100% SUBMITTAL

DESIGN	FED. RD. DIV. NO.	FEDERAL AID NO.		HIGHWAY NO.
BDH	6	F 2024(372)		CS
GRAPHICS BDH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RTC	TEXAS	LBB	LUBBOCK	1
CHECK KCM	CONTROL	SECTION	JOB	
	0905	06	095	

CITY OF LUBBOCK

TRAY PAYNE, MAYOR

TEXAS DEPARTMENT OF TRANSPORTATION

LUBBOCK DISTRICT

STEVEN P. WARREN, P.E., DISTRICT ENGINEER

FEDERAL PROJECT NUMBER: F 2024(372)

CSJ: 0905-06-095

UPLAND AVENUE

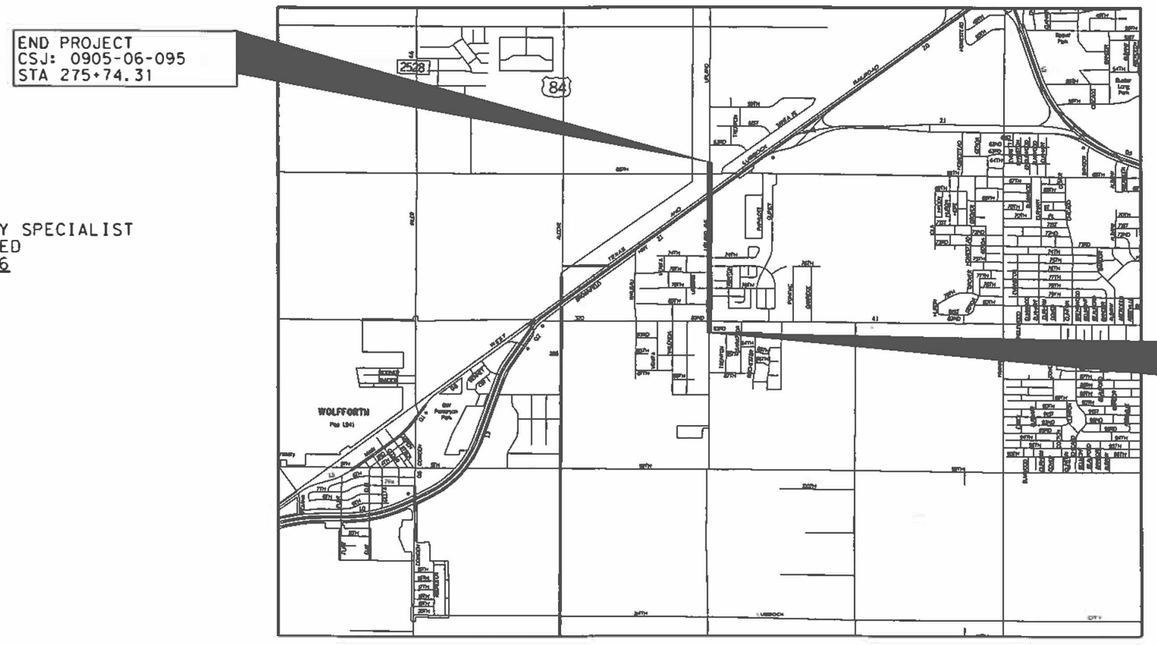
LUBBOCK COUNTY

755 FT NORTH OF 66TH ST TO 130 FT SOUTH OF 82ND ST

LIMITS: FROM 66th STREET TO 82nd STREET

TOTAL LENGTH OF PROJECT = 1.155 MILE (ROADWAY) + 0.008 MILE (BRIDGE) = 1.163 MILE = 6143 FEET

TYPE OF WORK: WIDEN NON-FREEWAY TWO LANES TO FIVE LANES
CONSISTING OF: GRADING, CEMENT TREAT SUBGRADE, HOTMIX, CRCP, CURB AND GUTTER, SIDEWALK, STRUCTURES, SIGNALS, ILLUMINATION, SIGNS AND PAVEMENT MARKINGS



LOCATION MAP

NO EQUATIONS
NO EXCEPTIONS
1 RAILROAD CROSSING DOT #017 728Y

REGISTERED ACCESSIBILITY SPECIALIST (RAS) INSPECTION REQUIRED
TDLR No. TABS 2020021096

NOTE:

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014, 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, OCTOBER, 2023)

UPLAND AVE
DESIGN SPEED = 50 MPH

ADT 2020 = 7600

ADT 2040 = 10750

FUNCTIONAL CLASS:
URBAN MINOR ARTERIAL (TXDOT)
PRINCIPAL ARTERIAL MODIFIED (CITY)

SUBMITTED BY:

STATE OF TEXAS — PEDRO CARRASCO JR. — 98380 — LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 11/16/2023

Texas Department of Transportation

RECOMMENDED FOR LETTING	11/17/2023	RECOMMENDED FOR LETTING	11/17/2023
DocuSigned by: Joe Wilder P.E. 40A057BF6367404...	AREA ENGINEER	DocuSigned by: Shelley C. Harris P.E. F9084108931347C	DISTRICT DESIGN ENGINEER
CONCURRENCE	11/20/2023	APPROVED FOR LETTING:	11/20/2023
DocuSigned by: Michael D. Keenum, P.E. 19E4B6A8BD7E43F...	CITY ENGINEER, CITY OF LUBBOCK	DocuSigned by: Kelly P. Warren P.E. 642C605E4DDD40A	DISTRICT ENGINEER

100% SUBMITTAL

SHEET	DESCRIPTION
	I. GENERAL
1	TITLE SHEET
2	INDEX SHEET
3	PROJECT LAYOUT
4 - 7	TYPICAL SECTIONS
8, 8A - 8O	GENERAL NOTES
9, 9A - 9E	ESTIMATE AND QUANTITY
	II. TRAFFIC CONTROL PLAN
10	TRAFFIC CONTROL NARRATIVE
11	TRAFFIC CONTROL PLAN SUMMARY
12 - 13	TRAFFIC CONTROL DETOUR
14 - 22	TRAFFIC CONTROL PLAN PHASE 1
23 - 32	TRAFFIC CONTROL PLAN PHASE 2
33 - 41	TRAFFIC CONTROL PLAN PHASE 3
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55	TCP (2-1) - 18
56	TCP (2-2) - 18
57	TCP (2-3) - 23
58	TCP (2-4) - 18
59	TCP (2-5) - 18
60	TCP (3-1) - 13
61	TCP (3-3) - 14
62	TCP (3-4) - 13
63	TCP (S-1) - 08A
64	TCP (S-2) - 08A
65	TCP (S-2c) - 10
66	TCP (S-3) - 08
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69	WZ (UL) - 13
70	WZ (STPM) - 23
71	WZ (RCD) - 13
72	WZ (RS) - 22
73	WZ (TD) - 17
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	IV. ROADWAY DETAILS
75	REMOVAL SUMMARY
76 - 79	REMOVAL PLANS
80	DOMINION HOLY GHOST CHURCH FENCE DETAIL
81 - 82	HORIZONTAL ALIGNMENT DATA
83	SURVEY CONTROL
84 - 85	EARTHWORK CALCULATIONS
86	ROADWAY SUMMARY
87	ALTERNATE BID SUMMARY
88	PAVEMENT ALTERNATIVES
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110	DRIVEWAY DETAILS
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149	CULVERT ALIGNMENT DATA SHEET
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224	RCD(1) - 22
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234 - 236	TSR (3) - 13 THRU TSR (5) - 13
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239 - 240	RAILROAD REQUIREMENTS
241	RAILROAD INTERSECTION LAYOUT
	XIII. UTILITIES
242 - 247	UTILITY LAYOUTS
	XIIII. ENVIRONMENTAL ISSUES
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251	EROSION CONTROL PLAN SUMMARY
252 - 254	EROSION CONTROL SHEETS
255 - 257	EC(1)-16 THRU EC(3)-16
258 - 260	EC(9) -16
261	EPIC

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

Pedro Carrasco Jr.

SIGNATURE OF REGISTRANT

10/5/2023

DATE

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 10/5/2023

TEXAS FIRM F-928

Kimley»Horn

FREESE AND NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation

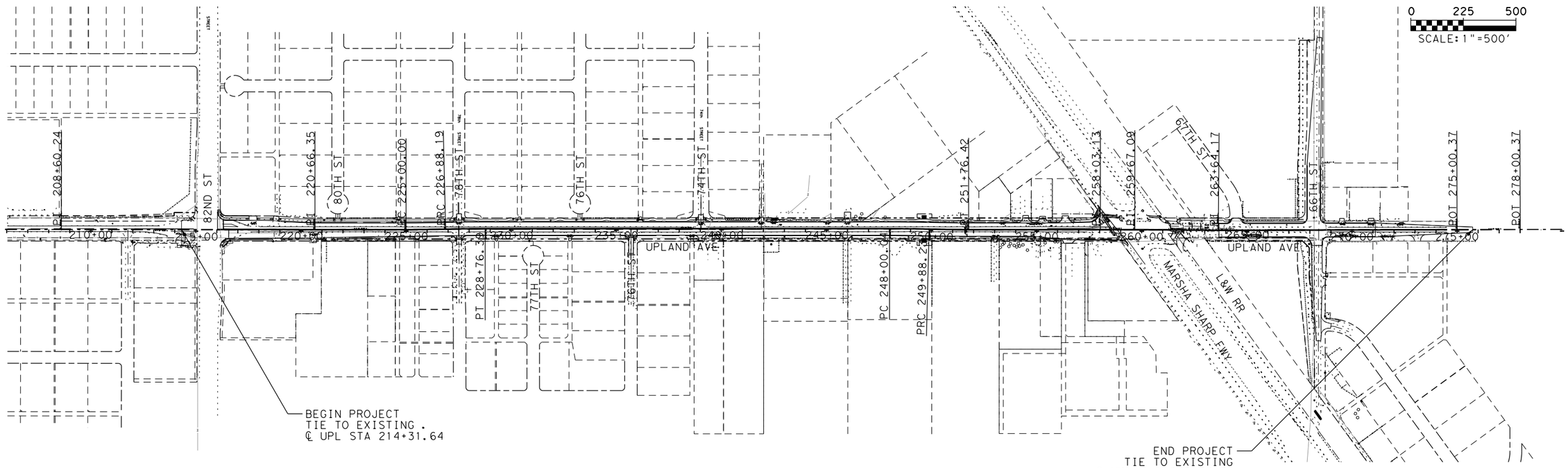
UPLAND AVENUE
66TH STREET TO 82ND STREET

INDEX

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	2
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

PROJECT LAYOUT

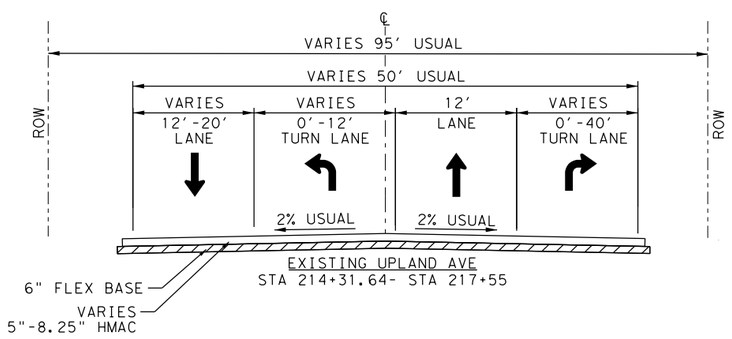
SHEET 1 OF 1

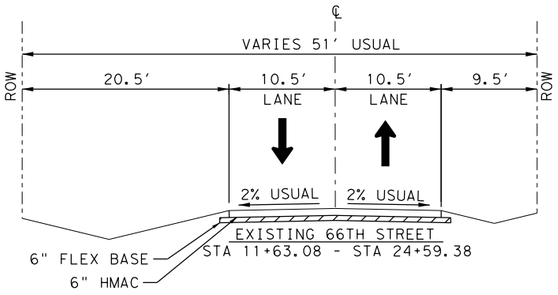
FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

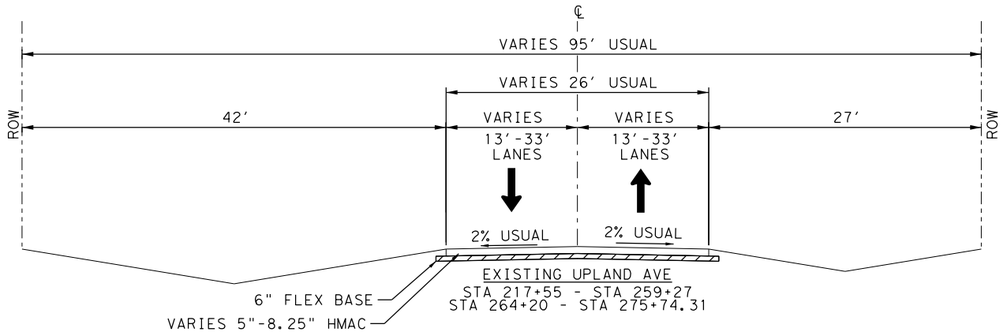
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	3
CONT.	SECT.	JOB	
0905	06	095, ETC.	

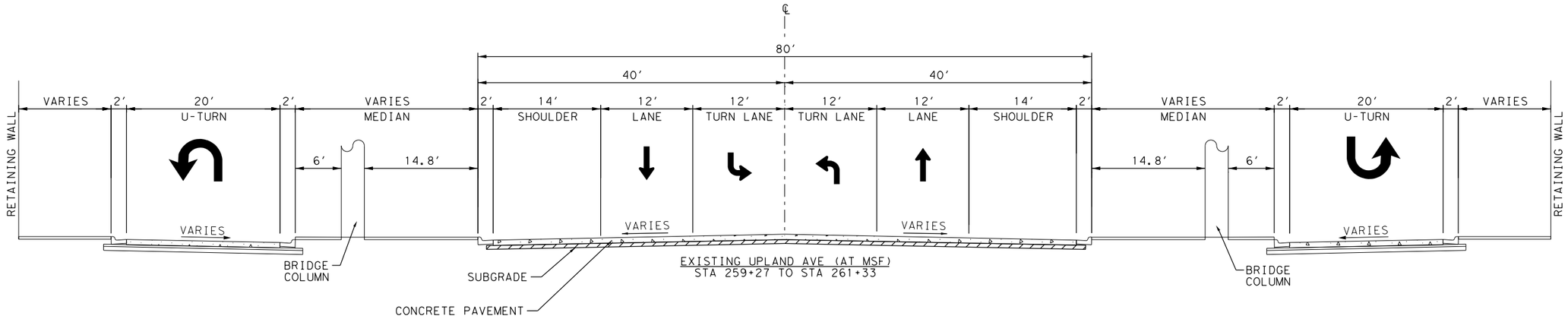
100% SUBMITTAL

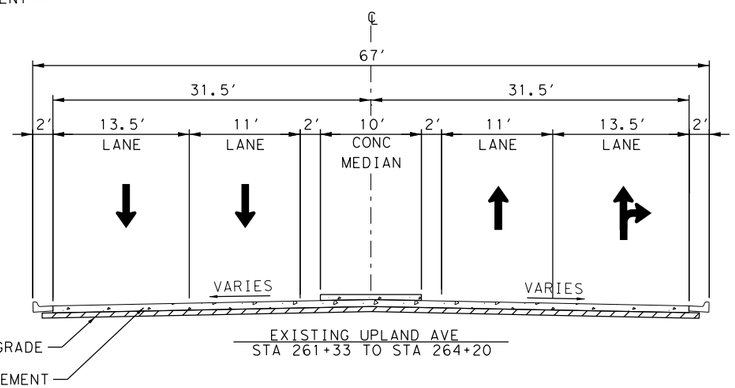
NOT TO SCALE

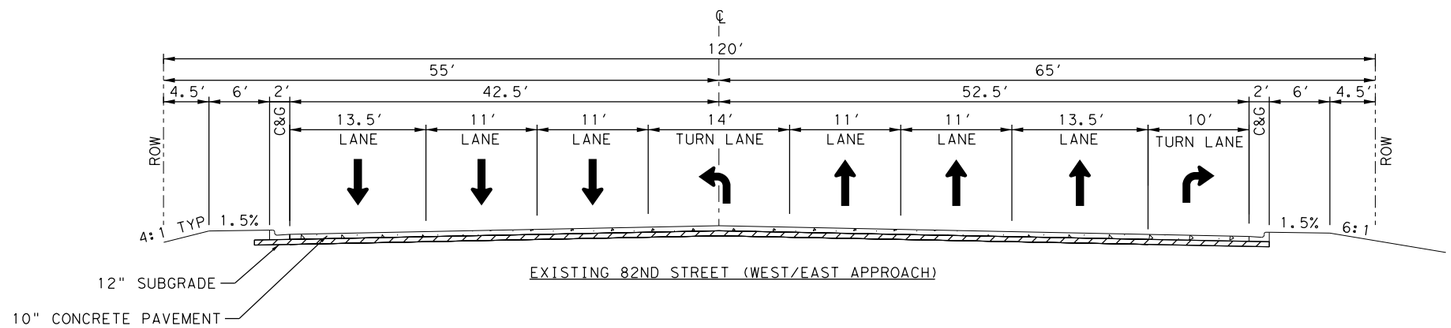












EXISTING CORE DEPTHS

CORE LOCATION	ASPHALT DEPTH	FLEX BASE DEPTH
UPL AND 66TH ST	8.25" HMAC	6"
UPL AND 76TH ST	4.50" HMAC	6"

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TYPICAL SECTIONS

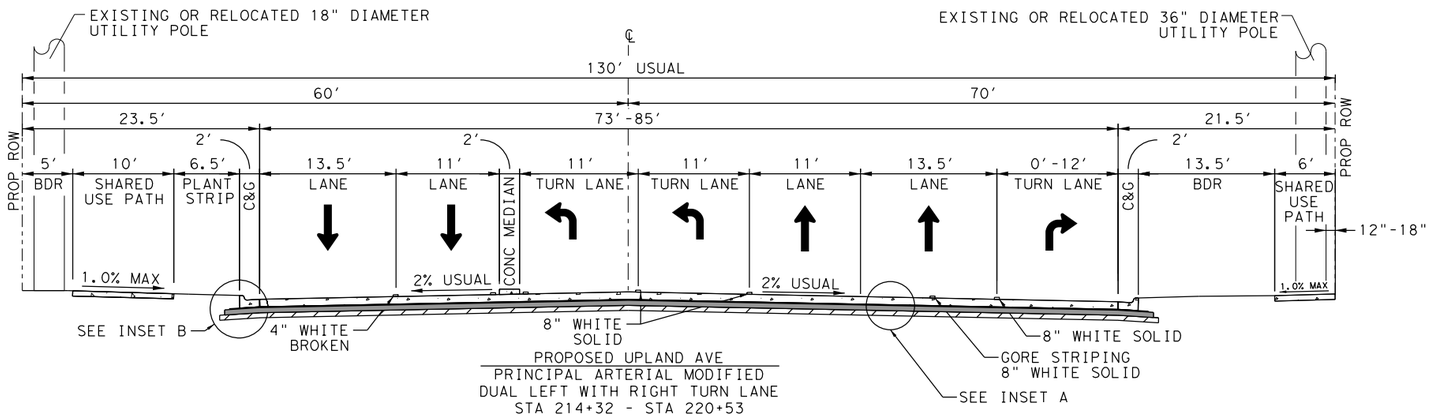
SHEET 1 OF 4

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

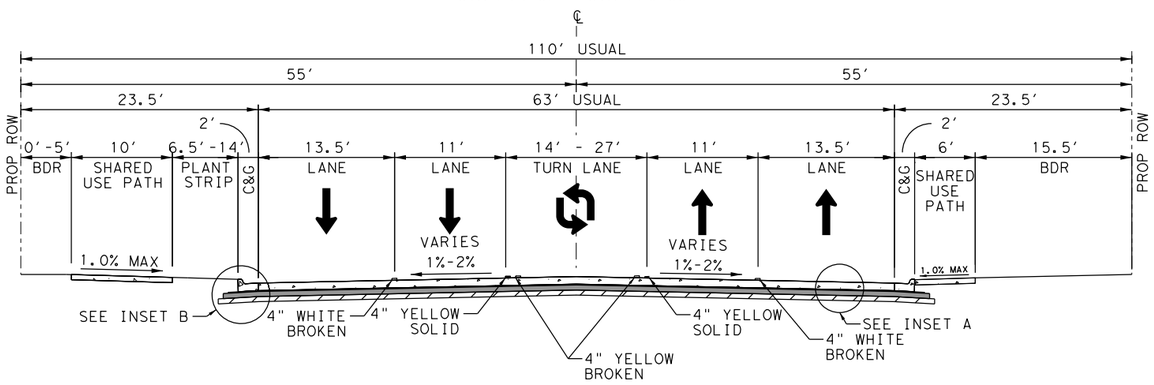
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	4
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

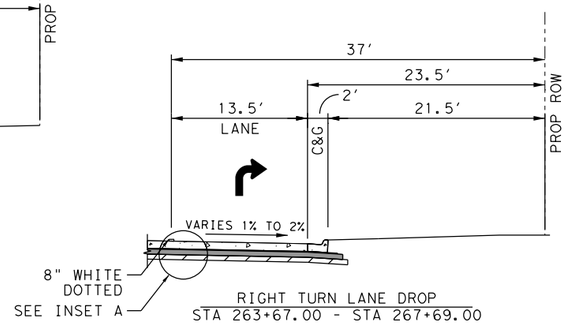
NOT TO SCALE



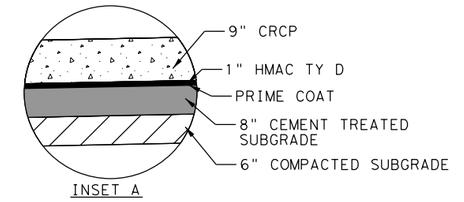
PROPOSED UPLAND AVE
PRINCIPAL ARTERIAL MODIFIED
DUAL LEFT WITH RIGHT TURN LANE
STA 214+32 - STA 220+53



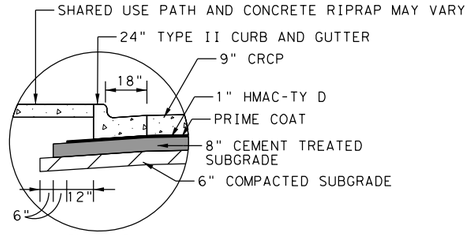
PROPOSED UPLAND AVE
PRINCIPAL ARTERIAL MODIFIED
STA 220+53 - STA 227+64
STA 260+70 - STA 263+67



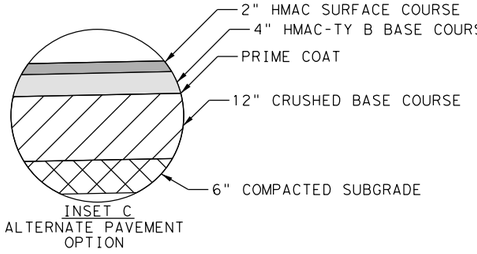
RIGHT TURN LANE DROP
STA 263+67.00 - STA 267+69.00



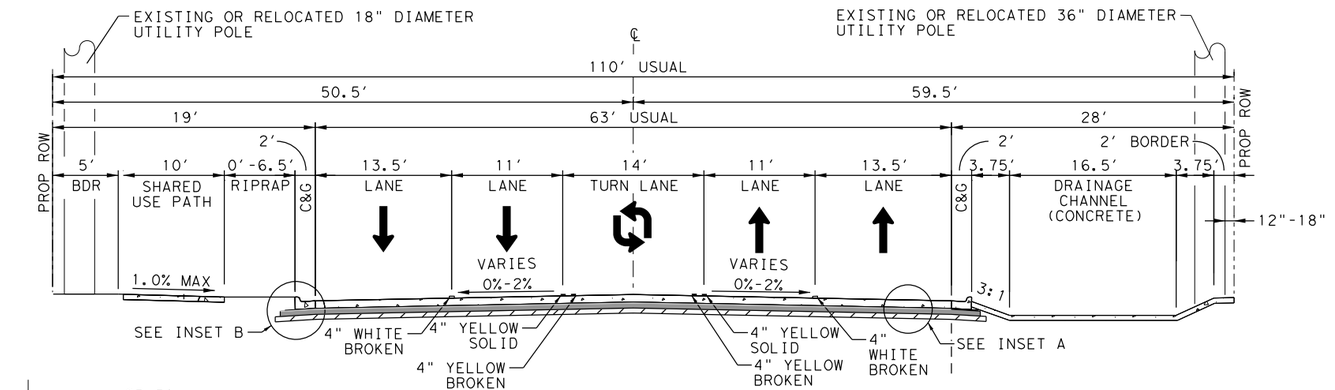
INSET A



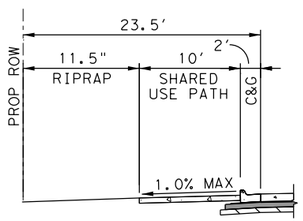
INSET B
PROPOSED CURB



INSET C
ALTERNATE PAVEMENT OPTION



PROPOSED UPLAND AVE
PRINCIPAL ARTERIAL MODIFIED
STA 227+64 - STA 255+00



VARYING FRONT SLOPE
STA 241+66.85 - STA 252+60.00

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STATE OF TEXAS
8/9/2023

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TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TYPICAL SECTIONS

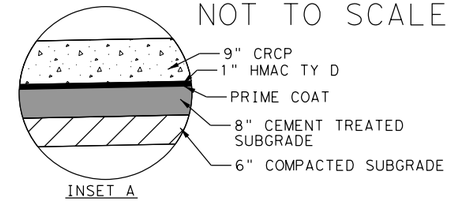
SHEET 2 OF 4

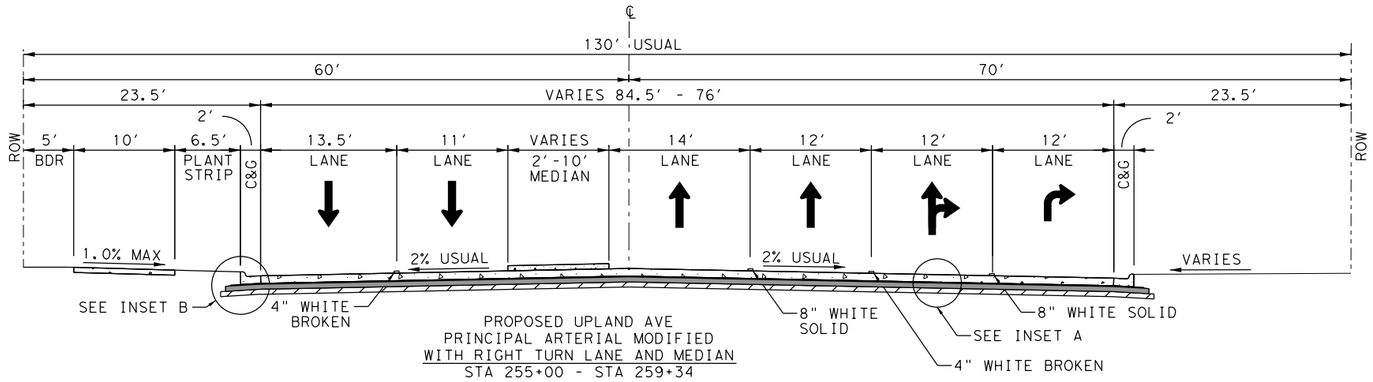
FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

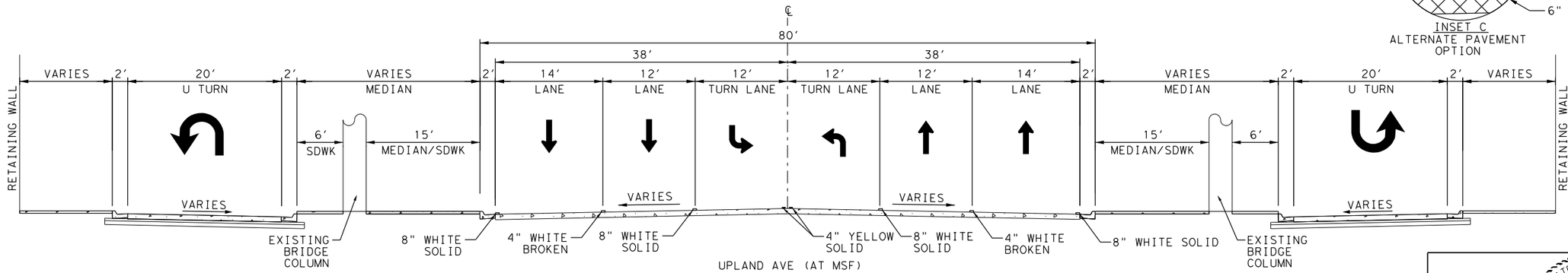
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	5
CONT.	SECT.	JOB	
0905	06	095,ETC.	

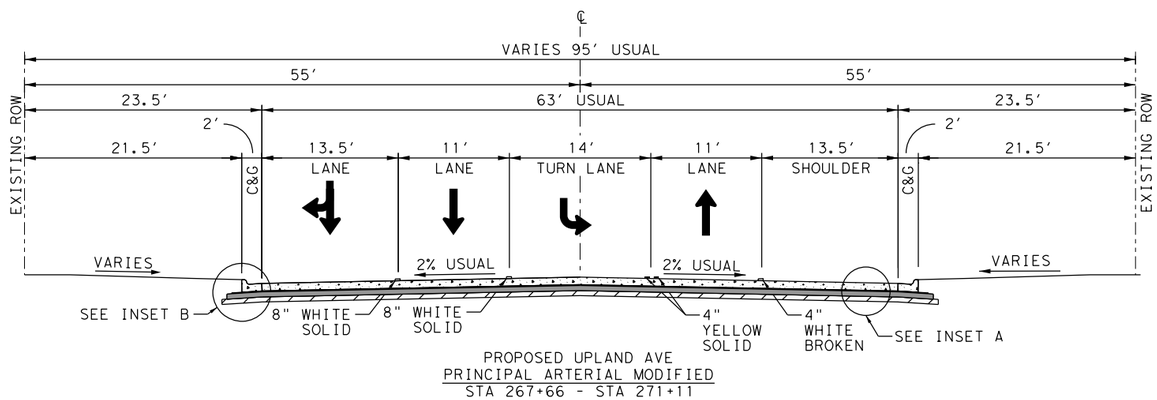
100% SUBMITTAL

NOT TO SCALE









STATE OF TEXAS
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Pedro Carrasco Jr. 8/9/2023

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FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TYPICAL SECTIONS

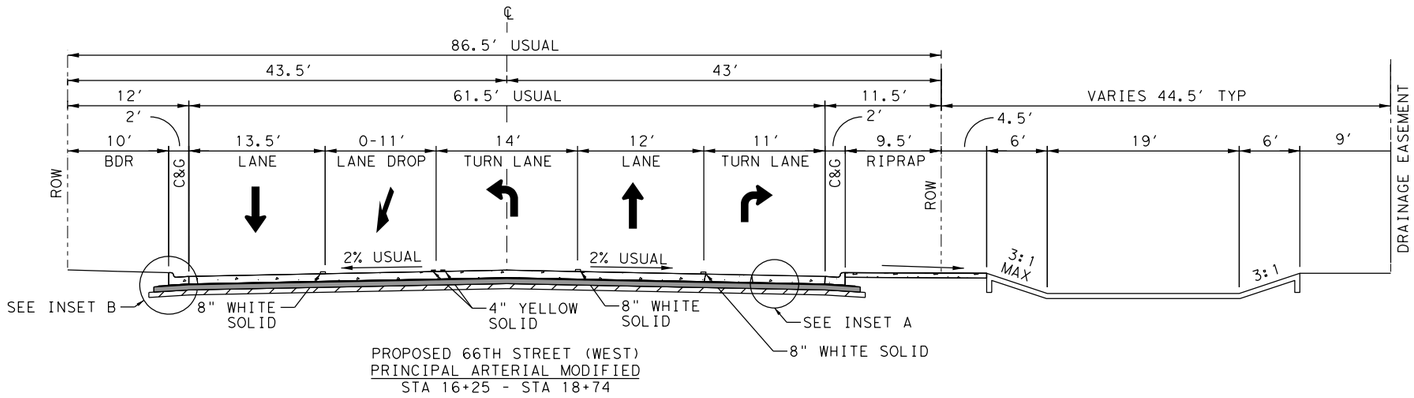
SHEET 3 OF 4

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

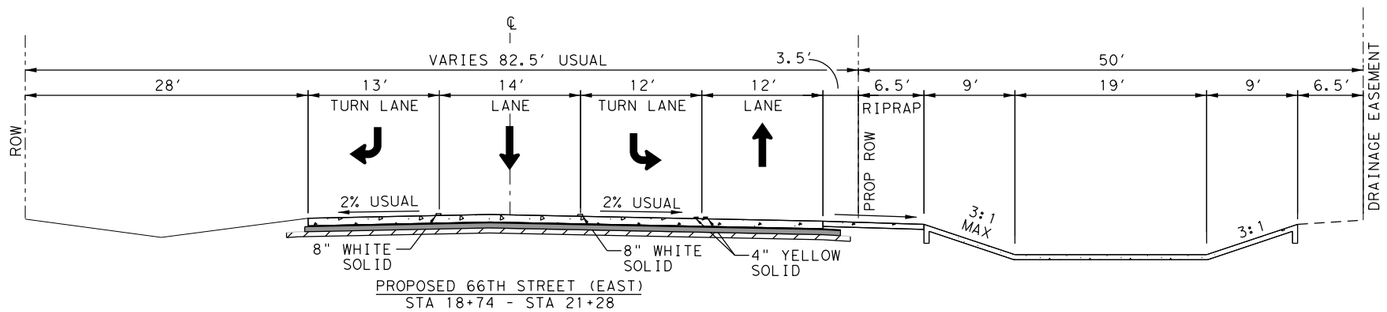
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	6
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

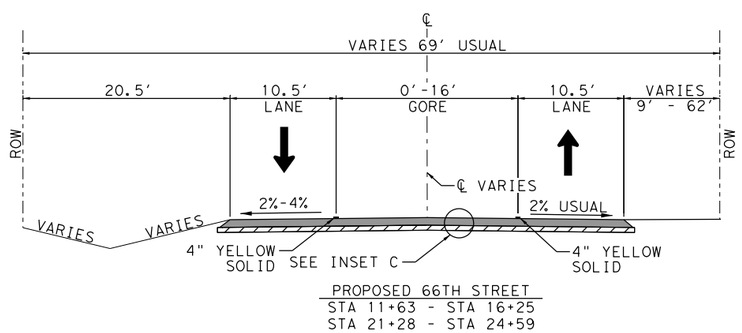
NOT TO SCALE



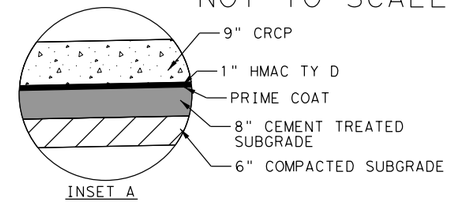
PROPOSED 66TH STREET (WEST)
PRINCIPAL ARTERIAL MODIFIED
STA 16+25 - STA 18+74



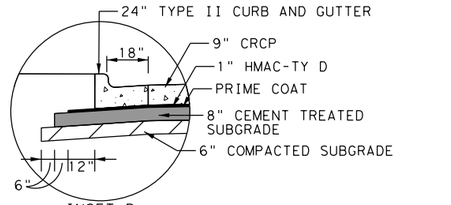
PROPOSED 66TH STREET (EAST)
STA 18+74 - STA 21+28



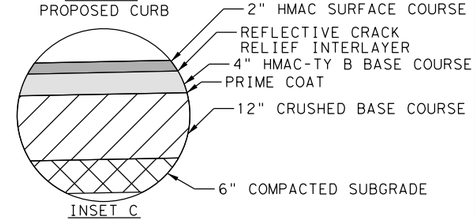
PROPOSED 66TH STREET
STA 11+63 - STA 16+25
STA 21+28 - STA 24+59



INSET A



INSET B
PROPOSED CURB



INSET C
ALTERNATE PAVEMENT OPTION

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 10/2/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TYPICAL SECTIONS

SHEET 4 OF 4

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	7
CONT.	SECT.	JOB	
0905	06	095, ETC.	

GENERAL NOTES:

Hot Mix Basis of Estimate

ITEM	DESCRIPTION	*RATE (approx.)
3076	1" D-GR HMA TY-D SAC-A PG76-28	115 LBS/SY
3077	4" SP MIXES SP-C SAC-A PG76-28	460 LBS/SY
3080	2" STONE-MTRX-ASPH SMA-D SAC-A PG76-28	236 LBS/SY

*Actual rates will be determined by Engineer in Field

Hot Mix Area (SY)

CSJ	MIX TYPE	PRIMARY	ALTERNATE
0905-06-095	1" D-GR HMA TY-D SAC-A PG76-28	47,026 SY	18,174 SY
0905-06-095	4" SP MIXES SP-C SAC-A PG76-28	7,726 SY	33,722 SY
0905-06-095	STONE-MTRX-ASPH SMA-D SAC-A PG76-28	7,534 SY	32,864 SY

Surface Treatment Basis of Estimate

DESCRIPTION	PRIME COAT	FIRST COURSE	FOG SEAL	TACK COAT
ASPH TYPE & GRADE	MC-30	AC-20-5TR	CSS-1H	trackless
ASPH RATE (GAL/SY)	0.20	0.42	0.14	0.14
AGGR TYPE		PB		
AGGR GRADE		4		
AGGR RATE (CY/SY)		1/85		

Surface Treatment Area (SY)

CSJ	PRIME COAT	1 COURSE SURF TREAT	FOG SEAL
0905-06-095	68,390	2,029	109,507

County: Lubbock **Control:** 0905-06-095, Etc.

Highway: CS (Upland Seg 1) **Sheet 8**

W.W.A.R.P

Provide coarse aggregate for all surface hotmix and overlays meeting a minimum class of **A** as published in the *AGGREGATE QUALITY MONITORING PROGRAM RATED SOURCE QUALITY CATALOGUE.*

Provide coarse aggregate for all base hotmix and surface treatments meeting a minimum class of **B** as published in the *AGGREGATE QUALITY MONITORING PROGRAM RATED SOURCE QUALITY CATALOGUE.*

General Requirements and Covenants - Items 1 thru 9

Contractor questions on this project are to be addressed to the following individual(s):
Joe Villalobos, Lubbock Area Engineer – Joe.Villalobos@txdot.gov (806) 748-4466
Michael Boyd, Lubbock Assistant Area Engineer – Michael.Boyd1@txdot.gov (806)748-4322

Contractor questions will be accepted through email, phone, and in person by the above individuals. Questions may also be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:
https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

All contractor questions will be reviewed by the Engineer. All questions and any corresponding responses that are generated will be posted through the same Letting Pre-Bid Q&A web page.

The Letting Pre-Bid Q&A web page for each project can be accessed by using the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

An ADA workshop is required for this project.

Item 1 – Abbreviations and Definitions

Contract Prosecution – Each contract awarded by the Department stands on its own and as such, is separate from other contracts. A contractor awarded multiple contracts, must be capable and sufficiently staffed to concurrently process any and all contracts at the same time.

Project Description – This project consists of performing pavement widening from two lanes to five lanes at Upland Ave in Lubbock County.

TxDOT Project Supervisor – The project will be managed by Joe Villalobos – (806) 748-4466, 135 Slaton Road Lubbock, Texas 79404.

Item 2 – Instructions to Bidders

The following standard(s) have been modified:

- TRANS-20(MOD)
- NBIS(MOD)-23

The construction time determination schedule will be posted on the Letting Pre-Bid Q&A web page.

Cross-sections will be posted on the Letting Pre-Bid Q&A web page.

View the plans on-line or download from the web at:
http://www.dot.state.tx.us/business/plansonline/agreement.htm
Choose "I Agree" then, "Click here", then "State-Let-Construction", pick the letting month, then "Plans" and then choose the plans set.

Order plans from any of the plan reproduction companies shown on the web at:
http://www.dot.state.tx.us/business/contractors_consultants/repro_companies.htm

By signing this proposal, a bidder acknowledges that he/she has a copy of the "Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges", adopted by the Texas Department of Transportation, November 1, 2014. This specification book may be purchased from the Department or downloaded at:
http://www.txdot.gov/business/resources/txdot-specifications.html

Utilities

Overhead and underground utility installations exist within the project limits.

Call One Call to mark the locations of all utilities. Call the City and TxDOT separately to have their respective utilities marked.

Item 5 – Control of the Work

Perform construction surveying in accordance with Article 5.9.3, "Method C."

When deviation from the plans is requested by the Contractor, but not required for installation, the Contractor will bear any additional costs associated with the deviation.

Alter the location of all ground boxes, foundations and structures shown on the plans only as approved by the Engineer in writing. Contact the Engineer prior to installing ground boxes, foundations and structures in order that the Inspector may verify and approve the location.

County: Lubbock **Control:** 0905-06-095, Etc.

Highway: CS (Upland Seg 1) **Sheet 8A**

Restore all disturbed areas due to trenching or any construction activity to a condition equivalent to the original condition within 14 working days from the time work began in the area including all necessary stabilization.

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.

At the end of each day remove from the ROW, inside or outside the project limits, any excess material and debris resulting from construction.

Correct any deficiencies identified during the final inspection including required paperwork.

Submit all required paperwork within 60 days of project acceptance.

All culverts, inlets, and low water crossings will be approved by the Engineer prior to installation.

Item 6 – Control of Materials

Use materials from pre-qualified producers. A list of material producers pre-qualified by the Construction Division (CST) of the Texas Department of Transportation (TxDOT) can be found at the following website:
http://www.txdot.gov/business/resources/producer-list.html

In addition to the requirements of the plans and specifications, make all material and equipment furnished, installed, modified, tested, or otherwise used on this contract, and becoming the property of TxDOT, fully functional within the manufacturer normal specifications, warranties, and guarantees. Make any additional functions of the material and equipment normally supplied by the manufacturer, but not specified by TxDOT, completely functional.

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit an original of the TxDOT Construction Material Buy America Certification Form for all items classified as construction materials. This form is not required for materials classified as a manufactured product.

Refer to the Buy America Material Classification Sheet for clarification on material categorization.

The Buy America Material Classification Sheet is located at the below link.
https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html
for clarification on material categorization.

Provide the State 30 days to test all materials and resolve any disputes.

Article 6.7

Contact the project supervisor to request department supplied material a minimum of one work day prior to pick up. Load material with contract personnel. Store material in a safe location off TxDOT property or Right of Way unless otherwise approved. Use material furnished by TxDOT only on the TxDOT project(s) intended. Return any unused material as soon as possible.

Article 6.11

Repair damage to the Right of Way to the satisfaction of the project supervisor.

Item 7 – Legal Relations and Responsibilities

Coordinate street closures with the local fire, police, and other emergency personnel.

Maintain access to adjacent property at all times.

Notify, in writing, each residence and business 10 days prior to beginning construction of the phase/phases that are expected to affect their ingress and egress. This notice may be hand delivered or mailed.

When applicable, comply with all requirements of the Environmental Permits Issues and Commitments (EPIC) sheets.

Provide a lidded dumpster to be used by Contractor's personnel on the job site. The lid or covering to the dumpsters needs to be able to stay closed in high winds for preventing trash from being blown out. This shall be considered subsidiary to the various bid items.

Dispose of all waste materials in compliance with local, state, and federal regulations. Submit a list of all approved waste sites to the Engineer for review.

All vehicles in the work zone shall use flashing amber strobe lights visible 360 degrees.

No significant traffic generator events identified.

This project will require a railroad agreement, flagging, insurance, and right-of-entry.

Item 8 - Prosecution and Progress

This project is to be complete in 304 days and 15 months of barricades in accordance with the contract documents.

Work must begin by 5/1/2024.

Monthly schedule updates are a very important aspect of managing the progress of this project. The Engineer may withhold the monthly estimate if the schedule update has not been received.

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Highway: CS (Upland Seg 1) **Sheet 8B**

A bar chart will be required on this project.

Do not begin work before sunrise or end work after sunset unless authorized by the Engineer, and remove all equipment from the roadway before sundown.

Perform any erosion control measures such as seeding or sodding before beginning the next phase, or land, unless otherwise authorized by the Engineer.

Working days will be computed and charged in accordance with Article 8.3.1.4 Standard Workweek.

Liquidated damages as defined in SP 000-1243 ($1,718) will be increased by the calculated road user cost of $1,763, for a total of $3,481 per day.

Shut down operations the working day before the following major traffic generating holidays: January 1st (New Year's); Last Monday in May (Memorial Day); July 4th (Independence Day); First Monday in September (Labor Day); Fourth Thursday in November (Thanksgiving); and December 24th (Christmas Eve).

If the season for SMA is past, time and work on the project will not be suspended until all other work is complete. When this work is complete, the Engineer will suspend time and work until SMA season begins.

The work zone shall not exceed 2 miles unless otherwise directed by the Engineer.

Payment for final 3% mobilization will be made once all project signage has been removed and all other items according to Article 500.3. Timeliness for submittal of required paperwork and correction of deficiencies is a consideration in developing the final contractor evaluation score.

Item 9 - Measurement and Payment

Submit material-on-hand payment requests by the monthly estimate cutoff date.

Material-on-hand will be paid item for item regardless of how the work was bid.

Item 100 - Preparing Right Of Way

Sprinkler systems shall be cut at the right-of-way line and restored to operating conditions using a licensed irrigator. Restoration is defined as notifying the adjacent property owner before capping the line to determine any adverse effect to the rest of sprinkler system. Payment for this work shall be considered subsidiary.

Item to be used for the preparation of areas to receive embankment, small tree removal less than 6" diameter, and any other removals not itemized.

Items 110 And 132 - Excavation and Embankment

Provide Type C Embankment conforming to the following material specifications:

Liquid Limit (maximum)	45
Plasticity Index (maximum)	25
Bar Linear Shrinkage (minimum)	2

Consider all embankment to be Earth Embankment in accordance with Article 132.3.1.

Proof roll, as directed by the Engineer.

Item 160 - Topsoil

Salvage and stockpile topsoil from areas designated for topsoil placement. Maximum salvage depth is 6-in.
Place a 4-in. layer of Topsoil to designated areas.

Item 164 - Seeding For Erosion Control

Notify the Engineer of scheduled seeding operations 24 hours prior to seeding applications. Do not begin seeding operations until the Engineer has approved seedbed preparations. Locate and flag all irrigation heads, valve covers, utility facility covers, etc. prior to commencing seed application operations.

Leave the seeded area lightly tracked in order to establish a better environment for seed germination.

Furnish seed tags from the seed supplier to the Engineer for verification of quantity and type.

Place cellulose fiber mulch (hydromulch) on all seeded areas.

Apply hydromulch from two opposite (180 degrees) directions to prevent “shadowing” and to provide an even coverage. Add tackifier to the slurry at a minimum of 3 percent of total volume as specified by the manufacturer, or as directed by the Engineer.

Do not disturb or drive on newly seeded areas. Repair any damage to the seeded areas to the satisfaction of the Engineer.

A Cultipak planter may be used in lieu of drill seeding.

Item 166 - Fertilizer

Provide and use a granular, commercial-grade, 15-5-10 analysis, "SCU" slow release fertilizer, applied at 660 lbs/acre.

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Apply fertilizer prior to seeding, or simultaneously with the seeding operation, but prior to the hydromulch application.

Item 168 - Vegetative Watering

Water newly seeded or sodded grass areas with a minimum of two-tenths (2/10) of an inch per day for 30 consecutive days and as directed.

Water from a tanked, spray-equipped vehicle capable of spraying water to all such areas without driving or trailering the vehicle on said areas.

Furnish and apply water containing less than 10,000 parts per million solids (as determined by evaporation).

Items 162, 164, 166, And 168

Furnish and place hay mulch or cellulose fiber mulch, seed, fertilizer, and vegetative watering on all cut and fill slopes as soon as each construction sequence will allow, but within 14 days of the end of the construction phase and prior to beginning a new construction phase. Leave the seeded area lightly tracked in order to provide the seed a better environment for germination.

Reseed at contractor’s expense if 70% growth hasn’t been attained in 2 months.

Item 216 – Proof Rolling

Provide a 25 ton roller, or other equipment approved by the Engineer for proof rolling.

Proof roll as directed.

Item 247 - Flexible Base

Provide Type A Grade 4 flexible base.

SPECIFICATION DATA

TEST TO BE IN ACCORDANCE WITH TEXAS DEPARTMENT OF TRANSPORTATION STANDARD TEST METHODS

FLEXIBLE BASE SPECIFICATION DATA

GRADING REQUIREMENTS PERCENT RETAINED – SIEVES SIEVE SIZES INCHES					**SOIL CONSTANTS**		**MAX WET BALL**	**MAX % INCREASE**	**MIN STRENGTH 15 PSI**
1 3/4	7/8	1/2	#4	#40	L.L. MAX	P.I. MAX			

0	10-30	30-55	50-75	70-90	40	15	45	20	175

The addition of field sand to reduce the plasticity index a maximum of three points below the original P.I. is permitted. Introduce field sand at the crusher on a feed belt prior to building the stockpile.

The addition of lime, or suitable material as approved by the Engineer, is permitted to reduce the plasticity index, if the mixture is mixed on the road or in a pugmill just prior to placement.

Proof roll as directed by the Engineer.

Provide the state at least 30 days to perform material testing on the flex base.

Item 251 - Reworking Base Courses

Before replacing salvaged material, construct and shape subgrade, using density control in accordance with Article 132.3.4.2.

A BOMAG or milling machine will not be allowed for scarifying existing material. Use rippers or other means to scarify.

Item 275 – Cement Treatment (Road-Mixed)

Use the target rate of *3%* percent by weight, based on an estimated unit weight of 125 pounds per cubic foot, unless otherwise directed by the Engineer. The actual rate to be used will be based on laboratory tests that yield a strength of 200 psi at unconfined lateral pressure unless otherwise directed by the Engineer.

Use a vane feeder system to distribute cement.

Cure treated base courses for a minimum of 72 hours before priming unless otherwise directed by the Engineer.

Asphalt material will not be permitted for curing.

Remove and replace areas that lose required moisture, stability or finish. Continue work until specification requirements are met and perform work at no additional expense to the Department.

Microcrack the treated base. This work is considered subsidiary.

Proof roll as directed by the Engineer.

A BOMAG or milling machine will not be allowed for initial scarifying of existing material. Use other means to scarify.

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Allow 30 days for testing of material.

Item 302 - Aggregates for Surface Treatments

Precoat aggregate with PG64-22 asphalt. Use Evotherm as the anti-stripping agent or an approved equivalent. The use of flux oil is not permitted.

Cure precoated aggregate a minimum of 72 hours before applying the aggregate to the roadway surface.

Aggregate will be subjected to five cycles of the magnesium sulfate soundness test in accordance with Test Method TEX-411-A. The loss shall not be greater than **20** percent.

The Contractor shall wet stockpiles to control dust as directed by the Engineer.

Allow 60 days for testing of material.

Item 310 - Prime Coat

Apply a prime coat to all finished treated base, new flexible and salvage base due to receive asphaltic concrete pavement or surface treatments. Remove all loose and scabbed material from the surface prior to prime coat application.

Allow the prime coat to penetrate and dry for a minimum of 72 hours before placing any asphaltic material on the primed surface, unless otherwise authorized by the Engineer.

Item 315 - Fog Seal

Apply the emulsified asphalt and water mixture, as directed by the Engineer.

Item 316 – Seal Coat

Do not place asphalt between September 1 and April 30, unless otherwise directed by the Engineer.

Remove all excess aggregate by brooming after sufficient curing has occurred but no later than the end of the day, as directed by the Engineer. Remove all excess aggregate from the project in curb and gutter sections, and other areas as directed by the Engineer.

Schedule the placement width for all asphalt surfaces in a manner such that all joints will coincide with proposed lane lines (+/- 6 inches).

Cover or protect any sealed expansion joints or rail on bridges and any railroad tracks encountered on this project, as directed by the Engineer. Clean any of these items not properly protected. This work will not be paid for directly but will be considered subsidiary to Item 316.

Leave signs and barricades in place until all brooming and the application of the center stripe is completed, unless otherwise directed by the Engineer.

Set a string line for all surface treatment operations, unless otherwise directed by the Engineer. Remove the string line daily.

Use medium pneumatic tire rollers, as directed by the Engineer.

Do not use flat wheel rollers.

Asphalt storage tanks may be used.

Place a one course surface treatment full width upon completion of the work to seal and dress up the areas where temporary pavement markings have been placed for traffic relocation during construction. Use aggregate, asphalt type and rates as directed.

Remove pavement markers.

Use asphalt spray bar end nozzles (T nozzles), or a deflector shield on both ends of the distributor spray bar.

Submit all invoices, bills of lading, and/or asphalt tickets in electronic format to the project inspector and Area Office's Records Keeper no later than 24 hours after receipt.

No more than 4-inch overlap will be allowed at all longitudinal joints.

Item 320 – Equipment for Asphalt Concrete Pavement

Provide waterproof tarpaulins on all hauling equipment.

Item 351 – Flexible Pavement Structure Repair

Saw cut at least two inches deep around the edges of concrete or asphaltic pavement to be removed, unless otherwise directed by the Engineer.

The type and grade of tack coat shall be AC or PG.

The type and grade of prime shall be MC-30.

A motor grader will be allowed only as directed by the Engineer.

Use a roadway structure of 3" Type B hotmix placed in one lift for surface repairs and 6" Type B hotmix placed in 2 lifts for full depth repairs.

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Highway: CS (Upland Seg 1) **Sheet 8E**

The minimum repair area shall be 10' wide by 20' long.

Schedule to cover any pavement repair areas with the surface layer within 2 weeks of repair.

The full pavement repair design constitutes the flexible pavement repair and the overlying pavement.

Item 354 – Planing and Texturing Pavement

Haul excess RAP to 8425 North Avenue P. Contractor shall coordinate with City of Lubbock Street Maintenance Supervisor by calling 806-775-2358.

Item 360 - Concrete Pavement

Multiple piece tie bars will be required.

Saw cut the perimeter of the concrete paving and seal with a class 5 or class 8 joint-sealant materials and fillers conforming to Item 438, "Cleaning and Sealing Joints."

Use Method B, as shown on JS-14, to seal joints.

CRCP will be designed using the Optimized Aggregate Gradation (OAG) procedure, in accordance with Tex-470-A.

Design the CRCP with a minimum of 10% - 35% fly ash.

A pre-paving meeting will be required.

Submit a paving plan detailing the location of joints and the sequence of paving to the Engineer a minimum of seven days before paving begins.

Use number 6 reinforcing bars.

The Engineer reserves the right to require fibrillated fibers in the mixture to mitigate dry shrinkage cracking. Dosage rate will be 5 lbs/CY. Payment will be subsidiary.

Concrete paving adjacent to existing Concrete Paving will require a neat saw cut edge and dowelling as per Item 361. This work will be considered subsidiary to Item 360.

The pay limits for concrete paving will not include curb and gutter sections, even when the curb and gutter is placed monolithically with the concrete paving. For measurement and payment purposes, curb and gutter sections are considered 24 inches wide.

Cold weather protection requirements within 72 hours of a concrete paving pour as per the following table:

PROJECTED LOW TEMP	PROTECTION REQUIRED
< 20 degrees	DO NOT POUR
20-27 degrees	cover with plastic, then a insulating blanket, and plastic on top
28-35 degrees	cover with plastic, then a insulating blanket
> 35 degrees	no protection required

All projected temperatures will be based on the NOAA website. None of the above actions releases the Contractor from the responsibility for freeze damaged concrete for whatever reason.

Stockpiling of earthen or rock materials on concrete paving will not be permitted.

Hotmix must be removed to within 6” of edge of concrete paving prior to placement of topsoil. This work shall be subsidiary.

Unless otherwise directed, use coarse aggregate to produce concrete, with a coefficient of thermal expansion (COTE) less than or equal to 5.5 microstrain/degree F when tested in accordance with Tex-428-A. Provide samples or test specimens as directed and allow 30 days for testing. TxDOT will perform the testing and test results are final. Testing is required for naturally occurring aggregates.

Place the evaporation retarder right after the finish float and before the curing compound.

Schedule the placement width in a manner such that all joints will coincide with proposed lane lines (+/- 6 inches).

Concrete test specimens will be cured under the same conditions as the pavement. Make 3 sets of cylinders. Cylinders will not be moved for 3 days and will not be stripped until out of their molds until testing.

The Engineer will perform all concrete job control testing.

Cure the transition slab with SS-1 emulsion. This is considered subsidiary.

Saw the contraction joints within 12 hours of concrete placement.

Provide good consolidation at the construction joints.

Item 400 - Excavation and Backfill for Structures

Furnish crushed caliche or sand and gravel as aggregate for cement stabilized backfill.

Deliver the cement stabilized backfill in a mixer truck in a flowable state and capable of filling all the voids.

Construct fill over structures to plan grade before hauling with heavy equipment over structures.

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Highway: CS (Upland Seg 1) **Sheet 8F**

Compact backfill used for structures, other than flowable backfill, to a minimum density of 95 percent.

Use a template in order to secure reasonably accurate Class C shaping of the foundation material outside of cement stabilized areas.

Contact the utility company and properly secure the utility poles prior to excavating next to the utility poles. The work and material used to secure the utility poles are subsidiary to the pertinent items.

Item 402 - Trench Excavation Protection

Maintain trench protection to protect State inspectors and Contractors during testing operations.

Excavation to install trench protection and backfill needed to replace excavated material for the protection shall be considered subsidiary to this item.

Item 403 – Temporary Special Shoring

The intent of this item is to provide a coffer dam for structures in playa lakes so the water may be pumped out and work resumed after a rain event.

Item 416 – Drilled Shaft Foundations

For large diameter drilled shafts, when water is encountered during drilling and slurry is not used, the shaft needs to be re-worked the next day to achieve proper skin friction capacity.

Item 420 - Concrete Substructures

Furnish and place preformed fiber material, a minimum one-half (1/2)-inch thick, as shown on the plans or directed by the Engineer.

Furnish a temperature recorder with the minimum capabilities of a 7-day recording time, 2 degree F division, and 120 VAC with 9-volt backup, for each curing tank used on the project. Supply all charts, recording pins, and other equipment necessary for complete operation of the temperature recorder during the project. The temperature recorder and all associated equipment will not be paid directly, but will be subsidiary to the various bid items.

Use Grade 3 or Grade 4 coarse aggregate in all concrete structures.

Cold weather protection requirements within 72 hours of a concrete pour as per the following table:

PROJECTED LOW TEMP	PROTECTION REQUIRED

< 20 degrees	DO NOT POUR
20-27 degrees	cover with plastic, then a insulating blanket, and plastic on top
28-35 degrees	cover with plastic, then a insulating blanket
> 35 degrees	no protection required

All projected temperatures will be based on the NOAA website. None of the above actions releases the Contractor from the responsibility for freeze damaged concrete for whatever reason.

Coring of structural classes of concrete will not be allowed. All coring of miscellaneous concrete shall be at the Contractor's expense including all prep work. Coring must be completed within 3 days of notice of failing 28-day samples; otherwise pay deductions apply using 28-day compressive strength.

Provide TY II curing compound for all curb and gutter, sidewalks, driveways, curb ramps, riprap, and cast-in-place SET's.

When doweling into concrete, clean out the hole, fill completely with epoxy, then place the dowel. Do not dip the dowel into epoxy first and shove it into the hole.

Do not place concrete when the wind gusts get to over 25 miles per hour.

Install the NBI number on bridges per the NBIS standard.

Place the evaporation retarder right after the finish float and before the curing compound.

Vibrate all concrete.

Item 421 - Hydraulic Cement Concrete

If fly ash is used, a maximum of 35% will be allowed.

Provide air entrainment in all concrete except for concrete used in drilled shafts and precast concrete members. Target an entrained air content of 4.0% +/- 1% for concrete pavement and 5.5% +/- 1% for all other concrete requiring air entrainment. Ensure the minimum entrained air content is at least 3.0% for all classes of concrete.

Air entrainment chemicals will not be allowed on-site.

The Engineer will perform all concrete job control testing.

The sulfate soundness of coarse aggregate used in drilled shaft concrete shall not exceed 18 percent.

Supply 2 – 4' x 8' sheets from a material that is flat, rigid, and non-absorbant, in order to perform required testing procedures at the location of concrete placements.

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Highway: CS (Upland Seg 1) **Sheet 8G**

Use 4-inch by 8-inch cylinder molds for concrete with Grade 3 or smaller coarse aggregate. Supply new cylinder molds and lids subsidiary to the various bid items.

Concrete plant must be capable of providing automated moisture content control for both coarse and fine aggregate.

Item 427 - Surface Finishes For Concrete

Provide surface area I concrete surfaces with a rub finish as soon as forms are removed.

Item 432 - Riprap

Provide 5-inch thick concrete riprap, unless otherwise indicated in the plans.

Reinforce with steel reinforcing using either #3 bars on 12"x12" spacing or #4 bars on 18"x18" spacing centered in the slab. Fiber reinforcement or welded wire will not be allowed.

In large areas of riprap, provide one-half (1/2)-inch thick expansion joint material at approximately 15-foot intervals, or as determined by the Engineer.

Place asphalt expansion joint material between proposed riprap and utility poles, guy wires, vent pipes, stand pipes and as directed.

Place felt or filter fabric at open joints as required by the Engineer. This will be considered subsidiary.

Follow cold weather protection requirements listed under Item 420.

Seal between concrete boundaries.

Item 464 - Reinforced Concrete Pipe

Join all concrete culvert pipe with a cold-applied plastic asphalt sewer joint compound.

Item 467 - Safety End Treatment

Install reinforced concrete aprons on all Type I SET, using reinforcing composed of #4 bars at 12-inch spacings, center-to-center, or as shown on the detail sheet.

Install riprap around all precast SETs. The riprap shall be Class B and reinforced in accordance with Item 432.3.1. Precast riprap will not be allowed.

Item 496 - Removing Structures

Dispose of removed structures.

Item 502 - Barricades, Signs And Traffic Handling

Prior to beginning construction, the Engineer shall approve the routing of traffic and sequence of work.

Additional signs and barricades as directed by the Engineer shall be considered subsidiary to Item 502.

Provide flashing portable arrow panels for all lane closures.

Wash the channelizing devices and barricades following each rainfall or snowfall event and at times deemed necessary by the Engineer.

To ensure the safety and convenience of traffic, flaggers may be required when construction machinery is being operated along, across, or adjacent to lanes carrying traffic. If considered necessary by the Engineer, supplemental signs and barricades may be required.

Fill any holes left by barricade or sign supports and restore the area to its original condition.

Barricades, Signs and Traffic Handling is a plan quantity item. If time is suspended, no additional compensation will be made.

Traffic switches will not be permitted on Fridays or any working day preceding a holiday unless authorized by the Engineer.

Cones or chevrons may be used in lieu of vertical panels at the discretion of the Engineer. Cones cannot be used to separate opposing traffic.

Construct temporary ramps to maintain access to driveways and city streets as directed by the Engineer. Temporary ramp construction is subsidiary to Item 502.

The Contractor shall bid the traffic control plan shown in the plans. Any proposed alterations to the TCP (combining work areas / phasing / etc.) shall be submitted to the Engineer at least 10 days prior to anticipated changes.

Even when not explicitly shown in the project TCP, vertical panels shall be used with an opposing lane divider every 5th panel in accordance with BC(9) for all opposing traffic conditions without a positive barrier.

Square tubing sign supports may be used for temporary construction signs. Aluminum and wood signs may be mounted if the vertical supports are embedded into the ground. Square tubing supports on skids which are typically held in place with sand bags can only support signs made of light weight flutted plastic.

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Highway: CS (Upland Seg 1) **Sheet 8H**

Any trench or drop off over 2” and less than 10” will require a safety slope of at least 1:1 if drop off is going to be existing for more than 2 nights. For drop-offs greater than 10”, a safety slope will be required at the end of operations for that day. This safety slope may be constructed with RAP, embankment, or other material approved by the Engineer. The placement, maintenance, and removal of this safety slope is the responsibility of the Contractor and will be considered subsidiary to the various bid items.

Provide an all-weather surface for all sections of the roadway prior to time suspension as directed by the Engineer. The all-weather surface shall be the original undisturbed asphalt pavement or a one course surface treatment on the constructed roadbed as shown in the typical sections.

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

Correct all noted deficiencies within 7 calendar days, otherwise, cease all operations until the noted deficiencies are corrected.

Stockpiles that meet the barricade requirements as shown on the BC(10) Standard are required to be erected at the time of material delivery in the Right-of-Way and maintained as long as the stockpile exists. Payment for Material-on-Hand will be withheld from the estimate for inadequate barricades or the failure to maintain barricades on a per stockpile basis as determined by the Engineer.

Like new traffic control devices will be required at the initial setup for all projects or as approved by the Engineer.

Provide flags and a CW8-15P “MOTORCYCLE WARNING” plaque on all CW20-1D “ROAD WORK AHEAD” signs except on side roads.

Use only the work zone speed limit and TCP signs that are relevant to the active work area and as directed. Reset signs for subsequent work phases as work progresses and approved by the Engineer. Reset normal speed limit signs at the ends of work zones.

Stop adjacent traffic using TCP(1-2) during the application of asphalts unless otherwise authorized by the Engineer.

Provide pilot cars as directed by the Engineer.

"No Passing" and "Pass With Care" signs shall be erected at the beginning and the end of each no passing zone until the permanent markings are in place.

All bid items and work requiring traffic control is the responsibility of the contractor, even when not explicitly detailed in the plans. Consider this work subsidiary to Item 502.

TMAs and Portable Changeable Message Boards will not be used as Arrow Boards.

Ground mount all signs if possible.

Barrels may be substituted for water filled barrier at the discretion of the Engineer.

Any necessary detour signage shall be in place before work can begin.

When the roadway is open to traffic and final striping is completed, any subsequent work shall be done under daytime traffic control.

The contractor is to respond on-site within 30 minutes to any traffic control maintenance after wind events, storms, etc., and as directed by the Engineer.

This project is for daytime work only. If you elect to work at night, all expenses for night work will not be compensated for.

Item 504 - Facilities for Field Office and Laboratory

Furnish one Type D structure and one Type B structure. Field offices and laboratory shall be located adjacent to the project site.

The Contractor will furnish a concrete cylinder breaker and cylinder bath, subsidiary to the furnished field laboratory. Provide calibration documentation for all supplied equipment.

Partition the floor of the Type D structure into a minimum of three interconnected rooms. Furnish each room with a door. Type D structure must have at least two windows and two exterior doors. Block and tie down portable structures.

Equip the Type D field lab with an eyewash facility capable of flushing the eyes for at least 15 minutes, connected to the main water supply or an approved stand-alone water supply.

Encompass the field office only with a fence enclosure providing a minimum 6.5-foot clearance around the perimeter of the field office.

Provide internet connectivity, a printer/fax/scanner/copier, and telephone service to field offices, including installation, monthly charges and the phones.

Equip all field offices and field labs with a surge protector at the circuit breaker panel.

County: Lubbock **Control:** 0905-06-095, Etc.

Highway: CS (Upland Seg 1) **Sheet 8I**

Item 506 - Temporary Erosion, Sedimentation, and Environmental Controls

Place a weatherproof bulletin board containing the TCEQ required information on the project at a site directed by the Engineer. Post the following documents: (1) "TCEQ TPDES Storm Water Program" Construction Site Notice and (2) TCEQ "TPDES Permit." Place rain gauge(s) at locations designated by the Engineer. At the completion of the contract, the bulletin board will become the property of the State and will remain in place until 70 percent vegetation coverage has been obtained.

Provide long-term, Type 1 construction exits, located at the Contractor's equipment storage area.

Silt fence, sandbags and other BMPs will be placed and relocated as directed by the Engineer in order to comply fully with the SW3P requirements.

The soil area disturbed by this project, including all disturbed areas within the limits of this project as described in the Contract and at Contractor project specific locations (PSLs) within one mile of the project limits, contributes to the establishment of the Texas Commission on Environmental Quality (TCEQ) Construction General Permit (CGP) requirements for storm water discharges. The Department will obtain an authorization from the TCEQ to discharge storm water for construction activities shown on the plans. The Contractor shall obtain the required authorization from the TCEQ for Contractor project specific locations (PSLs) for construction support activities off the right-of-way. As directed by the Engineer, the Contractor shall obtain any required authorization from the TCEQ for on-site PSLs. When the total area disturbed within the project limits and at PSLs within one mile of the project limits exceeds five acres, the Contractor shall provide a copy of the Contractor's Notice of Intent (NOI) submission and Construction General Permit for PSLs on the right-of-way to the Engineer (and submit a copy of NOIs to appropriate MS4 operators).

Water pumped off the project must have sediment and any other solids in suspension removed before discharging.

Sediments removed from BMPs shall be paid for by force account. The Contractor shall submit an invoice for the work.

Correct all noted deficiencies within 7 calendar days, otherwise, cease all operations until the noted deficiencies are corrected.

Maintain 100 feet of silt fence, 100 feet of erosion control logs, and 50 sandbags on site at all times for repairs/replacement as needed.

Water for dust control at least twice a day for all areas that are disturbed but not stabilized.

Set SWP3 measures by phase.

Item 508 - Constructing Detours

Provide detour sections consisting of six inches of Type B hot mix on primed prepared subgrade to lines and grades directed by the Engineer.

Any drainage pipe or SETs required for detours is subsidiary to this Item. The minimum pipe size is 18 inches.

Item 529 - Concrete Curb, Gutter and Combined Curb and Gutter

Place one-half (1/2)-inch pre-molded expansion joint material at 40-foot intervals and at the beginning and end of all radii. Place 3/25-inch grooved or sawed construction joints, as directed by the Engineer, spaced equally, with the spacing not to exceed ten feet between joints.

Monolithic curb will not be allowed.

All concrete curb and gutter shall be reinforced with four #4 bars.

The lip of gutter and back of curb shall be formed. The existing pavement edge shall not be used as the form.

Mortar will not be used to finish curb and gutter.

The joint between the lip of gutter and HMAC shall be sealed.

Item 530 – Intersections, Driveways, and Turnouts

Use Class A Concrete for all concrete driveways.

Reinforce concrete driveways with # 4 bars on 12”x12” grid spacing centered in the slab depth.

Item 531 - Sidewalks

Construct concrete sidewalks at least four inches thick, reinforced with # 3 bars on 18”x18” grid spacing centered in the slab depth. The locations and details shown on the plans may be field modified by the Engineer.

In areas where there is no curb fillet or concrete pavement, saw cut the existing curb and gutter and remove the curb.

Construct curb ramps in conformance with details shown on the plans. The accessibility of the curb ramps shall be according to the "Americans with Disabilities Act (ADA)."

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When lack of right of way width or obstructions creates insufficient space, the ramp may be relocated within the right of way when authorized by the Engineer. All deficient ramps will be removed and replaced at the Contractor's expense.

Form tooled joints on each side of the four-foot wide ramp section, and at each break in ramp slope or geometry, and at four-foot intervals as if it were sidewalk. Place asphalt expansion joint material between proposed ramps and existing concrete.

Form tooled joints in sidewalk at 6’ intervals or as directed.

Place asphalt expansion joint material every 40 ft and between proposed sidewalk and utility poles, guide wires, vent pipes, stand pipes and as directed.

All curbs on curb ramps will not be paid for directly but are considered subsidiary to the various bid items.

Notify the Engineer 48 hours in advance of beginning operations at a new location.

Schedule work such that two-way traffic is provided through all intersections and intersecting streets at all times, unless otherwise authorized by the Engineer.

Complete construction at curb ramp locations within ten working days. This includes concrete removal, concrete placement, backfilling, surface preparation for pavement markings, prefabricated pavement markings, and repair of existing pavement. Failure to finish within ten working days will result in restricting the number of ramp locations that may be under construction at any given time.

Chicago-brick-red truncated dome brick pavers or an approved equivalent are required for all curb ramps.

Removal and disposal of existing asphaltic concrete is considered subsidiary to this item.

Follow cold weather protection requirements listed under Item 420.

Item 560 - Mailbox Assemblies

Move and replace all mailboxes within the project limits such that they may be served by the mail carrier from his car at all times during and after construction. This work will be considered subsidiary to the various bid items of this contract.

Final placement shall include new metal mailboxes of similar size to the original mailbox, unless the property owner wants to retain their old mailbox.

Item 585 - Ride Quality for Pavement Surfaces

Use Surface Test Type B on the SP-C and SMA. Use Surface Test Type A on the CRCP and the hotmix under the concrete paving.

"Pay Adjustment Schedule" number 2 will be used on this project.

Corrective action, when required, shall be diamond grinding, as approved and directed by the Engineer. Seal all concrete surfaces after grinding with lindseed oil or as directed. This work is considered subsidiary.

Item 610 – Roadway Illumination Assemblies

For project specific shop drawings, furnish seven sets of drawings of the complete assembly in accordance with Item 441, "Steel Structures". Deliver shop drawings to the Engineer at the project address.

Provide a schedule and notify the District Traffic Office a minimum of 3 days prior to any illumination installation. Contact via email at LBB-TRFOPS@TxDOT.GOV.

Item 618 - Conduit

The location of conduit is diagrammatic and may be varied to meet local conditions upon approval of the Engineer. Ensure all couplings and connectors are made wrench tight. Trenching depths shall provide a minimum of 2.5 feet (30 inches) of cover unless otherwise approved by the Engineer. The Contractor must ensure that conduit is not damaged during trench or bore pit backfilling operations. No conductors shall be pulled through conduit until all backfilling for the conduit run is complete and the template, having a diameter of not less than 75 percent of the inside diameter of the conduit, has been drawn through the conduit. Open ends of all conduit shall be fitted with temporary caps or plugs to prevent entry of dirt or debris during construction operations. A non-metallic pull rope shall be used to pull electrical conductors and traffic signal cables through non-metallic conduit. A flat, high tensile strength polyester fiber pull rope shall be pulled through each conduit run and shall remain in the conduit for future use. A minimum of three feet of pull rope shall be neatly left coiled in the ground boxes at each end of the conduit run. The pull rope will not be paid for directly but shall be considered subsidiary to Item 618, "Conduit." After the work is completed, the Contractor shall restore any curbs, walks, driveways or raised concrete medians which have been damaged or disturbed to an equivalent original condition and to the satisfaction of the Engineer. This work shall not be paid for directly but shall be considered subsidiary to Item 618, "Conduit."

Use Schedule 80 PVC conduit for all traffic and illumination portion of this project. Bored conduit runs placed under driveways and streets or highway approaches shall maintain a minimum of 30 inches below the proposed natural ground elevation or 36 inches below the existing driveway or proposed top of pavement backfill and compact trenches the same day or erect plastic fencing to discourage entry into the trenched area by pedestrians or vehicles.

Item 620 – Electrical Conductors

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Grounding conductors that share the same conduit, junction box, ground box or structure shall be bonded together at every accessible point in accordance with the electrical detail sheets (ED), and the latest edition of the National Electrical Code.

Use certified persons to perform electrical work. See Item 7 Section 18.1.3 "Electrical Requirements" for additional details.

Item 628 - Electrical Services

Secure a permit for electrical service from Lubbock Power and Light (LP&L). Coordinate with LP&L during the first three weeks of the project lead-time period allowing adequate time for any necessary utility adjustments, transformer installation, etc. All necessary expense for power service connection shall be considered subsidiary to Item 628 "Electrical Services".

The STATE will be responsible for energy consumed and monthly telephone charges occurred by the new electrical service locations. These charges should be billed to the Texas Department of Transportation, 135 Slaton Highway, Lubbock, TX 79404-5201.

Silk screening or other acceptable methods are to be used to label the service enclosures indicating that the power provided is for the ITS System. Labeling service enclosures will be considered subsidiary to the bid Item 628: Electrical Services and will not be paid for directly.

Provide circuit breaker and install when additional circuit from existing electrical service is called for in the plans.

Concrete for service pole foundations, when required, will be Class C and will be in accordance with Item 421: Hydraulic Cement Concrete, except that concrete will not be paid for directly but is to be considered subsidiary to Item 628: Electrical Services. Reinforcing steel for service pole foundations, when required, will be in accordance with Item 440: Reinforcing Steel, except that reinforcing steel will not paid for directly but is to be considered subsidiary to Item 628: Electrical Services.

If you disconnect any lights or signals that are not directly part of the project to do work for the project, then reconnect everything back to proper working order.

Item 644 - Small Roadside Sign Assemblies

All signs on this project, new or relocated, will require a retroreflective wrap on the sign support. This wrap shall be 12 inches in height, visible in all directions and shall be placed 3 ft. below the bottom of the sign. The color for YIELD, STOP, WRONG WAY, and DO NOT ENTER signs shall be red. The color for all other signs shall be yellow. This retroreflective wrap will not be paid for directly but considered subsidiary to Item 644.

Stake all sign locations, and receive approval from the Engineer, prior to sign placement.

The triangular slip bases will be the two bolt clamp type (Southern Plains Fabrication or equivalent). For more information refer to the approved materials producers list: http://www.txdot.gov/business/resources/producer-list.html

Perform the following work subsidiary to Items 644.
For all signs designated for removal:

- Salvage aluminum signs,
- Palletize and band salvaged aluminum signs,
- Stockpile signs at the following location as directed by the Engineer.

Contact Person: Will Cummings, P.E (806) 775-2136
Address: 1314 Ave K Lubbock, Texas 79424

Item 656 - Foundations for Traffic Control Devices

Do not extend traffic signal pole foundations more than two inches above natural ground, medians or other surfaces surrounding the drilled shaft unless approval is obtained from the Engineer.

Use Class "C" concrete for traffic signal pole foundations.

Locate the bases for signal poles a minimum of 4 feet from the face of vertical curbs.

All existing and proposed wheelchair ramps, curbs and sidewalks are shown on the plans. If any repairs to these items should be needed after drilling foundations, installing pull boxes, conduit or loop detectors, the repairs shall be made by the Contractor as directed by the Engineer and shall be considered subsidiary to Item 656.

Drill shafts for roadway illumination assemblies located on the concrete traffic barrier will be required and are subsidiary to Item 514.

Item 662 - Work Zone Pavement Markings

Use short-term removable striping as directed by the Engineer.

Water base paint may be used for all non-removable striping if authorized by the Engineer.

The deviation rate in alignment shall not exceed one inch per 200 feet of roadway. The maximum deviation shall not exceed 2 inches nor shall any deviation be abrupt. Striping not in conformance shall be removed and replaced at the Contractor's expense.

All removable work zone pavement markings placed on CRCP shall consist of ceramic buttons and RPMs as shown on standard sheet BC(11). These shall be applied with a thermoplastic adhesive, unless otherwise directed by the Engineer.

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No guide markers will be placed on a finished surface unless they fall on a proposed lane line. Stick-down markings will be removed by the Contractor prior to final marking.

Do not place guide markers on a finished surface unless they fall on a proposed lane line. Remove Stick-down markings prior to final marking. Remove tabs at the same time as the RPM placement.

Type I markings must be at least one twenty-fifth (1/25) of an inch thick.

Remove ceramic buttons, RPMs, and Adhesives as directed by the Engineer. Payment for this work is subsidiary to Item 662.

Use thermoplastic adhesive to glue down work zone buttons and RPMs. Bituminous adhesive will not be allowed.

Dispose of the backing from tabs in an appropriate manner.

Any roadway opened to traffic shall be striped within 14 days.

Item 668 - Prefabricated Pavement Markings

Reference the "Standard Highway Sign Designs for Texas" manual for dimensions to words and symbols.

Manufacturer's sealer is subsidiary to this item. Surface preparation will be paid for separately under Item 678.

Item 677 - Eliminating Existing Pavement Markings and Markers

Eliminate existing pavement markings on asphalt surfaces by the Burn, Blasting, or Mechanical Methods at the project limits that get the work zone seal coat and as directed. Otherwise, use the Surface Treatment Method.

Eliminate existing pavement markings on concrete surfaces by the Water Blasting Method.

Payment for covering a solid yellow line with a broken yellow line next to it, parallel to the centerline of the highway, will be by the linear foot. This payment will be made only once for two stripes side-by-side.

Item 678 - Pavement Surface Preparation for Markings

Use water blasting for concrete surfaces.

Item 680 - Highway Traffic Signals

The city shall furnish all necessary controller cabinets, controllers, conflict monitors, and loop detector amplifiers. The city shall establish signal timing and phasing.

A representative of the City Traffic Engineer from the City of Lubbock shall be present when the signals are to be placed in operation. The Contractor shall notify the City a minimum of one week in advance to coordinate this work.

The signal installation will consist of the following principal items:

1) Installing signal poles, signal heads, optical detectors, multi-conductor signal cable, pull boxes, conduit, loop detectors, and signal controller.
2) Furnishing and placing all concrete for the signal pole foundations, pull boxes, and controller pad.
3) Furnishing and installing miscellaneous items essential for complete signal installation.

The City of Lubbock shall furnish and wire the controllers and establish signal timing and phasing.

The City of Lubbock shall furnish all street name signs.

Turn all non-operational signal heads down facing the roadway surface, or completely cover the lenses with an opaque material. The location of signal poles, conduit, ground boxes and controllers may be adjusted to accommodate existing utilities or local conditions with prior approval of the Engineer. Verify the location of all existing utilities in the field prior to construction. Provide a technician on call in the city at all times during the required 30-day test period.

Item 682 - Vehicle and Pedestrian Signal Heads

Provide pedestrian signal indications using symbol type and astro bracket mounted with CGB or galvanized pipe nipple.

Provide aluminum vehicle and pedestrian signal heads for this project. Furnish ABS formed black plastic back-plates with the vehicle signal heads. Attach back-plates to the vehicle signal heads and with a minimum of ½ inch of material from the edge of mounting holes to the near edge of the back plate. Furnish aluminum visors for vehicle signal heads.

Mount the signal head for horizontally mounted vehicle signal heads, at least 18 feet but no more than 20 feet, above the pavement grade measured from the center of the roadway to the bottom of the signal head.

Item 686 - Traffic Signal Pole Assemblies (Steel)

Use bracket assembly Option C of the SMA-100 and DMA-100 Standard Sheets for signal head mounting for both horizontal and vertical mount signal heads. Check foundation elevations to assure compliance with mounting height requirements.

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Attach dampening devices to mast arms 36 feet in length and longer. Dampening will not be paid for directly, but will be considered subsidiary to Item 686 – "Traffic Signal Pole Assemblies".

Internally wire signal cable for the vehicular signal heads without drip loops. Thread the hole in the mast arm shaft leading into the astro-bracket mount for a CGB connector or a galvanized pipe nipple. Furnish and install CGB connectors or galvanized pipe nipples. The materials and work necessary will not be paid for separately but will be considered subsidiary to Item 686 – "Traffic Signal Pole Assemblies".

Item 688 – Pedestrian Detectors and Vehicle Loop Detectors

Provide push buttons for pedestrian actuation meeting current ADA requirements.

City of Lubbock to furnish Accessible Pedestrian Signals (APS) meeting current ADA requirements under the force account to TxDOT. Contractor to install in accordance to the manufacturer's recommendations.

Item 730 - Roadside Mowing

Mow full-width from pavement edge to Right-of-Way line 2 times. The Engineer shall dictate the times to mow and the areas in the project to mow.

Each mowing cycle is for the entire project. (approx. 2 acres)

Notify the Engineer by 9:00 am each day for work completed the previous day, including hand trimming and cleanup. The Engineer will then inspect the section(s) of roadway for acceptance, not more than two (2) working days after notification.

Item 734 – Litter Removal

Perform litter removal prior to mowing and as directed by the Engineer.

Items 666, 668 & 6038 – Pavement Markings

Reference the existing striping in order to stripe the roadway as it was prior to sealing.

Mark the location of standard pavement markings, including barrier lines, no passing zones, gores, and transitions adjusting to meet latest standards or as directed by the Engineer.

For seal coated surfaces, leave the final course in place for three days and broom the roadway directly ahead of the striping machine prior to placing standard pavement markings.

After completion of all work and removal of the barricades, time charges will be suspended. The performance period for the project will not begin until all the striping has been completed. Final

acceptance will not be granted until the performance period for pavement markings is complete. If replacement markings are needed, traffic control for moving operations will be required. No payment will be made for traffic control during replacement striping work. All traffic control work shall be considered subsidiary to the project's replacement striping work.

The yellow or white long-line striping for re-striping operations will not lag one another by more than four (4) working days. The performance period for a roadway will not begin for a section of roadway or a project until all required striping for that section or project has been completed.

Provide a schedule and notify the District Traffic Office a minimum of 3 days prior to any striping operation. Contact via email at LBB-TRFOPS@TxDOT.GOV. If not notified, the time frame for testing and meeting the Retroreflectivity requirements in article 4.4 will start the day the department is made aware of that the markings have been applied.

Item 3032 – Reinforced Paving Mat for Asphalt Pavement Overlays

Provide a letter from the manufacturer that authorizes the installer to install the product.

Submerge a 2 in x 2 in of sample in D-Limonene or other approved solvent for 60 minutes. The result is passing if the solvent remains clear.

Don't install more reinforcing fabric that can't be covered that same day.

Provide PG76-28 binder at a rate of 0.15 gal/sy.

Items 3076, 3077, and 3080 – Hot Mix Asphalt Pavement

PG 76-28 asphalt is required for this project.

Provide a summary spreadsheet for each lot in accordance with Article 520.2 of the Standard Specifications.

Provide emulsified trackless asphalt for tack coat at a rate of 0.10-0.14 gal/sy.

The Contractor will be required to tack 100% of the surfaces prior to the subsequent lift including all vertical joints.

Design the mixture with a Superpave Gyratory Compactor (SGC).

Aggregate will be subjected to five cycles of the magnesium sulfate soundness test in accordance with Test Method TEX-411-A. The loss shall not be greater than **20** percent.

The mix will be evaluated for stripping through the boil and hamburg wheel tests. If it is determined to be stripping then 1% lime, liquid anti-strip or a warm mix additive proven to prevent stripping will be required.

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Schedule the placement width for the final hotmix surface in such a manner that all joints will coincide with proposed lane lines (+/- 6 inches).

Use a self-propelled, wheel-mounted material transfer vehicle (MTV) capable of receiving hot mix from the haul trucks separate from the paver on this project or provide the PaveIR. Minimum requirements for the MTV are a storage capacity of approximately 25 tons, a pivoting discharge conveyor, a means of completely remixing the ACP prior to placement, and a paver hopper equipped with a separate surge storage insert with a minimum capacity of approximately 20 tons.

Provide straight edges including the outside edge. Any edges not conforming to the typical sections will be cut and removed at the Contractor's expense.

No TxDOT RAP is available for this project.

There are paving widths less than 10 ft wide on this project.

Do not pave when temperatures get below 32 degrees F in a 12 hour period.

No substitute PG grade binders will be allowed.

Provide a square edge before laying the adjacent lane of hotmix as directed by the Engineer.

Do not place hotmix if the sustained wind speed gets to over 25 miles per hour.

All calibration pans will be mixed within the Lubbock District.

Seal all joints between hotmix and curb and gutter.

Item 3076 – Dense-Graded Hot-Mix Asphalt

Asphalt stabilized base will not be allowed as RAP.

Fractionate the RAP if used in the mixture design.

Post-consumer RAS will not be allowed.

No exempt production on driving lanes and shoulder.

Item 3077 – Superpave Mixtures

Place hot mix between May 1 and September 30.

Design the mixture to ensure stone on stone contact.

Design the mixture to pass below the reference zone.

Fly ash, cement and kiln dust will not be allowed to be used as mineral fillers.

Fractionate the RAP if used in the mixture design.

Item 3080 – Stone-Matrix Asphalt

Place hot mix between May 15 and September 30.

Tack coat for the horizontal surface prior to SMA placement will not be required. The reinforcing fabric binder will perform as the tack coat.

Cement and kiln dust will not be allowed to be used as mineral fillers.

The percent passing the #200 sieve will be 6.0-12.0 in Section 4.4.1, Table 7 Master Gradation Limits for SMA-D Medium.

RAP will not be allowed.

Beginning with Lot 2, if the Contractor's requested referee test results come back with a failing lab molded density, the Contractor may request performance tests on the laboratory tested material be used as a basis for acceptance of the sub lot at maximum production penalty.

If SMA fails performance tests then remove and replace the TY-D, Reinforcing Fabric/Grid, and SMA at the Contractor's expense.

Item 6001 - Portable Changeable Message Sign

Provide messages as directed by the Engineer.

Provide 6 solar powered changeable message signs for the duration of this project.

Inform the public 2 weeks before construction begins.

Item 6038 - Multipolymer Pavement Markings (MPM)

Provide modified urethane for all multipolymer pavement markings.

Item 6185 – Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

Provide 3 TMAs for stationary use for the duration of the project. Stationary TMAs will be used during the various phases of work required for this project. Payment will be made by the day for each TMA used in stationary operations.

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A TMA is considered stationary when the TMA is parked more than 15 minutes.

Provide 2 TMAs for mobile use. Mobile TMAs will be used for moving operations such as striping and RPM placement. Payment will be made by the day for each TMA used in mobile operations.

Item 6307 – Temporary Speed Monitoring System

Provide 1 speed monitoring trailer for this project.

Utilize the speed monitoring trailer on the project for the duration of this project as directed for the protection of the workers.

Change locations of speed monitoring trailer on a regular basis to improve driver attention.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0905-06-095 **DISTRICT** Lubbock **COUNTY** Lubbock
HIGHWAY UPLAND AVE

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0905-06-095**			
		PROJECT ID		**A00121393**			
		COUNTY		**Lubbock**			
		HIGHWAY		**UPLAND AVE**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6002	PREPARING ROW	STA	65.000		65.000	
	100-6004	PREPARING ROW(TREE)(12" TO 24" DIA)	EA	25.000		25.000	
	104-6001	REMOVING CONC (PAV)	SY	1,300.000		1,300.000	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	1,405.000		1,405.000	
	104-6022	REMOVING CONC (CURB AND GUTTER)	LF	199.000		199.000	
	104-6044	REMOVING CONC (FLUME)	SY	78.000		78.000	
	110-6001	EXCAVATION (ROADWAY)	CY	14,375.790		14,375.790	
	110-6003	EXCAVATION (SPECIAL)	CY	14.000		14.000	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY	8,245.000		8,245.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	10,010.000		10,010.000	
	164-6025	CELL FBR MLCH SEED(PERM)(URBAN)(SANDY)	SY	10,010.000		10,010.000	
	164-6037	DRILL SEEDING (PERM) (URBAN) (SANDY)	SY	10,010.000		10,010.000	
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5,005.000		5,005.000	
	166-6002	FERTILIZER	TON	0.640		0.640	
	168-6001	VEGETATIVE WATERING	MG	200.000		200.000	
	216-6001	PROOF ROLLING	HR	35.000		35.000	
	251-6033	REWORK BS MTL (TY C) (6") (ORD COMP)	SY	9,038.000		9,038.000	
	310-6009	PRIME COAT (MC-30)	GAL	13,678.000		13,678.000	
	315-6004	FOG SEAL (CSS-1H)	GAL	15,331.000		15,331.000	
	316-6017	ASPH (AC-20-5TR)	GAL	852.000		852.000	
	316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	20.000		20.000	
	351-6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	5,000.000		5,000.000	
	351-6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR(3")	SY	5,000.000		5,000.000	
	354-6061	PLANE ASHP CONC PAV (2" TO 9")	SY	20,455.000		20,455.000	
	400-6002	STRUCT EXCAV (BOX)	CY	1,176.000		1,176.000	
	400-6003	STRUCT EXCAV (PIPE)	CY	564.000		564.000	
	400-6005	CEM STABIL BKFL	CY	904.000		904.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	35.000		35.000	
	403-6006	TEMPORARY SPL SHORING (COFFERDAM)	SF	1,320.000		1,320.000	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	234.000		234.000	
	416-6030	DRILL SHAFT (TRF SIG POLE) (24 IN)	LF	66.000		66.000	
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	101.000		101.000	
	416-6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	88.000		88.000	
	432-6002	RIPRAP (CONC)(5 IN)	CY	1,284.000		1,284.000	
	432-6044	RIPRAP (CONC)(FLUME)	CY	12.000		12.000	
	450-6052	RAIL (HANDRAIL)(TY F)	LF	187.000		187.000	
	462-6010	CONC BOX CULV (6 FT X 3 FT)	LF	585.000		585.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0905-06-095 **DISTRICT** Lubbock **COUNTY** Lubbock
HIGHWAY UPLAND AVE

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0905-06-095**			
		PROJECT ID		**A00121393**			
		COUNTY		**Lubbock**			
		HIGHWAY		**UPLAND AVE**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	464-6017	RC PIPE (CL IV)(18 IN)	LF	384.000		384.000	
	464-6018	RC PIPE (CL IV)(24 IN)	LF	864.000		864.000	
	467-6219	SET (TY I)(S= 6 FT)(HW= 5 FT)(4:1) (C)	EA	3.000		3.000	
	467-6224	SET (TY I)(S= 6 FT)(HW= 6 FT)(4:1) (C)	EA	9.000		9.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA	8.000		8.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA	32.000		32.000	
	474-6021	CAST-IN-PLACE TRENCH DRAIN	LF	116.000		116.000	
	480-6001	CLEAN EXIST CULVERTS	EA	2.000		2.000	
	496-6016	REMOV STR (PIPE)	EA	22.000		22.000	
	496-6043	REMOV STR (SMALL FENCE)	LF	2,448.000		2,448.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	15.000		15.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	178.000		178.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	89.000		89.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	672.000		672.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	336.000		336.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	125.000		125.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	63.000		63.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	5,042.000		5,042.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	2,521.000		2,521.000	
	508-6001	CONSTRUCTING DETOURS	SY	7,030.000		7,030.000	
	529-6008	CONC CURB & GUTTER (TY II)	LF	5,990.000		5,990.000	
	529-6021	CONC CURB & GUTTER (SLOTTED)	LF	3,256.000		3,256.000	
	530-6004	DRIVEWAYS (CONC)	SY	2,309.000		2,309.000	
	531-6001	CONC SIDEWALKS (4")	SY	5,128.000		5,128.000	
	531-6019	CURB RAMPS (TY 2)	SY	175.000		175.000	
	531-6024	CURB RAMPS (TY 7)	SY	214.000		214.000	
	531-6027	CURB RAMPS (TY 10)	SY	206.000		206.000	
	531-6031	CURB RAMPS (TY 22)	SY	30.000		30.000	
	536-6002	CONC MEDIAN	SY	278.000		278.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1.000		1.000	
	550-6001	CHAIN LINK FENCE (INSTALL) (6')	LF	598.000		598.000	
	550-6003	CHAIN LINK FENCE (REMOVE)	LF	708.000		708.000	
	550-6009	CHAIN LINK FENCE(INSTALL)(6)(BARB TOP)	LF	400.000		400.000	
	550-6015	REMOVE AND INSTALL EXISTING GATE	EA	10.000		10.000	
	560-6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	14.000		14.000	
	610-6162	IN RD IL (TY SA) 30T-8 (250W EQ) LED	EA	3.000		3.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0905-06-095 **DISTRICT** Lubbock **COUNTY** Lubbock
HIGHWAY UPLAND AVE

			CONTROL SECTION JOB		**0905-06-095**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00121393**		
			COUNTY		**Lubbock**		
			HIGHWAY		**UPLAND AVE**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	610-6298	IN RD IL (TY AL) 50S-12 (400W EQ) LED	EA	21.000		21.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF	7,670.000		7,670.000	
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	1,310.000		1,310.000	
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	120.000		120.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	435.000		435.000	
	618-6053	CONDT (PVC) (SCH 80) (3")	LF	415.000		415.000	
	618-6058	CONDT (PVC) (SCH 80) (4")	LF	70.000		70.000	
	618-6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	1,115.000		1,115.000	
	620-6004	ELEC CONDR (NO.12) INSULATED	LF	160.000		160.000	
	620-6007	ELEC CONDR (NO.8) BARE	LF	5,060.000		5,060.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	10,590.000		10,590.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	2,145.000		2,145.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	680.000		680.000	
	624-6002	GROUND BOX TY A (122311)W/APRON	EA	5.000		5.000	
	624-6008	GROUND BOX TY C (162911)W/APRON	EA	18.000		18.000	
	628-6032	ELC SRV TY A 240/480 060(NS)AL(E)PS(U)	EA	2.000		2.000	
	628-6189	ELC SRV TY D 120/240 070(NS)SS(E)SP(U)	EA	4.000		4.000	
	644-6002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	EA	6.000		6.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3.000		3.000	
	644-6017	IN SM RD SN SUP&AM TY10BWG(2)SA(P)	EA	14.000		14.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	15.000		15.000	
	662-6048	WK ZN PAV MRK REMOV (REFL) TY I-C	EA	2,579.000		2,579.000	
	662-6050	WK ZN PAV MRK REMOV (REFL) TY II-A-A	EA	6,091.000		6,091.000	
	662-6056	WK ZN PAV MRK REMOV (TRAF BTN) TY W	EA	3,869.000		3,869.000	
	662-6058	WK ZN PAV MRK REMOV (TRAF BTN) TY Y	EA	9,136.000		9,136.000	
	662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	440.000		440.000	
	666-6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	1,675.000		1,675.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	4,372.000		4,372.000	
	666-6224	PAVEMENT SEALER 4"	LF	17,917.000		17,917.000	
	666-6226	PAVEMENT SEALER 8"	LF	12,924.000		12,924.000	
	666-6228	PAVEMENT SEALER 12"	LF	680.000		680.000	
	666-6230	PAVEMENT SEALER 24"	LF	1,695.000		1,695.000	
	666-6242	PAVEMENT SEALER (RR XING)	EA	4.000		4.000	
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	28.000		28.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	2,461.000		2,461.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	2,103.000		2,103.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	1,847.000		1,847.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0905-06-095 **DISTRICT** Lubbock **COUNTY** Lubbock
HIGHWAY UPLAND AVE

			CONTROL SECTION JOB		**0905-06-095**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00121393**		
			COUNTY		**Lubbock**		
			HIGHWAY		**UPLAND AVE**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	11,484.000		11,484.000	
	668-6016	PREFAB PAV MRK TY B (W)(12")(SLD)	LF	680.000		680.000	
	668-6018	PREFAB PAV MRK TY B (W)(24")(SLD)	LF	1,695.000		1,695.000	
	668-6019	PREFAB PAV MRK TY B (W)(ARROW)	EA	27.000		27.000	
	668-6020	PREFAB PAV MRK TY B (W)(DBL ARROW)	EA	3.000		3.000	
	668-6031	PREFAB PAV MRK TY B (W)(RR XING)	EA	4.000		4.000	
	668-6034	PREFAB PAV MRK TY B (W)(36")(YLD TRI)	EA	28.000		28.000	
	672-6007	REFL PAV MRKR TY I-C	EA	138.000		138.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	320.000		320.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	1,030.000		1,030.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	50.000		50.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	335.000		335.000	
	677-6016	ELIM EXT PAV MRK & MRKS (RR XING)	EA	3.000		3.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF	17,895.000		17,895.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	6,462.000		6,462.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	1,695.000		1,695.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	26.000		26.000	
	678-6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	3.000		3.000	
	680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA	4.000		4.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	27.000		27.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	18.000		18.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	33.000		33.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	25.000		25.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	39.000		39.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	11.000		11.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	17.000		17.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	30.000		30.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	7.000		7.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA	7.000		7.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	1,450.000		1,450.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	585.000		585.000	
	684-6036	TRF SIG CBL (TY A)(14 AWG)(10 CONDR)	LF	1,425.000		1,425.000	
	684-6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	1,590.000		1,590.000	
	684-6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF	2,485.000		2,485.000	
	686-6029	INS TRF SIG PL AM (S)1 ARM(28')	EA	1.000		1.000	
	686-6037	INS TRF SIG PL AM(S)1 ARM(36')	EA	2.000		2.000	
	686-6045	INS TRF SIG PL AM(S)1 ARM(44')	EA	2.000		2.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0905-06-095 **DISTRICT** Lubbock **COUNTY** Lubbock
HIGHWAY UPLAND AVE

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0905-06-095**			
		PROJECT ID		**A00121393**			
		COUNTY		**Lubbock**			
		HIGHWAY		**UPLAND AVE**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA	2.000		2.000	
	686-6053	INS TRF SIG PL AM(S)1 ARM(50')	EA	1.000		1.000	
	686-6061	INS TRF SIG PL AM(S)1 ARM(60')	EA	3.000		3.000	
	687-6001	PED POLE ASSEMBLY	EA	10.000		10.000	
	687-6002	PEDESTRIAN PUSH BUTTON POLE	EA	10.000		10.000	
	690-6021	REMOVAL OF TIMBER POLES	EA	10.000		10.000	
	690-6023	INSTALL OF TIMBER POLES	EA	10.000		10.000	
	730-6107	FULL - WIDTH MOWING	CYC	2.000		2.000	
	734-6002	LITTER REMOVAL	CYC	2.000		2.000	
	4171-6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	2.000		2.000	
	5012-6001	SPLIT RAIL FENCE (INSTALL)	LF	238.000		238.000	
	5013-6001	REMOVE AND RELOCATE STEEL FENCE	LF	1,022.000		1,022.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	1,350.000		1,350.000	
	6027-6008	GROUND BOX (PREPARE)	EA	3.000		3.000	
	6038-6001	MULTIPOLYMER PAV MRK (W)(4")(SLD)	LF	22.000		22.000	
	6038-6007	MULTIPOLYMER PAV MRK (W)(8")(SLD)	LF	415.000		415.000	
	6185-6002	TMA (STATIONARY)	DAY	660.000		660.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	8.000		8.000	
	6186-6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA	2.000		2.000	
	6306-6001	VIVDS PROSR SYS	EA	2.000		2.000	
	6306-6002	VIVDS CAM ASSY FXD LNS	EA	8.000		8.000	
	6306-6007	VIVDS CABLING	LF	1,590.000		1,590.000	
	6307-6003	TEMP SPEED MONITOR SYS	EA	1.000		1.000	
	7030-6001	HIGH PRESSURE WATER BLASTING SYSTEM 4"	LF	2,500.000		2,500.000	
	12	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		ITS: CONTRACTOR FORCE ACCOUNT WORK PARTICIPATING	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
	39	CITY FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
1	247-6238	FL BS (CMP IN PLC)(TY A GR 4)(12")	SY	8,297.000		8,297.000	
	275-6001	CEMENT	TON	558.000		558.000	
	275-6011	CEMENT TREAT(EXIST MATL)(8")	SY	48,810.000		48,810.000	
	360-6003	CONC PVMT (CONT REINF - CRCP) (9")	SY	42,289.000		42,289.000	
	3076-6052	D-GR HMA TY-D SAC-A PG76-28	TON	2,704.000		2,704.000	
	3077-6036	SP MIXES SP-C SAC-A PG76-28	TON	1,777.000		1,777.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0905-06-095 **DISTRICT** Lubbock **COUNTY** Lubbock
HIGHWAY UPLAND AVE

		CONTROL SECTION JOB		**0905-06-095**		TOTAL EST.	TOTAL FINAL
		PROJECT ID		**A00121393**			
		COUNTY		**Lubbock**			
		HIGHWAY		**UPLAND AVE**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
1	3080-6008	STONE-MTRX-ASPH SMA-D SAC-A PG76-28	TON	889.000		889.000	
1A	247-6238	FL BS (CMP IN PLC)(TY A GR 4)(12")	SY	39,618.000		39,618.000	
	275-6001	CEMENT	TON	185.000		185.000	
	275-6011	CEMENT TREAT(EXIST MATL)(8")	SY	18,540.000		18,540.000	
	360-6003	CONC PVMT (CONT REINF - CRCP) (9")	SY	16,109.000		16,109.000	
	3032-6001	REINFORCED FAB FOR ASPH PVMNT OVERLAYS	SY	33,722.000		33,722.000	
	3032-6004	ASPH FOR REINF FAB (PG76-28)	GAL	5,362.000		5,362.000	
	3076-6052	D-GR HMA TY-D SAC-A PG76-28	TON	1,045.000		1,045.000	
	3077-6036	SP MIXES SP-C SAC-A PG76-28	TON	7,756.000		7,756.000	
	3080-6008	STONE-MTRX-ASPH SMA-D SAC-A PG76-28	TON	3,878.000		3,878.000	

100% SUBMITTAL

UPLAND AVENUE TCP NARRATIVE CONCRETE OPTION

THE FOLLOWING NARRATIVE IS A SUPPLEMENT TO THE TRAFFIC CONTROL PLAN (TCP) SHEETS. THE TCP SHEETS DETAIL A GENERAL PLAN FOR CONSTRUCTION PHASING AND TRAFFIC MANAGEMENT.

THE GENERAL CRITERIA FOR TRAFFIC MANAGEMENT FOR UPLAND AVENUE IS TO MAINTAIN AT ALL TIMES ONE OPEN LANE IN BOTH DIRECTIONS.

CONTRACTOR TO PROVIDE ALL ADVANCE WARNING SIGNS PER TxDOT STANDARDS BC(2)-14 AND AS SHOWN IN THE TRAFFIC CONTROL PLANS FOR THE PROJECT LIMITS OR AS DIRECTED BY THE ENGINEER. CONFLICTING SIGNS SHALL BE COVERED OR REMOVED AND PAID FOR AS SUBSIDIARY TO ITEM 502.

SEE UTILITY PLANS FOR ADDITIONAL INFORMATION. CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITIES AND NOTIFY THE ENGINEER OF ANY CONFLICTS DISCOVERED. ANY DAMAGE TO UTILITIES SHALL BE REPAIRED/REPLACED AT CONTRACTOR'S EXPENSE.

CONTRACTOR TO PROVIDE POSITIVE DRAINAGE AT ALL TIMES.

PHASE 1 - UPLAND AVE

TRAFFIC:
UPLAND AVENUE OPERATES ON EXISTING LANES WITH ONE NORTHBOUND LANE ONE SOUTHBOUND LANE.

CONSTRUCTION:
1. PLACE ADVANCE WARNING SIGNS FOR THE PROJECT LIMITS IN ACCORDANCE WITH TMUTCD, TxDOT TRAFFIC STANDARD TCP (2-1)-18 AND AS DIRECTED BY THE ENGINEER.
2. PLACE TEMPORARY ASPHALT PAVEMENT PER PHASE 1 TCP PLANS.
3. INSTALL EROSION CONTROL DEVICES AS SHOWN ON SW3P LAYOUT.
4. INSTALL TRAFFIC CHANNELIZING DEVICES, BARRIERS, TEMP SIGNING AND STRIPING FOR PHASE 1.
5. SHIFT TRAFFIC TO PHASE 1 WORK ZONE LANE CONFIGURATION.
6. CONSTRUCT THE 2 NORTHBOUND LANES INCLUDING THE CURB AND GUTTERS, PARALLEL CULVERTS AND 66TH STREET EAST OF UPLAND AVENUE AS SHOWN IN THE PLANS.

PHASE 2 - UPLAND AVE

TRAFFIC:
UPLAND AVENUE OPERATES ON PHASE 1 NEW PAVEMENT WITH ONE NORTHBOUND LANE AND ONE SOUTHBOUND LANE.

CONSTRUCTION:
1. DO NOT BEGIN UNTIL PHASE 1 IS COMPLETE.
2. CONFLICTING SIGNS FROM PREVIOUS PHASE CONSTRUCTION SHALL BE REMOVED, RELOCATED OR COVERED AS REQUIRED. SHIFT TRAFFIC TO PHASE 2 LANE CONFIGURATION.
3. TEPORARY PAVEMENT FROM PHASE 1 NORTH SIDE SHALL BE REMOVED BY CONTRACTOR
4. INSTALL EROSION CONTROL DEVICES AS SHOWN ON SW3P LAYOUT.
5. CONSTRUCT REMAINING UPLAND AVENUE ROADWAY TO LIMITS SHOWN IN THE ROADWAY PLANS AND 66TH STREET WEST OF UPLAND AVE.
6. REMOVE WORK ZONE PAVEMENT MARKINGS.
7. PLACE FINAL PAVEMENT MARKINGS FOR UPLAND AVENUE AND 66TH STREET IN ALL DIRECTIONS.

PHASE 3 - UPLAND AVE

TRAFFIC:
UPLAND AVENUE OPERATES ON NEW PAVEMENT WITH ONE NORTHBOUND LANE, ONE SOUTHBOUND LANE AND THE TWO -WAY LEFT TURN LANE.

CONSTRUCTION:
1. DO NOT BEGIN UNTIL PHASE 2 IS COMPLETE.
2. PLACE ADVANCE WARNING SIGNS IN ACCORDANCE WITH TMUTCD, TCP (2-1)-18 AND BC STANDARDS AND AS DIRECTED BY THE ENGINEER. CONFLICTING SIGNS FROM PREVIOUS PHASE CONSTRUCTION SHALL BE REMOVED, RELOCATED OR COVERED AS REQUIRED.
3. INSTALL EROSION CONTROL DEVICES AS SHOWN ON SW3P LAYOUT.
4. INSTALL TRAFFIC CHANNELIZING DEVICES, BARRIERS AND TEMP SIGNING PER TxDOT STANDARD TCP(2-4a)-18.
5. SHIFT TRAFFIC TO NEW PAVEMENT.
6. CONSTRUCT REMAINING ITEMS TO LIMITS SHOWN IN THE ROADWAY PLANS.
7. REMOVE ANY AND ALL REMAINING EROSION CONTROL DEVICES PREVIOUSLY PLACED.
8. REMOVE ADVANCE WARNING SIGNS, CHANNELIZING DEVICES AND TEMPORARY SIGNS.
9. RESTORE TRAFFIC TO FINAL CONDITIONS.

UPLAND AVENUE TCP NARRATIVE ASPHALT OPTION

THE FOLLOWING NARRATIVE IS A SUPPLEMENT TO THE TRAFFIC CONTROL PLAN (TCP) SHEETS. THE TCP SHEETS DETAIL A GENERAL PLAN FOR CONSTRUCTION PHASING AND TRAFFIC MANAGEMENT.

THE GENERAL CRITERIA FOR TRAFFIC MANAGEMENT FOR UPLAND AVENUE IS TO MAINTAIN AT ALL TIMES ONE OPEN LANE IN BOTH DIRECTIONS.

CONTRACTOR TO PROVIDE ALL ADVANCE WARNING SIGNS PER TxDOT STANDARDS BC(2)-14 AND AS SHOWN IN THE TRAFFIC CONTROL PLANS FOR THE PROJECT LIMITS OR AS DIRECTED BY THE ENGINEER. CONFLICTING SIGNS SHALL BE COVERED OR REMOVED AND PAID FOR AS SUBSIDIARY TO ITEM 502.

SEE UTILITY PLANS FOR ADDITIONAL INFORMATION. CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITIES AND NOTIFY THE ENGINEER OF ANY CONFLICTS DISCOVERED. ANY DAMAGE TO UTILITIES SHALL BE REPAIRED/REPLACED AT CONTRACTOR'S EXPENSE.

CONTRACTOR TO PROVIDE POSITIVE DRAINAGE AT ALL TIMES.

PHASE 1 - UPLAND AVE

TRAFFIC:
UPLAND AVENUE OPERATES ON EXISTING LANES WITH ONE NORTHBOUND LANE ONE SOUTHBOUND LANE.

CONSTRUCTION:
1. PLACE ADVANCE WARNING SIGNS FOR THE PROJECT LIMITS IN ACCORDANCE WITH TMUTCD, TxDOT TRAFFIC STANDARD TCP (2-1)-18 AND AS DIRECTED BY THE ENGINEER.
2. PLACE TEMPORARY ASPHALT PAVEMENT PER PHASE 1 TCP PLANS.
3. INSTALL EROSION CONTROL DEVICES AS SHOWN ON SW3P LAYOUT.
4. INSTALL TRAFFIC CHANNELIZING DEVICES, BARRIERS, TEMP SIGNING AND STRIPING FOR PHASE 1.
5. SHIFT TRAFFIC TO PHASE 1 WORK ZONE LANE CONFIGURATION.
6. CONSTRUCT THE 2 NORTHBOUND LANES UP TO THE 4" TYPE B BASE COURSE INCLUDING THE CURB AND GUTTERS, PARALLEL CULVERTS AND 66TH STREET EAST OF UPLAND AVENUE AS SHOWN IN THE PLANS.

PHASE 2 - UPLAND AVE

TRAFFIC:
UPLAND AVENUE OPERATES ON PHASE 1 - 4" HMAC BASE COURSE WITH ONE NORTHBOUND LANE AND ONE SOUTHBOUND LANE.

CONSTRUCTION:
1. DO NOT BEGIN UNTIL PHASE 1 IS COMPLETE.
2. CONFLICTING SIGNS FROM PREVIOUS PHASE CONSTRUCTION SHALL BE REMOVED, RELOCATED OR COVERED AS REQUIRED. SHIFT TRAFFIC TO PHASE 2 LANE CONFIGURATION.
3. TEPORARY PAVEMENT FROM PHASE 1 NORTH SIDE SHALL BE REMOVED BY CONTRACTOR
4. INSTALL EROSION CONTROL DEVICES AS SHOWN ON SW3P LAYOUT.
5. CONSTRUCT REMAINING UPLAND AVENUE ROADWAY INCLUDING THE 2" HMAC SURFACE COURSE FOR THE LIMITS SHOWN IN THE ROADWAY PLANS AND 66TH STREET WEST OF UPLAND AVE.
6. REMOVE WORK ZONE PAVEMENT MARKINGS.
7. PLACE FINAL PAVEMENT MARKINGS FOR UPLAND AVENUE AND 66TH STREET IN ALL DIRECTIONS.

PHASE 2B - UPLAND AVE

TRAFFIC:
UTILIZING THE PHASE 1 TRAFFIC PATTERN, UPLAND AVENUE OPERATES ON PHASE 2 - 2" HMAC SURFACE COURSE LANES WITH ONE NORTHBOUND LANE ONE SOUTHBOUND LANE.

CONSTRUCTION:
1. DO NOT BEGIN UNTIL PHASE 2 IS COMPLETE.
2. PLACE ADVANCE WARNING SIGNS IN ACCORDANCE WITH TMUTCD, TCP (2-1)-18 AND BC STANDARDS AND AS DIRECTED BY THE ENGINEER. CONFLICTING SIGNS FROM PREVIOUS PHASE CONSTRUCTION SHALL BE REMOVED, RELOCATED OR COVERED AS REQUIRED.
3. INSTALL EROSION CONTROL DEVICES AS SHOWN ON SW3P LAYOUT.
4. INSTALL TRAFFIC CHANNELIZING DEVICES, BARRIERS AND TEMP SIGNING PER TxDOT STANDARD TCP(2-4a)-18.
5. SHIFT TRAFFIC TO NEW PAVEMENT.
6. CONSTRUCT 2" HMAC SURFACE COURSE.
7. PLACE FINAL PAVEMENT MARKINGS.
8. REMOVE ANY AND ALL REMAINING EROSION CONTROL DEVICES PREVIOUSLY PLACED.

PHASE 3 - UPLAND AVE TCP NARRATIVE ASPHALT OPTION

TRAFFIC:
UPLAND AVENUE OPERATES ON NEW PAVEMENT WITH ONE NORTHBOUND LANE, ONE SOUTHBOUND LANE AND THE TWO -WAY LEFT TURN LANE.

CONSTRUCTION:
1. DO NOT BEGIN UNTIL PHASE 2 IS COMPLETE.
2. PLACE ADVANCE WARNING SIGNS IN ACCORDANCE WITH TMUTCD, TCP (2-1)-18 AND BC STANDARDS AND AS DIRECTED BY THE ENGINEER. CONFLICTING SIGNS FROM PREVIOUS PHASE CONSTRUCTION SHALL BE REMOVED, RELOCATED OR COVERED AS REQUIRED.
3. INSTALL EROSION CONTROL DEVICES AS SHOWN ON SW3P LAYOUT.
4. INSTALL TRAFFIC CHANNELIZING DEVICES, BARRIERS AND TEMP SIGNING PER TxDOT STANDARD TCP(2-4a)-18.
5. SHIFT TRAFFIC TO NEW PAVEMENT.
6. CONSTRUCT REMAINING ITEMS TO LIMITS SHOWN IN THE ROADWAY PLANS.
7. REMOVE ANY AND ALL REMAINING EROSION CONTROL DEVICES PREVIOUSLY PLACED.
8. REMOVE ADVANCE WARNING SIGNS, CHANNELIZING DEVICES AND TEMPORARY SIGNS.
9. RESTORE TRAFFIC TO FINAL CONDITIONS.

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL NARRATIVE

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	10
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

SUMMARY OF TRAFFIC CONTROL ITEMS

	0500 6001	0502 6001	0508 6001	0662 6048	0662 6050	0662 6056	0662 6058	0662 6075	6001 6001
	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING	CONSTRUCTING DETOURS	WK ZN PAV MRK REMOVE (REFL) TY I - C	WK ZN PAV MRK REMOVE (REFL) TY II-A-A	WK ZN PAV MRK REMOVE (TRAF BTN) TY W	WK ZN PAV MRK REMOVE (TRAF BTN) TY Y	WK ZN PAV MRK REMOVE (W) 24" (SLD)	PORTABLE CHANGEABLE MESSAGE SIGN
STATIONING	LS	MO	SY	EA	EA	EA	EA	LF	DAY
PHASE 1		5							450
BEGIN PROJECT TO STA 219+00	1		74	153	204	229	307	105	
STA 219+00 TO STA 231+00			990	264	528	396	792		
STA 231+00 TO STA 243+00			1449	264	528	396	792		
STA 243+00 TO STA 255+00			1243	264	528	396	792		
STA 255+00 TO STA 267+00			278	212	471	319	706	195	
STA 267+00 TO 279+00			922	264	528	396	792		
STA 279+00 TO END PROJECT			172	91	182	137	274		
66TH ST STA 10+00 TO STA 17+00									
66TH ST STA 21+00 TO STA 26+77									
PHASE 2		5							450
BEGIN PROJECT TO STA 219+00			407	170	328	254	491		
STA 219+00 TO STA 231+00				132	528	198	792		
STA 231+00 TO STA 243+00				132	528	198	792		
STA 243+00 TO STA 255+00				132	528	198	792		
STA 255+00 TO STA 267+00				180	477	270	716	140	
STA 267+00 TO 279+00			1165	219	528	328	792		
STA 279+00 TO END PROJECT			330	102	204	153	307		
66TH ST STA 10+00 TO STA 17+00									
66TH ST STA 21+00 TO STA 26+77									
PHASE 3		5							450
BEGIN PROJECT TO STA 219+00									
STA 219+00 TO STA 231+00									
STA 231+00 TO STA 243+00									
STA 243+00 TO STA 255+00									
STA 255+00 TO STA 267+00									
STA 267+00 TO 279+00									
STA 279+00 TO END PROJECT									
66TH ST STA 10+00 TO STA 17+00									
66TH ST STA 21+00 TO STA 26+77									
PROJECT TOTAL	1	15	7030	2579	6091	3869	9136	440	1350

SUMMARY OF TRAFFIC CONTROL ITEMS

	6185 6002	6185 6005	6307 6003	7030 6001	
	TMA STATIONARY	TMA (MOBILE OPERATION)	TEMPORARY SPEED MONITORING SYSTEM	HIGH PRESSURE WATER BLASTING SYSTEM (4")	*
STATIONING	DAY	DAY	EA	LF	LF
PHASE 1	220	3	1	1250	
BEGIN PROJECT TO STA 219+00					245
STA 219+00 TO STA 231+00					1130
STA 231+00 TO STA 243+00					1200
STA 243+00 TO STA 255+00					1050
STA 255+00 TO STA 267+00					605
STA 267+00 TO 279+00					790
STA 279+00 TO END PROJECT					
66TH ST STA 10+00 TO STA 17+00					
66TH ST STA 21+00 TO STA 26+77					
PHASE 2	220	3		1250	
BEGIN PROJECT TO STA 219+00					13
STA 219+00 TO STA 231+00					
STA 231+00 TO STA 243+00					
STA 243+00 TO STA 255+00					
STA 255+00 TO STA 267+00					
STA 267+00 TO 279+00					36
STA 279+00 TO END PROJECT					
66TH ST STA 10+00 TO STA 17+00					
66TH ST STA 21+00 TO STA 26+77					
PHASE 3	220	2			
BEGIN PROJECT TO STA 219+00					
STA 219+00 TO STA 231+00					
STA 231+00 TO STA 243+00					
STA 243+00 TO STA 255+00					
STA 255+00 TO STA 267+00					
STA 267+00 TO 279+00					
STA 279+00 TO END PROJECT					
66TH ST STA 10+00 TO STA 17+00					
66TH ST STA 21+00 TO STA 26+77					
PROJECT TOTAL	660	8	1	2500	5069

* QUANTITY IS FOR WATER FILLED TRAFFIC BARRIER AND IS SUBSIDIARY TO ITEM 502.

8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

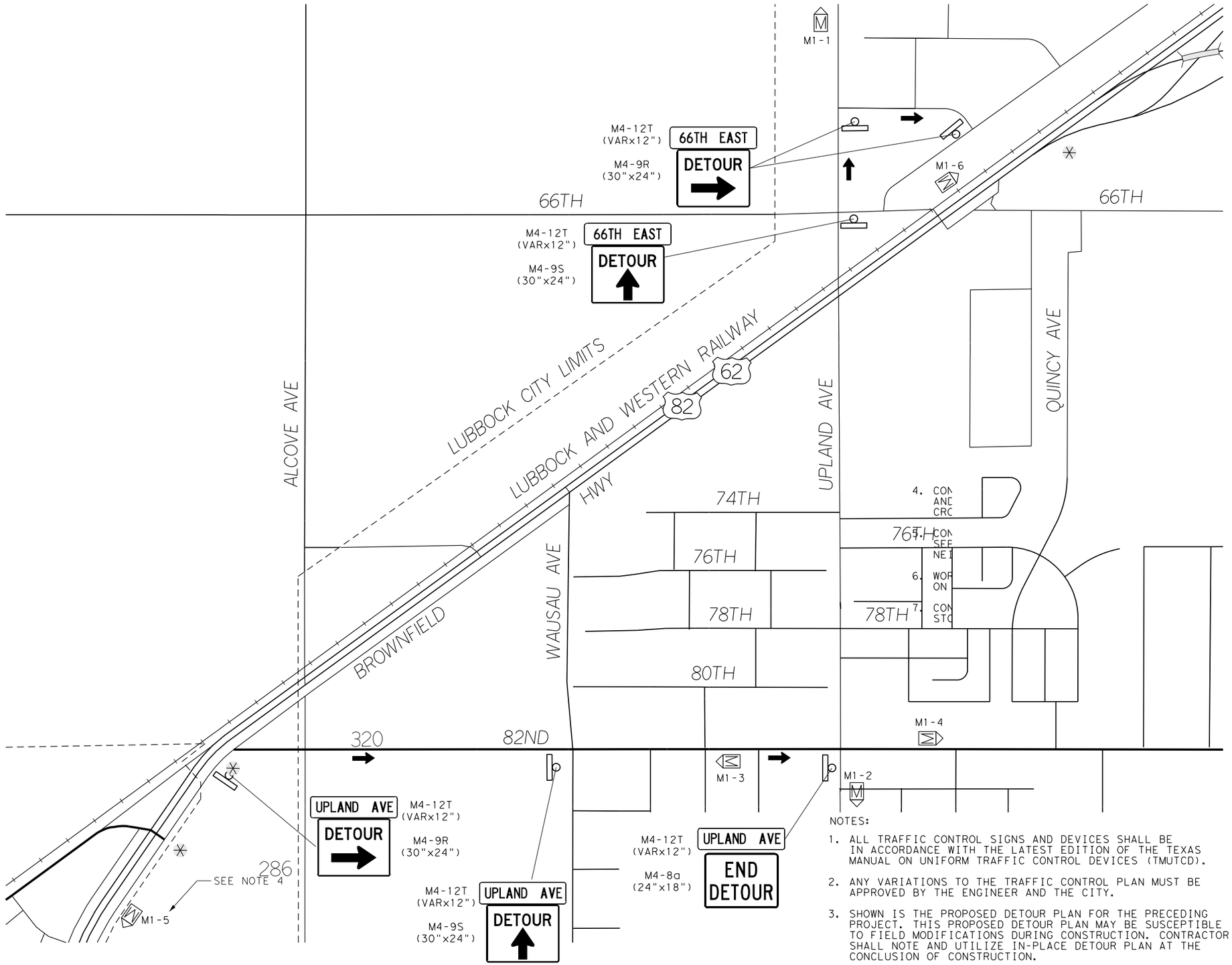
TRAFFIC CONTROL PLAN SUMMARY

SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	11
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTES:

1. ALL TRAFFIC CONTROL SIGNS AND DEVICES SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
2. ANY VARIATIONS TO THE TRAFFIC CONTROL PLAN MUST BE APPROVED BY THE ENGINEER AND THE CITY.
3. SHOWN IS THE PROPOSED DETOUR PLAN FOR THE PRECEDING PROJECT. THIS PROPOSED DETOUR PLAN MAY BE SUSCEPTIBLE TO FIELD MODIFICATIONS DURING CONSTRUCTION. CONTRACTOR SHALL NOTE AND UTILIZE IN-PLACE DETOUR PLAN AT THE CONCLUSION OF CONSTRUCTION.
4. PLACE PCMB PRIOR TO NB 82ND STREET EXIT RAMP

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

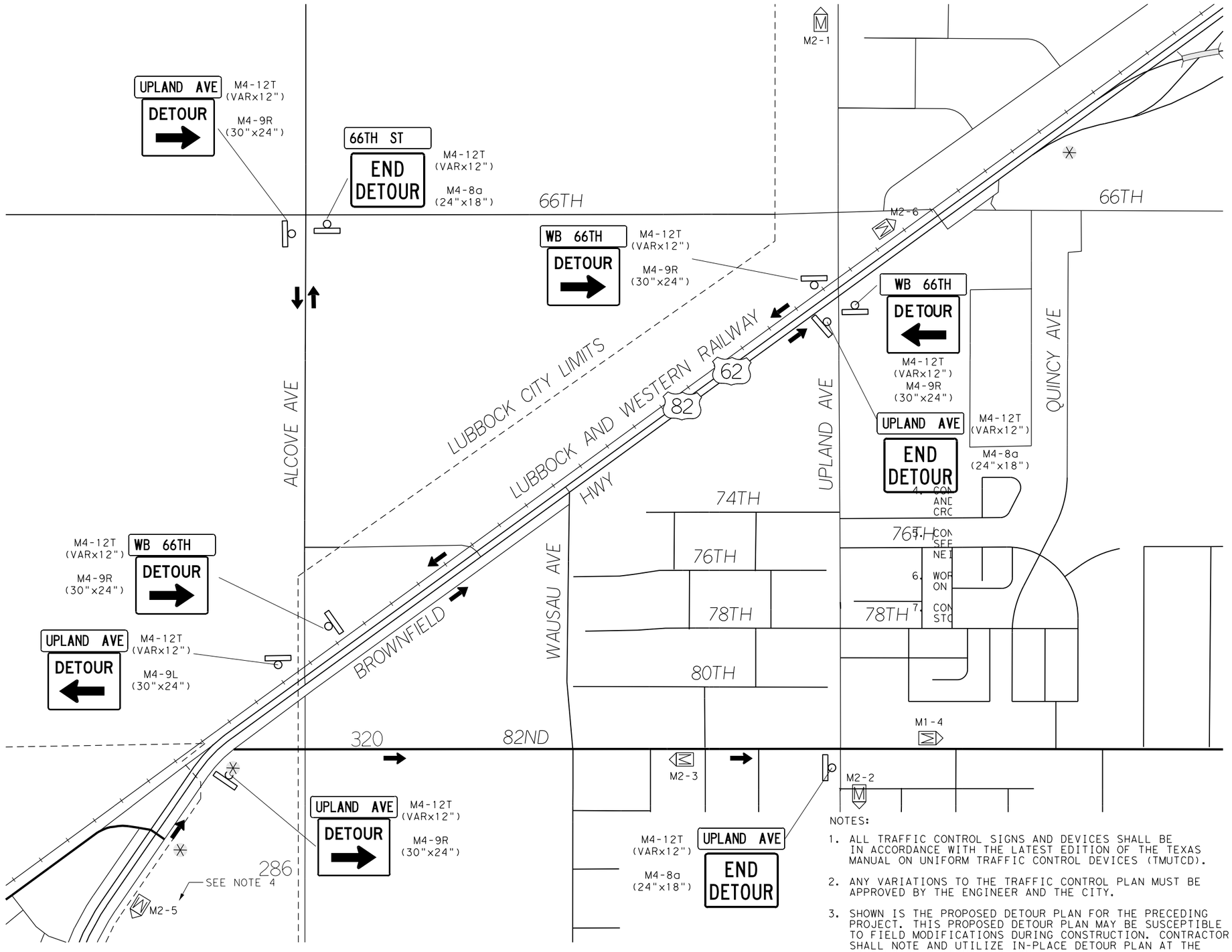
Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
TRAFFIC CONTROL DETOUR
PHASE 1

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	12
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTES:

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STATE OF TEXAS
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Pedro Carrasco Jr. 8/9/2023

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Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

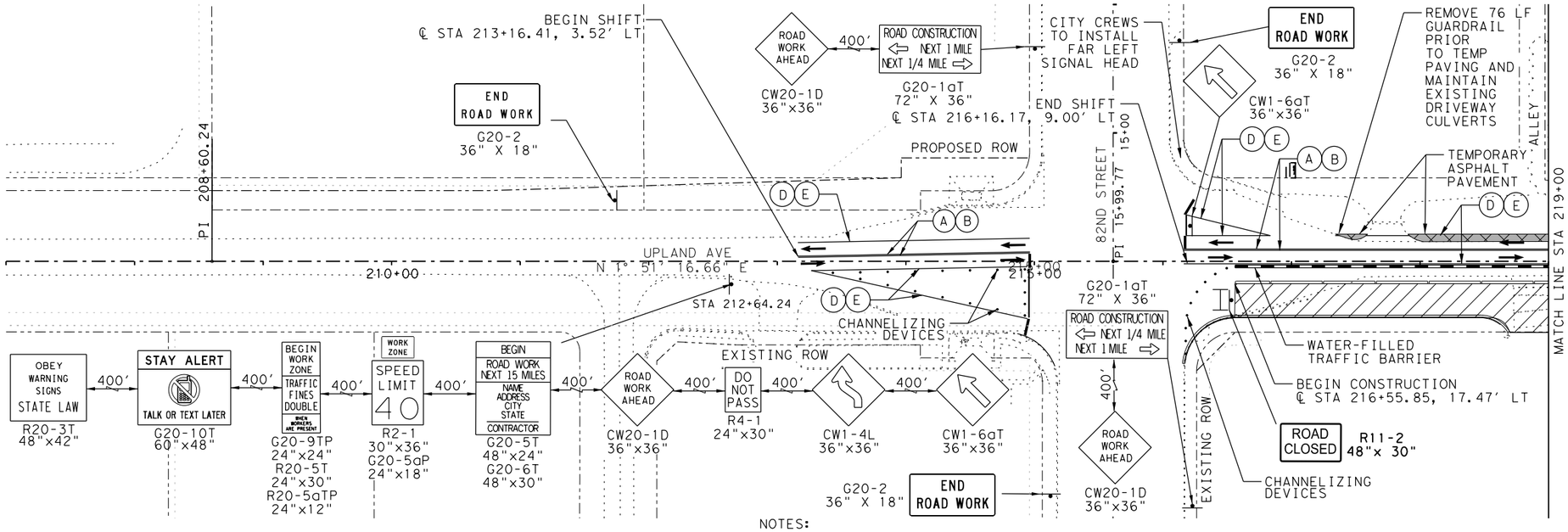
TRAFFIC CONTROL DETOUR

PHASE 2

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

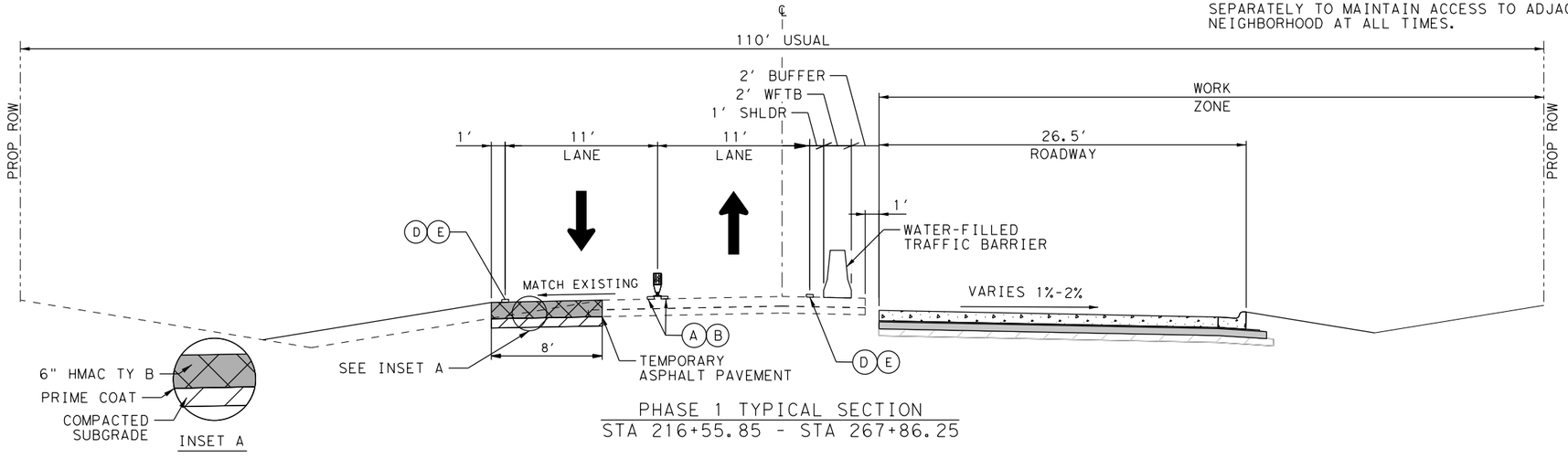
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	13
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
3. CONTRACTOR SHALL REGRADE DITCHES AND MAINTAIN DRAINAGE FLOW TO CROSS CULVERTS.
4. CONTRACTOR SHALL HAVE FOUR STOP SIGNS ON HAND AT ALL TIMES.
5. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.
6. CONTRACTOR SHALL MAINTAIN TEMPORARY PAVEMENT THROUGHOUT PHASE 1.
7. CONTRACTOR SHALL RELOCATE MAILBOXES TO TEMPORARY STANDS UNTIL PERMANENT MAILBOXES CAN BE INSTALLED AND BE MADE ACCESSIBLE.
8. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.



PHASE 1 TYPICAL SECTION
STA 216+55.85 - STA 267+86.25

0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER
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TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

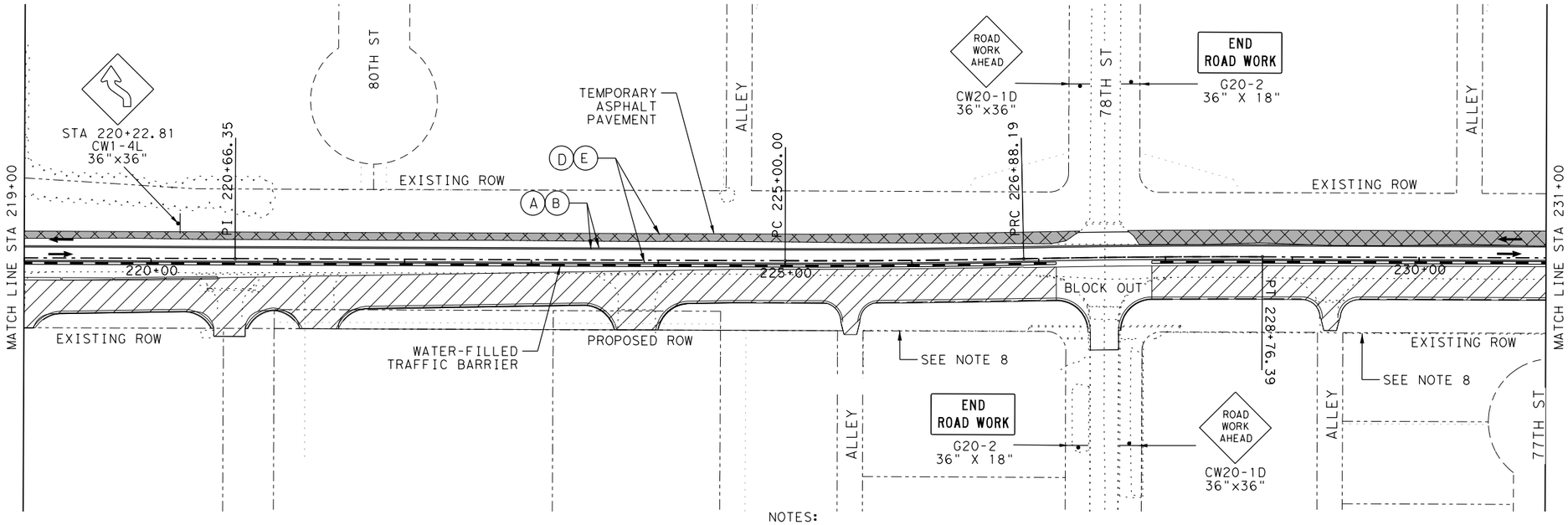
PHASE ONE
BEGIN TO STA 219+00

SHEET 1 OF 9

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

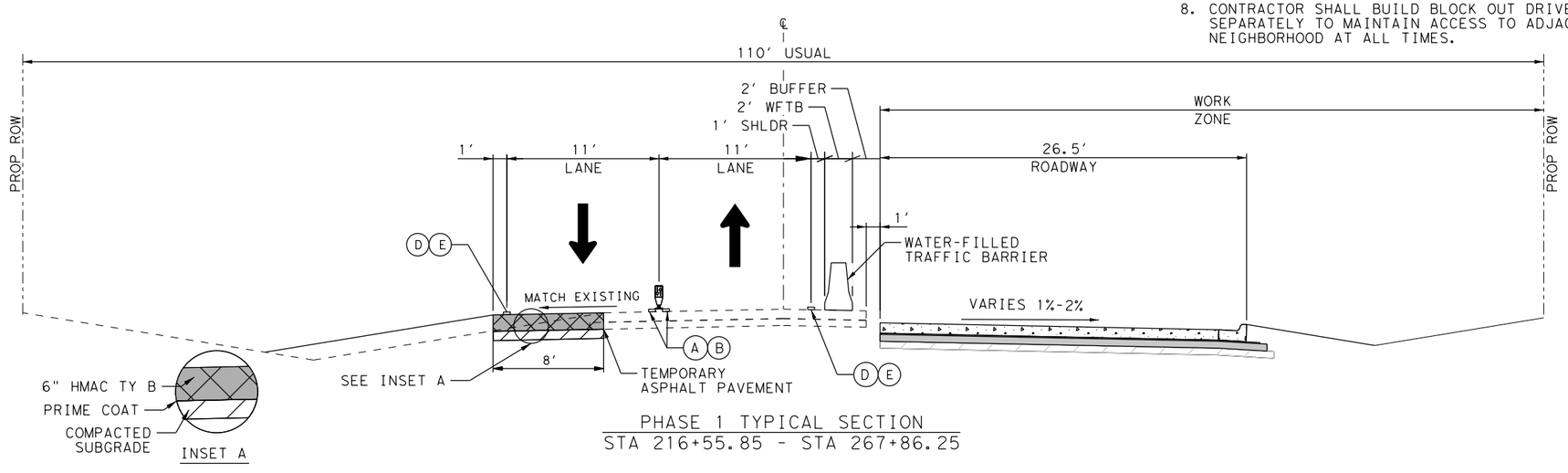
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	14
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
3. CONTRACTOR SHALL REGRADE DITCHES AND MAINTAIN DRAINAGE FLOW TO CROSS CULVERTS.
4. CONTRACTOR SHALL HAVE FOUR STOP SIGNS ON HAND AT ALL TIMES.
5. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.
6. CONTRACTOR SHALL MAINTAIN TEMPORARY PAVEMENT THROUGHOUT PHASE 1.
7. CONTRACTOR SHALL RELOCATE MAILBOXES TO TEMPORARY STANDS UNTIL PERMANENT MAILBOXES CAN BE INSTALLED AND BE MADE ACCESSIBLE.
8. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.



PHASE 1 TYPICAL SECTION
STA 216+55.85 - STA 267+86.25

0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

STATE OF TEXAS
PEDRO CARRASCO JR.
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LICENSED
PROFESSIONAL ENGINEER
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8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

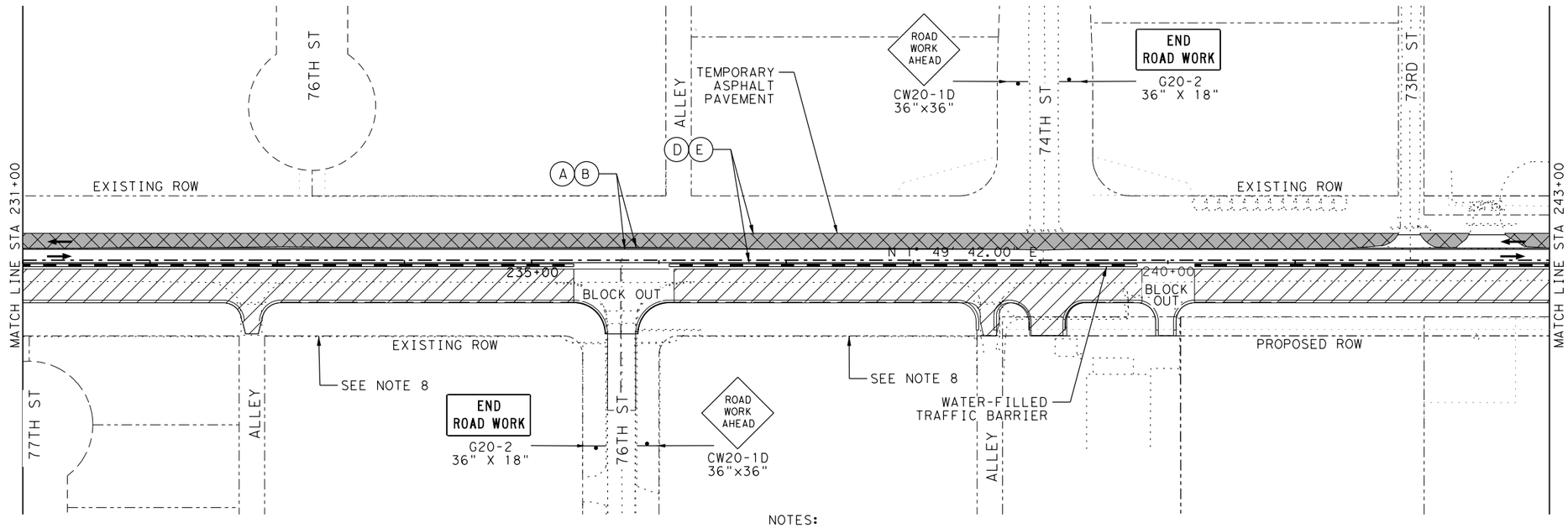
UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN
PHASE ONE
UPL STA 219+00 TO STA 231+00

SHEET 2 OF 9

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	15
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

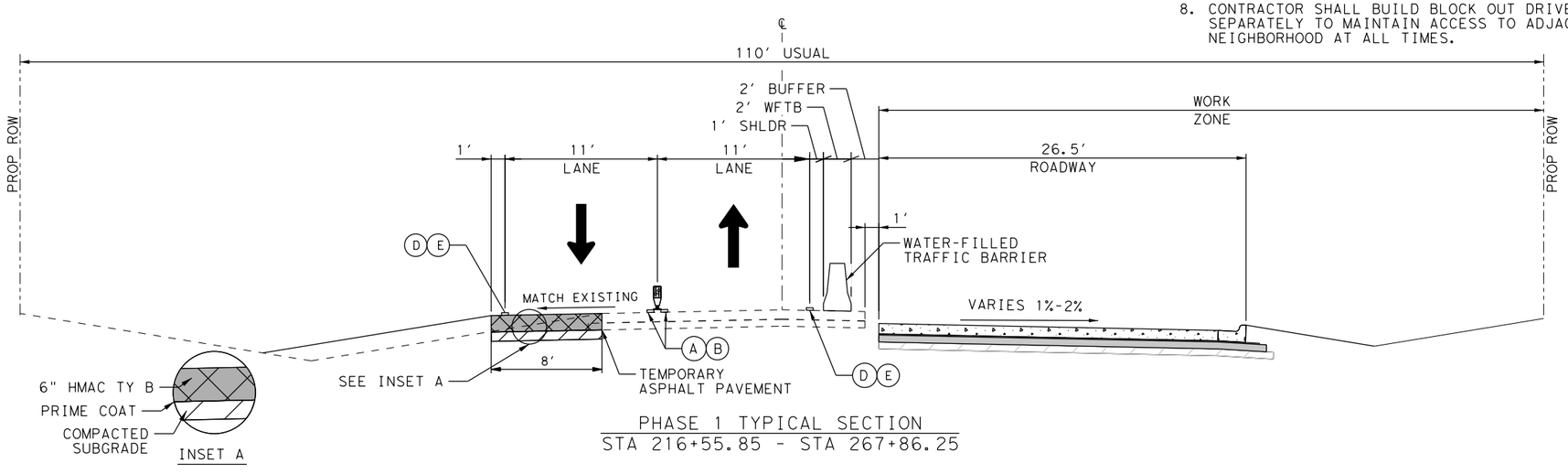


LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
3. CONTRACTOR SHALL REGRADE DITCHES AND MAINTAIN DRAINAGE FLOW TO CROSS CULVERTS.
4. CONTRACTOR SHALL HAVE FOUR STOP SIGNS ON HAND AT ALL TIMES.
5. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.
6. CONTRACTOR SHALL MAINTAIN TEMPORARY PAVEMENT THROUGHOUT PHASE 1.
7. CONTRACTOR SHALL RELOCATE MAILBOXES TO TEMPORARY STANDS UNTIL PERMANENT MAILBOXES CAN BE INSTALLED AND BE MADE ACCESSIBLE.
8. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.



PHASE 1 TYPICAL SECTION
STA 216+55.85 - STA 267+86.25

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

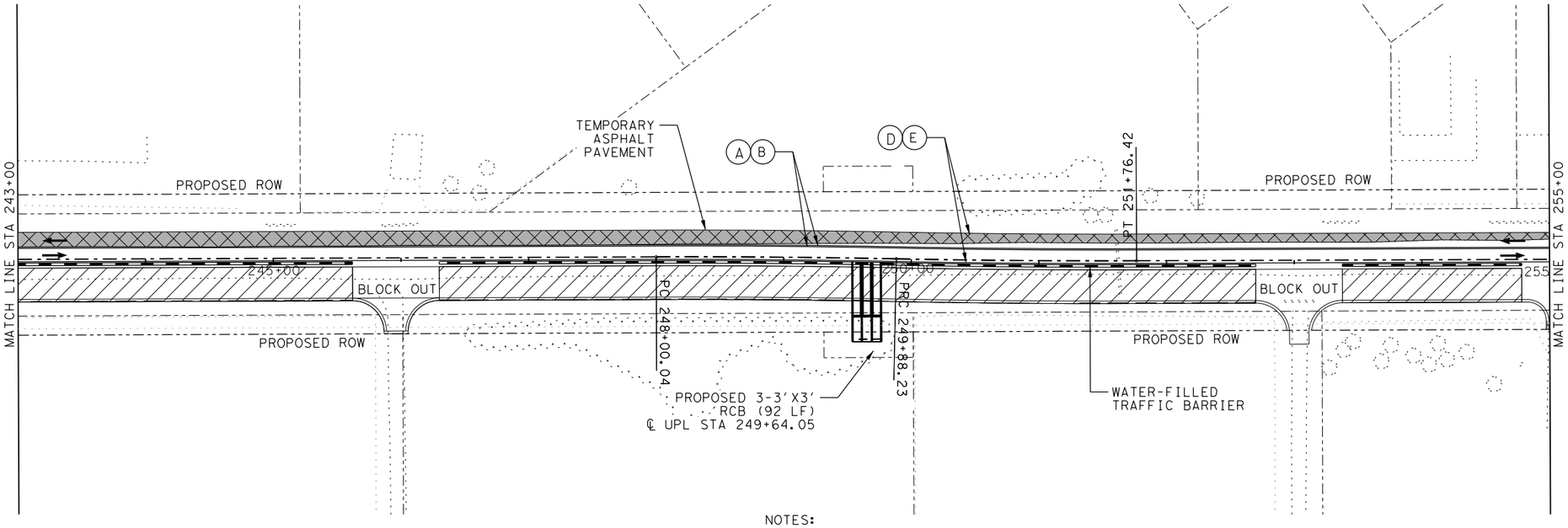
TRAFFIC CONTROL PLAN

PHASE ONE
UPL STA 231+00 TO STA 243+00

SHEET 3 OF 9

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	16
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
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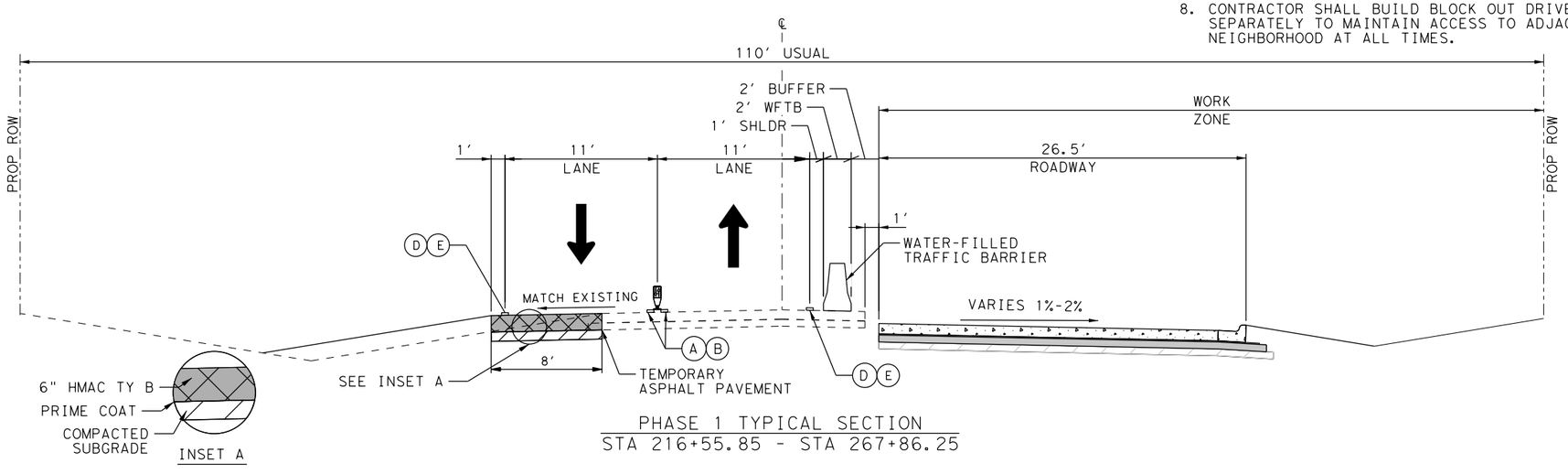
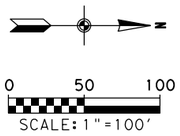


PHASE 1 TYPICAL SECTION
STA 216+55.85 - STA 267+86.25



LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

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Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

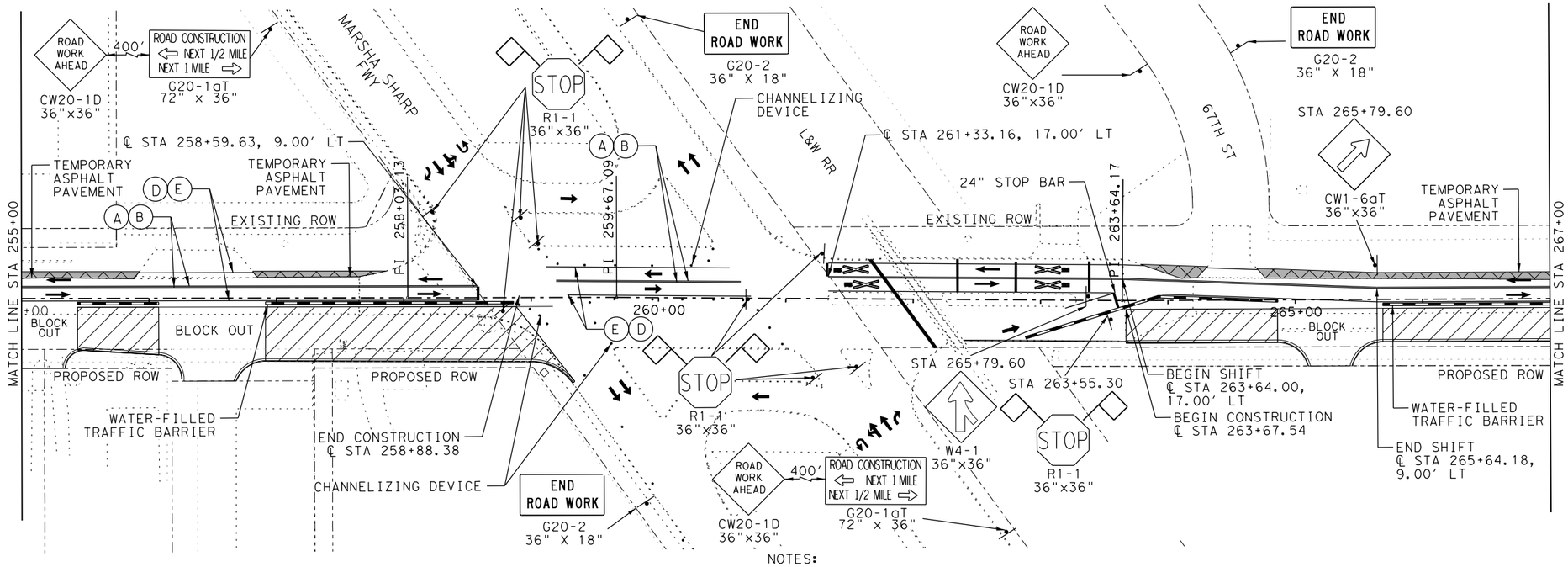
PHASE ONE
UPL STA 243+00 TO STA 255+00

SHEET 4 OF 9

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	17
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
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5. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.
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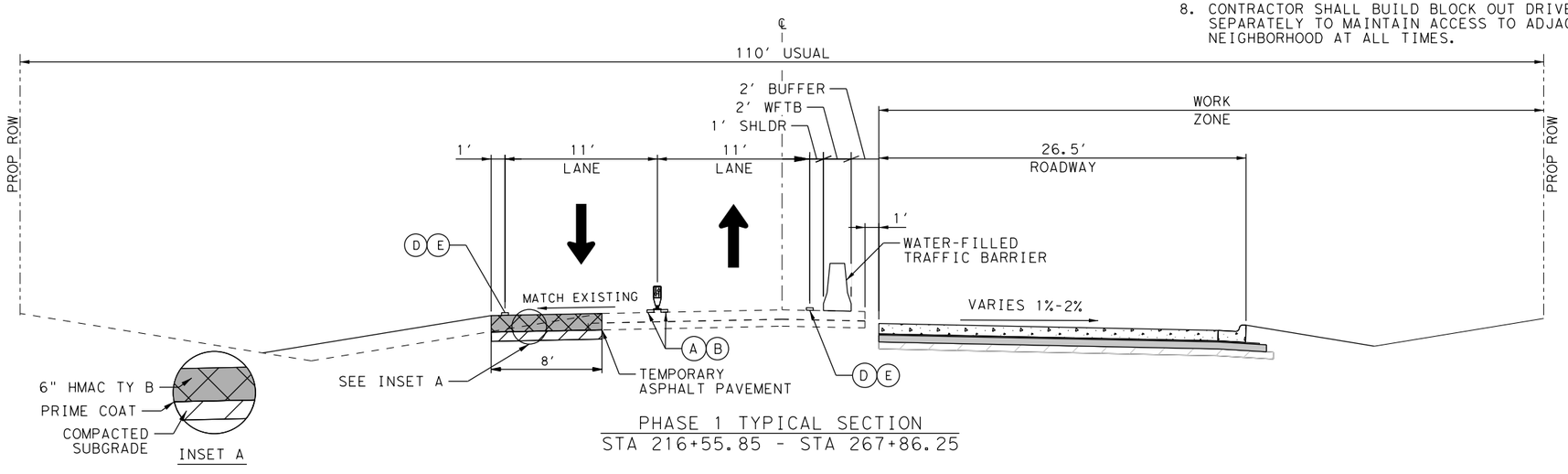
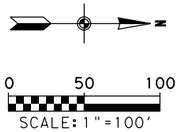
7. CONTRACTOR SHALL RELOCATE MAILBOXES TO TEMPORARY STANDS UNTIL PERMANENT MAILBOXES CAN BE INSTALLED AND BE MADE ACCESSIBLE.
8. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.

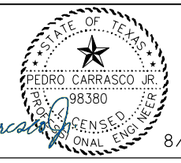


PHASE 1 TYPICAL SECTION
STA 216+55.85 - STA 267+86.25



LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W



8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

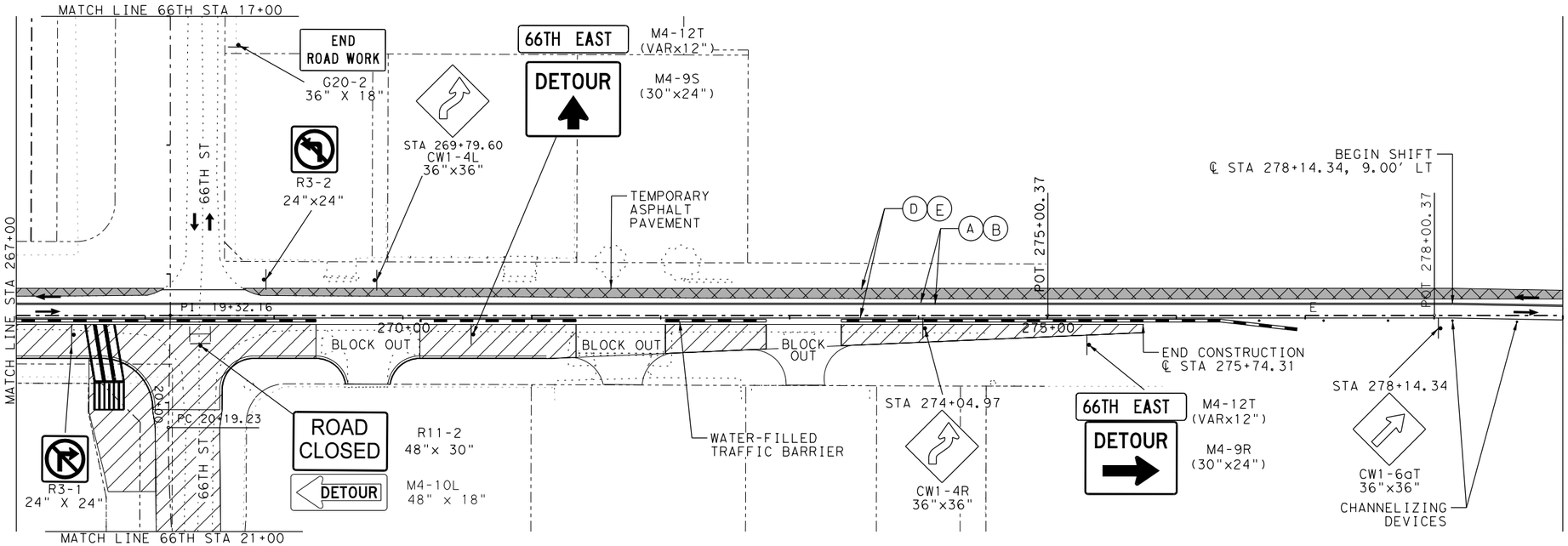
TRAFFIC CONTROL PLAN

PHASE ONE
UPL STA 255+00 TO STA 267+00

SHEET 5 OF 9

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	18
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



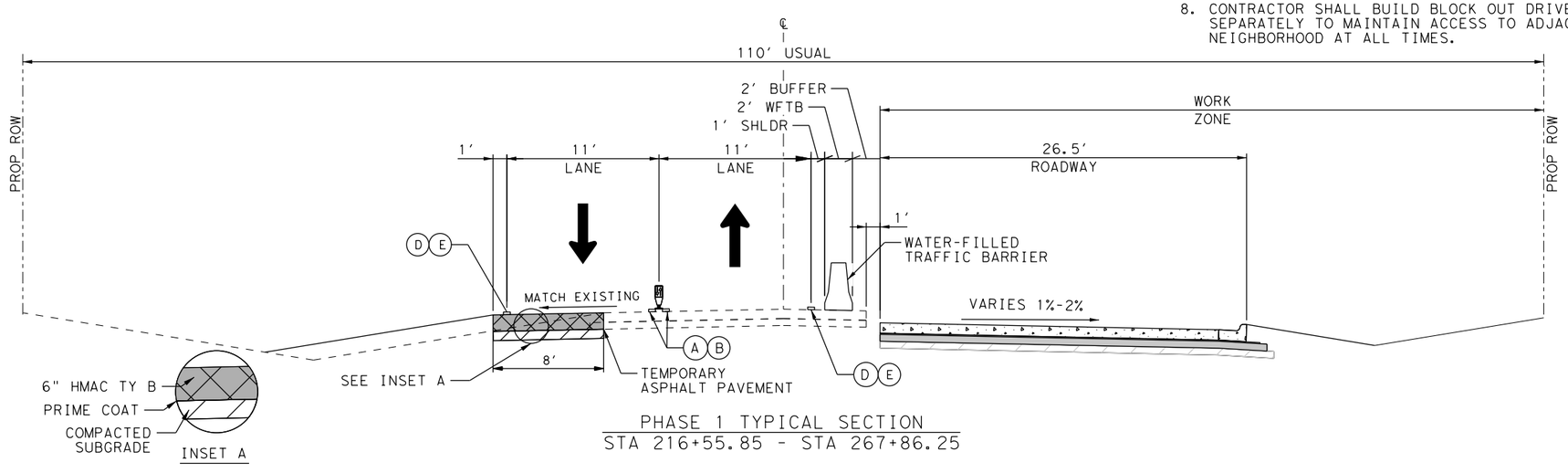
0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
3. CONTRACTOR SHALL REGRADE DITCHES AND MAINTAIN DRAINAGE FLOW TO CROSS CULVERTS.
4. CONTRACTOR SHALL HAVE FOUR STOP SIGNS ON HAND AT ALL TIMES.
5. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.
6. CONTRACTOR SHALL MAINTAIN TEMPORARY PAVEMENT THROUGHOUT PHASE 1.
7. CONTRACTOR SHALL RELOCATE MAILBOXES TO TEMPORARY STANDS UNTIL PERMANENT MAILBOXES CAN BE INSTALLED AND BE MADE ACCESSIBLE.
8. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.



PHASE 1 TYPICAL SECTION
STA 216+55.85 - STA 267+86.25

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

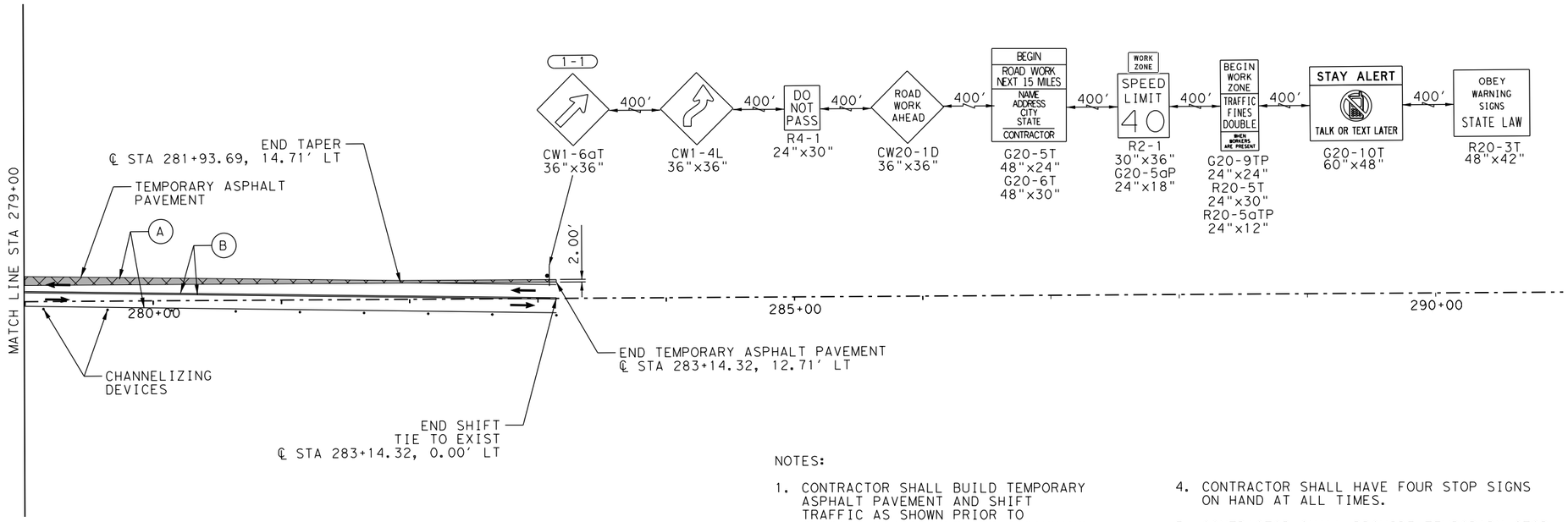
PHASE ONE
UPL STA 267+00 TO END PROJECT

SHEET 6 OF 9

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	19
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



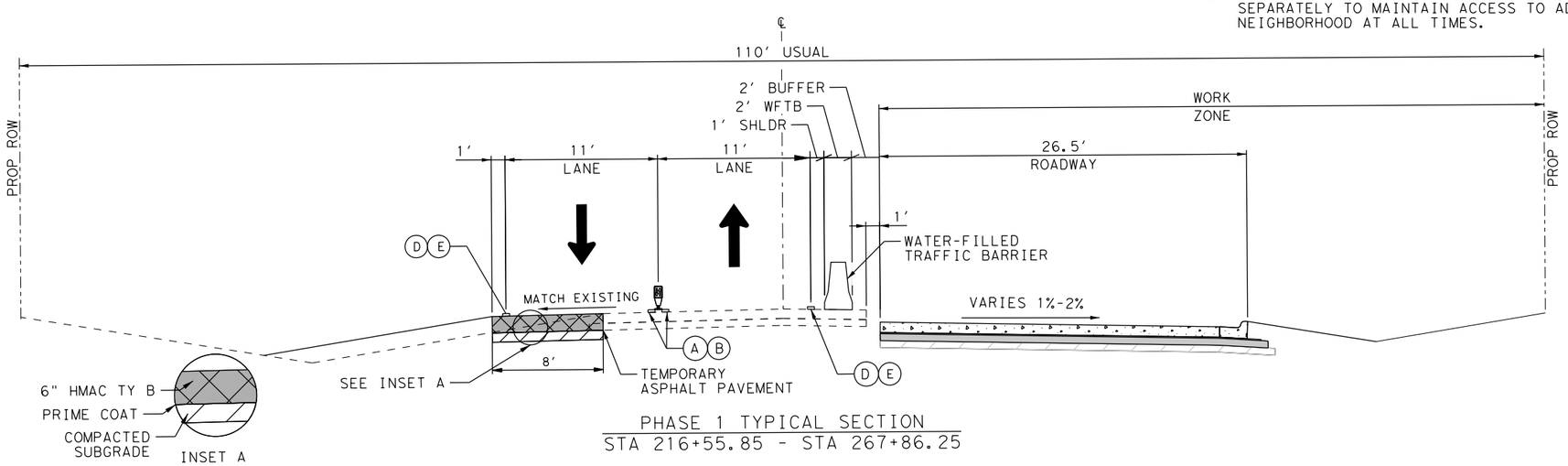
0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
3. CONTRACTOR SHALL REGRADE DITCHES AND MAINTAIN DRAINAGE FLOW TO CROSS CULVERTS.
4. CONTRACTOR SHALL HAVE FOUR STOP SIGNS ON HAND AT ALL TIMES.
5. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.
6. CONTRACTOR SHALL MAINTAIN TEMPORARY PAVEMENT THROUGHOUT PHASE 1.
7. CONTRACTOR SHALL RELOCATE MAILBOXES TO TEMPORARY STANDS UNTIL PERMANENT MAILBOXES CAN BE INSTALLED AND BE MADE ACCESSIBLE.
8. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.



PHASE 1 TYPICAL SECTION
STA 216+55.85 - STA 267+86.25

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

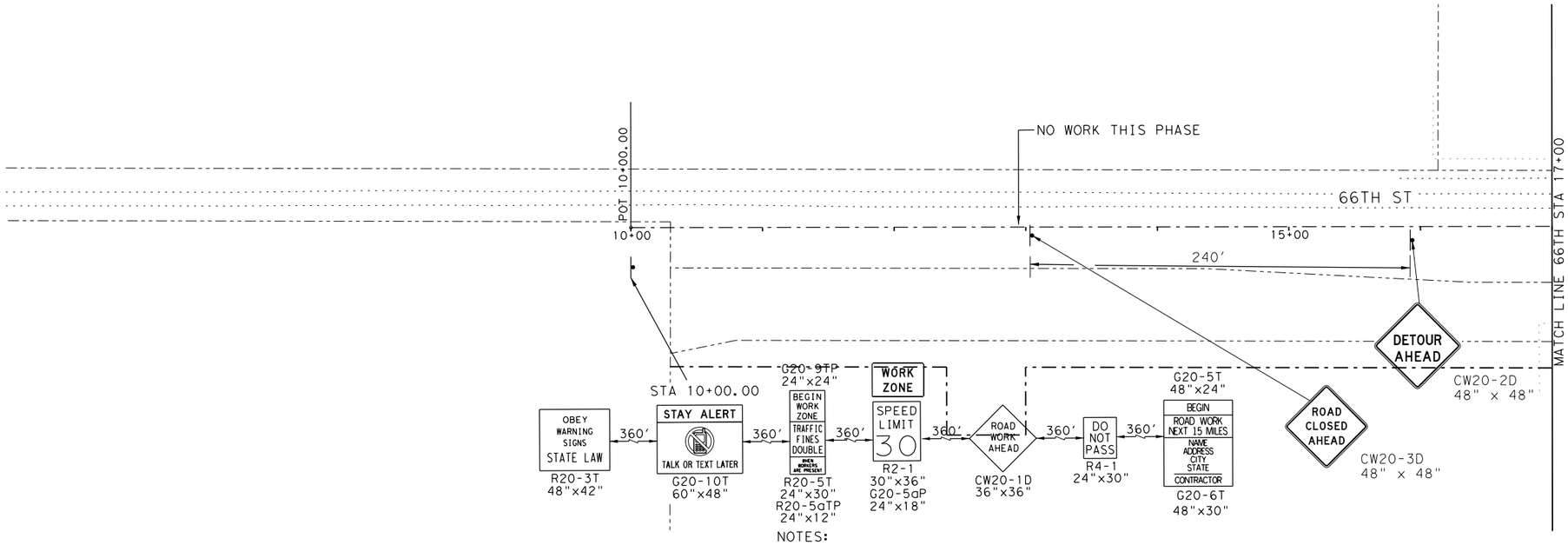
PHASE ONE
UPL STA 279+00 TO STA 291+00

SHEET 7 OF 9

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	20
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTES:

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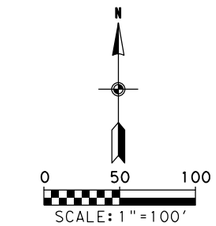


LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

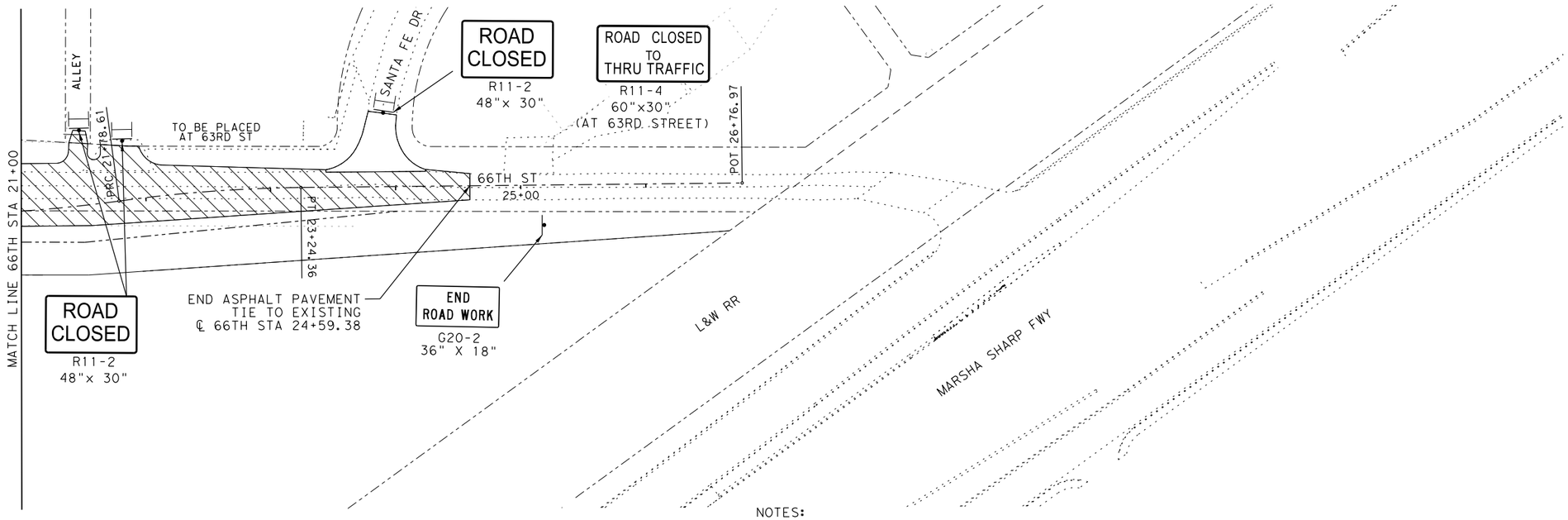
PHASE ONE
66TH STA 10+00 TO STA 17+00

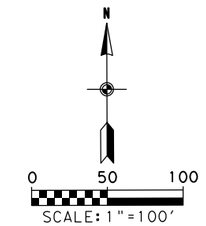
SHEET 8 OF 9

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	21
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
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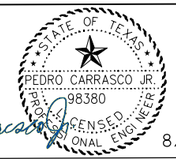


Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
TRAFFIC CONTROL PLAN
PHASE ONE

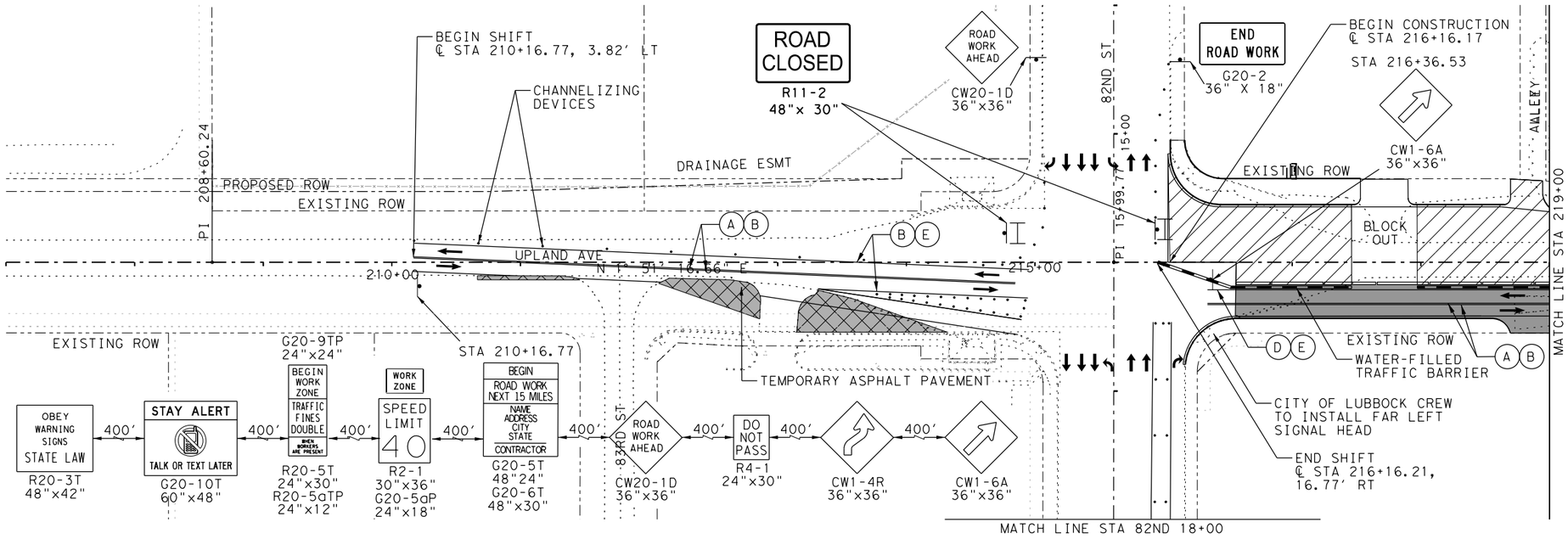
66TH STA 21+00 TO STA 26+76.97

SHEET 9 OF 9

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	22
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTES:

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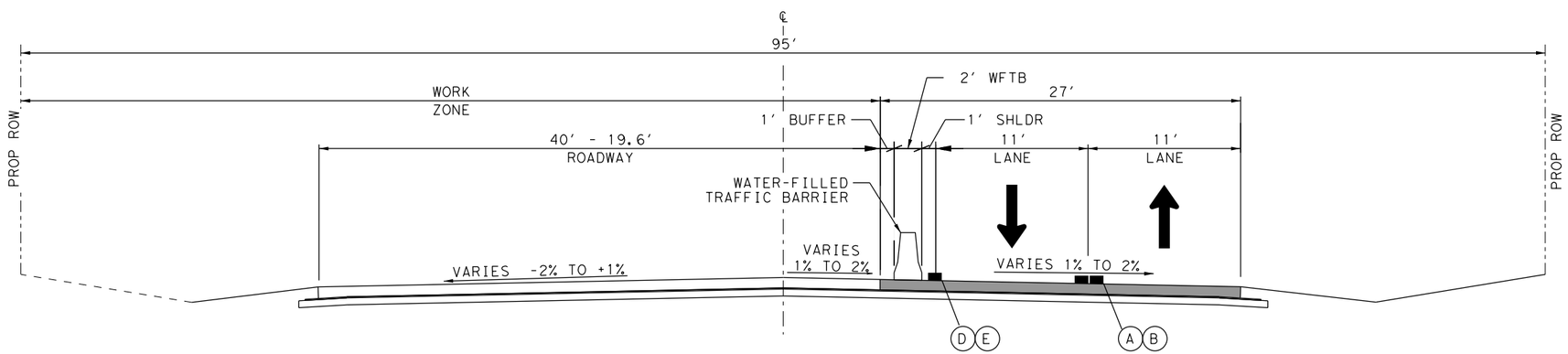
5. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



PHASE 2 TYPICAL SECTION
STA 271+11.45 - 275+74.36

0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

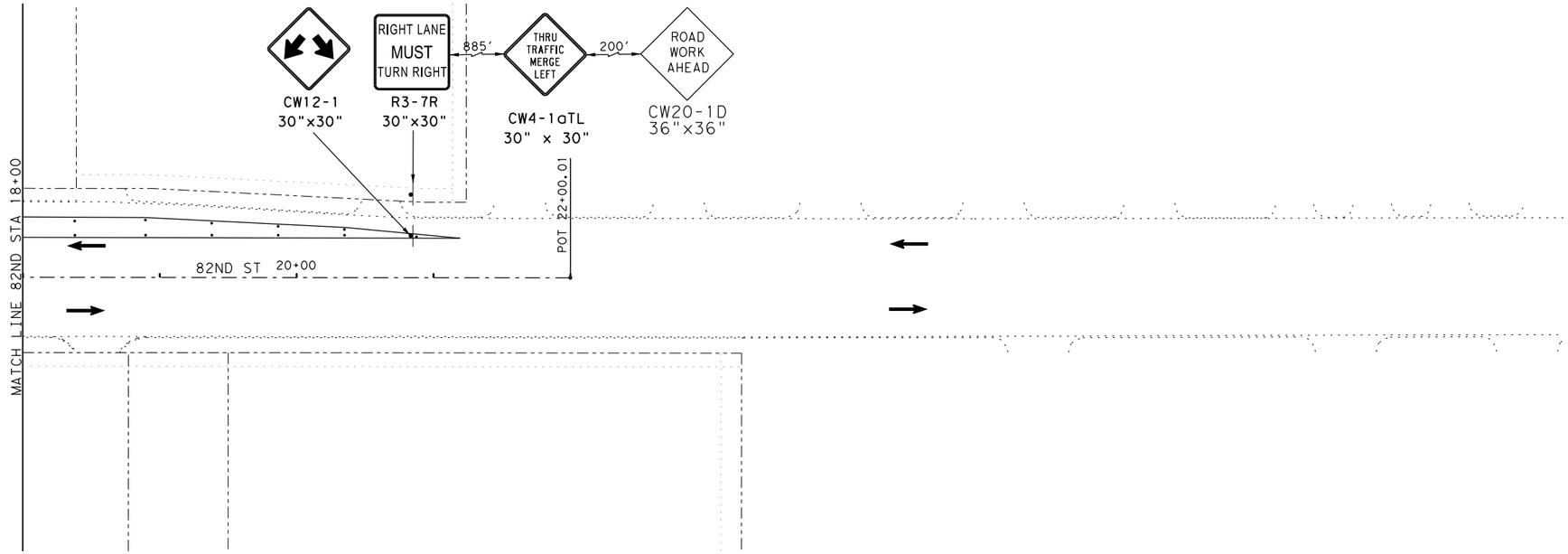
PHASE TWO
BEGIN TO STA 219+00

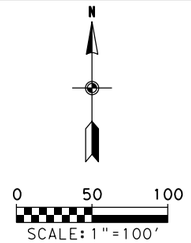
SHEET 1 OF 10

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	23
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
3. CONTRACTOR SHALL HAVE FOUR STOP SIGNS ON HAND AT ALL TIMES.
4. CONTRACTOR SHALL REGRADE DITCHES AND MAINTAIN DRAINAGE FLOW TO CROSS CULVERTS.
5. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.

Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

PHASE TWO

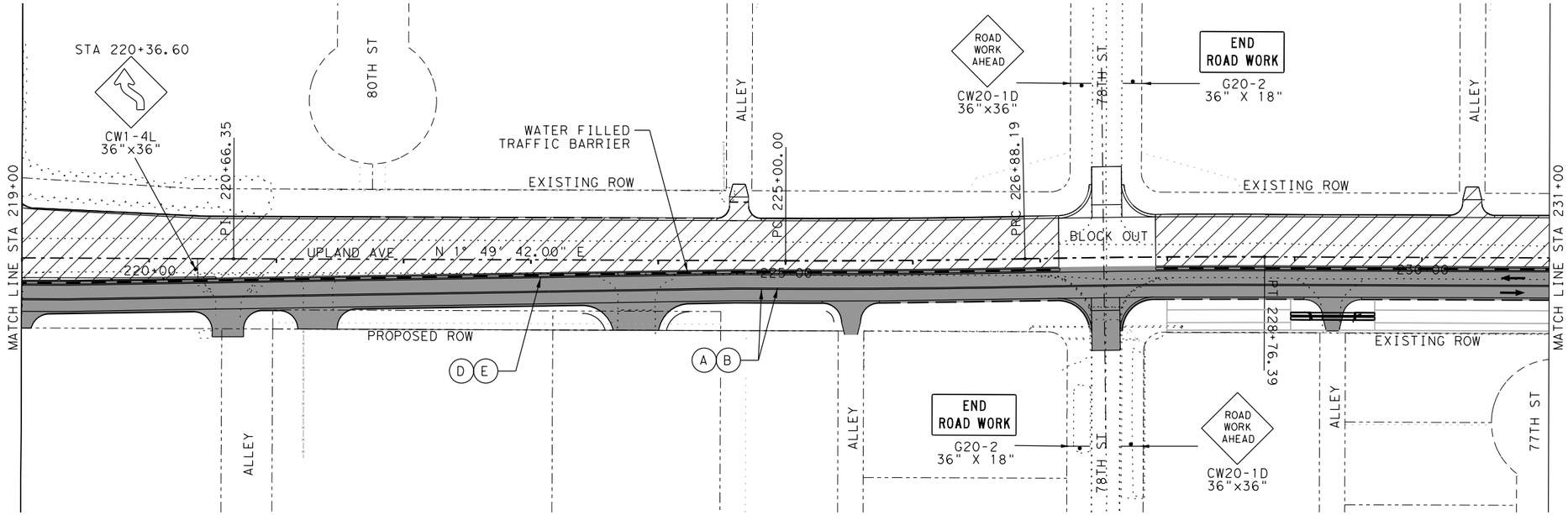
82ND STA 18+00 TO STA 22+00

SHEET 2 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	24
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

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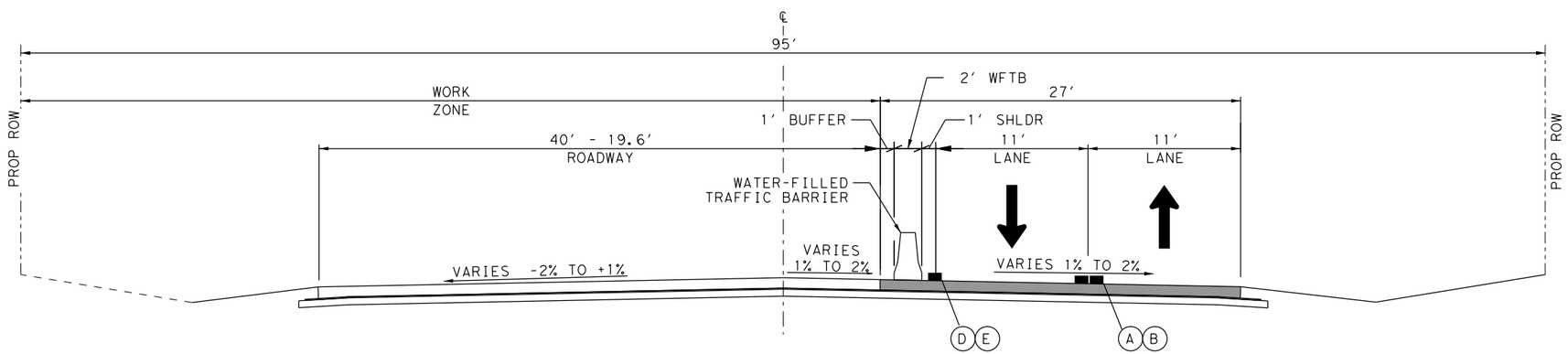
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



PHASE 2 TYPICAL SECTION
STA 271+11.45 - 275+74.36

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

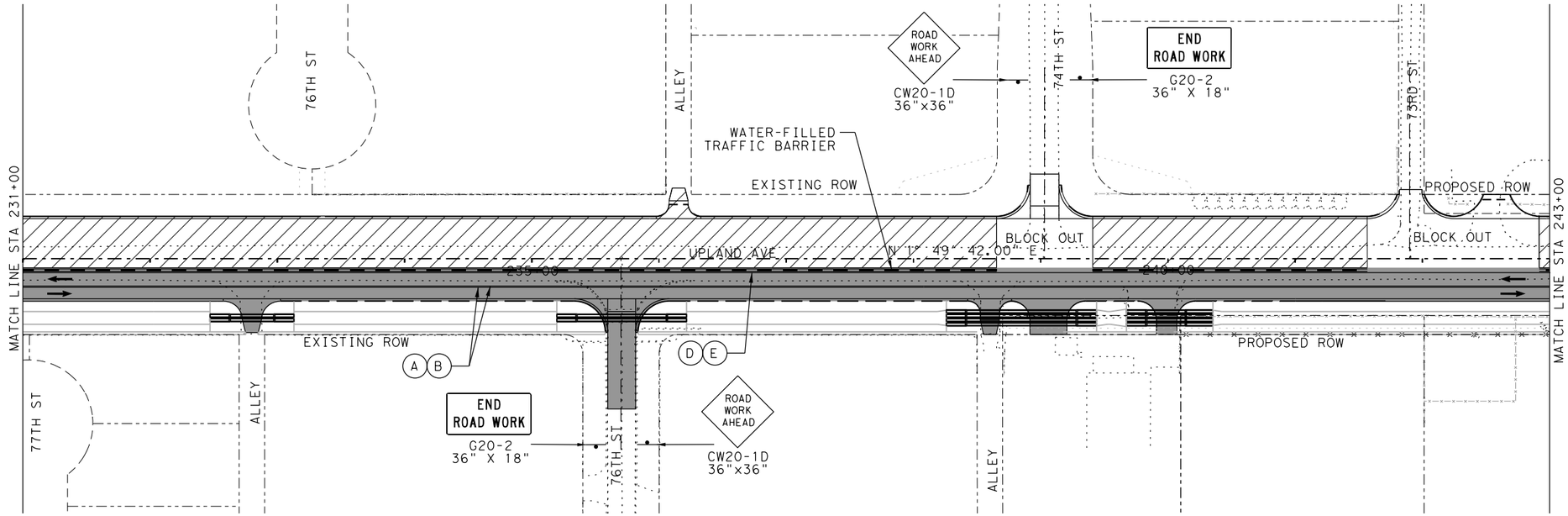
PHASE TWO
UPL STA 219+00 TO STA 231+00

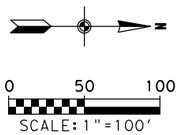
SHEET 3 OF 10

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	25
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



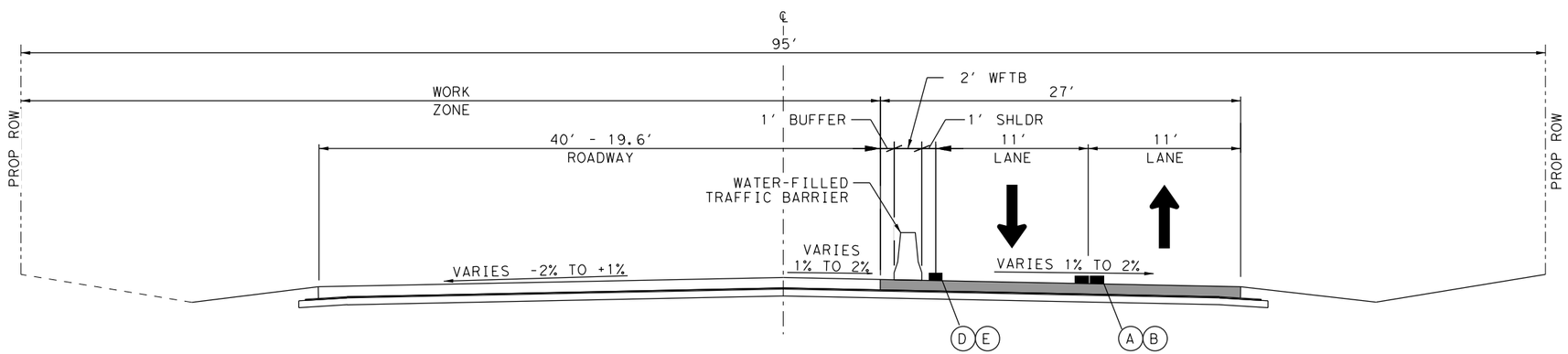


LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
3. CONTRACTOR SHALL HAVE FOUR STOP SIGNS ON HAND AT ALL TIMES.
4. CONTRACTOR SHALL REGRADE DITCHES AND MAINTAIN DRAINAGE FLOW TO CROSS CULVERTS.
5. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



PHASE 2 TYPICAL SECTION
STA 271+11.45 - 275+74.36

PEDRO CARRASCO JR. 98380 LICENSED PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

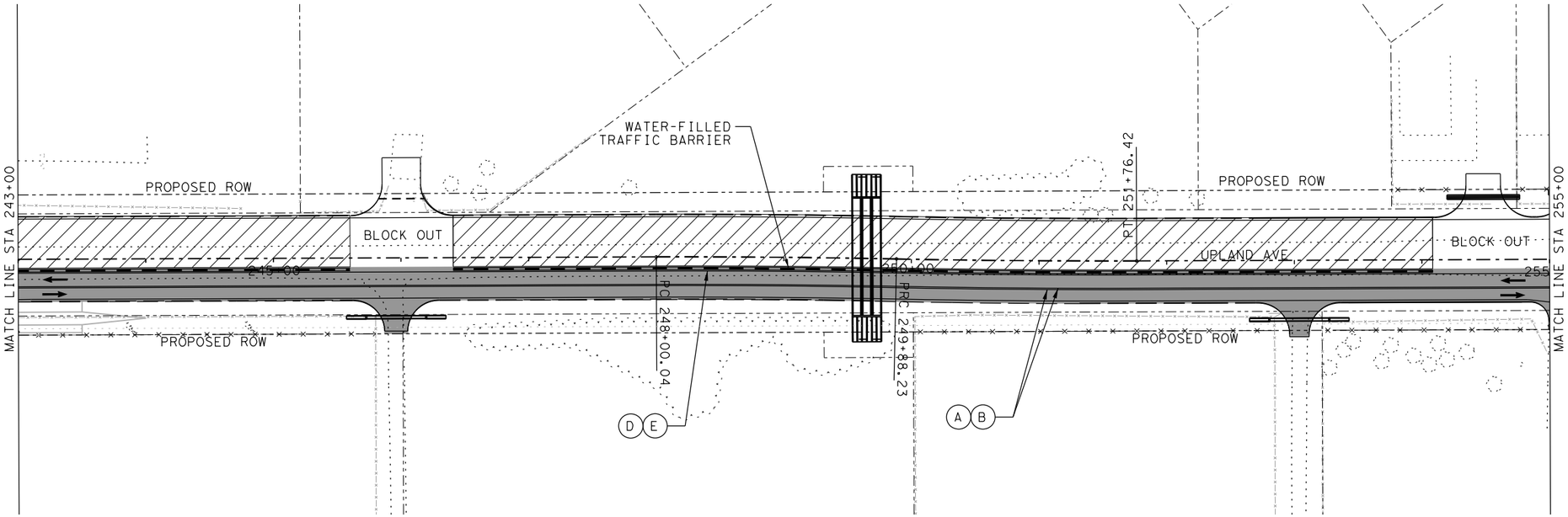
PHASE TWO
UPL STA 231+00 TO STA 243+00

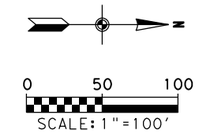
SHEET 4 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	26
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



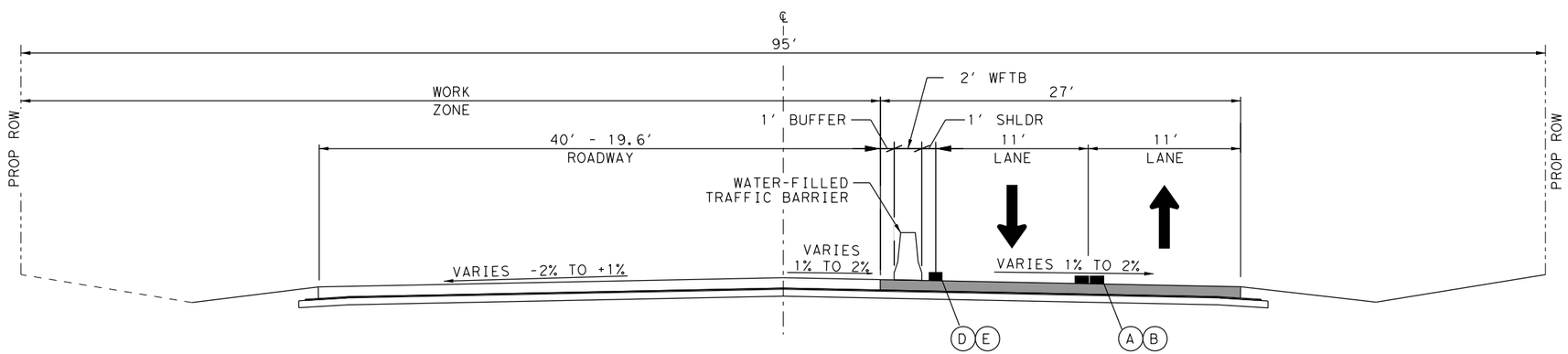


LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
3. CONTRACTOR SHALL HAVE FOUR STOP SIGNS ON HAND AT ALL TIMES.
4. CONTRACTOR SHALL REGRADE DITCHES AND MAINTAIN DRAINAGE FLOW TO CROSS CULVERTS.
5. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



PHASE 2 TYPICAL SECTION
STA 271+11.45 - 275+74.36

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

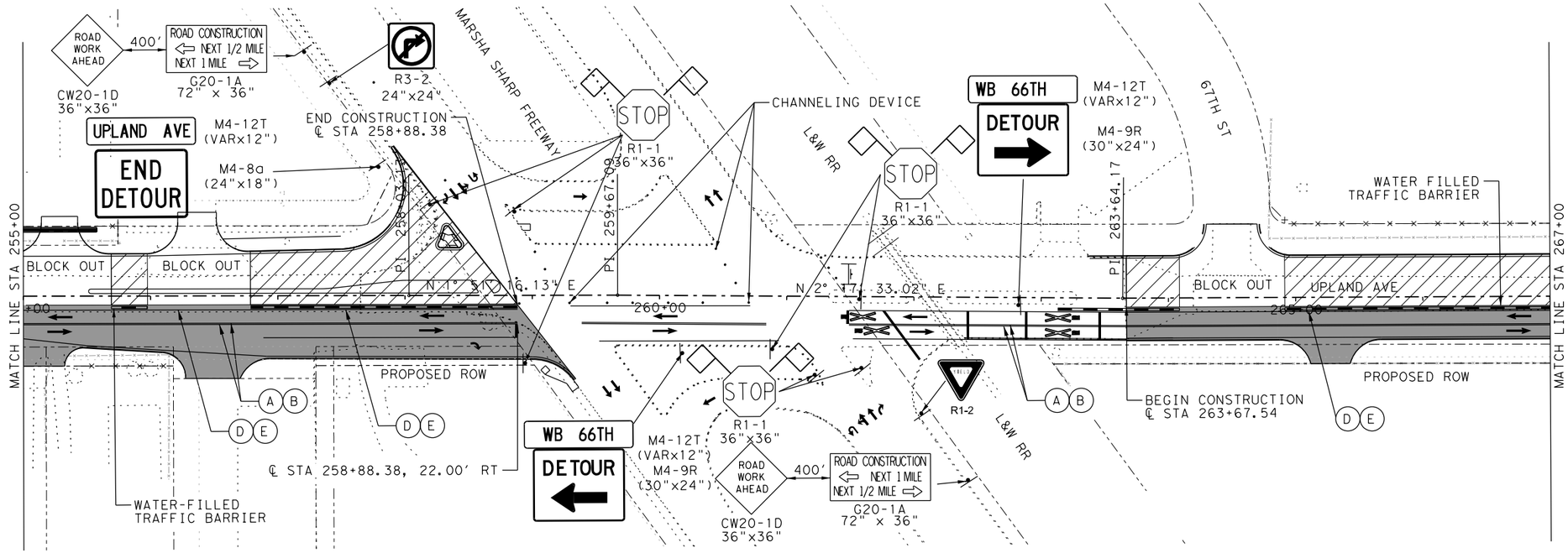
PHASE TWO
UPL STA 243+00 TO STA 255+00

SHEET 5 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	27
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



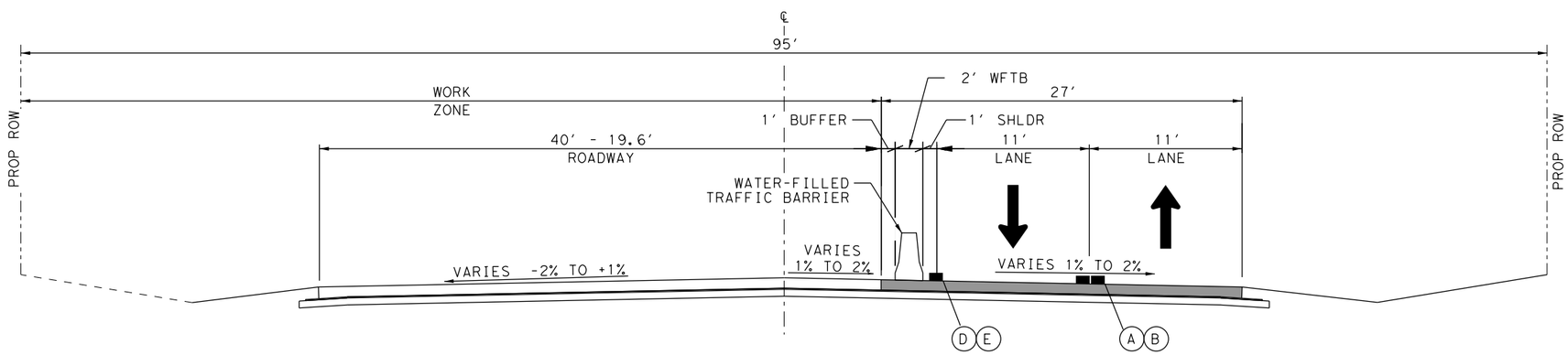
0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
3. CONTRACTOR SHALL HAVE FOUR STOP SIGNS ON HAND AT ALL TIMES.
4. CONTRACTOR SHALL REGRADE DITCHES AND MAINTAIN DRAINAGE FLOW TO CROSS CULVERTS.
5. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



PHASE 2 TYPICAL SECTION
STA 271+11.45 - 275+74.36

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

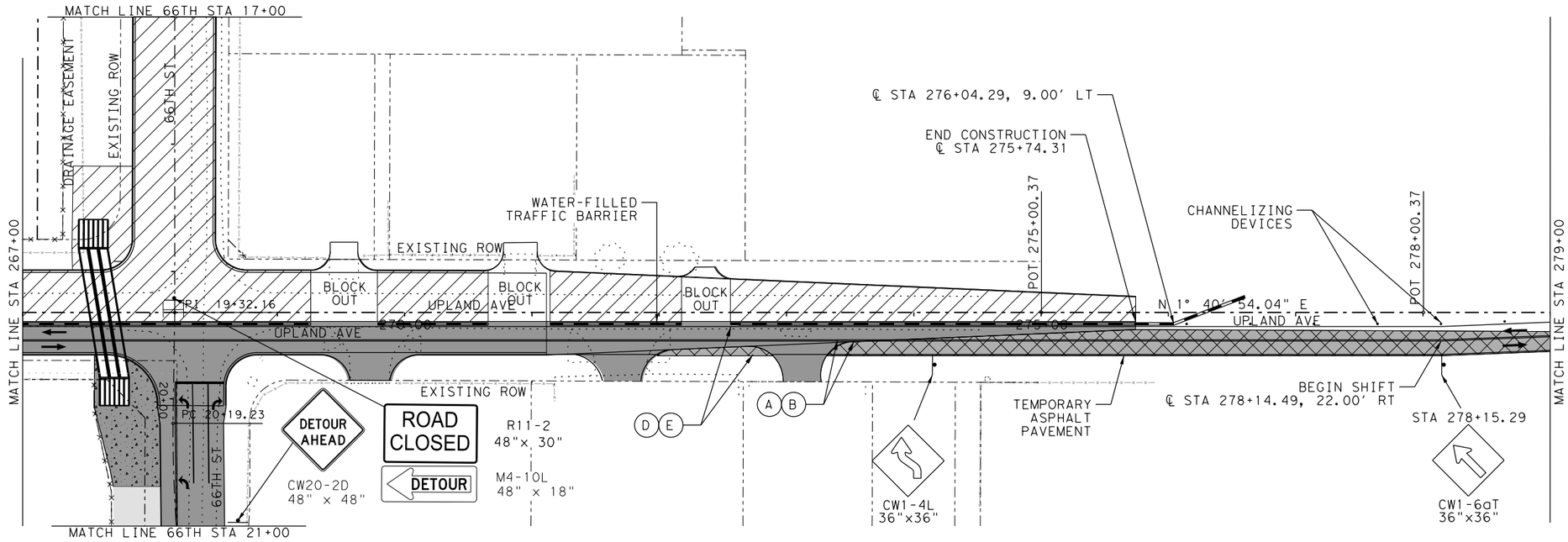
PHASE TWO
UPL STA 255+00 TO STA 267+00

SHEET 6 OF 10

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	28
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
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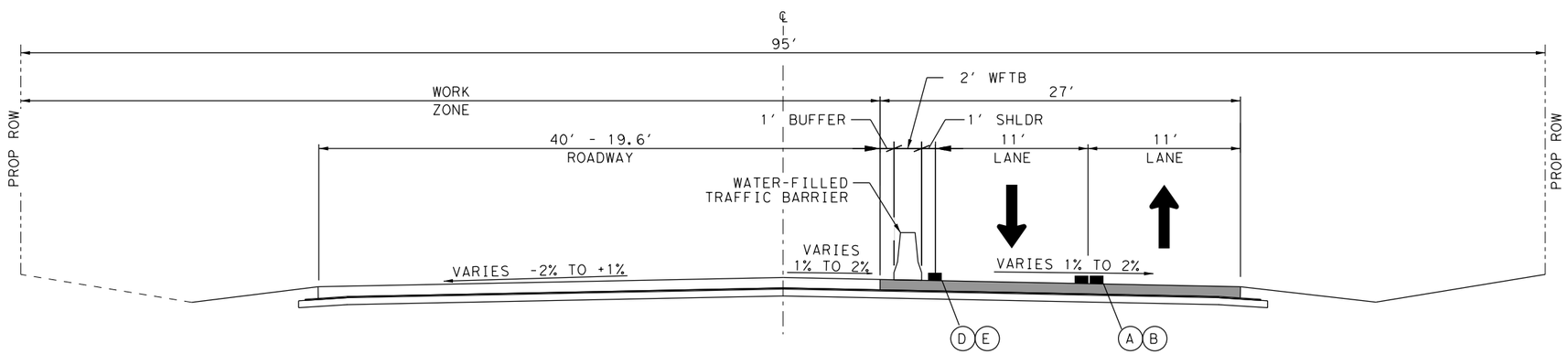
4. CONTRACTOR SHALL REGRADE DITCHES AND MAINTAIN DRAINAGE FLOW TO CROSS CULVERTS.
5. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



PHASE 2 TYPICAL SECTION
STA 271+11.45 - 275+74.36

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

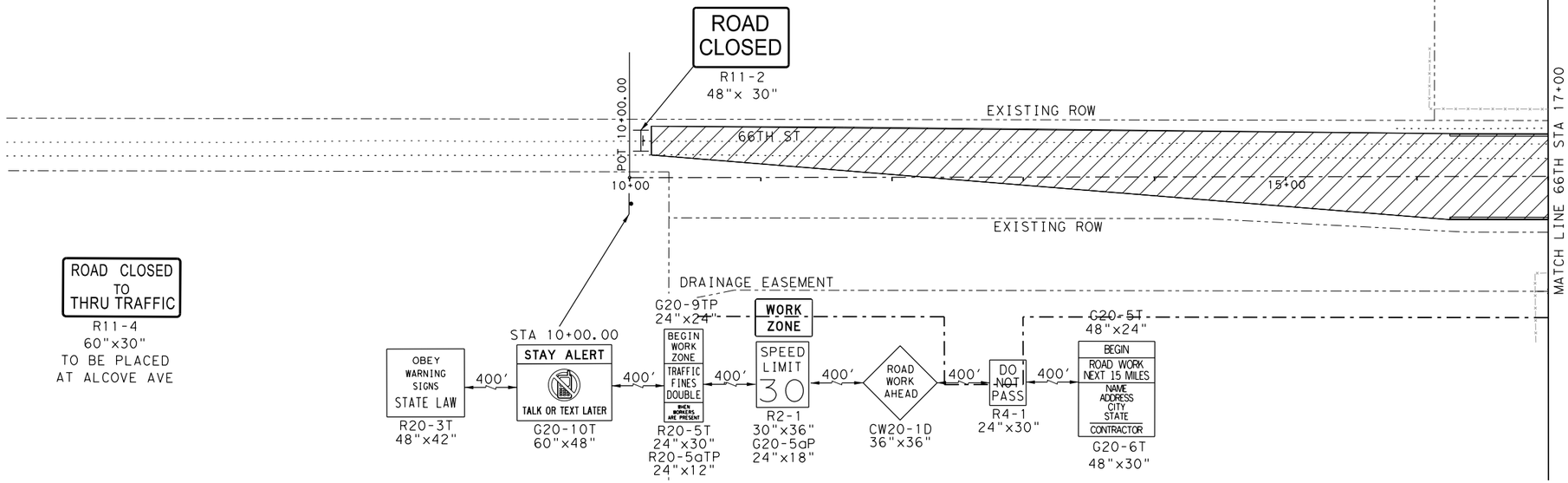
PHASE TWO
UPL STA 267+00 TO 279+00

SHEET 7 OF 10

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	29
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTES:

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6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.

