CONT	SECT	JOB	HIGHWAY
0923	06	095	CS
DIST	COUNTY		SHEET NO
BROWNWOOD	BROWN		1

INDEX OF SHEETS

CITY OF EARLY
PUBLIC WORKS DEPARTMENT

PLANS OF PROPOSED STREET IMPROVEMENT

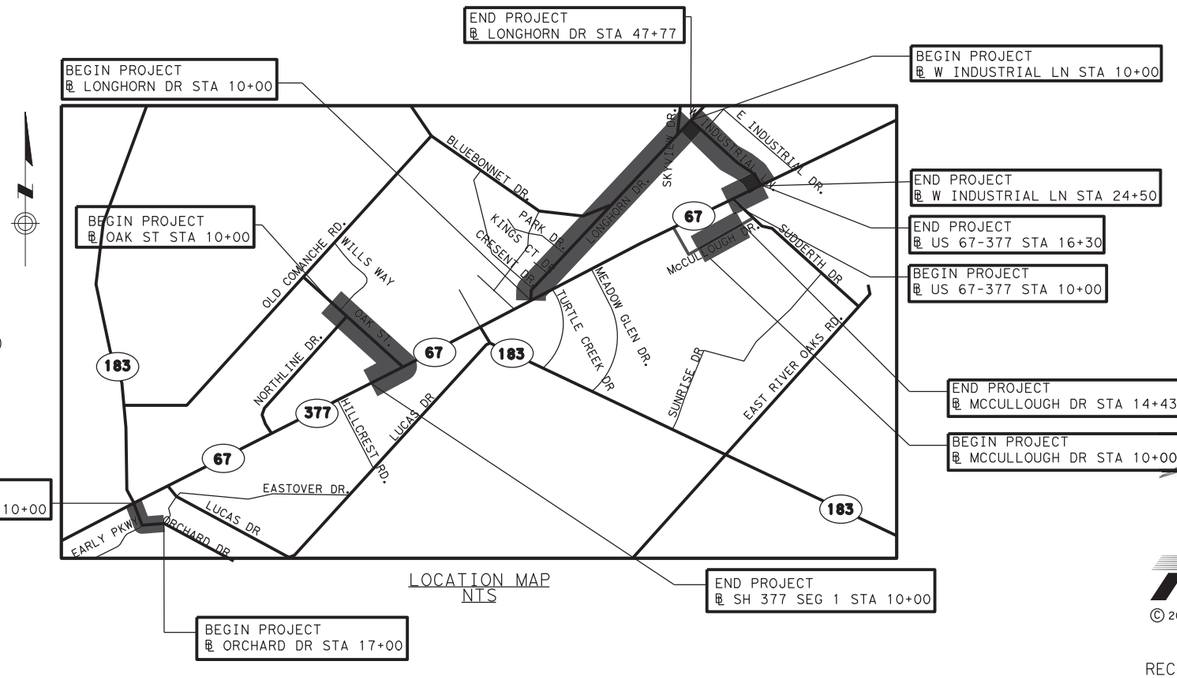
FEDERAL AID PROJECT

STP 2023(213)TAPS
CSJ: 0923-06-095

EARLY PEDESTRIAN PATHWAY CONNECTIVITY
BROWN COUNTY

FOR THE CONSTRUCTION OF CITY PEDESTRIAN PATHWAY IMPROVEMENTS.

FOR LIMITS REFER TO PROJECT LOCATION.



LOCATION MAP
NTS

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

FINAL PLANS

LETTING DATE: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK WAS COMPLETED: _____
DATE WORK WAS ACCEPTED: _____
FINAL CONTRACT COST: _____
CONTRACTOR _____

CONSTRUCTION WORK ON THIS PROJECT WAS PERFORMED IN ACCORDANCE WITH PLANS, CONTRACT AND APPROVED CHANGE ORDERS.

_____ DATE _____

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED PROFESSIONAL ENGINEER
09/29/2023

Texas Department of Transportation

TDLR REVIEW
REGISTERED ACCESSIBILITY SPECIALIST (RAS)
INSPECTION REQUIRED.

TDLR No._____

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)- 21 THRU BC (12)- 21 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION PROJECTS. (FORM FHWA 1273, OCTOBER 2023.

VOLKERT
F - 12679

CONCURRENCE: 10/5/2023
DocuSigned by:
Robert Maugrum
7998A3EDDBA74E8...
EARLY MAYOR

RECOMMENDED FOR LETTING: 10/6/2023
DocuSigned by:
77D14777834646F...
DISTRICT ENGINEER

RECOMMENDED FOR LETTING: 10/6/2023
DocuSigned by:
77D14777834646F...
PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 10/9/2023
DocuSigned by:
Gregory W. Cedillo, P.E.
58E2D01C26B344F...
DISTRICT ENGINEER

GENERAL NOTES

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

Item	Description	Soil Constants		
		Max LL.	Max. PI	Min. PI
* 132	Embankment (Final)(Dens Cont)(Ty C)	40	25	3
247	Fl Bs (Cmp In Plc) (Ty D Gr1-2)(Fnal Pos)			3

* Applies to borrow only.

The Contractor will not be allowed to store equipment, materials, incidentals, hazardous chemicals, petroleum products, concrete washouts, etc. in the Department's R.O.W. without written permission from the Engineer.

Trees that are to be trimmed and brush that is to be trimmed or removed that are not over the roadway or bridge(s), will be trimmed or removed in accordance with the Roadside Vegetation Management Manual to a height of fourteen feet. Remove limbs at the trunk with less than twenty-one feet of clearance above the pavement or bridge(s).

See the "Environmental" section of the plans for additional information.

TEXAS ONE CALL

Fiber optic cable systems, gas lines, underground power lines, water lines, sewer lines, and other various utilities may be buried within the project limits. Protection of these utility systems is of extreme importance since any break could disrupt service to users resulting in business interruption and loss of revenue and profits. The Contractor will telephone Texas One Call at 1-800-344-8377 (a 24-hour number), to determine if utilities are buried anywhere on the project in accordance with all UNDERGROUND FACILITY DAMAGE PREVENTION AND SAFETY laws. This action; however, will in no way be interpreted as relief of responsibilities under the terms of the Contract as set out in the plans and specifications. Coordinate the repair of all damages caused by daily operations and have facilities restored to service in a timely manner as directed at no additional cost to TxDOT.

GENERAL

Unless specifically noted as applying to only a certain project or projects, these general notes will apply to all projects associated to this contract.

County: BROWN **Sheet:** 2

Highway: Various **Control:** 0923-06-095

Contractor questions on this project are to be addressed to the following individual(s):

Name	Email Address
Chris Graf, P.E.	chris.graf@txdot.gov
Lucas DeLeon	lucas.deleon@txdot.gov

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.

The term "Article" or "Section" referred to hereon is defined in the forward of the *Standard Specifications for Construction and Maintenance of Highways, Streets, And Bridges* adopted by the Texas Department of Transportation November 2014.

A "Regulatory Construction Speed Zone" has been requested for this project.

Saw-Cutting with approved equipment as directed by the Engineer will be required at project limits, longitudinally, and/or at notch downs to establish clean and straight joints. This work will not be paid for directly but will be considered subsidiary to various bids.

The Contractor will establish drainage in ditches before seeding or as directed by the Engineer.
Watering for dust control will be required as Directed by the Engineer and will be considered subsidiary to the various bid items.

ITEM 5 CONTROL OF WORK

The responsibility for the construction surveying on this contract will be in accordance with Section 5.9.1. "Method B".

Prior to contract letting, bidders may obtain a computerized transfer of files (from the Engineer's office) that contains the earthwork information.

When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of

General Notes

the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

ITEM 6 CONTROL OF MATERIALS

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit a notarized 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.

In accordance with **Section 6.10.2**, the Contractor will dispose of all painted steel at a steel recycling or smelting facility and a receipt will be required. In lieu of this, the Contractor has the option to either show proof that the paint is lead free or show proof that the lead paint has been abated by an abatement certified company. The Department will not be obligated for the cost of paint testing and/or abatement materials, processes, personnel, incidentals, etc.

ITEM 7 LEGAL RELATIONS AND RESPONSIBILITIES

No significant traffic generator events identified.

ITEM 8 PROSECUTION AND PROGRESS

Working days will be computed and charged in accordance with Section 8.3.1.4. “Standard Workweek”.

Work will not be performed without time being charged unless otherwise exempted by the Section as defined above.

Construction will be completed in order, sequentially; as described in the traffic control plan phasing. Each step/phase will be completed before starting on the next step/phase unless otherwise approved by the Engineer.

PROJECT SCHEDULES

For monthly submittals, the Contractor will provide the schedule in an Adobe Acrobat compatible format (PDF file). If the Engineer requests the schedule in an electronic format, the Contractor will submit a schedule that is fully compatible with Primavera P6 Professional Release 15.

ITEM 9 MEASUREMENT AND PAYMENT

County: BROWN **Sheet:** 2A

Highway: Various **Control:** 0923-06-095

Monthly estimates will be computed from the 26th of the previous month through the 25th of the current month unless otherwise approved in writing by the Engineer.

ITEM 104 REMOVING CONCRETE

The Contractor will make a 1” cut to use as a guide before full depth cutting. Saw-Cut the full depth through the concrete before existing pavement removal.

ITEM 132 EMBANKMENT

Refer to Item 210 “Rolling” for additional roller requirements.

Shape the embankment, near the drainage structures, to the slope of the safety end treatment.

ITEM 166 FERTILIZER

Fertilize all areas of project to be seeded.

Furnish and apply fertilizer with analysis of 20-10-10 at a rate of 300 bulk pounds per acre.

ITEM 168 VEGETATIVE WATERING

Water all areas of project to be seeded or sodded.

Vegetative watering is estimated at 1 inch per week for 4 weeks. Paid by item 168-6001

Vegetative watering may be adjusted as directed by the Engineer to ensure saturation for vegetative establishment.

ITEM 334 HOT-MIX COLD-LAID ASPHALT CONCRETE PAVEMENT

20 tons of hot-mix cold-laid asphalt concrete pavement is estimated for this project and will be used as directed by the Engineer. This item is to be used as backfill curb between and gutter and existing pavement predominantly and between proposed sidewalk and existing driveway pavement.

ITEM 421 HYDRAULIC CEMENT CONCRETE

Furnish dome lids with 4” x 8” cylinder test molds.

Strength testing equipment is not required for Contract controlling test.

ITEM 427 SURFACE FINISHES FOR CONCRETE

Surface Area II will receive a rub finish.

ITEM 432 RIPRAP

Locations and quantities may be varied as directed by the Engineer to accommodate field conditions.

Limit excavation to within 1' of riprap. If excavation exceeds these limits without the Engineer's approval, riprap will be extended to the limits of the disturbance. No additional compensation will be allowed for this work.

Provide fiber reinforced concrete for slip formed cable median barrier mow strip.

Meet the following requirements when using fiber reinforcement:

- Use Class A Concrete for riprap.
- Use an approved method that ensure adequate concrete consolidation. Sprinkle and consolidate the subgrade before the concrete is placed. Finish the surface with wood float or broom finish as approved. Immediately after finishing operation, cure the riprap according to Item 420 "Concrete Structures".
- Reinforce with fibers made from 100% virgin homopolymer graded, fibrillated polypropylene fibers, containing no reprocessed olefin materials, conforming to ASTM C1116 Types I and III. The polypropylene fibers will be of a multi-length gradation, with no fibers over 2" in length, alkai-resistant and absorptive. Minimum dosage will be 3 lbs/cubic yard of concrete. The minimum average residual strength is 80 psi, per ASTM C13989. Provide evidence of material performance in concrete.

ITEM 502 BARRICADES, SIGNS, AND TRAFFIC HANDLING

The Contractor will be required to keep all TCP devices clean. If notified by the Engineer to clean the TCP devices, the Contractor will have until the end of that daylight period to comply. Failure to comply will result in a suspension of all work until the TCP devices are clean. Time will not be suspended.

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.

The Engineer will determine the locations of regulatory construction speed zone signs. The Contractor will furnish, install and remove speed zone signs at locations as directed by the Engineer.

Excavations in Intersections adjacent to travel lanes will not be exposed or open overnight. Backfilling will take place the day excavations are made.

The Contractor will be responsible for maintaining the edge of the roadway throughout the project in a traversable condition and/or as directed by the Engineer. Salvaged milling may be used as directed by the

County: BROWN **Sheet:** 2B

Highway: Various **Control:** 0923-06-095

Engineer. This work will not be paid for directly and will be considered subsidiary to Item 502 "Barricades, Signs, and Traffic Handling".

All devices shown on the TCP Standards are required and considered subsidiary to Item 502 unless specifically outlined elsewhere in the plans.

All signs will be constructed in accordance with the details shown in the current Standard Highway Sign Designs for Texas manual.

ITEM 506 TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS

The Contractor should anticipate multiple mobilizations for the installation of BMP's on this project.

The Engineer will determine actual time and placement locations of BMP's and temporary measures.

Contractor will not install BMPs until locations are approved by the Engineer.
Stockpile sites may be cleared of cover vegetation, but the vegetation root system will not be destroyed.

Erosion Control Logs Dam (CL-D) shall have stakes placed upstream in an alternating pattern of the downstream stakes as shown for CL-SST or CL-SSL details on the Erosion Control Standards.

ITEM 528 COLORED TEXTURED CONCRETE AND LANDSCAPE PAVERS

Integral Concrete Colorant shall be required.

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

Reinforcing steel will be required in all curb and gutter.

Construct tooled joints every 10' corresponding to the joints in the sidewalk where applicable or as directed by the Engineer.

Construct expansion joints to correspond to the sidewalk or as directed by the Engineer.

ITEM 531 SIDEWALKS

Expansion joints will be asphalt board, minimum one-half inch (1/2") thickness.

Fiber board will be required around existing features such as signs, fireplugs, utility poles, etc. as directed by the Engineer. When existing features are in the proposed sidewalk area, provide a four foot (4') minimum pathway.

Any excavation/embankment necessary for establishing new ramps to proper grade will be considered subsidiary to the various bid items.

The Contractor will be required to use orange pedestrian safety barriers to protect excavated areas as directed by the Engineer.

Unless otherwise shown in the plans, reinforcement will be #4 bars on eighteen inch (18") centers.

Fiber reinforced concrete will not be used for sidewalk on this project.

Sidewalks will be saw cut one third the depth of concrete or marked every 5 feet in length, by the use of an approved jointing tool. These joints shall correspond to the joints in the curb & gutter where applicable.

Expansion joints at every 50' with #4 smooth dowel bars on eighteen inch (18") centers.

Sidewalks that are adjacent to other concrete areas will be poured separately to ensure compliant cross slope on the walking path.

Pedestrian Ramps (all types) shall be 6" thick below detectable warning pads. Each ped ramp should be doweled into adjacent curb and gutter using #4 bars 12" on center.

ITEM 560 MAILBOX ASSEMBLIES

Mailboxes will be kept in a position accessible to the carrier's vehicle along the travel way except when performance of grading operations necessitates the moving of mailboxes. When grading operations necessitate the moving of mailboxes, the contractor will place them at a nearby location which will be accessible to the carrier's vehicle. Mailboxes will be returned to a position accessible to the carrier's vehicle along the travel way when grading operations are not in progress. This work will not be paid for directly but will be subsidiary to Item 560.

Mailboxes that create a protrusion of more than 4" into the pedestrian circulation path will have an additional curb or foundation at the bottom to provide a maximum 4" overhang. This work will not be paid for directly but will be considered subsidiary to Item 560 Mailbox Assemblies.

ITEM 600 ELECTRIC GENERAL

Electrical materials, wiring, and fittings not covered by the plans and specifications for this project will conform to the requirements of the current edition of the National Electrical Code as published by the National Fire Protection Association.

Contractor will maintain signals through construction with the exception of camera detection. Contractor will notify the District Director of Operations at 325-643-0417, 48 hours prior to beginning any electrical related work items and 48 hours prior to traffic switch so the district signal personnel can adjust the camera detection.

