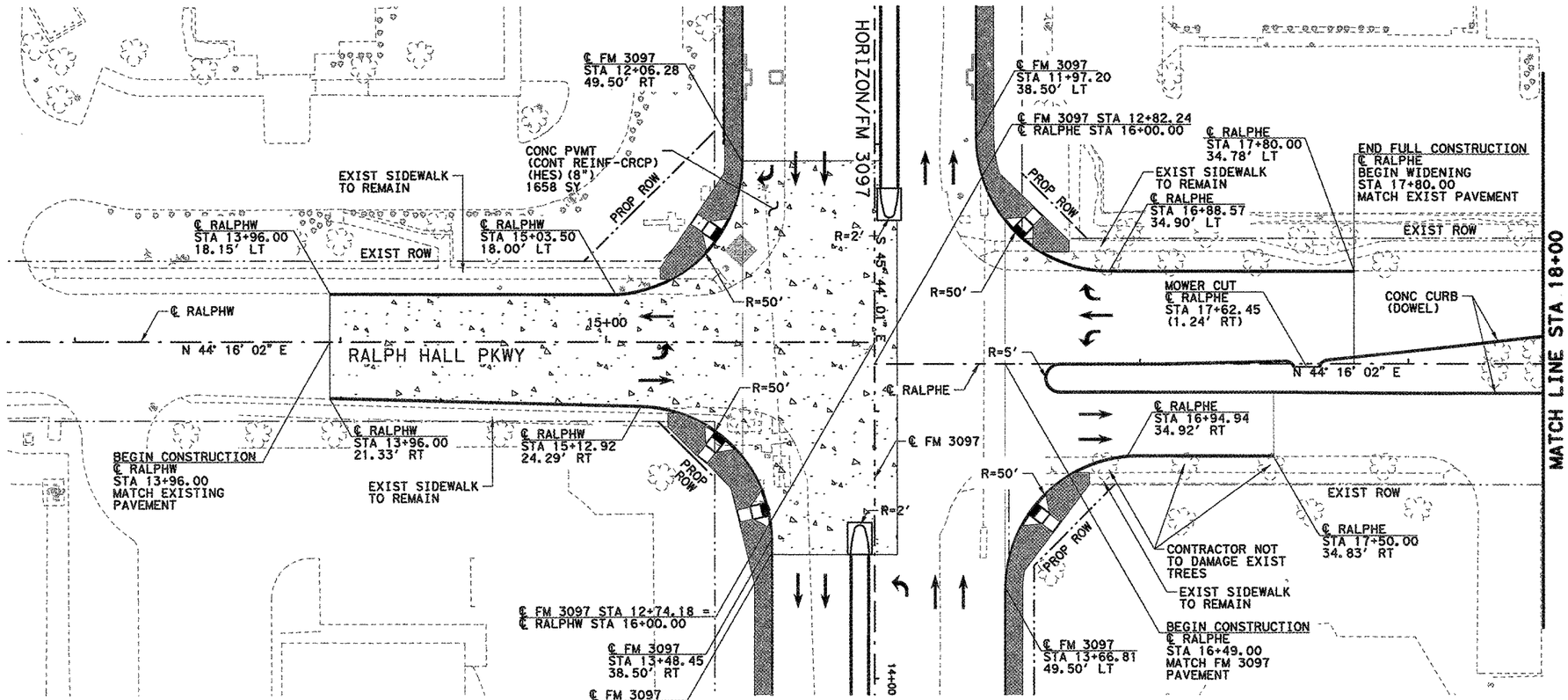
Texas Department of Transportation

INTERSECTION LAYOUT
FM 740

Designed: ANK	FED. RD. DIV.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.	
Checked: JBR	6	TEXAS	STP 2013 (597) MM				FM 3097	
Drawn: ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked: RRH	DAL	ROCKWALL	3148	01	006		88	

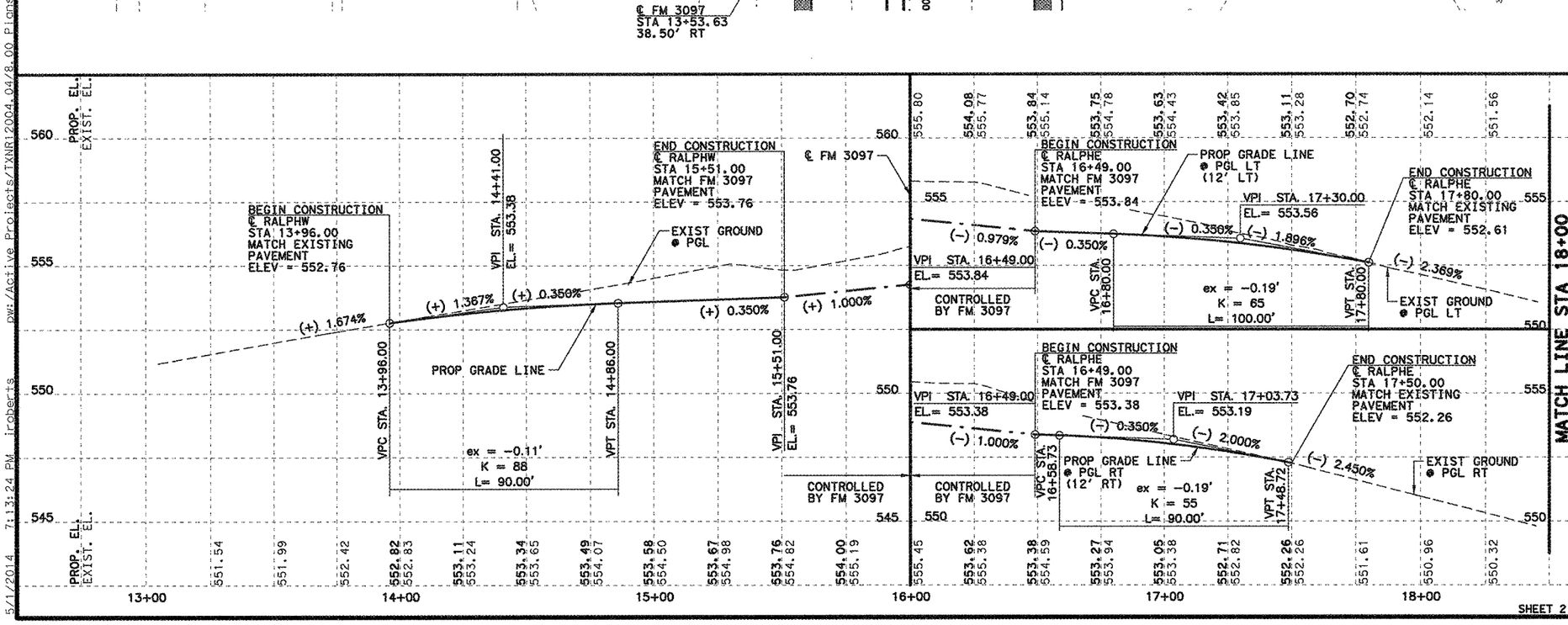
SHEET 1 OF 5

5/1/2014 7:12:39 PM iroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDcs01.dgn



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05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

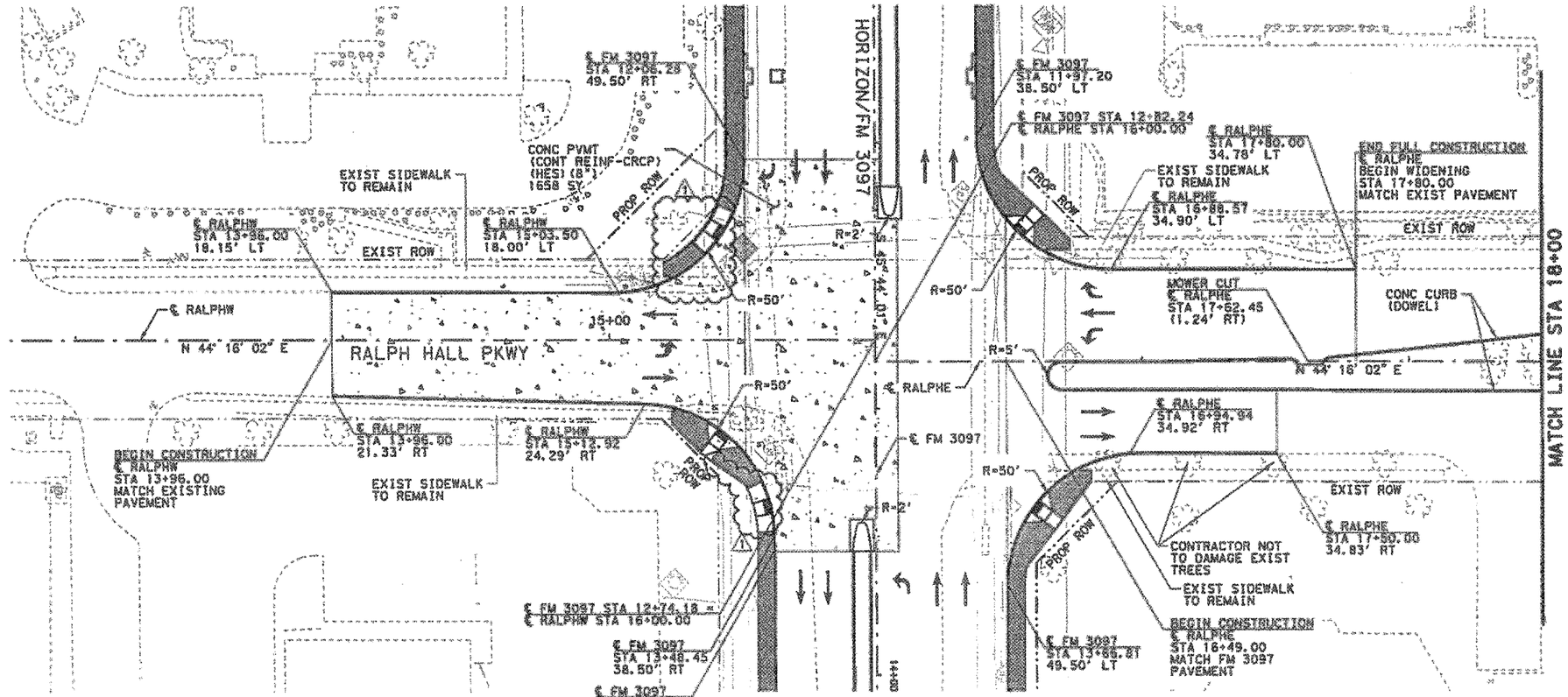
Texas Department of Transportation

INTERSECTION LAYOUT
RALPH HALL PKWY
BEGIN TO STA. 18+00

Designed: ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	3148	01	006	89

SHEET 2 OF 5

5/1/2014 7:13:24 PM jroberts pw:\Active Projects\TXNR12004.04\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.04 Roadway\120404RDcp02.dgn



25 12.5 0 25 50
SCALE FEET
HORZ.

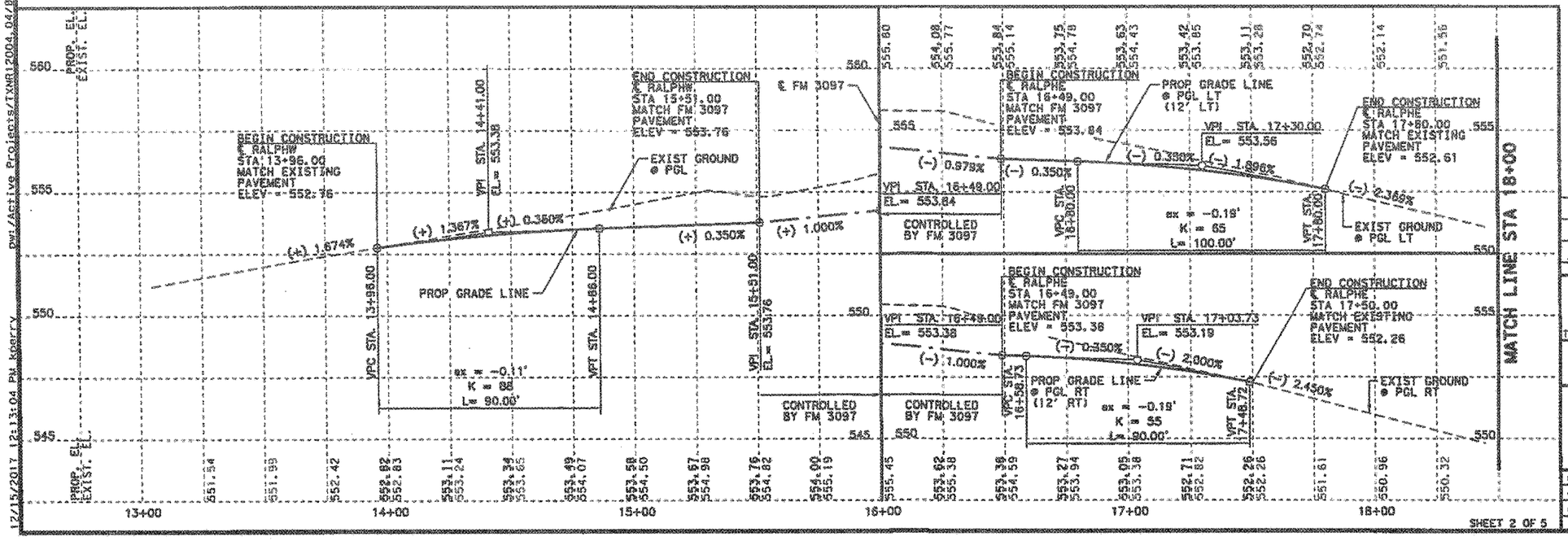
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SCALE FEET
VERT.

LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

NOTES:

1. ALL LINEAR DIMENSIONS ARE TO THE FACE OF CURB.
2. ALL RADII DIMENSIONS ARE TO THE BACK OF CURB.
3. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.
4. SEE DETAIL SHEETS FOR ADDITIONAL INFORMATION.
5. SEE INTERSECTION GRADING SHEETS FOR ADDITIONAL INFORMATION.



SHEET 2 OF 5

ROBIN R. HANDEL 86931 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
12/15/17

NO.	REVISION	BY	DATE
1	CHANGE ORDER #15	KLP	12/15/17

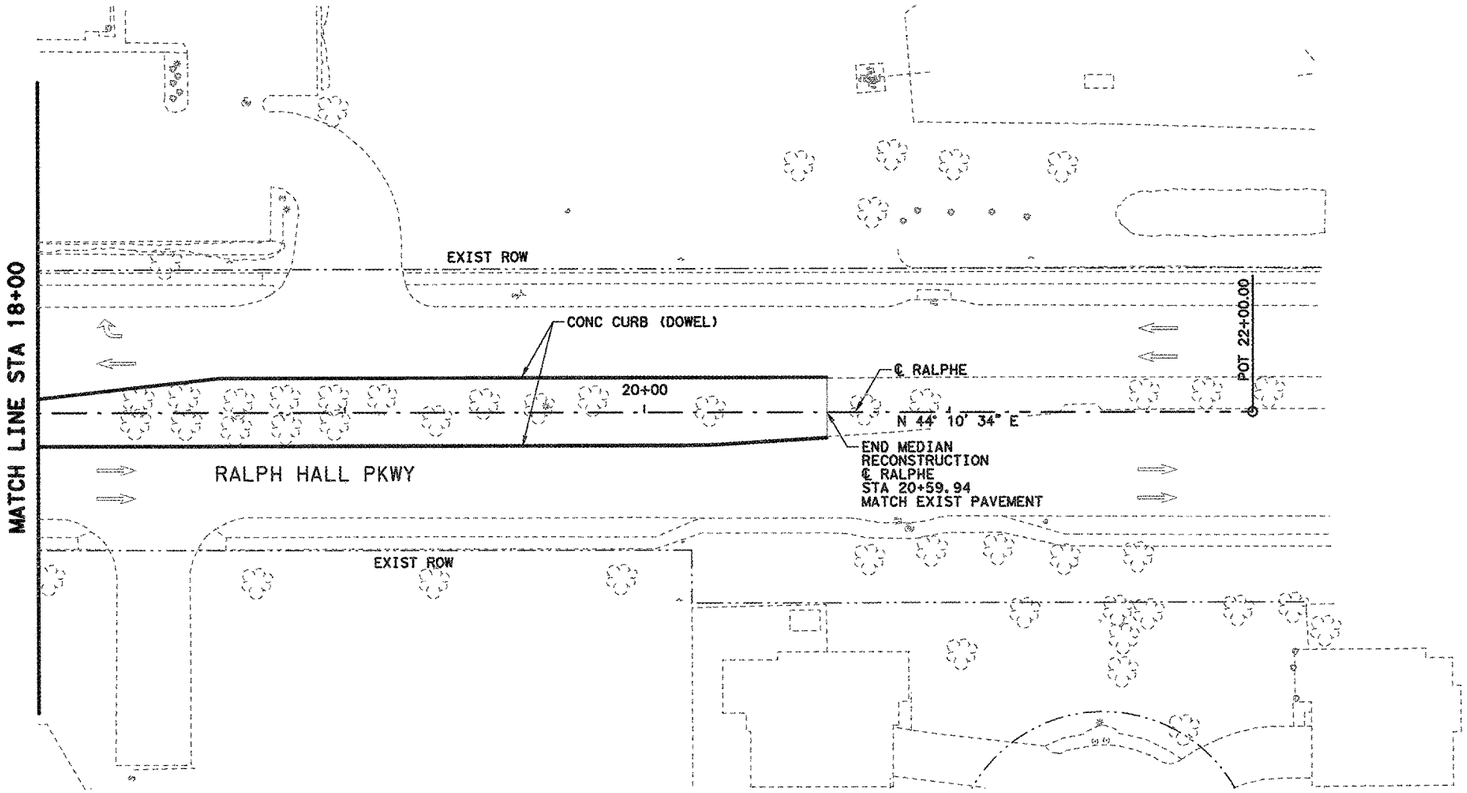
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

INTERSECTION LAYOUT
RALPH HALL PKWY
BEGIN TO STA. 18+00

		DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Designed	ANK	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked	JBR						
Drawn	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	RRH	DAL	ROCKWALL	3148	01	006	89

C:\Plans and Drawings\8.30 Cut Sheets\8.3.04 Roadway\120404R0cp02.dgn
12/15/2017 12:13:04 PM kperry
Dwl:\Active Projects\TXNR12004.04\8.00 Plans



N

25 12.5 0 25 50
SCALE FEET
HORZ.

2.5 0 2.5 5
SCALE FEET
VERT.

LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX — DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

NOTES:

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2. ALL RADII DIMENSIONS ARE TO THE BACK OF CURB.
3. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.
4. SEE DETAIL SHEETS FOR ADDITIONAL INFORMATION.
5. SEE INTERSECTION GRADING SHEETS FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

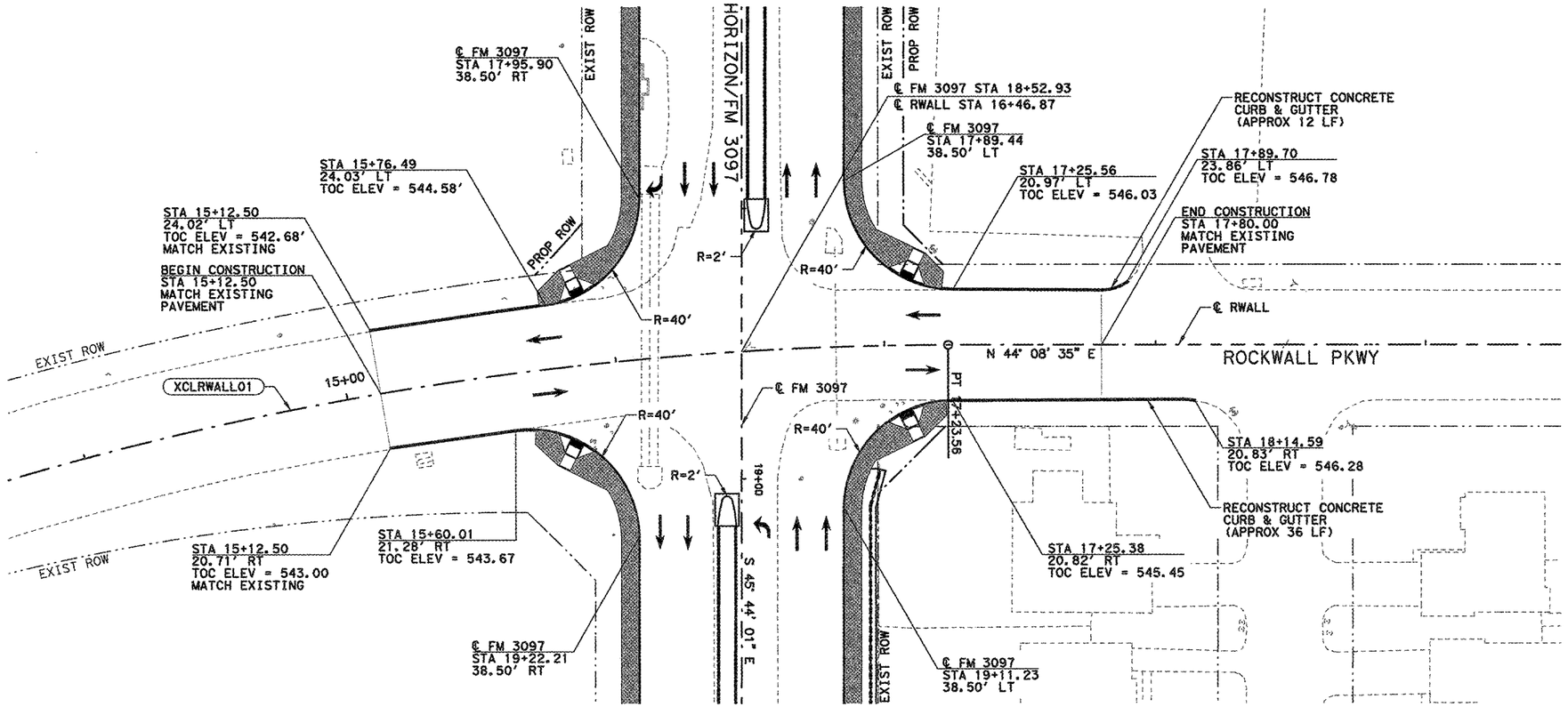
Texas Department of Transportation

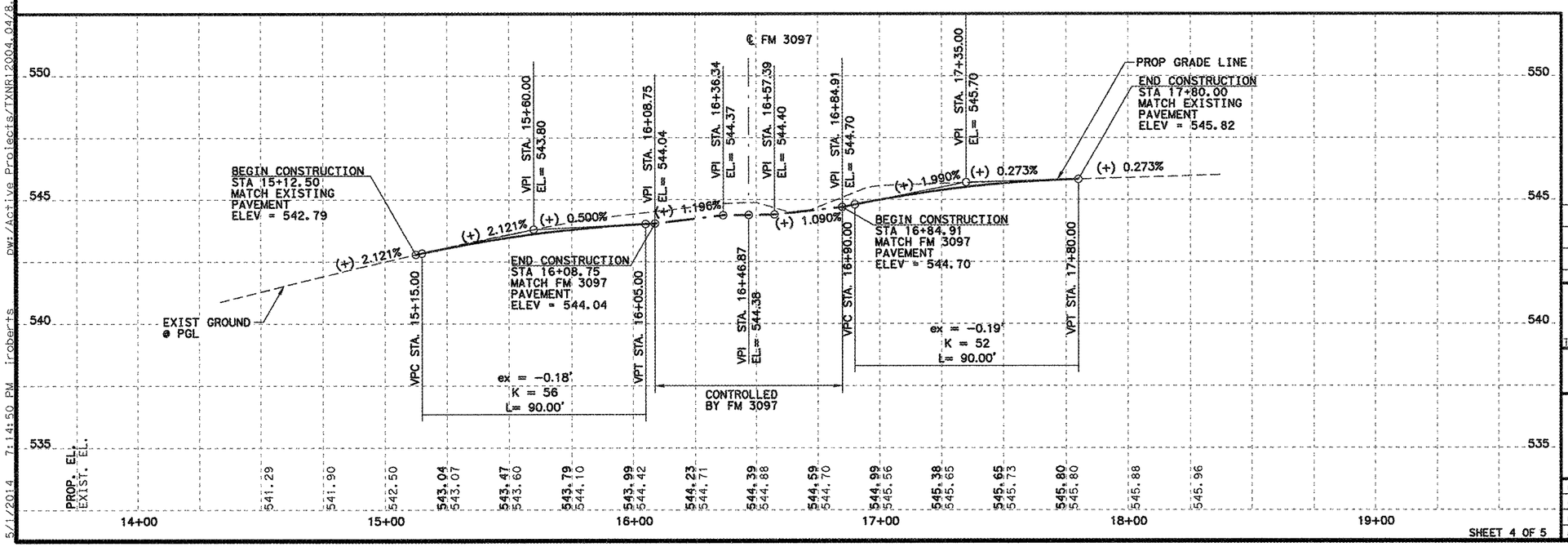
INTERSECTION LAYOUT
RALPH HALL PKWY
STA. 18+00 TO END

Designed:	ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		90

SHEET 3 OF 5

5/1/2014 7:14:07 PM iroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDcs03.dgn





SHEET 4 OF 5

25 12.5 0 25 50
SCALE FEET
HORZ.

2.5 0 2.5 5
SCALE FEET
VERT.

LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

NOTES:

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3. ALL STATIONS AND OFFSETS ARE FROM ℄ RWALL UNLESS OTHERWISE SPECIFIED.
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5. SEE INTERSECTION GRADING SHEETS FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

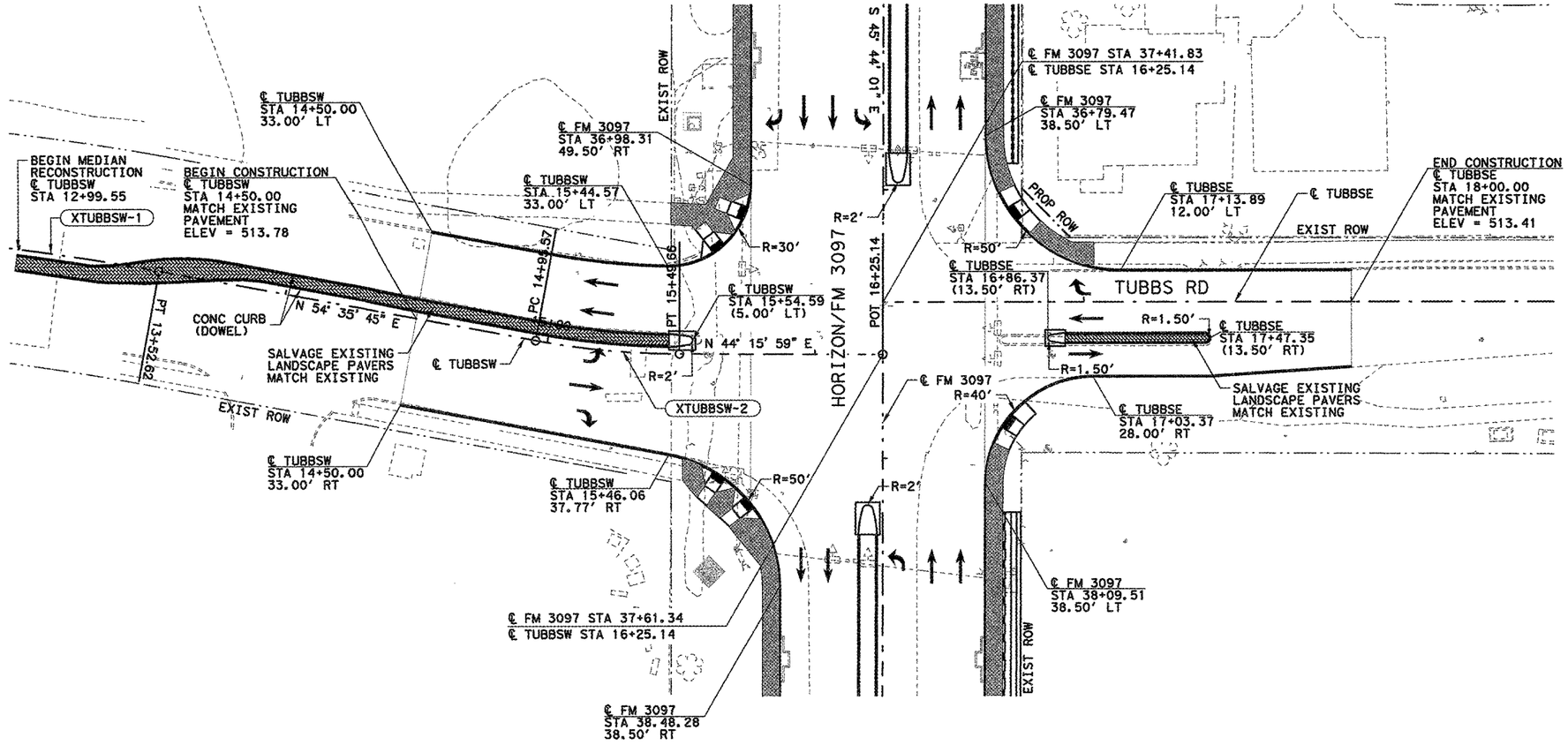
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

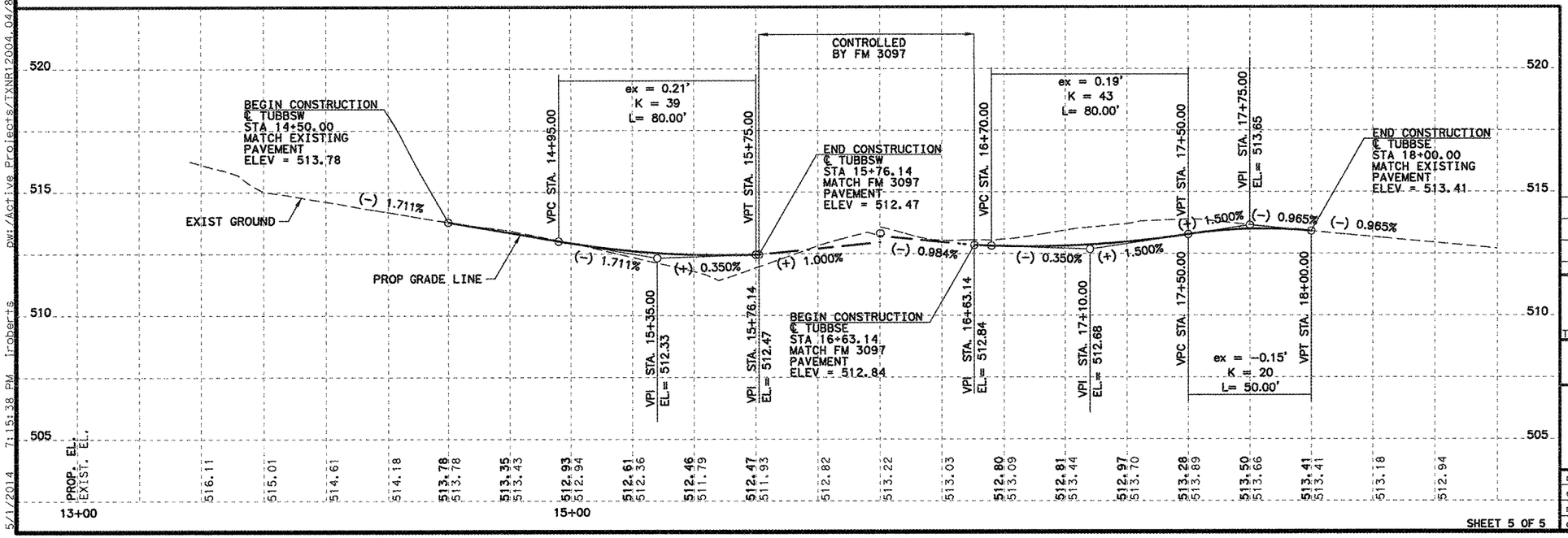
Texas Department of Transportation

INTERSECTION LAYOUT
ROCKWALL PKWY

Designed:	ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		91

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N

25 12.5 0 25 50
SCALE FEET
HORZ.
2.5 0 2.5 5
SCALE FEET
VERT.

LEGEND

- CONC SIDEWALKS 4"
- LANDSCAPE PAVERS
- PROPOSED LANE
- EXISTING LANE
- WXX — DRIVEWAY ID
- CURB RAMP TYPE 1
- CURB RAMP TYPE 2
- CURB RAMP TYPE 10

NOTES:

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2. ALL RADII DIMENSIONS ARE TO THE BACK OF CURB.
3. ALL STATIONS AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.
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5. SEE INTERSECTION GRADING SHEETS FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

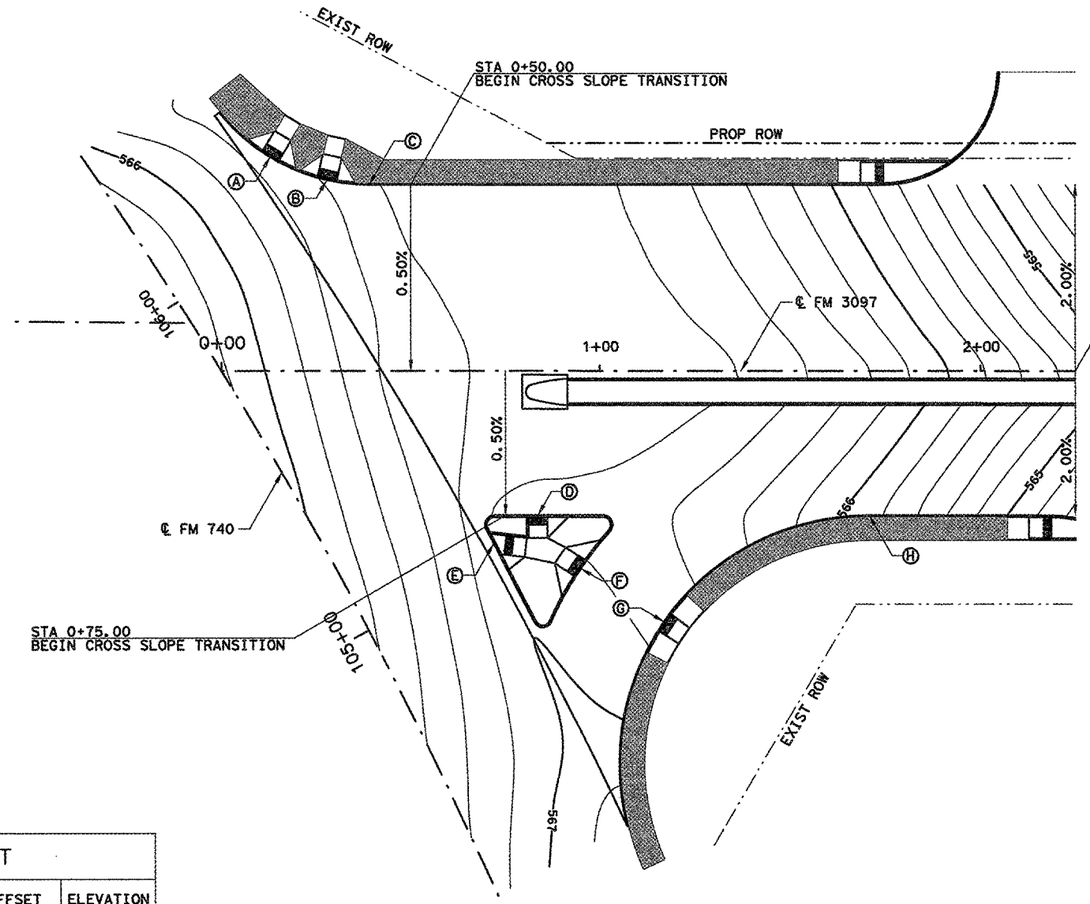
Texas Department of Transportation

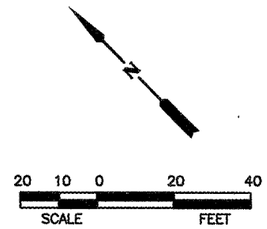
INTERSECTION LAYOUT
TUBBS RD

Designed:	ANK	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	ANK	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	92

SHEET 5 OF 5

5/1/2014 7:15:38 PM jroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDcp05.dgn





NOTES:

1. SEE INTERSECTION LAYOUTS FOR ADDITIONAL INFORMATION.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB

POINT CHART				
PT	BASELINE	STATION	OFFSET	ELEVATION
A	FM 3097	0+12.88	56.31' LT	566.50
B	FM 3097	0+27.82	50.26' LT	566.62
C	FM 3097	0+39.05	49.00' LT	566.75
D	FM 3097	0+83.67	38.00' RT	566.75
E	FM 3097	0+71.82	45.50' RT	566.86
F	FM 3097	0+94.98	52.06' RT	566.83
G	FM 3097	1+16.93	66.04' RT	566.73
H	FM 3097	1+70.66	38.00' RT	565.86

STATE OF TEXAS
ROBIN R. HANDEL
86931
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PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

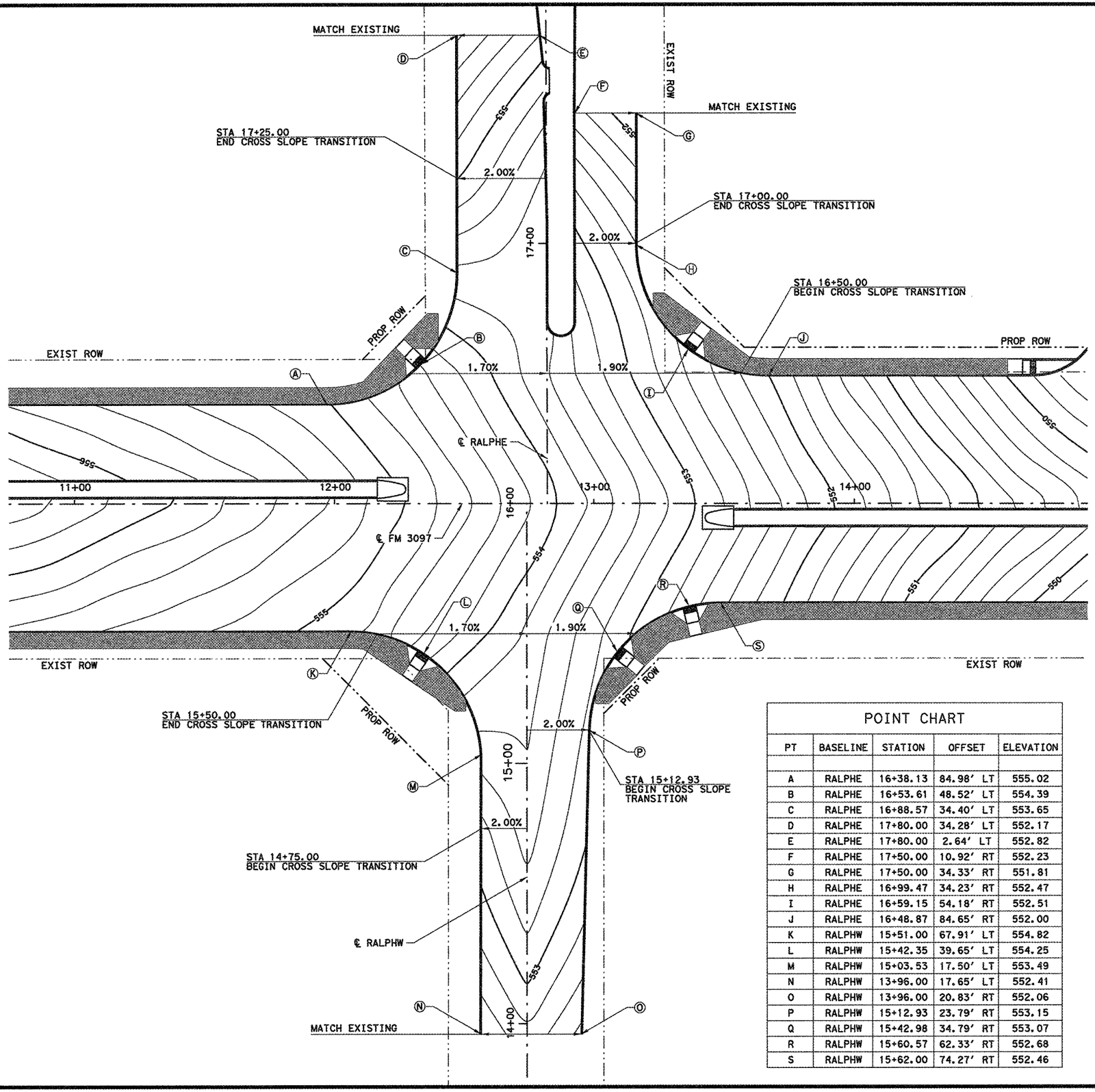
Texas Department of Transportation

GRADING LAYOUT
FM 740

Designed:	KLP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	KLP	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006	93

SHEET 1 OF 3

5/1/2014 7:10:01 PM jroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDlc01.dgn



20 10 0 20 40
SCALE FEET

NOTES:

1. SEE INTERSECTION LAYOUTS FOR ADDITIONAL INFORMATION.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB

POINT CHART

PT	BASELINE	STATION	OFFSET	ELEVATION
A	RALPHE	16+38.13	84.98' LT	555.02
B	RALPHE	16+53.61	48.52' LT	554.39
C	RALPHE	16+88.57	34.40' LT	553.65
D	RALPHE	17+80.00	34.28' LT	552.17
E	RALPHE	17+80.00	2.64' LT	552.82
F	RALPHE	17+50.00	10.92' RT	552.23
G	RALPHE	17+50.00	34.33' RT	551.81
H	RALPHE	16+99.47	34.23' RT	552.47
I	RALPHE	16+59.15	54.18' RT	552.51
J	RALPHE	16+48.87	84.65' RT	552.00
K	RALPHW	15+51.00	67.91' LT	554.82
L	RALPHW	15+42.35	39.65' LT	554.25
M	RALPHW	15+03.53	17.50' LT	553.49
N	RALPHW	13+96.00	17.65' LT	552.41
O	RALPHW	13+96.00	20.83' RT	552.06
P	RALPHW	15+12.93	23.79' RT	553.15
Q	RALPHW	15+42.98	34.79' RT	553.07
R	RALPHW	15+60.57	62.33' RT	552.68
S	RALPHW	15+62.00	74.27' RT	552.46

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

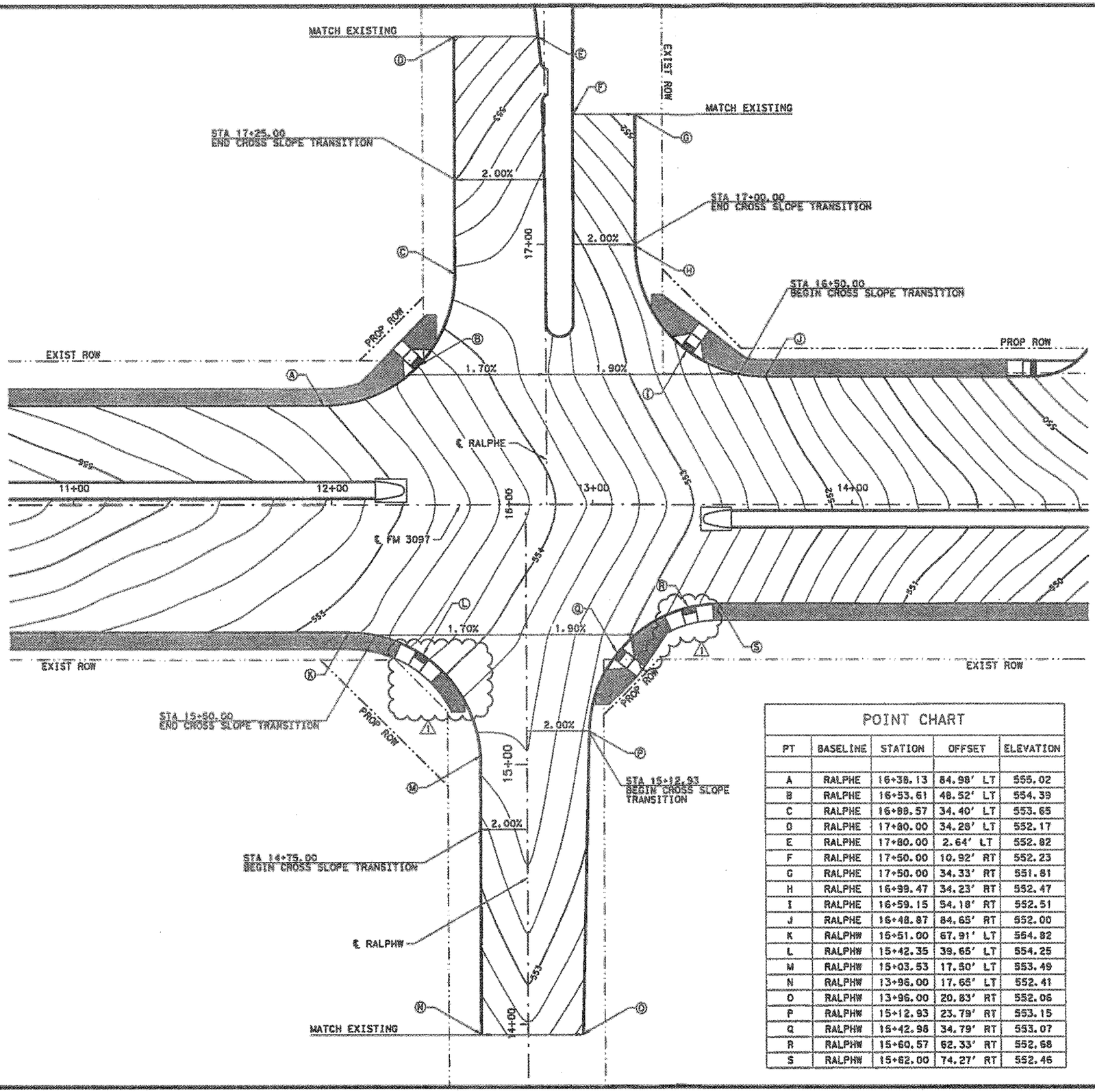
Texas Department of Transportation

GRADING LAYOUT
RALPH HALL PKWY

Designed:	KLP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.	
Checked:	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097	
Drawn:	KLP	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
Checked:	RRH	DAL	ROCKWALL	3148	01	006	94	

SHEET 2 OF 3

5/1/2014 7:10:38 PM lroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404R01c02.dgn



POINT CHART				
PT	BASELINE	STATION	OFFSET	ELEVATION
A	RALPHE	16+38.13	84.98' LT	555.02
B	RALPHE	16+53.61	48.52' LT	554.39
C	RALPHE	16+88.57	34.40' LT	553.65
D	RALPHE	17+80.00	34.28' LT	552.17
E	RALPHE	17+80.00	2.64' LT	552.82
F	RALPHE	17+50.00	10.92' RT	552.23
G	RALPHE	17+50.00	34.33' RT	551.81
H	RALPHE	16+99.47	34.23' RT	552.47
I	RALPHE	16+59.15	54.18' RT	552.51
J	RALPHE	16+48.87	84.65' RT	552.00
K	RALPHW	15+51.00	67.91' LT	554.82
L	RALPHW	15+42.35	39.65' LT	554.25
M	RALPHW	15+03.53	17.50' LT	553.49
N	RALPHW	13+96.00	17.66' LT	552.41
O	RALPHW	13+96.00	20.83' RT	552.06
P	RALPHW	15+12.93	23.79' RT	553.15
Q	RALPHW	15+42.98	34.79' RT	553.07
R	RALPHW	15+60.57	62.33' RT	552.68
S	RALPHW	15+62.00	74.27' RT	552.46

N

20 10 0 20 40
SCALE FEET

NOTES:

1. SEE INTERSECTION LAYOUTS FOR ADDITIONAL INFORMATION.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB

STATE OF TEXAS
ROBIN K. HANDEL
88931
LICENSED
PROFESSIONAL ENGINEER

12/15/17

NO.	REVISION	BY	DATE
1	CHANGE ORDER #15	KLP	12/15/17

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

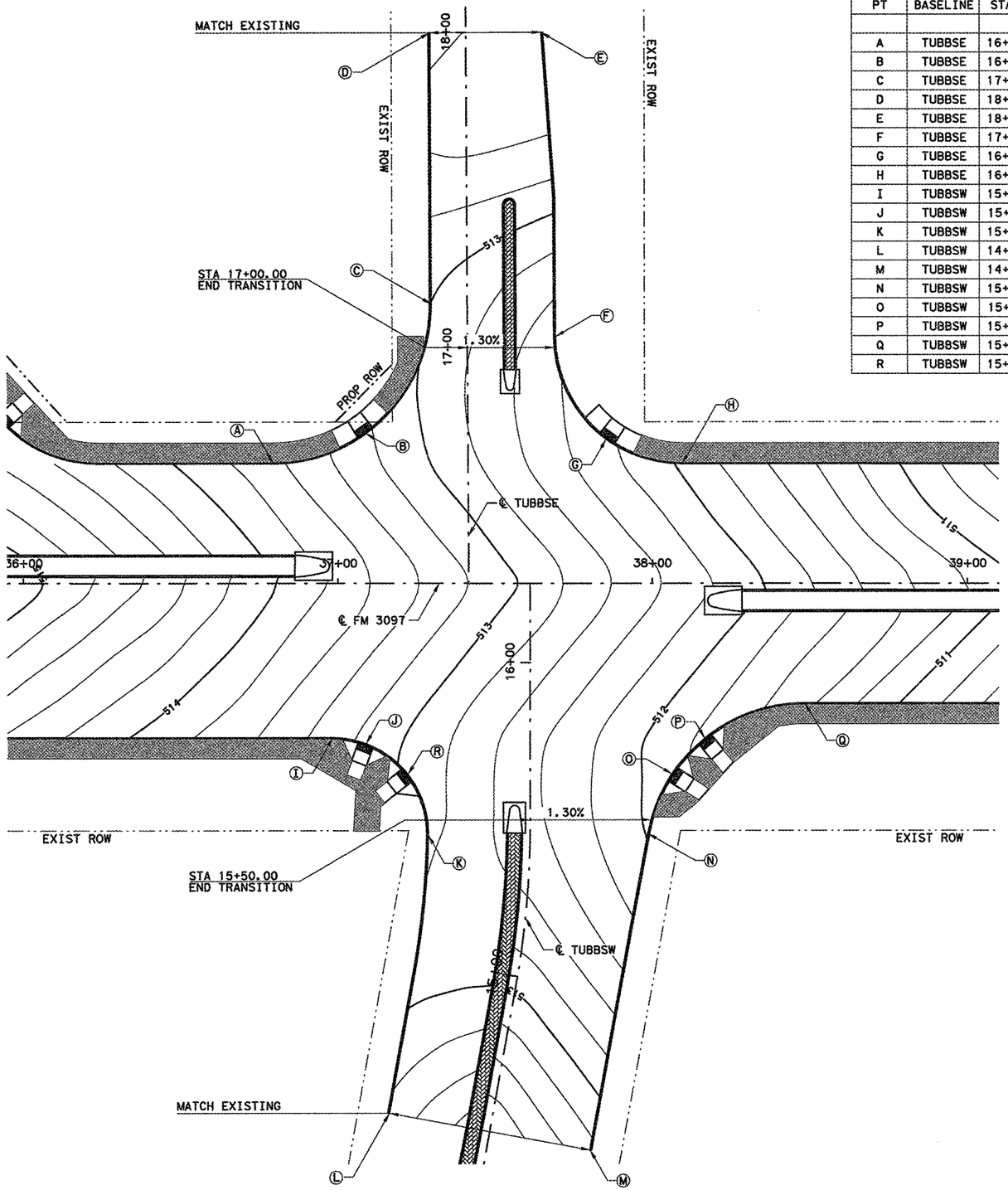
Texas Department of Transportation

GRADING LAYOUT
RALPH HALL PKWY

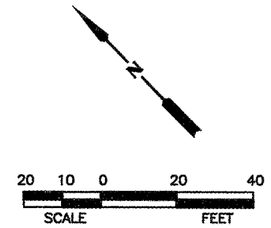
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Checked	JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn	KLP	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	RRH	DAL	ROCKWALL	3148	01	006	94 A

SHEET 2 OF 3

12/15/2017 12:15:16 PM kparry J:\Active Projects\TXNR12004.04\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.04 Roadway\120404801ic02.dgn



POINT CHART				
PT	BASELINE	STATION	OFFSET	ELEVATION
A	TUBBSE	16+63.39	62.20' LT	513.64
B	TUBBSE	16+72.88	32.52' LT	513.23
C	TUBBSE	17+13.89	11.50' LT	513.00
D	TUBBSE	18+00.00	11.50' LT	513.30
E	TUBBSE	18+00.00	23.99' RT	513.48
F	TUBBSE	17+03.37	28.00' RT	512.50
G	TUBBSE	16+70.76	43.99' RT	512.25
H	TUBBSE	16+62.87	67.84' RT	511.97
I	TUBBSW	15+76.14	63.03' LT	513.29
J	TUBBSW	15+74.21	52.35' LT	513.15
K	TUBBSW	15+44.57	32.50' LT	512.85
L	TUBBSW	14+50.00	32.50' LT	513.26
M	TUBBSW	14+50.00	32.50' RT	513.26
N	TUBBSW	15+46.13	37.28' RT	511.99
O	TUBBSW	15+64.61	44.89' RT	511.86
P	TUBBSW	15+75.88	55.15' RT	511.75
Q	TUBBSW	15+87.14	86.94' RT	511.45
R	TUBBSW	15+64.45	39.03' LT	512.96



NOTES:

1. SEE INTERSECTION LAYOUTS FOR ADDITIONAL INFORMATION.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB



05/02/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

GRADING LAYOUT
TUBBS RD

		FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	KLP	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	KLP	DAL	ROCKWALL	3148	01	006	95
Checked:	RRH						

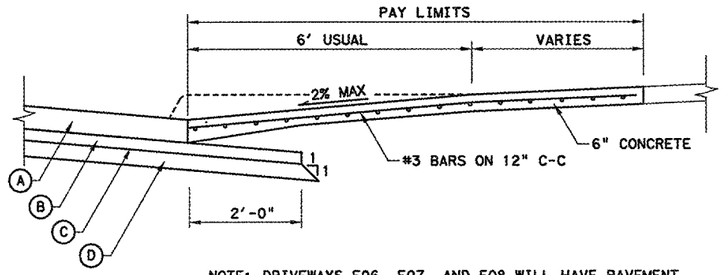
SHEET 3 OF 3

5/1/2014 7:11:33 PM iroberts ow:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/120404RDlc04.dgn

5/1/2014 7:16:38 PM jroberts pw:\Active Projects\TXNR12004_04\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.04 Roadway\Details\120404RD3d01.dgn

LEGEND

- (A) CONC PVMT (CONT REINF-CRCP) (8")
- (B) D-GR HMA (QCQA) TY-B PG 64-22 (4")
- (C) PRIME COAT (MC-30 OR AE-P)
- (D) FL BS (CMP IN PLC) (TY A GR 4) (FNAL POS) (6")



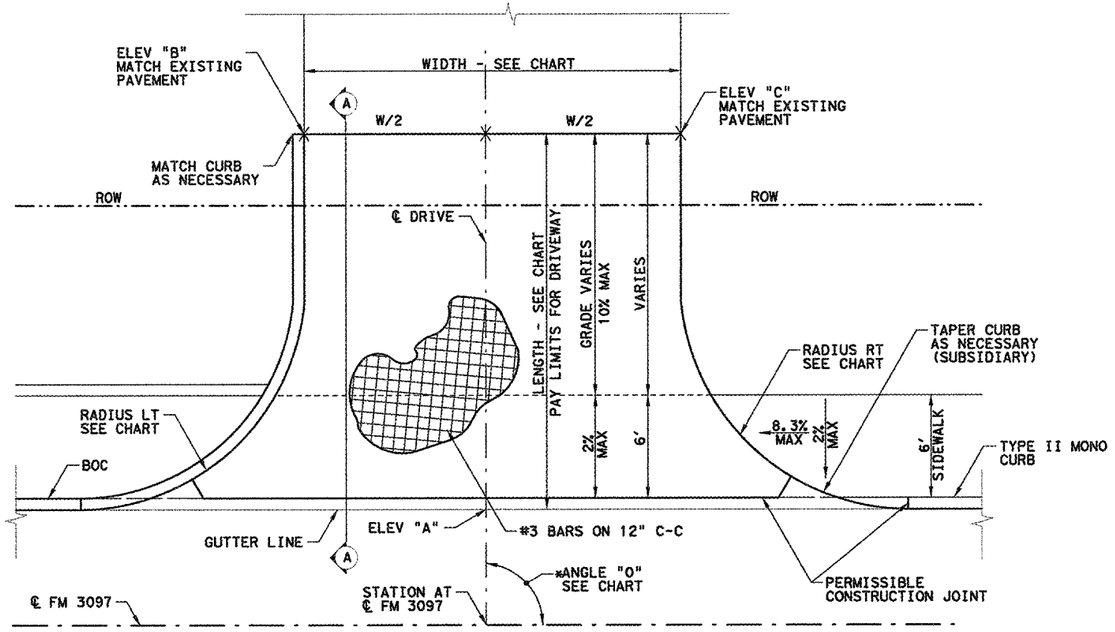
NOTE: DRIVEWAYS E06, E07, AND E08 WILL HAVE PAVEMENT SECTIONS EQUAL TO THAT OF THE MAINLANES.

SECTION "A-A"
SCALE: NTS

DRIVEWAY DETAIL

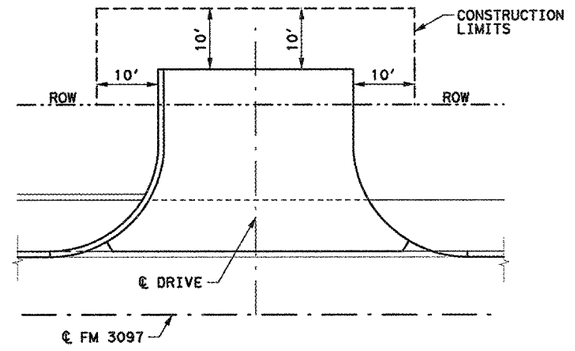
DRIVEWAY NUMBER	BASELINE	TYPE	STATION	ANGLE ℄	ELEV "A"	ELEV "B"	ELEV "C"	RADIUS LT (FT)	RADIUS RT (FT)	WIDTH (FT)	LENGTH (FT)	DRIVEWAY CONC (SY)
E01	FM 3097	CONCRETE	2+23.03	90°00'00"	564.32	565.49	564.45	30	30	36.12	29.82	169
E02	FM 3097	CONCRETE	4+15.39	90°00'00"	561.14	563.52	563.12	30	30	35.94	35.89	194
E04	FM 3097	CONCRETE	9+71.66	90°00'00"	556.69	558.65	558.69	30	30	40.44	30.62	151
E05	FM 3097	CONCRETE	15+08.13	90°00'00"	549.45	551.32	551.43	25	30	27.88	32.93	146
*E06	FM 3097	CONCRETE	26+55.30	90°00'00"	526.75	529.88	529.37	40	40	28.20	46.65	*
*E07	FM 3097	CONCRETE	33+34.78	90°00'00"	517.92	519.98	519.79	40	40	28.10	48.32	*
*E08	FM 3097	CONCRETE	35+64.99	90°00'00"	514.93	515.28	515.23	40	40	28.07	48.09	*
E09	FM 3097	CONCRETE	44+63.83	90°00'00"	513.29	512.16	513.00	15	15	38.21	29.24	122
W01	FM 3097	CONCRETE	2+72.08	90°00'00"	563.33	565.23	565.44	30	30	46.18	27.30	189
W02	FM 3097	CONCRETE	4+12.51	90°00'00"	561.16	564.32	565.07	25	25	54.97	49.23	222
W03	FM 3097	CONCRETE	7+44.02	90°00'00"	558.51	561.33	561.57	30	30	60.30	54.55	252
W04	FM 3097	CONCRETE	9+77.69	90°00'00"	556.64	558.39	559.52	30	30	50.03	42.62	204
W05	FM 3097	CONCRETE	15+83.01	86°49'06"	548.66	549.62	550.05	30	30	23.40	29.54	126
W06	FM 3097	CONCRETE	29+15.44	90°00'00"	523.36	519.30	516.89	50	50	57.98	51.64	427
W07	FM 3097	CONCRETE	39+83.34	90°00'00"	509.86	509.05	510.05	30	30	31.00	37.00	172

*SEE NOTE UNDER "SECTION A-A" REGARDING PAVEMENT SECTIONS.



*ANGLE SHALL BE MEASURED FROM LOCAL TANGENT IF CENTERLINE IS ON CURVE.

DRIVEWAY PLAN
SCALE: NTS



DRIVEWAY: LIMITS OF CONSTRUCTION
SCALE: NTS

LEGEND

1) DRIVEWAY LOCATIONS MAY BE SHIFTED AT TIME OF CONSTRUCTION AS DIRECTED BY THE EINGINEER TO MATCH EXISTING CONDITIONS.
2) OMIT PAYMENT FOR CURB WITHIN LIMITS OF DRIVEWAY. CURBS ON DRIVEWAYS SHALL BE CONSIDERED SUBSIDIARY TO THE PRICE BID PER SQUARE YARD FOR DRIVEWAY AND WILL NOT BE PAID FOR DIRECTLY.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

05/02/14

NO.	REVISION	BY	DATE

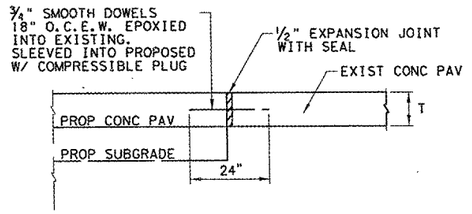
CP&Y
TEXAS REGISTERED ENGINEERING FIRM, F-1741

Texas Department of Transportation

DRIVEWAY DETAIL
FM 3097

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	IWM	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	JBR	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	IWM	DAL	ROCKWALL	3148	01	006	96
Checked:	RRH						

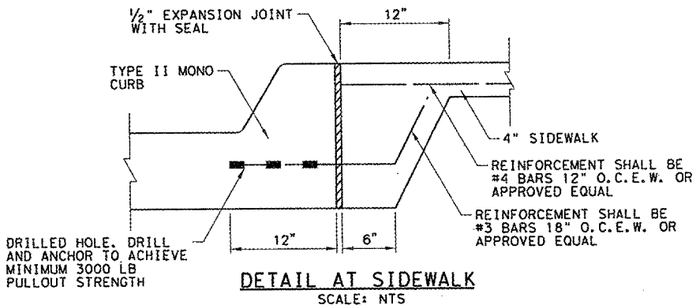
SHEET 1 OF 1



NOTE: SEAL JOINT AGAINST THE CURB

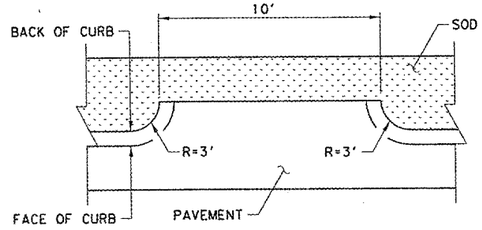
EXPANSION JOINT DETAIL

TO BE USED WHERE PROPOSED CONCRETE PAVEMENT MEETS EXISTING CONCRETE PAVEMENT
SCALE: NTS



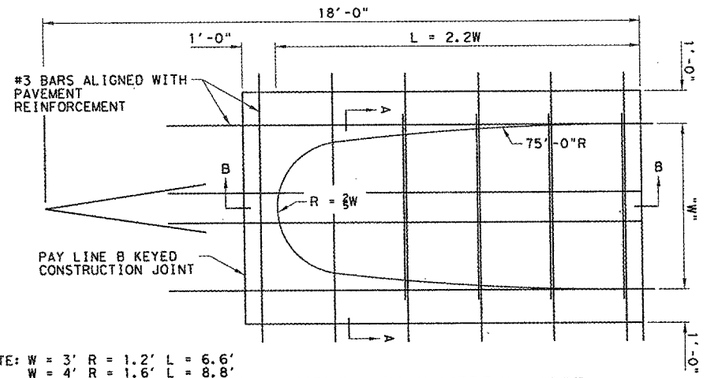
DETAIL AT SIDEWALK

SCALE: NTS



MOWER CURB DETAIL

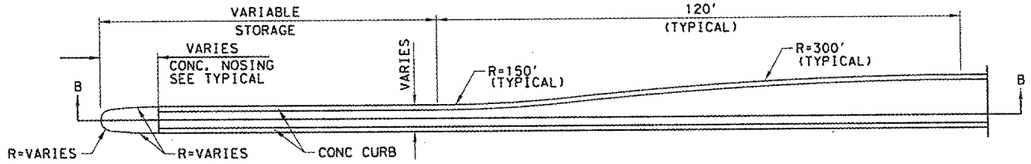
SCALE: NTS



NOTE: W = 3' R = 1.2' L = 6.6'
W = 4' R = 1.6' L = 8.8'
W = 5' R = 2.4' L = 13.2'

MONOLITHIC MEDIAN NOSE

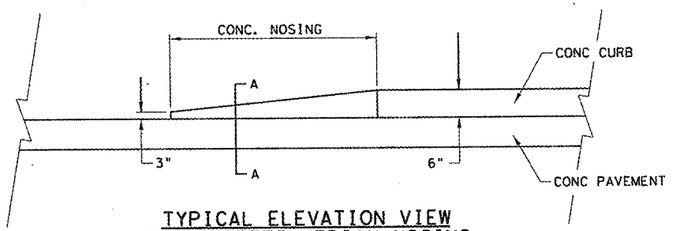
MONOLITHIC MEDIAN NOSE & PAVEMENT WITHIN PAY LINES SHALL BE PAID FOR AS CONCRETE MEDIAN BY THE SQUARE YARD
SCALE: NTS



NOTE: SEE LANDSCAPING PLANS FOR MEDIAN PLANTING INFORMATION.

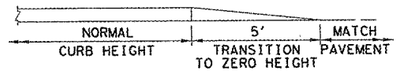
TYPICAL PLAN VIEW MEDIAN NOSE & LEFT TURN BAY

(ALL MEASUREMENTS ARE FROM FACE OF CURB)
SCALE: NTS



TYPICAL ELEVATION VIEW OF CONCRETE MEDIAN NOSING

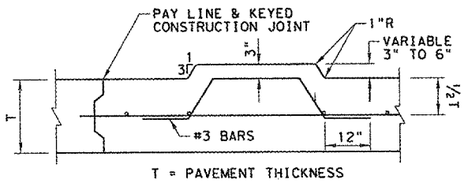
SCALE: NTS



CURB TRANSITION DETAIL

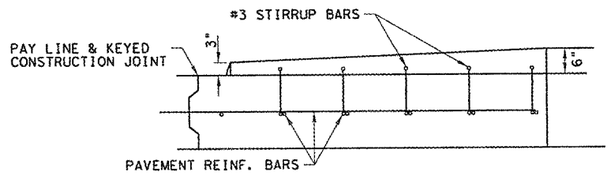
SCALE: NTS

1 Replaced, 7/2/14 R.T.

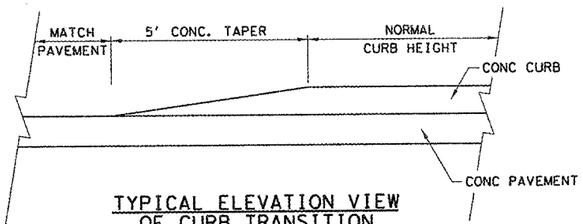


T = PAVEMENT THICKNESS

SECTION A-A

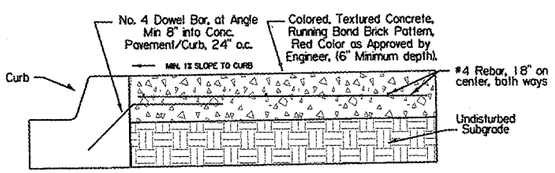


SECTION B-B



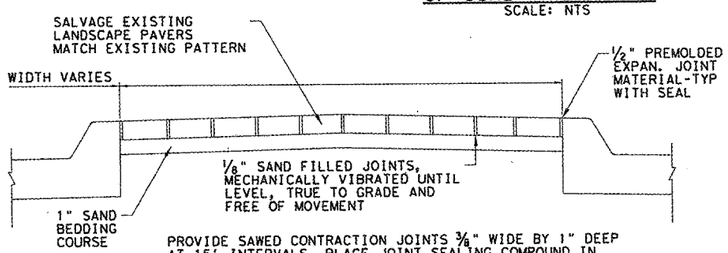
TYPICAL ELEVATION VIEW OF CURB TRANSITION

SCALE: NTS



COLORED, TEXTURED CONCRETE DETAIL

AT CONCRETE CURBS N.T.S.



PROVIDE SAWED CONTRACTION JOINTS 3/8" WIDE BY 1" DEEP AT 15' INTERVALS. PLACE JOINT SEALING COMPOUND IN ACCORDANCE WITH JOINT SEALS CONCRETE PAVING DETAILS.

PAVING STONE MEDIAN SECTION

SCALE: NTS



06/30/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097

MISCELLANEOUS ROADWAY DETAILS

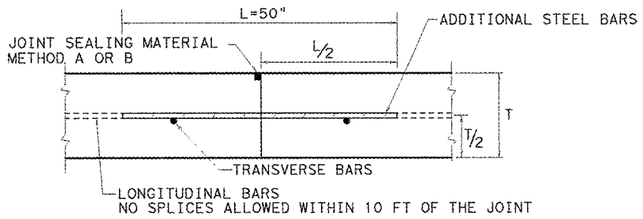
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Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	KLP	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		97

SHEET 1 OF 1

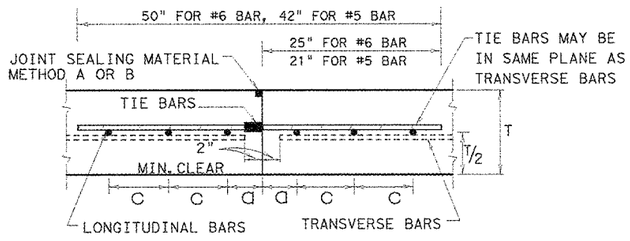
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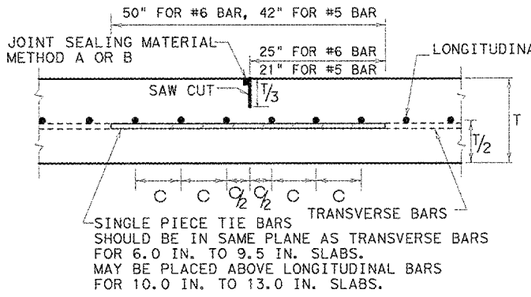
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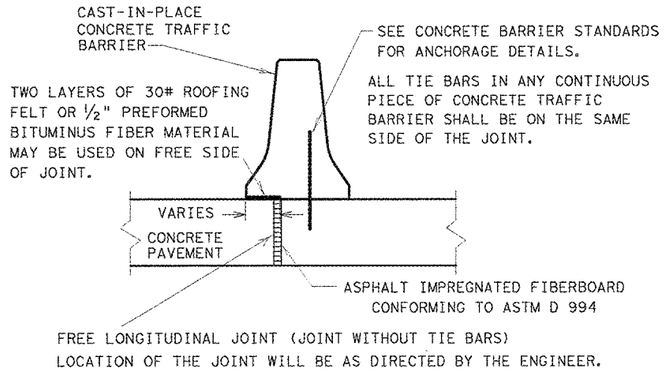
TRANSVERSE CONSTRUCTION JOINT
SECTION X - X



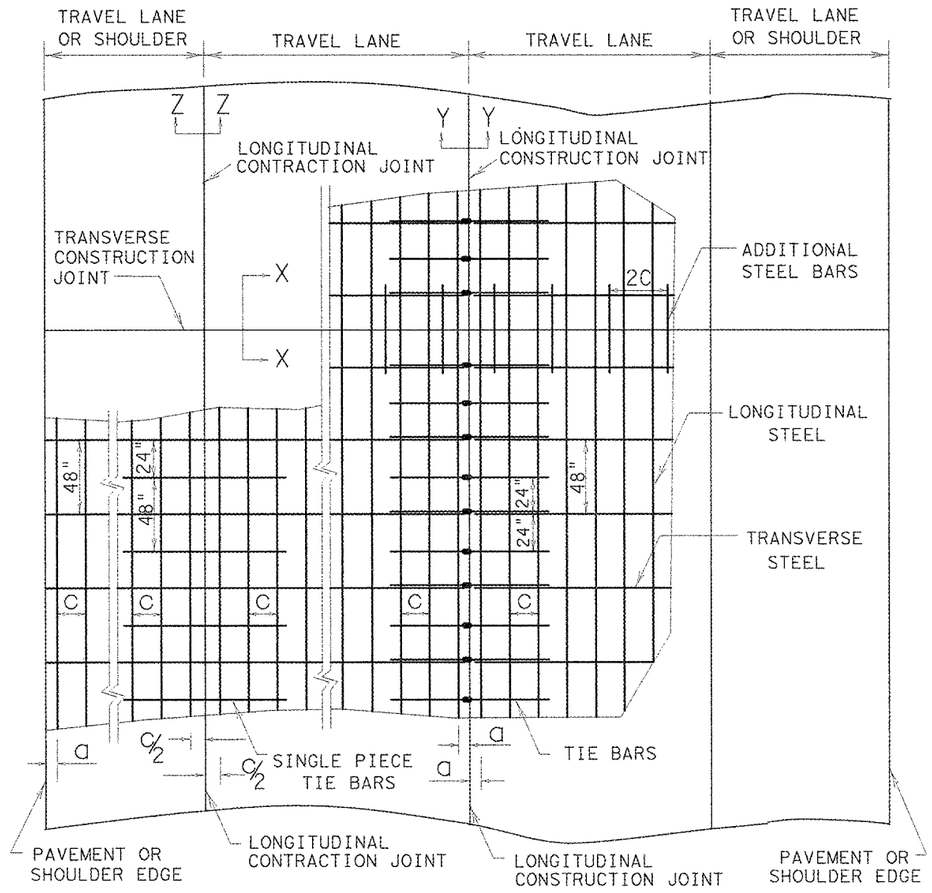
LONGITUDINAL CONSTRUCTION JOINT
SECTION Y - Y



LONGITUDINAL CONTRACTION JOINT
SECTION Z - Z



FREE LONGITUDINAL JOINT DETAIL



TYPICAL PAVEMENT LAYOUT

PLAN VIEW (NOT TO SCALE)

GENERAL NOTES

1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT, ARE NOT COVERED BY THIS STANDARD.
2. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."
3. ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60). STEEL BAR SIZES SHALL CONFORM TO TABLE NO. 1 & 2.
4. STEEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1 IN. HORIZONTALLY AND +/- 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS) SHALL CONFORM TO TABLE NO.1 AND AS SPECIFIED.
5. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
6. THE SAW CUT DEPTH FOR THE LONGITUDINAL CONTRACTION JOINT SHALL BE ONE THIRD OF THE SLAB THICKNESS.
7. WHEN APPROVED BY THE ENGINEER, SINGLE PIECE TIE BARS MAY BE USED BY INSERTING INTO PLASTIC CONCRETE AT LONGITUDINAL CONSTRUCTION JOINTS.
8. WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 IN. OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF TIE BAR.
9. MISSING OR DAMAGED TIE BARS SHALL BE REPLACED BY DRILLING AND EPOXY GROUTING AT THE CONTRACTOR'S EXPENSE.
10. OMIT TIE BARS LOCATED WITHIN 18 IN. OF THE TRANSVERSE CONSTRUCTION JOINTS. USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
11. OBTAIN THE ENGINEER'S WRITTEN APPROVAL, IF THE CONCRETE MIX DESIGN USES MORE THAN 5.5 SACKS/CY.
12. LONGITUDINAL REINFORCING STEEL SPLICES SHALL BE A MINIMUM OF 25 IN.

TABLE NO. 2 TRANSVERSE STEEL AND TIE BARS

SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT		TIE BARS AT LONGITUDINAL CONSTRUCTION JOINT	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
6.0 - 7.5	#5	48	#5	48	#5	24
8.0 - 13.0	#5	48	#6	48	#6	24

TABLE NO. 1 LONGITUDINAL STEEL

SLAB THICKNESS AND BAR SIZE		REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT	
T (IN.)	BAR SIZE	SPACING c (IN.)	SPACING a (IN.)	SPACING 2 x c (IN.)	LENGTH L (IN.)
6.0	#5	7.5	3 TO 4	15	50
6.5	#5	7.0	3 TO 4	14	50
7.0	#5	6.5	3 TO 4	13	50
7.5	#5	6.0	3 TO 4	12	50
8.0	#6	9.0	3 TO 4	18	50
8.5	#6	8.5	3 TO 4	17	50
9.0	#6	8.0	3 TO 4	16	50
9.5	#6	7.5	3 TO 4	15	50

TABLE NO. 1 LONGITUDINAL STEEL (Cont.)

SLAB THICKNESS AND BAR SIZE		REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT	
T (IN.)	BAR SIZE	SPACING c (IN.)	SPACING a (IN.)	SPACING 2 x c (IN.)	LENGTH L (IN.)
10.0	#6	7.0	3 TO 4	14	50
10.5	#6	6.75	3 TO 4	13.5	50
11.0	#6	6.5	3 TO 4	13	50
11.5	#6	6.25	3 TO 4	12.5	50
12.0	#6	6.0	3 TO 4	12	50
12.5	#6	5.75	3 TO 4	11.5	50
13.0	#6	5.5	3 TO 4	11	50

Texas Department of Transportation — Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

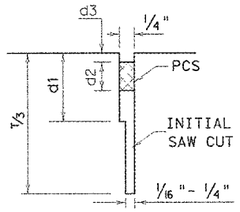
ONE LAYER STEEL BAR PLACEMENT
T - 6 to 13 INCHES

CRCP(1)-11

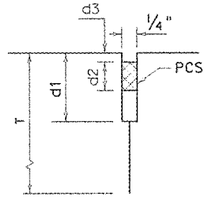
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© TxDOT November 2009	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
10/10/2011 ADD GN #12	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		98

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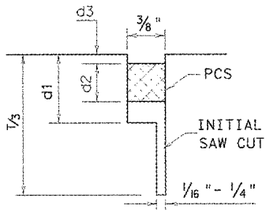


SAWED
LONGITUDINAL JOINT

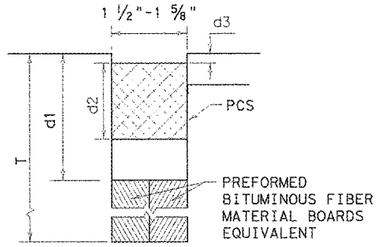


LONGITUDINAL
CONSTRUCTION JOINT

LONGITUDINAL JOINT SEALS



SAWED
CONTRACTION JOINT



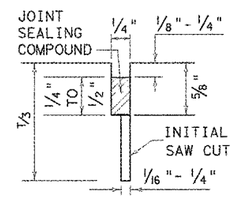
FORMED
FORMED EXPANSION JOINT

TRANSVERSE JOINT SEALS

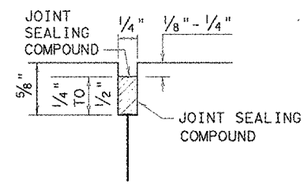
METHOD A: PREFORMED COMPRESSION SEALS (PCS)
(CLASS 6 PREFORMED JOINT SEALANT)

GENERAL NOTES FOR METHOD "A"

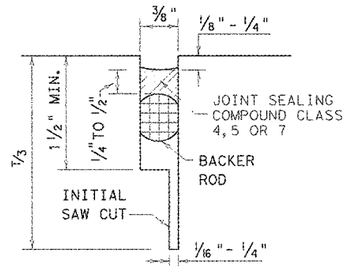
1. UNLESS OTHERWISE SHOWN IN THE PLANS, EITHER METHOD "A" OR METHOD "B" MAY BE USED.
2. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. DIMENSIONS d1, d2, AND d3 SHALL BE IN ACCORDANCE WITH THE PREFORMED COMPRESSION SEAL MANUFACTURES RECOMMENDATION.
4. THE JOINT RESERVOIR FOR SEALANT SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION AND THE TWO SAWED JOINTS.
5. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 AND PRIOR TO BEGINNING OPERATIONS, THE CONTRACTOR SHALL SUBMIT A STATEMENT FROM THE SEALANT MANUFACTURER SHOWING THE RECOMMENDED EQUIPMENT AND INSTALLATION PROCEDURES TO BE USED.
6. THE SAW CUT FOR THE LONGITUDINAL JOINT SHALL BE ONE FOURTH THE SLAB THICKNESS WHEN CRUSHED LIMESTONE IS USED AS THE COARSE AGGREGATE.



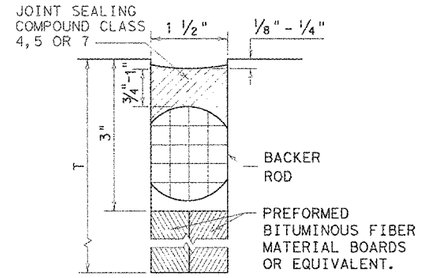
SAWED
LONGITUDINAL JOINT



LONGITUDINAL OR TRANSVERSE
CONSTRUCTION JOINT



TRANSVERSE SAWED
CONTRACTION JOINT



TRANSVERSE FORMED
EXPANSION JOINT

METHOD B: JOINT SEALING COMPOUND

GENERAL NOTES FOR METHOD "B"

1. UNLESS OTHERWISE SHOWN IN THE PLANS, EITHER METHOD "A" OR METHOD "B" MAY BE USED.
2. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. THE ENGINEER SHALL SELECT A TARGET PLACEMENT THICKNESS FOR THE SEALANT DETAILS WHICH SHOW RANGES IN THICKNESS. THE TARGET THICKNESS WILL NORMALLY BE THE MIDPOINT OF THE RANGE.
4. THE JOINT RESERVOIR FOR SEALANT SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION AND THE TWO SAWED JOINTS.
5. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 AND PRIOR TO BEGINNING OPERATIONS, THE CONTRACTOR SHALL SUBMIT A STATEMENT FROM THE SEALANT MANUFACTURER SHOWING THE RECOMMENDED EQUIPMENT AND INSTALLATION PROCEDURES TO BE USED.
6. THE SAW CUT FOR THE LONGITUDINAL JOINT SHALL BE ONE FOURTH THE SLAB THICKNESS WHEN CRUSHED LIMESTONE IS USED AS THE COARSE AGGREGATE.

Texas Department of Transportation

Design Division Standard

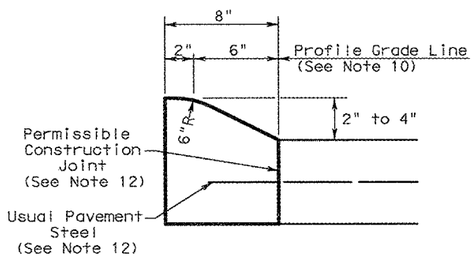
CONCRETE PAVING DETAILS
JOINT SEALS

JS-94

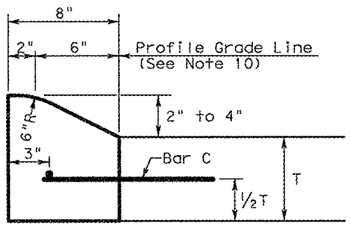
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©TxDOT September 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		99

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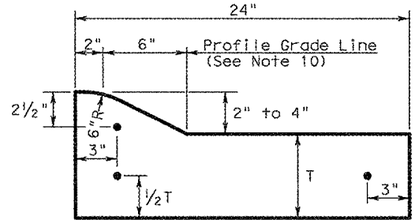
DATE:
FILE:



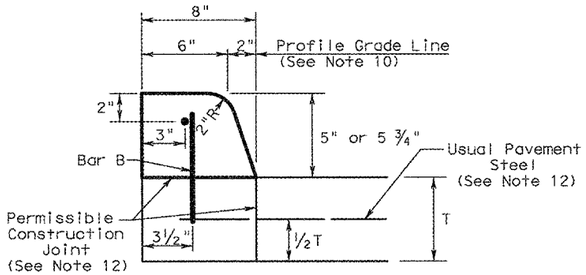
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



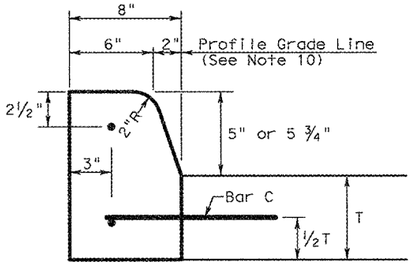
TYPE I CURB
2" - 4" HEIGHT



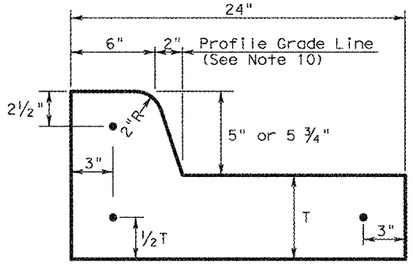
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



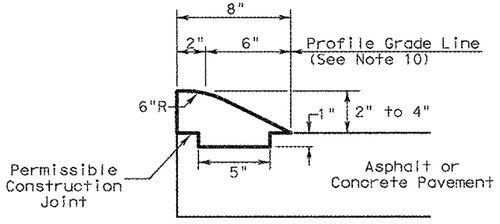
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



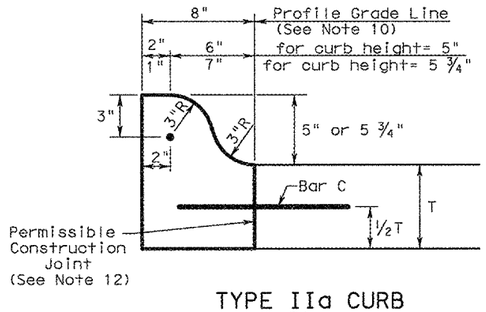
TYPE II CURB
5" - 5 ¾" HEIGHT



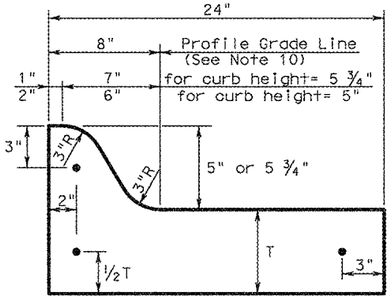
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



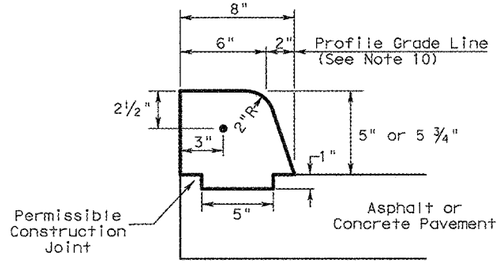
TYPE III CURB (KEYED)
2" - 4" HEIGHT



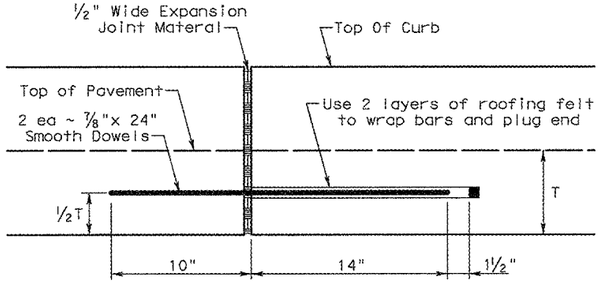
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

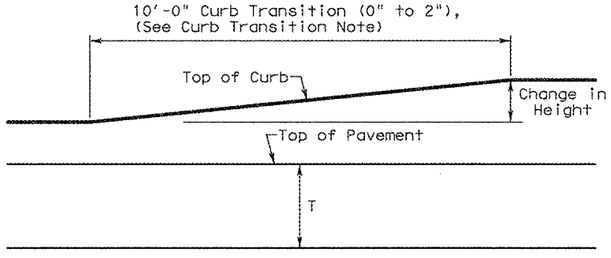


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

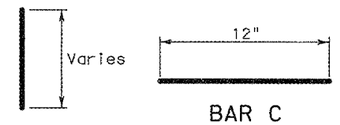
Curb Transition Note:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

General Notes

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No. 4 unless otherwise shown. The use of synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Producer List (MPL), maintained by TxDOT, Construction Division.
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is placed on existing concrete pavement, the pavement shall be drilled and the reinforcing bars grouted in place.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When vertical permissible construction joints are used, resulting in a longitudinal construction joint in the pavement, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans for longitudinal construction joints. Reinforcing steel for curb section shall then conform to that required for concrete curb.



BAR B BAR C

Texas Department of Transportation

Design Division Standard

CONCRETE CURB AND CURB AND GUTTER

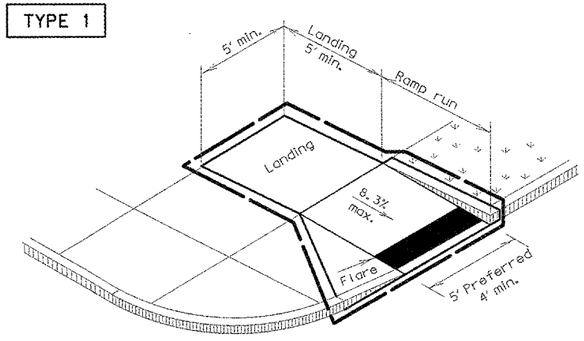
CCCG-12

FILE: cccg12	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		100

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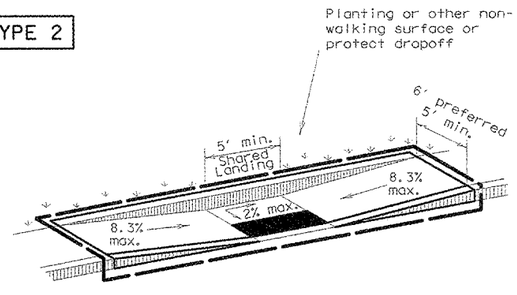
DATE:
FILE:

TYPE 1



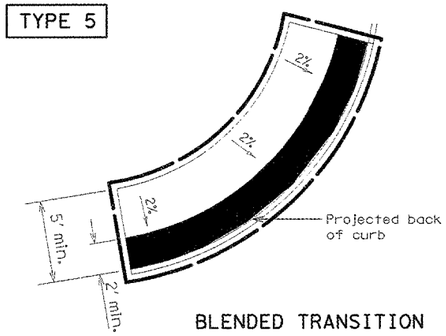
PERPENDICULAR CURB RAMP

TYPE 2



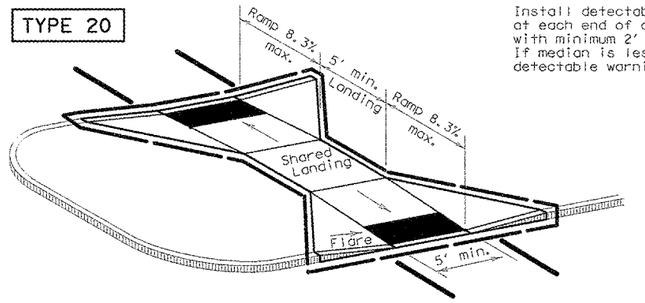
PARALLEL CURB RAMP
(Use only where water will not pond in the landing.)

TYPE 5



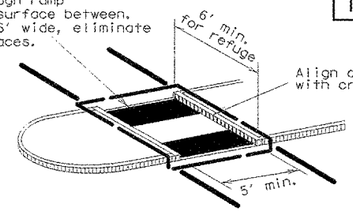
BLENDED TRANSITION

TYPE 20



Install detectable warning surface at each end of cut-through ramp with minimum 2' smooth surface between. If median is less than 6' wide, eliminate detectable warning surfaces.

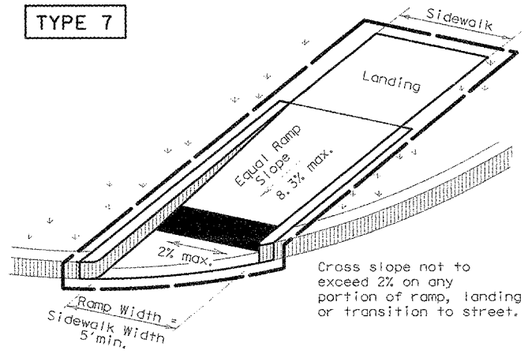
TYPE 21



Curb details are shown elsewhere in the plans.

CURB RAMPS AT MEDIAN ISLANDS

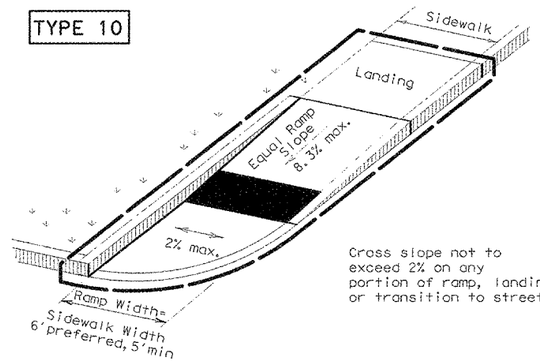
TYPE 7



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

(Sidewalk set back from curb)

TYPE 10

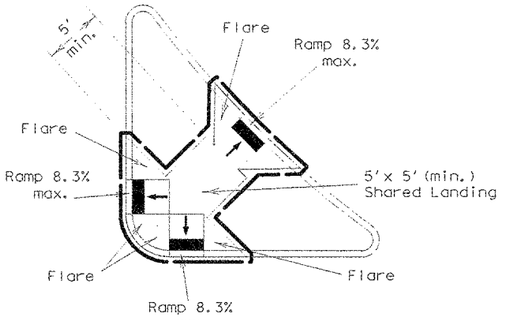


Cross slope not to exceed 2% on any portion of ramp, landing or transition to street.

(Sidewalk adjacent to curb)

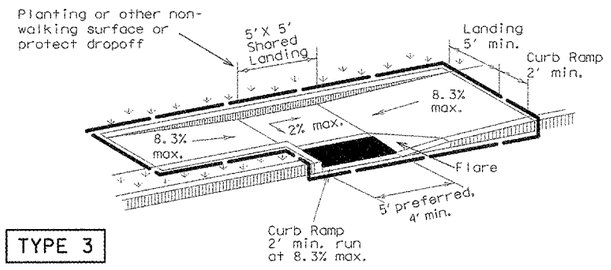
DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 22

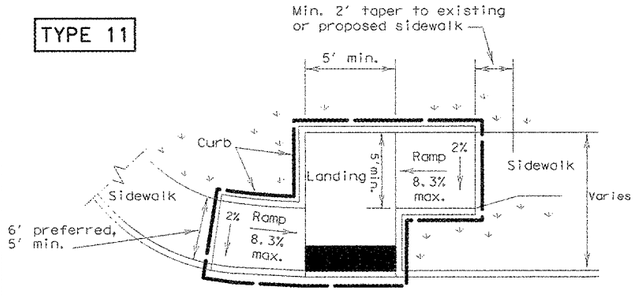


COMBINATION ISLAND RAMPS

TYPE 3

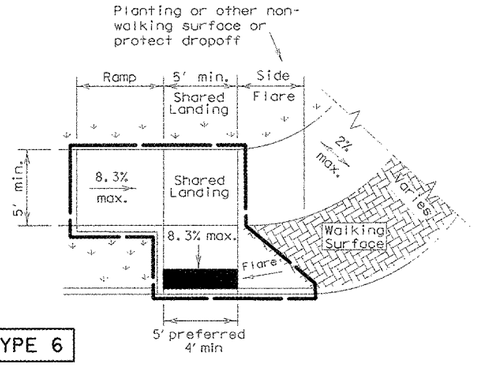


TYPE 11



OFFSET PARALLEL CURB RAMP

TYPE 6



COMBINATION CURB RAMPS

NOTES / LEGEND:

See General Notes on sheet 2 of 4 for more information.

Denotes planting or non-walking surface not part of pedestrian circulation path.

Ramp Limits of Payment

Detectable Warning Surface

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

FILE: ped12a.dgn	DN: TxDOT	CK: PK	DW: TxDOT	CK: HD
©TxDOT March 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
VP June 13, 2012	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		101

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DATE:
FILE:

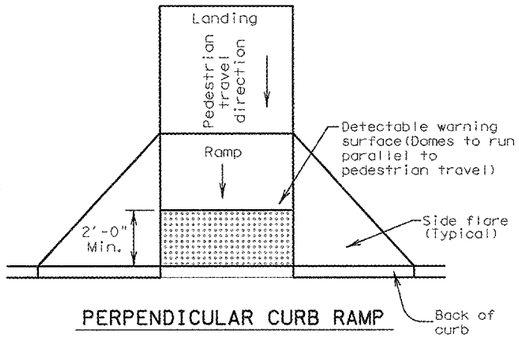
General Notes

Curb Ramps

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Lesser slopes that will still drain properly should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
4. Landings shall be 5'x 5' minimum with a maximum 2% slope in any direction.
5. Maneuvering space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
6. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the current edition of the Texas Accessibility Standards (TAS) and 16 TAC 68.102.
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Handrails are not required on curb ramps. Provide curb ramps wherever on accessible route crosses (penetrates) a curb.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Provide a smooth transition where the curb ramps connect to the street.
16. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
17. Existing features that comply with TAS may remain in place unless otherwise shown on the plans.

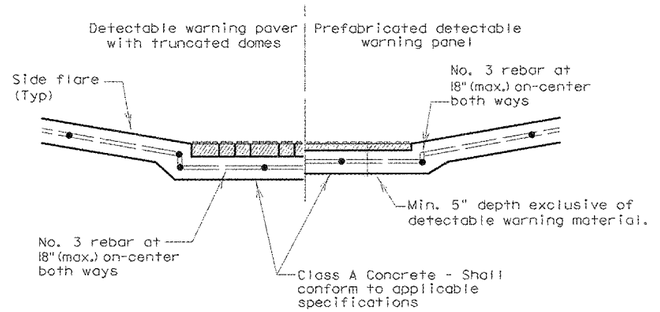
Detectable Warning Material

18. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with Section 705 of the TAS. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
19. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
20. Detectable warning surfaces must be slip resistant and not allow water to accumulate.
21. Detectable warning surfaces shall be a minimum of 24" in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
22. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb. Align the rows of domes to be perpendicular to the grade break between the ramp run and the street. Detectable warning surfaces may be curved along the corner radius.
23. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

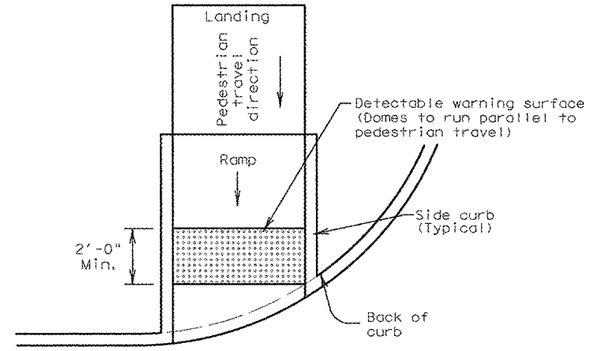


PERPENDICULAR CURB RAMP

Typical placement of detectable warning surface on sloping ramp run.

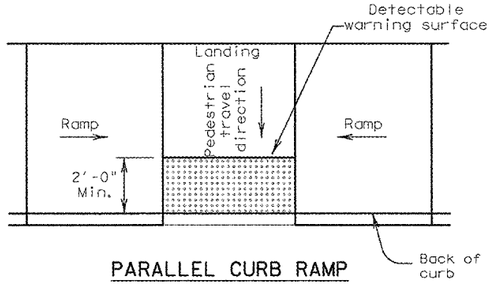


SECTION: CURB RAMP AT DETECTABLE WARNING



DIRECTIONAL CURB RAMP

Typical placement of detectable warning surface on sloping ramp run.



PARALLEL CURB RAMP

Typical placement of detectable warning surface on landing at street edge.

DETECTABLE WARNINGS

Detectable Warning Pavers

24. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
25. Lay full-size units first followed by closure units consisting of at least 25 percent of a full unit. Cut detectable warning paver units using a power saw.

Sidewalks

26. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within one or more reach ranges specified in TAS 308.
27. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
28. Street grades and cross slopes shall be as shown elsewhere in the plans.
29. Changes in level greater than 1/4 inch are not permitted.
30. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than 5% must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with TAS 505.
31. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
32. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
33. Sidewalk details are shown elsewhere in the plans.

Texas Department of Transportation

Design Division Standard

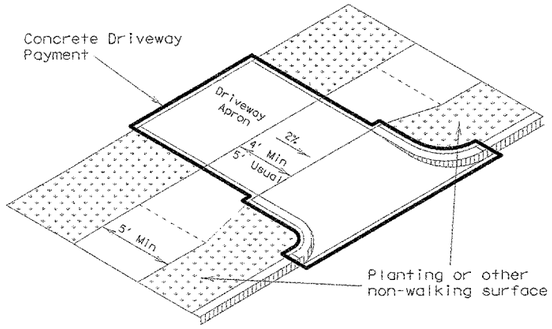
PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

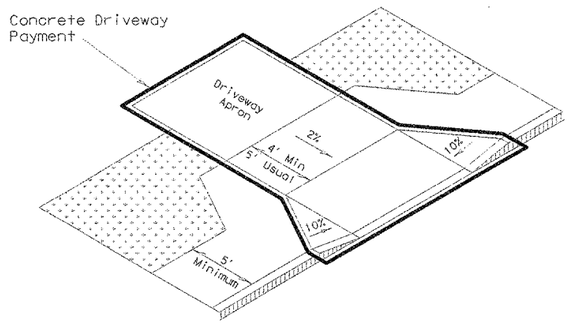
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© TxDOT March 2002		CONT	SECT	JOB		HIGHWAY	
REVISIONS		3148	01	006		FM 3097	
VP June 13, 2012		DIST	COUNTY			SHEET NO.	
		DAL	ROCKWALL			102	

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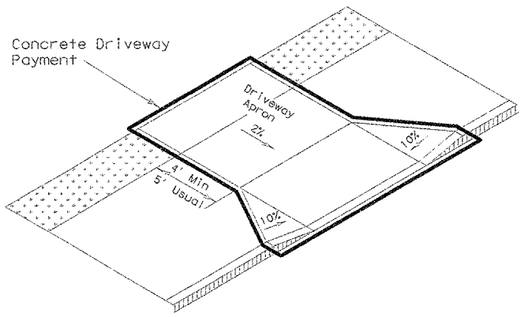
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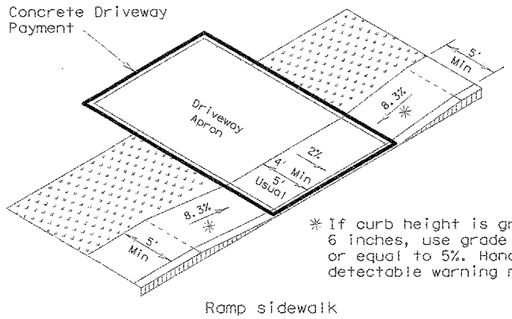
Setback sidewalk



Apron offset sidewalk



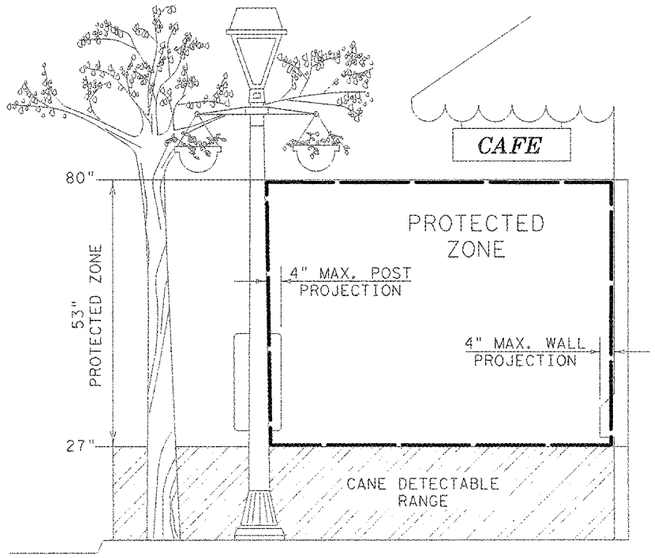
Wide sidewalk



* If curb height is greater than 6 inches, use grade less than or equal to 5%. Handrail and detectable warning not required.

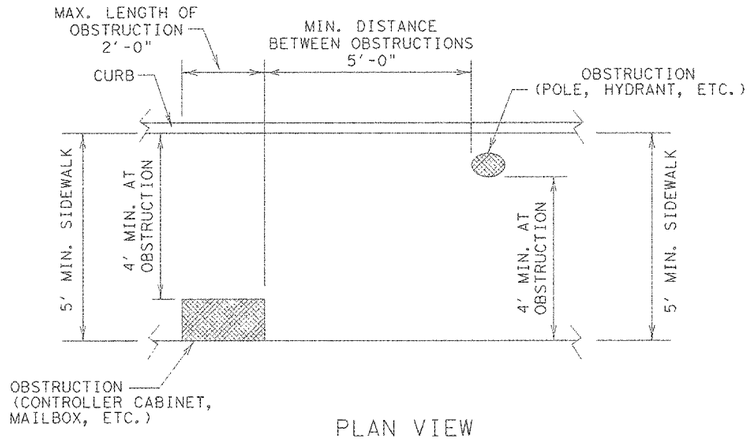
Ramp sidewalk

SIDEWALK TREATMENT AT DRIVEWAYS



PROTECTED ZONE

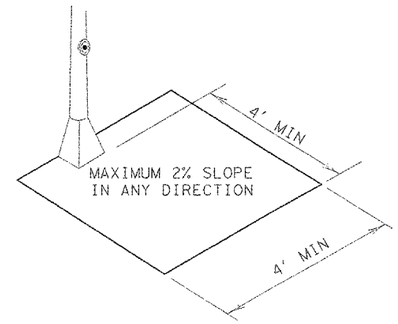
In pedestrian circulation area, maximum 4" projection for post or wall mounted objects between 27"and 80" above the surface.



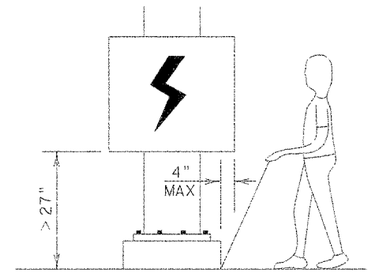
PLAN VIEW

PLACEMENT OF STREET FIXTURES

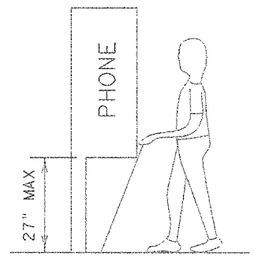
(ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)



CLEAR GROUND SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



When an obstruction of a height greater than 27" from the surface would create a protrusion of more than 4" into the pedestrian circulation area, construct additional curb or foundation at the bottom to provide a maximum 4" overhang.



Protruding objects of a height ≤ 27" are detectable by cane and do not require additional treatment.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

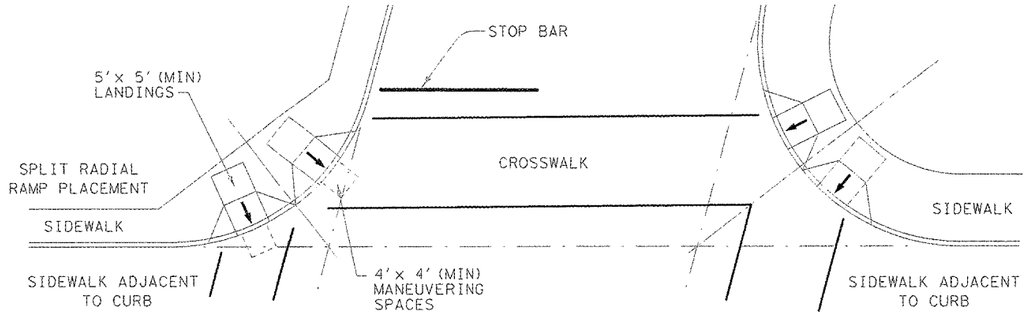
PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

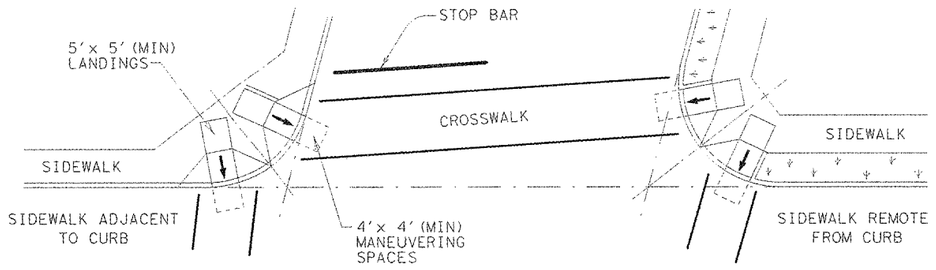
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© TxDOT March 2002	CONT	SECT	JOB	HIGHWAY		
REVISIONS	3148	01	006	FM 3097		
VP June 13, 2012	DIST	COUNTY		SHEET NO.		
	DAL	ROCKWALL		103		

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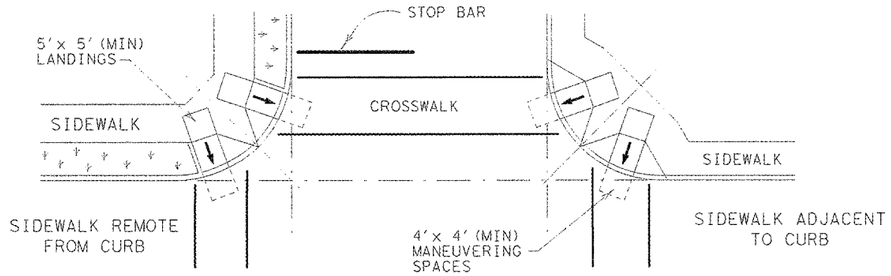
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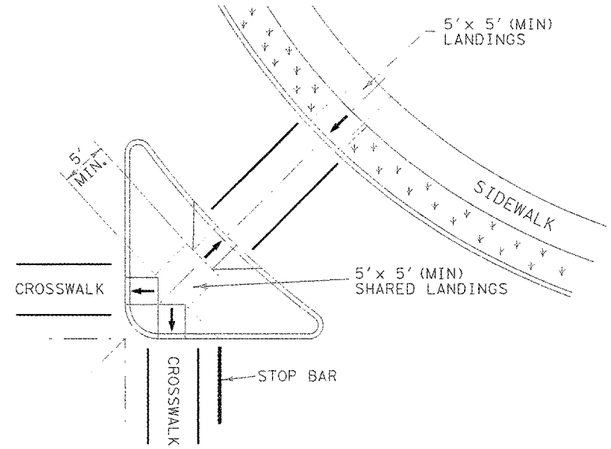
SKEWED INTERSECTION WITH "LARGE" RADIUS



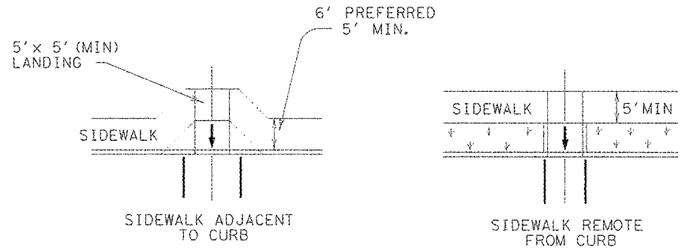
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

TYPICAL CROSSING LAYOUTS

Texas Department of Transportation | Design Division Standard

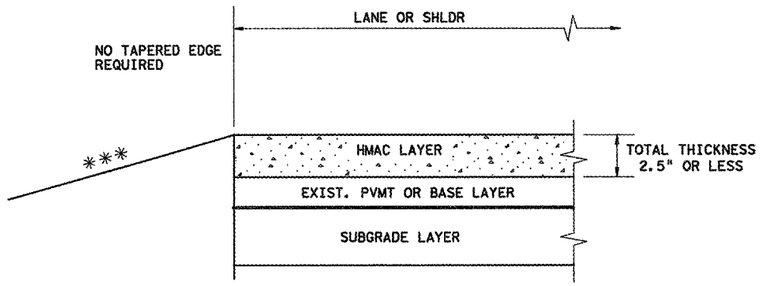
PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

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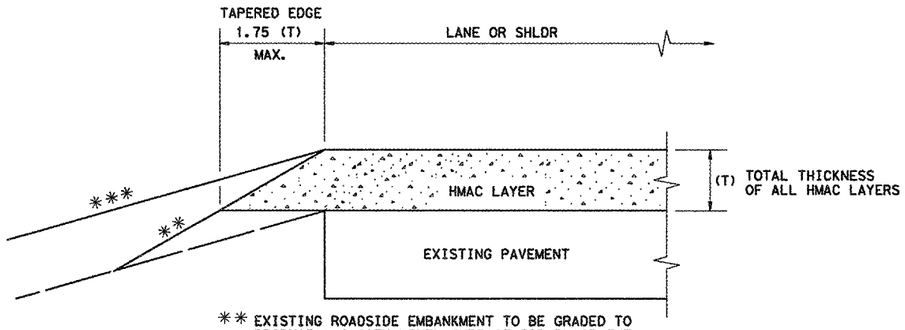
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*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 1

THIN HMAC SURFACES OR HMAC OVERLAY
WITH THICKNESS OF 2.5" OR LESS

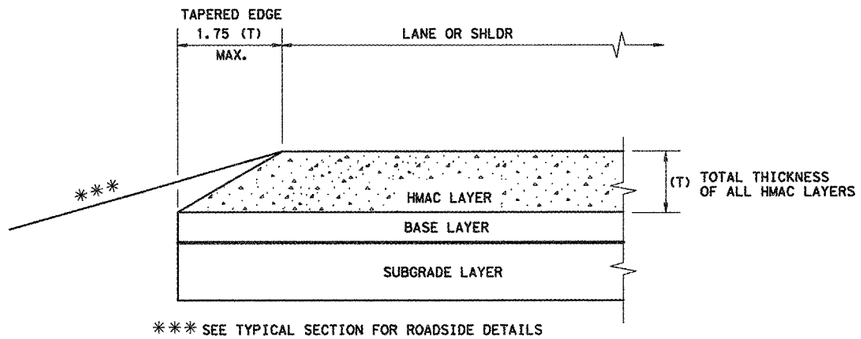


** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2

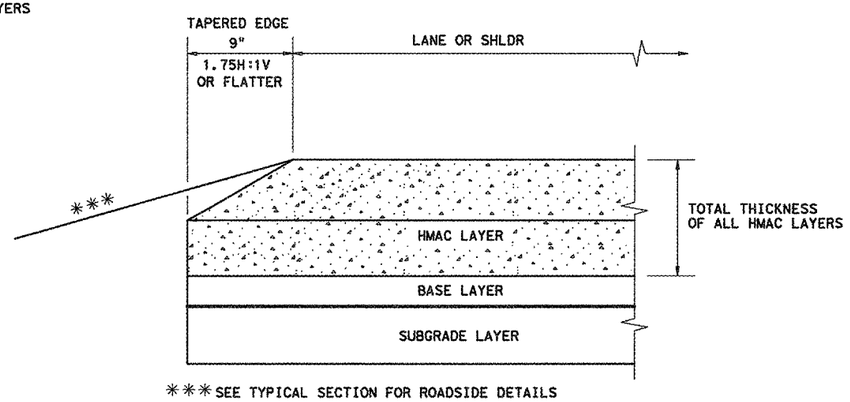
OVERLAY OF EXISTING PAVEMENT
HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3

NEW OR RECONSTRUCTED PAVEMENT
HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4

NEW OR RECONSTRUCTED PAVEMENT
HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

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Design Division Standard

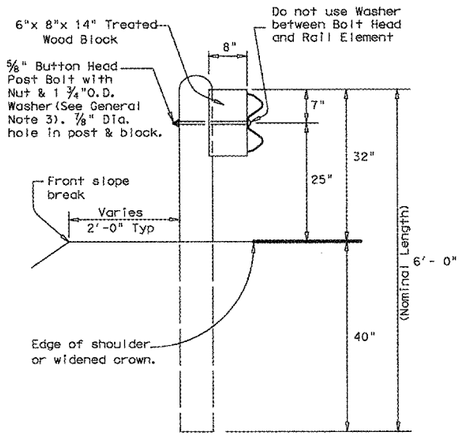
TAPERED EDGE DETAILS
HMAC PAVEMENT

TE(HMAC)-11

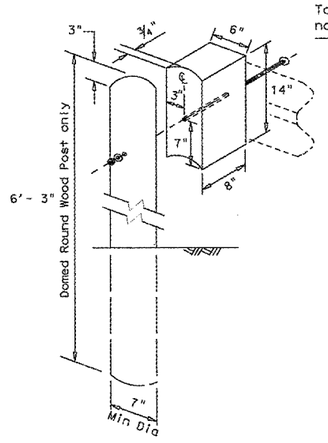
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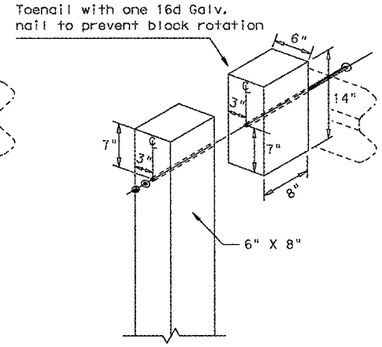
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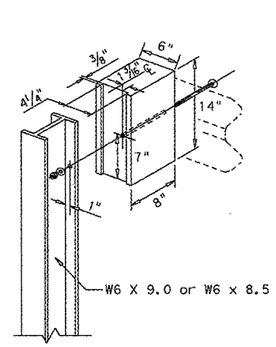
TYPICAL POST



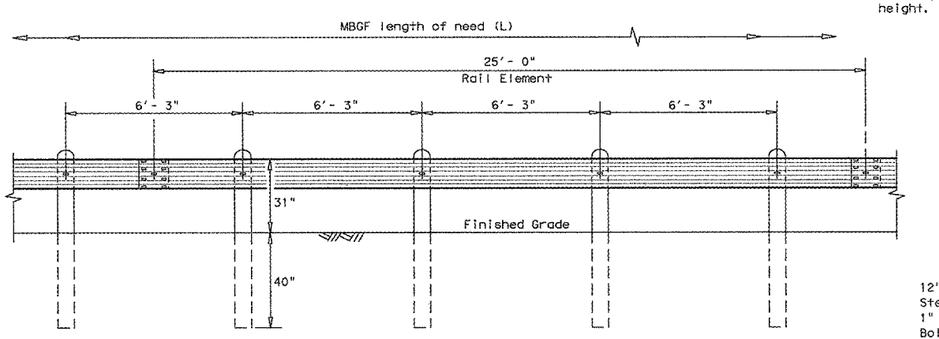
WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST

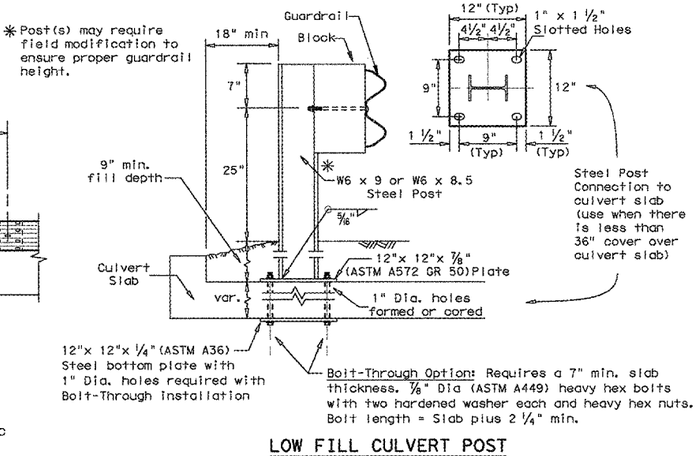


WOOD BLOCK TO STEEL POST



ELEVATION
MID-SPAN RAIL SPLICE

Showing a 25'- 0" section of W-Beam rail, 12'- 6" rail sections may also be supplied (See General Note 2)



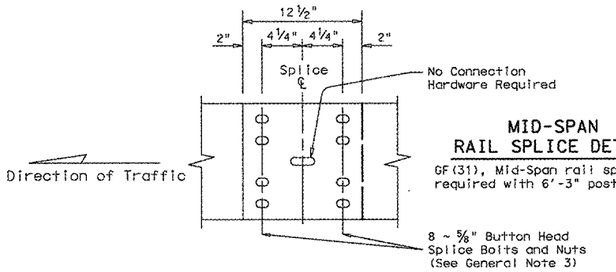
LOW FILL CULVERT POST

For use on culverts up to 50 ft. in length. Culverts of 25 ft. or less, See GF(31)LS standard for "Long Span" option.

Epoxy Note:
Epoxy Anchor Option: This option may only be used if the culvert slab is 8" min. thick. Threaded anchor rods must be ⅞" Dia. ASTM A449 or A193 Grade B7 with heavy hex nut, and one hardened washer each. Embed anchor rods 6" with Hilti HIT RE 500 epoxy adhesive. Other Type III Class C epoxy adhesives meeting the requirements of DMS-6100, "Epoxies and Adhesives", may be used if it can be demonstrated that they meet or exceed the strength of Hilti HIT RE 500 with the same embedment depth and threaded rod dia. Follow the manufacturer's requirements for installing epoxied threaded rods. Extend rods ¼" min. beyond nut.

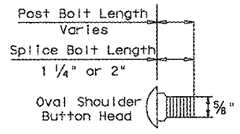
GENERAL NOTES

1. The type of post (round wood post, rectangular wood post, or steel post) will be as shown in the plans. The exact position of MBGF shall be shown in the plans or as directed by the Engineer. Steel posts to be galvanized in accordance with Item 445, "Galvanizing."
2. Rail element shall meet the requirements of Item 540, "Metal Beam Guard Fence" except as modified in the plans. The Contractor may furnish rail elements of 25'- 0", or 12'- 6" (nom.) lengths. Rail elements may have slotted holes at 3'-1½" C-C or 6'-3" C-C. A special length of rail may be manufactured to accommodate the downstream anchor terminal (DAT) and the transition sections of guardrail.
3. Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and Type A (1 ¾" O.D.)washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) are ⅝" x 1 ¼" (or 2" long at triple rail splices) with a ⅜" double recessed nut (ASTM A563). Thrie beam "connection" ⅞" dia. (ASTM A325) hex bolts shall be of sufficient length to extend through the full thickness of the rail, washers, and nuts.
4. Fittings (bolts, nuts, and washers) shall be galvanized in accordance with Item 445, "Galvanizing." Fittings shall be subsidiary to the bid item.
5. Crown shall be widened to accommodate the Metal Beam Guard Fence.
6. The lateral approach to the guard fence, shall have a maximum slope of 1V:10H.
7. If shown elsewhere in the plans or as directed by the Engineer, the guard fence may be flared at a rate of 25:1 or flatter.
8. Unless otherwise shown in the plans, guard fence placed in the vicinity of curbs shall be positioned so that the face of curb is located directly below or behind the face of the rail. Rail placed over curbs shall be installed so that the post bolt is located approximately 25 inches above the gutter pan or edge of shoulder.
9. If solid rock is encountered within 0 to 18" of the finished grade, drill a 22" dia. hole, or drill two 12" dia. front to back overlapping holes, 24" into the rock. If solid rock is encountered below 18", drill a 12" dia. hole, 12" into the rock or to the standard embedment depth, whichever maybe less. Any excess post length, after meeting these depths, may be field cut to ensure proper guardrail mounting height. Backfill with a cohesionless material.
10. Posts shall not be set in concrete, of any depth.
11. Special fabrication will be required at installations having a curvature of less than 150 ft. radius.
12. Unless otherwise shown in the plans, a composite material post and/or block that meets the requirements of DMS-7210, "Composite Material Posts and Blocks for Metal Beam Guard Fence" may be substituted for posts and/or blocks of similar dimensions. The Construction Division, TxDOT maintains a Material Producer List (MPL) for producers of materials conforming to DMS-7210. Only producers on the MPL may furnish composite material posts and/or blocks.
13. For posts located partially or wholly between precast box culvert units, the use of a cast-in-place concrete closure between boxes is required. See Detail "A" on Bridge Standard SCP-MD.



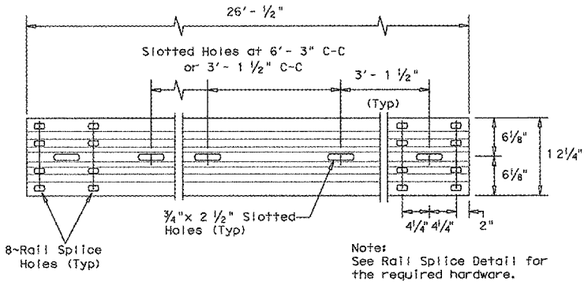
MID-SPAN
RAIL SPLICE DETAIL

GF(31), Mid-Span rail splices are required with 6'-3" post spacings.



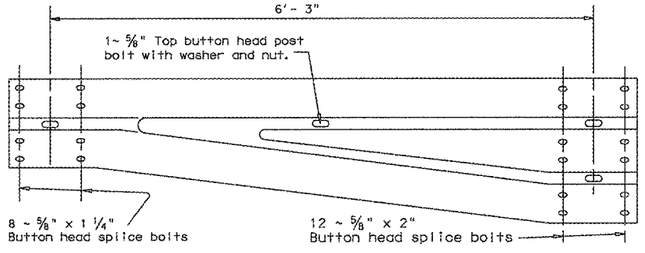
BUTTON HEAD BOLT

Post and Splice Bolts (See General Note 3)



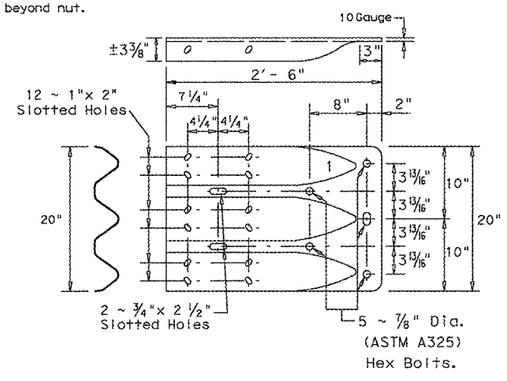
ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

12'- 6" rail sections may also be supplied (See General Note 2)



NON-SYMMETRICAL TRANSITION
FROM W-BEAM TO CONCRETE RAIL (10 GA.)

(See GF(31)DAT for Downstream Connection to Concrete Rail)



THRIE-BEAM TERMINAL CONNECTION (10 GA.)

(See General Note 3 for required hardware)

Texas Department of Transportation

Design Division Standard

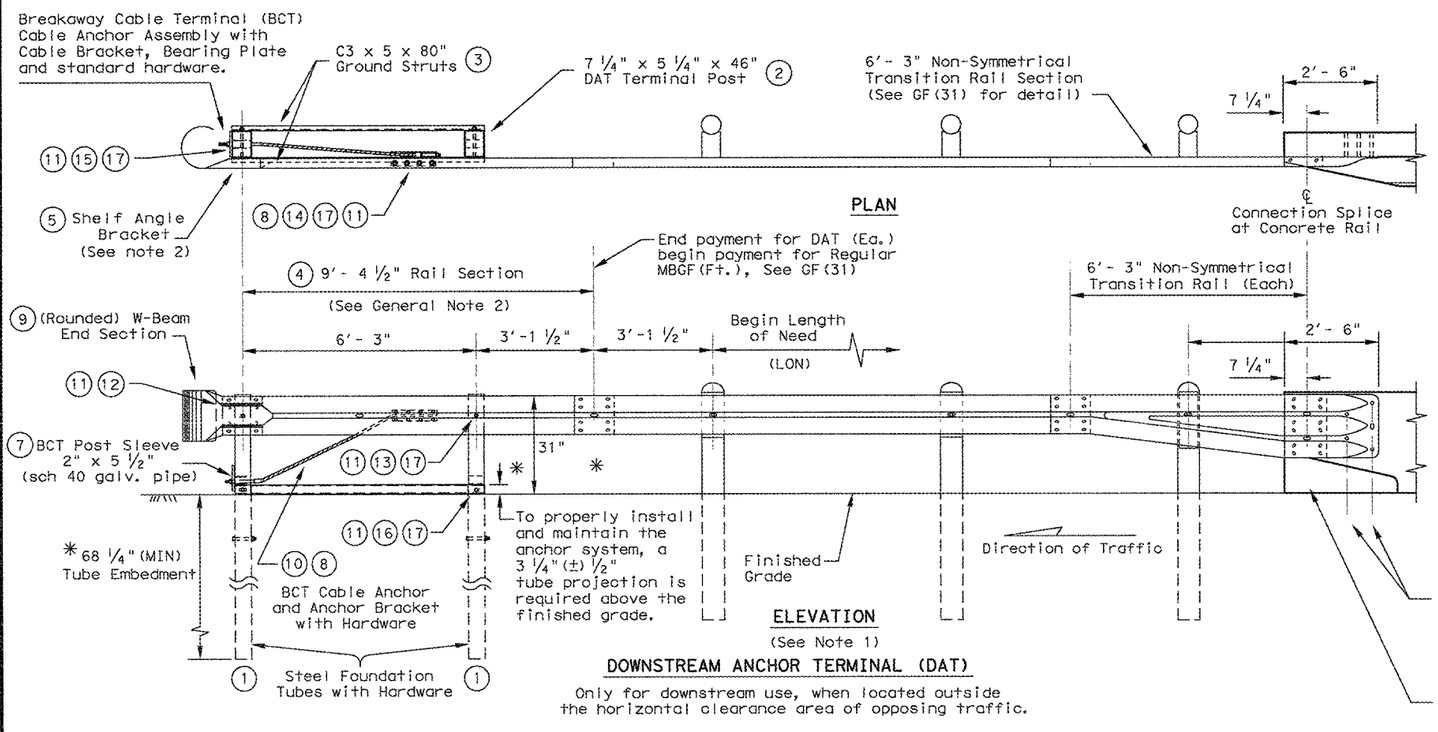
METAL BEAM GUARD FENCE

GF(31)-11

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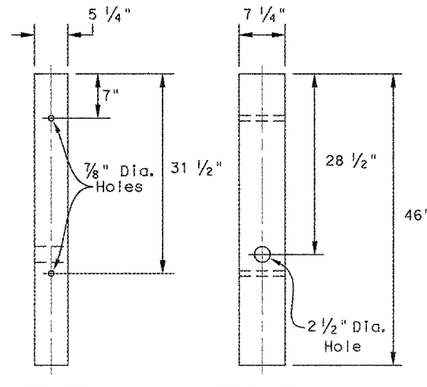
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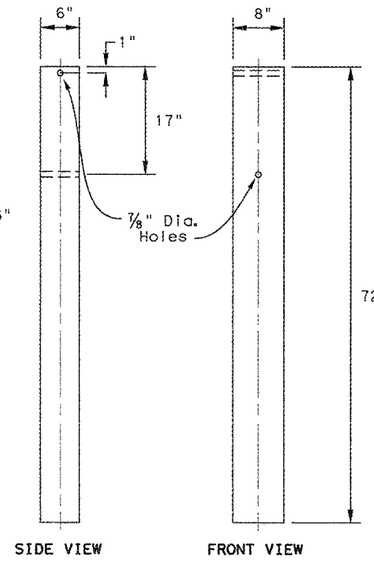
DOWNSTREAM ANCHOR TERMINAL (DAT)

Only for downstream use, when located outside the horizontal clearance area of opposing traffic.



TERMINAL POST

(2) 7 1/4" x 5 1/4" x 46" Wood Post



STEEL FOUNDATION TUBE

(1) 6" x 8" x 1/8" x 72" Steel Tube

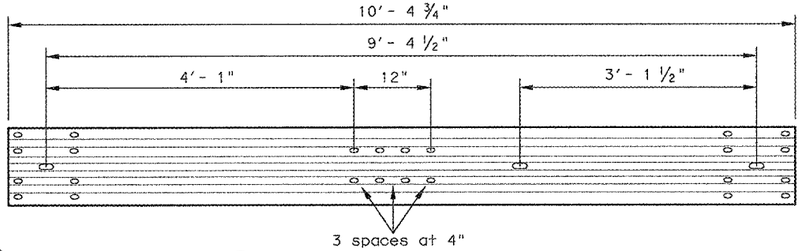
5 - 7/8" Dia. (ASTM A325 or A449) Heavy Hex Head Bolts, with two 1 3/4" O.D. washers under each head and nut. Bolts shall be of sufficient length to extend through the full thickness of the rail, washer, and nut. Install with bolt heads on traffic face.

Chamfer required on concrete rails that extend beyond the face of the guardrail transition.

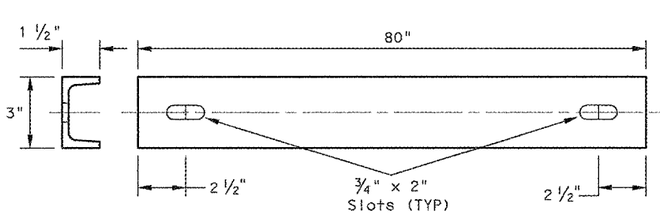
Terminal Connection Note

To ensure a stable connection. (12) Rectangular Washers (FWR03) are required under the recessed nuts at the Terminal Connection splice.

#	(DAT) PARTS LIST	QTY.
(1)	Steel Foundation Tube	2
(2)	DAT Terminal Post	2
(3)	Channel Strut	2
(4)	Terminal Rail Element	1
(5)	Shelf Angle Bracket	1
(6)	BCT Bearing Plate	1
(7)	BCT Post Sleeve	1
(8)	Guardrail Anchor Bracket	1
(9)	(Rounded) W-Beam End Section	1
(10)	BCT Cable Anchor	1
(11)	Recessed Nut, Guardrail	20
(12)	1 1/4" Button Head Bolt	4
(13)	10" Button Head Bolt	2
(14)	5/8" x 2" Hex Head Bolt	8
(15)	5/8" x 8" Hex Head Bolt	4
(16)	5/8" x 10" Hex Head Bolt	2
(17)	5/8" Flat Washer	18

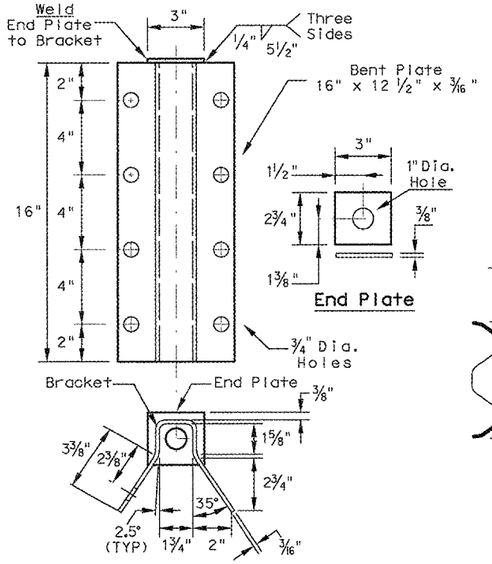


(4) TERMINAL RAIL ELEMENT FOR DAT

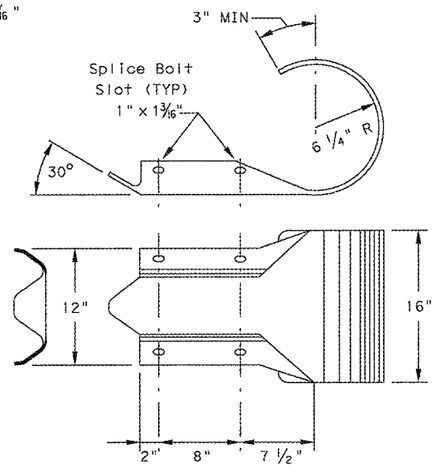


(3) CHANNEL STRUT

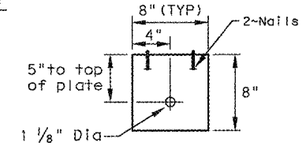
C3 x 5 x 80", Grade A36



(8) GUARDRAIL ANCHOR BRACKET



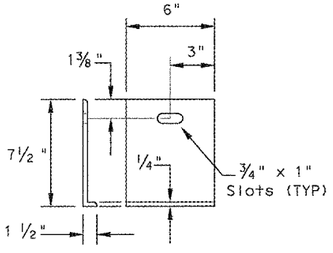
(9) W-BEAM END SECTION (ROUNDED) (12 GA.)



Note: Drive nails and bend over to prevent plate rotation

(6) BEARING PLATE

8" x 8" x 5/8" ℙ



(5) SHELF ANGLE BRACKET

GENERAL NOTES

1. The DAT detail shown is the minimum Length of Need (LON) for a DAT connected to a concrete rail.
2. The rail section at the end post is supported by the Shelf Angle Bracket. The rail element is not attached to the end post.
3. The foundation tubes shall not project more than 3 3/4" above the finished grade.
4. All hardware for DAT shall be ASTM A307 unless otherwise shown.
5. Refer to GF(31) sheet for terminal connection details.

MOW STRIP INSTALLATION

If a mow strip is required with the DAT installation the leave-out area around the steel foundation tubes and the two channel struts may be omitted. This will require a full pour at the foundation tubes.

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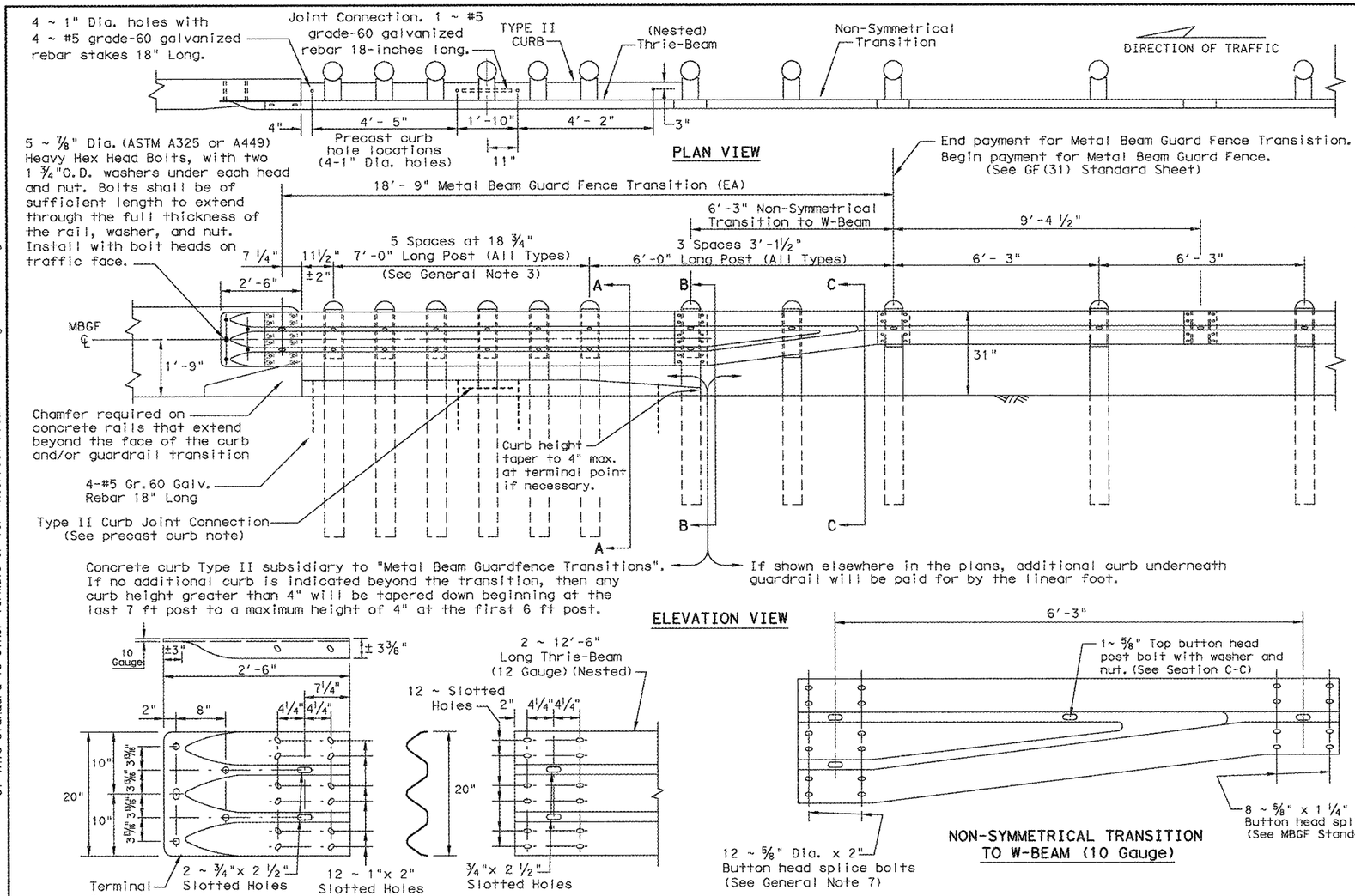
Design Division Standard

METAL BEAM GUARD FENCE
(Downstream Anchor Terminal)
GF(31)DAT-11

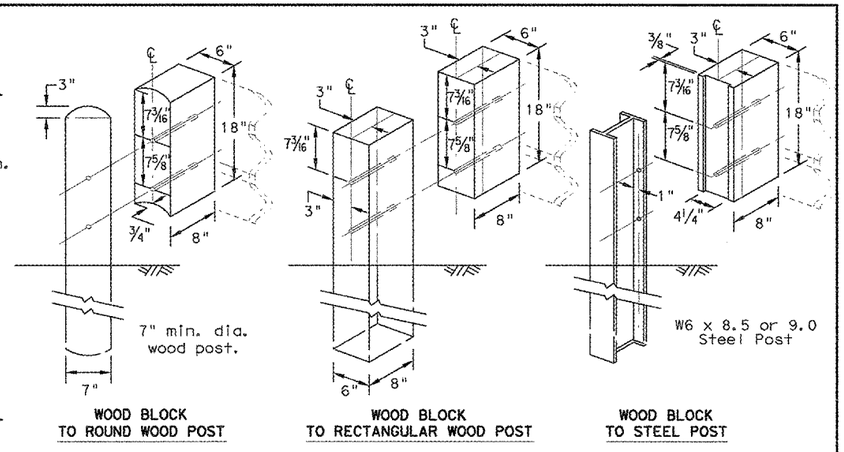
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PRECAST CURB:
Type II Precast Curb secured with 4~#5 Gr.60 Galv. Rebar stakes 18" long. The 12'- 2" section of curb may be cast in two sections.
Section ① 5'- 8" long
Section ② 6'- 6" long with the last 3'- 6" of curb tapered to a 4" height.
The Joint Connection is two 9" long 1" Dia. female ends connected with 1~#5 Gr.60 Galv.Rebar 18" long.



GENERAL NOTES

1. Concrete curb may be cast-in-place or precast as shown on this sheet. When used in conjunction with thrie-beam guard fence transitions, curb shall be Type II (Typically 5 3/4" height above surface; See CCCG standard sheet) unless otherwise shown in the plans. If other curb heights are shown in the plans in conjunction with the transition, the curb height may be from 4" to 8" with a relatively vertical face. Concrete curb shall be continuous to the seventh post.

   Contact the Design Division for drainage cut options needed within the curb section of the transition.

2. The type of post (round wood post, rectangular wood post or steel post) will be as shown in the plans.

3. The post length shall be marked on all 7'- 0" long posts by the Manufacturer. The mark shall be located within the top 1 ft. region of the post, at least 5/8" in height, and visible after installation. Wooden posts shall be marked with a brand, and steel posts with a stencil before galvanizing.

4. Rail element shall meet the requirements of Item 540, "Metal Beam Guard Fence" except as modified on the plans. The thrie-beam terminal connector and the thrie-beam transition to w-beam shall be of the same material, but shall not be less than 10 gauge.

   Contractor shall verify that the locations of bolt holes match those in the thrie-beam terminal connector prior to ordering materials.

5. Unless otherwise shown in the plans, transitions shall be placed with the block face in front of or directly above the curb face.

6. Galvanized washers used with the 5/8" dia. post bolts shall be Type A 1 3/4" O.D. washers. The (12) plate washers (FWR03) required at the terminal connector splice.

7. Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) 5/8" Dia.x 2" (at triple rail splices) with 5/8" double recessed nuts.

8. Fittings (bolts, nuts, and washers) shall be galvanized in accordance with Item 445, "Galvanizing".Fittings shall be subsidiary to the bid item.

9. Crown shall be widened to accommodate transitions.

10. If solid rock is encountered. See the MBGF standard sheet for the proper installation guidance.

11. Posts shall not be set in concrete.

12. Unless otherwise shown in the plans, a composite material post and/or block that meets the requirements of DMS-7210, "Composite Material Posts and Blocks for Metal Beam Guard Fence" may be substituted for posts and/or blocks of similar dimensions. The Construction Division, TxDOT, maintains a Material Producer List (MPL) for producers of materials conforming to DMS-7210. Only producers on the MPL can furnish composite material posts and/or blocks.

Texas Department of Transportation

Design Division Standard

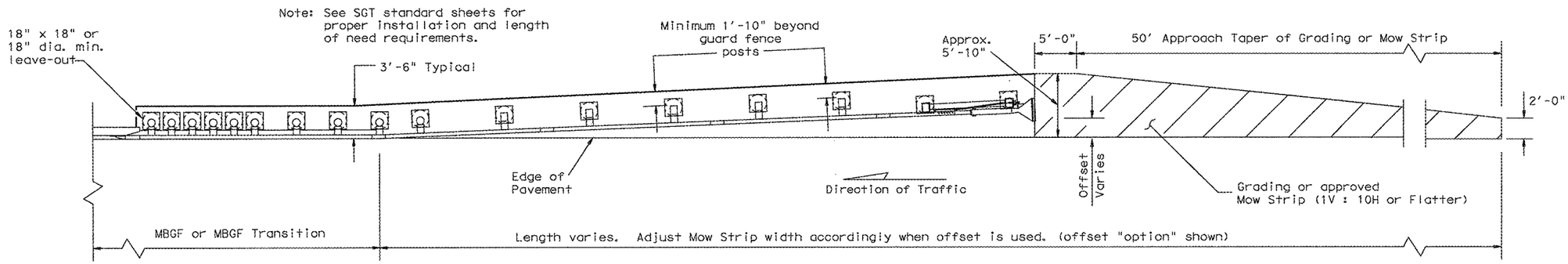
METAL BEAM GUARD FENCE TRANSITION (Thrie-Beam Transition)

GF(31)TR-13

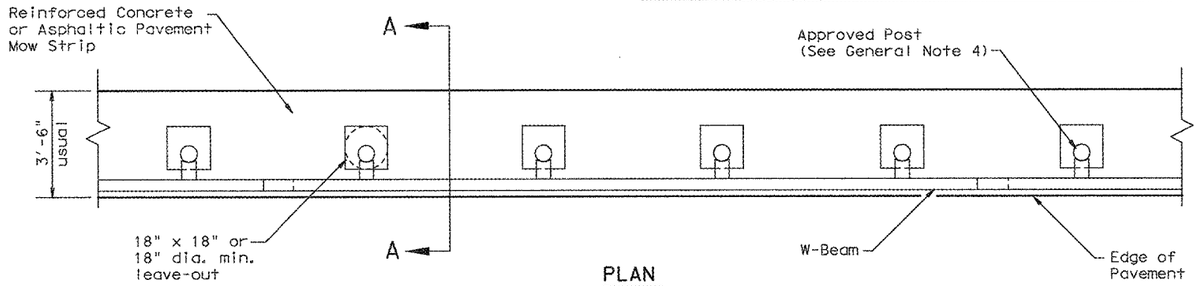
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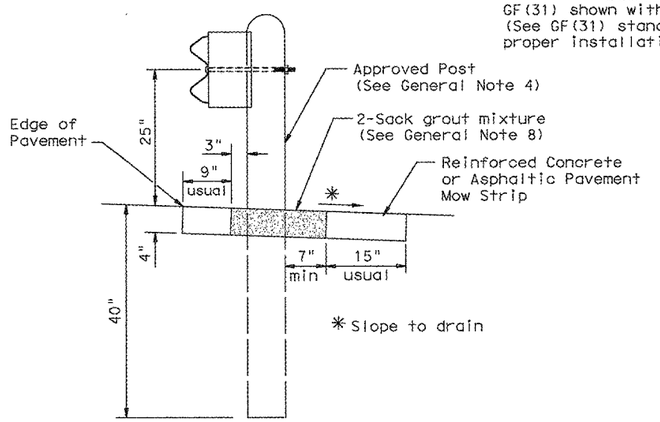


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



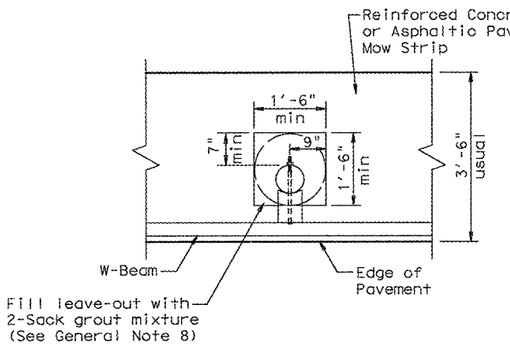
PLAN

GF(31) shown with Mow Strip (See GF(31) standard sheet for proper installation)



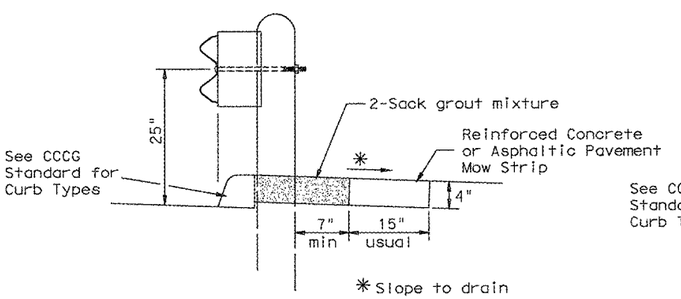
SECTION A-A

Typical



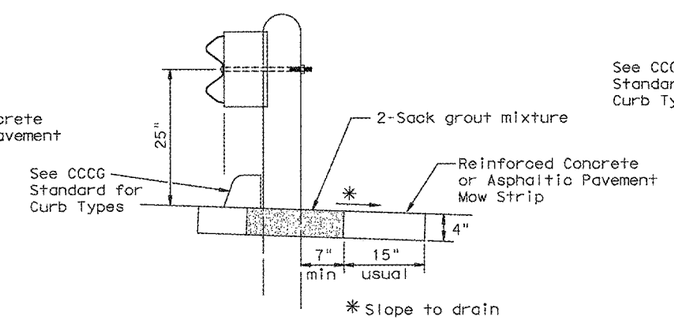
MOW STRIP DETAIL

Reinforced Concrete or Asphaltic Pavement Mow Strip with 18" x 18" or 18" dia. minimum leave-out.



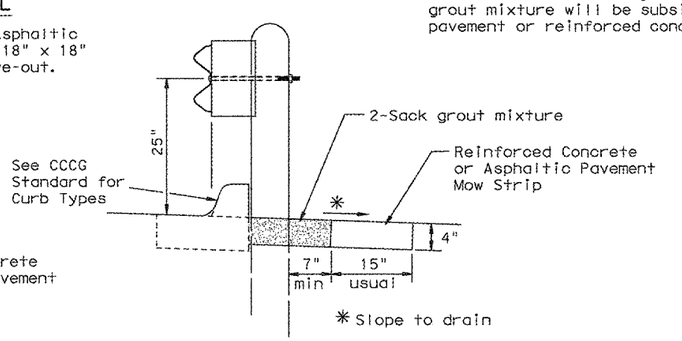
CURB OPTION (1)

This option will increase the post embedment through out the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments (See SGT standards for proper SGT installation).
2. Mow strips shall be asphaltic pavement or reinforced concrete (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Asphaltic pavement shall meet the requirements of the item, and be placed in accordance with the pertinent bid item as shown in the plans. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. The type of approved post will be as shown in the plans. See the applicable standard sheets for additional details and information.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for asphaltic pavement or reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with no more than a 2-sack grout mixture and placed in accordance with Section 421.2.F, "Mortar and Grout." Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of asphaltic pavement or reinforced concrete.

Texas Department of Transportation

Design Division Standard

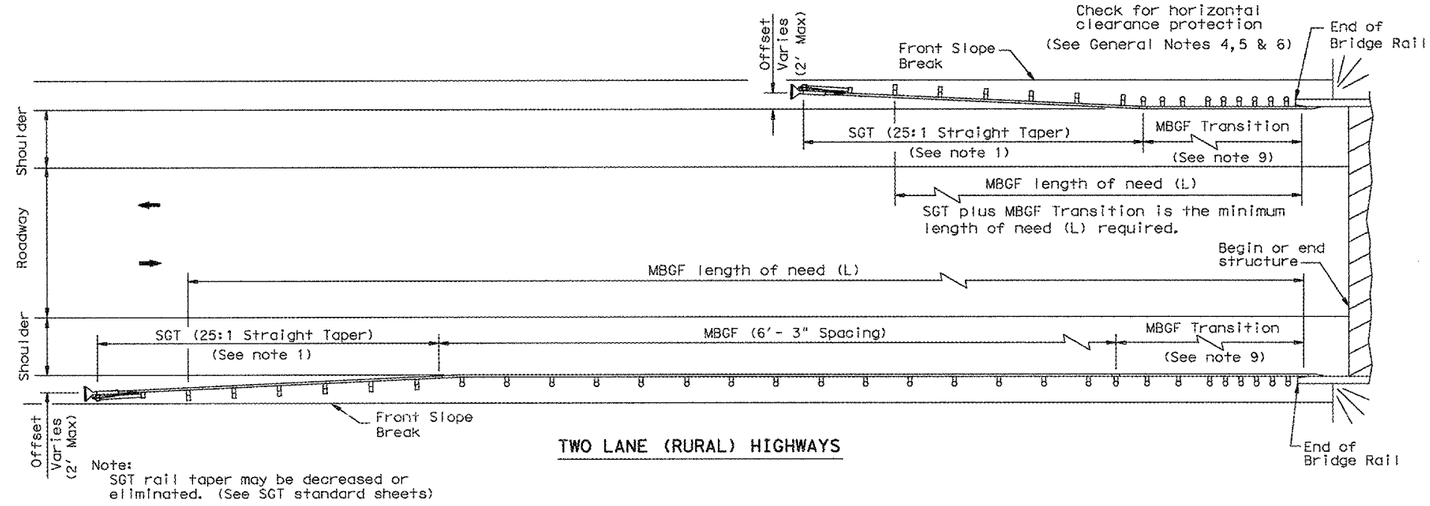
METAL BEAM GUARD FENCE

(MOW STRIP)

GF(31)MS-11

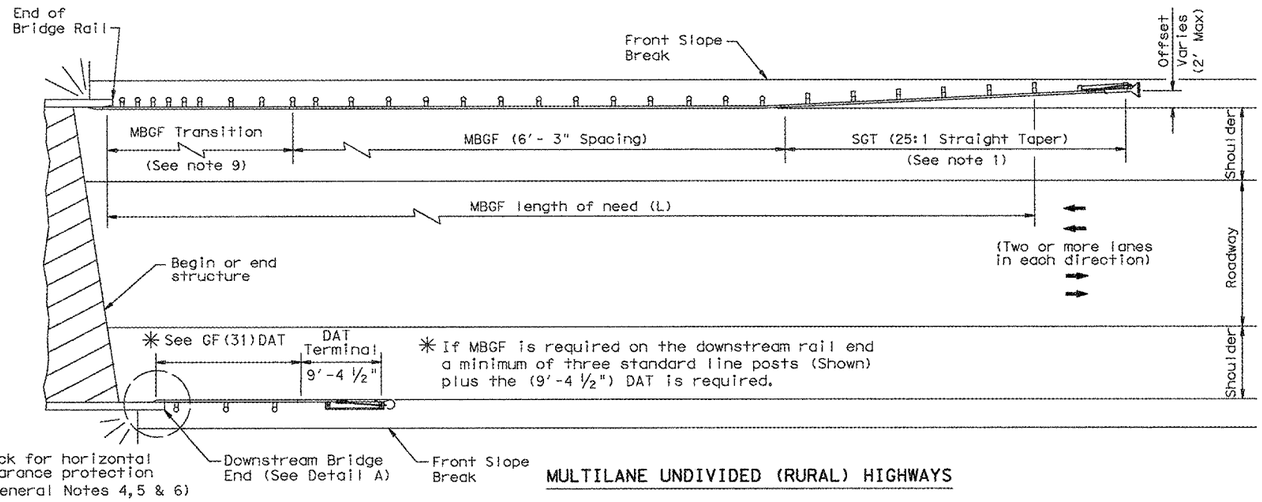
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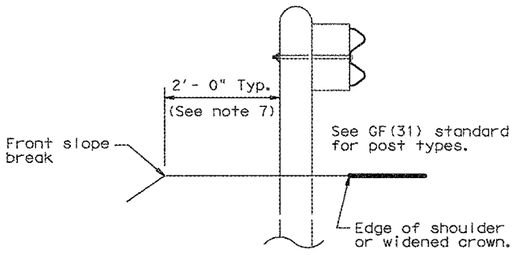


Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)

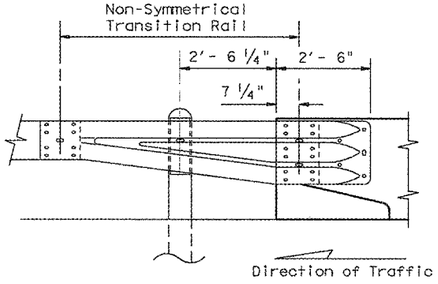
TWO LANE (RURAL) HIGHWAYS



MULTILANE UNDIVIDED (RURAL) HIGHWAYS



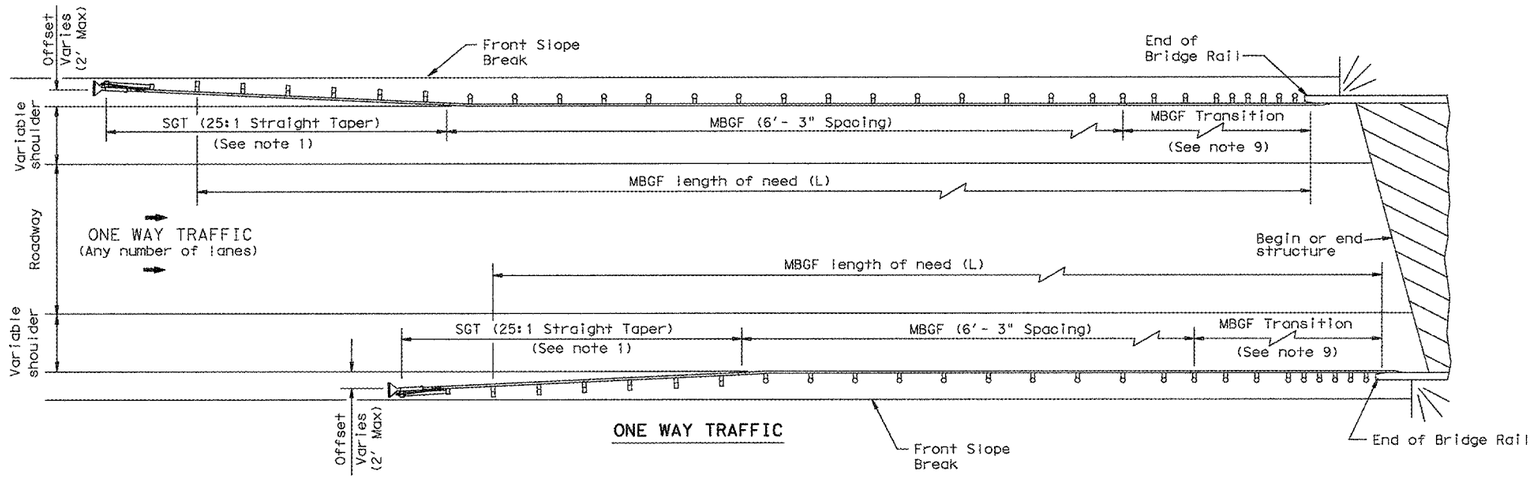
TYPICAL CROSS SECTION AT MBGF



Note:
All rail elements shall be lapped in the direction of adjacent traffic.

DETAIL A

Showing Downstream Rail Attachment



ONE WAY TRAFFIC

GENERAL NOTES

1. For more detail: See GF(31), SGT( )31, GF(31)TR, and GF(31)TL2 standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
3. Use average daily traffic (ADT) for the current year to determine MBGF length of need in accordance with the Roadway Design Manual unless otherwise specified. Where significant traffic volume growth is anticipated on low volume (0-750 ADT) highways, use length determinations for the higher volume category.
4. MBGF may not be required to shield departure end of bridge unless other obstacles within the horizontal clearance limits or opposing traffic indicate a MBGF consideration.
5. Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. Direct connection of MBGF to concrete rails are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (This requires a minimum of three standard line posts plus the DAT terminal, See Detail A)
7. The crown shall be widened to accommodate MBGF. Typically the "front slope" break should be 2'- 0" from the back of the MBGF post. This applies to new construction on new alignment or where existing roadway cross section is to be widened to increase roadway width. This does not apply to rehabilitation work where existing roadway crown width is to be retained (See Typical Cross Section at MBGF).
8. For restrictive bridge widths: The MBGF should be properly transitioned from the existing bridge rail to the adjoining MBGF (See MBGF Transition Standards). Metal beam guard fence at these bridge location(s) shall be flared at the rate of 25:1 or flatter, and be of the length necessary to locate the terminal end at the 2 ft."maximum" offset from the shoulder edge in the approach direction.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.

Texas Department of Transportation

Design Division Standard

BRIDGE END DETAILS

(Metal Beam Guard Fence Applications to Rigid Rails)

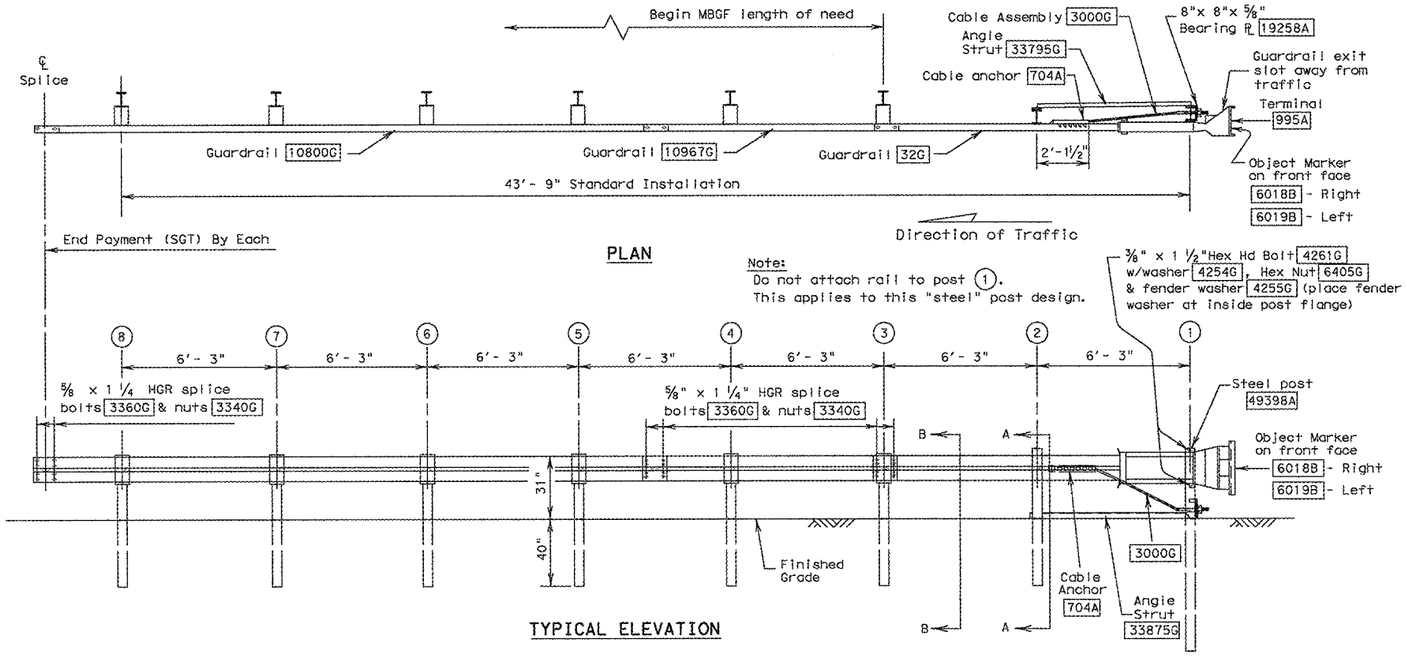
BED-11

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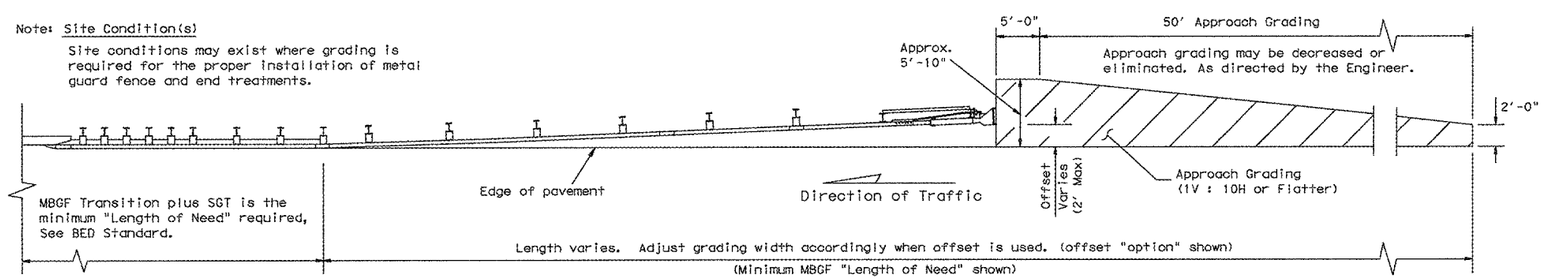
GENERAL NOTES

1. For additional information contact: Trinity Highway Products, 1-800-527-6050.
2. All bolts, nuts, cable assemblies, cable anchors, steel tubes & bearing plates shall be galvanized.
3. SGT's placed within the "minimum" 150 ft. radius, shall be a installed straight. Standard rail elements may be installed within the radius, without special fabrication.
4. A flare rate of 25:1 may be used to prevent the terminal head from encroaching on the shoulder. The flare may be decreased or eliminated for specific installations, if directed by the Engineer.
5. If solid rock is encountered. See the manufacturer's installation manual for the proper installation guidance.
6. The breakaway cable assembly must be taut. A locking device, (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening the nuts.
7. Hinge bolts shall not be set below finished grade. At curb locations the posts shall be installed at the proper ground elevation behind the curb. The posts will then require field drilling new holes to accommodate the rail to post connection bolt to maintain the proper height of the rail above the gutter pan. The excess post length above the rail will be removed as directed by the Engineer.
8. An object marker shall be installed on the front of the impact head as detailed on D&OM(VIA).
9. A special site evaluation should be considered, prior to using this end treatment where there is less than 25 feet between the extrusion side of the end treatment and any adjacent driving lane.

BILL OF MATERIAL

#	Qty.	DESCRIPTION
32G	1	Guardrail (12 Ga) at 12'- 6"
10967G	1	Guardrail (12 Ga) at 9'- 4 ½"
10800G	1	Guardrail (12 Ga) at 25'- 0"
49398A	1	HBA Steel Post - Post (1) Top
33873A	1	HBA Steel Post - Post (1) Bottom
15000G	7	SYT Steel Post - Posts (2) thru (8)
33795G	1	Angle Strut (ET/SYT/HBA)
4076B	6	Block - 14"x 6"x 8"
19258A	1	Bearing Plate - 8"x 8"x ⅝"
704A	1	Cable Anchor
3000G	1	Cable Assembly (¾"x 78")
995A	1	ET-Plus Extruder
6018B	1	Right - Object Marker
6019B	1	Left - Object Marker
3340G	31	⅝" Hex Nut
3360G	25	⅝" x 1 ¼" HGR Splice Bolt
3500G	6	⅝" x 10" Post Bolt
3701G	2	¾" Flat Washer
3704G	2	¾" Hex Nut
3717G	2	¾" x 2 ½" Hex HD Bolt (A325) ~ Post (1)
3900G	2	1" Flat Washer
3910G	2	1" Hex Nut
4254G	4	⅜" Flat Washer
4255G	2	⅜" Fender Washer (1 ½" OD)
4258G	2	⅜" Lockwasher
4261G	2	⅜" x 1 ½" Hex HD Bolt (Grade 5)
4389G	2	7/16" Flat Washer
4390G	2	7/16" x 1 ½" Hex HD Bolt ~ Post (2)
4393G	2	7/16" Lockwasher
4396G	2	7/16" Hex Nut
4699G	2	¾" Lockwasher
6321G	2	⅜" x 2" Hex HD Bolt (Grade 5) ~ Post (1)
6405G	4	⅜" Hex Nut
19948G	2	Plate Washer ~ Post (2)

Note: Site Condition(s)
Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.



GRADING AT GUARDRAIL END TREATMENTS

Texas Department of Transportation
Design Division Standard

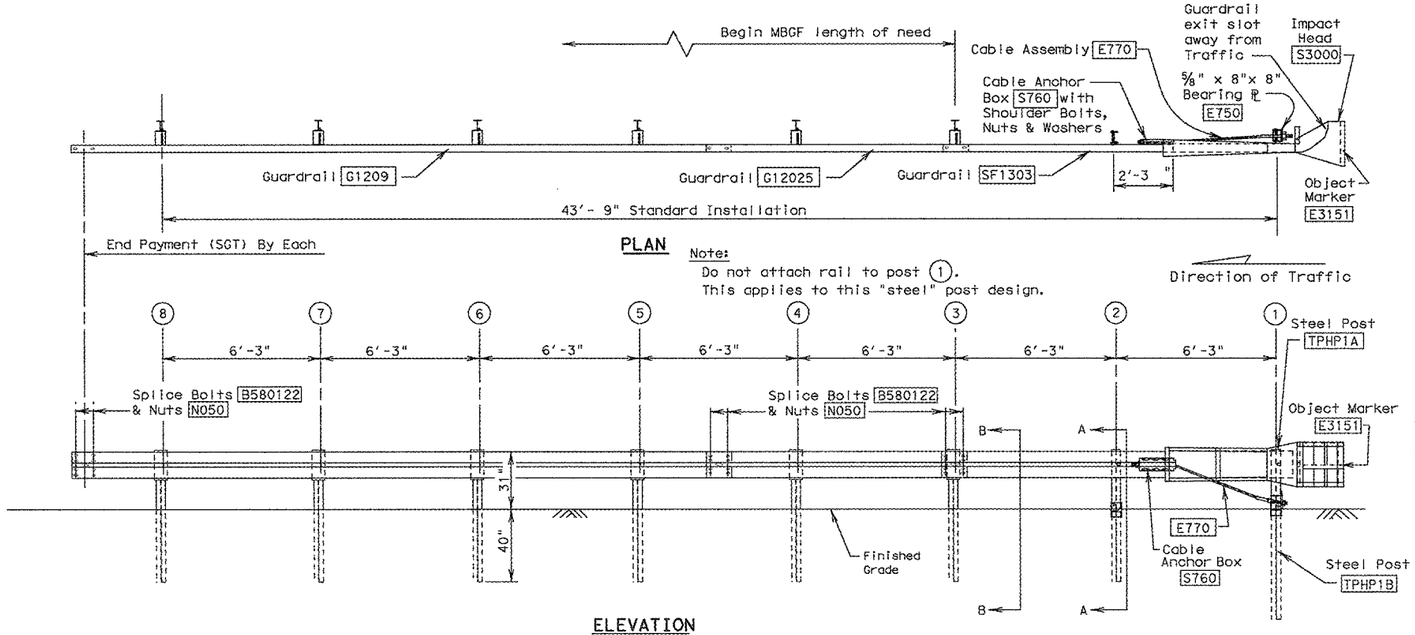
SINGLE GUARDRAIL TERMINAL (ET-31) (STEEL POST)

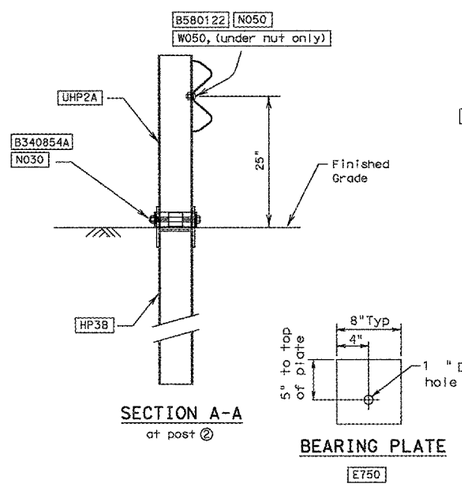
SGT(7S)31-11

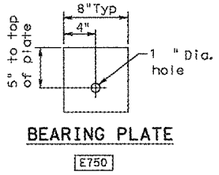
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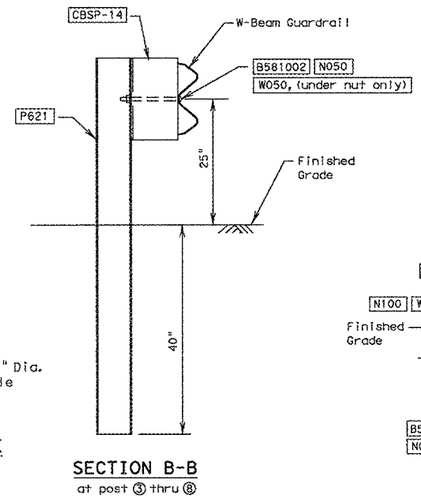
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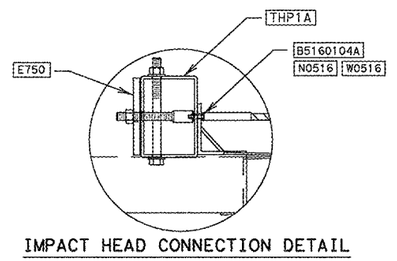
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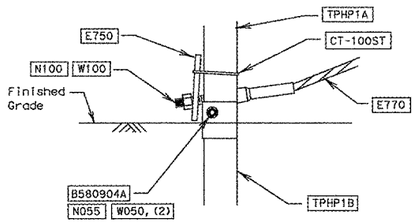


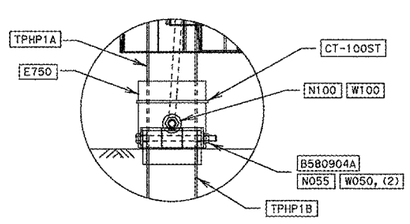








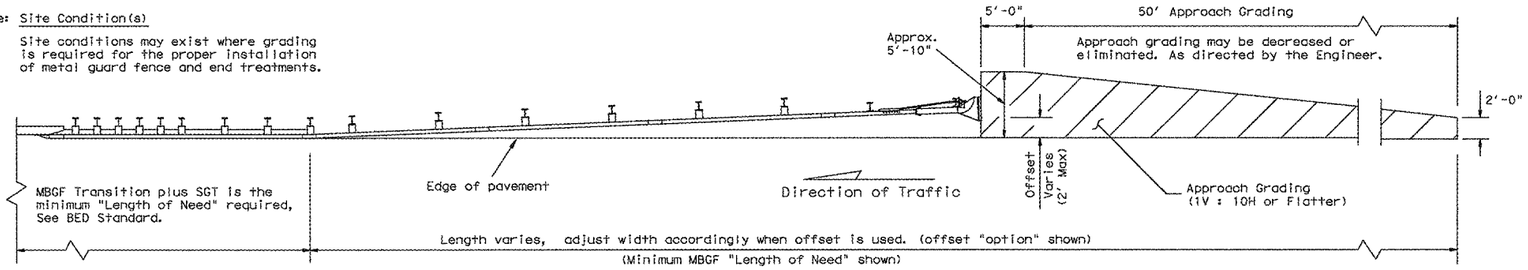




POST #1 CONNECTION DETAILS

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.



APPROACH GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

1. For additional information contact: Interstate Steel Inc., (432) 263-3725.
2. All bolts, nuts cable assemblies, cable anchors, steel posts & bearing plates shall be galvanized.
3. SGT's placed within the "minimum" 150 ft. radius, shall be installed straight. Standard rail elements may be installed within the radius without special fabrication.
4. A flare rate of 25:1 may be used to prevent the terminal head from encroaching on the shoulder. The flare may be decreased or eliminated for specific installations, if directed by the Engineer.
5. The lower sections of the post shall not protrude more than 4 inches above finished ground. Site grading may be necessary to meet this requirement.
6. The lower section of the steel posts should not be driven with the upper post attached. If the post is placed in a drilled hole, the backfill material must be satisfactorily compacted to prevent settlement.
7. If solid rock is encountered. See manufacturer's installation manual for the proper installation guidance.
8. The breakaway cable assembly must be taut. A locking device, (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening the nuts.
9. Hinge bolts shall not be set below finished grade. At curb locations the posts shall be installed at the proper grade elevation behind the curb. The posts will then require field drilling new holes to accommodate the rail to post connection bolt to maintain the proper height of the rail above the gutter pan. The excess post length above the rail will be removed as directed by the Engineer.
10. An object marker shall be installed on the front of the impact head as detailed on D&OM(VIA).
11. A special site evaluation should be considered, prior to using this end treatment where there is less than 25 feet between the outlet side of the end treatment and any adjacent driving lane.

ITEM NO.	QTY	BILL OF MATERIALS
SF1303	1	GUARDRAIL (12 GA) 12'- 6" SKT Panel
G12025	1	GUARDRAIL (12 GA) 9' - 4½"
G1209	1	GUARDRAIL (12 GA) 25'- 0"
TPHP1A	1	FIRST POST ASSEMBLY TOP, TUBE
TPHP1B	1	FIRST POST ASSEMBLY BOTTOM, 6'- 0"
UHP2A	1	SECOND POST ASSEMBLY TOP
HP3B	1	SECOND POST ASSEMBLY BOTTOM, 6'- 0"
P621	6	STANDARD STEEL LINE POST 6'- 0" (POST 3 THRU 8)
E750	1	BEARING PLATE
S760	1	CABLE ANCHOR BOX
E770	1	BCT CABLE ANCHOR ASSEMBLY
CT-100ST	1	CABLE TIE - STEEL
CBSP-14	6	ROUTED BLOCK
S3000	1	IMPACT HEAD
B580122	25	⅝" Dia. x 1 ¼" SPLICE BOLT
B580904A	1	⅝" Dia. x 9" HEX BOLT GR. 5
B340854A	1	¾" Dia. x 8 ½" HEX BOLT GR. 5
B581002	6	⅝" Dia. x 10" H.G.R. BOLT (Post 3 thru 8)
N055	1	⅝" Dia. HEX NUT (Post 1 only)
N050	31	⅝" Dia. H.G.R. NUT (at splices & at Post 1 thru 8)
W050	9	H.G.R. WASHER (At Post 2 thru 8)
N100	2	1" ANCHOR CABLE HEX NUT
W100	2	1" ANCHOR CABLE WASHER
B5160104A	2	⅝" x 1" HEX BOLT, GR. 5
N0516	2	⅝" HEX NUT
W0516	4	⅝" WASHER
SB58A	8	CABLE ANCHOR BOX SHOULDER BOLT
N030	1	¾" HEX NUT
N055A	8	½" A325 STR. NUT
W050A	16	1 1/16" OD x ⅝" ID A325 STR. WASHER
E3151	1	OBJECT MARKER (18" x 18")

Texas Department of Transportation

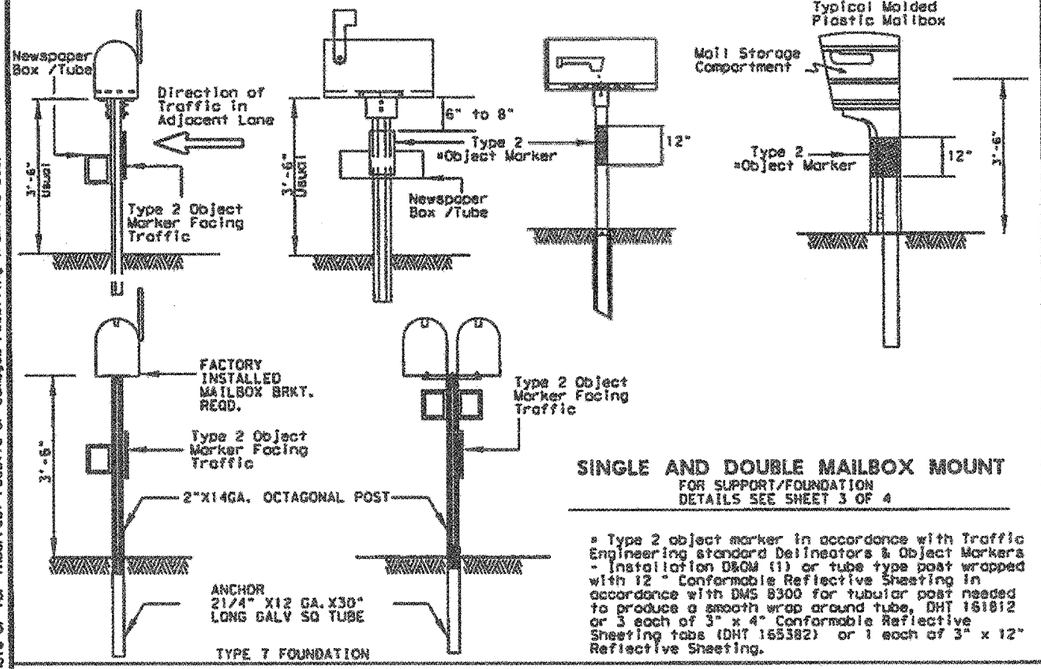
Design Division Standard

SINGLE GUARDRAIL TERMINAL (SKT-31) (STEEL POST)

SGT(8S)31-11

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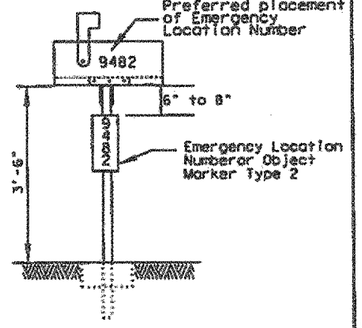
SINGLE AND DOUBLE MAILBOX MOUNT

FOR SUPPORT/FOUNDATION DETAILS SEE SHEET 3 OF 4

* Type 2 object marker in accordance with Traffic Engineering standard Delineators & Object Markers - Installation D&OM (1) or tube type post wrapped with 12 " Conformable Reflective Sheeting in accordance with DMS 8300 for tubular post needed to produce a smooth wrap around tube, DHT 161812 or 3 each of 3" x 4" Conformable Reflective Sheeting tabs (DHT 165382) or 1 each of 3" x 12" Reflective Sheeting.

Note: Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Pedestrian Facilities Curb ramps standard *PED-XX for pedestrian facilities.

*PED-XX: XX is the standard year for example PED- 12 , PED-13,etc.



PLACEMENT OF EMERGENCY LOCATION NUMBER

Location Number shall be placed on: 1. A yellow, type A plate with class 1 flat surface reflective sheeting in accordance with DMS 8600. The color of numbers shall be black. or 2: A green or blue plate with white numbers attached to post beside the object marker. Other contrasting color configuration, as approved , may be used. (Use Same type plate as used for the type 2 Object Marker. Recommended sign size is 6" by 15")

TYPICAL MAILBOX SIZE				LIGHT WEIGHT MATERIAL	
				SHEET METAL	**PLASTIC
SIZE	LENGTH	WIDTH	HEIGHT	MAXIMUM WEIGHT	
	INCHES			POUNDS	
SMALL	19 ½	6	7	5	5
MEDIUM	22 ½	8	11 ½	7	7
LARGE	23 ½*	11 ½*	13 ½*	10	10

* Maximum allowed dimensions for mailbox
** Excluding Molded Plastic on 4 x 4 Post

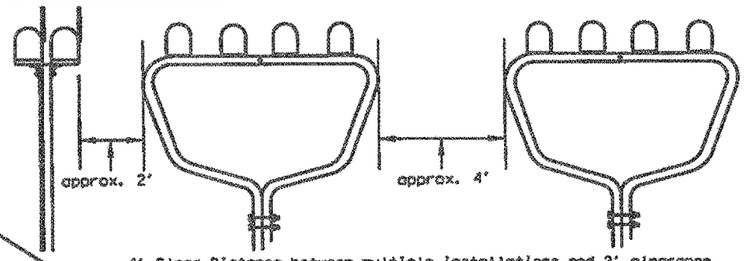
LOCKABLE ARCHITECTURAL MAILBOX SIZE (INCHES)					
VIEW	TOP	BOTTOM	FRONT SIDE	BACK SIDE	WEIGHT
SIDE	18	15	18.3	15	(POUNDS)
BACK	11 ½	11 ½		15	22.4

SEE TOP RIGHT CORNER OF SHEET 2 OF 4

MAILBOX SIZES

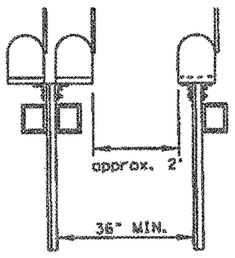
Mailboxes shall be made of light weight sheet metal or light weight plastic.
Lockable architectural mailboxes shall meet the requirements of the above table.

Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.



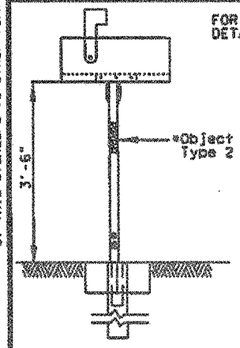
4' Clear Distance between multiple installations and 2' clearance between double or single installations and the multiple installation. DHT #'s 164116 or 149339.

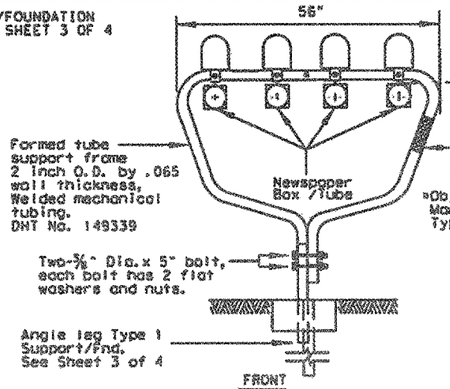
MULTIPLE MAILBOX PLACEMENT

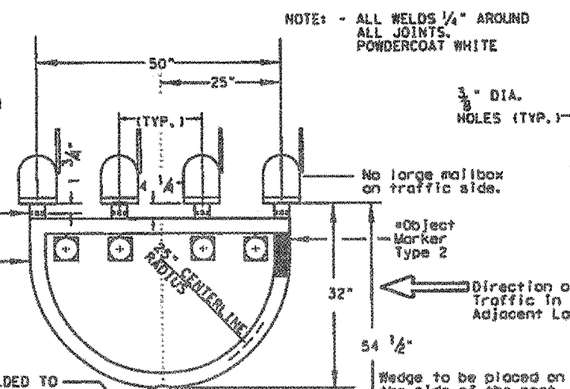


Clear Distance between single or double mounted posts. (Normally when 3 or more mailboxes are in one location, a multiple support is used).

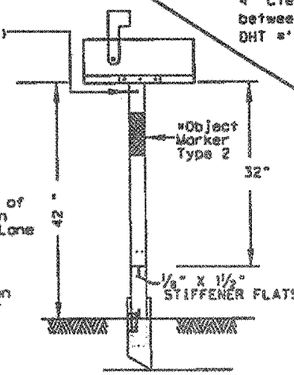
SINGLE & DOUBLE MAILBOX PLACEMENT





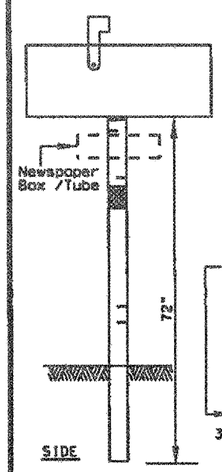


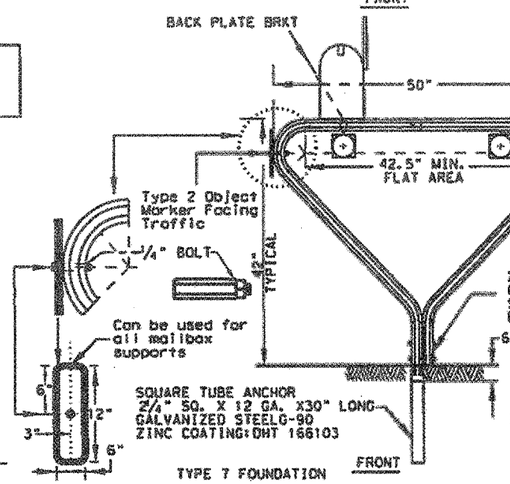
NOTE: - ALL WELDS ¼" AROUND ALL JOINTS. POWDERCOAT WHITE



DOUBLE AND MULTIPLE MAILBOX MOUNT

FOR SUPPORT/FOUNDATION DETAILS SEE SHEET 3 OF 4
FOR DHT NUMBERS SEE SHEET 4 OF 4

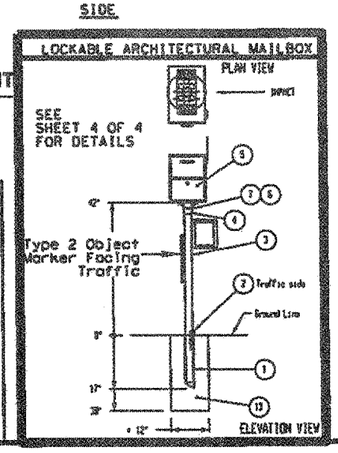




NEWSPAPER RECEPTACLE

A light weight receptacle for newspaper delivery can be attached to mailbox posts as shown on this page if the receptacle:

- Does not touch the mailbox.
- Does not present a hazard to traffic or delivery of the mail.
- Does not extend beyond the front of the mailbox.
- Does not display advertising, except the publication title.
- Newspaper receptacles on separate supports are prohibited.



MULTIPLE MAILBOX MOUNT

INDEX OF MAILBOX DETAIL SHEETS

1 of 4 MAILBOX MOUNTING AND SPACING
2 of 4 MAILBOX BRACKET CONNECTING DETAILS
3 of 4 MAILBOX SUPPORT / FOUNDATION
4 of 4 TABLE OF DHT NUMBERS

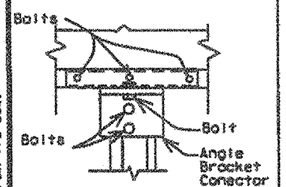
Texas Department of Transportation — Maintenance Division Standard

MAILBOX MOUNTING AND SPACING

MB-15(1)

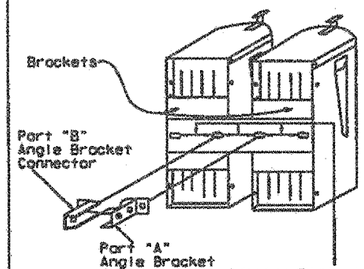
FILE: MB14111.DGN	DN: JED	CK: JED	DW:	CK:
©TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS: Revised additional newspaper receptacle for double mailbox support	3148	01	006	FM 3097
	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		112AA

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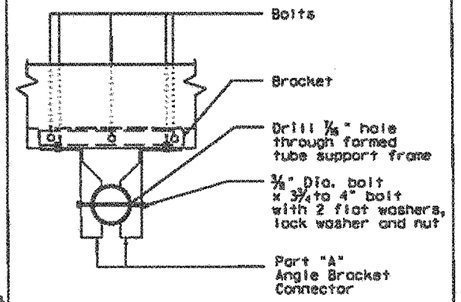
For bolt sizes see details below for "SMALL MAILBOX" and "MEDIUM AND LARGE MAILBOXES"

SINGLE MAILBOX

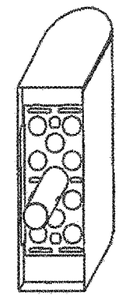


(Not permitted for Large Mailboxes)

DOUBLE MAILBOX

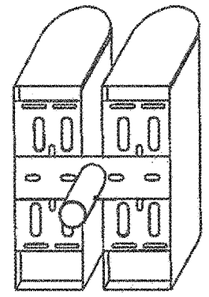


MULTIPLE MAILBOX



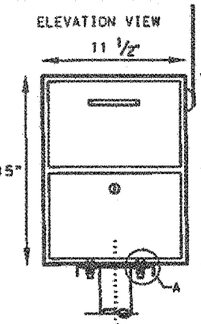
To be used with 2¾" OD RR or thinwall Steel posts.

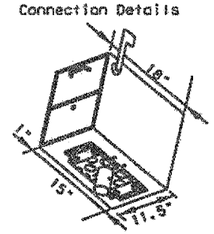
WELDED SINGLE MAILBOXBRACKET

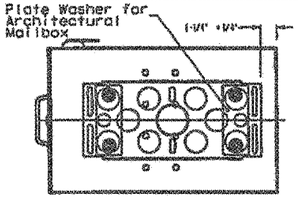


To be used with thinwall Steel posts. Not to be used with RR posts.

WELDED DOUBLE MAILBOX BRACKET WITHADAPTER PLATE

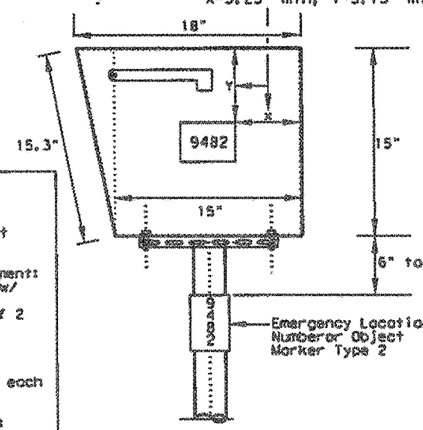






Preferred placement of Emergency Location Number

X-5.25" min; Y-5.75" min



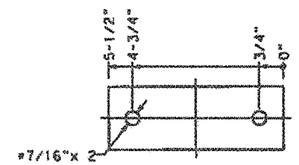
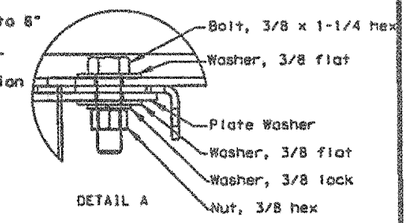
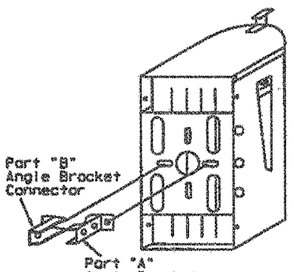
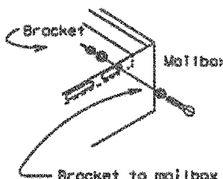


Plate Washer for Architectural Mailbox Plate, 2" x 1/8" ASTM A36 Steel



LOCKABLE ARCHITECTURAL MAILBOX CONNECTION DETAILS



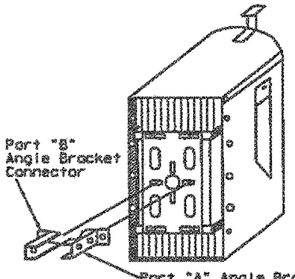


Bracket to mailbox attachment: 6 - ¼" Dia. x ¾" bolt w/ 2 flat washers and nut per each bolt.

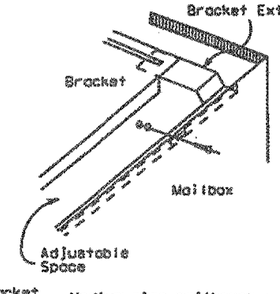
Angle to bracket attachment: 2 - ⅜" Dia. x ¾" bolt with 2 flat washers, lock washer and nut per each bolt.

Angle to 2 - ⅜" Dia. x 2½" bolt with 2 flat washers, lock washer and nut per each bolt.

SMALL MAILBOX



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



Bracket to mailbox attachment: 6 - ¼" Dia. x ¾" bolt w/2 flat washers and nut per each bolt.

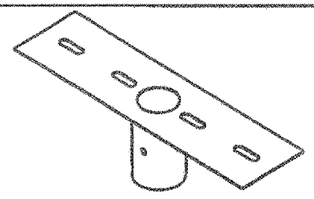
Bracket to bracket extension attachment: 2 - ¼" Dia. x ¾" carriage bolt w/ flat washer, lock washer and nut per bolt (4 bolts required if 2 bracket extensions are used).

Angle to bracket attachment: 2 - ⅜" Dia. x ¾" bolt w/2 flat washers, lock washer and nut per each bolt.

Angle to mailbox support attachment: 2 - ⅜" Dia. x 2½" bolt w/2 flat washers, lock washer, and nut per each bolt.

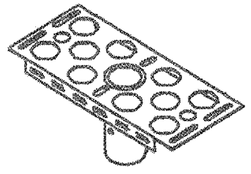
Medium size mailboxes - one extension bracket
Large size mailboxes - two extension brackets

MEDIUM AND LARGE MAILBOXES



DHT 162323

For use with galvanized thinwall steel posts DHT = 143426 or powder-coated thinwall steel post DHT = 162911.



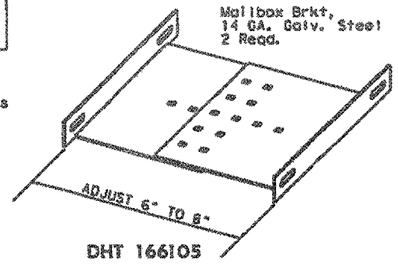
DHT 161443

For use with RCR post DHT = 161442 or galvanized thinwall steel post DHT = 143426 or powder-coated thinwall steel post. DHT = 162911.

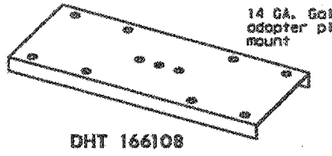


DHT #3789

Used for mounting two Mailboxes on the same post.



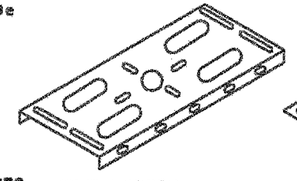
DHT 166105



DHT 166108

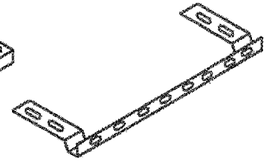
HARDWARE AT TXDOT REGIONAL WAREHOUSES

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



DHT 148939

Mailbox Bracket



DHT 148938

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

Bracket Extension



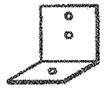
DHT 159489

Part "A" Angle Bracket Connector



DHT 159490

Part "B" Angle Bracket Connector



DHT 2917

Angle Bracket For Temporary Mailbox

See Table of Applicable DHT Numbers on sheet 4 of 4 for DHT description and unit of measure.