N

0 50 100

SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

PHASE TWO

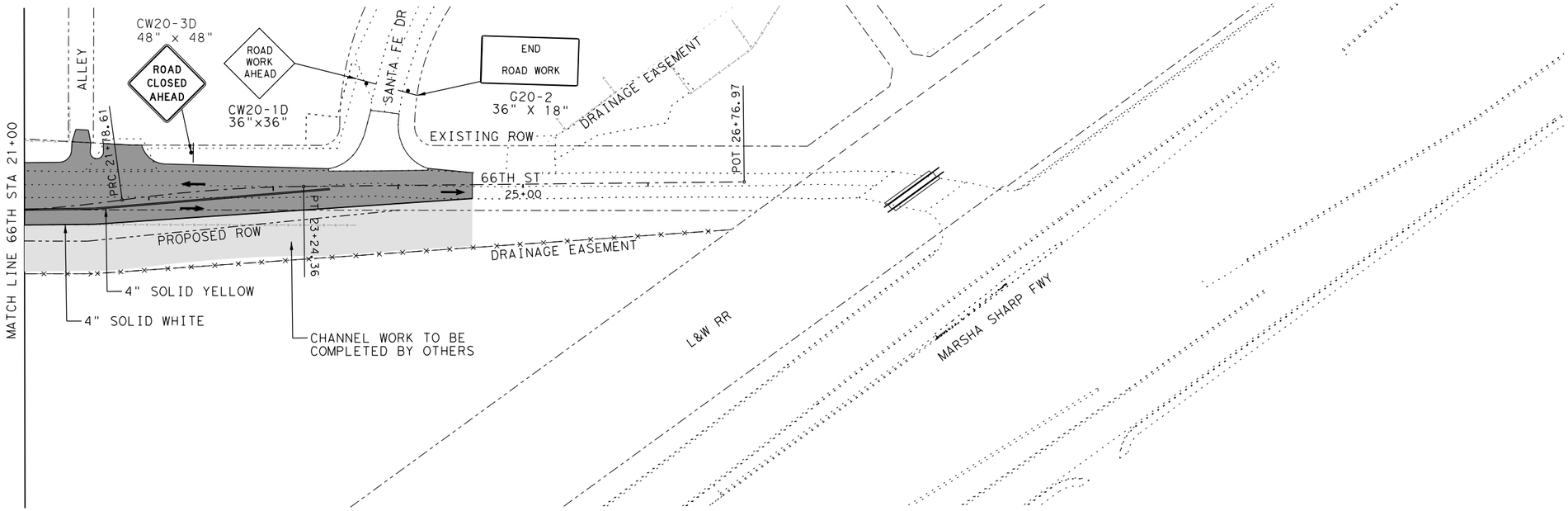
66TH STA 10+00 TO STA 17+00

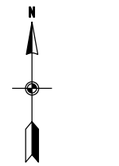
SHEET 8 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	30
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

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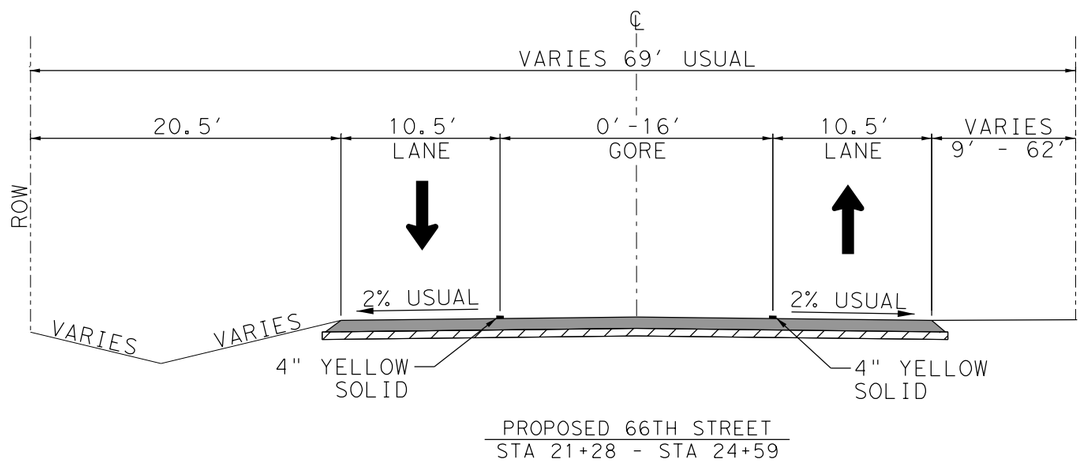


PROPOSED 66TH STREET
STA 21+28 - STA 24+59

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

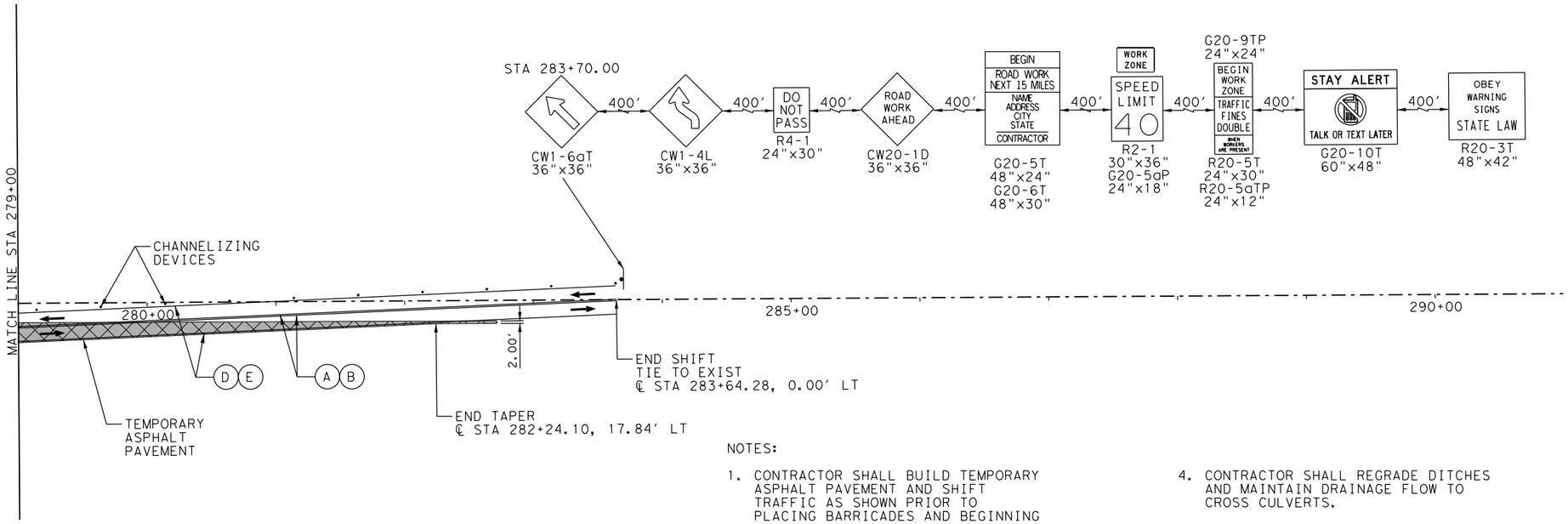
PHASE TWO
66TH STA 21+00 TO STA 26+76.97

SHEET 9 OF 10

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	31
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTES:

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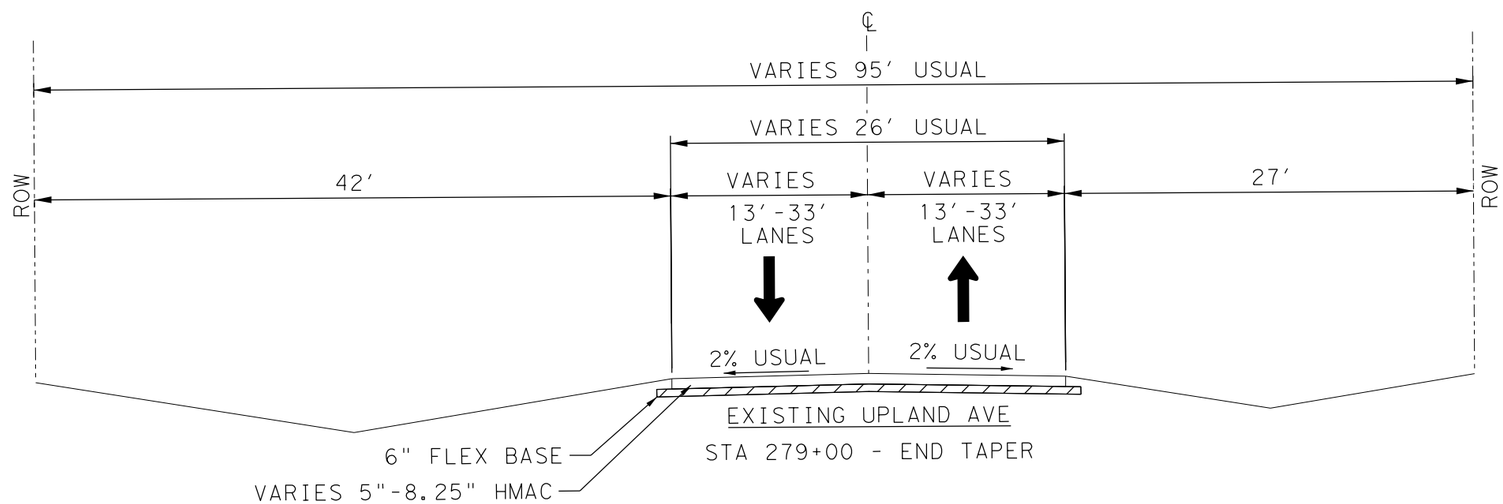
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

FREESE AND NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation
© 2023

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

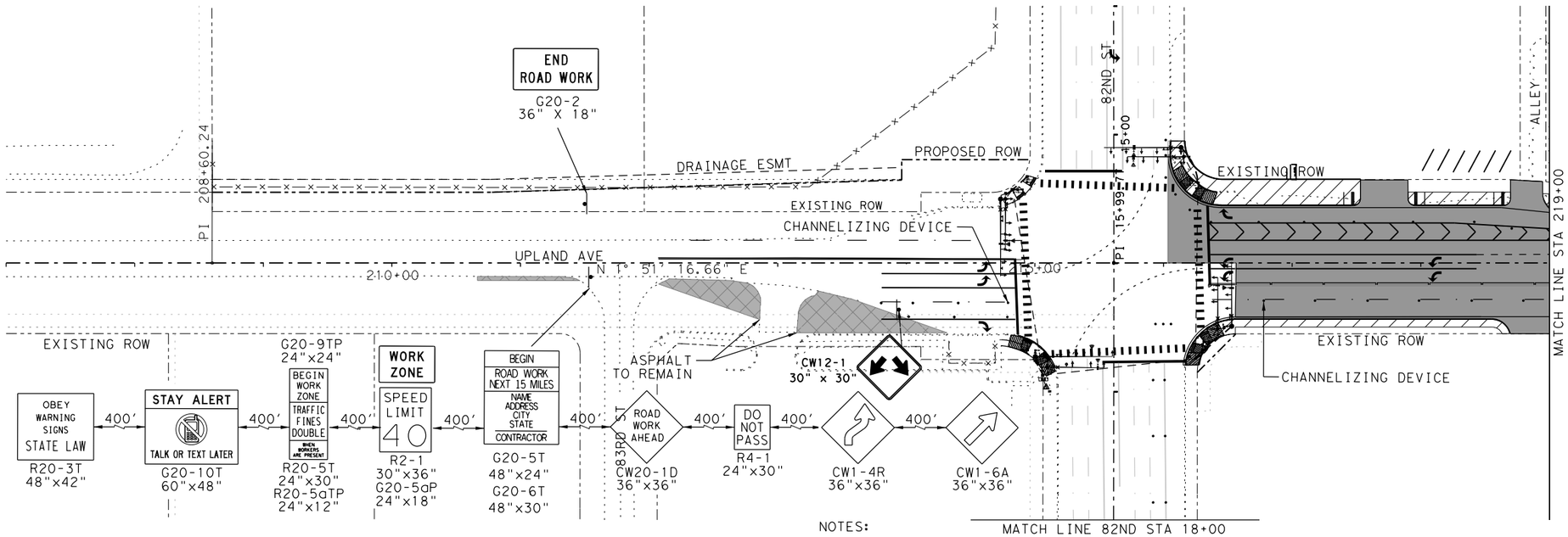
PHASE TWO
UPL STA 279+00 TO STA 291+00

SHEET 10 OF 10

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	32
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

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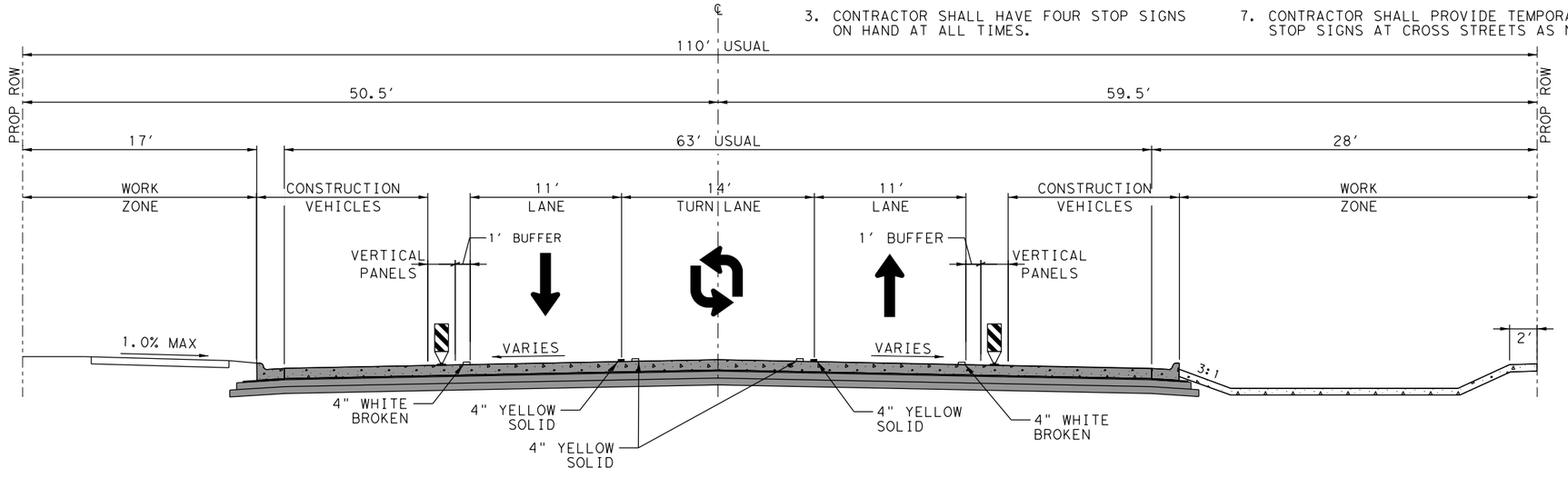
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



PHASE 3 TYPICAL SECTION
STA 210+16.77- STA 243+00.00

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

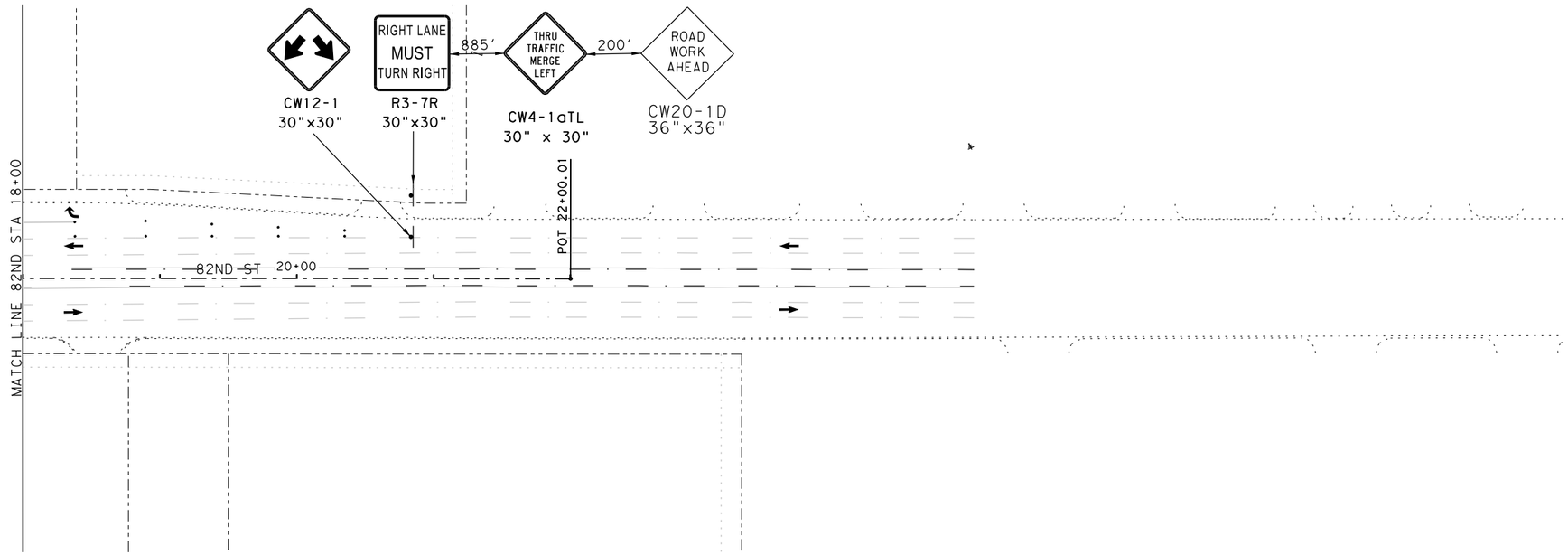
TRAFFIC CONTROL PLAN
PHASE THREE
BEGIN PROJECT TO STA 219+00

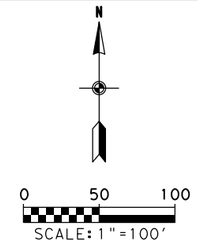
SHEET 1 OF 9

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	33
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



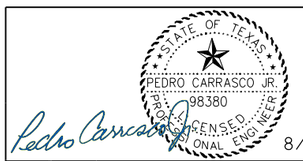


LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
3. CONTRACTOR SHALL HAVE FOUR STOP SIGNS ON HAND AT ALL TIMES.
4. CONTRACTOR SHALL REGRADE DITCHES AND MAINTAIN DRAINAGE FLOW TO CROSS CULVERTS.
5. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

PHASE THREE

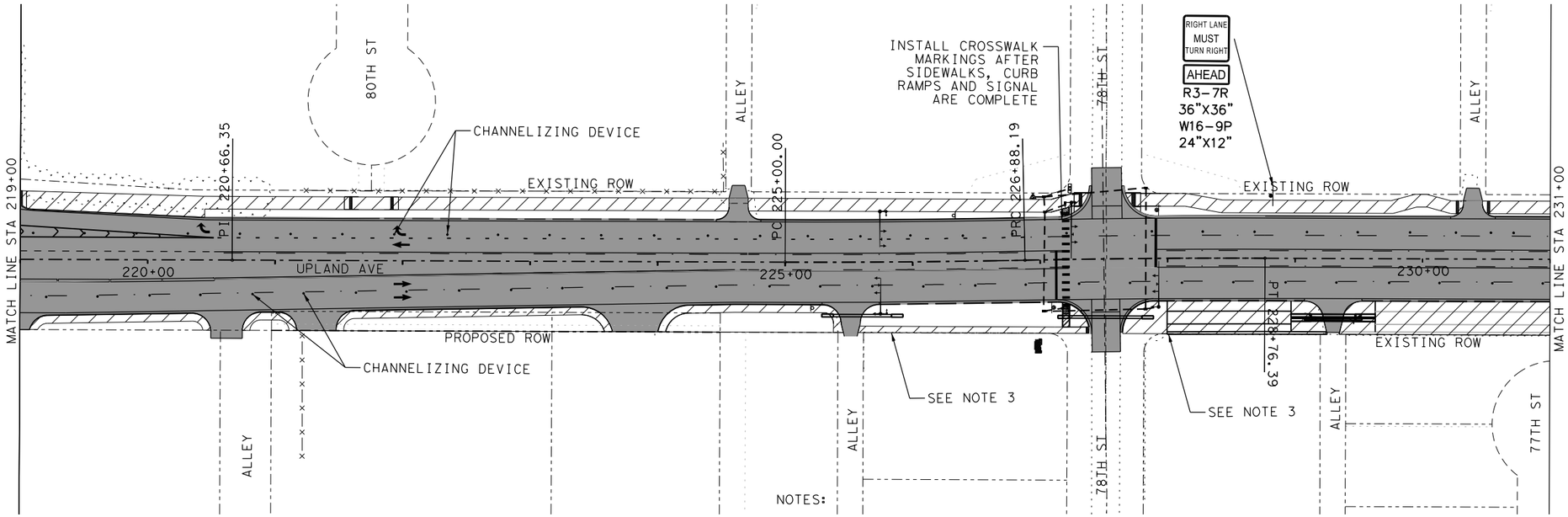
82ND STA 18+00 TO STA 22+00

SHEET 2 OF 9

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	34
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
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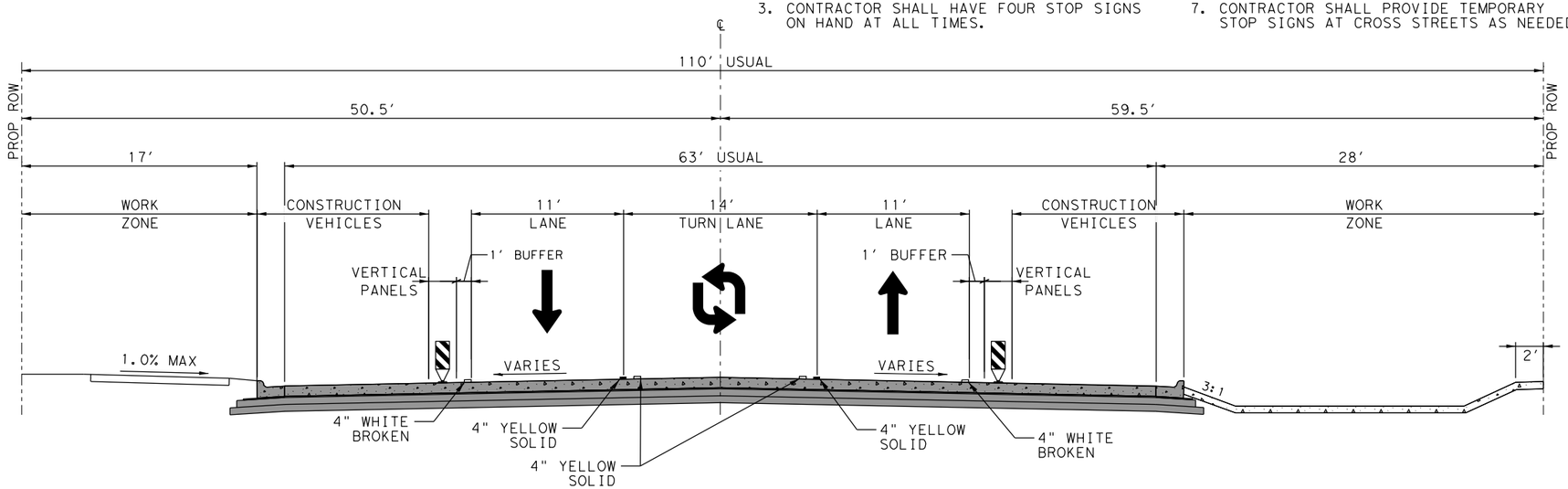
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



PHASE 3 TYPICAL SECTION
STA 210+16.77- STA 243+00.00

0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

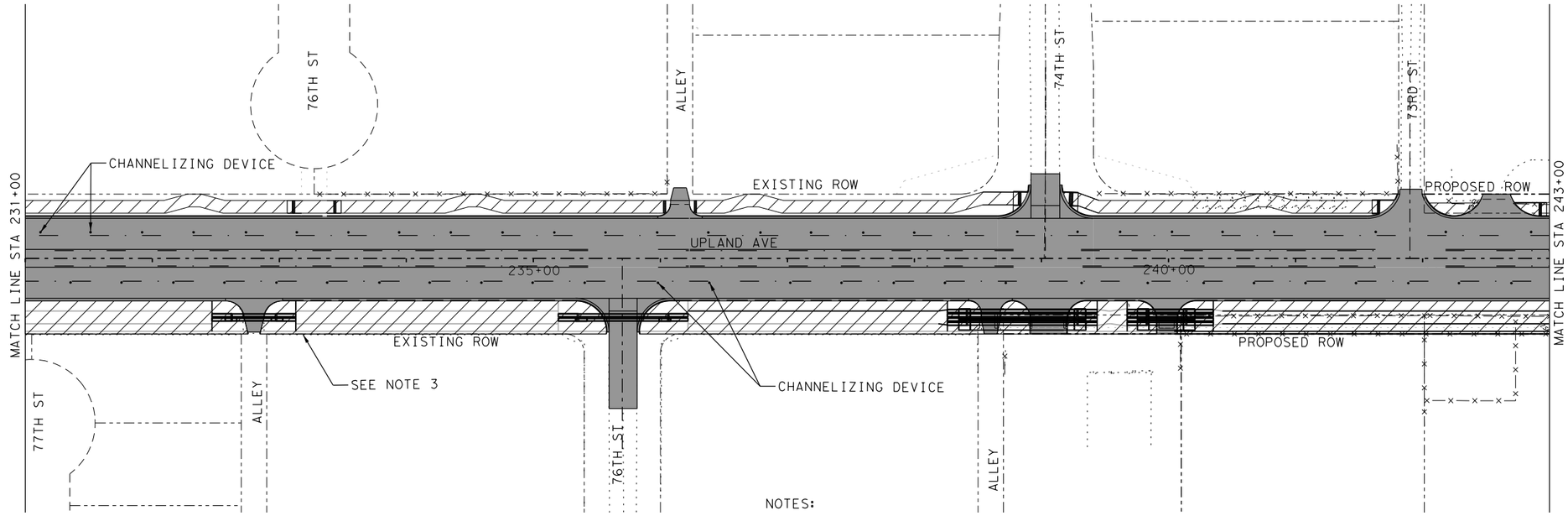
PHASE THREE
UPL STA 219+00 TO STA 231+00

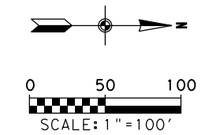
SHEET 3 OF 9

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	35
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
2. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC AND ALL DRIVEWAYS DURING CONSTRUCTION.
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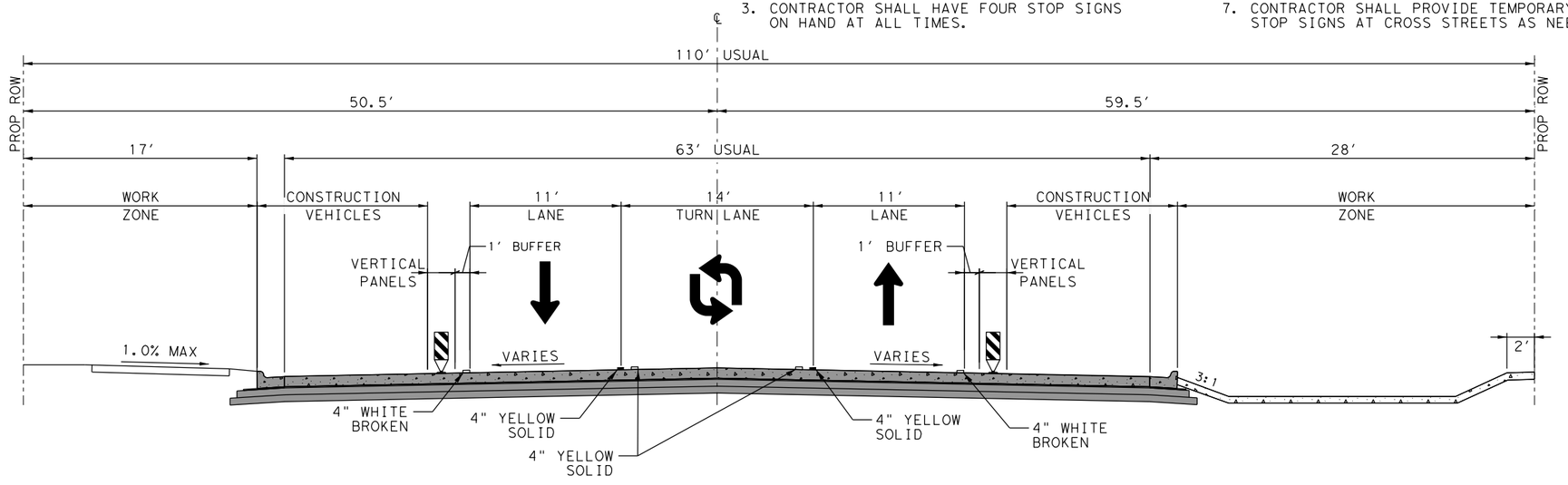
5. CONTRACTOR SHALL BUILD BLOCK OUT DRIVES SEPARATELY TO MAINTAIN ACCESS TO ADJACENT NEIGHBORHOOD AT ALL TIMES.
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



PHASE 3 TYPICAL SECTION
STA 210+16.77- STA 243+00.00

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

8/9/2023

TEXAS FIRM F-928
Kimley»Horn

FREESE AND NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

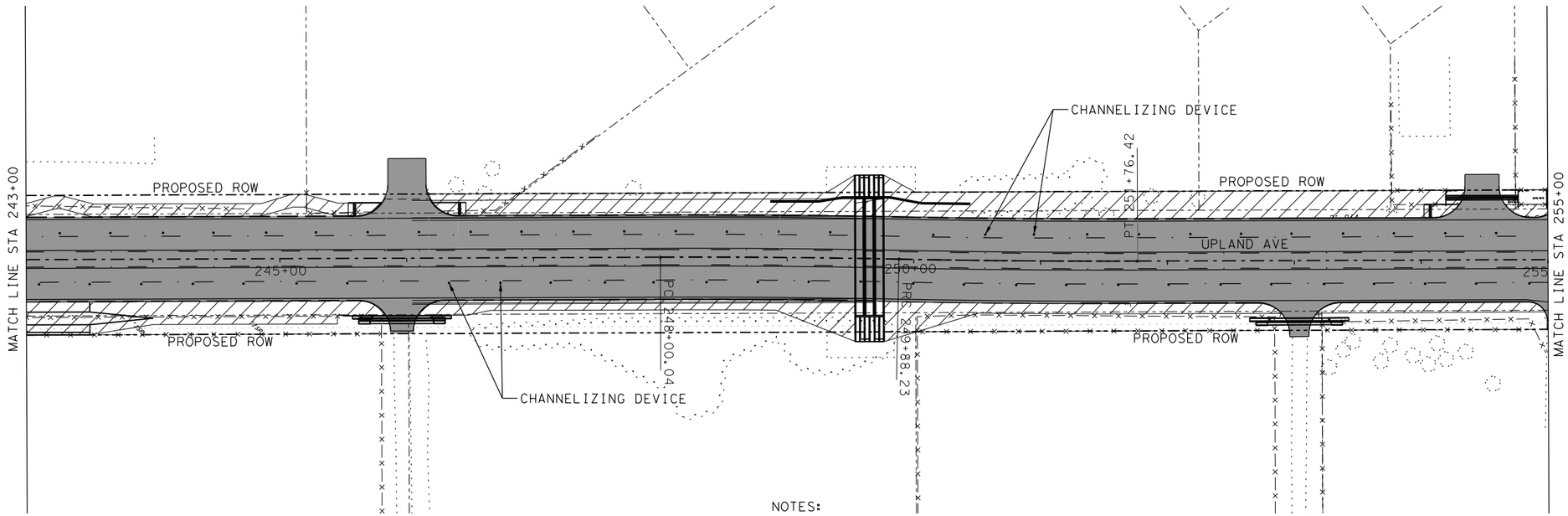
PHASE THREE
UPL STA 231+00 TO STA 243+00

SHEET 4 OF 9

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	36
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 50 100
SCALE: 1"=100'

LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

1. CONTRACTOR SHALL BUILD TEMPORARY ASPHALT PAVEMENT AND SHIFT TRAFFIC AS SHOWN PRIOR TO PLACING BARRICADES AND BEGINNING CONSTRUCTION ON UPLAND AVE.
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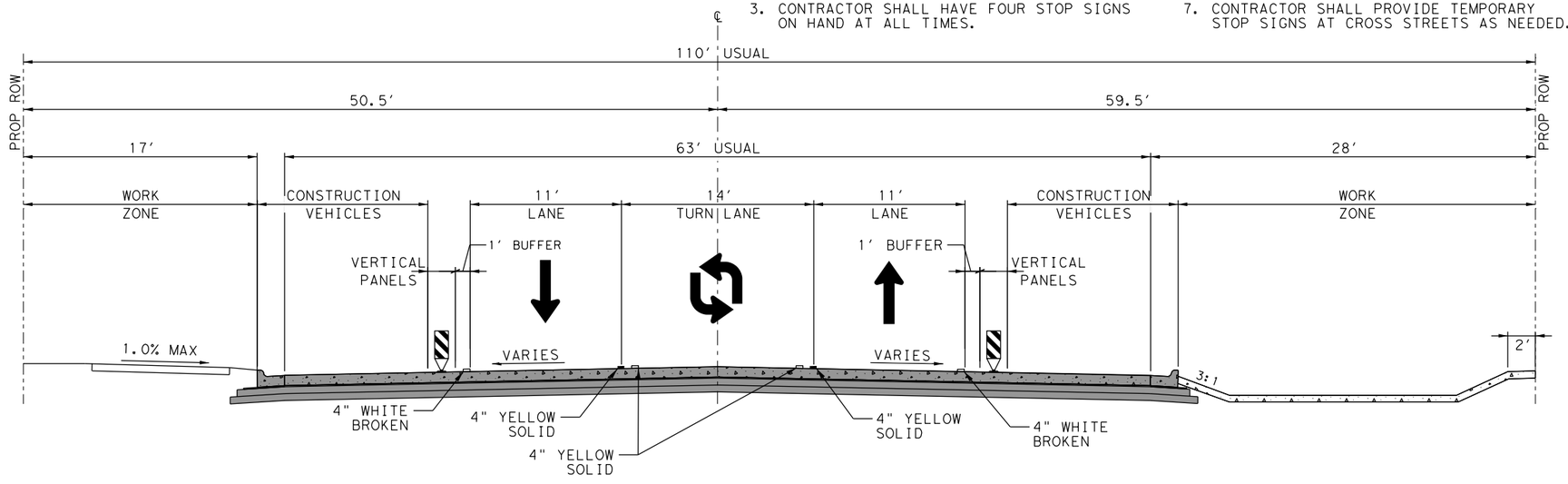
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



PHASE 3 TYPICAL SECTION
STA 210+16.77- STA 243+00.00

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

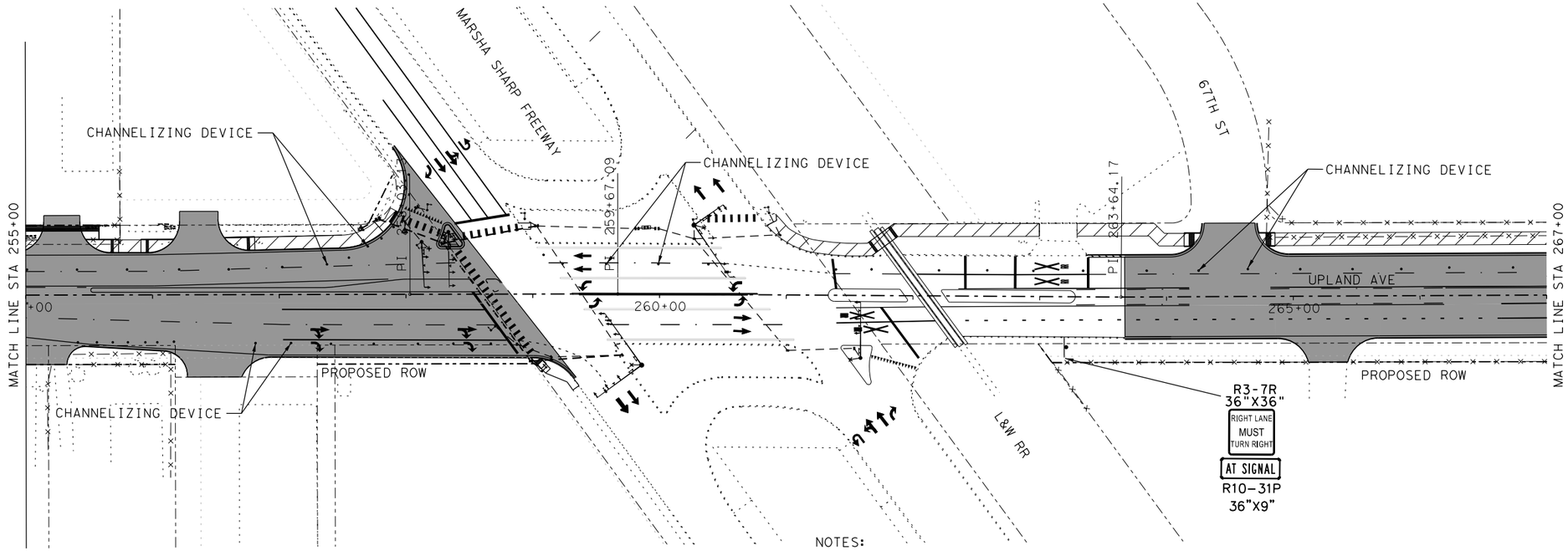
PHASE THREE
UPL STA 243+00 TO STA 255+00

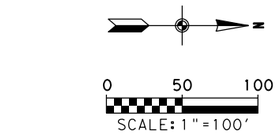
SHEET 5 OF 9

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	37
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

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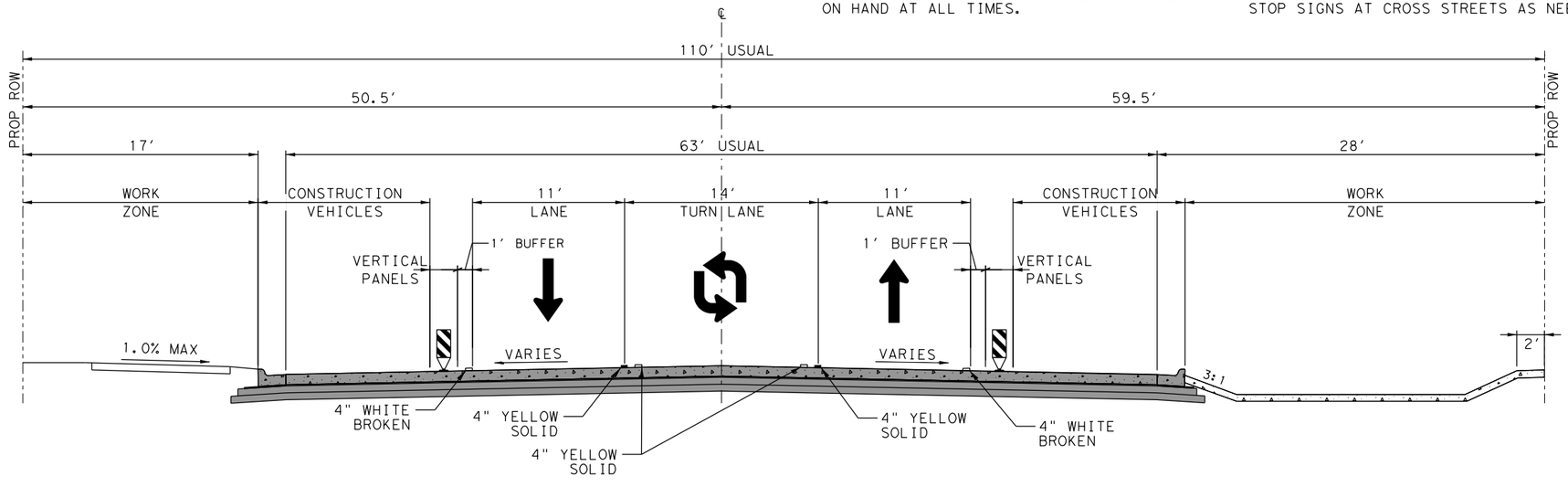
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



PHASE 3 TYPICAL SECTION
STA 210+16.77- STA 243+00.00

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

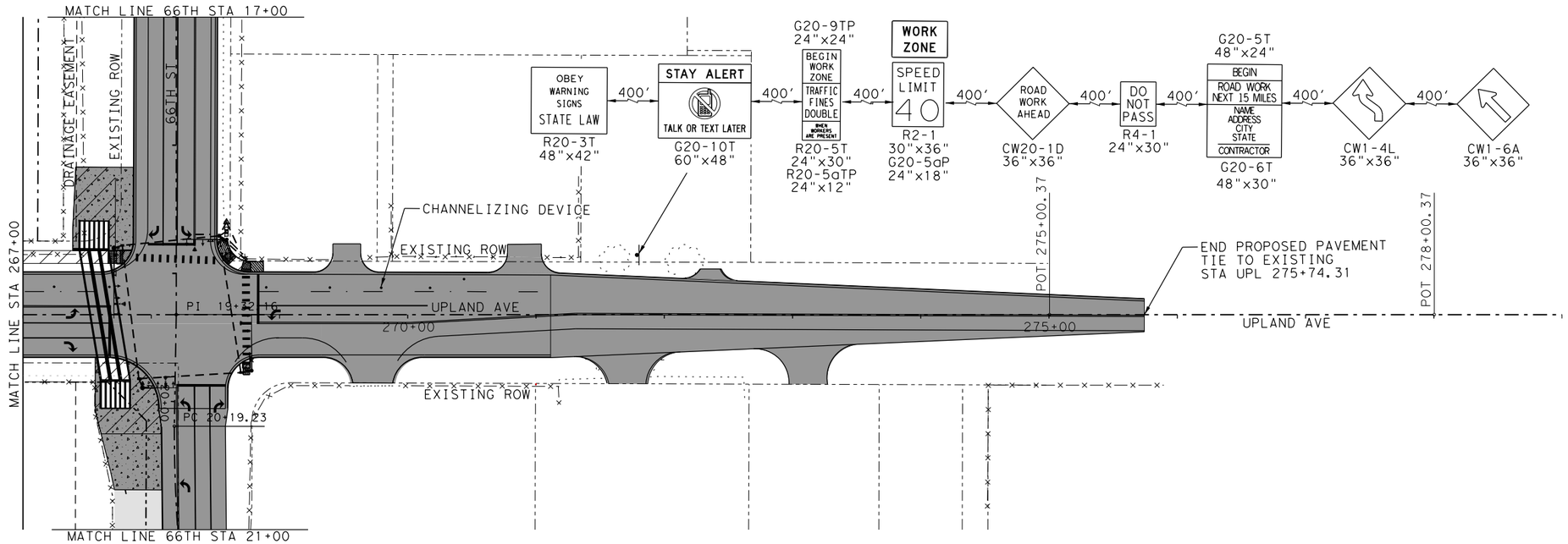
PHASE THREE
UPL STA 255+00 TO STA 267+00

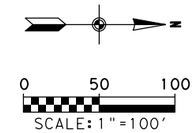
SHEET 6 OF 9

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	38
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

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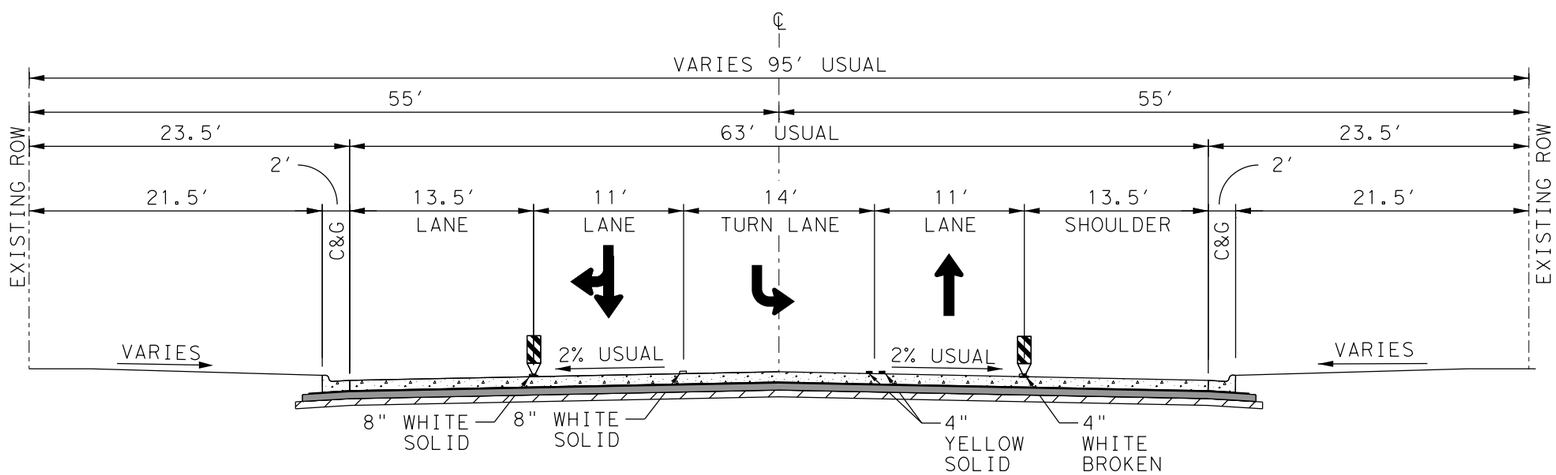


STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

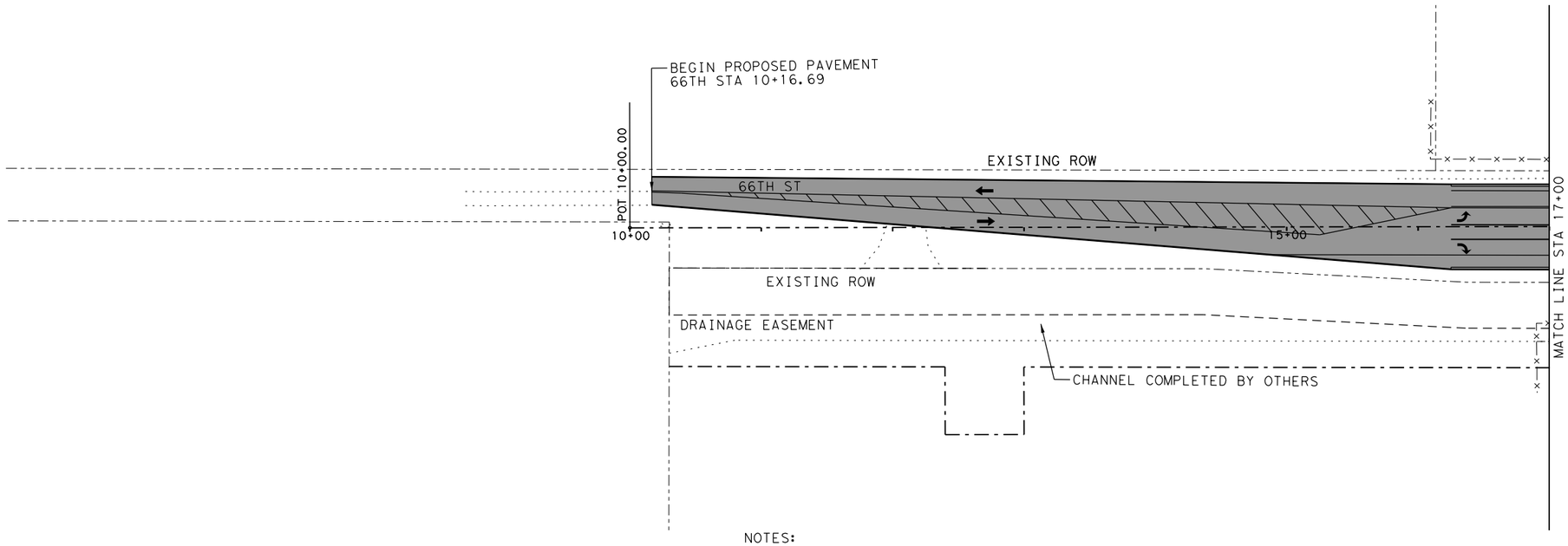
PHASE THREE
UPL STA 267+00 TO END PROJECT

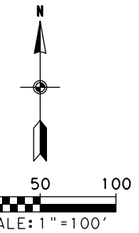
SHEET 7 OF 9

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	39
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

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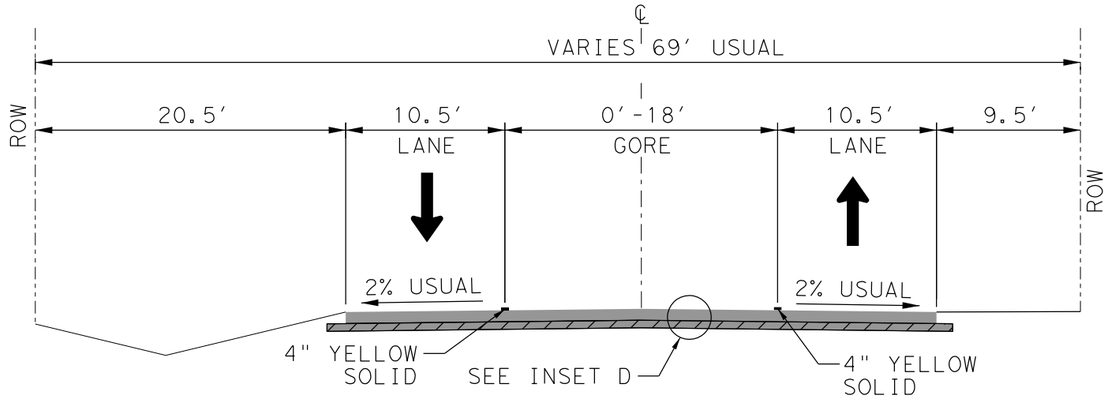


PHASE THREE TYPICAL SECTION
STA 11+63 - STA 16+25
STA 21+28 - STA 24+59

8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

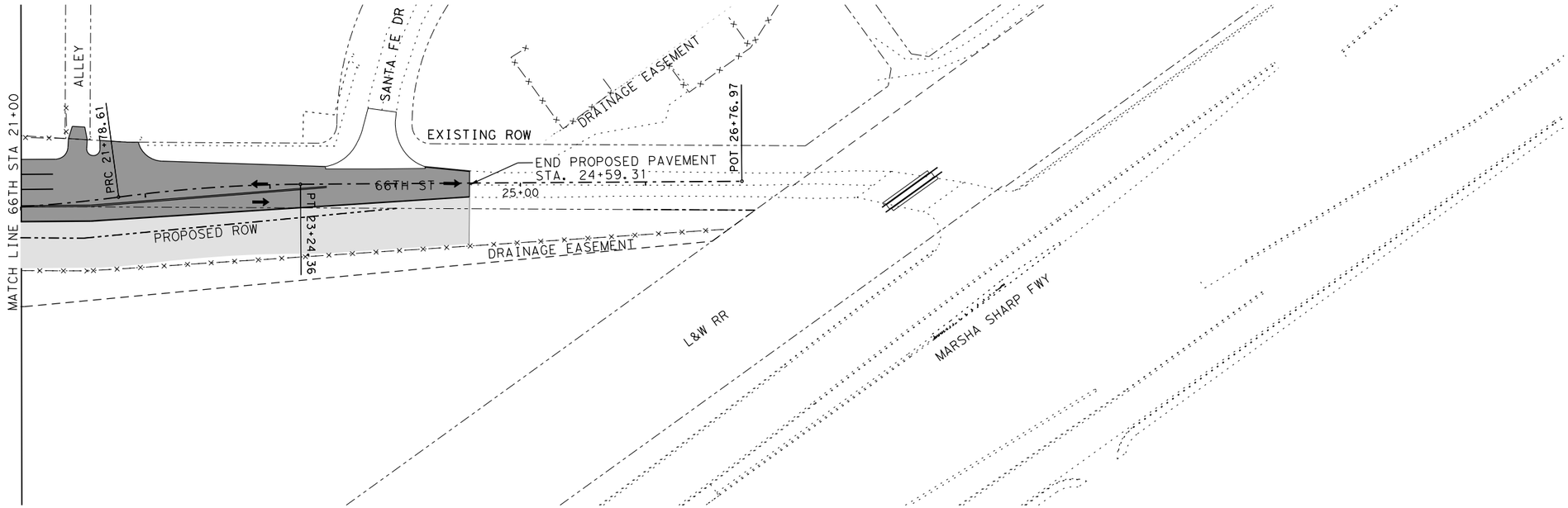
PHASE THREE
66TH STA 10+00 TO STA 17+00

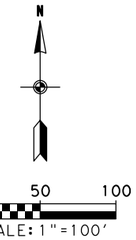
SHEET 8 OF 9

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	40
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- TEMPORARY PAVEMENT
- CONSTRUCTED THIS PHASE
- PREVIOUSLY CONSTRUCTED
- CHANNELIZING DEVICE
- CHANNELIZING DEVICE
- TYPE III BARRICADE
- CHANNELIZING FLAG
- WATER-FILLED TRAFFIC BARRIER
- WORK ZONE SIGN
- TRAFFIC DIRECTION
- (A) WK ZN PAV MRK REMOV (REFL) TY II-A-A
- (B) WK ZN PAV MRK REMOV (TRAF BTN) TY Y
- (C) WK ZN PAV MRK REMOV (TRAF BUTTON) TY W
- (D) WK ZN PAV MRK REMOV (REFL) TY I-C
- (E) WK ZN PAV MRK REMOV (TRAF BTN) TY W

NOTES:

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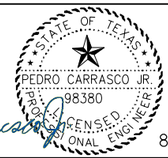
6. WORK ZONE TRAFFIC BUTTOM SHALL BE USED ON CRCP SURFACE.
7. CONTRACTOR SHALL PROVIDE TEMPORARY STOP SIGNS AT CROSS STREETS AS NEEDED.



Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC CONTROL PLAN

PHASE THREE

66TH STA 21+00 TO STA 26+76.97

SHEET 9 OF 9

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	41
CONT.	SECT.	JOB	
0905	06	095,ETC.	

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		42

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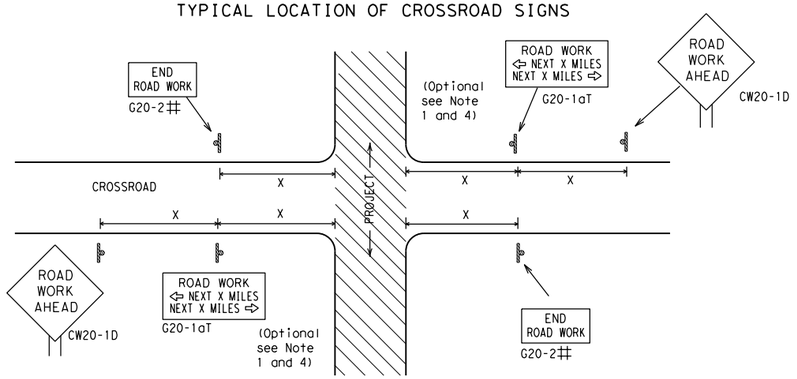
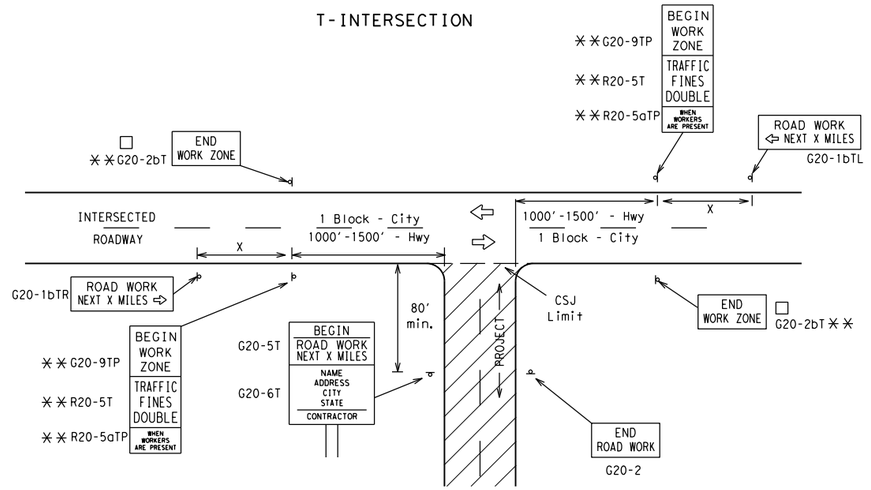
TYPICAL LOCATION OF CROSSROAD SIGNS



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 as per TMUTCD Part 5. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1aT)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

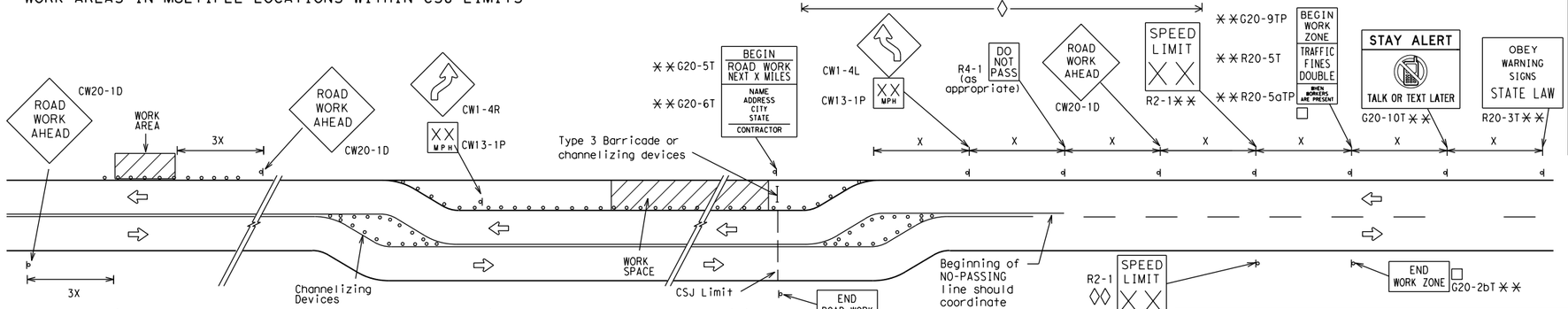
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

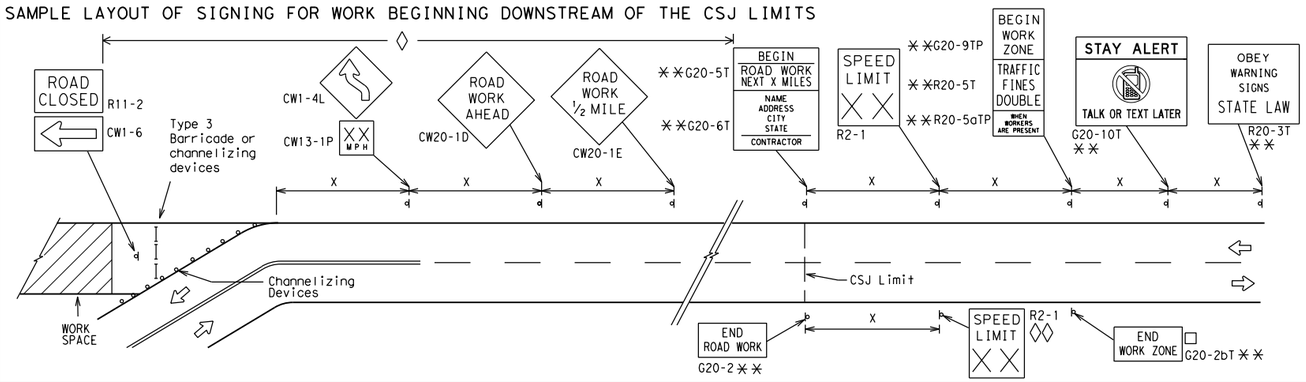
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LBB	LUBBOCK		43

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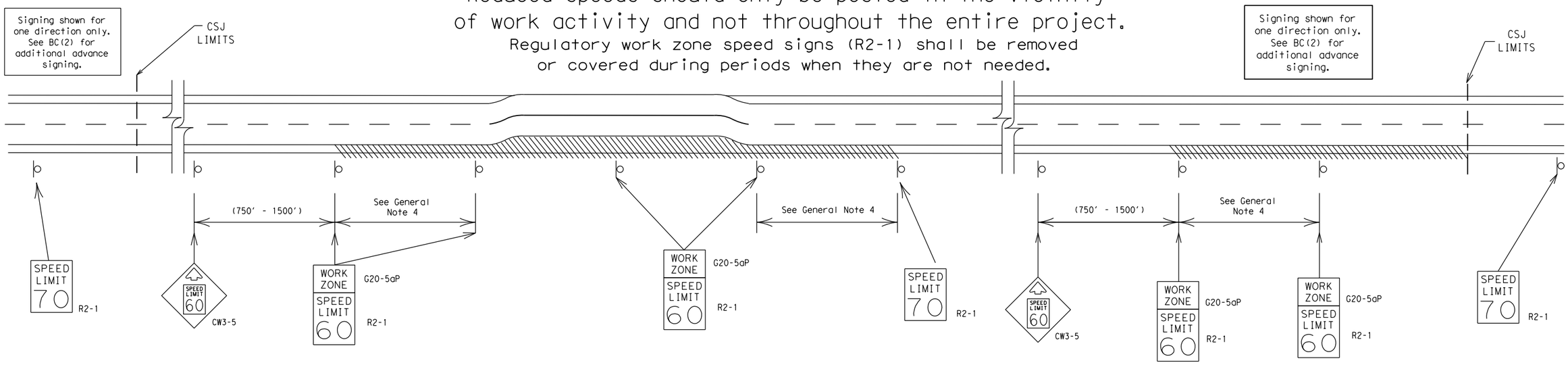
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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SHEET 3 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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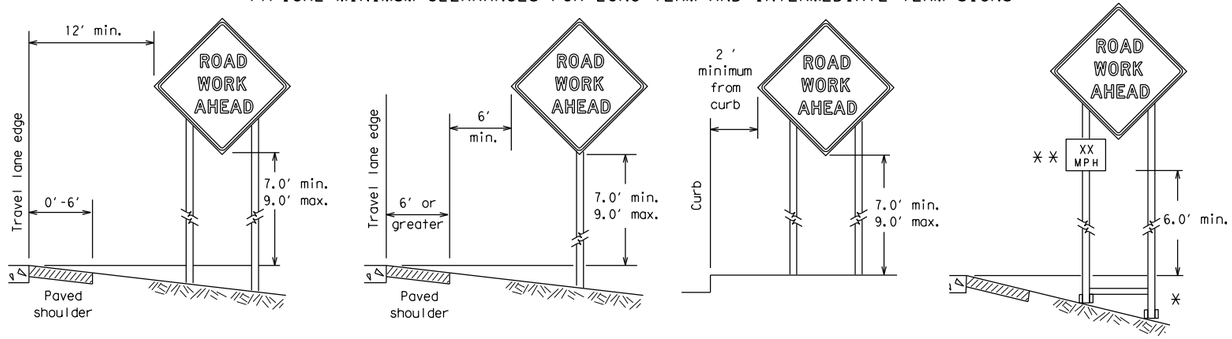
REVISIONS	0905	06	095,ETC.	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LBB	LUBBOCK		44

97

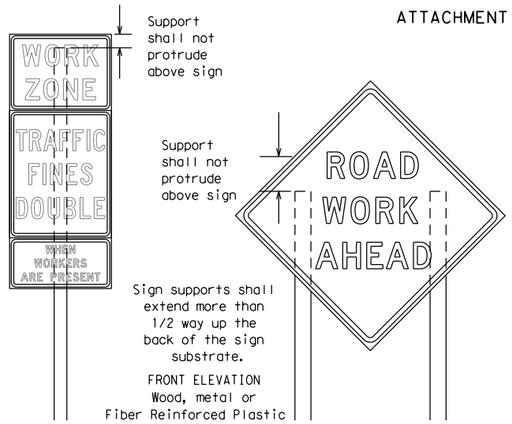
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

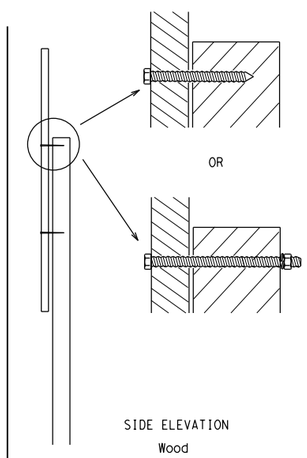


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ 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





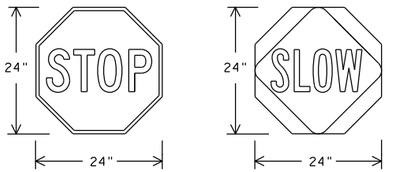
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LBB	LUBBOCK		45

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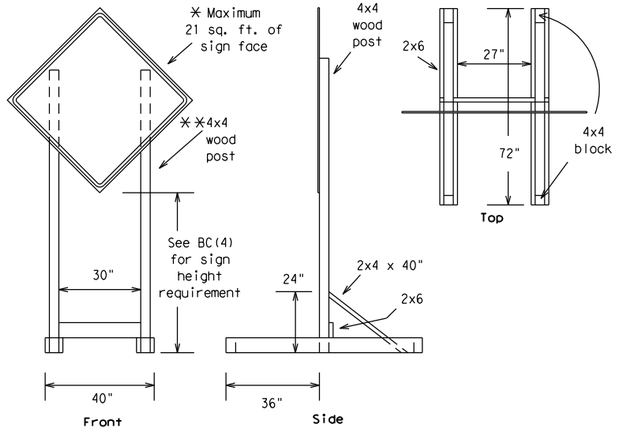
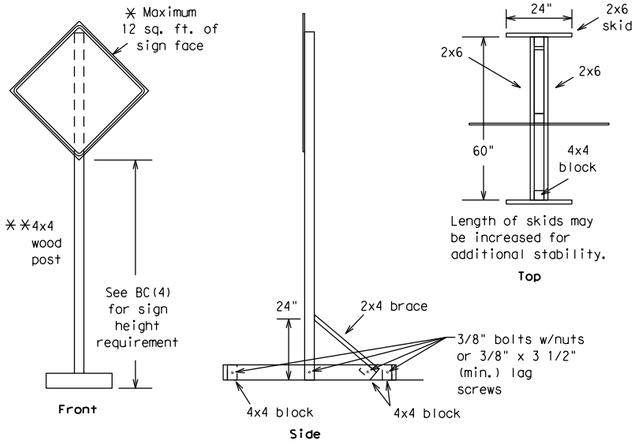
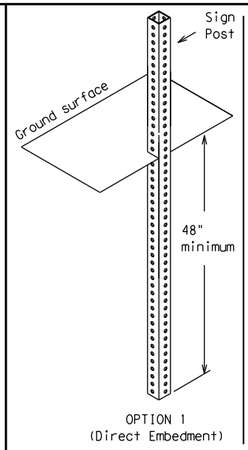
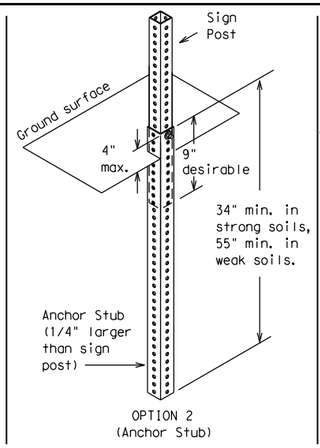


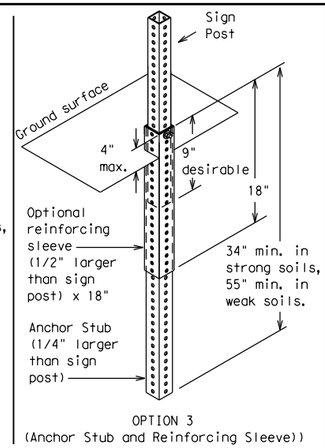


SKID MOUNTED WOOD SIGN SUPPORTS

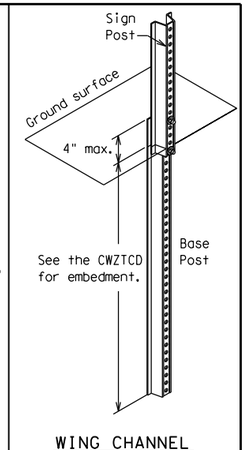
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







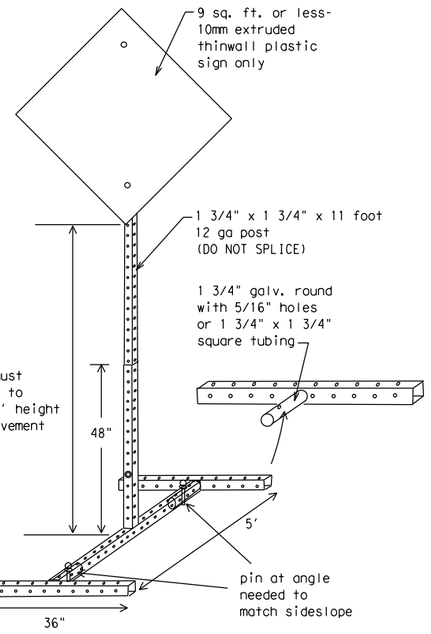
PERFORATED SQUARE METAL TUBING

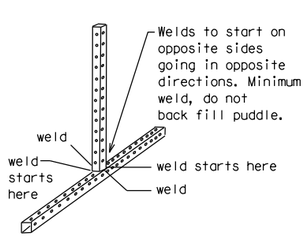


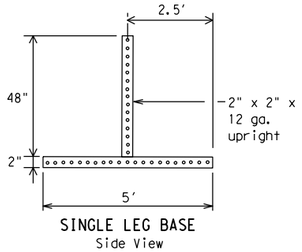
WING CHANNEL
Lap-splice/base bolted anchor

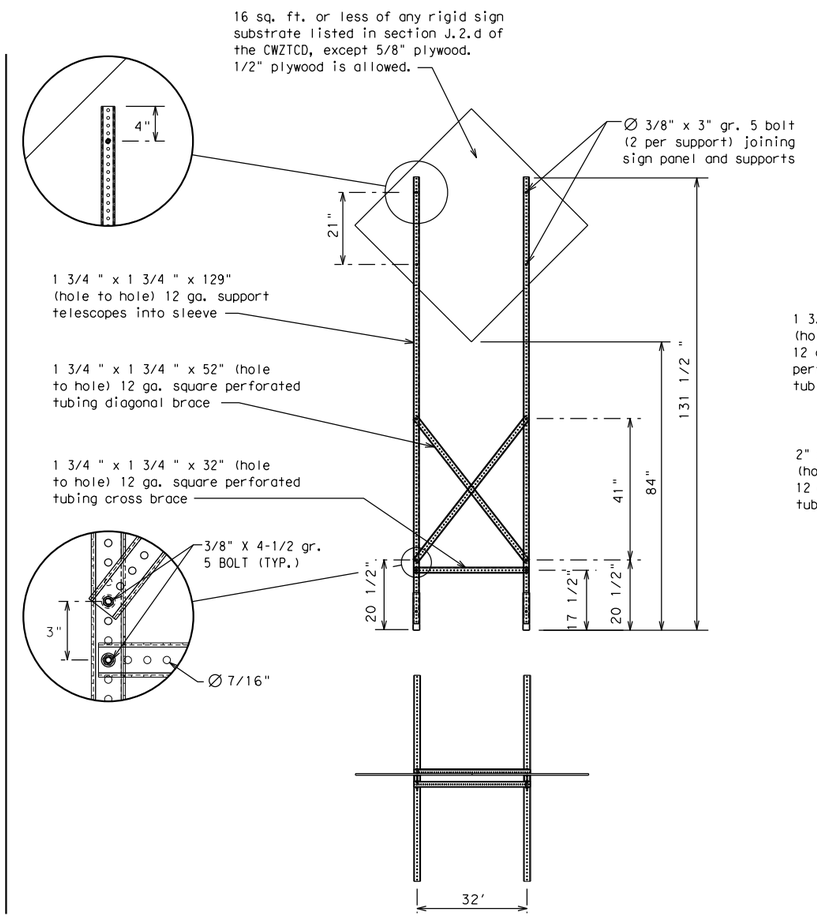
GROUND MOUNTED SIGN SUPPORTS

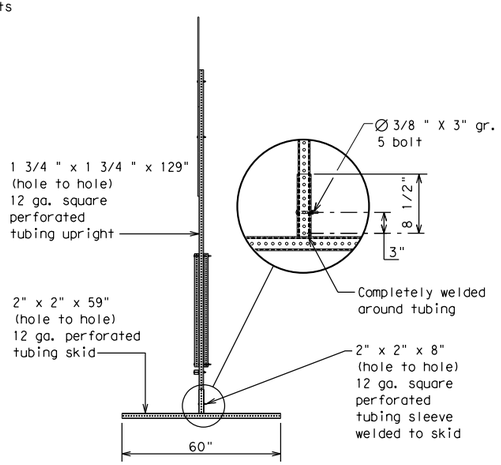
Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.











SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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REVISIONS	0905	06	095,ETC.	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LBB	LUBBOCK		46

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- 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 limited to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LBB	LUBBOCK		47

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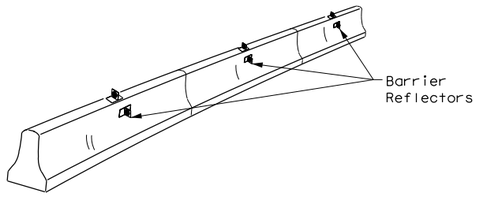
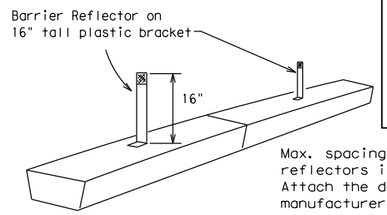
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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

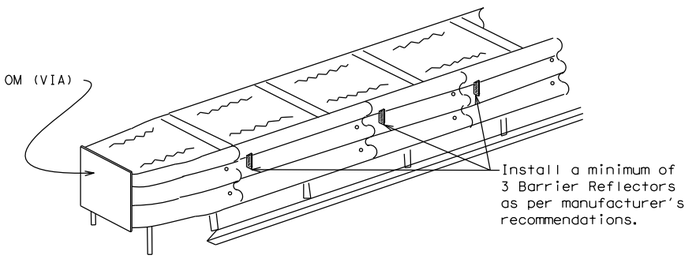


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

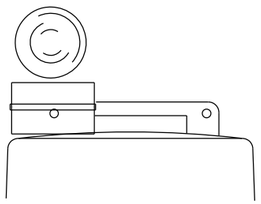


DELINEATION OF END TREATMENTS

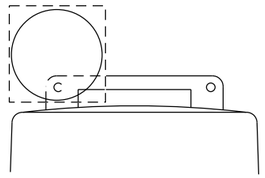
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the apppropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{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

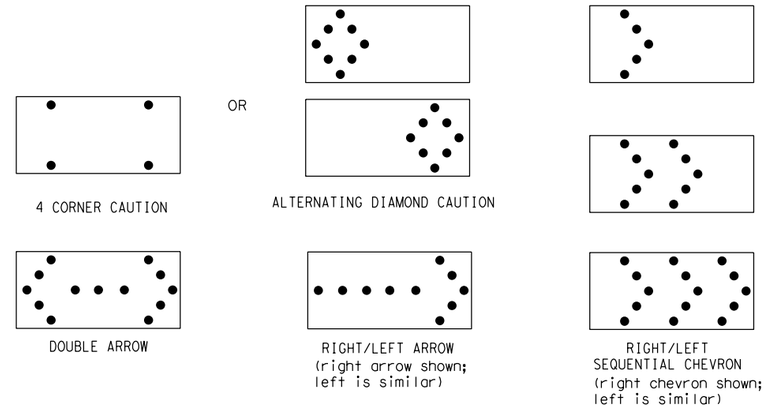
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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 Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LBB	LUBBOCK		48

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

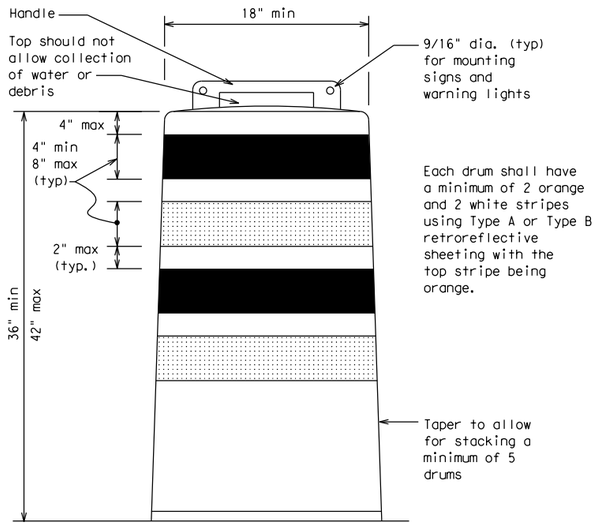
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

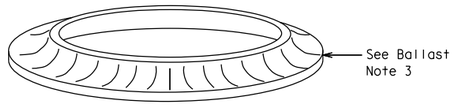
RETROREFLECTIVE SHEETING

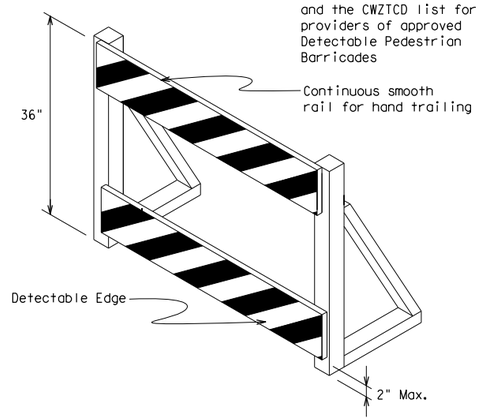
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

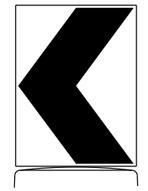




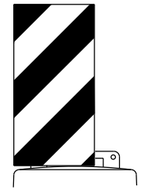


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	LBB	LUBBOCK		49
7-13				

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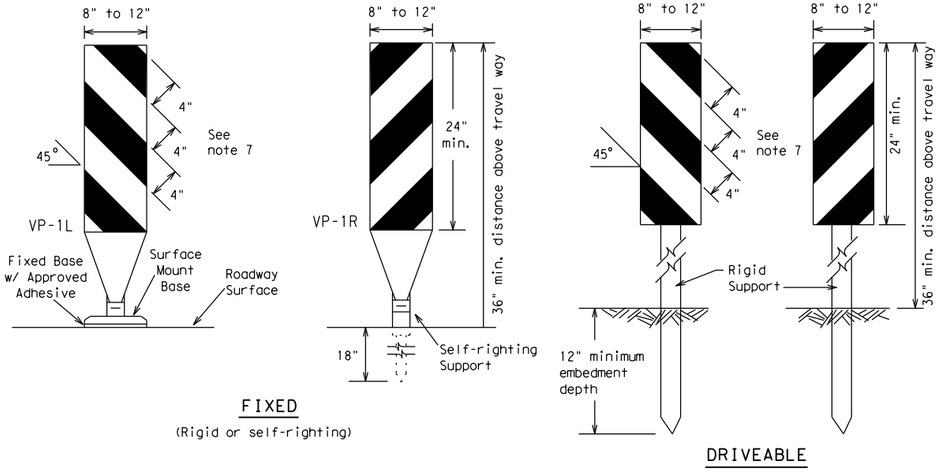
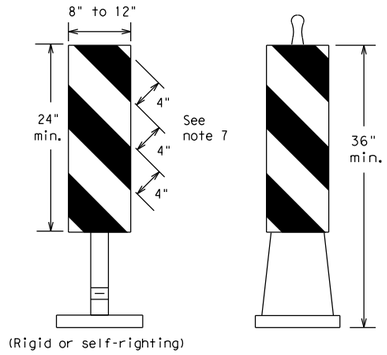


FIXED

(Rigid or self-righting)

DRIVEABLE

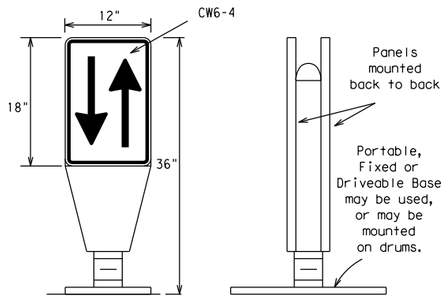


(Rigid or self-righting)

PORTABLE

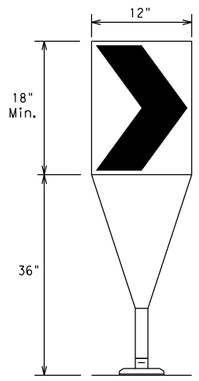
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



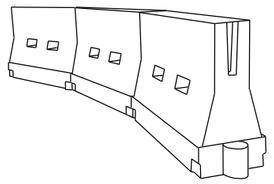
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0905	06	095,ETC.	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LBB	LUBBOCK		50

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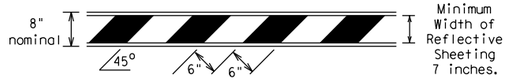
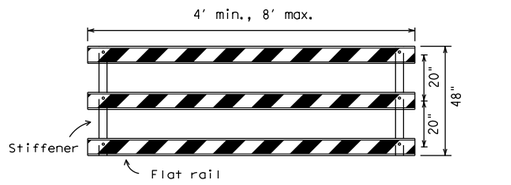
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



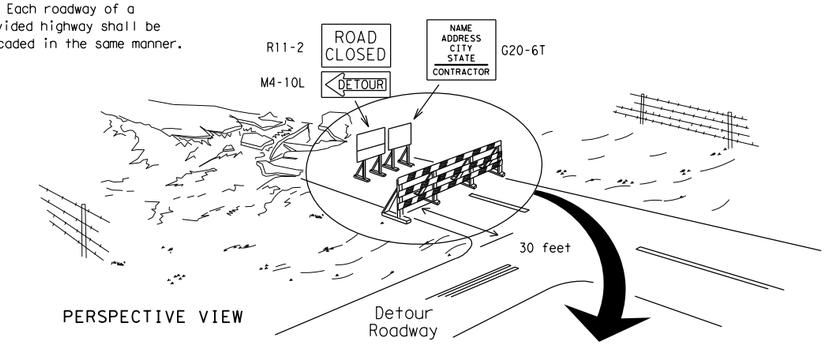
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

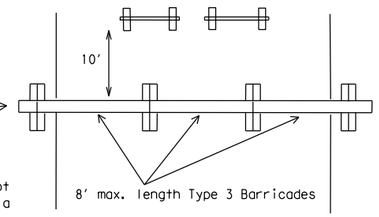
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

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

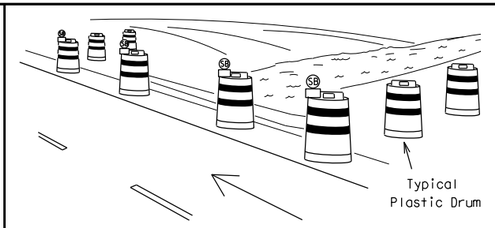
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

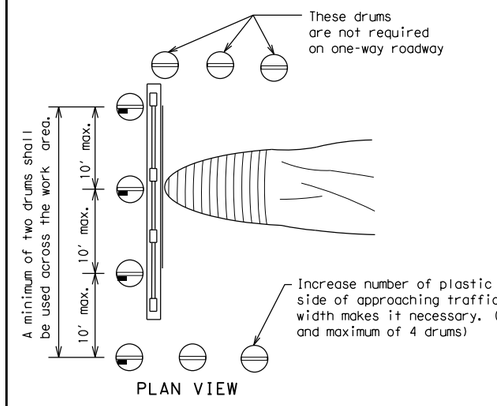
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

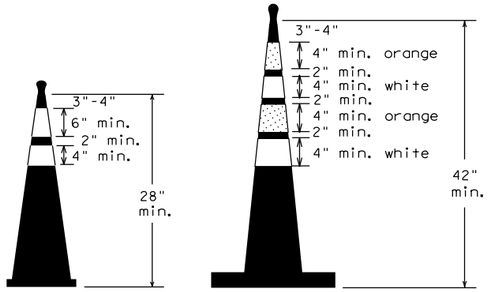
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

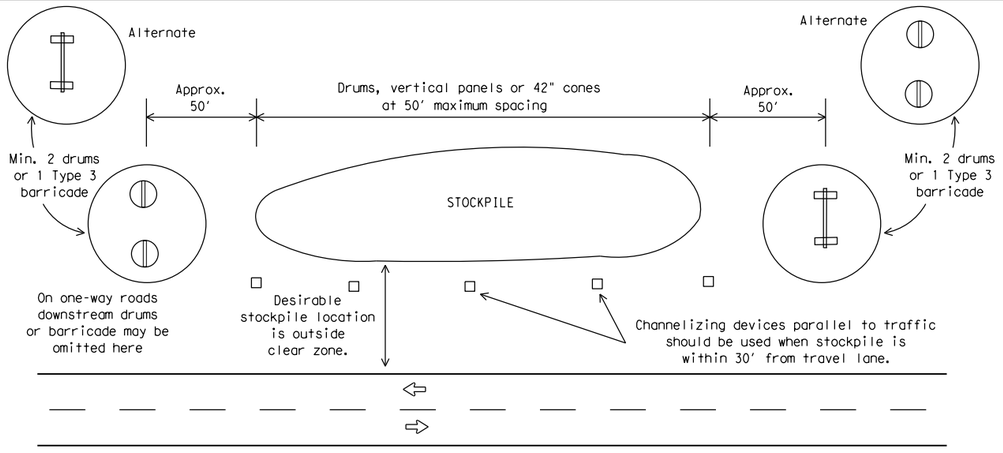
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LBB	LUBBOCK		51

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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.

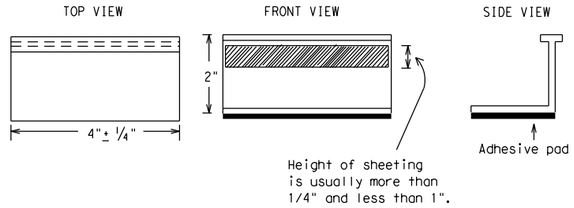
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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 Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	LBB	LUBBOCK		52
11-02 8-14				

105

DATE: 8/9/2023 9:18:10 AM
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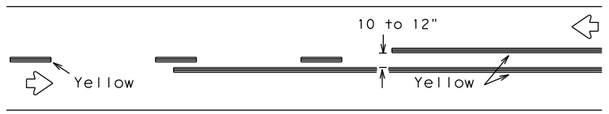
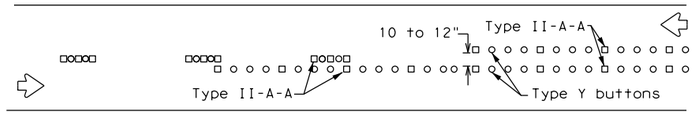
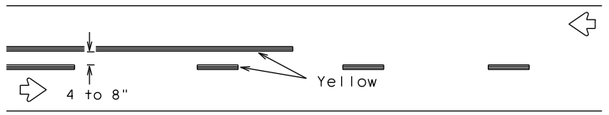
PAVEMENT MARKING PATTERNS



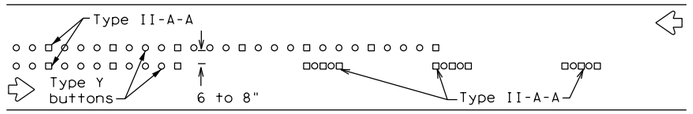
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



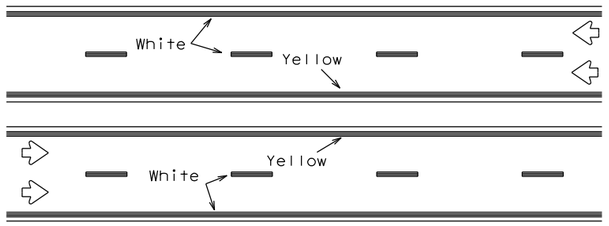
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



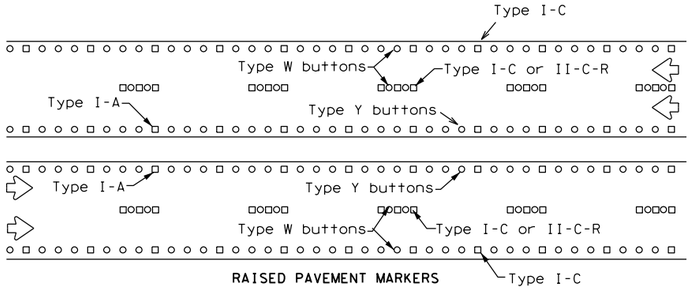
RAISED PAVEMENT MARKERS - PATTERN B

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



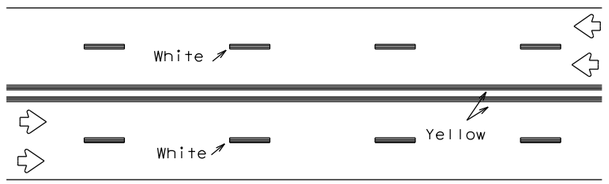
REFLECTORIZED PAVEMENT MARKINGS



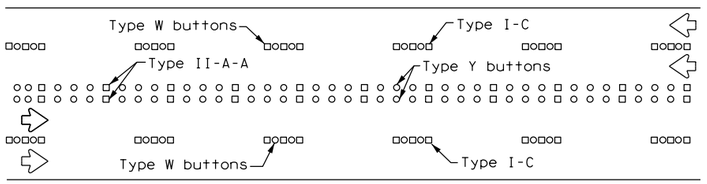
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



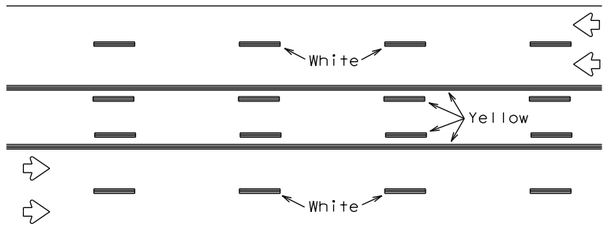
REFLECTORIZED PAVEMENT MARKINGS



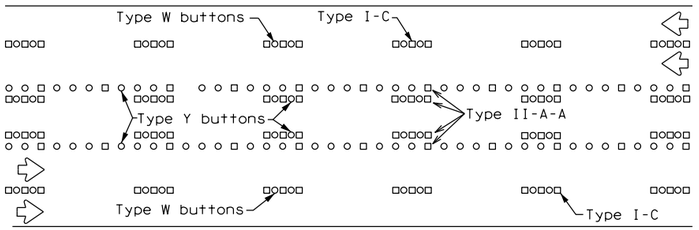
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

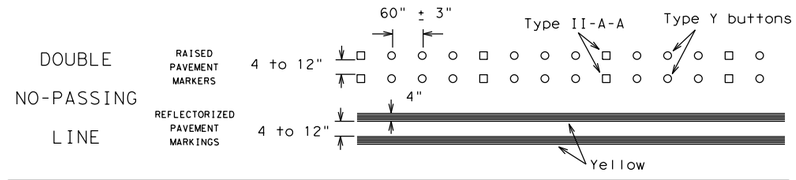
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

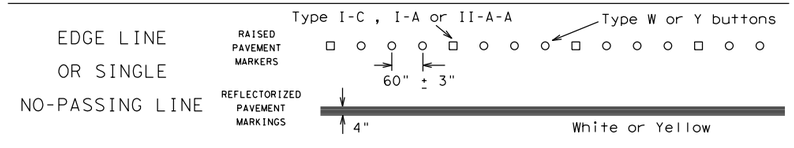
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

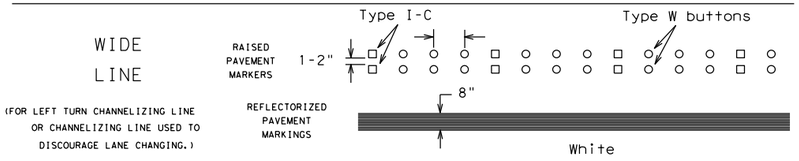


EDGE LINE OR SINGLE NO-PASSING LINE



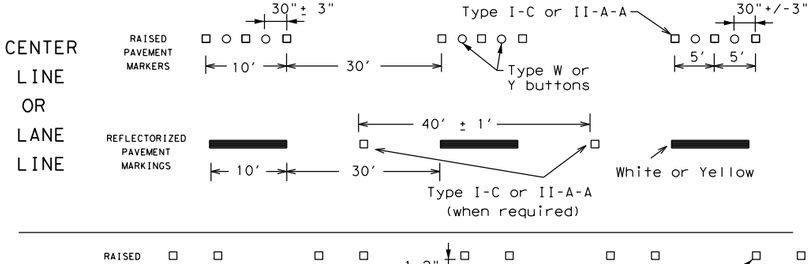
WIDE LINE

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

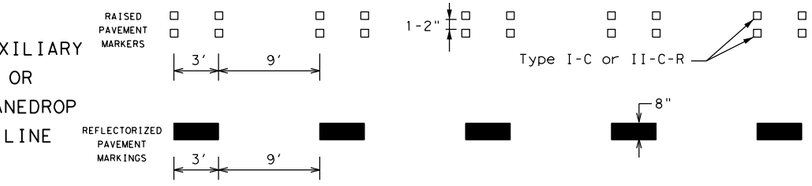


BROKEN LINES

CENTER LINE OR LANE LINE

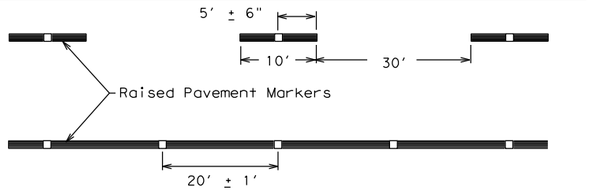


AUXILIARY OR LANEDROP LINE



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 Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0905	06	095,ETC.	CS
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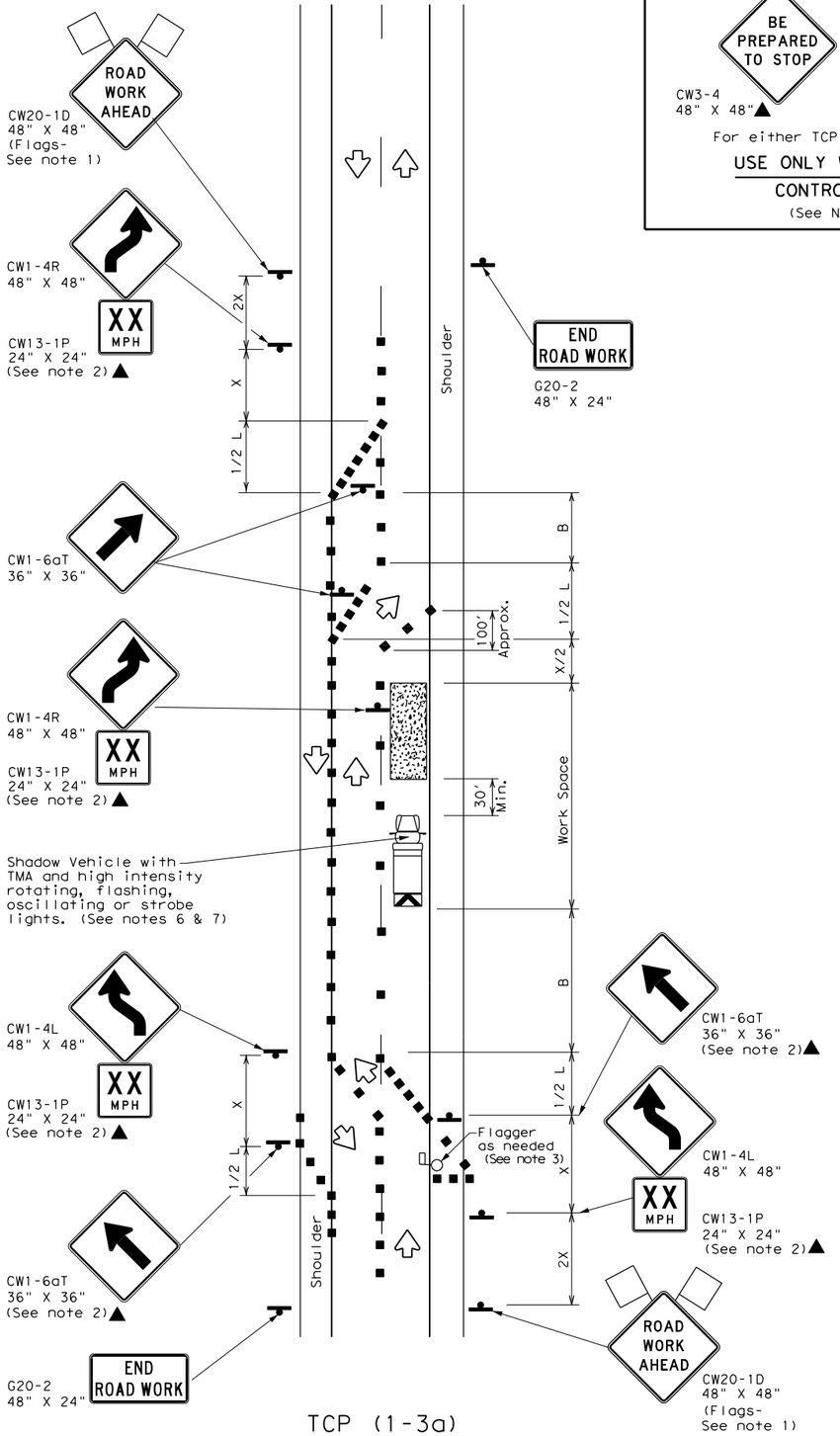


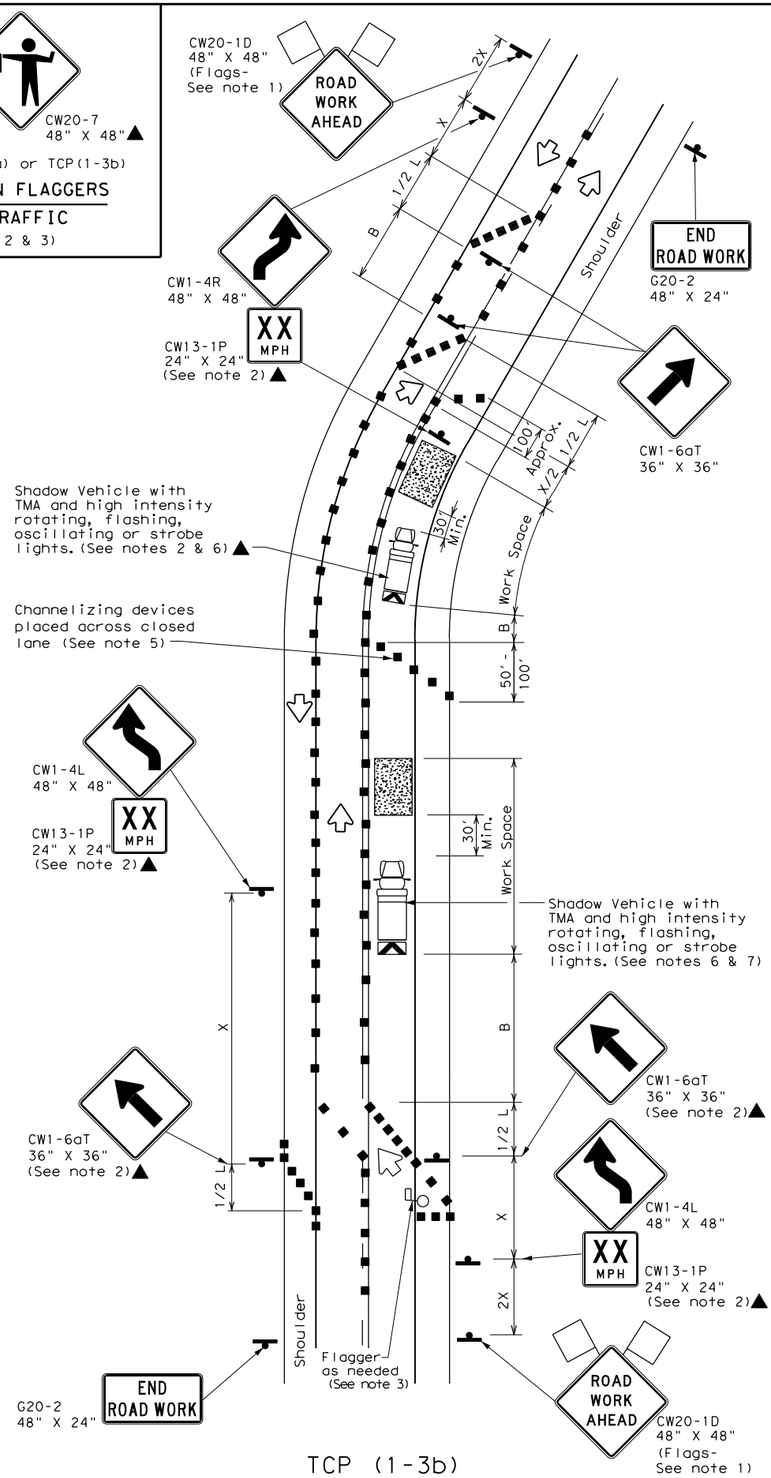
TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW

BE PREPARED TO STOP
CW3-4
48" X 48"
CW20-7
48" X 48"

For either TCP(1-3a) or TCP(1-3b)

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC
(See Notes 2 & 3)



TCP (1-3b)
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	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. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
4. DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
5. When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
8. 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 speed are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	LBB	LUBBOCK		54
1-97 2-18				

153

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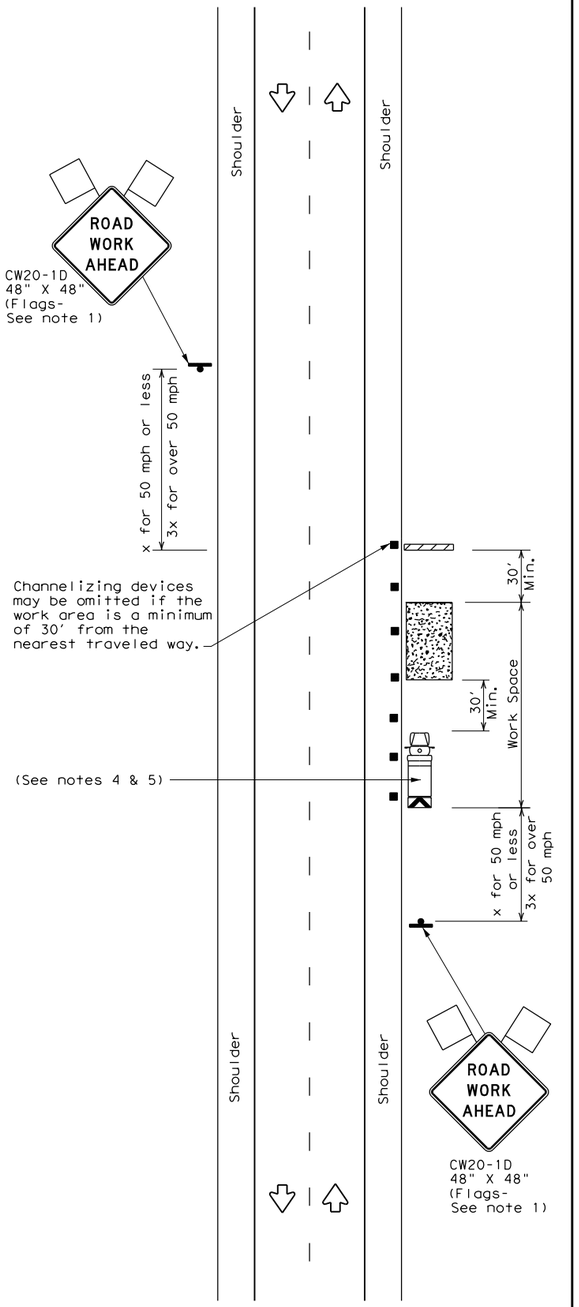
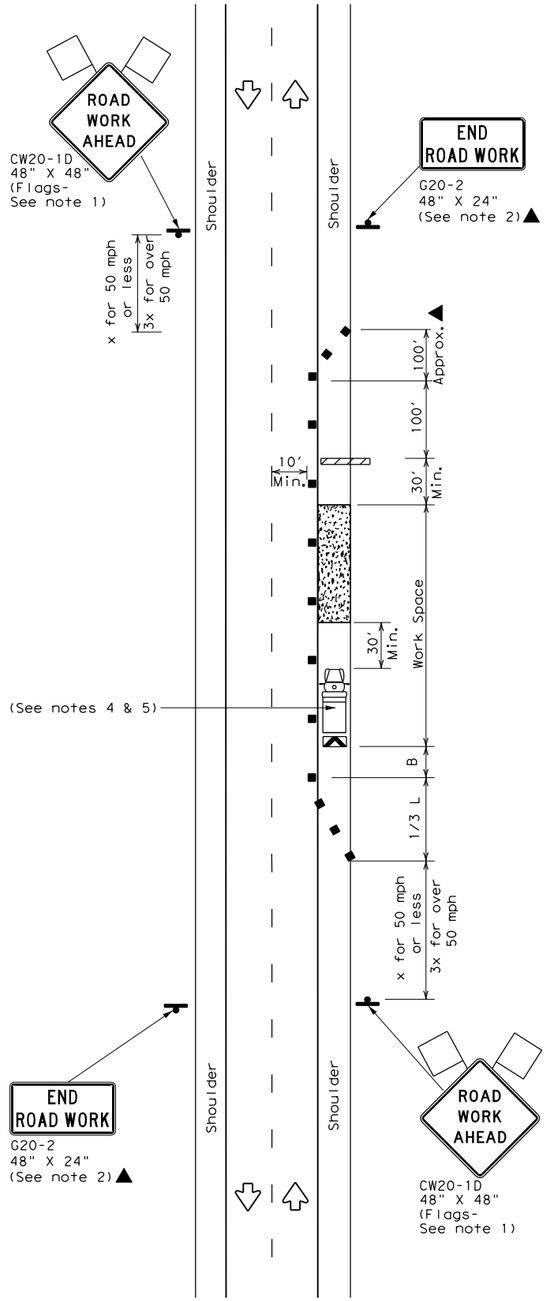


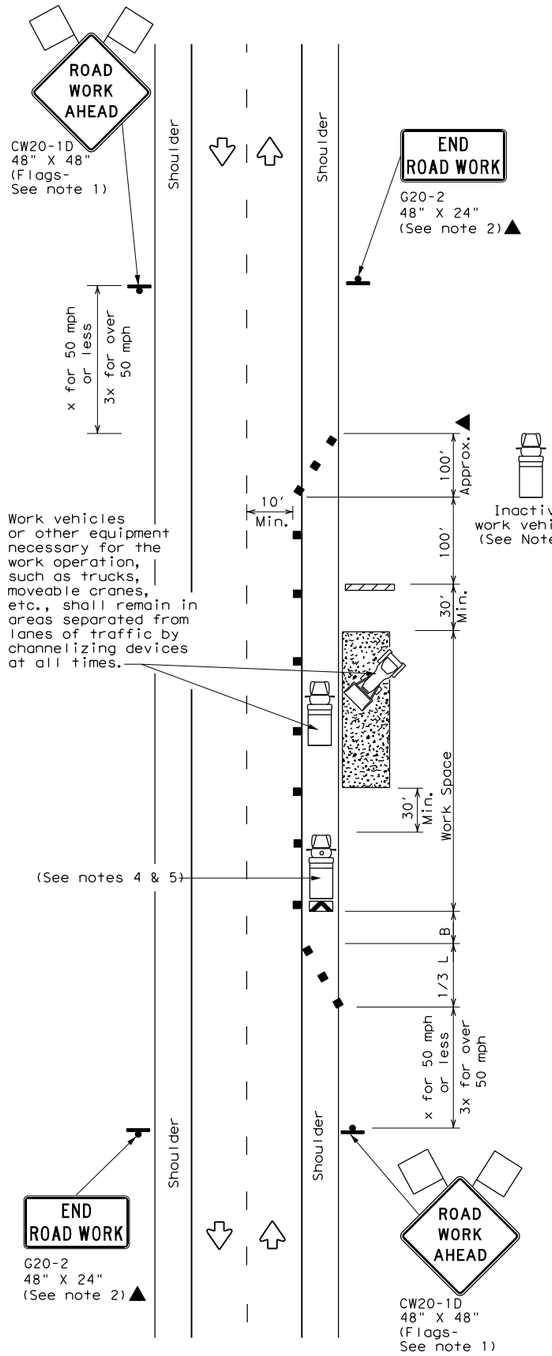
TCP (2-1a)

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 CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	LBB	LUBBOCK		55
1-97 2-18				

161

DATE: 8/9/2023 9:18:26 AM
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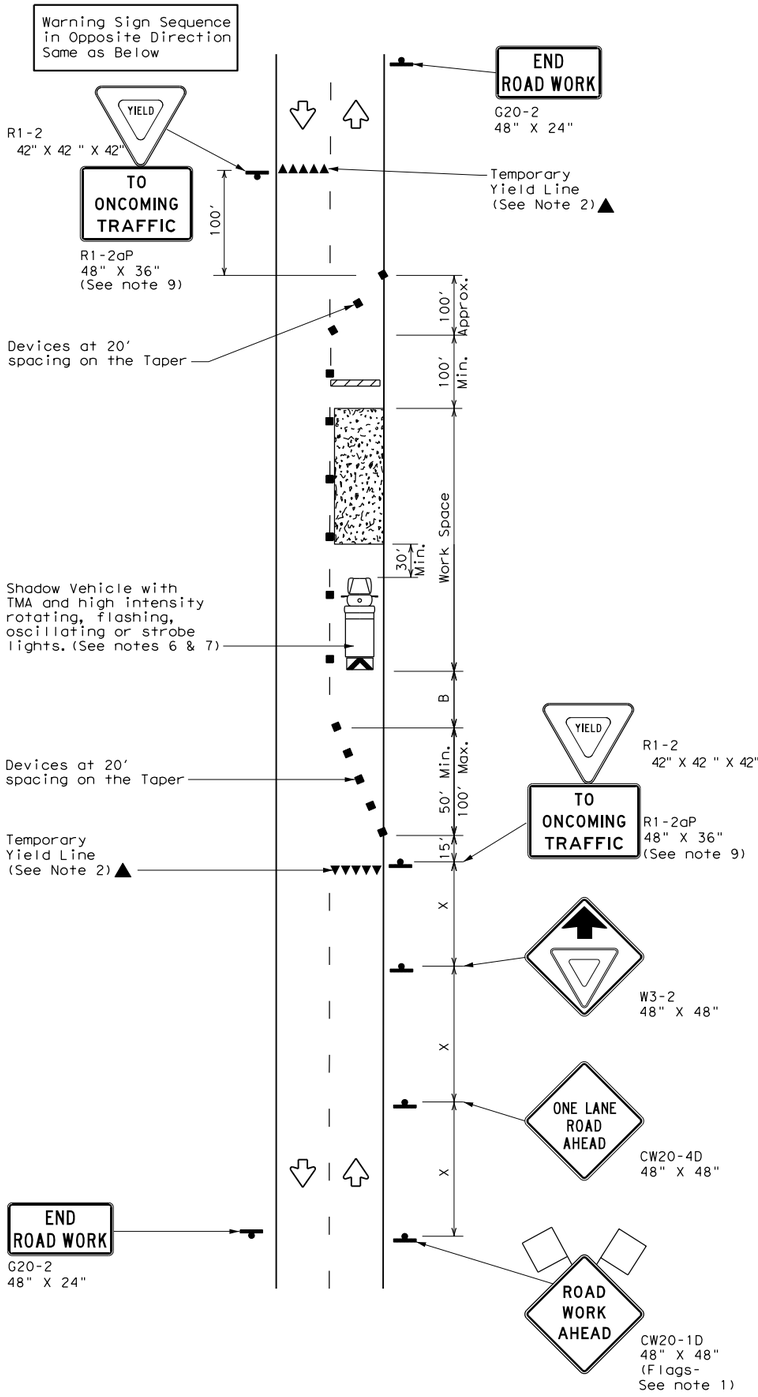
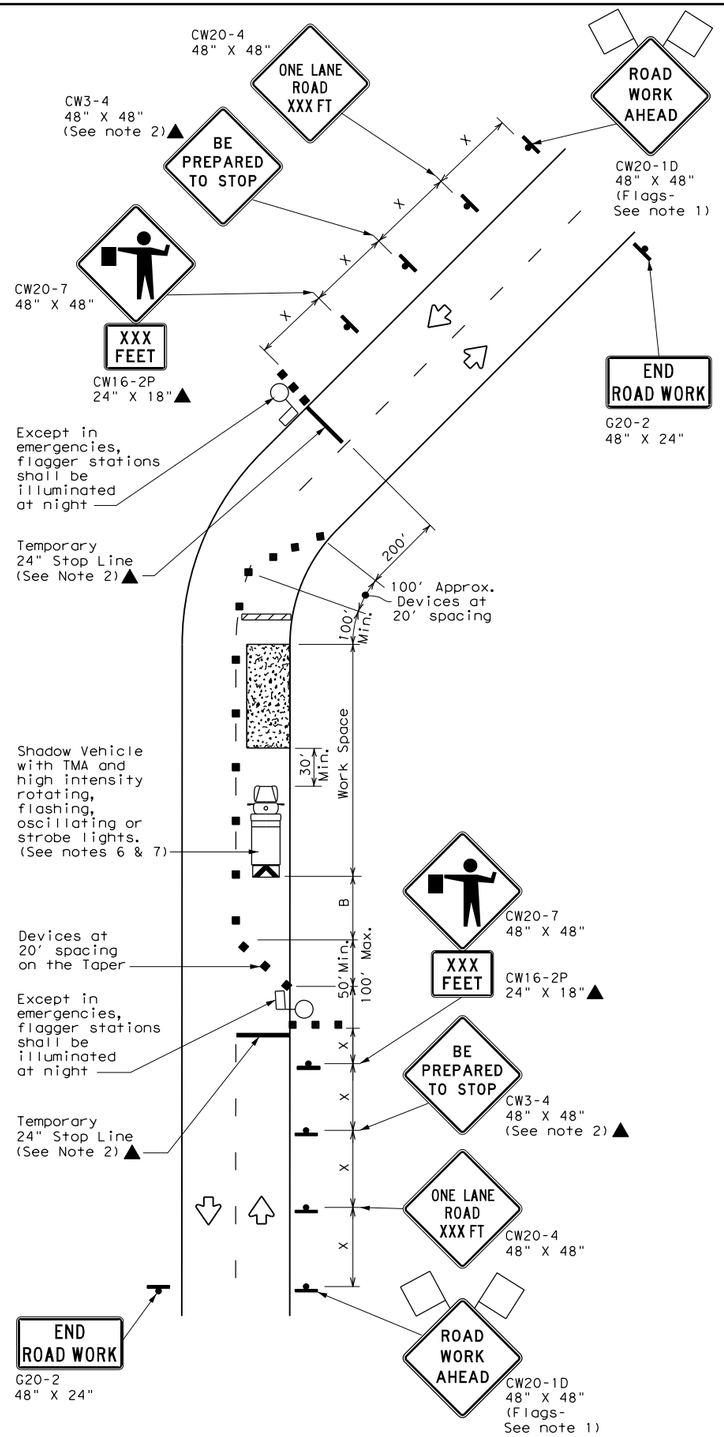


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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

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

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

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0905	06	095,ETC.	CS
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	LBB	LUBBOCK		56

162

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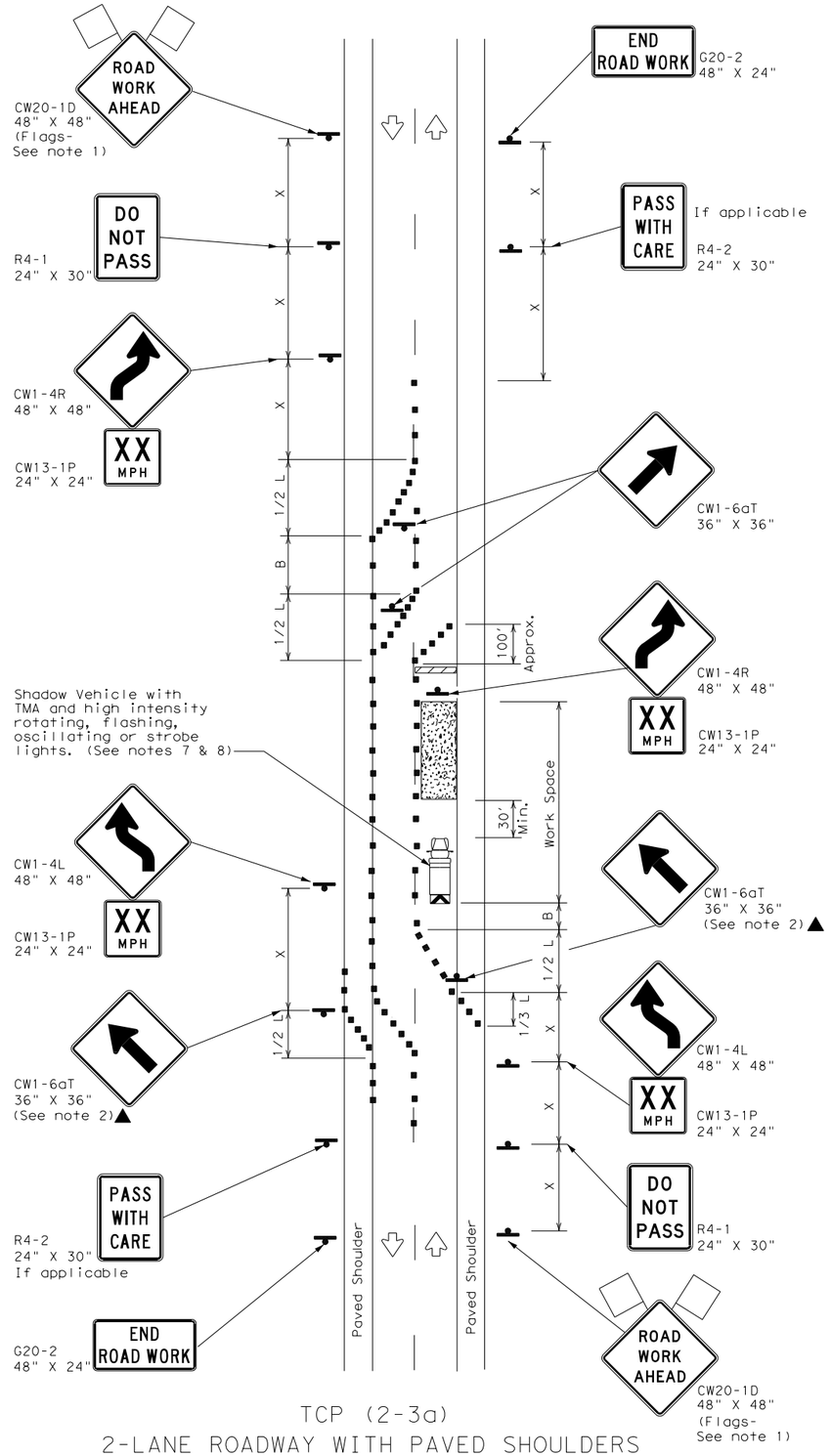
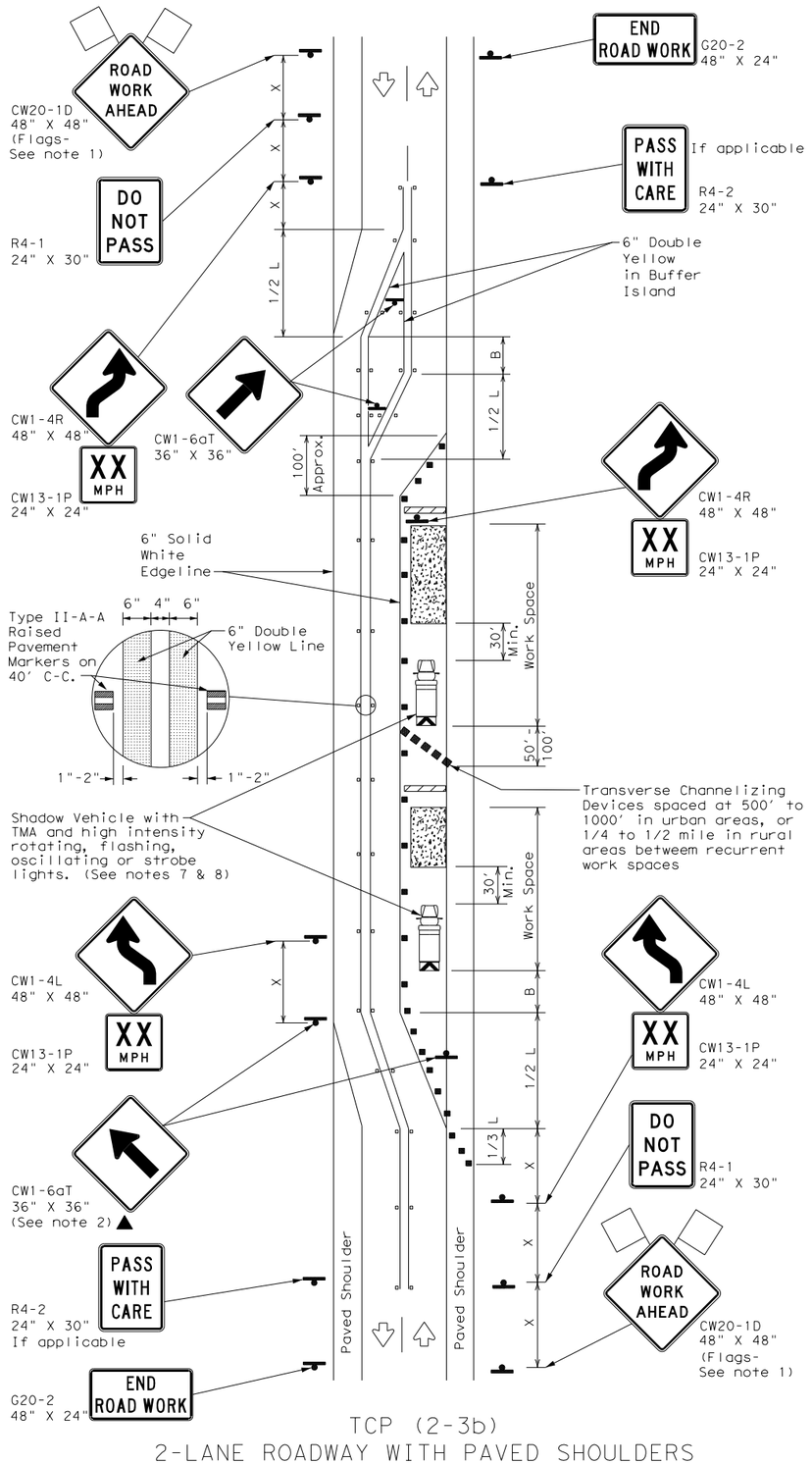


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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.

Texas Department of Transportation

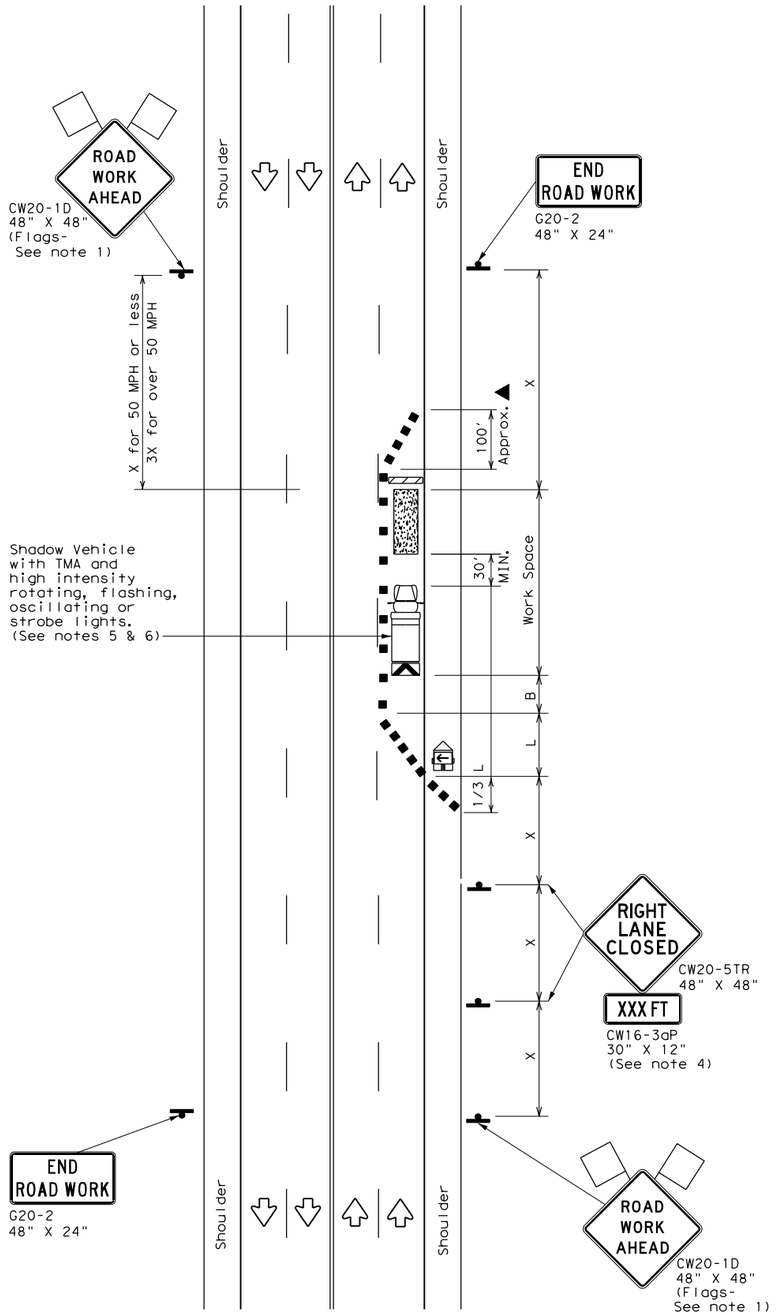
Traffic Safety Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-23

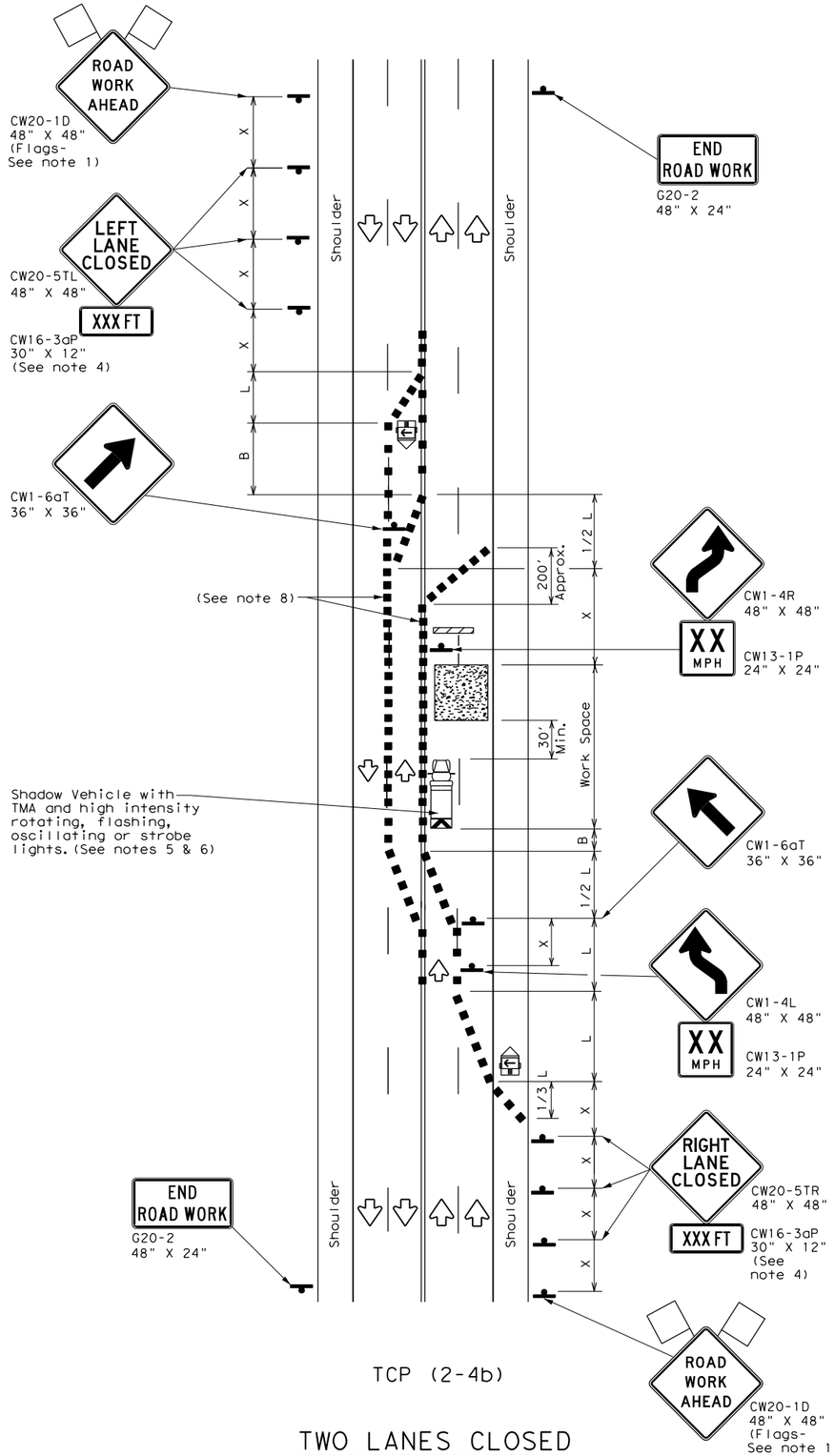
FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18 8-95 3-03 4-23 1-97 2-12	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		57

163



TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0905	06	095,ETC.	CS
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	LBB	LUBBOCK		58

DATE: 8/9/2023 9:18:58 AM
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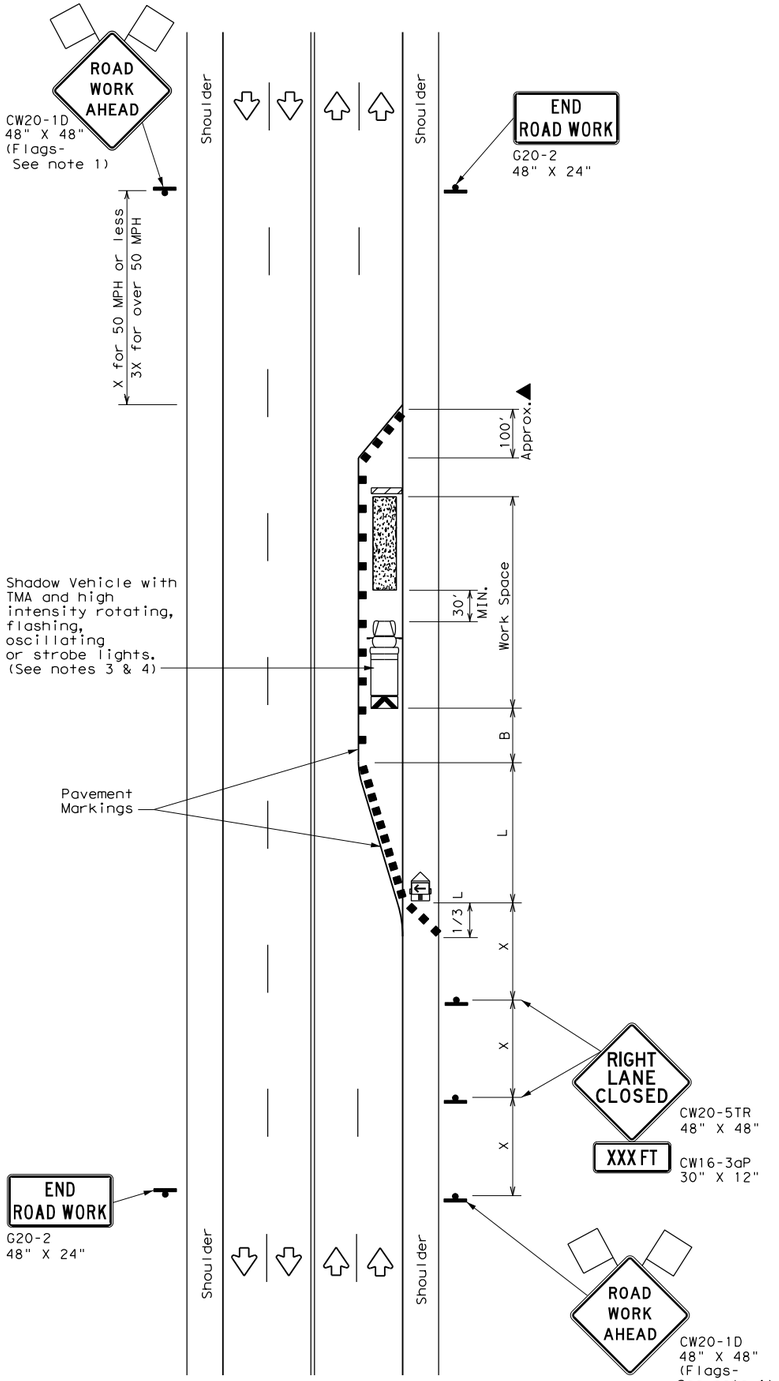
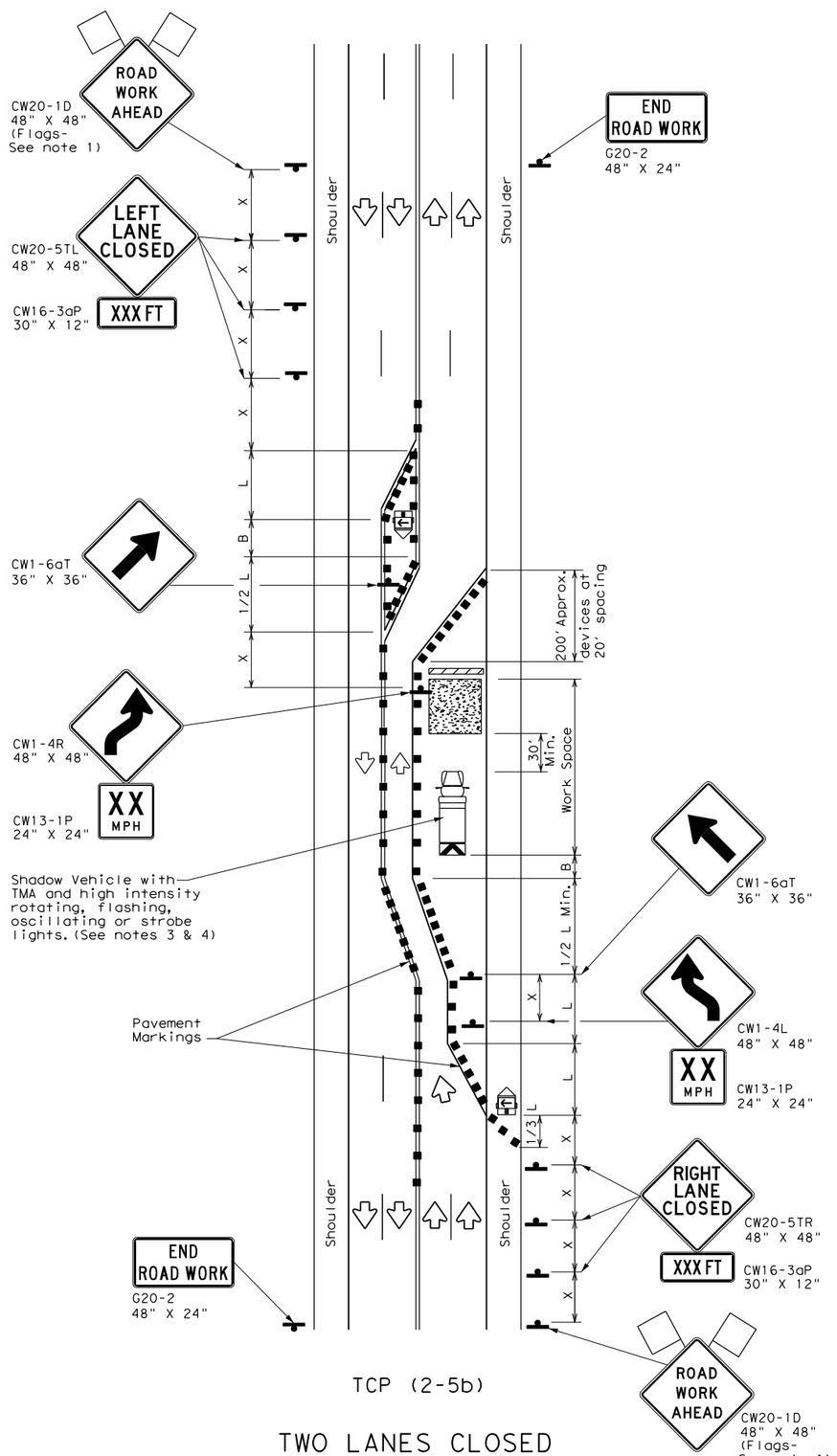


TCP (2-5a)

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 eposure 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 substitutued 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.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LONG TERM LANE CLOSURES
MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12 1-97 3-03 4-98 2-18	0905	06	095,ETC.	CS
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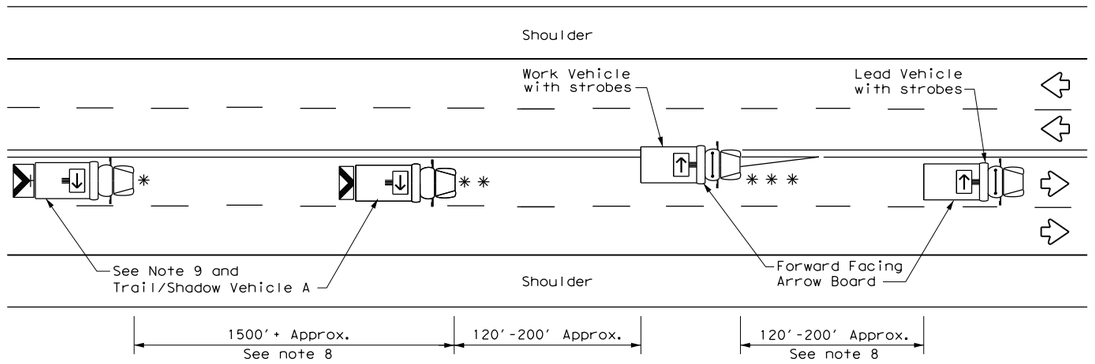
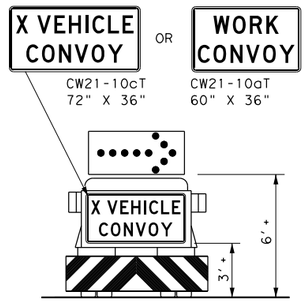


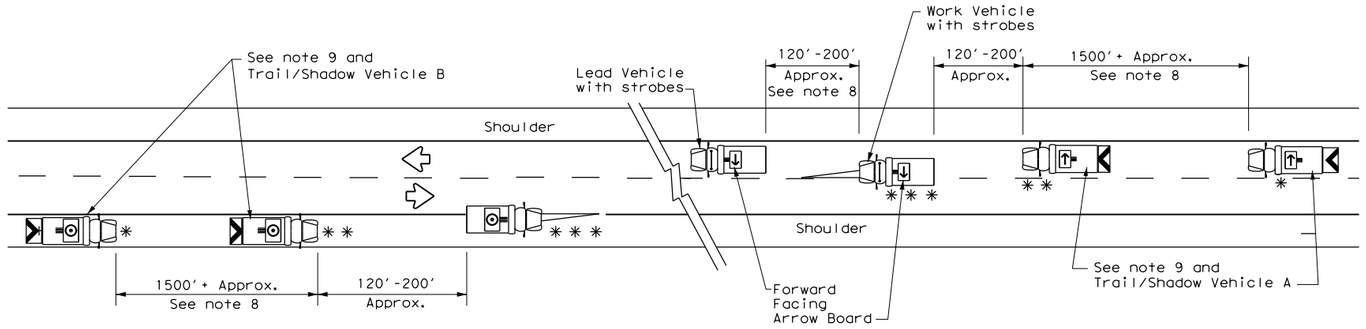
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

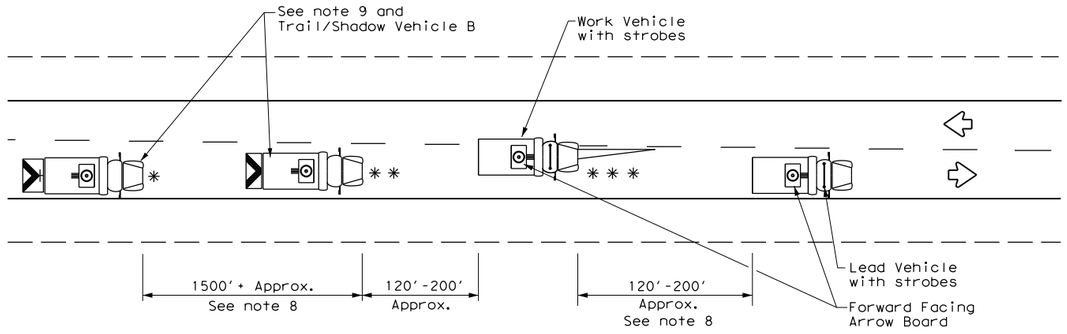


WORK ON SHOULDER

WORK ON TRAVEL LANE

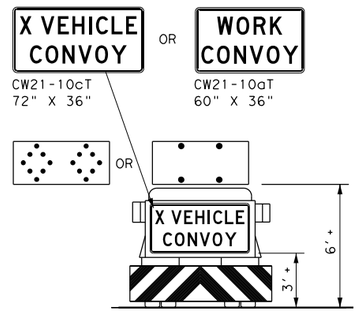
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

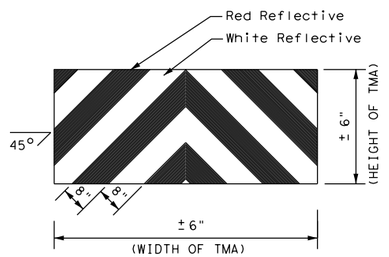
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		60

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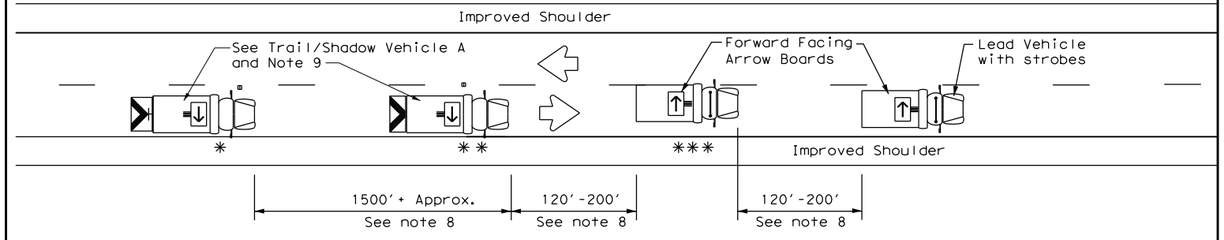
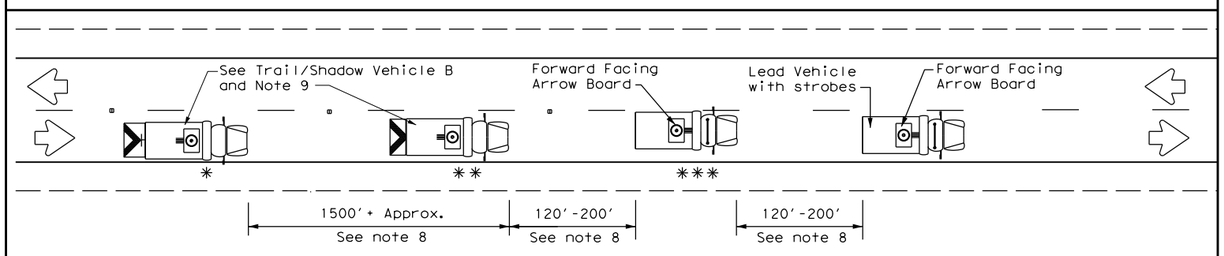


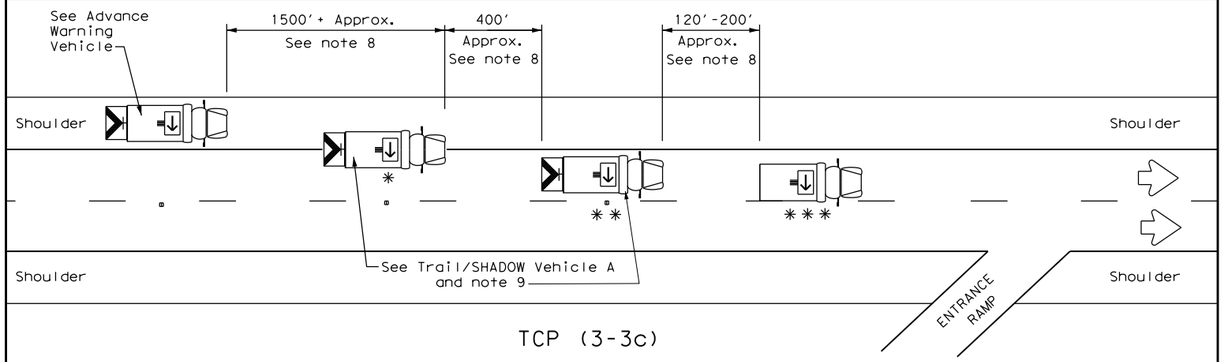
TCP (3-3a)

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



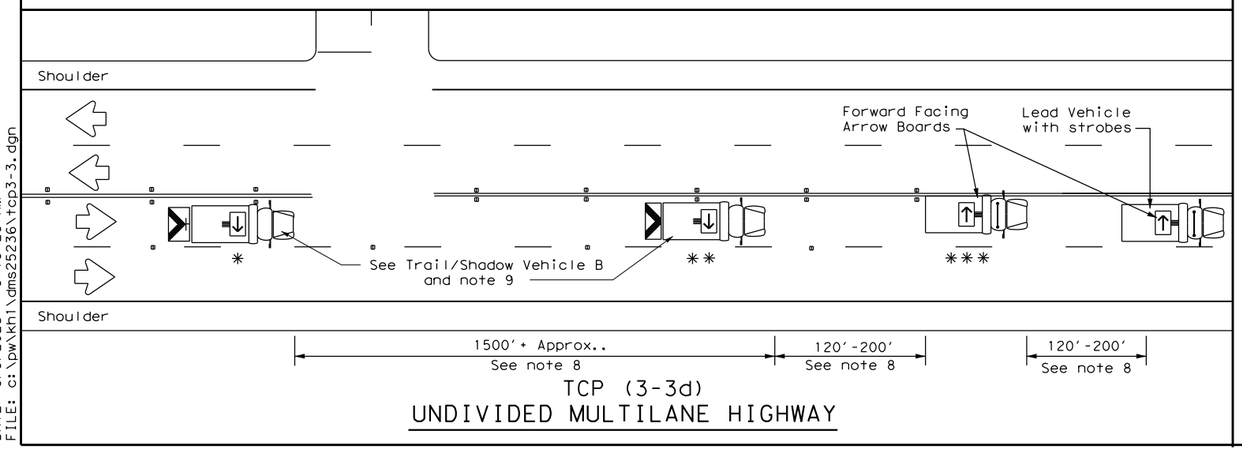
TCP (3-3b)

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



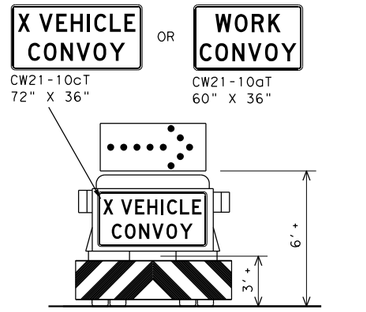
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



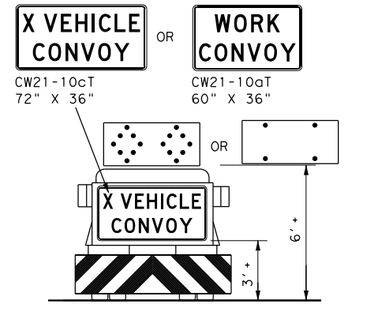
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



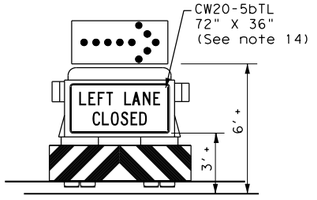
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

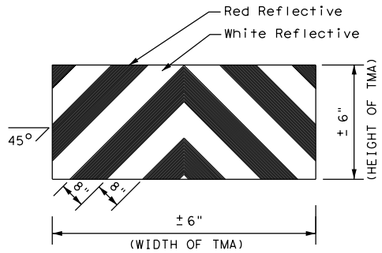


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	LBB	LUBBOCK		61
1-97 7-14				

177

DATE: 8/9/2023 9:19:28 AM
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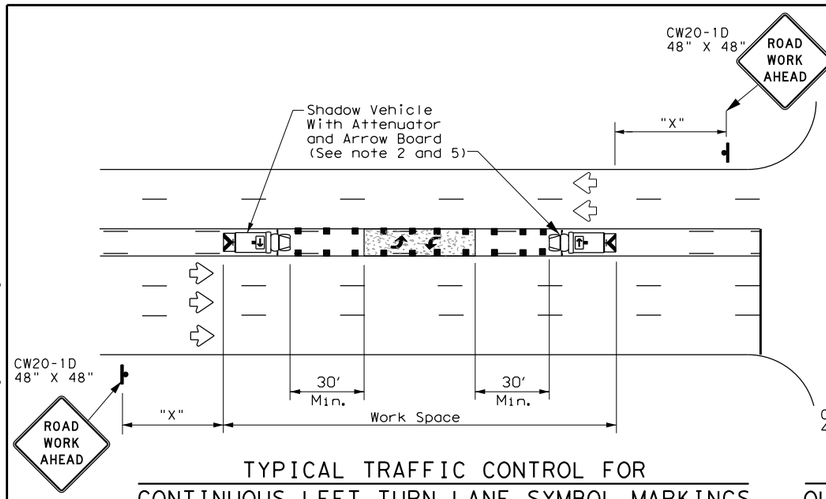
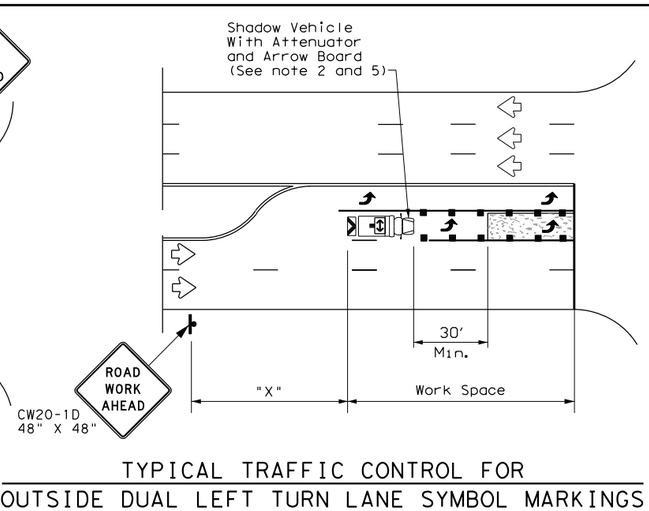
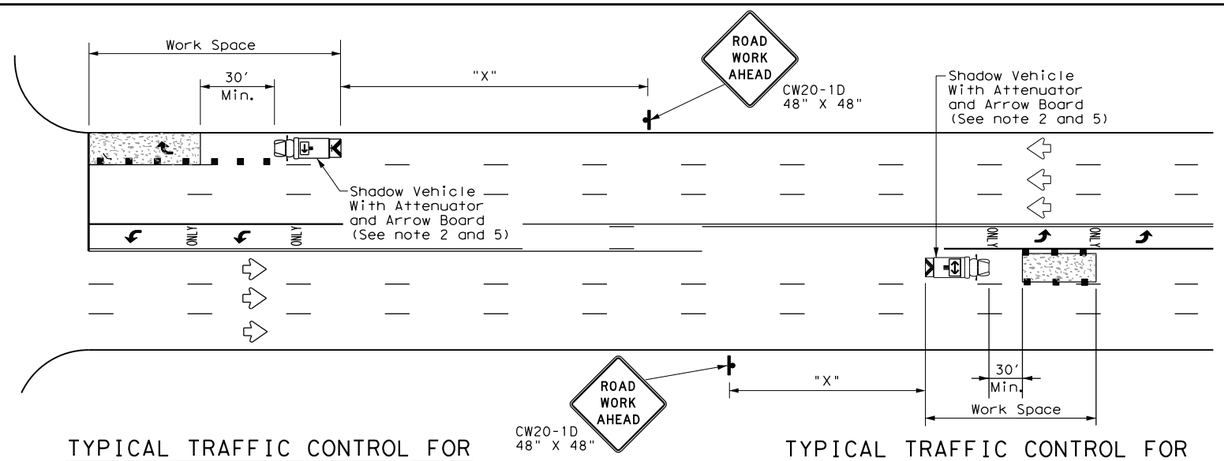


TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

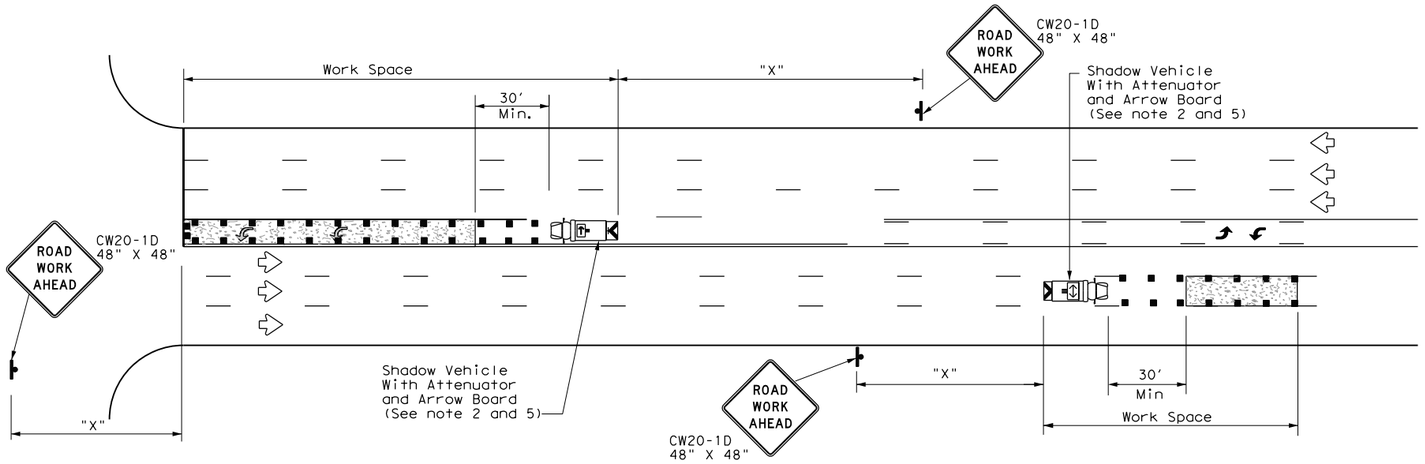


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR
OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR
LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
CENTER LANE MARKINGS

LEGEND			
✳	Trail Vehicle	ARROW BOARD DISPLAY	
✳✳	Shadow Vehicle		
✳✳✳	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow	■ ■ ■	Channelizing Devices

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

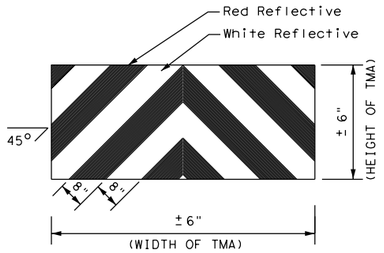
1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.

2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.

3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.

4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.

5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

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©TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		62

178

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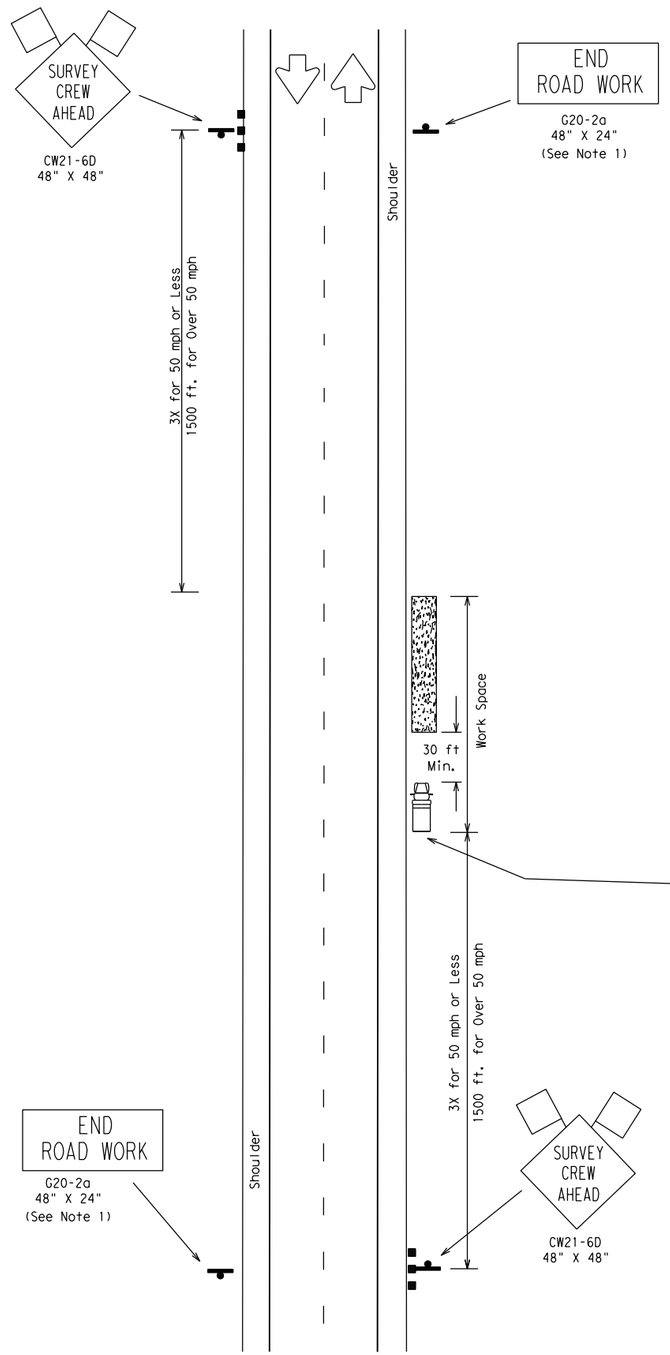
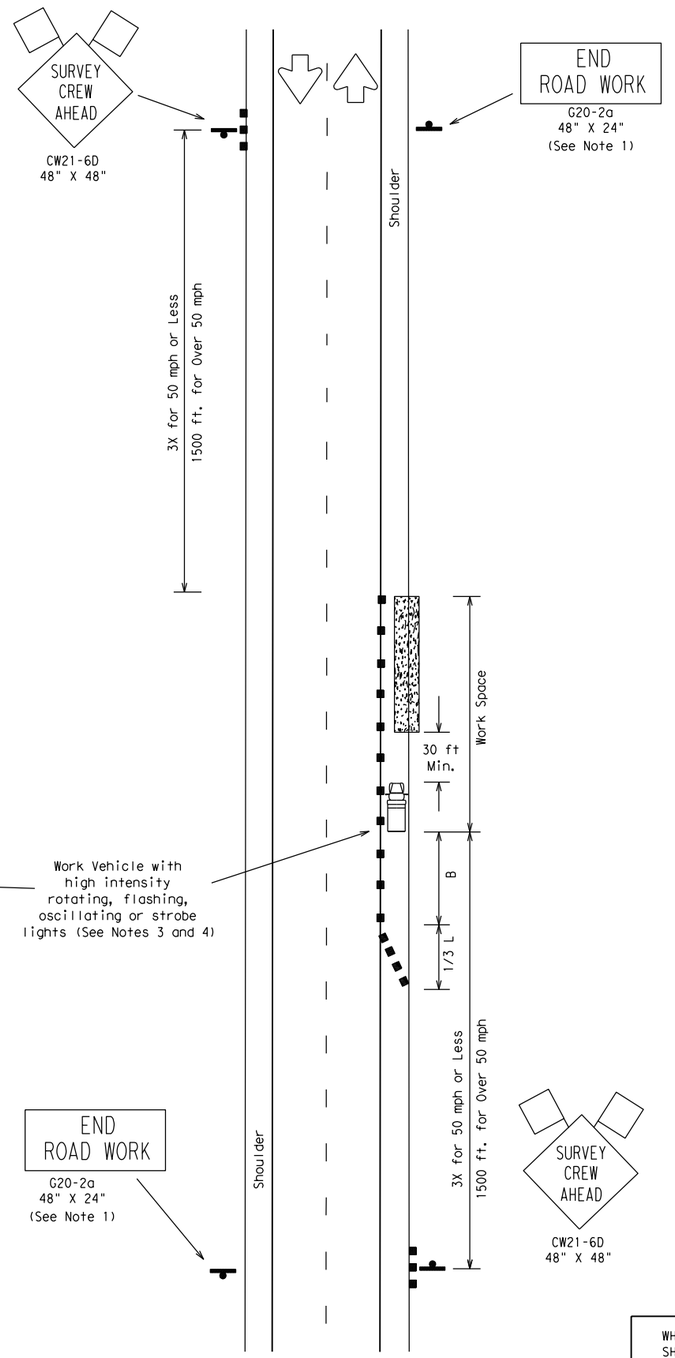


TCP (S-1a)
WORK OFF SHOULDER
OR PAVED SURFACE



TCP (S-1b)
WORK ON SHOULDER

Type III Barricade ■ ■ Channelizing Devices Flag
Heavy Work Vehicle Truck Mounted Attenuator (TMA)
Trailer Mounted Flashing Arrow Panel
Portable Changeable Message Sign (PCMS)
Flagger Sign Post

Posted Speed ✳	Formula	Minimum Desirable Taper Lengths ✳✳ 10′ Offset	11′ Offset	12′ Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150′	165′	180′	30′	60′-75′	120′	90′
35		205′	225′	245′	35′	70′-90′	160′	120′
40		265′	295′	320′	40′	80′-100′	240′	155′
45	L=WS	450′	495′	540′	45′	90′-110′	320′	195′
50		500′	550′	600′	50′	100′-125′	400′	240′
55		550′	605′	660′	55′	110′-140′	500′	295′
60		600′	660′	720′	60′	120′-150′	600′	350′
65		650′	715′	780′	65′	130′-165′	700′	410′
70		700′	770′	840′	70′	140′-175′	800′	475′
75		750′	825′	900′	75′	150′-185′	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
	✓	✓		

DEFINITIONS:
SHORT DURATION - work that occupies a location up to 1 hour.
SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:

1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Channelizing devices on the shoulder taper and tangent section may be omitted for short duration (less than 1 hour) work.
3. If line-of-sight requirements for surveying operations will preclude the placement of the Work Vehicle to protect workers, the channelizing devices mentioned in Note 2 are required.
1. 4. A Shadow Vehicle with a Truck Mounted Attenuator and flashing warning lights/arrow panel in caution mode may be used in lieu of the Work Vehicle to protect the work space.
5. The CW20-1D "ROAD WORK AHEAD" sign may be substituted for the CW21-6D "SURVEY CREW AHEAD" sign.
6. This plan may also be used for shoulder work or off shoulder work for multilane undivided roadways.
7. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.

TCP(S-1a)

8. Cones may be placed at edge of pavement adjacent to the work space to enhance safety.

WHENEVER POSSIBLE, SURVEY PARTIES SHOULD AVOID, BY THE USE OF OFFSET LINES, ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

8-18-08 Revision
1 Corrected misspelling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-1)-08A

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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	LBB	LUBBOCK		63

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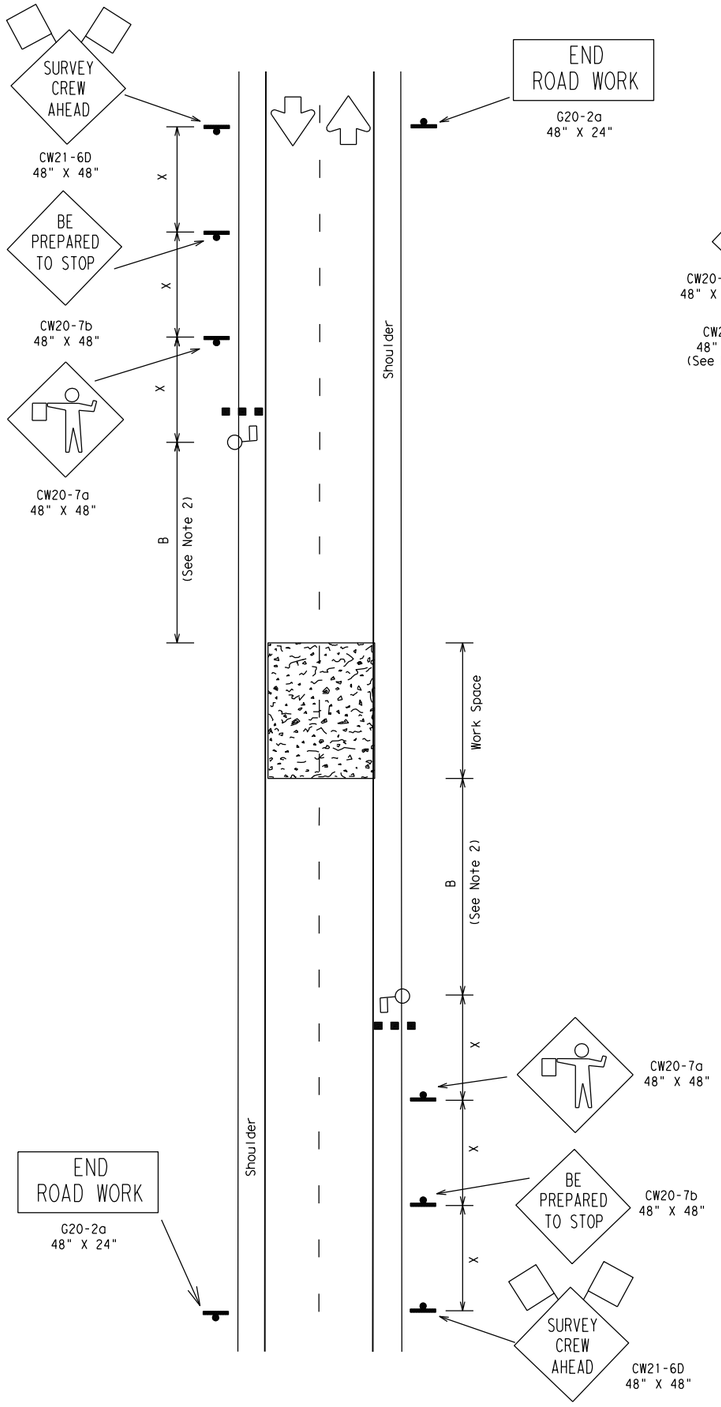
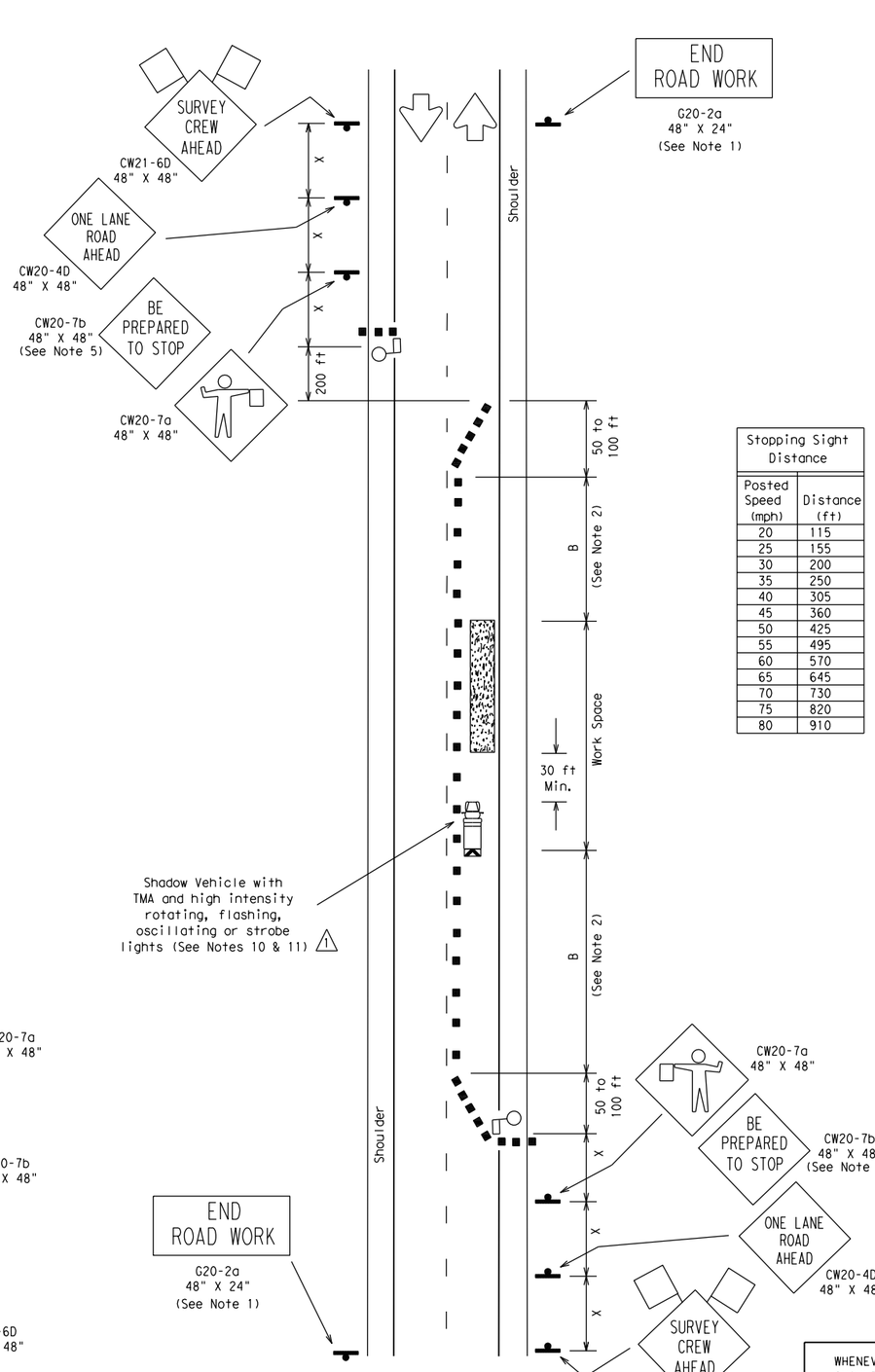


TCP (S-2a)
ROAD CLOSED FOR LESS THAN 20 MINUTES -
OFF PEAK TRAFFIC HOURS
WITH OR WITHOUT SHOULDERS



TCP (S-2b)
WORK IN ROADWAY
OFF PEAK TRAFFIC HOURS
WITH OR WITHOUT SHOULDERS

Stopping Sight Distance	
Posted Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

Type III Barricade ■■ Channelizing Devices Flag
Heavy Work Vehicle Truck Mounted Attenuator (TMA)
Trailer Mounted Flashing Arrow Panel
Portable Changeable Message Sign (PCMS)
Flagger Sign Post

Posted Speed ✳	Formula	Minimum Desirable Taper Lengths ✳✳ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'	120'	90'
35		205'	225'	245'	35'	70'-90'	160'	120'
40		265'	295'	320'	40'	80'-100'	240'	155'
45	L=WS	450'	495'	540'	45'	90'-110'	320'	195'
50		500'	550'	600'	50'	100'-125'	400'	240'
55		550'	605'	660'	55'	110'-140'	500'	295'
60		600'	660'	720'	60'	120'-150'	600'	350'
65		650'	715'	780'	65'	130'-165'	700'	410'
70		700'	770'	840'	70'	140'-175'	800'	475'
75		750'	825'	900'	75'	150'-185'	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
	✓	✓		

DEFINITIONS:
SHORT DURATION - work that occupies a location up to 1 hour.
SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:
1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Adequate Stopping Sight Distance (see Stopping Sight Distance table) should be maintained from approaching traffic to the flagger or a queue of stopped vehicles. The Buffer Space "B" should be extended around curves or other obstacles, when necessary, to have adequate Stopping Sight Distance to the flagger station.
3. Flaggers should use two-way radios or other means of communication while flagging.
4. The length of the work space should be based on the ability of the flaggers to communicate.
5. CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" signs.
6. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.

TCP(S-2a)

7. Road closures shall be less than 20 minutes. Closures less than 5 minutes are desirable.
8. Sign spacing should be increased if traffic repeatedly queues past the CW20-7b "BE PREPARED TO STOP" sign.
9. The surveying instrument should not be located on the paved surface.

TCP (S-2B)

10. For short duration work the Shadow Vehicle with a TMA may be replaced by another Work Vehicle with high intensity rotating, flashing or strobe lights.
11. Shadow Vehicles with a TMA are desirable when workers or equipment are in the work space. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Shadow Vehicle.
12. The CW20-7b "BE PREPARED TO STOP" sign is optional. When used, it should be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign.

WHENEVER POSSIBLE, SURVEY PARTIES SHOULD AVOID, BY THE USE OF OFFSET LINES, ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

8-18-08 Revision
1 Corrected referrence to notes.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-2)-08A

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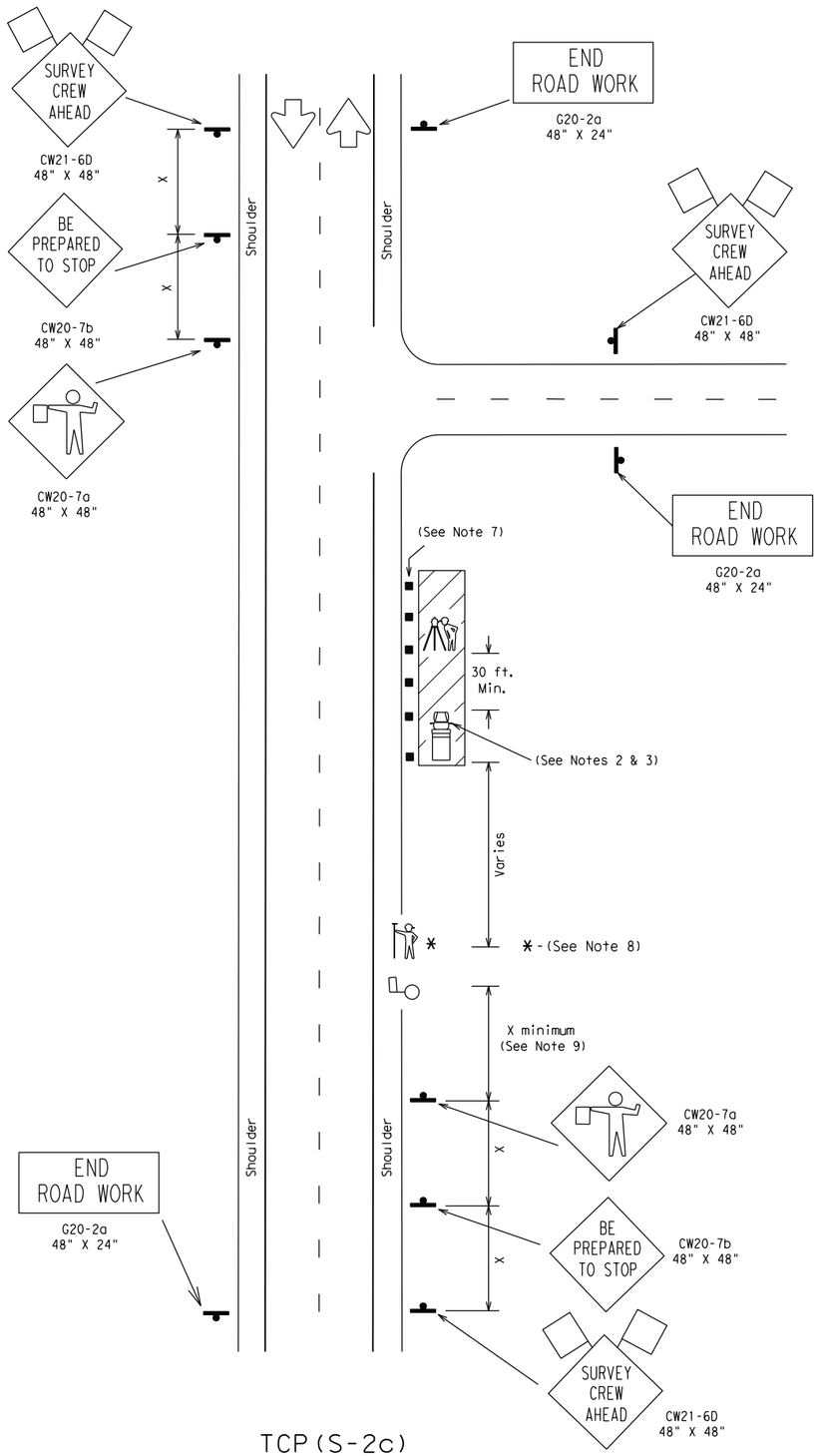

TCP(S-2c)

Stopping Sight Distance	
Posted Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

Type III Barricade ■ ■ Channelizing Devices Flag

Work Vehicle Truck Mounted Attenuator (TMA)

Flagger Sign Post Survey Rodman Instrument Person

Posted Speed ⁎	Formula	Minimum Desirable Taper Lengths ⁎⁎ 10′ Offset	11′ Offset	12′ Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	150′	165′	180′	30′	60′-75′	120′	90′
35		205′	225′	245′	35′	70′-90′	160′	120′
40		265′	295′	320′	40′	80′-100′	240′	155′
45	L=WS	450′	495′	540′	45′	90′-110′	320′	195′
50		500′	550′	600′	50′	100′-125′	400′	240′
55		550′	605′	660′	55′	110′-140′	500′	295′
60		600′	660′	720′	60′	120′-150′	600′	350′
65		650′	715′	780′	65′	130′-165′	700′	410′
70		700′	770′	840′	70′	140′-175′	800′	475′
75		750′	825′	900′	75′	150′-185′	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
	✓	✓		

DEFINITIONS:

MOBILE - work that moves continously or intermittently (stopping up to approximately 15 minutes).

SHORT DURATION - work that occupies a location up to 1 hour.

SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:

1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Work Vehicle with high intensity rotating, flashing, oscillating or strobe lights should be used to protect work space.
3. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Heavy Work Vehicle.
4. CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" SIGNS.
5. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads may be omitted when approved by the Engineer.
6. The Surveying Instrument shall not be located on the paved surface.
7. Cones at edge of pavement adjacent to instrument person may be omitted when approved by the Engineer.
8. Rodman may only enter roadway when accompanied by flagger and as traffic allows.
9. The distance between the advance warning signs and the work should not exceed a two mile maximum.
10. Flaggers and Survey Crew should use two-way radios or other means of communication.
11. Survey Crew and Flaggers shall wear high-visibility apparel meeting the ANSI 107-2007 standard performance for Class 2 or Class 3 risk exposure.
12. Additional traffic control devices may be required to address local site conditions.
13. Stopping Sight Distance shall be maintained from approaching traffic to the flagger. See "Stopping Sight Distance" table.