Electrical Contractor, Signal Shop personnel and Project Inspector will conduct a 'Tool Box' meeting to discuss upcoming electrical work.

County: BROWN **Sheet:** 2C

Highway: Various **Control:** 0923-06-095

All materials will be from the pre-qualified material producer list, "Roadway Illumination and Electrical Supplies" located on the TxDOT website. Electrical submittals will be required for all materials not on the pre-qualified list.

All electrical submittals will be forwarded to District Director of Operations (325-643-0417). No electrical work will be performed prior to approval of electrical materials.

ITEM 618 CONDUIT

All conduit will be SCH 80 PVC.

Where PVC, duct cable, and HDPE conduit 1" and larger is allowed and installed as per TxDOT standards, provide a PVC elbow at all ground boxes and foundations.

See plans & specifications regarding type of conduit. High density polyethylene (HDPE) may be substituted where PVC is called out. High density polyethylene (HDPE) may be threaded and used with threaded PVC connectors or couplings. All couplings & connections will be tight & waterproof. Each end of every PVC pipe connection and/or coupling will be cleaned with PVC cleaner and glued thoroughly with PVC sealer. Proposed and existing conduit will be brought into a pull box and elbowed unless otherwise shown. Where a rigid metal conduit run terminates, a bushing will be provided to protect the wire from abrasion.

The conduit will be placed at a minimum depth of two 2 ft. unless otherwise shown on the plans or directed by the Engineer. If utility lines or other obstacles are at the 2 ft. minimum depth then the conduit will be routed under the utility or obstacle unless otherwise approved by the Engineer.

The conduit will be placed on a 2 in. Sand cushion and then backfilled with a minimum of six inch (6") sand fill. The remainder of the trench will be backfilled with flexible base or soil as required by location of conduit on the project.

Flexible metal will not be permitted on this project.

Do not use cast iron junction boxes in concrete traffic barriers and single slope traffic barriers. Use polymer concrete junction boxes instead of the cast iron junction boxes shown on standard sheets CTBI (3), CTBI (4), and SSCB (4). Mount the junction boxes flush (+ 0", - ½") with concrete surface of concrete barrier.

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

The polymer concrete barrier box will not be paid for separately, but will be considered subsidiary to ITEM 618, "CONDUIT".

ITEM 620 ELECTRICAL CONDUCTORS

Labeling conductors with label maker is acceptable.
Grounding conductors that share the same conduit, junction box, ground box or structure will be bonded together at every accessible point in accordance with the National Electrical Code.

For Flashing Beacons (Item 685) and Ped poles (Item 687) within the project, provide single-pole breakaway disconnects. Use Bussman HEBW, Littlefuse LEB, Ferraz-Shawmut FEB, or equal on ungrounded conductors.
For all grounded conductors use Bussman HET, Littlefuse LET, Ferraz-Shawmut FEBN, or equal. These breakaway connectors have a white colored marking and a permanently installed solid neutral.

ITEM 6185 TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA)

Provide the number of vehicles with truck mounted attenuators (TMA) listed in the table below. The Contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

STANDARD / PHASE	# TMA'S REQUIRED
TCP(1-1)	1
TCP(1-2)	1
TCP(1-3)	1
TCP(1-4)	1
TCP(2-1)	1
TCP(2-2)	1

Stationary shadow vehicle(s) with TMA are estimated at 10 days for this project.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0923-06-095 **DISTRICT** Brownwood **COUNTY** Brown
HIGHWAY Various

			CONTROL SECTION JOB	0923-06-095		TOTAL EST.	TOTAL FINAL
			PROJECT ID	A00183842			
			COUNTY	Brown			
			HIGHWAY	Various			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	100-6001	PREPARING ROW	AC	1.250		1.250	
	104-6011	REMOVING CONC (MEDIANS)	SY	55.000		55.000	
	104-6028	REMOVING CONC (MISC)	SY	27.500		27.500	
	105-6011	REMOVING STAB BASE AND ASPH PAV (2"-6")	SY	238.500		238.500	
	132-6017	EMBANKMENT (VEHICLE)(ORD COMP)(TY A)	CY	70.000		70.000	
	158-6006	SPEC EXCAV WORK (VEHICLE)	CY	1,000.000		1,000.000	
	162-6002	BLOCK SODDING	SY	680.000		680.000	
	168-6001	VEGETATIVE WATERING	MG	303.000		303.000	
	334-6078	HMCL ACP TY-D SAC-B AC-1.5	TON	20.000		20.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	8.400		8.400	
	432-6023	RIPRAP (STONE COMMON)(DRY)(8 IN)	CY	9.100		9.100	
	432-6044	RIPRAP (CONC)(FLUME)	CY	20.410		20.410	
	450-6051	RAIL (HANDRAIL)(TY E)	LF	77.000		77.000	
	464-6001	RC PIPE (CL III)(12 IN)	LF	64.000		64.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF	96.000		96.000	
	465-6013	INLET (COMPL)(PCO)(3FT)(NONE)	EA	1.000		1.000	
	467-6326	SET (TY II) (12 IN) (RCP) (6: 1) (P)	EA	2.000		2.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA	4.000		4.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	6.000		6.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	5,262.400		5,262.400	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	5,262.400		5,262.400	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	452.100		452.100	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	452.100		452.100	
	528-6001	COLORED TEXTURED CONC (4")	SY	150.000		150.000	
	529-6002	CONC CURB (TY II)	LF	350.000		350.000	
	529-6008	CONC CURB & GUTTER (TY II)	LF	770.000		770.000	
	530-6004	DRIVEWAYS (CONC)	SY	9.000		9.000	
	530-6005	DRIVEWAYS (ACP)	SY	959.200		959.200	
	531-6001	CONC SIDEWALKS (4")	SY	3,720.000		3,720.000	
	531-6003	CONC SIDEWALKS (6")	SY	425.300		425.300	
	531-6004	CURB RAMPS (TY 1)	EA	8.000		8.000	
	531-6005	CURB RAMPS (TY 2)	EA	3.000		3.000	
	531-6008	CURB RAMPS (TY 5)	EA	3.000		3.000	
	531-6010	CURB RAMPS (TY 7)	EA	8.000		8.000	
	531-6013	CURB RAMPS (TY 10)	EA	6.000		6.000	
	560-6025	RELOCATE EXISTING MAILBOX	EA	1.000		1.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0923-06-095 **DISTRICT** Brownwood **COUNTY** Brown
HIGHWAY Various

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0923-06-095**			
		PROJECT ID		**A00183842**			
		COUNTY		**Brown**			
		HIGHWAY		**Various**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	2.000		2.000	
	618-6053	CONDT (PVC) (SCH 80) (3")	LF	2.000		2.000	
	618-6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF	100.000		100.000	
	620-6004	ELEC CONDR (NO.12) INSULATED	LF	158.000		158.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	128.000		128.000	
	644-6060	IN SM RD SN SUP&AM TYTWT(1)WS(P)	EA	6.000		6.000	
	644-6061	IN SM RD SN SUP&AM TYTWT(1)WS(T)	EA	4.000		4.000	
	644-6071	RELOCATE SM RD SN SUP&AM TY TWT	EA	1.000		1.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	742.000		742.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	742.000		742.000	
	666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	826.000		826.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	826.000		826.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	24.000		24.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	70.000		70.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF	826.000		826.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	742.000		742.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	2.000		2.000	
	687-6001	PED POLE ASSEMBLY	EA	1.000		1.000	
	688-6001	PED DETECT PUSH BUTTON (APS)	EA	2.000		2.000	
	688-6003	PED DETECTOR CONTROLLER UNIT	EA	1.000		1.000	
	690-6008	INSTALL OF GROUND BOXES	EA	1.000		1.000	
	690-6032	INSTALL OF PEDESTRIAN PUSH BUTTONS	EA	1.000		1.000	
	6185-6002	TMA (STATIONARY)	DAY	10.000		10.000	
	08	CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS	1.000		1.000	
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS	1.000		1.000	

LOCATION	100-6001 PREPARING ROW	104-6011 REMOVING CONC (MEDIANS)	104-6028 REMOVING CONC (MISC)	105-6011 REMOVING STAB BASE AND ASPH PAV (2"-6")	132-6017 EMBANKMENT (VEHICLE) (ORD COMP) (TY A)	158-6006 SPEC EXCAV WORK (VEHICLE)	168-6001 VEGETATIVE WATERING	162-6002 BLOCK SODDING	334-6078 HMCL ACP TY-D SAC-B AC-1.5	432-6001 RIPRAP (CONC) (4 IN)	432-6023 RIPRAP (STONE COMMON) (DRY) (8 IN)	432-6044 RIPRAP (CONC) (FLUME)	450-6051 RAIL (HANDRAIL) (TY E)	464-6001 RC PIPE (CL III) (12 IN)
	AC	SY	SY	SY	CY	CY	MG	SY	TON	CY	CY	CY	EA	EA
ORCHARD DR	0	55	5	70	5	20	49	109	4	0.2	9.1	0.0	0	0
OAK ST	0	0	0	144	44	20	112	250	5	8.2	0.0	8.1	55	64
LONGHORN DR	0	0	13	15	11	5	143	321	2	0.0	0.0	0.0	22	0
MCCULLOUGH DR	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0	0
INDUSTRIAL & US 67-377	0	0	0	0	5	5	0	0	5	0.0	0.0	0.0	0	0
INDUSTRIAL & US 67-377-PATE'S	0	0	10	10	5	100	0	0	4	0.0	0.0	12.3	0	0
TOTAL QUANTITIES	1	55	28	239	70	150	303	679	20	8.4	9.1	20	77	64

LOCATION	464-6003 RC PIPE (CL III) (18 IN)	465-6013 INLET (COMPL) (PSL) (FG) (3FTX3FT-3FTX3FT)	467-6326 SET (TY II) (12 IN) (RCP) (6:1) (P)	467-6363 SET (TY II) (18 IN) (RCP) (6:1) (P)	500-6001 MOBILIZATION	502-6001 BARRICADES, SIGNS AND TRAFFIC HANDLING	506-6038 TEMP SEDMT CONT FENCE (INSTALL)	506-6039 TEMP SEDMT CONT FENCE (REMOVE)	506-6041 BIODEG EROSN CONT LOGS (INSTL) (12")	506-6043 BIODEG EROSN CONT LOGS (REMOVE)	529-6002 CONC CURB (TY 2)	529-6008 CONC CURB & GUTTER (TY 2)	530-6004 DRIVEWAYS (CONC)	530-6005 DRIVEWAYS (ACP)
	EA	EA	EA	EA	LS	MO	LF	LF	LF	LF	LF	LF	SY	SY
ORCHARD DR	0	1	0	0			116	116	114	114	97	230	0	31
OAK ST	48	0	2	2			1194	1194	95	95	46	140	0	179
LONGHORN DR	48	0	0	2			1852	1852	202	202	85	21	9	9
MCCULLOUGH DR	0	0	0	0			1548	1548	0	0	24	0	0	0
INDUSTRIAL & US 67-377	0	0	0	0			74	74	0	0	98	0	0	0
INDUSTRIAL & US 67-377-PATE'S	0	0	0	0	0	0	478	478	41	41	0	384	0	740
TOTAL QUANTITIES	96	1	2	4	1	6	5262	5262	452	452	350	775	9	959

LOCATION	528-6001 COLORED TEXTURED CONC (4")	531-6001 CONC SIDEWALKS (4")	531-6003 CONC SIDEWALKS (6")	531-6004 CURB RAMPS (TY 1)	531-6005 CURB RAMPS (TY 2)	531-6008 CURB RAMPS (TY 5)	531-6010 CURB RAMPS (TY 7)	531-6013 CURB RAMPS (TY 10)	560-6025 RELOCATE EXISTING MAILBOX	618-6046 CONDT (PVC) (SCH 80) (2")	618-6053 CONDT (PVC) (SCH 80) (3")	618-6054 CONDT (PVC) (SCH 80) (3") (BORE)
	SY	SY	SY	EA	EA	EA	EA	EA	LF	LF	LF	LF
ORCHARD DR	150	279	46	4	6	0	1	0	0	0	0	0
OAK ST	0	1024	138	3	1	2	0	0	0	0	0	0
LONGHORN DR	0	1734	27	0	1	0	5	5	0	0	0	0
MCCULLOUGH DR	0	20	0	0	0	0	0	0	0	0	0	0
INDUSTRIAL & US 67-377	0	663	214	1	0	1	2	1	1	18	10	100
INDUSTRIAL & US 67-377-PATE'S	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL QUANTITIES	150	3720	425	8	8	3	8	6	1	18	10	100

LOCATION	620-6004 ELEC CONDR (NO. 12) INSULATED	620-6009 ELEC CONDR (NO. 6) BARE	682-6018 PED SIG SEC (LED) (COUNT DOWN)	687-6001 PED POLE ASSEMBLY	688-6001 PED DETECT PUSH BUTTON (APS)	688-6003 PED DETECTOR CONTROLLER UNIT	690-6008 INSTALL OF GROUND BOXES	690-6032 INSTALL OF PEDESTRIAN PUSH BUTTONS	644-6060 IN SM RD SN SUP&AM TYTWT (1) WS (P)	644-6061 IN SM RD SN SUP&AM TYTWT (1) WS (T)	644-6071 RELOCATE SM RD SN SUP&AM TY TWT
	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA
ORCHARD DR	0	0	0	0	0	0	0	0	2	0	1
OAK ST	0	0	0	0	0	0	0	0	0	4	0
LONGHORN DR	0	0	0	0	0	0	0	0	3	0	0
MCCULLOUGH DR	0	0	0	0	0	0	0	0	0	0	0
INDUSTRIAL & US 67-377	158	128	2	1	2	1	1	1	1	0	0
INDUSTRIAL & US 67-377-PATE'S	0	0	0	0							0
TOTAL QUANTITIES	158	128	2	1	2	1	1	1	6	4	1

LOCATION	666-6048 REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	666-6182 REFL PAV MRK TY II (W) 24" (SLD)	666-6210 REFL PAV MRK TY II (Y) 6" (SLD)	666-6321 RE PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)	672-6009 REFL PAV MRKR TY II-A-A	677-6007 ELIM EXT PAV MRK & MRKS (24")	678-6002 PAV SURF PREP FOR MRK (6")	678-6008 PAV SURF PREP FOR MRK (24")	752-6015 TREE AND BRUSH REMOVAL	6185-6002 TMA (STATIONARY)
	LF	LF	LF	LF	EA	SY	SY	LF	AC	DAY
ORCHARD DR	62	62	48	48	2	0	48	62	0	0
OAK ST	68	68	368	368	6	0	368	68	0	0
LONGHORN DR	406	406	362	362	12	0	362	406	0	0
MCCULLOUGH DR	0	0	0	0	0	0	0	0	0	0
INDUSTRIAL & US 67-377	206	206	48	48	4	70	48	206	0	0
INDUSTRIAL & US 67-377-PATE'S	0	0	0	0	0	0	0	0	0	0
TOTAL QUANTITIES	742	742	826	826	24	70	826	742	0.25	10

CITY OF EARLY

VOLKERT

F-12679

Texas Department of Transportation

QUANTITY SUMMARY SHEET

SHEET 1 OF 1

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	HWY-377
DRAWN ER	DIST	COUNTY		SHEET NO.
CHECKED BB	BWD	BROWN		5
APPROVED PF				

DATE: 26-OCT-2023 20:18
FILE: Projects\063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\1. General\Quantities_3 OF 3.dgn

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
1	1	R1-1	STOP	30 X 30	X		TWT	1	WS	P		
		R1-3P	ALL WAY (PLAQUE)	18 X 6	X							
	2	R1-1	STOP	30 X 30	X		TWT	1	WS	P		
		R1-3P	ALL WAY (PLAQUE)	18 X 6	X							
2	3	R1-5b	STOP HERE FOR PEDS	36 X 36	X		TWT	1	WS	T		
	4	R1-5b	STOP HERE FOR PEDS	36 X 36	X		TWT	1	WS	T		
3	5	R1-5b	STOP HERE FOR PEDS	36 X 36	X		TWT	1	WS	T		
	6	R1-5b	STOP HERE FOR PEDS	36 X 36	X		TWT	1	WS	T		
6	7	R1-1	STOP	30 X 30	X		TWT	1	WS	P		
13	8	R1-1	STOP	30 X 30	X		TWT	1	WS	P		
		R1-3P	ALL WAY (PLAQUE)	18 X 6	X							
	9	R1-1	STOP	30 X 30	X		TWT	1	WS	P		
		R1-3P	ALL WAY (PLAQUE)	18 X 6	X							
15	10	R1-1	STOP	30 X 30	X		TWT	1	WS	P		

DATE:
FILE:

PRELIMINARY PLANS

NOT INTENDED FOR CONSRUCTION, BIDDING OR PERMIT PURPOSES.