GENERAL NOTES

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

Texas Department of Transportation

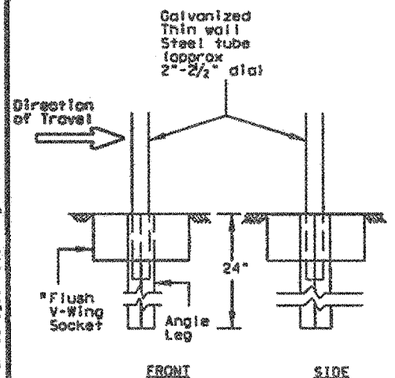
Maintenance Division Standard

MAILBOX BRACKET CONNECTING DETAILS

MB-15(1)

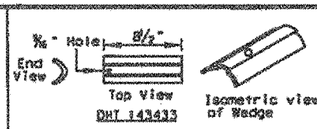
FILE: mb15(1)-21.DGN	DN: JED	CK:	DW: JED	CK:
©TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS ADDED DHT 163732	3148	01	006	FM 3097
	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		112BA

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TYPE 1 SUPPORT/FOUNDATION

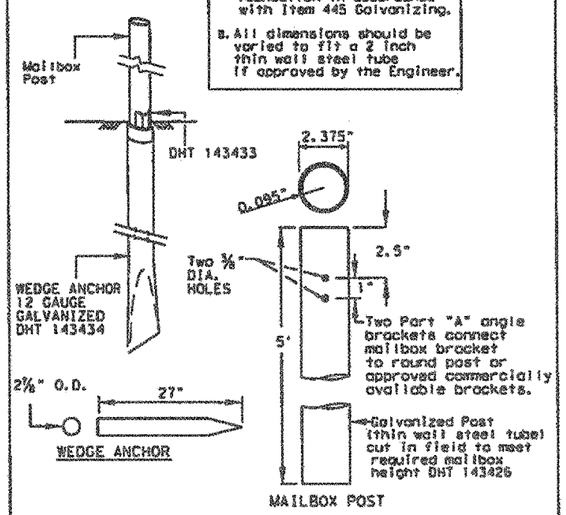
THIN WALL STEEL TUBE w/ V-LOC ANCHORAGE



NOTES FOR TYPE 2 SUPPORT/FOUNDATION

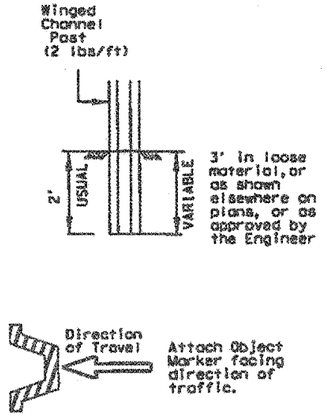
a. Galvanize steel support foundation in accordance with Item 445 Galvanizing.

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



TYPE 2 SUPPORT/FOUNDATION

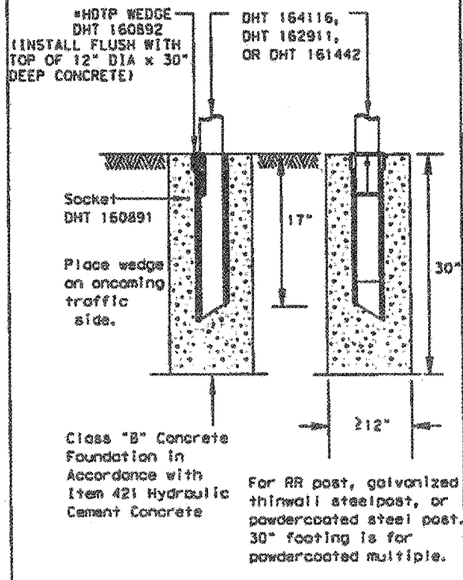
THIN WALL STEEL TUBE w/ WEDGE ANCHOR SYSTEM



TYPE 3 SUPPORT/FOUNDATION

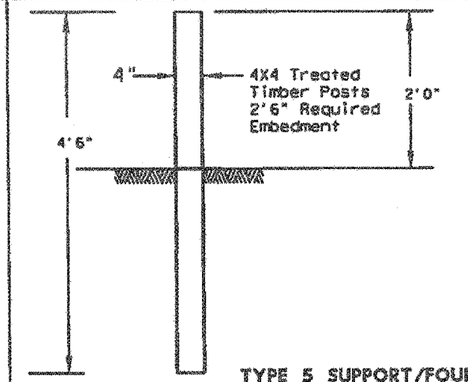
WINGED CHANNEL POST

Note on DHT Number
See Table of Applicable DHT Numbers on this sheet 4 for DHT description.



TYPE 4 SUPPORT/FOUNDATION

FOR WHITECOATED STEEL POST, MULTIPLE POST, AND RECYCLED RUBBER.

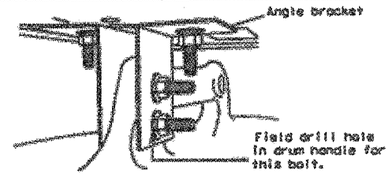


TYPE 5 SUPPORT/FOUNDATION

FOR ONE PIECE MOLDED PLASTIC MAILBOX

ONE PIECE MOLDED PLASTIC MAILBOXES

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

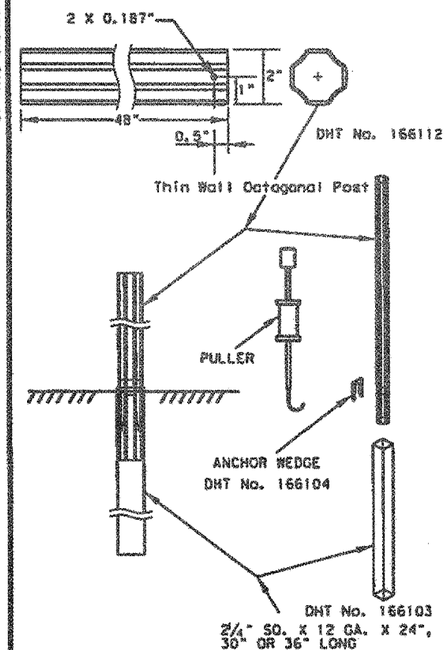


Placed on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).

Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

TYPE 6 TEMPORARY MAILBOX SUPPORT

CONNECTION DETAIL



TYPE 7 MAILBOX SUPPORT/FOUNDATION

CONNECTION DETAIL

MB-(X) ASSM TY (XXX) (X) (XX) (OPTIONAL)

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- SP = Single Plastic

Type of Post
- WC = Winged Channel Post
- RR = Recycled Rubber
- TWW = Thin Walled White Tubing
- TWG = Thin Walled Galvanized Tubing
- TIM = Timber

Type of Foundation
- Ty 1 = V-Loc
- Ty 2 = Wedge Anchor Steel System
- Ty 3 = Winged Channel post
- Ty 4 = Wedge Anchor Plastic System
- Ty 5 = 4 X 4 Post
- Ty 7 = Wedge Anchor

Type of Bracket
- AB = Angle Bracket.
- TB = 2.375" Tube Bracket

GENERAL NOTES

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Type 1, 2, 3, 4 or 7 supports or foundation can be used for single or double mailbox installations. The RCR post should be used only for a single installation with a small mailbox. The Type 5 support/foundation is used for the single molded plastic mailbox. The Type 4 support/foundation is used for the 2.375" O.D. RR post, thin wall steel post, and white multiple mailbox post.
4. The Type 1 or Type 7 support/foundation can be used for a multiple mailbox mount.
5. The Type 4 support should be used with thin wall steel pipe for the medium, large and double mailbox installations.
6. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition.

DOUBLE AND LARGE MAILBOXES MUST BE ON STEEL POST.

*HDTP: High density thermoplastic polyesters

SHEET 3 OF 4

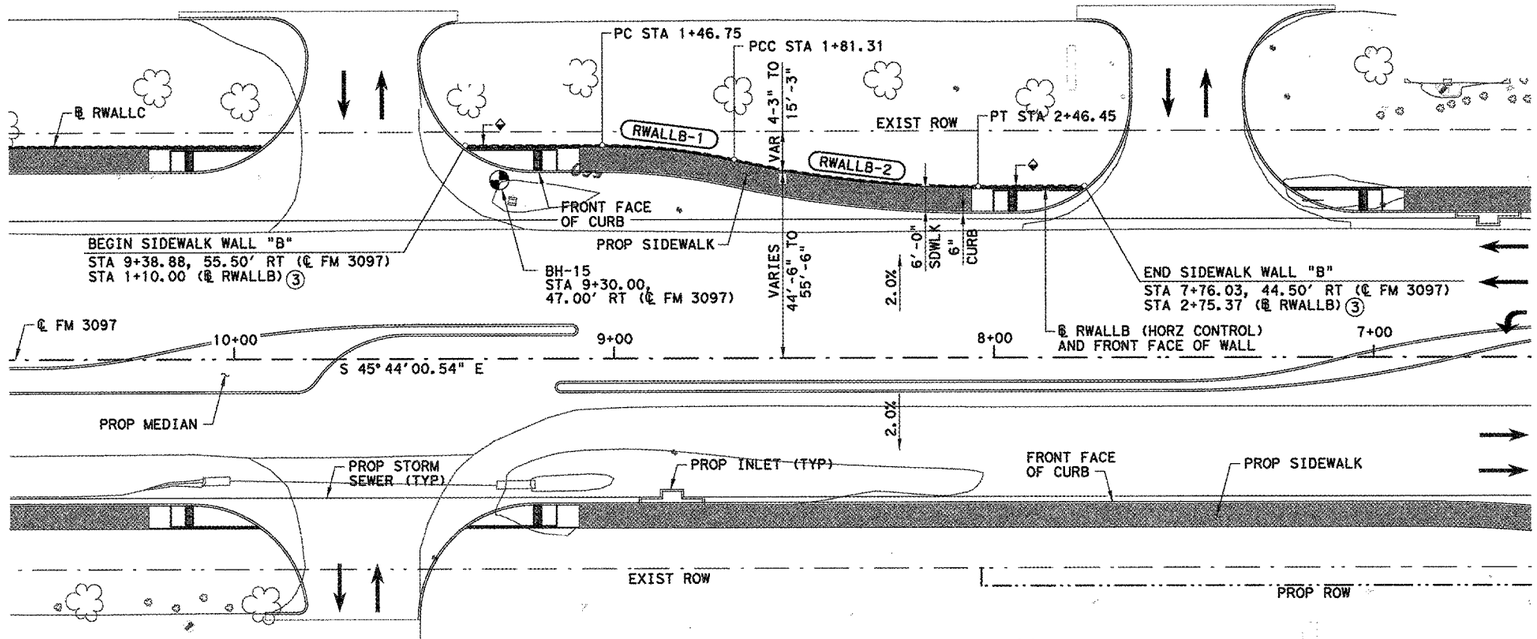
Texas Department of Transportation

Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB-15(1)

FILE: MB15(1).DGN	DN: JCD	CK:	DW: JCD	CK:
©TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		112CA



HORIZONTAL CURVE DATA

RWALLB-1

PI STA 1+64.03
Δ = 12° 41' 40.28" RT
D = 36° 43' 41.03"
T = 17.35'
R = 156.00'
L = 34.56'
PC STA 1+46.75
PCC STA 1+81.31
BACK BRNG = N 45° 44' 00.54" W

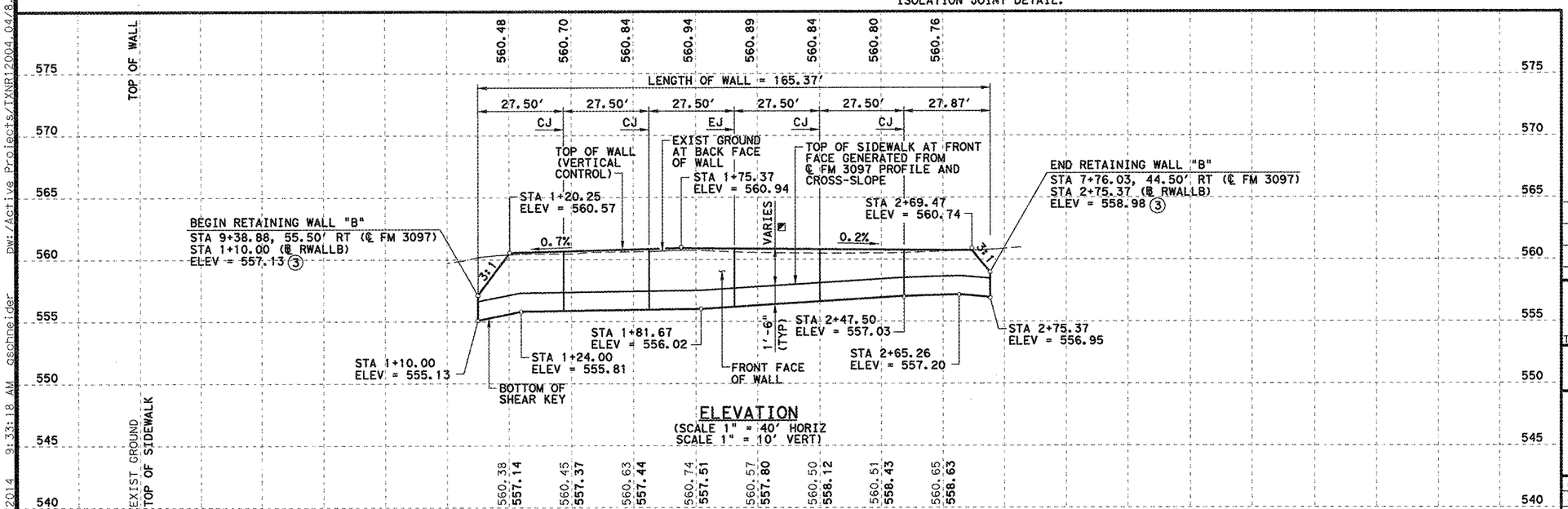
RWALLB-2

PI STA 2+13.88
Δ = 12° 41' 40.28" RT
D = 19° 29' 18.10"
T = 32.70'
R = 294.00'
L = 65.14'
PCC STA 1+81.31
PT STA 2+46.45
FWD BRNG = N 45° 44' 00.54" W

◈ WALL BEARING = N 45° 44' 00.54" W
◩ WALL HEIGHT VARIES:
MIN = 6"
MAX = 3'-6"

PLAN
(SCALE 1" = 40')

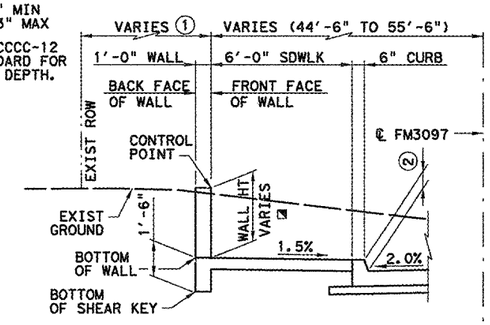
③ BEGIN AND END OF WALL TO SLOPE DOWN AND MATCH TOP OF CURB. PLACE ½" ISOLATION JOINT BETWEEN BACK OF CURB AND EDGE OF WALL. SEE SIDEWALK WALL DETAILS SHEET FOR ISOLATION JOINT DETAIL.



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

① 4'-3" MIN
15'-3" MAX

② SEE CCCC-12 STANDARD FOR CURB DEPTH.



TYPICAL SECTION
(NTS)

GENERAL NOTES:

1. ALL RETAINING WALL MEASUREMENTS ARE TO FRONT FACE OF WALL, UNLESS NOTED OTHERWISE.
2. SQUARE FOOT SURFACE AREA OF RETAINING WALL IS MEASURED BETWEEN TOP OF WALL AND PLAN DESIGNED BOTTOM OF WALL AS NOTED. CLASS "C" CONCRETE REQUIRED FOR SHEAR KEY IS SUBSIDIARY TO PAYMENT OF RETAINING WALL. SIDEWALK ADJACENT TO RETAINING WALL WILL BE PAID FOR BY THE BID ITEM "CONC SIDEWALKS (6')(6")".
3. ANY ADJUSTMENTS MADE TO ACCOMMODATE THE AVAILABLE DESIGNS WILL NOT BE MEASURED. THE QUANTITY FOR WHICH PAYMENT IS MADE WILL BE THE QUANTITY SHOWN IN THE PLANS.
4. CONTRACTOR TO PLACE 2" DIAMETER WEEP HOLES SPACED AT 15' MAX. SEE "SIDEWALK WALL DETAILS" FOR ADDITIONAL INFORMATION.
5. CJ = WALL CONSTRUCTION JOINT
   EJ = WALL EXPANSION JOINT
6. SEE "BORING LOGS" FOR GEOTECHNICAL INFORMATION.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
RETAINING WALL (CAST-IN-PLACE)	SF	465
SIDEWALK (SPL) (12")	LF	166

STATE OF TEXAS
KELLY HO
112947
LICENSED PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

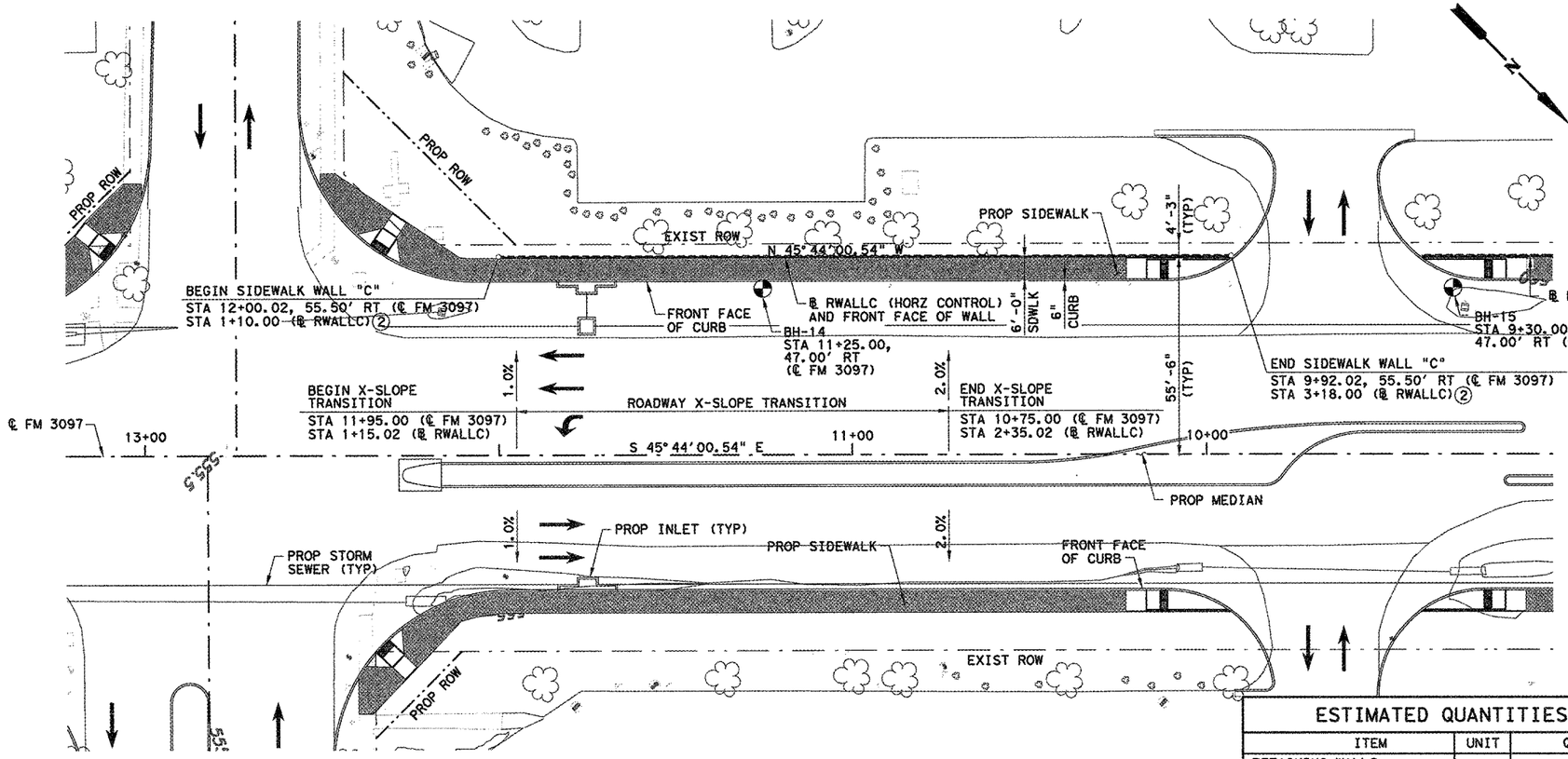
Texas Department of Transportation

FM 3097
SIDEWALK WALL LAYOUT WALL "B"

Designed:	KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006	113

SHEET 1 OF 1

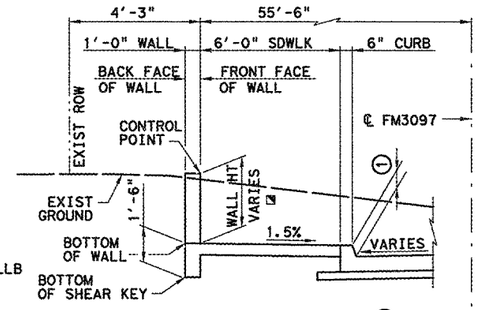
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② BEGIN AND END OF WALL TO SLOPE DOWN AND MATCH TOP OF CURB. PLACE ½" ISOLATION JOINT BETWEEN BACK OF CURB AND EDGE OF WALL. SEE SIDEWALK WALL DETAILS SHEET FOR ISOLATION JOINT DETAIL.

PLAN
(SCALE 1" = 40')

▩ WALL HEIGHT VARIES:
MIN = 6"
MAX = 3'-4"



TYPICAL SECTION
(NTS)

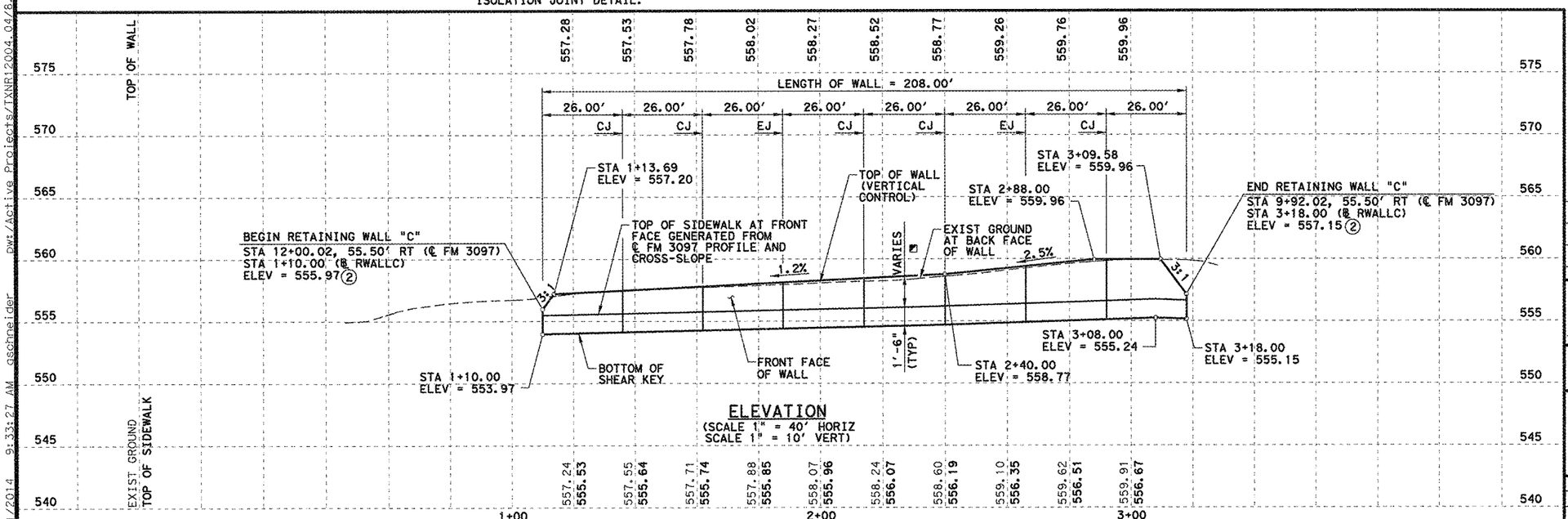
① SEE STANDARD CCCG-12 FOR CURB DEPTH.

GENERAL NOTES:

1. ALL RETAINING WALL MEASUREMENTS ARE TO FACE OF WALL, UNLESS NOTED OTHERWISE.
2. SQUARE FOOT SURFACE AREA OF RETAINING WALL IS MEASURED BETWEEN TOP OF WALL AND PLAN DESIGNED BOTTOM OF WALL AS NOTED. CLASS "C" CONCRETE REQUIRED FOR SHEAR KEY IS SUBSIDIARY TO PAYMENT OF RETAINING WALL. SIDEWALK ADJACENT TO RETAINING WALL WILL BE PAID FOR BY THE BID ITEM "CONC SIDEWALKS (6')(6")".
3. ANY ADJUSTMENTS MADE TO ACCOMMODATE THE AVAILABLE DESIGNS WILL NOT BE MEASURED. THE QUANTITY FOR WHICH PAYMENT IS MADE WILL BE THE QUANTITY SHOWN IN THE PLANS.
4. CONTRACTOR TO PLACE 2" DIAMETER WEEP HOLES SPACED AT 15' MAX. SEE "SIDEWALK WALL DETAILS" FOR ADDITIONAL INFORMATION.
5. CJ = CONSTRUCTION JOINT
   EJ = EXPANSION JOINT
6. SEE "BORING LOGS" FOR GEOTECHNICAL INFORMATION.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
RETAINING WALLS (CAST-IN-PLACE)	SF	504
SIDEWALK (SPL) (12")	LF	208



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)



NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

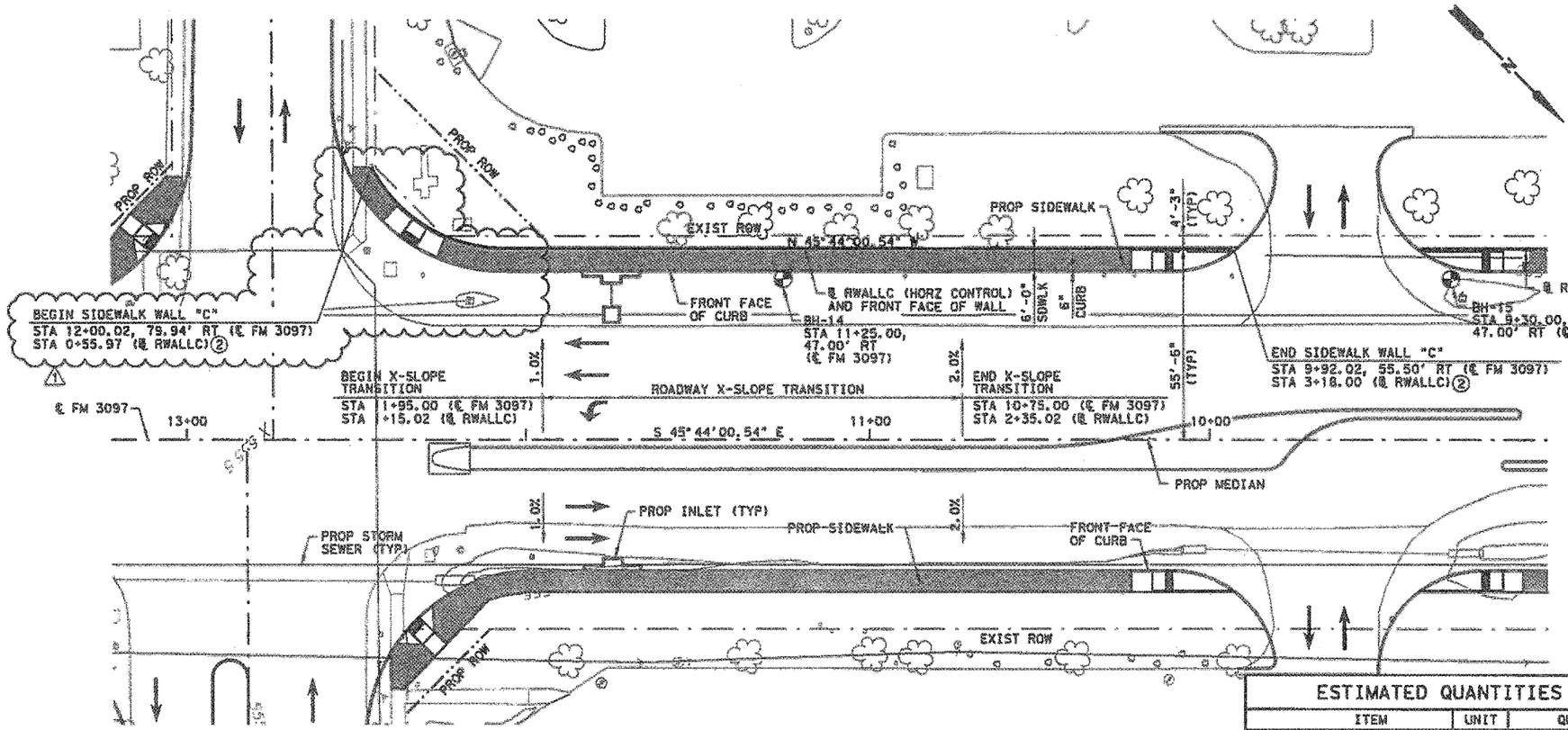
Texas Department of Transportation

FM 3097
SIDEWALK WALL LAYOUT
WALL "C"

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	KH	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	KWZ	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	GWS	DAL	ROCKWALL	3148	01	006	114
Checked:	KH						

SHEET 1 OF 1

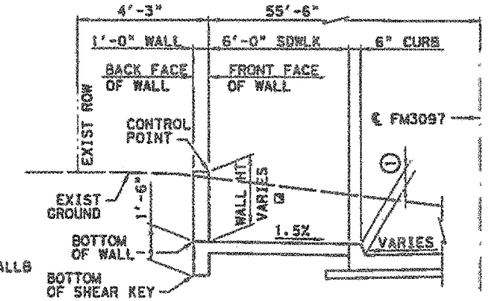
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②BEGIN AND END OF WALL TO SLOPE DOWN AND MATCH TOP OF CURB. PLACE ½" ISOLATION JOINT BETWEEN BACK OF CURB AND EDGE OF WALL. SEE SIDEWALK WALL DETAILS SHEET FOR ISOLATION JOINT DETAIL.

PLAN
(SCALE 1" = 40')

℄ WALL HEIGHT VARIES:
MIN = 6"
MAX = 3'-4"



TYPICAL SECTION
(NTS)

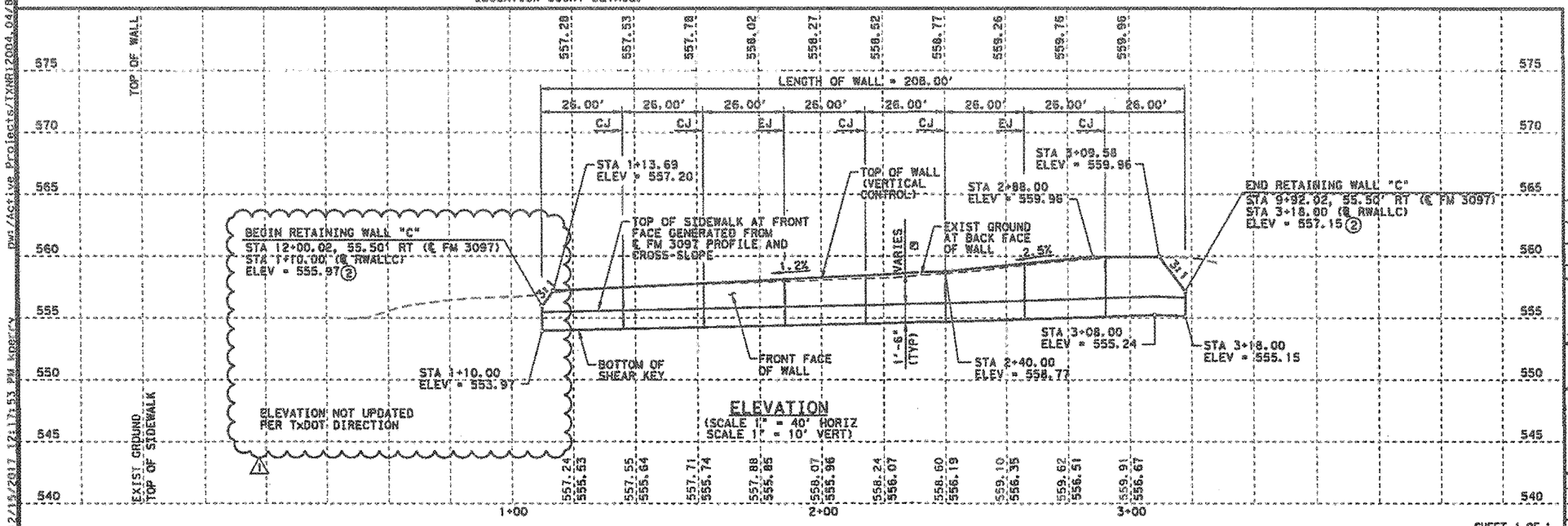
①SEE STANDARD CCCG-12 FOR CURB DEPTH.

GENERAL NOTES:

1. ALL RETAINING WALL MEASUREMENTS ARE TO FACE OF WALL, UNLESS NOTED OTHERWISE.
2. SQUARE FOOT SURFACE AREA OF RETAINING WALL IS MEASURED BETWEEN TOP OF WALL AND PLAN DESIGNED BOTTOM OF WALL AS NOTED. CLASS "C" CONCRETE REQUIRED FOR SHEAR KEY IS SUBSIDIARY TO PAYMENT OF RETAINING WALL. SIDEWALK ADJACENT TO RETAINING WALL WILL BE PAID FOR BY THE BID ITEM "CONC SIDEWALKS (6')(6")".
3. ANY ADJUSTMENTS MADE TO ACCOMMODATE THE AVAILABLE DESIGNS WILL NOT BE MEASURED. THE QUANTITY FOR WHICH PAYMENT IS MADE WILL BE THE QUANTITY SHOWN IN THE PLANS.
4. CONTRACTOR TO PLACE 2" DIAMETER WEEP HOLES SPACED AT 15' MAX. SEE "SIDEWALK WALL DETAILS" FOR ADDITIONAL INFORMATION.
5. CJ = CONSTRUCTION JOINT
   EJ = EXPANSION JOINT
6. SEE "BORING LOGS" FOR GEOTECHNICAL INFORMATION.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
RETAINING WALLS (CAST-IN-PLACE)	SF	504
SIDEWALK (SPL) (12")	LF	208



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SHEET 1 OF 1

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
12/15/17

NO.	REVISION	BY	DATE
⚠	CHANGE ORDER #15	KLP	12/15/17

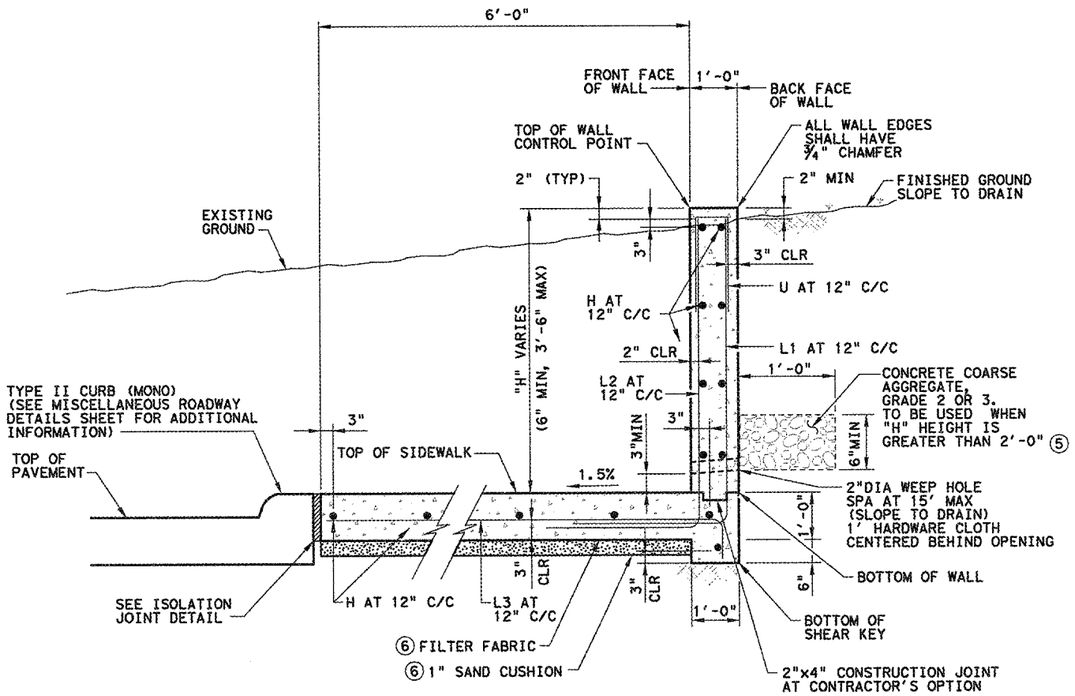
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

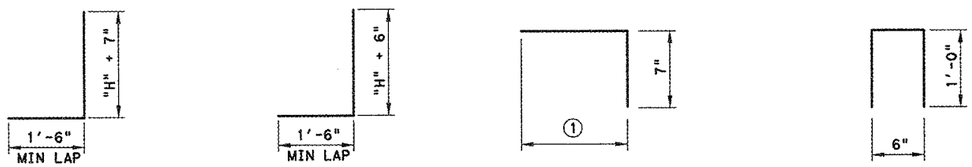
FM 3097
SIDEWALK WALL LAYOUT WALL "C"

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Checked	KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn	CWS	REGION	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	KH	DAL	ROCKWALL	3148	01	006	114 A

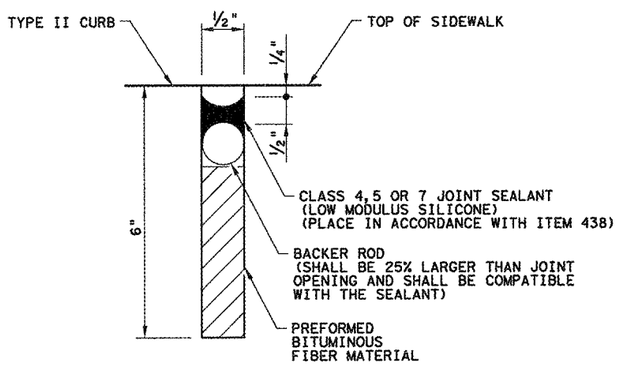
12/15/2017 12:17:53 PM KHenry
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SIDEWALK WALL



① ADJUST LENGTH AS NECESSARY TO MAINTAIN 2" END COVER WHERE SIDEWALK TAPERS HORIZONTALLY.
MIN = 1'-5"
MAX = 6'-3"



ISOLATION JOINT DETAIL

TABLE OF ESTIMATED QUANTITIES - WALL "B"

	BAR	NO.	SIZE	LENGTH	WEIGHT
②③	H	17	#4	166'- 9"	1,894
③	L1	168	#4	5'- 7"	627
③	L2	168	#4	5'- 6"	617
③	L3	168	#4	6'- 10"	767
	U	84	#4	2'-6"	140
④	REINFORCING STEEL			LB	4,045
④	CL "C" CONCRETE			CY	60.1

TABLE OF ESTIMATED QUANTITIES - WALL "C"

	BAR	NO.	SIZE	LENGTH	WEIGHT
②③	H	17	#4	210'- 0"	2,385
③	L1	208	#4	5'- 5"	753
③	L2	208	#4	5'- 4"	741
③	L3	208	#4	6'- 10"	950
	U	104	#4	2'- 6"	174
④	REINFORCING STEEL			LB	5,003
④	CL "C" CONCRETE			CY	72.6

② INCLUDES 2 ~ 1'-0" MIN LAP.

③ MAX BAR LENGTH SHOWN. CONTRACTOR TO FIELD CUT BARS AS NECESSARY TO MAINTAIN 2" END CLEARANCE.

④ FOR CONTRACTOR'S INFORMATION ONLY. QUANTITY INCLUDES RETAINING WALL, SHEAR KEY, AND SIDEWALK CONCRETE QUANTITY AND REINFORCING STEEL TOTAL.

⑤ CRUSHED CONCRETE, SLAG, OR COMBINATION OF WILL NOT BE ALLOWED AS CONCRETE COARSE AGGREGATE.

⑥ SAND CUSHION TO BE FILTER MATERIAL TYPE A OR D AS SPECIFIED IN TXDOT STANDARD SPECIFICATIONS ITEM 556.B TABLE 2. FILTER FABRIC TO CONFORM TO TXDOT STANDARD SPECIFICATIONS ITEM 556.C. FILTER FABRIC AND SAND CUSHION TO BE SUDSIDIARY TO "RETAINING WALL (CAST-IN-PLACE)" BID ITEM.

GENERAL NOTES:

1. DESIGNED IN ACCORDANCE WITH CURRENT AASHTO STANDARDS. ALL CONCRETE SHALL BE CLASS "C". ALL REINFORCING STEEL SHALL BE GRADE 60 AND MAINTAIN A 2" CLEAR COVER AND END COVER, UNLESS NOTED OTHERWISE.
2. SEE SIDEWALK WALL LAYOUTS FOR LOCATION OF EXPANSION AND CONSTRUCTION JOINTS. SEE RW 2 STANDARD FOR EXPANSION AND CONSTRUCTION JOINT DETAILS AND WATERSTOP DETAILS.

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

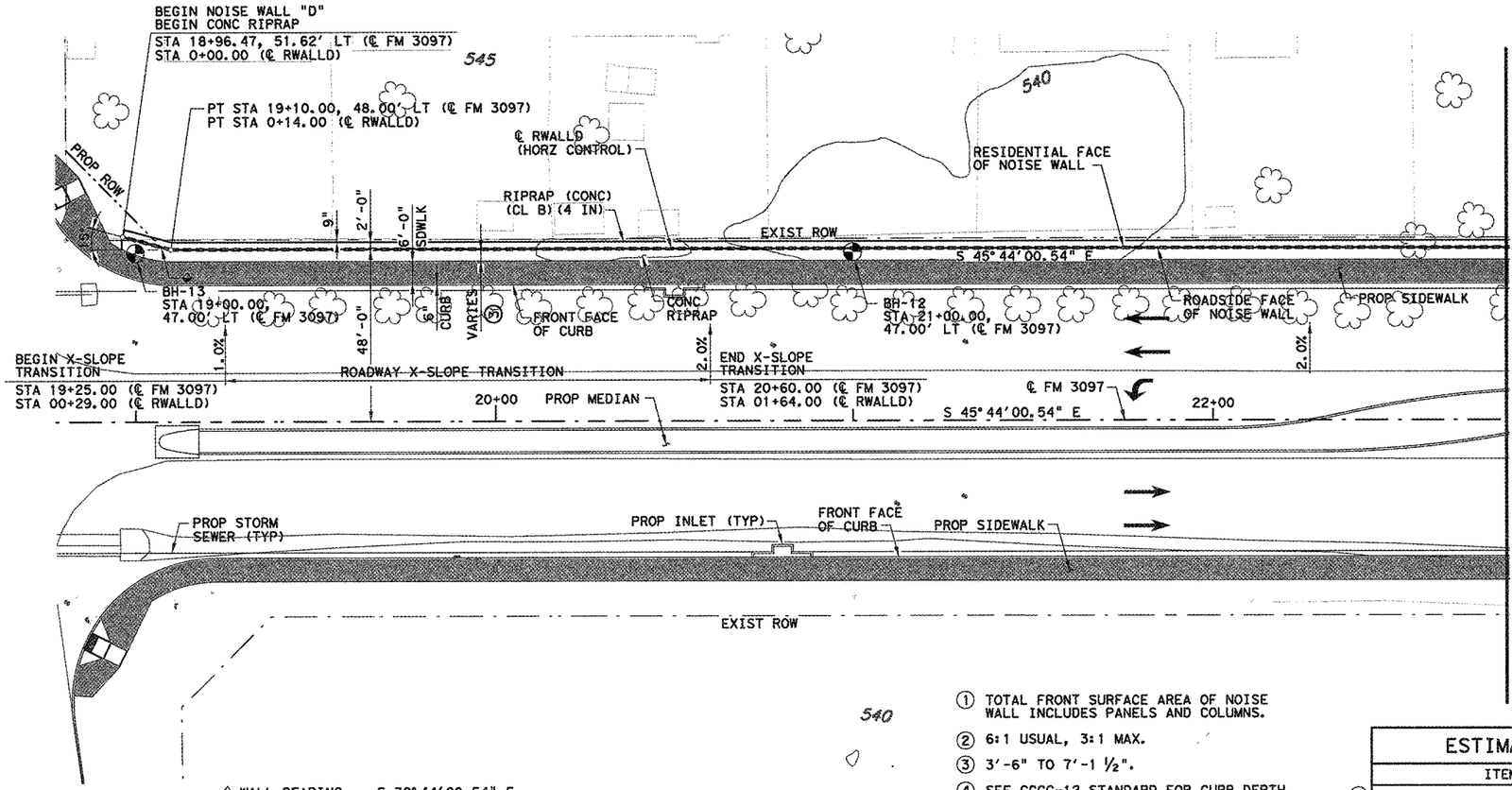
Texas Department of Transportation

FM 3097
SIDEWALK WALL DETAILS

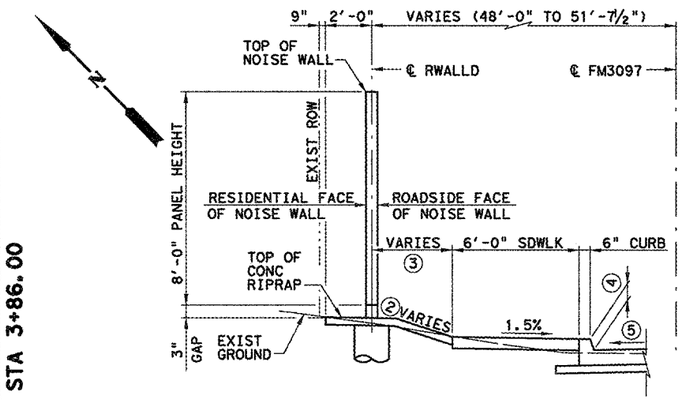
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Checked:	KWZ	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006		115

SHEET 1 OF 1

5/1/2014 9:33:33 AM gschneider pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.05 Walls/1204004RWX-D01.dgn



PLAN
(SCALE 1" = 40')



TYPICAL SECTION
(NTS)

① TOTAL FRONT SURFACE AREA OF NOISE WALL INCLUDES PANELS AND COLUMNS.

② 6:1 USUAL, 3:1 MAX.

③ 3'-6" TO 7'-1 ½".

④ SEE CCCG-12 STANDARD FOR CURB DEPTH.

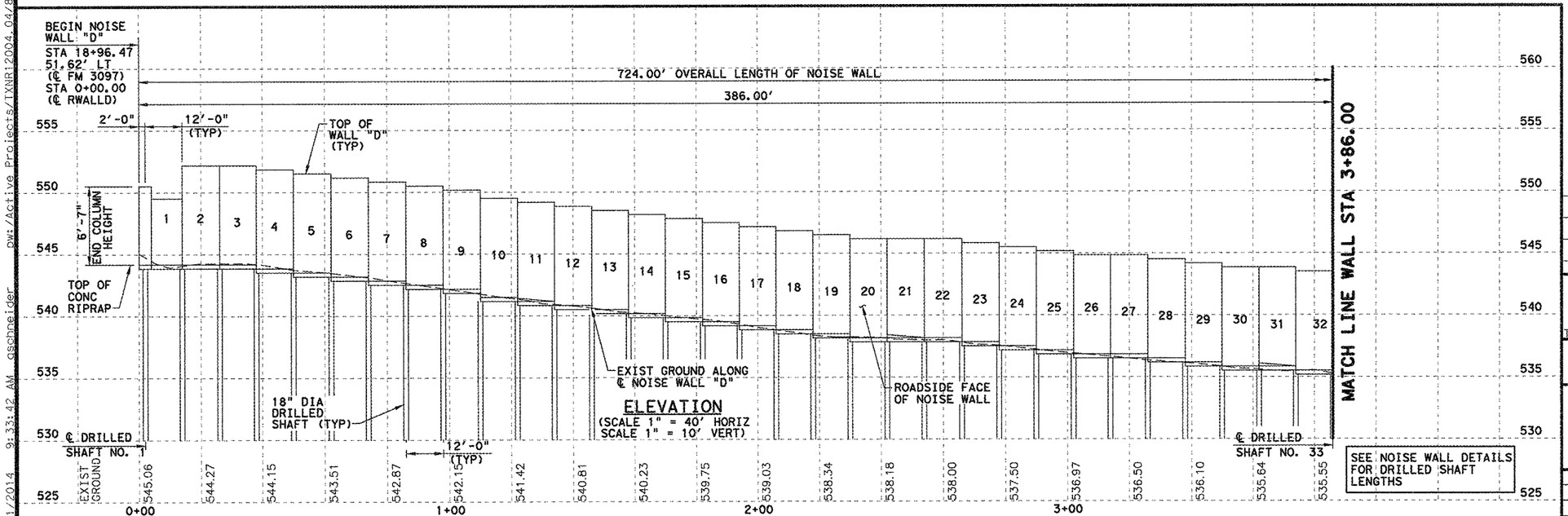
⑤ 1% TO 2% SLOPE.

GENERAL NOTES:

1. SEE "BORING LOGS" FOR GEOTECHNICAL INFORMATION.
2. SEE "NOISE WALL DETAILS" FOR TOP OF CONCRETE RIPRAP ELEVATIONS, TOP OF WALL ELEVATIONS AND ADDITIONAL GENERAL NOTES.

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
①	NOISE WALL (8FT)	SF	5,799
	RIPRAP (CONC) (CL B) (4 IN)	CY	50
	DRILL SHAFT (18 IN)	LF	1,098



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SEE NOISE WALL DETAILS FOR DRILLED SHAFT LENGTHS

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

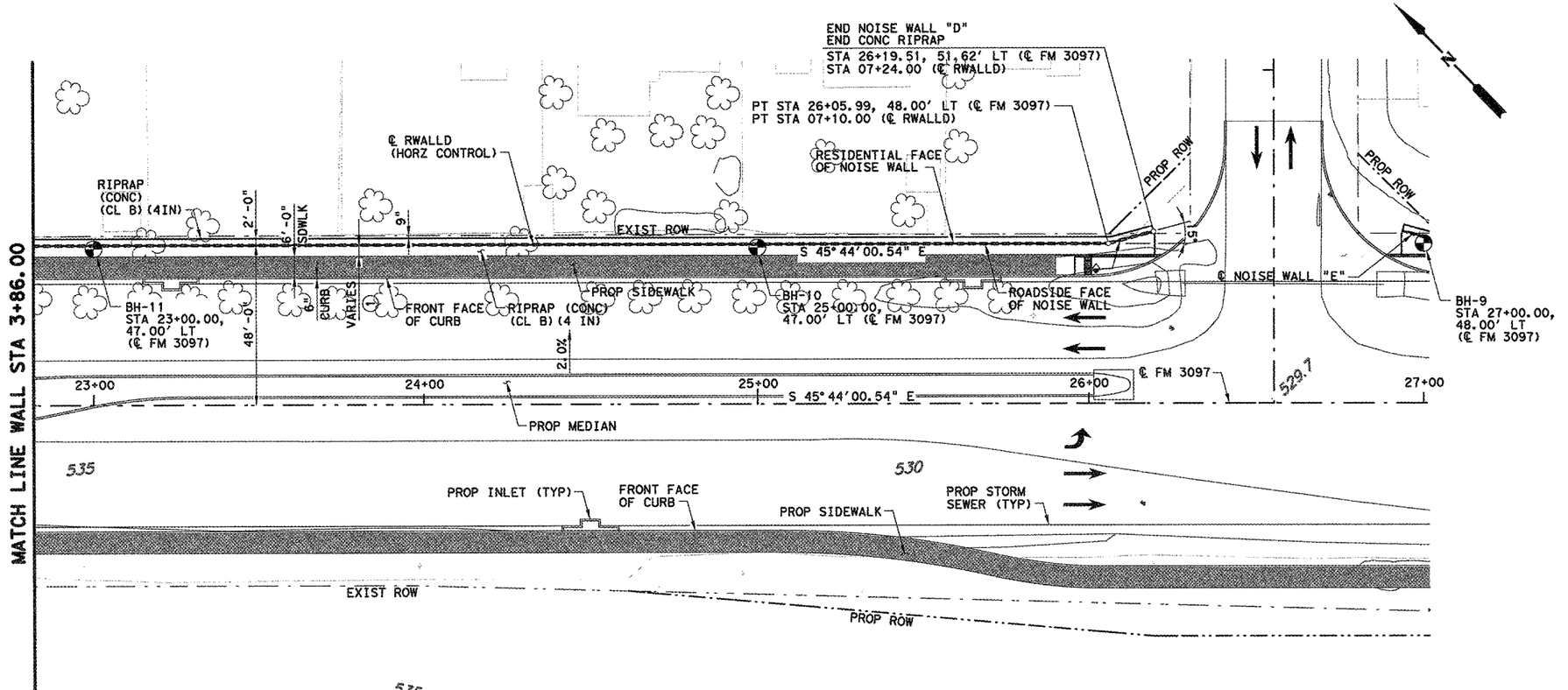
Texas Department of Transportation

FM 3097
NOISE WALL LAYOUT WALL "D"

Designed:	KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006	116

SHEET 1 OF 2

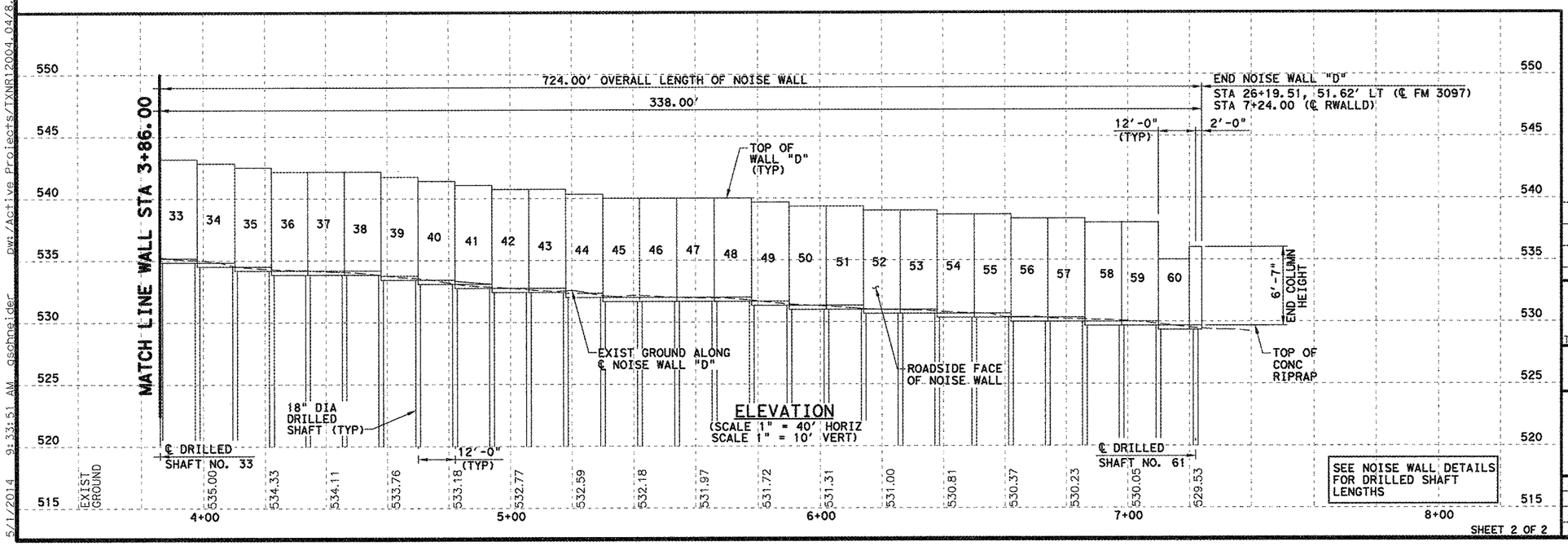
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5/1/2014 9:33:42 AM gschneider



PLAN
(SCALE 1" = 40')

① 3'-6" TO 7'-1 ½"

◆ WALL BEARING = S 60° 44' 00.54" E



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SEE NOISE WALL DETAILS
FOR DRILLED SHAFT
LENGTHS

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

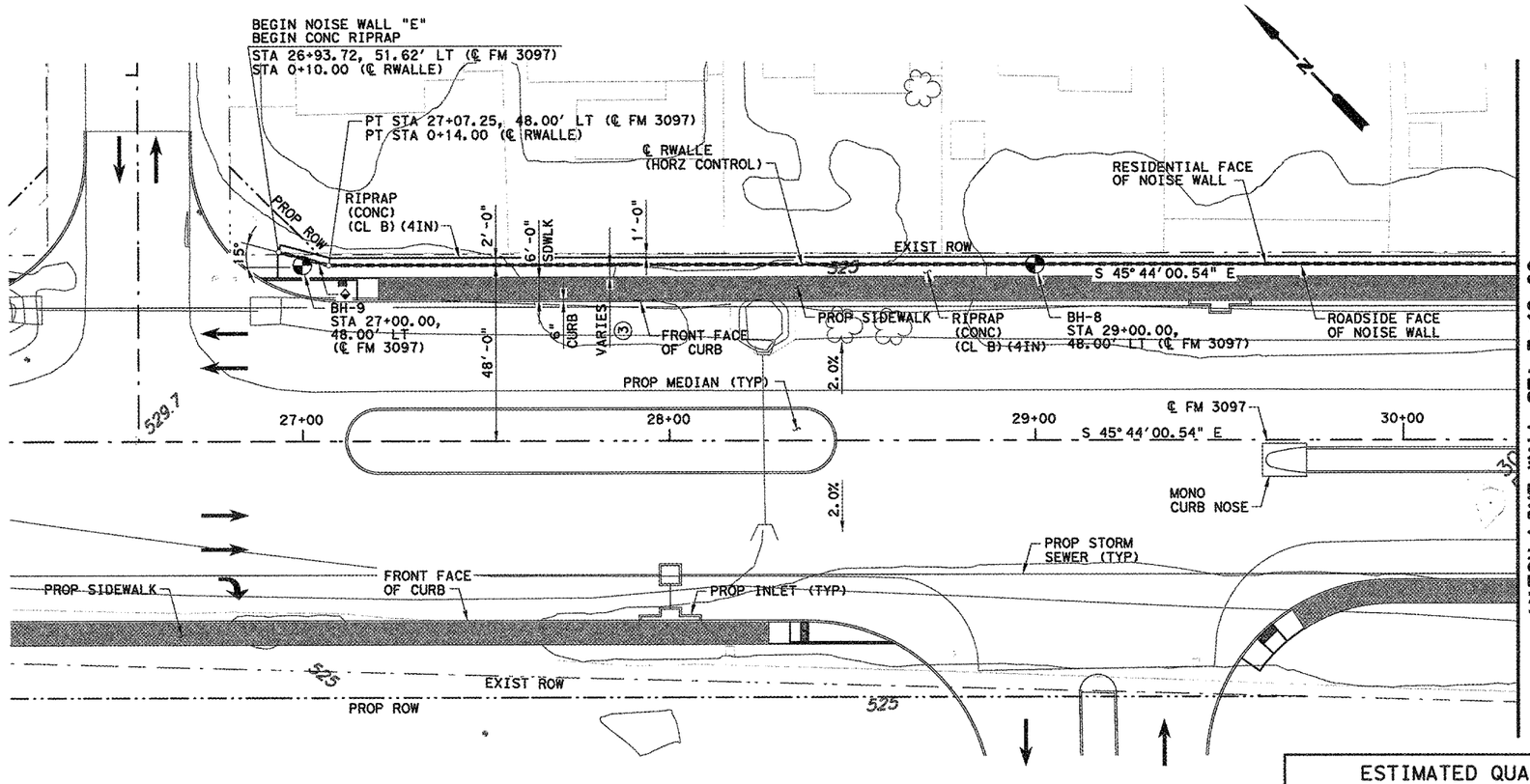
Texas Department of Transportation

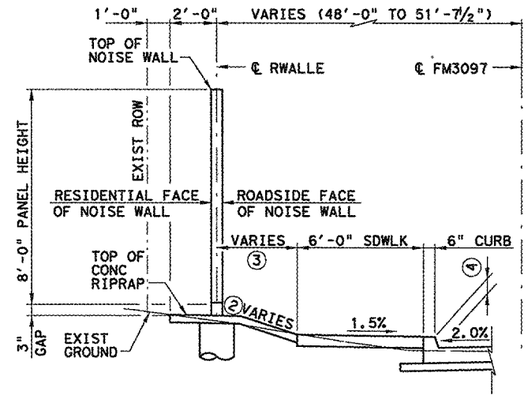
FM 3097
NOISE WALL LAYOUT
WALL "D"

Designed:	KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006	117

SHEET 2 OF 2

5/1/2014 9:33:51 AM gschneider ows:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.05 Walls/120404RWD-L02.dgn





TYPICAL SECTION
(NTS)

① TOTAL FRONT SURFACE AREA OF NOISE WALL INCLUDES PANELS AND COLUMNS.

② 6:1 USUAL, 3:1 MAX.

③ 3'-6" TO 7'-1 ½".

④ SEE CCCG-12 STANDARD FOR CURB DEPTH.

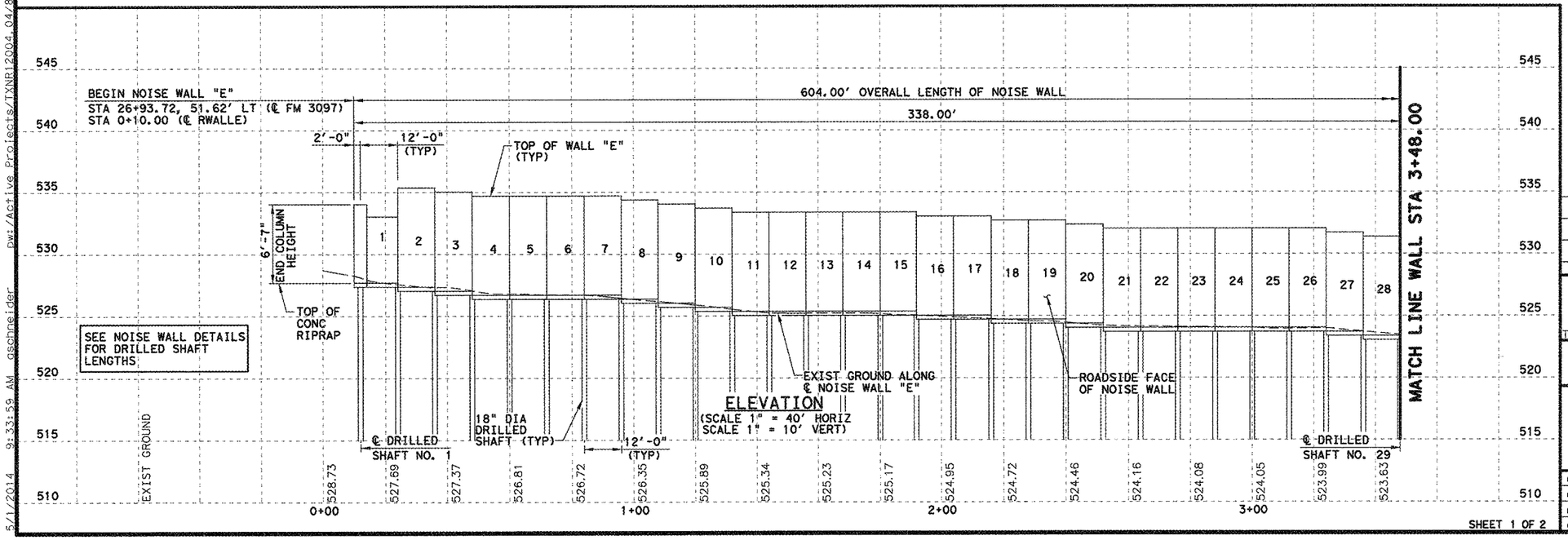
GENERAL NOTES:

1. SEE "BORING LOGS" FOR GEOTECHNICAL INFORMATION.
2. SEE "NOISE WALL DETAILS" FOR TOP OF CONCRETE RIPRAP ELEVATIONS, TOP OF WALL ELEVATIONS AND ADDITIONAL GENERAL NOTES.

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
① NOISE WALL (8FT)	SF	4,824
RIPRAP (CONC) (CL B) (4 IN)	CY	41
DRILL SHAFT (18 IN)	LF	877

◆ WALL BEARING = S 30° 44' 00.54" E

PLAN
(SCALE 1" = 40')



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SHEET 1 OF 2

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

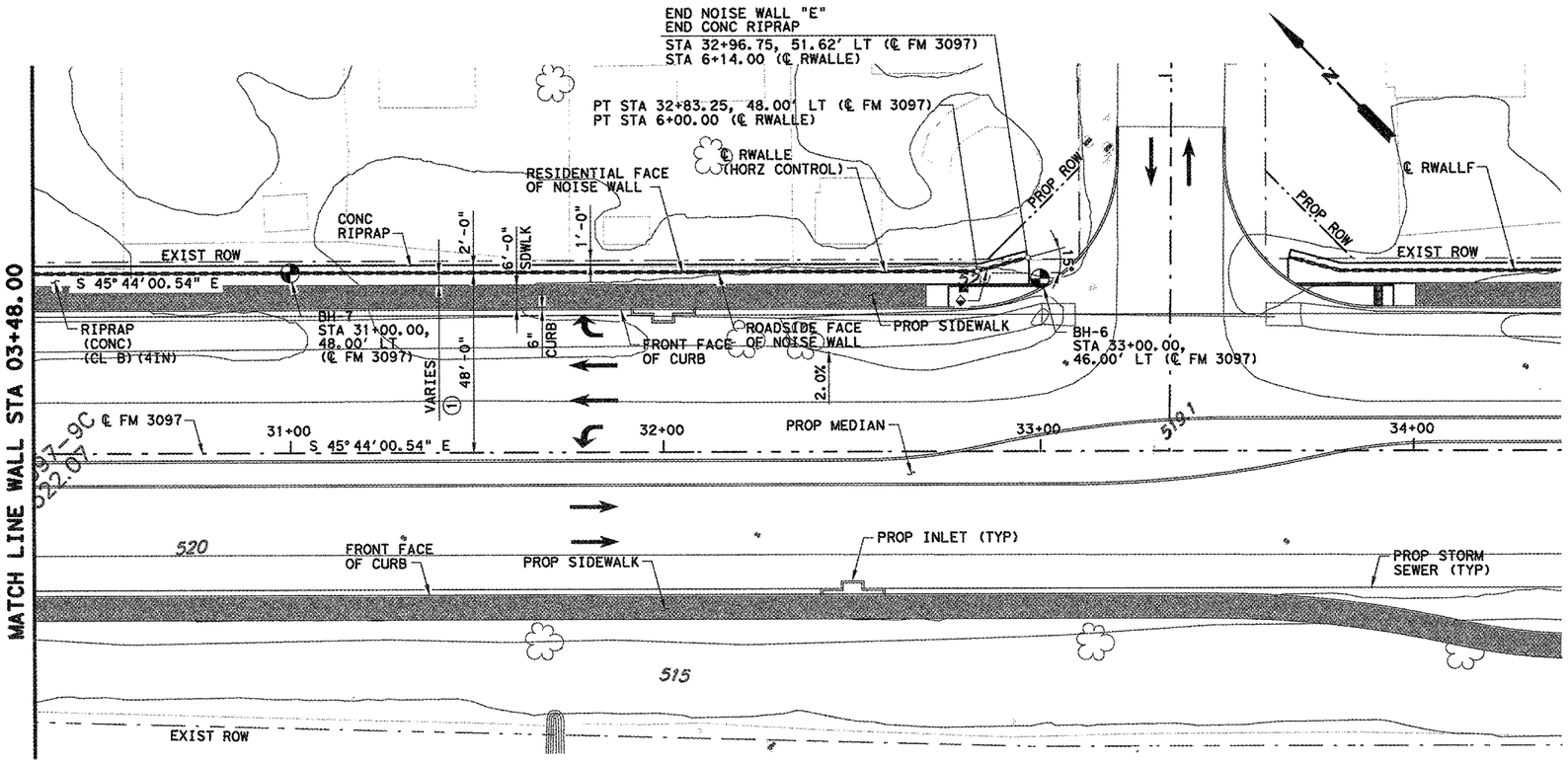
Texas Department of Transportation

FM 3097

NOISE WALL LAYOUT WALL "E"

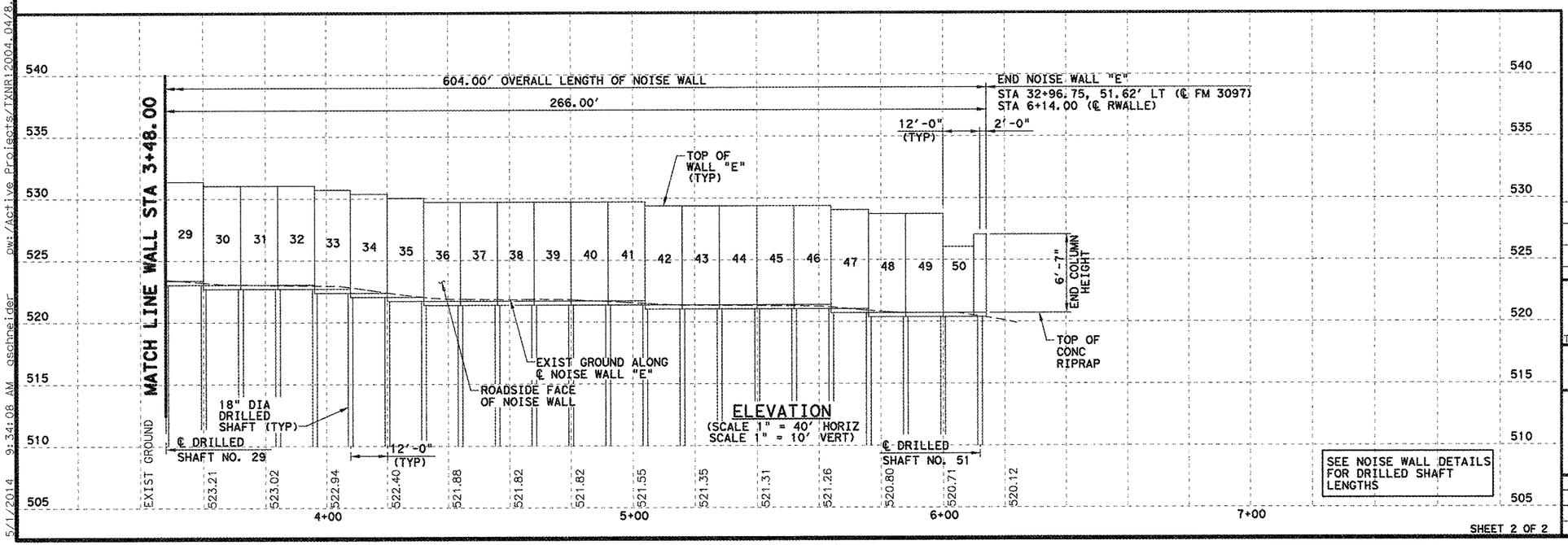
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Checked: KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: KH	DAL	ROCKWALL	3148	01	006	118

5/1/2014 9:33:59 AM dschneider Dw:/Active Projects/TXNR12004 04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.05 Walls/4120404RWE-L01.dgn



① 3'-6" TO 7'-1 ½"
◆ WALL BEARING = S 60° 44' 00.54" E

PLAN
(SCALE 1" = 40')



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SEE NOISE WALL DETAILS
FOR DRILLED SHAFT
LENGTHS

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

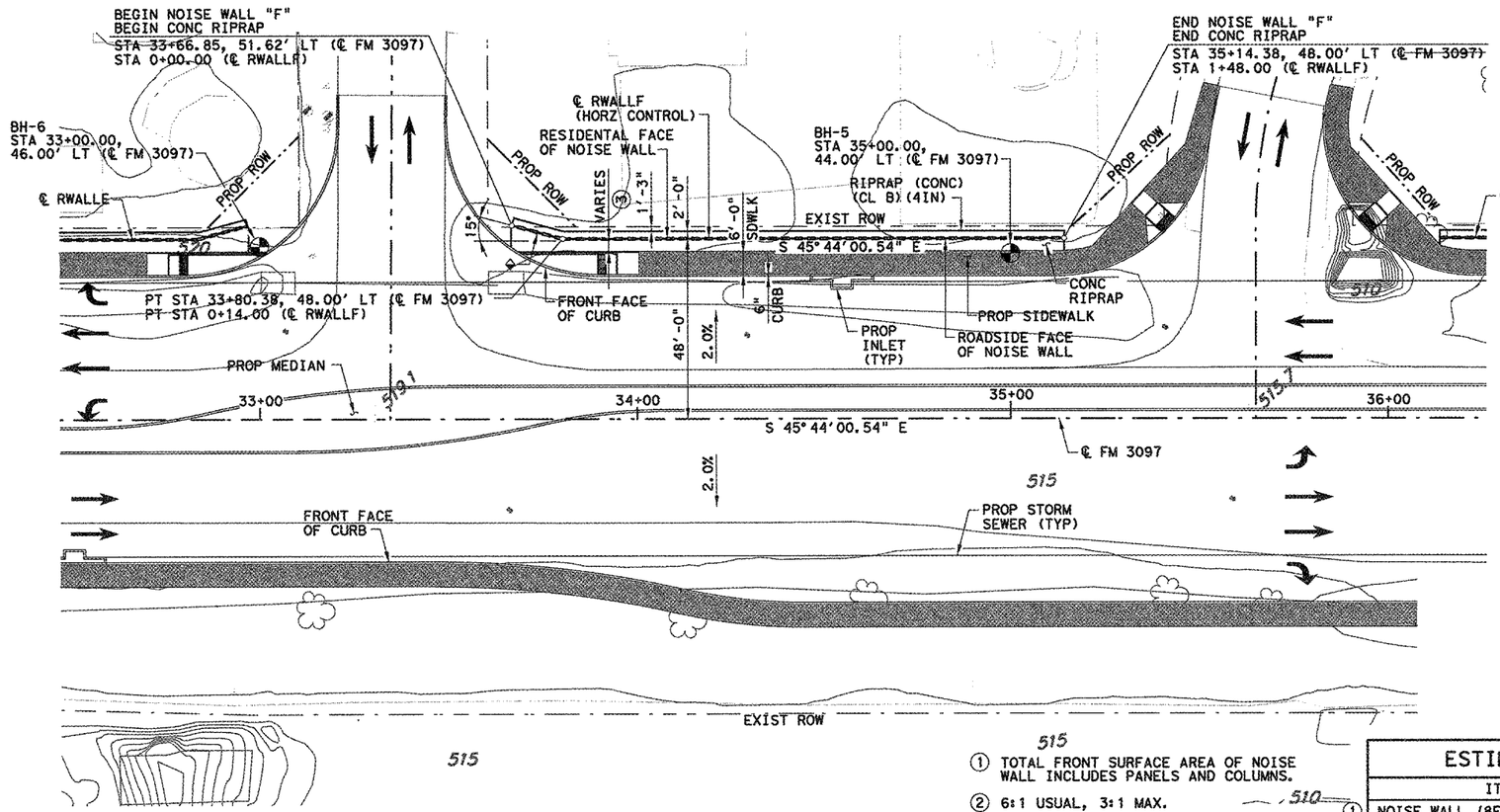
Texas Department of Transportation

FM 3097
NOISE WALL LAYOUT
WALL "E"

Designed:	KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	KWZ	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006		119

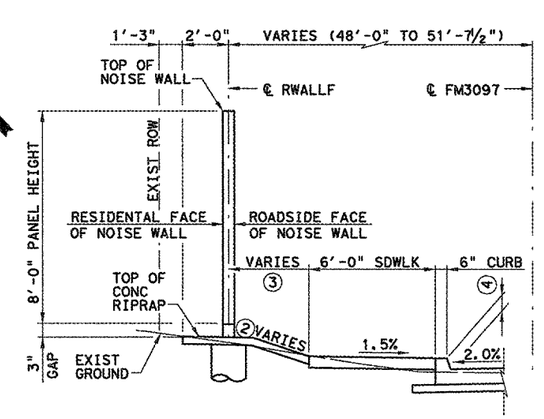
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5/1/2014 9:34:08 AM aschneider pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.05 Walls/120404RWE-L02.dgn



◆ WALL BEARING = S 30°44'00.54" E

PLAN
(SCALE 1" = 40')



TYPICAL SECTION
(NTS)

① TOTAL FRONT SURFACE AREA OF NOISE WALL INCLUDES PANELS AND COLUMNS.

② 6:1 USUAL, 3:1 MAX.

③ 3'-6" TO 7'-1 ½".

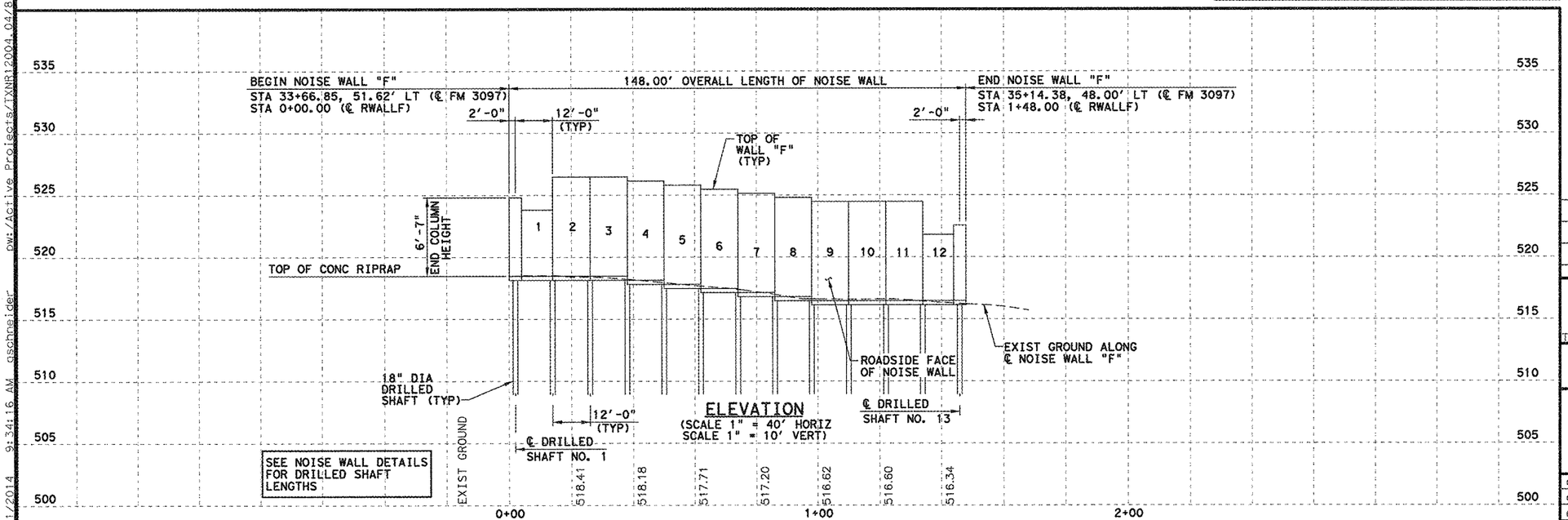
④ SEE CCCG-12 STANDARD FOR CURB DEPTH.

GENERAL NOTES:

1. SEE "BORING LOGS" FOR GEOTECHNICAL INFORMATION.
2. SEE "NOISE WALL DETAILS" FOR TOP OF CONCRETE RIPRAP ELEVATIONS, TOP OF WALL ELEVATIONS AND ADDITIONAL GENERAL NOTES.

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
①	NOISE WALL (8FT)	SF	1,119
	RIPRAP (CONC) (CL B) (4 IN)	CY	10
	DRILL SHAFT (18 IN)	LF	247



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SEE NOISE WALL DETAILS FOR DRILLED SHAFT LENGTHS

SHEET 1 OF 1

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

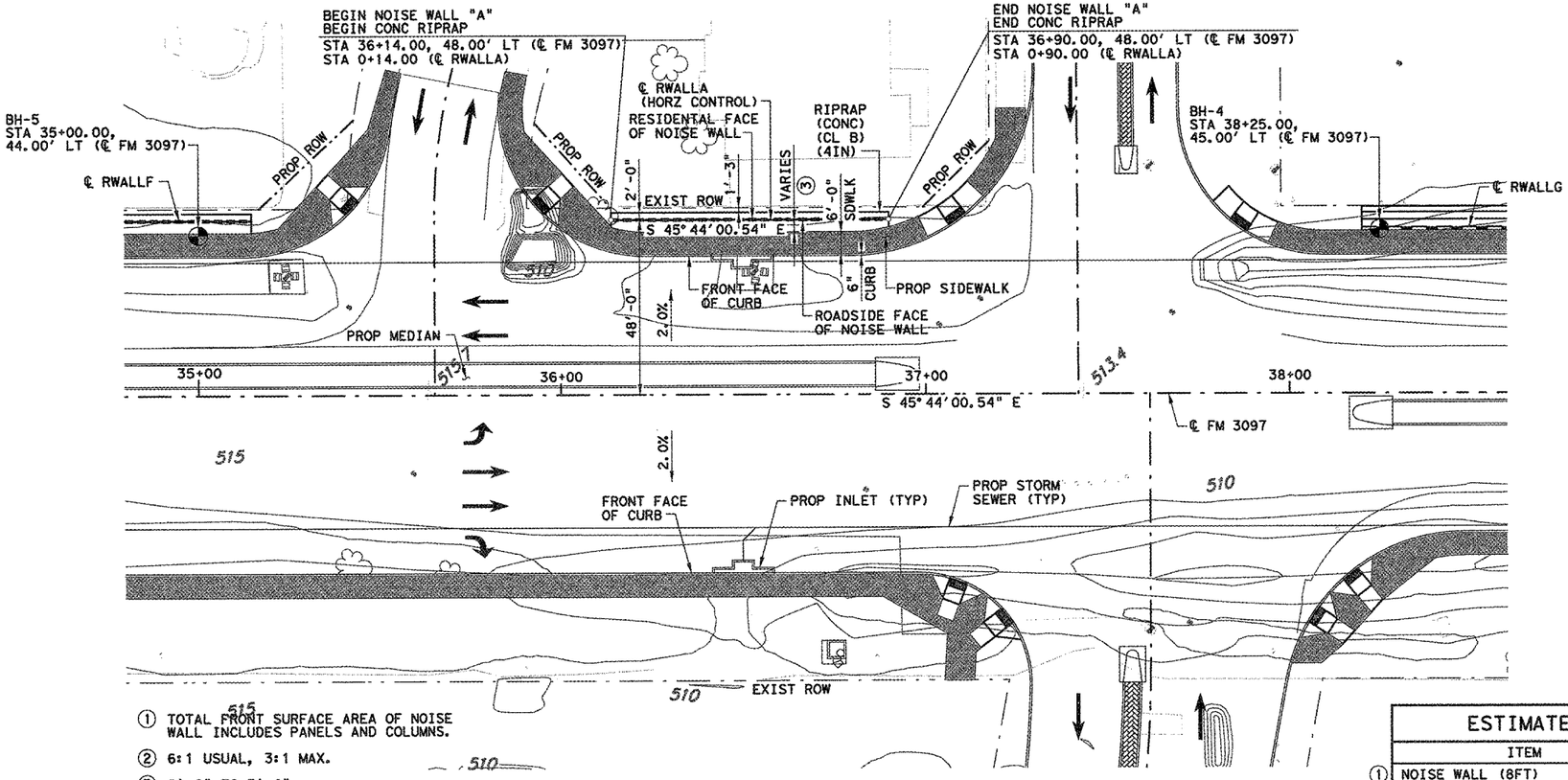
Texas Department of Transportation

FM 3097

NOISE WALL LAYOUT WALL "F"

Designed:	KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006	120

5/1/2014 9:34:16 AM dschneider dwt:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.05 Walls/120404RWF-101.dgn



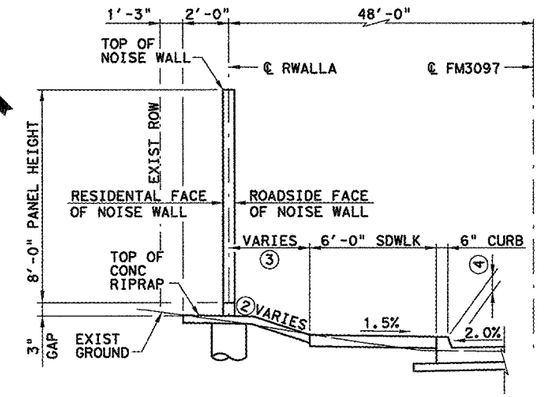
① TOTAL FRONT SURFACE AREA OF NOISE WALL INCLUDES PANELS AND COLUMNS.

② 6:1 USUAL, 3:1 MAX.

③ 2'-0" TO 3'-6".

④ SEE CCCG-12 STANDARD FOR CURB DEPTH.

PLAN
(SCALE 1" = 40')



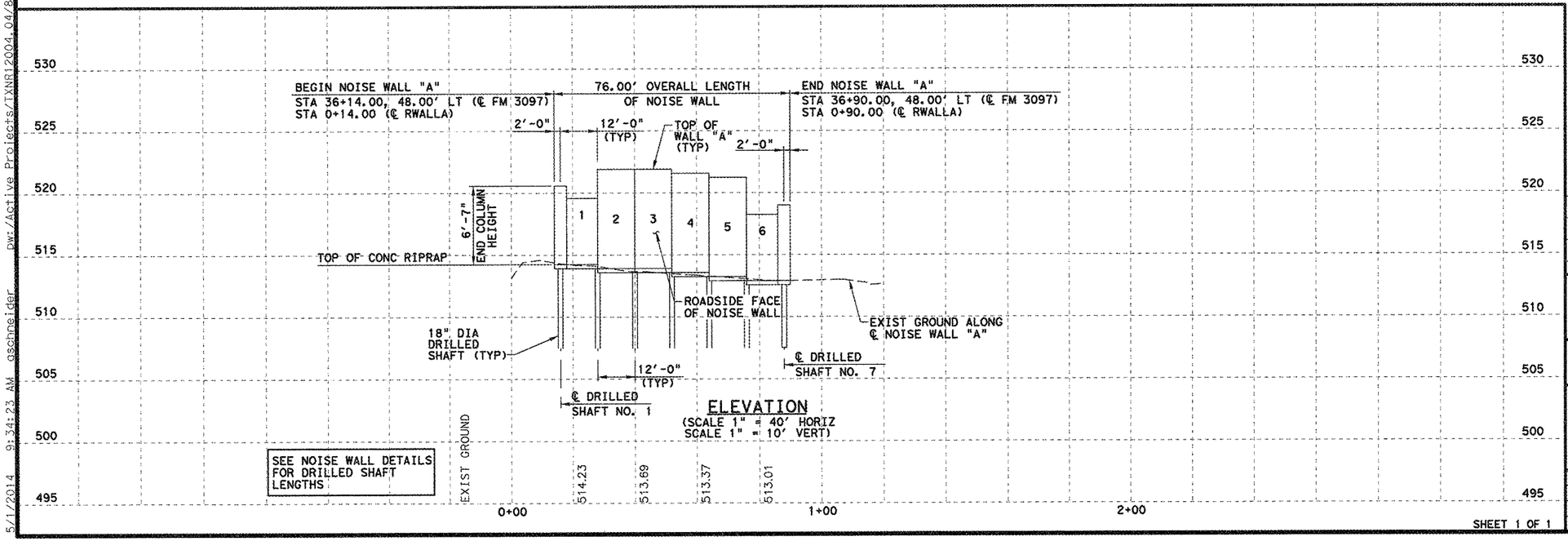
TYPICAL SECTION
(NTS)

GENERAL NOTES:

1. SEE BORING LOGS FOR GEOTECHNICAL INFORMATION.
2. SEE "NOISE WALL DETAILS" FOR TOP OF CONCRETE RIPRAP ELEVATIONS, TOP OF WALL ELEVATIONS AND ADDITIONAL GENERAL NOTES.

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
①	NOISE WALL (8FT)	SF	534
	RIPRAP (CONC) (CL B) (4 IN)	CY	5
	DRILL SHAFT (18 IN)	LF	133



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SEE NOISE WALL DETAILS FOR DRILLED SHAFT LENGTHS

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

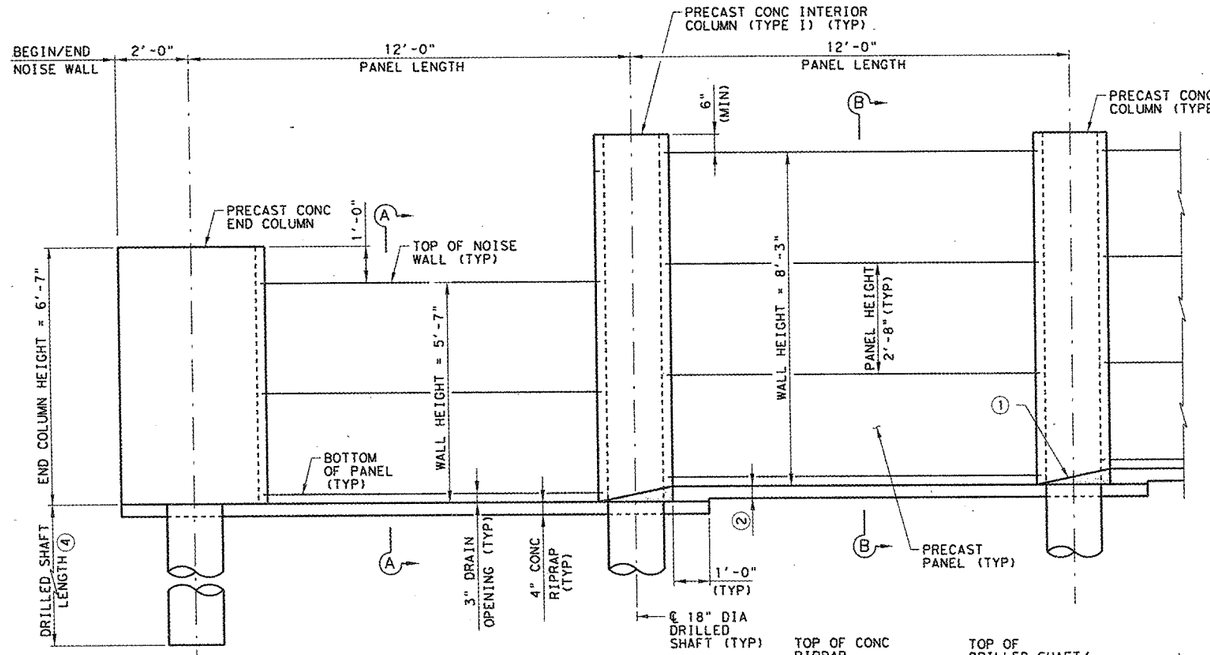
Texas Department of Transportation

FM 3097
NOISE WALL LAYOUT
WALL "A"

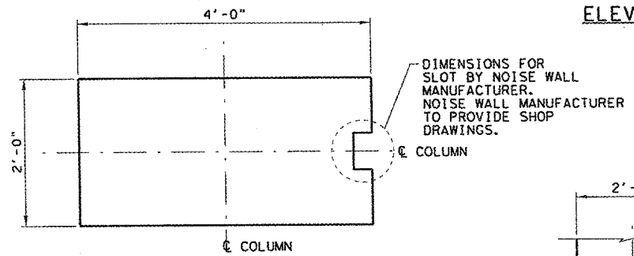
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Checked:	KH	DAL	ROCKWALL	3148	01	006		121

SHEET 1 OF 1

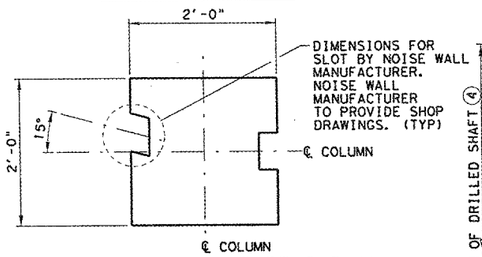
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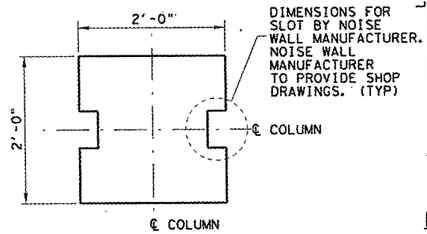
ELEVATION



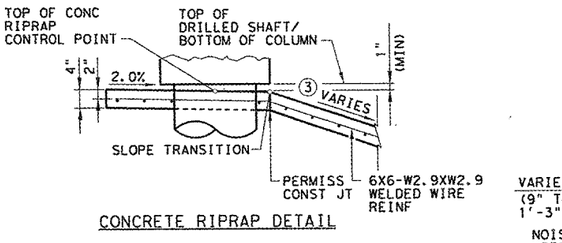
END COLUMN PLAN



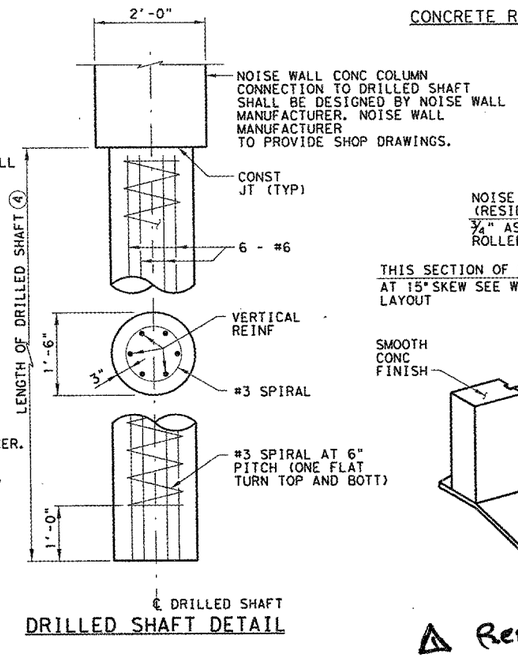
INTERIOR COLUMN TYPE I PLAN
(LEFT END SHOWN, RIGHT END OPPOSITE HAND)



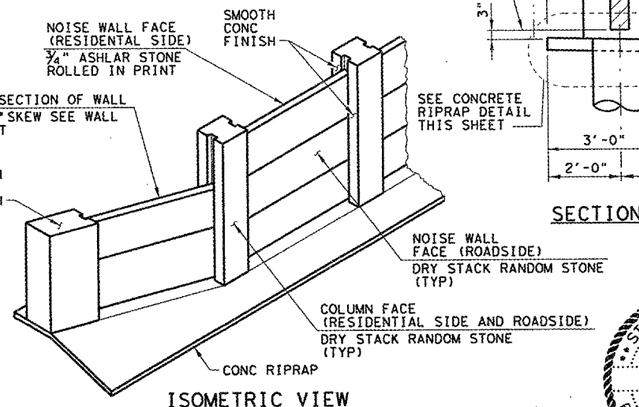
INTERIOR COLUMN TYPE II PLAN



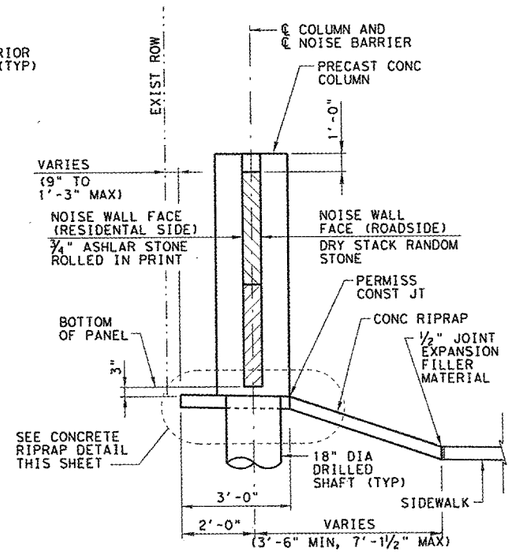
CONCRETE RIPRAP DETAIL



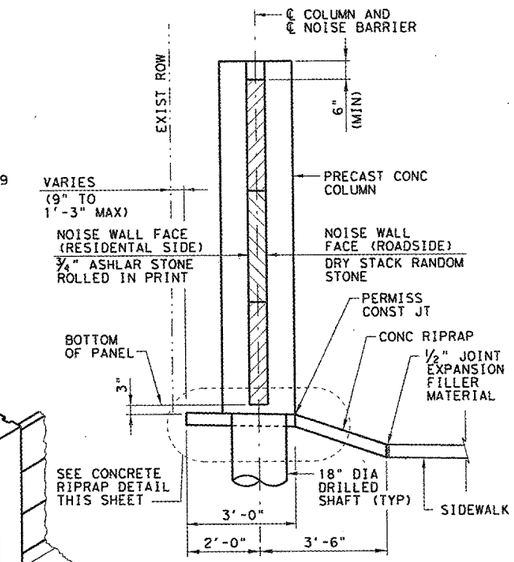
DRILLED SHAFT DETAIL



ISOMETRIC VIEW



SECTION A-A



SECTION B-B

ARCHITECTURAL FINISH NOTES:

ARCHITECTURAL CONCRETE TREATMENT WILL BE PLACED AS SHOWN AND WILL BE SUBSIDIARY TO THE BID ITEM.

THE RESIDENTIAL SIDE PANEL FACE OF THE NOISE WALL WILL RECEIVE A ¾" ASHLAR STONE ROLLED IN PRINT FINISH.

THE RESIDENTIAL AND ROADSIDE FACE OF COLUMNS AND ROADSIDE PANEL FACE WILL RECEIVE A DRY STACK RANDOM STONE FORM LINER IN ACCORDANCE WITH THE FOLLOWING OR AN APPROVED EQUIVALENT:

GREEN STREAK FORM LINER NUMBER 328
"DRY STACK RANDOM STONE"

THE FORM LINERS WILL RELEASE WITHOUT LEAVING PIECES OF LINER MATERIAL ON THE CONCRETE AND WITHOUT PULLING OR BREAKING CONCRETE FROM THE TEXTURED SURFACE. FORM RELEASE AGENTS WILL BE RECOMMENDED BY THE MANUFACTURER. FORM LINERS THAT HAVE, IN THE OPINION OF THE ENGINEER, BECOME DAMAGED OR WORN WILL BE REPLACED BY THE CONTRACTOR. REPLACEMENT OF FORM LINERS WILL BE CONSIDERED INCIDENTAL TO THE WORK AND WILL NOT ENTITLE THE CONTRACTOR TO ADDITIONAL COMPENSATION.

AT LEAST TEN DAYS IN ADVANCE OF STARTING CONSTRUCTION OF THE TEXTURED CONCRETE SURFACES, THE CONTRACTOR WILL CONSTRUCT A TEST PANEL USING EACH TYPE OF FORM LINER AS APPROVED BY THE ENGINEER. THE PANELS WILL MEET REQUIREMENTS OF THE PLANS AND SPECIFICATIONS AND WILL BE APPROVED BY THE ENGINEER BEFORE ANY CONSTRUCTION FORM LINERS MAY BE ORDERED, OBTAINED OR USED. THE TEXTURED PORTION OF THE PANEL WILL BE AT LEAST 5'-0" BY 5'-0" WITH A REPRESENTATIVE UNTEXTURED SURROUNDING SURFACE. IF ORDERED BY THE ENGINEER, ADDITIONAL TEST PANELS WILL BE CONSTRUCTED AND FINISHED UNTIL A SATISFACTORY CONCRETE SURFACE TEXTURE IS OBTAINED AT THE CONTRACTOR'S EXPENSE.

THE TEST PANEL WILL THEN BE THE STANDARD OF COMPARISON FOR THE PRODUCTION CONCRETE SURFACE TEXTURE. IF REQUIRED BY THE ENGINEER, A NEW TEST PANEL WILL BE BUILT TO DEMONSTRATE ACCEPTABILITY OF ANY PROPOSED CHANGE IN CONSTRUCTION METHOD AT THE CONTRACTOR'S EXPENSE.

AREAS SHOWN TO RECEIVE SURFACE TEXTURE THAT DO NOT EXHIBIT THE SURFACE SPECIFIED WILL BE TOOLED OR REPLACED AT THE CONTRACTOR'S EXPENSE SO AS TO EXHIBIT THE SPECIFIED FINISH.

① 2'-0" LENGTH OF GROUT FOR STEPPED RIPRAP. SLOPE AS SHOWN FRONT/BACK SIDE OF WALL.

② ADJUST OVERLAP SECTION OF CONCRETE RIPRAP AS NECESSARY TO ACHIEVE TOP OF CONRETE RIPRAP ELEVATION LISTED IN NOISE WALL DATA TABLES.

③ 6:1 USUAL, 3:1 MAX.

④ SEE "NOISE WALL DETAILS" SHEETS 3 OF 4 AND 4 OF 4 FOR DRILLED SHAFT LENGTH.

CONTRACTOR TO VERIFY LOCATION OF ALL UTILITIES PRIOR TO COMMENCING ANY DRILLING OR EXCAVATION. CONTRACTOR WILL BECOME SOLELY RESPONSIBLE FOR THE DESIGN OF DRILLED SHAFTS AND NOISE WALL IF SPACING OF DRILLED SHAFTS IS REVISED.

NO.	REVISION	BY	DATE

Replaced 7/2/14 A.T.

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TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

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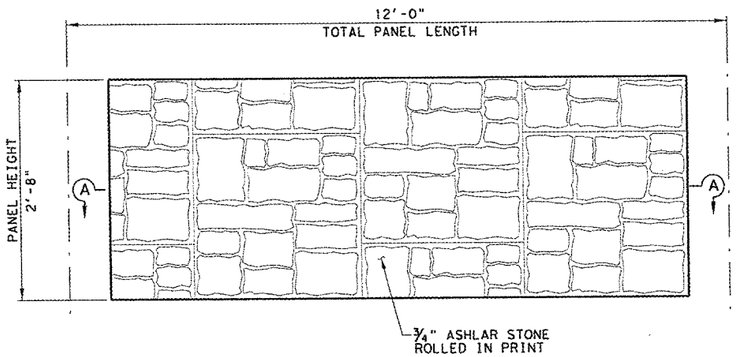
NOISE WALL DETAILS

STATE OF TEXAS
KELLY HO
112947
LICENSED PROFESSIONAL ENGINEER
07-02-2014

Designed: KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: KH	DAL	ROCKWALL	3148	01	006	122

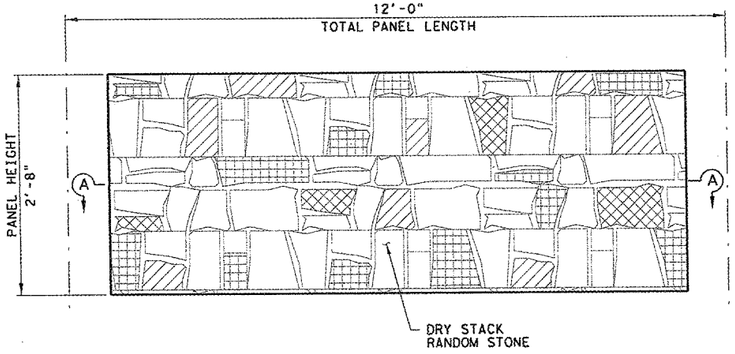
SHEET 1 OF 4

dw: /Active Projects/TXNR12004 04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.05 Walls/120404RWZ-D01.dgn
7/2/2014 9:30:15 AM kho



RESIDENTAL VIEW

BASE COLOR 27769



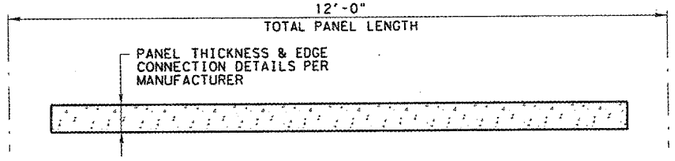
ROADSIDE VIEW

BASE COLOR 27769

ROCK COLOR 1 20266

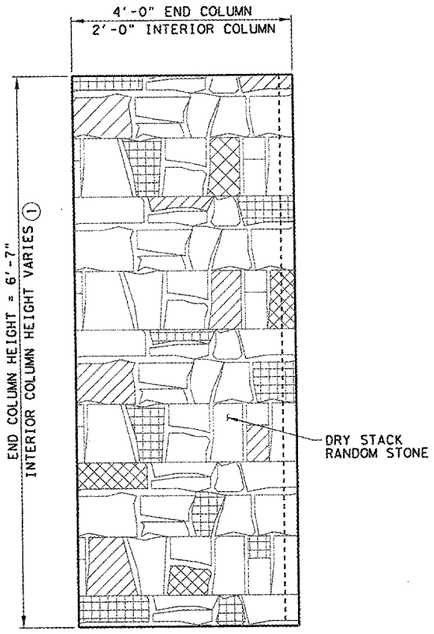
ROCK COLOR 2 20095

ROCK COLOR 3 23448



SECTION A-A

① INTERIOR COLUMN HEIGHT IS 8'-9" MIN PLUS THE OVERLAP SECTION OF CONCRETE RIPRAP REQUIRED TO ACHIEVE CONCRETE RIPRAP ELEVATION LISTED IN "NOISE WALL DETAILS" SHEETS 3 OF 4 AND 4 OF 4.



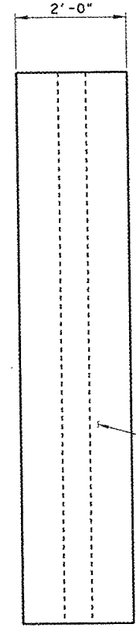
COLUMN FRONT/BACK VIEW

BASE COLOR 27769

ROCK COLOR 1 20266

ROCK COLOR 2 20095

ROCK COLOR 3 23448



COLUMN END VIEW

BASE COLOR 27769

COLOR FINISH NOTES:

THE NOISE WALL WILL HAVE THE FOLLOWING BASE COLOR APPLIED TO ALL EXPOSED CONCRETE SURFACES:

BASE COLOR 27769

ON TOP OF THE BASE COLOR, THE ROADSIDE OF THE COLUMNS AND PANELS WILL BE SPONGE PAINTED IN A RANDOM PATTERN TO MATCH THE EXISTING NEIGHBORHOOD NATURAL STONE WALLS. THE SECONDARY "ROCK" COLORS ARE:

ROCK COLOR 1 20266 (APPROXIMATELY 10%)

ROCK COLOR 2 20095 (APPROXIMATELY 5%)

ROCK COLOR 3 23448 (APPROXIMATELY 15%)

THE CONTRACTOR WILL VERIFY IN CONJUNCTION WITH THE ENGINEER THAT THE SPECIFIED COLORS ARE CONSISTENT WITH EXISTING NATURAL STONE WALLS PRIOR TO ORDERING MATERIALS.

FORMLINER WALL SHALL SIT 30 DAYS MIN PRIOR TO ANY COLOR APPLICATION. THE CONTRACTOR WILL APPLY THE SECONDARY "ROCK" COLORS TO ONE FULL HEIGHT NOISE WALL PANEL AND ADJACENT COLUMNS AS A REPRESENTATIVE PANEL FOR APPLYING THE SECONDARY "ROCK" COLORS. THIS REPRESENTATIVE PANEL WILL BE AGREED UPON BY TxDOT PRIOR TO COMPLETION OF THE REMAINING NOISE WALL PANELS FOR COLORING.

IT IS ESTIMATED THAT APPROXIMATELY 30% OF THE ROADSIDE NOISE WALL SURFACE AREA WILL RECEIVE THE SECONDARY COLORS. COLOR TO BE APPLIED TO ENTIRE AREA OF AN INDIVIVUAL STONE.

ALL EXPOSED SURFACES TO RECEIVE A TYPE III ANTI-GRAFFITI COATING IN ACCORDANCE WITH DMS-8111.

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER

07-02-2014

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097

NOISE WALL DETAILS

Designed: KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: KH	DAL	ROCKWALL	3148	01	006	123

⚠ Replaced, 7/2/14 A.T.

SHEET 2 OF 4

7/2/2014 10:51:23 AM gschneider DW:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.05 Walls/120404RWZ-002.dgn

NOISE WALL "D" DATA TABLE

PANEL	BEGIN/END PANEL STATIONS		PANEL LENGTH FT	TOP OF CONC RIPRAP ELEV	TOP OF WALL ELEV	PANEL DEPTH FT	PANEL AREA SF	DS NO.	DS LENGTH FT
1	0+02.00	0+14.00	12	544.17	549.75	5.33	64	1	18
2	0+14.00	0+26.00	12	544.17	552.42	8.00	96	2	18
3	0+26.00	0+38.00	12	544.17	552.42	8.00	96	3	18
4	0+38.00	0+50.00	12	543.84	552.09	8.00	96	4	18
5	0+50.00	0+62.00	12	543.50	551.75	8.00	96	5	18
6	0+62.00	0+74.00	12	543.17	551.42	8.00	96	6	18
7	0+74.00	0+86.00	12	542.84	551.09	8.00	96	7	18
8	0+86.00	0+98.00	12	542.50	550.75	8.00	96	8	18
9	0+98.00	1+10.00	12	542.17	550.42	8.00	96	9	18
10	1+10.00	1+22.00	12	541.50	549.75	8.00	96	10	18
11	1+22.00	1+34.00	12	541.17	549.42	8.00	96	11	18
12	1+34.00	1+46.00	12	540.84	549.09	8.00	96	12	18
13	1+46.00	1+58.00	12	540.50	548.75	8.00	96	13	18
14	1+58.00	1+70.00	12	540.17	548.42	8.00	96	14	18
15	1+70.00	1+82.00	12	539.84	548.09	8.00	96	15	18
16	1+82.00	1+94.00	12	539.50	547.75	8.00	96	16	18
17	1+94.00	2+06.00	12	539.17	547.42	8.00	96	17	18
18	2+06.00	2+18.00	12	538.84	547.09	8.00	96	18	18
19	2+18.00	2+30.00	12	538.50	546.75	8.00	96	19	18
20	2+30.00	2+42.00	12	538.17	546.42	8.00	96	20	18
21	2+42.00	2+54.00	12	538.17	546.42	8.00	96	21	18
22	2+54.00	2+66.00	12	538.17	546.42	8.00	96	22	18
23	2+66.00	2+78.00	12	537.84	546.09	8.00	96	23	18
24	2+78.00	2+90.00	12	537.50	545.75	8.00	96	24	18
25	2+90.00	3+02.00	12	537.17	545.42	8.00	96	25	18
26	3+02.00	3+14.00	12	536.84	545.09	8.00	96	26	18
27	3+14.00	3+26.00	12	536.84	545.09	8.00	96	27	18
28	3+26.00	3+38.00	12	536.50	544.75	8.00	96	28	18
29	3+38.00	3+50.00	12	536.17	544.42	8.00	96	29	18
30	3+50.00	3+62.00	12	535.84	544.09	8.00	96	30	18
31	3+62.00	3+74.00	12	535.84	544.09	8.00	96	31	18
32	3+74.00	3+86.00	12	535.50	543.75	8.00	96	32	18
33	3+86.00	3+98.00	12	535.17	543.42	8.00	96	33	18
34	3+98.00	4+10.00	12	534.84	543.09	8.00	96	34	18
35	4+10.00	4+22.00	12	534.50	542.75	8.00	96	35	18
36	4+22.00	4+34.00	12	534.17	542.42	8.00	96	36	18
37	4+34.00	4+46.00	12	534.17	542.42	8.00	96	37	18
38	4+46.00	4+58.00	12	534.17	542.42	8.00	96	38	18
39	4+58.00	4+70.00	12	533.75	542.00	8.00	96	39	18
40	4+70.00	4+82.00	12	533.42	541.67	8.00	96	40	18
41	4+82.00	4+94.00	12	533.08	541.33	8.00	96	41	18
42	4+94.00	5+06.00	12	532.75	541.00	8.00	96	42	18
43	5+06.00	5+18.00	12	532.75	541.00	8.00	96	43	18
44	5+18.00	5+30.00	12	532.34	540.59	8.00	96	44	18
45	5+30.00	5+42.00	12	532.00	540.25	8.00	96	45	18
46	5+42.00	5+54.00	12	532.00	540.25	8.00	96	46	18
47	5+54.00	5+66.00	12	532.00	540.25	8.00	96	47	18
48	5+66.00	5+78.00	12	532.00	540.25	8.00	96	48	18
49	5+78.00	5+90.00	12	531.67	539.92	8.00	96	49	18
50	5+90.00	6+02.00	12	531.34	539.59	8.00	96	50	18
51	6+02.00	6+14.00	12	531.34	539.59	8.00	96	51	18
52	6+14.00	6+26.00	12	531.00	539.25	8.00	96	52	18
53	6+26.00	6+38.00	12	531.00	539.25	8.00	96	53	18
54	6+38.00	6+50.00	12	530.67	538.92	8.00	96	54	18
55	6+50.00	6+62.00	12	530.67	538.92	8.00	96	55	18
56	6+62.00	6+74.00	12	530.34	538.59	8.00	96	56	18
57	6+74.00	6+86.00	12	530.34	538.59	8.00	96	57	18
58	6+86.00	6+98.00	12	530.00	538.25	8.00	96	58	18
59	6+98.00	7+10.00	12	530.00	538.25	8.00	96	59	18
60	7+10.00	7+22.00	12	529.67	535.25	5.33	64	60	18
		①TOTAL	720			②TOTAL	5,696	61	18
								TOTAL	1,098

① TOTAL PANEL LENGTH DOES NOT INCLUDE END COLUMN LENGTH.

② TOTAL PANEL AREA DOES NOT INCLUDE END AND INTERIOR COLUMN SURFACE AREA.

NOISE WALL "E" DATA TABLE

PANEL	BEGIN/END PANEL STATIONS		PANEL LENGTH FT	TOP OF CONC RIPRAP ELEV	TOP OF WALL ELEV	PANEL DEPTH FT	PANEL AREA SF	DS NO.	DS LENGTH FT
1	0+12.00	0+24.00	12	527.71	533.29	5.33	64	1	18
2	0+24.00	0+36.00	12	527.38	535.63	8.00	96	2	18
3	0+36.00	0+48.00	12	527.04	535.29	8.00	96	3	18
4	0+48.00	0+60.00	12	526.71	534.96	8.00	96	4	18
5	0+60.00	0+72.00	12	526.71	534.96	8.00	96	5	18
6	0+72.00	0+84.00	12	526.71	534.96	8.00	96	6	18
7	0+84.00	0+96.00	12	526.71	534.96	8.00	96	7	18
8	0+96.00	1+08.00	12	526.38	534.63	8.00	96	8	18
9	1+08.00	1+20.00	12	526.04	534.29	8.00	96	9	18
10	1+20.00	1+32.00	12	525.71	533.96	8.00	96	10	18
11	1+32.00	1+44.00	12	525.38	533.63	8.00	96	11	18
12	1+44.00	1+56.00	12	525.38	533.63	8.00	96	12	18
13	1+56.00	1+68.00	12	525.38	533.63	8.00	96	13	18
14	1+68.00	1+80.00	12	525.38	533.63	8.00	96	14	18
15	1+80.00	1+92.00	12	525.38	533.63	8.00	96	15	18
16	1+92.00	2+04.00	12	525.04	533.29	8.00	96	16	18
17	2+04.00	2+16.00	12	525.04	533.29	8.00	96	17	18
18	2+16.00	2+28.00	12	524.71	532.96	8.00	96	18	18
19	2+28.00	2+40.00	12	524.71	532.96	8.00	96	19	18
20	2+40.00	2+52.00	12	524.38	532.63	8.00	96	20	18
21	2+52.00	2+64.00	12	524.04	532.29	8.00	96	21	17
22	2+64.00	2+76.00	12	524.04	532.29	8.00	96	22	17
23	2+76.00	2+88.00	12	524.04	532.29	8.00	96	23	17
24	2+88.00	3+00.00	12	524.04	532.29	8.00	96	24	17
25	3+00.00	3+12.00	12	524.04	532.29	8.00	96	25	17
26	3+12.00	3+24.00	12	524.04	532.29	8.00	96	26	17
27	3+24.00	3+36.00	12	523.71	531.96	8.00	96	27	17
28	3+36.00	3+48.00	12	523.38	531.63	8.00	96	28	17
29	3+48.00	3+60.00	12	523.38	531.63	8.00	96	29	17
30	3+60.00	3+72.00	12	523.04	531.29	8.00	96	30	17
31	3+72.00	3+84.00	12	523.04	531.29	8.00	96	31	17
32	3+84.00	3+96.00	12	523.04	531.29	8.00	96	32	17
33	3+96.00	4+08.00	12	522.71	530.96	8.00	96	33	17
34	4+08.00	4+20.00	12	522.38	530.63	8.00	96	34	17
35	4+20.00	4+32.00	12	522.04	530.29	8.00	96	35	17
36	4+32.00	4+44.00	12	521.71	529.96	8.00	96	36	17
37	4+44.00	4+56.00	12	521.71	529.96	8.00	96	37	17
38	4+56.00	4+68.00	12	521.71	529.96	8.00	96	38	17
39	4+68.00	4+80.00	12	521.71	529.96	8.00	96	39	17
40	4+80.00	4+92.00	12	521.71	529.96	8.00	96	40	17
41	4+92.00	5+04.00	12	521.71	529.96	8.00	96	41	17
42	5+04.00	5+16.00	12	521.38	529.63	8.00	96	42	16
43	5+16.00	5+28.00	12	521.38	529.63	8.00	96	43	16
44	5+28.00	5+40.00	12	521.38	529.63	8.00	96	44	16
45	5+40.00	5+52.00	12	521.38	529.63	8.00	96	45	16
46	5+52.00	5+64.00	12	521.38	529.63	8.00	96	46	16
47	5+64.00	5+76.00	12	521.04	529.29	8.00	96	47	16
48	5+76.00	5+88.00	12	520.71	528.96	8.00	96	48	16
49	5+88.00	6+00.00	12	520.71	528.96	8.00	96	49	16
50	6+00.00	6+12.00	12	520.71	526.29	5.33	64	50	16
		①TOTAL	600			②TOTAL	4,736	51	16
								TOTAL	877

GENERAL NOTES:

NOISE WALL SHALL BE DESIGNED IN ACCORDANCE WITH AASHTO GUIDE SPECIFICATIONS FOR STRUCTURAL DESIGN OF SOUND BARRIERS.

MEASUREMENT AND PAYMENT OF NOISE WALLS SHALL BE IN ACCORDANCE WITH ITEM SS5296 "NOISE WALLS".

PRECAST SEGMENTS MAY BE CAST FULL HEIGHT. THE WALL MAY BE CAST MONOLITHICALLY WITH THE COLUMN. SEGMENTALLY PRECAST COLUMN JOINTS SHALL BE GROUTED.

ALL EXPOSED STEEL PARTS SHALL BE GALVANIZED IN ACCORDANCE WITH THE ITEM 445 "GALVANIZING".

THE NOISE WALL SHALL BE DESIGNED TO WITHSTAND A MINIMUM WIND SPEED OF 100 MILES PER HOUR AND SHALL BE DESIGNED FOR EXPOSURE B2.

ALL CONNECTIONS OF THE NOISE WALL TO THE FOUNDATIONS SHALL BE DESIGNED USING A FACTOR OF SAFETY OF TWO (2) AGAINST WIND LOAD ALONE. IN ADDITION TO OTHER LOAD COMBINATONS SPECIFIED. ALL CONNECTIONS UTILIZING THREADED RODS OR ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF THE ITEM "ANCHOR BOLTS". ALL CONNECTIONS UTILIZING POST TENSIONING SHALL CONFORM TO THE REQUIREMENTS OF THE ITEM "PRESTRESSING". NO UNGROUTED TENDONS WILL BE ALLOWED, EXCEPT PRESTRESSING USED TO TEMPORARILY SECURE THE WALL.

WIRE MESH MAY BE USED IN LIEU OF DEFORMED BARS.

ALL DRILLED SHAFTS CONCRETE SHALL BE CLASS "C". ALL REINFORCING STEEL SHALL BE GRADE 60.

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER

05-02-2014

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097

NOISE WALL DETAILS

Designed: KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: KH	DAL	ROCKWALL	3148	01	006	124

SHEET 3 OF 4

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NOISE WALL "F" DATA TABLE

PANEL	BEGIN/END PANEL STATIONS		PANEL LENGTH FT	TOP OF CONC RIPRAP ELEV	TOP OF WALL ELEV	PANEL DEPTH FT	PANEL AREA SF	DS NO.	DS LENGTH FT
1	0+02.00	0+14.00	12	518.48	524.06	5.33	64	1	19
2	0+14.00	0+26.00	12	518.48	526.73	8.00	96	2	19
3	0+26.00	0+38.00	12	518.48	526.73	8.00	96	3	19
4	0+38.00	0+50.00	12	518.15	526.40	8.00	96	4	19
5	0+50.00	0+62.00	12	517.81	526.06	8.00	96	5	19
6	0+62.00	0+74.00	12	517.48	525.73	8.00	96	6	19
7	0+74.00	0+86.00	12	517.15	525.40	8.00	96	7	19
8	0+86.00	0+98.00	12	516.81	525.06	8.00	96	8	19
9	0+98.00	1+10.00	12	516.48	524.73	8.00	96	9	19
10	1+10.00	1+22.00	12	516.48	524.73	8.00	96	10	19
11	1+22.00	1+34.00	12	516.48	524.73	8.00	96	11	19
12	1+34.00	1+46.00	12	516.48	522.06	5.33	64	12	19
		①TOTAL	144			②TOTAL	1,088	13	19
								TOTAL	247

NOISE WALL "A" DATA TABLE

PANEL	BEGIN/END PANEL STATIONS		PANEL LENGTH FT	TOP OF CONC RIPRAP ELEV	TOP OF WALL ELEV	PANEL DEPTH FT	PANEL AREA SF	DS NO.	DS LENGTH FT
1	0+16.00	0+28.00	12	514.27	519.86	5.33	64	1	19
2	0+28.00	0+40.00	12	513.94	522.19	8.00	96	2	19
3	0+40.00	0+52.00	12	513.94	522.19	8.00	96	3	19
4	0+52.00	0+64.00	12	513.61	521.86	8.00	96	4	19
5	0+64.00	0+76.00	12	513.27	521.52	8.00	96	5	19
6	0+76.00	0+88.00	12	512.94	518.52	5.33	64	6	19
		①TOTAL	72			②TOTAL	512	7	19
								TOTAL	133

① TOTAL PANEL LENGTH DOES NOT INCLUDE END COLUMN LENGTH.

② TOTAL PANEL AREA DOES NOT INCLUDE END AND INTERIOR COLUMN SURFACE AREA.

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER

05-02-2014

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

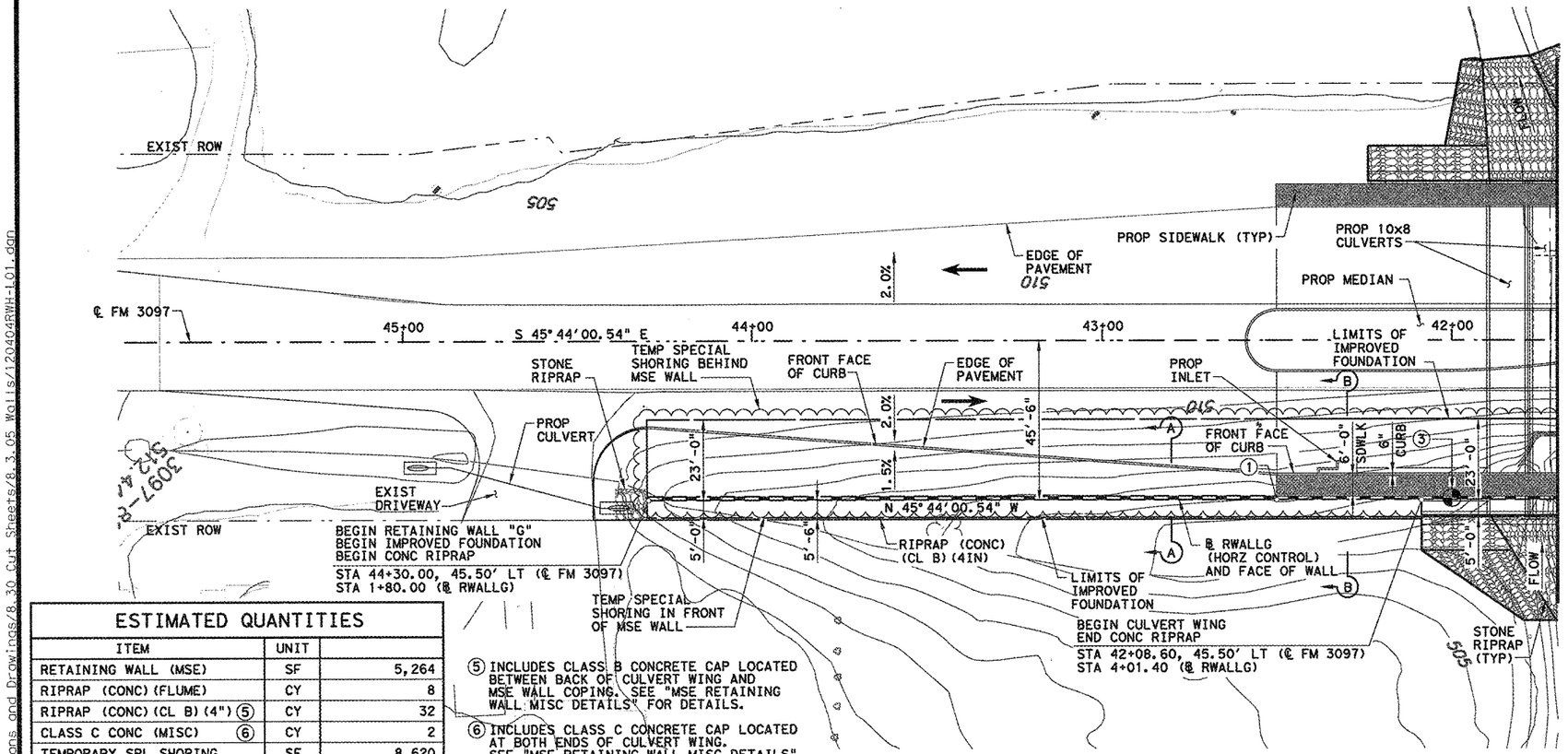
FM 3097

NOISE WALL DETAILS

Designed:	KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	KWZ	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006		125

SHEET 4 OF 4

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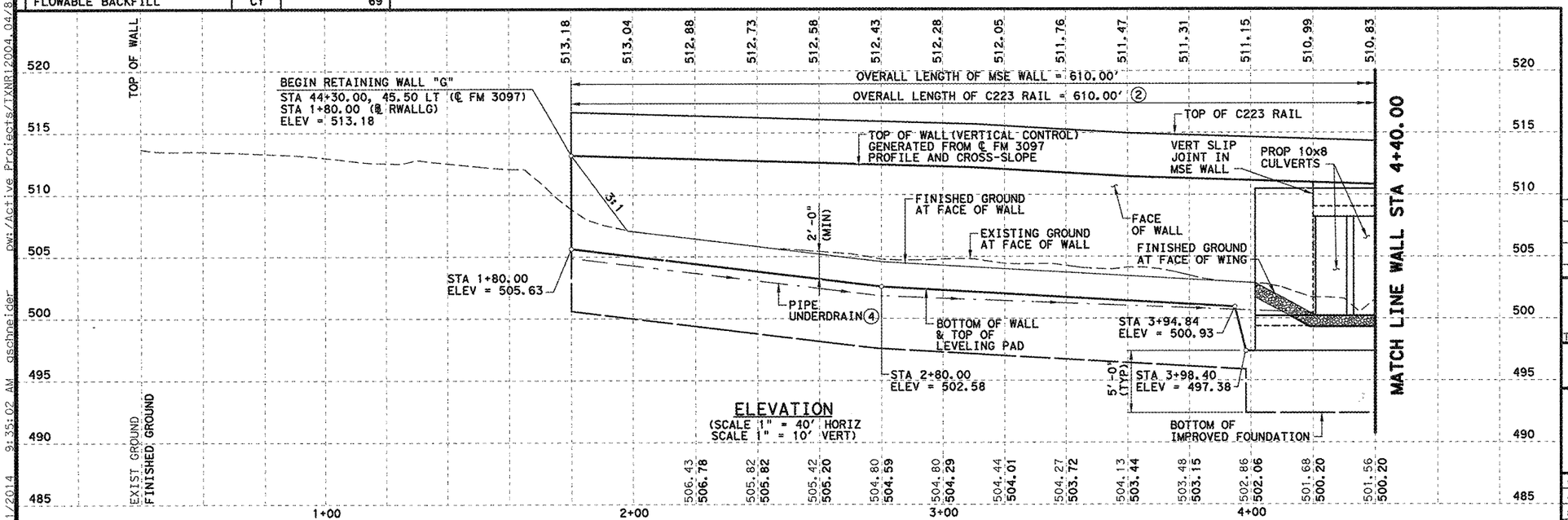


PLAN
(SCALE 1" = 40')

ESTIMATED QUANTITIES		
ITEM	UNIT	
RETAINING WALL (MSE)	SF	5,264
RIPRAP (CONC) (FLUME)	CY	8
RIPRAP (CONC) (CL B) (4") ⑤	CY	32
CLASS C CONC (MISC) ⑥	CY	2
TEMPORARY SPL SHORING	SF	8,620
EMBANKMENT (FINAL) (DENS CONT) (TY C2)	CY	2,574
FLOWABLE BACKFILL	CY	69

⑤ INCLUDES CLASS B CONCRETE CAP LOCATED BETWEEN BACK OF CULVERT WING AND MSE WALL COPING. SEE "MSE RETAINING WALL MISC DETAILS" FOR DETAILS.

⑥ INCLUDES CLASS C CONCRETE CAP LOCATED AT BOTH ENDS OF CULVERT WING. SEE "MSE RETAINING WALL MISC DETAILS" FOR DETAILS.



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SHEET 1 OF 2

GENERAL NOTES:

1. ALL RETAINING WALL MEASUREMENTS ARE TO FRONT FACE OF WALL, UNLESS NOTED OTHERWISE.
2. SQUARE FOOT SURFACE AREA OF RETAINING WALL IS MEASURED BETWEEN FINISHED GRADE AT TOP OF WALL AND THE PLAN DESIGNED TOP OF LEVELING PAD.
3. ANY ADJUSTMENTS MADE TO ACCOMMODATE THE AVAILABLE DESIGNS WILL NOT BE MEASURED. THE QUANTITY FOR WHICH PAYMENT IS MADE WILL BE THE QUANTITY SHOWN IN THE PLANS.
4. PROVIDE TYPE D BACKFILL FOR IMPROVED FOUNDATION SOIL UNDER WALL TO LIMITS SHOWN ON LAYOUT. TYPE D BACKFILL TO BE INSTALLED IN ACCORDANCE WITH TXDOT STANDARD SPECIFICATION ITEM 423. TYPE D BACKFILL TO BE SUBSIDIARY TO "RETAINING WALL (MSE)" PAY ITEM.

   FOR CONTRACTOR'S INFORMATION ONLY:
   CLASS D BACKFILL FOR IMPROVED FOUNDATION = 2,800 CY
   (QUANTITY DOES NOT INCLUDE CLASS D BACKFILL REQUIRED FOR REINFORCED EARTH ZONE BEHIND MSE WALL).
5. SEE "MSE RETAINING WALL TYPICAL SECTIONS" FOR WALL SECTIONS.
6. SEE "MSE RETAINING WALL MISC DETAILS" FOR CULVERT AND MSE WALL INTERFACE DETAILS.
7. SEE "BORING LOGS" FOR GEOTECHNICAL INFORMATION.
8. SEE "TEMPORARY SPECIAL SHORING WALL G" FOR LIMITS OF SHORING.
9. CONTRACTOR TO PLACE FABRIC FILTER AROUND PERIMETER OF CLASS D BACKFILL MATERIAL, INCLUDING IMPROVED FOUNDATION SOIL. FILTER FABRIC TO CONFORM TO TXDOT STANDARD SPECIFICATIONS ITEM 556.C. FILTER FABRIC TO BE SUSIDIARY TO "RETAINING WALL (MSE)" BID ITEM.

① BEGIN SIDEWALK/END CONCRETE FLUME
STA 42+50.00 (℄ FM 3097)
STA 03+60.00 (℄ RWALLG).

② LENGTH OF C223 RAIL TO BE QUANTIFIED WITH ROADWAY QUANTITIES.

③ BORING BH-1
STA 42+00.00, 45.00' LT (℄ FM 3097)

④ SEE "BRIDGE CLASS CULVERT LAYOUT" FOR PIPE UNDERDRAIN AND CULVERT CONNECTION INFORMATION.

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

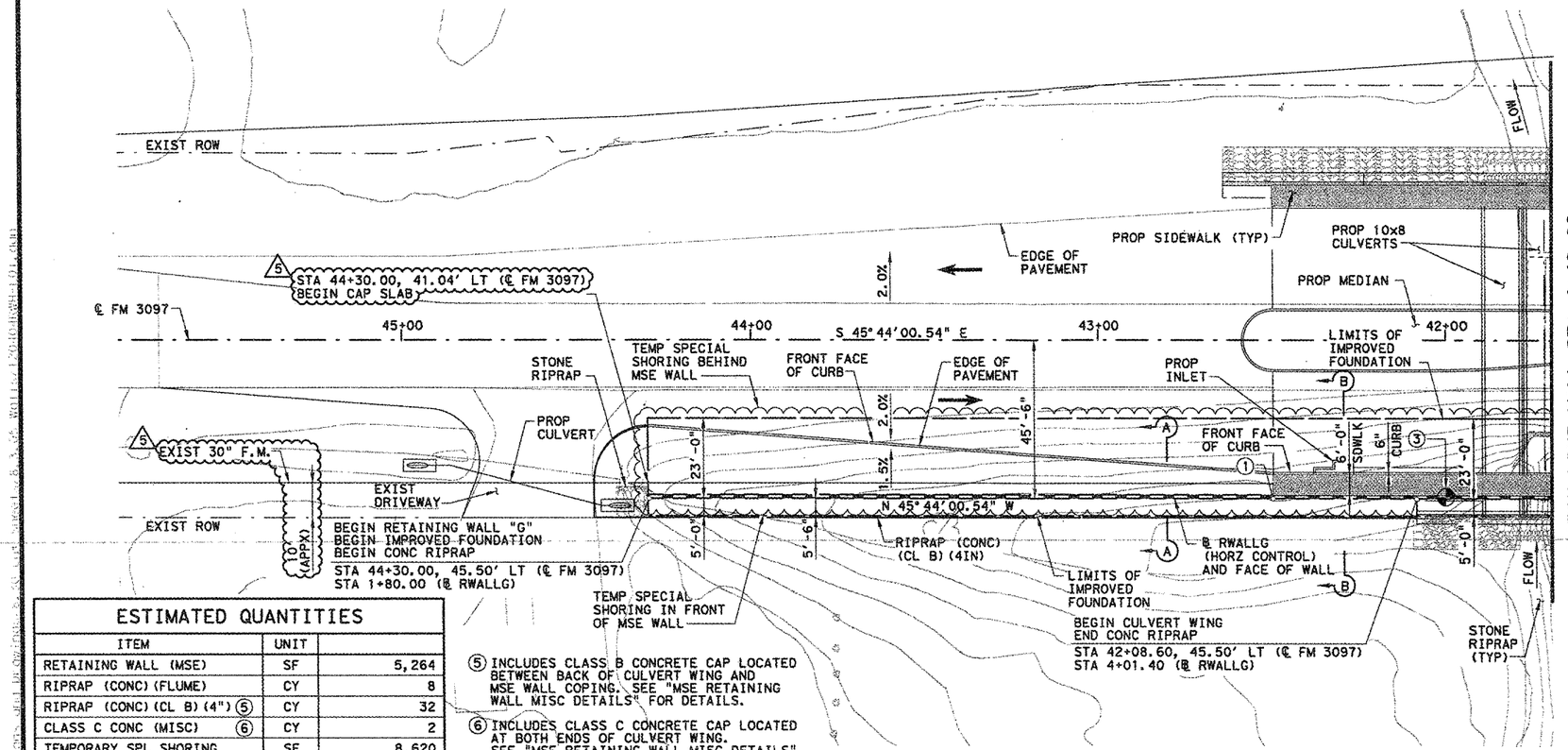
CP&Y
TEXAS REGISTERED ENGINEERING FIRM, F-1741

Texas Department of Transportation

FM 3097
MSE RETAINING WALL LAYOUT WALL "G"

Designed: KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: KH	DAL	ROCKWALL	3148	01	006	126

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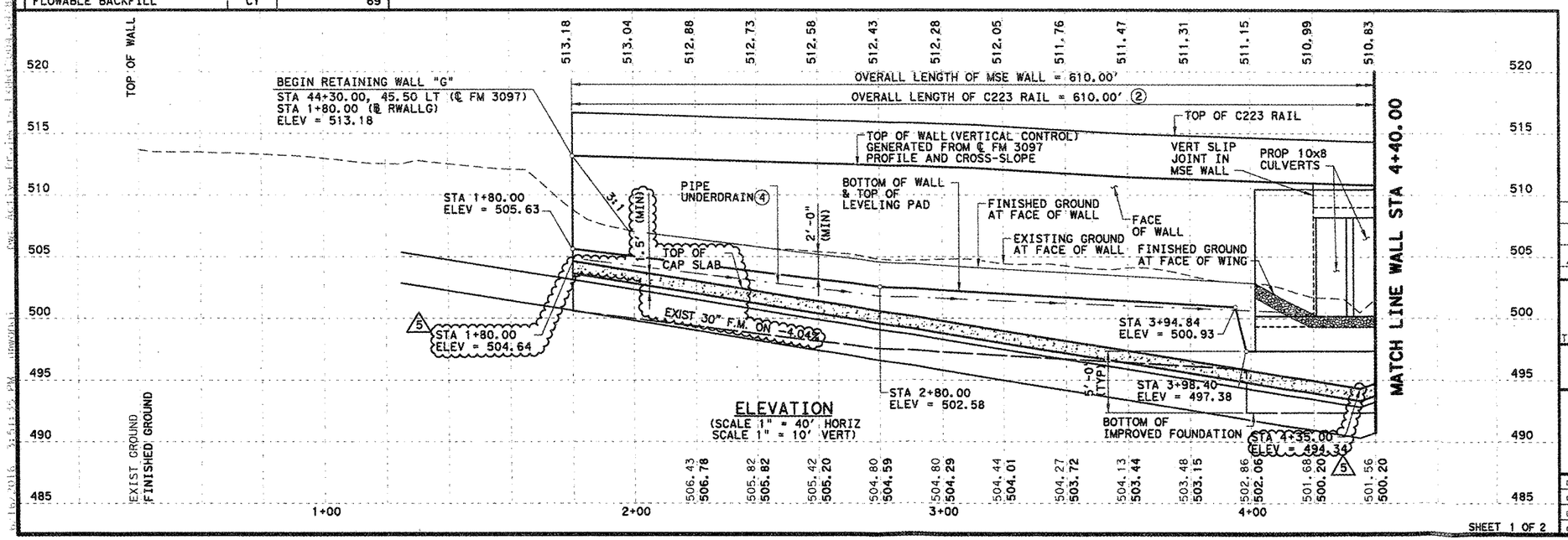
PLAN
(SCALE 1" = 40')

ESTIMATED QUANTITIES

ITEM	UNIT	
RETAINING WALL (MSE)	SF	5,264
RIPRAP (CONC) (FLUME)	CY	8
RIPRAP (CONC) (CL B) (4") ⑤	CY	32
CLASS C CONC (MISC) ⑥	CY	2
TEMPORARY SPL SHORING	SF	8,620
EMBANKMENT (FINAL) (DENS CONT) (TY C2)	CY	2,574
FLOWABLE BACKFILL	CY	69

⑤ INCLUDES CLASS B CONCRETE CAP LOCATED BETWEEN BACK OF CULVERT WING AND MSE WALL COPING. SEE "MSE RETAINING WALL MISC DETAILS" FOR DETAILS.

⑥ INCLUDES CLASS C CONCRETE CAP LOCATED AT BOTH ENDS OF CULVERT WING. SEE "MSE RETAINING WALL MISC DETAILS" FOR DETAILS.



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SHEET 1 OF 2

GENERAL NOTES:

1. ALL RETAINING WALL MEASUREMENTS ARE TO FRONT FACE OF WALL, UNLESS NOTED OTHERWISE.
2. SQUARE FOOT SURFACE AREA OF RETAINING WALL IS MEASURED BETWEEN FINISHED GRADE AT TOP OF WALL AND THE PLAN DESIGNED TOP OF LEVELING PAD.
3. ANY ADJUSTMENTS MADE TO ACCOMMODATE THE AVAILABLE DESIGNS WILL NOT BE MEASURED. THE QUANTITY FOR WHICH PAYMENT IS MADE WILL BE THE QUANTITY SHOWN IN THE PLANS.
4. PROVIDE TYPE D BACKFILL FOR IMPROVED FOUNDATION SOIL UNDER WALL TO LIMITS SHOWN ON LAYOUT. TYPE D BACKFILL TO BE INSTALLED IN ACCORDANCE WITH TXDOT STANDARD SPECIFICATION ITEM 423. TYPE D BACKFILL TO BE SUBSIDIARY TO "RETAINING WALL (MSE)" PAY ITEM.

   FOR CONTRACTOR'S INFORMATION ONLY:
   △5 CLASS D BACKFILL FOR IMPROVED FOUNDATION = 2,200 CY
   (QUANTITY DOES NOT INCLUDE CLASS D BACKFILL REQUIRED FOR REINFORCED EARTH ZONE BEHIND MSE WALL).
5. SEE "MSE RETAINING WALL TYPICAL SECTIONS" FOR WALL SECTIONS.
6. SEE "MSE RETAINING WALL MISC DETAILS" FOR CULVERT AND MSE WALL INTERFACE DETAILS.
7. SEE "BORING LOGS" FOR GEOTECHNICAL INFORMATION.
8. SEE "TEMPORARY SPECIAL SHORING WALL G" FOR LIMITS OF SHORING.
9. CONTRACTOR TO PLACE FABRIC FILTER AROUND PERIMETER OF CLASS D BACKFILL MATERIAL, INCLUDING IMPROVED FOUNDATION SOIL. FILTER FABRIC TO CONFORM TO TXDOT STANDARD SPECIFICATIONS ITEM 556.C. FILTER FABRIC TO BE SUSIDIARY TO "RETAINING WALL (MSE)" BID ITEM.
10. △5 CONTRACTOR TO VERIFY UTILITY LOCATION AND ELEVATION PRIOR TO DIGGING AND PLACING CAP SLAB.

① BEGIN SIDEWALK/END CONCRETE FLUME
STA 42+50.00 (℄ FM 3097)
STA 03+60.00 (℄ RWALLG).

② LENGTH OF C223 RAIL TO BE QUANTIFIED WITH ROADWAY QUANTITIES.

③ BORING BH-1
STA 42+00.00, 45.00' LT (℄ FM 3097)

④ SEE "BRIDGE CLASS CULVERT LAYOUT" FOR PIPE UNDERDRAIN AND CULVERT CONNECTION INFORMATION.

CONCRETE CAP SLAB △5

STATE OF TEXAS
KELLY HO
112947
LICENSED PROFESSIONAL ENGINEER
06/16/16

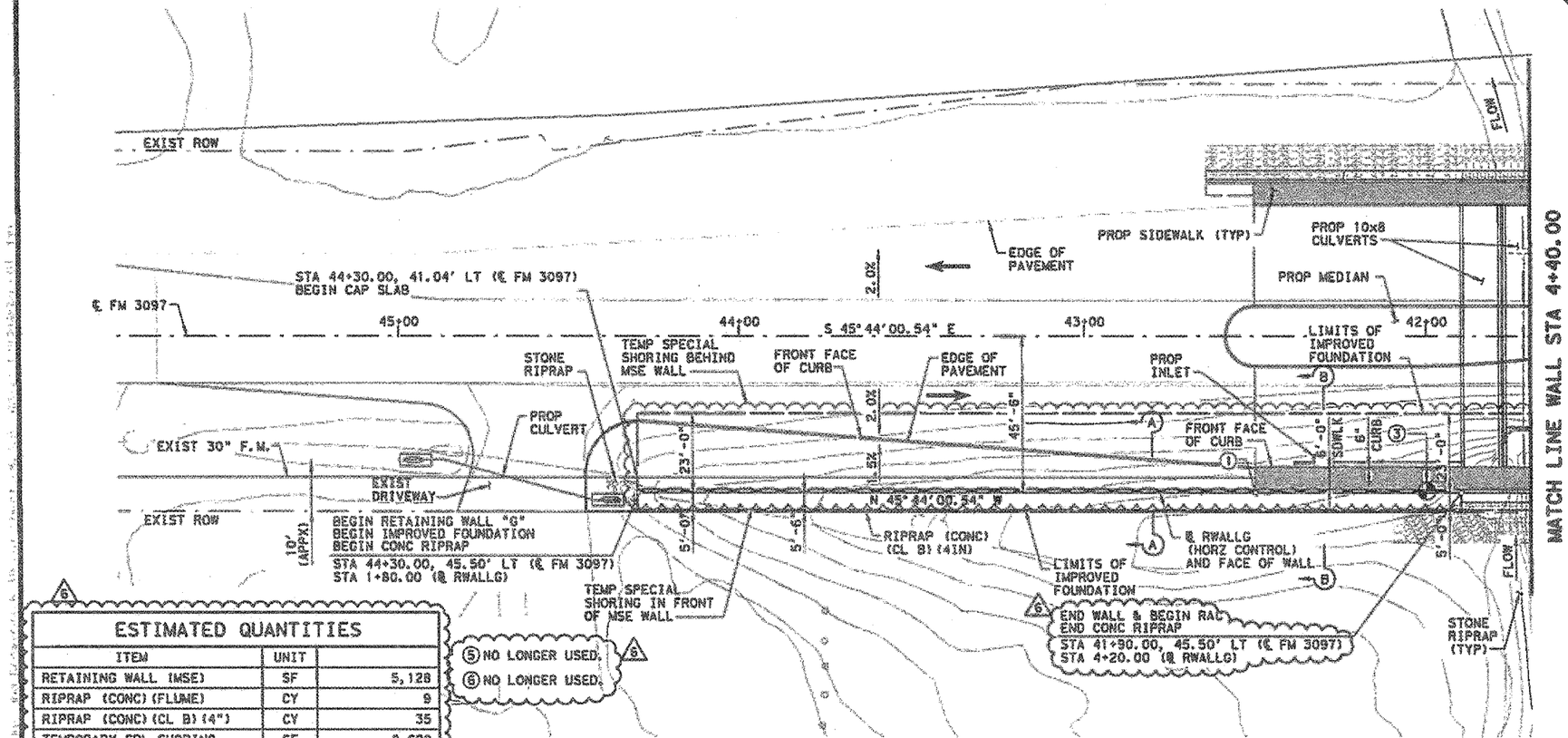
NO.	REVISION	BY	DATE
△5	ADDED CAP SLAB AND EXIST PIPE LIMITS	KH	06/15/16

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TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097
MSE RETAINING WALL LAYOUT WALL "G"

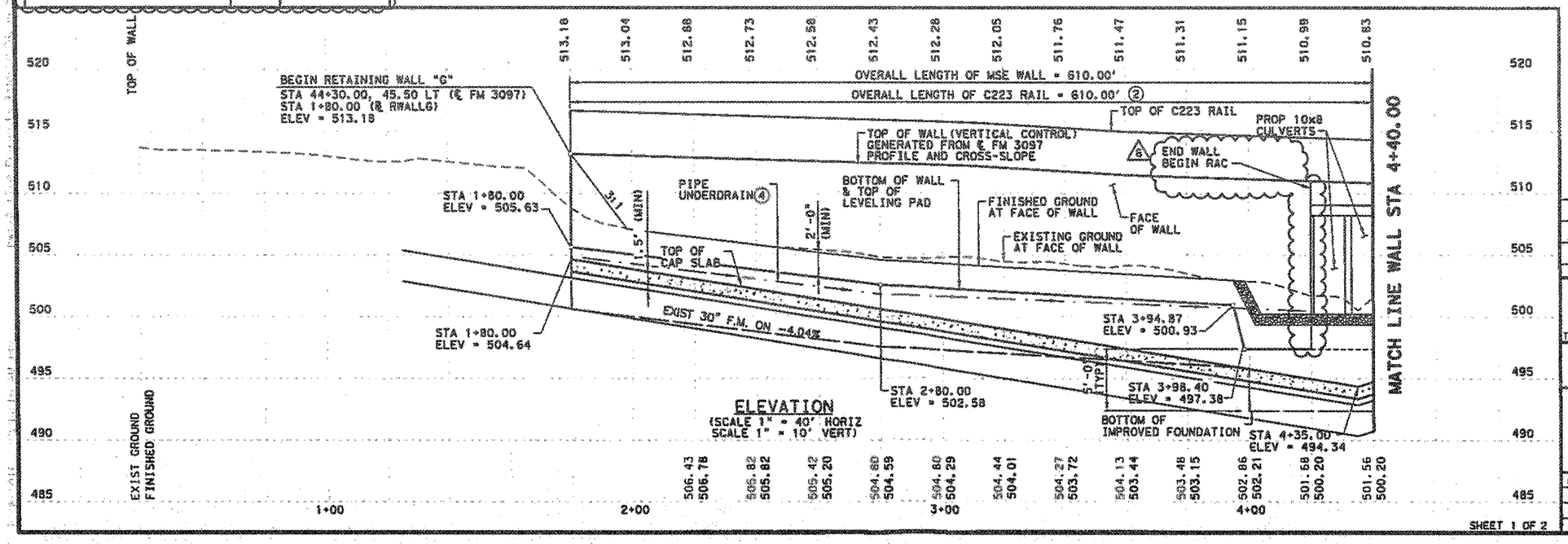
		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	KH	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	KWZ	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	CWS	DAL	ROCKWALL	3148	01	006	126 A
Checked:	KH						



PLAN
(SCALE 1" = 40')

ESTIMATED QUANTITIES		
ITEM	UNIT	
RETAINING WALL (MSE)	SF	5,128
RIPRAP (CONC) (FLUME)	CY	9
RIPRAP (CONC) (CL B) (4")	CY	35
TEMPORARY SPL SHORING	SF	8,620
EMBANKMENT (FINAL) (DENS CONT) (TY C2)	CY	2,874

⑤ NO LONGER USED.
⑥ NO LONGER USED.



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SHEET 1 OF 2

GENERAL NOTES:

1. ALL RETAINING WALL MEASUREMENTS ARE TO FRONT FACE OF WALL, UNLESS NOTED OTHERWISE.
2. SQUARE FOOT SURFACE AREA OF RETAINING WALL IS MEASURED BETWEEN FINISHED GRADE AT TOP OF WALL AND THE PLAN DESIGNED TOP OF LEVELING PAD.
3. ANY ADJUSTMENTS MADE TO ACCOMMODATE THE AVAILABLE DESIGNS WILL NOT BE MEASURED. THE QUANTITY FOR WHICH PAYMENT IS MADE WILL BE THE QUANTITY SHOWN IN THE PLANS.
4. PROVIDE TYPE D BACKFILL FOR IMPROVED FOUNDATION SOIL UNDER WALL TO LIMITS SHOWN ON LAYOUT. TYPE D BACKFILL TO BE INSTALLED IN ACCORDANCE WITH TXDOT STANDARD SPECIFICATION ITEM 423. TYPE D BACKFILL TO BE SUBSIDIARY TO "RETAINING WALL (MSE)" PAY ITEM.

   FOR CONTRACTOR'S INFORMATION ONLY:
   CLASS D BACKFILL FOR IMPROVED FOUNDATION = 2,200 CY
   (QUANTITY DOES NOT INCLUDE CLASS D BACKFILL REQUIRED FOR REINFORCED EARTH ZONE BEHIND MSE WALL).
5. SEE "MSE RETAINING WALL TYPICAL SECTIONS" FOR WALL SECTIONS.
6. SEE "MSE RETAINING WALL MISC DETAILS" FOR CULVERT AND MSE WALL INTERFACE DETAILS.
7. SEE "BORING LOGS" FOR GEOTECHNICAL INFORMATION.
8. SEE "TEMPORARY SPECIAL SHORING WALL G" FOR LIMITS OF SHORING.
9. CONTRACTOR TO PLACE FABRIC FILTER AROUND PERIMETER OF CLASS D BACKFILL MATERIAL, INCLUDING IMPROVED FOUNDATION SOIL. FILTER FABRIC TO CONFORM TO TXDOT STANDARD SPECIFICATIONS ITEM 556.C. FILTER FABRIC TO BE SUBSIDIARY TO "RETAINING WALL (MSE)" BID ITEM.
10. CONTRACTOR TO VERIFY UTILITY LOCATION AND ELEVATION PRIOR TO DIGGING AND PLACING CAP SLAB.

① BEGIN SIDEWALK/END CONCRETE FLUME
STA 42+50.00 (℄ FM 3097)
STA 03+60.00 (℄ RWALLG).

② LENGTH OF C223 RAIL TO BE QUANTIFIED WITH ROADWAY QUANTITIES.

③ BORING BH-1
STA 42+00.00, 45.00' LT (℄ FM 3097)

④ SEE "BRIDGE CLASS CULVERT LAYOUT" FOR PIPE UNDERDRAIN AND CULVERT CONNECTION INFORMATION.

CONCRETE CAP SLAB

STATE OF TEXAS
KELLY NO
112947
LICENSED
PROFESSIONAL ENGINEER
07/28/16

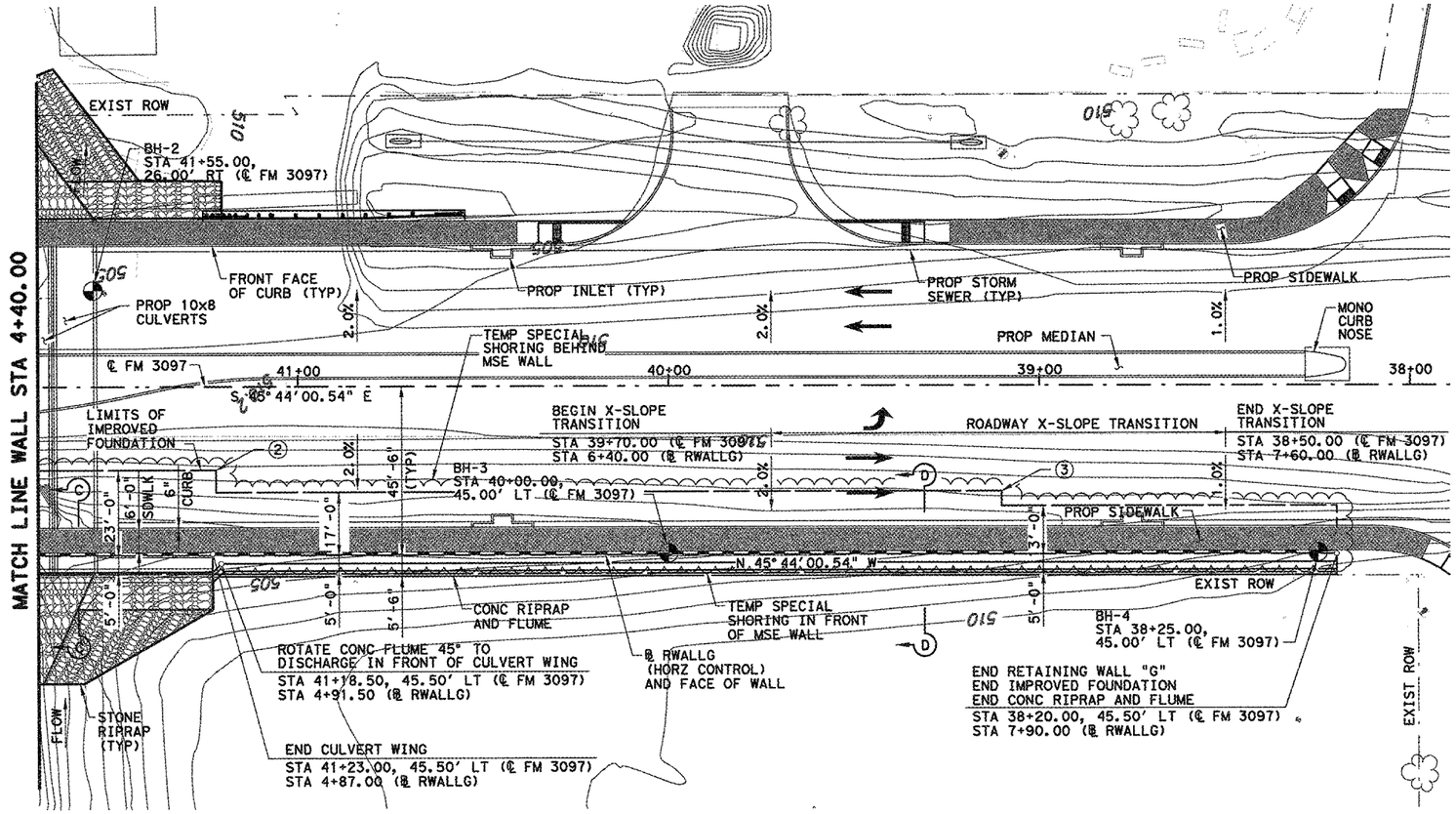
NO.	REVISION	BY	DATE
1	REVISED CULVERT WING	KH	7/28/16
2	ADDED CAP SLAB AND EXIST PIPE LIMITS	KH	06/15/16

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097
MSE RETAINING WALL LAYOUT WALL "G"

Designed	KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked	KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	KH	DAL	ROCKWALL	3148	01	006	126



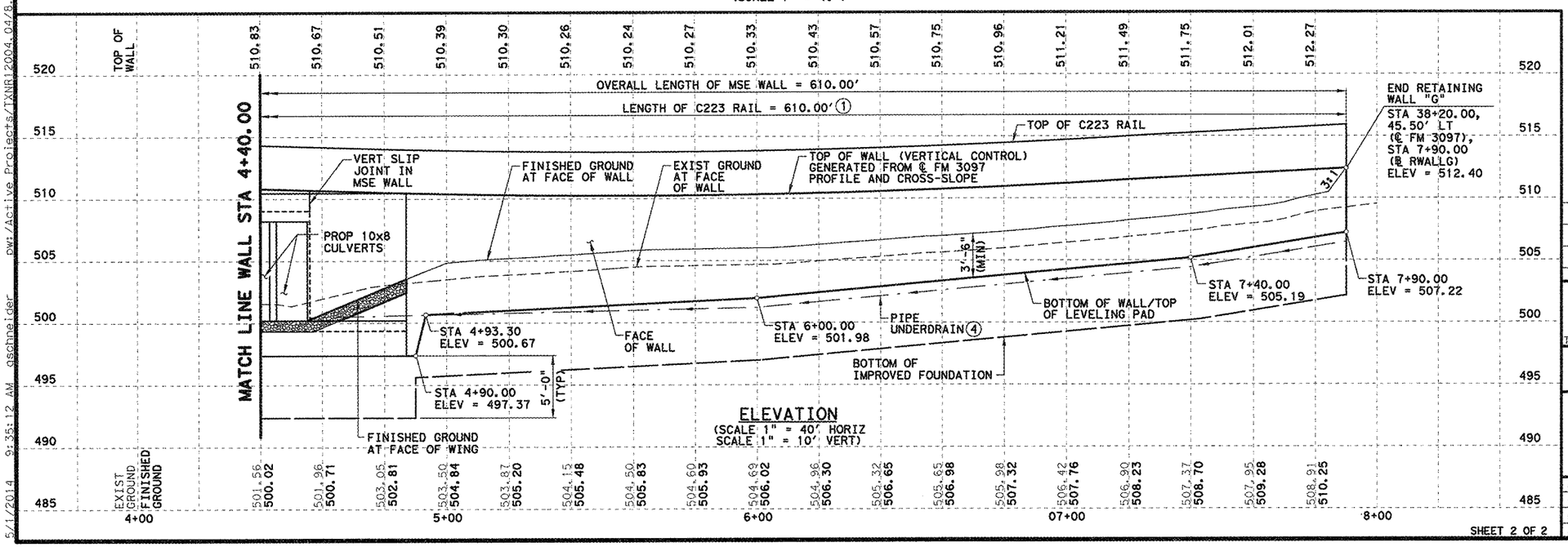
PLAN
(SCALE 1" = 40')

① LENGTH OF C223 RAIL TO BE QUANTIFIED WITH ROADWAY QUANTITIES.

② FOUNDATION IMPROVEMENT TRANSITION:
STA 41+22.00 (℄ FM 3097)
STA 4+88.00 (℄ RWALLG)

③ FOUNDATION IMPROVEMENT TRANSITION:
STA 39+10.00 (℄ FM 3097)
STA 7+00.00 (℄ RWALLG)

④ SEE "BRIDGE CLASS CULVERT LAYOUT" FOR PIPE UNDERDRAIN AND CULVERT CONNECTION INFORMATION.



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

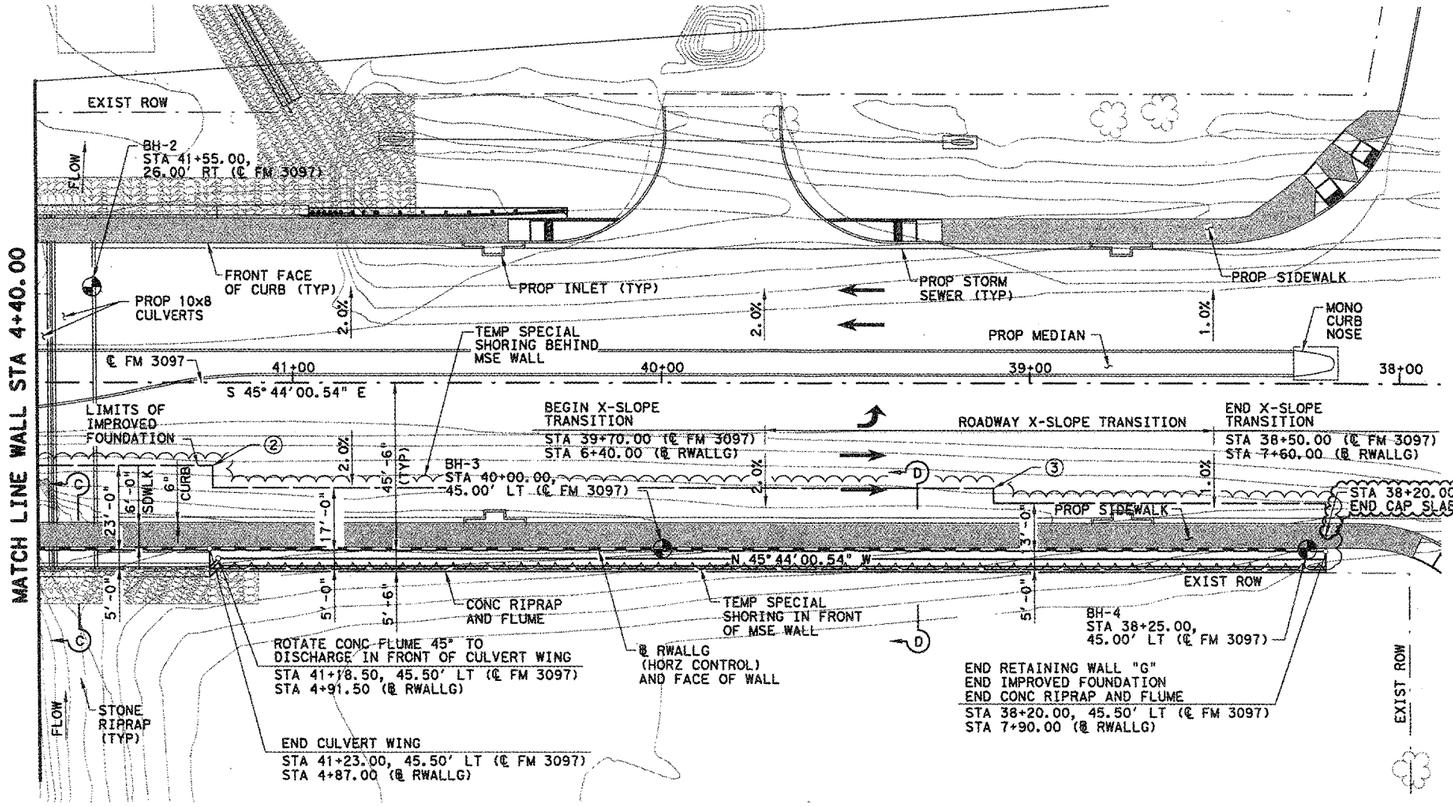
Texas Department of Transportation

FM 3097
MSE RETAINING WALL LAYOUT
WALL "G"

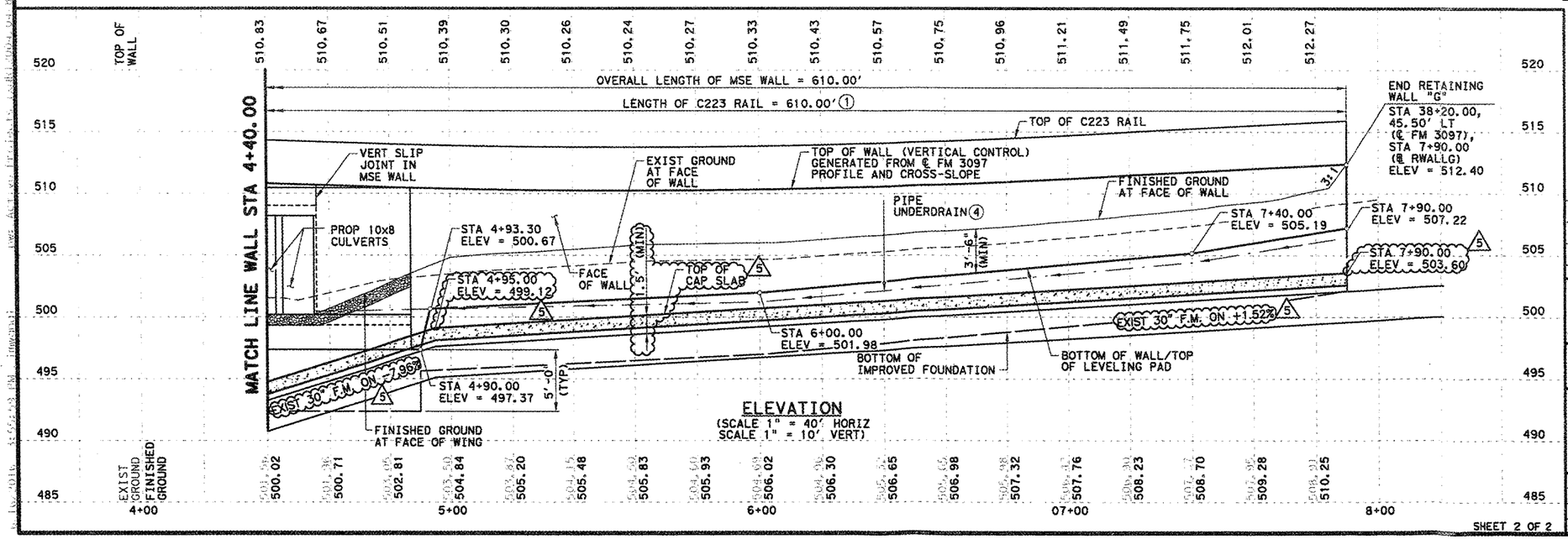
Designed:	KH	FED. AID DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006	127

SHEET 2 OF 2

5/1/2014 9:35:12 AM gschneider pw:\Active Projects\TXNR12004.04\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.05 Walls\120404RWG-L01.dgn



PLAN
(SCALE 1" = 40')



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SHEET 2 OF 2

GENERAL NOTE:

1. CONTRACTOR TO VERIFY UTILITY LOCATION AND ELEVATION PRIOR TO DIGGING AND PLACING CAP SLAB.

① LENGTH OF C223 RAIL TO BE QUANTIFIED WITH ROADWAY QUANTITIES.

② FOUNDATION IMPROVEMENT TRANSITION:
STA 41+22.00 (℄ FM 3097)
STA 4+88.00 (℄ RWALLG)

③ FOUNDATION IMPROVEMENT TRANSITION:
STA 39+10.00 (℄ FM 3097)
STA 7+00.00 (℄ RWALLG)

④ SEE "BRIDGE CLASS CULVERT LAYOUT" FOR PIPE UNDERDRAIN AND CULVERT CONNECTION INFORMATION.

5 CONCRETE CAP SLAB

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
06/16/16

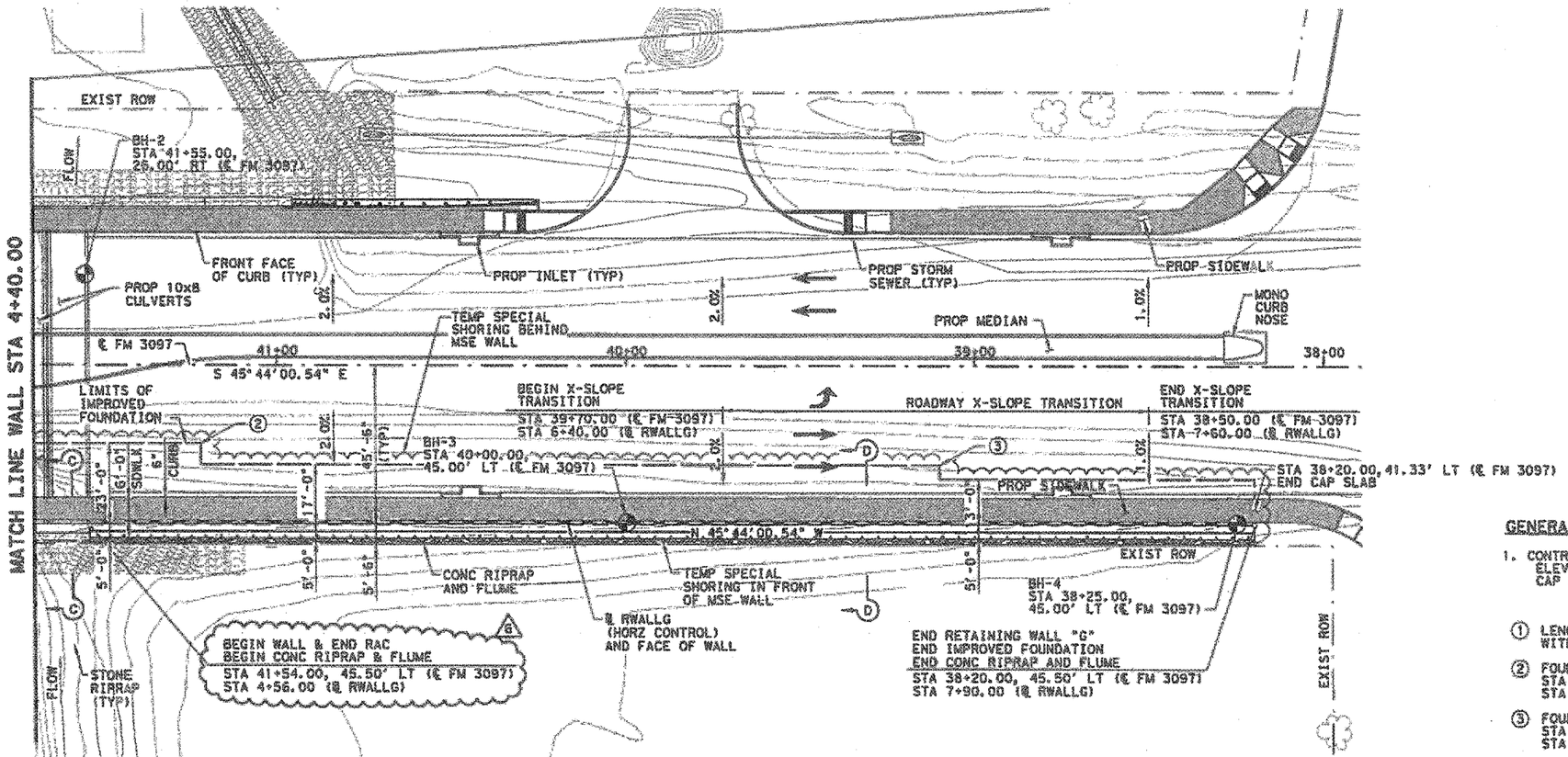
NO.	REVISION	BY	DATE
5	ADDED CAP SLAB AND EXIST PIPE LIMITS	KH	06/15/16

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

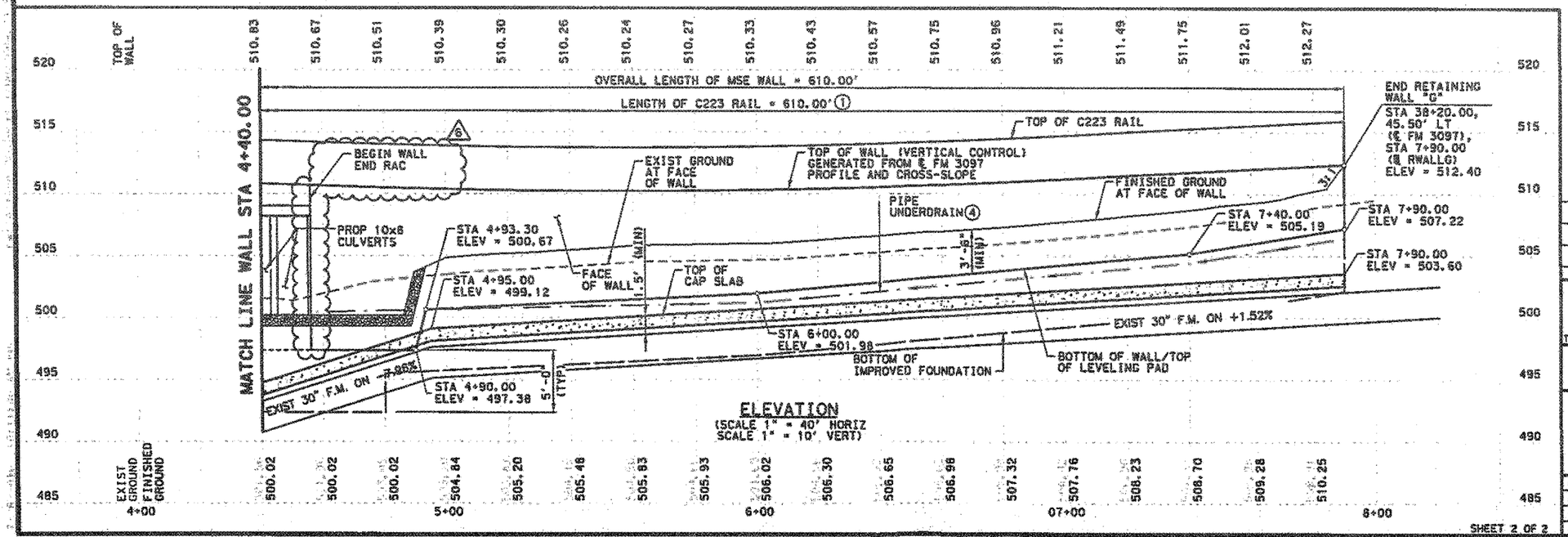
Texas Department of Transportation

FM 3097
MSE RETAINING WALL LAYOUT WALL "G"

Designed:	KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006	127A



PLAN
(SCALE 1" = 40')



ELEVATION
(SCALE 1" = 40' HORIZ
SCALE 1" = 10' VERT)

SHEET 2 OF 2

GENERAL NOTE:

1. CONTRACTOR TO VERIFY UTILITY LOCATION AND ELEVATION PRIOR TO DIGGING AND PLACING CAP SLAB.

(1) LENGTH OF C223 RAIL TO BE QUANTIFIED WITH ROADWAY QUANTITIES.

(2) FOUNDATION IMPROVEMENT TRANSITION:
STA 41+22.00 (℄ FM 3097)
STA 4+88.00 (℄ RWALLG)

(3) FOUNDATION IMPROVEMENT TRANSITION:
STA 39+10.00 (℄ FM 3097)
STA 7+00.00 (℄ RWALLG)

(4) SEE "BRIDGE CLASS CULVERT LAYOUT" FOR PIPE UNDERDRAIN AND CULVERT CONNECTION INFORMATION.

CONCRETE CAP SLAB

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
07/28/16

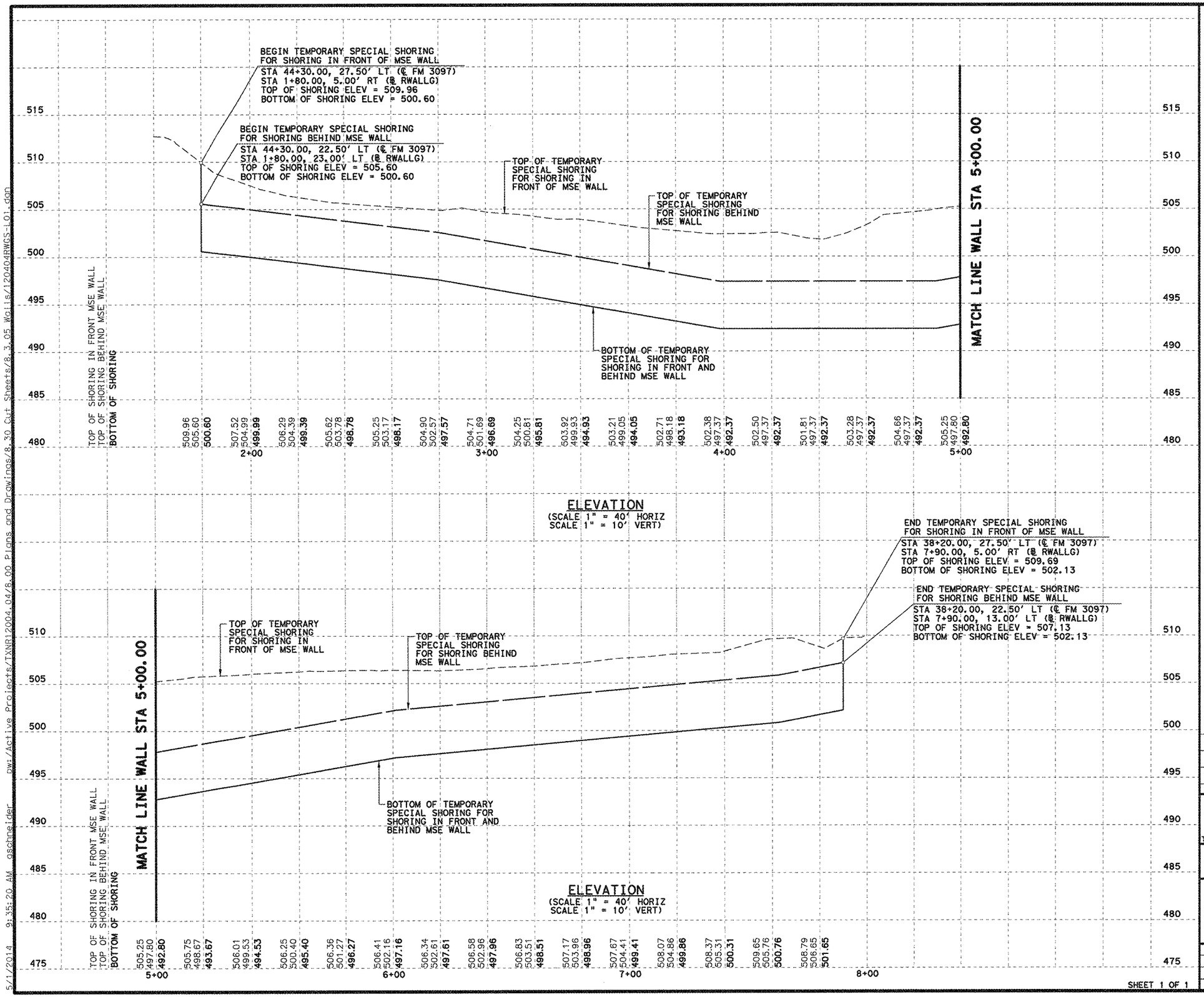
NO.	REVISION	BY	DATE
1	REVISED CULVERT WING	KH	07/28/16
2	ADDED CAP SLAB AND EXIST PIPE LIMITS	KH	06/15/16

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097
MSE RETAINING WALL LAYOUT
WALL "G"

Designed: KH	FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: KWZ	6	TEXAS	STP 2013 (897) MM			FM 3097
Drawn: EMS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: KH	DAL	ROCKWALL	3148	01	006	127



GENERAL NOTES:

1. SEE "MSE RETAINING WALL LAYOUT" FOR LOCATION OF TEMPORARY SPECIAL SHORING IN FRONT AND BEHIND MSE WALL AND TOTAL ESTIMATED QUANTITY.

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
Kelly Ho
05-02-2014

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

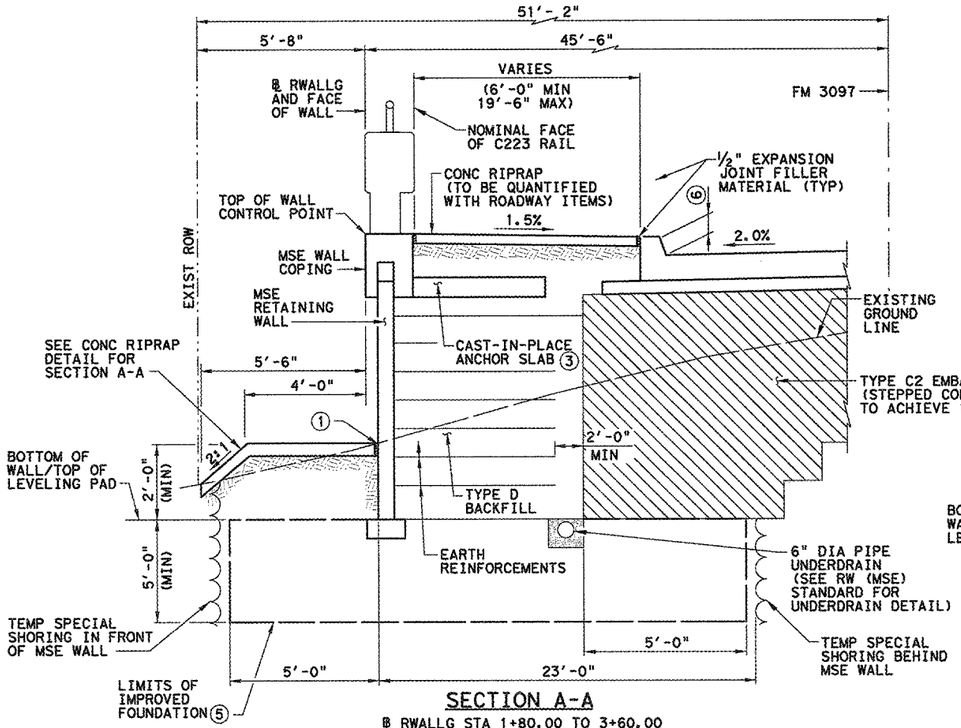
FM 3097

TEMPORARY SPECIAL SHORING WALL "G"

Designed:	KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	JDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006	128

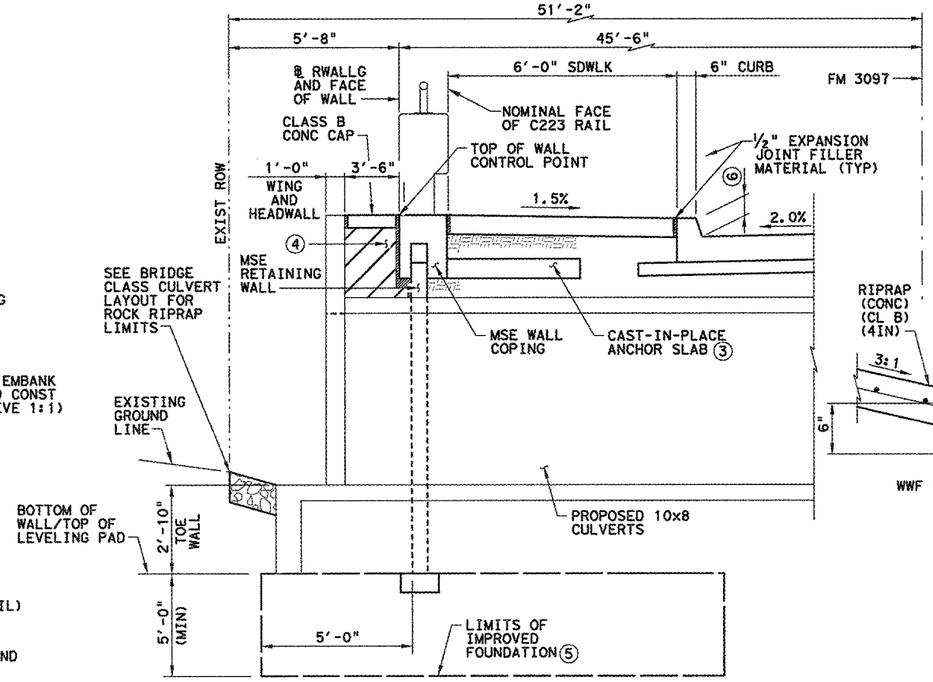
SHEET 1 OF 1

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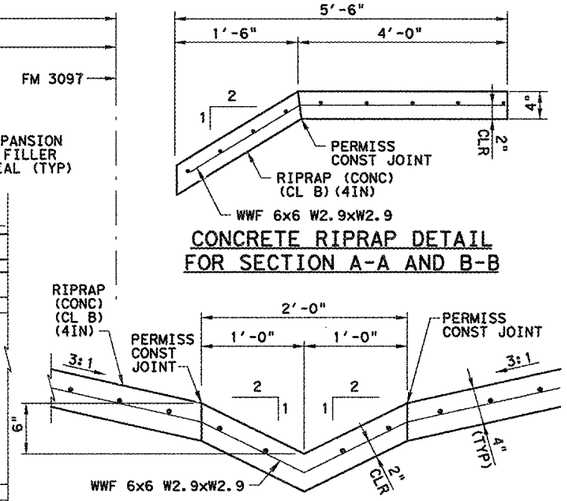
SECTION A-A

℄ RWALLG STA 1+80.00 TO 3+60.00
℄ FM 3097 STA 42+50.00 TO 44+00.00
(NTS)



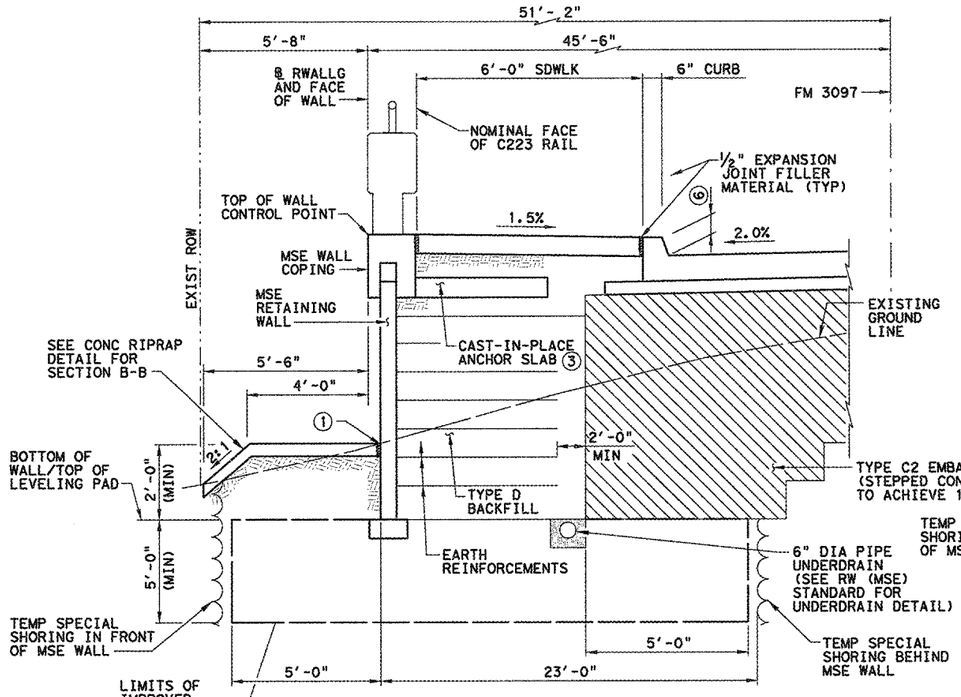
SECTION C-C

℄ RWALLG STA 4+01.40 TO 4+87.00
℄ FM 3097 STA 41+23.00 TO 42+08.60
(NTS)



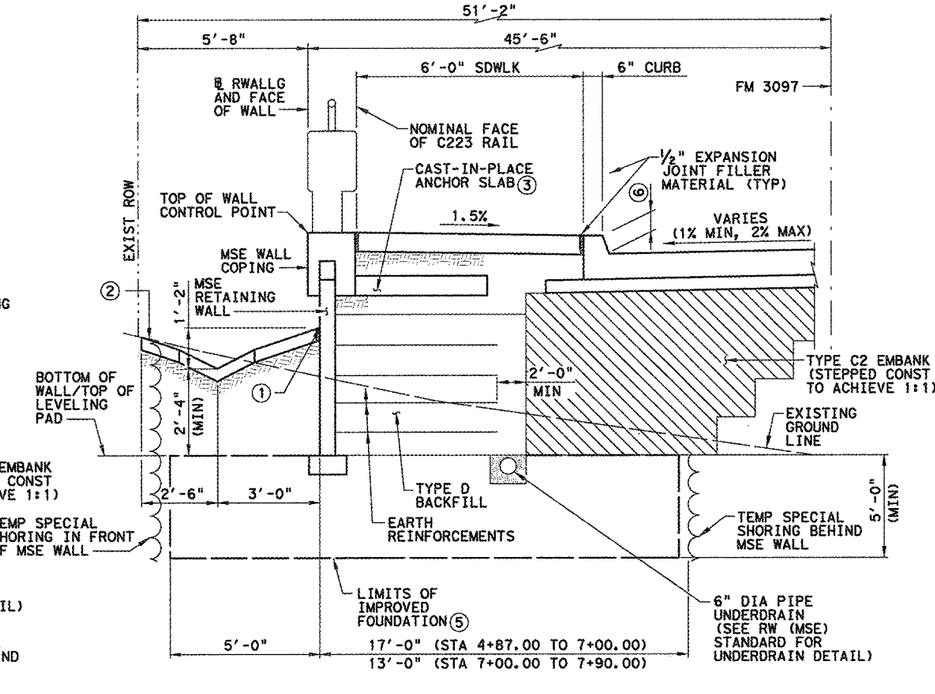
CONCRETE RIPRAP DETAIL FOR SECTION A-A AND B-B

CONCRETE RIPRAP AND FLUME DETAIL FOR SECTION D-D



SECTION B-B

℄ RWALLG STA 3+60.00 TO 4+01.40
℄ FM 3097 STA 42+08.60 TO 42+50.00
(NTS)



SECTION D-D

℄ RWALLG STA 4+87.00 TO 7+90.00
℄ FM 3097 STA 38+20.00 TO 41+23.00
(NTS)

① FINISHED GROUND LINE AT FACE OF WALL. 1/2" EXPANSION JOINT FILLER MATERIAL BETWEEN WALL PANEL AND CONCRETE RIPRAP OR CONCRETE FLUME. EXPANSION MATERIAL TO CONFORM WITH SPECIFICATION ITEM 420.E.

② RIPRAP (CONC) (CL B) (4IN). SEE "CONCRETE RIPRAP AND FLUME DETAIL FOR SECTION D-D".

③ SEE RW (TRF) STANDARD FOR ADDTIONAL DETAILS.

④ FLOWABLE BACKFILL. SEE "MSE RETAINING WALL MISC DETAILS" SHEET FOR ADDITIONAL DETAILS.

⑤ SEE "MSE RETAINING WALL LAYOUT" SHEETS FOR LIMITS OF IMPROVED FOUNDATION.

⑥ TYPE II (MONO) CURB. SEE CCCG-12 STANDARD FOR CURB DEPTH.

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

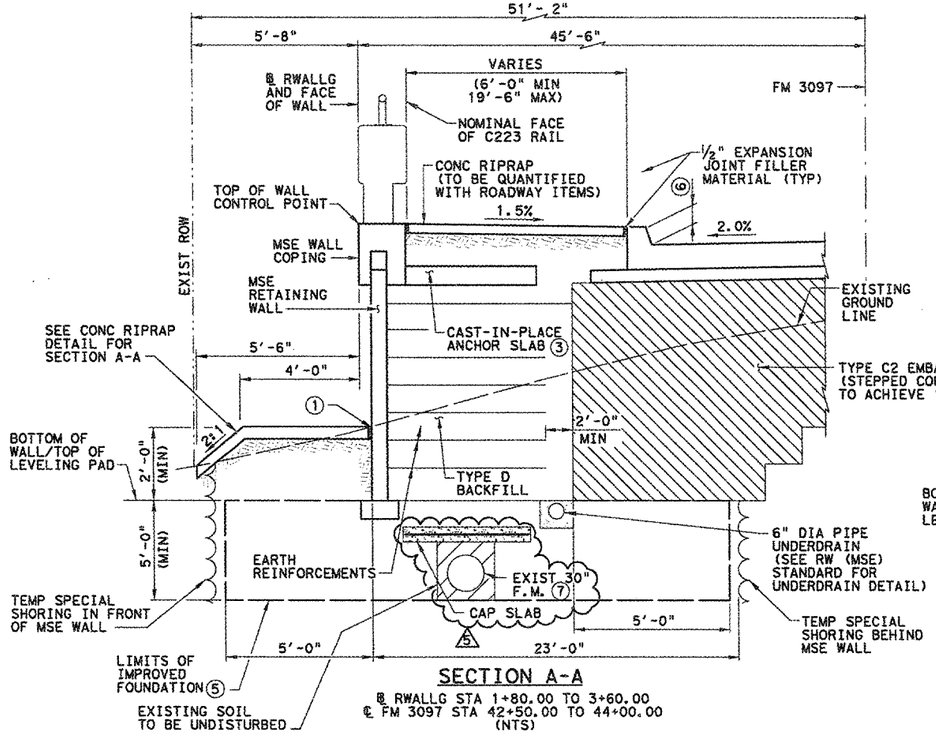
FM 3097

MSE RETAINING WALL TYPICAL SECTIONS

Designed:	KH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006	129

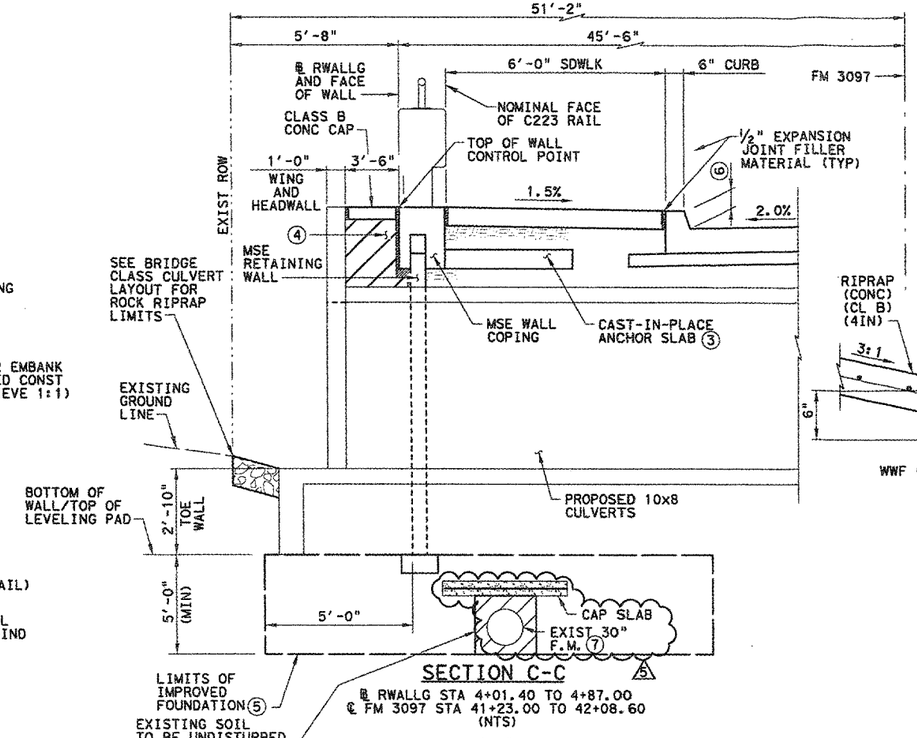
SHEET 1 OF 1

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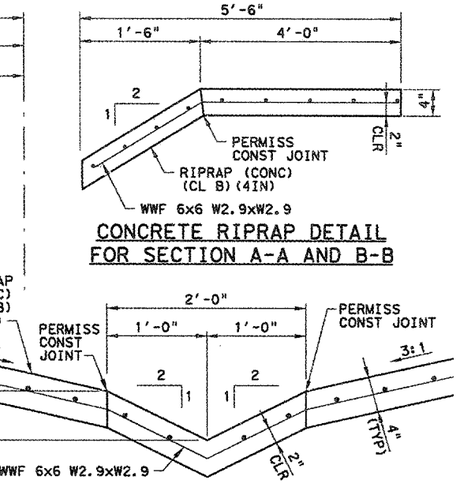
SECTION A-A

℄ RWALLG STA 1+80.00 TO 3+60.00
℄ FM 3097 STA 42+50.00 TO 44+00.00
(NTS)



SECTION C-C

℄ RWALLG STA 4+01.40 TO 4+87.00
℄ FM 3097 STA 41+23.00 TO 42+08.60
(NTS)



① FINISHED GROUND LINE AT FACE OF WALL. ½" EXPANSION JOINT FILLER MATERIAL BETWEEN WALL PANEL AND CONCRETE RIPRAP OR CONCRETE FLUME. EXPANSION MATERIAL TO CONFORM WITH SPECIFICATION ITEM 420.E.