SURVEY PARTIES SHOULD AVOID ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

This TCP is to cover two lane rural type roadways as determined by the Engineer. All other type roadways will be covered by other established Survey TCP'S.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-2c)-10

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

REVISIONS

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
LBB	LUBBOCK		65

212A

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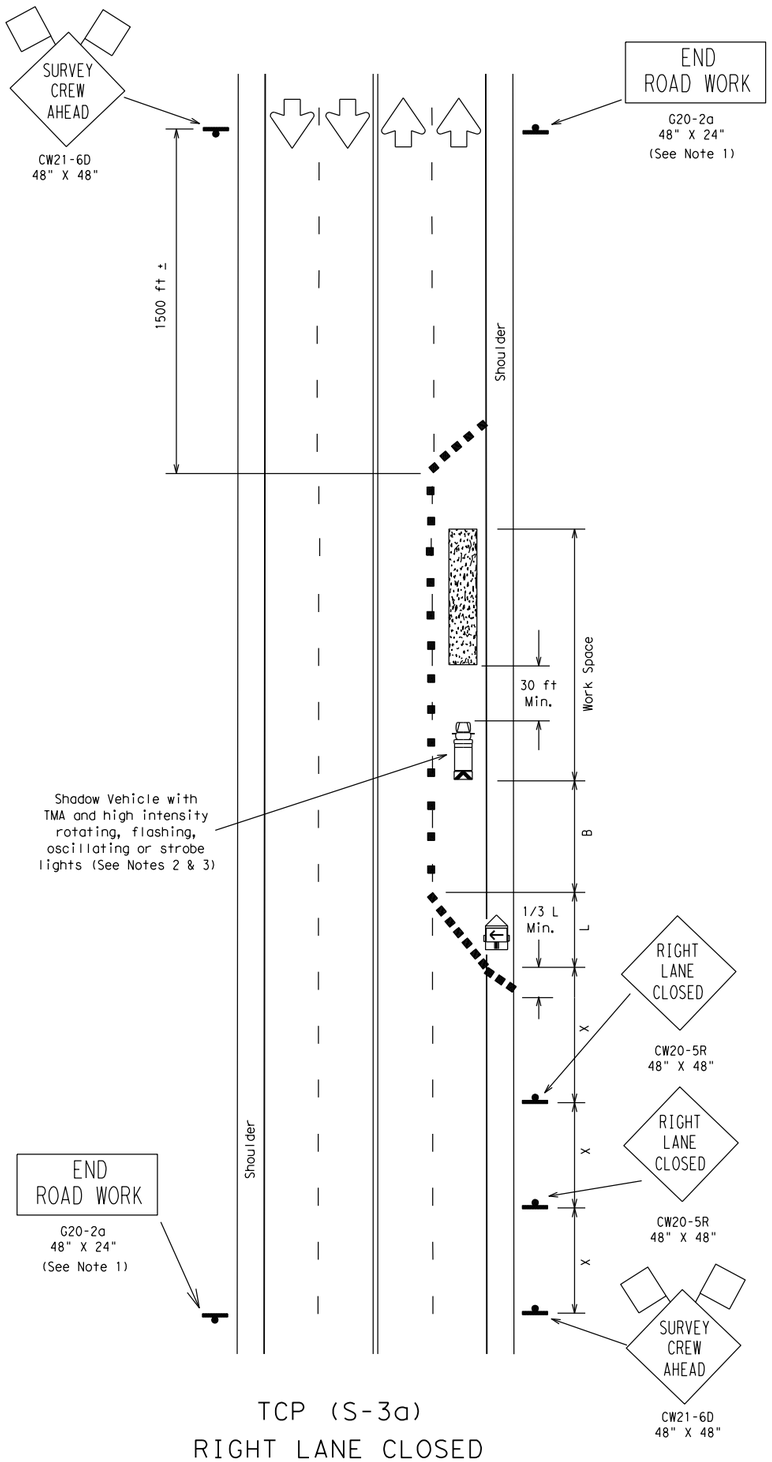
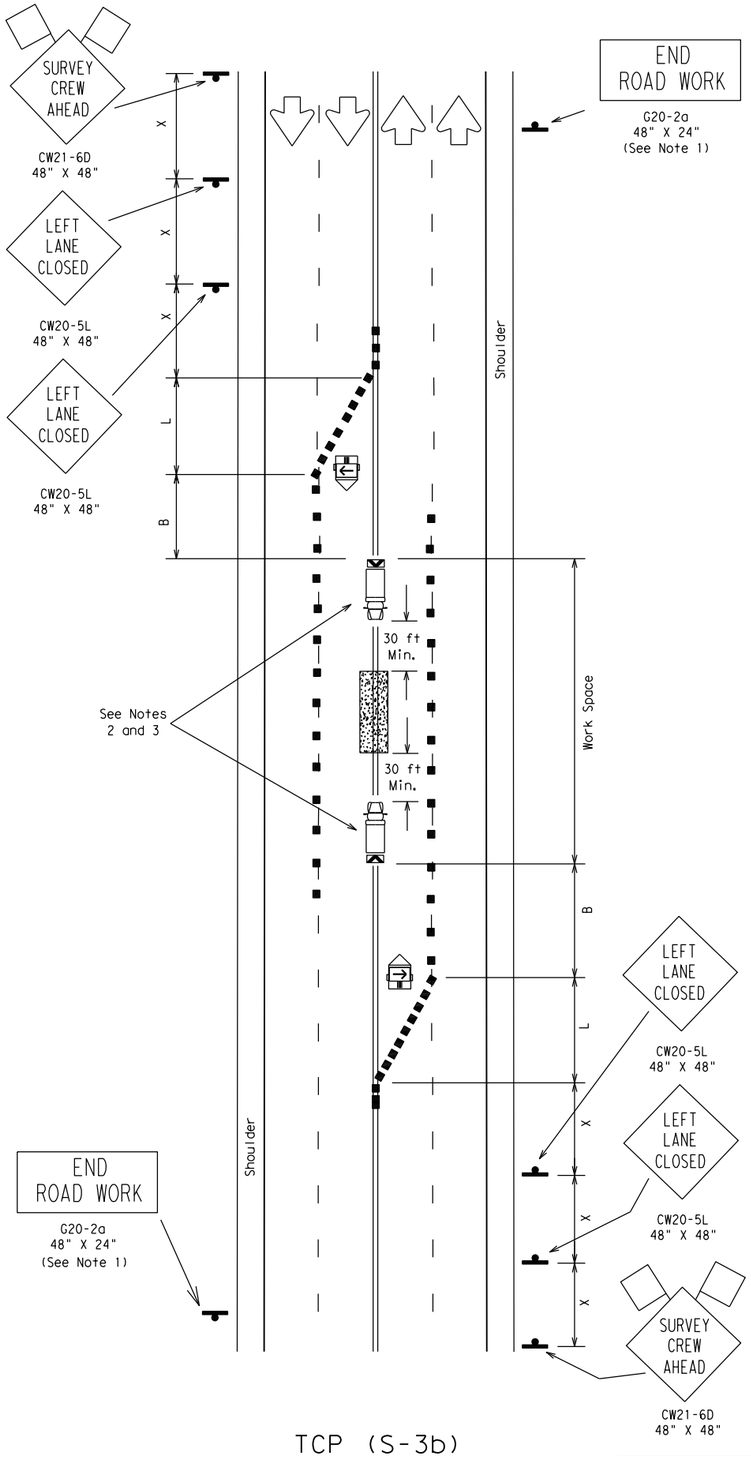


TCP (S-3a)
RIGHT LANE CLOSED
WITH OR WITHOUT SHOULDERS



TCP (S-3b)
WORK ON CENTERLINE

WHENEVER POSSIBLE, SURVEY PARTIES SHOULD AVOID, BY THE USE OF OFFSET LINES, ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

Type III Barricade ■ ■ Channelizing Devices Flag
Heavy Work Vehicle Truck Mounted Attenuator (TMA)
Trailer Mounted Flashing Arrow Panel
Portable Changeable Message Sign (PCMS)
Flagger Sign Post

Posted Speed ✳	Formula	Minimum Desirable Taper Lengths ✳✳ 10′ Offset	11′ Offset	12′ Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	150′	165′	180′	30′	60′-75′	120′	90′
35		205′	225′	245′	35′	70′-90′	160′	120′
40		265′	295′	320′	40′	80′-100′	240′	155′
45	L=WS	450′	495′	540′	45′	90′-110′	320′	195′
50		500′	550′	600′	50′	100′-125′	400′	240′
55		550′	605′	660′	55′	110′-140′	500′	295′
60		600′	660′	720′	60′	120′-150′	600′	350′
65		650′	715′	780′	65′	130′-165′	700′	410′
70		700′	770′	840′	70′	140′-175′	800′	475′
75		750′	825′	900′	75′	150′-185′	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
	✓	✓		

DEFINITIONS:
SHORT DURATION - work that occupies a location up to 1 hour.
SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:
1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. For short duration work the Shadow Vehicle with TMA may be replaced by another Work Vehicle with high intensity rotating, flashing or strobe lights.
3. Shadow Vehicles with a TMA are desirable when workers or equipment are in the work space. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Shadow Vehicle.
4. CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" signs.
5. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.

TCP(S-3a)
6. If shoulders are not present, the 1/3L shoulder taper is to be omitted and four channelizing devices shall be placed in front of the arrow panel, perpendicular to traffic.

TCP(S-3b)
7. One CW20-5L "LEFT LANE CLOSED" sign in each direction may be omitted when the posted speed is less than 45mph and volume is less then 2000 ADT.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-3)-08

REVISIONS

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

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LBB	LUBBOCK		66

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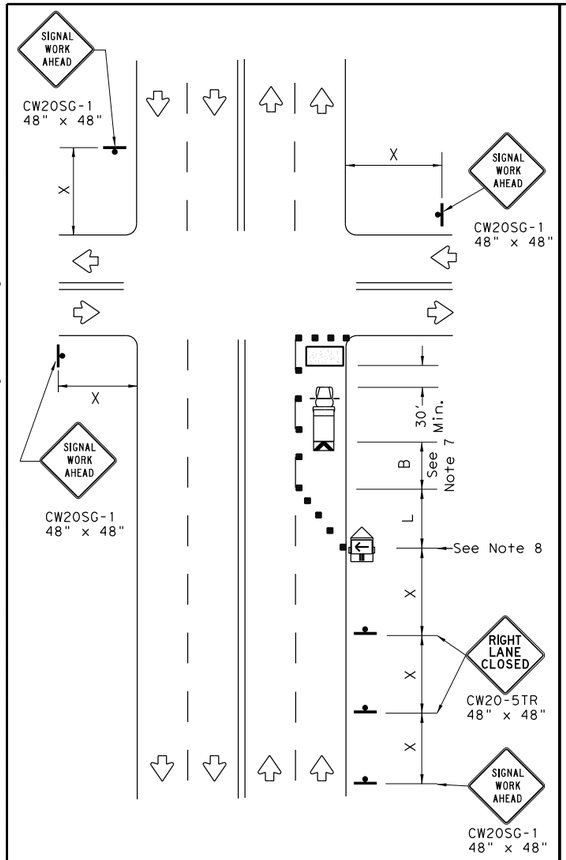
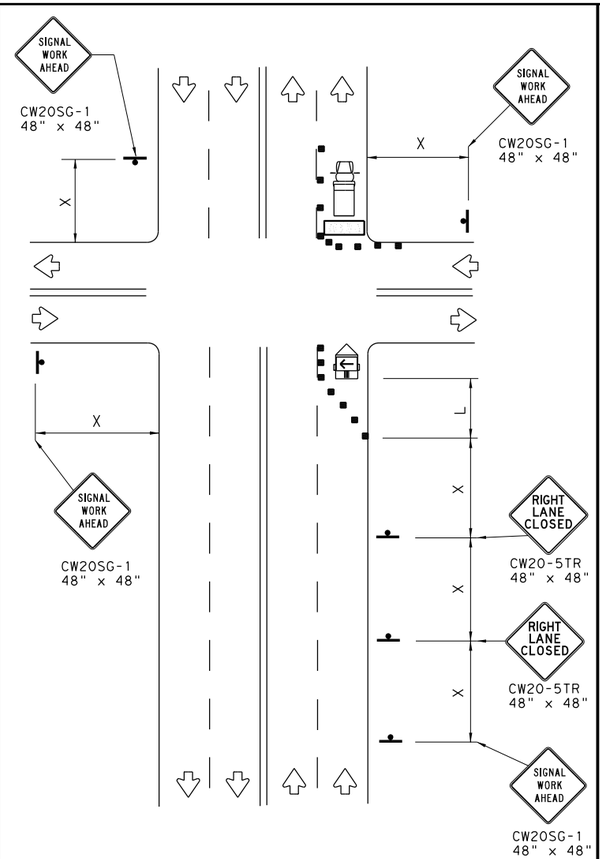


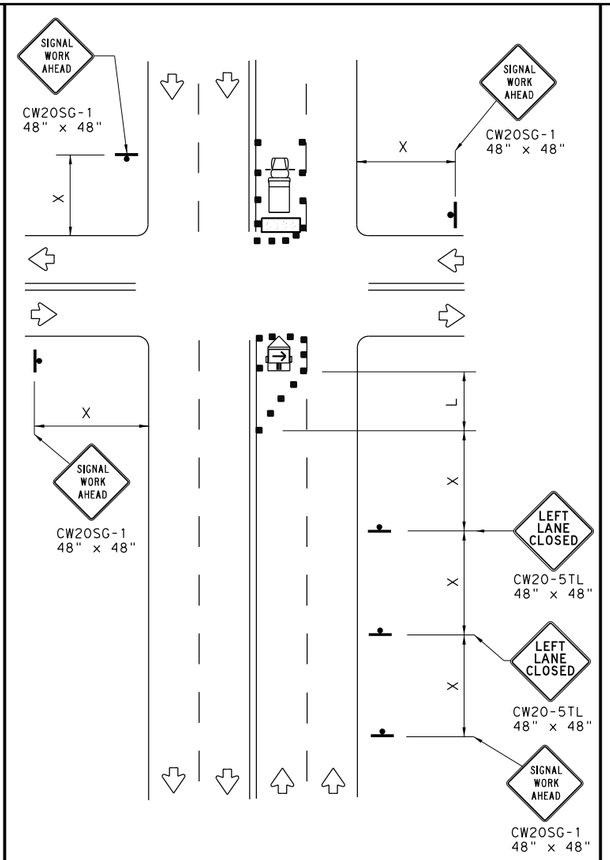
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



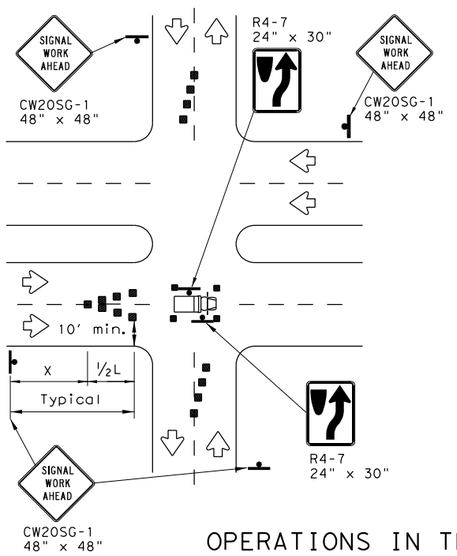
FAR SIDE RIGHT LANE CLOSURE

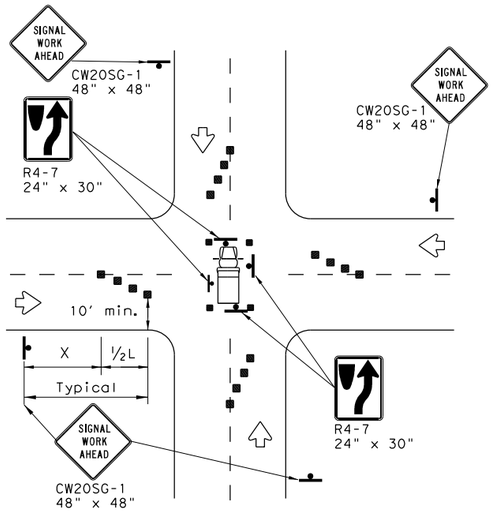
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	LBB	LUBBOCK		67

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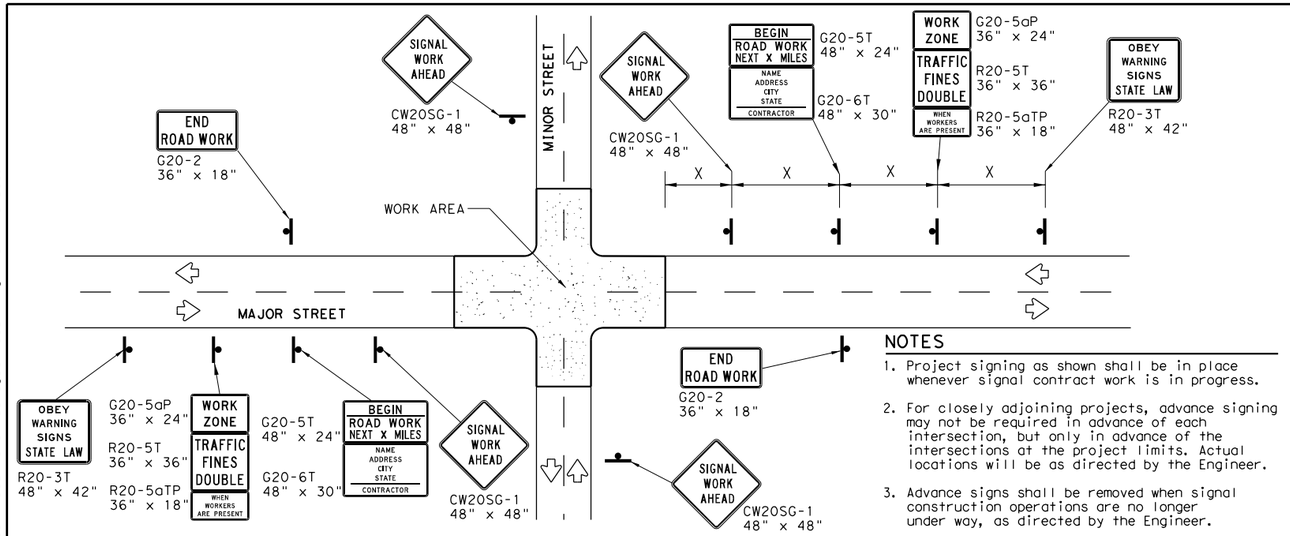


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

DURATION OF WORK

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

SIGN MOUNTING HEIGHT

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

REMOVING OR COVERING

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

REFLECTIVE SHEETING

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

SIGN SUPPORT WEIGHTS

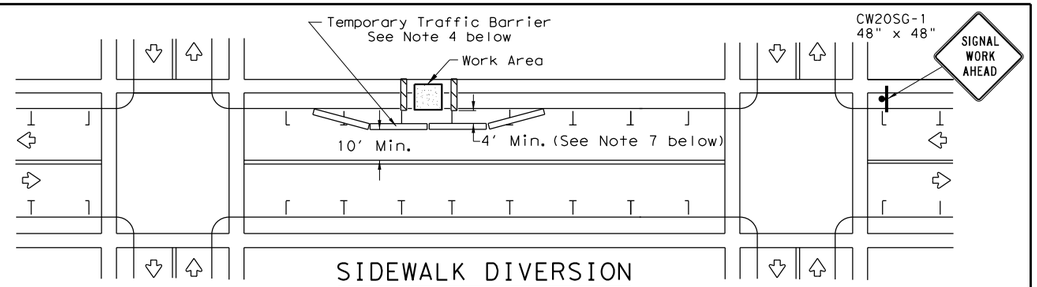
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

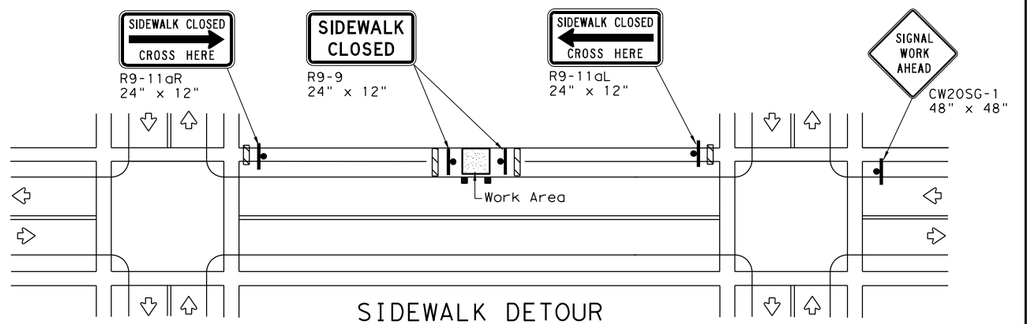
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

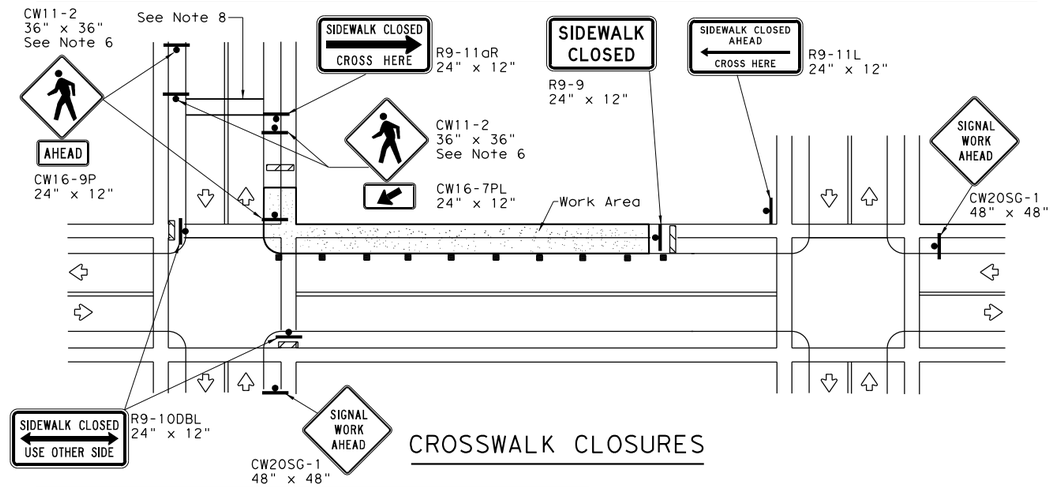
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

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2-98 10-99 7-13		DIST	COUNTY		SHEET NO.
4-98 3-03		LBB	LUBBOCK		68

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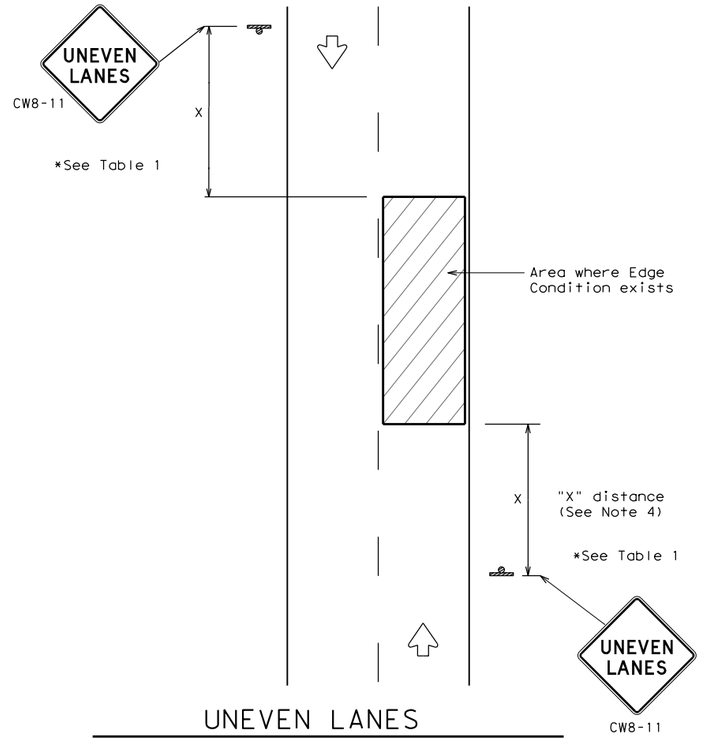
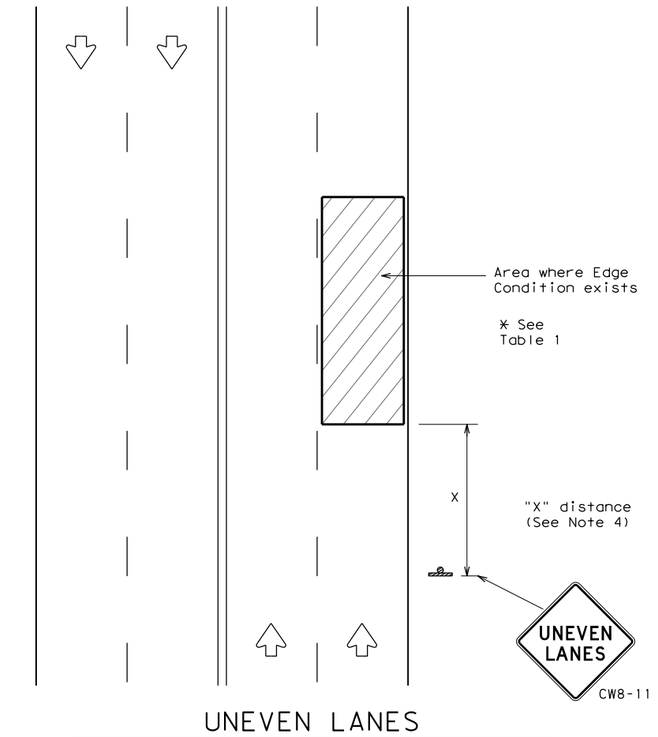
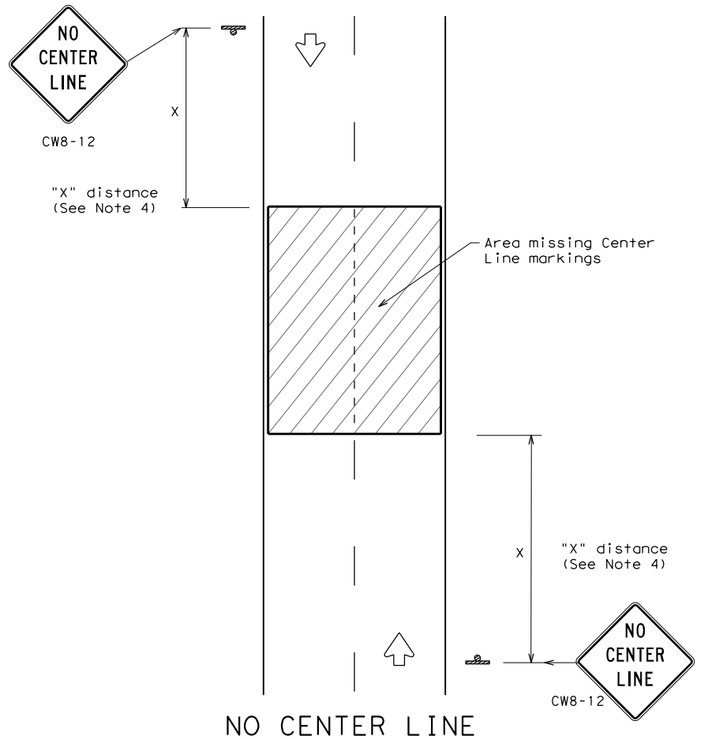


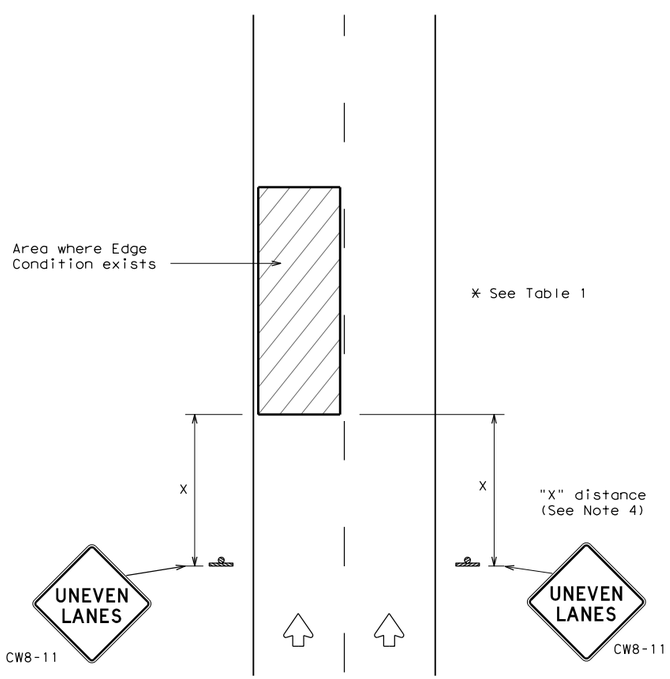
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

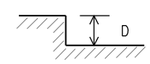
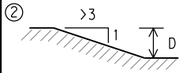
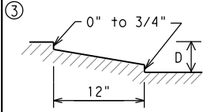
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	LBB	LUBBOCK		69

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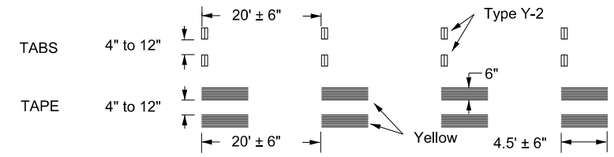
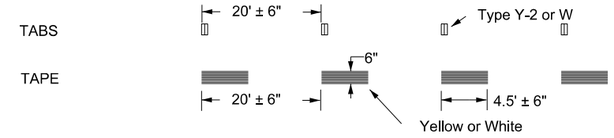
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

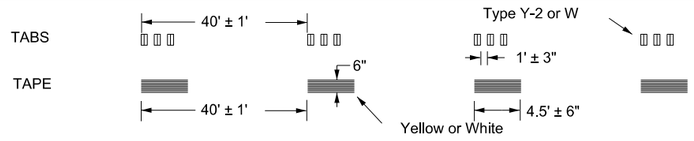


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



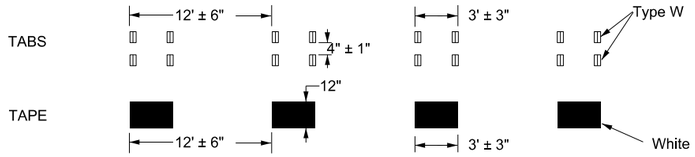
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

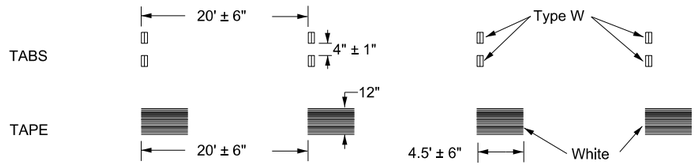


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



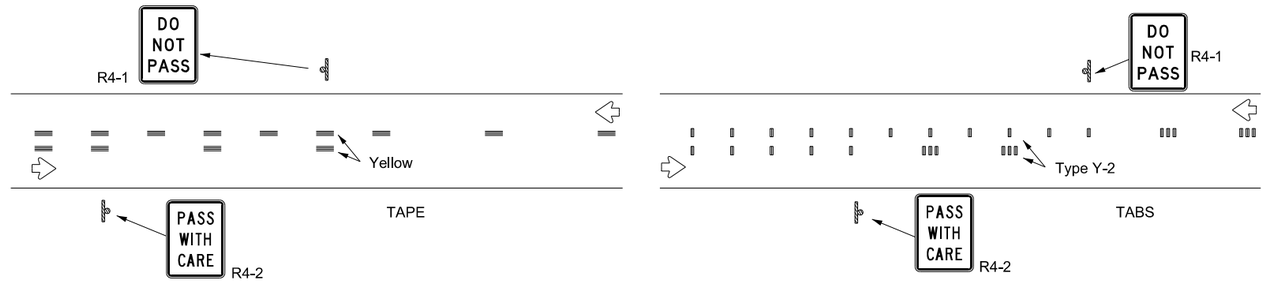
NOTES:

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

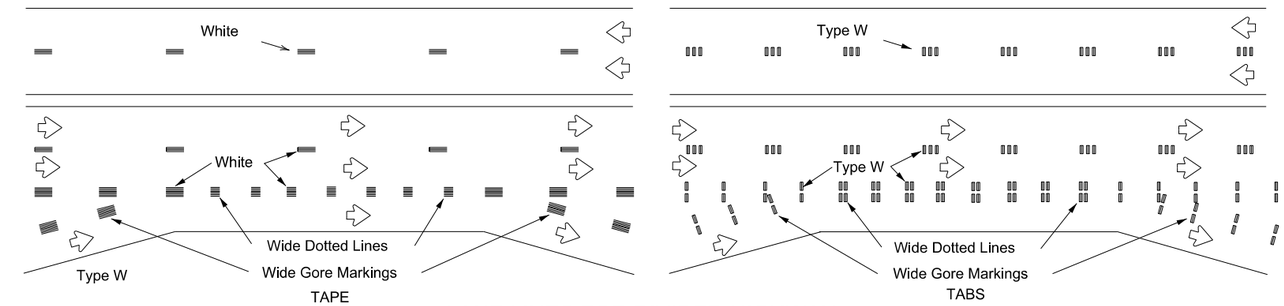
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

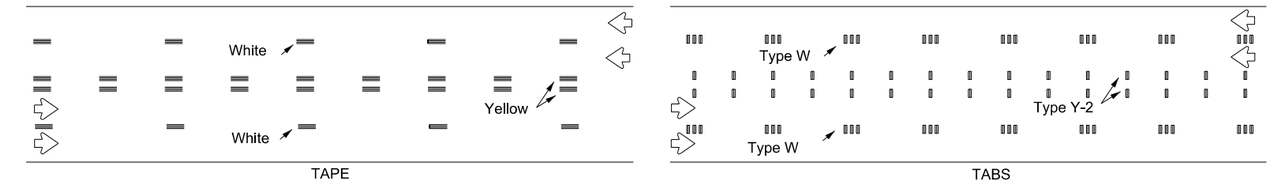
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



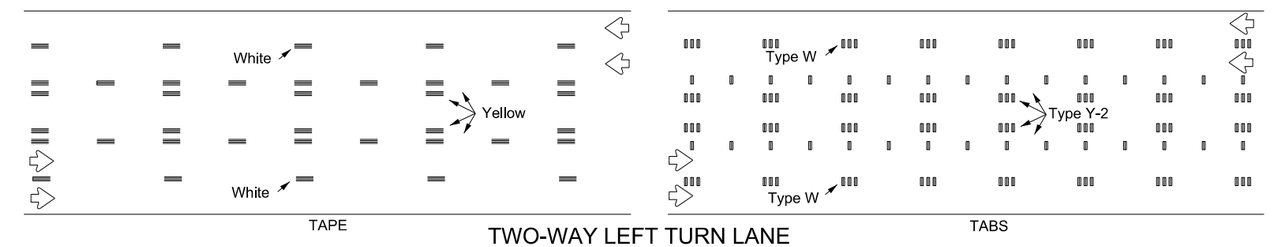
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



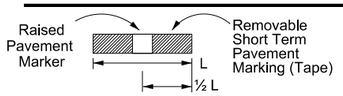
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
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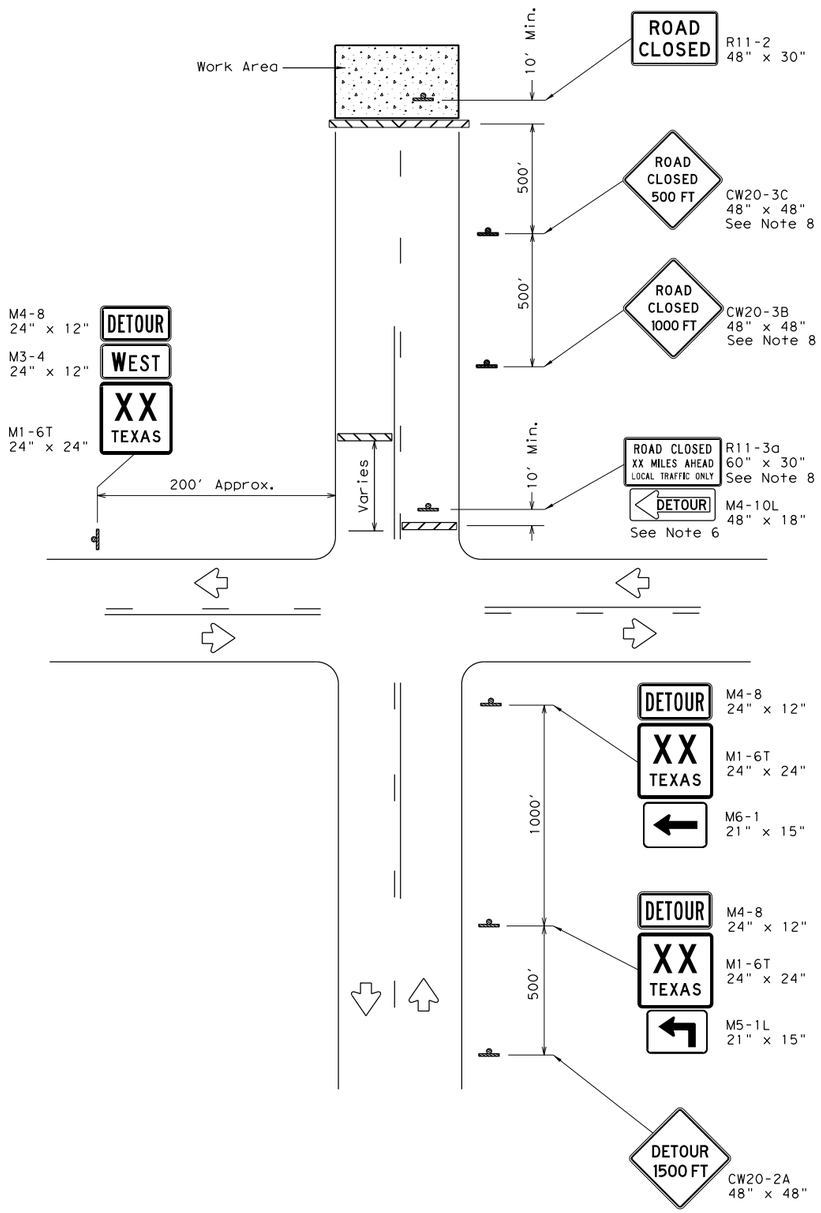
	LBB	LUBBOCK		70

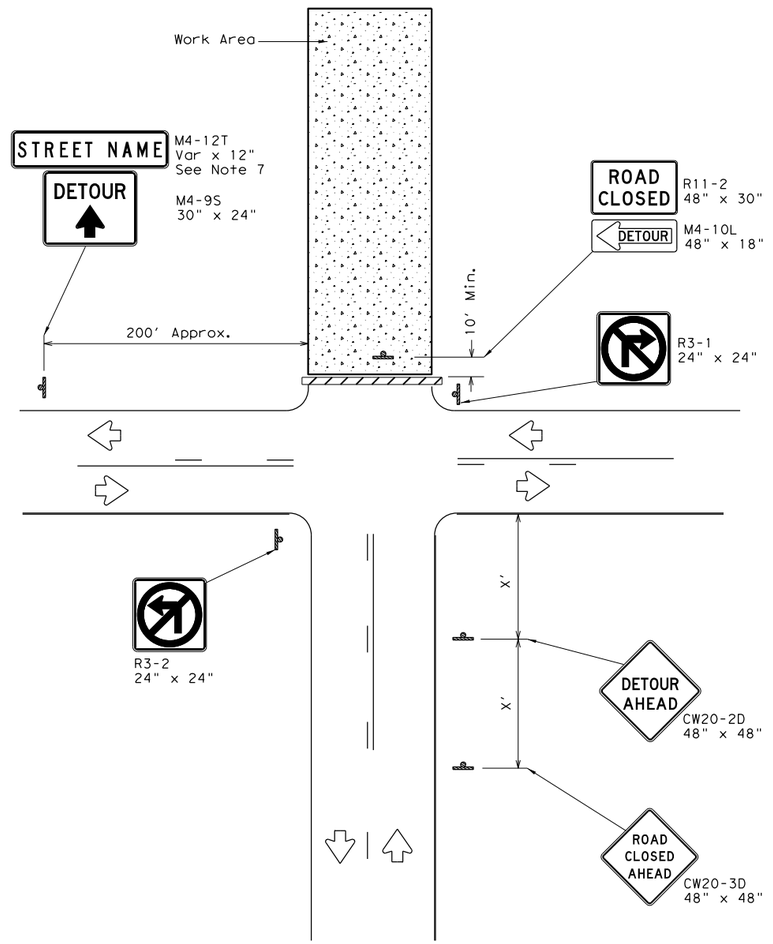
111

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	0905	06	095,ETC.	CS
1-97 4-98 7-13	DIST	COUNTY		SHEET NO.
2-98 3-03	LBB	LUBBOCK		71

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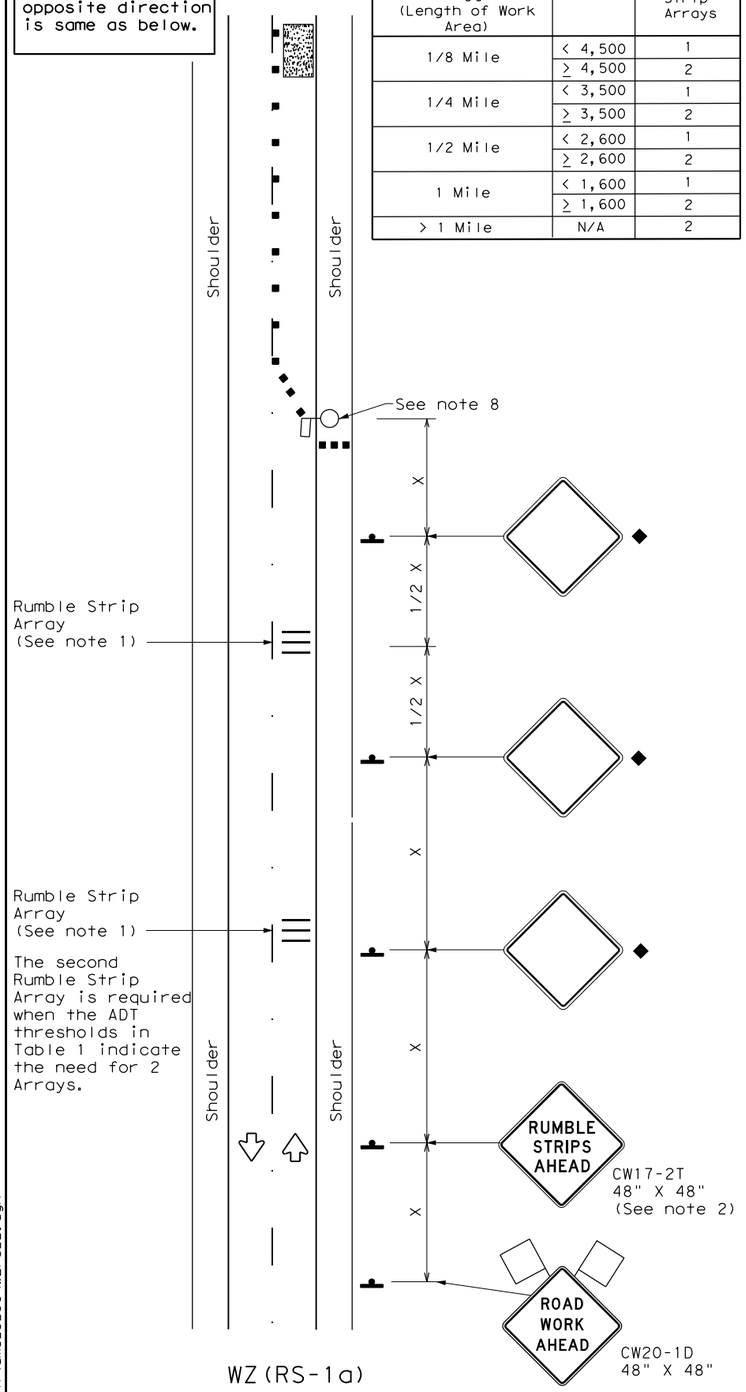
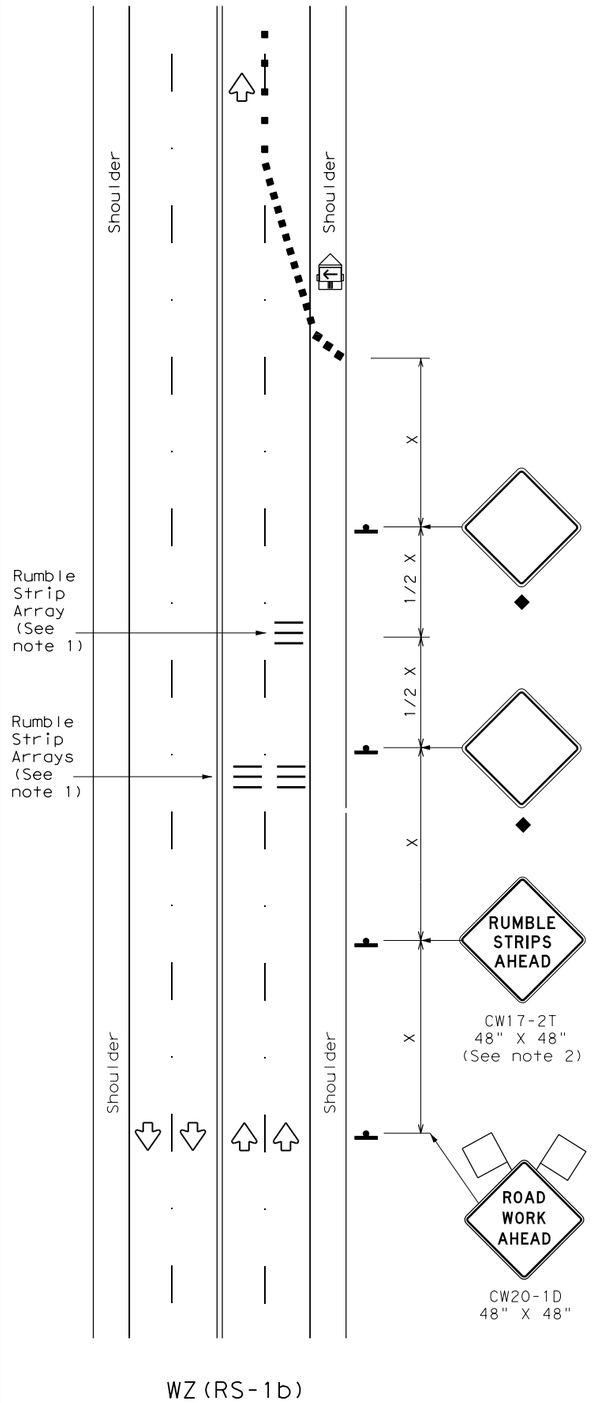
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

* For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.

TABLE 2	
Speed	Approximate distance between strips in an array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
= 60 MPH	20'
≥ 65 MPH	* 35' +

Texas Department of Transportation — Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0905	06	095,ETC.	CS
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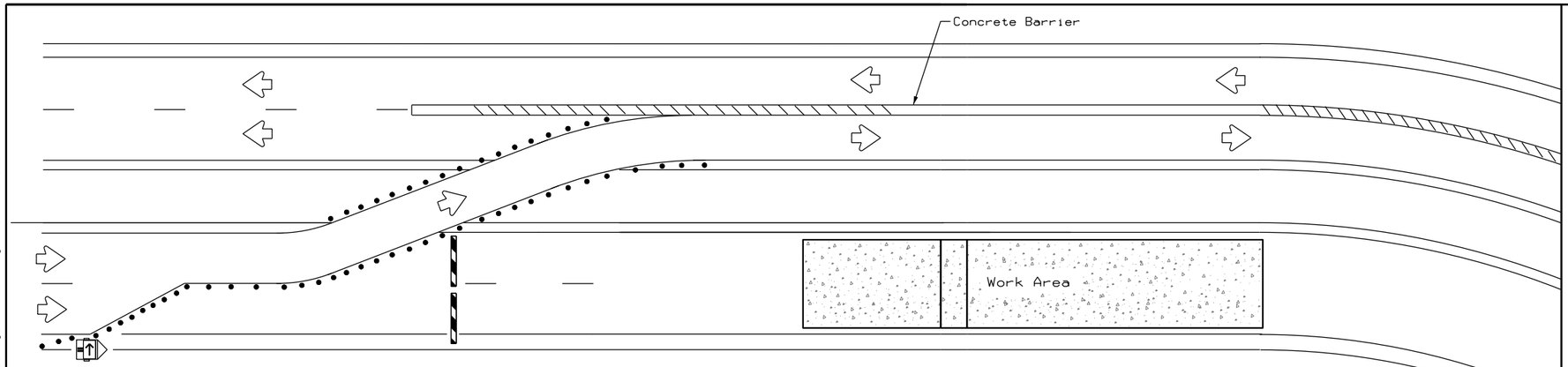


NOTES:

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

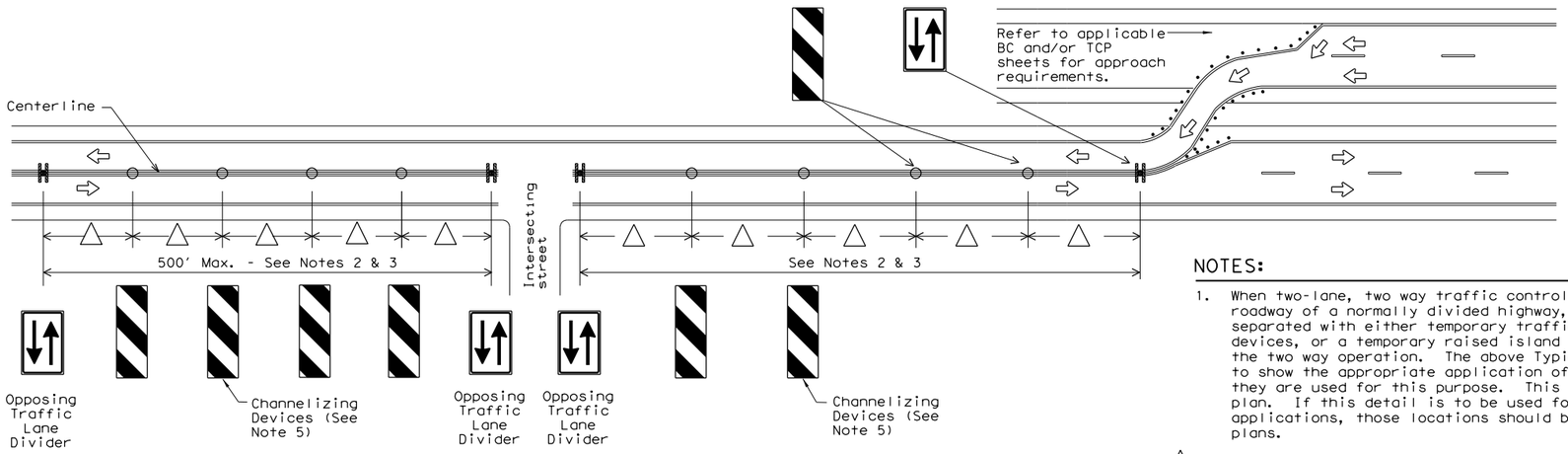
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

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

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

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

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



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

NOTES:

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 2-17 3-03 7-13	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		73

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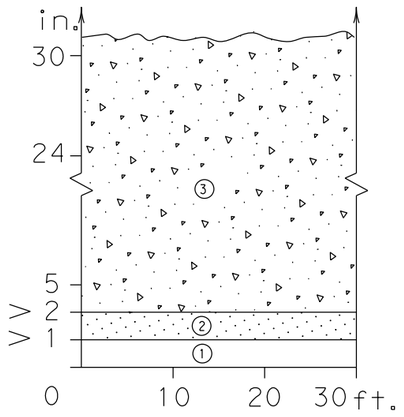
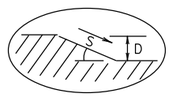
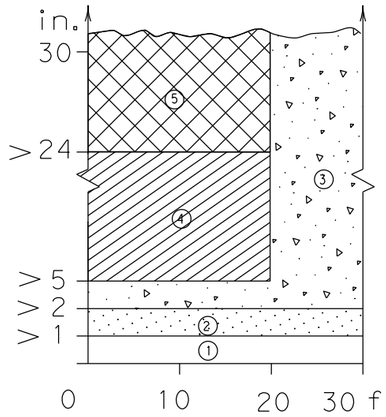
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet

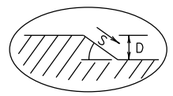


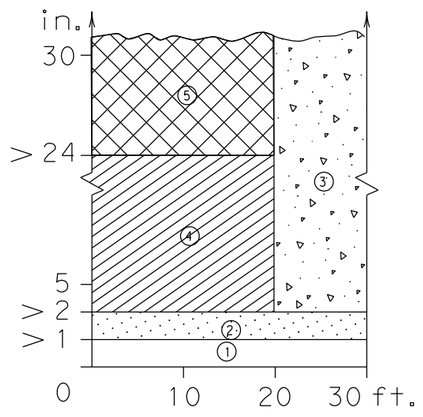
Edge Condition I
S = (3:1) (or flatter)



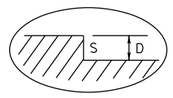


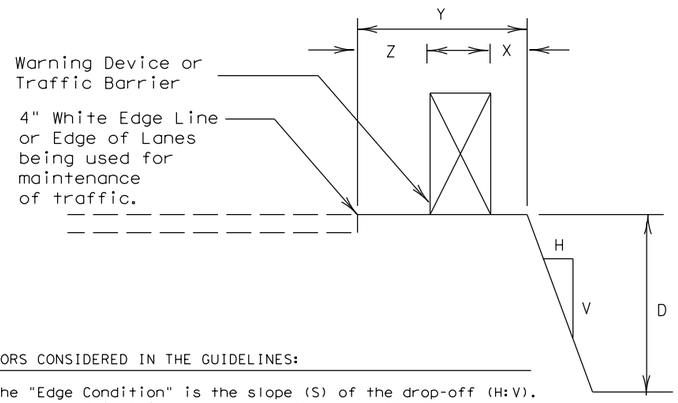
Edge Condition II
S = ((2.99):1) to (1:1)





Edge Condition III
S is steeper than (1:1)





FACTORS CONSIDERED IN THE GUIDELINES:

1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".

2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.

3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.

4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.

5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment.
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a "Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW 8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge fill may be provided to change the edge slope to that of the preferable Edge Condition I.
⑤	Check indications (Figure-1) for positive barrier. Where positive barrier is not indicated, the treatment shown above for Zone- 4 may be used after consideration of other applicable factors.

Edge Condition Notes:

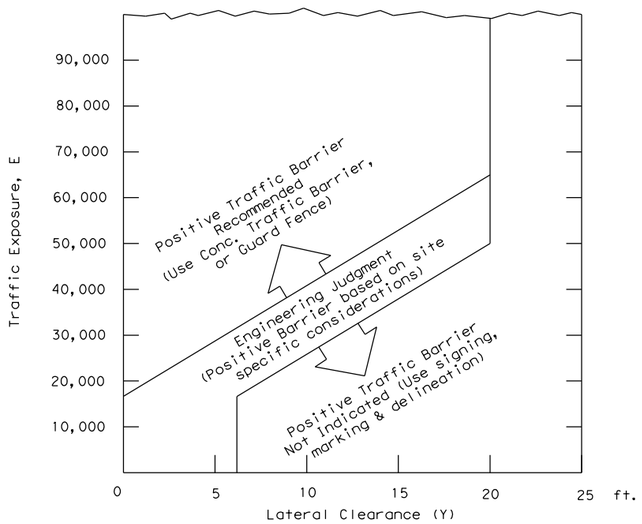
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.

3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 (▨)



1 E = ADT x T
Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.

2 Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.

3 An approved end treatment should be provided for any positive barrier end located within a lateral offset of 20 feet from the edge of the travel lane.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

Engineer's Seal

Pedro Carrasco Jr.

Date 8/9/2023

Texas Department of Transportation
Traffic Operations Division

TREATMENT FOR VARIOUS EDGE CONDITIONS

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

REVISIONS
03-01
08-01 correct typos

CONT	SECT	JOB	HIGHWAY
0905	06	095, ETC.	CS
DIST	COUNTY		SHEET NO.
LBB	LUBBOCK		74

100% SUBMITTAL

SUMMARY OF REMOVAL ITEMS												
	0104 6001	0104 6017	0104 6022	0104 6044	0354 6061	0496 6016	0496 6043	0544 6003	0550 6003	0550 6015	0644 6076	0677 6001
	REMOVING CONC (PAV)	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB AND GUTTER)	REMOVING CONC (FLUME)	PLANE ASPH CONC PAV (2" TO 9")	REMOV STR (PIPE)	REMOVE STR (SMALL FENCE)	GUARDRAIL END TREATMENT (REMOVE)	CHAINK LINK FENCE (REMOVE)	REMOVE & INSTALL EXISTING GATE	REMOVE SM RD SN SUP&AM	ELIM EXT PAV MRK & MRKS (4")
STATIONING	SY	SY	LF	SY	SY	EA	LF	EA	LF	EA	EA	LF
BEGIN PROJECT TO STA 219+00	364	173	59	78	1166	1		1			3	
STA 219+00 TO STA 231+00		401			3925	3						
STA 231+00 TO STA 243+00		26			4419	6	305			7	2	
STA 243+00 TO STA 255+00					3668	6	1267					
STA 255+00 TO STA 267+00	936	428	140		2281	1	419		528	3	10	1030
STA 267+00 TO END PROJECT		261			3737	5	276					
66TH ST STA 10+00 TO STA 17+00					1259				180			
66TH ST STA 21+00 TO STA 26+77		116			813		181					
PROJECT TOTAL	1300	1405	199	78	20455	22	2448	1	708	10	15	1030

SUMMARY OF REMOVAL ITEMS					
	0677 6003	0677 6007	0677 6016	0690 6021	5013 6001
	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (24")	ELIM EXT PAV MRK & MRKS (RR XING)	REMOVAL OF TIMBER POLES	REMOVE AND RELOCATE STEEL FENCE
STATIONING	LF	LF	EA	EA	LF
BEGIN PROJECT TO STA 219+00					
STA 219+00 TO STA 231+00					
STA 231+00 TO STA 243+00				10	932
STA 243+00 TO STA 255+00	50				
STA 255+00 TO STA 267+00		335	3		90
STA 267+00 TO END PROJECT					
66TH ST STA 10+00 TO STA 17+00					
66TH ST STA 21+00 TO STA 26+77					
PROJECT TOTAL	50	335	3	10	1022

8/9/2023

TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

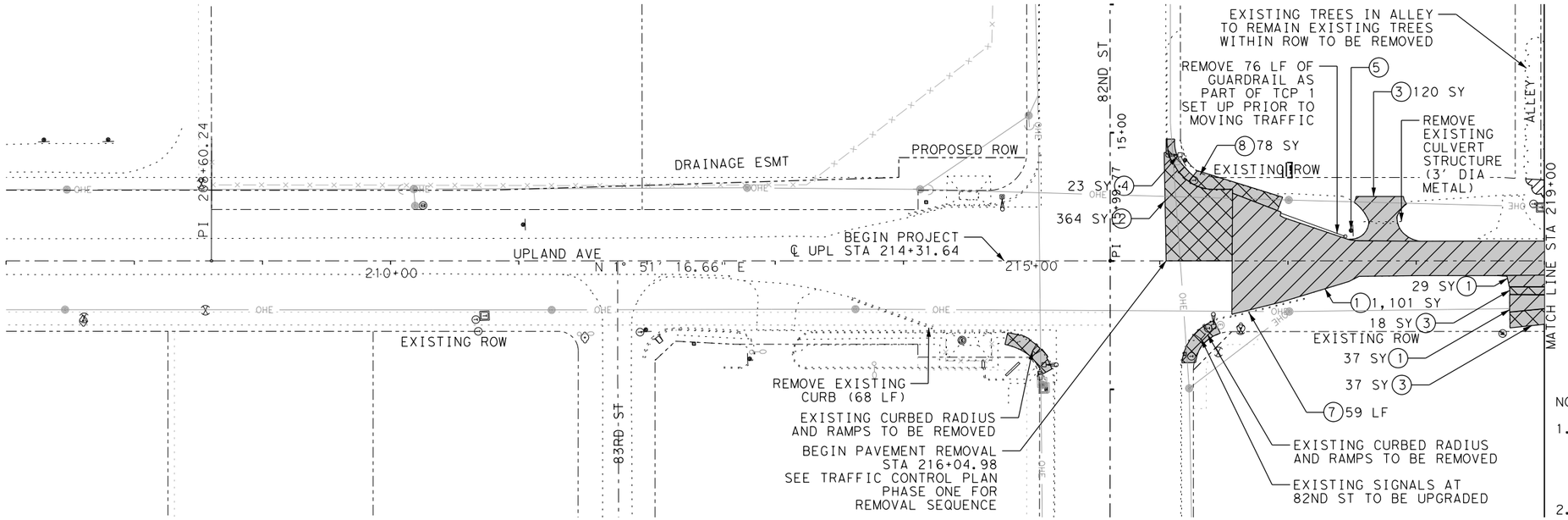
UPLAND AVENUE
66TH STREET TO 82ND STREET

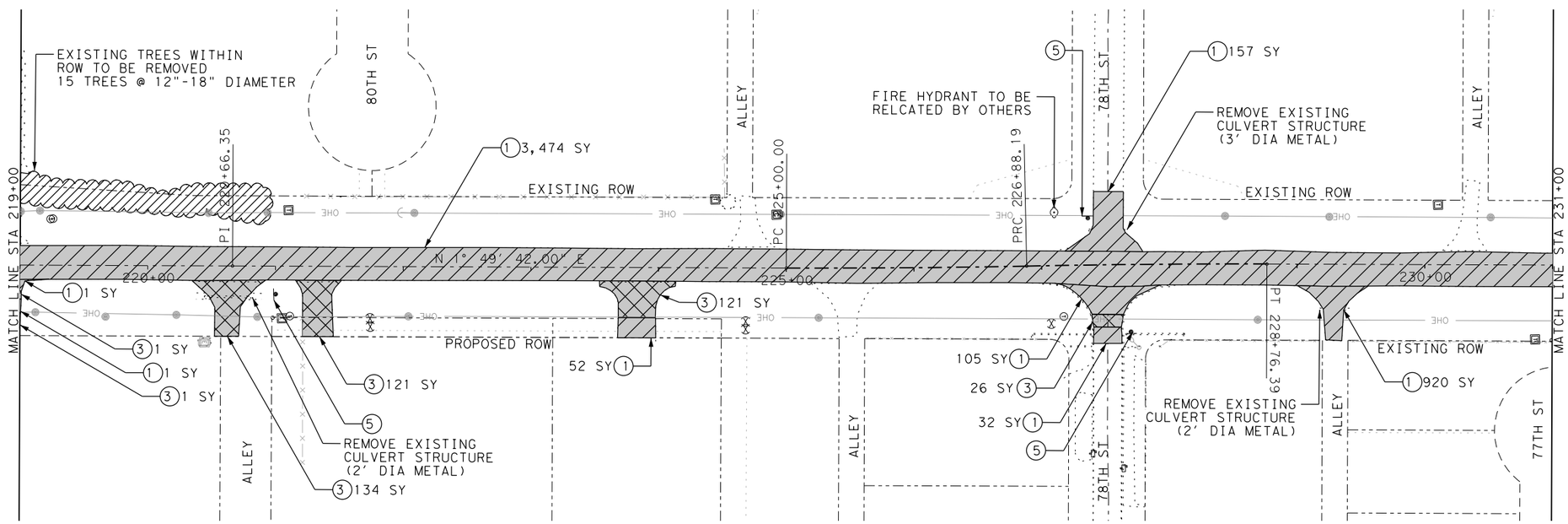
REMOVAL SUMMARY

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	75
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





0 50 100
SCALE: 1"=100'

LEGEND

- ASPHALT REMOVAL
- CONCRETE REMOVAL
- (1) STAB BASE & ASPH
- (2) CONCRETE PAVEMENT
- (3) CONCRETE DRIVEWAY
- (4) CONCRETE SIDEWALK
- (5) SIGN AND POST
- (6) FENCE
- (7) CURB AND GUTTER
- (8) CONCRETE RIPRAP
- (9) ELIM EXT PAV MRK

NOTES:

1. SIGNS IDENTIFIED FOR REMOVAL TO BE TURNED OVER TO THE CITY OF LUBBOCK TRAFFIC DEPARTMENT. CITY WILL PICK UP. CONTACT THE CITY OF LUBBOCK TRAFFIC DEPARTMENT AT 806-775-2132 TO COORDINATE PICK UP.
2. CONTRACTOR SHALL TAKE CARE TO PROTECT EXISTING CURB, GUTTER, FENCE, AND SIDEWALK DESIGNATED TO REMAIN. ANY DAMAGE CAUSE BY CONTRACTOR OR CONTRACTOR'S EQUIPMENT WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
3. REMOVAL OF HEADWALLS/WINGWALLS SHALL BE SUBSIDIARY TO STRUCTURE REMOVAL
4. REFER TO SIGNAL SHEETS FOR REMOVAL OF SIGNAL, ITS, GROUND BOX AND CONDUIT RELATED ITEMS.

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET
REMOVAL PLAN

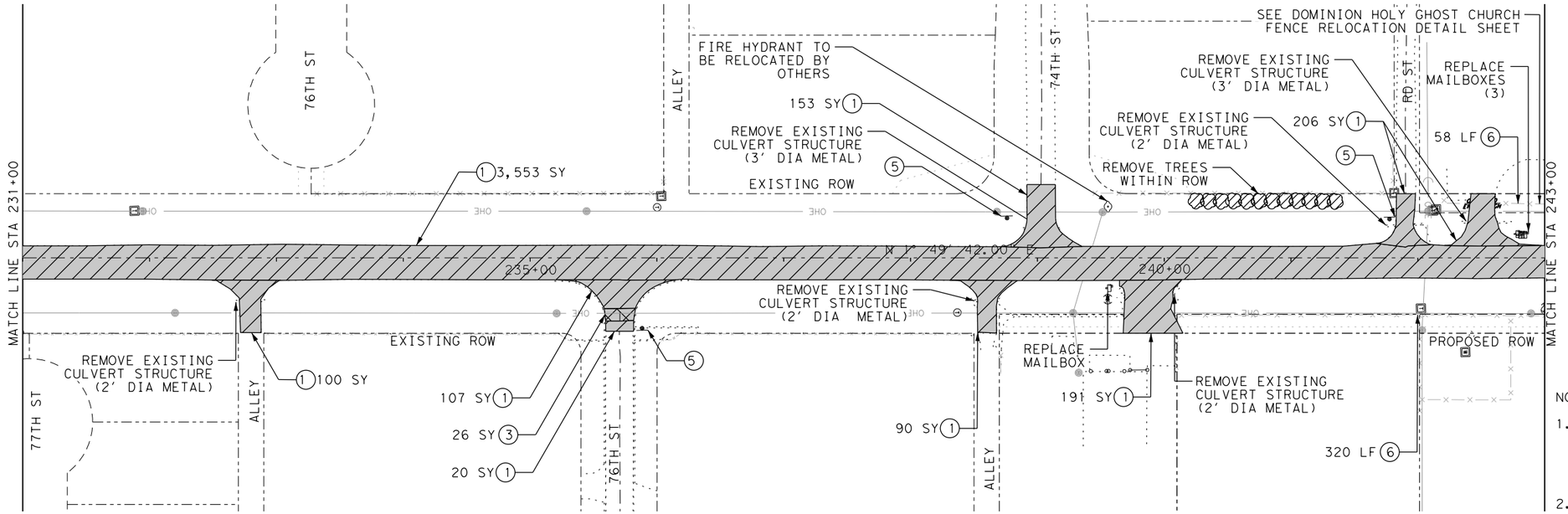
BEGIN PROJECT TO STA 231+00

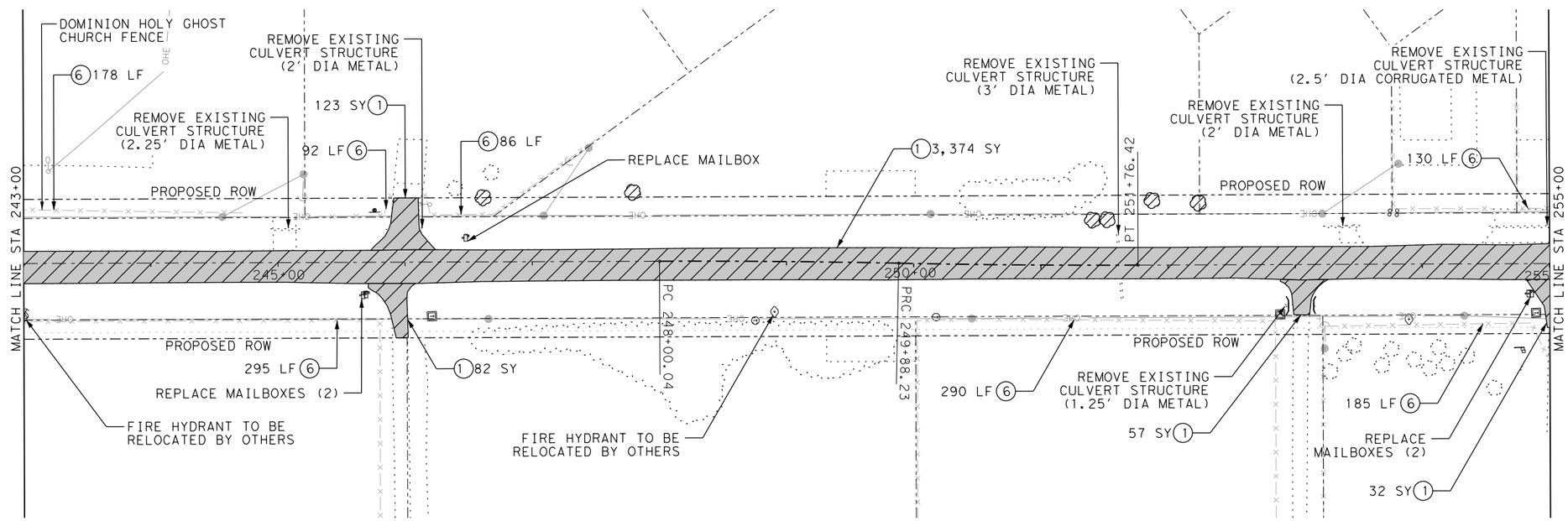
SHEET 1 OF 4

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	76
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





0 50 100
SCALE: 1"=100'

LEGEND

- ASPHALT REMOVAL
- CONCRETE REMOVAL
- (1) STAB BASE & ASPH
- (2) CONCRETE PAVEMENT
- (3) CONCRETE DRIVEWAY
- (4) CONCRETE SIDEWALK
- (5) SIGN AND POST
- (6) FENCE
- (7) CURB AND GUTTER
- (8) CONCRETE RIPRAP
- (9) ELIM EXT PAV MRK

NOTES:

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STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr. 8/9/2023

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UPLAND AVENUE
66TH STREET TO 82ND STREET

REMOVAL PLAN

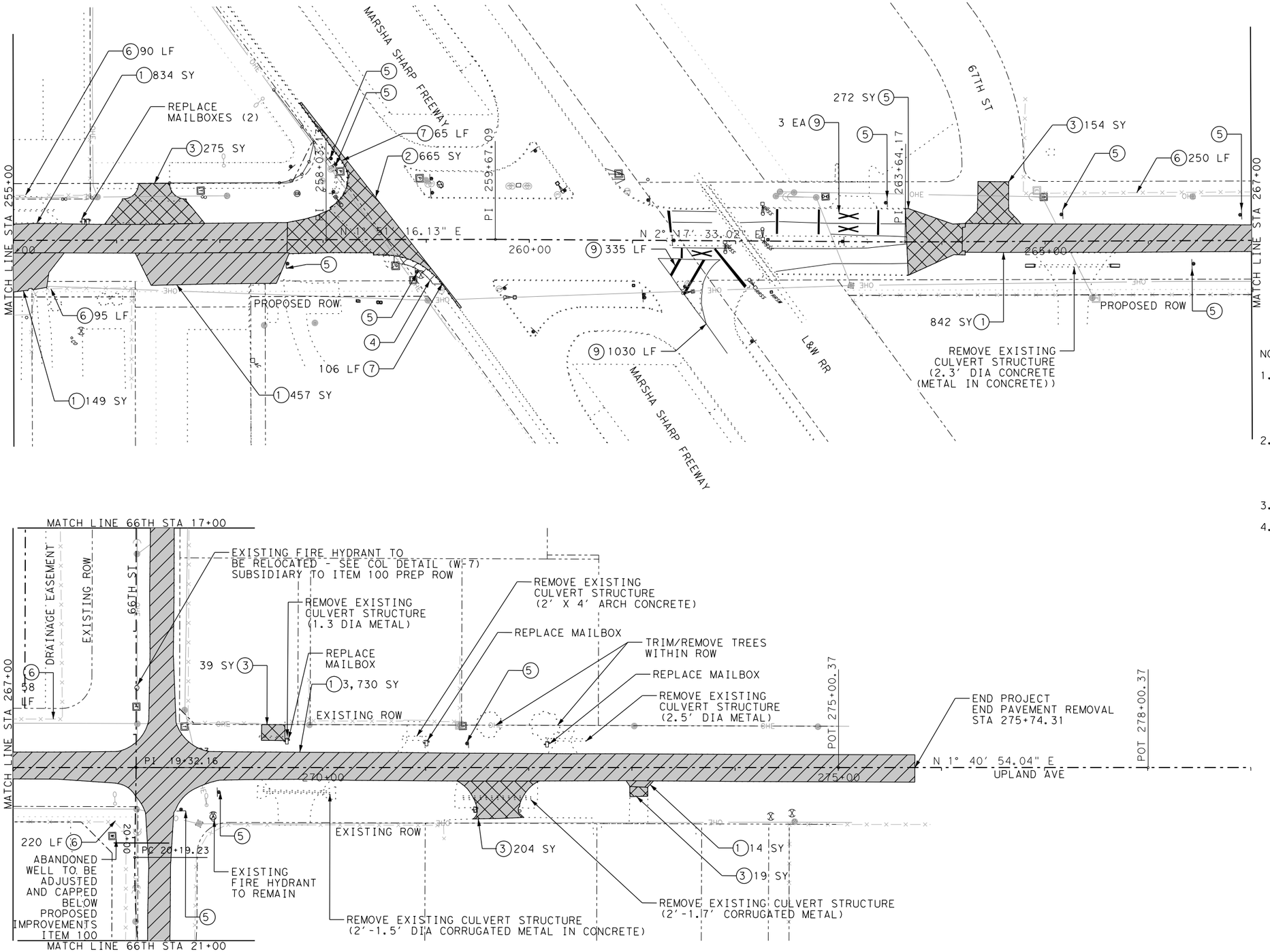
UPL STA 231+00 TO STA 255+00

SHEET 2 OF 4

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	77
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



LEGEND

- ASPHALT REMOVAL
- CONCRETE REMOVAL
- (1) STAB BASE & ASPH
- (2) CONCRETE PAVEMENT
- (3) CONCRETE DRIVEWAY
- (4) CONCRETE SIDEWALK
- (5) SIGN AND POST
- (6) FENCE
- (7) CURB AND GUTTER
- (8) CONCRETE RIPRAP
- (9) ELIM EXT PAV MRK

NOTES:

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STATE OF TEXAS
PEDRO CARRASCO JR.
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LICENSED PROFESSIONAL ENGINEER
9/28/2023

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UPLAND AVENUE
66TH STREET TO 82ND STREET

REMOVAL PLAN

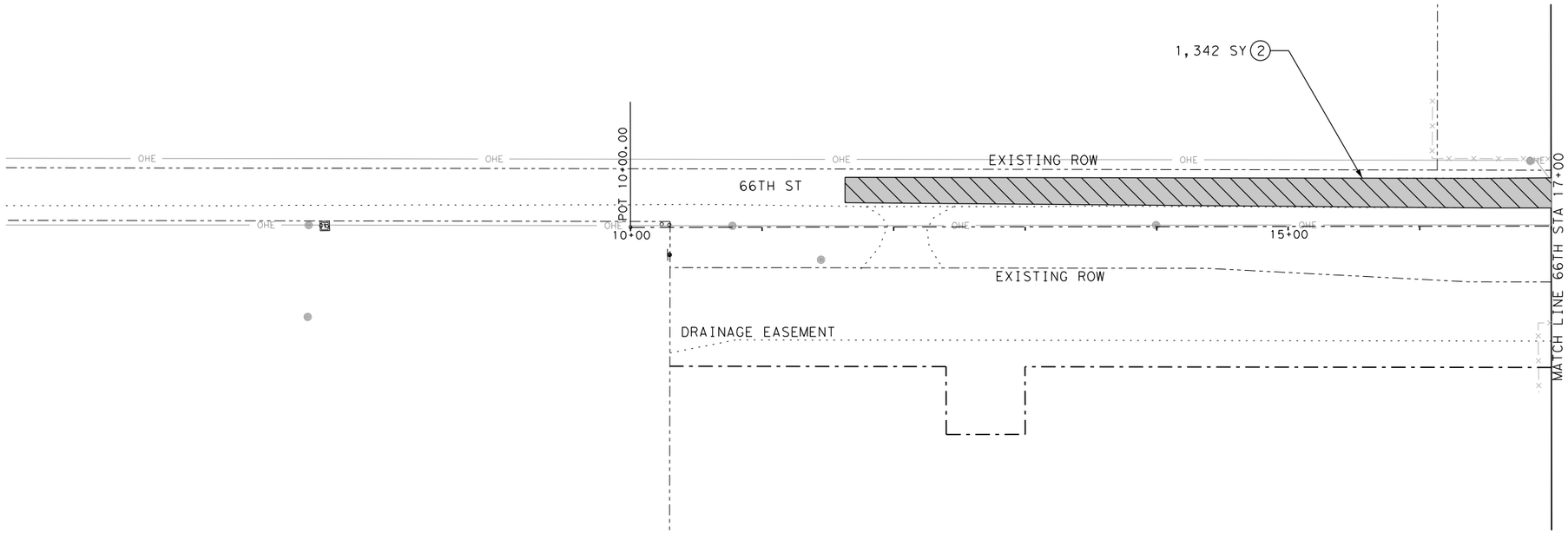
UPL STA 255+00 TO END PROJECT

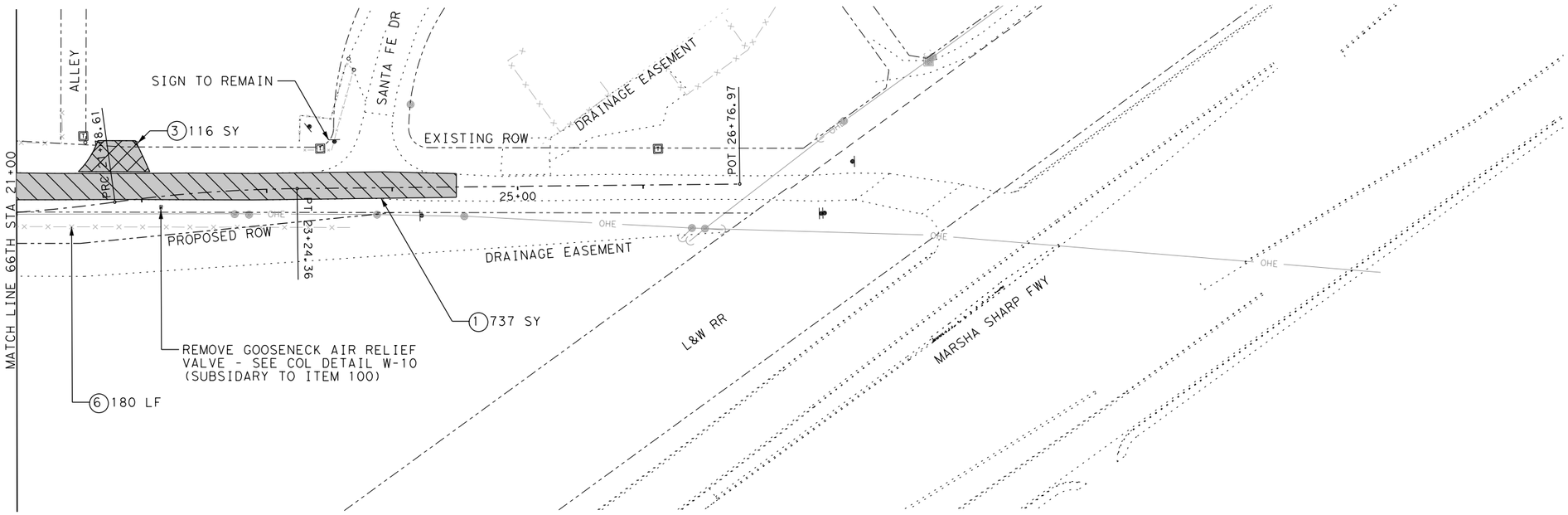
SHEET 3 OF 4

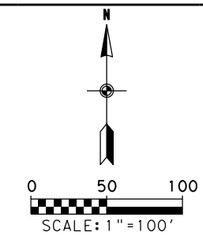
FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	78
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL







LEGEND

- ASPHALT REMOVAL
- CONCRETE REMOVAL
- (1) STAB BASE & ASPH
- (2) CONCRETE PAVEMENT
- (3) CONCRETE DRIVEWAY
- (4) CONCRETE SIDEWALK
- (5) SIGN AND POST
- (6) FENCE
- (7) CURB AND GUTTER
- (8) CONCRETE RIPRAP
- (9) ELIM EXT PAV MRK

NOTES:

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STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

9/28/2023

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TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET

REMOVAL PLAN

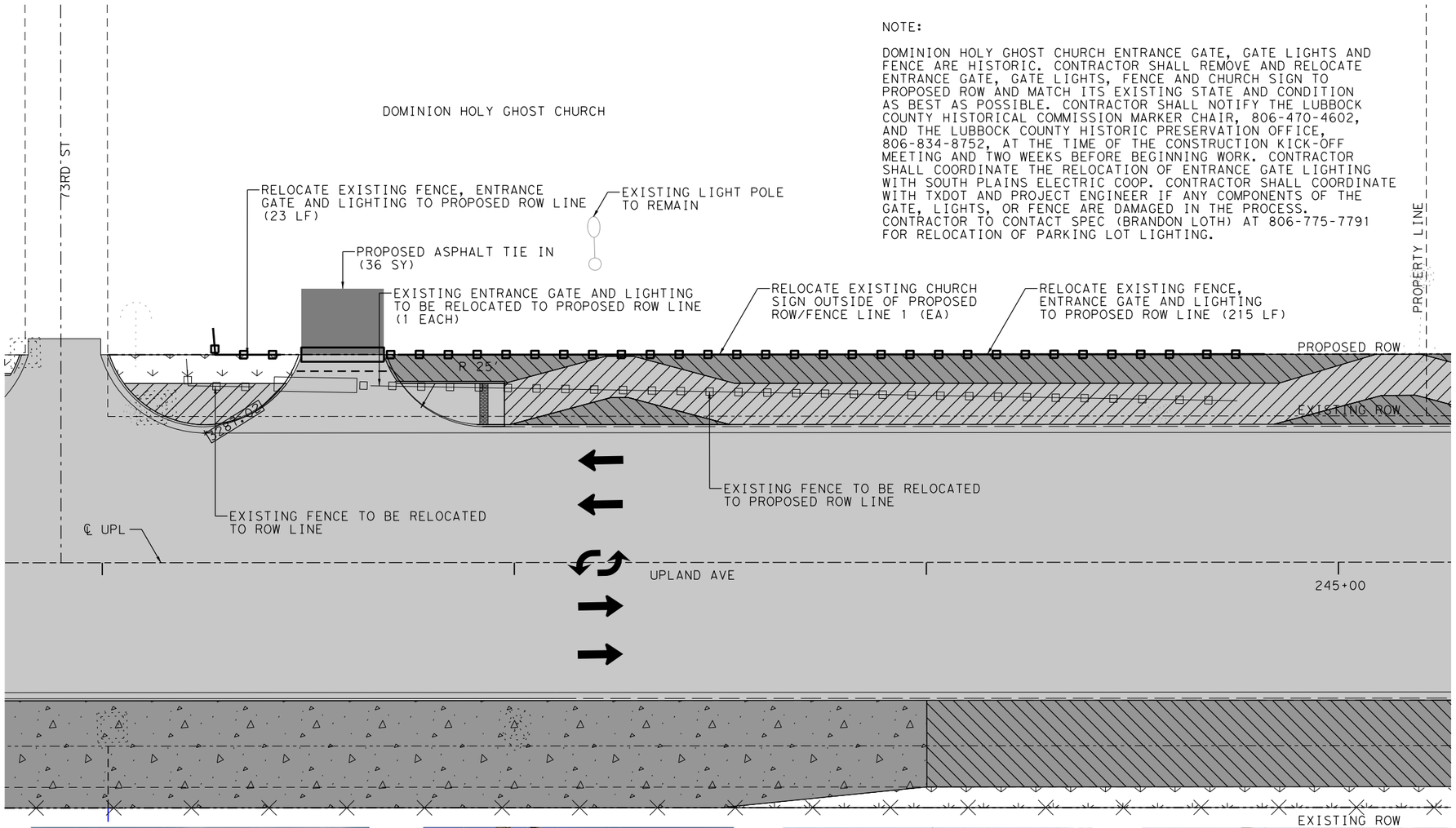
66TH STA 10+00 TO STA 17+00
66TH STA 21+00 TO STA 26+76.97

SHEET 4 OF 4

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	79
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



NOTE:

DOMINION HOLY GHOST CHURCH ENTRANCE GATE, GATE LIGHTS AND FENCE ARE HISTORIC. CONTRACTOR SHALL REMOVE AND RELOCATE ENTRANCE GATE, GATE LIGHTS, FENCE AND CHURCH SIGN TO PROPOSED ROW AND MATCH ITS EXISTING STATE AND CONDITION AS BEST AS POSSIBLE. CONTRACTOR SHALL NOTIFY THE LUBBOCK COUNTY HISTORICAL COMMISSION MARKER CHAIR, 806-470-4602, AND THE LUBBOCK COUNTY HISTORIC PRESERVATION OFFICE, 806-834-8752, AT THE TIME OF THE CONSTRUCTION KICK-OFF MEETING AND TWO WEEKS BEFORE BEGINNING WORK. CONTRACTOR SHALL COORDINATE THE RELOCATION OF ENTRANCE GATE LIGHTING WITH SOUTH PLAINS ELECTRIC COOP. CONTRACTOR SHALL COORDINATE WITH TXDOT AND PROJECT ENGINEER IF ANY COMPONENTS OF THE GATE, LIGHTS, OR FENCE ARE DAMAGED IN THE PROCESS. CONTRACTOR TO CONTACT SPEC (BRANDON LOTH) AT 806-775-7791 FOR RELOCATION OF PARKING LOT LIGHTING.

N

0 15 30

SCALE: 1"=30'

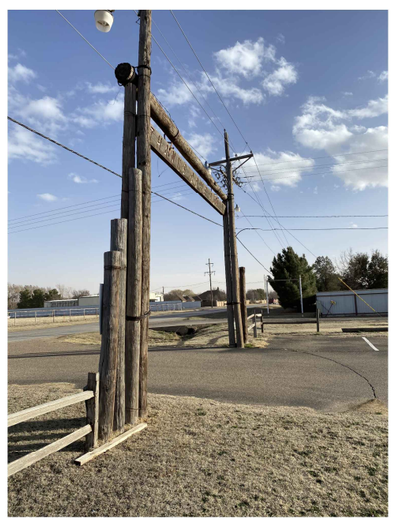
LEGEND

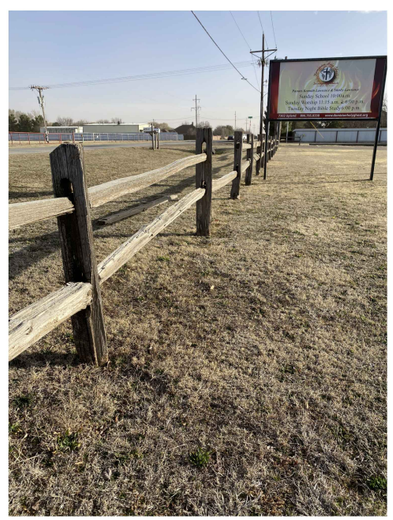
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED SHARED USE PATH
- PROPOSED CONCRETE RIPRAP
- (D#) DRIVEWAY
- PROPOSED FENCE LOCATION
- EXISTING FENCE LOCATION

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII ARE TYPICAL
UNLESS OTHERWISE NOTED





STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

DOMINION HOLY GHOST CHURCH FENCE RELOCATION DETAILS

SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	80
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

Beginning chain UPL_CL description
Feature: Geom_Centerline

Point 99 N 7,254,458.1482 E 910,024.1670 Sta 210+00.00

Course from 99 to 100 N 1° 51′ 16.66" E Dist 1,206.1149

Point 100 N 7,255,663.6313 E 910,063.2013 Sta 220+66.35

Course from 100 to PC UPL_CL_11 N 1° 49′ 42.00" E Dist 433.6468

Curve Data

Curve UPL_CL_11

P.I. Station	225+94.10	N	7,256,191.1105	E	910,080.0392
Delta =	1° 22′ 12.36" (LT)				
Degree =	0° 43′ 40.90"				
Tangent =	94.1011				
Length =	188.1932				
Radius =	7,870.0000				
External =	0.5626				
Long Chord =	188.1887				
Mid. Ord. =	0.5625				
P.C. Station	225+00.00	N	7,256,097.0573	E	910,077.0369
P.T. Station	226+88.19	N	7,256,285.2086	E	910,080.7917
C.C.		N	7,256,348.1499	E	902,211.0434
Back = N	1° 49′ 42.00" E				
Ahead = N	0° 27′ 29.64" E				
Chord Bear = N	1° 08′ 35.82" E				

Curve Data

Curve UPL_CL_12

P.I. Station	227+82.29	N	7,256,379.3067	E	910,081.5443
Delta =	1° 22′ 12.36" (RT)				
Degree =	0° 43′ 40.90"				
Tangent =	94.1011				
Length =	188.1932				
Radius =	7,870.0000				
External =	0.5626				
Long Chord =	188.1887				
Mid. Ord. =	0.5625				
P.C. Station	226+88.19	N	7,256,285.2086	E	910,080.7917
P.T. Station	228+76.39	N	7,256,473.3599	E	910,084.5466
C.C.		N	7,256,222.2674	E	917,950.5400
Back = N	0° 27′ 29.64" E				
Ahead = N	1° 49′ 42.00" E				
Chord Bear = N	1° 08′ 35.82" E				

Course from PT UPL_CL_12 to PC UPL_CL_15 N 1° 49′ 42.00" E Dist 1,923.6494

Curve Data

Curve UPL_CL_15

P.I. Station	248+94.14	N	7,258,490.0832	E	910,148.9230
Delta =	1° 22′ 12.36" (RT)				
Degree =	0° 43′ 40.90"				
Tangent =	94.1011				
Length =	188.1932				
Radius =	7,870.0000				
External =	0.5626				
Long Chord =	188.1887				
Mid. Ord. =	0.5625				
P.C. Station	248+00.04	N	7,258,396.0300	E	910,145.9207
P.T. Station	249+88.23	N	7,258,584.0377	E	910,154.1733
C.C.		N	7,258,144.9375	E	918,011.9141
Back = N	1° 49′ 42.00" E				
Ahead = N	3° 11′ 54.36" E				
Chord Bear = N	2° 30′ 48.18" E				

Curve Data

Curve UPL_CL_16

P.I. Station	250+82.33	N	7,258,677.9922	E	910,159.4236
Delta =	1° 22′ 12.36" (LT)				
Degree =	0° 43′ 40.90"				
Tangent =	94.1011				
Length =	188.1932				
Radius =	7,870.0000				
External =	0.5626				
Long Chord =	188.1887				
Mid. Ord. =	0.5625				
P.C. Station	249+88.23	N	7,258,584.0377	E	910,154.1733
P.T. Station	251+76.42	N	7,258,772.0454	E	910,162.4259
C.C.		N	7,259,023.1379	E	902,296.4325
Back = N	3° 11′ 54.36" E				
Ahead = N	1° 49′ 42.00" E				
Chord Bear = N	2° 30′ 48.18" E				

Course from PT UPL_CL_16 to 101 N 1° 49′ 42.00" E Dist 626.7084

Point 101 N 7,259,398.4347 E 910,182.4210 Sta 258+03.13

Course from 101 to 102 N 1° 51′ 16.13" E Dist 163.9578

Point 102 N 7,259,562.3067 E 910,187.7269 Sta 259+67.09

Course from 102 to 103 N 2° 17′ 33.02" E Dist 397.0809

Point 103 N 7,259,959.0698 E 910,203.6105 Sta 263+64.17

Course from 103 to 104 N 1° 40′ 54.04" E Dist 1,136.1986

Point 104 N 7,261,094.7790 E 910,236.9541 Sta 275+00.37

Course from 104 to 105 N 1° 40′ 54.04" E Dist 300.0000

Point 105 N 7,261,394.6498 E 910,245.7581 Sta 278+00.37

Ending chain UPL_CL description

STATE OF TEXAS
PEDRO CARRASCO JR.
99380
LICENSED PROFESSIONAL ENGINEER

8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	81
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

Beginning chain CL_66 description
Feature: Geom_Centerline

Point 115 N 7,260,441.5059 E 909,285.2081 Sta 100+00.00

Course from 115 to 116 S 88° 19′ 05.96" E Dist 932.1648

Point 116 N 7,260,414.1501 E 910,216.9714 Sta 109+32.16

Course from 116 to PC CL_66_5 S 87° 22′ 32.85" E Dist 87.0648

Curve Data

Curve CL_66_5

P.I. Station	110+99.05	N	7,260,407.5975	E	910,383.7219
Delta =	7° 57′ 47.88" (LT)				
Degree =	4° 59′ 47.18"				
Tangent =	79.8183				
Length =	159.3795				
Radius =	1,146.7325				
External =	2.7745				
Long Chord =	159.2513				
Mid. Ord. =	2.7678				
P.C. Station	110+19.23	N	7,260,410.1638	E	910,303.9448
P.T. Station	111+78.61	N	7,260,416.1081	E	910,463.0852
C.C.		N	7,261,556.3034	E	910,340.8148

Back = S 88° 09′ 26.99" E
Ahead = N 83° 52′ 45.12" E
Chord Bear = N 87° 51′ 39.07" E

Curve Data

Curve CL_66_6

P.I. Station	112+51.58	N	7,260,423.8889	E	910,535.6429
Delta =	7° 16′ 56.12" (RT)				
Degree =	4° 59′ 46.92"				
Tangent =	72.9738				
Length =	145.7510				
Radius =	1,146.7490				
External =	2.3195				
Long Chord =	145.6530				
Mid. Ord. =	2.3148				
P.C. Station	111+78.61	N	7,260,416.1081	E	910,463.0852
P.T. Station	113+24.36	N	7,260,422.4098	E	910,608.6017
C.C.		N	7,259,275.8964	E	910,585.3573

Back = N 83° 52′ 45.12" E
Ahead = S 88° 50′ 18.75" E
Chord Bear = N 87° 31′ 13.19" E

Course from PT CL_66_6 to 117 S 88° 50′ 18.75" E Dist 352.6062

Point 117 N 7,260,415.2625 E 910,961.1355 Sta 116+76.97

Ending chain CL_66 description

STATE OF TEXAS
PEDRO CARRASCO JR.
95280
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

8/9/2023

TEXAS FIRM F-928
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TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

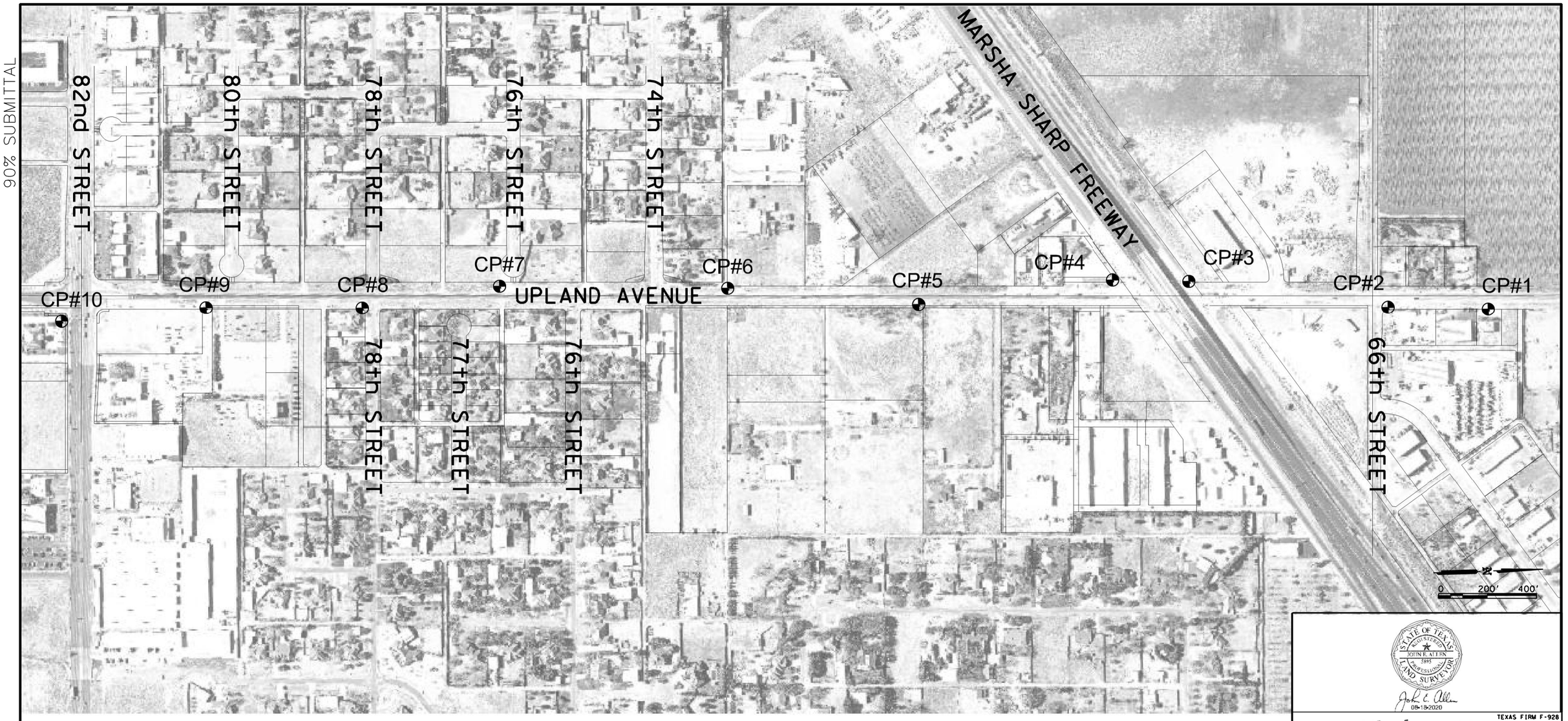
HORIZONTAL ALIGNMENT DATA

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	82
CONT.	SECT.	JOB	
0905	06	095, ETC.	

90% SUBMITTAL



POINT #	NORTHING (Y)	EASTING (X)	ELEV (Z)	MONUMENT DESCRIPTION
1	7260907.52	910286.23	3277.26	ALUMINUM CAP IN CONCRETE DRIVE
2	7260497.55	910265.54	3277.22	ALUMINUM CAP IN CONCRETE CYLINDER
3	7259688.87	910133.56	3282.57	ALUMINUM CAP IN CONCRETE WALK
4	7259377.96	910117.99	3281.33	ALUMINUM CAP IN CONCRETE RIBBON
5	7258578.68	910192.44	3277.71	ALUMINUM CAP IN CONCRETE CYLINDER
6	7257802.17	910101.45	3282.30	ALUMINUM CAP IN CONCRETE ALLEY RETURN
7	7256869.81	910063.50	3285.67	ALUMINUM CAP IN CONCRETE CYLINDER
8	7256304.66	910134.67	3288.60	ALUMINUM CAP IN CONCRETE RIBBON
9	7255667.53	910113.67	3293.33	ALUMINUM CAP IN DRIVE APRON
10	7255075.83	910150.69	3295.34	ALUMINUM CAP IN CURB

CERTIFICATION:

I, JOHN E. ALLEN, TEXAS REGISTERED PROFESSIONAL LAND SURVEYOR No. 5895, DO HEREBY CERTIFY THAT THE SURVEY INFORMATION HEREIN WAS SURVEYED ON THE GROUND. SAID SURVEY WAS CONDUCTED FROM NOVEMBER, 2018 THROUGH JUNE, 2019. DOCUMENTS ON FILE AT THE HRA OFFICE DESCRIBE RECONSTRUCTION AND CONTROLLING MONUMENTS.

NOTES:

1. ALL LOCATIONS ARE RELATIVE TO THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE, NAD 83 (2011), EPOCH 2010.0
2. ALL ELEVATIONS ARE NAVD 88.
3. COORDINATES ARE SURFACE, U.S. SURVEY FEET AND HAVE A COMBINED SCALE FACTOR OF 1.0002485 APPLIED.
4. SURVEY DATA CONTAINED HEREIN MAY OR MAY NOT SHOW ALL CURRENTLY EXISTING IMPROVEMENTS AND UTILITIES, ABOVE OR BELOW GROUND. ALL VEGETATION IS NOT SHOWN HEREIN AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE ENTIRE PROJECT PRIOR TO SUBMITTING A BID.
5. CONTRACTOR TO VERIFY CONTROL POINT COORDINATES PRIOR TO BEGINNING CONSTRUCTION AND REPORT ANY DISCREPANCIES TO THE ENGINEER.

TYPICAL ALUMINUM DISK

MONUMENTS
1 THRU 10

STATE OF TEXAS
REGISTERED
JOHN E. ALLEN
5895
PROFESSIONAL
LAND SURVEYOR

08-18-2020

TEXAS FIRM F-928

Kimley»Horn

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET

SURVEY CONTROL

SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LUB	LUBBOCK	83
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

UPLAND AVE EARTHWORK

End Area Volume Report

Report Created: 6/18/2020
Time: 7:56pm

Cross Section Set Name: UPLAND_EW
Alignment Name: UPL_CL
Input Grid Factor: 1.000000 **Note:** All units in this report are in feet. square feet and cubic feet unless specified otherwise.

Baseline Station	Station Quantities: Cut Factor	Cut Area	Cut Volume	Cut Adjusted	Fill Factor	Fill Area	Fill Volume	Fill Adjusted	Added Quantities: Cut Factor	Cut Volume	Cut Adjusted	Fill Factor	Fill Volume	Fill Adjusted	Mass Ordinate
216+05.0000 R1	1.0000	61	0.0	0.0	1.0000	4	0.0	0.0							0.0
216+50.0000 R1	1.0000	44	2369.5	2369.5	1.0000	7	249.6	249.6							246.2
217+00.0000 R1	1.0000	154	4958.5	4958.5	1.0000	0	165.1	165.1							2710.9
217+50.0000 R1	1.0000	141	7373.7	7373.7	1.0000	0	6.6	6.6							7069.7
218+00.0000 R1	1.0000	126	6665.1	6665.1	1.0000	0	10.5	10.5							10716.1
218+50.0000 R1	1.0000	101	5668.8	5668.8	1.0000	0	7.7	7.7							13369.7
219+00.0000 R1	1.0000	96	4913.5	4913.5	1.0000	0	3.8	3.8							15444.4
219+50.0000 R1	1.0000	77	4322.2	4322.2	1.0000	2	58.0	58.0							16932.5
220+00.0000 R1	1.0000	66	3591.5	3591.5	1.0000	5	187.7	187.7							17564.1
220+50.0000 R1	1.0000	86	3806.5	3806.5	1.0000	3	213.0	213.0							18557.1
221+00.0000 R1	1.0000	56	3537.8	3537.8	1.0000	3	157.6	157.6							19465.1
221+50.0000 R1	1.0000	33	2212.8	2212.8	1.0000	7	245.6	245.6							18993.2
222+00.0000 R1	1.0000	21	1335.3	1335.3	1.0000	23	746.7	746.7							17118.5
222+50.0000 R1	1.0000	19	987.4	987.4	1.0000	23	1154.7	1154.7							14462.8
223+00.0000 R1	1.0000	22	1018.9	1018.9	1.0000	18	1023.4	1023.4							12002.7
223+50.0000 R1	1.0000	26	1188.0	1188.0	1.0000	11	731.2	731.2							10095.2
224+00.0000 R1	1.0000	33	1464.4	1464.4	1.0000	8	491.5	491.5							8795.0
224+50.0000 R1	1.0000	79	2796.1	2796.1	1.0000	3	280.3	280.3							9070.6
225+00.0000 R1	1.0000	102	4525.0	4525.0	1.0000	0	77.4	77.4							11239.6
225+50.0000 R1	1.0000	69	4266.9	4266.9	1.0000	2	53.7	53.7							13178.3
226+00.0000 R1	1.0000	110	4474.9	4474.9	1.0000	1	71.1	71.1							15307.6
226+50.0000 R1	1.0000	127	5931.5	5931.5	1.0000	1	39.7	39.7							18866.0
227+00.0000 R1	1.0000	138	6619.8	6619.8	1.0000	0	23.2	23.2							23129.3
227+50.0000 R1	1.0000	134	6786.5	6786.5	1.0000	0	2.5	2.5							27696.7
228+00.0000 R1	1.0000	174	7692.9	7692.9	1.0000	0	0.3	0.3							33171.5
228+50.0000 R1	1.0000	172	8650.5	8650.5	1.0000	0	0.5	0.5							39483.9
229+00.0000 R1	1.0000	153	8120.8	8120.8	1.0000	0	4.3	4.3							45263.3
229+50.0000 R1	1.0000	159	7806.8	7806.8	1.0000	1	22.9	22.9							50771.7
230+00.0000 R1	1.0000	186	8636.3	8636.3	1.0000	0	19.1	19.1							57114.0
230+50.0000 R1	1.0000	176	9059.7	9059.7	1.0000	0	0.8	0.8							63897.8
231+00.0000 R1	1.0000	186	9055.2	9055.2	1.0000	0	3.2	3.2							70674.8
231+50.0000 R1	1.0000	176	9039.6	9039.6	1.0000	0	6.8	6.8							77374.3
232+00.0000 R1	1.0000	158	8342.8	8342.8	1.0000	0	9.6	9.6							83374.1
232+50.0000 R1	1.0000	160	7945.1	7945.1	1.0000	0	8.3	8.3							88977.6
233+00.0000 R1	1.0000	149	7719.9	7719.9	1.0000	0	14.0	14.0							94408.5
233+50.0000 R1	1.0000	156	7629.5	7629.5	1.0000	0	15.9	15.9							99747.1
234+00.0000 R1	1.0000	152	7700.1	7700.1	1.0000	0	8.5	8.5							105105.4
234+50.0000 R1	1.0000	148	7489.3	7489.3	1.0000	0	8.7	8.7							110252.7
235+00.0000 R1	1.0000	155	7558.8	7558.8	1.0000	0	12.6	12.6							115465.5
235+50.0000 R1	1.0000	133	7200.3	7200.3	1.0000	0	7.8	7.8							120383.1
236+00.0000 R1	1.0000	130	6588.1	6588.1	1.0000	2	52.6	52.6							124760.2
236+50.0000 R1	1.0000	151	7025.0	7025.0	1.0000	0	57.6	57.6							129510.9
237+00.0000 R1	1.0000	141	7293.6	7293.6	1.0000	1	27.8	27.8							134443.4
237+50.0000 R1	1.0000	141	7044.0	7044.0	1.0000	0	33.3	33.3							139120.8
238+00.0000 R1	1.0000	145	7150.0	7150.0	1.0000	0	12.0	12.0							143925.5
238+50.0000 R1	1.0000	107	6294.0	6294.0	1.0000	1	15.8	15.8							147928.7
239+00.0000 R1	1.0000	114	5515.5	5515.5	1.0000	0	14.3	14.3							151271.6
239+50.0000 R1	1.0000	136	6241.0	6241.0	1.0000	1	22.6	22.6							155273.4
240+00.0000 R1	1.0000	108	6083.9	6083.9	1.0000	1	41.0	41.0							159041.2
240+50.0000 R1	1.0000	142	6251.7	6251.7	1.0000	1	47.7	47.7							162970.3
241+00.0000 R1	1.0000	134	6907.9	6907.9	1.0000	2	89.7	89.7							167455.1

UPLAND AVE EARTHWORK (CONTINUED)

Baseline Station	Station Quantities: Cut Factor	Cut Area	Cut Volume	Cut Adjusted	Fill Factor	Fill Area	Fill Volume	Fill Adjusted	Added Quantities: Cut Factor	Cut Volume	Cut Adjusted	Fill Factor	Fill Volume	Fill Adjusted	Mass Ordinate
241+50.0000 R1	1.0000	119	6321.3	6321.3	1.0000	2	110.4	110.4							171332.7
242+00.0000 R1	1.0000	128	6159.9	6159.9	1.0000	0	49.9	49.9							175167.8
242+50.0000 R1	1.0000	101	5700.5	5700.5	1.0000	1	23.5	23.5							178628.2
243+00.0000 R1	1.0000	61	4045.1	4045.1	1.0000	14	374.1	374.1							180024.3
243+50.0000 R1	1.0000	48	2722.5	2722.5	1.0000	16	756.1	756.1							179657.4
244+00.0000 R1	1.0000	45	2313.4	2313.4	1.0000	16	804.9	804.9							178832.6
244+50.0000 R1	1.0000	34	1962.8	1962.8	1.0000	21	929.8	929.8							177532.3
245+00.0000 R1	1.0000	44	1946.2	1946.2	1.0000	12	828.8	828.8							176316.3
245+50.0000 R1	1.0000	27	1770.6	1770.6	1.0000	25	924.3	924.3							174829.3
246+00.0000 R1	1.0000	22	1204.5	1204.5	1.0000	0	630.3	630.3							173186.9
246+50.0000 R1	1.0000	17	960.5	960.5	1.0000	45	1122.6	1122.6							170808.1
247+00.0000 R1	1.0000	6	580.2	580.2	1.0000	77	3053.7	3053.7							166001.3
247+50.0000 R1	1.0000	5	278.7	278.7	1.0000	80	3929.9	3929.9							160016.7
248+00.0000 R1	1.0000	1	144.9	144.9	1.0000	94	4341.6	4341.6							153486.6
248+50.0000 R1	1.0000	2	69.8	69.8	1.0000	104	4950.1	4950.1							146273.0
249+00.0000 R1	1.0000	2	95.1	95.1	1.0000	113	5433.2	5433.2							138601.6
249+50.0000 R1	1.0000	3	122.7	122.7	1.0000	120	5828.3	5828.3							130562.7
250+00.0000 R1	1.0000	3	139.0	139.0	1.0000	132	6287.8	6287.8							122080.5
250+50.0000 R1	1.0000	1	88.3	88.3	1.0000	149	7025.4	7025.4							112810.1
251+00.0000 R1	1.0000	1	40.4	40.4	1.0000	145	7348.9	7348.9							103168.2
251+50.0000 R1	1.0000	4	126.0	126.0	1.0000	148	7324.3	7324.3							93636.6
252+00.0000 R1	1.0000	4	213.2	213.2	1.0000	133	7042.5	7042.5							84474.0
252+50.0000 R1	1.0000	4	200.6	200.6	1.0000	130	6586.9	6586.9							75754.3
253+00.0000 R1	1.0000	1	113.8	113.8	1.0000	80	5253.2	5253.2							68339.9
253+50.0000 R1	1.0000	0	20.5	20.5	1.0000	117	4935.5	4935.5							61149.9
254+00.0000 R1	1.0000	0	0.0	0.0	1.0000	123	6016.9	6016.9							52799.6
254+50.0000 R1	1.0000	0	0.0	0.0	1.0000	88	5276.7	5276.7							45247.9
255+00.0000 R1	1.0000	0	0.0	0.0	1.0000	56	3603.0	3603.0							39454.6
255+50.0000 R1	1.0000	0	0.0	0.0	1.0000	69	3136.1	3136.1							34003.1
256+00.0000 R1	1.0000	2	46.3	46.3	1.0000	49	2945.0	2945.0							28586.2
256+50.0000 R1	1.0000	56	1441.6	1441.6	1.0000	16	1606.6	1606.6							25840.9
257+00.0000 R1	1.0000	105	4010.2	4010.2	1.0000	0	394.0	394.0							26689.1
257+50.0000 R1	1.0000	72	4423.7	4423.7	1.0000	4	102.0	102.0							28043.5
258+00.0000 R1	1.0000	194	6664.0	6664.0	1.0000	0	99.9	99.9							30892.9
258+50.0000 R1	1.0000	96	7259.0	7259.0	1.0000	0	0.0	0.0							34486.2
259+00.0000 R1	1.0000	53	3724.8	3724.8	1.0000	0	0.0	0.0							36269.9
260+00.0000 R1	1.0000	0	0.0	0.0	1.0000	0	0.0	0.0							36269.9
260+50.0000 R1	1.0000	0	0.0	0.0	1.0000	0	0.0	0.0							36269.9
261+00.0000 R1	1.0000	0	0.0	0.0	1.0000	0	0.0	0.0							36269.9
261+50.0000 R1	1.0000	0	0.0	0.0	1.0000	0	0.0	0.0							36269.9
262+00.0000 R1	1.0000	0	0.0	0.0	1.0000	0	0.0	0.0							36269.9
262+50.0000 R1	1.0000	0	0.0	0.0	1.0000	0	0.0	0.0							36269.9
263+00.0000 R1	1.0000	0	0.0	0.0	1.0000	0	0.0	0.0							36269.9
263+50.0000 R1	1.0000	0	0.0	0.0	1.0000	0	0.0	0.0							36269.9
264+00.0000 R1	1.0000	39	0.0	0.0	1.0000	31	0.0	0.0							36269.9
264+50.0000 R1	1.0000	11	1234.9	1234.9	1.0000	18	1244.1	1244.1							33985.6
265+00.0000 R1	1.0000	7	446.7	446.7	1.0000	41	1486.6	1486.6							30729.1
265+50.0000 R1	1.0000	0	176.2	176.2	1.0000	57	2454.5	2454.5							26234.1
266+00.0000 R1	1.0000	0	0.0	0.0	1.0000	127	4588.2	4588.2							19370.9
266+50.0000 R1	1.0000	0	0.0	0.0	1.0000	157	7082.5	7082.5							9955.1
266+96.1261 R1															0.0
267+00.0000 R1	1.0000	0	0.0	0.0	1.0000	182	8457.8	8457.8							-836.1
267+50.0000 R1	1.0000	0	0.0	0.0	1.0000	195	9404.1	9404.1							-12573.5
268+00.0000 R1	1.0000	0	0.0	0.0	1.0000	146	8512.0	8512.0							-23302.5
268+50.0000 R1	1.0000	0	0.0	0.0	1.0000	141	7180.6	7180.6							-32584.2
269+00.0000 R1	1.0000	0	0.0	0.0	1.0000	164	7632.0	7632.0							-42433.7
269+50.0000 R1	1.0000	5	119.7	119.7	1.0000	52	5403.1	5403.1							-49931.6
270+00.0000 R1	1.0000	0	119.7	119.7	1.0000	51	2571.9	2571.9							-54540.0

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET

EARTHWORK CALCULATIONS

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	84
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

UPLAND AVE EARTHWORK (CONTINUED)

Baseline Station	Station Quantities								Added Quantities						Mass Ordinate
	Cut				Fill				Cut			Fill			
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	Factor	Volume	Adjusted	Factor	Volume	Adjusted	
270+50.0000 R1	1.0000	7	182.3	182.3	1.0000	47	2439.3	2439.3							-59072.0
271+00.0000 R1	1.0000	27	865.3	865.3	1.0000	13	1493.7	1493.7							-61966.9
271+10.0000 R1	1.0000	25	259.7	259.7	1.0000	20	166.3	166.3							-62313.3
Grand Total:			361171.7	361171.7			185751.4	185751.4							

66TH STREET EARTHWORK

End Area Volume Report

Report Created: 6/18/2020
Time: 8:05pm

Cross Section Set Name: 66ST_EW
Alignment Name: CL_66
Input Grid Factor: 1.000000 **Note:** All units in this report are in feet, square feet and cubic feet unless specified otherwise.

Baseline Station	Station Quantities								Added Quantities						Mass Ordinate
	Cut				Fill				Cut			Fill			
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	Factor	Volume	Adjusted	Factor	Volume	Adjusted	
16+30.0000	1.0000	38	0.0	0.0	1.0000	76	0.0	0.0							0.0
16+50.0000	1.0000	40	779.9	779.9	1.0000	83	1584.5	1584.5							-804.6
17+00.0000	1.0000	41	2016.4	2016.4	1.0000	63	3643.6	3643.6							-2431.8
17+50.0000	1.0000	45	2142.5	2142.5	1.0000	74	3419.7	3419.7							-3708.9
18+00.0000	1.0000	46	2273.4	2273.4	1.0000	70	3600.5	3600.5							-5036.0
18+50.0000	1.0000	47	2338.1	2338.1	1.0000	63	3336.1	3336.1							-6034.0
19+00.0000	1.0000	0	1181.5	1181.5	1.0000	0	1581.1	1581.1							-6433.5
19+50.0000	1.0000	0	0.0	0.0	1.0000	0	0.0	0.0							-6433.5
20+00.0000	1.0000	0	0.0	0.0	1.0000	0	0.0	0.0							-6433.5
20+50.0000	1.0000	134	3353.1	3353.1	1.0000	156	3889.1	3889.1							-6969.5
21+00.0000	1.0000	131	6635.1	6635.1	1.0000	159	7866.0	7866.0							-8200.4
21+50.0000	1.0000	119	6254.4	6254.4	1.0000	159	7942.3	7942.3							-9888.3
Grand Total:			26974.6	26974.6			36862.9	36862.9							

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

EARTHWORK CALCULATIONS

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	85
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

SUMMARY OF ROADWAY ITEMS

	0100 6002 PREPARING ROW	0100 6004 PREP ROW (TREE) (12" TO 24" DIA)	0110 6001 EXCAVATION (ROADWAY)	0132 6006 EMBANKMENT (FINAL) (DENS CONT) (TY C)	0160 6003 FURNISHING AND PLACING TOPSOIL (4")	0164 6025 CELL FBR MLCH SEED (PERM) (URBAN) (SANDY)	0164 6037 DRILL SEEDING (PERM) (URBAN) (SANDY)	0164 6051 DRILL SEED (TEMP) (WARM OR COOL)	0166 6002 FERTILIZER	0168 6001 VEGETATIVE WATERING	0216 6001 PROOF ROLLING	0247 6238 FL BS (CMP IN PLC) (TY A GR 4) (12")	0251 6033 REWORK BS MTL (TY C) (6") (ORD COMP)	0275 6001 CEMENT	0275 6011 CEMENT TREAT (EXISTMATL) (8")
STATIONING	STA	EA	CY	CY	SY	SY	SY	SY	TON	MG	HR	SY	SY	TON	SY
BEGIN PROJECT TO STA 219+00	8				290	290	290	145	0.64	25	2.5		496	35	3190
STA 219+00 TO STA 225+00	12	15			1155	1155	1155	578		25	2.5		900	67	5672
STA 225+00 TO STA 231+00					754	754	754	377		25	2.5		854	62	5087
STA 231+00 TO STA 237+00	12	10			265	265	265	133		25	2.5		935	61	5189
STA 237+00 TO STA 243+00					230	230	230	115		25	2.5		868	64	5493
STA 243+00 TO STA 249+00	12				721	721	721	361		25	2.5		813	61	5167
STA 249+00 TO STA 255+00	12				766	766	766	383			2.5		817	61	5213
STA 255+00 TO STA 261+00					574	574	574	287			2.5		702	47	4682
STA 261+00 TO STA 267+00					1033	1033	1033	517			2.5		461	35	2954
STA 267+00 TO STA 273+00	9				1048	1048	1048	524		25	2.5	1585	928	47	4495
66TH ST STA 10+00 TO STA 12+35					1042	1042	1042	521		25	2.5	796	121		
66th ST STA 12+35 TO STA 18+25					1612	1612	1612	806			2.5	2379	635	18	1668
66TH ST STA 20+20 TO STA 26+25					520	520	520	260			2.5	2174	315		
STA 273+00 TO END PROJECT											2.5	1363	193		0
PROJECT TOTAL	**65**	**25**	**14375.79**	**8245**	**10010**	**10010**	**10010**	**5005**	**0.64**	**200**	**35**	**8297**	**9038**	**558**	**48810**

SUMMARY OF ROADWAY ITEMS

	0310 6009 PRIME COAT (MC-30)	0315 6004 FOG SEAL (CSS-1H)	0316 6017 ASPH (AC-20-5TR)	0316 6224 AGGR (TY-PB GR-4 SAC-B)	0351 6002 FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	0351 6019 FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	0360 6003 CONC PVMT (CONT REINF - CRCP) (9")	0432 6002 RIPRAP (CONC) (5 IN)	0432 6044 RIPRAP (CONC) (FLUME)	0529 6008 CONC CURB & GUTTER (TY II)	0529 6021 CONC CURB & GUTTER (SLOTTED)	0530 6004 DRIVEWAYS (CONC) (6")
STATIONING	GAL	GAL	GAL	CY	SY	SY	SY	CY	CY	LF	LF	SY
BEGIN PROJECT TO STA 219+00	777	449	852	20	1000	1000	2723	23		102		213
STA 219+00 TO STA 225+00	1373	1585					4890		7			344
STA 225+00 TO STA 231+00	1305	1503					4722	15		86	266	160
STA 231+00 TO STA 237+00	1272	1468					4615	23	5	283	322	102
STA 237+00 TO STA 243+00	1325	1529					4705	22		231	261	300
STA 243+00 TO STA 249+00	1238	1429					4466	170		10	522	191
STA 249+00 TO STA 255+00	1245	1437			1000	1000	4480	182		148	370	197
STA 255+00 TO STA 261+00	1070	1234					3723			306		428
STA 261+00 TO STA 267+00	702	810					2599			253		106
STA 267+00 TO STA 273+00	1424	1643			1000	1000	3910	24		436	170	268
66TH ST STA 10+00 TO STA 12+35	188	216			1000	1000						
66th ST STA 12+35 TO STA 18+25	972	1122					1456	2		400		
66TH ST STA 20+20 TO STA 26+25	485	558			1000	1000						
STA 273+00 TO END PROJECT	302	348										
PROJECT TOTAL	**13678**	**15331**	**852**	**20**	**5000**	**5000**	**42289**	**461**	**12**	**2255**	**1911**	**2309**

SUMMARY OF ROADWAY ITEMS

	0536 6002 CONC MEDIAN	0550 6001 CHAIN LINK FENCE (INSTALL) (6')	0550 6009 CHAIN LINK FENCE (INSTALL) (6') (BARB TOP)	0560 6003 MAILBOX INSTALL-M (TWG-POST) TY 1	0690 6023 INSTALL OF TIMBER POLES	0730 6107 FULL-WIDTH MOWING	0734 6002 LITTER REMOVAL	3076 6052 D-GR HMA TY-D SAC-A PG76-28	3077 6036 SP MIXES SP-C SP-C SAC-A PG76-28	3080 6008 STONE-MTRX-ASPH SMA-D SAC-A PG76-28	5012 6001 SPLIT RAIL FENCE (INSTALL)
STATIONING	SY	LF	LF	EA	EA	CYC	CYC	TON	TON	TON	LF
BEGIN PROJECT TO STA 219+00	53					2	2	174			
STA 219+00 TO STA 225+00	35							358			
STA 225+00 TO STA 231+00								289			
STA 231+00 TO STA 237+00				4				289			
STA 237+00 TO STA 243+00					10			294			58
STA 243+00 TO STA 249+00				5				280			180
STA 249+00 TO STA 255+00		290		2				281			
STA 255+00 TO STA 261+00	190							239			
STA 261+00 TO STA 267+00		250						164			
STA 267+00 TO STA 273+00		58	220	3				250	342	171	
66TH ST STA 10+00 TO STA 12+35									166	83	
66th ST STA 12+35 TO STA 18+25								87	515	257	
66TH ST STA 20+20 TO STA 26+25			180						465	232	
STA 273+00 TO END PROJECT									290	145	
PROJECT TOTAL	**278**	**598**	**400**	**14**	**10**	**2**	**2**	**2704**	**1777**	**889**	**238**

SUMMARY OF PEDESTRIAN ACCESS ITEMS

	0450 6052 RAIL (HANDRAIL) (TY F)	0529 6008 CONC CURB & GUTTER (TY II)	0529 6021 CONC CURB & GUTTER (SLOTTED)	05316001 CONC SIDEWALKS (4")	05316031 CURB RAMPS (TY 22)	0531 6019 CURB RAMPS (TY 2)	0531 6024 CURB RAMPS (TY 7)	0531 6027 CURB RAMPS (TY 10)
STATIONING	LF	LF	LF	SY	SY	SY	SY	SY
BEGIN PROJECT TO STA 219+00		523		344		128		45
STA 219+00 TO STA 225+00		695	281	1029			25	6
STA 225+00 TO STA 231+00		685	140	703			69	
STA 231+00 TO STA 237+00		576	20	585			45	
STA 237+00 TO STA 243+00		436	9	487			43	21
STA 243+00 TO STA 249+00			520	561				46
STA 249+00 TO STA 255+00	159	145	365	593				24
STA 255+00 TO STA 261+00		260		154	30	9	5	64
STA 261+00 TO STA 267+00		324		599			27	
STA 267+00 TO STA 273+00	28	91	10	73		38		
66TH ST STA 10+00 TO STA 12+35								
66th ST STA 12+35 TO STA 18+25								
66TH ST STA 20+20 TO STA 26+25								
STA 273+00 TO END PROJECT								
PROJECT TOTAL	**187**	**3735**	**1345**	**5128**	**30**	**175**	**214**	**206**

12/13/2023

Kimley»Horn TEXAS FIRM F-928

FREESE AND NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

ROADWAY SUMMARY

SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	86
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

SUMMARY OF ROADWAY ITEMS									
	0247 6238 FL BS (CMP IN PLC) (TY A GR 4) (12")	0275 6001 CEMENT	0275 6011 CEMENT TREAT (EXISTMATL) (8")	0360 6003 CONC PVMT (CONT REINF - CRCP) (9")	3032 6001 REINFORCED FAB FOR ASPH PVMNT OVERLAYS	3032 6004 ASPH FOR REINF FAB (PG76-28)	3076 6052 D-GR HMA TY-D SAC-A PG76-28	3077 6036 SP MIXES SP-C SP-C SAC-A PG76-28	3080 6008 STONE-MTRX-ASPH SMA-D SAC-A PG76-28
STATIONING	SY	TON	SY	SY	SY	GAL	TON	TON	TON
BEGIN PROJECT TO STA 219+00		32	3157	2802			179		
STA 219+00 TO STA 225+00	5210	4	387	288	4643	738	21	1068	534
STA 225+00 TO STA 231+00	3615	18	1774	1520	3054	486	100	702	351
STA 231+00 TO STA 237+00	3475	18	1761	1489	3023	481	99	695	348
STA 237+00 TO STA 243+00	862	44	4425	3890	696	111	250	160	80
STA 243+00 TO STA 249+00	5078				4462	709		1026	513
STA 249+00 TO STA 255+00	5000				4431	705		1019	510
STA 255+00 TO STA 261+00	3211	14	1417	1186	2721	433	80	626	313
STA 261+00 TO STA 267+00	2318	7	703	587	1987	316	39	457	229
STA 267+00 TO STA 273+00	2911	37	3652	3280	2175	346	206	500	250
66TH ST STA 10+00 TO STA 12+35	917				720	114		166	83
66th ST STA 12+35 TO STA 18+25	3059	13	1264	1067	2540	404	71	584	292
66TH ST STA 20+20 TO STA 26+25	2390				2007	319		462	231
STA 273+00 TO END PROJECT	1572				1263	201		290	145
PROJECT TOTAL	39618	185	18540	16109	33722	5362	1045	7756	3878

9/28/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

ROADWAY SUMMARY
ALTERNATE BID ITEMS

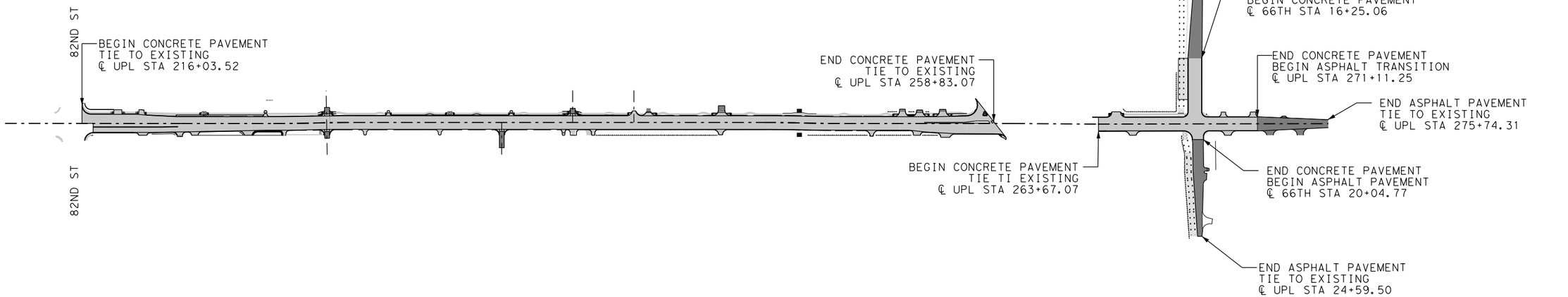
SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

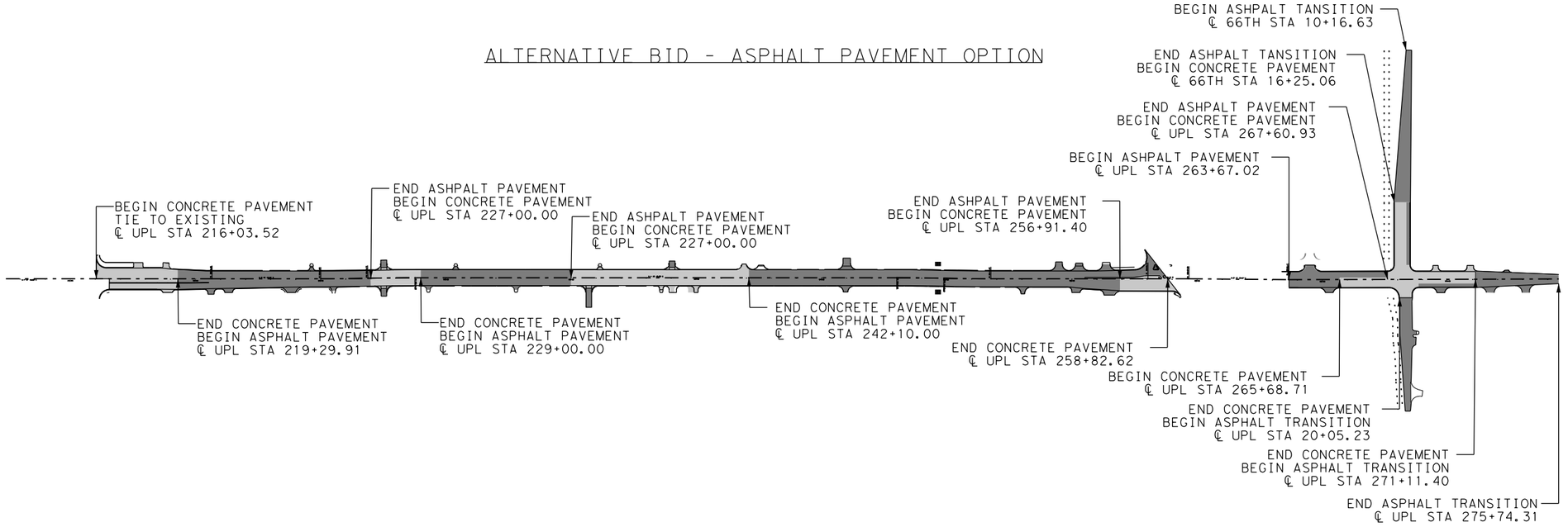
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	87
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

PRIMARY BID - CONCRETE PAVEMENT OPTION



ALTERNATIVE BID - ASPHALT PAVEMENT OPTION



STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

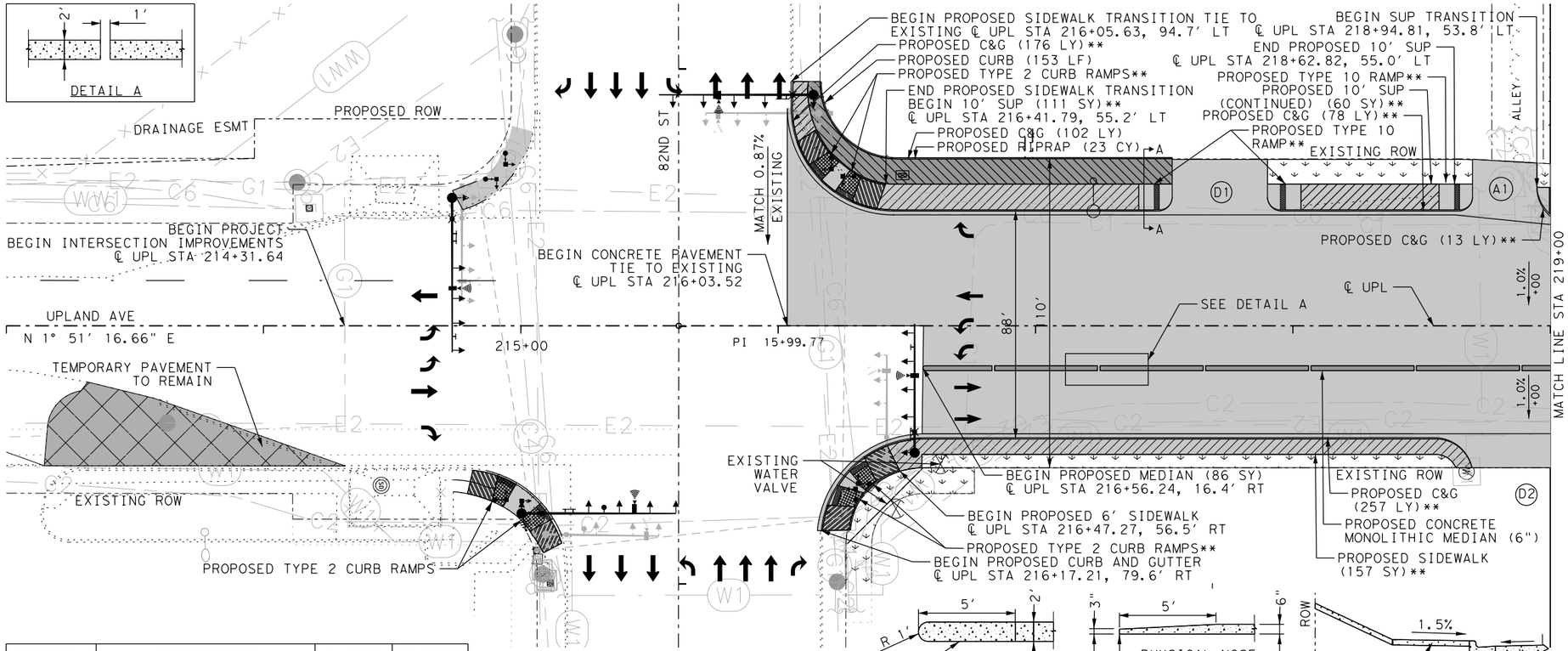
PAVEMENT ALTERNATIVES

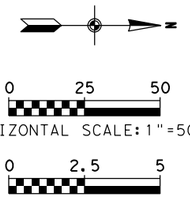
SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	88
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

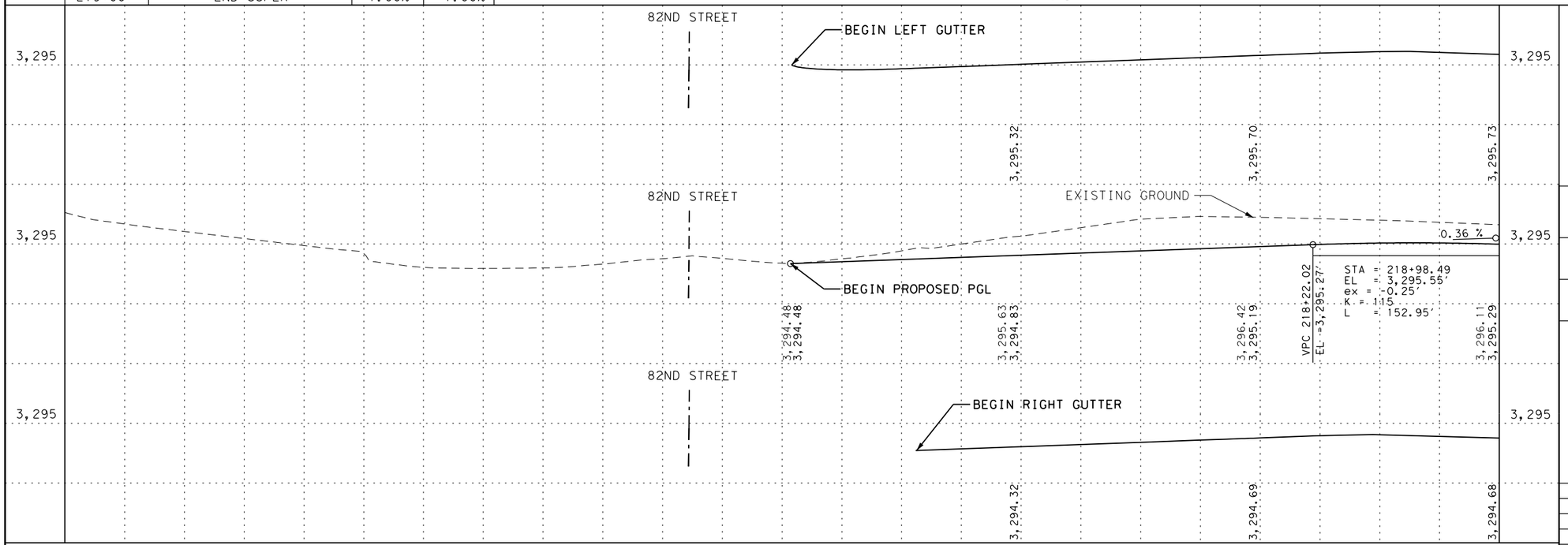
NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105

STATION	DESCRIPTION	L SIDE	R SIDE
BEGIN	SUPER	0.87%	-1.00%
219+00	END SUPER	1.00%	-1.00%

SEEDING: 290 SY



8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

PLAN AND PROFILE

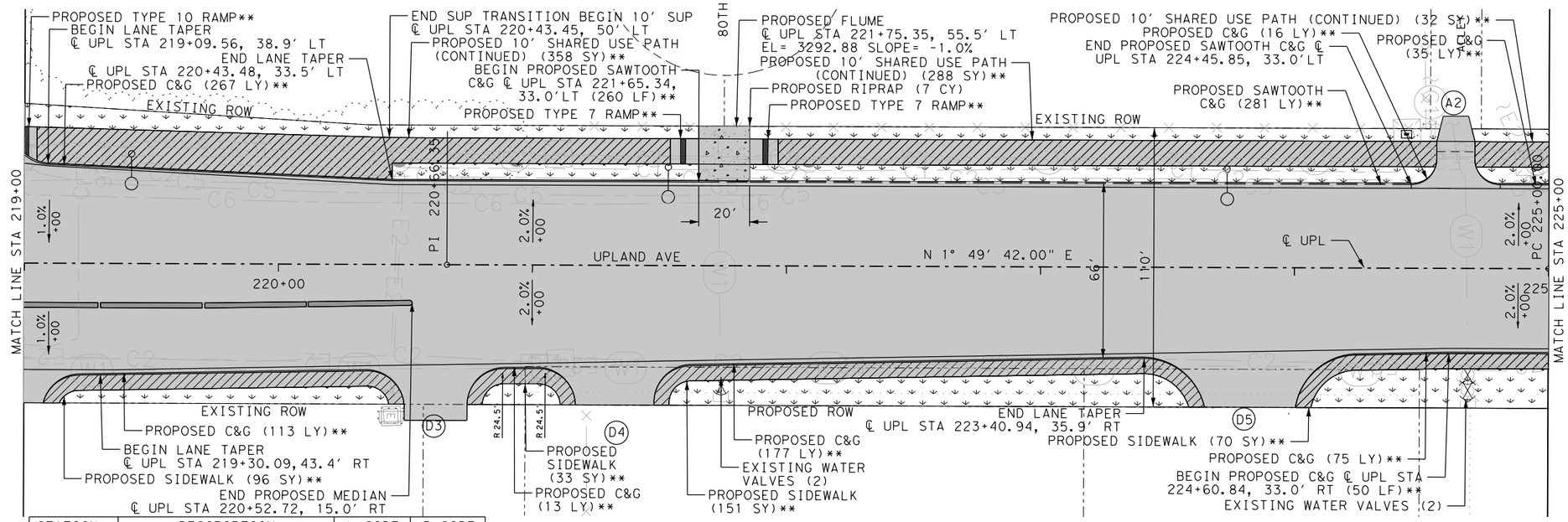
BEGIN PROJECT TO STA 219+00

SHEET 1 OF 14

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	89
CONT.	SECT.	JOB	
0905	06	095,ETC.	

100% SUBMITTAL



STATION	DESCRIPTION	L SIDE	R SIDE
219+00	END SUPER	1.00%	-1.00%
221+00	BEGIN NORMAL CROWN	-2.00%	-2.00%
225+00	END NORMAL CROWN	-2.00%	-2.00%

SEEDING: 1155 SY

0 25 50
HORIZONTAL SCALE: 1"=50'

0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

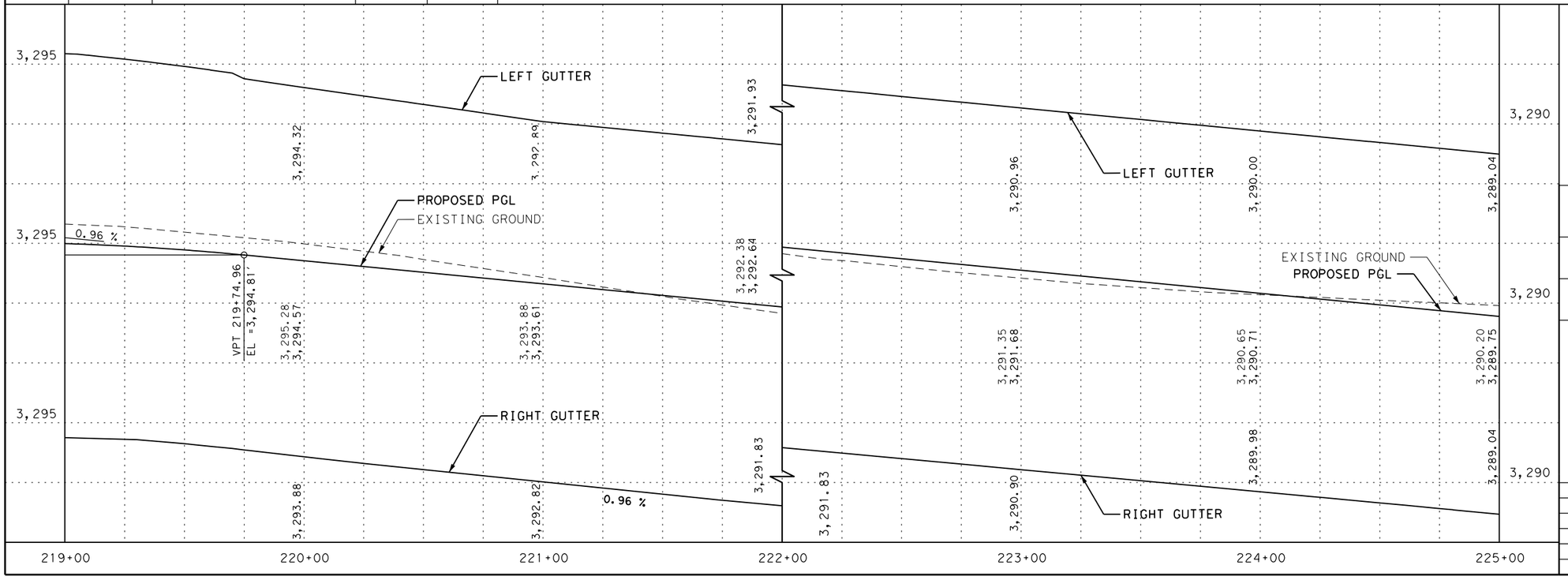
CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105



STATE OF TEXAS
PEDRO CARRASCO JR.
98580
LICENSED PROFESSIONAL ENGINEER

8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

PLAN AND PROFILE

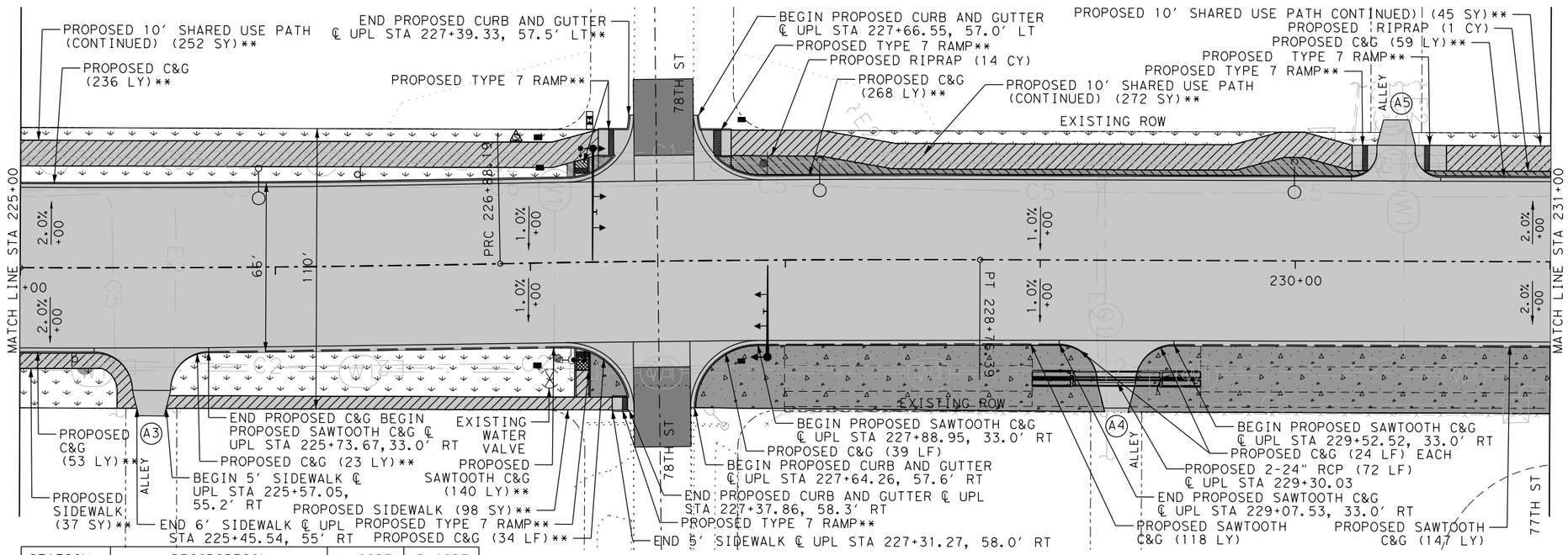
UPL STA 219+00 TO STA 225+00

SHEET 2 OF 14

FED.RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

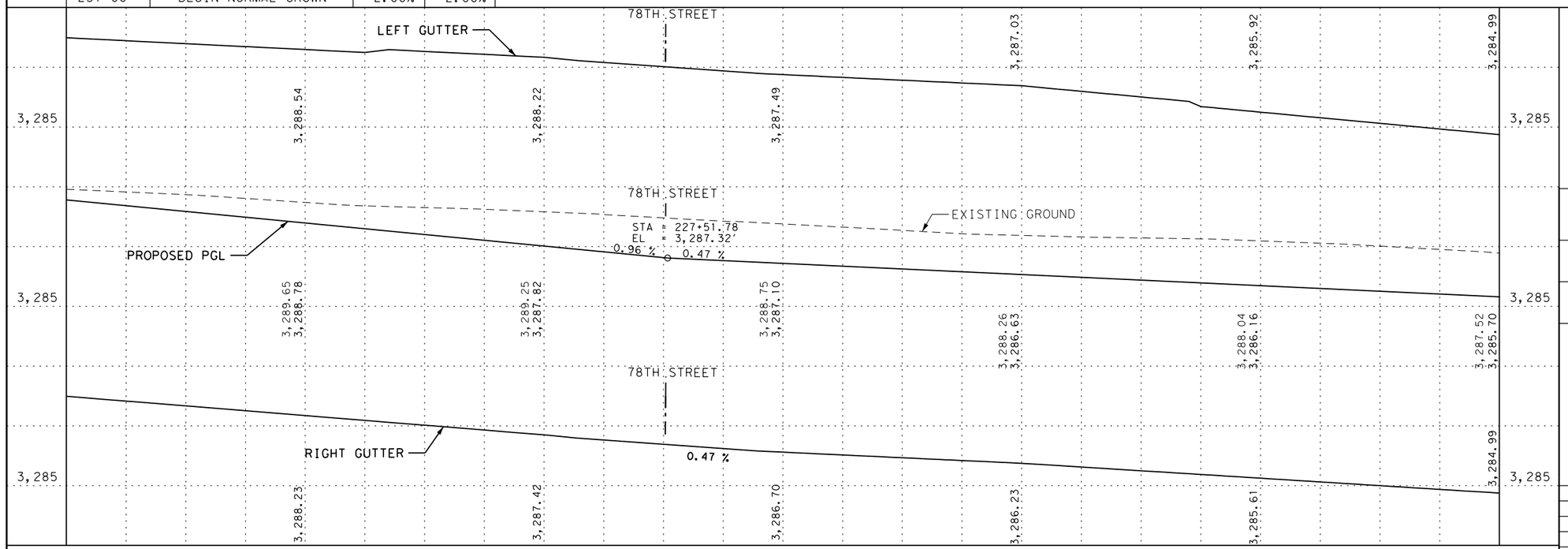
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	90
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



STATION	DESCRIPTION	L SIDE	R SIDE
225+00	END NORMAL CROWN	-2.00%	-2.00%
227+00	BEGIN SUPER	1.00%	-1.00%
229+00	END SUPER	1.00%	-1.00%
231+00	BEGIN NORMAL CROWN	-2.00%	-2.00%

SEEDING: 754 SY



0 25 50
HORIZONTAL SCALE: 1"=50'

0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105

STATE OF TEXAS
PEDRO CARRASCO JR.
98580
LICENSED PROFESSIONAL ENGINEER

8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

PLAN AND PROFILE

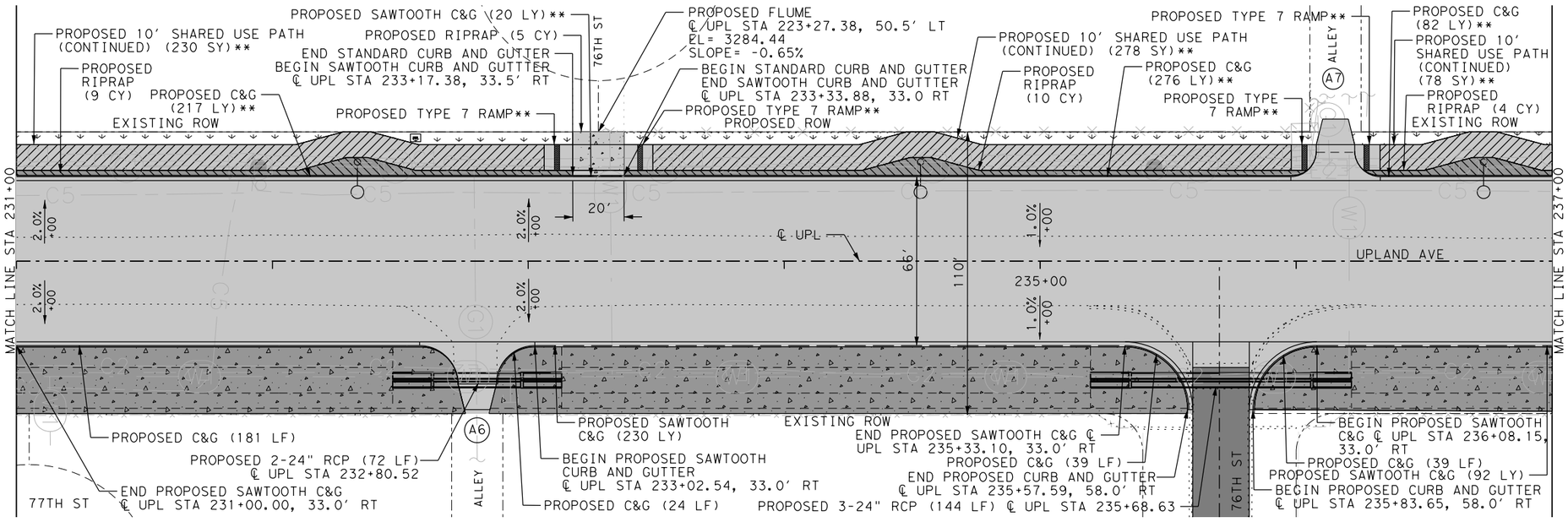
UPL STA 225+00 TO STA 231+00

SHEET 3 OF 14

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	91
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 25 50
HORIZONTAL SCALE: 1"=50'

0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

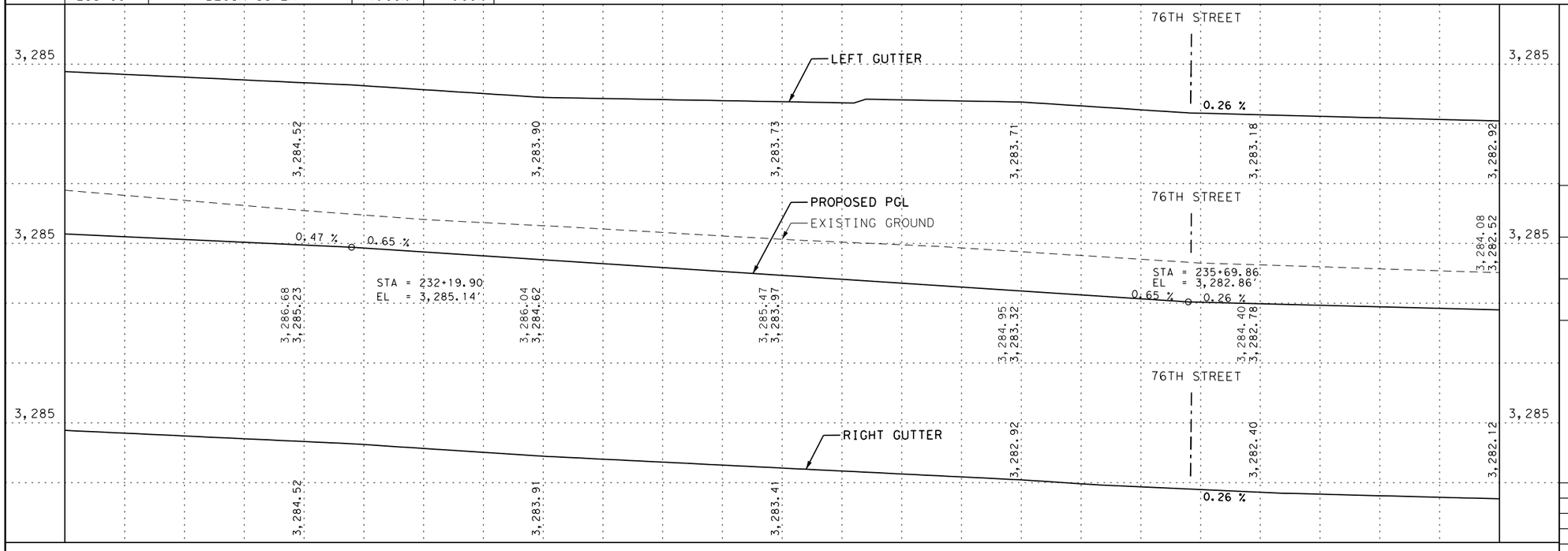
NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105

STATION	DESCRIPTION	L SIDE	R SIDE
231+00	BEGIN NORMAL CROWN	-2.00%	-2.00%
233+00	END NORMAL CROWN	-2.00%	-2.00%
235+00	BEGIN SUPER	1.00%	-1.00%

SEEDING: 265 SY



STATE OF TEXAS
PEDRO CARRASCO JR.
98180
LICENSED PROFESSIONAL ENGINEER

8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

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UPLAND AVENUE
66TH STREET TO 82ND STREET

PLAN AND PROFILE

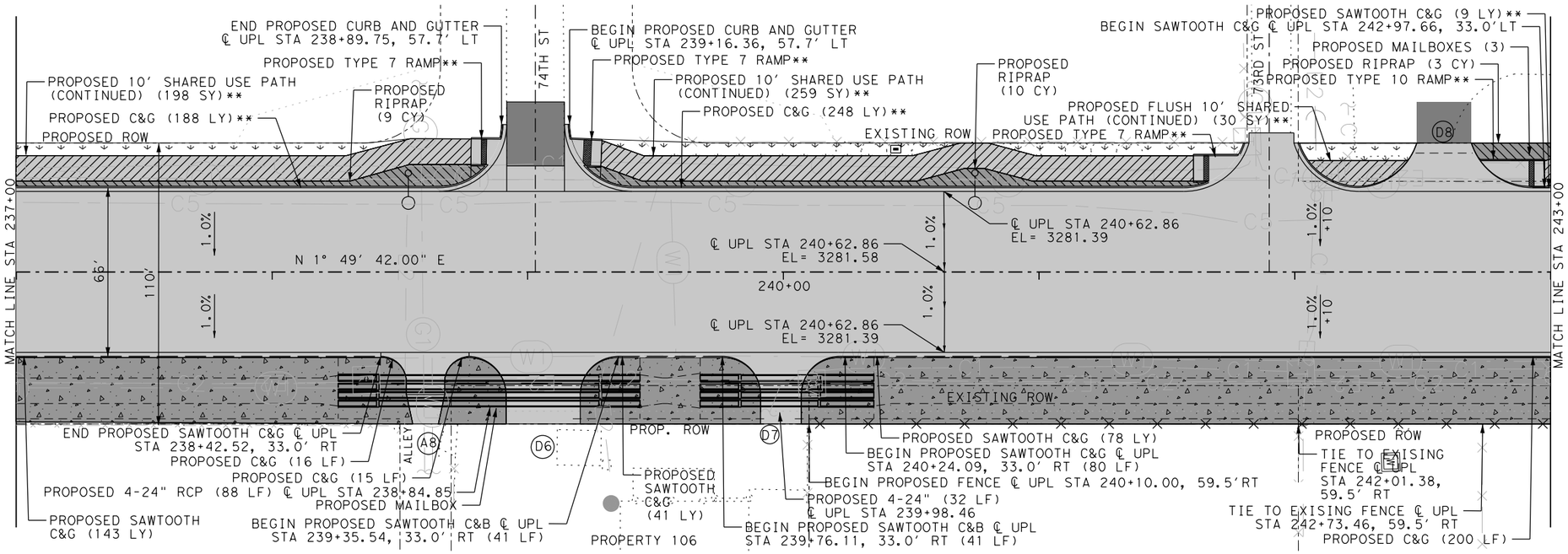
UPL STA 231+00 TO STA 237+00

SHEET 4 OF 14

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	92
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 25 50
HORIZONTAL SCALE: 1"=50'

0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

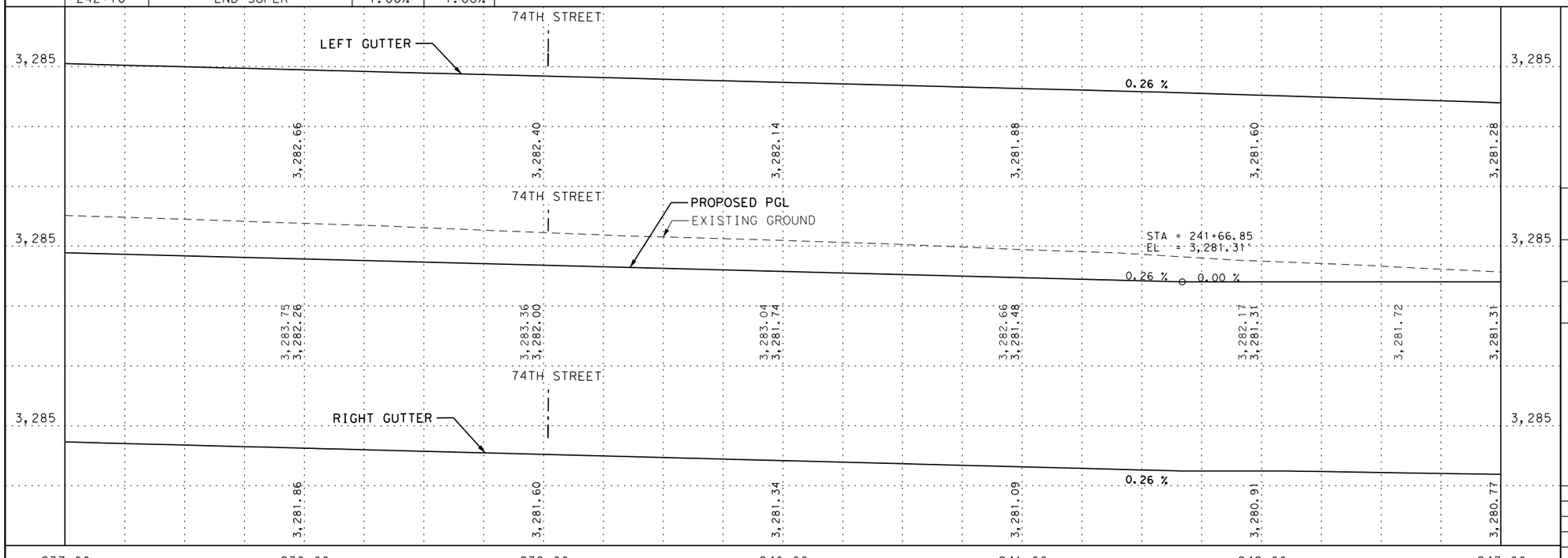
NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105

STATION	DESCRIPTION	L SIDE	R SIDE
242+10	END SUPER	1.00%	-1.00%

SEEDING: 230 SY



STATE OF TEXAS
PEDRO CARRASCO JR.
98080
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco

8/9/2023

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UPLAND AVENUE
66TH STREET TO 82ND STREET

PLAN AND PROFILE

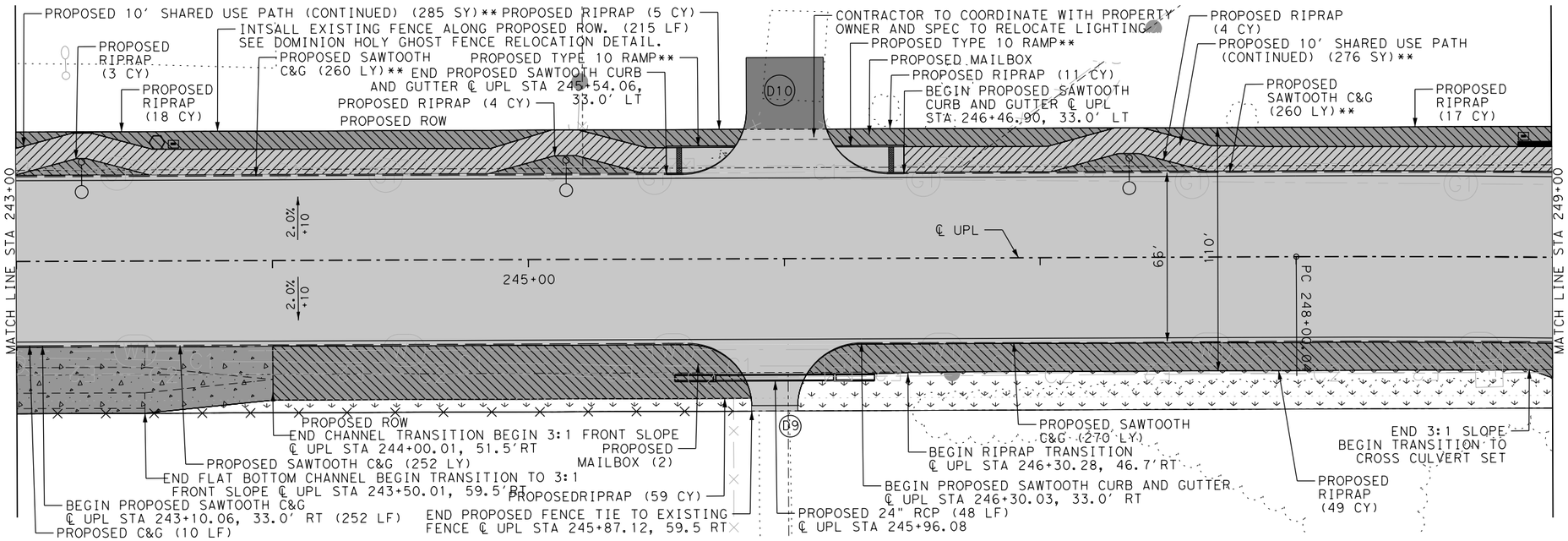
UPL STA 237+00 TO STA 243+00

SHEET 5 OF 14

FED.RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	93
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



SEEDING: 721 SY

STATION	DESCRIPTION	L SIDE	R SIDE
244+10	BEGIN NORMAL CROWN	-2.00%	-2.00%

LIMITS OF RIPRAP WITH TOE WALL
LEFT: STA 246+20 TO 254+30
RIGHT: STA 244+00 TO 255+00
SEE ROADWAY DETAILS.

0 25 50
HORIZONTAL SCALE: 1"=50'

0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

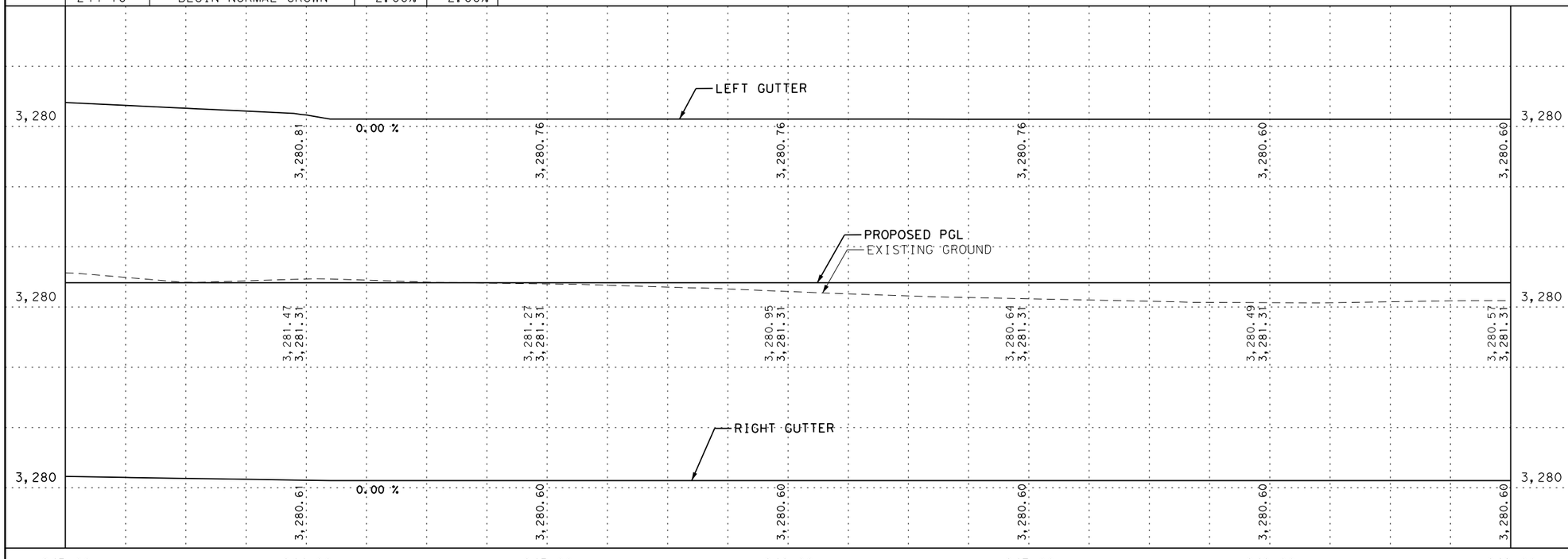
CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105



STATE OF TEXAS
PEDRO CARRASCO JR.
98180
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8/9/2023

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UPLAND AVENUE
66TH STREET TO 82ND STREET

PLAN AND PROFILE

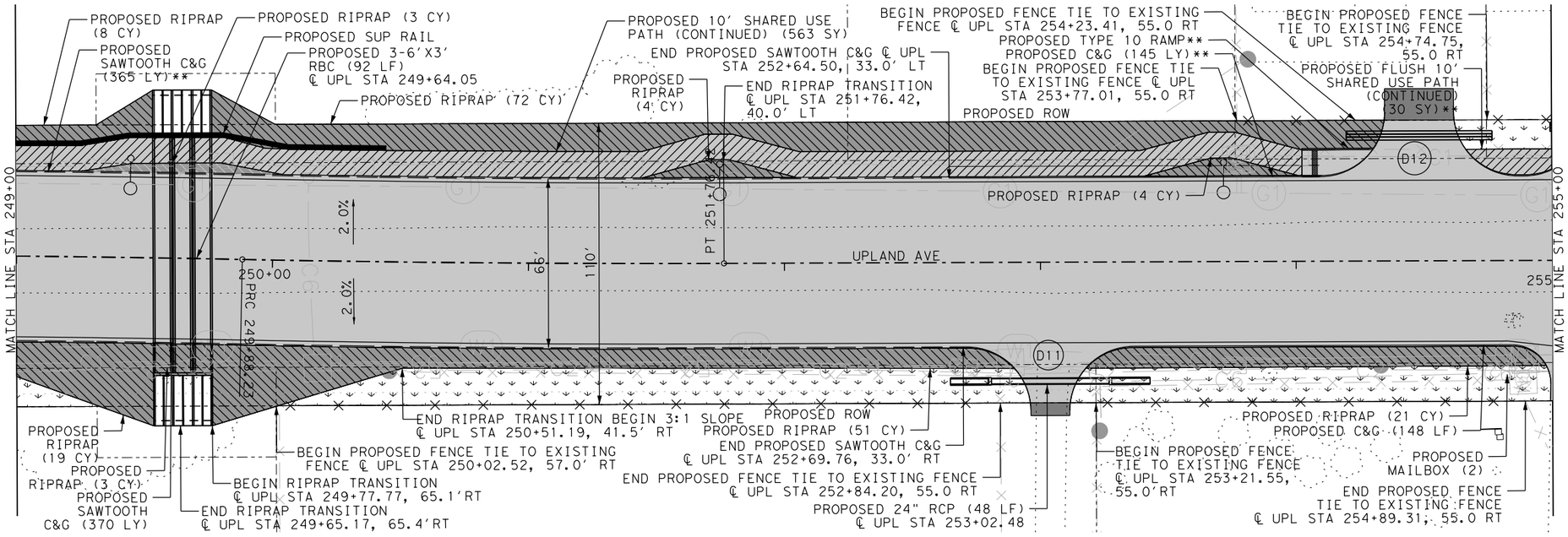
UPL STA 243+00 TO STA 249+00

SHEET 6 OF 14

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	94
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



SEEDING: 766 SY

LIMITS OF RIPRAP WITH TOE WALL
LEFT: STA 246+20 TO 254+30
RIGHT: STA 244+00 TO 255+00
SEE ROADWAY DETAILS.

0 25 50
HORIZONTAL SCALE: 1"=50'

0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

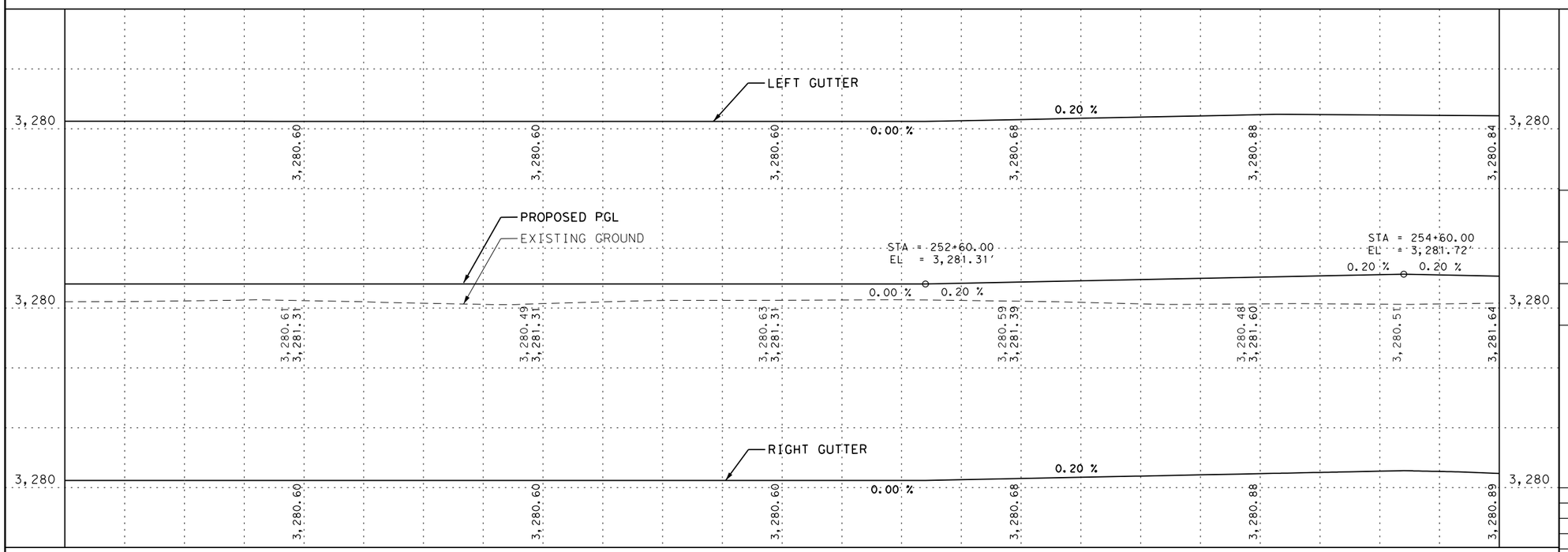
CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105



STATE OF TEXAS
PEDRO CARRASCO JR.
98380
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8/9/2023

TEXAS FIRM F-928
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Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

PLAN AND PROFILE

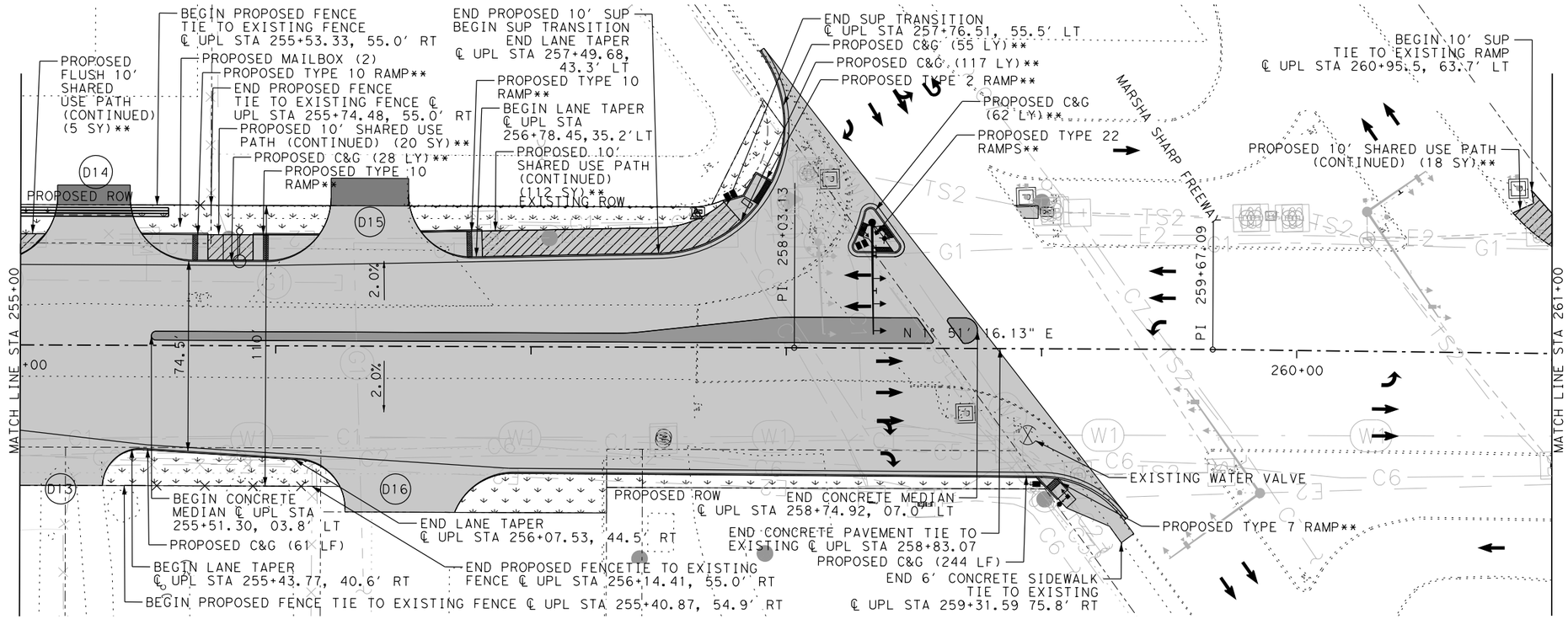
UPL STA 249+00 TO STA 255+00

SHEET 7 OF 14

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	95
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 25 50
HORIZONTAL SCALE: 1"=50'

0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

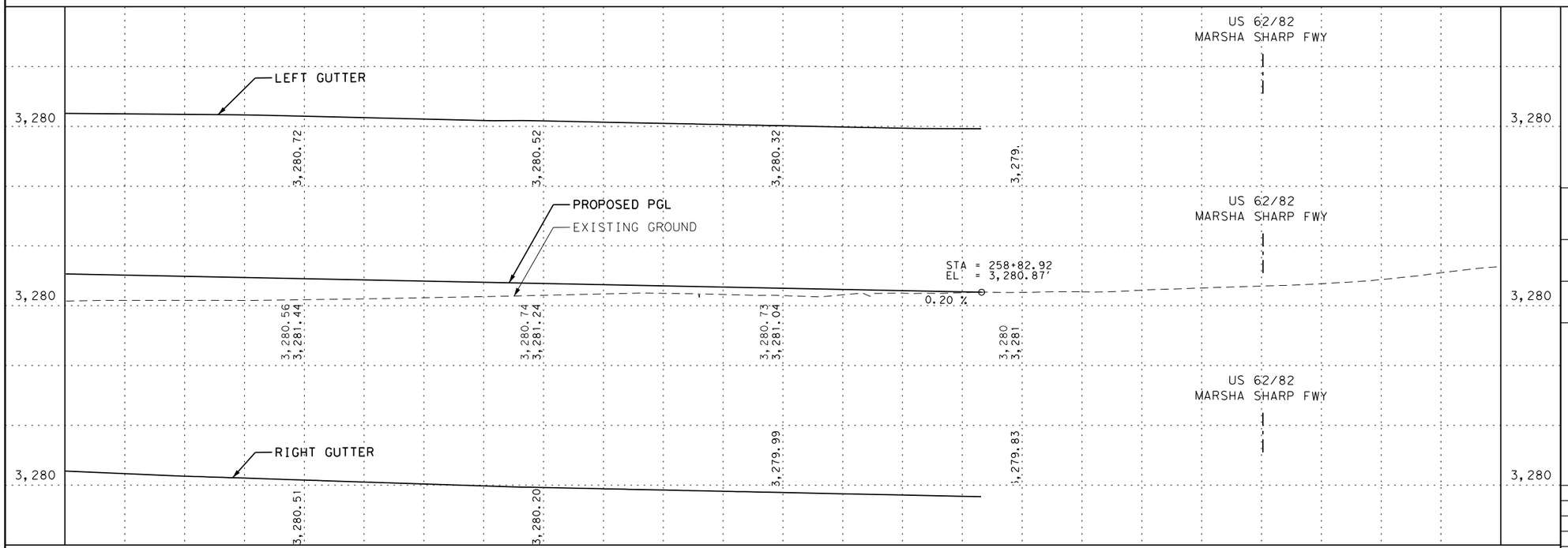
CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105



STATE OF TEXAS
PEDRO CARRASCO JR.
95180
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

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FREESE AND NICHOLS

UPLAND AVENUE
66TH STREET TO 82ND STREET

PLAN AND PROFILE

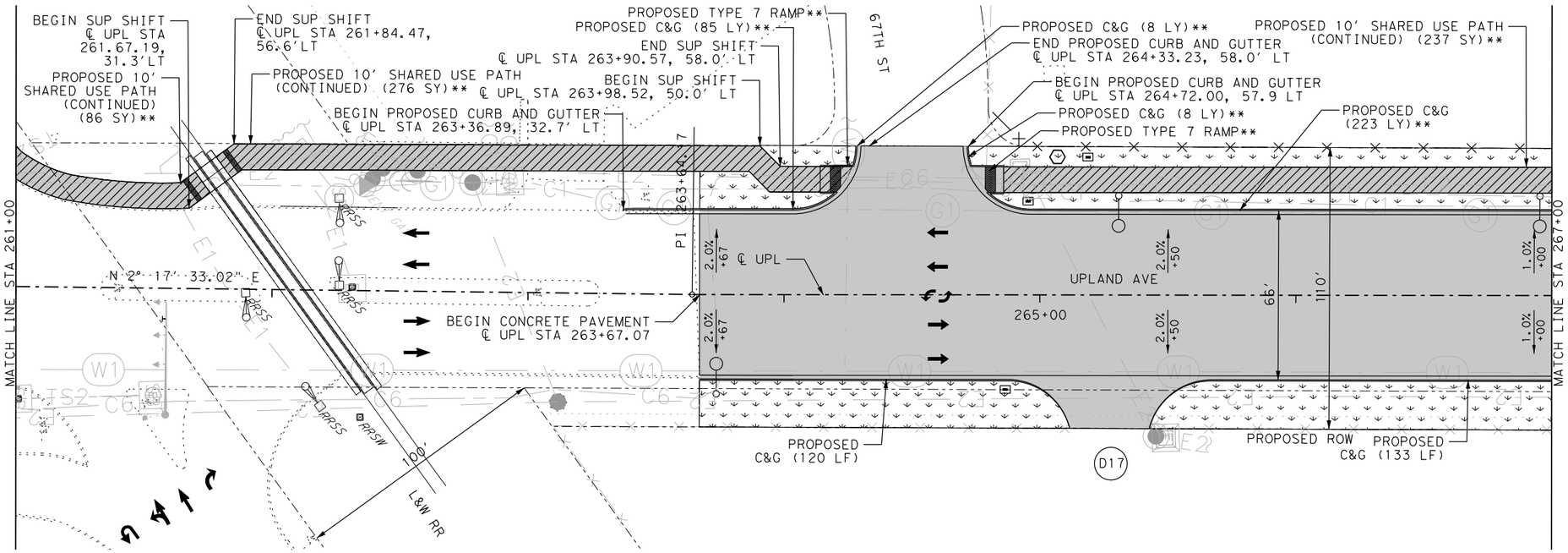
UPL STA 255+00 TO STA 261+00

SHEET 8 OF 14

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	96
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 25 50
HORIZONTAL SCALE: 1"=50'

0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

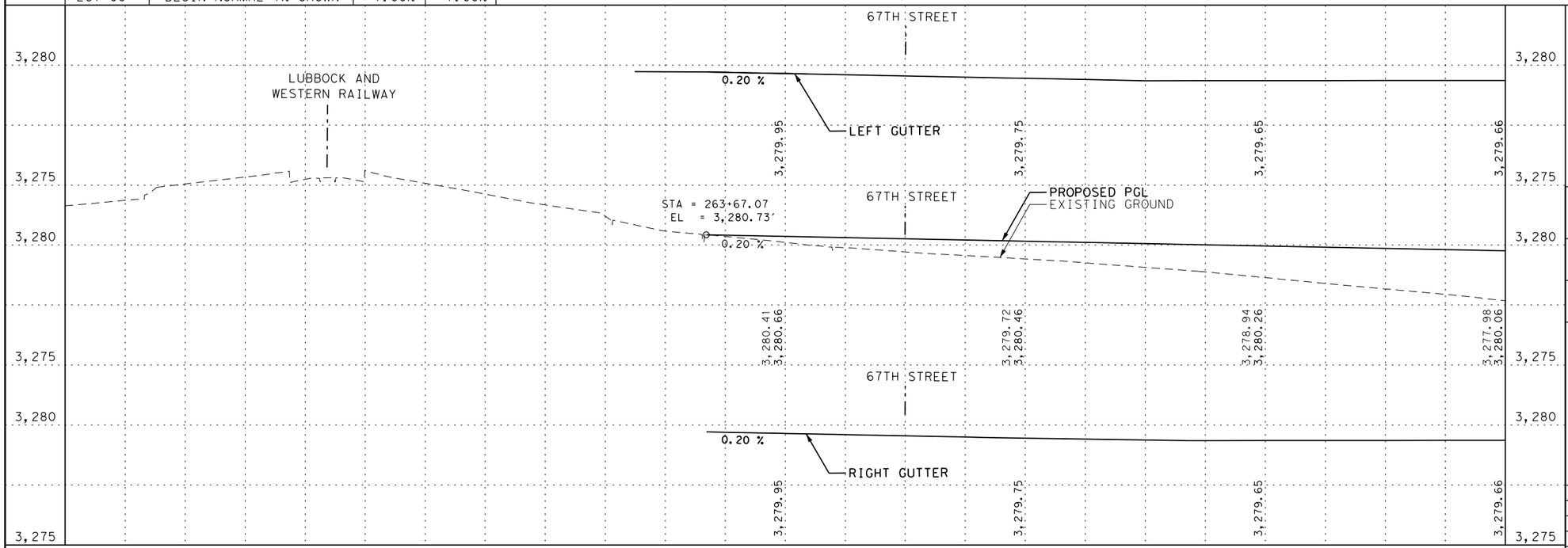
NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105

STATION	DESCRIPTION	L SIDE	R SIDE
265+50	END NORMAL 2% CROWN	-2.00%	-2.00%
267+00	BEGIN NORMAL 1% CROWN	-1.00%	-1.00%

SEEDING: 1033 SY



STATE OF TEXAS
PEDRO CARRASCO JR.
98380
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8/9/2023

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FREESE AND NICHOLS

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UPLAND AVENUE
66TH STREET TO 82ND STREET

PLAN AND PROFILE

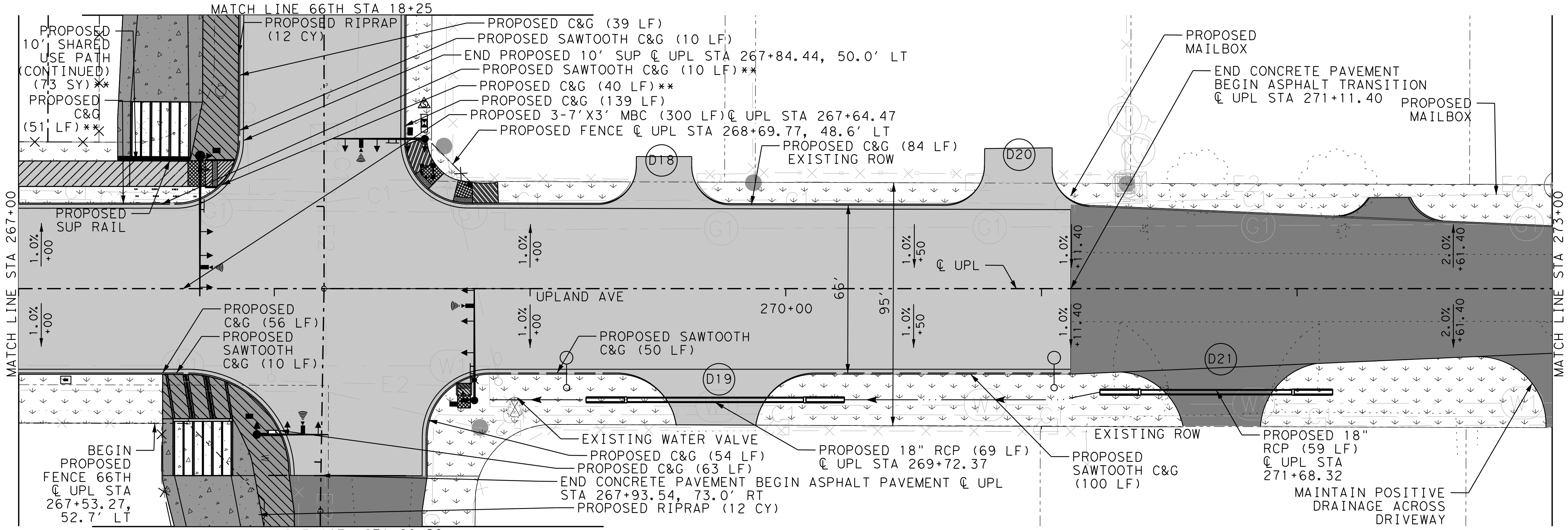
UPL STA 261+00 TO STA 267+00

SHEET 9 OF 14

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	97
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 25 50
HORIZONTAL SCALE: 1"=50'

0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- D# DRIVEWAY
- A# ALLEY

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

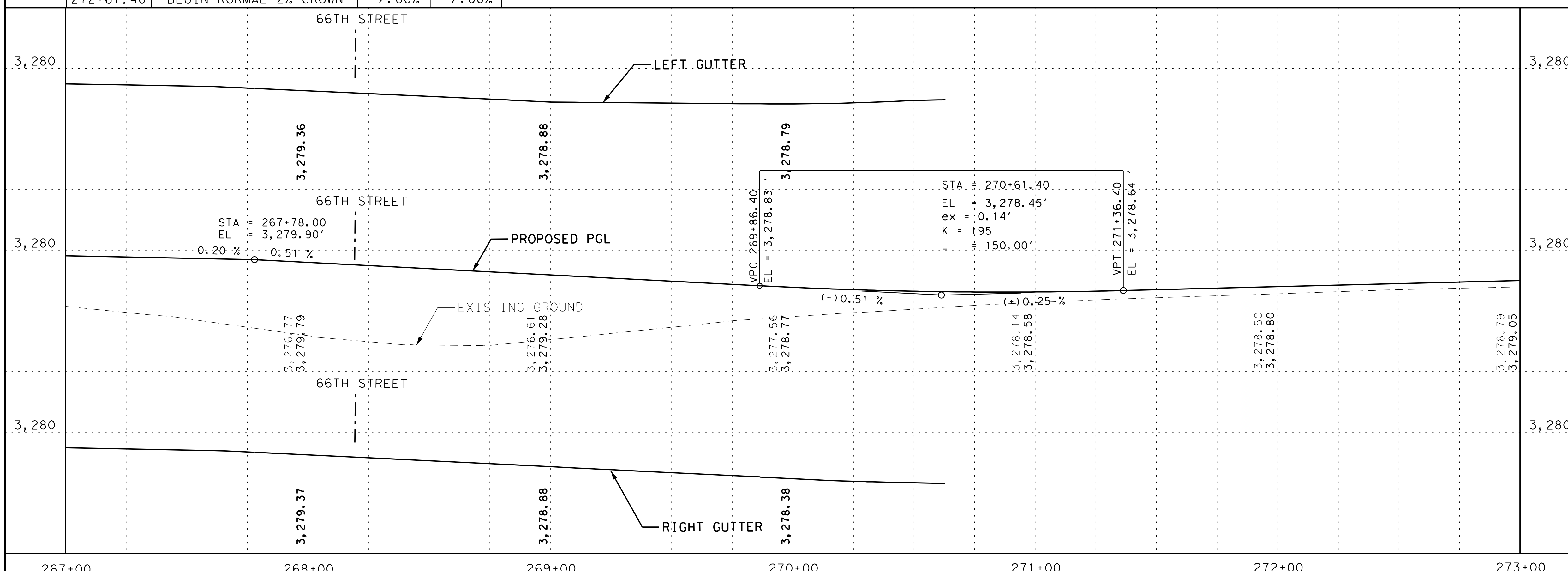
*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105

STATION	DESCRIPTION	L SIDE	R SIDE
267+00	BEGIN NORMAL 1% CROWN	-1.00%	-1.00%
269+00	END NORMAL 1% CROWN	-1.00%	-1.00%
270+50	BEGIN SUPER	1.00%	-1.00%
271+11.40	END SUPER	1.00%	-1.00%
272+61.40	BEGIN NORMAL 2% CROWN	-2.00%	-2.00%

SEEDING: 1048 SY

NOTE:
SEE INTERSECTION LAYOUT FOR SAWTOOTH CURB AND GUTTER NOTE



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UPLAND AVENUE
66TH STREET TO 82ND STREET

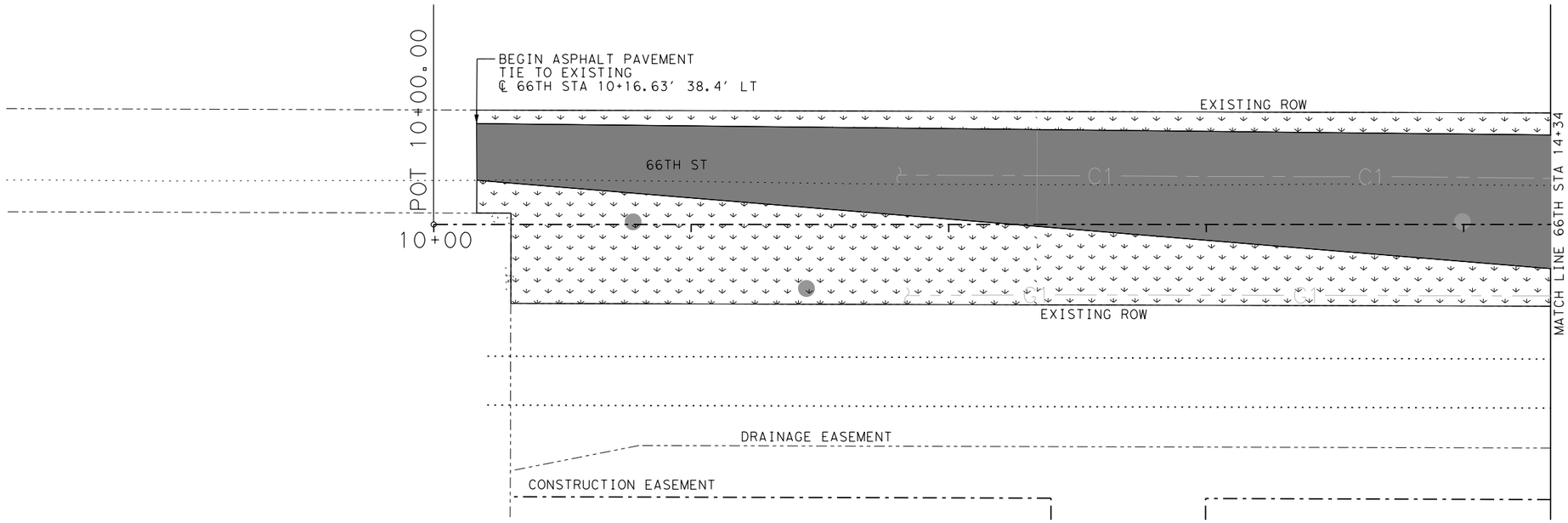
PLAN AND PROFILE

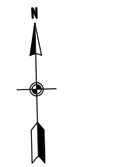
UPL STA 267+00 TO STA 273+00

SHEET 10 OF 14

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.	
6	SEE TITLE SHEET		CS	
STATE	DIST.	COUNTY		SHEET NO.
TEXAS	LBB	LUBBOCK		98
CONT.	SECT.	JOB		
0905	06	095, ETC.		