ERICK A. RAMIREZ, PE NO. 144130

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).
4. Use Poz-Lock-Wedge 30894A and Poz Lock Socket 30894A for each anchor post connection as requested by the City of Early.

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	0923	06	095	(CS)
4-16	DIST	COUNTY		SHEET NO.
8-16	BWD	BROWN		6

TRAFFIC CONTROL PLAN NARRATIVE

1. PLACE SIGNS IN ACCORDANCE WITH THE BARRICADE AND CONSTRUCTION (BC) STANDARDS AND LATEST EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TEXAS MUTCD). THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN CONTINUOUS ACCESS TO SIDE STREETS AND PRIVATE DRIVEWAYS DURING ALL CONSTRUCTION ACTIVITIES.

2. TRAFFIC MUST BE HANDLED THROUGHOUT THE PROJECT DURING CONSTRUCTION . CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SAFE AND COMFORTABLE PASSAGE FOR THE VEHICULAR AND PEDESTRIAN TRAFFIC WITH MINIMAL INCONVENIENCE TO THE PUBLIC. REQUESTS FOR LANE SHIFTS OR CLOSURES SHOULD BE REQUESTED WITH SUFFICIENT NOTICE FOR APPROVAL BY THE ENGINEER. ALL TRAFFIC HANDLING SHOULD FOLLOW THE TCP STANDARDS LISTED.

3. CONSTRUCT DRAINAGE FEATURES, PATHWAY, DRIVEWAYS, STRIPING, AND OTHER PEDESTRIAN ELEMENTS. CONTRACTOR SHALL CONSTRUCT AREAS SEQUENTIALLY UNLESS DIRECTED OR AUTHORIZED BY THE ENGINEER. CONSTRUCTION SEQUENCE IS AS FOLLOWS 1ST ORCHARD DR., 2ND OAK ST., 3RD W. INDUSTRIAL LN., 4TH LONGHORN DR., AND 5TH McCULLOUGH DR.

4. COORDINATE WITH ADJACENT PROJECTS IF PRESENT. ILLUMINATION AND ROUNDABOUT STRIPING SHALL BE CONSTRUCTED BY OTHERS IN ADVANCE, IF NOT COORDINATE WITH ENGINEER AND THE CITY OF EARLY FOR PHASING OF WORK.

5. PLACE SWPPP ITEMS PRIOR TO CONSTRUCTION ACTIVITIES IN THEIR CONTROL AREA BUT NO SOONER THAN 2 WEEKS BEFORE SOIL DISTURBANCE. TEMPORARY SWPPP CONTROLS SHALL BE REMOVED UPON VEGETATION ESTABLISHMENT OR AS DIRECTED OR AUTHORIZED BY THE ENGINEER.

6. THE PROPOSED PEDESTRIAN CROSSING ACROSS US-67 AT THE SUDDERTH DR. INTERSECTION SHOULD NOT BEGIN WORK UNTIL JUNE 1ST, AND TO BE COMPLETED BEFORE AUGUST 1ST TO AVOID VEHICLE AND PEDESTRIAN CONFLICT DURING THE SCHOOL YEAR.

7. COORDINATE WITH TXDOT FOR SIGNAL TIMING REVISIONS AS NECESSARY FOR THE PROPOSED PEDESTRIAN CROSSING AT US-67 AND SUDDERTH DR. TO ALLOW PEDESTRIANS A MINIMUM OF 28 SECONDS TO CROSS THE INTERSECTION.

8. ONCE CONSTRUCTION IS COMPLETE, REMOVE TEMPORARY TRAFFIC DEVICES AS DIRECTED BY THE ENGINEER

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER
09/29/2023

CITY OF EARLY

VOLKERT

F-12679

TRAFFIC CONTROL NARRATIVE

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0923	06	095	(CS)
DIST	COUNTY		SHEET NO.
BROWNWOOD	BROWN		7

DATE: 29-SEP-2023 04:14
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\2. TCP\TRAFFIC CONTROL PLAN NARRATIVE.dgn

DATE:
FILE:

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

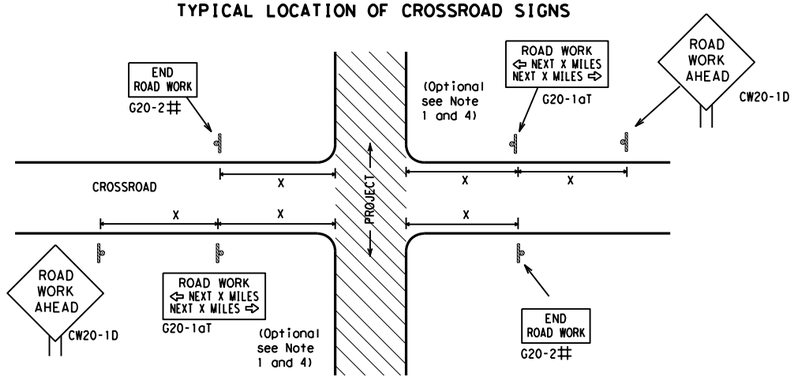
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	CS
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	BWD	BROWN		8
5-10 5-21				

DATE:
FILE:

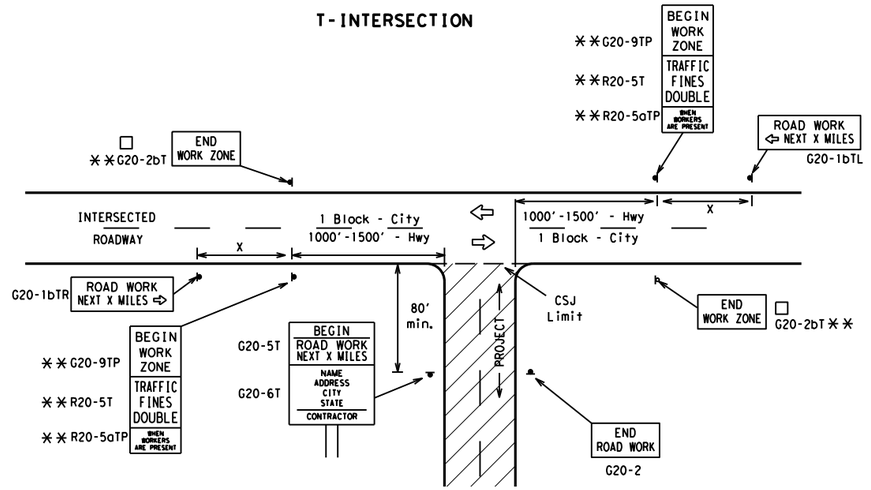
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

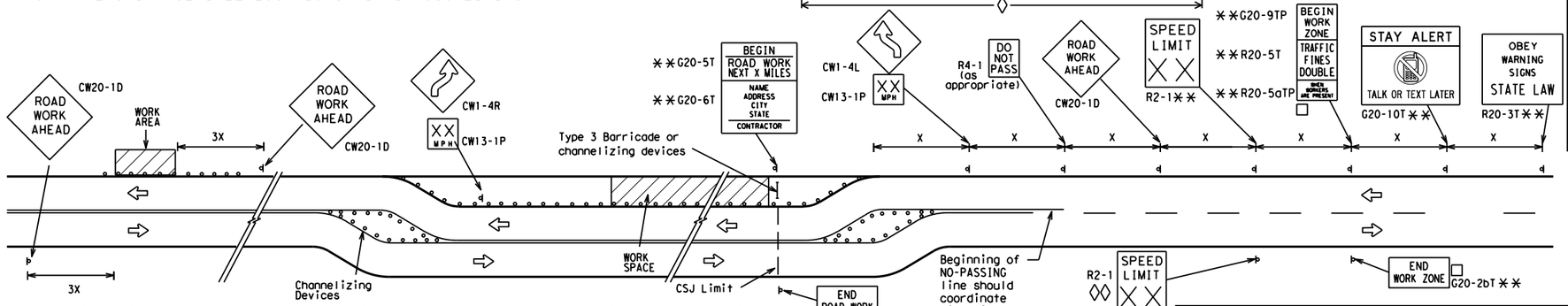
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

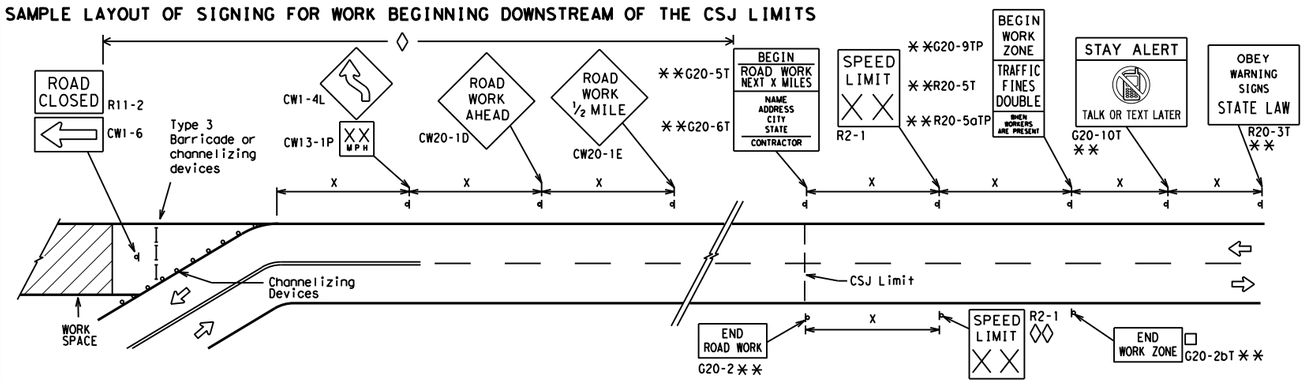
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BWD	BROWN		9

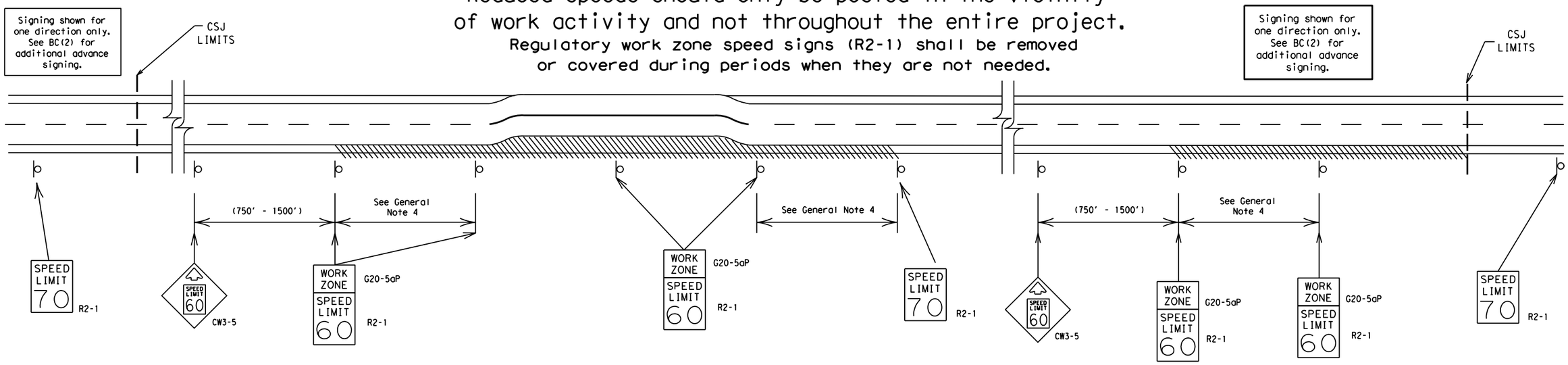
DATE:
FILE:

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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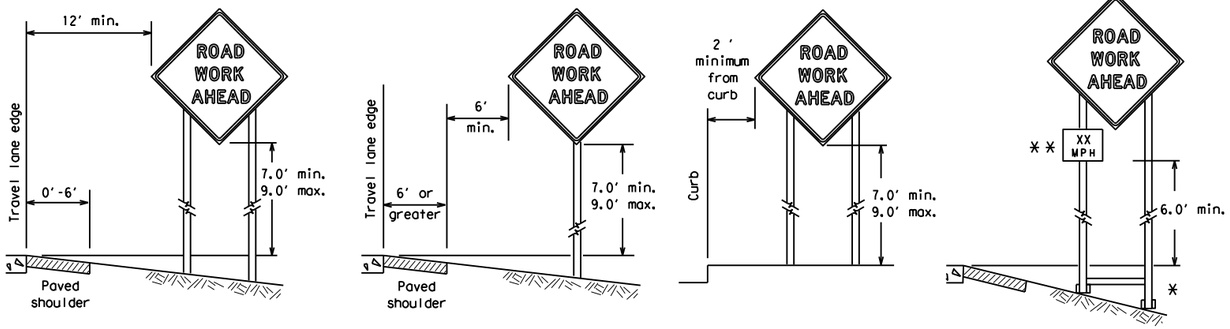
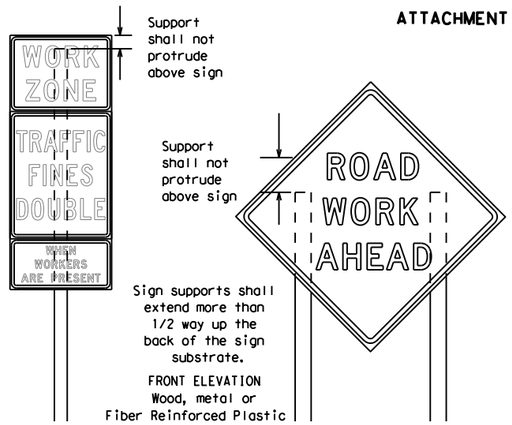
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

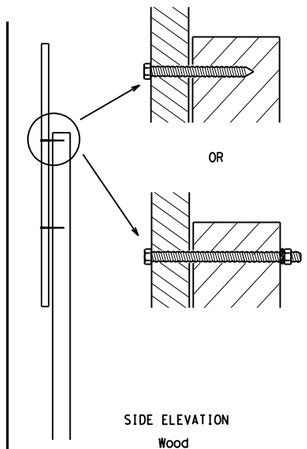


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





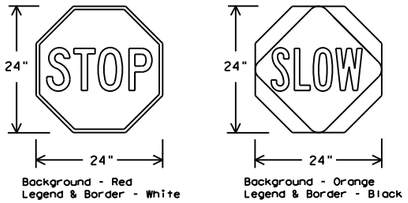
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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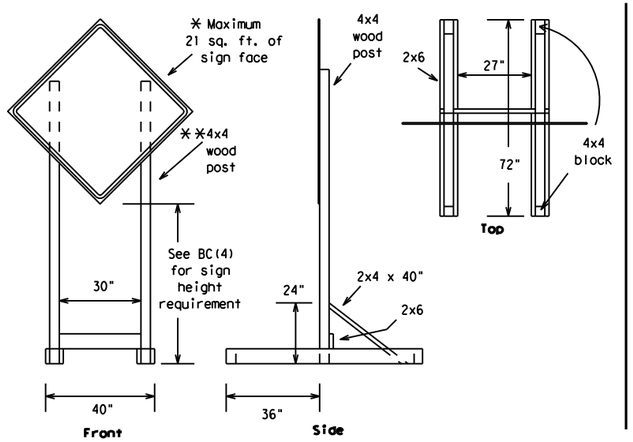
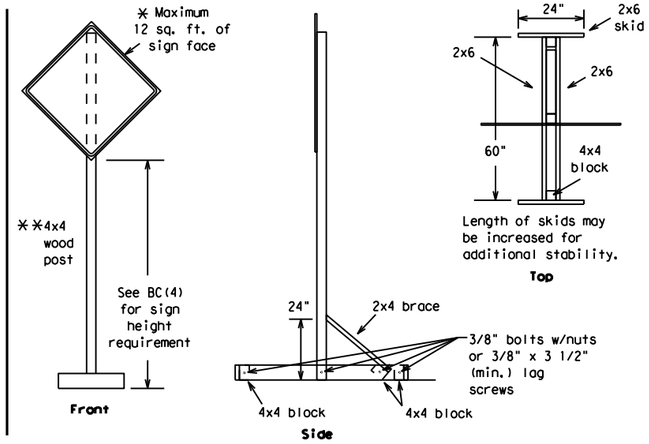
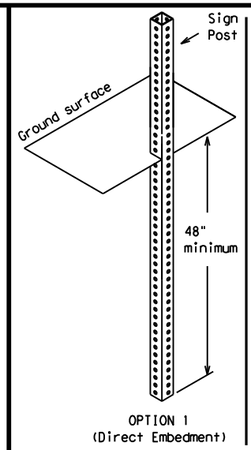