② RIPRAP (CONC) (CL B) (4IN). SEE "CONCRETE RIPRAP AND FLUME DETAIL FOR SECTION D-D".

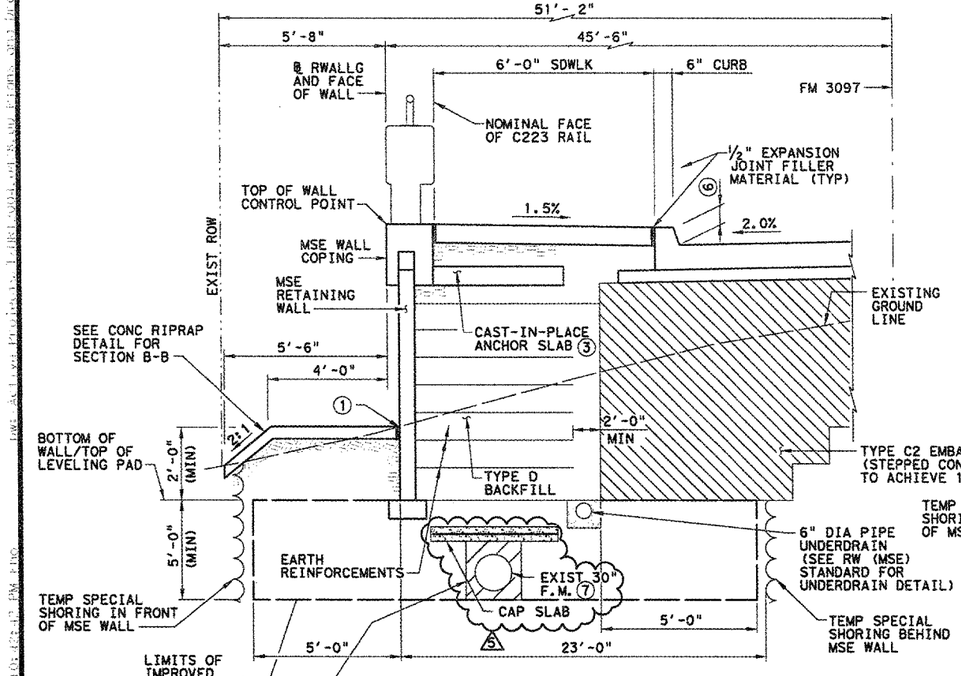
③ SEE RW (TRF) STANDARD FOR ADDTIONAL DETAILS.

④ FLOWABLE BACKFILL. SEE "MSE RETAINING WALL MISC DETAILS" SHEET FOR ADDITIONAL DETAILS.

⑤ SEE "MSE RETAINING WALL LAYOUT" SHEETS FOR LIMITS OF IMPROVED FOUNDATION.

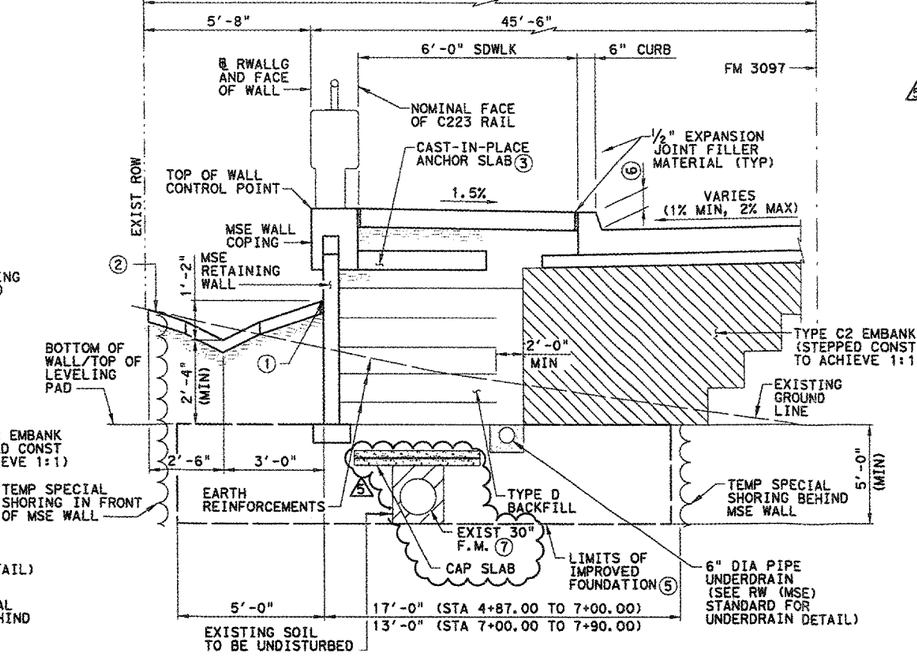
⑥ TYPE II (MONO) CURB. SEE CCCG-12 STANDARD FOR CURB DEPTH.

⑦ SEE "MSE RETAINING WALL MISC DETAILS" FOR CAP SLAB DETAIL.



SECTION B-B

℄ RWALLG STA 3+60.00 TO 4+01.40
℄ FM 3097 STA 42+08.60 TO 42+50.00
(NTS)



SECTION D-D

℄ RWALLG STA 4+87.00 TO 7+90.00
℄ FM 3097 STA 38+20.00 TO 41+23.00
(NTS)

STATE OF TEXAS
KELLY HO
112947
LICENSED PROFESSIONAL ENGINEER
06/16/16

NO.	REVISION	BY	DATE
⚠5	ADDED CAP SLAB AND EXIST PIPE LIMITS	KH	06/15/16

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

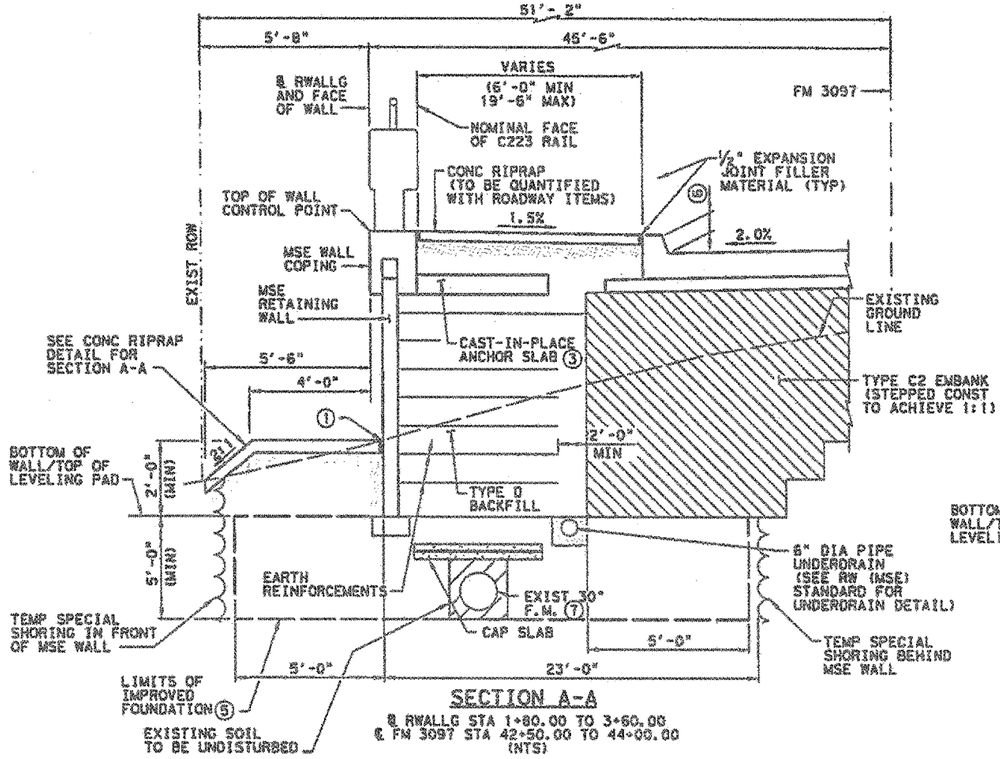
Texas Department of Transportation

FM 3097

MSE RETAINING WALL TYPICAL SECTIONS

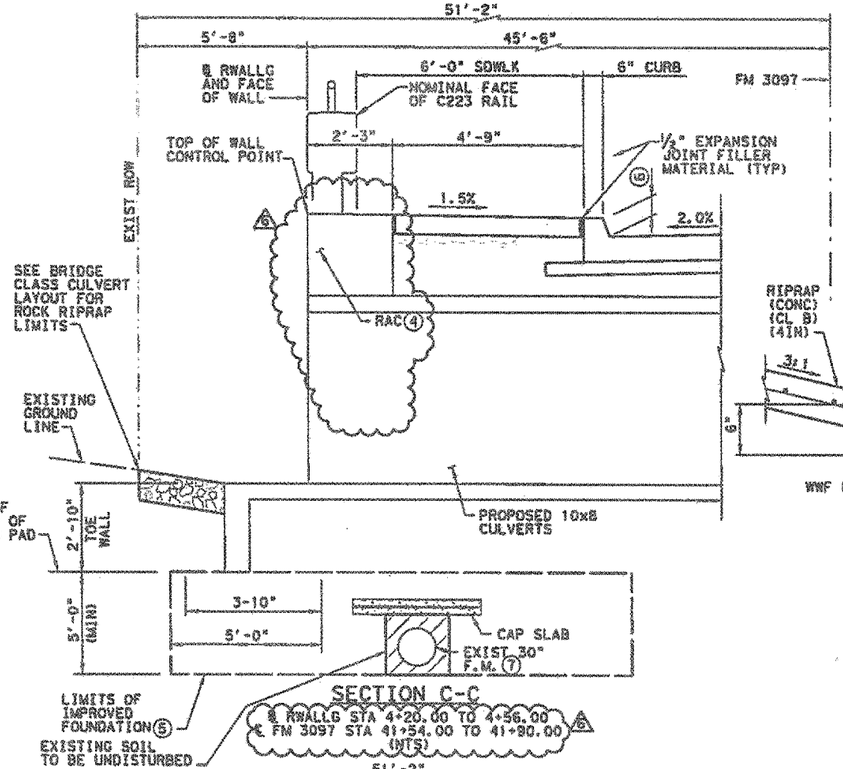
Designed: KH	FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: KWZ	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: KH	DAL	ROCKWALL	3148	01	006	129A

SHEET 1 OF 1



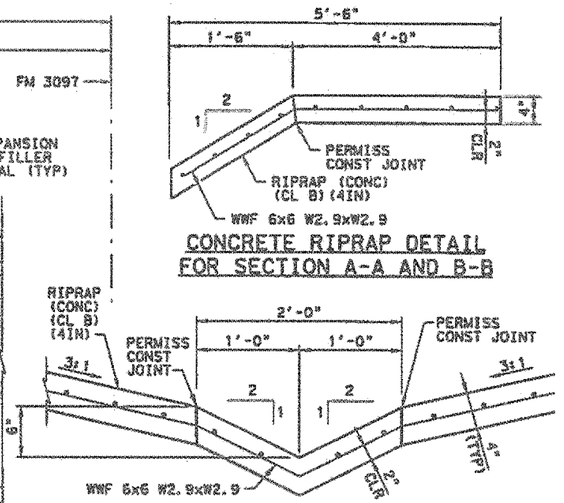
SECTION A-A

℄ RWALLG STA 1+80.00 TO 3+60.00
℄ FM 3097 STA 42+50.00 TO 44+00.00
(NTS)



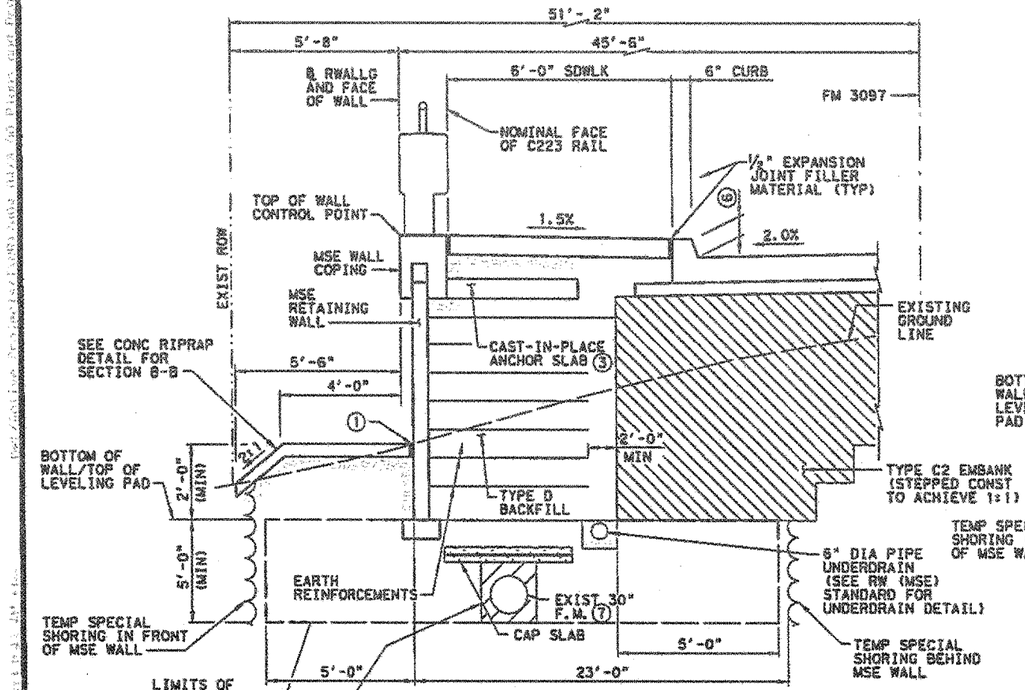
SECTION C-C

℄ RWALLG STA 4+20.00 TO 4+56.00
℄ FM 3097 STA 41+54.00 TO 41+90.00
(NTS)



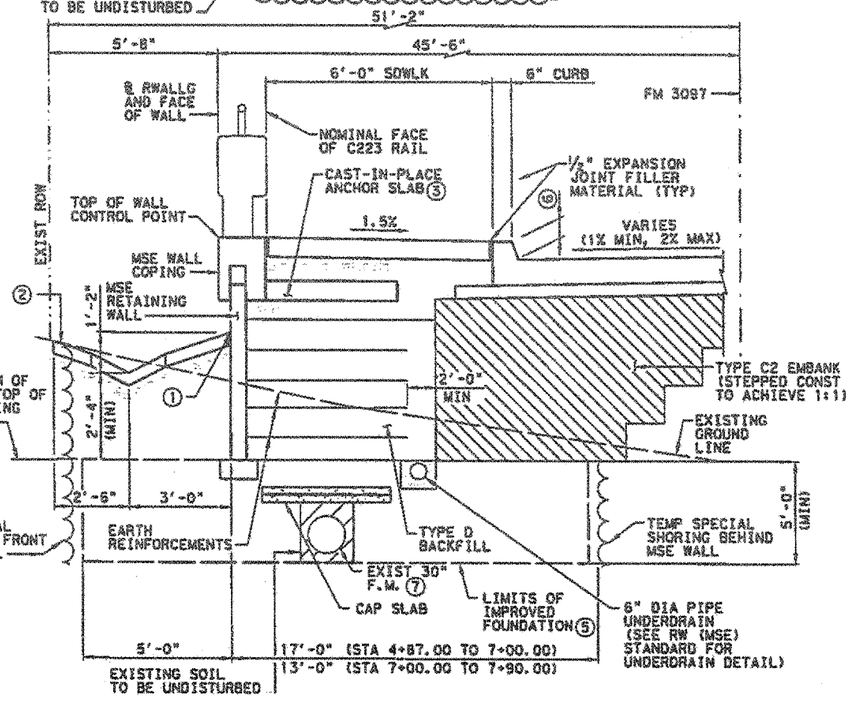
CONCRETE RIPRAP DETAIL FOR SECTION A-A AND B-B

CONCRETE RIPRAP AND FLUME DETAIL FOR SECTION D-D



SECTION B-B

℄ RWALLG STA 3+60.00 TO 4+20.00
℄ FM 3097 STA 41+90.00 TO 42+50.00
(NTS)



SECTION D-D

℄ RWALLG STA 4+56.00 TO 7+90.00
℄ FM 3097 STA 38+20.00 TO 41+54.00
(NTS)

1. FINISHED GROUND LINE AT FACE OF WALL. 1/2" EXPANSION JOINT FILLER MATERIAL BETWEEN WALL PANEL AND CONCRETE RIPRAP OR CONCRETE FLUME. EXPANSION MATERIAL TO CONFORM WITH SPECIFICATION ITEM 420.E.
2. RIPRAP (CONC)(CL B)(4IN). SEE "CONCRETE RIPRAP AND FLUME DETAIL FOR SECTION D-D".
3. SEE RW (TRF) STANDARD FOR ADDTIONAL DETAILS.
4. SEE RAC STANDARD FOR ADDITIONAL DETAILS. (5)
5. SEE "MSE RETAINING WALL LAYOUT" SHEETS FOR LIMITS OF IMPROVED FOUNDATION.
6. TYPE II (MONO) CURB. SEE CCCG-12 STANDARD FOR CURB DEPTH.
7. SEE "MSE RETAINING WALL MISC DETAILS" FOR CAP SLAB DETAIL.

STATE OF TEXAS
KELLY HO
112947
LICENSED PROFESSIONAL ENGINEER
07/28/16

NO.	REVISION	BY	DATE
1	REVISED CULVERT WING	KH	07/28/16
2	ADDED CAP SLAB AND EXIST PIPE LIMITS	KH	08/15/16

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

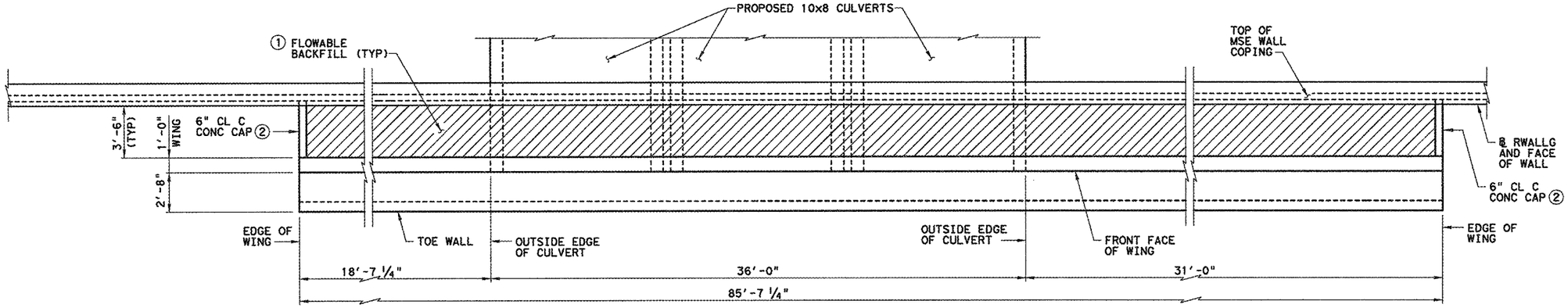
Texas Department of Transportation

FM 3097

MSE RETAINING WALL TYPICAL SECTIONS

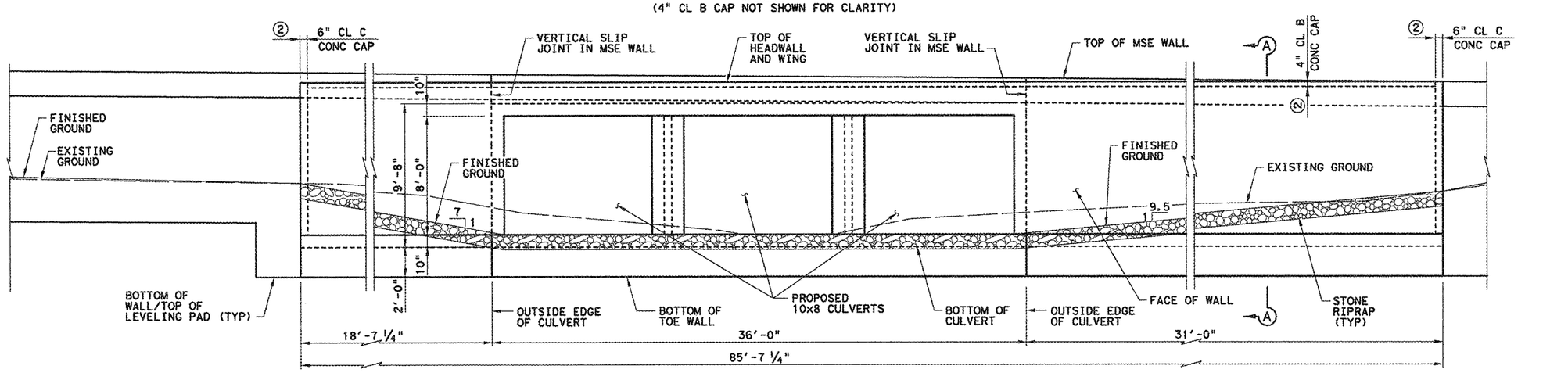
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Drawn	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	KH	DAL	ROCKWALL	3148	01	006	129

SHEET 1 OF 1



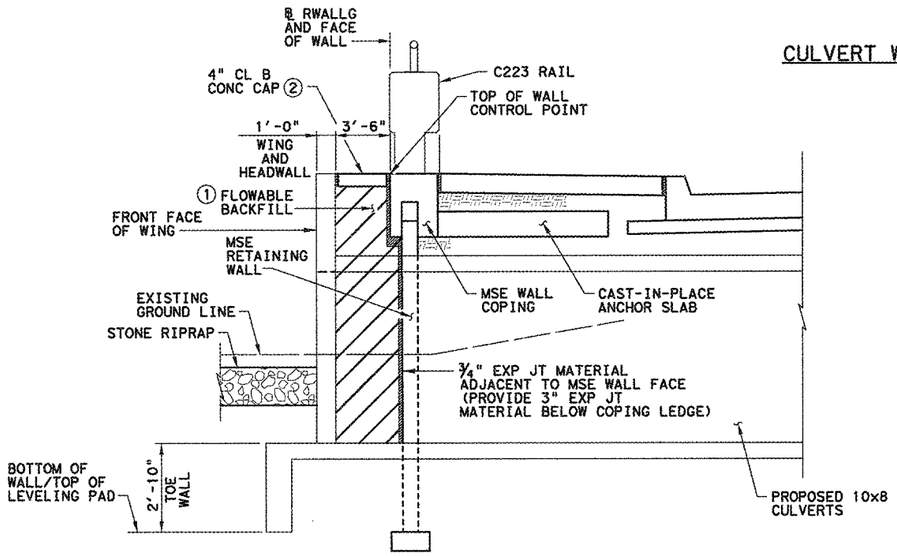
PLAN

(4" CL B CAP NOT SHOWN FOR CLARITY)



ELEVATION

CULVERT WING/MSE WALL INTERFACE DETAILS



SECTION A-A

① SEE SPECIFICATION ITEM 401 "FLOWABLE BACKFILL" FOR ADDTIONAL INFORMATION NOT SHOWN.

② SEE "MSE RETAINING WALL MISC DETAILS" SHEET 2 OF 2 FOR ADDITIONAL DETAILS.

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097

MSE RETAINING WALL MISC DETAILS

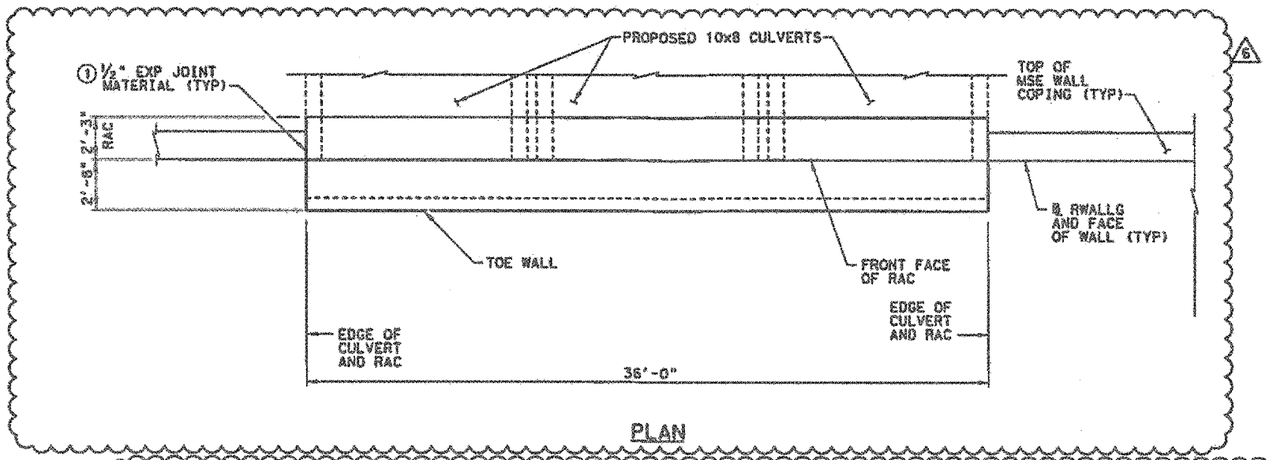
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STATE OF TEXAS
KELLY HO
112947
LICENSED PROFESSIONAL ENGINEER

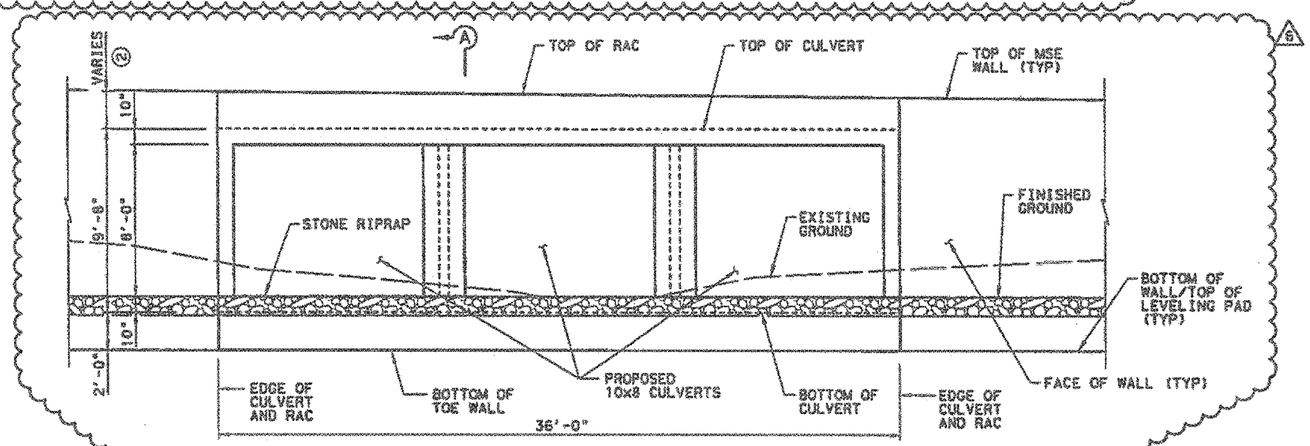
05-02-2014

SHEET 1 OF 2

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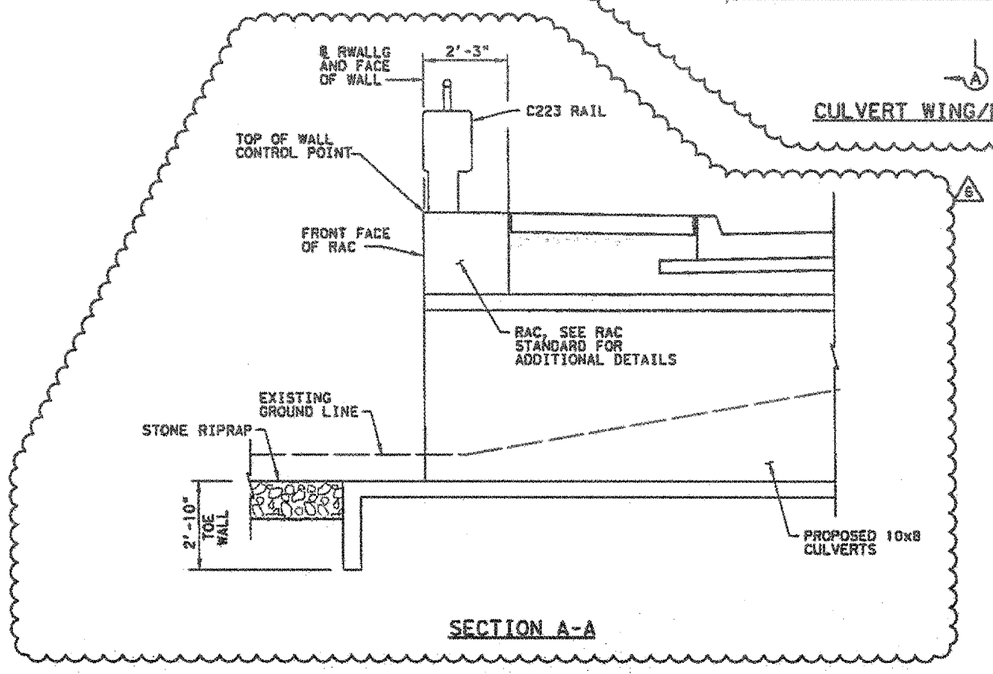


PLAN



A ELEVATION

CULVERT WING/MSE WALL INTERFACE DETAILS



SECTION A-A

⑤ ① PLACE ½" EXPANSION JOINT MATERIAL (CLASS B) BETWEEN THE VERTICAL EDGE OF MSE WALL COPING AND PANELS AND EDGE OF CULVERT AND RAC IN ACCORDANCE WITH DMS-6310 "JOINT SEALANTS AND FILLERS".

② 1'-9" MIN, 2'-0¼" MAX.

STATE OF TEXAS
KELLY HO
112947
LICENSED PROFESSIONAL ENGINEER
07/28/16

NO.	REVISION	BY	DATE
6	REVISED CULVERT WING	KH	07/28/16

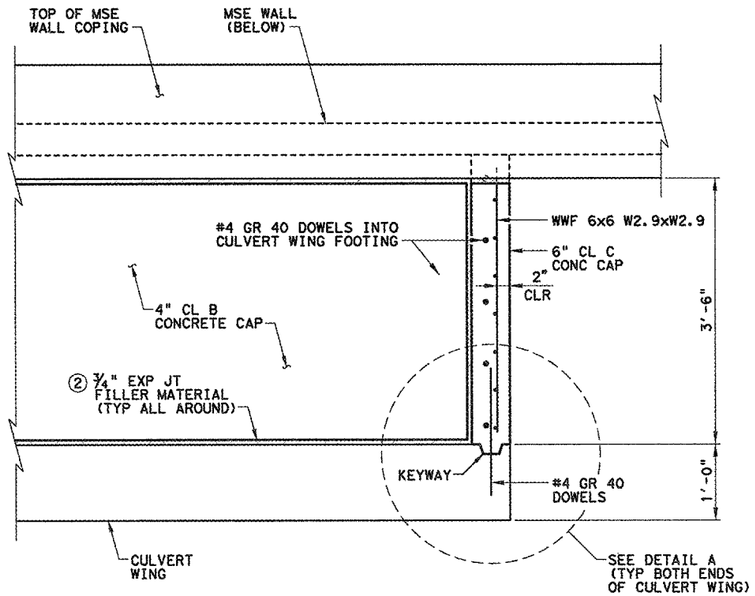
CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1751

Texas Department of Transportation

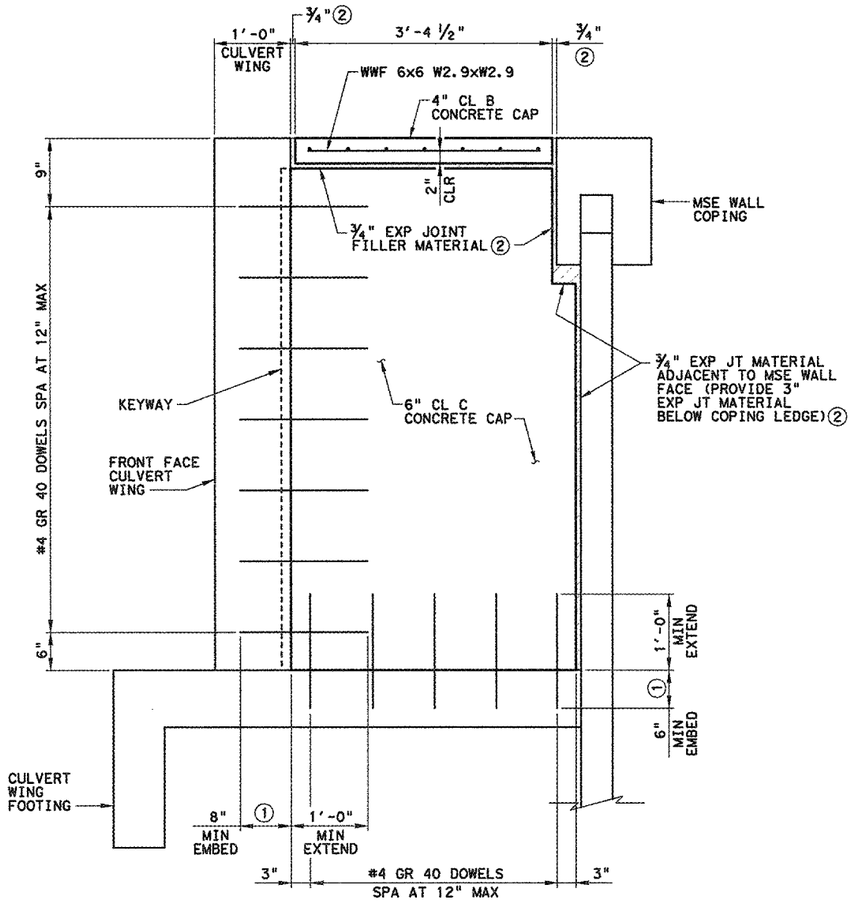
FM 3097

MSE RETAINING WALL MISC DETAILS

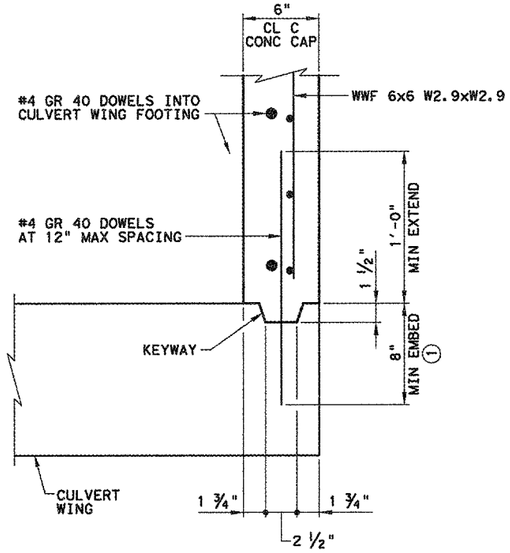
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Drawn	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	KH	DAL	ROCKWALL	3148	01	006	130A



PLAN



ELEVATION



DETAIL A

① AT CONTRACTOR'S OPTION, DOWELS MAY BE DRILLED AND EPOXIED AFTER CULVERT WING CONSTRUCTION IS COMPLETE. EPOXY MATERIAL TO CONFORM WITH SPECIFICATION ITEM 420.I.

② EXPANSION JOINT FILLER MATERIAL TO CONFORM WITH SPECIFICATION ITEM 420.E.

STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM, F-1741

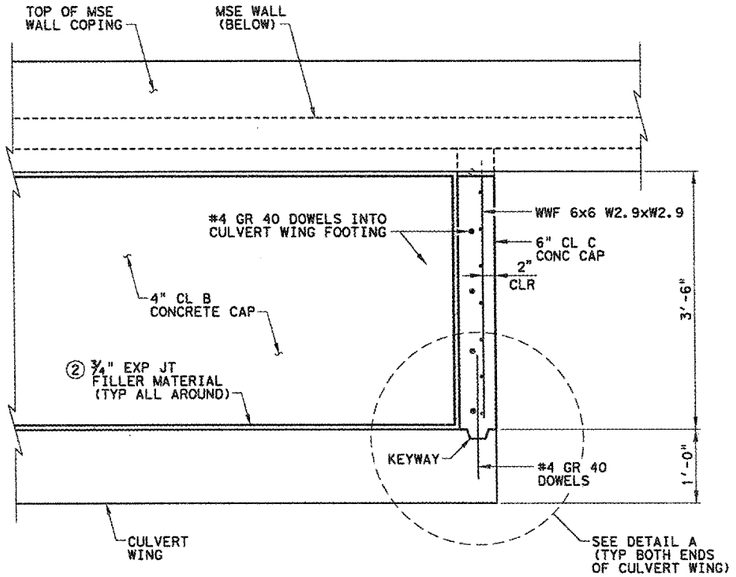
Texas Department of Transportation

FM 3097
MSE RETAINING WALL MISC DETAILS

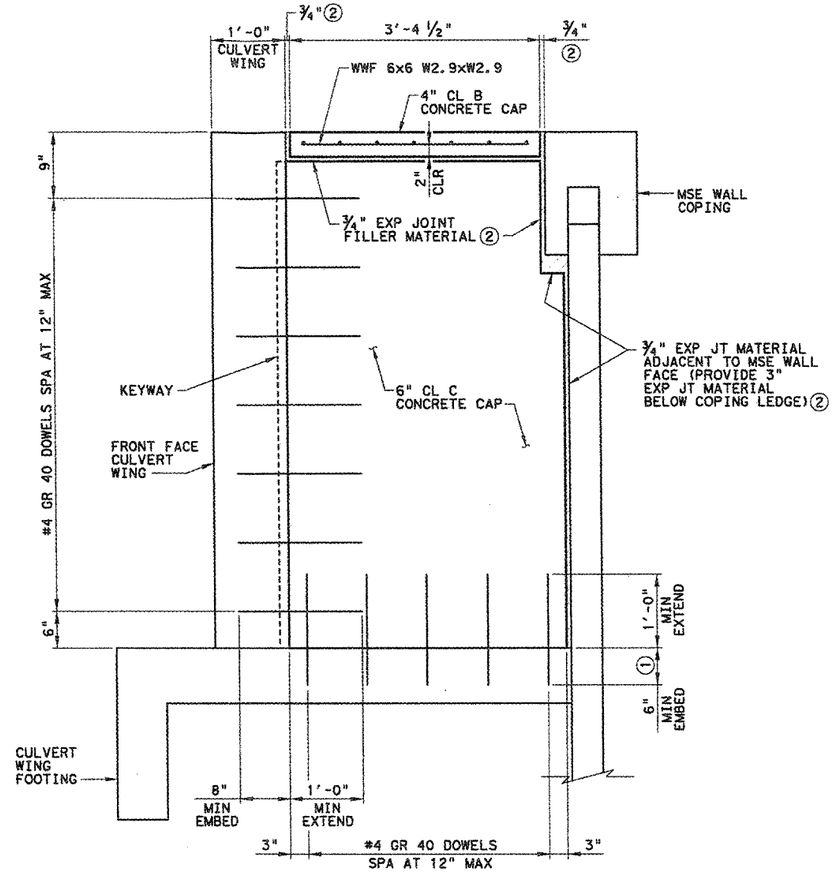
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Checked:	KH	DAL	ROCKWALL	3148	01	006	131	

SHEET 2 OF 2

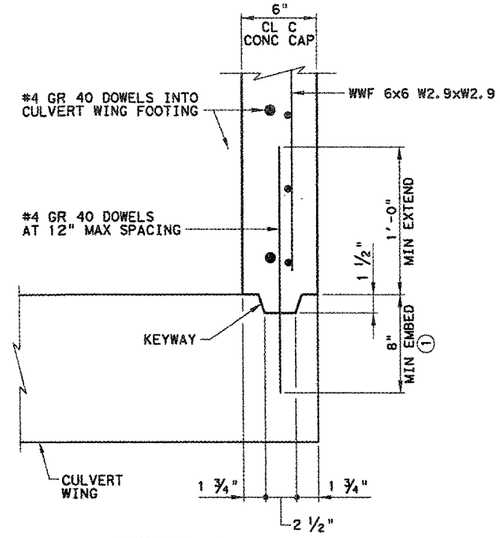
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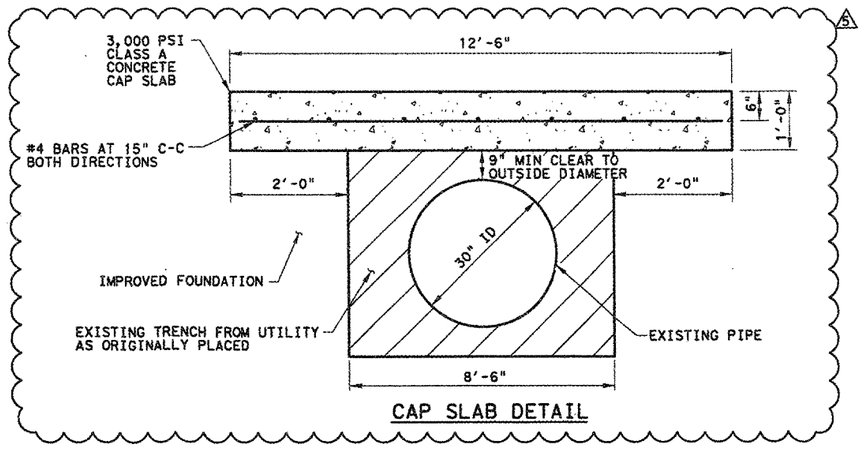
PLAN



ELEVATION



DETAIL A



CAP SLAB DETAIL

① AT CONTRACTOR'S OPTION, DOWELS MAY BE DRILLED AND EPOXIED AFTER CULVERT WING CONSTRUCTION IS COMPLETE. EPOXY MATERIAL TO CONFORM WITH SPECIFICATION ITEM 420.I.

② EXPANSION JOINT FILLER MATERIAL TO CONFORM WITH SPECIFICATION ITEM 420.E.

⑤ ③ CONTRACTOR TO EXCAVATE AT 1H:1V SLOPE OR STEEPER.

STATE OF TEXAS
KELLY HO
112947
LICENSED PROFESSIONAL ENGINEER

06/16/16

NO.	REVISION	BY	DATE
⑤	ADDED CAP SLAB AND EXIST PIPE LIMITS	KH	06/15/16

CP&Y

TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

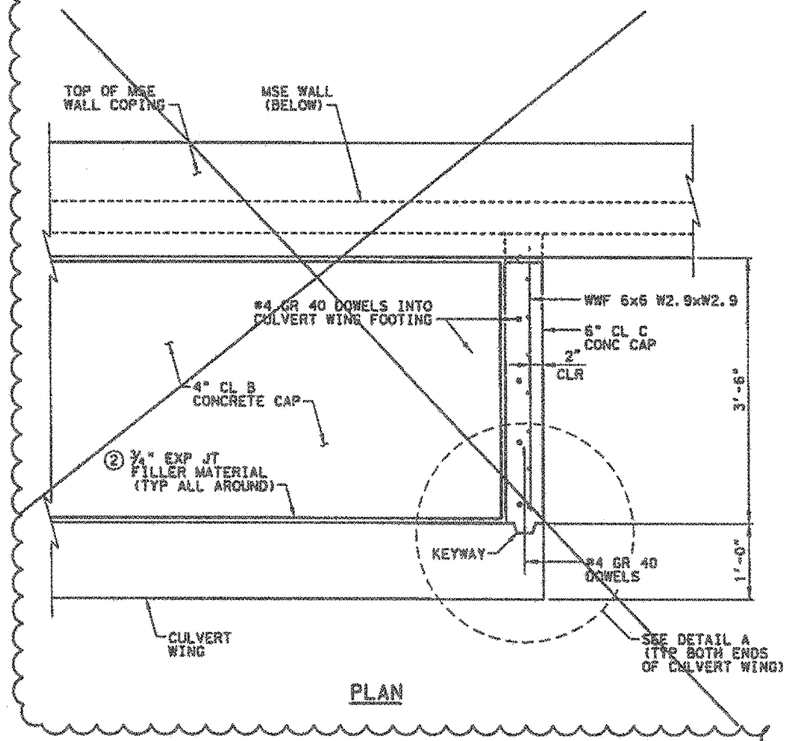
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MSE RETAINING WALL MISC DETAILS

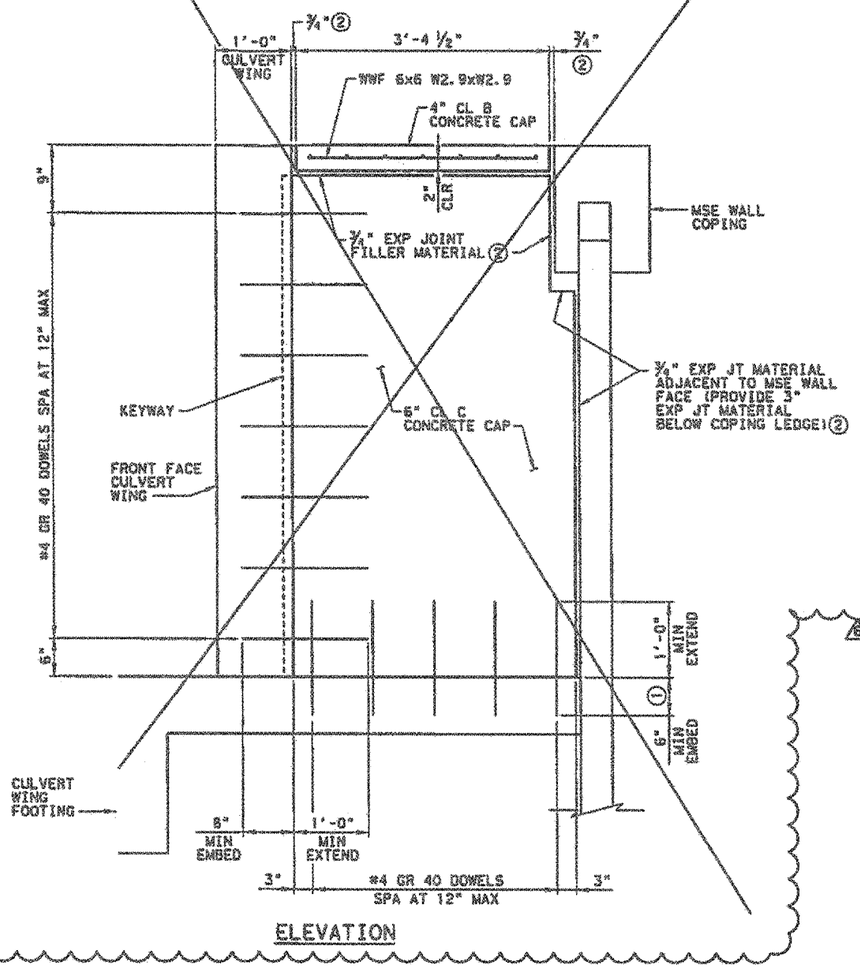
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SHEET 2 OF 2

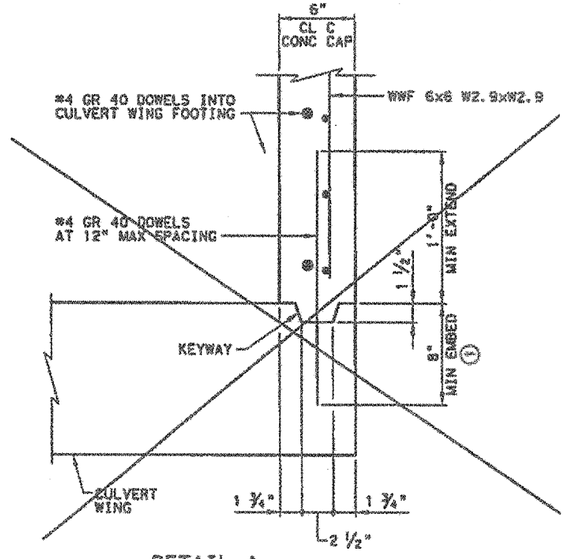
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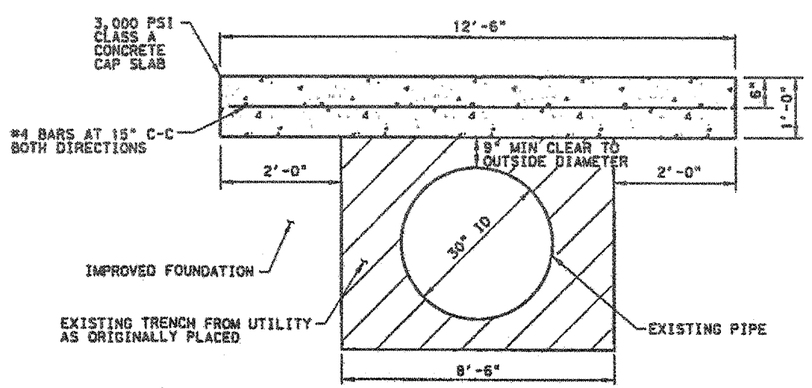
PLAN



ELEVATION



DETAIL A



CAP SLAB DETAIL

⑥

① AT CONTRACTOR'S OPTION, DOWELS MAY BE DRILLED AND EPOXIED AFTER CULVERT WING CONSTRUCTION IS COMPLETE. EPOXY MATERIAL TO CONFORM WITH SPECIFICATION ITEM 420.I.

② EXPANSION JOINT FILLER MATERIAL TO CONFORM WITH SPECIFICATION ITEM 420.E.

STATE OF TEXAS
KELLY HO
112947
LICENSED PROFESSIONAL ENGINEER

07/28/16

NO.	REVISION	BY	DATE
⑥	REVISED CULVERT WING, DETAILS NO LONGER APPLY	KH	07/28/16
⑤	ADDED CAP SLAB AND EXIST PIPE LIMITS	KH	05/13/16

CP&Y

TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

MSE RETAINING WALL MISC DETAILS

Designed	KH	FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked	CPY	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	KH	DAL	ROCKWALL	3148	01	006	131

SHEET 2 OF 2

5/1/2014 9:47:03 AM aschneider pw:/Active Projects/TXNR120044/8.00 Plans and Drawings/8.30 Cut Sheets/8_3_05 Walls/120404RWBL01.dgn

BORING NO. BH-1
STA 42+00.00
OFFSET 45.00' LT
ELEV 503.1

505
500
495
490
485
480
475

6(6)5(6)
7(6)8(6)
50(3.5)50(1.25)
50(1)50(1.25)
50(1)50(0.5)

CLAY, sandy, very stiff, yellowish brown (CL)
CLAY, fat, soft to very stiff, yellowish brown and gray (CH)
CLAY, shaley, very stiff to hard, dark brown and light gray (CL)
SHALE, hard to very hard, dark gray

B/H = 478.1

BORING NO. BH-2
STA 41+55.00
OFFSET 26.00' RT
ELEV 505.6

6(6)6(6)
12(6)22(6)
50(1)50(0.5)

CLAY, fat, soft to very stiff, yellowish brown and gray (CH)
CLAY, lean, stiff to very stiff, moist, yellowish brown and gray (CL)
SHALE, clayey, very hard, gray

B/H = 490.6

BORING NO. BH-3
STA 40+00.00
OFFSET 45.00' LT
ELEV 505.4

3(6)2(6)
15(6)32(6)
50(0.75)50(0.5)
50(1)50(0.25)
50(1)50(0.25)

CLAY, lean, very soft to very stiff, moist, yellowish brown, with sand (CL)
CLAY, stiff to very stiff, moist, yellowish brown, with shale layers (CL)
SHALE, very hard, dark gray

B/H = 480.4

BORING NO. BH-4
STA 38+25.00
OFFSET 45.00' LT
ELEV 508.3

520
515
510
505
500
495
490
485
480

50(1)50(0.25)
50(1)50(0.5)
50(1)50(0.5)
50(0.75)50(0.25)

CLAY, fat, stiff to very stiff, yellowish brown, with gravel and limestone seams (CH)
CLAY, lean, very stiff, yellowish brown, with shale layers (CL)
SHALE, very hard, dark gray

B/H = 483.3

BORING NO. BH-5
STA 35+00.00
OFFSET 44.00' LT
ELEV 516.0

4(6)4(6)
50(3)50(1.75)
50(0.5)50(0.25)
50(1)50(0.5)
50(1)50(0.5)

CLAY, sandy, soft to very stiff, yellowish brown, (CL)
CLAY, stiff to hard, yellowish brown, with sand and shale layers (CL)
SHALE, very hard, dark gray

B/H = 491.0

BORING NO. BH-6
STA 33+00.00
OFFSET 46.00' LT
ELEV 519.8

50(5.5)50(3)
50(1)50(0.25)
50(0.25)50(0.25)
50(1)50(0.5)

CLAY, very stiff, yellowish brown, with sand (CL)
CLAY, fat, very stiff to hard, yellowish brown and gray, with shale layers (CH)
SHALE, very hard, dark gray

B/H = 499.8

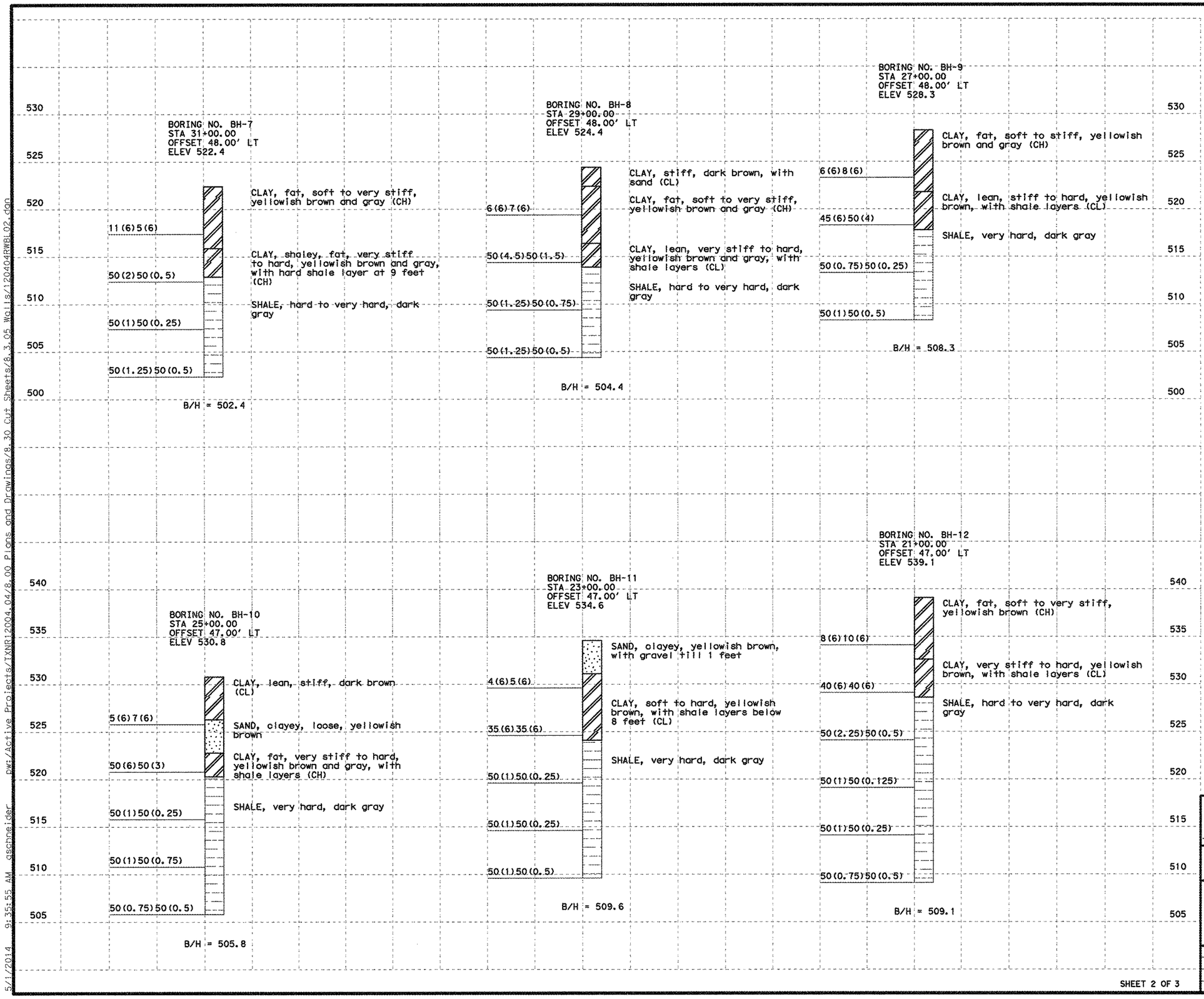
STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097
BORING LOGS

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Drawn:	JDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006	132



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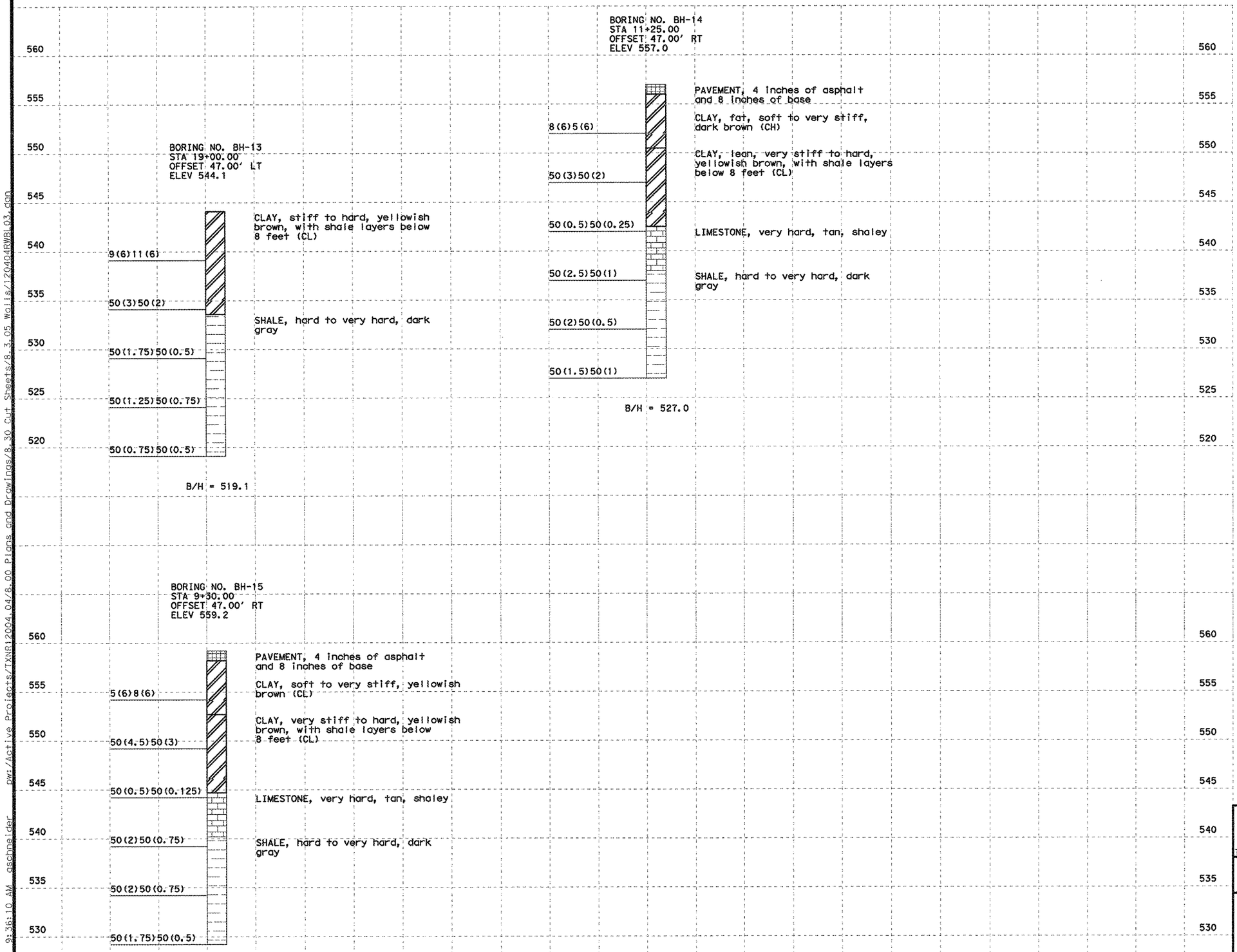
STATE OF TEXAS
KELLY HO
112947
LICENSED
PROFESSIONAL ENGINEER
05-02-2014

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

FM 3097
BORING LOGS

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Drawn: JDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: KH	DAL	ROCKWALL	3148	01	006	133



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PROFESSIONAL ENGINEER
STATE OF TEXAS

05-02-2014

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TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

FM 3097
BORING LOGS

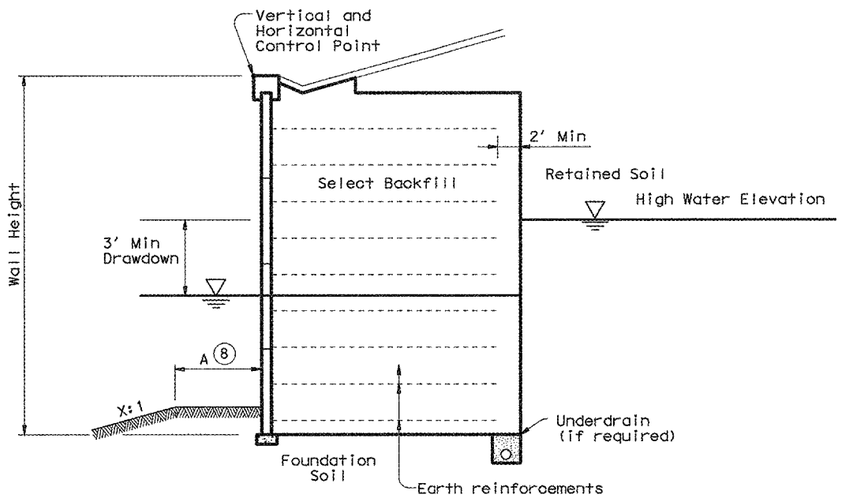
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Drawn:	JDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KH	DAL	ROCKWALL	3148	01	006	134

SHEET 3 OF 3

WALL SUMMARY

MSE Retaining Wall	Begin Station (1)	End Station (1)	Retained Soil Friction Angle (2)	Foundation Soil Friction Angle (2)	Ground Improvement (3)	Min Earth Reinforcement Length (4)	Min Wall Embedment (7)	Underdrain Required (5)	Drawdown Analysis (6)	Bench Width (8)
RETAINING WALL "G"	STA 1+80.00	STA 4+00.00	30°	24°	REQUIRED	140% X HT	2′	REQUIRED	REQUIRED	4′
	STA 4+00.00	STA 7+90.00	30°	24°	REQUIRED	120% X HT	2′	REQUIRED	REQUIRED	4′

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TYPICAL SECTION
(RAPID DRAWDOWN CONDITION)

(1) Indicate limits for which the stated soil design requirements/assumptions are applicable.

(2) Retained and Foundation friction angle listed should be based on local experience or measured/correlated long term strength values.

(3) Indicate if ground improvement is required or not required. If shown as required, refer to Ground Improvement Detail(s) for additional information.

(4) Indicate on table minimum length and length ratio required. The minimum default length of earth reinforcements shall be either 8′-0" or 70% of the wall height, whichever is greater. Wall height and design wall height may differ depending on project geometry and loading conditions. Note: Wall height at bridge abutments is equal to the distance between the top of leveling pad and finished grade at the bridge abutment backwall.

(5) Indicate if underdrain is required or not required.

(6) Indicate if rapid drawdown analysis is required.

(7) Guidance to wall designer of record for determination of minimum wall embedment: Unless noted elsewhere in the plans, the minimum embedment provided from the top of leveling pad to finish grade shall be 1′ for level ground where there is no potential for erosion or future excavation or 2′ for sloping ground (4.0H:1.0V or steeper) or where there is potential for removal of soil in front of the wall.

(8) Horizontal Bench width at base of wall varies. Use the following criteria to establish base width.
A = 2.0′ Min for X ≥ 4. or
A = 4.0′ Min for X ≤ 4.
Applicable to both drawdown and dry condition.

STATE OF TEXAS
KELLY HO
112947
LICENSED PROFESSIONAL ENGINEER
05-02-2014

Texas Department of Transportation
Bridge Division

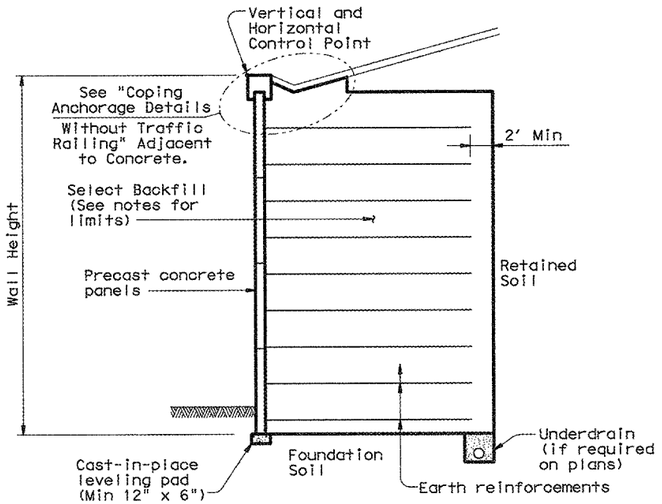
MECHANICALLY STABILIZED EARTH RETAINING WALL DESIGN DATA

RW(MSE)DD

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	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

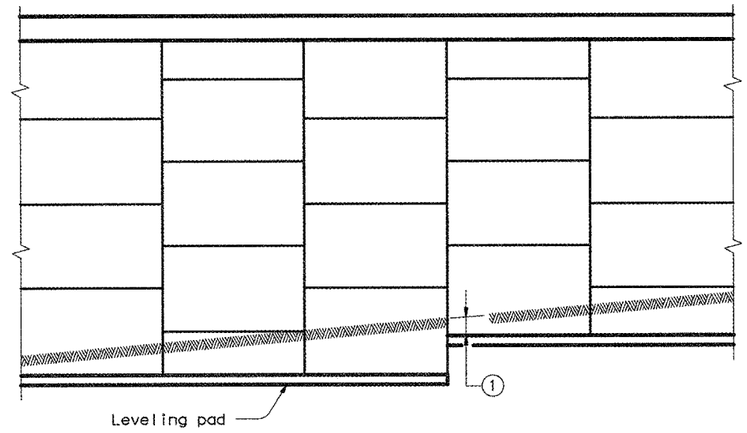
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LEVELS DISPLA
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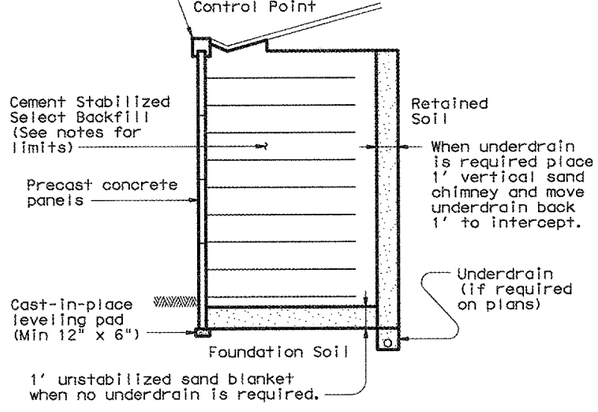


TYPICAL SECTION

(Wall at bottom of slope)

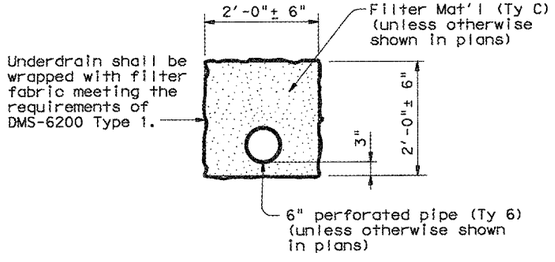


ELEVATION

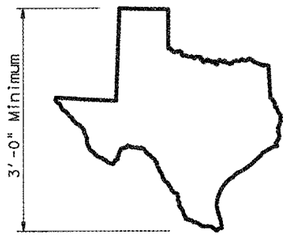


SPECIAL DRAINAGE PROVISIONS

(When cement stabilized backfill is used)



UNDERDRAIN DETAIL



MAP OF TEXAS EMBLEM (2)

(1) Minimum embedment conforming to values given on the RW(MSE)DD standard.

(2) Map of Texas emblem shall be formed into a wall panel next to each bridge abutment. The exact location of each emblem shall be approved by the Engineer. The cost of forming the emblems will not be paid for directly, but shall be incidental to the Item "Retaining Wall". The map of Texas shall be inset a minimum of ¾" into the face of the panel, and shall receive a smooth finish. The inset area shall be finished in a contrasting color as approved by the Engineer.

SHEET 1 OF 2

Texas Department of Transportation
Bridge Division

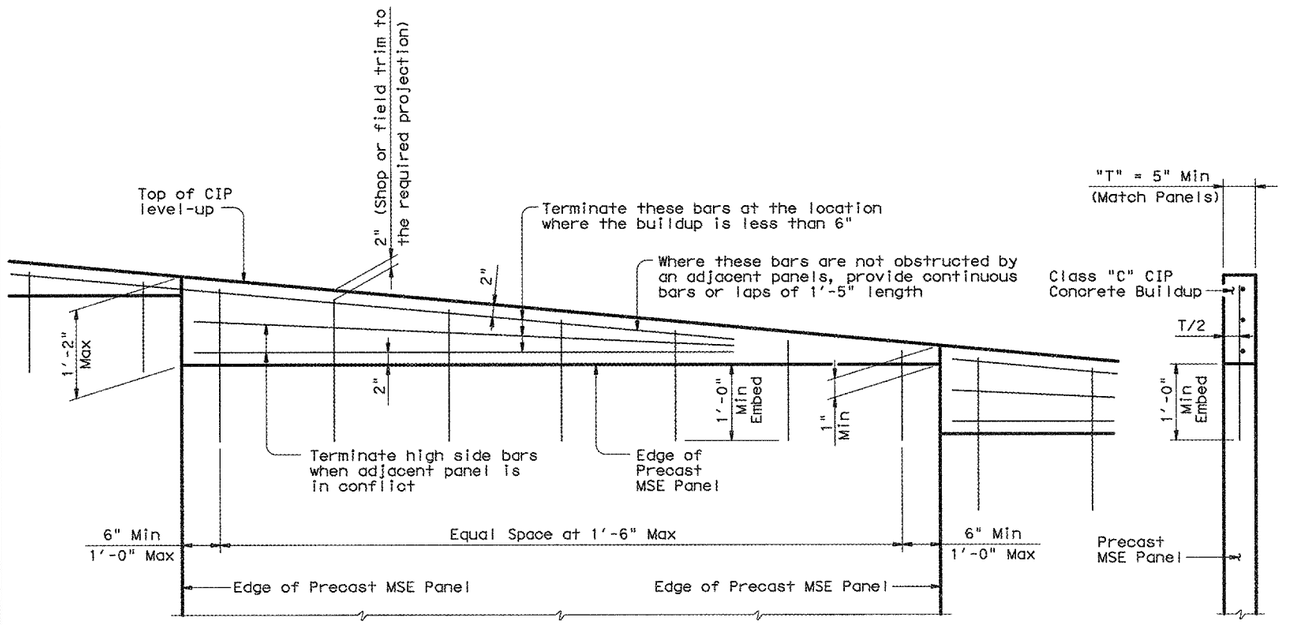
MECHANICALLY STABILIZED EARTH RETAINING WALL

RW(MSE)

FILE: rwstde01.dgn	DN: TxDOT	CK: TxDOT	DW: JGD	CK: MJG			
©TxDOT March 2010	DISTRICT	FEDERAL AID PROJECT			SHEET		
REVISIONS 04-11: Added table & Corrosion Criteria. 01-13: Wall embed, (WS) table, retained fill, soil strength.	DAL	STP 2013 (597) NM			136		
	COUNTY		CONTROL	SECT	JOB	HIGHWAY	
	ROCKWALL		3148	01	006	FM 3097	

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LEVELS DISPLAYED:
PATH:



LEVEL UP DETAIL (5)

Provide Grade 60 (#4) Reinforcement

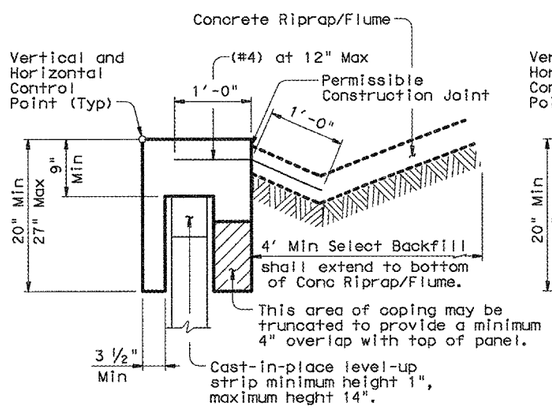
(3) Precast coping shall be anchored to prevent rotation or displacement. Use these details to develop custom anchorage for precast copings. Details shall include coping reinforcement. Concrete flume (if required) shall be paid for separately from Item 423.

(4) Soil design parameter must be based on long term soil strength. Design parameters must be listed on the RW(MSE)DD standard.

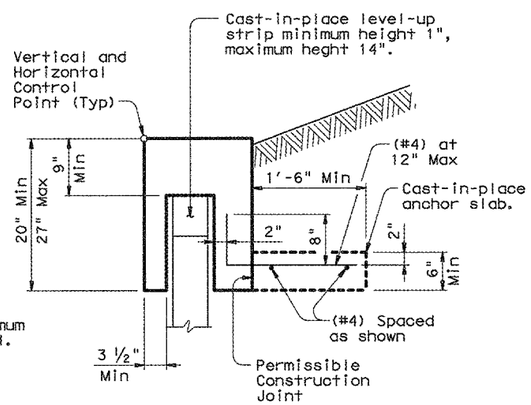
(5) Cast vertical bars into the top of panels. At contractor's option vertical bars may be embedded 4" with a Type III Clac C epoxy anchorage system. Follow manufacturer's directions for installing the epoxied vertical bars.

(6)

SELECT BACKFILL UNIT WEIGHT			
Type A, B & D	Unit Weight	Inernal Stability	External Stability
	105 PCF	Pullout	Sliding, Overturning, Eccentricity
	125 PCF	Rupture	Bearing



ADJACENT TO CONCRETE
(Excluding Concrete Pavement)



ADJACENT TO SOIL

COPING ANCHORAGE DETAILS WITHOUT TRAFFIC RAILING (3)

DESIGN PARAMETERS:

Design of retaining walls shall be based on the following design parameters unless stated elsewhere in the plans:

Retained Soil	Unit Weight = 125 pcf Ø = (4) C = 0 psf
Foundation Soil	Ø = (4) C = 0 psf
Select Backfill	Unit Weight = See Table (6) Ø = 34 C = 0 psf
Cement Stabilized Select Backfill	Unit Weight = 125 pcf Ø = 45 C = 0 psf

Stress in steel and concrete shall be in accordance with current AASHTO Standard and Interim Specifications.
The minimum length of earth reinforcements are as shown on the RW(MSE)DD standard.

STABILITY CRITERIA:

Stability criteria applies to both dry and drawdown analysis.
Factor of safety in sliding along the base of the structure shall be greater than or equal to 1.5.
Factor of safety in overturning shall be greater than or equal to 2.0.
The base pressure resultant shall fall within the middle third of the retaining wall.
The factor of safety against pullout of the earth reinforcements shall be greater than or equal to 1.5 at each level. Pullout resistance shall be determined from test data evaluated at 3/4 inch strain.

CORROSION CRITERIA:

The earth reinforcement elements shall be designed to have a minimum design life of 75 years, using current AASHTO corrosion rates.
Stress calculations (rupture) shall be done on the calculated earth reinforcement section remaining after 75 years. Pullout calculations may be based on non-corroded section.

PRECAST COPINGS:

Wall supplier is to maximize lengths of precast coping. Precast coping is to be provided in 10' minimum lengths (typical). To optimize coping lengths at radiuses, end of runs or other wall geometric conditions favorable to shorter coping sections, shorter lengths may be used pending approval by the Engineer. This applies only to coping without railing.

JOINT SEALER:

The joints between coping segments must be sealed in accordance with the DMS-6310 "Joint Sealant's and Fillers", joint sealing material, Class 4. The joint must be sealed 3" below and 6" above the adjoining pavement surface, or as directed by the Engineer. The purpose of the joint sealing is to contain surface drainage and prevent infiltration into the retaining wall backfill.

GENERAL NOTES:

Section and elevation shown is for informational purposes only. Specific geometry is to be determined based on wall layouts and other plan information.
The select backfill specified for use within the mechanically stabilized earth volume shall extend horizontally from the back of the panels to a minimum 2' beyond the end of the earth reinforcements. The select backfill shall extend vertically from the top of the leveling pad or 4" below the lowest earth reinforcement, whichever is lower, to the top of panels.
The uppermost earth reinforcements shall be no more than 3.0' below the top of wall.
The lowest level of earth reinforcements shall be no more than 2.0' above the top of the leveling pad.
Minimum wire size for earth reinforcements shall be W7.0. If different longitudinal and cross wires are used in an earth reinforcement mesh, the smaller wire shall have at least 50% of the cross sectional area of the larger wire.
A maximum of four wire mesh configurations (wire sizes) will be allowed on a project. Each mesh configuration shall have a unique transverse bar spacing, differing from other configurations by a minimum of 3". Earth reinforcement lengths shall be stepped in increments no finer than 12".
Standard precast concrete panels shall have a maximum height of 6', and a maximum surface area of 50 sq ft. Top and bottom panels may exceed these limitations as necessary to achieve required wall grades. Maximum height of any panel shall be 7'-6". Minimum panel thickness shall be 5". Panels shall be arranged to provide offset horizontal joints.
An open joint shall be provided around the perimeter of the concrete panels. The joint configuration shall be such that 1) the filter fabric and/or pad materials are not exposed at the wall face and 2) the design opening is between 3/8" and 3/4".
A one-piece corner panel shall be provided for wall angle changes of greater than 30 degrees. Butting of chamfered panels will be allowed for angle changes of 30 degrees or less.
Concrete coping shall be provided along the top of wall, at the vertical steps at bridge backwalls, and at other vertical steps along the top of wall. The joints between all coping segments shall be sealed to prevent infiltration of water into the retaining wall backfill. Sealing shall be in accordance with the DMS-6310 "Joint Sealants and Fillers", using Class 4 joint sealant.
When obstructions (inlets, drilled shafts, piling, etc.) prevent placement of soil reinforcements in their normal locations, provide details and calculations that establish support for the affected panels. Furnish the same earth reinforcement coverage as that required in the absence of the obstruction. For skewed (rotated) earth reinforcements no adjustment in length is needed for skew angles between 1 and 10 degrees. For skew angles greater than 10 degrees adjust the length of earth reinforcement to provide a cosine length of the reinforcement equivalent to the stated design length for the section of wall. Provide calculations that justify any alterations made to the soil reinforcements or modifications to their normal placement. Do not use panels without any soil reinforcements connected to them unless they are connected with galvanized hardware to adjacent panels which do have supporting soil reinforcements attached to them and as approved by the Engineer.
Reinforced concrete must be Class "C", Precast concrete Class "H", Unreinforced concrete Class "A".
All reinforcing steel must be Grade 60.
Coping and anchor slabs are considered subsidiary to the Item "Retaining Wall".
These details are to be used in conjunction with the retaining wall layout, standard RW(MSE)DD and other applicable standards.

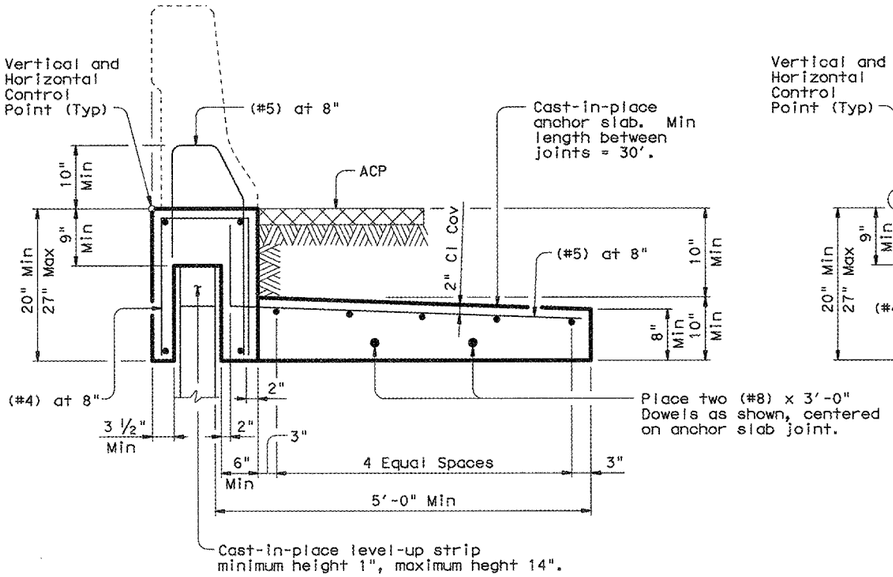
Texas Department of Transportation
Bridge Division

MECHANICALLY STABILIZED EARTH RETAINING WALL

RW(MSE)

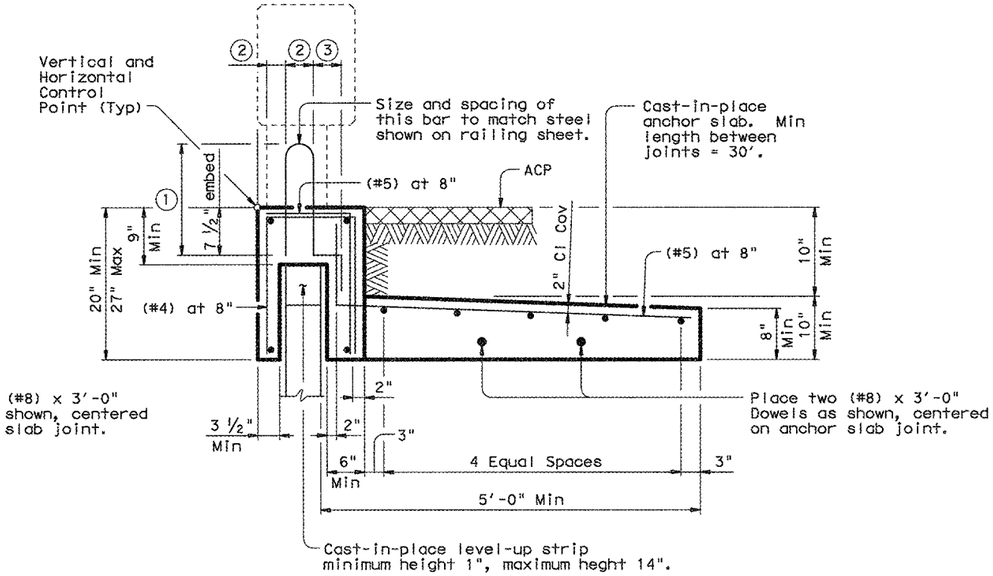
FILE: rwstde01.dgn	DN: TxDOT	CK: TxDOT	DW: JGD	CK: MJG
© TxDOT March 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 04-11: Added Table & Corrosion Criteria. 01-13: Wall embed, (WS) table, retained fill, soil strength.	DAL	STP 2013 (597) MM		137
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

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"WIDE BASED" ADJACENT TO ACP

(Showing T551 Rail, other rails listed similar)



"NARROW BASED" ADJACENT TO ACP

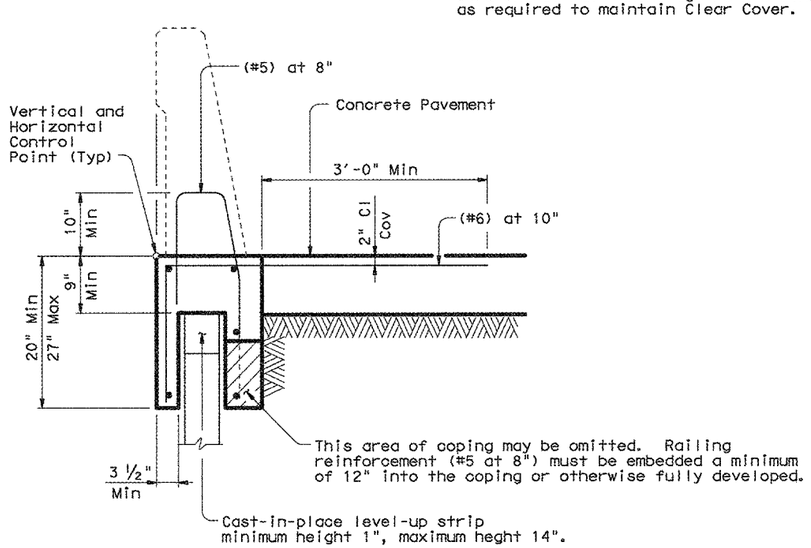
(Showing T223 Rail, other rails listed similar)

Rail Type	Detail	Precasting Rail with Coping Allowed
T1F/T1W/C1W	NARROW	NO
T221/C221	NARROW	YES
T223/C223	NARROW	NO
T401/T402/C402	NARROW	NO
T411/C411	NARROW	NO
T551/T552	WIDE	YES
T66	NARROW	NO
T77	NARROW	NO
SSTR	WIDE	YES
C412	NARROW	NO

① Reinforcement length equal to length shown on the appropriate Rail standard plus 1".

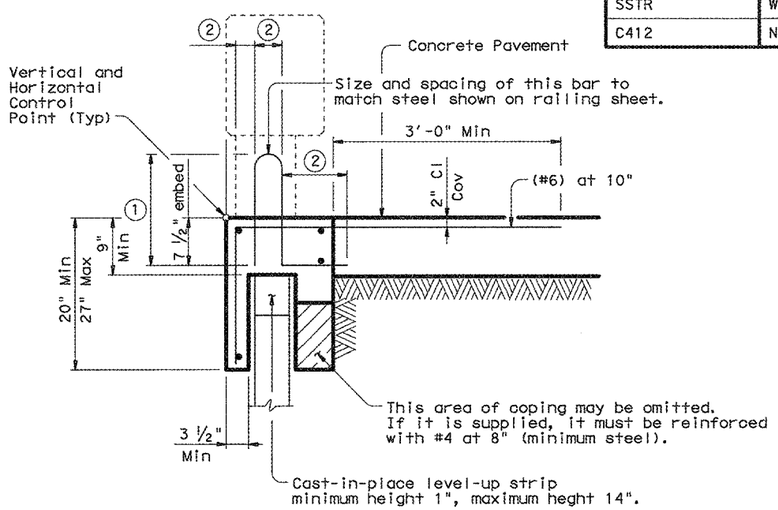
② Match dimension on the appropriate Rail standard.

③ Match dimension on the appropriate Rail standard. Bend end of rail anchorage reinforcing as shown as required to maintain Clear Cover.



"WIDE BASED" ADJACENT TO CONCRETE PAVEMENT

(Showing SSTR Rail, other rails listed similar)



"NARROW BASED" ADJACENT TO CONCRETE PAVEMENT

(Showing T223 Rail, other rails listed similar)

CAST-IN-PLACE COPINGS:

Casting of the coping directly against the precast panel sides will not be permitted, as this may result in panel cracking. The contractor must use a ¼"(Min) compressible material on both sides of the panel to isolate the coping from the precast panel.

When cast-in-place coping is anchored to reinforced concrete pavement, a smooth level-up strip must be provided on the top of the precast panels. The purpose of the level-up is to allow the pavement and coping to move longitudinally relative to the wall without causing damage.

Railing and coping joints must be provided at 33' maximum spacing. Railing and coping joints must be placed to coincide with precast panel joints.

PRECAST COPINGS:

A smooth level-up strip must be provided on top of the precast panels prior to installation of the coping. Shims may be used on top of the level-up strip to facilitate alignment. Total shim thickness not to exceed 1".

Precast coping must be provided in 10' minimum lengths.

JOINTED CONCRETE PAVEMENT:

When coping is adjacent to and anchored into jointed concrete pavement, the coping joints must coincide with the pavement joints.

JOINT SEALER:

The joints between coping segments must be sealed in accordance with the DMS-6310 "Joint Sealant's and Fillers", joint sealing material, Class 4. The joint must be sealed 3" below and 6" above the adjoining pavement surface, or as directed by the Engineer. The purpose of the joint sealing is to contain surface drainage and prevent infiltration into the retaining wall backfill.

GENERAL NOTES:

Details on this sheet are to be used in development of specific details for mounting traffic railing on mechanically stabilized earth (MSE) walls.

The specific details proposed must have strengths equivalent to those shown on this sheet. Areas of particular importance are the connection of the coping to the railing, the strength of the vertical coping leg connecting the railing to the anchor slab, and the connection of the coping to the anchor slab or concrete pavement.

Shop drawings for the traffic railing foundations must be submitted to the Engineer in accordance with the Item "Retaining Wall". The shop drawings must include bar bending details.

Precasting of the coping or coping and railing will be allowed. The anchor slab, when required, must be cast-in-place.

The Contractor's attention is directed to the fact that various configurations of precast coping/railing combinations are covered by patent. The contractor must provide for use of these systems in accordance with Article 7.3.

Concrete must be Class "C".

All reinforcing steel must be Grade 60.

Longitudinal bars must be (#4), unless otherwise shown.

Coping and anchor slabs must be considered subsidiary to the Item "Retaining Wall". The traffic railing will be paid for by the linear foot for the appropriate railing type.

Texas Department of Transportation
Bridge Division

RETAINING WALL TRAFFIC RAILING FOUNDATIONS

RW(TRF)

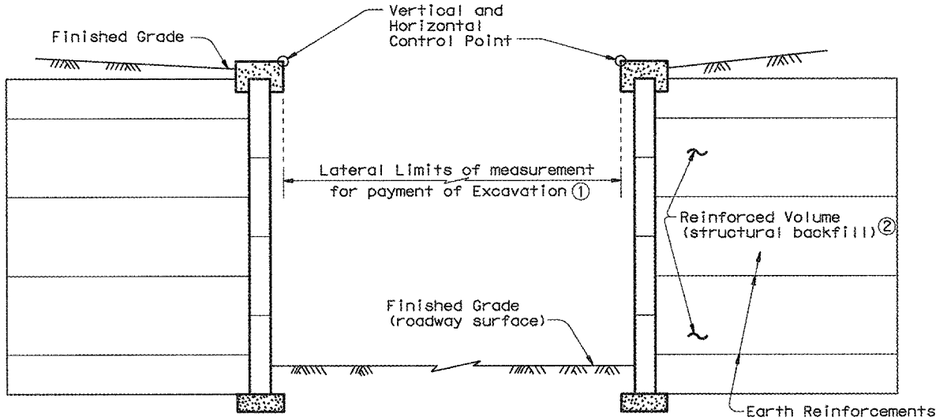
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©TxDOT March 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 01-13: Precast option with Rails.	DAL	STP 2013 (597) MM		138
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

LEVELS DISPLAY PATH:

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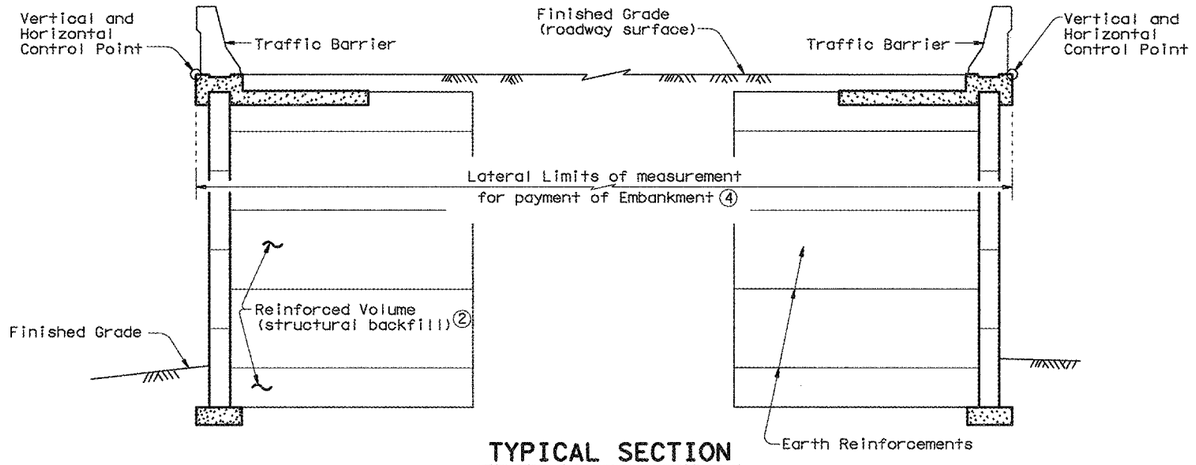
PATH:

LEVELS DISP



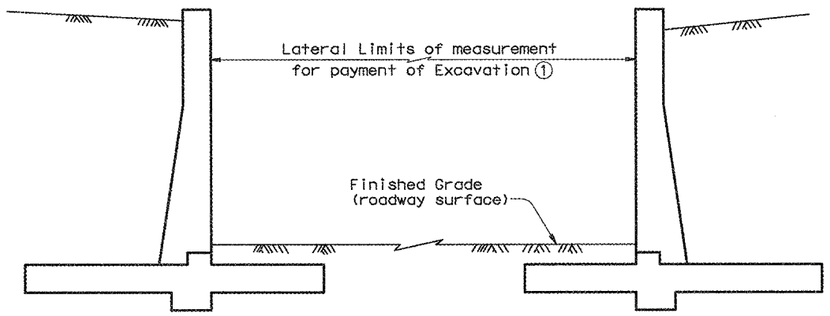
TYPICAL SECTION

Excavation Between MSE Retaining Walls ③



TYPICAL SECTION

Embankment Between MSE Retaining Walls ③



TYPICAL SECTION

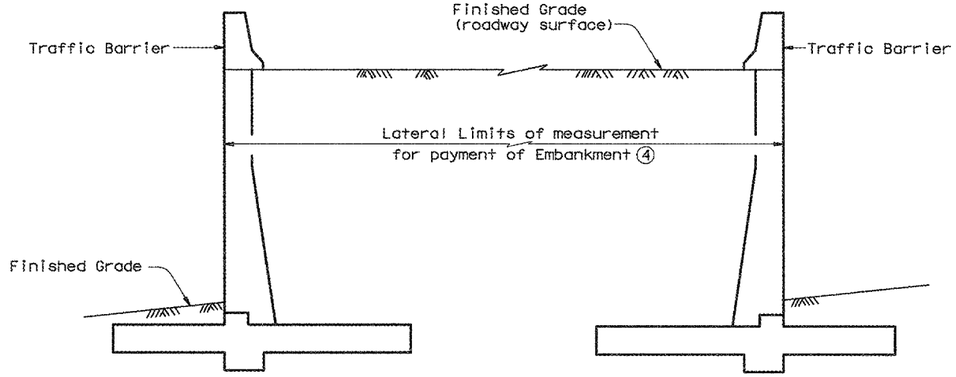
Excavation Between Conventional Retaining Walls

① Only the Excavation above the proposed subgrade elevation will be measured for payment.

② Meeting requirements of Retaining-Wall Item.

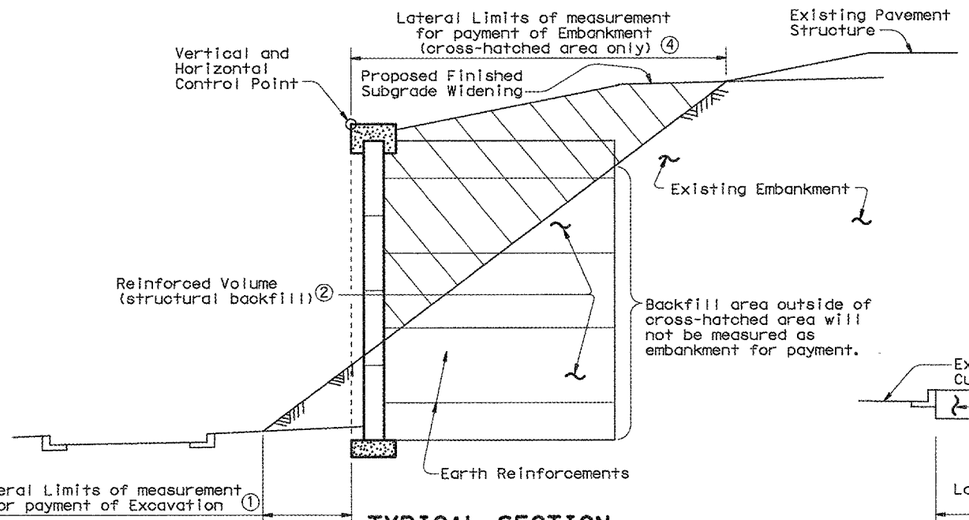
③ Earthwork measurement with other designs of retaining walls will be made to the outside finished face in the same manner.

④ Only the Embankment above the existing ground line will be measured for payment.



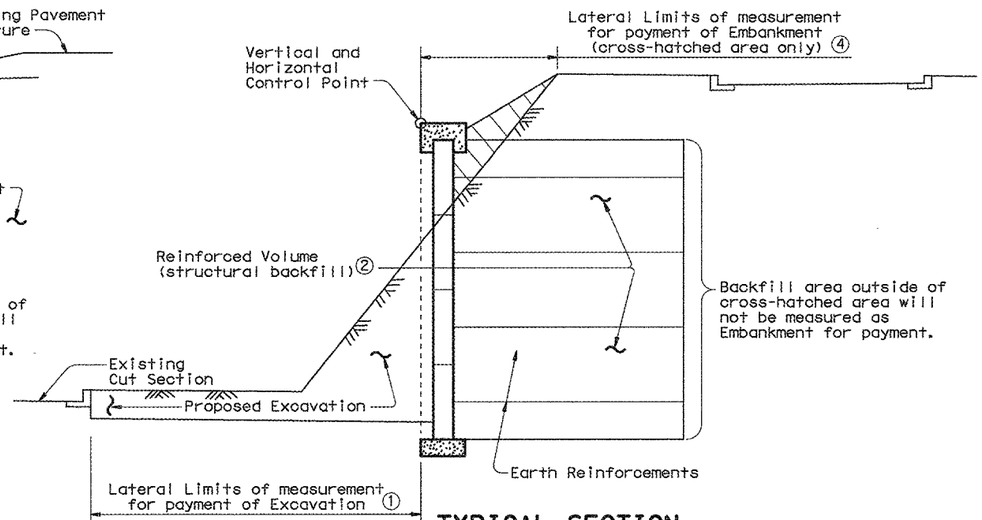
TYPICAL SECTION

Embankment Between Conventional Retaining Walls



TYPICAL SECTION

Widening Embankment with MSE Retaining Walls ③



TYPICAL SECTION

Widening Cut Section with MSE Retaining Walls ③

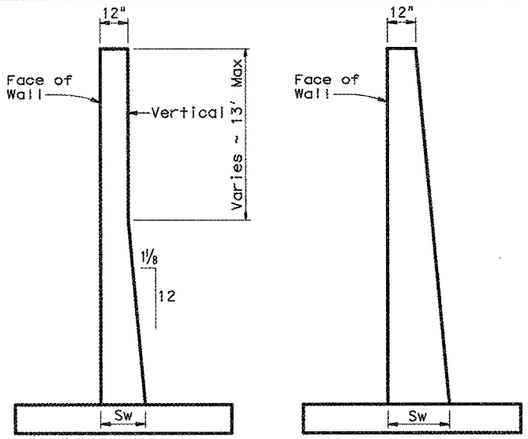
Texas Department of Transportation
Bridge Division

EARTHWORK MEASUREMENT AT RETAINING WALLS

RW(EM)

FILE: rwstde12.dgn	DN: TxDOT	CK: TxDOT	DW: BWH		CK: JMH		
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REVISIONS	DAL	STP 2013 (597) MM				139	
	COUNTY			CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL			3148	01	006	FM 3097

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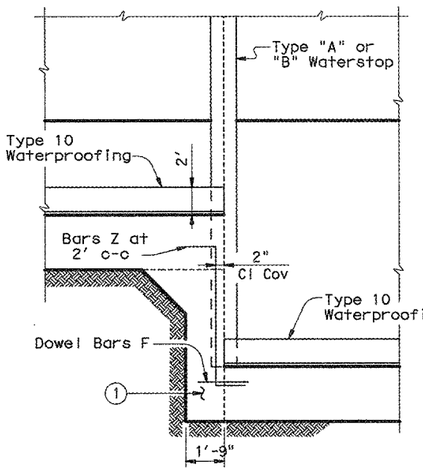


AS DETAILED ALL HEIGHTS
(Basis for payment)

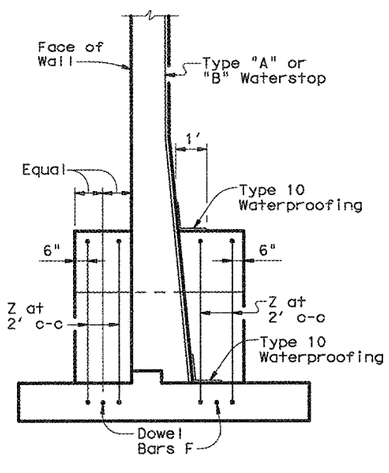
FRONT FACE VERTICAL BACK FACE SLOPED

ALTERNATE STEM SLOPE DETAILS

Walls with slopes other than those shown may be used after approval by the Engineer. Sw shall not be less than shown in Table on Sheet 1. No payment will be made for excess concrete due to changing of slope of wall stem.



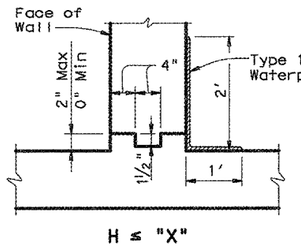
PARTIAL ELEVATION



PARTIAL SECTION

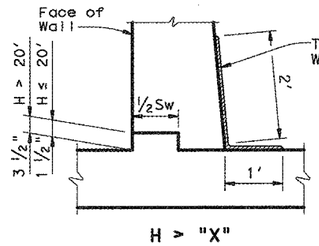
SHOWING WATERSTOP AT FOOTING JOINT

(1) Unreinforced Class "C" Concrete when difference in top of footing elevations is less than 6'. Omit when Dowel Bars F can be placed between adjacent footings with 4" cover top and bottom.



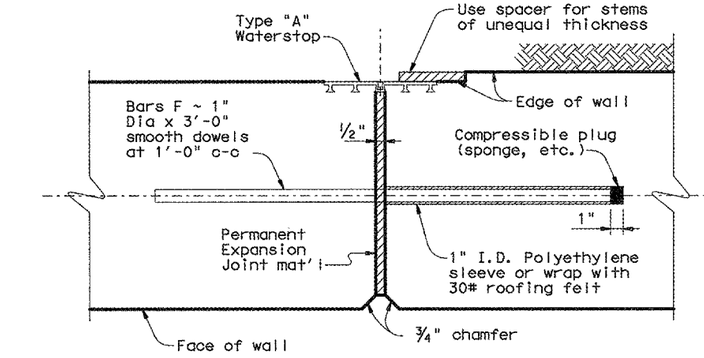
H ≤ "X"

DESIGN	"X"
A	14'
B	12'
C	11'

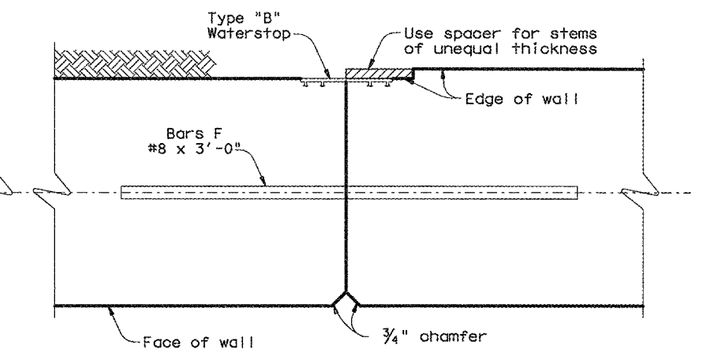


H > "X"

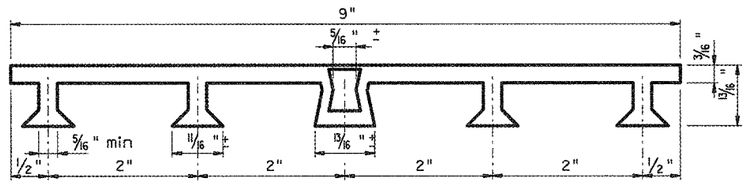
JOINT AND WATERSTOP DETAILS



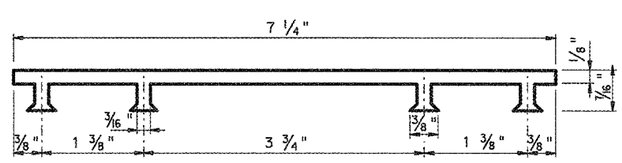
EXPANSION JOINT



CONSTRUCTION JOINT

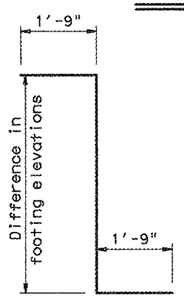


PVC WATERSTOP TYPE "A"



PVC WATERSTOP TYPE "B"

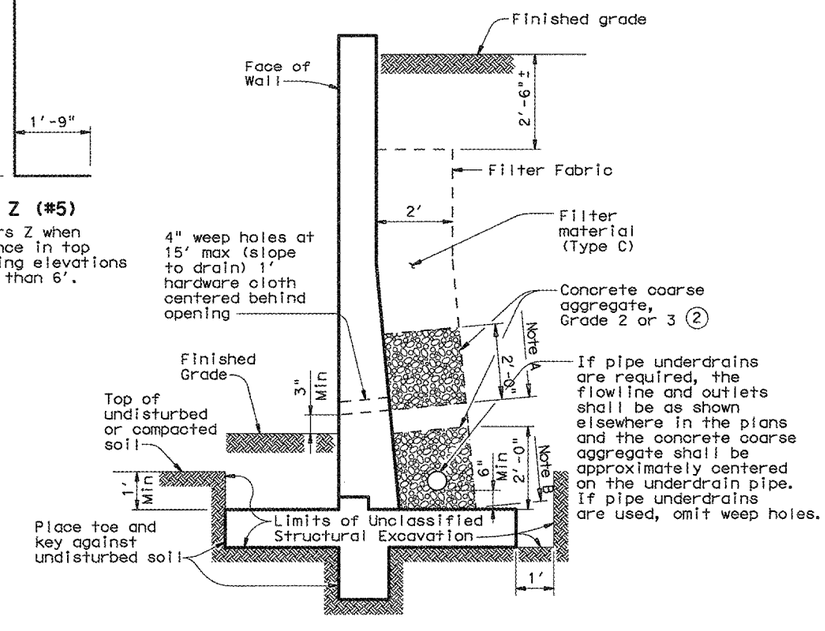
Note: Dimensions and shapes may vary slightly depending on manufacturer.



BARS Z (#5)

Omit Bars Z when difference in top of footing elevations is less than 6'.

(2) Crushed blast furnace slag, recycled crushed hydraulic cement concrete or combination there of may not be used.



DRAINAGE DETAILS AND EXCAVATION DIAGRAM

Note A: Stop coarse aggregate at this level when weep holes are used.

Note B: Use coarse aggregate to here with filter material above when underdrains are used.

GENERAL NOTES:

Walls are designed assuming unit weight of soil = 120 pcf, and coefficient of horizontal earth pressure = 0.33.

Walls are designed to provide a minimum factor of safety against sliding of 1.5. The undisturbed or compacted soil depth in front of walls, from bottom of Key up, shall not be less than Kw + Ft + 1'.

Retaining walls are detailed to be placed on grades up thru 10% with footing level, with no changes in reinforcing steel. Steeper grades can be accommodated by shortening Bars A1 and B and increasing length of legs of Bars U by the same amount. No change in Quantities will be involved

Retaining walls may be placed on Horizontal Curves by adjusting lengths of footing Bars T and H. Minor revisions of Concrete Quantities may be required.

Designed in accordance with current AASHTO Standard and Interim Specifications.

All concrete to be Class "C".

All reinforcing steel to be Grade 60.

Texas Department of Transportation
Bridge Division

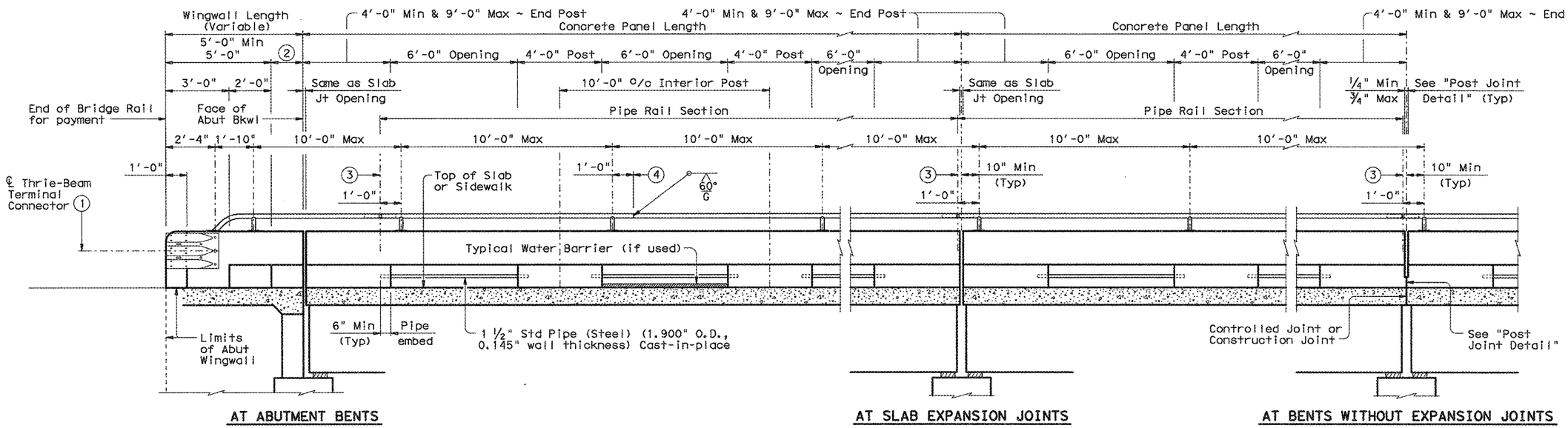
RETAINING WALL MISCELLANEOUS DETAILS

RW 2

FILE: rwstdet1.dgn	DN: TxDOT	CK: TxDOT	DW: JGD		CK: MJG	
©TxDOT March 2010	DISTRICT	FEDERAL AID PROJECT				SHEET
REVISIONS	DAL	STP 2013 (597) MM				140
04-11: Added Note 2.	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		3148	01	006	FM 3097

LEVELS DISPLAY PATH:

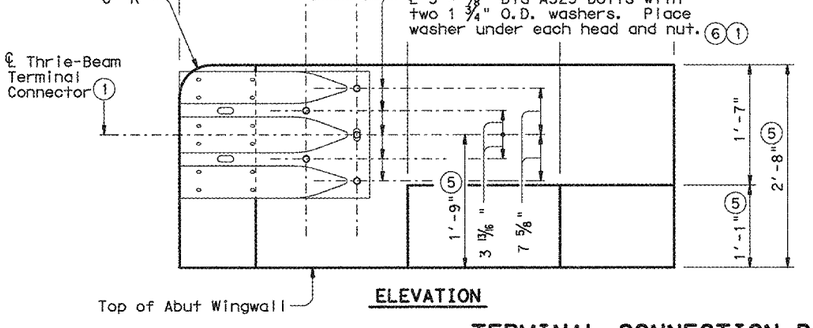
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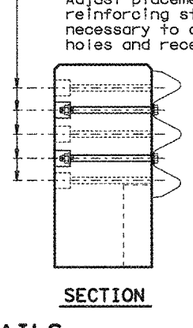
AT ABUTMENT BENTS | AT SLAB EXPANSION JOINTS | AT BENTS WITHOUT EXPANSION JOINTS

ROADWAY ELEVATION OF RAIL

(Showing without raised sidewalk)

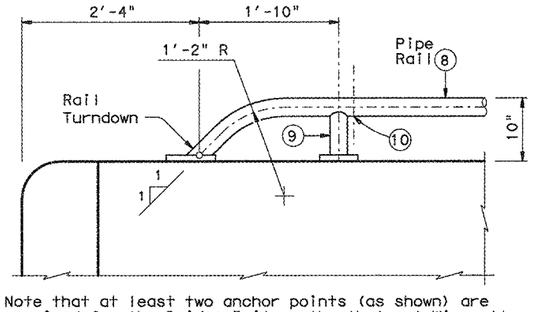


ELEVATION



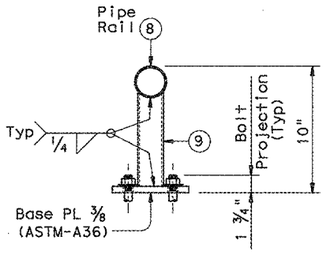
SECTION

TERMINAL CONNECTION DETAILS

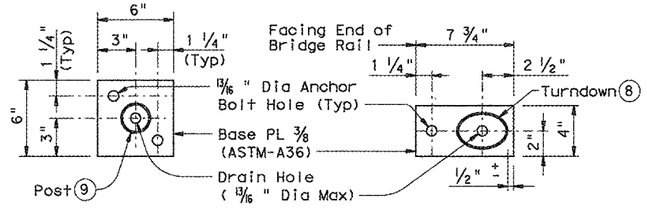


Note that at least two anchor points (as shown) are required for the Bridge Rail on the Abutment Wingwall. Longer Wingwalls may require more than two Rail anchorages.

PIPE RAIL TERMINAL DETAIL



TRANSVERSE SECTION



POST BASE PLATE PLAN | RAIL TURNDOWN BASE PLATE PLAN

PIPE RAIL DETAILS

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Metal Beam Guard Fence Transitions must be attached to the bridge rail and extended along the embankment unless otherwise shown in the plans.

(2) Wingwall Length minus 5'-0" (Varies)

(3) ℄ Splice Jt or Exp Jt

(4) One shop splice per pipe rail section is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.

(5) Increase 2" for structures with overlay.

(6) Bolts must be sufficient length to extend ½" to ¾" beyond nut.

(7) Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail.

(8) 2 ½" Std Pipe (2.875" O.D. 0.203" wall thickness)

(9) 2" Std Pipe (2.375" O.D., 0.154" wall thickness)

(10) ⅜" Dia Hole in bottom of pipe or tube (Minimum 1 hole between posts ~ Typ)

The use of this railing is restricted to design speeds of 45 mph or less.

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Bridge Division

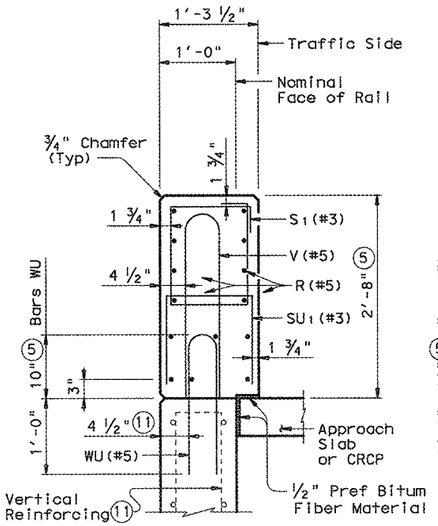
COMBINATION RAIL

TYPE C223

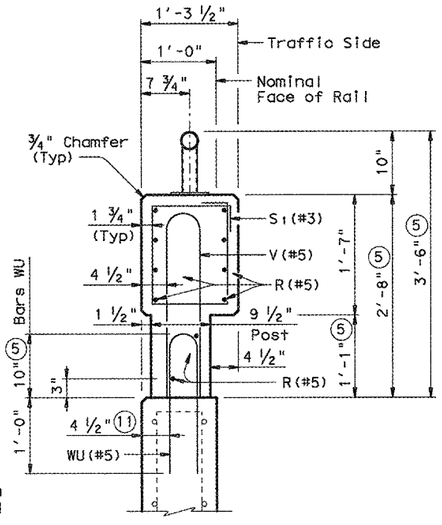
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©TxDOT April 2009	DISTRICT	FEDERAL AID PROJECT				SHEET	
REVISIONS	DAL	STP 2013 (597) MM				141	
05-11: Post Joint Note. 07-12: Guardrail Transition.	COUNTY		CONTROL	SECT	JOB	HIGHWAY	
	ROCKWALL		3148	01	006	FM 3097	

PATH:
LEVELS DISPLAY

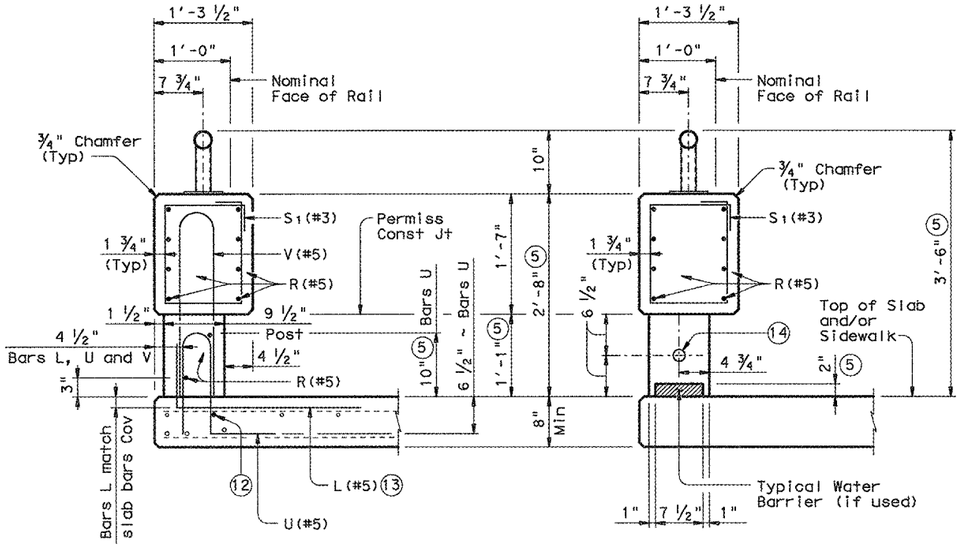
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SECTION A-A
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

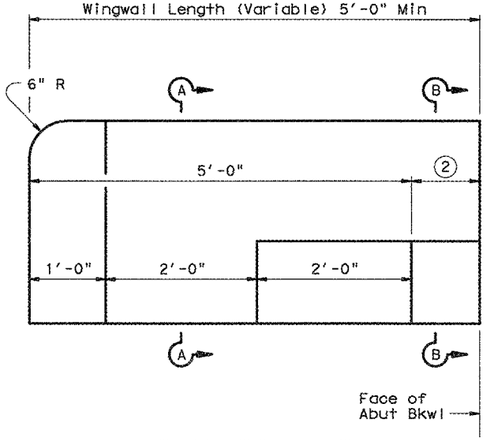


SECTION B-B
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



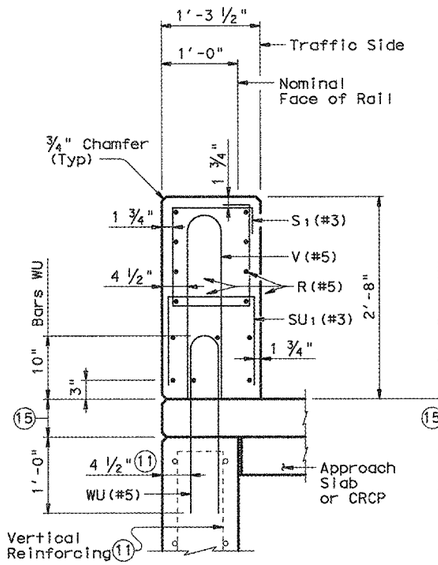
AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

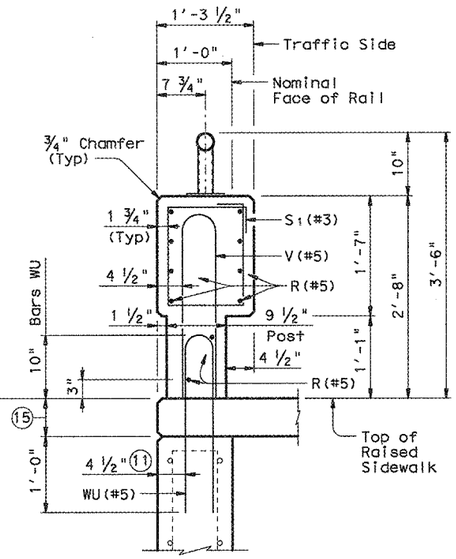


ELEVATION AT
ABUTMENT WINGWALL
(Pipe rail not shown for clarity)

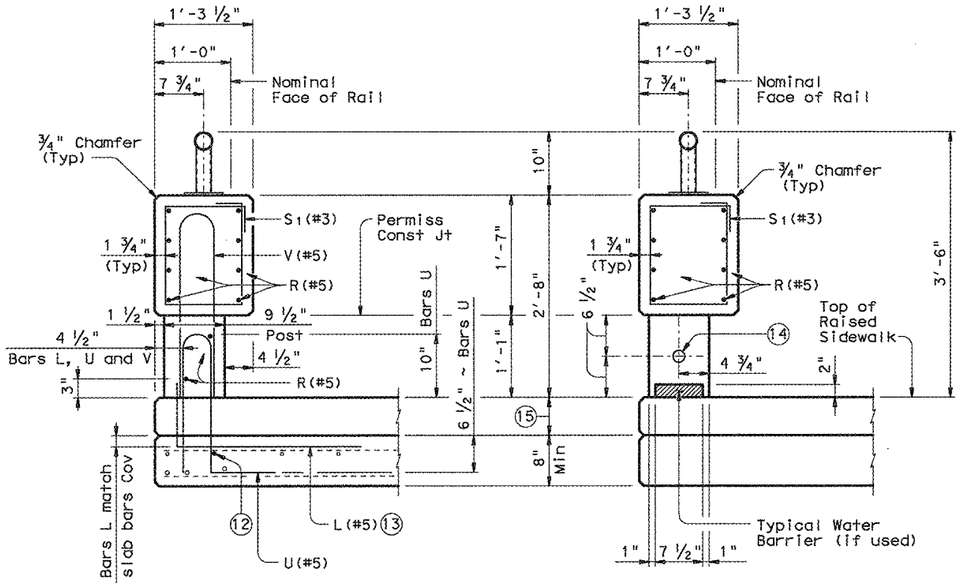
SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK



SECTION A-A
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

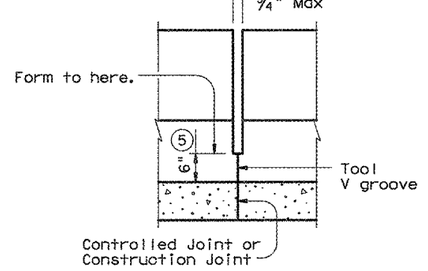


SECTION B-B
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB



POST JOINT DETAIL
(Showing without raised sidewalk)
Provide at all interior bents without slab expansion joints. Location independent of pipe rail splices.

SECTIONS THRU RAIL WITH RAISED SIDEWALK

(2) Wingwall Length minus 5'-0" (Varies)

(5) Increase 2" for structures with overlay.

(11) When vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls on traffic side of wall, move the horizontal wingwall/retaining wall reinforcing to the inside of Bars WU where bars conflict.

(12) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(13) Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

(14) 1 ½" Std Pipe (Steel) (1.900" O.D., 0.145" wall thickness)

(15) Raised Sidewalk.

SHEET 2 OF 3

Texas Department of Transportation
Bridge Division

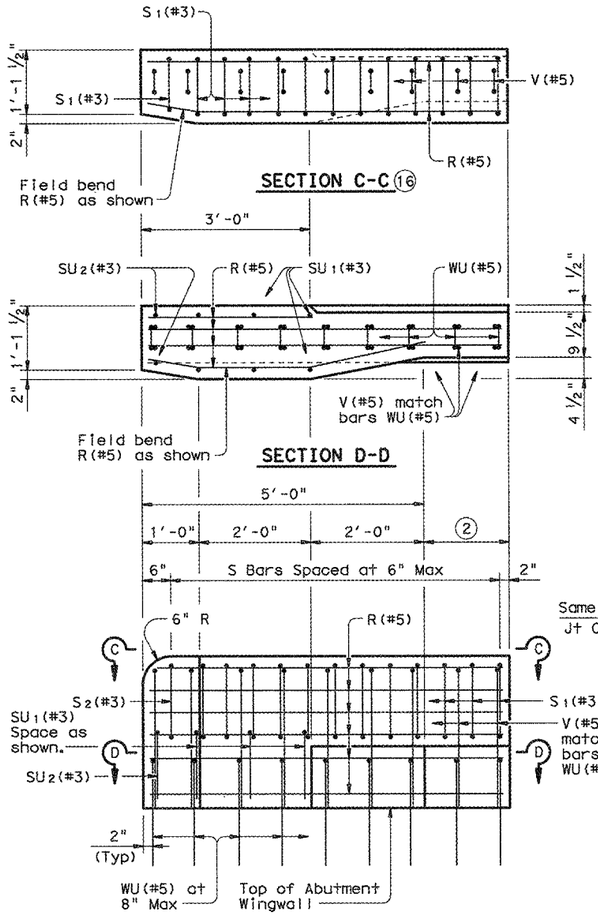
COMBINATION RAIL

TYPE C223

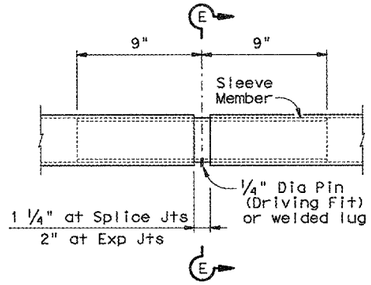
FILE: rlstd019.dgn	DN: TxDOT	CK: TxDOT	DW: JTR		CK: JMH	
©TxDOT April 2009	DISTRICT	FEDERAL AID PROJECT				SHEET
REVISIONS	DAL	STP 2013 (597) MM				142
05-11: Post Joint Note. 07-12: Guardrail Transition.	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		3148	01	006	FM 3097

LEVELS DISPLA... PATH:

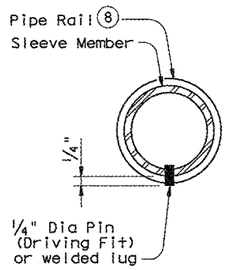
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AT ABUT WINGWALL



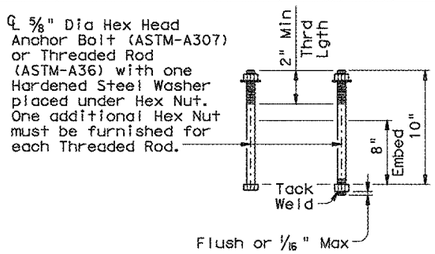
AT SPLICE OR EXP JTS



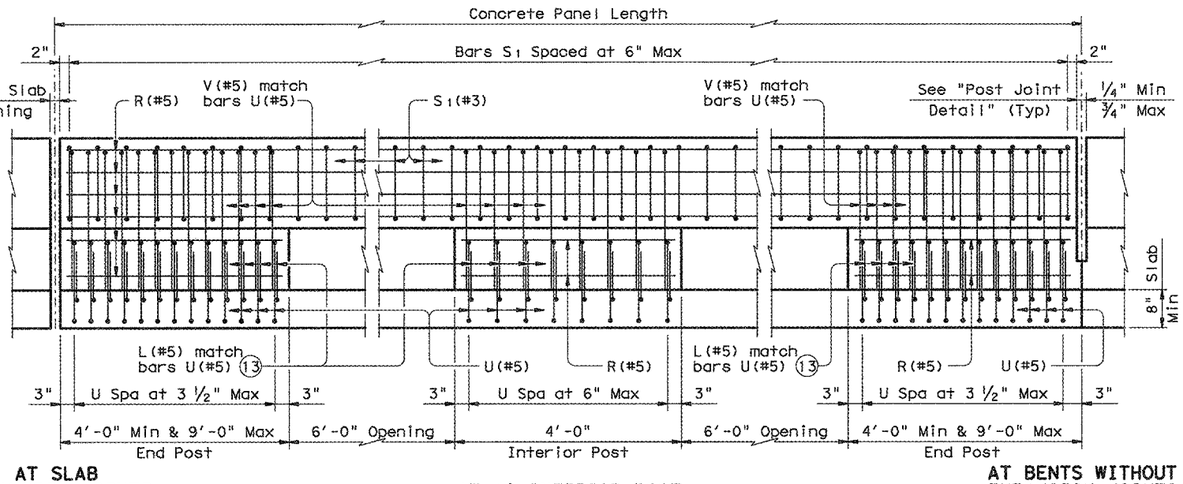
SECTION E-E

The difference between the outside dimension of sleeve and inside dimension of pipe rail must not exceed 0.167" before galvanizing. Minimum wall thickness of sleeve is 0.120".

PIPE SPLICE DETAILS



CAST-IN-PLACE ANCHOR BOLT OPTIONS (17)



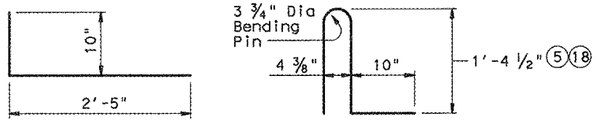
AT SLAB EXPANSION JOINTS

AT 4' INTERIOR POST

AT BENTS WITHOUT EXPANSION JOINTS

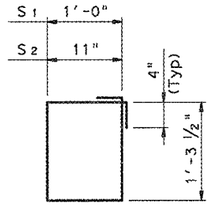
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

(Showing without raised sidewalk. Pipes not shown for clarity)

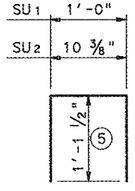


BARS L (#5)

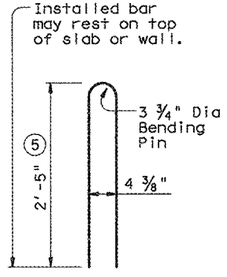
BARS U (#5) (20)



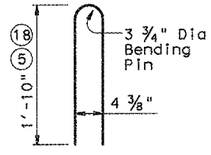
BARS S (#3)



BARS SU (#3)



BARS V (#5) (20)



BARS WU (#5)

(2) Wingwall Length minus 5'-0" (Varies)

(5) Increase 2" for structures with overlay.

(8) 2 1/2" Std Pipe (2.875" O.D. 0.203" wall thickness)

(13) Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

(16) Bars SU1(#3), SU2(#3) and WU(#5) not shown for clarity.

(17) See "Material Notes" for anchor bolt information.

(18) For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.

(19) Shop drawings for approval required for steel pipe rail sections.

(20) At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5" above the roadway/sidewalk surface without overlay.

RAIL DATA FOR HORIZONTAL CURVES

	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
Pipe Rail	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	To required radius (19) or to chords shown (19)
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	To required radius (19)

CONSTRUCTION NOTES:

Face of rail, posts and parapet must be vertical transversely unless otherwise approved by the Engineer. Pipe rail posts and opening end faces must be perpendicular to top of adjacent concrete parapet grade. Use epoxy mortar under pipe rail post base plates if gaps larger than 1/16" exist.

Water barriers must be provided at openings draining onto undercrossing roadways and sidewalks. They may be cast-in-place or precast in convenient lengths and bonded to the bridge deck with an approved epoxy cement.

Pipe rail sections must not include less than two posts, and no more than four (except at Abutments).

Exposed edges of pipe rail and pipe rail posts must be rounded or chamfered to approximately 1/16" by grinding.

At the contractor's option anchor bolts may be cast with the parapet (See Cast-in-Place Anchor Bolt Options).

MATERIAL NOTES:

All steel components except reinforcing must be galvanized unless otherwise shown on plans.

Use Class "C" concrete. Use Class "C" (HPC) if required elsewhere. Chamfer all exposed corners.

Epoxy coat all rail reinforcement if slab bars are epoxy coated.

All reinforcing must be Grade 60.

Anchor bolts must be 5/8" Dia ASTM A36 threaded rods with one hex nut and one hardened steel washer at each bolt. Embed threaded rods into parapet wall with a Type III Class C epoxy anchorage system. Minimum embedment depth is 3". Anchorage system chosen must be able to achieve an ultimate tensile resistance of 8.4 kips per bolt. The Contractor must provide evidence to the Engineer that this can be achieved. Evidence of adequate tensile resistance can be based on the manufacturer's published values of ultimate tensile strength (anchor spacing and edge distance must be accounted for). Anchor installation, including hole size, drilling, and clean-out, must be in accordance with the manufacturer's instructions.

Optional cast-in-place anchor bolts must be 5/8" Dia ASTM A307 Grade A bolts (or A36 threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt.

Pipe for pipe rail must conform to ASTM A53 Grade B or A500 Grade B.

GENERAL NOTES:

This rail has been evaluated and accepted to be of equal strength to railings with like geometry, which have been crash tested to meet NCHRP Report 350 TL-4 criteria. However, its use is limited to design speeds of 45 mph or less due to the presence of the pipe rail.

This railing cannot be used on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Erection drawings showing panel lengths, pipe rail post spacing, and anchor bolt setting must be submitted to the Engineer for approval.

Average weight of railing with no overlay:
370 plf total
358 plf (Conc)
12 plf (Steel)

Texas Department of Transportation
Bridge Division

COMBINATION RAIL

TYPE C223

FILE: rlstd019.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH	
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REVISIONS	DAL	STP 2013 (597) MM			143
06-11: Post Joint Note. 07-12: Guardrail Transition.	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		3148	01	006	FM 3097

PATH:
LEVELS DISPLA

RUNOFF COMPUTATIONS

DRAINAGE AREA NO.	AREA (AC)	AREA C RUNOFF COEFF.				COMPOSITE C RUNOFF COEFF.	Tc (MIN)	INTENSITY (IN/HR)			FLOW (CFS)		
		Grass	Resid.	Com.	Pvmt.			10-YR	25-YR	100-YR	10-YR	25-YR	100-YR
		0.35	0.50	0.90	0.90								
A-1	0.83	0.09	0.00	0.00	0.74	0.84	10.0	7.47	9.02	11.41	5.20	6.29	7.96
A-2	0.69	0.26	0.00	0.00	0.43	0.69	10.0	7.47	9.02	11.41	3.56	4.29	5.43
A-2A	0.48	0.14	0.00	0.00	0.34	0.74	10.0	7.47	9.02	11.41	2.65	3.20	4.05
A-2B	0.33	0.06	0.00	0.00	0.27	0.82	10.0	7.47	9.02	11.41	2.02	2.44	3.09
A-2C	0.32	0.05	0.00	0.00	0.27	0.81	10.0	7.47	9.02	11.41	1.92	2.34	2.96
A-3	0.25	0.07	0.00	0.00	0.18	0.74	10.0	7.47	9.02	11.41	1.35	1.67	2.11
A-4	0.80	0.13	0.27	0.00	0.40	0.68	10.0	7.47	9.02	11.41	4.06	4.91	6.21
A-5	0.89	0.00	0.58	0.00	0.31	0.64	10.0	7.47	9.02	11.41	4.25	5.14	6.50
A-5A	0.76	0.00	0.53	0.00	0.23	0.62	10.0	7.47	9.02	11.41	3.50	4.25	5.38
A-6	0.99	0.00	0.53	0.00	0.46	0.68	10.0	7.47	9.02	11.41	5.03	6.07	7.68
A-7	0.70	0.00	0.42	0.00	0.28	0.66	10.0	7.47	9.02	11.41	3.48	4.17	5.27
A-7A	0.83	0.00	0.48	0.00	0.35	0.67	10.0	7.47	9.02	11.41	4.17	5.02	6.35
A-8	0.72	0.00	0.45	0.00	0.27	0.65	10.0	7.47	9.02	11.41	3.51	4.22	5.34
A-8A	0.43	0.00	0.00	0.00	0.43	0.90	10.0	7.47	9.02	11.41	2.87	3.49	4.42
A-9	0.42	0.00	0.00	0.00	0.42	0.90	10.0	7.47	9.02	11.41	2.82	3.41	4.31

RUNOFF COMPUTATIONS

DRAINAGE AREA NO.	AREA (AC)	AREA C RUNOFF COEFF.				COMPOSITE C RUNOFF COEFF.	Tc (MIN)	INTENSITY (IN/HR)			FLOW (CFS)		
		Grass	Resid.	Com.	Pvmt.			10-YR	25-YR	100-YR	10-YR	25-YR	100-YR
		0.35	0.50	0.90	0.90								
B-0	0.32	0.12	0.00	0.00	0.20	0.70	10.0	7.47	9.02	11.41	1.68	2.02	2.56
B-1	0.51	0.07	0.00	0.00	0.44	0.82	10.0	7.47	9.02	11.41	3.13	3.77	4.77
B-1A	0.79	0.41	0.00	0.00	0.38	0.61	10.0	7.47	9.02	11.41	3.64	4.35	5.50
B-2	0.84	0.19	0.00	0.00	0.65	0.77	10.0	7.47	9.02	11.41	4.83	5.83	7.38
B-3	0.91	0.32	0.00	0.00	0.59	0.73	10.0	7.47	9.02	11.41	4.96	5.99	7.58
B-4	0.54	0.04	0.00	0.03	0.47	0.86	10.0	7.47	9.02	11.41	3.49	4.19	5.30
B-4A	0.48	0.00	0.00	0.11	0.37	0.90	10.0	7.47	9.02	11.41	3.23	3.90	4.93
B-5	0.45	0.04	0.00	0.03	0.38	0.90	10.0	7.47	9.02	11.41	3.02	3.65	4.62
B-5A	0.45	0.00	0.00	0.00	0.45	0.90	10.0	7.47	9.02	11.41	3.02	3.65	4.62
B-6	0.49	0.00	0.00	0.00	0.49	0.90	10.0	7.47	9.02	11.41	3.30	3.98	5.03
B-6A	0.50	0.00	0.00	0.14	0.36	0.90	10.0	7.47	9.02	11.41	3.35	4.04	5.11
B-7	0.39	0.00	0.00	0.00	0.39	0.90	10.0	7.47	9.02	11.41	2.62	3.17	4.00
C-1	0.27	0.00	0.00	0.00	0.27	0.90	10.0	7.47	9.02	11.41	1.75	2.11	2.67
DW07	0.26	0.26	0.00	0.00	0.00	0.35	10.0	7.47	9.02	11.41	0.68	0.82	1.04
DE09	2.03	0.00	1.85	0.00	0.18	0.54	10.0	7.47	9.02	11.41	8.12	9.80	12.40

INLET COMPUTATIONS

INLET	LOCATION	RUNOFF COMPUTATIONS					CARRY OVER IN (cfs)	TOTAL Qa (cfs)	Z	Z/N N=0.015	S (ft/ft)	Y (ft)	POND WIDTH Y x Z (ft)	POND WIDTH ALLOW (ft)	A (ft)	QL (cfs)	CURB INLET DESIGN						CARRY OVER OUT (cfs)	CARRY OVER DESIRABLE (cfs)	REMARKS
		DA NO	Tc used (min)	FREQ (yr)	I (in/hr)	Qa (cfs)											Lreq = Qa/QL (ft)	L (ft)	L/ Lreq	A/Y	Q/Qa	Q (cfs)			
A-1	STA 5+65.00, 49' LT	A-1	10.0	10	7.47	5.20	0.00	5.20	50.00	3333	0.0080	0.27	13.64	26.00	0.25	0.28	18.86	15	0.80	0.93	0.95	4.92	0.28	0.50	C.O. to A-2
A-2	STA 8+85.00, 38' LT	A-2	10.0	10	7.47	3.56	0.28	3.81	50.00	3333	0.0080	0.24	12.14	14.00	0.25	0.24	15.95	15	0.94	1.04	1.06	3.76	0.05	0.50	C.O. to A-2A
A-2A	STA 11+75.00, 38' LT	A-2A	10.0	10	7.47	2.65	0.05	2.69	50.00	3333	0.0079	0.21	10.69	14.00	0.25	0.20	13.15	15	1.14	1.19	1.01	2.69	0.00	0.50	C.O. to A-2B
A-2B	STA 14+45.00, 49' LT	A-2B	10.0	10	7.47	2.02	0.00	1.98	50.00	3333	0.0080	0.18	10.23	26.00	0.25	0.16	12.53	15	1.20	1.39	0.98	1.98	0.00	0.50	C.O. to A-2C
A-2C	STA 15+85.00, 49' LT	A-2C	10.0	10	7.47	1.92	0.00	1.92	50.00	3333	0.0100	0.18	9.00	26.00	0.25	0.16	11.64	10	0.86	1.39	0.96	1.85	0.07	0.50	C.O. to A-3
A-3	STA 17+15.00, 38' LT	A-3	10.0	10	7.47	1.35	0.07	1.43	100.00	6667	0.0189	0.10	12.54	14.00	0.25	0.09	15.62	15	0.96	2.50	1.04	1.41	0.02	0.50	C.O. to B-4
A-4	STA 20+50.00, 38' LT	A-4	10.0	10	7.47	4.06	0.00	4.03	50.00	3333	0.0243	0.20	10.17	14.00	0.25	0.19	21.61	15	0.69	1.25	0.91	3.68	0.35	0.50	C.O. to A-5
A-5	STA 23+23.44, 38' LT	A-5	10.0	10	7.47	4.25	0.35	4.60	50.00	3333	0.0225	0.21	10.73	14.00	0.25	0.20	22.63	15	0.66	1.19	0.97	4.12	0.48	0.50	C.O. to A-5A
A-5A	STA 25+65.00, 38' LT	A-5A	10.0	10	7.47	3.50	0.48	3.98	50.00	3333	0.0174	0.21	10.67	14.00	0.25	0.20	19.67	15	0.76	1.19	1.07	3.75	0.24	0.50	C.O. to A-6
A-6	STA 29+50.00, 38' LT	A-6	10.0	10	7.47	5.03	0.24	5.27	50.00	3333	0.0130	0.25	12.51	14.00	0.25	0.25	21.33	15	0.70	1.00	0.95	4.79	0.48	0.50	C.O. to A-7
A-7	STA 32+00.00, 38' LT	A-7	10.0	10	7.47	3.48	0.48	3.96	50.00	3333	0.0130	0.22	11.24	14.00	0.25	0.22	18.29	15	0.82	1.14	1.09	3.80	0.16	0.50	C.O. to A-8
A-7A	STA 34+55.00, 38' LT	A-7A	10.0	10	7.47	4.17	0.00	4.17	50.00	3333	0.0130	0.23	11.47	14.00	0.25	0.22	18.82	15	0.80	1.09	0.95	3.97	0.20	0.50	C.O. to A-8
A-8	STA 36+50.00, 38' LT	A-8	10.0	10	7.47	3.51	0.37	3.88	50.00	3333	0.0130	0.22	11.15	14.00	0.25	0.21	18.08	15	0.83	1.14	1.06	3.73	0.15	0.50	C.O. to A-8A
A-8A	STA 38+75.00, 38' LT	A-8A	10.0	10	7.47	2.87	0.15	3.02	50.00	3333	0.0130	0.20	10.16	14.00	0.25	0.19	15.81	15	0.95	1.25	1.04	2.99	0.03	0.50	C.O. to A-9
A-9	STA 40+45.00, 38' LT	A-9	10.0	10	7.47	2.82	0.12	2.94	50.00	3333	n/a	0.41	20.40	22.00	0.25		n/a	15		0.61	7.11	20.09	n/a	n/a	SAG
B-0	STA 2+00.00, 38' RT	B-0	10.0	10	7.47	1.68	0.00	1.68	50.00	3333	0.0145	0.16	7.99	22.00	0.25	0.08	20.84	10	0.48	1.56	0.96	1.61	0.06	0.50	C.O. to B-1
B-1	STA 3+50.00, 38' RT	B-1	10.0	10	7.47	3.13	0.06	3.19	50.00	3333	0.0145	0.20	10.16	14.00	0.25	0.15	20.84	15	0.72	1.25	1.00	3.13	0.06	0.50	C.O. to B-1A
B-1A	STA 6+70.00, 38' RT	B-1A	10.0	10	7.47	3.64	0.06	3.70	50.00	3333	0.0080	0.24	12.01	14.00	0.25	0.20	18.11	15	0.83	1.04	1.01	3.66	0.04	0.50	C.O. to B-2
B-2	STA 11+75.00, 49' RT	B-2	10.0	10	7.47	4.83	0.04	4.87	100.00	6667	0.0072	0.21	20.21	26.00	0.25	0.21	23.35	15	0.64	1.19	0.87	4.18	0.68	0.50	C.O. to B-3
B-3	STA 17+55.00, 38' RT	B-3	10.0	10	7.47	4.96	0.68	5.67	50.00	3333	0.0198	0.24	11.88	14.00	0.25	0.22	26.27	15	0.57	1.04	0.98	4.88	0.79	1.00	C.O. to B-4
B-4	STA 20+80.00, 38' RT	B-4	10.0	10	7.47	3.49	1.07	4.56	50.00	3333	0.0225	0.21	10.70	14.00	0.25	0.20	22.60	15	0.66	1.19	1.17	4.10	0.47	0.50	C.O. to B-4A
B-4A	STA 24+50.00, 38' RT	B-4A	10.0	10	7.47	3.23	0.47	3.72	50.00	3333	0.0225	0.20	9.91	14.00	0.25	0.18	20.51	15	0.73	1.25	1.08	3.48	0.24	0.50	C.O. to B-5
B-5	STA 28+00.00, 49' RT	B-5	10.0	10	7.47	3.02	0.24	3.25	50.00	3333	0.0130	0.21	10.45	26.00	0.25	0.20	16.53	15	0.91	1.19	1.06	3.20	0.05	0.50	C.O. to B-5A
B-5A	STA 32+50.00, 38' RT	B-5A	10.0	10	7.47	3.02	0.05	3.07	50.00	3333	0.0130	0.20	10.22	14.00	0.25	0.19	15.96	15	0.94	1.25	1.01	3.04	0.03	0.50	C.O. to B-6
B-6	STA 36+50.00, 49' RT	B-6	10.0	10	7.47	3.30	0.03	3.34	50.00	3333	0.0130	0.21	10.55	26.00	0.25	0.20	16.68	15	0.90	1.19	0.99	3.27	0.06	0.50	C.O. to B-6A
B-6A	STA 38+75.00, 38' RT	B-6A	10.0	10	7.47	3.35	0.06	3.41	50.00	3333	0.0130	0.21	10.63	14.00	0.25	0.19	17.95	15	0.84	1.19	1.00	3.34	0.07	0.50	C.O. to B-7
B-7	STA 40+45.00, 38' RT	B-7	10.0	10	7.47	2.62	0.07	2.72	50.00	3333	n/a	0.39	19.39	22.00	0.25		n/a	15		0.64	7.66	20.09	n/a	n/a	SAG
C-1	STA 42+30.00, 38' LT	C-1	10.0	10	7.47	1.75	0.00	1.80	50.00	3333	0.0145	0.16	8.20	14.00	0.25	0.10	17.95	10	0.56	1.56	0.98	1.71	0.09	0.50	C.O. to A-9

STORM DRAIN COMPUTATIONS

LINE	FROM	TO	DRAINAGE AREA NUMBERS	TOTAL DRAINAGE AREA (ac)	TOTAL CA	HYDRAULIC LENGTH (ft)	Tc ALONG STORM LINE (min)	FREQ (yr)	INTENSITY (in/hr)	Q (cfs)	DESIGN					REMARKS
											PIPE SLOPE (%)	DIA. (in)	HG (%)	CAP. (cfs)	V (ft/s)	
A	A-1	BEND-A11	A-1	0.83	0.70	7.50	10.00	10	7.47	5.20	3.00	24	9.60	45.66	6.53	
	BEND-A11	BEND-A12	A-1	0.83	0.70	5.47	10.01	10	7.47	5.20	0.55	24	1.28	19.86	3.59	
	BEND-A12	A-2	A-1	0.83	0.70	315.84	10.03	10	7.47	5.20	0.75	24	0.83	22.83	5.58	
	A-2	A-2A	A-1, A-2	1.52	1.17	290.00	10.97	10	7.19	8.41	0.74	24	0.82	22.69	6.32	
	A-2A	WYE-2B1	A-1, A-2, A-2A	1.99	1.51	273.50	11.74	10	6.97	10.62	1.99	24	2.16	37.21	9.68	
	A-2B	BEND-2B1	A-2B	0.37	0.30	7.50	10.00	10	7.47	2.25	6.50	24	0.00	67.49	0.91	
	BEND-2B1	WYE-2B1	A-2B	0.37	0.30	4.95	10.01	10	7.47	2.25	1.21	24	0.20	29.53	0.87	
	WYE-2B1	WYE-2C1	A-1, A-2, A-2A, A-2B	2.36	1.82	140.00	12.21	10	6.84	12.47	2.00	24	2.51	37.28	10.00	
	A-2C	BEND-2C1	A-2C	0.32	0.26	7.50	10.00	10	7.47	1.92	5.33	24	9.20	60.88	6.34	
	BEND-2C1	WYE-2C1	A-2C	0.32	0.26	4.95	10.01	10	7.47	1.92	0.61	24	0.81	18.64	2.48	
	WYE-2C1	A-3	A-1, A-2, A-2A, A-2B, A-2C	2.68	2.09	126.50	12.44	10	6.77	14.09	2.00	24	2.54	37.28	10.26	
	A-3	A-4	A-1, A-2, A-2A, A-2B, A-2C, A-3	2.93	2.26	335.00	12.64	10	6.71	15.19	1.54	24	1.67	32.74	9.68	
	A-4	A-5	A-1, A-2, A-2A, A-2B, A-2C, A-3, A-4	3.72	2.79	273.44	13.22	10	6.55	18.35	2.21	24	2.44	39.23	11.60	
	A-5	A-5A	A-1, A-2, A-2A, A-2B, A-2C, A-3, A-4, A-5	4.61	3.37	241.56	13.61	10	6.44	21.70	2.23	24	2.48	39.34	12.07	
	A-5A	A-6	A-1, A-2, A-2A, A-2B, A-2C, A-3, A-4, A-5, A-5A	5.37	3.87	385.00	13.94	10	6.34	24.36	1.41	24	1.51	31.27	10.35	
	A-6	A-7	A-1, A-2, A-2A, A-2B, A-2C, A-3, A-4, A-5, A-5A, A-6	6.35	4.51	250.00	14.56	10	6.17	27.83	1.64	24	1.82	33.73	11.24	
	A-7	A-7A	A-1, A-2, A-2A, A-2B, A-2C, A-3, A-4, A-5, A-5A, A-6, A-7	7.06	5.01	255.00	14.93	10	6.06	30.17	0.93	30	1.07	46.15	9.44	
	A-7A	A-8	A-1, A-2, A-2A, A-2B, A-2C, A-3, A-4, A-5, A-5A, A-6, A-7, A-7A	7.89	5.52	195.00	15.38	10	5.99	33.19	1.34	30	1.61	55.27	10.99	
	A-8	A-8A	A-1, A-2, A-2A, A-2B, A-2C, A-3, A-4, A-5, A-5A, A-6, A-7, A-7A, A-8	8.61	6.03	225.00	15.67	10	5.96	35.79	1.33	30	1.56	55.09	11.19	
	A-8A	A-9	A-1, A-2, A-2A, A-2B, A-2C, A-3, A-4, A-5, A-5A, A-6, A-7, A-7A, A-8, A-8A	9.04	6.42	170.00	16.01	10	5.92	37.82	0.86	36	0.28	72.13	5.35	
	A-9	OUTFALL-A	A-1, A-2, A-2A, A-2B, A-2C, A-3, A-4, A-5, A-5A, A-6, A-7, A-7A, A-8, A-8A, A-9	9.50	6.84	109.80	16.30	10	5.88	40.05	0.50	36	0.31	54.98	5.67	
B	B-0	B-1	B-0	0.30	0.20	149.52	10.00	10	7.47	1.53	2.27	24	2.42	39.72	5.78	
	B-1	B-1A	B-0, B-1	1.13	0.85	320.47	10.43	10	7.35	6.23	0.94	24	1.03	25.63	6.38	
	B-1A	MH-B2	B-0, B-1, B-1A	1.92	1.32	505.00	11.27	10	7.11	9.49	0.81	24	0.86	23.70	6.76	
	B-2	MH-B2	B-2	0.84	0.65	11.00	10.00	10	7.47	4.83	2.93	24	0.36	44.61	1.54	
	MH-B2	B-3	B-0, B-1, B-1A, B-2	2.76	1.99	580.00	12.51	10	6.75	13.38	1.56	24	1.73	32.95	9.43	
	B-3	B-4	B-0, B-1, B-1A, B-2, B-3	3.80	2.74	325.00	13.54	10	6.46	17.71	2.22	24	2.41	39.25	11.52	
	B-4	B-4A	B-0, B-1, B-1A, B-2, B-3, B-4	4.34	3.21	370.00	14.01	10	6.32	20.29	2.34	24	2.51	40.34	12.16	
	B-4A	MH-B5	B-0, B-1, B-1A, B-2, B-3, B-4, B-4A	4.82	3.66	350.00	14.51	10	6.18	22.52	1.69	24	1.83	34.23	10.97	
	B-5	MH-B5	B-5	0.45	0.41	11.00	10.00	10	7.47	3.02	3.14	24	0.18	47.03	0.96	
	MH-B5	B-5A	B-0, B-1, B-1A, B-2, B-3, B-4, B-4A, B-5	5.27	4.06	450.00	15.04	10	6.03	24.43	1.10	24	1.22	27.68	9.32	
	B-5A	WYE-B6	B-0, B-1, B-1A, B-2, B-3, B-4, B-4A, B-5, B-5A	5.72	4.46	403.50	15.85	10	5.94	26.43	1.42	30	1.55	56.95	10.77	
	B-6	BEND-B6	B-6	0.49	0.44	7.50	10.00	10	7.47	3.30	0.50	24	0.13	18.64	1.05	
	BEND-B6	WYE-B6	B-6	0.49	0.44	4.95	10.03	10	7.47	3.30	0.40	24	0.20	18.64	1.23	
	WYE-B6	B-6A	B-0, B-1, B-1A, B-2, B-3, B-4, B-4A, B-5, B-5A, B-6	6.21	4.91	221.50	16.47	10	5.86	28.68	1.29	30	1.61	54.34	10.54	
	B-6A	B-7	B-0, B-1, B-1A, B-2, B-3, B-4, B-4A, B-5, B-5A, B-6, B-6A	6.77	5.42	170.00	16.82	10	5.82	31.40	0.79	30	0.50	42.44	6.40	
	B-7	OUTFALL-B	B-0, B-1, B-1A, B-2, B-3, B-4, B-4A, B-5, B-5A, B-6, B-6A, B-7	7.17	5.74	109.80	17.14	10	5.78	33.24	0.50	36	0.56	33.80	6.77	
C	C-1	OUTFALL-C	C-1	0.27	0.24	40.83	10.00	10	7.47	1.80	4.80	24	0.02	53.32	0.57	

NOTES:

1. DRAINAGE SYSTEMS ARE DESIGNED IN ACCORDANCE WITH TXDOT HYDRAULIC DESIGN MANUAL, OCT. 2011. RATIONAL METHOD C VALUES ALSO COMPLY WITH THE CITY OF ROCKWALL STANDARDS OF DESIGN AND CONSTRUCTION, AUG. 2003, TABLE 3.1.
2. RAINFALL INTENSITIES FOR TC ARE EXTRAPOLATED USING 15 MIN AND 30 MIN STORM DURATION FIGURES FROM USGS ATLAS OF DEPTH-DURATION FREQUENCY OF PRECIPITATION ANNUAL MAXIMA FOR TEXAS, 2004.

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
5/6/2014

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

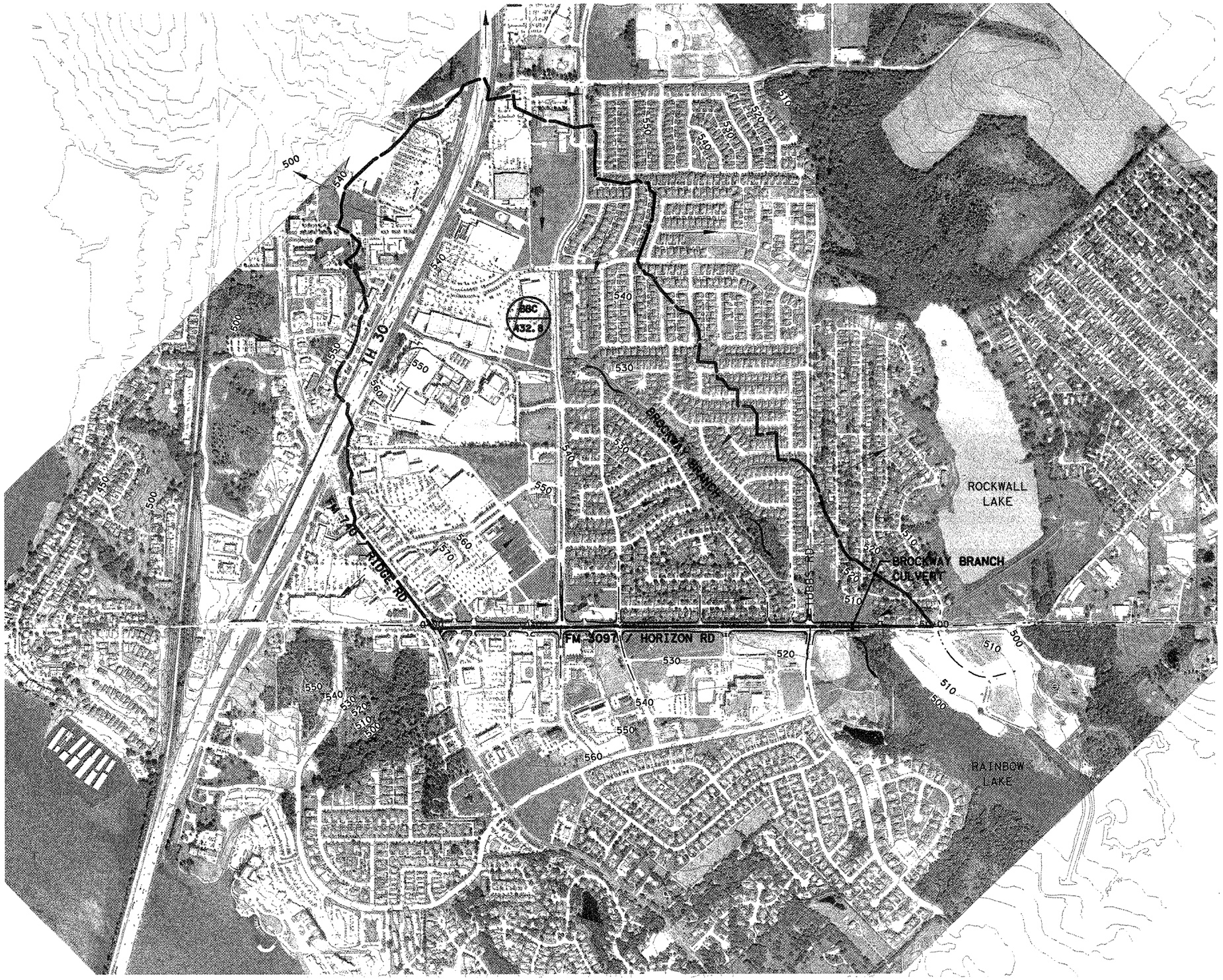
Texas Department of Transportation

FM 3097
DRAINAGE COMPUTATIONS

Designed:	KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	ER	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	ER	DAL	ROCKWALL	3148	01	006		144

SHEET 1 OF 1

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SCALE FEET

LEGEND

A-1 / 0.50 — DRAINAGE AREA ID / DRAINAGE AREA ACRES

DRAINAGE AREA BOUNDARY

FLOW DIRECTION

NOTES

1. AERIAL AND CONTOURS FROM FLOOD STUDY OF RAINBOW LAKE & BROCKWAY BRANCH FOR HORIZON RIDGE CENTER, MAY 2006.

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
5/6/2014

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097
EXTERIOR DRAINAGE AREA MAP
BROCKWAY BRANCH CULVERT

Designed: KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: ER	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn: KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: ER	DAL	ROCKWALL	3148	01	006		145

SHEET 1 OF 1

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SUMMARY OF HEC-RAS OUTPUT

RS 5493 APPROACH	25 YR EX.	25 YR PROP.	CHANGE	100 YR EX.	100 YR PROP.	CHANGE
FLOW (cfs)	1561	1561	0	1997	1997	0
VELOCITY (ft/s)	1.15	1.78	0.63	1.20	1.35	0.15
WSEL (ft)	511.49	509.84	-1.65	512.13	511.85	-0.28

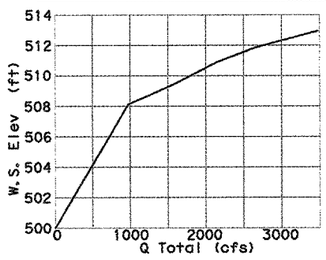
RS 5435 US FACE OF CULVERT	25 YR EX.	25 YR PROP.	CHANGE	100 YR EX.	100 YR PROP.	CHANGE
FLOW (cfs)	1384	1591	207	2554	2664	110
VELOCITY (ft/s)	0.59	4.98	4.39	1.00	0.96	-0.04
WSEL (ft)	511.50	509.39	-2.11	512.14	511.86	-0.28

RS 5385 CULVERT	25 YR EX.	25 YR PROP.	CHANGE	100 YR EX.	100 YR PROP.	CHANGE
FLOW - TOTAL (cfs)	1384	1591	207	2554	2664	110
FLOW - WEIR (cfs)	769	0	-769	1969	329	-1640

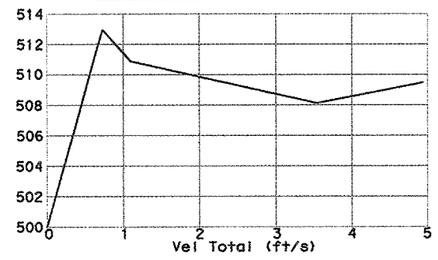
RS 5330 DS FACE OF CULVERT	25 YR EX.	25 YR PROP.	CHANGE	100 YR EX.	100 YR PROP.	CHANGE
FLOW (cfs)	1384	1591	207	2554	2664	110
VELOCITY (ft/s)	1.00	4.94	3.94	1.54	1.30	-0.24
WSEL (ft)	508.98	508.85	0.13	509.86	509.86	0.00

RS 5240.5 EXIT	25 YR EX.	25 YR PROP.	CHANGE	100 YR EX.	100 YR PROP.	CHANGE
FLOW (cfs)	1384	1591	207	2554	2664	110
VELOCITY (ft/s)	1.18	3.17	1.99	1.82	2.10	0.28
WSEL (ft)	508.97	508.93	0.04	509.85	509.84	-0.01

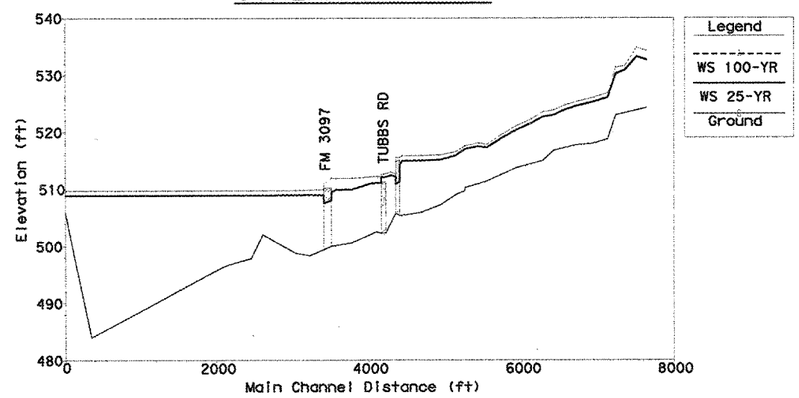
CONVEYANCE CURVE



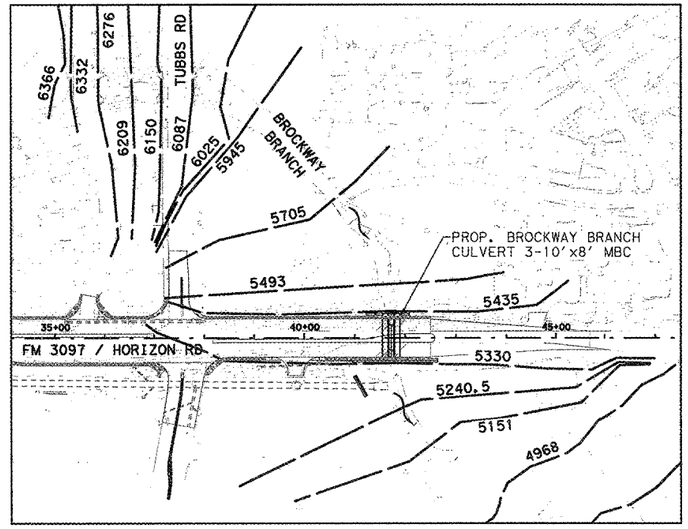
VELOCITY CURVE



STREAM PROFILE



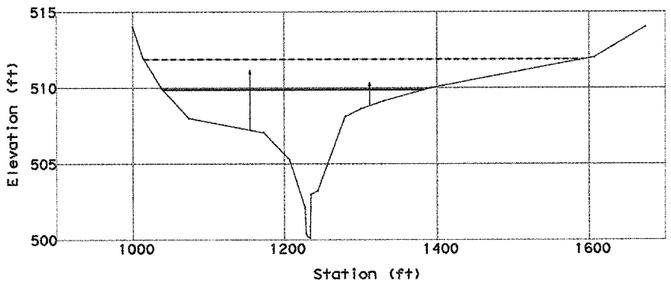
LOCATION MAP



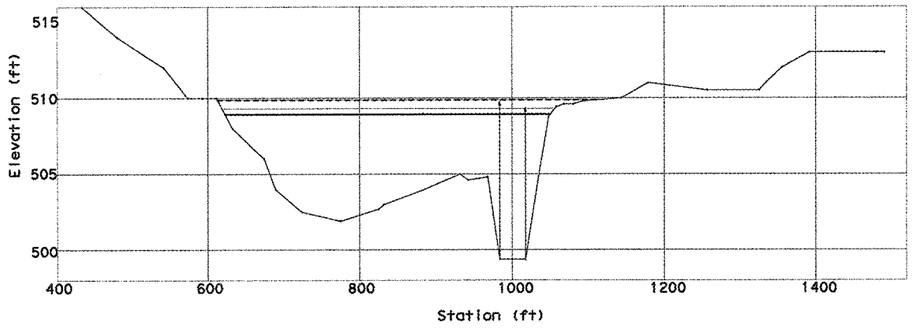
NOTES:

1. HEC-RAS V4.1.0 USED FOR HYDRAULIC ANALYSIS OF EXISTING CONDITIONS AND DESIGN OF PROPOSED STRUCTURE.
2. SEE HYDRAULIC REPORT PREPARED BY HDR, JULY 2013 FOR HYDROLOGIC AND OTHER INFORMATION.
3. SEE DRAINAGE AREA MAP - BROCKWAY BRANCH FOR DRAINAGE AREA DELINEATION.
4. SEE BRIDGE CLASS CULVERT LAYOUT FOR CULVERT CROSS SECTION WITH ROADWAY PROFILE.
5. CROSS SECTIONS LISTED ARE NORMAL TO STREAM FLOW.
6. WSEL ARE SHOWN IN NAVD88.
7. SITE IS DESIGNATED AS ZONE A, FIRM PANEL #48397C0040L. SEE CITY OF ROCKWALL STUDY DATED 2006 FOR DETAILED STUDY.
8. CITY OF ROCKWALL PARTICIPATES IN THE NFIP. COORDINATION WITH LOCAL FLOODPLAIN ADMINISTRATOR BETWEEN THE 60% AND 95% SUBMITTALS.

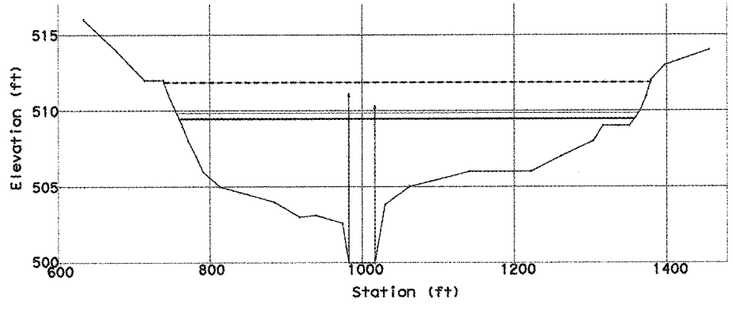
UPSTREAM (APPROACH): RS 5493



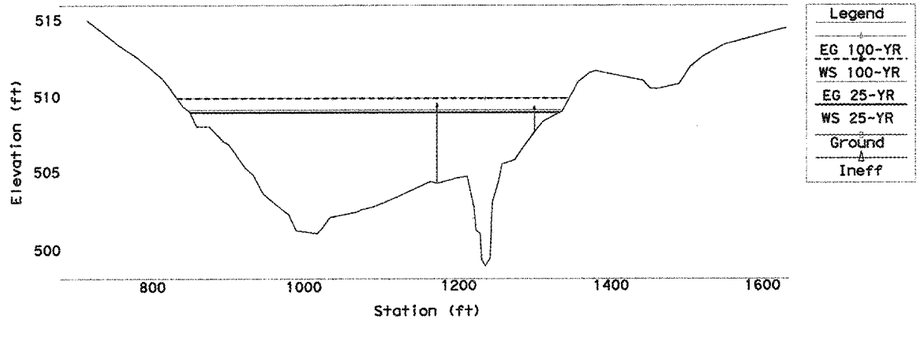
DOWNSTREAM AT CULVERT: RS 5330



UPSTREAM AT CULVERT: RS 5435



DOWNSTREAM (EXIT): RS 5240.5



STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
5/9/2014

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

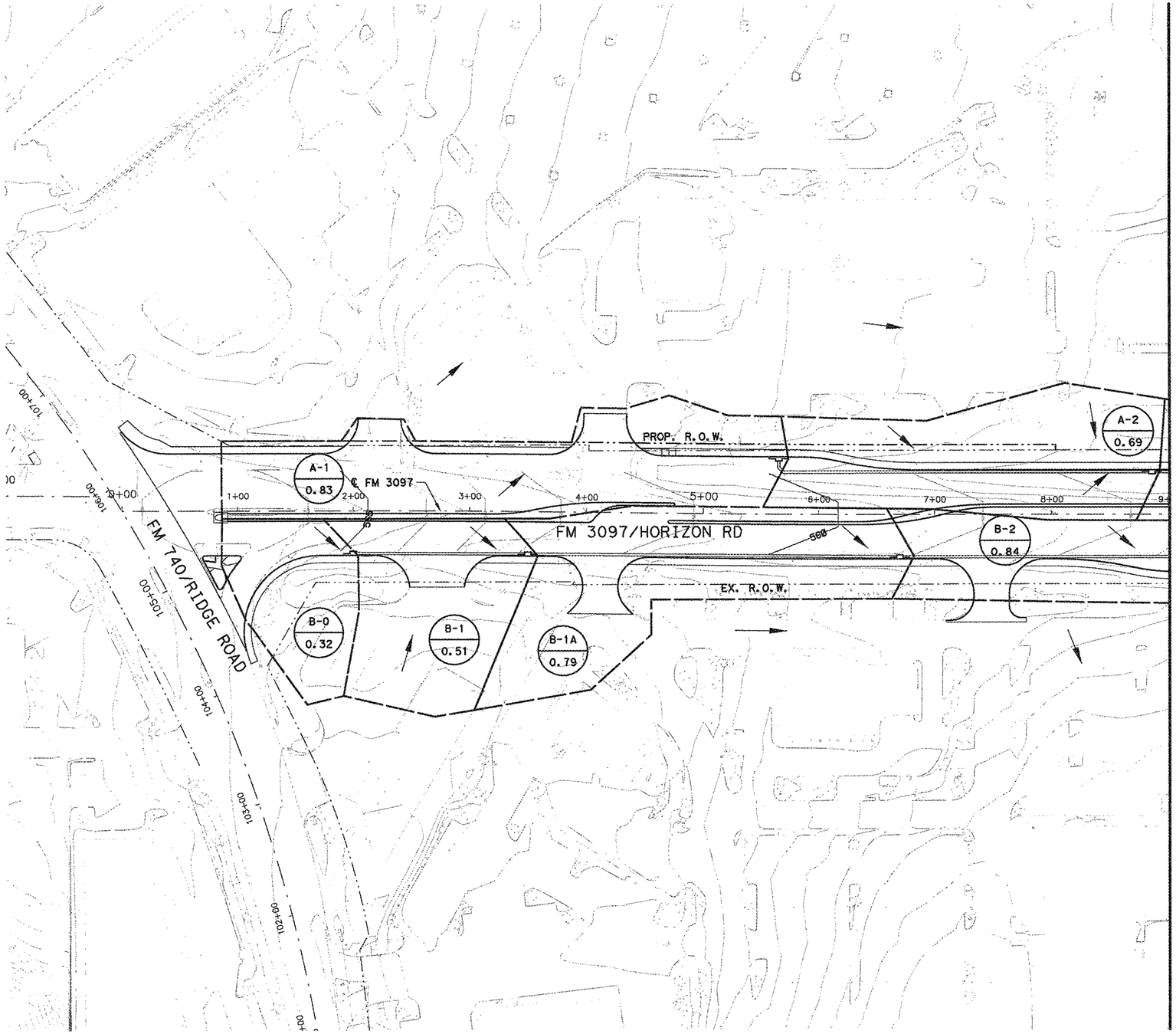
Texas Department of Transportation

FM 3097
HYDRAULIC DATA SHEET
BROCKWAY BRANCH

Designed: KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: ER	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: ER	DAL	ROCKWALL	3148	01	006	146

SHEET 1 OF 1

5/4/2014 8:44:40 PM lmalvee P:\Active Projects\TXHR\2004 Gdl'S Or Plans and Drawings\35 HCR Cut Sheets Drainage 120404ORDrv80.dgn



N

50 25 0 50 100
SCALE FEET
HORZ.

LEGEND

- A-1 / 0.50 — DRAINAGE AREA ID / DRAINAGE AREA ACRES
- DRAINAGE AREA BOUNDARY
- FLOW DIRECTION
- INLET
- MANHOLE
- STORM SEWER

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
5/6/2014

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

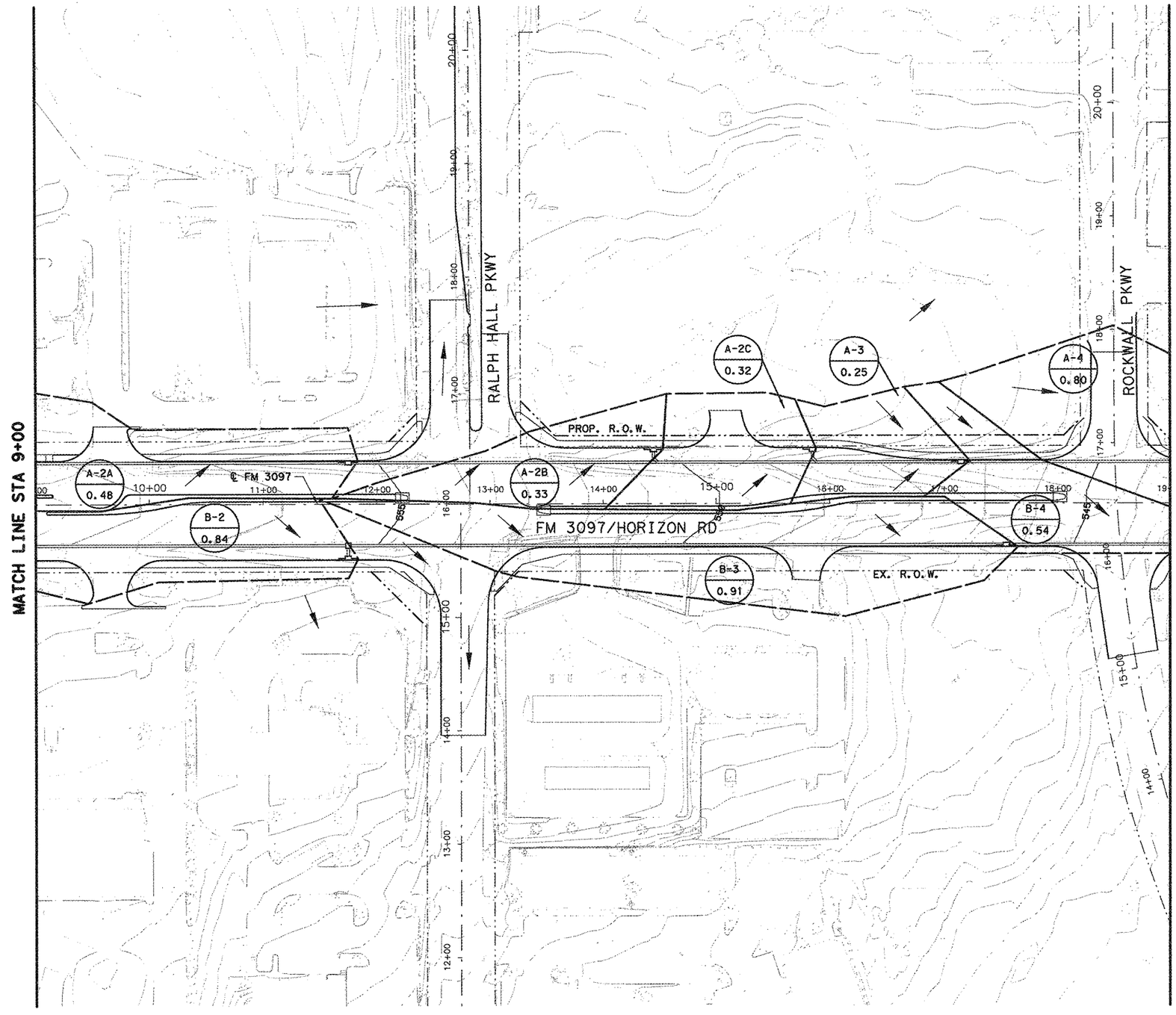
Texas Department of Transportation

INTERIOR DRAINAGE AREA MAP
FM 3097
BEGIN PROJECT TO STA 9+00

Designed:	KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	ER	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	ER	DAL	ROCKWALL	3148	01	006	147

SHEET 1 OF 5

5/4/2014 8:35:34 PM lmcilvee ow:/Active Projects/TxDR12004.0478.00 Plans and Drawings/8.35 HDR Cut Sheets Drainage/120404DRda01.dgn



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50 25 0 50 100
SCALE HORZ. FEET

LEGEND

- A-1 / 0.50 — DRAINAGE AREA ID / DRAINAGE AREA ACRES
- DRAINAGE AREA BOUNDARY
- FLOW DIRECTION
- INLET
- MANHOLE
- STORM SEWER

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED PROFESSIONAL ENGINEER
Kristal McIlveene, P.E.
5/4/2014

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

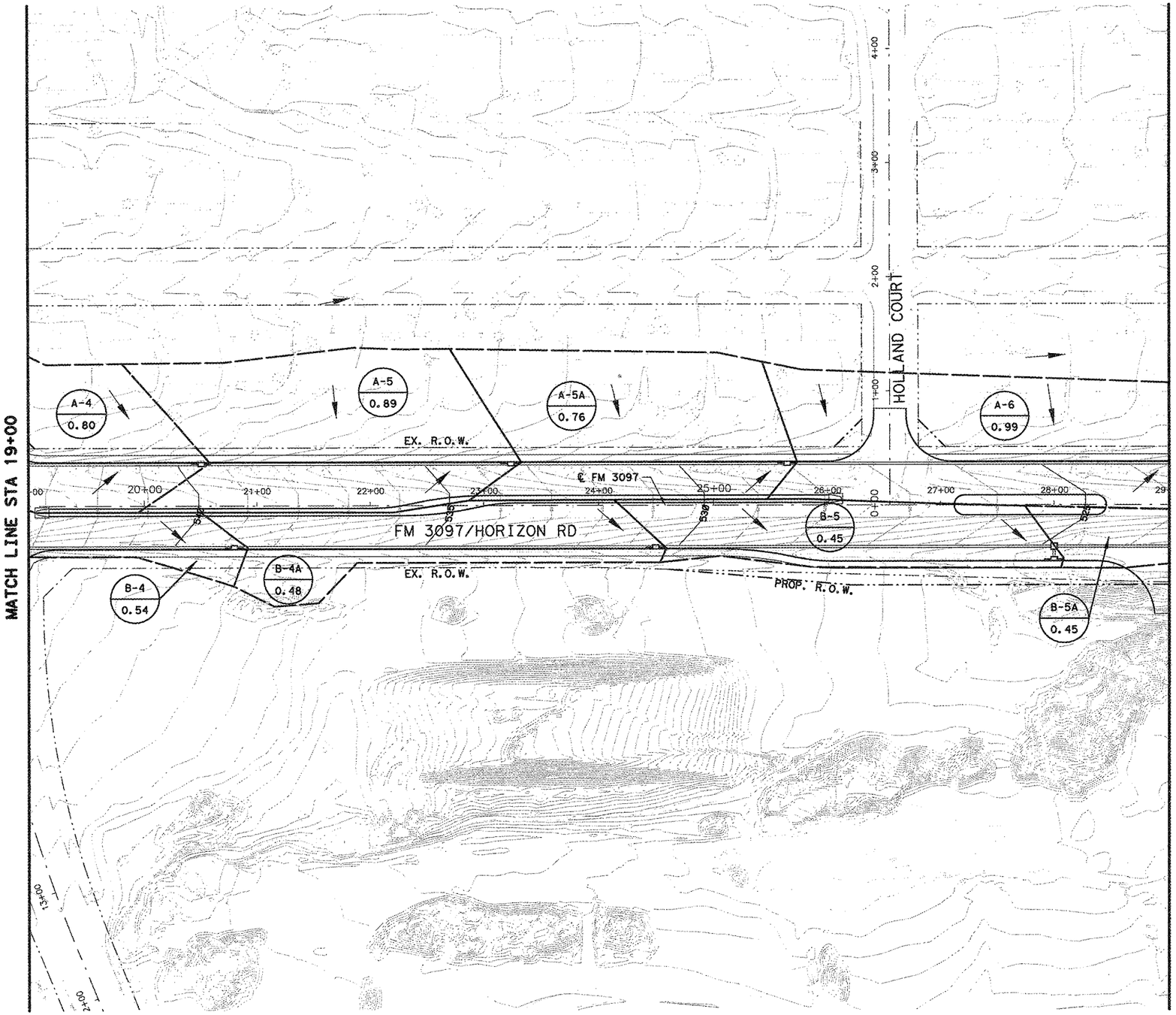
Texas Department of Transportation

INTERIOR DRAINAGE AREA MAP
FM 3097
STA 9+00 TO STA 19+00

Designed:	KDM	REG. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	ER	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	ER	DAL	ROCKWALL	3148	01	006	148

SHEET 2 OF 5

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SCALE HORZ. FEET

LEGEND

- A-1 / 0.50 — DRAINAGE AREA ID
- DRAINAGE AREA ACRES
- DRAINAGE AREA BOUNDARY
- FLOW DIRECTION
- INLET
- MANHOLE
- STORM SEWER

STATE OF TEXAS
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96621
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FIRM REGISTRATION No. F-754

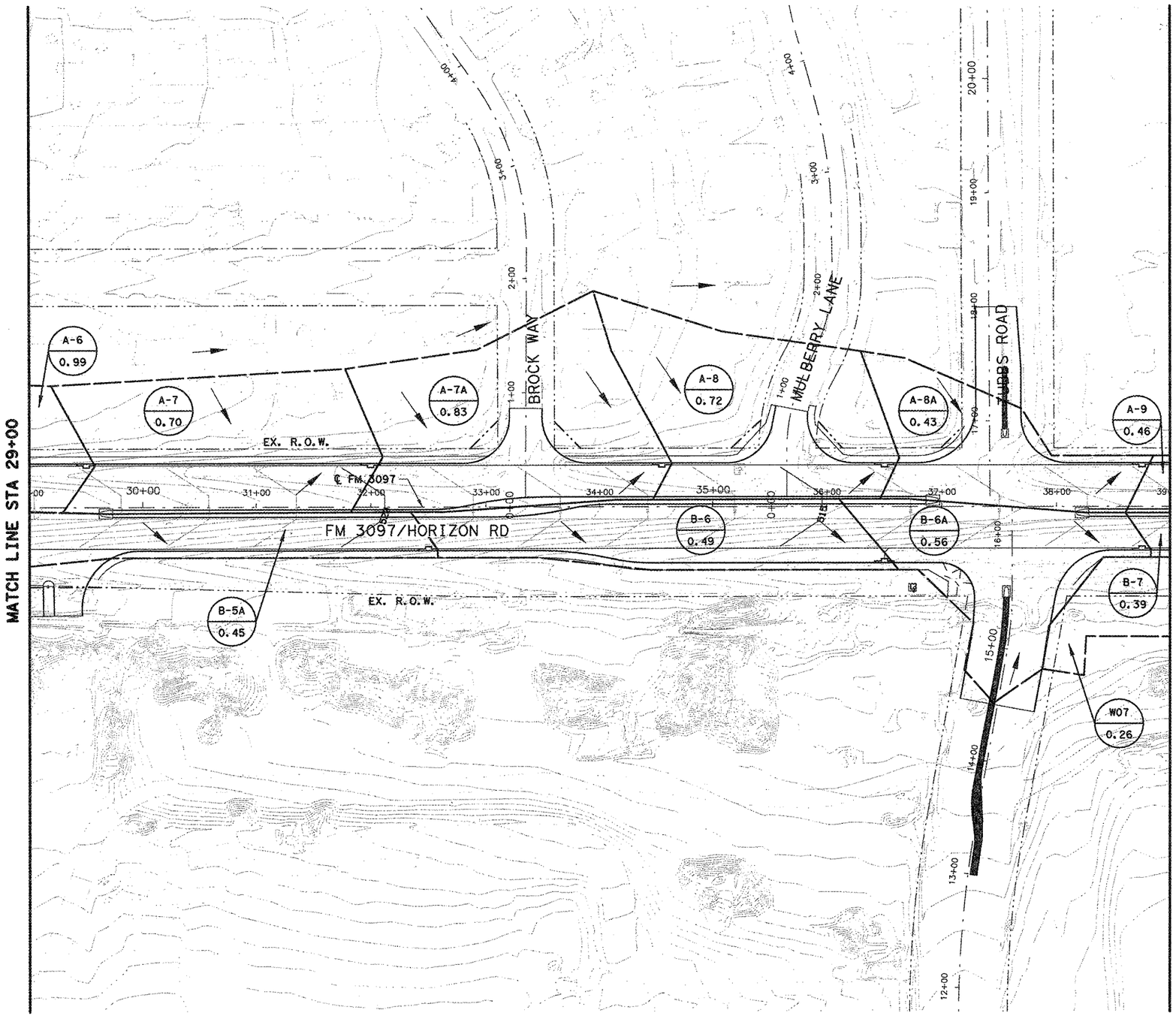
Texas Department of Transportation

INTERIOR DRAINAGE AREA MAP
FM 3097
STA 19+00 TO STA 29+00

Designed: KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: ER	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: ER	DAL	ROCKWALL	3148	01	006	149

SHEET 3 OF 5

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N

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SCALE FEET
HORZ.