100% SUBMITTAL





0 25 50
HORIZONTAL SCALE: 1"=50'

0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

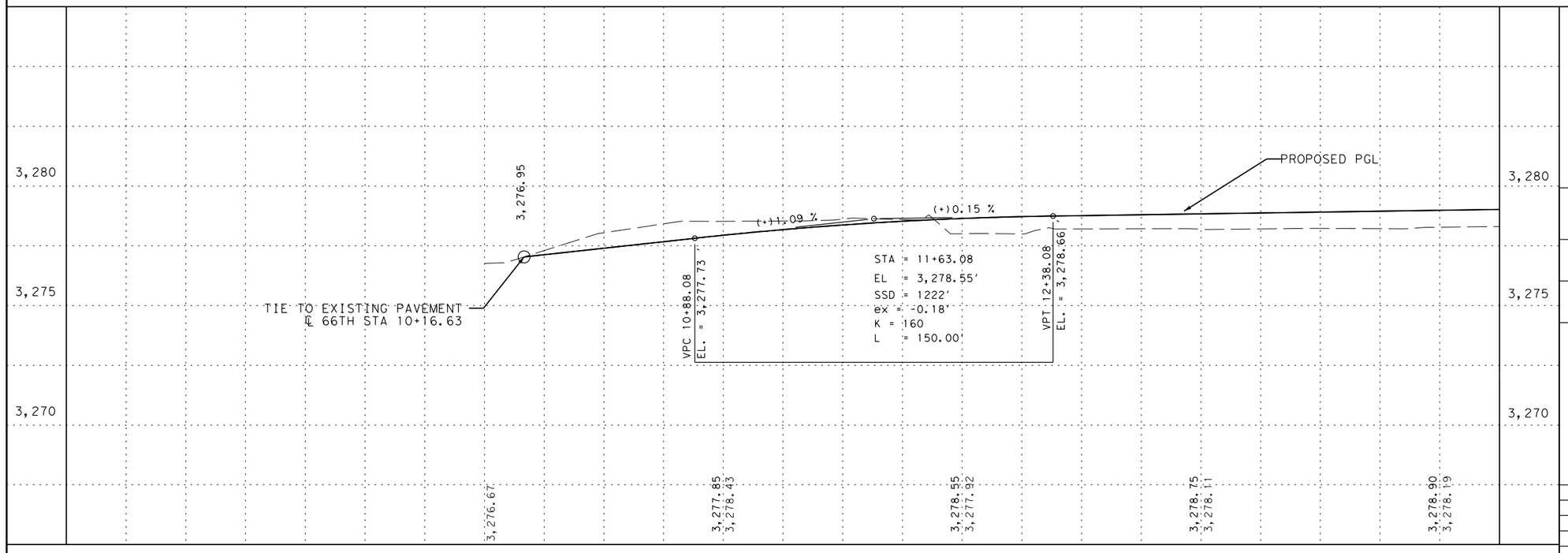
CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII DIMENSIONS ARE TYPICAL
UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105



STATE OF TEXAS
PEDRO CARRASCO JR.
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9/28/2023

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FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

66TH STREET PLAN AND PROFILE

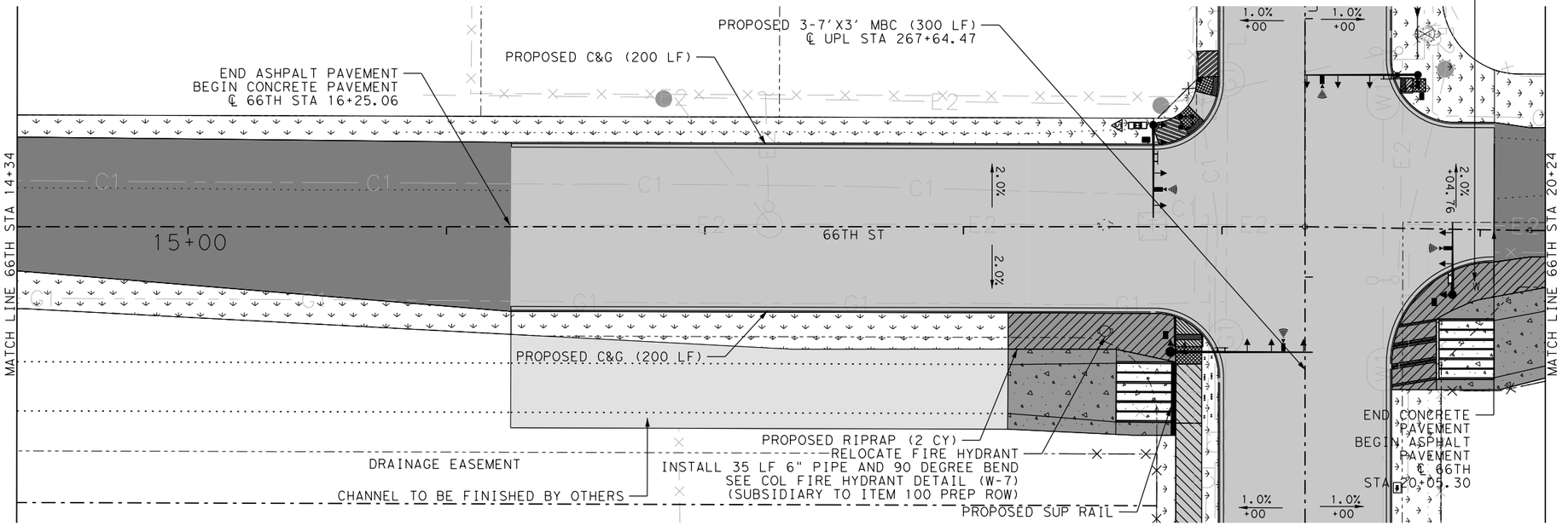
66TH STA 10+00 TO STA 14+34

SHEET 11 OF 14

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

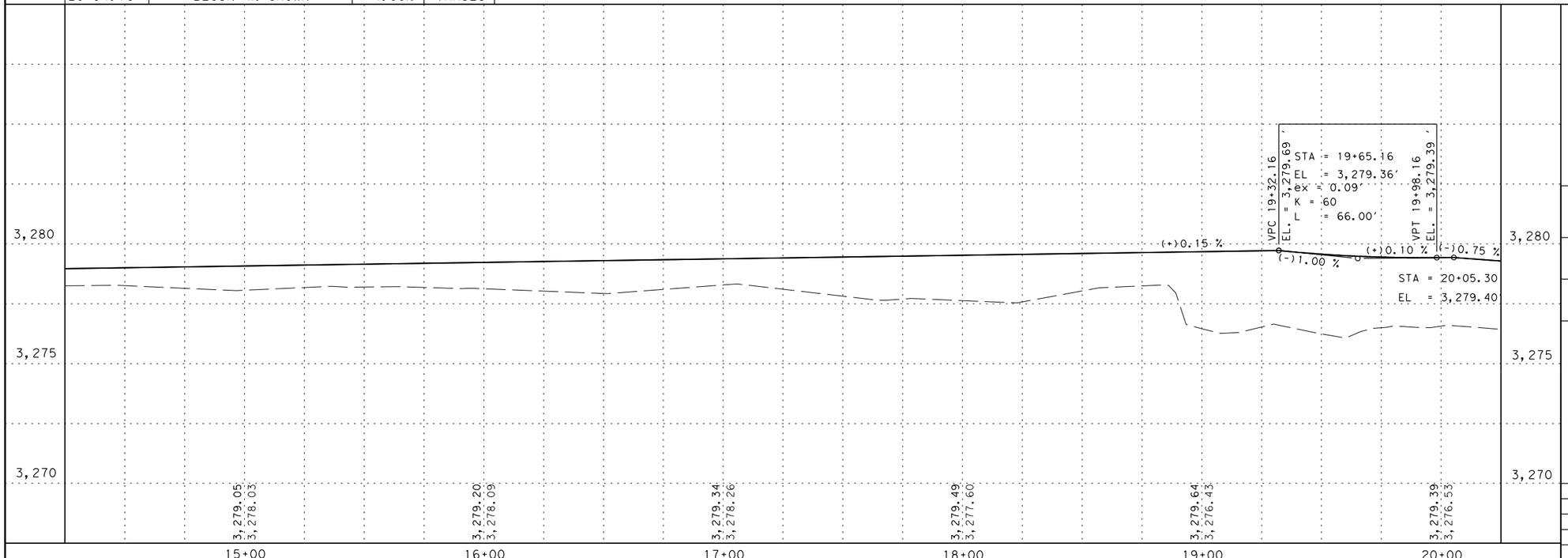
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	99
CONT.	SECT.	JOB	
0905	06	095, ETC.	

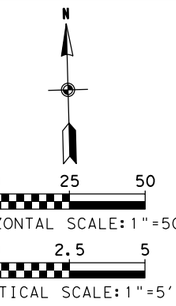
100% SUBMITTAL



SEEDING: 1062 SY

STATION	DESCRIPTION	L SIDE	R SIDE
20+04.76	END NORMAL 2% CROWN	-2.00%	VARIES
20+94.76	BEGIN 4% CROWN	-4.00%	VARIES





LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105

STATE OF TEXAS
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UPLAND AVENUE
66TH STREET TO 82ND STREET

66TH STREET PLAN AND PROFILE

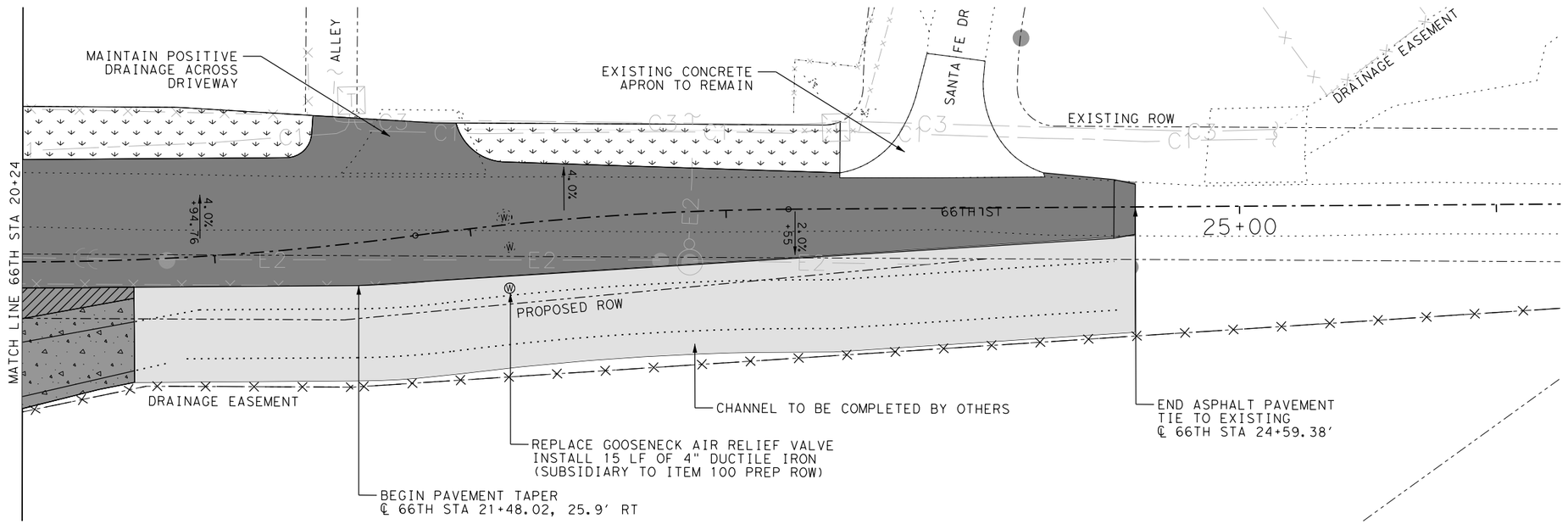
66TH STA 14+34 TO STA 20+24

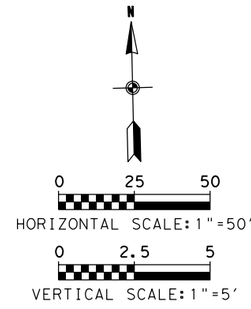
SHEET 12 OF 14

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	100
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

SEEDING: 520 SY

CURB RADIUS CHART

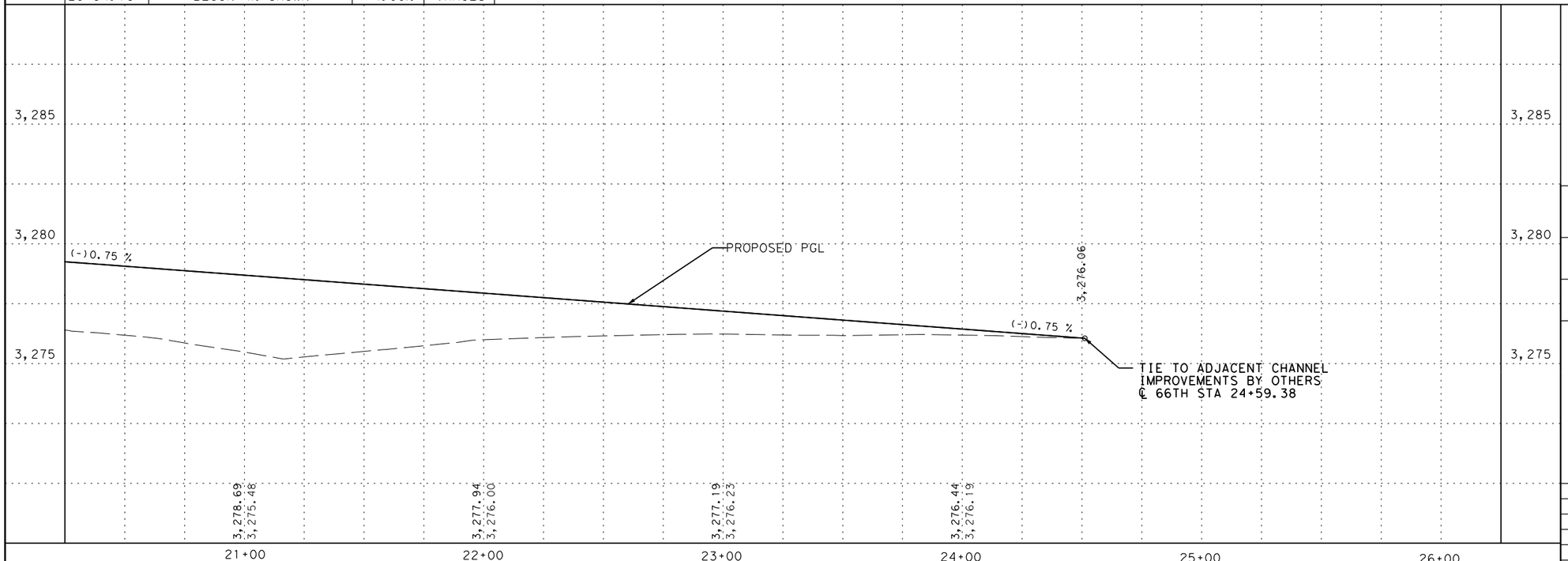
15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105

STATION	DESCRIPTION	L SIDE	R SIDE
20+04.76	END NORMAL 2% CROWN	-2.00%	VARIES
20+94.76	BEGIN 4% CROWN	-4.00%	VARIES



STATE OF TEXAS
PEDRO CARRASCO JR.
98380
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9/28/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

66TH STREET
PLAN AND PROFILE

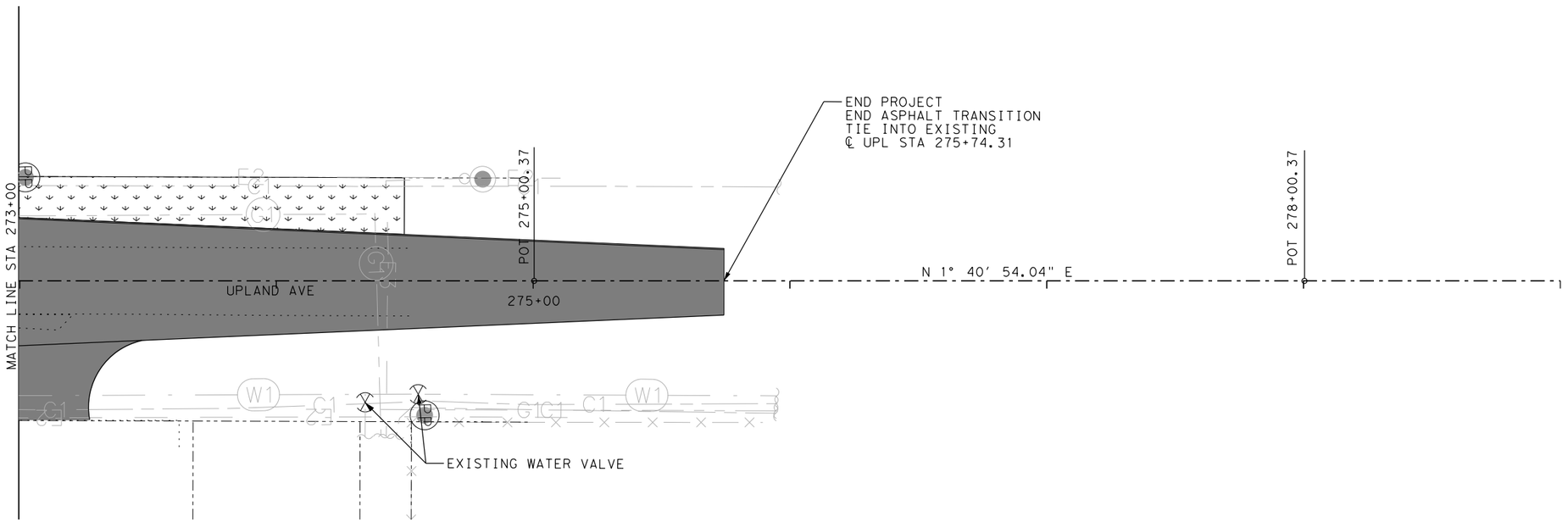
66TH STA 20+24 TO STA 26+24

SHEET 13 OF 14

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	101
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

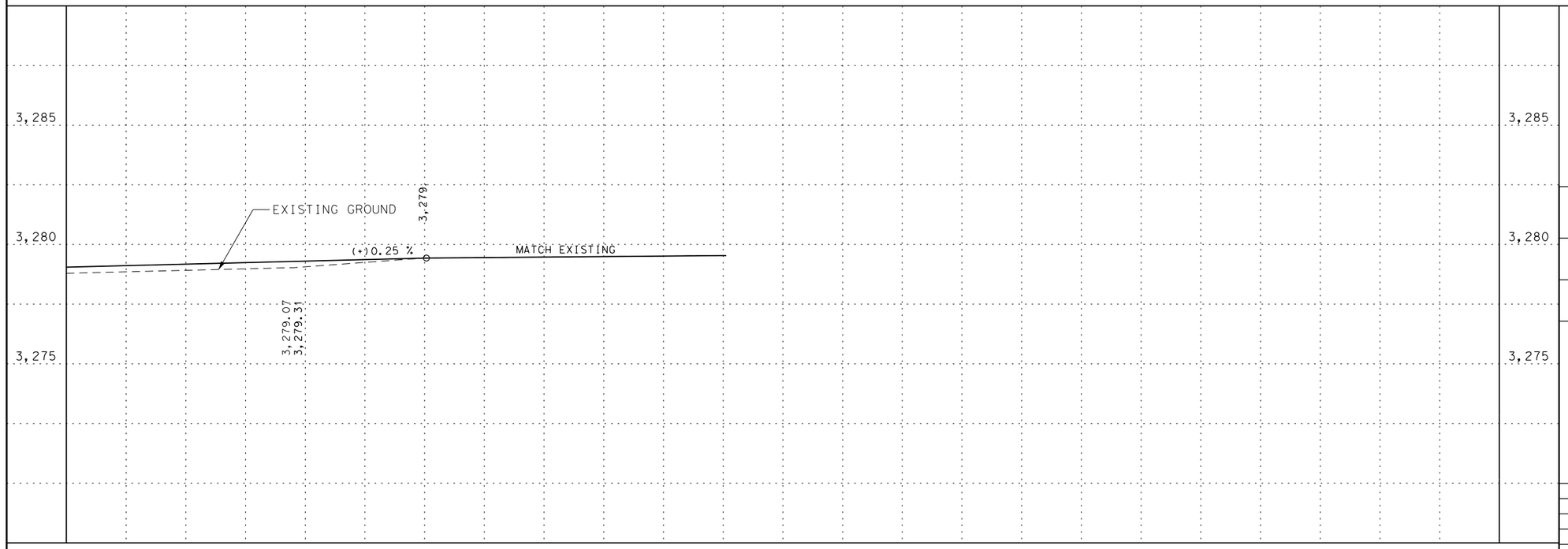
CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII DIMENSIONS ARE TYPICAL
UNLESS OTHERWISE NOTED
SUP = SHARED USE PATH

*CONTRACTOR SHALL BUILD ALL DRIVEWAY RADII WITH TYPICAL CURB AND GUTTER

**ITEM PAID FOR UNDER CSJ: 0905-06-105



STATE OF TEXAS
PEDRO CARRASCO JR.
98580
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

9/28/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

PLAN AND PROFILE

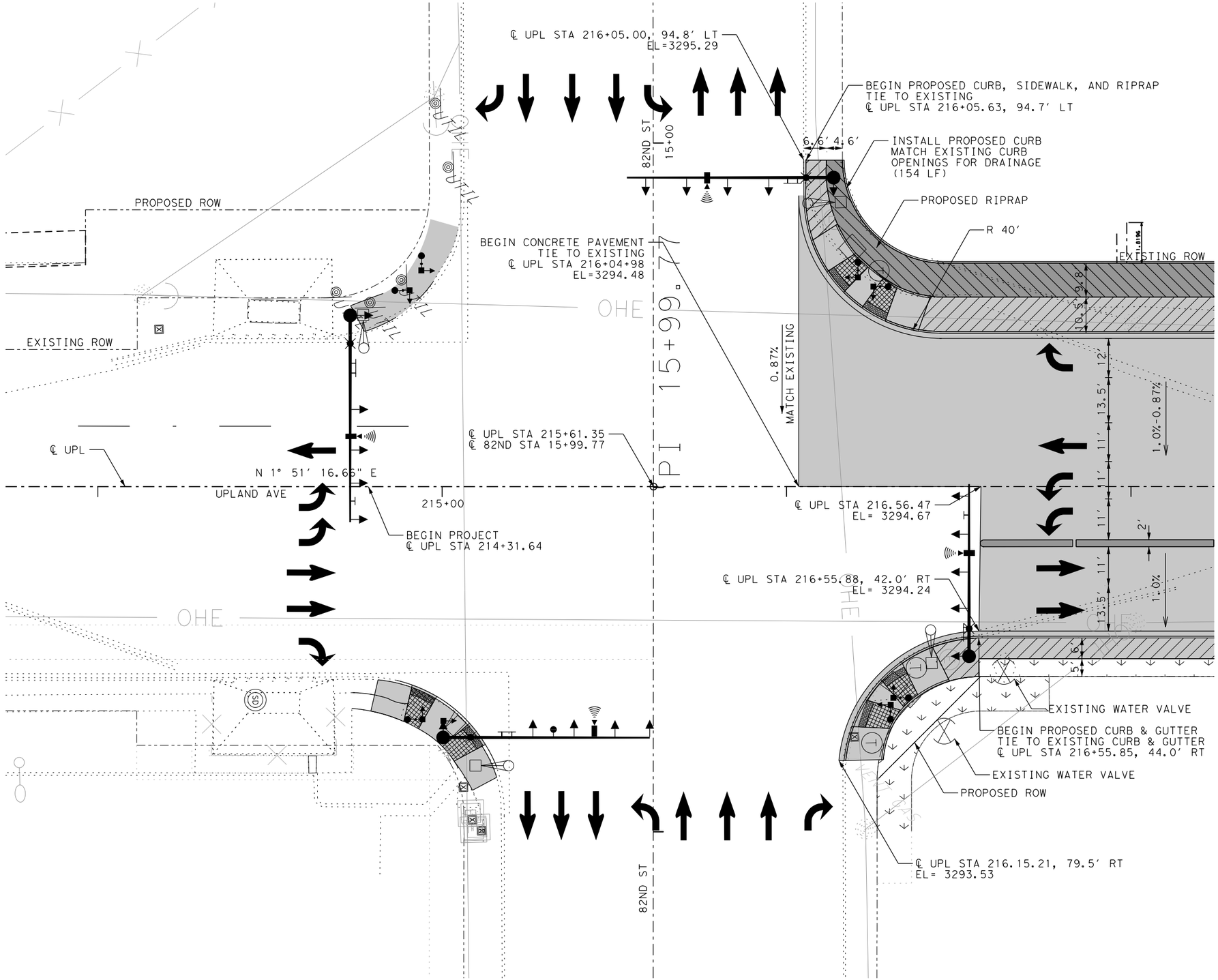
UPL STA 273+00 TO END

SHEET 14 OF 14

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	102
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SOD/SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
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UNLESS OTHERWISE NOTED

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FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

INTERSECTION LAYOUT

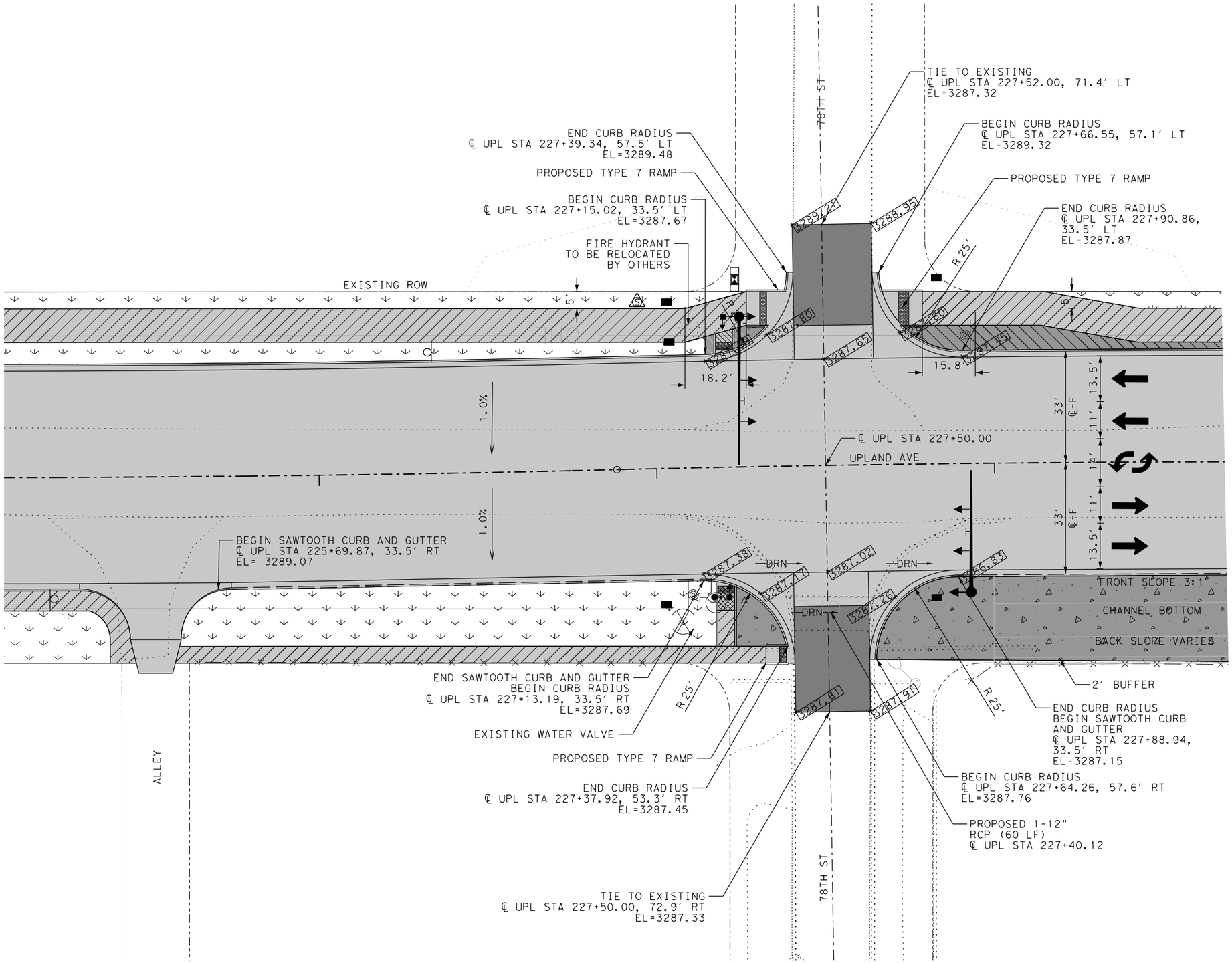
UPLAND AVE AT 82ND STREET

SHEET 1 OF 6

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	103
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



N

0 15 30

SCALE: 1"=30′

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SOD/SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15′ TYPICAL DRIVEWAY
25′ TYPICAL CROSSROAD
40′ TYPICAL PA(M) INTERSECTION

NOTE:
RADII ARE TYPICAL
UNLESS OTHERWISE NOTED

*SUP = SHARED USE PATH

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Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

INTERSECTION LAYOUT

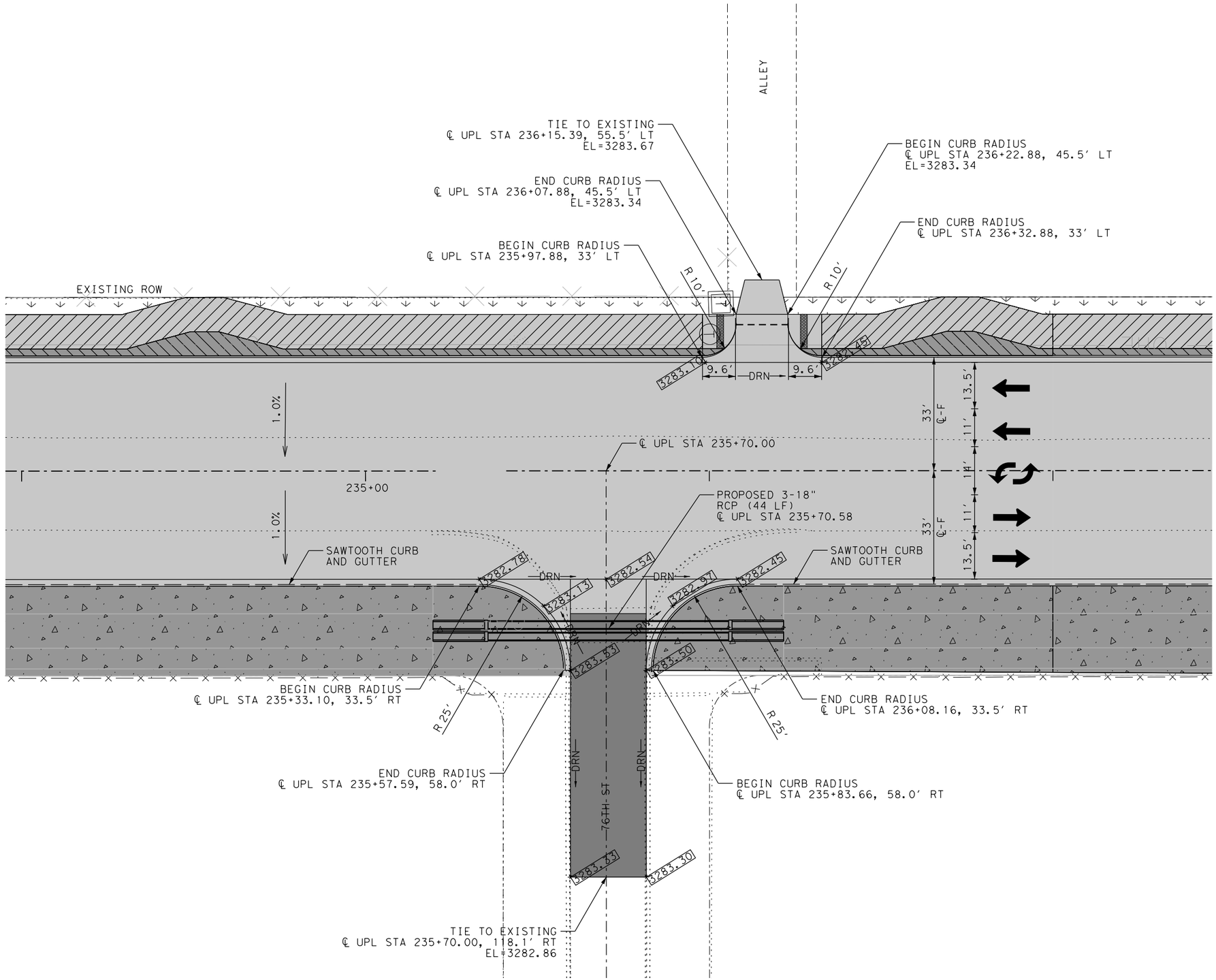
UPLAND AVE AT 78TH STREET
(HAWK CROSSING)

SHEET 2 OF 6

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	104
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



N

0 15 30

SCALE: 1"=30′

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SOD/SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15′ TYPICAL DRIVEWAY
25′ TYPICAL CROSSROAD
40′ TYPICAL PA(M) INTERSECTION

NOTE:
RADII ARE TYPICAL
UNLESS OTHERWISE NOTED

*SUP = SHARED USE PATH

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Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

INTERSECTION LAYOUT

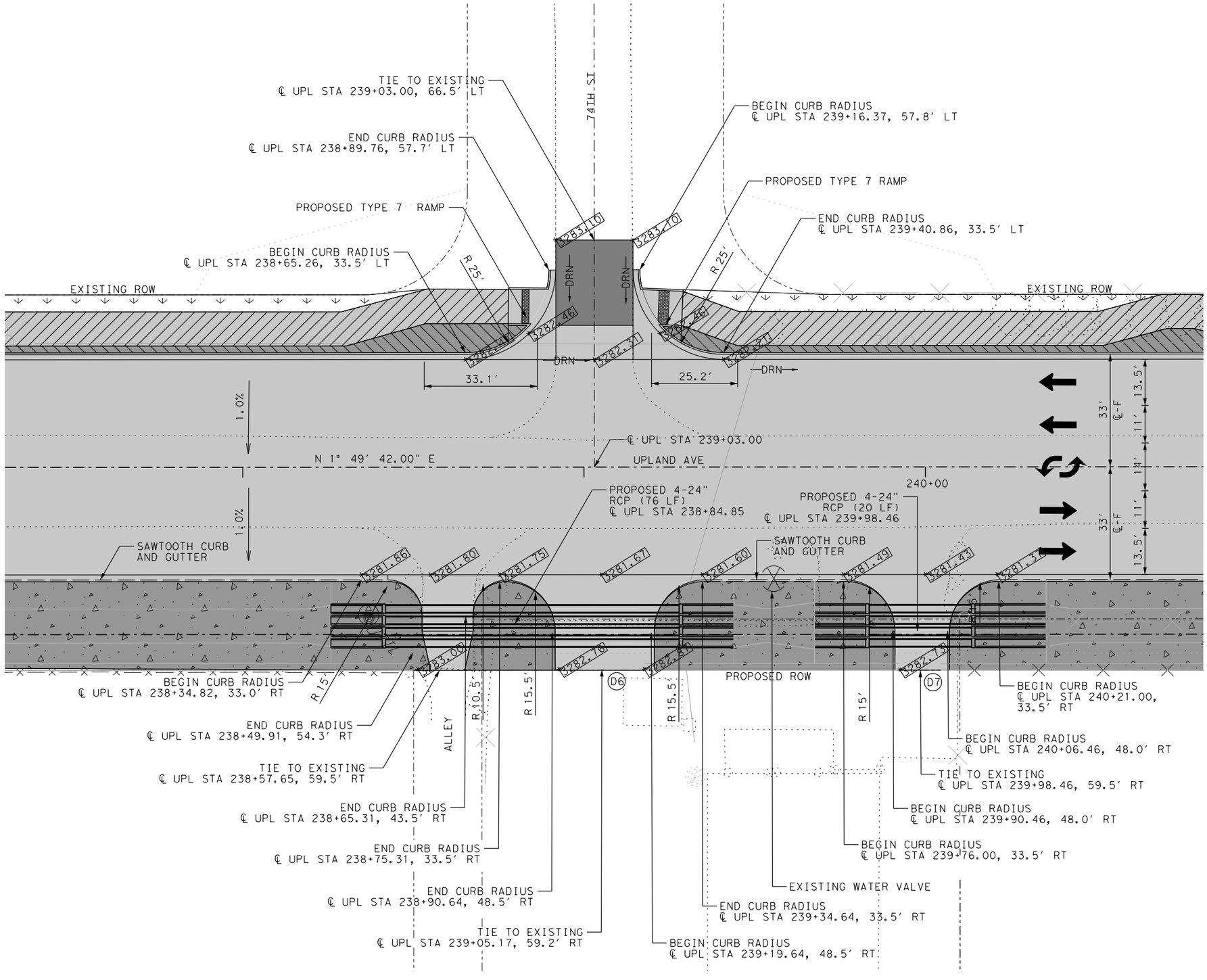
UPLAND AVE AT 76TH STREET

SHEET 3 OF 6

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	105
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



N

0 15 30

SCALE: 1"=30'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SOD/SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII ARE TYPICAL
UNLESS OTHERWISE NOTED

*SUP = SHARED USE PATH

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Pedro Carrasco Jr. 8/9/2023

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Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

INTERSECTION LAYOUT

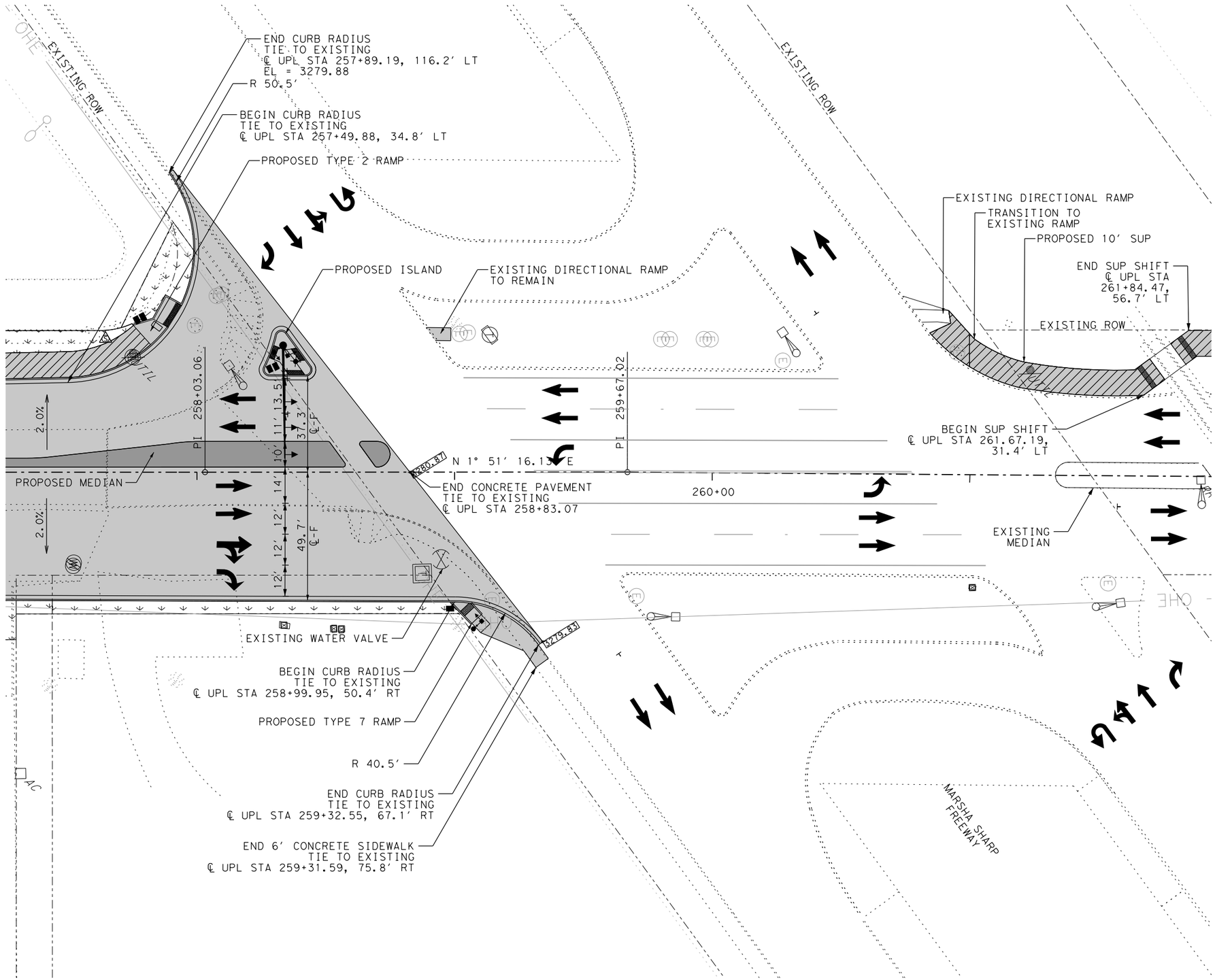
UPLAND AVE AT 74TH STREET

SHEET 4 OF 6

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	106
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 20 40
SCALE: 1"=40'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SOD/SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII ARE TYPICAL
UNLESS OTHERWISE NOTED

*SUP = SHARED USE PATH

STATE OF TEXAS
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Pedro Carrasco Jr. 8/9/2023

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UPLAND AVENUE
66TH STREET TO 82ND STREET

INTERSECTION LAYOUT

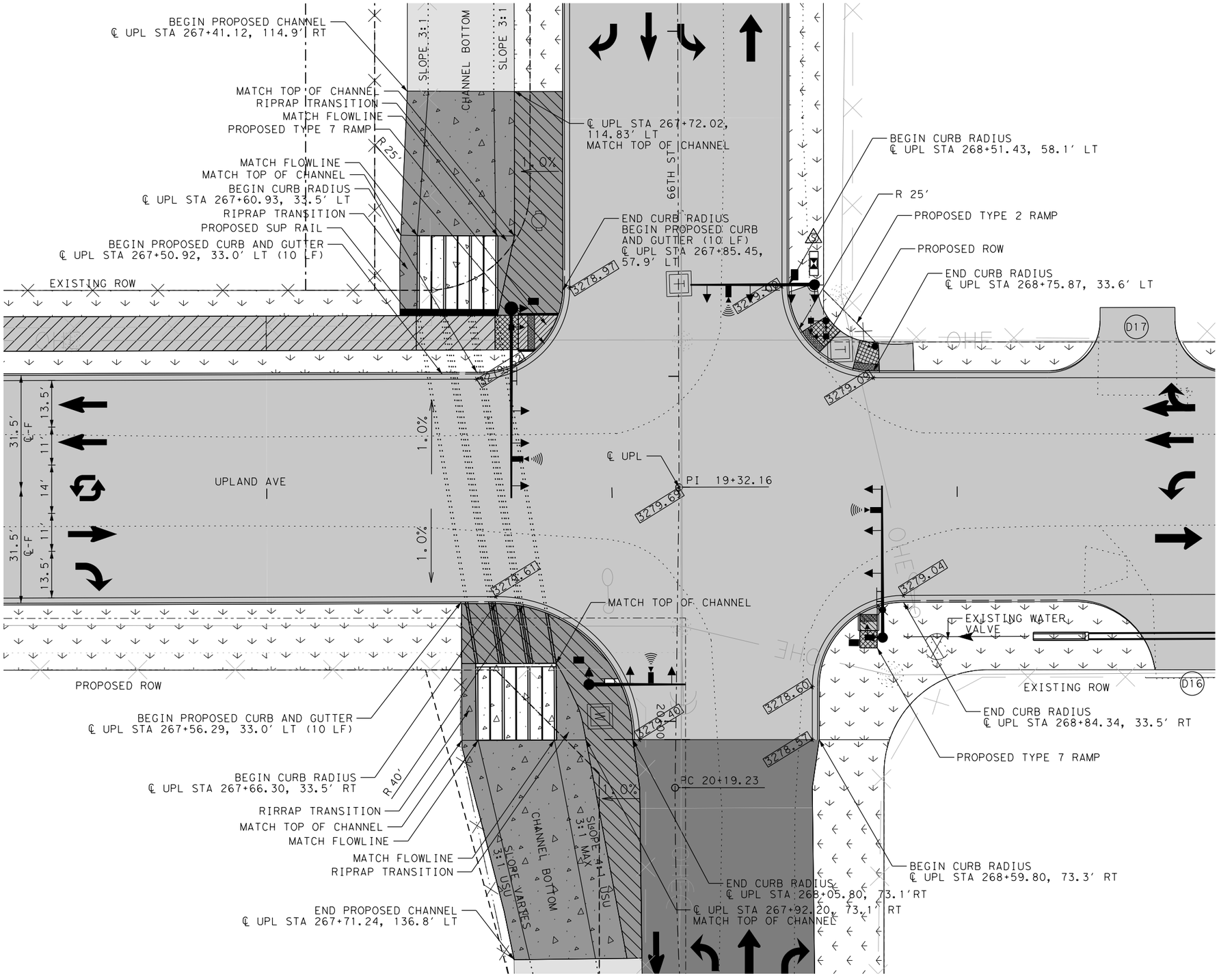
UPLAND AVE AT MARSHA SHARP FREEWAY

SHEET 5 OF 6

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	107
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 15 30
SCALE: 1"=30'

LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SOD/SEED LIMITS
- (D#) DRIVEWAY
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NOTE:
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*SUP = SHARED USE PATH

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10/2/2023

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UPLAND AVENUE
66TH STREET TO 82ND STREET

INTERSECTION LAYOUT

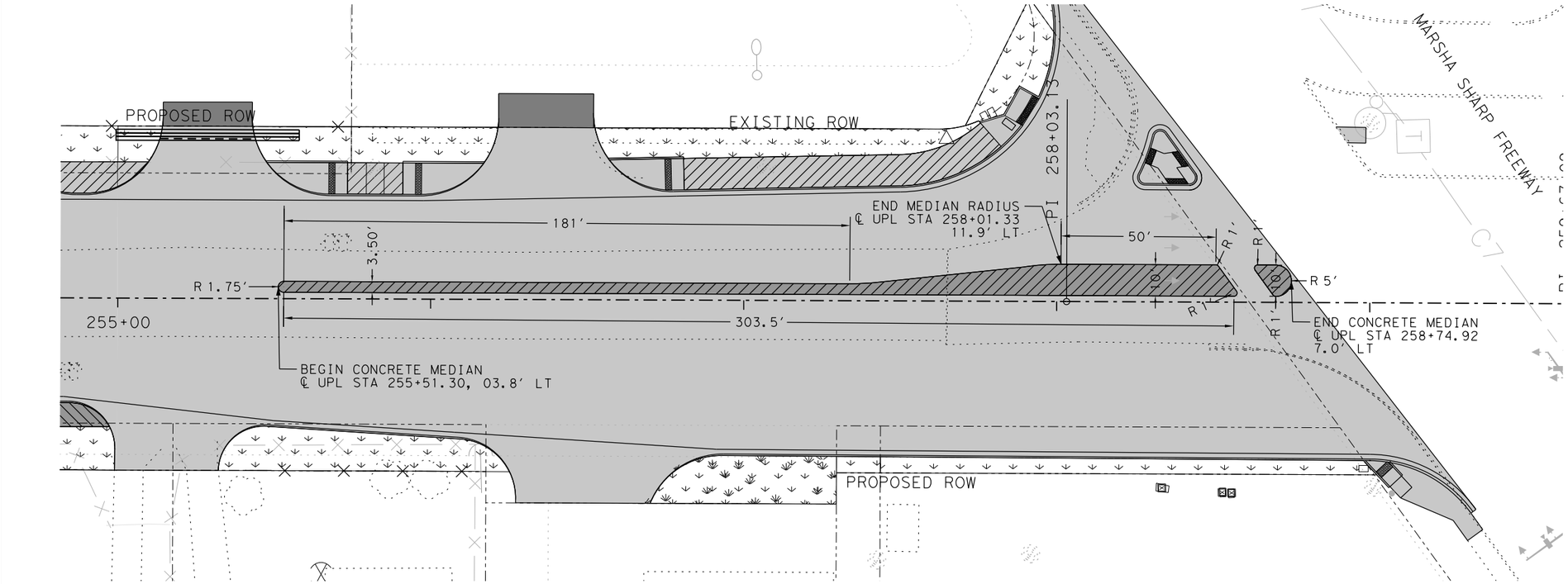
UPLAND AVE AT 66TH STREET

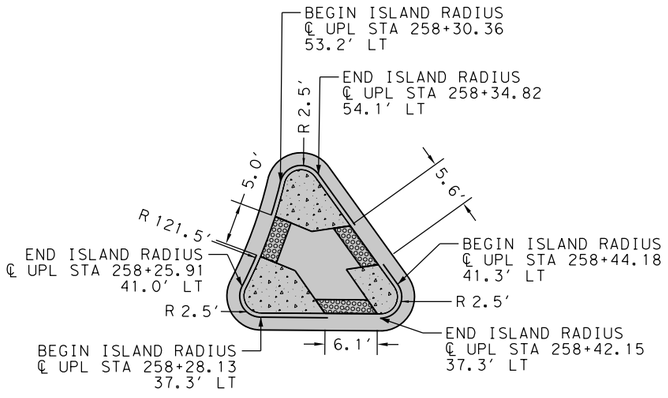
SHEET 6 OF 6

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	108
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





ISLAND DIMENSIONS
NTS

STATE OF TEXAS
PEDRO CARRASCO JR.
98080
LICENSED
PROFESSIONAL ENGINEER

8/9/2023

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TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

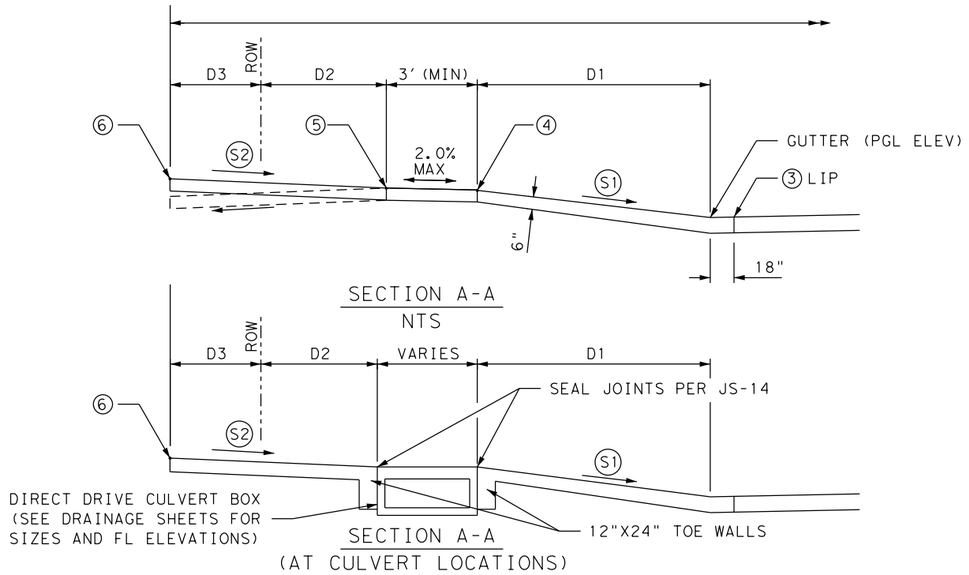
MEDIAN DETAILS

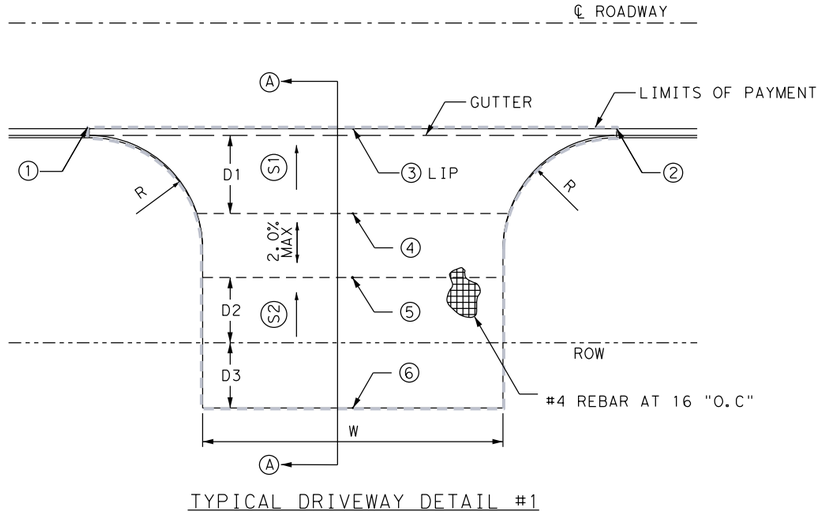
SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

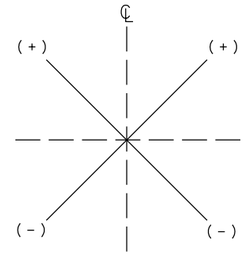
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	109
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





TYPICAL DRIVEWAY DETAIL #1



DRIVEWAY SLOPE SIGN CONVENTION

NOTES:

1. SEE ROADWAY DETAILS SHEET FOR MORE INFORMATION
2. ALL GUTTER ELEVATIONS ARE ARE 1" BELOW EOP ELEVATIONS
3. DRIVEWAYS DENOTED WITH AN * INDICATE NEGATIVE SLOPE TO APPROPRIATELY TIE INTO EX.

	R	W		1		2		3		S1	4	D1	5	D2	6	S2	D3	7
				NORTH(LT)/SOUTH(RT)		SOUTH(LT)/NORTH(RT)		TIE			PROPERTY TIE AT DRIVEWAY							
DRIVEWAY NUMBER	RADIUS	DRIVEWAY WIDTH	RT/LT	STATION	LIP EL	STATION	LIP EL	STATION	LIP EL	BEGINNING SLOPE	ELEVATION	DISTANCE FROM GUTTER TO 4	ELEVATION AT BACK OF SIDEWALK	DISTANCE FROM 5 TO ROW	TIE IN ELEVATION TO EX. / AT ROW	SLOPE BETWEEN 5 & TIE IN POINT	DISTANCE BEYOND ROW	BEYOND ROW TIE IN ELEVATION
D1	5	37.0	LT	217+95.62	3295.60	217+47.62	3295.42	217+71.62	3295.51	1.50%	3295.42		3295.51	9.82	3296.64	8.00%		
A1	5/15	25.0	LT	219+07.86	3295.61	218+62.83	3295.78	218+82.32	3295.74	1.50%	3295.66		3295.80	11.94	3296.76	8.00%		
D2	15	38.0	RT	218+55.00	3294.92	219+21.92	3294.74	218+88.62	3294.90	3.59%	3295.02	5.58	3295.11		3295.11			
D3*	15	24.7	RT	220+34.47	3293.57	220+89.38	3292.95	220+61.70	3293.26	-1.42%	3293.06	8.14	3292.98		3292.98		6.30	3292.89
D4*	15	30.9	RT	221+02.04	3292.82	221+62.69	3292.26	221+32.21	3292.54	-3.28%	3292.14	9.43	3292.02		3292.02			
D5	25	35.8	RT	223+39.82	3290.62	224+24.75	3289.83	223+82.22	3290.22	0.90%	3290.27	14.45	3290.32		3290.32			
A2	10	10.0	LT	224+80.85	3289.31	224+45.85	3289.63	224+63.35	3289.47	1.47%	3289.49	7.00	3289.64	10.00	3289.79	1.47%		
A3	15	11.5	RT	225+28.93	3288.89	225+73.67	3288.52	225+51.29	3288.70	0.74%	3288.75	17.20	3288.78		3288.78			
A4	15	15.0	RT	229+07.53	3286.27	229+52.53	3285.99	229+30.03	3286.13	7.50%	3287.17	15.00			3287.17			
A5	10	15.0	LT	230+56.88	3285.49	230+21.88	3285.80	230+39.38	3285.64	11.13%	3286.61	9.50	3286.67		3286.67			
A6	15	15.0	RT	232+57.53	3284.26	233+02.53	3283.98	232+80.03	3284.12	8.24%	3284.90	10.53			3284.90			
A7	10	15.0	LT	236+32.88	3283.01	235+97.88	3283.10	236+15.38	3283.06	9.15%	3283.84	9.50	3283.90		3283.90			
A8	10	15.0	RT	238+42.53	3281.84	238+77.07	3281.75	238+60.03	3281.79	9.64%	3283.15	14.98			3283.15			
D6	15	29.0	RT	238+77.07	3281.75	239+35.54	3281.60	239+06.05	3281.67	4.78%	3282.86	26.47			3282.86			
D7	15	16.0	RT	239+76.04	3281.49	240+22.03	3281.37	239+99.03	3281.43	5.23%	3282.73	26.50			3282.73			
D8	25	21.3	LT	242+92.88	3281.23	242+25.10	3281.55	242+58.38	3281.40	0.12%	3281.31		3281.33	7.50	3281.34	0.12%		
D9*	25	17.9	RT	245+62.13	3280.68	246+30.03	3280.68	245+96.08	3280.68	-2.84%	3280.25	12.21	3280.25	9.63	3279.32	-9.67%		
D10*	25	30.1	LT	246+42.02	3280.68	245+58.92	3280.68	246+00.47	3280.68	-2.00%	3280.60		3280.40	7.50	3280.08	-4.27%	28.00	3278.88
D11*	25	15.2	RT	252+69.60	3280.70	253+37.84	3280.84	253+03.72	3280.77	-9.54%	3278.11	27.00			3278.11			
D12*	25	27.0	LT	254+86.67	3281.03	254+09.69	3280.97	254+48.18	3281.07	-2.00%	3280.98		3280.78	24.30	3279.34	-5.92%		
D13*	15	33.2	RT	254+84.59	3281.04	255+49.85	3280.76	255+15.75	3280.90	-9.44%	3279.09	18.36			3279.09			
D14*	25	28.5	LT	255+67.81	3280.87	254+89.32	3281.02	255+28.56	3280.95	-2.00%	3280.87		3280.67	19.74	3279.12	-7.86%		
D15*	25	30.4	LT	256+77.41	3280.62	255+96.51	3280.81	256+36.65	3280.72	-2.00%	3280.63		3280.43	11.15	3280.30	-1.14%	10.80	3280.18
D16*	19/25	42.3	RT	256+07.64	3280.57	256+93.67	3280.30	256+48.81	3280.44	-2.69%	3279.86	18.53			3279.86			
D17*	25	31.1	RT	264+87.43	3279.85	265+67.10	3279.73	265+27.26	3279.78	-4.85%	3278.77	19.11			3278.77			
D18*	15	21.7	LT	269+78.20	3278.40	269+26.49	3278.76	269+52.39	3278.58	0.47%	3278.54	11.19		11.15	3278.46	-0.72%		
D19*	25	35.0	RT	269+33.87	3278.71	270+11.61	3278.15	269+72.74	3278.44	-4.69%	3277.40	20.34			3277.40			
D20	15	26.5	LT	271+18.94	3277.78	270+62.19	3277.87	270+90.98	3277.81	0.26%	3277.78	22.61			3277.78			

NOTE:
IF DRIVEWAY TIES OUTSIDE OF ROW.
LIMIT OF PAYMENT EXTENDS TO TIE
IN DIMENSION SHOWN BELOW IN THE TABLE.

8/9/2023

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Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET

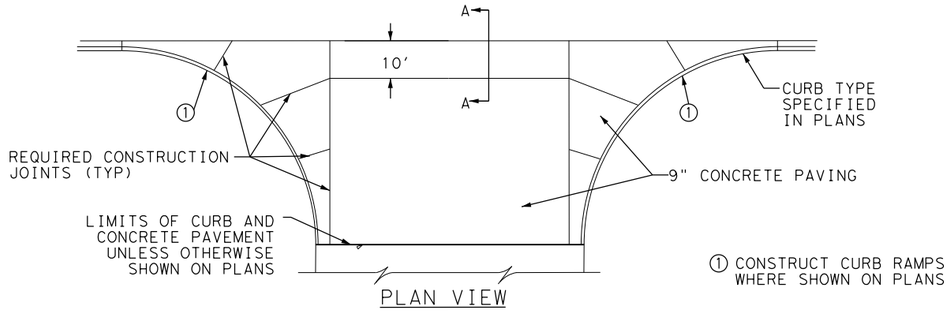
DRIVEWAY DETAILS

SHEET 1 OF 1

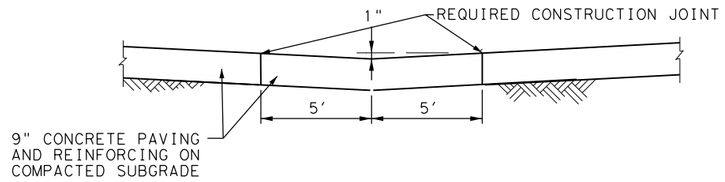
FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	110
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



PLAN VIEW

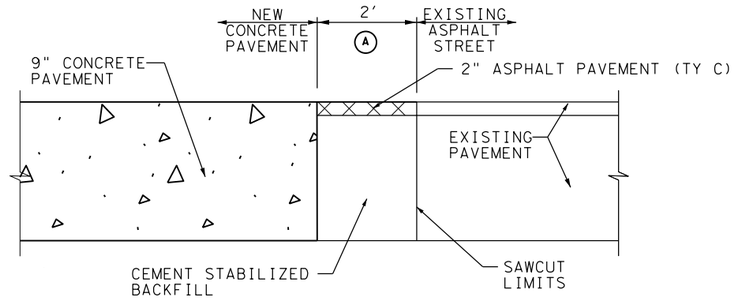


SECTION "A-A"

TYPICAL STREET DETAIL (STREET APRON)

NTS

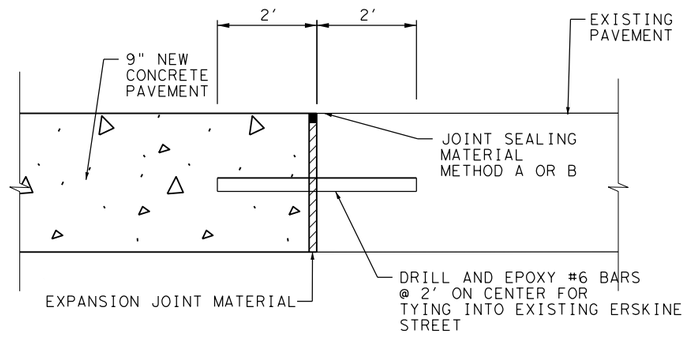
(A) PAYMENT FOR CSB AND ASPHALT PAVEMENT WILL NOT BE MADE DIRECTLY, BUT IS CONSIDERED SUBSIDIARY TO CONCRETE PAVEMENT AND/OR INTERSECTIONS.



TYPICAL SECTION

NEW CONCRETE TIE TO EXIST ASPHALT

NTS



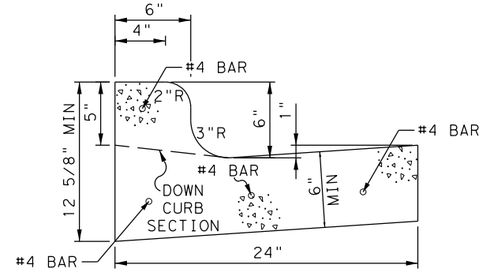
TYPICAL SECTION

NEW CONCRETE TIE TO EXIST CONCRETE

NTS

TYPE A

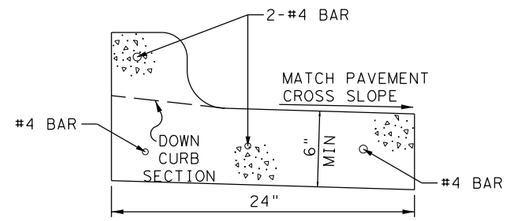
NTS



TYPE B

NTS

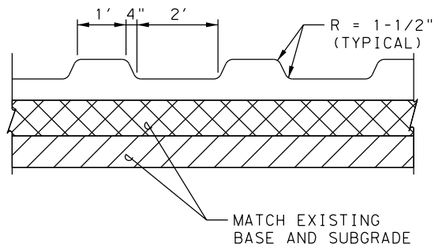
STA 216+05 TO STA 221+00
STA 225+00 TO STA 231+00
STA 233+00 TO STA 244+10
STA 265+50 TO STA 267+00
STA 269+00 TO STA 270+50
(LEFT ONLY)



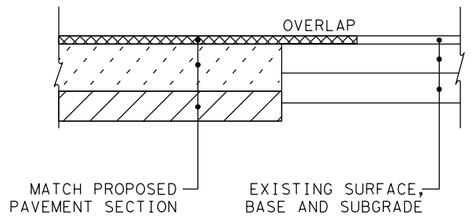
DOWN CURB SECTION

NOTES:

1. REINFORCED GUTTER SECTION WILL BE CONSTRUCTED WITH 4 - #4 BARS RUNNING THE ENTIRE LENGTH OF THE DRIVEWAY SECTION AND THE THREE HORIZONTAL BARS WILL BE SUPPORTED WITH CHAIRS, ON A SPACING TO GIVE ACCURATE PLACEMENT.
2. THE CURB AND GUTTER MAY BE CONSTRUCTED MONOLITHICALLY WITH THE ADJACENT ROADWAY PAVEMENT OR CAN BE CONSTRUCTED SEPARATELY. THE CURB MAY ALSO BE CONSTRUCTED AT A DEPTH TO MATCH THE ADJACENT 9" ROADWAY. PAYMENT FOR CURB WILL BE BASED ON LINEAR FEET ONLY.
3. ON ALL CURB, A LONGITUDINAL JOINT WILL BE LOCATED 2' FROM THE BACK OF CURB. THIS JOINT SHOULD CONFORM TO SECTION Y-Y OR SECTION Z-Z SHOWN ON THE CONCRETE PAVING DETAILS SHEET.



SAWTOOTH CURB AND GUTTER PROFILE



TYPICAL SECTION

NEW ASPHALT TIE TO EXISTING ASPHALT

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

8/9/2023

TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

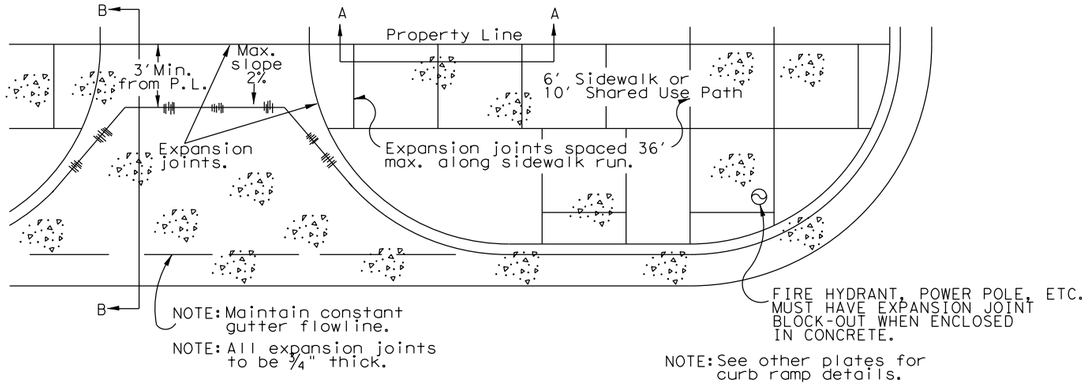
ROADWAY DETAILS

SHEET 1 OF 3

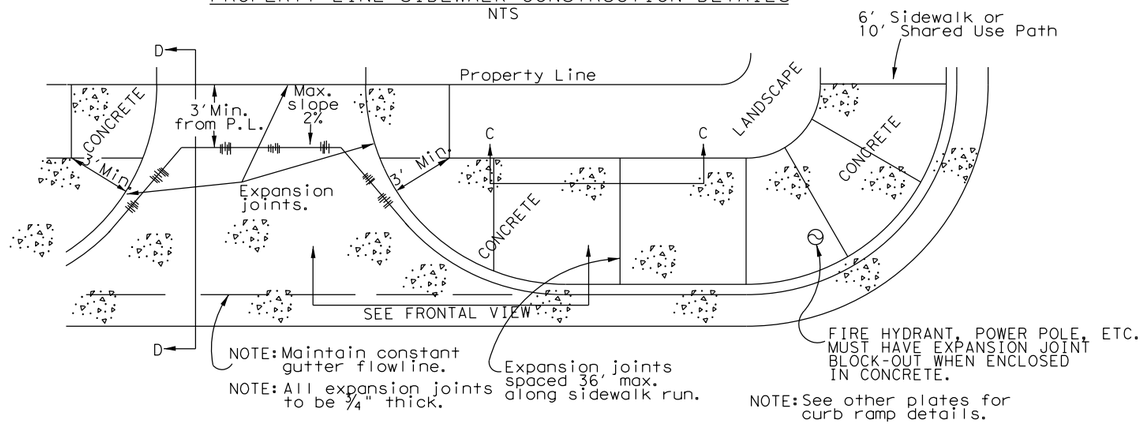
FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	111
CONT.	SECT.	JOB	
0905	06	095, ETC.	

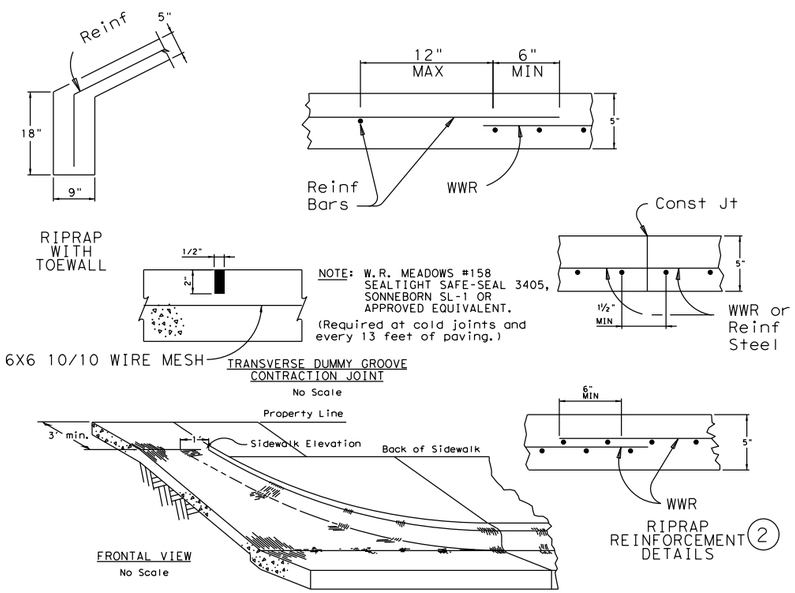
100% SUBMITTAL

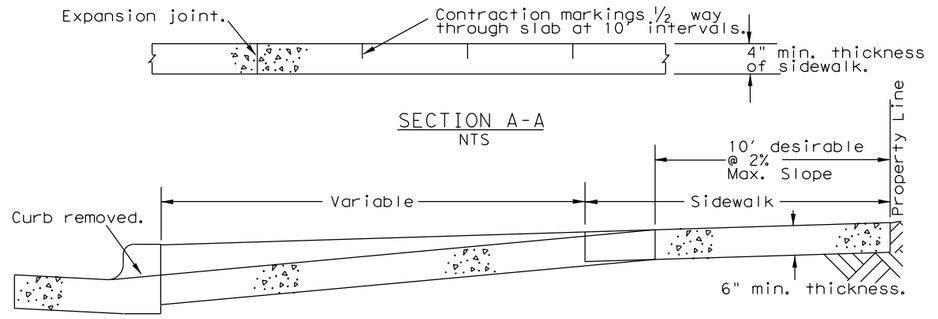


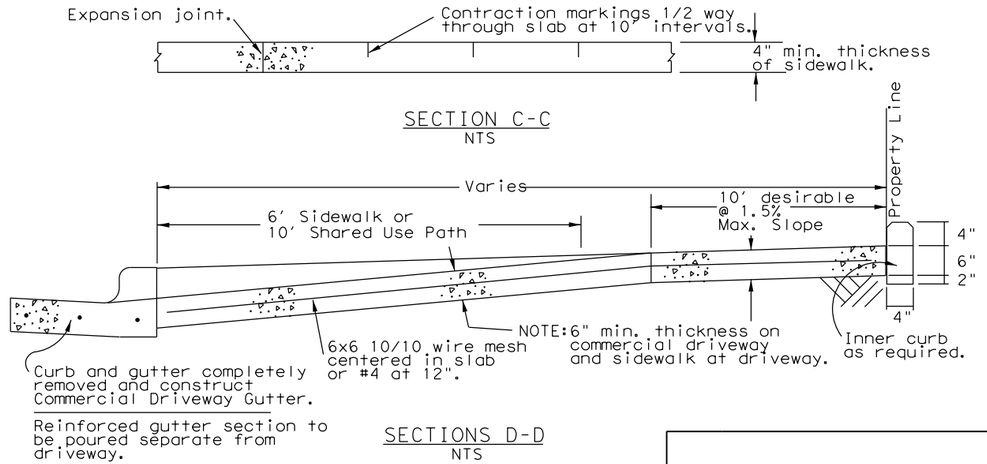
PROPERTY LINE SIDEWALK CONSTRUCTION DETAILS
NTS



CURB BACK SIDEWALK CONSTRUCTION DETAILS
NTS







GENERAL NOTES:

All reinforcing steel shall be Grade 60.
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.
Construction joints or grooved joints extending the full slant slope height shall be at intervals of approximately 20 feet unless otherwise directed by the Engineer.
Hardware cloth, loose graded stone behind weep holes, flashing, or other sealing material shall not be paid for directly but shall be subsidiary to the bid item "Riprap".
Unless specified elsewhere in the plans to be only reinforcing bars, the riprap reinforcing may be composed of reinforcing bars, Welded Wire Reinforcement (WWR), or any suitable combination of both types.
See Layout for limits of riprap.

(1) #5 bars shown are required even when synthetic fiber reinforcing option is selected.

(2) Reinforcing bars shall be #3 at 12" Spa c-c. Welded Wire Reinforcement (WWR) shall be 6X6-W2.9XW2.9. Combinations of WWR and reinforcing bars may be used if both are permitted. Lap splices shall be a minimum of 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars.

STATE OF TEXAS
PEDRO CARRASCO JR.
98580
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

FREESE AND NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET

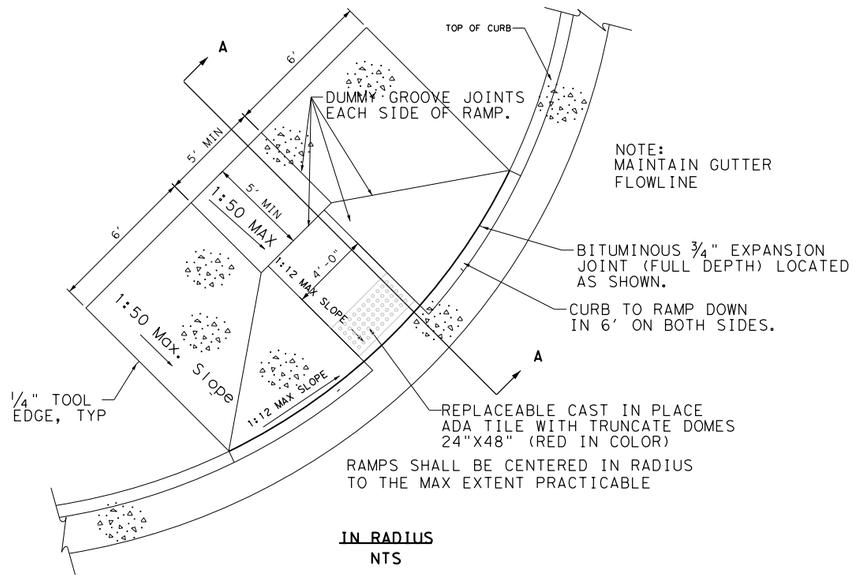
ROADWAY DETAILS

SHEET 2 OF 3

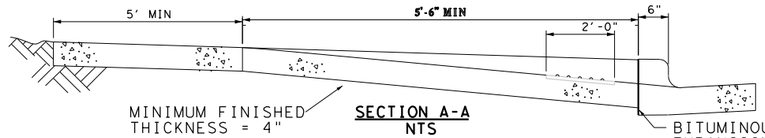
FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	112
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



IN RADIUS
NTS



SECTION A-A
NTS

TYPICAL ACCESSIBLE RAMP PLAN
NTS

**ITEM PAID FOR UNDER CSJ: 0905-06-105

GENERAL NOTES

ALL SLOPES ARE MAXIMUM ALLOWABLE. THE LEAST POSSIBLE SLOPE THAT WILL STILL DRAIN PROPERLY SHOULD BE USED. RAMP LENGTH OR GRADE OF APPROACH SIDEWALKS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

MAXIMUM ALLOWABLE CROSS SLOPE ON SIDEWALK AND RAMP SURFACES IS 2%.

ALL CONCRETE SURFACES SHALL RECEIVE A LIGHT BROOM FINISH UNLESS NOTED OTHERWISE IN THE PLANS.

RAMP TEXTURES MUST CONSIST OF TRUNCATED DOME SURFACES. TEXTURES ARE REQUIRED TO BE DETECTABLE UNDERFOOT. SURFACES THAT WOULD ALLOW WATER TO ACCUMULATE ARE PROHIBITED.

ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, LIGHT REFLECTIVE VALUE AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) PREPARED AND ADMINISTERED BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR).

8/9/2023

TEXAS FIRM F-928
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TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

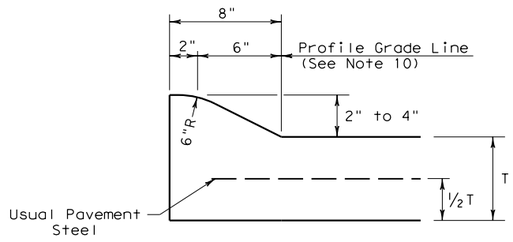
UPLAND AVENUE
66TH STREET TO 82ND STREET

ROADWAY DETAILS

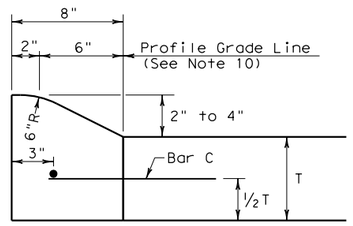
SHEET 3 OF 3

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	113
CONT.	SECT.	JOB	
0905	06	095, ETC.	

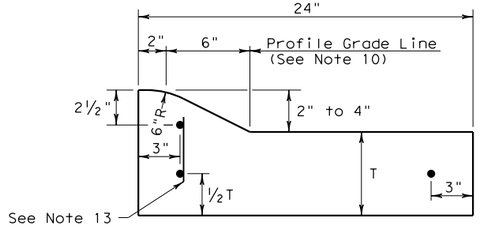
DATE:
FILE:



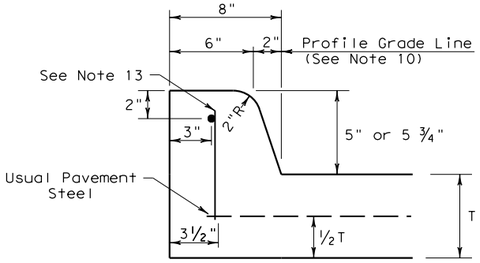
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



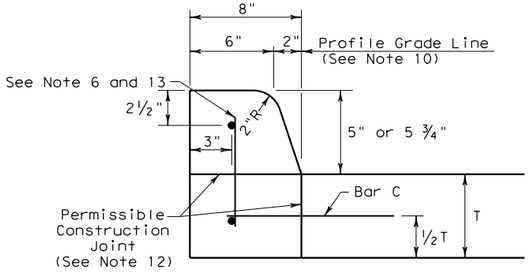
TYPE I CURB
2" - 4" HEIGHT



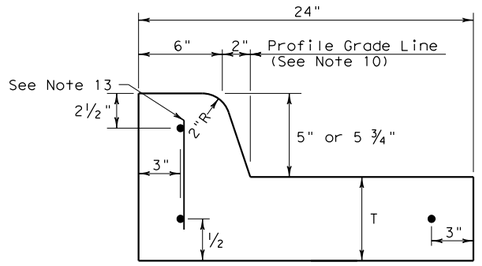
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



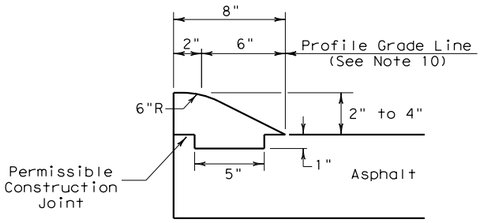
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



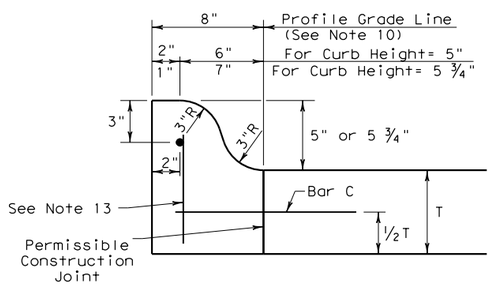
TYPE II CURB
5" - 5 ¾" HEIGHT



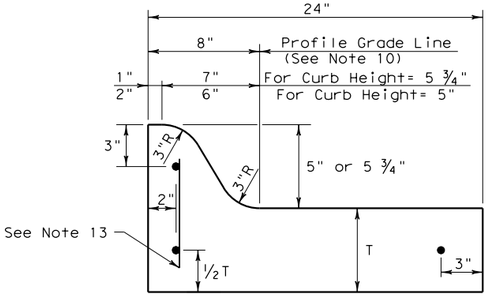
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



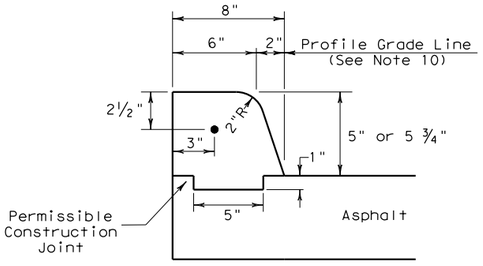
TYPE III CURB (KEYED)
2" - 4" HEIGHT



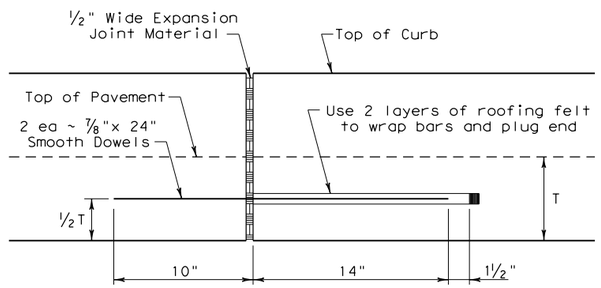
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

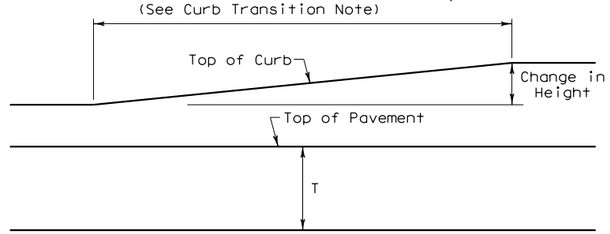


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

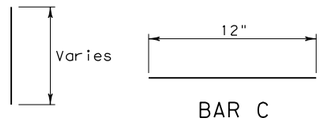
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



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 fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.



BAR B

BAR C

Texas Department of Transportation

Design Division Standard

CONCRETE CURB AND CURB AND GUTTER

CCCG-22

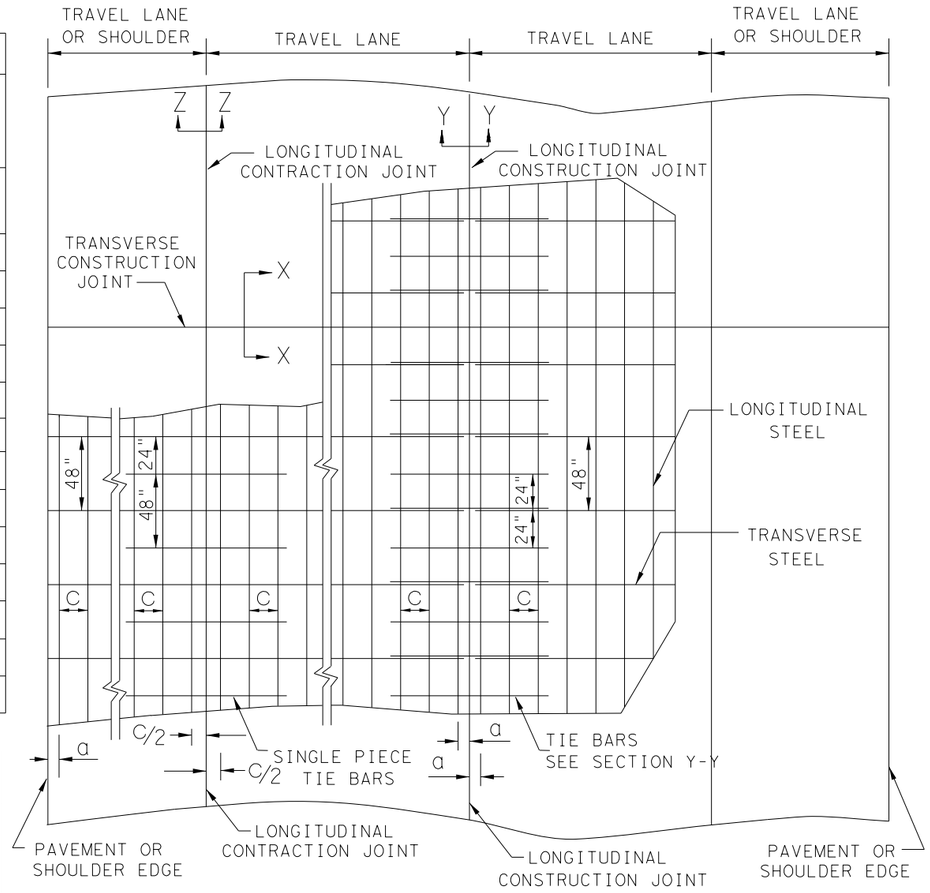
FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: CS	CK: KM
© TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		114

GENERAL NOTES

TABLE NO. 1 LONGITUDINAL STEEL				
SLAB THICKNESS AND BAR SIZE		LONGITUDINAL STEEL BARS	FIRST SPACING AT EDGE OR JOINT	LONG. STEEL VERTICAL POSITION FROM BOTTOM OF PAVEMENT
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING a (IN.)	T1 (IN.)
7.0	#5	6.5	3 TO 4	3.5
7.5	#5	6.0	3 TO 4	3.75
8.0	#6	9.0	3 TO 4	4.0
8.5	#6	8.5	3 TO 4	4.25
9.0	#6	8.0	3 TO 4	4.5
9.5	#6	7.5	3 TO 4	4.75
10.0	#6	7.0	3 TO 4	5.0
10.5	#6	6.75	3 TO 4	5.5
11.0	#6	6.5	3 TO 4	6.0
11.5	#6	6.25	3 TO 4	6.5
12.0	#6	6.0	3 TO 4	7.0
12.5	#6	5.75	3 TO 4	7.5
13.0	#6	5.5	3 TO 4	8.0

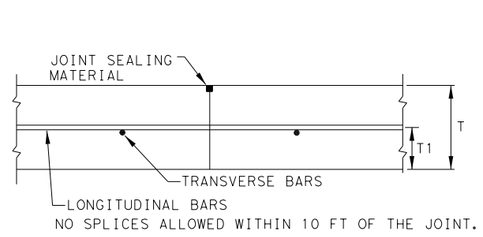
TABLE NO. 2 TRANSVERSE STEEL AND TIE BARS						
SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONSTRUCTION JOINT (SECTION Y-Y)	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
7.0 - 7.5	#5*	48	#5*	48	#5*	24
8.0 - 13.0	#5*	48	#6	48	#6	24

*CONTRACTOR MAY USE #6 REINFORCING STEEL INSTEAD OF #5 REINFORCING STEEL OR COMBINATION OF EACH SIZE



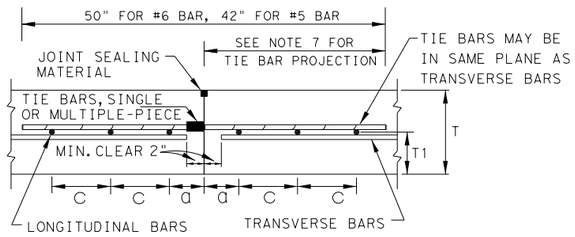
TYPICAL PAVEMENT LAYOUT

PLAN VIEW (NOT TO SCALE)



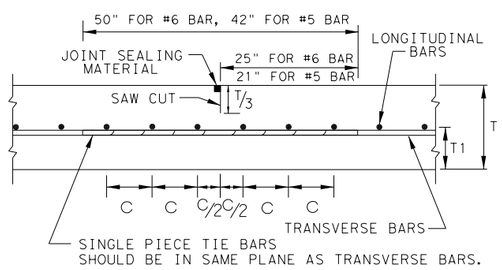
TRANSVERSE CONSTRUCTION JOINT

SECTION X - X



LONGITUDINAL CONSTRUCTION JOINT

SECTION Y - Y



LONGITUDINAL CONTRACTION JOINT

SECTION Z - Z

SHEET 1 OF 2

Texas Department of Transportation

Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

CRCP(1)-23

FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES	CK:
© TxDOT: APRIL 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095, ETC.	CS
APRIL 2023: REVISED LONG. STEEL VERTICAL LOCATION. REMOVED ADDITIONAL TIEBAR AT TRANSVERSE CONSTRUCTION JOINTS	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		115

DATE: 8/10/2023 10:30:38 AM
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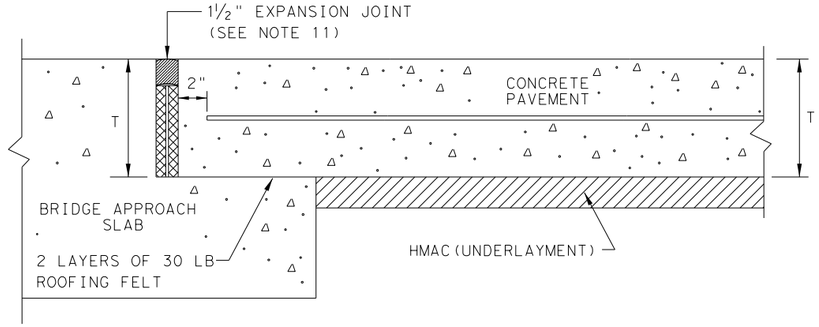
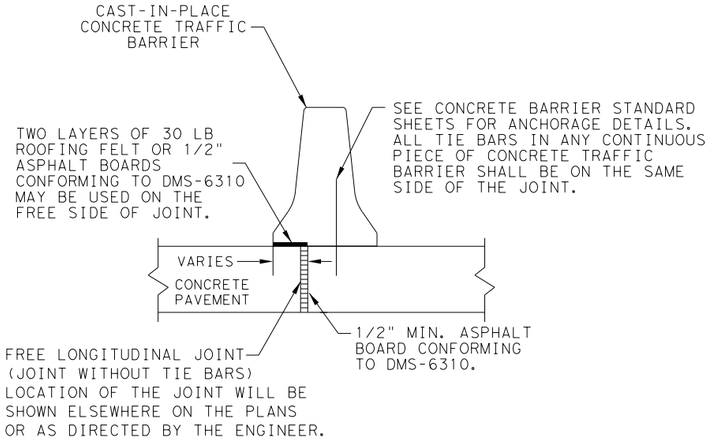
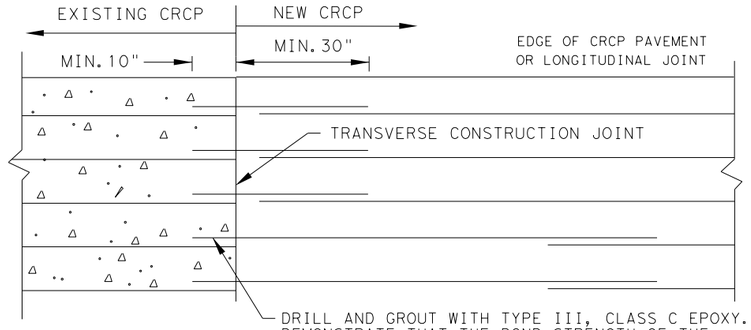


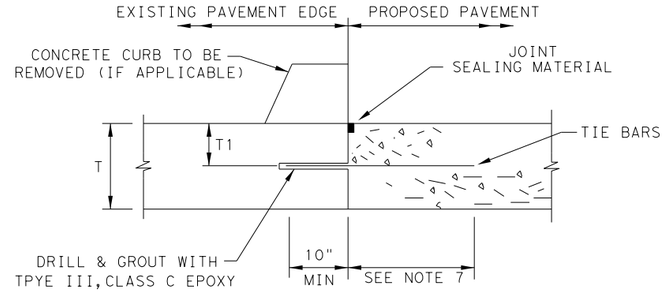
TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH



CENTERLINE FREE LONGITUDINAL JOINT DETAIL

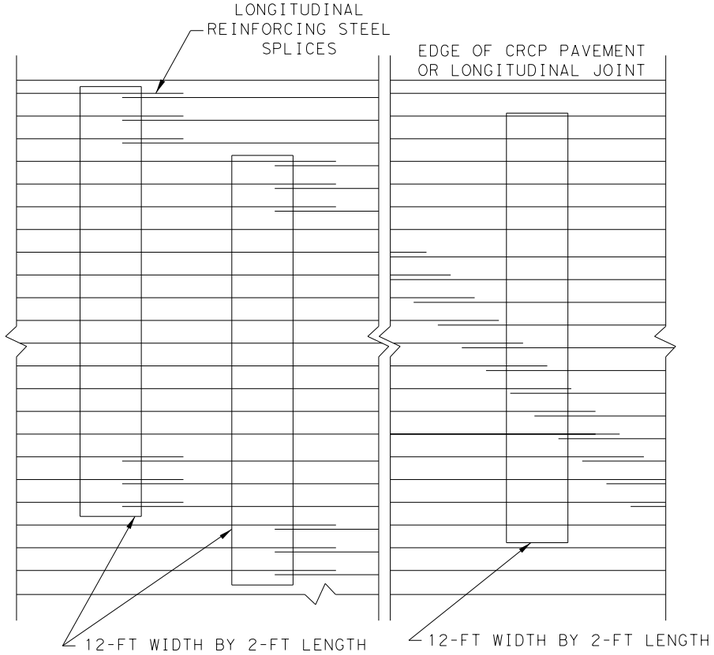


OPTION A: DRILL AND EPOXY
PLAN VIEW (NOT TO SCALE)



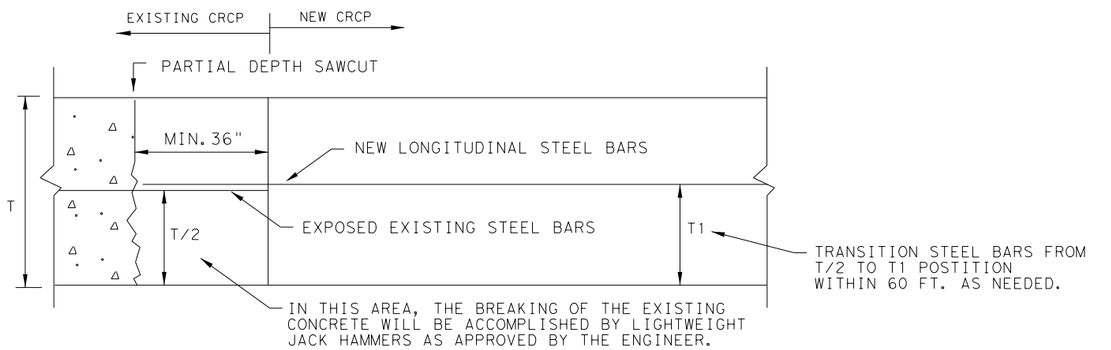
1. BEFORE CONCRETE PLACEMENT, PERFORM PULL-OUT TESTS ON EPOXY-GROUTED TIE BARS IN ACCORDANCE WITH ITEM 360.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER PAVEMENTS, USE #5 TIE BARS FOR LESS THAN 8" THICK PAVEMENTS.

LONGITUDINAL WIDENING JOINT DETAIL



STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT. ANY OTHER LAP CONFIGURATION MEETING THIS REQUIREMENT WILL BE ALLOWED.

EXAMPLES OF LAP CONFIGURATION
PLAN VIEW (NOT TO SCALE)



OPTION B: BREAKBACK AND LAP

TRANSVERSE TIE JOINT DETAIL
NEW CRCP TO EXISTING CRCP

SHEET 2 OF 2

Texas Department of Transportation — Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

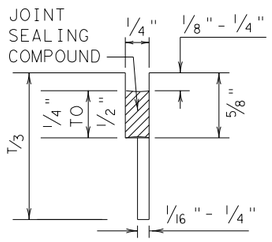
ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

CRCP(1)-23

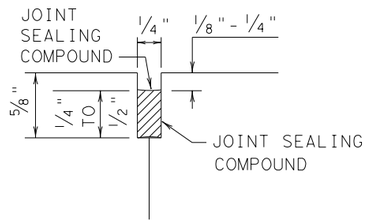
FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES	CK:
©TxDOT: APRIL 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
APRIL 2023: MODIFIED EXPANSION JOINT DETAIL AT BRIDGE APPROACH SLAB	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		116

DATE:
FILE:

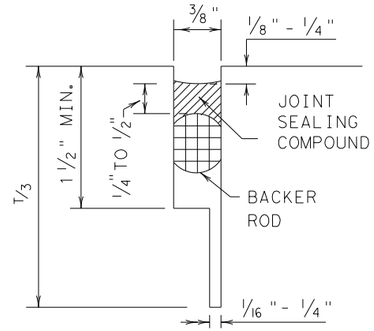
METHOD B: JOINT SEALING COMPOUND



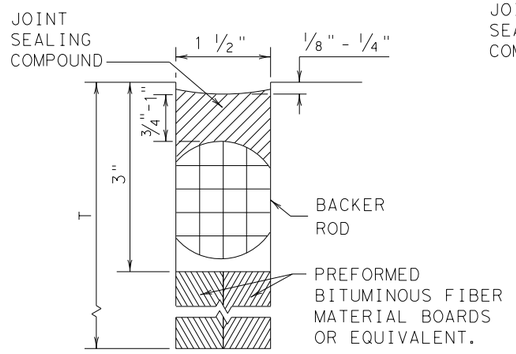
LONGITUDINAL SAWED CONTRACTION JOINT



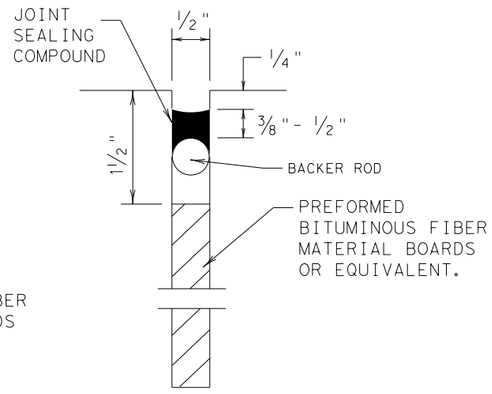
LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT

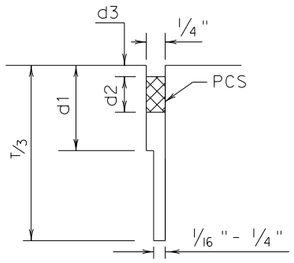


TRANSVERSE FORMED EXPANSION JOINT

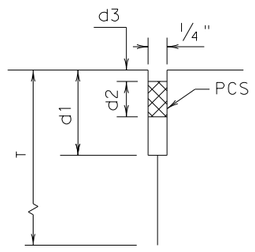


FORMED ISOLATION JOINT

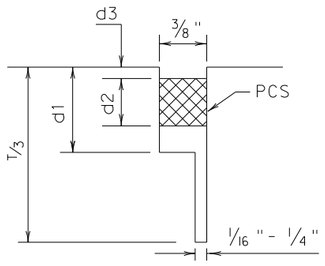
METHOD A: PREFORMED COMPRESSION SEALS (PCS)(DMS-6310 CLASS 6)



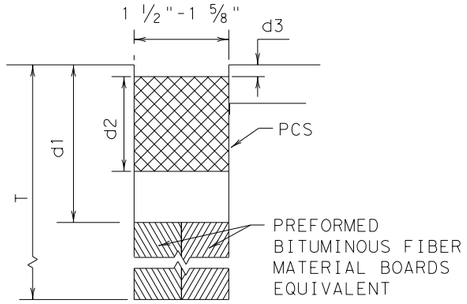
LONGITUDINAL SAWED CONTRACTION JOINT



LONGITUDINAL CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT



TRANSVERSE FORMED EXPANSION JOINT

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, EITHER METHOD "A" OR METHOD "B" MAY BE USED.
2. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. THE JOINT RESERVOIR FOR SEALANT OR PCS SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION JOINTS AND THE SAWED JOINTS.
4. DIMENSIONS d1, d2, AND d3 SHOWN IN METHOD A SHALL BE IN ACCORDANCE WITH THE PREFORMED COMPRESSION SEAL MANUFACTURER'S RECOMMENDATION.
5. REFER TO DMS-6310 "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
6. FOR SAWED LONGITUDINAL JOINT, LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT, USE JOINT SEALANT CLASS 5 OR 8 UNLESS OTHERWISE SHOWN ON THE PLAN OR APPROVED.
7. FOR TRANSVERSE SAWED CONTRACTION, TRANSVERSE FORMED EXPANSION JOINT, AND ISOLATION JOINT USE JOINT SEALANT CLASS 5 OR 8 AT NEW JOINTS. USE JOINT SEALANT CLASS 4,5,7,OR 8 FOR MAINTAINING EXISTING JOINTS.
8. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 "CLEANING AND SEALING JOINTS" OR ITEM 713 "CLEANING AND SEALING JOINTS AND CRACKS (CONCRETE PAVEMENT)".
9. ISOLATION JOINTS ACCOMMODATE HORIZONTAL AND VERTICAL MOVEMENTS THAT OCCUR BETWEEN A PAVEMENT AND A STRUCTURE. ISOLATION JOINTS MAY BE USED FOR BRIDGE ABUTMENTS, INTERSECTIONS, CURB AND GUTTER, OLD AND NEW PAVEMENTS, OR AROUND DRAINAGE INLETS, MANHOLES, FOOTINGS AND LIGHTING STRUCTURES.

Texas Department of Transportation

Design Division Standard

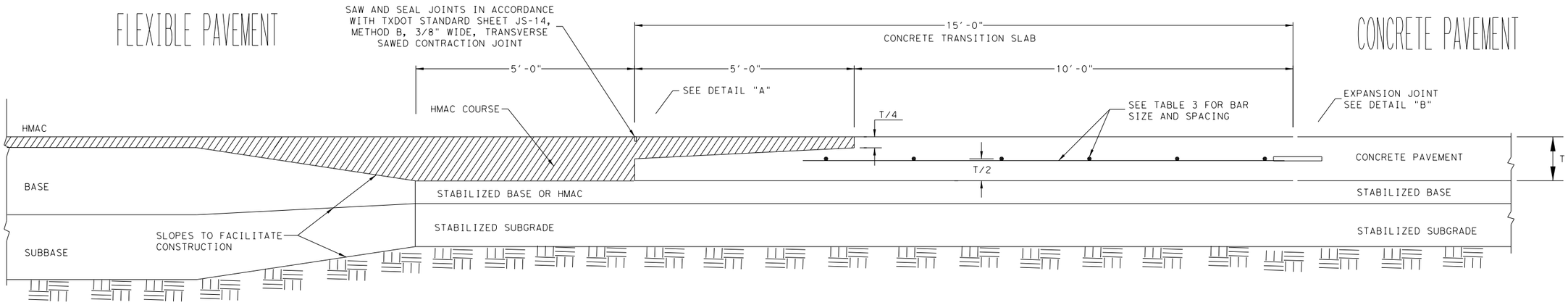
CONCRETE PAVING DETAILS

JOINT SEALS

JS-14

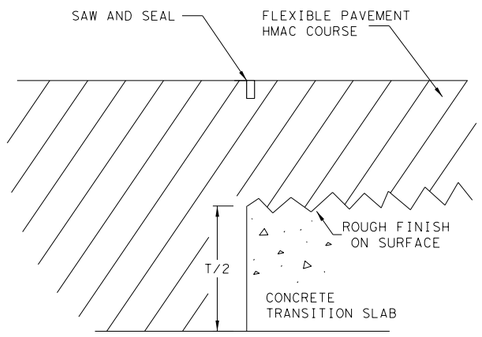
FILE: js14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		117

DATE: 8/14/2023
FILE: c:\pw\km1\dms25236\transitslab20(MOD).dgn

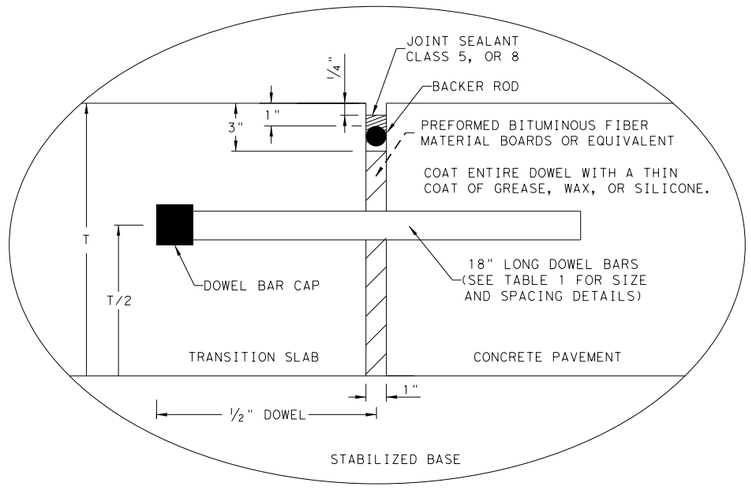


TYPICAL JUNCTION OF CONCRETE PAVEMENT WITH FLEXIBLE PAVEMENT

(NOT TO SCALE)



DETAIL "A"



DETAIL "B"

GENERAL NOTES

1. FOR FURTHER INFORMATION REGARDING THE PLACEMENT OF CONCRETE AND LOAD TRANSFER DEVICES REFER TO THE GOVERNING SPECIFICATIONS FOR "CONCRETE PAVEMENT" AND "REINFORCING STEEL."
2. DETAILS FOR PAVEMENT WIDTH AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS.
3. MATCH THE LONGITUDINAL JOINTS OF THE CONCRETE TRANSITION SLAB WITH ADJOINING CONCRETE PAVEMENT. PROVIDE EQUIVALENT TIEBARS OR TRANSVERSE BARS AT THESE LONGITUDINAL JOINTS, SEE TABLE NO. 2.
4. REFER TO DMS-6310, "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
5. TRANSITION SLABS WILL BE PAID UNDER ITEM 360, "CONCRETE PAVEMENTS."
6. CURE TRANSITION SLAB WITH SS-1 EMULSION.

STATE OF TEXAS
PEDRO CARRASCO JR.
68380
LICENSED PROFESSIONAL ENGINEER
8/9/2023

TABLE NO.1 DOWELS (SMOOTH BARS)

SLAB THICKNESS T (IN.)	BAR DIA. AND LENGTH	SPACING (IN.)
7 TO 7.5	1" X 18"	12
8 TO 10	1 1/4" X 18"	12
10 TO 13	1 1/2" X 18"	12

TABLE NO.2 TIE BARS (DEFORMED BARS)

SLAB THICKNESS T (IN.)	BAR SIZE	SPACING (IN.)
7 TO 7.5	#5	24
8 TO 13	#6	24

TABLE NO.3 TRANSITION SLAB STEEL (DEFORMED BARS)

SLAB THICKNESS T (IN.)	BAR SIZE	SPACING (IN.) TRANSVERSE DIRECTION	SPACING (IN.) LONGITUDINAL DIRECTION
7 TO 7.5	#5	24	12
8 TO 13	#6	24	12

ADJUST SPACING OF LONGITUDINAL BARS AS NEEDED TO ACCOMDATE DOWEL BAR SPACING.

Texas Department of Transportation

Design Division Standard

CONCRETE PAVEMENT DETAILS TRANSITION SLAB

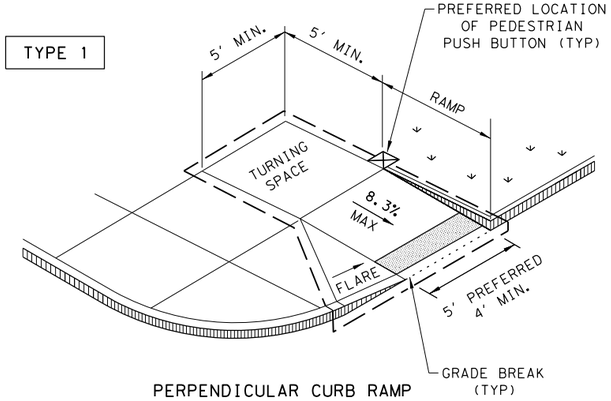
T-7 to 13 INCHES

TRANS-20(MOD)

FILE: transitslab20.dgn	DN: TxDOT	DN: TxDOT	DW: AN	CK: KM
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	05	095	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		118

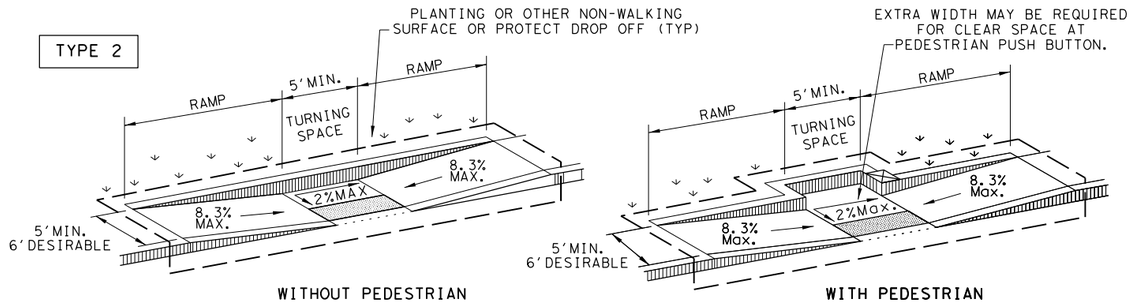
DATE: 8/9/2023
FILE: c:\pw\km1\dms25236\ped18.dgn

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

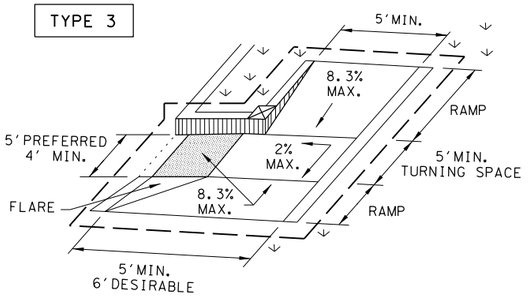


WITHOUT PEDESTRIAN PUSH BUTTON

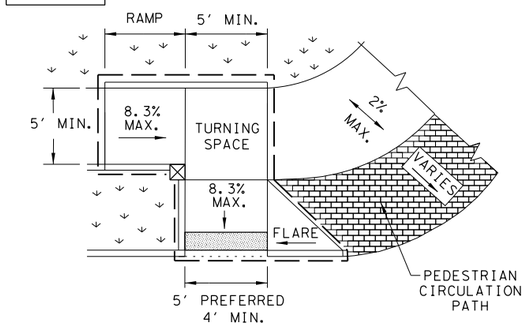
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

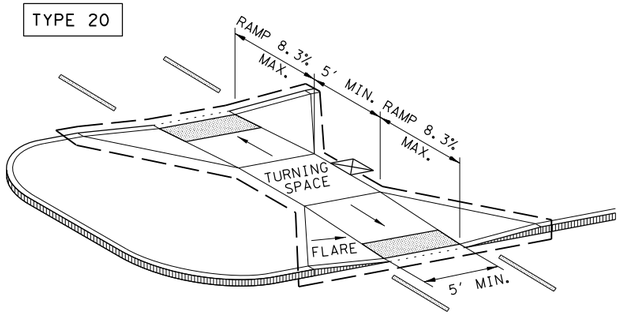


TYPE 6



COMBINATION CURB RAMPS

TYPE 20

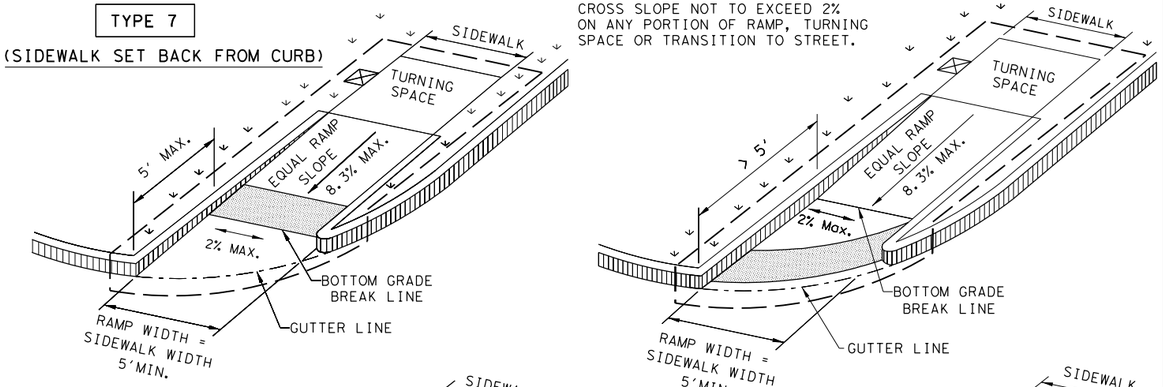


CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

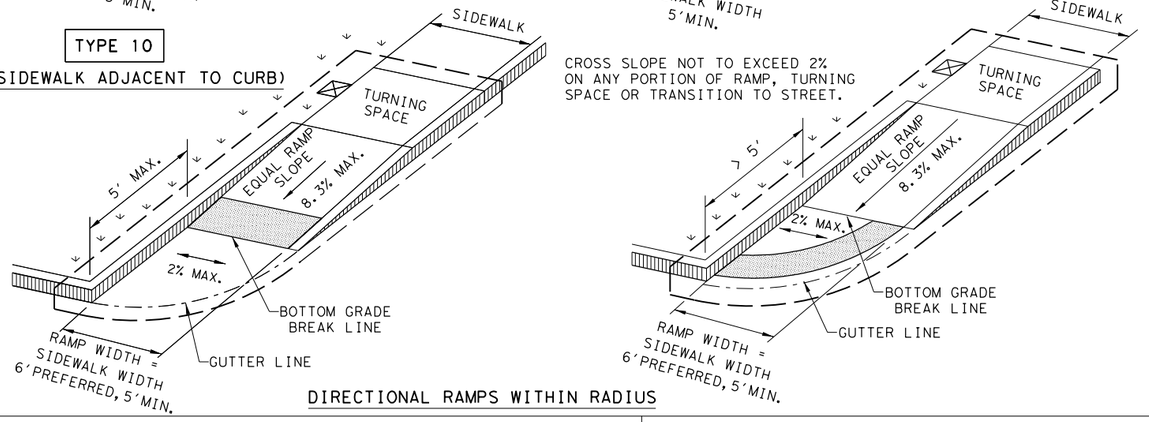
CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



TYPE 10

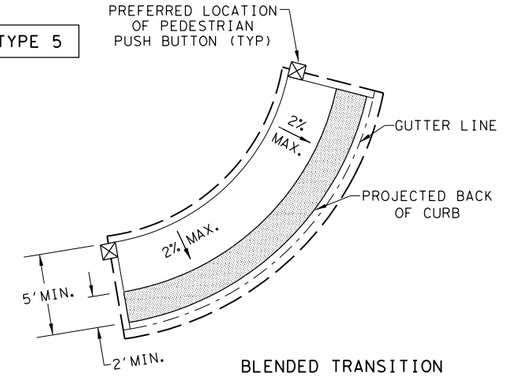
(SIDEWALK ADJACENT TO CURB)

CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

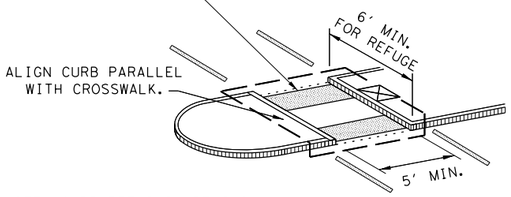
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

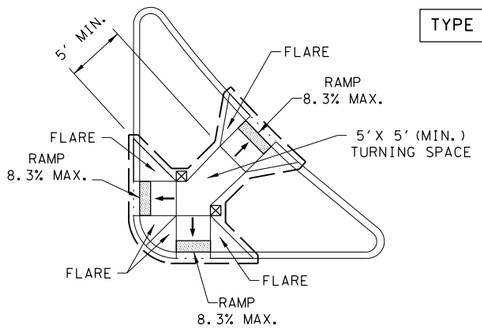
TYPE 21

INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.



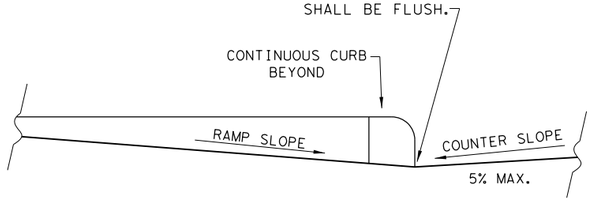
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095, ETC.	CS
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		119

DATE: 8/9/2023
FILE: c:\pw\kh1\dms25236\ped18.dgn

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

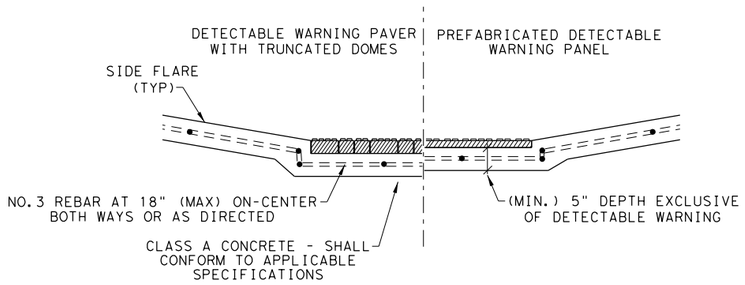
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

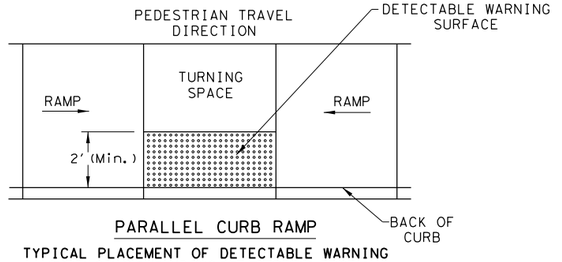
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

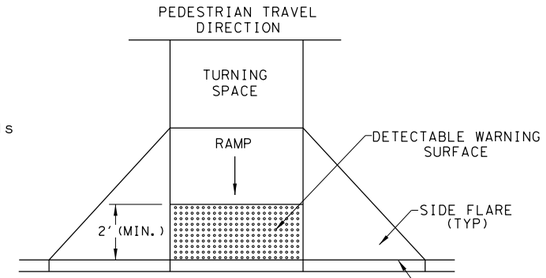


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

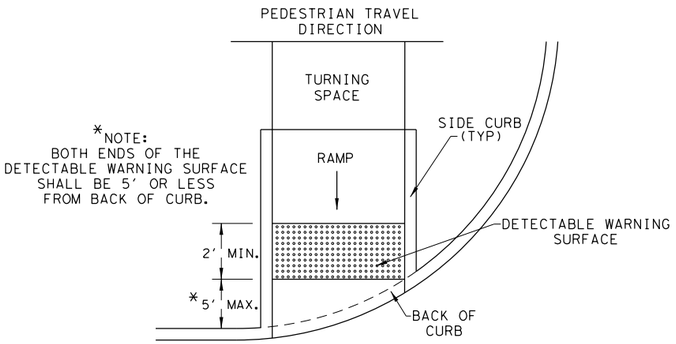
DETECTABLE WARNING SURFACE DETAILS



PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

Texas Department of Transportation | Design Division Standard

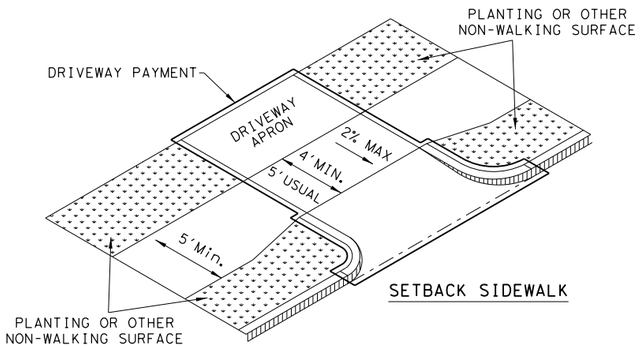
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

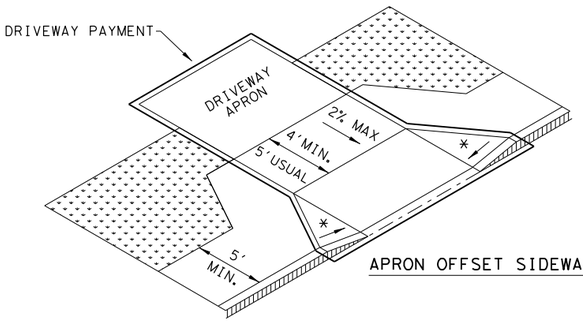
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0905	06	095, ETC.		CS
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	LBB	LUBBOCK			120

DATE: 8/9/2023
FILE: c:\pw\kh1\dms25236\ped18.dgn

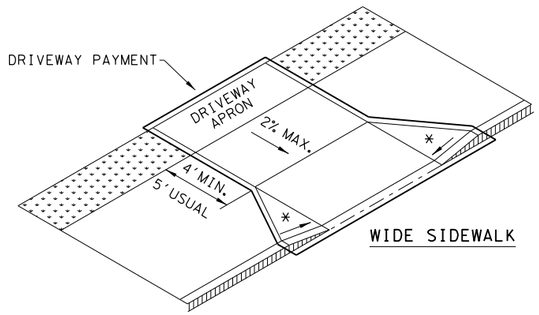
SIDEWALK TREATMENT AT DRIVEWAYS



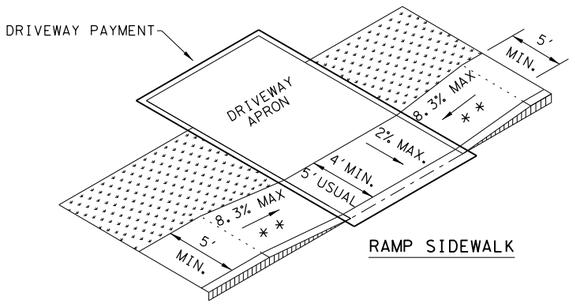
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

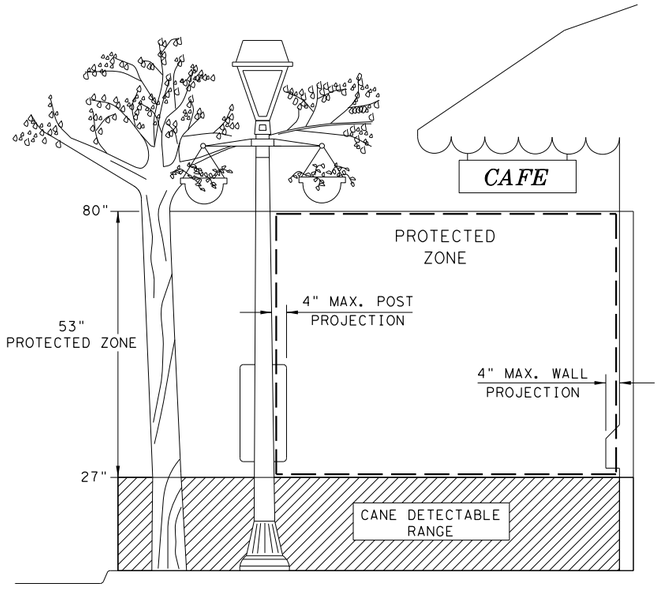


RAMP SIDEWALK

NOTES:

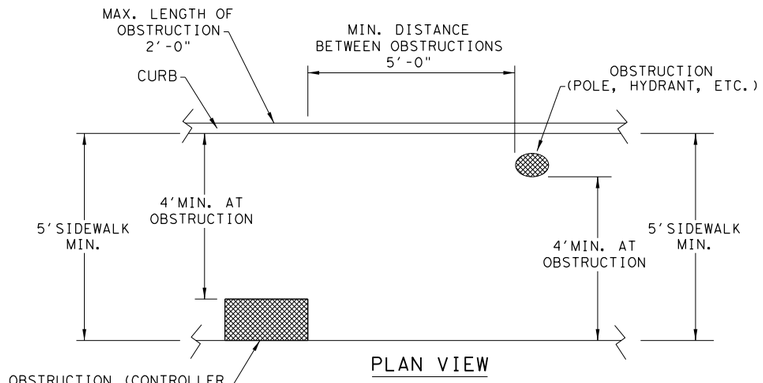
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



PROTECTED ZONE

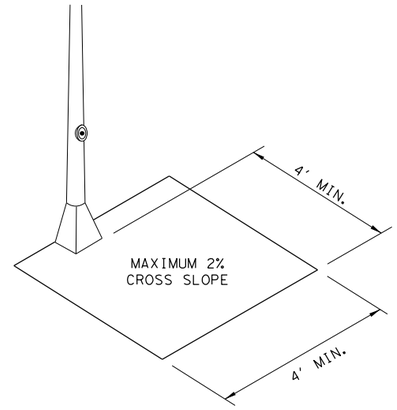
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



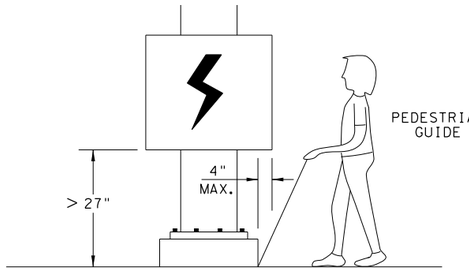
PLAN VIEW

PLACEMENT OF STREET FIXTURES

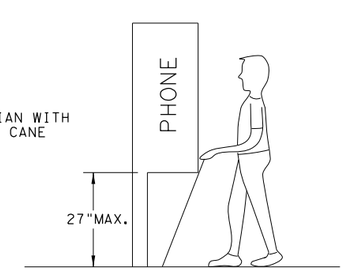
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

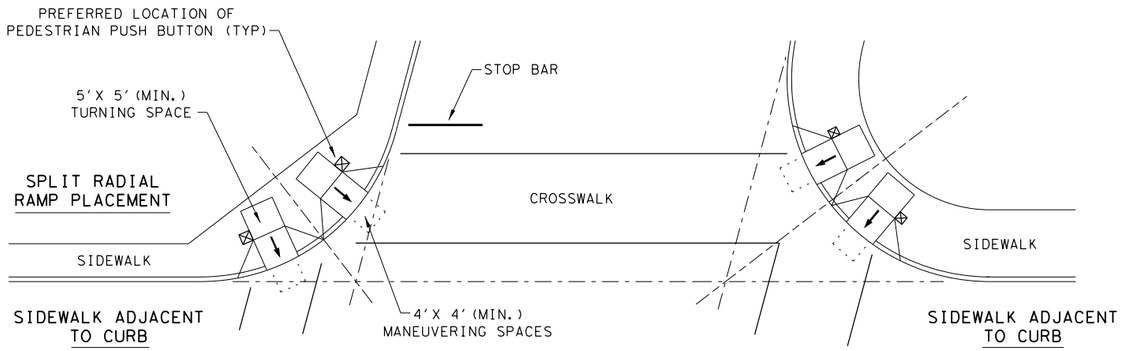
PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095, ETC.	CS
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		121

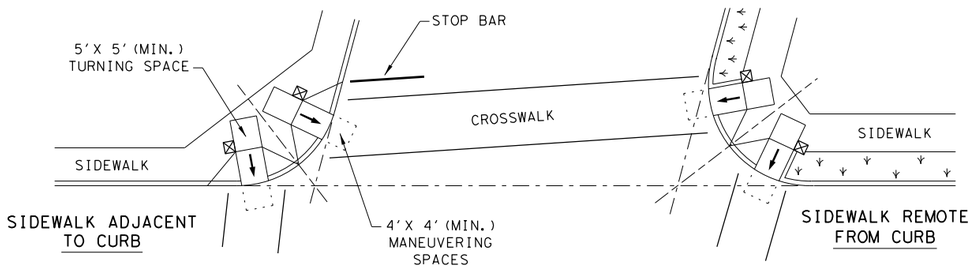
DATE: 8/9/2023
FILE: c:\pw\kn1\dms25236\ped18.dgn

TYPICAL CROSSING LAYOUTS

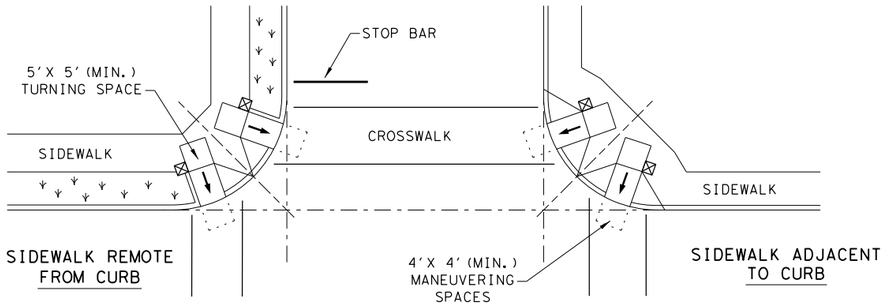
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



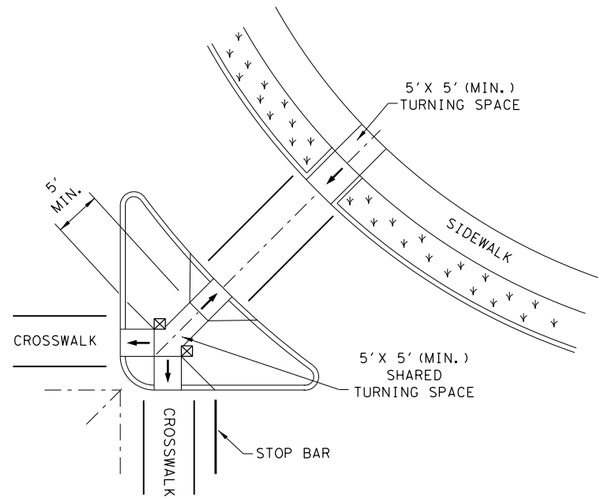
SKEWED INTERSECTION WITH "LARGE" RADIUS



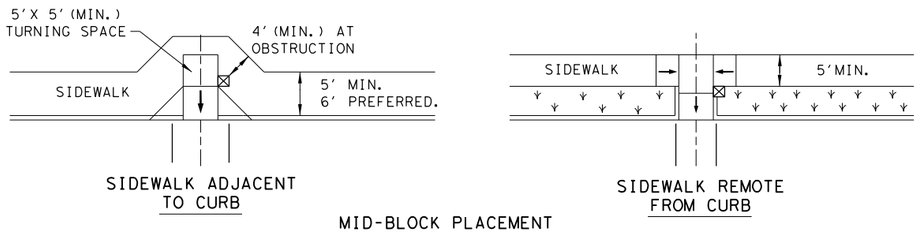
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ☒

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

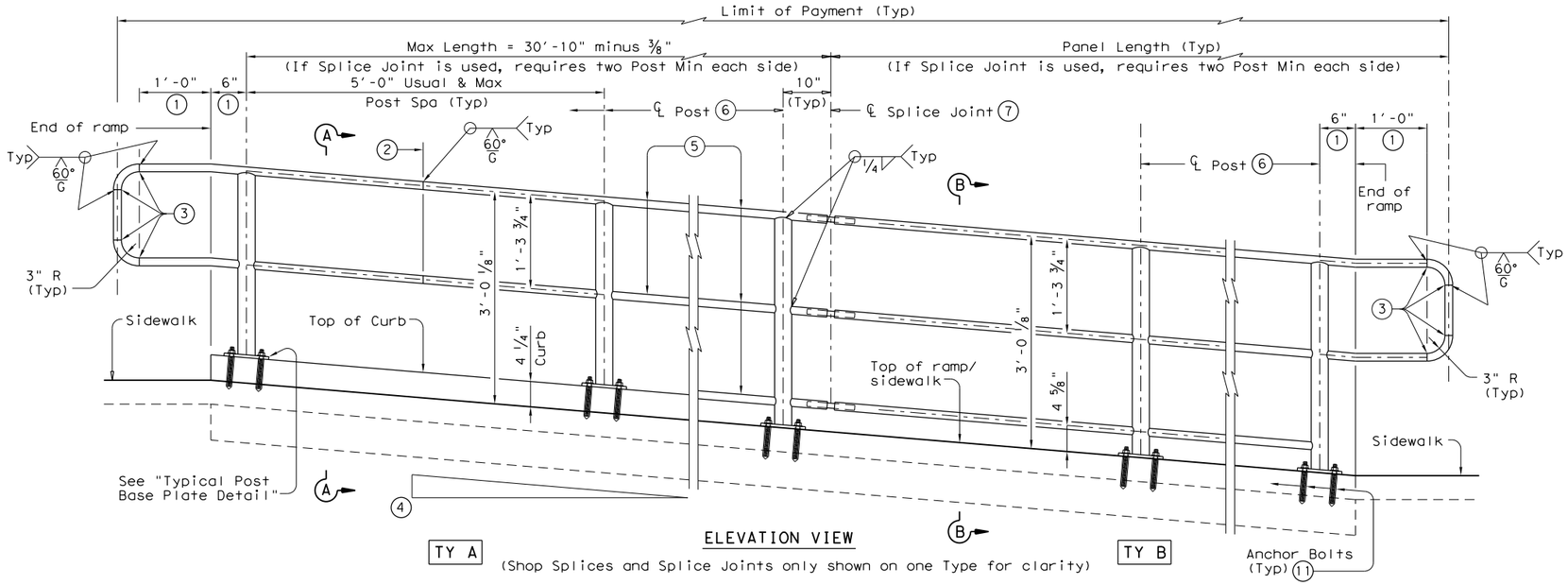
SHEET 4 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

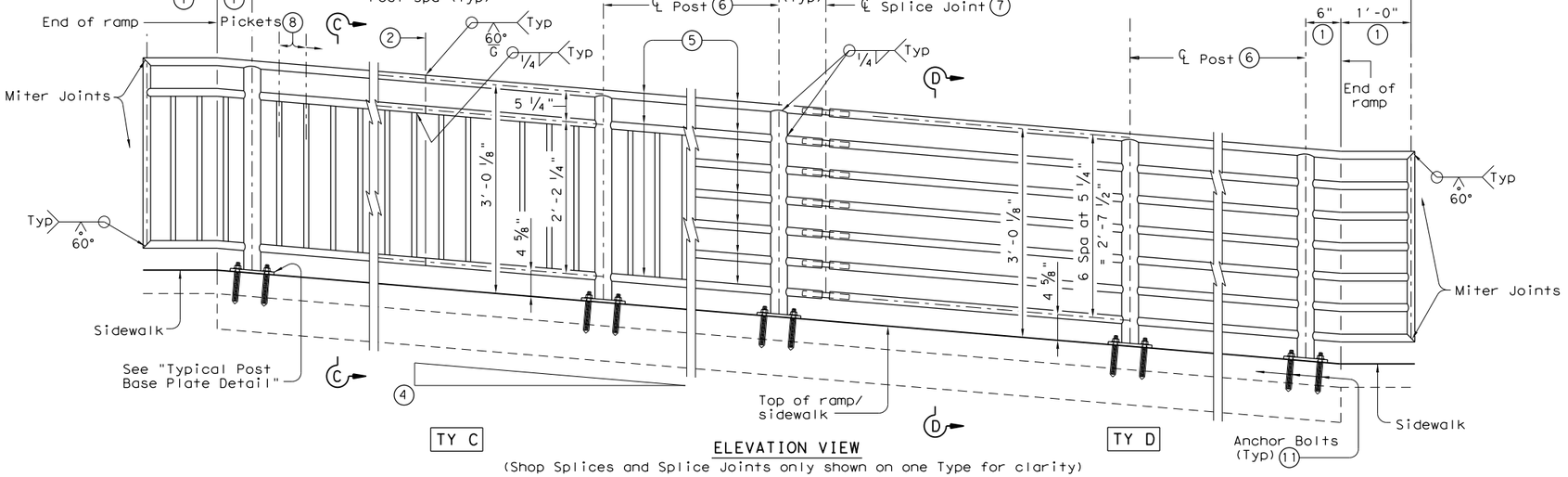
PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0905	06	095, ETC.		CS
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY			SHEET NO.
	LBB	LUBBOCK			122



ELEVATION VIEW

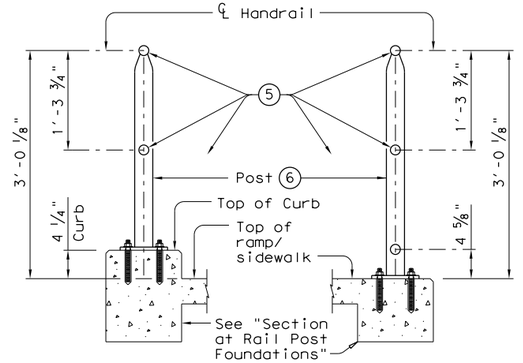
(Shop Splices and Splice Joints only shown on one Type for clarity)



ELEVATION VIEW

(Shop Splices and Splice Joints only shown on one Type for clarity)

RECOMMENDED USAGE (9)(10)	
Dropoff Height/ Condition	Recommended Rail Options
< 30" dropoff	TY A, TY B, TY C, or TY D
≥ 30" dropoff, or along Bike Path	TY E or TY F

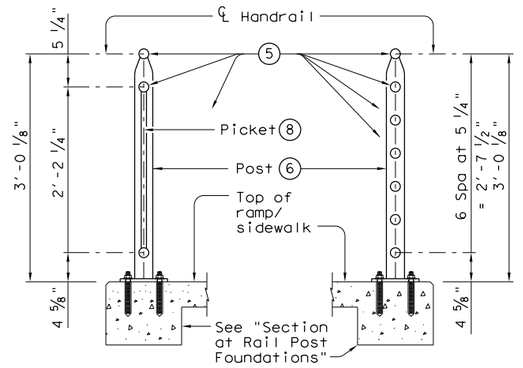


SECTION A-A

(Showing Handrail TY A)

SECTION B-B

(Showing Handrail TY B)



SECTION C-C

(Showing Handrail TY C)

SECTION D-D

(Showing Handrail TY D)

1. Parallel to ground.
2. One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
3. Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
4. See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
5. 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.
6. 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
7. See "Handrail Fabrication Details" for Splice Joints.
8. ℄ ⅝" Dia. Round Bar equal spacing at 4 ½" Max. Plumb all pickets.
9. When needed for accessibility (grade > 5 percent) or as needed for pedestrian safety.
10. Not to be used on bridges.
11. See "General Notes" for anchor bolt information.

DATE: 8/9/2023
FILE: c:\pw\kmi\dms25236\prd13.dgn

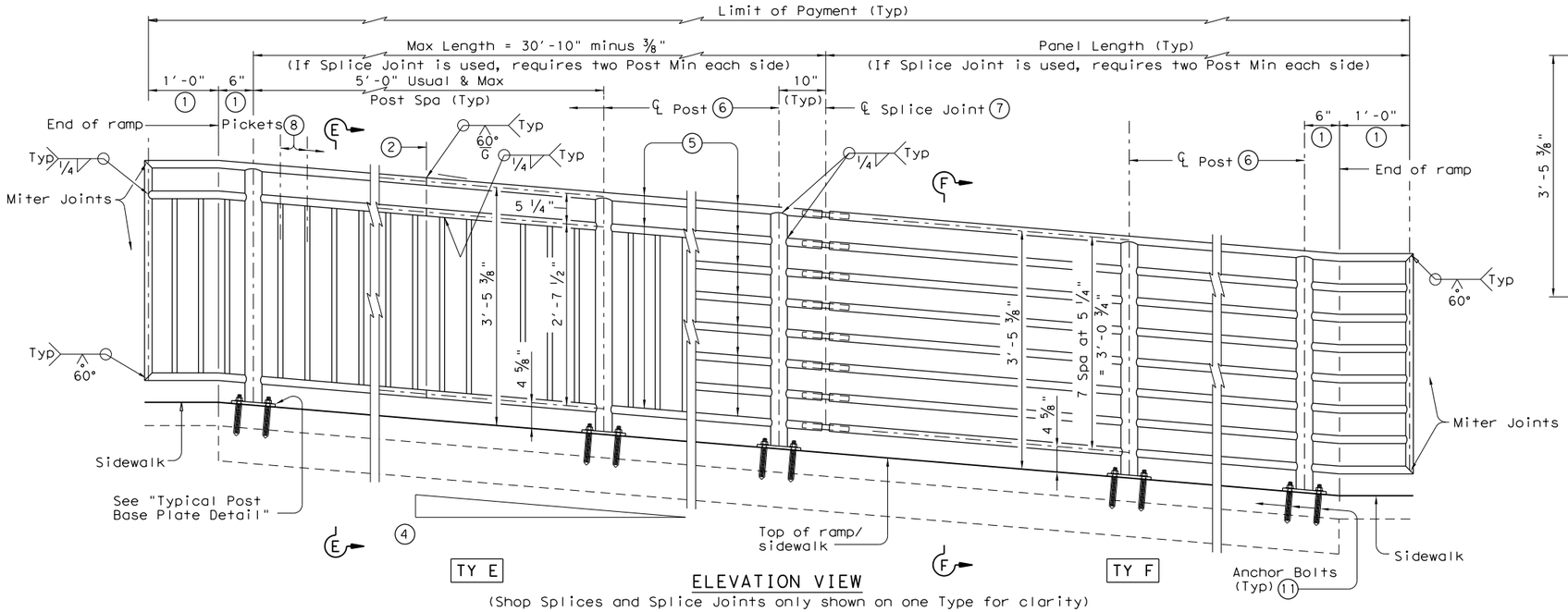
Texas Department of Transportation

Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

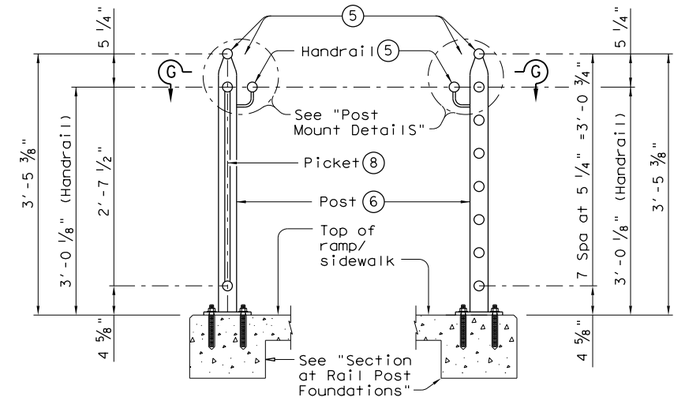
PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT Decmeber 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED MAY, 2013 (VP)	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		123



ELEVATION VIEW

(Shop Splices and Splice Joints only shown on one Type for clarity)

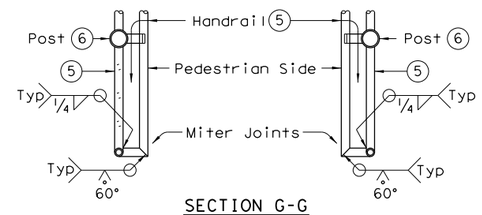


SECTION E-E

(Showing Handrail TY E)

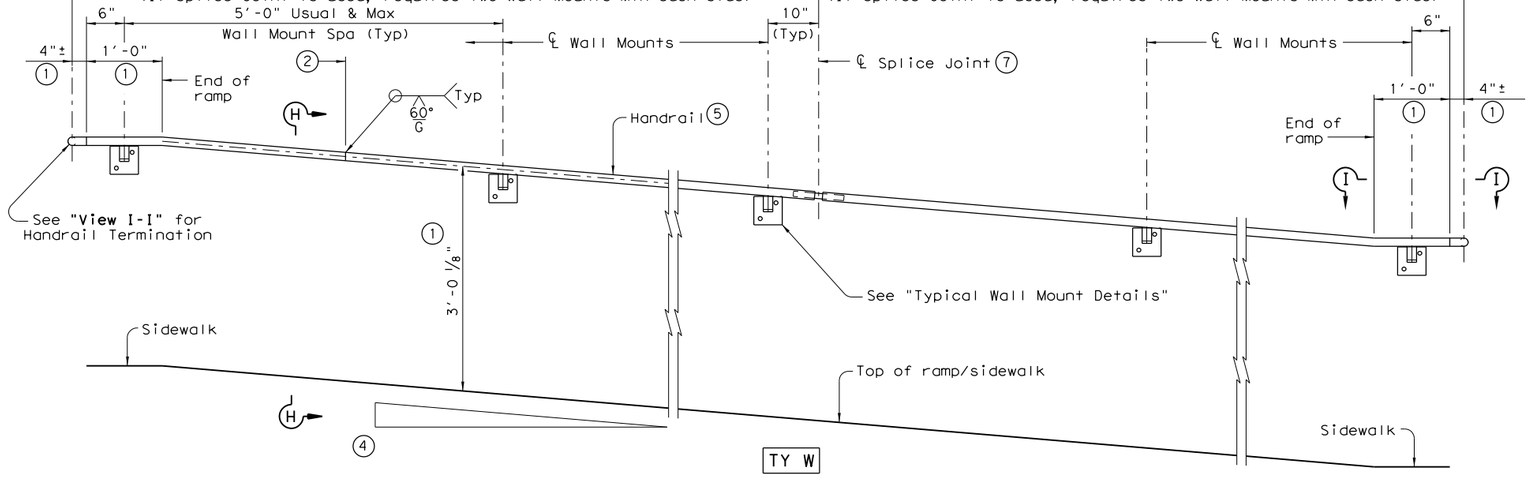
SECTION F-F

(Showing Handrail TY F)

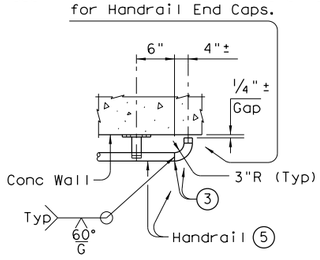


SECTION G-G

(Showing Handrail Termination)

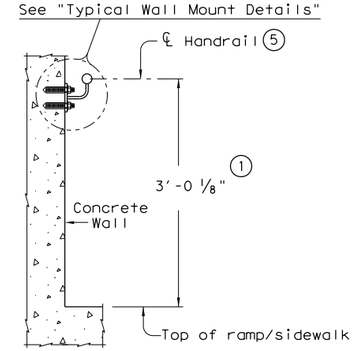


ELEVATION VIEW



VIEW I-I

(Showing Handrail Termination)



SECTION H-H

(Showing Handrail TY W)

1. Parallel to ground.
2. One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
3. Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
4. See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
5. 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.
6. 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
7. See "Handrail Fabrication Details" for Splice Joints.
8. ℄ 5/8" Dia. Round Bar equal spacing at 4 ½" Max. Plumb all pickets.
11. See "General Notes" for anchor bolt information.

DATE: 8/9/2023
FILE: c:\pw\kh1\dms25236\prd13.dgn

Texas Department of Transportation

Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED MAY, 2013 (VP)	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		124

DATE: 8/9/2023
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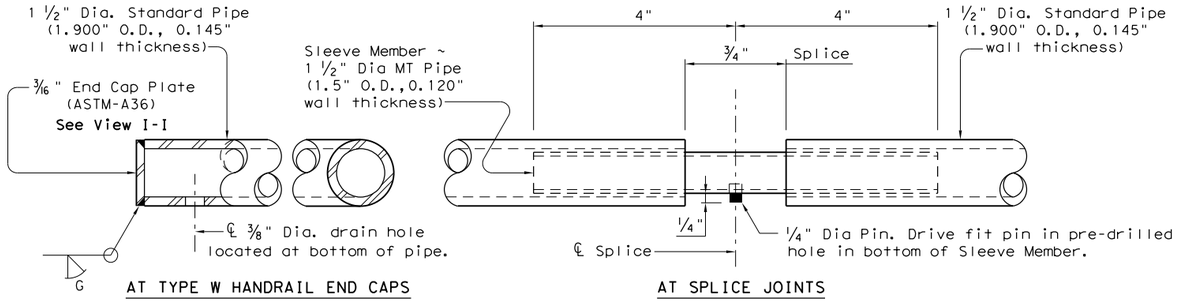
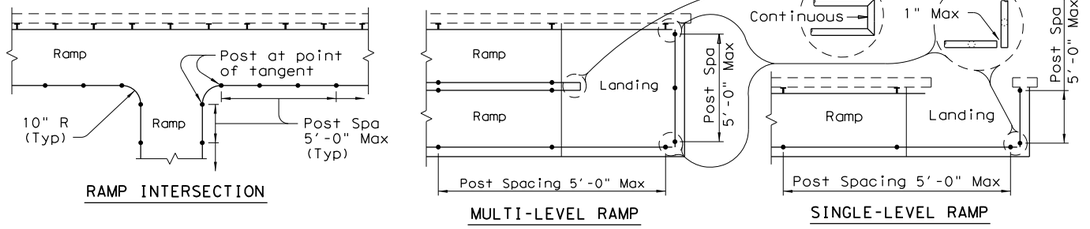
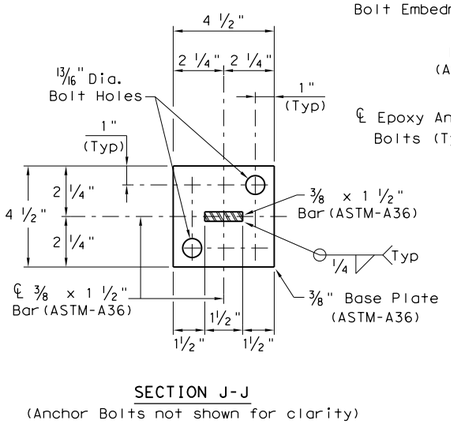
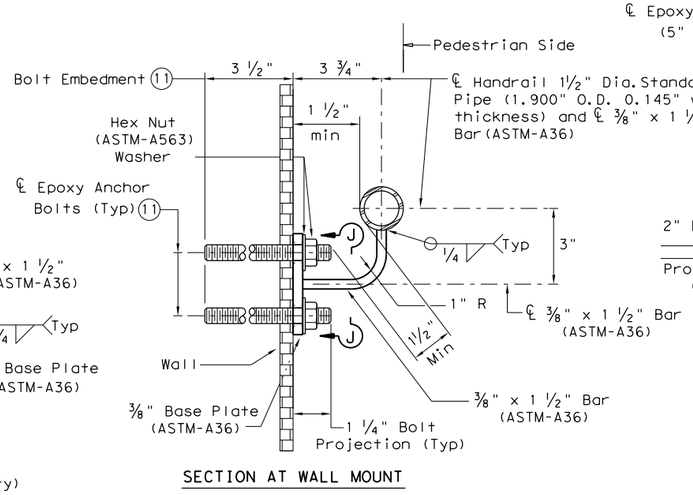


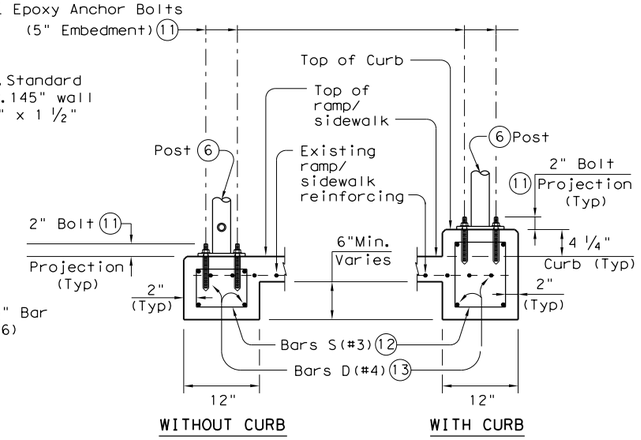
HANDRAIL FABRICATION DETAILS



PLAN SHOWING RAIL AT RAMP CONDITIONS







SECTION AT RAIL POST FOUNDATIONS

TYPICAL WALL MOUNT DETAILS

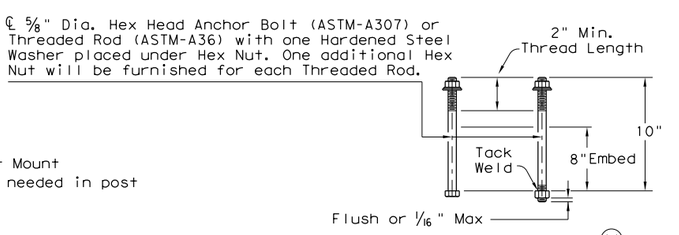
(5) 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp/sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.

(6) 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). Plumb all posts. See "Post Mount Detail" for crimping and trimming post to fit the diamenter of top rail. Provide holes as needed in post for galvanizing drainage and venting.

(11) See "General Notes" for anchor bolt information.

(12) Bars S(#3) spaced at 12" Max (Spaced 3" from outside edge of overall length of Ramp/Sidewalk).

(13) Provide 1 ½" end cover to Bars D(#4) from outside edge of overall length of Ramp/Sidewalk.



GENERAL NOTES

Designed according to ADAAG, Texas Accessibility Standards, Uniform Building Code, and AASHTO LRFD Specifications.

Handrail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Pipe will conform to ASTM-A53 Grade B or A500 Grade B. Steel plates and steel bars will conform to ASTM-A36. Mechanical tubing (MT) will conform to ASTM A513 Grade 1015 or higher. Galvanize all steel components except reinforcing steel unless noted otherwise.

Concrete for foundations will be in accordance with Item 531 "Sidewalks". All reinforcing steel must be Grade 60. Bar laps, where required, will be as follows: Uncoated ~ #4 = 1'-5" Epoxy coated ~ #4 = 2'-1"

When the plans require painted steel, follow the requirements for painting galvanized steel in Item 446, "Cleaning and Painting Steel". Sleeve Members will receive galvanization and only get field painted after installation unless directed otherwise by Engineer.

Epoxy Anchor bolts for wall mount and post base plate will be 5/8" Dia. ASTM A36 threaded rods with one hex nut and one hardened steel washer at each bolt. 5/8" Dia. threaded rod embedment depth for wall mounts is 3 ½" and embedment depth for post base plate is 5".

Embed threaded rods into concrete with a Type III (Class C) epoxy meeting the requirements of DMS-6100, "Epoxies and Adhesives". Mix and dispense adhesive with the manufacturer's static mixing nozzle/dual cartridge system. Core drill holes (percussion drilling not permitted).

At the contractor's option the post base plate anchor bolts may be cast with the Ramp/Sidewalk (See Cast-in-Place Anchor Bolt Options).

Optional cast-in-place anchor bolts will 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. Embedment depth of cast-in-place bolt will be 8" for post base plate.

Handrails and any wall or other surface adjacent to them will be free of any sharp or abrasive elements.

Submit shop drawings to the Engineer unless otherwise noted. For curved handrail applications, fabricate the handrail to the curve if radius is less than 600 ft. Shop drawings are required when rail is fabricated to the curve.

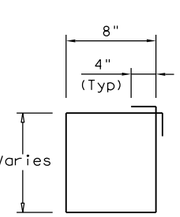
For all handrails, erection drawings will be submitted to the Engineer for approval to ensure proper installation.

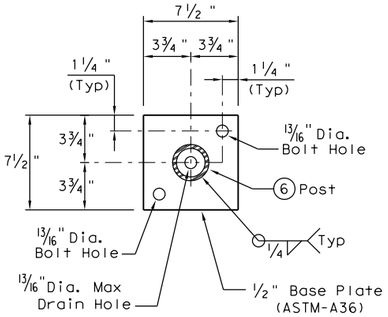
Drawings will show handrail mount locations with bolts setting, spacing, ramp slope, and/or splice joint locations, and handrail lengths with identification showing where each handrail goes on the layout.

Payment for concrete sidewalks or curb ramps will be paid for in accordance with Item 531 "Sidewalks".

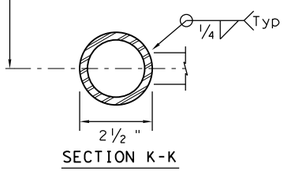
Payment for all items shown is to be included in unit price bid in accordance with Item 450 "Railing" of the type specified.

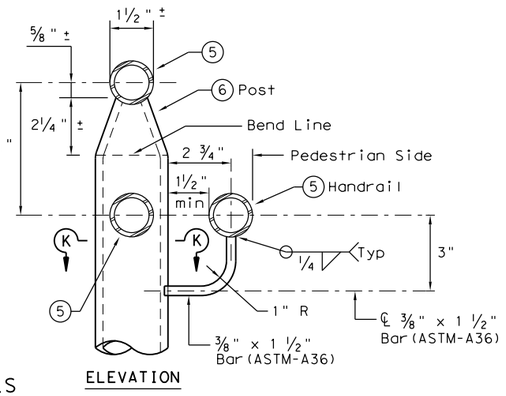
All exposed edges will be rounded or chamfered to approximately 1/8" by grinding.





TYPICAL POST BASE PLATE DETAIL





POST MOUNT DETAILS

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
REVISED MAY, 2013 (VP)	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		125

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DATE: 8/9/2023 9:34:22 AM
FILE: c:\pw\kn1\dms25236\mb-21(1).dgn

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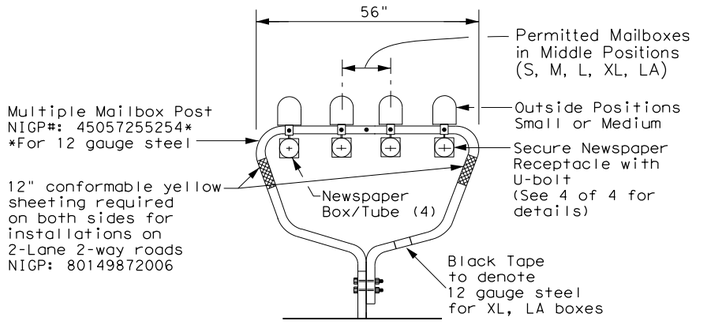
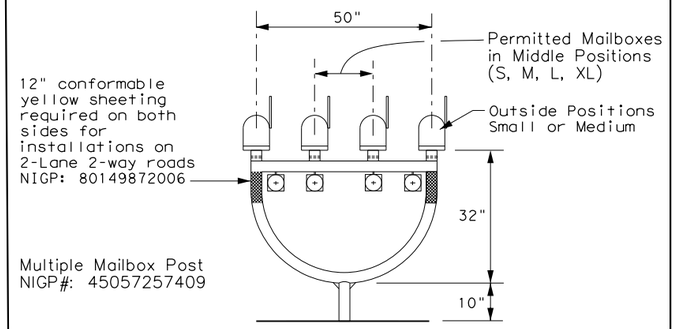


TYPE 4 - MULTIPLE



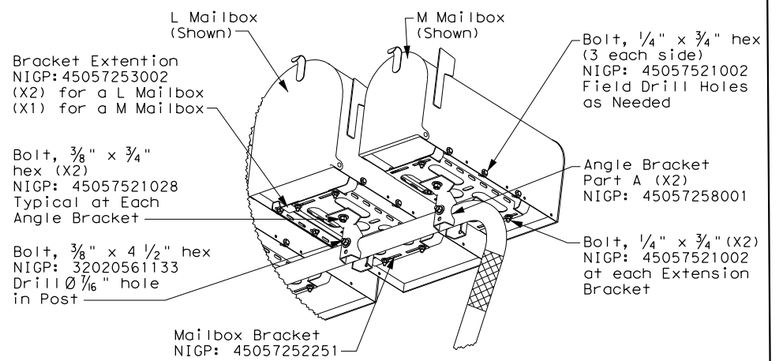
MAILBOX SIZES

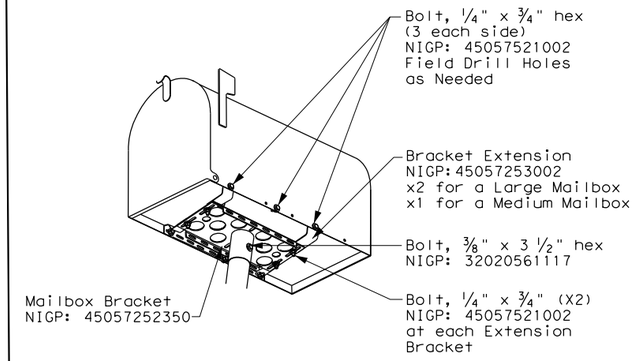
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX **
	LENGTH	WIDTH	HEIGHT	WEIGHT
SMALL	19 ½"	6"	7"	6 LBS
MEDIUM	22 ½" *	8" *	11 ½" *	8 LBS
LARGE	23 ½"	11 ½"	13 ½"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 ½"	15"	23 LBS

* See Note 1.
** Excluding Molded Plastic on 4 X 4 Post

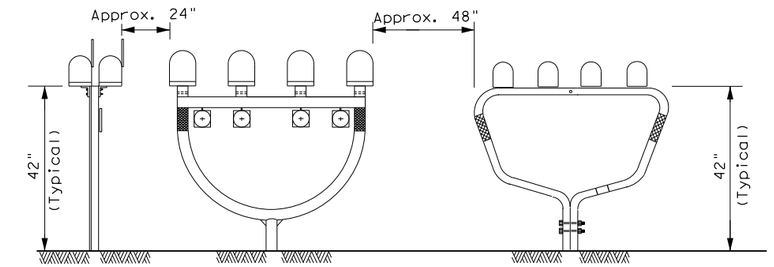
GENERAL NOTES:

1. Dimensions shown (length, width, and height) are typical, not maximums. However, anytime a medium size mailbox is mounted on a single/double mount or on the outside position on a multi mount, the dimensions shown are maximums.
2. Mailboxes shall be made of light weight sheet metal or light weight plastic. Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.





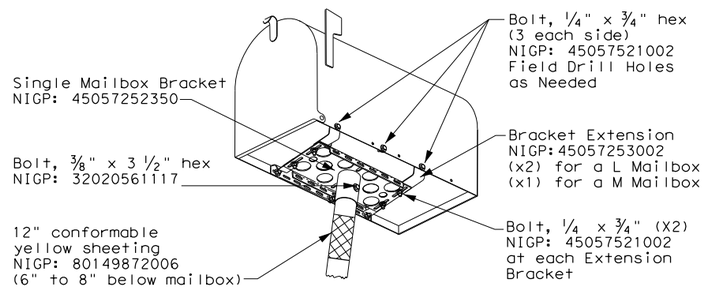
TYPICAL INSTALLATION MEASUREMENTS

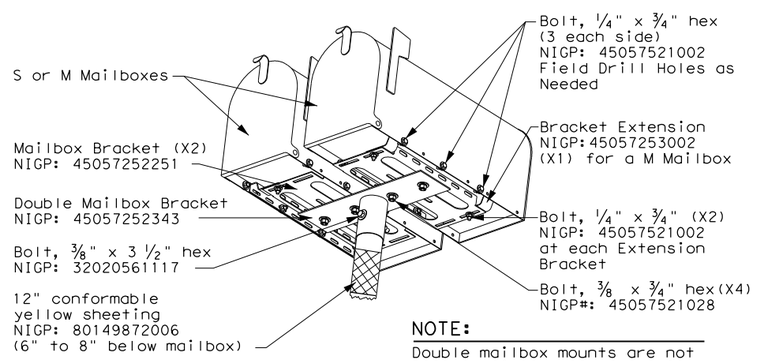


NOTE:

Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Design Standard sheets PED-Pedestrian Facilities Curb Ramps.

TYPE 2 and 4 - SINGLE/DOUBLE

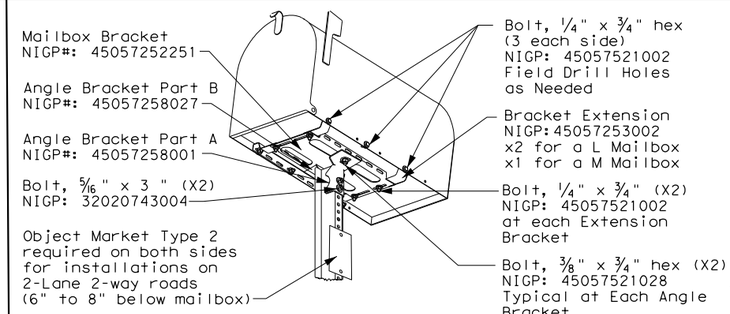


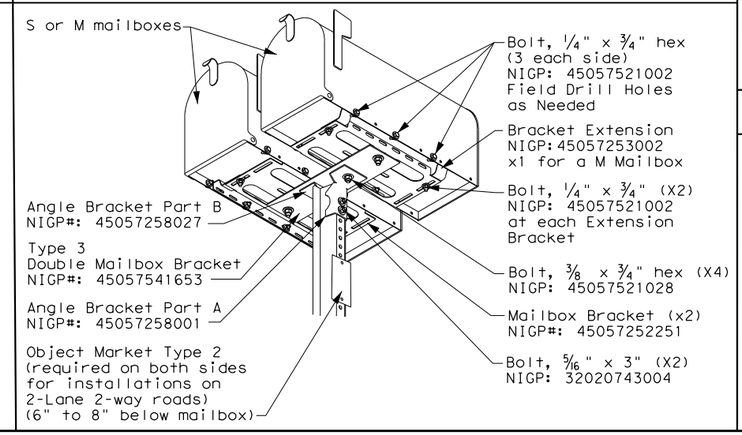


NOTE:

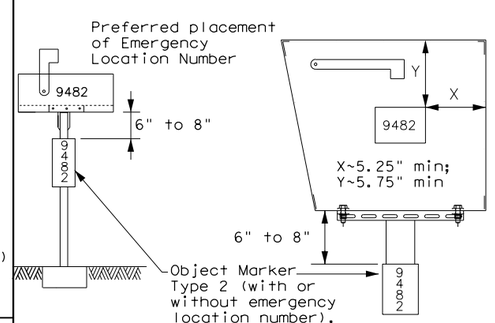
Double mailbox mounts are not allowed with a type 4 multiple mailbox installation

TYPE 3 - SINGLE/DOUBLE





PLACEMENT OF EMERGENCY LOCATION NUMBER

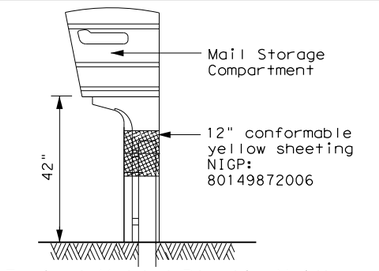


NOTES:

1. Location numbers are provided by homeowner. Minimum size 1" height.
2. Location number is typically placed on the mailbox in a contrasting color.
3. Black numbers may be placed on the Type 2 object marker if the numbers cannot be placed on the mailbox.
4. Alternatively, a green or blue plate with white numbers attached may be mounted below the object marker. Other contrasting color configuration, as approved, may be used.
5. See 3 of 4 for Foundation details.
6. See 4 of 4 for Hardware details.

SHEET 1 OF 4

TYPE 5



Typical Molded Plastic Mailbox

Texas Department of Transportation
Maintenance Division Standard

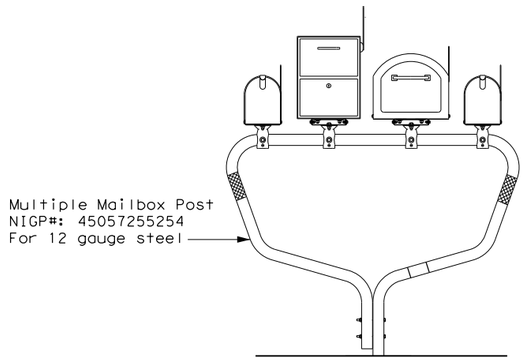
MAILBOX MOUNTING AND ASSEMBLY

MB(1)-21

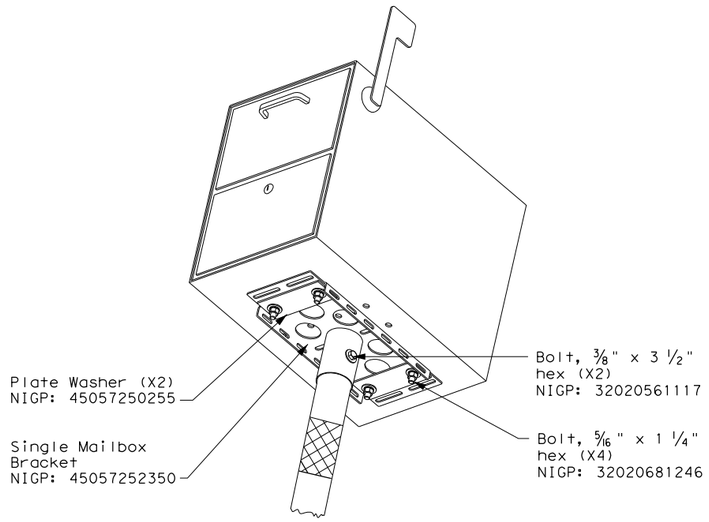
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		126

DATE: 8/9/2023 9:34:22 AM
FILE: c:\pw\khl\dms25236\mb-21(1).dgn

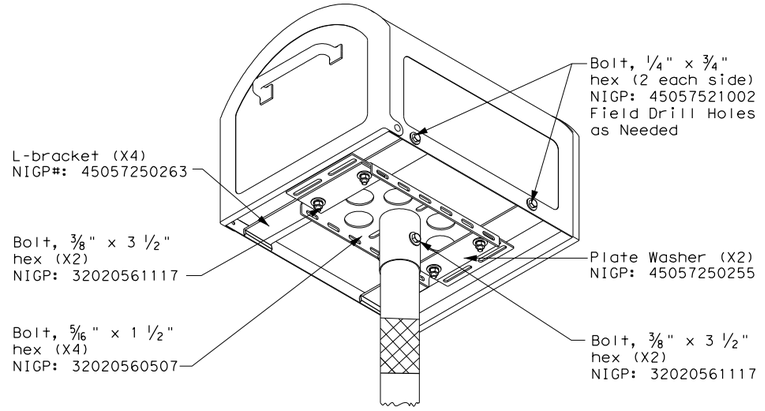
TYPE 1- MULTI LOCKABLE AND XL MAILBOX



TYPE 2/4 - SINGLE LOCKABLE MAILBOX

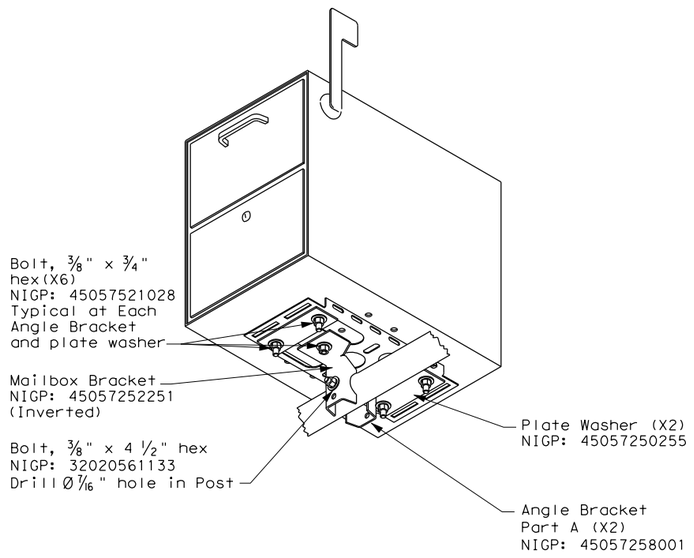


TYPE 2/4 - SINGLE XL MAILBOX

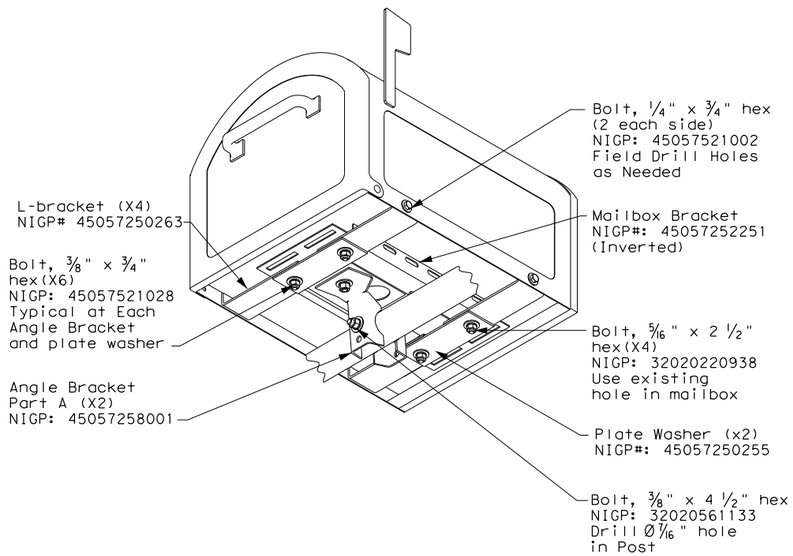


NOTE:
Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

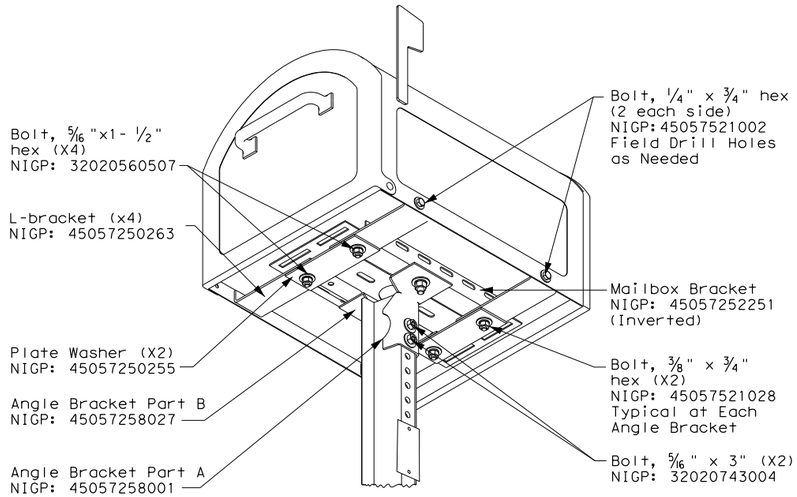
TYPE 1 MULTI – LOCKABLE ARCHITECTURAL (LA)



TYPE 1 MULTI – XL MAILBOX



TYPE 3 - XL MAILBOX MOUNTING



Texas Department of Transportation — Maintenance Division Standard

XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY

MB(2)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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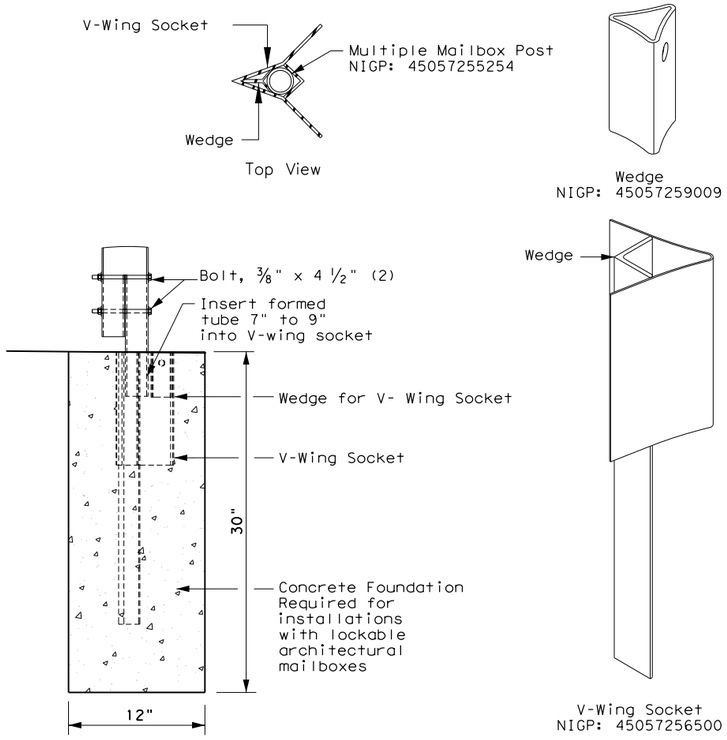
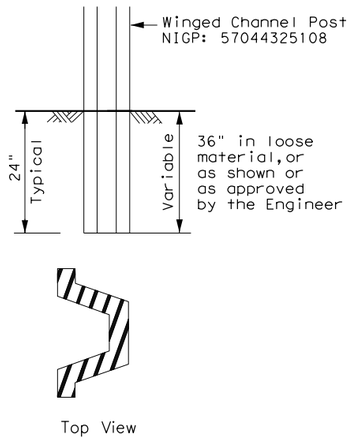
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		127

DATE: 8/9/2023 9:34:23 AM
FILE: c:\pw\khi\dms25236\mb-21(1).dgn

TYPE 1 - SUPPORT/FOUNDATION
Thin Wall Tube w/ V-LOC Anchorage

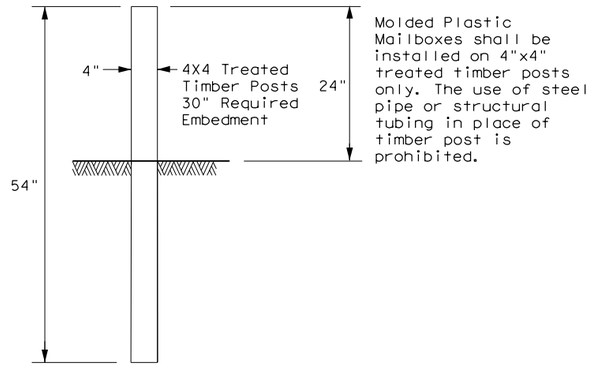


TYPE 3 - SUPPORT/FOUNDATION

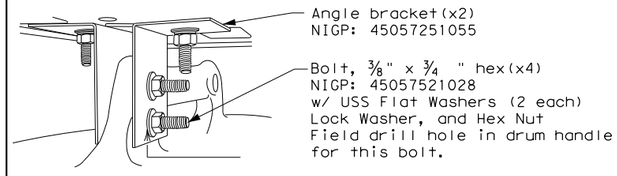


NOTES:
1. Attach Object Marker(OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

TYPE 5 - SUPPORT/FOUNDATION



TYPE 6 - TEMPORARY MAILBOX SUPPORT

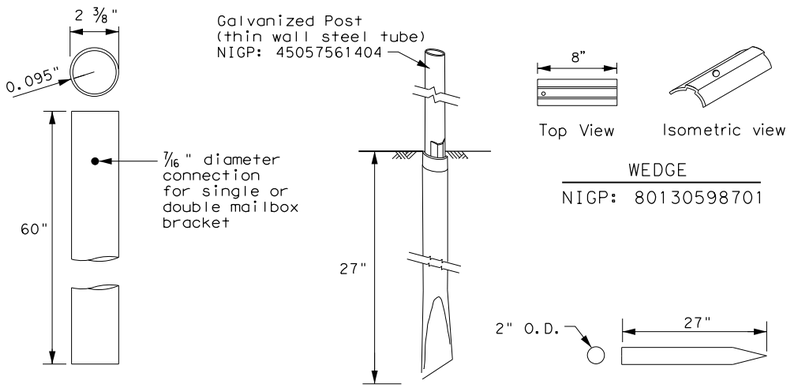


Plastic Drum NIGP: 55093383655
Rubber Collar NIGP: 55093387102

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

GENERAL NOTES:
1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. 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, only on Type 1, Type 2, and Type 4

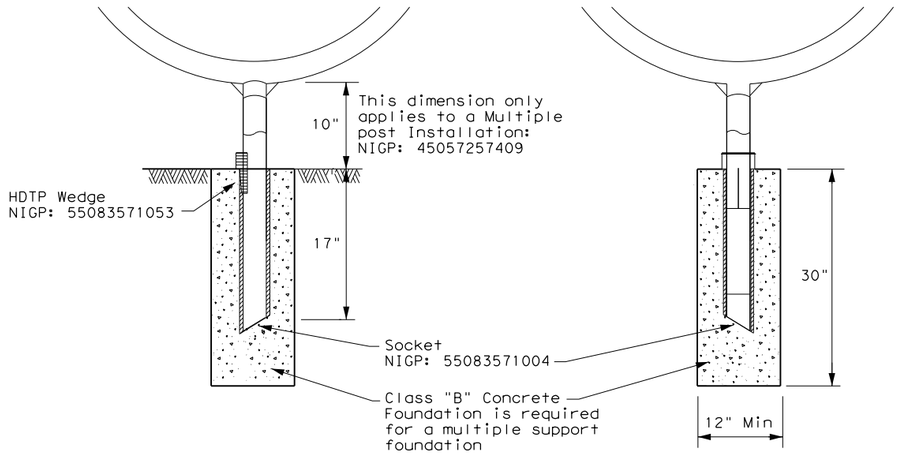
TYPE 2 - SUPPORT/FOUNDATION
Thin Wall Steel Tube w/Wedge Anchor System



MAILBOX POST

WEDGE ANCHOR
NIGP: 80130238407

TYPE 4 - SUPPORT/FOUNDATION
Whitecoated steel post NIGP: 45057561107
Multiple post NIGP: 45057257409
Recycled Rubber post (RR) NIGP: 45057561057



SHEET 3 OF 4

Texas Department of Transportation | Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB(3)-21

FILE: MB-21.dgn	DN:	CK:	DW:	CK:
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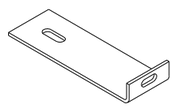
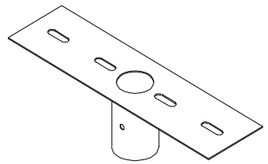
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		128

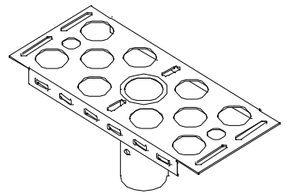
TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4			TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple	Single	Single
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: SS, SM, MM	S, M, L, XL, or LA	SS, SM, or MM	Outside Position: S or M Inside Position: S, M, L, or XL	Molded Plastic	S, or M
Mailbox Post NIGP #	45057255254 (Galvanized Multiple)	45057561404 (Thin Walled Gavanize)	57044325108 (Wing Channel Post)	45057561107 (Thin walled white powder coated) 45057561057 (Recycled Rubber Post: S or M only)	45057561107 (Thin Walled White Powder Coated)	45057257409 (White Powder Coated Multiple)	4x4 Timber	Construction Barrel
Post and Mailbox Hardware NIGP #	45057259009 (Wedge) 45057256500 (V-Wing Socket) 45057253002 (Bracket Extension) 45057252251 (Mailbox Bracket) 45057258001 (Part A Angle Bracket x2) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	80130598701 (Wedge) 80130238407 (Wedge Anchor) 45057253002 (Bracket Extension) 45057252343 (Double MB Bracket) 45057252350 (S. Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket forXL x4)	45057541653 (Type 3 Double Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057253002 (Bracket Extension) 45057258001 (Part A Angle Bracket) 45057258027 (Part B Angle Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057252350 (Single Mailbox Bracket) 45057253002 (Bracket Extension) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252343 (Double Mount Bracket) 45057252251 (Mailbox Bracket x2)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252350 (Single Mount Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	None	45057251055 Angle Bracket (x2)
Foundation Used	Class B Concrete (Required for LA Mailboxes)	Class B Concrete (Required for LA Mailboxes)	None	Class B Concrete (not used with recycled rubber post, required for LA Mailboxes)	Class B Concrete (not required)	Class B Concrete	None	None



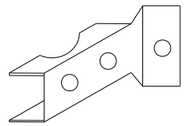
NIGP: 45057250263
L-Bracket x4 for
XL sized mailboxes



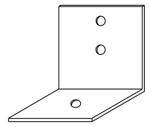
NIGP: 45057252343
Double Mailbox Bracket
For Type 2 and Type 4
double mount



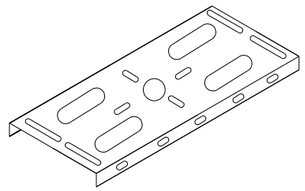
NIGP: 45057252350
Single Mailbox Bracket
For Type 2 single and for
Type 4 single and multi mount



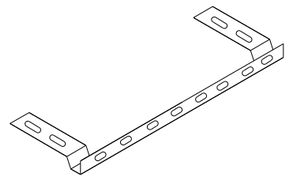
NIGP: 45057258001
Part "A" Angle Bracket
For Type 1 multi (2 per mailbox)
and Type 3 single and double



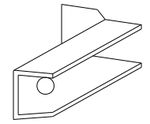
NIGP: 45057251055
Type 6 Angle Bracket
(2 per mailbox)



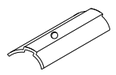
NIGP: 45057252251
Mailbox Bracket
For Type 1 multi and
any double mount (use 2)



NIGP: 45057253002
Bracket Extension
Use 1 for a medium Mailbox
Use 2 for a Large Mailbox



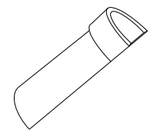
NIGP: 45057258027
Part "B" Angle Bracket
For Type 3 single
and double



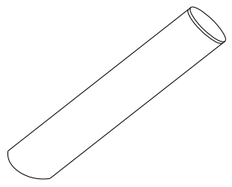
NIGP: 80130598701
Wedge for Type 2

NIGP: 45057250255
Plate Washer for Architecural
and XL Mailboxes

NIGP: 45057541653
Type 3 double mailbox bracket

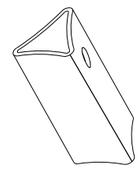


NIGP: 55083571053
Type 4 Mailbox Wedge

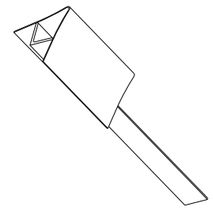


NIGP: 55083571004
Type 4 Mailbox Socket

NIGP: 80130238407
Type 2 Wedge Anchor



NIGP: 45057259009
Wedge for Type 1 V-wing Socket



NIGP: 45057256500
V-wing Socket for
Type 1 Foundation

NIGP #	OBJECT MARKERS AND CONFORMABLE SHEETING
55008311759	Type 2 OM 4"x4" (3 Needed) for Type 3 Wing Channel Post
55008312906	Type 2 OM 6"x12" (1 needed) for Type 3 Wing Channel Post
80149872006	12" Conformable Reflective Yellow Sheeting for Flexible Posts

NOTES:

1. Type 2 object marker in accordance with Traffic Engineering Standard Delineators & Object Markers.
2. A light weight receptacle for newspaper delivery can be attached to mailbox posts if the receptacle does not touch the mailbox, present a hazard to traffic or delivery of the mail, extend beyond the front of the mailbox, or display advertising, except the publication title.

BID CODES FOR CONTRACTS

MB-(X) ASSM TY (XXX) (X)

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- MP = Molded 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

DATE: 8/9/2023 9:34:23 AM
FILE: c:\pw\khl\dms25236\mb-21(1).dgn

Texas Department of Transportation — Maintenance Division Standard

NIGP PARTS LIST AND COMPATIBILITY

MB(4)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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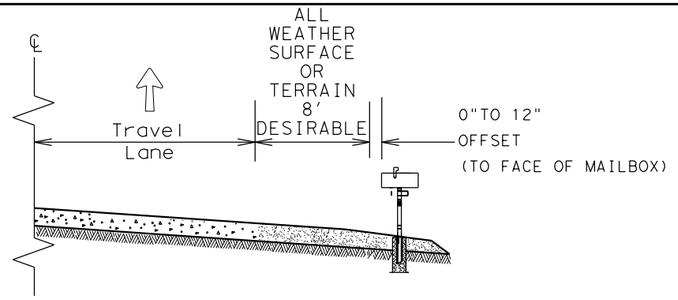
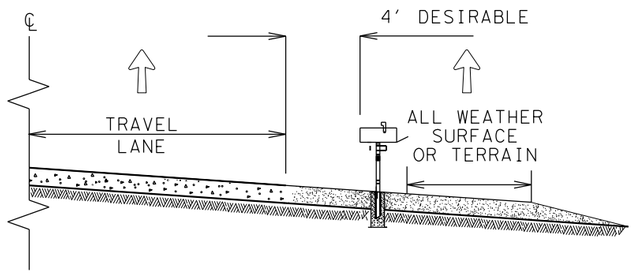
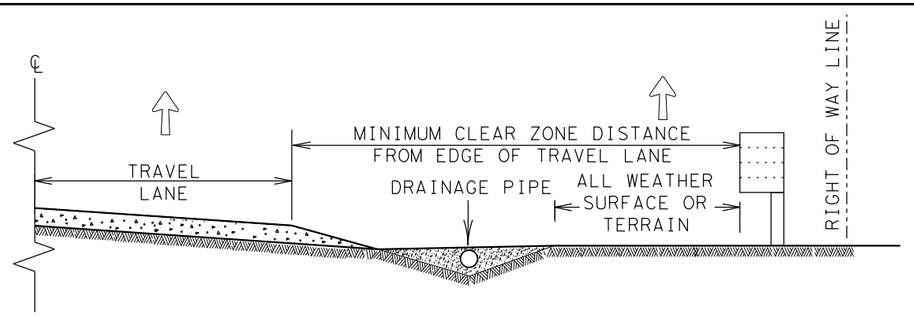
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		129



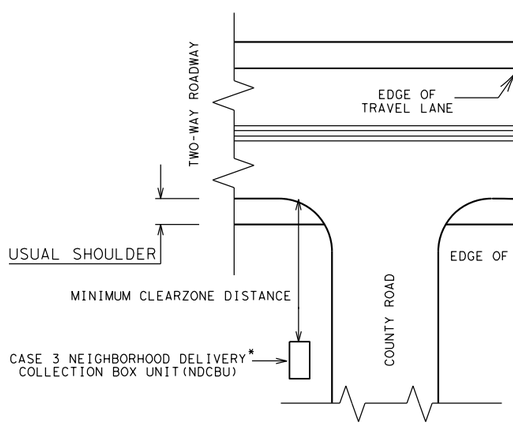
CASE 1. OFF TRAVEL WAY DELIVERY

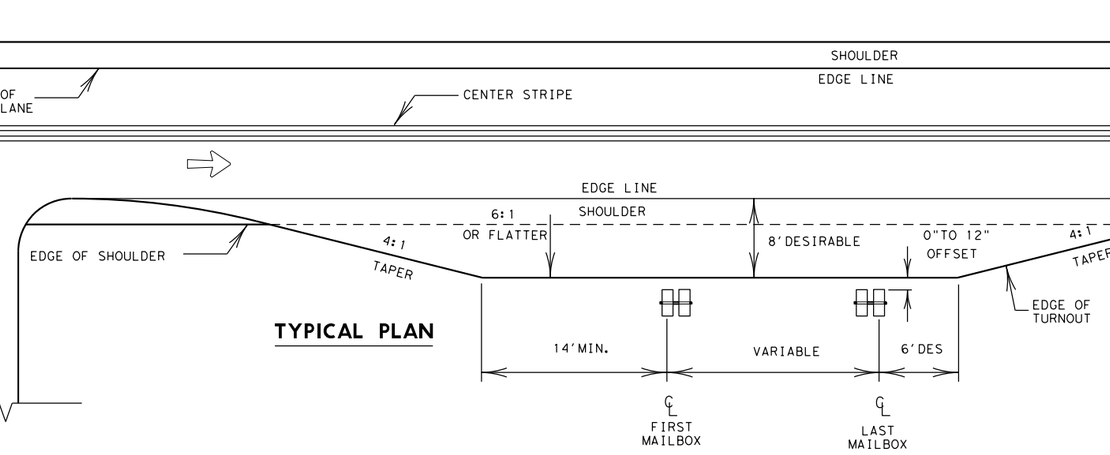


CASE 2. BACK SIDE DELIVERY

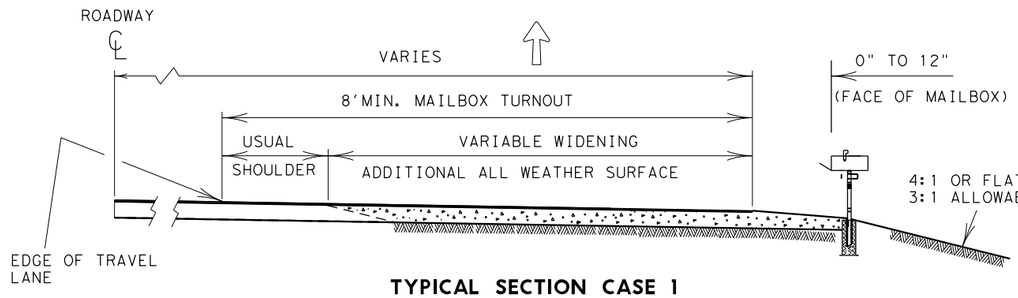


CASE 3. DELIVERY NEAR RIGHT OF WAY LINE





TYPICAL PLAN



TYPICAL SECTION CASE 1

GENERAL NOTES:

1. CASE 1 IS THE MOST COMMON METHOD.
2. TURN OUT BEHIND MAILBOX FOR CASE 2 WILL NORMALLY BE ALLOWED FOR NATURAL TERRAIN THAT WILL SERVE AS AN ALL WEATHER SURFACE.
3. ALL WEATHER DRIVEWAYS FOR CASE 3 MAILBOXES LOCATED AT THE RIGHT OF WAY LINE SHOULD NORMALLY BE PLACED IN CONJUNCTION WITH COUNTY ROADS OR OTHER CONNECTING COMMUNITY ROADS OR STREETS. WHEN 3 OR MORE MULTI-RACKS ARE ANTICIPATED, THE USE OF AN NDCBU IS RECOMMENDED. ONLY RURAL PATRONS LOCATED ON STATE MAINTAINED HIGHWAYS MAY HAVE A MAILBOX OR NDCBU SLOT ON TXDOT RIGHT OF WAY.

* NDCBU MAY BE INSTALLED ON COUNTY ROAD ROW WITH APPROVAL OF COUNTY.

MAIL DELIVERY VEHICLE TRAVEL DIRECTION

Texas Department of Transportation | Maintenance Division Standard

Guideline

MAILBOX SIDE ROAD PLACEMENT AND TURNOUTS

MBP(1)-22

FILE: MBP-22.DGN	DN: VS	CK:	DW: VS	CK:
© TxDOT OCTOBER 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 12/2012 5/2014	0905	06	095, ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		130

DATE: 8/9/2023 9:34:29 AM
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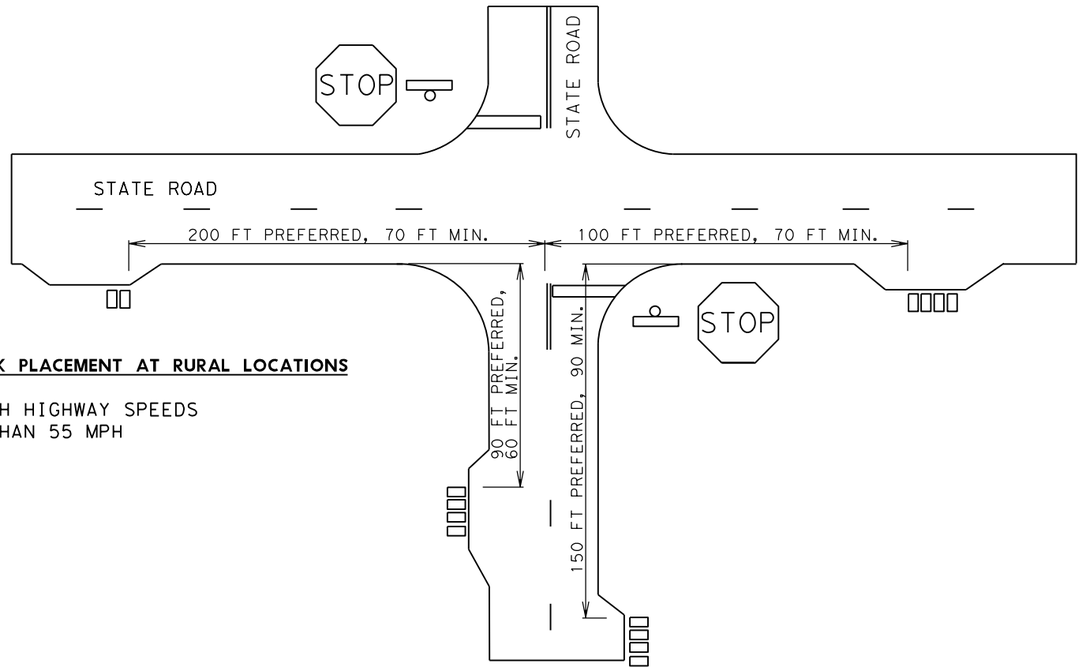
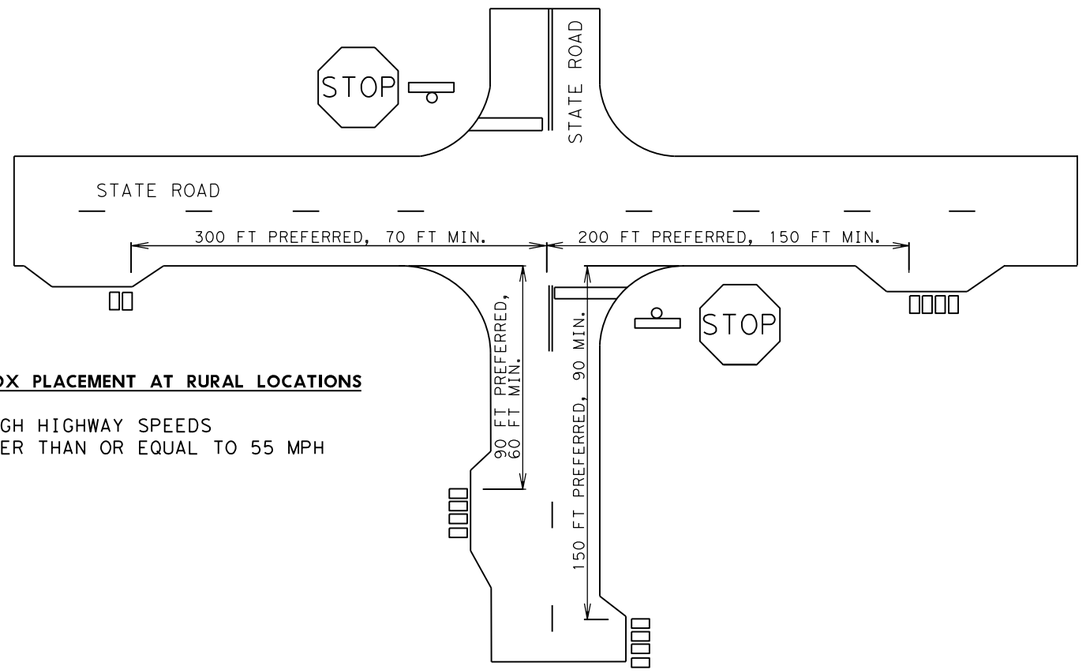


MAILBOX PLACEMENT AT RURAL LOCATIONS

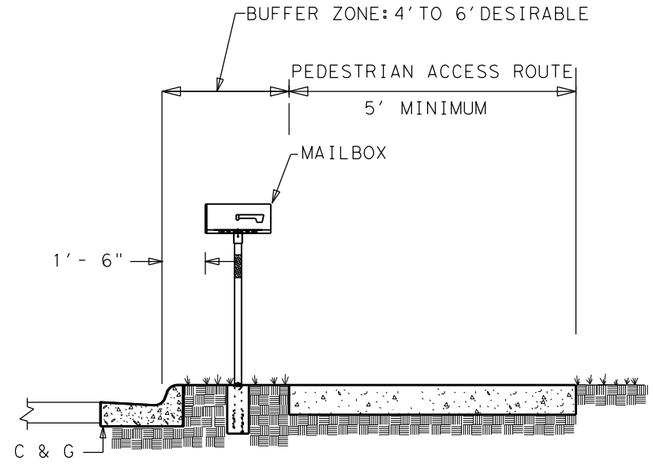
THROUGH HIGHWAY SPEEDS
LESS THAN 55 MPH



MAILBOX PLACEMENT AT RURAL LOCATIONS

THROUGH HIGHWAY SPEEDS
GREATER THAN OR EQUAL TO 55 MPH

CURB AND GUTTER MAILBOX INSTALLATION



NOTES:
1. A NON-TRAVERSABLE SURFACE MUST BE INSTALLED NEAR THE MAILBOX (NATURAL VEGETATION OR OTHER) IN THE BUFFER ZONE. ALTERNATIVELY, A BASE WITH A MINIMUM HEIGHT OF 2.5 INCHES MAY BE INSTALLED SO THAT THE EDGE OF THE MAILBOX DOES NOT EXTEND OUT MORE THAN 4 INCHES HORIZONTALLY BEYOND THE BASE.