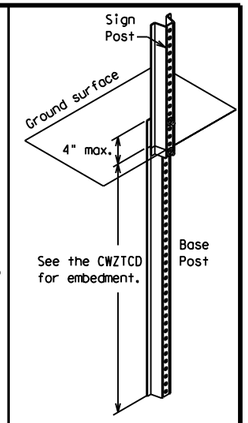


SKID MOUNTED WOOD SIGN SUPPORTS

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



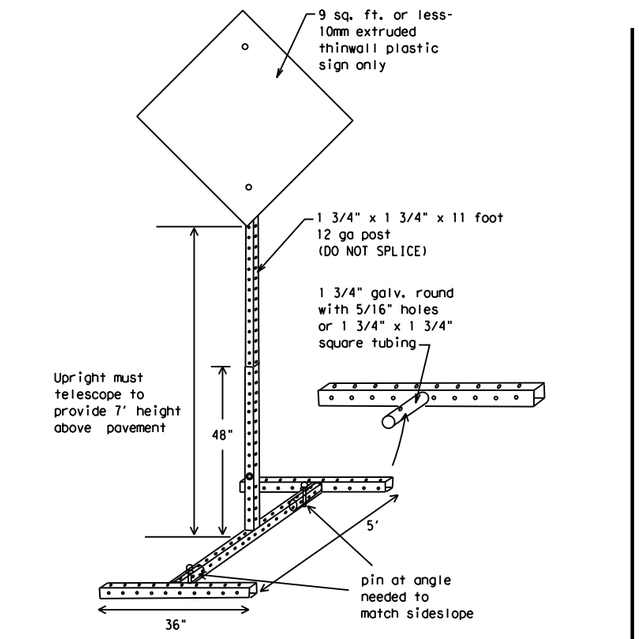
PERFORATED SQUARE METAL TUBING

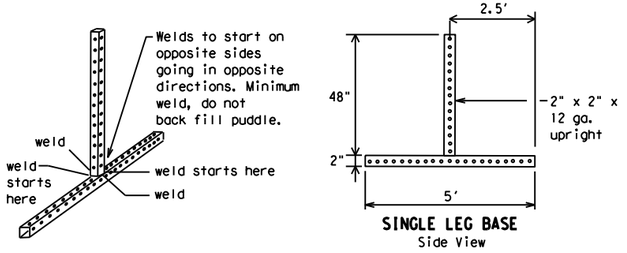


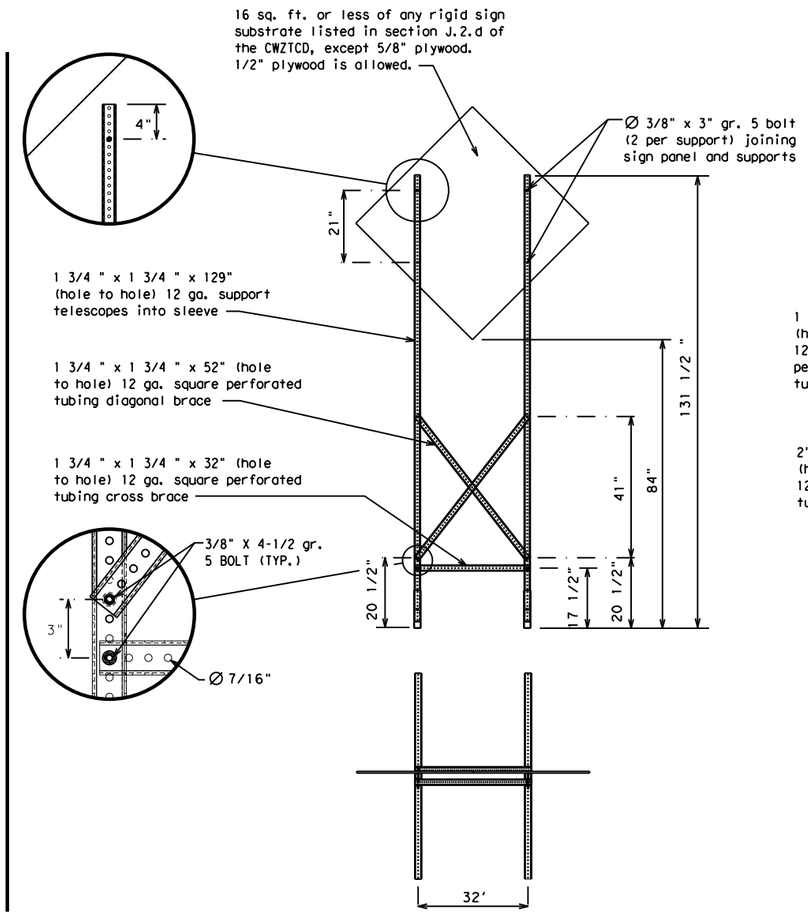
WING CHANNEL
Lap-splice/base bolted anchor

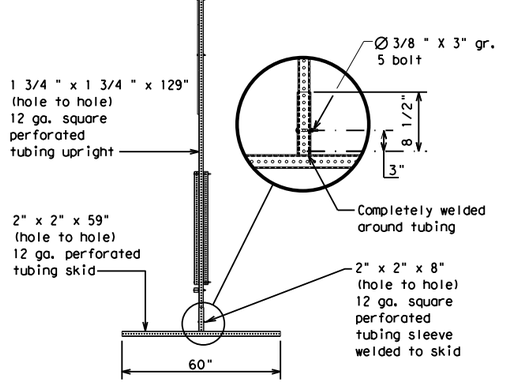
GROUND MOUNTED SIGN SUPPORTS

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.

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BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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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
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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BWD	BROWN		13

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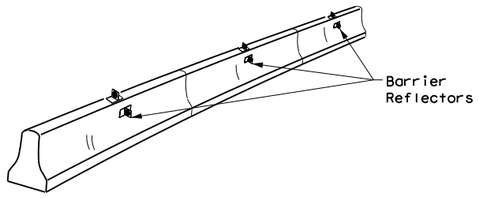
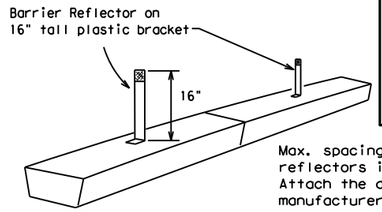
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



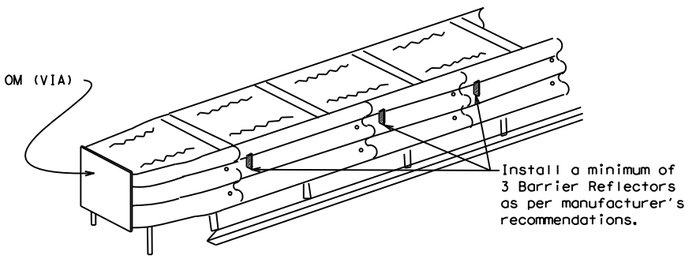
CONCRETE TRAFFIC BARRIER (CTB)

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)



DELINEATION OF END TREATMENTS

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

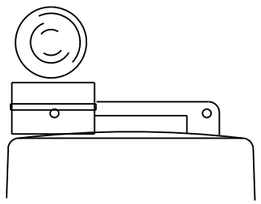
LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

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

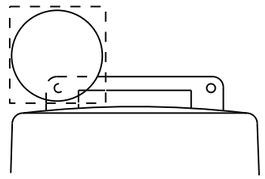
WARNING LIGHTS



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

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



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

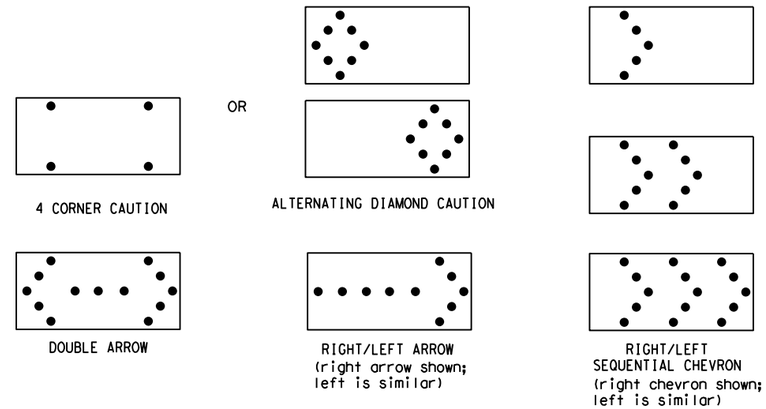
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

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	0923	06	095	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BWD	BROWN		14

101

DATE:
FILE:

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:

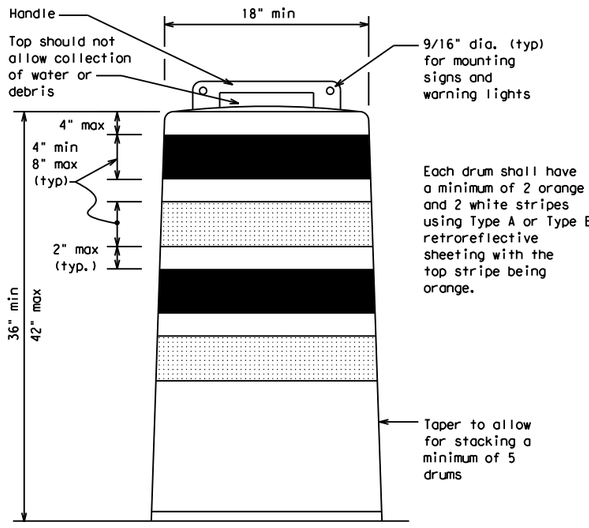
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

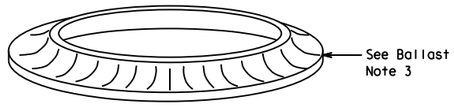
RETROREFLECTIVE SHEETING

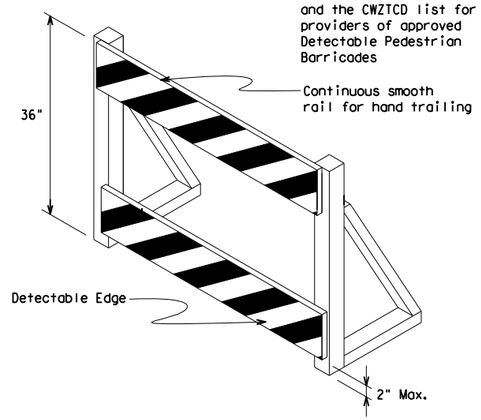
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

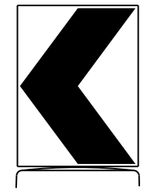




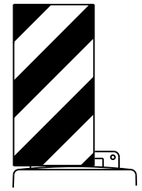


DETECTABLE PEDESTRIAN BARRICADES

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	0923	06	095	CS
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	BWD	BROWN		15
7-13				

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DATE:
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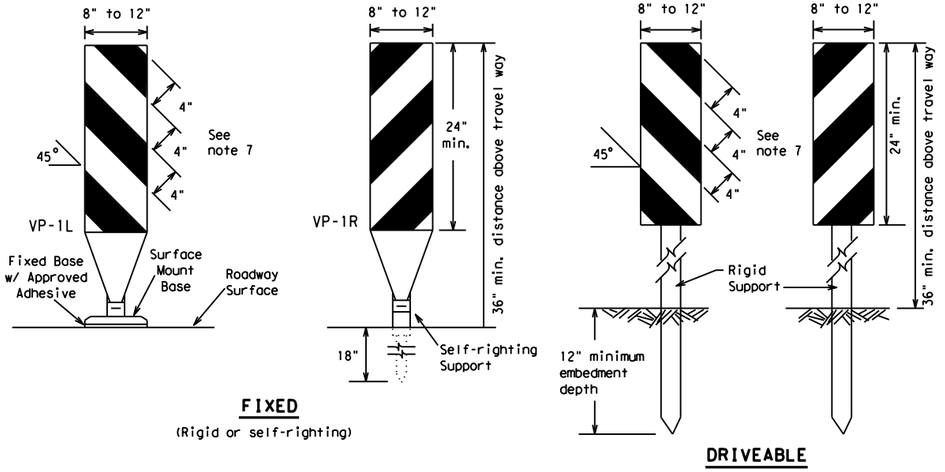
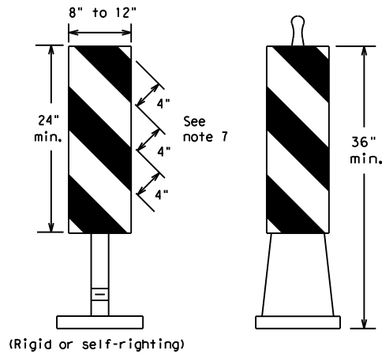


FIXED
(Rigid or self-righting)

DRIVEABLE

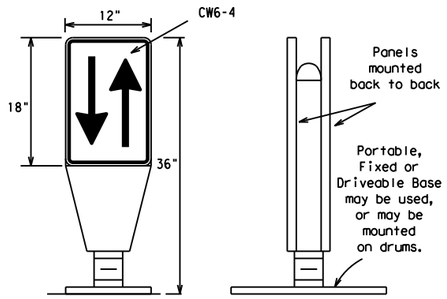


(Rigid or self-righting)

PORTABLE

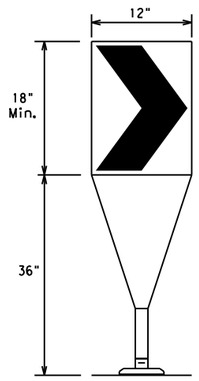
VERTICAL PANELS (VPs)

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.



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)



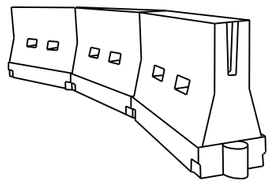
Fixed Base w/ Approved Adhesive
(Driveable Base, or Flexible Support can be used)

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

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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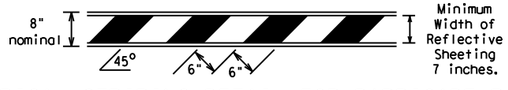
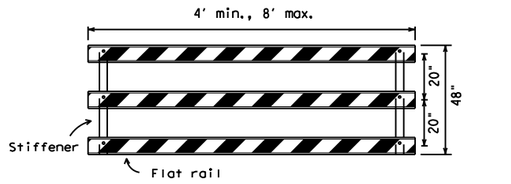
TYPE 3 BARRICADES

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.