LEGEND

- A-1 / 0.50 — DRAINAGE AREA ID / DRAINAGE AREA ACRES
- DRAINAGE AREA BOUNDARY
- FLOW DIRECTION
- INLET
- MANHOLE
- STORM SEWER

STATE OF TEXAS
KRISTAL MoILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
5/4/2014

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

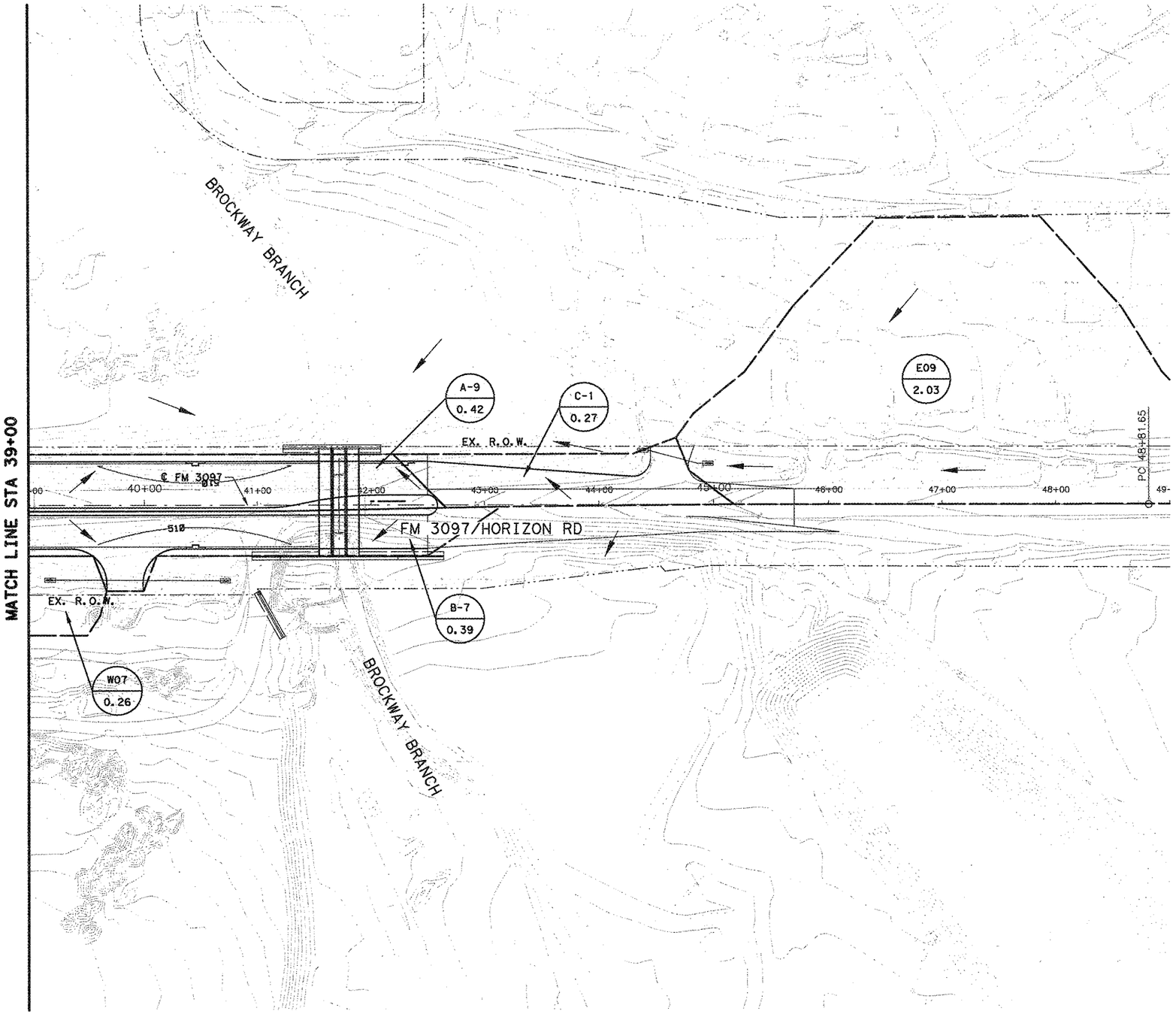
Texas Department of Transportation

INTERIOR DRAINAGE AREA MAP
FM 3097
STA 29+00 TO STA 39+00

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Designed:	KDM	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	ER	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	KDM	DAL	ROCKWALL	3148	01	006	150
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SHEET 4 OF 5

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SCALE HORZ. FEET

LEGEND

- A-1 / 0.50 — DRAINAGE AREA ID / DRAINAGE AREA ACRES
- DRAINAGE AREA BOUNDARY
- FLOW DIRECTION
- INLET
- MANHOLE
- STORM SEWER

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
5/6/2014

NO.	REVISION	BY	DATE

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FIRM REGISTRATION No. F-754

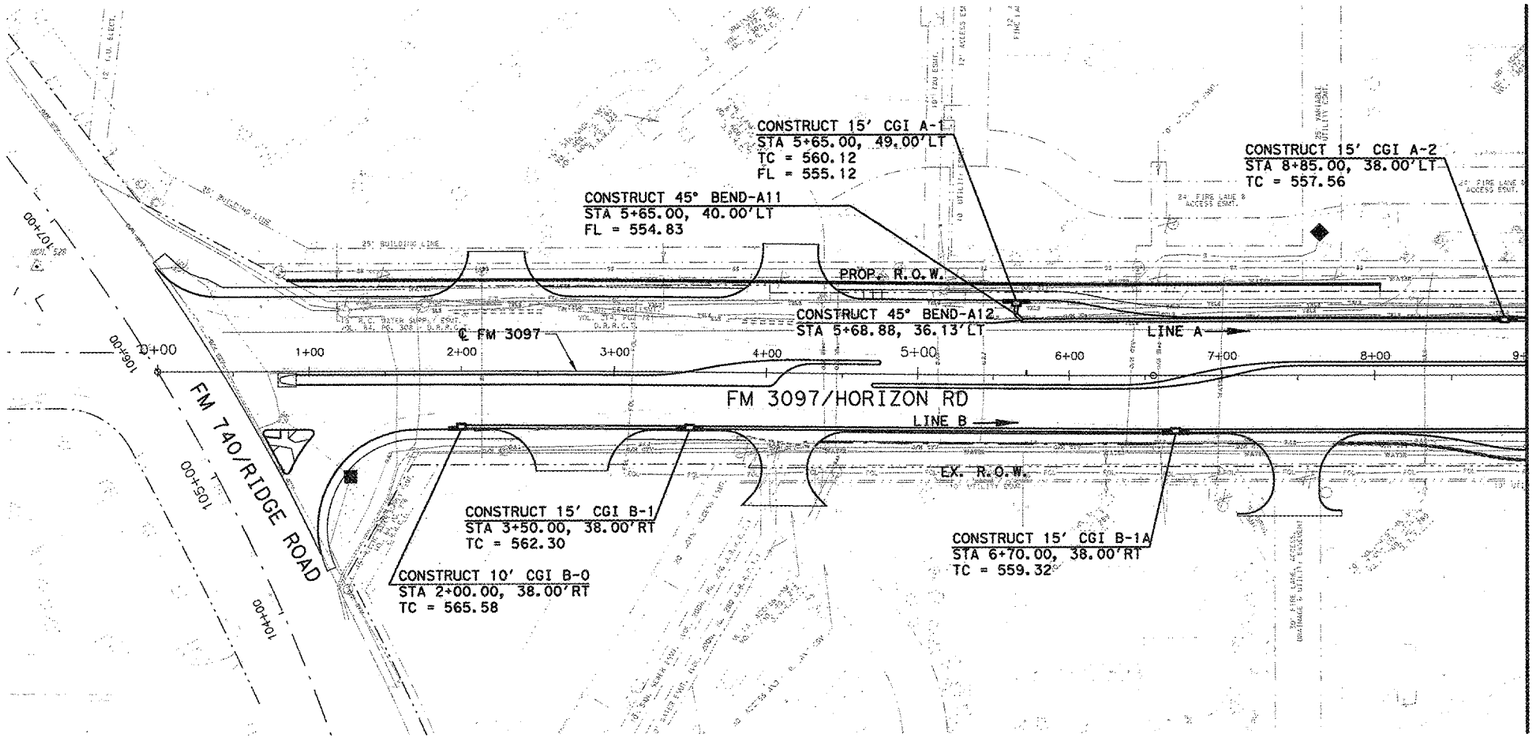
Texas Department of Transportation

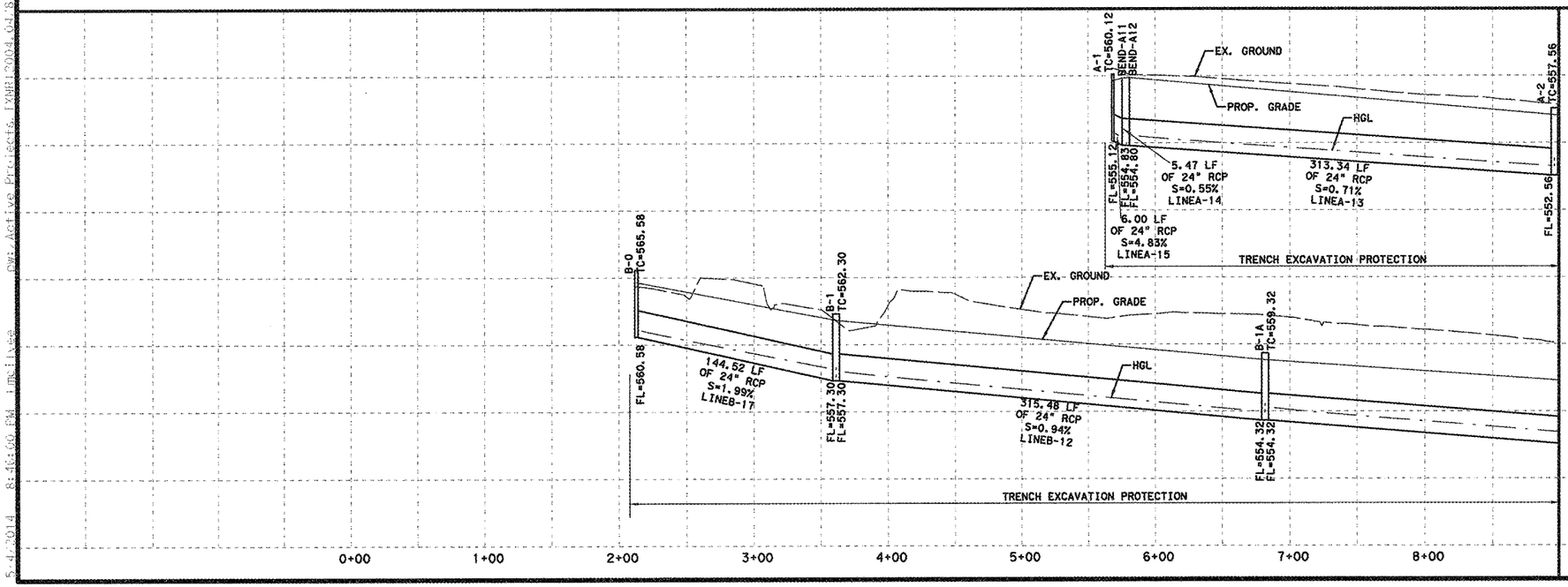
INTERIOR DRAINAGE AREA MAP
FM 3097
STA 39+00 TO END PROJECT

Designed:	KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	ER	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	ER	DAL	ROCKWALL	3148	01	006		151

SHEET 5 OF 5

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N

50 25 0 50 100
SCALE FEET
HORZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- INLET
- MANHOLE
- STORM SEWER
- STORM SEWER FLOW DIRECTION

NOTES

1. DRAINAGE STRUCTURES ARE OF THE TYPE LISTED BELOW UNLESS OTHERWISE NOTED.
   INLETS: DALLAS DIST. CGI(TY I)-08
   MANHOLES: MH-M
   PIPE: RCP CLASS III
2. FOR CGI INLETS, A 10' INLET IS A 5' INLET WITH 1 - 5' EXTENSION. A 15' INLET IS A 5' INLET WITH 2 - 5' EXTENSIONS.
3. SEE REMOVAL PLANS FOR EXISTING DRAINAGE STRUCTURES TO BE REMOVED.
4. TRENCH EXCAVATION PROTECTION LIMITS SHOWN ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR FOLLOWING TXDOT, OSHA, AND OTHER SAFETY MEASURES AS REQUIRED BY THE GENERAL NOTES AND SPECIFICATIONS.
5. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
5/4/2014

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

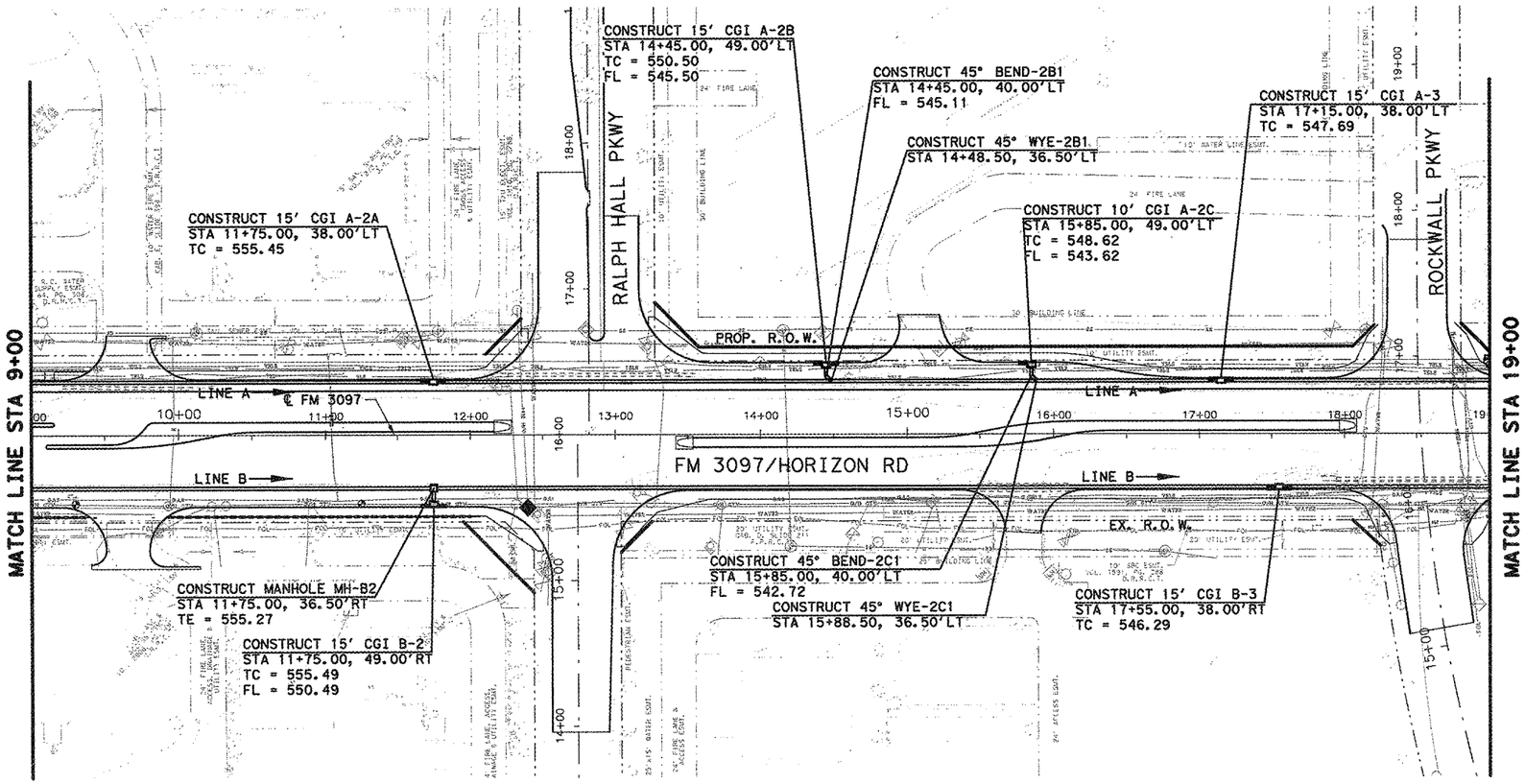
Texas Department of Transportation

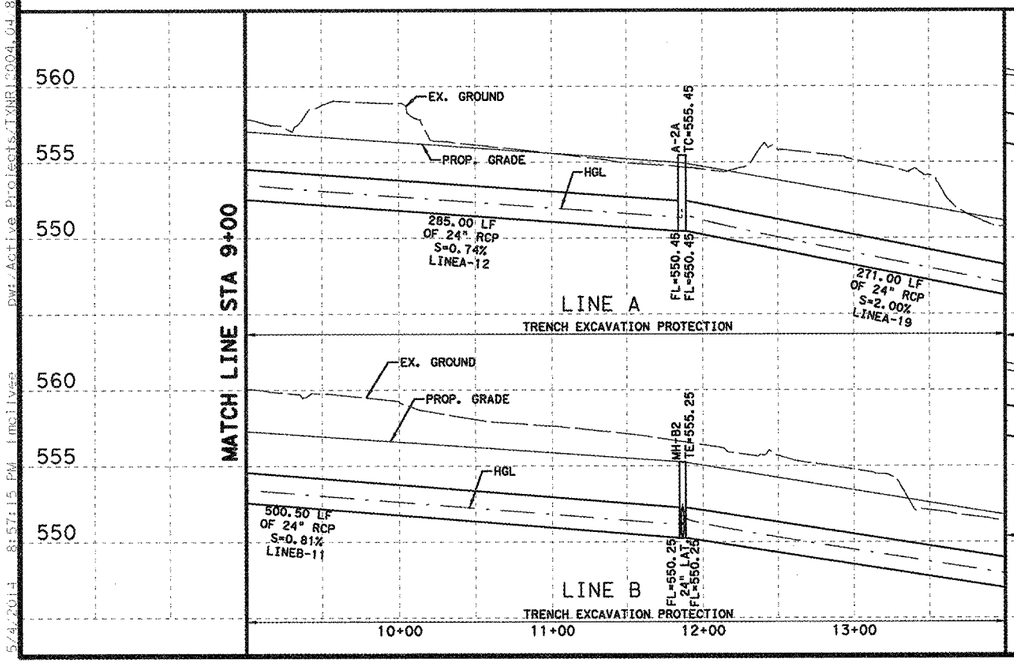
STORM SEWER PLAN AND PROFILE
FM 3097
BEGIN PROJECT TO STA 9+00

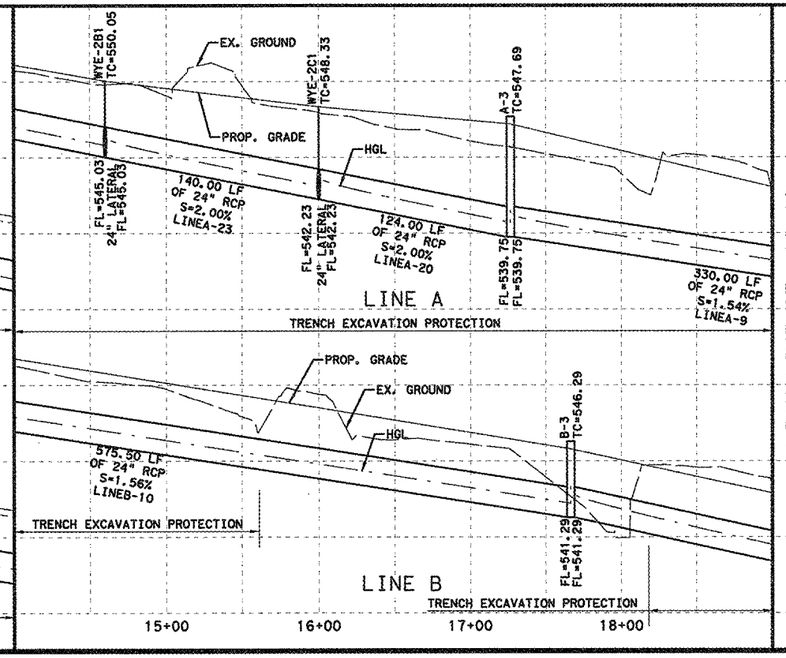
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Drawn:	KDM	DAL	ROCKWALL	3148	01	006	152
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SHEET 1 OF 5

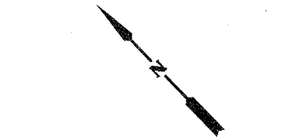
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SHEET 2 OF 5



LEGEND

- INLET
- MANHOLE
- STORM SEWER
- STORM SEWER FLOW DIRECTION

NOTES

1. DRAINAGE STRUCTURES ARE OF THE TYPE LISTED BELOW UNLESS OTHERWISE NOTED.
   INLETS: DALLAS DIST. CGI(TY I)-08
   MANHOLES: MH-M
   PIPE: RCP CLASS III
2. FOR CGI INLETS, A 10' INLET IS A 5' INLET WITH 1 - 5' EXTENSION. A 15' INLET IS A 5' INLET WITH 2 - 5' EXTENSIONS.
3. SEE REMOVAL PLANS FOR EXISTING DRAINAGE STRUCTURES TO BE REMOVED.
4. TRENCH EXCAVATION PROTECTION LIMITS SHOWN ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR FOLLOWING TXDOT, OSHA, AND OTHER SAFETY MEASURES AS REQUIRED BY THE GENERAL NOTES AND SPECIFICATIONS.
5. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.



NO.	REVISION	BY	DATE

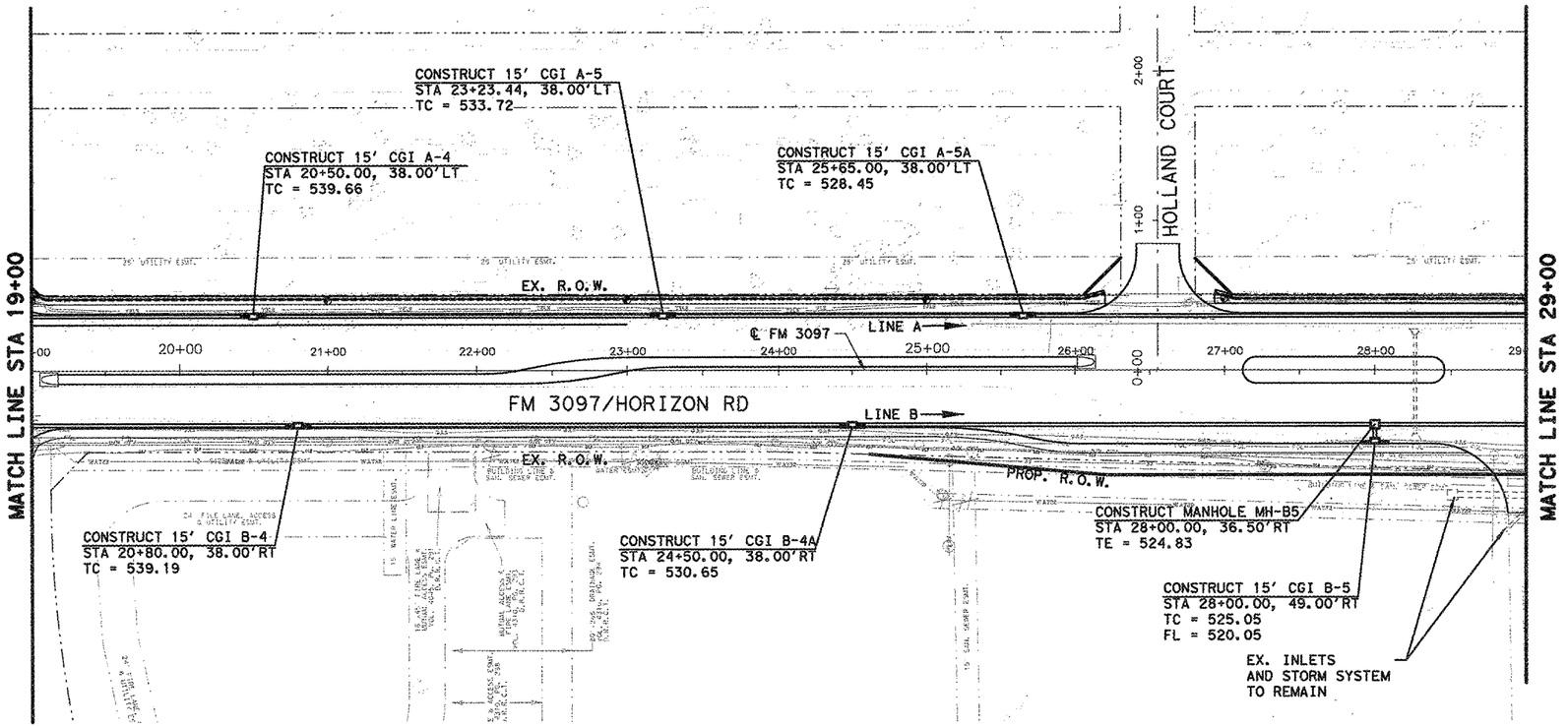
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FIRM REGISTRATION No. F-754

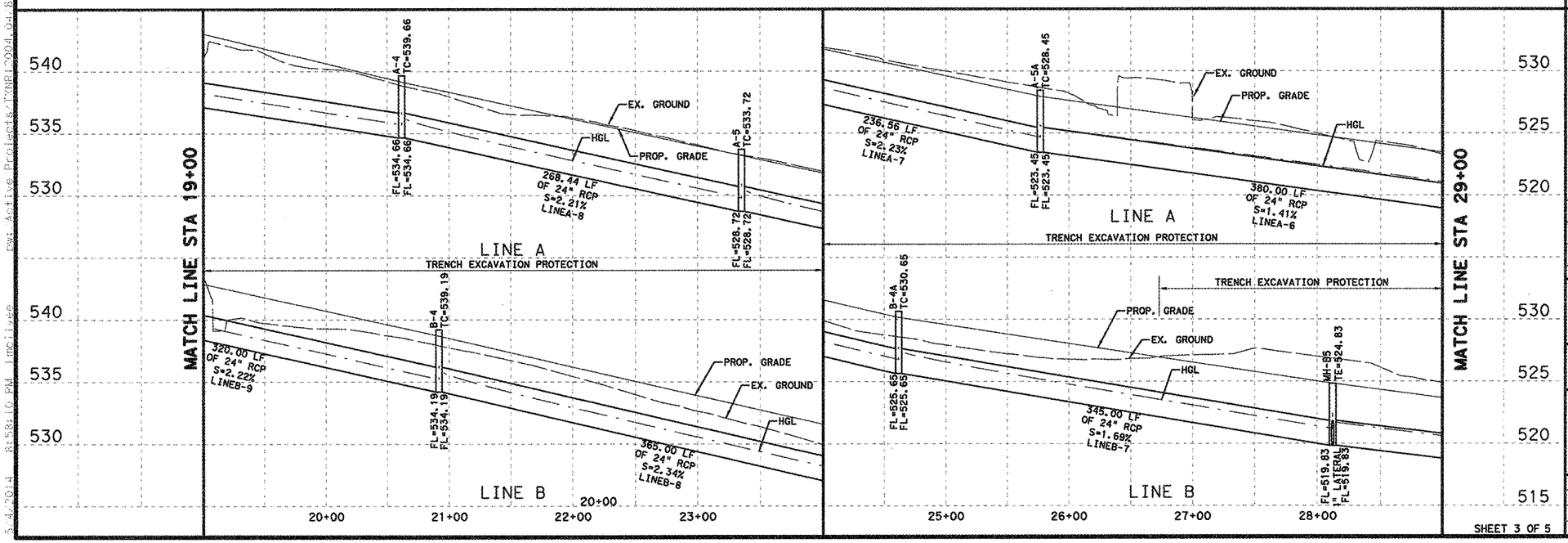
Texas Department of Transportation

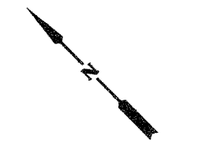
STORM SEWER PLAN AND PROFILE
FM 3097
STA 9+00 TO STA 19+00

Designed: KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: ER	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: ER	DAL	ROCKWALL	3148	01	006	153

5/6/2014 8:57:15 PM jmcilvee Dwr Active Projects/TXNR12004.04 8.00 Plans and Drawings/8.35 HDR Cut Sheets/Drainage 1204048R0102.dgn







LEGEND

- INLET
- MANHOLE
- STORM SEWER
- STORM SEWER FLOW DIRECTION

NOTES

1. DRAINAGE STRUCTURES ARE OF THE TYPE LISTED BELOW UNLESS OTHERWISE NOTED.
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   PIPE: RCP CLASS III
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4. TRENCH EXCAVATION PROTECTION LIMITS SHOWN ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR FOLLOWING TXDOT, OSHA, AND OTHER SAFETY MEASURES AS REQUIRED BY THE GENERAL NOTES AND SPECIFICATIONS.
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NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

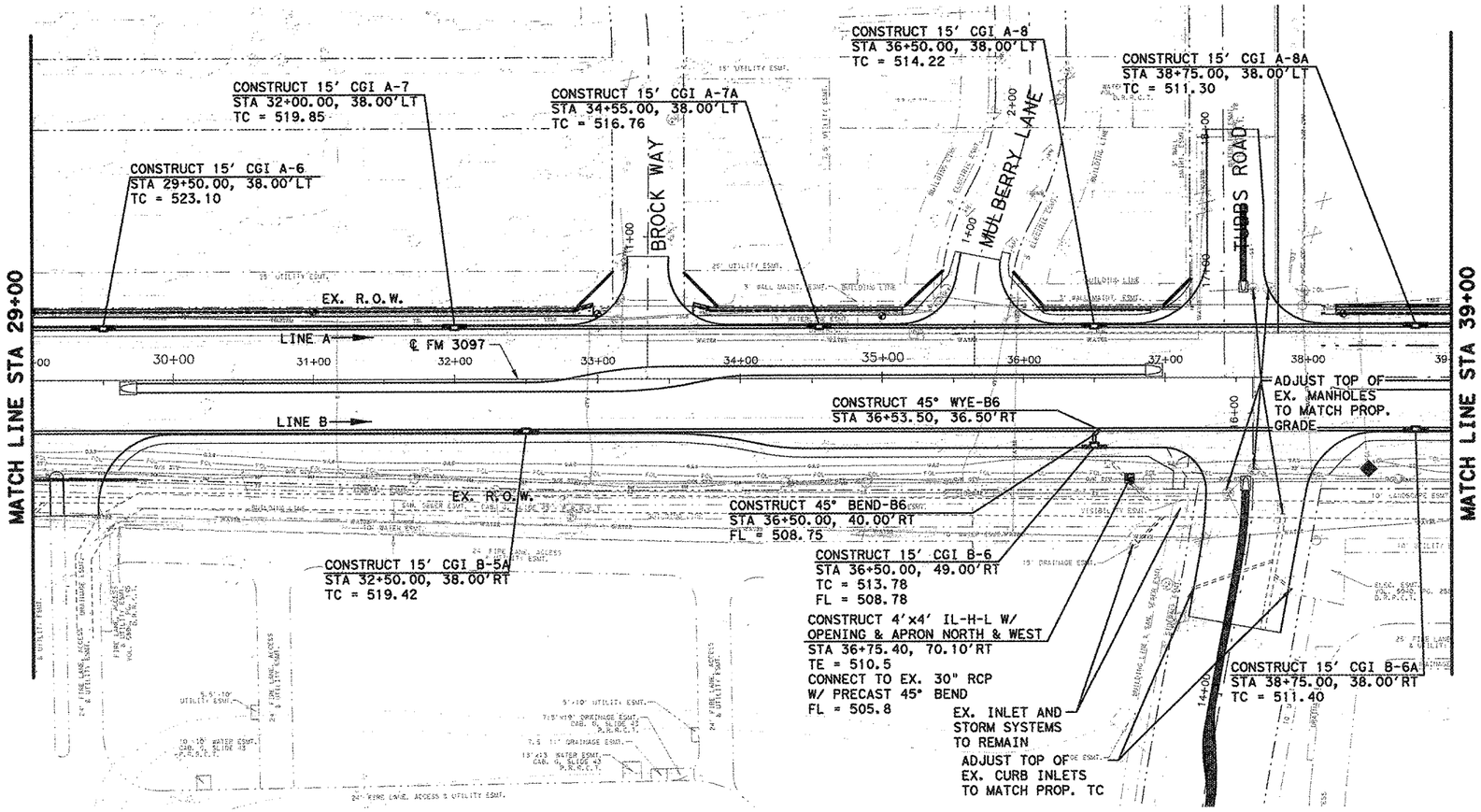
Texas Department of Transportation

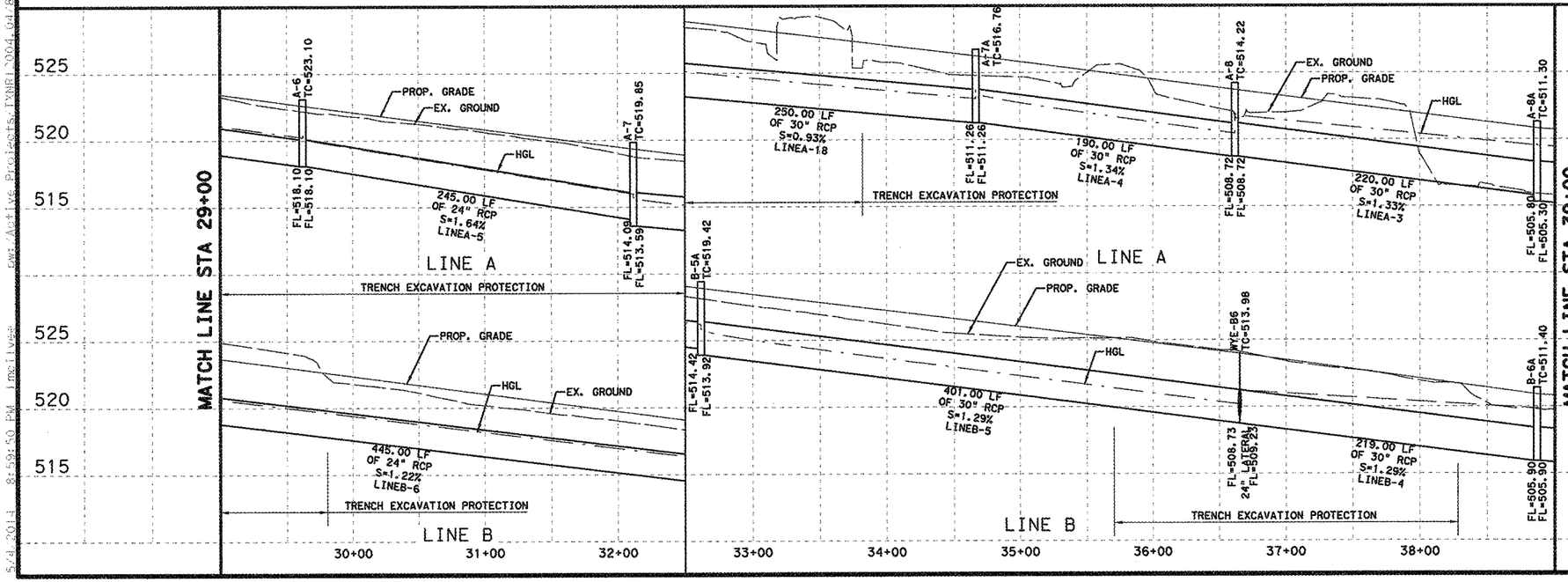
STORM SEWER PLAN AND PROFILE
FM 3097
STA 19+00 TO STA 29+00

Designed:	KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
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Drawn:	KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	ER	DAL	ROCKWALL	3148	01	006	154

SHEET 3 OF 5

5/4/2014 8:58:16 PM kmcilvee
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SCALE HORZ. 50 25 0 50 100 FEET

SCALE VERT. 5 2.5 0 5 10 FEET

LEGEND

- INLET
- MANHOLE
- STORM SEWER
- STORM SEWER FLOW DIRECTION

NOTES

1. DRAINAGE STRUCTURES ARE OF THE TYPE LISTED BELOW UNLESS OTHERWISE NOTED.
   INLETS: DALLAS DIST. CGI(TY I)-08
   MANHOLES: MH-M
   PIPE: RCP CLASS III
2. FOR CGI INLETS, A 10' INLET IS A 5' INLET WITH 1 - 5' EXTENSION. A 15' INLET IS A 5' INLET WITH 2 - 5' EXTENSIONS.
3. SEE REMOVAL PLANS FOR EXISTING DRAINAGE STRUCTURES TO BE REMOVED.
4. TRENCH EXCAVATION PROTECTION LIMITS SHOWN ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR FOLLOWING TXDOT, OSHA, AND OTHER SAFETY MEASURES AS REQUIRED BY THE GENERAL NOTES AND SPECIFICATIONS.
5. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
5/4/2014

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

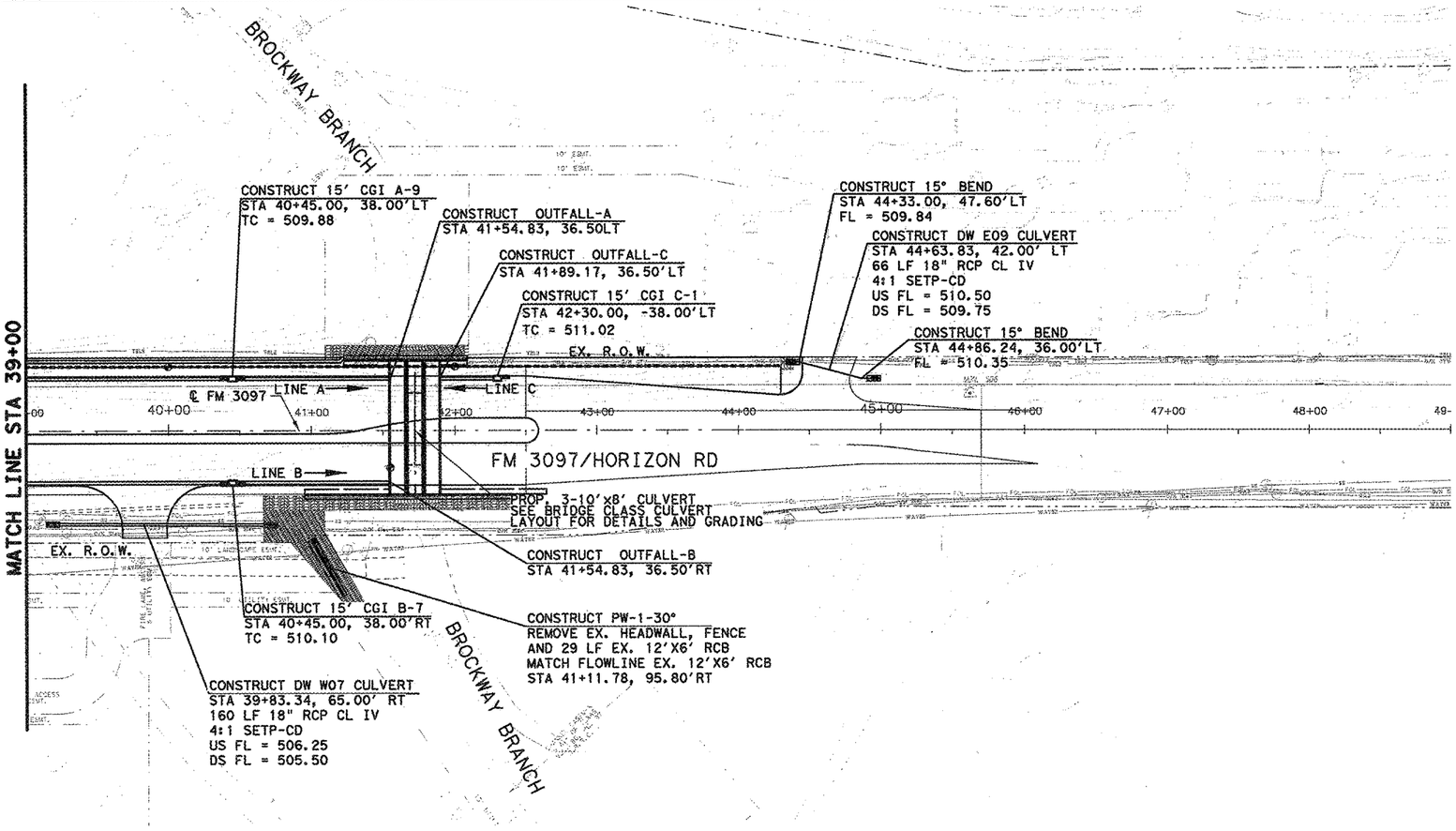
Texas Department of Transportation

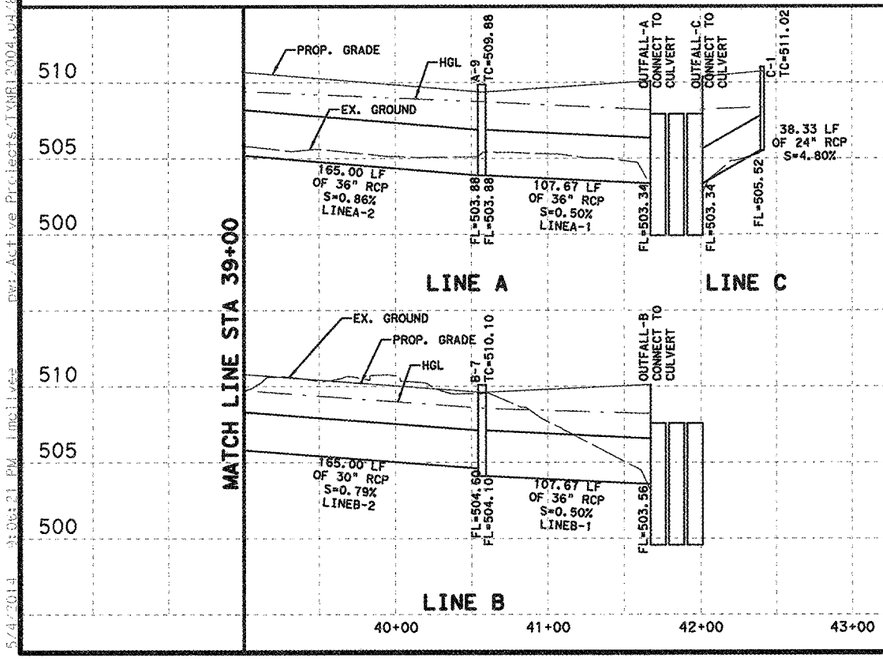
STORM SEWER PLAN AND PROFILE
FM 3097
STA 29+00 TO STA 39+00

Designed:	KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	ER	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	ER	DAL	ROCKWALL	3148	01	006		155

SHEET 4 OF 5

5/4/2014 8:59:50 PM imcilvee c:\Active Projects\TXNRI\004.04\8.00 Plans and Drawings\8.35 HDR Cut Sheets\Drainage\130404Rp104.dgn







LEGEND

- INLET
- MANHOLE
- STORM SEWER
- STORM SEWER FLOW DIRECTION

NOTES

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NO.	REVISION	BY	DATE

HDR Engineering, Inc.
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Texas Department of Transportation

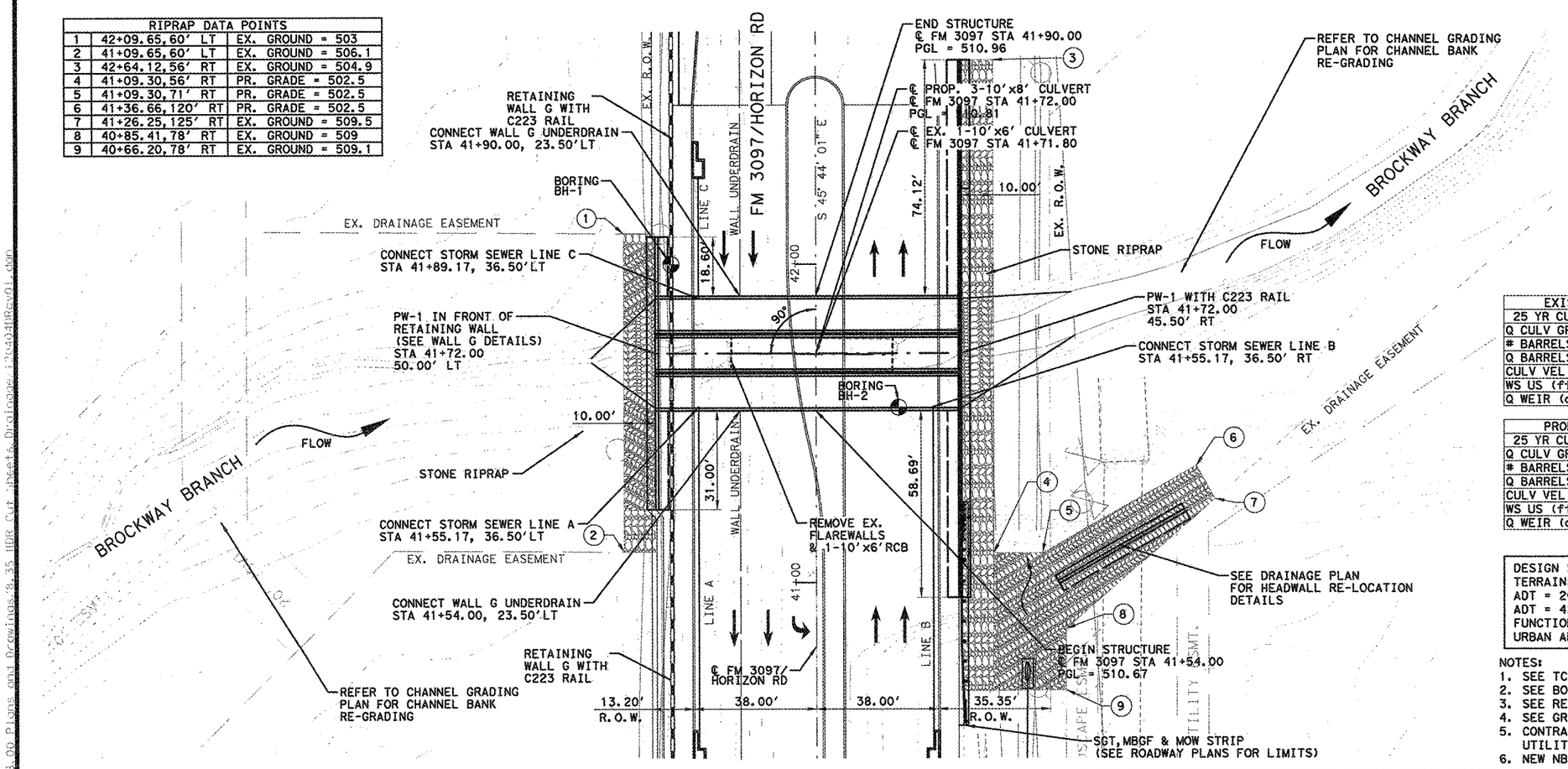
STORM SEWER PLAN AND PROFILE
FM 3097
STA 39+00 TO END PROJECT

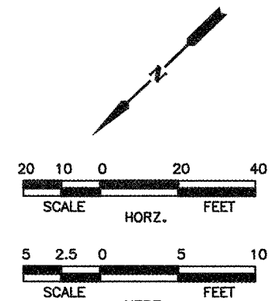
Designed:	KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	ER	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	ER	DAL	ROCKWALL	3148	01	006	156

SHEET 5 OF 5

5/14/2014 10:03:31 PM I:\Projects\TXMR\300418\R0105.dgn

RIPRAP DATA POINTS		
1	42+09.65,60' LT	EX. GROUND = 503
2	41+09.65,60' LT	EX. GROUND = 506.1
3	42+64.12,56' RT	EX. GROUND = 504.9
4	41+09.30,56' RT	PR. GRADE = 502.5
5	41+09.30,71' RT	PR. GRADE = 502.5
6	41+36.66,120' RT	PR. GRADE = 502.5
7	41+26.25,125' RT	EX. GROUND = 509.5
8	40+85.41,78' RT	EX. GROUND = 509
9	40+66.20,78' RT	EX. GROUND = 509.1



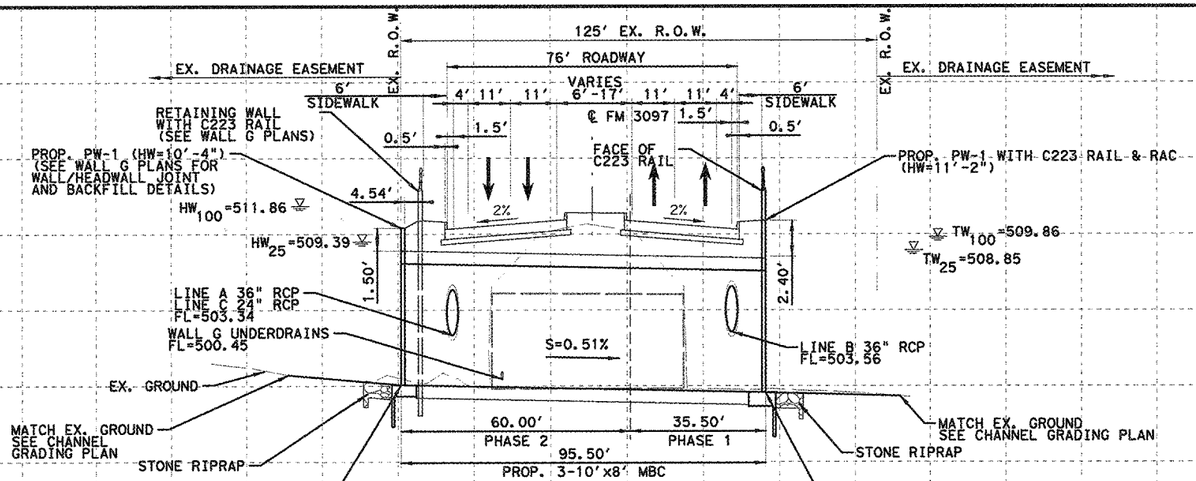


EXISTING HYDRAULIC DATA - DRAINAGE AREA = 432.80 AC			
25 YR CULV OUTPUT (RS 5384.5)		100 YR CULV OUTPUT (RS 5384.5)	
Q CULV GROUP (cfs)	1384.00	Q CULV GROUP (cfs)	2554.00
# BARRELS	1	# BARRELS	1
Q BARRELS (cfs)	615.30	Q BARRELS (cfs)	584.81
CULV VEL US (ft/s)	10.25	CULV VEL US (ft/s)	9.75
WS US (ft)	511.50	WS US (ft)	512.14
Q WEIR (cfs)	768.70	Q WEIR (cfs)	1969.20

PROPOSED HYDRAULIC DATA - DRAINAGE AREA = 438.10 AC			
25 YR CULV OUTPUT (RS 5384.5)		100 YR CULV OUTPUT (RS 5384.5)	
Q CULV GROUP (cfs)	1591.00	Q CULV GROUP (cfs)	2335.46
# BARRELS	3	# BARRELS	3
Q BARRELS (cfs)	1591.00	Q BARRELS (cfs)	2006.92
CULV VEL US (ft/s)	6.63	CULV VEL US (ft/s)	9.73
WS US (ft)	509.39	WS US (ft)	511.86
Q WEIR (cfs)	0.00	Q WEIR (cfs)	328.54

DESIGN SPEED: 40 MPH
TERRAIN: FLAT
ADT = 26,620 (2013)
ADT = 42,180 (2033)
FUNCTIONAL CLASS:
URBAN ARTERIAL

NOTES:
1. SEE TCP FOR CULVERT CONSTRUCTION PHASING AND SHORING.
2. SEE BORING LOG SHEETS FOR BORING INFORMATION.
3. SEE RETAINING WALL PLANS FOR UNDERDRAIN DETAILS.
4. SEE GRADING PLAN - BROCKWAY BRANCH FOR GRADING DETAILS.
5. CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.
6. NEW NBI# 18-199-0-3148-01-001



BROCKWAY BRANCH
BRIDGE CLASS CULVERT
℄ FM 3097 STA 41+72.00
0° SKEW
REMOVE EX. 1-10'x6' RBC
INSTALL 96 LF OF 3-10'x8' MBC, 0° SKEW
SCP-10, SCP-MD, ECD, PW-1 (LT & RT), RAC

SHEET 1 OF 2

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
5/4/2014

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

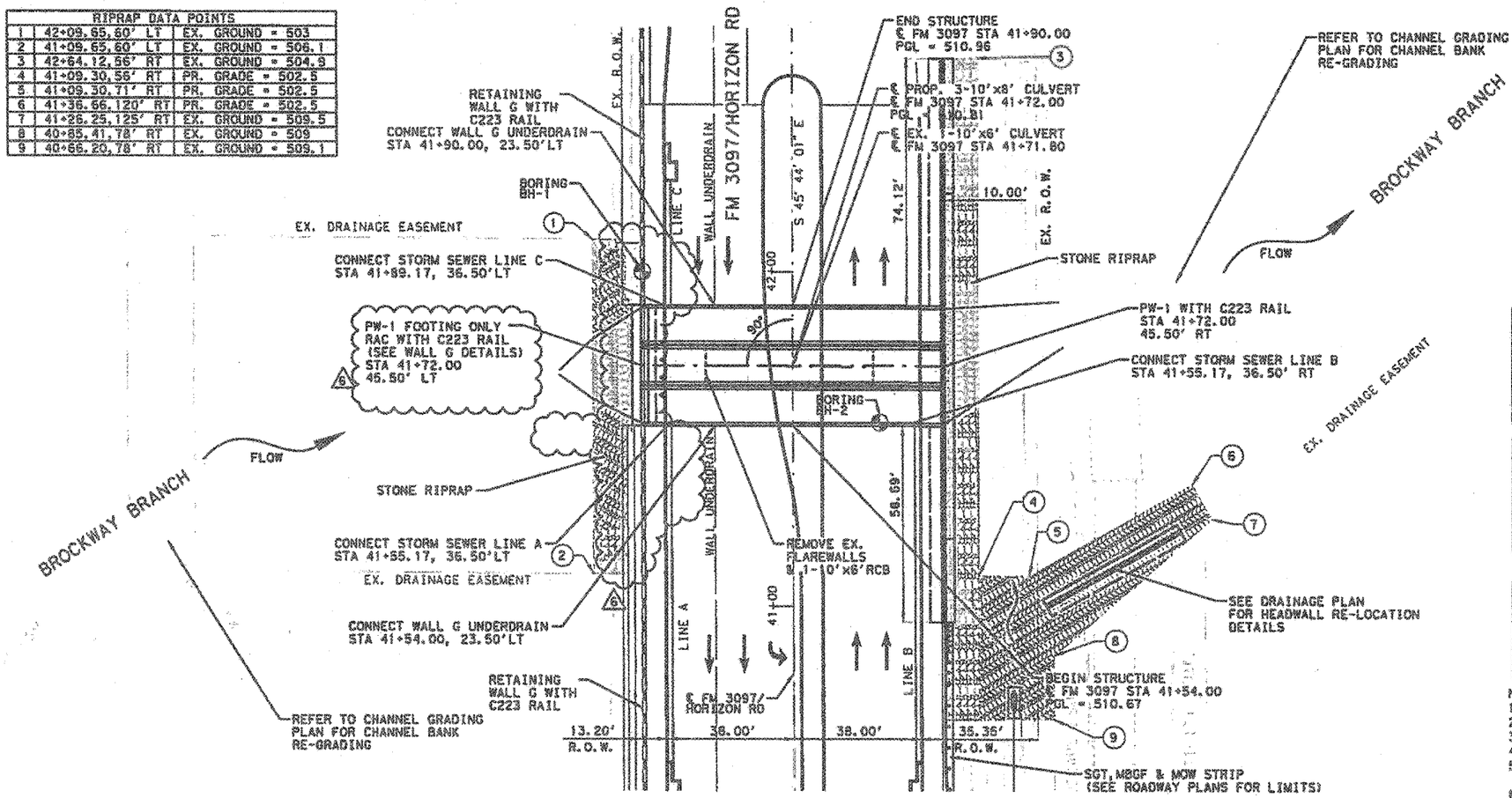
Texas Department of Transportation

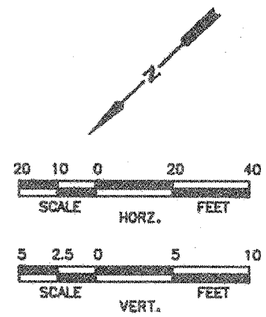
FM 3097
BRIDGE CLASS CULVERT LAYOUT
BROCKWAY BRANCH

Designed:	KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	ER	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	ER	DAL	ROCKWALL	3148	01	006	157

5/4/2014 6:57:52 PM Implivse ewr:Active Projects:IXR1004.04:8.00 Plans and Drawings:

RIPRAP DATA POINTS		
1	42+09.65,60' LT	EX. GROUND = 503
2	41+09.65,60' LT	EX. GROUND = 506.1
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8	40+85.41,78' RT	EX. GROUND = 509
9	40+66.20,78' RT	EX. GROUND = 509.1



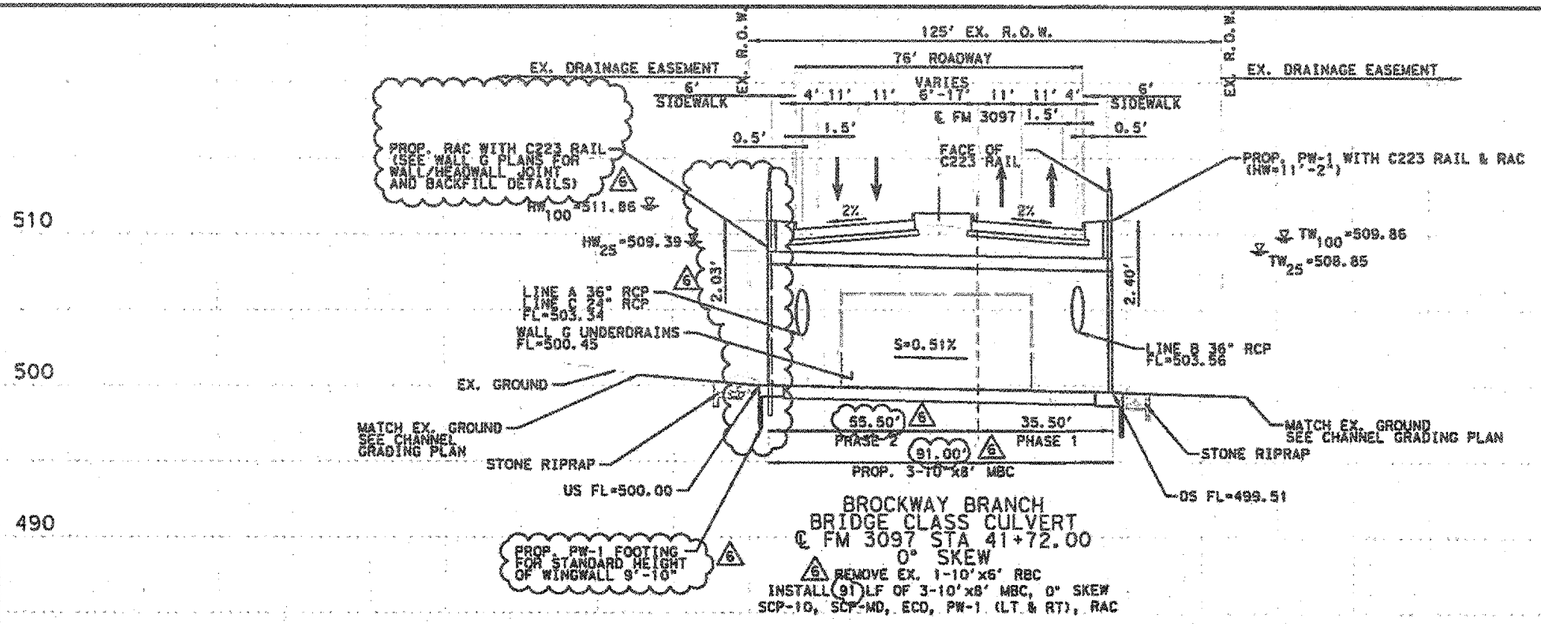


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CULV VEL US (ft/s)	6.63	CULV VEL US (ft/s)	9.73
WS US (ft)	509.39	WS US (ft)	511.86
Q WEIR (cfs)	0.00	Q WEIR (cfs)	328.54

DESIGN SPEED: 40 MPH
TERRAIN: FLAT
ADT = 26,620 (2013)
ADT = 42,180 (2033)
FUNCTIONAL CLASS: URBAN ARTERIAL

NOTES:
1. SEE TCP FOR CULVERT CONSTRUCTION PHASING AND SHORING.
2. SEE BORING LOG SHEETS FOR BORING INFORMATION.
3. SEE RETAINING WALL PLANS FOR UNDERDRAIN DETAILS.
4. SEE GRADING PLAN - BROCKWAY BRANCH FOR GRADING DETAILS.
5. CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.
6. NEW NBI# 18-199-0-3148-01-001



BROCKWAY BRANCH
BRIDGE CLASS CULVERT
℄ FM 3097 STA 41+72.00
0° SKEW

6 REMOVE EX. 1-10'x6' RBC
INSTALL (91) LF OF 3-10'x8' MBC, 0° SKEW
SCP-10, SCP-MD, ECD, PW-1 (LT & RT), RAC

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
7/28/2016

NO.	REVISION	BY	DATE
6	REVISED CULVERT HEADWALL AND CULVERT LENGTH	RM	7/15/16

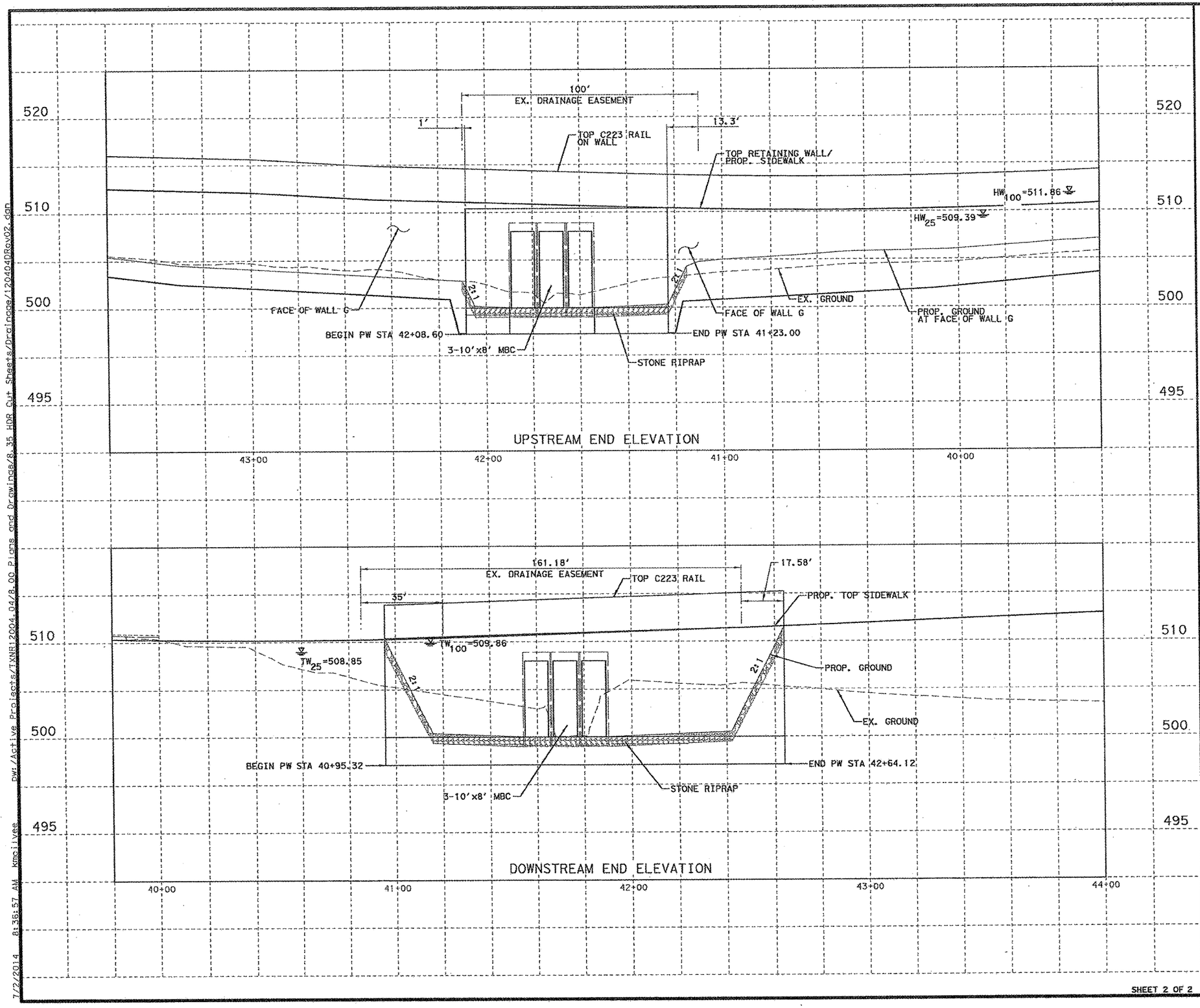
HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097
BRIDGE CLASS CULVERT LAYOUT
BROCKWAY BRANCH

Designed	KDM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked	ER	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn	KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	ER	DAL	ROCKWALL	3148	01	006	157A

SHEET 1 OF 2



20 10 0 20 40
SCALE FEET
HORZ.

5 2.5 0 5 10
SCALE FEET
VERT.

BROCKWAY BRANCH
STA 41+54.00 TO STA 41+90.00

TABLE OF QUANTITIES			
BID ITEM	DESCRIPTION	QTY	UNIT
110-2002	EXCAVATION (CHANNEL)	6590	CY
400-2002	STRUCT EXCAV (BOX)#	600	CY
432-2019	RIPRAP(STONE PROTEC.)(12 IN)	201	CY
462-2032	CONC BOX CULV (10'x8')	287	LF
466-2333	WINGWALL (PW-1)(HW=10 FT)	1	EA
466-2334	WINGWALL (PW-1)(HW=11 FT)	1	EA
496-2005	REMOV STR (WINGWALL)	2	EA
496-2008	REMOV STR (BOX CULVERT)	50	LF
169-2008	SOIL RET BLNKT (CL 2)(TY H)	890	SY

NOTES:

1. ITEM 400-2002 IS FOR CONTRACTOR'S INFORMATION ONLY.
2. TEMPORARY SHORING IS QUANTIFIED AS PART OF ROADWAY CONSTRUCTION.
3. RAIL AND REMOVALS ARE QUANTFIED WITH ROADWAY QUANTITIES.

REQUIRED STANDARDS:

1. PW: PARALLEL WINGS SKEWED/NON SKEWED
2. SCP-MD: PRECAST MISCELLANCEOUS DETAILS
3. SCP-10: PRECAST 10' SPAN BOXES
4. ECD: EXT CURB DETAILS FROM 1' TO 5'
5. RAC: BOX CULVERT RAIL MOUNTING DETAILS
6. C223: T223 W/STEEL PIPE RAIL (42" TALL)

⚠ Replaced 7/2/2014 A.T.

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
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7/2/2014

NO.	REVISION	BY	DATE

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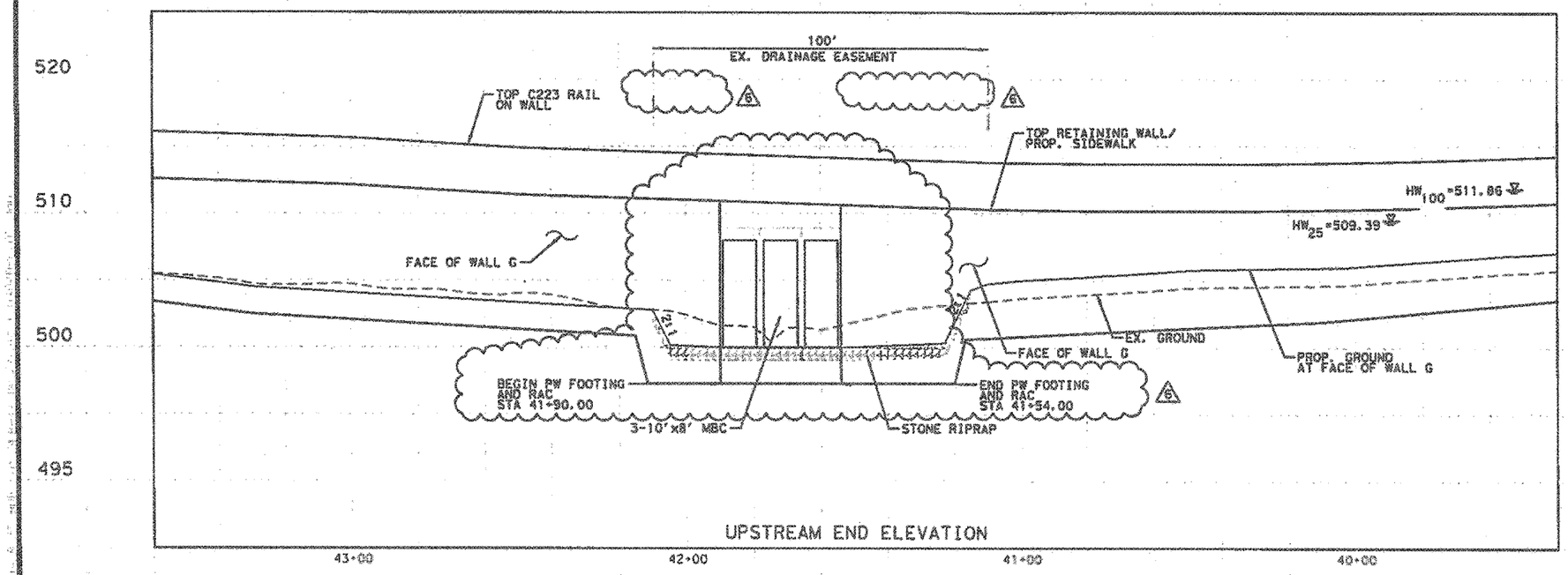
Texas Department of Transportation

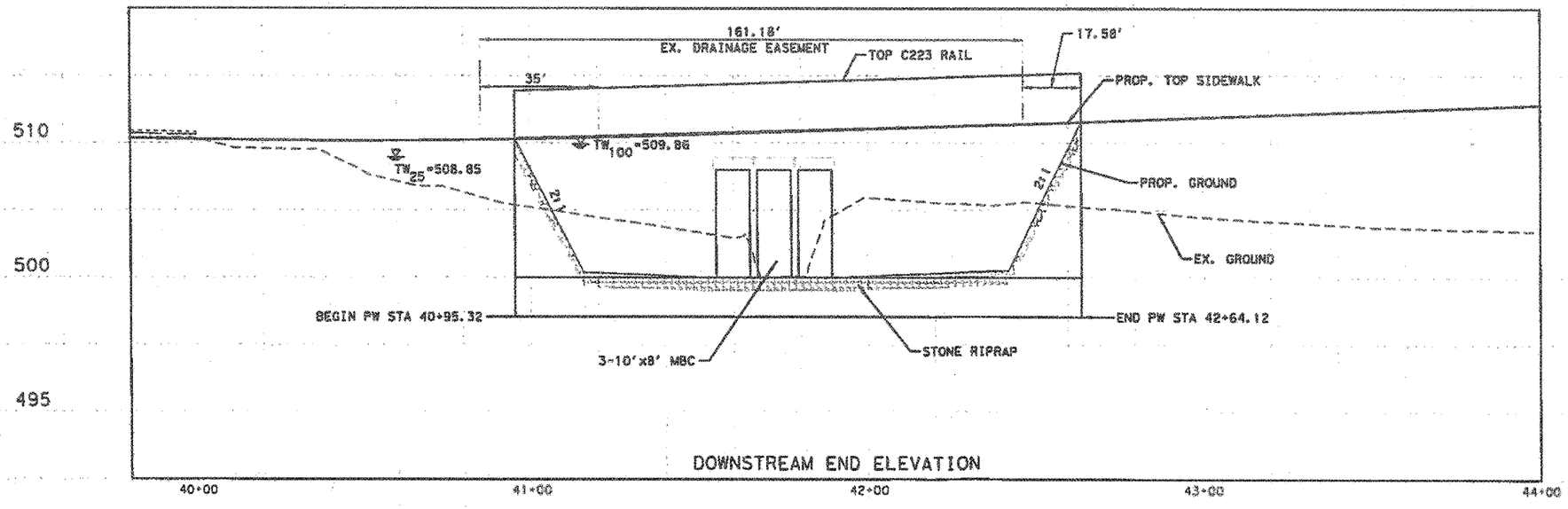
FM 3097
BRIDGE CLASS CULVERT LAYOUT
BROCKWAY BRANCH

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	KDM	6	TEXAS	STP 2013 (597) MM			FM 3097
Checked:	ER			CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	KDM	DIST.	COUNTY				
Checked:	ER	DAL	ROCKWALL	3148	01	006	158

SHEET 2 OF 2

PW:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.35 HDR Cut Sheets/Drainage/120404PRev02.dgn
7/2/2014 8:36:57 AM kmcilvee





20 10 0 20 40
SCALE FEET
HORZ.

5 2.5 0 5 10
SCALE FEET
VERT.

BROCKWAY BRANCH
STA 41+54.00 TO STA 41+90.00

TABLE OF QUANTITIES

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3. SCP-10: PRECAST 10' SPAN BOXES
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STATE OF TEXAS
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7/28/2016

NO.	REVISION	BY	DATE
6	REVISED CULVERT HEADWALL AND CULVERT LENGTH	KM	7/15/16

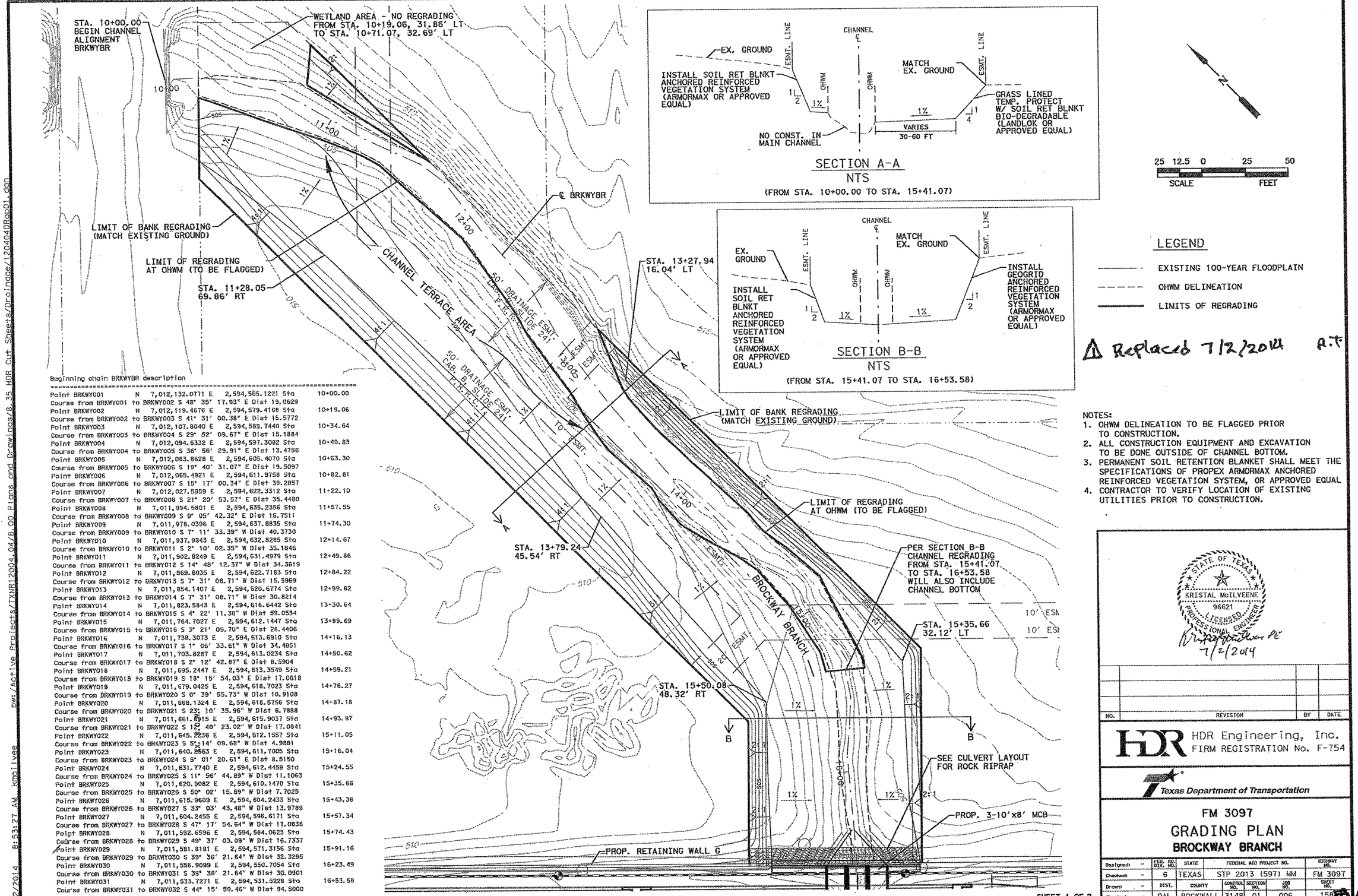
HDR Engineering, Inc.
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Texas Department of Transportation

FM 3097
BRIDGE CLASS CULVERT LAYOUT
BROCKWAY BRANCH

DESIGNED	KDM	FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
CHECKED	ER	6	TEXAS	STP 2013 (597) MM				FM 3097
DRAWN	KDM	DIST.	COUNTY	CONTROL NO.	SECTION NO.		JOB NO.	SHEET NO.
CHECKED	ER	DAL	ROCKWALL	3148	01		006	15B

SHEET 2 OF 2



SECTION A-A
NTS
(FROM STA. 10+00.00 TO STA. 15+41.07)

SECTION B-B
NTS
(FROM STA. 15+41.07 TO STA. 16+53.58)

25 12.5 0 25 50
SCALE FEET

LEGEND

- EXISTING 100-YEAR FLOODPLAIN
- OHWM DELINEATION
- LIMITS OF REGRADING

⚠ Replaced 7/2/2014 A.T

NOTES:
1. OHWM DELINEATION TO BE FLAGGED PRIOR TO CONSTRUCTION.
2. ALL CONSTRUCTION EQUIPMENT AND EXCAVATION TO BE DONE OUTSIDE OF CHANNEL BOTTOM.
3. PERMANENT SOIL RETENTION BLANKET SHALL MEET THE SPECIFICATIONS OF PROPEX ARMORMAX ANCHORED REINFORCED VEGETATION SYSTEM, OR APPROVED EQUAL
4. CONTRACTOR TO VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

Beginning chain BRKWYBR description

Point BRKWY001	N	7,012,132.0771	E	2,594,565.1221 Sta 10+00.00
Course from BRKWY001 to BRKWY002	S 48° 35' 17.93" E	Dist 19.0629		
Point BRKWY002	N	7,012,119.4676	E	2,594,579.4188 Sta 10+19.06
Course from BRKWY002 to BRKWY003	S 41° 31' 00.38" E	Dist 15.5772		
Point BRKWY003	N	7,012,107.8040	E	2,594,589.7440 Sta 10+34.64
Course from BRKWY003 to BRKWY004	S 29° 52' 09.67" E	Dist 15.1884		
Point BRKWY004	N	7,012,094.6332	E	2,594,597.3082 Sta 10+49.83
Course from BRKWY004 to BRKWY005	S 36° 56' 29.91" E	Dist 13.4756		
Point BRKWY005	N	7,012,083.8628	E	2,594,605.4070 Sta 10+63.30
Course from BRKWY005 to BRKWY006	S 19° 40' 31.07" E	Dist 19.5097		
Point BRKWY006	N	7,012,065.4921	E	2,594,611.9758 Sta 10+82.81
Course from BRKWY006 to BRKWY007	S 15° 17' 00.34" E	Dist 39.2857		
Point BRKWY007	N	7,012,027.5959	E	2,594,622.3312 Sta 11+22.10
Course from BRKWY007 to BRKWY008	S 21° 20' 53.57" E	Dist 35.4480		
Point BRKWY008	N	7,011,994.5801	E	2,594,635.2356 Sta 11+57.55
Course from BRKWY008 to BRKWY009	S 9° 05' 42.32" E	Dist 16.7511		
Point BRKWY009	N	7,011,978.0396	E	2,594,637.8835 Sta 11+74.30
Course from BRKWY009 to BRKWY010	S 7° 11' 33.39" W	Dist 40.3730		
Point BRKWY010	N	7,011,937.9843	E	2,594,632.8285 Sta 12+14.67
Course from BRKWY010 to BRKWY011	S 2° 10' 02.35" W	Dist 35.1846		
Point BRKWY011	N	7,011,902.8249	E	2,594,631.4979 Sta 12+49.86
Course from BRKWY011 to BRKWY012	S 14° 48' 12.37" W	Dist 34.3619		
Point BRKWY012	N	7,011,869.8035	E	2,594,622.7183 Sta 12+84.22
Course from BRKWY012 to BRKWY013	S 7° 31' 08.71" W	Dist 15.5969		
Point BRKWY013	N	7,011,854.1407	E	2,594,620.6774 Sta 12+99.82
Course from BRKWY013 to BRKWY014	S 7° 31' 08.71" W	Dist 30.8214		
Point BRKWY014	N	7,011,823.5843	E	2,594,616.6442 Sta 13+30.64
Course from BRKWY014 to BRKWY015	S 4° 22' 11.38" W	Dist 59.0534		
Point BRKWY015	N	7,011,764.7027	E	2,594,612.1447 Sta 13+89.69
Course from BRKWY015 to BRKWY016	S 3° 21' 09.70" E	Dist 26.4406		
Point BRKWY016	N	7,011,738.3073	E	2,594,613.6910 Sta 14+16.13
Course from BRKWY016 to BRKWY017	S 1° 06' 33.61" W	Dist 34.4851		
Point BRKWY017	N	7,011,703.8287	E	2,594,613.0234 Sta 14+50.62
Course from BRKWY017 to BRKWY018	S 2° 12' 42.87" E	Dist 8.5904		
Point BRKWY018	N	7,011,695.2447	E	2,594,613.3549 Sta 14+59.21
Course from BRKWY018 to BRKWY019	S 15° 15' 54.03" E	Dist 17.0618		
Point BRKWY019	N	7,011,679.0425	E	2,594,618.7023 Sta 14+76.27
Course from BRKWY019 to BRKWY020	S 0° 39' 55.73" W	Dist 10.9108		
Point BRKWY020	N	7,011,668.1324	E	2,594,618.5756 Sta 14+87.18
Course from BRKWY020 to BRKWY021	S 23° 10' 35.96" W	Dist 6.7888		
Point BRKWY021	N	7,011,661.8915	E	2,594,615.9037 Sta 14+93.97
Course from BRKWY021 to BRKWY022	S 15° 40' 23.02" W	Dist 17.0841		
Point BRKWY022	N	7,011,645.5236	E	2,594,612.1557 Sta 15+11.05
Course from BRKWY022 to BRKWY023	S 5° 14' 09.68" W	Dist 4.9881		
Point BRKWY023	N	7,011,640.3863	E	2,594,611.7005 Sta 15+16.04
Course from BRKWY023 to BRKWY024	S 5° 01' 20.61" E	Dist 8.5150		
Point BRKWY024	N	7,011,631.7740	E	2,594,612.4459 Sta 15+24.55
Course from BRKWY024 to BRKWY025	S 11° 56' 44.89" W	Dist 11.1063		
Point BRKWY025	N	7,011,620.9082	E	2,594,610.1470 Sta 15+35.66
Course from BRKWY025 to BRKWY026	S 50° 02' 15.69" W	Dist 7.7025		
Point BRKWY026	N	7,011,615.9609	E	2,594,604.2433 Sta 15+43.36
Course from BRKWY026 to BRKWY027	S 33° 03' 43.48" W	Dist 13.9789		
Point BRKWY027	N	7,011,604.2455	E	2,594,596.6171 Sta 15+57.34
Course from BRKWY027 to BRKWY028	S 47° 17' 54.54" W	Dist 17.0838		
Point BRKWY028	N	7,011,592.6596	E	2,594,584.0623 Sta 15+74.43
Course from BRKWY028 to BRKWY029	S 49° 37' 03.09" W	Dist 16.7337		
Point BRKWY029	N	7,011,581.8181	E	2,594,571.3156 Sta 15+91.16
Course from BRKWY029 to BRKWY030	S 39° 36' 21.64" W	Dist 32.3295		
Point BRKWY030	N	7,011,556.9099	E	2,594,550.7054 Sta 16+23.49
Course from BRKWY030 to BRKWY031	S 39° 36' 21.64" W	Dist 30.0901		
Point BRKWY031	N	7,011,533.7271	E	2,594,531.5228 Sta 16+53.58
Course from BRKWY031 to BRKWY032	S 44° 15' 59.46" W	Dist 94.5000		

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097

GRADING PLAN

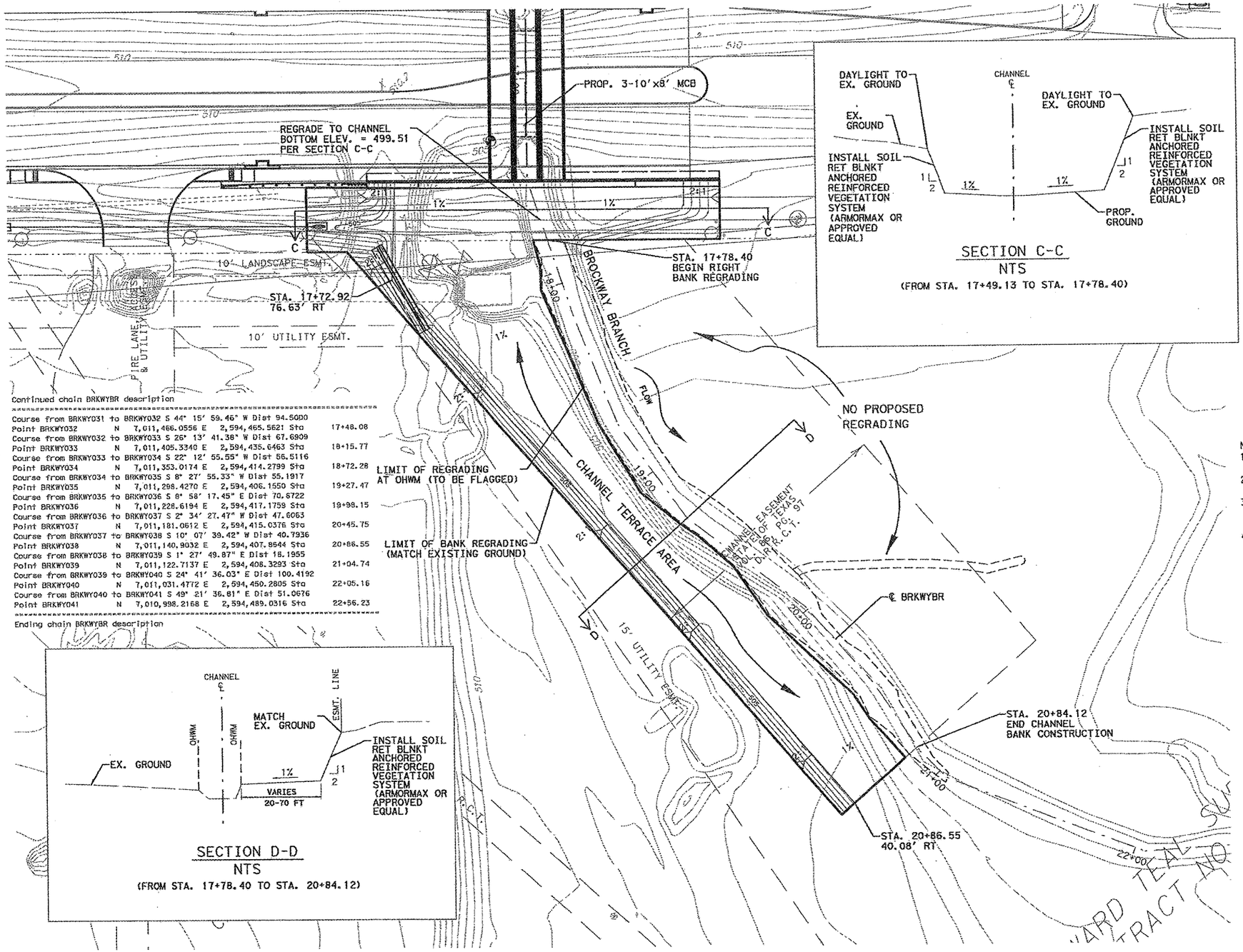
BROCKWAY BRANCH

Designed: -	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: -	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: -	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: -	DAL	ROCKWALL	3148	01	006	158

SHEET 1 OF 2

KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
7/2/2014

7/2/2014 8:53:27 AM kmcilvee P:\Active Projects\TXNR12004.04\8.00 Plans and Drawings\8.35 HDR Cut Sheets\Drainage\1204040RagD1.dgn



Continued chain BRKWYBR description

Course from BRKWY031 to BRKWY032 S 44° 15' 59.46" W Dist 94.5080					
Point BRKWY032	N	7,011,466.0556 E	2,594,465.5621 Sta		17+48.08
Course from BRKWY032 to BRKWY033 S 26° 13' 41.38" W Dist 67.6909					
Point BRKWY033	N	7,011,405.3340 E	2,594,435.6463 Sta		18+15.77
Course from BRKWY033 to BRKWY034 S 22° 12' 55.55" W Dist 56.5116					
Point BRKWY034	N	7,011,353.0174 E	2,594,414.2799 Sta		18+72.28
Course from BRKWY034 to BRKWY035 S 8° 27' 55.33" W Dist 55.1917					
Point BRKWY035	N	7,011,298.4270 E	2,594,406.1550 Sta		19+27.47
Course from BRKWY035 to BRKWY036 S 6° 58' 17.45" E Dist 70.6722					
Point BRKWY036	N	7,011,228.6194 E	2,594,417.1759 Sta		19+98.15
Course from BRKWY036 to BRKWY037 S 2° 34' 27.47" W Dist 47.6063					
Point BRKWY037	N	7,011,181.0612 E	2,594,415.0376 Sta		20+45.75
Course from BRKWY037 to BRKWY038 S 10° 07' 39.42" W Dist 40.7936					
Point BRKWY038	N	7,011,140.9032 E	2,594,407.8644 Sta		20+86.55
Course from BRKWY038 to BRKWY039 S 1° 27' 49.87" E Dist 18.1955					
Point BRKWY039	N	7,011,122.7137 E	2,594,408.3293 Sta		21+04.74
Course from BRKWY039 to BRKWY040 S 24° 41' 36.03" E Dist 100.4192					
Point BRKWY040	N	7,011,031.4772 E	2,594,450.2805 Sta		22+05.16
Course from BRKWY040 to BRKWY041 S 49° 21' 36.81" E Dist 51.0676					
Point BRKWY041	N	7,010,998.2168 E	2,594,489.0316 Sta		22+56.23

Ending chain BRKWYBR description

SECTION D-D
NTS
(FROM STA. 17+78.40 TO STA. 20+84.12)

SECTION C-C
NTS
(FROM STA. 17+49.13 TO STA. 17+78.40)

25 12.5 0 25 50
SCALE FEET

LEGEND

- EXISTING 100-YEAR FLOODPLAIN
- OHWM DELINEATION
- LIMITS OF REGRADING

Δ Replaced 7/2/2014 B.T.

NOTES:
1. OHWM DELINEATION TO BE FLAGGED PRIOR TO CONSTRUCTION.
2. ALL CONSTRUCTION EQUIPMENT AND EXCAVATION TO BE DONE OUTSIDE OF CHANNEL BOTTOM.
3. PERMANENT SOIL RETENTION BLANKET SHALL MEET THE SPECIFICATIONS OF PROPEX ARMORMAX ANCHORED REINFORCED VEGETATION SYSTEM, OR APPROVED EQUAL
4. CONTRACTOR TO VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
Kristal McIlveene P.E.
7/2/2014

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097

GRADING PLAN
BROCKWAY BRANCH

Designed: ~	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: ~	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: ~	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: ~	DAL	ROCKWALL	3148	01	006	158B Δ

SHEET 2 OF 2

7/2/2014 8:52:29 AM kmcilvee DWI/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.35 HDR Cut Sheets/Draincage/1204040Ros02.dgn

Culvert Station and/or Creek name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans ~ Span X Height	Max Fill Height (Ft)	Applicable Box Culvert Standard (4)	Applicable Wingwall or End Treatment Standard	Skew Angle (0°, 15°, 30° or 45°)	Side Slope or Channel Slope Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw (1) Height of Wingwall (Ft)	A Curb to End of Wingwall (Ft)	B Offset of End of Wingwall (Ft)	Lw Length of Longest Wingwall (Ft)	Ltw Culvert Toewall Length (Ft)	Atw Anchor Toewall Length (Ft)	Riprap Apron (C.Y.)	Class "C" (2) Conc (Curb) (C.Y.)	Class "C" (3) Conc (Wingwall) (C.Y.)	Total Wingwall Area (S.F.)
Brockway Branch, US (Lt) *	3 ~10'x 8'	3'	SCP-10	PW-1	0°	3:1	10"	10"	1.000'	9.833'	N/A	N/A	31.000'	36.000'	N/A	0.0	2.0	42.5	641
Brockway Branch, DS (Rt) *	3 ~10'x 8'	3'	SCP-10	PW-1	0°	3:1	10"	10"	2.400'	11.229'	N/A	N/A	33.688'	36.000'	N/A	0.0	3.2	53.5	757
Existing 12'x6' (Rt)	1 ~12'x 6'	4'	SCP-12	PW-1	30°	2:1	12"	12"	1.000'	8.000'	N/A	N/A	18.475'	16.166'	N/A	0.0	0.6	19.3	296

* WINGWALLS FOR PW AT BROCKWAY BRANCH ARE NON STANDARD LENGTHS. SEE BRIDGE CLASS CULVERT LAYOUT AND RETAINING WALL DETAILS FOR CULVERT WING DIMENSIONS.

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NOTES:

Skew Angle = 0° for SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standards.
30° Maximum for Safety End Treatment

SL:1 = Horizontal:1 Vertical
Side Slope at culvert for Flared or Straight Wingwalls. Channel Slope for Parallel Wingwalls.
Slope shall be 3:1 or flatter for Safety End Treatments.

T = Box Culvert Top Slab Thickness. Dimension can be found on the applicable Box Culvert Standard.

U = Box Culvert Wall Thickness. Dimension can be found on the applicable Box Culvert Standard.

C = Curb Height.

See applicable wing or end treatment standards for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.
Hw = Height of Wingwall.
A = Distance from Face of Curb to End of Wingwall (Not applicable to Parallel or Straight Wingwalls).
B = Offset of End of Wingwall (Not applicable to Parallel or Straight Wingwalls).
Lw = Length of Longest Wingwall.
Ltw = Length of Culvert Toewall (Not applicable when using Riprap Apron).
Atw = Length of Anchor Toewall (Applicable to Safety End Treatment only).
Total Wingwall Area = Wingwall area in S.F. for two wingwalls (one structure end) if Lt or Rt.
Area for four wingwalls (two structure ends) if Both.

(1) The wall heights shown will be rounded to the nearest Foot for bidding purposes.

(2) Concrete volume shown is for box culvert curb only. For curbs using the RAC standard, quantities shown must be increased by a factor of 2. If Class "S" concrete is required for the top slab of the culvert, the curb concrete shall also be Class "S". Curb concrete is considered part of the Box Culvert for payment.

(3) Concrete volume shown is total of wing, footing, culvert toewall (if any), anchor toewall (if any) and wingwall toewall. Riprap apron, culvert and curb quantities are not included.

(4) Regardless of the type of culvert shown on this sheet, the Contractor shall have the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it shall be the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

STATE OF TEXAS
KRISTAL McILVEENE
96621
LICENSED
PROFESSIONAL ENGINEER
5/6/2014

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation
Bridge Division

BOX CULVERT SUPPLEMENT
WINGS AND END TREATMENTS

BCS

FILE: bcsstdel.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		159
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

LEVELS DISPLAYED
COMMENTS:

Culvert Station and/or Creek name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans ~ Span X Height	Max Fill Height (Ft)	Applicable Box Culvert Standard (4)	Applicable Wingwall or End Treatment Standard	Skew Angle (0°, 15°, 30° or 45°)	Side Slope or Channel Slope Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw (1) Height of Wingwall (Ft)	A Curb to End of Wingwall (Ft)	B Offset of End of Wingwall (Ft)	Lw Length of Longest Wingwall (Ft)	Ltw Culvert Toewall Length (Ft)	Atw Anchor Toewall Length (Ft)	Riprap Apron (C.Y.)	Class C Conc (Curb) (2) (C.Y.)	Class C Conc (Wingwall) (3) (C.Y.)	Total Wingwall Area (S.F.)
Brockway Branch, US (Lt) *	3 ~10'x 8'	3'	SCP-10	PW-1	0°	3:1	10	10	1.000'	9.833'	N/A	N/A	31.000	36.000	N/A	0.0	2.0	42.5	641
Brockway Branch, DS (Rt) *	3 ~10'x 8'	3'	SCP-10	PW-1	0°	2:1	10	10	2.400'	11.229'	N/A	N/A	74.120'	36.000'	N/A	0.0	3.2	100.53	1,491
Existing 12'x6' (Rt)	1 ~12'x 6'	4'	SCP-12	PW-1	30°	2:1	12"	12"	1.000	8.000	N/A	N/A	16.475'	16.166'	N/A	0.0	0.6	19.3	296

9

* WINGWALLS FOR PW AT BROCKWAY BRANCH ARE NON STANDARD LENGTHS. SEE BRIDGE CLASS CULVERT LAYOUT AND RETAINING WALL DETAILS FOR CULVERT WING DIMENSIONS.

NOTES:

Skew Angle = 0° for SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standards.
30° Maximum for Safety End Treatment

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Side Slope at culvert for Flared or Straight Wingwalls. Channel Slope for Parallel Wingwalls.
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T = Box Culvert Top Slab Thickness. Dimension can be found on the applicable Box Culvert Standard.

U = Box Culvert Wall Thickness. Dimension can be found on the applicable Box Culvert Standard.

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See applicable wing or end treatment standards for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.
Hw = Height of Wingwall.
A = Distance from Face of Curb to End of Wingwall (Not applicable to Parallel or Straight Wingwalls).
B = Offset of End of Wingwall (Not applicable to Parallel or Straight Wingwalls).
Lw = Length of Longest Wingwall.
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Total Wingwall Area = Wingwall area in S.F. for two wingwalls (one structure end) if Lt or Rt.
Area for four wingwalls (two structure ends) if Both.

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(3) Concrete volume shown is total of wing, footing, culvert toewall (if any), anchor toewall (if any) and wingwall toewall. Riprap apron, culvert and curb quantities are not included.

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COMMENTS:

STATE OF TEXAS
JUAN A PAREDES
115938
LICENSED
PROFESSIONAL ENGINEER

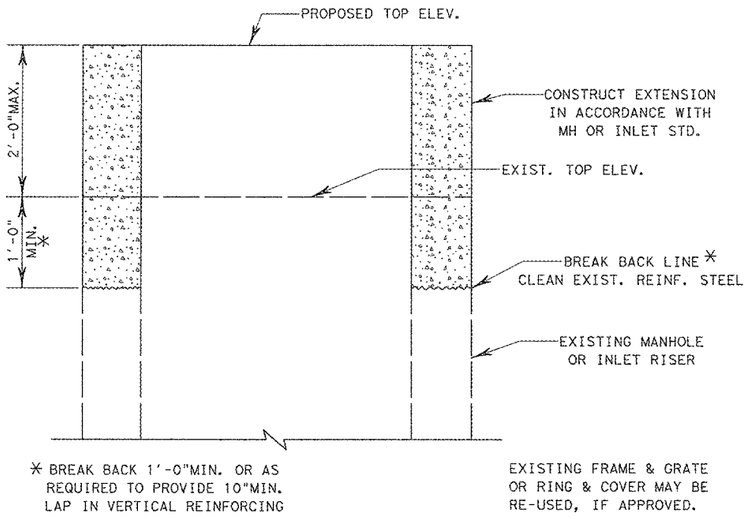
Jun A. Paredes, P.E. 9/26/16

Texas Department of Transportation
Bridge Division

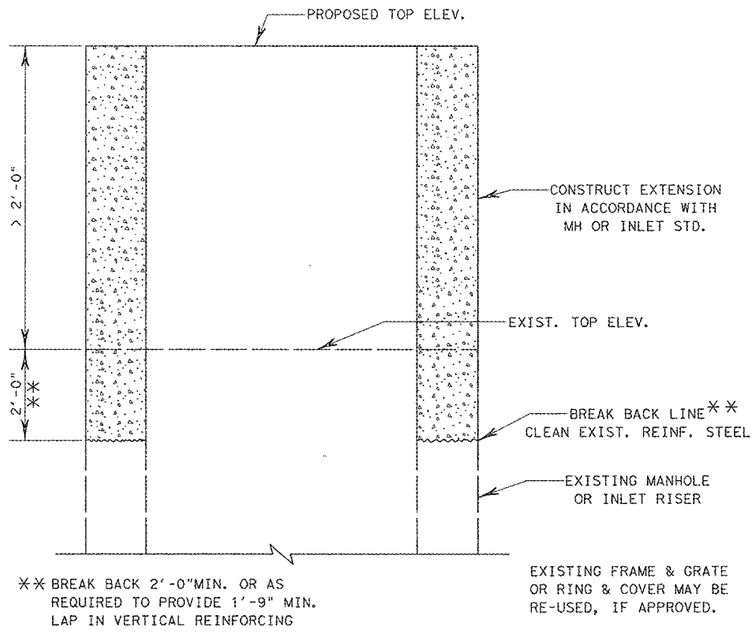
BOX CULVERT SUPPLEMENT
WINGS AND END TREATMENTS

BCS

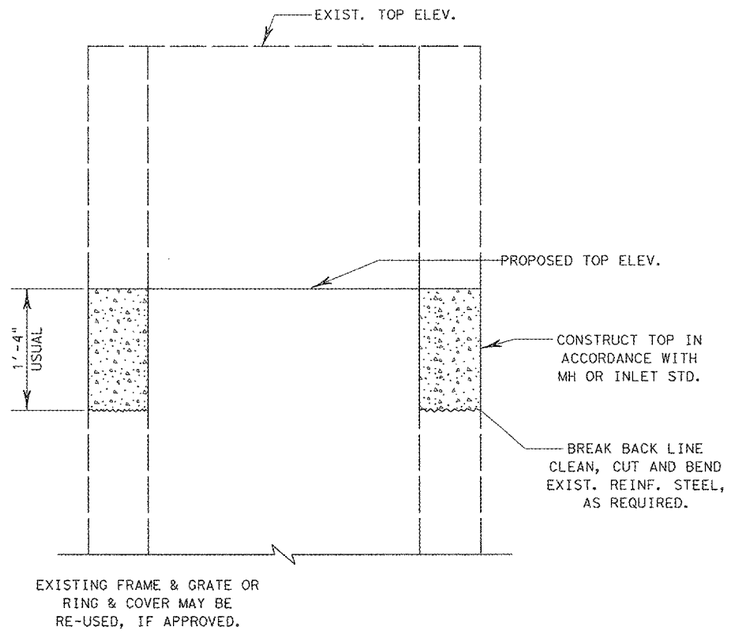
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©TxDOT 2016	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		159A
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097



VERTICAL EXTENSIONS
< 2'-0"

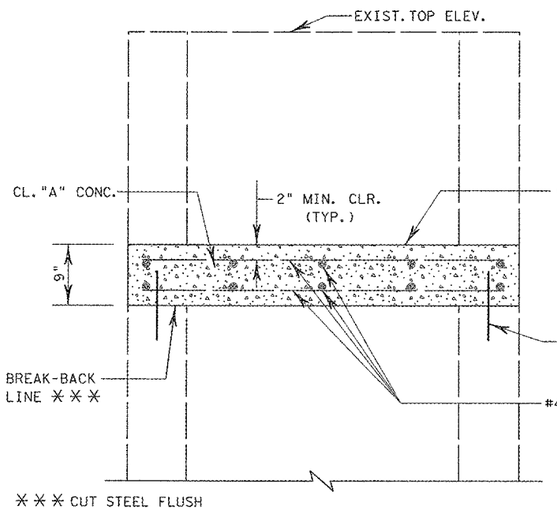


VERTICAL EXTENSIONS
> 2'-0"



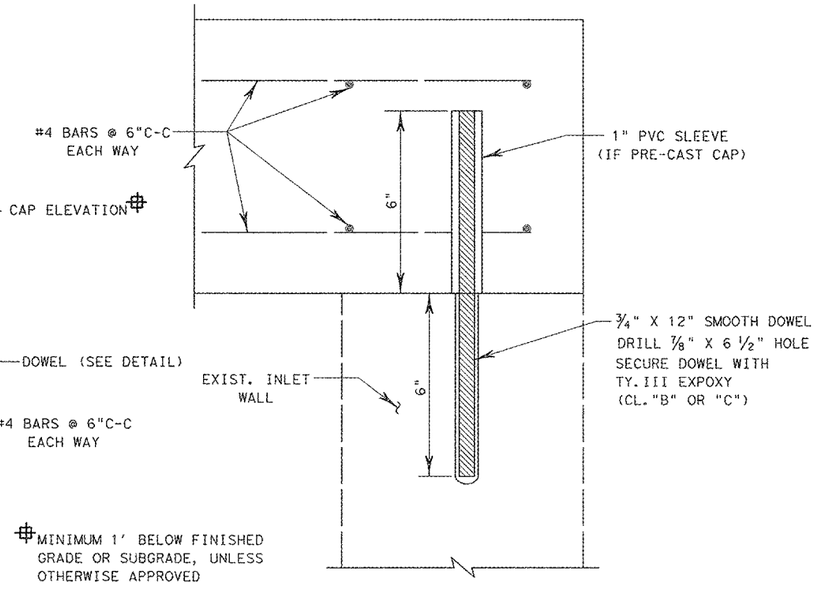
VERTICAL REDUCTION

MANHOLE AND INLET ADJUSTMENT DETAILS



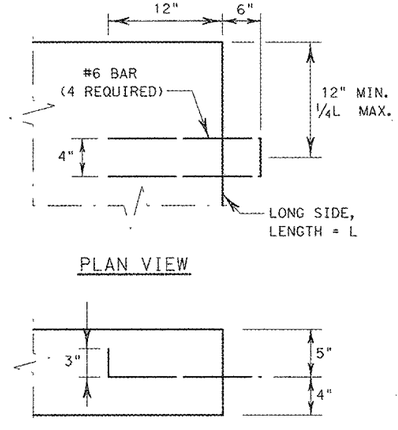
MANHOLE OR INLET CAP

PROP. EL.
EXIST. EL.



DOWEL DETAIL

MIN. - 4 EA. - PLACED AT CORNERS OF INLET OR MANHOLE
FOR CURB INLETS, PLACE AT CORNERS
AND AT 5'± C-C ALONG WALLS



LIFTING LOOPS
USE WITH PRE-CAST CAP

GENERAL NOTES

ALL CONCRETE SHALL BE CLASS A.

MANHOLE AND INLET CAPS MAY BE PRE-CAST OR CAST-IN-PLACE. IF CAST-IN-PLACE, PERMANENT METAL DECK FORMS (PMDF) MAY BE USED. THE METHOD OF SUPPORTING PMDF TO BE APPROVED IN WRITING



NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097
MANHOLE AND INLET ADJUSTMENT AND CAP DETAILS

	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	DAL	ROCKWALL	3148	01	006	160

SHEET 1 OF 1

MANHOLE AND INLET CAP DETAILS

5/4/2014 9:25:49 PM kmcilvee P:\Active Projects\TXNRI2004.04\8.00 Plans and Drawings\8.35 HDR Cut Sheets\Drainage\Standards\miscfw.dgn

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LEVELS DISPLAYED

ACC:

TABLE OF DIMENSIONS & REINFORCING STEEL
(Wings for One Structure End)

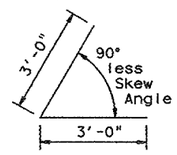
Dimensions					Variable Reinforcing				Estimated ④ Quantities per ft of wing (2~Wings)		Estimated Quantities per ft of Toewall (1~Toewall)	
					Bars J1		Bars J2					
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'- 2"	1'- 2"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'- 2"	1'- 2"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'- 9"	1'- 7"	1'- 2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'- 9"	1'- 7"	1'- 2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'- 4"	2'- 0"	1'- 4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'- 4"	2'- 0"	1'- 4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'- 0"	2'- 3"	1'- 9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'- 0"	2'- 3"	1'- 9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'- 6"	2'- 8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'- 6"	2'- 8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'- 0"	2'-10"	2'- 2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'- 5"	3'- 0"	2'- 5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'- 2"	3'- 6"	2'- 8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'- 8"	3'- 9"	2'-11"	1'- 0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'- 2"	4'- 0"	3'- 2"	1'- 2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'- 5"	3'- 5"	1'- 4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'- 6"	4'-10"	3'- 8"	1'- 6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'- 0"	3'-11"	1'- 7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING (2~Wings)

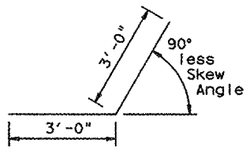
Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

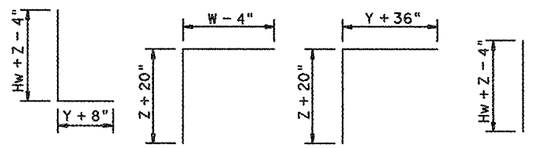
Bar	Size	No	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



BARS D1



BARS D2



BARS J1 BARS J2 BARS J3 BARS V

WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)

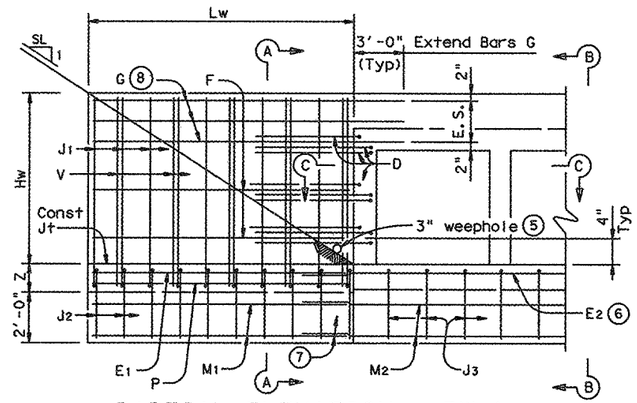
Hw = H + T + C
Lw = (Hw) (SL) ÷ Cosine Θ for Ty PW-1
= (Hw - 1') (SL) ÷ Cosine Θ for Ty PW-2 and Hw ≥ 4'
= (Hw - 0.5') (SL) ÷ Cosine Θ for Ty PW-2 and Hw < 4'

For Cast-in-place culverts:
Ltw = [(N) (S) + (N + 1) (U)] ÷ Cosine Θ

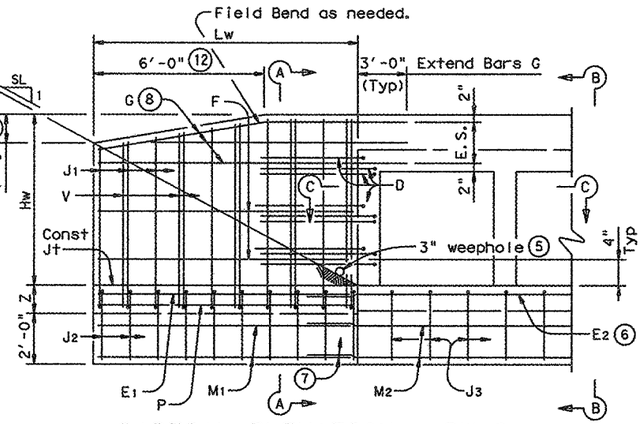
For Precast culverts:
Ltw = [(N) (2 U + S) + (N - 1) (0.5')] ÷ Cosine Θ
Total Wingwall Area (Two Wings ~ SF)
= (2) (Hw) (Lw) for Ty PW-1
= (2) (Hw) (Lw) - 6 SF for Ty PW-2 and Hw ≥ 4'
= (2) (Hw) (Lw) - 1.5 SF for Ty PW-2 and Hw < 4'

Hw = Height of Wingwall
Lw = Length of Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans
SL:1 = Channel Slope ratio. (Horizontal: 1 Vertical, Usual value is 2:1)
Θ = Culvert Skew

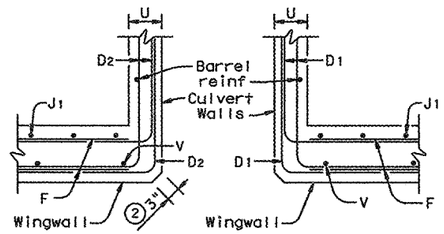
See applicable box culvert standard for S, H, T and U values.



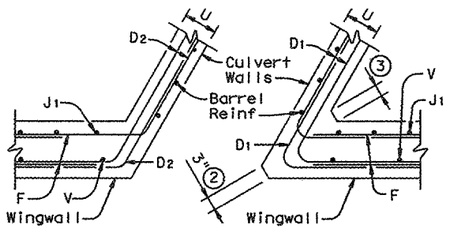
PARTIAL ELEVATION - PW-1



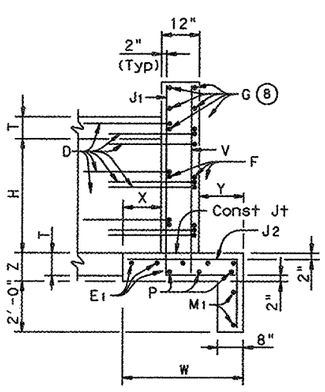
PARTIAL ELEVATION - PW-2



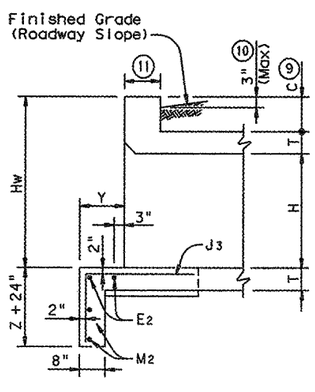
SECTION C-C



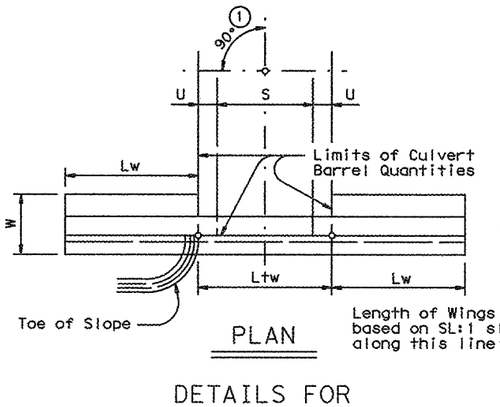
SECTION C-C



SECTION A-A
(Showing Wing Reinf)

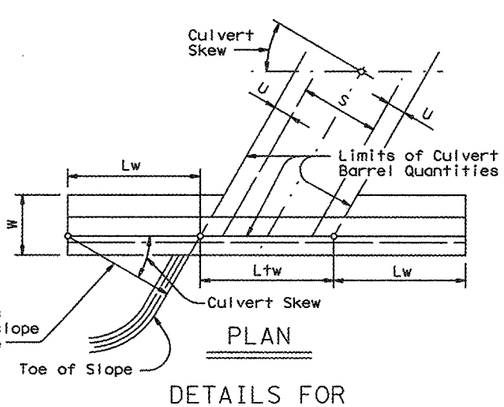


SECTION B-B
(Showing Wing Reinf)



PLAN

DETAILS FOR
NON-SKEWED BOX CULVERTS



PLAN

DETAILS FOR
SKEWED BOX CULVERTS
(Showing 30° Skew)

① Skew Angle = 0°

② At discharge end, chamfer may be ¾".

③ For 15° Skew ~ 1"
For 30° Skew ~ 2"
For 45° Skew ~ 3"

④ Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.

⑤ Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.

⑥ Extend Bars E2 1'-6" minimum into the wingwall footing.

⑦ Lap Bars M1 1'-6" minimum with Bars M2.

⑧ Bars G equally spaced at 8" maximum, place as shown. Provide at least two pair Bars G per wing.

⑨ 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

⑩ For vehicle safety, the following requirements must be met:
- For structures without bridge rail, curbs cannot project more than 3" above finished grade.
- For structures with bridge rail, build curbs flush with finished grade.
Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

⑪ 1'-0" typical. 2'-0" typical when RAC standard is referenced elsewhere in the plans.

⑫ 3'-0" for Hw < 4'.

⑬ 6" for Hw < 4'.

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.

Provide Class "C" Concrete (f'c = 3,600 psi Min) and Grade 60 reinforcing steel.

Provide 1 ¼" Min clear cover to reinforcing steel.

Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.

See BCS sheet for wingwall type and additional dimensions and information.

The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

DESIGNER NOTES:

Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.

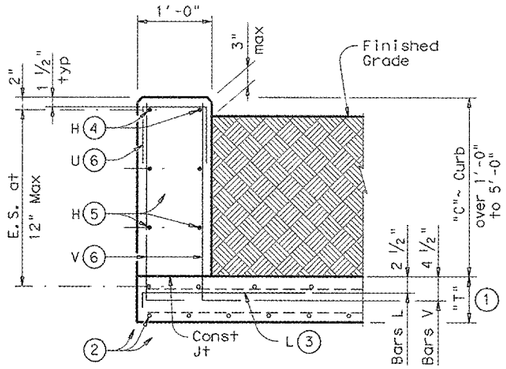
Type PW-2 can only be used for applications without a railing mounted to the wingwall.

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Bridge Division

CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

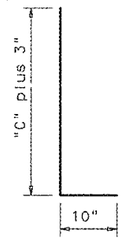
PW

FILE: pwstde01.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	SEE TITLE SHEET		161
11-10: Reinforcing Quantities. 01-12: PW-1 & PW-2.	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097



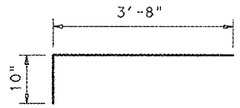
TYPICAL SECTION

Used for Curbs over 1'-0" to 5'-0"



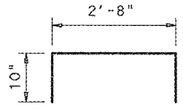
BARS V (#5) (6)

Spaced at 12" max



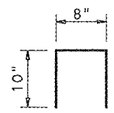
BARS L (#5) (3)

Spaced at 12" max



OPTIONAL BARS L (#5) (3)(7)

Spaced at 12" max



BARS U (#4) (6)

Spaced at 12" max

(1) "T" is equal to the culvert top slab thickness. For Precast Boxes with slabs less than 7", see SCP-MD Standard for additional details.

(2) Normal culvert slab bars adjusted as necessary to clear obstructions.

(3) Place bars L as shown. Tilt hook as necessary to maintain cover.

(4) Place normal culvert curb bars H (#4) as shown. Adjust as necessary to clear obstructions.

(5) Additional bars H (#4) as required to maintain 12" max spa.

(6) Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" max. Adjust length of bars V as necessary to maintain clear cover.

(7) Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.

(8) Quantities shown are for contractor's information only. Quantities are per linear foot of curb length. The values for each section type in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES (8)

Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)
1'-0"	0.037	8.9
1'-6"	0.056	14.3
2'-0"	0.074	15.4
2'-6"	0.093	17.7
3'-0"	0.111	18.8
3'-6"	0.130	21.2
4'-0"	0.148	22.2
4'-6"	0.167	24.6
5'-0"	0.185	25.6

GENERAL NOTES:

Designed according to current AASHTO LRFD Specifications.

These extended curb details have sufficient strength to allow for future retrofit of Type T6 railing. These details are suitable for use with PR1, PR2 and PR3 type rails. These details are not suitable for the mounting of other rail types. For new construction using T6 railing, use the T6-CM standards.

All reinforcing shall be Grade 60. Adjust reinforcing as necessary to provide 1 ¼" cover.

All concrete for curbs shall be Class "C" with a minimum compressive strength of 3600 psi.

This Curb shall be considered as part of the Box Culvert for payment.

For vehicle safety, the top of the curb shall project no more than 3" above the finished grade.

DISCLAIMER:
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LEVELS DISPLAYED

PATH:

Texas Department of Transportation
Bridge Division

EXTENDED CURB DETAILS

FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL

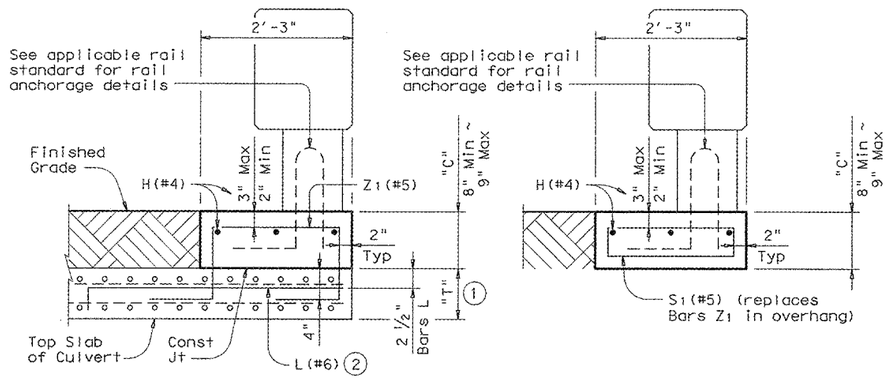
ECD

FILE: ecdstdet.dgn	DW: GAF	CK:	DW: TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		162
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

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ACC:

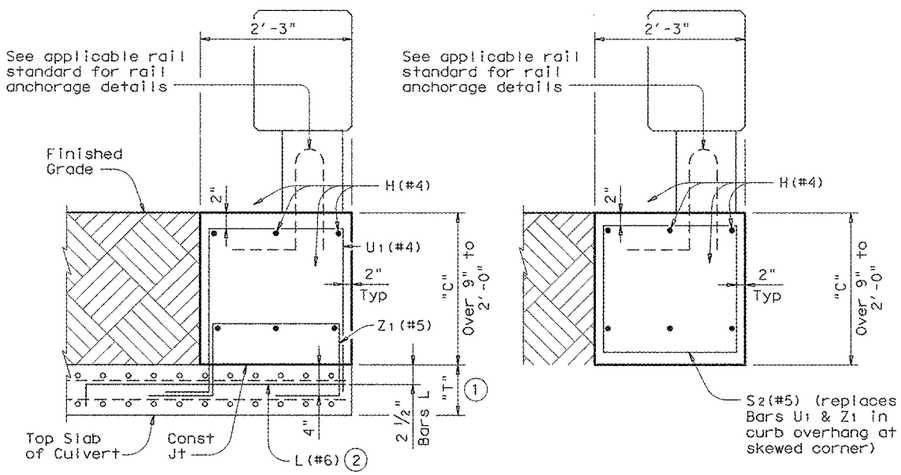
LEVELS DISPLAYED



SECTION A-A SECTION B-B

TYPE 1 CURB

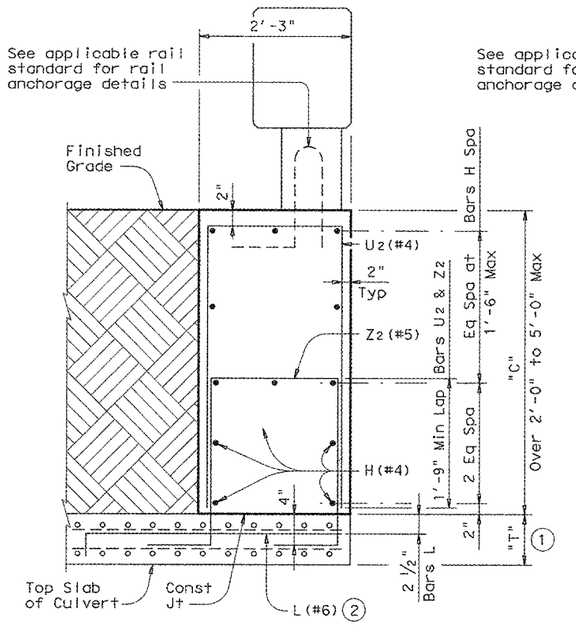
Used for curbs from 8" to 9" (Showing "C"= 9"). Showing T223 Rail, other rails similar. (Bars L on T223 and C223 Rails are not used for this structure). Bars H as shown and required on standards T80HT and T80SS are not required.



SECTION A-A SECTION B-B

TYPE 2 CURB

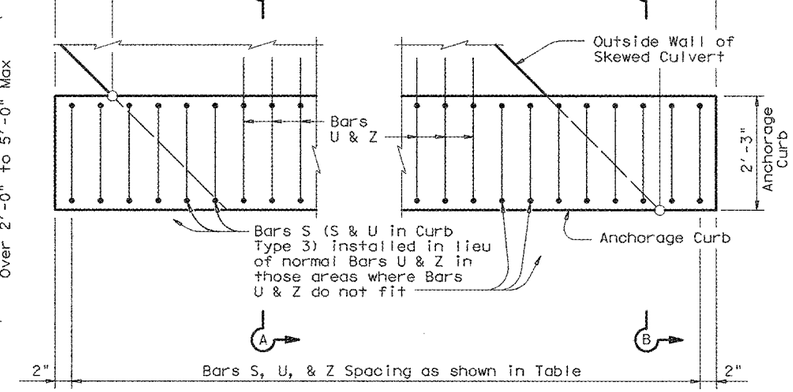
Used for curbs over 9" to 2'-0" (Showing "C"= 2'-0"). Showing T223 Rail, other rails similar. (Bars L on T223 and C223 Rails are not used for this structure). Bars H as shown and required on standards T80HT and T80SS are not required.



SECTION A-A SECTION B-B

TYPE 3 CURB

Used for curbs over 2'-0" to 5'-0" (Showing "C"= 4'-0"). Showing T223 Rail, other rails similar. (Bars L on T223 and C223 Rails are not used for this structure). Bars H as shown and required on standards T80HT and T80SS are not required.



TYPICAL CURB PLAN

Showing typical installation on skewed culvert. (Bars L on T223 and C223 Rails are not used for this structure). Bars H as shown and required on standards T80HT and T80SS are not required.

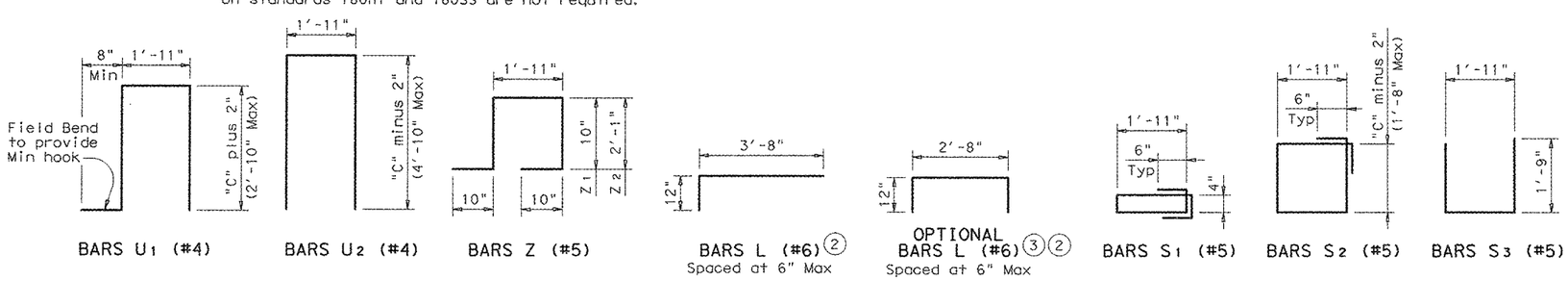


TABLE OF REINFORCING SPACING		
Curb Height "C"	Section Type	Bars S, U, & Z Spa
8" to 9"	1	12"
Over 9" to 2'-0"	2	9"
Over 2'-0" to 3'-0"	3	7"
Over 3'-0" to 5'-0"	3	5"

TABLE OF ESTIMATED QUANTITIES (4)			
Curb Height "C"	Section Type	Reinf Steel (Lb/LF)	Class "C" Concrete (CY/LF)
8"	1	21.5	0.056
9"	1	21.5	0.063
1'-0"	2	29.7	0.083
1'-6"	2	30.6	0.125
2'-0"	2	31.5	0.167
3'-0"	3	44.6	0.250
4'-0"	3	56.8	0.333
5'-0"	3	60.0	0.417

(1) "T" is equal to the culvert top slab thickness. For Precast Boxes with slabs less than 7", see SCP-MD Standard for additional details.

(2) Tilt Bars L hook as necessary to maintain cover.

(3) Optional Bars L are to be used only for Precast Box Culverts with 3'-0" closure pours.

(4) Quantities shown are for Contractor's information only. Quantities are per Linear Foot of curb length. The values for each section type in table can be interpolated for intermediate values of Curb Height, "C".

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

The rail anchorage curb details have sufficient strength for use with all standard rail types.

See appropriate rail standard for approved design speed restrictions, notes and details not shown.

All reinforcing steel must be Grade 60.

All concrete must be Class "C" with a minimum compressive strength of 3,600 psi.

When using this anchorage curb, omit normal culvert curb reinforcing bars K and H shown on the culvert standard sheets.

This anchorage curb is considered part of the Box Culvert for payment.

For vehicle safety, the top of the curb must be flush with the finished grade.

SPECIAL NOTE:

These details are for use with curbs that are 8" to 5'-0" tall only. Curb heights that are less than or greater than those shown will require special design.

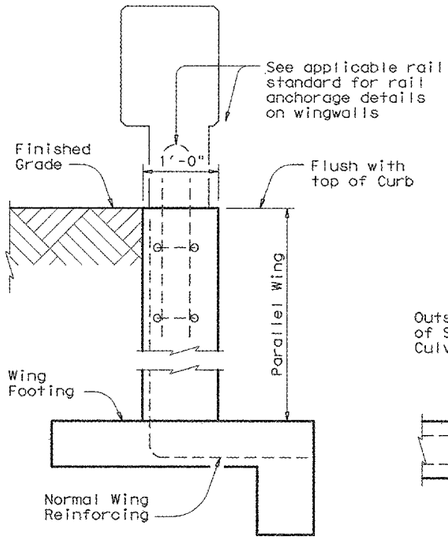
Texas Department of Transportation
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RAIL ANCHORAGE CURB
BOX CULVERT
RAIL MOUNTING DETAILS
(CURBS 8" TO 5'-0" TALL ONLY)

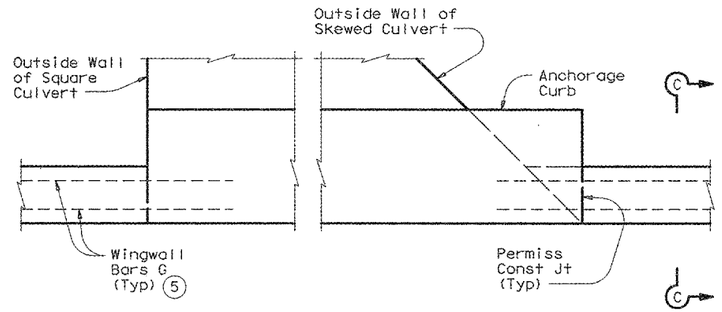
RAC

FILE: racste01.dgn	DN: GAF	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		163
05-11: Type 3 Curb, Sect B-B, Gen Notes, Tied Anchor PL. 07-12: Width.	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

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SECTION C-C



TYPICAL CURB PLAN
Curb reinforcing and footings not shown for clarity

INSTALLATION AT PARALLEL CULVERT WINGWALLS

See culvert wingwall standard for bars and details not shown.

(5) Bars G (#5), as identified on the PARALLEL WINGS PW standard sheet, must extend 1'-6" into the Anchorage Curb similar to that shown for a normal culvert curb.

LEVELS DISPLAYED
ACC:

SHEET 2 OF 2

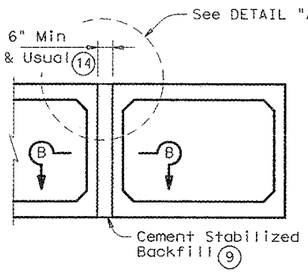
Texas Department of Transportation
Bridge Division

RAIL ANCHORAGE CURB
BOX CULVERT
RAIL MOUNTING DETAILS
(CURBS 8" TO 5'-0" TALL ONLY)

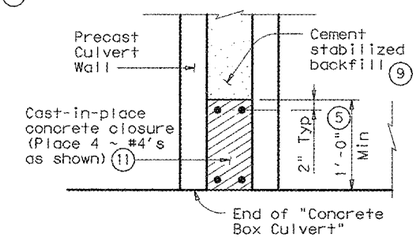
RAC

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©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		164
05-11: Type 3 Curb, Sect B-B, Gen Notes, T101 Anchor Pt. 07-12: Width.	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

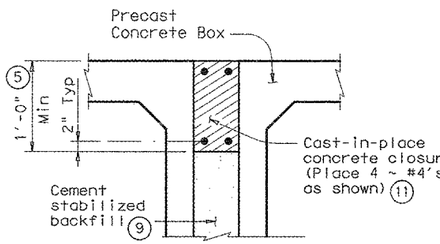
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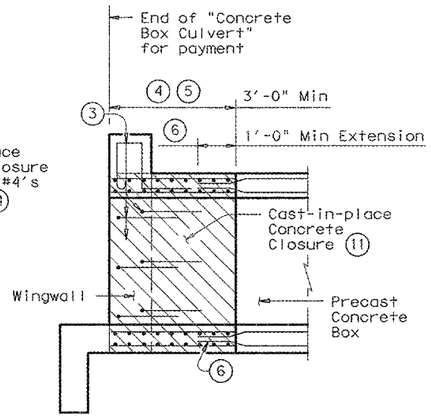
MULTIPLE UNIT PLACEMENT



SECTION B-B

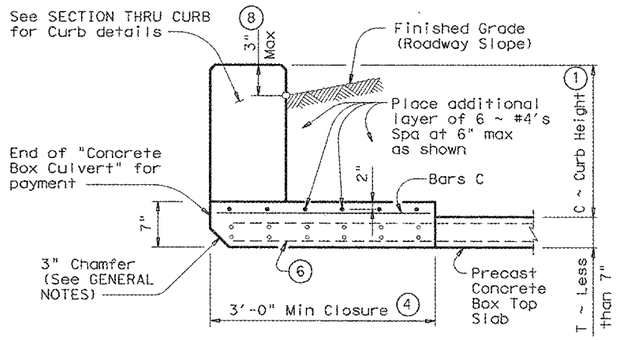


DETAIL "A" (13)

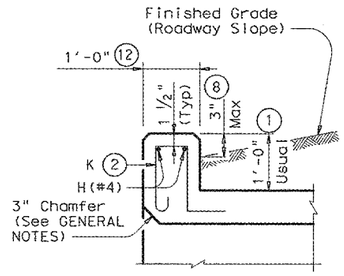


WINGWALL CONNECTION

(Also applies to Safety End Treatment)

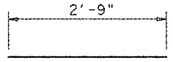


SECTION THRU TOP SLABS LESS THAN 7"

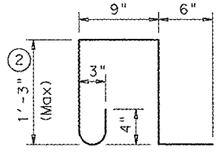


SECTION THRU CURB

(10) QUANTITIES PER FOOT OF CURB	
Reinforcing Steel	4.18 Lb
Concrete	0.037 CY



BARS C ~ #4
(Spa = 1'-0" Max)



BARS K ~ #4
(Spa = 1'-0" Max)
(Length = 4'-3")

(1) 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 traffic rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

(2) For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

(3) Curb, Wingwall or Safety End Treatment reinforcing shall extend into concrete closure. Any reinforcing that does not fit into the closure shall be bent or trimmed as necessary.

(4) Cast-in-place concrete closure shall be 3'-0" min. Boxes shall be cast short or broken back in the field. All reinforcing in the closure shall be the same size and spacing as in the precast box section. Except where shown otherwise, the cast-in-place closure shall be flush with the inside and outside faces of the precast box section.

(5) For multiple unit placements the length of the closure for the interior walls may be adjusted as necessary. The length of the top slab, bottom slab, and exterior wall closure shall not be less than 3'-0". See Section B-B detail when interior walls are cast full length.

(6) Precast box reinforcing shall extend a minimum of 1'-0" into concrete closure (Typ).

(7) Bands of reinforcing matching the inside and outside face reinforcing shall be placed in the gaps of the top and bottom slabs. A band matching the outside face reinforcing of the wall shall be placed in the gaps of the walls (placed in the outside face only). The bands shall be tack welded to the exposed reinforcing at each point of contact.

(8) For vehicle safety, the following requirements must be met:
- For structures without bridge rail, curbs shall project no more than 3" above finished grade.
- For structures with bridge rail, curbs shall be flush with finished grade.

Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(9) Cement Stabilized Backfill between boxes is considered part of the Box Culvert for payment.

(10) All curb concrete and reinforcing is considered part of the Box Culvert for payment.

(11) Any additional concrete and reinforcing required for the closures shall be considered as subsidiary to the Concrete Box Culvert.

(12) 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.

(13) For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in DETAIL "A".

(14) This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

GENERAL NOTES:

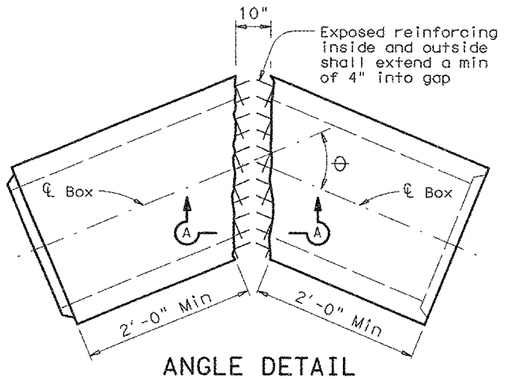
Designed according to AASHTO LRFD Specifications.

All closure concrete shall be Class "C" with a minimum compressive strength of 3600 psi and shall be placed according to the Item, "Concrete Structures".

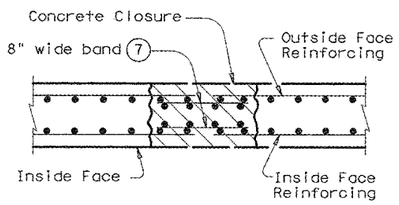
Any additional concrete required for the closures shall be considered as subsidiary to the Concrete Box Culvert.

Refer to the Single Box Culverts Precast standard for details not shown.

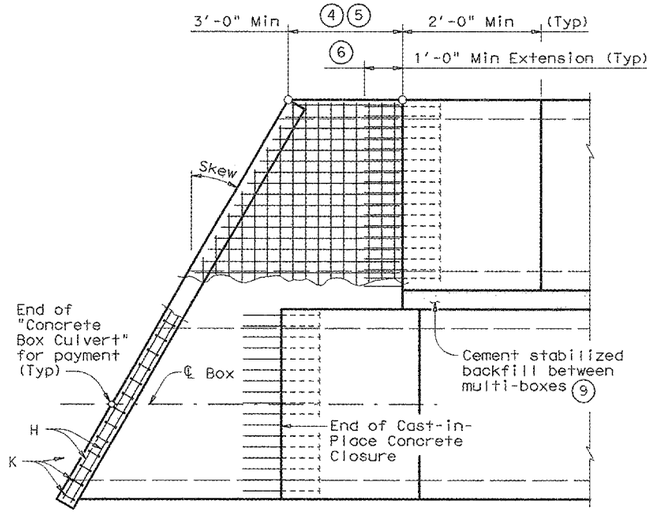
The bottom edge of the top slab closure shall be chamfered 3 inches at the entrance.



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi-box placement)

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Bridge Division

BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

FILE: scpmdste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		165
	COUNTY	CONTROL	SECT JOB	HIGHWAY
	ROCKWALL	3148	01 006	FM 3097

LEVELS DISPLAYED ACC:

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ACC:

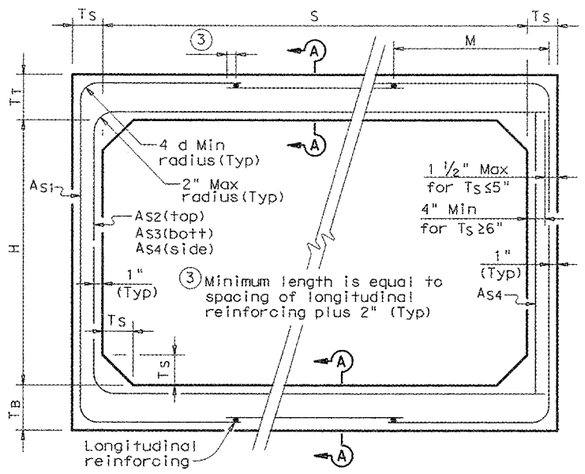
LEVELS DISPLAYED

BOX DATA

SECTION DIMENSIONS					Fill Height	M (Min)	REINFORCING (in^2/ft) ②								① Lift Weight (Tons)
S (ft)	H (ft)	T_T (in)	T_B (in)	T_S (in)	(ft)	(in)	A_{S1}	A_{S2}	A_{S3}	A_{S4}	A_{S5}	A_{S6}	A_{S7}	A_{S8}	
10	5	10	10	10	<2	-	0.30	0.36	0.30	0.24	0.24	0.24	0.24	0.24	17.5
10	5	10	10	10	2<3	58	0.35	0.39	0.34	0.24	-	-	-	-	17.5
10	5	10	10	10	3-5	53	0.28	0.31	0.30	0.24	-	-	-	-	17.5
10	5	10	10	10	10	52	0.33	0.35	0.36	0.24	-	-	-	-	17.5
10	5	10	10	10	15	47	0.42	0.46	0.47	0.24	-	-	-	-	17.5
10	5	10	10	10	20	47	0.55	0.59	0.61	0.24	-	-	-	-	17.5
10	5	10	10	10	25	47	0.68	0.73	0.75	0.24	-	-	-	-	17.5
10	6	10	10	10	<2	-	0.28	0.38	0.33	0.24	0.24	0.24	0.24	0.24	18.5
10	6	10	10	10	2<3	58	0.32	0.42	0.37	0.24	-	-	-	-	18.5
10	6	10	10	10	3-5	52	0.26	0.34	0.33	0.24	-	-	-	-	18.5
10	6	10	10	10	10	52	0.30	0.38	0.39	0.24	-	-	-	-	18.5
10	6	10	10	10	15	47	0.39	0.49	0.51	0.24	-	-	-	-	18.5
10	6	10	10	10	20	47	0.50	0.63	0.65	0.24	-	-	-	-	18.5
10	6	10	10	10	25	47	0.61	0.78	0.80	0.24	-	-	-	-	18.5
10	7	10	10	10	<2	-	0.25	0.40	0.36	0.24	0.24	0.24	0.24	0.24	19.5
10	7	10	10	10	2<3	58	0.30	0.45	0.40	0.24	-	-	-	-	19.5
10	7	10	10	10	3-5	58	0.24	0.36	0.35	0.24	-	-	-	-	19.5
10	7	10	10	10	10	52	0.28	0.40	0.42	0.24	-	-	-	-	19.5
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10	7	10	10	10	20	47	0.46	0.67	0.69	0.24	-	-	-	-	19.5
10	7	10	10	10	25	47	0.56	0.82	0.85	0.24	-	-	-	-	19.5
10	8	10	10	10	<2	-	0.24	0.41	0.38	0.24	0.24	0.24	0.24	0.24	20.5
10	8	10	10	10	2<3	64	0.27	0.47	0.43	0.24	-	-	-	-	20.5
10	8	10	10	10	3-5	58	0.24	0.38	0.38	0.24	-	-	-	-	20.5
10	8	10	10	10	10	52	0.26	0.42	0.44	0.24	-	-	-	-	20.5
10	8	10	10	10	15	47	0.34	0.54	0.57	0.24	-	-	-	-	20.5
10	8	10	10	10	20	47	0.43	0.69	0.72	0.24	-	-	-	-	20.5
10	9	10	10	10	<2	-	0.24	0.42	0.41	0.24	0.24	0.24	0.24	0.24	21.5
10	9	10	10	10	2<3	70	0.26	0.50	0.46	0.24	-	-	-	-	21.5
10	9	10	10	10	3-5	64	0.24	0.40	0.40	0.24	-	-	-	-	21.5
10	9	10	10	10	10	58	0.25	0.43	0.46	0.24	-	-	-	-	21.5
10	9	10	10	10	15	52	0.32	0.56	0.59	0.24	-	-	-	-	21.5
10	9	10	10	10	20	47	0.40	0.71	0.75	0.24	-	-	-	-	21.5
10	10	10	10	10	<2	-	0.24	0.44	0.44	0.24	0.24	0.24	0.24	0.24	22.5
10	10	10	10	10	2<3	79	0.25	0.52	0.48	0.24	-	-	-	-	22.5
10	10	10	10	10	3-5	70	0.24	0.42	0.43	0.24	-	-	-	-	22.5
10	10	10	10	10	10	64	0.24	0.44	0.48	0.24	-	-	-	-	22.5
10	10	10	10	10	15	52	0.30	0.57	0.61	0.24	-	-	-	-	22.5
10	10	10	10	10	20	52	0.38	0.73	0.77	0.24	-	-	-	-	22.5

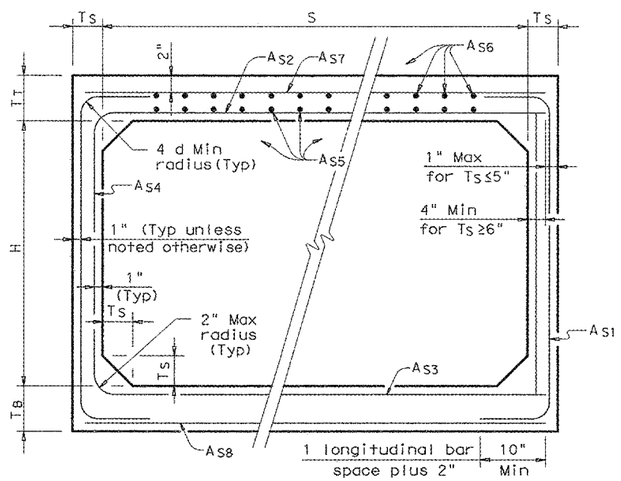
① For Box Length = 8'-0"

② A_{S1} thru A_{S4}, A_{S7} and A_{S8} are minimum required areas of reinforcement per linear foot of box length. A_{S6} and A_{S5} are minimum required areas of reinforcement per linear foot of box width.



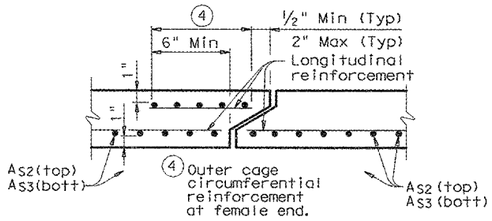
CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT



SECTION A-A

(TOP AND BOTTOM SLAB JOINT REINFORCEMENT)

GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.

All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.

See SCP-MD standard sheet for miscellaneous details and notes not shown.

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structures".

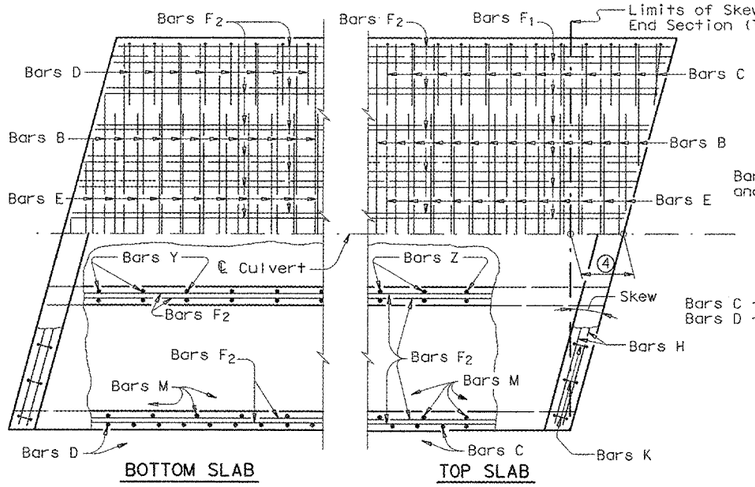
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Texas Department of Transportation
Bridge Division

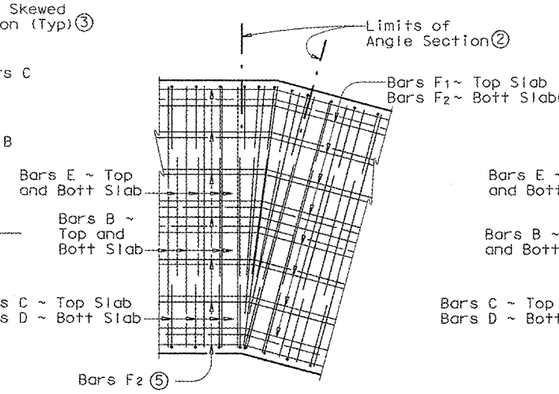
SINGLE BOX CULVERTS PRECAST
10'-0" SPAN

SCP-10

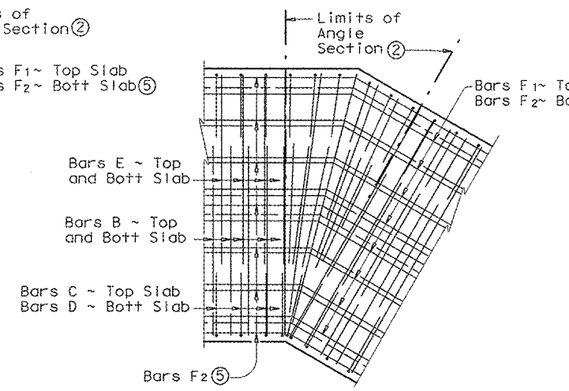
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©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		166
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	ROCKWALL	3148	01	006	FM 3097



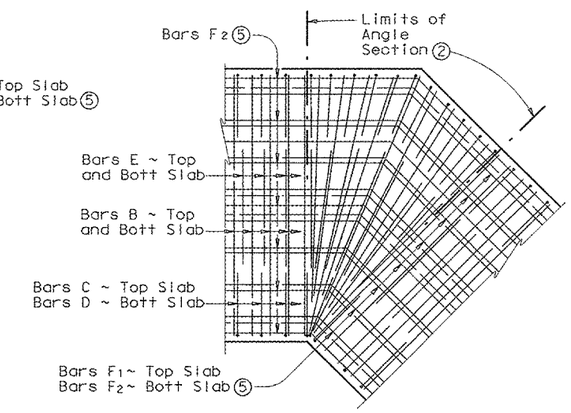
PLAN OF SKEWED ENDS ~ FROM 0° TO 15° ⑦



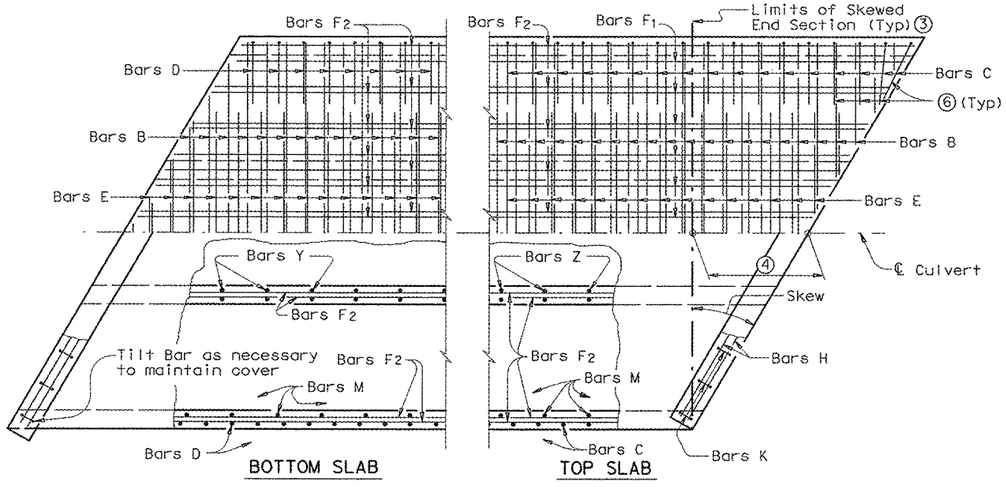
PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



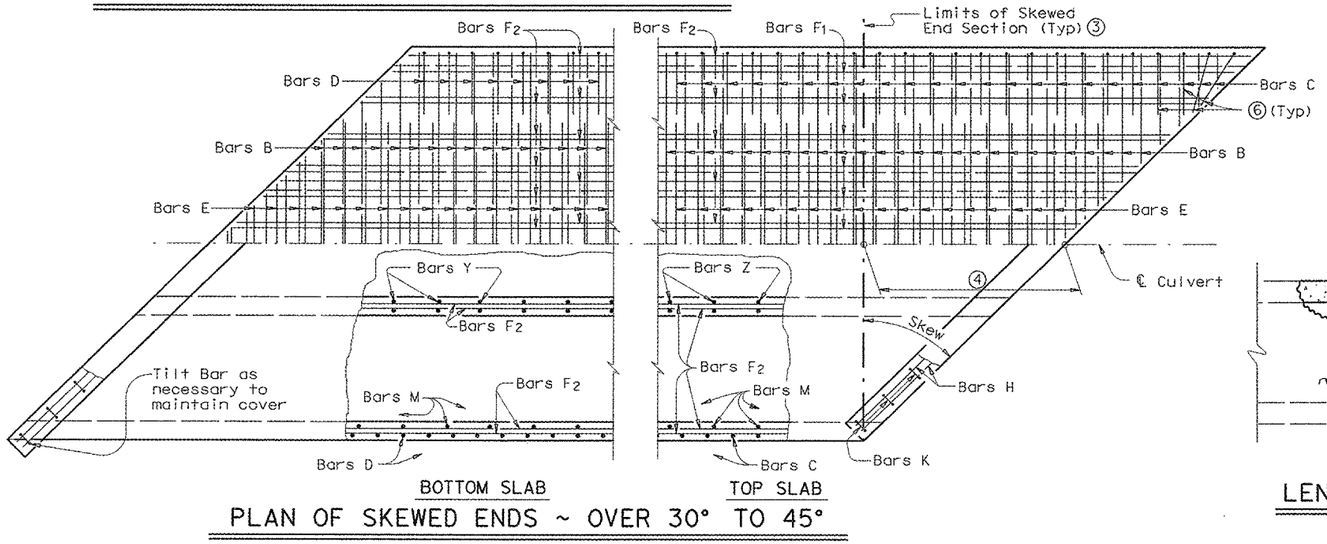
PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



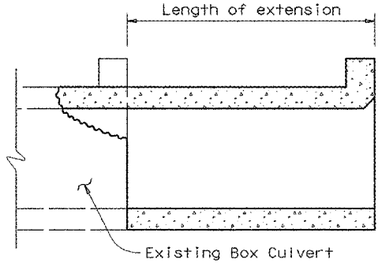
PLAN OF ANGLE SECTION ~ OVER 30° TO 45°



PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



LENGTHENING DETAIL ①

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

All reinforcing steel shall be Grade 60.

All concrete shall be Class "C" with these exceptions: use Class "S" for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

Class "C" concrete shall have a minimum compressive strength of 3,600 psi. Class "S" concrete shall have a minimum compressive strength of 4,000 psi.

Refer to Multiple Box Culverts Cast-in-Place standard for details of straight sections of culvert. For skewed sections and angle sections refer to Multiple Box Culverts Cast-in-Place standard for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown. For Skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume and reinforcing steel weight by dividing the values shown on the culvert standards by the cosine of the skew angle.

The use of permanent forms is not allowed.

Laps for Bars H, when required, shall be 1'-9" for uncoated bars and 2'-7" for epoxy coated.

① For box culverts with less than 2'-0" of fill, the top slab shall be broken back to provide a minimum 1'-10" lap of the existing longitudinal bars with the longitudinal bars in the extension. If the depth of fill is 2'-0" or greater, the top slab shall be broken back to provide a 1'-0" minimum embedment of existing longitudinal reinforcing into the extension. Alternatively, if the fill height is greater than 2'-0", the existing curb may be left in place and 2'-0" long #6 bars shall be drilled and grouted 1'-0" into the existing top slab at 1'-6" center to center spacing. Wings and apron shall be broken back as necessary to install the extension. Exposed wingwall and apron reinforcing may be removed or cleaned and included in the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, horizontal and vertical transitions shall be formed as directed by the Engineer. Bottom slabs shall match to maintain an uninterrupted flow line. Existing and new reinforcing shall be field bent into transition maintaining specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, the "H" dimension may be adjusted to provide a smooth riding surface.

② When the spacing between Bars B or Bars E becomes less than half of the normal spacing, bars shall be cut to avoid fouling

③ The length of Bars B and E will vary in the skewed end sections

④ [One half of overall width] x [Tan of the skew angle]

⑤ Bars F1 and F2 shall be continuous through the angle section. They shall be bent to remain parallel to the walls of the Box Culvert.

⑥ When necessary to avoid fouling in acute corners, the slab extension leg of Bars C and Bars D may be shortened to a minimum of 1'-6" for skews of 30° and 45°.

⑦ For skews of 15° or less, the contractor has the option of placing Bars B, C, D and E parallel to the skewed end while maintaining spacing along centerline box. Lengths of Bars B and E shown on the standards shall be increased to accommodate the skew.

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MULTIPLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS

MC-MD

FILE: mc-mdste.dgn	DN: GAF	CK: LAW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		167
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

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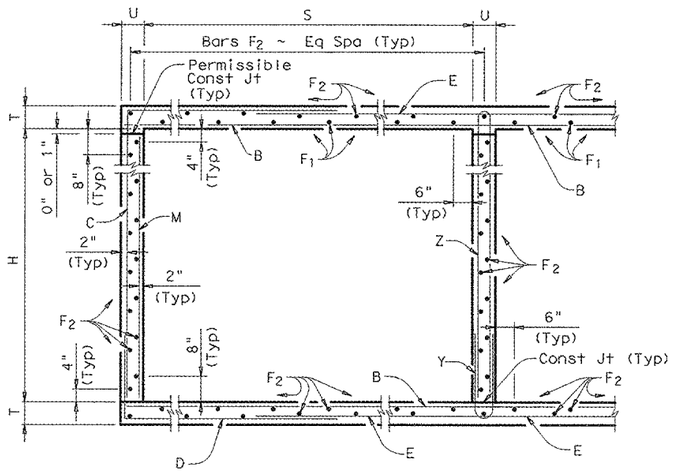
ACTIVE FILE LEVELS DISPLAYED

COMMENTS:

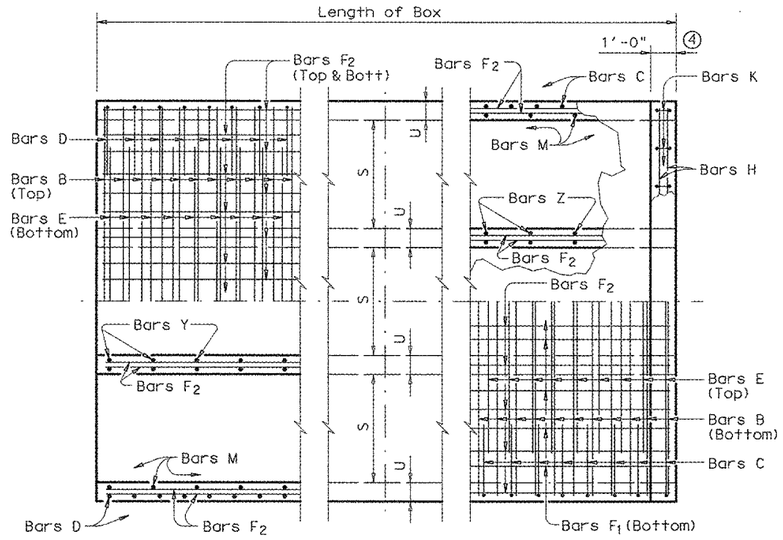
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ACC:

LEVELS DISPLAYED



TYPICAL SECTION



PART PLANS

① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

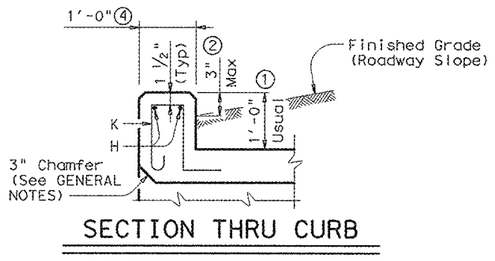
② For vehicle safety, the following requirements must be met:
- For structures without bridge rail, curbs shall project no more than 3" above finished grade.
- For structures with bridge rail, curbs shall be flush with finished grade.
Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

③ For curbs less than 1'-0" high, tilt bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, bars K may be omitted.

④ 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.

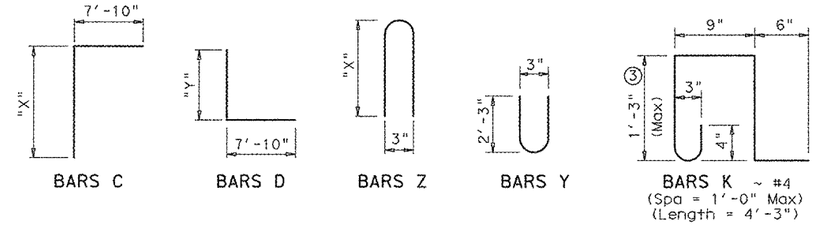
Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
WWR required = (0.44 sq in/ 0.5') x (60 ksi/70 ksi) = 0.754 sq in/ft.
If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = (0.306 sq in/ 0.754 sq in/ft) x 12 in/ft = 4.87" Max spacing.
Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).



SECTION THRU CURB

H	Bar Dimensions	
	"X"	"Y"
5'-0"	5'-6"	2'- 3"
6'-0"	6'-6"	2'- 3"
7'-0"	7'-6"	2'- 3"
8'-0"	8'-6"	2'- 3"
9'-0"	9'-6"	2'- 3"
10'-0"	10'-6"	2'- 8"



GENERAL NOTES:
Designed according to AASHTO LRFD Specifications.
Designed to the maximum fill height shown.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" with these exceptions: use Class "S" for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.
Class "C" concrete shall have a minimum compressive strength of 3,600 psi. Class "S" concrete shall have a minimum compressive strength of 4,000 psi.
The use of permanent forms is not allowed.
The bottom edge of the top slab shall be chamfered 3" at the entrance.
Reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
Construction joints shown at the flow line may be raised a maximum of 6" at the Contractor's option. If this option is used, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.
See standard MC-MD for skewed ends, angle sections and lengthening details.

HL93 LOADING

Texas Department of Transportation
Bridge Division

MULTIPLE BOX CULVERTS CAST-IN-PLACE
10'-0" SPAN
0' TO 7' FILL

MC-10-7

FILE: mc107ste.dgn	DN: CAF	CK: LMW	DW: BWH/TxDOT	CK: CAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		168
10-12: Added WWR	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

BILLS OF REINFORCING STEEL (For Box Length = 40 feet)

NUMBER OF SPANS	SECTION DIMENSIONS				Bars B⑤				Bars C & D						Bars E				Bars F_1 ~#4				Bars F_2 ~#4 at 1'-6" Max			Bars M~#4 at 1'-6" Max			Bars Y & Z~#4 at 8" Max				Bars H ⑤ 4~#4		Bars K	
												Bar C		Bar D																						
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Length	Wt	No.	Length	Wt	No.	Bar Y Length	Bar Y Wt	Bar Z Length	Bar Z Wt	Length	Weight	No.	Weight
2	10'-0"	5'-0"	8"	7"	162	#6	6"	21'- 6"	5,231	194	#4	5"	13'- 4"	1,728	10'- 1"	1,307	162	#6	6"	11'- 0"	2,677	30	8"	39'-9"	797	72	39'-9"	1,912	56	5'- 0"	187	61	4'- 8"	190	11'- 2"	455	21'- 6"	57	46	131
3	10'-0"	5'-0"	8"	7"	162	#6	6"	32'- 1"	7,807	194	#4	5"	13'- 4"	1,728	10'- 1"	1,307	162	#6	6"	21'- 7"	5,252	45	8"	39'-9"	1,195	103	39'-9"	2,735	56	5'- 0"	187	122	4'- 8"	380	11'- 2"	910	32'- 1"	86	66	187
4	10'-0"	5'-0"	8"	7"	162	#6	6"	42'- 8"	10,382	194	#4	5"	13'- 4"	1,728	10'- 1"	1,307	162	#6	6"	32'- 2"	7,827	60	8"	39'-9"	1,593	134	39'-9"	3,558	56	5'- 0"	187	183	4'- 8"	570	11'- 2"	1,365	42'- 8"	114	88	250
5	10'-0"	5'-0"	8"	7"	162	#6	6"	53'- 3"	12,957	194	#4	5"	13'- 4"	1,728	10'- 1"	1,307	162	#6	6"	42'- 9"	10,402	75	8"	39'-9"	1,991	165	39'-9"	4,381	56	5'- 0"	187	244	4'- 8"	761	11'- 2"	1,820	53'- 3"	142	110	312
6	10'-0"	5'-0"	8"	7"	162	#6	6"	66'- 5"	16,161	194	#4	5"	13'- 4"	1,728	10'- 1"	1,307	162	#6	6"	53'- 4"	12,977	90	8"	39'-9"	2,390	196	39'-9"	5,204	56	5'- 0"	187	305	4'- 8"	951	11'- 2"	2,275	65'- 7"	175	130	369
2	10'-0"	6'-0"	8"	7"	162	#6	6"	21'- 6"	5,231	194	#4	5"	14'- 4"	1,857	10'- 1"	1,307	162	#6	6"	11'- 0"	2,677	30	8"	39'-9"	797	78	39'-9"	2,071	56	6'- 0"	224	61	4'- 8"	190	13'- 2"	537	21'- 6"	57	46	131
3	10'-0"	6'-0"	8"	7"	162	#6	6"	32'- 1"	7,807	194	#4	5"	14'- 4"	1,857	10'- 1"	1,307	162	#6	6"	21'- 7"	5,252	45	8"	39'-9"	1,195	111	39'-9"	2,947	56	6'- 0"	224	122	4'- 8"	380	13'- 2"	1,073	32'- 1"	86	66	187
4	10'-0"	6'-0"	8"	7"	162	#6	6"	42'- 8"	10,382	194	#4	5"	14'- 4"	1,857	10'- 1"	1,307	162	#6	6"	32'- 2"	7,827	60	8"	39'-9"	1,593	144	39'-9"	3,824	56	6'- 0"	224	183	4'- 8"	570	13'- 2"	1,610	42'- 8"	114	88	250
5	10'-0"	6'-0"	8"	7"	162	#6	6"	53'- 3"	12,957	194	#4	5"	14'- 4"	1,857	10'- 1"	1,307	162	#6	6"	42'- 9"	10,402	75	8"	39'-9"	1,991	177	39'-9"	4,700	56	6'- 0"	224	244	4'- 8"	761	13'- 2"	2,146	53'- 3"	142	110	312
6	10'-0"	6'-0"	8"	7"	162	#6	6"	66'- 5"	16,161	194	#4	5"	14'- 4"	1,857	10'- 1"	1,307	162	#6	6"	53'- 4"	12,977	90	8"	39'-9"	2,390	210	39'-9"	5,576	56	6'- 0"	224	305	4'- 8"	951	13'- 2"	2,683	65'- 7"	175	130	369
2	10'-0"	7'-0"	8"	7"	162	#6	6"	21'- 6"	5,231	194	#4	5"	15'- 4"	1,987	10'- 1"	1,307	162	#6	6"	11'- 0"	2,677	30	8"	39'-9"	797	78	39'-9"	2,071	56	7'- 0"	262	61	4'- 8"	190	15'- 2"	618	21'- 6"	57	46	131
3	10'-0"	7'-0"	8"	7"	162	#6	6"	32'- 1"	7,807	194	#4	5"	15'- 4"	1,987	10'- 1"	1,307	162	#6	6"	21'- 7"	5,252	45	8"	39'-9"	1,195	111	39'-9"	2,947	56	7'- 0"	262	122	4'- 8"	380	15'- 2"	1,236	32'- 1"	86	66	187
4	10'-0"	7'-0"	8"	7"	162	#6	6"	42'- 8"	10,382	194	#4	5"	15'- 4"	1,987	10'- 1"	1,307	162	#6	6"	32'- 2"	7,827	60	8"	39'-9"	1,593	144	39'-9"	3,824	56	7'- 0"	262	183	4'- 8"	570	15'- 2"	1,854	42'- 8"	114	88	250
5	10'-0"	7'-0"	8"	7"	162	#6	6"	53'- 3"	12,957	194	#4	5"	15'- 4"	1,987	10'- 1"	1,307	162	#6	6"	42'- 9"	10,402	75	8"	39'-9"	1,991	177	39'-9"	4,700	56	7'- 0"	262	244	4'- 8"	761	15'- 2"	2,472	53'- 3"	142	110	312
6	10'-0"	7'-0"	8"	7"	162	#6	6"	66'- 5"	16,161	194	#4	5"	15'- 4"	1,987	10'- 1"	1,307	162	#6	6"	53'- 4"	12,977	90	8"	39'-9"	2,390	210	39'-9"	5,576	56	7'- 0"	262	305	4'- 8"	951	15'- 2"	3,090	65'- 7"	175	130	369
2	10'-0"	8'-0"	8"	7"	162	#6	6"	21'- 6"	5,231	194	#4	5"	16'- 4"	2,117	10'- 1"	1,307	162	#6	6"	11'- 0"	2,677	30	8"	39'-9"	797	84	39'-9"	2,230	56	8'- 0"	299	61	4'- 8"	190	17'- 2"	700	21'- 6"	57	46	131
3	10'-0"	8'-0"	8"	7"	162	#6	6"	32'- 1"	7,807	194	#4	5"	16'- 4"	2,117	10'- 1"	1,307	162	#6	6"	21'- 7"	5,252	45	8"	39'-9"	1,195	119	39'-9"	3,160	56	8'- 0"	299	122	4'- 8"	380	17'- 2"	1,399	32'- 1"	86	66	187
4	10'-0"	8'-0"	8"	7"	162	#6	6"	42'- 8"	10,382	194	#4	5"	16'- 4"	2,117	10'- 1"	1,307	162	#6	6"	32'- 2"	7,827	60	8"	39'-9"	1,593	154	39'-9"	4,089	56	8'- 0"	299	183	4'- 8"	570	17'- 2"	2,099	42'- 8"	114	88	250
5	10'-0"	8'-0"	8"	7"	162	#6	6"	53'- 3"	12,957	194	#4	5"	16'- 4"	2,117	10'- 1"	1,307	162	#6	6"	42'- 9"	10,402	75	8"	39'-9"	1,991	189	39'-9"	5,019	56	8'- 0"	299	244	4'- 8"	761	17'- 2"	2,798	53'- 3"	142	110	312
6	10'-0"	8'-0"	8"	7"	162	#6	6"	66'- 5"	16,161	194	#4	5"	16'- 4"	2,117	10'- 1"	1,307	162	#6	6"	53'- 4"	12,977	90	8"	39'-9"	2,390	224	39'-9"	5,948	56	8'- 0"	299	305	4'- 8"	951	17'- 2"	3,498	65'- 7"	175	130	369
2	10'-0"	9'-0"	8"	7"	162	#6	6"	21'- 6"	5,231	194	#4	5"	17'- 4"	2,246	10'- 1"	1,307	162	#6	6"	11'- 0"	2,677	30	8"	39'-9"	797	90	39'-9"	2,390	56	9'- 0"	337	61	4'- 8"	190	19'- 2"	781	21'- 6"	57	46	131
3	10'-0"	9'-0"	8"	7"	162	#6	6"	32'- 1"	7,807	194	#4	5"	17'- 4"	2,246	10'- 1"	1,307	162	#6	6"	21'- 7"	5,252	45	8"	39'-9"	1,195	127	39'-9"	3,372	56	9'- 0"	337	122	4'- 8"	380	19'- 2"	1,562	32'- 1"	86	66	187
4	10'-0"	9'-0"	8"	7"	162	#6	6"	42'- 8"	10,382	194	#4	5"	17'- 4"	2,246	10'- 1"	1,307	162	#6	6"	32'- 2"	7,827	60	8"	39'-9"	1,593	164	39'-9"	4,355	56	9'- 0"	337	183	4'- 8"	570	19'- 2"	2,343	42'- 8"	114	88	250
5	10'-0"	9'-0"	8"	7"	162	#6	6"	53'- 3"	12,957	194	#4	5"	17'- 4"	2,246	10'- 1"	1,307	162	#6	6"	42'- 9"	10,402	75	8"	39'-9"	1,991	201	39'-9"	5,337	56	9'- 0"	337	244	4'- 8"	761	19'- 2"	3,124	53'- 3"	142	110	312
6	10'-0"	9'-0"	8"	7"	162	#6	6"	66'- 5"	16,161	162	#5	6"	17'- 4"	2,929	10'- 6"	1,774	162	#6	6"	53'- 4"	12,977	90	8"	39'-9"	2,390	238	39'-9"	6,320	56	9'- 0"	337	305	4'- 8"	951	19'- 2"	3,905	65'- 7"	175	130	369
2	10'-0"	10'-0"	8"	7"	162	#6	6"	21'- 6"	5,231	162	#5	6"	18'- 4"	3,098	10'- 6"	1,774	162	#6	6"	11'- 0"	2,677	30	8"	39'-9"	797	90	39'-9"	2,390	56	10'- 0"	374	61	4'- 8"	190	21'- 2"	862	21'- 6"	57	46	131
3	10'-0"	10'-0"	8"	7"	162	#6	6"	32'- 1"	7,807	162	#5	6"	18'- 4"	3,098	10'- 6"	1,774	162	#6	6"	21'- 7"	5,252	45	8"	39'-9"	1,195	127	39'-9"	3,372	56	10'- 0"	374	122	4'- 8"	380	21'- 2"	1,725	32'- 1"	86	66	187
4	10'-0"	10'-0"	8"	7"	162	#6	6"	42'- 8"	10,382	162	#5	6"	18'- 4"	3,098	10'- 6"	1,774	162	#6	6"	32'- 2"	7,827	60	8"	39'-9"	1,593	164	39'-9"	4,355	56	10'- 0"	374	183	4'- 8"	570	21'- 2"	2,587	42'- 8"	114	88	250
5	10'-0"	10'-0"	8"	7"	162	#6	6"	53'- 3"	12,957	162	#5	6"	18'- 4"	3,098	10'- 6"	1,774	162	#6	6"	42'- 9"	10,402	75	8"	39'-9"	1,991	201	39'-9"	5,337	56	10'- 0"	374	244	4'- 8"	761	21'- 2"	3,450	53'- 3"	142	110	312
6	10'-0"	10'-0"	8"	7"	162	#6	6"	66'- 5"	16,161	162	#5	6"	18'- 4"	3,098	10'- 6"	1,774	162	#6	6"	53'- 4"	12,977	90	8"	39'-9"	2,390	238	39'-9"	6,320	56	10'- 0"	374	305	4'- 8"	951	21'- 2"	4,312	65'- 7"	175	130	369

QUANTITIES

Per foot of Barrel		Curb		Total	
Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
1.398	362.1	1.6	188	57.5	14,672
2.029	537.5	2.4	273	83.6	21,774
2.659	712.9	3.2	364	109.6	28,881
3.290	888.4	4.0	454	135.6	35,988
3.921	1,079.5	4.7	544	161.5	43,724
1.463	372.3	1.6	188	60.1	15,079
2.115	551.1	2.4	273	87.0	22,315
2.767	729.9	3.2	364	113.9	29,558
3.420	908.6	4.0	454	140.8	36,799
4.072	1,103.2	4.7	544	167.6	44,670
1.528	378.5	1.6	188	62.7	15,328
2.202	559.3	2.4	273	90.5	22,646
2.876	740.2	3.2	364	118.2	29,970
3.549	921.0	4.0	454	146.0	37,293
4.223	1,117.5	4.7	544	173.6	45,245
1.593	388.7	1.6	188	65.3	15,736
2.288	572.9	2.4	273	93.9	23,189
2.984	757.1	3.2	364	122.6	30,647
3.679	941.3	4.0	454	151.2	38,105
4.374	1,141.2	4.7	544	179.7	46,192
1.657	398.9	1.6	188	67.9	16,144
2.374	586.5	2.4	273	97.4	23,731
3.092	774.0	3.2	364	126.9	31,324
3.809	961.6	4.0	454	156.4	38,916
4.526	1,193.6	4.7	544	185.7	48,288
1.722	434.8	1.6	188	70.5	17,581
2.461	624.4	2.4	273	100.8	25,250
3.200	814.0	3.2	364	131.2	32,924
3.938	1,003.6	4.0	454	161.5	40,598
4.677	1,208.9	4.7	544	191.8	48,901

⑤ Bar lengths over 60' include one bar lap as follows:
#4 = 1'-9", #5 = 2'-2", & #6 = 2'-7"
For Epoxy coated reinforcing, bar laps shall be as follows:
#4 = 2'-7", #5 = 3'-3", & #6 = 3'-10"

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
WWR required = (0.44 sq in/ 0.5') x (60 ksi/70 ksi) = 0.754 sq in/ft.
If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = (0.306 sq in/ 0.754 sq in/ft) x 12 in/ft = 4.87" Max spacing.
Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).

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.

LEVELS DISPLAYED | ACC:

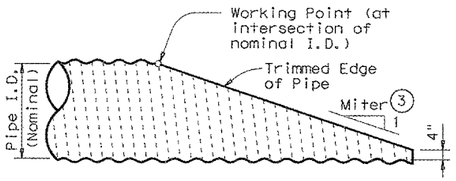
HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation
Bridge Division

MULTIPLE BOX CULVERTS CAST-IN-PLACE
10'-0" SPAN
0' TO 7' FILL

MC-10-7

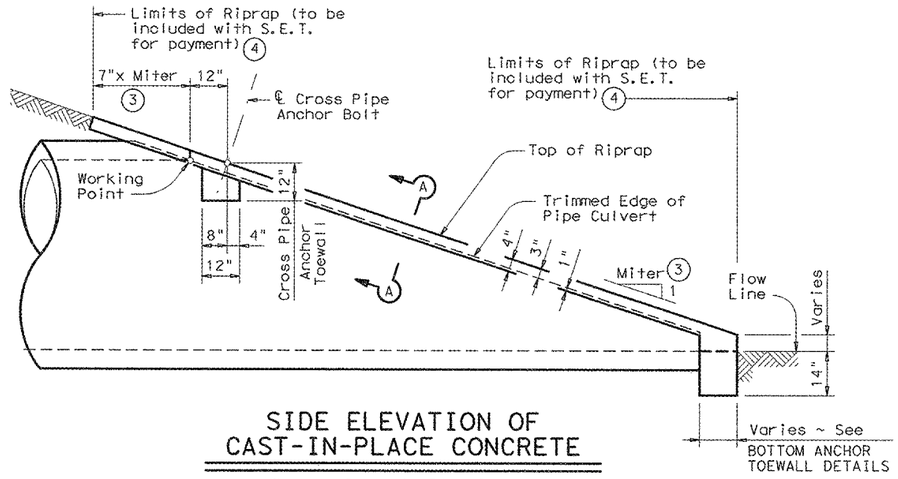
FILE: mc107ste.dgn	DN: GAF	CK: LAW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		169
10-12: Added WWR	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097



NOTE: All Pipe Runners, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

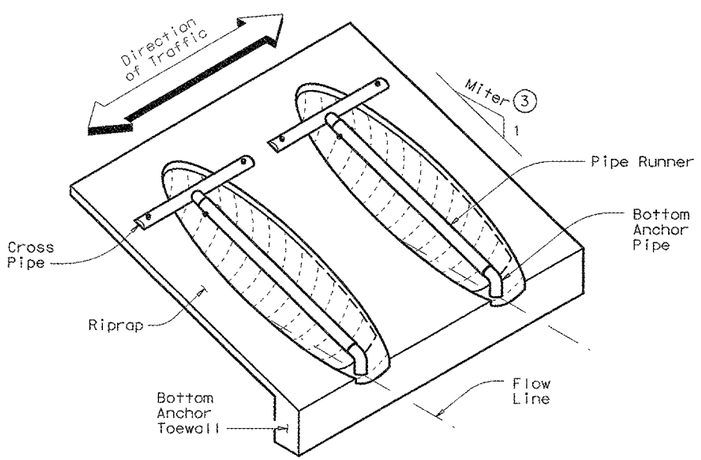
SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing Corrugated Metal Pipe Culvert. Details of Concrete Pipe Culvert are similiar.)



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing Concrete Pipe Culvert. Details of Corrugated Metal Pipe Culvert are similar. Pipe Runners not shown for clarity)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing installation with no skew.)

CROSS PIPE LENGTHS & PIPE RUNNER LENGTHS (1)(2)

Nominal Culvert I.D.	Pipe Culvert Spa ~ G	Cross Pipe Length	Pipe Runner Length											
			3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
			0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
24"	1'- 7"	3'- 5"	N/A	N/A	N/A	5'-10"	N/A	N/A	N/A	8'- 1"	N/A	N/A	N/A	12'- 9"
27"	1'- 8"	3'- 8"	N/A	N/A	5'- 5"	6'-11"	N/A	N/A	7'- 7"	9'- 7"	N/A	N/A	11'-11"	14'-11"
30"	1'-10"	3'-11"	N/A	N/A	6'- 4"	8'- 0"	N/A	N/A	8'- 9"	11'- 0"	N/A	N/A	13'- 8"	17'- 0"
33"	1'-11"	4'- 2"	6'- 2"	6'- 5"	7'- 3"	9'- 1"	8'- 6"	8'-10"	10'- 0"	12'- 5"	13'- 3"	13'- 9"	15'- 5"	19'- 2"
36"	2'- 1"	4'- 5"	6'-11"	7'- 3"	8'- 2"	10'- 2"	9'- 6"	9'-11"	11'- 2"	13'-10"	14'- 9"	15'- 3"	17'- 2"	21'- 3"
42"	2'- 4"	4'-11"	8'- 6"	8'-10"	9'-11"	12'- 4"	11'- 7"	12'- 0"	13'- 6"	16'- 8"	17'- 9"	18'- 5"	20'- 8"	25'- 7"
48"	2'- 7"	5'- 5"	10'- 1"	10'- 5"	11'- 9"	N/A	13'- 7"	14'- 2"	15'-10"	N/A	20'- 9"	21'- 6"	24'- 2"	N/A
54"	3'- 0"	5'-11"	11'- 8"	12'- 1"	N/A	N/A	15'- 8"	16'- 3"	N/A	N/A	23'-10"	24'- 8"	N/A	N/A
60"	3'- 3"	6'- 5"	13'- 3"	N/A	N/A	N/A	17'- 9"	N/A	N/A	N/A	26'-10"	N/A	N/A	N/A

TYPICAL PIPE CULVERT MITERS (3)

Side Slope	0° Skew	15° Skew	30° Skew	45° Skew
3:1	3:1	3.106:1	3.464:1	4.243:1
4:1	4:1	4.141:1	4.619:1	5.657:1
6:1	6:1	6.212:1	6.928:1	8.485:1

CONDITIONS WHERE PIPE RUNNERS ARE NOT REQUIRED (2)

Nominal Culvert I.D.	Single Pipe Culvert	Multiple Pipe Culverts
12" thru 21"	Skews thru 45°	Skews thru 45°
24"	Skews thru 45°	Skews thru 30°
27"	Skews thru 30°	Skews thru 15°
30"	Skews thru 15°	Skews thru 15°
33"	Skews thru 15°	Always required
36"	Normal (No Skew)	Always required
42" to 60"	Always required	Always required

STANDARD PIPE SIZES & MAX PIPE RUNNER LENGTHS (1)

Pipe Size	Pipe O.D.	Pipe I.D.	Max Pipe Runner Length
2" STD	2.375"	2.067"	N/A
3" STD	3.500"	3.068"	10'- 0"
4" STD	4.500"	4.026"	19'- 8"
5" STD	5.563"	5.047"	34'- 2"

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) (5)

Nominal Culvert I.D.	3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
12"	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.8
15"	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9
18"	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0
21"	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.2
24"	0.6	0.7	0.7	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.1	1.3
27"	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.1	1.1	1.1	1.2	1.4
30"	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.3	1.6
33"	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.3	1.3	1.4	1.5	1.7
36"	0.9	0.9	0.9	1.1	1.1	1.1	1.2	1.4	1.4	1.5	1.6	1.8
42"	1.0	1.0	1.1	1.3	1.2	1.3	1.3	1.6	1.6	1.7	1.8	2.1
48"	1.1	1.1	1.2	N/A	1.4	1.4	1.5	N/A	1.9	1.9	2.1	N/A
54"	1.3	1.3	N/A	N/A	1.6	1.6	N/A	N/A	2.1	2.1	N/A	N/A
60"	1.4	N/A	N/A	N/A	1.7	N/A	N/A	N/A	2.3	N/A	N/A	N/A

(1) Size of Pipe Runner shall be as shown in the tables. Cross Pipe shall be the same size as the Pipe Runner. Cross Pipe Stub Out and Bottom Anchor Pipe shall be the next smaller size pipe as shown in the STANDARD PIPE SIZES table.

(2) This standard allows for the placement of only one pipe runner across each culvert pipe opening. In order to limit the clear opening to be traversed by an errant vehicle, the following conditions must be met:

For 60" culvert pipes, the skew must not exceed 0°.
For 54" culvert pipes, the skew must not exceed 15°.
For 48" culvert pipes, the skew must not exceed 30°.
For all culvert pipe sizes 42" and less, the skew must not exceed 45°.

If the above conditions cannot be met, the designer should consider using a safety end treatment with flared wings. For further information, refer to the TxDOT "Roadway Design Manual".

(3) Miter = Slope of Mitered Pipe Culvert End

(4) Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".

(5) Quantities shown are for one end of one reinforced Concrete Pipe Culvert. For multiple Pipe Culverts or for Corrugated Metal Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

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ACC:
LEVELS DISPLAYED:

SHEET 1 OF 2

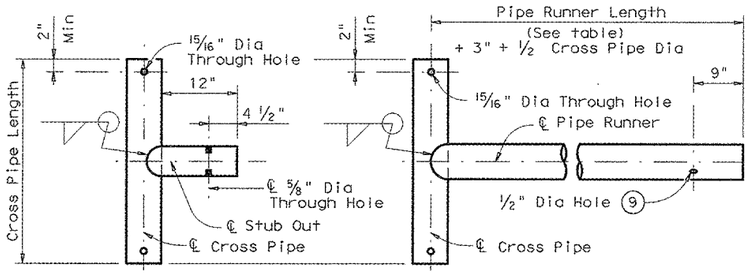
Texas Department of Transportation
Bridge Division

SAFETY END TREATMENT
FOR 12" DIA TO 60" DIA PIPE CULVERTS TYPE II ~ CROSS DRAINAGE

SETP-CD

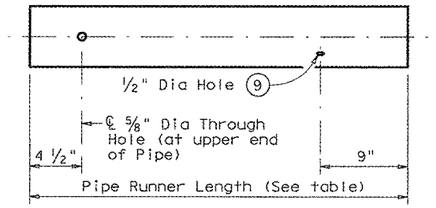
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© TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		170
11-10: Add note for synthetic fibers.	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

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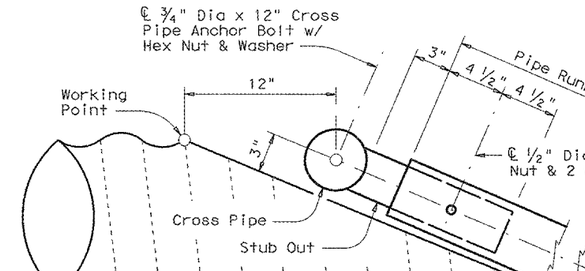
OPTION A1 OPTION A2

CROSS PIPE AND CONNECTIONS DETAILS



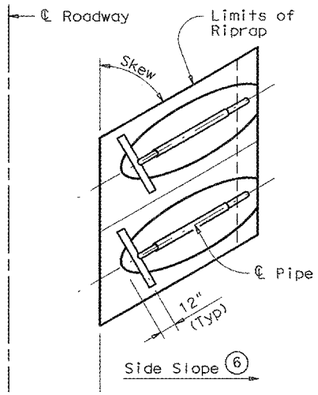
NOTE: The separate Pipe Runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS

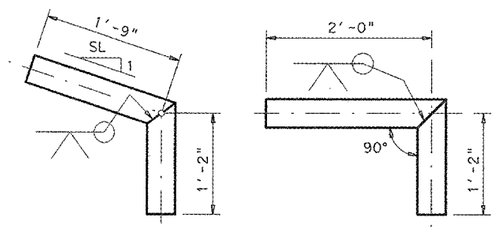


SIDE ELEVATION OF SAFETY END TREATMENT INSTALLATION

(Showing Pipe Runner with Cross Pipe Connection option A1 and Anchor Pipe option B2 on Corrugated Metal Pipe Culvert. Concrete Pipe Culvert details are similar. Riprap not shown for clarity)

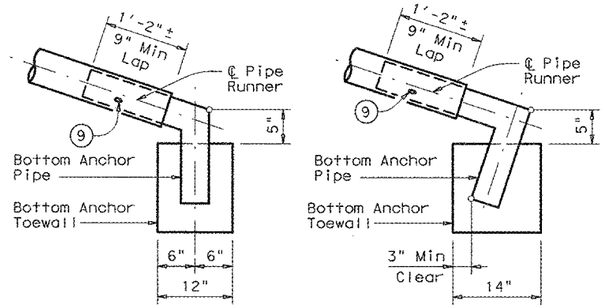


PLAN OF SKEWED INSTALLATION



OPTION B1 OPTION B2

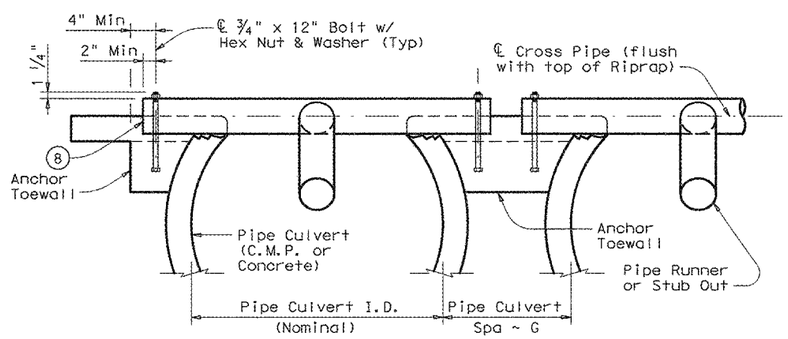
BOTTOM ANCHOR PIPE DETAILS (10)



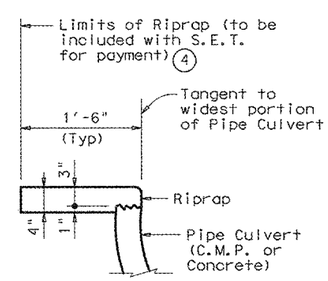
OPTION B1 OPTION B2

BOTTOM ANCHOR TOEWALL DETAILS

(Culvert & Riprap not shown for clarity)



SHOWING CROSS PIPE & ANCHOR TOEWALL



SHOWING TYPICAL PIPE CULVERT & RIPRAP

SECTION A-A

(4) Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".

(6) Recommended values of side slope are 3:1, 4:1, & 6:1. All quantities, calculations, and dimensions shown herein are based on these recommended values. Slope of 3:1 or flatter is required for vehicle safety.

(7) Note that actual slope of Pipe Runner may vary slightly from Side Slope of Riprap and trimmed Culvert Pipe edge.

(8) Care shall be taken to ensure that Riprap concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanout access.

(9) After installation, the 1/2" hole shall be inspected to ensure that the lap of the Pipe Runner with the Bottom Anchor Pipe is adequate.

(10) At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the Runner) may be substituted for the mitered and welded joint in the Bottom Anchor Pipe.

GENERAL NOTES:

Pipe Runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

The Safety End Treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Pipe Runners.

Riprap and all necessary inverts shall be Concrete Riprap conforming to the requirements of Item 432, "Riprap".

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

Pipe Runners, Cross Pipes, and Anchor Pipes shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Bolts and nuts shall conform to ASTM A307.

All steel components, except concrete reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

Texas Department of Transportation
Bridge Division

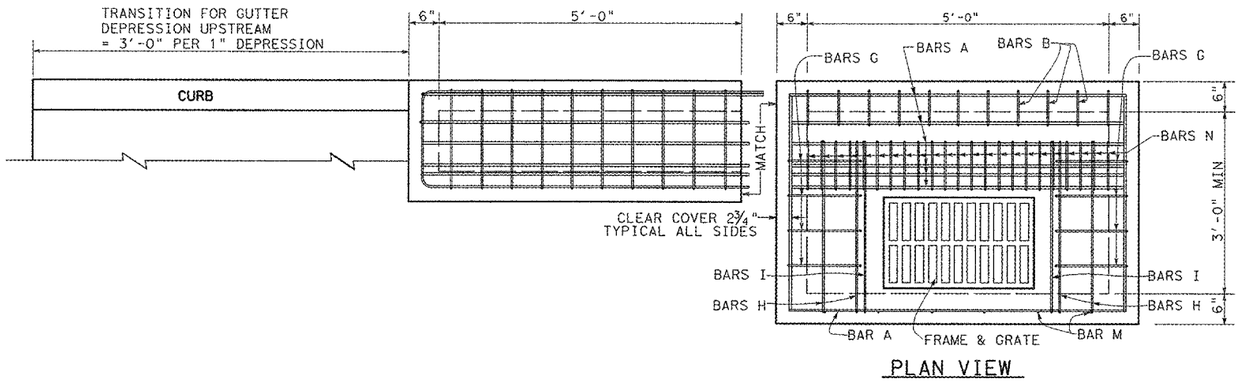
SAFETY END TREATMENT
FOR 12" DIA TO 60" DIA PIPE CULVERTS TYPE II ~ CROSS DRAINAGE

SETP-CD

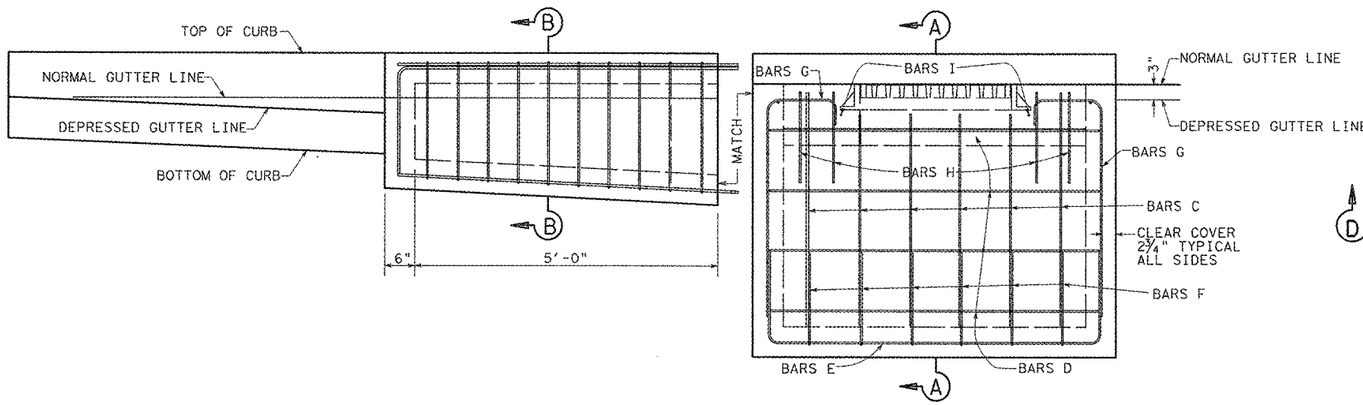
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©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		171
11-10: Add note for synthetic fibers.	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

LEVELS DISPLAYED ACC:

cgityi.dgn

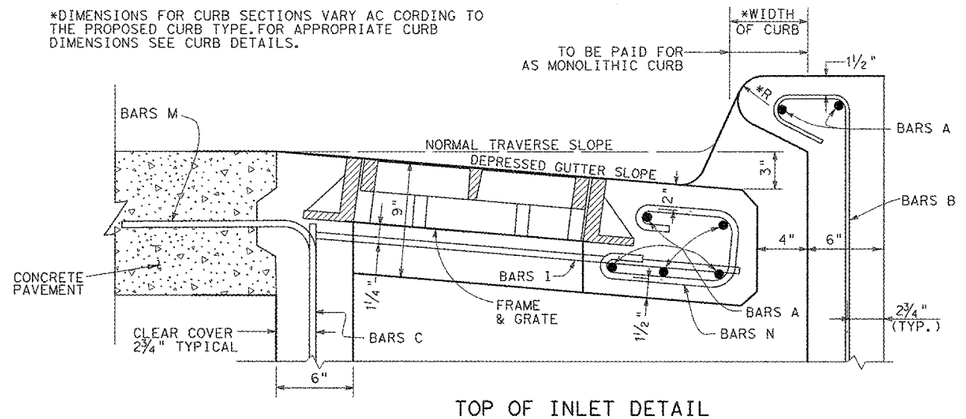


PLAN VIEW

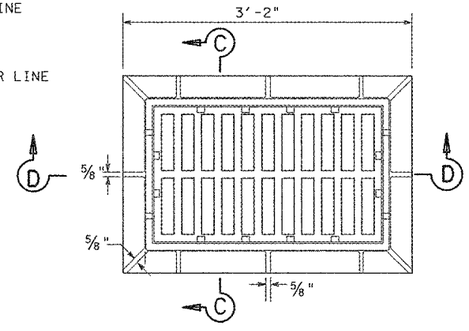


ELEVATION VIEW

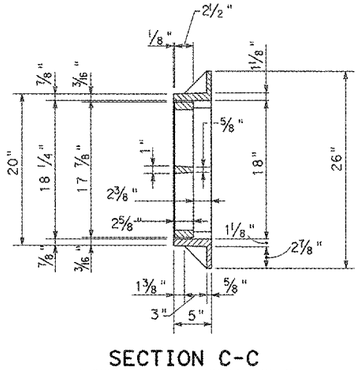
*DIMENSIONS FOR CURB SECTIONS VARY AC CORDING TO THE PROPOSED CURB TYPE. FOR APPROPRIATE CURB DIMENSIONS SEE CURB DETAILS.



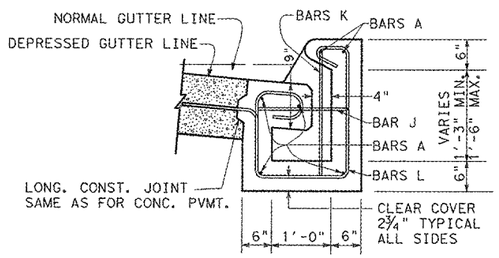
TOP OF INLET DETAIL



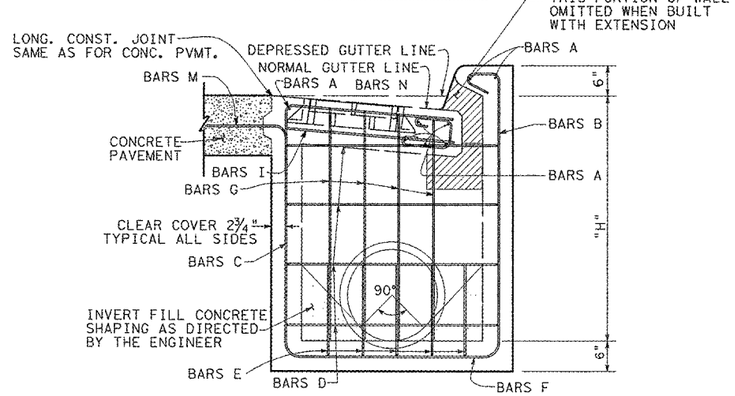
PLAN



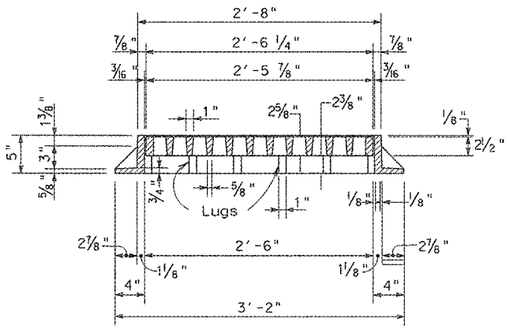
SECTION C-C



SECTION B-B



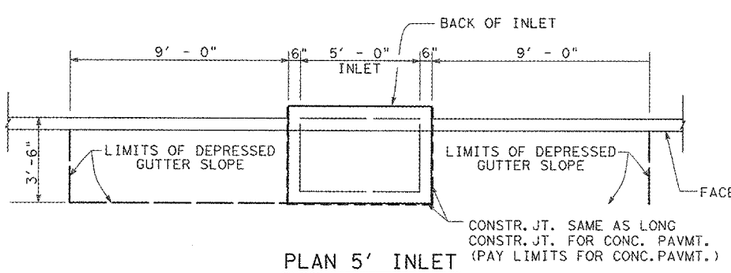
SECTION A-A



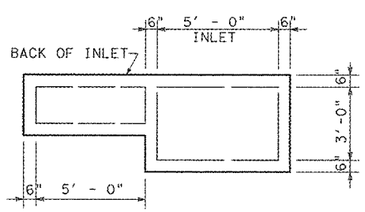
SECTION D-D

FRAME & GRATE TYPE "A"

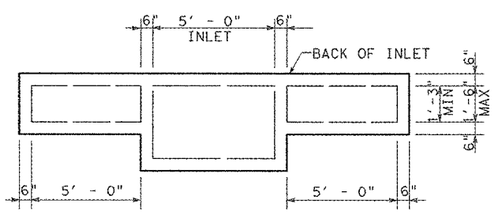
NOTE:
FRAME AND GRATE TO BE OF GRAY CAST IRON CONFORMING TO A.S.T.M. SPEC. A-48 FOR CLASS NO. 30 CAST IRON



PLAN 5' INLET



PLAN 10' INLET



PLAN 15' INLET

REVISED ON 9/10/08
NOT TO SCALE

SHEET 1 OF 2

Texas Department of Transportation
Dallas District

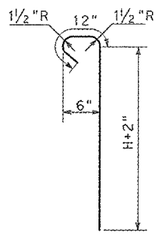
CURB & GRATE INLET TYPE I

CGI(TY I)-08

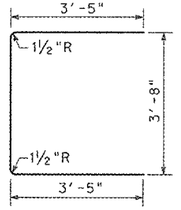
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© TxDOT	DISTRICT	FEDERAL AID PROJECT		SHEET
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	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

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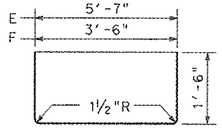
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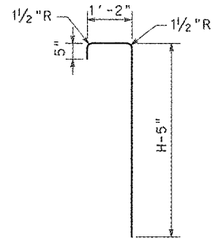
BAR "B"



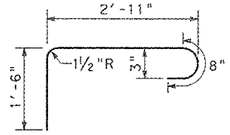
BAR "D"



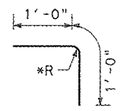
BARS "E" & "F"



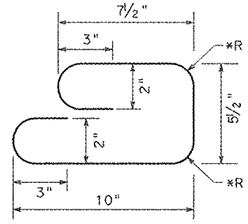
BAR "G"



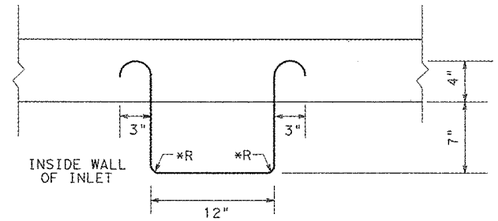
BAR "H"



BAR "M"



BAR "N"



DETAIL OF INLET STEP
INLET STEP SHALL BE NO. 6
GALVANIZED REINFORCING BAR

* MINIMUM INSIDE DIAMETER OF BAR BENDS AS PRE TABLE 4 OF ITEM 440

INLET SIZE		INLET REINFORCING STEEL AND CONCRETE																																					
		BAR "A"					BAR "B"					BAR "C" *					BAR "D"					BAR "E"					BAR "F"					BAR "G"					BAR "H"				
HEIGHT FT.	WIDTH FT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.
2.5	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	2'-4"	17	6	4	10"C.C.	2'-4"	9	4	4	12"C.C.	10'-6"	28	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	3'-8"	20	4	4	AS SHN	4'-11"	13
3.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	2'-10"	21	6	4	10"C.C.	2'-10"	11	6	4	12"C.C.	10'-6"	42	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	4'-2"	22	4	4	AS SHN	4'-11"	13
3.5	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	3'-4"	24	6	4	10"C.C.	3'-4"	13	6	4	12"C.C.	10'-6"	42	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	4'-8"	25	4	4	AS SHN	4'-11"	13
4.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	3'-10"	28	6	4	10"C.C.	3'-10"	15	8	4	12"C.C.	10'-6"	56	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	5'-2"	28	4	4	AS SHN	4'-11"	13
4.5	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	4'-4"	32	6	4	10"C.C.	4'-4"	17	8	4	12"C.C.	10'-6"	56	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	5'-8"	30	4	4	AS SHN	4'-11"	13
5.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	4'-10"	36	6	4	10"C.C.	4'-10"	19	10	4	12"C.C.	10'-6"	70	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	6'-2"	33	4	4	AS SHN	4'-11"	13
5.5	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	5'-4"	39	6	4	10"C.C.	5'-4"	21	10	4	12"C.C.	10'-6"	70	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	6'-8"	36	4	4	AS SHN	4'-11"	13
6.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	5'-10"	43	6	4	10"C.C.	5'-10"	23	12	4	12"C.C.	10'-6"	84	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	7'-2"	38	4	4	AS SHN	4'-11"	13
7.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	6'-10"	50	6	4	10"C.C.	6'-10"	27	14	4	12"C.C.	10'-6"	98	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	8'-2"	44	4	4	AS SHN	4'-11"	13
8.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	6'-10"	58	6	4	10"C.C.	6'-10"	31	14	4	12"C.C.	10'-6"	98	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	8'-2"	49	4	4	AS SHN	4'-11"	13
9.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	6'-10"	65	6	4	10"C.C.	6'-10"	35	14	4	12"C.C.	10'-6"	98	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	8'-2"	54	4	4	AS SHN	4'-11"	13
10.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	6'-10"	72	6	4	10"C.C.	6'-10"	39	14	4	12"C.C.	10'-6"	98	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24	8	4	7"C.C.	8'-2"	60	4	4	AS SHN	4'-11"	13

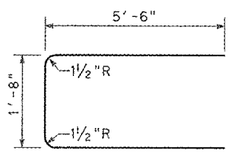
* REDUCE BAR LENGTH AS NECESSARY TO PROVIDE CLEARANCE UNDER GRATE

INLET SIZE		INLET REINFORCING STEEL AND CONCRETE (CONT.)															TOTALS	
		BAR "I"					BAR "M"					BAR "N"						
HEIGHT FT.	WIDTH FT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACIN	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.	STEEL LBS.	CONC. C.Y.
2.5	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	236	1.63
3.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	258	1.80
3.5	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	266	1.96
4.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	289	2.13
4.5	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	297	2.29
5.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	320	2.46
5.5	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	328	2.62
6.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	350	2.79
7.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	381	3.12
8.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	398	3.45
9.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	414	3.78
10.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	431	4.11

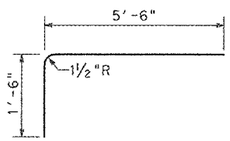
CONCRETE TO BE DEDUCTED FOR ONE PIPE	
PIPE DIA.	CONC. C.Y.
15"	0.04
18"	0.05
21"	0.07
24"	0.09
27"	0.11
30"	0.14
36"	0.20

GENERAL NOTES:

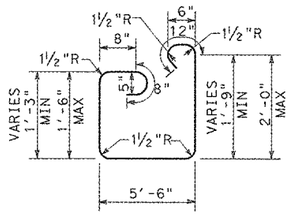
1. ALL CONCRETE SHALL BE CLASS "A".
2. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
3. INLET STEPS SPACED 14" C.C. AND LOCATED AND DIRECTED BY THE ENGINEER, SHALL BE PROVIDED AND INSTALLED IN ALL INLETS WHERE THE DEPTH EXCEEDS 5'-0".
4. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO THE CENTER OF THE BARS.
5. TOTAL QUANTITIES SHOWN FOR CONCRETE AND REINFORCING STEEL ARE APPROXIMATE AND ARE PLACED HEREON FOR INFORMATIONAL PURPOSES ONLY.