2. THE SIDEWALK WIDTH MAY BE REDUCED TO 4 FOOT FOR SHORT DISTANCES AROUND THE MAILBOX IF NEEDED.

3. MAINTAIN A MINIMUM OF 5 FEET BETWEEN OBSTRUCTIONS IN THE PEDESTRIAN ACCESS ROUTE.

Texas Department of Transportation | Maintenance Division Standard

MAILBOX PLACEMENT CURBS & INTERSECTIONS

MBP(2)-22

FILE: MBP-22.DGN	DN: VS	CK:	DW: VS	CK:
© TxDOT OCTOBER 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 12/2012 5/2014	0905	06	095, ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		131

100% SUBMITTAL

SUMMARY OF DRAINAGE ITEMS

LOCATION	110 6003 EXCAVATION (SPECIAL) CY	400 6002 STRUCT EXCAV (BOX) CY	400 6003 STRUCT EXCAV (PIPE) CY	400 6005 CEM STABIL BKFL CY	403 6006 TEMPORARY SPL SHORING (COFFERDAM) SF	432 6002 RIPRAP (CONC)(5 IN) CY	462 6010 CONC BOX CULV (6 FT X 3 FT) LF	464 6017 RC PIPE (CL IV)(18 IN) LF	464 6018 RC PIPE (CL IV)(24 IN) LF	467 6219 SET (TY I)(S= 6 FT)(HW= 5 FT)(4:1) (C) EA	467 6224 SET (TY I)(S= 6 FT)(HW= 6 FT)(4:1) (C) EA	467 6363 SET (TY II)(18 IN)(RCP)(6: 1)(P) EA	467 6395 SET (TY II)(24 IN)(RCP)(6: 1)(P) EA	474 6021 CAST-IN-PLACE TRENCH DRAIN LF
STORM WATER ROUTING PLAN AND PROFILE (1 OF 10) (BEGIN TO STA 219+00)														
STORM WATER ROUTING PLAN AND PROFILE (2 OF 10) (STA 219+00 TO STA 225+00)														
STORM WATER ROUTING PLAN AND PROFILE (3 OF 10) (STA 225+00 TO STA 231+00 (STR#1)			47	35		134			72				4	
STORM WATER ROUTING PLAN AND PROFILE (4 OF 10) (STA 231+00 TO STA 237+00) (STR#2 AND STR#3)			141	105		236			216				8	
STORM WATER ROUTING PLAN AND PROFILE (5 OF 10) (STA 237+00 TO STA 243+00) (STR#4 AND STR#5)			312	231		227			480				16	
STORM WATER ROUTING PLAN AND PROFILE (6 OF 10) (STA 243+00 TO STA 249+00) (STR#6)			32	24		98			48				2	
STORM WATER ROUTING PLAN AND PROFILE (7 OF 10) (STA 249+00 TO STA 255+00) (NBI-002)		555	32	253					48				2	
STORM WATER ROUTING PLAN AND PROFILE (8 OF 10) (STA 255+00 TO STA 261+00)														116
STORM WATER ROUTING PLAN AND PROFILE (9 OF 10) (STA 261+00 TO STA 267+00)														
STORM WATER ROUTING PLAN AND PROFILE (10 OF 10) (STA 267+00 TO STA 273+00) (NBI-001)		621		256				128				4		
STORM WATER ROUTING PLAN AND PROFILE (66TH ST)						128								
CULVERT LAYOUT CULVERT C-1-NBI-05-152-0-B004-69-001 3-6X3 AT STA 267+64.47	14						276							
CULVERT LAYOUT CULVERT C-2-NBI-05-152-0-B004-69-002 3-6X3 AT STA 249+63.33					1320		309			3	9			
PROJECT TOTALS	**14**	**1176**	**564**	**904**	**1320**	**823**	**585**	**128**	**864**	**3**	**9**	**4**	**32**	**116**

SUMMARY OF DRAINAGE ITEMS

LOCATION	402 6001 TRENCH EXCAVATION PROTECTION LF	480 6001 CLEAN EXIST CULVERTS EA	4171 6001 INSTALL BRIDGE IDENTIFICATION NUMBERS EA
STORM WATER ROUTING PLAN AND PROFILE (1 OF 10) (BEGIN TO STA 219+00)			
STORM WATER ROUTING PLAN AND PROFILE (2 OF 10) (STA 219+00 TO STA 225+00)			
STORM WATER ROUTING PLAN AND PROFILE (3 OF 10) (STA 225+00 TO STA 231+00 (STR#1)			
STORM WATER ROUTING PLAN AND PROFILE (4 OF 10) (STA 231+00 TO STA 237+00) (STR#2 AND STR#3)			
STORM WATER ROUTING PLAN AND PROFILE (5 OF 10) (STA 237+00 TO STA 243+00) (STR#4 AND STR#5)			
STORM WATER ROUTING PLAN AND PROFILE (6 OF 10) (STA 243+00 TO STA 249+00) (STR#6)			
STORM WATER ROUTING PLAN AND PROFILE (7 OF 10) (STA 249+00 TO STA 255+00) (NBI-002)			
STORM WATER ROUTING PLAN AND PROFILE (8 OF 10) (STA 255+00 TO STA 261+00)			
STORM WATER ROUTING PLAN AND PROFILE (9 OF 10) (STA 261+00 TO STA 267+00)			
STORM WATER ROUTING PLAN AND PROFILE (10 OF 10) (STA 267+00 TO STA 273+00) (NBI-001)			
STORM WATER ROUTING PLAN AND PROFILE (66TH ST)			
CULVERT LAYOUT CULVERT C-1-NBI-05-152-0-B004-69-001 3-6X3 AT STA 267+64.47		1	1
CULVERT LAYOUT CULVERT C-2-NBI-05-152-0-B004-69-002 3-6X3 AT STA 249+63.33	35	1	1
PROJECT TOTALS	**35**	**2**	2

TEXAS FIRM F-928

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TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

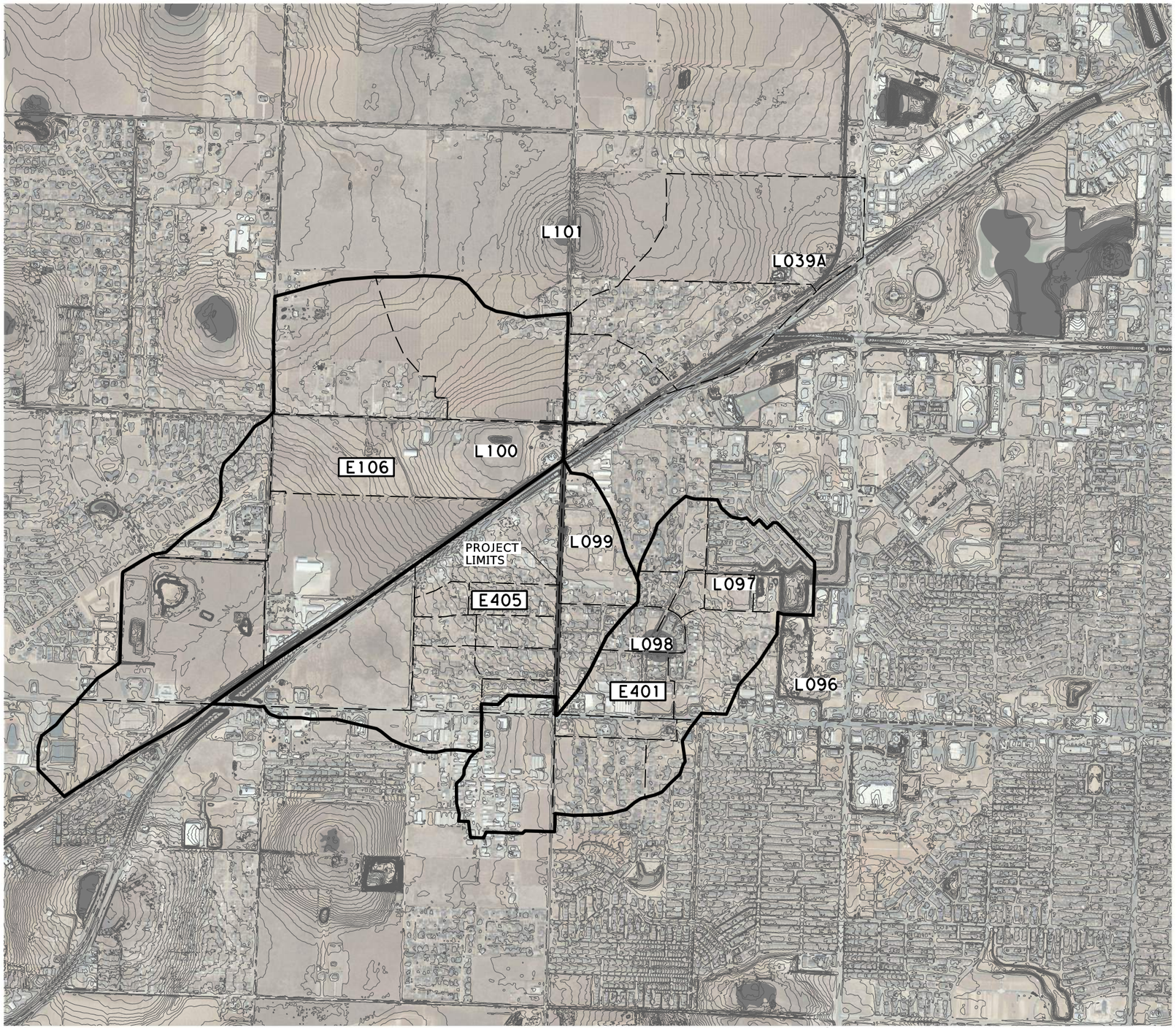
UPLAND AVENUE
66TH STREET TO 82ND STREET
DRAINAGE SUMMARY

SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	132
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



N

0 2000 4000

SCALE: 1"=2000'

E106-2 - SYSTEM E SUB BASIN ID
L099 - PLAYA LAKE NUMBER
——— - BASIN LIMITS
— — — - UPLAND AVENUE SUB-BASIN LIMITS

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100095
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PROFESSIONAL ENGINEER

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Texas Department of Transportation

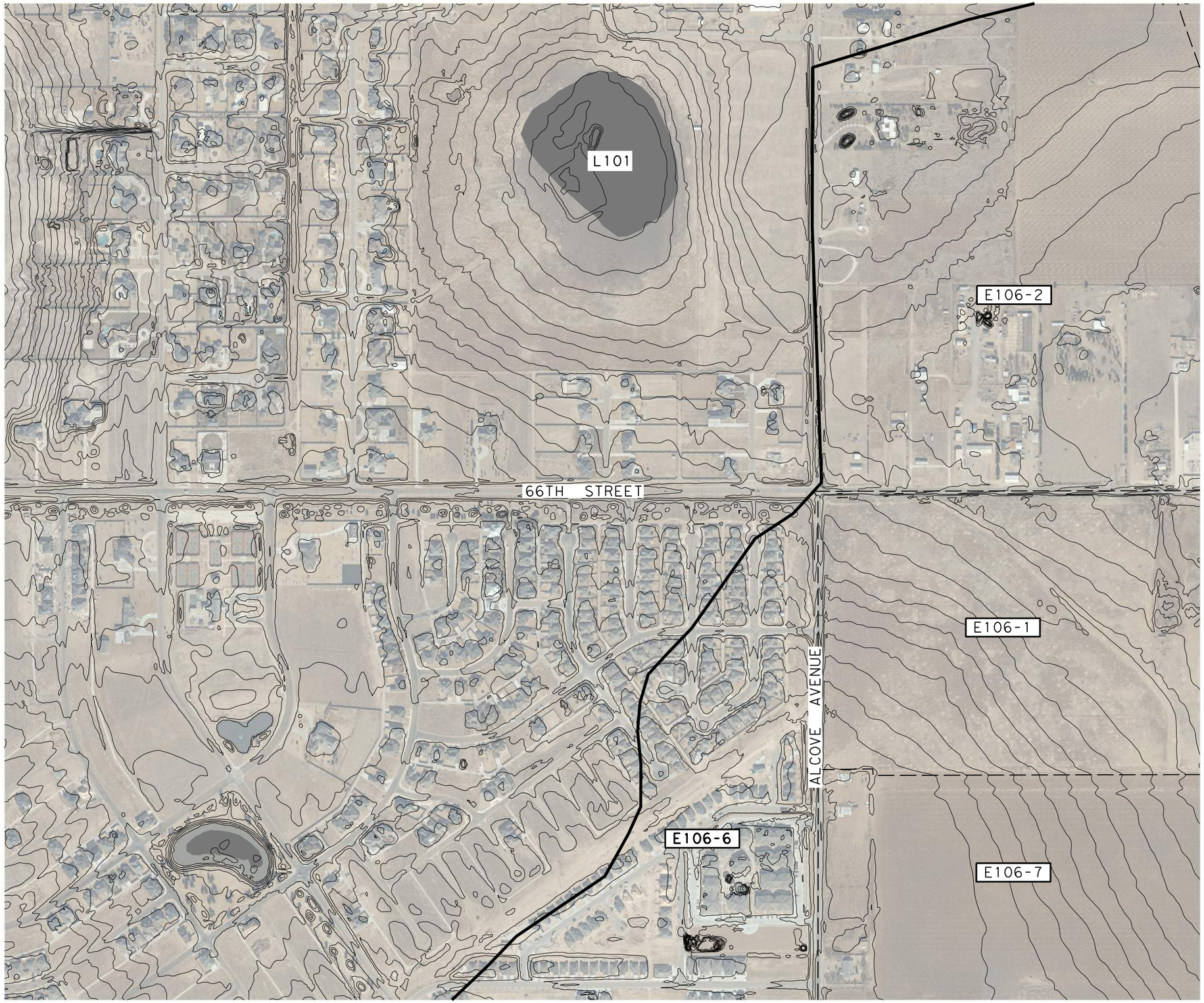
UPLAND AVENUE
66TH STREET TO 82ND STREET

DRAINAGE AREA MAP
OVERALL

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	133
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



N

0 250 500

SCALE: 1"=250'

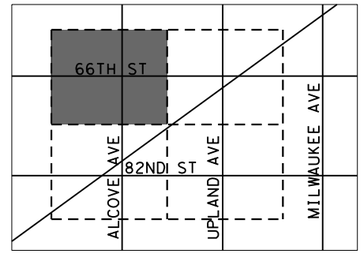
E106-2 - SYSTEM E SUB BASIN ID

L099 - PLAYA LAKE NUMBER

- BASIN LIMITS

- - - - - UPLAND AVENUE SUB-BASIN LIMITS

LOCATOR MAP



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UPLAND AVENUE
66TH STREET TO 82ND STREET

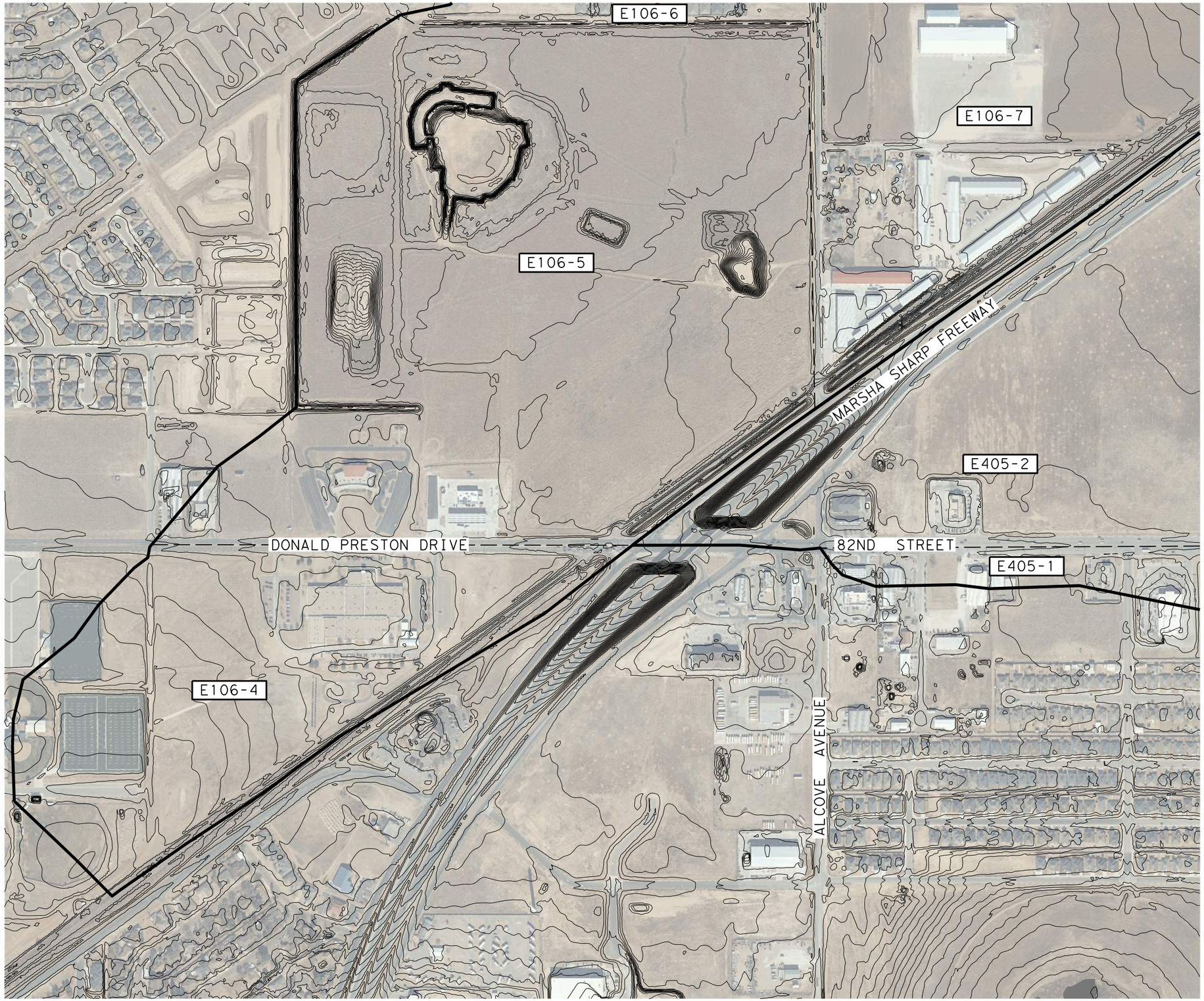
DRAINAGE AREA MAP
LOCAL

SHEET 1 OF 4

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	134
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



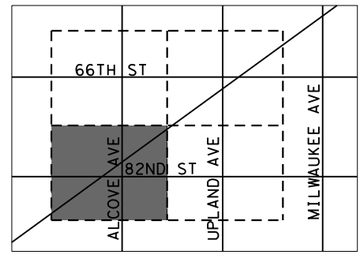
N

0 250 500

SCALE: 1"=250'

E106-2 - SYSTEM E SUB BASIN ID
L099 - PLAYA LAKE NUMBER
— — — - BASIN LIMITS
— — — - UPLAND AVENUE SUB-BASIN LIMITS

LOCATOR MAP



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UPLAND AVENUE

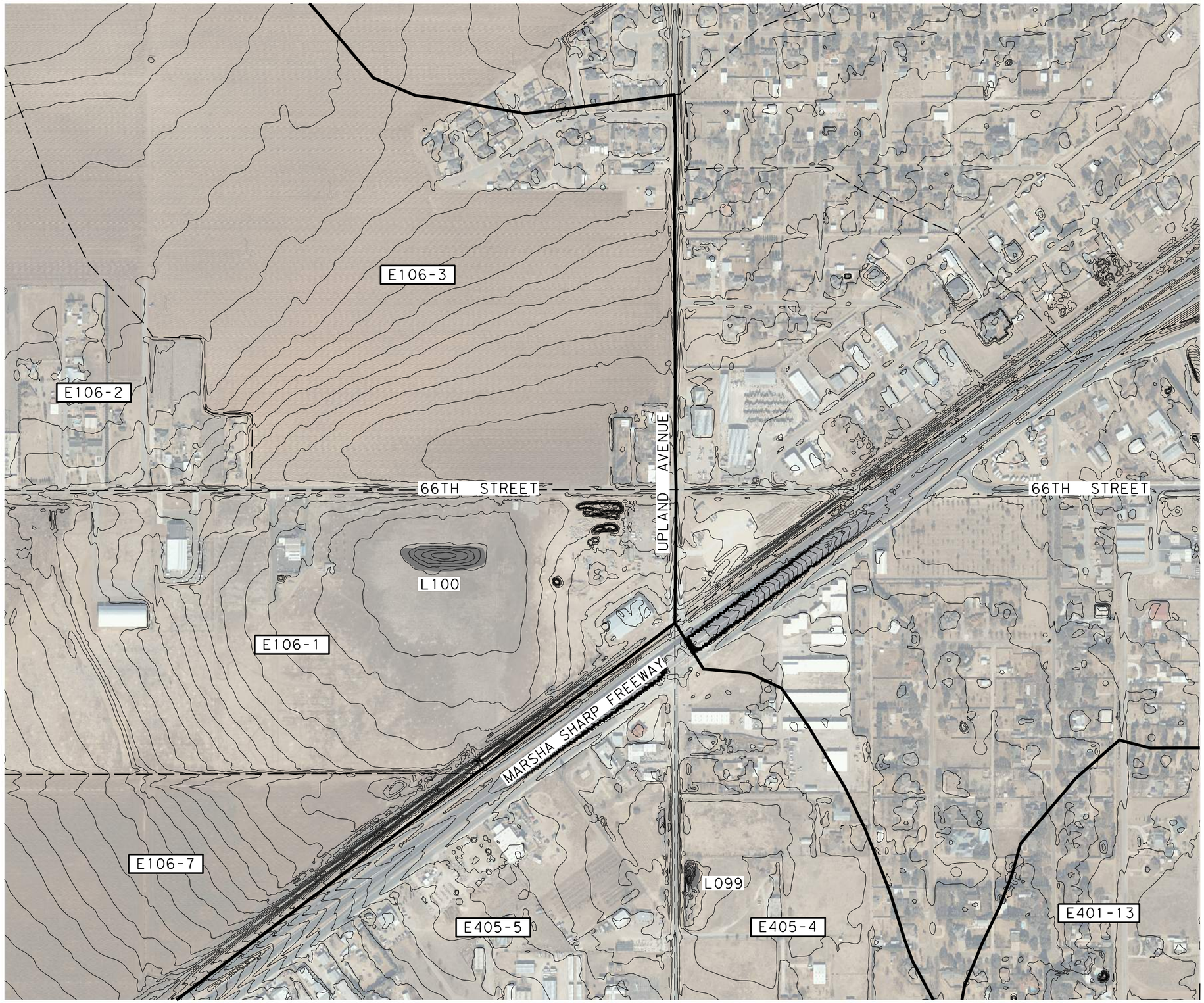
DRAINAGE AREA MAP
LOCAL

SHEET 2 OF 4

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	135
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



N

0 250 500

SCALE: 1"=250'

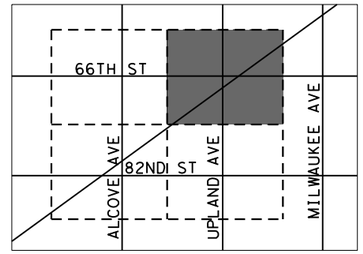
E106-2 - SYSTEM E SUB BASIN ID

L099 - PLAYA LAKE NUMBER

\- BASIN LIMITS

\- UPLAND AVENUE SUB-BASIN LIMITS

LOCATOR MAP



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UPLAND AVENUE
66TH STREET TO 82ND STREET

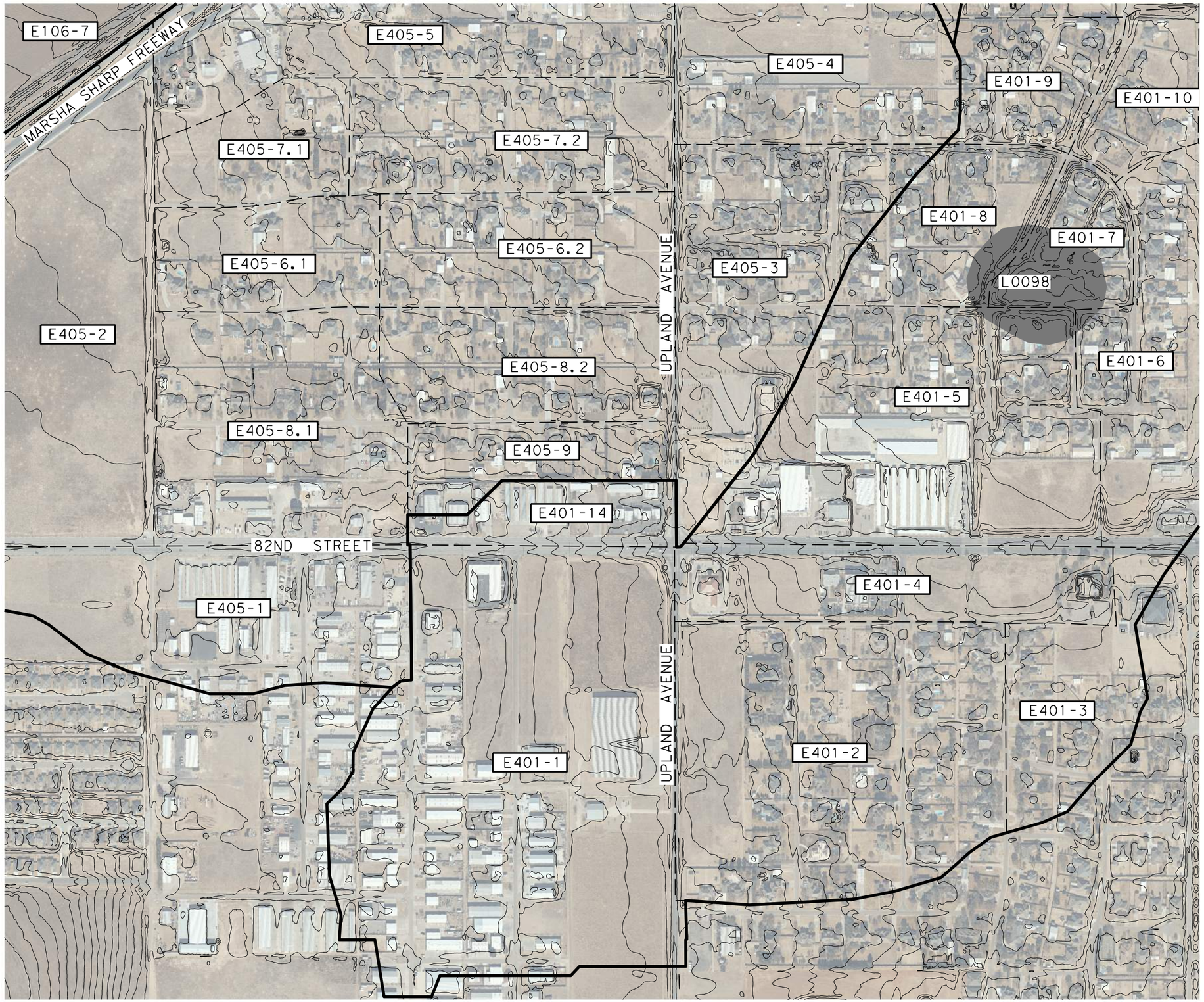
DRAINAGE AREA MAP
LOCAL

SHEET 3 OF 4

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	136
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



N

0 250 500

SCALE: 1"=250'

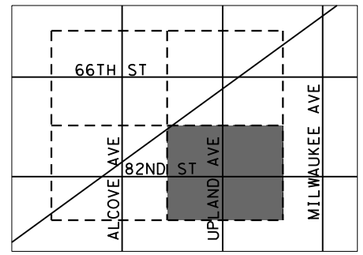
E106-2 - SYSTEM E SUB BASIN ID

L099 - PLAYA LAKE NUMBER

\- BASIN LIMITS

\- UPLAND AVENUE SUB-BASIN LIMITS

LOCATOR MAP



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UPLAND AVENUE
66TH STREET TO 82ND STREET

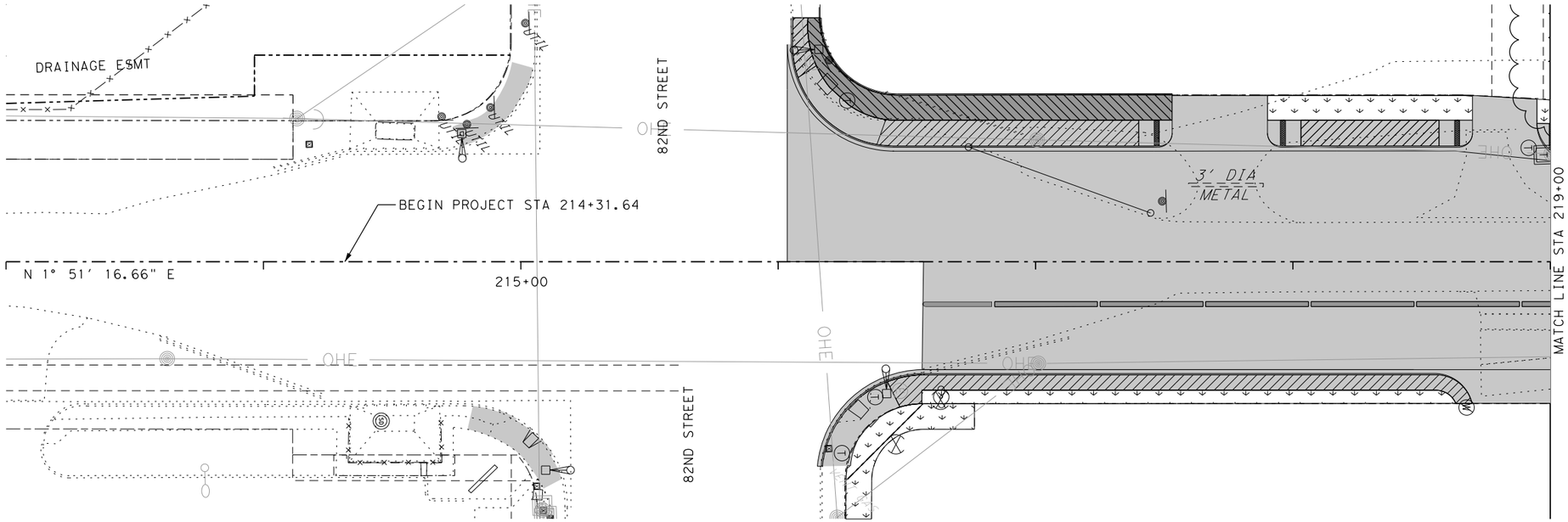
DRAINAGE AREA MAP
LOCAL

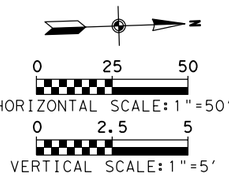
SHEET 4 OF 4

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	137
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



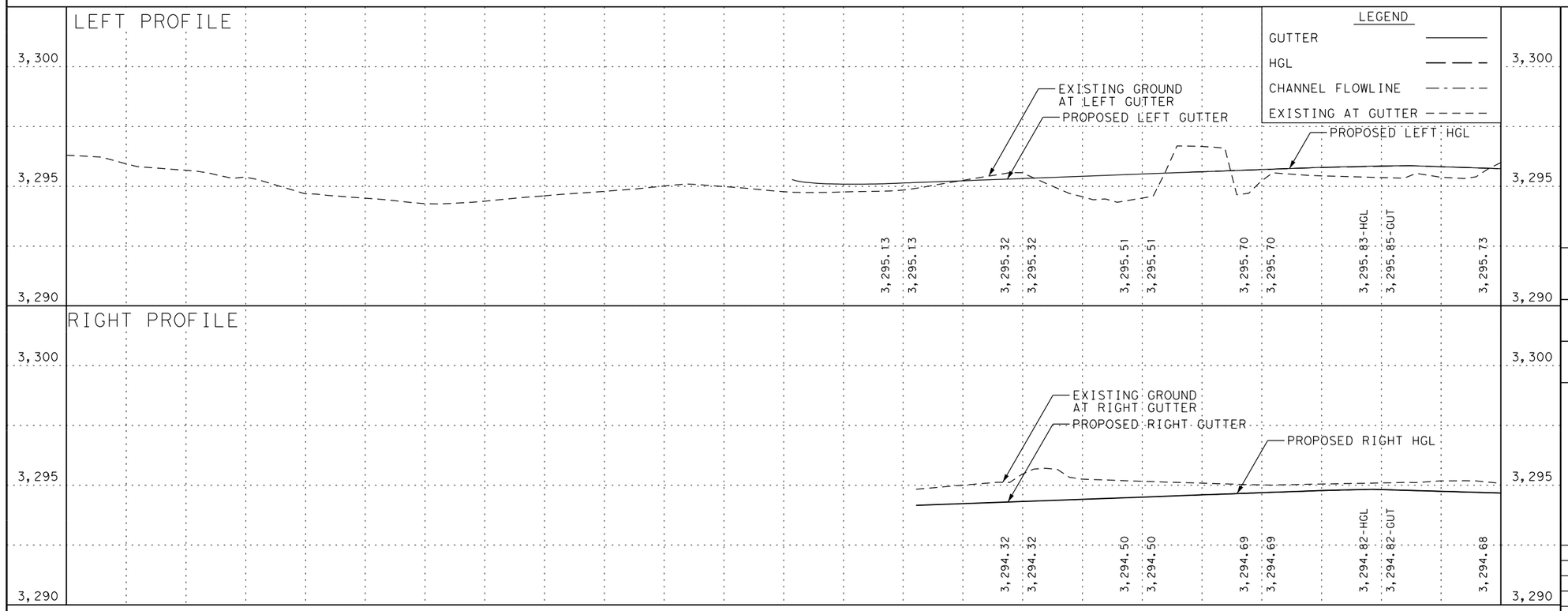


LEGEND

- PROP CULVERT
- PROP WSEL
- FLOWLINE

NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT VERSION OF THE CITY OF LUBBOCK MINIMUM DESIGN STANDARDS AND SPECIFICATIONS AND DRAINAGE CRITERIA MANUAL.
2. FOR OFFSITE DRAINAGE, SEE OVERALL DRAINAGE AREA MAP SHEET 117.
3. ALL REINFORCED CONCRETE PIPES ARE CLASS IV UNLESS OTHERWISE NOTED.
4. WATER SURFACE ELEVATIONS SHOWN ARE ESTIMATED FROM MODELING USING THE 100 YR, 24 HR DESIGN STORM EVENT USING PROPOSED ELEVATIONS OF THE ROADWAY DESIGN PROFILE AND TYPICAL SECTIONS.
5. REFER TO ROADWAY PLAN AND PROFILE SHEETS FOR MORE DETAILED INFORMATION ABOUT THE PROPOSED ROADWAY IMPROVEMENTS.
6. CONTRACTOR TO GRADE TO DRAIN.



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UPLAND AVENUE
66TH STREET TO 82ND STREET

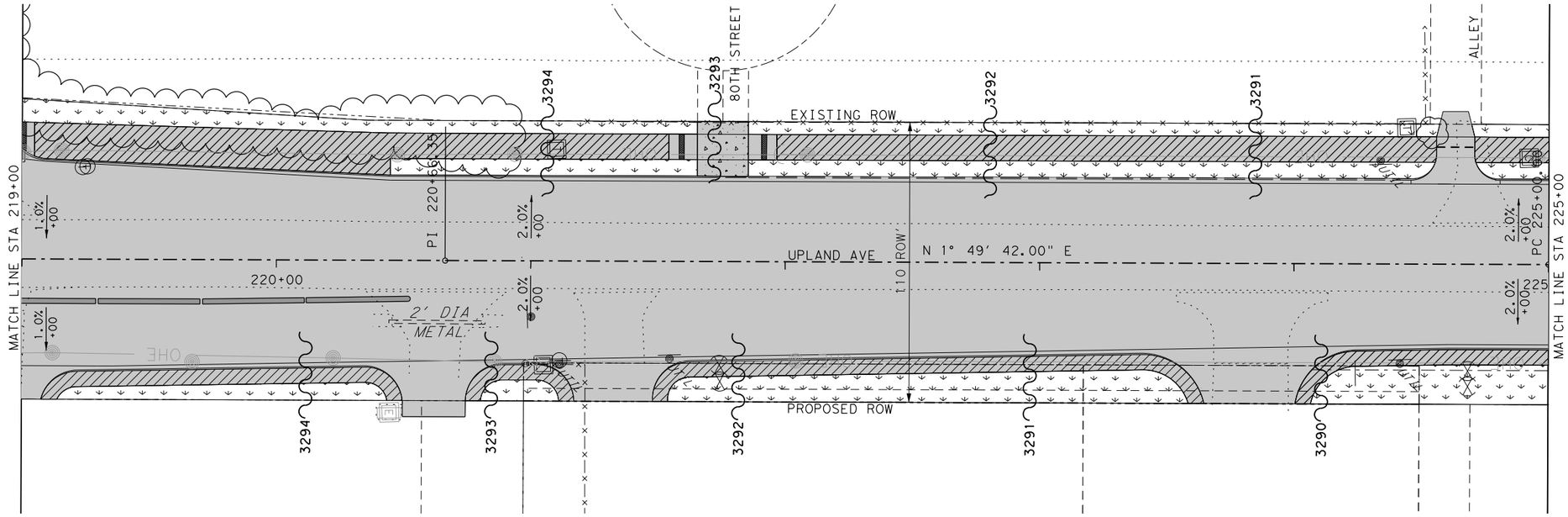
STORMWATER ROUTING
PLAN AND PROFILE
BEGIN PROJECT TO STA 219+00

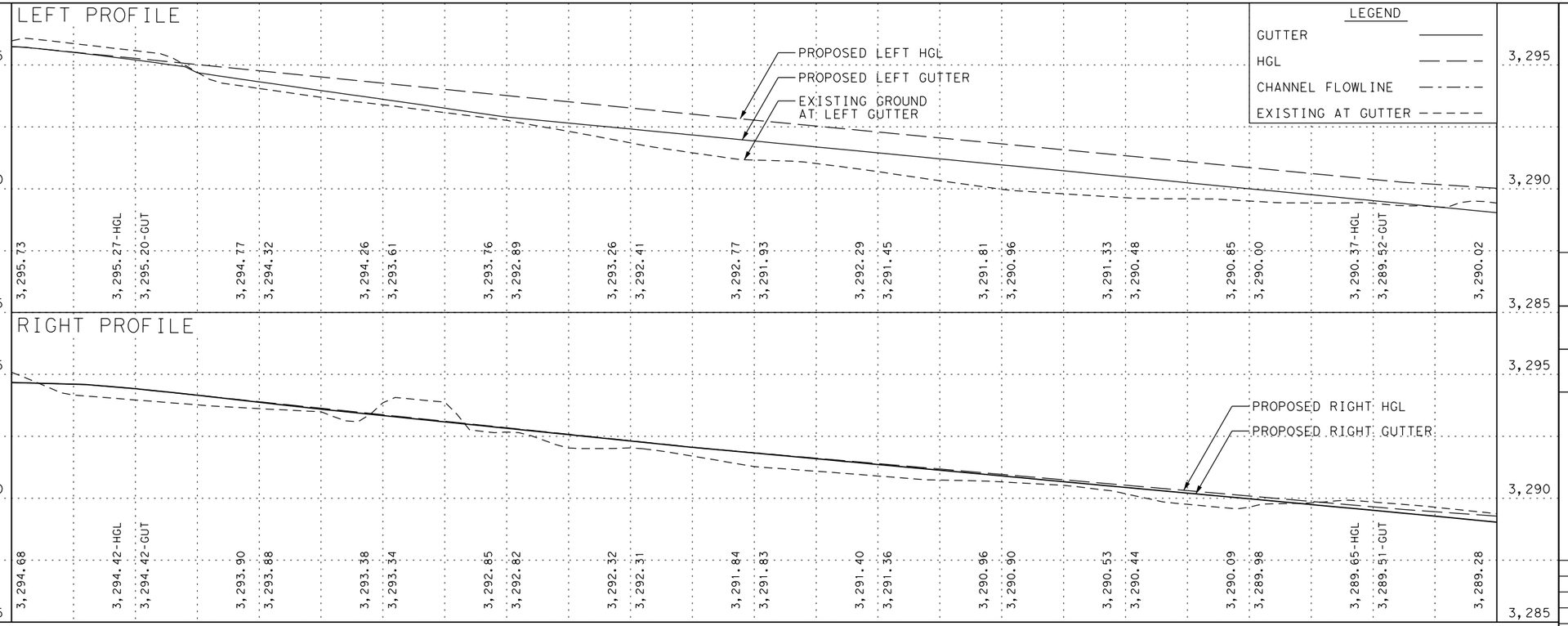
SHEET 1 OF 10

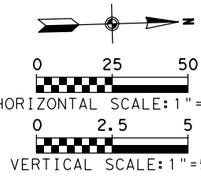
FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	138
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL







LEGEND

- PROP CULVERT
- PROP WSEL
- FLOWLINE

NOTES:

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2. FOR OFFSITE DRAINAGE, SEE OVERALL DRAINAGE AREA MAP SHEET 117.
3. ALL REINFORCED CONCRETE PIPES ARE CLASS IV UNLESS OTHERWISE NOTED.
4. WATER SURFACE ELEVATIONS SHOWN ARE ESTIMATED FROM MODELING USING THE 100 YR, 24 HR DESIGN STORM EVENT USING PROPOSED ELEVATIONS OF THE ROADWAY DESIGN PROFILE AND TYPICAL SECTIONS.
5. REFER TO ROADWAY PLAN AND PROFILE SHEETS FOR MORE DETAILED INFORMATION ABOUT THE PROPOSED ROADWAY IMPROVEMENTS.
6. CONTRACTOR TO GRADE TO DRAIN.

8/1/2023

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Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
STORM WATER ROUTING PLAN AND PROFILE

UPL STA 219+00 TO STA 225+00

SHEET 2 OF 10

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	139
CONT.	SECT.	JOB	
0905	06	095, ETC.	

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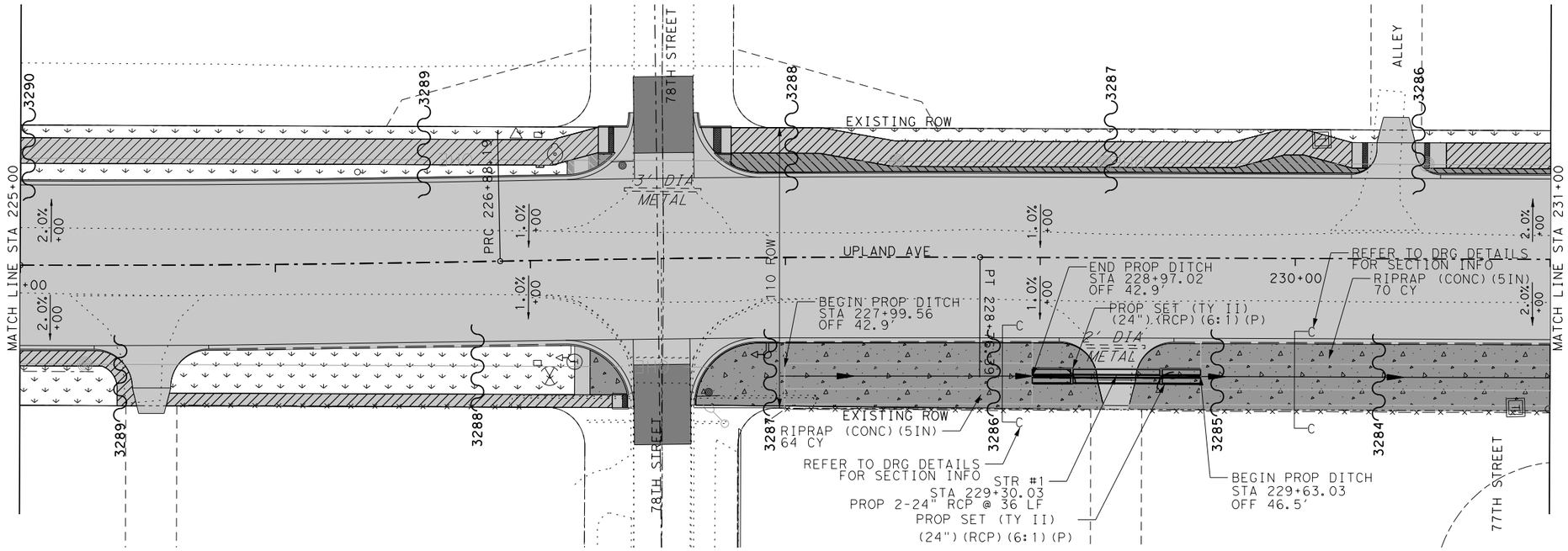

0 25 50
HORIZONTAL SCALE: 1"=50'
0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

PROP CULVERT
PROP WSEL
FLOWLINE

NOTES:

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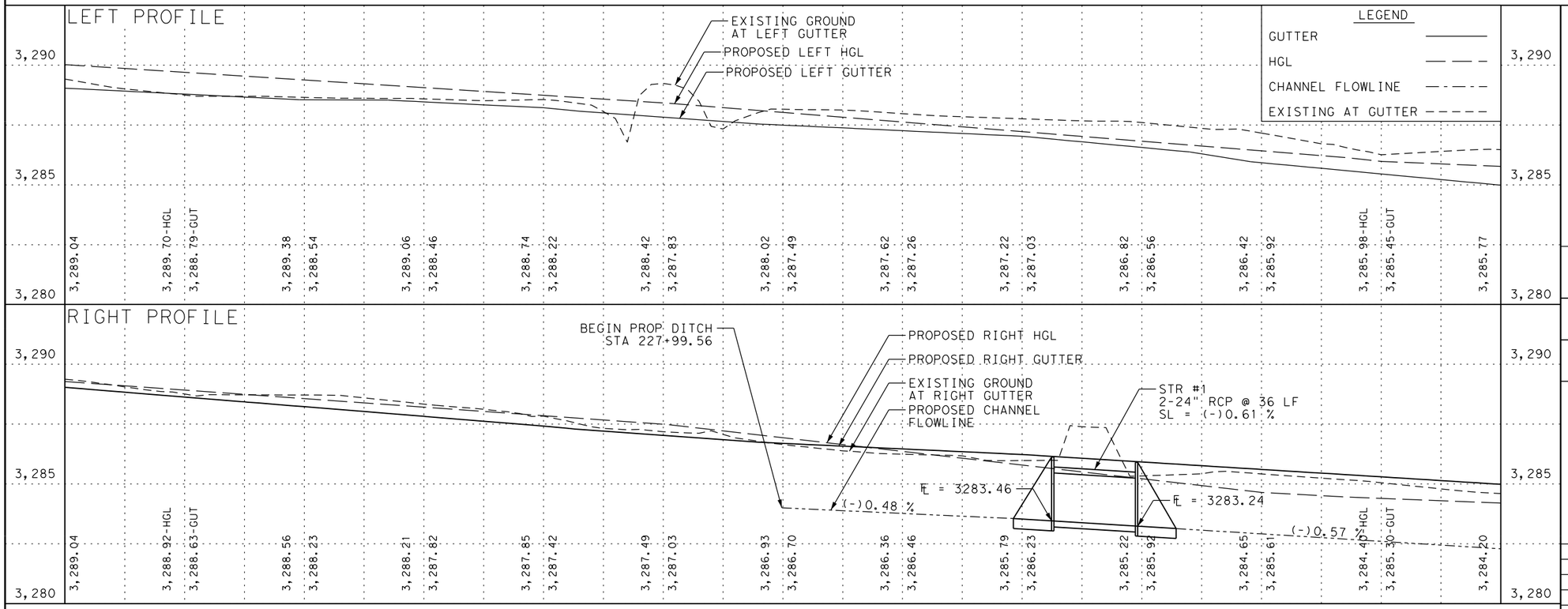
5. REFER TO ROADWAY PLAN AND PROFILE SHEETS FOR MORE DETAILED INFORMATION ABOUT THE PROPOSED ROADWAY IMPROVEMENTS.
6. CONTRACTOR TO GRADE TO DRAIN.



HEATHER RAE KEISTER
100095
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
8/1/2023

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TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
STORM WATER ROUTING PLAN AND PROFILE

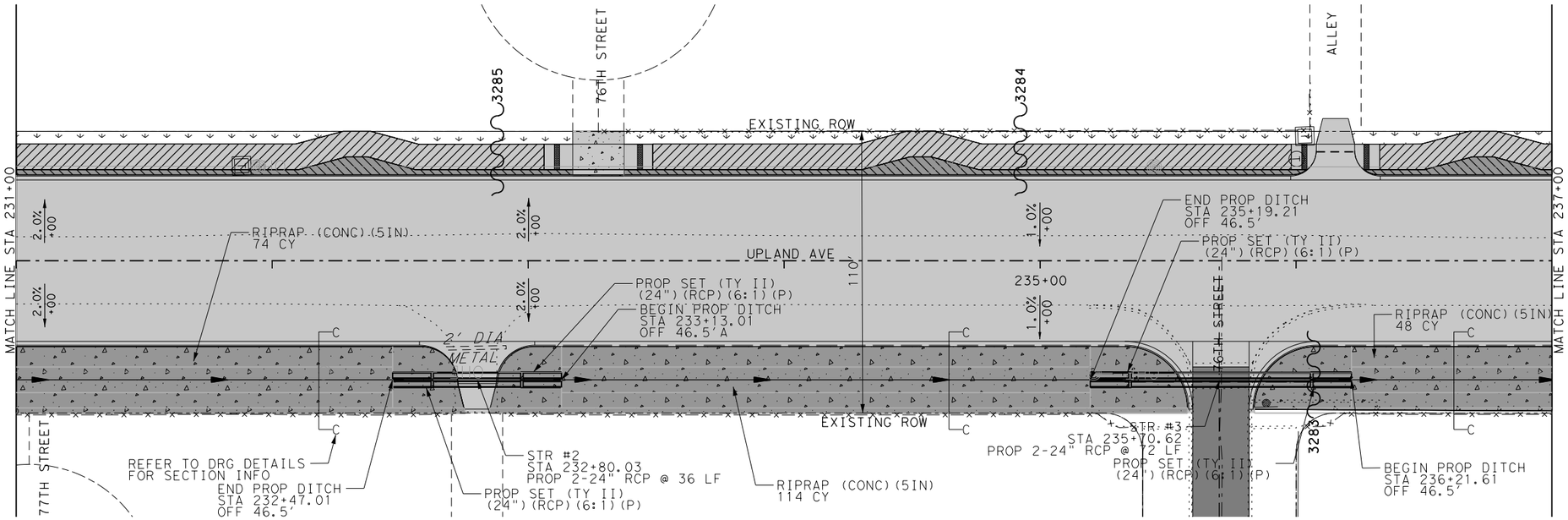
UPL STA 225+00 TO STA 231+00

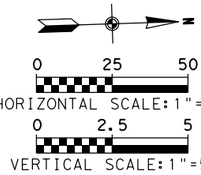
SHEET 3 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	140
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- PROP CULVERT
- PROP WSEL
- FLOWLINE

NOTES:

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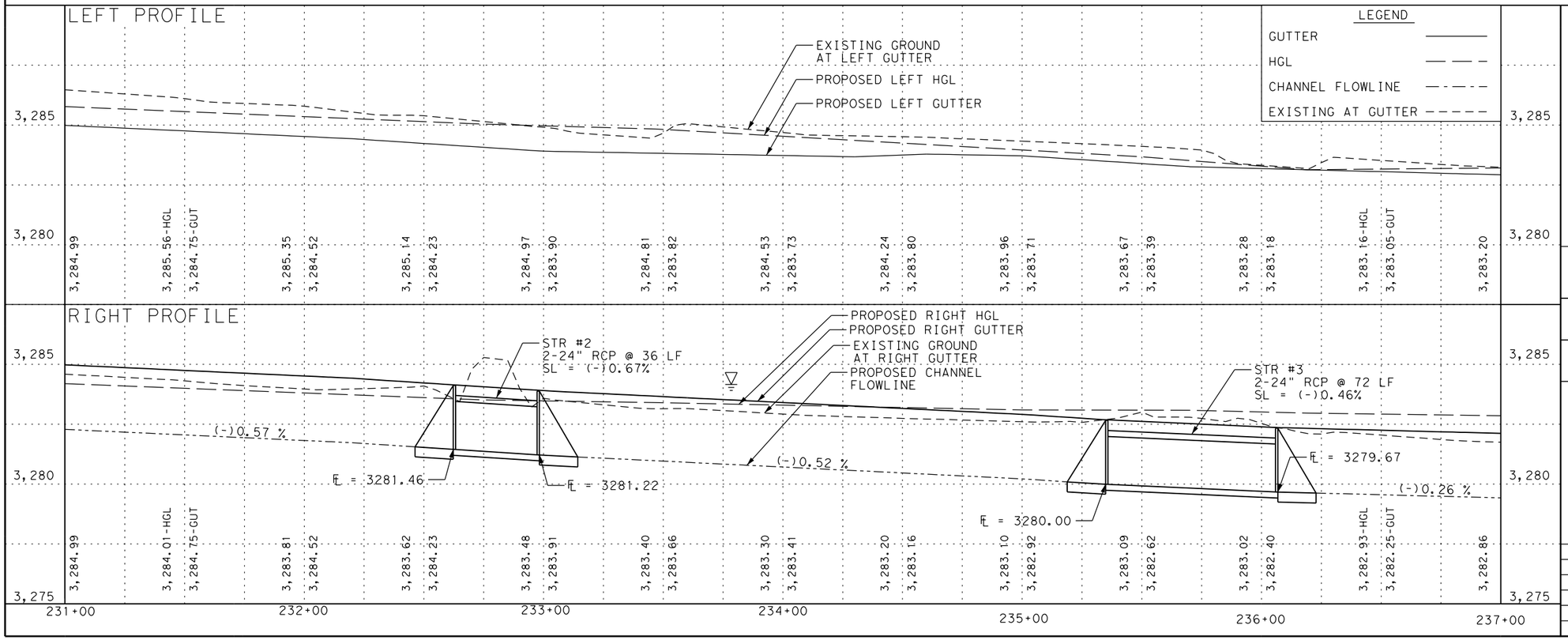
4. WATER SURFACE ELEVATIONS SHOWN ARE ESTIMATED FROM MODELING USING THE 100 YR, 24 HR DESIGN STORM EVENT USING PROPOSED ELEVATIONS OF THE ROADWAY DESIGN PROFILE AND TYPICAL SECTIONS.
5. REFER TO ROADWAY PLAN AND PROFILE SHEETS FOR MORE DETAILED INFORMATION ABOUT THE PROPOSED ROADWAY IMPROVEMENTS.
6. CONTRACTOR TO GRADE TO DRAIN.



8/1/2023

TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
STORM WATER ROUTING PLAN AND PROFILE

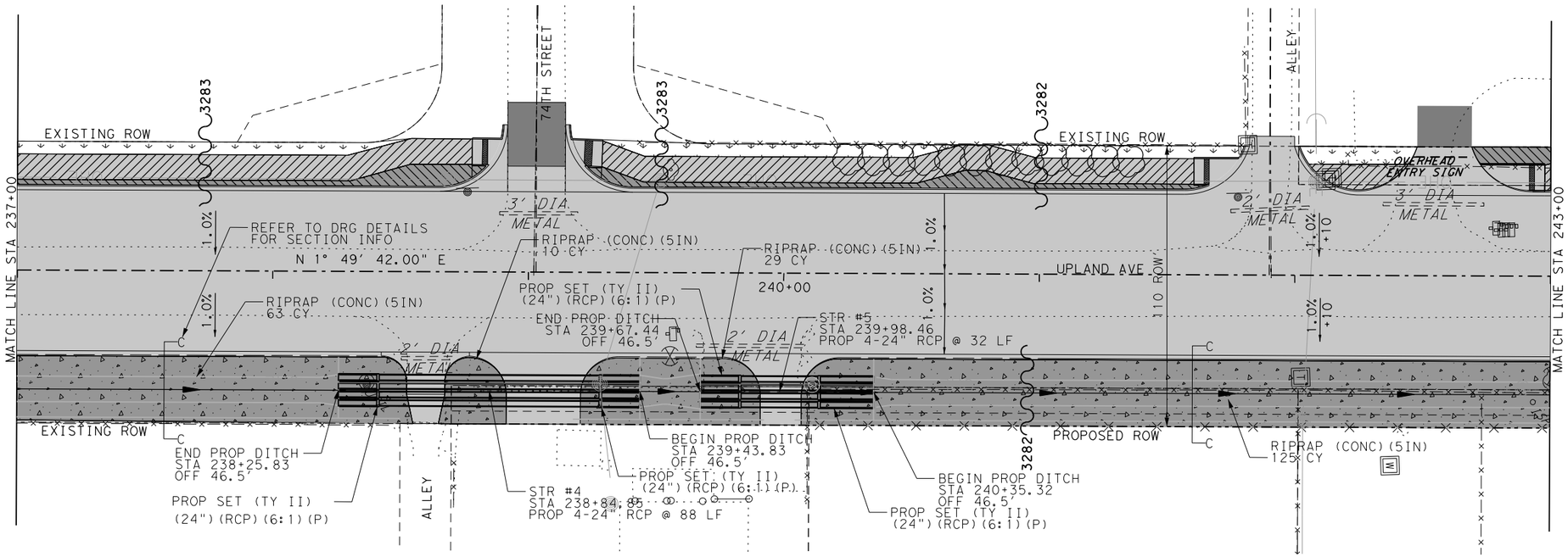
UPL STA 231+00 TO STA 237+00

SHEET 4 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	141
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 25 50
HORIZONTAL SCALE: 1"=50'
0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

PROP CULVERT
PROP WSEL
FLOWLINE

NOTES:

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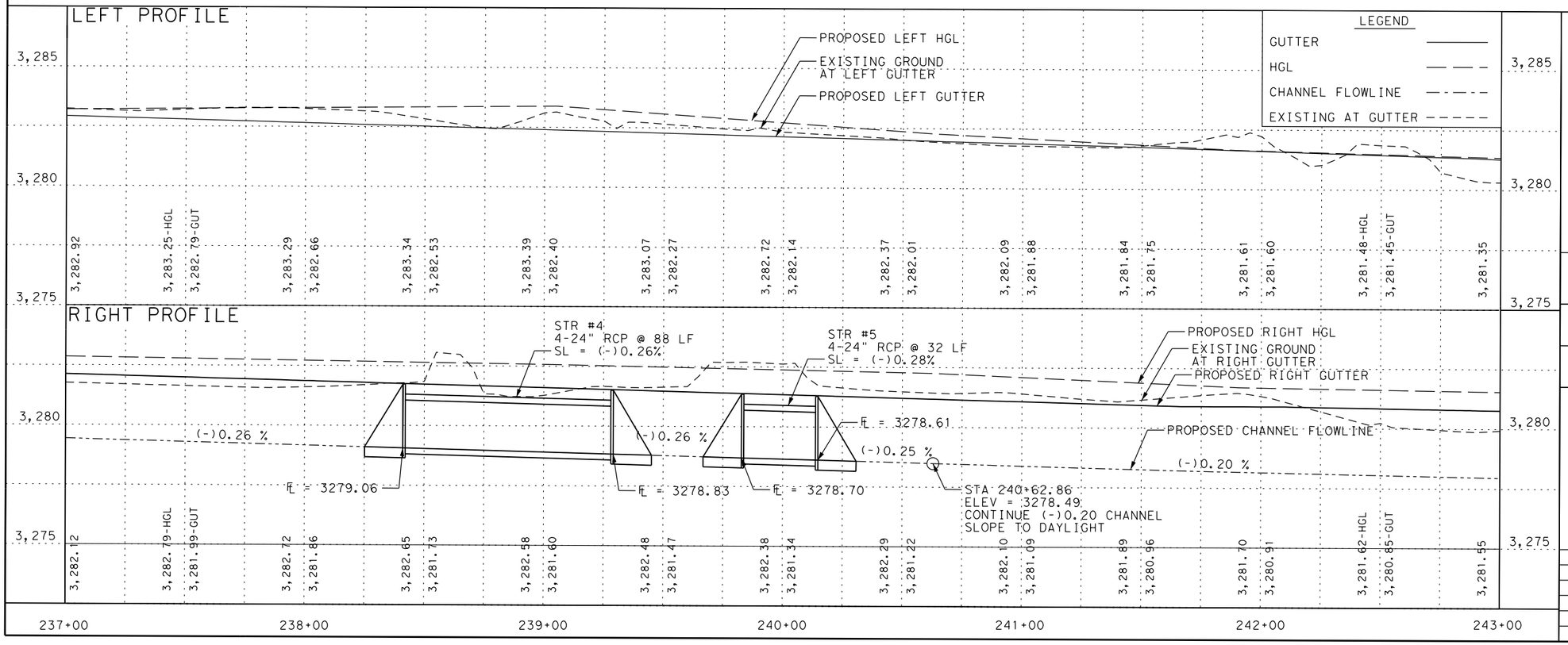
2. FOR OFFSITE DRAINAGE, SEE OVERALL DRAINAGE AREA MAP SHEET 117.
3. ALL REINFORCED CONCRETE PIPES ARE CLASS IV UNLESS OTHERWISE NOTED.
4. WATER SURFACE ELEVATIONS SHOWN ARE ESTIMATED FROM MODELING USING THE 100 YR, 24 HR DESIGN STORM EVENT USING PROPOSED ELEVATIONS OF THE ROADWAY DESIGN PROFILE AND TYPICAL SECTIONS.
5. REFER TO ROADWAY PLAN AND PROFILE SHEETS FOR MORE DETAILED INFORMATION ABOUT THE PROPOSED ROADWAY IMPROVEMENTS.
6. CONTRACTOR TO GRADE TO DRAIN.



STATE OF TEXAS
HEATHER RAE KEISTER
100095
LICENSED PROFESSIONAL ENGINEER
8/1/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

UPLAND AVENUE
66TH STREET TO 82ND STREET
STORM WATER ROUTING PLAN AND PROFILE

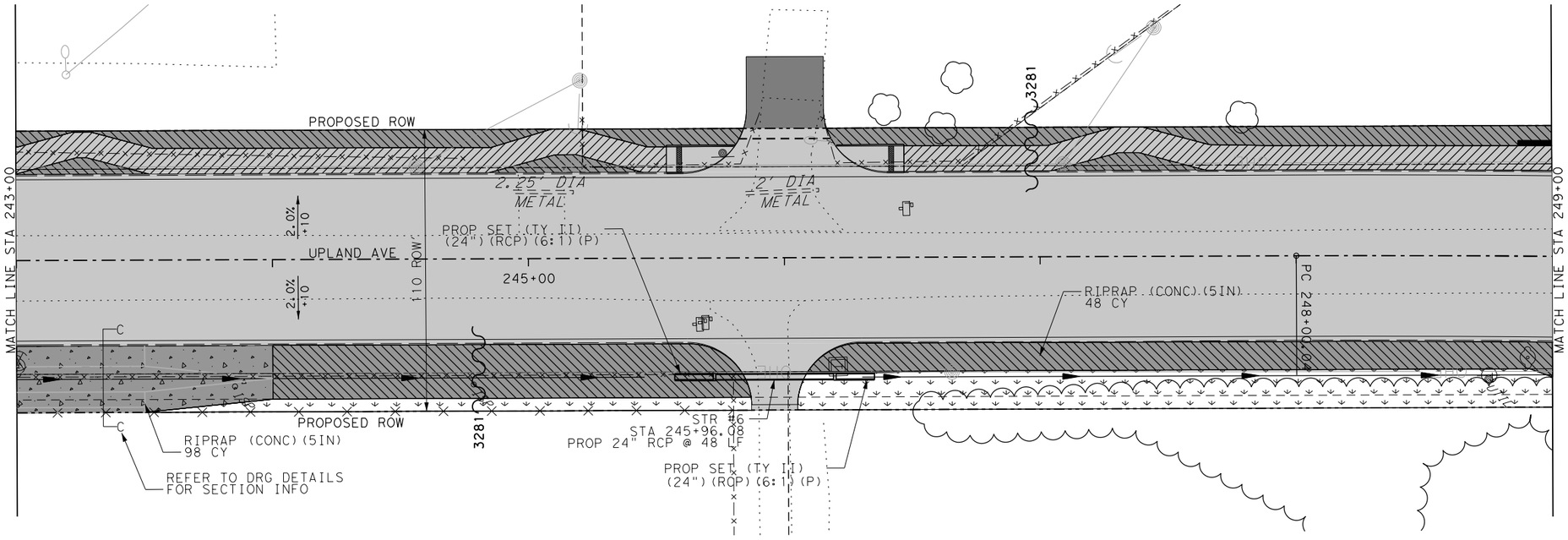
UPL STA 237+00 TO STA 243+00

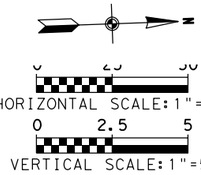
SHEET 5 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	142
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- PROP CULVERT
- PROP WSEL
- FLOWLINE

NOTES:

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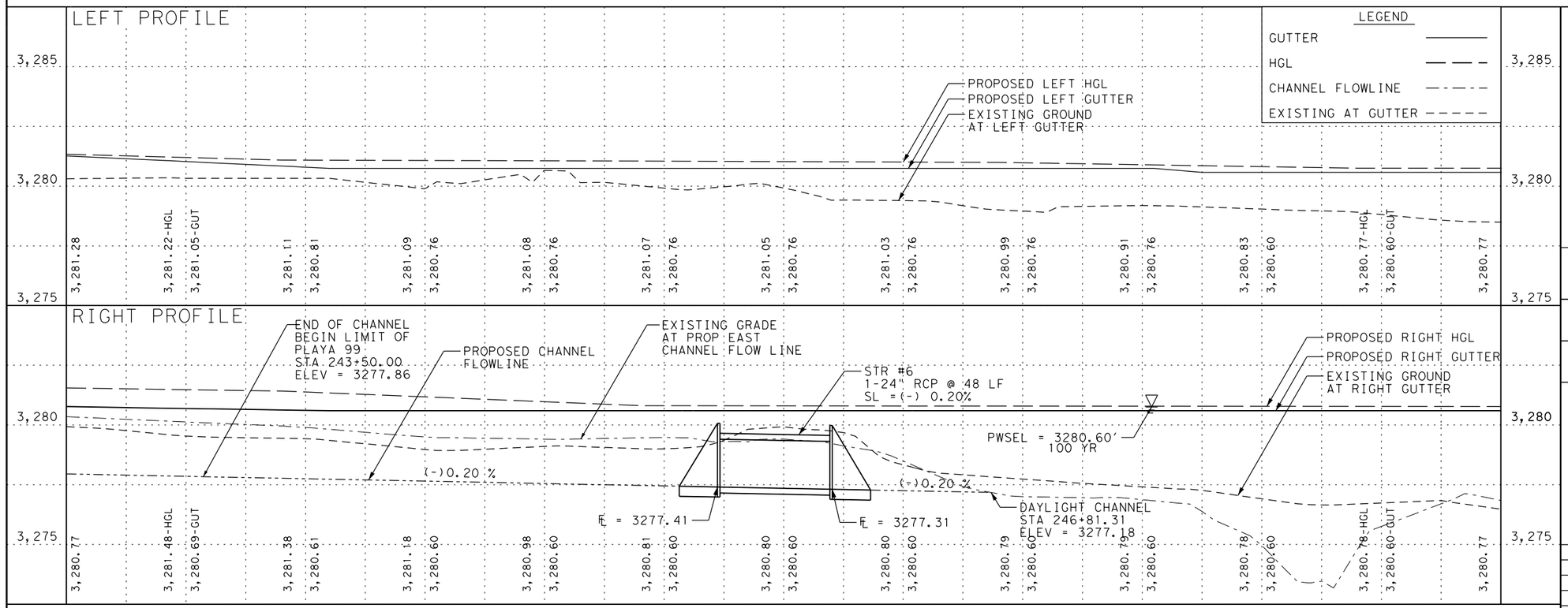
6. CONTRACTOR TO GRADE TO DRAIN.



8/1/2023

TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
STORM WATER ROUTING PLAN AND PROFILE

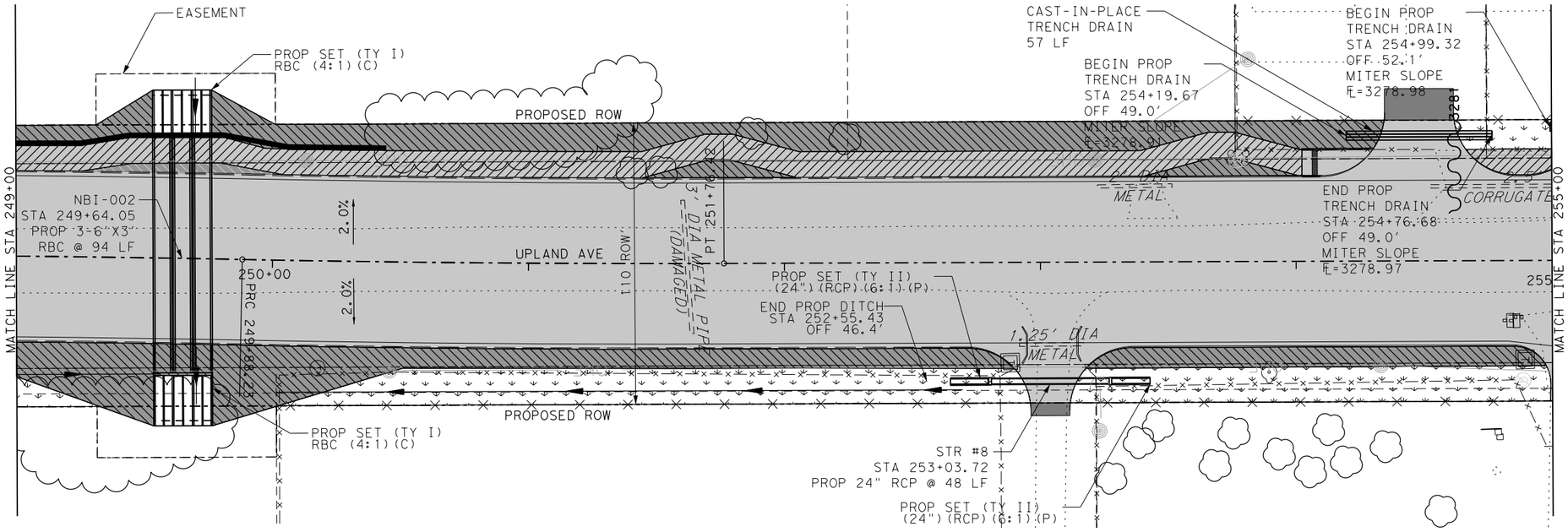
UPL STA 243+00 TO STA 249+00

SHEET 6 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	143
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



HORIZONTAL SCALE: 1"=50'
0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROP CULVERT
- PROP WSEL
- FLOWLINE

NOTES:

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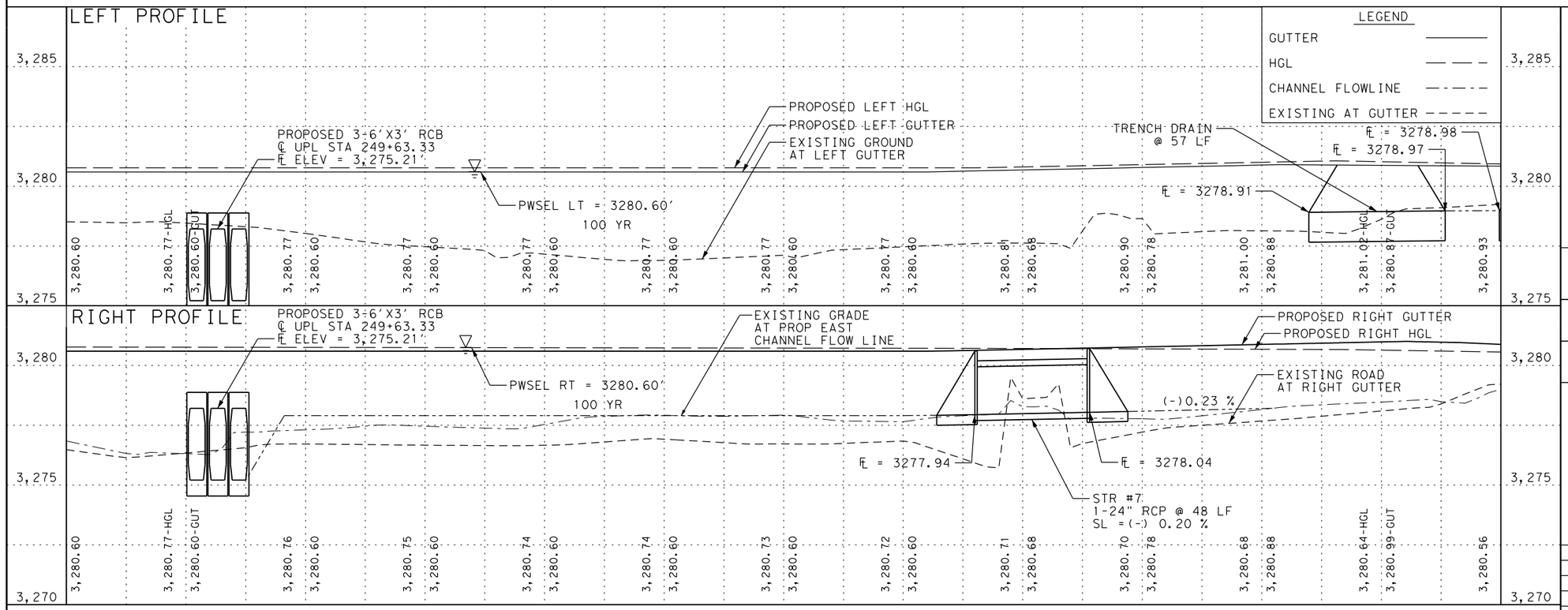
6. CONTRACTOR TO GRADE TO DRAIN.



HEATHER RAE KEISTER
100095
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
8/1/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
STORM WATER ROUTING PLAN AND PROFILE

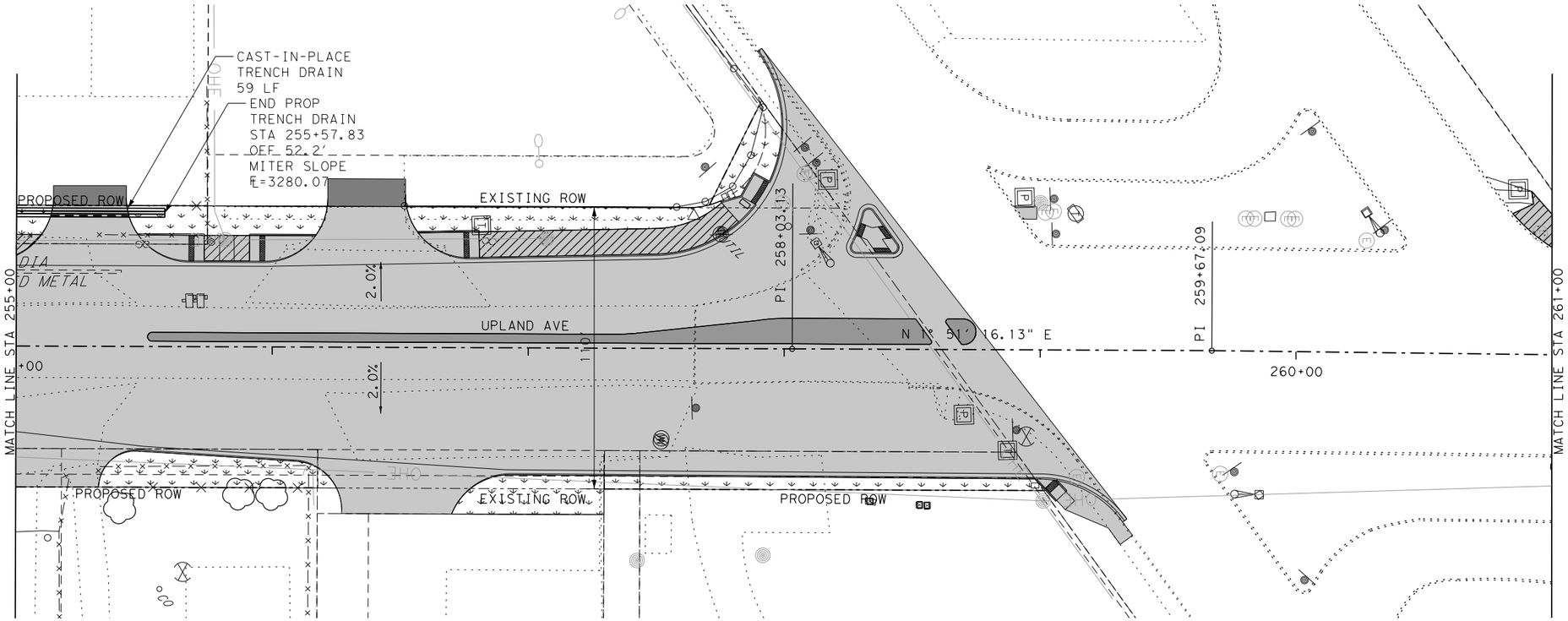
UPL STA 249+00 TO STA 255+00

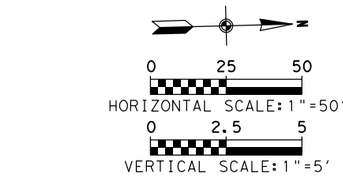
SHEET 7 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	144
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- PROP CULVERT
- PROP WSEL
- FLOWLINE

NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT VERSION OF THE CITY OF LUBBOCK MINIMUM DESIGN STANDARDS AND SPECIFICATIONS AND DRAINAGE CRITERIA MANUAL.
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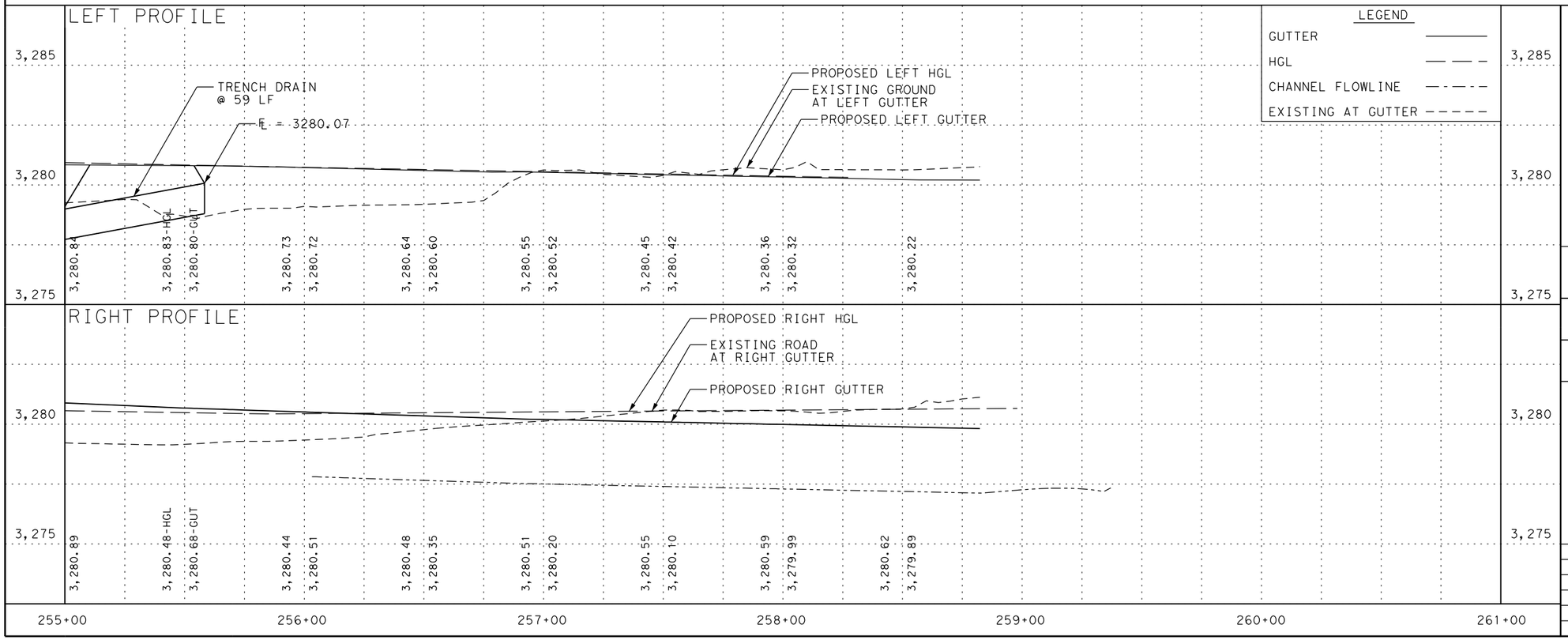
6. CONTRACTOR TO GRADE TO DRAIN.



LEGEND

- GUTTER
- HGL
- CHANNEL FLOWLINE
- EXISTING AT GUTTER

STATE OF TEXAS
HEATHER RAE KEISTER
100095
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8/1/2023

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FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
STORM WATER ROUTING PLAN AND PROFILE

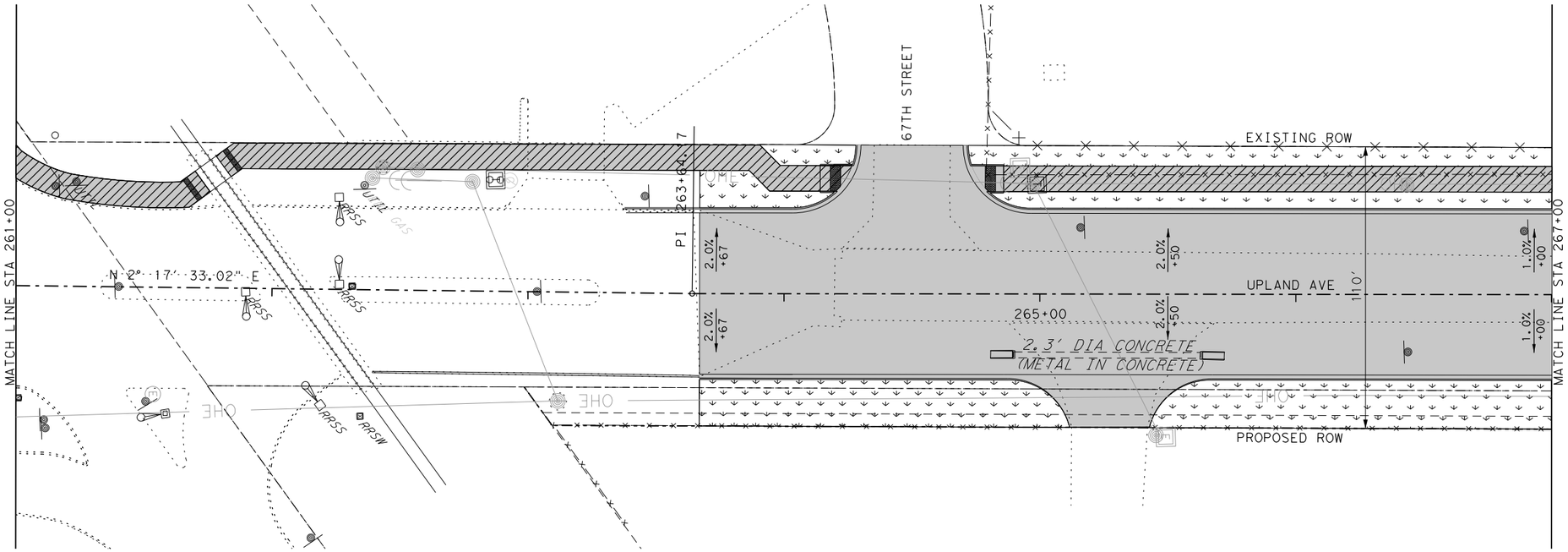
UPL STA 255+00 TO STA 261+00

SHEET 8 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	145
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 25 50
HORIZONTAL SCALE: 1"=50'
0 2.5 5
VERTICAL SCALE: 1"=5'

LEGEND

- PROP CULVERT
- PROP WSEL
- FLOWLINE

NOTES:

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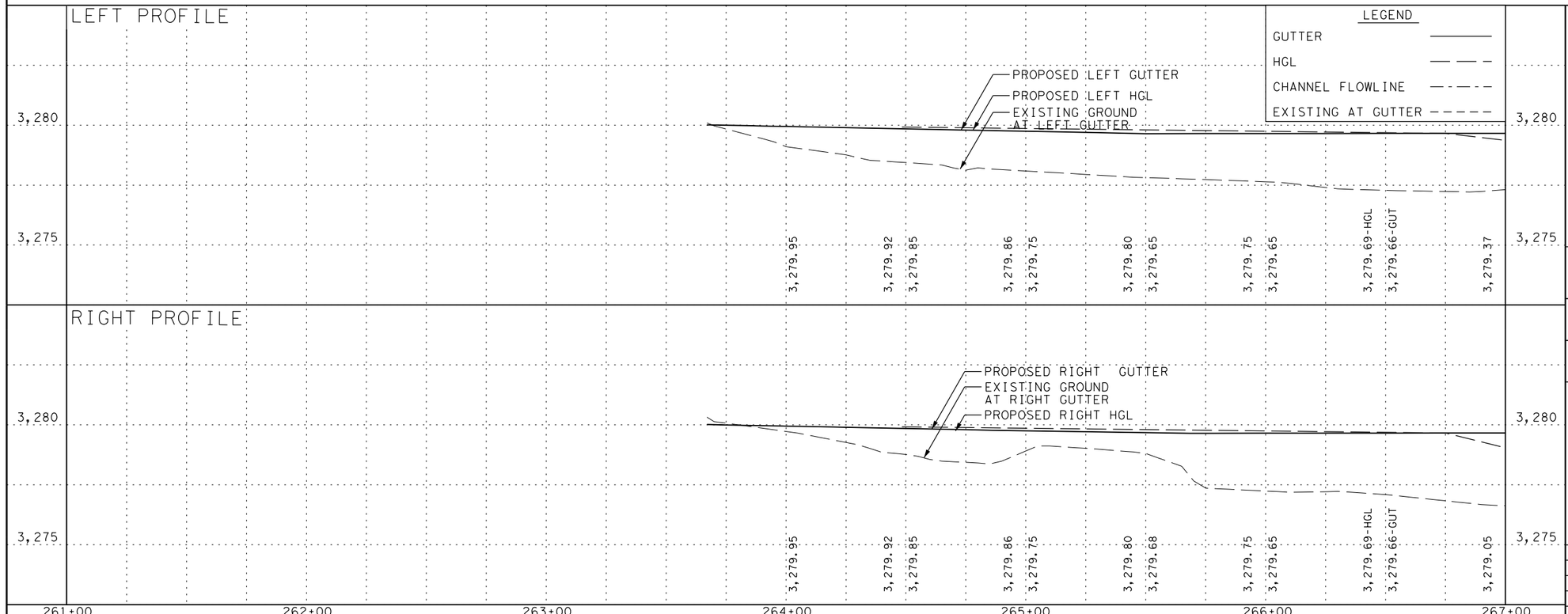

STATE OF TEXAS
HEATHER RAE KEISTER
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8/1/2023

TEXAS FIRM F-928
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TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
STORM WATER ROUTING PLAN AND PROFILE

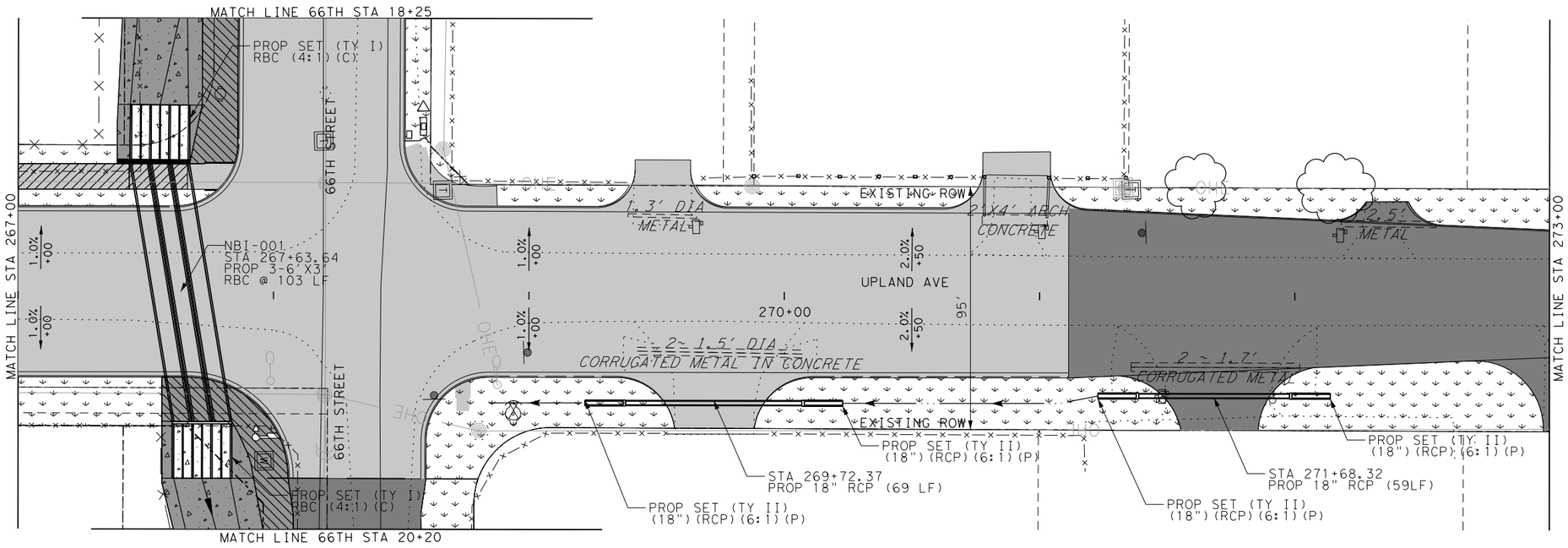
UPL STA 261+00 TO STA 267+00

SHEET 9 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	146
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 25 50

HORIZONTAL SCALE: 1"=50'

0 2.5 5

VERTICAL SCALE: 1"=5'

LEGEND

- PROP CULVERT
- PROP WSEL
- FLOWLINE

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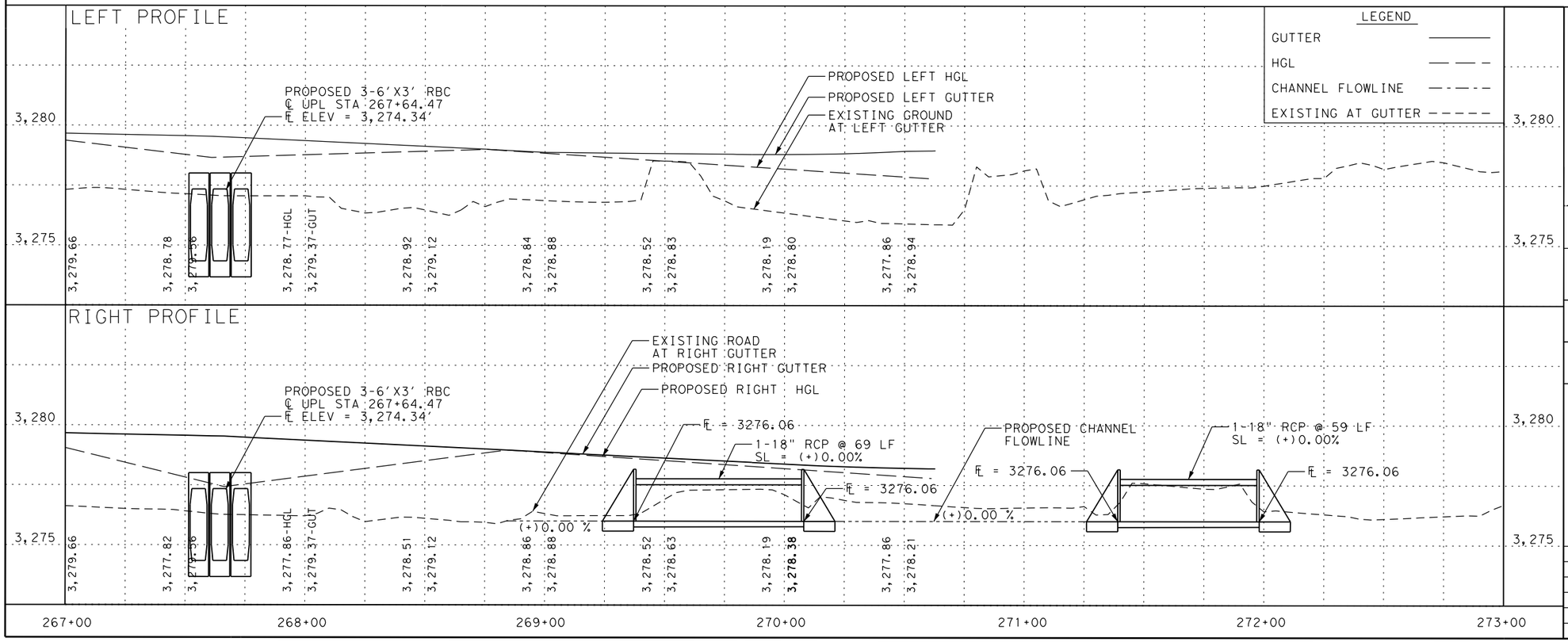


10/6/2023

Kimley»Horn TEXAS FIRM F-928

FREESE NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
STORM WATER ROUTING PLAN AND PROFILE

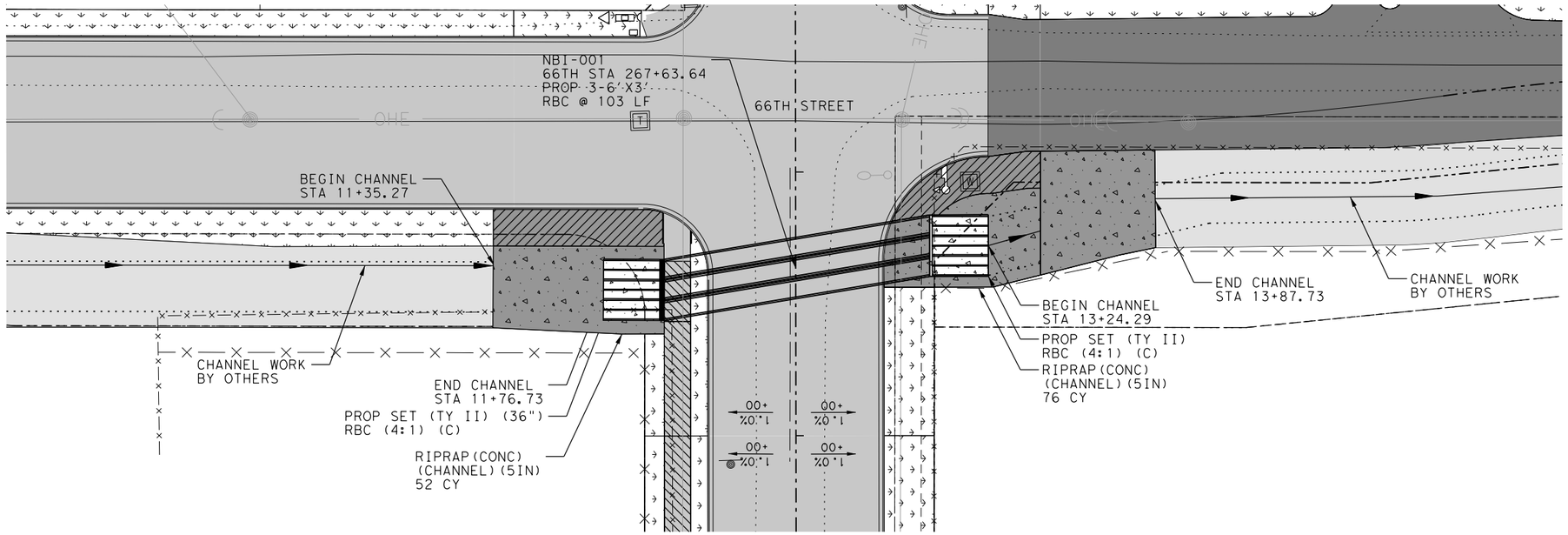
UPL STA 267+00 TO STA 273+00

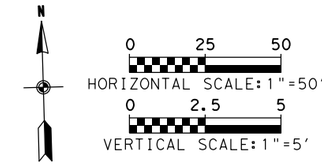
SHEET 10 OF 10

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	147
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





LEGEND

- PROP CULVERT
- PROP WSEL
- FLOWLINE

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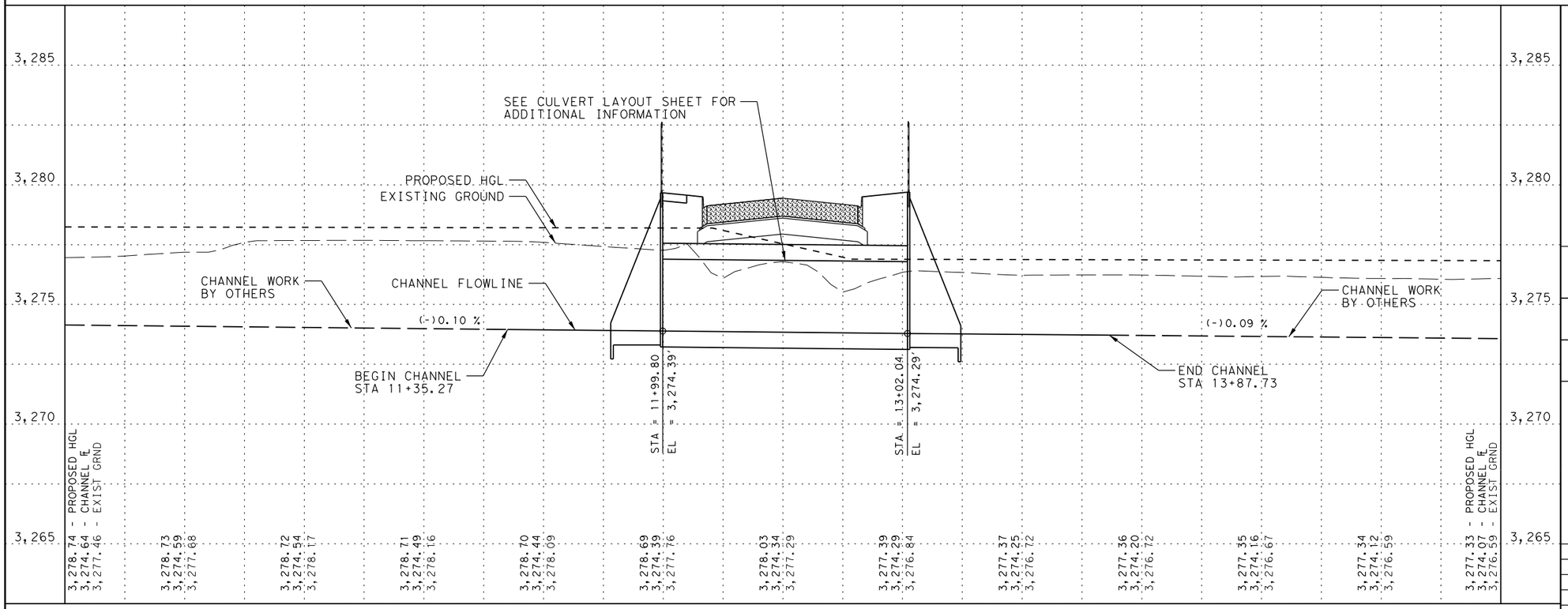

STATE OF TEXAS
HEATHER RAE KEISTER
100095
LICENSED
PROFESSIONAL ENGINEER

8/1/2023

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UPLAND AVENUE
66TH STREET TO 82ND STREET
STORM WATER ROUTING PLAN AND PROFILE

66TH ST CHANNEL STA 11+35.27 TO STA 13+92.61

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	148
CONT.	SECT.	JOB	
0905	06	095,ETC.	

100% SUBMITTAL

Beginning chain CL 66THCH description

Point 206	N	7,260,241.0328	E	909,111.5102	Sta	1+00.00
Course from 206 to 207 N 53° 41′ 42.88" E Dist 235.4289						
Point 207	N	7,260,380.4256	E	909,301.2375	Sta	3+35.43
Course from 207 to 208 S 88° 09′ 27.00" E Dist 799.8403						
Point 208	N	7,260,354.7090	E	910,100.6643	Sta	11+35.27
Course from 208 to 209 S 86° 48′ 19.09" E Dist 41.4567						
Point 209	N	7,260,352.3986	E	910,142.0565	Sta	11+76.73
Course from 209 to 210 S 87° 58′ 40.39" E Dist 23.0708						
Point 210	N	7,260,351.5846	E	910,165.1129	Sta	11+99.80
Course from 210 to 211 N 82° 18′ 10.14" E Dist 102.2398						
Point 211	N	7,260,365.2783	E	910,266.4315	Sta	13+02.04
Course from 211 to 212 S 88° 19′ 05.96" E Dist 22.2556						
Point 212	N	7,260,364.6252	E	910,288.6775	Sta	13+24.29
Course from 212 to 213 N 76° 39′ 00.48" E Dist 68.3187						
Point 213	N	7,260,380.3997	E	910,355.1501	Sta	13+92.61
Course from 213 to 214 S 88° 51′ 01.04" E Dist 85.5278						
Point 214	N	7,260,378.6836	E	910,440.6607	Sta	14+78.14
Course from 214 to 215 N 87° 52′ 26.60" E Dist 303.4651						
Point 215	N	7,260,389.9410	E	910,743.9169	Sta	17+81.60
Course from 215 to PC CL 66THCH1 N 88° 10′ 17.40" E Dist 65.6754						

Curve Data

Curve CL 66THCH1					
P.I. Station	18+90.91	N	7,260,393.4289	E	910,853.1720
Delta =	32° 26′ 23.09" (LT)				
Degree =	38° 11′ 49.87"				
Tangent =	43.6355				
Length =	84.9271				
Radius =	150.0000				
External =	6.2180				
Long Chord =	83.7973				
Mid. Ord. =	5.9705				
P.C. Station	18+47.28	N	7,260,392.0366	E	910,809.5588
P.T. Station	19+32.21	N	7,260,417.9987	E	910,889.2328
C.C.		N	7,260,541.9602	E	910,804.7726
Back = N	88° 10′ 17.40" E				
Ahead = N	55° 43′ 54.31" E				
Chord Bear = N	71° 57′ 05.85" E				

Course from PT CL 66THCH1 to 216 N 55° 43′ 54.31" E Dist 47.2192

Point 216	N	7,260,444.5863	E	910,928.2553	Sta	19+79.43
Course from 216 to 217 N 55° 43′ 54.31" E Dist 488.7184						
Point 217	N	7,260,719.7680	E	911,332.1372	Sta	24+68.14
Course from 217 to 218 N 60° 18′ 20.42" E Dist 100.3195						
Point 218	N	7,260,769.4636	E	911,419.2828	Sta	25+68.46
Course from 218 to 219 N 55° 43′ 54.30" E Dist 1,589.8894						
Point 219	N	7,261,664.6797	E	912,733.1840	Sta	41+58.35
Course from 219 to 220 N 50° 01′ 16.86" E Dist 100.4991						
Point 220	N	7,261,729.2505	E	912,810.1949	Sta	42+58.85
Course from 220 to 221 N 55° 43′ 52.70" E Dist 74.4224						
Point 221	N	7,261,771.1559	E	912,871.6980	Sta	43+33.27
Course from 221 to 222 N 61° 26′ 33.52" E Dist 100.4984						
Point 222	N	7,261,819.1980	E	912,959.9696	Sta	44+33.77
Course from 222 to 223 N 55° 43′ 54.28" E Dist 566.2554						
Point 223	N	7,262,138.0384	E	913,427.9290	Sta	50+00.03
Course from 223 to 224 N 59° 42′ 37.86" E Dist 100.2476						
Point 224	N	7,262,188.6002	E	913,514.4916	Sta	51+00.28
Course from 224 to 225 N 55° 44′ 00.27" E Dist 300.0608						
Point 225	N	7,262,357.5477	E	913,762.4699	Sta	54+00.34
Course from 225 to 226 N 51° 43′ 46.40" E Dist 100.2526						
Point 226	N	7,262,419.6416	E	913,841.1778	Sta	55+00.59
Course from 226 to PC CL 66THCH2 N 55° 44′ 00.27" E Dist 1,111.2658						

Curve Data

Curve CL 66THCH2					
P.I. Station	67+56.74	N	7,263,126.9099	E	914,879.2941
Delta =	39° 49′ 19.02" (LT)				
Degree =	14° 19′ 26.20"				
Tangent =	144.8847				
Length =	278.0097				
Radius =	400.0000				
External =	25.4310				
Long Chord =	272.4477				
Mid. Ord. =	23.9108				
P.C. Station	66+11.85	N	7,263,045.3335	E	914,759.5576
P.T. Station	68+89.86	N	7,263,266.2435	E	914,919.0145
C.C.		N	7,263,375.9041	E	914,534.3399
Back = N	55° 44′ 00.27" E				
Ahead = N	15° 54′ 41.24" E				
Chord Bear = N	35° 49′ 20.76" E				

Course from PT CL 66THCH2 to 227 N 15° 54′ 41.24" E Dist 125.4319

Point 227	N	7,263,386.8697	E	914,953.4018	Sta	70+15.30

Ending chain CL 66THCH description

NOTE: CL 66THCH (66TH ST CHANNEL) ALIGNMENT DATA
FROM STA 1+00 TO STA 11+35.27 AND STA 13+92.61
TO STA 70+15.30 IS SHOWN FOR INFORMATION ONLY.
CHANNEL CONSTRUCTION FROM STA 11+35.27 TO STA 13+87.73
SHALL BE CONSTRUCTED WITH THIS PROJECT.

Beginning chain UPL1*CULV*C1 description

Point 3000	N	7,258,564.5078	E	910,033.0745	Sta	0+00.00
Course from 3000 to 3001 S 88° 10′ 18.00" E Dist 240.0000						
Point 3001	N	7,258,556.8506	E	910,272.9523	Sta	2+40.00

Ending chain UPL1*CULV*C1 description

STATE OF TEXAS
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8/1/2023

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TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET
CULVERT ALIGNMENT DATA

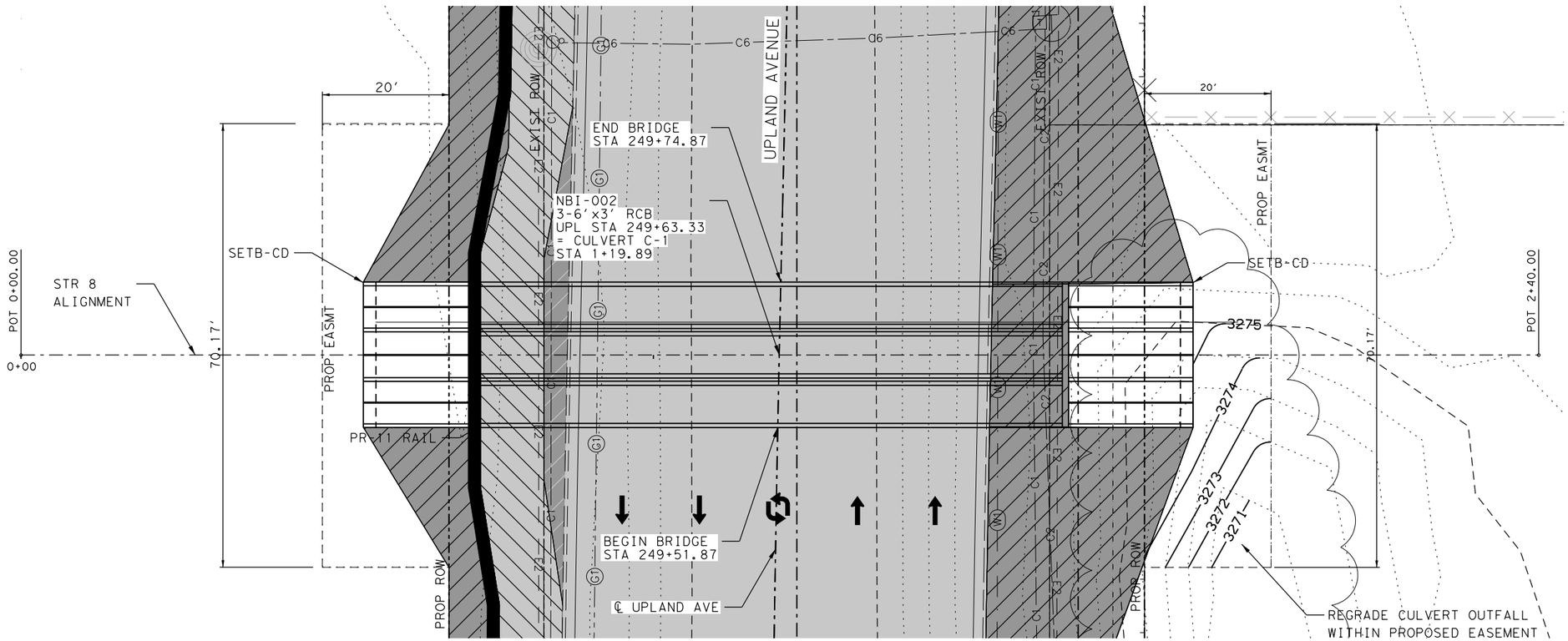
66TH STREET CHANNEL

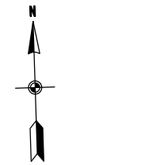
SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	149
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

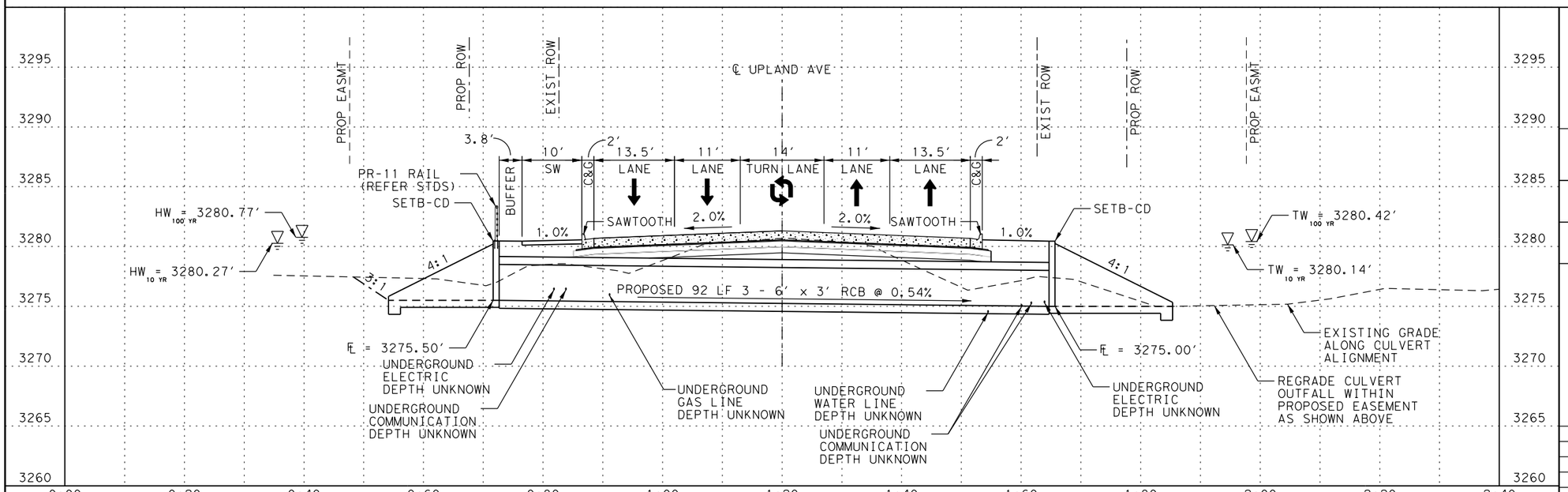




NOTE:
CONTRACTOR MAY USE TEMPORARY SPECIAL SHORING IN THE INSTANCE WHERE WATER LEVELS MAY IMPACT CONSTRUCTION OF THIS CULVERT.

HW 10 YR =	3280.27'
HW 100 YR =	3280.77'
TW 10 YR =	3280.14'
TW 100 YR =	3280.42'
V 10 YR =	4.54 FT/S
V 100 YR =	7.52 FT/S

NBI 05-152-0-B004-69-002



STATE OF TEXAS
HEATHER RAE KEISTER
100095
LICENSED
PROFESSIONAL ENGINEER
8/1/2023

TEXAS FIRM F-928
Kimley»Horn

FREESE AND NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET

CULVERT LAYOUT
CULVERT C-1

UPL STA 249+63.33

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	150
CONT.	SECT.	JOB	
0905	06	095, ETC.	

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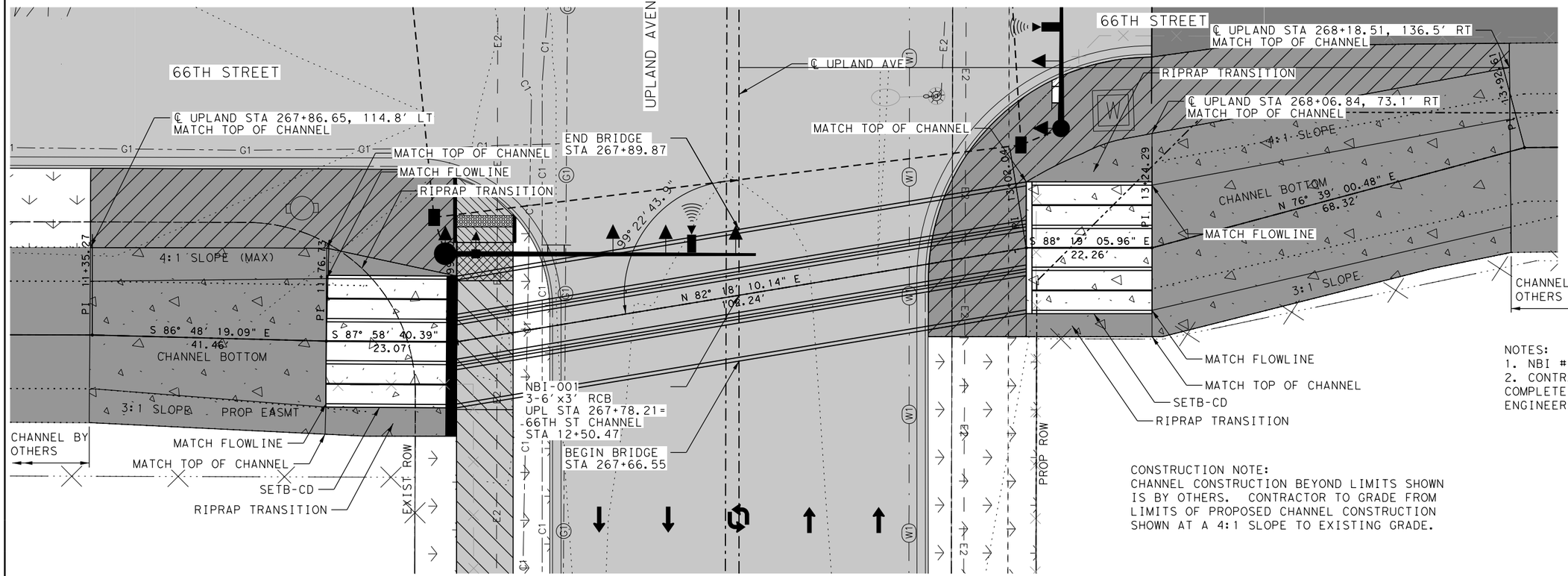


N

0 10 20
HORIZONTAL SCALE: 1"=20'

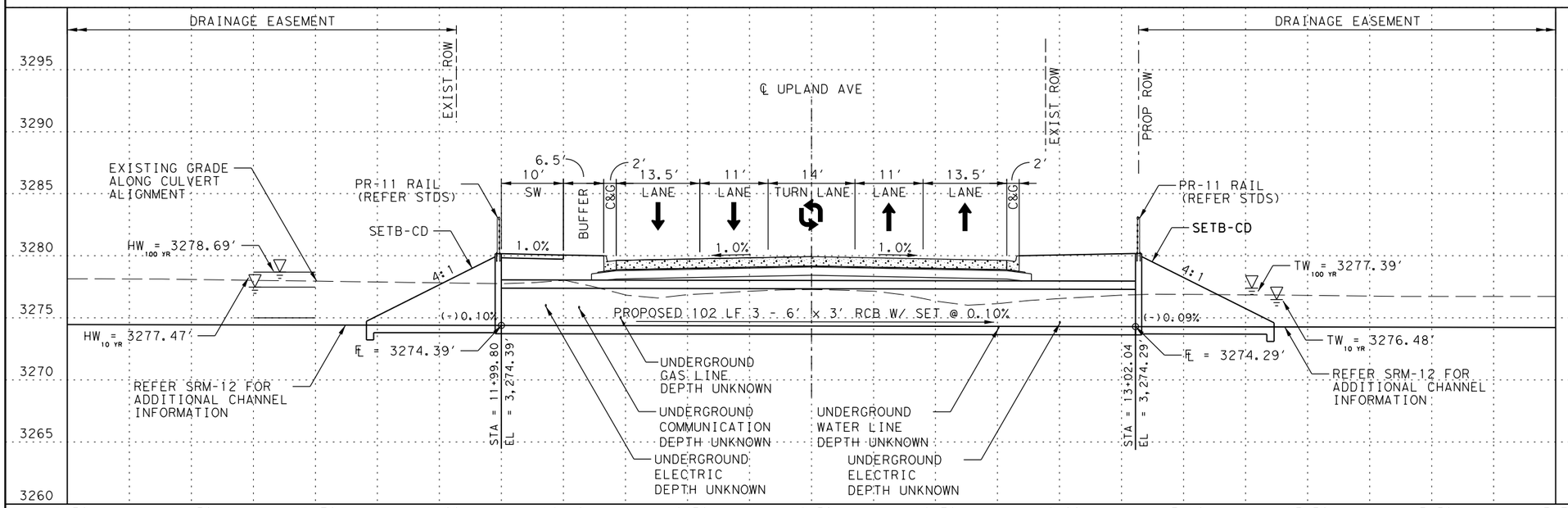
0 5 10
VERTICAL SCALE: 1"=10'

NOTES:
1. NBI # 05-152-0-B004-69-001
2. CONTRACTOR SHALL PAINT NBI # ON COMPLETED CULVERT STRUCTURE, PER ENGINEER'S DIRECTION

CONSTRUCTION NOTE:
CHANNEL CONSTRUCTION BEYOND LIMITS SHOWN IS BY OTHERS. CONTRACTOR TO GRADE FROM LIMITS OF PROPOSED CHANNEL CONSTRUCTION SHOWN AT A 4:1 SLOPE TO EXISTING GRADE.

HW 10 YR	= 3278.47'
HW 100 YR	= 3278.69'
TW 10 YR	= 3276.48'
TW 100 YR	= 3277.39'
V 10 YR	= 5.78 FT/S
V 100 YR	= 7.67 FT/S

NBI 05-152-0-B004-69-001



STATE OF TEXAS
HEATHER RAE KEISTER
100095
LICENSED PROFESSIONAL ENGINEER

9/29/2023

TEXAS FIRM F-928
Kimley»Horn

FREESE AND NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation

UPLAND AVENUE
82ND STREET TO 66TH STREET

CULVERT LAYOUT
CULVERT C-2

UPL STA 267+64.47

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	151
CONT.	SECT.	JOB	
0905	06	095, ETC.	

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 Height of Wingwall (1) (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 (CY)	Class "C" Conc (Curb) (2) (CY)	Class "C" Conc (Wingwall) (3) (CY)	Total Wingwall Area (SF)
CULVERT C-1 LT	3~6X3	1.57	SCP-6	SETB-CD	0	4:1	8	7	1.297	4.708	N/A	N/A	17.500	N/A	22.500	0.0	1.1	12.9	N/A
CULVERT C-1 RT	3~6X3	1.57	SCP-6	SETB-CD	0	4:1	8	7	1.778	5.188	N/A	N/A	19.417	N/A	22.500	0.0	1.5	14.6	N/A
CULVERT C-2 LT	3~6X3	1.18	SCP-6	SETB-CD	0	4:1	8	7	2.110	5.521	N/A	N/A	20.750	N/A	22.500	0.0	1.8	15.9	N/A
CULVERT C-2 RT	3~6X3	1.18	SCP-6	SETB-CD	0	4:1	8	7	2.232	5.646	N/A	N/A	21.250	N/A	22.500	0.0	1.9	16.4	N/A

DATE:
FILE:

NOTES:
Skew = 0° on SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standard sheets;
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 must 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 sheet.

U = Box culvert wall thickness. Dimension can be found on the applicable box culvert standard sheet.

C = Curb height

See applicable wing or end treatment standard sheets 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 sq. ft. for two wingwalls (one structure end) if Lt or Rt.
Area for four wingwalls (two structure ends) if Both.

(1) Round the wall heights shown to the nearest foot for bidding purposes.

(2) Concrete volume shown is for box culvert curb only. For curbs using the Box Culvert Rail Mounting Details (RAC) standard sheet quantities shown must be increased by a factor of 2.25. If Class S concrete is required for the top slab of the culvert, also provide Class S concrete for the curb. Curb concrete is considered part of the Box Culvert for payment.

(3) Concrete volume shown is total of wings, footings, culvert toewall (if any), anchor toewalls (if any) and wingwall toewalls. Riprap aprons, culverts, and curb quantities are not included.

(4) Regardless of the type of culvert shown on this sheet, the Contractor has 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 is the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

SPECIAL NOTE:

This sheet is a supplement to the box culvert standards. It is to be filled out by the culvert specifier and provides dimensions for the construction of the box culvert wingwalls and safety end treatments.

An Excel 2010 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.

STATE OF TEXAS
HEATHER RAE KEISTER
100095
LICENSED
PROFESSIONAL ENGINEER
8/1/2023

Texas Department of Transportation

Bridge Division Standard

BOX CULVERT SUPPLEMENT
WINGS AND END TREATMENTS

BCS

FILE: bcsstde1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		152

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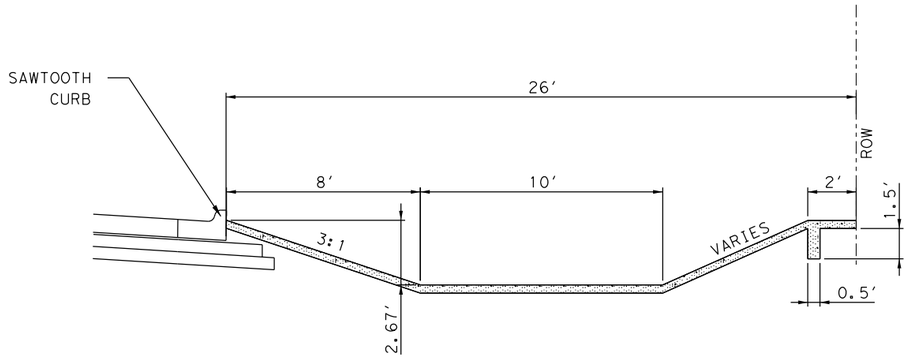
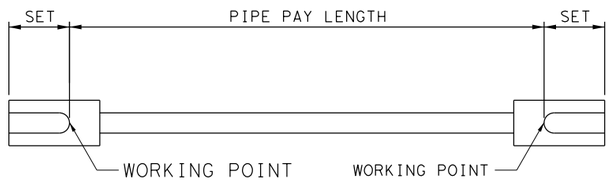
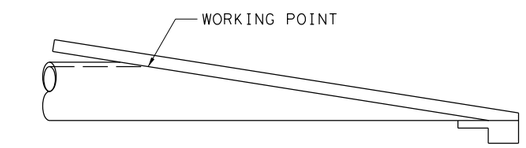


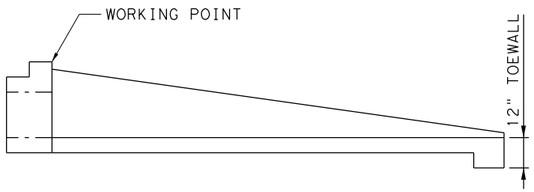
SECTION C
STA 227+99.56 TO STA 243+50



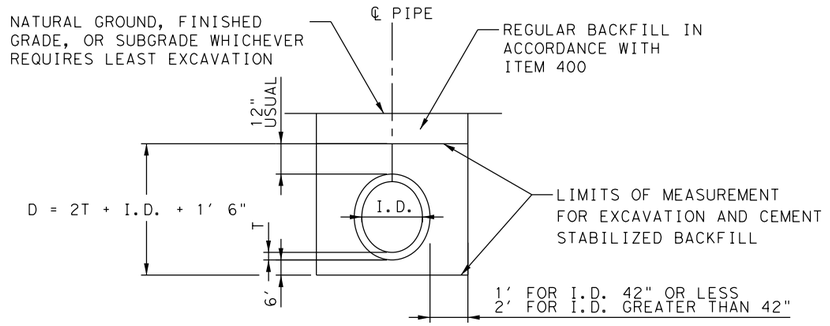
PIPE LENGTH DETAIL
(CAST-IN-PLACE TY II SET SHOWN)



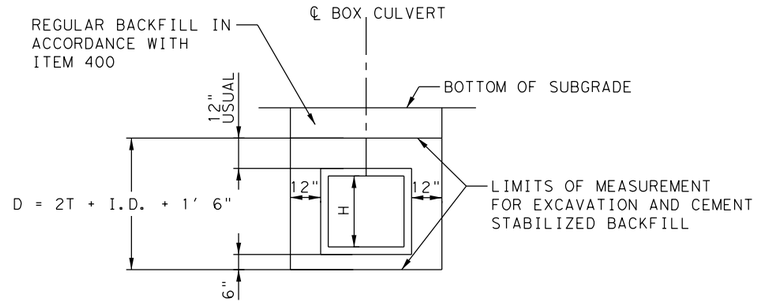
TYPE II CAST IN PLACE OPTION



TYPE II PRECAST OPTION



EXCAVATION & BACKFILL DETAIL
REINFORCED CONCRETE PIPE
IN A GRADED OR PAVED AREA
INCLUDING DETOURS



BACKFILL DETAIL
BOX CULVERTS
IN A GRADED OR PAVED AREA
INCLUDING DETOURS

STATE OF TEXAS
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8/1/2023

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FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

DRAINAGE DETAILS

SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	153
CONT.	SECT.	JOB	
0905	06	095, ETC.	

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UPLAND AVENUE AND PARALLEL CHANNEL HYDRAULIC SUMMARY

LT - 100-year FFD							RT - 100-year FFD						
Station	West Upstream Node Order				Post-Project		Station	East Upstream Node Order				Post-Project	
		PROP DITCH EL	PROP GL EL	FLOW (cfs)	WSE	Depth			PROP DITCH EL	PROP GL EL	FLOW (cfs)	WSE	Depth
268+44	UPL066-CW		3279.15	695.27	3278.69	-0.46	268+43	UPL066-CE		3279.16	827.70	3277.39	-1.77
258+30	UPLMSF-SW		3280.26	0.00	3280.3	0.04	258+98	UPLMSF-SE		3279.94	7.53	3280.66	0.72
255+81	UPLMSF-1-CW		3280.76	0.00	3280.77	0.01	255+84	UPLMSF-1-CE		3280.56	0.00	3280.43	-0.13
254+31	UPLMSF-2-CW		3281.06	0.00	3281.06	0.00	254+34	UPLMSF-2-CE		3281.05	0.00	3280.67	-0.38
252+81	UPLMSF-3-CW		3280.64	0.01	3280.77	0.13	252+84	UPLMSF-3-CE		3280.65	0.00	3280.72	0.07
251+31	UPLMSF-4-CW		3280.60	0.00	3280.77	0.17	251+34	UPLMSF-4-CE		3280.60	0.00	3280.74	0.14
249+90	UPLMSF-5-CW		3280.60	0.01	3280.77	0.17	249+92	UPLMSF-5-CE		3280.60	0.00	3280.76	0.16
248+40	PL099-CW		3280.60	0.00	3280.77	0.17	248+41	PL099-CE	3276.94	3280.60	0.00	3280.78	0.18
246+90	UPL073-3-CW		3280.76	0.76	3281.01	0.25	246+91	UPL073-3-CE	3277.24	3280.60	11.79	3280.79	0.19
245+40	UPL073-2-CW		3280.76	0.94	3281.07	0.31	245+41	UPL073-2-CE	3277.54	3280.60	11.96	3280.81	0.21
243+90	UPL073-1-CW		3280.86	1.20	3281.11	0.25	243+91	UPL073-1-CE	3277.84	3280.63	66.03	3281.42	0.79
241+90	UPL073-CW		3281.63	0.00	3281.64	0.01	241+91	UPL073-CE	3278.24	3280.91	129.61	3281.71	0.80
239+05	UPL074-CW		3282.39	59.34	3283.39	1.00	239+06	UPL074-CE	3278.92	3281.59	403.07	3282.57	0.98
236+19	UPL076-3-CW		3283.13	0.00	3283.13	0.00	236+19	UPL076-CE	3279.66	3282.33	269.04	3282.97	0.64
							235+70	UPL076-1-CE	3279.86	3282.53	281.50	3283.09	0.56
235+50	UPL076-1.1-CW		3283.39	2.03	3283.67	0.28	235+00	UPL076-1.1-CE	3280.25	3282.92	245.57	3283.1	0.18
233+47	UPL076-1.2-CW		3283.82	56.80	3284.83	1.01	233+47	UPL076-1.2-CE	3281.00	3283.67	245.74	3283.41	-0.26
232+74	UPL076-2-CW		3284.07	101.40	3285.04	0.97	232+75	UPL076-2-CE	3281.40	3284.07	192.30	3283.52	-0.55
230+50	UPL076-2.1-CW		3285.45	18.57	3285.98	0.53							
230+36	UPL077-CW		3285.59	18.63	3286.13	0.54	230+36	UPL077-CE	3282.71	3285.38	158.78	3284.45	-0.93
							230+00	UPL077.1-CE	3282.94	3285.61	155.42	3284.65	-0.96
227+53	UPL078-CW		3287.80	23.57	3288.4	0.60	227+52	UPL078-CE	3285.76	3287.04	153.30	3287.48	0.44
224+62	UPL079-CW		3289.40	58.09	3290.26	0.86	224+62	UPL079-CE		3289.40	1.74	3289.55	0.15
221+79	UPL080-CW		3292.13	67.14	3292.97	0.84	221+78	UPL080-CE		3292.03	0.00	3292.03	0.00
217+70	UPL082-NW		3294.67	0.00	3294.67	0.00	217+70	UPL082-NE		3294.33	0.13	3294.4	0.07

HYDROLOGIC DATA SUMMARY TABLE

SUB-BASIN ID	DRAINAGE AREA (AC)	NRCS URBANIZED FULLY DEVELOPED CURVE NUMBER	TIME OF CONCENTRAITON (MIN)	100-YR PEAK FLOW FULLY DEVEOPED (CFS)
E106-1	164	86.5	19	881
E106-2	134	83.0	28	563
E106-3	145	82.6	39	495
E106-4	64	98.0	14	439
E106-5	154	88.3	20	812
E106-6	57	85.8	31	234
E106-7	159	87.2	14	966
E401-1	75	98.0	53	258
E401-2	51	85.5	57	53
E401-3	15	85.6	33	53
E401-4	20	87.5	18	200
E401-5	45	84.2	29	120
E401-6	62	98.0	58	67
E401-7	9	84.9	27	139
E401-8	14	88.6	33	62
E401-9	11	98.0	17	124
E401-10	9	92.8	13	208
E401-11	13	86.6	33	171
E401-12	58	88.7	42	39
E401-13	28	86.0	28	55
E401-14	9	84.9	7	58
E405-1	39	98.0	80	99
E405-2	109	98.0	41	445
E405-3	31	90.2	29	142
E405-4	58	95.2	29	279
E405-5	79	96.3	29	384
E405-6.1	14	83.6	8	91
E405-6.2	20	85.4	13	119
E405-7.1	12	88.6	8	80
E405-7.2	22	86.8	9	146
E405-8.1	33	89.3	10	223
E405-8.2	19	84.5	13	115
E405-9	11	87.0	9	70

PONDING WIDTHS

STATION	WIDTH	RT/LT
STA 227+50.00	45.78'	RT
STA 235+50.00	42.56'	RT
STA 239+00.00	75.35'	RT/LT

NRCS TYPE II DESIGN STORM RAINFALL TOTALS (24-HOUR EVENT)

RETURN PERIOD (YEARS)	TP-40 PRECIPITATION DEPTH (INCHES)
2	2.80
5	3.80
10	4.60
25	5.30
50	6.00
100	6.80
500	8.38

NOTES:

1. INTERCONNECTED POND ROUTING (ICPR) VERSION 4 SOFTWARE USED FOR ALL HYDROLOGIC AND HYDRAULIC SIMULATIONS

2. ALL STORM EVENTS ARE 24-HR DURATION.

3. FUTURE FULLY DEVELOPED HYDROLOGIC CONDITIONS WERE USED FOR DESIGN.

REFERENCES:

1. CITY OF LUBBOCK MASTER DRAINAGE PLAN 2018 UPDATE.

2. CITY OF LUBBOCK DRAINAGE CRITERIA MANUAL.

3. CITY OF LUBBOCK 2016 LIDAR DATA.

CULVERT SUMMARIES

66TH STREET CULVERT HYDRAULIC DATA		
STORM	10 YEAR	100 YEAR
Q (CFS)	268.41	413.99
V (FPS)	5.78	7.67
UPSTREAM PWSE (FT)	3277.47	3278.69
DOWNSTREAM PWSE (FT)	3276.48	3277.39

PLAYA LAKE 099 CULVERT HYDRAULIC DATA		
STORM	10 YEAR	100 YEAR
Q (CFS)	245.16	406.22
V (FPS)	4.54	7.52
UPSTREAM PWSE (FT)	3280.14	3280.77
DOWNSTREAM PWSE (FT)	3280.27	3280.42

PLAYA LAKE SUMMARY

PLAYA LAKE NUMBER	DESIGN INITIAL W/S ELEVATION	ESTIMATED OVERFLOW ELEVATION	PEAK WATER SURFACE ELEVATION (NAVD)				
	(NAVD)	(NAVD)	5-YEAR	10-YEAR	25-YEAR	50-YEAR	100-YEAR
L099	3278.4	3278.4		3280.21			3280.60
L100	3270.0	3277.9		3277.36			3278.80

NOTES:

L099 INITIAL WATER SURFACE ELVATION FROM MDP
L100 INITIAL WATER SURFACE ELEVATION ASSUMES APPROXIMATELY 120 AC-FT OF EXCAVATION
L100 PEAK WATER SURFACE ELEVATION ASSUMES POST 66TH STREET CHANNEL CONSTRUCTION
L099 AND L100 WERE MODELED USING FUTURE FULLY DEVELOPED DESIGN CONDITIONS

STATE OF TEXAS
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8/1/2023

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UPLAND AVENUE
66TH STREET TO 82ND STREET

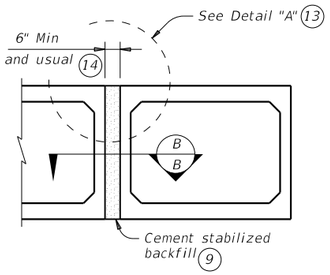
HYDROLOGIC DESIGN DATA

UPL STA 215+61.35 TO STA 275+74.23

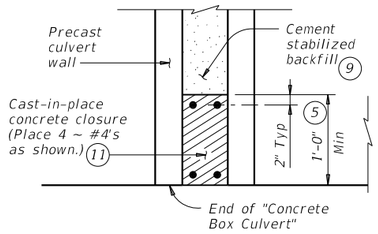
FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	154
CONT.	SECT.	JOB	
0905	06	095,ETC.	

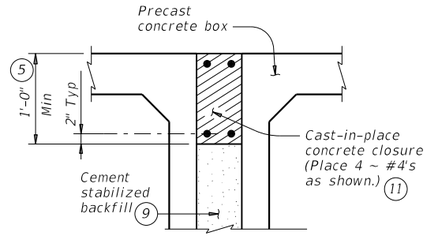
DATE:
FILE:



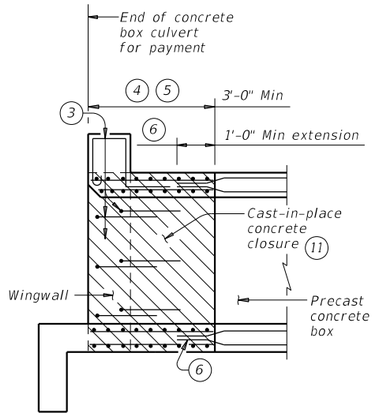
MULTIPLE UNIT PLACEMENT



SECTION B-B

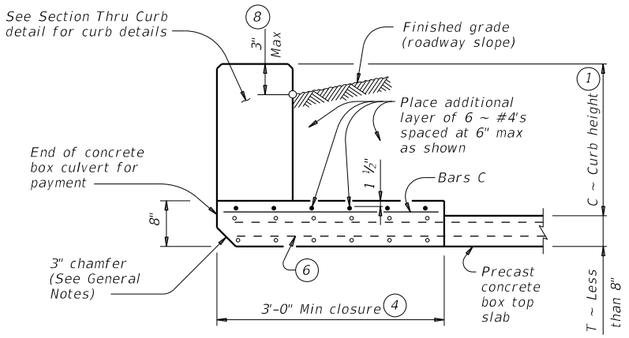


DETAIL "A" (13)

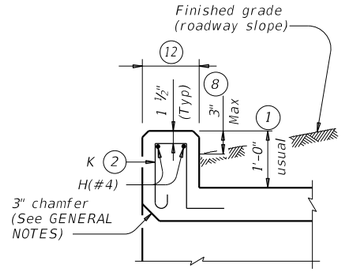


WINGWALL CONNECTION

(Also applies to safety end treatment.)

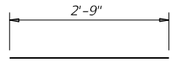


SECTION THRU TOP SLABS LESS THAN 8"

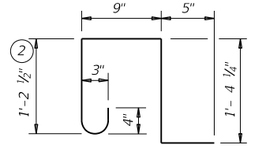


SECTION THRU CURB

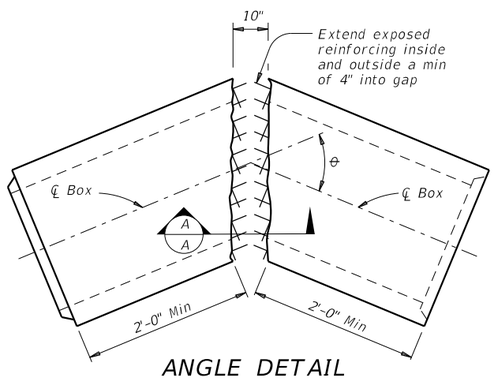
QUANTITIES PER FOOT OF CURB (10)	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY



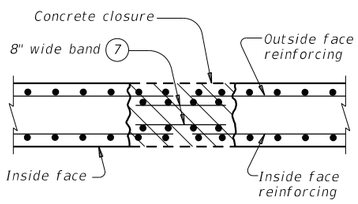
BARS C (#4)
(Spa = 1'–0" Max)



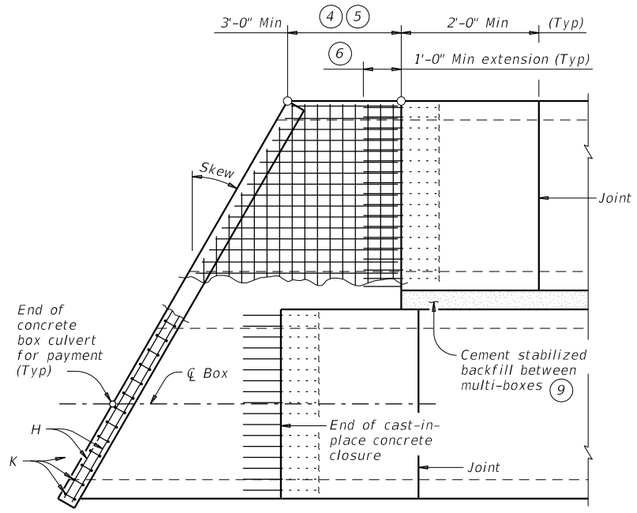
BARS K (#4)
(Spa = 1'–0" Max)
(Length = 4'–2")



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi-box placement.)

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 the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631–CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
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. Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.
4. Provide a 3'–0" Min cast–in–place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast–in–place closure flush with the inside and outside faces of the precast box section.
5. For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'–0" Min cast–in–place closure in the top slab, bottom slab, and exterior wall. See Section B–B detail when interior walls are cast full length.
6. Extend precast box reinforcing a minimum of 1'–0" into concrete closure (Typ).
7. Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.
8. For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, construct curbs no more than 3" above finished grade.
   - For structures with bridge rail, construct curbs flush with finished grade.

   Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
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 will be considered subsidiary to the box culvert for payment.
12. 1'–0" typical. 2'–3" when the Box Culvert Rail Mounting Details (RAC) standard sheet 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.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide ASTM A1064 welded wire reinforcement.
Provide Class C concrete (f'c = 3,600 psi) for the closures.
Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
Any additional concrete required for the closures will be considered subsidiary to the box culvert.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bars dimensions are out–to–out of bars.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

FILE: scpmdsts-20.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095, ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		155

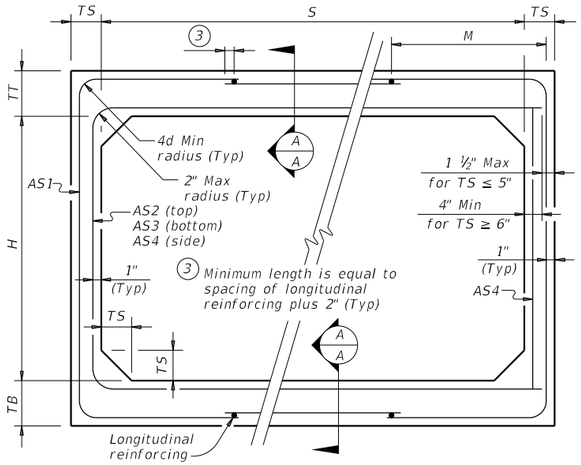
DATE:
FILE:

BOX DATA

SECTION DIMENSIONS					Fill Height	M (Min)	REINFORCING (sq. in. / ft.) (2)							(1) Lift Weight
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	(ft.)	(in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	(tons)
6	2	8	7	7	< 2	–	0.23	0.27	0.19	0.17	0.19	0.19	0.17	7.2
6	2	7	7	7	2 < 3	43	0.25	0.21	0.17	0.17	–	–	–	6.8
6	2	7	7	7	3 – 5	43	0.20	0.17	0.17	0.17	–	–	–	6.8
6	2	7	7	7	10	39	0.20	0.17	0.17	0.17	–	–	–	6.8
6	2	7	7	7	15	39	0.26	0.20	0.20	0.17	–	–	–	6.8
6	2	7	7	7	20	39	0.34	0.26	0.26	0.17	–	–	–	6.8
6	2	7	7	7	25	39	0.43	0.32	0.32	0.17	–	–	–	6.8
6	2	7	7	7	30	39	0.52	0.38	0.39	0.17	–	–	–	6.8
6	3	8	7	7	< 2	–	0.20	0.31	0.22	0.17	0.19	0.19	0.17	7.9
6	3	7	7	7	2 < 3	43	0.21	0.24	0.19	0.17	–	–	–	7.5
6	3	7	7	7	3 – 5	39	0.17	0.18	0.17	0.17	–	–	–	7.5
6	3	7	7	7	10	39	0.17	0.18	0.19	0.17	–	–	–	7.5
6	3	7	7	7	15	38	0.22	0.24	0.24	0.17	–	–	–	7.5
6	3	7	7	7	20	38	0.28	0.31	0.31	0.17	–	–	–	7.5
6	3	7	7	7	25	38	0.35	0.38	0.39	0.17	–	–	–	7.5
6	3	7	7	7	30	38	0.42	0.46	0.46	0.17	–	–	–	7.5
6	4	8	7	7	< 2	–	0.19	0.34	0.25	0.17	0.19	0.19	0.17	8.6
6	4	7	7	7	2 < 3	43	0.19	0.27	0.21	0.17	–	–	–	8.2
6	4	7	7	7	3 – 5	39	0.17	0.21	0.19	0.17	–	–	–	8.2
6	4	7	7	7	10	39	0.17	0.20	0.21	0.17	–	–	–	8.2
6	4	7	7	7	15	38	0.18	0.27	0.27	0.17	–	–	–	8.2
6	4	7	7	7	20	38	0.24	0.34	0.35	0.17	–	–	–	8.2
6	4	7	7	7	25	38	0.29	0.43	0.42	0.17	–	–	–	8.2
6	4	7	7	7	30	38	0.35	0.51	0.52	0.17	–	–	–	8.2
6	5	8	7	7	< 2	–	0.19	0.37	0.28	0.17	0.19	0.19	0.17	9.3
6	5	7	7	7	2 < 3	43	0.17	0.30	0.24	0.17	–	–	–	8.9
6	5	7	7	7	3 – 5	43	0.17	0.23	0.21	0.17	–	–	–	8.9
6	5	7	7	7	10	39	0.17	0.22	0.23	0.17	–	–	–	8.9
6	5	7	7	7	15	38	0.17	0.28	0.29	0.17	–	–	–	8.9
6	5	7	7	7	20	38	0.20	0.37	0.38	0.17	–	–	–	8.9
6	5	7	7	7	25	38	0.25	0.45	0.46	0.17	–	–	–	8.9
6	5	7	7	7	30	38	0.30	0.54	0.55	0.17	–	–	–	8.9
6	6	8	7	7	< 2	–	0.19	0.38	0.30	0.17	0.19	0.19	0.17	10
6	6	7	7	7	2 < 3	52	0.17	0.32	0.26	0.17	–	–	–	9.6
6	6	7	7	7	3 – 5	52	0.17	0.24	0.22	0.17	–	–	–	9.6
6	6	7	7	7	10	43	0.17	0.23	0.24	0.17	–	–	–	9.6
6	6	7	7	7	15	39	0.17	0.29	0.31	0.17	–	–	–	9.6
6	6	7	7	7	20	39	0.18	0.38	0.39	0.17	–	–	–	9.6
6	6	7	7	7	25	38	0.23	0.46	0.48	0.17	–	–	–	9.6
6	6	7	7	7	30	38	0.27	0.55	0.57	0.17	–	–	–	9.6

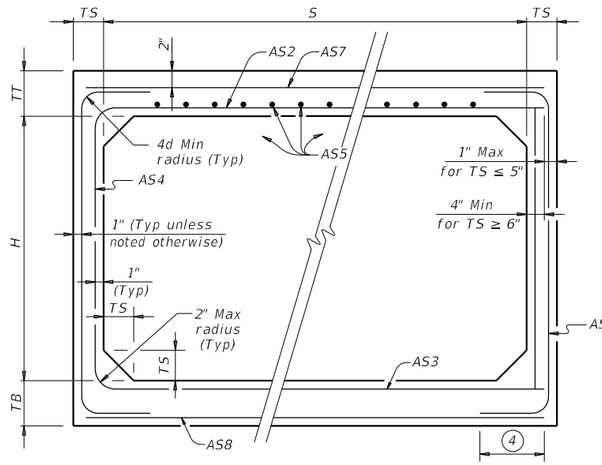
(1) For box length = 8'-0"

(2) AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.



CORNER OPTION "A" CORNER OPTION "B"

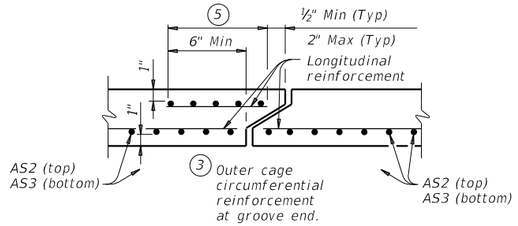
FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

(4) Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



SECTION A-A

(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.

Provide Class H concrete (f`c = 5,000 psi).

GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.

See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for 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. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

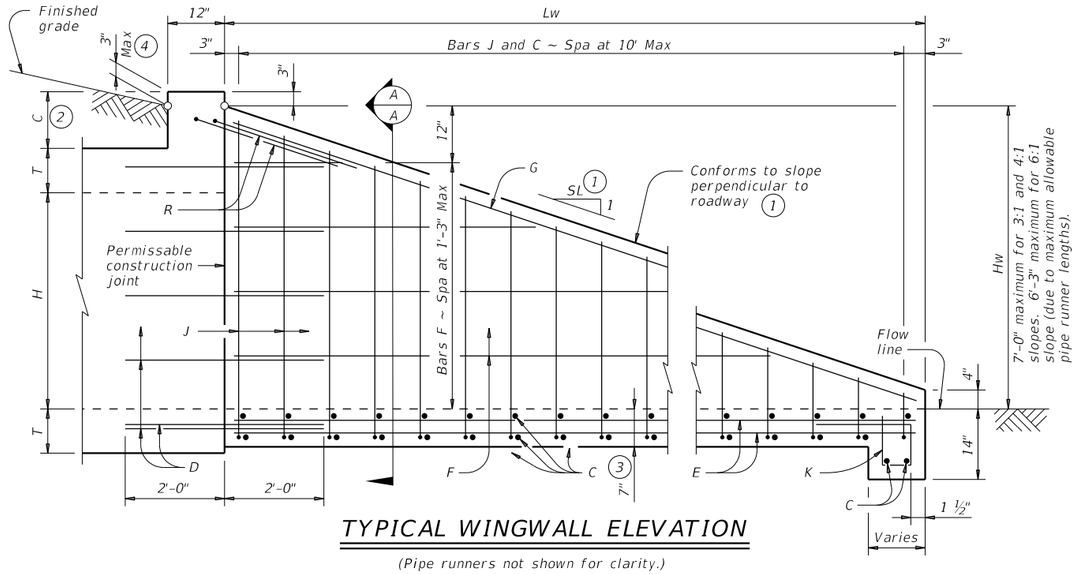
SINGLE BOX CULVERTS PRECAST

6'-0" SPAN

SCP-6

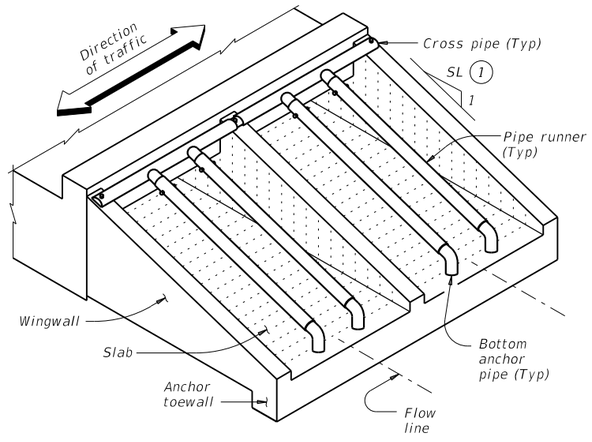
FILE: scp06sts-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		156

DATE:
FILE:



TYPICAL WINGWALL ELEVATION

(Pipe runners not shown for clarity.)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

WING DIMENSION CALCULATIONS:

Hw = H + T + C – 0.250'
Lw = (Hw – 0.333') (SL)

For cast-in-place culverts:
Atw = (N) (S) + (N + 1) (U)
For precast culverts:
Atw = (N) (2U + S) + (N – 1) (0.500')

Total Wingwall Area (SF)
= (0.5) (Hw + 0.333') (Lw) (N + 1)
Total Concrete Volume (CY)
= [(Wingwall Area) (0.583') +
(Lw) (Atw) (0.583') +
(Atw) (1.167') (1.167' – 0.583')] ÷ (27)

PIPE RUNNER DIMENSION CALCULATIONS:

Pipe Runner Length
= (Lw) (K1) – (1.917')
Total Reinforcing (Lb)
= (1.55) (Lw) (Atw) +
(4.43) (Atw) +
(K2) (Hw) (N + 1) (√Lw)

C = Height of curb above top of top slab (feet)
Hw = Height of wingwall (feet)
K = Constant value for use in formulas

Slope SL:1	K1	K2
3:1	~ 1.054 ~	7.45
4:1	~ 1.031 ~	8.49
6:1	~ 1.014 ~	10.30

Atw = Anchor toewall length (feet)
Lw = Length of wingwall (feet)
N = Number of culvert barrels
SL:1 = Side slope ratio (horizontal : 1 vertical)

See applicable box culvert standard for H, S, T, and U values.

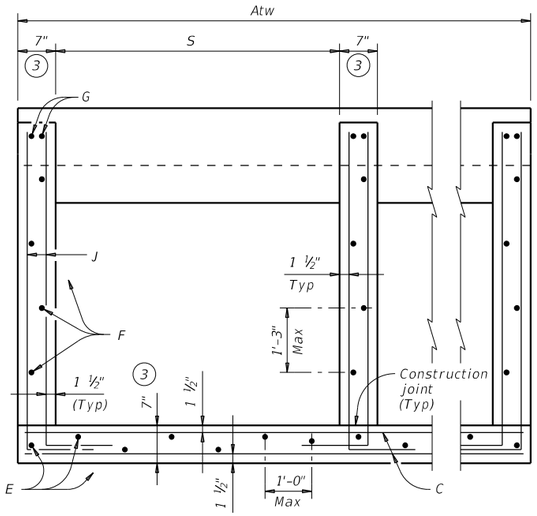
MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Adjust reinforcing as necessary to provide a minimum clear cover of 1 ½".
Provide Class "C" concrete (f`c = 3,600 psi).
Provide pipe runners, cross pipes, and anchor pipes meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.
Provide ASTM A307 bolts.
Galvanize all steel components, except the concrete reinforcing, unless required elsewhere in the plans, after fabrication.
Repair galvanizing damaged during transport or construction in accordance with the Item 445, "Galvanizing".

GENERAL NOTES:

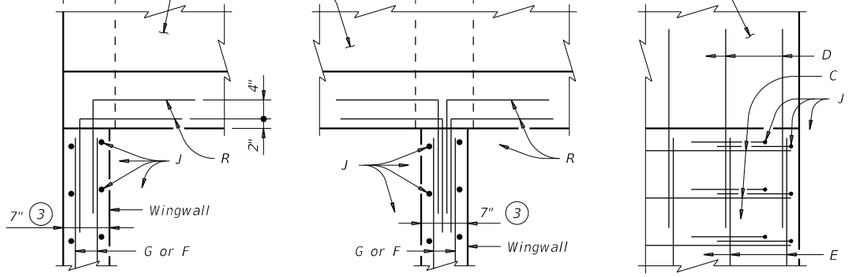
Designed according to AASHTO LRFD Bridge Design Specifications.
The safety end treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.
Pipe runners are designed for a traversing 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 quantities for pipe runners, reinforcing steel, and concrete resulting from the formulas given herein are for Contractor's information only.
See the Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
Alternate design drawings bearing the seal of a professional engineer will be acceptable for precast construction of the safety end treatments.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.



SECTION A-A

(Showing typical wingwall and wing slab reinforcing. Pipe runners not shown for clarity.)



AT TOP OF EXTERIOR WINGWALL

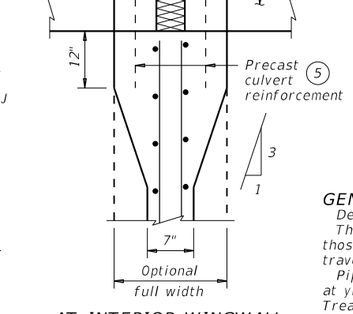
(Cast-in-place culvert)

AT TOP OF INTERIOR WINGWALL

(Cast-in-place culvert)

AT OUTSIDE OF BOTTOM SLAB

(Cast-in-place culvert)



AT INTERIOR WINGWALL

(Precast culvert)

PLAN VIEWS OF CORNER DETAILS

(1) *Recommended values of slope are: 3:1, 4:1, and 6:1. Provide 3:1 or flatter slope.*

(2) *0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet.*

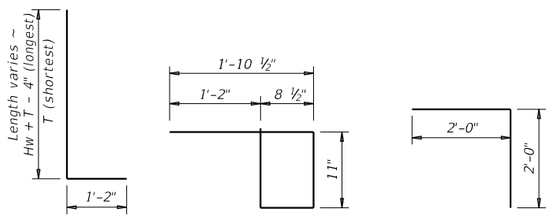
(3) *Wingwall and slab thicknesses may be the same as the adjacent culvert wall and slab thicknesses (7" minimum). If thicknesses greater than the minimum (7") are used, no changes will be made in quantities and no additional compensation will be allowed.*

(4) *For vehicle safety, reduce curb height, if necessary, to provide a maximum 3" projection. No changes will be made in quantities and no additional compensation will be allowed for this work.*

(5) *For culverts with C = 0", the precast culvert reinforcing may extend 1'-0" minimum into wingwall. Wingwall Bars D and R may be omitted. Otherwise, refer to the Wingwall Connection detail on the Box Culvert Precast Miscellaneous Details (SCP-MD) standard sheet.*

TABLE OF REINFORCING BAR SIZES AND SPACING

Bar	Size	Spacing
C	#4	10" Max
D	#4	Match F and E
E	#4	1'-0" Max
F	#4	1'-3" Max
G	#6	As shown
J	#4	10" Max
K	#4	1'-0" Max
R	#4	As shown



SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

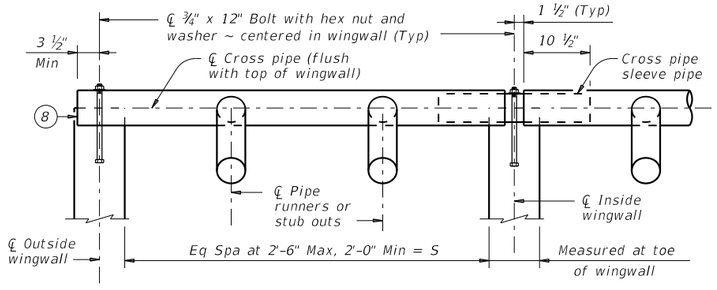
SAFETY END TREATMENT

FOR 0° SKEW BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ CROSS DRAINAGE

SETB-CD

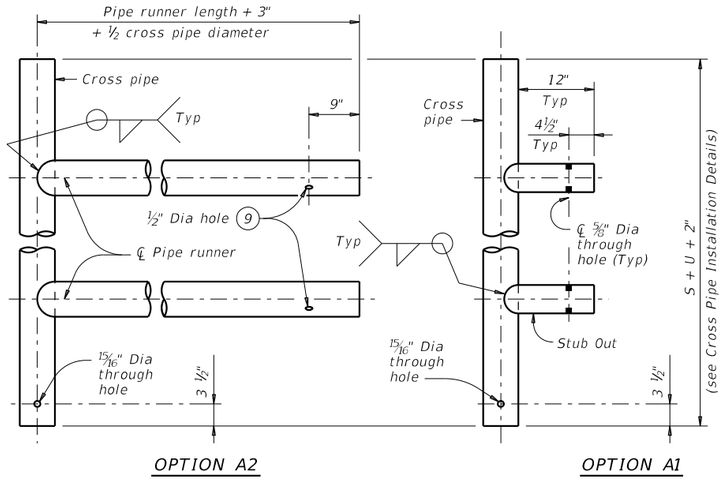
FILE: setbcdse-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		157

DATE:
FILE:



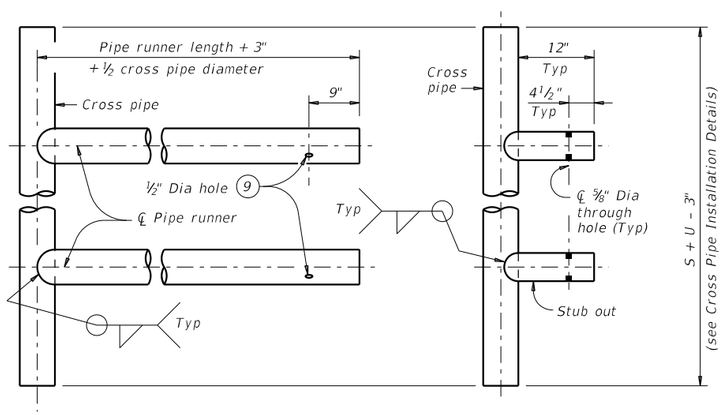
NOTE: At Contractor's option, make the cross pipe continuous across the inside wingwalls. If option is selected, omit the sleeve pipe and make a 15⁄16" diameter through hole in the cross pipe to accept the anchor bolt at the centerline of each inside wingwall.

CROSS PIPE INSTALLATION DETAILS



OPTION A2 OPTION A1

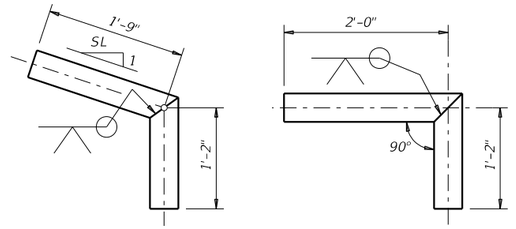
FOR USE IN OUTSIDE CULVERT BAY



OPTION A2 OPTION A1

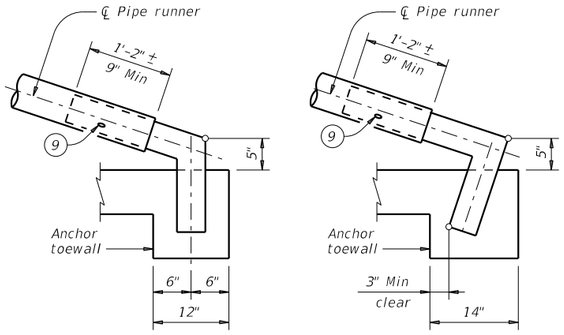
FOR USE IN INSIDE CULVERT BAY

CROSS PIPE AND CONNECTIONS DETAILS



OPTION A OPTION B

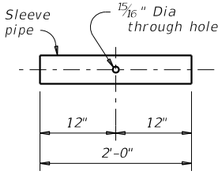
BOTTOM ANCHOR PIPE DETAILS (10)



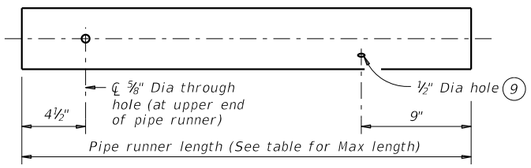
OPTION B1 OPTION B2

BOTTOM ANCHOR TOEWALL DETAILS

(Wingwall not shown for clarity.)

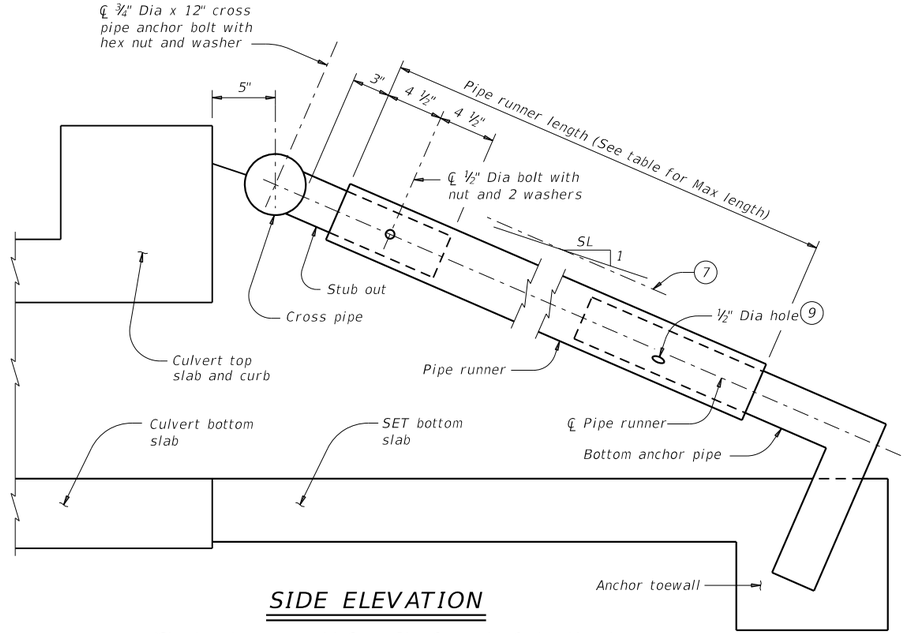


CROSS PIPE SLEEVE PIPE DETAILS



NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS



SIDE ELEVATION

(Showing pipe runner with Cross Pipe Connection Option A1 and Bottom Anchor Toewall Option B2. Wingwall not shown for clarity.)

(6) Cross pipe is the same size as the pipe runner. Cross pipe stub out is the same size as the anchor pipe.

(7) Note that actual slope of safety pipe runner may vary slightly from side slope.

(8) Take care 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, inspect the 1#2" hole to ensure that the lap of the safety 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.

MAXIMUM PIPE RUNNER LENGTHS AND (6) REQUIRED PIPE RUNNER AND ANCHOR PIPE SIZES

Maximum Pipe Runner Length	Required Pipe Runner Size			Required Anchor Pipe Size		
	Pipe Size	Pipe O.D.	Pipe I.D.	Pipe Size	Pipe O.D.	Pipe I.D.
10'- 0"	3" STD	3.500"	3.068"	2" STD	2.375"	2.067"
19'- 8"	4" STD	4.500"	4.026"	3" STD	3.500"	3.068"
34'- 2"	5" STD	5.563"	5.047"	4" STD	4.500"	4.026"

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 0° SKEW BOX CULVERTS
(MAXIMUM Hw = 7'-0")
TYPE I ~ CROSS DRAINAGE

SETB-CD

FILE: setbcdse-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020 REVISIONS	CONT	SECT	JOB	HIGHWAY
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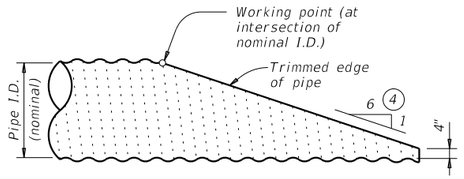
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		158

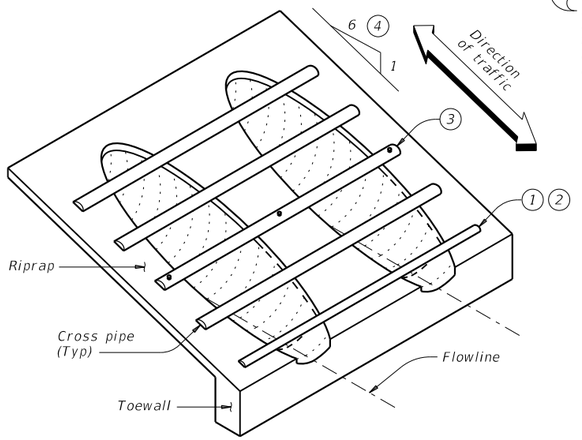
DATE:
FILE:



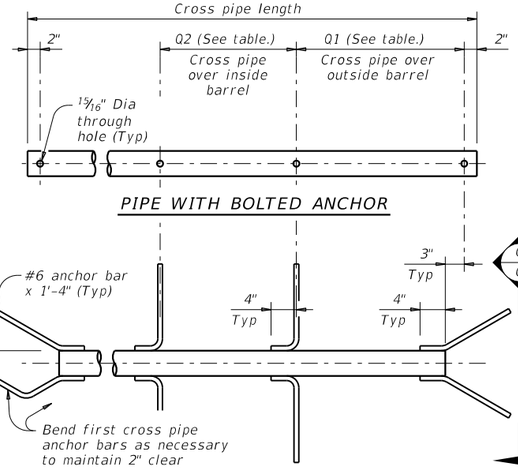
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert Details at reinforced concrete pipe (RCP) culvert are similar.)

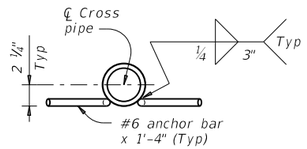


ISOMETRIC VIEW OF TYPICAL INSTALLATION



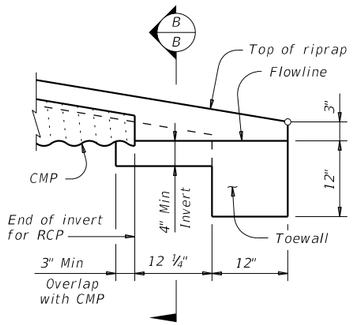
PIPE WITH BOLTED ANCHOR

PIPE WITH ANCHOR BARS



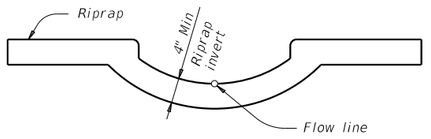
SECTION C-C

CROSS PIPE DETAILS



DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



SECTION B-B

(Cross pipes not shown for clarity.)

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES (2)

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"		
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	2 or more pipe culverts	
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All pipe culverts	
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"	All pipe culverts	4" Std (4.500" O.D.)
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"		
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"	All pipe culverts	5" Std (5.563" O.D.)
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"		
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"		
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

(1) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.

(2) Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.

(3) Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.

(4) Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.

(5) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

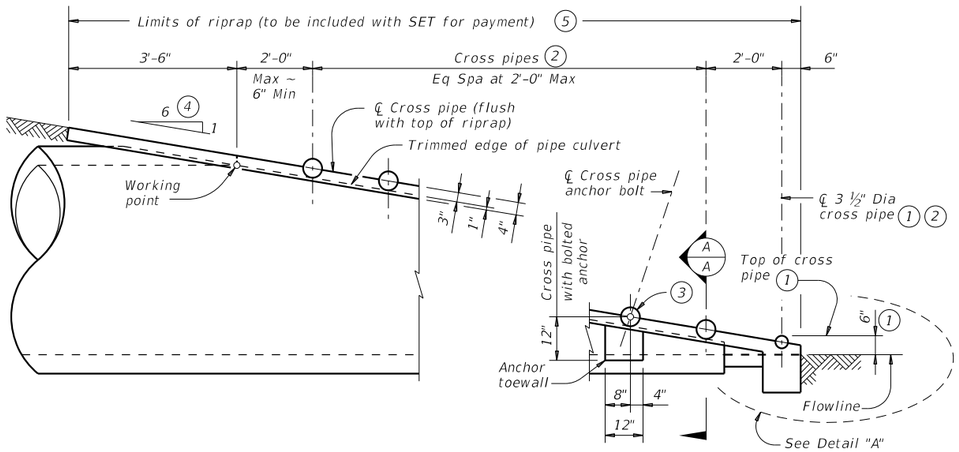
GENERAL NOTES:

Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.

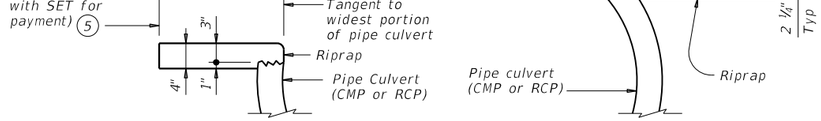
Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.



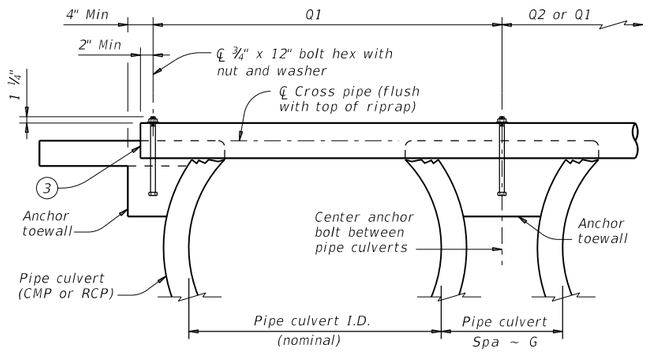
SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SHOWING CROSS PIPE WITH ANCHOR BAR



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 72" DIA PIPE CULVERTS TYPE II ~ PARALLEL DRAINAGE

SETP-PD

FILE: setppdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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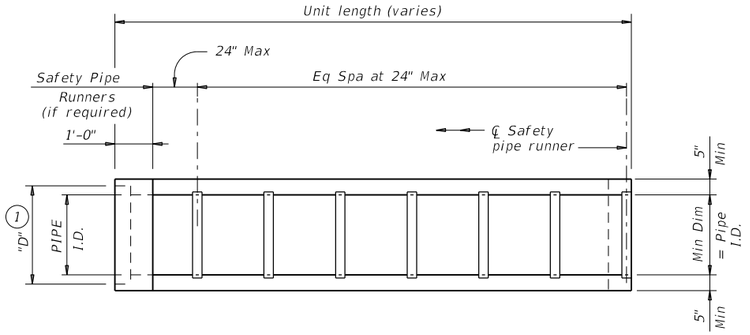
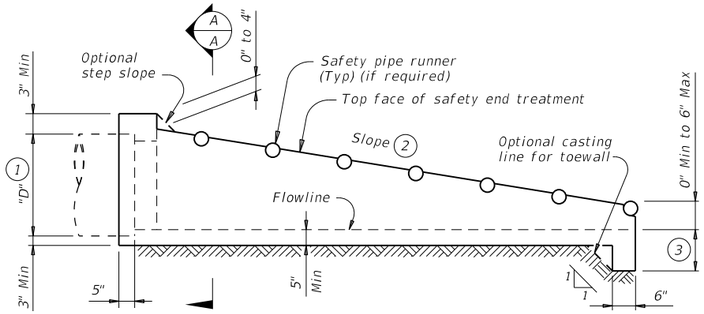
	LBB	LUBBOCK		159



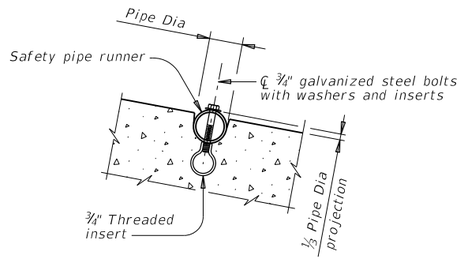
PLAN

(Showing bell end connection.)



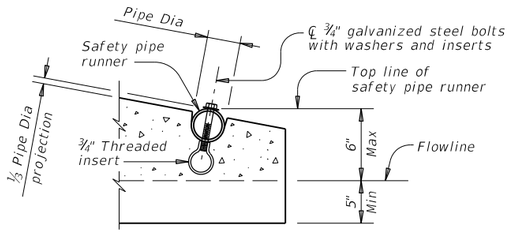
LONGITUDINAL ELEVATION

(Showing bell end connection.)

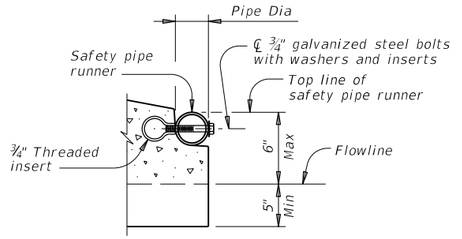


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



OPTION A



OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (7)	"D" (1)	Slope	Min Length	Pipe Runners Required		Required Pipe Runner Size		
						Single Pipe	Multiple Pipe	Nominal Dia.	O.D.	I.D.
12"	2"	1.15"	17.00"	6:1	4' – 9"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
15"	2 ¼"	1.30"	20.50"	6:1	6' – 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 ½"	1.60"	24.00"	6:1	8' – 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' – 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 ½"	2.65"	38.50"	6:1	14' – 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' – 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	2.7"	52.50"	6:1	21' – 2"	Yes	Yes	4" STD	4.500"	4.026"

(1) Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.

(2) Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment."

(5) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(6) Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures." Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment." When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(7) Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment."

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below :

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" – D12 x D12 or 5"x5" – D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).

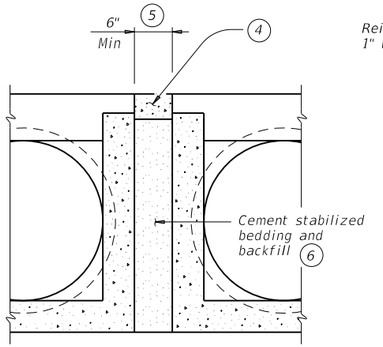
At the option and expense of the Contractor the next larger size of safety end treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

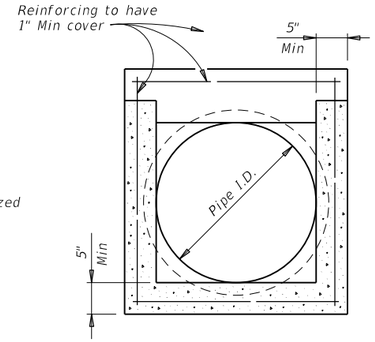
Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

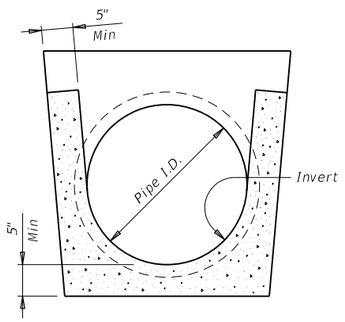
Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464, "Reinforced Concrete Pipe." Connect TP by grouting. See Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.



MULTIPLE PIPE INSTALLATION

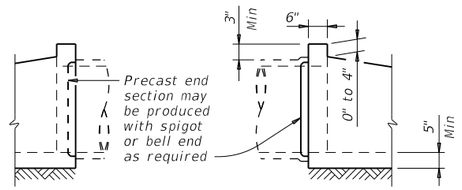


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment.)

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-SP

FILE: CD-PSET-SP-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		160

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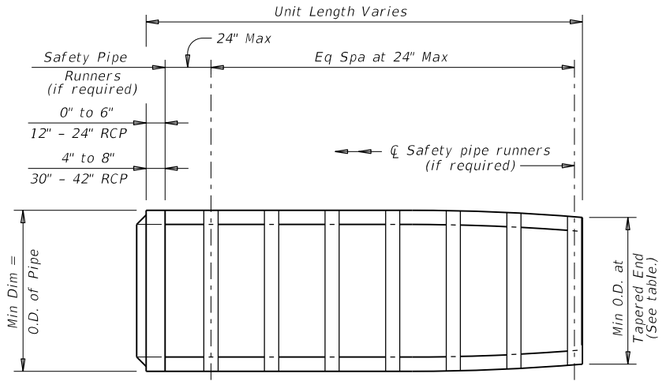
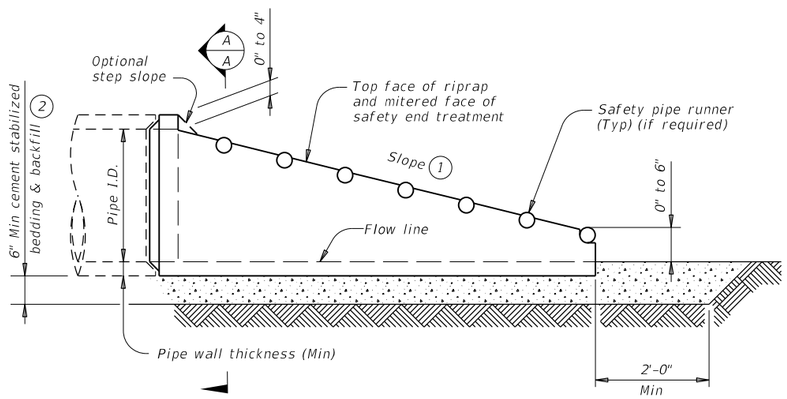


PLAN VIEW – 12" THRU 24"

(Showing spigot end connection.)



LONGITUDINAL ELEVATION - 12" THRU 24"

(Showing spigot end connection.)

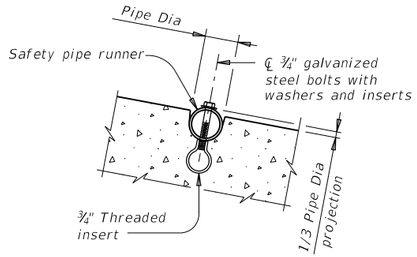
(1) Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

Provide cement stabilized bedding and backfill in accordance with the Item, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(3) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

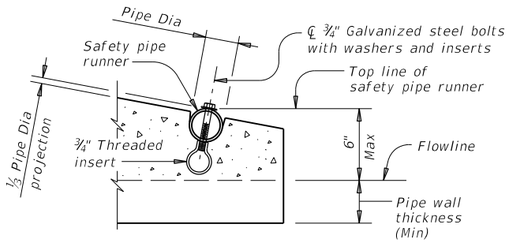
(4) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(5) Safety pipe runners are required for multiple pipe culverts with more than two pipes.

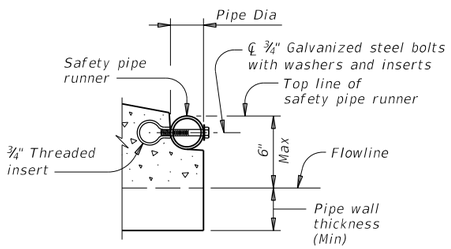


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



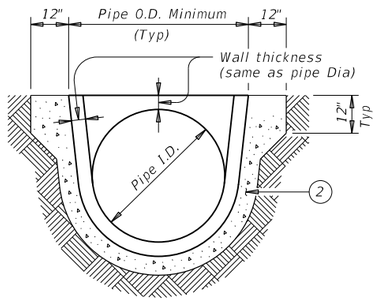
OPTION A



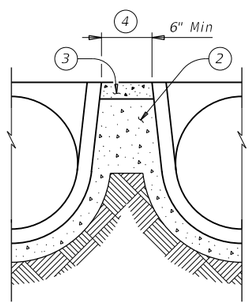
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)



SECTION A-A



MULTIPLE PIPE INSTALLATION

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	Min Wall Thickness	Min O.D.	Min O.D. at Tapered End	Min Reinf Requirements (sq. in. per ft. of Pipe)	Max Slope	Min Length of Unit	Pipe Runner Requirements		Required Pipe Runner Sizes		
							Single Pipe	Multiple Pipe	Nominal Dia	O.D.	I.D.
12"	2"	16"	16"	0.07 Circ.	6:1	4'-0"	No	(5)	3" STD	3.500"	3.068"
15"	2 ¼"	19 ½"	19"	0.07 Circ.	6:1	5'-8"	No	(5)	3" STD	3.500"	3.068"
18"	2 ½"	23"	21 ½"	0.07 Circ.	6:1	7'-3"	No	(5)	3" STD	3.500"	3.068"
24"	3"	30"	27"	0.07 Circ.	6:1	10'-6"	No	(5)	3" STD	3.500"	3.068"
30"	3 ½"	37"	31"	0.18 Circ.	6:1	12'-1"	No	Yes	4" STD	4.500"	4.026"
36"	4"	44"	36"	0.19 Ellip.	6:1	15'-4"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	51"	41 ½"	0.23 Ellip.	6:1	18'-7"	Yes	Yes	4" STD	4.500"	4.026"

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Galvanize steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP) may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Manufacture precast concrete end sections in accordance with Item 464, "Reinforced Concrete Pipe" and in accordance with ASTM Specification C-76, Class III, Wall B for circular pipe.

Provide precast concrete end sections with a spigot or bell end for compatibility to upstream or downstream end conditions with sufficient annular space to allow for grout, mortar, cold applied asphalt joint compound or pre-formed plastic gasket material.

Methods of lifting shall be provided by the manufacturer for ease of loading, unloading and installation.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Texas Department of Transportation

Bridge Division Standard

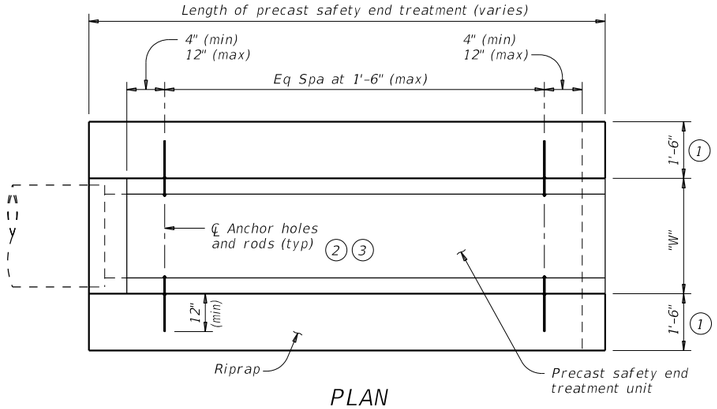
PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

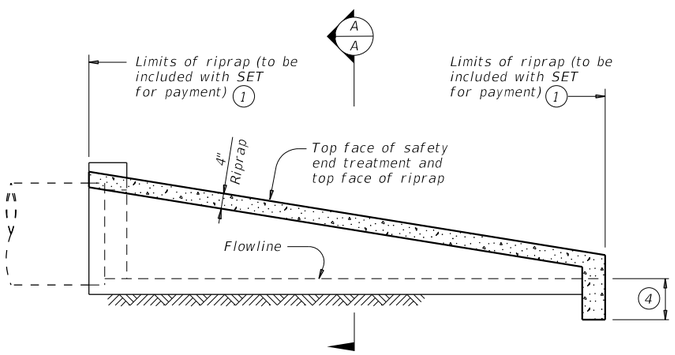
PSET-RP

FILE: psetrpss-20.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LUB	LUBBOCK		161

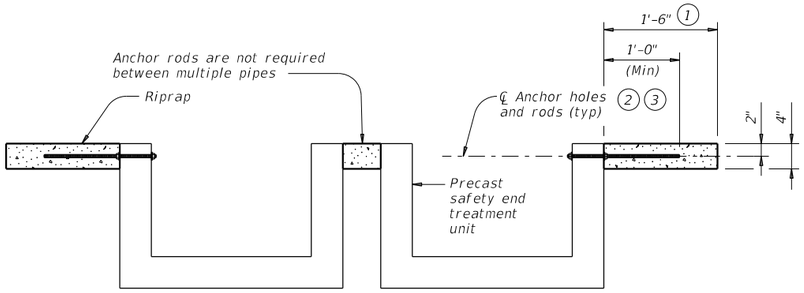
DATE:
FILE:



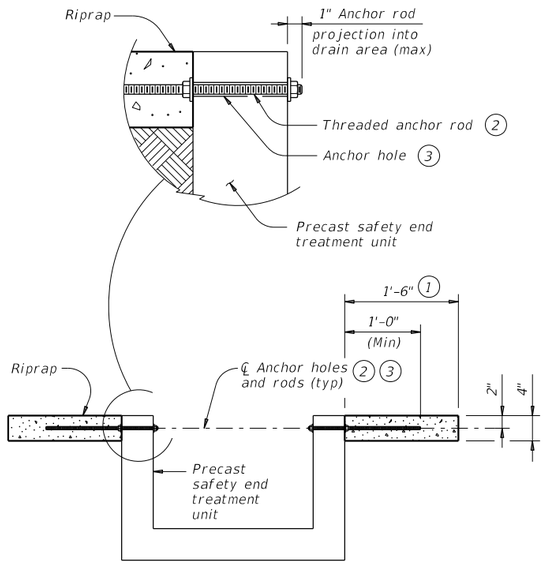
PLAN



LONGITUDINAL ELEVATION



MULTIPLE PIPE INSTALLATION



SINGLE PIPE INSTALLATION

SECTION A-A

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) (5)

Nominal Culvert (Pipe) I.D.	PSET-SC and PSET-SP Standards				PSET-RC and PSET-RP Standards			
	Unit Width "W"	Side Slope			Unit Width "W"	Side Slope		
		3:1	4:1	6:1		3:1	4:1	6:1
12"	23.0"	0.1	0.2	0.2	16.0"	0.1	0.1	0.2
15"	26.5"	0.2	0.2	0.3	19.5"	0.1	0.2	0.2
18"	30.0"	0.2	0.2	0.3	23.0"	0.2	0.2	0.3
24"	37.0"	0.3	0.3	0.5	30.0"	0.2	0.3	0.4
30"	44.5"	0.3	0.4	0.6	37.0"	0.3	0.3	0.5
36"	51.5"	0.4	0.5	0.7	44.0"	0.3	0.4	0.6
42"	58.5"	0.5	0.6	0.8	51.0"	0.4	0.5	0.7

(1) Riprap placed beyond the limits shown will be paid as concrete riprap in accordance with Item 432, "Riprap". When riprap is cast integrally with the precast safety end treatment, this dimension is 1'-0" minimum.

(2) 1#2" Dia ASTM A307 Gr A threaded anchor rod with 2 nuts and 2 washers. Galvanize all components in accordance with Item 445, "Galvanizing". Repair galvanizing that is damaged during transport or construction in accordance with the specifications.

(3) 3#4" through holes in walls of safety end treatment for riprap anchor rods may be drilled with rotary (coring or masonry) type drilling equipment or may be formed. Do not use percussive (star) type drilling equipment. If holes are drilled, patch spalls in the inside face of the wall exceeding 1#2" from the holes.

(4) Provide riprap toe wall when dimension is shown elsewhere in the plans or when field conditions require a toe wall.

(5) Quantities shown are for one end of one reinforced concrete pipe culvert. For multiple pipe culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only. Quantities are based on the minimum unit lengths shown on the Precast Saftey End Treatment (SET) standard sheets.

MATERIAL NOTES:

Provide Class "B" riprap in accordance with 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. The anchor rods shown are always required.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment".

Refer to PSET-SC or PSET-SP standard sheets for details of square safety end treatments not shown. Refer to PSET-RC or PSET-RP standard sheets for details of round safety end treatments not shown.

For precast units with integrally cast riprap, substitute reinforcing steel in the amount on 0.26 in./ft. minimum for the threaded anchor rods shown. When requested, submit sealed engineering drawings for approval prior to construction. Shop drawings will not be required. Note that a proprietary precast unit with integral riprap is available from L&R Precast Concrete Works, Inc. (956) 583-6293 or www.lrprecast.com.

Payment for riprap and toewalls is included in the price bid for each safety end treatment.

These riprap details are only applicable when notes that require placement of riprap with precast safety end treatments are shown elsewhere in the plans.

Precast units with integrally cast riprap are permitted unless noted otherwise on the plans.

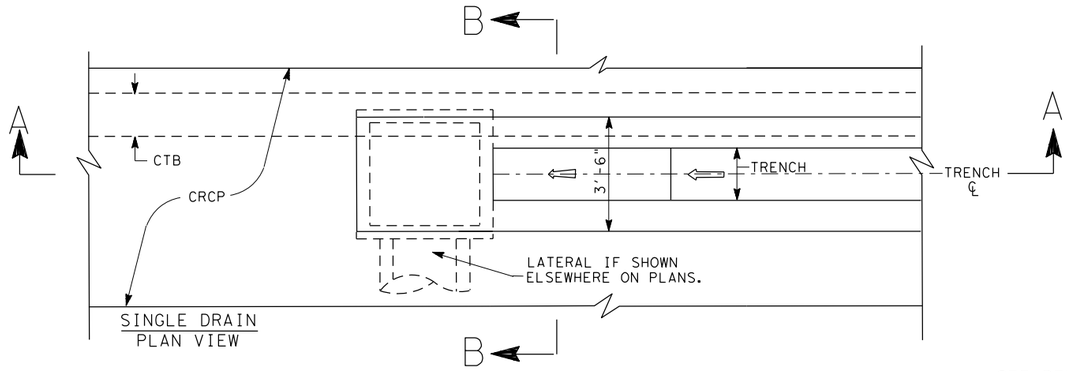
Texas Department of Transportation

Bridge Division Standard

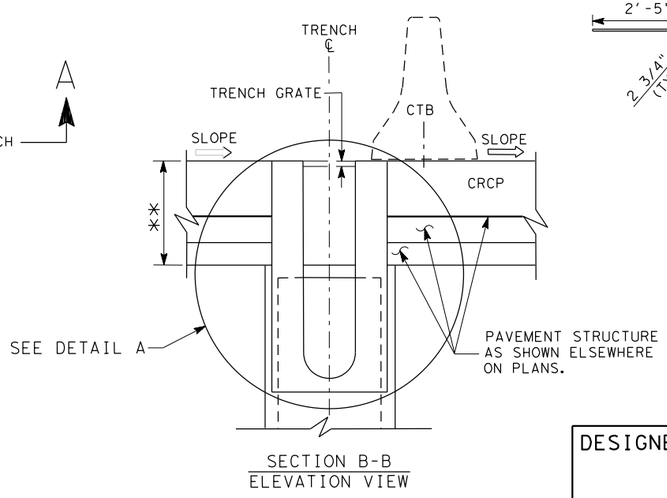
PRECAST SAFETY END TREATMENT
TYPE II
RIPRAP DETAILS

PSET-RR

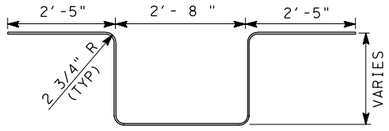
FILE: psetrrse-20.dgn	DN: GAF	CK: TxDOT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		162



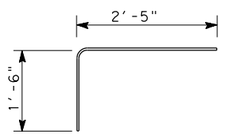
SINGLE DRAIN
PLAN VIEW



SECTION B-B
ELEVATION VIEW



BAR U1

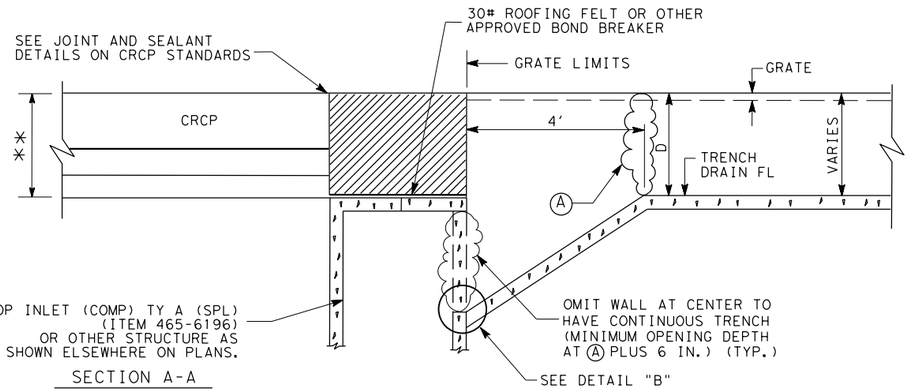


BAR L1

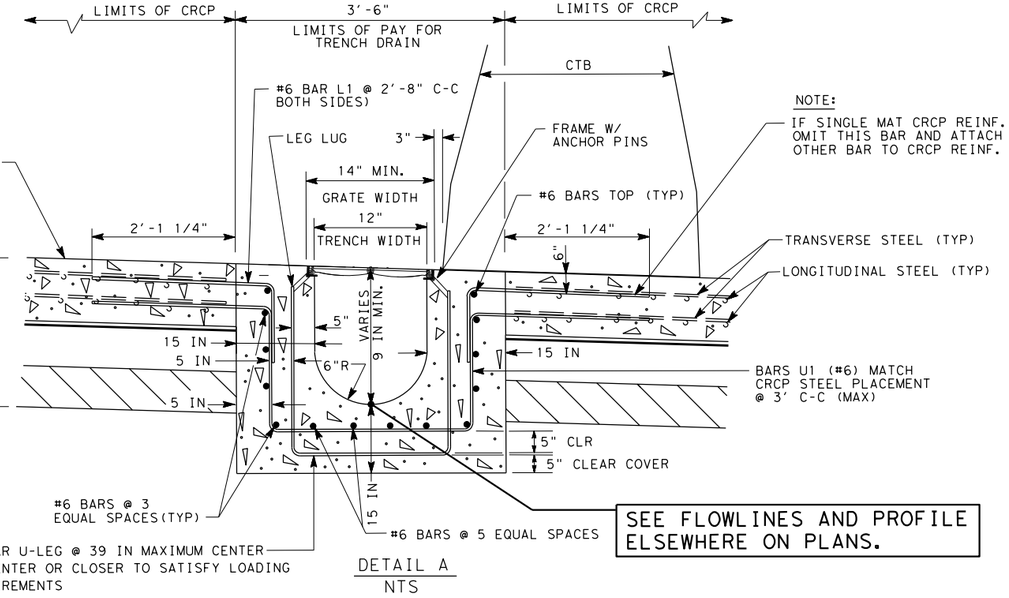
NOTES

1. THIS STANDARD IS TO BE USED IN CONJUNCTION WITH SPECIAL SPECIFICATION, 4008, "TRENCH DRAIN."
2. PROPRIETARY TRENCH DRAIN SYSTEMS ARE ALLOWED. SUBMIT PRE-CONSTRUCTION DRAWINGS WITH ENOUGH DETAIL TO SHOW HOW TO INTEGRATE INTO THE PLAN DETAILS. SUBMITTALS SHALL MEET MINIMUM REQUIREMENTS, AREAS, AND DIMENSIONS.