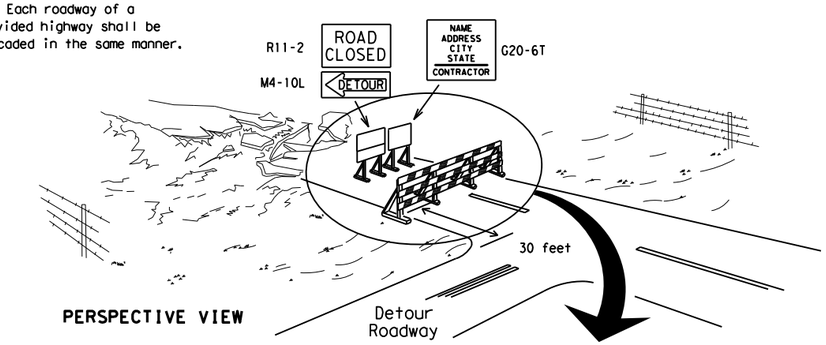
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

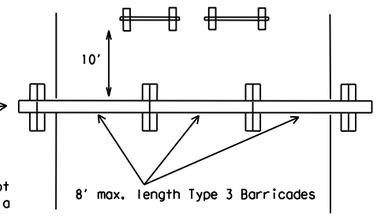
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

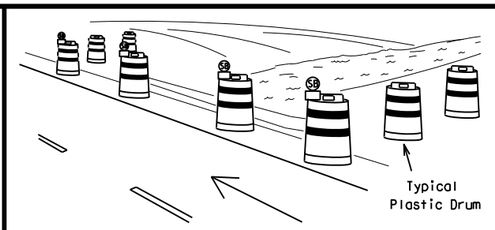
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

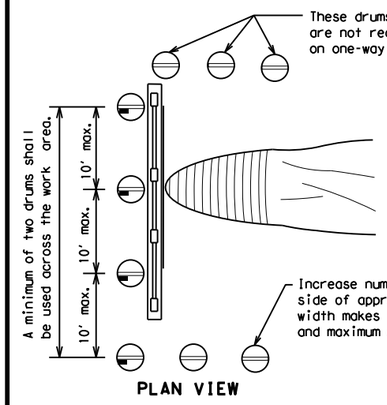
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

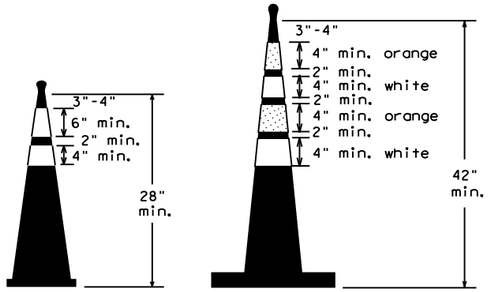
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

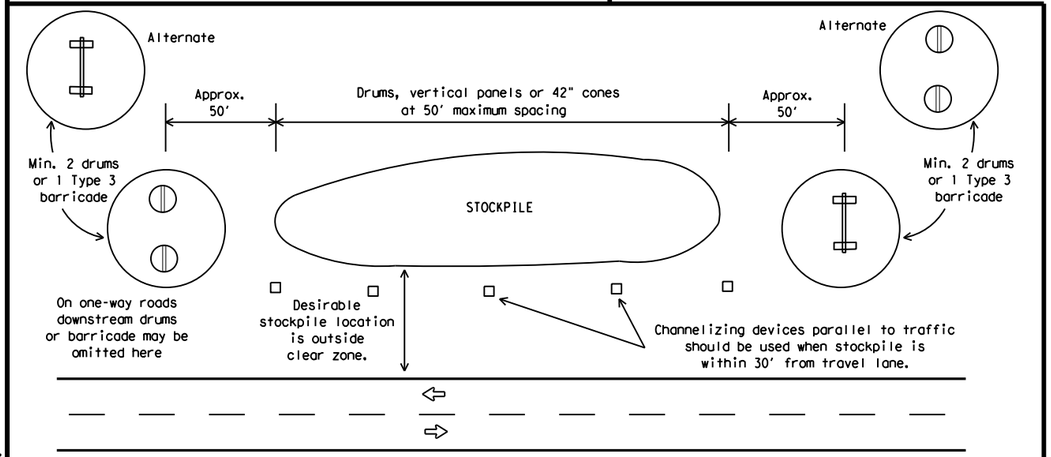
PLAN VIEW

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

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Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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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.

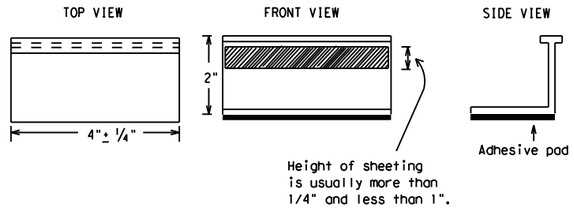
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

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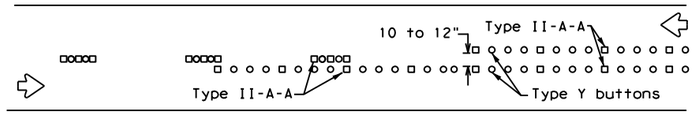
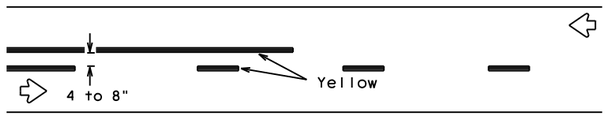
PAVEMENT MARKING PATTERNS

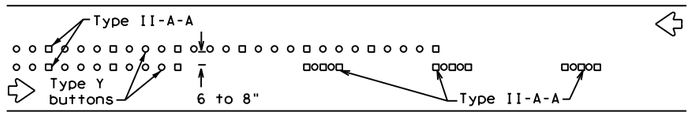
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



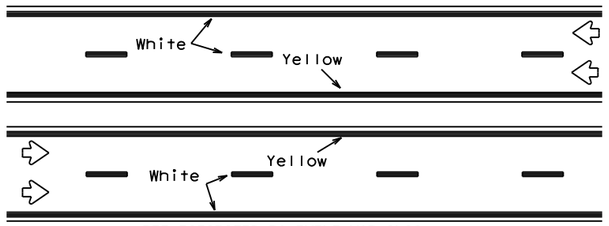
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



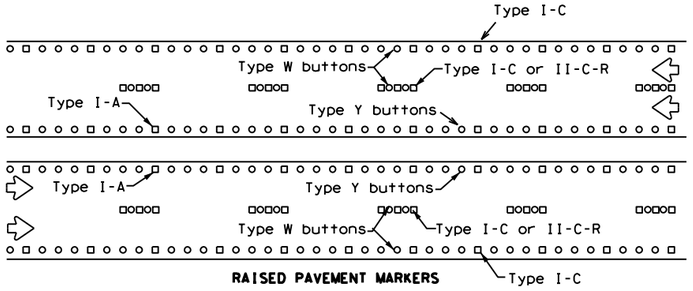
RAISED PAVEMENT MARKERS - PATTERN B

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



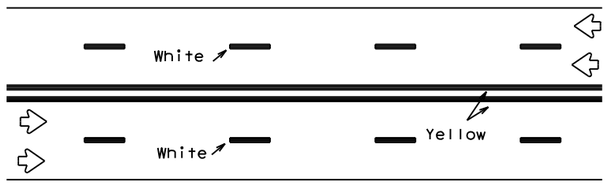
REFLECTORIZED PAVEMENT MARKINGS



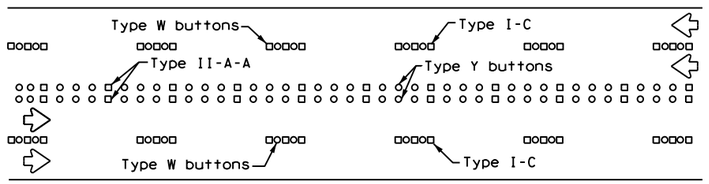
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



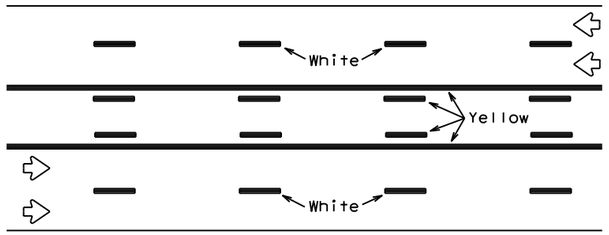
REFLECTORIZED PAVEMENT MARKINGS



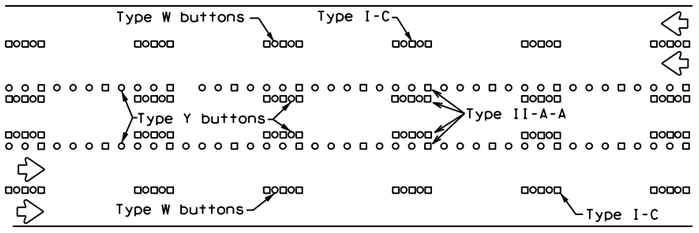
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

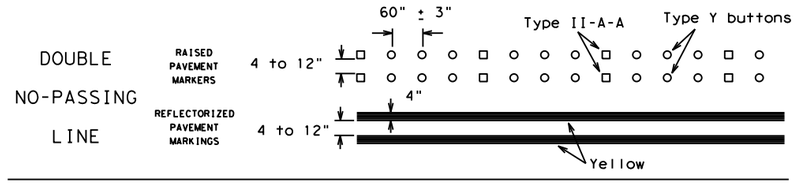
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

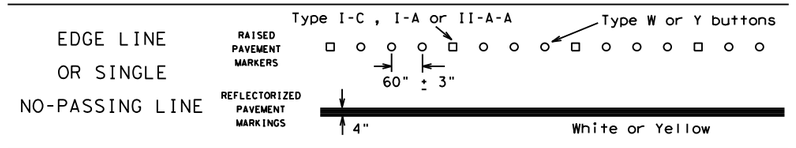
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

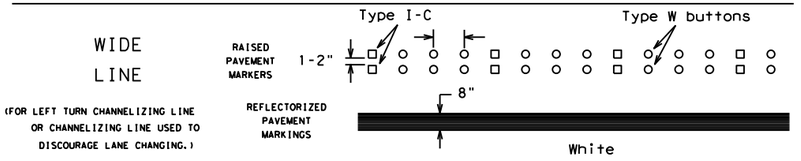


EDGE LINE OR SINGLE NO-PASSING LINE



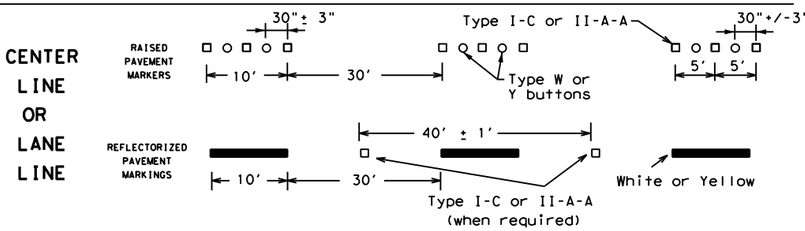
WIDE LINE

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

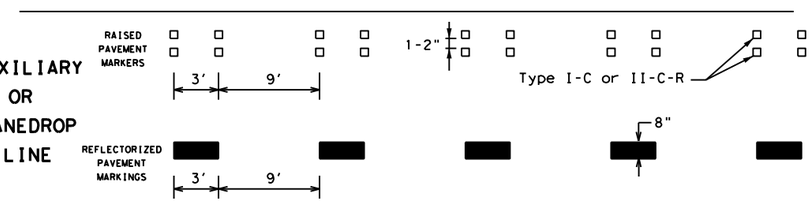


BROKEN LINES

CENTER LINE OR LANE LINE

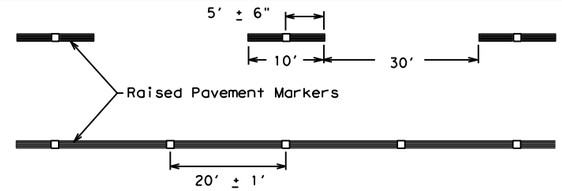


AUXILIARY OR LANEDROP LINE



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

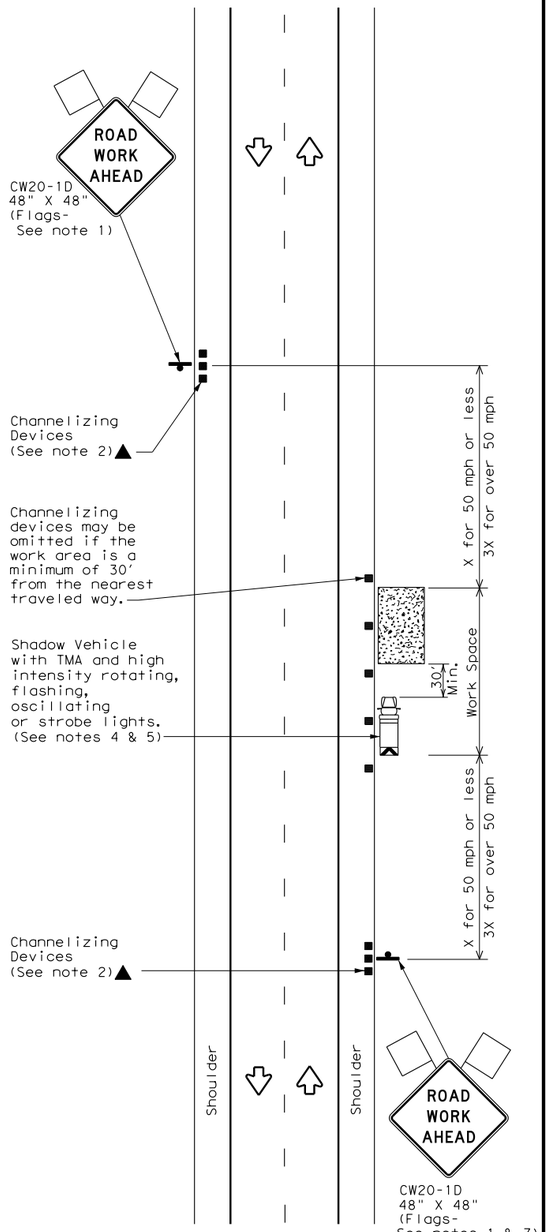
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

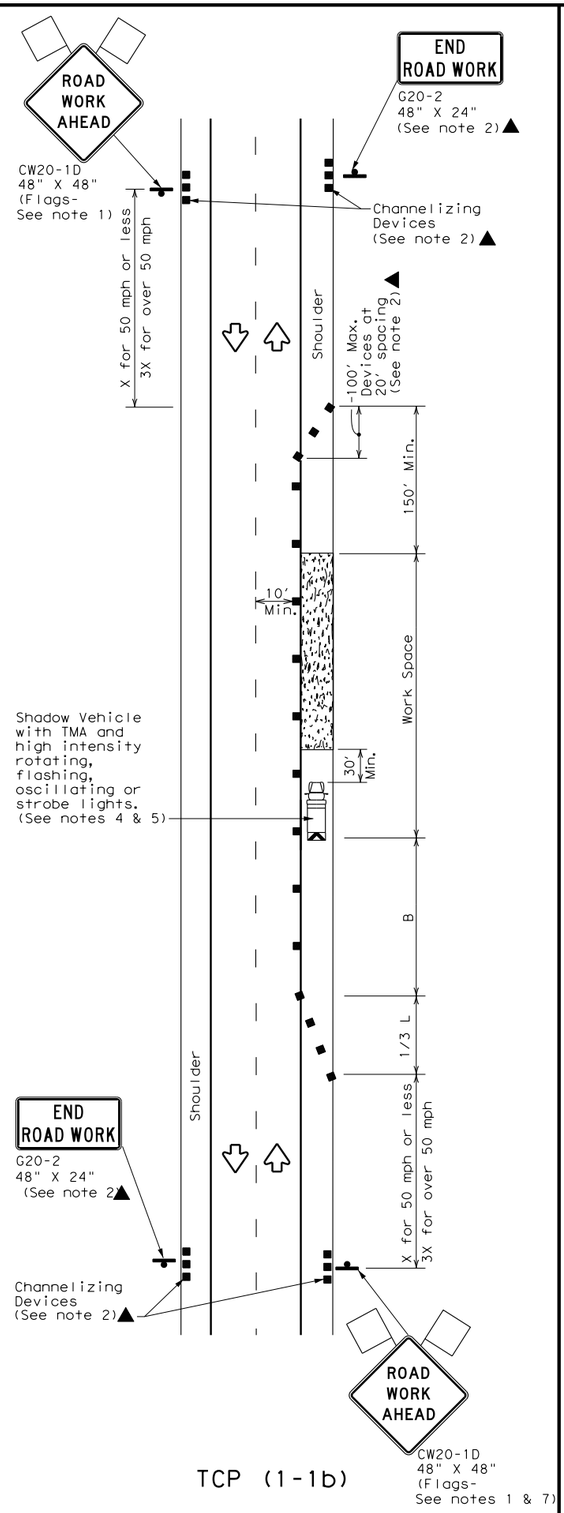
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0923	06	095	CS
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		19