BAR "J"



BAR "K"



BAR "L"

INLET REINFORCING STEEL AND CONCRETE FOR ONE 5' EXTENSION					
BAR	NO.	SIZE	SPACING	LENGTH	WT.
A	6	6	AS SHN	5'-6"	50
J	1	4	AS SHN	12'-8"	8
K	1	4	AS SHN	7'-4"	5
L	10	4	6"C.C.	6'-7"TO 7'-1"	46
M	4	4	24"C.C.	1'-11"	5
TOTAL REINFORCING STEEL (LBS.)					114
TOTAL CONCRETE (C.Y.)					0.64

REVISED ON 9/10/08
NOT TO SCALE

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LEVELS DISPLAYED

SHEET 2 OF 2

Texas Department of Transportation
Dallas District

CURB & GRATE INLET TYPE I

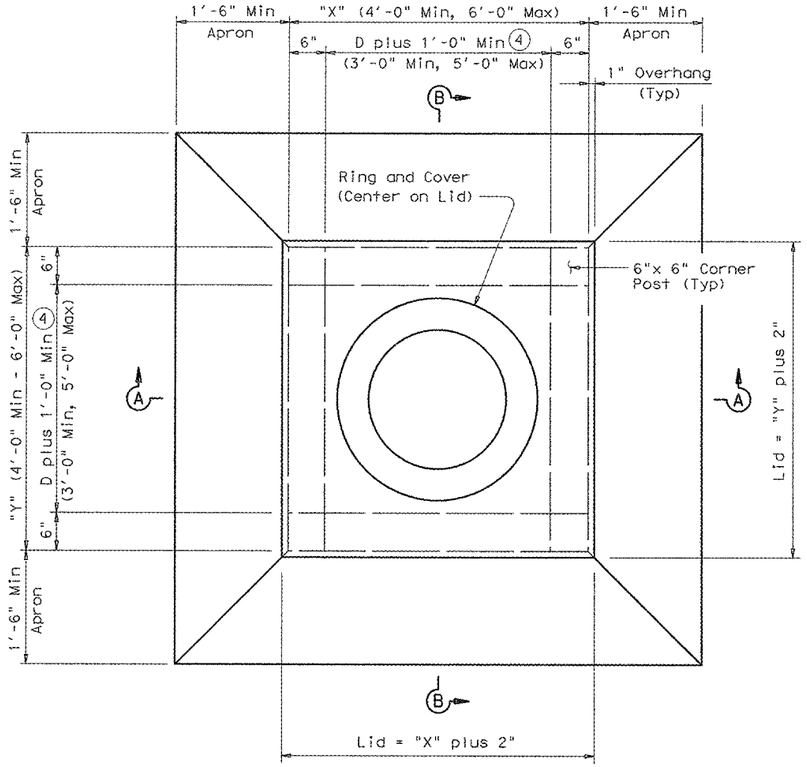
CGI(TY I)-08

FILE: CGI(TY I)-08	DN: TxDOT	CK: TxDOT	DW:	CK:
© TxDOT	DISTRICT	FEDERAL AID PROJECT		SHEET
	DAL	STP 2043 (597) MM		173
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

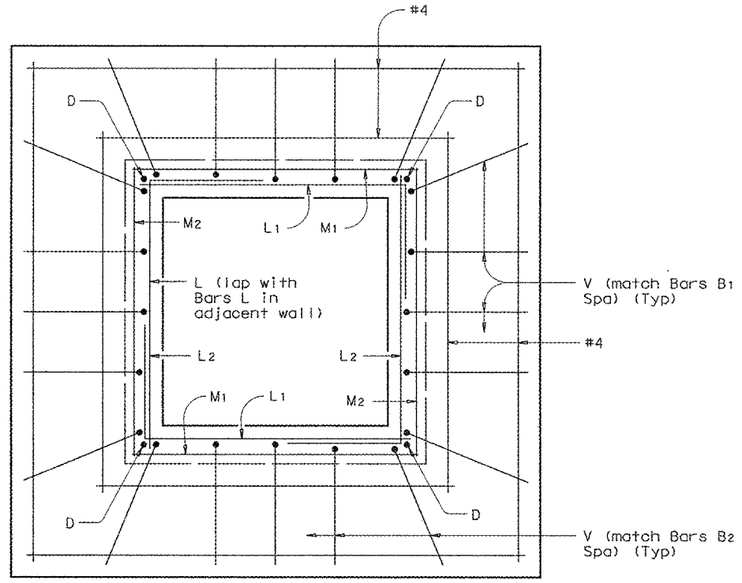
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LEVELS DISPLAYED:

PATH:

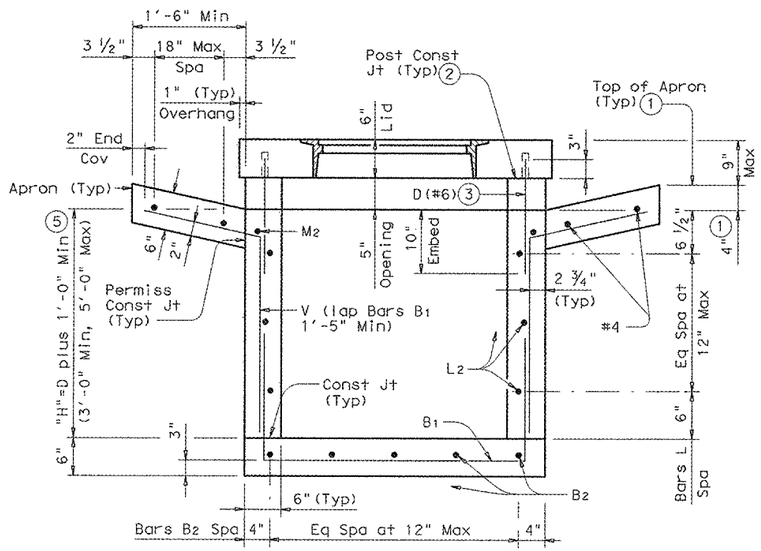


PLAN

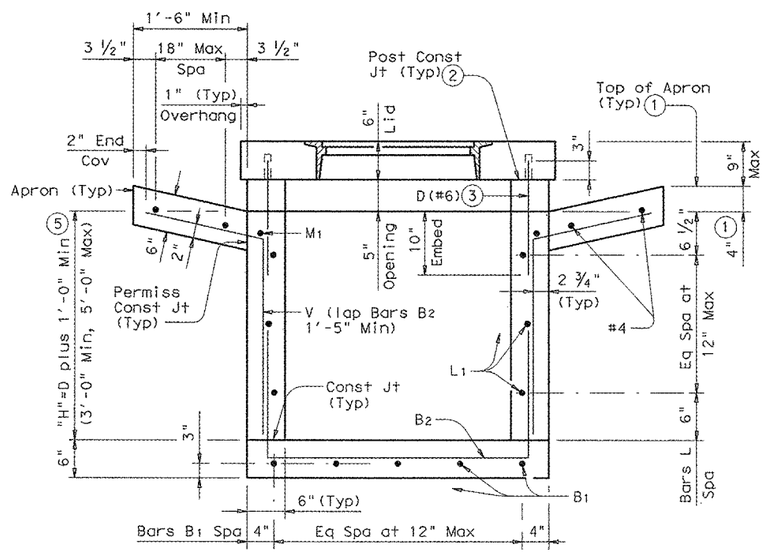


TYPICAL APRON PLAN

(Lid not shown for clarity. Showing reinforcing in walls and in apron.)



SECTION A-A



SECTION B-B

1. May be changed as directed by the Engineer.
2. Place layer of grout between lid and corner posts to provide stable seating of lid.
3. Center Dowels D in corner posts. (Typ)
4. D equals the maximum inside diameter of any pipe entering the wall shown or the opposite wall.
5. D equals the maximum inside diameter of any pipe entering the inlet.

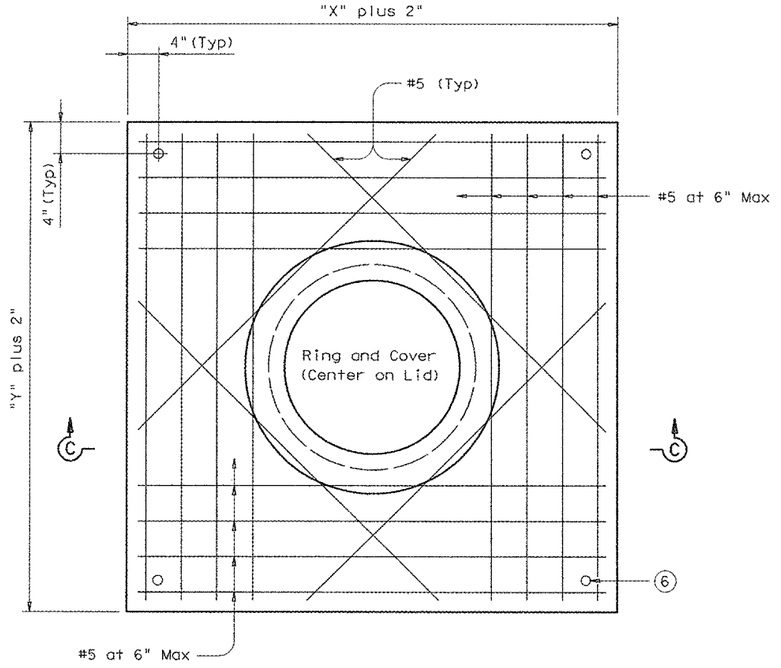
Texas Department of Transportation
Bridge Division

HORIZONTAL INLET TYPE H WITH LID (MAX 48" DIA PIPES)

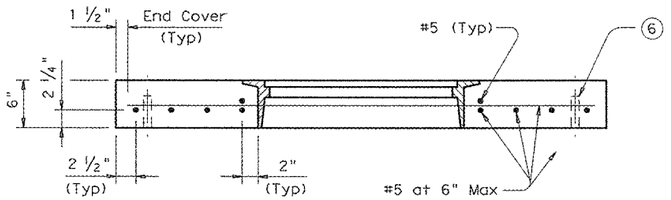
IL-H-L

FILE: iihste02.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT		
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT				SHEET
REVISIONS	DAL	STP 2043 (597) MM				174
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		3148	01	006	FM 3097

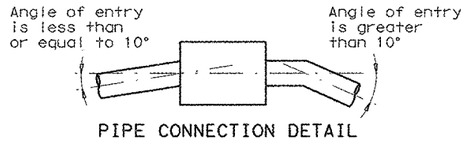
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TYPICAL PRECAST LID PLAN



SECTION C-C



PIPE CONNECTION DETAIL

Connecting pipes should enter within 10° of normal to inlet wall. If necessary, pipe elbow or curved approach alignment should be used to stay within this limit.

GENERAL NOTES:

When approved, precast inlets with equivalent structural capacity may be furnished. Sealed engineering calculations and drawings shall be submitted for approval prior to construction.

Shop drawings will not be required.

Apron will be cast-in-place.

Lid will be precast.

In areas of conflict between reinforcing steel, blockouts, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.

Structural Steel for grates shall conform to the requirements of ASTM Designation A-36 or AISI Designation M1010-M1020.

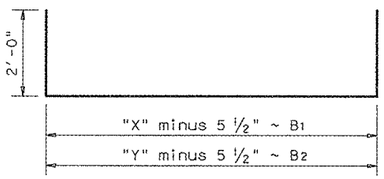
All reinforcing steel shall be Grade 60 unless otherwise noted.

All concrete shall be Class "A" (f'c = 3,000 psi).

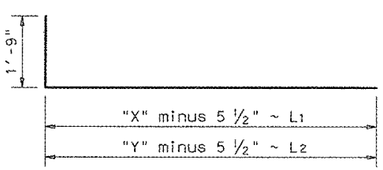
All steel components except reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

Inlet is to used in ditches and medians away from the roadway.

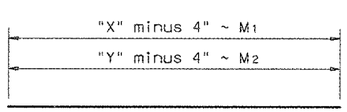
(6) Form holes in lid for Dowels D using 1" Dia x 4" PVC Pipe (SCH 40) (Typ)



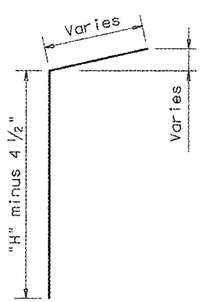
BARS B (#4)



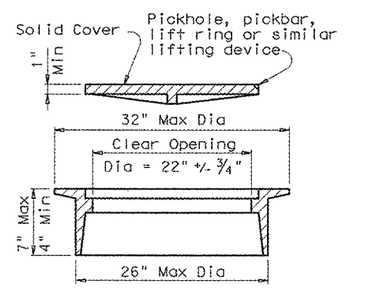
BARS L (#4)



BARS M (#4)



BARS V (#4)



RING AND COVER DETAILS

Approximate Weight = 245 lb

Texas Department of Transportation
Bridge Division

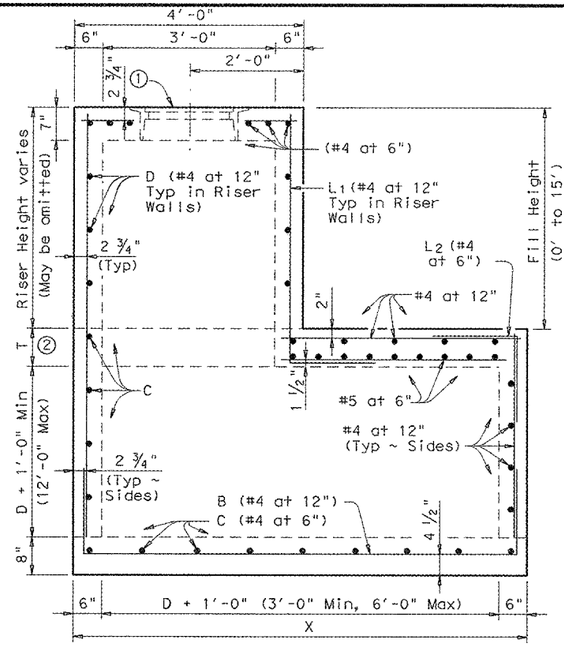
HORIZONTAL INLET TYPE H WITH LID (MAX 48" DIA PIPES)

IL-H-L

FILE: ilhste02.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT		
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT				SHEET
REVISIONS	DAL	STP 2043 (597) MM				175
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		3148	01	006	FM 3097

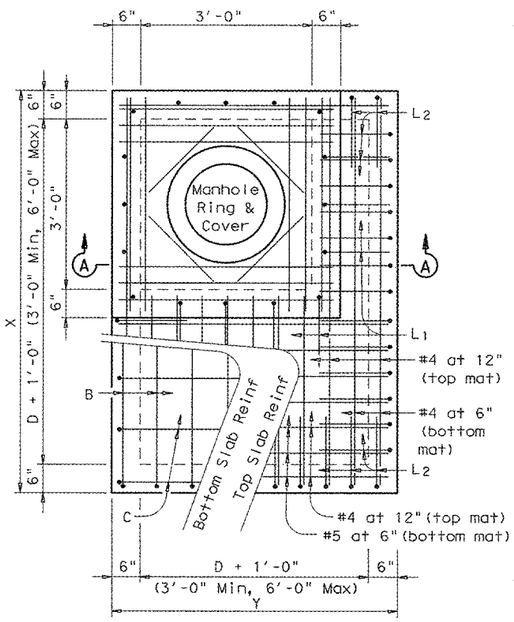
LEVELS DISPLAYED
PATHS:

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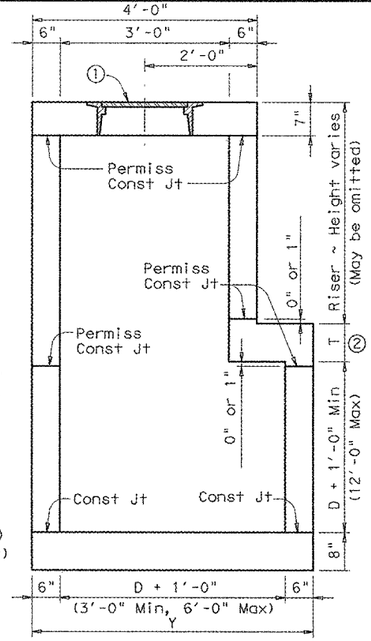


ELEVATION

D = Maximum inside diameter of any Pipe entering the side shown or the opposite side



PLAN

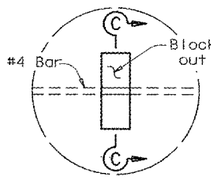


SECTION A-A

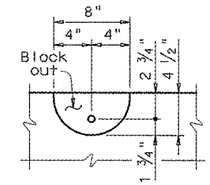
MANHOLE WITH CAST-IN-PLACE RISER

① See Ring and Cover Details

② For Fill Height less than or equal to 10', T=8".
For Fill Height between 10' and 15', T=10".

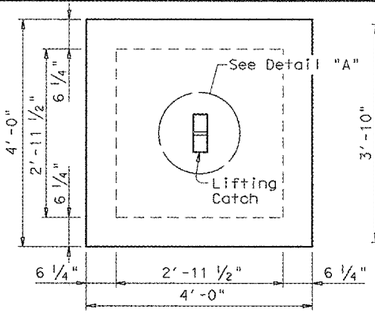


DETAIL "A"

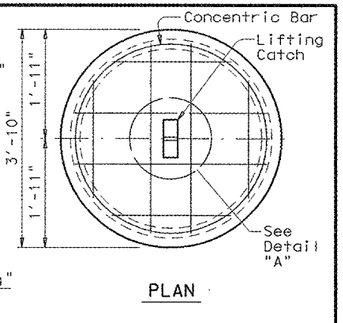


SECTION C-C

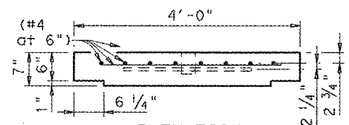
LIFTING CATCH



PLAN

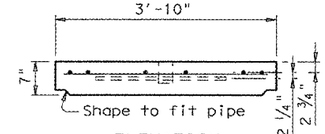


PLAN



ELEVATION

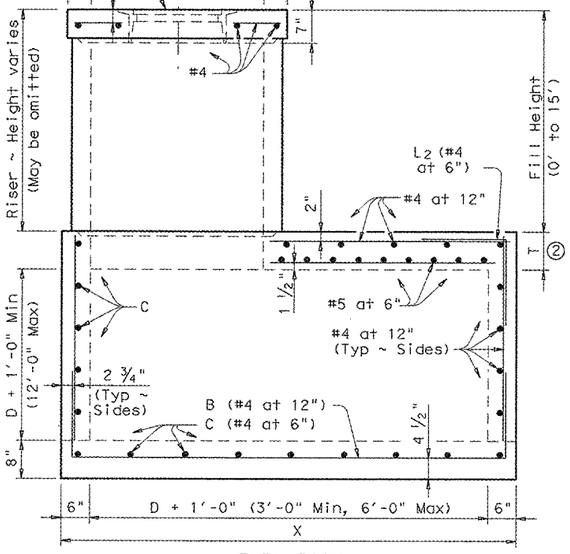
CAST-IN-PLACE RISER COVER



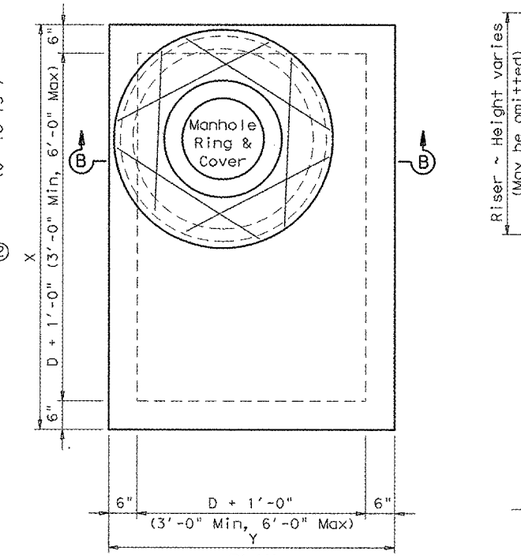
ELEVATION

CONCRETE PIPE RISER COVER

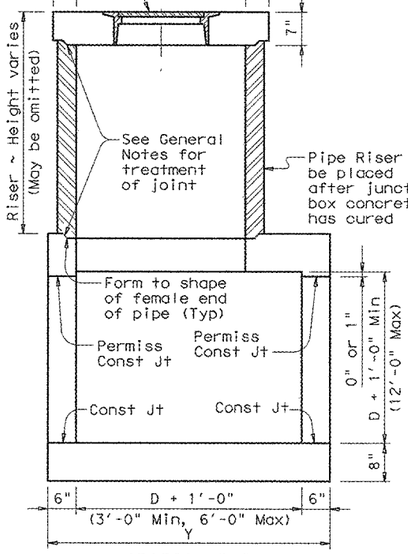
OPTIONAL PRECAST CONCRETE LIFT-OFF COVERS



ELEVATION

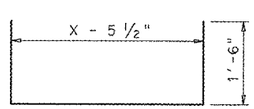


PLAN

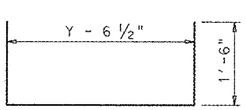


SECTION B-B

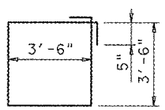
OPTIONAL MANHOLE WITH CONCRETE PIPE RISER



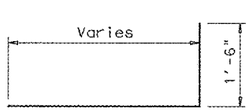
BARS B



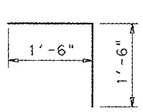
BARS C



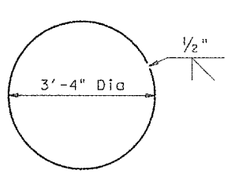
BARS D



BARS L_1



BARS L_2

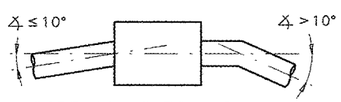


CONCENTRIC BAR



RING AND COVER DETAILS

Approximate Weight = 245 lb



PIPE CONNECTION DETAIL

Connecting pipes should enter within 10° of normal to inlet wall. If necessary, pipe elbow or curved approach alignment should be used to stay within this limit.

GENERAL NOTES:

Unless otherwise shown in the plans, payment will be made for each manhole of the Type M.

When approved, precast inlets with equivalent structural capacity may be furnished. Sealed engineering calculations and drawings shall be submitted for approval prior to construction.

Shop drawings will not be required.

In areas of conflict between reinforcing steel, blockouts, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.

The riser may be constructed of reinforced concrete as shown or of Reinforced Concrete Pipe, Class III, in accordance with ASTM Designation C-76. If pipe is used, joints shall conform to the Item "Reinforced Concrete Pipe Culverts". Precast Concrete Lift-Off Cover may be substituted for Ring and Cover.

The riser, either cast-in-place or concrete pipe, may be located in any corner.

All reinforcing steel shall be #4 unless otherwise noted.

Pipes may enter any or all walls. The maximum size of pipe that can be accommodated is 60". More than one pipe may enter a side, subject to the maximum box dimension shown. The clear distance between adjacent pipes should be 9" minimum.

Ring and cover shall conform to the requirements of AASHTO M306, "Standard Specification for Drainage Structure Castings". Materials shall conform to ASTM A48, Class 35B for gray iron castings or ASTM A536, Grade 65-45-12 for ductile iron castings. Aluminum alloy castings shall not be permitted.

All concrete shall be Class "A" (f'c = 3000 psi).

Texas Department of Transportation
Bridge Division

MANHOLE TYPE M
(JUNCTION BOX WITH ACCESS)
15' MAX FILL

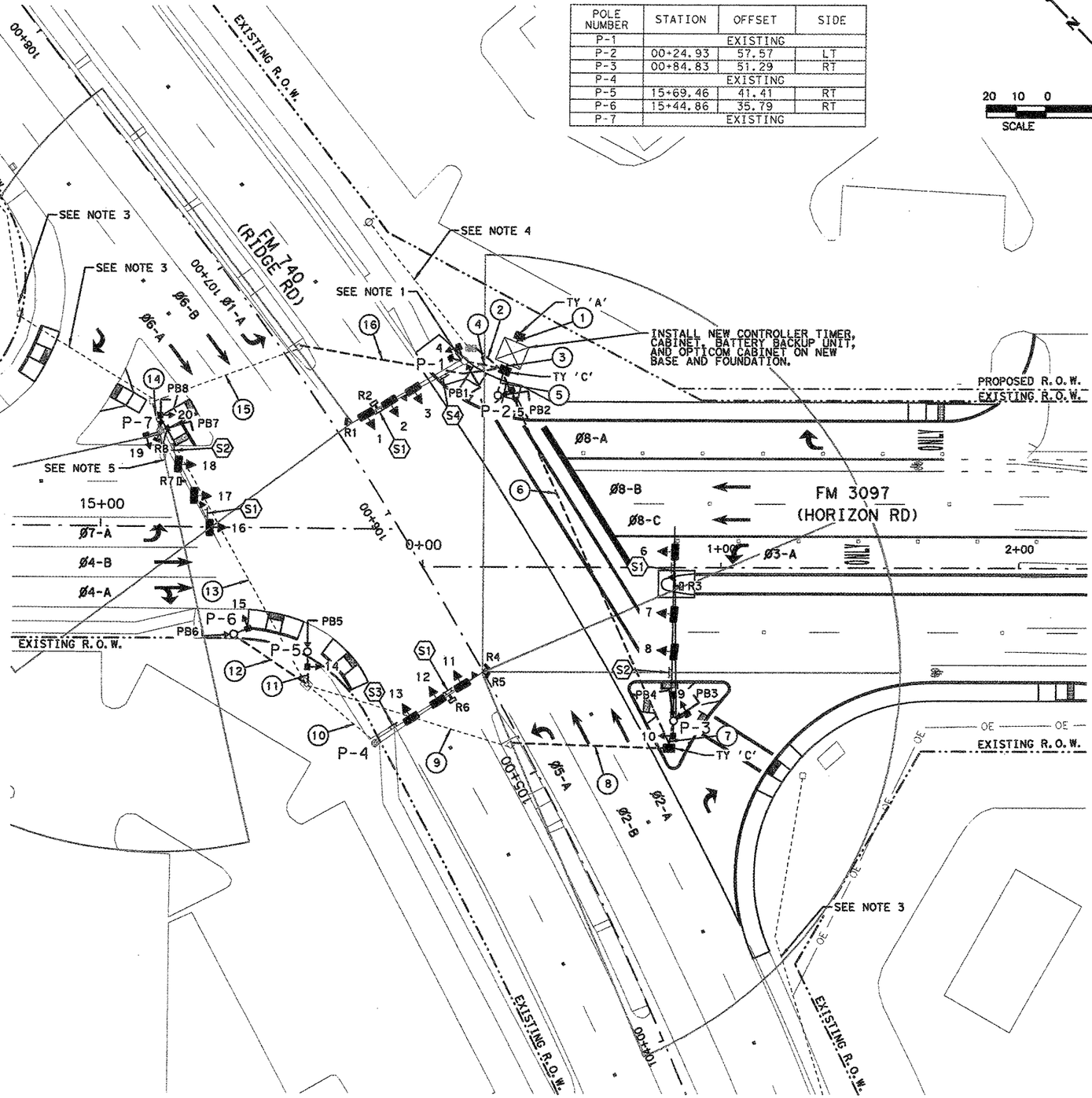
MH-M

FILE: mh-mside.dgn	DN: TxDOT	CK: TER	DW: MCB	CK: TER/CAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	STP 2043 (597) MM		176
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

ACC:
LEVELS DISPLAYED

TRAFFIC SIGNAL POLE SCHEDULE

POLE NUMBER	STATION	OFFSET	SIDE
P-1	EXISTING		
P-2	00+24.93	57.57	LT
P-3	00+84.83	51.29	RT
P-4	EXISTING		
P-5	15+69.46	41.41	RT
P-6	15+44.86	35.79	RT
P-7	EXISTING		



NOTES

1. PROPOSED SIDEWALK WILL BE CONSTRUCTED AROUND EXISTING SIGNAL POLE. AN ADA COMPLIANT WALKWAY WILL BE PROVIDED BETWEEN PEDESTRIAN RAMP AND SIGNAL POLE.
2. PROPOSED POLES SHOULD BE PAINTED TO MATCH THE COLOR (AUBURN SW-2729) OF THE EXISTING SIGNAL POLES.
3. EXISTING LOOP CONDUIT TO BE ABANDONED.
4. CONDUIT RUN AND CABLES TO REMAIN.
5. EXISTING LUMINAIRE TO REMAIN.
6. POLES P-1, P-4, AND P-7 TO REMAIN.
7. ALL NEW SIGNAL EQUIPMENT AND CABLE TO BE INSTALLED AT THIS INTERSECTION UNLESS OTHERWISE NOTED.
8. CONDUIT RUNS 10,11,14,15, AND 16 TO REMAIN.
9. ALL PEDESTRIAN EQUIPMENT TO BE UPGRADED TO APS UNITS AND COUNTDOWN PEDESTRIAN HEADS.
10. LOCATION OF ALL UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CONFIRM LOCATIONS OF UTILITIES IN THE FIELD.
11. POLE LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL FIELD ADJUST AS NECESSARY TO AVOID UTILITIES.
12. CONTRACTOR WILL COORDINATE WITH ELECTRIC COMPANY TO OBTAIN APPROVAL ON THE LOCATION OF SIGNAL POLES TO MEET OSHA CLEARANCE REQUIREMENTS FOR POWER LINES. FINAL LOCATIONS OF TRAFFIC SIGNAL MUST BE APPROVED BY THE ENGINEER.
13. ALL PUSH BUTTONS WILL BE ADJACENT TO THE PEDESTRIAN RAMPS AND BE ACCESSIBLE TO MEET ADA AND TMUTCD REQUIREMENTS.
14. MASTER RADIO IS LOCATED AT IH 30 AND FM 740. NEW SSR ANTENNAS SHOULD BE AIMED TO THIS LOCATION.
15. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.

LEGEND

- PROP. SIGNAL CONTROLLER
- PROP. SIGNAL POLE AND MAST ARM
- PROP. PEDESTRIAN POLE
- PROP. SIGNAL HEAD
- PROP. PEDESTRIAN HEAD
- PROP. PEDESTRIAN PUSH BUTTON
- PROP. STOP BAR RADAR DETECTION
- PROP. ADVANCED RADAR DETECTION
- PROP. SSR ANTENNA
- PROP. GROUND BOX
- PROP. SIGN
- PROP. LUMINAIRE
- PROP. PREEMPTION SENSOR
- PROP. CONDUIT
- PROP. SERVICE METER
- PROP. SIGN CALLOUT (X)
- PROP. CONDUIT RUN CALLOUT (X)
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. RETAINING WALL
- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. CONDUIT
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND BOX
- OE — EXIST. OVERHEAD ELECTRIC
- TRAFFIC FLOW DIRECTION
- PROPOSED SIDEWALK

4.30.19

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND FM 740

PROPOSED TRAFFIC SIGNAL LAYOUT

Designed:	LDP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.	
Checked:	KK	6	TEXAS	STP 2013 (597) MM			FM 3097	
Drawn:	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
Checked:	LDP	DAL	ROCKWALL	3148	01	006	177	

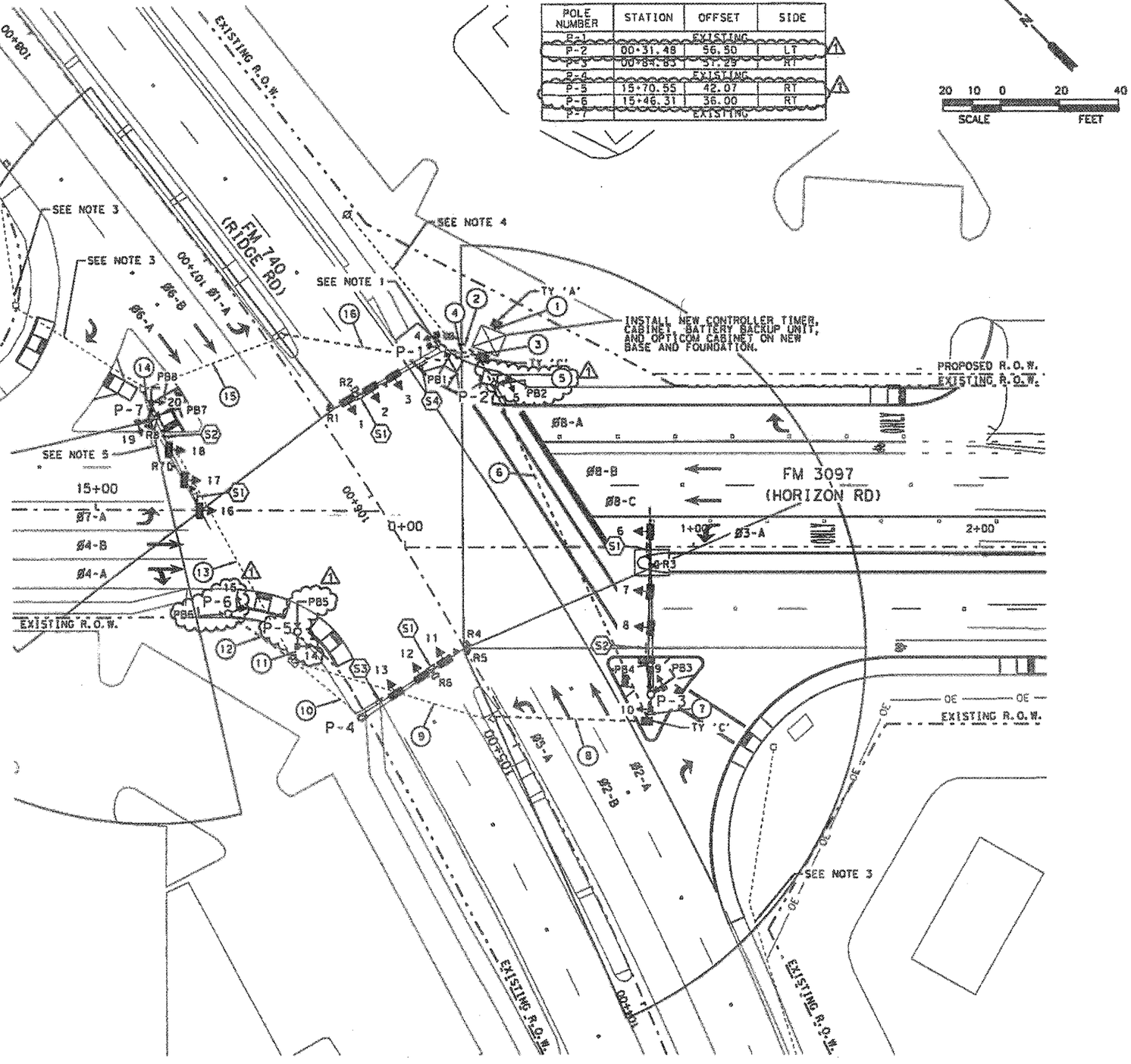
SHEET 1 OF 3

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TRAFFIC SIGNAL POLE SCHEDULE

POLE NUMBER	STATION	OFFSET	SIDE
P-1	EXISTING		
P-2	00+31.48	56.50	LT
P-3	00+84.83	31.29	RT
P-4	EXISTING		
P-5	15+70.55	42.07	RT
P-6	15+46.31	36.00	RT
P-7	EXISTING		



NOTES

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20 10 0 20 40
SCALE FEET

LEGEND

- PROP. SIGNAL CONTROLLER
- PROP. SIGNAL POLE AND MAST ARM
- PROP. PEDESTRIAN POLE
- PROP. SIGNAL HEAD
- PROP. PEDESTRIAN HEAD
- PROP. PEDESTRIAN PUSH BUTTON
- PROP. STOP BAR RADAR DETECTION
- PROP. ADVANCED RADAR DETECTION
- PROP. SSR ANTENNA
- PROP. GROUND BOX
- PROP. SIGN
- PROP. LUMINAIRE
- PROP. PREEMPTION SENSOR
- PROP. CONDUIT
- PROP. SERVICE METER
- PROP. SIGN CALLOUT
- PROP. CONDUIT RUN CALLOUT
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. RETAINING WALL
- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. CONDUIT
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND BOX
- OE — EXIST. OVERHEAD ELECTRIC
- TRAFFIC FLOW DIRECTION
- PROPOSED SIDEWALK

Leslie D Pollack
STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED PROFESSIONAL ENGINEER
12/20/17

NO.	REVISION	BY	DATE
1	AS-BUILT REVISIONS	LP	12/17

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND FM 740

PROPOSED TRAFFIC SIGNAL LAYOUT

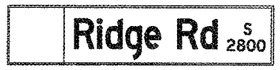
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Checked	KK	6	TEXAS	STP 2013 (597) MM			FM 3097	
Drawn	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
Checked	LDP	DAL	ROCKWALL	3148	01	008	177A	

SHEET 1 OF 3

PROPOSED SIGN LEGEND



S1
R10-12
30" x 36"
LEFT TURN YIELD ON GREEN



S2
CITY WILL FURNISH
WITH CITY LOGO



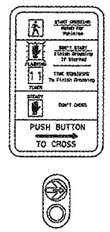
S3
CITY WILL FURNISH
WITH CITY LOGO



S4
CITY WILL FURNISH
WITH CITY LOGO



S5
R10-3eL
PB1-PB2,PB5-PB8
ACCESSIBLE
PEDESTRIAN
PUSH BUTTON
AND SIGN

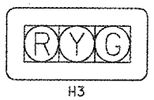


S6
R10-3eR
PB3-PB4
ACCESSIBLE
PEDESTRIAN
PUSH BUTTON
AND SIGN

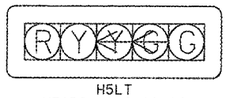
APS MESSAGE INFORMATION

APS UNIT #	ACKNOWLEDGEMENT DEFAULT	EXTENDED PRESS MESSAGE	WALK PHASE MESSAGE	COUNTDOWN SPEECH MESSAGE
		"WAIT TO CROSS (STREET NAME) AT (CROSS STREET NAME)."	"(STREET NAME) WALK SIGN IS ON TO CROSS, (STREET NAME)" OR TONE	
PB1	"WAIT"	RIDGE ROAD AT HORIZON ROAD	RAPID TICK	OFF
PB2	"WAIT"	HORIZON ROAD AT RIDGE ROAD	RAPID TICK	OFF
PB3	"WAIT TO CROSS HORIZON ROAD AT RIDGE ROAD"	HORIZON ROAD AT RIDGE ROAD	AUSTRALIAN TONE	OFF
PB4	"WAIT TO CROSS RIDGE ROAD AT HORIZON ROAD"	RIDGE ROAD AT HORIZON ROAD	AUSTRALIAN TONE	OFF
PB5	"WAIT"	RIDGE ROAD AT HORIZON ROAD	RAPID TICK	OFF
PB6	"WAIT"	HORIZON ROAD AT RIDGE ROAD	RAPID TICK	OFF
PB7	"WAIT TO CROSS HORIZON ROAD AT RIDGE ROAD"	HORIZON ROAD AT RIDGE ROAD	AUSTRALIAN TONE	OFF
PB8	"WAIT TO CROSS RIDGE ROAD AT HORIZON ROAD"	RIDGE ROAD AT HORIZON ROAD	AUSTRALIAN TONE	OFF

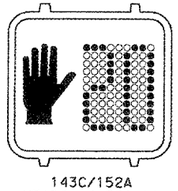
SIGNAL HEAD LEGEND



H3
HEADS: 2,3,7,8,
12,13,17,18

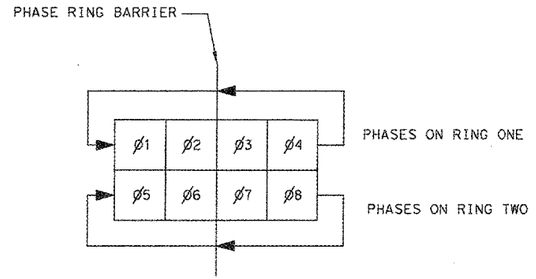


H5LT
HEADS: 1,6,11,16



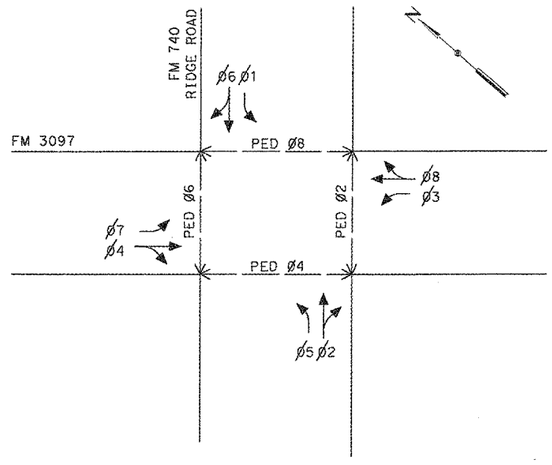
143C/152A
HEADS: 4,5,9,10
14,15,19,20

PHASING RING DIAGRAM



Ø1, Ø3, Ø5, Ø7 ARE PROTECTED/PERMISSIVE LEFT TURN PHASES

PHASING DIAGRAM



SIGNAL HEAD SUMMARY

SIGNAL HEAD NUMBER	SIGNAL HEAD TYPE	SIGNAL HEADS (EA) 12" BACKPLATES 3 SEC	SIGNAL HEADS (EA) 12" BACKPLATES 5 SEC	SIGNAL SECTIONS (EA) 12" LED GRN	GRN ARW	YEL	YEL ARW	RED	PED SIGNAL SECTIONS (EA)
2,3,7,8,12,13,17,18	H3	8		8		8		8	
1,6,11,16	H5LT		4	4	4	4	4	4	
4,5,9,10,14,15,19,20	143C/152A								8
	TOTALS	8	4	12	4	12	4	12	8



NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND FM 740

SIGNING & PHASING

Designed: LDP	FED. RD. DIV. NO.: 6	STATE: TEXAS	FEDERAL AID PROJECT NO.: STP 2013 (597) MM			HIGHWAY NO.: FM 3097	
Checked: KK							
Drawn: BC	DIST.: DAL	COUNTY: ROCKWALL	CONTROL NO.: 3148	SECTION NO.: 01	JOB NO.: 006	SHEET NO.: 178	
Checked: LDP							

4/30/2014 11:01:45 AM rtatum pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.35 HDR Cut Sheets/Signals/120404SGNL-740-02.dgn

RADAR DETECTION ZONE DETAILS

RADAR DETECTOR	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATION	ZONE	CHANNEL
R1	MAST ARM POLE P-1	19'	STOPBAR	Ø1-A	1
				Ø6-A	2
				Ø6-B	2
R2	MAST ARM POLE P-1	19'	FROM STOPBAR TO 500' BACK	Ø6	N/A
R3	MAST ARM POLE P-3	19'	FROM STOPBAR TO 500' BACK	Ø8	N/A
R4	MAST ARM POLE P-4	19'	STOPBAR	Ø3-A	1
				Ø8-A	2
				Ø8-B	3
				Ø8-C	3
R5	MAST ARM POLE P-4	19'	STOPBAR	Ø5-A	1
				Ø2-A	2
				Ø2-B	2
R6	MAST ARM POLE P-4	19'	FROM STOPBAR TO 500' BACK	Ø2	N/A
R7	MAST ARM POLE P-7	19'	FROM STOPBAR TO 500' BACK	Ø4	N/A
R8	POLE P-7	19'	STOPBAR	Ø7-A	1
				Ø4-A	2
				Ø4-B	3

CONDUCTOR AND CONDUIT SCHEDULE

RUN	LENGTH (LF)	CONDUITS					NO. 8 BARE	NO. 6 BARE	NO. 8 XHHW (LUM'S)	NO. 6 XHHW	TY A 14 AWG		TY C 12 AWG	OPTICOM	RADAR CABLE	COAX (RADIO)
		EXISTING 2" PVC	2" PVC	3" PVC	4" PVC	3" PVC BORED					16/C SIGNAL CABLE	7/C SIGNAL CABLE	2/C APS UNIT			
		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
1*	5			2												
2	10		1					1	2	2						
3	5				2		1	1		2	4	3	8	4	8	1
4	10			1			1				1		1	1	2	1
5	10			1			1					1	1			
6	125					1	1		2		1		2	1	1	
7	10			1			1		2		1		2	1	1	
8	55					1	1									
9	70	1					1									
10	25	1					1				1			1	3	
11	10			1			1					1	1			
12	25			1			1					1	1			
13	95	1					1				1	2	2	1	3	
14	10	1					1		2		1		2	1	2	
15	50	1					1		2		2	2	4	2	5	
16	75					1	1		2		2	2	4	2	5	
TOTAL (LF)		250	10	75	10	255	575	15	560	30	545	500	1075	545	1200	15

NOTE
* SPARE CONDUITS PER STANDARD TS-CF

CABLE TERMINATION CHART

Conductor Cable	Cable 1 Pole P-1 16/C 14 AWG	Cable 2 Pole P-2 7/C 14 AWG	Cable 3 Pole P-3 16/C 14 AWG	Cable 4 Pole P-4 16/C 14 AWG	Cable 5 Pole P-5 7/C 14 AWG	Cable 6 Pole P-6 7/C 14 AWG	Cable 7 Pole P-7 16/C 14 AWG
Black	Spare	Spare	Spare	Spare	Spare	Spare	Spare
White	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common
Red	SH 1,2,3 R Ph 2	SH 5 DNW Ped Ph 2	SH 6,7,8 R Ph 4	SH 11,12,13 R Ph 6	SH 14 DNW Ped Ph 4	SH 15 DNW Ped Ph 6	SH 16,17,18 R Ph 8
Green	SH 1,2,3 G Ph 2	SH 5 W Ped Ph 2	SH 6,7,8 G Ph 4	SH 11,12,13 G Ph 6	SH 14 W Ped Ph 4	SH 14 W Ped Ph 6	SH 16,17,18 G Ph 8
Orange	SH 1,2,3 Y Ph 2	Spare	SH 6,7,8 Y Ph 4	SH 11,12,13 Y Ph 6	Spare	Spare	SH 16,17,18 Y Ph 8
Blue	SH 1 G ARW Ph 5	Spare	SH 6 G ARW Ph 7	SH 11 G ARW Ph 1	Spare	Spare	SH 16 G ARW Ph 3
White/Black	SH 1 Y ARW Ph 5	Spare	SH 6 Y ARW Ph 7	SH 11 Y ARW Ph 1	Spare	Spare	SH 16 Y ARW Ph 3
Red/Black	SH 4 DNW Ped Ph 8		SH 9 DNW Ped Ph 2	Spare			SH 19 DNW Ped Ph 6
Green/Black	SH 4 W Ped Ph 8		SH 9 W Ped Ph 2	Spare			SH 19 W Ped Ph 6
Orange/Black	Spare		SH 10 DNW Ped Ph 4	Spare			SH 20 DNW Ped Ph 8
Blue/Black	Spare		SH 10 W Ped Ph 4	Spare			SH 20 W Ped Ph 8
Black/White	Spare		Spare	Spare			Spare
Red/White	Spare		Spare	Spare			Spare
Green/White	Spare		Spare	Spare			Spare
Blue/White	Spare		Spare	Spare			Spare
Black/Red	Spare		Spare	Spare			Spare

NOTE
SEPARATE 12 AWG 2/C CABLES WILL BE RUN TO EACH INDIVIDUAL APS UNIT ACCORDING TO MANUFACTURER SPECIFICATIONS

POLE DETAILS & WIRING INSIDE POLES AND ARMS

POLE	TYPE	CONDUCTORS/CABLE IN POLES (LF) 14 AWG 5/C	14 AWG 7/C	12 AWG 2/C	RADAR CABLE	COAX (RADIO)	OPTICOM	#12 XHHW (LUMINAIRES)	FOUNDATION TYPE	FOUNDATION (LF)
	EXISTING POLES									
P-1	STEEL POLE WITH 44 FT MAST ARM	65	75	10	130	30	65			
P-4	STEEL POLE WITH 44 FT MAST ARM	65	65		195		65			
P-7	STEEL POLE WITH 44 FT MAST ARM AND LUMINAIRE (30' TALL)	65	85	20	130		65	90		
	PROPOSED POLES									
P-2	PEDESTAL POLE		10	10					24-A	6
P-3	STEEL POLE WITH 65 FT MAST ARM AND LUMINAIRE (30' TALL)	85	105	20	85		85	90	48-A	22
P-5	PEDESTAL POLE		10	10					24-A	6
P-6	PEDESTAL POLE		10	10					24-A	6
TOTALS		280	360	80	540	30	280	180		

WIRING INSIDE CABINET

TY A 14 AWG		TY C 12 AWG	RADAR CABLE	COAX (RADIO)	OPTICOM
16/C	7/C	2/C			
20	15	40	40	5	20

GROUND BOX SUMMARY

TYPE	EACH
A	1
C	2

ELECTRICAL SERVICE DATA

MAINTAIN EXISTING ELECTRICAL SERVICE

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER
4.30.14

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND FM 740

CONDUCTOR AND CONDUIT SCHEDULES

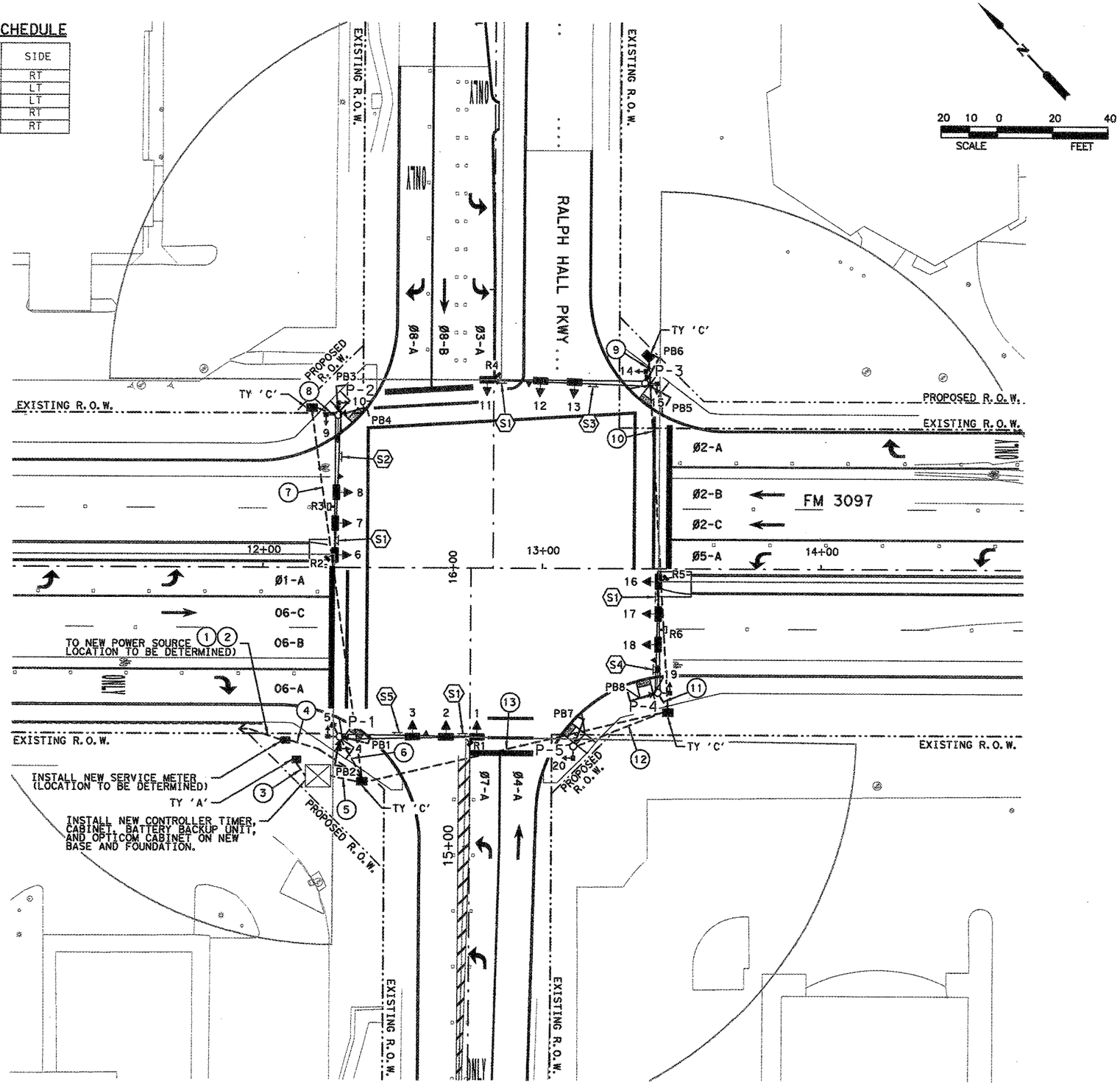
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Checked: KK						
Drawn: BG	DIST. DAL	COUNTY ROCKWALL	CONTROL NO. 3148	SECTION NO. 01	JOB NO. 006	SHEET NO. 179
Checked: LDP						

SHEET 3 OF 3

4/30/2014 11:01:52 AM rtatum pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.35 HDR Cut Sheets/Signals/120404SGNL_740-03.dgn

TRAFFIC SIGNAL POLE SCHEDULE

POLE NUMBER	STATION	OFFSET	SIDE
P-1	12+27.84	60.65	RT
P-2	12+26.48	54.72	LT
P-3	12+36.65	66.50	LT
P-4	13+41.99	44.35	RT
P-5	13+11.51	63.69	RT



NOTES

1. LOCATION OF RELOCATED ELECTRIC SERVICE TO BE DETERMINED. CONDUIT RUNS 1 AND 2 NOT SHOWN ON PLAN.
2. LOCATION OF ALL UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CONFIRM LOCATIONS OF UTILITIES IN THE FIELD.
3. POLE LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL FIELD ADJUST AS NECESSARY TO AVOID UTILITIES.
4. CONTRACTOR WILL COORDINATE WITH ELECTRICITY COMPANY TO ESTABLISH POWER SOURCE AND INSTALL SERVICE METER. THIS TASK IS INCLUDED UNDER ITEM 628 AND WILL NOT BE PAID FOR SEPERATELY.
5. CONTRACTOR WILL COORDINATE WITH ELECTRIC COMPANY TO OBTAIN APPROVAL ON THE LOCATION OF SIGNAL POLES TO MEET OSHA CLEARANCE REQUIREMENTS FOR POWER LINES. FINAL LOCATIONS OF TRAFFIC SIGNAL MUST BE APPROVED BY THE ENGINEER.
6. ALL PUSH BUTTONS WILL BE ADJACENT TO THE PEDESTRIAN RAMPS AND BE ACCESSIBLE TO MEET ADA AND TMUTCD REQUIREMENTS.
7. MASTER RADIO IS LOCATED AT IH 30 AND FM 740. NEW SSR ANTENNAS SHOULD BE AIMED TO THIS LOCATION.
8. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.

LEGEND

- PROP. SIGNAL CONTROLLER
- PROP. SIGNAL POLE AND MAST ARM
- PROP. PEDESTRIAN POLE
- PROP. SIGNAL HEAD
- PROP. PEDESTRIAN HEAD
- PROP. PEDESTRIAN PUSH BUTTON
- PROP. STOP BAR RADAR DETECTION
- PROP. ADVANCED RADAR DETECTION
- PROP. SSR ANTENNA
- PROP. GROUND BOX
- PROP. SIGN
- PROP. LUMINAIRE
- PROP. PREEMPTION SENSOR
- PROP. CONDUIT
- PROP. SERVICE METER
- PROP. SIGN CALLOUT
- PROP. CONDUIT RUN CALLOUT
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. RETAINING WALL
- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. CONDUIT
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND BOX
- OE — EXIST. OVERHEAD ELECTRIC
- TRAFFIC FLOW DIRECTION
- PROPOSED SIDEWALK

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED PROFESSIONAL ENGINEER
4.30.14

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND RALPH HALL PKWY

PROPOSED TRAFFIC SIGNAL LAYOUT

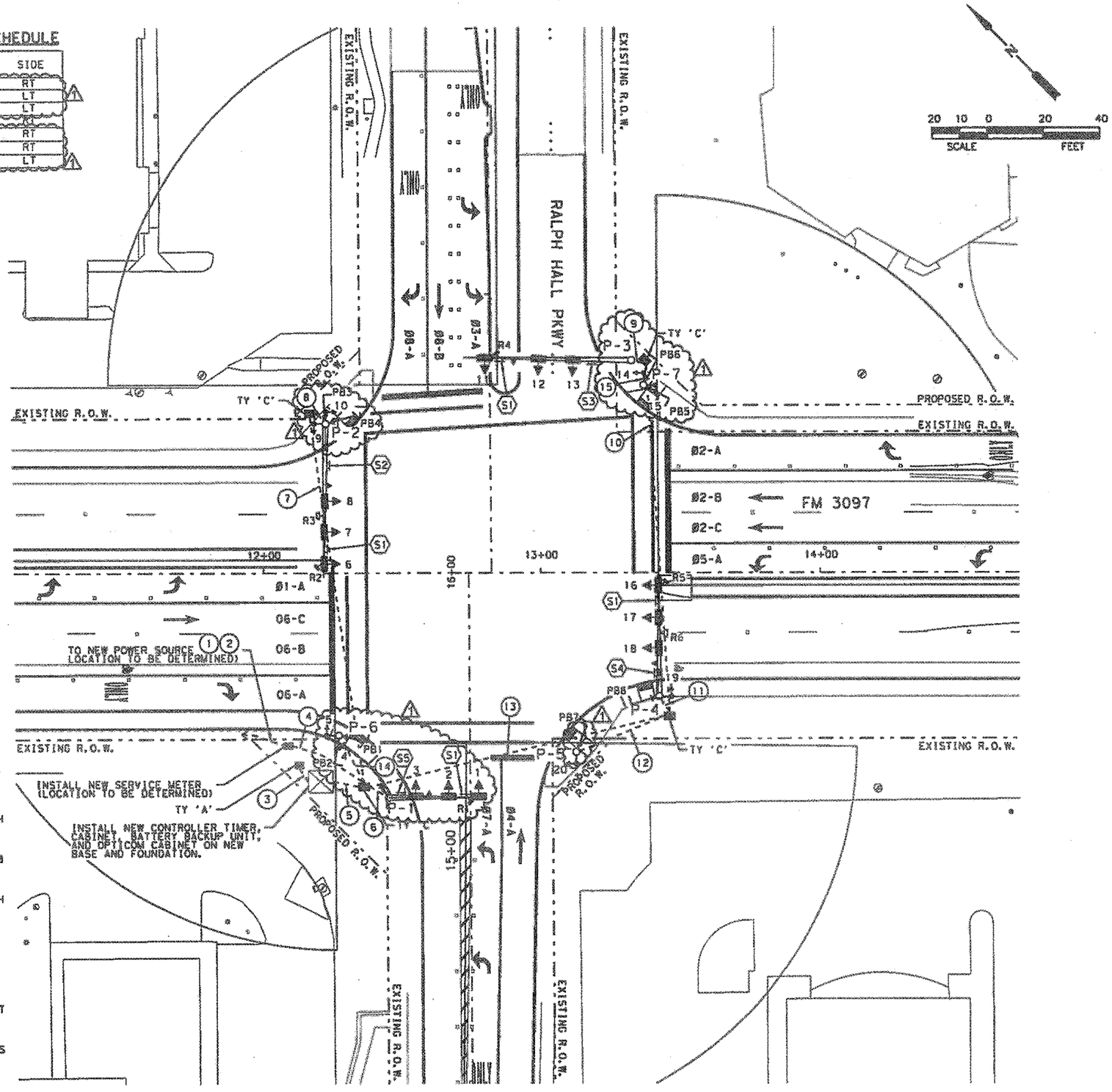
Designed:	LDP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KK	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	LDP	DAL	ROCKWALL	3148	01	006	180

SHEET 1 OF 3

4/30/2014 11:02:00 AM rtatum
DWG/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.35 HDR Cut Sheets/Signals/120404SGNL-RHP-01.dgn

TRAFFIC SIGNAL POLE SCHEDULE

POLE NUMBER	STATION	OFFSET	SIDE
P-1	12+44.55	80.61	RT
P-2	12+22.93	53.55	LT
P-3	13+32.80	76.15	LT
P-4	13+92.00	45.00	RT
P-5	13+12.17	64.33	RT
P-6	12+26.90	58.33	RT
P-7	13+37.10	67.30	LT



NOTES

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2. LOCATION OF ALL UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CONFIRM LOCATIONS OF UTILITIES IN THE FIELD.
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5. CONTRACTOR WILL COORDINATE WITH ELECTRIC COMPANY TO OBTAIN APPROVAL ON THE LOCATION OF SIGNAL POLES TO MEET OSHA CLEARANCE REQUIREMENTS FOR POWER LINES. FINAL LOCATIONS OF TRAFFIC SIGNAL MUST BE APPROVED BY THE ENGINEER.
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LEGEND

- PROP. SIGNAL CONTROLLER
- PROP. SIGNAL POLE AND MAST ARM
- PROP. PEDESTRIAN POLE
- PROP. SIGNAL HEAD
- PROP. PEDESTRIAN HEAD
- PROP. PEDESTRIAN PUSH BUTTON
- PROP. STOP BAR RADAR DETECTION
- PROP. ADVANCED RADAR DETECTION
- PROP. SSR ANTENNA
- PROP. GROUND BOX
- PROP. SIGN
- PROP. LUMINAIRE
- PROP. PREEMPTION SENSOR
- PROP. CONDUIT
- PROP. SERVICE METER
- PROP. SIGN CALLOUT (X)
- PROP. CONDUIT RUN CALLOUT (X)
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. RETAINING WALL
- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. CONDUIT
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND BOX
- OE — EXIST. OVERHEAD ELECTRIC
- TRAFFIC FLOW DIRECTION
- PROPOSED SIDEWALK

Leslie D Pollack

STATE OF TEXAS — LESLIE POLLACK — 101285 — LICENSED PROFESSIONAL ENGINEER

12/20/17

NO.	REVISION	BY	DATE
1	AS-BUILT REVISIONS	LP	12/17

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND RALPH HALL PKWY

PROPOSED TRAFFIC SIGNAL LAYOUT

Designed	LDP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked	KK	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	LDP	DAL	ROCKWALL	3148	01	006	180

SHEET 1 OF 3

12/15/2017 7:09:09 PM KMARSH
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4/30/2014 11:02:06 AM r'atum pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.35 HDR Cut Sheets/Signals/120404SGNL RHP 02.dgn

PROPOSED SIGN LEGEND



S1
R10-17T
36" x 42"
LEFT TURN YIELD ON
FLASHING YELLOW ARROW



S2
CITY WILL FURNISH
WITH CITY LOGO



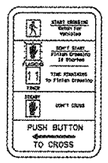
S3
CITY WILL FURNISH
WITH CITY LOGO



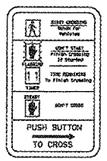
S4
CITY WILL FURNISH
WITH CITY LOGO



S5
CITY WILL FURNISH
WITH CITY LOGO

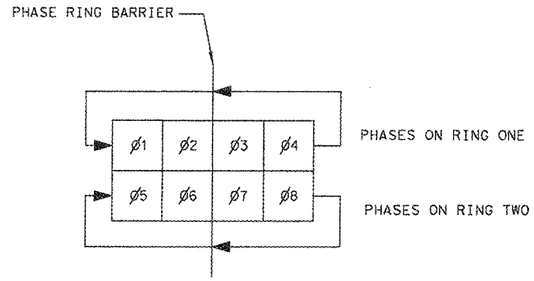


S6
R10-3eL
PB3, PB4, PB5, PB8
ACCESSIBLE
PEDESTRIAN
PUSH BUTTON
AND SIGN



S7
R10-3eR
PB1, PB2, PB6, PB7
ACCESSIBLE
PEDESTRIAN
PUSH BUTTON
AND SIGN

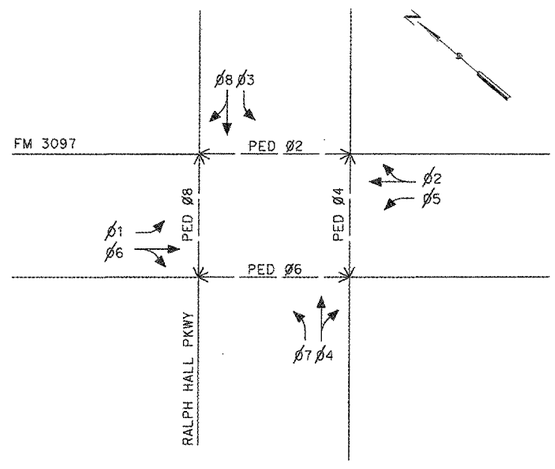
PHASING RING DIAGRAM



Ø1, Ø3, Ø5, Ø7 ARE PROTECTED/PERMISSIVE LEFT TURN PHASES

O.L.A = SBLT FYA, O.L.B = WBLT FYA, O.L.C = NBLT FYA, O.L.D = EBLT FYA

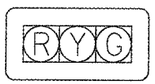
PHASING DIAGRAM



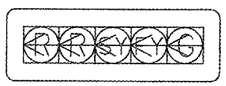
APS MESSAGE INFORMATION

APS UNIT #	ACKNOWLEDGEMENT DEFAULT	EXTENDED PRESS MESSAGE "WAIT TO CROSS (STREET NAME) AT (CROSS STREET NAME)."	WALK PHASE MESSAGE "(STREET NAME) WALK SIGN IS ON TO CROSS, (STREET NAME)" OR TONE	COUNTDOWN SPEECH MESSAGE
PB1	"WAIT TO CROSS HORIZON ROAD AT RALPH HALL PARKWAY"	HORIZON ROAD AT RALPH HALL PARKWAY	AUSTRALIAN TONE	OFF
PB2	"WAIT TO CROSS RALPH HALL PARKWAY AT HORIZON ROAD"	RALPH HALL PARKWAY AT HORIZON ROAD	AUSTRALIAN TONE	OFF
PB3	"WAIT TO CROSS RALPH HALL PARKWAY AT HORIZON ROAD"	RALPH HALL PARKWAY AT HORIZON ROAD	AUSTRALIAN TONE	OFF
PB4	"WAIT TO CROSS HORIZON ROAD AT RALPH HALL PARKWAY"	HORIZON ROAD AT RALPH HALL PARKWAY	AUSTRALIAN TONE	OFF
PB5	"WAIT TO CROSS HORIZON ROAD AT RALPH HALL PARKWAY"	HORIZON ROAD AT RALPH HALL PARKWAY	AUSTRALIAN TONE	OFF
PB6	"WAIT TO CROSS RALPH HALL PARKWAY AT HORIZON ROAD"	RALPH HALL PARKWAY AT HORIZON ROAD	AUSTRALIAN TONE	OFF
PB7	"WAIT"	RALPH HALL PARKWAY AT HORIZON ROAD	RAPID TICK	OFF
PB8	"WAIT"	HORIZON ROAD AT RALPH HALL PARKWAY	RAPID TICK	OFF

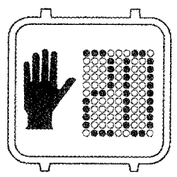
SIGNAL HEAD LEGEND



H3
HEADS: 2, 3, 7,
8, 12, 13, 17, 18



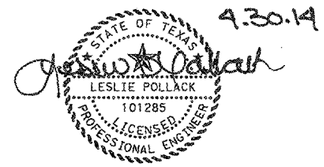
H5FLT
HEADS: 1, 6, 11, 16



143C/152A
HEADS: 4, 5, 9,
10, 14, 15, 19, 20

SIGNAL HEAD SUMMARY

SIGNAL HEAD NUMBER	SIGNAL HEAD TYPE	SIGNAL HEADS (EA) 12" BACKPLATES 3 SEC	SIGNAL HEADS (EA) 12" BACKPLATES 5 SEC	SIGNAL SECTIONS (EA) 12" LED GRN	GRN ARW	YEL	YEL ARW	RED	RED ARW	PED SIGNAL SECTIONS (EA)
2,3,7,8,12,13,17,18	H3	8		8		8		8		
1,6,11,16	H5FLT		4		4		8		8	
4,5,9,10,14,15,19,20	143C/152A									8
	TOTALS	8	4	8	4	8	8	8	8	8



NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND RALPH HALL PKWY

SIGNING & PHASING

Designed: LDP	FED. RD. DIV. NO. 6	STATE TEXAS	FEDERAL AID PROJECT NO. STP 2013 (597) MM			HIGHWAY NO. FM 3097
Checked: KK						
Drawn: BG	DIST. DAL	COUNTY ROCKWALL	CONTROL NO. 3148	SECTION NO. 01	JOB NO. 006	SHEET NO. 181
Checked: LDP						

CABLE TERMINATION CHART

Conductor Cable	Cable 1 Pole P-1 16/C 14 AWG	Cable 2 Pole P-2 16/C 14 AWG	Cable 3 Pole P-3 16/C 14 AWG	Cable 4 Pole P-4 16/C 14 AWG	Cable 5 Pole P-5 7/C 14 AWG
Black	Spare	Spare	Spare	Spare	Spare
White	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common
Red	SH 2,3 R Ph 8	SH 7,8 R Ph 2	SH 12,13 R Ph 4	SH 17,18 R Ph 6	SH 20 DNW Ped Ph 6
Green	SH 2,3 G Ph 8	SH 7,8 G Ph 2	SH 12,13 G Ph 4	SH 17,18 G Ph 6	SH 20 W Ped Ph 6
Orange	SH 2,3 Y Ph 8	SH 7,8 Y Ph 2	SH 12,13 Y Ph 4	SH 17,18 Y Ph 6	Spare
Blue	SH 1 G ARW Ph 3	SH 6 G ARW Ph 5	SH 11 G ARW Ph 7	SH 16 G ARW Ph 1	Spare
White/Black	SH 1 SY ARW Ph 3	SH 6 SY ARW Ph 5	SH 11 SY ARW Ph 7	SH 16 SY ARW Ph 1	Spare
Red/Black	SH 1 R ARW Ph 3	SH 6 R ARW Ph 5	SH 11 R ARW Ph 7	SH 16 R ARW Ph 1	
Green/Black	SH 1 FY ARW O.L.B	SH 6 FY ARW O.L.C	SH 11 FY ARW O.L.D	SH 16 FY ARW O.L.A	
Orange/Black	SH 5 DNW Ped Ph 8	SH 10 DNW Ped Ph 2	SH 15 DNW Ped Ph 4	Spare	
Blue/Black	SH 5 W Ped Ph 8	SH 10 W Ped Ph 2	SH 15 W Ped Ph 4	Spare	
Black/White	Spare	Spare	Spare	Spare	
Red/White	SH 4 DNW Ped Ph 6	SH 9 DNW Ped Ph 8	SH 14 DNW Ped Ph 2	SH 19 DNW Ped Ph 4	
Green/White	SH 4 W Ped Ph 6	SH 9 W Ped Ph 8	SH 14 W Ped Ph 2	SH 19 W Ped Ph 4	
Blue/White	Spare	Spare	Spare	Spare	
Black/Red	Spare	Spare	Spare	Spare	

NOTE
SEPARATE 12 AWG 2/C CABLES WILL BE RUN TO EACH INDIVIDUAL APS UNIT ACCORDING TO MANUFACTURER SPECIFICATIONS

RADAR DETECTION ZONE DETAILS

RADAR DETECTOR	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATION	ZONE	CHANNEL
R1	MAST ARM POLE P-1	19'	STOPBAR	Ø7-A	1
				Ø4-A	2
R2	MAST ARM POLE P-2	19'	STOPBAR	Ø1-A	1
				Ø6-A	2
				Ø6-B	3
				Ø6-C	3
R3	MAST ARM POLE P-2	19'	FROM STOPBAR TO 500' BACK	Ø6	N/A
R4	MAST ARM POLE P-3	19'	STOPBAR	Ø3-A	1
				Ø8-A	2
				Ø8-B	3
R5	MAST ARM POLE P-4	19'	STOPBAR	Ø5-A	1
				Ø2-A	2
				Ø2-B	3
				Ø2-C	3
R6	MAST ARM POLE P-4	19'	FROM STOPBAR TO 500' BACK	Ø2	N/A

CONDUCTOR AND CONDUIT SCHEDULE

RUN	LENGTH (LF)	CONDUITS 1" RMC (RISER)	2" PVC	3" PVC	4" PVC	3" PVC BORED	NO. 8 BARE	NO. 6 BARE	NO. 8 XHHW (LUM'S)	NO. 6 XHHW	TY A 14 AWG 16/C SIGNAL CABLE	TY A 14 AWG 7/C SIGNAL CABLE	TY C 12 AWG 2/C APS UNIT	OPTICOM	RADAR CABLE	COAX (RADIO)
		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
1	40	1							2	2						
2	**		1					1	2	2						
3*	10			2												
4	**		1					1	2	2						
5	15				2		1	1		2	4	1	8	4	6	1
6	20			1			1				1		2	1	1	1
7	135					1	1		2		1		2	1	2	
8	10			1			1		2		1		2	1	2	
9	10			1			1				1		2	1	1	
10	130					1	1				1		2	1	1	
11	10			1			1		2		1		1	1	2	
12	40			1			1					1	1			
13	115					1	1		2		2	1	4	2	3	
TOTAL (LF)		40	0	110	30	380	485	15	620	110	605	170	1240	605	905	35

NOTE
* SPARE CONDUITS PER STANDARD TS-CF
**TO BE DETERMINED - AS REQUIRED BY UTILITY

POLE DETAILS & WIRING INSIDE POLES AND ARMS

POLE	TYPE	CONDUCTORS/CABLE IN POLES (LF) 14 AWG 5/C	14 AWG 7/C	12 AWG 2/C	RADAR CABLE	COAX (RADIO)	OPTICOM	#12 XHHW (LUMINAIRES)	FOUNDATION TYPE	FOUNDATION (LF)
P-1	STEEL POLE WITH 50 FT MAST ARM (19.5' TALL)	70	90	20	70	20	70		48-A	22
P-2	STEEL POLE WITH 55 FT MAST ARM AND LUMINAIRE (30' TALL)	75	95	20	150		75	90	48-A	22
P-3	STEEL POLE WITH 60 FT MAST ARM (19.5' TALL)	80	100	20	80		80		48-A	22
P-4	STEEL POLE WITH 40 FT MAST ARM AND LUMINAIRE (30' TALL)	60	70	10	120		60	90	36-A	13
P-5	PEDESTAL POLE		10	10					24-A	6
TOTALS		285	385	80	420	20	285	180		

ELECTRICAL SERVICE DATA

SERVICE POLE NO.	SERVICE POLE DESCRIPTION (SEE ED (4) - 03)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO/SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BKR. POLE/AMP	TWO-POLE CONTACTOR AMPS	PANELBOARD/ LOAD CENTER AMP RATING	CIRCUIT NO.	BRANCH CKT. BKR. POLE/AMPS	CIRCUIT AMP LOAD	SERVICE KVA LOAD
1	ELC SRV TY D (*20/240) 070 (NS)SS(E)GC(O)	1-1/4"	3/#4	N/A	2P/70	30	100	TRF SIG LIGHTING	1P / 50 2P / 20	40 6	6.2

WIRING INSIDE CABINET

TY A 14 AWG 16/C	TY A 14 AWG 7/C	TY C 12 AWG 2/C	RADAR CABLE	COAX (RADIO)	OPTICOM
20	5	40	30	5	20

GROUND BOX SUMMARY

TYPE	EACH
A	1
C	4

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED PROFESSIONAL ENGINEER
4.30.14

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND RALPH HALL PKWY

CONDUCTOR AND CONDUIT SCHEDULES

Designed:	LDP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	KK	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.		JOB NO.	SHEET NO.
Checked:	LDP	DAL	ROCKWALL	3148	01		006	182

SHEET 3 OF 3

4/30/2014 11:02:12 AM rtatum pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.35 HDR Cut Sheets/Signals/1/2040SGNL RHP-03.dgn

CABLE TERMINATION CHART

Conductor Cable	Cable 1 Pole P-1 16/C 14 AWG	Cable 2 Pole P-2 16/C 14 AWG	Cable 3 Pole P-3 16/C 14 AWG	Cable 4 Pole P-4 16/C 14 AWG	Cable 5 Pole P-5 7/C 14 AWG	Cable 6 Pole P-6 7/C 14 AWG	Cable 7 Pole P-7 7/C 14 AWG
Black	Spare	Spare	Spare	Spare	Spare	Spare	Spare
White	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common
Red	SH 2,3 R Ph 8	SH 7,8 R Ph 2	SH 12,13 R Ph 4	SH 17,18 R Ph 6	SH 20 DNW Ped Ph 8	SH 5 DNW Ped Ph 8	SH 15 DNW Ped Ph 4
Green	SH 2,3 G Ph 8	SH 7,8 G Ph 2	SH 12,13 G Ph 4	SH 17,18 G Ph 6	SH 20 W Ped Ph 8	SH 5 W Ped Ph 8	SH 15 W Ped Ph 4
Orange	SH 2,3 Y Ph 8	SH 7,8 Y Ph 2	SH 12,13 Y Ph 4	SH 17,18 Y Ph 6	Spare	SH 4 DNW Ped Ph 8	SH 14 DNW Ped Ph 2
Blue	SH 1 G ARW Ph 3	SH 6 G ARW Ph 5	SH 11 G ARW Ph 7	SH 16 G ARW Ph 1	Spare	SH 4 W Ped Ph 5	SH 14 W Ped Ph 2
White/Black	SH 1 SY ARW Ph 3	SH 6 SY ARW Ph 5	SH 11 SY ARW Ph 7	SH 16 SY ARW Ph 1	Spare	Spare	Spare
Red/Black	SH 1 R ARW Ph 3	SH 6 R ARW Ph 5	SH 11 R ARW Ph 7	SH 16 R ARW Ph 1			
Green/Black	SH 1 FY ARW O.L.B	SH 6 FY ARW O.L.C	SH 11 FY ARW O.L.D	SH 16 FY ARW O.L.A			
Orange/Black	Spare	SH 10 DNW Ped Ph 2	Spare	Spare			
Blue/Black	Spare	SH 10 W Ped Ph 2	Spare	Spare			
Black/White	Spare	Spare	Spare	Spare			
Red/White	Spare	SH 9 DNW Ped Ph 8	Spare	SH 19 DNW Ped Ph 4			
Green/White	Spare	SH 9 W Ped Ph 8	Spare	SH 19 W Ped Ph 4			
Blue/White	Spare	Spare	Spare	Spare			
Black/Red	Spare	Spare	Spare	Spare			

NOTE
SEPARATE 12 AWG 2/C CABLES WILL BE RUN TO EACH INDIVIDUAL APS UNIT ACCORDING TO MANUFACTURER SPECIFICATIONS

CONDUCTOR AND CONDUIT SCHEDULE

RUN	LENGTH (LF)	CONDUITS 1" RMC (RISER)	2" PVC	3" PVC	4" PVC	3" PVC SCORED	NO. 8 BARE	NO. 6 BARE	NO. 8 XHHW (LUM'S)	NO. 6 XHHW	TY A 14 AWG 16/C SIGNAL CABLE	TY A 14 AWG 7/C SIGNAL CABLE	TY C 12 AWG 2/C APS UNIT	OPTICOM	RADAR CABLE	COAX (RADIO)
		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
1	40	1							2	2						
2	**		1					1	2	2						
3*	10			2												
4	**		1					1	2	2						
5	15				2		1	1			4		4	4	6	1
6	10			1			1				1		1	1	1	1
7	135					1	1		2		1		1	1	2	
8	10			1			1		2		1		1	1	2	
9	10			1			1				1		1	1	1	
10	130					1	1				1		2	1	1	
11	10			1			1		2		1		1	1	2	
12	40			1			1						1			
13	115						1		2		2		2	2	2	
14	20												1			
15	10			1			1						1			
TOTAL (LF)		40	0	110	30	380	485	15	640	110	395	475	1240	595	995	25

NOTE
* SPARE CONDUITS PER STANDARD TS-CF
**TO BE DETERMINED - AS REQUIRED BY UTILITY

POLE DETAILS & WIRING INSIDE POLES AND ARMS

POLE	TYPE	CONDUCTORS/CABLE IN POLES (LF) 14 AWG 5/C	14 AWG 7/C	12 AWG 2/C	RADAR CABLE	COAX (RADIO)	OPTICOM	#12 XHHW (LUMINAIRES)	FOUNDATION TYPE	FOUNDATION (LF)
P-1	STEEL POLE WITH 32 FT MAST ARM AND LUMINAIRE (30' TALL)	55	55		55	30	55	80	30-A	11
P-2	STEEL POLE WITH 50 FT MAST ARM AND LUMINAIRE (50' TALL)	75	90	20	190		75	90	48-A	22
P-3	STEEL POLE WITH 60 FT MAST ARM (19.5' TALL)	80	80		80		80		48-A	22
P-4	STEEL POLE WITH 40 FT MAST ARM AND LUMINAIRE (30' TALL)	60	70	10	120		60	90	36-A	13
P-5	PEDESTAL POLE		10	10					24-A	8
P-6	PEDESTAL POLE		20	20					24-A	8
P-7	PEDESTAL POLE		20	20					24-A	8
TOTALS		270	350	80	405	30	270	270		

ELECTRICAL SERVICE DATA

SERVICE POLE NO.	SERVICE POLE DESCRIPTION (SEE ED (4) - 03)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO/SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BKR. POLE/AMP	TWO-POLE CONTACTOR AMPS	PANELBOARD/ LOAD CENTER AMP RATING	CIRCUIT NO.	BRANCH CKT BKR. POLE/AMPS	CIRCUIT AMP LOAD	SERVICE KVA LOAD
1	ELC SRV TY D (120/240) 070 (NS)SS(E)GC(O)	1-1/4"	3/#4	N/A	2P/70	30	100	TRF SIG LIGHTING	1P / 50 2P / 20	40 6	8.2

RADAR DETECTION ZONE DETAILS

RADAR DETECTOR	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATION	ZONE	CHANNEL
R1	MAST ARM POLE P-1	19'	STOPBAR	Ø7-A	1
				Ø4-A	2
R2	MAST ARM POLE P-2	19'	STOPBAR	Ø1-A	1
				Ø6-A	2
				Ø8-B	3
				Ø8-C	3
R3	MAST ARM POLE P-2	19'	FROM STOPBAR TO 500' BACK	Ø8	N/A
R4	MAST ARM POLE P-3	19'	STOPBAR	Ø3-A	1
				Ø8-A	2
				Ø8-B	3
R5	MAST ARM POLE P-4	19'	STOPBAR	Ø5-A	1
				Ø2-A	2
				Ø2-B	3
				Ø2-C	3
R6	MAST ARM POLE P-4	19'	FROM STOPBAR TO 500' BACK	Ø2	N/A

WIRING INSIDE CABINET

TY A 14 AWG 16/C	TY A 14 AWG 7/C	TY C 12 AWG 2/C	RADAR CABLE	COAX (RADIO)	OPTICOM
20	15	40	30	5	20

GROUND BOX SUMMARY

TYPE	EACH
A	1
C	4

Jessie D Pollack
STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED PROFESSIONAL ENGINEER
12/20/17

NO.	REVISION	BY	DATE
1	AS-BUILT REVISIONS	LP	12/17

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND RALPH HALL PKWY

CONDUCTOR AND CONDUIT SCHEDULES

Designed	LDP	FED. AID DIST. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked	KK	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn	BS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	LDP	DAL	ROCKWALL	3148	01	006	182A

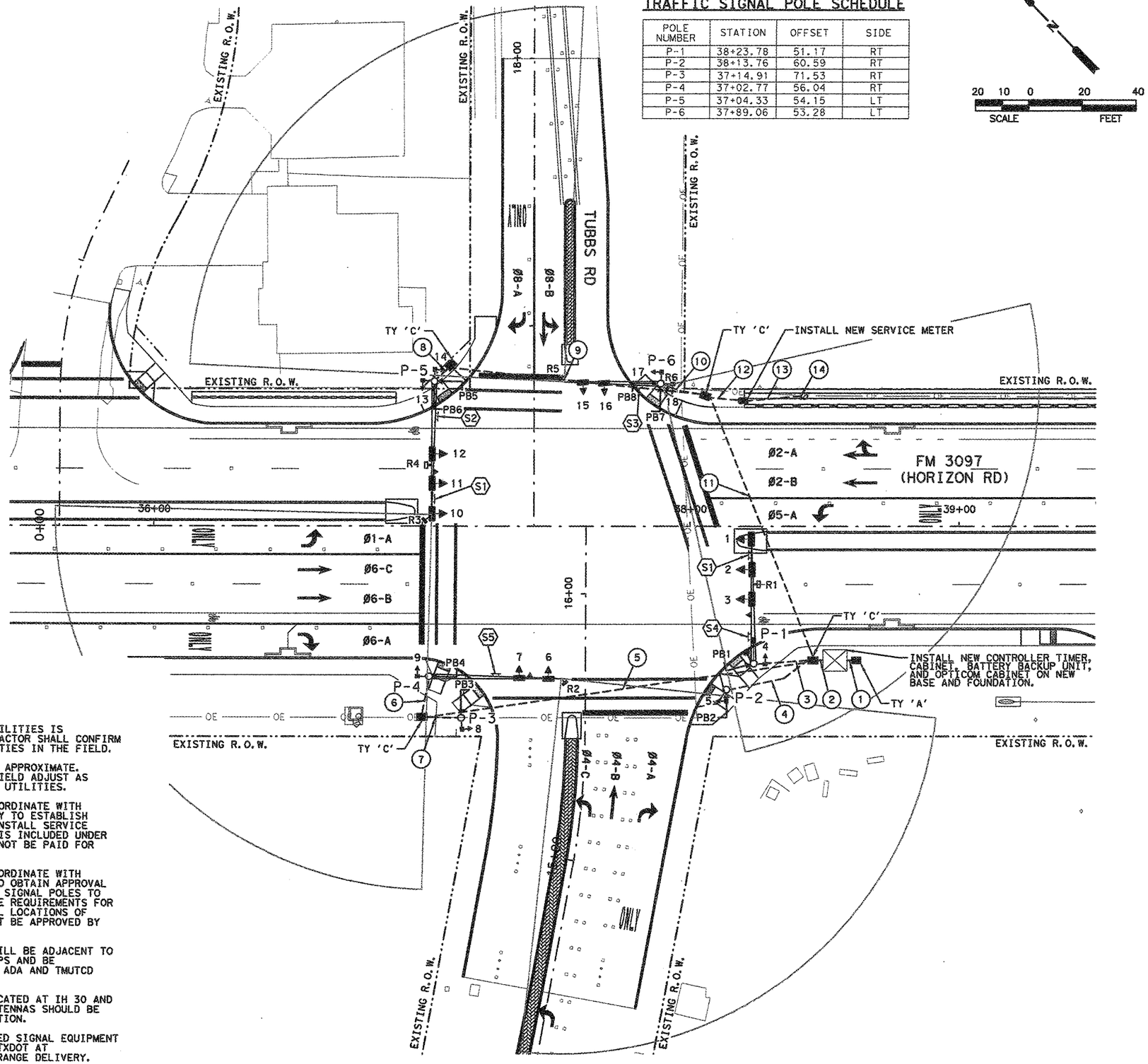
SHEET 3 OF 3

12/15/2017 7:10:06 PM KNARSH pw:/Active Projects/TXNR12004.04/6.00 Plans and Drawings/6.35 HDR Cut Sheets/Signals/ASBUILT_120404SGNL-RHP-03.dgn

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TRAFFIC SIGNAL POLE SCHEDULE

POLE NUMBER	STATION	OFFSET	SIDE
P-1	38+23.78	51.17	RT
P-2	38+13.76	60.59	RT
P-3	37+14.91	71.53	RT
P-4	37+02.77	56.04	RT
P-5	37+04.33	54.15	LT
P-6	37+89.06	53.28	LT



NOTES

1. LOCATION OF ALL UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CONFIRM LOCATIONS OF UTILITIES IN THE FIELD.
2. POLE LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL FIELD ADJUST AS NECESSARY TO AVOID UTILITIES.
3. CONTRACTOR WILL COORDINATE WITH ELECTRICITY COMPANY TO ESTABLISH POWER SOURCE AND INSTALL SERVICE METER. THIS TASK IS INCLUDED UNDER ITEM 628 AND WILL NOT BE PAID FOR SEPERATELY.
4. CONTRACTOR WILL COORDINATE WITH ELECTRIC COMPANY TO OBTAIN APPROVAL ON THE LOCATION OF SIGNAL POLES TO MEET OSHA CLEARANCE REQUIREMENTS FOR POWER LINES. FINAL LOCATIONS OF TRAFFIC SIGNAL MUST BE APPROVED BY THE ENGINEER.
5. ALL PUSH BUTTONS WILL BE ADJACENT TO THE PEDESTRIAN RAMPS AND BE ACCESSIBLE TO MEET ADA AND TMUTCD REQUIREMENTS.
6. MASTER RADIO IS LOCATED AT IH 30 AND FM 740. NEW SSR ANTENNAS SHOULD BE AIMED TO THIS LOCATION.
7. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.

LEGEND

- PROP. SIGNAL CONTROLLER
- PROP. SIGNAL POLE AND MAST ARM
- PROP. PEDESTRIAN POLE
- PROP. SIGNAL HEAD
- PROP. PEDESTRIAN HEAD
- PROP. PEDESTRIAN PUSH BUTTON
- PROP. STOP BAR RADAR DETECTION
- PROP. ADVANCED RADAR DETECTION
- PROP. SSR ANTENNA
- PROP. GROUND BOX
- PROP. SIGN
- PROP. LUMINAIRE
- PROP. PREEMPTION SENSOR
- PROP. CONDUIT
- PROP. SERVICE METER
- PROP. SIGN CALLOUT (X)
- PROP. CONDUIT RUN CALLOUT (X)
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. RETAINING WALL
- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. CONDUIT
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND BOX
- OE — EXIST. OVERHEAD ELECTRIC
- TRAFFIC FLOW DIRECTION
- PROPOSED SIDEWALK

4.30.14

LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

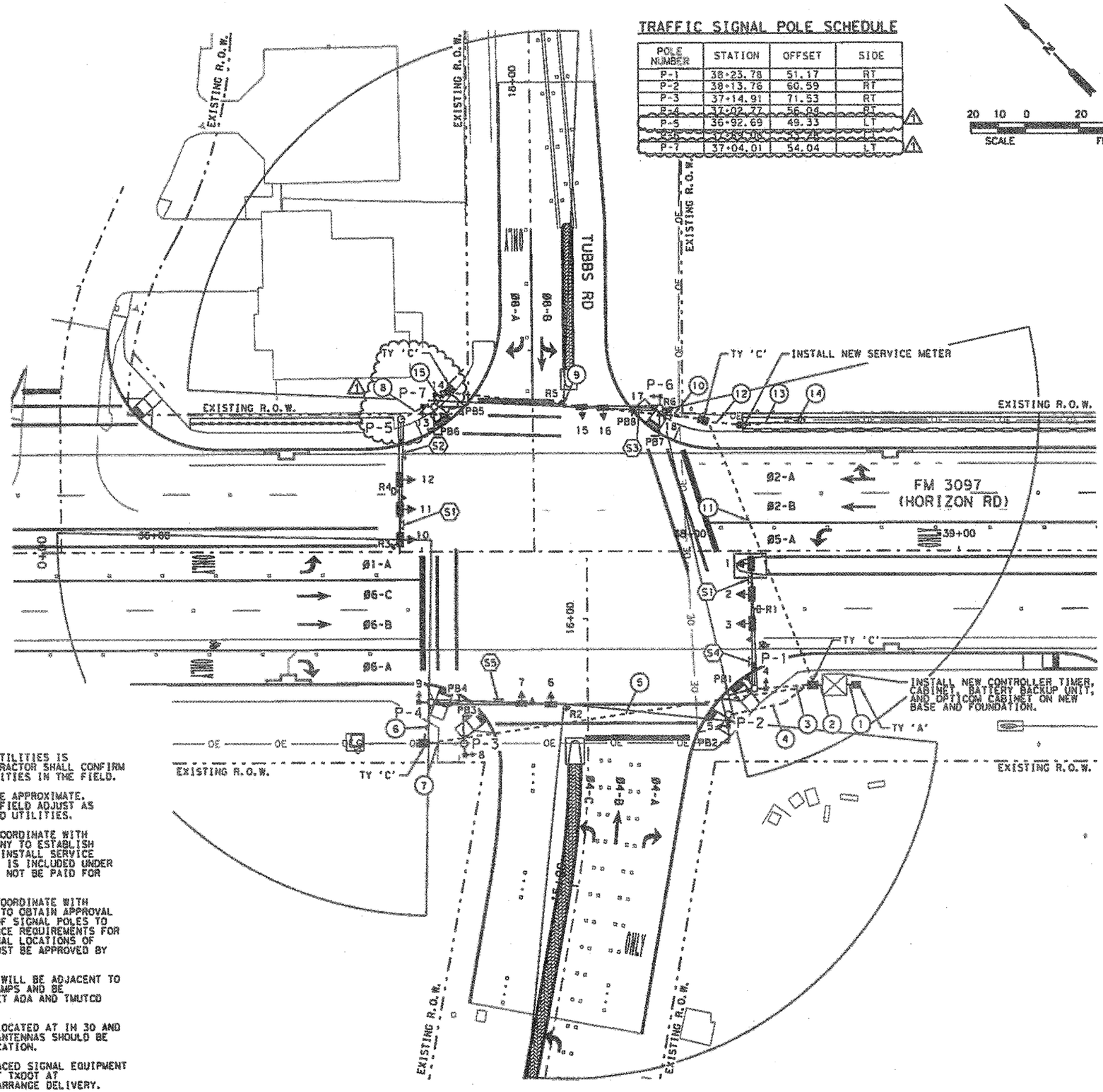
HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND TUBBS RD

PROPOSED TRAFFIC SIGNAL LAYOUT

Designed:	LDP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	KK	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	LDP	DAL	ROCKWALL	3148	01	006		183



TRAFFIC SIGNAL POLE SCHEDULE

POLE NUMBER	STATION	OFFSET	SIDE
P-1	38+23.78	51.17	RT
P-2	38+13.76	60.59	RT
P-3	37+14.91	71.83	RT
P-4	37+02.27	56.04	RT
P-5	36+92.69	49.33	LT
P-6	37+93.06	52.28	LT
P-7	37+04.01	54.04	LT

NOTES

1. LOCATION OF ALL UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CONFIRM LOCATIONS OF UTILITIES IN THE FIELD.
2. POLE LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL FIELD ADJUST AS NECESSARY TO AVOID UTILITIES.
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LEGEND

- PROP. SIGNAL CONTROLLER
- PROP. SIGNAL POLE AND MAST ARM
- PROP. PEDESTRIAN POLE
- PROP. SIGNAL HEAD
- PROP. PEDESTRIAN HEAD
- PROP. PEDESTRIAN PUSH BUTTON
- PROP. STOP BAR RADAR DETECTION
- PROP. ADVANCED RADAR DETECTION
- PROP. SSR ANTENNA
- PROP. GROUND BOX
- PROP. SIGN
- PROP. LUMINAIRE
- PROP. PREEMPTION SENSOR
- PROP. CONDUIT
- PROP. SERVICE METER
- PROP. SIGN CALLOUT
- PROP. CONDUIT RUN CALLOUT
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. RETAINING WALL
- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. CONDUIT
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND BOX
- OE — EXIST. OVERHEAD ELECTRIC
- TRAFFIC FLOW DIRECTION
- PROPOSED SIDEWALK

Leslie D Pollack
STATE OF TEXAS
LESLIE POLLACK
101286
LICENSED
PROFESSIONAL ENGINEER
12/20/17

NO.	REVISION	BY	DATE
1	AS-BUILT REVISIONS	LP	12/17

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND TUBBS RD

PROPOSED TRAFFIC SIGNAL LAYOUT

Designed	LOP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked	KK	6	TEXAS	STP 2013 (597) ALM				FM 3097
Drawn	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked	LOP	DAL	ROCKWALL	3148	01	006		183A

SHEET 1 OF 3

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PROPOSED SIGN LEGEND



S1
R10-17T
36" x 42"
LEFT TURN YIELD ON
FLASHING YELLOW ARROW



S2
CITY WILL FURNISH
WITH CITY LOGO



S3
CITY WILL FURNISH
WITH CITY LOGO



S4
CITY WILL FURNISH
WITH CITY LOGO



S5
CITY WILL FURNISH
WITH CITY LOGO

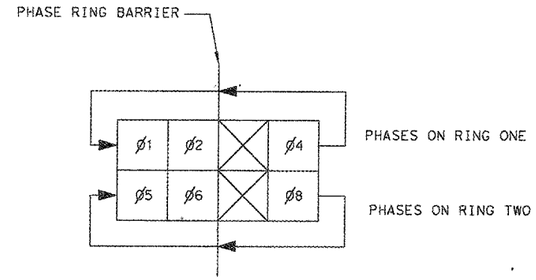


S6
R10-3eL
PB1-PB3, PB5, PB7
ACCESSIBLE
PEDESTRIAN
PUSH BUTTON
AND SIGN



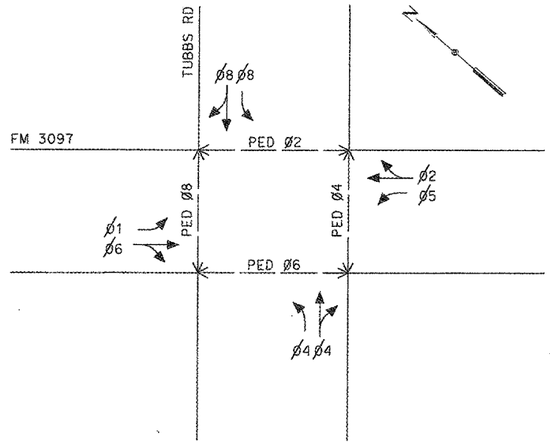
S7
R10-3eR
PB4, PB6, PB8
ACCESSIBLE
PEDESTRIAN
PUSH BUTTON
AND SIGN

PHASING RING DIAGRAM



ø1, ø5 ARE PROTECTED/PERMISSIVE LEFT TURN PHASES
O.L.A = SBLT FYA, O.L.C = NBLT FYA

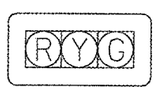
PHASING DIAGRAM



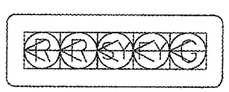
APS MESSAGE INFORMATION

APS UNIT #	ACKNOWLEDGEMENT DEFAULT	EXTENDED PRESS MESSAGE	WALK PHASE MESSAGE	COUNTDOWN SPEECH MESSAGE
		"WAIT TO CROSS (STREET NAME) AT (CROSS STREET NAME)."	"(STREET NAME) WALK SIGN IS ON TO CROSS, (STREET NAME)" OR TONE	
PB1	"WAIT"	HORIZON ROAD AT TUBBS ROAD	RAPID TICK	OFF
PB2	"WAIT"	TUBBS ROAD AT HORIZON ROAD	RAPID TICK	OFF
PB3	"WAIT"	TUBBS ROAD AT HORIZON ROAD	RAPID TICK	OFF
PB4	"WAIT"	HORIZON ROAD AT TUBBS ROAD	RAPID TICK	OFF
PB5	"WAIT TO CROSS HORIZON ROAD AT TUBBS ROAD"	HORIZON ROAD AT TUBBS ROAD	AUSTRALIAN TONE	OFF
PB6	"WAIT TO CROSS TUBBS ROAD AT HORIZON ROAD"	TUBBS ROAD AT HORIZON ROAD	AUSTRALIAN TONE	OFF
PB7	"WAIT TO CROSS TUBBS ROAD AT HORIZON ROAD"	TUBBS ROAD AT HORIZON ROAD	AUSTRALIAN TONE	OFF
PB8	"WAIT TO CROSS HORIZON ROAD AT TUBBS ROAD"	HORIZON ROAD AT TUBBS ROAD	AUSTRALIAN TONE	OFF

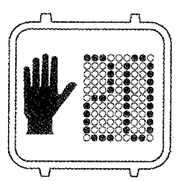
SIGNAL HEAD LEGEND



H3
HEADS: 2, 3, 6, 7,
11, 12, 15, 16



H5FLT
HEADS: 1, 10



143C/152A
HEADS: 4, 5, 8, 9
13, 14, 17, 18

SIGNAL HEAD SUMMARY

SIGNAL HEAD NUMBER	SIGNAL HEAD TYPE	SIGNAL HEADS (EA) 12" BACKPLATES		SIGNAL SECTIONS (EA) 12" LED						PED SIGNAL SECTIONS
		3 SEC	5 SEC	GRN	GRN ARW	YEL	YEL ARW	RED	RED ARW	
2,3,6,7,11,12,15,16	H3	8		8		8		8		
1,10	H5FLT		2		2		4		2	
4,5,8,9,13,14,17,18	143C/152A									8
	TOTALS	8	2	8	2	8	4	8	2	8



NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND TUBBS RD

SIGNING & PHASING

Designed:	LDP	FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KK	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	LDP	DAL	ROCKWALL	3148	01	006	184

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CABLE TERMINATION CHART

Conductor Cable	Cable 1 Pole P-1 16/C 14 AWG	Cable 2 Pole P-2 7/C 14 AWG	Cable 3 Pole P-3 7/C 14 AWG	Cable 4 Pole P-4 16/C 14 AWG	Cable 5 Pole P-5 16/C 14 AWG	Cable 6 Pole P-6 16/C 14 AWG
Black	Spare	Spare	Spare	Spare	Spare	Spare
White	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common
Red	SH 2,3 R Ph 6	SH 5 DNW Ped Ph 6	SH 8 DNW Ped Ph 6	SH 6,7 R Ph 8	SH 11,12 R Ph 2	SH 15,16 R Ph 8
Green	SH 2,3 G Ph 6	SH 5 W Ped Ph 6	SH 8 W Ped Ph 6	SH 6,7 G Ph 8	SH 11,12 G Ph 2	SH 15,16 G Ph 8
Orange	SH 2,3 Y Ph 6	Spare	Spare	SH 6,7 Y Ph 8	SH 11,12 Y Ph 2	SH 15,16 Y Ph 8
Blue	SH 1 G ARW Ph 1	Spare	Spare	Spare	SH 10 G ARW Ph 5	Spare
White/Black	SH 1 SY ARW Ph 1	Spare	Spare	Spare	SH 10 SY ARW Ph 5	Spare
Red/Black	SH 1 R ARW Ph 1			Spare	SH 10 R ARW Ph 5	Spare
Green/Black	SH 1 FY ARW O.L.A			Spare	SH 10 FY ARW O.L.C	Spare
Orange/Black	Spare			SH 9 DNW Ped Ph 8	SH 14 DNW Ped Ph 2	SH 18 DNW Ped Ph 4
Blue/Black	Spare			SH 9 W Ped Ph 8	SH 14 W Ped Ph 2	SH 18 W Ped Ph 4
Black/White	Spare			Spare	Spare	Spare
Red/White	SH 4 DNW Ped Ph 4			Spare	SH 13 DNW Ped Ph 8	SH 17 DNW Ped Ph 2
Green/White	SH 4 W Ped Ph 4			Spare	SH 13 W Ped Ph 8	SH 17 W Ped Ph 2
Blue/White	Spare			Spare	Spare	Spare
Black/Red	Spare			Spare	Spare	Spare

NOTE
SEPARATE 12 AWG 2/C CABLES WILL BE RUN TO EACH INDIVIDUAL APS UNIT ACCORDING TO MANUFACTURER SPECIFICATIONS

RADAR DETECTION ZONE DETAILS

RADAR DETECTOR	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATION	ZONE	CHANNEL
R1	MAST ARM POLE P-1	19'	FROM STOPBAR TO 500' BACK	Ø2	N/A
R2	MAST ARM POLE P-4	19'	STOPBAR	Ø4-A	1
				Ø4-B	2
				Ø4-C	3
R3	MAST ARM POLE P-5	19'	STOPBAR	Ø1-A	1
				Ø6-A	2
				Ø6-B	3
				Ø6-C	3
R4	MAST ARM POLE P-5	19'	FROM STOPBAR TO 500' BACK	Ø6	N/A
R5	MAST ARM POLE P-6	19'	STOPBAR	Ø8-A	1
				Ø8-B	2
R6	POLE P-6	19'	STOPBAR	Ø5-A	1
				Ø2-A	2
				Ø2-B	3

GROUND BOX SUMMARY

TYPE	EACH
A	1
C	4

CONDUCTOR AND CONDUIT SCHEDULE

RUN	LENGTH (LF)	CONDUITS 1" RMC (RISER)	2" PVC	3" PVC	4" PVC	3" PVC BORED	NO. 8 BARE	NO. 6 BARE	NO. 8 XHHW (LUM'S)	NO. 6 XHHW	TY A 14 AWG 16/C SIGNAL CABLE	TY A 14 AWG 7/C SIGNAL CABLE	TY C 12 AWG 2/C APS UNIT	OPTICOM	RADAR CABLE	COAX (RADIO)
		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
1*	10			2												
2	10				2		1	1		2	4	2	8	4	6	1
3	25			1			1		2		1		1	1	1	1
4	40			1			1					1	1			
5	150					1	1				1	1	2	1	1	
6	20			1			1				1		1	1	1	
7	20			1			1					1	1			
8	15			1			1		2		1		2	1	2	
9	100					1	1	1	2		1		2	1	2	
10	20			1			1				1		2	1	2	
11	110					1	1	1	2	2	2		4	2	4	
12	15		1					1	2	2						
13	25		1					1	2	2						
14	40	1						1	2	2						
TOTAL (LF)		40	40	160	20	360	510	300	660	400	590	230	1195	590	965	35

NOTE
* SPARE CONDUITS PER STANDARD TS-CF

ELECTRICAL SERVICE DATA

SERVICE POLE NO.	SERVICE POLE DESCRIPTION (SEE ED (4) - 03)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO/SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BKR. POLE/AMP	TWO-POLE CONTACTOR AMPS	PANELBOARD/ LOAD CENTER AMP RATING	CIRCUIT NO.	BRANCH CKT. BKR. POLE/AMPS	CIRCUIT AMP LOAD	SERVICE KVA LOAD
2	ELC SRV TY D (120/240) 070 (NS)SS(E)GC(O)	1-1/4"	3/#4	N/A	2P/70	30	100	TRF SIG LIGHTING	1P / 50 2P / 20	40 6	6.2

WIRING INSIDE CABINET

TY A 14 AWG 16/C	TY A 14 AWG 7/C	TY C 12 AWG 2/C	RADAR CABLE	COAX (RADIO)	OPTICOM
20	10	40	30	5	20

POLE DETAILS & WIRING INSIDE POLES AND ARMS

POLE	TYPE	CONDUCTORS/CABLE IN POLES (LF) 14 AWG 5/C	14 AWG 7/C	12 AWG 2/C	RADAR CABLE	COAX (RADIO)	OPTICOM	#12 XHHW (LUMINAIRES)	FOUNDATION TYPE	FOUNDATION (LF)
P-1	STEEL POLE WITH 48 FT MAST ARM AND LUMINAIRE (30' TALL)	70	80	10	70	30	70	90	36-A	13
P-2	PEDESTAL POLE		10	10					24-A	6
P-3	PEDESTAL POLE		10	10					24-A	6
P-4	STEEL POLE WITH 50 FT MAST ARM (19.5' TALL)	70	80	10	70		70		48-A	22
P-5	STEEL POLE WITH 50 FT MAST ARM AND LUMINAIRE (30' TALL)	70	90	20	140		70	90	48-A	22
P-6	STEEL POLE WITH 36 FT MAST ARM (19.5' TALL)	60	80	20	80		60		36-A	13
TOTALS		270	350	80	360	30	270	180		

4.30.14

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND TUBBS RD

CONDUCTOR AND CONDUIT SCHEDULES

Designed: LDP	FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: KK	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: LDP	DAL	ROCKWALL	3148	01	006	185

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CABLE TERMINATION CHART

Conductor Cable	Cable 1 Pole P-1 16/C 14 AWG	Cable 2 Pole P-2 7/C 14 AWG	Cable 3 Pole P-3 7/C 14 AWG	Cable 4 Pole P-4 16/C 14 AWG	Cable 5 Pole P-5 16/C 14 AWG	Cable 6 Pole P-6 16/C 14 AWG	Cable 7 Pole P-7 7/C 14 AWG
Black	Spare	Spare	Spare	Spare	Spare	Spare	Spare
White	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common
Red	SH 2,3 R Ph 8	SH 5 DNW Ped Ph 6	SH 8 DNW Ped Ph 8	SH 6,7 R Ph 8	SH 11,12 R Ph 2	SH 15,16 R Ph 8	SH 13 DNW Ped Ph 8
Green	SH 2 3 G Ph 8	SH 5 W Ped Ph 8	SH 8 W Ped Ph 8	SH 6,7 G Ph 8	SH 11,12 G Ph 2	SH 15,16 G Ph 8	SH 13 W Ped Ph 8
Orange	SH 2,3 Y Ph 8	Spare	Spare	SH 6,7 Y Ph 8	SH 11,12 Y Ph 2	SH 15,16 Y Ph 8	SH 14 DNW Ped Ph 2
Blue	SH 1 G ARW Ph 1	Spare	Spare	Spare	SH 10 G ARW Ph 5	Spare	SH 14 W Ped Ph 2
White/Black	SH 1 SY ARW Ph 1	Spare	Spare	Spare	SH 10 SY ARW Ph 5	Spare	Spare
Red/Black	SH 1 R ARW Ph 1			Spare	SH 10 R ARW Ph 5	Spare	
Green/Black	SH 1 FY ARW O.L.A			Spare	SH 10 FY ARW O.L.C	Spare	
Orange/Black	Spare			SH 9 DNW Ped Ph 8	Spare	SH 18 DNW Ped Ph 4	
Blue/Black	Spare			SH 9 W Ped Ph 8	Spare	SH 18 W Ped Ph 4	
Black/White	Spare			Spare	Spare	Spare	
Red/White	SH 4 DNW Ped Ph 4			Spare	Spare	SH 17 DNW Ped Ph 2	
Green/White	SH 4 W Ped Ph 4			Spare	Spare	SH 17 W Ped Ph 2	
Blue/White	Spare			Spare	Spare	Spare	
Black/Red	Spare			Spare	Spare	Spare	

NOTE
SEPARATE 12 AWG 2/C CABLES WILL BE RUN TO EACH INDIVIDUAL APS UNIT ACCORDING TO MANUFACTURER SPECIFICATIONS

CONDUCTOR AND CONDUIT SCHEDULE

RUN	LENGTH (LF)	CONDUITS 1" RMC (RISER) EA	2" PVC EA	3" PVC EA	4" PVC EA	3" PVC BORED EA	NO. 8 BARE EA	NO. 6 BARE EA	NO. 8 XHHW (LUM'S) EA	NO. 6 XHHW EA	TY A 14 AWG 16/C SIGNAL CABLE EA	TY A 14 AWG 7/C SIGNAL CABLE EA	TY C 12 AWG 2/C APS UNIT EA	OPTICOM EA	RADAR CABLE EA	COAX (RADIO) EA
1*	10			2												
2	10				2		1	1		2	4	3	8	4	8	1
3	25			1			1		2		1		1	1	1	1
4	40			1			1						1			
5	150					1	1				1	1	2	1	1	
6	20			1			1				1		1	1	1	
7	20			1			1					1	1			
8	15			1			1		2		1		1	1	2	
9	100					1	1	1	2		1	1	2	1	2	
10	20			1			1				1		2	1	2	
11	110					1	1	1	2	2	2	1	4	2	4	
12	15		1					1	2	2						
13	25		1					1	2	2						
14	40							1	2	2						
15	20			1			1					1	2			
TOTAL (LF)		40	40	180	20	380	530	360	980	400	540	470	1205	980	965	32

NOTE
* SPARE CONDUITS PER STANDARD TS-CF

ELECTRICAL SERVICE DATA

SERVICE POLE NO.	SERVICE POLE DESCRIPTION (SEE ED (4) - 03)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO/SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BKR. POLE/AMP	TWO-POLE CONTACTOR AMPS	PANELBOARD/ LOAD CENTER AMP RATING	CIRCUIT NO.	BRANCH CKT. BKR POLE/AMPS	CIRCUIT AMP LOAD	SERVICE KVA LOAD
2	ELC SRV TY D (120/240) 070 (NS)SS(E)GC(O)	1-1/4"	3/#4	N/A	2P/70	30	100	TRF SIG LIGHTING	1P / 50 2P / 20	40 6	6.2

RADAR DETECTION ZONE DETAILS

RADAR DETECTOR	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATION	ZONE	CHANNEL
R1	MAST ARM POLE P-1	19'	FROM STOPBAR TO 500' BACK	Ø2	N/A
R2	MAST ARM POLE P-4	19'	STOPBAR	Ø4-A	1
				Ø4-B	2
				Ø4-C	3
R3	MAST ARM POLE P-5	19'	STOPBAR	Ø1-A	1
				Ø6-A	2
				Ø6-B	3
				Ø6-C	3
R4	MAST ARM POLE P-5	19'	FROM STOPBAR TO 500' BACK	Ø6	N/A
R5	MAST ARM POLE P-3	19'	STOPBAR	Ø8-A	1
				Ø8-B	2
R6	POLE P-6	19'	STOPBAR	Ø5-A	1
				Ø2-A	2
				Ø2-B	3

WIRING INSIDE CABINET

TY A 14 AWG 16/C	TY A 14 AWG 7/C	TY C 12 AWG 2/C	RADAR CABLE	COAX (RADIO)	OPTICOM
20	15	40	30	5	30

GROUND BOX SUMMARY

TYPE	EACH
A	1
C	4

POLE DETAILS & WIRING INSIDE POLES AND ARMS

POLE	TYPE	CONDUCTORS/CABLE IN POLES (LF) 14 AWG 5/C	14 AWG 7/C	12 AWG 2/C	RADAR CABLE	COAX (RADIO)	OPTICOM	#12 XHHW (LUMINAIRES)	FOUNDATION TYPE	FOUNDATION (LF)
P-1	STEEL POLE WITH 48 FT MAST ARM AND LUMINAIRE (30' TALL)	70	80	10	70	30	70	90	36-A	13
P-2	PEDESTAL POLE		10	10					24-A	8
P-3	PEDESTAL POLE		10	10					24-A	8
P-4	STEEL POLE WITH 50 FT MAST ARM (19.5' TALL)	70	80	10	70		70		48-A	22
P-5	STEEL POLE WITH 50 FT MAST ARM AND LUMINAIRE (30' TALL)	70	70		140		70	90	48-A	22
P-6	STEEL POLE WITH 36 FT MAST ARM (19.5' TALL)	60	60	20	50		40		36-A	13
P-7	PEDESTAL POLE		20	20					24-A	8
TOTALS		270	350	80	360	30	270	180		

SHEET 3 OF 3

Leslie D Pollack
STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER
12/20/17

NO.	REVISION	BY	DATE
1	AS-BUILT REVISIONS	LP	12/17

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND TUBBS RD

CONDUCTOR AND CONDUIT SCHEDULES

Designed	LDP	DIST. COUNTY	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked	KK	6	TEXAS	STP 2013 (597) MM	FM 3097
Drawn	BC	DIST. COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	LDP	DAL ROCKWALL	3148	01	006	185A

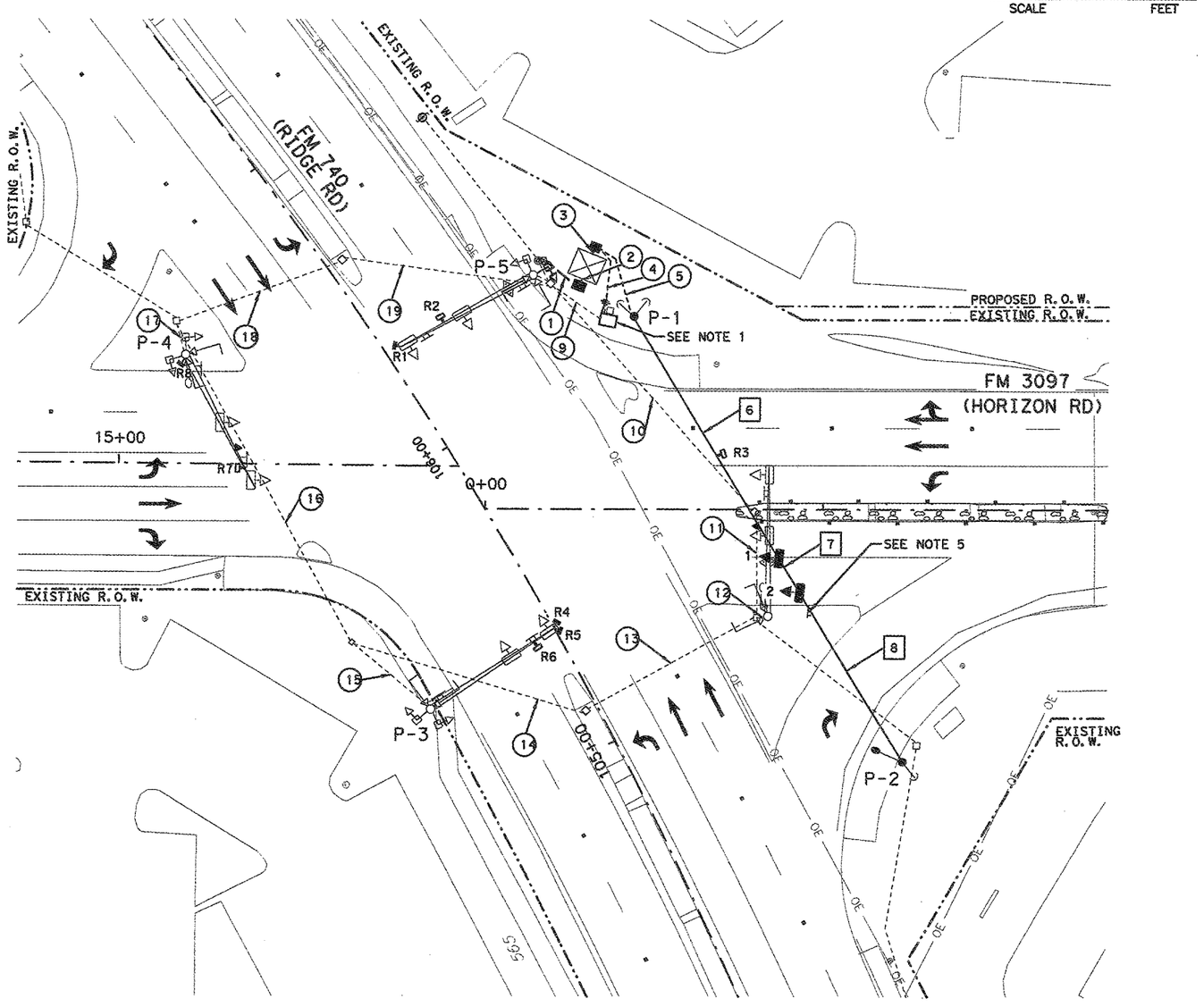
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NOTE:

DESIGN IS FOR TEMPORARY TRAFFIC SIGNAL LAYOUT ONLY. TEMPORARY TRAFFIC CONTROL DEVICES, TEMPORARY STRIPING, AND CONSTRUCTION PHASING ARE FOR REFERENCE ONLY.

TRAFFIC SIGNAL POLE SCHEDULE

POLE NUMBER	STATION	OFFSET	SIDE
P1	00+43.73	57.00	LT
P2	01+23.65	74.46	RT



NOTES

1. EXISTING SIGNAL AND SIGNAL CONTROLLER WILL BE USED FOR THIS STAGE. ALL TEMPORARY SIGNAL EQUIPMENT WILL BE INSTALLED AND BAGGED.
2. TEMPORARY TIMBER SIGNAL POLES AND SPANS TO BE INSTALLED AS SHOWN.
3. PERMANENT TRAFFIC SIGNAL CONTROLLER WILL BE INSTALLED FOR FUTURE PHASES. MAINTAIN EXISTING POWER SOURCE FOR PERMANENT SIGNAL CONTROLLER.
4. INSTALL RADAR ON TIMBER POLES AND MAST ARMS AS SHOWN. TEMPORARY CABLES SHOULD BE RUN THROUGH EXISTING CONDUIT TO CONNECT RADAR DEVICES ON POLES P-3, P-4, AND P-5.
5. RELOCATE EXISTING STREET NAME SIGNS TO SPAN WIRE SIGNALS AS SHOWN.
6. RELOCATE EXISTING OPTICOM DETECTORS TO SPAN WIRE SIGNALS AS SHOWN.
7. LOCATION OF ALL UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CONFIRM LOCATIONS OF UTILITIES IN THE FIELD.
8. POLE LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL FIELD ADJUST AS NECESSARY TO AVOID UTILITIES.
9. CONTRACTOR WILL COORDINATE WITH ELECTRIC COMPANY TO OBTAIN APPROVAL ON THE LOCATION OF SIGNAL POLES TO MEET OSHA CLEARANCE REQUIREMENTS FOR POWER LINES. FINAL LOCATIONS OF TRAFFIC SIGNAL MUST BE APPROVED BY THE ENGINEER.
10. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
11. COIL SUFFICIENT TEMPORARY SIGNAL CABLE TO ALLOW FOR HEAD SHIFT DURING ALL PHASES OF CONSTRUCTION.
12. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
13. MINIMUM 40 FOOT TIMBER POLES SHOULD BE USED FOR TEMPORARY SIGNALS. TALLER POLES MAY BE REQUIRED IF ADEQUATE CLEARANCE (17'-6" MINIMUM) BETWEEN STREET GRADE AND BOTTOM OF SIGNAL HEAD CANNOT BE ACHIEVED WITH 40 FOOT POLE HEIGHT. TIMBER POLES TO BE INSTALLED AT AN EMBEDMENT DEPTH OF 7 FEET. TEMPORARY POLES WILL REMAIN IN PLACE THROUGHOUT ALL PHASES OF CONSTRUCTION.

LEGEND

- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. SIGNAL HEAD
- EXIST. PEDESTRIAN HEAD
- EXIST. PEDESTRIAN PUSH BUTTON
- EXIST. GROUND BOX
- EXIST. LUMINAIRE
- EXIST. SIGN ON MAST ARM
- EXIST. SIGNAL CONTROLLER
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND MOUNTED SIGN
- EXIST. MANHOLE
- EXIST. FIRE HYDRANT
- OE — EXIST. OVERHEAD ELECTRIC
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. CONDUIT
- PROP. SIGNAL CONTROLLER
- PROP. GROUND BOX
- PROP. SERVICE METER
- TEMP. CONDUIT
- TEMP. TIMBER POLE
- TEMP. GUY WIRE
- TEMP. SIGNAL HEAD
- TEMP. SIGN
- TEMP. LUMINAIRE
- TEMP. STOP BAR RADAR DETECTION
- TEMP. ADVANCED RADAR DETECTION
- TEMP. PREEMPTION SENSOR
- (X) PROP. CONDUIT RUN CALLOUT
- [X] TEMP. SPAN WIRE CALLOUT
- ⟨X⟩ TEMP. SIGN CALLOUT
- CONSTRUCTION THIS STAGE
- CONSTRUCTION PREVIOUS STAGES
- TEMP. PAVEMENT THIS STEP
- TEMP. PAVEMENT PREVIOUS STEPS
- TRAFFIC FLOW DIRECTION
- TYPE 3 BARRICADE
- CHANNELIZER

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER
4.30.14

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND FM 740
TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 1 STAGE 1

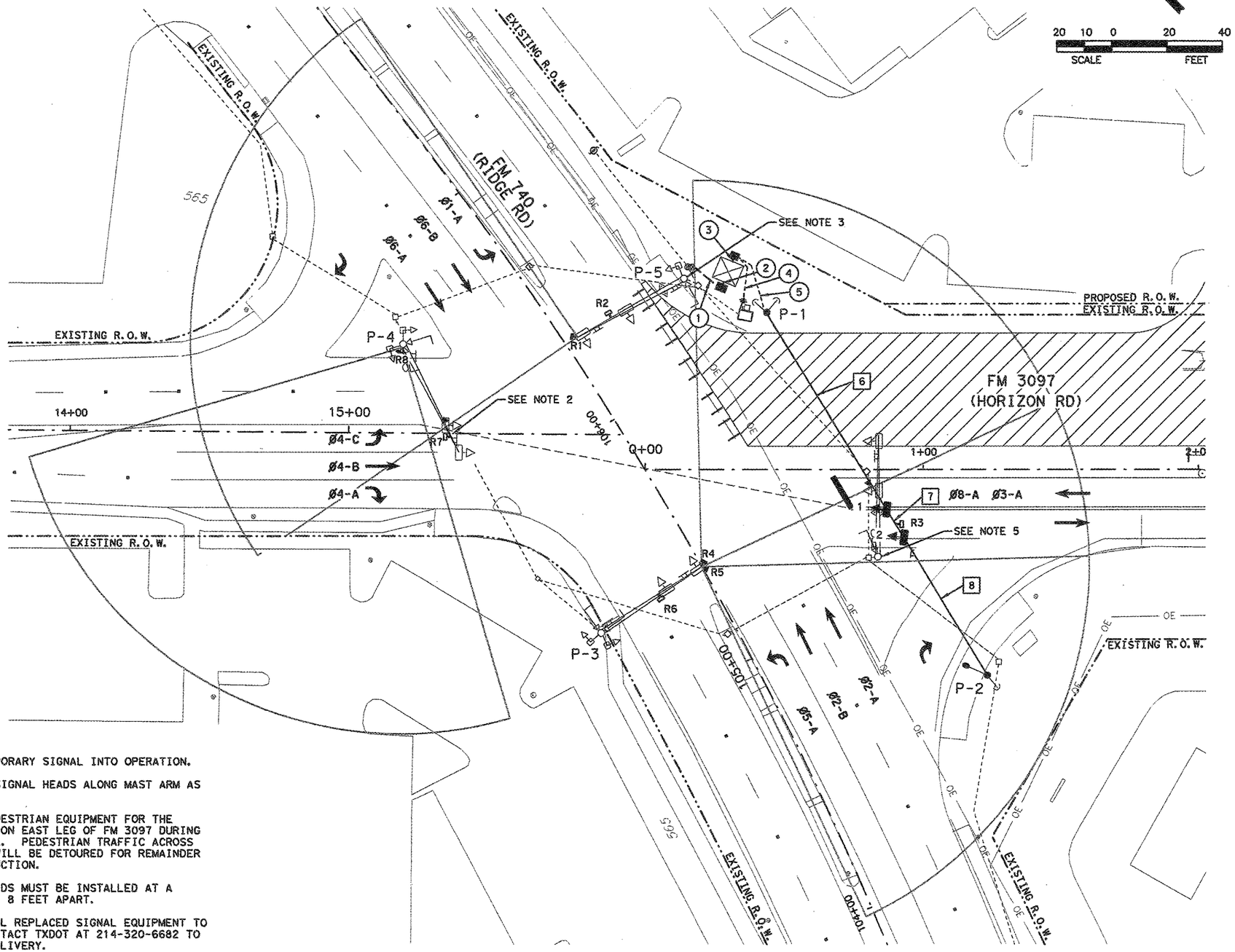
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Checked:	KK	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	BG	DIST.	COUNTY	CONTROL	SECTION NO.	JOB NO.	SHEET NO.
Checked:	LDP	DAL	ROCKWALL	3148	01	006	186

SHEET 1 OF 6

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NOTE:

DESIGN IS FOR TEMPORARY TRAFFIC SIGNAL LAYOUT ONLY. TEMPORARY TRAFFIC CONTROL DEVICES, TEMPORARY STRIPING, AND CONSTRUCTION PHASING ARE FOR REFERENCE ONLY.



NOTES

1. PLACE TEMPORARY SIGNAL INTO OPERATION.
2. RELOCATE SIGNAL HEADS ALONG MAST ARM AS SHOWN.
3. REMOVE PEDESTRIAN EQUIPMENT FOR THE CROSSWALK ON EAST LEG OF FM 3097 DURING THIS STAGE. PEDESTRIAN TRAFFIC ACROSS THIS LEG WILL BE DETOURED FOR REMAINDER OF CONSTRUCTION.
4. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
5. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
6. ALL FOUNDATIONS WILL BE REMOVED 6 INCHES BELOW GROUND SURFACE AND THE AREA WILL BE BACKFILLED AND COMPACTED TO MATCH ADJACENT SECTION.

LEGEND

- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. SIGNAL HEAD
- EXIST. PEDESTRIAN HEAD
- EXIST. PEDESTRIAN PUSH BUTTON
- EXIST. GROUND BOX
- EXIST. LUMINAIRE
- EXIST. SIGN ON MAST ARM
- EXIST. SIGNAL CONTROLLER
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND MOUNTED SIGN
- EXIST. MANHOLE
- EXIST. FIRE HYDRANT
- OE EXIST. OVERHEAD ELECTRIC
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. CONDUIT
- PROP. SIGNAL CONTROLLER
- PROP. GROUND BOX
- PROP. SERVICE METER
- TEMP. CONDUIT
- TEMP. TIMBER POLE
- TEMP. GUY WIRE
- TEMP. SIGNAL HEAD
- TEMP. SIGN
- TEMP. LUMINAIRE
- TEMP. STOP BAR RADAR DETECTION
- TEMP. ADVANCED RADAR DETECTION
- TEMP. PREEMPTION SENSOR
- PROP. CONDUIT RUN CALLOUT
- TEMP. SPAN WIRE CALLOUT
- TEMP. SIGN CALLOUT
- CONSTRUCTION THIS STAGE
- CONSTRUCTION PREVIOUS STAGES
- TEMP. PAVEMENT THIS STEP
- TEMP. PAVEMENT PREVIOUS STEPS
- TRAFFIC FLOW DIRECTION
- TYPE 3 BARRICADE
- CHANNELIZER

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER
4.30.14

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND FM 740

TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 2 STAGE 1

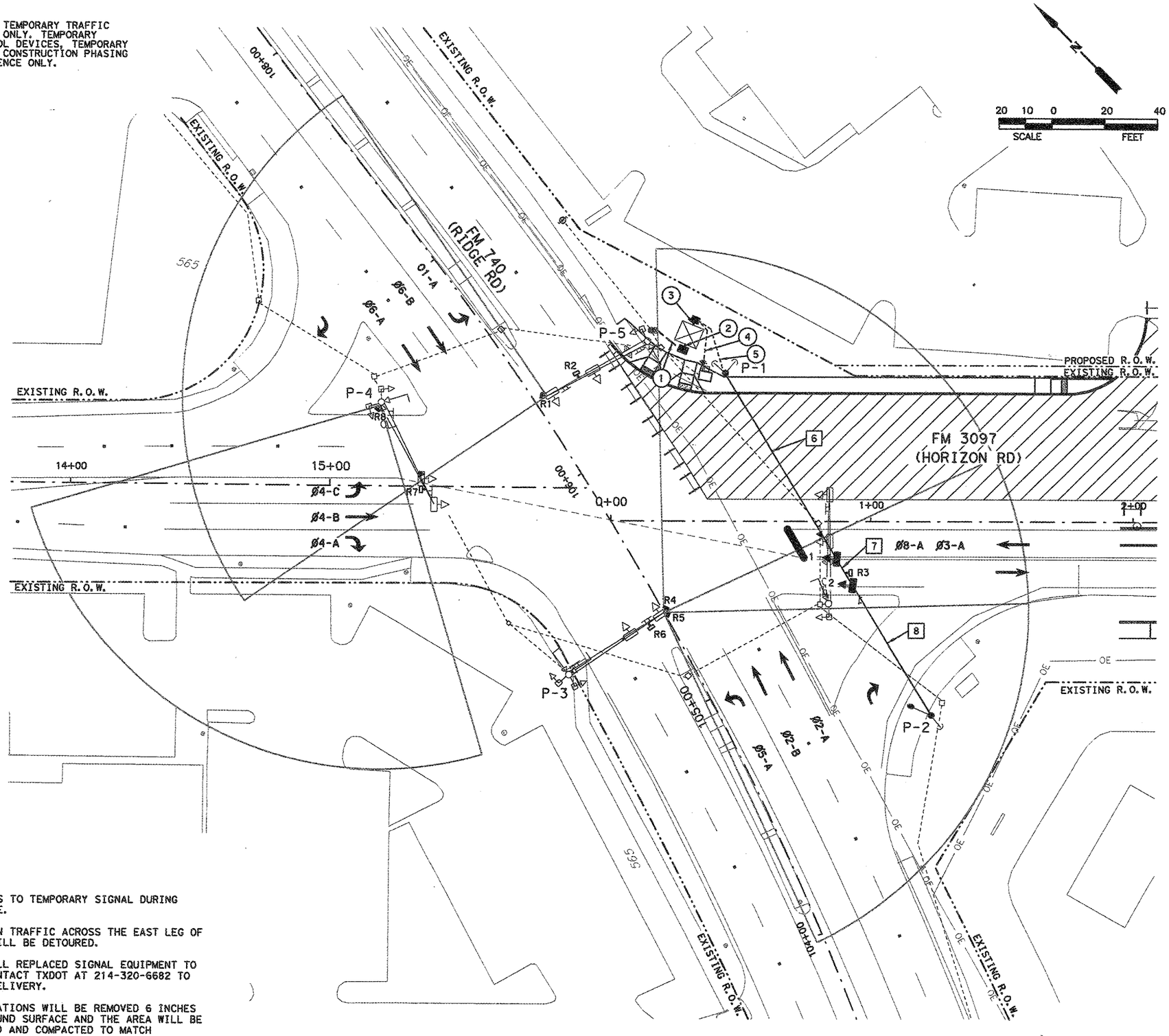
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Drawn:	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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SHEET 2 OF 6

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NOTE:

DESIGN IS FOR TEMPORARY TRAFFIC SIGNAL LAYOUT ONLY. TEMPORARY TRAFFIC CONTROL DEVICES, TEMPORARY STRIPING, AND CONSTRUCTION PHASING ARE FOR REFERENCE ONLY.



NOTES

1. NO CHANGES TO TEMPORARY SIGNAL DURING THIS STAGE.
2. PEDESTRIAN TRAFFIC ACROSS THE EAST LEG OF FM 3097 WILL BE DETOURED.
3. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
4. ALL FOUNDATIONS WILL BE REMOVED 6 INCHES BELOW GROUND SURFACE AND THE AREA WILL BE BACKFILLED AND COMPACTED TO MATCH ADJACENT SECTION.

LEGEND

- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. SIGNAL HEAD
- EXIST. PEDESTRIAN HEAD
- EXIST. PEDESTRIAN PUSH BUTTON
- EXIST. GROUND BOX
- EXIST. LUMINAIRE
- EXIST. SIGN ON MAST ARM
- EXIST. SIGNAL CONTROLLER
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND MOUNTED SIGN
- EXIST. MANHOLE
- EXIST. FIRE HYDRANT
- OE EXIST. OVERHEAD ELECTRIC
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. CONDUIT
- PROP. SIGNAL CONTROLLER
- PROP. GROUND BOX
- PROP. SERVICE METER
- TEMP. CONDUIT
- TEMP. TIMBER POLE
- TEMP. GUY WIRE
- TEMP. SIGNAL HEAD
- TEMP. SIGN
- TEMP. LUMINAIRE
- TEMP. STOP BAR RADAR DETECTION
- TEMP. ADVANCED RADAR DETECTION
- TEMP. PREEMPTION SENSOR
- (X) PROP. CONDUIT RUN CALLOUT
- [X] TEMP. SPAN WIRE CALLOUT
- ⟨X⟩ TEMP. SIGN CALLOUT
- CONSTRUCTION THIS STAGE
- CONSTRUCTION PREVIOUS STAGES
- TEMP. PAVEMENT THIS STEP
- TEMP. PAVEMENT PREVIOUS STEPS
- TRAFFIC FLOW DIRECTION
- TYPE 3 BARRICADE
- CHANNELIZER

4.30.14

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND FM 740
TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 2 STAGE 2

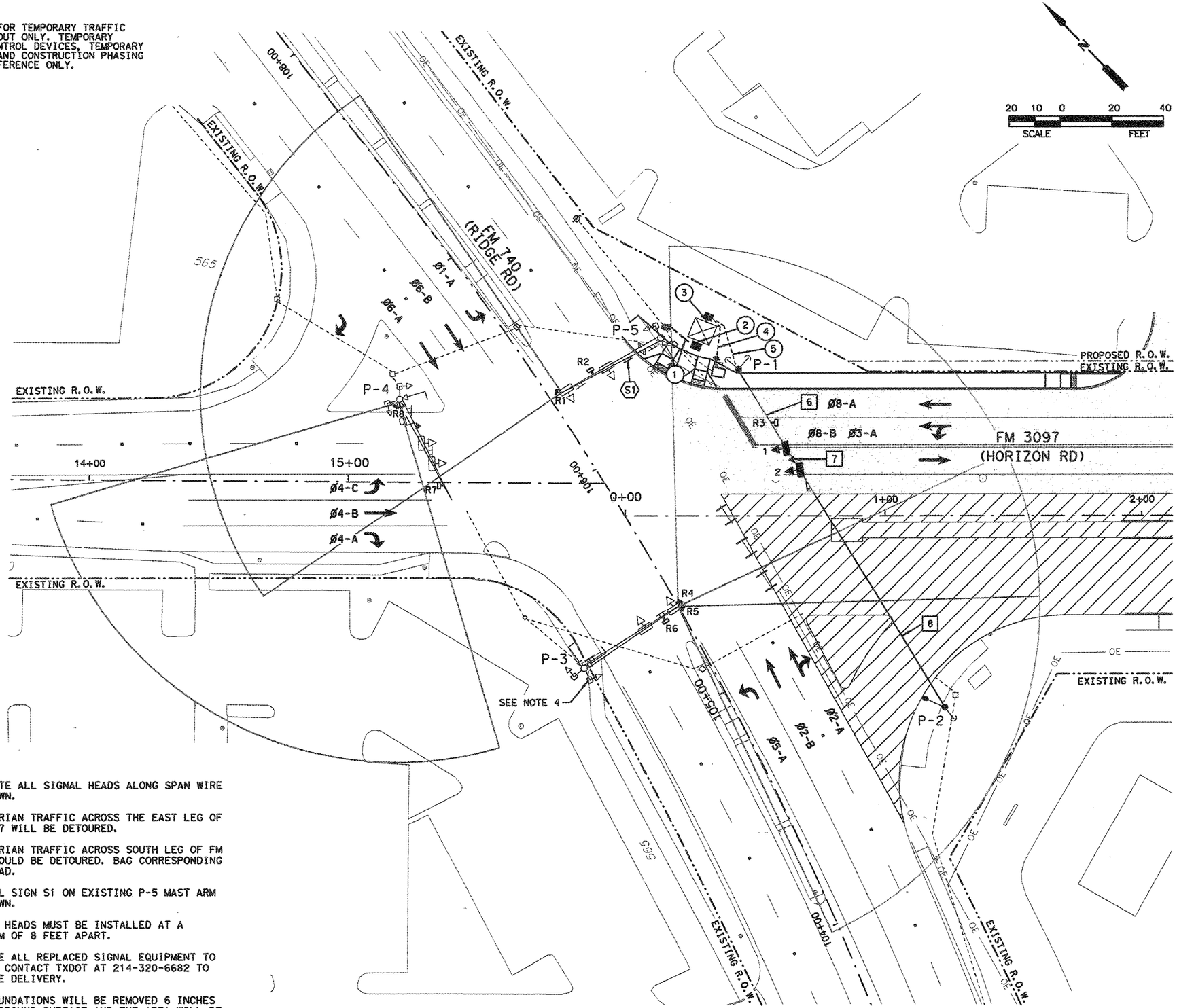
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Checked:	KK	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	LDP	DAL	ROCKWALL	3148	01	006		188

SHEET 3 OF 6

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NOTE:

DESIGN IS FOR TEMPORARY TRAFFIC SIGNAL LAYOUT ONLY. TEMPORARY TRAFFIC CONTROL DEVICES, TEMPORARY STRIPING, AND CONSTRUCTION PHASING ARE FOR REFERENCE ONLY.



NOTES

1. RELOCATE ALL SIGNAL HEADS ALONG SPAN WIRE AS SHOWN.
2. PEDESTRIAN TRAFFIC ACROSS THE EAST LEG OF FM 3097 WILL BE DETOURED.
3. PEDESTRIAN TRAFFIC ACROSS SOUTH LEG OF FM 740 SHOULD BE DETOURED. BAG CORRESPONDING PED HEAD.
4. INSTALL SIGN S1 ON EXISTING P-5 MAST ARM AS SHOWN.
5. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
6. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
7. ALL FOUNDATIONS WILL BE REMOVED 6 INCHES BELOW GROUND SURFACE AND THE AREA WILL BE BACKFILLED AND COMPACTED TO MATCH ADJACENT SECTION.

LEGEND

- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. SIGNAL HEAD
- EXIST. PEDESTRIAN HEAD
- EXIST. PEDESTRIAN PUSH BUTTON
- EXIST. GROUND BOX
- EXIST. LUMINAIRE
- EXIST. SIGN ON MAST ARM
- EXIST. SIGNAL CONTROLLER
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND MOUNTED SIGN
- EXIST. MANHOLE
- EXIST. FIRE HYDRANT
- OE — EXIST. OVERHEAD ELECTRIC
- EXIST. RIGHT OF WAY
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- PROP. CONDUIT
- PROP. SIGNAL CONTROLLER
- PROP. GROUND BOX
- PROP. SERVICE METER
- TEMP. CONDUIT
- TEMP. TIMBER POLE
- TEMP. GUY WIRE
- TEMP. SIGNAL HEAD
- TEMP. SIGN
- TEMP. LUMINAIRE
- TEMP. STOP BAR RADAR DETECTION
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4.30.14

STATE OF TEXAS
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FM 3097 AND FM 740

TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 3 STAGE 1

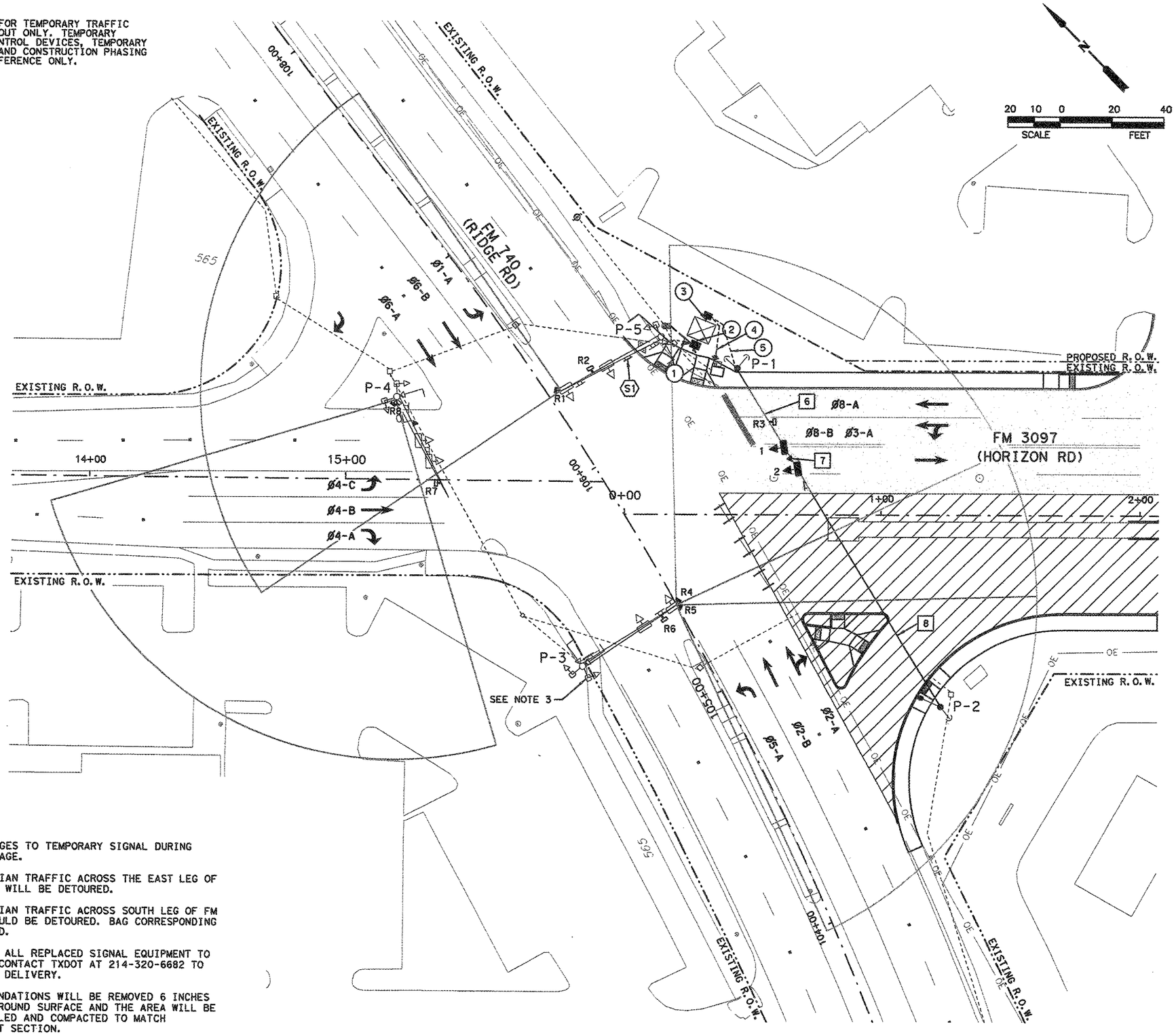
Designed:	LDP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KK	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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SHEET 4 OF 6

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NOTE:

DESIGN IS FOR TEMPORARY TRAFFIC SIGNAL LAYOUT ONLY. TEMPORARY TRAFFIC CONTROL DEVICES, TEMPORARY STRIPING, AND CONSTRUCTION PHASING ARE FOR REFERENCE ONLY.



NOTES

1. NO CHANGES TO TEMPORARY SIGNAL DURING THIS STAGE.
2. PEDESTRIAN TRAFFIC ACROSS THE EAST LEG OF FM 3097 WILL BE DETOURED.
3. PEDESTRIAN TRAFFIC ACROSS SOUTH LEG OF FM 740 SHOULD BE DETOURED. BAG CORRESPONDING PED HEAD.
4. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
5. ALL FOUNDATIONS WILL BE REMOVED 6 INCHES BELOW GROUND SURFACE AND THE AREA WILL BE BACKFILLED AND COMPACTED TO MATCH ADJACENT SECTION.

LEGEND

- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. SIGNAL HEAD
- EXIST. PEDESTRIAN HEAD
- EXIST. PEDESTRIAN PUSH BUTTON
- EXIST. GROUND BOX
- EXIST. LUMINAIRE
- EXIST. SIGN ON MAST ARM
- EXIST. SIGNAL CONTROLLER
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND MOUNTED SIGN
- EXIST. MANHOLE
- EXIST. FIRE HYDRANT
- OE EXIST. OVERHEAD ELECTRIC
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. CONDUIT
- PROP. SIGNAL CONTROLLER
- PROP. GROUND BOX
- PROP. SERVICE METER
- TEMP. CONDUIT
- TEMP. TIMBER POLE
- TEMP. GUY WIRE
- TEMP. SIGNAL HEAD
- TEMP. SIGN
- TEMP. LUMINAIRE
- TEMP. STOP BAR RADAR DETECTION
- TEMP. ADVANCED RADAR DETECTION
- TEMP. PREEMPTION SENSOR
- (X) PROP. CONDUIT RUN CALLOUT
- [X] TEMP. SPAN WIRE CALLOUT
- ⟨X⟩ TEMP. SIGN CALLOUT
- CONSTRUCTION THIS STAGE
- CONSTRUCTION PREVIOUS STAGES
- TEMP. PAVEMENT THIS STEP
- TEMP. PAVEMENT PREVIOUS STEPS
- TRAFFIC FLOW DIRECTION
- TYPE 3 BARRICADE
- CHANNELIZER

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER
4.30.14

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND FM 740
TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 3 STAGE 2

Designed:	LDP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KK	6	TEXAS	STP 2013 (597) MM			FM 3097
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SHEET 5 OF 6

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PROPOSED SIGN LEGEND



S1
R10-11b
24" x 24"

WIRING INSIDE CABINET

16/C	7/C	OPTICOM	RADAR CABLE
15	5	20	40

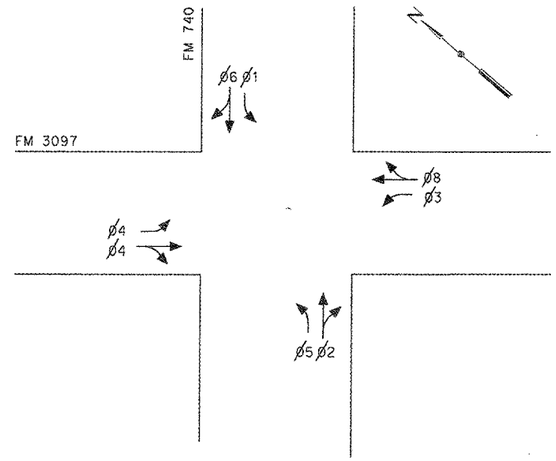
PHASING DIAGRAM P1S1

MAINTAIN EXISTING OPERATIONS.

PHASING RING DIAGRAM P1S1

MAINTAIN EXISTING OPERATIONS.

PHASING DIAGRAM P2S1 THROUGH P3S2



SIGNAL HEAD LEGEND P2S1 THROUGH P3S2



H3
HEADS: 1,2

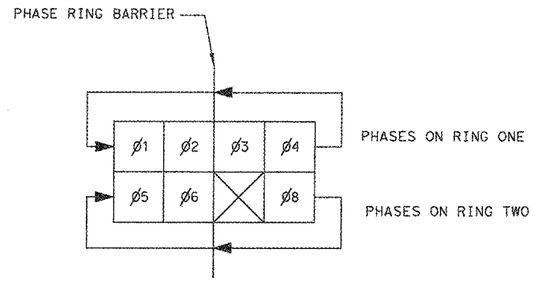
POLE DETAILS & WIRING ON POLES

POLE	TYPE	CONDUIT		CONDUCTORS/CABLE IN EXTERNAL RM CONDUIT ON TIMBER POLES AND IN EXISTING POLES (LF)				
		1.5" RMC (RISER)	2" RMC (RISER)	NO. 8 XHHW	NO. 8 BARE	7/C	OPTICOM	RADAR CABLE
P-1	TIMBER POLE		20	40	20	20	20	20
P-2	TIMBER POLE	20		40	20			
P-3	EXISTING POLE							195
P-4	EXISTING POLE							80
P-5	EXISTING POLE							130
TOTALS		20	20	80	40	20	20	425

RADAR DETECTION ZONE DETAILS

RADAR DETECTOR	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATION	ZONE	CHANNEL
R1	MAST ARM POLE P-5	19'	STOPBAR	Ø1-A	1
				Ø6-A	2
				Ø6-B	2
R2	MAST ARM POLE P-5	19'	FROM STOPBAR TO 500' BACK	Ø6	N/A
R3	SPAN P-1/P-2	19'	FROM STOPBAR TO 500' BACK	Ø8	N/A
R4	MAST ARM POLE P-3	19'	STOPBAR	Ø3-A	1
				Ø8-A	2
				Ø8-B	3
R5	MAST ARM POLE P-3	19'	STOPBAR	Ø5-A	1
				Ø2-A	2
				Ø2-B	3
R6	MAST ARM POLE P-3	19'	FROM STOPBAR TO 500' BACK	Ø2	N/A
R7	MAST ARM POLE P-4	19'	FROM STOPBAR TO 500' BACK	Ø4	N/A
R8	POLE P-4	19'	STOPBAR	Ø4-A	1
				Ø4-B	2
				Ø4-C	3

PHASING RING DIAGRAM P2S1 THROUGH P3S2



CONDUCTOR AND CONDUIT SCHEDULE

RUN	MAX LENGTH (LF)	CONDUITS		NO. 8 BARE	NO. 8 XHHW (LUMS)	TY A 14 AWG		TY C 12 AWG	OPTICOM	RADAR CABLE
		2" PVC	3" PVC			16/C	7/C	5/C		
		EA	EA	EA	EA	EA	EA	EA	EA	EA
1										
2										
3	5			2		3	1	5	4	8
4	25		2	2	2	3			3	1
5	35	2		2	2		1		1	1
6	85				2		1		1	1
7	15				2		1			1
8	110				2					
9	20									8
10	90									3
11	30									3
12	5									
13	55									3
14	70									3
15	30									3
16	110									
17	10									2
18	50									2
19	60									2
20	5									2
TOTAL (LF)		70	50	130	540	90	140	25	215	1435

NOTE
1. RUNS 1 THROUGH 3 ARE PERMANENT CONDUIT. SEE PERMANENT TRAFFIC SIGNAL PLANS.
2. WITH THE EXCEPTION OF RADAR CABLES AND OPTICOM CABLE TO P-4, CABLES IN RUN 4 WILL BE SPLICED TO EXISTING 16/C CABLES AT EXISTING CONTROLLER
3. NEW RADAR CABLES WILL BE INSTALLED TO ADVANCED AND STOP BAR RADAR ON POLES P-3, P-4, P-5, AND ON SPAN P-1/P-2.
4. NEW OPTICOM CABLE WILL BE INSTALLED TO RELOCATED NB FM 3097 OPTICOM ON POLE P-4.

CABLE TERMINATION CHART P2S1 THROUGH P3S2

Conductor Cable	Cable 1 Span P-1/P-2 7/C 14 AWG
Black	Spare
White	Signal Common
Red	SH 1-2 R Ph 4
Green	SH 1-2 R Ph 4
Orange	SH 1-2 Y Ph 4
Blue	Spare
White/Black	Spare

4-30-19

STATE OF TEXAS
LESLIE POLLACK
101285
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HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND FM 740

TEMPORARY PHASING, CONDUIT & CONDUCTOR SCHEDULES

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Checked:	LDP	DAL	ROCKWALL	3148	01	006	191

SHEET 6 OF 6

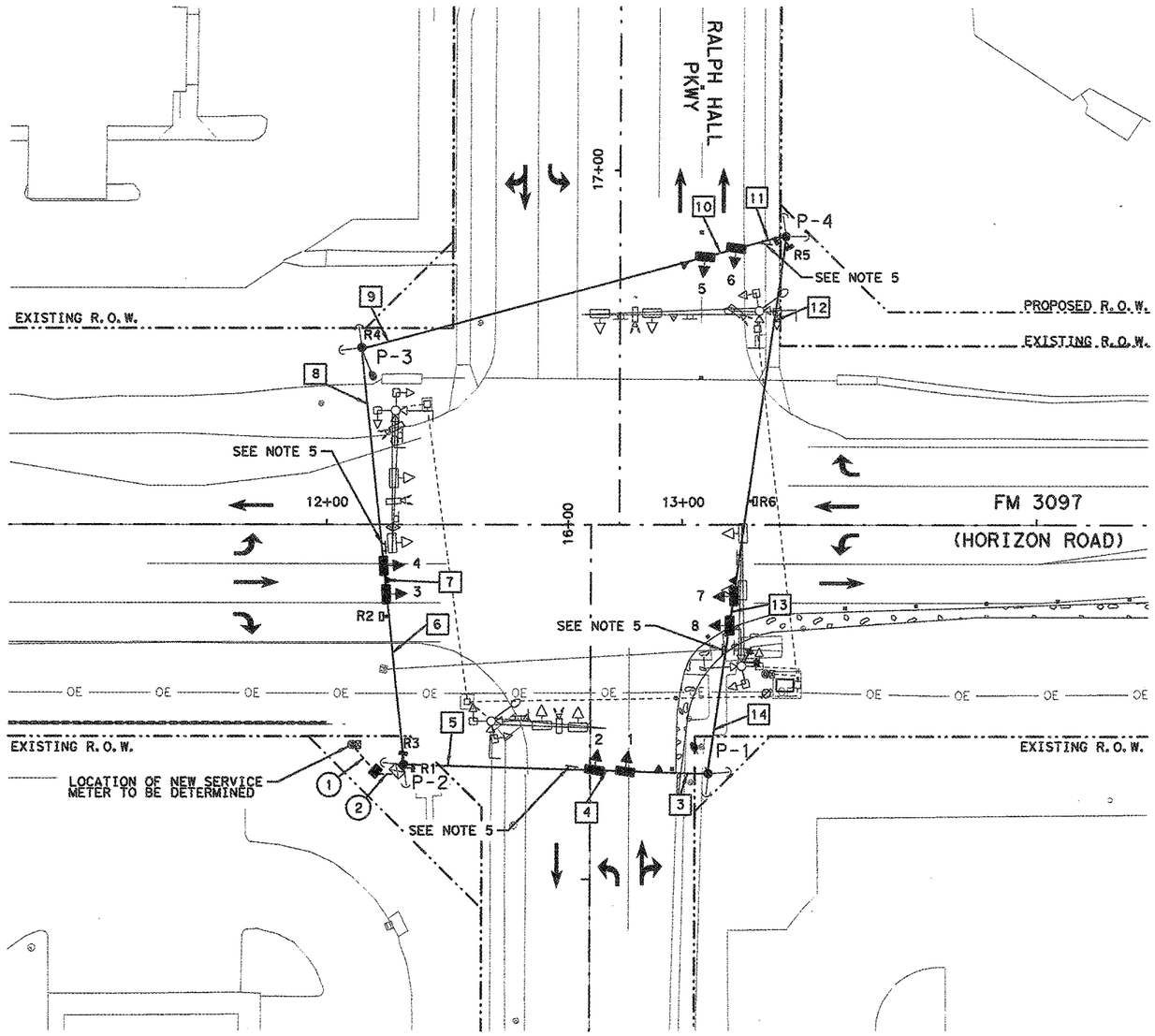
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TRAFFIC SIGNAL POLE SCHEDULE

POLE NUMBER	STATION	OFFSET	SIDE
P1	13+07.54	70.11	RT
P2	12+22.00	67.63	RT
P3	12+09.85	49.91	LT
P4	13+28.97	81.38	LT



NOTES

1. EXISTING CONTROLLER AND SIGNAL EQUIPMENT WILL BE USED FOR THIS STAGE. TEMPORARY SIGNAL EQUIPMENT SHOULD BE INSTALLED AND BAGGED DURING THIS STAGE.
2. TEMPORARY TIMBER SIGNAL POLES AND SPANS TO BE INSTALLED AS SHOWN.
3. TEMPORARY POLE-MOUNTED TRAFFIC SIGNAL CONTROLLER WILL BE INSTALLED FOR FUTURE PHASES.
4. LOCATION OF RELOCATED ELECTRICAL SERVICE TO BE DETERMINED. CONDUIT RUNS 1 AND 2 NOT SHOWN ON PLAN.
5. RELOCATE EXISTING STREET NAME SIGNS TO SPAN WIRE SIGNALS AS SHOWN.
6. RELOCATE EXISTING OPTICOM DETECTORS TO SPAN WIRE SIGNALS AS SHOWN.
7. LOCATION OF ALL UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CONFIRM LOCATIONS OF UTILITIES IN THE FIELD.
8. POLE LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL FIELD ADJUST AS NECESSARY TO AVOID UTILITIES.
9. CONTRACTOR WILL COORDINATE WITH ELECTRICITY COMPANY TO ESTABLISH POWER SOURCE AND INSTALL SERVICE METER. THIS TASK IS INCLUDED UNDER ITEM 628 AND WILL NOT BE PAID FOR SEPERATELY.
10. CONTRACTOR WILL COORDINATE WITH ELECTRIC COMPANY TO OBTAIN APPROVAL ON THE LOCATION OF SIGNAL POLES TO MEET OSHA CLEARANCE REQUIREMENTS FOR POWER LINES. FINAL LOCATIONS OF TRAFFIC SIGNAL MUST BE APPROVED BY THE ENGINEER.
11. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
12. COIL SUFFICIENT TEMPORARY SIGNAL CABLE TO ALLOW FOR HEAD SHIFT DURING ALL PHASES OF CONSTRUCTION.
13. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
14. MINIMUM 40 FOOT TIMBER POLES SHOULD BE USED FOR TEMPORARY SIGNALS. TALLER POLES MAY BE REQUIRED IF ADEQUATE CLEARANCE (17'-6" MINIMUM) BETWEEN STREET GRADE AND BOTTOM OF SIGNAL HEAD CANNOT BE ACHIEVED WITH 40 FOOT POLE HEIGHT. TIMBER POLES TO BE INSTALLED AT AN EMBEDMENT DEPTH OF 7 FEET. TEMPORARY POLES WILL REMAIN IN PLACE THROUGHOUT ALL PHASES OF CONSTRUCTION.
15. PEDESTRIAN HEADS WILL BE BAGGED DURING CONSTRUCTION AND PEDESTRIAN ACCESS WILL BE DETOURED. REFER TO TRAFFIC CONTROL PLANS.

LEGEND

- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. SIGNAL HEAD
- EXIST. PEDESTRIAN HEAD
- EXIST. PEDESTRIAN PUSH BUTTON
- EXIST. GROUND BOX
- EXIST. LUMINAIRE
- EXIST. SIGN ON MAST ARM
- EXIST. SIGNAL CONTROLLER
- EXIST. POWER SOURCE
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- PROP. SERVICE METER
- TEMP. CONDUIT
- TEMP. TIMBER POLE
- TEMP. GUY WIRE
- TEMP. SIGNAL HEAD
- TEMP. SIGN
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- TEMP. STOP BAR RADAR DETECTION
- TEMP. ADVANCED RADAR DETECTION
- TEMP. PREEMPTION SENSOR
- PROP. CONDUIT RUN CALLOUT
- TEMP. SPAN WIRE CALLOUT
- TEMP. SIGN CALLOUT
- CONSTRUCTION THIS STAGE
- CONSTRUCTION PREVIOUS STAGES
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- TRAFFIC FLOW DIRECTION
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- CHANNELIZER

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED PROFESSIONAL ENGINEER
4.30.14

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FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND RALPH HALL PKWY

TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 1 STAGE 1

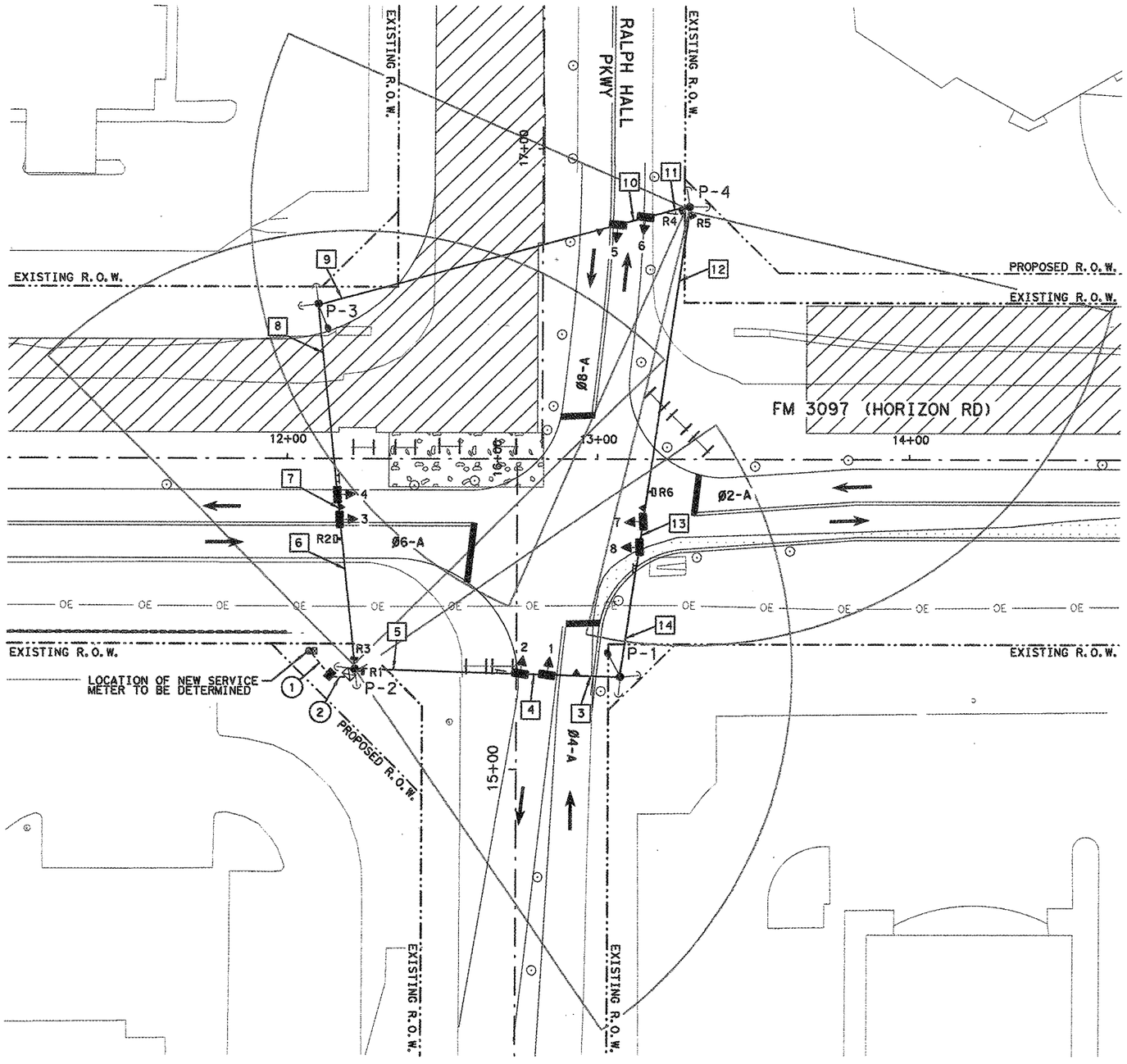
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SHEET 1 OF 6

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NOTE:

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NOTES

1. PLACE TEMPORARY SIGNAL INTO OPERATION.
2. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
3. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
4. ALL FOUNDATIONS WILL BE REMOVED 6 INCHES BELOW GROUND SURFACE AND THE AREA WILL BE BACKFILLED AND COMPACTED TO MATCH ADJACENT SECTION.
5. PEDESTRIAN TRAFFIC WILL BE DETOURED DURING CONSTRUCTION. REFER TO TRAFFIC CONTROL PLANS.
6. LOCATION OF ELECTRICAL SERVICE TO BE DETERMINED. CONDUIT RUNS 1 AND 2 NOT SHOWN ON PLAN.

LEGEND

- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. SIGNAL HEAD
- EXIST. PEDESTRIAN HEAD
- EXIST. PEDESTRIAN PUSH BUTTON
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- PROP. SIGNAL CONTROLLER
- PROP. GROUND BOX
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- TEMP. SIGN
- TEMP. LUMINAIRE
- TEMP. STOP BAR RADAR DETECTION
- TEMP. ADVANCED RADAR DETECTION
- TEMP. PREEMPTION SENSOR
- (X) PROP. CONDUIT RUN CALLOUT
- X TEMP. SPAN WIRE CALLOUT
- X TEMP. SIGN CALLOUT
- CONSTRUCTION THIS STAGE
- CONSTRUCTION PREVIOUS STAGES
- TEMP. PAVEMENT THIS STEP
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FM 3097 AND RALPH HALL PKWY

TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 2 STAGE 1

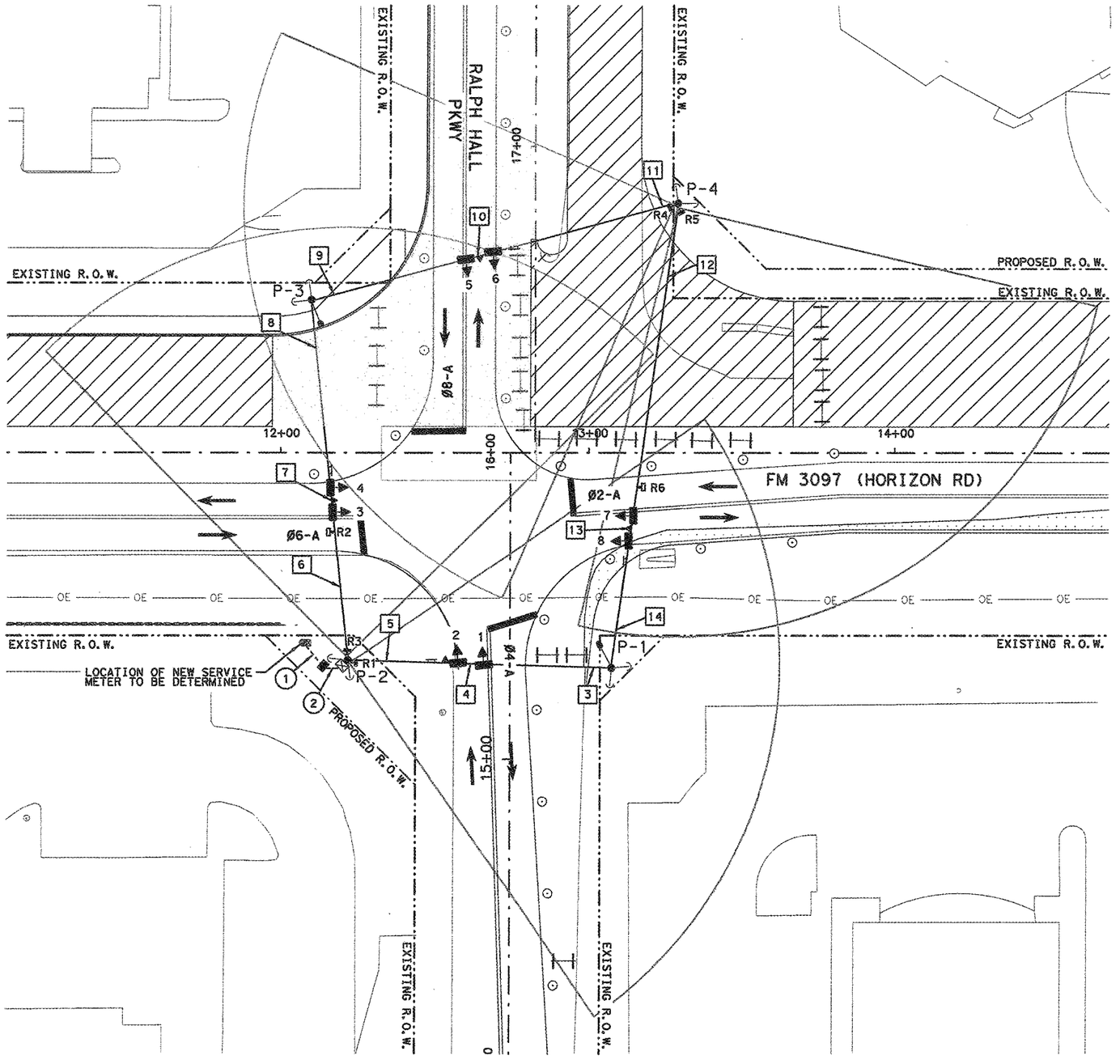
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SHEET 2 OF 6

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NOTES

1. RELOCATE SIGNAL HEADS ALONG SPAN WIRE AS SHOWN.
2. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
3. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
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TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 2 STAGE 2

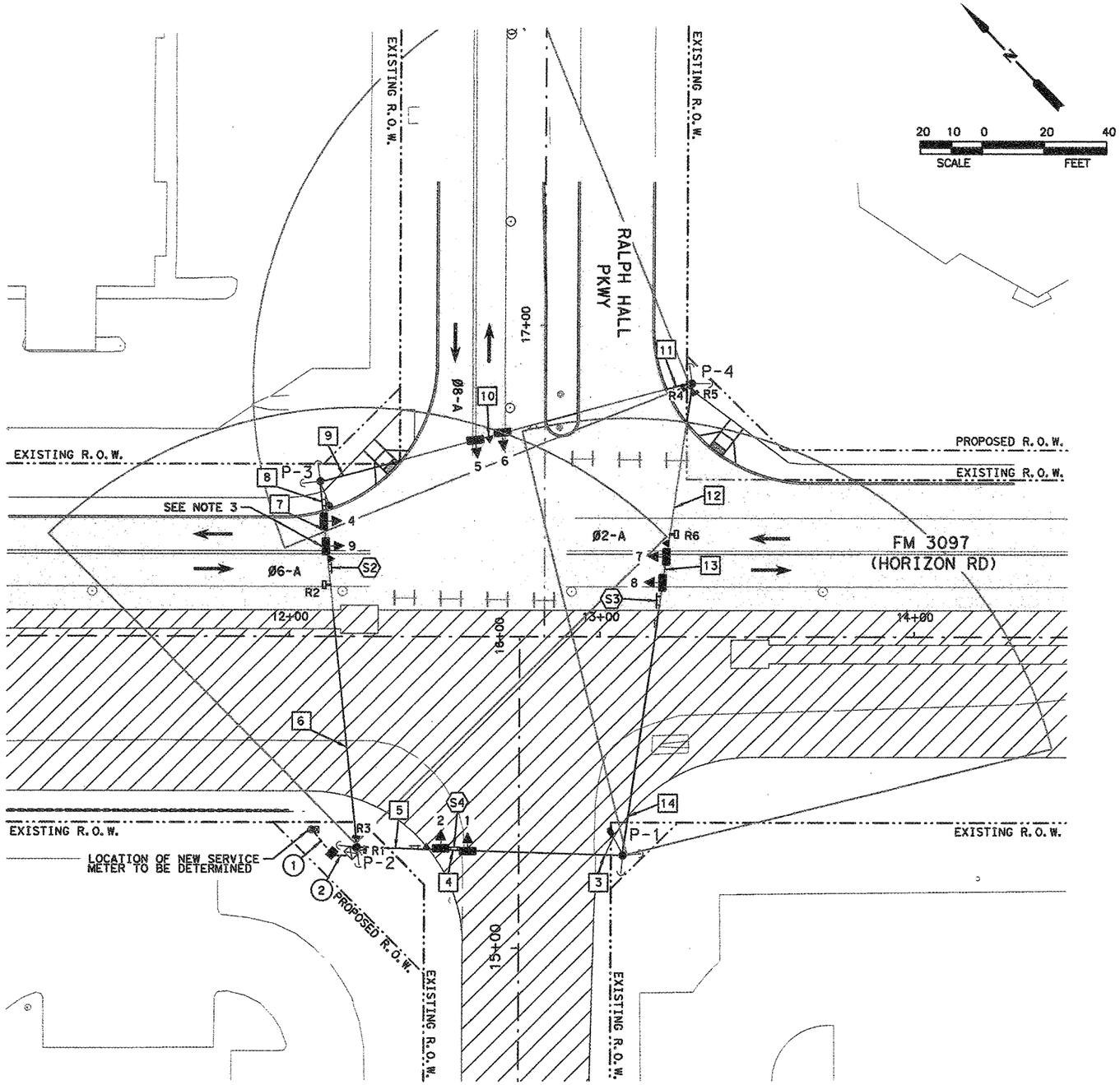
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SHEET 3 OF 6

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NOTES

1. RELOCATE SIGNAL HEADS ALONG SPAN WIRE AS SHOWN.
2. ADJUST ALL RADAR DETECTION ZONES AS SHOWN.
3. REPLACE SIGNAL HEAD 3 WITH SIGNAL HEAD 9 DURING THIS STAGE.
4. INSTALL SIGNS S2, S3, AND S4 DURING THIS STAGE.
5. BAG NORTHBOUND HEADS DURING THIS PHASE.
6. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
7. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
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- CHANNELIZER

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED PROFESSIONAL ENGINEER
4.30.14

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND RALPH HALL PKWY

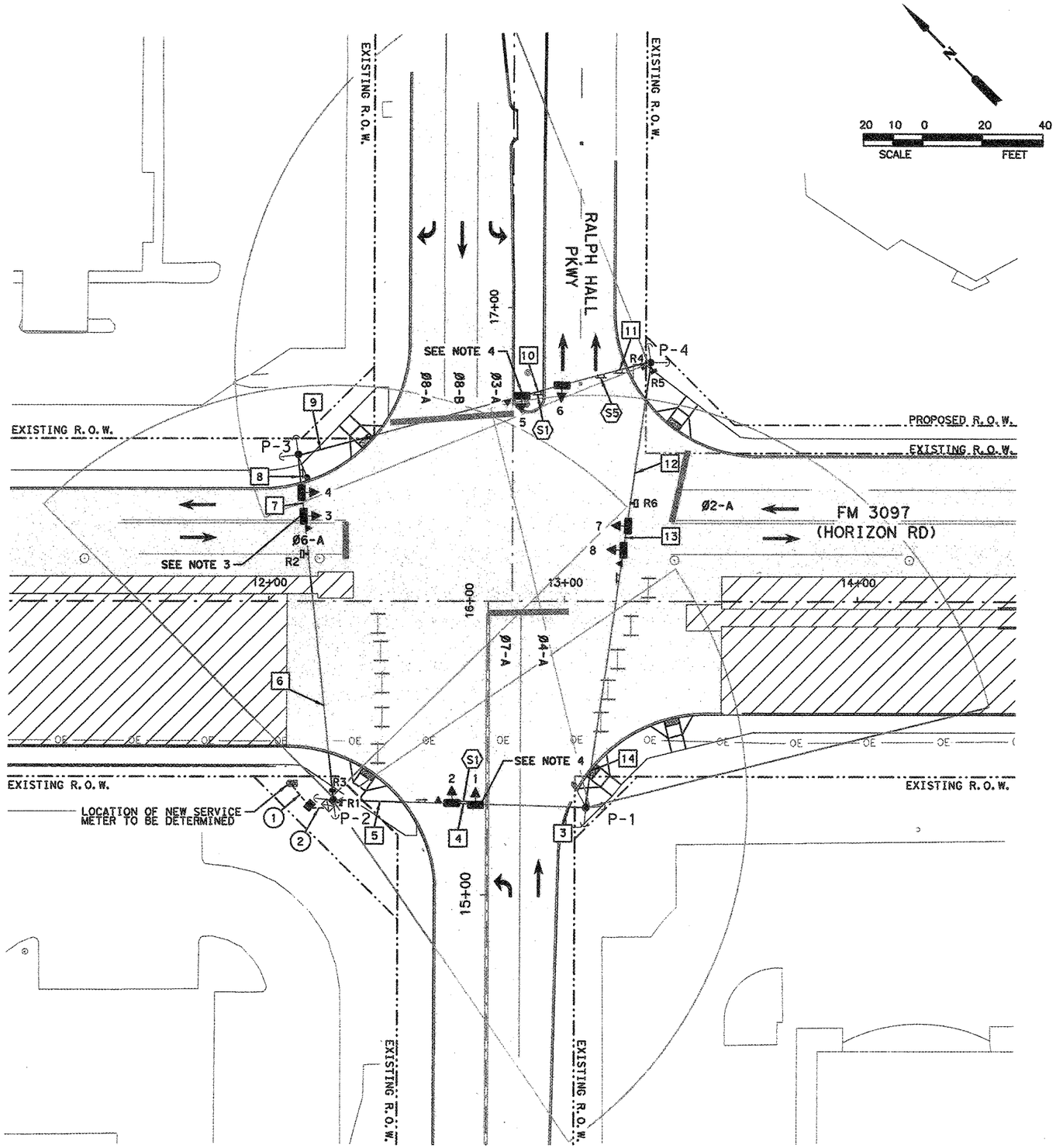
TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 3 STAGE 1

Designed: LDP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: KK	6	TEXAS	STP 2013 (597) MM			FM 3097
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Checked: LDP	DAL	ROCKWALL	3148	01	006	195

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NOTE:

DESIGN IS FOR TEMPORARY TRAFFIC SIGNAL LAYOUT ONLY. TEMPORARY TRAFFIC CONTROL DEVICES, TEMPORARY STRIPING, AND CONSTRUCTION PHASING ARE FOR REFERENCE ONLY.



NOTES

1. RELOCATE SIGNAL HEADS ALONG SPAN WIRE AS SHOWN.
2. REPLACE SIGNAL HEAD 9 WITH SIGNAL HEAD 3 DURING THIS STAGE.
3. REPLACE SIGNAL HEADS 1 AND 5 WITH SIGNAL HEADS 10 AND 11 DURING THIS STAGE.
4. INSTALL "LEFT TURN YIELD ON GREEN" SIGNS (S1) FOR NORTHBOUND AND SOUTHBOUND SIGNAL HEADS DURING THIS STAGE.
5. INSTALL SIGN S5 DURING THIS STAGE.
6. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
7. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
8. ALL FOUNDATIONS WILL BE REMOVED 6 INCHES BELOW GROUND SURFACE AND THE AREA WILL BE BACKFILLED AND COMPACTED TO MATCH ADJACENT SECTION.
9. PEDESTRIAN TRAFFIC WILL BE DETOURED DURING CONSTRUCTION. REFER TO TRAFFIC CONTROL PLANS.
10. LOCATION OF ELECTRICAL SERVICE TO BE DETERMINED. CONDUIT RUNS 1 AND 2 NOT SHOWN ON PLAN.

LEGEND

- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. SIGNAL HEAD
- EXIST. PEDESTRIAN HEAD
- EXIST. PEDESTRIAN PUSH BUTTON
- EXIST. GROUND BOX
- EXIST. LUMINAIRE
- EXIST. SIGN ON MAST ARM
- EXIST. SIGNAL CONTROLLER
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND MOUNTED SIGN
- EXIST. MANHOLE
- EXIST. FIRE HYDRANT
- OE EXIST. OVERHEAD ELECTRIC
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. CONDUIT
- PROP. SIGNAL CONTROLLER
- PROP. GROUND BOX
- PROP. SERVICE METER
- TEMP. CONDUIT
- TEMP. TIMBER POLE
- TEMP. GUY WIRE
- TEMP. SIGNAL HEAD
- TEMP. SIGN
- TEMP. LUMINAIRE
- TEMP. STOP BAR RADAR DETECTION
- TEMP. ADVANCED RADAR DETECTION
- TEMP. PREEMPTION SENSOR
- (X) PROP. CONDUIT RUN CALLOUT
- [X] TEMP. SPAN WIRE CALLOUT
- <X> TEMP. SIGN CALLOUT
- CONSTRUCTION THIS STAGE
- CONSTRUCTION PREVIOUS STAGES
- TEMP. PAVEMENT THIS STEP
- TEMP. PAVEMENT PREVIOUS STEPS
- TRAFFIC FLOW DIRECTION
- TYPE 3 BARRICADE
- CHANNELIZER

STATE OF TEXAS
LESLIE POLLACK
101285
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Texas Department of Transportation

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TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 3 STAGE 2

Designed:	LDP	FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KK	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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SHEET 5 OF 6

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SIGNAL HEAD LEGEND



H3
HEADS: 2, 4, 6, 8, 9

H4LT
HEADS: 3, 7

H5LT
HEADS: 1, 5

PHASING DIAGRAM P1S1

MAINTAIN EXISTING OPERATIONS.

PHASING RING DIAGRAM P1S1

MAINTAIN EXISTING OPERATIONS.

PROPOSED SIGN LEGEND



S1
R10-12
30 x 36
LEFT TURN YIELD ON GREEN

S2
R3-2
30 x 30
NO LEFT TURN

S3
R3-1
30 x 30
NO RIGHT TURN

S4
MANDATORY MOVEMENT
LANE CONTROL

S5
R10-11b
24 x 24

RADAR DETECTION ZONE DETAILS

RADAR DETECTOR	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATION	ZONE	CHANNEL
R1	POLE P-2	19'	STOPBAR	Ø7-A	1
				Ø4-A	2
R2	SPAN P-2/P-3	19'	FROM STOPBAR TO 500' BACK	Ø6	N/A
R3	POLE P-2	19'	STOPBAR	Ø6-A	1
				Ø6-B	2
R4	POLE P-4	19'	STOPBAR	Ø3-A	1
				Ø8-A	2
				Ø8-B	3
R5	POLE P-4	19'	STOPBAR	Ø2-A	1
				Ø2-B	2
R6	SPAN P-1/P-4	19'	FROM STOPBAR TO 500' BACK	Ø2	N/A

POLE DETAILS & WIRING ON POLES

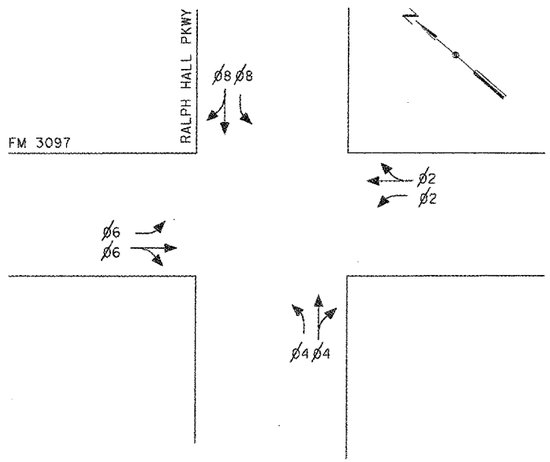
POLE	TYPE	CONDUIT			CONDUCTORS/CABLE IN EXTERNAL RM CONDUIT ON TIMBER POLES (LF)						
		1.5" RMC (RISER)	2" RMC (RISER)	3" RMC (RISER)	NO. 6 XHHW	NO. 6 BARE	NO. 8 XHHW	NO. 8 BARE	7/C	OPTICOM	RADAR CABLE
P-1	TIMBER POLE	20	25	15	10	5	60	55	60	60	90
P-2	TIMBER POLE										
P-3	TIMBER POLE	20					40	20			
P-4	TIMBER POLE										
TOTALS		40	25	15	10	5	120	75	60	60	90

CONDUCTOR AND CONDUIT SCHEDULE

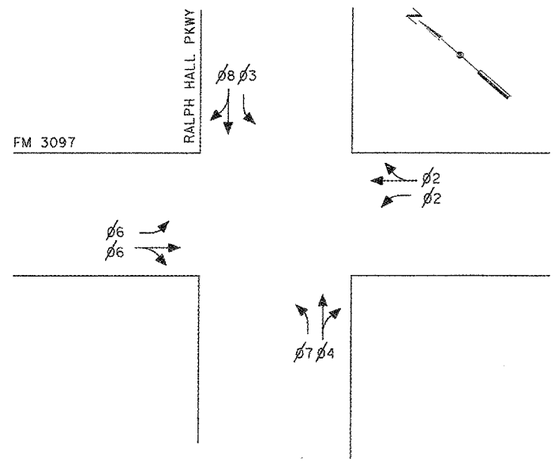
RUN	MAX LENGTH (LF)	CONDUITS		NO. 6 BARE	NO. 8 BARE	NO. 8 XHHW (LUMS)	NO. 6 XHHW	TY A 14 AWG		OPTICOM	RADAR CABLE
		2" PVC	2" PVC (LUMS)					5/C SIGNAL CABLE	7/C SIGNAL CABLE		
		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
1	*	1		1		4	2	4			
2	5	1	1	1	1	4	2	4			
3	55					2		2	1	1	3
4	10					2		1	2	2	3
5	55					2		1	2	2	3
6	95					2		1	2	2	1
7	10					2		1	2	2	
8	65					2		1	1	1	
9	105								1	1	
10	10								1	1	
11	65										
12	105							2			3
13	10							2	1		3
14	90							2	1		3
TOTAL (LF)		5	5	5	5	600	10	775	675	575	1070

NOTE
*TO BE DETERMINED - AS REQUIRED BY UTILITY

PHASING DIAGRAM P2S1 THROUGH P3S1



PHASING DIAGRAM P3S2



PHASING RING DIAGRAM P2S1 THROUGH P3S1

PHASING RING DIAGRAM P3S2

WIRING INSIDE CABINET

7/C	OPTICOM	RADAR CABLE
20	20	30

CABLE TERMINATION CHART

Conductor Cable	Cable 1 Span P-1/P-2 7/C 14 AWG	Cable 2 (Except P3S1) Span P-2/P-3 7/C 14 AWG	Cable 2 (P3S1) Span P-2/P-3 7/C 14 AWG	Cable 3 Span P-3/P-4 7/C 14 AWG	Cable 4 Span P-1/P-4 7/C 14 AWG
Black	Spare	Spare	Spare	Spare	Spare
White	Signal Common	Signal Common	Signal Common	Signal Common	Signal Common
Red	SH 1-2 R Ph 8	SH 3-4 R Ph 2	SH 9-4 R Ph 2	SH 5-6 R Ph 4	SH 7-8 R Ph 6
Green	SH 1-2 G Ph 8	SH 3-4 G Ph 2	SH 9-4 G Ph 2	SH 5-6 G Ph 4	SH 7-8 G Ph 6
Orange	SH 1-2 Y Ph 8	SH 3-4 Y Ph 2	SH 9-4 Y Ph 2	SH 5-6 Y Ph 4	SH 7-8 Y Ph 6
Blue	SH 1 G ARW Ph 3	SH 3 G ARW Ph 2	Spare	SH 5 G ARW Ph 7	SH 7 G ARW Ph 6
White/Black	SH 1 Y ARW Ph 3	Spare	Spare	SH 5 Y ARW Ph 7	Spare

NOTE
1. TERMINATE SH 1 AND 5 YELLOW AND GREEN ARROWS TO PARENT PHASES WHEN SPLIT-PHASED

4/30.14
STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER

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Texas Department of Transportation

FM 3097 AND RALPH HALL PKWY

TEMPORARY PHASING, CONDUIT & CONDUCTOR SCHEDULES

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Checked: LDP	DAL	ROCKWALL	3148	01	006		197

SHEET 6 OF 6

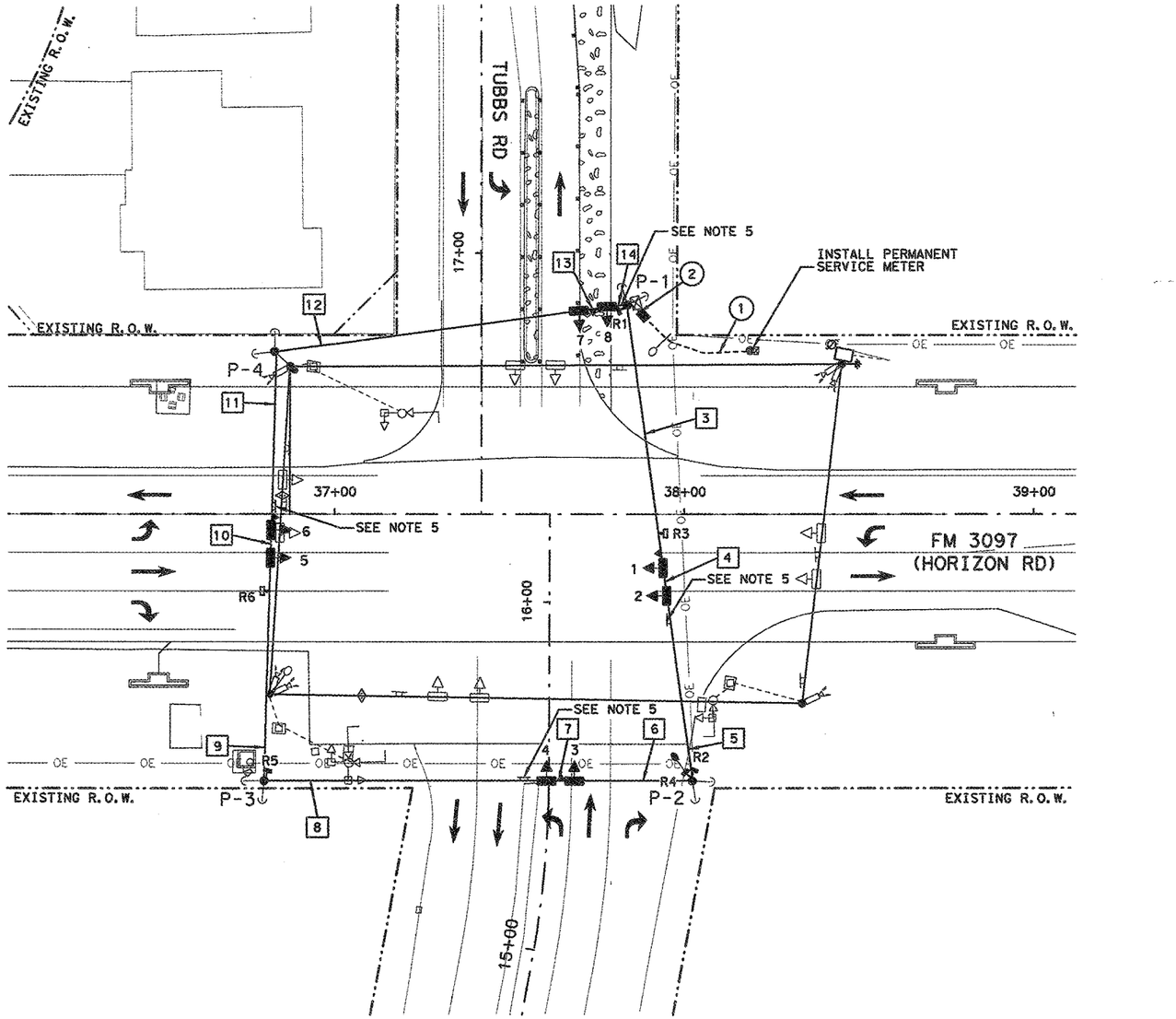
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NOTE:

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TRAFFIC SIGNAL POLE SCHEDULE

POLE NUMBER	STATION	OFFSET	SIDE
P1	37+83.40	59.99	LT
P2	38+02.45	76.41	RT
P3	36+80.38	76.41	RT
P4	36+87.35	42.27	LT



20 10 0 20 40
SCALE FEET

NOTES

1. EXISTING CONTROLLER AND SIGNAL EQUIPMENT WILL BE USED FOR THIS STAGE. TEMPORARY SIGNAL EQUIPMENT SHOULD BE INSTALLED AND BAGGED DURING THIS STAGE.
2. TEMPORARY TIMBER SIGNAL POLES AND SPANS TO BE INSTALLED AS SHOWN.
3. TEMPORARY POLE-MOUNTED TRAFFIC SIGNAL CONTROLLER WILL BE INSTALLED FOR FUTURE PHASES. MAINTAIN EXISTING POWER SOURCE BUT RELOCATE SERVICE METER AS SHOWN.
4. LOCATION OF ALL UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CONFIRM LOCATIONS OF UTILITIES IN THE FIELD.
5. RELOCATE EXISTING STREET NAME SIGNS TO SPAN WIRE SIGNALS AS SHOWN.
6. RELOCATE EXISTING OPTICOM DETECTORS TO SPAN WIRE SIGNALS AS SHOWN.
7. POLE LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL FIELD ADJUST AS NECESSARY TO AVOID UTILITIES.
8. CONTRACTOR WILL COORDINATE WITH ELECTRICITY COMPANY TO ESTABLISH POWER SOURCE AND INSTALL SERVICE METER. THIS TASK IS INCLUDED UNDER ITEM 628 AND WILL NOT BE PAID FOR SEPERATELY.
9. CONTRACTOR WILL COORDINATE WITH ELECTRIC COMPANY TO OBTAIN APPROVAL ON THE LOCATION OF SIGNAL POLES TO MEET OSHA CLEARANCE REQUIREMENTS FOR POWER LINES. FINAL LOCATIONS OF TRAFFIC SIGNAL MUST BE APPROVED BY THE ENGINEER.
10. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
11. COIL SUFFICIENT TEMPORARY SIGNAL CABLE TO ALLOW FOR HEAD SHIFT DURING ALL PHASES OF CONSTRUCTION.
12. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
13. MINIMUM 40 FOOT TIMBER POLES SHOULD BE USED FOR TEMPORARY SIGNALS. TALLER POLES MAY BE REQUIRED IF ADEQUATE CLEARANCE (17'-6" MINIMUM) BETWEEN STREET GRADE AND BOTTOM OF SIGNAL HEAD CANNOT BE ACHIEVED WITH 40 FOOT POLE HEIGHT. TIMBER POLES TO BE INSTALLED AT AN EMBEDMENT DEPTH OF 7 FEET. TEMPORARY POLES WILL REMAIN IN PLACE THROUGHOUT ALL PHASES OF CONSTRUCTION.
14. PEDESTRIAN HEADS WILL BE BAGGED DURING CONSTRUCTION AND PEDESTRIAN TRAFFIC WILL BE DETOURED. REFER TO TRAFFIC CONTROL PLANS.
15. EXISTING STRAIN POLES AND SPAN WIRES CAN BE USED FOR TEMPORARY TRAFFIC CONTROL TO THE EXTENT THAT CONSTRUCTION ALLOWS. CONTRACTOR WILL COORDINATE WITH DESIGN ENGINEER FOR MODIFIED SIGNAL LAYOUT.