DESIGNER: SPECIAL SPECIFICATION REQUIRES 66% OPENING OF GRATE AREA. FOR SAFETY FACTOR, USE 33% OPENING ON HYDRAULIC CALCULATIONS.

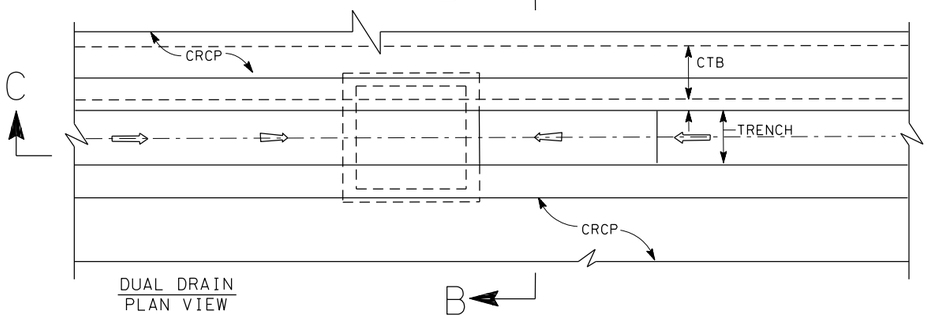


SECTION A-A
ELEVATION VIEW

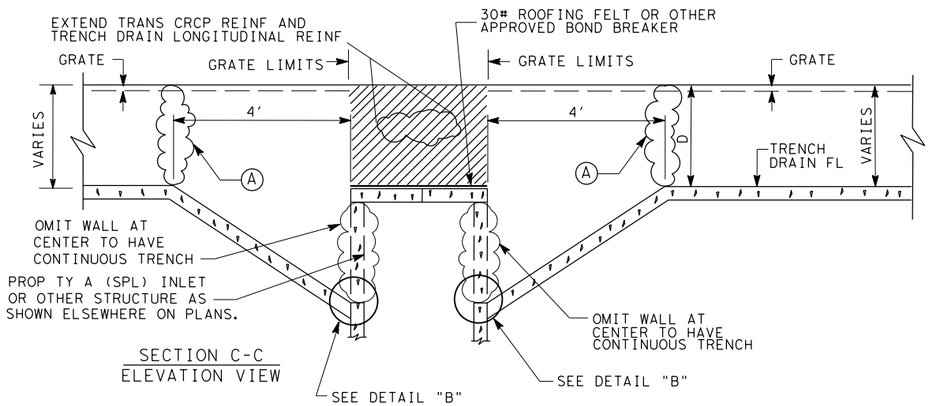


DETAIL A
NTS

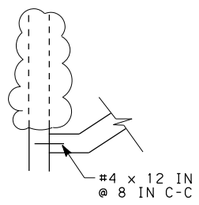
NOTE:
IF SINGLE MAT CRCP REINF. OMIT THIS BAR AND ATTACH OTHER BAR TO CRCP REINF.



DUAL DRAIN
PLAN VIEW



SECTION C-C
ELEVATION VIEW



DETAIL B
NTS

CROSS SECTIONAL VIEW OF TRENCH DRAIN

SOLID CONCRETE (NO TRENCH) INCLUDED IN TRENCH DRAIN PAYMENT

LEGEND

CRCP = CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

Ⓐ = MAXIMUM TRENCH DEPTH

NOT TO SCALE

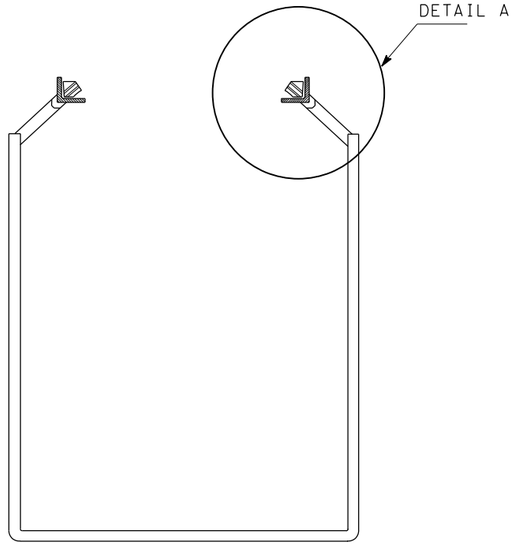
STATE OF TEXAS
HEATHER RAE KEISTER
100095
LICENSED
PROFESSIONAL ENGINEER
8/1/2023

Texas Department of Transportation
Houston District

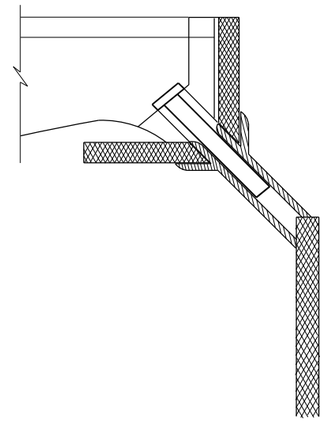
TRENCH DRAIN DETAILS

TDD

FILE: STDD14a.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	STD:	
©TxDOT Feb. 2010	DIST	FED REG	PROJECT NO.			SHEET
REVISIONS 11/11 ADDED MIN. TO 14" DIMENSION. 06/12 ADDED CALLOUT 03/15 2014 SPECS	LBB	6	SEE TITLE SHEET			163
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	LUBBOCK		0905	06	095, ETC.	CS



BAR U-LEG



DETAIL A

GRATE RETAINER
PIN-REMOVABLE
STAINLESS

NOT TO SCALE

STATE OF TEXAS
HEATHER RAE KEISTER
100095
LICENSED
PROFESSIONAL ENGINEER
8/1/2023

SHEET 2 OF 2

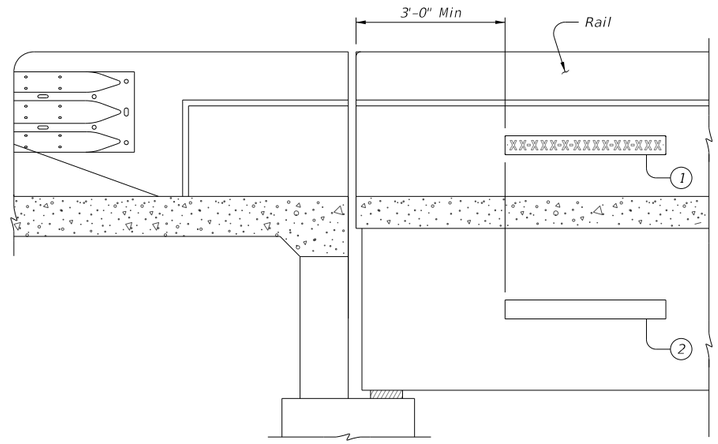
Texas Department of Transportation
Houston District

TRENCH DRAIN DETAILS

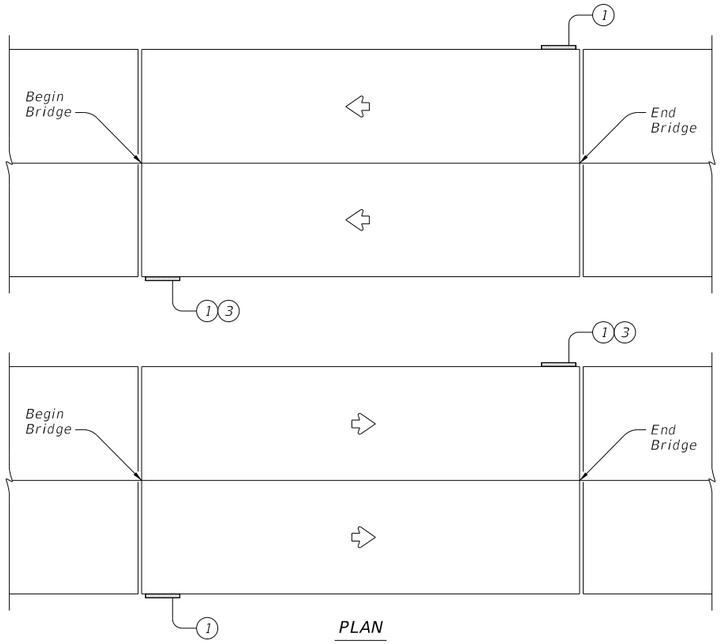
TDD

FILE: STDD14b.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	STD:	
©TxDOT Feb. 2010	DIST	FED REG	PROJECT NO.			SHEET
REVISIONS 06/12 ADDED CALLOUT 03/15 2014 SPECS	LBB	6	SEE TITLE SHEET			164
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	LUBBOCK		0905	06	095, ETC.	CS

DATE: 8/10/2023 10:49:18 AM
FILE: c:\pw\kh1\dms25236\NBIS(MOD)-23.dgn

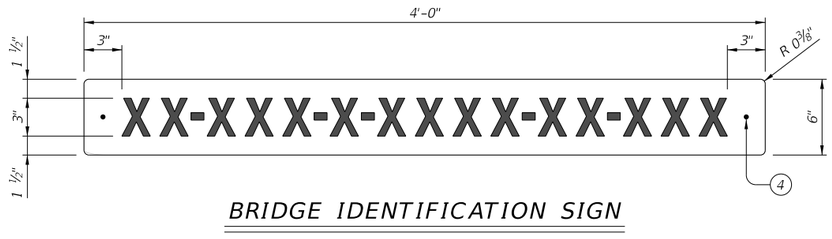


ELEVATION

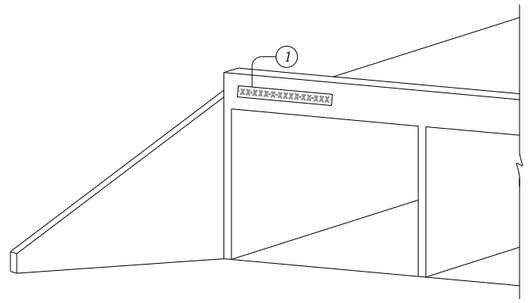


PLAN

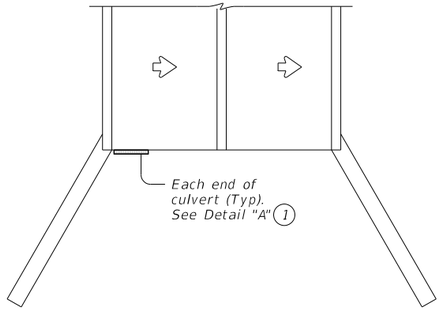
BRIDGE SIGN LOCATIONS



BRIDGE IDENTIFICATION SIGN

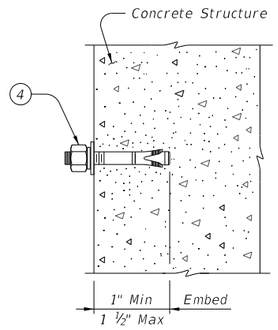


DETAIL "A"



PLAN

BRIDGE CLASS CULVERT SIGN PLACEMENT



ANCHOR DETAIL

SHEETING REQUIREMENTS		
Usage	Color	Sign Face Material
Background	White	Type B or C Sheeting
Letters and Symbols	Black	Type B or C Sheeting

(1) Bridge identification sign location

(2) Alternate sign placement location for exterior concrete beams.

(3) If adjacent bridges are less than 2 feet apart, these signs may be omitted.

(4) ¼" Diameter stainless steel expansion anchor with hex nut, washer, and spring-lock washer.

SIGN NOTES:

Standard sign designs can be found in the Standard Highway Sign Designs for Texas (SHSD).

Use the Clearview Alphabet CV-2W for the letters and symbols.

MATERIAL NOTES:

Provide lateral spacing between letters and numerals conforming with the SHSD, and any approved changes thereto. Provide a balanced appearance when spacing is not shown.

Provide aluminum sign blanks with a minimum thickness of 0.080" that meet the requirements of DMS-7110.

Provide sign face materials that meet the requirements of DMS-8300 and the sheeting requirements shown in the table.

Provide ¼" diameter stainless steel expansion anchors with one hex head nut, one flat washer, and one helical spring-lock washer each.

Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). Provide anchor products that have a designated ICC-ES Evaluation Report number. The approval status must be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.

Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.

Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environments, provide both stainless steel anchor bodies and expansion wedges.

GENERAL NOTES:

Prior to hole drilling, locate rebar to ensure clearing of existing reinforcement and/or strands.

Prior to installation, obtain approval of sign locations from the Engineer. Avoid placement of sign over travel lanes and pedestrian walkways. Submit proposed installation method to Engineer prior to beginning work. Install anchors as shown on plans and in accordance with the anchor manufacturer's published installation instructions.

Do not install anchors sections of members under tension.

Signs will be paid using Item 4171.

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/10/2023

Texas Department of Transportation

Bridge Division Standard

NBI BRIDGE IDENTIFICATION SIGN STANDARD

NBIS (MOD)

FILE: MS-NBIS-23.dgn	DN: TAR	CK: TxDOT	DW: JER	CK: TAR
©TxDOT March 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		165

100% SUBMITTAL

SUMMARY OF QUANTITIES

ITEM NO.	CODE	DESCRIPTION	UNIT	UPLAND AVE AT 66TH ST	UPLAND AVE AT 82ND ST	UPLAND AVE - HAWK SIGNAL	UPLAND AVE AT US 82 FWY	PROJECT TOTAL
416	6030	DRILL SHAFT (TRF SIG POLE) (24 IN)	LF	12	42	6	6	66
416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	56		30	15	101
416	6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	88				88
618	6046	CONDT (PVC) (SCH 80) (2")	LF	65		25	30	120
618	6053	CONDT (PVC) (SCH 80) (3")	LF	95	210	65	45	415
618	6058	CONDT (PVC) (SCH 80) (4")	LF	20		50		70
618	6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	375		340	400	1115
620	6004	ELEC CONDR (NO.12) INSULATED	LF	80			80	160
620	6008	ELEC CONDR (NO.8) INSULATED	LF	270			180	450
620	6009	ELEC CONDR (NO.6) BARE	LF	535	650	465	495	2145
620	6010	ELEC CONDR (NO.6) INSULATED	LF	50	20	100	510	680
624	6008	GROUND BOX TY C (162911)W/APRON	EA	4		5	5	14
628	6189	ELC SRV TY D 120/240 070(NS)SS(E)SP(U)	EA	1	1	1	1	4
680	6011	INSTALL HWY TRF SIG (UPGRADE)	EA	1	1	1	1	4
682	6001	VEH SIG SEC (12")LED(GRN)	EA	11	14		2	27
682	6002	VEH SIG SEC (12")LED(GRN ARW)	EA	7	10		1	18
682	6003	VEH SIG SEC (12")LED(YEL)	EA	11	14	6	2	33
682	6004	VEH SIG SEC (12")LED(YEL ARW)	EA	11	12		2	25
682	6005	VEH SIG SEC (12")LED(RED)	EA	11	14	12	2	39
682	6006	VEH SIG SEC (12")LED(RED ARW)	EA	4	6		1	11
682	6018	PED SIG SEC (LED)(COUNTDOWN)	EA	4	8	2	3	17
682	6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	8	14	6	2	30
682	6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	4	2		1	7
682	6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA	3	4			7
684	6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	310	810	215	115	1450
684	6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	285	235		65	585
684	6036	TRF SIG CBL (TY A)(14 AWG)(10 CONDR)	LF	35	1080		310	1425
684	6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	465	655	285	185	1590
684	6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF	325	1260	205	695	2485
686	6029	INS TRF SIG PL AM (S)1 ARM(28')	EA	1				1
686	6037	INS TRF SIG PL AM(S)1 ARM(36')	EA	1		1		2
686	6045	INS TRF SIG PL AM(S)1 ARM(44')	EA	1		1		2
686	6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA	1			1	2
686	6053	INS TRF SIG PL AM(S)1 ARM(50')	EA		1			1
686	6061	INS TRF SIG PL AM(S)1 ARM(60')	EA		3			3
687	6001	PED POLE ASSEMBLY	EA	2	7		1	10
687	6002	PEDESTRIAN PUSH BUTTON POLE	EA	2	7		1	10
6027	6008	GROUND BOX (PREPARE)	EA		2			2
6306	6001	VIVDS PROSR SYS	EA	1	1			2
6306	6002	VIVDS CAM ASSY FXD LNS	EA	4	4			8
6306	6007	VIVDS CABLING	LF	695	895			1590

12/13/23

TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

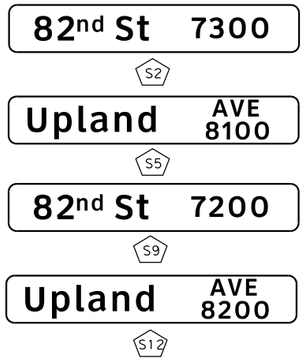
TRAFFIC SIGNAL SUMMARY OF QUANTITIES

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

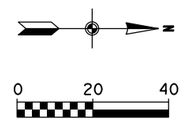
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	166
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

PROPOSED SIGNS

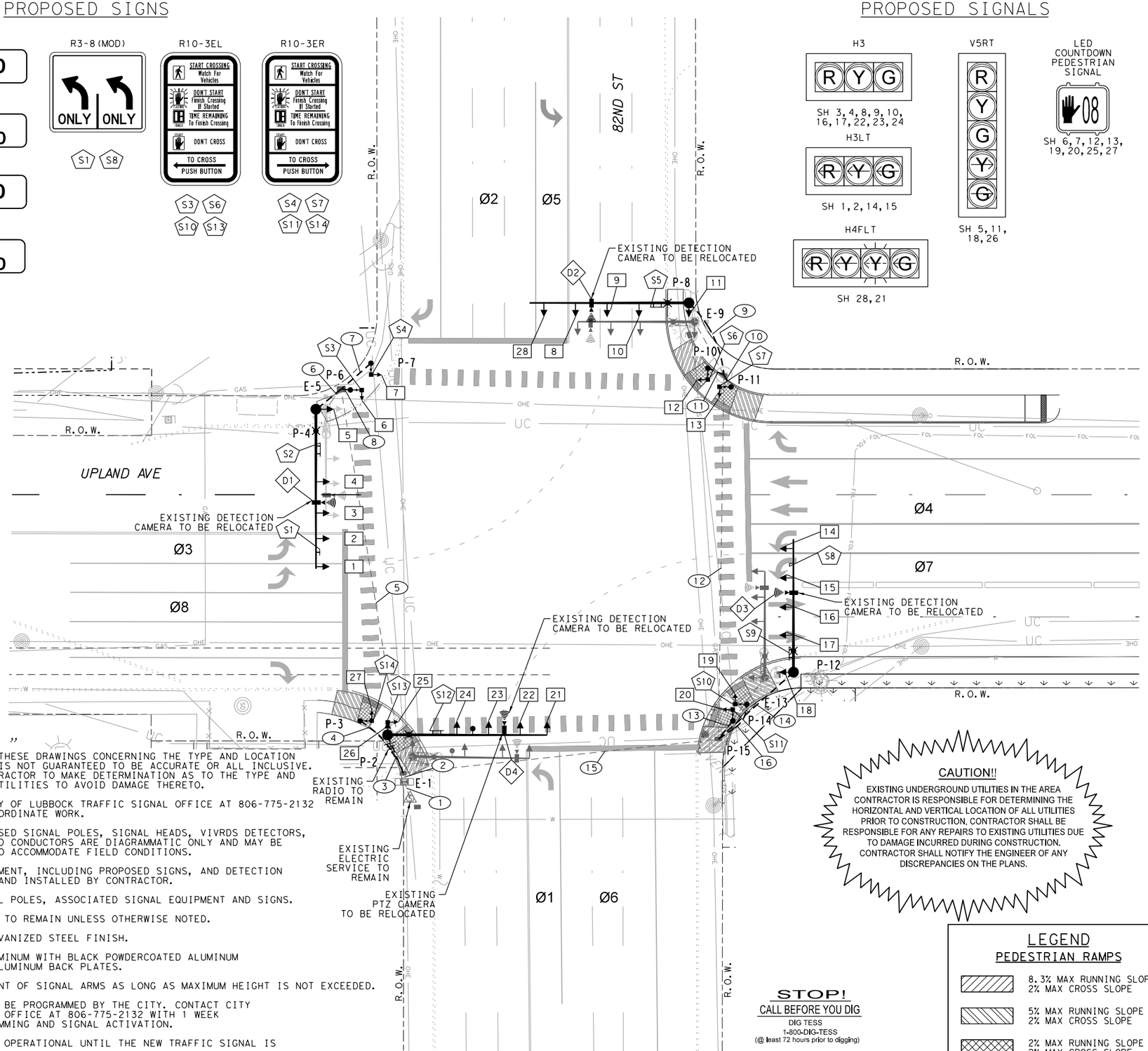


PROPOSED SIGNALS



LEGEND

- TYPICAL PROPOSED MAST ARM COMBINATION SIGNAL\ WITH PEDESTRIAN SIGNAL, PUSH BUTTON, LED LUMINAIRE (250W E.Q.), AND SIGNAGE
- TYPICAL EXISTING TO BE REMOVED MAST ARM COMBINATION SIGNAL
- TRAFFIC SIGNAL CONTROLLER CABINET AND CONCRETE PAD
- EXISTING GROUND BOX
- PROPOSED TYPE C GROUND BOX W/ APRON
- EXISTING CONDUIT
- PROPOSED CONDUIT
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- D1 PROPOSED VEHICLE DETECTOR AND LABEL
- D1 EXISTING VEHICLE DETECTOR TO BE RELOCATED AND LABEL
- S EXISTING ELECTRICAL SERVICE
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER
- E-# EXISTING TRAFFIC SIGNAL POLE NUMBER



NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF LUBBOCK TRAFFIC SIGNAL OFFICE AT 806-775-2132 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, VIVRDS DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
4. ALL PROPOSED SIGNAL EQUIPMENT, INCLUDING PROPOSED SIGNS, AND DETECTION EQUIPMENT TO BE PROCURED AND INSTALLED BY CONTRACTOR.
5. REMOVE ALL EXISTING SIGNAL POLES, ASSOCIATED SIGNAL EQUIPMENT AND SIGNS.
6. EXISTING SIGNAL EQUIPMENT TO REMAIN UNLESS OTHERWISE NOTED.
7. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
8. SIGNAL HEADS SHALL BE ALUMINUM WITH BLACK POWDERCOATED ALUMINUM VISORS AND BLACK VENTED ALUMINUM BACK PLATES.
9. MOUNT SIGNAL HEADS IN FRONT OF SIGNAL ARMS AS LONG AS MAXIMUM HEIGHT IS NOT EXCEEDED.
10. VIVRDS DETECTION ZONES TO BE PROGRAMMED BY THE CITY. CONTACT CITY OF LUBBOCK TRAFFIC SIGNAL OFFICE AT 806-775-2132 WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.
11. TRAFFIC SIGNAL SHALL STAY OPERATIONAL UNTIL THE NEW TRAFFIC SIGNAL IS COMPLETELY CONSTRUCTED.

NOTES CONTINUED ON NEXT SHEET.

CAUTION!!

EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

STOP!
CALL BEFORE YOU DIG
DIG TESS
1-800-DIG-TESS
(@ least 72 hours prior to digging)

LEGEND
PEDESTRIAN RAMPS

- 8.3% MAX RUNNING SLOPE 2% MAX CROSS SLOPE
- 5% MAX RUNNING SLOPE 2% MAX CROSS SLOPE
- 2% MAX RUNNING SLOPE 2% MAX CROSS SLOPE

STATE OF TEXAS
LUKE A. SCHMIDT
120384
PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
TRAFFIC SIGNAL LAYOUT

UPLAND AVE AT 82ND STREET

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	167
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

SIGNS SUMMARY

SIGN	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R3-8	INTERSECTION LANE CONTROL	F/I	P-4	36"x30"
S2	STREET NAME	82ND STREET 7300	I	P-4	24"x VA
S3	R10-3EL	PED PUSH BUTTON	F/I	P-6	9"x15"
S4	R10-3ER	PED PUSH BUTTON	F/I	P-7	9"x15"
S5	STREET NAME	UPLAND AVENUE 8100	I	P-8	24"x VA
S6	R10-3EL	PED PUSH BUTTON	F/I	P-10	9"x15"
S7	R10-3ER	PED PUSH BUTTON	F/I	P-11	9"x15"
S8	R3-8	INTERSECTION LANE CONTROL	F/I	P-12	36"x30"
S9	STREET NAME	82ND STREET 7200	I	P-12	24"x VA
S10	R10-3EL	PED PUSH BUTTON	F/I	P-14	9"x15"
S11	R10-3ER	PED PUSH BUTTON	F/I	P-15	9"x15"
S12	STREET NAME	UPLAND AVENUE 8200	I	P-2	24"x VA
S13	R10-3EL	PED PUSH BUTTON	F/I	P-2	9"x15"
S14	R10-3ER	PED PUSH BUTTON	F/I	P-3	9"x15"

STATUS: F/I=FURNISH AND INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=EXISTING TO BE RELOCATED; I= INSTALL

NOTES:

12. CITY OF LUBBOCK TO PROVIDE VIVRDS CAMERAS AND MOUNTING HARDWARE. CONTRACTOR TO PROVIDE ALL NECESSARY WIRING, CONNECTIONS, AND OTHER MATERIALS REQUIRED TO MAKE VIVRDS SYSTEM FUNCTIONAL. CONTRACTOR TO INSTALL CITY PROVIDED EQUIPMENT.

13. THE CITY OF LUBBOCK TO PROVIDE ALL CONTROLLER CABINETS, CABINET BASES, CONTROLLER, SIGNAL MONITOR, VEHICLE AND PEDESTRIAN DETECTION (INCLUDING APS), AND COMM HARDWARE. CONTRACTOR SHALL PROVIDE WIRING AND OTHER COMPONENTS NECESSARY FOR A FUNCTIONAL SYSTEM. CITY OF LUBBOCK STAFF TO INSTALL AND WIRE THE TRAFFIC SIGNAL CABINET, CONTROLLER AND COMPONENTS IN THE CABINET. CONTRACTOR TO INSTALL ALL OTHER EQUIPMENT.

14. CITY OF LUBBOCK TO ONLY PROVIDE MAST ARM MOUNTED OVERHEAD STREET NAME SIGNS. CONTRACTOR TO PROVIDE ALL MOUNTING HARDWARE AND INSTALL MAST ARM MOUNTED STREET NAME SIGNS. CONTRACTOR SHALL FURNISH AND INSTALL ALL OTHER PROPOSED SIGNS ON THE PROJECT.

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS
P-2	Phase 8	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDICATION
P-3	Phase 2	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDICATION
P-6	Phase 2	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDICATION
P-7	Phase 4	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDICATION
P-10	Phase 4	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDICATION
P-11	Phase 6	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDICATION
P-14	Phase 6	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDICATION
P-15	Phase 8	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDICATION

* COUNTDOWN SPEECH MESSAGE = "OFF" FOR ALL UNITS

SIGNAL HEADS (ITEM 682)

SIGNAL HEAD NUMBER	12" LED SIGNAL INDICATION													PED SIG SEC (LED) (COUNTDOWN)
	SIGNAL HEAD TYPE	STATUS	BACK PLATE			LED SIGNAL LAMPS								
			3 SEC	4 SEC	5 SEC	<-G-	G	-G->	<-Y-	Y	-Y->	<-R-	R	
			EA	EA	EA	EA	EA		EA	EA		EA	EA	EA
1	H3LT	I	1			1			1			1		
2	H3LT	I	1			1			1			1		
3	H3	I	1				1			1			1	
4	H3	I	1				1			1			1	
5	V5RT	I			1		1	1		1	1		1	
6	PED	I												1
7	PED	I												1
8	H3	I	1				1			1			1	
9	H3	I	1				1			1			1	
10	H3	I	1				1			1			1	
11	V5RT	I			1		1	1		1	1		1	
12	PED	I												1
13	PED	I												1
14	H3LT	I	1			1			1			1		
15	H3LT	I	1			1			1			1		
16	H3	I	1				1			1			1	
17	H3	I	1				1			1			1	
18	V5RT	I			1		1	1		1	1		1	
19	PED	I												1
20	PED	I												1
21	H4FLT	I		1		1			2			1		
22	H3	I	1				1			1			1	
23	H3	I	1				1			1			1	
24	H3	I	1				1			1			1	
25	PED	I												1
26	V5RT	I			1		1	1		1	1		1	
27	PED	I												1
28	H4FLT	I		1		1			2			1		
TOTAL (NEW)			14	2	4	6	14	4	8	14	4	6	14	8

STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=RELOCATE

CONDUIT AND CABLE CHART
WIRE SIZE AND TYPE

RUN NO	CONDUIT STATUS	ITEM 618 CONDUIT										CABLE STATUS	ITEM 620 ELECTRICAL				ITEM 684 TRAFFIC SIGNAL CABLES								ITEM 6002		TOTAL LENGTH OF RUN	RUN NO
		2" PVC SCH 80 (RISER)		2" PVC (TRENCHED)		3" PVC (TRENCHED)		4" PVC (TRENCHED)		4" PVC (BORED)			NO. 6 XHHW WIRE		NO. 6 BARE WIRE		TY C 2 CNDR NO. 12		TY A 5 CNDR NO. 14		TY A 7 CNDR NO. 14		TY A 10 CNDR NO. 14		TY A 20 CNDR NO. 14		VIVRD CABLE			
		Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len		Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len		
1	E			1	10							I	2	20	1	10												10	1
2	E					1	5					I			1	5							7	35					5	2
	E							1	5			I			1	5	8	40											5	
	E							1	5			I			1	5									4	20	4	20	5	
	E							1	5			I			1	5													5	
3	I					1	15					I			1	15	1	15							1	15	1	15	15	3
4	I					1	30					I			1	30	1	30					1	30					30	4
5	E									1	150	I			1	150	2	300					2	300	1	150	1	150	150	5
6	I					1	15					I			1	15									1	15	1	15	15	6
7	I					1	15					I			1	15	1	15					1	15					15	7
8	I					1	5					I			1	5	1	5					1	5					5	8
9	I					1	35					I			1	35									1	35	1	35	35	9
10	I					1	10					I			1	10	1	10					1	10					10	10
11	I					1	10					I			1	10	1	10					1	10					10	11
12	E									1	140	I			1	140	2	280					2	280	1	140	1	140	140	12
13	I					1	15					I			1	15	1	15					1	15					15	13
14	I					1	40					I			1	40									1	40	1	40	40	14
15	E									1	120	I			1	120	4	480					3	360	2	240	2	240	120	15
16	I					1	20					I			1	20	1	20					1	20					20	16
SUBTOTAL			0		0		210		0		0			20		650		1220		0		0		1080		655		655		
P-2	P											I						5		175		100						75	VARIES	P-2
P-3	P											I						5											VARIES	P-3
P-4	P											I								255		20						55	VARIES	P-4
P-6	P											I						5											VARIES	P-6
P-7	P											I						5											VARIES	P-7
P-8	P											I								155		95						60	VARIES	P-8
P-10	P											I						5											VARIES	P-10
P-11	P											I						5											VARIES	P-11
P-12	P											I								205		20						50	VARIES	P-12
P-14	P											I						5		10									VARIES	P-14
P-15	P											I						5		10									VARIES	P-15
SUBTOTAL			0		0		0		0		0			0		0		40		810		235		0		0		240		
TOTAL			0		0		210		0		0			20		650		1260		810		235		1080		655		895		

CONDUIT STATUS: I=INSTALL; E=EXISTING; P=WIRE TO BE INSTALLED INSIDE STEEL POLE; A=ABANDON; REM=REMOVE AND SALVAGE

P-# - REFERS TO WIRING WITHIN THE SIGNAL POLE AND MAST ARM.

* - THE CONTRACTOR SHALL INSTALL A 2" PVC CONDUIT FROM THE POINT OF DELIVERY TO THE PEDESTAL METER. ELECTRICAL PROVIDER WILL INSTALL THE ELECTRICAL CONDUCTORS FROM THE POINT OF DELIVERY TO THE PEDESTAL METER.

STATE OF TEXAS
LUKE A. SCHMIDT
120384
PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
TRAFFIC SIGNAL
PROPOSED QUANTITIES

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	168
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

CABLE TERMINATION CHART

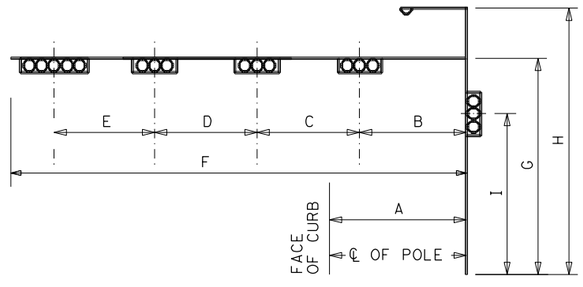
TERMINAL BLOCKS	PRIMARY COLOR	TRACER COLOR	CABLE 1 20 CNDR. FROM P-2 TO CNTRL.	CABLE 2 10 CNDR. FROM P-3 TO CNTRL.	CABLE 3 20 CNDR. FROM P-4 TO CNTRL.	CABLE 4 10 CNDR. FROM P-6 TO CNTRL.	CABLE 5 10 CNDR. FROM P-7 TO CNTRL.	CABLE 6 20 CNDR. FROM P-8 TO CNTRL.	CABLE 7 10 CNDR. FROM P-10 TO CNTRL.	CABLE 8 10 CNDR. FROM P-11 TO CNTRL.	CABLE 9 20 CNDR. FROM P-12 TO CNTRL.	CABLE 10 10 CNDR. FROM P-14 TO CNTRL.	CABLE 10 10 CNDR. FROM P-15 TO CNTRL.
TERMINAL #1	RED	BLACK	SH 21 - OLC R (LT ARW)		SH 1, 2 - Ø7 R (LT ARW)			SH 28 - OLA R (LT ARW)			SH 14,15 - OLB R (LT ARW)		
TERMINAL #2	ORANGE	BLACK	SH 21 - OLC Y (LT ARW)		SH 1, 2 - Ø7 Y (LT ARW)			SH 28 - OLA Y (LT ARW)			SH 14,15 - OLB Y (LT ARW)		
TERMINAL #3	GREEN	BLACK	SH 21 - OLC FY (LT ARW)		SPARE			SH 28 - OLA FY (LT ARW)			SH 14,15 - OLB FY (LT ARW)		
TERMINAL #4	BLUE	-	SH 21 - Ø5 G (LT ARW)		SH 1, 2 - Ø7 G (LT ARW)			SH 28 - Ø1 G (LT ARW)			SH 14,15 - Ø3 G (LT ARW)		
TERMINAL #5	WHITE	-	SPARE		SPARE			SPARE			SPARE		
TERMINAL #6			SPARE		SPARE			SPARE			SPARE		
TERMINAL #7	RED	-	SH 22,23,24 - Ø2 R		SH 3,4 - Ø4 R			SH 8,9,10 - Ø6 R			SH 16,17 - Ø8 R		
TERMINAL #8			SH 26 - OLK R		SH 5 - OLD R			SH 11 - OLG R			SH 18 - OLH R		
TERMINAL #9	ORANGE	-	SH 22,23,24 - Ø2 Y		SH 3,4 - Ø4 Y			SH 8,9,10 - Ø6 Y			SH 16,17 - Ø8 Y		
TERMINAL #10			SH 26 - OLK Y		SH 5 - OLD Y			SH 11 - OLG Y			SH 18 - OLH Y		
TERMINAL #11	GREEN	-	SH 22,23,24 - Ø2 G	SPARE	SH 3,4 - Ø4 G	SPARE	SPARE	SH 8,9,10 - Ø6 G	SPARE	SPARE	SH 16,17 - Ø8 G	SPARE	SPARE
TERMINAL #12			SH 26 - OLK G	SPARE	SH 5 - OLD G	SPARE	SPARE	SH 11 - OLG G	SPARE	SPARE	SH 18 - OLH G	SPARE	SPARE
TERMINAL #13	BLACK	WHITE	SH 26 - OLK Y (RT ARW)	SPARE	SH 5 - OLD Y (RT ARW)	SPARE	SPARE	SH 11 - OLG Y (RT ARW)	SPARE	SPARE	SPARE	SPARE	SPARE
TERMINAL #14	BLUE	WHITE	SH 26 - OLK G (RT ARW)	SPARE	SH 5 - OLD G (RT ARW)	SPARE	SPARE	SH 11 - OLG G (RT ARW)	SPARE	SPARE	SPARE	SPARE	SPARE
TERMINAL #15	RED	WHITE	SPARE	SH 27 - Ø2 DW	SPARE	SH 6 - Ø2 DW	SPARE	SPARE	SPARE	SH 13 - Ø6 DW	SPARE	SH 19 - Ø6 DW	SPARE
TERMINAL #16	GREEN	WHITE	SPARE	SH 27 - Ø2 W	SPARE	SH 6 - Ø2 W	SPARE	SPARE	SPARE	SH 13 - Ø6 W	SPARE	SH 19 - Ø6 W	SPARE
TERMINAL #17			SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
TERMINAL #18			SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
TERMINAL #19	BLUE	BLACK	SH 25 - Ø8 DW	SPARE	SPARE	SPARE	SH 7 - Ø4 DW	SPARE	SH 12 - Ø4 DW	SPARE	SPARE	SPARE	SH 20 - Ø8 DW
TERMINAL #20	WHITE	BLACK	SH 25 - Ø8 W	SPARE	SPARE	SPARE	SH 7 - Ø4 W	SPARE	SH 12 - Ø4 W	SPARE	SPARE	SPARE	SH 20 - Ø8 W

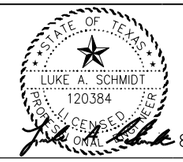
SIGNAL HEAD AND POLE PLACEMENT (FT)

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	NO. OF HEADS (EA) *	ITEM 6002 VIVID (EA)	LUM	DRILLED SHAFT LENGTH (FT) 24" DIA SUB TO ITEM 687	DRILLED SHAFT LENGTH (FT) 48" DIA TYPE A ITEM 416	FDN. TYPE WIND ZONE 100 MPH
E-1	REM	6	20	14	10	-	44	19	-	4	-	N	-	-	-
P-2	I	9	23	12	12	12	60	19	-	4	1	N	-	22	48-A
P-3	I	9	PEDESTRIAN PUSH BUTTON POLE					10	-	-	-	N	6	-	24-A
P-4	I	6	27	12	10	11	60	19	-	4	1	N	-	22	48-A
E-5	REM	5	19	10	11	-	40	19	-	4	-	N	-	-	-
P-6	I	7	PEDESTRIAN PUSH BUTTON POLE					10	-	-	-	N	6	-	24-A
P-7	I	7	PEDESTRIAN PUSH BUTTON POLE					10	-	-	-	N	6	-	24-A
P-8	I	8	19	12	12	12	60	19	-	4	1	N	-	22	48-A
E-9	REM	11	16	11	12	-	40	19	-	4	-	N	-	-	-
P-10	I	9	PEDESTRIAN PUSH BUTTON POLE					10	-	-	-	N	6	-	24-A
P-11	I	9	PEDESTRIAN PUSH BUTTON POLE					10	-	-	-	N	6	-	24-A
P-12	I	5	14	11	11	11	50	19	-	4	1	N	-	22	48-A
E-13	REM	5	20	10	10	-	40	19	-	4	-	N	-	-	-
P-14	I	9	PEDESTRIAN PUSH BUTTON POLE					10	-	-	-	N	6	-	24-A
P-15	I	9	PEDESTRIAN PUSH BUTTON POLE					10	-	-	-	N	6	-	24-A
										TOTAL:	4		42	88	

SIGNAL POLE STATUS: I=FURNISH & INSTALL; E=EXISTING; REM=REMOVE; F=INSTALL IN FUTURE PHASE

*- DOES NOT INCLUDE VERTICAL SIDEMOUNT SIGNAL HEADS OR PEDESTRIAN SIGNAL HEADS





TEXAS FIRM F-928

Kimley»Horn

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FREESE AND NICHOLS

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UPLAND AVENUE
66TH STREET TO 82ND STREET

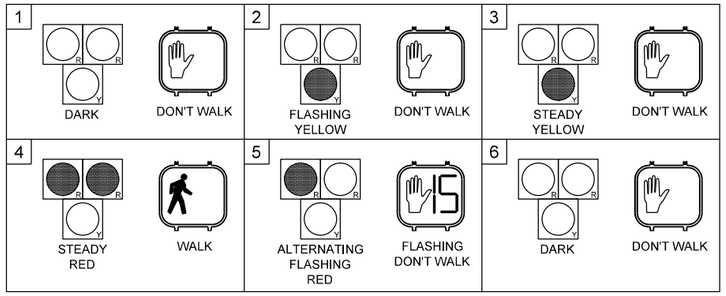
TRAFFIC SIGNAL PROPOSED QUANTITIES

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

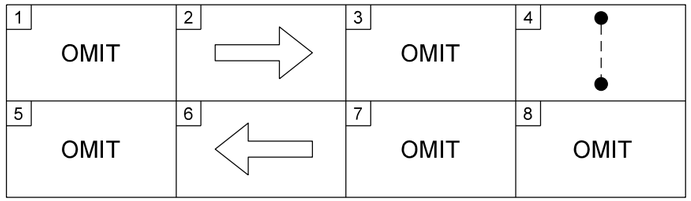
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	169
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

SEQUENCE FOR A HAWK SIGNAL



PHASING DIAGRAM



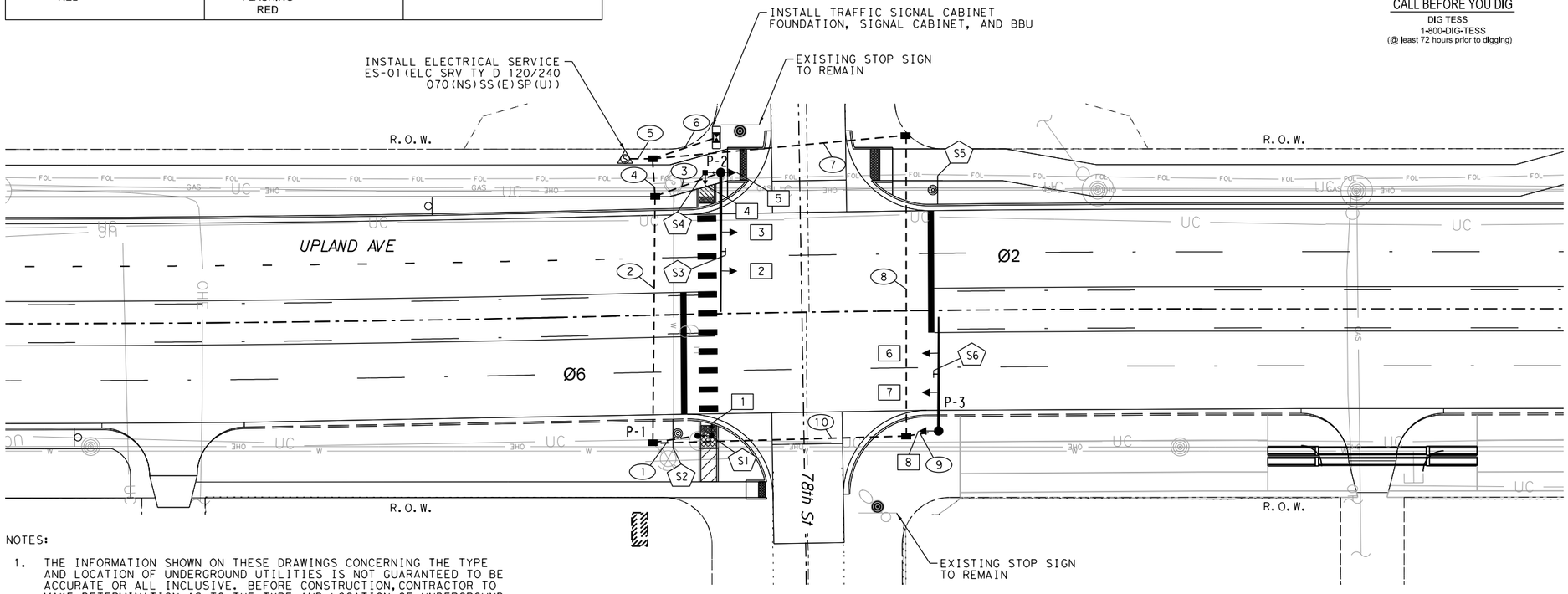
CAUTION!!

EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

N

0 20 40

STOP!
CALL BEFORE YOU DIG
DIG TESS
1-800-DIG-TESS
(@ least 72 hours prior to digging)



LEGEND

- TYPICAL PROPOSED MAST ARM COMBINATION SIGNAL WITH PEDESTRIAN SIGNAL, PUSH BUTTON, LED LUMINAIRE (250W E.Q.), AND SIGNAGE
- TRAFFIC SIGNAL CONTROLLER CABINET AND CONCRETE PAD
- PROPOSED TYPE C GROUND BOX W/ APRON
- PROPOSED CONDUIT
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- PROPOSED ELECTRICAL SERVICE
- PROPOSED RADIO
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF LUBBOCK TRAFFIC SIGNAL OFFICE AT 806-775-2132 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, VIVRDS DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
4. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL PROVIDER CONCERNING TRAFFIC SIGNAL ELECTRICAL SERVICE. CONTACT ELECTRICAL PROVIDER (TBD) REGARDING POINT OF DELIVERY AND DISTRIBUTION TO ELECTRICAL PEDESTAL SERVICE. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. CITY OF LUBBOCK TO ONLY PROVIDE MAST ARM MOUNTED OVERHEAD STREET NAME SIGNS. CONTRACTOR TO PROVIDE ALL MOUNTING HARDWARE AND INSTALL MAST ARM MOUNTED STREET NAME SIGNS. CONTRACTOR SHALL FURNISH AND INSTALL ALL OTHER PROPOSED SIGNS ON THE PROJECT.
6. INSTALL BASE MOUNTED CONTROLLER CABINET (CITY PROVIDED) AND FOUNDATION.
7. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
8. SIGNAL HEADS SHALL BE ALUMINUM WITH BLACK POWDERCOATED ALUMINUM VISORS AND VENTED ALUMINUM BACK PLATES.
9. MOUNT SIGNAL HEADS IN FRONT OF SIGNAL ARMS AS LONG AS MAXIMUM HEIGHT IS NOT EXCEEDED.
10. THE CITY OF LUBBOCK TO PROVIDE ALL CONTROLLER CABINETS, CABINET BASES, CONTROLLER, SIGNAL MONITOR, VEHICLE AND PEDESTRIAN DETECTION (INCLUDING APS), AND COMM HARDWARE. CONTRACTOR SHALL PROVIDE WIRING AND OTHER COMPONENTS NECESSARY FOR A FUNCTIONAL SYSTEM. CITY OF LUBBOCK STAFF TO INSTALL AND WIRE THE TRAFFIC SIGNAL CABINET, CONTROLLER AND COMPONENTS IN THE CABINET. CONTRACTOR TO INSTALL ALL OTHER EQUIPMENT.

PROPOSED SIGNALS

PEDESTRIAN HYBRID BEACON

SH 2, 3, 5, 6, 7, 8

LED COUNTDOWN PEDESTRIAN SIGNAL

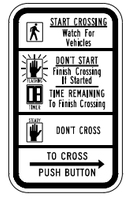
SH 1, 4

PROPOSED SIGNS

R10-6

S2 S5

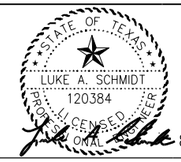
R10-3ER



S1 S4

R10-23a

S3 S6



8/9/2023

TEXAS FIRM F-928
Kimley»Horn

FREESE AND NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET

HAWK SIGNAL LAYOUT

UPLAND AVE AT 78TH STREET

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	170
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

CABLE TERMINATION CHART

TERMINAL BLOCKS	PRIMARY COLOR	TRACER COLOR	CABLE 1 10 CNDR. FROM P-1 TO CNTRL.	CABLE 2 20 CNDR. FROM P-2 TO CNTRL.	CABLE 3 20 CNDR. FROM P-3 TO CNTRL.
TERMINAL #1	RED	BLACK	PB COM	PB COM	PB COM
TERMINAL #2	ORANGE	BLACK	SPARE	SPARE	SPARE
TERMINAL #3	GREEN	BLACK	SPARE	SPARE	SPARE
TERMINAL #4	BLUE	-	SPARE	SPARE	SPARE
TERMINAL #5	WHITE	-	SPARE	SPARE	SPARE
TERMINAL #6			SPARE	SPARE	SPARE
TERMINAL #7	RED	-	SPARE	SH 2, 3, 4 - Ø2 R	SH 6, 7, 8 - Ø6 R
TERMINAL #8			SPARE	SPARE	SPARE
TERMINAL #9	ORANGE	-	SPARE	SH 2, 3, 4 - Ø2 Y	SH 6, 7, 8 - Ø6 Y
TERMINAL #10			SPARE	SPARE	SPARE
TERMINAL #11	GREEN	-	SPARE	SPARE	SPARE
TERMINAL #12			SPARE	SPARE	SPARE
TERMINAL #13	BLACK	WHITE	SPARE	SPARE	SPARE
TERMINAL #14	BLUE	WHITE	SPARE	SPARE	SPARE
TERMINAL #15	RED	WHITE	Ø2 PED CALL	Ø2 PED CALL	SPARE
TERMINAL #16	GREEN	WHITE	SPARE	SPARE	SPARE
TERMINAL #17			SPARE	SPARE	SPARE
TERMINAL #18			SPARE	SPARE	SPARE
TERMINAL #19	BLUE	BLACK	SH 1 - Ø4 DW	SH 4 - Ø4 DW	SPARE
TERMINAL #20	WHITE	BLACK	SH 1 - Ø4 W	SH 4 - Ø4 W	SPARE

SIGNS SUMMARY

SIGN	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R10-3ER	PED PUSH BUTTON	I	P-1	9"x15"
S2	R10-6	STOP HERE ON RED	I	GROUND MOUNTED	24"x36"
S3	R10-23a	CROSSWALK STOP ON RED	I	P-2	24"x30"
S4	R10-3ER	PED PUSH BUTTON	I	P-2	9"x15"
S5	R10-6	STOP HERE ON RED	I	GROUND MOUNTED	24"x36"
S6	R10-23a	CROSSWALK STOP ON RED	I	P-3	24"x30"

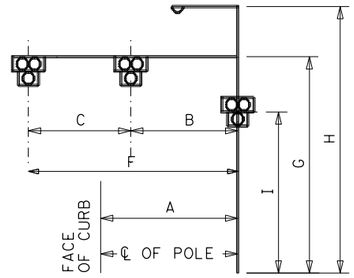
STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=EXISTING TO BE RELOCATED

SIGNAL HEAD AND POLE PLACEMENT (FT)

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	F (FT)	G (FT)	H (FT)	NO. OF HEADS (EA) *	LUM	DRILLED SHAFT 24" DIA SUB TO ITEM 687	DRILLED SHAFT 36" DIA TYPE B ITEM 416	FDN. TYPE WIND ZONE 100 MPH
P-1	I	5	PEDESTRIAN SIGNAL POLE				10	-	-	N	6	-	24-A
P-2	I	9	19	12	-	44	19	-	2	N	-	15	36-B
P-3	I	5	12	13	-	36	19	-	2	N	-	15	36-B
									TOTAL:		6	30	

SIGNAL POLE STATUS: I=INSTALL; E=EXISTING; REM=REMOVE; F=INSTALL IN FUTURE PHASE

*- DOES NOT INCLUDE VERTICAL SIDEMOUNT SIGNAL HEADS OR PEDESTRIAN SIGNAL HEADS



ELECTRICAL SERVICE DATA

ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED(5)-14)	SERVICE CONDUIT **SIZE	SERVICE CONDUCTORS NO. / SIZE	SAFETY SWITCH AMPS	MAIN CKT. BRK. POLE / AMPS	TWO-POLE CONTACTOR AMPS	PANELBD / LOADCENTER AMP RATING (MIN)	BRANCH CIRCUIT ID	BRANCH CKT. BRK. POLE / AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-01	TY D (120/240) 070 (NS) SS (E) SP (U)	2"	3 / #4	N/A	2P / 70	30	100	T.S.	1P / 50	23	<7.1

** - VERIFY SERVICE CONDUIT SIZE WITH UTILITY. SIZE MAY CHANGE DUE TO THE UTILITY METER REQUIREMENTS. ENSURE CONDUIT SIZE MEETS THE NATIONAL ELECTRICAL CODE.

GROUND BOX SUMMARY

ITEM NO.	DESCRIPTION	UNIT	QTY.
0624	GROUND BOX TY C (162911) W/APRON	EA	5

SIGNAL HEADS (ITEM 682)

SIGNAL HEAD NUMBER	12" LED SIGNAL INDICATION: SIGNAL HEAD TYPE	STATUS	BACK PLATE: HYBRID EA	Y EA	<-R- EA	R EA	PED SIG SEC (LED) (COUNTDOWN) EA
1	PED	I					1
2	HYBRID	I	1	1		2	
3	HYBRID	I	1	1		2	
4	PED	I					1
5	HYBRID	I	1	1		2	
6	HYBRID	I	1	1		2	
7	HYBRID	I	1	1		2	
8	HYBRID	I	1	1		2	
TOTAL (NEW)			6	6		12	2

STATUS: I=INSTALL

CONDUIT AND CABLE CHART WIRE SIZE AND TYPE

RUN NO	CONDUIT STATUS	ITEM 618 CONDUIT: 2" PVC SCH 80 (RISER) Qty	2" PVC SCH 80 (RISER) Len	2" PVC (TRENCHED) Qty	2" PVC (TRENCHED) Len	3" PVC (TRENCHED) Qty	3" PVC (TRENCHED) Len	4" PVC (TRENCHED) Qty	4" PVC (TRENCHED) Len	4" PVC (BORED) Qty	4" PVC (BORED) Len	CABLE STATUS	ITEM 620 ELECTRICAL: NO. 6 XHHW WIRE Qty	NO. 6 XHHW WIRE Len	NO. 6 BARE WIRE Qty	NO. 6 BARE WIRE Len	ITEM 684 TRAFFIC SIGNAL CABLES: TY C 2 CNDR NO. 12 Qty	TY C 2 CNDR NO. 12 Len	TY A 5 CNDR NO. 14 Qty	TY A 5 CNDR NO. 14 Len	TY A 20 CNDR NO. 14 Qty	TY A 20 CNDR NO. 14 Len	TOTAL LENGTH OF RUN	RUN NO
1	I					1	15					I			1	15	1	15					15	1
2	I									1	75	I			1	75	1	75					75	2
3	I					1	15					I			1	15	1	15			1	15	15	3
4	I					1	20					I			1	20	2	40			1	20	20	4
5	I											I			1	10							10	5
6	I			1	25							I	2	50	1	25	2	50					25	6
	I							2	50			I	2	50	1	25					2	50	25	
7	I									1	85	I			1	85					1	85	85	7
8	I									1	100	I			1	100					1	100	100	8
9	I					1	15					I			1	15					1	15	15	9
10	I									1	80	I			1	80							80	10
SUBTOTAL			0		25		65		50		340			100		465		195		0		285		
P-1	P											I						5					VARIES	P-1
P-2	P											I						5		115			VARIES	P-2
P-3	P											I								100			VARIES	P-3
SUBTOTAL			0		0		0		0		0			0		0		10		215		0		
TOTAL			0		25		65		50		340			100		465		205		215		285		

CONDUIT STATUS: E=EXISTING; I=INSTALL; A=ABANDON; AC=AERIAL CABLE; R=REMOVE AND SALVAGE; P=INSTALL WIRE INSIDE STEEL POLE

P-# - REFERS TO WIRING WITHIN THE SIGNAL POLE AND MAST ARM

STATE OF TEXAS
LUKE A. SCHMIDT
120384
LICENSED PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET

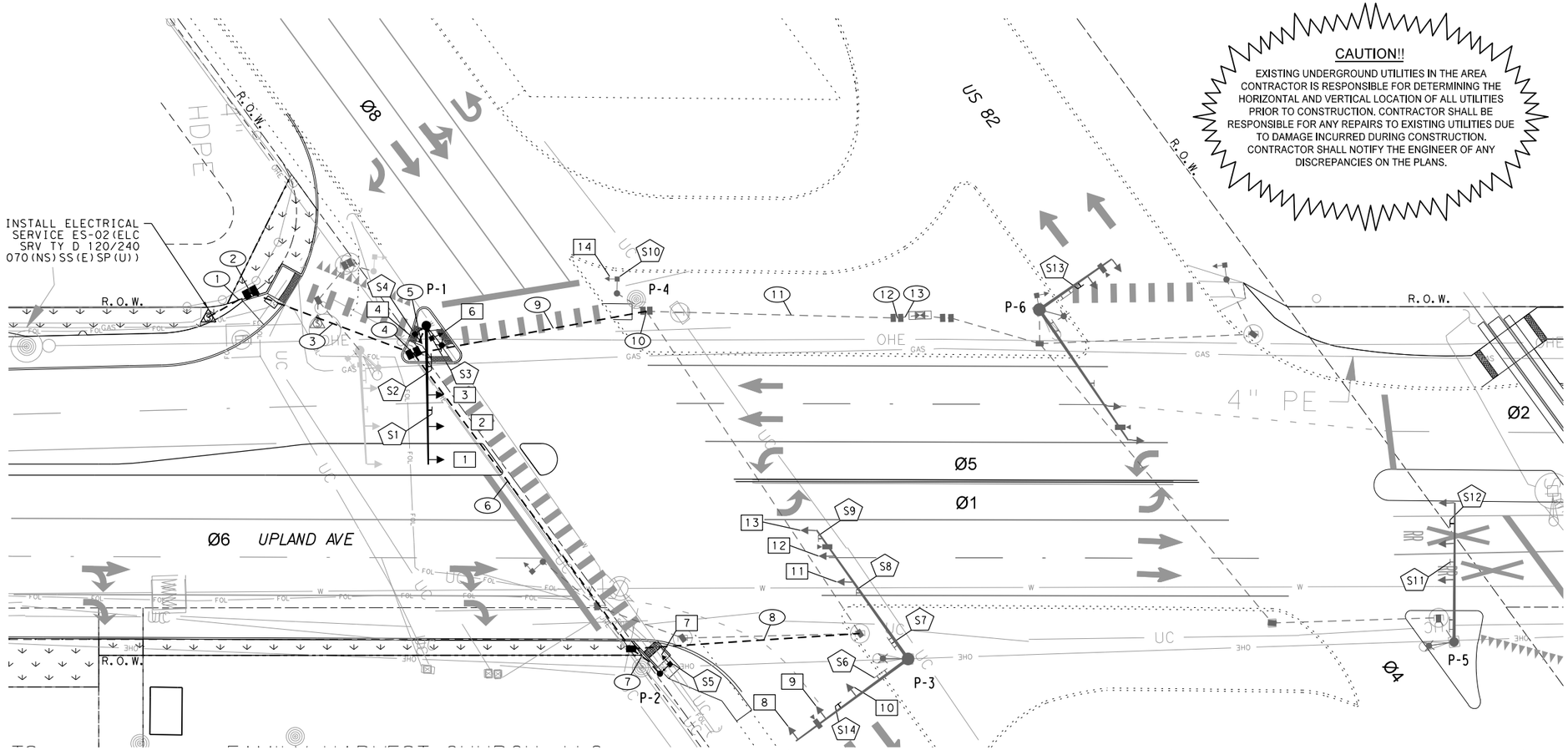
HAWK SIGNAL PROPOSED QUANTITIES

UPLAND AVE AT 78TH STREET

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	171
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



CAUTION!!

EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

STOP!
CALL BEFORE YOU DIG
DIG TESS
1-800-DIG-TESS
(@ least 72 hours prior to digging)

0 50 100
SCALE: 1"=100'

LEGEND

- TYPICAL PROPOSED MAST ARM COMBINATION SIGNAL\ WITH PEDESTRIAN SIGNAL, PUSH BUTTON, LED LUMINAIRE (250W E.Q.), AND SIGNAGE
- TYPICAL EXISTING TO BE REMOVED MAST ARM COMBINATION SIGNAL
- TRAFFIC SIGNAL CONTROLLER CABINET AND CONCRETE PAD
- EXISTING GROUND BOX
- PROPOSED TYPE C GROUND BOX W/ APRON
- EXISTING CONDUIT
- PROPOSED CONDUIT
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- D1 PROPOSED VEHICLE DETECTOR AND LABEL
- D1 EXISTING VEHICLE DETECTOR TO REMAIN AND LABEL
- S EXISTING ELECTRICAL SERVICE
- S PROPOSED ELECTRICAL SERVICE
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER
- E-# EXISTING TRAFFIC SIGNAL POLE NUMBER

0 20 40

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF LUBBOCK TRAFFIC SIGNAL OFFICE AT 806-775-2132 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE CITY OF LUBBOCK TO PROVIDE ALL CONTROLLER CABINETS, CABINET BASES, CONTROLLER, SIGNAL MONITOR, VEHICLE & PEDESTRIAN DETECTION (INCLUDING APS), AND COMM HARDWARE. CONTRACTOR SHALL PROVIDE WIRING AND OTHER COMPONENTS NECESSARY FOR A FUNCTIONAL SYSTEM. CITY OF LUBBOCK STAFF TO INSTALL AND WIRE THE TRAFFIC SIGNAL CABINET, CONTROLLER AND COMPONENTS IN THE CABINET. CONTRACTOR TO INSTALL ALL OTHER EQUIPMENT.
4. CITY OF LUBBOCK TO ONLY PROVIDE MAST ARM MOUNTED OVERHEAD STREET NAME SIGNS. CONTRACTOR TO PROVIDE ALL MOUNTING HARDWARE AND INSTALL MAST ARM MOUNTED STREET NAME SIGNS. CONTRACTOR SHALL FURNISH AND INSTALL ALL OTHER PROPOSED SIGNS ON THE PROJECT.
5. CITY OF LUBBOCK TO PROVIDE VIVIDS CAMERAS AND MOUNTING HARDWARE. CONTRACTOR TO PROVIDE ALL NECESSARY WIRING, CONNECTIONS, AND OTHER MATERIALS REQUIRED TO MAKE VIVIDS SYSTEM FUNCTIONAL.CONTRACTOR TO INSTALL CITY PROVIDED EQUIPMENT.
6. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, VEHICLE DECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
7. ALL PROPOSED LOCATION FOR SIGNAL POLES AND NEW PULL BOXES ARE BASED ON EXISTING DATA PROVIDED. ALL PROPOSED LOCATIONS FOR THESE ITEMS CAN BE FIELD ADJUSTED BY THE INSPECTING ENGINEER AND MUST BE VERIFIED AND APPROVED BY THEM PRIOR TO INSTALLATION.
8. EXISTING SIGNAL EQUIPMENT TO REMAIN UNLESS OTHERWISE NOTED.
9. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
10. SIGNAL HEADS SHALL BE ALUMINUM WITH BLACK POWDERCOATED ALUMINUM VISORS AND VENTED ALUMINUM BACK PLATES.
11. MOUNT SIGNAL HEADS IN FRONT OF SIGNAL ARMS AS LONG AS MAXIMUM HEIGHT IS NOT EXCEEDED.
12. VIVID ZONES TO BE PROGRAMMED BY THE CITY. CONTACT CITY OF LUBBOCK TRAFFIC SIGNAL OFFICE AT 806-775-2132 WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.

EXISTING SIGNALS TO REMAIN

H3 — R Y G — SH 8,9,10, 11,12,13

LED COUNTDOWN PEDESTRIAN SIGNAL — 08 — SH 14

PROPOSED SIGNALS

H4FLT — R Y Y G — SH 1

H3 — R Y G — SH 2,3

LED COUNTDOWN PEDESTRIAN SIGNAL — 08 — SH 4, 6, 7

PROPOSED SIGNS

R3-8 LSS (S1, S12) — ONLY ONLY ONLY

R3-8 (MOD) (S13, S14)

R10-3ER (S3, S4, S5) — START CROSSING Watch For Vehicles; DON'T START Finish Crossing If Started; TIME REMAINING To Finish Crossing; DON'T CROSS; TO CROSS PUSH BUTTON

EXISTING SIGNS TO REMAIN

S6 — Upland Ave 6900

S7 — 62 82 M Sharp Fwy 7200

S2 — 62 82 M Sharp Fwy 7300

R6-2R — ONE WAY (S8)

R10-3ER (S10) — START CROSSING Watch For Vehicles; DON'T START Finish Crossing If Started; TIME REMAINING To Finish Crossing; DON'T CROSS; TO CROSS PUSH BUTTON

EXISTING SIGNS TO BE REMOVED

R3-6L (S11)

R3-6R (S9)

LEGEND
PEDESTRIAN RAMPS

- 8.3% MAX RUNNING SLOPE, 2% MAX CROSS SLOPE
- 5% MAX RUNNING SLOPE, 2% MAX CROSS SLOPE
- 2% MAX RUNNING SLOPE, 2% MAX CROSS SLOPE

STATE OF TEXAS
LUKE A. SCHMIDT
120384
LICENSED ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
TRAFFIC SIGNAL LAYOUT

UPLAND AVE AT MARSHA SHARP FREEWAY

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	172
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

CONDUIT AND CABLE CHART
WIRE SIZE AND TYPE

RUN NO	CONDUIT STATUS	ITEM 618 CONDUIT								CABLE STATUS	ITEM 620 ELECTRICAL CONDUCTORS								ITEM 684 TRAFFIC SIGNAL CABLES										TOTAL LENGTH OF RUN	RUN NO
		2" PVC SCH 80 (RISER)		2" PVC (TRENCHED)		3" PVC (TRENCHED)		4" PVC (BORED)			NO. 6 XHHW WIRE		NO. 6 BARE WIRE		NO. 8 XHHW WIRE		NO. 12 XHHW WIRE		TY C 2 CNDR NO. 12		TY A 5 CNDR NO. 14		TY A 7 CNDR NO. 14		TY A 10 CNDR NO. 14		TY A 20 CNDR NO. 14			
		Qty	Len	Qty	Len	Qty	Len	Qty	Len		Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len		
1	I	1	15	1	15					I	2	30	1	15	2	30													15	1
2	I					2	10			I	2	10	1	5	2	10													5	2
3	I							1	55	I	2	110	1	55	2	110													55	3
4	I					2	10			I	2	10	1	5	2	10													5	4
5	I					1	10			I			1	10	2	20			2	20							1	10	10	5
6	I							1	120	I			1	120					1	120					1	120			120	6
7	I					1	15			I			1	15					1	15					1	15			15	7
8	I							1	75	I			1	75															75	8
9	I							2	150	I	2	150	1	75					3	225					1	75	1	75	75	9
10	E									I	2	10	1	5					3	15					1	5	1	5	5	10
11	E									I	2	160	1	80					3	240					1	80	1	80	80	11
12	E									I	2	10	1	5					3	15					1	5	1	5	5	12
13	E									I	2	20	1	10					3	30									10	13
	E									I			1	10											1	10	1	10	10	
	E									I			1	10															10	
SUBTOTAL			15		15		45		400			510		495		180		0		680		0		0		310		185		
P-1	I									I								80		10		115		65					VARIES	P-1
P-2	I									I										5									VARIES	P-2
P-3	I									I																			VARIES	P-3
P-4	I									I																			VARIES	P-4
SUBTOTAL			0		0		0		0			0		0		0		80		15		115		65		0		0		
TOTAL			15		15		45		400			510		495		180		80		695		115		65		310		185		

CONDUIT STATUS: E=EXISTING; I=INSTALL; A=ABANDON; AC=AERIAL CABLE; R=REMOVE AND SALVAGE; P=INSTALL WIRE INSIDE STEEL POLE
P-# - REFERS TO WIRING WITHIN THE SIGNAL POLE AND MAST ARM

SIGNS SUMMARY

SIGN	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R3-8 LSS	LANE ASSIGNMENT	I	P-1	VA x 30"
S2	STREET NAME	SHARP	E	P-1	24"x VA
S3	R10-3ER	PED PUSH BUTTON	I	P-1	9"x15"
S4	R10-3ER	PED PUSH BUTTON	I	P-1	9"x15"
S5	R10-3ER	PED PUSH BUTTON	I	P-2	9"x15"
S6	STREET NAME	UPLAND AVE 6900	E	P-3	24"x VA
S7	STREET NAME	SHARP FWY 7200	E	P-3	24"x VA
S8	R6-2R	ONE WAY	E	P-3	30"x36"
S9	R3-6R	LANE ASSIGNMENT	REM	P-3	30"x36"
S10	R10-3ER	PED PUSH BUTTON	E	P-4	9"x15"
S11	R3-6L	LANE ASSIGNMENT	REM	P-5	30"x36"
S12	R3-8 LSS	LANE ASSIGNMENT	I	P-5	VA x 30"
S13	R3-8 (MOD)	LANE ASSIGNMENT	I	P-6	VA x 30"
S14	R3-8 (MOD)	LANE ASSIGNMENT	I	P-3	VA x 30"

STATUS: I=FURNISH AND INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=EXISTING TO BE RELOCATED

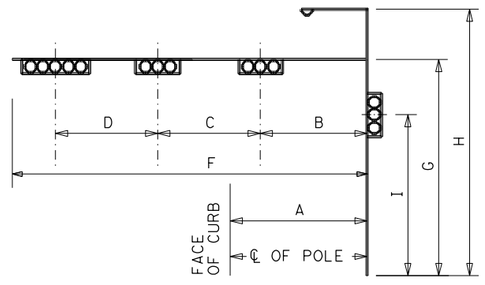
GROUND BOX SUMMARY

ITEM NO.	DESCRIPTION	UNIT	QTY.
0624	GROUND BOX TY C (162911) W/APRON	EA	5

SIGNAL HEAD AND POLE PLACEMENT (FT)

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	F (FT)	G (FT)	H (FT)	NO. OF HEADS (EA)*	LUM	DRILLED SHAFT LENGTH (FT)		FDN. TYPE WIND ZONE 100 MPH
											24" DIA SUB TO ITEM 687	36" DIA TYPE B ITEM 416	
P-1	I	11	22	10	11	44	19	30	3	Y	-	15	36-B
P-2	I	11	PEDESTRIAN SIGNAL POLE				10	-	-	N	6	-	24-A
									TOTAL:		6	15	

SIGNAL POLE STATUS: I=FURNISH AND INSTALL; E=EXISTING; REM=REMOVE; F=INSTALL IN FUTURE PHASE
*- DOES NOT INCLUDE VERTICAL SIDEMOUNT SIGNAL HEADS OR PEDESTRIAN SIGNAL HEADS



ELECTRICAL SERVICE DATA

ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED(5)-14)	SERVICE CONDUIT **SIZE	SERVICE CONDUCTORS NO. / SIZE	SAFETY SWITCH AMPS	MAIN CKT. BRK. POLE / AMPS	TWO-POLE CONTACTOR AMPS	PANELBD / LOADCENTER AMP RATING (MIN)	BRANCH CIRCUIT ID	BRANCH CKT. BRK. POLE / AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-02	TY D (120/240) 070 (NS) SS (E) SP (U)	2"	3 / #4	N/A	2P / 70	30	100	T.S. LIGHTING	1P / 50 2P / 20	23 4	<7.1

** - VERIFY SERVICE CONDUIT SIZE WITH UTILITY. SIZE MAY CHANGE DUE TO THE UTILITY METER REQUIREMENTS. ENSURE CONDUIT SIZE MEETS THE NATIONAL ELECTRICAL CODE.

STATE OF TEXAS
LUKE A. SCHMIDT
120384
PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC SIGNAL PROPOSED QUANTITIES

UPLAND AVE AT MARSHA SHARP FREEWAY

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	173
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

CABLE TERMINATION CHART

TERMINAL BLOCKS	PRIMARY COLOR	TRACER COLOR	CABLE 1 20 CNDR. FROM P-1 TO CNTRL.	CABLE 2 10 CNDR. FROM P-3 TO CNTRL.
TERMINAL #1	RED	BLACK	SH 1 - OLA R (LT ARW)	
TERMINAL #2	ORANGE	BLACK	SH 1 - OLA Y (LT ARW)	
TERMINAL #3	GREEN	BLACK	SH 1 - OLA FY (LT ARW)	
TERMINAL #4	BLUE	-	SH 1 - *5 G (LT ARW)	
TERMINAL #5	WHITE	-	SPARE	
TERMINAL #6			SPARE	
TERMINAL #7	RED	-	SH 2,3 - Ø2 R	
TERMINAL #8			SPARE	
TERMINAL #9	ORANGE	-	SH 2,3 - Ø2 Y	
TERMINAL #10			SPARE	
TERMINAL #11	GREEN	-	SH 2,3 - Ø2 G	SPARE
TERMINAL #12			SPARE	SPARE
TERMINAL #13	BLACK/RED	WHITE	SPARE	SPARE
TERMINAL #14	BLUE	WHITE	SPARE	SPARE
TERMINAL #15	RED	WHITE	SH 4 - Ø8 DW	SH 7 - Ø8 DW
TERMINAL #16	GREEN	WHITE	SH 4 - Ø8 W	SH 7 - Ø8 W
TERMINAL #17			SPARE	SPARE
TERMINAL #18			SPARE	SPARE
TERMINAL #19	BLUE	BLACK	SH 6 - Ø6 DW	SPARE
TERMINAL #20	WHITE	BLACK	SH 6 - Ø6 W	SPARE

*NOTE: HOME RUN 2 CONDR. TO ALL POLES WITH PED HEADS FOR PED CALL

**NOTE: CABLE TERMINATION CHART ONLY SHOWS THE PROPOSED 10 AND 20 CONDUCTOR CABLES TO BE ADDED/MODIFIED AS PART OF THIS TABLE. CABLES NOT IDENTIFIED ABOVE ARE TO REMAIN AS INSTALLED.

SIGNAL HEADS (ITEM 682)

SIGNAL HEAD NUMBER	12" LED SIGNAL INDICATION										PED SIG SEC (LED) (COUNTDOWN)
	SIGNAL HEAD TYPE	STATUS	BACK PLATE		LED SIGNAL LAMPS						
			3 SEC	4 SEC	<-G-	G	<-Y-	Y	<-R-	R	
			EA	EA	EA	EA	EA	EA	EA	EA	EA
1	H4FLT	I		1	1		2		1		
2	H3	I	1			1		1		1	
3	H3	I	1			1		1		1	
4	PED	I									1
6	PED	I									1
7	PED	I									1
TOTAL (NEW)			2	1	1	2	2	2	1	2	3

STATUS: I=FURNISH AND INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=RELOCATE

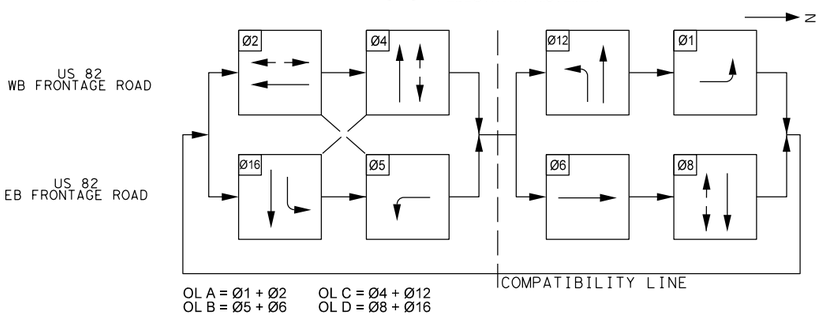
NOTE: EXISTING SIGNAL HEADS NOT IDENTIFIED ABOVE TO REMAIN AS INSTALLED

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS
P-1	Phase 2	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDCATION
P-1	Phase 8	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDCATION
P-2	Phase 8	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDCATION

PHASE SEQUENCE

COMPATIBLE PHASES
PEDESTRIAN MOVEMENT



OL A = Ø1 + Ø2
OL B = Ø5 + Ø6
OL C = Ø4 + Ø12
OL D = Ø8 + Ø16

STATE OF TEXAS
LUKE A. SCHMIDT
120384
LICENSED ENGINEER
PROFESSIONAL
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC SIGNAL PROPOSED QUANTITIES

UPLAND AVE AT MARSHA SHARP FREEWAY

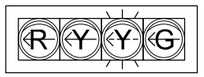
FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	174
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

PROPOSED SIGNALS

H4FLT

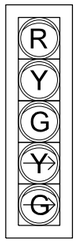


SH 1, 7, 12, 15

H3

SH 2, 3, 8, 9, 13, 16, 17

V5RT



SH 4, 11, 14

V3

SH 18

LED COUNTDOWN PEDESTRIAN SIGNAL

SH 5, 6, 10, 19

PROPOSED SIGNS

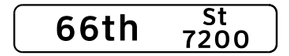
R10-3EL

S3 S5

R10-3ER

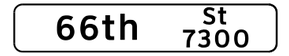
S2 S8

D3-1



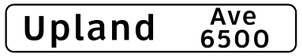
S4

D3-1



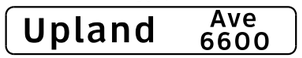
S7

D3-1



S1

D3-1



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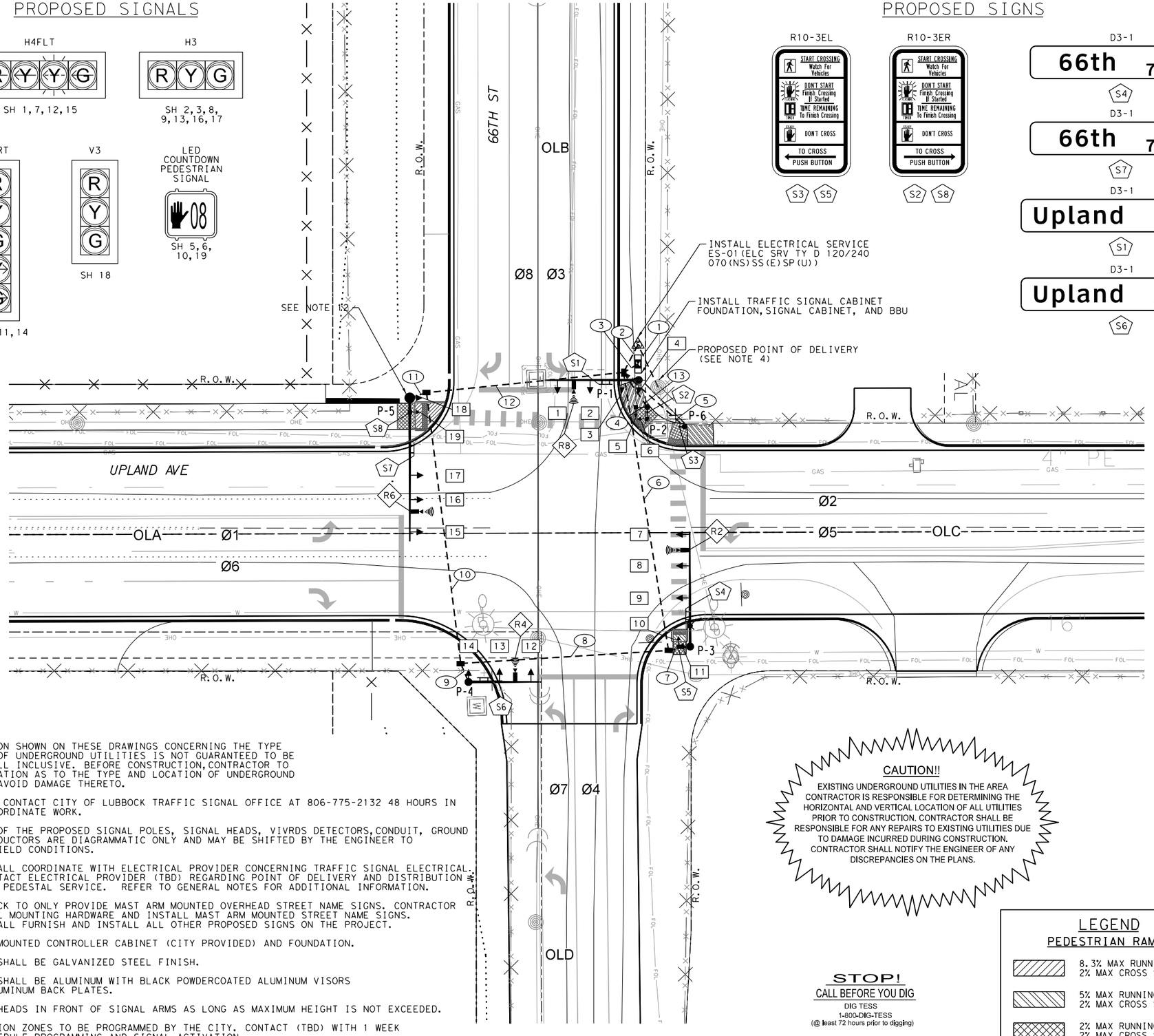

0 20 40

LEGEND

- TYPICAL PROPOSED MAST ARM COMBINATION SIGNAL\ WITH PEDESTRIAN SIGNAL, PUSH BUTTON, LED LUMINAIRE (250W E.Q.), AND SIGNAGE
- TRAFFIC SIGNAL CONTROLLER CABINET AND CONCRETE PAD
- EXISTING GROUND BOX
- PROPOSED TYPE A GROUND BOX W/ APRON
- PROPOSED TYPE C GROUND BOX W/ APRON
- PROPOSED CONDUIT
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- R1 PROPOSED VIVRDS DETECTOR AND LABEL
- S PROPOSED ELECTRICAL SERVICE
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF LUBBOCK TRAFFIC SIGNAL OFFICE AT 806-775-2132 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, VIVRDS DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
4. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL PROVIDER CONCERNING TRAFFIC SIGNAL ELECTRICAL SERVICE. CONTACT ELECTRICAL PROVIDER (TBD) REGARDING POINT OF DELIVERY AND DISTRIBUTION TO ELECTRICAL PEDESTAL SERVICE. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. CITY OF LUBBOCK TO ONLY PROVIDE MAST ARM MOUNTED OVERHEAD STREET NAME SIGNS. CONTRACTOR TO PROVIDE ALL MOUNTING HARDWARE AND INSTALL MAST ARM MOUNTED STREET NAME SIGNS. CONTRACTOR SHALL FURNISH AND INSTALL ALL OTHER PROPOSED SIGNS ON THE PROJECT.
6. INSTALL BASE MOUNTED CONTROLLER CABINET (CITY PROVIDED) AND FOUNDATION.
7. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
8. SIGNAL HEADS SHALL BE ALUMINUM WITH BLACK POWDERCOATED ALUMINUM VISORS AND VENTED ALUMINUM BACK PLATES.
9. MOUNT SIGNAL HEADS IN FRONT OF SIGNAL ARMS AS LONG AS MAXIMUM HEIGHT IS NOT EXCEEDED.
10. VIVRDS DETECTION ZONES TO BE PROGRAMMED BY THE CITY. CONTACT (TBD) WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.

NOTES CONTINUED ON NEXT SHEET.

CAUTION!!

EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

STOP!

CALL BEFORE YOU DIG

DIG TESS
1-800-DIG-TESS
(@ least 72 hours prior to digging)

LEGEND

PEDESTRIAN RAMPS

- 8.3% MAX RUNNING SLOPE 2% MAX CROSS SLOPE
- 5% MAX RUNNING SLOPE 2% MAX CROSS SLOPE
- 2% MAX RUNNING SLOPE 2% MAX CROSS SLOPE

STATE OF TEXAS
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FREESE AND NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

TRAFFIC SIGNAL LAYOUT

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	175
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

CONDUIT AND CABLE CHART
WIRE SIZE AND TYPE

RUN NO	CONDUIT STATUS	ITEM 618 CONDUIT										CABLE STATUS	ITEM 620 ELECTRICAL CONDUCTORS								ITEM 684 TRAFFIC SIGNAL CABLES										ITEM 6002		TOTAL LENGTH OF RUN	RUN NO
		2" PVC SCH 80 (RISER)		2" PVC (TRENCHED)		3" PVC (TRENCHED)		4" PVC (TRENCHED)		4" PVC (BORED)			NO. 6 XHHW WIRE		NO. 6 BARE WIRE		NO. 8 XHHW WIRE		NO. 12 XHHW WIRE		TY C 2 CNDR NO. 12		TY A 5 CNDR NO. 14		TY A 7 CNDR NO. 14		TY A 10 CNDR NO. 14		TY A 20 CNDR NO. 14		VIVRD CABLE			
		Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len		Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len	Qty	Len		
1	I	1	20	1	20							I			1	20																20	1
2	I			1	15							I	2	30	1	15	2	30														15	2
3	I							1	10			I			1	10													4	40	4	40	10	3
	I							1	10			I			1	10					4	40					1	10						
	I			1	10							I	2	20	1	10																	
4	I					1	10					I			1	10													1	10	1	10	10	4
5	I					1	25					I			1	25					1	25					1	25					25	5
6	I									1	110	I			1	110	2	220			1	110							1	110	2	220	110	6
7	I					1	10					I			1	10	2	20			1	10							1	10	1	10	10	7
8	I									1	80	I			1	80															1	80	80	8
9	I					1	10					I			1	10													1	10	1	10	10	9
10	I									1	105	I			1	105													1	105			105	10
11	I					1	20					I			1	20					1	20							1	20	1	20	20	11
12	I									1	80	I			1	80					1	80							2	160	1	80	80	12
13	I					1	20					I			1	20					1	20											20	13
SUBTOTAL			20		45		95		20		375			50		535		270		0		305		0		0		35		465		470		
P-1	P											I												70		75						50	VARIES	P-1
P-2	P											I										5											VARIES	P-2
P-3	P											I								80		5		95		85						60	VARIES	P-3
P-4	P											I												35		65						45	VARIES	P-4
P-5	P											I										5		110		60						70	VARIES	P-5
P-6	P											I										5											VARIES	P-6
SUBTOTAL			0		0		0		0		0			0		0		0		80		20		310		285		0		0		225		
TOTAL			20		45		95		20		375			50		535		270		80		325		310		285		35		465		695		

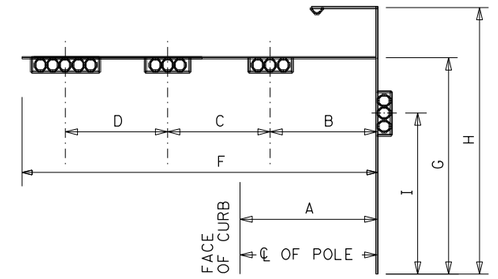
CONDUIT STATUS: E=EXISTING; I=INSTALL; A=ABANDON; AC=AERIAL CABLE; R=REMOVE AND SALVAGE; P=INSTALL WIRE INSIDE STEEL POLE

P-# - REFERS TO WIRING WITHIN THE SIGNAL POLE AND MAST ARM

* - THE CONTRACTOR SHALL INSTALL A 2" PVC CONDUIT FROM THE POINT OF DELIVERY TO THE PEDESTAL METER. ELECTRICAL PROVIDER WILL INSTALL THE ELECTRICAL CONDUCTORS FROM THE POINT OF DELIVERY TO THE PEDESTAL METER.

GROUND BOX SUMMARY

ITEM NO.	DESCRIPTION	UNIT	QTY.
0624	GROUND BOX TY C (162911) W/APRON	EA	4



SIGNS SUMMARY

SIGN	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	D3-1	UPLAND AVE 6500	I	P-1	24"x VA
S2	R10-3EL	PED PUSH BUTTON	F/I	P-2	9"x15"
S3	R10-3ER	PED PUSH BUTTON	F/I	P-6	9"x15"
S4	D3-1	66TH ST 7200	I	P-3	24"x VA
S5	R10-3EL	PED PUSH BUTTON	F/I	P-3	9"x15"
S6	D3-1	UPLAND AVE 6600	I	P-4	24"x VA
S7	D3-1	66TH ST 7300	I	P-5	24"x VA
S8	R10-3EL	PED PUSH BUTTON	F/I	P-5	9"x15"

STATUS: F/I=FURNISH AND INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=EXISTING TO BE RELOCATED; I= INSTALL

SIGNAL HEAD AND POLE PLACEMENT (FT)

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	F (FT)	G (FT)	H (FT)	NO. OF HEADS (EA) *	ITEM 6002 VIVRD (EA)	LUM	DRILLED SHAFT LENGTH (FT) 24" DIA SUB TO ITEM 687	36" DIA TYPE A ITEM 416	36" DIA TYPE B ITEM 416	FDN. TYPE WIND ZONE 100 MPH
P-1	I	7	7	12	1	36	19	-	3	1	N	-	13	-	36-A
P-2	I	9	PEDESTRIAN PUSH BUTTON POLE				10	-	-	-	N	6	-	-	24-A
P-3	I	9	19	12	12	44	19	30	3	1	Y	-	-	15	36-B
P-4	I	9	12	12	-	28	19	-	2	1	N	-	13	-	36-A
P-5	I	4	18	10	13	44	19	-	3	1	N	-	-	15	36-B
P-6	I	8	PEDESTRIAN PUSH BUTTON POLE				5	-	-	-	N	6	-	-	24-A
									TOTAL:	4		12	26	30	

SIGNAL POLE STATUS: I=FURNISH AND INSTALL; E=EXISTING; REM=REMOVE; F=INSTALL IN FUTURE PHASE

* - DOES NOT INCLUDE VERTICAL SIDEMOUNT SIGNAL HEADS OR PEDESTRIAN SIGNAL HEADS

ELECTRICAL SERVICE DATA

ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED(5)-14)	SERVICE CONDUIT **SIZE	SERVICE CONDUCTORS NO. / SIZE	SAFETY SWITCH AMPS	MAIN CKT. BRK. POLE / AMPS	TWO-POLE CONTACTOR AMPS	PANELBD / LOADCENTER AMP RATING (MIN)	BRANCH CIRCUIT ID	BRANCH CKT. BRK. POLE / AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-01	TY D (120/240) 070 (NS) SS (E) SP (U)	2"	3 / #4	N/A	2P / 70	30	100	T.S.	1P / 50	23	<7.1
								LIGHTING	2P / 20	4	

** - VERIFY SERVICE CONDUIT SIZE WITH UTILITY. SIZE MAY CHANGE DUE TO THE UTILITY METER REQUIREMENTS. ENSURE CONDUIT SIZE MEETS THE NATIONAL ELECTRICAL CODE.

NOTES:

11. CITY OF LUBBOCK TO PROVIDE VIVRDS CAMERAS AND MOUNTING HARDWARE. CONTRACTOR TO PROVIDE ALL NECESSARY WIRING, CONNECTIONS, AND OTHER MATERIALS REQUIRED TO MAKE VIVRDS SYSTEM FUNCTIONAL. CONTRACTOR TO INSTALL CITY PROVIDED EQUIPMENT.

12. THE CITY OF LUBBOCK TO PROVIDE ALL CONTROLLER CABINETS, CABINET BASES, CONTROLLER, SIGNAL MONITOR, VEHICLE AND PEDESTRIAN DETECTION (INCLUDING APS), AND COMM HARDWARE. CONTRACTOR SHALL PROVIDE WIRING AND OTHER COMPONENTS NECESSARY FOR A FUNCTIONAL SYSTEM. CITY OF LUBBOCK STAFF TO INSTALL AND WIRE THE TRAFFIC SIGNAL CABINET, CONTROLLER AND COMPONENTS IN THE CABINET. CONTRACTOR TO INSTALL ALL OTHER EQUIPMENT.

13. MAST ARM TO BE AT LEAST 20' ABOVE TRAVELED WAY.

STATE OF TEXAS
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PROFESSIONAL ENGINEER
8/9/2023

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Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
TRAFFIC SIGNAL
PROPOSED QUANTITIES

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	176
CONT.	SECT.	JOB	
0905	06	095,ETC.	

100% SUBMITTAL

CABLE TERMINATION CHART

TERMINAL BLOCKS	PRIMARY COLOR	TRACER COLOR	CABLE 1 20 CNDR. FROM P-1 TO CNTRL.	CABLE 2 10 CNDR. FROM P-2 TO CNTRL.	CABLE 3 20 CNDR. FROM P-3 TO CNTRL.	CABLE 4 20 CNDR. FROM P-4 TO CNTRL.	CABLE 5 20 CNDR. FROM P-5 TO CNTRL.
TERMINAL #1	RED	BLACK	SH 1 - OLD R (LT ARW)		SH 7 - OLA R (LT ARW)	SH 12 - OLB R (LT ARW)	SH 15 - OLC R (LT ARW)
TERMINAL #2	ORANGE	BLACK	SH 1 - OLD Y (LT ARW)		SH 7 - OLA Y (LT ARW)	SH 12 - OLB Y (LT ARW)	SH 15 - OLC Y (LT ARW)
TERMINAL #3	GREEN	BLACK	SH 1 - OLD FY (LT ARW)		SH 7 - OLA FY (LT ARW)	SH 12 - OLB FY (LT ARW)	SH 15 - OLC FY (LT ARW)
TERMINAL #4	BLUE	-	SH 1 - Ø7 G (LT ARW)		SH 7 - Ø1 G (LT ARW)	SH 12 - Ø3 G (LT ARW)	SH 15 - Ø5 G (LT ARW)
TERMINAL #5	WHITE	-	SPARE		SPARE	SPARE	SPARE
TERMINAL #6			SPARE		SPARE	SPARE	SPARE
TERMINAL #7	RED	-	SH 2,3,4 - Ø4 R		SH 8,9,11 - Ø6 R	SH 13,14 - Ø8 R	SH 16,17,18 - Ø2 R
TERMINAL #8			SPARE		SPARE	SPARE	SPARE
TERMINAL #9	ORANGE	-	SH 2,3,4 - Ø4 Y		SH 8,9,11 - Ø6 Y	SH 13,14 - Ø8 Y	SH 16,17,18 - Ø2 Y
TERMINAL #10			SPARE		SPARE	SPARE	SPARE
TERMINAL #11	GREEN	-	SH 2,3,4 - Ø4 G	SPARE	SH 8,9,11 - Ø6 G	SH 13,14 - Ø8 G	SH 16,17,18 - Ø2 G
TERMINAL #12			SPARE	SPARE	SPARE	SPARE	SPARE
TERMINAL #13	BLACK	WHITE	SH 4 - Ø5 Y (RT ARW)	SPARE	SH 11 - Ø7 Y (RT ARW)	SH 14 - Ø1 Y (RT ARW)	SPARE
TERMINAL #14	BLUE	WHITE	SH 4 - Ø5 G (RT ARW)	SPARE	SH 11 - Ø7 G (RT ARW)	SH 14 - Ø1 G (RT ARW)	SPARE
TERMINAL #15	RED	WHITE	SPARE	SH 6 - Ø2 DW	SH 10 - Ø6 DW	SPARE	SH 19 - Ø2 DW
TERMINAL #16	GREEN	WHITE	SPARE	SH 6 - Ø2 W	SH 10 - Ø6 W	SPARE	SH 19 - Ø2 W
TERMINAL #17			SPARE	SPARE	SPARE	SPARE	SPARE
TERMINAL #18			SPARE	SPARE	SPARE	SPARE	SPARE
TERMINAL #19	BLUE	BLACK	SPARE	SH 5 - Ø4 DW	SPARE	SPARE	SPARE
TERMINAL #20	WHITE	BLACK	SPARE	SH 5 - Ø4 W	SPARE	SPARE	SPARE

SIGNAL HEADS (ITEM 682)

SIGNAL HEAD NUMBER	12" LED SIGNAL INDICATION													PED SIG SEC (LED) (COUNTDOWN)
	SIGNAL HEAD TYPE	STATUS	BACK PLATE			LED SIGNAL LAMPS								
			3 SEC	4 SEC	5 SEC	<-G-	-G->	G	<-Y-	-Y->	Y	<-R-	R	
			EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
1	H4FLT	I		1		1			2			1		
2	H3	I	1					1			1		1	
3	H3	I	1					1			1		1	
4	V5RT	I			1		1	1		1	1		1	
5	PED	I												1
6	PED	I												1
7	H4FLT	I		1		1			2			1		
8	H3	I	1					1			1		1	
9	H3	I	1					1			1		1	
10	PED	I												1
11	V5RT	I			1		1	1		1	1		1	
12	H4FLT	I		1		1			2			1		
13	H3	I	1					1			1		1	
14	V5RT	I			1		1	1		1	1		1	
15	H4FLT	I		1		1			2			1		
16	H3	I	1					1			1		1	
17	H3	I	1					1			1		1	
18	V3	I	1					1			1		1	
19	PED	I												1
	TOTAL (NEW)		8	4	3	4	3	11	8	3	11	4	11	4

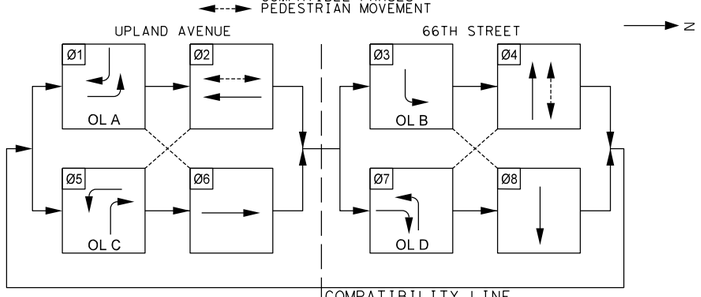
STATUS: I=FURNISH AND INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=RELOCATE

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS
P-2	Phase 2	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDCATION
P-6	Phase 4	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDCATION
P-3	Phase 4	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDCATION
P-5	Phase 2	BUTTON PUSH ON DW
		EXTENDED BUTTON PUSH
		LOCATOR TONE
		WALK INDCATION

PHASE SEQUENCE

COMPATIBLE PHASES
PEDESTRIAN MOVEMENT



OL A = Ø1 + Ø2
OL B = Ø3 + Ø4
OL C = Ø5 + Ø6
OL D = Ø7 + Ø8

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PROFESSIONAL ENGINEER
STATE OF TEXAS
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
TRAFFIC SIGNAL
PROPOSED QUANTITIES

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	177
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

SUMMARY OF ILLUMINATION ITEMS

	0416 6029	0610 6162	0610 6298	0618 6023	0618 6024	0618 6047	0620 6007	0620 6008	0624 6002	0624 6008	0628 6032	6027 6008	6186 6002
	DRILL SHAFT (RDW ILL POLE) (30 IN)	IN RD IL (TY SA) 30T-8 (250W EQ) LED	IN RD IL (TY SA) 50S-12 (400W EQ) LED	CONDT (PVC) (SCH 40) (2") (PVC) (SCH 40) (C)	CONDT (PVC) (SCH 40) (2") (BORE) (2") (C)	CONDT (PVC) (SCH 80) (2") (BORE) (2") (C)	ELEC CONDR (NO. 8) BARE	ELEC CONDR (NO. 8) INSULATED	GROUND BOX TY A (122311) W/APRON GROUND BOX TY A	GROUND BOX TY C (162911) W/APRON GROUND BOX TY C	ELC SRV TY A 240/480 060 (E)PS(C)	GROUND BOX (PREPARE)	ITS GND BOX (PCAST) TY 1 (243636) W/APRON
LOCATION	LF	EA	EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA
BEGIN TO STA 219+00 (1 OF 6)	10	0	1	275	180		190	380	0	0			0
STA 219+00 TO STA 231+00 (2 OF 6)	60		6	2485	285		1375	2750	0	1		0	0
STA 231+00 TO STA 243+00 (3 OF 6)	50	0	5	2165	315		1135	2270	0	2		0	1
STA 243+00 TO STA 255+00 (4 OF 6)	60		6	1825	305	85	1275	2570	1	1	1	0	0
STA 255+00 TO STA 267+00 (5 OF 6)	38	1	3	720	160	215	685	1370	3		1	1	1
STA 267+00 TO END (6 OF 6)	16	2	0	200	65	135	400	800	1	0		0	0
PROJECT TOTAL	**234**	**3**	**21**	**7670**	**1310**	**435**	**5060**	**10140**	**5**	**4**	**2**	**1**	**2**

12/13/2023

TEXAS FIRM F-928

Kimley»Horn

TEXAS FIRM F-2144

FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

LIGHTING PLAN

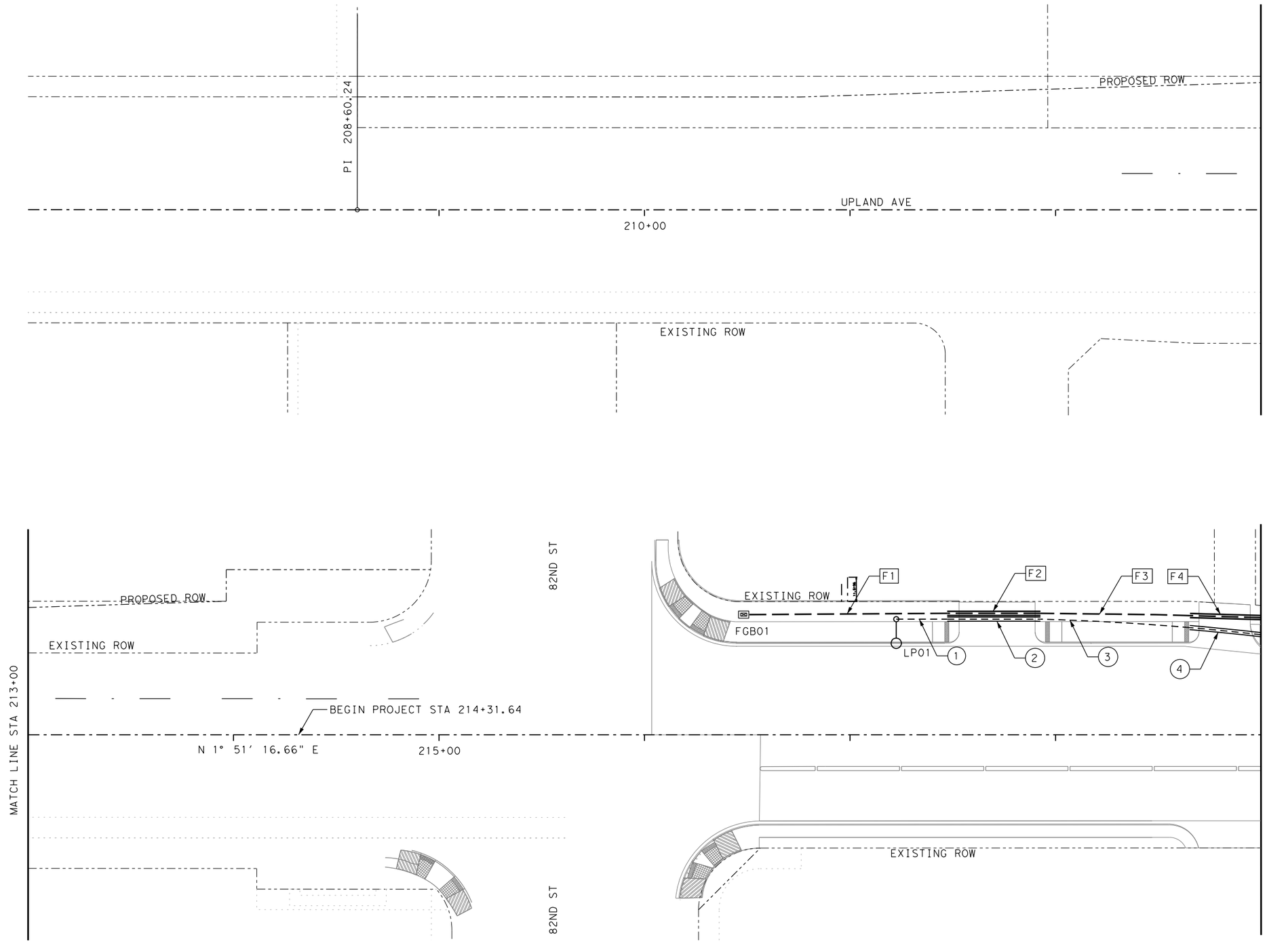
ILLUMINATION & FIBER QUANTITY SUMMARY

SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	178
CONT.	SECT.	JOB	
0905	06	095,ETC.	

100% SUBMITTAL



0 25 50

SCALE: 1"=50'

LEGEND

- PROPOSED LIGHT POLE
- PROPOSED ELECTRICAL SERVICE
- ILLUMINATION CONDUIT (TRENCHED)
- ILLUMINATION CONDUIT (BORED)
- FIBER CONDUIT (TRENCHED)
- FIBER CONDUIT (BORED)
- GROUND BOX W/ APRON
- ITS GROUND BOX W/ APRON
- # ILLUMINATION CONDUIT RUN NUMBER
- F# FIBER CONDUIT RUN NUMBER

NOTES:

1. ALL LIGHT POLE FOUNDATIONS SHALL BE A MINIMUM OF 4' FROM BACK OF CURB TO FACE OF FOUNDATION.
2. LIGHTING CONDUIT SHOWN IS DIAGRAMMATIC ONLY. THE BEST FINAL CONDUIT ROUTING SHALL BE DETERMINED BY THE CONTRACTOR AT THE TIME OF CONSTRUCTION.
3. THE INFORMATION SHOWN ON THESE PLANS REGARDING THE TYPE AND LOCATION OF UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. CONTRACTOR SHALL DETERMINE THE FINAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL EXERCISE EXTREME CAUTION WITH EXISTING OVERHEAD POWER LINES AND COMMUNICATION LINES IN THE AREA AND MAINTAIN ADEQUATE CLEARANCES (10' MIN DESIRABLE).

STATE OF TEXAS
HAMZA KHAN
131492
LICENSED
PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET

LIGHTING PLAN

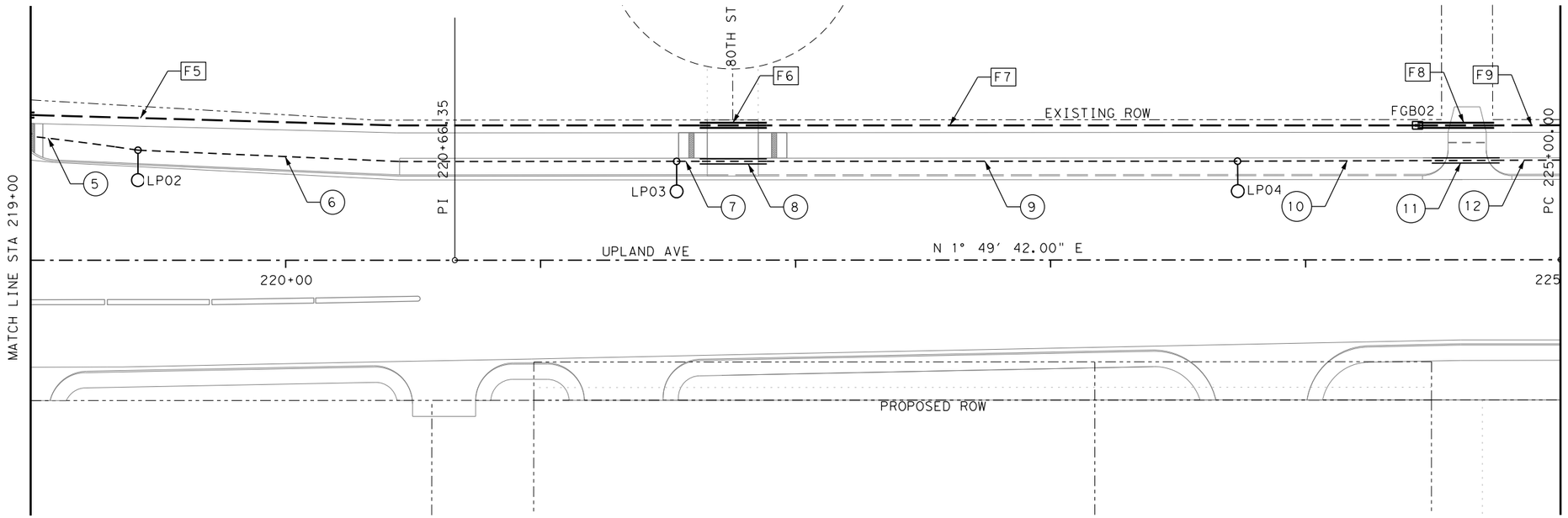
UPL BEGIN STA TO STA 219+00

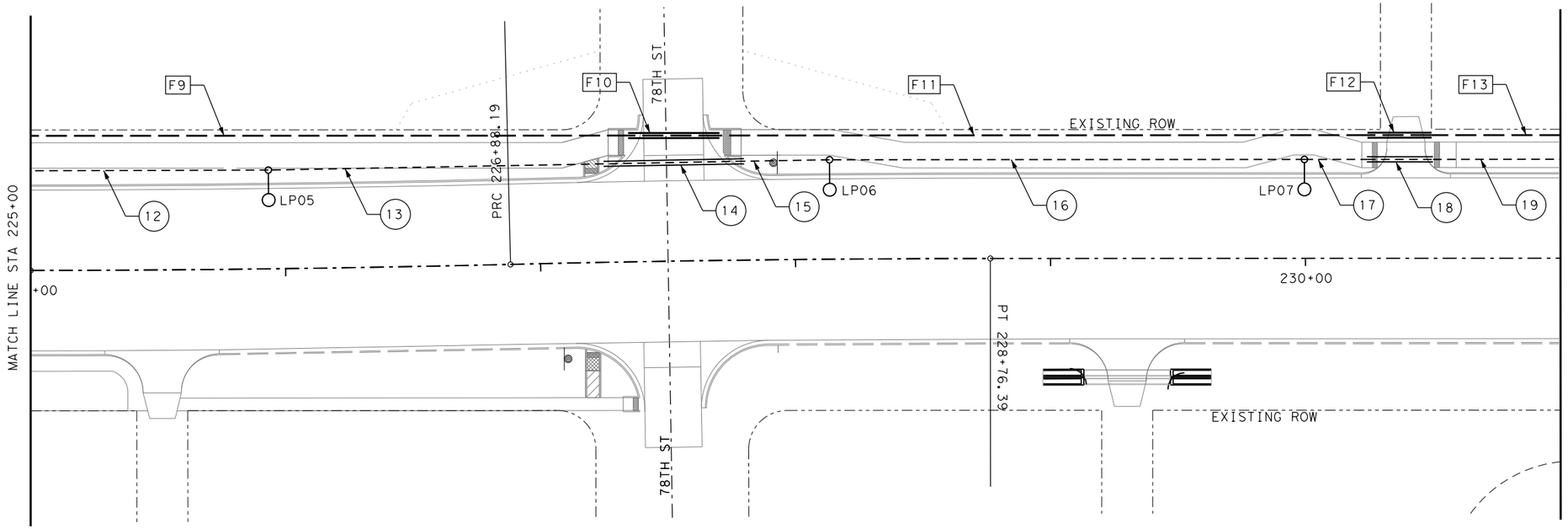
SHEET 1 OF 6

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	179
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





0 25 50

SCALE: 1"=50'

LEGEND

- PROPOSED LIGHT POLE
- PROPOSED ELECTRICAL SERVICE
- ILLUMINATION CONDUIT (TRENCHED)
- ILLUMINATION CONDUIT (BORED)
- FIBER CONDUIT (TRENCHED)
- FIBER CONDUIT (BORED)
- GROUND BOX W/ APRON
- ITS GROUND BOX W/ APRON
- ILLUMINATION CONDUIT RUN NUMBER
- FIBER CONDUIT RUN NUMBER

NOTES:

1. ALL LIGHT POLE FOUNDATIONS SHALL BE A MINIMUM OF 4' FROM BACK OF CURB TO FACE OF FOUNDATION.
2. LIGHTING CONDUIT SHOWN IS DIAGRAMMATIC ONLY. THE BEST FINAL CONDUIT ROUTING SHALL BE DETERMINED BY THE CONTRACTOR AT THE TIME OF CONSTRUCTION.
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4. CONTRACTOR SHALL EXERCISE EXTREME CAUTION WITH EXISTING OVERHEAD POWER LINES AND COMMUNICATION LINES IN THE AREA AND MAINTAIN ADEQUATE CLEARANCES (10' MIN DESIRABLE).

STATE OF TEXAS
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UPLAND AVENUE
66TH STREET TO 82ND STREET

LIGHTING PLAN

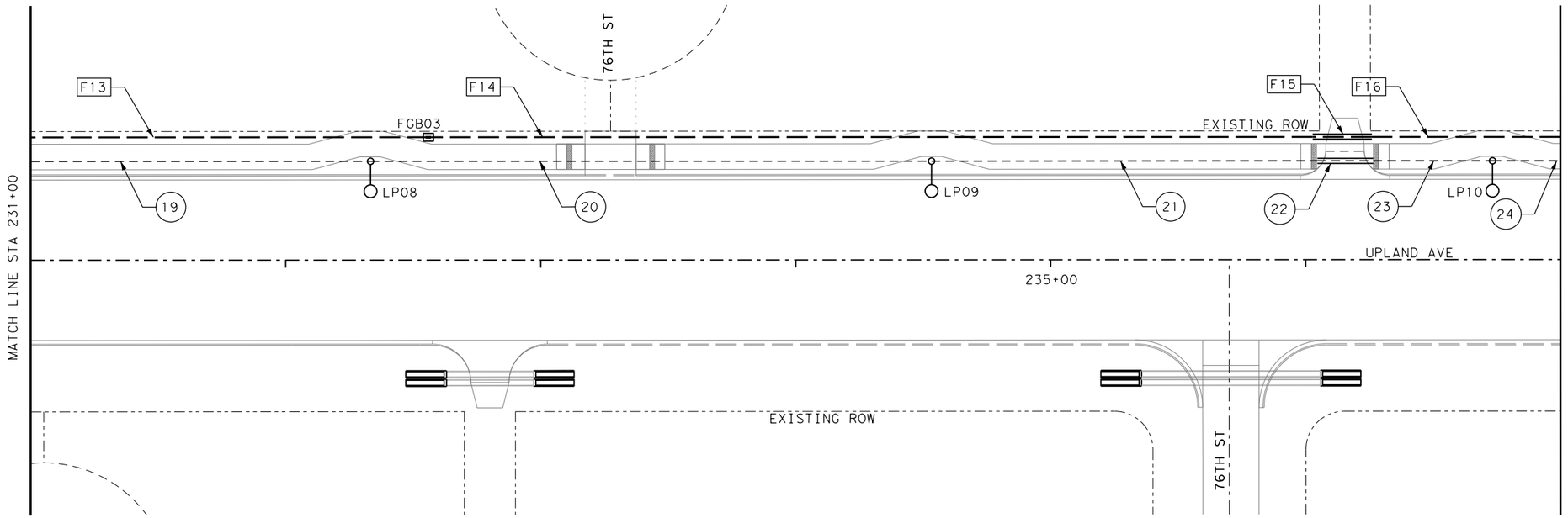
UPL STA 219+00 TO STA 231+00

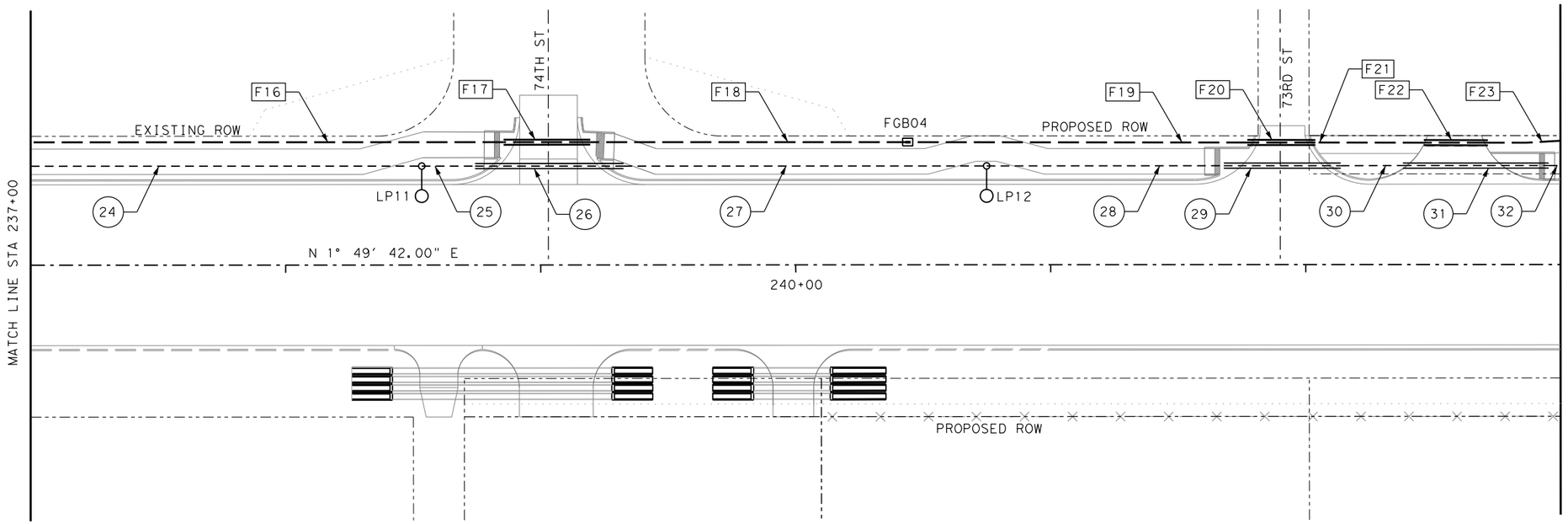
SHEET 2 OF 6

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	180
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





0 25 50

SCALE: 1"=50'

LEGEND

- PROPOSED LIGHT POLE
- PROPOSED ELECTRICAL SERVICE
- ILLUMINATION CONDUIT (TRENCHED)
- ILLUMINATION CONDUIT (BORED)
- FIBER CONDUIT (TRENCHED)
- FIBER CONDUIT (BORED)
- GROUND BOX W/ APRON
- ITS GROUND BOX W/ APRON
- # ILLUMINATION CONDUIT RUN NUMBER
- F# FIBER CONDUIT RUN NUMBER

NOTES:

1. ALL LIGHT POLE FOUNDATIONS SHALL BE A MINIMUM OF 4' FROM BACK OF CURB TO FACE OF FOUNDATION.
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3. THE INFORMATION SHOWN ON THESE PLANS REGARDING THE TYPE AND LOCATION OF UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. CONTRACTOR SHALL DETERMINE THE FINAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
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TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

LIGHTING PLAN

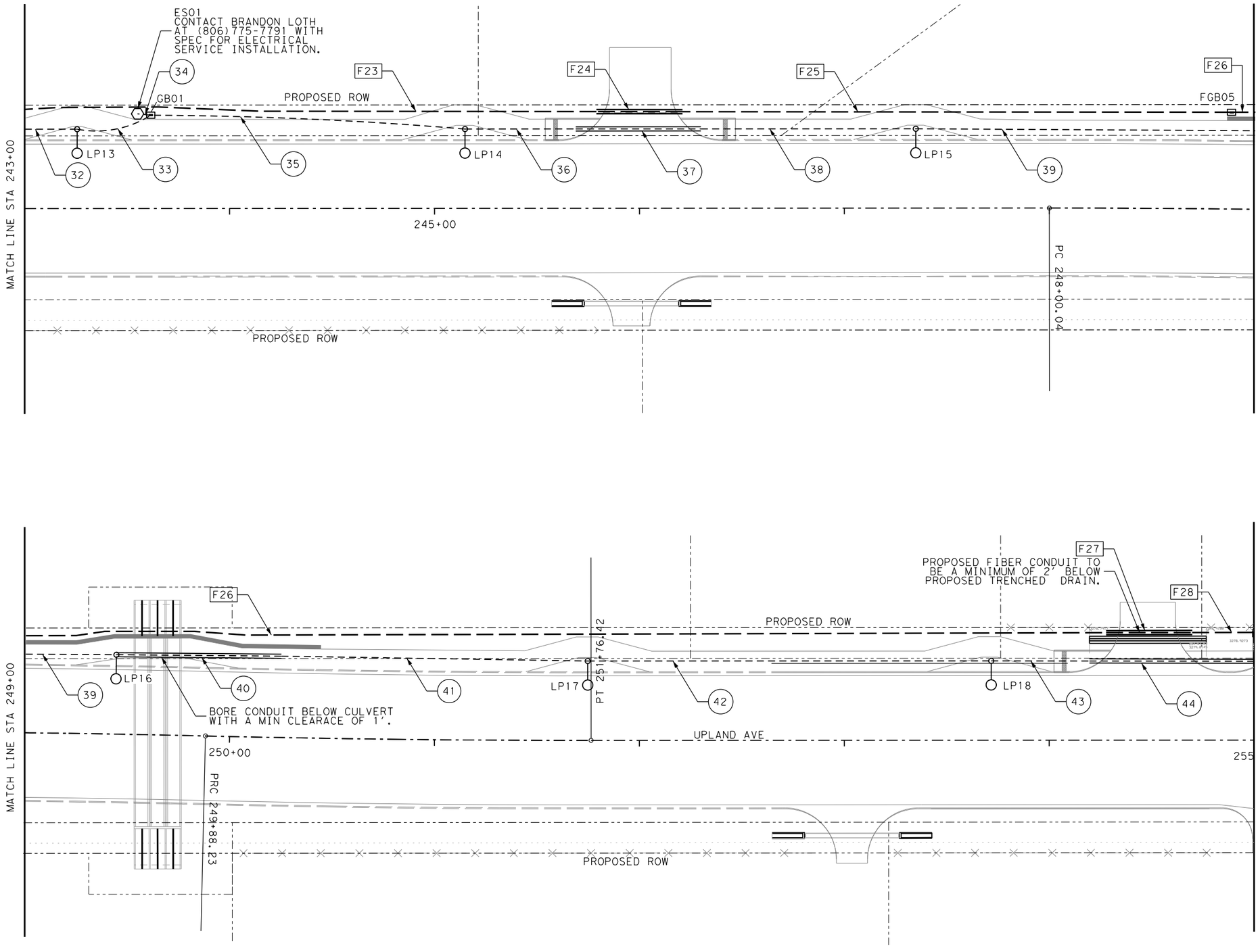
UPL STA 231+00 TO STA 243+00

SHEET 3 OF 6

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	181
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 25 50

SCALE: 1"=50'

LEGEND

- PROPOSED LIGHT POLE
- PROPOSED ELECTRICAL SERVICE
- ILLUMINATION CONDUIT (TRENCHED)
- ILLUMINATION CONDUIT (BORED)
- FIBER CONDUIT (TRENCHED)
- FIBER CONDUIT (BORED)
- GROUND BOX W/ APRON
- ITS GROUND BOX W/ APRON
- # ILLUMINATION CONDUIT RUN NUMBER
- F# FIBER CONDUIT RUN NUMBER

NOTES:

1. ALL LIGHT POLE FOUNDATIONS SHALL BE A MINIMUM OF 4' FROM BACK OF CURB TO FACE OF FOUNDATION.
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UPLAND AVENUE
66TH STREET TO 82ND STREET

LIGHTING PLAN

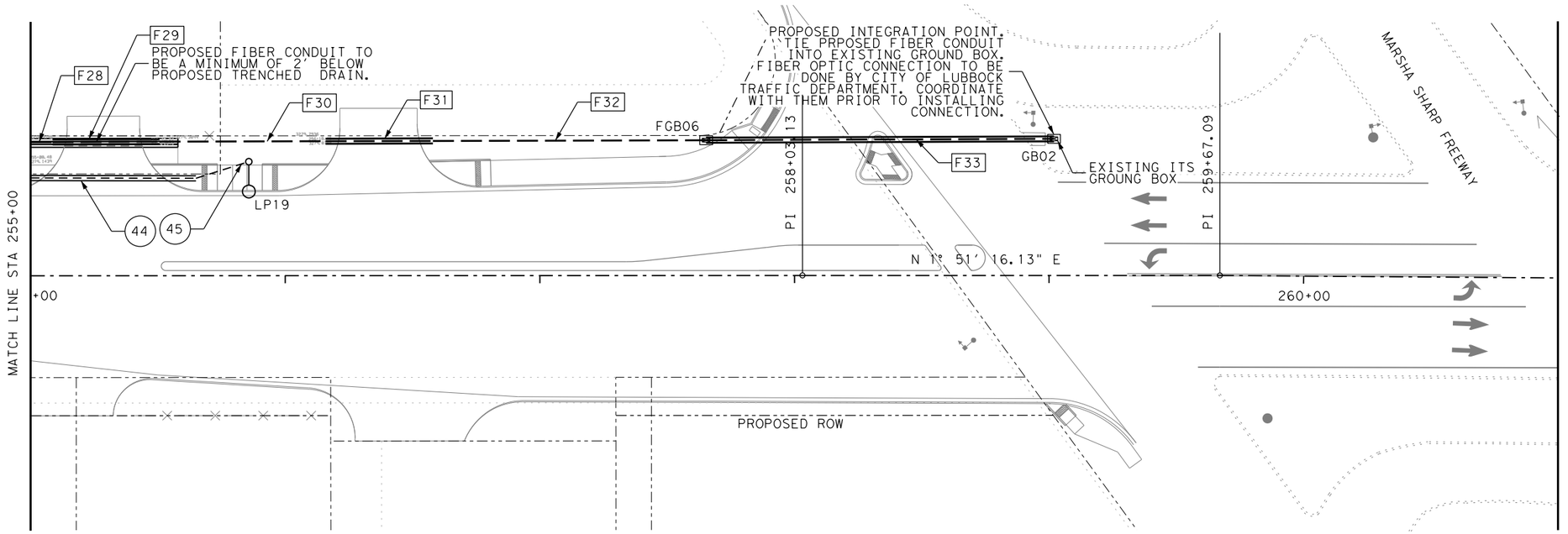
UPL STA 243+00 TO STA 255+00

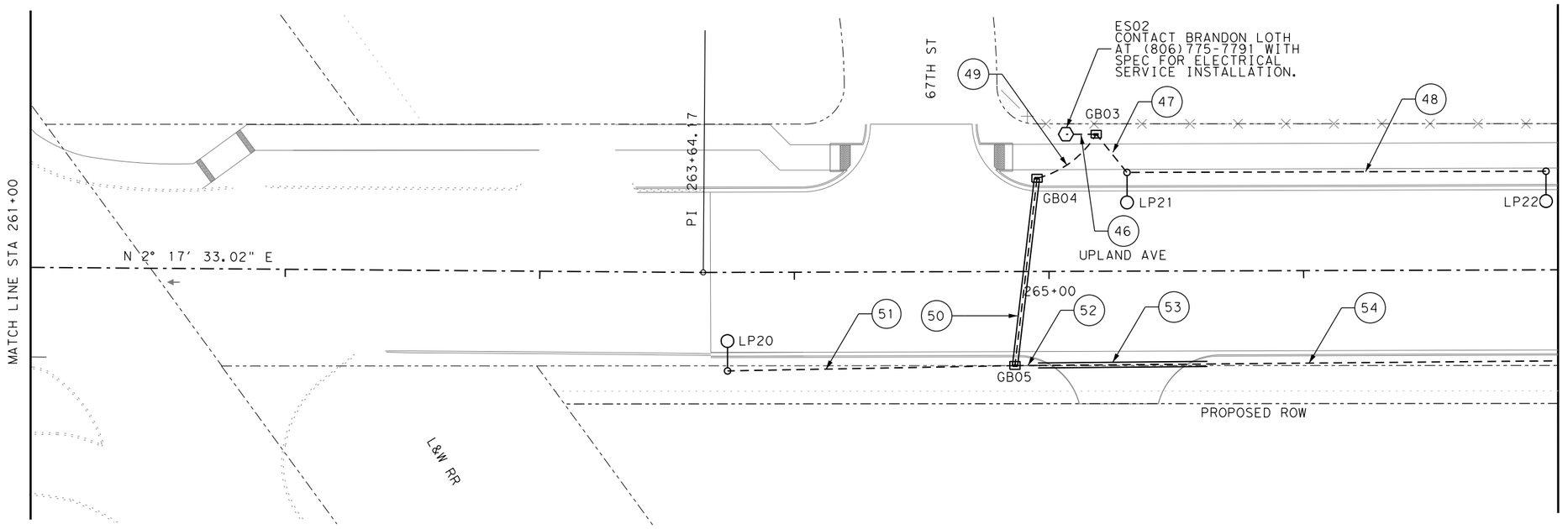
SHEET 4 OF 6

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	182
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





0 25 50
SCALE: 1"=50'

LEGEND

- PROPOSED LIGHT POLE
- PROPOSED ELECTRICAL SERVICE
- ILLUMINATION CONDUIT (TRENCHED)
- ILLUMINATION CONDUIT (BORED)
- FIBER CONDUIT (TRENCHED)
- FIBER CONDUIT (BORED)
- GROUND BOX W/ APRON
- ITS GROUND BOX W/ APRON
- ILLUMINATION CONDUIT RUN NUMBER
- FIBER CONDUIT RUN NUMBER

NOTES:

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8/9/2023

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Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

LIGHTING PLAN

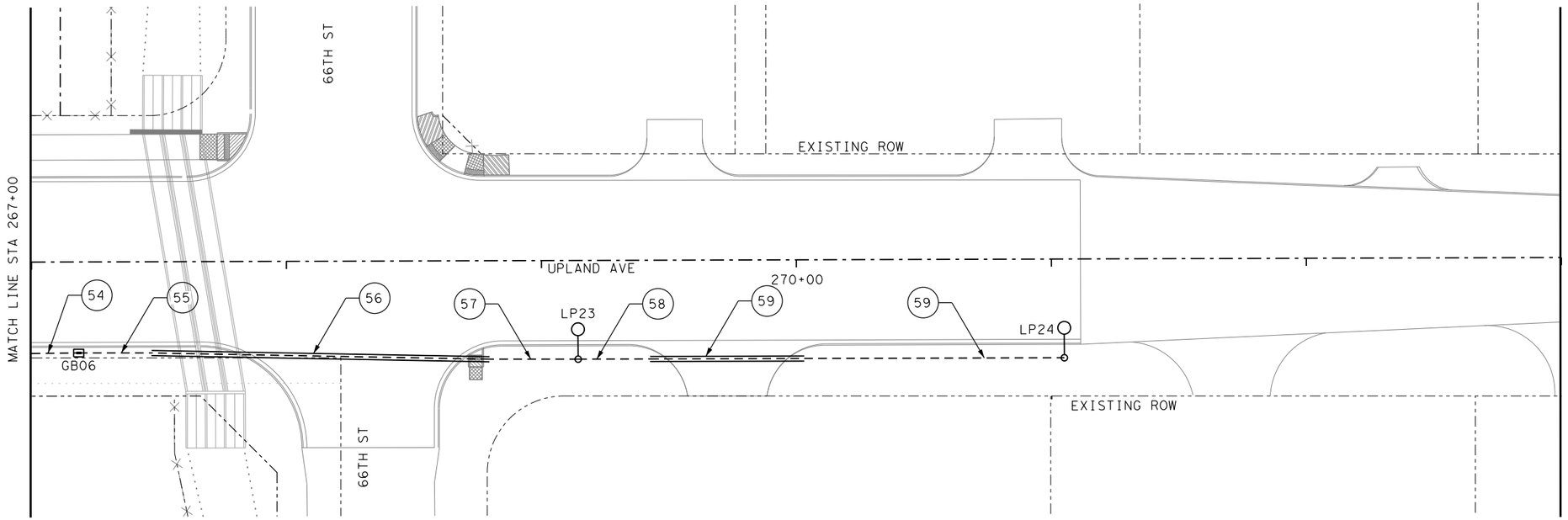
UPL STA 255+00 TO STA 267+00

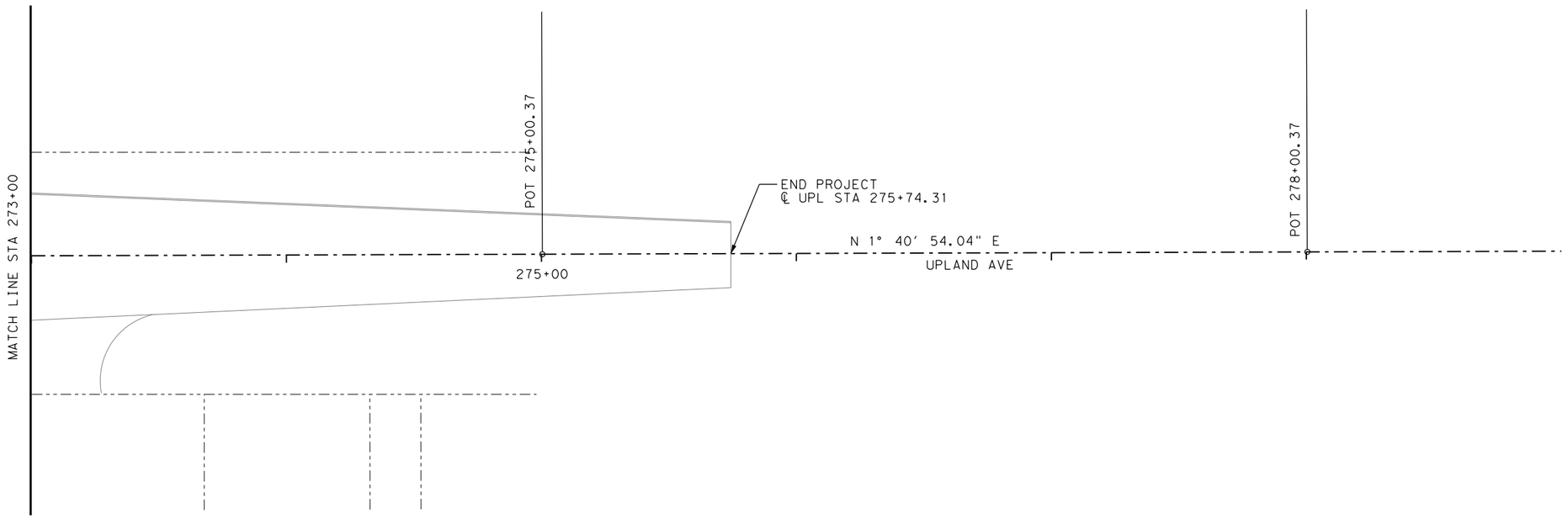
SHEET 5 OF 6

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	183
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





0 25 50

SCALE: 1"=50'

LEGEND

- PROPOSED LIGHT POLE
- PROPOSED ELECTRICAL SERVICE
- ILLUMINATION CONDUIT (TRENCHED)
- ILLUMINATION CONDUIT (BORED)
- FIBER CONDUIT (TRENCHED)
- FIBER CONDUIT (BORED)
- GROUND BOX W/ APRON
- ITS GROUND BOX W/ APRON
- # ILLUMINATION CONDUIT RUN NUMBER
- F# FIBER CONDUIT RUN NUMBER

NOTES:

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UPLAND AVENUE
66TH STREET TO 82ND STREET

LIGHTING PLAN

UPL STA 267+00 TO STA END

SHEET 6 OF 6

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	184
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

NOTES:

1. REFERENCE POINT FOR STA AND OFFSET FOR LIGHT POLES IS THE CENTER OF THE POLE.

ELECTRICAL SERVICE DATA

Elec. Service No.	Sheet No.	Electrical Service Description (see ED (5)-14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contactor Amps	Panelbd/ Loadcenter Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole/Amp	Branch Circuit Amps	KVA Load
ES01	4 OF 6	ELEC SERV TY A(240/480)060(NS)AL(E)PS(U)	1 1/4"	3/#2	N/A	2P/100	100	N/A	A - LIGHTING SB	2P/20	11	7.7
									B - LIGHTING NB	2P/20	5	
ES02	5 OF 6	ELEC SERV TY A(240/480)060(NS)AL(E)PS(U)	1 1/4"	3/#2	N/A	2P/100	100	N/A	A - LIGHTING NB	2P/20	4	1.9

SUMMARY OF LIGHT POLE DETAILS

SHEET NO.	LIGHT POLE LABEL	ILLUMINATION ASSEMBLY DESCRIPTION*	CHAIN	STN	OFFSET (FEET)	SIDE
SHEET 1 OF 6	LP01	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	217+22	56.3	LEFT
SHEET 2 OF 6	LP02	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	219+42	43.2	LEFT
SHEET 2 OF 6	LP03	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	221+53	38.8	LEFT
SHEET 2 OF 6	LP04	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	223+73	38.8	LEFT
SHEET 2 OF 6	LP05	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	225+94	38.2	LEFT
SHEET 2 OF 6	LP06	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	228+14	39.0	LEFT
SHEET 2 OF 6	LP07	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	230+00	38.8	LEFT
SHEET 3 OF 6	LP08	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	232+33	38.8	LEFT
SHEET 3 OF 6	LP09	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	234+53	38.8	LEFT
SHEET 3 OF 6	LP10	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	236+73	38.8	LEFT
SHEET 3 OF 6	LP11	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	238+53	38.8	LEFT
SHEET 3 OF 6	LP12	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	240+75	38.8	LEFT
SHEET 4 OF 6	LP13	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	243+26	38.8	LEFT
SHEET 4 OF 6	LP14	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	245+15	38.8	LEFT
SHEET 4 OF 6	LP15	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	247+35	38.8	LEFT
SHEET 4 OF 6	LP16	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	249+44	38.8	LEFT
SHEET 4 OF 6	LP17	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	251+75	38.8	LEFT
SHEET 4 OF 6	LP18	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	253+72	38.3	LEFT
SHEET 5 OF 6	LP19	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	255+86	44.8	LEFT
SHEET 5 OF 6	LP20	IN RD IL (TY SA) 30T-8 (250W EQ) LED	UPLAND	263+74	38.8	RIGHT
SHEET 5 OF 6	LP21	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	265+31	38.8	LEFT
SHEET 5 OF 6	LP22	IN RD IL (TY SA) 50S-12 (400W EQ) LED	UPLAND	266+95	38.8	LEFT
SHEET 6 OF 6	LP23	IN RD IL (TY SA) 30T-8 (250W EQ) LED	UPLAND	269+14	38.8	RIGHT
SHEET 6 OF 6	LP24	IN RD IL (TY SA) 30T-8 (250W EQ) LED	UPLAND	271+05	38.8	RIGHT

SUMMARY OF GROUND BOXES

SHEET NO.	GROUND BOX LABEL	GROUND BOX DESCRIPTION
SHEET 1 OF 6	FGB01	ITS GND BOX(PCAST) TY 1 (243636)W/APRN
SHEET 2 OF 6	FGB02	GROUND BOX TY C (162911)W/APRON
SHEET 3 OF 6	FGB03	GROUND BOX TY C (162911)W/APRON
SHEET 3 OF 6	FGB04	GROUND BOX TY C (162911)W/APRON
SHEET 4 OF 6	FGB05	GROUND BOX TY C (162911)W/APRON
SHEET 4 OF 6	GB01	GROUND BOX TY A (122311)W/APRON
SHEET 5 OF 6	FGB06	ITS GND BOX(PCAST) TY 1 (243636)W/APRN
SHEET 5 OF 6	GB02	GROUND BOX (PREPARE)
SHEET 5 OF 6	GB03	GROUND BOX TY A (122311)W/APRON
SHEET 5 OF 6	GB04	GROUND BOX TY A (122311)W/APRON
SHEET 5 OF 6	GB05	GROUND BOX TY A (122311)W/APRON
SHEET 6 OF 6	GB06	GROUND BOX TY A (122311)W/APRON

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER
10/5/2023

TEXAS FIRM F-928
Kimley»Horn

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FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

LIGHTING PLAN

ELECTRICAL SERVICE, LIGHT POLE, AND GROUND BOX SUMMARY

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	185
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

ES01 - SUMMARY OF CONDUIT AND CONDUCTORS											
SHEET NO	RUN NO	RUN LENGTH	CIRCUIT	CONDUIT TYPE	CONDUIT			CONDUCTORS			
					2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80 BORE	ELEC CONDR (NO. 8) BARE		ELEC CONDR (NO. 8) INSULATED	
								QA	LENGTH	QA	LENGTH
SHEET 1 OF 6	1	25	A	T	25			1	25	2	50
SHEET 1 OF 6	2	50	A	B		50		1	50	2	100
SHEET 1 OF 6	3	75	A	T	75			1	75	2	150
SHEET 1 OF 6	4	40	A	B		40		1	40	2	80
SHEET 2 OF 6	5	45	A	T	45			1	45	2	90
SHEET 2 OF 6	6	215	A	T	215			1	215	2	430
SHEET 2 OF 6	7	10	A	T	10			1	10	2	20
SHEET 2 OF 6	8	30	A	B		30		1	30	2	60
SHEET 2 OF 6	9	185	A	T	185			1	185	2	370
SHEET 2 OF 6	10	80	A	T	80			1	80	2	160
SHEET 2 OF 6	11	30	A	B		30		1	30	2	60
SHEET 2 OF 6	12	120	A	T	120			1	120	2	240
SHEET 2 OF 6	13	135	A	T	135			1	135	2	270
SHEET 2 OF 6	14	60	A	B		60		1	60	2	120
SHEET 2 OF 6	15	35	A	T	35			1	35	2	70
SHEET 2 OF 6	16	190	A	T	190			1	190	2	380
SHEET 2 OF 6	17	25	A	T	25			1	25	2	50
SHEET 2 OF 6	18	30	A	B		30		1	30	2	60
SHEET 2 OF 6	19	185	A	T	185			1	185	2	370
SHEET 3 OF 6	20	225	A	T	225			1	225	2	450
SHEET 3 OF 6	21	155	A	T	155			1	155	2	310
SHEET 3 OF 6	22	25	A	B		25		1	25	2	50
SHEET 3 OF 6	23	50	A	T	50			1	50	2	100
SHEET 3 OF 6	24	185	A	T	185			1	185	2	370
SHEET 3 OF 6	25	25	A	T	25			1	25	2	50
SHEET 3 OF 6	26	60	A	B		60		1	60	2	120
SHEET 3 OF 6	27	145	A	T	145			1	145	2	290
SHEET 3 OF 6	28	95	A	T	95			1	95	2	190
SHEET 3 OF 6	29	50	A	B		50		1	50	2	100
SHEET 3 OF 6	30	25	A	T	25			1	25	2	50
SHEET 3 OF 6	31	60	A	B		60		1	60	2	120
SHEET 3 OF 6	32	35	A	T	35			1	35	2	70
SHEET 4 OF 6	33	40	A	T	40			1	40	2	80
SHEET 4 OF 6	34	10	A, B	T	10			1	10	4	40
SHEET 4 OF 6	35	155	B	T	155			1	155	2	310
SHEET 4 OF 6	36	55	B	T	55			1	55	2	110
SHEET 4 OF 6	37	65	B	B		65		1	65	2	130
SHEET 4 OF 6	38	105	B	T	105			1	105	2	210
SHEET 4 OF 6	39	210	B	T	210			1	210	2	420
SHEET 4 OF 6	40	85	B	B			85	1	85	2	170
SHEET 4 OF 6	41	150	B	T	150			1	150	2	300
SHEET 4 OF 6	42	200	B	T	200			1	200	2	400
SHEET 4 OF 6	43	50	B	T	50			1	50	2	100
SHEET 4 OF 6	44	150	B	B		150		1	150	2	300
SHEET 5 OF 6	45	25	B	T	25			1	25	2	50
				TOTALS	3,265	650	85		4,000		8,020

ES02 - SUMMARY OF CONDUIT AND CONDUCTORS											
SHEET NO	RUN NO	RUN LENGTH	CIRCUIT	CONDUIT TYPE	CONDUIT			CONDUCTORS			
					2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80 BORE	ELEC CONDR (NO. 8) BARE		ELEC CONDR (NO. 8) INSULATED	
								QA	LENGTH	QA	LENGTH
SHEET 5 OF 6	46	15	A	T	15			1	15	2	30
SHEET 5 OF 6	47	20	A	T	20			1	20	2	40
SHEET 5 OF 6	48	165	A	T	165			1	165	2	330
SHEET 5 OF 6	49	30	A	T	30			1	30	2	60
SHEET 5 OF 6	50	75	A	B			75	1	75	2	150
SHEET 5 OF 6	51	115	A	T	115			1	115	2	230
SHEET 5 OF 6	52	10	A	T	10			1	10	2	20
SHEET 5 OF 6	53	70	A	B		70		1	70	2	140
SHEET 5 OF 6	54	160	A	T	160			1	160	2	320
SHEET 6 OF 6	55	30	A	T	30			1	30	2	60
SHEET 6 OF 6	56	135	A	B			135	1	135	2	270
SHEET 6 OF 6	57	35	A	T	35			1	35	2	70
SHEET 6 OF 6	58	30	A	T	30			1	30	2	60
SHEET 6 OF 6	59	65	A	B		65		1	65	2	130
SHEET 6 OF 6	60	105	A	T	105			1	105	2	210
				TOTALS	715	135	210		1,060		2,120

SUMMARY OF FIBER CONDUIT						
SHEET NO	RUN NO	RUN LENGTH	CONDUIT TYPE	CONDUIT		
				2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80 BORE
SHEET 1 OF 6	F1	100	T	100		
SHEET 1 OF 6	F2	50	B		50	
SHEET 1 OF 6	F3	75	T	75		
SHEET 1 OF 6	F4	40	B		40	
SHEET 2 OF 6	F5	270	T	270		
SHEET 2 OF 6	F6	30	B		30	
SHEET 2 OF 6	F7	260	T	260		
SHEET 2 OF 6	F8	35	B		35	
SHEET 2 OF 6	F9	265	T	265		
SHEET 2 OF 6	F10	40	B		40	
SHEET 2 OF 6	F11	255	T	255		
SHEET 2 OF 6	F12	30	B		30	
SHEET 2 OF 6	F13	210	T	210		
SHEET 3 OF 6	F14	350	T	350		
SHEET 3 OF 6	F15	25	B		25	
SHEET 3 OF 6	F16	260	T	260		
SHEET 3 OF 6	F17	35	B		35	
SHEET 3 OF 6	F18	125	T	125		
SHEET 3 OF 6	F19	135	T	135		
SHEET 3 OF 6	F20	30	B		30	
SHEET 3 OF 6	F21	45	T	45		
SHEET 3 OF 6	F22	30	B		30	
SHEET 3 OF 6	F23	310	T	310		
SHEET 4 OF 6	F24	45	B		45	
SHEET 4 OF 6	F25	270	T	270		
SHEET 4 OF 6	F26	540	T	540		
SHEET 4 OF 6	F27	45	B		45	
SHEET 4 OF 6	F28	40	T	40		
SHEET 5 OF 6	F29	45	B		45	
SHEET 5 OF 6	F30	70	T	70		
SHEET 5 OF 6	F31	45	B		45	
SHEET 5 OF 6	F32	110	T	110		
SHEET 5 OF 6	F33	140	B			140
			TOTALS	3,690	525	140

NOTES:

1. CONDUIT TYPE:
   T - TRENCH
   B - BORE
2. ALL EXISTING CONDUIT TO REMAIN UNLESS OTHERWISE NOTED ON PLANS.
3. THERE WILL BE NO EXTRA COMPENSATION IF CONTRACTOR CHOOSES TO BORE CONDUIT RATHER THAN TRENCH.

8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

LIGHTING PLAN

FIBER AND ELECTRICAL SERVICE SUMMARY

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	186
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

SUMMARY OF PAVEMENT MARKING AND SIGNING ITEMS											
	0644 6002	0644 6004	0644 6017	0666 6033	0666 6036	0666 6224	0666 6226	0666 6228	0666 6230	0666 6242	0666 6243
	IN SM RD SN SUP&AM TY10BWG(1) SA(P-BM)	IN SM RD SN SUP&AM TY10BWG(1) SA(T)	IN SM RD SN SUP&AM TY10BWG(1) SA(P)	REFL PAV MRK TY I (W)8"(LNDP) (100MIL)	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	PAVEMENT SEALER 4"	PAVEMENT SEALER 8"	PAVEMENT SEALER 12"	PAVEMENT SEALER 24"	PAVEMENT SEALER (RR XING)	PAVEMENT SEALER (YLD TRI)
STATIONING	EA	EA	EA	LF	LF	LF	LF	LF	LF	EA	EA
BEGIN PROJECT TO STA 219+00	2	1	6	235	1292	148	3054		738		
STA 219+00 TO STA 231+00				775	340	3189	2230		137		
STA 231+00 TO STA 243+00	2		5			3447					
STA 243+00 TO STA 255+00						3547					
STA 255+00 TO STA 267+00	2		3	515	1058	1938	3976	680	590	4	28
STA 267+00 TO STA 279+00											
STA 279+00 TO END PROJECT		2		75	1575	2634	3300		230		
66TH ST STA 10+00 TO STA 17+00				75	107	2113	364				
66TH ST STA 21+00 TO STA 26+77						901					
PROJECT TOTAL	**6**	**3**	**14**	**1675**	**4372**	**17917**	**12924**	**680**	**1695**	**4**	**28**

SUMMARY OF PAVEMENT MARKING AND SIGNING ITEMS											
	0666 6300	0666 6303	0666 6312	0666 6315	0668 6016	0668 6018	0668 6019	0668 6020	0668 6031	0668 6034	0672 6007
	RE PM W/RET REQ TY I (W)4"(BRK) (100MIL)	RE PM W/RET REQ TY I (W)4"(SLD) (100MIL)	RE PM W/RET REQ TY I (Y)4"(BRK) (100MIL)	RE PM W/RET REQ TY I (Y)4"(SLD) (100MIL)	PREFAB PAV MRK TY B (W)(12")(SLD)	PREFAB PAV MRK TY B (W)(24")(SLD)	PREFAB PAV MRK TY B (W)(ARROW)	PREFAB PAV MRK TY B (W)(DBL ARROW)	PREFAB PAV MRK TY B (W)(RR XING)	PREFAB PAV MRK TY B (W)(36")(YLD TRI)	REFL PAV MRKR TY I-C
STATIONING	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA
BEGIN PROJECT TO STA 219+00	67		28	53		738	8				7
STA 219+00 TO STA 231+00	591		516	2082		137	1				30
STA 231+00 TO STA 243+00	595		557	2295							29
STA 243+00 TO STA 255+00	585		562	2400							30
STA 255+00 TO STA 267+00	521	229	184	992	680	590	8	1	4	28	12
STA 267+00 TO STA 279+00											
STA 279+00 TO END PROJECT	56	464		2104		230	9	2			10
66TH ST STA 10+00 TO STA 17+00	46	927		1140			1				10
66TH ST STA 21+00 TO STA 26+77		483		418							10
PROJECT TOTAL	**2461**	**2103**	**1847**	**11484**	**680**	**1695**	**27**	**3**	**4**	**28**	**138**

SUMMARY OF PAVEMENT MARKING AND SIGNING ITEMS								
	0672 6009	0678 6001	0678 6004	0678 6008	0678 6009	0678 6010	6038 6001	6038 6007
	REFL PAV MRKR TY II-A-A	PAV SURF PREP FOR MRK (4")	PAV SURF PREP FOR MRK (8")	PAV SURF PREP FOR MRK (24")	PAV SURF PREP FOR MRK (ARROW)	PAV SURF PREP FOR MRK (DBL ARROW)	MULTIPOLYMER PAV MRK (W) (4")(SLD)	MULTIPOLYMER PAV MRK (W) (8")(SLD)
STATIONING	EA	LF	LF	LF	EA	EA	LF	LF
BEGIN PROJECT TO STA 219+00	20	148	1527	738	8			
STA 219+00 TO STA 231+00	60	3189	1115	137				
STA 231+00 TO STA 243+00	60	3447						
STA 243+00 TO STA 255+00	60	3547						
STA 255+00 TO STA 267+00	60	1926	1988	590	8	1	12	415
STA 267+00 TO STA 279+00								
STA 279+00 TO END PROJECT	20	2624	1650	230	9	2	10	
66TH ST STA 10+00 TO STA 17+00	20	2113	182		1			
66TH ST STA 21+00 TO STA 26+77	20	901						
PROJECT TOTAL	**320**	**17895**	**6462**	**1695**	**26**	**3**	**22**	**415**

8/9/2023

TEXAS FIRM F-928
Kimley»Horn

FREESE AND NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation

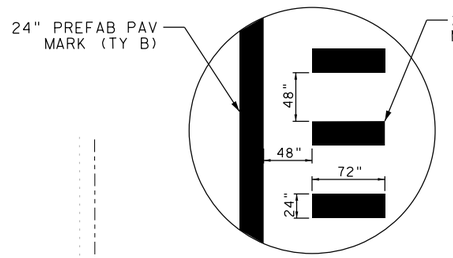
UPLAND AVENUE
66TH STREET TO 82ND STREET
PAVEMENT MARKING AND SIGNING SUMMARY

SHEET 1 OF 1

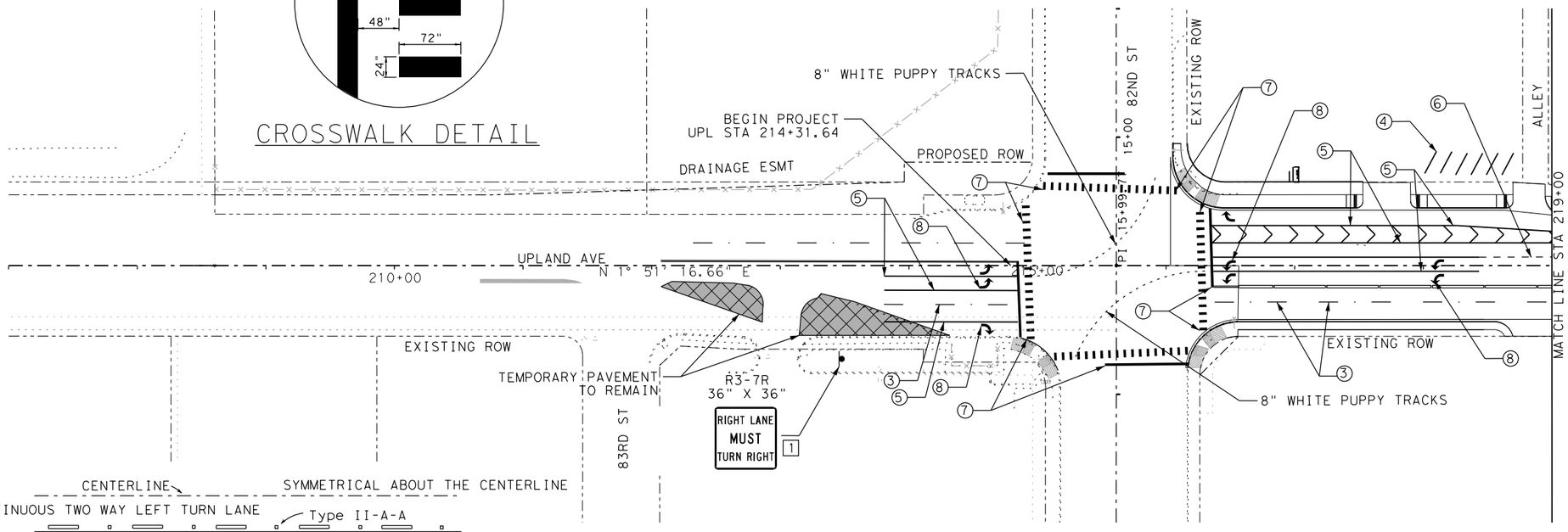
FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

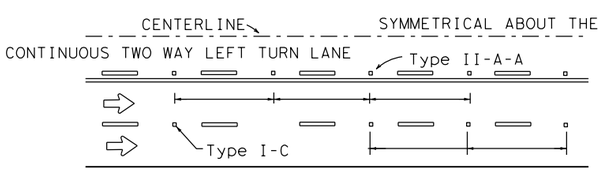
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	187
CONT.	SECT.	JOB	
0905	06	095,ETC.	

100% SUBMITTAL

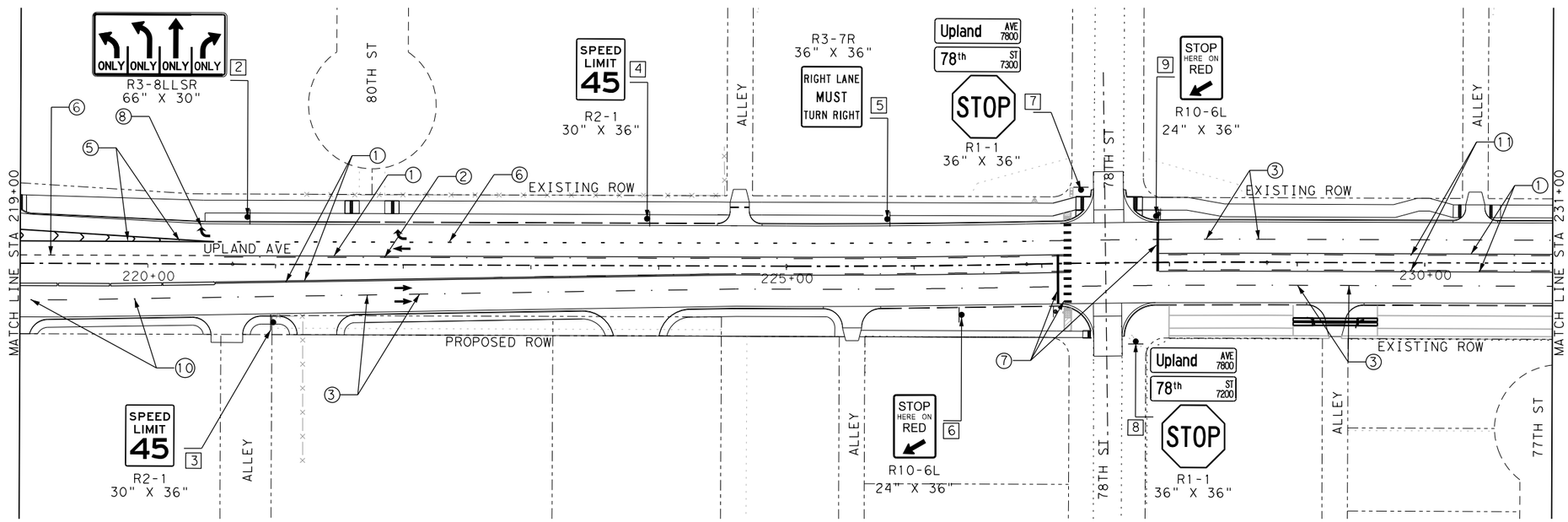


CROSSWALK DETAIL





RAISED PAVEMENT MARKER DETAIL
FOR CITY OF LUBBOCK



NOTES:

1. CITY OF LUBBOCK WILL PROVIDE ALL ALL OVERHEAD STREET NAME MARKERS
2. ALL MEDIAN NOSES SHALL BE PAINTED YELLOW

0 50 100
SCALE: 1"=100'

LEGEND

#	SIGN NUMBER (REFER TO SIGN CHART)
1	4" YELLOW SOLID
2	4" YELLOW BROKEN
3	4" WHITE BROKEN
4	4" WHITE SOLID
5	8" WHITE SOLID
6	8" WHITE LANE DROP
7	24" WHITE SOLID
8	ARROW WHITE TY B
9	DOUBLE ARROW WHITE TY B
10	RPM TY I-C
11	RPM TY II A-A
12	RAILROAD CROSSING MARKING
	EXISTING SIGN
	PROPOSED SIGN

*TxDOT markings shall be multipoly

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

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UPLAND AVENUE
66TH STREET TO 82ND STREET

PAVEMENT MARKING AND SIGNING PLAN

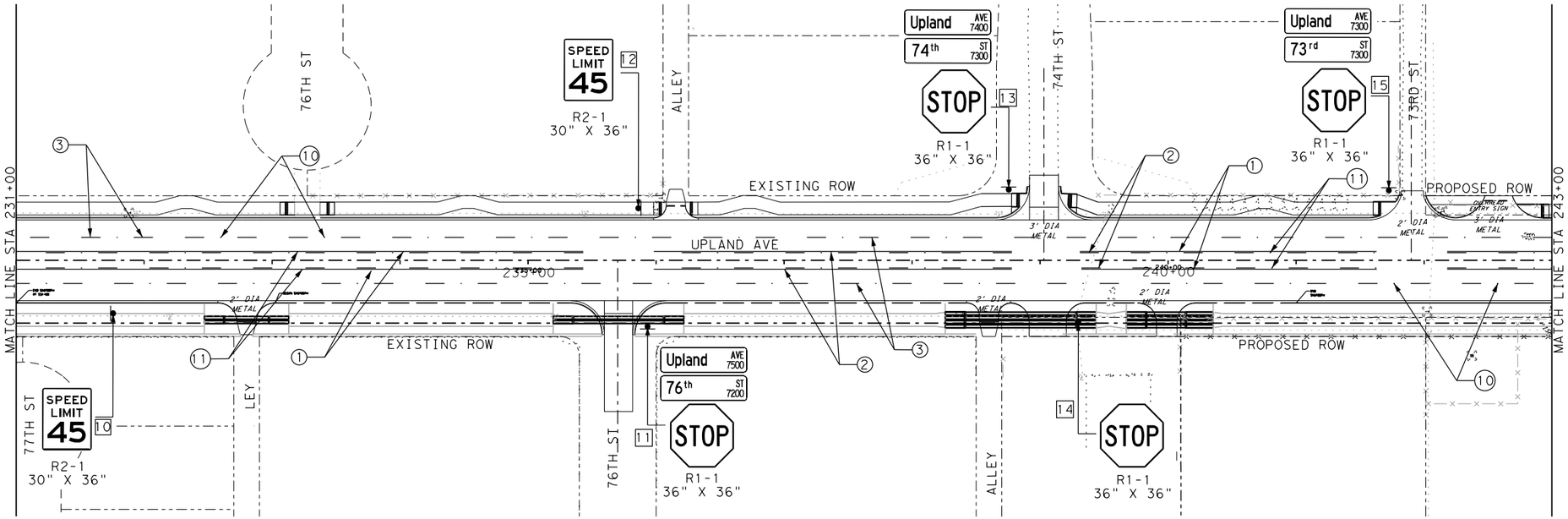
BEGIN PROJECT TO STA 231+00

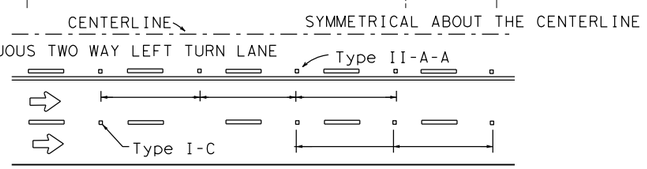
SHEET 1 OF 4

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

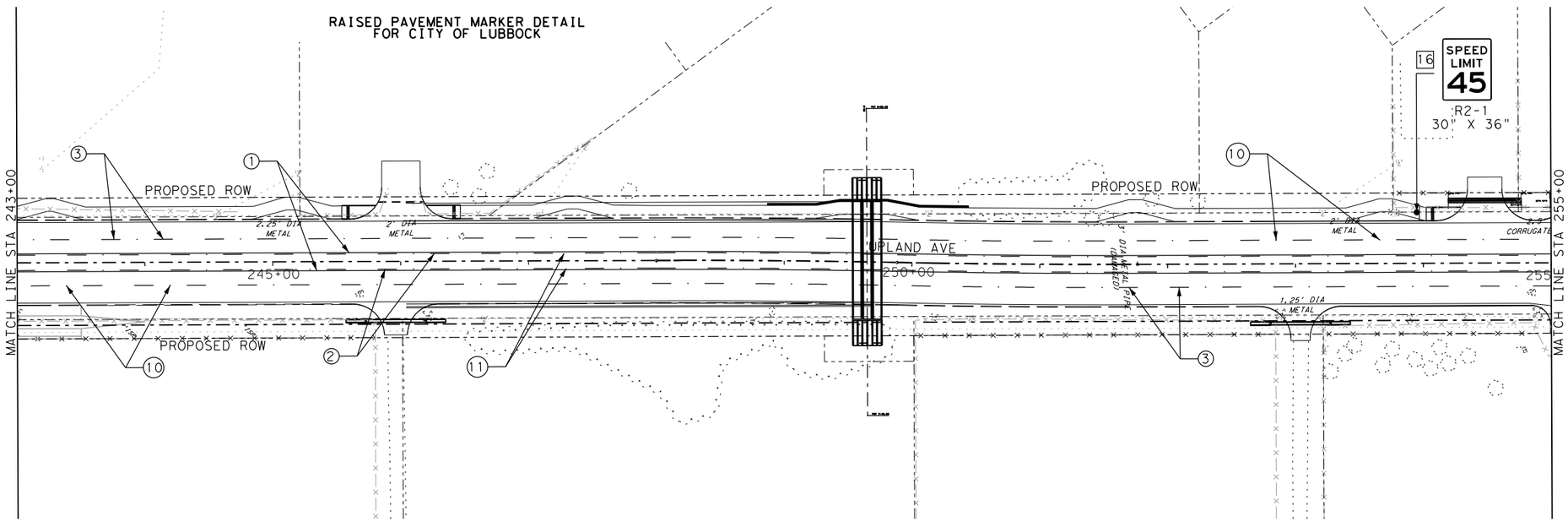
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	188
CONT.	SECT.	JOB	
0905	06	095, ETC.	

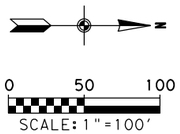
100% SUBMITTAL





RAISED PAVEMENT MARKER DETAIL
FOR CITY OF LUBBOCK





LEGEND

[#]	SIGN NUMBER (REFER TO SIGN CHART)
(1)	4" YELLOW SOLID
(2)	4" YELLOW BROKEN
(3)	4" WHITE BROKEN
(4)	4" WHITE SOLID
(5)	8" WHITE SOLID
(6)	8" WHITE LANE DROP
(7)	24" WHITE SOLID
(8)	ARROW WHITE TY B
(9)	DOUBLE ARROW WHITE TY B
(10)	RPM TY I-C
(11)	RPM TY II A-A
(12)	RAILROAD CROSSING MARKING
	EXISTING SIGN
	PROPOSED SIGN

*TxDOT markings shall be multipoly

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
8/9/2023

TEXAS FIRM F-928
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TEXAS FIRM F-2144
FREESE AND NICHOLS

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UPLAND AVENUE
66TH STREET TO 82ND STREET
PAVEMENT MARKING AND SIGNING PLAN

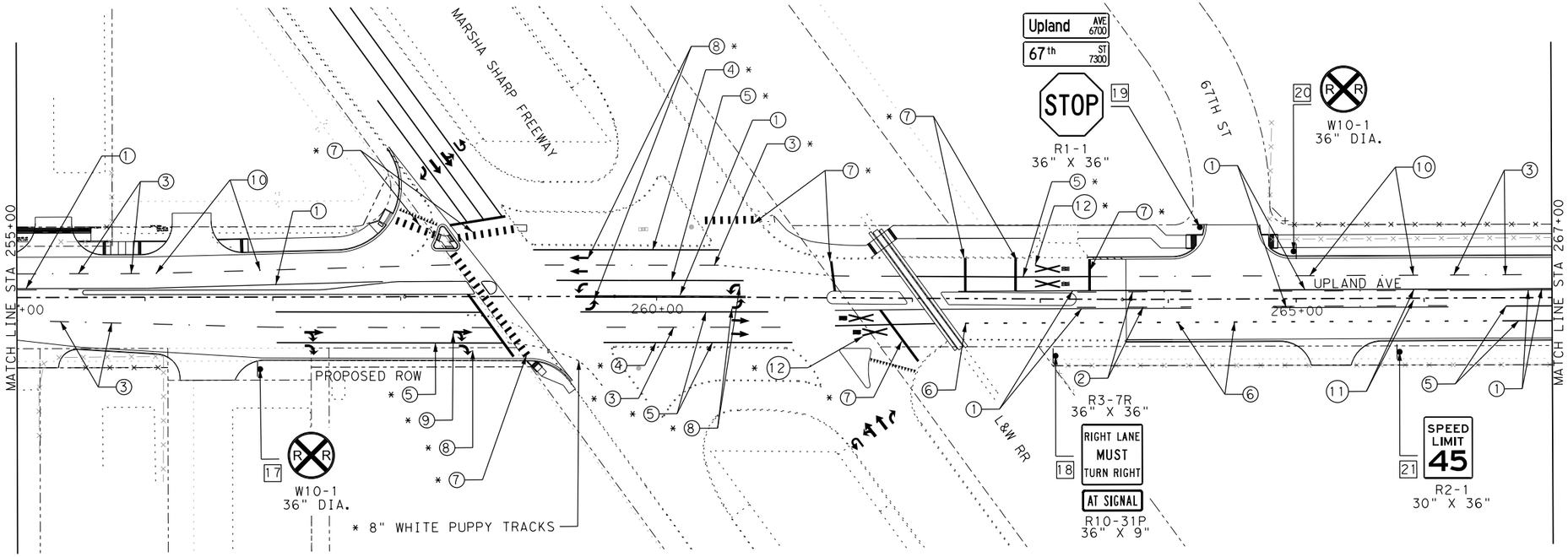
UPL STA 231+00 TO STA 255+00

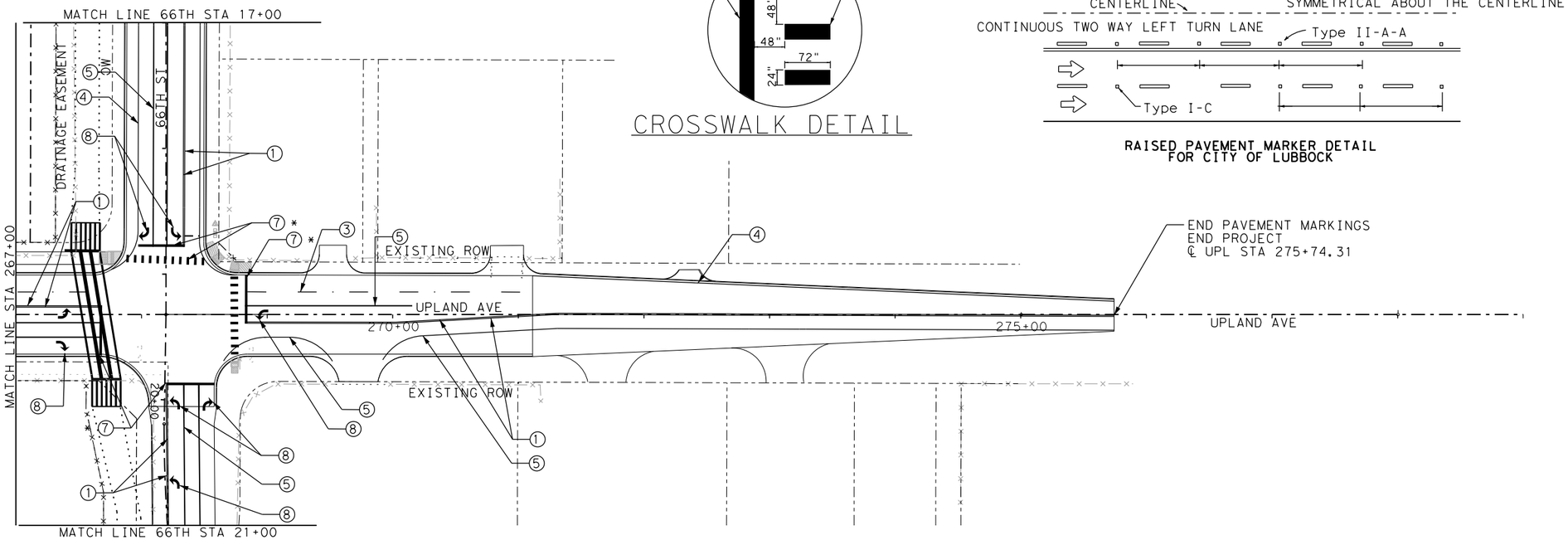
SHEET 2 OF 4

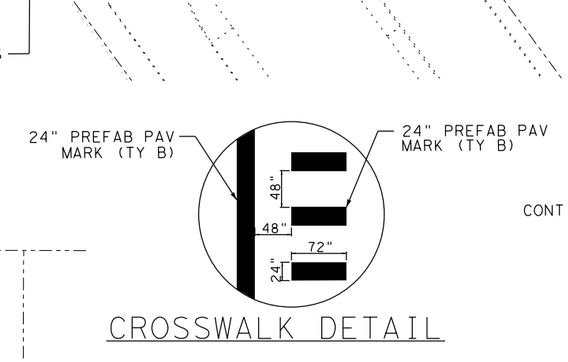
FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	189
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL







CROSSWALK DETAIL

RAISED PAVEMENT MARKER DETAIL
FOR CITY OF LUBBOCK

0 50 100
SCALE: 1"=100'

LEGEND

#	SIGN NUMBER (REFER TO SIGN CHART)
1	4" YELLOW SOLID
2	4" YELLOW BROKEN
3	4" WHITE BROKEN
4	4" WHITE SOLID
5	8" WHITE SOLID
6	8" WHITE LANE DROP
7	24" WHITE SOLID
8	ARROW WHITE TY B
9	DOUBLE ARROW WHITE TY B
10	RPM TY I-C
11	RPM TY II A-A
12	RAILROAD CROSSING MARKING
	EXISTING SIGN
	PROPOSED SIGN

*TxDOT markings shall be multipoly

NOTES:

1. ALL MEDIAN NOSES SHALL BE PAINTED YELLOW

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

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UPLAND AVENUE
66TH STREET TO 82ND STREET
PAVEMENT MARKING AND SIGNING PLAN

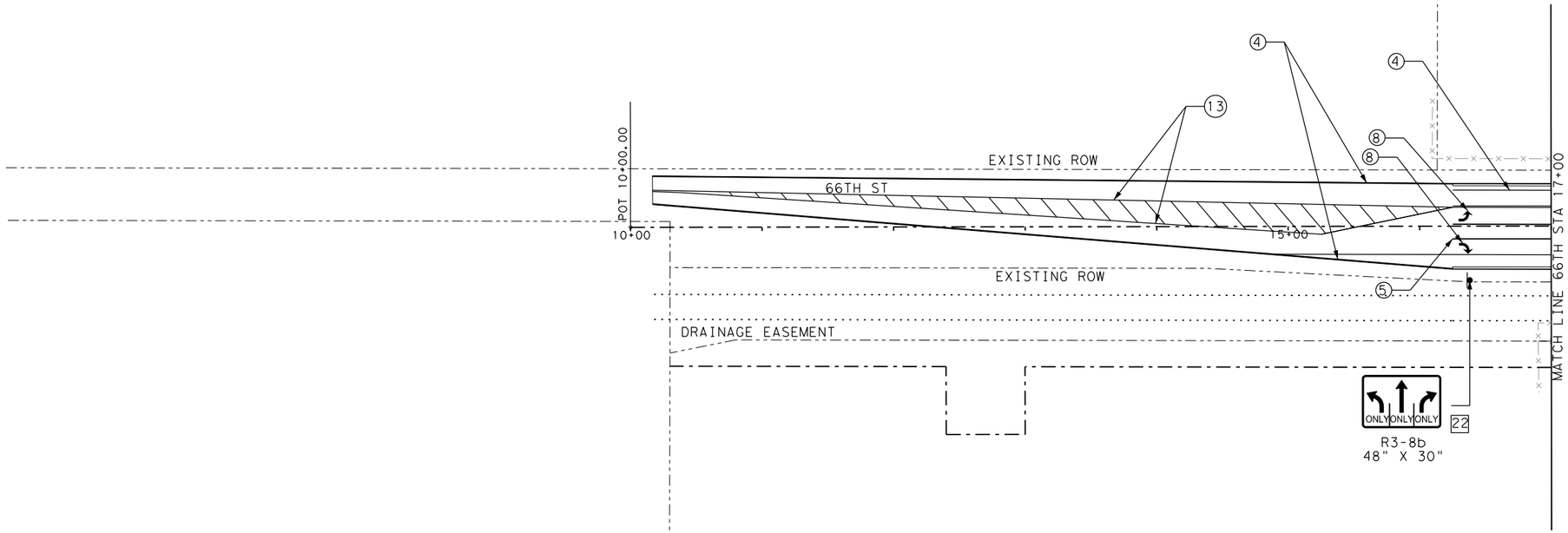
UPL STA 255+00 TO END PROJECT

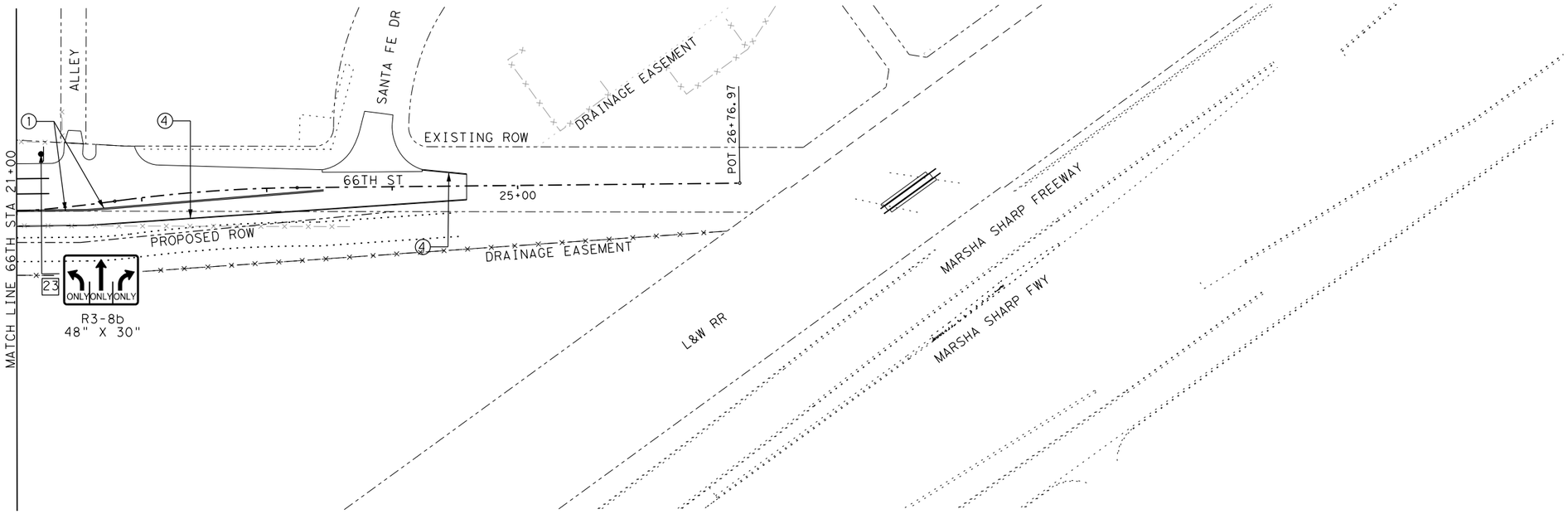
SHEET 3 OF 4

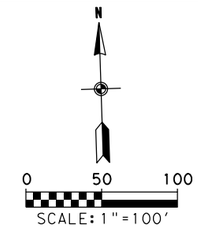
FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	190
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL







LEGEND

#	SIGN NUMBER (REFER TO SIGN CHART)
1	4" YELLOW SOLID
2	4" YELLOW BROKEN
3	4" WHITE BROKEN
4	4" WHITE SOLID
5	8" WHITE SOLID
6	8" WHITE LANE DROP
7	24" WHITE SOLID
8	ARROW WHITE TY B
9	DOUBLE ARROW WHITE TY B
10	RPM TY I-C
11	RPM TY II A-A
12	RAILROAD CROSSING MARKING
13	8" YELLOW SOLID
	EXISTING SIGN
	PROPOSED SIGN

*TxDOT markings shall be multipoly

STATE OF TEXAS
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8/9/2023

TEXAS FIRM F-928
Kimley»Horn

FREESE AND NICHOLS TEXAS FIRM F-2144

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

PAVEMENT MARKING AND SIGNING PLAN

66TH STA 10+00 TO STA 17+00
66TH STA 21+00 TO STA 26+76.97

SHEET 4 OF 4

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	191
CONT.	SECT.	JOB	
0905	06	095, ETC.	

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
1	1	R3-7R	RIGHT LANE MUST TURN RIGHT	36" X 36"			10BWG	1	SA	P	-	-
	2	R3-8LLSR	LANE CONTROL SIGN (LLTR)	66" X 30"			10BWG	1	SA	T	-	-
	3	R2-1	SPEED LIMIT (45)	30" X 36"			10BWG	1	SA	P	-	-
	4	R2-1	SPEED LIMIT (45)	30" X 36"			10BWG	1	SA	P	-	-
	5	R3-7R	RIGHT LANE MUST TURN RIGHT	36" X 36"			10BWG	1	SA	P	-	-
	6	R10-6L	STOP HERE ON RED	24" X 36"			10BWG	1	SA	P	-	-
	7	R1-1, 2 x D3-1	* STOP, UPLAND AVE, 78TH ST	36" X 36"			10BWG	1	SA	P	BM	-
	8	R1-1, 2 x D3-1	* STOP, UPLAND AVE, 78TH ST	36" X 36"			10BWG	1	SA	P	BM	-
	9	R10-6L	STOP HERE ON RED	24" X 36"			10BWG	1	SA	P	-	-
2	10	R2-1	SPEED LIMIT (45)	30" X 36"			10BWG	1	SA	P	-	-
	11	R1-1, 2 x D3-1	* STOP, UPLAND AVE, 76TH ST	36" X 36"			10BWG	1	SA	P	BM	-
	12	R2-1	SPEED LIMIT (45)	30" X 36"			10BWG	1	SA	P	-	-
	13	R1-1, 2 x D3-1	* STOP, UPLAND AVE, 74TH ST	36" X 36"			10BWG	1	SA	P	BM	-
	14	R1-1	STOP	36" X 36"			10BWG	1	SA	P	-	-
	15	R1-1, 2 x D3-1	* STOP, UPLAND AVE, 73RD ST	36" X 36"			10BWG	1	SA	P	BM	-
	16	R2-1	SPEED LIMIT (45)	30" X 36"			10BWG	1	SA	P	-	-
3	17	W10-1	RR	36' DIA			10BWG	1	SA	P	-	-
	18	R3-7R, R10-31P	RIGHT LANE MUST TURN RIGHT, AT SIGNAL	36" X 36", 36" X 9"			10BWG	1	SA	P	-	-
	19	R1-1, 2 x D3-1	* STOP, UPLAND AVE, 67TH ST	36" X 36"			10BWG	1	SA	P	BM	-
	20	W10-1	RR	36' DIA			10BWG	1	SA	P	-	-
	21	R2-1	SPEED LIMIT (45)	30" X 36"			10BWG	1	SA	P	-	-
4	22	R3-8B	LANE CONTROL SIGN (LTR)	48" X 30"			10BWG	1	SA	T	-	-
	23	R3-8B	LANE CONTROL SIGN (LTR)	48" X 30"			10BWG	1	SA	T	-	-

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

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

http://www.txdot.gov/

NOTE:

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

* City of Lubbock will supply all overhead street name markers.

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Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
4-16	DIST	COUNTY		SHEET NO.
8-16	LBB	LUBBOCK		192

18

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS		0905	06	095,ETC.	CS
		DIST	COUNTY		SHEET NO.
		LBB	LUBBOCK		193

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

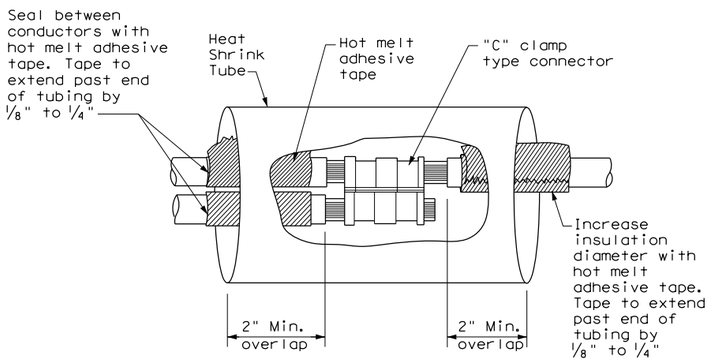
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

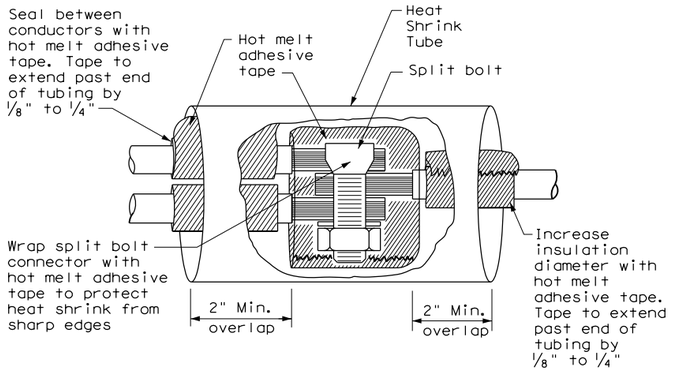
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

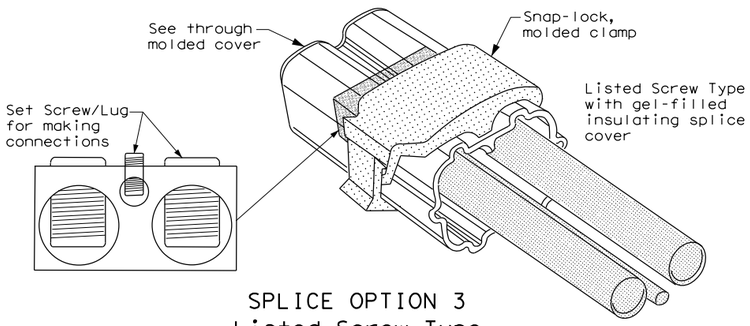
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

FILE: ed3-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		194

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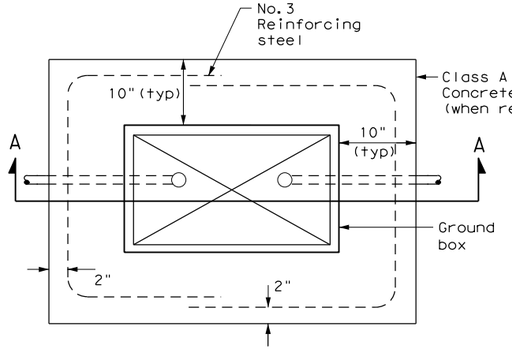
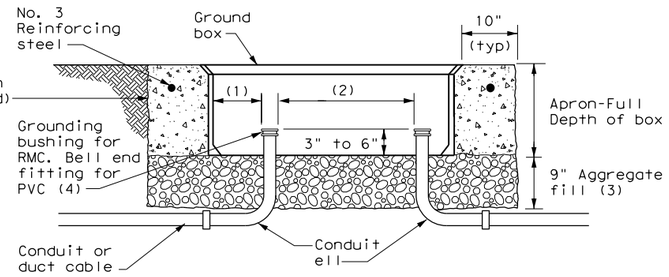


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

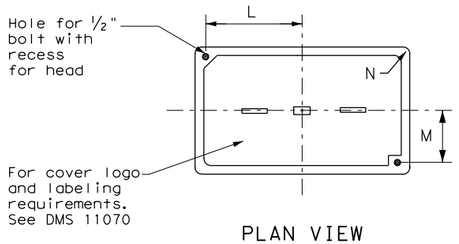
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

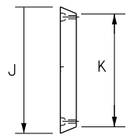
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



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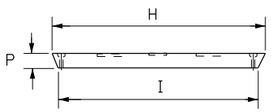

SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
GROUND BOXES

ED(4)-14

FILE: ed4-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		195

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

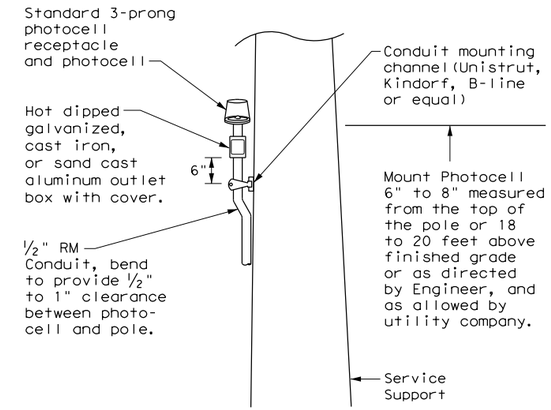
* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

- Schematic Type
- Service Voltage V / V
- Disconnect Amp Rating
  000 indicates main lug only/
  Typically Type T
- (SS)= Safety Switch Ahead of Meter-Check with Utility
  (NS)= No safety Switch Ahead of Meter-Check with Utility
- Enclosure Type
  GS= Galvanized steel("off the shelf")
  SS= Stainless steel(Custom Enclosure)See MPL
  AL= Aluminum (Custom Enclosure)See MPL
- Photocell Mounting Location
  (E)= Inside Service/Enclosure Mounted
  (T)= Top of pole
  (L)= Luminaire mounted
  (N)= None/No Photocell or Lighting Contactor Required
- Service Support Type
  GC= Granite concrete
  OC= Other concrete
  TP= Timber pole
  SP= Steel pole
  SF= Steel frame
  OT= Pole by others or paid for separately
  EX= Existing pole
  TS= Service on traffic signal pole
  PS= Pedestal Service
- O= Overhead Service Feed from Utility
  U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		196

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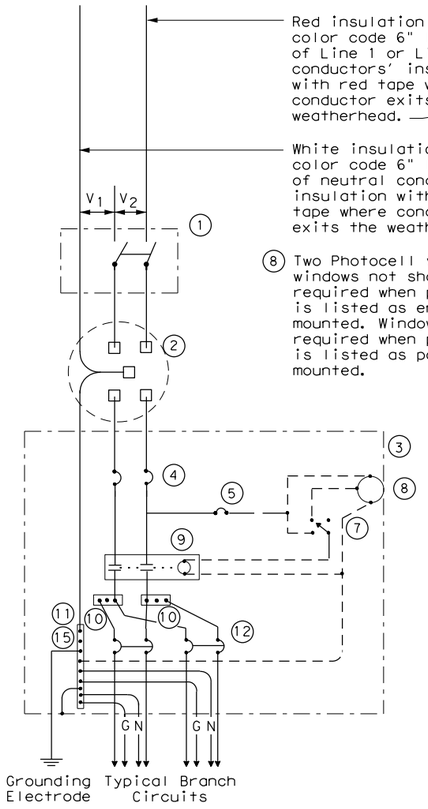
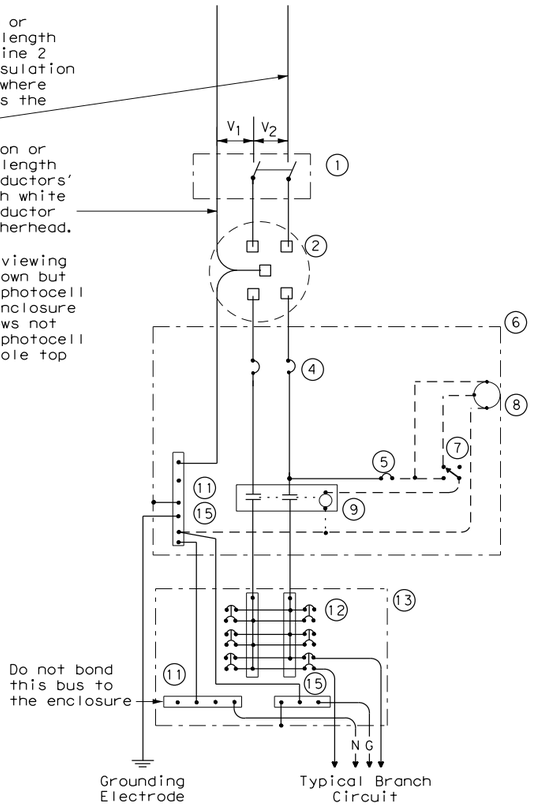
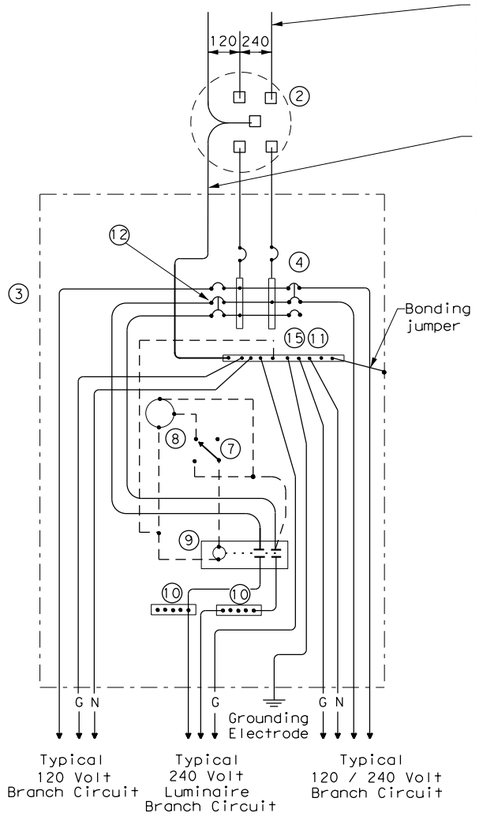


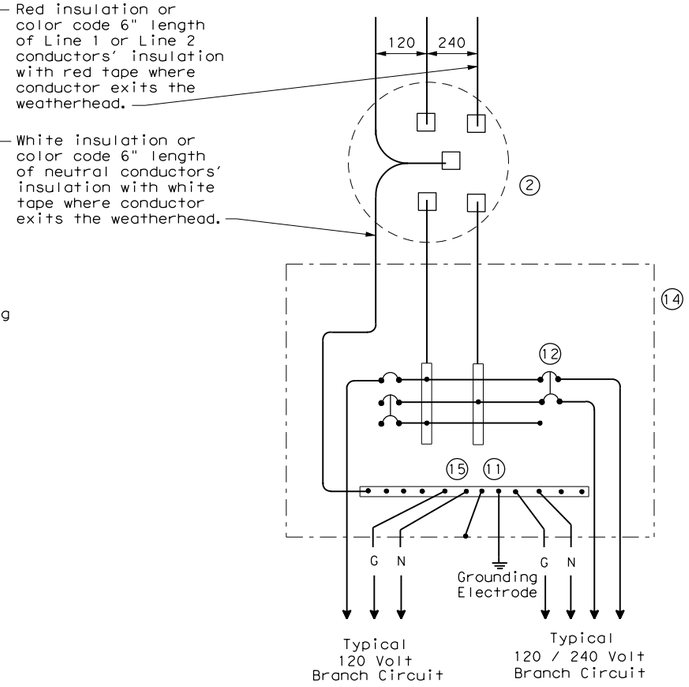
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
- - - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

FILE: ed6-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0905	06	095,ETC.	CS
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	LBB	LUBBOCK		197

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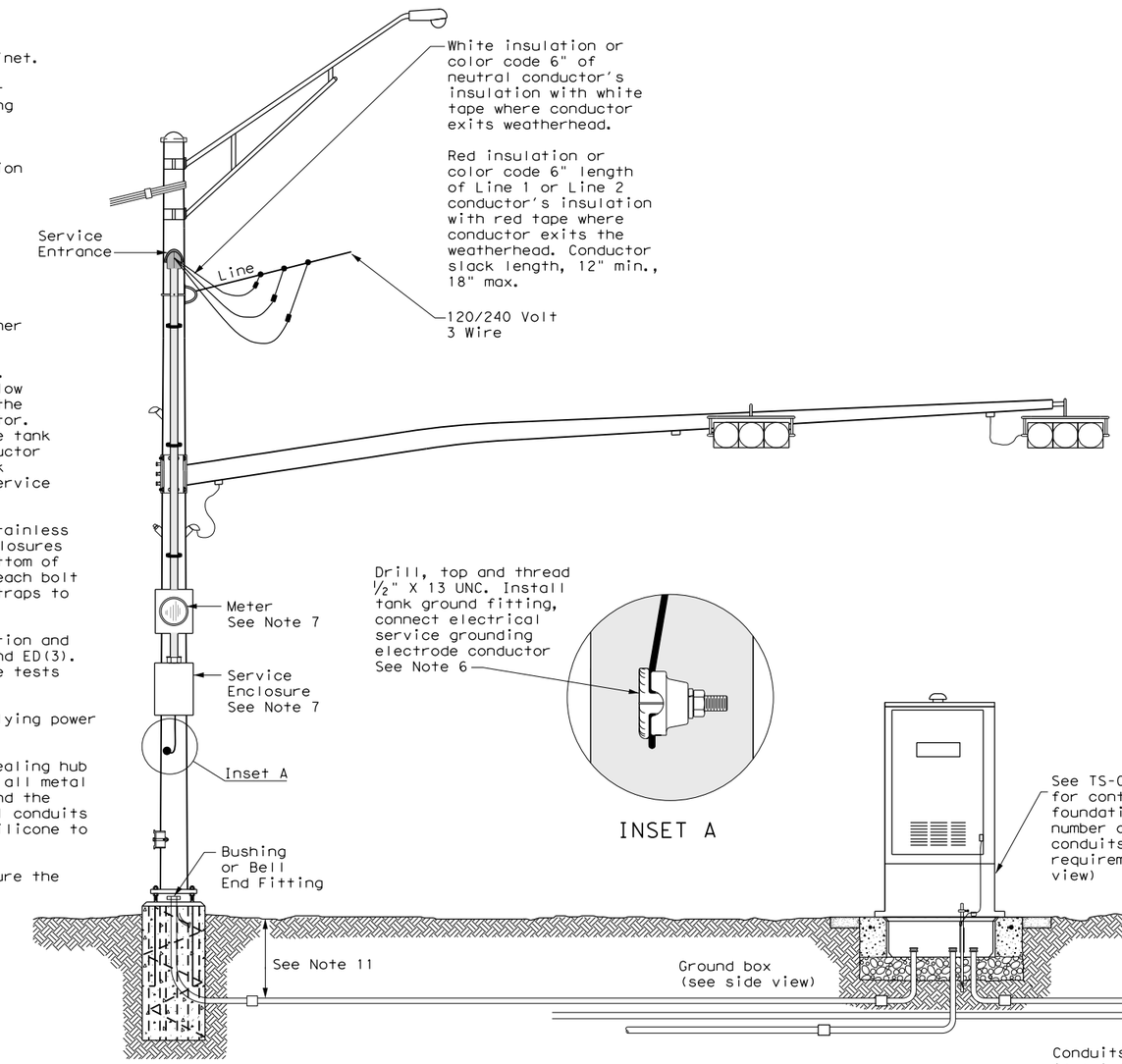
TRAFFIC SIGNAL NOTES

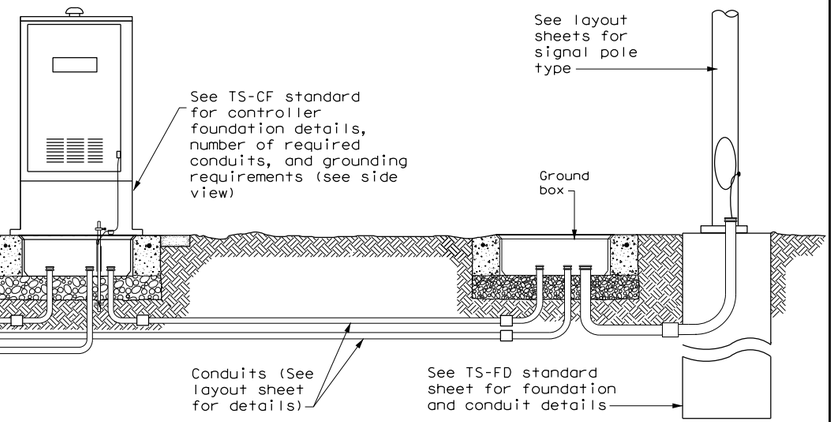
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



SIGNAL POLE WITH SERVICE

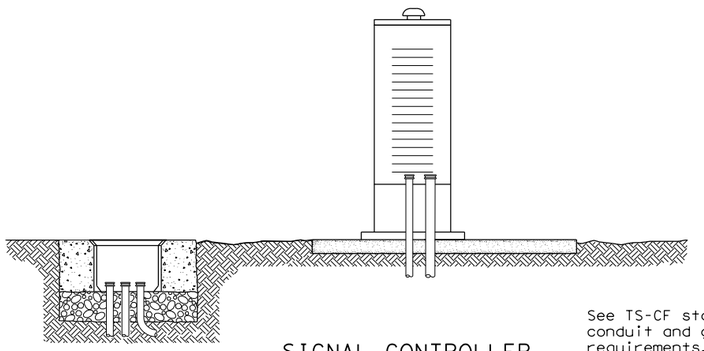
Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

INSET A



SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

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REVISIONS	0905	06	095,ETC.	CS
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	LBB	LUBBOCK		198

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PEDESTAL SERVICE NOTES

1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS)11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services. "Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.