106



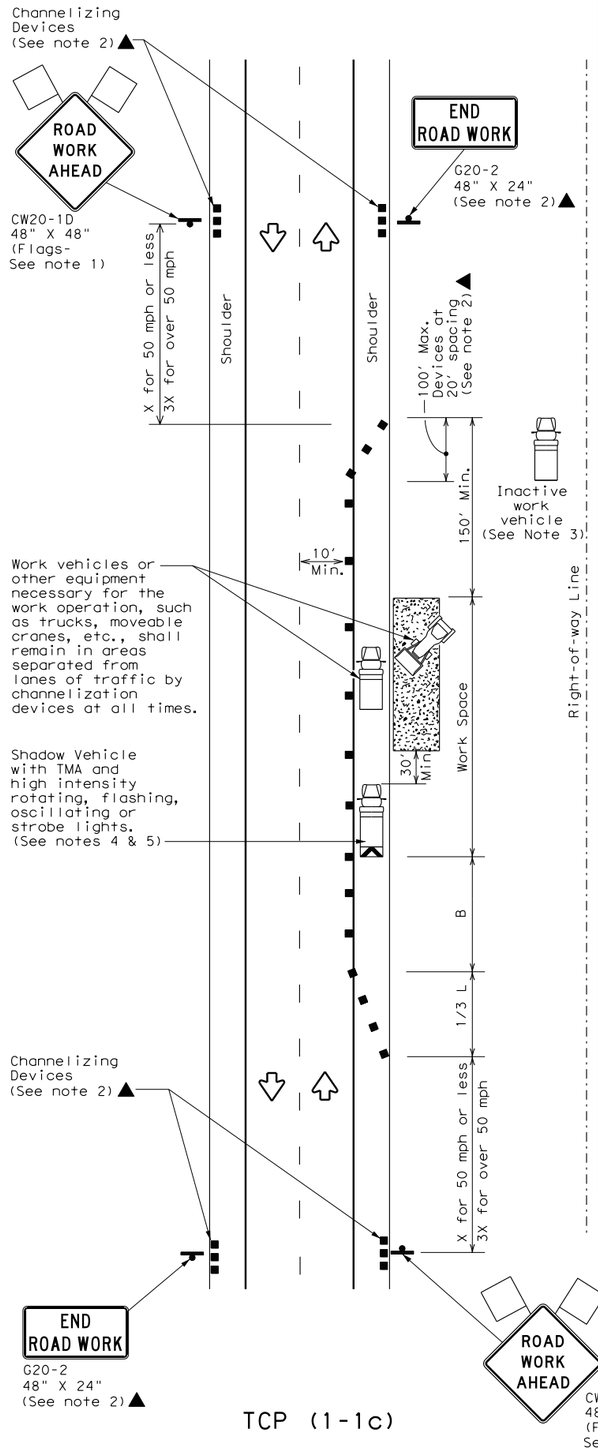
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

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 elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. 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 wider work spaces.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. 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

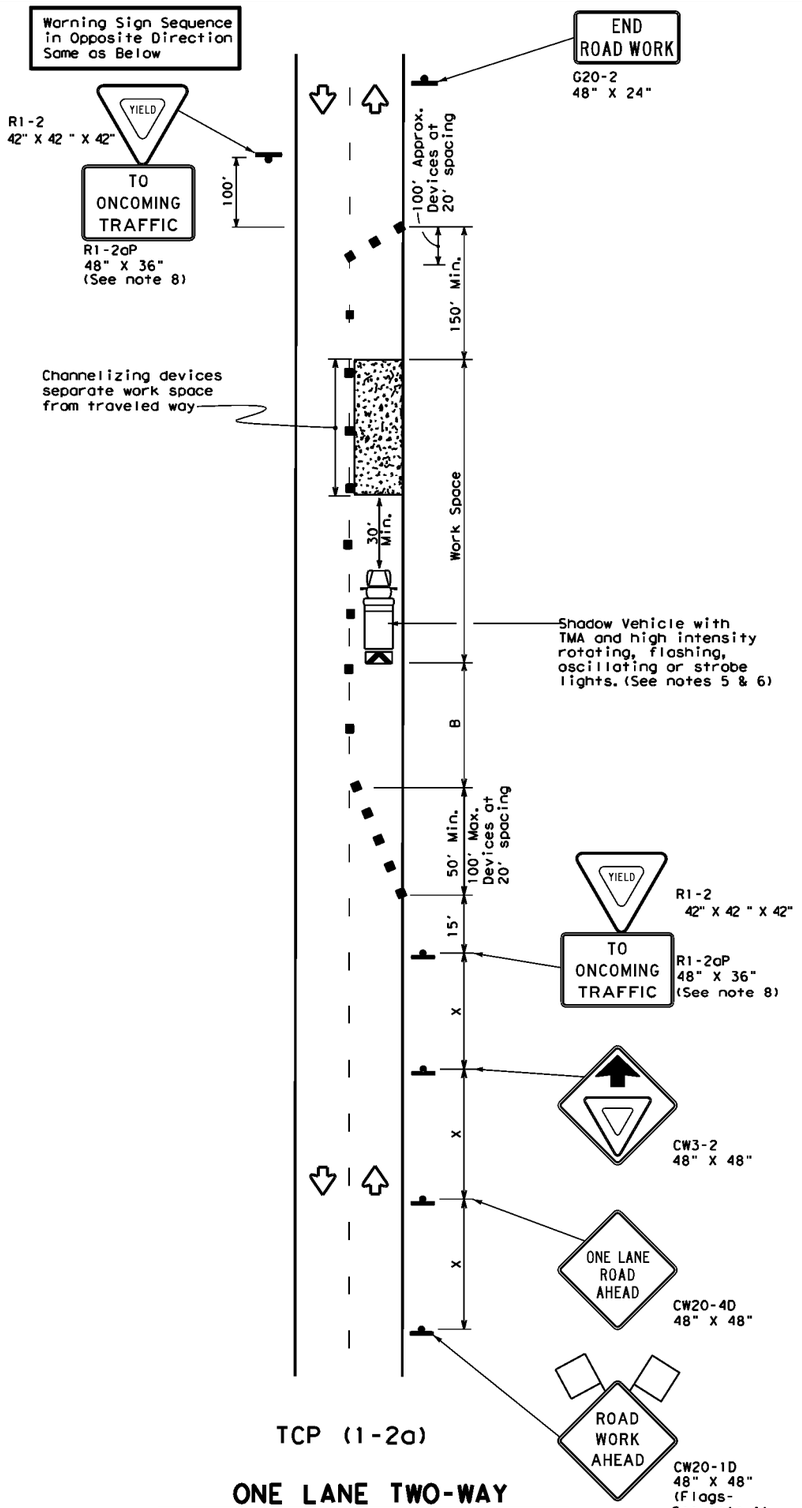
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	BWD	BROWN		20
1-97 2-18				

DATE:
FILE:

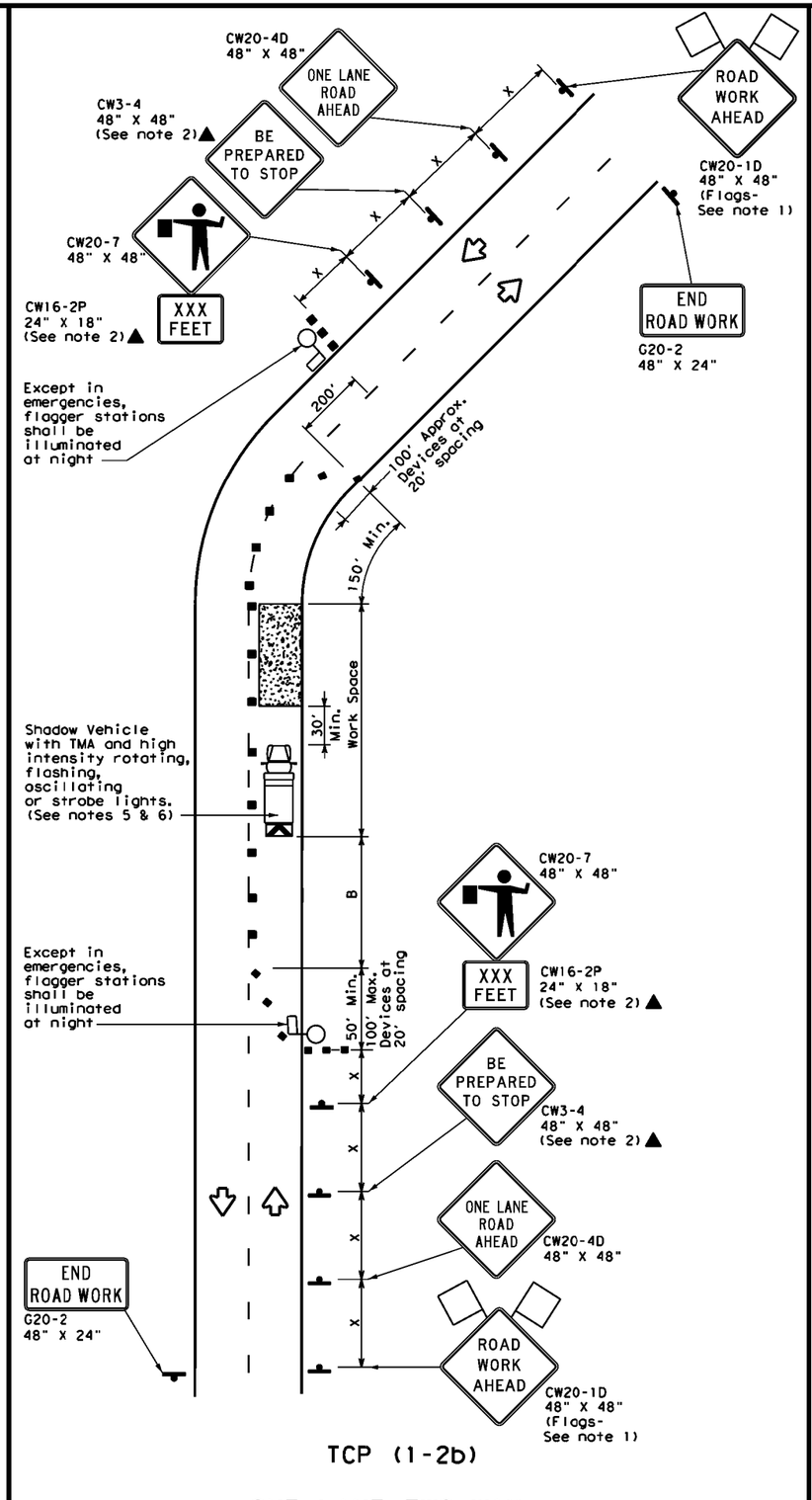
DATE:
FILE:



TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

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'	90'	240'	195'	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'	500'	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 CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
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 off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

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

TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation

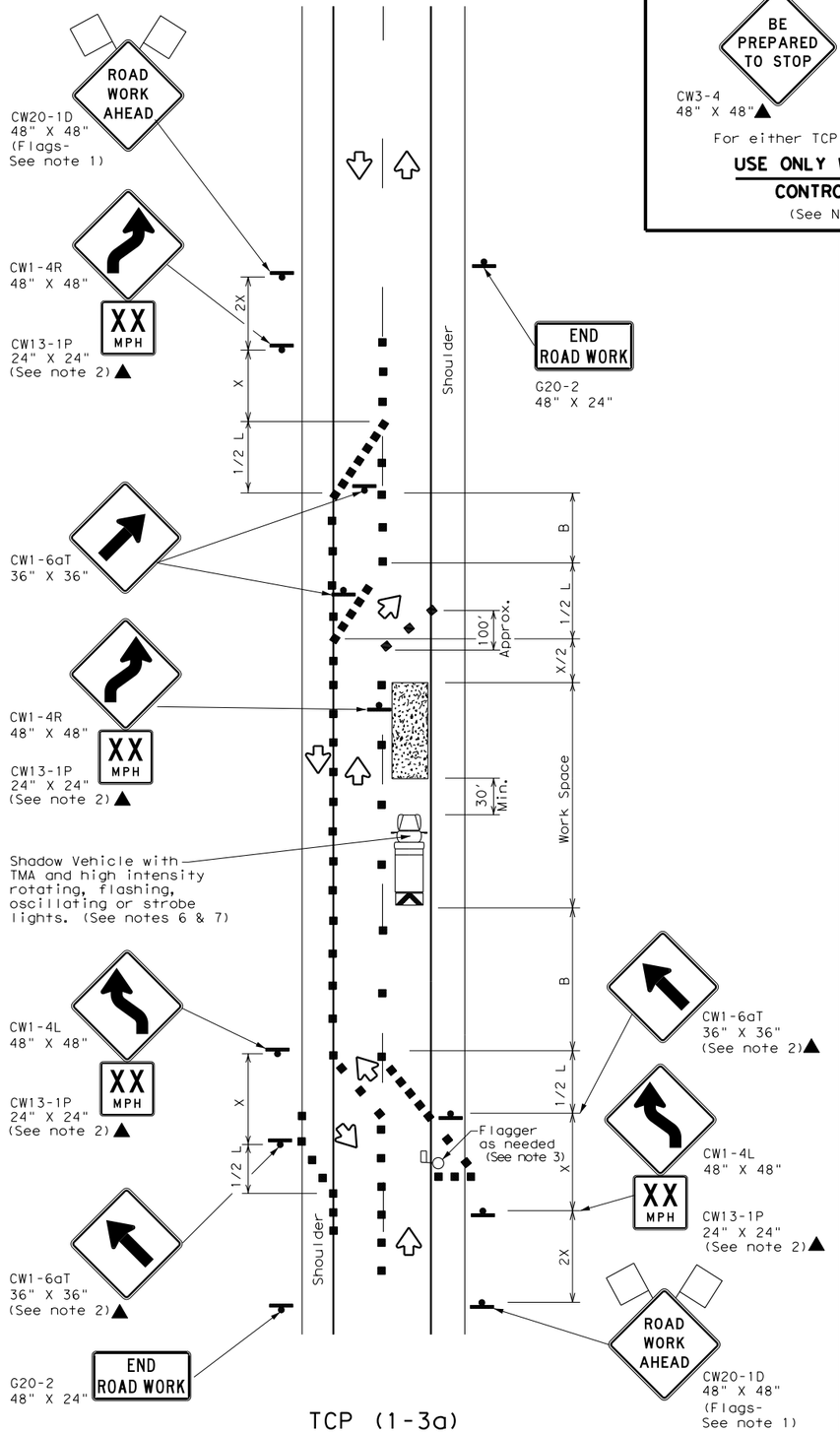
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
4-90 4-98	DIST	COUNTY		SHEET NO.
2-94 2-12	BWD	BROWN		21
1-97 2-18				

DATE:
FILE:



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

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW

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

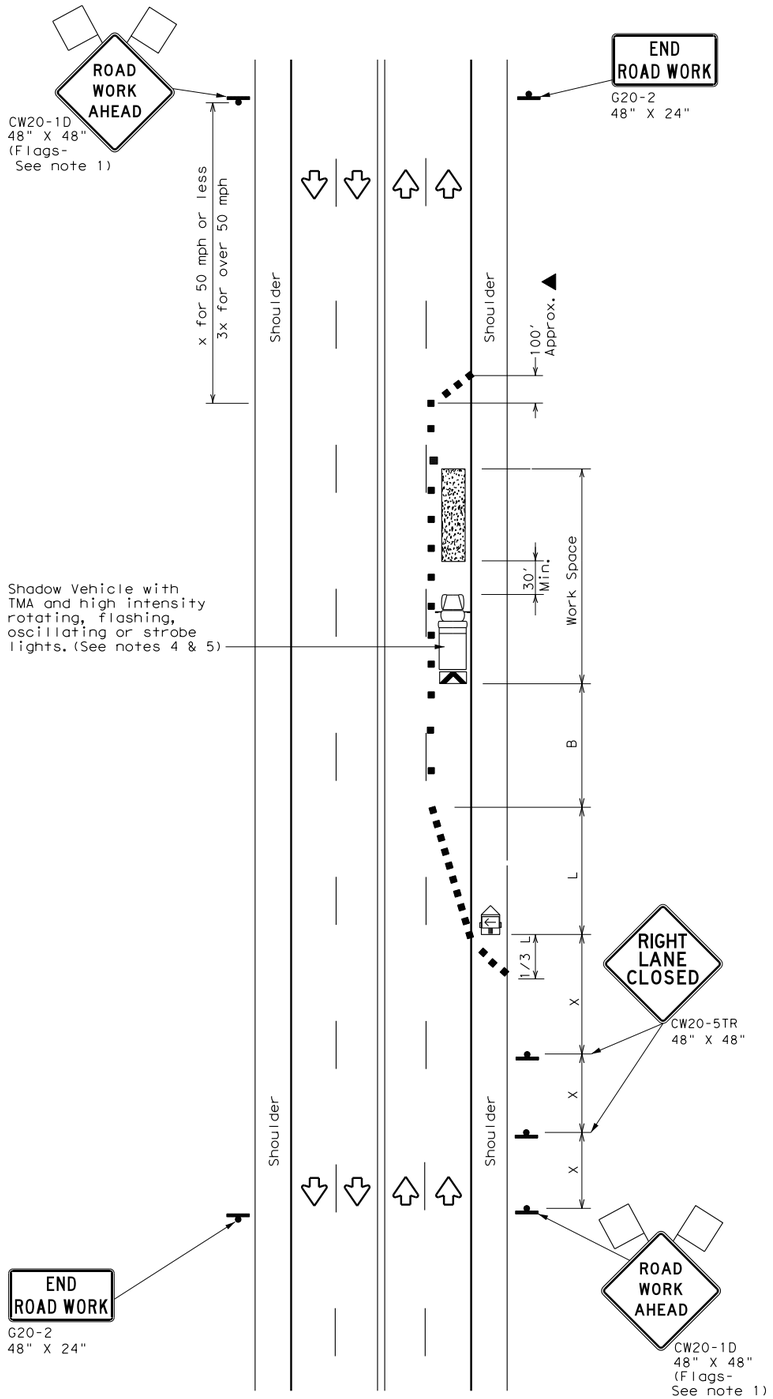
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

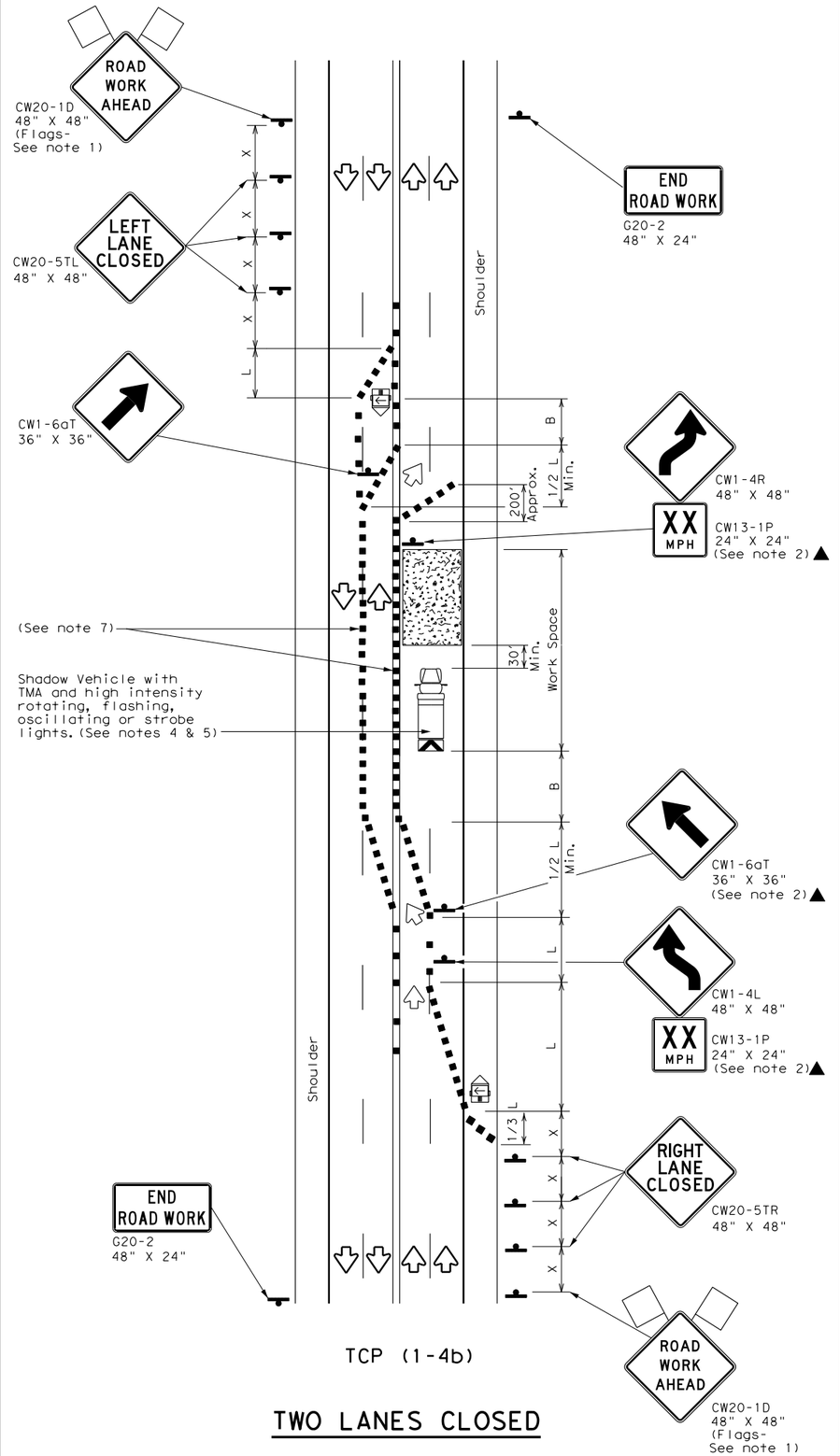
FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	BWD	BROWN		22
1-97 2-18				

DATE:
FILE:



TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

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 CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. 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 wider work spaces.

TCP (1-4a)

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 where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. 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 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation

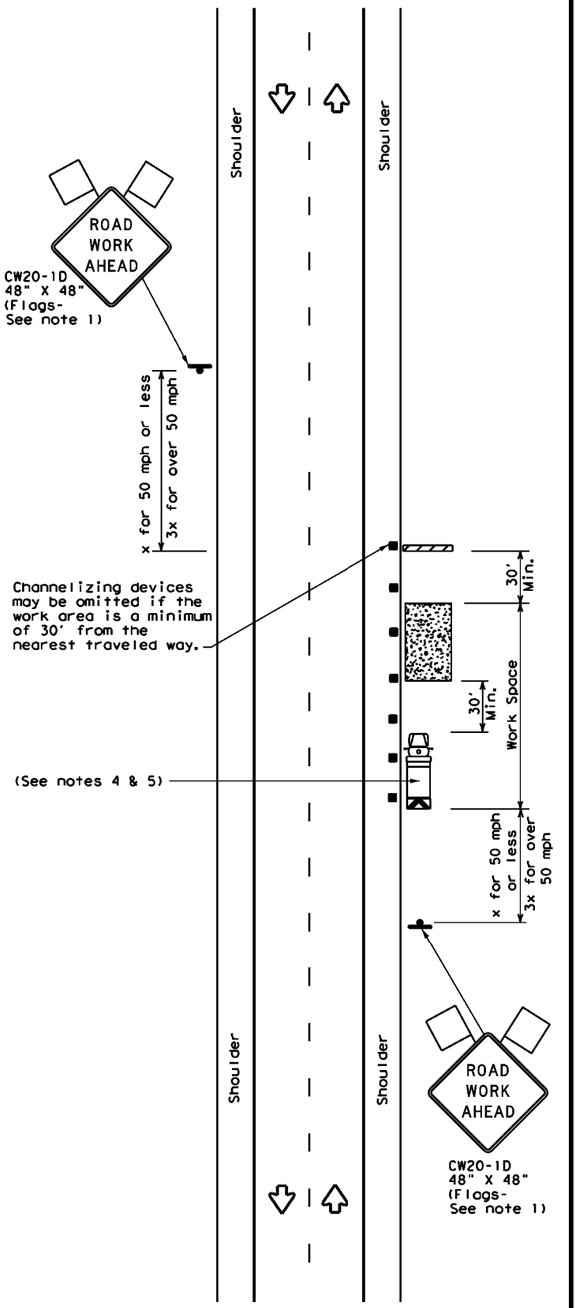
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

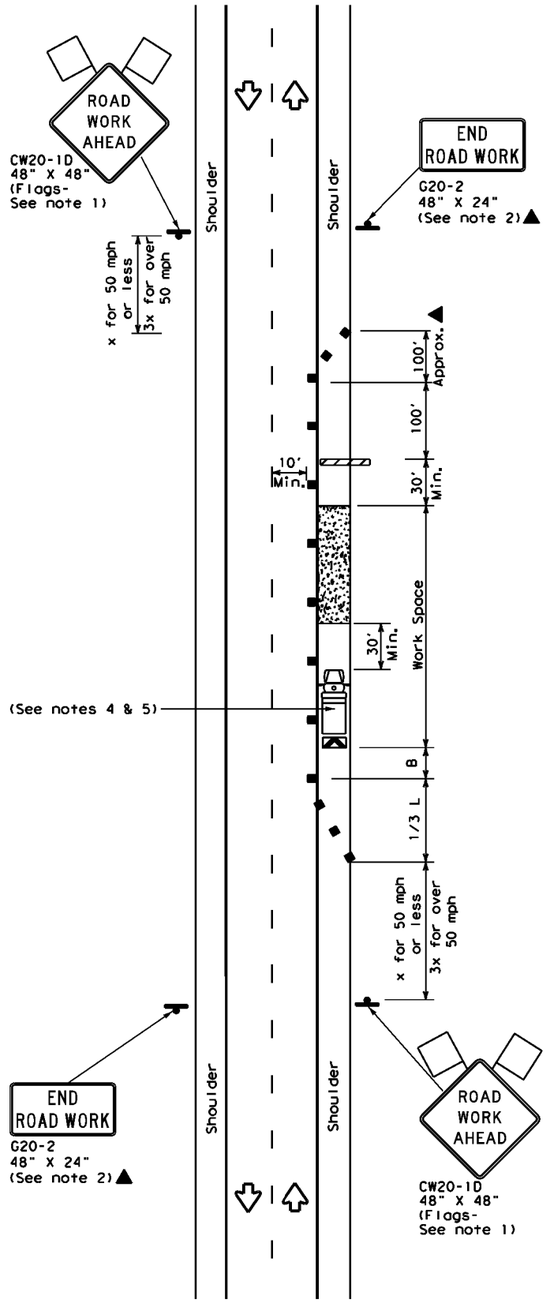
FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	BWD	BROWN		23
1-97 2-18				

DATE:
FILE:



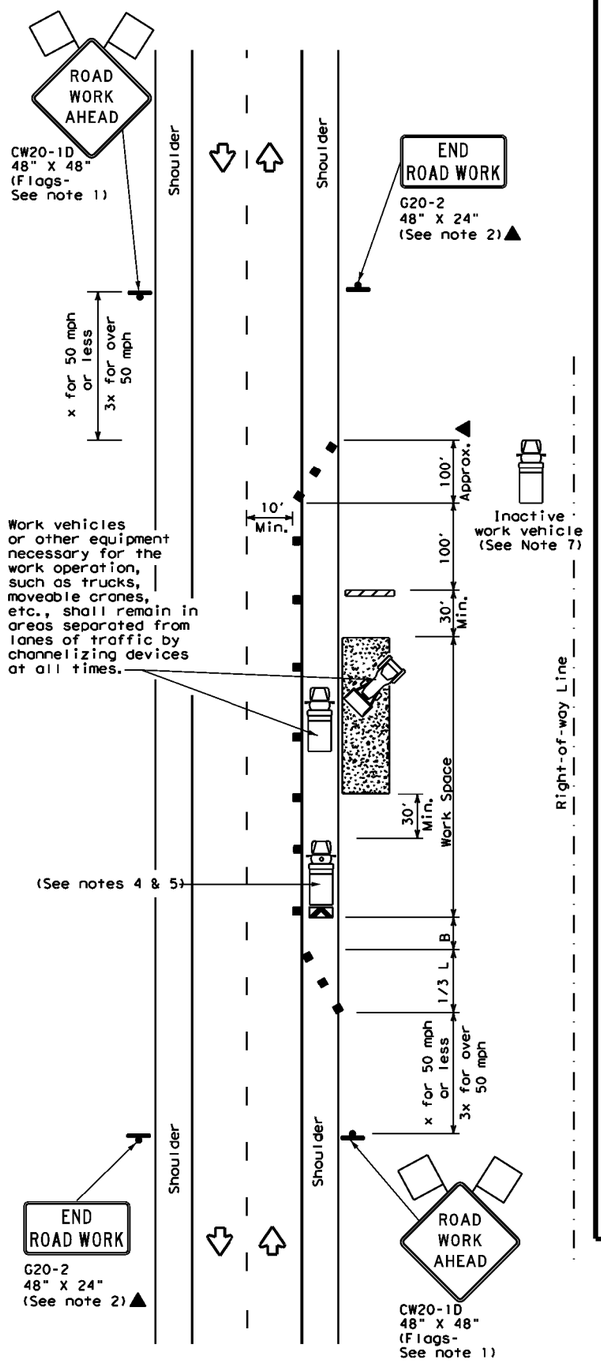
TCP (2-1a)

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'	155'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	500'	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 2-94 4-98 8-95 2-12 1-97 2-18	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		24