LEGEND

- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. SIGNAL HEAD
- EXIST. PEDESTRIAN HEAD
- EXIST. PEDESTRIAN PUSH BUTTON
- EXIST. GROUND BOX
- EXIST. LUMINAIRE
- EXIST. SIGN ON MAST ARM
- EXIST. SIGNAL CONTROLLER
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND MOUNTED SIGN
- EXIST. MANHOLE
- EXIST. FIRE HYDRANT
- OE EXIST. OVERHEAD ELECTRIC
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. CONDUIT
- PROP. SIGNAL CONTROLLER
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- TEMP. CONDUIT
- TEMP. TIMBER POLE
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- TEMP. SIGNAL HEAD
- TEMP. SIGN
- TEMP. LUMINAIRE
- TEMP. STOP BAR RADAR DETECTION
- TEMP. ADVANCED RADAR DETECTION
- TEMP. PREEMPTION SENSOR
- (X) PROP. CONDUIT RUN CALLOUT
- [X] TEMP. SPAN WIRE CALLOUT
- (X) TEMP. SIGN CALLOUT
- CONSTRUCTION THIS STAGE
- CONSTRUCTION PREVIOUS STAGES
- TEMP. PAVEMENT THIS STEP
- TEMP. PAVEMENT PREVIOUS STEPS
- TRAFFIC FLOW DIRECTION
- TYPE 3 BARRICADE
- CHANNELIZER

4.30.14

STATE OF TEXAS · LESLIE POLLACK · 101285 · LICENSED · PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
FIRM REGISTRATION No. F-754

Texas Department of Transportation

FM 3097 AND TUBBS ROAD

TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 1 STAGE 1

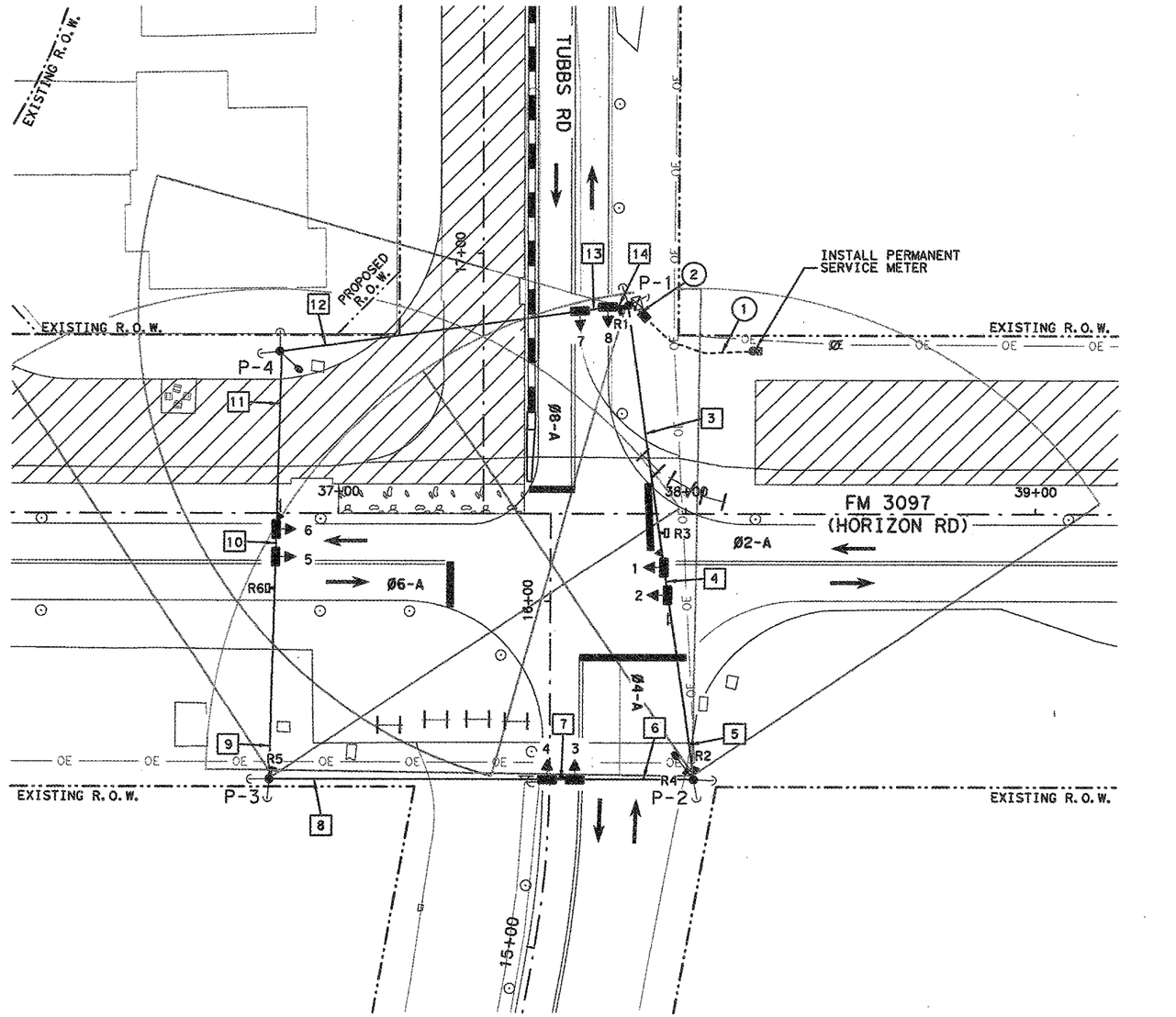
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Checked:	KK	6	TEXAS	STP 2013 (597) MM				FM 3097	
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SHEET 1 OF 6

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NOTE:

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NOTES

1. PLACE TEMPORARY SIGNAL INTO OPERATION.
2. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
3. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
4. ALL FOUNDATIONS WILL BE REMOVED 6 INCHES BELOW GROUND SURFACE AND THE AREA WILL BE BACKFILLED AND COMPACTED TO MATCH ADJACENT SECTION.
5. PEDESTRIAN TRAFFIC WILL BE DETOURED DURING CONSTRUCTION. REFER TO TRAFFIC CONTROL PLANS.
6. EXISTING STRAIN POLES AND SPAN WIRES CAN BE USED FOR TEMPORARY TRAFFIC CONTROL TO THE EXTENT THAT CONSTRUCTION ALLOWS. CONTRACTOR WILL COORDINATE WITH DESIGN ENGINEER FOR MODIFIED SIGNAL LAYOUT.

LEGEND

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- EXIST. PEDESTRIAN HEAD
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- EXIST. GROUND BOX
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STATE OF TEXAS
LESLIE POLLACK
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FM 3097 AND TUBBS ROAD

TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 2 STAGE 1

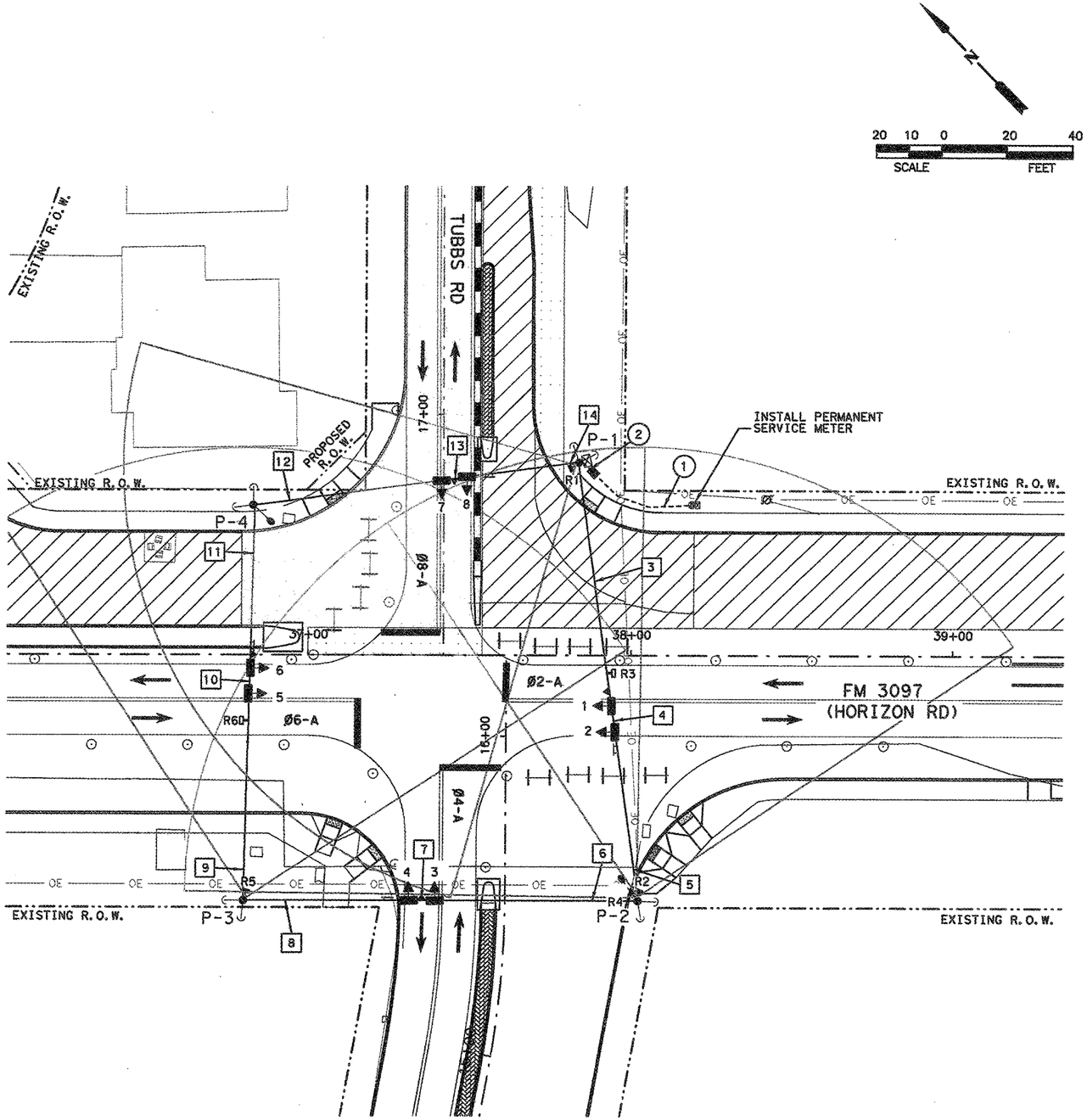
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SHEET 2 OF 6

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NOTES

1. RELOCATE SIGNAL HEADS ALONG SPAN WIRE AS SHOWN.
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4. ALL FOUNDATIONS WILL BE REMOVED 6 INCHES BELOW GROUND SURFACE AND THE AREA WILL BE BACKFILLED AND COMPACTED TO MATCH ADJACENT SECTION.
5. PEDESTRIAN TRAFFIC WILL BE DETOURED DURING CONSTRUCTION. REFER TO TRAFFIC CONTROL PLANS.
6. EXISTING STRAIN POLES AND SPAN WIRES CAN BE USED FOR TEMPORARY TRAFFIC CONTROL TO THE EXTENT THAT CONSTRUCTION ALLOWS. CONTRACTOR WILL COORDINATE WITH DESIGN ENGINEER FOR MODIFIED SIGNAL LAYOUT.

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FM 3097 AND TUBBS ROAD

TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 2 STAGE 2

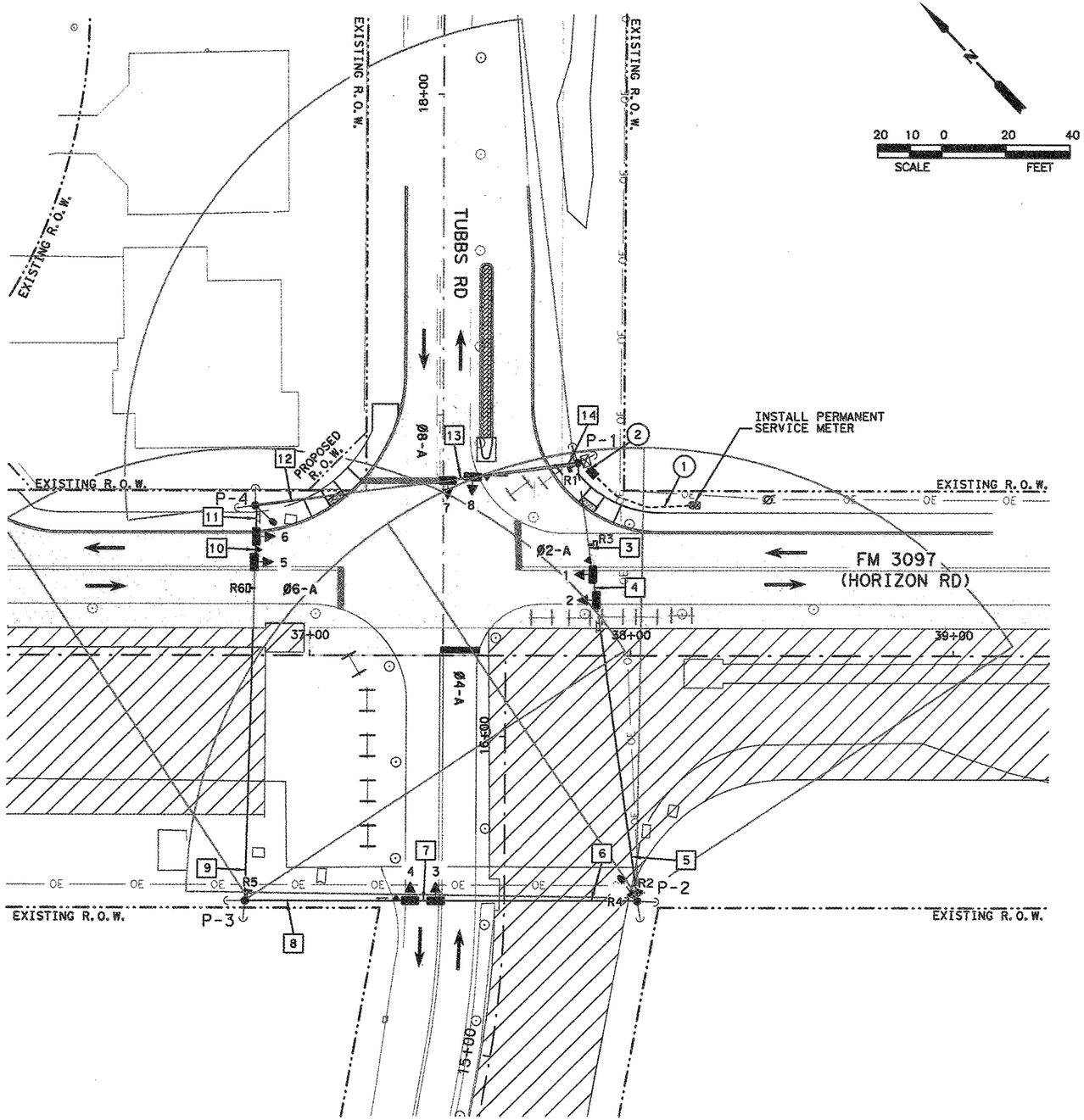
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SHEET 3 OF 6

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NOTES

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2. ADJUST RADAR DETECTION ZONES AS SHOWN.
3. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
4. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
5. ALL FOUNDATIONS WILL BE REMOVED 6 INCHES BELOW GROUND SURFACE AND THE AREA WILL BE BACKFILLED AND COMPACTED TO MATCH ADJACENT SECTION.
6. PEDESTRIAN TRAFFIC WILL BE DETOURED DURING CONSTRUCTION. REFER TO TRAFFIC CONTROL PLANS.
7. EXISTING STRAIN POLES AND SPAN WIRES CAN BE USED FOR TEMPORARY TRAFFIC CONTROL TO THE EXTENT THAT CONSTRUCTION ALLOWS. CONTRACTOR WILL COORDINATE WITH DESIGN ENGINEER FOR MODIFIED SIGNAL LAYOUT.

LEGEND

- EXIST. SIGNAL POLE AND MAST ARM
- EXIST. SIGNAL HEAD
- EXIST. PEDESTRIAN HEAD
- EXIST. PEDESTRIAN PUSH BUTTON
- EXIST. GROUND BOX
- EXIST. LUMINAIRE
- EXIST. SIGN ON MAST ARM
- EXIST. SIGNAL CONTROLLER
- EXIST. POWER SOURCE
- EXIST. SERVICE METER
- EXIST. GROUND MOUNTED SIGN
- EXIST. MANHOLE
- EXIST. FIRE HYDRANT
- OE EXIST. OVERHEAD ELECTRIC
- EXIST. RIGHT OF WAY
- PROP. RIGHT OF WAY
- PROP. CONDUIT
- PROP. SIGNAL CONTROLLER
- PROP. GROUND BOX
- PROP. SERVICE METER
- TEMP. CONDUIT
- TEMP. TIMBER POLE
- TEMP. GUY WIRE
- TEMP. SIGNAL HEAD
- TEMP. SIGN
- TEMP. LUMINAIRE
- TEMP. STOP BAR RADAR DETECTION
- TEMP. ADVANCED RADAR DETECTION
- TEMP. PREEMPTION SENSOR
- PROP. CONDUIT RUN CALLOUT
- TEMP. SPAN WIRE CALLOUT
- TEMP. SIGN CALLOUT
- CONSTRUCTION THIS STAGE
- CONSTRUCTION PREVIOUS STAGES
- TEMP. PAVEMENT THIS STEP
- TEMP. PAVEMENT PREVIOUS STEPS
- TRAFFIC FLOW DIRECTION
- TYPE 3 BARRICADE
- CHANNELIZER

4.30.14

STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

HDR Engineering, Inc.
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FM 3097 AND TUBBS ROAD

TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 3 STAGE 1

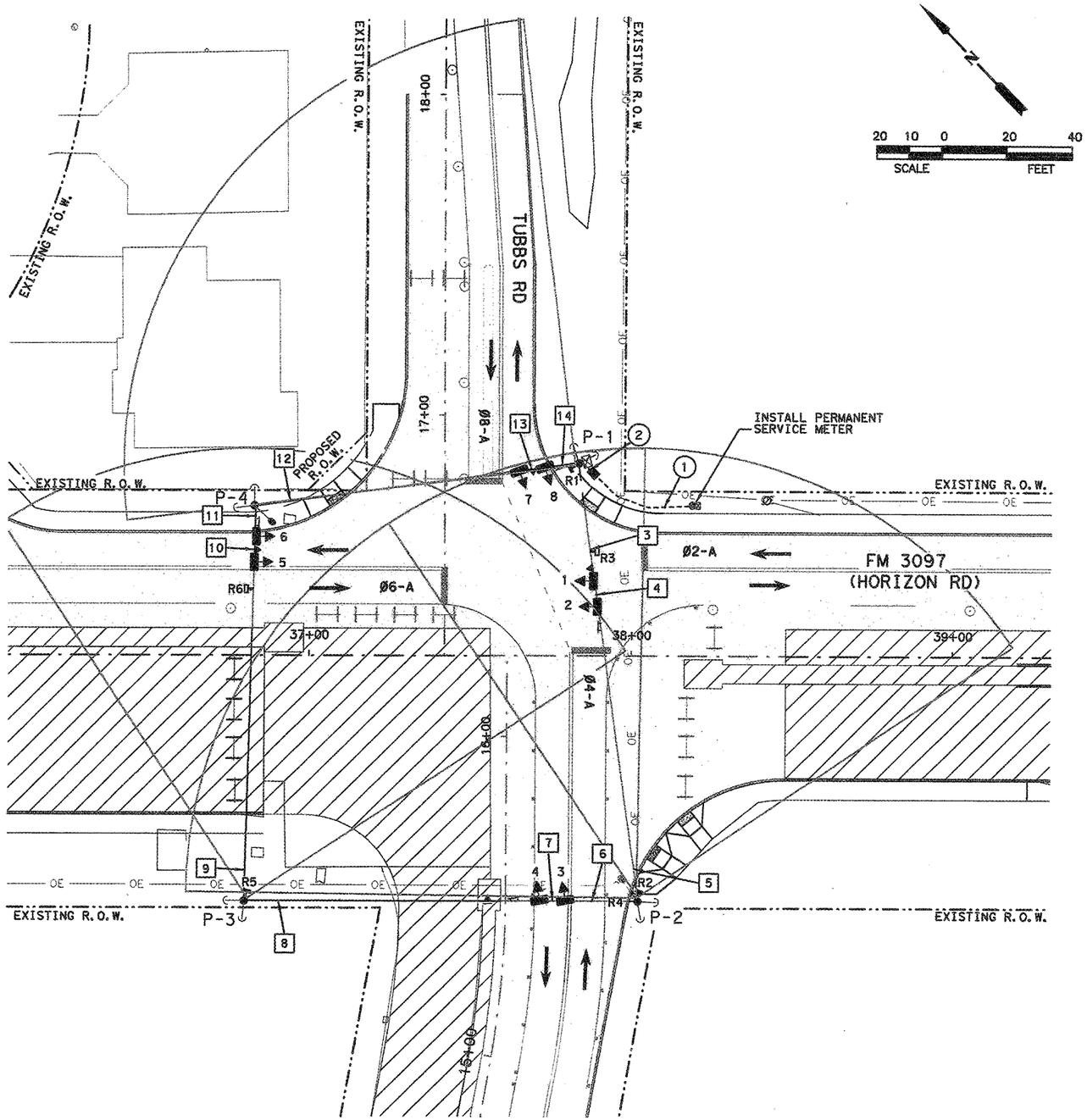
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Checked:	KK	6	TEXAS	STP 2013 (597) MM				FM 3097
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SHEET 4 OF 6

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NOTE:

DESIGN IS FOR TEMPORARY TRAFFIC SIGNAL LAYOUT ONLY. TEMPORARY TRAFFIC CONTROL DEVICES, TEMPORARY STRIPING, AND CONSTRUCTION PHASING ARE FOR REFERENCE ONLY.



NOTES

1. RELOCATE SIGNAL HEADS ALONG SPAN WIRE AS SHOWN.
2. SIGNAL HEADS MUST BE INSTALLED AT A MINIMUM OF 8 FEET APART.
3. SALVAGE ALL REPLACED SIGNAL EQUIPMENT TO TXDOT. CONTACT TXDOT AT 214-320-6682 TO ARRANGE DELIVERY.
4. ALL FOUNDATIONS WILL BE REMOVED 6 INCHES BELOW GROUND SURFACE AND THE AREA WILL BE BACKFILLED AND COMPACTED TO MATCH ADJACENT SECTION.
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- EXIST. POWER SOURCE
- EXIST. SERVICE METER
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- TEMP. TIMBER POLE
- TEMP. GUY WIRE
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FM 3097 AND TUBBS ROAD

TEMPORARY TRAFFIC SIGNAL LAYOUT PHASE 3 STAGE 2

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SHEET 5 OF 6

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POLE DETAILS & WIRING ON POLES

POLE	TYPE	CONDUIT			CONDUCTORS/CABLE IN EXTERNAL RM CONDUIT ON TIMBER POLES (LF)						
		1.5" RMC (RISER)	2" RMC (RISER)	3" RMC (RISER)	NO. 6 XHHW	NO. 6 BARE	NO. 8 XHHW	NO. 8 BARE	7/C	OPTICOM	RADAR CABLE
P-1	TIMBER POLE		25	15	10	5	80	35	60	60	90
P-2	TIMBER POLE	20					40	20			
P-3	TIMBER POLE										
P-4	TIMBER POLE	20					40	20			
TOTALS		40	25	15	10	5	160	75	60	60	90

CONDUCTOR AND CONDUIT SCHEDULE

RUN	MAX LENGTH (LF)	CONDUITS		NO. 6 BARE	NO. 8 BARE	NO. 8 XHHW (LUM'S)	NO. 6 XHHW	TY A 14 AWG		OPTICOM	RADAR CABLE
		2" PVC	2" PVC (LUM'S)					5/C SIGNAL CABLE	7/C SIGNAL CABLE		
		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
1	40	1		1		4	2				
2	5	1	1	1	1	4	2				
3	75					2			2	2	4
4	10					2			2	2	3
5	95					2			1	1	3
6	65								1	1	1
7	10								1	1	1
8	95										1
9	105										1
10	10								1	1	1
11	55								1	1	1
12	90					2		2	1	1	1
13	10					2		1	2	2	1
14	35					2		1	2	2	1
15								1			
TOTAL (LF)		45	5	45	5	810	90	225	585	585	1090

CABLE TERMINATION CHART

Conductor Cable	Cable 1 Span P-1/P-2 7/C 14 AWG	Cable 2 Span P-2/P-3 7/C 14 AWG	Cable 3 Span P-3/P-4 7/C 14 AWG	Cable 4 Span P-1/P-4 7/C 14 AWG
Black	Spare	Spare	Spare	Spare
White	Signal Common	Signal Common	Signal Common	Signal Common
Red	SH 1-2 R Ph 6	SH 3-4 R Ph 8	SH 5-6 R Ph 2	SH 7-8 R Ph 4
Green	SH 1-2 G Ph 6	SH 3-4 G Ph 8	SH 5-6 G Ph 2	SH 7-8 G Ph 4
Orange	SH 1-2 Y Ph 6	SH 3-4 Y Ph 8	SH 5-6 Y Ph 2	SH 7-8 Y Ph 4
Blue	SH 1 G ARW Ph 6	SH 3 G ARW Ph 8	SH 5 G ARW Ph 2	SH 7 G ARW Ph 4
White/Black	Spare	Spare	Spare	Spare

RADAR DETECTION ZONE DETAILS

RADAR DETECTOR	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATION	ZONE	CHANNEL
R1	POLE P-1	19'	STOPBAR	Ø8-A	1
R2	POLE P-2	19'	STOPBAR	Ø2-A	1
R3	SPAN P-1/P-2	19'	FROM STOPBAR TO 500' BACK	Ø2	N/A
R4	POLE P-2	19'	STOPBAR	Ø4-A	1
R5	POLE P-3	19'	STOPBAR	Ø6-A	1
R6	SPAN P-3/P-4	19'	FROM STOPBAR TO 500' BACK	Ø6	N/A

PHASING DIAGRAM P1S1

MAINTAIN EXISTING OPERATIONS.

PHASING RING DIAGRAM P1S1

MAINTAIN EXISTING OPERATIONS.

WIRING INSIDE CABINET

7/C	OPTICOM	RADAR CABLE
20	20	30

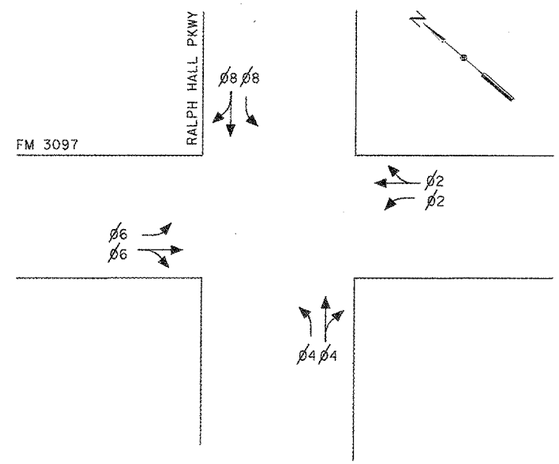
SIGNAL HEAD LEGEND



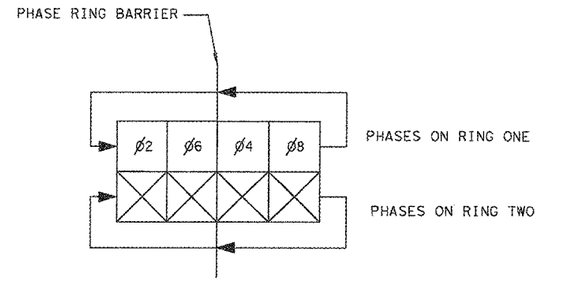
H3
HEADS: 2, 4, 6, 8

H4LT
HEADS: 1, 3, 5, 7

PHASING DIAGRAM P2S1 THROUGH P3S2



PHASING RING DIAGRAM P2S1 THROUGH P3S2



4.30.19

STATE OF TEXAS
LESLIE POLLACK
101285
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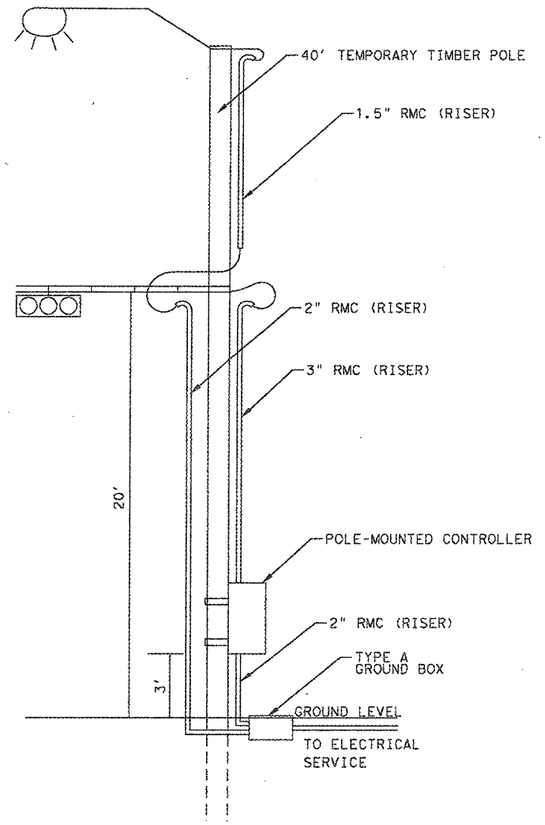
FM 3097 AND TUBBS RD

TEMPORARY PHASING, CONDUIT & CONDUCTOR SCHEDULES

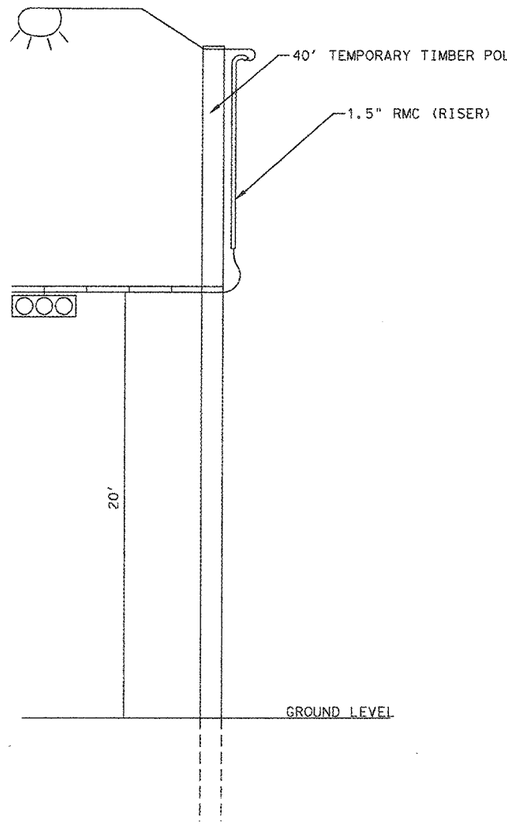
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Checked:	KK	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	BG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	LDP	DAL	ROCKWALL	3148	01	006	203

SHEET 6 OF 6

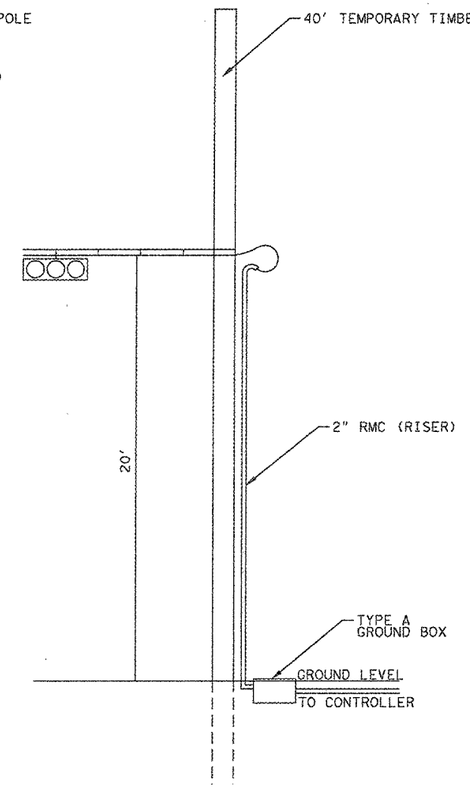
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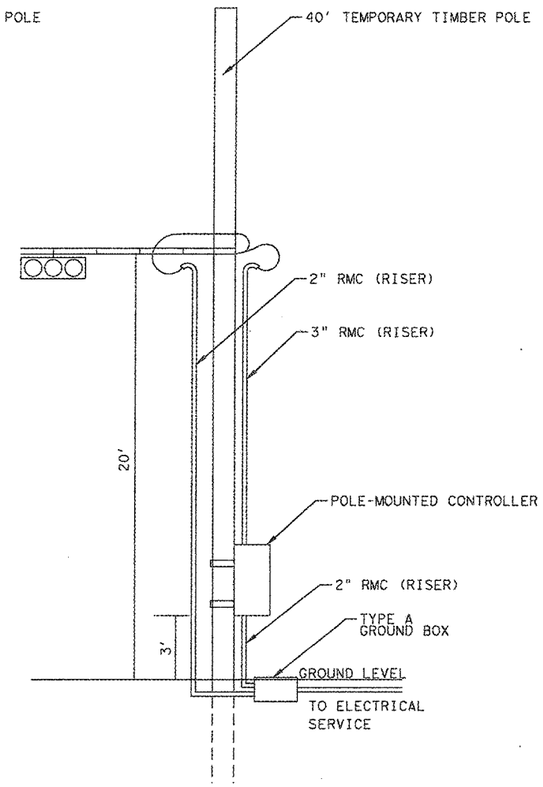
RALPH HALL PKWY: P-2



FM 740: P-2
RALPH HALL PKWY: P-3
TUBBS RD: P-2, P-4

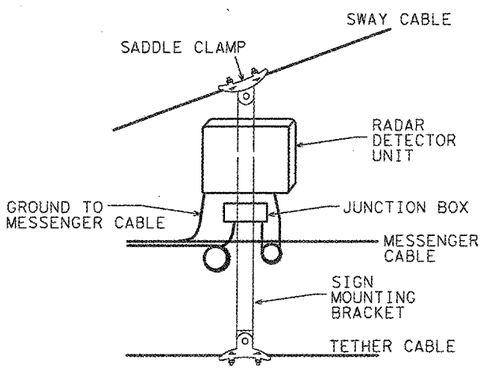


FM 740: P-1



TUBBS RD: P-1

RADAR ADVANCED DETECTION MOUNTING



NOTES

1. NOT TO SCALE.
2. GUY WIRES TO BE INSTALLED BASED ON FIELD CONDITIONS. CONTRACTOR TO COORDINATE WITH PROPOERTY OWNERS IF NECESSARY TO INSTALL GUY WIRES OUTSIDE R.O.W.

STATE OF TEXAS
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101285
LICENSED PROFESSIONAL ENGINEER
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Texas Department of Transportation

FM 3097 TRAFFIC SIGNAL DESIGN

POLE-MOUNTED CONTROLLER/ ADVANCED RADAR SPAN WIRE MOUNTING DETAILS

Designed:	LDP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	KK	6	TEXAS	STP 2013 (597) MM			FM 3097
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Checked:	LDP	DAL	ROCKWALL	3148	01	006	204

SHEET 1 OF 1

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FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft 10	15	40	ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

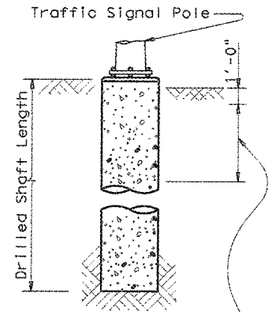
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET) 24-A	30-A	36-A	36-B	42-A
FM 740								
P-2	10	24-A	1	6				
P-5	10	24-A	1	6				
P-6	10	24-A	1	6				
RALPH HALL								
P-4	10	36-A	1			13		
P-5	10	24-A	1	6				
TUBBS								
P-1	10	36-A	1			13		
P-2	10	24-A	1	6				
P-3	10	24-A	1	6				
P-6	10	36-A	1			13		
TOTAL DRILLED SHAFT LENGTHS				36		39		

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'

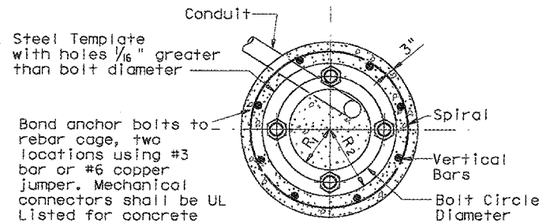


Use average N value over the top third of the embedded shaft. Ignore the top 1' of soil.

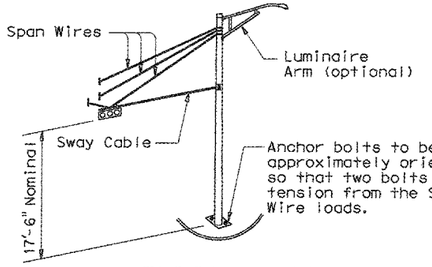
ANCHOR BOLT & TEMPLATE SIZES

BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	Rz	Rt
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

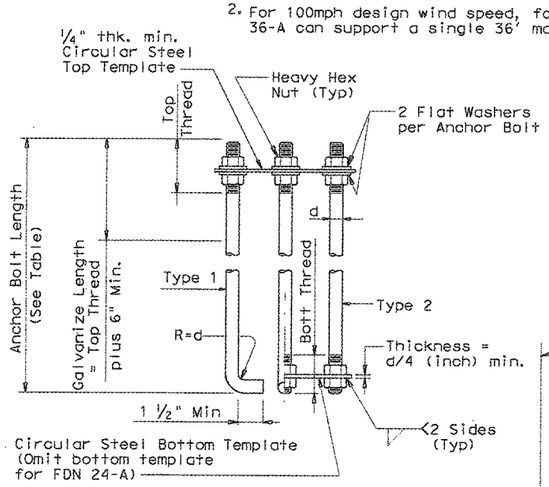
⑦ Min dimensions given, longer bolts are acceptable.



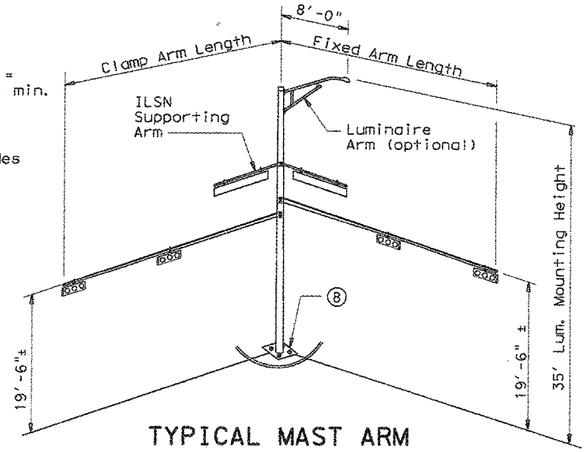
EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



TYPICAL STRAIN POLE ASSEMBLY

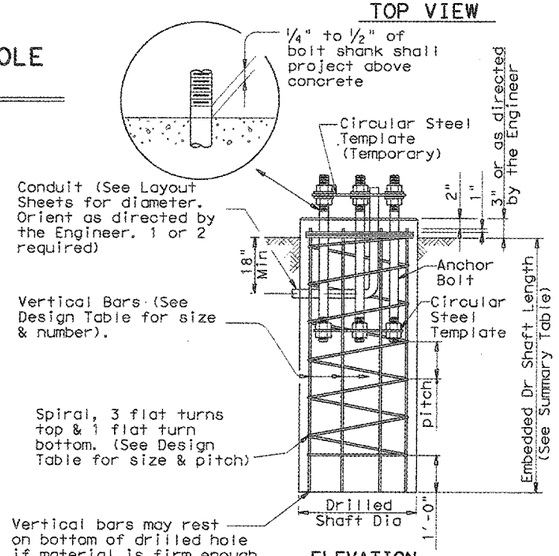


ANCHOR BOLT ASSEMBLY



⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.

TYPICAL MAST ARM ASSEMBLY



FOUNDATION DETAILS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

9.30.14

STATE OF TEXAS LESLIE POLACK 101285 LICENSED PROFESSIONAL ENGINEER

FOUNDATION SUMMARY TABLE ONLY

Texas Department of Transportation
Traffic Operations Division

FM 3097 TRAFFIC SIGNAL DESIGN

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

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DN: MS	CK: JSY	DW: MAG/MMF	CK: JSY/TEB

REVISIONS 5-95, 11-98, 1-12

CONT	SECT	JOB	HIGHWAY
3148	01	006	FM 3097

DIST	COUNTY	SHEET NO.
DAL	ROCKWALL	205

DATE:
FILE:

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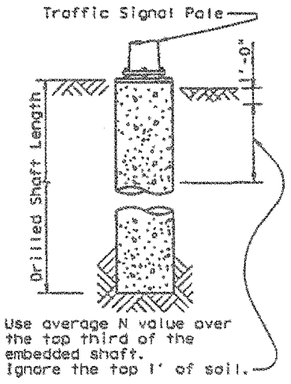
FOUNDATION DESIGN TABLE

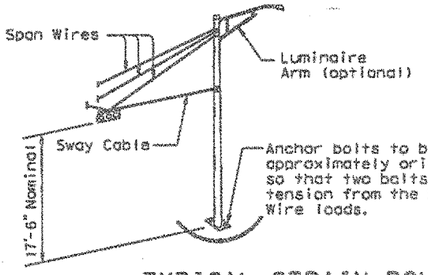
FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft 10	15	40	ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

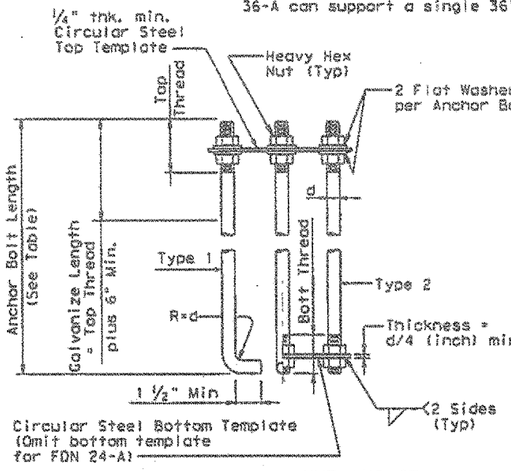
		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'

EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.

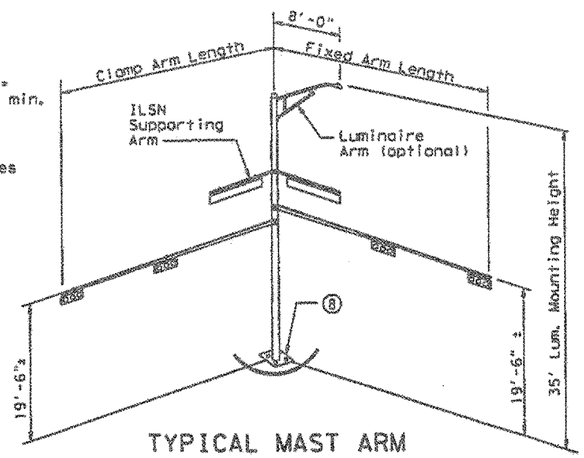




TYPICAL STRAIN POLE ASSEMBLY



ANCHOR BOLT ASSEMBLY



⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.

TYPICAL MAST ARM ASSEMBLY

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

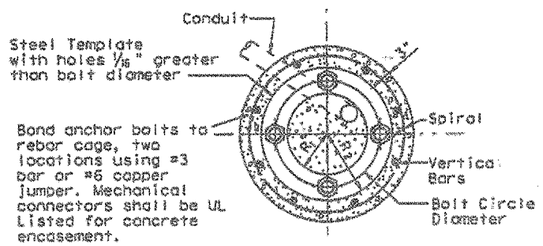
⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

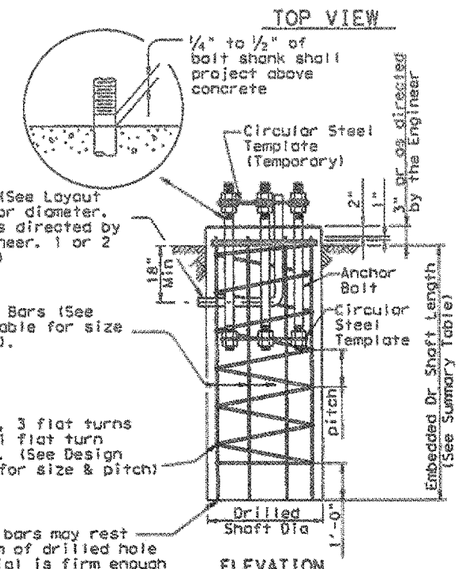
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

ANCHOR BOLT & TEMPLATE SIZES

BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅜"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ⅜"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.





FOUNDATION DETAILS

FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET) 24-A	30-A	36-A	36-B	42-A
FM 740								
P-2	10	24-A	1	6				
P-5	10	24-A	1	6				
P-6	10	24-A	1	6				
RALPH HALL								
P-1	10	30-A	1		11			
P-4	10	36-A	1			13		
P-5	10	24-A	1	6				
P-6	10	24-A	1	6				
P-7	10	24-A	1	6				
TUBBS								
P-1	10	36-A	1			13		
P-2	10	24-A	1	6				
P-3	10	24-A	1	6				
P-6	10	36-A	1			13		
P-7	10	24-A	1	6				
TOTAL DRILLED SHAFT LENGTHS				54	11	39		

⚠1 AS-BUILT REVISIONS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

Jessie D Pollack
STATE OF TEXAS
LESLIE POLLACK
101285
LICENSED PROFESSIONAL ENGINEER
12/20/17

Texas Department of Transportation
Traffic Operations Division

FM 3097 TRAFFIC SIGNAL DESIGN

TRAFFIC SIGNAL POLE FOUNDATION

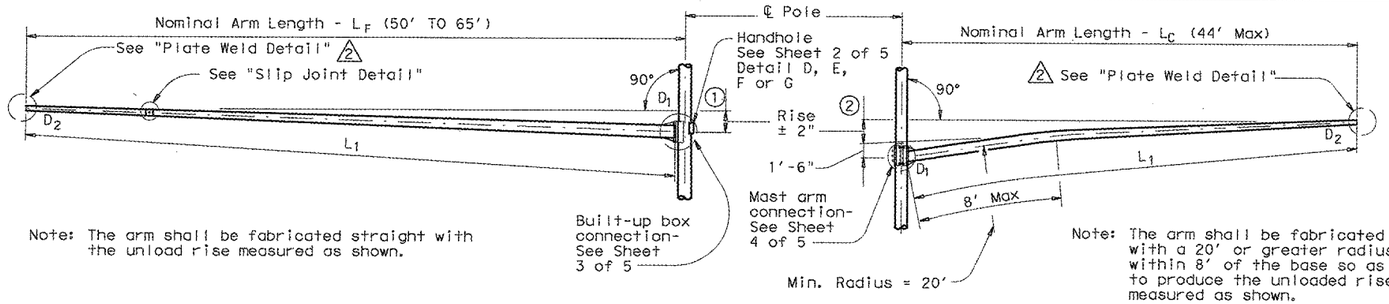
TS-FD-12

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DN: MS	CK: JSY	DW: MADUNAF	CK: JSY/FED
REVISIONS	CONT	SECT	JOB	HIGHWAY
3-98	3148	01	006	FM 3097
11-98	DIST	COUNTY	SHEET NO.
1-02	DAL	ROCKWALL	205A

1204045GNL-TSFD12.dgn

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Note: The arm shall be fabricated straight with the unload rise measured as shown.

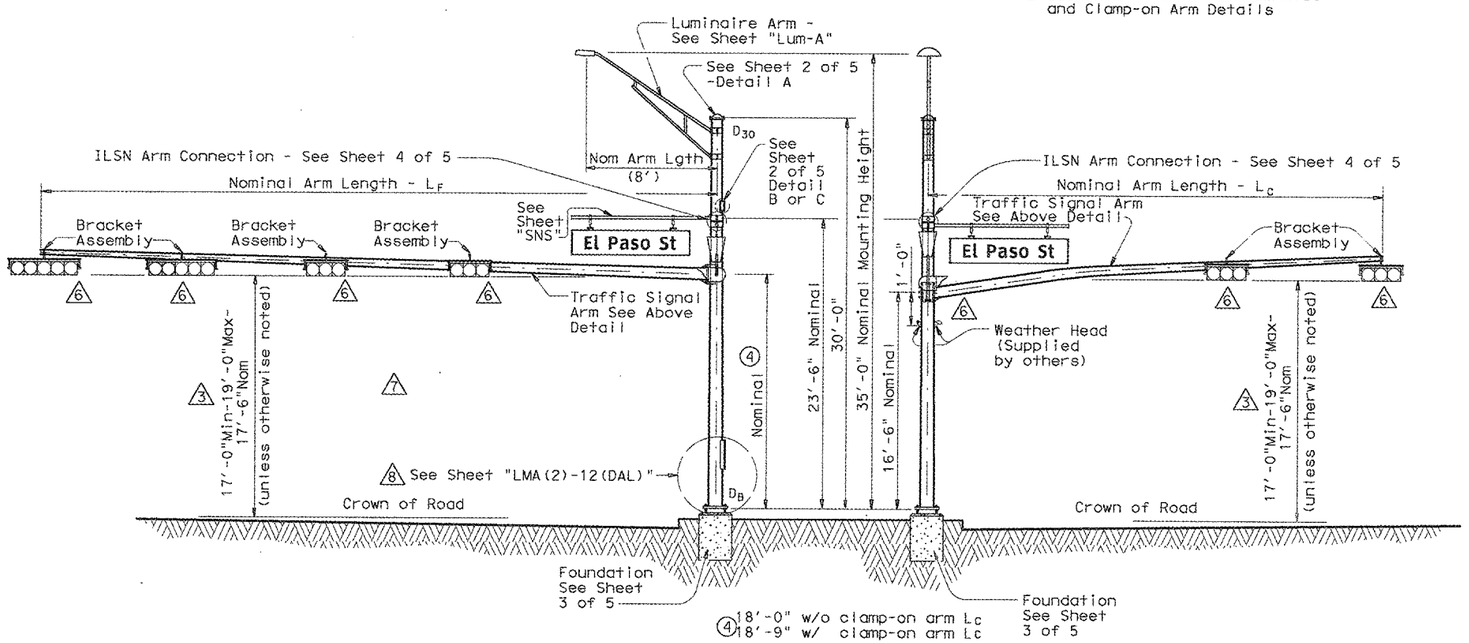
Note: The arm shall be fabricated with a 20' or greater radius within 8' of the base so as to produce the unloaded rise measured as shown.

FIXED MOUNT TRAFFIC SIGNAL ARM

1 See Sheet 3 of 5 for Arm Rise

CLAMP-ON TRAFFIC SIGNAL ARM (IF REQUIRED)

2 See Sheet 4 of 5 for Arm Rise and Clamp-on Arm Details



ELEVATION (Showing fixed mount arm)

STRUCTURE ASSEMBLY

ELEVATION (Showing clamp-on arm)

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed can be either 100 mph or 80 mph plus a 1.3 gust factor. If clamp-on traffic signal is required, designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

Poles are designed to support one 8'-0" luminaire arm, two 9'-0" internally lighted street name (ILSN) signs and two traffic signal arms with limited length combinations.

Each arm with its related attachment is shown below

Arm	Equivalent DL (5)	WL EPA (5)(6)
8' Luminaire Arm	Luminaire 60 lbs	1.6 sq ft
9' ILSN Arm	Sign 85 lbs	11.5 sq ft
50' to 65' Fixed Mount Arm	Signal Loads 310 lbs	52 sq ft
Up to 44' Clamp-on Arm	Signal Loads 180 lbs	32.4 sq ft

(5) Equivalent dead load plus horizontal wind load applied at the end of arm except ILSN arm, which applied 4.5' from the centerline of the pole.

(6) Effective projected area (actual area times drag coefficient) for the application of horizontal wind load.

4 Except as noted in Sheet 1 thru 5 of 5, other details not covered shall refer to Standard Sheet "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Material, fabrication tolerances, and shipping practices shall also meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing" after fabrication.

Deviations from the details and dimensions shown herein require submission of shop drawings in accordance with the Item 441, "Steel Structures". Alternate designs are not acceptable.

Installation of damping plate for the long mast arm is not recommended.

Provision of the bracket assembly used to support the traffic signal heads shall be under the direction of the Engineer for approval.

Design also conforms to NCHRP Report 412 for fatigue resistance except that there are no stiffeners at the base plate. TxDOT is conducting tests to determine if stiffeners at the base plate will or will not result in optimal performance; depending upon the results of the tests, poles may need a retrofit to ensure optimal fatigue performance.

MODIFICATIONS:

1 REPLACED CGB CONNECTOR WITH BRACKET ASSEMBLY. (2/12)

2 REPLACED TENON DETAIL WITH PLATE WELD DETAIL. (2/12)

3 REVISED MINIMUM SIGNAL HEIGHT. (3/12)

4 REMOVED "MA-D" REFERENCE. (2/12)

5 REMOVED TABLE OF DIMENSIONS "A". (2/12)

6 REMOVED CGB CONNECTORS. (2/12)

7 REMOVED THREADED COUPLING FOR CGB CONNECTOR. (2/12)

8 REVISED THE ELEVATION OF ACCESS COMPARTMENT. (3/12)

5

NOTE:

Pole manufacturer shall drill ½" hole in bottom of mast arm at end plate. (for hot-dip galvanizing)

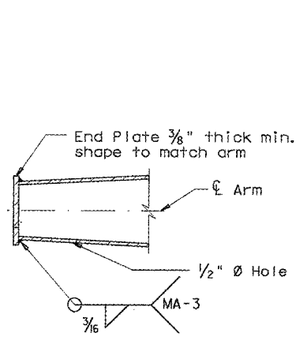
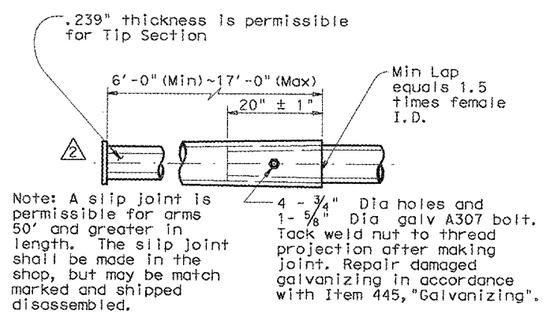


PLATE WELD DETAIL



Note: A slip joint is permissible for arms 50' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

SLIP JOINT DETAIL (FIXED MOUNT ARM)

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE) LMA(1)-12(DAL)

Sheet 1 of 5

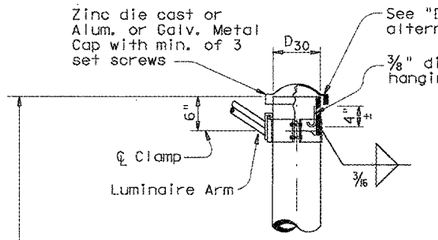
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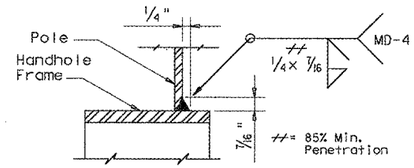
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3148	01	006	FM 3097
DIST	COUNTY		SHEET NO.
DAL	ROCKWALL		206

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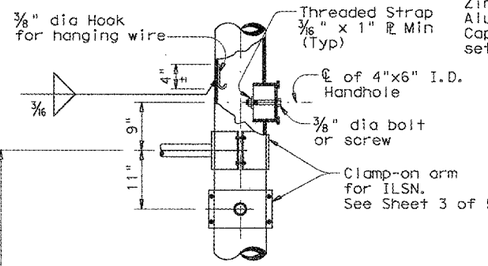


DETAIL A

(for pole with luminaire)

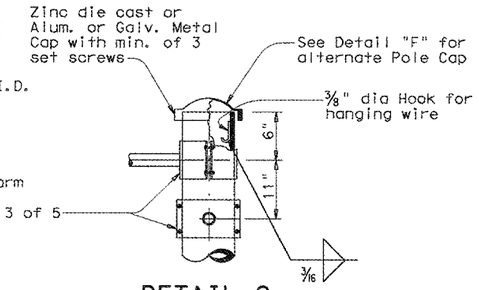


DETAIL H

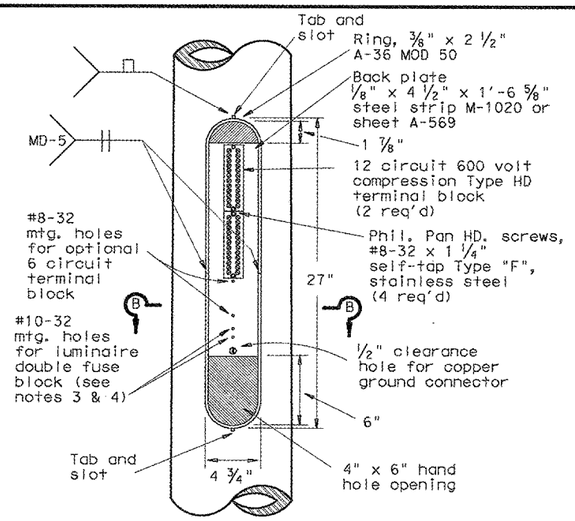


DETAIL B

(If ILSN applied)



DETAIL C

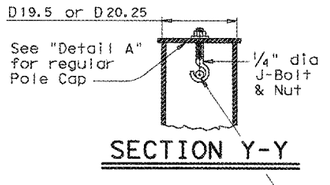


ACCESS COMPARTMENT

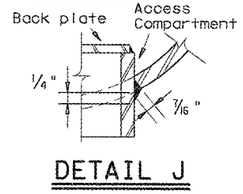
MATERIALS	
Round Shafts or Polygonal Shafts (7)	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 (8)
Plates (7)	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325, or A449 except where noted
Pin Bolts	ASTM A325
Pipe (7)	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

(7) ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

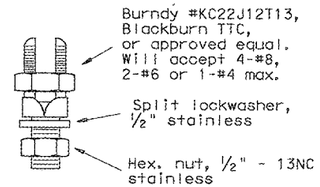
(8) ASTM A1011 SS Gr.50 shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.



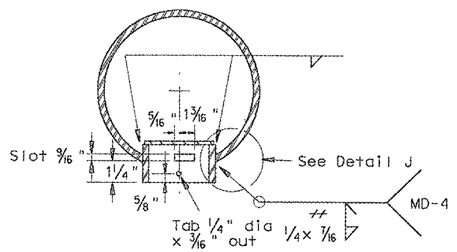
SECTION Y-Y



DETAIL J



COPPER GROUND CONNECTOR

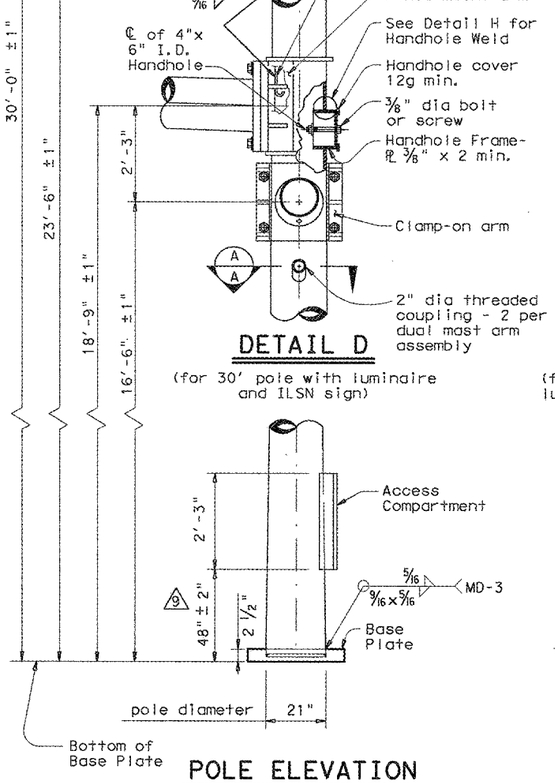


SECTION B-B

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.

ACCESS COMPARTMENT NOTES:

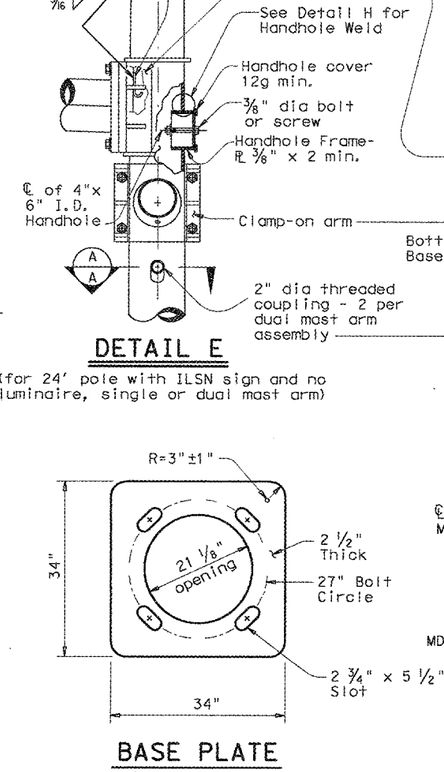
1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.



DETAIL D

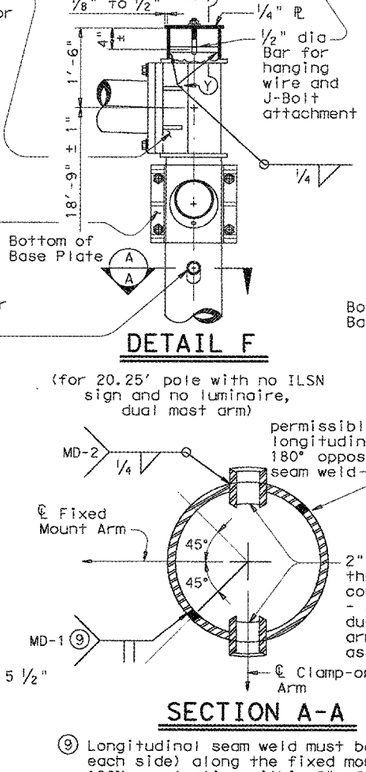
(for 30' pole with luminaire and ILSN sign)

POLE ELEVATION



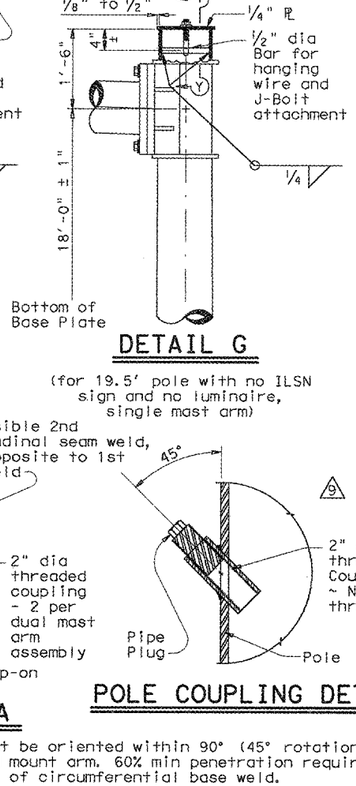
DETAIL E

(for 24' pole with ILSN sign and no luminaire, single or dual mast arm)



DETAIL F

(for 20.25' pole with no ILSN sign and no luminaire, dual mast arm)

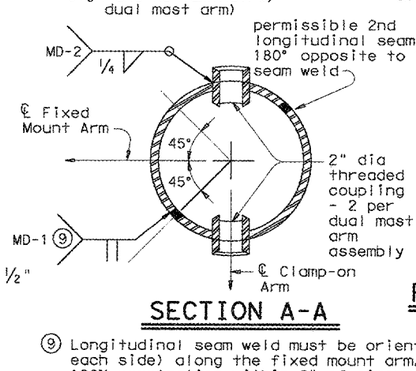


DETAIL G

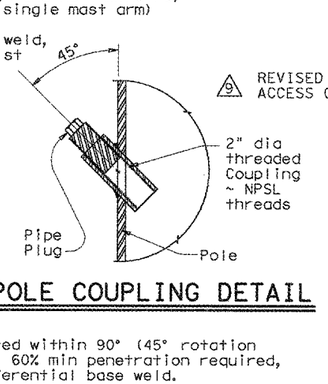
(for 19.5' pole with no ILSN sign and no luminaire, single mast arm)

POLE ELEVATION

BASE PLATE



SECTION A-A



POLE COUPLING DETAIL

(9) Longitudinal seam weld must be oriented within 90° (45° rotation each side) along the fixed mount arm. 60% min penetration required, 100% penetration within 6" of circumferential base weld.

(9) REVISED THE ELEVATION OF ACCESS COMPARTMENT (2/12).

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 2 of 5

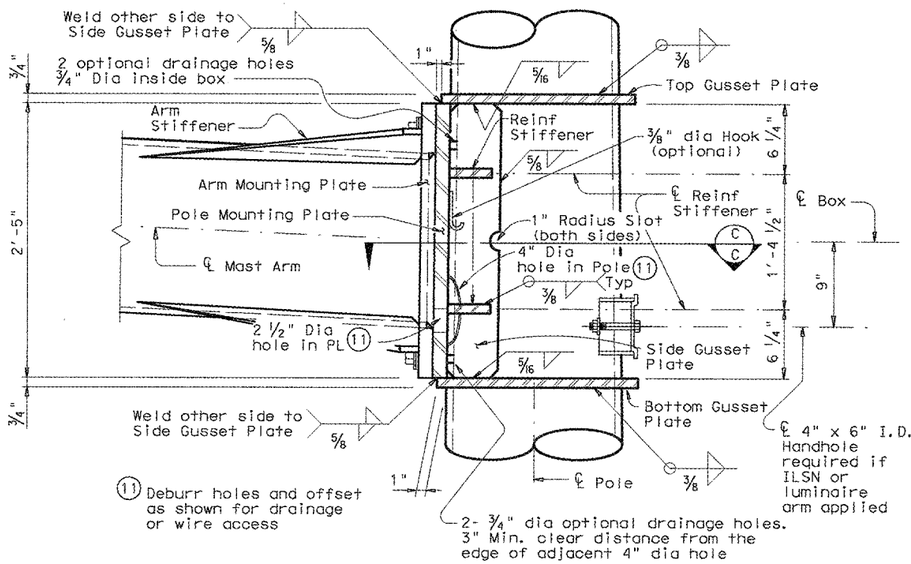
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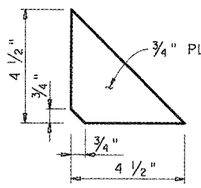
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REVISIONS	CONT	SECT	JOB	HIGHWAY
4-20-01 1-12	3148	01	006	FM 3097
	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		207

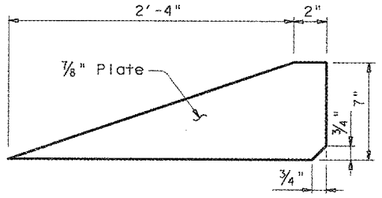
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BUILT-UP BOX CONNECTION

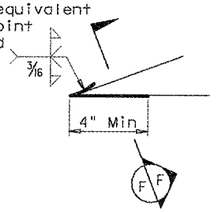


REINFORCING STIFFENER



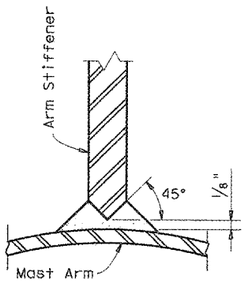
ARM STIFFENER
(Cut to match arm inclination and taper)

Provide Detail shown in SECTION F-F or equivalent 100% complete joint penetration weld from both sides.



Only 4" length at tip of Arm Stiffener requires a complete joint penetration weld. Smooth weld radius to connect Stiffener. Only a fillet weld is required for the remaining weld length.

DETAIL "K"



SECTION F-F

Fixed Mount Arm L_F	ROUND POLES (13)					Foundation Type
	D_B	$D_{19.5}$ or $D_{20.25}$	D_{24}	D_{30}	(12) thk	
ft.	in.	in.	in.	in.	in.	
50', 55' 60', 65'	21.0	18.2	17.6	16.8	.3125	48-A

Fixed Mount Arm L_F	ROUND ARMS (13)				
	L_1	D_1	D_2	(12) thk	Rise
ft.	ft.	in.	in.	in.	
50	49	18.5	11.7	.3125	3'- 3"
55	54	18.5	11.0	.3125	3'- 7"
60	59	18.5	10.3	.3125	3'-11"
65	64	18.5	9.6	.3125	4'- 4"

D_B = Pole Base O.D.
$D_{19.5}$ = Pole Top O.D. with no Luminaire and no ILSN (single mast arm)
$D_{20.25}$ = Pole Top O.D. with no Luminaire and no ILSN (dual mast arm)
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L_F = Fixed Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

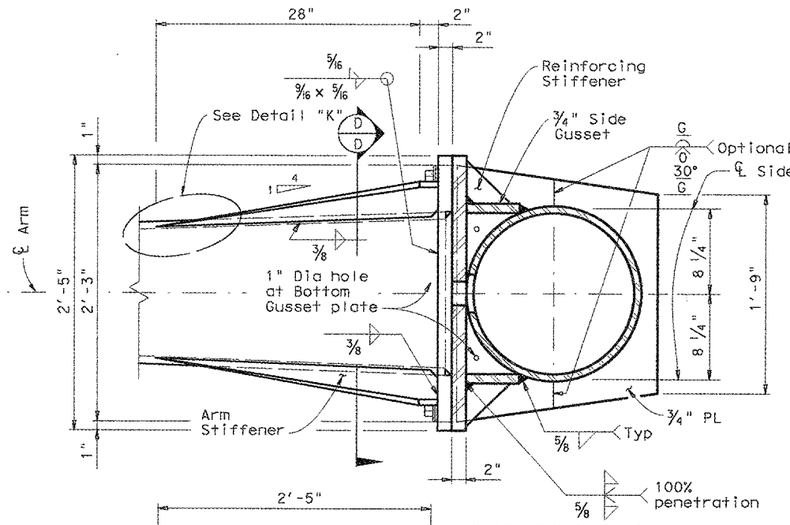
(13) Shaft profile 16-sided or 18-sided is considered to be equivalent to round section.

GENERAL NOTES:

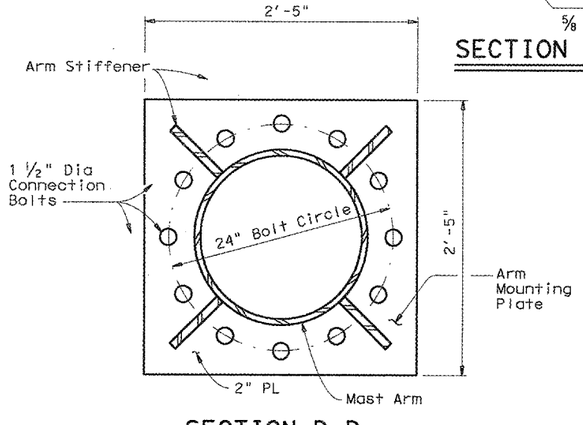
Built-up Box Connection: For the welded arm-to-pole connection as a build-up box configuration illustrated here is an example only, fabricators are required to submit a shop drawing of box connection for approval. The drawing shall specify the details of each box element, welds of arm-to-pole connection, arm-to-plate socket connection, and arm rise creation. Specify the proper location of drain holes along the pole. 2 1/2" dia hole in the pole mounting plate and 4" dia hole in the pole need to be aligned for wiring access or drainage. Arm stiffeners cut to match arm inclination and taper shall also be included.

The deviation from flat for either arm or pole mounting plate shall not exceed 3/32 in., which is measured along the center of mounting plate to a radial distance of 13.5 in. The deformed-from-flat connection between arm and pole mounting plates shall not be allowed if the center of both mounting plates cannot contact directly.

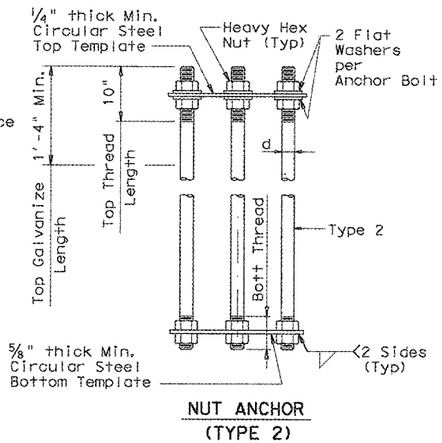
Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.



SECTION C-C

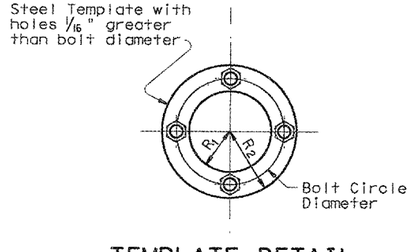


SECTION D-D



NUT ANCHOR
(TYPE 2)

ANCHOR BOLT ASSEMBLY



TEMPLATE DETAIL

ANCHOR BOLT & TEMPLATE SIZE						
Bolt Dia in.	Length ‡	Top Thread	Bottom Thread	Bolt Circle	R_2	R_1
2 1/2"	5'-2"	10"	6 1/2"	27"	16"	11"

‡ Min dimension given, longer bolts are acceptable.

FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft (16), (17), (18)			ANCHOR BOLT DESIGN (14)				FOUNDATION DESIGN LOAD (15)		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
48-A	48"	20 #9	#4 at 6"	21.9	19.5	14.7	2 1/2"	55	27"	2	490	10	50' to 65' Mast arm assembly.

SEE SHEET "TS-FD" FOR ADDITIONAL DETAILS.

(14) Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

(15) Foundation Design Loads are the allowable moments and shears at the base of the structure.

(16) Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

(17) If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

(18) Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 3 of 5 LMA(3)-12

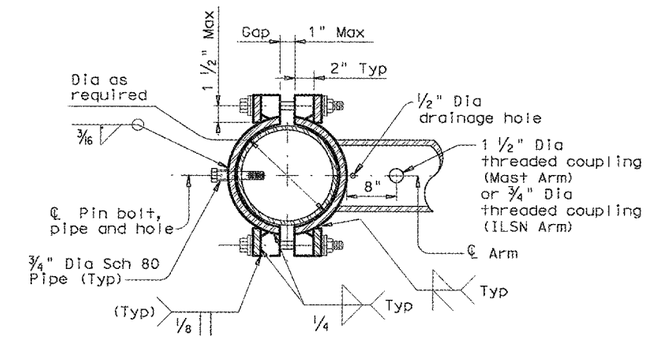
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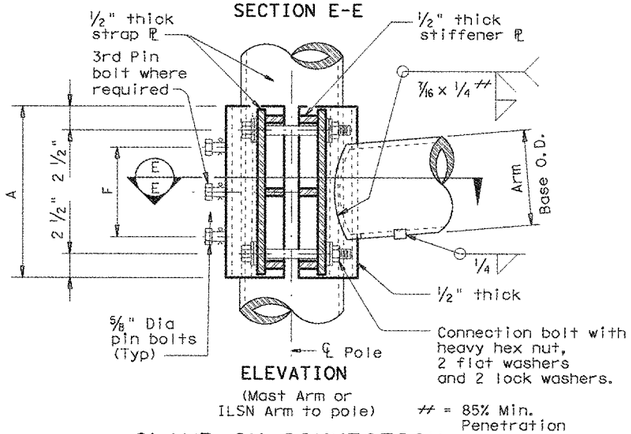
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CONT	SECT	JOB	HIGHWAY
3148	01	006	FM 3097
DIST	COUNTY		SHEET NO.
DAL	ROCKWALL		208

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SECTION E-E



ELEVATION

(Mast Arm or ILSN Arm to pole)

= 85% Min. Penetration

CLAMP-ON CONNECTION

80 MPH WIND

Clamp-on Arm Lc	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	thk (12)	Rise	L_1	D_1	D_2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"

100 MPH WIND

Clamp-on Arm Lc	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	thk (12)	Rise	L_1	D_1	D_2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

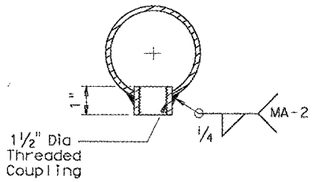
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
Lc = Clamp-on Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

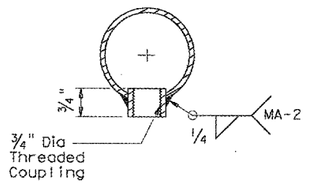
CLAMP-ON ARM CONNECTION

ILSN Arm Size		A	F	4 Conn. Bolts	⅝" Dia. Pin Bolts
Sch 40 pipe Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
3	.216	10	4	¾	2

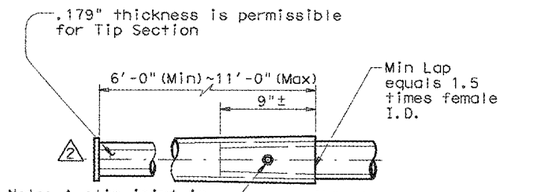
Mast Arm Size		A	F	4 Conn. Bolts	⅝" Dia. Pin Bolts
Base Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
6.5	.179	12	6	1	2
7.5	.179	14	8	1	2
8.0	.179	14	8	1	2
9.0	.179	16	10	1	2
9.5	.179	18	12	1 ¼	3
9.5	.239	18	12	1 ¼	3
10.0	.239	18	12	1 ¼	3
10.5	.239	18	12	1 ¼	3
11.0	.239	18	12	1 ¼	3
11.5	.239	18	12	1 ¼	3



ARM COUPLING DETAIL



ILSN ARM COUPLING DETAIL

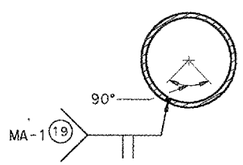


Note: A slip joint is permissible for arms 40' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

SLIP JOINT DETAIL (CLAMP-ON ARM)

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

(19) Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm.
60% Min penetration
100% penetration within 6" of circumferential base welds.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies or ILSN arm support. For a clamp-on mast arm, a maximum 1 ½" wide vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1". For an ILSN arm, a 1 ½" diameter hole shall be cut in the front clamp plate for wire access. A matched hole shall be field drilled through the pole to provide wire access after arm is oriented. Deburr both holes.

Where duplicate parts occur on a detail, welds shown for part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces. Pin bolts shall be ASTM A325 with threads excluded from the shear plane. Pin bolt and ¾" diameter pipe shall have 3/16" diameter holes for a ⅛" diameter galvanized cotter pin. Back clamp plate shall be furnished with a ¾" diameter hole for each pin bolt. An 11/16" diameter hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

2 REPLACED TENON DETAIL WITH PLATE WELD DETAIL (2/12).

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 4 of 5 LMA(4)-12(DAL)

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CONT	SECT	JOB	HIGHWAY
3148	01	006	FM 3097

DIST	COUNTY	SHEET NO.
DAL	ROCKWALL	209

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Shipping Parts List

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers, and any additional hardware listed in the table.

Nominal Arm Length	30' Poles with Luminaire	24' Poles with ILSN	19.50' (Single Mast Arm) 20.25' (Dual Mast Arm) Poles with no Luminaire and no ILSN
	See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex	See note above plus one small hand hole	See note above

Single Mast Arm

Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	50L	1	50S		50	2
55	55L	1	55S		55	
60	60L		60S		60	1
65	65L	1	65S		65	

Dual Mast Arm

Lf ft.	Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	20	5020L		5020S		5020	
	24	5024L		5024S		5024	
	28	5028L		5028S		5028	
	32	5032L		5032S		5032	
	36	5036L		5036S		5036	
	40	5040L		5040S		5040	
	44	5044L		5044S		5044	
55	20	5520L		5520S		5520	
	24	5524L		5524S		5524	
	28	5528L		5528S		5528	
	32	5532L		5532S		5532	
	36	5536L		5536S		5536	
	40	5540L		5540S		5540	
	44	5544L		5544S		5544	
60	20	6020L		6020S		6020	
	24	6024L		6024S		6024	
	28	6028L		6028S		6028	
	32	6032L		6032S		6032	
	36	6036L		6036S		6036	
	40	6040L		6040S		6040	
	44	6044L		6044S		6044	
65	20	6520L		6520S		6520	
	24	6524L		6524S		6524	
	28	6528L		6528S		6528	
	32	6532L		6532S		6532	
	36	6536L		6536S		6536	
	40	6540L		6540S		6540	
	44	6544L		6544S		6544	

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet) 48-A
FM 740			
P-3	10	1	22
RALPH HALL			
P-1	10	1	22
P-2	10	1	22
P-3	10	1	22
TUBBS			
P-4	10	1	22
P-5	10	1	22
Total Drill Shaft Length			132

Notes

** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

*** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Shipping Parts List

Traffic Signal Arms (Fixed Mount) (1 per pole)
Ship each arm with listed equipment attached

Nominal Arm Length	Type IV Arm (4 Signals) ⚠ 4 Bracket Assemblies	
ft.	Designation	Quantity
50	50IV	3
55	55IV	1
60	60IV	1
65	65IV	1

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	3

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm Length ⚠	Type I Arm (1 Signal) 1 Bracket Assembly and 1clamp w/bolts and washers		Type II Arm (2 Signals) 2 Bracket Assemblies and 1clamp w/bolts and washers		Type III Arm (3 Signals) 3 Bracket Assemblies and 1clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44					44III-80	

Traffic Signal Arms (100 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm ⚠	Type I Arm (1 Signal) 1 Bracket Assembly and 1clamp w/bolts and washers		Type II Arm (2 Signals) 2 Bracket Assemblies and 1clamp w/bolts and washers		Type III Arm (3 Signals) 3 Bracket Assemblies and 1clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
2 1/2 "	5' - 3"	6

Each anchor bolt assembly consists of the following: Top and bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers and 4 nut anchor devices (type 2) per Standard Drawing "TS-FD". Templates may be removed for shipment.

Abbreviations
Lf= Fixed Arm Length
Lc= Clamp-on Arm Length (44' Max.)

⚠ REPLACED CGB CONNECTOR WITH BRACKET ASSEMBLY(2/12).

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LONG MAST ARM ASSEMBLY PARTS LIST

LMA(5)-12(DAL)

Sheet 5 of 5

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CONT	SECT	JOB	HIGHWAY
3148	01	006	FM 3097
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DAL	ROCKWALL		210

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Shipping Parts List

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers, and any additional hardware listed in the table.

Nominal Arm Length	30' Poles with Luminaire	24' Poles with ILSN	19.50' (Single Mast Arm) 20.25' (Dual Mast Arm) Poles with no Luminaire and no ILSN
	See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex	See note above plus one small hand hole	See note above

Single Mast Arm

Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	50L		50S		50	2
55	55L		55S		55	
60	60L		60S		60	1
65	65L	1	65S		65	

Dual Mast Arm

Lf ft.	Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	20	5020L		5020S		5020	
	24	5024L		5024S		5024	
	28	5028L		5028S		5028	
	32	5032L		5032S		5032	
	36	5036L		5036S		5036	
	40	5040L		5040S		5040	
	44	5044L		5044S		5044	
55	20	5520L		5520S		5520	
	24	5524L		5524S		5524	
	28	5528L		5528S		5528	
	32	5532L		5532S		5532	
	36	5536L		5536S		5536	
	40	5540L		5540S		5540	
	44	5544L		5544S		5544	
60	20	6020L		6020S		6020	
	24	6024L		6024S		6024	
	28	6028L		6028S		6028	
	32	6032L		6032S		6032	
	36	6036L		6036S		6036	
	40	6040L		6040S		6040	
	44	6044L		6044S		6044	
65	20	6520L		6520S		6520	
	24	6524L		6524S		6524	
	28	6528L		6528S		6528	
	32	6532L		6532S		6532	
	36	6536L		6536S		6536	
	40	6540L		6540S		6540	
	44	6544L		6544S		6544	

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet) 48-A
FM 740			
P-1	10	1	22
RALPH HALL			
P-2	10	1	22
P-3	10	1	22
TUBBS			
P-4	10	1	22
P-5	10	1	22
Total Drill Shaft Length			110

Notes

** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

*** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Shipping Parts List

Traffic Signal Arms (Fixed Mount) (1 per pole)
Ship each arm with listed equipment attached

Nominal Arm Length	Type IV Arm (4 Signals)	
	⚠1 4 Bracket Assemblies	
ft.	Designation	Quantity
50	50IV	2 ⚠2
55	55IV	1
60	60IV	1
65	65IV	1

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	3

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm Length ⚠1	Type I Arm (1 Signal) 1 Bracket Assembly and 1clamp w/bolts and washers		Type II Arm (2 Signals) 2 Bracket Assemblies and 1clamp w/bolts and washers		Type III Arm (3 Signals) 3 Bracket Assemblies and 1clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44					44III-80	

Traffic Signal Arms (100 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm ⚠1	Type I Arm (1 Signal) 1 Bracket Assembly and 1clamp w/bolts and washers		Type II Arm (2 Signals) 2 Bracket Assemblies and 1clamp w/bolts and washers		Type III Arm (3 Signals) 3 Bracket Assemblies and 1clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
2 1/2 "	5' - 3"	3 ⚠2

Each anchor bolt assembly consists of the following: Top and bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers and 4 nut anchor devices (type 2) per Standard Drawing "TS-FD". Templates may be removed for shipment.

Abbreviations
Lf= Fixed Arm Length
Lc= Clamp-on Arm Length (44' Max.)

⚠1 REPLACED CGB CONNECTOR WITH BRACKET ASSEMBLY(2/12).
⚠2 AS-BUILT REVISIONS

Texas Department of Transportation

LONG MAST ARM ASSEMBLY PARTS LIST LMA(5)-12(DAL)

Sheet 5 of 5

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REVISIONS	CONT	SECT	JOB	HIGHWAY
4-98-01 T-11	3148	01	006	FM 3097
	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		210 ⚠2

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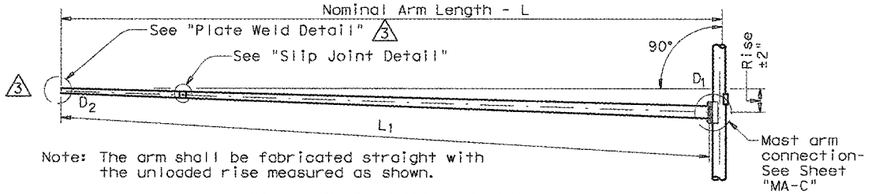
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
32	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
36	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
40	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
44	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
48	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	① thk	Rise	L_1	D_1	② D_2	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"
48	47.0	10.5	4.1	.239	3'-4"	47.0	11.0	3.5	.239	2'-9"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.

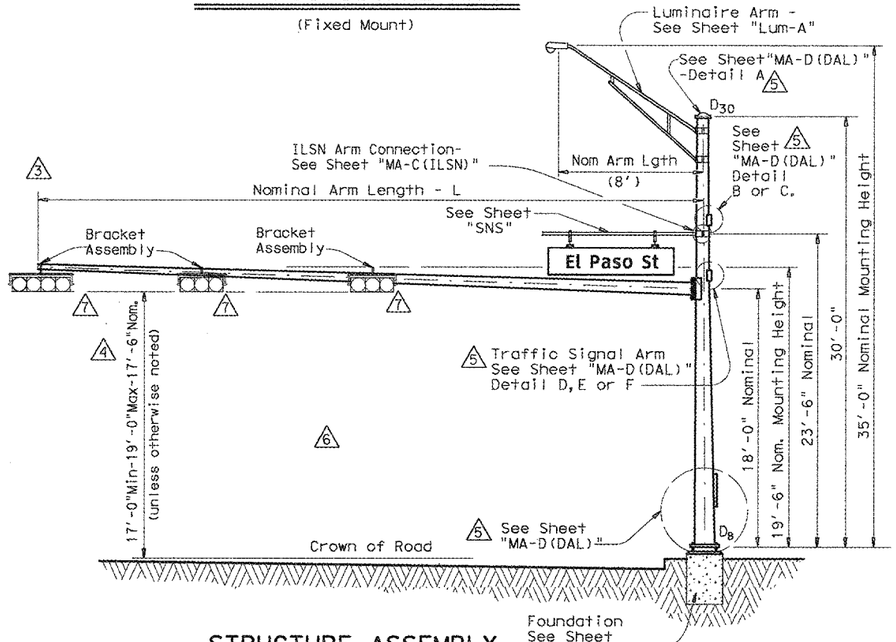
② D_2 may be increased by up to 1" for polygonal arms.



Note: The arm shall be fabricated straight with the unloaded rise measured as shown.

TRAFFIC SIGNAL ARM

(Fixed Mount)



STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-80		20S-80		20-80	
24	24L-80		24S-80		24-80	
28	28L-80		28S-80		28-80	
32	32L-80		32S-80		32-80	
36	36L-80		36S-80		36-80	
40	40L-80		40S-80		40-80	
44	44L-80		44S-80		44-80	
48	48L-80		48S-80		48-80	

Traffic Signal Arms (1 per Pole) Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 1 Bracket Assembly		2 Bracket Assemblies		3 Bracket Assemblies	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40			2 40II-80		40III-80	
44			44II-80		44III-80	
48					48III-80	

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ½"	3'-4"	
1 ¾"	3'-10"	

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

MODIFICATIONS:

1 REPLACED CGB CONNECTOR WITH BRACKET ASSEMBLY. (2/12)

2 ADDITIONAL OPTION. (3/12)

3 REPLACED TENON DETAIL WITH PLATE WELD DETAIL. (2/12)

4 REVISED MINIMUM SIGNAL HEIGHT. (3/12)

5 REPLACED "MA-D" WITH "MA-D(DAL)". (2/12)

6 REMOVED TABLE OF DIMENSIONS "A". (2/12)

7 REMOVED CGB CONNECTORS. (2/12)

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(1)-12(DAL)

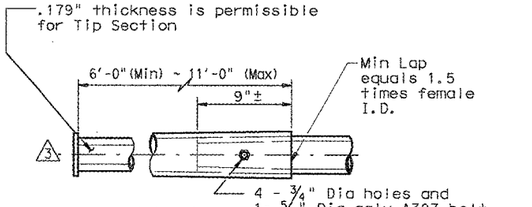
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CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
DAL	ROCKWALL		211

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Note: A slip joint is permissible for arms 40' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

SLIP JOINT DETAIL

NOTE:

Pole manufacturer shall drill ½" hole in bottom of mast arm at end plate. (for hot-dip galvanizing)

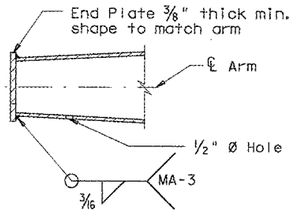


PLATE WELD DETAIL

△3

VIBRATION WARNING

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backpates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor.

Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

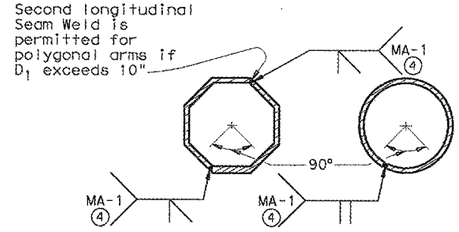
△5 See Standard Sheet "MA-D(DAL)" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

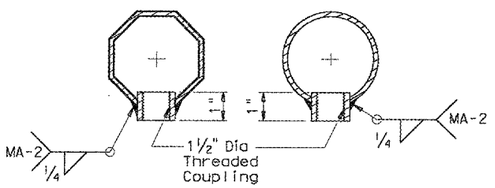
Second longitudinal Seam Weld is permitted for polygonal arms if D_1 exceeds 10"



Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm.

ARM WELD DETAIL

④ 60% Min. penetration 100% pemetration within 6" of circumferential base welds.



ARM COUPLING DETAILS

△3 REPLACED TENON DETAIL WITH PLATE WELD DETAIL(2/12).

△5 REPLACED "MA-D" WITH "MA-D(DAL)"(2/12).

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(2)-12(DAL)

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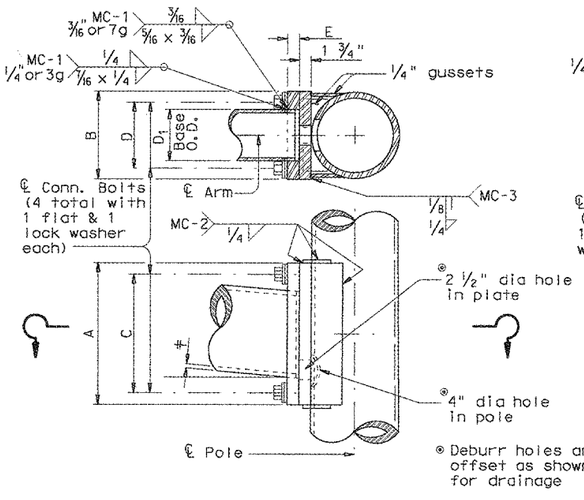
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CONT	SECT	JOB	HIGHWAY
3148	01	006	FM 3097
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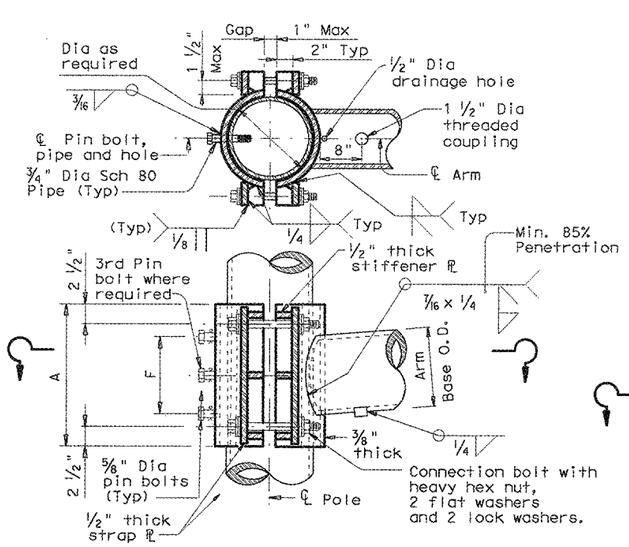
DATE:
FILE:

ARM SIZE D_1	ARM SIZE ϕ	A	B	C	D	E	CONN BOLT DIA
in.	in.	in.	in.	in.	in.	in.	in.
6.5	.179	12	9	9	6	1 3/4	1
7.5	.179	13	9	10	6	1 3/4	1
8.0	.179	14	10	11	7	2	1 1/4
9.0	.179	16	11	13	8	2	1 1/4
9.5	.179	17	12	14	9	2	1 1/4
9.5	.239	18	12	15	9	2	1 1/4
10.0	.239	18	12	15	9	2	1 1/4
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11.0	.239	18	13	15	10	3	1 1/2



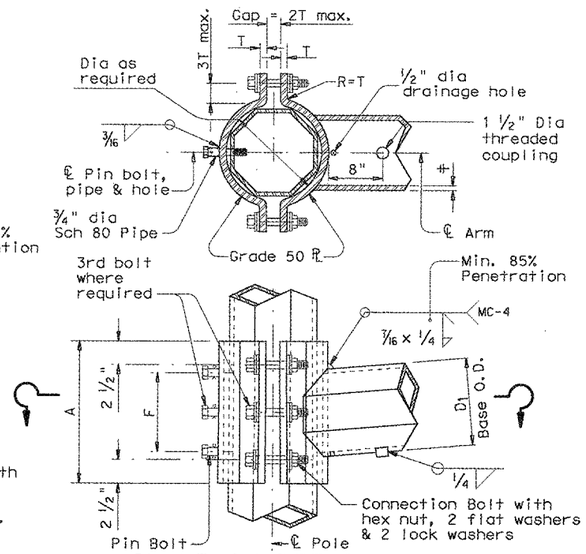
FIXED MOUNT DETAIL 1

ARM SIZE D_1	ARM SIZE ϕ	A	F	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	ea.	in.	ea.	in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	4	1 1/4	3	5/8
9.5	.239	18	12	4	1 1/4	3	5/8
10.0	.239	18	12	4	1 1/4	3	5/8

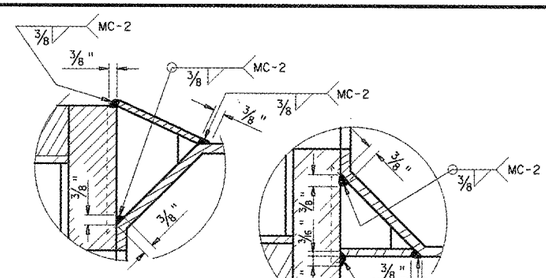


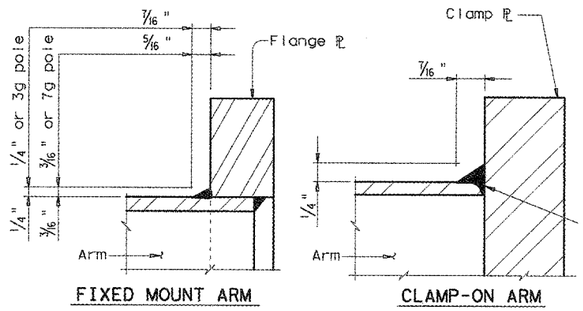
CLAMP-ON DETAIL 1

ARM SIZE D_1	ARM SIZE ϕ	A	F	T	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	in.	ea.	in.	ea.	in.
7.0	.179	12	6	3/4	4	3/4	2	5/8
7.5	.179	14	8	3/4	4	3/4	2	5/8
8.0	.179	14	8	3/4	4	3/4	2	5/8
9.0	.179	16	10	7/8	4	1	2	5/8
10.0	.179	18	10	7/8	4	1	2	5/8
9.5	.239	18	10	1	6	1	3	5/8
10.0	.239	18	10	1	6	1	3	5/8



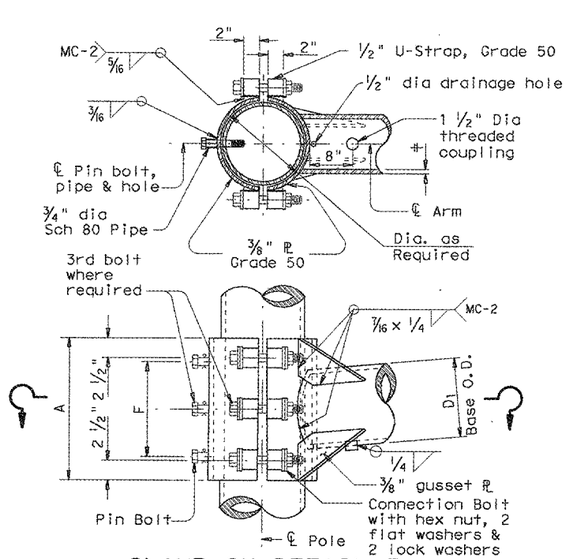
CLAMP-ON DETAIL 2





ARM BASE WELD DETAILS

ARM SIZE D_1	ARM SIZE ϕ	A	F	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	ea.	in.	ea.	in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	6	1	3	5/8
9.5	.239	18	12	6	1	3	5/8
10.0	.239	18	12	6	1	3	5/8



CLAMP-ON DETAIL 3

MATERIALS	
Round Shafts or Polygonal Shafts①	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 ②
Plates①	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 or A449, except where noted
Pin Bolts	ASTM A325
Pipe①	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

① ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

② ASTM A1011 SS Gr.50 material shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 1/2" wide vertical slotted hole shall be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and 3/4" dia pipe shall have 3/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a 3/4" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

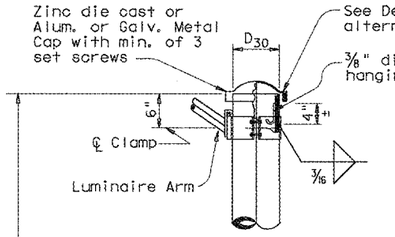
MAST ARM CONNECTIONS

MA-C-12

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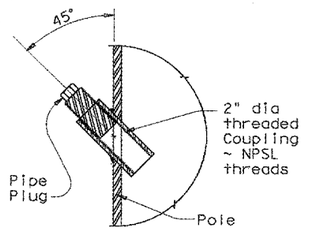
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5-09	3148	01	006	FM 3097
1-12	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		213

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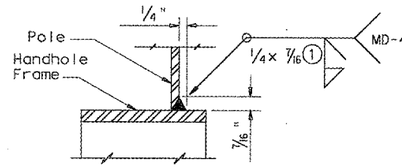


DETAIL A

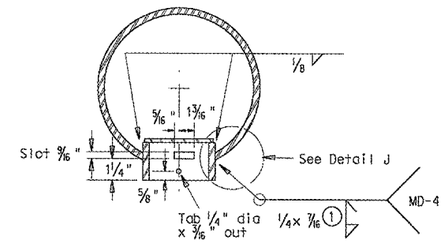
(for pole with luminaire)



POLE COUPLING DETAIL

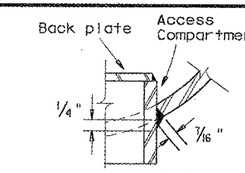


DETAIL G

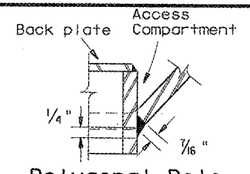


SECTION X-X

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.

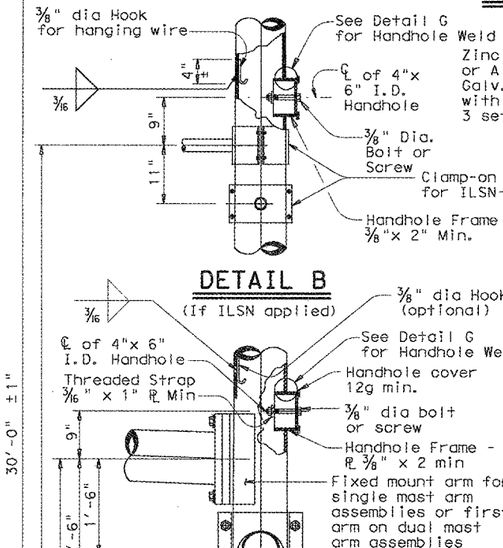


Round Pole

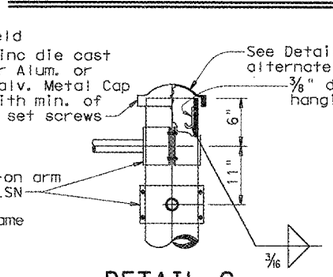


Polygonal Pole

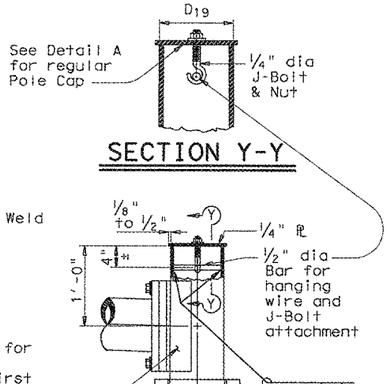
DETAIL J



DETAIL B



DETAIL C

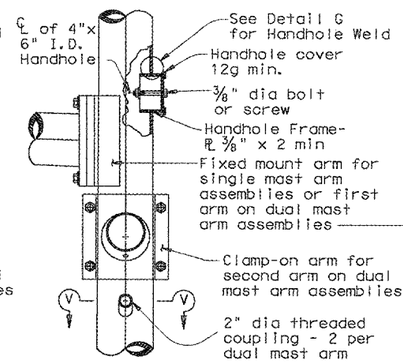


SECTION Y-Y

COPPER GROUND CONNECTOR

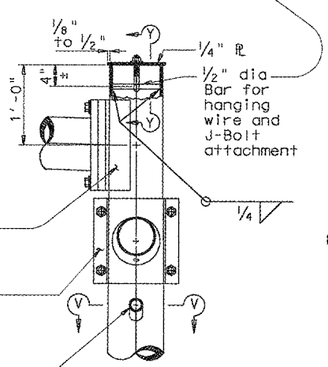
DETAIL D

(for 30' pole with luminaire and ILSN sign)



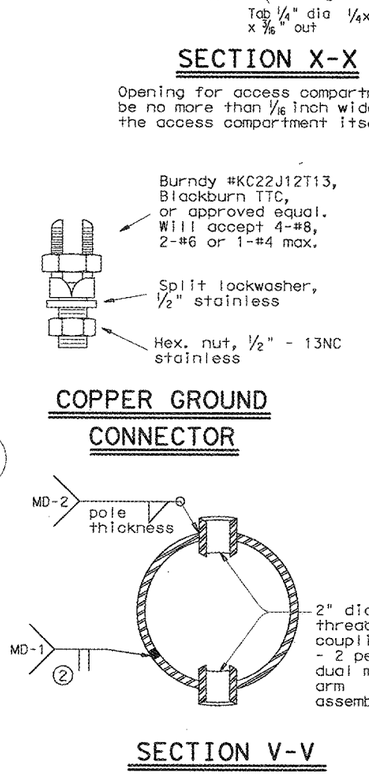
DETAIL E

(for 24' pole with ILSN sign and no luminaire)

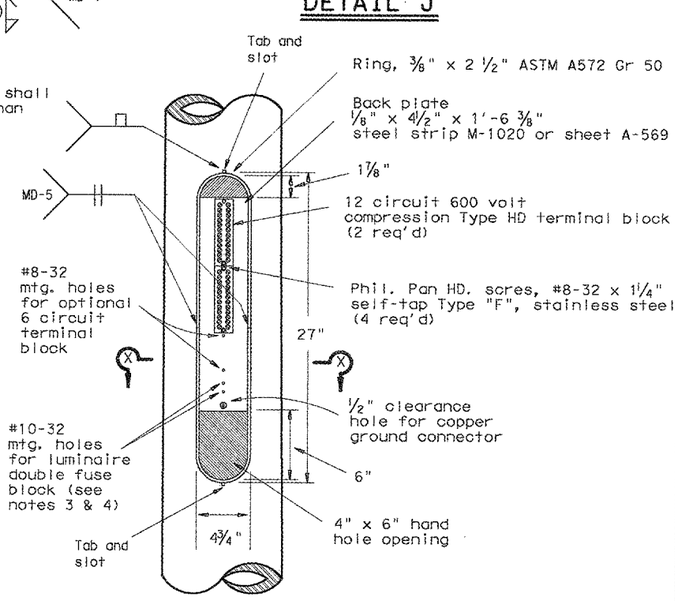


DETAIL F

(for 19' pole with no ILSN sign and no luminaire)



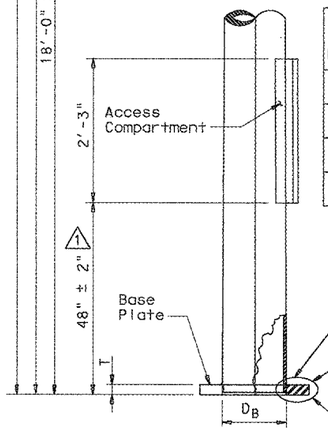
SECTION V-V



ACCESS COMPARTMENT

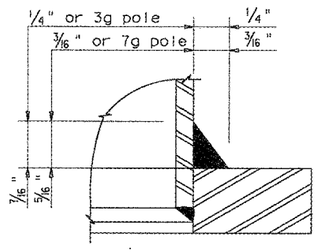
NOTES:

1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

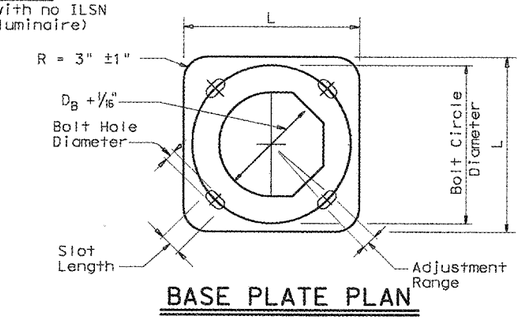


POLE ELEVATION

Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base ℞ Dim. L x T	Adjust. Range
1 1/2"	1 3/4"	3 1/2"	17"	18" x 1 1/2"	13.4°
1 3/4"	2"	4"	19"	20" x 1 3/4"	13.5°
2"	2 1/4"	4 1/2"	21"	22" x 2"	13.6°
2 1/4"	2 1/2"	5"	23"	24" x 2 1/4"	13.7°



DETAIL H



BASE PLATE PLAN

① 85% Min. penetration

② 60% Min. penetration 100% pemetration within 6" of circumferential base welds.

⚠ REVISED THE ELEVATION OF ACCESS COMPARTMENT (2/12).

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

MA-D-12(DAL)

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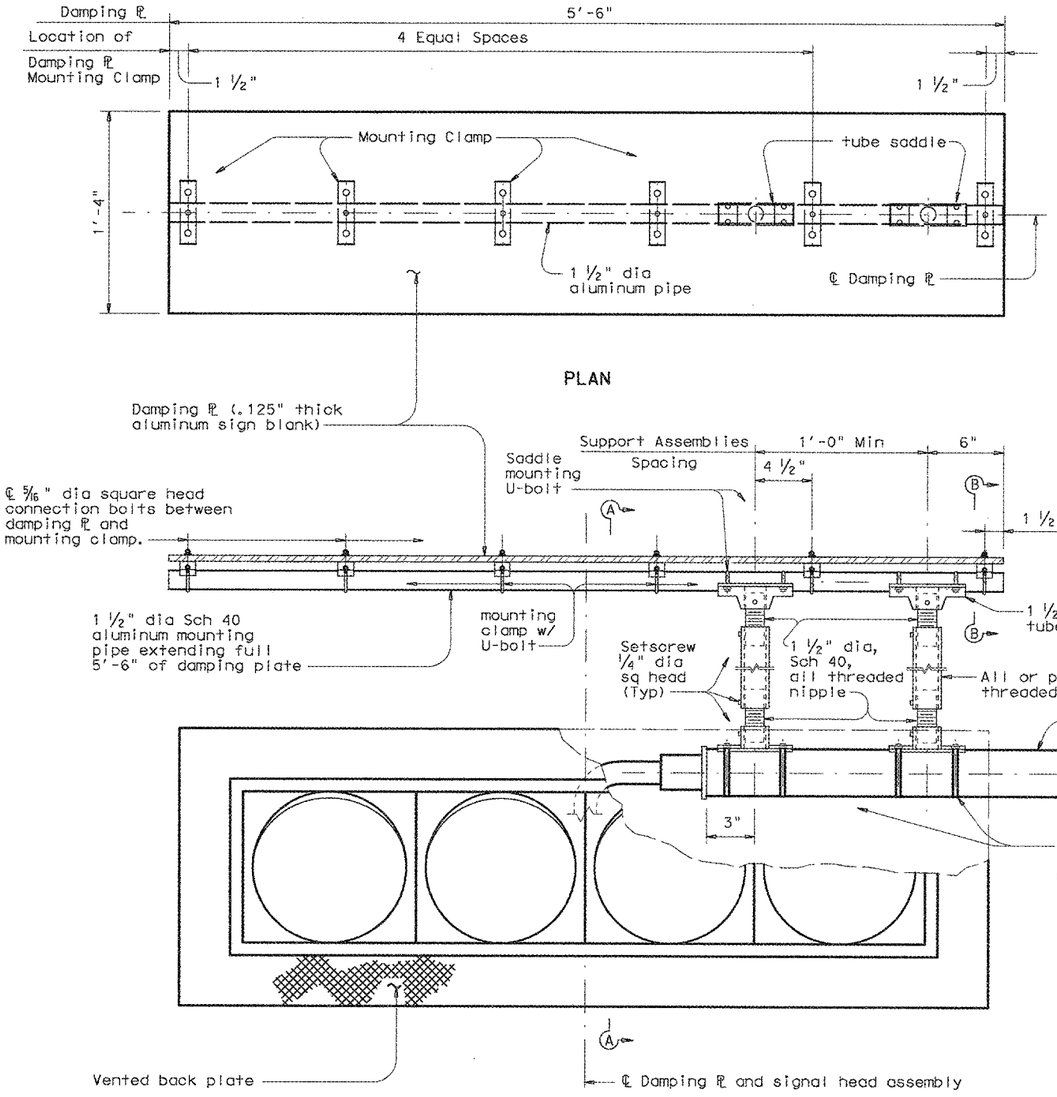
REVISIONS: 8-99, 1-12

CONT	SECT	JOB	HIGHWAY
3148	01	006	FM 3097

DIST	COUNTY	SHEET NO.
DAL	ROCKWALL	214

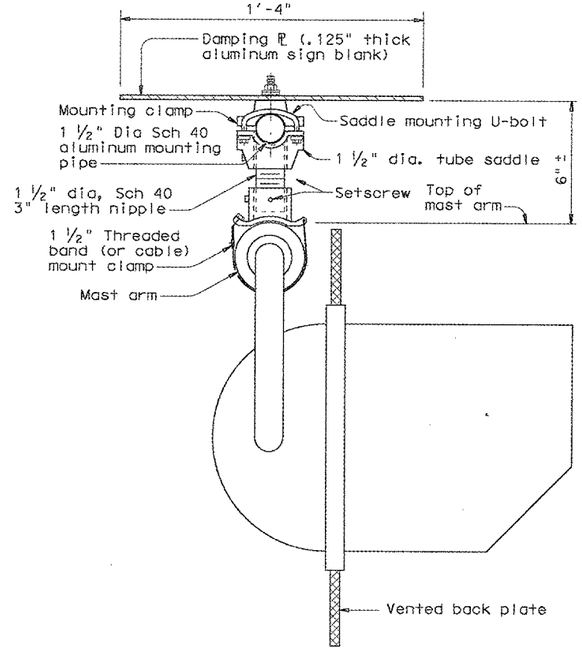
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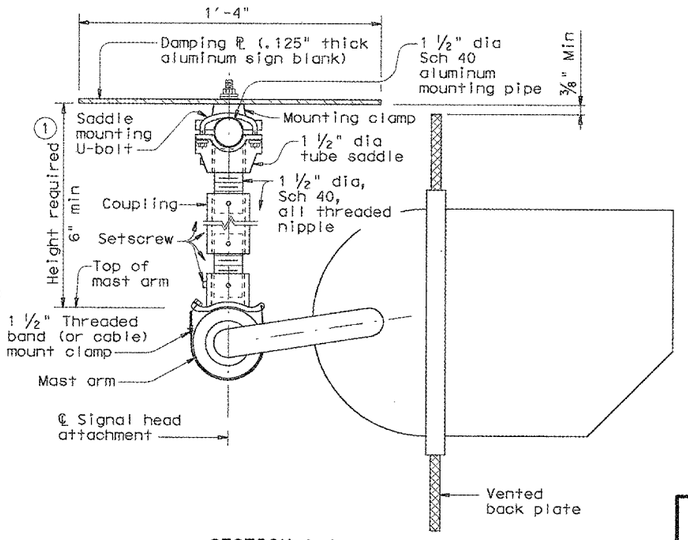
DAMPING PLATE MOUNTING DETAILS

(Showing alternate placement of signal head)



SECTION A-A

(Showing standard placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)



SECTION A-A

(Showing alternate placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)

(1) Recommended supporting assemblies to achieve required height			
Height required	One nipple each length	Two nipples each length plus	One coupling each length
6"-6 ¾"	3"	-	-
7"-8 ½"	4"	-	-
9"-10 ½"	6"	-	-
11"-15 ½"	-	4"	5"
16"-24"	-	6"	10"

GENERAL NOTES:

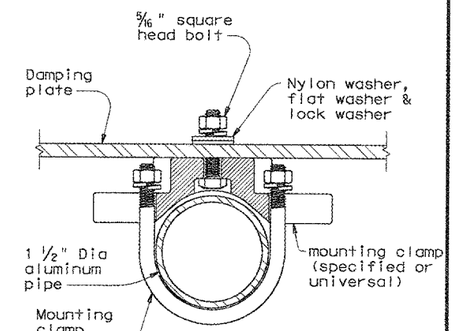
In accordance with the findings of TxDOT sponsored research, the installation of a damping plate in accordance with the details shown here at the end of signal mast arms of SMA and DMA standard structures reduces excessive harmonic vertical vibration, and thus fatigue damage. Any deviation from these details may reduce the effectiveness of this damping device.

Aluminum sign blank for damping plate shall conform to Departmental Material Specifications DMS-7110. Materials for mast arm mounting clamp and tube saddle shall be aluminum castings or aluminum alloys as in accordance with manufacturers' stipulations. Mounting pipe, pipe nipple and coupling shall be aluminum alloy 6061-T6 or 6063-T6. Damping plate mounting clamp and u-bolt assemblies shall conform to Standard sheet SMD(GEN)-08. U-bolts for saddle mounting shall have a minimum yield strength of 36 ksi.

Damping plate shall be mounted horizontally. Position centerline of damping plate to align with centerline of signal head assembly. Vertical clearance between signal head (with or without backing plate) and bottom of damping plate shall be maintained as shown. The attachments shown here are examples only, other supporting details which meet both alignment and vertical clearance requirements are also acceptable.

Unless stipulated by the manufacturers, all steel parts shall be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".

Contractor shall verify applicable field dimensions before the installation.



SECTION B-B

(Showing damping plate attachment)

Texas Department of Transportation
Traffic Operations Division

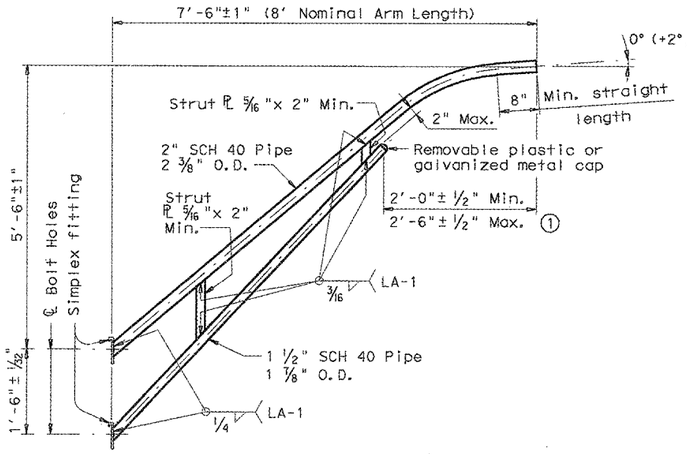
MAST ARM DAMPING PLATE DETAILS

MA-DPD-12

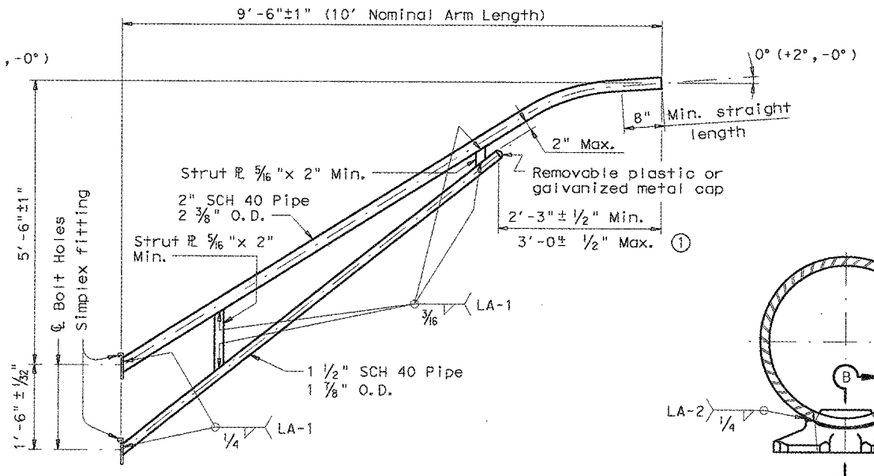
©TxDOT January 2012	DN: JSY	CK: ARC	DW: TGG	CK: JSY
REVISIONS	CONT	SECT	JOB	HIGHWAY
	3148	01	006	FM 3097
	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		215

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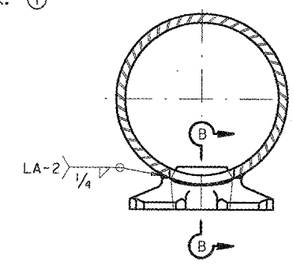
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FILE:



8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM



DIRECT ATTACHMENT DETAIL

MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr.65-35 or A148 Gr.80-50, A576 Gr.1021 (3), or A36 (Arm only)
Arm Pipes	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50 (4), or A1011 HSLAS-F Gr.50 (4)
Arm Strut Plates (2)	ASTM A36, A572 Gr.50 (4), or A588
Misc.	ASTM designations as noted

(1) Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

(2) Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

(3) A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

(4) ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft.

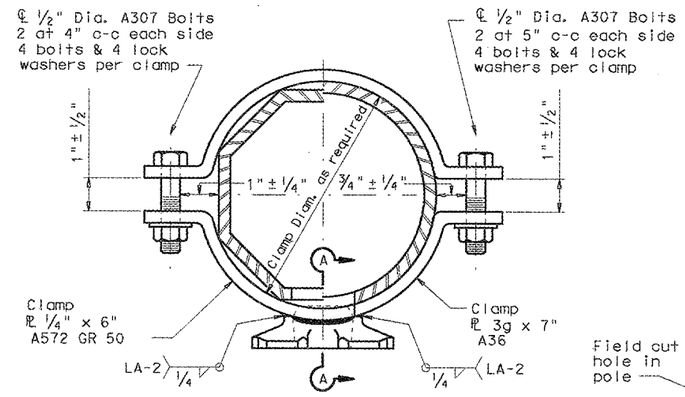
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absense of specified Fabricaton tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing".

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

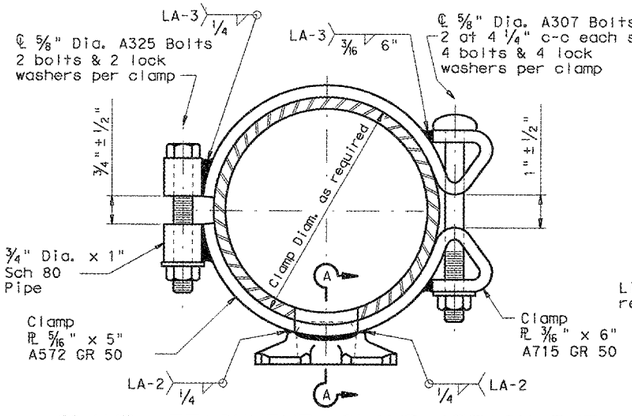
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



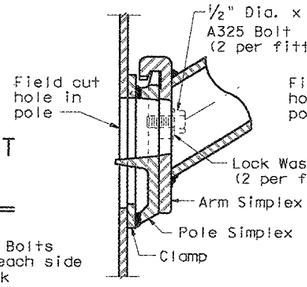
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)

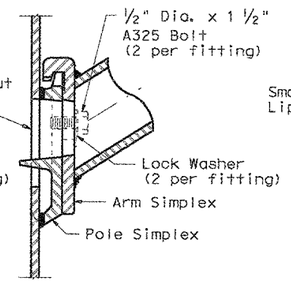


CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION)

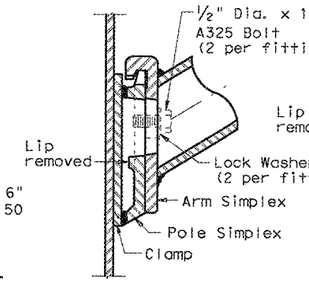
CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)



UPPER SIMPLEX FITTING

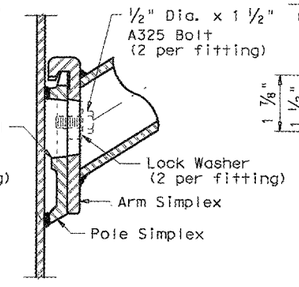


UPPER SIMPLEX FITTING



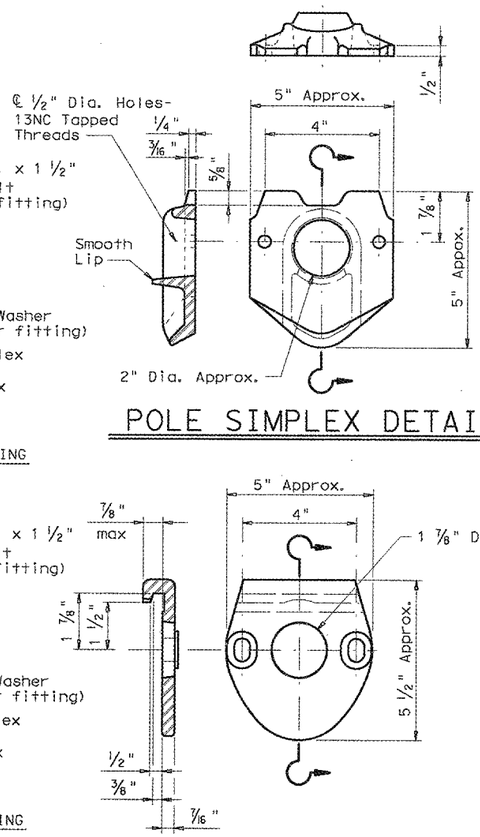
LOWER SIMPLEX FITTING

SECTON A-A

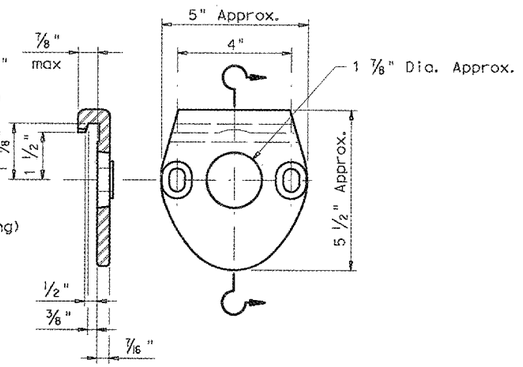


LOWER SIMPLEX FITTING

SECTON B-B



POLE SIMPLEX DETAIL



ARM SIMPLEX DETAIL

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

LUM-A-12

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DW: LSH	CK: JSY	DW: LYT	CK: TEB

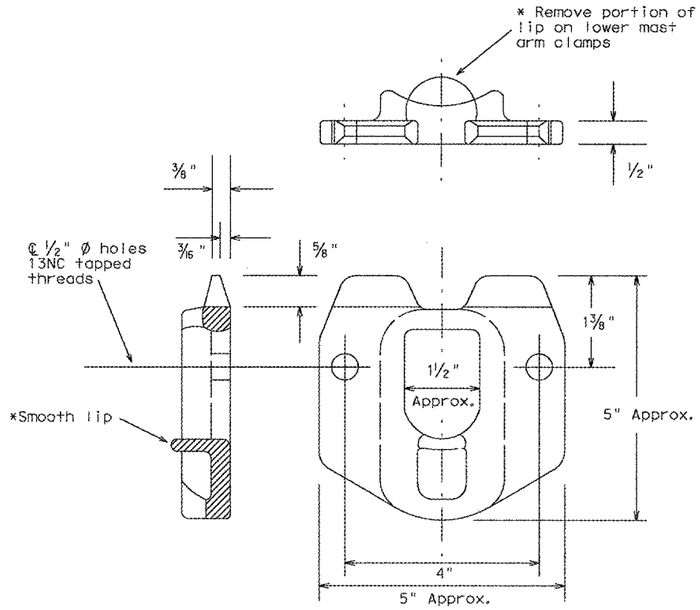
REVISIONS
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1-12

CONT	SECT	JOB	HIGHWAY
3148	01	006	FM 3097

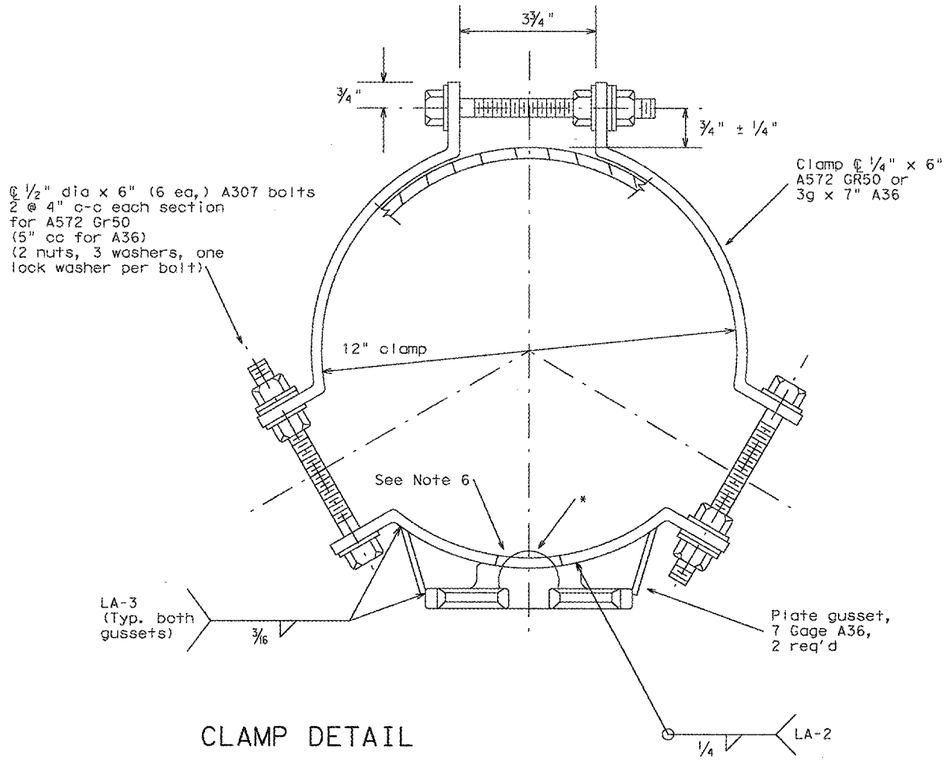
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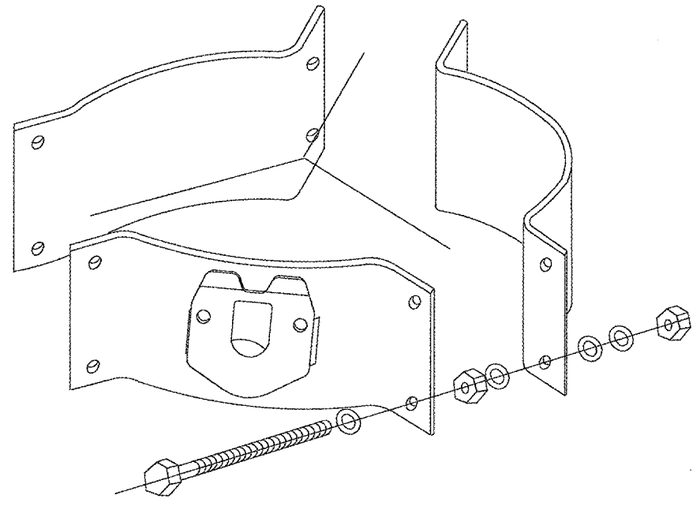
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POLE SIMPLEX DETAILS



CLAMP DETAIL



PROJECTION

OTHER MATERIALS:

1. Pole simplex shall be ASTM A27 GR65-35 or A148 GR80-50 or A576 GR1021. ASTM A576 must be suitable for forging and also meet minimum tensile of 65ksi, minimum yield of 35ksi, and a minimum elongation of 22 percent in 2 inches.
2. Welded tabs and backplates shall be ASTM A-36 steel or better.
3. Nylon insert locknuts shall conform to ASTM A563.

GENERAL NOTES:

1. Materials and fabrication shall be in accordance with Standard Sheet "MA-C" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
2. All parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing". The throat of the Simplex shall be made free of all rough or sharp edges resulting from the galvanizing process.
3. Each simplex fitting shall be supplied with 2 ASTM A325 bolts, 1/2 in. X 1 1/2 in. and 2 lock washers. The bolts and lock washers shall be secured to the clamp with the other hardware items. The Fabricator shall ship clamp assembly together in a single package, including all bolts, nuts, and washers required for the clamp and simplex fitting.
4. Design conforms to 1994 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals" and interim revisions thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. Clamps are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq.ft.,12 ft. maximum arm length.
5. Each assembly shall consist of one upper piece simplex fitting having a smooth lip and one lower piece simplex fitting with the lip removed.
6. Approximately 2 in. diameter hole in upper mast arm clamp.

For 8.9 - 12 inch diameter Signal Poles
(Two req'd for each mast arm)

Texas Department of Transportation
Traffic Operations Division

CLAMP ON FITTING ASSEMBLY FOR LUMINAIRE MAST ARM

CFA-12

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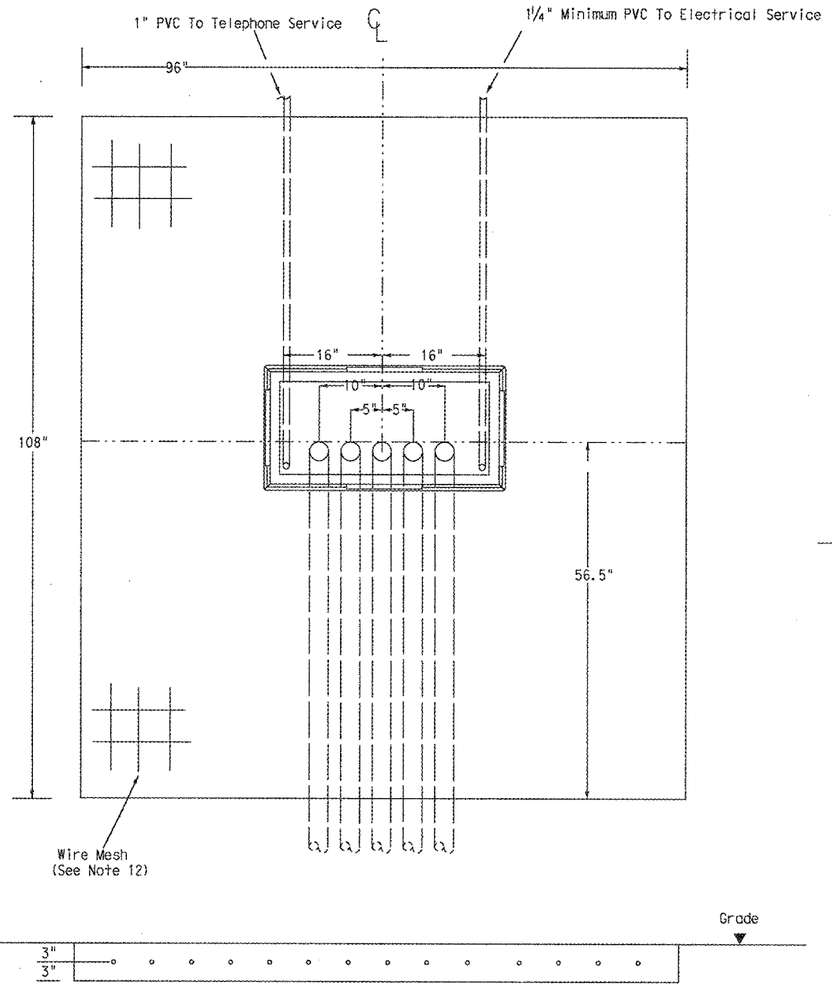
REVISIONS
11-99
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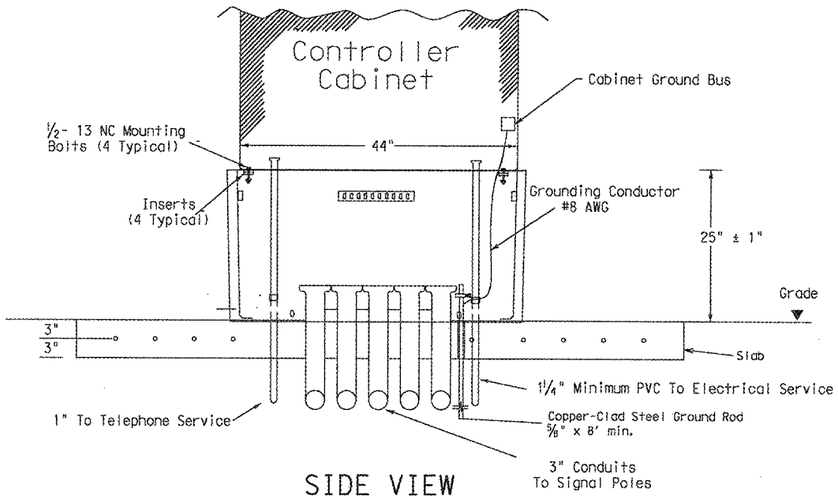
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3148	01	006	FM 3097
DIST	COUNTY		SHEET NO.
DAL	ROCKWALL		217

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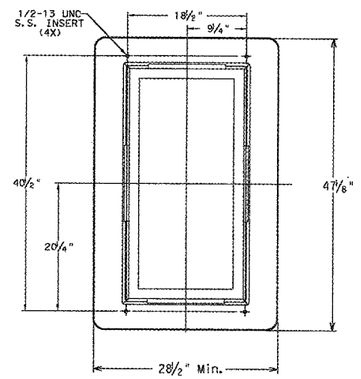
DATE:
FILE:

TOP VIEW
(Slab & Base)





SIDE VIEW
(Slab & Base)



CABINET BASE

TRAFFIC SIGNAL CONTROLLER BASE:

1. Provide a traffic signal controller base (cabinet base) manufactured of polymer concrete material consisting of calcareous and siliceous stone; glass fibers and thermoset polyester resin. The polymer concrete cabinet base must be reinforced on the inside of the cabinet base with fiberglass matting. Provide one of the following bases: Armorcast Part # A6001848X24, Quazite Model # PG3048Z709, or other as approved by TxDOT Traffic Operation Division.
2. The polymer concrete material must have a minimum compressive strength of 10,300 pounds per square inch (psi), minimum flexural strength of 3600 psi, and minimum shear strength of 3600 psi.
3. The polymer concrete cabinet base must conform to the dimensions shown and must accommodate a standard TxDOT basemount cabinet.
4. Supply the cabinet base with four ½"-13 UNC stainless steel inserts for attachment of the cabinet to the base. Inserts must withstand a minimum torque of 50 ft-lb and a minimum straight pull out strength of 750 lbs.
5. Provide the cabinet base with 4 cable racks mounted one on each side of the base 2" to 7 " from the top edge of the base. Unless approved otherwise, cable racks must be 1-1/2 x ⅜ x ⅜ inch steel channel with eight T-slots spaced at 1-1/2 inches. The cable racks must easily accommodate the insertion of tie wraps to attach field wiring to the racks to serve as strain relief. Secure cable racks to the base using ½"-13 UNC stainless steel screws and inserts.
6. The cabinet base, when secured to the concrete slab with controller cabinet attached, must withstand a minimum wind load of 125 mph or a 850 lb force applied at 49" above the bottom of the base without causing the base or cabinet to come out of their anchored position or cause any permanent deformation. The manufacturer must supply certification by an independent testing laboratory or sealed by a Texas Licensed Professional Engineer. Provide the cabinet base with hardware for attachment to a concrete slab.
7. The traffic signal base must be permanently marked either by impress or by permanent ink with the manufacturer's model number and name or logo.
8. Seal the base to the concrete with a silicone caulk bead and fastened to the slab per manufacturer's instructions.

CONCRETE SLAB:

9. Traffic signal controller pad must be a portland cement concrete slab poured in place, must conform to the dimensions shown, and must be level.
10. Bond a #8 AWG copper ground wire and an 8 ft ground rod bonded to the reinforcing mesh by a suitable UL Listed clamp and terminated to the cabinet grounding bus for the purpose of providing a local ground for the electrical grounding conductor. The electrical grounding conductor specified in Item 680-3.A.4 is required and must be terminated to the cabinet ground bus.
11. Install a PVC sleeve to prevent the ground rod from direct embedment in the slab.
12. Provide welded wire mesh 6X6-W2.9 X W2.9 for reinforcement. Provide joints and splices in the mesh with a minimum 6-inch overlap. Center the mesh between top and bottom and provide a minimum 3 inch cover on the edges.
13. Provide Class B concrete minimum for the slab in accordance with Item 421. Construct the slab in accordance with Item 531.

CONDUITS:

14. Stub up and run 3-inch conduits through the slab to the various traffic signal poles and ground boxes as shown on the layouts. Install the number of conduits as shown on layouts plus two additional 3 inch conduits for future use. Terminate the conduits with a bushing between 2 and 4-inches above the slab.
15. Extend conduits for future use at least 18-inches from the edge of the slab, terminate underground with a coupling, and cap and seal so that the seal can be removed without damaging the coupling. This must also apply to unused telephone conduit.
16. Stub up two separate conduits through the slab from the electrical and telephone services. Run the conduit for the electrical feed directly to the electrical service enclosure. Run the conduit for the telephone line directly to the telephone service, usually located on the same pole as the electrical service. Telephone must not under any circumstance share a conduit with any other function.
17. Terminate electric and telephone conduits above the slab with a coupling. After the base is installed, extend the conduits above the top of the base and secure to the base using a steel one-hole strap or similar suitable substitute.

CONTROLLER CABINET:

18. Anchor the controller cabinet to the base using four stainless steel 1/2-13 NC bolts.
19. The silicone caulk bead specified in Item 680.3.B must be RTV 133.

PAYMENT:

20. Bid TS-CF as subsidiary to Item 680.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD

TS-CF-04

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DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
12-04 REVISIONS			

CONT	SECT	JOB	HIGHWAY
3148	01	006	FM 3097
DIST	COUNTY		SHEET NO.
DAL	ROCKWALL		218

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I. GENERAL REQUIREMENTS FOR ALL ELECTRICAL WORK

The location of all conductors, conduits, junction boxes, ground boxes, and electrical services is diagrammatic only and may be shifted by the Engineer to accommodate local conditions.

Materials shall be new and unused. Materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC), National Electrical Manufacturers Association (NEMA) standards, and shall be Underwriters Laboratories (UL) Listed unless otherwise shown on the plans or specifications or approved by the Engineer in writing. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection. When reference is made to UL, it can be considered to mean a Nationally Recognized Independent Testing Lab (NRTL). Comparable standards of Canadian Standard Association, Electrical Testing Laboratories or Factory Mutual can be equal to the referenced UL standard. Where reference is made to NEMA listed devices, IEC listed devices shall not be considered to be an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing.

With the exception of high strength bolts, miscellaneous nuts, bolts and hardware may be stainless steel when plans specify galvanized, provided that bolts are 1/2 inch or less in diameter. The Contractor shall provide the following electrical test instruments as required by the Engineer to confirm compliance with the contract and the NEC. Those test instruments are voltmeter, amp probe, megger (1000 volt DC) and torque wrenches. All meters shall have been properly calibrated within one year. Calibration certification shall be provided to the Engineer upon request. Calibration certification tag shall also be applied to the meter. The Contractor shall operate meters during inspection as requested by the Engineer. Grounding shall be as shown on the plans and in accordance with the NEC. Metallic conduit, light poles, luminaires on bridge structures, and all metal enclosures shall be bonded to the system-grounding conductor. The ground rod in each ground box or junction box at the bridge ends, and in each ground box installed for underpass lighting will also be bonded to the system grounding conductor. The grounding conductor shall be bare or, if insulated, shall be green. Ground rods, connectors, and bonding jumpers will not be paid for separately, but will be subsidiary to the various bid items.

SUBMITTALS:

The contractor shall submit for approval six (6) copies of catalog cut sheets for each of the following three (3) categories.
Category 1. Electrical services including photocell.
Catagory 2. Breakaway disconnects, heat shrink tubing, heat shrink filler tape, GelCaps and ground boxes which will include loading capacity certification.
Category 3. Highmast assembly kits, when applicable. See Item 614 "Highmast Illumination Assemblies". Submittals shall be legible and shall be marked to indicate which product on a cut sheet is to be supplied. Where manufacturers provide warranties and guarantees as a customary trade practice, the Contractor shall furnish to the State such warranties and guarantees.
Any deviation from plans or specifications, including deviations due to plan error should be prominently displayed on the submittal. Any changes not prominently noted in submittal and incorporated into the work without proper authorization will constitute grounds for rejection of that portion of the work.

II. CONDUIT

A. MATERIALS

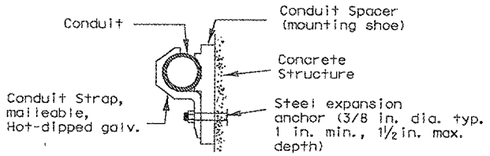
1. Conduit and fittings shall be UL Listed for the intended use shown on plan sheets.
2. Conduit shall be the type shown by descriptive code or shown elsewhere on the plans. Substitution of the various types of conduits will not be permitted. All flexible conduit in rigid metallic conduit (RMC) systems shall be Liquidtight Flexible Metal (LFMC) conduit. All flexible conduit in PVC systems shall be Liquidtight Flexible Non-metallic conduit (LFNC).
3. All exposed conduits shall be RMC, unless otherwise specifically shown on the plans. All metal conduit shall be properly grounded.
4. Couplings, connectors, conduit bodies, grounding bushings, and offset nipples for RMC shall be electro-zinc plated steel or hot dipped galvanized malleable iron, threaded or threadless compression type, rain-tight and shall be UL listed for the intended use.
5. Expansion joints for metal conduit shall be provided with an internal or external bonding jumper and shall be UL listed.
6. Unless otherwise shown on the plans, junction box minimum sizes shall be in accordance with the following table which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes are present, the conductors shall be counted as if all are of the larger size. Situations not applicable to the table shall be sized in accordance with NEC 370-28.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

7. RMC system junction boxes equal to or smaller, in any dimension, than 12 x 12 x 6 (HxWxD), surface mounted and containing conductors #8 or larger, shall be hot dipped galvanized cast iron with minimum wall thickness of 3/16 inch, shall have external mounting lugs, and shall be UL listed Crouse-Hinds Type WAB, OZ/Gedney Type YS or approved equal. Unless otherwise shown elsewhere on the plans, RMC system junction boxes larger than the aforementioned boxes but equal to or smaller, in any dimension, than 18 x 18 x 6 (HxWxD) shall be 14-ga. stainless steel; RMC system junction boxes larger than 18 x 18 x 6 (HxWxD) shall be 12-ga. stainless steel. All metal junction boxes shall be equipped with a threaded hole or lug for grounding. Stainless steel boxes 12 x 12 x 6 and larger need not be UL Listed but shall meet the other requirements of the NEC and shall have ribs, stiffeners, or thicker metal and shall have external mounting feet. Junction boxes with an internal volume of more than 100 cu. in. may be supported by connection of two or more rigid metal conduits, where specifically shown on the plans or where approved by the Engineer.
8. Junction boxes containing only #10 or #12 AWG conductors shall be Crouse Hinds Type GRFX, Appleton Type JBOX, two-gang FD, or similar approved cast iron box. Boxes shall be sized according to NEC Table 370-16(a).
9. IMC and EMT conduit shall not be used unless specifically required by the plan layout sheets. Junction boxes in EMT conduit systems shall be made from galvanized sheeting and shall be UL listed and approved for outdoor use, unless otherwise noted on the plans. Sheet metal junction boxes shall be sized in accordance with the NEC. Junction boxes for IMC conduit systems shall meet the requirements of boxes used with RMC systems.
10. Junction boxes in PVC conduit systems shall be PVC, intended for outdoor use, unless otherwise noted on the plans.
11. Elbows in PVC conduit systems one inch and larger shall be rigid metal, with the exception of traffic signal systems which may have PVC elbows instead of rigid. If any part of the rigid metal elbow is buried less than 18 inches underground the elbow and rigid metal extension shall be grounded. Grounding shall be accomplished by means of a grounding bushing installed on the extension. Unless specifically shown on the plans, rigid metal elbows containing, or entering ground boxes containing only communications conductors, loop detectors, or other low voltage power limited circuits need not be grounded unless a ground wire is present in the conduit or ground box. The rigid metal elbows located in concrete foundations may be extended with PVC conduit and need not be grounded provided that the end of the elbow nearest the end of the conduit run exiting the foundation is at least 2 inches below the concrete. RMC elbows will not be eliminated. RMC elbows will not be paid for directly, but will be subsidiary to various bid items.
12. High-Density Polyethylene (HDPE) conduit shall meet the requirements of Item 622, Duct Cable, except that the HDPE conduit, when bid under Item 618, Conduit, shall not contain factory installed conductors. Fittings for HDPE conduit shall be UL listed as an electrical conduit connector or shall be thermally fused using an electrically heated wound wire resistance welding method. HDPE conduit may be substituted for bored schedule 40 or schedule 80 PVC conduit. When such substitution is made, bored HDPE shall be schedule 40 of the size PVC being replaced. The HDPE conduit shall transition to PVC (or RMC elbow when required) at the bore pit. Size and schedule shall be as shown on the plans. Substituted conduit may not be extended to ground boxes or foundations; RMC elbows shall be installed at ground boxes and foundations. RMC elbows will not be eliminated.
13. All conduit support hardware including straps, nuts, bolts, screws, retaining anchors and washers shall be hot dipped galvanized or stainless steel. Strut type conduit straps shall be stainless steel or hot dipped galvanized. Strut type straps need not be made of malleable type material. Stamped-cadmium plated straps will not be allowed. Straps having only one mounting hole shall not be allowed for use on conduits 2 inches and larger with the exception of electrical service poles where stainless steel standoff straps will be allowed. Two piece conduit straps designed to be used with a mounting shoe shall be installed only with the correctly sized shoe.

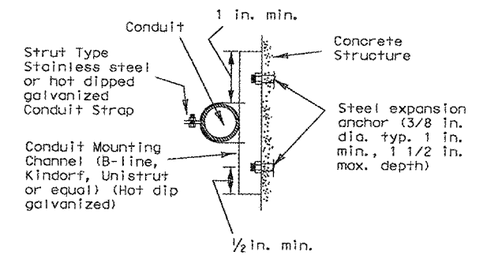
B. CONSTRUCTION METHODS

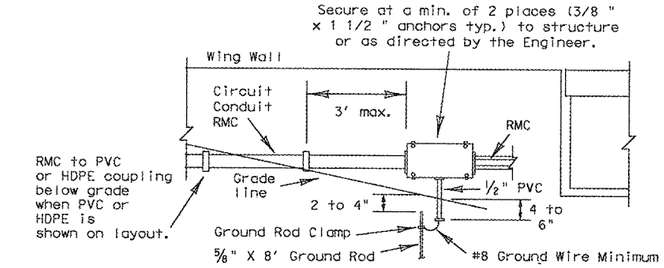
1. Conduit in structures shall have expansion fittings at structure expansion joints. All straight runs of RMC conduit exposed on structures such as bridges shall have expansion joints installed at maximum intervals of 150 feet. Expansion joints shall be installed so they allow for movement of the conduit. Installation of the joint in such a manner that will not allow for movement shall be repaired at no expense to the state. The method of determining the final setting length of the expansion joint shall be provided to the Engineer upon request.
2. Conduit supports shall be spaced at maximum intervals of 5 feet. Conduit spacers shall be used with metal conduit placed on surfaces of concrete structures (See conduit mounting options).
3. Conduit supports shall not be attached directly to prestressed concrete beams except as shown specifically in the plans and approved by the Engineer.
4. Unless otherwise shown on the plans, conduit placed beneath existing roadways, driveways, or sidewalks, or after the base or surfacing operation has begun, shall be accomplished by jacking or boring. The Contractor shall back fill and compact the bore pits to the bottom of the conduit prior to installing connecting conduit or duct cable to prevent bending of the connection.
5. Conduit trenched in the subgrade of new roadways shall be backfilled with excavated material, unless otherwise noted on the plans. Conduit trenched in the sub-base of new roadways shall be backfilled with cement-stabilized base.
6. Open ends of all conduit and raceways shall be fitted with temporary caps or plugs to prevent entry of dirt, debris and rodents during construction. The temporary cap may be constructed of duct tape, but in all cases shall be tightly fixed to the conduit and shall be durable. The contractor shall clean out the conduit and prove it clear in accordance with Standard Specifications Item 618.3 prior to installing any conductors.
7. Conduit entry into the top of enclosures such as safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes shall be made weatherproof using conduit sealing hubs, or threaded bosses.
8. A bonding jumper shall be installed from each grounding bushing to the nearest grounding rod, grounding lug, and/or equipment grounding conductor. All jumpers shall be the same size as equipment grounding conductor. Conduit used as casing under roadways for duct cable need not be grounded if duct extends full length through the casing. At electrical services, grounding electrode conductor shall be a solid Copper #6 AWG.
9. Metal junction boxes shall be bonded to the grounding conductor in accordance with the NEC.
10. Conduits entering ground boxes shall be placed so that the conduit ends shall be not less than 3 inches nor more than 6 inches from bottom of box (See ground box detail on sheet ED(3).
11. Conduit ends shall be sealed with heat shrink boots with waterproof sealant, urethane foam, or by other methods approved by the Engineer. Sealing shall be done after completion of any required pull tests. Duct tape shall not be used as a permanent conduit sealant. Silicone caulking shall not be used as a sealant.
12. All strut mounting material and hardware shall be hot-dip galvanized or shall be stainless steel. The cut ends of strut and non-galvanized rigid metal conduit threads shall be coated with a zinc rich paint (90% or more zinc content). Zinc rich paint may only be used to touch up galvanized material as allowed under item 445.6 galvanizing. The painting of non-galvanized material with a zinc rich paint shall not be considered as an approved alternative for galvanized materials.
13. All PVC conduit terminations shall be fitted with bushings or bell ends. All metal conduit terminations shall be fitted with a grounding type bushing.



CONDUIT MOUNTING OPTIONS

(Attachment to concrete surfaces)
(See para. II.B.2)

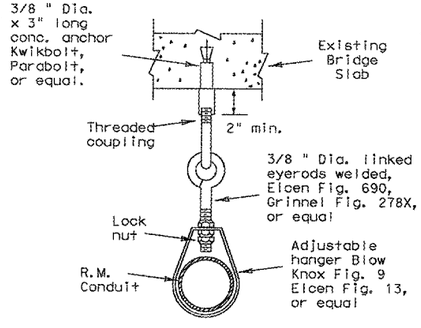




TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

NOTES

1.) Ground rod clamp to be UL listed for direct burial.
2.) For conduit placed in structure, use flush-mounted box.
3.) Bond junction box and metal conduits to equipment grounding conductor and grounding electrode conductor using listed connector.
4.) Seal all conduits entering the junction box from underground.
5.) Install bell end or bushing on 1/2 " PVC conduit both ends.
6.) Ground rod to be driven within 8 inches of 1/2 inch PVC conduit end.



CONDUIT HANGER DETAIL

(Attachment to horizontal surfaces)
Hangers need not be UL listed for electrical use
ie: plumber pipe hangers are acceptable

5/03 Revision

⚠1 Revised notes.

Texas Department of Transportation
Traffic Operations Division

ELECTRICAL DETAILS-CONDUIT

ED(1)-03

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REVISIONS	CONT	SECT	JOB	HIGHWAY
4-98	3148	01	006	FM 3097
12-00	DIST	COUNTY		SHEET NO.
3-03	DAL	ROCKWALL		219
5-03				

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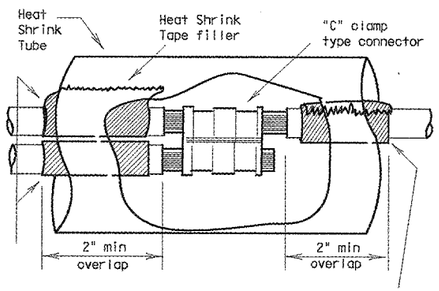
I. ELECTRICAL CONDUCTORS

A. MATERIALS

1. Insulated conductors shall be NEC Type XHHW. Insulated conductors shall be color coded in accordance with the NEC, articles 200, 250, and 310; i.e. Insulation of grounded conductors (neutrals) shall be white. Grounding conductors (ground wires) shall be bare or insulation shall be green. Insulation of ungrounded conductors (hots) shall be any color except green, white, or gray. Identification of conductors #6 American Wire Guage (AWG) and smaller shall be by continuous jacket color. Color coding of electrical conductors #4 AWG and larger shall be either by continuous color jacket or by colored tape. Colored tape marker shall consist of a half-lap of tape covering a 6-inch length of conductor.
2. Where two or more circuits are present in one conduit or enclosure, the conductors of each circuit shall be identified by a permanent non-metallic tag at each accessible location. The tag shall be fastened to the conductors by two plastic straps. Each tag shall indicate circuit number, letter, or other identification shown in the plans.
3. Grounding electrode conductor #6 AWG for bonding to ground rod at electrical service, shall be solid. Connection of conductor to ground rod shall be made using UL Listed connectors designed for such purposes.
4. Heat Shrink Tape filler shall be used to seal the ends of heat shrink tubing around two or more conductors that are insulated with heat shrink tubing. Tape material shall have a minimum dielectric strength of 225 volts per mil and shall be cross-linked butyl rubber. Tape shall be supplied in rolls and shall have a backing (release paper) to prevent the tape from sticking to itself.
5. Heat shrink tubing shall be heavy wall, UL listed for 600 volts or greater and shall have factory applied internal sealant.
6. GelCaps shall be UL listed for 600-volt applications. GelCap shall have see-through elastomer molded cover. Cover shall be filled with high dielectric insulating gel silicone sealant to provide waterseal. Cover shall be held in place by snap-lock, molded clamp made of UV stable polypropylene.
7. Splicing materials, insulating materials, breakaway disconnects, GelCaps and fuse holders will not be paid for directly but shall be subsidiary to various bid items.

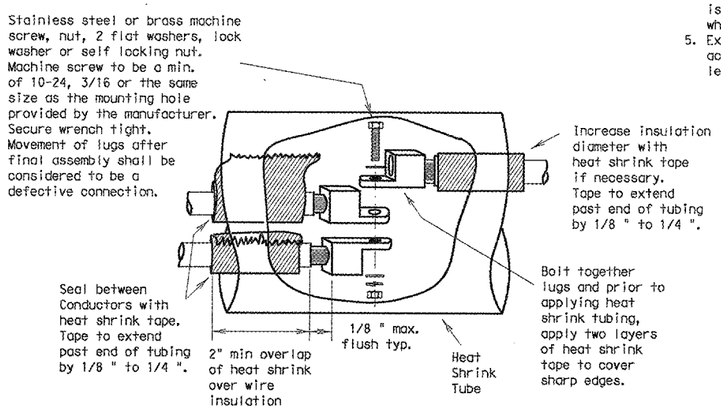
B. CONSTRUCTION METHODS

1. After conductors have been installed in conduit, a pull test shall be made on conductors. When any length of conductor cannot be freely pulled, the Contractor shall make any needed alterations or repairs at no expense to the State.
2. The Contractor shall perform insulation resistance tests in accordance with Item 620, "Electrical Conductors." The Contractor shall coordinate with the Engineer to witness the tests.
3. A sufficient length of conductor for making up connections shall be left in ground boxes (2 feet minimum, 3 feet maximum, to point of splice, 3 feet minimum, 4 feet maximum, when conductor is pulled through with no splice), enclosures, weatherheads and pole bases (1 foot minimum, 1.5 feet maximum).
4. Splices shall be made only in junction boxes, ground boxes, pole bases, or electrical enclosures and shall be made with listed compression or screw type pressure connectors, terminal blocks, bolted lugs, or split bolt connectors. Splices shall be insulated with heavy wall heat shrink tubing or GelCaps and shall be made so as to provide a watertight splice. Heat shrink sleeve shall overlap conductor insulation a minimum of 2 inches on both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, the Contractor shall increase the diameter of the conductors insulation using heat shrink filler tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Tape shall be visible after completion of all splices. Where filler tape is used but not visible, the Engineer shall approve each individual splice by conducting a physical inspection of each splice. When it appears the tubing has been burned, or overheated the tubing shall be considered to be defective and shall be replaced.
5. GelCaps when used in place of heat shrink method of splicing, shall be sized and installed according to manufacturer's specifications. (Raychem GelCap and GelCap SL or equal.)
6. Wire nuts may be used for #8 AWG or smaller conductors in above-ground junction boxes, but not in pole bases or ground boxes. Wire nuts shall be positioned upright to prevent the accumulation of water. Wire nuts used at these locations shall have factory applied waterproof sealant.
7. Conductors in illumination poles shall be supported by a J-hook in the top of the pole.
8. All conductors bid under Item 620 "Electrical Conductors" shall have breakaway electrical disconnects installed anytime conductors pass through a break-away support device.
9. For terminating the conductors, insulation-jacketing material shall be removed in such a manner as to not nick any of the individual strands of the conductor. When individual conductor strands are removed, the conductor shall be considered to be damaged.
10. When a conductor or cable has been damaged, or fails to pass an insulation resistance test, the conductor shall be replaced.
11. Duct tape, black electrical tape, or wire nuts shall not be used in the repair of a damaged conductor.
12. For terminations, no more than one wire may be installed under a single pressure connector, unless the device is listed for more than one wire.
13. Conductors connected to break-away in line fuse holders must be installed in accordance with the specific manufacturer's installation instructions. Where threaded connections are made, they shall be properly torqued. Where crimp type connections are made, crimps shall be made using properly sized crimping pliers. Proper conductor terminations are critical to the safe operation of break-away devices.
14. Waterproofing boots shall be properly trimmed to fit snugly around the conductor so as to provide a water proof connection. No more than one wire may enter a single opening in any one boot. Water proofing boots must provide the correct number of openings. Where only one wire is to be connected to a boot, the boot may not be a two wire type.



SPLICE OPTION 1

C-CLAMP

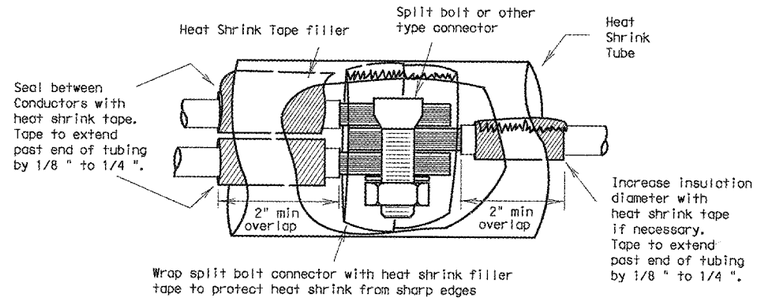


SPLICE OPTION 2

BOLTED WIRE LUGS

SPLICE OPTION 3

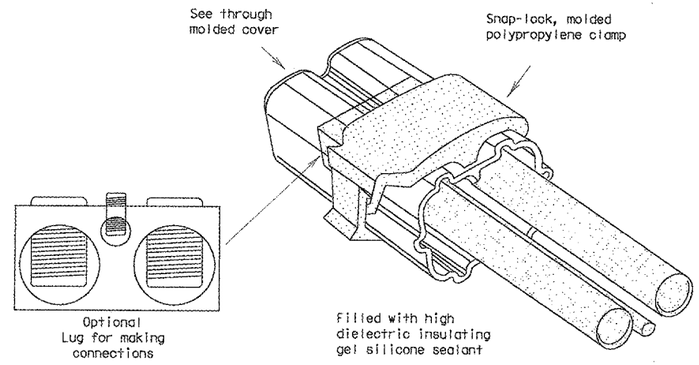
SPLIT BOLT



SPLICE OPTION 4

GELCAP

GelCap shall be sized and installed according to manufacturers specifications



15. All conduits that contain circuit wiring of 50 volts or more shall contain an equipment grounding conductor (EGC). Conduit for traffic signals shall have an EGC, with a minimum size of #8 AWG stranded. Unless otherwise shown on the plans, the EGC for all other conduits shall be the same AWG size as the largest current carrying conductor contained in that conduit. The EGC shall be paid for item 620-Electrical Conductors.

C. TEMPORARY WIRING

1. Temporary conductors and electrical equipment to provide power for utilization equipment, shall be installed in accordance with the NEC article 305. All temporary wiring materials and methods shall comply with the standard sheets. All power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade, supplied from a utility power source, shall be provided with a ground fault circuit interrupter.
2. Residual current protective devices (GFCI) may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.
3. Where wire nuts are approved for temporary wiring, they shall be of the self-sealing type.
4. All conductor splices must be contained within a listed enclosure, ground box or the splices will be more than ten feet above grade vertically and more than five feet horizontally from any metal structure. Where temporary conductors are installed in any area that is likely to be subjected to vehicle traffic, or mobile construction equipment, the vertical clearance to ground shall be at least 18 feet when measured at the lowest point. Where power conductors are to be supported by a span wire, the span wire shall be properly grounded.
5. Existing conduit containing service conductors uncovered during the construction process shall be repaired in a timely manner in accordance with the NEC. Existing non-metallic conduit exposed during construction shall not be left exposed above grade, or with less than eighteen inches of cover, without protective methods approved by the Engineer.

Texas Department of Transportation
Traffic Operations Division

ELECTRICAL DETAILS-CONDUCTORS

ED(2)-03

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10-93	CONT	SECT	JOB	HIGHWAY
4-98	3148	01	006	FM 3097
12-00	DIST	COUNTY		SHEET NO.
3-03	DAL	ROCKWALL		220

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II. GROUND RODS

A. MATERIALS

1. All ground rods installed at electrical services, including supplemental lightning protection ground rods specified by the plans in other locations such as pole bases, shall be copper clad and UL listed. Rods shall be a minimum diameter of 5/8 inch. The length shall be a minimum of 8 feet. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets.
2. Ground rod clamps shall be listed to be in direct contact with the soil. Where concrete encasement is required, the clamp shall be listed for concrete encasement.

B. CONSTRUCTION METHODS

1. Ground rods installed in locations such as pole bases, to provide supplemental lightning protection need not be totally in contact with the soil. Where called for in the plans, rods may be encased in soil or concrete or any combination of soil and concrete. When concrete encased, the connection of the conductor to the rod shall be readily accessible for inspection or repairs. When driven into the soil the upper end shall be between 2 to 4 inches below finished grade. Ground rods shall not be placed in the same drilled hole as a timber pole.
2. Ground rods shall be installed such that the end imprinted with the rod's part number is installed as being the upper end.
3. Non-conductive coatings such as concrete splatter shall be removed from the rod at the clamp location.
4. Routing of lightning protection ground rod wires shall be run as short and straight as possible. Where bends are required they shall have a minimum radius of four inches.
5. Unless specifically called for by the plans, conduits used for ground rod wires shall be non-metallic. Where metal conduits are specified, a grounding bushing and properly sized bonding jumper shall be provided and properly installed on each end.
6. Where rocky soil or a solid rock bottom is encountered when driving a ground rod and the horizontal trench placement method is the only viable solution, written authorization from the Engineer must be obtained.

III. GROUND BOX

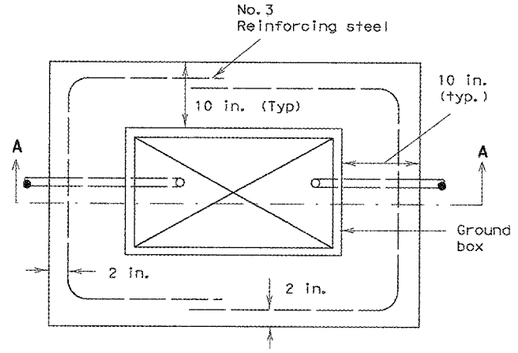
A. MATERIALS

1. Ground boxes 16x30x24 inches (WxLxD) or smaller shall be polymer concrete of the type required by the descriptive code shown elsewhere. Larger ground boxes shall be as shown elsewhere in the plans.
2. All ground boxes and covers shall be permanently marked either by impress or by permanent ink, with manufacturer's model number and manufacturer's name or logo.
3. Covers shall be bolted down, and bolt holes in the box shall be arranged to drain dirt.
4. Ground box Types A, B, C, D & E shall meet the following requirements:
   a. Ground boxes and covers be manufactured from polymer concrete reinforced with continuous strands of woven or stitched borosilicate fiberglass cloth. The polymer concrete shall be made from catalyzed polyester resin, sand and aggregate, and shall have a minimum compressive strength of 11,000 psi. Polymer concrete containing chopped fiberglass or fiberglass reinforced plastic is not acceptable.
   b. Minimum inside dimensions shall be as follows (width x length x depth):
      Type A shall be 11.5 inches x 21 inches x 10 inches, (122311)
      Type B shall be 11.5 inches x 21 inches x 20 inches, (122322)
      Type C shall be 15.25 inches x 28.25 inches x 10 inches, (162911)
      Type D shall be 15.25 inches x 28.25 inches x 20 inches, (162922)
      Type E shall be 11.5 inches x 21 inches x 16 inches, (122317)
   c. Bottom edge of box or extension shall be footed with a minimum 1 1/4 inch flange.
   d. Ground boxes shall withstand 600 lbs. per sq. ft. applied over the entire sidewall with less than 1/4 inch deflection per foot length of box. Ground boxes and covers shall withstand a test loading of 20,000 lbs. over a 10 inch by 10 inch area centered on the cover with less than 1/2 inch deflection. Ground boxes and covers shall meet Western Underground Standards 3.6. Manufacturer shall supply certification by an independent laboratory or sealed by a Texas-Licensed Professional Engineer.
   e. Covers shall be 2 inch (nominal) thick polymer concrete. All hardware shall be stainless steel. Cover shall be secured with two 1/2 inch stainless steel bolts. Bolts shall be self-retaining and shall withstand a minimum of 70 ft-lbs. torque and shall have a minimum 750 lbs. straight pull out strength. Nuts shall be floating and shall provide a minimum of 1/2 inch movement from the center of the nut. Covers shall be skid resistant, minimum 0.5 coefficient of friction. Covers shall be interchangeable between manufacturers and shall conform to the dimensions shown herein. Unless otherwise approved by the Engineer, cover shall be legibly imprinted with the following words in minimum 1 inch letters:
      Ground Boxes containing wiring for traffic signals shall be labeled, Danger High Voltage Traffic Signal.
      Ground boxes containing wiring for illumination systems shall be labeled, Danger High Voltage Illumination.
      Ground boxes containing wiring for traffic management systems shall be labeled, Danger High Voltage Traffic Management.
      Ground boxes containing wiring for sign illumination systems shall be labeled, Danger High Voltage Sign Illumination.
      Ground boxes containing wiring for traffic signals that also contain illumination, powered by the signal electrical service, shall be labeled, Danger High Voltage Traffic Signal.

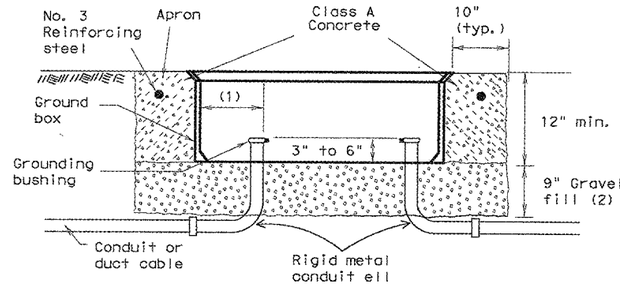
B. CONSTRUCTION METHODS

⚠1

1. Ground boxes shall be set on a 9 inch (minimum) bed of aggregate from 3/4 " up to 2" in size. Aggregate shall be in place prior to setting box and conduits shall be capped. Any gravel or dirt in conduit shall be removed.
2. When required by Item descriptive code, construction of an apron encasing a ground box including concrete and reinforcing steel shall not be paid for directly but shall be subsidiary to the ground box. Reinforcing steel may be field bent. Concrete for aprons shall be considered miscellaneous concrete for testing purposes. Aprons shall be cast in place.
3. Conduit holes may be cut in the walls of type B & D boxes at least 18 inches beneath the cover.
4. If, within the limits of this project, the Contractor must utilize an existing ground box equipped with a metal cover, the Contractor shall bond the cover to the grounding conductor with a 3 foot long flexible stranded jumper the same size as the grounding conductor. Connection of bonding jumper to metal ground cover shall not be paid for directly but shall be subsidiary to various bid items. The box(es) must be clearly shown on the plans with plan notes fully describing the work required.
5. If there are other ground boxes with metal Covers within the project limits but not involved in the contract, the Engineer may direct the Contractor to ground the covers, designating and identifying the specific boxes in writing. This work will be paid for separately.
6. Termination to metal ground box covers shall be made using a tank ground type lug.



PLAN VIEW

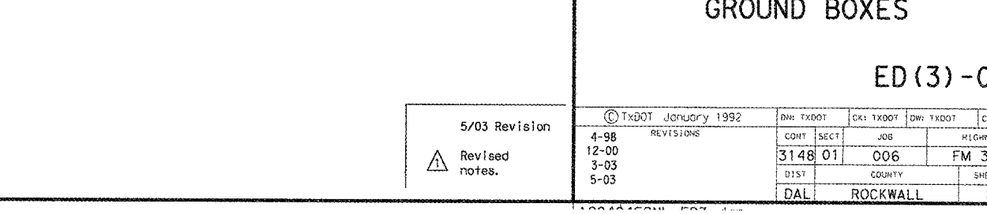


SECTION A - A

APRON FOR GROUND BOXES

(Where required)

(1) Final position of end of conduit shall not exceed one-half the distance to the side of box opposite the conduit entry.
(2) Place gravel "under" the box. not "in" the box. Gravel should not encroach on the interior volume of the box.
(3) Install bushing on the upper end of all ells.
(4) Where a ground rod is present in the ground box, connect it to any and all equipment grounding conductors using a listed connector.
(5) Maintain sufficient space between all conduits so as to allow for proper installation of bushings.
(6) All conduits shall be installed in a neat and workmanlike manner.
(7) All conduits installed in the ground box shall be sealed after completion of conductor installation and any required pull tests. Silicone shall not be used as sealant.



PLAN VIEW

END

SIDE

GROUND BOX COVER

GROUND BOX COVER DIMENSIONS								
BOX	DIMENSIONS (INCHES)							
SIZE	H	I	J	K	L	M	N	P
A, B & E	23 ¼	23	13 ¾	13 ½	9 ⅞	5 ⅛	1 ⅜	2
C & D	30 ½	30 ¼	17 ½	17 ¼	13 ¼	6 ¾	1 ⅜	2

5/03 Revision

⚠1 Revised notes.

Texas Department of Transportation
Traffic Operations Division

ELECTRICAL DETAILS- GROUND BOXES

ED(3)-03

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REVISIONS	CONT	SECT	JOB	HIGHWAY
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ELECTRICAL SERVICES NOTES

All work, materials, services, and incidentals, whether or not specifically shown on the plans, which may be necessary for a complete and proper electrical service installation as specified in the plans to obtain electrical power shall be paid for, performed, furnished and installed by the Contractor. The Contractor shall contact the Utility for metering and shall comply with all Utility requirements.

Primary line extensions, connection charges, meter charges, and other charges by the Utility company to provide power to the location shown, when required, shall be paid for under force account work. The costs associated with these charges shall be approved by the Engineer prior to engaging the Utility company to do the work. The Contractor shall consult with the appropriate Utility to determine costs and requirements, and shall coordinate the Utility's work as approved by the Engineer. The Contractor shall be reimbursed only the amount billed by the Utility. No additional amount for supervision of the Utility's work will be paid.

Materials shall be new and unused, materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards and shall be Underwriters Laboratories (UL) Listed. Electrical Service conduits, conductors, disconnects, contactors, circuit breaker panel sizes, and branch circuit breakers, shall be as shown in the Electrical Service Data elsewhere in the plans. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection.

The Contractor shall submit for approval no less than six (6) copies of catalog cut sheets on electrical service materials. Submittals shall be legible and shall be marked to indicate which product on a cut-sheet is to be supplied. Where manufacturers provide warranties and guarantees as a customary trade practice, Contractor shall furnish to the State such warranties or guarantees.

The Contractor shall provide locks keyed with Master #2195 for all lockable electrical enclosures. Keys and locks become property of the State. Unless otherwise approved by the Engineer, enclosures shall not be energized until locks are provided and all bolts are installed.

Circuit directories, where provided, shall be filled out. All breakers and components in shop built panels and enclosures shall be labeled with duo-colored plastic labels. Letters shall be a minimum 3/8 " in height.

Enclosures with external disconnects that de-energize all equipment inside the enclosure, need not have dead front trim, except that incoming line terminations shall be protected from incidental contact.

When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used. All wiring and components shall be rated for 75 degrees C. Minimum size for service entrance conductors shall be #6 XHHW.

I. Safety Switch. A safety switch, placed ahead of the meter, shall only be used when specified by the Utility and when shown on the Electrical Service Data. The switch shall be UL Listed, heavy duty type, 600 volt, unfused, with a UL type 3R enclosure and equipped with a solid neutral (s/n) assembly. The switch shall be padlockable in the "on" position.

II. Service Type. Electrical service types A, C, D, and T shall be as schematically detailed on ED(4) or ED(5). Other service types shall be as detailed elsewhere on the plans.

III. Branch Circuit Breakers. Circuit breakers shall be thermal magnetic and have a minimum interrupting capacity of 10,000 amps and a voltage rating compatible with their use. Circuit breakers shall be sized as shown in the electrical service data. Circuit breakers in panelboards and load centers shall be full size and designed exclusively for the panelboard or load center in use. Tandem and half-width breakers shall not be used. All circuit breakers shall be permanently and clearly marked identifying the circuit or device supplied. Circuit breakers shall be UL Listed to UL489.

IV. Circuit Breaker Panelboard. Panelboards shall be UL Listed. Panelboards shall have copper busses, a minimum of 6 one-pole spaces or as required in the electrical service data, and when required will be rated for service equipment. Enclosure shall meet or exceed UL type 3R classification. Panelboards shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be bolt-in type only.

V. Circuit Breaker Load Center. Load centers shall be UL Listed.
Load centers for type T services may have copper or aluminum busses, all other load centers will be copper bus only. Load center will have a minimum of 4 one-pole spaces, and shall be rated for service equipment. Enclosure shall meet UL type 3R classification. Load centers shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be plug-in type only. Load centers for type T services shall accomodate a maximum of 6 one-pole breakers.

VI. Separate or Auxiliary Enclosure. Separate enclosures for HOA, photocell and lighting contactors for types D & T Services shall be a UL Listed assembly with outer door. Interior shall have dead front trim. HOA switch operator shall extend through the dead front trim. Photocell shall be mounted inside the enclosure as described in paragraph XIII when required by descriptive code. Separate enclosures shall meet the construction requirements of paragraph VIII. E, except that separate enclosure shall not have external operating handle, need not have a data pocket and door may latch at only one point. All equipment may be located in one enclosure instead of two, when approved by the Engineer.

VII. Where a Type D or T service is provided, laminated "as built" drawings are required as shown on ED(5) VIII E; shall be delivered before completion of the work, to the Engineer in lieu of placement within these smaller enclosures. Conduit may not enter the back wall of a service enclosure penetrating the equipment mounting panel. Provide grounding bushings on all metal conduits, terminate bonding jumper to grounding bus. Grounding bushing is not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss such as a meter base.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X (XXX/XXX) XXX (XX) XX (X) XX (X)

Example: ELEC SERV TY A(240/480)100(NS)SS(E)GC(O)

Schematic Type

Service Voltage (V / V)

Disconnect Amp Rating
(000 indicates main lug only)

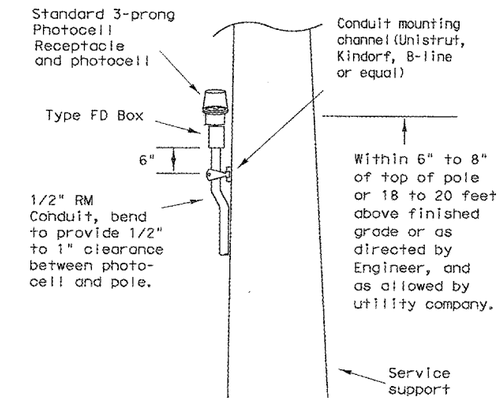
SS= Safety switch ahead of meter
NS= No switch ahead of meter and/or no meter required

Enclosure Type
GS= Galvanized steel (see ED(5)VIII,D)
SS= Stainless steel
AL= Aluminum

Photocell Mounting Location
T= Top of pole
E= Inside service/separate enclosure
L= Luminaire mounted
N= None

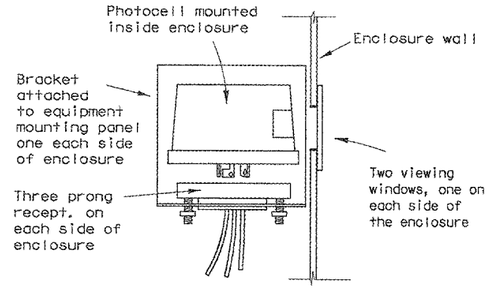
Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Switch gear to be placed on traffic signal pole
RT= Rectangular structural tubing
PS= Pedestal Service (see ED(5)VIII,G)

O= Overhead service
U= Underground service



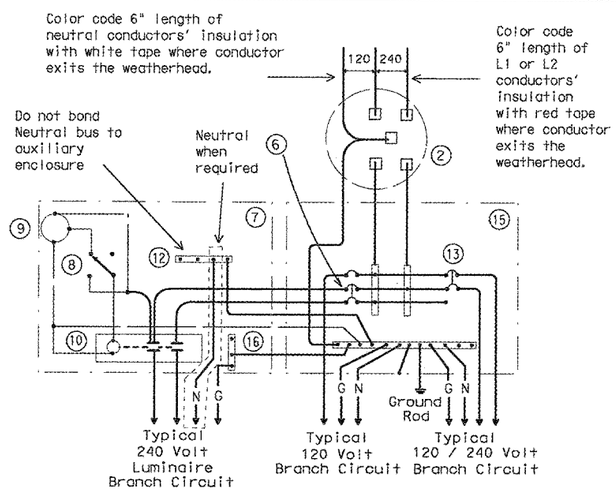
TOP MOUNTED PHOTOCELL

Conduit support spacing 3 feet from enclosure; 5 feet max.



ENCLOSURE MOUNTED PHOTOCELL

For photocell specifications see ED(5),XIII.



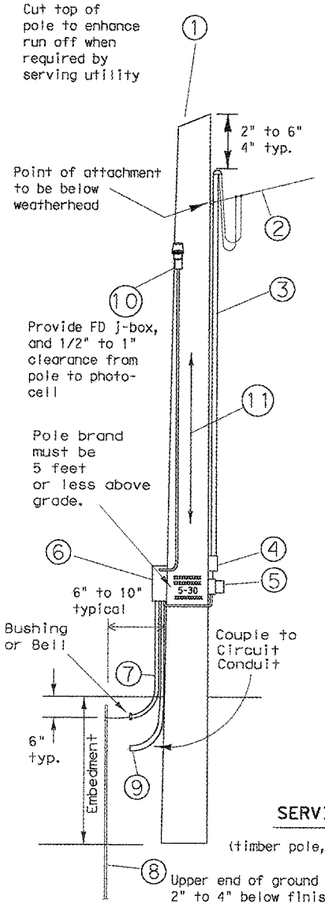
SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data.

SCHEMATIC LEGEND

1 - omitted
2 - Meter (when required)
3 - Service Assembly Enclosure
4 - Main Disconnect Breaker (Not Used)
5 - Omit
6 - Circuit Breaker, 15 Amp typical for control circuit wiring
7 - Auxiliary Enclosure
8 - Control Station ("H-O-A" Switch)
9 - Photo Electric Control (enclosure-mounted shown)
10 - Lighting Contactor
11 - Power Distribution Terminal Blocks (Not Used)
12 - Neutral Bus required when 120 v. lights are controlled by lighting contactor
13 - Branch Circuit Breaker (See Electrical Service Data)
14 - Circuit Breaker Panelboard (Not Used)
15 - Load Center
16 - Ground Bus

——— Power Wiring
— — — Control Wiring
—N— Neutral Conductor (when required-to serve 120 v. loads only)
—G— Equipment grounding conductor-always required



1 - Class 5 pole, height as required
2 - Service drop from utility company (attached below weatherhead)
3 - Service conduit and service entrance conductors(RMC) (See Electrical Service Data)
4 - Safety switch (when required)
5 - Meter (when required)
6 - Service enclosure
7 - No. 6 bare grounding electrode conductor in 1/2 " PVC to ground rod - extend 1/2 " PVC 6" underground.
8 - 5/8 " x 8' Copper clad ground rod - drive ground rod completely underground unless otherwise approved by the Engineer.
9 - RM conduit - same size as branch circuit conduit.
10 - Photocell and conduit - if top mounted. (See Electrical Service Data)
11 - When required by the serving utility provide bare #6 awg copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor to a height of 8 ft above finish grade.

LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

(If applicable)

- Liquidtight flexible metal conduit, may be used when meter and service enclosure are mounted 90 to 180 degrees to each other. Size shall be same as service entrance conduit.
- LFMC shall not exceed 3 ft. and shall be securely supported within one ft. of each end. No strap required for LFMC shorter then 12"
- Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting.
- A neutral conductor must be installed within the LFMC.
- Bend in liquidtight flexible metal conduit shall not exceed 180 degrees.
- A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.

SERVICE SUPPORT TYPE TP (O)

(timber pole, overhead service, typical arrangement)

TIMBER POLE NOTES

1. Conduit and electrical conductors attached to the electrical service pole and underground within 12 inches of service pole shall not be paid for directly but shall be subsidiary to the service pole.
2. Pole top mounted photocell, install on north side of pole or in service enclosure as required. See Electrical Service Data.
3. Attach meter and service equipment with stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Gain pole as required to provide flat surfaces for each strut. Paint ends of galvanized channel with zinc rich paint. Gain depth 5/8" max. Gain height 1 7/8" max. Strut to be 1" max. deep, and 1 5/8" wide max. Secure each strut section to timber pole with two galvanized or SS lag bolts, 1/4" diameter min. by 1 1/2" length min. Place flat cut galvanized or SS washer on each lag bolt. Gain pole in a neat and workmanlike manner.
4. Embedment depth shall be as required in Item 627 Treated Timber Poles.
5. Poles trimmed for excess length shall be trimmed from the top end only.

Texas Department of Transportation
Traffic Operations Division

ELECTRICAL DETAILS- SERVICE SCHEMATICS AND SUPPORT-TYPE TP (OVERHEAD)

ED(4)-03

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12-00
3-03

CONT	SECT	JOB	HIGHWAY
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SERVICE ENCLOSURE NOTES

VIII. Service Assembly Enclosures. All service assemblies and enclosures shall be UL Listed for the intended purpose.

A. Shop built or shop assembled service assemblies (all types except Type T and Type D without lighting contactor or enclosure mounted photo cell) and all auxiliary equipment enclosures mounted with service equipment and paid for as part of Item 628, "Electrical Services", shall be built or assembled by a UL Listed Industrial Control Panel shop and shall have a unique serial numbered UL Label with the words "LISTED ENCLOSED INDUSTRIAL CONTROL PANEL". The same or an additional label shall have the name, location, and phone number of the shop, the UL file number of the shop, the shop order or drawing number, date of manufacture or assembly, and the line voltage. The service assembly enclosure shall also be labeled "SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT".

B. Conduit entries into the top of enclosures shall have threaded hub. Conduit entries through the equipment mounting back plate will not be allowed.

C. All service enclosure front doors shall be permanently labeled "DANGER HIGH VOLTAGE". Label shall be a self sticking type, intended for outdoor installation. Lettering style, layout and colors of red, black and white shall be as required by OSHA. Label letters shall be 1 to 1 1/2 inches high or as high as the enclosure door width will permit for smaller services. Separate or auxiliary lighting enclosures need not be OSHA labeled when mounted in the same viewing plane as the service enclosure front door. Where only one type of load is served by the service, the service door shall be marked using duo-colored plastic labels or self adhesive vinyl weather resistant labels, minimum of 1 inch high, applied in a neat and workmanlike manner. On the label will be the service number shown on the plans as well as identifying the load served specifically (i.e. lighting, landscaping, signals, traffic management or other wording as directed by the Engineer). Safety switches need not be OSHA labeled unless specifically required by the serving utility.

D. Type GS enclosures will only be allowed for service Types D and T without an enclosure mounted photocell and/or lighting contactor and the Type C panelboard. This spec will allow an "off the shelf" product meeting these specifications to be used. Type GS enclosures shall be made from pre-galvanized steel sheeting, hot dipped galvanized steel, or powder coat painted steel unless shown differently on the plans. Steel enclosures shall be painted inside and outside; galvanized enclosures may be painted. Unless otherwise approved by the Engineer, painted enclosures shall be gray, beige, white or light green. Panelboard/loadcenter enclosures shall meet UL type 3R requirements, shall have a dead front trim, and an outer padlockable door preventing unauthorized persons from operating contained equipment. Galvanized steel is no longer allowed for Types A, C, or custom-built D or T enclosures. If GS is shown in the descriptive code for any of these, an AL shall be provided.

E. Type AL enclosures for service Types A and C shall meet UL type 3R requirements and shall also meet additional requirements of this paragraph. The enclosure shall have both a main disconnect remote operator handle and a door latch handle. Die-cast handles are not acceptable. The main disconnect remote operator shall be flange-mounted, shall interlock the door when in the "on" position, and shall be padlockable in both the "on" or "off" positions. Door latch shall latch at two or more points, operate by a handle separate from disconnect switch and be capable of being locked. Door closure clamps will not be allowed. Lock must be keyed to Master #2195. All the enclosures shall have either a continuous stainless steel piano hinge with stainless steel pin or enclosures less than 30 inches may have two heavy duty hinges, those over 30 inches must have three. Heavy duty two and three point hinges shall have a 0.185 inch minimum diameter electro-zinc plated steel pin or a stainless steel pin. Two point hinged doors shall be rated for 56 lbs of loading. Three point hinged doors shall be rated for 70 lbs of loading. The door shall have an attached data pocket constructed of either thermoplastic or metal. Pocket shall be 12" x 12", unless that size will not fit in enclosure. The pocket shall then be as large as possible, as approved by the Engineer, and mechanically attached with stainless steel nuts and bolts, or stainless steel or aluminum rivets. Enclosure shall include an equipment mounting panel installed inside the enclosure on collar studs or tapped bosses, and constructed of a minimum 12 guage galvanized steel. Equipment mounting panels shall not be painted. Enclosure shall have factory installed external mounting feet. Enclosure door shall be capable of opening at least 130 degrees, with arm or other approved means to hold the door open. Only the enclosure exterior will be primed and painted. Paint color shall be beige or gray and shall be powder coat paint as shown below. Condensation drainage shall be provided in the bottom of the enclosure before leaving the factory. The Contractor shall prepare and submit a schematic drawing unique to an individual service. The approved drawing shall be laminated and placed in the document pocket of the service at the time of shipment to the job site. All applicable wiring diagrams and plan sheet layouts for all equipment and branch breaker circuits supplied by that service shall also be laminated and placed in the document pocket prior to shipping. Type AL enclosures for Type D and T services with enclosure mounted photocell and/or lighting contactor shall have the loadcenter interior mounted in an enclosure with properly adapted dead front trim. Types D and T shall not have a loadcenter exterior "can" mounted inside another enclosure meeting these specifications. (Do not put one enclosure inside another enclosure). Types D and T with enclosure mounted photocell and/or lighting contactor shall meet the additional requirements of this paragraph except that remote-operating handle will not be provided.

F. Type SS enclosures for Type A and C shall meet all the requirements above for their respective type AL. Type SS enclosures for D and T shall meet all the requirements above for their respective type AL. Stainless Steel shall not be painted.

G. PS enclosure shall be as detailed and specified on ED(8). Galvanized steel will not be allowed for any pedestal service. If GS is shown in the descriptive code an AL will be provided.

IX. Powder Coat Paint. Powder coating shall be either a polyester thermosetting resin, a zinc rich primer with a TGIC (triglycidyl isocyanurate) powder overcoating, or a zinc-rich epoxy powder, applied by either electrostatic spray or fluidized bed immersion, high temperature oven cured, high density, low gloss, 4 mil thick (minimum), coating. Adhesion shall meet the 5A or 5B classifications of ASTM D3359. Finish shall be uniform in appearance and free of scratches.

X. Main Disconnect. Main disconnect device shall be a circuit breaker, as specified in the Electrical Service Data, shall be two or three pole, and rated for the voltage and amperage specified. Circuit breaker shall be an UL Listed thermal-magnetic circuit breaker controlled by flange-mounted remote operator in the service assembly enclosure when required. Circuit breakers shall have a minimum interrupting rating of 10,000 Amps. When the utility company provides a transformer larger than 50 KVA, Contractor shall verify that the available fault current is less than the circuit breaker amps interrupting capacity (AIC) rating and shall provide documentation from the Utility to the Engineer. Documentation shall be submitted at the same time as other electrical submittals. Circuit breaker shall be UL Listed to UL489. No backfed breakers will be allowed for use as a main disconnect.

XI. Control Circuit. Control circuit protection shall be 15 amp circuit breaker.

XII. Control Station ("H-O-A" Switch). Control station shall be a maintained-contact, three position selector switch in an UL type enclosure. Switch shall be rated 600 volts and shall be fitted with "Hand-Off-Auto" legend.

XIII. Photo Electric Control. Photo electric control shall consist of a photocell, internal lightning arrester, and relay or bimetallic switch mounted inside a weatherproof enclosure with standard 3-prong twist lock photocell plug and receptacle. The enclosure shall be made of poly-acrylic with clear acrylic window. Enclosure chassis shall be molded thermosetting plastic. The photocell shall have a polyethylene gasket, and shall have a hermetically sealed cadmium sulfide cell. The arrester shall have an enclosed type expulsion arrester rated 2.0 kV sparkover with 5,000 amps follow-through. Relay or switch shall be time delay type with normally closed contacts. Photo electric control shall be rated a minimum of 1800 VA, voltage as required. Enclosure mounted photocells shall be the same as above except that the photocell shall be mounted inside the enclosure. The enclosure shall have two acrylic paned windows, or other material approved by the Engineer, one on each side of the enclosure. Each window shall be rectangular approximately one inch by two inches, round 2 inch diameter, or as otherwise approved by the Engineer. Bracket and photocell's receptacle will be mounted inside enclosure next to each window. Except for window side, 2" of clearance is required on all sides of photocell for ease of replacement. The photocell's receptacle is held in place by two mounting screws on bracket and located next to each window of the enclosure. The 3-prong twist lock photocell shall be mounted in a position to receive light from the window closest to the photocell. The photocell shall be mounted in a position to receive light from one window. Top of pole mounted photocells shall be mounted as shown on ED(4). The Contractor shall be responsible for proper operation of the photo-electric control. The Contractor shall move and/or adjust or shield the photocell from stray or ambient nighttime light or shall make any other adjustments required for proper operation. The photocell shall face North when practicable. Unless otherwise shown on the plans, the photocell shall turn on the illumination system at 1.0 +(-) 0.5 footcandle and turn off the illumination system at two footcandles higher than turn on.

XIV. Lighting Contactor. Lighting contactor shall be a UL Listed NEMA rated lighting contactor, two-pole or multipole as required, electrically held type designed to control high pressure sodium lighting loads, with silver alloy double break contacts rated at 240 volts, 480 volts or 600 volts as required. Lighting contactor shall not be the DIN rail mounted type.

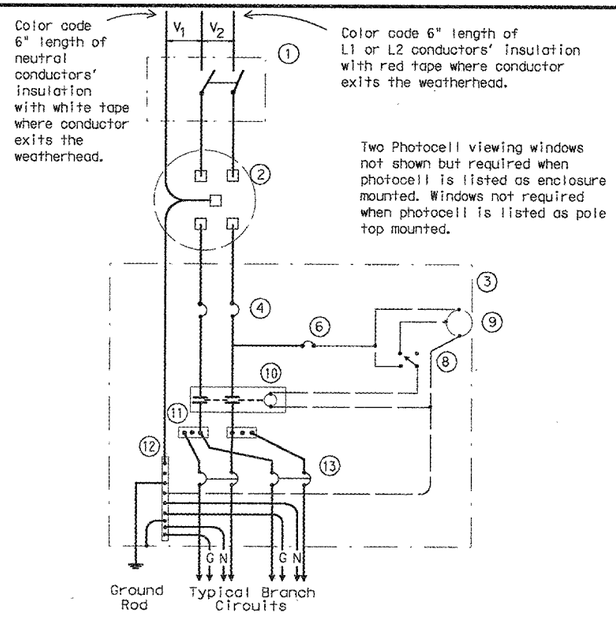
XV. Power Distribution Terminal Blocks. Power distribution terminal blocks shall be rated for 600 volts and shall be used for line side connections to branch circuit breakers where more than one circuit breaker is required. Lugs on blocks shall be properly sized for conductors being used. Only one conductor shall be placed under each lug.

XVI. Neutral/Ground Bus. Neutral/ground bus shall be a factory made bus permanently bonded to the enclosure with properly sized lugs for grounding and neutral conductors.

SCHEMATIC LEGEND

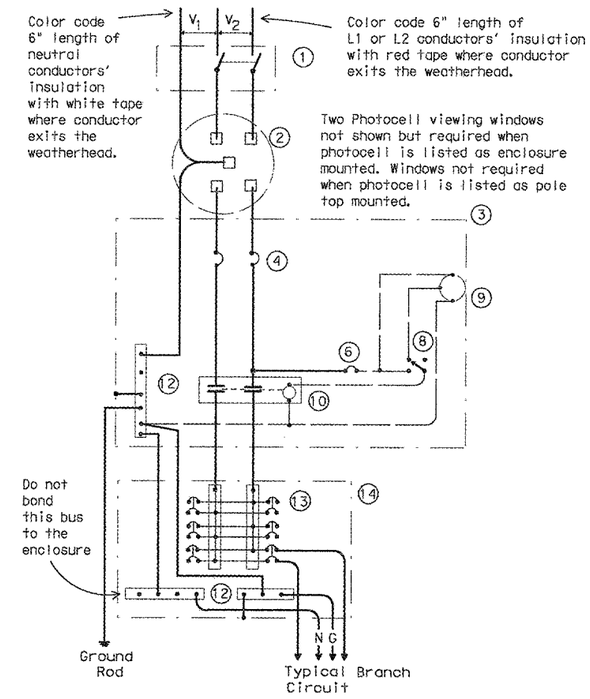
1 - Safety Switch (when required)
2 - Meter (when required)
3 - Service Assembly Enclosure
4 - Main Disconnect Breaker (See Electrical Service Data)
5 - Omit
6 - Circuit Breaker, 15Amp
7 - Auxiliary Enclosure
8 - Control Station ("H-O-A" Switch)
9 - Photo Electric Control (enclosure-mounted shown)
10 - Lighting Contactor
11 - Power Distribution Terminal Blocks
12 - Neutral/Ground Bus
13 - Branch Circuit Breaker (See Electrical Service Data)
14 - Circuit Breaker Panelboard (See Electrical Service Data) (If Type C is shown as AL or SS on descriptive code, this is the service assembly enclosure only. Panelboard enclosure is GS unless otherwise noted.
15 - Load Center

———— Power Wiring
— — — — Control Wiring
—— N —— Neutral Conductor (when required) serve 120 v. loads only)
—— G —— Equipment grounding conductor-always required



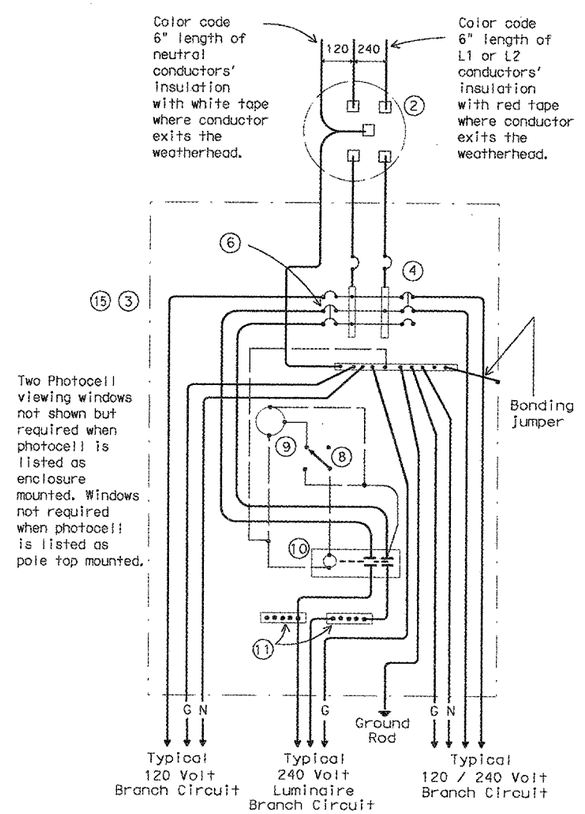
SCHEMATIC TYPE A
THREE WIRE

Maximum feeder circuit size (High Mast Poles): 100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V. Maximum branch circuit size: 50 amps.



SCHEMATIC TYPE C
THREE WIRE

Maximum feeder circuit size (High Mast Poles): 100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V. Maximum branch circuit size: 50 amps.



SCHEMATIC TYPE D
120/240 VOLTS - THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data. See Type D service notes.

TYPE D SERVICE NOTES

Photocell and lighting contactor shall be located either in the same UL type 3R enclosure with load center or, if approved by Engineer, in separate enclosure. There shall be a window on each side of enclosure to allow operation of photocell. Both photocell contactor and breaker area shall have dead front trim. Enclosure, except for RT and PS supports, shall not exceed 36 inches in height or 16 inches in width unless approved by the Engineer. Ty D load center with lighting controls or TY D separate lighting control enclosure shall have power distribution blocks for a minimum of 4, #8 conductors per phase.