2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.

3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.

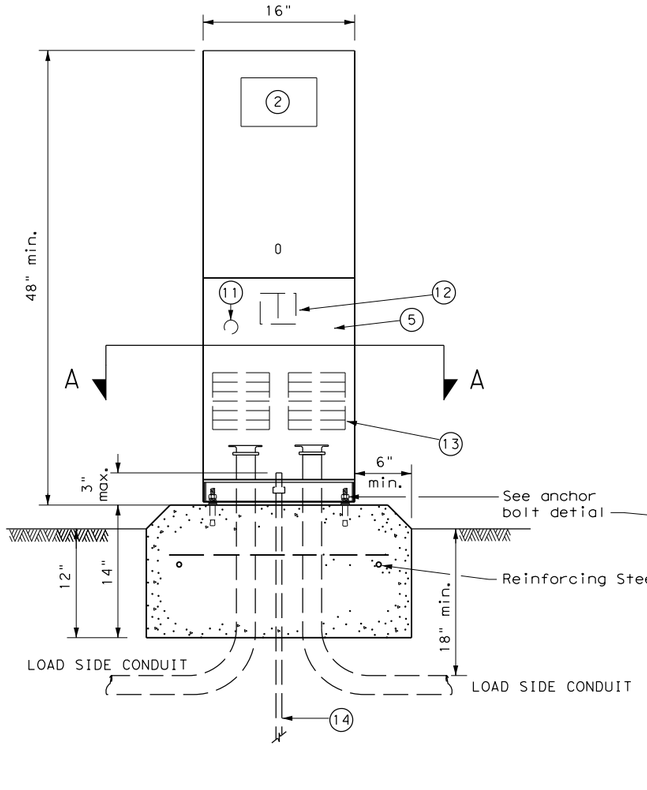
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install ½ in. X 2 ⅛ in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a ½ in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.

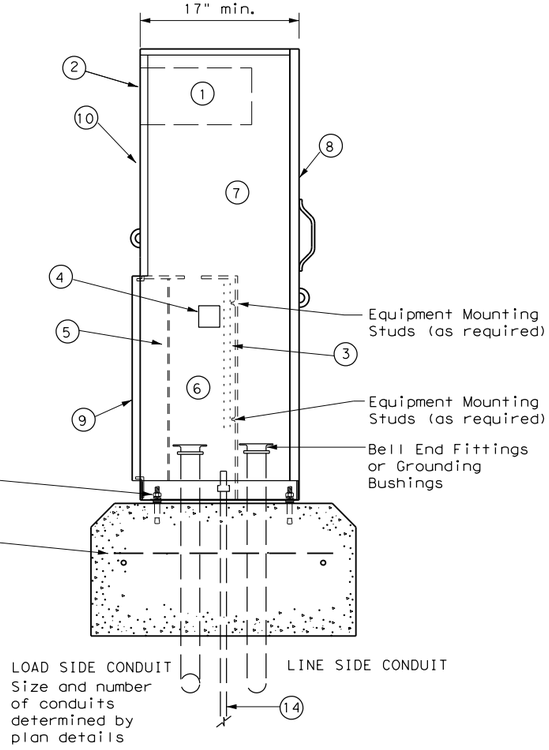
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within ¼ in. Repair rocking or movement of the service enclosure at no additional cost to the department.

7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.

8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.

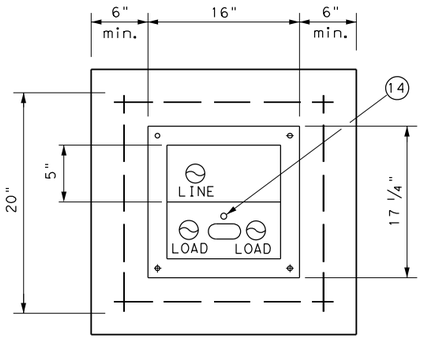


FRONT VIEW

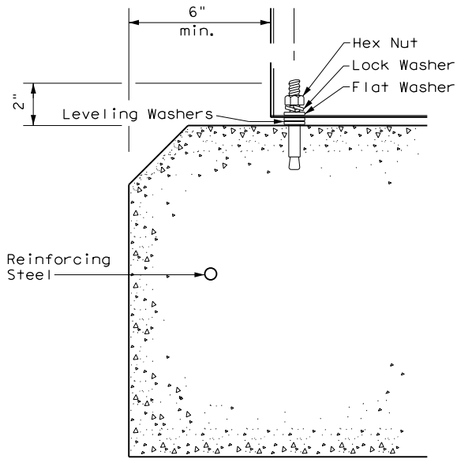


SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A



ANCHOR BOLT DETAIL

LEGEND	
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS
ED(9)-14

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	LBB	LUBBOCK		199

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TIMBER POLE (TP) SERVICE SUPPORT NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627 "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Conduit and electrical conductors attached to the electrical service pole and underground within 12 in. of service pole are not paid for directly but are subsidiary to the electrial service.
3. Install pole-top mounted photocell (T) on north side of pole, or in service enclosure (E) as required. See Electrical Service Data chart in plan set.
4. Gain pole as required to provide flat surface for each channel. Gain timber pole to 5/8 in. max. depth and 1 7/8 in. max. height. Gain pole in a neat and workmanlike manner.
5. Mount meter and service equipment on stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Provide channel sized 1 in. to 3 3/4 in. maximum depth, and 1½ in. to 1⅝ in. maximum width. File smooth the cut ends of galvanized channel and paint with zinc rich paint before installing on pole. Secure each channel section to timber pole with two galvanized or SS lag bolts, ¼ in. minimum diameter by 1½ in. minimum length. Use a galvanized or SS flat washer on each lag bolt. Do not stack channel.
6. When excess length must be trimmed from poles, trim from the top end only.

(1) Class 5 pole, height as required

(2) Service drop from utility company (attached below weatherhead)

(3) Service conduit (RMC) and service entrance conductors - One Red, One Black, One White (See Electrical Service Data)

(4) Safety switch (when required)

(5) Meter (when required)

(6) Service enclosure

(7) 6 AWG bare grounding electrode conductor in ½ in. PVC to ground rod - extend ½ in. PVC 6 in. underground.

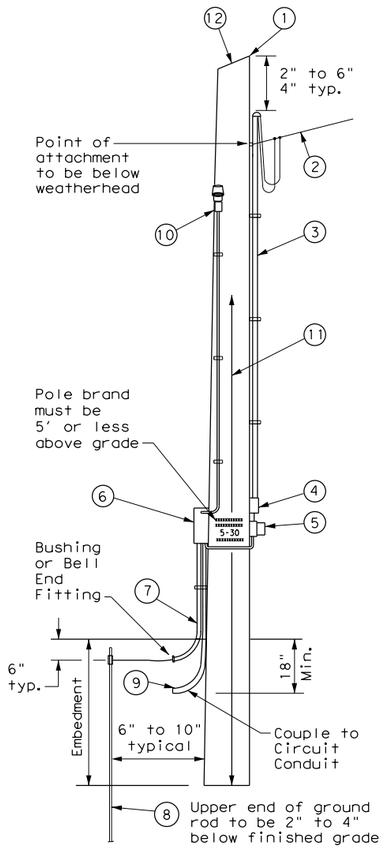
(8) ⅝ in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.

(9) RMC same size as branch circuit conduit.

(10) See pole-top mounted photocell detail on ED(5).

(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 with non-conductive material to a height of 8 ft. above finished grade.

(12) When required by utility, cut top of pole at an angle to enhance rain run off.

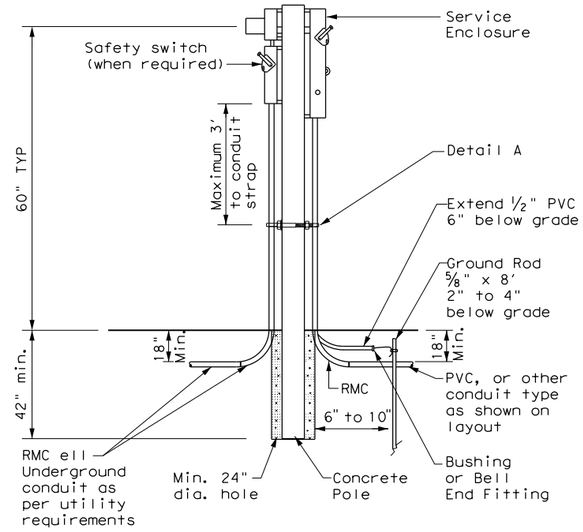


SERVICE SUPPORT TYPE TP (O)

GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' above final grade. Use the two-point pickup locations when handling pole in horizontal position, and one-point pickup location for use in raising the pole to a vertical position. These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., whichever is greater.
5. Ensure all installation details of services are in accordance with utility company specifications.
6. Install a one point rack or eye bolt bracket 6 inches to 12 inches below the weatherhead as an overhead service drop anchoring point for the electric utility.
7. Furnish and install galvanized or stainless steel channel strut 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep (Unistrut, Kindorf, B-line or equal). Attach channel strut with stainless steel concrete anchors (max. 1" depth), square U-bolts or back to back channel strut with long bolts, or other secure mounting as approved by the Engineer. Ensure bolts are galvanized in accordance with ASTM A153. Do not stack channel struts.
8. Backfill the holes thoroughly by tamping in 6 in. lifts. After tamping to grade, place additional backfill material in a 6 inch high cone around the pole to allow for settling. Use material equal in composition and density to the surrounding area. Backfilling will not be paid for directly but is subsidiary to various bid items.

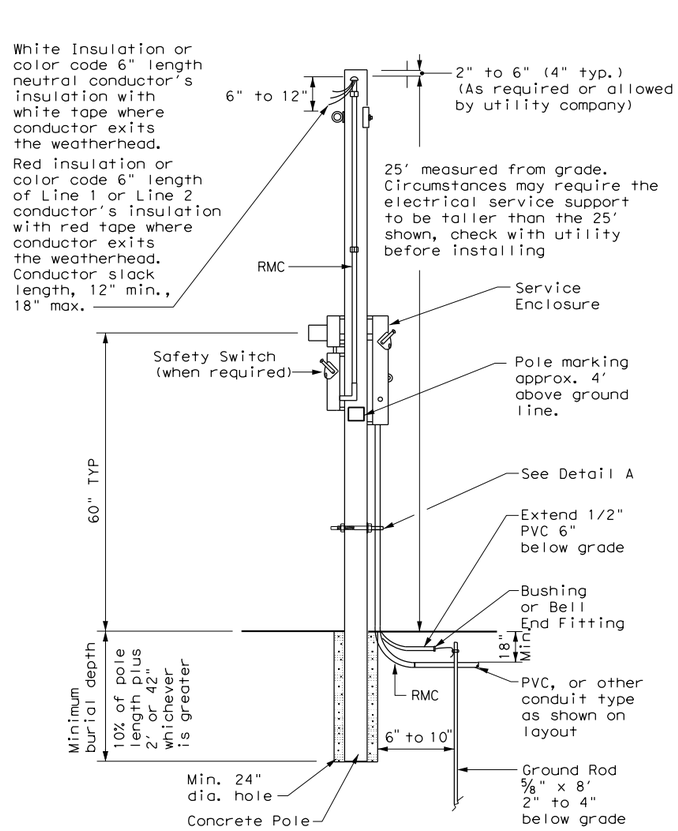


CONCRETE SERVICE SUPPORT

Underground (U)

DETAIL A

See Note 7. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.



CONCRETE SERVICE SUPPORT

Overhead (O)

Texas Department of Transportation

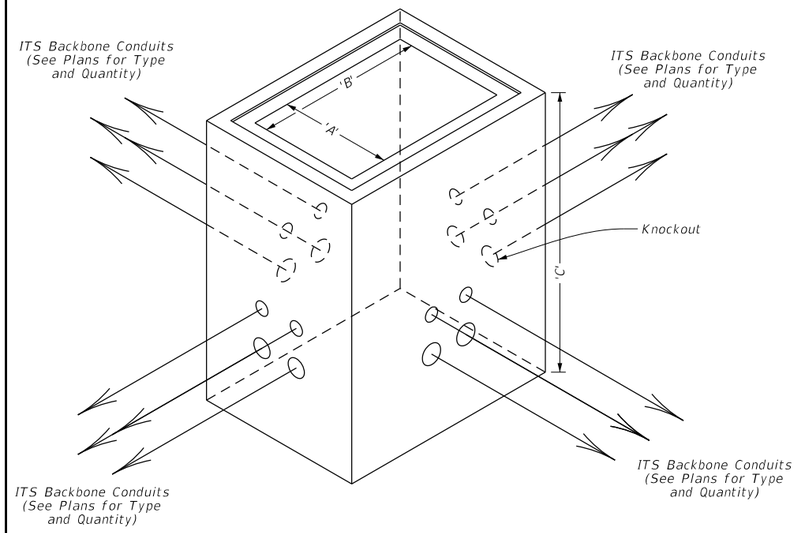
Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP

ED(10)-14

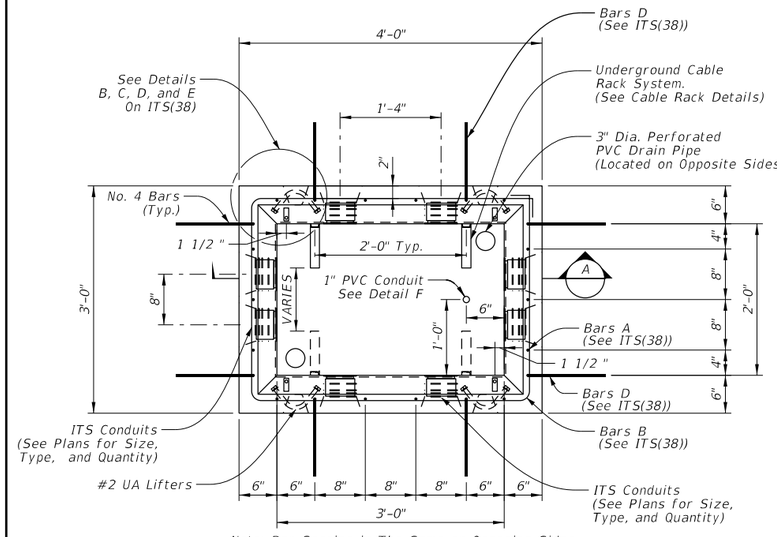
FILE: ed10-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095, ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		200

71K



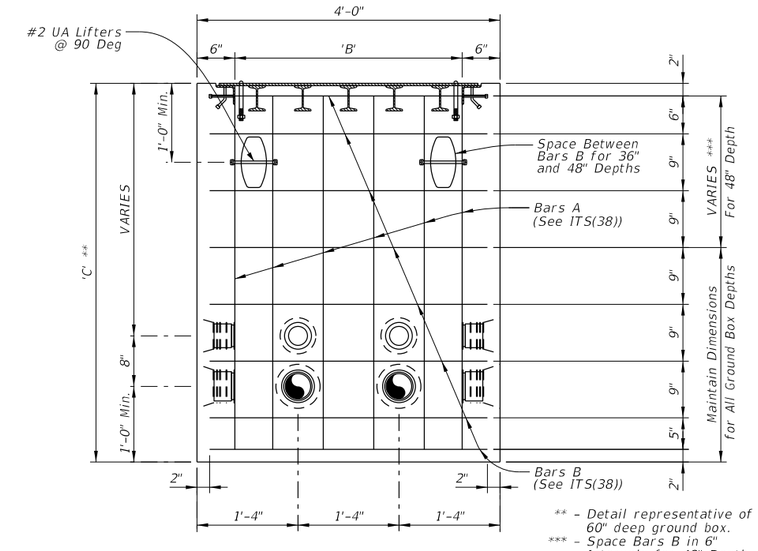
See Ground Box Schedule for A, B, and C Dimensions

Type 1 Ground Box Isometric View

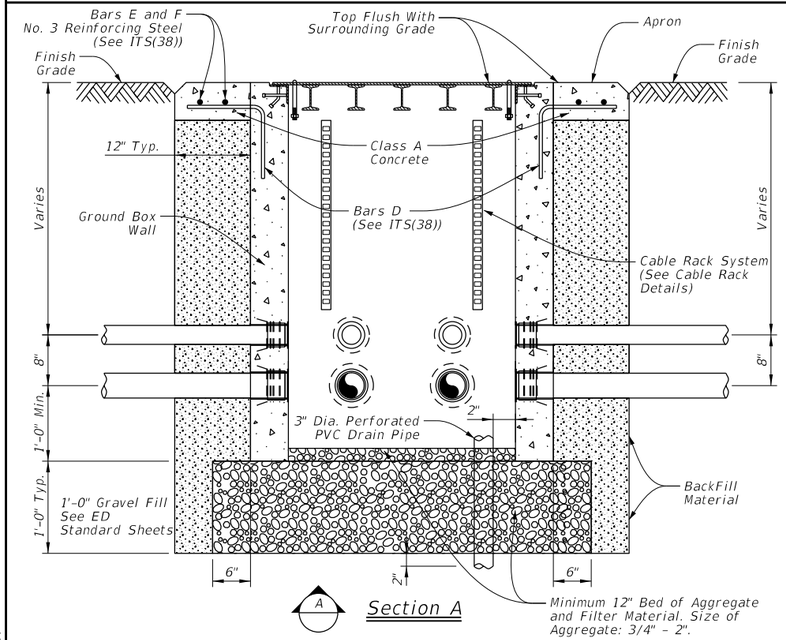


Note: Bar Spacing is The Same on Opposing Sides.

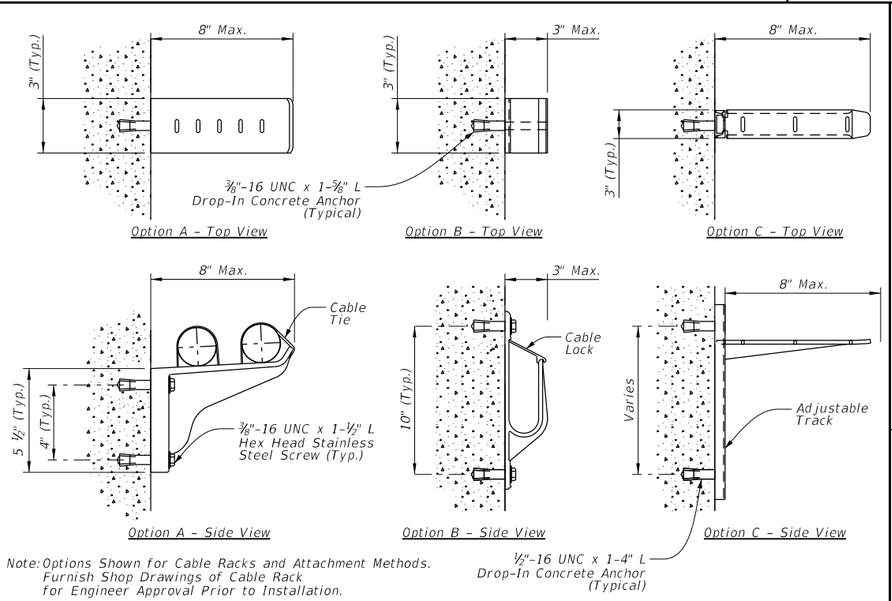
Type 1 Ground Box Plan View



Type 1 Ground Box Elevation View

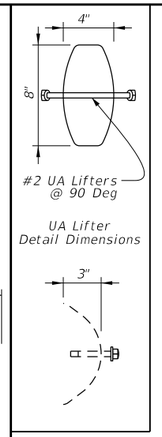


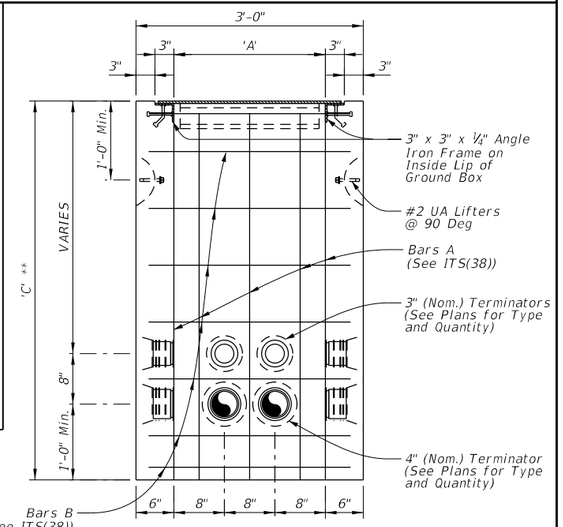
Section A



Note: Options Shown for Cable Racks and Attachment Methods. Furnish Shop Drawings of Cable Rack for Engineer Approval Prior to Installation.

Type 1 Cable Rack Details





Type 1 Ground Box Side View

** - Detail representative of 60" deep ground box.

General Notes:

1. Conduit entry points shown represent the standard configuration for backbone conduit as detailed on ITS(27). Additional conduits may be required as shown on the plans.
2. Provide Class A concrete for Type "1" ground boxes.
3. Provide terminators for the PVC conduit cast in the walls and placed symmetrically about the centerline of the box at the depths shown, unless otherwise noted, for the number of conduits identified on the plans to enter the box.
4. Provide terminators appropriately sized for the conduits indicated on the plans. Provide terminators with an air tight and water tight connection.
5. Closed bottom Type "1" ground boxes are acceptable in lieu of open bottom boxes. Provide two 3" Dia. perforated PVC drain pipes on opposite corners to optimize water drainage. Provide 12-inch bed of aggregate that extends 6 inches in all directions from the perimeter of the box for closed bottom boxes. Aggregate bed will be subsidiary to Special Specification, "ITS Ground Box."
6. Install all open bottom Type "1" ground boxes on a 12-inch bed of aggregate that extends 6 inches in all directions from the perimeter of the box. Aggregate bed will be subsidiary to Special Specification, "ITS Ground Box."
7. Cap and seal terminators that do not have conduits attached.
8. When additional conduit entry points are needed to accommodate existing conduit, core drill conduit knockouts in the field of the appropriate number and size of conduit at each location, as directed by the Engineer.
9. Provide a bell fitting on the end of each conduit to ensure a flush fit inside the ground box.
10. Concrete grout around the knockout (inside and out) and around the conduit and bell fitting to ensure a neat watertight fit after the conduit and bell fitting have been placed in a knockout. Ensure all openings in the ground box are sealed prior to grouting operations.
11. Install a nylon string and plug all unused conduits with tug-plugs sized for the particular conduits. Provide split innerduct plugs in conduits or innerducts with cables to seal the innerduct around the cables to prevent water and dirt from entering.
12. Provide steel (ASTM A-153), glass reinforced nylon, or equivalent cable rack assemblies designed to support the amount of cable storage slack identified in the plans. Locate cable rack system on one side only (longer length side) to allow access to the inside of the ground box. Cable racks may be installed at the factory or in the field. When mounting cable racks in the field, seal all penetrations to the concrete side wall to prevent moisture penetration. Ground metallic cable rack systems to grounding system inside ground box in accordance with the National Electrical Code.

Ground Box Schedule

Ground Box Type	'A' Width Inside (Inches)	'B' Length Inside (Inches)	'C' Depth Inside (Inches)
Type 1	24	36	36, 48, 60

Sheet Details
Not to Scale

Texas Department of Transportation

Traffic Safety Division Standard

ITS GROUND BOX DETAILS TYPE "1" WITH STEEL COVER

ITS(37)-22

FILE: its(37)-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 02-16 10-22	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		201

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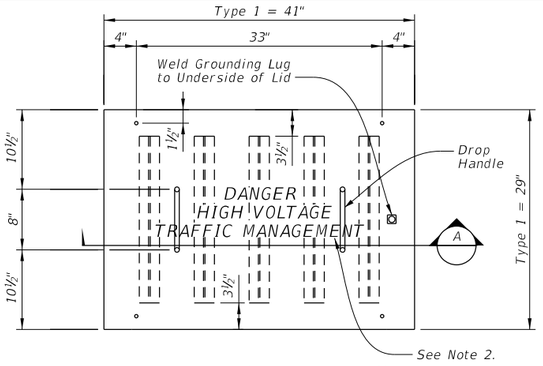
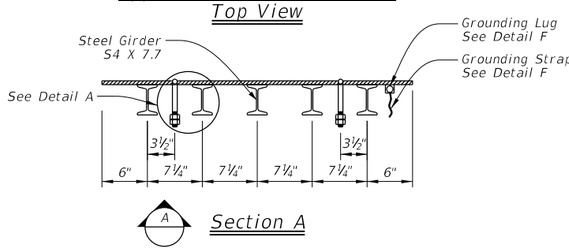
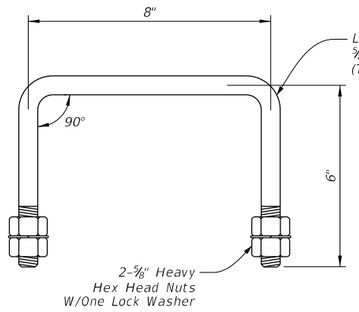


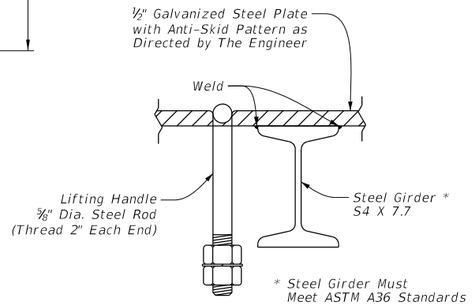
Type 1 Steel Cover Details
Top View



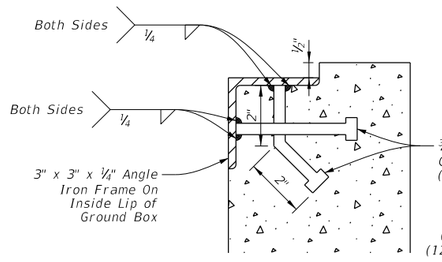
Section A



Drop Handle Detail



Detail A



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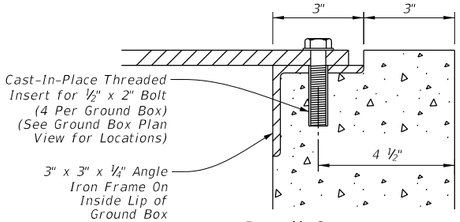
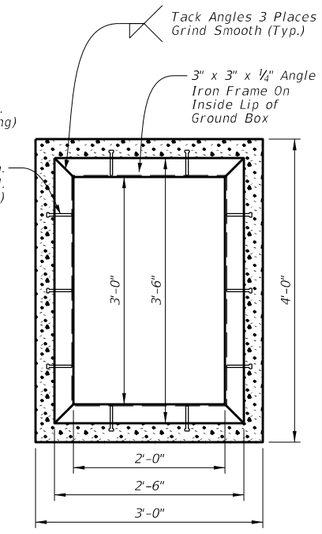
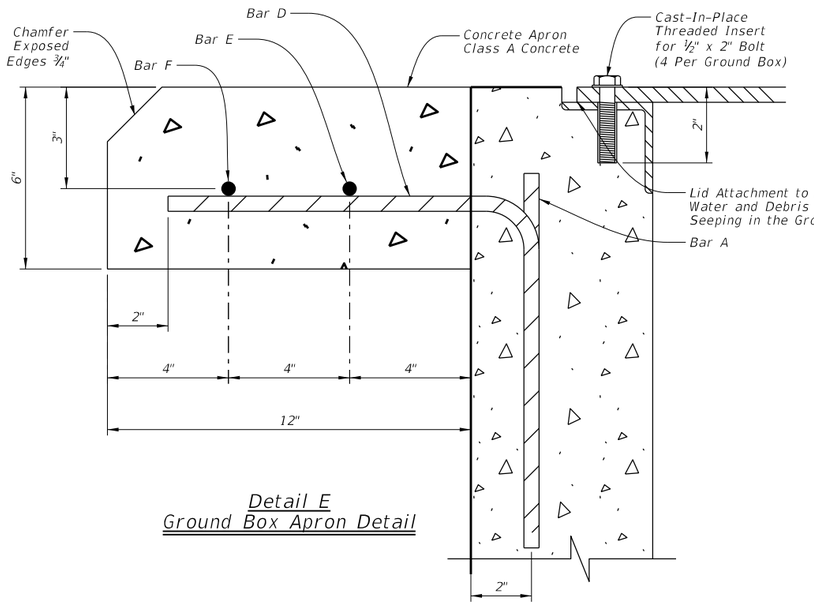


Detail C
Lid Attachment Detail



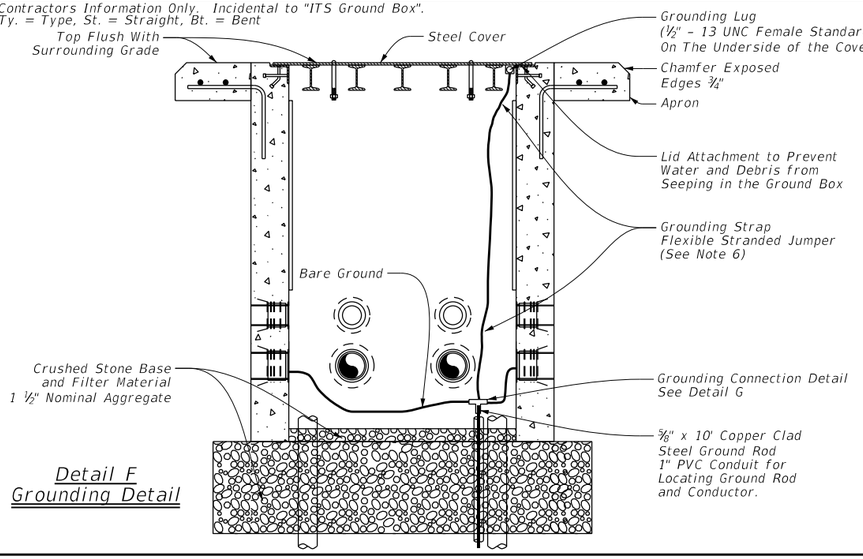
Detail D



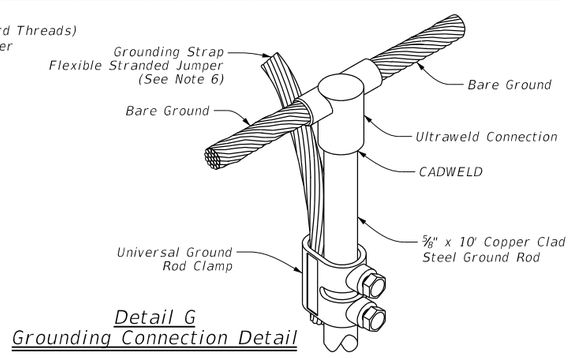
Detail E
Ground Box Apron Detail

Ground Box Type 1	BAR A					BAR B					BAR D					BAR E					BAR F					TOTALS	
	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	Steel * LBS.	Conc. * CY
36" Depth	22	#4	St.	2'-8"	39.3	5	#4	Bt.	13'-2"	44.1	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	108.1	.67
48" Depth	22	#4	St.	3'-8"	54.0	7	#4	Bt.	13'-2"	61.8	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	140.5	.89
60" Depth	22	#4	St.	4'-8"	68.8	8	#4	Bt.	13'-2"	70.6	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	164.1	1.11

* - For Contractors Information Only. Incidental to "ITS Ground Box".
Legend: Ty. = Type, St. = Straight, Bt. = Bent



Detail F
Grounding Detail



Detail G
Grounding Connection Detail

Note - All grounding connections to be CADWELD or approved equal. This work will not be paid for directly, but is considered incidental to ITS ground box.

General Notes:

1. See ITS(37) for additional Type "1" ground box details.
2. Hot-dip galvanized steel covers after all welds are made.
3. Label top of cover with the words "DANGER HIGH VOLTAGE TRAFFIC MANAGEMENT" using template-guided, hand-welded lettering at a height of 2 inches to ensure neatness.
4. Provide all Type "1" ground boxes with a securable, tamper-proof cover equipped with a bolting system that positively secures the cover in place.
5. Ground steel covers in accordance with the National Electrical Code.
6. Ground covers to the grounding cable using a split-bolt kearney clamp, and a minimum 8-foot long flexible stranded jumper the same size as the grounding conductor. Terminate to metal ground box cover with a tank ground type lug as approved and directed by the Engineer.
7. Provide Type "1" ground box and cover designed for heavy duty loading in accordance with AASHTO H20 loading when located where the box may experience deliberate, continuous vehicular traffic, such as near the shoulder or an auxiliary lane, or immediately adjacent to the unprotected edge of pavement.
8. Provide a Type "1" ground box and cover tested by a laboratory independent of the manufacturer certifying loading requirements are met. Provide certification of such tests to the Engineer for approval.
9. Provide a steel or cast iron cover in accordance with Item 471, Article 471.2, "Frames, Grates, Rings, and Covers." Provide covers with the number of drop handles shown. Provide Class "A" concrete for ground box construction and aprons.
10. Fabricate cover so to fits properly on the ground box, and no undue noise results when traffic contacts the cover.

Sheet Details
Not to Scale

SHEET 2 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

ITS GROUND BOX DETAILS TYPE "1" WITH STEEL COVER

ITS(38)-17

FILE: its(38)-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 5-17	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		202

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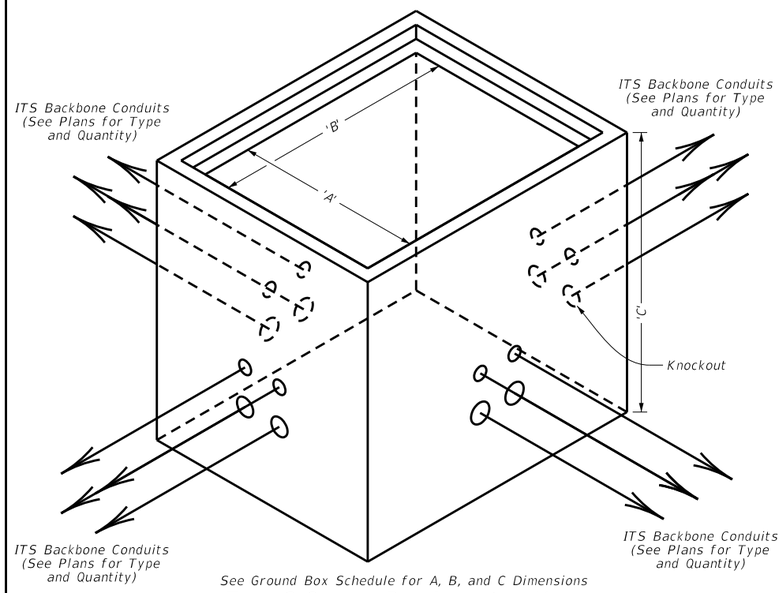
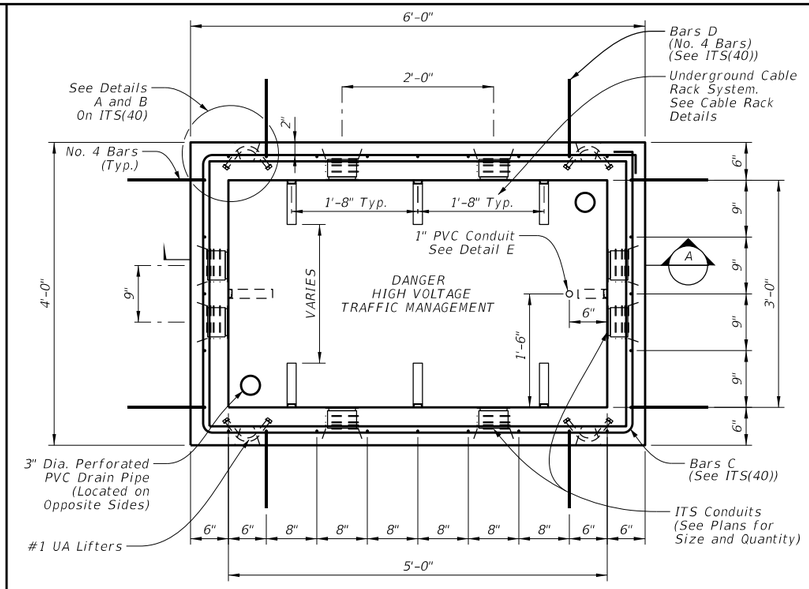


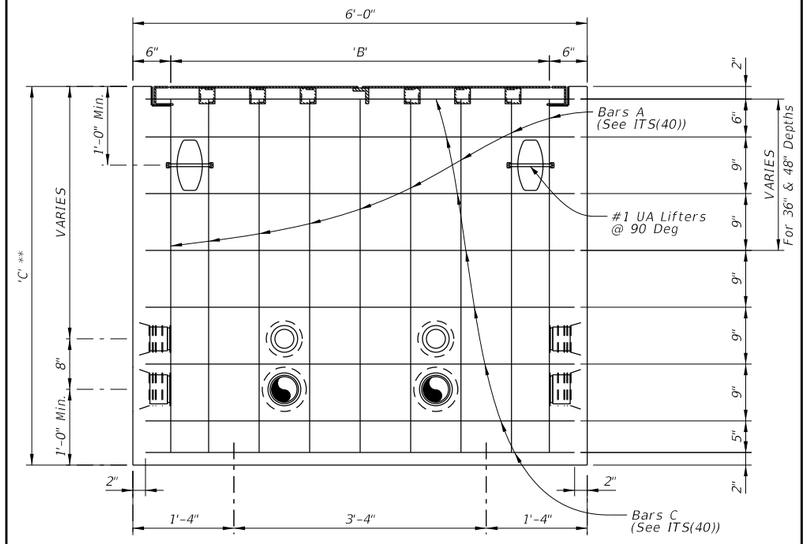
See Ground Box Schedule for A, B, and C Dimensions

Type 2 Ground Box Isometric View



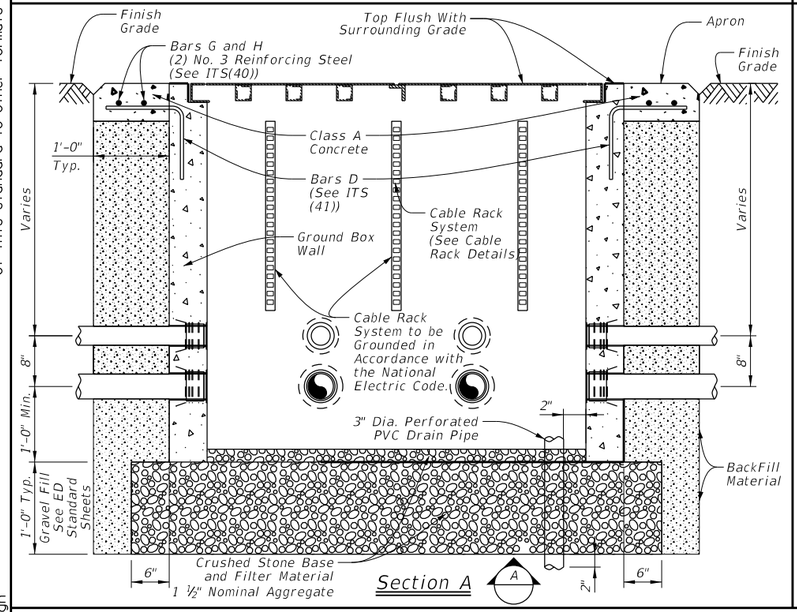
Note: Bar Spacing is The Same on Opposing Sides.

Type 2 Ground Box Plan View

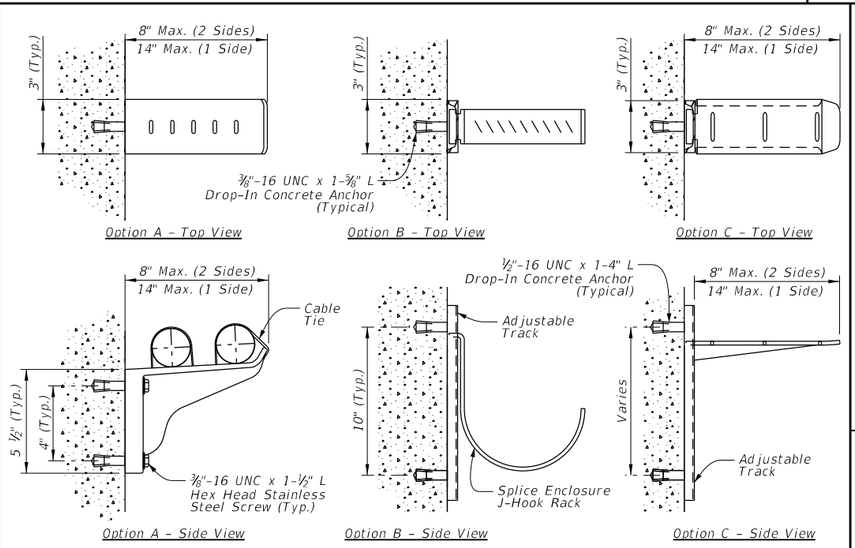


** - Detail representative of 60" deep ground box.

Type 2 Ground Box Elevation View

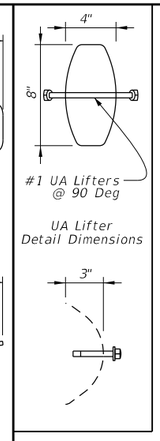


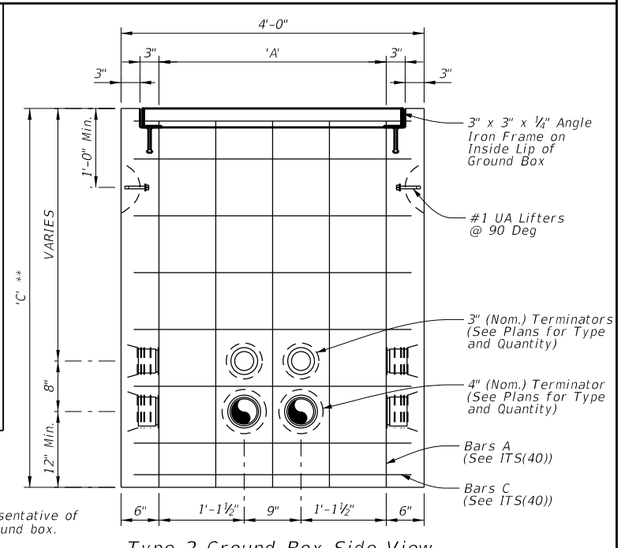
Section A



Note: Options Shown for Cable Racks and Attachment Methods Contractor to Supply Shop Drawings of Cable Rack and Cable Rack Grounding System (If Applicable) for Engineer Approval Prior to Installation.

Type 2 Cable Rack Details





** - Detail representative of 60" deep ground box.

Type 2 Ground Box Side View

SHEET 1 OF 2

General Notes:

1. Conduit entry points shown represent the standard configuration for backbone conduit as detailed on ITS(27). Additional conduits may be required as shown on the plans.
2. Provide Class "A" concrete for Type "2" ground boxes.
3. Provide terminators for the PVC conduit cast in the walls and placed symmetrically about the centerline of the box at the depths shown, unless otherwise noted, for the number of conduits identified on the plans to enter the box.
4. Provide terminators appropriately sized for the conduits indicated on the plans. Provide terminators with an air tight and water tight connection.
5. Closed bottom Type "2" ground boxes are acceptable in lieu of open bottom boxes. Provide two 3" Dia. perforated PVC drain pipes on opposite corners to optimize water drainage. Provide closed bottom boxes with a 12-inch base of crushed stone which extends 6 inches in all directions from the perimeter of the box. Crushed stone will be subsidiary to Special Specification, "ITS Ground Box."
6. When additional conduit entry points are needed to accommodate existing conduit, core drill conduit knockouts in the field of the appropriate number and size of conduit at each location, as directed by the Engineer.
7. Provide a bell fitting on the end of each conduit to ensure a flush fit inside the ground box.
8. Concrete grout around the knockout (inside and out) and around the conduit and bell fitting to ensure a neat watertight fit after the conduit and bell fitting have been placed in a knockout. Ensure all openings in the ground box are sealed prior to grouting operations.
9. Install a nylon string and plug all unused conduits with tug-plugs sized for the particular conduits. Provide split innerduct plugs in conduits or innerducts with cables to seal the innerduct around the cables to prevent water and dirt from entering.
10. Install all open bottom Type "2" ground boxes on a 12-inch base of crushed stone which extends 6 inches in all directions from the perimeter of the box. Crushed stone will be subsidiary to special specification, "ITS Ground Box."
11. Cap and seal terminators that do not have conduits attached.
12. Backfill in accordance with Item 400, "Excavation and Backfill for Structures."
13. Provide steel (ASTM A-153), glass reinforced nylon, or equivalent cable rack assemblies designed to support the amount of cable storage slack and splice enclosures identified in the plans. Locate cable rack system on any side but allow for sufficient access to the inside of the ground box. Cable racks may be installed at the factory or in the field. When mounting cable racks in the field, seal all penetrations to the concrete side wall to prevent moisture penetration. Ground metallic cable rack systems to grounding system inside ground box in accordance with the National Electrical Code.

Ground Box Schedule

Ground Box Type	'A' Width Inside (Inches)	'B' Length Inside (Inches)	'C' Depth Inside (Inches)
Type 2	36	60	36, 48, 60

Sheet Details
Not to Scale

Texas Department of Transportation

Traffic Operations Division Standard

ITS GROUND BOX DETAILS TYPE "2" WITH STEEL COVER

ITS(39)-16

FILE: its(39)-16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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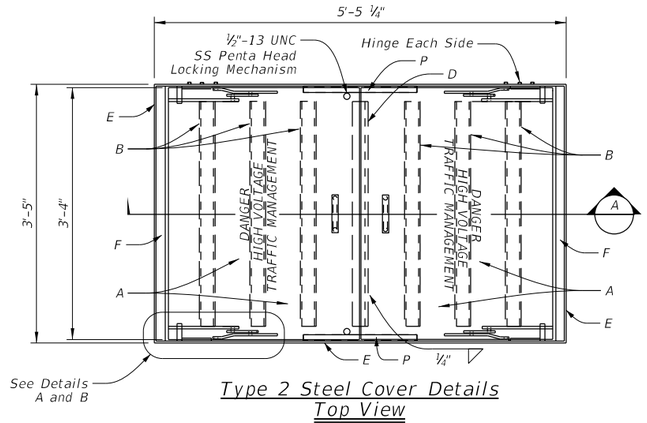
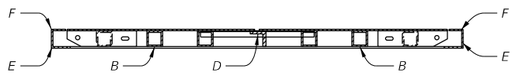
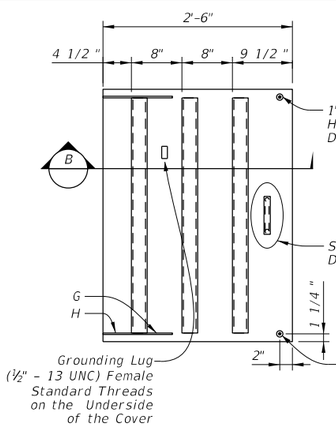


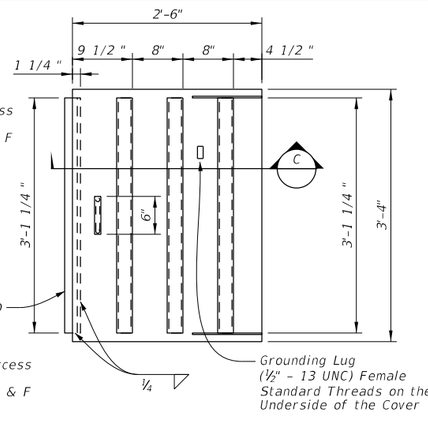
Type 2 Steel Cover Details Top View



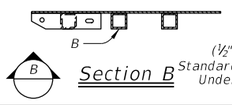
Section A



Type 2 Steel Cover Details Bottom View (Left)



Type 2 Steel Cover Details Bottom View (Right)



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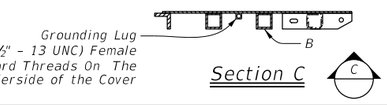
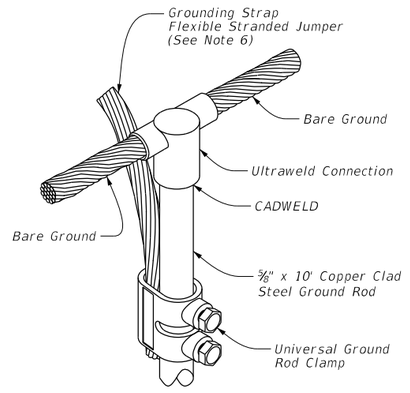


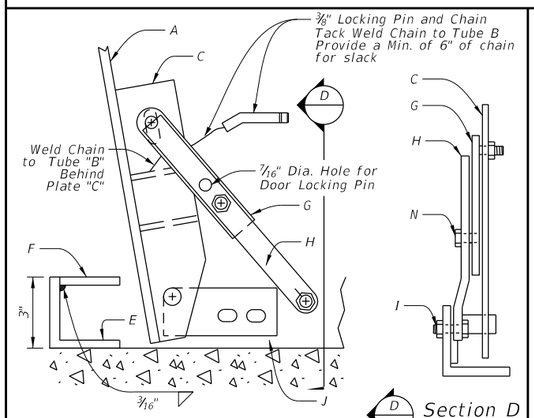
Section C



Detail G Grounding Connection Detail

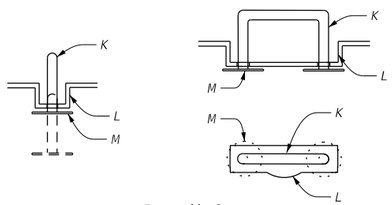
Note – All grounding connections to be CADWELD or approved equal. This work will not be paid for directly, but is considered incidental to ITS ground box.

Item	Qty	Incidental "ITS Ground Box" Material
A	2	¼" Floor Plate 40" x 30"
B	6	2 ½" x 2 ½" x 37 ¼" Tube
C	4	11" x 2 ½" x ¼" Plate
D	1	2 ½" x 2 ½" x ½" x 37" ¼ Angle
E	4	3" x 3" x ¼" Angle
F	2	40 ½" x 2" x ¼" Plate
G	4	6 ½" x 1 ¼" x ¼" Plate
H	4	10 ½" x 1 ¼" x ¼" Plate
I	12	½" Bolt/Nut
J	4	4 ¾ x 2" x ¾" Plate
K	2	⅝" Drop Handle
L	2	1 ½" x ⅝" x 3/16" Channel x 7"
M	4	1 ½" x ⅛" P Disk
N	8	½" x ⅝" Bolt
P	2	1" x 1" x ⅛" Angle x 18"

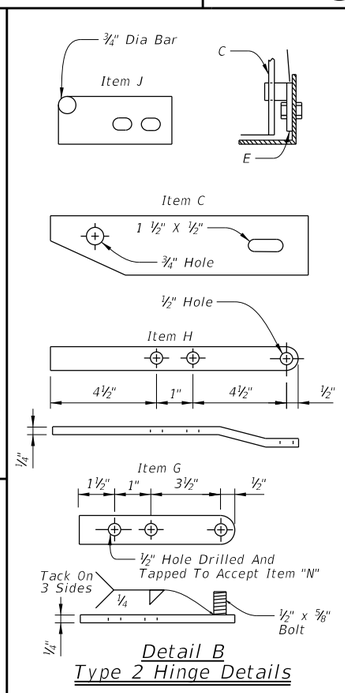


Detail A Type 2 Cover Side View Detail

Section D



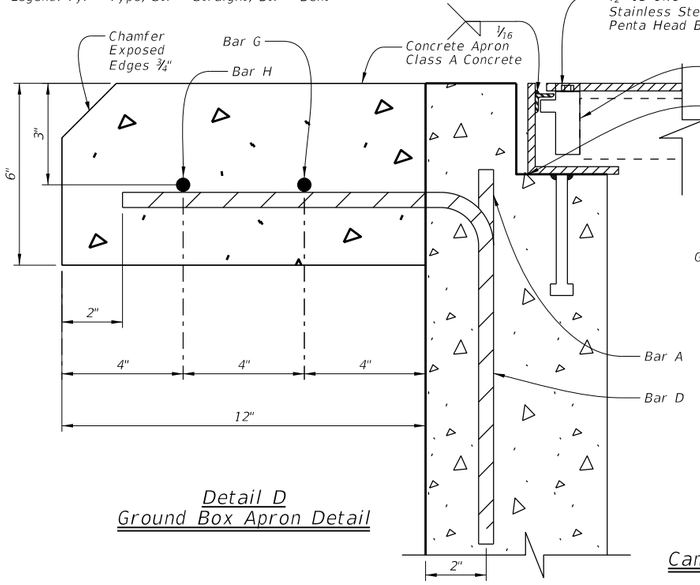
Detail C Type 2 Drop Handle Details



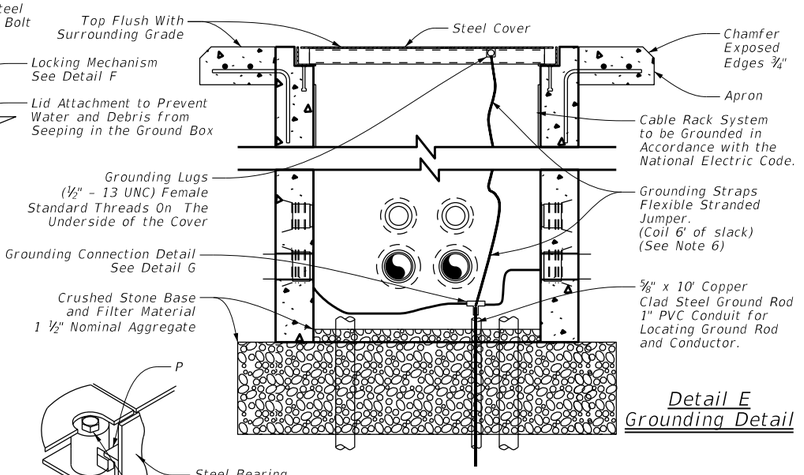
Detail B Type 2 Hinge Details

Ground Box Type 2	BAR A					BAR C					BAR D					BAR G					BAR H					TOTALS	
	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	Steel * LBS.	Conc. * CY
36" Depth	28	#4	St.	2'-8"	50.0	5	#4	Bt.	19'-1"	63.9	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	23'-3"	8.8	1	#3	Bt.	25'-11"	9.8	143.2	1.00
48" Depth	28	#4	St.	3'-8"	68.8	7	#4	Bt.	19'-1"	89.5	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	23'-3"	8.8	1	#3	Bt.	25'-11"	9.8	187.6	1.33
60" Depth	28	#4	St.	4'-8"	87.5	8	#4	Bt.	19'-1"	102.3	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	23'-3"	8.8	1	#3	Bt.	25'-11"	9.8	219.1	1.67

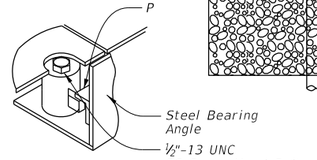
* – For Contractors Information Only. Incidental to "ITS Ground Box".
Legend: Ty. = Type, St. = Straight, Bt. = Bent



Detail D Ground Box Apron Detail



Detail E Grounding Detail



Detail F Cam Locking Mechanism

General Notes:

1. See ITS(39) for additional Type "2" ground box details.
2. Hot-dip galvanized steel covers after all welds are made.
3. Label top of cover with the words "DANGER HIGH VOLTAGE TRAFFIC MANAGEMENT" using template-guided, hand-welded lettering at a height of 2 inches to ensure neatness.
4. Provide all Type "2" ground boxes with a securable, tamper-proof cover equipped with a bolting system that positively secures the cover in place.
5. Ground steel covers in accordance with the National Electrical Code.
6. Ground covers to the grounding cable using a split-bolt kearney clamp, and a minimum 8-foot long flexible stranded jumper the same size as the grounding conductor. Terminate to metal ground box cover with a tank ground type lug as approved and directed by the Engineer.
7. Provide Type "2" ground box and cover designed for heavy duty loading in accordance with AASHTO H20 loading when located where the box may experience deliberate, continuous vehicular traffic, such as near the shoulder or an auxiliary lane, or immediately adjacent to the unprotected edge of pavement.
8. Provide a Type "2" ground box and cover tested by a laboratory independent of the manufacturer certifying loading requirements are met. Provide certification of such tests to the Engineer for approval.
9. Provide a steel or cast iron cover in accordance with Item 471, Article 471.2, "Frames, Grates, Rings, and Covers." Provide covers with the number of drop handles shown. Provide Class "A" concrete for ground box construction and aprons.
10. Fabricate cover so to fits properly on the ground box, and no undue noise results when traffic contacts the cover.

Sheet Details
Not to Scale

SHEET 2 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

ITS GROUND BOX DETAILS TYPE "2" WITH STEEL COVER

ITS(40)-17

FILE: its(40)-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
5-17	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		204

DATE: 8/9/2023 9:43:36 AM
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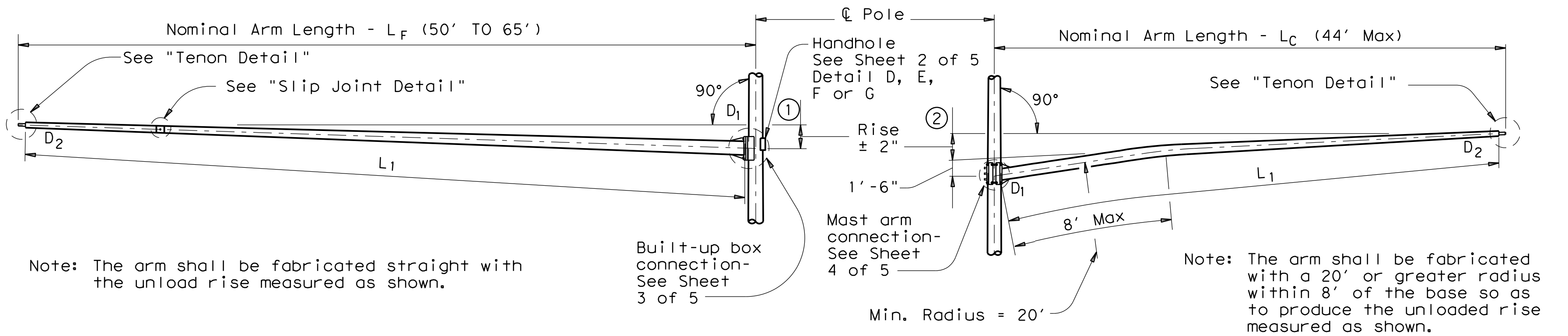
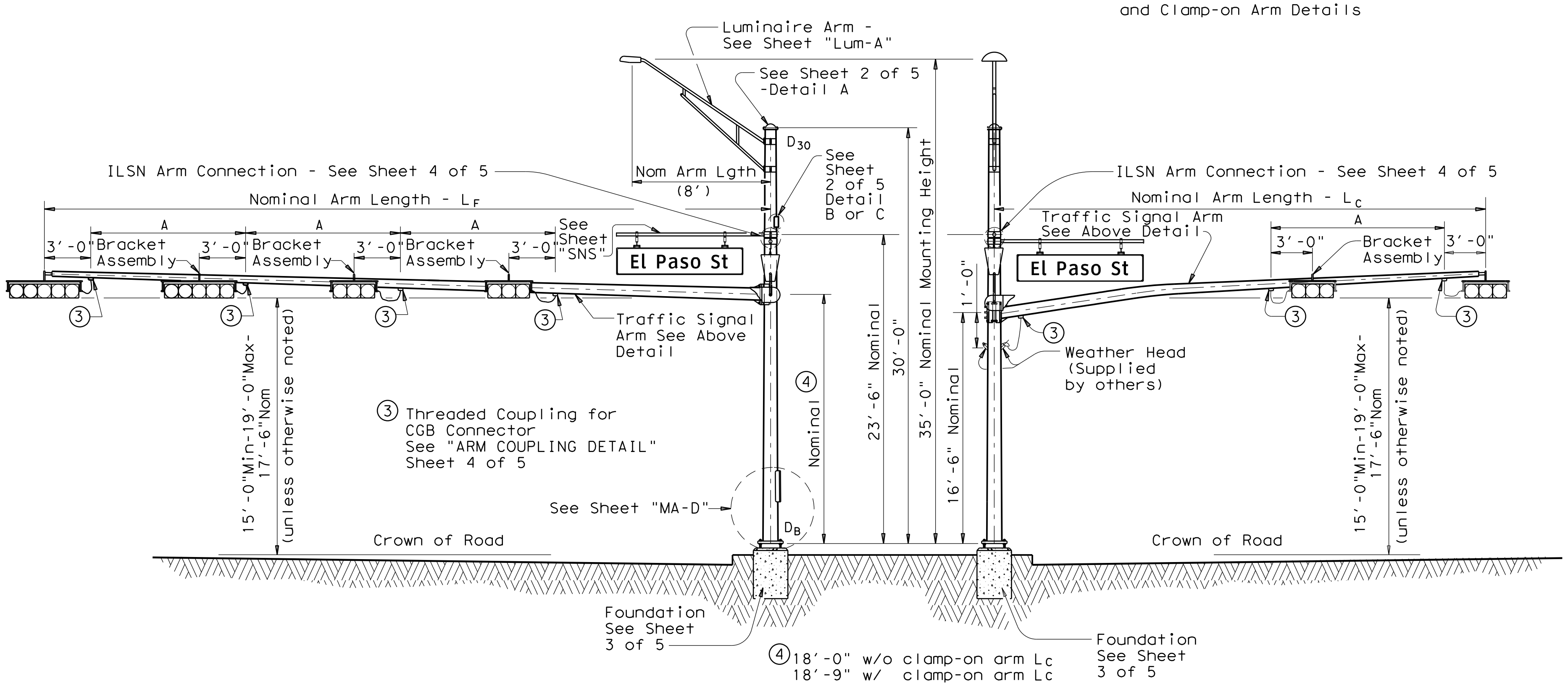


FIXED MOUNT TRAFFIC SIGNAL ARM

(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



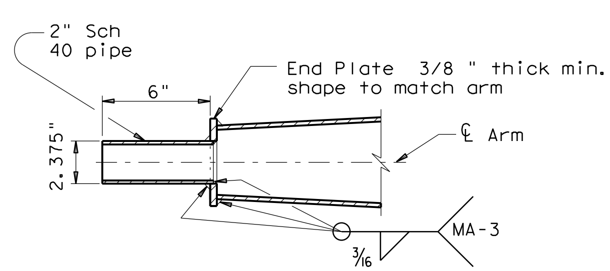
ELEVATION
(Showing fixed mount arm)

STRUCTURE ASSEMBLY

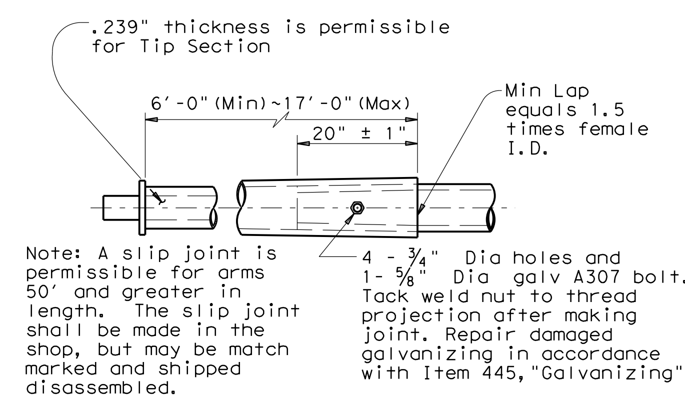
ELEVATION
(Showing clamp-on arm)

TABLE OF DIMENSIONS "A"

Arm Length	24'	28'	32'	36'	40'	44'	50'	55'	60'	65'
Arm Type II	10'	11'	12'	13'						
Arm Type III			10'	11'	12'	12'				
Arm Type IV							12'	12'	12'	12'



TENON DETAIL



SLIP JOINT DETAIL (FIXED MOUNT ARM)

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed can be either 100 mph or 80 mph plus a 1.3 gust factor. If clamp-on traffic signal is required, designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

Poles are designed to support one 8'-0" luminaire arm, two 9'-0" internally lighted street name (ILSN) signs and two traffic signal arms with limited length combinations.

Each arm with its related attachment is shown below

Arm	Equivalent DL (5)	WL EPA (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.

Except as noted in Sheet 1 thru 5 of 5, other details not covered shall refer to Standard Sheet "MA-D" for pole details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Material, fabrication tolerances, and shipping practices shall also meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing" after fabrication.

Deviations from the details and dimensions shown herein require submission of shop drawings in accordance with the Item 441, "Steel Structures". Alternate designs are not acceptable.

Installation of damping plate for the long mast arm is not recommended.

Provision of the bracket assembly used to support the traffic signal heads shall be under the direction of the Engineer for approval.

Design also conforms to NCHRP Report 412 for fatigue resistance except that there are no stiffeners at the base plate. TxDOT is conducting tests to determine if stiffeners at the base plate will or will not result in optimal performance; depending upon the results of the tests, poles may need a retrofit to ensure optimal fatigue performance.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)
LMA(1)-12

Sheet 1 of 5

©TxDOT July 2000	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS 4-20-01 1-12	CONT 0905	SECT 06	JOB 095, ETC.	HIGHWAY CS
	DIST LBB		COUNTY LUBBOCK	SHEET NO. 205

131A

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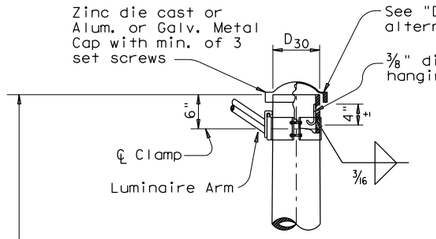
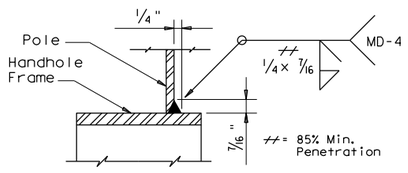
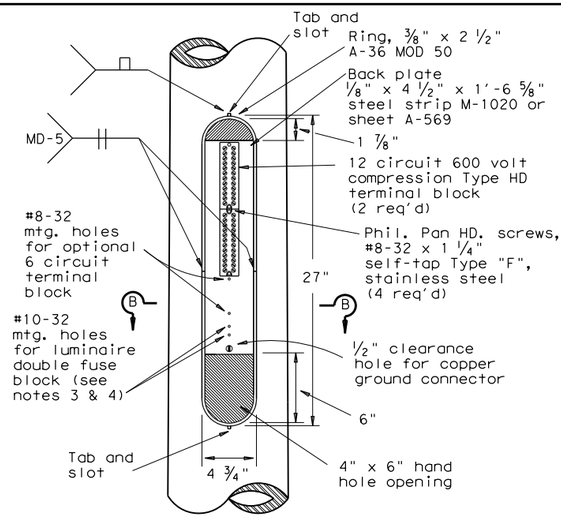


DETAIL A

(for pole with luminaire)



DETAIL H

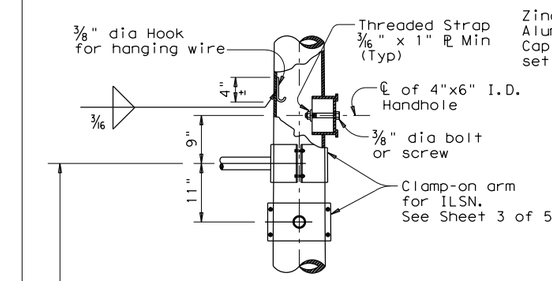


ACCESS COMPARTMENT

MATERIALS	
Round Shafts or Polygonal Shafts (7)	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 (8)
Plates (7)	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325, or A449 except where noted
Pin Bolts	ASTM A325
Pipe (7)	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

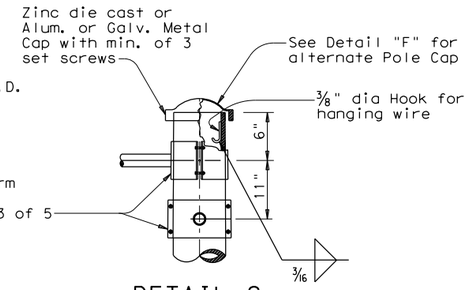
(7) ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

(8) ASTM A1011 SS Gr.50 shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

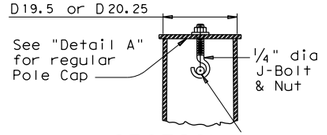


DETAIL B

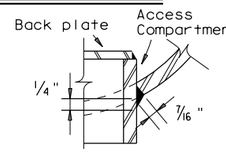
(If ILSN applied)



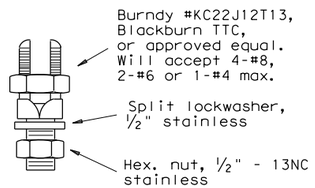
DETAIL C



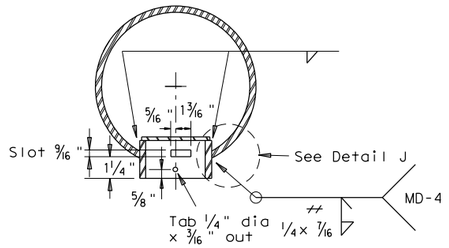
SECTION Y-Y



DETAIL J



COPPER GROUND CONNECTOR



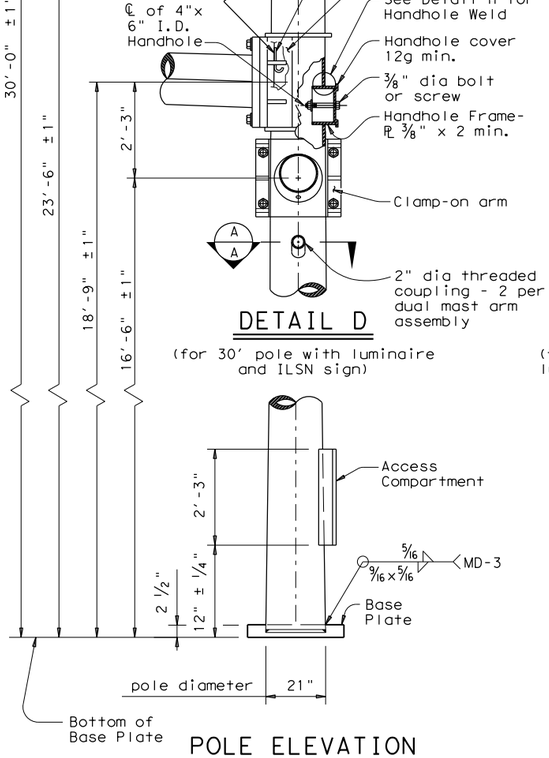
SECTION B-B

// = 85% Min. Penetration

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.

ACCESS COMPARTMENT NOTES:

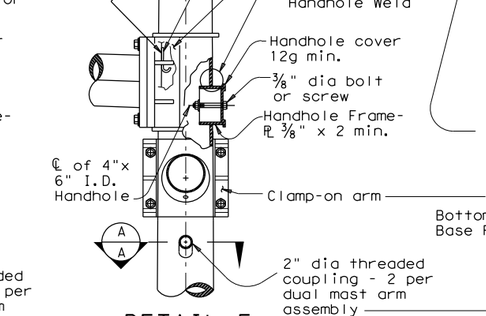
1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 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

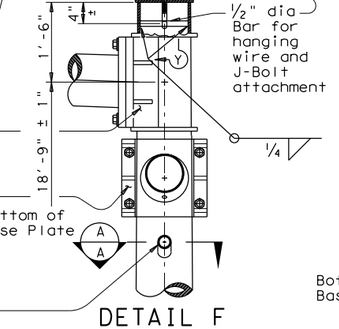
(for 30' pole with luminaire and ILSN sign)

POLE ELEVATION



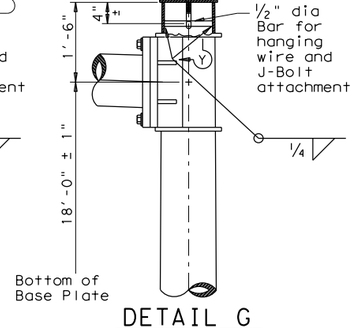
DETAIL E

(for 24' pole with ILSN sign and no luminaire, single or dual mast arm)



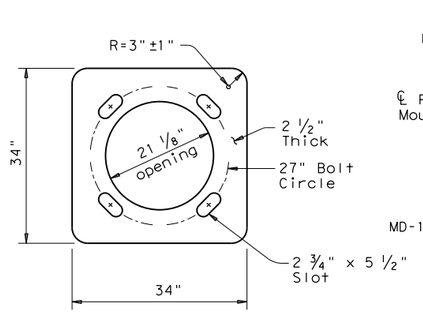
DETAIL F

(for 20.25' pole with no ILSN sign and no luminaire, dual mast arm)

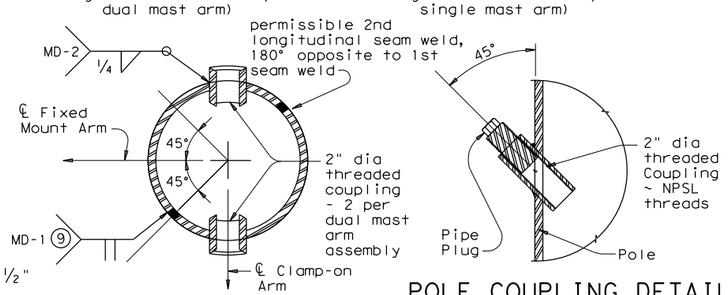


DETAIL G

(for 19.5' pole with no ILSN sign and no luminaire, single mast arm)



BASE PLATE



SECTION A-A

POLE COUPLING DETAIL

(9) Longitudinal seam weld must be oriented within 90° (45° rotation each side) along the fixed mount arm. 60% min penetration required, 100% penetration within 6" of circumferential base weld.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 2 of 5

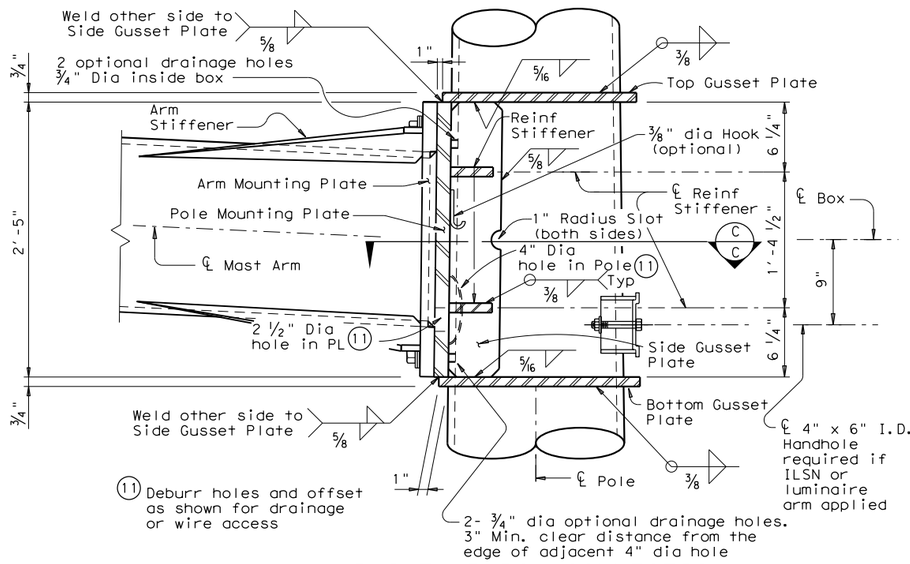
LMA(2)-12

DN: JSY	CK: ARC	DW: TGG	CK: JSY

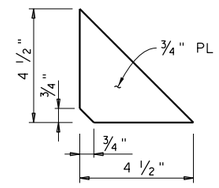
REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0905	06	095,ETC.	CS
DIST	COUNTY		SHEET NO.
LBB	LUBBOCK		206

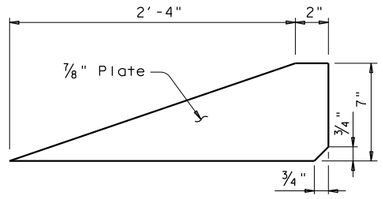
131B



BUILT-UP BOX CONNECTION

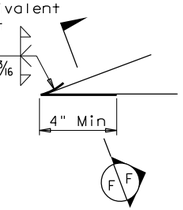


REINFORCING STIFFENER



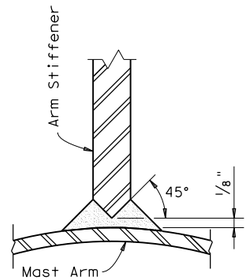
ARM STIFFENER
(Cut to match arm inclination and taper)

Provide Detail shown in SECTION F-F or equivalent 100% complete joint penetration weld from both sides.



Only 4" length at tip of Arm Stiffener requires a complete joint penetration weld. Smooth weld radius to connect Stiffener. Only a fillet weld is required for the remaining weld length.

DETAIL "K"



SECTION F-F

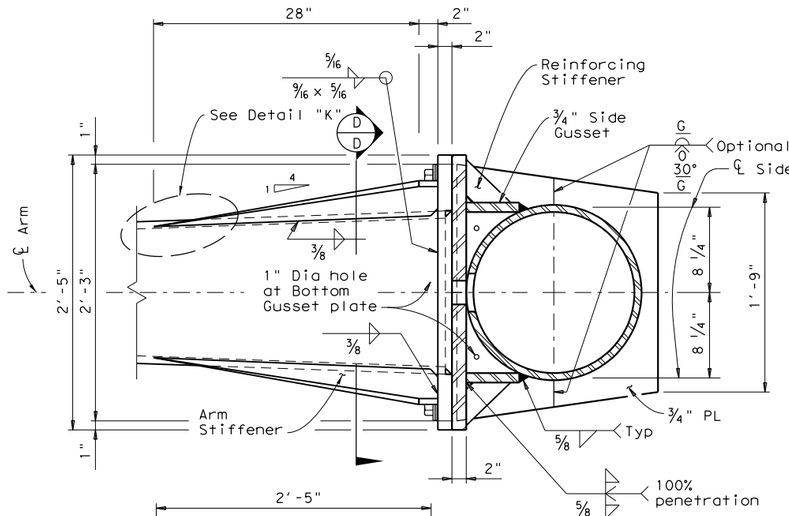
Fixed Mount Arm L_F	ROUND POLES (13)					Foundation Type
	D_B	$D_{19.5}$ or $D_{20.25}$	D_{24}	D_{30}	(12) thk	
ft.	in.	in.	in.	in.	in.	
50', 55' 60', 65'	21.0	18.2	17.6	16.8	.3125	48-A

Fixed Mount Arm L_F	ROUND ARMS (13)				
	L_1	D_1	D_2	(12) thk	Rise
ft.	ft.	in.	in.	in.	
50	49	18.5	11.7	.3125	3'- 3"
55	54	18.5	11.0	.3125	3'- 7"
60	59	18.5	10.3	.3125	3'-11"
65	64	18.5	9.6	.3125	4'- 4"

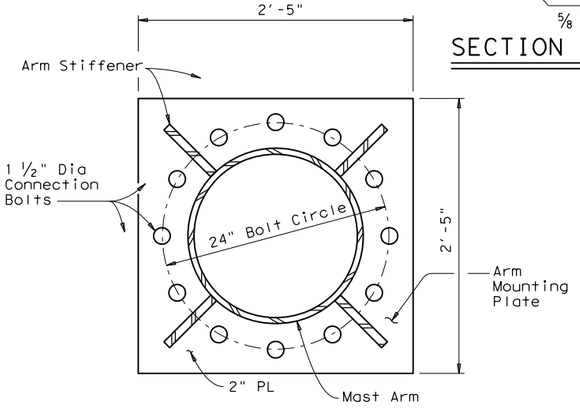
D_B = Pole Base O.D.
$D_{19.5}$ = Pole Top O.D. with no Luminaire and no ILSN (single mast arm)
$D_{20.25}$ = Pole Top O.D. with no Luminaire and no ILSN (dual mast arm)
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L_F = Fixed Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

(13) Shaft profile 16-sided or 18-sided is considered to be equivalent to round section.

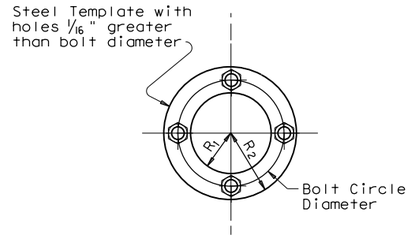


SECTION C-C



SECTION D-D

NUT ANCHOR
(TYPE 2)



TEMPLATE DETAIL

ANCHOR BOLT ASSEMBLY

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 Laods.

(15) Foundation Design Loads are the allowable moments and shears at the base of the structure.

(16) Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

(17) If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

(18) Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

GENERAL NOTES:

Built-up Box Connection: For the welded arm-to-pole connection as a build-up box configuration illustrated here is an example only, fabricators are required to submit a shop drawing of box connection for approval. The drawing shall specify the details of each box element, welds of arm-to-pole connection, arm-to-plate socket connection, and arm rise creation. Specify the proper location of drain holes along the pole. 2 1/2" dia hole in the pole mounting plate and 4" dia hole in the pole need to be aligned for wiring access or drainage. Arm stiffeners cut to match arm inclination and taper shall also be included.

The deviation from flat for either arm or pole mounting plate shall not exceed 1/32 in., which is measured along the center of mounting plate to a radial distance of 13.5 in. The deformed-from-flat connection between arm and pole mounting plates shall not be allowed if the center of both mounting plates cannot contact directly.

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 3 of 5 LMA(3)-12

DN: JSY	CK: ARC	DW: TGG	CK: JSY

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0905	06	095, ETC.	CS
DIST	COUNTY		SHEET NO.
LBB	LUBBOCK		207

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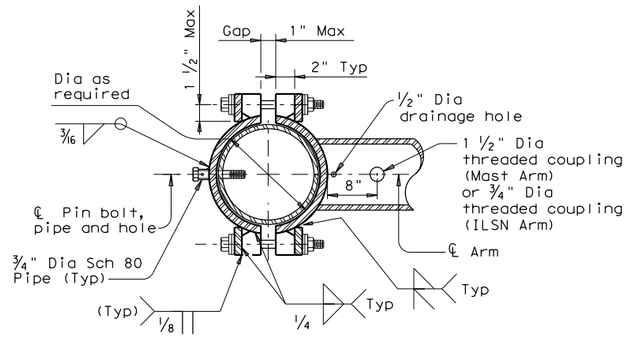
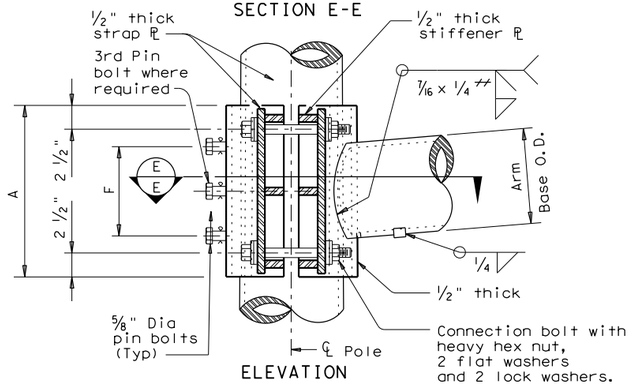


SECTION E-E



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"

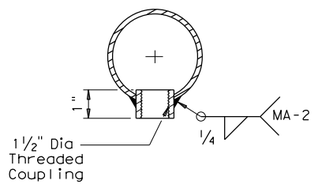
D1 = Arm Base O.D.
D2 = Arm End O.D.
L1 = Shaft Length
Lc = Clamp-on Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

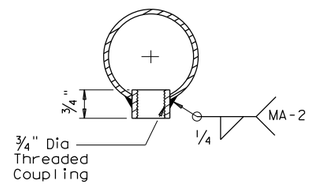
CLAMP-ON ARM CONNECTION

ILSN Arm Size		A	F	4 Conn. Bolts	⅝" Dia. Pin Bolts
Sch 40 pipe Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
3	.216	10	4	¾	2

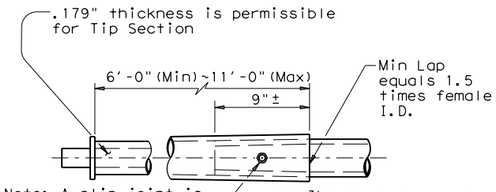
Mast Arm Size		A	F	4 Conn. Bolts	⅝" Dia. Pin Bolts
Base Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
6.5	.179	12	6	1	2
7.5	.179	14	8	1	2
8.0	.179	14	8	1	2
9.0	.179	16	10	1	2
9.5	.179	18	12	1 ¼	3
9.5	.239	18	12	1 ¼	3
10.0	.239	18	12	1 ¼	3
10.5	.239	18	12	1 ¼	3
11.0	.239	18	12	1 ¼	3
11.5	.239	18	12	1 ¼	3



ARM COUPLING DETAIL



ILSN ARM COUPLING DETAIL

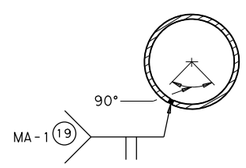


Note: A slip joint is permissible for arms 40' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

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.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 4 of 5 LMA(4)-12

DN: JK	CK: GRB	DW: FDN	CK: CAL

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0905	06	095, ETC.	CS
DIST	COUNTY		SHEET NO.
LBB	LUBBOCK		208

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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: See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		24' Poles with ILSN: See note above plus one small hand hole		19.50' (Single Mast Arm) 20.25' (Dual Mast Arm) Poles with no Luminaire and no ILSN: See note above	
Single Mast Arm						
Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	50L	1	50S		50	
55	55L		55S		55	
60	60L	3	60S		60	
65	65L		65S		65	
Dual Mast Arm						
Lf ft. / Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50 / 20	5020L		5020S		5020	
50 / 24	5024L		5024S		5024	
50 / 28	5028L		5028S		5028	
50 / 32	5032L		5032S		5032	
50 / 36	5036L		5036S		5036	
50 / 40	5040L		5040S		5040	
50 / 44	5044L		5044S		5044	
55 / 20	5520L		5520S		5520	
55 / 24	5524L		5524S		5524	
55 / 28	5528L		5528S		5528	
55 / 32	5532L		5532S		5532	
55 / 36	5536L		5536S		5536	
55 / 40	5540L		5540S		5540	
55 / 44	5544L		5544S		5544	
60 / 20	6020L		6020S		6020	
60 / 24	6024L		6024S		6024	
60 / 28	6028L		6028S		6028	
60 / 32	6032L		6032S		6032	
60 / 36	6036L		6036S		6036	
60 / 40	6040L		6040S		6040	
60 / 44	6044L		6044S		6044	
65 / 20	6520L		6520S		6520	
65 / 24	6524L		6524S		6524	
65 / 28	6528L		6528S		6528	
65 / 32	6532L		6532S		6532	
65 / 36	6536L		6536S		6536	
65 / 40	6540L		6540S		6540	
65 / 44	6544L		6544S		6544	

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet)
			48-A
82ND ST AT UPLAND AVE	10	4	88
Total Drill Shaft Length			88

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) 3 Bracket Assembly and 4 CGB Connectors	
ft.	Designation	Quantity
50	50IV	1
55	55IV	
60	60IV	3
65	65IV	

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	

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) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp w/bolts and washers		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp 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) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp	
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"	4

Each anchor bolt assembly consists of the following: Top and bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers and 4 nut anchor devices (type 2) per Standard Drawing "TS-FD". Templates may be removed for shipment.

Abbreviations
Lf= Fixed Arm Length
Lc= Clamp-on Arm Length (44' Max.)

Texas Department of Transportation
Traffic Operations Division

LONG MAST ARM ASSEMBLY PARTS LIST

LMA(5)-12

Sheet 5 of 5

DN: JK	CK: GRB	DW: FDN	CK: CAL

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0905	06	095,ETC.	CS
DIST	COUNTY		SHEET NO.
LBB	LUBBOCK		209

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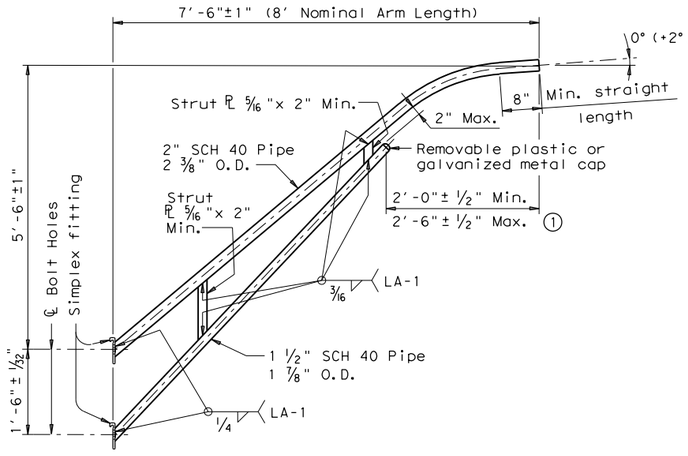
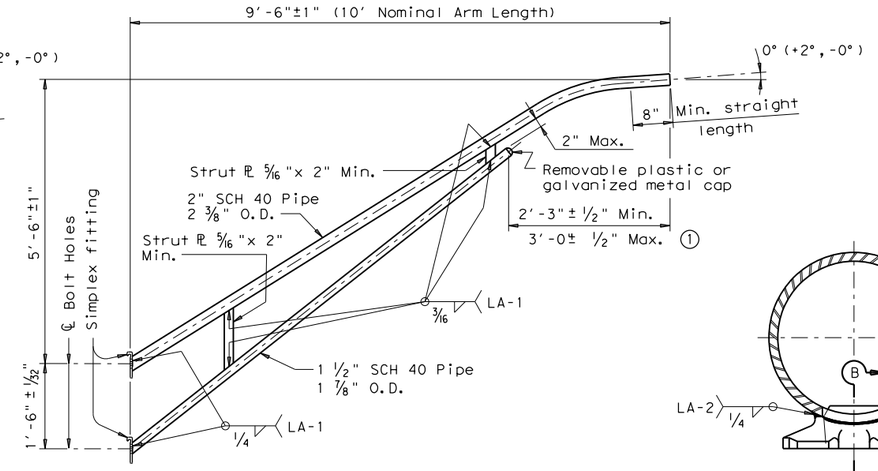
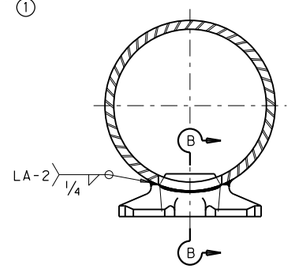


8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM



DIRECT ATTACHMENT DETAIL

MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr.65-35 or A148 Gr.80-50, A576 Gr.1021 (3), or A36 (Arm only)
Arm Pipes	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50 (4), or A1011 HSLAS-F Gr.50 (4)
Arm Strut Plates (2)	ASTM A36, A572 Gr.50 (4), or A588
Misc.	ASTM designations as noted

(1) Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

(2) Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

(3) A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

(4) ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft.

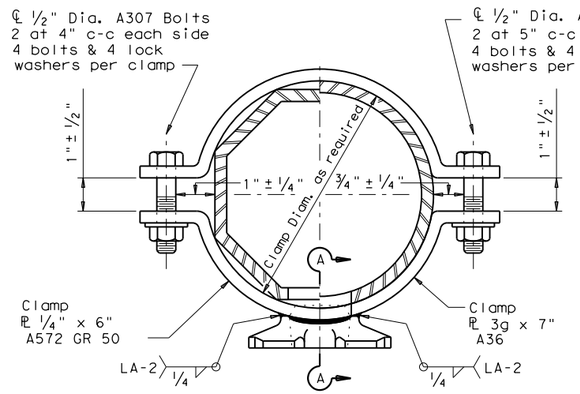
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absense of specified Fabricaton tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing".

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

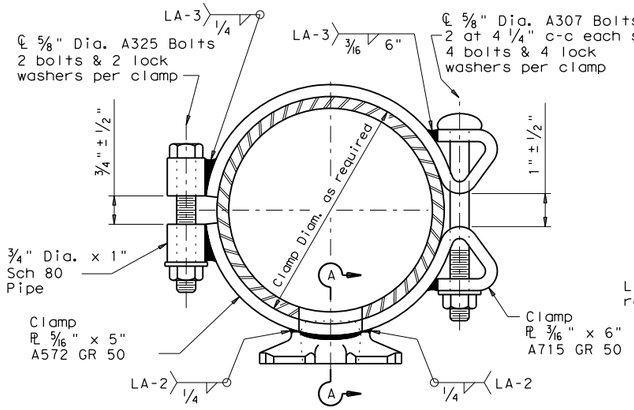
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



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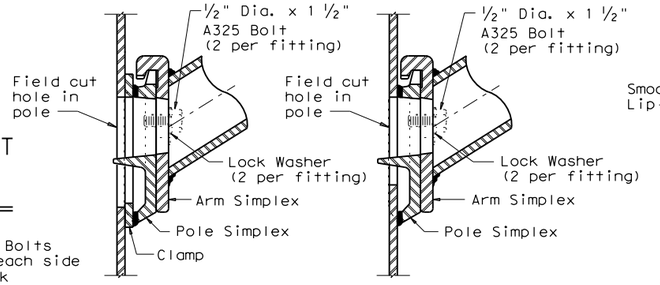
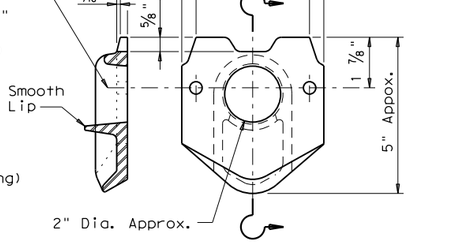
CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)

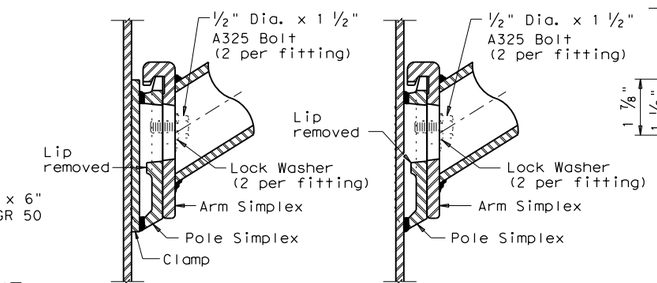


UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING



POLE SIMPLEX DETAIL

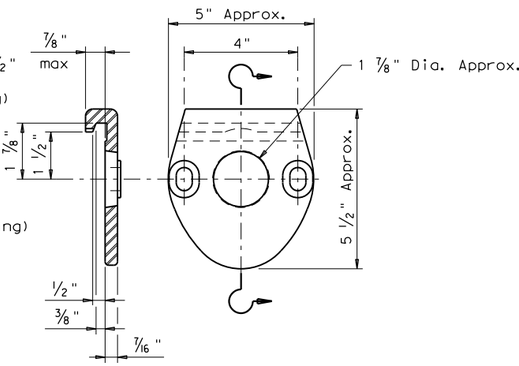


LOWER SIMPLEX FITTING

LOWER SIMPLEX FITTING

SECTON A-A

SECTON B-B



ARM SIMPLEX DETAIL

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

LUM-A-12

DN: LEH	CK: JSY	DW: LTT	CK: TEB

REVISIONS	CONT	SECT	JOB	HIGHWAY
5-96	0905	06	095,ETC.	CS
1-99	DIST	COUNTY		SHEET NO.
1-12	LBB	LUBBOCK		210

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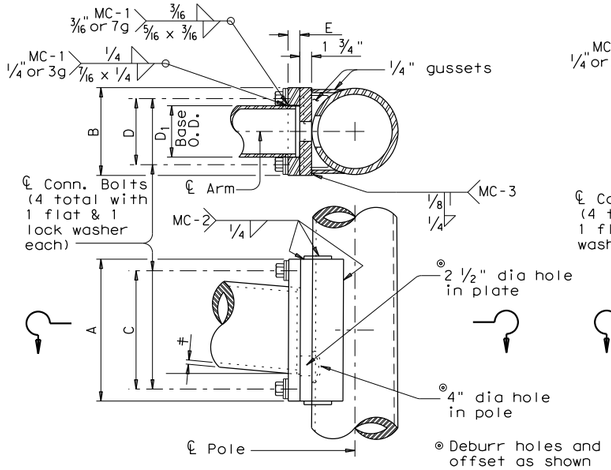
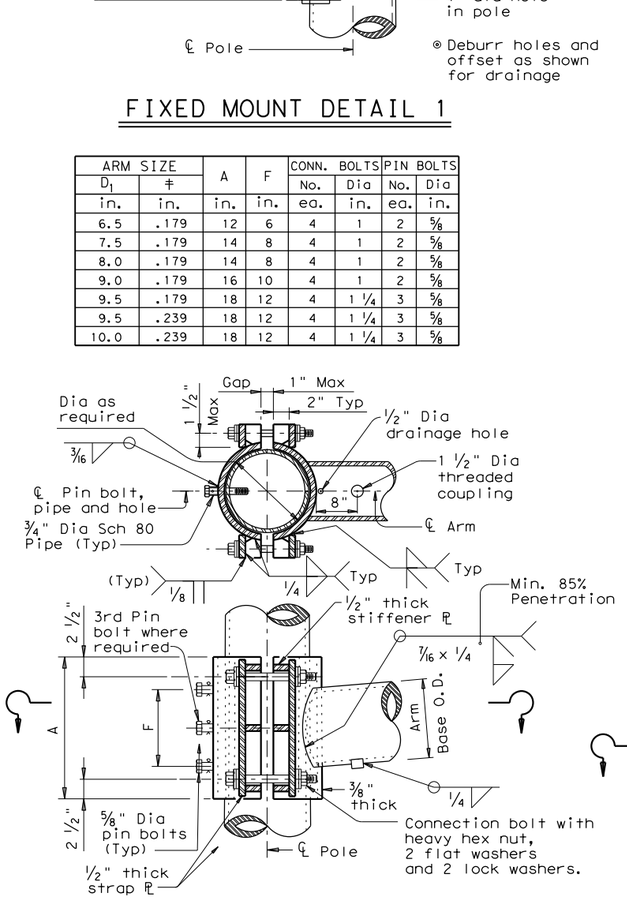
ARM SIZE D_1 in.	ARM SIZE ǂ in.	A in.	B in.	C in.	D in.	E in.	CONN BOLT DIA in.
6.5	.179	12	9	9	6	1 ¾	1
7.5	.179	13	9	10	6	1 ¾	1
8.0	.179	14	10	11	7	2	1 ¼
9.0	.179	16	11	13	8	2	1 ¼
9.5	.179	17	12	14	9	2	1 ¼
9.5	.239	18	12	15	9	2	1 ¼
10.0	.239	18	12	15	9	2	1 ¼
10.5	.239	18	13	15	10	3	1 ½
11.0	.239	18	13	15	10	3	1 ½



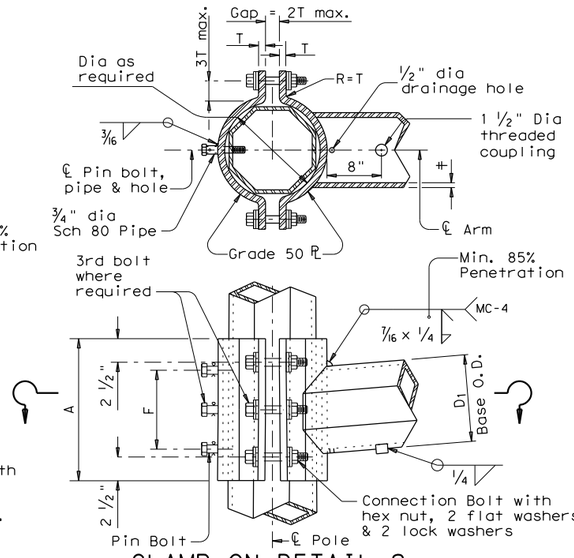
FIXED MOUNT DETAIL 1

ARM SIZE D_1 in.	ARM SIZE ǂ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	4	1 ¼	3	5/8
9.5	.239	18	12	4	1 ¼	3	5/8
10.0	.239	18	12	4	1 ¼	3	5/8



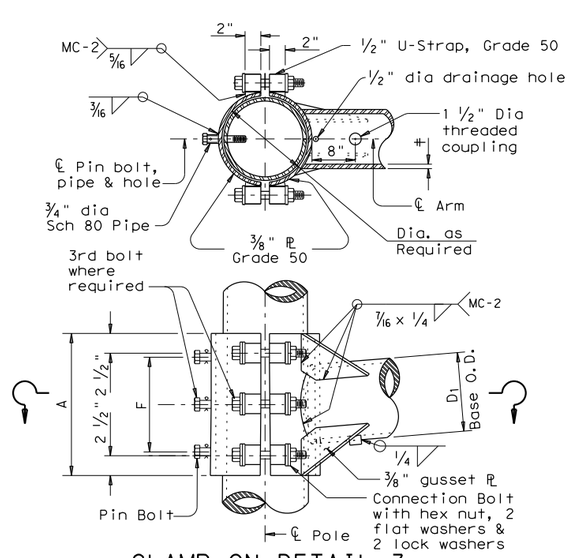
CLAMP-ON DETAIL 1

ARM SIZE D_1 in.	ARM SIZE ǂ in.	A in.	F in.	T in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
7.0	.179	12	6	¾	4	¾	2	5/8
7.5	.179	14	8	¾	4	¾	2	5/8
8.0	.179	14	8	¾	4	¾	2	5/8
9.0	.179	16	10	⅞	4	1	2	5/8
10.0	.179	18	10	⅞	4	1	2	5/8
9.5	.239	18	10	1	6	1	3	5/8
10.0	.239	18	10	1	6	1	3	5/8

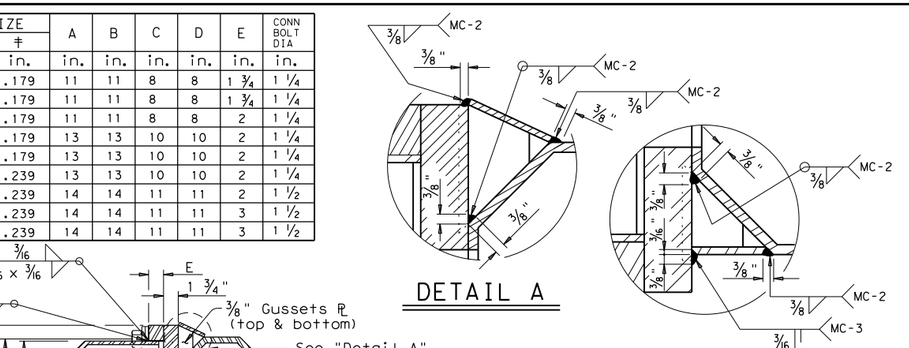


CLAMP-ON DETAIL 2

ARM SIZE D_1 in.	ARM SIZE ǂ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	6	1	3	5/8
9.5	.239	18	12	6	1	3	5/8
10.0	.239	18	12	6	1	3	5/8

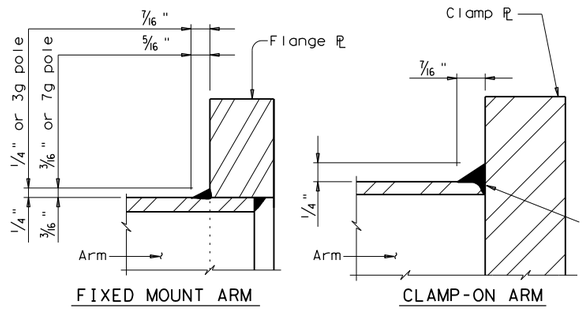


CLAMP-ON DETAIL 3



DETAIL A

DETAIL B



FIXED MOUNT ARM

CLAMP-ON ARM

ARM BASE WELD DETAILS

ARM SIZE D_1 in.	ARM SIZE ǂ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	6	1	3	5/8
9.5	.239	18	12	6	1	3	5/8
10.0	.239	18	12	6	1	3	5/8

MATERIALS

Round Shafts or Polygonal Shafts ①	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 ②
Plates ①	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 or A449, except where noted
Pin Bolts	ASTM A325
Pipe ①	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

① ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

② ASTM A1011 SS Gr.50 material shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 ½" wide vertical slotted hole shall be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and ¾" dia pipe shall have 5/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a ¾" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST ARM CONNECTIONS

MA-C-12

DN: MS	CK: JSY	DW: MMF	CK: JSY

REVISIONS
5-96
5-09
1-12

CONT	SECT	JOB	HIGHWAY
0905	06	095, ETC.	CS
DIST	COUNTY		SHEET NO.
LBB	LUBBOCK		211

126A

DATE: 8/9/2023 9:43:57 AM
FILE: c:\pw\khl\dms32711\mac.dgn

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

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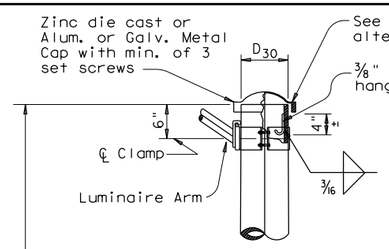
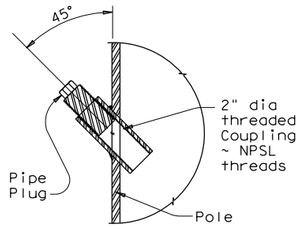
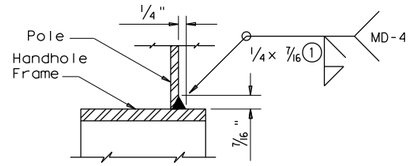


DETAIL A

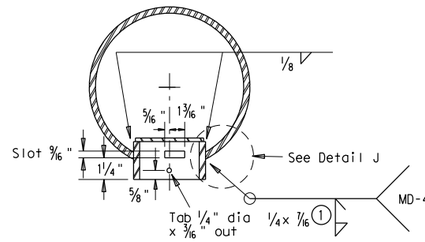
(for pole with luminaire)



POLE COUPLING DETAIL

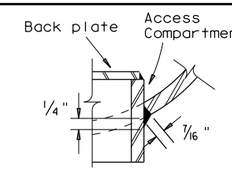


DETAIL G

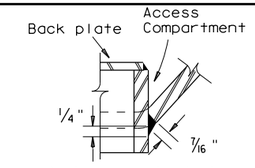


SECTION X-X

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.

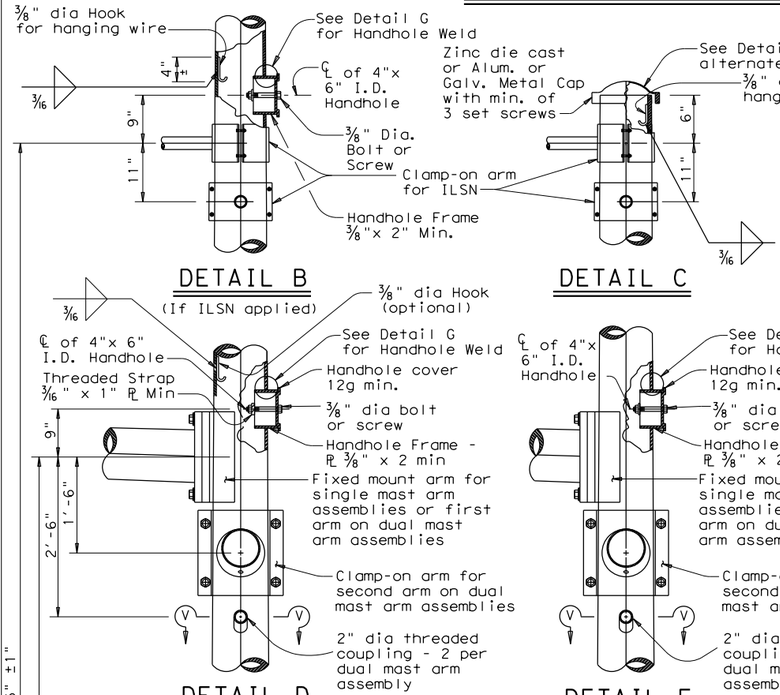


Round Pole



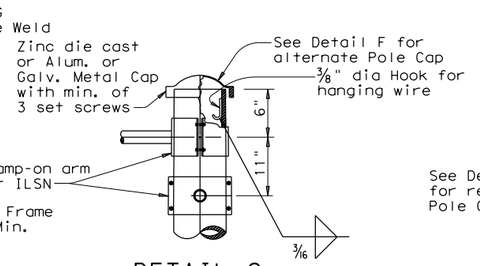
Polygonal Pole

DETAIL J

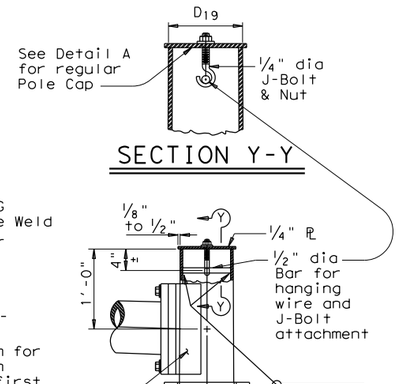


DETAIL B

(If ILSN applied)



DETAIL C

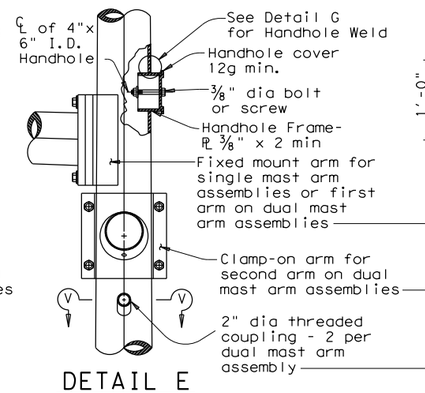


SECTION Y-Y

COPPER GROUND CONNECTOR

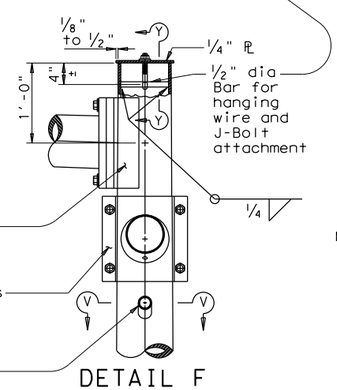
DETAIL D

(for 30' pole with luminaire and ILSN sign)



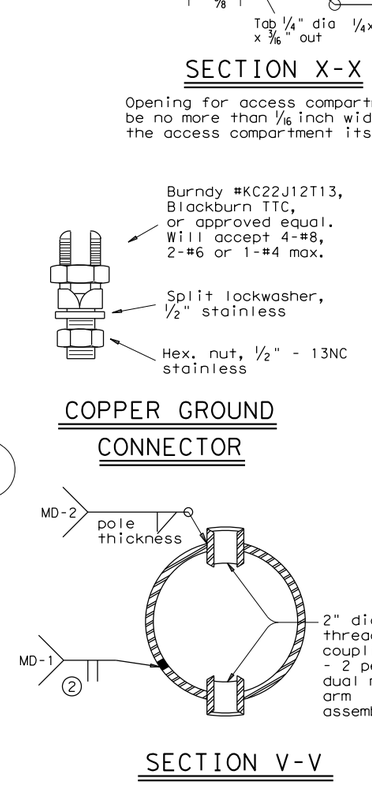
DETAIL E

(for 24' pole with ILSN sign and no luminaire)

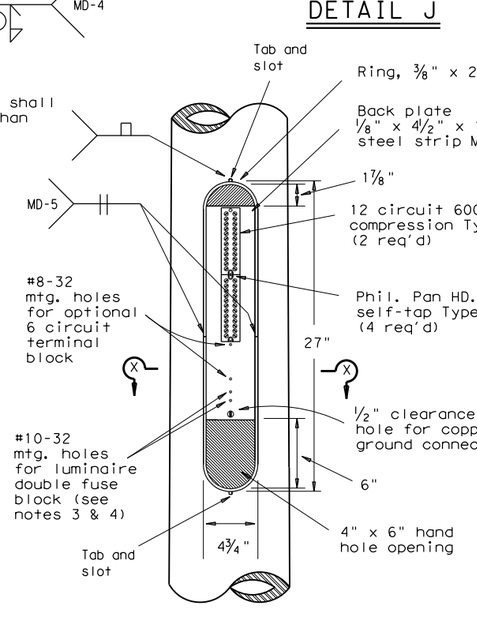


DETAIL F

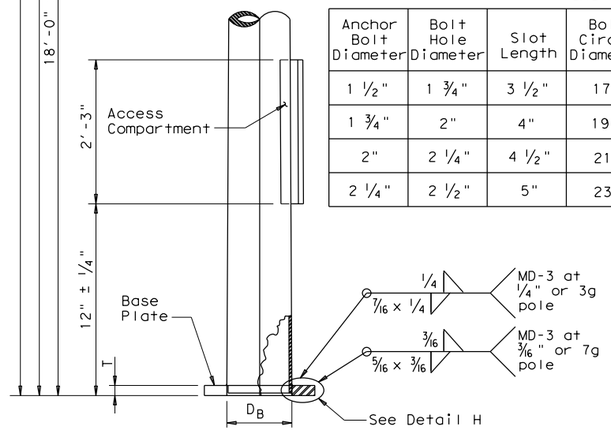
(for 19' pole with no ILSN sign and no luminaire)



SECTION V-V

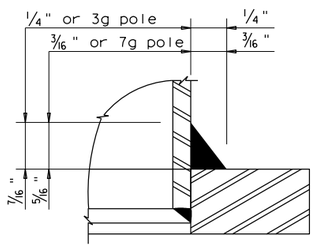


ACCESS COMPARTMENT

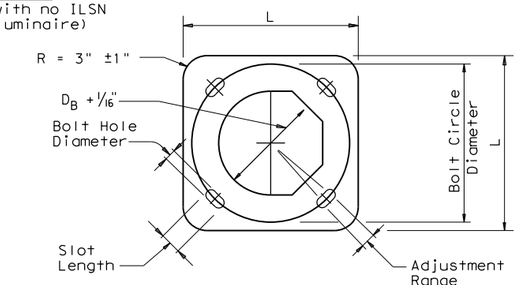


POLE ELEVATION

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.

NOTES:

1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

MA-D-12

DN: MS	CK: JSY	DW: FDN	CK: CAL

REVISIONS
8-99
1-12

CONT	SECT	JOB	HIGHWAY
0905	06	095,ETC.	CS

DIST	COUNTY	SHEET NO.
LBB	LUBBOCK	212

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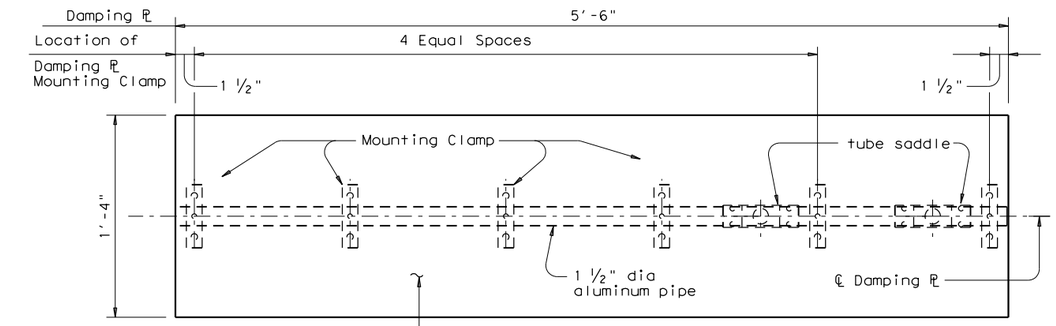
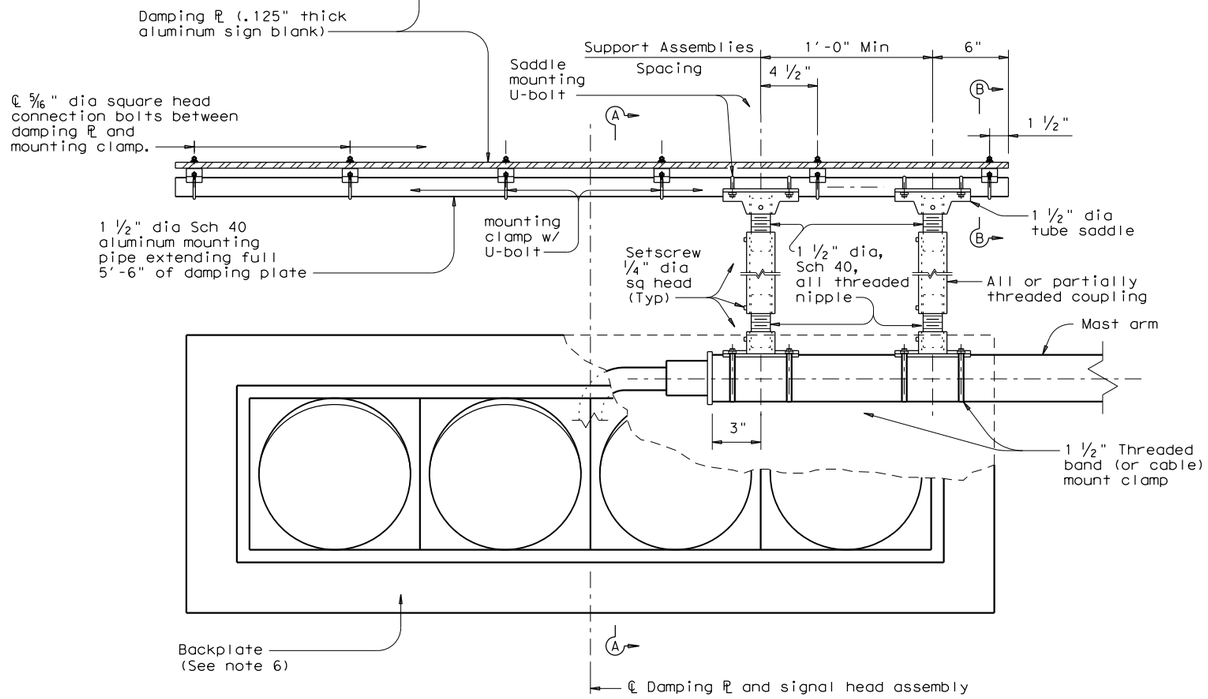


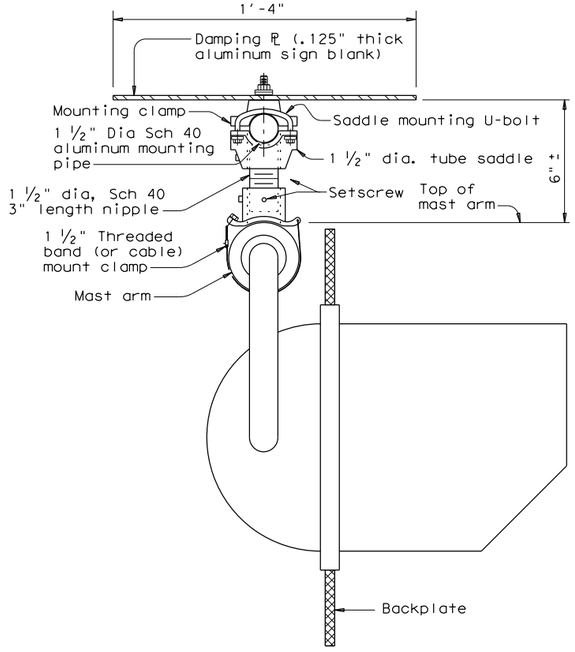
PLAN



ELEVATION

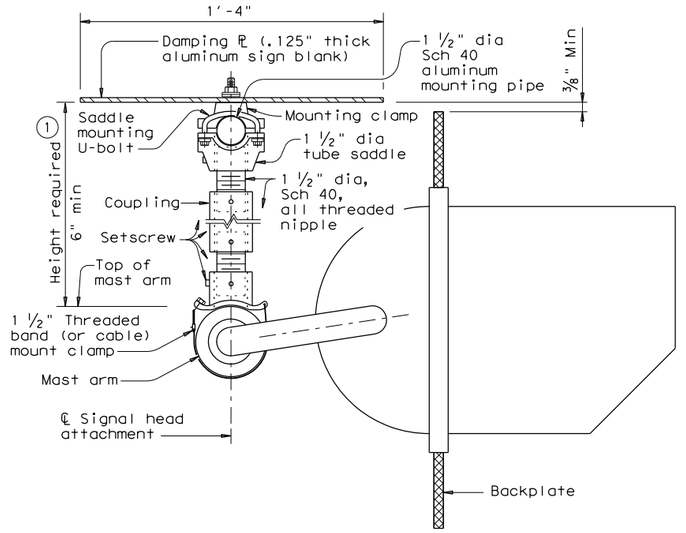
DAMPING PLATE MOUNTING DETAILS

(Showing alternate placement of signal head)



SECTION A-A

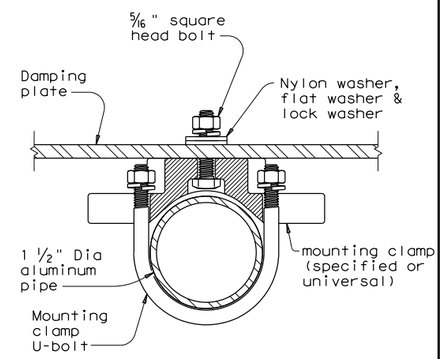
(Showing standard placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)



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 for horizontal section heads			
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"



SECTION B-B

(Showing damping plate attachment)

GENERAL NOTES:

1. 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.

2. Aluminum sign blank for damping plate will conform to Departmental Material Specifications DMS-7110. Materials for mast arm mounting clamp and tube saddle will be aluminum castings or aluminum alloys as in accordance with manufacturers' stipulations. Mounting pipe, pipe nipple and coupling will be aluminum alloy 6061-T6 or 6063-T6. Damping plate mounting clamp and u-bolt assemblies will conform to Standard sheet SMD(GEN). U-bolts for saddle mounting will have a minimum yield strength of 36 ksi.

3. Damping plate will be mounted horizontally. Position centerline of damping plate to align with centerline of mast arm or horizontal signal head assembly. Vertical clearance between signal head (with or without backing plate) and bottom of damping plate will 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.

4. Unless stipulated by the manufacturers, all steel parts will be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".

5. Contractor will verify applicable field dimensions before the installation.

6. Backplates are optional for traffic signals. When backplates are used, Backplates will have a 2-inch fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 "Sign Face Materials." See Sheet TS-BP-20 for backplate details.

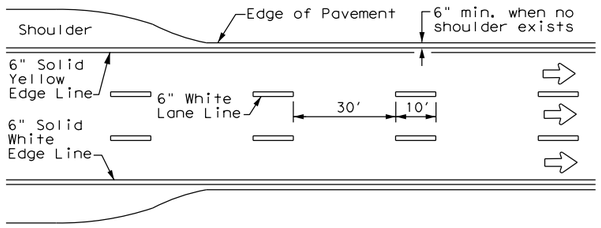
Texas Department of Transportation

Traffic Safety Division Standard

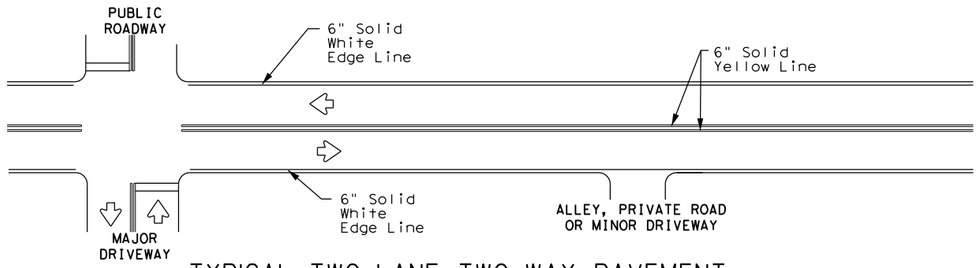
MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

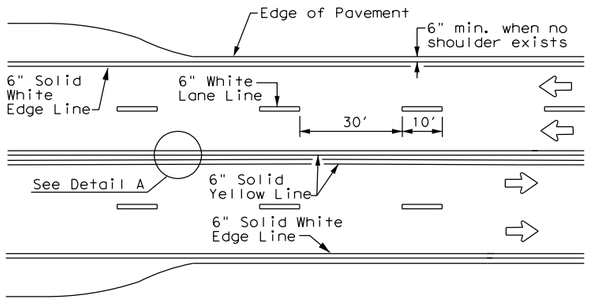
FILE: ma-dpd-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095, ETC.	CS
6-20	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		213

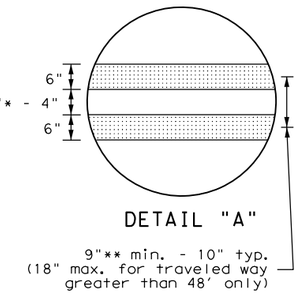


EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS

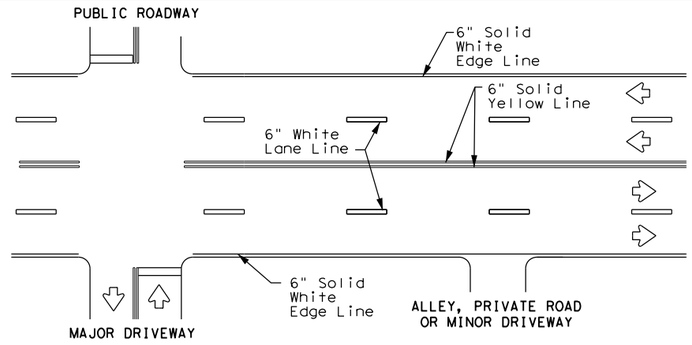




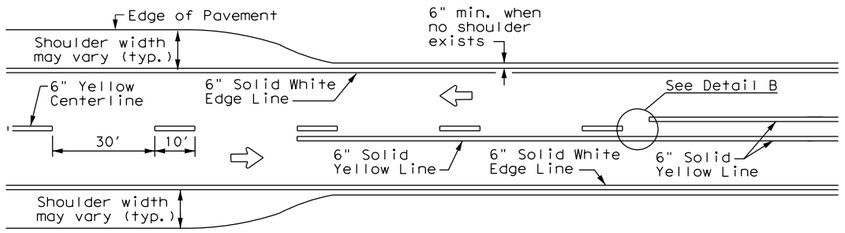
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

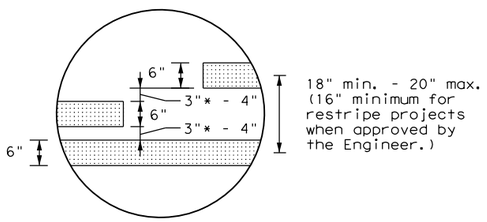
** 8" minimum for restripe projects when approved by the Engineer.



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS

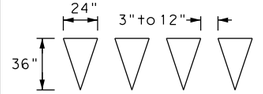


TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



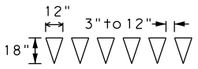
DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.

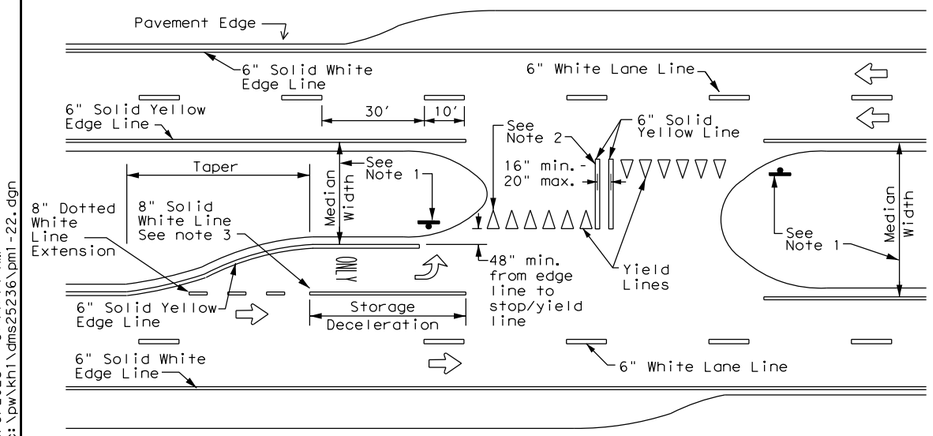


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



For posted speed on road being marked equal to or less than 40 MPH.



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

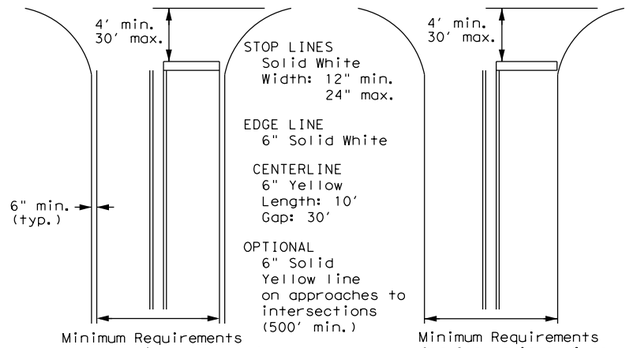
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections.
   Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line 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.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE
Based on Traveled Way and Pavement Widths
for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

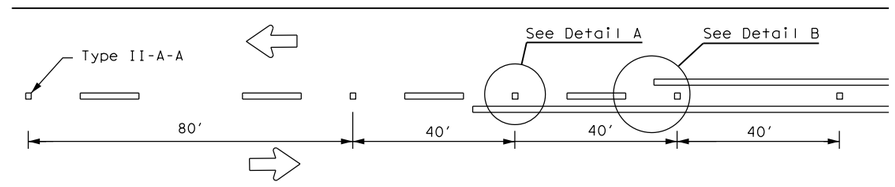
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20	0905	06	095,ETC.	CS
8-95 3-03 12-22	DIST	COUNTY		SHEET NO.
5-00 2-12	LBB	LUBBOCK		214

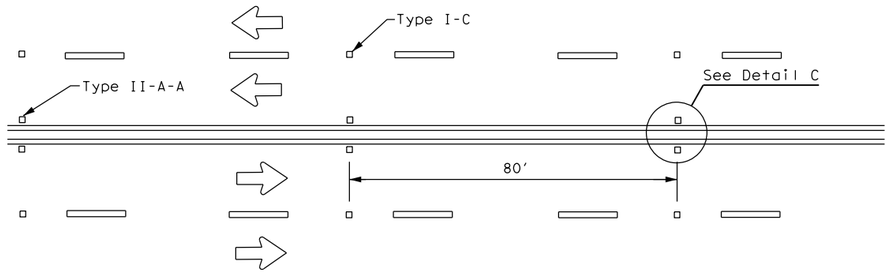
22A

DATE: 8/9/2023 9:44:14 AM
FILE: c:\pw\khi\dms25236\pm1-22.dgn

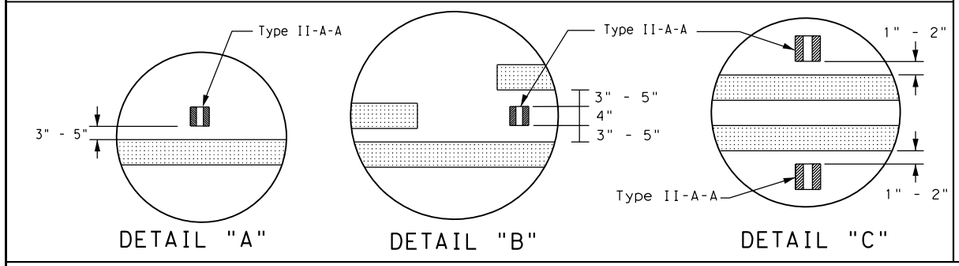
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

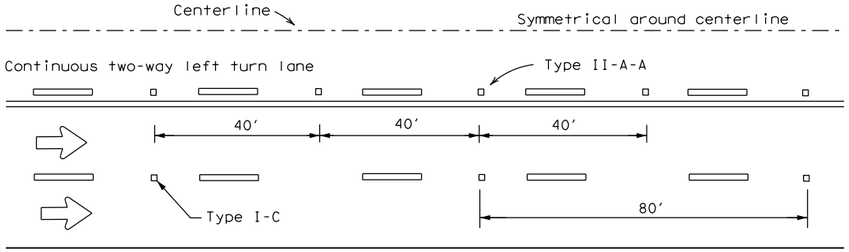


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

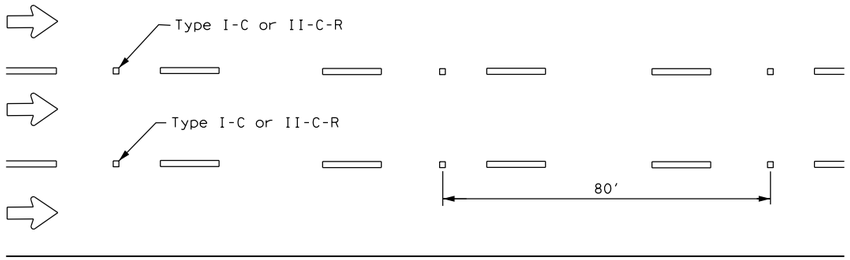


CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY ROADWAYS





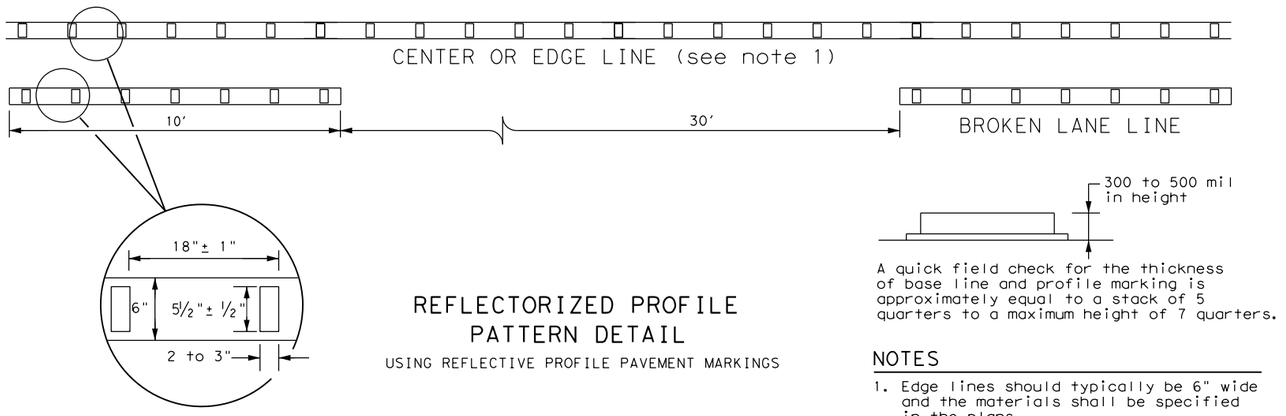
CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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.

See Note 3.



6" EDGE LINE, 6" CENTERLINE
OR 6" LANE LINE

REFLECTORIZED PROFILE
PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

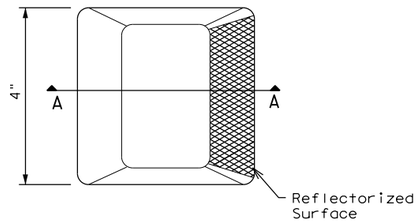
1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

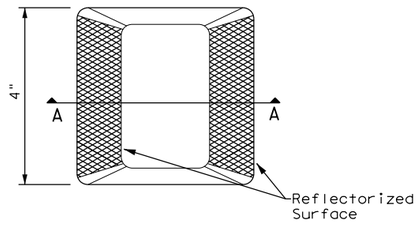
1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

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

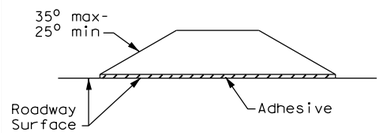
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

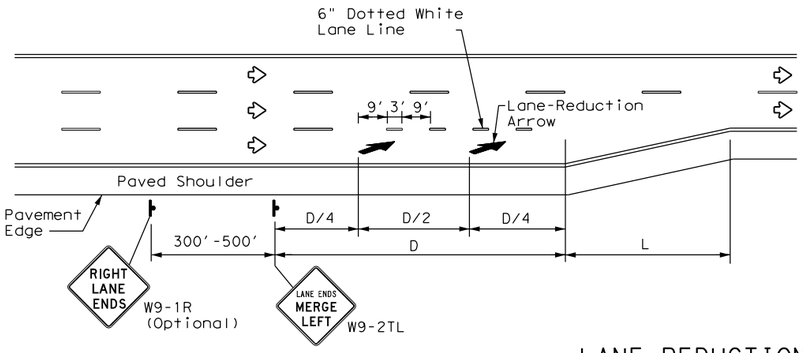
Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
4-77 8-00 6-20	DIST	COUNTY		SHEET NO.
4-92 2-10 12-22	LBB	LUBBOCK		215
5-00 2-12				

22B

DATE: 8/9/2023 9:44:20 AM
FILE: c:\pw\kh1\dms25236\pm2-22.dgn

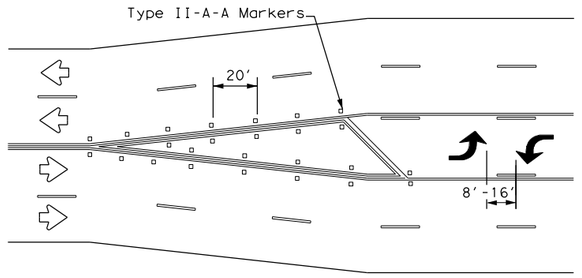


LANE REDUCTION

NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	



A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

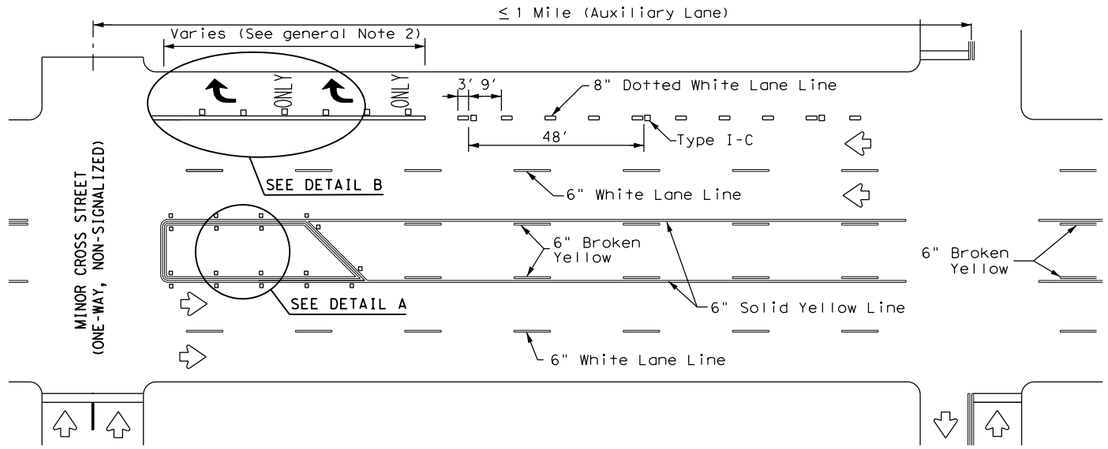
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

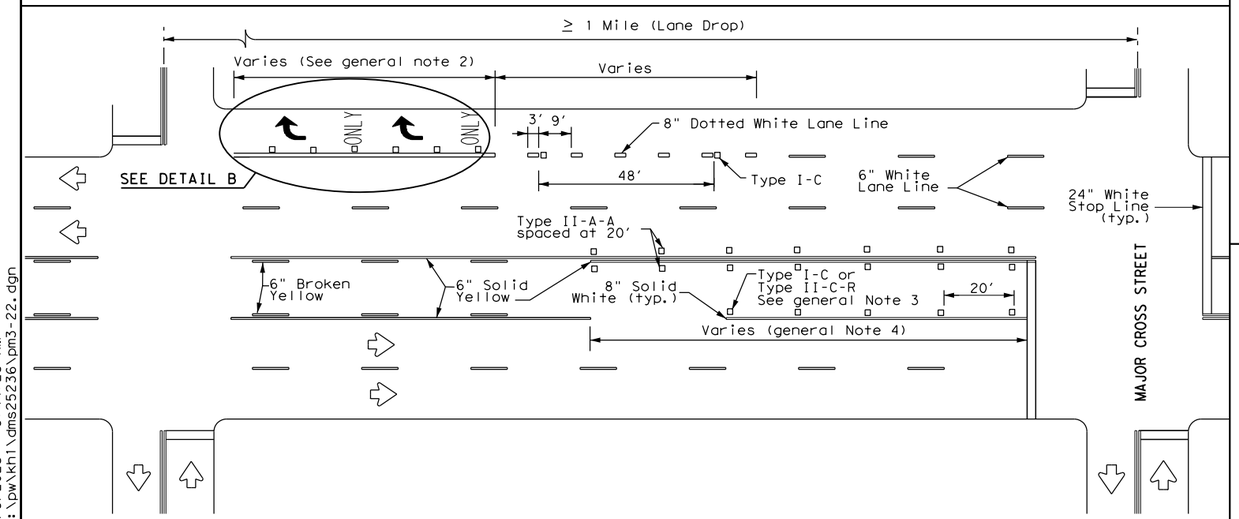
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

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

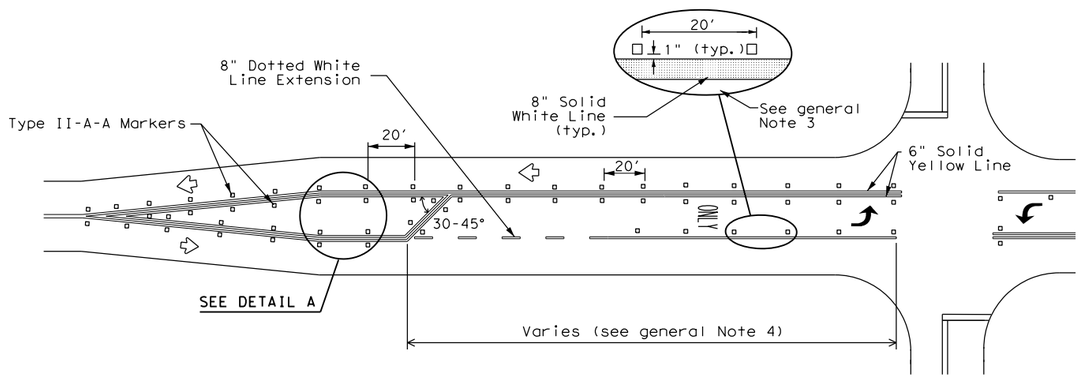
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



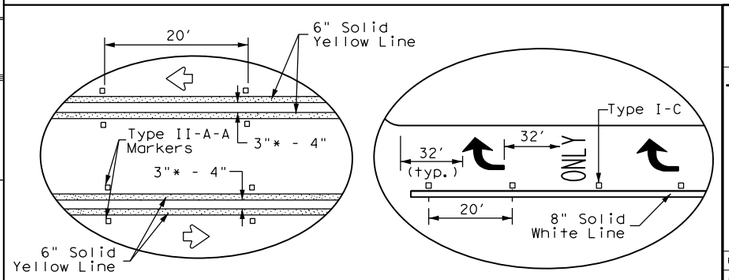
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



* 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		216

22C

DATE: 8/9/2023 9:44:25 AM
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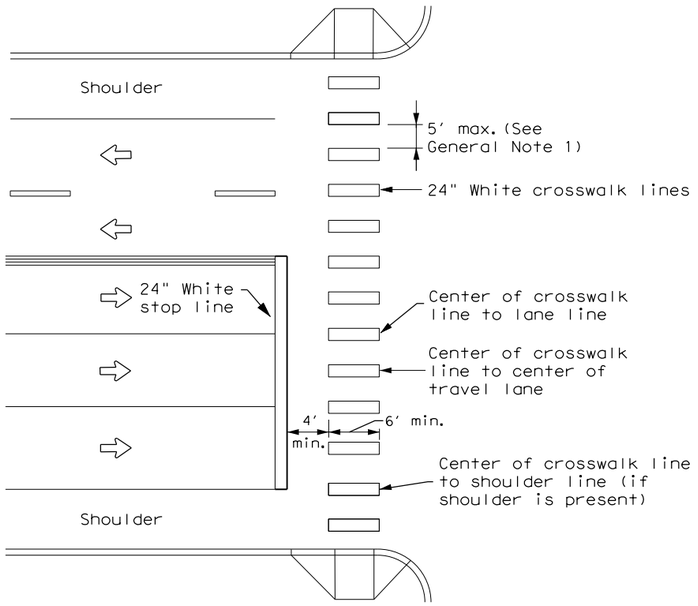


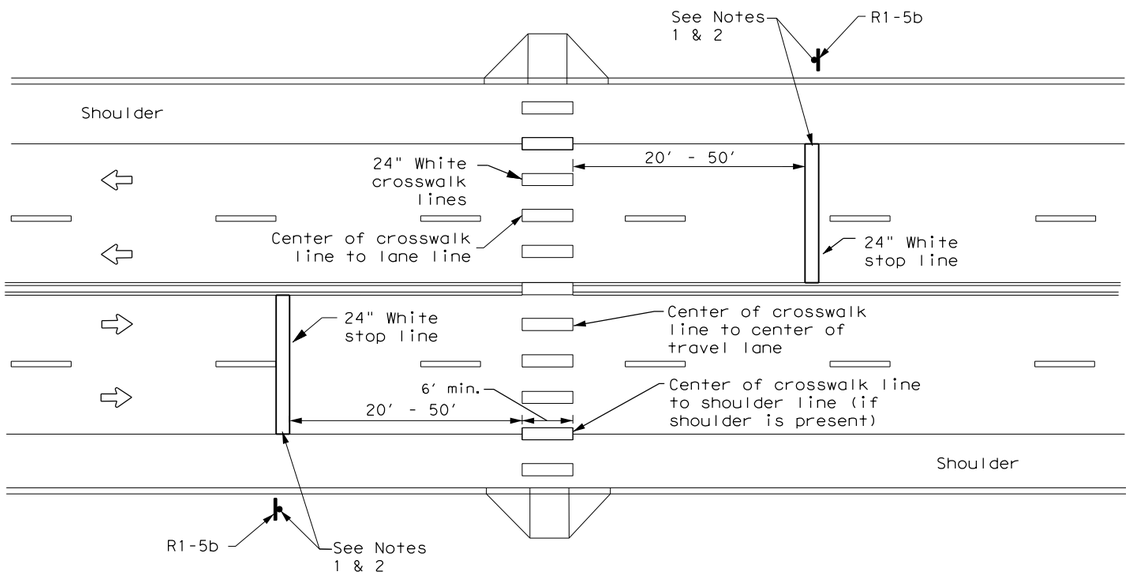
HIGH-VISIBILITY LONGITUDINAL CROSSWALK
AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

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.



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY
LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
6-20	DIST	COUNTY		SHEET NO.
6-22	LBB	LUBBOCK		217
12-22				
22D				

DATE: 10/5/2023 4:34:17 PM
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DATE: 8/9/2023 9:44:37 AM
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SHIPPING PARTS LIST - POLES AND LUMINAIRE ARMS

Nominal Mounting Ht. (ft)	Shoe Base Designation Pole	A1	A2	Luminaire	Quantity	T-Base Designation Pole	A1	A2	Luminaire	Quantity	CSB/SSCB Mounted Designation Pole	A1	A2	Luminaire	Quantity
20	(Type SA 20 S - 4)			(150W EQ) LED		(Type SA 20 T - 4)			(150W EQ) LED						
	(Type SA 20 S - 4 - 4)			(150W EQ) LED		(Type SA 20 T - 4 - 4)			(150W EQ) LED						
30	(Type SA 30 S - 4)			(250W EQ) LED		(Type SA 30 T - 4)			(250W EQ) LED		(Type SP 28 S - 4)			(250W EQ) LED	
	(Type SA 30 S - 4 - 4)			(250W EQ) LED		(Type SA 30 T - 4 - 4)			(250W EQ) LED		(Type SP 28 S - 4 - 4)			(250W EQ) LED	
	(Type SA 30 S - 8)			(250W EQ) LED		(Type SA 30 T - 8)			(250W EQ) LED	3	(Type SP 28 S - 8)			(250W EQ) LED	
	(Type SA 30 S - 8 - 8)			(250W EQ) LED		(Type SA 30 T - 8 - 8)			(250W EQ) LED		(Type SP 28 S - 8 - 8)			(250W EQ) LED	
40	(Type SA 40 S - 4)			(250W EQ) LED		(Type SA 40 T - 4)			(250W EQ) LED		(Type SP 38 S - 4)			(250W EQ) LED	
	(Type SA 40 S - 4 - 4)			(250W EQ) LED		(Type SA 40 T - 4 - 4)			(250W EQ) LED		(Type SP 38 S - 4 - 4)			(250W EQ) LED	
	(Type SA 40 S - 8)			(250W EQ) LED		(Type SA 40 T - 8)			(250W EQ) LED		(Type SP 38 S - 8)			(250W EQ) LED	
	(Type SA 40 S - 8 - 8)			(250W EQ) LED		(Type SA 40 T - 8 - 8)			(250W EQ) LED		(Type SP 38 S - 8 - 8)			(250W EQ) LED	
	(Type SA 40 S - 10)			(250W EQ) LED		(Type SA 40 T - 10)			(250W EQ) LED		(Type SP 38 S - 10)			(250W EQ) LED	
	(Type SA 40 S - 10 - 10)			(250W EQ) LED		(Type SA 40 T - 10 - 10)			(250W EQ) LED		(Type SP 38 S - 10 - 10)			(250W EQ) LED	
	(Type SA 40 S - 12)			(250W EQ) LED		(Type SA 40 T - 12)			(250W EQ) LED		(Type SP 38 S - 12)			(250W EQ) LED	
	(Type SA 40 S - 12 - 12)			(250W EQ) LED		(Type SA 40 T - 12 - 12)			(250W EQ) LED		(Type SP 38 S - 12 - 12)			(250W EQ) LED	
50	(Type SA 50 S - 4)			(400W EQ) LED		(Type SA 50 T - 4)			(400W EQ) LED		(Type SP 48 S - 4)			(400W EQ) LED	
	(Type SA 50 S - 4 - 4)			(400W EQ) LED		(Type SA 50 T - 4 - 4)			(400W EQ) LED		(Type SP 48 S - 4 - 4)			(400W EQ) LED	
	(Type SA 50 S - 8)			(400W EQ) LED		(Type SA 50 T - 8)			(400W EQ) LED		(Type SP 48 S - 8)			(400W EQ) LED	
	(Type SA 50 S - 8 - 8)			(400W EQ) LED		(Type SA 50 T - 8 - 8)			(400W EQ) LED		(Type SP 48 S - 8 - 8)			(400W EQ) LED	
	(Type SA 50 S - 10)			(400W EQ) LED		(Type SA 50 T - 10)			(400W EQ) LED		(Type SP 48 S - 10)			(400W EQ) LED	
	(Type SA 50 S - 10 - 10)			(400W EQ) LED		(Type SA 50 T - 10 - 10)			(400W EQ) LED		(Type SP 48 S - 10 - 10)			(400W EQ) LED	
	(Type SA 50 S - 12)			(400W EQ) LED	21	(Type SA 50 T - 12)			(400W EQ) LED		(Type SP 48 S - 12)			(400W EQ) LED	
	(Type SA 50 S - 12 - 12)			(400W EQ) LED		(Type SA 50 T - 12 - 12)			(400W EQ) LED		(Type SP 48 S - 12 - 12)			(400W EQ) LED	

OTHER Designation Pole	A1	A2	Luminaire	Quantity

GENERAL NOTES:

1. All work, materials and services not shown on the plans which may be necessary for complete and proper construction shall be performed, furnished and installed by the Contractor. Faulty fabrication or poor workmanship in any material, equipment or installation will be considered justification for rejection. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the Department such warranties or guarantees.

2. The location of poles and fixtures are diagrammatic only and may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. Standard Steel Pole Designs. Steel poles fabricated in accordance with the details and dimensions shown herein, shall be considered standard designs. Submission of shop drawings and design calculations for standard designs is not required.

4. Optional Steel Pole Designs. Multi-sided steel poles may be allowed as optional designs, if steel poles are permitted or required, pending approval by the Department as outlined below.

   a. Shop Drawings. Optional designs require submission of shop drawings and design calculations bearing the seal of an engineer licensed in the State of Texas, in accordance with Item 441, "Steel Structures." The Department may elect to pre-approve some shop drawings for optionally designed poles. Submission of shop drawings and design calculations is not required for structures fabricated in accordance with the details of shop drawings on the pre-approved list maintained by the TxDOT Traffic Operations Division. Any deviation from the pre-approved shop drawings will require submission of shop drawings of the complete assembly and design calculations as described above.
   b. Structural Support Design for Luminaires. Lighting support structures shall be designed for a 25 year design life in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto. All poles shall be designed for 110 mph 3-second gust wind speeds. The Gust Factor, G, and Wind Importance Factor, Ir, shall be applied as per the AASHTO Specifications assuming a 25-year design life. The design wind pressure for hurricane wind velocities greater than 100 mph shall not be less than the design wind pressure using 100 mph with the non-hurricane Wind Importance Factor, Ir, value. For transformer base poles, fabricator shall include transformer base and connecting hardware in design calculations and shop drawing submittals. All transformer bases shall have been structurally tested to resist the theoretical plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with the shop drawings. Shop drawings shall show breakaway base model number, and manufacturer's name and logo. Manufacturer's shop drawings shall include the ASTM designations for all materials to be used.
   c. Mast Arm Attachments. All poles and attachments shall be structurally designed to support two 12-foot mast arms and luminaires. Poles shall be supplied with mast arm combinations as shown in the plans. All mast arms shall be designed for a 60-pound luminaire having an effective projected area of 1.6 square feet.
   d. Anchor Bolt Assembly. Anchor bolt assemblies for optionally designed poles shall be the same as those shown herein.

5. Aluminum Pole Designs. Aluminum pole designs may be allowed, if aluminum poles are permitted or required, pending approval by the Department as outlined below.

   a. Meet all of the requirements stated above for optional steel pole designs and the following:
      1. Aluminum poles shall be fabricated in accordance with "Structural Welding Code-Aluminum" AWS D1.2.
      2. Aluminum pole designs shall use the same anchor bolt assembly and be subject to the same geometric restraints and other requirements for steel poles specified herein.
      3. Aluminum poles shall be equipped with vibration mitigation devices, as approved by the engineer.
      4. Pole components shall be constructed using the following material:
         Shaft: ASTM B221 or B241 Alloy 6063-T6, ASTM B209 Alloy 5086-H34, ASTM B221 Alloy 6005-T5.
         Base Flange: ASTM B26 Alloy 356.0-T6 or ASTM B108 Alloy 356.0-T6 (Yield strength test required).
         Mast Arm Fitting: ASTM B209 Alloy 6061-T6 or ASTM B221 Alloy 6005-T5.
         Mast Arms: ASTM B241 Alloy 6061-T6 or Alloy 6063-T6.
         Pole Cap: ASTM B209 Alloy 5086-H32 or ASTM B108 or B26 Alloy 356.0-T6.
         Bolts: Stainless Steel AISI 300 series. Bolts threading into aluminum threads shall be treated with anti-seize compound, Never-Seez Compound, Permatex 133K or equal.

6. Special Designs. Poles with architectural treatments shall meet the requirements shown elsewhere in the plans.

7. Luminaire Mounting Height. Actual luminaire mounting height shall be the nominal mounting height given on RIP(2) for all pole-arm combinations except for poles with 4 ft. luminaire arms, which shall be 3'-0" lower than the nominal height, unless otherwise shown or directed.

EXPLANATION OF ROADWAY ILLUMINATION ASSEMBLY DESIGNATIONS

(TYPE SA 50 T - X - X) (400W EQ) LED

- SA: Pole and mast arm may be steel or aluminum.
- ST: Pole and mast arm must be steel.
- AL: Pole and mast arm must be aluminum.
- SP: Special (ovalized) steel or aluminum pole for installing on CSB or SSCB. See standard sheet CSB (4), or SSCB (4).

Two numerical digits denote nominal mounting height in feet.

Next letter denotes type of base, (S-Shoe Base, T-Transformer Base, or B-Bridge/Ret.Wall Mount)

First number denotes length of mast arm in feet.

Use of second mast arm is indicated by second dashed number which denotes length in feet.

Luminaire rating in watts (i.e. 400W). Equivalent wattage LED fixtures will include EQ (i.e. 400W EQ)

Last letters indicate light source (S - High Pressure Sodium; LED - LED luminaire)

SHEET 1 OF 4

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(1)-19

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7-17	DIST	COUNTY		SHEET NO.
12-19	LBB	LUBBOCK		218

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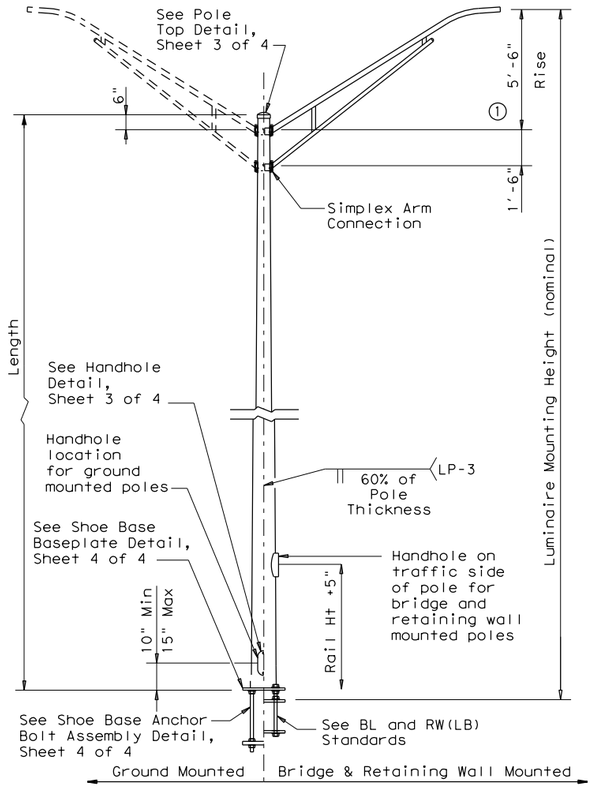
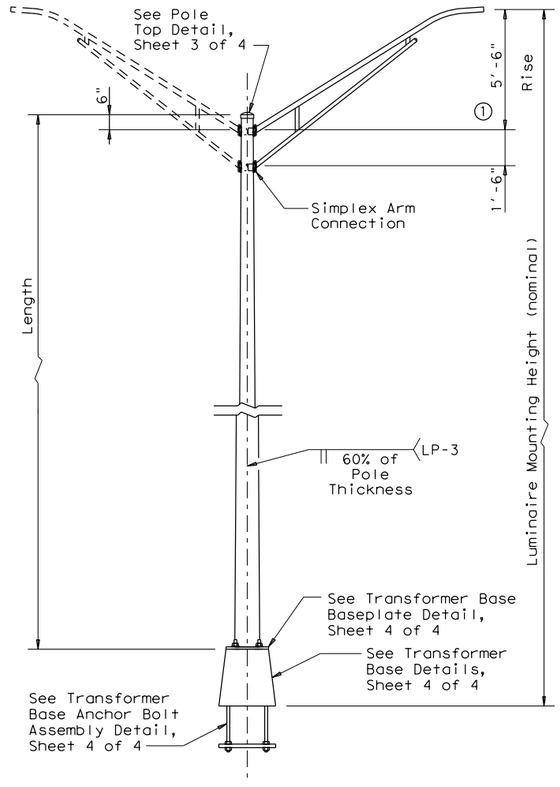


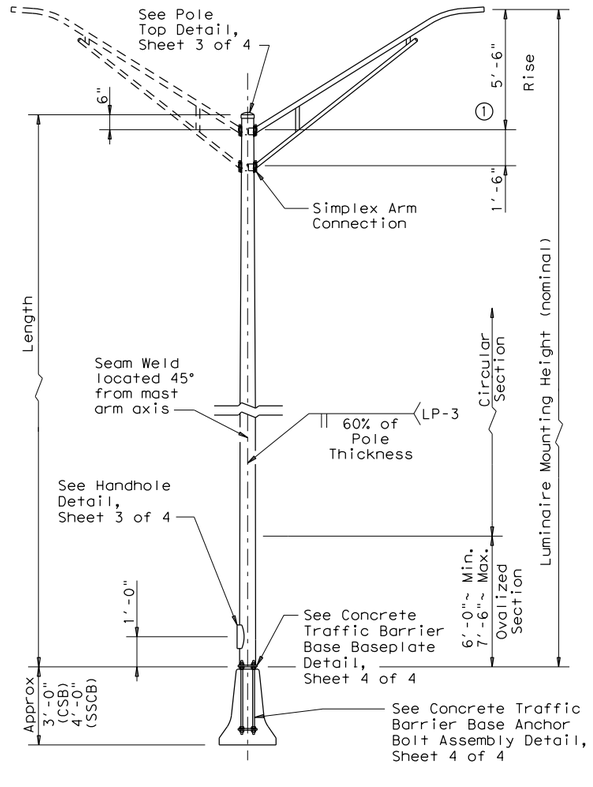
SHOE BASE POLE

SHOE BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	4.90	15.00	0.1196	7.1
30.00	7.50	4.00	25.00	0.1196	13.2
31.00-39.00	8.00	4.36-3.24	26.00-34.00	0.1196	20.7
40.00	8.50	3.60	35.00	0.1196	20.7
50.00	10.50	4.20	45.00	0.1196	30.3



TRANSFORMER BASE POLE

TRANSFORMER BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	5.11	13.50	0.1196	7.1
30.00	7.50	4.21	23.50	0.1196	13.2
31.00-39.00	8.00	4.57-3.45	24.50-32.50	0.1196	20.7
40.00	8.50	3.81	33.50	0.1196	20.7
50.00	10.00	3.91	43.50	0.1196	30.3



CONCRETE TRAFFIC BARRIER BASE POLE

CONCRETE TRAFFIC BARRIER BASE POLE (CSB/SSCB)						
Luminaire Mounting Height (Nominal) (ft)	Base ② Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)	
					About ℄ of Rail	Perp. to Rail
28.00	9.00	5.78	23.00	0.1196	10.3	13.2
38.00	9.00	4.38	33.00	0.1196	16.6	20.8
48.00	10.50	4.48	43.00	0.1345	25.1	30.5

MATERIAL DATA		
COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)
Pole Shaft (0.14"/ft. Taper)	A572 Gr 50, A595 Gr A, A1011 HSLAS Gr 50 Cl 2 ③, or A1008 HSLAS Gr 50 Cl 2	50
Base Plate and Handhole Frame	A572 Gr.50, or A36	36
T-Base Connecting Bolts	F3125 Gr A325	92
Anchor Bolts	F1554 Gr 55, A193-B7 or A321	55 105
Anchor Bolt Templates	A36	36
Heavy Hex (H.H.) Nuts	A194 Gr 2H, or A563 Gr DH	
Flat Washers	F436	

NOTES:

① 2'-6" rise for 4 ft. luminaire arms.

② Before ovalized as shown on Concrete Traffic Barrier Base Baseplate details, Sheet 4 of 4.

③ A1011 SS Gr 50 may be used instead of HSLAS, provided the material meets the elongation requirements for HSLAS.

POLE ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Shaft length	+1"
I.D. of outside piece of slip fitting pieces	+1/8", -1/16"
O.D. of inside piece of slip fitting pieces	+1/32", -1/8"
Shaft diameter: other	+3/16"
Out of "round"	1/4"
Straightness of shaft	±1/4" in 10 ft
Twist in multi-sided shaft	4° in 50 ft
Perpendicular to baseplate	1/8" in 24"
Pole centered on baseplate	±1/4"
Location of Attachments	±1/4"
Bolt hole spacing	±1/16"

GENERAL NOTES:

1. Designs conform to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals , 6th Edition (2013) and Interim Revisions thereto. Design 3-Second Gust Wind Speed equals 110 mph with a 1.14 gust factor. A wind importance factor of 0.80 is applied to adjust the wind speed to a 25 year recurrence interval. Design moments listed in tables assume base of pole is 25' above natural ground level.
2. Structures are designed to support two 12' luminaire mast arms and luminaires. Mast arms are designed to support a 60-pound luminaire having an effective projected area of 1.6 square feet.
3. Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Do not submit shop drawings for roadway illumination pole assemblies fabricated in accordance 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 these sheets and the Specifications. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
4. For mounting heights between values shown in the tables, use base diameter and thickness values for the larger height.
5. Unless otherwise noted, all steel parts shall be galvanized in accordance with Item 445, "Galvanizing."
6. Steel poles shall be fabricated in accordance with Item 441, "Steel Structures." Longitudinal seam welds for pole sections shall have 60% minimum penetration. All welding shall be in accordance with AWS D1.1, Structural Welding Code-Steel.
7. Two-section poles joined by circumferential welds will not be permitted, unless otherwise shown on the plans. Poles may be fabricated in two sections and field-assembled by the lap-joint method. The two sections shall telescope together with a lap length of not less than 1-1/2 times the shaft diameter at the lap joint.
8. Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
9. Lubricate and tighten anchor bolts, when erecting shoe base poles and concrete traffic barrier base poles, in accordance with Item 449, "Anchor Bolts."
10. All poles, except Transformer Base Poles, shall have hand holes with reinforcing frames and covers. For ground mounted shoe base poles, hand holes shall be placed 90 degrees to mast arm unless otherwise noted on the plans. For poles mounted on a concrete traffic barrier with one luminaire arm, hand holes shall be located 180 degrees from luminaire arm. For poles mounted on a concrete traffic barrier with two luminaire arms, all hand holes shall be on the same side of the barrier. For poles mounted on a bridge lighting bracket or a retaining wall lighting bracket, hand hole shall be on traffic side of the pole, at a height that will clear the barrier.
11. The finished pole shall have a smooth, uniform finish free of pits, blisters, or other defects. Scratched, chipped, and other damaged galvanized areas on poles and mast arms shall be repaired in accordance with Item 445, "Galvanizing."
12. Pole length is based on a 5'-6" luminaire arm rise. 4 ft. luminaire arms have a 2'-6" rise. A pole with 4 ft. luminaire arms will have an actual mounting height 3'-0" less than the nominal mounting height. Increasing the pole length to meet the nominal mounting height is allowed, but unnecessary unless otherwise directed by the engineer.
13. Erect transformer base poles in accordance with sheet RID(1).

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ROADWAY ILLUMINATION POLES

RIP(2)-19

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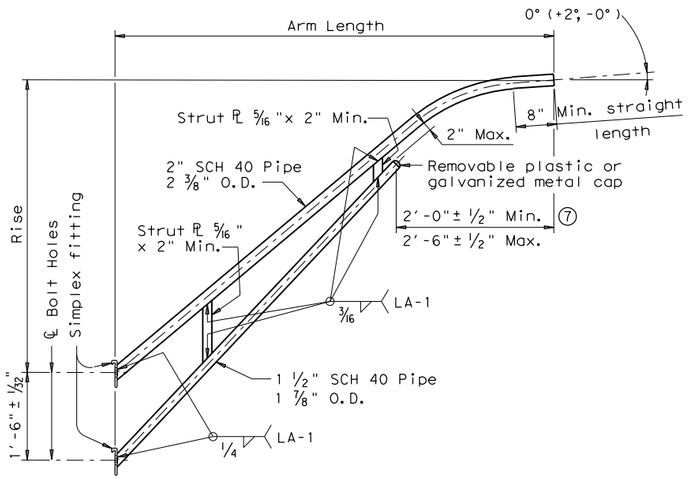
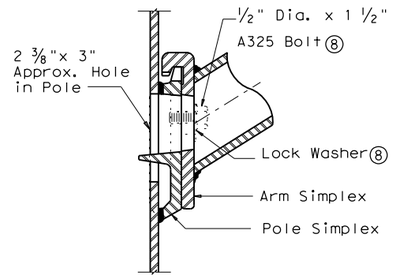


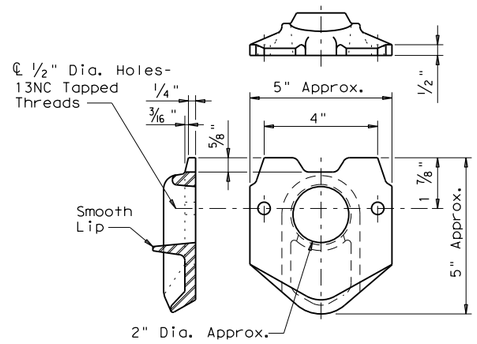
LUMINAIRE ARM

LUMINAIRE ARM DIMENSIONS		
Nominal Arm Length	Arm Length	Rise
4'-0"	3'-6"	2'-6"
6'-0"	5'-6"	5'-6"
8'-0"	7'-6"	5'-6"
10'-0"	9'-6"	5'-6"
12'-0"	11'-6"	5'-6"

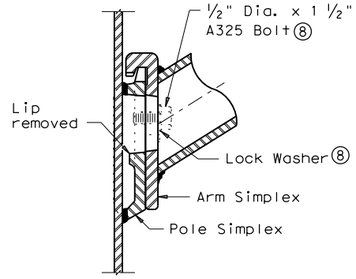
ARM ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Arm Length	±1"
Arm Rise	±1"
Deviation from flat	1/8" in 12"
Spacing between holes	±1/32"



UPPER SIMPLEX FITTING
(Gusset not shown for clarity)

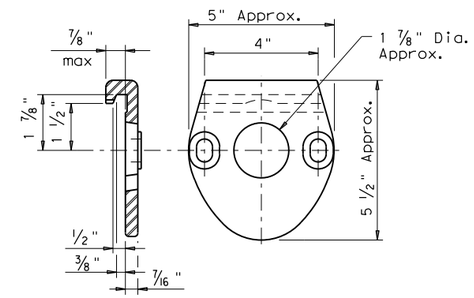


POLE SIMPLEX DETAIL ⑨



LOWER SIMPLEX FITTING
(Gusset not shown for clarity)

SECTION B-B



ARM SIMPLEX DETAIL ⑨

NOTES:

④ Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

⑤ 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.

⑥ A572, A1008 HSLAS-F, and A1011 HSLAS-F materials may have higher yield strengths but shall not have less elongation than the grade indicated.

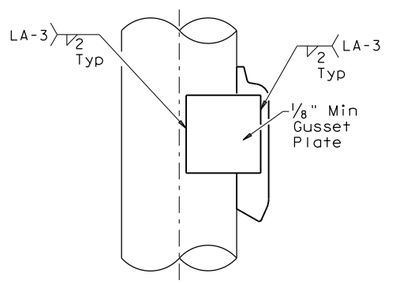
⑦ Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

⑧ Each pole simplex fitting shall be supplied with 2 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.

⑨ Proposed deviations in arm simplex dimensions or materials must be submitted to the Department for approval.

⑩ A welded handhole frame is permissible. Maximum of two (2) CJP weld splices is allowed.

MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr 65-35 or Gr 70-36, A148 Gr 80-50, A576 Gr 1021 ⑤, or A36 (Arm only)
Arm Pipes	ASTM A53 Gr A or B, A500 Gr B, A501, A 1008 HSLAS-F Gr 50 ⑥, or A1011 HSLAS-F Gr 50 ⑥
Arm Struts and Gusset Plates ④	ASTM A36, A572 Gr 50 ⑥, or A588
Misc.	ASTM designations as noted



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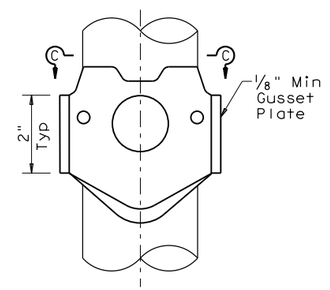
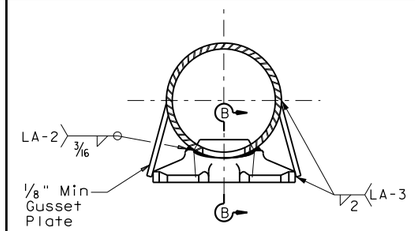
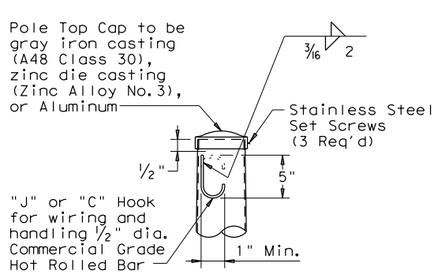


ELEVATION

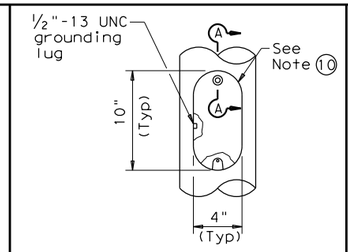


SECTION C-C

SIMPLEX ATTACHMENT DETAIL



POLE TOP



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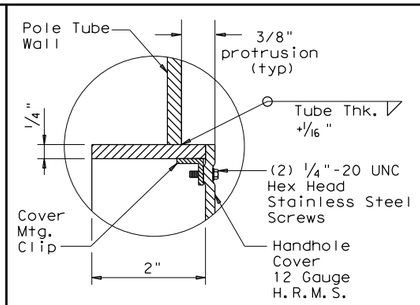

SECTION A-A

HANDHOLE

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(3)-19

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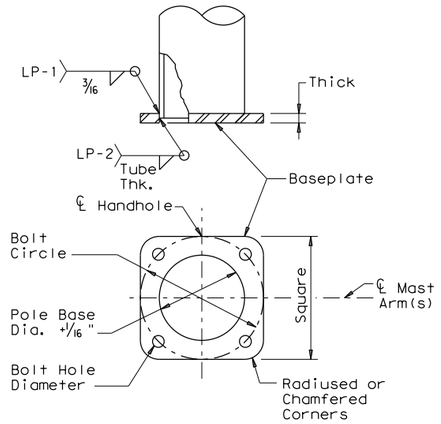
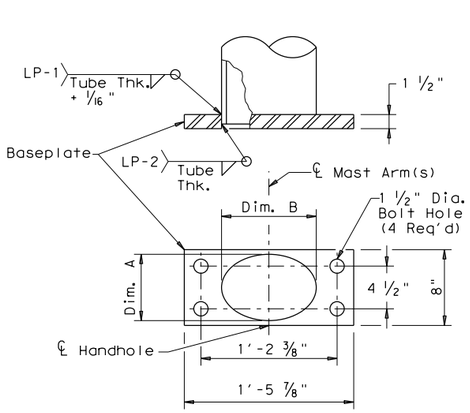


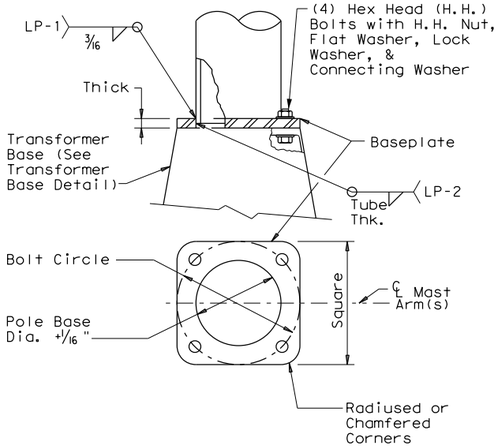
SHOE BASE BASEPLATE

SHOE BASE BASEPLATE TABLE				
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	BOLT HOLE DIAMETER
20′ - 39′	13"	13"	1 1/4"	1 1/4"
40′	15"	15"	1 1/4"	1 1/2"
50′	15"	15"	1 1/2"	1 1/2"



CONCRETE TRAFFIC BARRIER BASE BASEPLATE

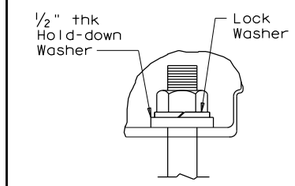
CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA.(12)	DIM. A	DIM. B
28′ - 38′	9"	7"± 1/4"	10"± 1/4"
48′	10 1/2"	7"± 1/4"	13"± 1/4"



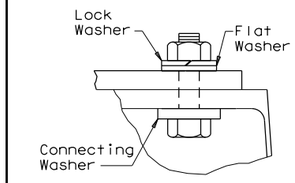
TRANSFORMER BASE BASEPLATE

TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFOMER BASE TYPE
20′ - 39′	13"	13"	1 1/4"	1"	1 1/4"	A
40′	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50′	15"	15"	1 1/2"	1 1/4"	1 1/2"	B

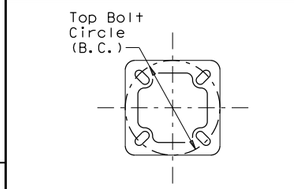
TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



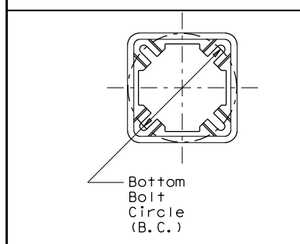
DETAIL A



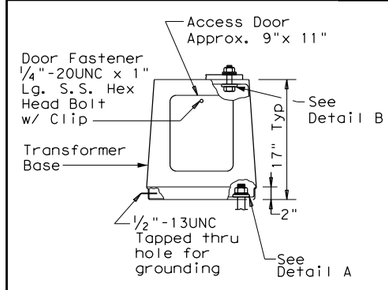
DETAIL B



TOP PLAN



BOTTOM PLAN



ELEVATION

TRANSFORMER BASE DETAILS

GENERAL NOTES:

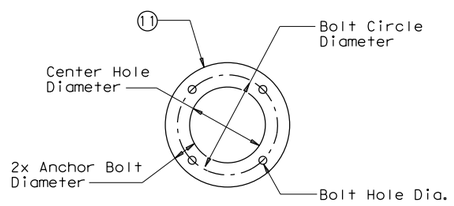
1. For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
2. All breakaway bases shall meet the breakaway requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to resist 150% of the design moment.
3. Transformer bases shall be cast from aluminum, ASTM B108 or B26 Alloy 356.0-T6, or other material approved by the Engineer. Four Hex Head (H.H.) bolts with four H.H. nuts, four lock washers, four flat washers, and connecting and hold-down washers as recommended by the manufacturer, galvanized to ASTM A153 Class C or D, or B695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A563 grade DH galvanized.
4. Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
5. Doors for transformer bases shall be made of plastic, fiberglass or other non-metallic material approved by the Engineer and shall be attached with stainless steel screws or bolts. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.

NOTES:

(11) Anchor Bolt Templates do not need to be galvanized.

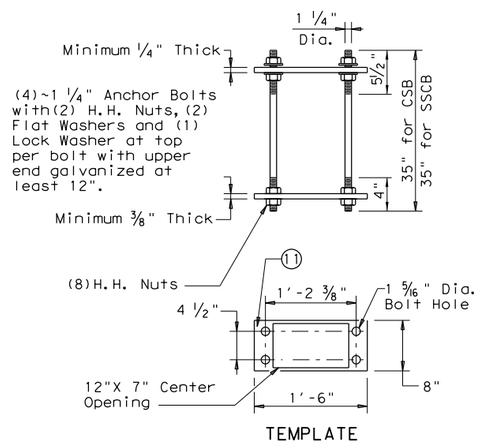
(12) Pole diameter before ovalized.

ANCHOR BOLT FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"



SHOE BASE ANCHOR BOLT ASSEMBLY

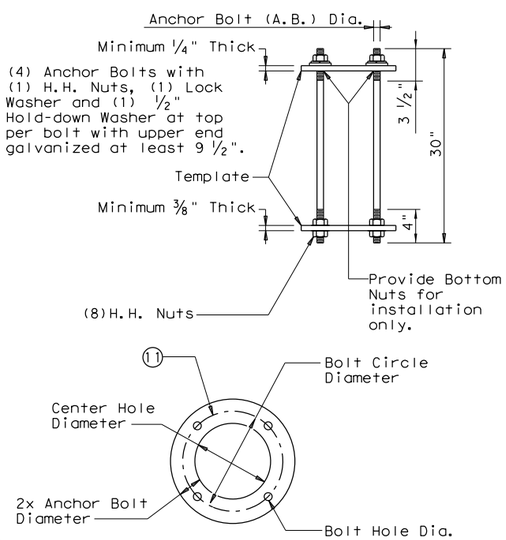
SHOE BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20′-39′	1"	13"	11"	1 1/16"
40′-50′	1 1/4"	15"	12 1/2"	1 5/16"



TEMPLATE

CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

TRANSFORMER BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20′- 39′	1"	14"	12"	1 1/16"
40′- 50′	1 1/4"	17 1/4"	14 3/4"	1 5/16"



TRANSFORMER BASE ANCHOR BOLT ASSEMBLY

SHEET 4 OF 4

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Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(4)-19

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	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		221

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ROADWAY ILLUMINATION ASSEMBLY NOTES

1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.

2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC),TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA),and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.

4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.

5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.

   a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.

   b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25′ above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 6th Edition (2013) of the AASHTO Design Specifications. For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25′ above the surrounding terrain, provide poles meeting the following requirements:

      i. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).

      ii. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to resist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.

6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.

7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.

8. Install T-Base with following procedure:

   a. Anchor Bolt Tightening.

      i. Coat the threads of the anchor bolts with electrically conductive lubricant.

      ii. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.

      iii. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.

      iv. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.

      v. Check top of T-base for level. If not level then foundation must be leveled.

   b. Top Bolt Procedure

      i. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.

      ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."

      iii. Tighten each nut to 150 ft-lb. using a torque wrench.

   c. Level and Plumb

      i. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.

9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).

10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150W HPS or 150W EQ LED.

11. Mount luminaires on arms level as shown by the luminaire level indicator.

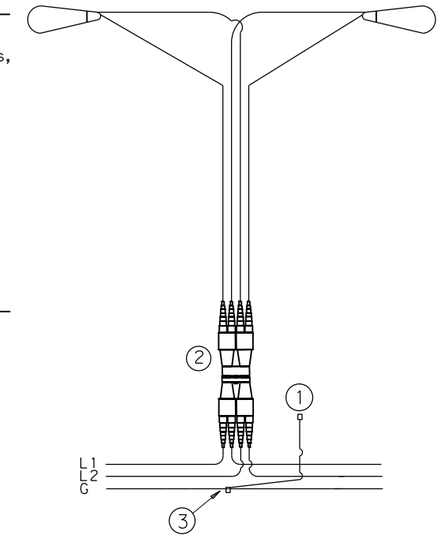
12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

Wiring Diagram Notes:

(1) Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.

(2) Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.

(3) Split Bolt or other connector.



L1,L2 = Hot Conductors
G = Grounding Conductor

TYPICAL WIRING DIAGRAM

LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.

Decorative LED Lighting Notes:

1. LED Drivers in Remote Outdoor enclosures (for drivers that do not include an enclosure as part of a factory assembly):

   a. Provide NEMA 3R outdoor enclosure or as approved.

   b. Install enclosure at least 12" above ground or other horizontal surface. Mount vertically or on ceiling, and avoid direct sun where possible.

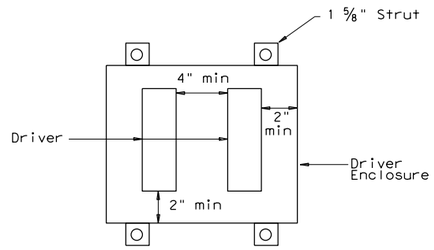
   c. Install drivers with at least 2 inches of space from enclosure walls.

   d. For multiple drivers in an enclosure, provide at least 4 inches side to side and 1 inch end to end from other drivers or electronic equipment

   e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.

   f. Provide remote drivers with a maximum of 100 watts

   g. Provide drivers with documentation of 100,000 hr lifetime at Tcase of 65C or higher.



Driver Spacing In Remote Enclosure

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS

RID(1)-20

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7-17	DIST	COUNTY		SHEET NO.
12-20	LBB	LUBBOCK		222

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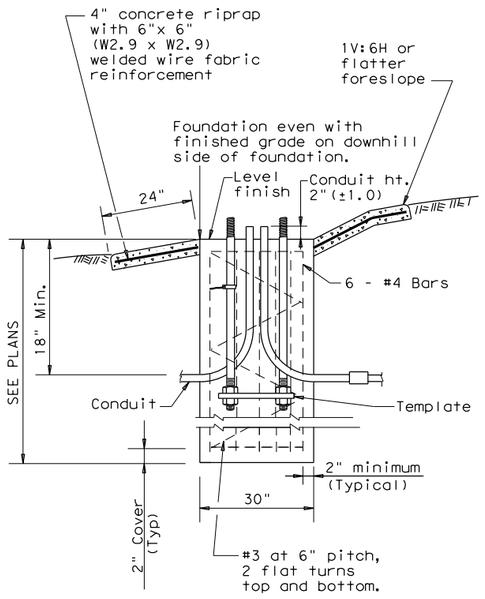
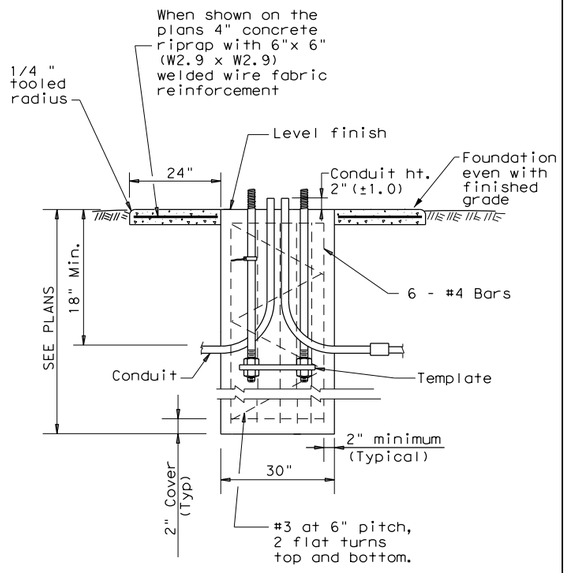


SECTION A-A
SHOWING SLOPED GRADE



SECTION A-A
SHOWING CONSTANT GRADE

TABLE 1

ANCHOR BOLTS

POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1in.x 30in.
40-50 ft.	15 in.	17 ¼in.	1 ¼in. x 30in.

TABLE 2

RECOMMENDED FOUNDATION LENGTHS (See note 1)

MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
≤20 ft.	6′	6′	6′
>20 ft. to 30 ft.	8′	6′	6′
>30 ft. to 40 ft.	8′	8′	6′
>40 ft. to 50 ft.	10′	8′	6′

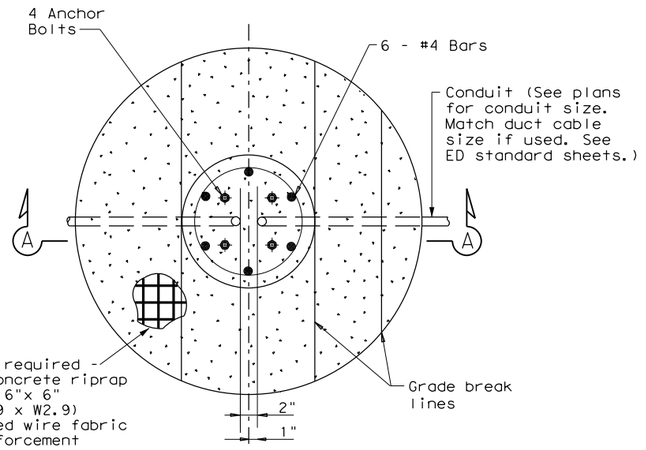
TABLE 3

PAY QUANTITY OF RIPRAP PER FOUNDATION (Install only when shown on the plans)

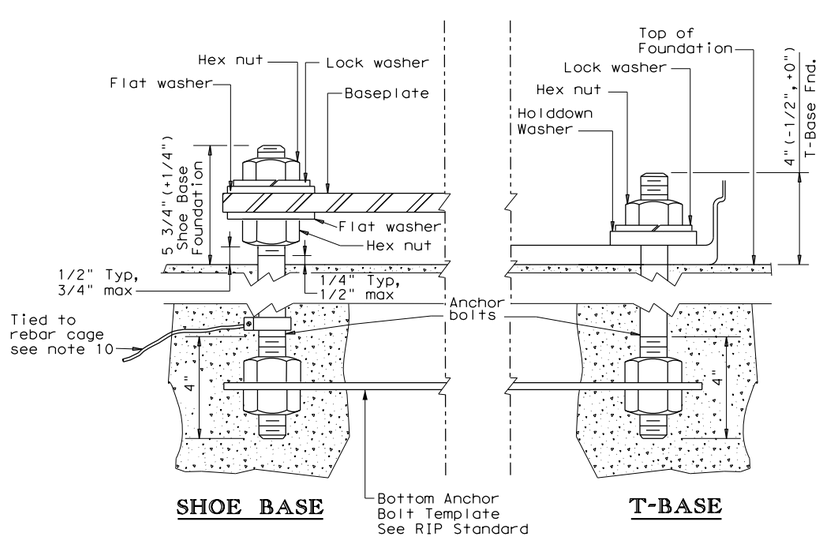
Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

GENERAL NOTES:

1. "Recommended Foundation Lengths" table is for information purposes only. Foundation lengths shall be as shown on the plans, or as directed by the Engineer. Foundations will be paid for under Item 416, "Drilled Shaft Foundations," unless otherwise shown on the plans.
2. Erect roadway illumination assembly poles plumb and true. Form and level the top 6" of the foundation so the pole will be plumb. Use leveling nuts to plumb shoe base poles. Do not use shims or leveling nuts under transformer bases. Do not grout between baseplate and the foundation.
3. Ensure Class 2A and 2B fit for anchor bolts and nuts. Tap and chase nuts after galvanizing. Anchor bolt body with rolled threads need not be full size.
4. Use appropriate class of concrete as specified in Items 416 and 432. Concrete for riprap may be upgraded to Class C at no extra cost to the Department.
5. Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
6. Locate breakaway roadway illumination assemblies as shown in the placement table, unless otherwise dimensioned on the plans. Protect non-breakaway illumination assemblies from vehicular impact (i.e. 2.5 ft. behind guard rail or mounted on traffic barrier), or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less. See Roadway Design Manual for further information.
7. Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
8. Install a minimum of 2 conduits in each foundation. See lighting layout sheets for locations of foundations with more than 2 conduits. Cap unused conduits in foundations on both ends.
9. Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
10. Bond anchor bolt to rebar cage with #6 bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. The bonded steel in the foundation creates a concrete encased grounding electrode which replaces the ground rod.
11. Grade earthwork around T-base foundations even with the finished grade as shown in Section A-A to ensure proper function of the breakaway device. Use riprap on T-base foundations that are located on sloped grades, and as shown on the plans for level grades.



FOUNDATION DETAIL



SHOE BASE T-BASE

ANCHOR BOLT DETAIL

TABLE 4

BREAKAWAY POLE PLACEMENT (See note 6)

ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

* or as close to ROW line as is practical

** provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.

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ROADWAY ILLUMINATION DETAILS
(RDWY ILLUM FOUNDATIONS)

RID(2)-20

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	LBB	LUBBOCK		223

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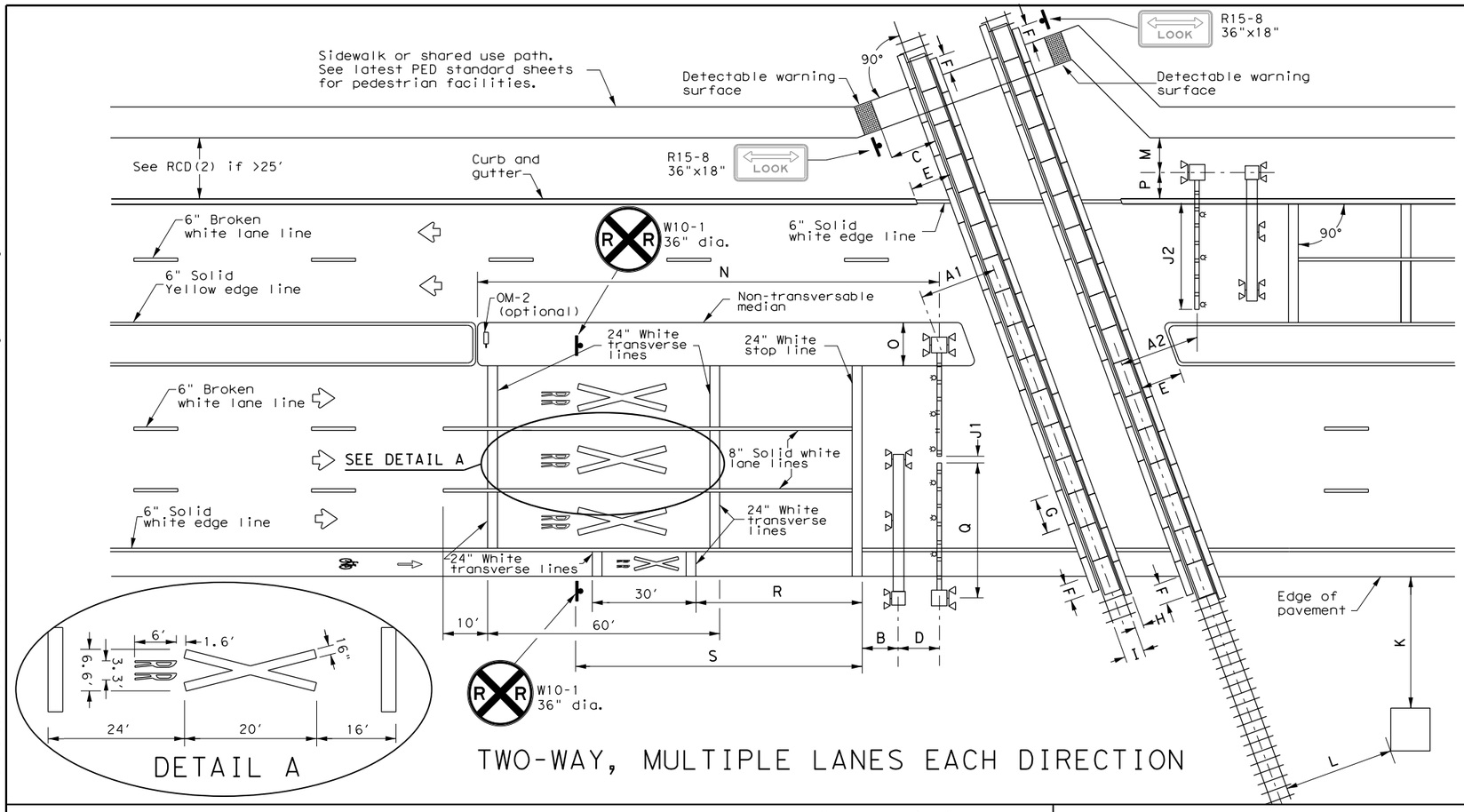


NOTES

A1: Center of RR mast to center of rail: 12′ minimum, 15′ typical.

A2: Tip of gate to center of rail: 12′ minimum, 15′ typical.

B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8′ (NOTE: Stop line may be moved as needed, but should be at least 8′ back from gates, if present).

C: Near edge of detectable warning surface to nearest rail: 12′ minimum.

D: Center of gate mast to center of cantilever mast: 6′ typical. NOTE: Cantilever may be located in front or behind gates.

E: Edge of median or curb to nearest rail: 10′ typical. NOTE: Design median edge to be parallel with rail.

F: Edge of planking panel from edge of pavement or sidewalk: 3′ minimum. NOTE: Field panels need not be in line with gauge panels.

G: Length of panels along rail: 8′ typical.

H: Width of field panel: 2′ typical (check with railroad company).

I: Distance between rails: 4′- 8′1/2".

J1: Tip of gate to tip of gate: 2′ maximum.

J2: 90% of traveled roadway to be covered by gate.

K: Nearest edge of RR cabinet from edge of pavement: 30′ typical. NOTE: Cabinet not required to be parallel to edge of pavement.

L: Nearest edge of RR cabinet from nearest rail: 25′ typical.

M: Center of RR mast to edge of sidewalk: 6′ minimum.

N: Center of gate mast to leading edge of non-traversable median: 100′ minimum to qualify as a Quiet Zone SSM. NOTE: 60′will suffice if there is a street intersection within the 100′ and all street intersections within 60′ are closed.

O: Width of median for RR gate assembly: 8′-6" minimum, 10′ typical when using median gates. NOTE: Center of gate mast minimum 4′-3" from face of curb.

P: Center of RR mast to face of curb: 5′-3" minimum.
Center of RR mast to edge of pavement (with shoulder): 7′ minimum.
Center of RR mast to edge of pavement (no shoulder): 9′-3" minimum.
NOTE: Final location determined by the railroad company.

Q: Gate length: 28′ or less typical, but railroad company may allow up to 32′ under special circumstances.

R: Stop line to first RR Crossing transverse line (bike lane): 50′ typical.

S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.

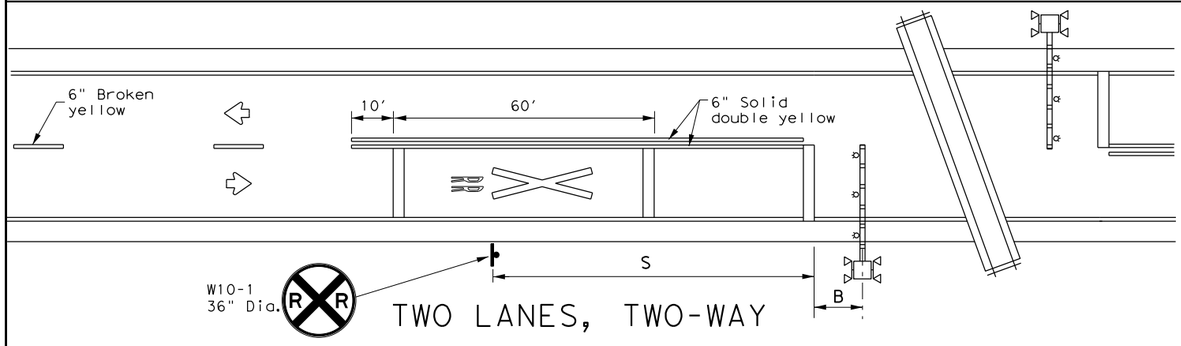
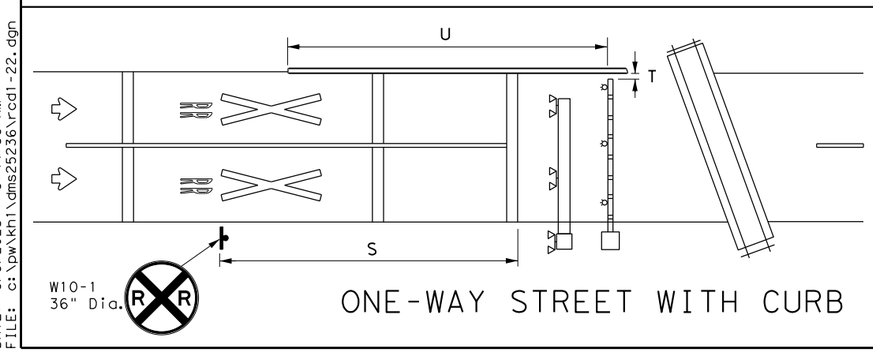


TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND	
	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

GENERAL NOTES

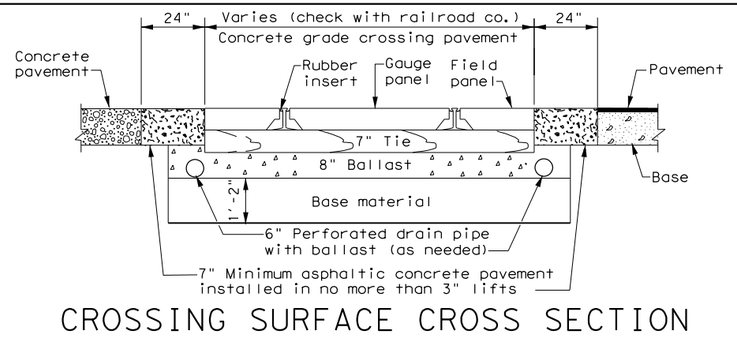
1. Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6" tall minimum and used on roadways where speed does not exceed 40 mph.
2. Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
3. Medians preferred whenever possible to prevent vehicles from driving around gates.
4. Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
5. See SMD standard sheets for sign mounting details.
6. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.



NOTES

T: Tip of gate to edge of curb: 1′ maximum for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations.

U: Non-traversable curb length from gate: 100′ minimum for a Quiet Zone SSM, 10′ minimum for all other locations.



Texas Department of Transportation

Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT RCD(1)-22

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2-16	DIST	COUNTY		SHEET NO.
11-22	LBB	LUBBOCK		224

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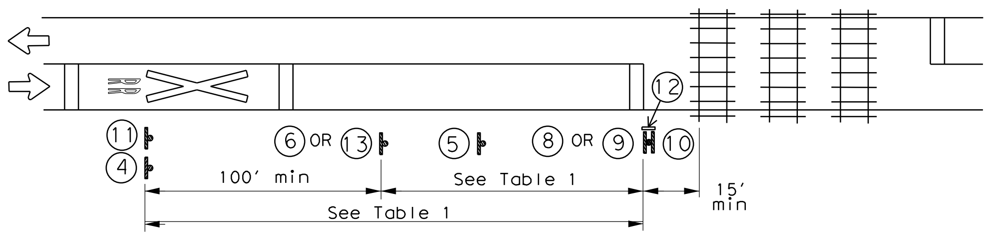
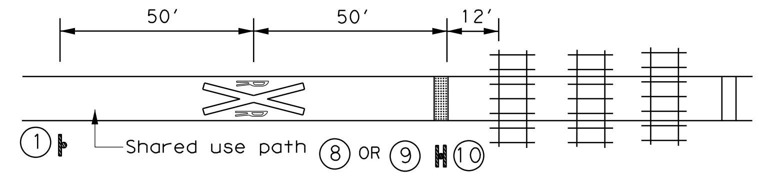


PASSIVE CROSSING

NOTES

1. STOP or YIELD sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.
3. See the Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings section of the TMUTCD for further details about sign mounting arrangements.



NOTES

1. A shared use path is considered a separate pathway crossing when more than 25' from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller signs preferred. See the Design of Bicycle Signs section within the TMUTCD for sizing details.

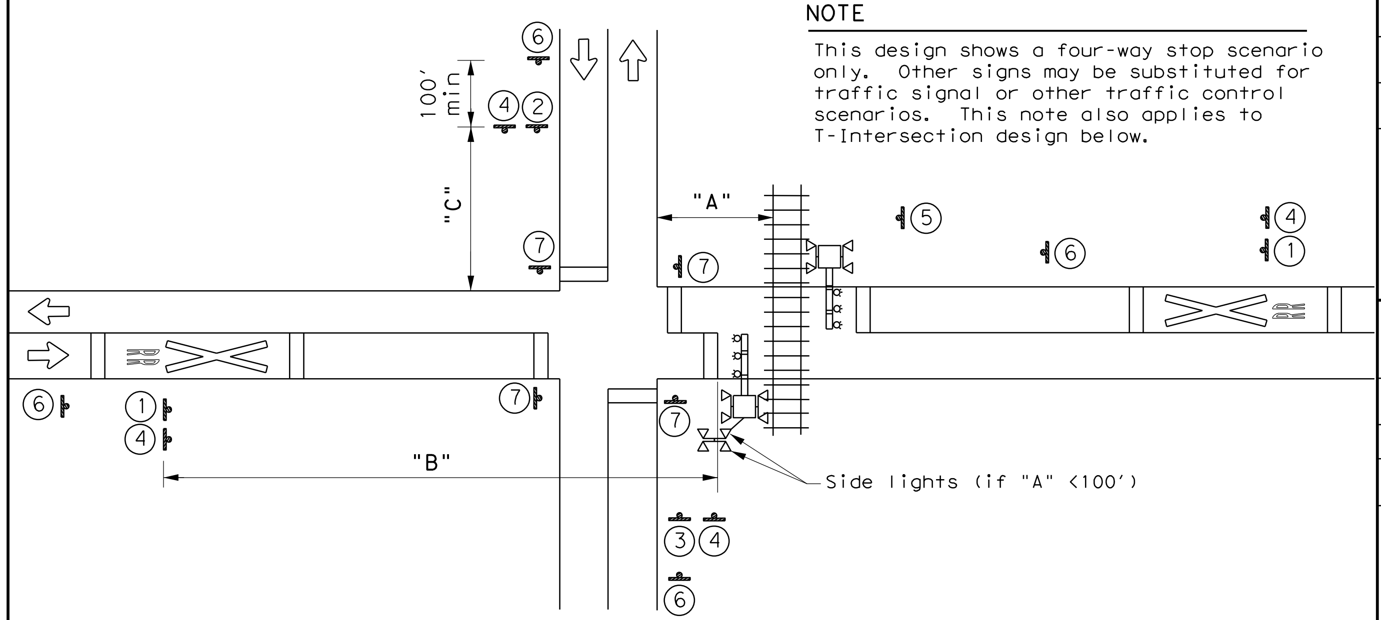
PATHWAY CROSSING

TABLE 1

Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

GENERAL NOTES

1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS (R15-2P) plaque (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
2. LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
3. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2) signs may be modified as needed to fit roadway geometry.
4. Table 1 placement distances may vary per the Placement of Warning Signs section of the TMUTCD.
5. See Table 1 to determine placement of STOP AHEAD (W3-1) and YIELD AHEAD (W3-2) signs unless shown otherwise.
6. DO NOT STOP ON TRACKS (R8-8) signs installed when potential for vehicles stopping on tracks is significant as determined by sealing engineer. Install so sign does not block view of RR mast.
7. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

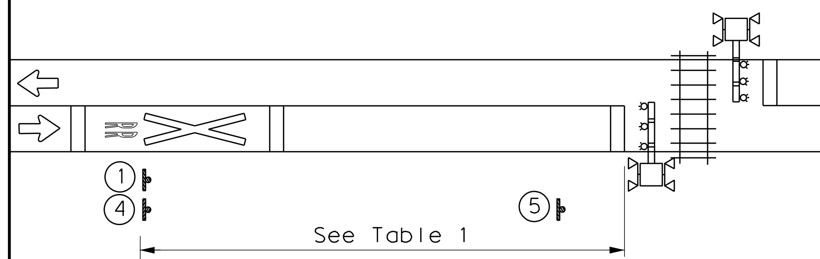


NOTE

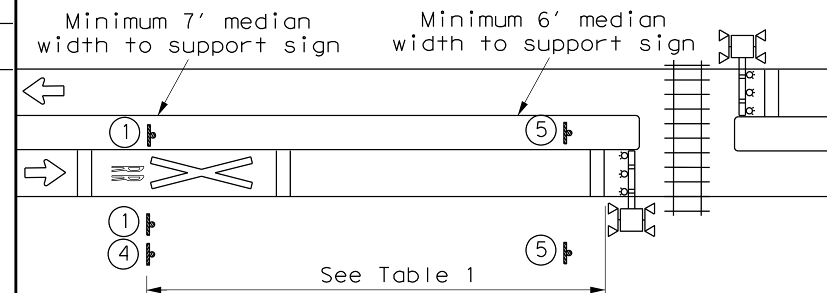
This design shows a four-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

	"A" <100'	"A" ≥100'
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection.
"C"	See Table 1.	GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1.

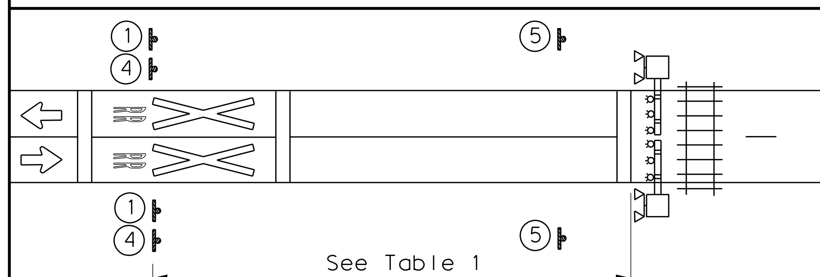
GRADE CROSSING NEAR A PARALLEL STREET



TWO-WAY

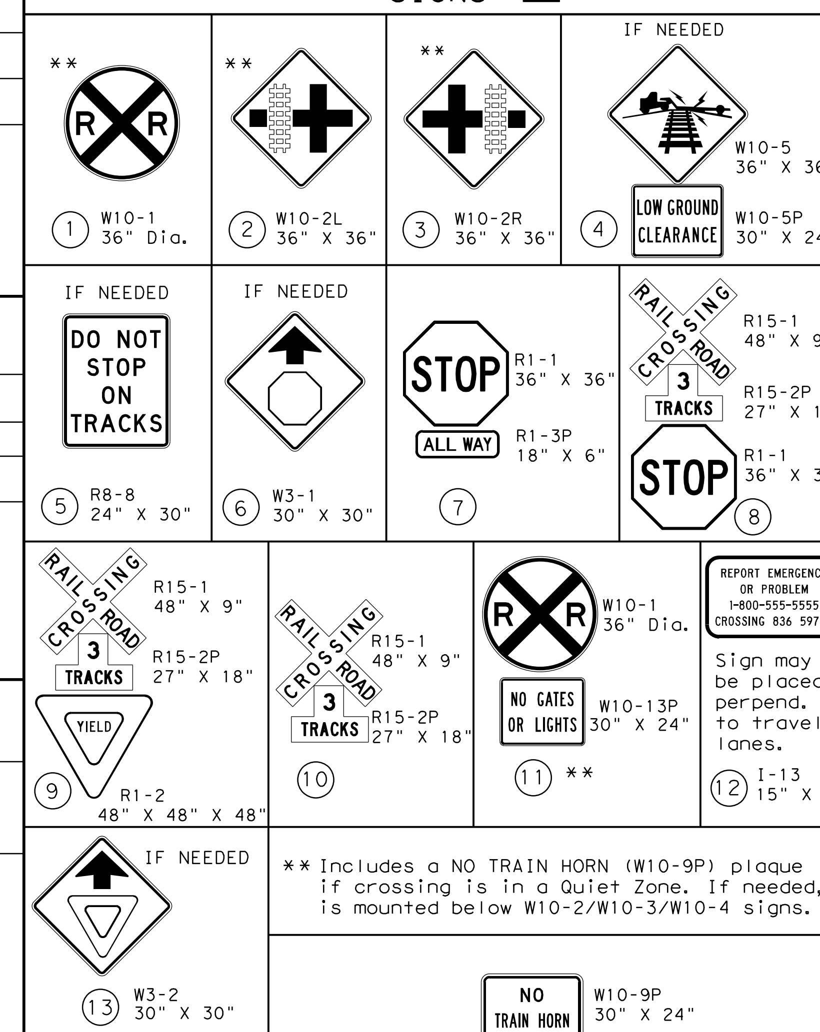


TWO-WAY WITH MEDIAN

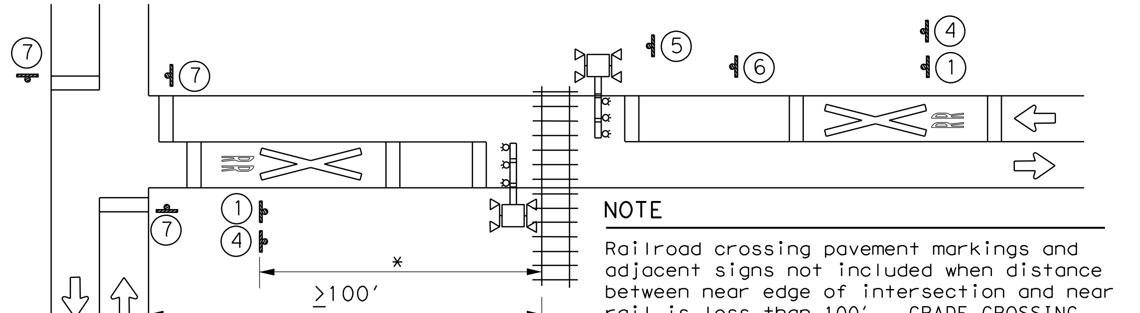


ONE-WAY

SIGNS



** Includes a NO TRAIN HORN (W10-9P) plaque if crossing is in a Quiet Zone. If needed, is mounted below W10-2/W10-3/W10-4 signs.

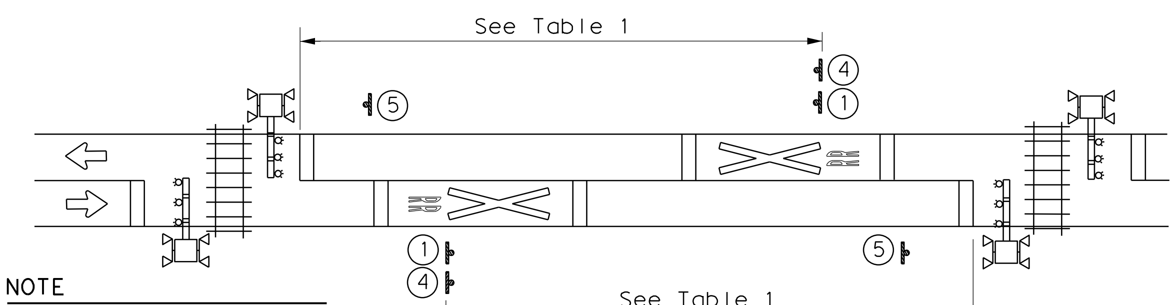


*Use Table 1 if sufficient space exists.

NOTE

Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100'. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.

T-INTERSECTION



NOTE

Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100' apart.

TWO ADJACENT CROSSINGS

Texas Department of Transportation

Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-22

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11-22	LBB		LUBBOCK	225

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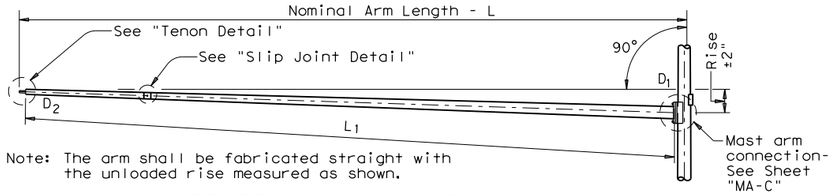
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
24	12.0	9.3	8.6	7.8	.239	13.0	10.0	9.2	8.3	.239	36-A
28	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
32	13.0	10.3	9.6	8.8	.239	14.0	11.0	10.2	9.3	.239	36-A
36	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
40	14.0	11.3	10.6	9.8	.239	16.0	13.0	12.2	11.3	.239	36-B
44	14.5	11.8	11.1	10.3	.239	16.5	13.5	12.7	11.8	.239	36-B

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	① thk	Rise	L_1	D_1	② D_2	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1′-8"	19.1	8.0	3.5	.179	1′-7"
24	23.1	9.0	5.8	.179	1′-9"	23.1	9.0	3.5	.179	1′-8"
28	27.1	9.5	5.7	.179	1′-10"	27.1	10.0	3.5	.179	1′-9"
32	31.0	9.5	5.2	.239	1′-11"	31.0	9.5	3.5	.239	1′-10"
36	35.0	10.0	5.1	.239	2′-0"	35.0	10.0	3.5	.239	1′-11"
40	39.0	10.5	5.1	.239	2′-3"	39.0	11.0	3.5	.239	2′-1"
44	43.0	11.0	5.1	.239	2′-8"	43.0	11.5	4.0	.239	2′-3"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.

② D_2 may be increased by up to 1" for polygonal arms.



Note: The arm shall be fabricated straight with the unloaded rise measured as shown.

TRAFFIC SIGNAL ARM

(Fixed Mount)

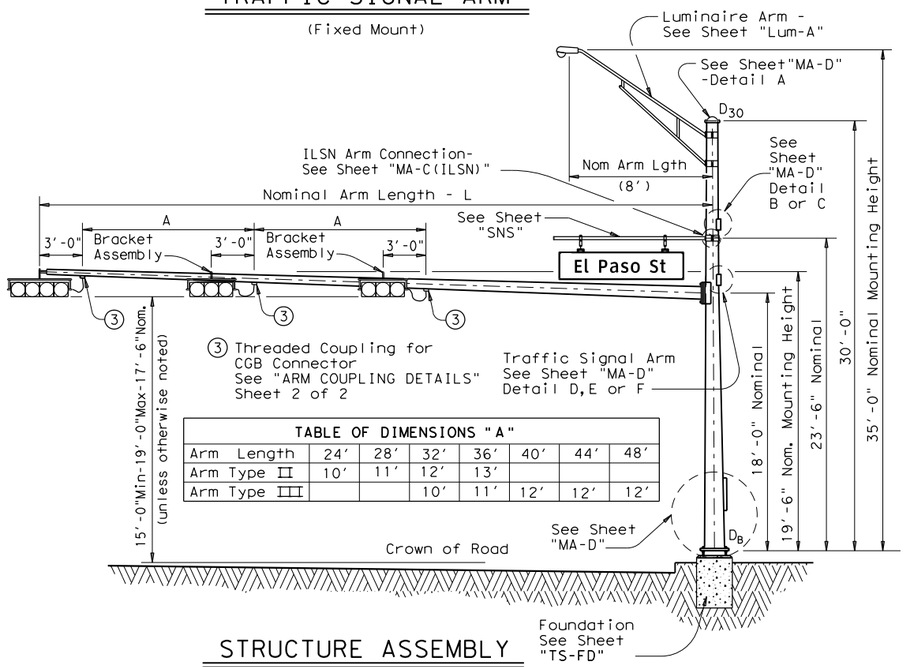


TABLE OF DIMENSIONS "A"

Arm Length	24′	28′	32′	36′	40′	44′	48′
Arm Type II	10′	11′	12′	13′			
Arm Type III			10′	11′	12′	12′	12′

STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30′ Poles With Luminaire		24′ Poles With ILSN		19′ Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-100		20S-100		20-100	
24	24L-100		24S-100		24-100	
28	28L-100		28S-100		28-100	1
32	32L-100		32S-100		32-100	
36	36L-100		36S-100		36-100	2
40	40L-100		40S-100		40-100	
44	44L-100	2	44S-100		44-100	2

Traffic Signal Arms (1 per pole) Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors		2 Bracket Assemblies and 3 CGB Connectors	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Luminaire Arms (1 per 30′ pole)

Nominal Arm Length	Quantity
8′ Arm	2

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7′ Arm	
9′ Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ½"	3′-4"	
1 ¾"	3′-10"	2
2"	4′-3"	5

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(100 MPH WIND ZONE)

SMA-100(1)-12

DN: MS	CK: JSY	DW: MMF	CK: JSY

REVISIONS
5-96
11-99
1-12

CONT	SECT	JOB	HIGHWAY
0905	06	095,ETC.	CS
DIST	COUNTY		SHEET NO.
LBB	LUBBOCK		226

123A

DATE: 8/9/2023 9:45:07 AM
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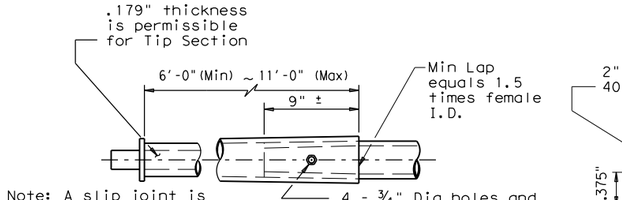
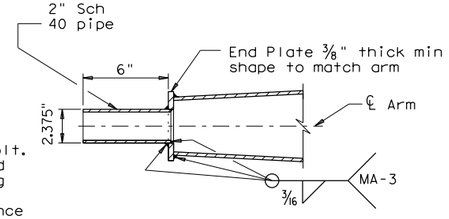


SLIP JOINT DETAIL



TENON DETAIL

VIBRATION WARNING

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

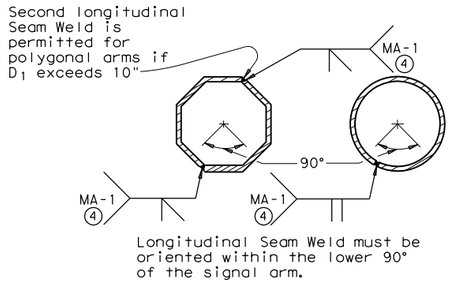
If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backpates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

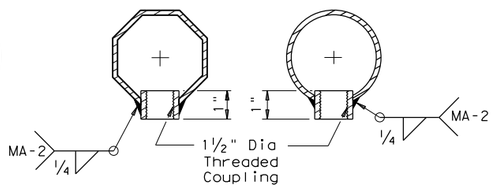
Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

④ 60% Min. penetration
100% pemetration within 6" of circumferential base welds.



ARM COUPLING DETAILS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 100 mph plus a 1.3 gust factor.

Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(100 MPH WIND ZONE)

SMA-100(2)-12

DN: MS	CK: JSY	DW: MWF	CK: JSY

REVISIONS
5-96
1-12

CONT	SECT	JOB	HIGHWAY
0905	06	095,ETC.	CS
DIST	COUNTY		SHEET NO.
LBB	LUBBOCK		227

123B

DATE: 8/9/2023 9:45:07 AM
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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)

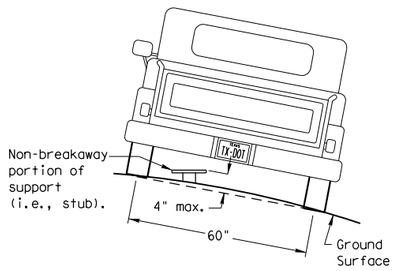
Anchor Type

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

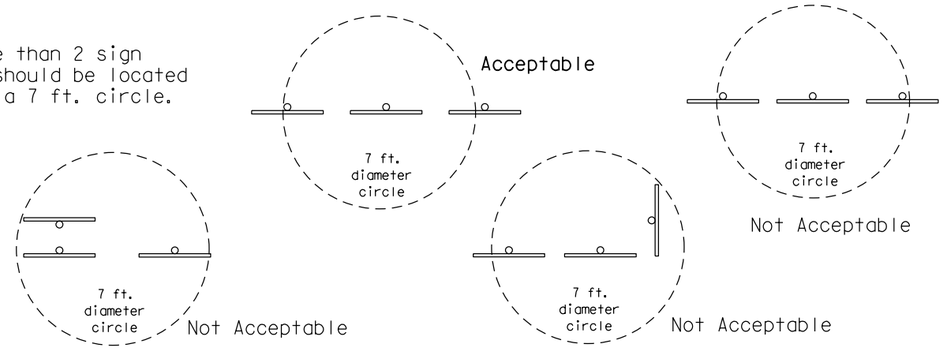
P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))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

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



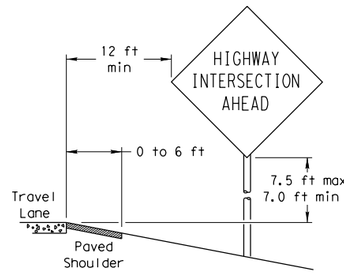
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

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



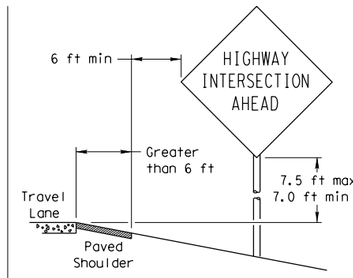
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

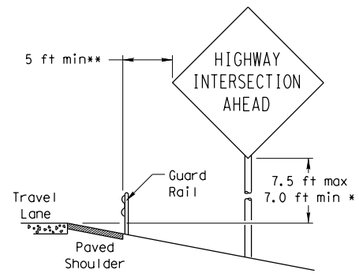
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



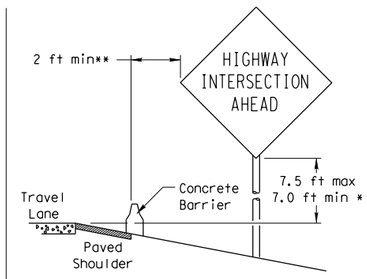
GREATER THAN 6 FT. WIDE

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

BEHIND BARRIER



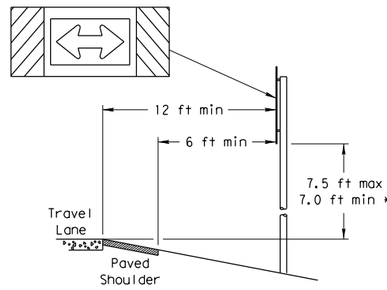
BEHIND GUARDRAIL



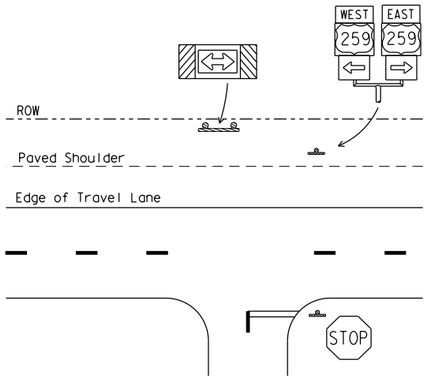
BEHIND CONCRETE BARRIER

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

T-INTERSECTION



When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



* Signs shall be mounted using the following condition that results in the greatest sign elevation:

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

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

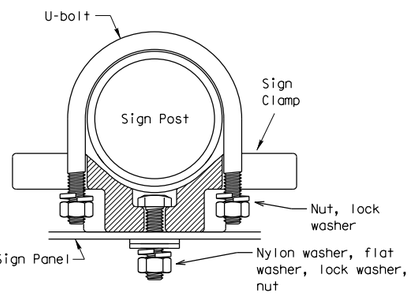
The maximum values may be increased when directed by the Engineer.

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

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

TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

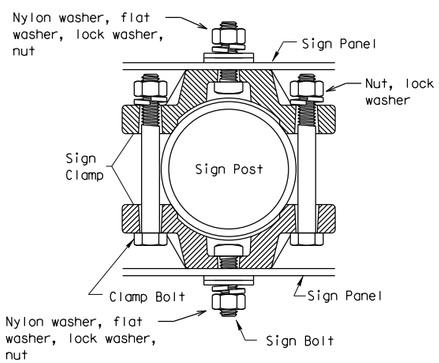


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

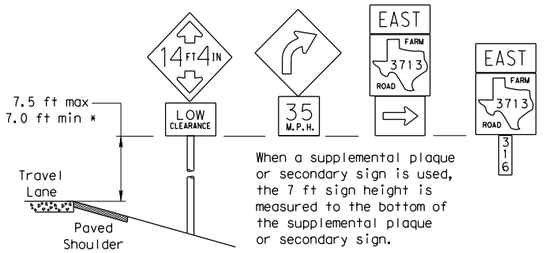
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



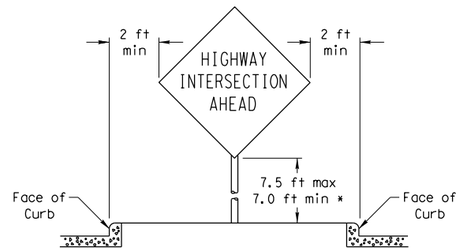
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



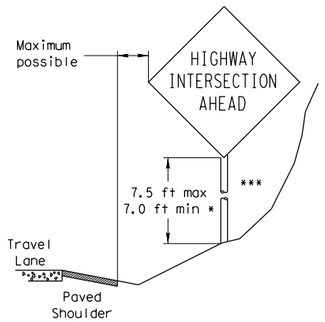
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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

9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
0905	06	095,ETC.	CS
DIST	COUNTY		SHEET NO.
LBB	LUBBOCK		228

26A

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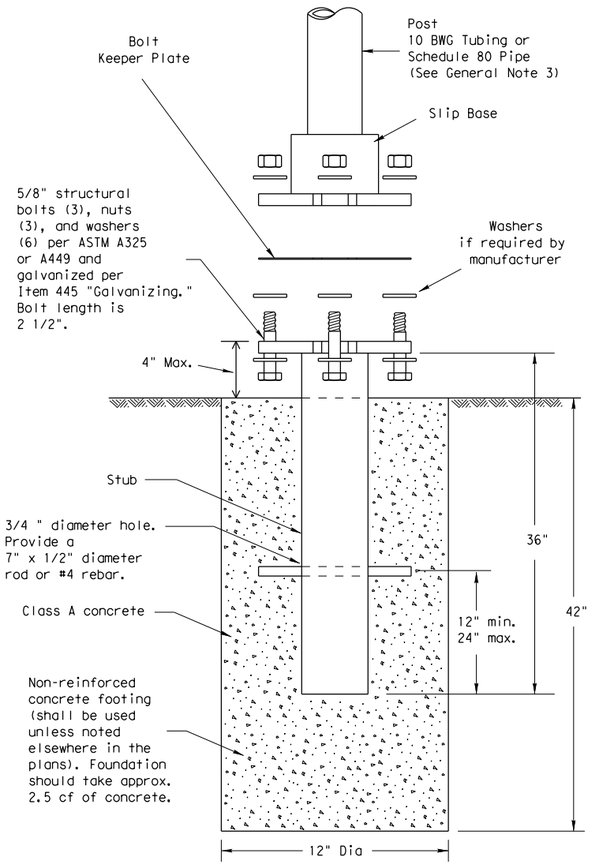
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

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

GENERAL NOTES:

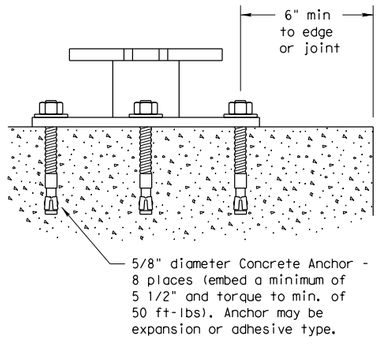
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)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

ASSEMBLY PROCEDURE

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

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

CONCRETE ANCHOR



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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0905	06	095,ETC.	CS

DIST	COUNTY	SHEET NO.
LBB	LUBBOCK	229

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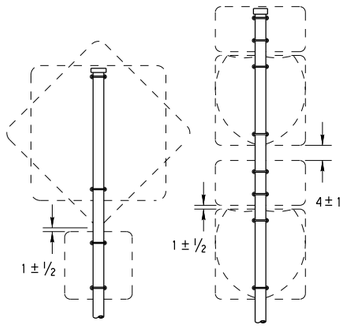

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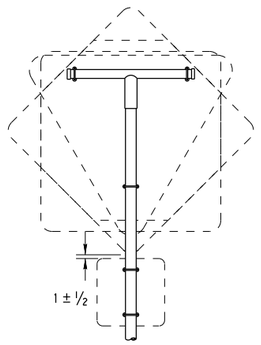

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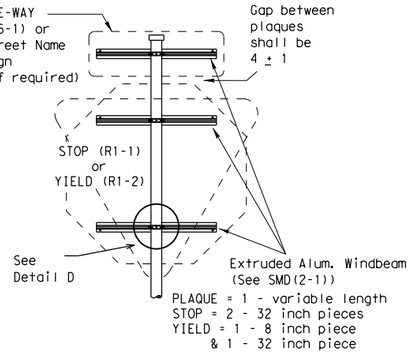

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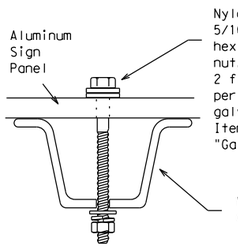
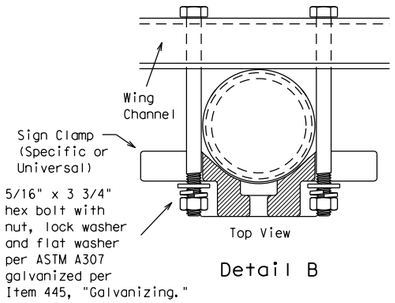


Detail A



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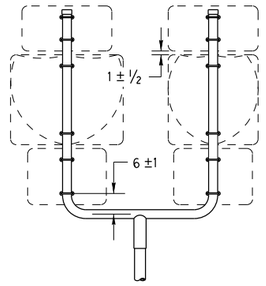

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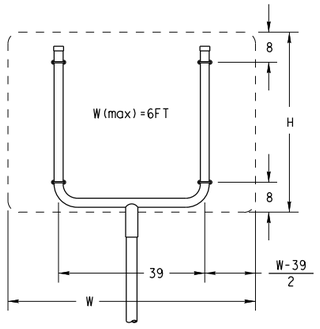

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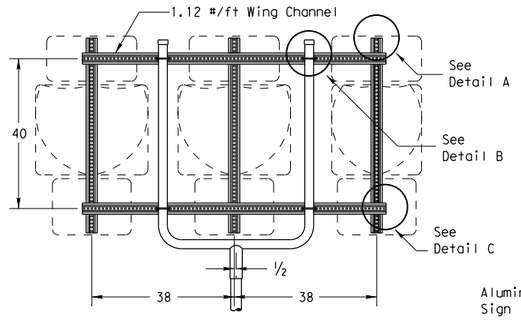
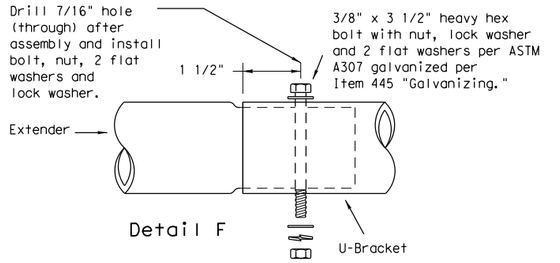
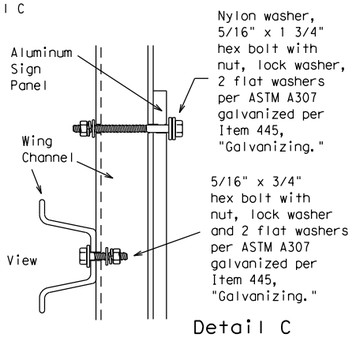


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

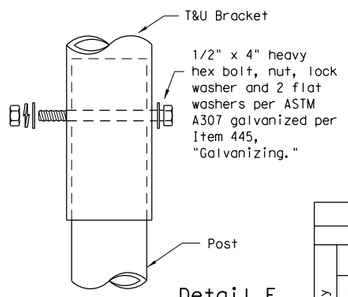


Detail F

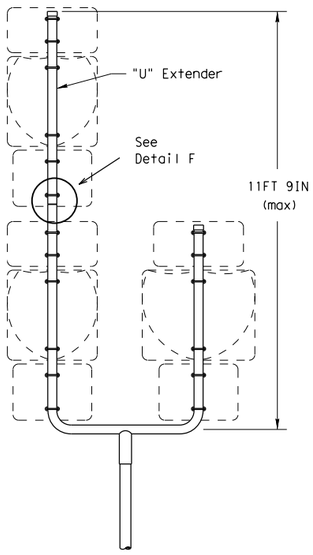
Splices shall only be allowed behind the sign substrate.



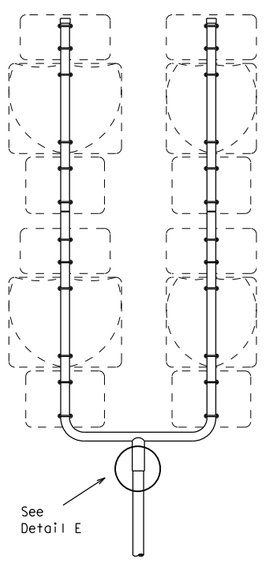
Detail C



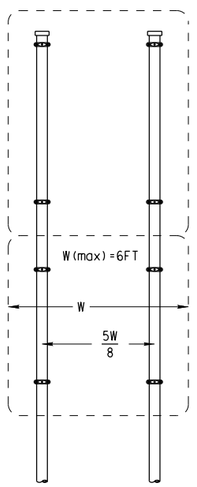
Detail E



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

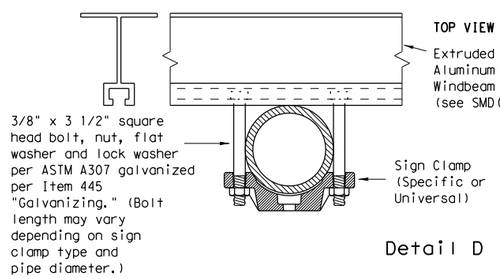


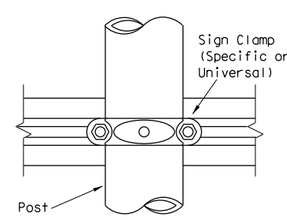
SM RD SGN ASSM TY S80(1)XX(U-2EXT)



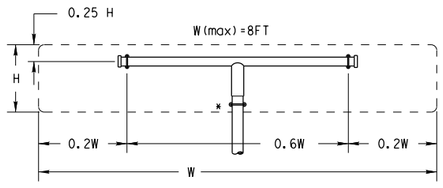
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW





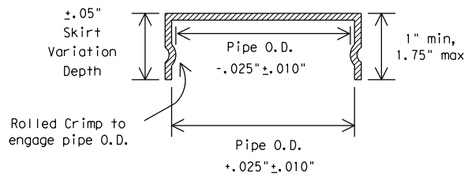
Detail D



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

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



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

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

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

GENERAL NOTES:

1.

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

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

REQUIRED SUPPORT

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		230

26C

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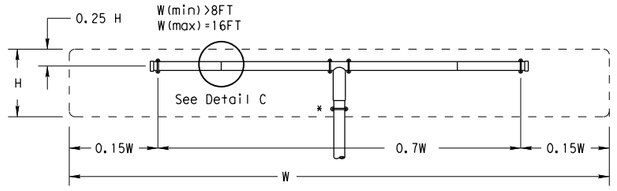
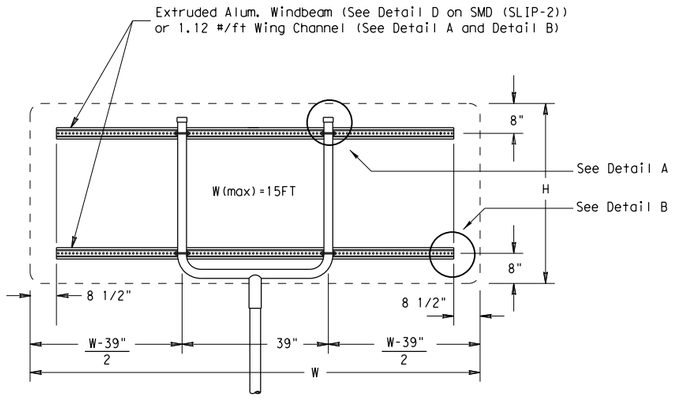
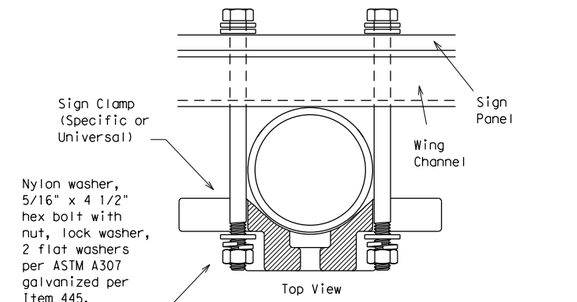


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)

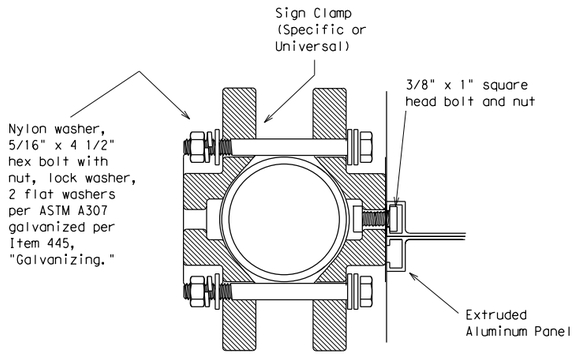
(* - See Note 12)



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

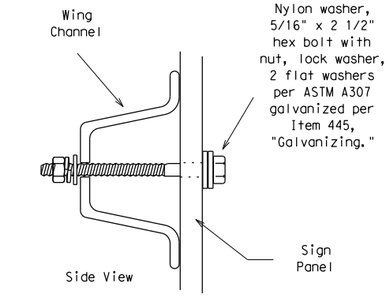


Detail A

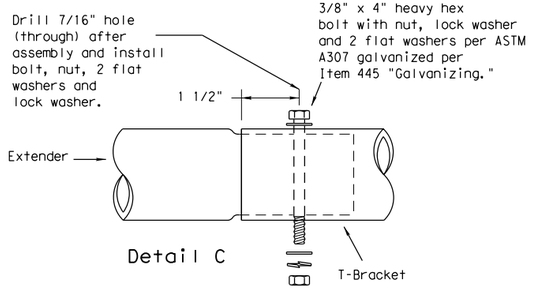


Detail D

EXTRUDED ALUMINUM SIGN WITH T BRACKET

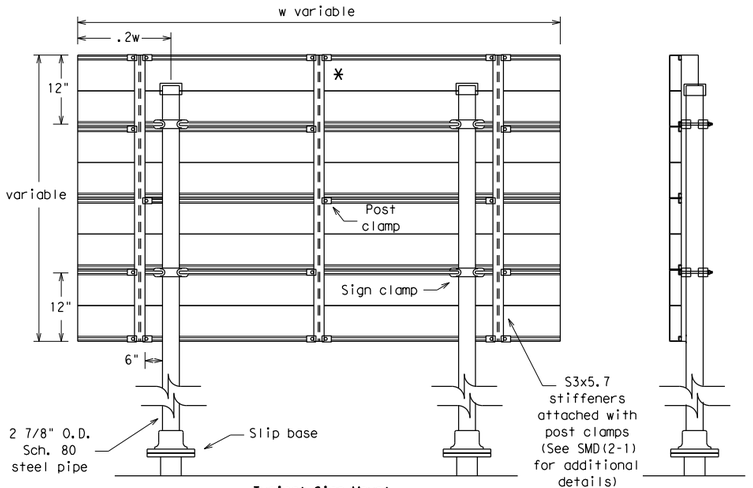


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

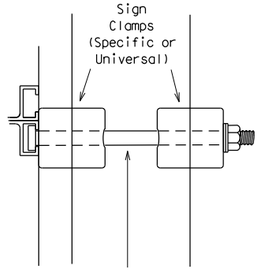


Typical Sign Mount

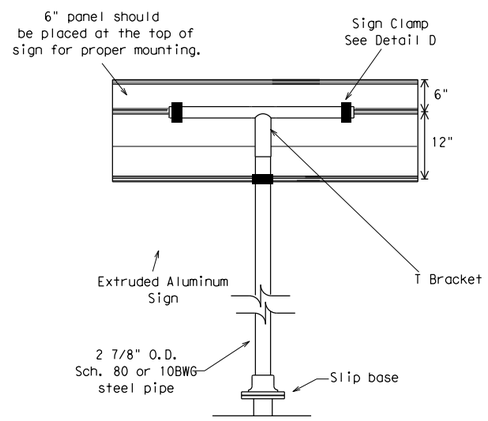
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

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

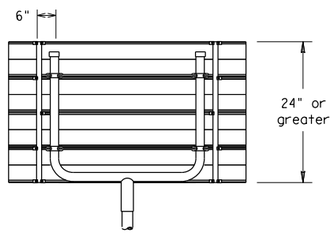
See Detail E
for clamp installation



Detail E



Extruded Aluminum Sign
With T Bracket



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

See Detail E
for clamp installation

GENERAL NOTES:

1.

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

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

REQUIRED SUPPORT

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		231

26D

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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			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

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.

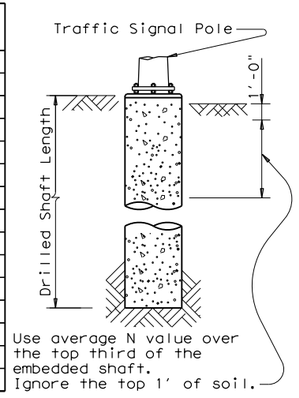
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

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	48-A
66TH ST AT UPLAND AVE	10	24-A	2	12				
	10	36-A	2			26		
	10	36-B	2				30	
82ND ST AT UPLAND AVE	10	24-A	7	42				
	10	48-A	4					88
US 82 AT UPLAND AVE	10	24-A	1	6				
	10	36-B	1				15	
78TH ST AT UPLAND AVE	10	24-A	1	6				
	10	36-B	2				30	
TOTAL DRILLED SHAFT LENGTHS				66		26	75	88

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'



ANCHOR BOLT & TEMPLATE SIZES

BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

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".

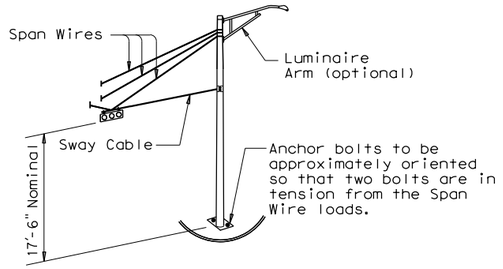
Concrete shall be Class "C".

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.

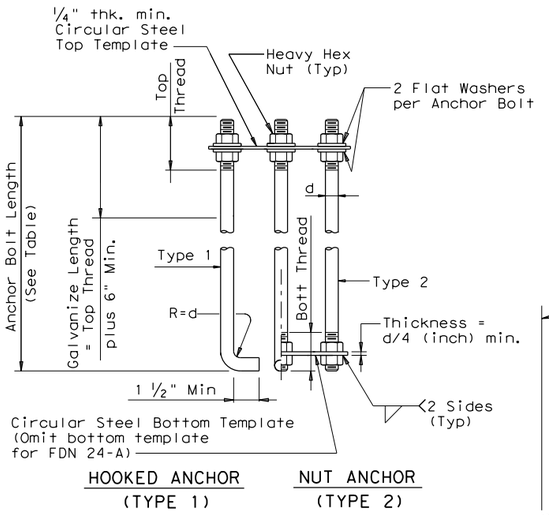
Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise 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".

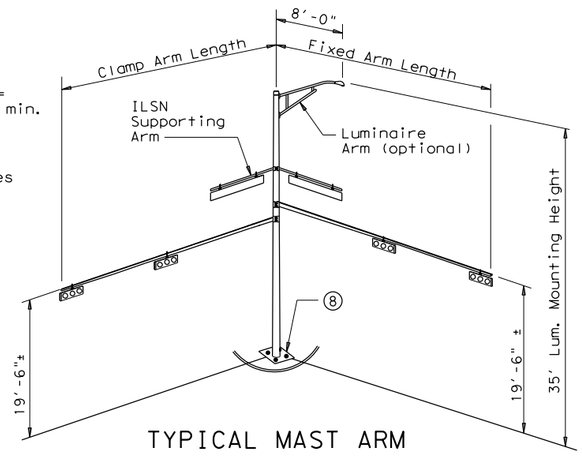
EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



TYPICAL STRAIN POLE ASSEMBLY



ANCHOR BOLT ASSEMBLY



TYPICAL MAST ARM ASSEMBLY

⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.

FOUNDATION DETAILS

8/9/2023

STATE OF TEXAS
LUKE A. SCHMIDT
120384
LICENSED PROFESSIONAL ENGINEER

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

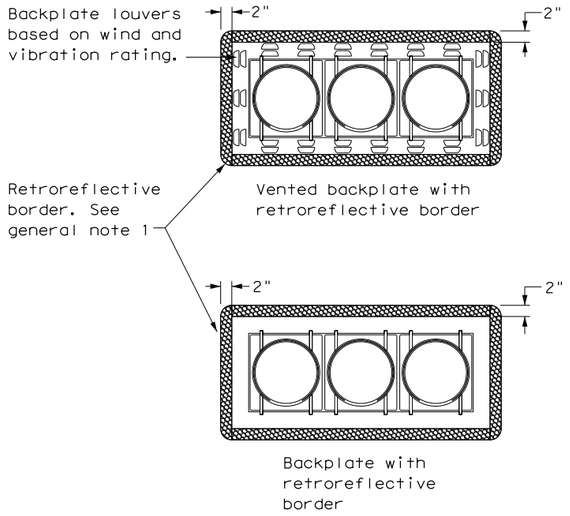
DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB

REVISIONS: 5-96, 11-98, 1-12

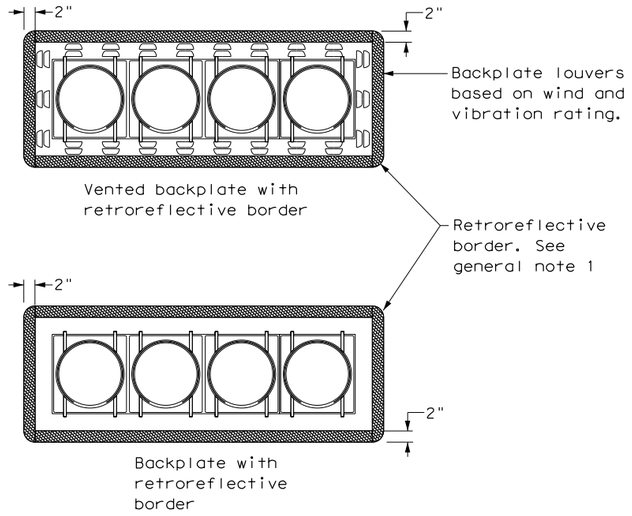
CONT	SECT	JOB	HIGHWAY
0905	06	095,ETC.	CS
DIST	COUNTY		SHEET NO.
LBB	LUBBOCK		232

DATE: 8/9/2023 9:45:35 AM
FILE: c:\pw\khl\dms32711\ts-fd.dgn

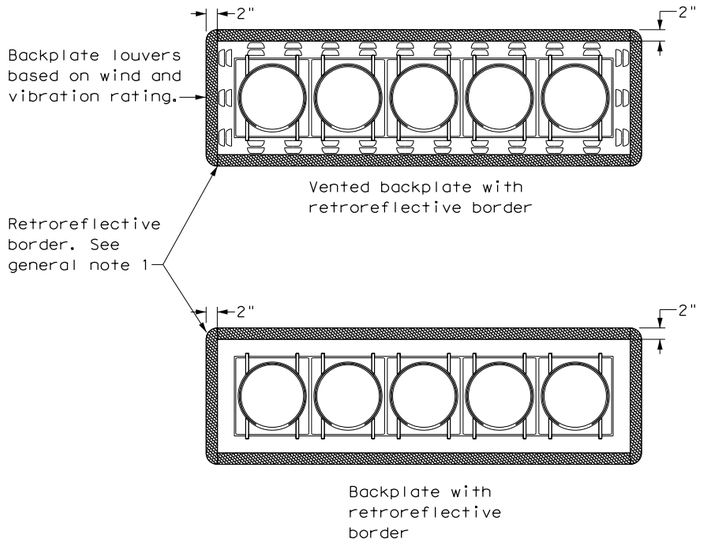
DATE: 8/9/2023 9:45:41 AM
FILE: c:\pw\kh1\dms25236\ts-bp-20.dgn



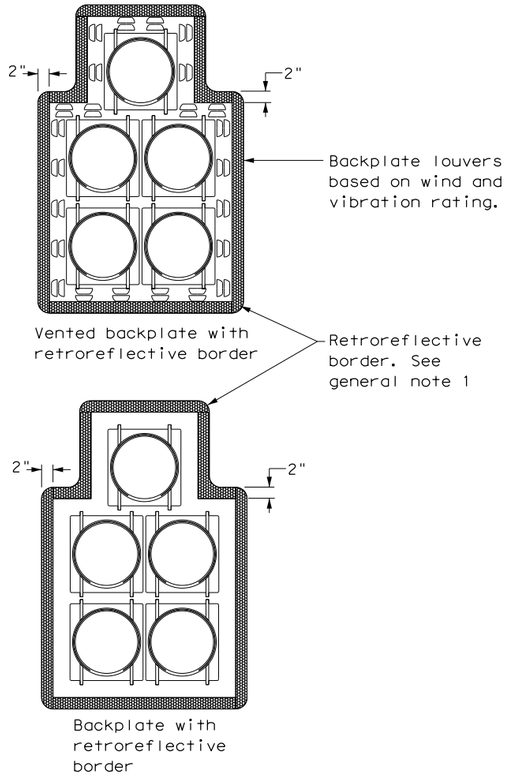
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



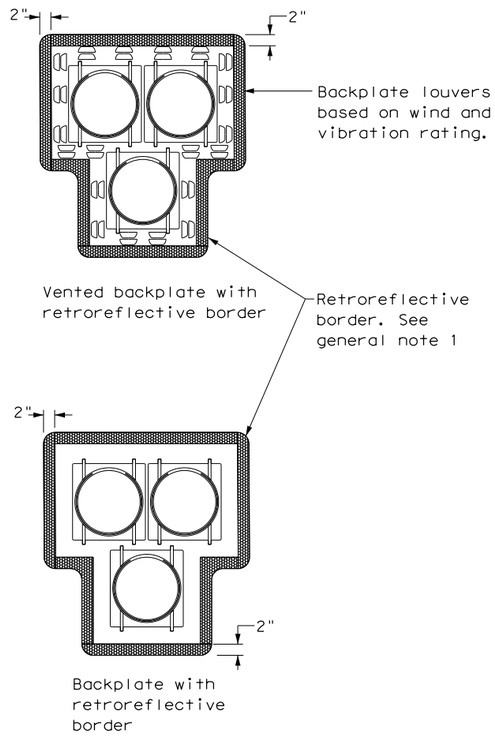
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatability must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
   - Pole mounted
   - Overhead mounted
   - Span wire mounted
   - Mast arm mounted
   - Vertical signal heads
   - Horizontal signal heads
   - Clustered signal heads
   - Pedestrian hybrid beacons

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE

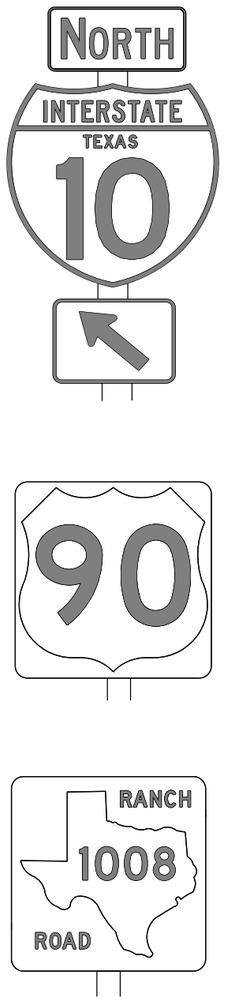
TS-BP-20

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		233

DATE: 8/9/2023 9:45:47 AM
FILE: c:\pw\kh1\dms25236\tsr3-13.dgn

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

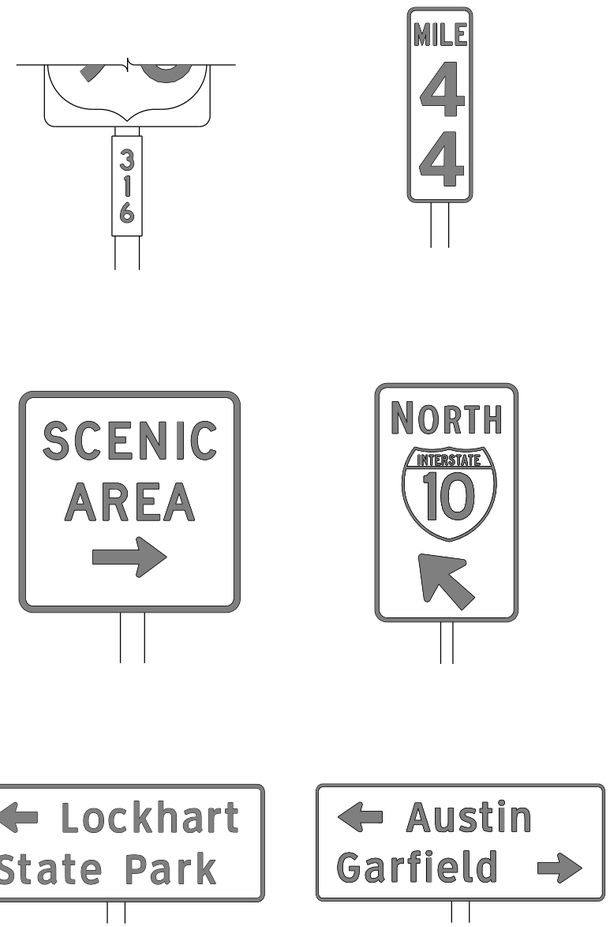
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



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

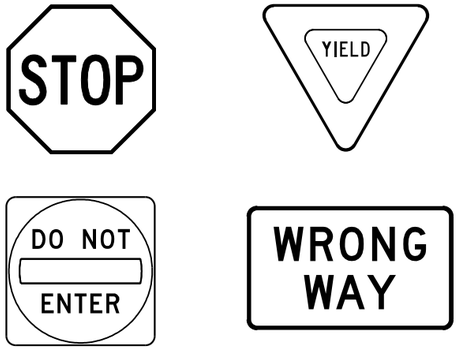
TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	LBB	LUBBOCK		234

DATE: DATE TIME
FILE: DOCUMENT NAME

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

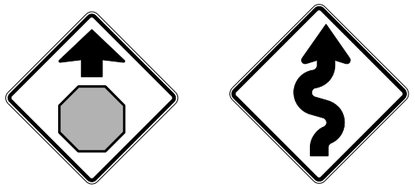
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(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	0905	06	095,ETC.	CS
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	LBB	LUBBOCK		235

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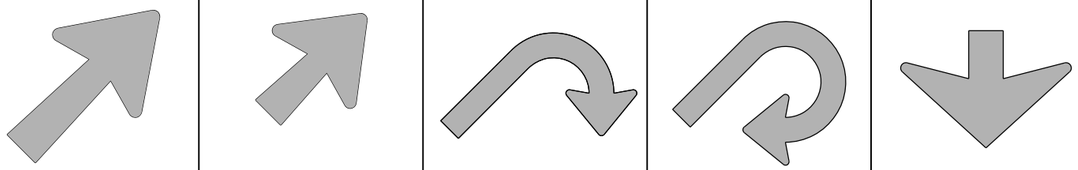
DATE: DATE TIME
FILE: DOCUMENT NAME

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



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

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

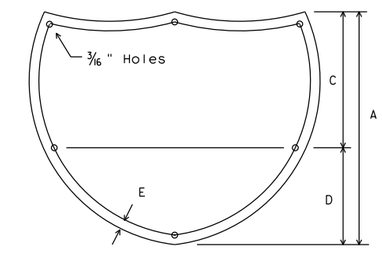
NOTE

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

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

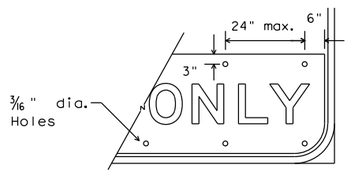
http://www.txdot.gov/

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

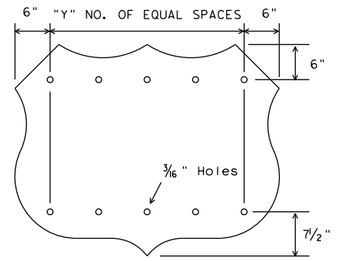


INTERSTATE ROUTE MARKERS

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

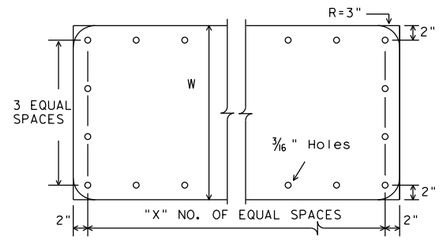


EXIT ONLY PANEL



U.S. ROUTE MARKERS

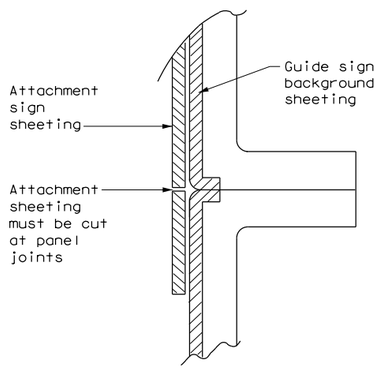
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



STATE ROUTE MARKERS

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

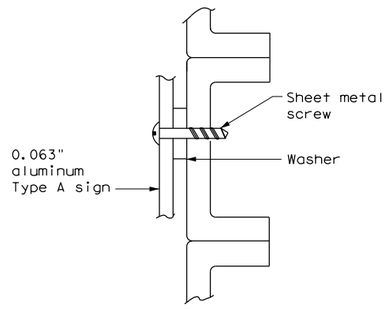
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



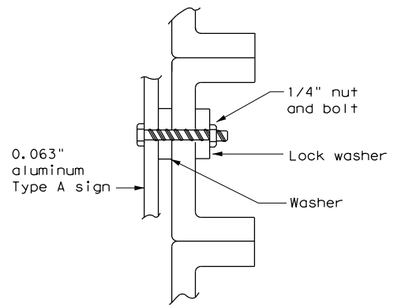
DIRECT APPLIED ATTACHMENT

NOTE:

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



SCREW ATTACHMENT



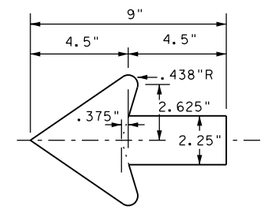
NUT/BOLT ATTACHMENT

NOTE:

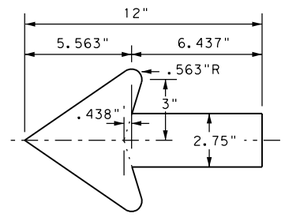
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	LBB	LUBBOCK		236

5

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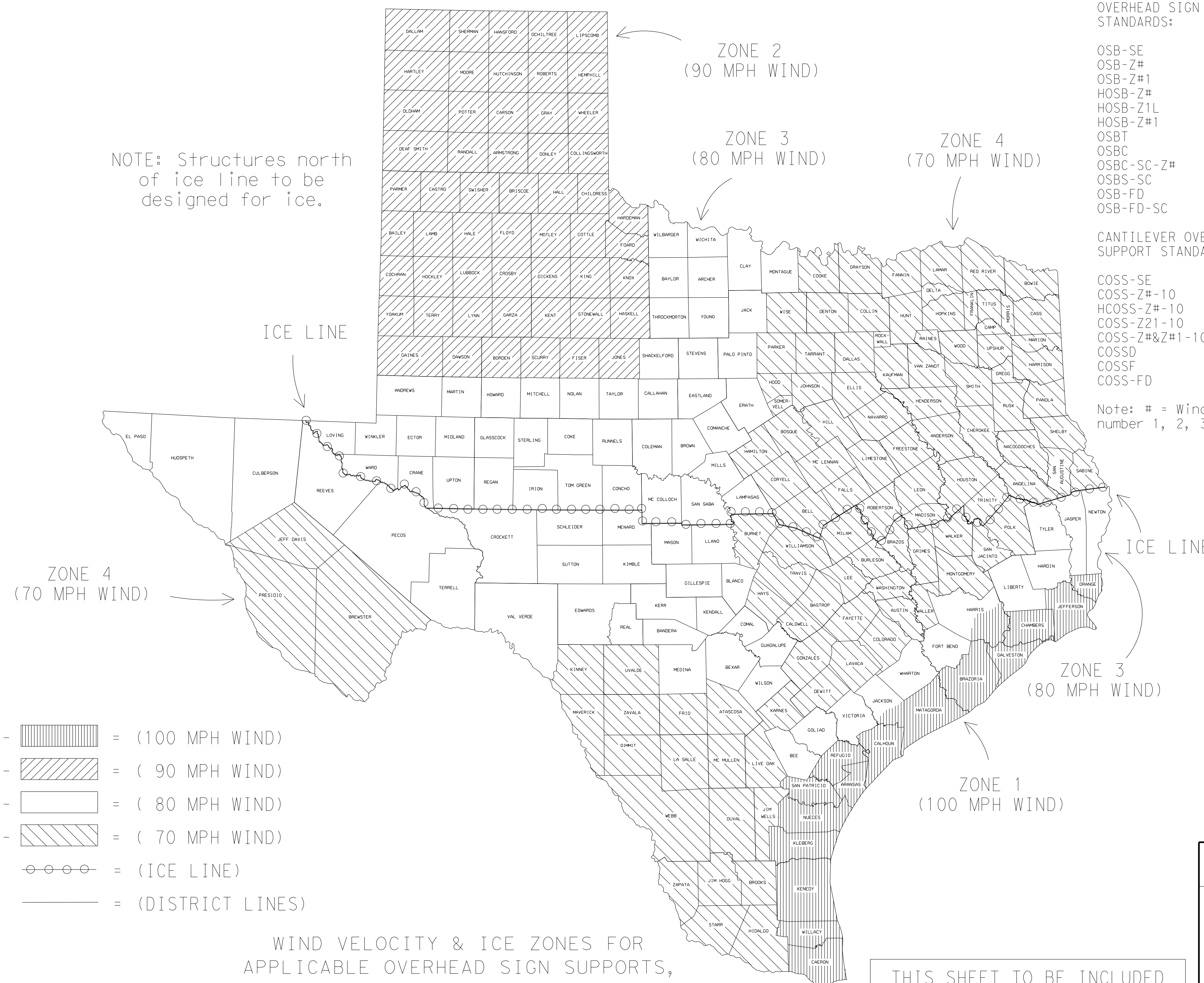

APPLICABLE STANDARDS SHEETS

OVERHEAD SIGN BRIDGE STANDARDS:

OSB-SE
OSB-Z#
OSB-Z#1
HOSB-Z#
HOSB-Z1L
HOSB-Z#1
OSBT
OSBC
OSBC-SC-Z#
OSBS-SC
OSB-FD
OSB-FD-SC

CANTILEVER OVERHEAD SIGN SUPPORT STANDARDS:

COSS-SE
COSS-Z#-10
HCOSS-Z#-10
COSS-Z21-10
COSS-Z#&Z#1-10
COSSD
COSSF
COSS-FD

Note: # = Wind Zone number 1, 2, 3 or 4

HIGH MAST ILLUMINATION POLE STANDARDS:

HMIP-98
HMIF-98

WALKWAYS AND BRACKETS STANDARDS:

SWW
SB(SWL-1)

TRAFFIC SIGNAL POLE STANDARDS:

SP-80
SP-100
SMA-80
SMA-100
DMA-80
DMA-100
MA-C
MAC(ILSN)
MAD-D
TS-FD
LUM-A
CFA
LMA
TS-C
MA-DPD

FOR HARRIS CO. ONLY
Zone line is just North of US 90, around on the North, West and South sides of IH 610 and down the West side of SH 288.

FOR JACKSON CO. ONLY
Zone line is just North of SH 616.

LEGEND

ZONE 1 - = (100 MPH WIND)
ZONE 2 - = (90 MPH WIND)
ZONE 3 - = (80 MPH WIND)
ZONE 4 - = (70 MPH WIND)
= (ICE LINE)
= (DISTRICT LINES)

WIND VELOCITY & ICE ZONES FOR APPLICABLE OVERHEAD SIGN SUPPORTS, HIGH MAST POLES, AND TRAFFIC SIGNAL POLES

Based on 50 Year Mean Recurrence Interval of Fastest Mile Wind Velocity at 33 feet height.

THIS SHEET TO BE INCLUDED IN ALL P.S.&E. PACKAGES CONTAINING ONE OR MORE OF THE APPLICABLE STANDARD SHEETS LISTED HEREON

Texas Department of Transportation

Traffic Operations Division Standard

WIND VELOCITY AND ICE ZONES

WV & IZ-14

FILE: windice.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1996	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
8-14-Added list of applicable standards, restricting use to structures designed for fastest mile wind speeds.	DIST		COUNTY	SHEET NO.
	LBB		LUBBOCK	237

30

DATE: 9:46:04 AM
FILE: ...52236\windice.dgn

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 017728Y
Crossing Type: Public
RR Company Operating Track at Crossing: Lubbock & Western Railway
RR Company Owning Track at Crossing: Lubbock & Western Railway
RR MP: 8.530
RR Subdivision: Seagraves
City: Lubbock
County: Lubbock
CSJ at this Crossing: 0905-06-095
Latitude: 33°31'56.91"N
Longitude: 101°58'28.20"W

Scope of Work, including any TCP, to be performed by State Contractor:

Construct a 10' Shared Use Path adjacent to the west side of Upland Ave, refresh striping on roadway.

Scope of Work to be performed by Railroad Company:

Flagging

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 15

On this project, night or weekend flagging is:

☑ Expected
☐ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☐ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☐ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☑ OTHERS: LWR - 888-783-4316

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required
Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☐ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☑ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☑ Other Railroads: Lubbock & Western Railway

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: LWR
Railroad Emergency Line at: 888-783-4316
Location: DOT Upland Ave
RR Milepost: 8.530
Subdivision: Seagraves

RRD Review Only
Initials: _____
Date: 09/14/2023

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0905	06	095,ETC.		CS	
6/2023		DIST	COUNTY			SHEET NO.	
		LBB	LUBBOCK			238	

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0905	06	095, ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		239

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		240

DATE: 8/9/2023 9:46:17 AM
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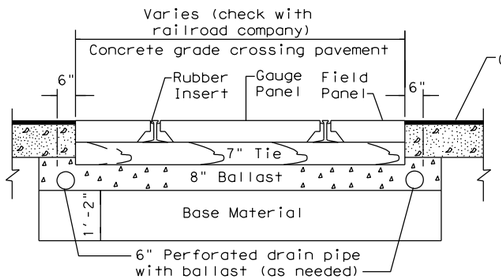
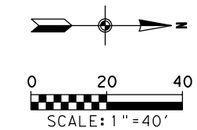
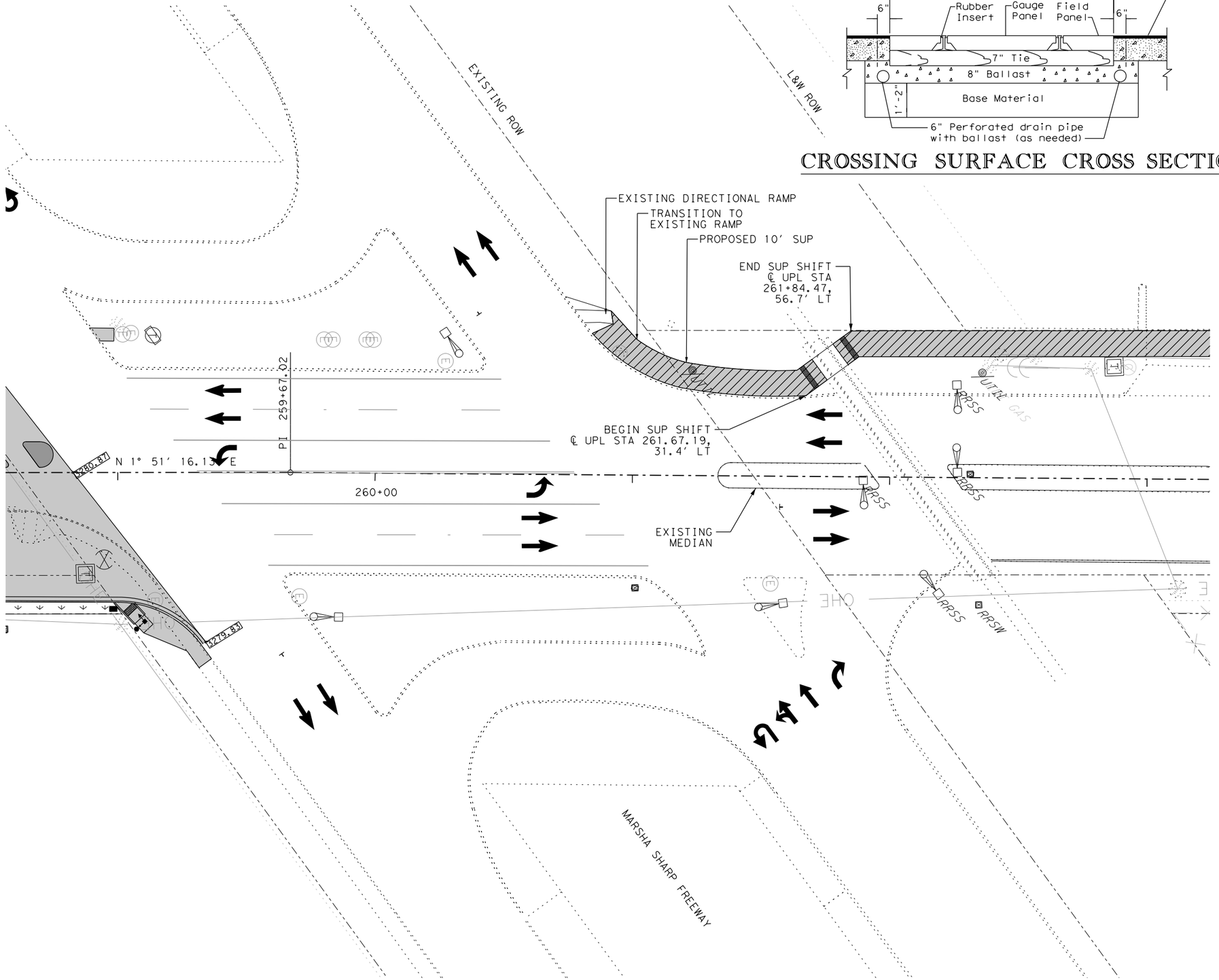
100% SUBMITTAL



CROSSING SURFACE CROSS SECTION





LEGEND

- PROPOSED SHARED USE PATH
- PROPOSED ROADWAY
- PROPOSED CONCRETE CHANNEL
- PROPOSED CONCRETE RIPRAP
- PROPOSED ASPHALT PAVEMENT
- PROPOSED MEDIAN
- PROPOSED SOD/SEED LIMITS
- (D#) DRIVEWAY
- (A#) ALLEY

CURB RADIUS CHART

15' TYPICAL DRIVEWAY
25' TYPICAL CROSSROAD
40' TYPICAL PA(M) INTERSECTION

NOTE:
RADII ARE TYPICAL
UNLESS OTHERWISE NOTED

*SUP = SHARED USE PATH

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation
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UPLAND AVENUE
66TH STREET TO 82ND STREET

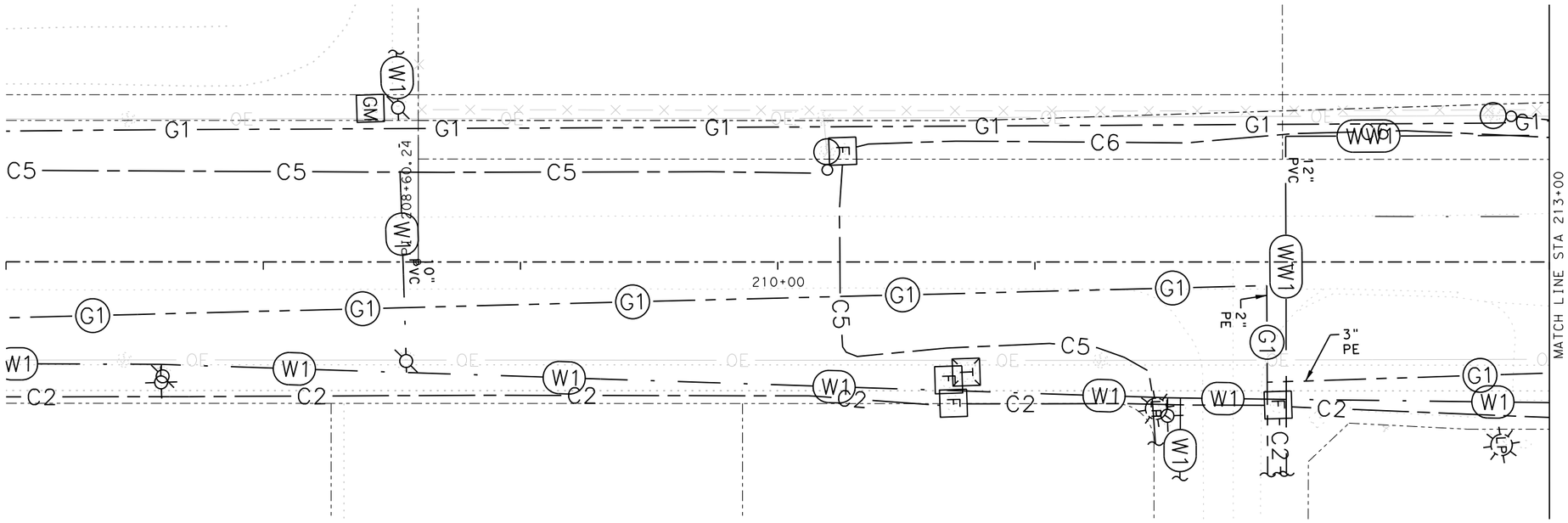
EXHIBIT A

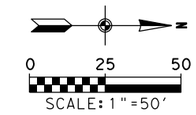
UPLAND AVE AT MARSHA SHARP FREEWAY

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	241
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





CAUTION!
EXISTING OVERHEAD AND UNDERGROUND ELECTRIC LINES

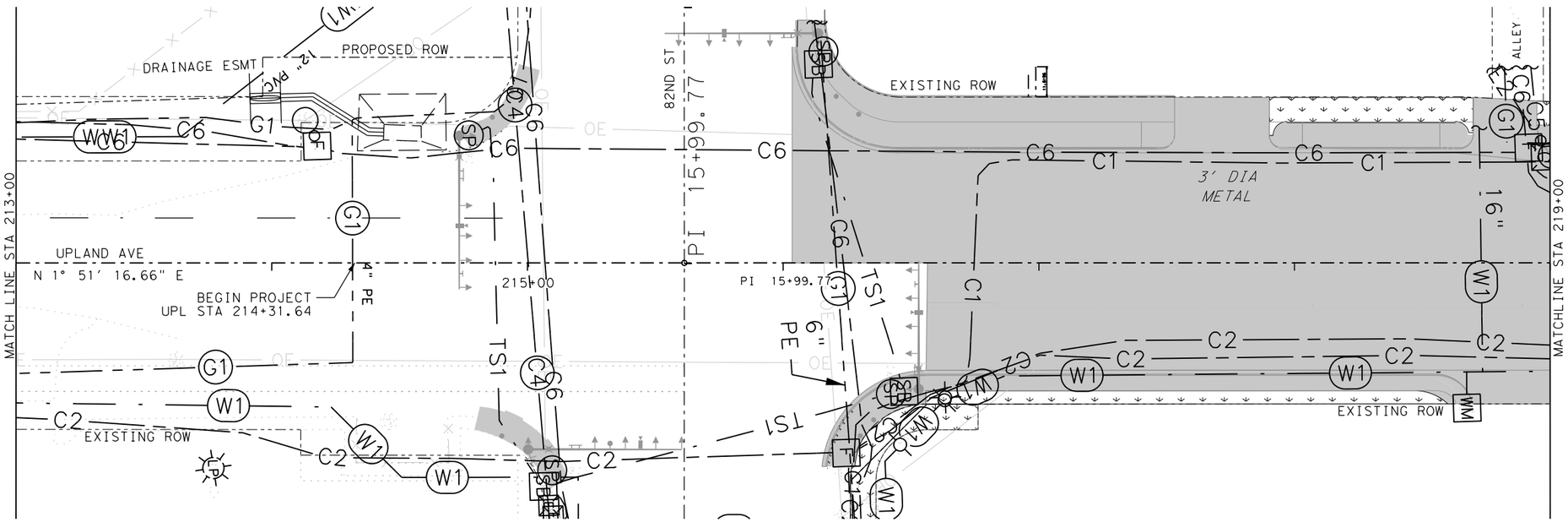
NOTE:
1. UTILITIES SHOWN ARE A GENERAL REPRESENTATION OF KNOWN OR PROPOSED LOCATIONS. UPON REQUEST BY THE CONTRACTOR, ENGINEER MAY MAKE AVAILABLE SUB-SURFACE UTILITY ENGINEERING (SUE) PLANS. CONTRACTOR IS RESPONSIBLE FOR LOCATION VERIFICATION THROUGH DIGTESS AND/OR FRANCHISE UTILITY OWNER. UTILITIES WILL BE RELOCATED BY UTILITY OWNER.

LEGEND

QL "B"
- C5 — SUDDENLINK CABLE
- C6 — SUDDENLINK (FO/DUCT)
- C7 — TXDOT (FO/DUCT)
- C1 — AT&T (TELE)
- C2 — AT&T (FO/DUCT)
- E2 — SOUTH PLAINS ELECTRIC

QL "C"/QL "D"
- ROW
- WW1 — SANITARY SEWER
- G1 — ATMOS
- C4 — NTS (FO/DUCT)
- E2 — PROPOSED SOUTH PLAINS ELECTRIC
- W1 — CITY OF LUBBOCK WATER

- WATER VALVE
- FIRE HYDRANT
- MAILBOX
- UTILITY POLE



STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

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UPLAND AVENUE
66TH STREET TO 82ND STREET
EXISTING UTILITY LAYOUT

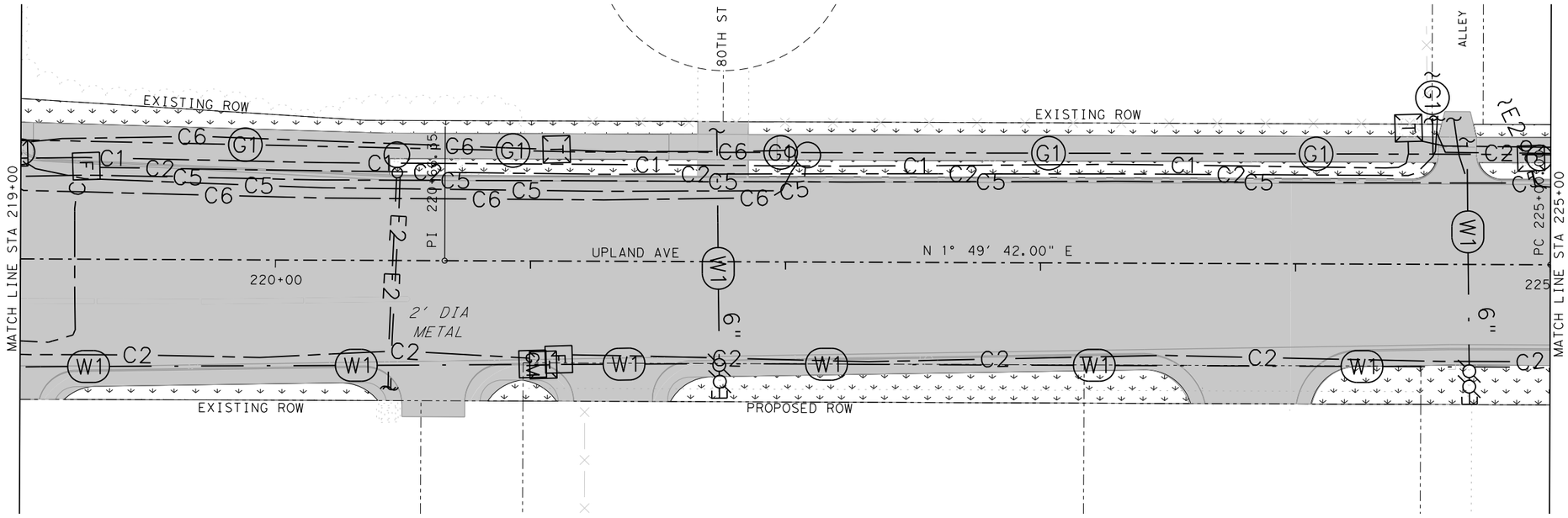
BEGIN TO UPL STA 219+00

SHEET 1 OF 6

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	242
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



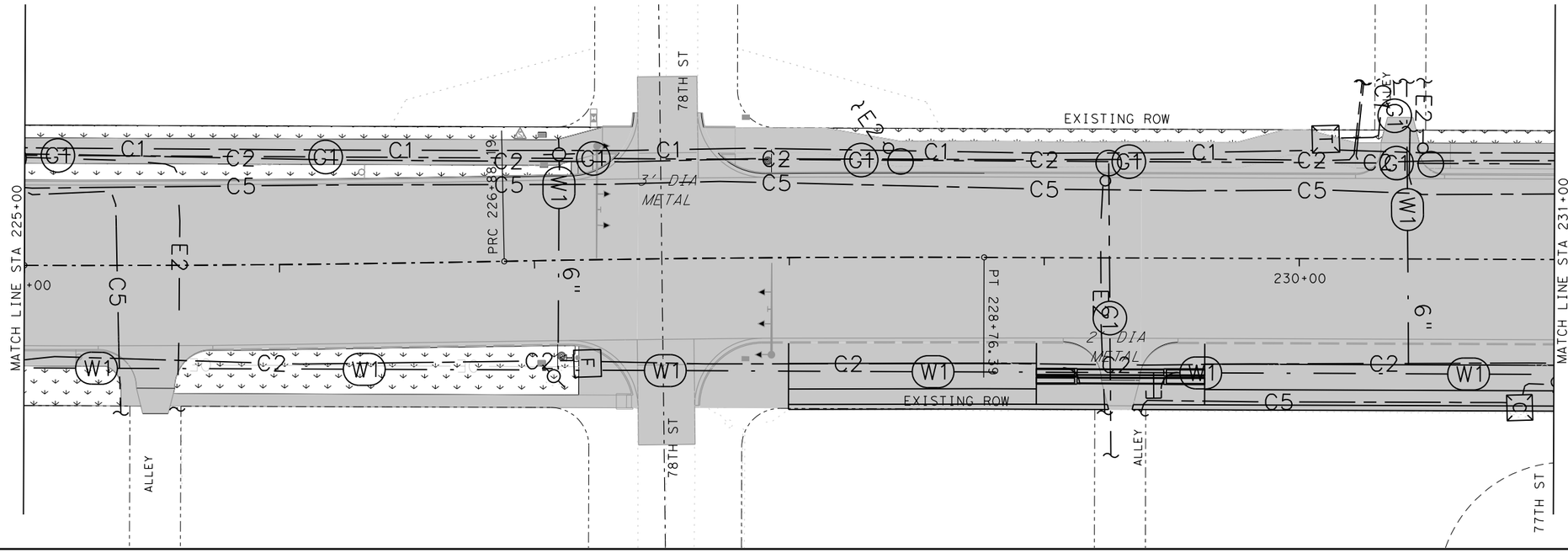
0 25 50
SCALE: 1"=50'

CAUTION!
EXISTING OVERHEAD AND UNDERGROUND ELECTRIC LINES

NOTE:
1. UTILITES SHOWN ARE A GENERAL REPRESENTATION OF KNOWN OR PROPOSED LOCATIONS. UPON REQUEST BY THE CONTRACTOR, ENGINEER MAY MAKE AVAILABLE SUB-SURFACE UTILITY ENGINEERING (SUE) PLANS. CONTRACTOR IS RESPONSIBLE FOR LOCATION VERIFICATION THROUGH DIGTESS AND/OR FRANCHISE UTILITY OWNER. UTILITIES WILL BE RELOCATED BY UTILITY OWNER.

LEGEND

QL "B"
- ROW
- QL "C"/QL "D" SANITARY SEWER
- QL "B" AT&T (TELE)
- QL "B" AT&T (FO/DUCT)
- QL "B" SUDDENLINK CABLE
- QL "B" SUDDENLINK (FO/DUCT)
- QL "B" TXDOT (FO/DUCT)
- QL "B" SOUTH PLAINS ELECTRIC
- QL "C"/QL "D" ATMOS
- QL "C"/QL "D" NTS (FO/DUCT)
- PROPOSED SOUTH PLAINS ELECTRIC
- CITY OF LUBBOCK WATER
- WATER VALVE
- FIRE HYDRANT
- MAILBOX
- UTILITY POLE



PEDRO CARRASCO JR. 98380 LICENSED PROFESSIONAL ENGINEER
8/9/2023

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TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

EXISTING UTILITY LAYOUT

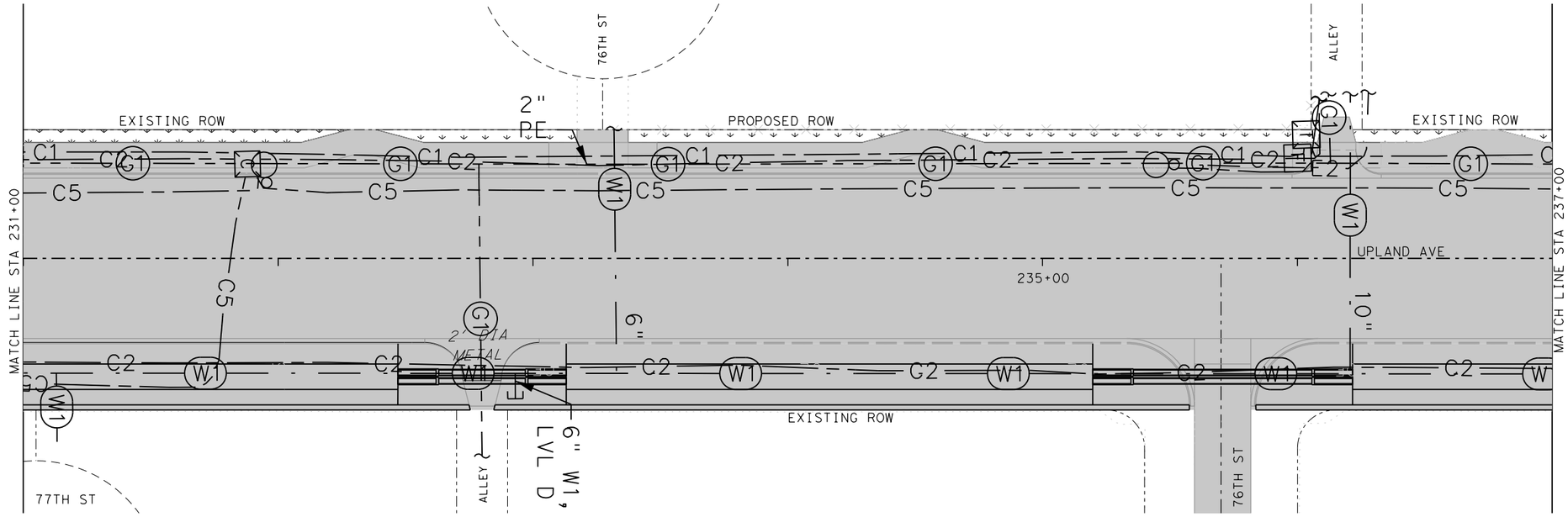
UPL STA 219+00 TO STA 231+00

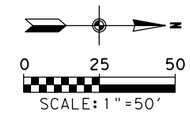
SHEET 2 OF 6

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	243
CONT.	SECT.	JOB	
0905	06	095,ETC.	

100% SUBMITTAL





CAUTION!
EXISTING OVERHEAD AND UNDERGROUND ELECTRIC LINES

NOTE:
1. UTILITES SHOWN ARE A GENERAL REPRESENTATION OF KNOWN OR PROPOSED LOCATIONS. UPON REQUEST BY THE CONTRACTOR, ENGINEER MAY MAKE AVAILABLE SUB-SURFACE UTILITY ENGINEERING (SUE) PLANS. CONTRACTOR IS RESPONSIBLE FOR LOCATION VERIFICATION THROUGH DIGTESS AND/OR FRANCHISE UTILITY OWNER. UTILITIES WILL BE RELOCATED BY UTILITY OWNER.

LEGEND

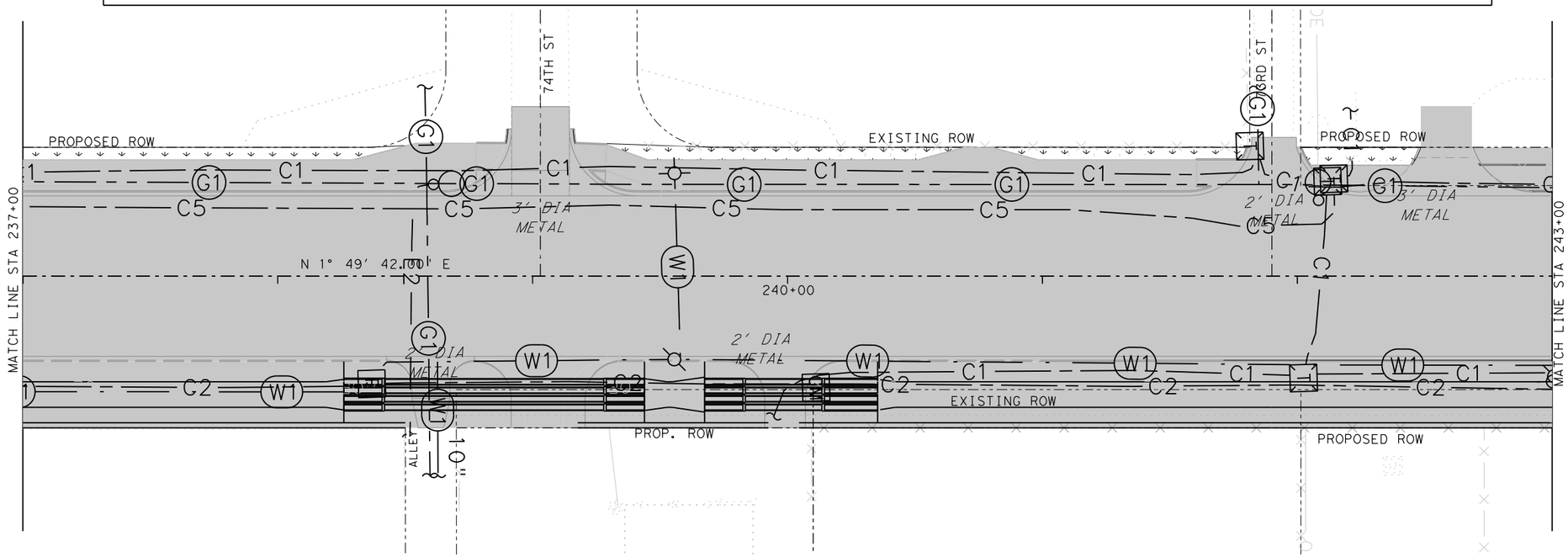
QL "B"
- C5 — SUDDENLINK CABLE
- C6 — SUDDENLINK (FO/DUCT)
- C7 — TXDOT (FO/DUCT)
- E2 — SOUTH PLAINS ELECTRIC

QL "C"/QL "D"
- ROW
- WW1 — SANITARY SEWER

QL "B"
- C1 — AT&T (TELE)
- C2 — AT&T (FO/DUCT)

QL "C"/QL "D"
- G1 — ATMOS
- C4 — NTS (FO/DUCT)
- E2 — PROPOSED SOUTH PLAINS ELECTRIC
- W1 — CITY OF LUBBOCK WATER

- WATER VALVE
- FIRE HYDRANT
- MAILBOX
- UTILITY POLE



STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED PROFESSIONAL ENGINEER
Pedro Carrasco Jr.
8/9/2023

TEXAS FIRM F-928
Kimley»Horn

FREESE AND NICHOLS TEXAS FIRM F-2144

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UPLAND AVENUE
66TH STREET TO 82ND STREET

EXISTING UTILITY LAYOUT

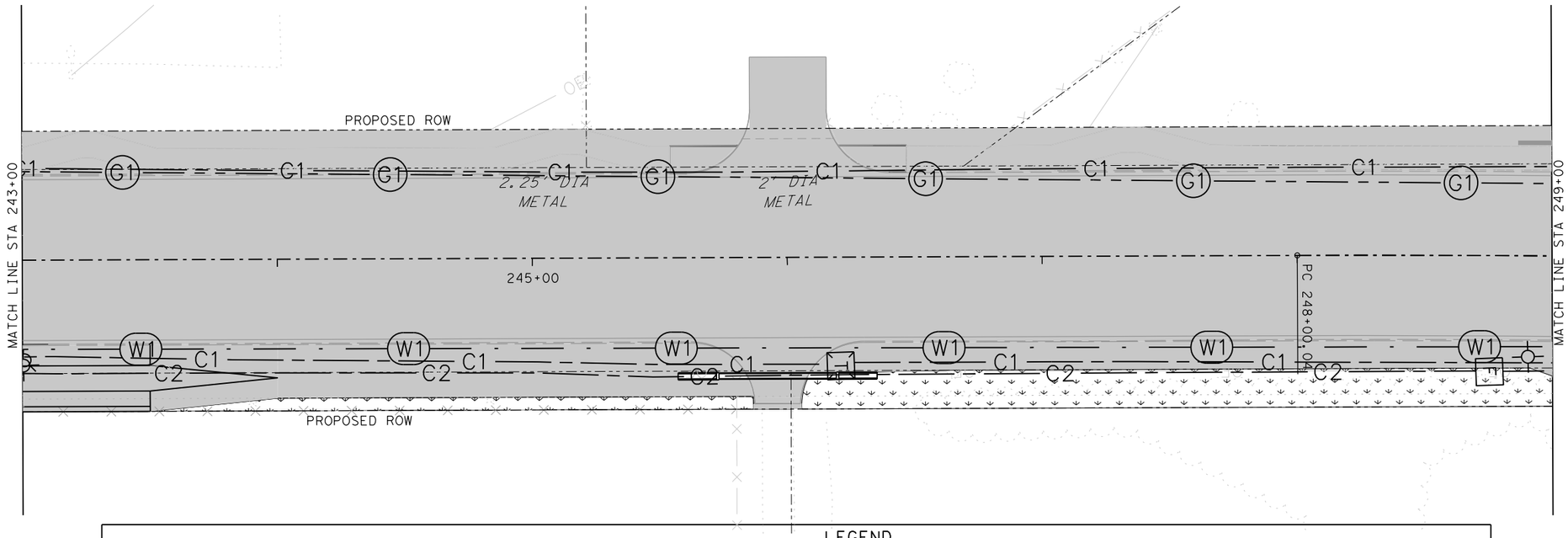
UPL STA 231+00 TO UPL STA 243+00

SHEET 3 OF 6

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	244
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL



0 25 50
SCALE: 1"=50'

CAUTION!
EXISTING OVERHEAD AND UNDERGROUND ELECTRIC LINES

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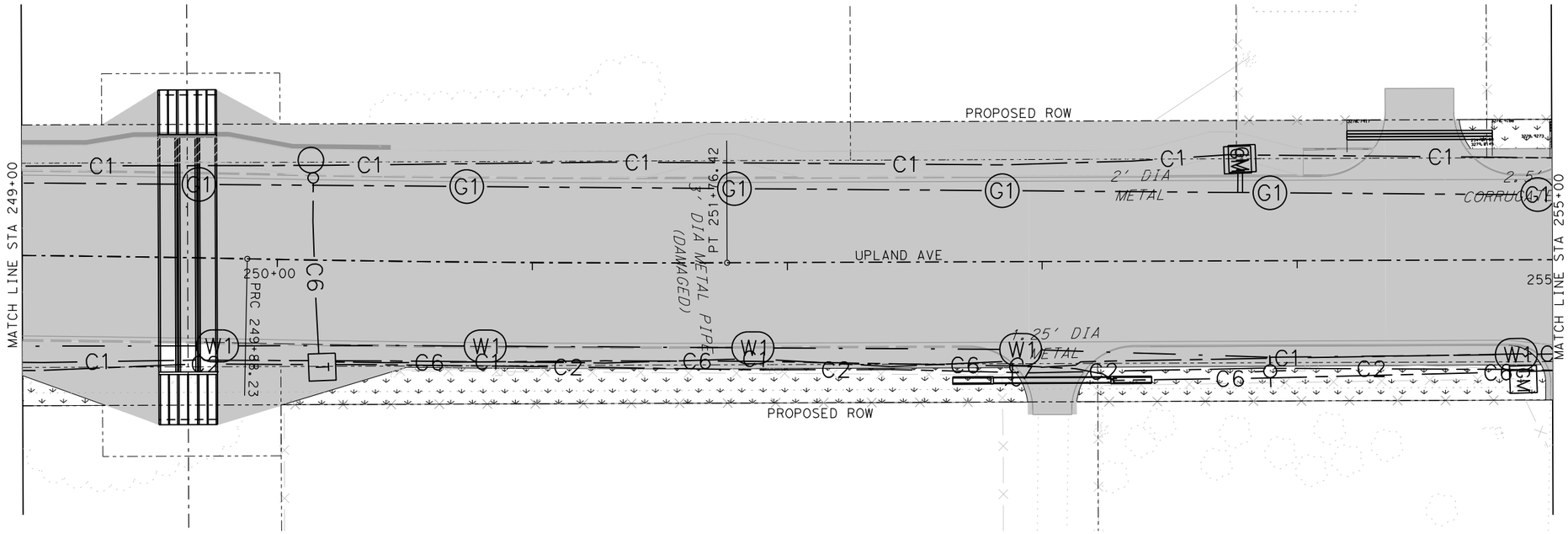
LEGEND

ROW	QL "B" C5 SUDDENLINK CABLE	QL "C"/QL "D" G1 ATMOS	WATER VALVE
QL "C"/QL "D" WW1 SANITARY SEWER	C6 SUDDENLINK (FO/DUCT)	C4 NTS (FO/DUCT)	FIRE HYDRANT
QL "B" C1 AT&T (TELE)	C7 TXDOT (FO/DUCT)	E2 PROPOSED SOUTH PLAINS ELECTRIC	MAILBOX
C2 AT&T (FO/DUCT)	E2 SOUTH PLAINS ELECTRIC	W1 CITY OF LUBBOCK WATER	UTILITY POLE



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8/9/2023

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FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

EXISTING UTILITY LAYOUT

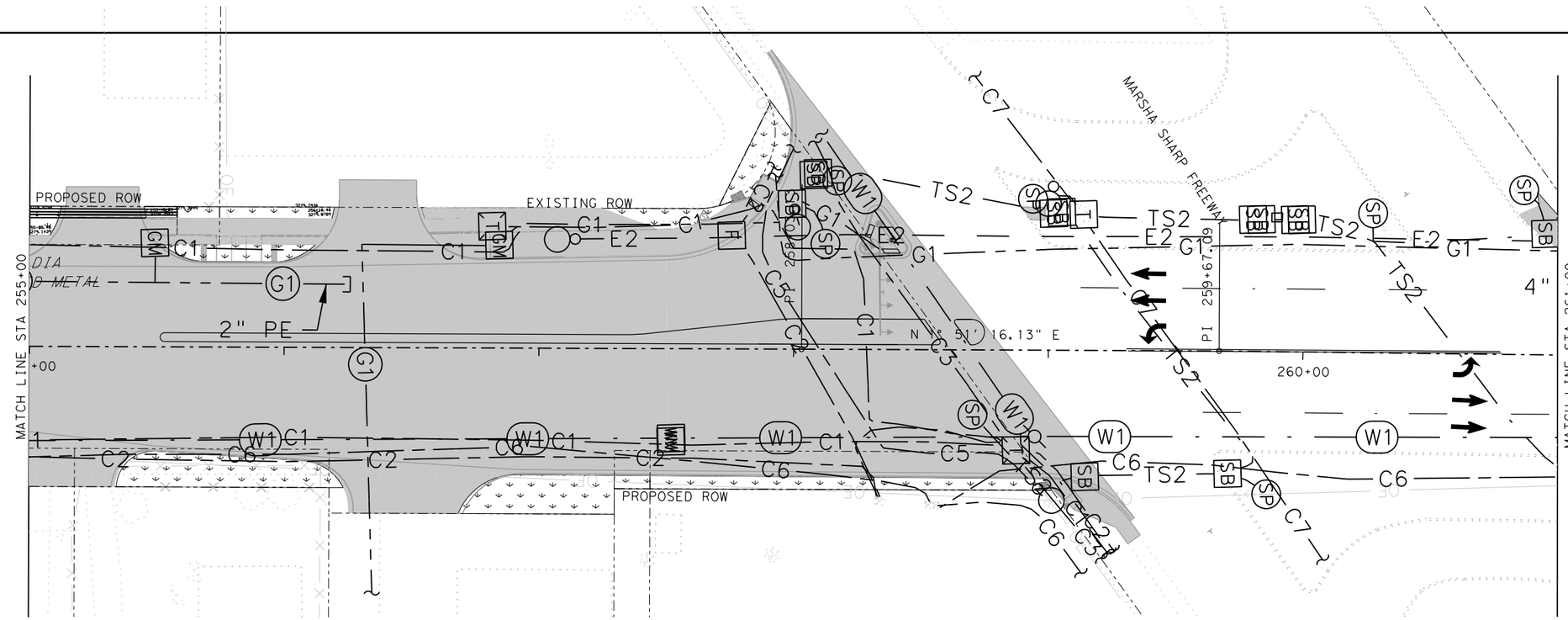
UPL STA 243+00 TO UPL STA 255+00

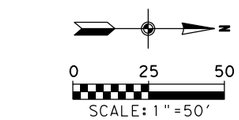
SHEET 4 OF 6

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	245
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





CAUTION!
EXISTING OVERHEAD AND UNDERGROUND ELECTRIC LINES

NOTE:
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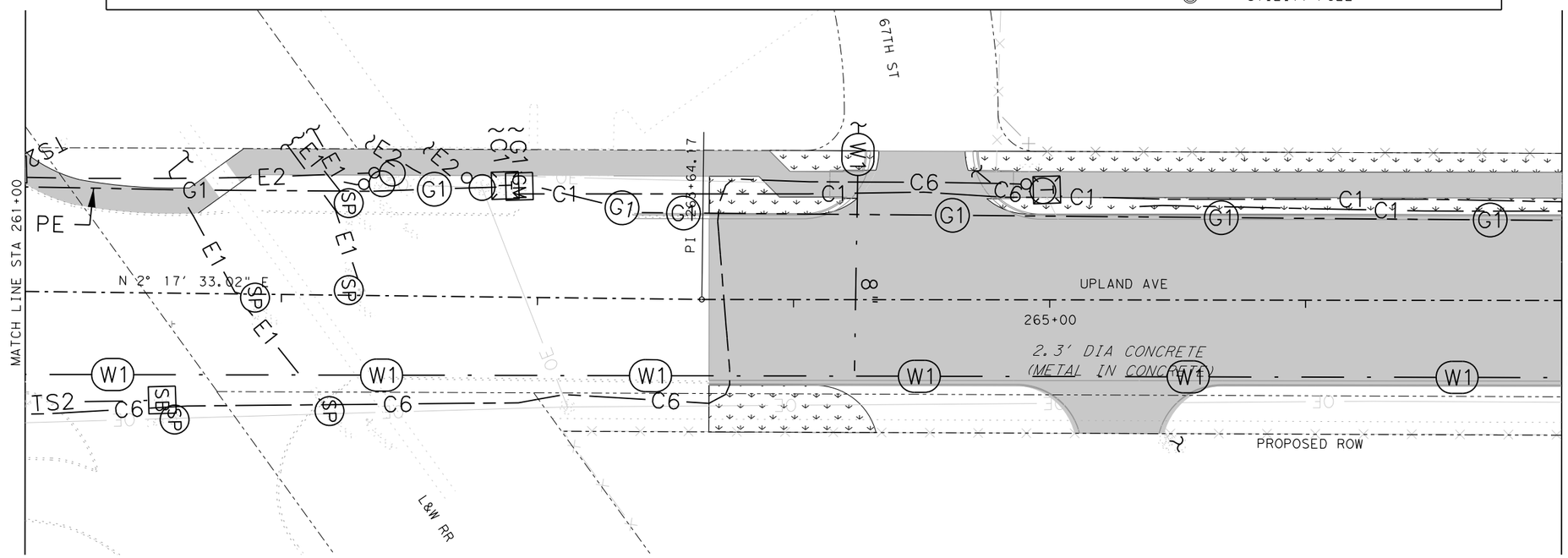
LEGEND

QL "C"/QL "D"
- ROW
- SANITARY SEWER

QL "B"
- AT&T (TELE)
- AT&T (FO/DUCT)
- SUDDENLINK CABLE
- SUDDENLINK (FO/DUCT)
- TXDOT (FO/DUCT)
- SOUTH PLAINS ELECTRIC

QL "C"/QL "D"
- ATMOS
- NTS (FO/DUCT)
- PROPOSED SOUTH PLAINS ELECTRIC
- CITY OF LUBBOCK WATER

- WATER VALVE
- FIRE HYDRANT
- MAILBOX
- UTILITY POLE



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8/9/2023

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UPLAND AVENUE
66TH STREET TO 82ND STREET

EXISTING UTILITY LAYOUT

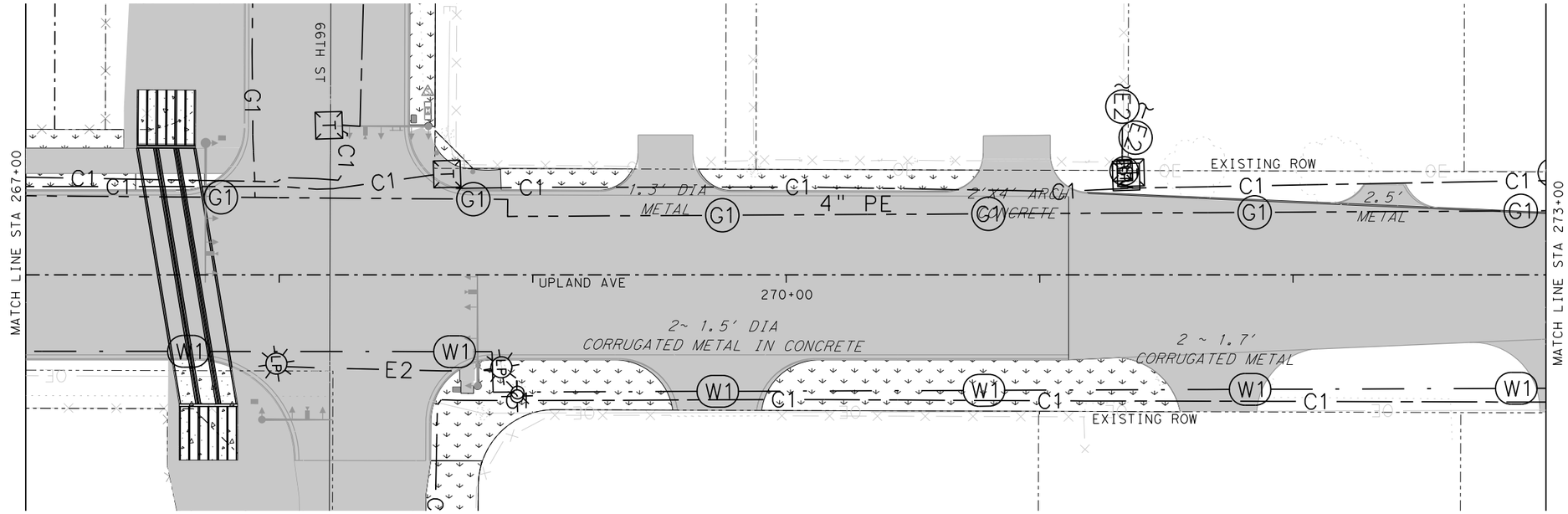
UPL STA 255+00 TO UPL STA 267+00

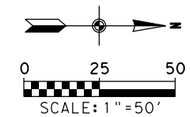
SHEET 5 OF 6

FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	246
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL





CAUTION!
EXISTING OVERHEAD AND UNDERGROUND ELECTRIC LINES

NOTE:
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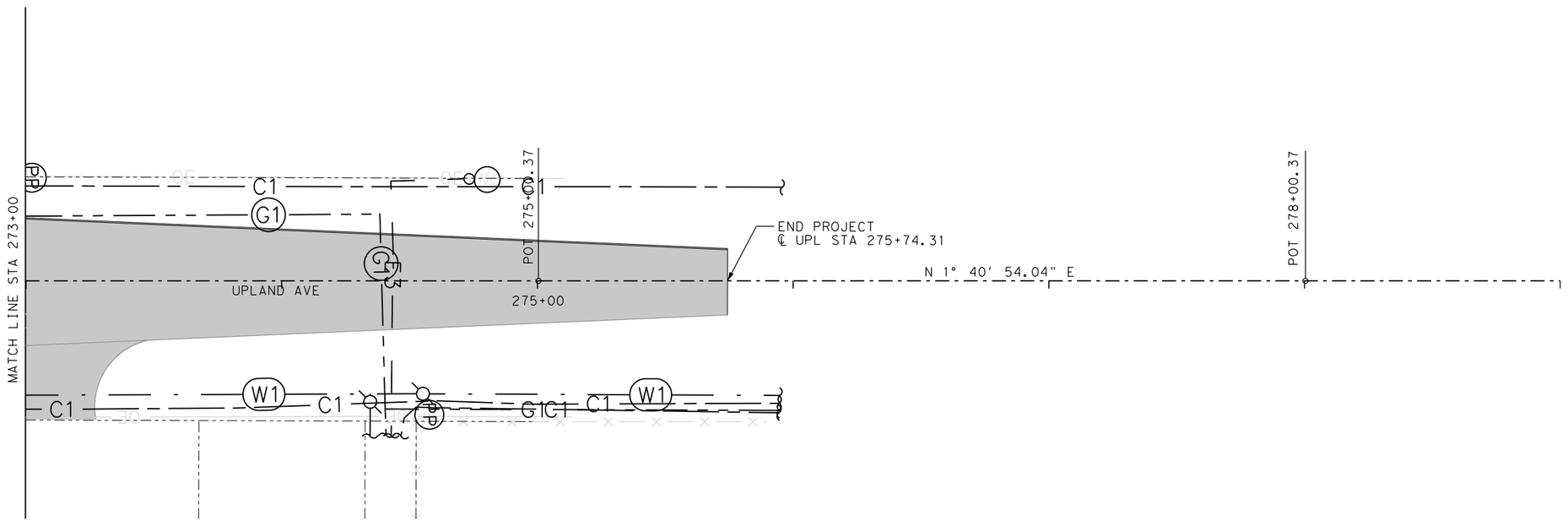
LEGEND

QL "C"/QL "D"
- ROW
- SANITARY SEWER (WW1)

QL "B"
- AT&T (TELE) (C1)
- AT&T (FO/DUCT) (C2)
- SUDDENLINK CABLE (C5)
- SUDDENLINK (FO/DUCT) (C6)
- TXDOT (FO/DUCT) (C7)
- SOUTH PLAINS ELECTRIC (E2)

QL "C"/QL "D"
- ATMOS (G1)
- NTS (FO/DUCT) (C4)
- PROPOSED SOUTH PLAINS ELECTRIC (E2)
- CITY OF LUBBOCK WATER (W1)

- WATER VALVE
- FIRE HYDRANT
- MAILBOX
- UTILITY POLE



STATE OF TEXAS
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8/9/2023

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UPLAND AVENUE
66TH STREET TO 82ND STREET

EXISTING UTILITY LAYOUT
UPL STA 267+00 TO END PROJECT

SHEET 6 OF 6

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	247
CONT.	SECT.	JOB	
0905	06	095,ETC.	

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept in the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0905-06-095

1.2 PROJECT LIMITS:
From: 66TH ST

To: 82ND ST

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 33.5338709 ,(Long) -101.9744057

END: (Lat) 33.5201874 ,(Long) -101.9743898

1.4 TOTAL PROJECT AREA (Acres): 14.33 AC

1.5 TOTAL AREA TO BE DISTURBED (Acres): 14.33 AC

1.6 NATURE OF CONSTRUCTION ACTIVITY:
WIDEN NON-FREEWAY TWO LANES TO FIVE LANES, INCLUDING CEMENT TREAT SUBGRADE, HOTMIX, CRCP, INSTALLING STRUCTURES, SIGNALS, ILLUMINATION, SIGNS, AND PAVEMENT MARKINGS.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
ACUFF LOAM, 0 TO 1 PERCENT SLOPES	85% ACUFF SOILS, WELL DRAINED, NEGLIGIBLE RUNOFF CLASS
ACUFF LOAM, 1 TO 3 PERCENT SLOPES	85% ACUFF SOILS, WELL DRAINED, LOW RUNOFF CLASS
AMARILLO FINE SANDY LOAM, 0 TO 1 PERCENT SLOPES	90% AMARILLO SOILS, WELL DRAINED, NEGLIGIBLE RUNOFF CLASS
ESTACADO CLAY LOAM, 0 TO 1 PERCENT SLOPES	85% ESTACADO SOILS, WELL DRAINED, NEGLIGIBLE RUNOFF CLASS
ESTACADO CLAY LOAM, 1 TO 3 PERCENT SLOPES	85% ESTACADO SOILS, WELL DRAINED, LOW RUNOFF CLASS
OLTON CLAY LOAM, 0 TO 1 PERCENT SLOPES	85% OLTON SOILS, WELL DRAINED, LOW RUNOFF CLASS
RANDALL CLAY, 0 TO 1 PERCENT SLOPES	80% RANDALL SOILS, POORLY DRAINED, NEGLIGIBLE RUNOFF CLASS

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):
PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☐ PSLs determined during preconstruction meeting
☒ PSLs determined during construction
☐ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

☒ Mobilization
☒ Install sediment and erosion controls
☒ Blade existing topsoil into windrows, prep ROW, clear and grub
☒ Remove existing pavement
☒ Grading operations, excavation, and embankment
☒ Excavate and prepare subgrade for proposed pavement widening
☐ Remove existing culverts, safety end treatments (SETs)
☐ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☒ Install culverts, culvert extensions, SETs
☐ Install mow strip, MBGF, bridge rail
☒ Place flex base
☒ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☒ Revegetation of unpaved areas
☒ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

☒ Sediment laden stormwater from stormwater conveyance over disturbed area
☒ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☒ Solvents, paints, adhesives, etc. from various construction activities
☒ Transported soils from offsite vehicle tracking
☒ Construction debris and waste from various construction activities
☒ Contaminated water from excavation or dewatering pump-out water
☒ Sanitary waste from onsite restroom facilities
☒ Trash from various construction activities/receptacles
☒ Long-term stockpiles of material and waste
☒ Other: *Concrete washout pollutants from concrete trucks, concrete pump trucks, and paving equipment.*
☐ Other: _____

Concrete truck wash-out is allowed provided:
a) wash-out of concrete trucks to surface waters in the state, including storm sewer drains and inlets, is prohibited;
b) wash-out shall be to a structural control;
c) the direct discharge of wash-out water is prohibited at all times;
d) the discharge shall not contribute to groundwater contamination;
e) wash-out areas must be shown on the site map;
f) wash-out pits shall be bermed and lined with plastic.

1.11 RECEIVING WATERS:
Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
	PLAYA LAKE 100
	PLAYA LAKE 39A

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☒ Submit NOI/CSN to local MS4
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____

NOTE: Environmental Documentation shall be uploaded to Site Manager and Projectwise within 7 calendar days per CGP Part III.E.

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☒ Submit NOI/CSN to local MS4
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____

NOTE: Environmental Documentation must be readily available.

1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:

MS4 Entity
CITY OF LUBBOCK
CITY OF WOLFFORTH

STATE OF TEXAS
PEDRO CARRASCO JR
98380
LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr 8/9/2023

STORMWATER POLLUTION PREVENTION PLAN (SWP3) NARRATIVE - OVER 1 ACRE

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	248

STATE	STATE DIST.	COUNTY
TEXAS	LBB	LUBBOCK

CONT.	SECT.	JOB	HIGHWAY NO.
0905	06	095, ETC.	CS

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- ☐ ☐ Protection of Existing Vegetation
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☐ X Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- X ☐ Temporary Seeding
- ☐ X Permanent Planting, Sodding or Seeding
- X ☐ Biodegradable Erosion Control Logs
- X ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Vertical Tracking
- ☐ ☐ Interceptor Swale
- ☐ ☐ Riprap
- ☐ ☐ Diversion Dike
- ☐ ☐ Temporary Pipe Slope Drain
- ☐ ☐ Embankment for Erosion Control
- ☐ ☐ Paved Flumes
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- X ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- X ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- X ☐ Sediment Control Fence
- X ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Vegetated Filter Strips
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- ☐ ☐ Sediment Trap
  - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - ☐ 3,600 cubic feet of storage per acre drained
- X ☐ Sedimentation Basin
  - ☐ Not required (<10 acres disturbed)
  - ☐ Required (>10 acres) and implemented.
    - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - ☐ 3,600 cubic feet of storage per acre drained
  - X Required (>10 acres), but not feasible due to:
    - ☐ Available area/Site geometry
    - ☐ Site slope/Drainage patterns
    - ☐ Site soils/Geotechnical factors
    - ☐ Public safety
    - X Other: Right-of-way is limited and the construction of a sedimentation basin would be within the boundaries of the roadway's clear zone and for the safety of motorists, sedimentation basins cannot be constructed within the clear zone. Since sediment basins are not feasible due to a lack of right-of-way, mathematical calculations have not been developed.

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- X Excess dirt/mud on road removed daily
- X Haul roads dampened for dust control
- X Loaded haul trucks to be covered with tarpaulin
- X Stabilized construction exit
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- X Chemical Management
- X Concrete and Materials Waste Management
- X Debris and Trash Management
- X Dust Control
- X Sanitary Facilities
- X Other: *Lidded Dumpster (Part III.G.4.c in CGP)*
- ☐ Other: _____

Litter and Construction Debris:
Storage of construction and waste materials on-site shall be temporary. The project contractor shall establish a schedule for the regular removal of litter and construction debris; this schedule shall be approved by the project engineer; and, once approved, implemented by the contractor. As needed, the project engineer shall direct the contractor to establish good housekeeping measures consistent with the TCEQ's Construction General Permit.

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- X Fire hydrant flushings
- X Irrigation drainage
- X Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- X Potable water sources
- X Springs
- X Uncontaminated groundwater
- X Water used to wash vehicles or control dust
- X Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

NOTE: Discharges from dewatering activities are prohibited unless managed by appropriate controls per the CGP. Part III.G.3

2.8 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3 .

Inspection of Controls:

Lubbock District: an informal inspection of controls shall occur every work day; a formal inspection of controls accompanied by an inspection report using Form 2118 shall occur every seven calendar days. Inspectors must inspect disturbed areas that have not been finally stabilized, areas that are used for storage of materials and that are exposed to rain, discharge locations and structural controls for evidence of, or the potential for, pollutants entering the drainage system. The SW3P must be modified based on the results of inspections to better control pollutants in runoff. Revisions to the SW3P must be completed within seven calendar days following inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the SW3P and wherever possible those changes implemented before the next storm event.

2.9 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

STORMWATER POLLUTION PREVENTION PLAN (SWP3) NARRATIVE - OVER 1 ACRE

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		249
STATE	STATE DIST.	COUNTY	
TEXAS	LBB	LUBBOCK	
CONT.	SECT.	JOB	HIGHWAY NO.
0905	06	095, ETC.	CS

DESCRIPTION OF BMPs USED TO MINIMIZE POLLUTION IN RUNOFF:
EROSION AND SEDIMENT CONTROLS: If it is necessary to pump water, BMP's shall be used to reduce the off-site transport of sediment. BMP's shall be installed per the manufacturer specifications or as directed by the Engineer.

GENERAL SCHEDULE FOR IMPLEMENTATION OF SW3P CONTROLS:

CONTROL	IMPLEMENTATION SCHEDULE AND DESCRIPTION	REMOVAL SCHEDULE
general, various controls	control measures are to be provided at a time and in a manner that will minimize impacts to receiving waters	at final stabilization; at the resumption of construction (temporary measures); at the direction of the SW3P plan; at the direction of the project manager
rock filter dams	to be installed prior to soil disturbing activities in the surrounding areas	at final stabilization or as directed by the project engineer
sandbag berms	to be installed prior to the start of construction; sandbag berms are to serve as water velocity dissipaters, as ditch blocks, as sedimentation basins, in support of other control devices, and as a final multiple control for water leaving the construction zone	at final stabilization or as directed by the project engineer
silt fence	silt fence will be installed prior to the start of construction along right-of-way lines silt fence will be installed as quickly as feasible (where it is reasonable to do so) at the toe of header bank and other slopes silt fence may be installed at the start of construction, during construction as appropriate, and during construction to support other controls as needed	at final stabilization or as directed by the project engineer at final stabilization or as directed by the project engineer at the removal of the construction exit, at final stabilization, or as directed by the project engineer
tackifiers/emulsions	soil tackifiers may be used to control dust	erosion controls that are designed to remain in-place for a indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal (CGP, page 23)
water	to be used to suppress dust and compact dirt on an as needed schedule	erosion controls that are designed to remain in-place for a indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal (CGP, page 23)
seed, temporary	to be installed, when apprppriate, in disturbed areas where construction has temporarily ceased for 21 days	erosion controls that are designed to remain in-place for a indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal (CGP, page 23)
seed, permanent	to be installed as a final stabilization measure where construction is complete or as directed by the Engineer	erosion controls that are designed to remain in-place for a indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal (CGP, page 23)
construction exits	to be installed at all construction vehicle exit points to publicly traveled ways prior to the use of these exits by construction vehicles	as directed by construction conditions or by the Engineer
erosion control logs	to be installed prior to the start of construction; erosion control logs are to serve as water velocity dissipaters, as ditchblocks, as sedimentation basins, and in support of other control devices.	as directed by construction conditions or by the Engineer
soil retention blankets	to be installed as a final stabilization measure where construction is complete or as directed by the Engineer	erosion controls that are designed to remain in-place for a indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal (CGP, page 23)
inlet protectors	to be installed to cover curb inlets with support from sandbags or as directed by the Engineer	as directed by construction conditions or by the Engineer
compost socks	to be installed as channel blocks, inlet protectors, and to support sandbag berms, silt fences or as directed by the Engineer	as directed by construction conditions or by the Engineer

Notes from the Lubbock District:
-This is a general schedule for the installation of and removal of SW3P best management practice controls. The final determination of the implementation and removal of controls is at the discretion of the project engineer.
-Control measures must be properly selected, installed, and maintained according to the manufacturer's or designer's specifications. If periodic inspections or other information indicates control has been used incorrectly, or that the control is performing inadequately, the operator must replace or modify the control as soon as practicable after the discovery that the control has been used incorrectly, is performing inadequately, or is damaged.
-Sediment must be removed from traps and sedimentation ponds no later than the time that design capacity has been reduced by 50 percent.
-If sediment escapes the site, accumulations must be removed at a frequency to minimize further negative effects, and whenever feasible, prior to the next rain event.
-Controls must be developed to limit, to the extent practicable, the off-site transport of litter, construction debris, and construction materials.
-Erosion and sediment controls must be designed to retain sediment on-site to the extent practicable with consideration for local topography, soil type, and rainfall. Controls must also be designed and utilized to reduce the off-site transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water.

MAINTENANCE REQUIREMENTS:
Control measures shall be properly installed and maintained according to the manufacturer's specifications. Sediment must be removed from BMP's as directed by the SW3P plan requirements, and as directed by the manufacturer's recommendations, but no later than the time at which the capacity of the BMP has been reduced by 50 percent. If sediment or other pollutants escape the site, accumulations will be removed to reduce further negative effects. If inspections or other information indicates a control has been installed, used, or is performing inadequately, the contractor must modify or replace the control as soon as practicable after the problem is discovered. Controls shall be maintained in effective operating condition. If inspections determine that BMPs are not operating effectively, maintenance shall be performed as necessary to continue the effectiveness of the controls. Controls that have been intentionally disabled, run over, removed, or otherwise made ineffective, must be corrected or replaced at discovery.

LITTER AND CONSTRUCTION DEBRIS:
The project contractor shall establish a schedule for the regular removal of litter and construction debris; this schedule shall be approved by the project engineer; and, once approved, implemented by the contractor. As needed, the project engineer shall direct the contractor to establish good housekeeping measures consistent with the TCEQ's Construction General Permit.

DESCRIPTION OF PERMANENT STORM WATER CONTROLS:
PERMANENT STORM WATER CONTROLS: A description of controls that will stay in-place after construction is completed must be included in the SW3P.

1. Riprap: concrete riprap can be installed as a permanent stabilization measure at locations where construction is completed must be included in the SW3P.
2. Existing Vegetation & Vegetative Buffers: to the extent practicable, existing vegetation will not be disturbed by construction activities; and, where feasible (especially at storm water discharge sites), existing vegetation will remain undisturbed to form a vegetative buffer between construction areas and areas undisturbed by construction.
3. Permanent Sodding/Seeding & Plantings: this is the establishment of permanent perennial vegetation. Permanent vegetation stabilizes soil by holding soil particles in-place. Vegetation filters sediments, helps soil absorb water, improves wildlife habitat, and enhances aesthetics of the site.
4. Permanent vegetation will remain in vegetated channels.

SEDIMENT CONTROL PRACTICES:
1. Sandbags: the purpose of a sandbag is to intercept sediment laden storm water from disturbed areas, create a detention pond, detain sediment and release water in a sheet flow. Sandbag berms are a general purpose sediment control device and will be used throughout the project to detain sediment on site. Sandbags will be placed in ditches and channels to form sedimentation basins. Sandbags will also be used where runoff exits the construction site to enter receiving waters and to support other storm water controls.
2. Silt fence: silt fence is to be installed with construction near the perimeter of a disturbed area to intercept sediment while allowing water to percolate through. This is a general use control that will be used to create detention basins that retain sediment on-site; they will also be used in support of other controls such as construction exits and rock filter dams.
   Silt fence will be used along playa lakes to reduce the loss of sediment from roadway front slopes; it may be used in ditches, channels, discharge points to support sandbag berms; may be used to support stabilized construction exits.
3. Rock Filter Dams: the purpose of a rock filter dam is to intercept and slow sediment laden water runoff from disturbed areas, retain the sediment and release the water in sheet flow. Rock filter dams will generally be used in high water velocity flow channels.
4. Stabilized Construction Exit: the purpose of the stabilized exit is to reduce the tracking of sediment and dirt onto public roadways beyond the construction zone.
   Stabilized Construction Exits are to be in-place at exit points to streets and thoroughfares in urban areas and are to be used by all construction vehicles regardless of size. They are to be supported where appropriate with silt fence and mechanized brooms.

Sediment basins are required where feasible for common drainage locations that serve an area with 10 or more acres disturbed at one time. Temporary or permanent sediment basins that provide water storage capacity are located on the project; the following controls provide, where feasible, structural controls / sediment basins:
1. Sandbag Berm as a Sediment Basin: a temporary basin designed to intercept sediment-laden storm water runoff and to trap sediment on-site.
2. Vegetative Buffer Strip: vegetative buffer strips reduce water velocity which reduces the potential of water erosion and allows sediments to fall out of the storm water.
3. Silt Fence will be used to reduce the loss of sediment from roadway front slopes adjacent to playa lakes by filtering out silt laden storm water from construction area.

Erosion control and stabilization measures must be initiated immediately in portions of the site where construcion activities have ceased and will not resume for a period exceeding 14 calendar days. Stabilization measures that provide a protective cover must be initiated immediately in portions of the site where construction activities have permanently ceased (CGP Part III Sect. F2(b)iii page 33).

STABILIZATION PRACTICES AND OTHER REQUIRED CONTROLS AND BMPs:
1. Stabilized Construction Exit: a stabilized pad of stone, timber, or other stabilized surface located at points where construction traffic will leave the construction zone to enter a public roadway. The purpose of the stabilized exit is to reduce the tracking of sediment and dirt onto public roadways beyond the construction zone. Stabilized Construction Exits will be placed as needed.
2. Water: water will be used to temporarily suppress dust and compact dirt.
3. Tackifiers: tackifiers such as asphalt emulsion, guar, (and other natural tackifiers), and synthetic tackifiers will be used to control air (dust) & water erosion.
4. Existing Vegetation & Vegetative Buffers: to the extent practicable, existing vegetation will not be disturbed by construction activities; where feasible (especially at storm water discharge sites), existing vegetation will remain undisturbed to form a vegetative buffer between construction areas and areas undisturbed by construction.
5. Cleaning and Sweeping: clean and sweep curb and gutter sections twice a month to reduce dirt and trash or as directed.
6. Riprap: concrete riprap can be installed as a permanent stabilization measure at locations where construction is complete and permanent stabilization is required.
7. Tracking and Dust: Off-site tracking and generation of dust must be minimized.

ON-SITE STORAGE OF CONSTRUCTION AND WASTE MATERIALS:
1. Disposal methods must meet federal, state, and local waste management requirements. No construction waste shall be buried or burned on-site. Spoils of disposal, material storage, and waste materials from the demolition of existing roads and structures shall be stored in areas designated by the project engineer, and prevented from becoming a pollutant source with appropriate BMPs. Construction and waste materials that might be temporarily stored on-site include concrete and steel pipe; steel reinforcing bar, forms and frames; sand and gravel; wire, concrete and steel beams; wood and steel building units; and controls, construction signs and barricades. A list of construction and waste materials stored on site and controls will be presented to the Project Engineer.
2. Contractor shall design and utilize appropriate controls to minimize the offsite transport of suspended sediments and other pollutants, if it is necessary to pump or channel standing water from the site.
3. Litter, construction debris, and construction material exposed to stormwater shall be managed in a manner that prevents this material from becoming a pollutant. A regular sweep of the project shall be made to pick up litter. No construction material of any kind (including dirt) shall be discharged to a water of the United States (ephemeral streams and playa lakes) without a permit from the Corps of Engineers.
4. Oil, gasoline, grease, solvents, and other petroleum products are not to be stored on-site. Major vehicle maintenance shall occur on-site only under emergency conditions, and when this maintenance type is necessary, a plastic cover shall be used (and properly disposed of) to prevent petroleum products from contaminating the surrounding soil.
5. Potential Pollutant Sources from Areas Other than Construction:
   oil, grease, and other petroleum fluids construction traffic at concrete plant and field office
   sediment laden stormwater disturbed soil from concrete batch plant and field office
   litter, motorists driving through the project

All best management practices available to this construction project are available to control non-construction generated pollutants including sand bag berms, silt fence, stabilized construction exits, sedimentation basins, and litter management programs among other controls listed in this document.

STORAGE TANKS:
Storage tanks that are above ground, regardless of whether they are used to store petroleum products, hazardous waste, or other hazardous material must follow the Summary of Federal Requirements.

Aboveground storage tanks (ASTs) used for the storage of petroleum products is regulated primarily under 40 CFR 112. These containers are used for purposes including, but not limited to, the storage of oil prior to use, while being used, or prior to further distribution in commerce.

A bulk storage container is 55 gal. or greater and may be aboveground, partially buried, bunkered, or completely buried. AST's include mobile storage containers such as trailers and tanked vehicles. Oil-filled electrical, operating, or manufacturing equipment is not a bulk storage container.

All bulk storage container installations must be constructed so a secondary means of containment is provided for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. Diked areas must be sufficiently impervious to contain discharged oil.

Mobile/Portable AST:
Mobile or portable oil bulk storage containers must be positioned or located to prevent a discharge and furnished with a secondary means of containment, such as a dike or catchment basin, sufficient to contain the capacity of the largest single compartment or container with sufficient freeboard to contain precipitation.

DETERMINATION OF REPORTABLE QUANTITIES:
A list of each substance designated as hazardous in 40 CFR Part 116 is found in the project's SW3P folder. The 40 CFR 116 registration applies to quantities, when discharged into or upon the Waters of the United States, adjoining shorelines, into or upon the contiguous zone, or beyond the contiguous zone as provided in the Act.

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER

Pedro Carrasco Jr. 8/9/2023

STORMWATER POLLUTION PREVENTION PLAN (SWP3) NARRATIVE - OVER 1 ACRE

Sheet 3 of 3

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		250
STATE	STATE DIST.	COUNTY	
TEXAS	LBB	LUBBOCK	
CONT.	SECT.	JOB	HIGHWAY NO.
0905	06	095, ETC.	CS

100% SUBMITTAL

SUMMARY OF EROSION CONTROL ITEMS								
	0506 6002	0506 6011	0506 6020	0506 6024	0506 6038	0506 6039	0506 6042	0506 6043
	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE) (ROCK FILTER DAMS)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE) (CONSTRUCTION EXITS)	TEMP SDMT CONT FENCE (INSTALL)	TEMP SDMT CONT FENCE (REMOVE)	*BIODEG EROSN CONT LOGS (INSTALL) (18")	*BIODEG EROSN CONT LOGS (REMOVE)
STATIONING	LF	LF	SY	SY	LF	LF	LF	LF
BEGIN PROJECT TO STA 219+00			112	56			540	270
STA 219+00 TO STA 231+00			112	56			600	300
STA 231+00 TO STA 243+00			112	56			324	162
STA 243+00 TO STA 255+00	128	64	112	56				
STA 255+00 TO STA 267+00	25	13	112	56	25	13	**2938**	**1469**
STA 279+00 TO END PROJECT	25	13	112	56	100	50	640	320
W 66TH ST STA 10+00 TO STA 17+00								
E 66TH ST STA 21+00 TO STA 26+76.97								
PROJECT TOTAL	**178**	**89**	**672**	**336**	**125**	**63**	**5042**	**2521**

SEDIMENT BASINS ARE NOT FEASIBLE ON THE PROJECT BECAUSE OF RIGHT-OF-WAY IS LIMITED AND THE CONSTRUCTION OF A SEDIMENTATION BASIN WOULD BE WITHIN THE BOUNDARIES OF THE ROADWAY'S CLEAR ZONE AND FOR THE SAFETY OF MOTORISTS, SEDIMENTATION BASINS CANNOT BE CONSTRUCTED WITHIN THE CLEAR ZONE. SINCE SEDIMENT BASINS ARE NOT FEASIBLE DUE TO A LACK OF RIGHT-OF-WAY, MATHEMATICAL CALCULATIONS HAVE NOT BEEN DEVELOPED.

CONSTRUCTION EXIT SHALL BE APPROXIMATELY 20' BY 50' LONG.

EROSION CONTROL LOGS SHALL BE SOAKED AT TIME OF INSTALLATION TO HELP HOLD THEM IN PLACE ALONG WITH THE APPLICATION OF WOODEN STAKES.

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TEXAS FIRM F-928
Kimley»Horn

TEXAS FIRM F-2144
FREESE AND NICHOLS

Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET

EROSION CONTROL PLAN SUMMARY

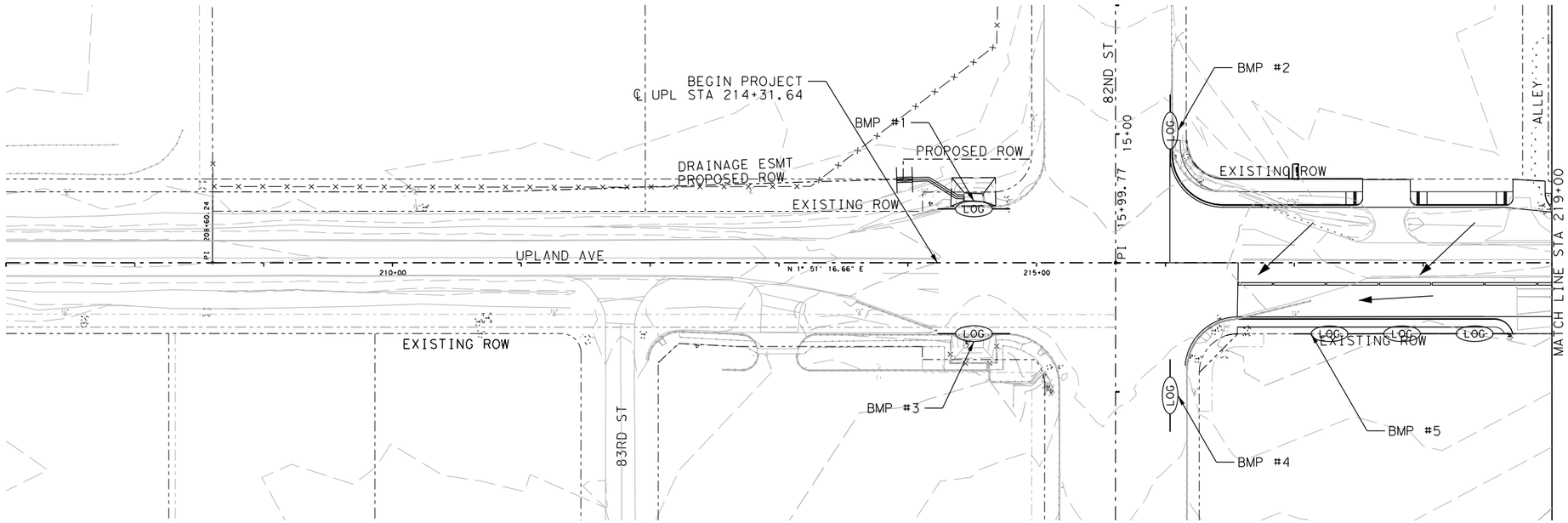
SHEET 1 OF 1

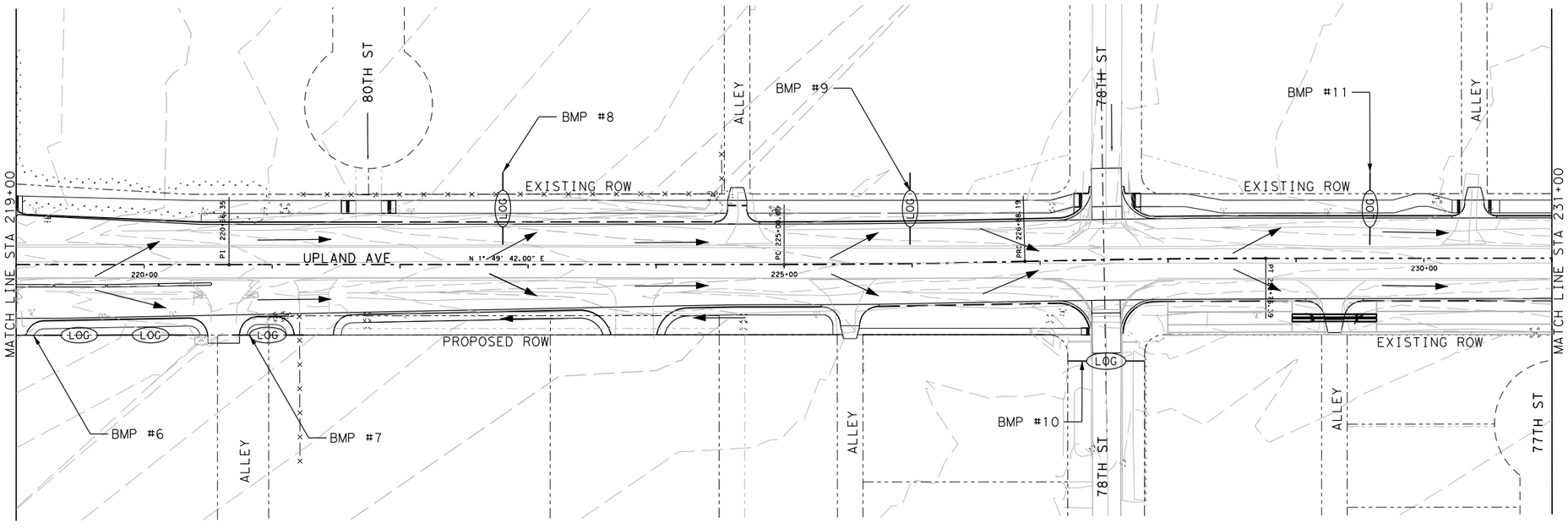
FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	251
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

BMP#	1	2	3	4	5	6	7	8	9	10	11	
Type	Control Log	Control Log	Control Log	Control Log	Control Log	Control Log	Control Log	Control Log	Control Log	Control Log	Control Log	Construction Exit
Quantity (LF)	25	25	25	25	170	143	45	25	25	37	25	400 SY
Install Date												
Remove Date												





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Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
EROSION CONTROL PLAN SUMMARY

BEGIN PROJECT TO STA 231+00

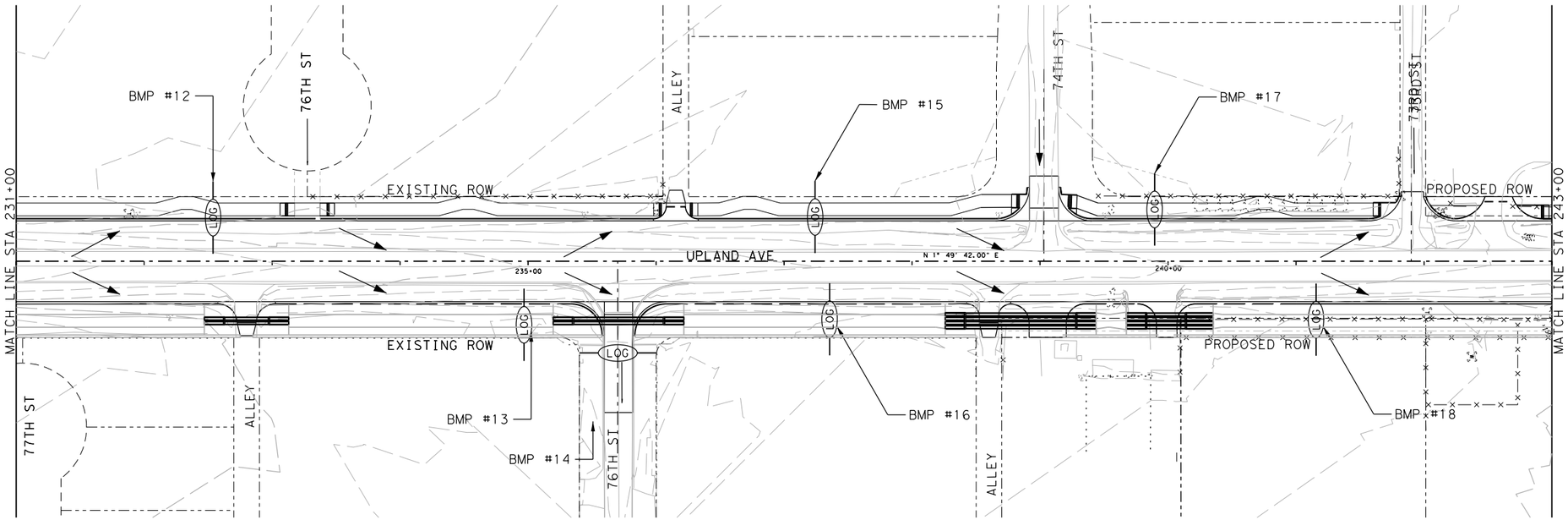
SHEET 1 OF 3

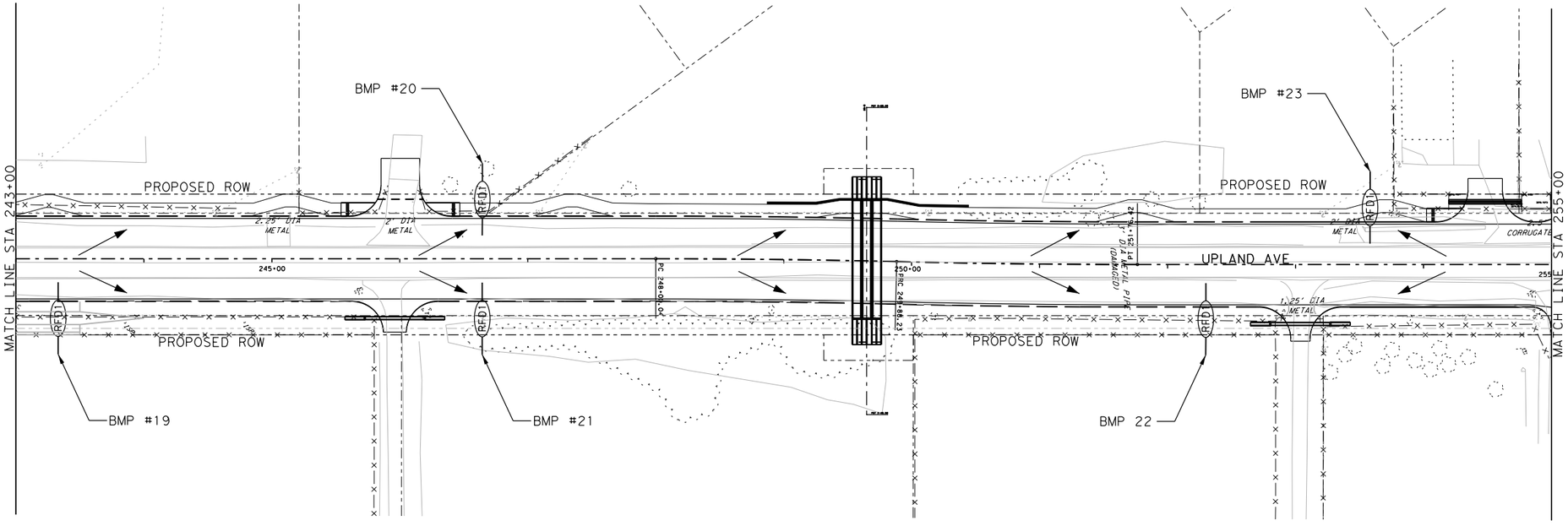
FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	252
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

BMP#	12	13	14	15	16	17	18	19	20	21	22	23
Type	Control Log	Control Log	Control Log	Control Log	Control Log	Control Log	Control Log	Rock Filter	Rock Filter	Rock Filter	Rock Filter	Rock Filter
Quantity (LF)	17	26	38	17	26	17	21	21	17	26	21.5	21.5
Install Date												
Remove Date												





0 50 100
SCALE: 1"=100'

LEGEND

- FLOW ARROWS
- LOG — 18" EROSION CONTROL LOG
- RFD1 — ROCK FILTER DAM
- SCF — SEDIMENT CONTROL FENCE

STATE OF TEXAS
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8/9/2023

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Texas Department of Transportation

UPLAND AVENUE
66TH STREET TO 82ND STREET
EROSION CONTROL PLAN SUMMARY

STA 231+00 TO STA 255+00

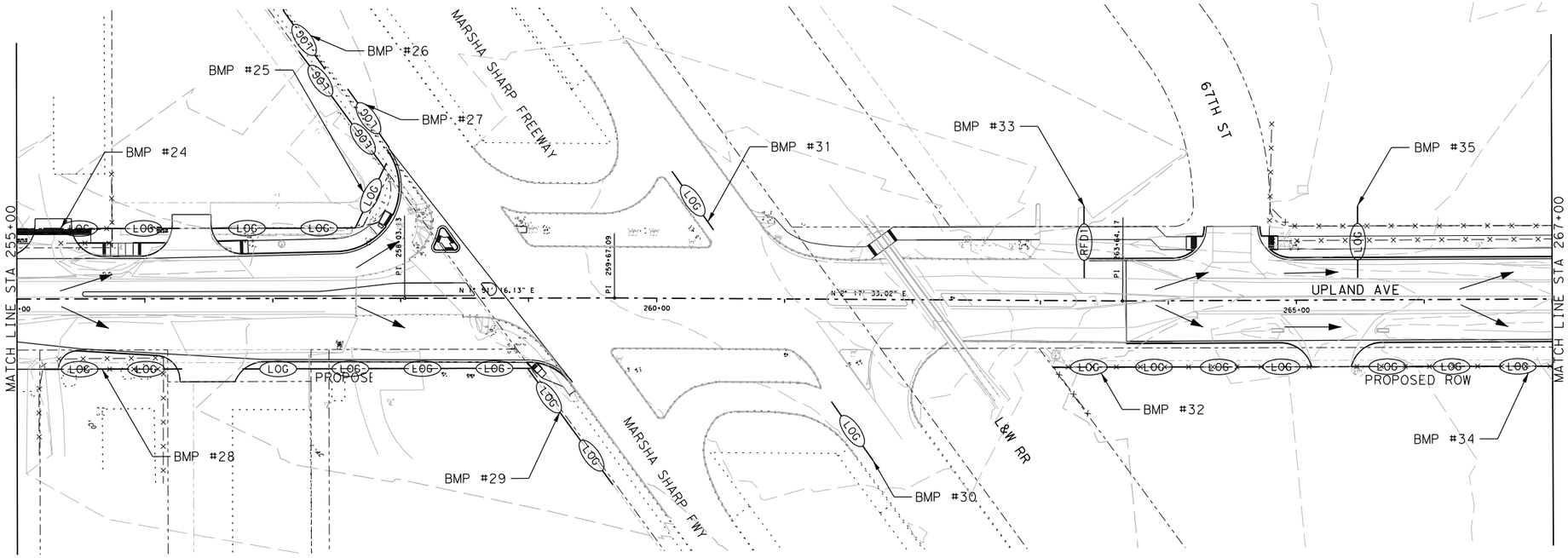
SHEET 2 OF 3

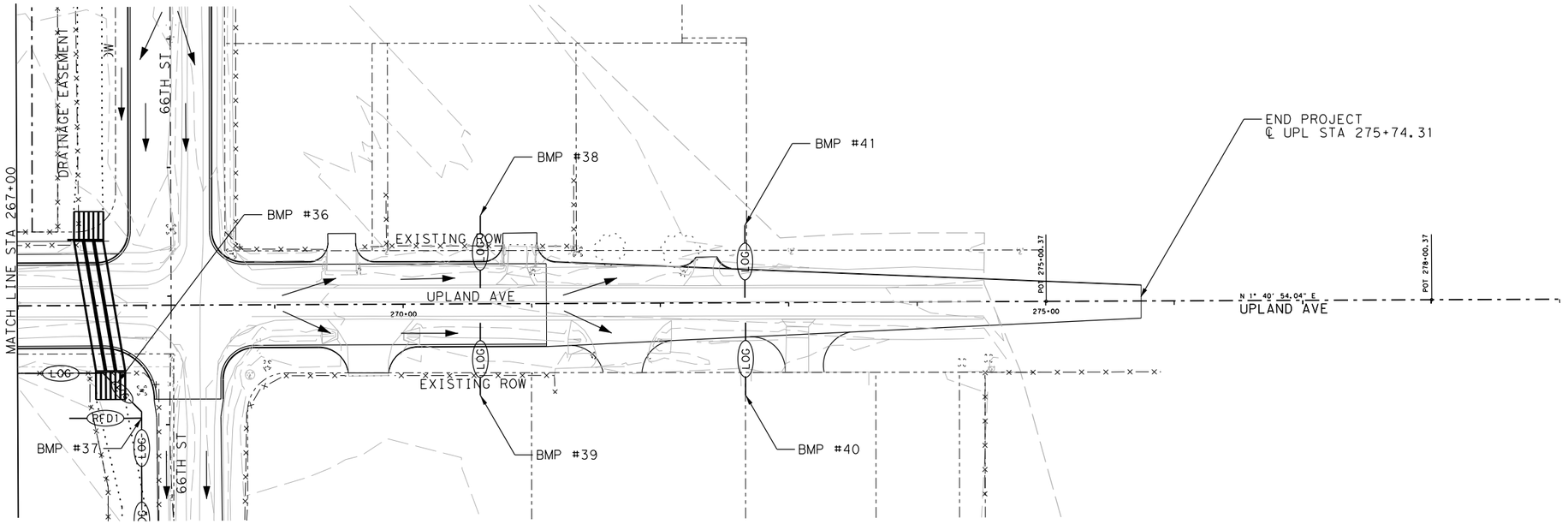
FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	253
CONT.	SECT.	JOB	
0905	06	095, ETC.	

100% SUBMITTAL

BMP#	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
Type	Control Log	Control Log	Control Log	Control Log	Control Log	Control Log	Control Log	Control Log	Rock Filter	Control Log	Control Log	Sediment Control	Control Log	Rock Filter	Control Log	Control Log	Control Log	Control Log	Construction Exit
Quantity (LF)	94	284	25	220	100	336	25	25	25	202	158	25	220	25	25	25	25	25	272 SY
Install Date																			
Remove Date																			





0 50 100
SCALE: 1"=100'

LEGEND
- FLOW ARROWS
- LOG — 18" EROSION CONTROL LOG
- RFD1 — ROCK FILTER DAM
- SCF — SEDIMENT CONTROL FENCE

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8/9/2023

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Texas Department of Transportation

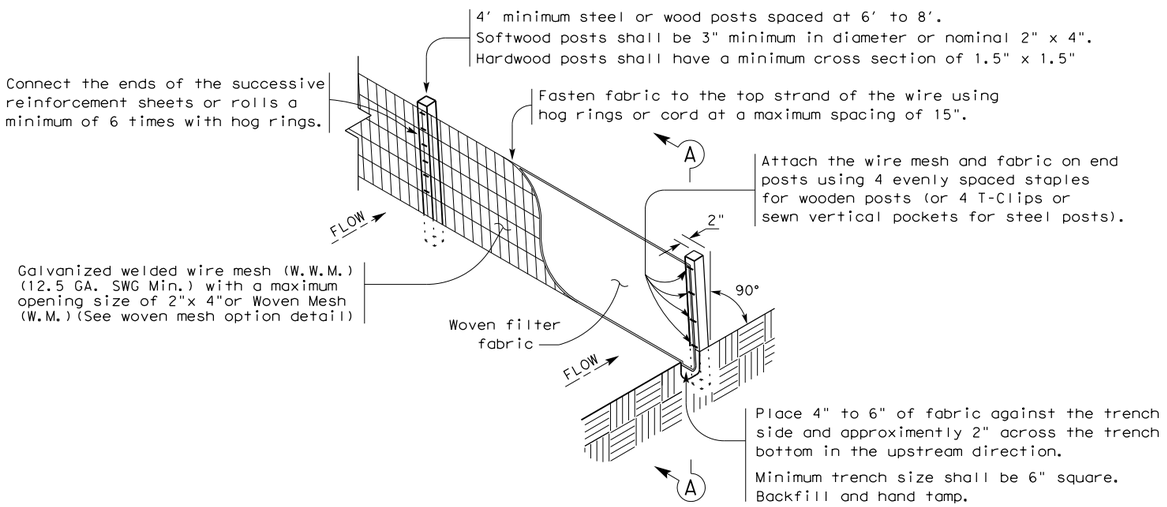
UPLAND AVENUE
66TH STREET TO 82ND STREET
EROSION CONTROL PLAN SUMMARY

STA 255+00 TO END PROJECT

SHEET 3 OF 3

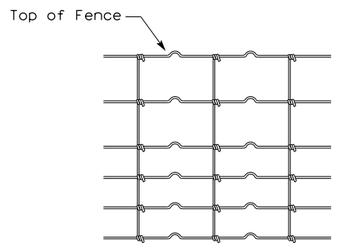
FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

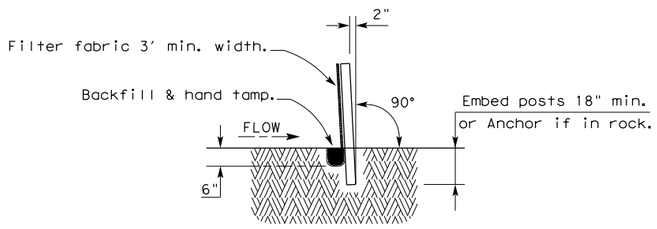
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	LBB	LUBBOCK	254
CONT.	SECT.	JOB	
0905	06	095, ETC.	



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

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

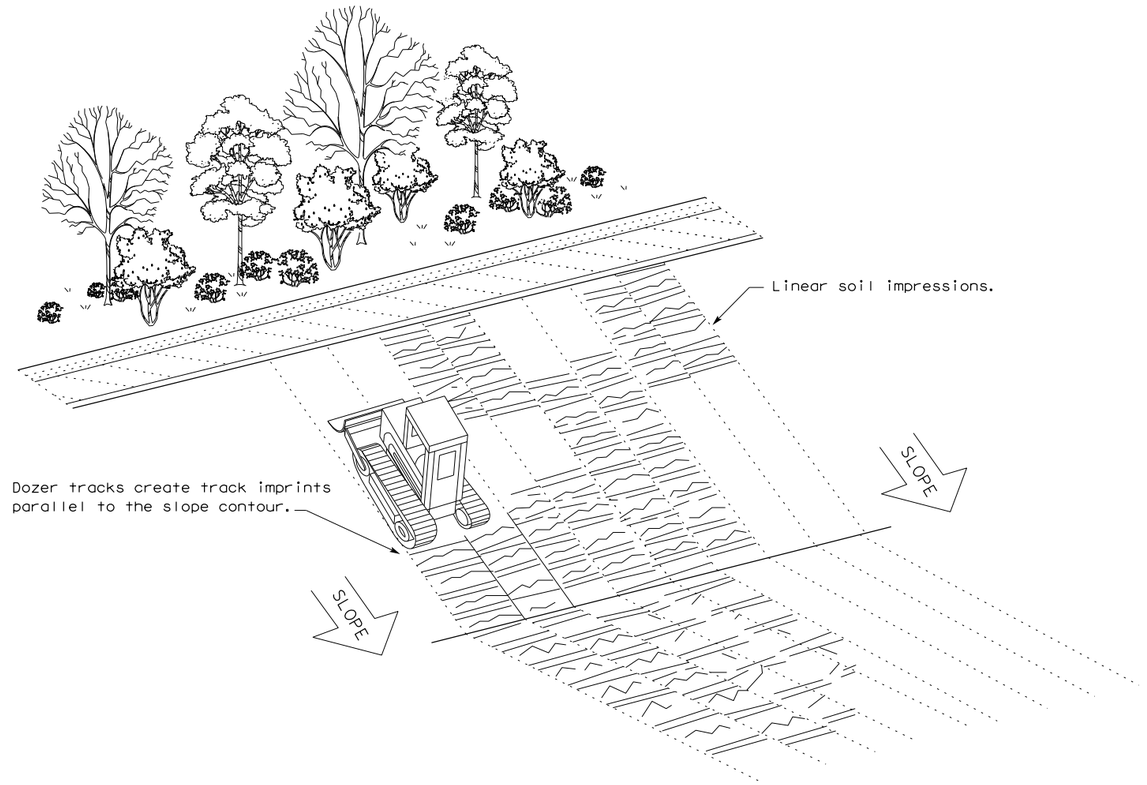
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0905	06	095,ETC.		CS	
	DIST	COUNTY			SHEET NO.	
	LBB	LUBBOCK			255	

8/17/2023
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DATE: 8/9/2023
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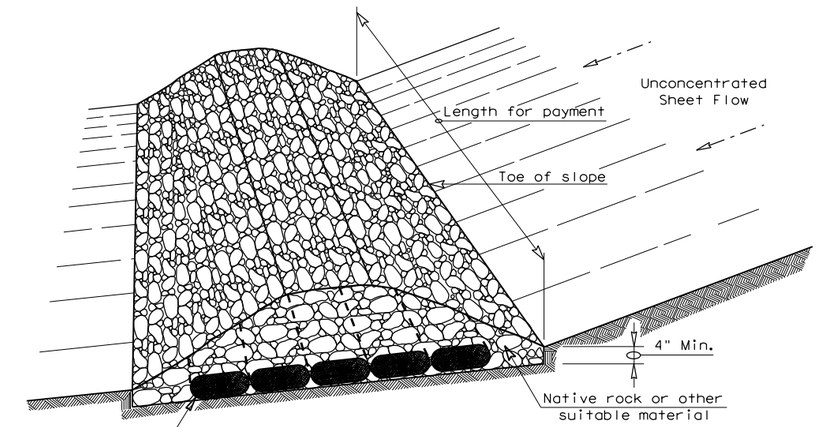
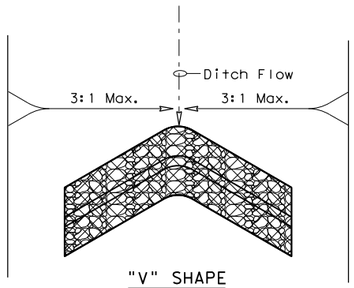
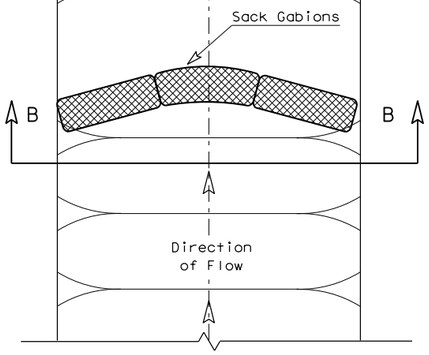


FILTER DAM AT TOE OF SLOPE

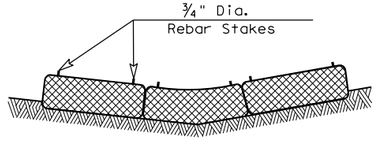
RFD1



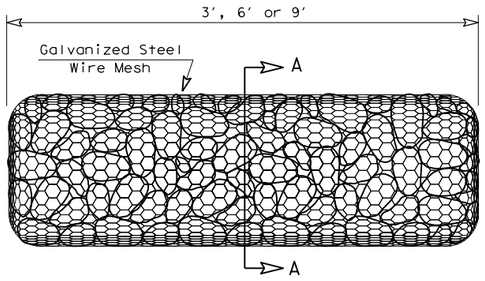
"V" SHAPE
PLAN VIEW



PLAN VIEW

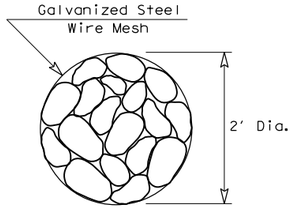


SECTION B-B

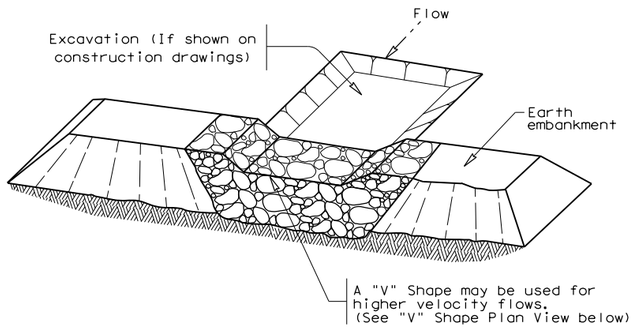


TYPE 4 (SACK GABIONS)

RFD4

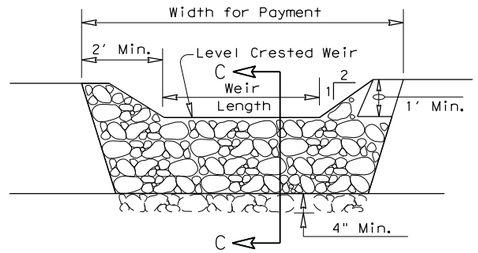


SECTION A-A

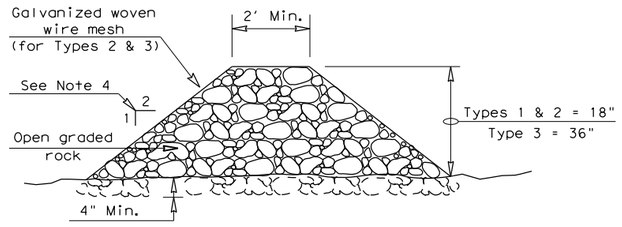


FILTER DAM AT SEDIMENT TRAP

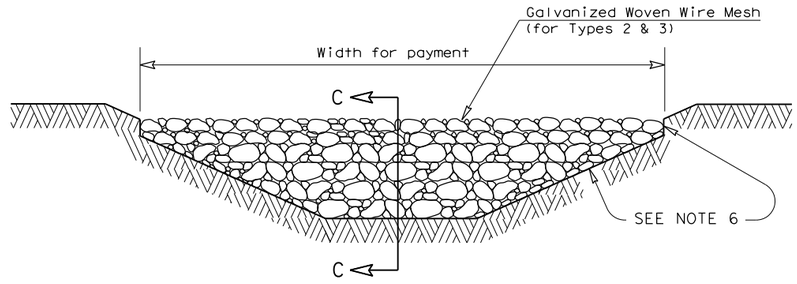
RFD1 OR RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation

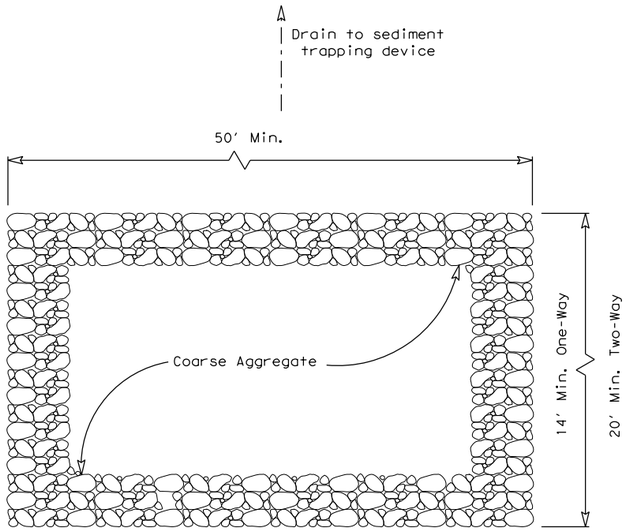
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

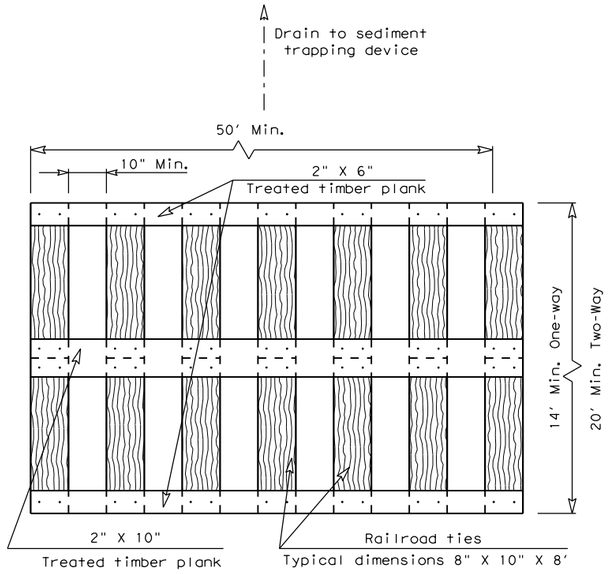
ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		256



PLAN VIEW



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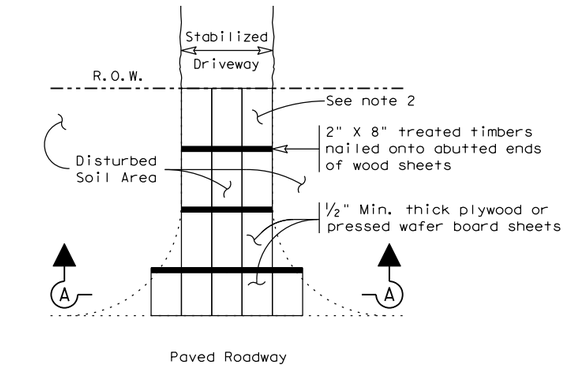
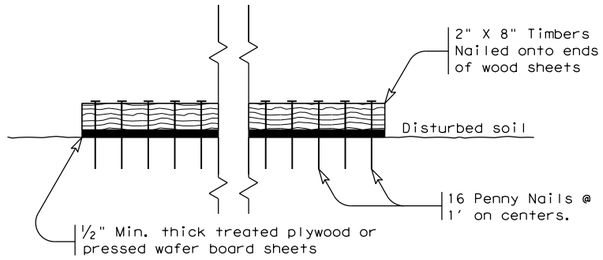


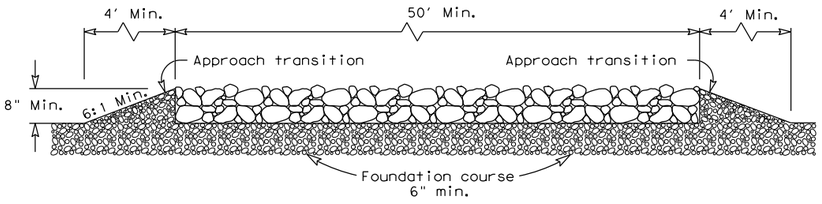
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

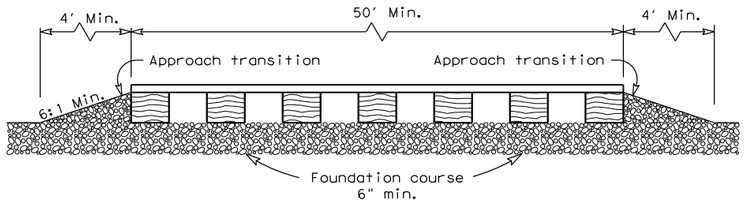
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50′.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50′.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		257

DATE: 8/9/2023
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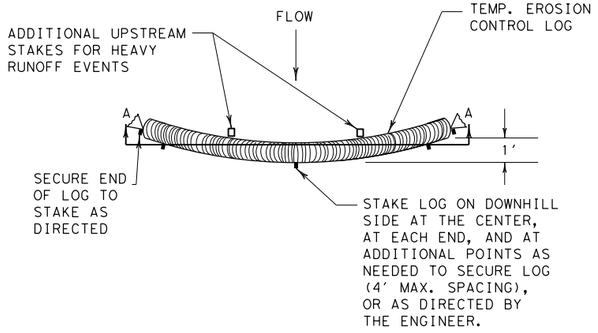
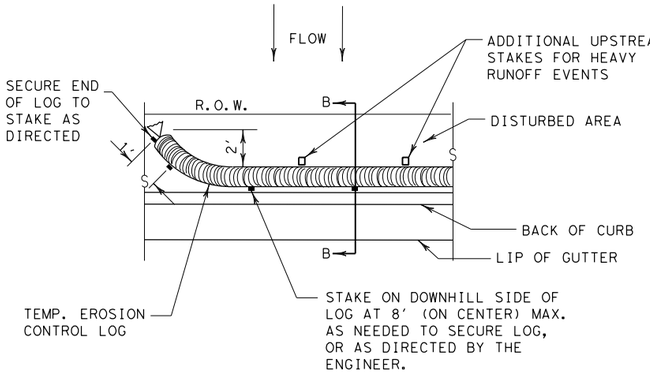
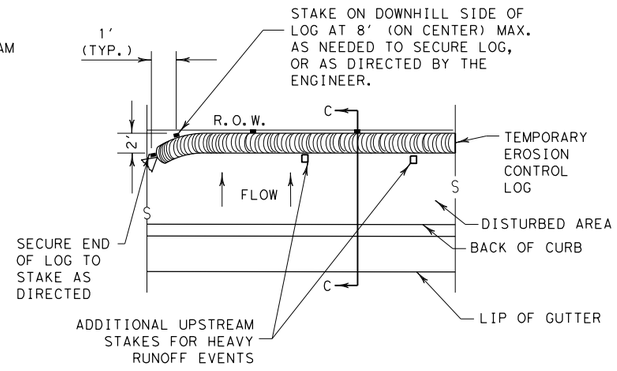


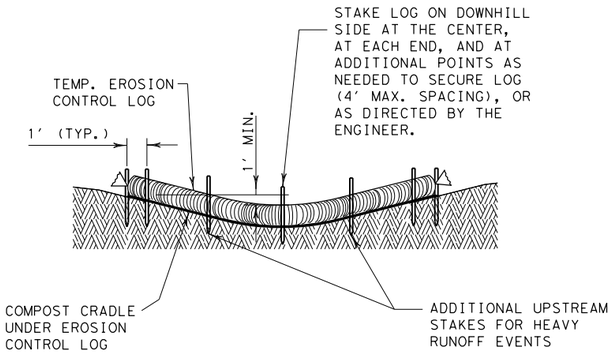
PLAN VIEW



PLAN VIEW



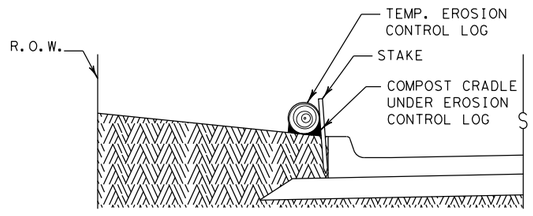
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

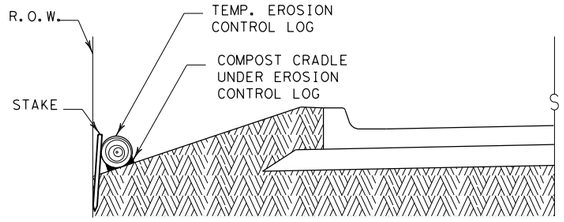
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



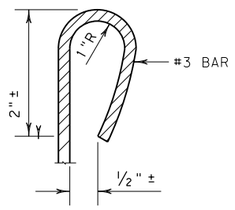
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW

LEGEND

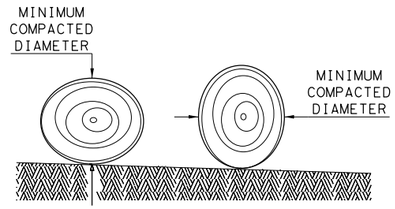
- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET



REBAR STAKE DETAIL

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

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

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0905	06	095, ETC.		CS		
	DIST	COUNTY			SHEET NO.		
	LBB	LUBBOCK			258		

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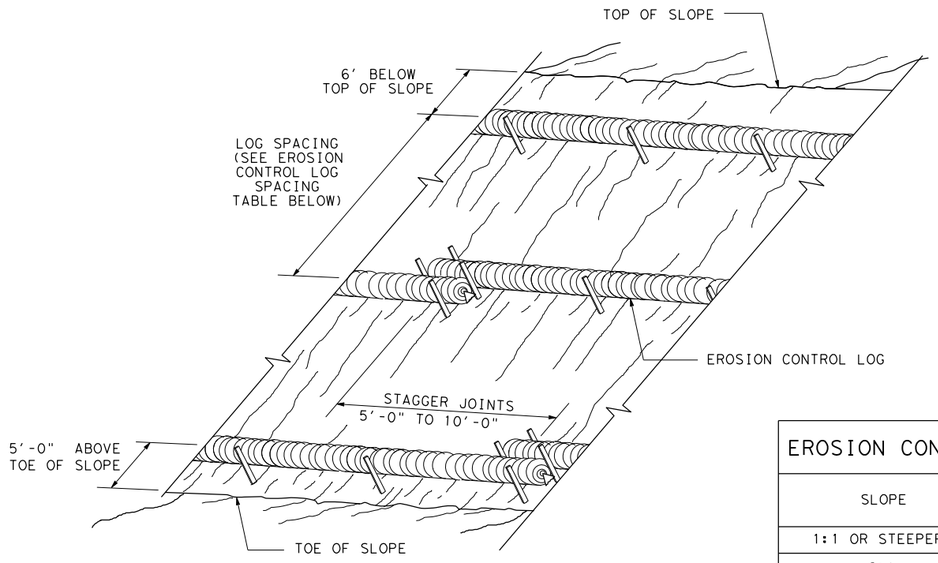
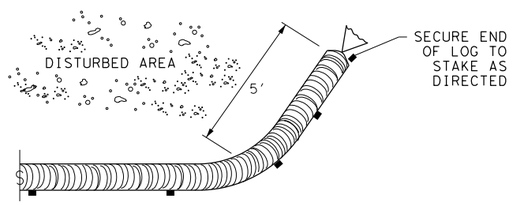


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

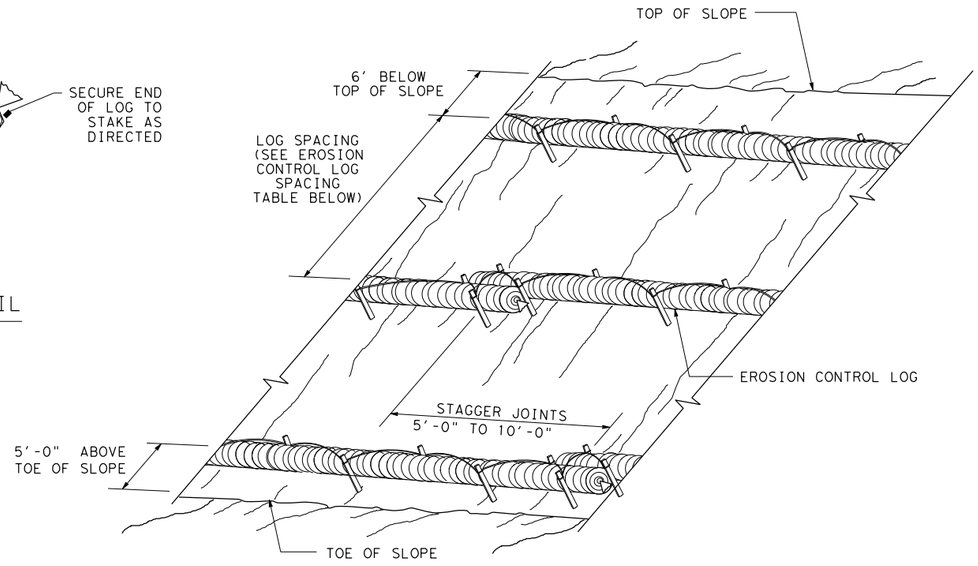
CL-SST



END SECTION RAP DETAIL

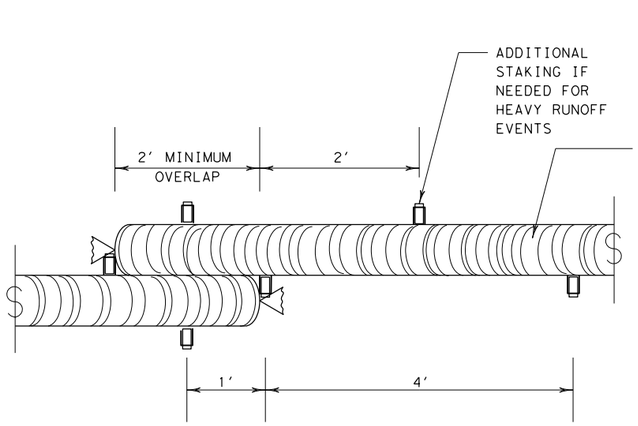
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

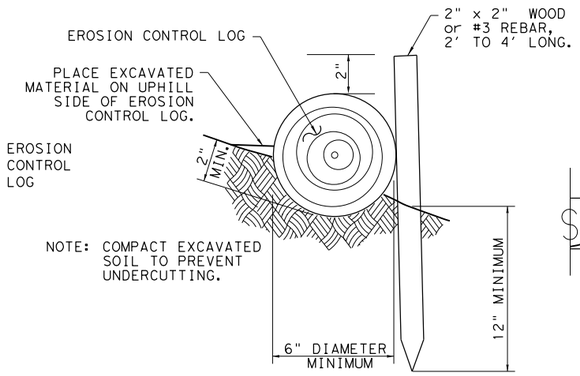
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

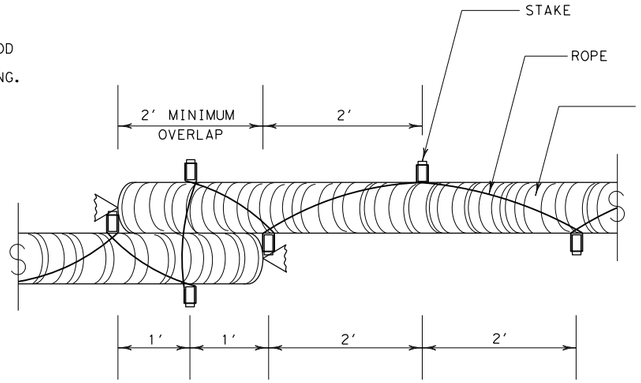




STAKE AND TRENCHING ANCHORING DETAIL

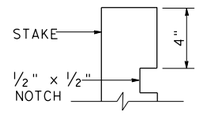
CL-SST

TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

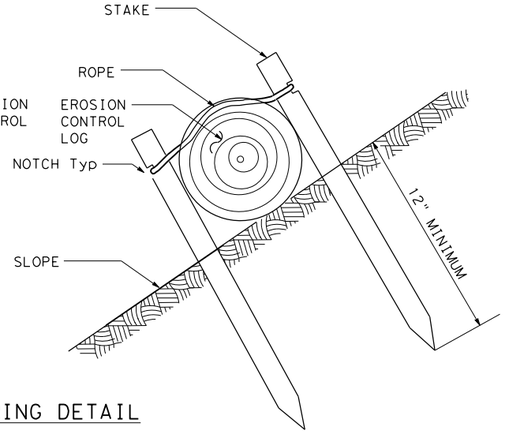


STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL



Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0905	06	095,ETC.		CS	
	DIST	COUNTY			SHEET NO.	
	LBB	LUBBOCK			259	

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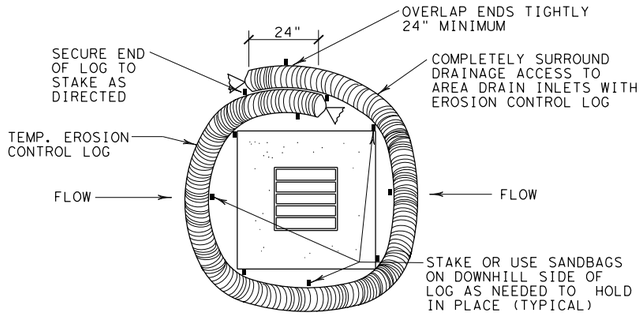
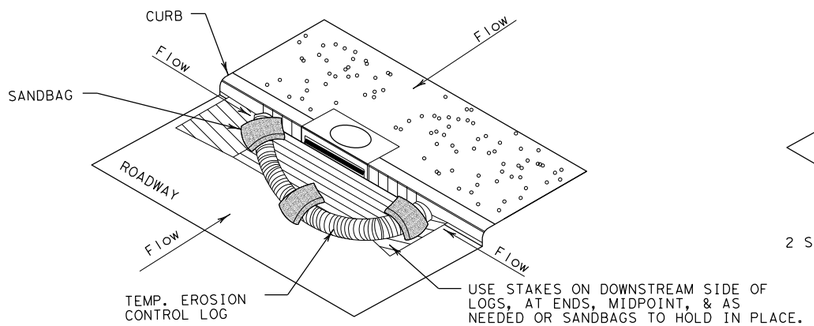


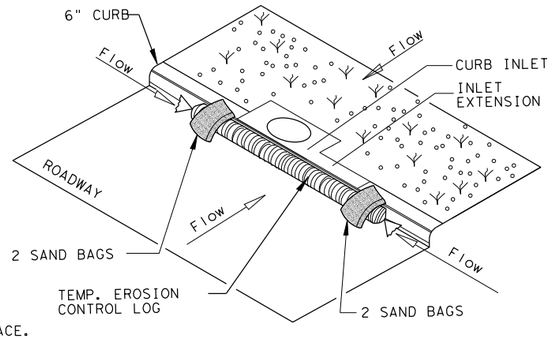
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

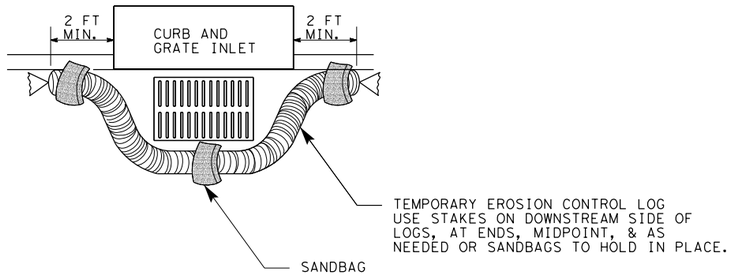
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

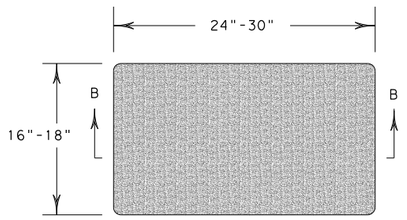
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095, ETC.	CS
	DIST	COUNTY		SHEET NO.
	LBB	LUBBOCK		260

DATE: 8/9/2023
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DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-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 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. CITY OF LUBBOCK

2. CITY OF WOLFFORTH

☐ 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.

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.

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.

1.

2.

3.

4.

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:

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	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☐ No Action Required ☒ Required Action

ACTION NO.

1. Dominion Holy Gohst Church entrance gate, gate lights and fence are historic. Contractor shall remove and relocate entrance gate, gate lights, fence and church sign to proposed right of way and match its existing state and condition as best as possible. Contractor shall notify the Lubbock County Historical Commision marker chair, 806-834-8752, at the time of construction kick-off meeting and two weeks before beginning work. Contractor shall coordinate the relocation of entrance gate lighting withSouth Plains Electric Coop. Contractor shall coordinate with TxDOT and the Project Engineer if any components of the gate, lights or fence are damaged in the process.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☐ No Action Required ☒ Required Action

Action No.

1. Comply with Executive Order 13112 on Invasive Plant Species.
2. Comply with TxDOT Executive Memorandum on beneficial landscaping.
3. Comply with temporary and permanent vegetation stabilization protocols of the SW3P.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

Action No.

1. Do not handle or harm Texas horned lizards, prairie dogs, barn swallows or burrowing owls.
2. No prairie dog towns can be damaged or crossed with equipment without approval of the Engineer.
3. No nests of burrowing owls (in prairie dog holes) can be disturbed or damaged (See General Notes).
4. No nests of barn swallows (likely on structures such as bridges) can be disturbed or damaged (See General Notes).
5. Obey the Bald and Golden Eagle Protection Act. Do not handle, harm, capture, disturb, or kill the species. Do not handle, harm, or take nests, eggs, feathers, bones, or eagles.
6. Obey the Migratory Bird Treaty Act of 1916, of which details there cannot be any handling or harming of migratory bird species; including their eggs, nests, or feathers.

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 immediate area, and contact the Engineer immediately.

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

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 Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action 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 notify 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

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☐ No Action Required ☒ Required Action

Action No.

1. Maintain equipment muffler systems and work hour restrictions to reduce traffic noise.
2. No PSL's may be located in the prairie dog towns, playa lakes (wet or dry) or stream beds (wet or dry).
3. No dumping of construction material in playa lakes or stream beds regardless of property owner requests.
4. Contractor must obtain historical and archaeological clearances for off-site PSL's.
5. Contractor is responsible for air quality permits for concrete and asphalt batch and similar plants.
6. Contractor is responsible for water appropriation or impoundment TCEQ permits.
7. Contractor will protect environmentally sensitive areas with fencing, work sequencing or scheduling as directed.
8. PSL's beyond the project right-of-way have "individual operator" status under the TPDES Construction General Permit and the Contractor is responsible for the SW3P and any TCEQ permits.
9. No waste material of any type may be placed at any location where it could be washed into a water of the U.S. or a surface water of Texas.
10. Flood elevations will not be increased to a level that would violate flood plain regulations or ordinances.
11. Contractor shall remove all construction debris daily from the waterway by close of business, where applicable.
12. The SW3P, including best management practices, must be in-place prior to disturbing soil.

Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0905	06	095,ETC.	CS
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.
05-07-14 ADDED NOTE SECTION IV.	LBB	LUBBOCK		261
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.				