Texas Department of Transportation
Traffic Operations Division

ELECTRICAL DETAILS- SERVICE ENCLOSURE & NOTES

ED(5)-03

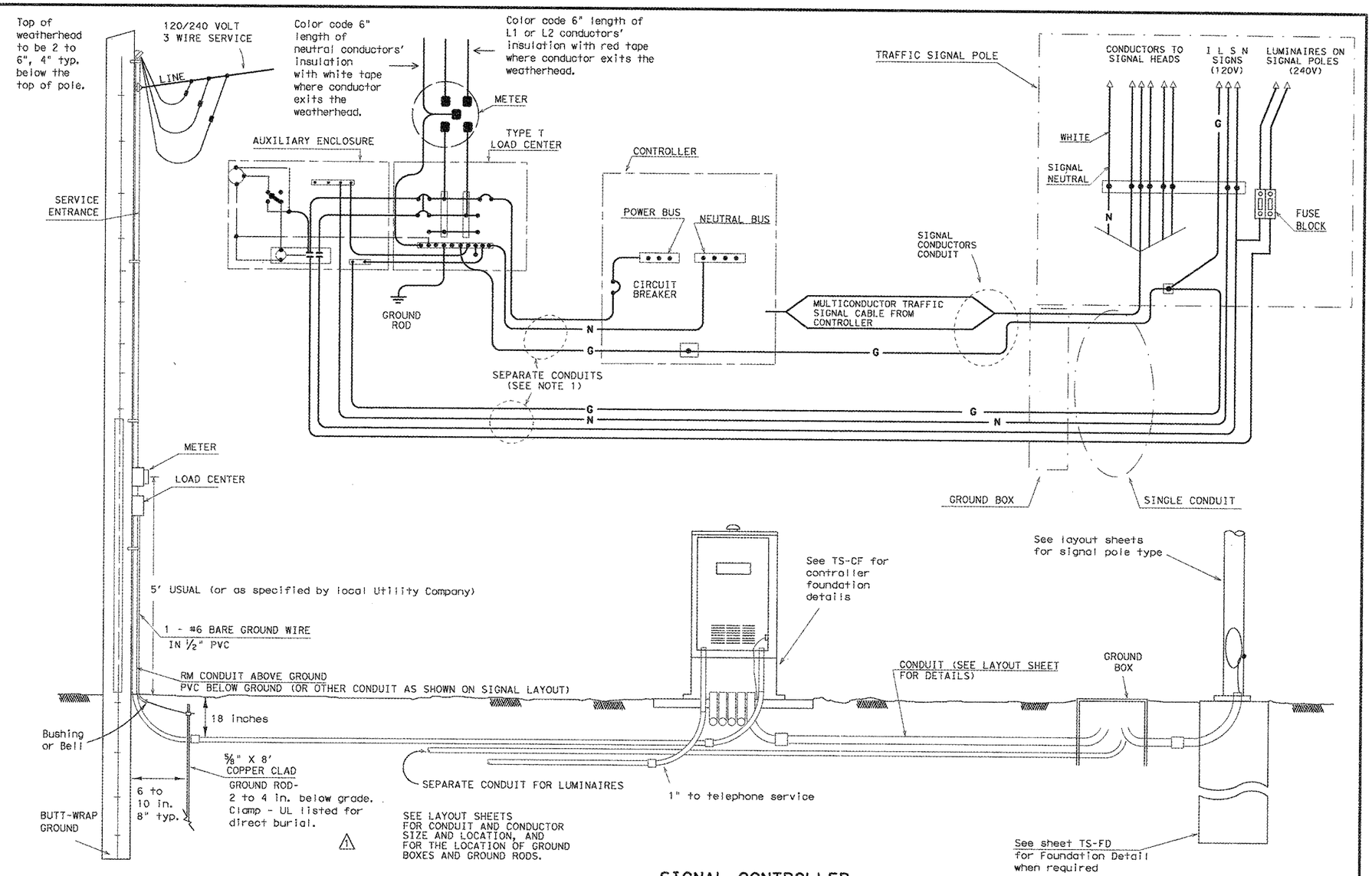
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NOTES:

1. Luminaire conductors shall not be looped through controller cabinet.
2. Electrical system to include an equipment grounding conductor noted here as "G". All exposed metal parts are to be bonded to grounding conductor.
3. Photocell, when required, shall be mounted at top of pole or in enclosure as shown on ED(4) and ED(5) and as required by descriptive code.
4. Roadway lighting fixtures, when required, shall be in accordance with the material and construction methods of the Item, "Roadway Illumination Assemblies" except for the test period for proper operation of the luminaires. Installed roadway lighting luminaires and internally lighted street name signs shall be tested for proper operation as a part of the associated traffic signal system.
5. Internally lighted street name signs (ILSN), when required, shall be in accordance with the Item "Internally Lighted Street Name Signs". Because of the electrical isolation of ILSN hinges, a #12 green grounding conductor shall be run to the ILSN fixture.
6. Install ground rod at alternate location when directed by the Engineer. Maintain a minimum of 8 ft in contact with the earth.
7. Liquidtight flexible metal conduit (LFMC), may be used when meter and service enclosure are mounted 90 to 180 degrees to each other. LFMC shall be same size as service entrance conduit. LFMC shall not exceed 3 ft. and shall be securely supported within one foot of each end. No strap required for a LFMC shorter than 12". Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. A neutral conductor must be installed within the LFMC. Bend in liquidtight flexible metal conduit shall not exceed 180 degrees.
8. Minimum embedment depth as per Item 627 Treated Timber Poles.
9. Pole to be set plumb.
10. Back fill thoroughly tamped in 6 in. lifts. Place 6 inches additional backfill above grade around pole base to allow for settling, as per Item 627.
11. Excess pole length shall be trimmed from the top at a slope to aid water run off.
12. Gain pole two places for each meter, service, separate or auxiliary enclosure. See ED(4) for details.
13. All illumination and power conductors to be pull tested and megged. Do not meg traffic signal cable.
14. Enclosures are to be locked, and ground box covers are to be bolted before power is applied to the circuit.
15. Conduits entering top of enclosures to be fitted with conduit sealing hub or threaded boss, such as meter hub. Off-set nipple, when required, shall not be zinc-die-pressure cast. All metal conduits not connected to conduit sealing hub, or threaded boss must have a grounding bushing. Terminate bonding jumper to ground bus. All conduits entering enclosures shall be sealed. Silicone shall not be allowed.



ELECTRICAL SERVICE

(TYPE T TIMBER POLE SHOWN AS EXAMPLE, SEE ELECTRICAL DETAILS, LAYOUT SHEETS, AND ELECTRICAL SERVICE DATA SHEET FOR SERVICE REQUIRED AND FOR DETAILS.)

SIGNAL CONTROLLER

SIGNAL POLE

Unless shown elsewhere in the plans, electrical service data for Types D and T shall be as follows.

ELECTRICAL SERVICE DATA

ELECTRICAL SERVICE DESCRIPTION(SEE ED(4))	SERVICE CONDUIT SIZE (RMC)	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE/AMP	TWO-POLE CONTACTOR AMPS ***	PANELBD./ LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE/AMPS	KVA LOAD
TY D (120/240)070(NS)AL(E)**(*)	1¼ ⚠1	3/#4	N/A	2P/70	30	100	T.S. Lighting	1P/50 2P/15	<7.1
TY T (120/240)000(NS)GS(E)**(*)	1¼ ⚠1	3/#4	N/A	None	30	70	T.S. Lighting	1P/50 2P/15	<7.1

*** Eliminate photocell, contactor and seperate enclosure if lighting, or internally lighted signs are not required by plans
** See descriptive code in estimate for service support type.
* See descriptive code in estimate for overhead or underground service.

5/03 Revision
⚠1 Revised notes.

Texas Department of Transportation
Traffic Operations Division

ELECTRICAL DETAILS- TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(7)-03

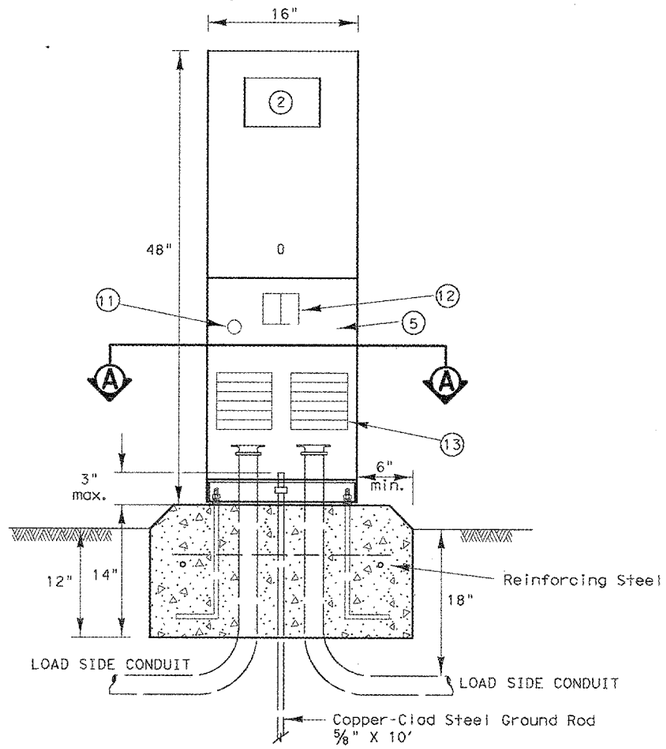
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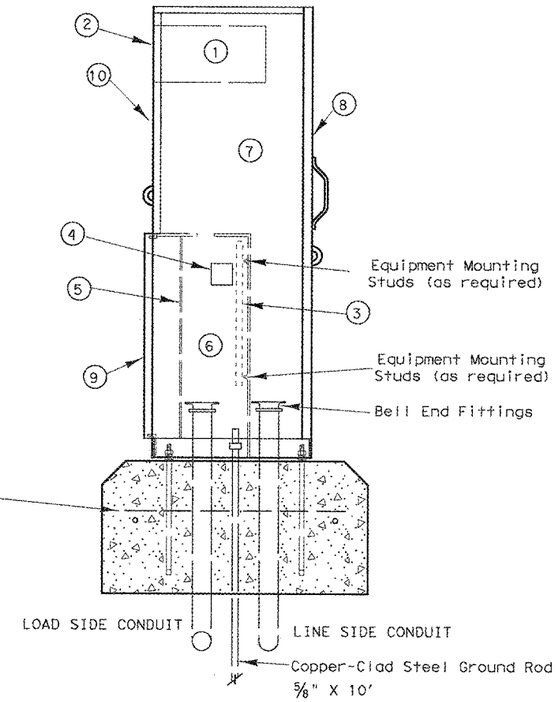
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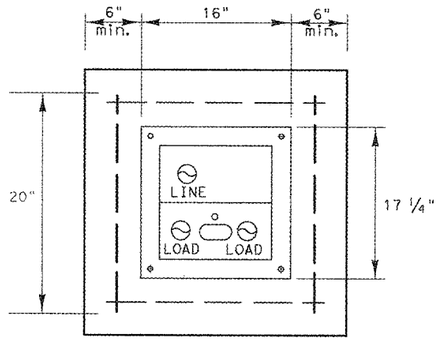
Note: Ells in foundation are rigid metal, size called for on the plans. Extension conduits from these ells may be PVC, provided ends of rigid metal conduits are more than 2 in. below top of concrete foundation. Where extension conduits are metal, grounding bushing must be installed and a bonding jumper properly terminated.

FRONT VIEW

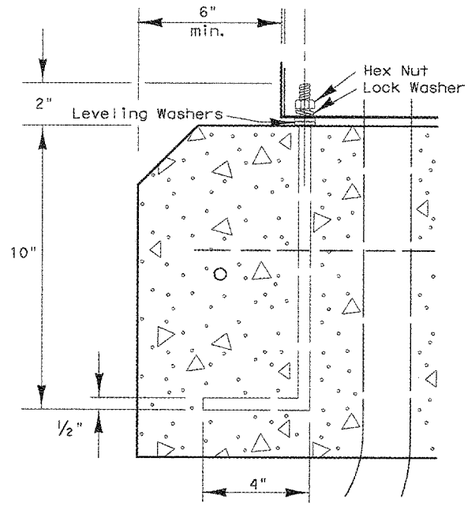
Ty C shown, Ty A similar except that Ty A shall have individual circuit breakers mounted on a equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SIDE VIEW



SECTION A-A



ANCHOR BOLT DETAIL

GENERAL NOTES

1. The pedestal service shall be UL type 3R, and shall be constructed of a minimum of 12 guage stainless steel or aluminum as required by descriptive code. Stainless steel shall not be painted. For aluminum, the finish shall be an electrostatic applied poly-urethane baked on powder, light green in color, or color as shown elsewhere and as approved by the Engineer. The front of the interior dead front trim shall be permanently labeled, "Danger High Voltage" with OSHA style label. The exterior of the pedestal service door shall be permanently labeled with a placard as to its use (i.e. Roadway Lighting, Traffic Signals, etc.). Placard shall be neat and professional in appearance. Lettering shall be 1" minimum height.
2. Utility Access Door shall have stainless steel piano hinge and provisions for padlocking.
3. Pedestal door shall have stainless steel piano hinge and stainless steel latch with provisions for padlocking.
4. Meter Access shall be hinged and capable of padlocking.
5. All mounting hardware and installation details of services shall be in accordance with utility company specifications. The Contractor is responsible for contacting the local utility company and obtaining their approval of pedestal details prior to making submittal to the Department and prior to constructing the electrical pedestal service. Any changes required by the utility company shall be noted on the submittals.
6. Meter Socket shall be a minimum of 100 amp rating and shall comply with the local utility requirements.
7. Photoelectric Control shall meet the requirements as shown on ED(5). Shield to control stray light is allowable. The Contractor shall be responsible for proper operation of the photo-electric control. The Contractor shall move and/or adjust or shield the photocell from stray or ambient nighttime light or shall make any other adjustments required for proper operation. The photocell shall face North when practicable. Unless otherwise shown on the plans, the photocell shall turn on the illumination system at 1.0 +(-) 0.5 foot-candle and turn off the illumination system at two footcandles higher than turn on.
8. The Control Station (H-O-A Switch) shall be as shown on ED(5) except that H-O-A Switch operating handle shall protrude through hinged deadfront trim and NEMA 1 enclosure will not be required.
9. Concrete for pedestal service foundation shall be class A or C and shall be in accordance with Item 420, "CONCRETE STRUCTURES", except that concrete will not be paid for directly but shall be considered subsidiary to Item 628, "ELECTRICAL SERVICES".
10. Reinforcing steel shall be #4 rebar in accordance with Item 440, "REINFORCING STEEL".
11. Anchor bolts shall be A36M55 in accordance with Item 449, "ANCHOR BOLTS". Anchor bolts shall be ½inch x 12 inches x 4 inches (dia. x length x hook length).
12. All conduit and conductors attached to the pedestal service and within 12 inches of the pedestal service will not be paid for directly, but shall be subsidiary to the pedestal service. All service conduit and conductors from the utility company transformer to a point 12 inches from the pedestal service shall be paid for separately. Service conduit shall be the size and type as shown in the Electrical Service Data.
13. Dimensions may vary to accomodate required equipment, utility company requirements, or manufacturer's standard equipment dimensions. The Contractor shall submit to the Engineer for approval, six (6) copies of brochures and/or drawings of the pedestal service to be supplied, including actual dimensions, and a paint color sample.
14. A separate enclosure as shown on ED(4) or ED(5) for photocell shall not be used for pedestal services. Photocell shall be installed as shown here.
15. The pedestal door shall have a mechanically attached data pocket on the inside. Pocket shall be either metal or thermoplastic and shall measure at least 12 inches by 12 inches. The Contractor shall prepare and submit a schematic drawing unique to an individual service. The approved drawing shall be laminated and placed in the document pocket of the service at the time of shipment to the job site. All applicable wiring diagrams and plan sheet layouts for all equipment and branch breaker circuits supplied by that service shall also be laminated and placed in the document pocket prior to shipping.
16. ⚠ Ground rod clamp to be UL listed for direct burial. All non-conductive coating to be removed from ground rod at clamp location. Ground rod wire to be #6 AWG solid copper. Metal conduit ells to have grounding bushing and bonding jumpers correctly installed.
17. All conduits entering enclosures from underground must be sealed. Silicone shall not be allowed.
18. All conductors shall be megged and pull tested. Traffic signal cable not to be megged after connection, as electronics will be damaged.
19. Top of concrete foundation to be finished in a neat and workman like manner. If leveling washers are used, no more than⅛in. height shall be used at any one corner. Maximum dip or rise in foundation is not to exceed⅛in per foot. When properly installed, top of service enclosure shall read level front to back and side to side within¼in. Rocking or movement of the service enclosure shall be repaired by the contractor at no cost to the state.
20. Liquidtight flexible metal conduit shall not be allowed on PS type services.

LEGEND

1. METER SOCKET, (when required)
2. METER SOCKET WINDOW, (when required)
3. EQUIPMENT MOUNTING PANEL
4. PHOTO ELECTRIC CONTROL WINDOW, (when required)
5. HINGED DEADFRONT TRIM
6. LOAD SIDE CONDUIT AREA
7. LINE SIDE CONDUIT AREA
8. UTILITY ACCESS DOOR, with handle
9. PEDESTAL DOOR
10. HINGED METER ACCESS
11. CONTROL STATION (H-O-A Switch)
12. MAIN DISCONNECT
13. BRANCH CIRCUIT BREAKERS

5/03 Revision

⚠ Revised notes.

Texas Department of Transportation
Traffic Operations Division

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS

ED(8)-03

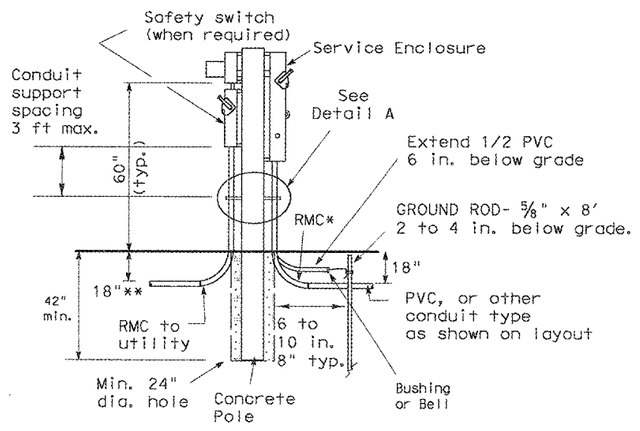
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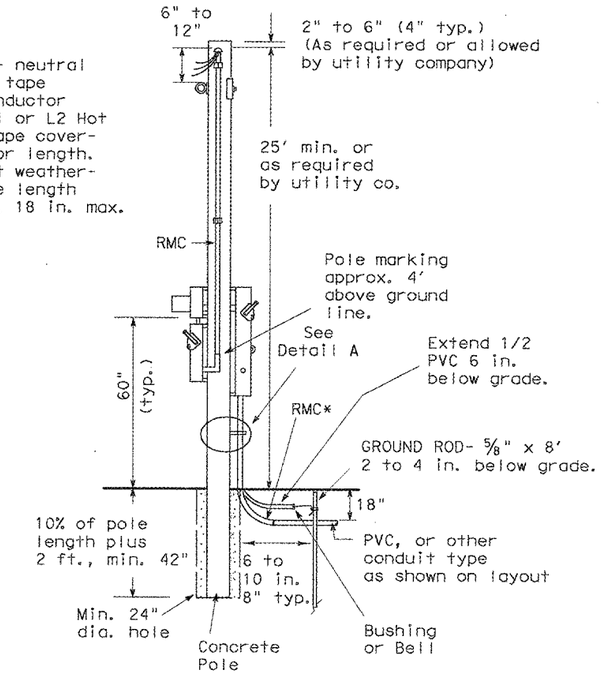
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Color code grounded - neutral conductor with white tape covering 6 in. of conductor length. Color code L1 or L2 Hot conductor with red tape covering 6 in. of conductor length. Where conductors exit weatherhead, conductors free length shall be 12 in. min., 18 in. max.



CONCRETE SERVICE SUPPORT

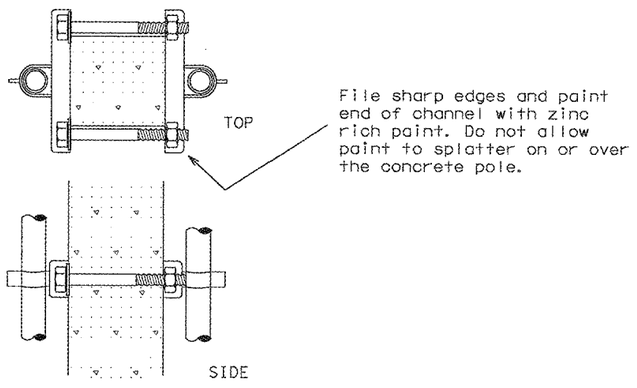
(Underground)



CONCRETE SERVICE SUPPORT

(Overhead)

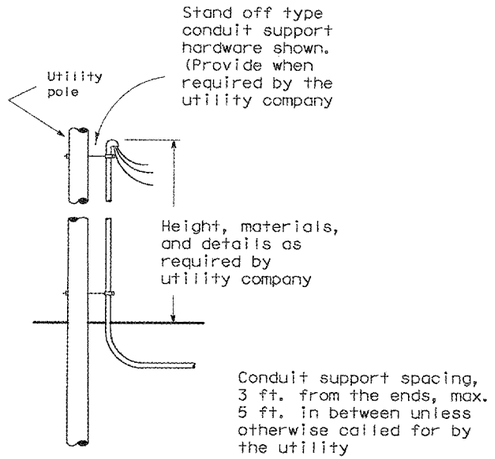
*same size as branch circuit conduit shown on layout sheets.
** or as required by utility company.



DETAIL A

Channel bracket or other arrangement approved by the Engineer. (Kindorf, Unistrut, B-line or equal)

Note: Attach channels with stainless steel concrete anchors (max. 1" depth), square U-bolts or back to back channel with long bolts, or other secure mounting as approved by the Engineer. Bolts galvanized in accordance with ASTM A153. Channel shall be galvanized.



UTILITY POLE CONNECTIONS

(When underground service is required by descriptive code and utility is overhead.)

NOTES:

Electrical service support structures bid as type GC or OC shall be concrete poles and shall meet the following specifications.

1. Poles shall be prestressed concrete and suitable for direct embedment into the ground without special foundations.
2. Poles bid as type "GC" shall be a granite concrete mixture consisting of gray Portland cement with exposed pink granite aggregate. Poles bid as type "OC" shall be other concrete mixture as shown elsewhere on the plans or as directed by the Engineer.
3. Poles greater than 10 ' shall be square in cross-section, with chamfered corners, and shall have a standard taper of 0.162 inch per foot. Cross sectional dimensions shall not deviate by more than 3/8 inch. Poles 10' or less may be tapered .162"/ft or may be non-tapered. The allowable tolerance shall be plus 3 inches and -2 inches in the overall length. The width of the bottom face of the pole as it is cast may be less than the top face. All small cavities shall be cleaned, saturated with water and then filled with mortar. A small cavity is defined as one larger than 1/4 inch but smaller than 3/4 inch in diameter, and less than 3/8 inch deep. Larger non-structural cavities and spalls shall be repaired by opening side of the damaged area on a 1 to 1 slope using a mechanical grinder, cleaning thoroughly and filling with a high-strength non-shrink concrete repair material. Poles with other defects may be repaired only upon authorization of and using the method prescribed by the Engineer.
4. The end of each steel reinforcing strand in the tip and butt shall be burned back to a minimum depth of 1/2 inch. The holes left by the removal of the strand shall be thoroughly cleaned of any loose residue. The holes shall then be completely filled with non-shrink grout and smoothed evenly with tip or butt surface.
5. Prestressing strands shall have a minimum concrete cover of 1 1/4 inch.
6. A straight line joining the edge of the pole at the butt and the edge of the pole at the top shall not be distant from the surface of the pole at any point by more than 3/8 inch for each 10 feet of length.
7. The chloride content of the concrete mix, including all ingredients shall be 0.4 pounds per cubic yard, or less.
8. Concrete used in poles shall have a compressive strength at transfer of not less than 4,000 PSI, and a 28-day compressive strength of not less than 7,000 PSI.
9. Materials shall comply with the latest version of the following standards:
   a) Portland Cement - ASTM C105
   b) Admixtures - ASTM C494
   c) Aggregates - ASTM C33 or C330
   d) Reinforcing Bars - ASTM A615
   e) Cold-Drawn Spiral Wire - ASTM A82
   f) Prestressing Strand, 270K - ASTM A416
10. Poles greater than 10' shall have a 4 inch tip and 3/8 inch strands. Poles 10' or less shall have a 5 inch min. tip and 3/8 inch strands. Pole shall have a load capacity of greater than 1188 lbs. applied 2 ft. below tip.
11. Poles shall be capable of withstanding single point pick up from the horizontal position when lifting from a point 30% of the overall length down from the tip.
12. All poles shall be marked by imprinting on one face. Marking shall indicate manufacturer's name, year of manufacture, length and name or type of pole. Marking shall be located approximately 4 ft. above ground line.
13. Dunnage points, two-point pickup locations for handling pole in horizontal position, and one-point pickup locations for use in raising the pole to a vertical position and handling in setting operation shall be marked on the pole with durable ink or paint or cast into the pole. These marks shall be small but conspicuous.
14. Poles shall be embedded 42 inches or 10% of length plus 2 ft. into the ground whichever is greater.
15. When required by utility company for overhead services, poles longer than 10 feet shall have a #6 solid ground wire running the entire length exiting within 6 inches from the top and bottom of the pole. The Contractor shall connect the bottom to a butt wrap or butt plate grounding device.
16. All conduit and conductors attached to the service support and within 12 inches of the service support will not be paid for directly, but shall be subsidiary to the electrical service. All conduit and conductors from the utility company pole to a point 12 inches from the service support, including conduit and conductors required for the utility pole riser when furnished by the Contractor, will be paid for separately.
17. All mounting hardware and installation details of services shall be in accordance with utility company specifications.
18. All conduit on service supports shall be rigid metal conduit except the conduit for grounding electrode conductor (ground rod wire) shall be 1/2 inch PVC. Service entrance conduit size shall be as shown elsewhere. Conduit for branch circuit entry to enclosure shall be the same size as that shown on the layout sheets for branch circuit conduit. Rigid metal conduit shall extend a minimum of six inches underground and then coupled to the type conduit shown on the layout for that particular branch circuit. RMC shall have grounding bushings in enclosures.
19. Backfill shall be in accordance with Item 400 except for measurement and payment. Backfilling will not be paid for directly but shall be subsidiary to the various bid items.
20. Liquid tight flexible metal conduit (LFMC), may be used when meter and service enclosure are mounted 90 to 180 degrees to each other. LFMC shall not exceed 3 ft. and shall be securely supported within one ft. of each end. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. A neutral conductor must be installed within the LFMC. Bend in LFMC shall not exceed 180 degrees. LFMC may not be installed on utility company owned poles. A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.
21. Contractor may order concrete service support structures with 3/4" hole near top of pole for eye bolt type bracket. Eye bolt bracket may be installed as means of overhead service drop anchoring point by utility. Pole may also be center drilled in the field for installation of eye bolt bracket. When used, install bracket 6" to 12" below weatherhead.

Texas Department of Transportation
Traffic Operations Division

ELECTRICAL DETAILS- SERVICE SUPPORT TYPES GC AND OC

ED(9)-03

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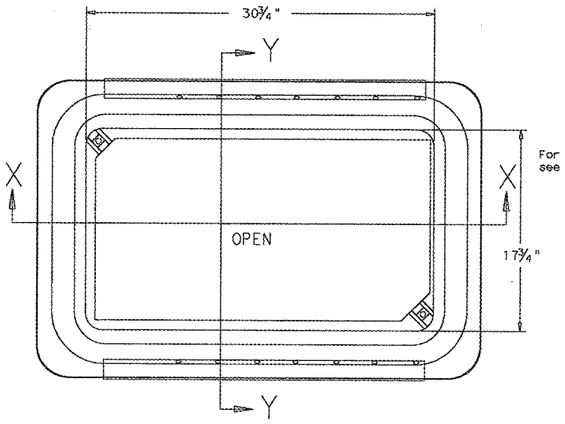
GROUND BOX - Type - Battery Box

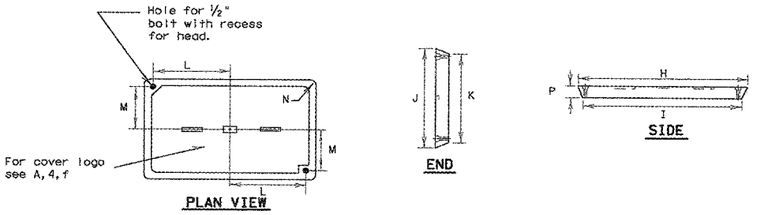
A. MATERIALS

1. Battery box ground boxes shall be constructed such that it will be possible to install and accomodate up to 4 batteries measuring 8" x 13.5" x 10" (W x L x D).
2. All battery box ground boxes and covers shall be permanently marked either by impress or by permanent ink, with manufacturer's model number and manufacturer's name or logo.
3. Covers shall be bolted down, and bolt holes in the box shall be arranged to drain dirt.
4. Battery box ground boxes shall meet the following requirements:
   a. Battery box cover and cover ring will be manufactured from polymer concrete reinforced with continuous strands of woven or stitched borosilicate fiberglass cloth. The polymer concrete shall be made from catalyzed polyester resin, sand and aggregate, and shall have a minimum compressive strength of 11,000 psi. Polymer concrete containing chopped fiberglass or fiberglass reinforced plastic is not acceptable.
   b. Battery box ground box walls will be manufactured from fiberglass reinforced plastic reinforced with continuos strands of woven or stitched borosilicate fiberglass cloth. The fiberglass reinforced plastic shall be made from catalyzed polyester resin, lightweight filler and reinforced with woven roving and shall have a minimum compressive strength of 7,500 psi.
   c. Minimum inside dimensions shall be at least as follows (width x length x depth): Battery box shall be at least 15 1/4 inches x 28 1/4 inches x 14 1/2 inches.
   d. Bottom edge of box or extension shall be footed with a minimum 1/2 inch flange.
   e. Battery ground boxes shall withstand 600 lbs. per sq. ft. applied over the entire sidewall with less than 1/4 inch deflection per foot length of box. Ground boxes and covers shall withstand a test loading of 20,000 lbs. over a 10 inch by 20 inch area centered on the cover with less than 1/2 inch deflection. Battery ground boxes and covers shall meet Western Underground Standards 3.6. Manufacturer shall supply certification by an independent laboratory or sealed by a Texas-Licensed Professional Engineer.
   f. Covers shall be 2 inch thick polymer concrete. All hardware shall be stainless steel. Cover shall be secured with two 1/2 inch stainless steel bolts. Bolts shall be self-retaining and shall withstand a minimum of 70 ft-lbs. torque and shall have a minimum 750 lbs. straight pull out strength. Nuts shall be floating and shall provide a minimum of 1/2 inch movement from the center of the nut. Covers shall be skid resistant, minimum 0.5 coefficient of friction. Covers shall be interchangeable between manufacturers and shall conform to the dimensions shown herein. Unless otherwise approved by the Engineer, cover shall be legibly labeled, "Traffic Signals Danger High Voltage" in minimum 1 inch letters.
   g. The battery box shall be supplied with predrilled holes to accept 3/8 inch stainless steel rods. The holes shall be installed 1 1/2 inches (+/- 1/4 inches) above the bottom edge of the box along the length of the box at 3 1/2 inch centers beginning 4 1/2 inches from the edge of the box.
   h. A minimum of seven 3/8 inch stainless steel rods threaded on both ends shall come equipped to be inserted in the predrilled holes to serve as a rack sufficient to accommodate up to four batteries. The rods shall be secured in place utilizing 3/8" stainless steel (s.s.) nuts and 3/8" X 1" s.s. flat washers.
   i. Ground boxes of the type specified above shall meet the requirements shown above. The Contractor will be permitted to furnish like materials of any manufacturer provided they are of equal quality and comply with the specifications.
   j. Two 3/8" plastic sheets measuring a nominal 6" x 24" shall be supplied which are to be placed on the secured rods upon which the batteries (supplied by others) are to be set.
   k. A minimum of four battery "bell jars" and respective tie down straps are to be supplied. These bell jars are inverted over the batteries and strapped to the batteries.

B. CONSTRUCTION METHODS

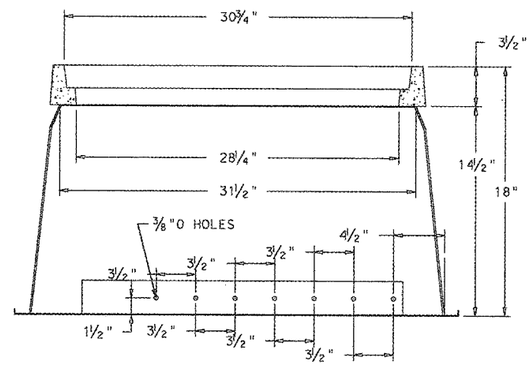
1. Battery box ground boxes shall be set on a 9 inch (minimum) bed of coarse No. 1 aggregate as defined by Item 421. Gravel shall be in place prior to setting box and conduits shall be capped. Any gravel or dirt in conduit shall be removed.
2. Construction of an apron encasing the battery box ground box including concrete and reinforcing steel is required and shall not be paid for directly but shall be subsidiary to the ground box. Reinforcing steel may be field bent. Concrete for aprons shall be considered miscellaneous concrete for testing purposes. Aprons shall be cast in place.
3. Any holes cut into the sidewall of battery box ground boxes shall be accomplished using a round hole saw or other method approved by the Engineer.



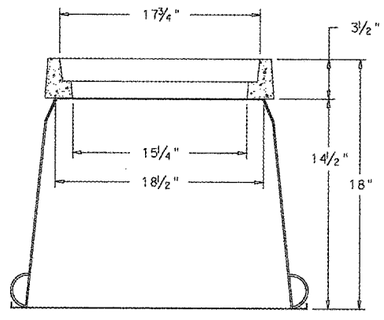


GROUND BOX COVER

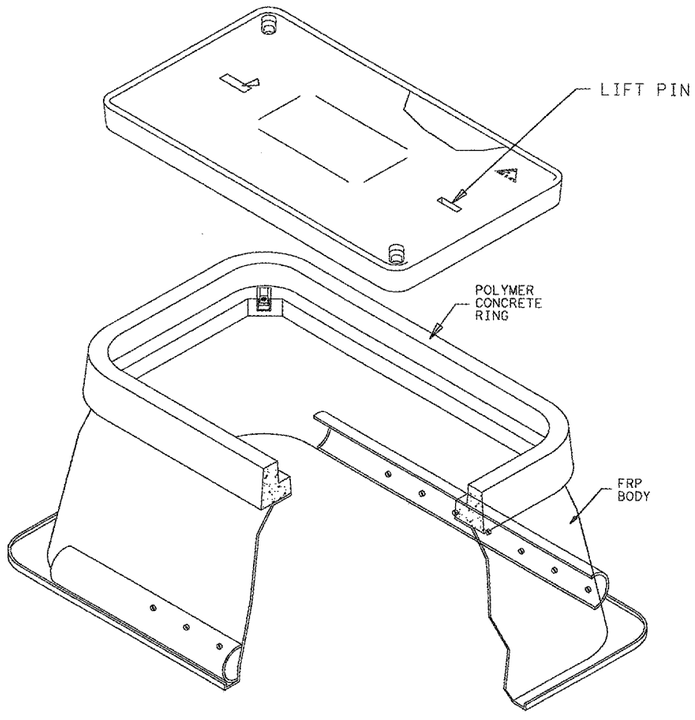
GROUND BOX COVER DIMENSIONS								
BOX SIZE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
Battery box	30 ½	30 ¼	17 ½	17 ¼	13 ¼	6 ¾	1 ⅜	2

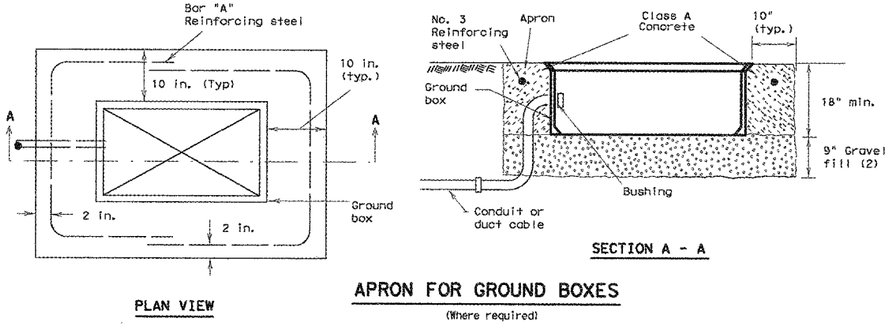


SECTION X-X



SECTION Y-Y





APRON FOR GROUND BOXES
(Where required)

(1) Place gravel "under" the box, not "in" the box. Gravel should not encroach on the interior volume of the box.
(2) Install bushing on the upper end of all ells.
(3) All conduits shall be installed in a neat and workmanlike manner.

Texas Department of Transportation
Traffic Operations Division

ELECTRICAL DETAILS GROUND BOXES/ BATTERY BOX

ED(13)-03

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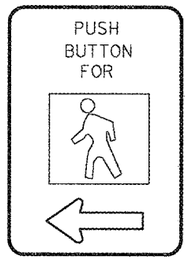
REVISIONS

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

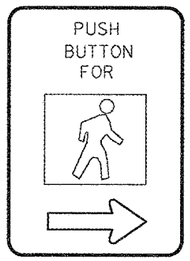
CONT	SECT	JOB	HIGHWAY
3148	01	006	FM 3097

DIST	COUNTY	SHEET NO.
DAL	ROCKWALL	227

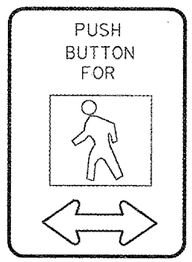
SIGN R10-4bL
9" x 12"



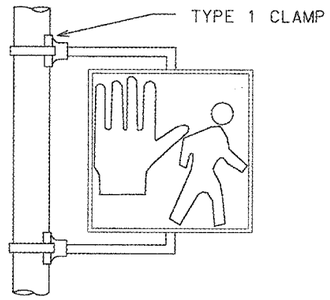
SIGN R10-4bR
9" x 12"



SIGN R10-4bRL
9" x 12"

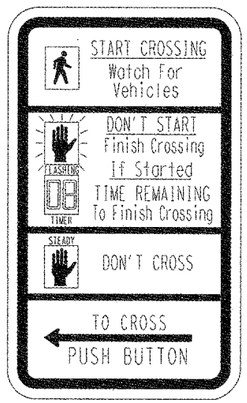


PEDESTRIAN PUSHBUTTON
SIGN DETAILS

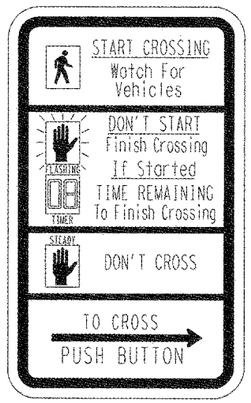


PEDESTRIAN SIGNAL HEAD MOUNTING
FOR ONE PEDESTRIAN SIGNAL HEAD
152A

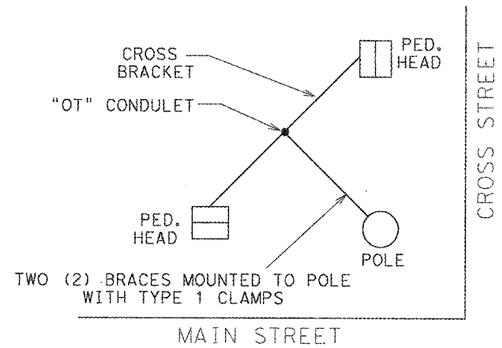
SIGN R10-3eL
9" X 15"



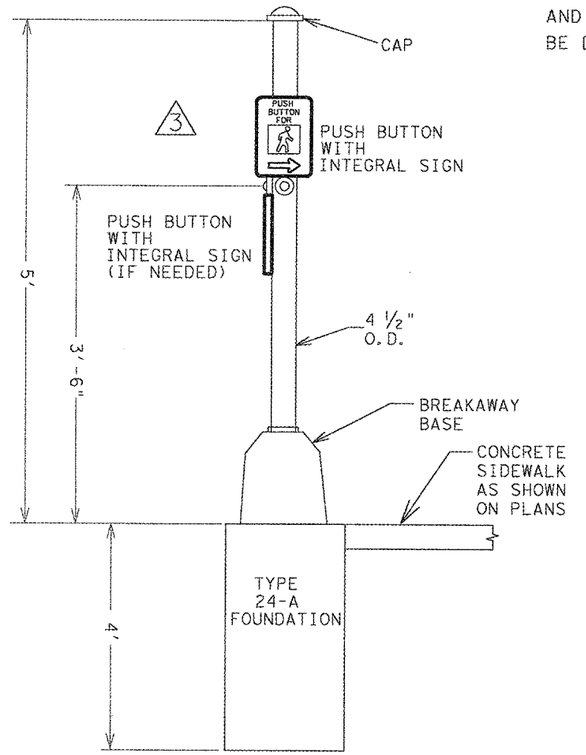
SIGN R10-3eR
9" X 15"



COUNTDOWN PEDESTRIAN PUSHBUTTON
SIGN DETAILS



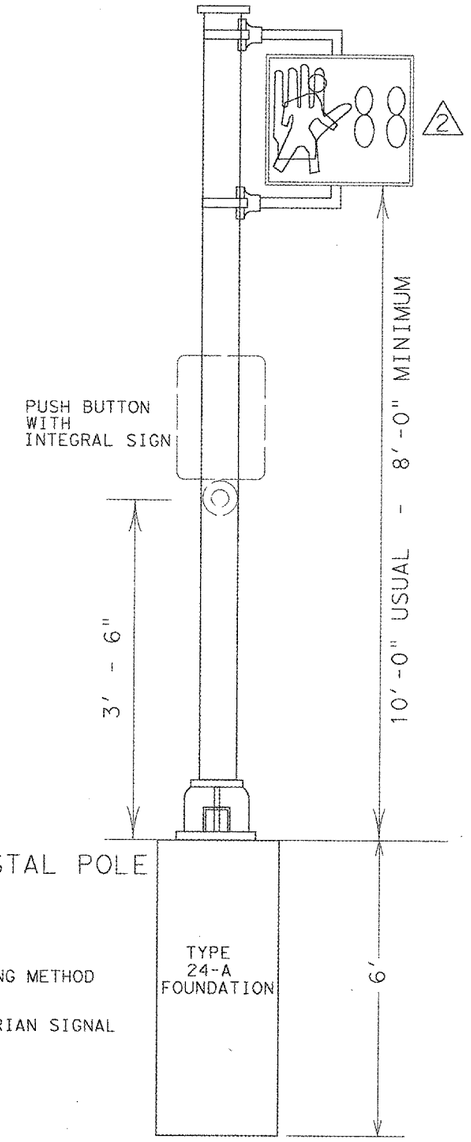
PEDESTRIAN SIGNAL HEAD MOUNTING
FOR TWO PEDESTRIAN SIGNAL HEADS
143C



PEDESTRIAN PUSH BUTTON POLE

NOTE:

THE POLES ON THIS DRAWING ARE SHOWN AS AN EXAMPLE ONLY. POLES OF SIMILAR DESIGN FOR ANY CROSS SECTION WHICH MEET THE SPECIFICATIONS AND REQUIREMENTS SHOWN ON THESE DRAWINGS AND ARE APPROVED BY THE ENGINEER WILL BE DEEMED ACCEPTABLE.

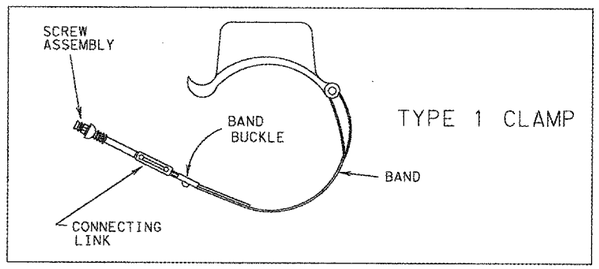


PEDESTAL POLE

1. NOTE: CLAM SHELL MOUNTING HARDWARE MAY BE USED INSTEAD OF MOUNTING HARDWARE SHOWN ABOVE, AS APPROVED BY THE ENGINEER. ICC P/N 4805 OR McCAIN QUICKMOUNT OR APPROVED EQUAL.

NOTES:

1. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH TYPE 1 CLAMPS AND APPROPRIATE TUBING.
2. ALL PEDESTRIAN SIGNAL HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
3. ALL WIRING FOR PEDESTRIAN SIGNALS SHALL BE TOTALLY ENCLOSED WITHIN THE SIGNAL MOUNTING HARDWARE.
4. ALL PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON SIGNS SHALL DISPLAY THE SYMBOLIZED MESSAGES SHOWN ABOVE.



TYPE 1 CLAMP

1. ALTERNATIVE MOUNTING METHOD revised 12-92
2. ALTERNATIVE PEDESTRIAN SIGNAL HEAD AND SIGNING revised 10-08
3. PEDESTRIAN PUSH BUTTON POLE revised 01-11

DALLAS DISTRICT STANDARD

PEDESTRIAN SIGNAL HEAD IDENTIFICATION

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		228
STATE	STATE DIST.	COUNTY	
TEXAS	DAL	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
3148	01	006	FM 3097

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.

ROADWAY ILLUMINATION LIGHT FIXTURES

Fixture Housing:

A. Provide *UL listed fixture suitable for use in wet locations. Ensure optical compartment meets IEC Standard 60529-IP 65. Place a permanent label inside fixture indicating fixture meets *UL, IP 65 optical, and shows date of manufacture. Meet ANSI 136.15 wattage label requirements.

B. Construct fixture housing, lens frame, and door from 96% copper-free, die cast aluminum. Provide fixture mounting to a 2-in. pipe arm. Equip fixture with a 4-bolt clamp capable of adjustments plus or minus 5 degrees from level. Meet ANSI 136.31 3.0 G vibration requirements.

C. Attach a level bubble to the fixture housing. Ensure the level bubble is sensitive to 1 degree changes in position at any point within 5 degrees of the level position. Ensure the level bubble is clearly visible from the ground up to a 50 ft. mounting height. Ensure level bubble corresponds to level position of fixture.

D. Do not exceed 1.6 sq. ft. effective projected area. Do not exceed 60 lb. maximum weight.

E. Equip fixture with a 3-prong photocell receptacle with shorting cap installed.

F. Paint inside and outside of fixture light gray, when installing on galvanized poles. For all other fixtures, paint to match the color of the pole as directed by the Department.

G. Use a thermoset powder coat system. Ensure paint exceeds 1000-hr. salt-spray test in accordance with ASTM B117. Ensure a nominal thickness of 2.5 mil and no pigment loss upon 50 double-rubs using Methyl Ethyl Ketone (MEK) solvent in accordance with ASTM D5402, "Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs."

H. Fabricate brackets, nuts, bolts, washers, ballast tray, and parts from stainless-steel, or aluminum of adequate thickness as approved by the Department except that:
1. The 4 bolts/studs, 4 flat washers, 4 lock washers, and clamp that attach the luminaire to the arm may be galvanized in accordance with ASTM A123, A153 or B633. Provide means to ensure clamp is in the open position when installing.
2. Glass lens retainer spring clips may be fabricated from galvanized steel in accordance with ASTM A153.
3. Provide nylon throat or other approved locking means for all stainless steel nuts.

I. Provide optical assemblies which meet the following:
1. Polished aluminum reflectors with Alzak or equal coating.
2. Do not paint reflectors, except that, when approved by the Engineer, some surfaces may be painted with 92% reflective white paint.
3. Reflectors may be one piece or segmented as follows.
   a. One piece reflectors:
      1. Seal photometric compartment by the use of a seamless or vulcanized seam, closed-cell silicone gasket, or other method approved by the Department.
      2. Provide a non-adjustable lamp socket mounting method so the lamp center is consistent with the reflector.
   b. Segmented reflectors:
      1. Attach segments at both ends (or opposite sides if segments are square) of the segment to a rigid aluminum base plate and side wall support assembly. Seal glass lens to lens frame with a one piece seamless silicone gasket.
4. Equip the optical assembly with a lamp support in addition to the lamp socket to ensure the outer envelope is positioned as intended.

J. Provide 5/32 in. thick (min.) clear heat tempered or borosilicate glass.

Electrical Components:

K. Meet the following ballast requirements and pass tests in accordance with Test Method Tex-1130-T, "Ballasts of Lighting Assemblies."
1. Mount electrical components on a removable stainless steel or aluminum tray of adequate thickness.
2. Provide a fixture wiring diagram on or near the ballast.
3. Use a copper wound magnetic regulating three isolated coil ballast.
4. Provide ballast factor between 0.95 and 1.0.
5. When the circuit voltage indicated on the plans is applied, the ballast input wattage during fluctuations of the test voltage of plus 10 percent and minus 10 percent, do not exceed the following:
   a. 220 Watts for 150 watt nominal lamp rating
   b. 440 Watts for 250 watt nominal lamp rating
   c. 552 Watts for 400 watt nominal lamp rating
6. During fluctuation of the test voltage of plus 10 percent and minus 10 percent, ensure the lamp wattage fluctuation does not exceed a total of 20 percent and ballast maintains lamp wattage within the following limits.
   a. 110 Watts minimum and 180 Watts maximum for 150 Watt nominal lamp rating
   b. 175 Watts minimum and 370 Watts maximum for 250 Watt nominal lamp rating
   c. 280 Watts minimum and 475 Watts maximum for 400 Watt nominal lamp rating
7. Ensure the ballast power factor, when tested at circuit voltage indicated on the plans, is not less than 90%.
8. Permanently and clearly mark ballast or fixture to indicate following:
   a. Lamp type
   b. Catalog number
   c. Voltage rating
   d. Connection diagram
   e. Manufacturer
   f. *UL listing

L. Meet the following electronic starting aid requirements and pass tests in accordance with Test Method Tex-1140-T, "Electronic Starting Aids of High Pressure Sodium Vapor Lighting Assemblies."
1. Provide a starting pulse with an amplitude of 2500 volts minimum, 4000 volts maximum.
2. Ensure the pulse width is a minimum of 0.8 microseconds at 2250 volts.
3. Ensure the pulse occurs when the open circuit voltage is equal to or greater than 90 percent of peak open circuit voltage.
4. Ensure pulse repetition rate is a minimum of one per cycle.
5. Provide a pulse current of 0.18 amperes (min.).
6. Discontinue to pulse when, either,
   a. the lamp starts, or
   b. after a minimum of 3 minutes and a maximum of 10 minutes if the lamp fails to start.

M. Do not place fuses inside pole mounted luminaires. For wall mount or underpass mounted luminaires, provide internal 10 amp time-delay fuses.

N. Provide a two position terminal block for connecting supply wires which meet the following requirements:
1. Insulate using nylon, porcelain, or phenolic material. Ensure phenolic terminal block is of adequate construction as approved by the Department.
2. Fabricate terminals from nickel, tin plated brass, or aluminum.

O. Equip fixture with MOV surge protection in accordance with IEEE recommendations.
1. Connect MOV from line to neutral or from line to line.
2. Install MOV on the terminal block.

Lamp & Socket:

P. Provide *UL listed mogul base lamp sockets rated for 600 V, 1500 W that can withstand a 5000 V pulse. Meet *UL 496 requirements. Use porcelain-insulated lamp sockets with nickel plated copper alloy screw shells. Equip socket shell with a spring tensioned contact. Use nickel-plated copper alloy or stainless steel for the spring and contact.

Q. Supply and secure lamps inside the fixture that meet the following:
1. Use pre-qualified high pressure sodium (HPS) lamps from TxDOT's material producers list of the wattages shown on the plans. No alternatives allowed.
2. Average rated lamp life 30,000 hours.
3. Fully extinguish at end of usable lamp life and remain extinguished without cycling.
4. Do not provide lamps that burn at reduced output at end of life.
5. Meet the Federal Toxic Characteristic Leachate Procedure (TCLP) limits.

Performance:

R. Meet the following photometric requirements using published photometric data and photometric data obtained by testing sampled fixtures.
1. 150 Watt mast arm (underpass) mounted luminaire. Meet IESNA Cutoff requirements. Provide a minimum intensity of 0.20 foot-candle in a rectangular area measuring 110.0 ft. by 30.0 ft., when mounted in a level position as indicated on the properly mounted fixture level bubble 20.0 ft. above the midpoint of either long side of the surface area. Do not exceed 50:1 maximum to minimum horizontal illuminance uniformity ratio within the rectangular area.
2. 250-watt mast arm mounted luminaire. Meet IESNA Cutoff requirements. Provide a minimum intensity of 0.20 foot-candle in a rectangular area measuring 190.0 ft. by 45.0 ft., when mounted properly in a level position as indicated on the level bubble 40.0 ft. above the midpoint either long side of the surface area. Ensure light intensities along a line parallel to and 20.0 ft. in from the long side of this rectangular area do not decrease by more than 0.50 foot-candles in any 5.0 ft. interval along the line from 10.0 ft. to 90.0 ft. on both sides of the luminaire and provide a minimum intensity of 0.30 foot-candles at any point along the line. Do not exceed 20:1 maximum-to-minimum horizontal illuminance uniformity ratio within the rectangular area.
3. 400-watt mast arm mounted luminaire. Meet IESNA Cutoff requirements. Provide a minimum intensity of 0.20 foot-candle in a rectangluiar area measuring 220.0 ft. by 60.0 ft. when mounted properly in a level position as indicated on the level bubble 50.0 ft. above the midpoint of either long side of the surface area. Ensure light intensities along a line parallel to and 30.0 ft. in from the long side of this rectangular area do not decrease by more than 0.75 foot-candle in any 10.0 ft. interval along the line from 10.0 ft. to 90.0 ft. on both sides of the luminaire and provide a minimum intensity of 0.30 foot-candle at any point along the line. Do not exceed 20:1 maximum-to-minimum horizontal illuminance uniformity ratio within the rectangular area.

S. Ensure photometric data is consistent from fixture to fixture. Match published photometric data (or approved photometric reports submitted during the prequalification process as the typical photometric output instead of published data) as follows:
1. Point of maximum candela within 5 degrees horizontally and vertically.
2. Maximum candela within 20% of published maximum candela.
3. Fixture efficiency within 10% of published efficiency.

* When reference is made to UL, it can be considered to mean a Nationally Recognized Independent Testing Lab (NRTL). Comperable standards of Canadian Standard Association, Electrical Testing Laboratories or Factory Mutual can be equal to the referenced UL standard.

DATE:
FILE:

Sheet 1 of 2

Texas Department of Transportation
Traffic Operations Division

ROADWAY ILLUMINATION DETAILS
(RDWY ILLUM LIGHT FIXTURES)

RID(LUM1)-07

©TxDOT January 2007	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
	3148	01	006	FM 3097
	DIST	COUNTY		SHEET NO.
	DAL	ROCKWALL		229

1204045FSN_RID_LUM1.dgn

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DATE:
FILE:

Prequalification:

T. Use only pre-qualified fixtures. No alternates will be considered.
   1. Only materials with approved product codes or designations from prequalified producers are accepted on bids. The Construction Division (CST) of the Texas Department of Transportation (TxDOT) maintains the material producers list of approved producer product codes or designations. Use the following website to view this list: http://www.dot.state.tx.us/business/producer_list.htm
      Use of prequalified material does not relieve the contractor of the responsibility to provide materials that meet the specifications. All materials, including those shown on the prequalified material list, may be inspected and tested at any time and may be rejected if not in compliance with the specifications.
   2. Notify the Department in writing as to which fixture from the prequalified list of approved fixtures will be supplied on each project.
   3. To have a fixture listed as pre-qualified:
      a. Submit a sample of each type of luminaire and all pertinent data, including published photometric data and recently tested photometric data (IES format, both "averaged" and both sides of "un-averaged" data) to:
         TXDOT- TRF 118 East Riverside Dr. Austin, TX 78704
      b. Demonstrate a commitment to quality.
      c. Submit the following documentation:
         1. QA/QC program documentation with the following minimum requirements;
            a. Written statement of the companies QA/QC policy.
            b. QA/QC person employed that has special QA/QC training and has QA/QC as their primary job responsibility.
            c. A written procedure specifically for handling orders for fixtures built to TxDOT specifications.
            d. A written procedure for keeping track of fixtures built, certified, and tested for TxDOT orders.
            e. A check list of features for TxDOT fixtures with QA/QC person signature.
         2. Fixture UL certification
         3. IP 65 certification
         4. 3G certification
         5. Aluminum casting and paint analysis
         6. Socket, MOV, and shutoff ignitor data
         7. Stainless steel and aluminum bracket data
         8. Ballast electrical data
         9. Photometric data
         10. Lamp data
      d. Prequalification samples, if approved, will not be returned to the manufacturer but will be retained by the the Department for comparison testing. Once a fixture has been approved, do not change any material or manufacturing method without prior approval of the Department. Unapproved changes will result in rejection of the fixture.
      e. In addition, luminaires will be tested for compliance with this specification. Luminaires that inconsistently pass testing or that are inconsistent with published photometric information will be removed from the pre-qualified list at the discretion of the Department.

Sampling:

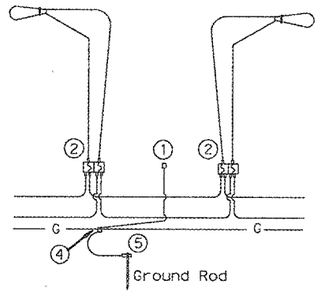
U. Sample in accordance with Test Method Tex-1110-T, "Sampling Lighting Assemblies."

Manufacturer Warranty:

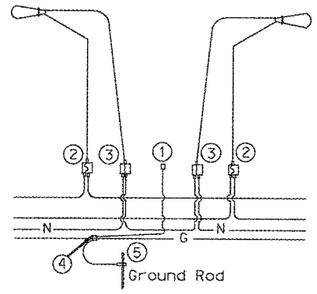
V. Replace failed fixtures, when non-operable due to defects in materials or workmanship within five years of installation with a fixture that passes all testing, delivered to the project location. Lamps and photocells are subject to the warranties of their respective manufacturers.

Testing:

W. Conduct electrical testing required in the Ballast section. Provide photometric testing of fixtures. Test fixtures at the following rates.
   1. Manufactuer Testing. Before fixtures are shipped from the manufacturer, test fixtures as follows. From each lot or manufacturing run, select one completed fixture of each 25, with a minimum of 2 and a maximum of 5. Test photometrics at an independent test lab inspected and approved by TxDOT. Electrical testing may be performed at manufacturer's facility.
      a. Provide IES photometric report in two formats:
         1. Standard averaged format for asymmetric fixtures.
         2. Un-averaged format showing both sides. Un-averaged data may be supplied in two files or as approved by the Department.
      b. Provide electrical and photometric test data directly to TRF-TE electronically for evaluation prior to shipping fixtures to the project. Do not ship fixtures until test data for each lot is approved by TRF-TE.
      c. Provide the following information on test reports:
         1. TxDOT's Control-Section-Job number, maintenance contract number, or purchase order number the fixtures are assigned to,
         2. a unique fixture test number per fixture,
         3. date of manufacture, and
         4. quantities supplied and lot number per fixture type.
      d. Write the unique lab report number on the top of the fixture housing with permanent marker. Ensure the test lab retains the results for 5 years. Provide the Department access to documentation.
      e. Retain records of manufacturing lots, test reports, lot quantities, and other pertinent details. Submit records to the Department upon request.
      f. Submit to TRF-TE a daily shipment report for shipments to each job.
      g. Make available to TxDOT inspectors upon request, all manufacturing facilities involved in the production of fixtures for use on Department projects, inventories of fixtures produced to Department specifications, and records of fixture testing and tracking.
   2. Departmental Test Reporting. Departmental test reports will be issued in accordance with Tex 1110-T.



FOR THREE-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR FOR 120/240 VOLT SERVICE.



FOUR-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 240V
(240/480 VOLT SERVICE)

NOTES:

(1) Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors.
(2)(3) Use pre-qualified Breakaway Connectors for both T-Base and Shoe-Base installations.
(4) Split Bolt or other connector.
(5) Use Ground Rod Clamp listed for its intended purpose (i.e. concrete, direct burial...)

Texas Department of Transportation
Traffic Operations Division

ROADWAY ILLUMINATION DETAILS

(RDWY ILLUM LIGHT FIXTURES)

RID(LUM2)-07

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

REVISIONS

CONT	SECT	JOB	HIGHWAY
3148	01	006	FM 3097

DIST	COUNTY	SHEET NO.
DAL	ROCKWALL	230

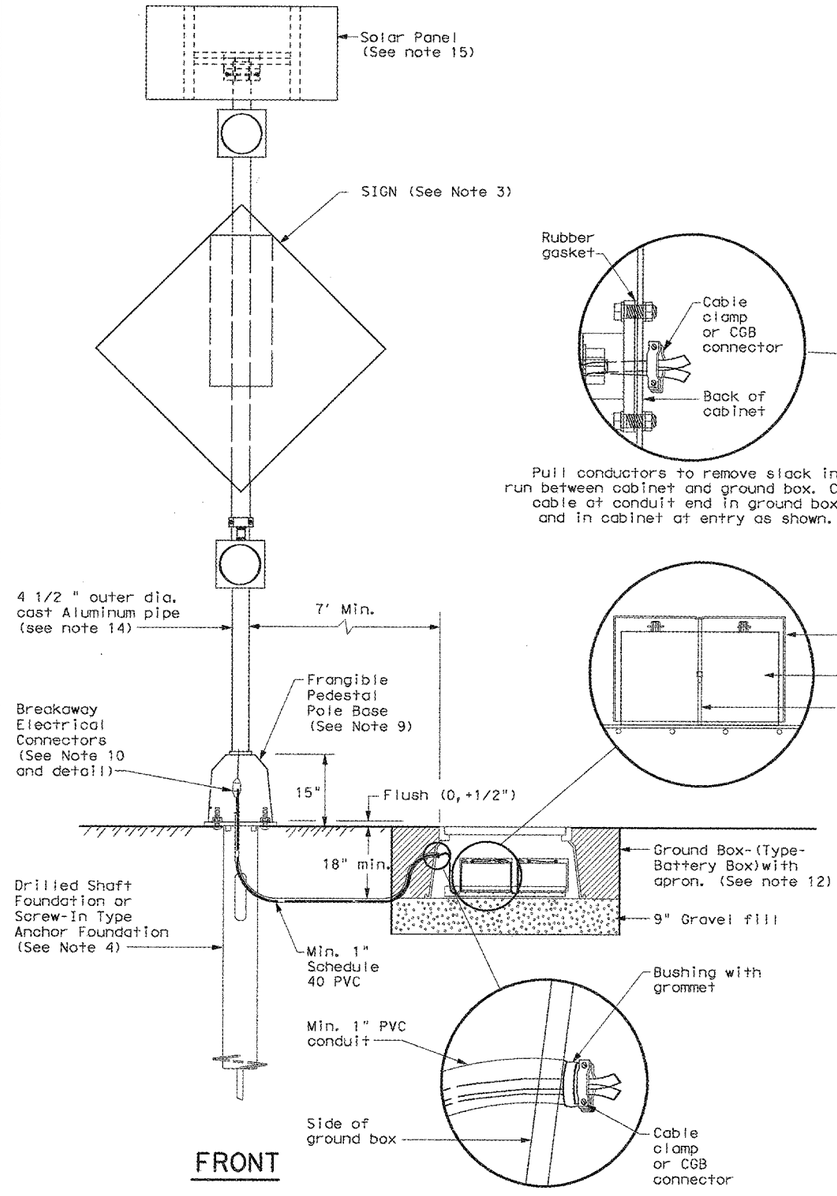
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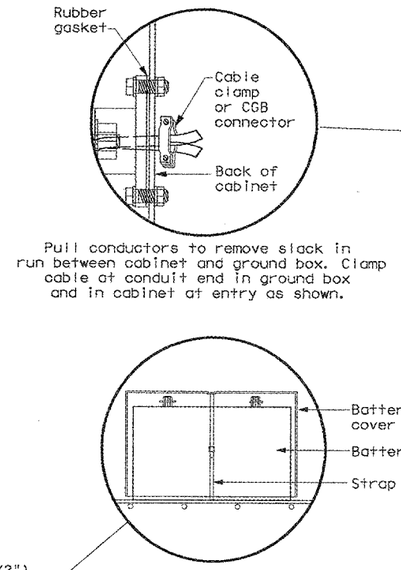
GENERAL NOTES:

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. Use materials specifically designed for attaching cabinets, beacon heads, solar panels, etc., to poles.
7. Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.
8. Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."
9. Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening on connection.
10. Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies." Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse slug). For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).
11. Install the batteries in a battery box. Place the batteries on a 3/16" thick plastic sheet and connect together. Place a plastic cover (battery bell jar) over the top of each battery and secure the battery bell jar to the battery with a strap. The batteries, bell jars, straps and 3/16" plastic sheet are subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies." When required, install batteries in the flasher cabinet. Wire batteries according to manufacturers recommendations. Provide the number of batteries as required by the manufacturer.
12. See standard sheet Electrical Details (ED) for additional requirements regarding the installation of ground boxes/battery boxes, conduit, and cabinets.
13. Provide clearance as shown above the sidewalk or pavement grade at the edge of the road. When a bottom beacon is not used, mount the bottom of the sign at least 7 ft. above the sidewalk or pavement grade at the edge of the road.
14. Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.
15. Orient solar panel for optimum exposure to sunlight (face to the south). Prior to installation, check the location to ensure there is no overhead obstruction that would block the solar panel from receiving full sunlight. Unless specified elsewhere, mount a minimum of 14' above grade.
16. Ensure height of conduit is below top of anchor bolts.

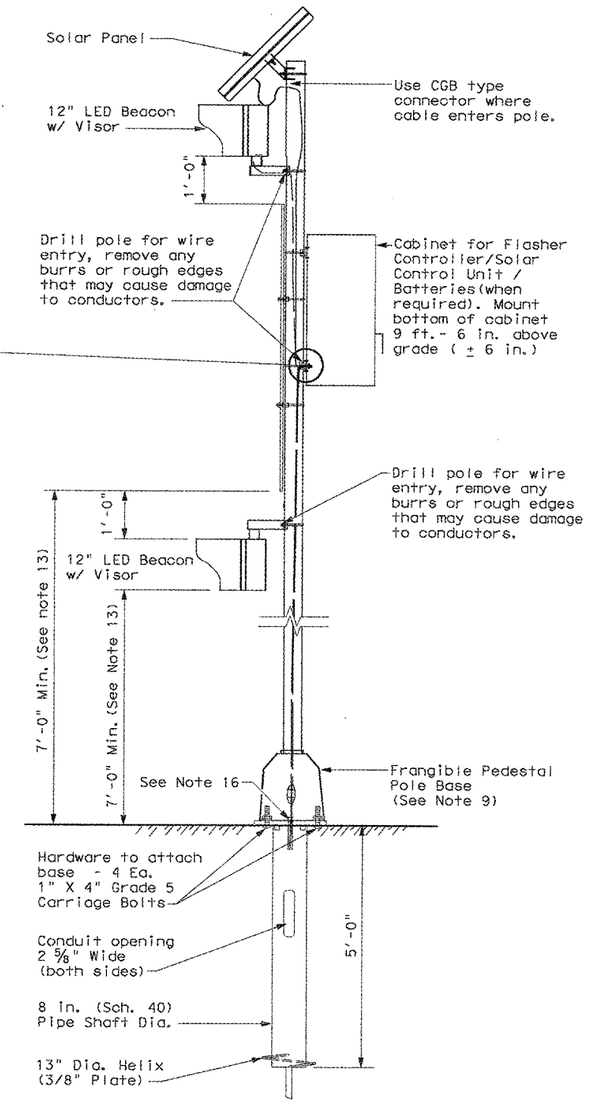
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

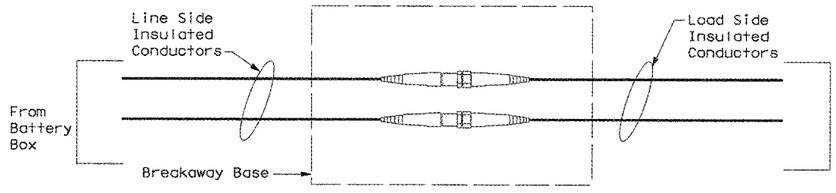
DATE:
FILE:



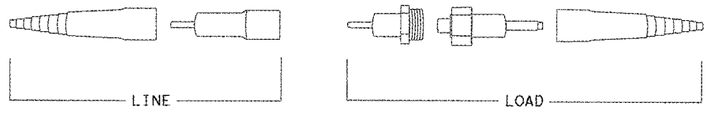


Pull conductors to remove slack in run between cabinet and ground box. Clamp cable at conduit end in ground box and in cabinet at entry as shown.





NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS
EXPLODED VIEW

Texas Department of Transportation

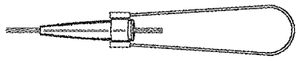
Traffic Operations Division Standard

SOLAR POWERED ROADSIDE FLASHING BEACON ASSEMBLY DETAILS

SPRFBA(1)-13

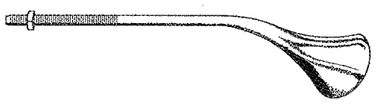
FILE: spbi-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	3148	01	006	FM 3097
12-04	DIST	COUNTY		SHEET NO.
3-13	DAL	ROCKWALL		231

120404SCNL-SPRFBA(1)-13.dgn



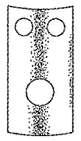
COMPRESSION FITTING

SOURCES:
RELIABLE ELECTRIC NO.5264
FARGO NO. OR EQUAL



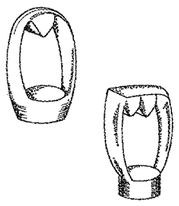
THIMBLEYE BOLT (Angle Type)

SOURCES:
HUBBELL POWER SYS. NO. 5016
MCLEAN POWER SYS. NO. J8154
OR EQUAL



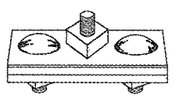
LIFT PLATE

SOURCES:
HUBBELL POWER SYS. NO. 7898
MCLEAN POWER SYS. NO. J7890
OR EQUAL



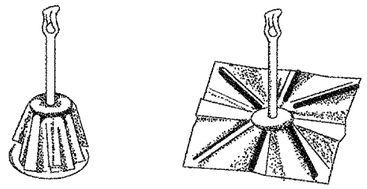
EYE NUTS (Twineye & tripleye)

SOURCES:
HUBBELL POWER SYS. NO. 6560 (TWIN), 6510 (SINGLE)
MCLEAN POWER SYS. NO. J6515 (TWIN), J6510 (SINGLE)
OR EQUAL



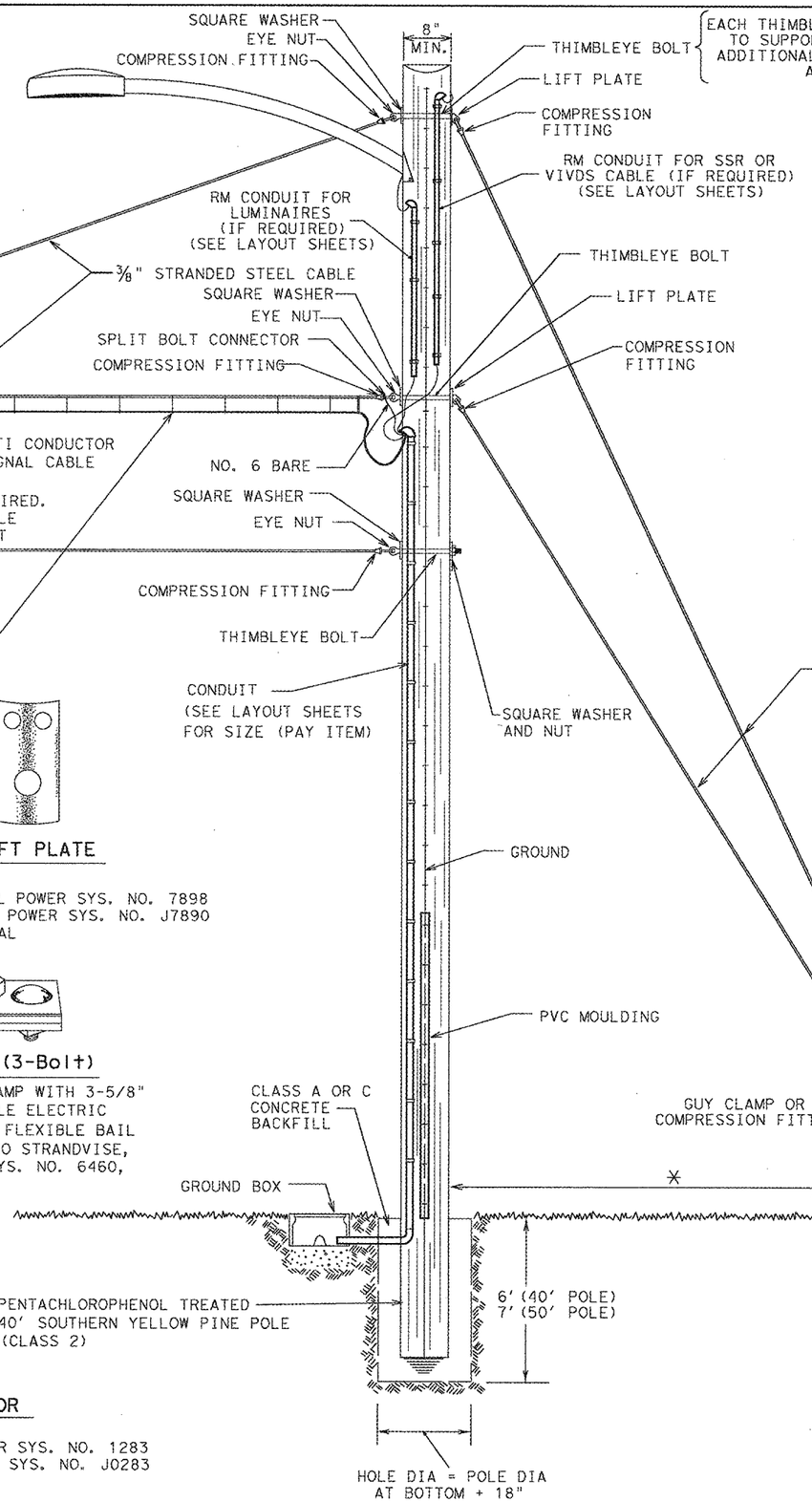
GUY CLAMP (3-Bolt)

6" HEAVY GUY CLAMP WITH 3-5/8" BOLTS OR RELIABLE ELECTRIC STRANDVISE WITH FLEXIBLE BAIL (NO. 5264), FARGO STRANDVISE, HUBBELL POWER SYS. NO. 6460, OR EQUAL

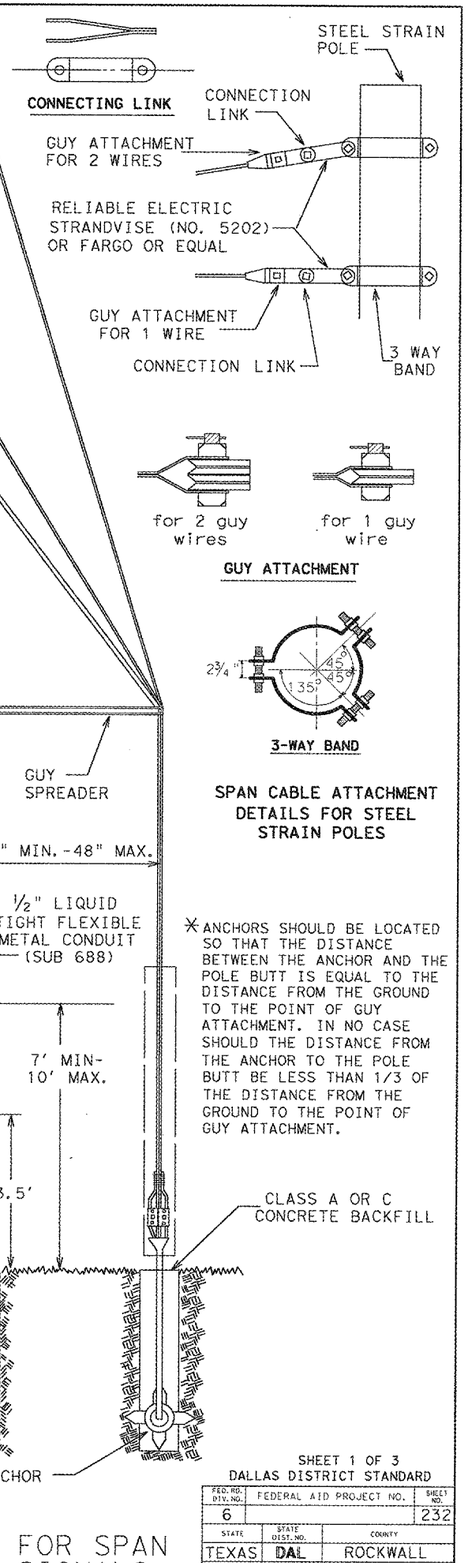


8-WAY ANCHOR

SOURCES:
HUBBELL POWER SYS. NO. 1283
MCLEAN POWER SYS. NO. J0283
OR EQUAL



EACH THIMBLEYE BOLT SHALL NOT BE USED TO SUPPORT MORE THAN 3 SAG SPANS. ADDITIONAL THIMBLEYE BOLTS SHALL BE ADDED AS REQUIRED.



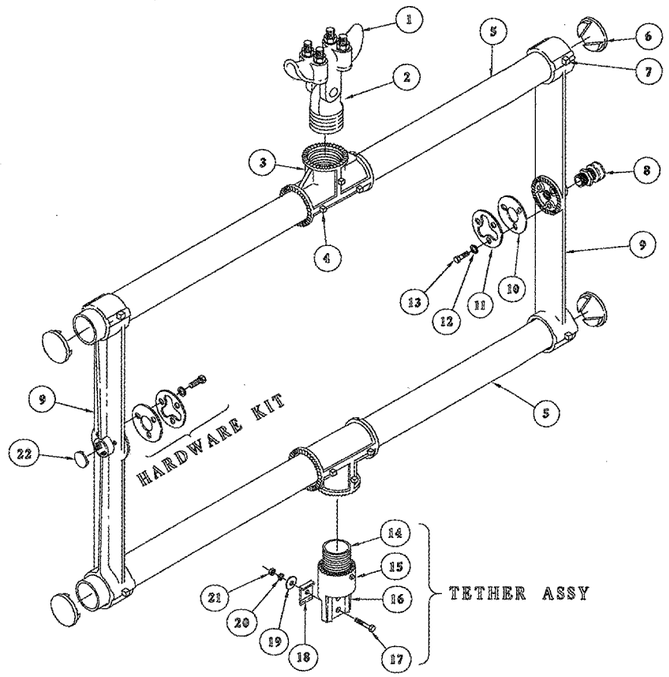
SPAN CABLE ATTACHMENT DETAILS FOR STEEL STRAIN POLES

✳ANCHORS SHOULD BE LOCATED SO THAT THE DISTANCE BETWEEN THE ANCHOR AND THE POLE BUTT IS EQUAL TO THE DISTANCE FROM THE GROUND TO THE POINT OF GUY ATTACHMENT. IN NO CASE SHOULD THE DISTANCE FROM THE ANCHOR TO THE POLE BUTT BE LESS THAN 1/3 OF THE DISTANCE FROM THE GROUND TO THE POINT OF GUY ATTACHMENT.

CONSTRUCTION DETAILS FOR SPAN WIRE MOUNTED TRAFFIC SIGNALS

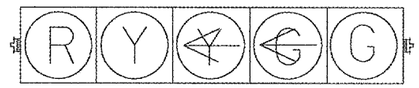
SHEET 1 OF 3
DALLAS DISTRICT STANDARD

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			232
STATE	STATE DIST. NO.	COUNTY	
TEXAS	DAL	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
3148	01	006	FM 3097



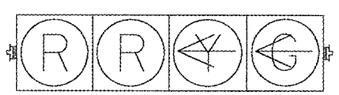
BOTTOM TETHERED, SPAN WIRE SIGNAL HEAD HARDWARE ASSEMBLY (BACKPLATE NOT SHOWN)

ITEM	DESCRIPTION	QTY
1	SPAN WIRE CLAMP, IRON, W/ U-BOLTS	1
2	SPAN WIRE ADAPTER, ALUM W/ STAINLESS BUSHING	1
3	TEE HORIZONTAL SLIP, DIE CAST ALUM	2
4	SCREW, SET SQ HD, 1/4"-20 X 1/2", STAINLESS	6
5	TUBE, 1 1/2" X LENGTH, ALUM	2
6	TUBE CAP, 1 1/2", PLASTIC	4
7	SCREW, SET SQ HD, 5/16"-18 X 5/8", STAINLESS	8
8	CGB, 3/4" .55-.65, ZINC 1	1
9	CAST ARM, FOR HORIZONTAL MOUNTED SIGNAL, ALUM	2
10	GASKET, TRI-BOLT, 1/16" X 70 DURO NEOPRENE	2
11	WASHER, SLOTTED, ZINC 2	2
12	WASHER, LOCK SPLIT, 1/4", STAINLESS	6
13	BOLT, HEX HD, 1/4"-20 X 1 1/2", GRADE 5, STAINLESS	6
14	NIPPLE, ALLTHREAD, 1 1/2" NPS X 2.13", ALUM	1
15	SCREW, SET SQ HD, 1/4"-20 X 5/8", STAINLESS	1
16	BODY, 1 1/2", HANGER, ALUM	1
17	BOLT, HEX HD, 5/16"-18 X 1 1/2", STAINLESS	1
18	PLATE, TETHER, 1-HOLE, ALUM	1
19	WASHER, FENDER, 5/16", STAINLESS	1
20	WASHER, SPLIT LOCK, 5/16", STAINLESS	1
21	NUT, HEX HD, 5/16"-18, STAINLESS	1
22	CAP, EN-3/4, BLUE (FOR CGB)	1



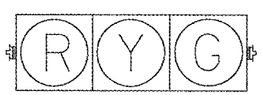
H5LT

TYPICAL SPAN WIRE
HORIZONTAL MOUNT
INSTALLATION



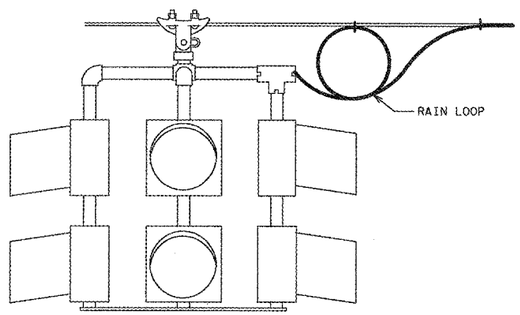
H4LT

TYPICAL SPAN WIRE
HORIZONTAL MOUNT
INSTALLATION

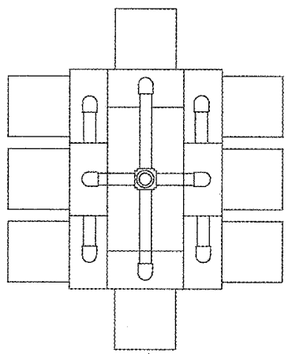


H3

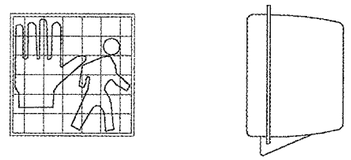
TYPICAL SPAN WIRE
HORIZONTAL MOUNT
INSTALLATION



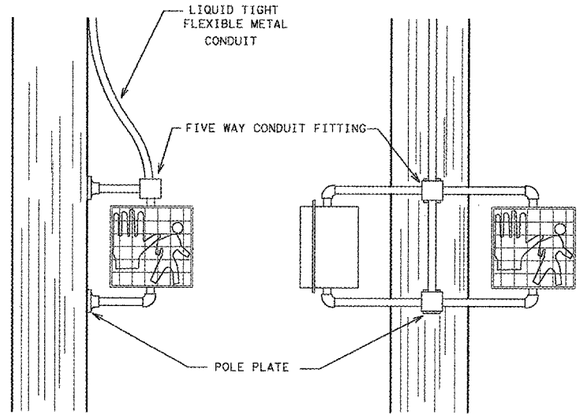
TYPICAL
FLASHING BEACON
INSTALLATION



TOP

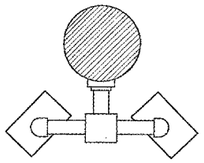


"EGGCRATE" VISOR PEDESTRIAN SIGNAL
WITH ONE-PIECE REFLECTOR



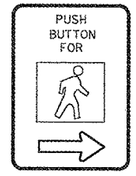
152A
ONE-WAY
ADJUSTABLE FACE SIGNAL FOR
WOOD POLE MOUNTING

143C
TWO-WAY
ADJUSTABLE FACE SIGNAL FOR
WOOD POLE MOUNTING

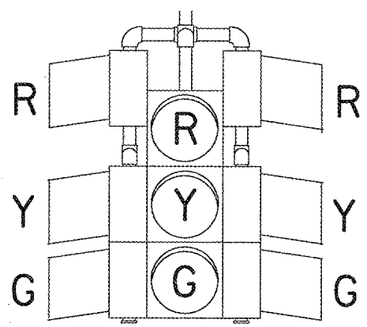


143C
PLAN VIEW

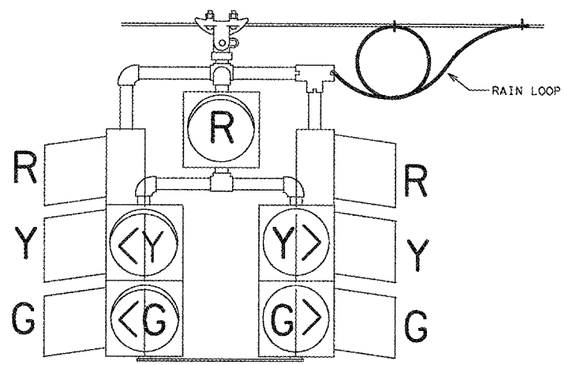
SIGN R10-4bR
SIGN R10-4bL
9"X12"



PEDESTRIAN PUSHBUTTON
SIGN DETAILS



SIDES

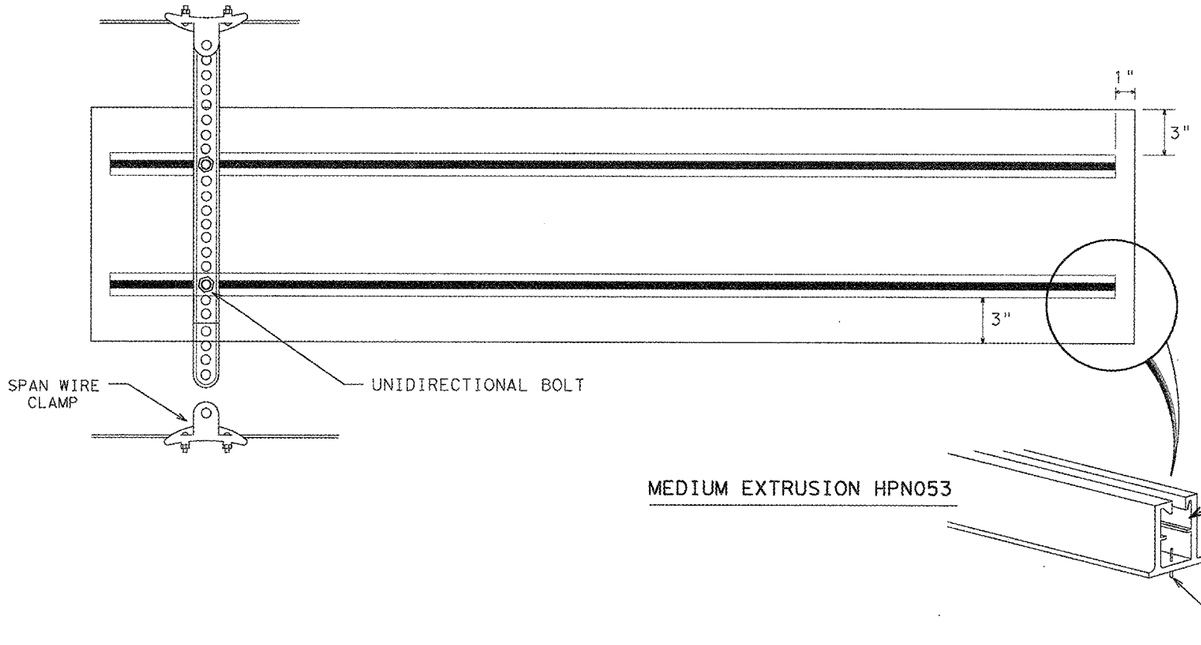


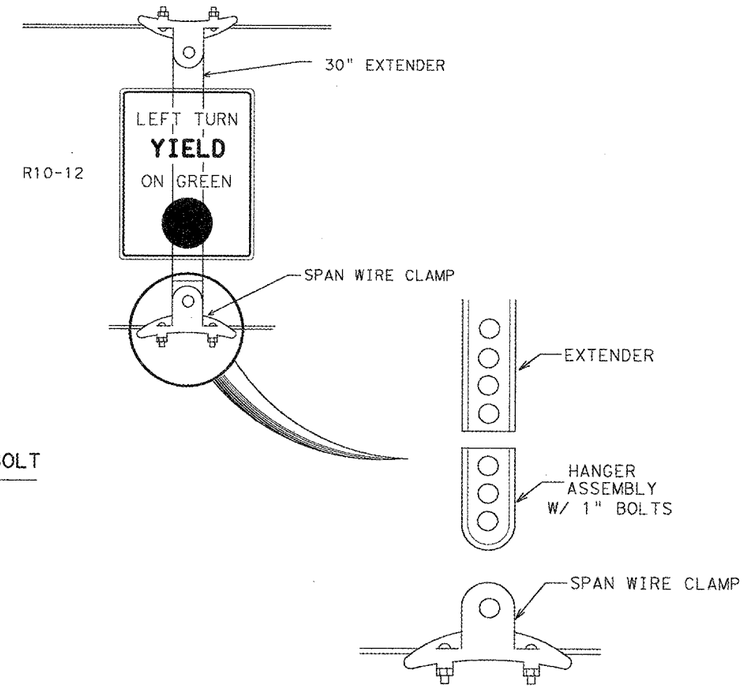
FRONT AND BACK

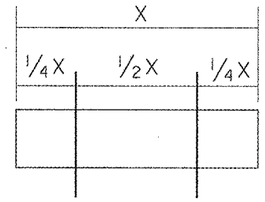
SHEET 2 OF 3
DALLAS DISTRICT STANDARD

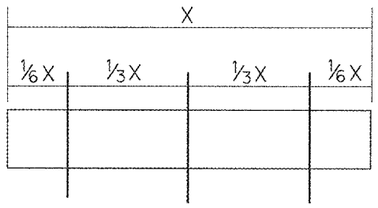
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			233
STATE	STATE DIST. NO.	COUNTY	
TEXAS	DAL	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
3148	01	006	FM 3097

CONSTRUCTION DETAILS FOR SPAN WIRE MOUNTED TRAFFIC SIGNALS





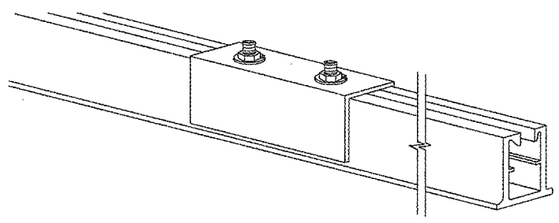




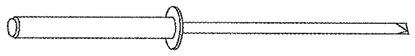
HANGER ASSEMBLY DETAILS

NOTES: 1. BASED ON SIGN WIDTH, THE NUMBER OF VERTICAL SUPPORTS REQUIRED ARE AS FOLLOWS:
3'-0" OR LESS - 1 SUPPORT REQUIRED
>3'-0" UP TO 8'-0" - 2 SUPPORTS REQUIRED
>8'-0" - 3 SUPPORTS REQUIRED
SEE DIAGRAMS FOR SIGN SUPPORT SPACING

2. FOR STREET NAME SIGNS, EXTRUDED ALUMINUM SHALL BE MOUNTED FOR HORIZONTAL SUPPORT AS SHOWN.



5" ALUMINUM COUPLING
6061-T6



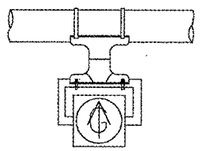
ALUMINUM RIVET

NOTE: ALUMINUM RIVETS SHALL BE USED TO ATTACH THE SIGN TO THE EXTRUDED ALUMINUM. SPACINGS OF RIVETS SHALL BE 6" O.C.

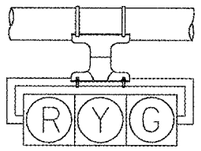
CONSTRUCTION DETAILS FOR SPAN WIRE MOUNTED TRAFFIC SIGNALS

SHEET 3 OF 3
DALLAS DISTRICT STANDARD

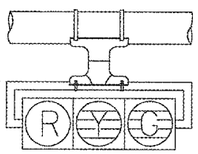
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			234
STATE	STATE DIST. NO.	COUNTY	
TEXAS	DAL	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
3148	01	006	FM 3097



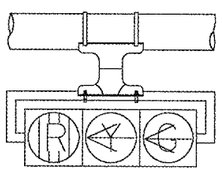
H1TA



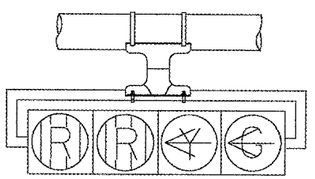
H3



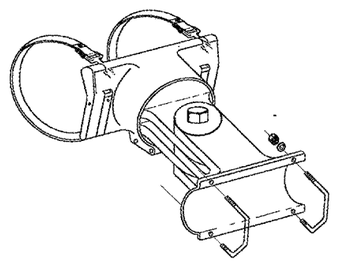
H3L



H3LLT

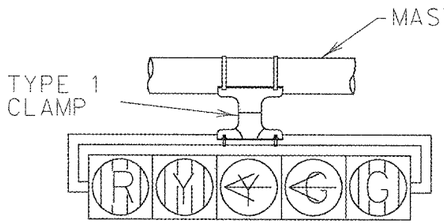


H4LLT

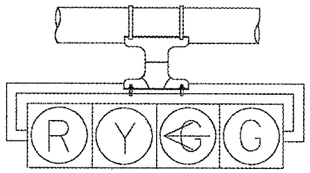


TYPE 2 CLAMP KIT

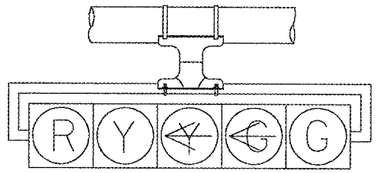
SHALL BE INSTALLED WHEN ROTATION ABOUT THE HORIZONTAL AND VERTICAL AXES ARE NEEDED.



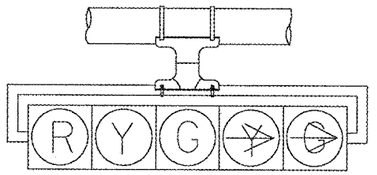
H5LLT



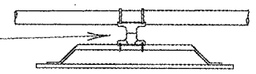
H4LT



H5LT

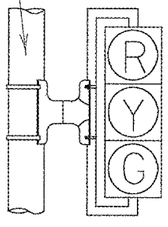


H5RT

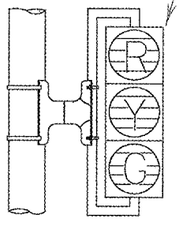


ONE (1) CLAMP SHALL BE USED ON SIGNS LESS THAN OR EQUAL TO 10'-0" IN LENGTH.

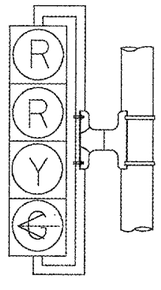
TWO (2) CLAMPS SHALL BE USED ON SIGNS GREATER THAN 10'-0" IN LENGTH.



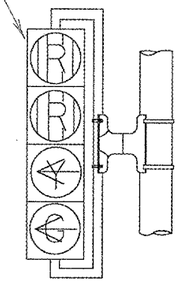
V3



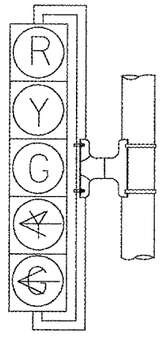
V3L



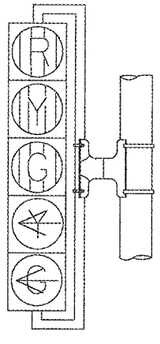
V4LT



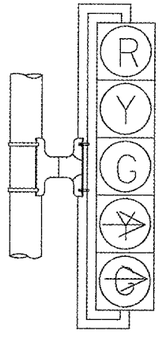
V4LLT



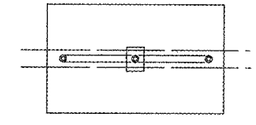
V5LT



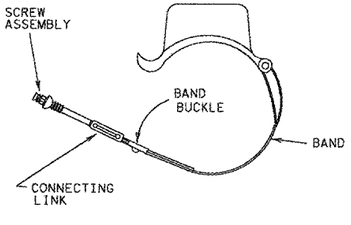
V5LLT



V5RT



SIGN OR DAMPENING DEVICE ATTACHMENT FOR MAST ARMS



TYPE 1 AND 2 CLAMPS

NOTES:

1. VEHICLE SIGNAL HEADS SHALL BE MOUNTED WITH TYPE 1 CLAMP AND APPROPRIATE TUBING.
2. ALL POLE MOUNTED VEHICLE HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.

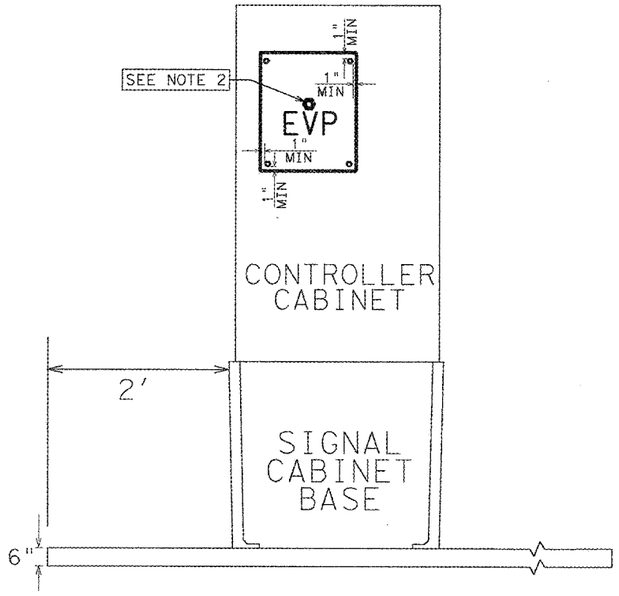
© TXDOT 2005
DALLAS DISTRICT STANDARD

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		235
STATE	STATE DIST.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
3148	01	006	FM 3097

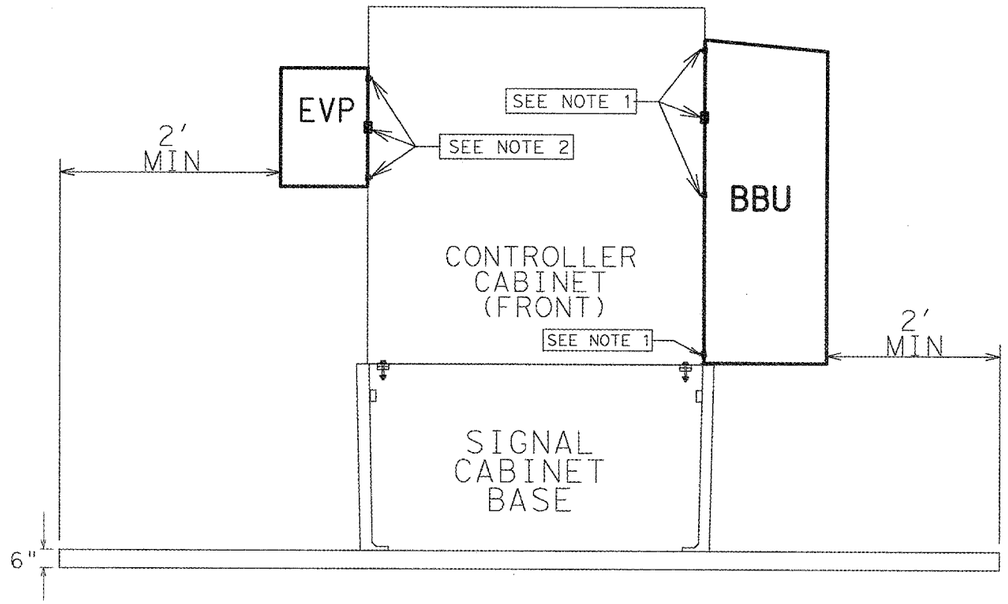
TRAFFIC SIGNAL HEAD IDENTIFICATION

NOTES:

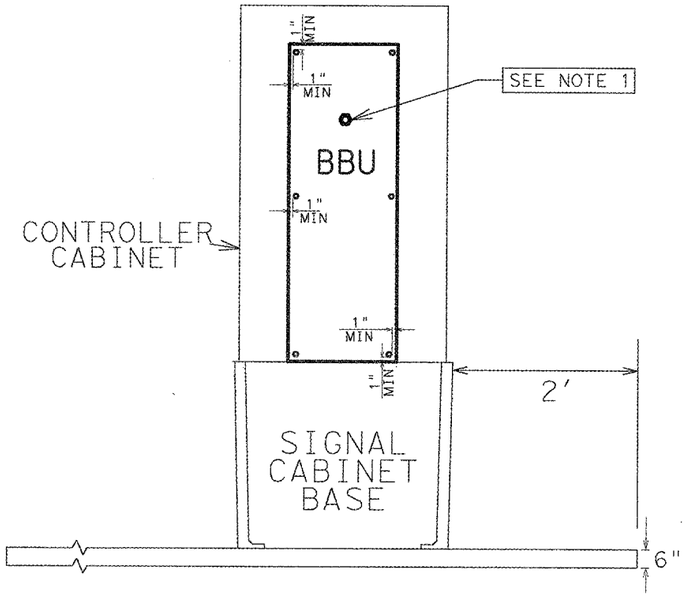
1. INSTALL 1½" ALL THREAD NIPPLE WITH BONDING BUSHINGS ON BOTH ENDS AND 6 EA OF ½" X 1½" 13 UNC MOUNTING BOLTS BETWEEN THE TWO CABINETS (SIGNAL AND BBU).
2. INSTALL 2 " FITTING FOR EVP CABLES/WIRES AND 4 EA OF ½" X 1½" 13 UNC MOUNTING BOLTS BETWEEN THE TWO CABINETS (SIGNAL AND EVP).
3. USE SILICON SEALANT TO SEAL BETWEEN THE CABINETS OF THE CONTROLLER, EVP AND BBU UNIT.
4. THE ABOVE WORK PERFORMED AND MATERIALS FURNISHED WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE SUBSIDIARY TO PERTINENT ITEMS.



SIDE VIEW (EVP)



ELEVATION VIEW

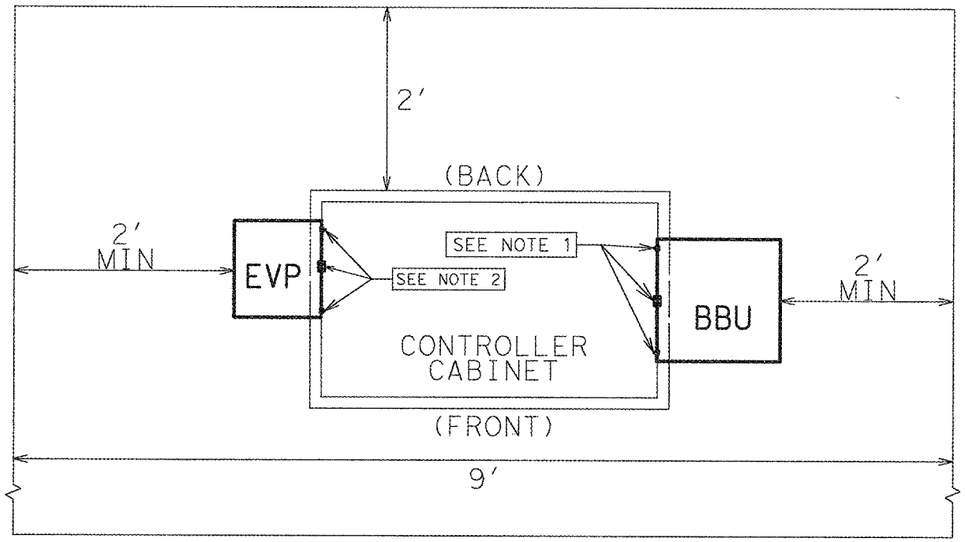


SIDE VIEW (BBU)

REQUIRED CABLE/CONDUCTORS FOR EVP			
QUANTITY EACH	WIRE SIZE	COLOR	FUNCTION
1	#14	BLACK	120 VAC FOR EVP
1	#14	RED	120 VAC FOR FAN & CABINET LIGHT
1	#14	WHITE	AC NEUTRAL
1	#14	GREEN	CHASIS GROUND
1	#18	GRAY	LOGIC GROUND
4	#18	BLUE	PREEMPT COMMANDS
4	-	-	CABLE FROM DETECTOR UNIT

REQUIRED CONDUCTORS FOR BBU			
QUANTITY EACH	WIRE SIZE	COLOR	FUNCTION
1	-	BLACK	120 VAC FROM SERVICE
1	-	WHITE	AC NEUTRAL FROM SERVICE
1	#6	BLACK	120 VAC TO CONTROLLER
1	#6	WHITE	AC NEUTRAL TO CONTROLLER
1	#6	GREEN	GROUND

LEGEND:
EVP-EMERGENCY VEHICLE PREEMPTION CABINET.
BBU-BATTERY BACKUP UNIT.



PLAN VIEW

Texas Department of Transportation
© 2012

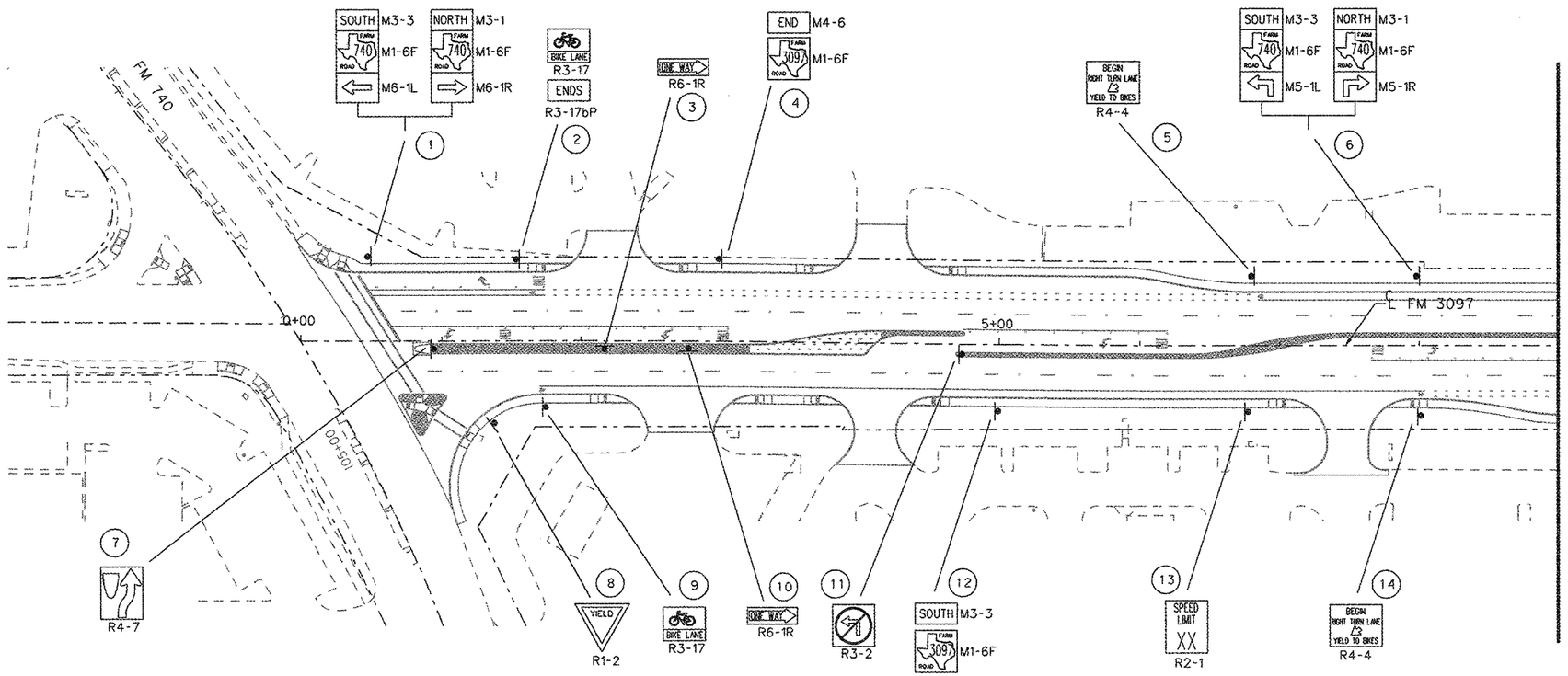
INSTALLATION OF BBU/EVP

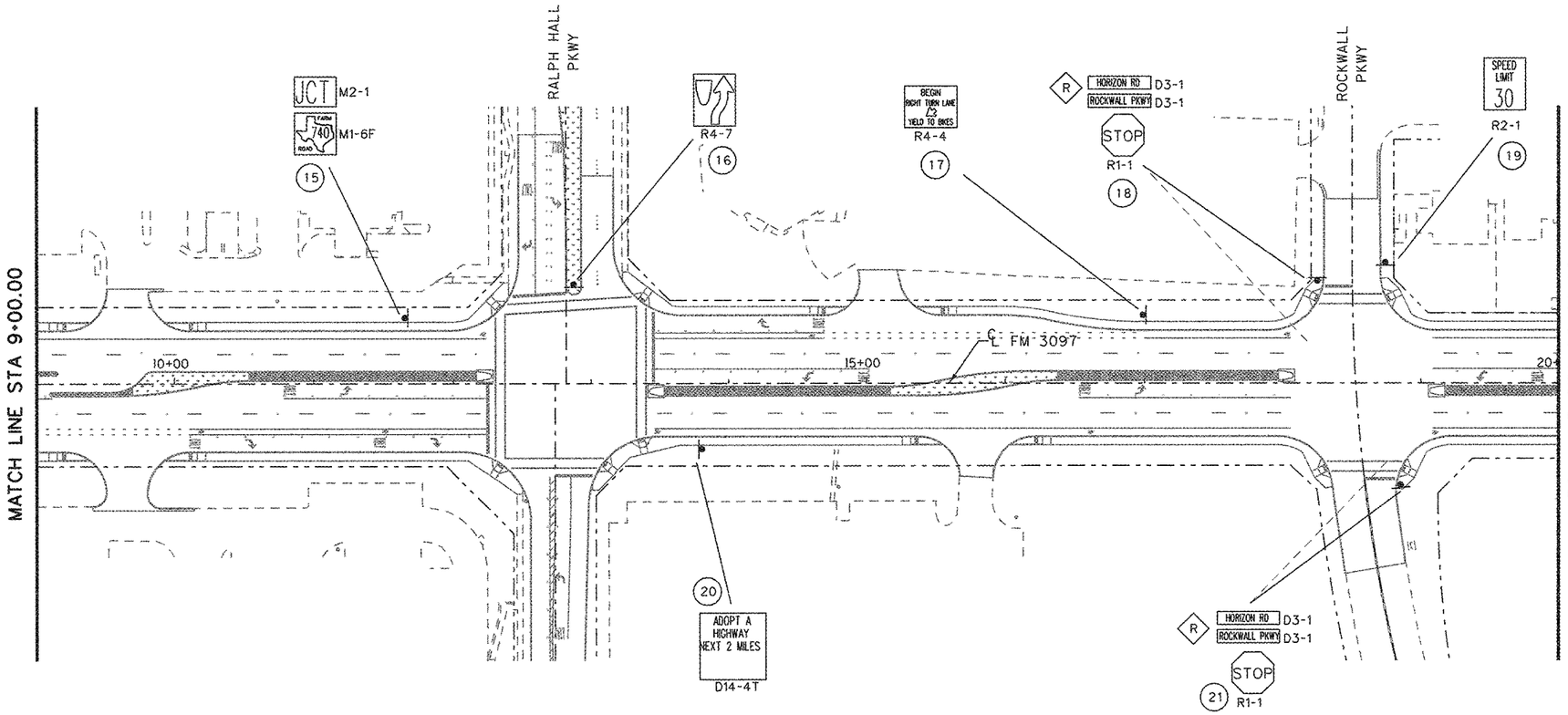
EXTERNAL SIDE MOUNT CABINET INSTALLATION DETAILS
DALLAS DISTRICT STANDARD

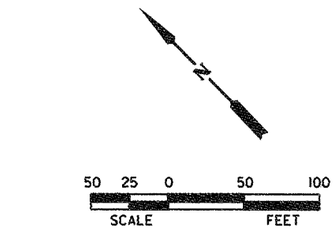
N. T. S.

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		FM3097
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	DAL	ROCKWALL	236
CONTROL	SECTION	JOB	
3148	01	006	







LEGEND

- PROPOSED SMALL SIGN
- R — RELOCATED EXISTING SIGN
- PROPOSED SMALL SIGN ASSEMBLY

STATE OF TEXAS
T. SCOTT BOND
62907
REGISTERED PROFESSIONAL ENGINEER
4/30/2014

NO.	REVISION	BY	DATE

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

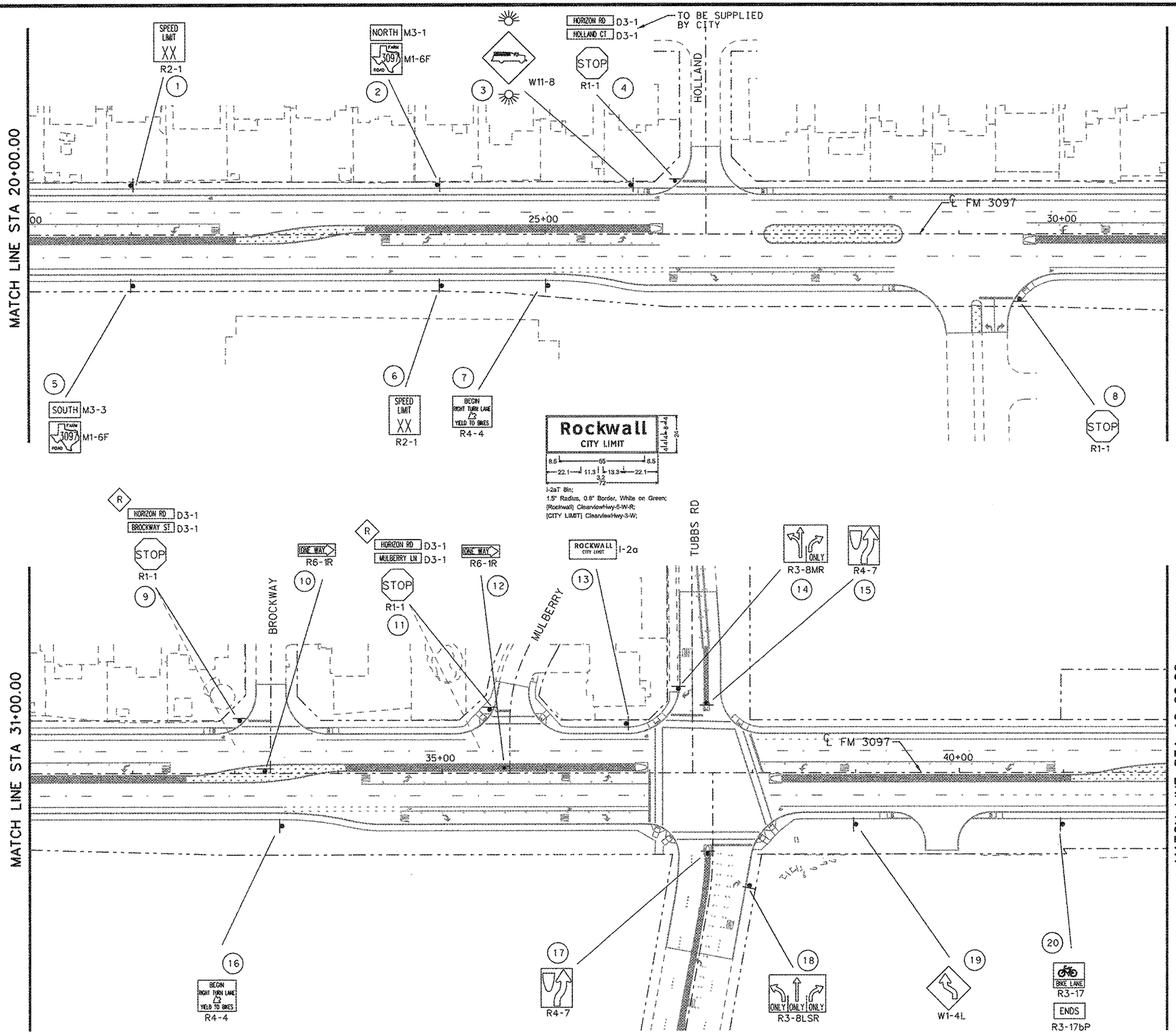
Texas Department of Transportation

FM 3097
SIGNING LAYOUT
STA. 0+00.00 TO STA. 20+00.00

Designed:	CH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	TSB	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	CH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	TSB	DAL	ROCKWALL	3148	01	006		237

SHEET 1 OF 3

C:\8440602\dlv\120404RDss01.dgn
4/30/2014 8:21:54 AM



50 25 0 50 100
SCALE FEET

LEGEND

- PROPOSED SMALL SIGN
- R — RELOCATED EXISTING SIGN
- PROPOSED SMALL SIGN ASSEMBLY

STATE OF TEXAS
T. SCOTT BOND
62907
REGISTERED PROFESSIONAL ENGINEER

4/30/2014

NO.	REVISION	BY	DATE

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #687

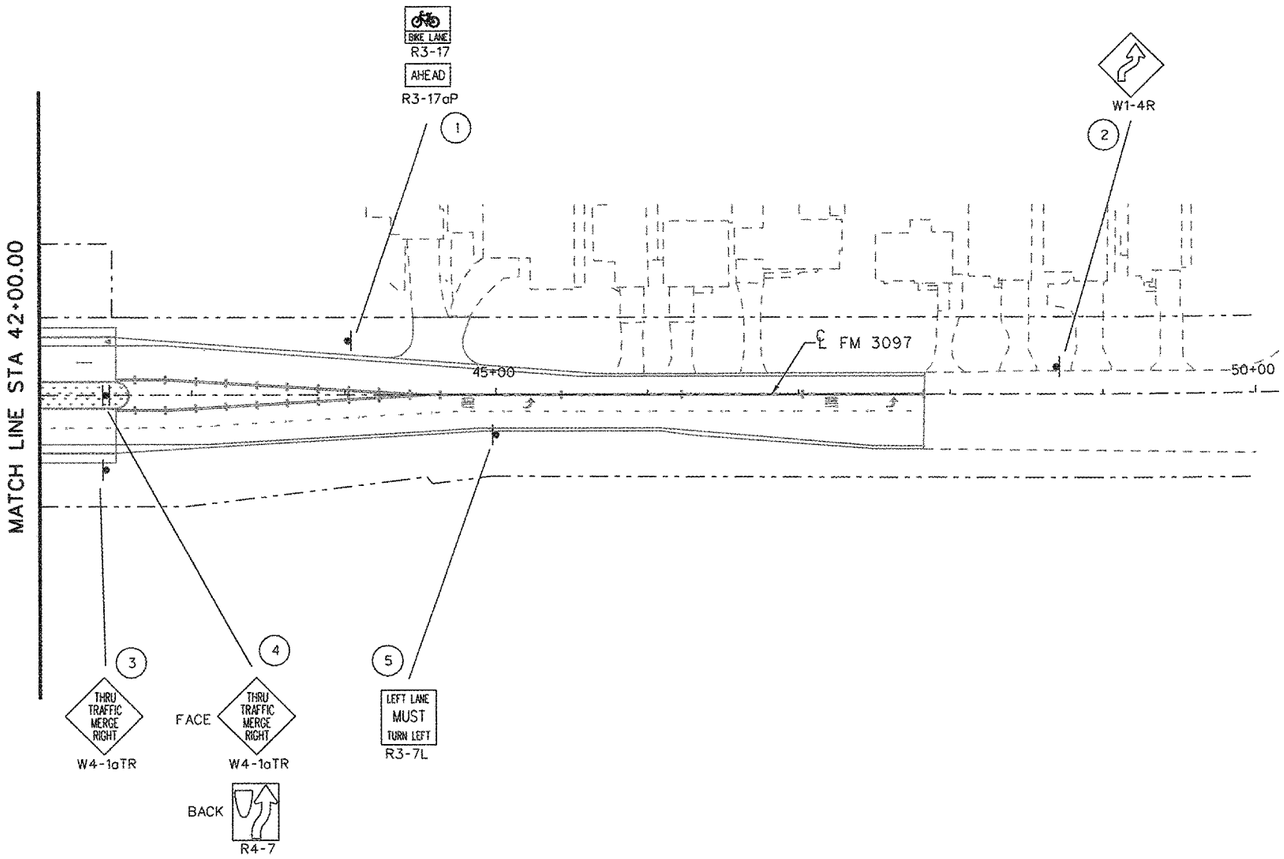
Texas Department of Transportation

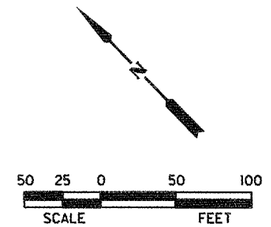
FM 3097
SIGNING LAYOUT
STA. 20+00.00 TO STA. 42+00.00

Designed:	CH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	TSB	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	CH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	TSB	DAL	ROCKWALL	3148	01	006	238

SHEET 2 OF 3

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4/30/2014 8:22:59 AM





LEGEND

- PROPOSED SMALL SIGN
- R — RELOCATED EXISTING SIGN
- PROPOSED SMALL SIGN ASSEMBLY

STATE OF TEXAS
T. SCOTT BOND
62907
REGISTERED PROFESSIONAL ENGINEER

4/30/2014

NO.	REVISION	BY	DATE

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation

FM 3097
SIGNING LAYOUT
STA. 42+00.00 TO END PROJECT

Designed:	CH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	TSB	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	CH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	TSB	DAL	ROCKWALL	3148	01	006		239

SHEET 3 OF 3

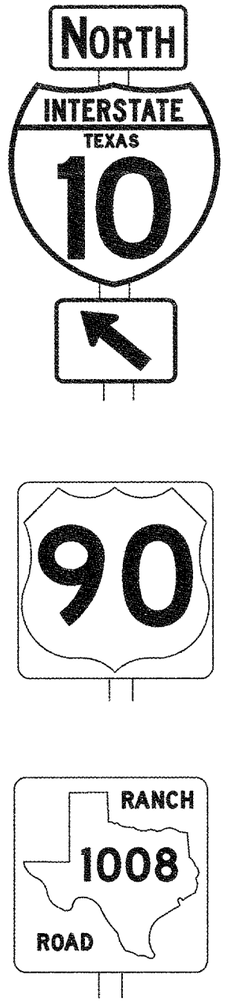
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DATE:
FILE:

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

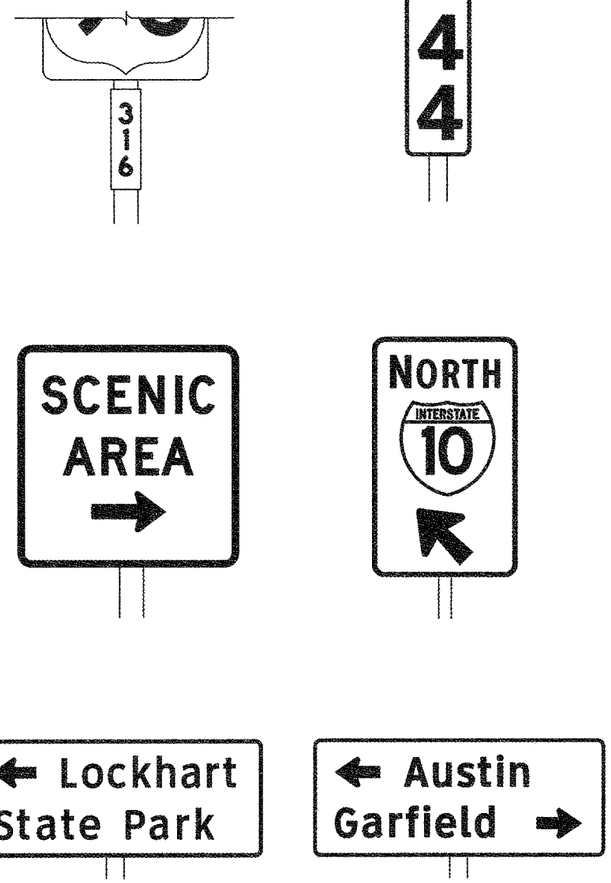
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



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	DIST	COUNTY		SHEET NO.
9-08				240

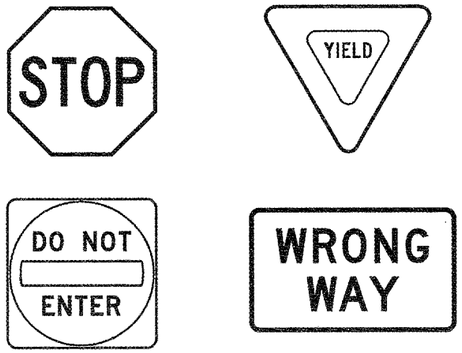
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DATE:
FILE:

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

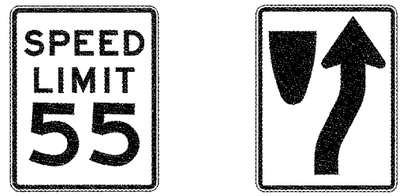


REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

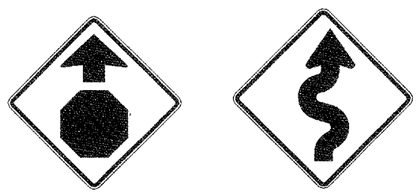
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



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

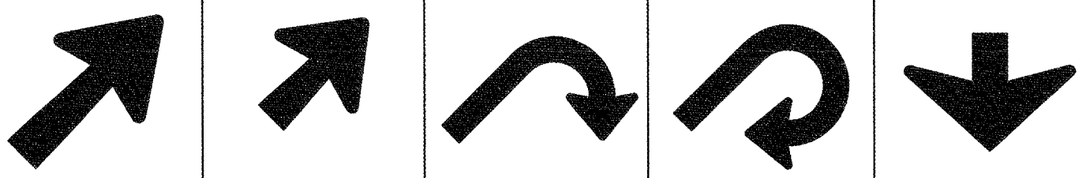
FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-03 7-13 9-08	DIST	COUNTY		SHEET NO. 241

4

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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

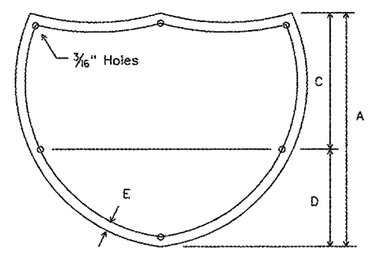
NOTE

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.

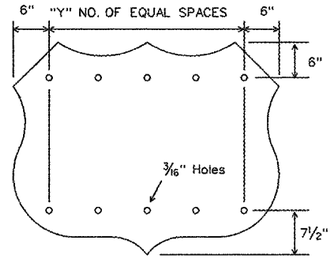
http://www.txdot.gov/

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



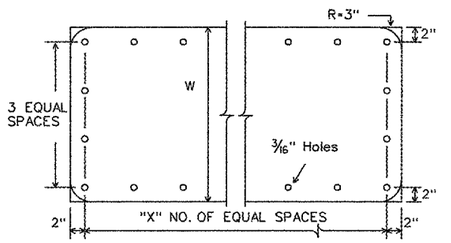
INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1½
48	28	20	1¾



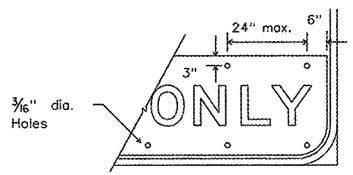
U.S. ROUTE MARKERS

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



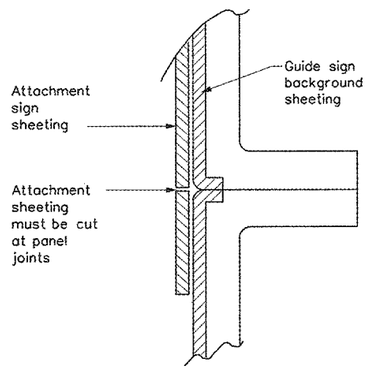
STATE ROUTE MARKERS

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



EXIT ONLY PANEL

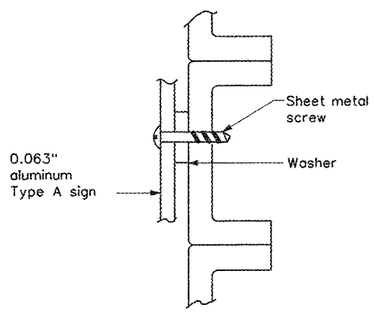
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



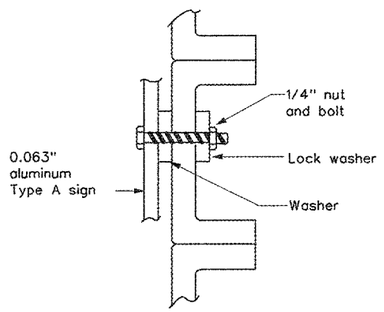
DIRECT APPLIED ATTACHMENT

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



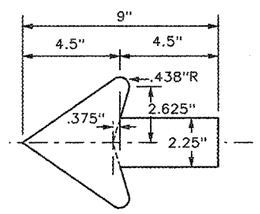
NUT/BOLT ATTACHMENT

NOTE:

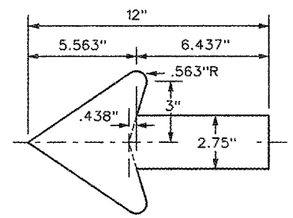
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

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				242

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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)

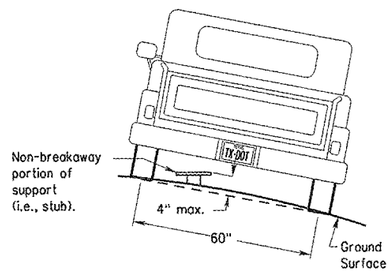
Anchor Type

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))

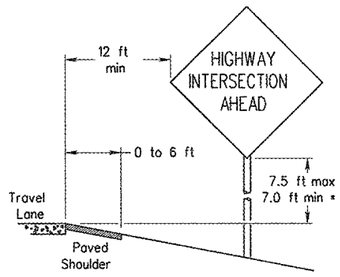
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

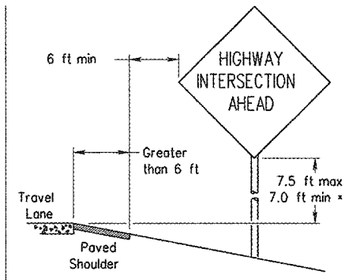
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

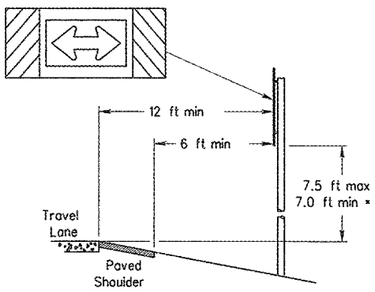
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



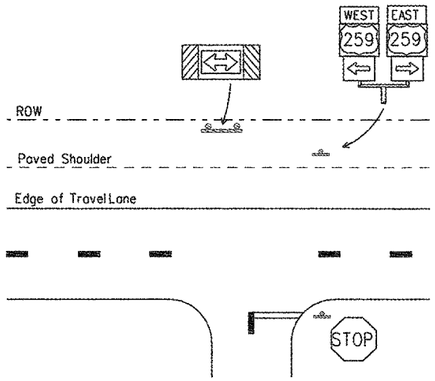
GREATER THAN 6 FT. WIDE

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.

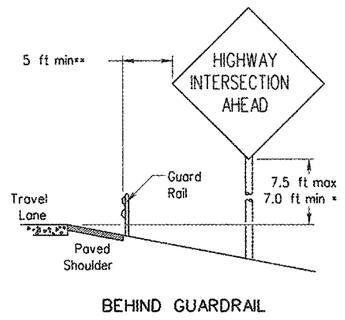
T-INTERSECTION



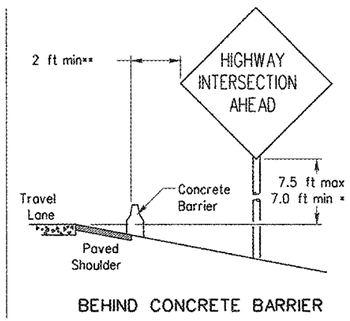
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



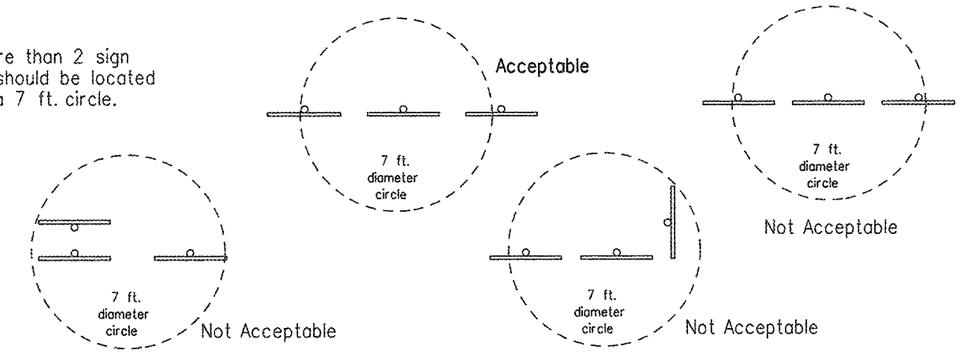
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

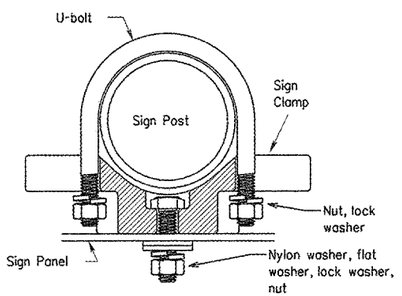
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

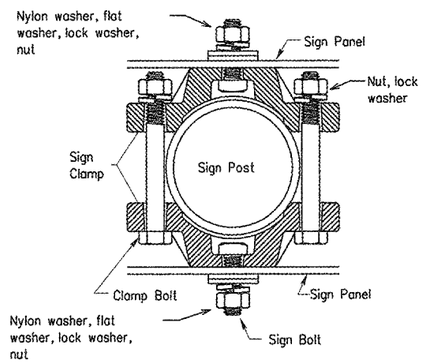


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

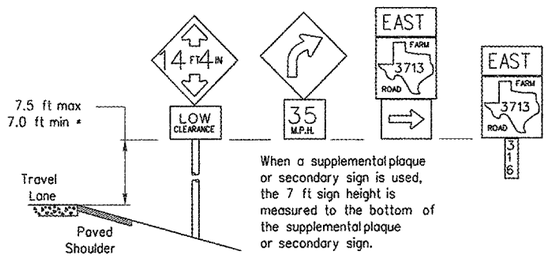
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



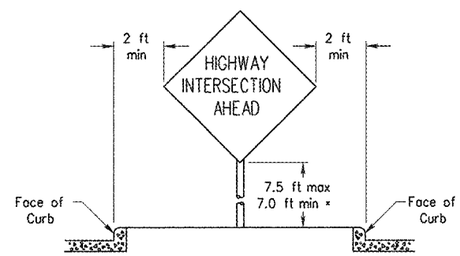
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



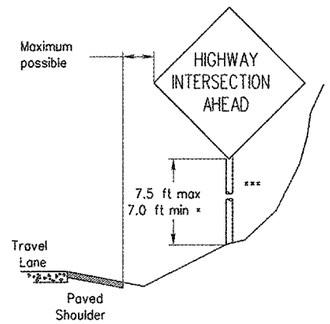
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

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

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

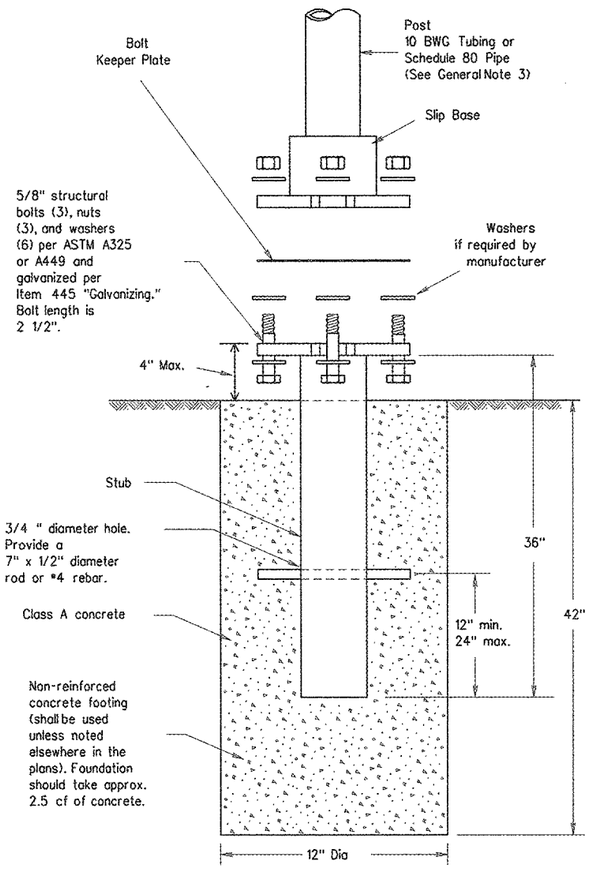
SMD(GEN)-08

©TxDOT July 2002	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.
				243

DATE:
FILE:

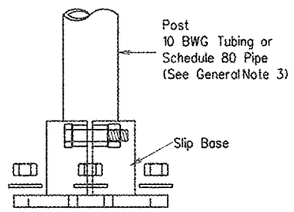
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TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS

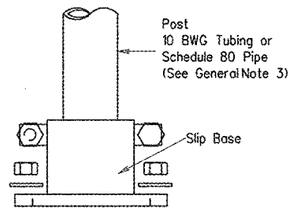


SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

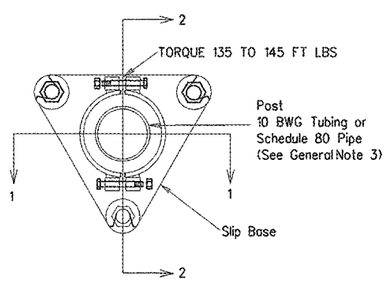
NOTE
The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.



SIDE VIEW 1-1



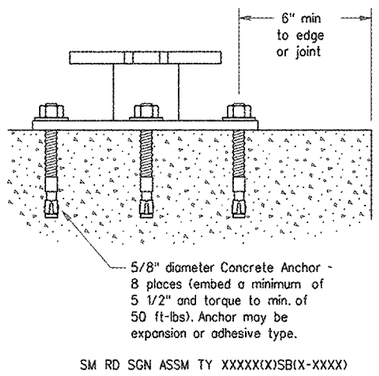
SIDE VIEW 2-2



TOP VIEW

DETAIL A

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.

GENERAL NOTES:

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

ASSEMBLY PROCEDURE

Foundation

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

ADDED DETAIL A FOR CLAMP BASE
10-2010

Texas Department of Transportation
Dallas District Standard

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08(DAL)

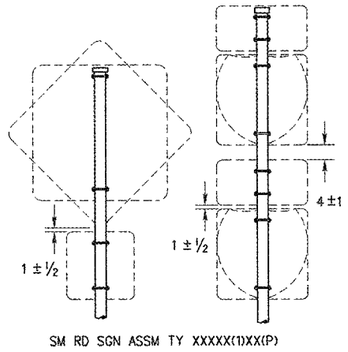
© TxDOT July 2002

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

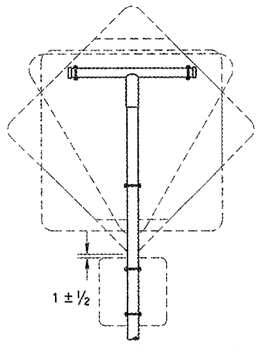
REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08				
12-10 (DISTRICT) ADDED CLAMP BASE DETAIL FOR SLIP BASE INSTALLATION	0196	03	223	IH 35E
	DIST	COUNTY		SHEET NO.
	DALLAS	DALLAS		244

DATE:
FILE:

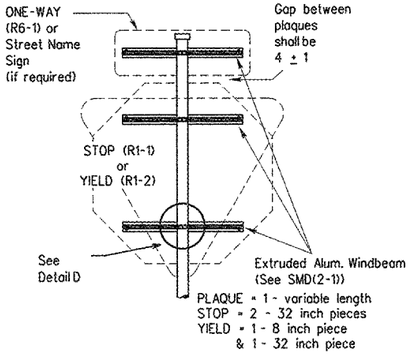
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



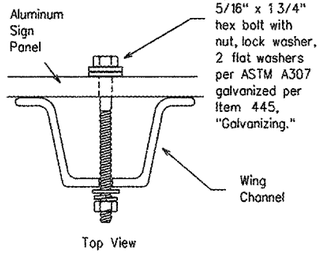
SM RD SGN ASSM TY XXXXX(1)XX(P)



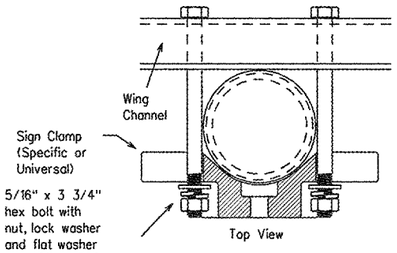
SM RD SGN ASSM TY XXXXX(1)XX(T)



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



Detail A



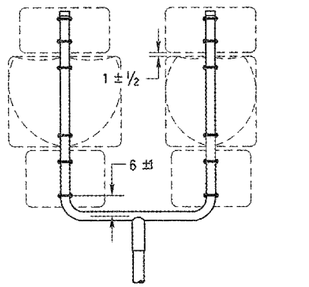
Detail B

GENERAL NOTES:

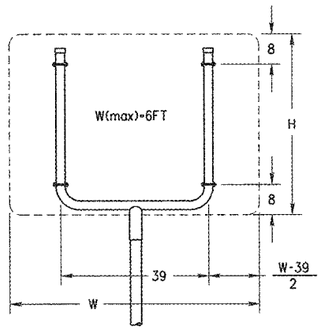
1.

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

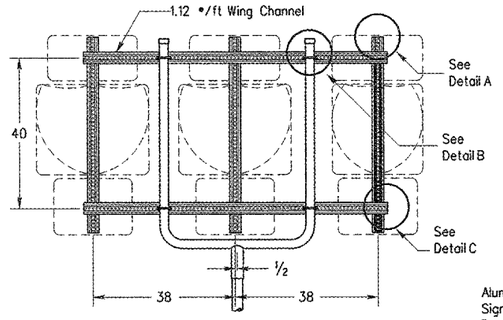
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material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



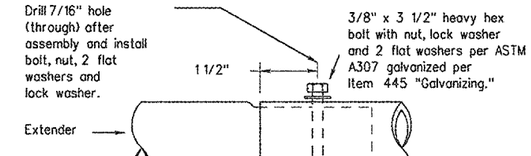
SM RD SGN ASSM TY XXXXX(1)XX(U)



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

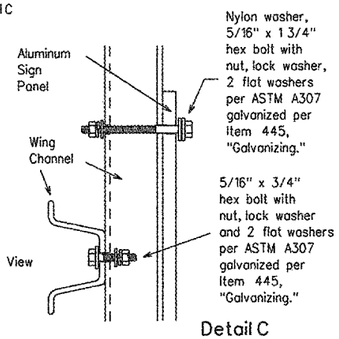


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

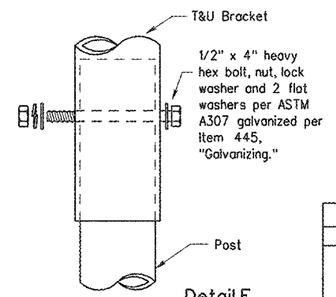


Detail F

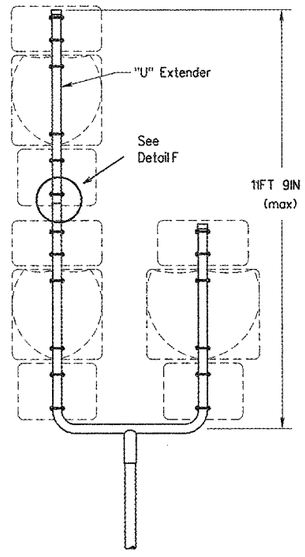
Splices shall only be allowed behind the sign substrate.



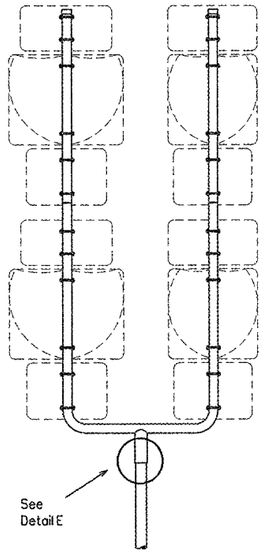
Detail C



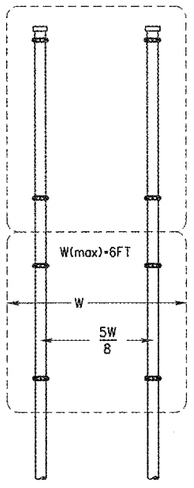
Detail E



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

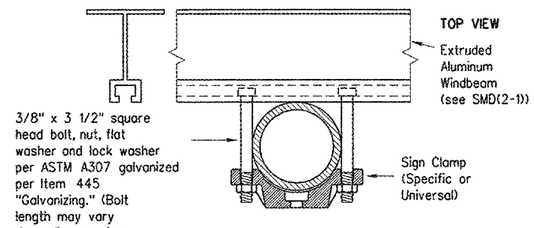


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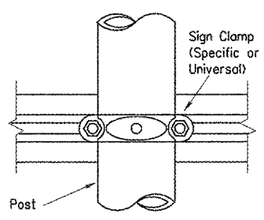


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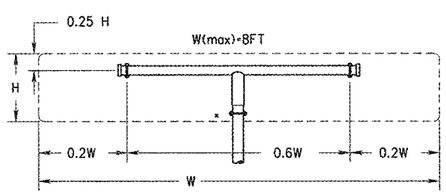
SIDE VIEW



Detail D



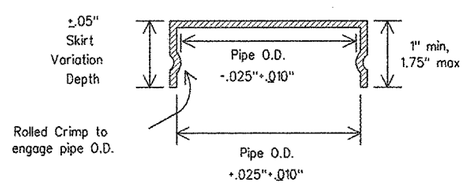
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)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



All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(T)
(x - 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.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

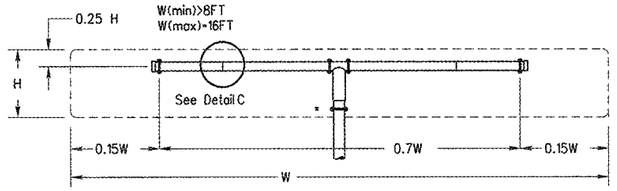
©TxDOT July 2002

DW: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
			245

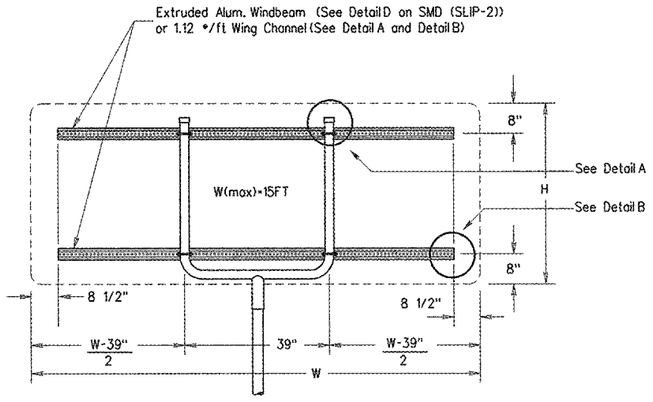
9-08 REVISIONS

DATE:
FILE:

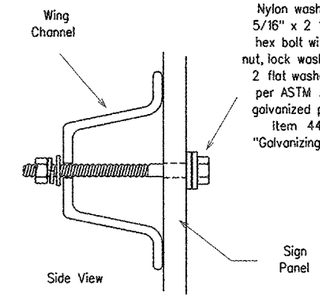
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



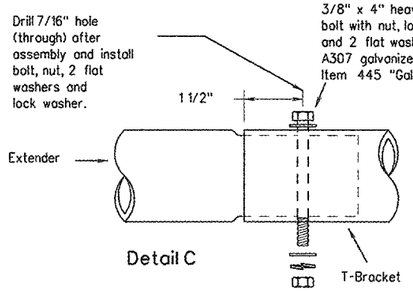
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



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

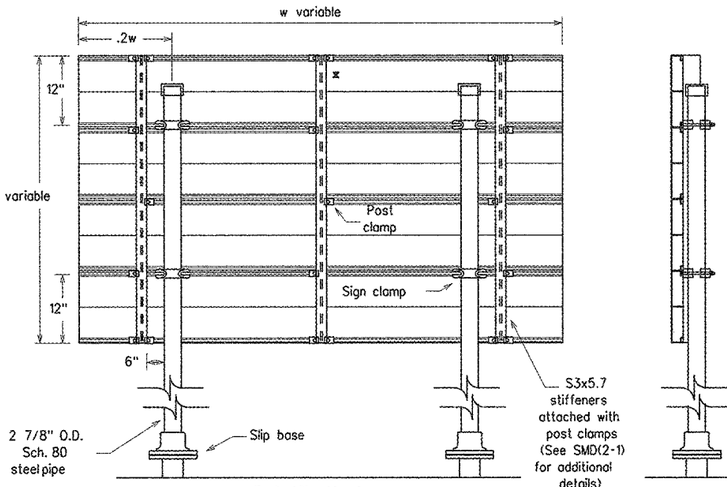


Detail B



Detail C

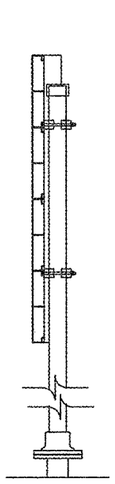
Splices shall only be allowed behind the sign substrate.



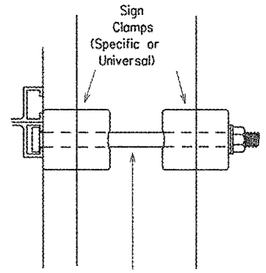
Typical Sign Mount

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

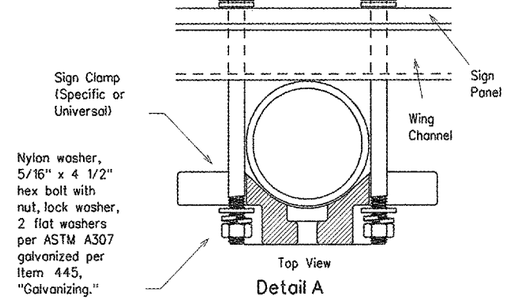
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



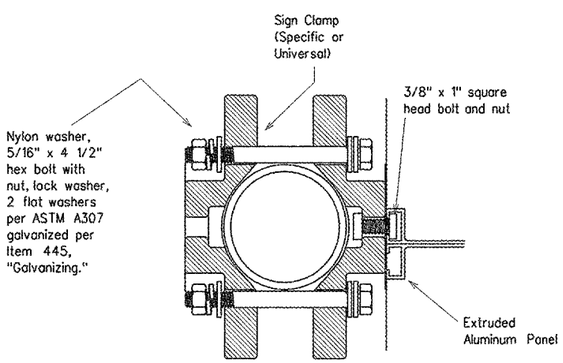
See Detail E for clamp installation



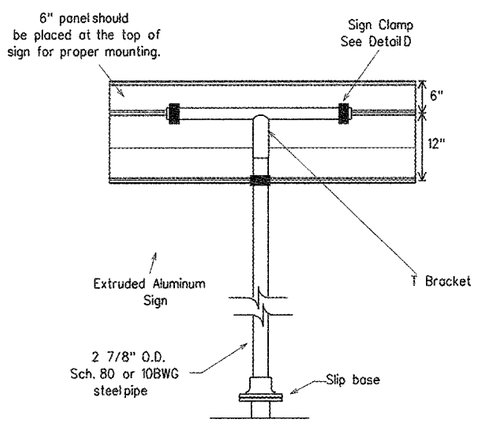
Detail E



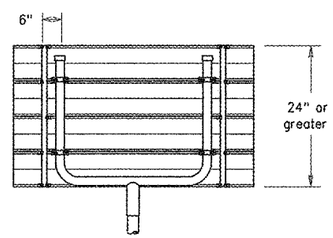
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



Extruded Aluminum Sign
With T Bracket



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

See Detail E
for clamp installation

GENERAL NOTES:

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 SBO(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY SBO(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

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

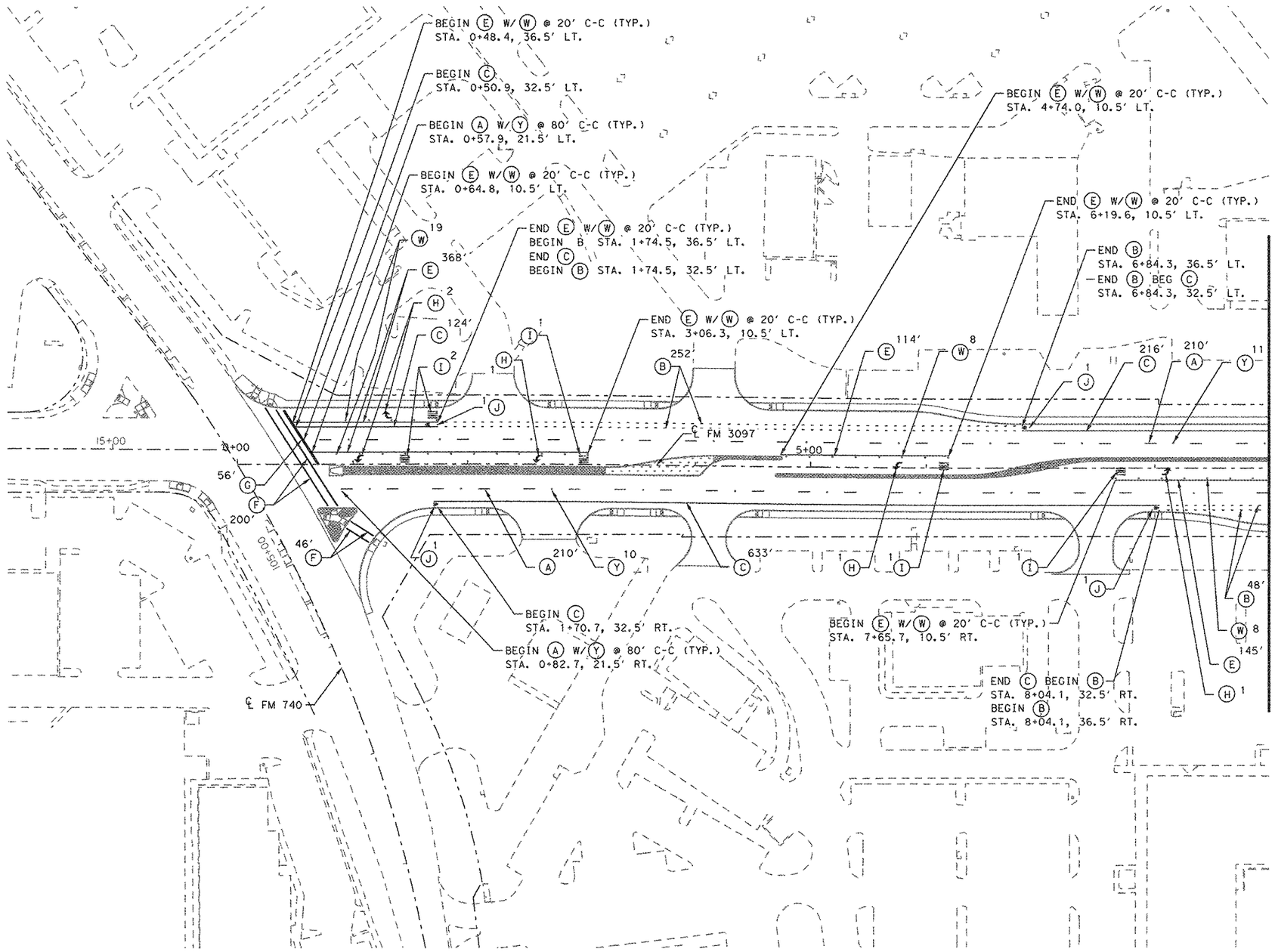
CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
		246

9-08 REVISIONS

DATE:
FILE:

26D



N

50 25 0 50 100
SCALE FEET

LEGEND

- (A) REFL PAV MRK TY I & TY II (W)4"(BRK)
- (B) REFL PAV MRK TY I & TY II (W)4"(DOT)
- (C) REFL PAV MRK TY I & TY II (W)4"(SLD)
- (D) REFL PAV MRK TY I & TY II (W)8"(DOT)
- (E) REFL PAV MRK TY I & TY II (W)8"(SLD)
- (F) REFL PAV MRK TY I & TY II (W)12"(SLD)
- (G) REFL PAV MRK TY I & TY II (W)24"(SLD)
- (H) REFL PAV MRK TY I & TY II (W)(ARROW)
- (I) REFL PAV MRK TY I & TY II (W)(WORD)
- (J) REFL PAV MRK TY I & TY II (W)(BIKE SYML)
- (K) REFL PAV MRK TY I & TY II (Y)4"(SLD)
- (L) REFL PAV MRK TY I & TY II (Y)8"(SLD)
- (M) REFL PAV MRK TY I & TY II (Y)24"(SLD)
- (W) REFL PAV MRKR TY I-C
- (X) REFL PAV MRKR TY II-A-A
- (Y) REFL PAV MRKR TY II-C-R
- (Z) TRAFFIC BUTTON TY W

NOTES:

1. ALL STATION AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.

STATE OF TEXAS
T. SCOTT BOND
62907
REGISTERED PROFESSIONAL ENGINEER

T.S.B. 4/30/2014

NO.	REVISION	BY	DATE

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

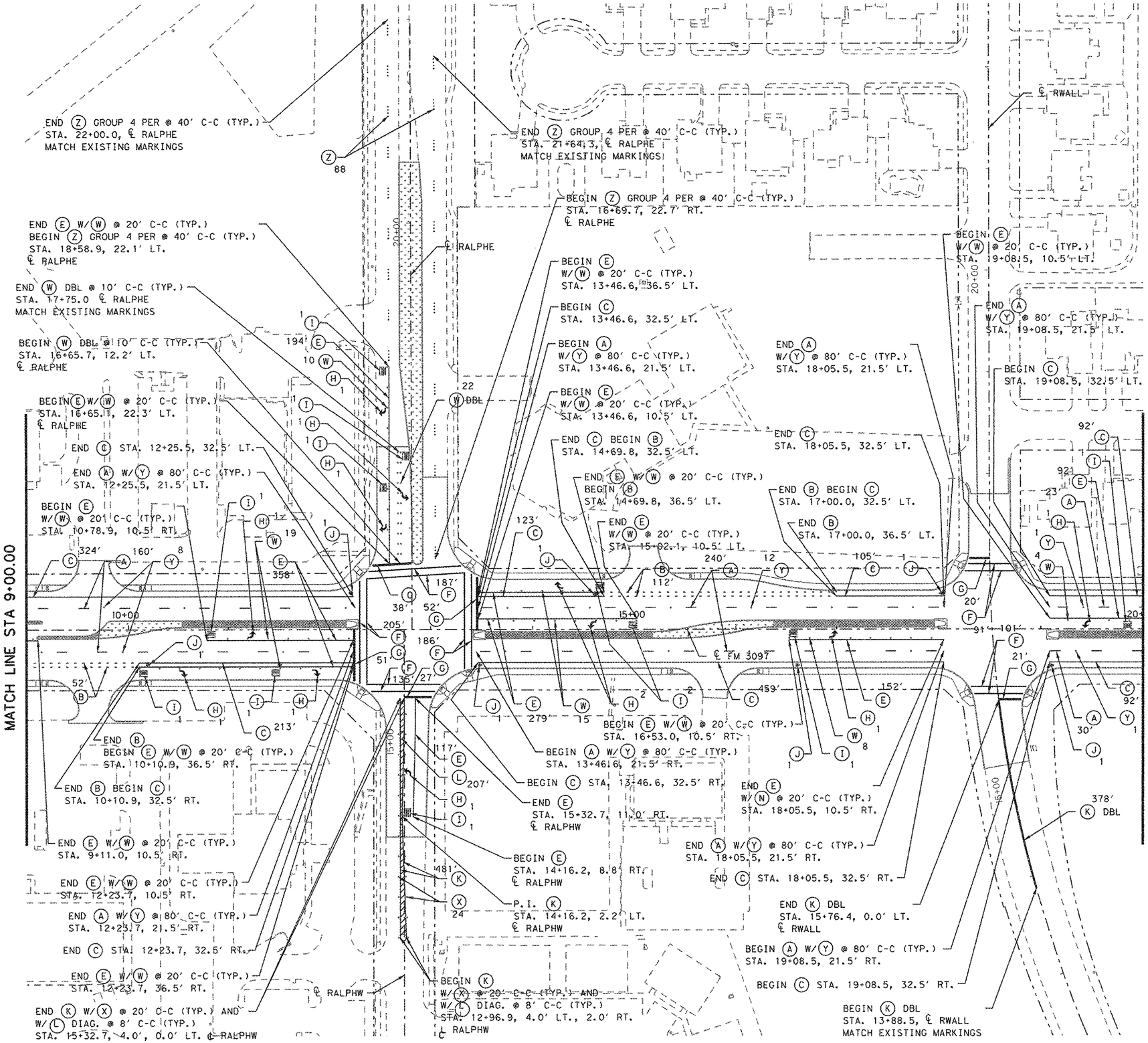
Texas Department of Transportation

FM 3097
PAVEMENT MARKINGS LAYOUT
STA. 0+00.00 TO STA. 9+00.00

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Checked:	TSB	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	CH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	TSB	DAL	ROCKWALL	3148	01	006		247

SHEET 1 OF 5

C:\8440602\dtv\120404R0pm01.dgn
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50 25 0 50 100
SCALE FEET

LEGEND

- (A) REFL PAV MRK TY I & TY II (W)4"(BRK)
- (B) REFL PAV MRK TY I & TY II (W)4"(DOT)
- (C) REFL PAV MRK TY I & TY II (W)4"(SLD)
- (D) REFL PAV MRK TY I & TY II (W)8"(DOT)
- (E) REFL PAV MRK TY I & TY II (W)8"(SLD)
- (F) REFL PAV MRK TY I & TY II (W)12"(SLD)
- (G) REFL PAV MRK TY I & TY II (W)24"(SLD)
- (H) REFL PAV MRK TY I & TY II (W)(ARROW)
- (I) REFL PAV MRK TY I & TY II (W)(WORD)
- (J) REFL PAV MRK TY I & TY II (W)(BIKE SYML)
- (K) REFL PAV MRK TY I & TY II (Y)4"(SLD)
- (L) REFL PAV MRK TY I & TY II (Y)8"(SLD)
- (M) REFL PAV MRK TY I & TY II (Y)24"(SLD)
- (W) REFL PAV MRKR TY I-C
- (X) REFL PAV MRKR TY II-A-A
- (Y) REFL PAV MRKR TY II-C-R
- (Z) TRAFFIC BUTTON TY W

NOTES:

1. ALL STATION AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.

STATE OF TEXAS
T. SCOTT BOND
62907
REGISTERED PROFESSIONAL ENGINEER

T. Scott Bond 4/30/2014

NO.	REVISION	BY	DATE

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #687

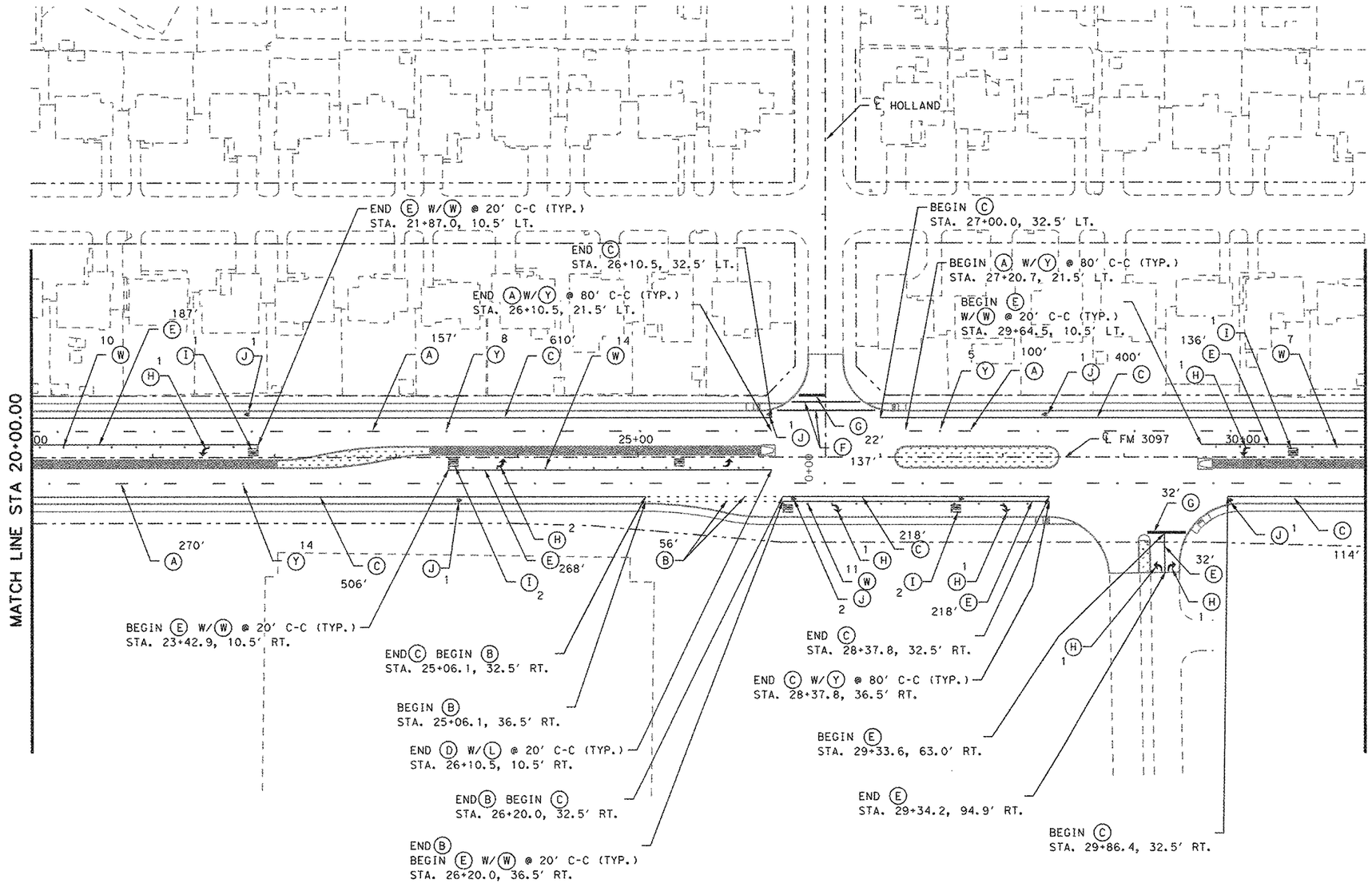
Texas Department of Transportation

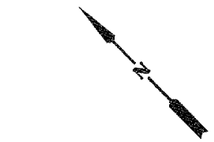
FM 3097
PAVEMENT MARKINGS LAYOUT
STA. 9+00.00 TO STA. 20+00.00

Designed:	CH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	TSB	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn:	CH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	TSB	DAL	ROCKWALL	3148	01	006	248

SHEET 2 OF 5

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4/30/2014 8:19:03 AM





LEGEND

- (A) REFL PAV MRK TY I & TY II (W)4"(BRK)
- (B) REFL PAV MRK TY I & TY II (W)4"(DOT)
- (C) REFL PAV MRK TY I & TY II (W)4"(SLD)
- (D) REFL PAV MRK TY I & TY II (W)8"(DOT)
- (E) REFL PAV MRK TY I & TY II (W)8"(SLD)
- (F) REFL PAV MRK TY I & TY II (W)12"(SLD)
- (G) REFL PAV MRK TY I & TY II (W)24"(SLD)
- (H) REFL PAV MRK TY I & TY II (W)(ARROW)
- (I) REFL PAV MRK TY I & TY II (W)(WORD)
- (J) REFL PAV MRK TY I & TY II (W)(BIKE SYML)
- (K) REFL PAV MRK TY I & TY II (Y)4"(SLD)
- (L) REFL PAV MRK TY I & TY II (Y)8"(SLD)
- (M) REFL PAV MRK TY I & TY II (Y)24"(SLD)
- (W) REFL PAV MRKR TY I-C
- (X) REFL PAV MRKR TY II-A-A
- (Y) REFL PAV MRKR TY II-C-R
- (Z) TRAFFIC BUTTON TY W

NOTES:

1. ALL STATION AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.

STATE OF TEXAS
T. SCOTT BOND
62907
REGISTERED PROFESSIONAL ENGINEER

4/30/2014

NO.	REVISION	BY	DATE

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

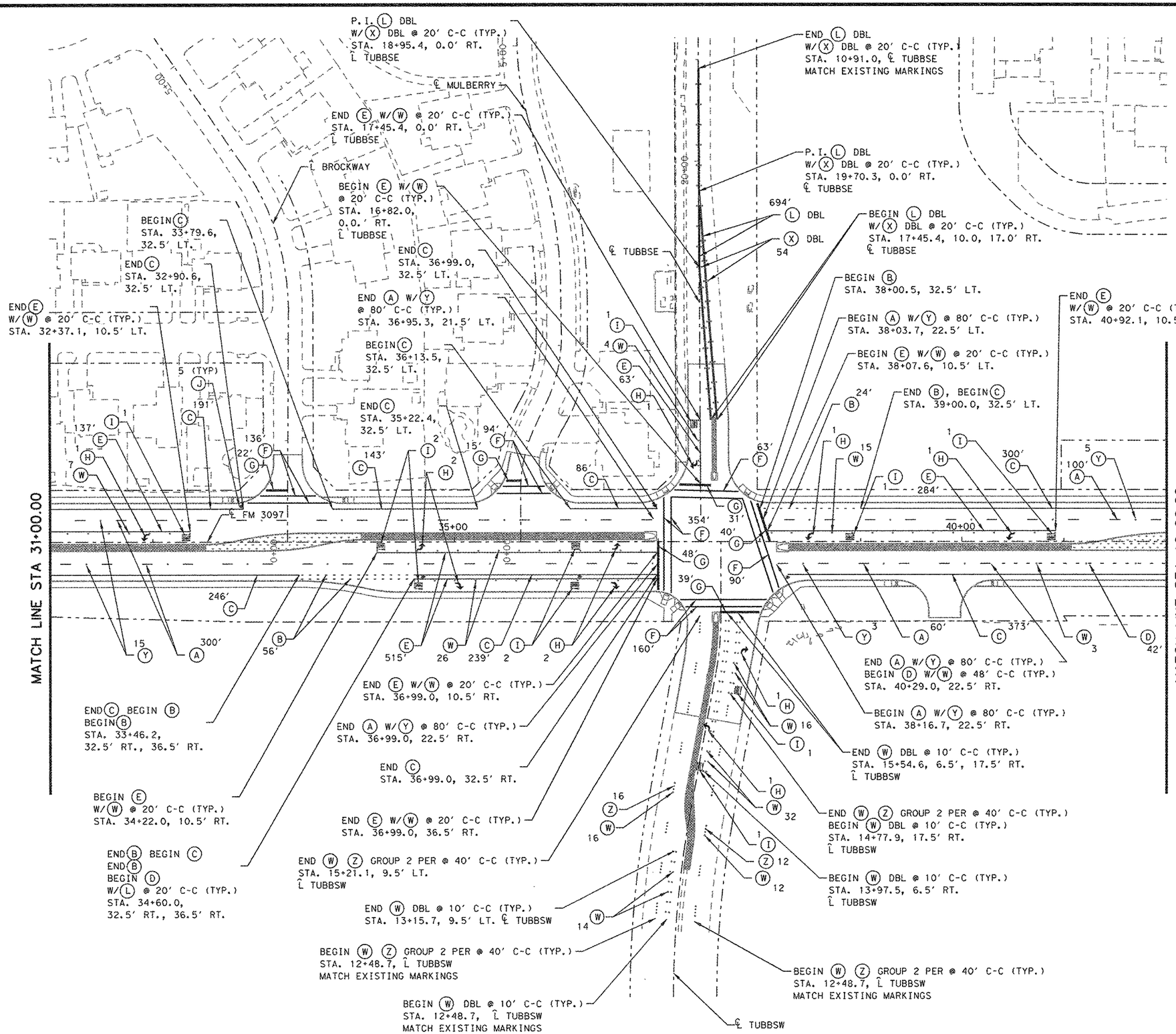
Texas Department of Transportation

FM 3097
PAVEMENT MARKINGS LAYOUT
STA. 20+00.00 TO STA. 31+00.00

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Drawn:	CH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
Checked:	TSB	DAL	ROCKWALL	3148	01	006	249	

SHEET 3 OF 5

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50 25 0 50 100
SCALE FEET

LEGEND

- (A) REFL PAV MRK TY I & TY II (W)4"(BRK)
- (B) REFL PAV MRK TY I & TY II (W)4"(DOT)
- (C) REFL PAV MRK TY I & TY II (W)4"(SLD)
- (D) REFL PAV MRK TY I & TY II (W)8"(DOT)
- (E) REFL PAV MRK TY I & TY II (W)8"(SLD)
- (F) REFL PAV MRK TY I & TY II (W)12"(SLD)
- (G) REFL PAV MRK TY I & TY II (W)24"(SLD)
- (H) REFL PAV MRK TY I & TY II (W)(ARROW)
- (I) REFL PAV MRK TY I & TY II (W)(WORD)
- (J) REFL PAV MRK TY I & TY II (W)(BIKE SYML)
- (K) REFL PAV MRK TY I & TY II (Y)4"(SLD)
- (L) REFL PAV MRK TY I & TY II (Y)8"(SLD)
- (M) REFL PAV MRK TY I & TY II (Y)24"(SLD)
- (W) REFL PAV MRKR TY I-C
- (X) REFL PAV MRKR TY II-A-A
- (Y) REFL PAV MRKR TY II-C-R
- (Z) TRAFFIC BUTTON TY W

NOTES:

1. ALL STATION AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.

STATE OF TEXAS
T. SCOTT BOND
62907
REGISTERED PROFESSIONAL ENGINEER
4/30/2014

NO.	REVISION	BY	DATE

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

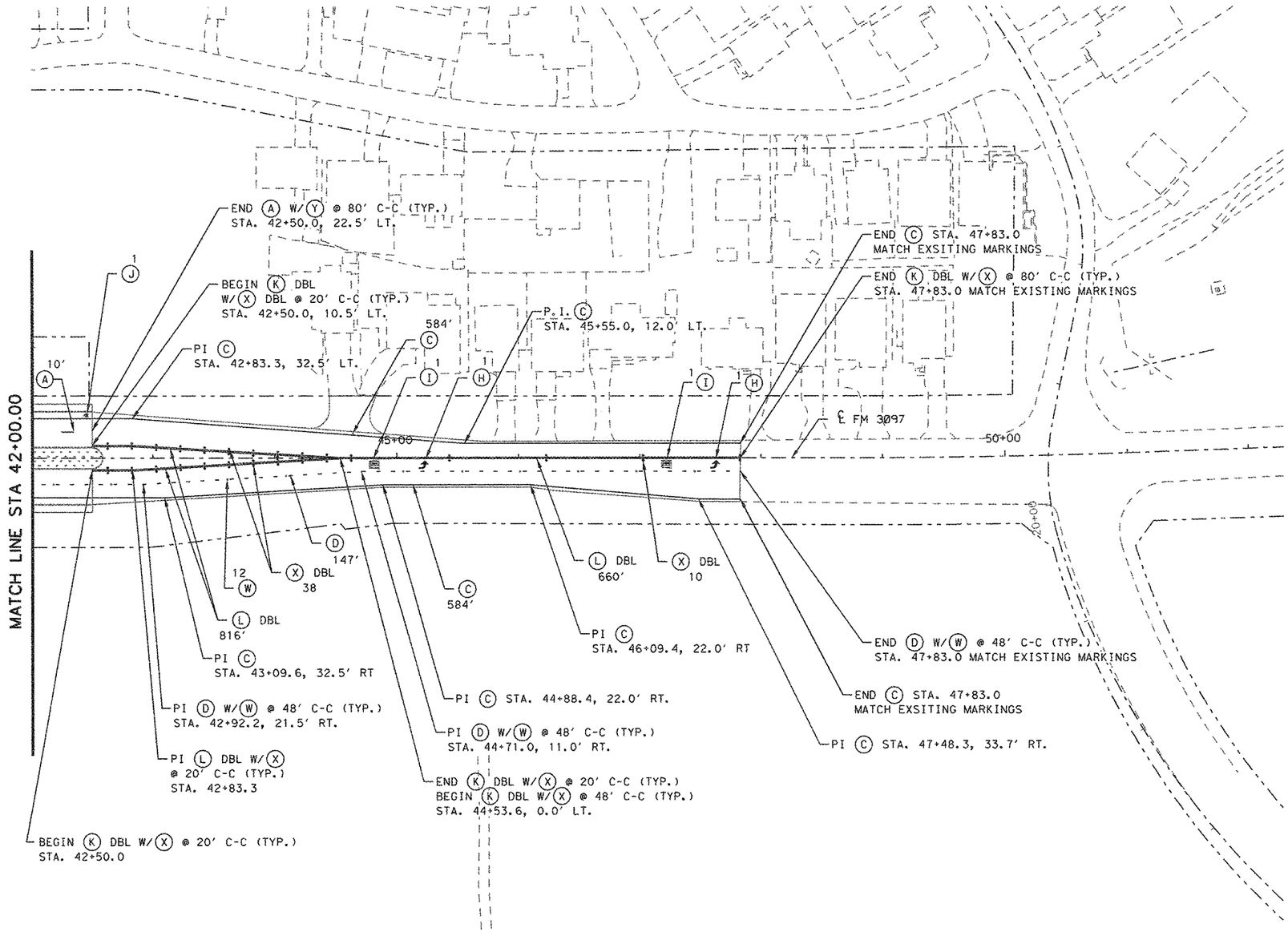
Texas Department of Transportation

FM 3097
PAVEMENT MARKINGS LAYOUT
STA. 31+00.00 TO STA. 42+00.00

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Checked:	TSB	DAL	ROCKWALL	3148	01	006		250

SHEET 4 OF 5

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4/30/2014 8:20:25 AM



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SCALE FEET

LEGEND

- (A) REFL PAV MRK TY I & TY II (W)4"(BRK)
- (B) REFL PAV MRK TY I & TY II (W)4"(DOT)
- (C) REFL PAV MRK TY I & TY II (W)4"(SLD)
- (D) REFL PAV MRK TY I & TY II (W)8"(DOT)
- (E) REFL PAV MRK TY I & TY II (W)8"(SLD)
- (F) REFL PAV MRK TY I & TY II (W)12"(SLD)
- (G) REFL PAV MRK TY I & TY II (W)24"(SLD)
- (H) REFL PAV MRK TY I & TY II (W)(ARROW)
- (I) REFL PAV MRK TY I & TY II (W)(WORD)
- (J) REFL PAV MRK TY I & TY II (W)(BIKE SYML)
- (K) REFL PAV MRK TY I & TY II (Y)4"(SLD)
- (L) REFL PAV MRK TY I & TY II (Y)8"(SLD)
- (M) REFL PAV MRK TY I & TY II (Y)24"(SLD)
- (W) REFL PAV MRKR TY I-C
- (X) REFL PAV MRKR TY II-A-A
- (Y) REFL PAV MRKR TY II-C-R
- (Z) TRAFFIC BUTTON TY W

NOTES:

1. ALL STATION AND OFFSETS ARE FROM ℄ FM 3097 UNLESS OTHERWISE SPECIFIED.

STATE OF TEXAS
T. SCOTT BOND
62907
REGISTERED PROFESSIONAL ENGINEER

4/30/2014

NO.	REVISION	BY	DATE

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation

FM 3097
PAVEMENT MARKINGS LAYOUT
STA. 42+00.00 TO END PROJECT

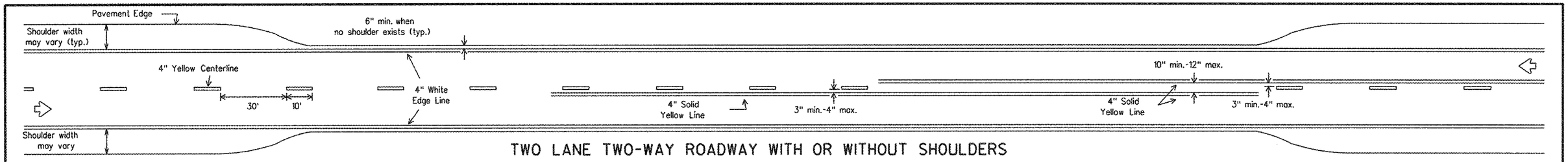
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Checked:	TSB	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	CH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
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SHEET 5 OF 5

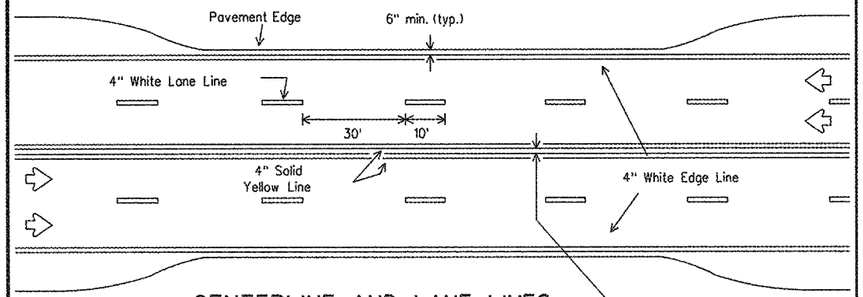
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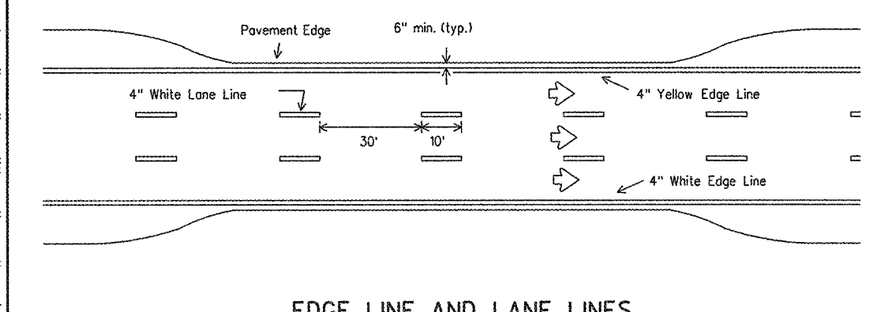
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FILE:



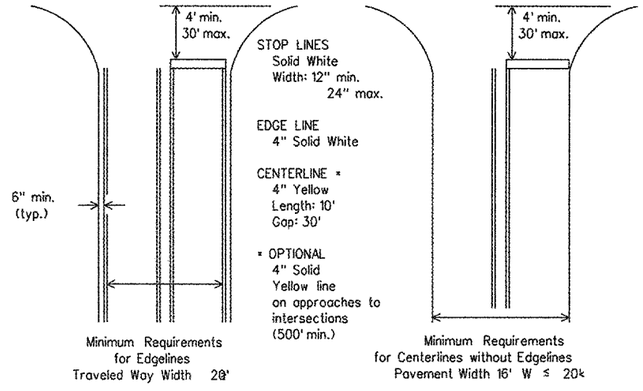
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

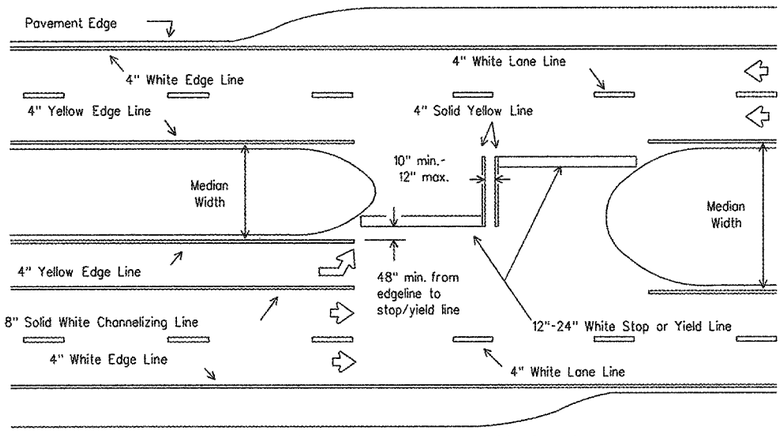


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



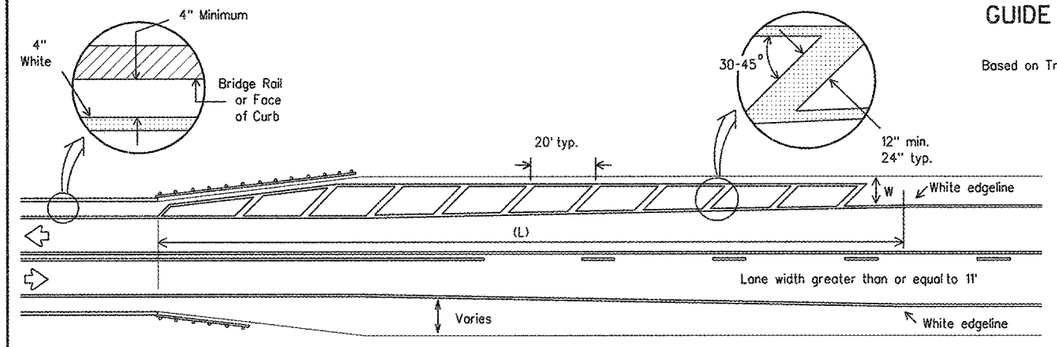
GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

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 *	Formula
≤ 40	$L = \frac{WS^2}{60}$
≥ 45	L=WS

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

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

EXAMPLES:

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

L = 8 x 70 = 560 ft.

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

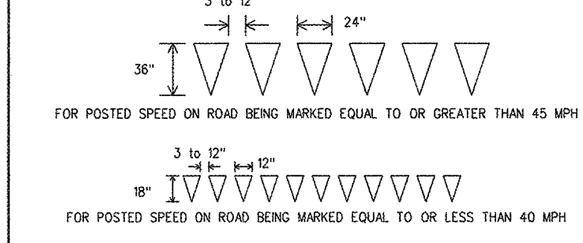
L = 4(40) ÷ 60 = 106.67 ft. rounded to 110 ft.

GENERAL NOTES

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

© TxDOT November 1978

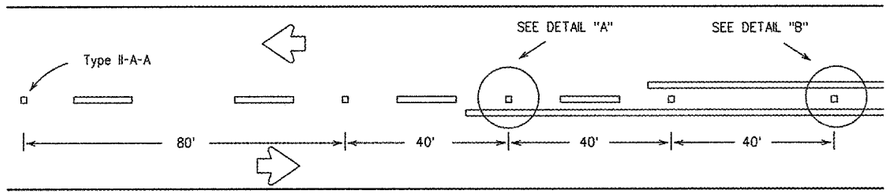
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REVISIONS	CONT	SECT	JOB	HIGHWAY
8-95 2-12				
5-00				
8-00	DIST	COUNTY		SHEET NO.
3-03				252

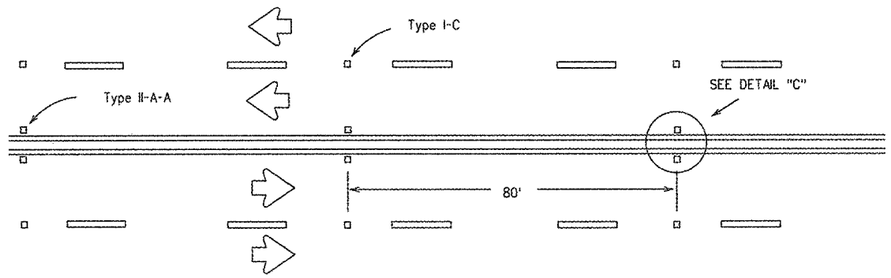
22A

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REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

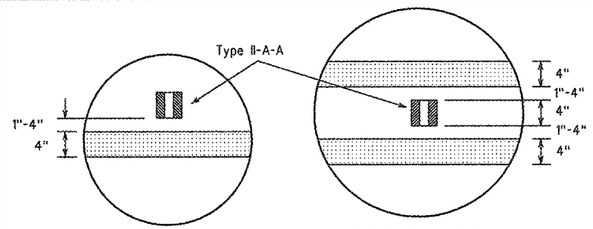


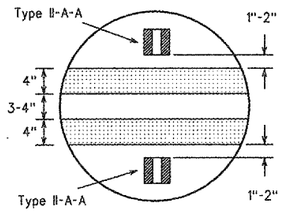
CENTERLINE FOR ALL TWO LANE ROADWAYS

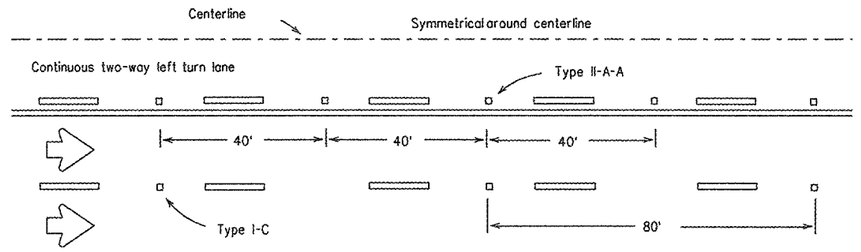


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS

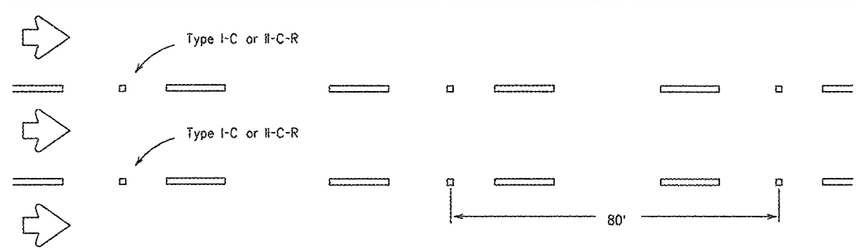
Raised pavement marker Type I-C, clear face toward normal traffic, shall be placed on 80-foot centers.





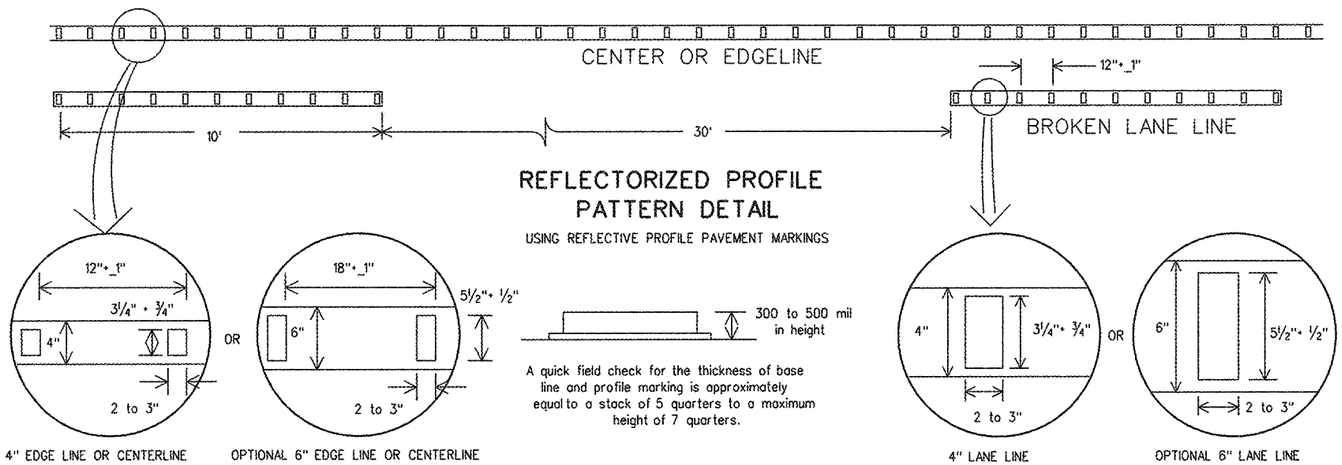


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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

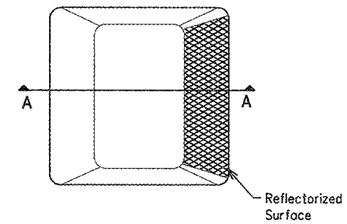
NOTE:
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

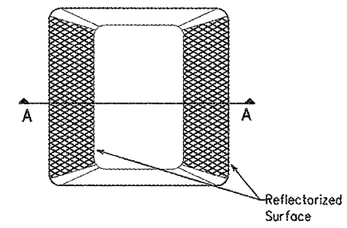
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

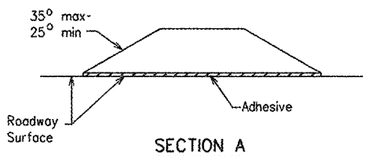
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



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

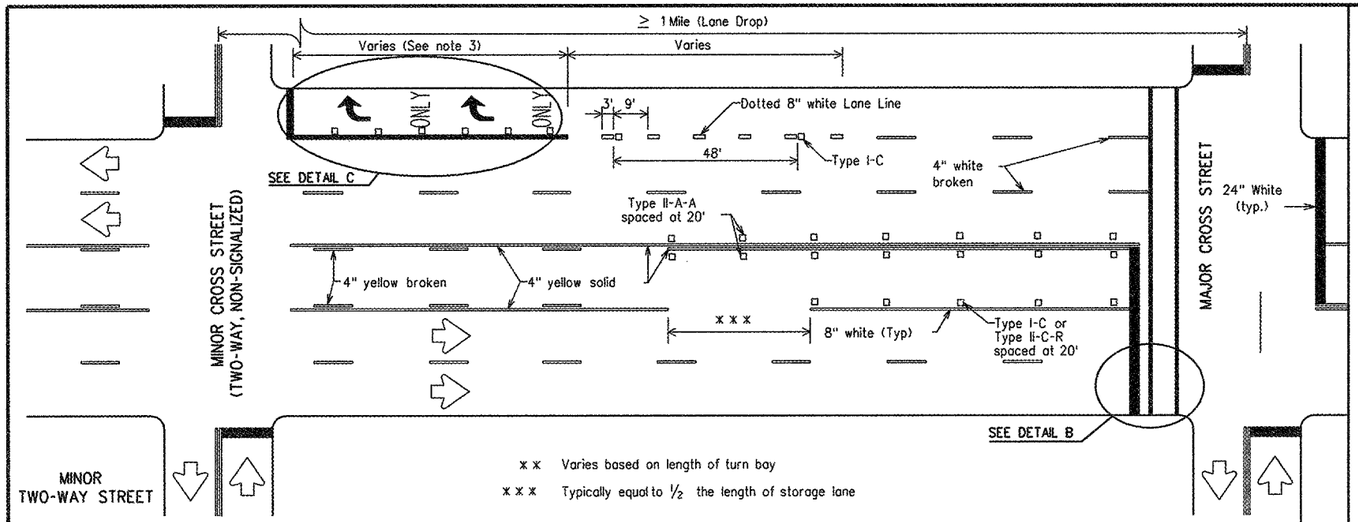
© TxDOT April 1977

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

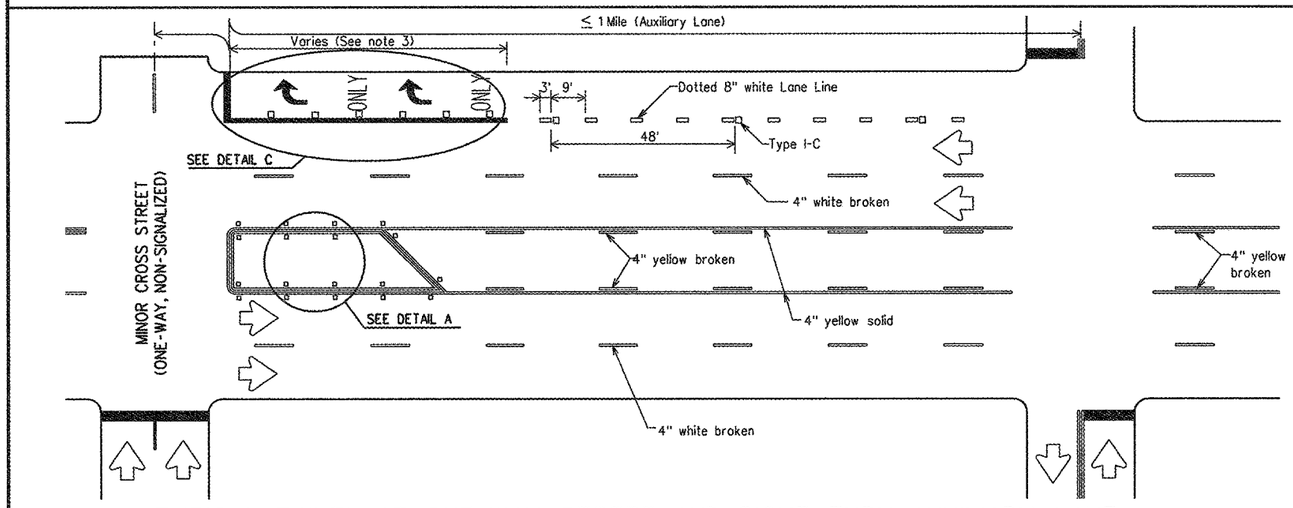
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4-92	2-10				
5-00	2-12				
8-00		DIST	COUNTY		SHEET NO.
2-08					253

DATE:
FILE:

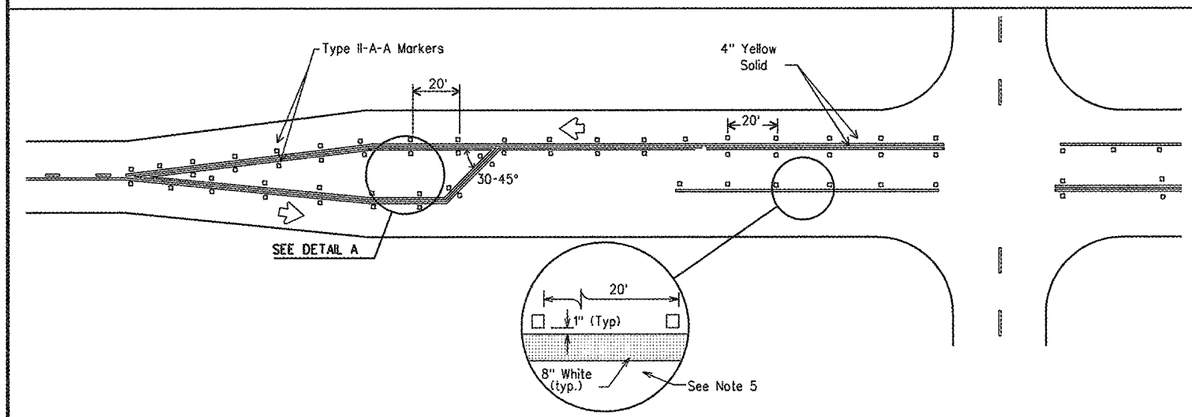
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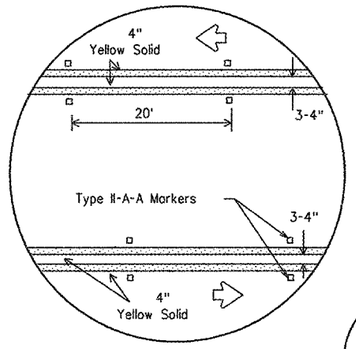
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



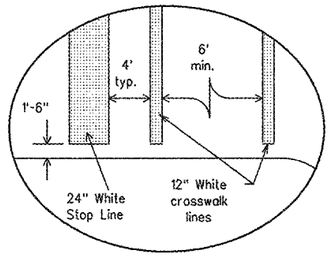
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS

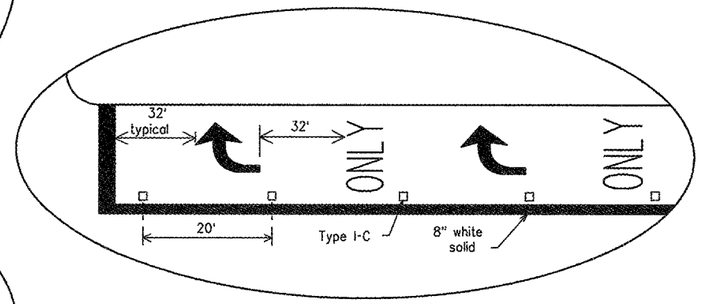


DETAIL A



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

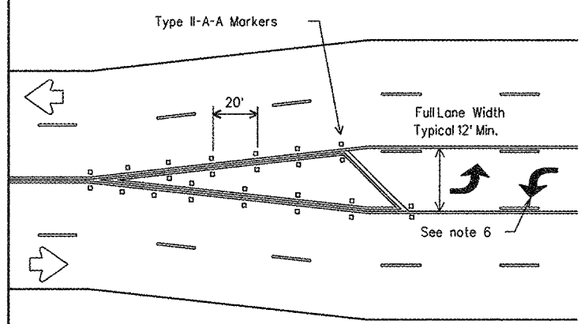
DETAIL B



DETAIL C

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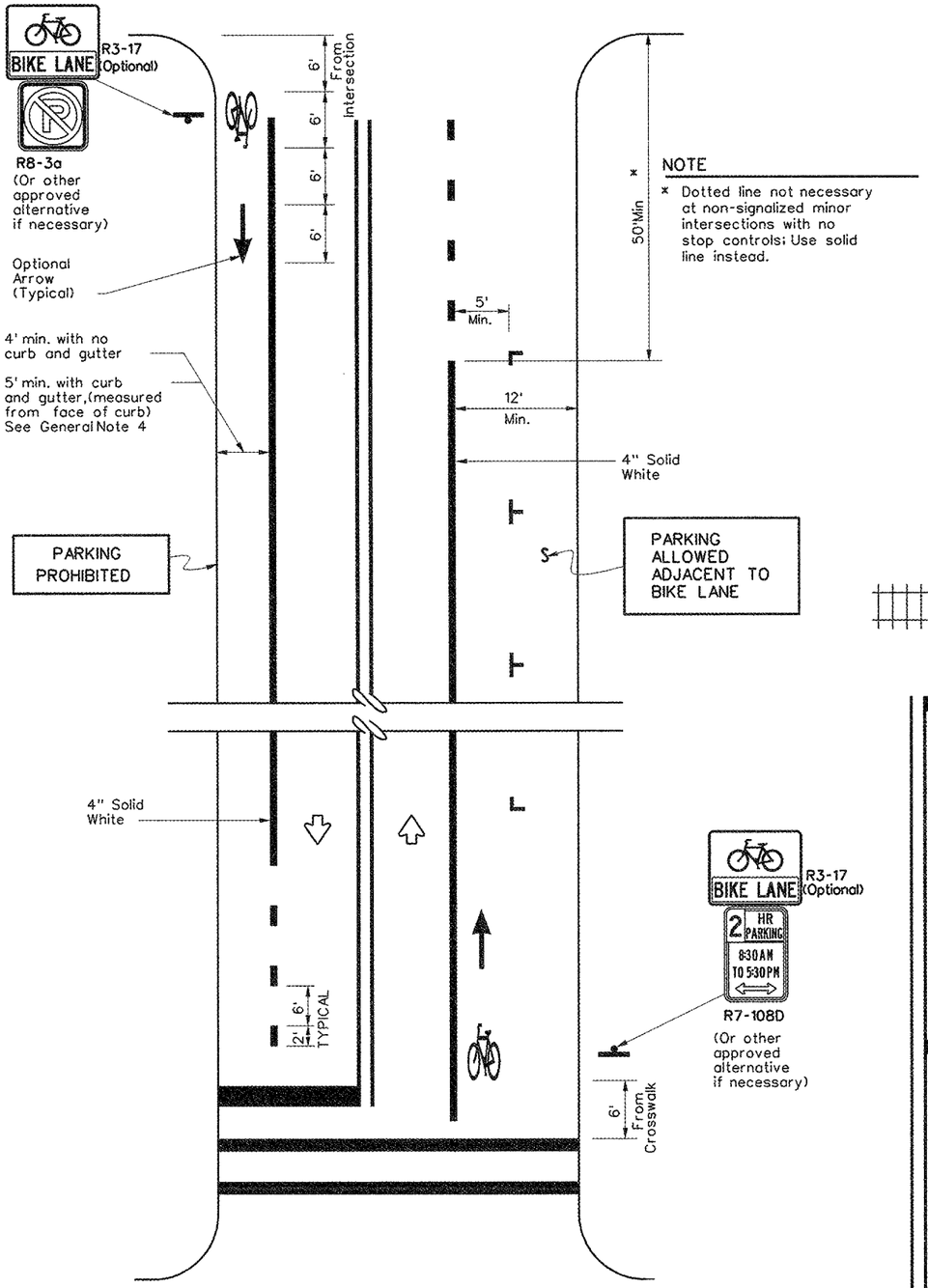
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
5-00 2-12				
8-00				
3-03	DIST	COUNTY		SHEET NO.
2-10				254

DATE:
FILE:

22C

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NOTE

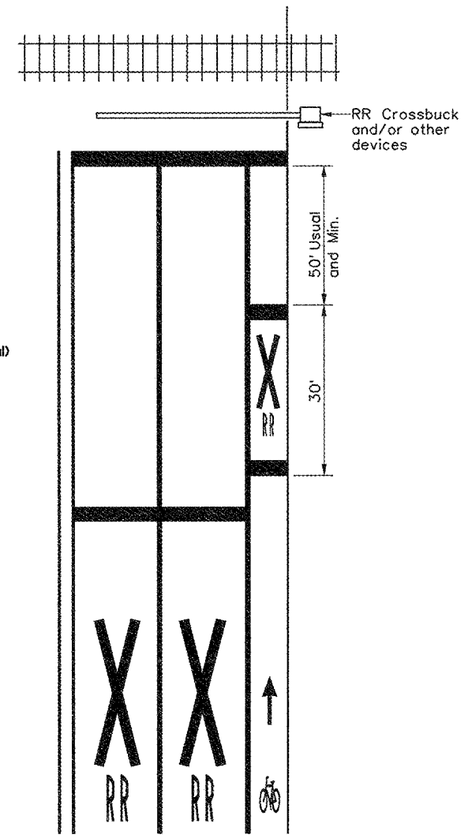
* Dotted line not necessary at non-signalized minor intersections with no stop controls: Use solid line instead.

NOTES

1. Bicycle lane pavement markings typically repeated after each intersection or signalized driveway.
2. On uninterrupted sections of roadway, bicycle lane pavement markings typically repeated as follows:

   -1200' for 45 MPH or less roads
   -2500' for 50 MPH and greater roads.

TWO-WAY STREET



(See RCPM Standard for travel lane details)

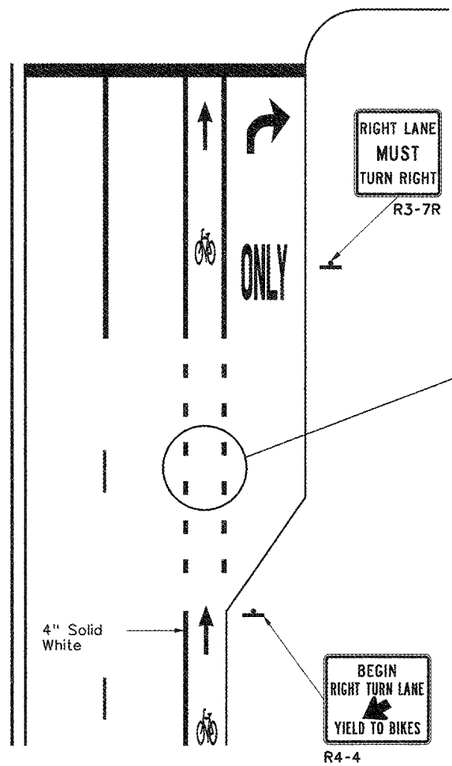
RAILROAD CROSSING APPROACH

GENERAL NOTES

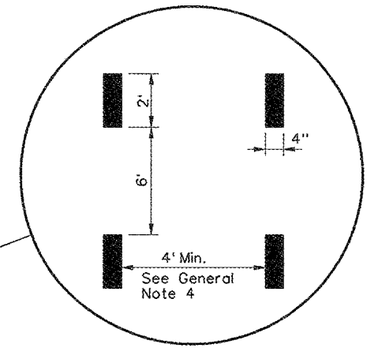
1. All bicycle lane pavement markings shall be white unless otherwise noted.
2. All pavement marking materials shall meet the required Department Material Specifications as specified by the plans.
3. Exact sign placement and details are shown elsewhere in the plans.
4. The current edition of AASHTO'S Guide for the Development of Bicycle Facilities should be referenced for variations in design, other geometric conditions, and lane width options.
5. Other bicycle lane symbol or word markings as shown in the Texas Manual on Uniform Traffic Control Devices may be used. Details for words, arrows and symbols as shown in the Standard Highway Sign Designs for Texas.
6. The "BIKE LANE" (R3-17) sign with the "AHEAD" (R3-17a) sign mounted directly below should be installed in advance of the beginning of a marked bike lane.
7. The "BIKE LANE" (R3-17) sign with the "END" (R3-17b) sign mounted directly below should be installed at the end of marked bicycle lane.

LEGEND	
	Sign
	Traffic Flow

SPECIFICATION REFERENCE TABLE	
Traffic Paint	DMS-8200
Hot Applied Thermoplastic	DMS-8220
Permanent Prefabricated Pavement Markings	DMS-8240
Glass Traffic Beads	DMS-8290



RIGHT TURN ONLY LANE



DETAIL "A"

Texas Department of Transportation
Traffic Operations Division

BICYCLE LANE PAVEMENT MARKINGS

BLPM-10

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REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.
				255

DATE:
FILE:

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1. Do not alter Sheet Design or Font style, size or weight - match text attributes.
2. If additional space is needed for a numbered section, fence and adjust sections up as needed - proportioning and readability but do not relocate from its relative position.
3. All areas should be addressed thoroughly and verify the necessary pay items are set up to support actions needed.

Revised: May 2012
Prepared by: ROBIN HANDEL of CP&Y, INC on 09/15/13

I. STORMWATER POLLUTION PREVENTION PLAN-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 1122.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with General Notes. Additional erosion and sedimentation controls may be required as directed by the project engineer.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.
5. MS4 Operators: City of Rockwall and Rockwall County.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas. No equipment is allowed in any sream channel below the ordinary High Water Mark except on approved temporary stream crossings or drill pads.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☐ No Permit Required
☒ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List Waters of the US Permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

Refer to General Notes for permitting requirements at the following stream channels:

Brockway Branch - Approximate Station 41+72.00

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices for applicable 401 General Conditions:

Erosion	Sedimentation	Post-Construction TSS
☒ Temporary Vegetation	☒ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☒ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☒ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☒ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☒ Vegetation Lined Ditches
	☒ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☐ No Action Required ☒ Required Action

Action No.

1. See note above.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.

☐ No Action Required ☒ Required Action

Action No.

1. Preserve native vegetation to the extent practical by limiting clearing activities to those necessary for construction.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS TREATY ACT.

☐ No Action Required ☒ Required Action

Action No.

1. The contractor shall be aware that protected species are common in this area and shall take appropriate measures to avoid injuring or killing any wildlife encountered during construction.
2. The migratory bird treaty act prohibits harm to most bird species. The contractor shall not begin activities that could damage or destroy adult birds, eggs, or nestlings until the birds have abandoned any occupied nests. The contractor shall not harm any birds or active nests regardless of the date. See general notes for more instructions.
3. Protected/Endangered species as follows: Texas Garter Snake, Timber/Canebrake Rattlesnake, and Plains Spotted Skunk.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediated area, and contact the Engineer immediately.

Special Note: The Migratory Bird Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade or transport any migratory bird, nest, young, feather or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. The contractor would remove all old migratory bird nests from any structure where work would be done from October 1 to February 15. In addition, the contractor would be prepared to prevent migratory birds from building nest(s) between February 15 to October 1. In the event that migratory birds are encountered on-site during project construction, efforts to avoid adverse impacts on protected birds, active nests, eggs and/or young would be observed.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corp of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropiate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canisters, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation(s) or replacement(s) (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☒ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notifiy DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☐ No Action Required ☒ Required Action

Action No.

1. If potentially hazardous material and/or contaminated media (i.e. soil, groundwater, surface water, sediment, building materials) are unexpectedly encountered during construction, cease work in the immediate area and contact the Engineer immediately.

VII. OTHER ENVIRONMENTAL ISSUES

(Includes regional issues such as Edwards Aquifer District, etc.)

☒ No Action Required ☐ Required Action

Action No.

GENERAL NOTE:

Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities, as additional environmental clearance may be required.

LAST REVISION: MAY 2012

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Texas Department of Transportation
Dallas District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	STP 2013 (597) MM		FM 3097
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	ROCKWALL	
CONTROL	SECTION	JOB	SHEET NO.
3148	01	006	256

A. GENERAL SITE DATA

1. PROJECT LIMITS: *FROM FM 740 TO 0.15 MILES SOUTH TUBBS STREET*

Project Coordinates: -96.497777 N ; 32.783662 E

2. PROJECT SITE MAPS:

- * *Project Location Map: The Title Sheet*
- * *Drainage Patterns: Drainage Area Maps (Sheets 144 - 148)*
- * *Slopes Anticipated After Major Gradings or Areas of Soil Disturbance: Typical Sections (Sheets 4 - 10)*
- * *Location of Erosion and Sediment Controls: SW3P Site Maps (Sheets 251 - 259)*
- * *Surface Waters and Discharge Locations: Drainage and Culvert Layouts (Sheets 142 - 155)*
- * *Project Specific Locations: To be specified by the Project Field Office during construction and located in the Project SW3P File. Reference item *10 below.*

3. PROJECT DESCRIPTION:

FOR THE CONSTRUCTION OF RECONSTRUCT AND WIDEN 2 LANE UNDIVIDED TO 4 LANE DIVIDED CONSISTING OF: GRADING, DRAINAGE, REMOVALS, BRIDGE CLASS CULVERTS, RETAINING WALLS, SIGNALIZATION, STORM WATER POLLUTION PREVENTION PLANS, SIGNING, PAVEMENT MARKINGS, AND MISCELLANEOUS DETAILS.

4. MAJOR SOIL DISTURBING ACTIVITIES:

The soil will be disturbed by way of grading and right-of-way prepping.

5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:

The soil types found on site are as follows: Clay (dark gray with traces of gravel), Clay (brown and gray with traces of calcareous nodules), and Clay (silty, weathered, light brown, light gray, calcareous). The vegatative cover is in good condition and makes up approximately 50% of the site.

6. TOTAL PROJECT AREA: *14.30* Acres

7. TOTAL AREA TO BE DISTURBED: *11.22* Acres (*78 %*)

8. WEIGHTED RUNOFF COEFFICIENT

BEFORE CONSTRUCTION: *0.57*
AFTER CONSTRUCTION: *0.73*

9. NAME OF RECEIVING WATERS:

EAST FORK TRINITY RIVER (From the confluence with the Trinity River in Kaufman County to Rockwall-Forney Dam in Kaufman County)
SEGMENT 0819*

10. PROJECT SW3P FILE:

A. For projects disturbing one to five acres, TxDOT will maintain SW3P file at the project field office which contains the followowing: Index Sheet, TCEQ Signature Authority, TCEQ Small Construction Site Notice, SW3P Inspector Qualification Statements, Inspection and Maintenance Reports, EPIC Sheet, SW3P Sheet, Site Location Maps, Stored Material Lists specifying associated control measures, and the Appendix which contains the TPDES Construction General Permit and the Construction PSL Permits per all applicable requirements.

B. For projects disturbing 5 acres or more, TxDOT will follow the actions listed in (10.A.) above with the addition of the following: Notice Of Intent (N.O.I.) and Fee Payment Form, TCEQ Large Construction Site Notice (to be used instead of Small Site Notice), and TPDES Permit Coverage Notice.

C. For projects disturbing less than one acre, actions described in (10.A.) and (10.B.) above are not required.

B. EROSION AND SEDIMENT CONTROLS

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

- T TEMPORARY SEEDING
- ____ MULCHING (Hay or Straw)
- ____ BUFFER ZONES
- ____ PLANTING
- ____ SEEDING
- P SODDING
- ____ PRESERVATION OF NATURAL RESOURCES
- ____ FLEXIBLE CHANNEL LINER
- ____ RIGID CHANNEL LINER
- ____ SOIL RETENTION BLANKET
- ____ COMPOST MANUFACTURED TOPSOIL
- T VERTICAL TRACKING
- ____ OTHER:

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

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

NOTE: TOP OF BMP'S SHOULD NOT BE HIGHER THAN ROADWAY ELEVATION AS NOT TO FLOOD ROADWAY UNLESS PRIOR APPROVAL FROM ENGINNER IS OBTAINED.

3. STORM WATER MANAGEMENT:

A. Storm water drainage will be provided by ditches, inlets, and storm water systems which carry drainage within the R.O.W. to the lows within the roadway and project site which drains to natural facilities.

B. Other permanent erosion controls include hydraulic design to limit structure outlet velocities and grading design generally consisting of 4 :1 or flatter slopes with permanent vegetative cover.

4. STORM WATER MANAGEMENT ACTIVITIES: (Sequence of Construction)

The storm water management practices shown within the project are as follows: Silt fences will be placed before any construction begins. This will contain any on-site debris from affecting properties or waters. Temporary seeding will be placed in areas of high runoff potential during construction. Erosion control logs will be placed around all inlets. Rock filter dams will be placed at the upstream end of the proposed culvert. Final sodding will take place at the end of construction.

This project is not a good canidate for the use of retention ponds due to it being urban. There is minimal right-of-way take with this project. There is no area within the project limits or surrounding area to place a retention pond.

5. NON-STORM WATER DISCHARGES:

Filter non-storm water discharges, or hold 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 washwater containing no detergents.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:

Maintain all erosion and sediment controls in good working order. Perform any necessary repairs 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. Stabilize disturbed areas on which construction activities have ceased, temporarily or permanently, within 14 calendar days unless they are scheduled to and do resume within 21 calendar days. The areas adjacent to creeks and drainageways have priority followed by devices protecting storm sewer inlets.

2. INSPECTION:

A TxDOT inspector will perform a regularly scheduled SW3P inspection every 7 calendar days. An inspection and Maintenance Report, signed by the TxDOT inspector and the Contractor, will be filed for each inspection. Revise and/or repair each BMP control device in accordance with the current inspection and Maintenance Report and item (1.) above.

3. WASTE MATERIALS:

On a daily basis, or as may be directed, collect all waste materials, trash and debris from the construction site and deposit into a metal dumpster having a secure cover and which meets all state and local city solid waste management requirements. Empty the dumpster as required by regulation, or as may be directed, at a local approved landfill site. Do not bury construction waste on the construction project site.

4. HAZARDOUS WASTE & SPILL REPORTING:

As a minimum, any products in the following categories are considered to be hazardous: Paints, Acids, Solvents, Fuels, Asphalt Products, Chemical Additives for Soil Stabilization, and Concrete Curing Compounds or Additives. When storing hazardous material on the project site, or at a Project Specific Location, take all practicable precaution to prevent and/or contain any spillage of these materials. In the event of a spill, contact the spill coordinator immediately.

5. SANITARY WASTE:

Use a licensed sanitary waste management contractor to collect all sanitary waste from portable units as may be required by local regulation, or as directed.

6. CONSTRUCTION VEHICLE TRACKING:

On a regular basis, or as may be directed, dampen haul roads for dust control and stabilize construction entrances/exits. Provide for a motorized broom or vacuum type sweeper to be available on a daily basis, or as may be directed, to remove sediment from paved roadways abutting or transversing the project site.

7. MANAGEMENT PRACTICES:

A. Construct disposal areas, stockpiles, haul roads and PSL's in a manner that will minimize and control the amount of sediment that may enter receiving waters. Do not locate disposal areas in any wetland, waterbody or streambed.
B. Locate construction staging areas, vehicle maintenance and PSL's areas in a manner to minimize the runoff of pollutants.
C. When working in or near a wetland, install and maintain operating soil erosion and sediment controls at all times during construction and isolate the work from the wetland.
D. Clear all waterways as soon as practicable of temporary embankment, temporary bridges, matting, falsework, piling, debris or other obstructions placed during construction operations that are not a part of the finished work.
E. Procedures and/or practices should be taken to control dust.
F. Sediment to be removed from roadways daily or when work begins after weather events if construction activities have ceased due to weather event.

FILE NAME
DATE
DESIGNER

CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation
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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

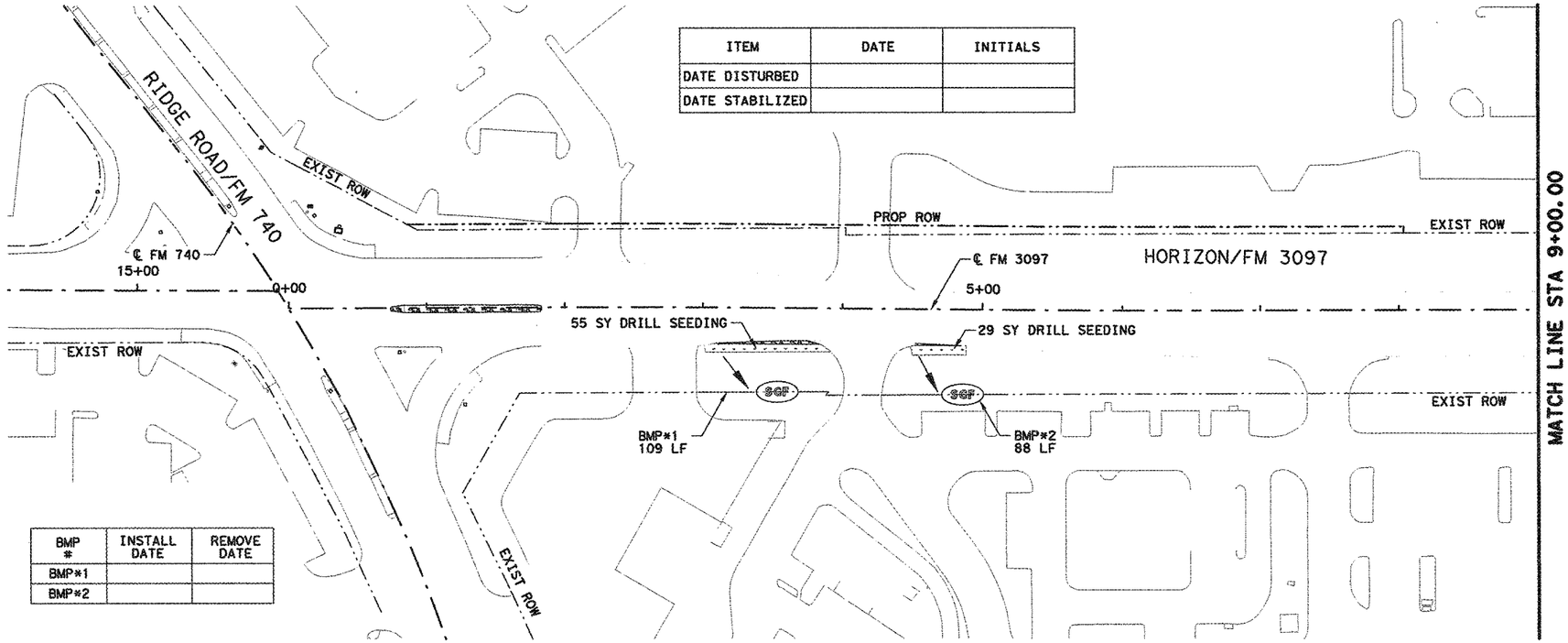
, P.E. 05/02/14
Signature of Registrant & Date

DALLAS DISTRICT ENVIRONMENTAL

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

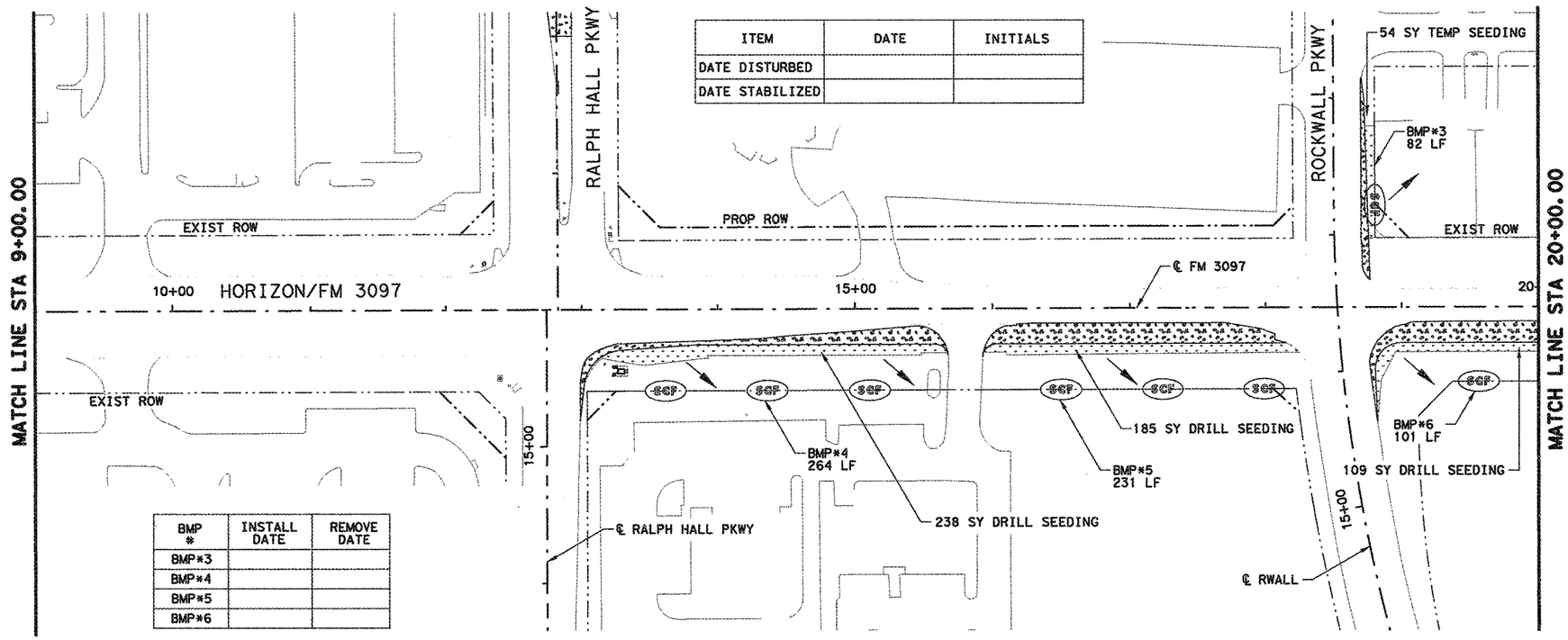
TEMPLATE REVISION DATE: 10/23/09

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
IWM	6	STP 2013 (597) MM		FM 3097
GRAPHICS KLP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK JBR	TEXAS	DALLAS	ROCKWALL	
CHECK RRH	CONTROL 3148	SECTION 01	JOB 006	257



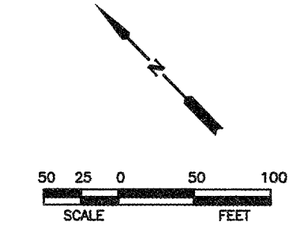
ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

BMP #	INSTALL DATE	REMOVE DATE
BMP*1		
BMP*2		



ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

BMP #	INSTALL DATE	REMOVE DATE
BMP*3		
BMP*4		
BMP*5		
BMP*6		



LEGEND

- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- SEEDING/VEGETATION
- FLOW DIRECTION
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- SFC — TEMPORARY SEDIMENT CONTROL FENCE

NOTES:

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
05/02/14

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM, F-1741

Texas Department of Transportation

SW3P

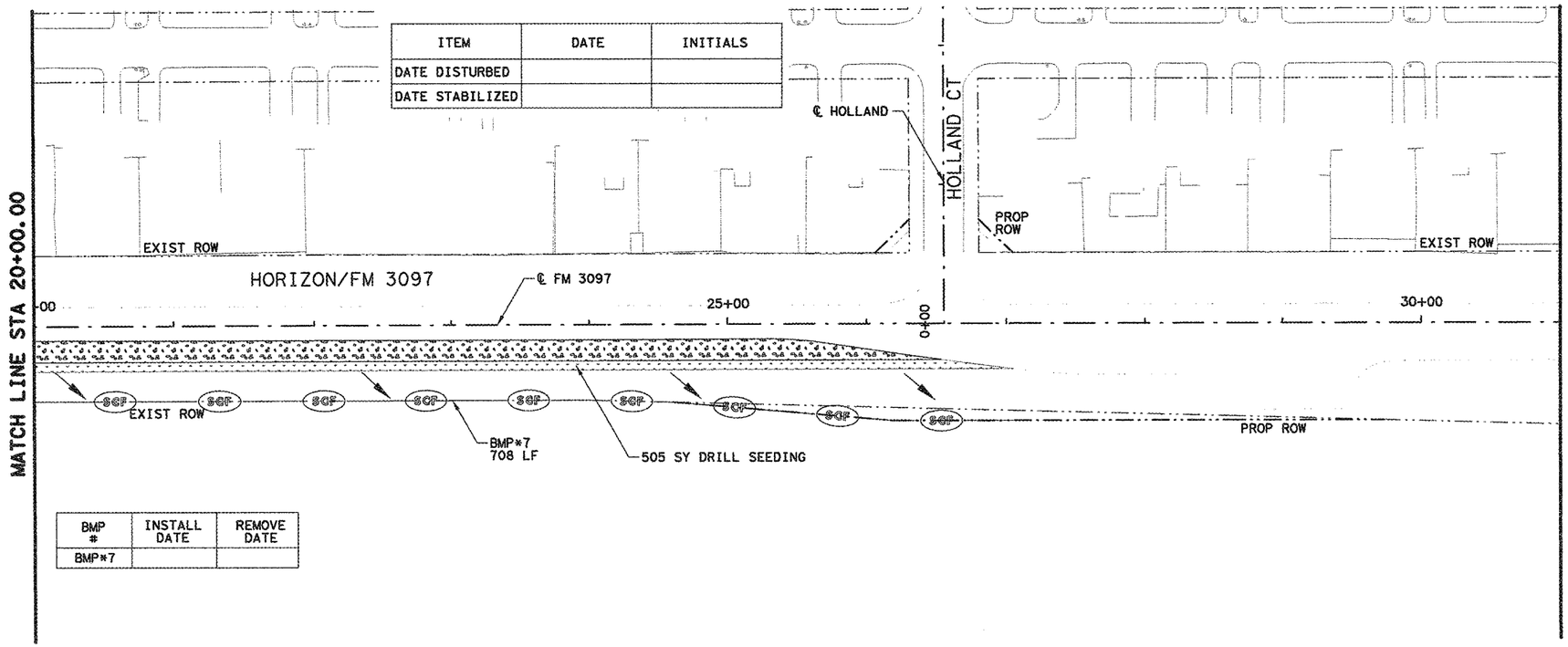
SITE PLAN PHASE 1

STA. 0+00.00 TO STA. 20+00.00

Designed:	TWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	TWM	DIST.	COUNTY		CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL		3148	01	006	258

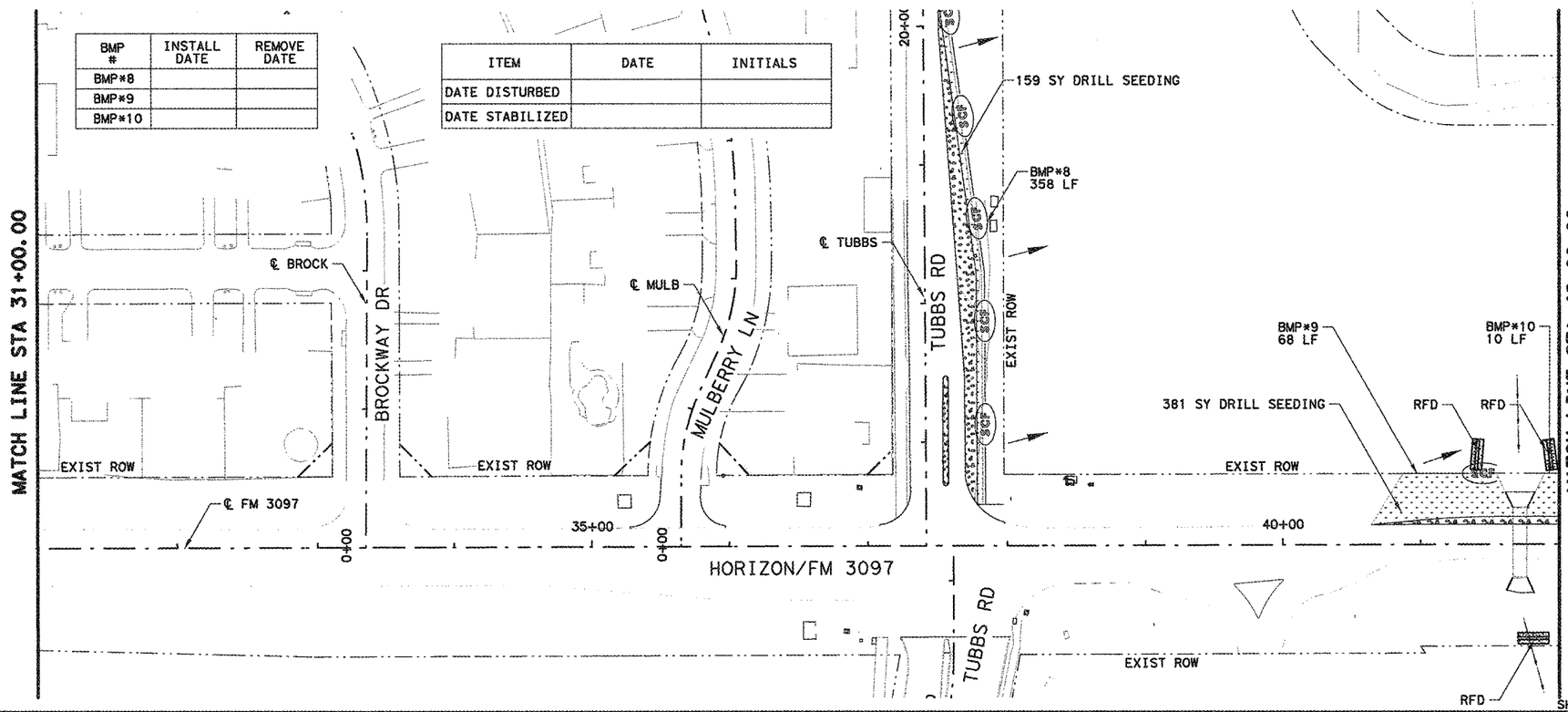
SHEET 1 OF 3

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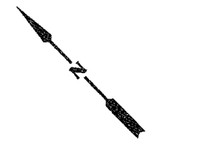
ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

BMP #	INSTALL DATE	REMOVE DATE
BMP*7		



BMP #	INSTALL DATE	REMOVE DATE
BMP*8		
BMP*9		
BMP*10		

ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		



LEGEND

- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- SEEDING/VEGETATION
- FLOW DIRECTION
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05/05/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM, F-1741

Texas Department of Transportation

SW3P

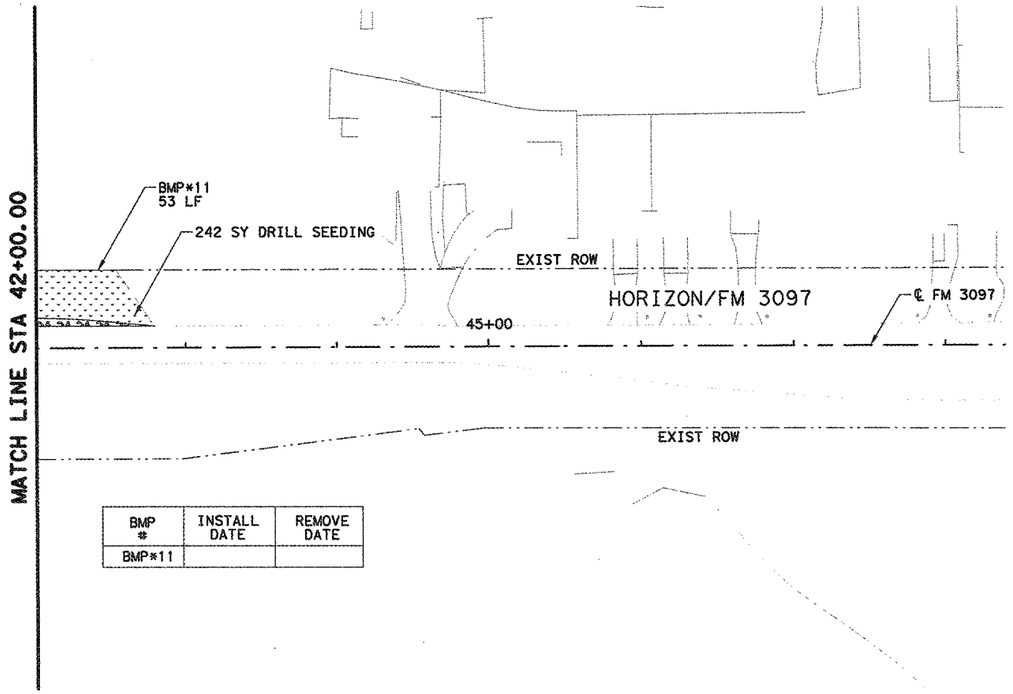
SITE PLAN PHASE 1

STA. 20+00.00 TO STA. 42+00.00

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		259

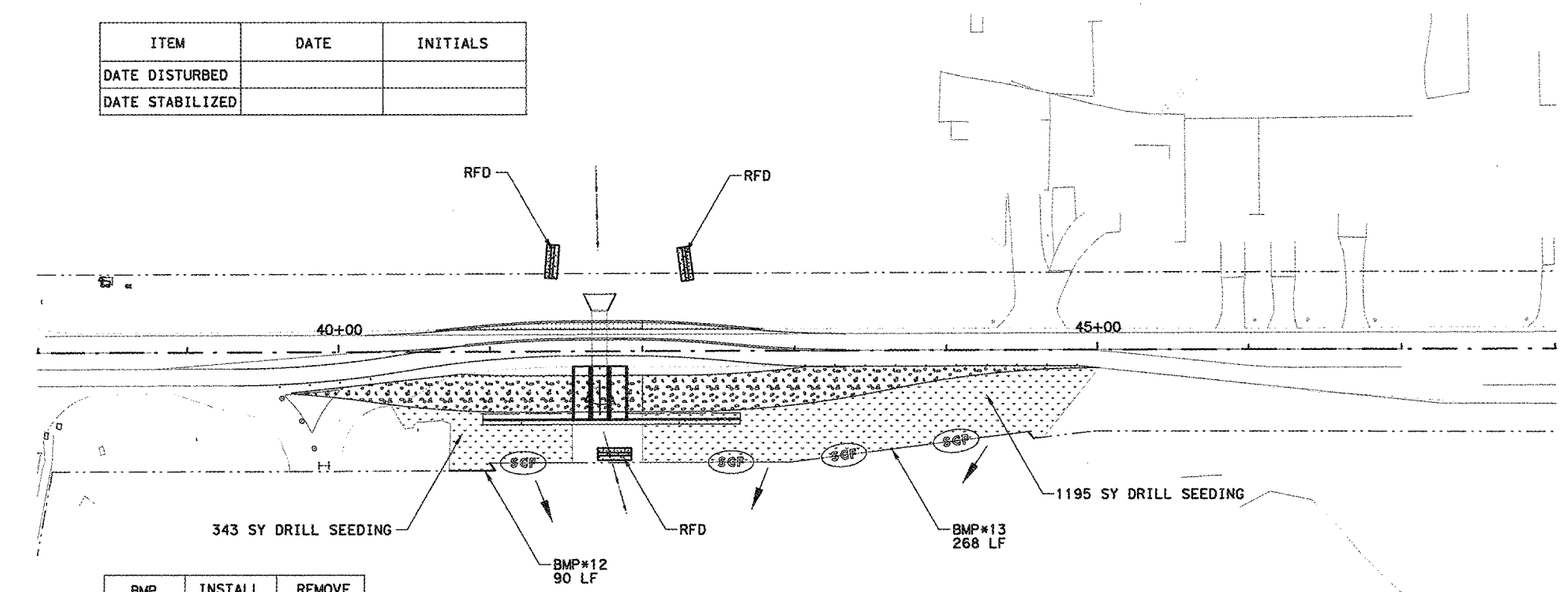
SHEET 2 OF 3

5/5/2014 8:39:41 AM iwmgi pw://Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.xx SW3P/120404RPel02.dgn



BMP #	INSTALL DATE	REMOVE DATE
BMP*11		

ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		



BMP #	INSTALL DATE	REMOVE DATE
BMP*12		
BMP*13		

ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

PHASE 1A

50 25 0 50 100
SCALE FEET

LEGEND

- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- SEEDING/VEGETATION
- FLOW DIRECTION
- ECL FOR CURB INLET (35 LF TYP)
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STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER

05/05/14

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CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

Texas Department of Transportation

SW3P

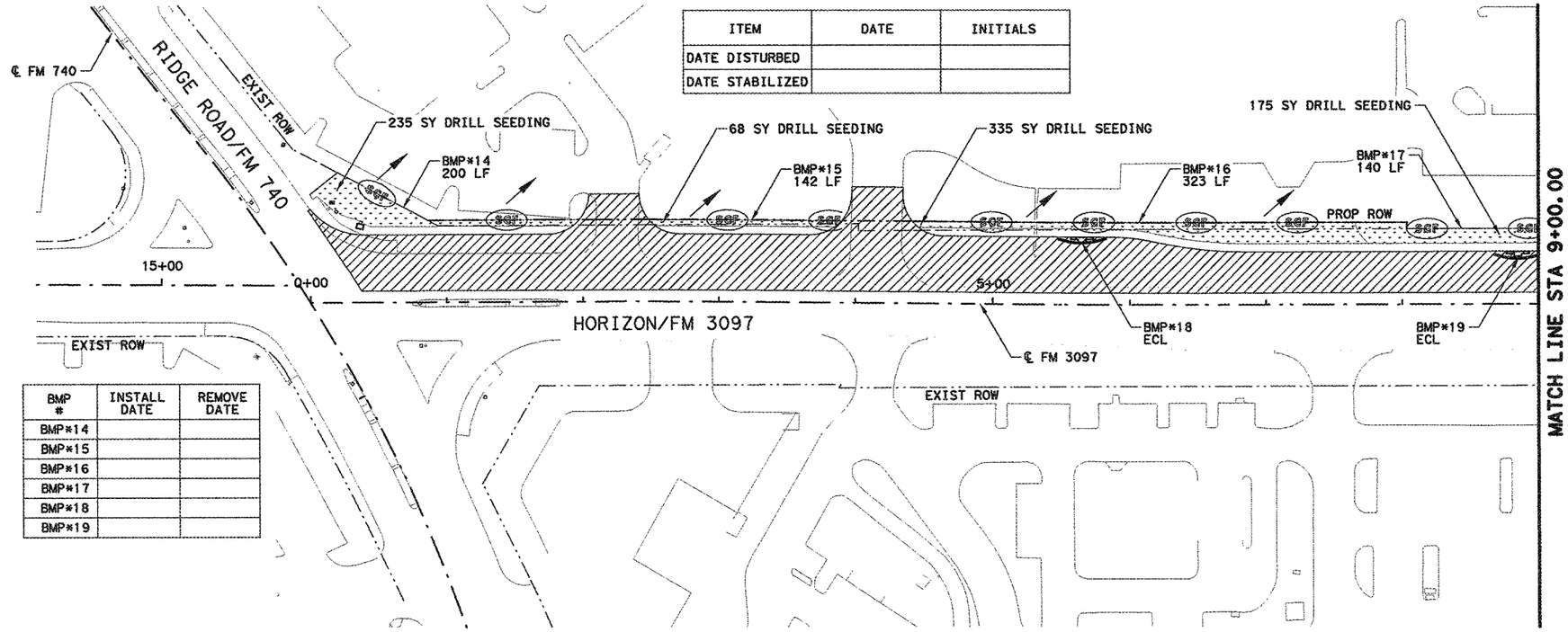
SITE PLAN PHASE 1

STA. 42+00.00 TO STA. 45+70.00

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		260

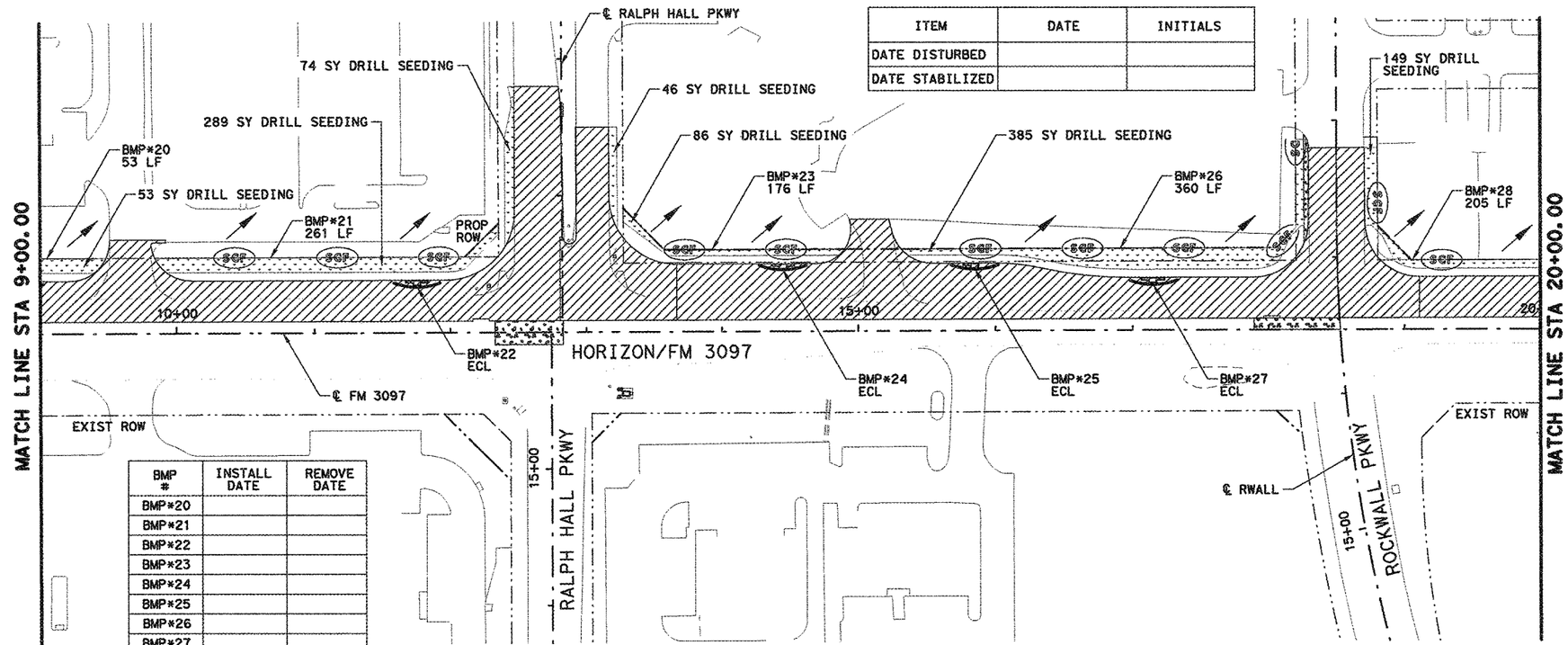
SHEET 3 OF 3

5/5/2014 8:40:55 AM iwang1 pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.xx SW3P/120404RDel03.dgn



ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

BMP #	INSTALL DATE	REMOVE DATE
BMP*14		
BMP*15		
BMP*16		
BMP*17		
BMP*18		
BMP*19		



ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

BMP #	INSTALL DATE	REMOVE DATE
BMP*20		
BMP*21		
BMP*22		
BMP*23		
BMP*24		
BMP*25		
BMP*26		
BMP*27		
BMP*28		

N

50 25 0 50 100
SCALE FEET

LEGEND

- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- SEEDING/VEGETATION
- FLOW DIRECTION
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STATE OF TEXAS
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05/02/14

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CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

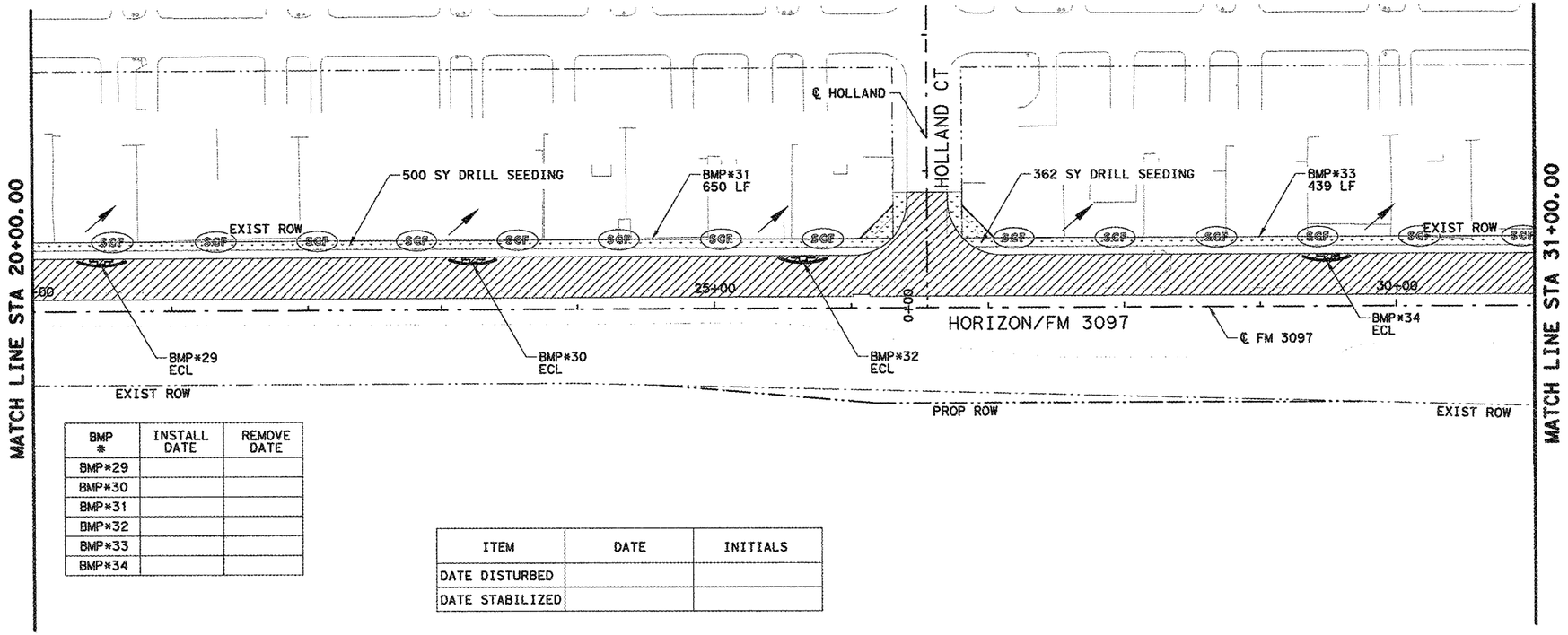
Texas Department of Transportation

SW3P
SITE PLAN PHASE 2
STA. 0+00.00 TO STA. 20+00.00

Designed: IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: JBR	6	TEXAS	STP 2013 (597) MM			FM 3097
Drawn: IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	3148	01	006	261

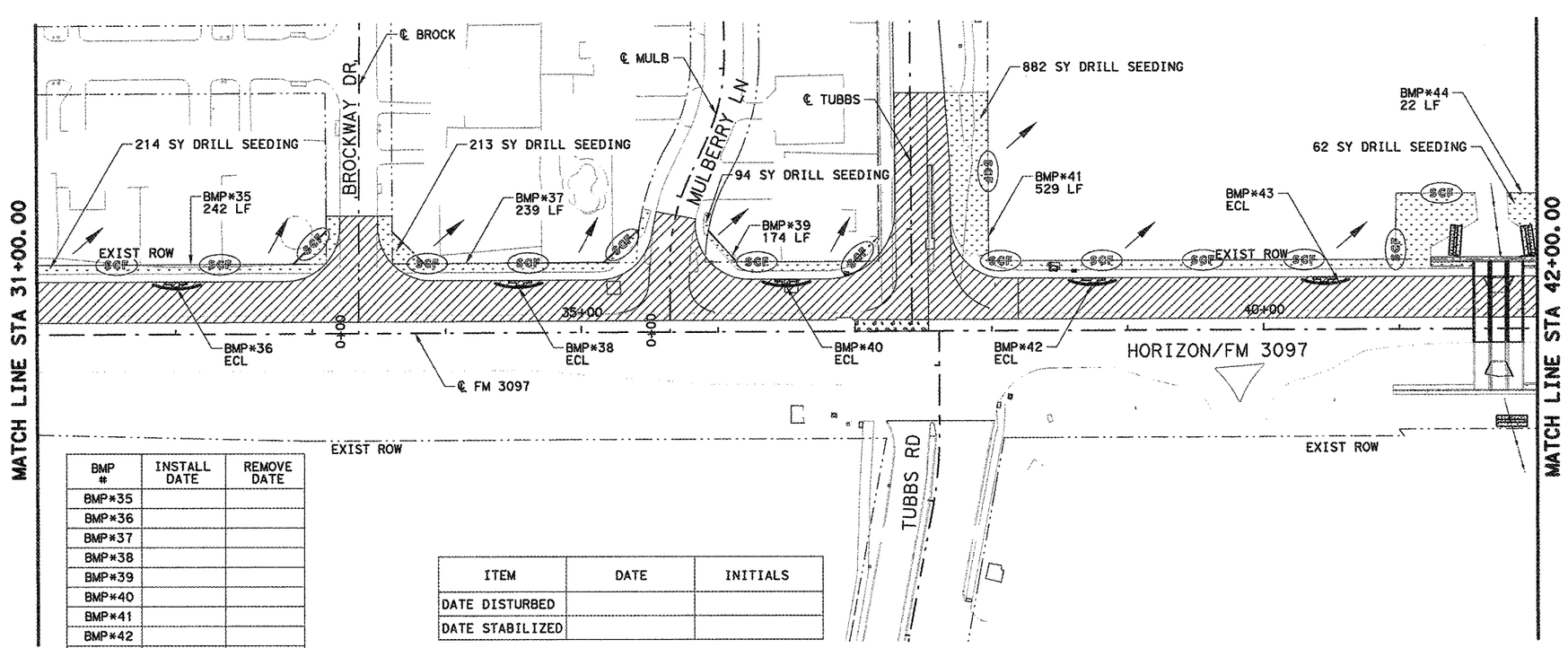
SHEET 1 OF 3

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BMP #	INSTALL DATE	REMOVE DATE
BMP*29		
BMP*30		
BMP*31		
BMP*32		
BMP*33		
BMP*34		

ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		



BMP #	INSTALL DATE	REMOVE DATE
BMP*35		
BMP*36		
BMP*37		
BMP*38		
BMP*39		
BMP*40		
BMP*41		
BMP*42		
BMP*43		
BMP*44		

ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

SHEET 2 OF 3

50 25 0 50 100
SCALE FEET

LEGEND

- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- SEEDING/VEGETATION
- FLOW DIRECTION
- ECL FOR CURB INLET (35 LF TYP)
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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER

05/05/14

NO.	REVISION	BY	DATE

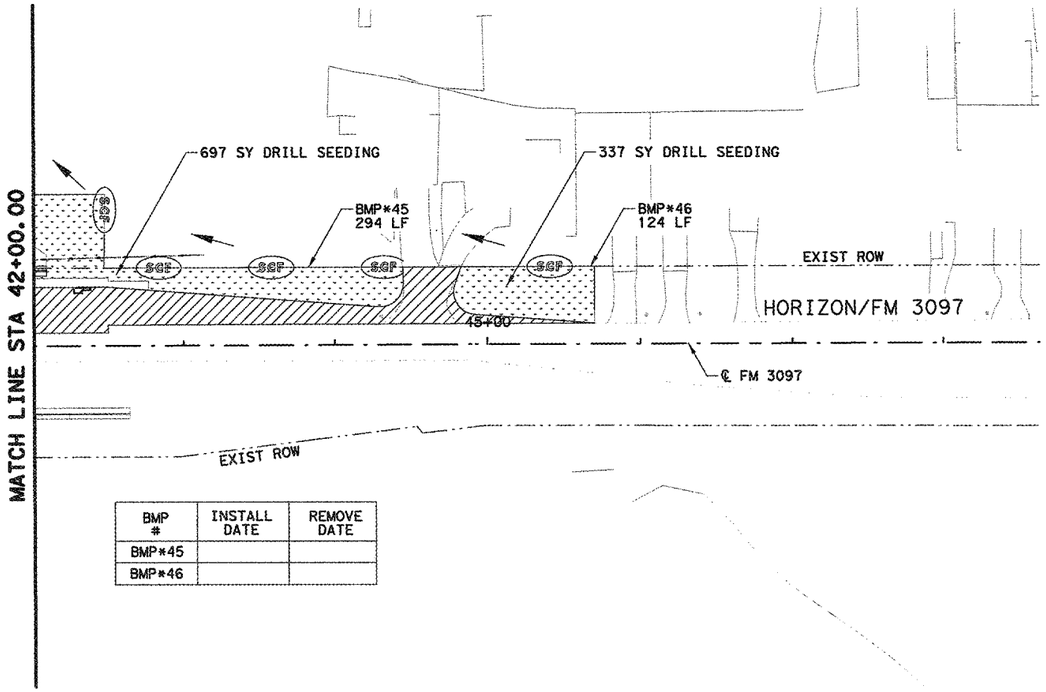
CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

SW3P
SITE PLAN PHASE 2
STA. 20+00.00 TO STA. 42+00.00

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		262

5/5/2014 8:42:01 AM iwmgal ow:\Active Projects\TXNR12004_04\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.xx SW3P\120404RDel05.dgn



BMP #	INSTALL DATE	REMOVE DATE
BMP*45		
BMP*46		

ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

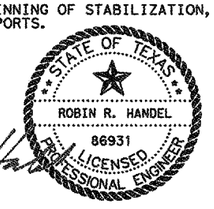


LEGEND

- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- SEEDING/VEGETATION
- FLOW DIRECTION
- ECL FOR CURB INLET (35 LF TYP)
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TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

SW3P

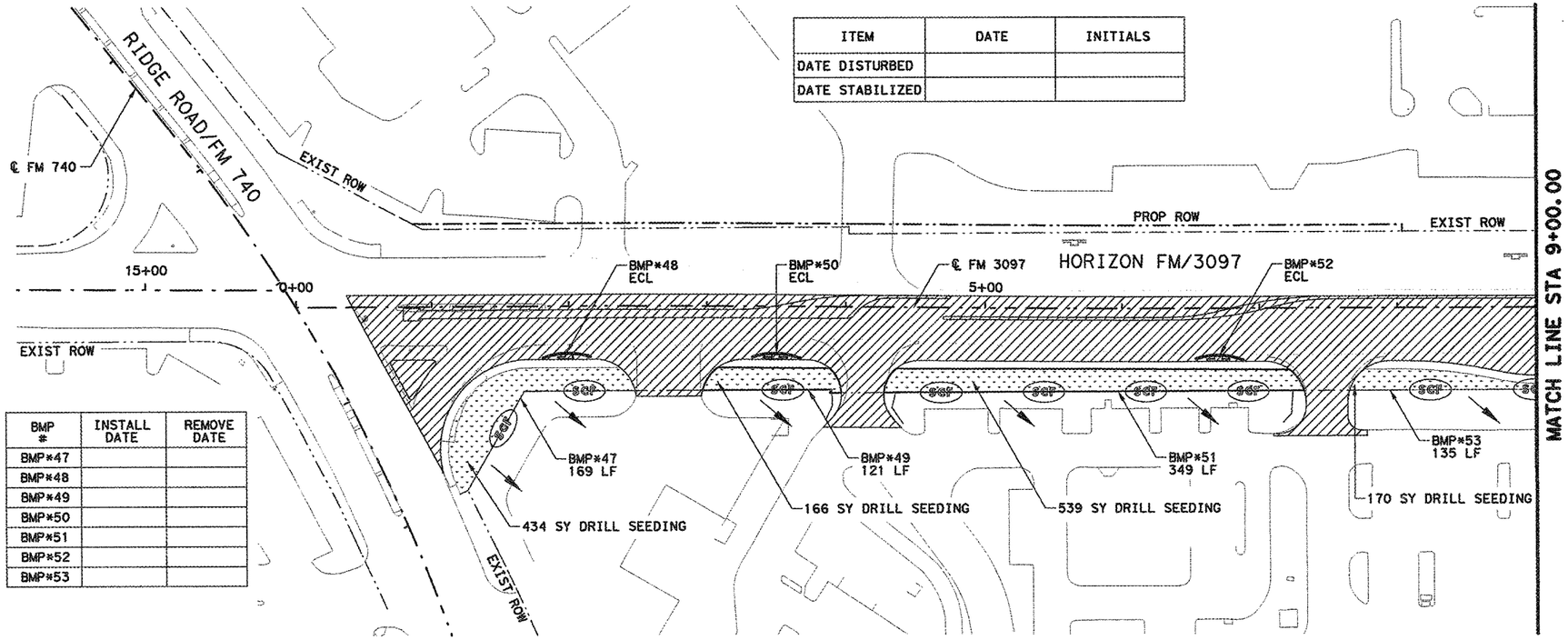
SITE PLAN PHASE 2

STA. 42+00.00 TO STA. 45+70.00

Designed: IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.					HIGHWAY NO.	
Checked: JBR	6	TEXAS	STP 2013 (597) MM					FM 3097	
Drawn: IWM	DIST.	COUNTY		CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked: RRH	DAL	ROCKWALL		3148	01	006		263	

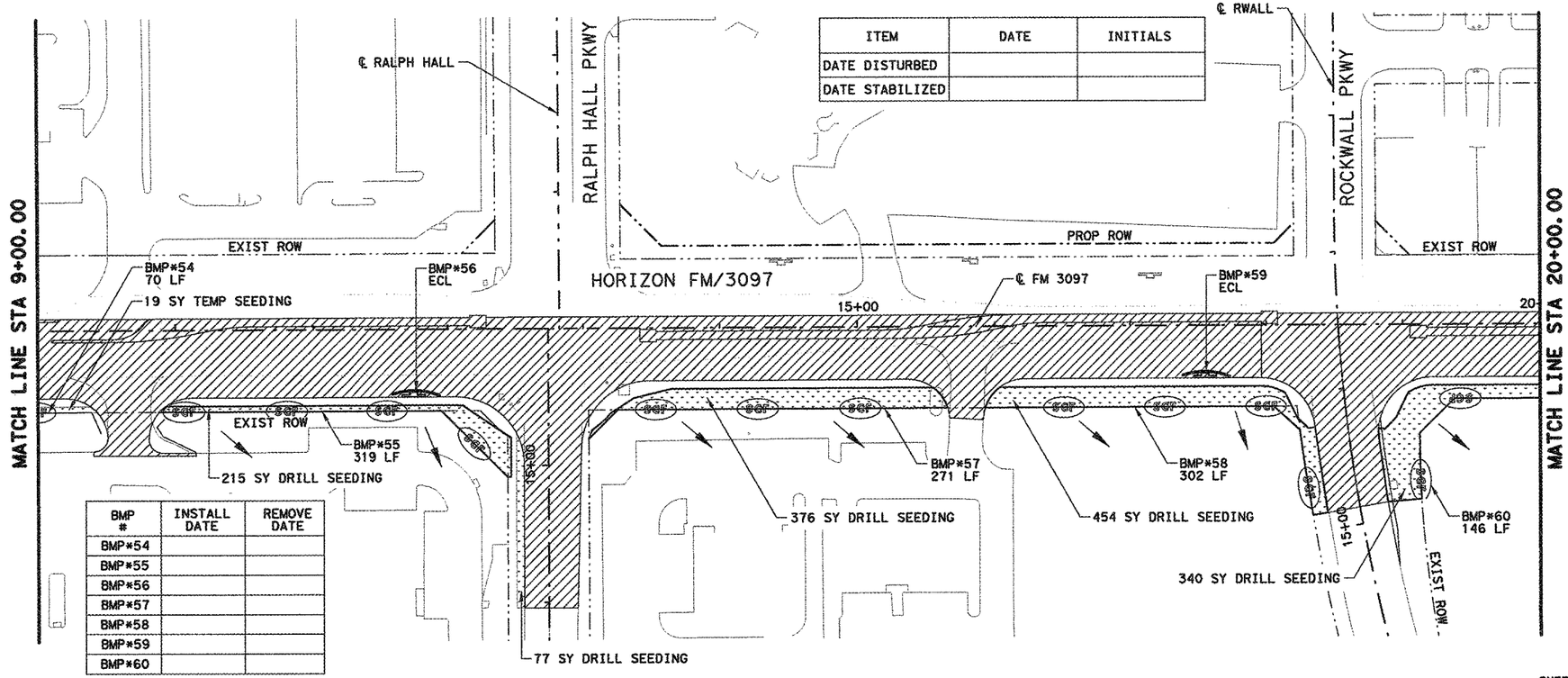
SHEET 3 OF 3

5/5/2014 8:43:17 AM imwangi ow:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.xx SW3P/120404RDel06.dgn



ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

BMP #	INSTALL DATE	REMOVE DATE
BMP*47		
BMP*48		
BMP*49		
BMP*50		
BMP*51		
BMP*52		
BMP*53		



ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

BMP #	INSTALL DATE	REMOVE DATE
BMP*54		
BMP*55		
BMP*56		
BMP*57		
BMP*58		
BMP*59		
BMP*60		

SHEET 1 OF 3

N

50 25 0 50 100
SCALE FEET

LEGEND

- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- SEEDING/VEGETATION
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NO.	REVISION	BY	DATE

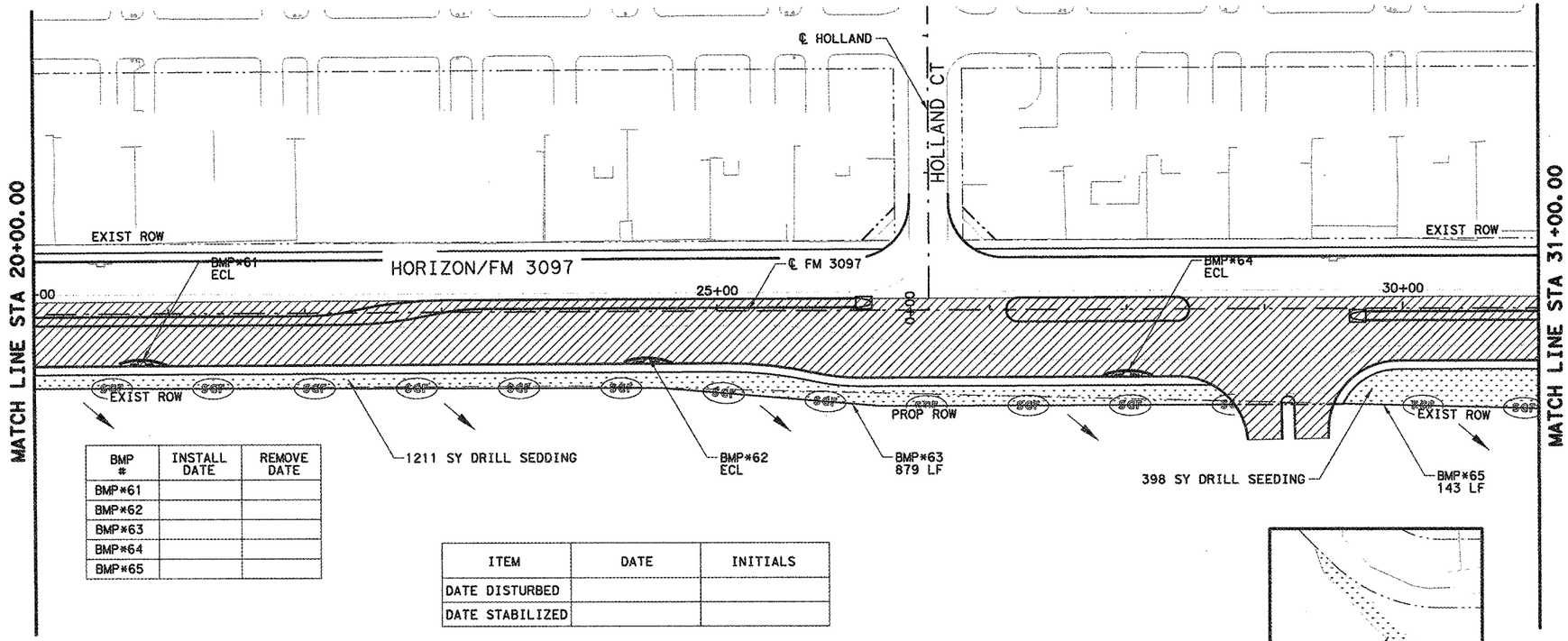
CP&Y
TEXAS REGISTERED ENGINEERING FIRM. F-1741

Texas Department of Transportation

SW3P
SITE PLAN PHASE 3
STA. 0+00.00 TO STA. 20+00.00

Designed:	IWM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JBR	6	TEXAS	STP 2013 (597) MM				FM 3097
Drawn:	IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	3148	01	006		264

5/1/2014 10:25:33 PM jroberts pw:/Active Projects/TXNR12004.04/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.xx SW3P/120404RDel07.dgn



BMP #	INSTALL DATE	REMOVE DATE
BMP*61		
BMP*62		
BMP*63		
BMP*64		
BMP*65		

ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

BMP #	INSTALL DATE	REMOVE DATE
BMP*66		
BMP*67		
BMP*68		
BMP*69		
BMP*70		
BMP*71		
BMP*72		

ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

50 25 0 50 100
SCALE FEET

LEGEND

- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- SEEDING/VEGETATION
- FLOW DIRECTION
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SW3P

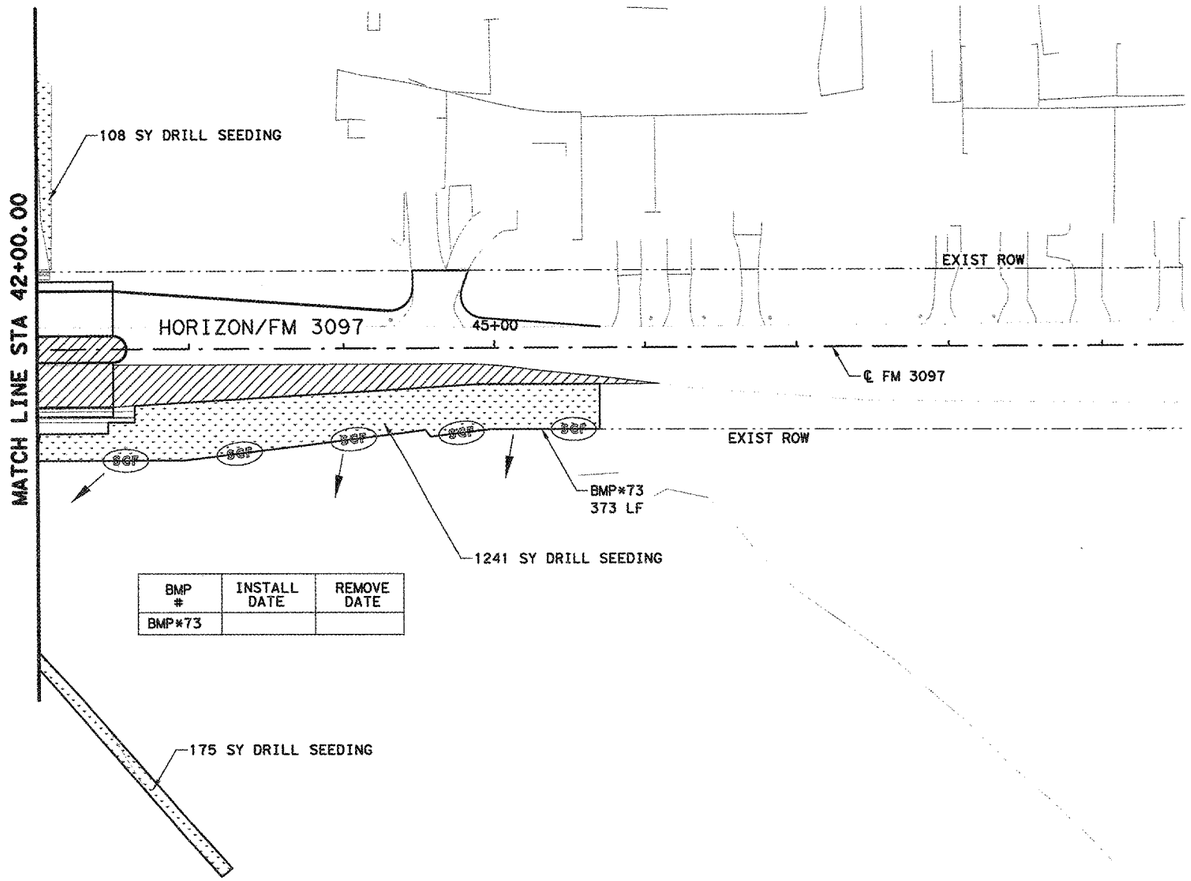
SITE PLAN PHASE 3

STA. 20+00.00 TO STA. 42+00.00

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Drawn: IWM	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: RRH	DAL	ROCKWALL	3148	01	006		265

SHEET 2 OF 3

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ITEM	DATE	INITIALS
DATE DISTURBED		
DATE STABILIZED		

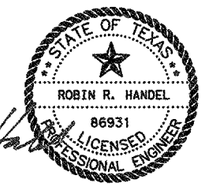


LEGEND

- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- SEEDING/VEGETATION
- FLOW DIRECTION
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- SFC — TEMPORARY SEDIMENT CONTROL FENCE

NOTES:

1. EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY AND SHALL REMAIN IN PLACE UNTIL CONSTRUCTION AND FINAL GRADING IS COMPLETE.
2. ALL INLETS WITHIN THE PROJECT LIMIT OR AFFECTED BY CONSTRUCTION DEBRIS SHALL BE PROTECTED AT ALL TIMES.
3. EROSION CONTROL DEVICE INSTALLATION, MAINTENANCE, AND REMOVAL SHALL BE IN ACCORDANCE WITH TxDOT STANDARDS FOR EROSION CONTROL.
4. LOCATIONS OF EROSION CONTROL DEVICES ARE APPROXIMATIONS. ACTUAL LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ENGINEER
5. FOR BEGINNING OF STABILIZATION, SEE DAILY WORK REPORTS.



05/05/14

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM, F-1741

Texas Department of Transportation

SW3P

SITE PLAN PHASE 3

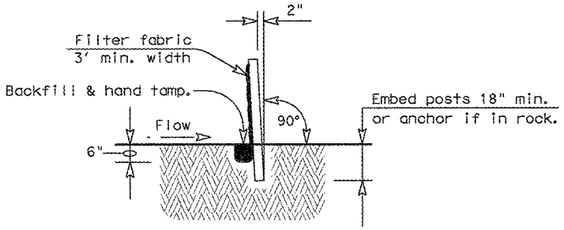
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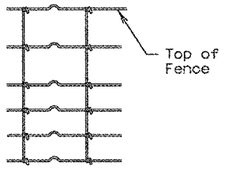
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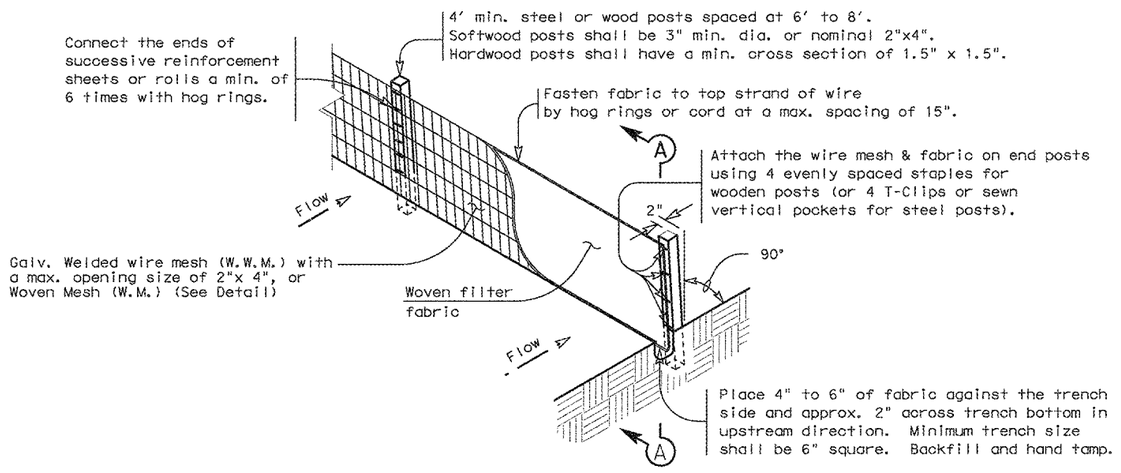


SECTION A-A

Galv. Hinge joint knot woven mesh (12.5 Ga. Min.) requires a minimum of five horizontal wires spaced at a max. 12 inches apart and all vertical wires spaced at a max. 12 inches apart.



Hinge Joint Knot Woven Mesh (Option)



TEMPORARY SEDIMENT CONTROL FENCE

SCF

GENERAL NOTES

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

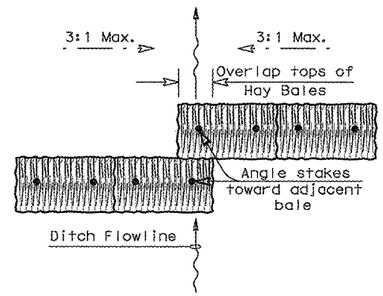
PLAN SHEET LEGEND

Sediment Control Fence ——(SCF)——

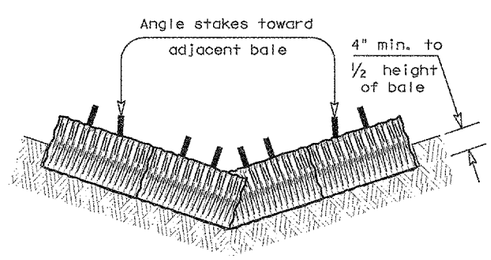
SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

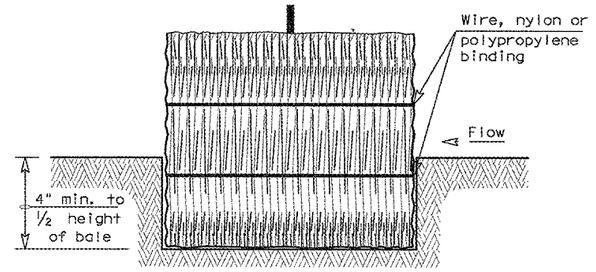
Sediment control fence should be sized to filter a max. flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.



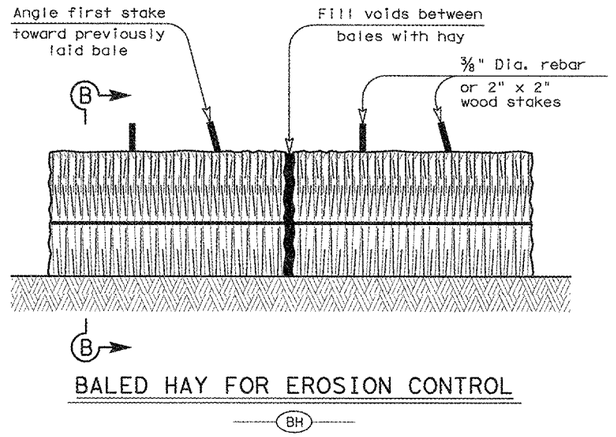
PLAN VIEW



PROFILE VIEW



SECTION B-B



BALED HAY FOR EROSION CONTROL

BH

PLANS SHEET LEGEND

Baled Hay ——(BH)——

BALED HAY USAGE GUIDELINES

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

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

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

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

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

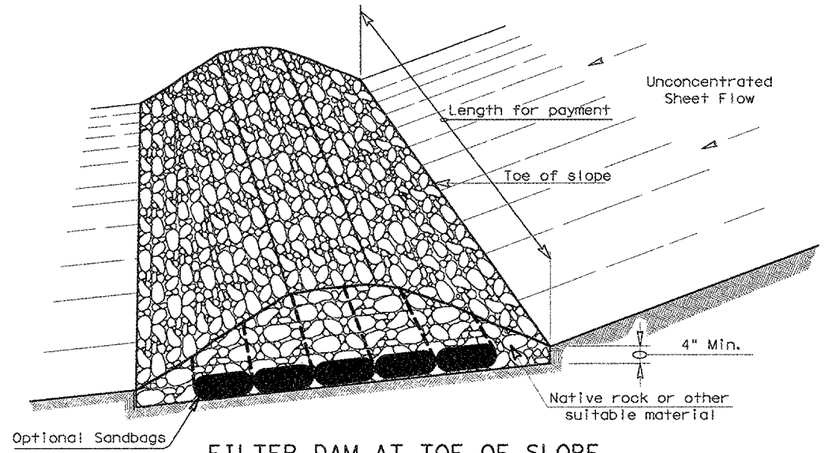
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & BALED HAY

EC(1)-09

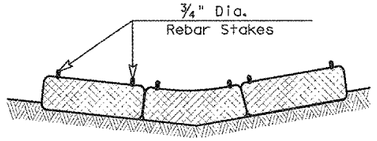
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©TxDOT June 1993	CONT	SECT	JOB	HIGHWAY		
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	DIST	COUNTY			SHEET NO.	
	DAL	ROCKWALL			267	

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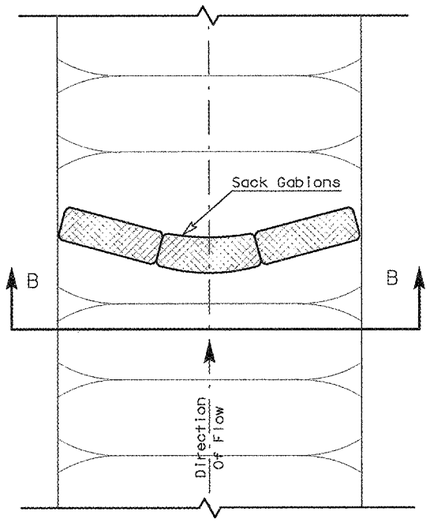


FILTER DAM AT TOE OF SLOPE

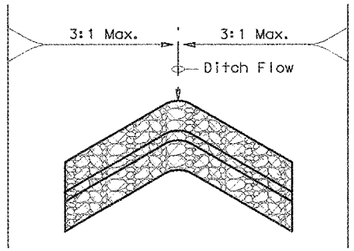
RFD1
TYPE 1



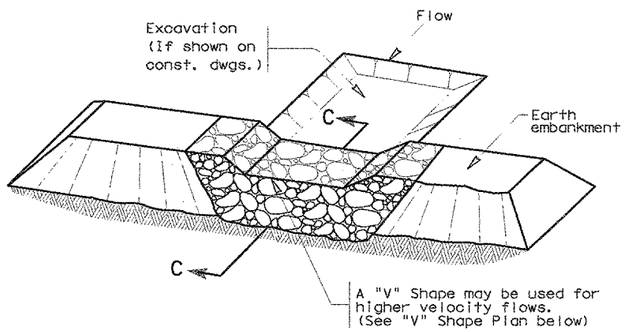
SECTION B-B



PLAN VIEW

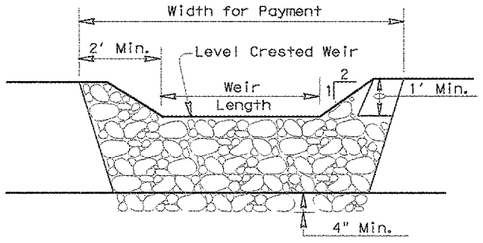


"V" SHAPE
(Plan View)

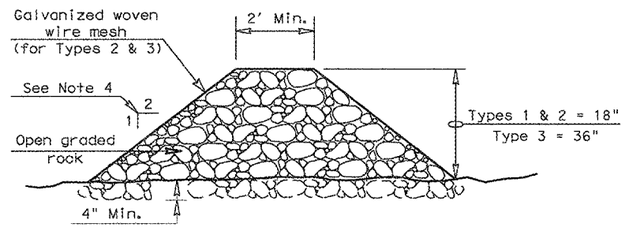


FILTER DAM AT SEDIMENT TRAP

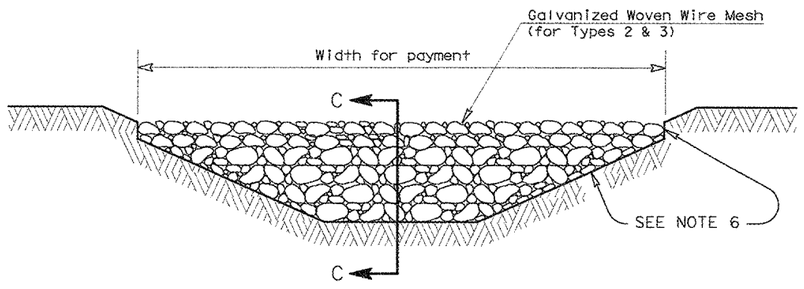
RFD1 — OR — RFD2
TYPE 1 OR TYPE 2



PROFILE



SECTION C-C

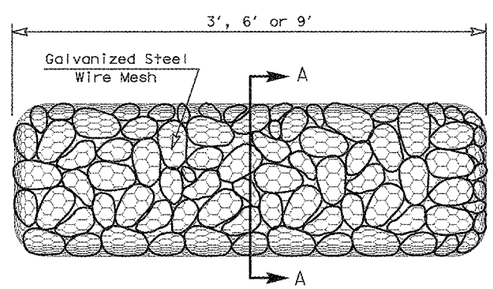


FILTER DAM AT CHANNEL SECTIONS

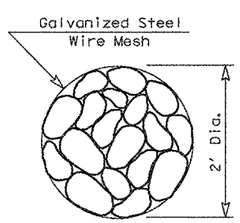
RFD1 — OR — RFD2 — OR — RFD3
TYPE 1 OR TYPE 2

PLANS SHEET LEGEND

Type 1 Rock Filter Dam RFD1
Type 2 Rock Filter Dam RFD2
Type 3 Rock Filter Dam RFD3



TYPE 4 (SACK GABIONS)



SECTION A-A

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approx. 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. In stream use the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes.
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

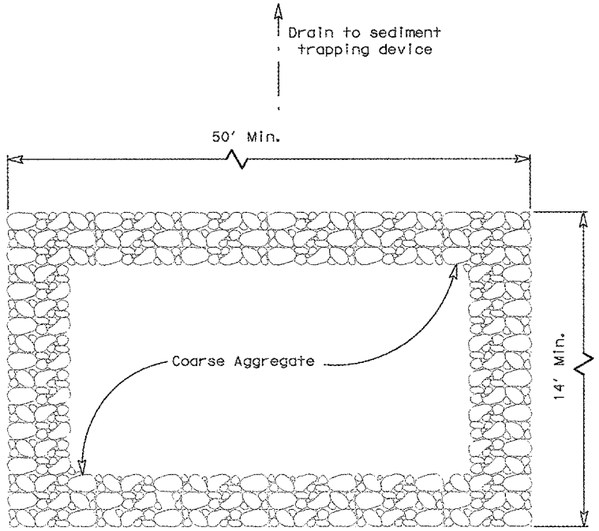
EC(2)-93

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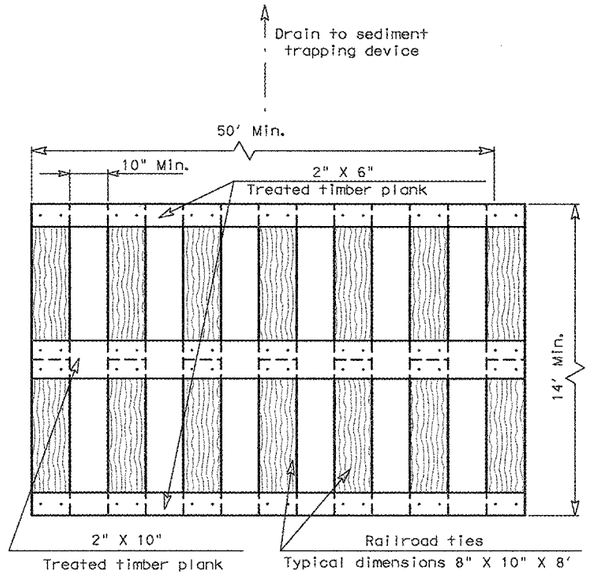
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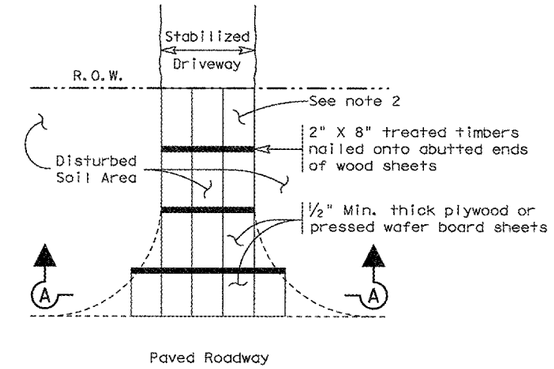
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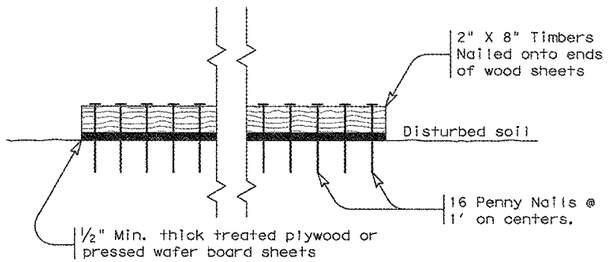
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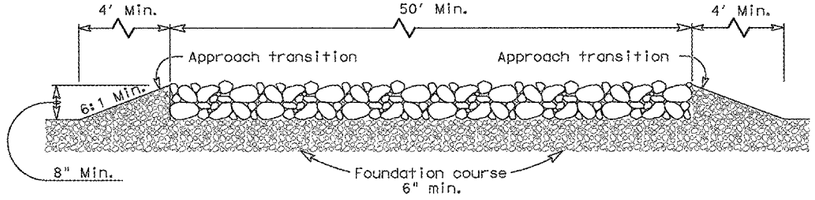
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PLAN



SECTION A-A

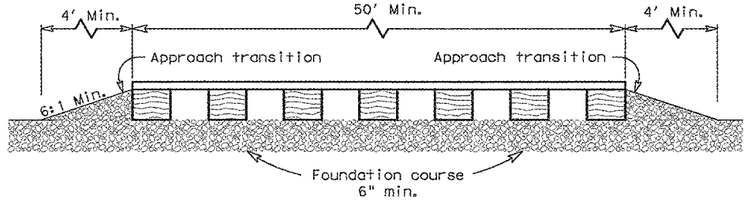


PROFILE

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: HEJ	DW: BD	CK:	
©TxDOT June 1993	CONT	SECT	JOB	HIGHWAY	
REVISIONS	3148	01	006	FM 3097	
	DIST	COUNTY		SHEET NO.	
	DAL	ROCKWALL		269	

SEEDING FOR EROSION CONTROL

RECOMMENDED PLANTING SEASON	PERMANENT RURAL SEED MIX ITEM 164 DRILL SEEDING (PERM) (RURAL) (CLAY)	PERMANENT URBAN SEED MIX ITEM 164 DRILL SEEDING (PERM) (URBAN) (CLAY)	TEMPORARY DRILL SEED MIX ITEM 164 DRILL SEED(TEMP) (WARM OR COOL)
WARM SEASON Mar.15th, April, May, June, July, August, Sept. 15th	Pure Live Seed Rate Green Sprangletop (Leptochloa dubia) - 0.3 lbs/AC Bermudagrass (Cynodon dactylon) - 1.2 lbs/AC Sideoats Grama (El Reno)(Bouteloua curtipendula) - 2.7 lbs/AC Little Bluestem (Native)(Schizachyrium scoparium) - 2.0 lbs/AC Buffalograss (Texoka)(Buchloe dactyloides) - 1.6 lbs/AC Illinois Bundleflower (Desmanthus illinoensis) - 1.0 lbs/AC	Pure Live Seed Rate Green Sprangletop (Leptochloa dubia) - 0.3 lbs/AC Sideoats Grama (El Reno)(Bouteloua curtipendula) - 3.6 lbs/AC Buffalograss (Texoka)(Buchloe dactyloides) - 1.6 lbs/AC Bermudagrass (Cynodon dactylon) - 2.4 lbs/AC	Pure Live Seed Rate Foxtail Millet (Setaria italica) - 34 lbs/AC
COOL SEASON Sept 16th, Oct, Nov, Dec, Jan, Feb, Mar 14th			Pure Live Seed Rate Tall Fescue (Festuca grundinaceae) - 4.5 lbs/AC Western Wheatgrass (Agropyron smithii)- 5.6 lbs/AC Red Winter Wheat (Triticum aestivum) - 34 lbs/AC

SEEDING NOTES:

1. Refer to Item 164 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2004 for specifications, dimensions, volumes, and measurements that have been modified or not shown.
2. Apply seed upon completion of each construction stage (dependent on planting date requirements) without compensation for additional move-ins.
3. All seed will meet labeling, delivery, analysis, and testing requirements as described in Item 164.2(A).
4. Hydroseeding machines will not be allowed.
5. Fertilizer will be applied under Item 166 prior to seeding to help drill fertilizer into soil.
6. Refer to Item 166 Fertilizer this sheet for specifications.
7. All areas to be seeded will be cultivated to a depth as described in Item 164.3 before both temporary and permanent seeding.
8. Seed will be drilled to a depth as described in Item164.3(D).
9. Vegetative watering will be paid for under Item 168 as shown on this sheet.
10. **BROADCAST SEEDING METHOD OF APPROPRIATE PERMANENT OR TEMPORARY SEED MIX MAY ONLY BE USED WHERE SITE CONDITIONS PREVENT DRILL SEEDING.**

FERTILIZER ITEM 166 FERTILIZER AC

FERTILIZER RATE
Unless otherwise stated in the plans, perform one soil analysis on each project before fertilization and submit results to the Engineer with recommended fertilizer rates based on soil analysis. Soil analysis maybe waived if both compost and sod are used on entire project.

FERTILIZER NOTES:

1. Refer to Item 166 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2004 for specifications, dimensions, volumes, and measurements that have been modified or not shown.
2. Fertilizer will be applied before seeding and sodding.
3. Fertilizer will be delivered in bags unless otherwise specified or approved prior to delivery. Bags will be clearly labeled showing contents. When non-bagged, loose fertilizer is approved, documentation will be required for each load of material delivered verifying authenticity of material.
4. Fertilizer will be granular and essentially dust free.
5. Do not exceed 60 lbs of Nitrogen per acre without consulting with the Engineer.

VEGETATIVE WATERING FOR ESTABLISHING SEED AND SOD ITEM 168 VEGETATIVE WATERING MG

WATERING SCHEDULE			
SEASON (Usual Months)	RATE	TIME SCHEDULE	TOTAL WATER ESTIMATE
SPRING & FALL (March, April, May, October)	7000 gallons/acre per working day	Vegetative watering for seed shall begin on the day after rainfall described below and continue for 60 consecutive working days; vegetative watering for sod shall begin on the day the sod is placed and continue for a minimum of 15 consecutive working days.	420,000 gallons/acre (60 working days)
SUMMER (June, July, August, September)	12,000 gallons/acre per working day		720,000 gallons/acre (60 working days)
WINTER (November through February)	1000 gallons/acre per working day	Vegetative watering for seed and/or sod shall begin on the day after placement for 30 consecutive working days	30,000 gallons/acre (30 working days)
Rate and frequency may be adjusted, with the approval of the Engineer, to meet site conditions (especially with sod). SEE ADDITIONAL WATERING NOTE. For informational purposes only: 1,000 gallons equals 1 MG			

VEGETATIVE WATERING NOTES: (SEE ADDITIONAL NOTES)

1. Refer to Item 168 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2004 for specifications, dimensions, volumes, and measurements that have been modified or not shown.
2. Watering operations for warm season grasses shall be delayed until soil temperature exceeds 70 degrees F.
3. **After drill seeding, postpone watering operations until the site receives at least 1/2" of natural rainfall in a single day. Use Vegetative Watering to keep the seed bed moist during germination; not to provide the initial watering.**
4. Provide even spray patterns that do not disturb seed bed and/or dislodge seed from seed bed.
5. Water will be evenly distributed over entire area(s) designated for seeding and/or sodding.
6. If 1/4 inch or more of rainfall occurs on site on any given working day, no vegetative watering will be needed on that working day (Note: 1/4 inch rain equals 7000 gallons of water per acre).
7. **Should the Contractor fail to apply the specified amount of water within the time allowed, any seed or sod in poor condition will be replaced, fertilized, and watered at the Contractor's expense.**
8. No watering applications between the hours of 1:00 pm and 8:00 pm when daytime temperatures exceed 95 degrees.
9. After initial establishment period, provide intermittent watering (approx. 1"/week) to newly established seed or sod during summer months until end of contract.
10. All watering equipment will have a metering device.

SODDING FOR EROSION CONTROL ITEM 162 BLOCK SOD (BERMUDA) SY

BLOCK OR ROLL SOD	
COMMON NAME	BOTANICAL NAME
Common Bermuda Grass	Cynodon dactylon

SODDING NOTES:

1. Refer to Item 162 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2004 for specifications, dimensions, volumes, and measurements that have been modified or not shown.
2. All sod (blocks or rolls) will be placed within 24 hours of delivery to the site.
3. Sod will be placed only after soil preparation is complete and fertilizer has been applied to soil.
4. Sod blocks will be placed firmly against adjacent sod blocks.
5. Sod will be placed with joints alternating on each row to prevent all joints from lining up.
6. Vegetative watering will be paid for under Item 168 as shown on this sheet. Sod will be watered immediately following placement. Hot, dry soil may require pre-watering before placing sod.

COMPOST APPLICATION ITEM 161 COMPOST MANF. TOPSOIL (BOS) (4") SY

APPLICATION RATE
A one inch uniform layer of compost will be placed on grade with existing topsoil. (Additional topsoil may required to be imported.) Incorporate compost into the soil (by till or disk) to a 3 to 4 inch depth.

COMPOST NOTES:

1. Refer to Item 161 - Compost for specifications, dimensions, volumes, and measurements that have been modified or not shown.
2. Erosion Control Compost (ECC) will be used to control erosion on slopes. ECC will be used in lieu of Soil Retention Blankets and other slope applications on slopes 3:1 and flatter. The ECC will be uniformly placed on the slope in a minimum one inch layer.
3. Filter berms may be placed in locations where concentration of flow may cause erosion.

ROADSIDE MOWING ITEM 730 PROJECT MAINTENANCE AC

Mowing will be included during project construction. Provide three mowing cycles per year during the project.

Once seed is established, mowing will be used to promote the warm season grasses by mowing any remaining cool season and/or temporary grasses.

ADDITIONAL WATERING NOTE:

Utilize sound judgement and best practices when watering vegetation. Examples: Do not water immediately after sufficient rain events; Ensure proper nozzles are used to prevent erosion of soil or plantings and evenly distribute watering; Consider wind, heat, and other weather conditions when determining daily watering rates; etc.

REQUIRED ITEMS:

- COMPOST MANUFACTURED TOPSOIL
- FERTILIZER TO BE USED WITH ALL SEEDING AND MOST SODDING.
- VEGETATIVE WATERING TO BE USED WITH ALL SEEDING AND SODDING.
- ONLY BROADCAST SEED IN AREAS THAT CANNOT DRILLED OR SODDED.

SEQUENCE OF WORK:

PREPARE SOIL WITH COMPOST
APPLY FERTILIZER
PLACE SEED AND/OR SOD
APPLY WATER FOR SEED AND SOD AREAS
MOW TO PROMOTE WARM SEASON GRASSES

Texas Department of Transportation
© 2013

VEGETATION ESTABLISHMENT SHEET

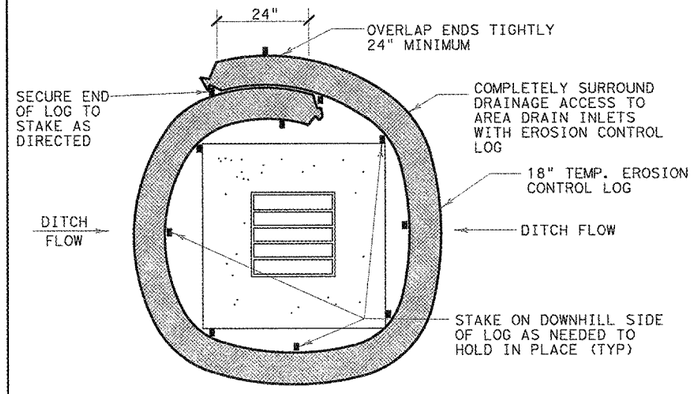
(DALLAS DISTRICT)

TEMPLATE REVISION DATE: 11/30/12

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	STP 2013 (597) MM		FM 3097
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
XXX	TEXAS	DALLAS	ROCKWALL	270
CHECK	CONTROL	SECTION	JOB	
XXX	3148	01	006	
CHECK				
XXX				

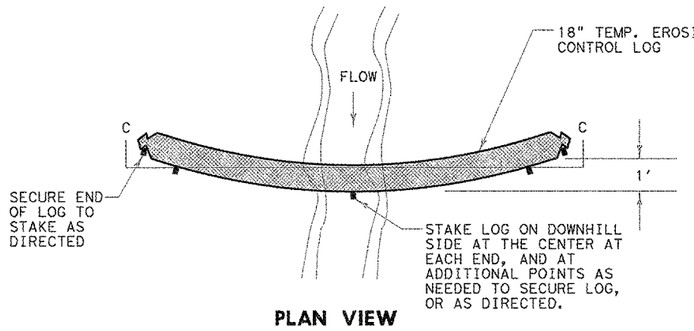
DISCLAIMER:
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http://www.dot.state.tx.us/ftw/specinfo/standard.htm <tecifw.dgn>

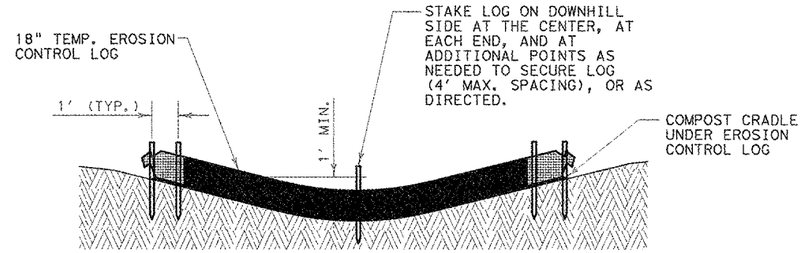


LOGS PLACED AT AREA DRAIN INLETS

NTS



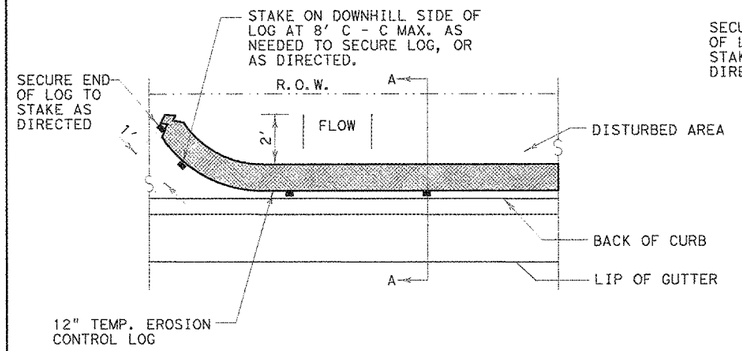
PLAN VIEW



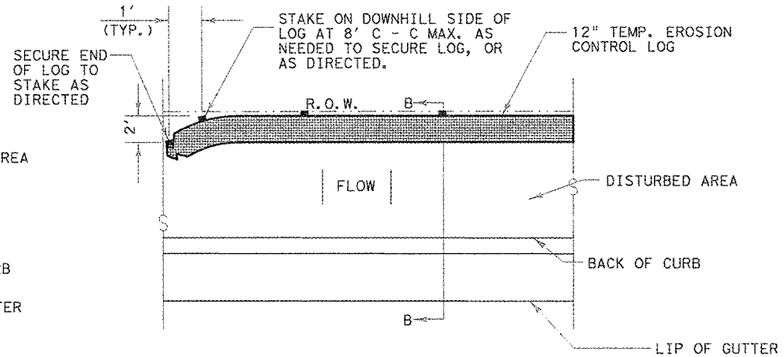
SECTION C-C

EROSION CONTROL LOG CHECK DAM

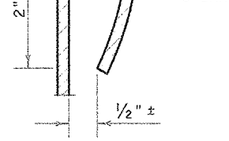
NTS



PLAN VIEW



PLAN VIEW

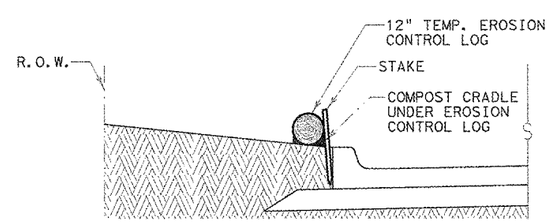


REBAR STAKE DETAIL

NTS

GENERAL NOTES:

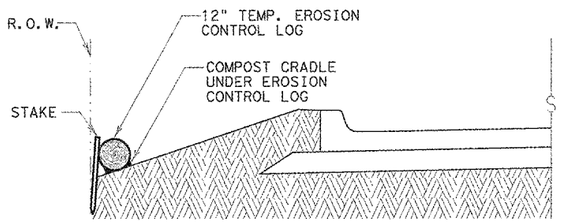
1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED. MAXIMUM LENGTH OF LOGS SHALL BE 60' FOR 18" DIAMETER OR 30' FOR 12" DIAMETER LOGS.
2. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH 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 OR #3 REBAR, 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED.
5. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.



SECTION A-A

LOG PLACED AT BACK OF CURB

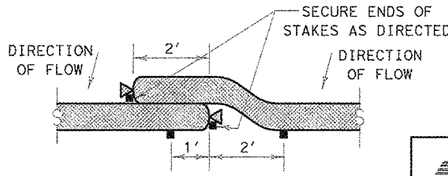
NTS



SECTION B-B

LOG PLACED AT EDGE OF RIGHT-OF-WAY

NTS



LAP DETAIL

NTS

REVISED ON 9/10/08

Texas Department of Transportation ©

DALLAS DISTRICT

EROSION CONTROL LOGS

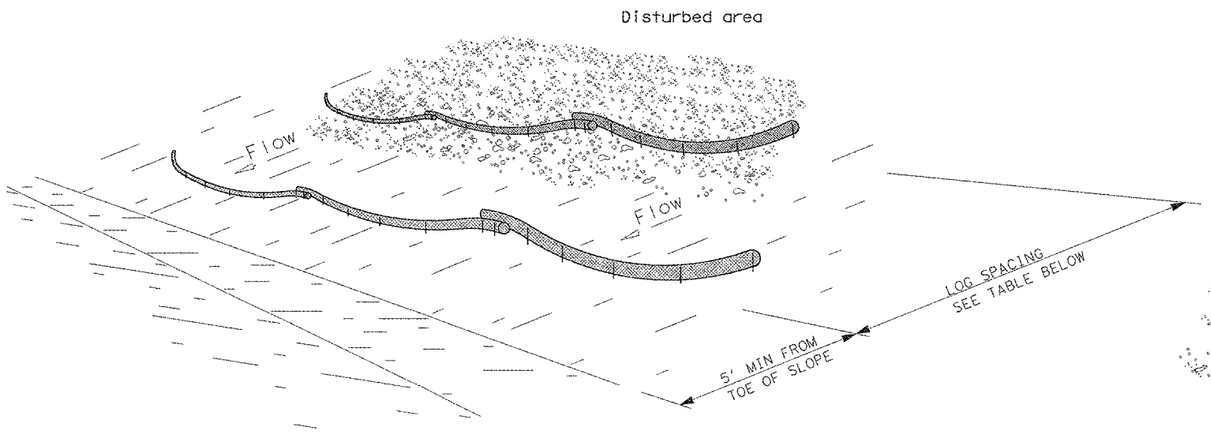
SCALE: NOT TO SCALE SHEET 1

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2013 (597) MM		FM 3097
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	DALLAS	ROCKWALL	
CHECK	CONTROL	SECTION	JOB	271
	3148	01	006	

LEVELS DISPLAY
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
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49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

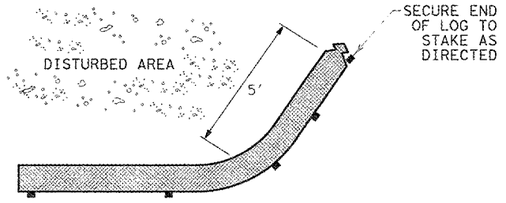
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http://www.dot.state.tx.us/ftw/specinfo/standard.htm <tec!fw.dgn>



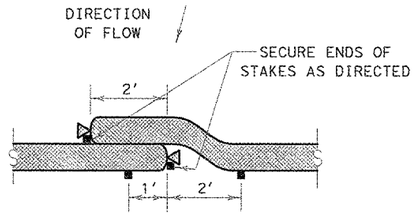
LOGS PLACED ON EXPOSED SLOPES

NTS



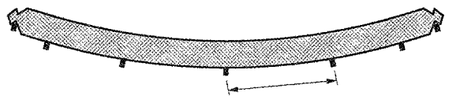
END SECTION RAP DETAIL

NTS



LAP DETAIL

NTS

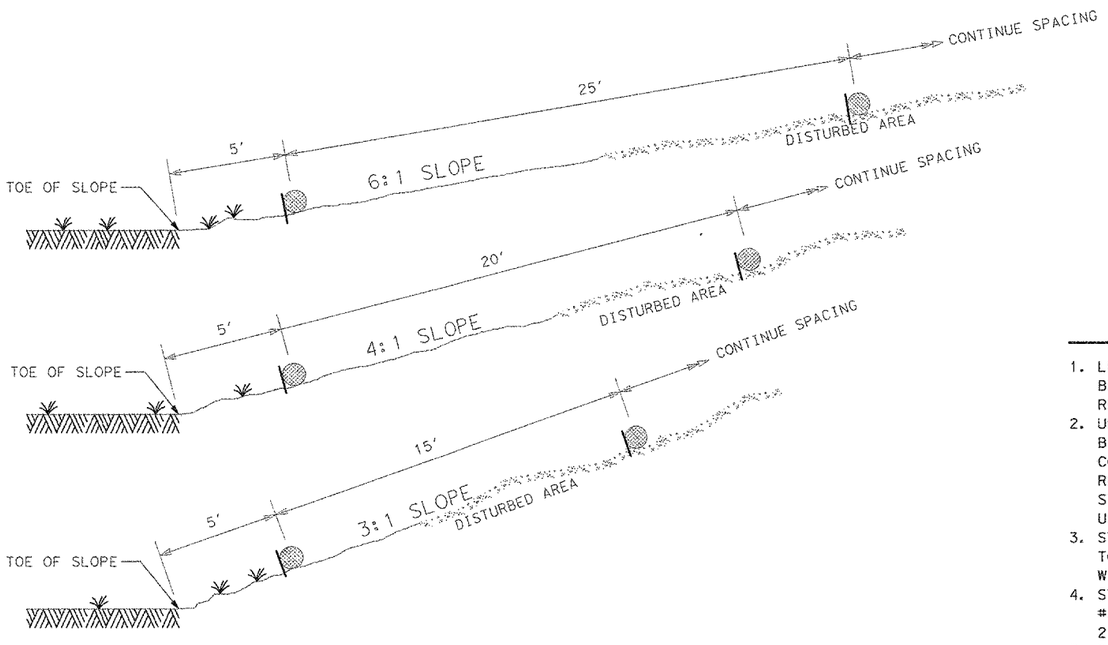


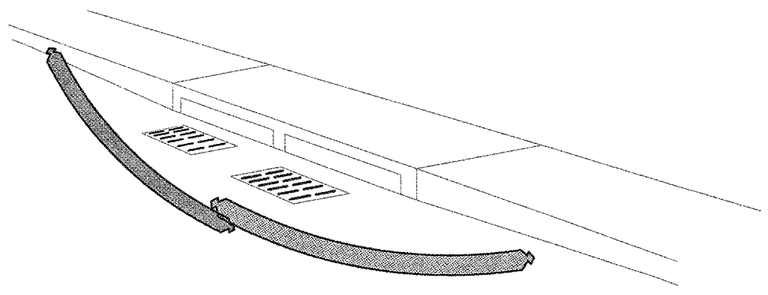
STAKE ON DOWNHILL SIDE OF LOG AT 8' C - C MAX. AS NEEDED TO SECURE LOG, OR AS DIRECTED.

STAKE DETAIL

NTS

SLOPE	LOG DIAMETER	SPACING BETWEEN LOGS
3:1	6"	15'
4:1	6"	20'
6:1	6"	25'





COMPLETED INLETS DETAIL

WITH NO TRAFFIC NTS

GENERAL NOTES:

1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS DIRECTED BY THE ENGINEER.
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 OR #3 REBAR, 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED.
5. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.

REVISED ON 9/10/08

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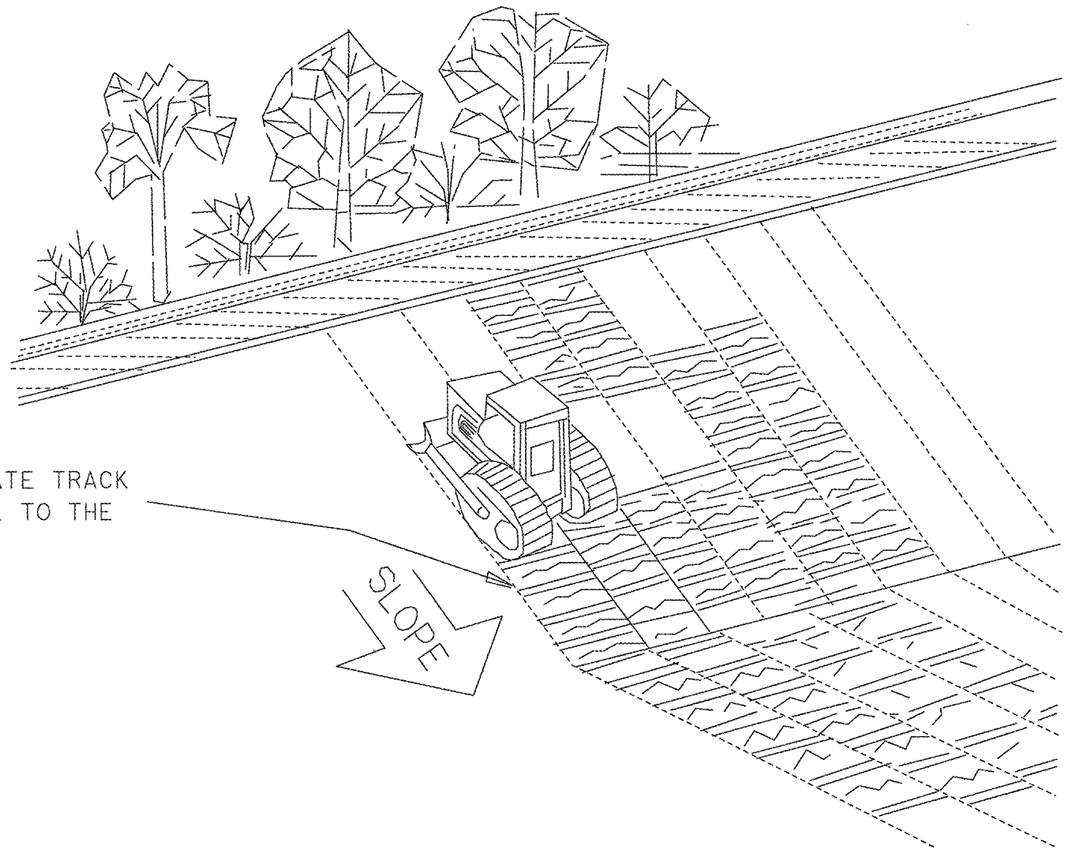
DALLAS DISTRICT

EROSION CONTROL LOGS

SCALE: NOT TO SCALE SHEET 2

	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGN / GRAPHICS	6	STP 2013 597 MM		FM 3097
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	DALLAS	ROCKWALL	
CHECK	CONTROL	SECTION	JOB	272
	3148	01	006	

LEVELS DISPLAY
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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



NOTE:

PERFORM VERTICAL TRACKING ON SLOPES TO TEMPORARILY STABILIZE SOIL. PROVIDE EQUIPMENT WITH A TRACK UNDERCARRIAGE CAPABLE OF PRODUCING LINEAR SOIL IMPRESSIONS MEASURING AT LEAST 12" IN LENGTH BY 2" TO 4" IN WIDTH BY 1/2" TO 2" IN DEPTH. DO NOT EXCEED 12" BETWEEN TRACK CLEATS. INSTALL CONTINOUS LINEAR TRACK IMPRESSIONS WHERE THE MINIMUM 12" IN LENGTH IS PERPENDICULAR TO THE DIRECTION OF WATER FLOW.

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Dallas District Standard

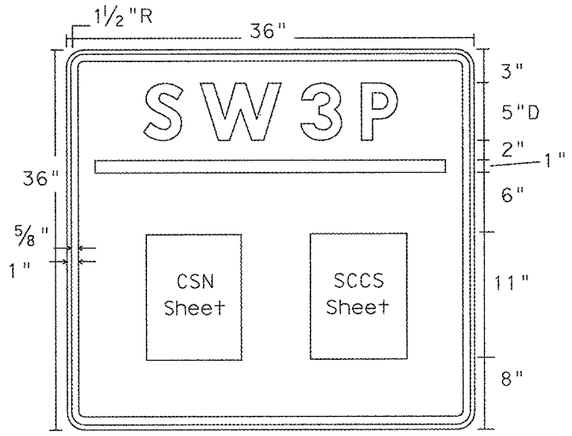
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

VERTICAL TRACKING FOR EROSION CONTROL

FED. RD. DIV. NO.	PROJECT NUMBER		SHEET NUMBER
6	STP 2013 (597) MM		273
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	ROCKWALL	
CONTROL	SECTION	JOB	HIGHWAY NUMBER
3148	01	006	FM 3097

FILENAME: c:\pwworking\jroberts\d0325457\VertTrack.dgn

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SW3P SIGN

Large or Small Construction Site Notice (CSN) & Signed Contractor Certification Statement (SCCS)

Sign Dimensions

36" X 36"

Letters - White
Numbers - White
Border - White
Background - Blue

GENERAL NOTES:

1. The alphabets and lateral spacing between letters and numerals shall conform with the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways", (TMUTCD) latest edition, and the "Compliant Work Zone Traffic Control Devices List". Lateral spacing of text shall provide a balanced appearance. All materials shall conform to Department Specifications.
2. Legend and border may be applied by reverse screening process with transparent colored ink, cut-out white reflective sheeting applied to colored background or combination thereof. Background shall be reflective sheeting Type C.
3. CSN & SCCS Sheets will be laminated and attached to the sign with an adhesive. Ensure sheets remain dry. (See Figure 1).
4. Signs should be placed just inside the right of way line at the project limits at a readable height. If the sign cannot be placed outside the clear zone, it must adhere to the TMUTCD. If placed outside the clear zone, SW3P sign may be placed perpedicular or parallel to ROW line.
5. Final location of the signs will be approved by the Engineer.

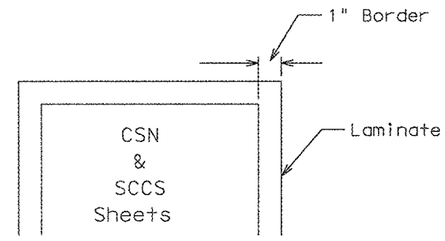
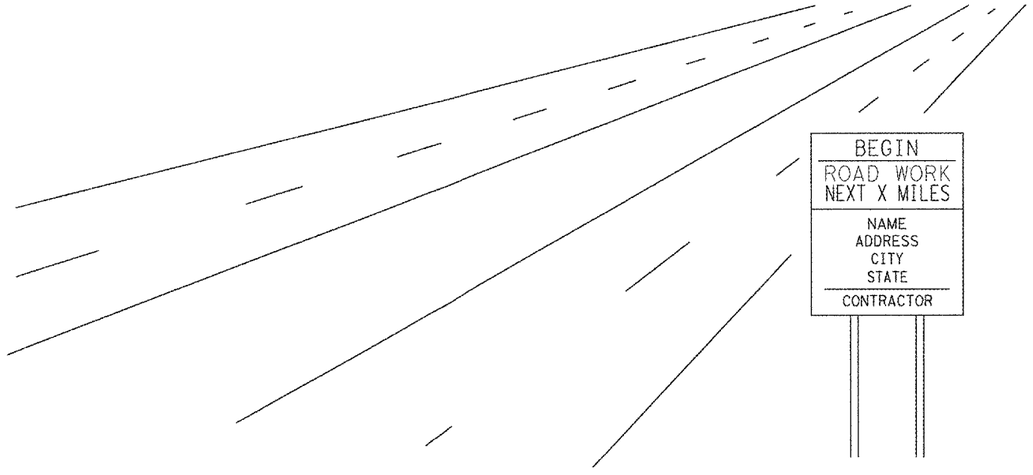
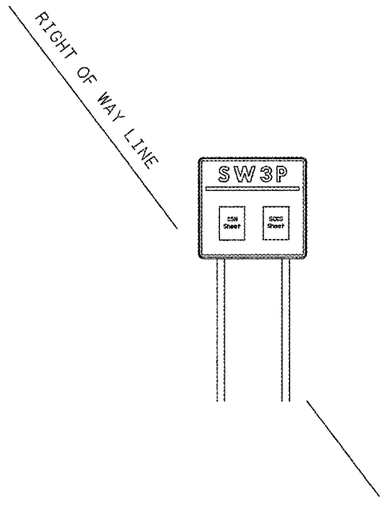


Figure 1





DEPARTMENT MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
FLAT SURFACE REFLECTIVE SHEETING	DMS-8300
VINYL NON-REFLECTIVE DECAL SHEETING	DMS-8320

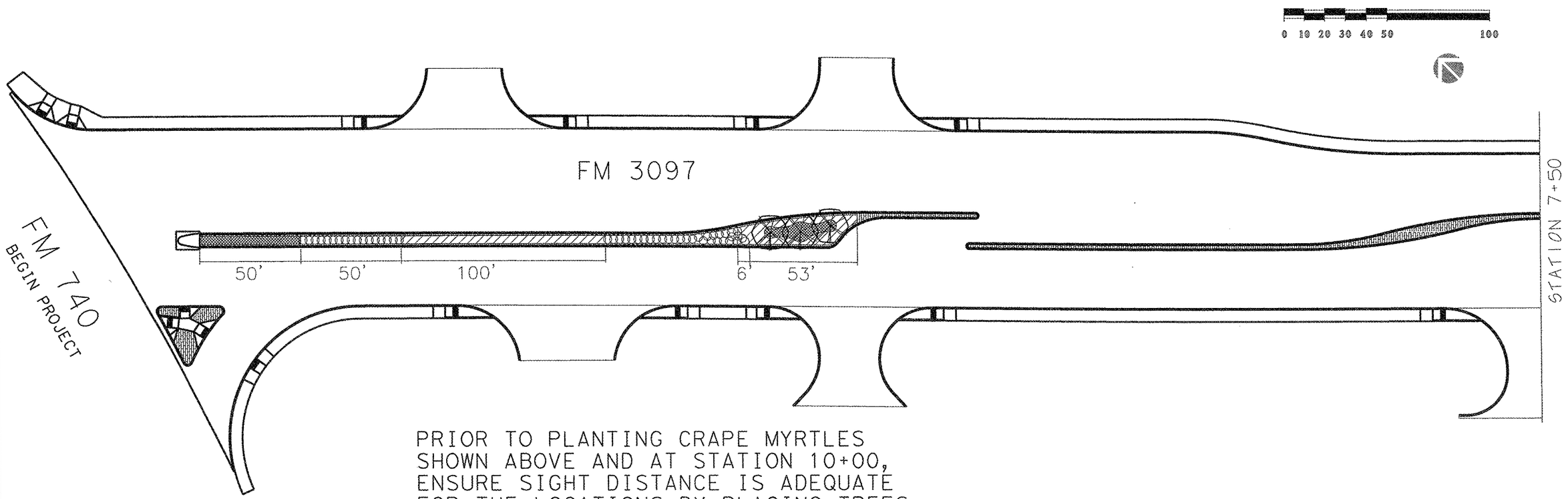
COLOR	USAGE	REFLECTIVE SHEETING OR OTHER MATERIAL
BLUE	BACKGROUND	TYPE C (FLUORESCENT PRISMATIC)
WHITE	LEGEND & BORDERS	VINYL NON-REFLECTIVE DECAL SHEETING

Texas Department of Transportation
DALLAS DISTRICT STANDARD

SW3P SIGN SHEET

FILE:	DN: TxDOT	CK:	DW:	CK:	
©TxDOT 2013	DISTRICT	FEDERAL AID PROJECT			SHEET
	DALLAS	STP 2013 (537) MM			274
REVISION DATE: 4/02/13	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	3148	01	006	FM 3097

PATH:
LEVELS DISPLAY



PRIOR TO PLANTING CRAPE MYRTLES SHOWN ABOVE AND AT STATION 10+00, ENSURE SIGHT DISTANCE IS ADEQUATE FOR THE LOCATIONS BY PLACING TREES IN PLACE WHILE STILL IN THEIR CONTAINERS.

ESTIMATED SHEET QUANTITIES

DESCRIPTION	QTY.	UNIT
CEDAR ELM	-	EA
CRAPE MYRTLE	3	EA
DWARF LOROPETALUM	49	EA
REGAL MIST GULF MUHLY	364	EA
HAMELN GRASS	185	EA
STEEL EDGING	23	LF
BED PREPARATION	197.2	SY
COLORED TEXTURED CONC.	204.2	SY

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick Haigh RLA 30 apr 2014
Signature of Registrant & Date

Texas Department of Transportation
© 2014

LANDSCAPE PLANTING PLAN

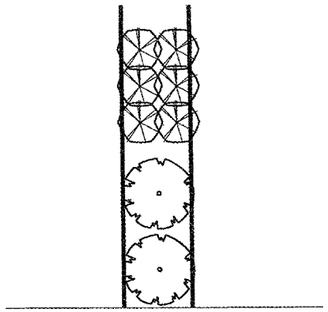
SCALE: 1"=50'-0" SHEET 1 OF 6

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS PJH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK EBB	TEXAS	DALLAS	ROCKWALL	275
CHECK XXX	CONTROL	SECTION	JOB	
	3148	01	006	

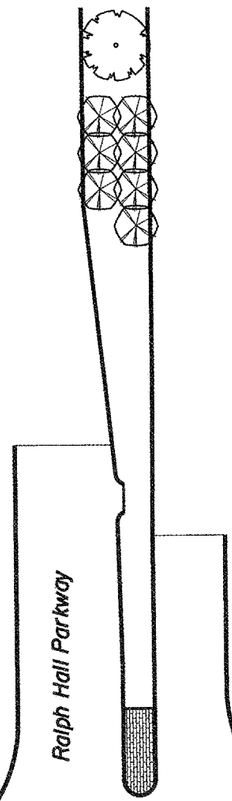
TEMPLATED REVISED: 10-23-02

ESTIMATED SHEET QUANTITIES

DESCRIPTION	QTY.	UNIT
CEDAR ELM	3	EA
CRAPE MYRTLE	16	EA
DWARF LOROPETALUM	59	EA
REGAL MIST GULF MUHLY	236	EA
HAMELN GRASS	275	EA
STEEL EDGING	24	LF
BED PREPARATION	202.5	SY
COLORED TEXTURED CONC.	163.3	SY



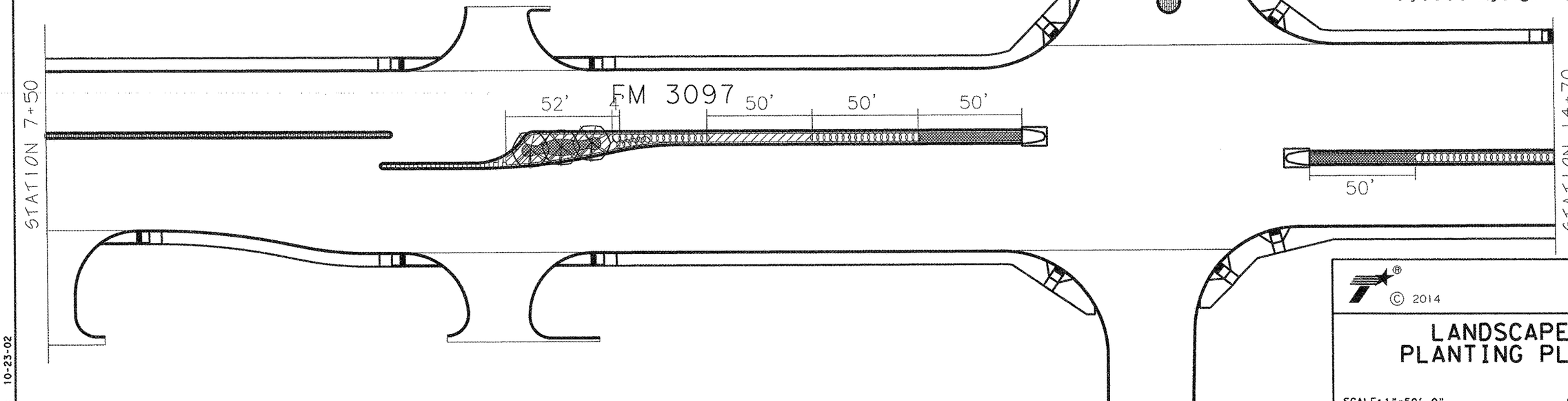
MATCHLINE A



0 10 20 30 40 50 100

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick J. Haigh RLA 30 apr 2014
Signature of Registrant & Date



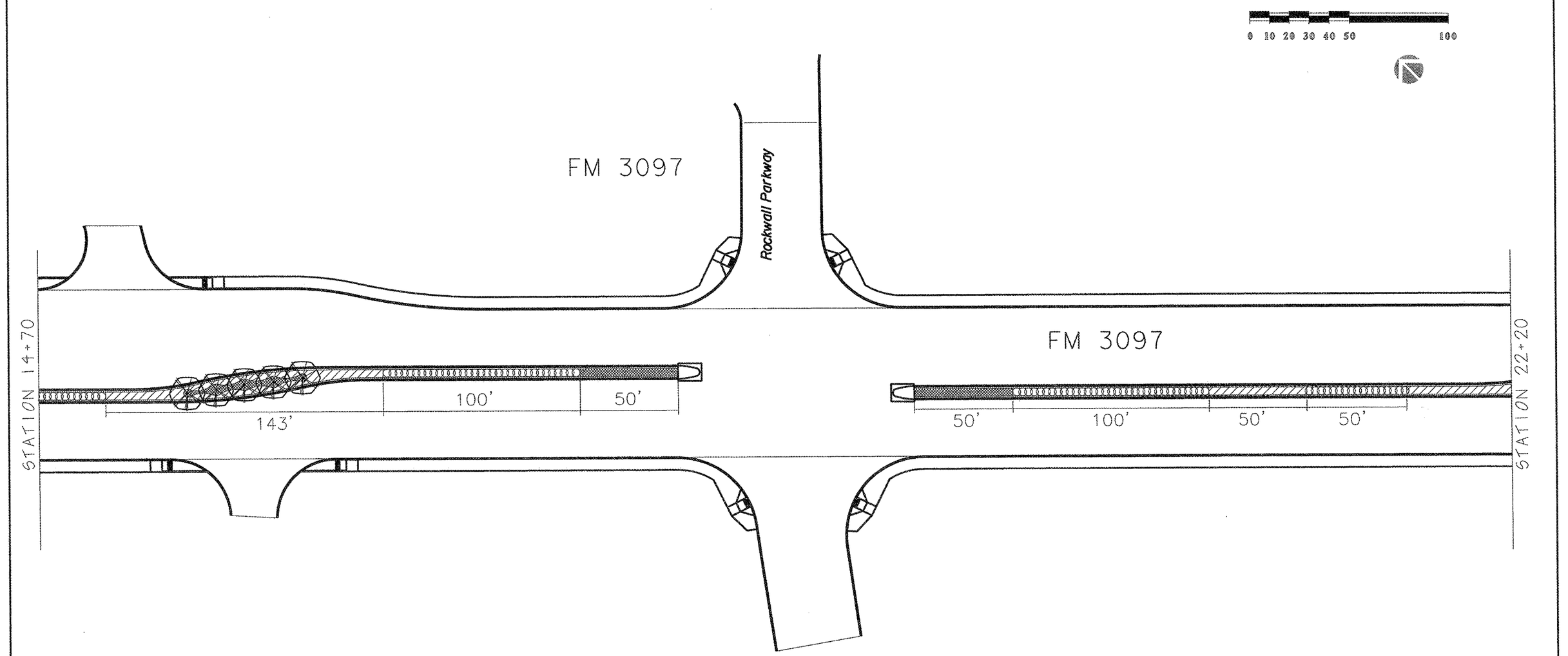
© 2014

LANDSCAPE PLANTING PLAN

SCALE: 1"=50'-0" SHEET 2 OF 6

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS PJH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK EBB	TEXAS	DALLAS	ROCKWALL	276
CHECK XXX	CONTROL	SECTION	JOB	
	3148	01	006	

TEMPLATED REVISED: 10-23-02



ESTIMATED SHEET QUANTITIES

DESCRIPTION	QTY.	UNIT
CEDAR ELM	-	EA
CRAPE MYRTLE	5	EA
DWARF LOROPETALUM	94	EA
REGAL MIST GULF MUHLY	502	EA
HAMELN GRASS	275	EA
STEEL EDGING	28	LF
BED PREPARATION	320.5	SY
COLORED TEXTURED CONC.	140.0	SY

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick J Haigh RLA 30 Apr 2014
Signature of Registrant & Date

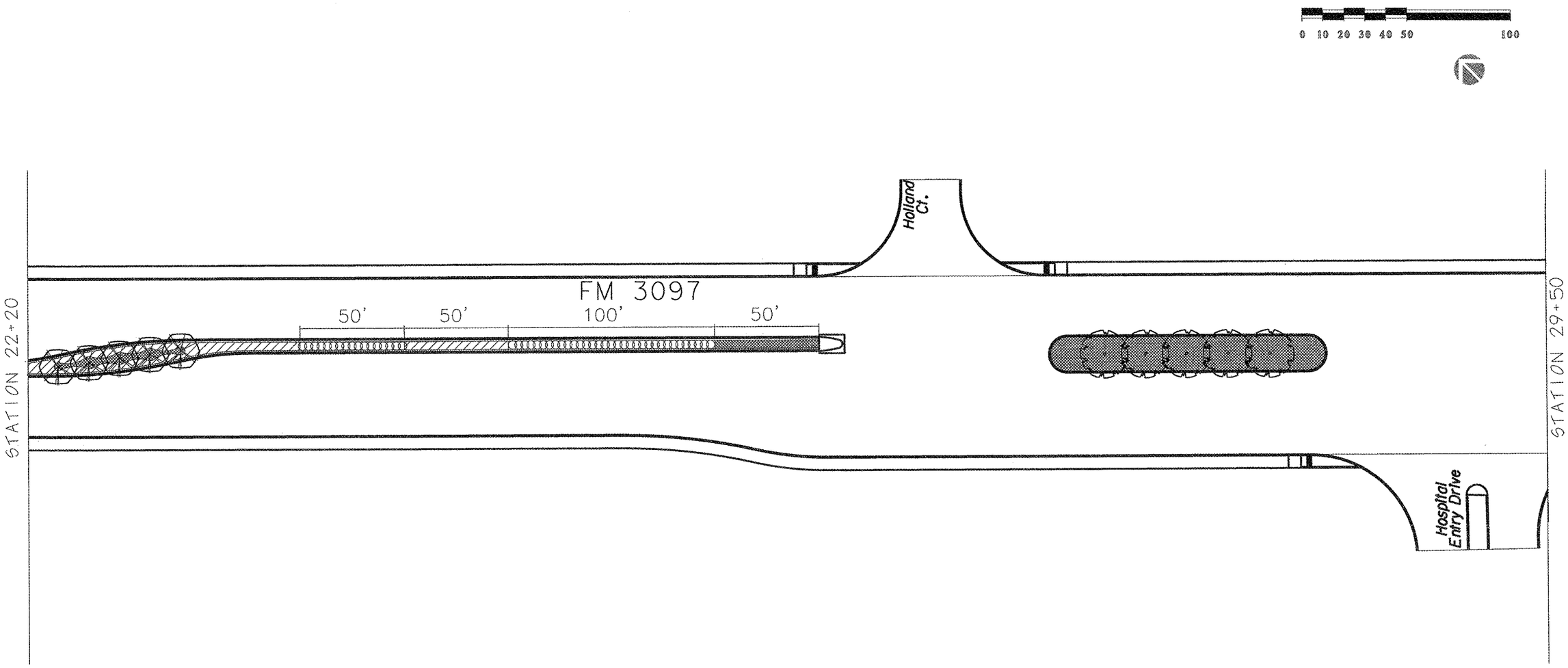
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LANDSCAPE PLANTING PLAN

SCALE: 1"=50'-0" SHEET 3 OF 6

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
PJH	TEXAS	DALLAS	ROCKWALL	277
CHECK	CONTROL	SECTION	JOB	
EBB	3148	01	006	
CHECK				
XXX				

TEMPLATED REVISED: 10-23-02



ESTIMATED SHEET QUANTITIES

DESCRIPTION	QTY.	UNIT
CEDAR ELM	5	EA
CRAPE MYRTLE	5	EA
DWARF LOROPETALUM	50	EA
REGAL MIST GULF MUHLY	406	EA
HAMELN GRASS	1164	EA
STEEL EDGING	16	LF
BED PREPARATION	214.9	SY
COLORED TEXTURED CONC.	84.9	SY

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick Haigh LA 30apr2014
Signature of Registrant & Date

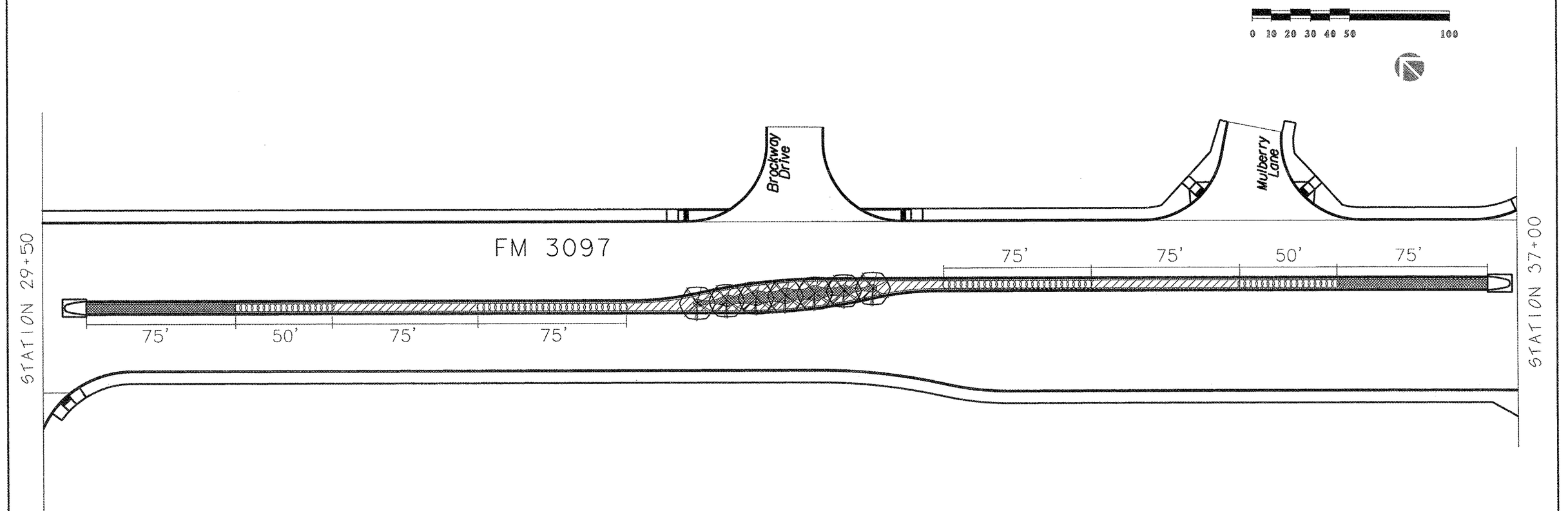
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LANDSCAPE PLANTING PLAN

SCALE: 1"=50'-0" SHEET 4 OF 6

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS PJH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK EBB	TEXAS	DALLAS	ROCKWALL	278
CHECK ~~APM~~	CONTROL	SECTION	JOB	
	3148	01	006	

TEMPLATED REVISED: 10-23-02



ESTIMATED SHEET QUANTITIES

DESCRIPTION	QTY.	UNIT
CEDAR ELM	-	EA
CRAPE MYRTLE	7	EA
DWARF LOROPETALUM	84	EA
REGAL MIST GULF MUHLY	692	EA
HAMELN GRASS	461	EA
STEEL EDGING	32	LF
BED PREPARATION	399.5	SY
COLORED TEXTURED CONC.	158.6	SY

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick Haigh RLA 30 Apr 2014
Signature of Registrant & Date

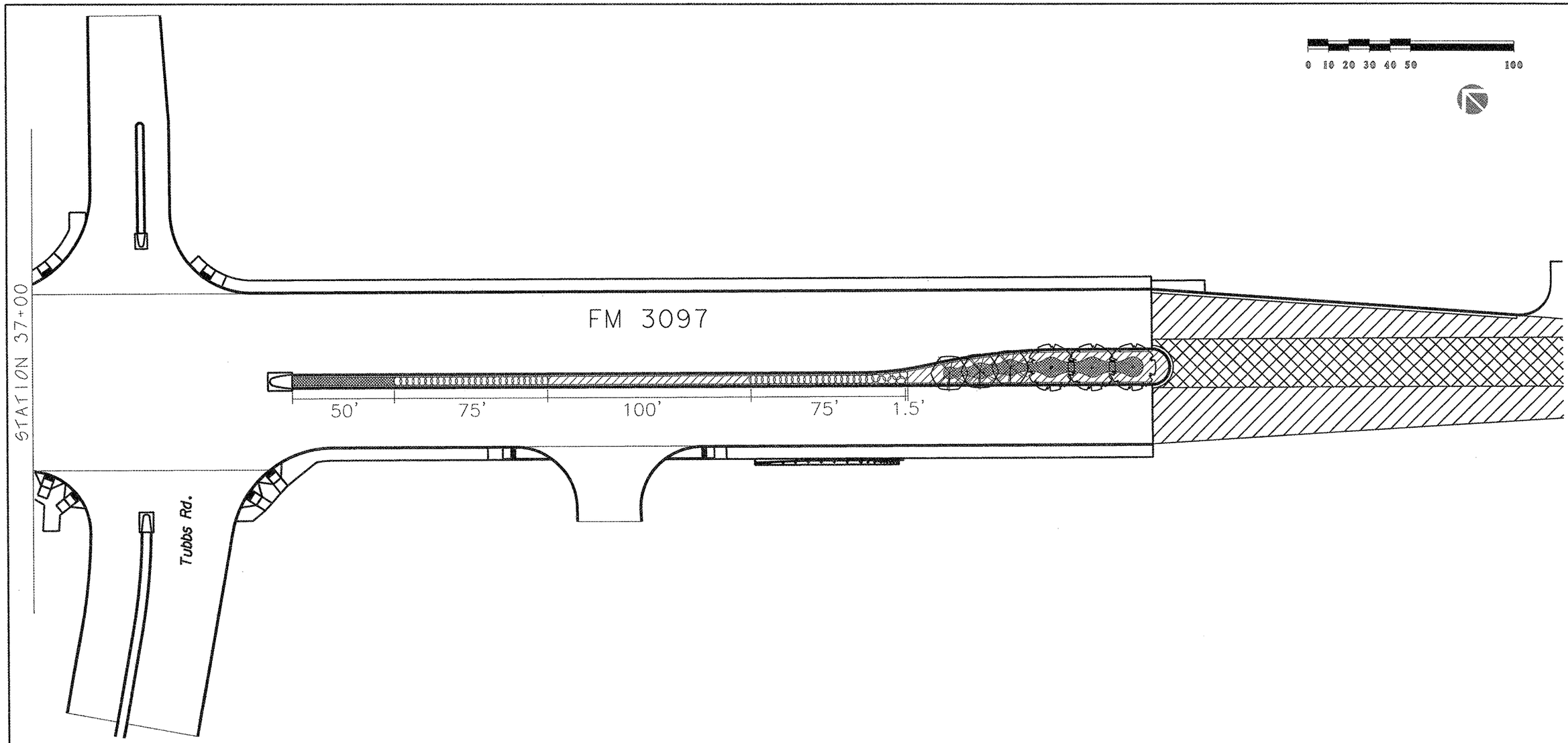
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LANDSCAPE PLANTING PLAN

SCALE: 1"=50'-0" SHEET 5 OF 6

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS PJH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK EBB	TEXAS	DALLAS	ROCKWALL	279
CHECK XXX	CONTROL	SECTION	JOB	
	3148	01	006	

TEMPLATED REVISED: 10-23-02



ESTIMATED SHEET QUANTITIES

DESCRIPTION	QTY.	UNIT
CEDAR ELM	3	EA
CRAPE MYRTLE	3	EA
DWARF LOROPETALUM	52	EA
REGAL MIST GULF MUHLY	649	EA
HAMELN GRASS	360	EA
STEEL EDGING	18	LF
BED PREPARATION	320.8	SY
COLORED TEXTURED CONC.	93.8	SY

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick Haigh RLA 30 apr 2014
Signature of Registrant & Date

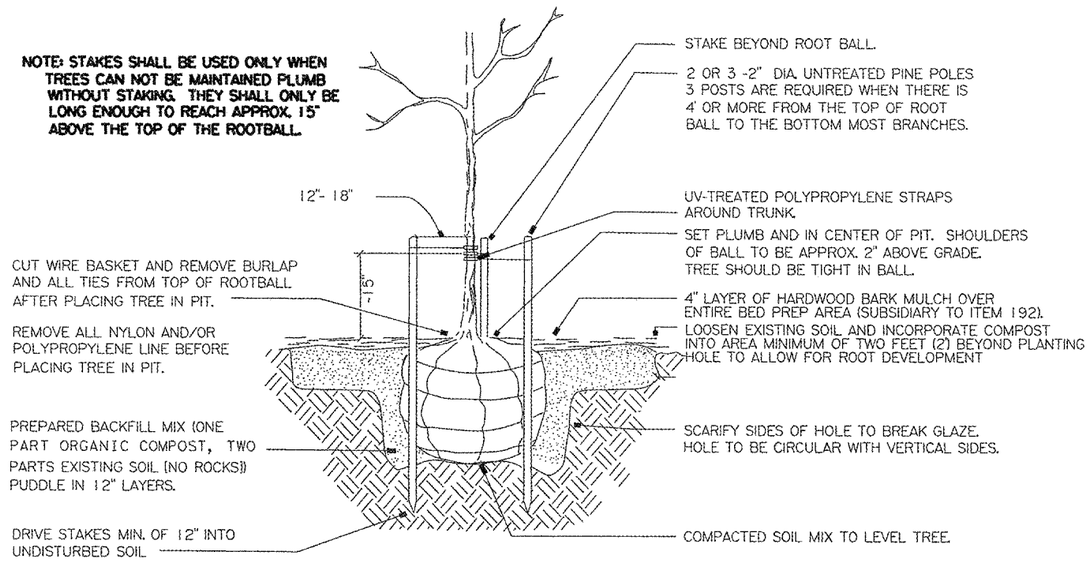
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LANDSCAPE PLANTING PLAN

SCALE: 1"=50'-0" SHEET 6 OF 6

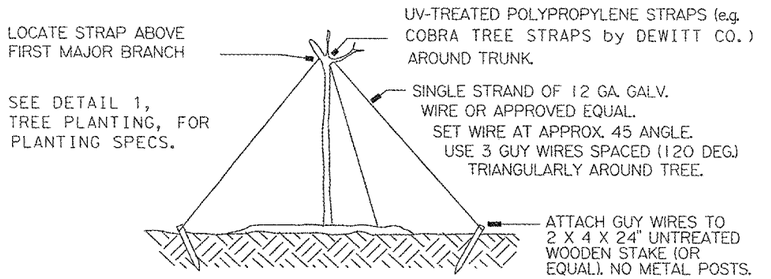
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS PJH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK EBB	TEXAS	DALLAS	ROCKWALL	280
CHECK XXX	CONTROL	SECTION	JOB	
	3148	01	006	

TEMPLATED REVISED: 10-23-02



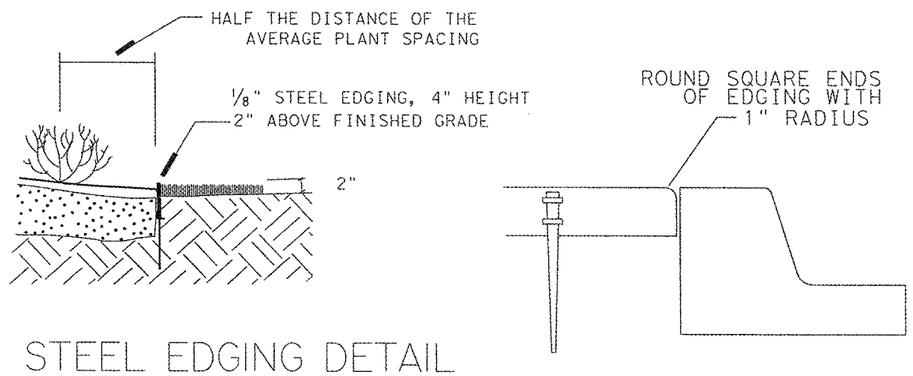
1 TREE PLANTING - B&B, BOX, CAN

(LESS THAN 3" CALIPER) N.T.S.



2 TREE GUYING

(REQUIRED ON TREES GREATER THAN 3" CALIPER) N.T.S.



3 STEEL EDGING DETAIL

Used to Separate Plant Types in Bed Areas N.T.S.

PLANT SPECIFICATIONS

Botanical Name	Common Name	Color	Quantity	Item 192.3(2)(a)(ii) Item 192.3(3) Root Condition	Caliper	Height	Spread	* Remarks
LARGE TREES (ITEMS 192-2007)								
Ulmus crassifolia	Cedar Elm		11	45 Gallon	Min. 2 1/2"	Min. 14'	Min. 4'	Typically Spaced 20' o.c.
SMALL TREES/LARGE SHRUBS (ITEMS 192-2006)								
Lagerstroemia indica 'Cherokee'	Cherokee Red Crape Myrtle		39	30 Gallon	Min. 2" (MT)	Min. 10'	4'-5'	Spaced 12' o.c.
SHRUBS/ORNAMENTAL GRASS (ITEM 192-2002 & 192-2003)								
Loropetalum chinense 'Suzanne'	Suzanne Dwarf Loropetalum		388	3 Gallon	N/A	Min. 12 in	Min. 8 in	Spaced 36" o.c.
Muhlenbergia capillaris	Regal Mist Gulf Muhly		2849	1 Gallon	N/A	Min. 8 in	Min. 5 in	Spaced 18" o.c.
Pennisetum alopecuroides 'Hamelin'	Hamelin Grass		2720	1 Gallon	N/A	Min. 8 in	Min. 5 in	Spaced 18" o.c.

* All plant material will be nursery-grown in containers

GENERAL NOTES:

1. Contractor will be responsible for referencing Item 192 of the Texas Standard Specifications for Construction of Highways, Streets and Bridges 2004 for specifications, dimensions, volumes and measurements that have been modified or not shown.
2. All plants will be nursery-grown in containers unless otherwise shown on plans.
3. Rejection of plants will be in accordance with Item 192.2(b).
4. Locations of trees, shrubs, and beds will be staked in the field by the Contractor in accordance with Item 192.3(c).
5. The Contractor will be responsible for the safe transportation of plants to the project site and their condition upon arrival.
6. Plant materials will not be stored on hard surface or left exposed to the sun.
7. Protect the root balls and water regularly until planting.
8. If plants are left in storage over the weekend or holiday, a means of periodically watering and inspection container moisture will be provided.
9. All plants will be hardy, symmetrical, tight knit, and so trained or favored in development and appearance as to be superior in form, number of branches, and compactness. Plants will be sound, healthy and vigorous, well branched, densely foliated when in leaf, and will have healthy, well developed root systems.
10. All shrub and tree plantings will be mulched after planting to the depth indicated in the details. Mulch will be shredded hardwood with a minimum 3/8 inch (not over 25% by volume) of fine particles and dust. Mulch will be free of any plastic, glass, metals, and other contaminants (sticks, stones, clay, or other foreign matter).
11. **PLANTING BED PREPARATION:**

    Once bed locations have been approved in the field, apply a glyphosate herbicide within the bed areas to kill existing grasses and weeds. Wait 7-10 days to ensure complete vegetation control. Reapply as necessary before applying compost.

    Apply Three inches (3") of General Use Compost to all planting areas and thoroughly till to a depth of six inches (6"). Specification Item 161 Compost - General Use Compost and Herbicide Applications will not be paid for separately but will be considered subsidiary to Item 192, planting bed preparation.

REGISTERED LANDSCAPE ARCHITECT PATRICK J. HAIGH 1498 STATE OF TEXAS

Patrick Haigh RLA 30 Apr 20
Signature of Registrant & Date

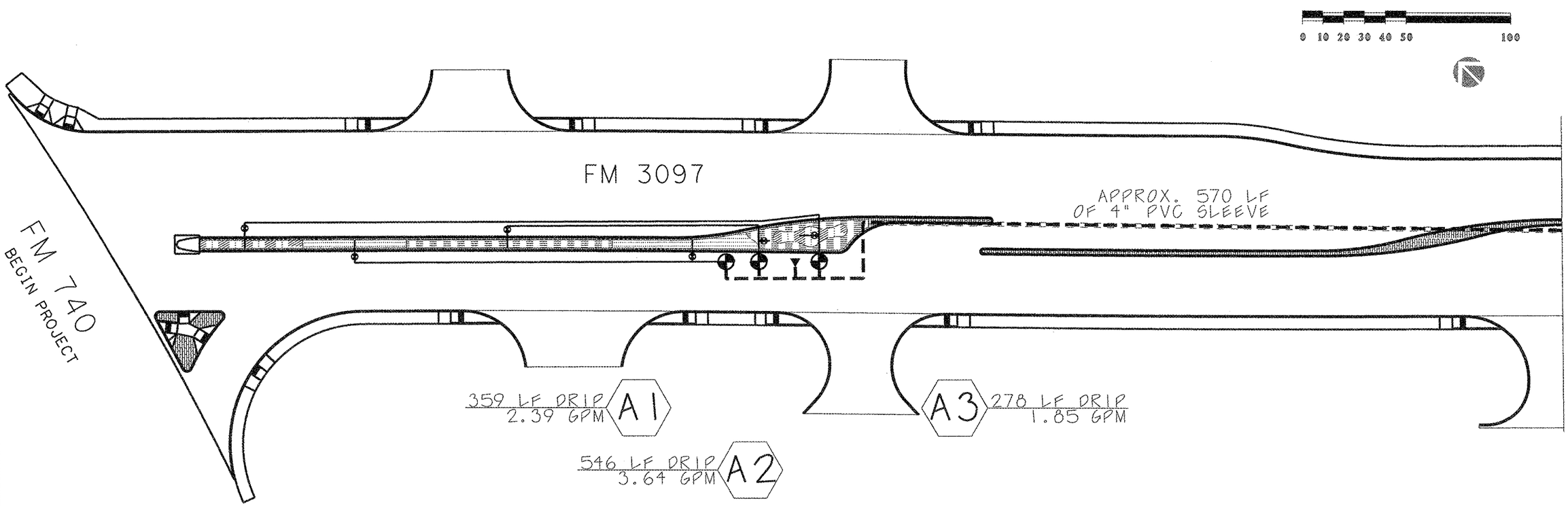
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LANDSCAPE PLANTING DETAILS

SCALE: As Shown

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XXX	6	(See Title Sheet)		FM 3097
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
XXX	TEXAS	DALLAS	ROCKWALL	281
CHECK	CONTROL	SECTION	JOB	
XXX	3148	01	006	
CHECK				
XXX				

TEMPLATED REVISED: 10-23-02



WHEN MAIN LINE AND VALVES ARE SHOWN IN ROADWAY IT IS FOR CLARITY PURPOSES ONLY.

SHOW DRIP LINE ISOLATION VALVE LOCATIONS ON AS-BUILT DRAWINGS ALONG WITH OTHER REQUIRED DIMENSIONS.

IRRIGATION LEGEND

- M — NEW 3/4" WATER METER
- NEW 1" BACKFLOW PREVENTION DEVICE
- VALVE LABEL ~~ZONE TYPE / FLOW RATE~~
- 1" ELECTRIC VALVE
- DRIP LINE ISOLATION VALVE
- 4" CASED BORE/SLEEVE
- 1 1/2" MAINLINE
- 3/4" LATERAL LINE
- 1/2" LATERAL LINE
- (A) CONTROLLER LOCATION
- QUICK COUPLING VALVE
- DRIP LINE TREE RING
- DRIP LINE IN BEDS

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick J Haigh RLA 30 Apr 2014
Signature of Registrant & Date

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LANDSCAPE IRRIGATION PLAN

SCALE: 1"=50'-0" SHEET 1 OF 6

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
PJH	TEXAS	DALLAS	ROCKWALL	282
CHECK	CONTROL	SECTION	JOB	
EBB	3148	01	006	
CHECK				
XXX				

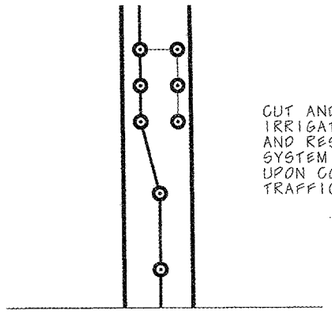
TEMPLATED REVISED: 10-23-02

IRRIGATION LEGEND

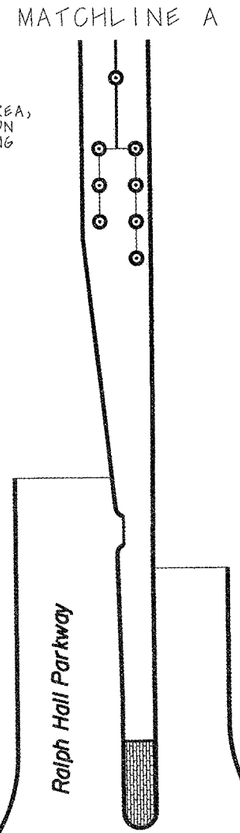
- NEW 3/4" WATER METER
- NEW 1" BACKFLOW PREVENTION DEVICE
- VALVE LABEL ~~ZONE TYPE / FLOW RATE~~
- 1" ELECTRIC VALVE
- DRIP LINE ISOLATION VALVE
- 4" CASED BORE/SLEEVE
- 1 1/2" MAINLINE
- 3/4" LATERAL LINE
- 1/2" LATERAL LINE
- (A) CONTROLLER LOCATION
- QUICK COUPLING VALVE
- DRIP LINE TREE RING
- DRIP LINE IN BEDS

WHEN MAIN LINE AND VALVES ARE SHOWN IN ROADWAY IT IS FOR CLARITY PURPOSES ONLY.

SHOW DRIP LINE ISOLATION VALVE LOCATIONS ON AS-BUILT DRAWINGS ALONG WITH OTHER REQUIRED DIMENSIONS.



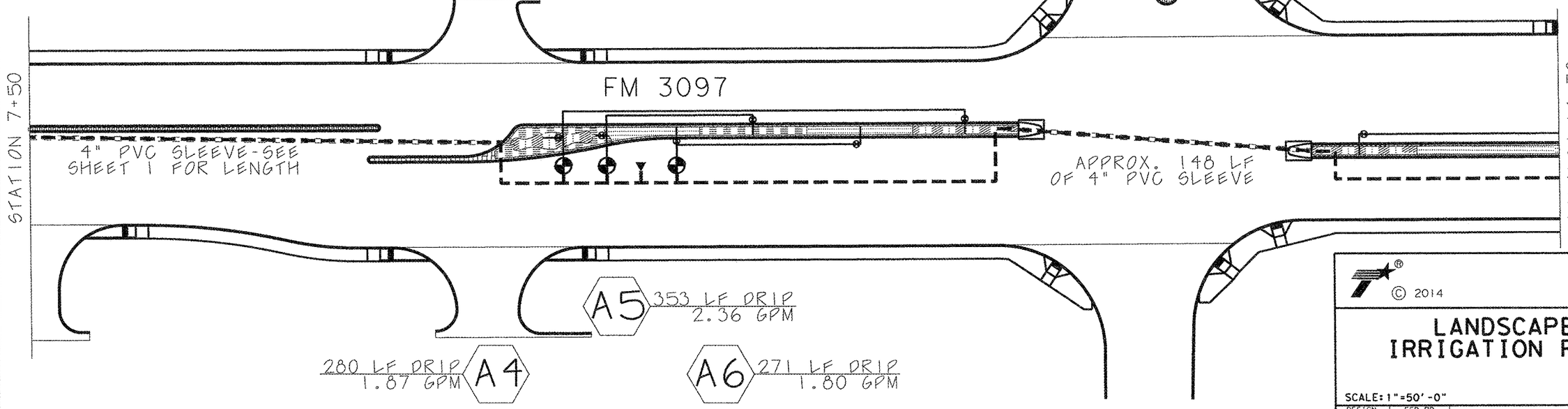
CUT AND CAP EXISTING IRRIGATION IN THIS AREA, AND RESTORE IRRIGATION SYSTEM TO NEW PLANTING UPON COMPLETION OF TRAFFIC DETOURS.



0 10 20 30 40 50 100

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick J. Haigh RLA 30apr2014
Signature of Registrant & Date



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LANDSCAPE IRRIGATION PLAN

SCALE: 1"=50'-0" SHEET 2 OF 6

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS PJH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK EBB	TEXAS	DALLAS	ROCKWALL	283
CHECK XXX	CONTROL	SECTION	JOB	
	3148	01	006	

TEMPLATED REVISED: 10-23-02

0 10 20 30 40 50 100

FM 3097

Rockwall Parkway

FM 3097

475 LF DRIP
3.17 GPM
A8

STATION 14+70

APPROX. 132 LF
OF 4" PVC SLEEVE

STATION 22+20

413 LF DRIP
2.76 GPM
A7

A9
533 LF DRIP
3.56 GPM

WHEN MAIN LINE AND VALVES ARE SHOWN IN ROADWAY IT IS FOR CLARITY PURPOSES ONLY.

SHOW DRIP LINE ISOLATION VALVE LOCATIONS ON AS-BUILT DRAWINGS ALONG WITH OTHER REQUIRED DIMENSIONS.

IRRIGATION LEGEND

- M — NEW 3/4" WATER METER
- NEW 1" BACKFLOW PREVENTION DEVICE
- VALVE LABEL — ZONE TYPE / FLOW RATE
- 1" ELECTRIC VALVE
- DRIP LINE ISOLATION VALVE
- 4" CASED BORE/SLEEVE
- 1 1/2" MAINLINE
- 3/4" LATERAL LINE
- 1/2" LATERAL LINE
- (A) — CONTROLLER LOCATION
- QUICK COUPLING VALVE
- DRIP LINE TREE RING
- DRIP LINE IN BEDS

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick J Haigh RLA 30apr2014
Signature of Registrant & Date

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LANDSCAPE IRRIGATION PLAN

SCALE: 1"=50'-0" SHEET 3 OF 6

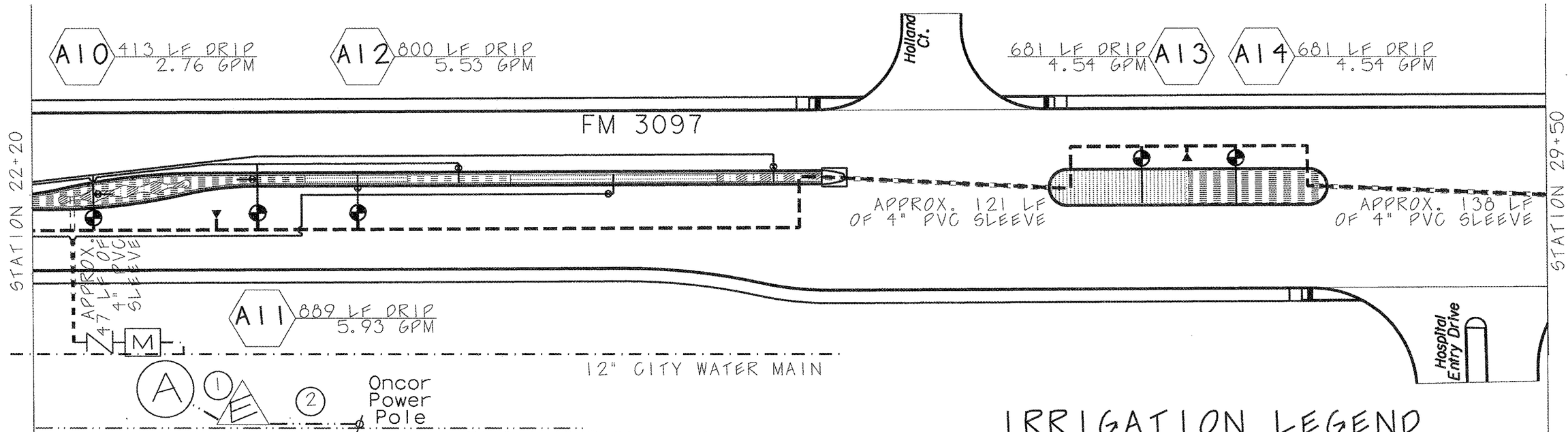
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
PJH	TEXAS	DALLAS	ROCKWALL	284
CHECK	CONTROL	SECTION	JOB	
EBB / XXX	3148	01	006	

TEMPLATED REVISED: 10-23-02

ELECTRICAL SERVICE DATA SHEET

Elec. Service No.	Sheet No.	Electrical Service Description (see ED (4) - 03)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contactor Amps	Panelbd/ Loadcenter Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
3		ELEC SERV TY D(120/240)060(NS)AL(N)PS(U)	2"	3/#6	N/A	2P/60	N/A	100	A	1P/15	2.5	0.3

0 10 20 30 40 50 100



WHEN MAIN LINE AND VALVES ARE SHOWN IN ROADWAY IT IS FOR CLARITY PURPOSES ONLY.

SHOW DRIP LINE ISOLATION VALVE LOCATIONS ON AS-BUILT DRAWINGS ALONG WITH OTHER REQUIRED DIMENSIONS.

CONDUIT RUN					
Run No.	Conduit Size/ Type (LF)	Electrical CNDR (EA)			Length of Run (LF)
	2" Sched 80 PVC	No. 8 Bare Wire	No. 12 XHHW Wire	No. 6 XHHW Wire	
1	20	1	2	-	20
2	50	-	-	3	50
Total	70	20	40	150	-

IRRIGATION LEGEND

- M — NEW 3/4" WATER METER
- NEW 1" BACKFLOW PREVENTION DEVICE
- VALVE LABEL ~~ZONE TYPE FLOW RATE~~
- 1" ELECTRIC VALVE
- DRIP LINE ISOLATION VALVE
- 4" CASED BORE/SLEEVE
- 1 1/2" MAINLINE
- 3/4" LATERAL LINE
- 1/2" LATERAL LINE
- A — CONTROLLER LOCATION
- QUICK COUPLING VALVE
- DRIP LINE TREE RING
- DRIP LINE IN BEDS

STATE OF TEXAS
ALAN PAUL McNEIL
69951
REGISTERED PROFESSIONAL ENGINEER

Alan P. McNeil, P.E. 4/30/14
Signature of Registrant & Date

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick J. Haigh, RLA 30apr2014
Signature of Registrant & Date

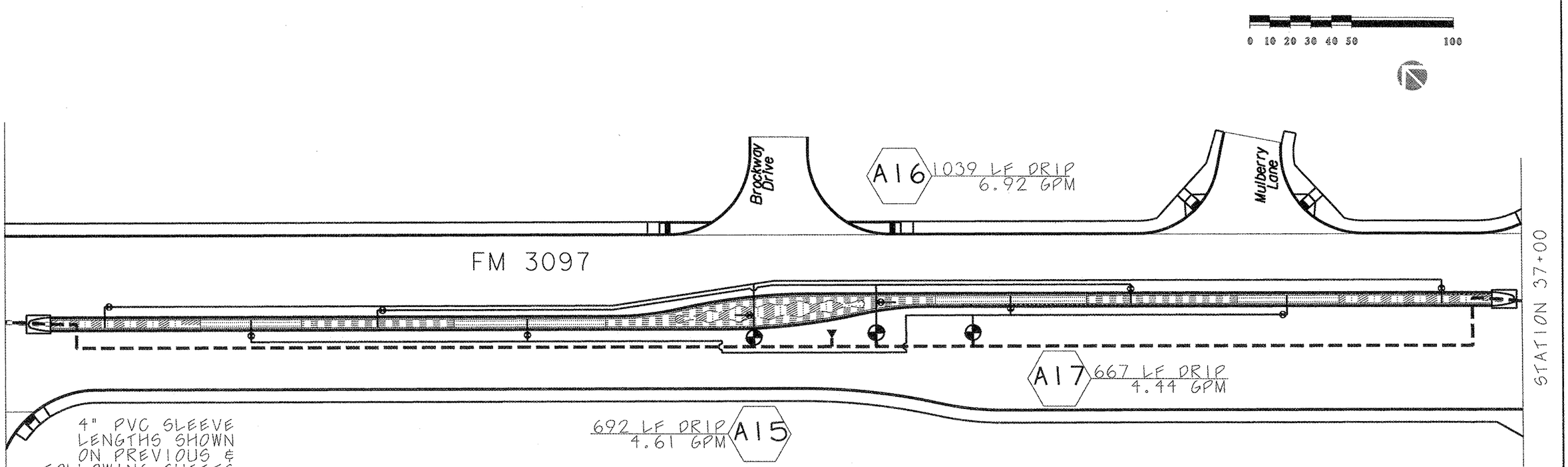
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LANDSCAPE IRRIGATION PLAN

SCALE: 1"=50'-0" SHEET 4 OF 6

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS PJH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK EBB	TEXAS	DALLAS	ROCKWALL	285
CHECK APM	CONTROL 3148	SECTION 01	JOB 006	

TEMPLATED REVISED: 10-23-02



WHEN MAIN LINE AND VALVES ARE SHOWN IN ROADWAY IT IS FOR CLARITY PURPOSES ONLY.

SHOW DRIP LINE ISOLATION VALVE LOCATIONS ON AS-BUILT DRAWINGS ALONG WITH OTHER REQUIRED DIMENSIONS.

IRRIGATION LEGEND

- [M] NEW 3/4" WATER METER
- NEW 1" BACKFLOW PREVENTION DEVICE
- VALVE LABEL ZONE TYPE / FLOW RATE
- 1" ELECTRIC VALVE
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- 1/2" LATERAL LINE
- (A) CONTROLLER LOCATION
- QUICK COUPLING VALVE
- DRIP LINE TREE RING
- DRIP LINE IN BEDS

REGISTERED LANDSCAPE ARCHITECT PATRICK J. HAIGH 1498 STATE OF TEXAS

Patrick Haigh RLA 30 Apr 2014
Signature of Registrant & Date

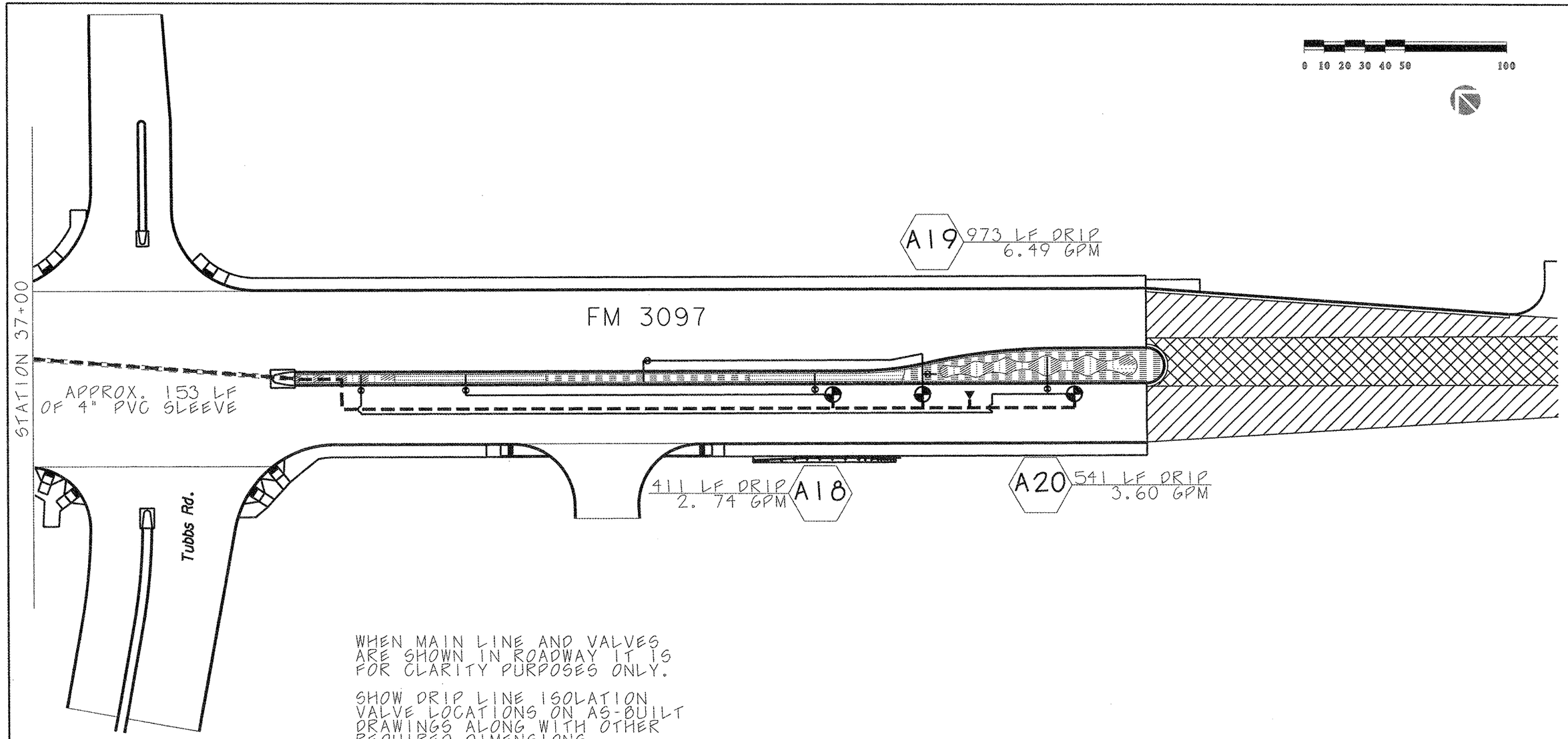
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LANDSCAPE IRRIGATION PLAN

SCALE: 1"=50'-0" SHEET 5 OF 6

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS PJH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK EBB	TEXAS	DALLAS	ROCKWALL	286
CHECK XXX	CONTROL	SECTION	JOB	
	3148	01	006	

TEMPLATED REVISED: 10-23-02



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SHOW DRIP LINE ISOLATION VALVE LOCATIONS ON AS-BUILT DRAWINGS ALONG WITH OTHER REQUIRED DIMENSIONS.

IRRIGATION LEGEND

- [M] NEW 3/4" WATER METER
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REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
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STATE OF TEXAS

Patrick Haigh RLA 30apr2014
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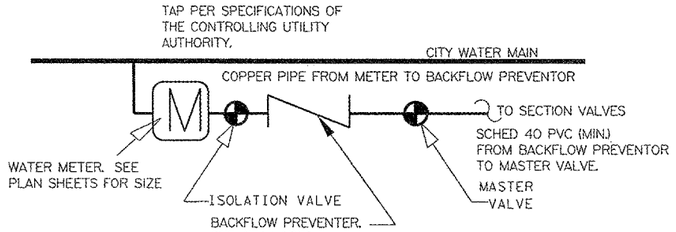
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LANDSCAPE IRRIGATION PLAN

SCALE: 1"=50'-0" SHEET 6 OF 6

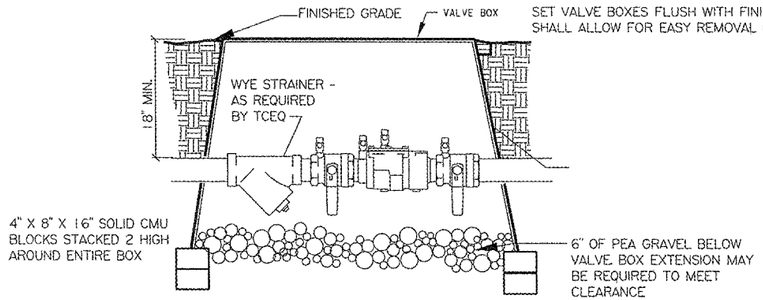
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(see Title Sheet)		FM 3097
GRAPHICS PJH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK EBB	TEXAS	DALLAS	ROCKWALL	287
CHECK XXX	CONTROL	SECTION	JOB	
	3148	01	006	

TEMPLATED REVISED: 10-23-02



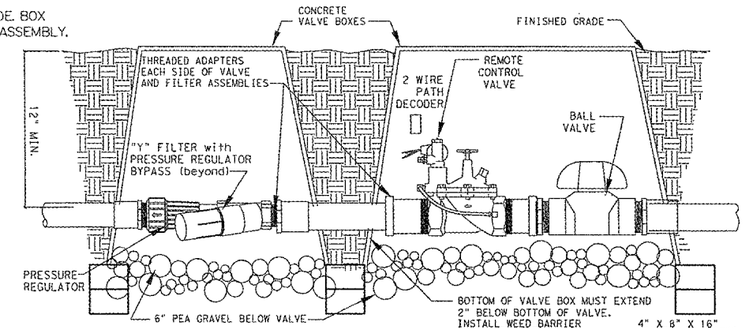
1 TYPICAL TAP & METER ASSEMBLY

SPACE VALVES 18" (MIN) TO 36" (MAX) APART — N.T.S.



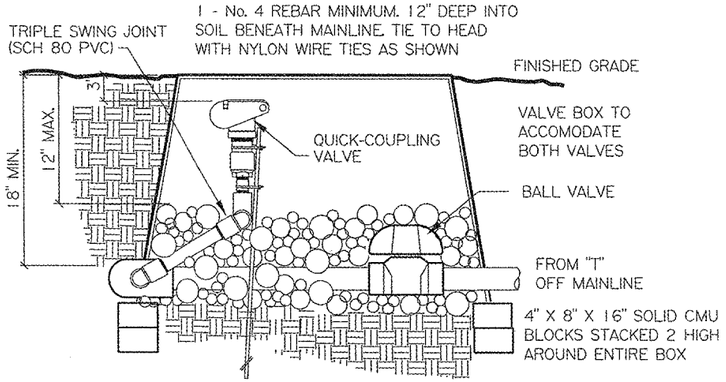
2 DOUBLE CHECK VALVE ASSEMBLY

N.T.S.



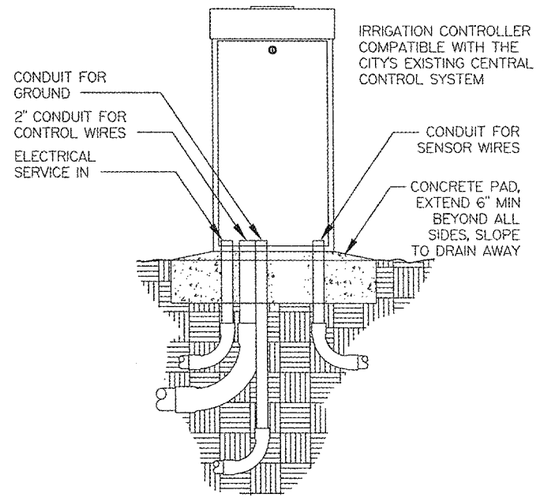
3 CONTROL VALVE

PROVIDE "Y" FILTER & PRESSURE REGULATOR FOR EACH ZONE — N.T.S.



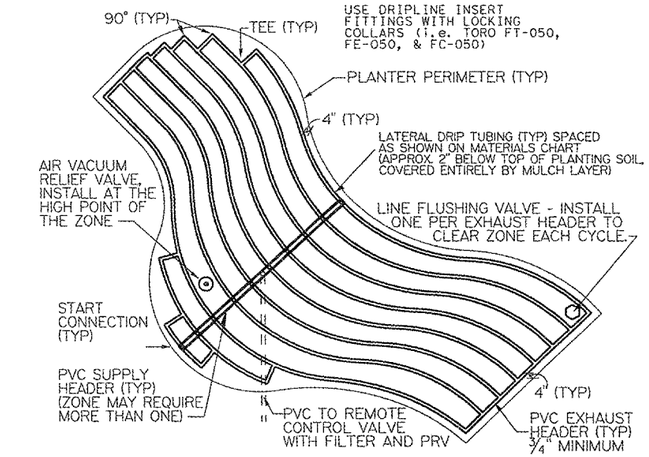
4 QUICK-COUPLING VALVE

N.T.S.



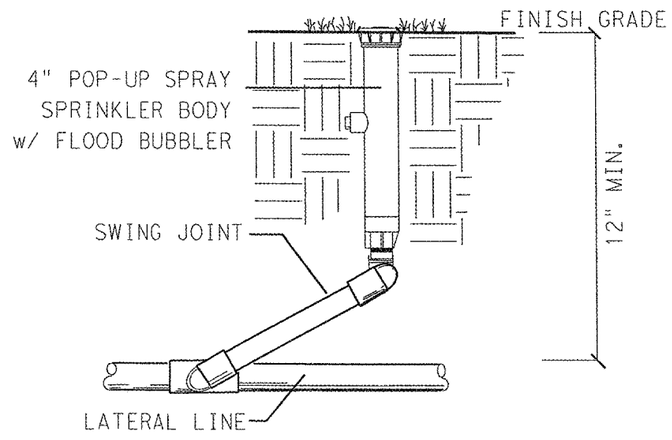
5 IRRIGATION CONTROLLER

N. T. S.



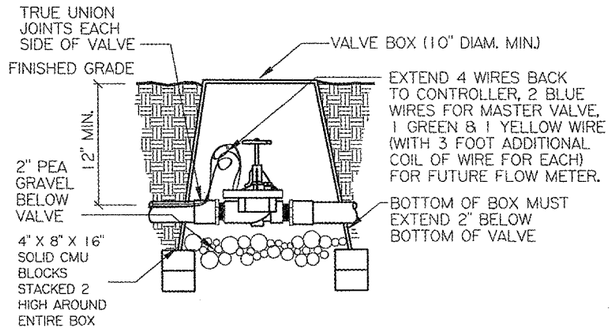
6 DRIP TUBING LAYOUT (TYP)

IRREGULAR — N.T.S.



7 TREE BUBBLER

TWO PER TREE PLACED ON OPPOSITE SIDES OF TREE AT 6" (MIN.) FROM ROOT BALL — N.T.S.



8 MASTER VALVE ASSEMBLY

N.T.S.

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick Haigh 10th 2014
Signature of Registrant & Date

Texas Department of Transportation
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IRRIGATION DETAILS

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(See Title Sheet)		FM 3097
GRAPHICS PJH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK PJH	TEXAS	DALLAS	ROCKWALL	288
CHECK XXX	CONTROL	SECTION	JOB	
	3148	01	006	

TEMPLATED REVISED: 10-23-02

GENERAL IRRIGATION NOTES:

1. Contractor shall be responsible for referencing Item 170 of the Texas Standard specifications for Construction of Highways, Streets and Bridges 2004 for specifications, dimensions, volumes and measurements that have been modified or not shown.
2. The contactor shall be responsible for obtaining all permits, licenses, tests, and/or approvals, paying any fees (including impact fees) and deposits and installing or arranging for all water meters and taps for installation and operation as applicable. Deposits will not be refunded. Water meters shall be placed in name of the contractor, as directed by engineer. The contractor will pay for monthly water charges during the project. Water meters shall remain operational and turned on through all phases of the contract to ensure plants receive required watering. Transfer meters to the City of Rockwall at the end of project.
3. Backflow preventers shall be placed in the name of the City of Rockwall, as directed by engineer. The contractor shall be responsible for all charges, fees, tests, and coordination for any backflow preventer testing, at installation or annual inspection, required by local entity through all phases of the contract.
4. The drawings are diagramatic of the work to be performed. Changes may be required due to varying conditions or as directed by the engineer.
5. Contractor shall verify location of any underground utilities with appropriate agencies. Underground utilities (if shown) on the plans are approximate.
6. See IRRIGATION DETAILS AND MATERIALS CHART for materials specifications, sizes, and requirements.

CONSTRUCTION METHODS:

1. The contractor shall investigate the site conditions affecting the work and shall furnish offsets, fittings, and sleeves as may be required to meet site conditions.
2. All irrigation valves, mainlines, quick coupler valves, dripline, etc., shall be located for approval by the engineer prior to installation.
3. Deviations in the piping as shown on the plans shall be permitted with approval, in writing, from the engineer.
4. Care shall be exercised when excavating near trees. No mechanical trenching shall be permitted below the canopy of existing trees. Contractor shall adjust trench path and/or excavate by hand to avoid damage to existing tree root system.
5. Contractor shall coordinate and verify location of signal wiring, traffic loop detector wiring, and CTMS wiring prior to beginning any work. Damage to signal wiring, loop detector wiring, CTMS wiring, any utilities not listed, and structres shall be repaired at contractor's expense. Contact TxDOT signal section @ 214-320-6683 for "TxDOT Locates".
6. Any underground utilities, high mast wiring, and CTMS wiring shown on plans are approximate locations only and shall not relieve contractor's responsibility of coordinating with appropriate authorities to locate underground utilities, wiring and any structure.
7. Dig trenches straight and support pipe continuously on bottom of trench. Install pipe to an even grade. Trench bottom shall be clean and smooth with all organic debris and sharp objects removed. Pipe shall be snaked in trench, to allow for expansion and contraction. For public safety, plastic construction fencing, minimum 4 feet high, shall be used around open excavations.
8. Boring and sleeve requirements. Boring and sleeve locations shall be staked for engineer's approval. Boring depth shall be at 24" below pavement. All borings and sleeves shall be continuous and shall extend the full width of the pavement and 5 feet on each side thereof. Boring and sleeves shall be measured and paid for in accordance with Item 618. Additional payments for distances greater than 5 feet beyond pavement will not be made except as already shown on plans. Bore encasement pipe must be installed same day as boring.
9. PVC casing(s) for bores and sleeves shall consist of SCH 40 smooth wall pipe with welded joints and seams, and shall be continuous. The size of bore shall not exceed the diameter of casing(s) required by the plans by more than 1 inch.
10. Pipe shall not be installed when air temperature is below 40 degrees fahrenheit. Plastic pipe shall be cut in a manner that will insure a square cut. Burrs at cut ends shall be removed prior to installation so that a smooth unobstructed flow will be obtained.
11. All water lines, valves, and sprinkler bodies shall be thoroughly flushed before installing dripline or sprinkler nozzles.
12. Control wire and wire connections shall be as described on IRRIGATION MATERIALS SPECIFICATIONS CHART. All wire connections and splices shall be made in ground boxes.
13. Compaction of the pipe trenches must be sufficient to limit short term settling of the backfill to no more than 1 inch. The contractor shall correct settling greater than this without additional compensation.

GUARANTEE AND ACCEPTANCE:

1. Maintenance period. The irrigation system shall be inspected concurrently with, and subject to the same establishment/maintenance requirement periods under Items 192 and 193 (if used). During the installation, establishment, and maintenance, contractor shall perform the following activities as a minimum and to the satisfaction of the engineer:
   - A) Install and maintain the controller program to insure the proper distribution of water (includes replacement of any batteries).
   - B) Inspect, repair, and/or replace any equipment that is found defective or may be damaged by other maintenance.
   - C) Make any adjustments that may become necessary to ensure the proper delivery of water to the plant material.
2. As-built drawings. Upon completion of the required maintenance period, the engineer will make an inspection of the project. The contractor shall furnish the engineer a set of as-built drawings on reproducible 11x17 film base sheets. The engineer will check base sheets to be sure they are a true record of the project conditions and will direct the contractor to correct any errors that are found. The drawings shall show all valve locations by triangulation from a fixed object and any change to sprinkler head location from a fixed object and any change to sprinkler head location and rerouting of main and lateral lines (changes of this nature shall be approved by the engineer prior to installation).
3. Operating and maintenance data. The contractor shall provide instructions covering full operation, care and maintenance of the equipment, including a schedule showing length of time each valve is to be open to provide determined amount of water, and instruct the state's designated personnel in proper operation of the system.
4. Test. Testing of the system for leakage shall be in accordance with Item 170. The contractor shall also test and assure the proper electrical working order of the system to the satisfaction of the engineer.

IRRIGATION MATERIALS SPECIFICATIONS

DESCRIPTION	* EXAMPLE OR EQUAL	SIZE	APPROXIMATE QUANTITIES FOR INFORMATIONAL PURPOSE ONLY
WATER METER	PER LOCAL CODE	2 inch	1, IRRIGATION ZONES DESIGNED BASED ON MINIMUM 50 PSI STATIC PRESSURE. NOTIFY LANDSCAPE ARCHITECT PRIOR TO INSTALLING SYSTEM IN THE EVENT STATIC PRESSURE IS LESS THAN 50 PSI.
LANDSCAPE DRIP TUBING (FOR PLANTING BED AREAS)	NETAFIM TLCV6-18; RAINBIRD XFCV6-18;	0.6 GPH, 18" Dripper Spacing	11,224 LF (spaced 18" o.c.)
TREE BUBBLERS	RAINBIRD 1804 w/ 1402 Nozzle HUNTER PROS-04 w/ PCN-50 Nozzle	0.5 gpm	32, 2 per tree in Ralph Hall Parkway median
DRIP CONTROL ZONE KIT	HUNTER ICZ-101-40	1 inch	18
BALL VALVE	NIBCO OR EQUAL	same as mainline	26
BACKFLOW PREVENTER	FEBCO 850 (OR PER LOCAL CODE)	2 inch	1
QUICK COUPLING VALVE	RAINBIRD 3-DRC	¾" inch	8, PROVIDE 3 QUICK COUPLING KEYS TO ENGINEER.
IRRIGATION CONTROLLERS	TORO SENTINEL SSAK-24-PS1-6-??-S-1	24 Station	1, SEE IRRIGATION MOUNTING DETAILS FOR MOUNTING INFORMATION
COPPER PIPE Extend from meter to inlet side of Master Valve.	TYPE "K"	2 inch	INSTALL BETWEEN METER AND BACKFLOW PREVENTOR
PVC SCH 40 CONDUIT Pressure rated with slip type solvent welded joints		4 inch	Paid for under Item 618, See note 8, CONSTRUCTION METHODS on this sheet.
PVC CLASS 200 MAINLINE Pressure rated with twin gasket couplings and fittings or slip type solvent welded joints		1 ½ inch	4166 LF TOTAL
PVC CLASS 200 LATERALS AND HEADERS		As indicated on the plans	MEASURE FROM PLAN
ABOVE GROUND PIPE INCLUDING BURIED RISERS AND SWING-JOINT COMPONENTS shall be PVC SCH 80 pipe rated for direct sunlight exposure			AS NEEDED
FITTINGS All fittings incorporated into system shall be of the same type, size and class material as the pipe			AS NEEDED
CONTROL WIRE All low voltage control wire shall be color coded. Wire sizes shall conform to the controller manufacturer specifications for maximum distances for specific wire sizes. All wire shall be specifically manufactured for direct burial. All wire connections and splices shall be made in ground boxes. The splice shall be completely waterproof and shall be completely encapsulated within a Tom King Black Splice Connector enclosure or an approved equal.		14 GA.	PROVIDE WIRE COIL EVERY 100 FEET TO ALLOW FOR EXPANSION.
SOLVENT CEMENT Solvent cement shall be the type recommended by the pipe manufacturer			DO NOT USE BLUE CEMENT. USE A COLORED PRIMER.
VALVE BOXES Boxes for section valves, below-ground backflow preventors, and quick coupling valves shall be as shown on detail sheet		BOX SIZE SHALL BE MIN. 10" AND ALLOW FOR EASY REMOVAL OF VALVE, ETC.	QUANTITY AS REQUIRED FOR SECTION VALVES, BELOW GROUND BACKFLOW PREVENTORS, QUICK COUPLING VALVES AND ANY ACCESSORIES. PROVIDE WEED BARRIER OR FILTER FABRIC AROUND BOXES TO REDUCE SILTATION. TAPE FABRIC IN PLACE AROUND ENTRY POINTS.
VALVE BOX RISERS	CONCRETE MASONRY UNIT (CMU) BLOCKS STACKED 2 HIGH AS SHOWN IN DETAILS.	4" X 8" X 16"	QUANTITY AS REQUIRED FOR SECTION VALVES, BELOW GROUND BACKFLOW PREVENTORS, QUICK COUPLING VALVES AND ANY ACCESSORIES

* REFERENCE TO MANUFACTURER'S TRADE NAME OR CATALOG NUMBER IS FOR THE PURPOSE OF IDENTIFICATION ONLY, CONTRACTOR SHALL BE PERMITTED TO FURNISH LIKE MATERIALS OF OTHER MANUFACTURERS PROVIDED THEY ARE OF EQUAL QUALITY AND COMPLY WITH SPECIFICATIONS FOR THIS PROJECT AND ARE APPROVED BY THE ENGINEER.

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick Haigh 30 Apr 2014
Signature of Registrant & Date

DATE: $DATE$
FILE: $FILE$

Texas Department of Transportation
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IRRIGATION GENERAL NOTES & MATERIAL SPECIFICATIONS

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PJH	6	(See Title Sheet)		FM 3097
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
PJH	TEXAS	DALLAS	ROCKWALL	289
CHECK	CONTROL	SECTION	JOB	
PJH	3148	01	006	
CHECK				
XXX				