DATE:
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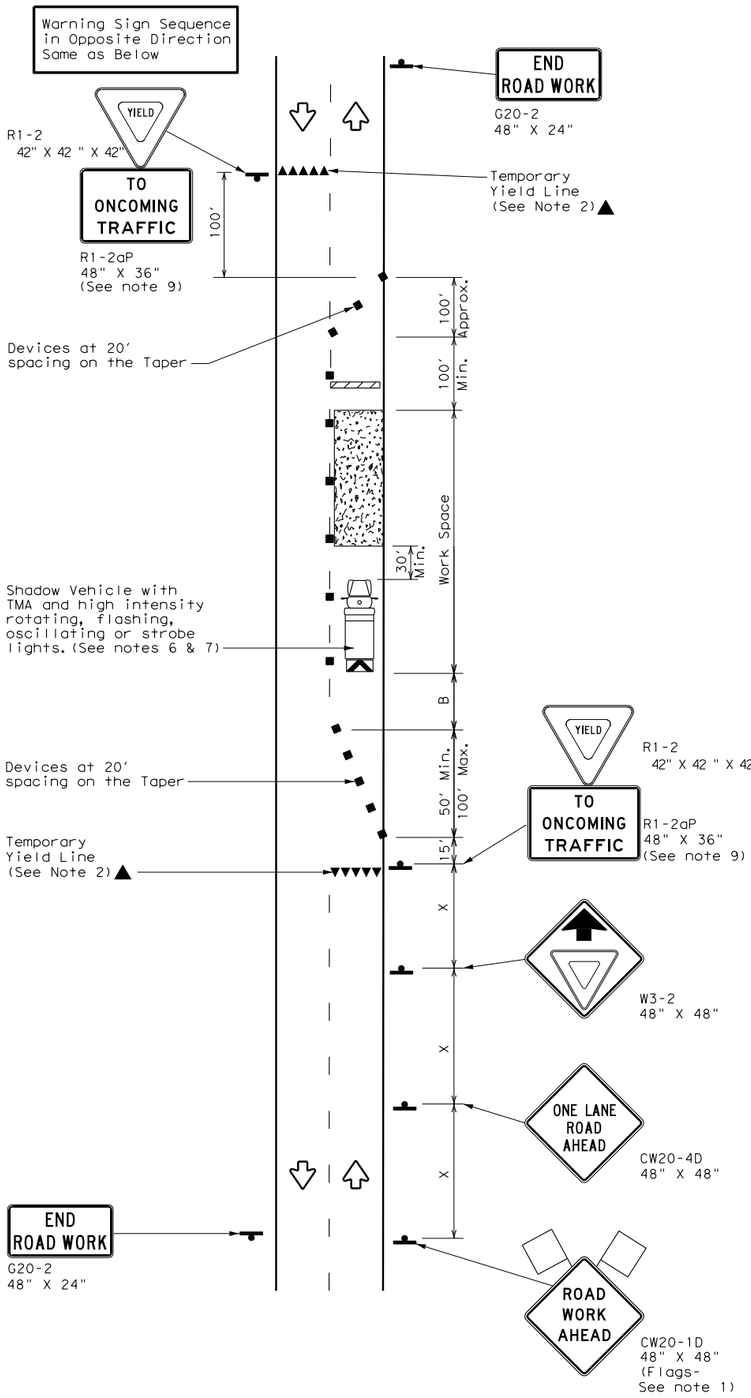
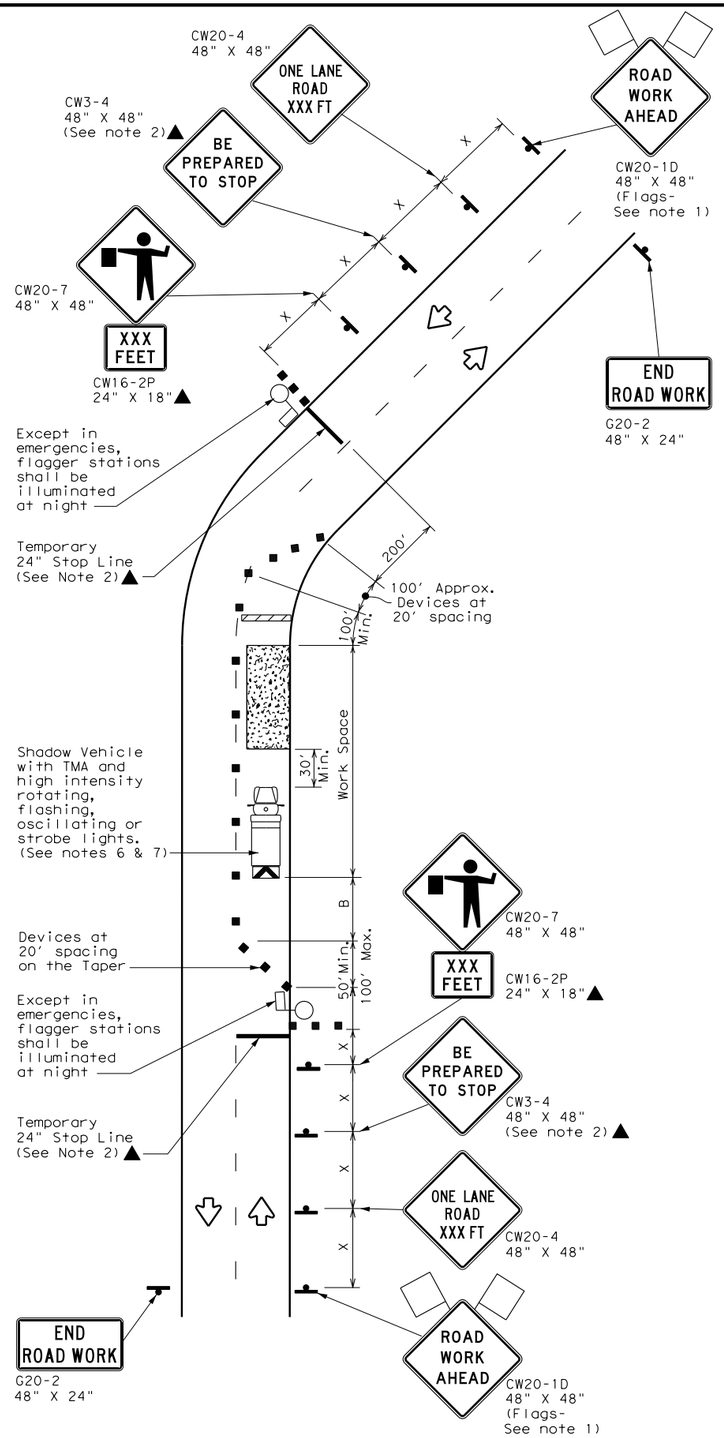


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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	0923	06	095	(CS)
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	BWD	BROWN		25
4-98 2-18				

Horizontal Alignment Data Report

Report Created:1/64 Wednesday, August 23, 2023
Time:1/64 4:01:38 AM
Project:1/64 Default
Description:1/64
File Name:1/64 c: \ volkert_pw_workingdir \ eric.ramirez \ d0335697\ Alignments(Openroads).dgn
Last Revised:1/64 8/23/2023 04:00:09
1/64 Note: 1/64 All units in this report are in feet unless specified otherwise.

Alignment Name:1/64 EARLY PKWY
Alignment Description:1/64
Alignment Style:1/64 Alignment \ Baseline
Station Northing Easting

Element: Linear
POT ( ) 1000.000 R1 10597099.842 2722534.387
PC ( ) 1210.655 R1 10597185.935 2722726.646
Tangential Direction: N65.877 ° E
Tangential Length: 210.655

Element: Circular
PC ( ) 1210.655 R1 10597185.935 2722726.646
PI ( ) 1229.350 R1 10597193.576 2722743.708
CC ( ) 10597222.442 2722710.298
PT ( ) 1245.632 R1 10597211.566 2722748.791
Radius: 40.000
Delta: 50.100 ° Left
Degree of Curvature (Arc): 143.239 °
Length: 34.977

Tangent: 18.695
Chord: 33.873
Middle Ordinate: 3.763
External: 4.153
Back Tangent Direction: N65.877 ° E
Back Radial Direction: S24.123 ° E
Chord Direction: N40.827 ° E
Ahead Radial Direction: S74.223 ° E
Ahead Tangent Direction: N15.777 ° E

Element: Linear
PT ( ) 1245.632 R1 10597211.567 2722748.791
POT ( ) 1247.170 R1 10597213.046 2722749.209
Tangential Direction: N15.777 ° E
Tangential Length: 1.538

Alignment Name:1/64 INDUSTRIAL LN.
Alignment Description:1/64
Alignment Style:1/64 Alignment \ Baseline
Station Northing Easting

Element: Linear
POT ( ) 1000.000 R1 10603343.156 2731375.826
PI ( ) 1336.002 R1 10603111.051 2731618.775
Tangential Direction: S46.308 ° E
Tangential Length: 336.002

Element: Linear
PI ( ) 1336.002 R1 10603111.051 2731618.775
PC ( ) 1958.782 R1 10602661.458 2732049.729
Tangential Direction: S43.787 ° E
Tangential Length: 622.780

Element: Circular
PC ( ) 1958.782 R1 10602661.458 2732049.729
PI ( ) 2000.088 R1 10602631.994 2732078.678
CC ( ) 10602726.768 2732116.203
PRC ( ) 2036.544 R1 10602633.655 2732119.950
Radius: 93.188
Delta: 47.811 ° Left
Degree of Curvature (Arc): 61.484 °
Length: 77.762

Tangent: 41.306
Chord: 75.525
Middle Ordinate: 7.994
External: 8.744
Back Tangent Direction: S44.494 ° E
Back Radial Direction: S45.506 ° W
Chord Direction: S68.399 ° E
Ahead Radial Direction: S2.305 ° E
Ahead Tangent Direction: N87.695 ° E

Element: Circular
PRC ( ) 2036.544 R1 10602633.655 2732119.950
PI ( ) 2076.177 R1 10602635.249 2732159.552
CC ( ) 10602540.542 2732123.698
PT ( ) 2111.491 R1 10602607.828 2732188.169
Radius: 93.188
Delta: 46.081 ° Right
Degree of Curvature (Arc): 61.484 °
Length: 74.948

Tangent: 39.634
Chord: 72.944
Middle Ordinate: 7.434
External: 8.078
Back Tangent Direction: N87.695 ° E
Back Radial Direction: S2.305 ° E
Chord Direction: S69.264 ° E
Ahead Radial Direction: S43.776 ° W
Ahead Tangent Direction: S46.224 ° E

Element: Linear
PT ( ) 2111.491 R1 10602607.828 2732188.169
PC ( ) 2414.617 R1 10602398.113 2732407.041
Tangential Direction: S46.224 ° E
Tangential Length: 303.126

Element: Circular
PC ( ) 2414.617 R1 10602398.113 2732407.041
PI ( ) 2424.127 R1 10602391.534 2732413.908
CC ( ) 10602364.983 2732375.297
PT ( ) 2433.371 R1 10602382.768 2732417.594
Radius: 45.883
Delta: 23.419 ° Right
Degree of Curvature (Arc): 124.872 °
Length: 18.754

Tangent: 9.510
Chord: 18.624
Middle Ordinate: 0.955
External: 0.975
Back Tangent Direction: S46.224 ° E
Back Radial Direction: S43.776 ° W
Chord Direction: S34.515 ° E
Ahead Radial Direction: S67.195 ° W
Ahead Tangent Direction: S22.805 ° E

Element: Linear
PT ( ) 2433.371 R1 10602382.768 2732417.594
POT ( ) 2510.909 R1 10602311.716 2732448.638
Tangential Direction: S23.602 ° E
Tangential Length: 77.538

STATE OF TEXAS
ERICK A. RAMIREZ
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LICENSED
PROFESSIONAL ENGINEER
09/18/2023

CITY OF EARLY

VOLKERT
F-12679

Texas Department of Transportation
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HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 5

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER	DIST	COUNTY		SHEET NO.
CHECKED BB	BWD	BROWN		26
APPROVED PF				

DATE: 18-SEP-2023 22:24
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Horizontal Alignment Sheet 1.dgn

Alignment Name: 1/64 LONGHORN DR
Alignment Description: 1/64
Alignment Style: 1/64 Alignment \ Baseline

Station	Northing	Easting

Element: Linear
POT ( ) 1000.000 R1 10600603.636 2728869.133
PI (BL CL-21) 1132.619 R1 10600678.442 2728865.208
Tangential Direction: N3.004 ° W
Tangential Length: 74.909

Element: Linear
PI ( ) 1074.909 R1 10600624.460 2728858.553
PI ( ) 1076.040 R1 10600625.474 2728858.052
Tangential Direction: N26.269 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1076.040 R1 10600625.474 2728858.052
PI ( ) 1077.172 R1 10600626.501 2728857.575
Tangential Direction: N24.937 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1077.172 R1 10600626.501 2728857.575
PI ( ) 1078.304 R1 10600627.537 2728857.122
Tangential Direction: N23.605 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1078.304 R1 10600627.537 2728857.122
PI ( ) 1079.435 R1 10600628.585 2728856.693
Tangential Direction: N22.273 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1079.435 R1 10600628.585 2728856.693
PI ( ) 1080.567 R1 10600629.641 2728856.289
Tangential Direction: N20.941 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1080.567 R1 10600629.641 2728856.289
PI ( ) 1081.698 R1 10600630.707 2728855.909
Tangential Direction: N19.609 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1081.698 R1 10600630.707 2728855.909
PI ( ) 1082.830 R1 10600631.782 2728855.554
Tangential Direction: N18.277 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1082.830 R1 10600631.782 2728855.554
PI ( ) 1083.961 R1 10600632.864 2728855.224
Tangential Direction: N16.946 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1083.961 R1 10600632.864 2728855.224
PI ( ) 1085.093 R1 10600633.954 2728854.920
Tangential Direction: N15.614 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1085.093 R1 10600633.954 2728854.920
PI ( ) 1086.225 R1 10600635.051 2728854.641
Tangential Direction: N14.282 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1086.225 R1 10600635.051 2728854.641
PI ( ) 1087.356 R1 10600636.153 2728854.387
Tangential Direction: N12.950 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1087.356 R1 10600636.153 2728854.387
PI ( ) 1088.488 R1 10600637.262 2728854.159
Tangential Direction: N11.618 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1088.488 R1 10600637.262 2728854.159
PI ( ) 1089.619 R1 10600638.375 2728853.957
Tangential Direction: N10.286 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1089.619 R1 10600638.375 2728853.957
PI ( ) 1090.751 R1 10600639.493 2728853.781
Tangential Direction: N8.955 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1090.751 R1 10600639.493 2728853.781
PI ( ) 1091.882 R1 10600640.615 2728853.631
Tangential Direction: N7.623 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1091.882 R1 10600640.615 2728853.631
PI ( ) 1093.014 R1 10600641.739 2728853.507
Tangential Direction: N6.291 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1093.014 R1 10600641.739 2728853.507
PI ( ) 1094.146 R1 10600642.867 2728853.409
Tangential Direction: N4.959 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1094.146 R1 10600642.867 2728853.409
PI ( ) 1095.277 R1 10600643.996 2728853.337
Tangential Direction: N3.627 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1095.277 R1 10600643.996 2728853.337
PI ( ) 1096.409 R1 10600645.127 2728853.292
Tangential Direction: N2.295 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1096.409 R1 10600645.127 2728853.292
PI ( ) 1097.540 R1 10600646.258 2728853.273
Tangential Direction: N0.964 ° W
Tangential Length: 1.132

Element: Linear
PI ( ) 1097.540 R1 10600646.258 2728853.273
PI ( ) 1098.672 R1 10600647.390 2728853.280
Tangential Direction: N0.368 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1098.672 R1 10600647.390 2728853.280
PI ( ) 1099.803 R1 10600648.521 2728853.314
Tangential Direction: N1.700 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1099.803 R1 10600648.521 2728853.314
PI ( ) 1100.935 R1 10600649.651 2728853.374
Tangential Direction: N3.032 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1100.935 R1 10600649.651 2728853.374
PI ( ) 1102.067 R1 10600650.779 2728853.460
Tangential Direction: N4.364 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1102.067 R1 10600650.779 2728853.460
PI ( ) 1103.198 R1 10600651.905 2728853.572
Tangential Direction: N5.696 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1103.198 R1 10600651.905 2728853.572
PI ( ) 1104.330 R1 10600653.028 2728853.711
Tangential Direction: N7.027 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1104.330 R1 10600653.028 2728853.711
PI ( ) 1105.461 R1 10600654.148 2728853.875
Tangential Direction: N8.359 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1105.461 R1 10600654.148 2728853.875
PI ( ) 1106.593 R1 10600655.263 2728854.066
Tangential Direction: N9.691 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1106.593 R1 10600655.263 2728854.066
PI ( ) 1107.724 R1 10600656.374 2728854.282
Tangential Direction: N11.023 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1107.724 R1 10600656.374 2728854.282
PI ( ) 1108.856 R1 10600657.479 2728854.524
Tangential Direction: N12.355 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1108.856 R1 10600657.479 2728854.524
PI ( ) 1109.988 R1 10600658.578 2728854.792
Tangential Direction: N13.687 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1109.988 R1 10600658.578 2728854.792
PI ( ) 1111.119 R110600659.671 2728855.085
Tangential Direction: N15.018 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1111.119 R110600659.671 2728855.085
PI ( ) 1112.251 R1 10600660.757 2728855.404
Tangential Direction: N16.350 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1112.251 R1 10600660.757 2728855.404
PI ( ) 1113.382 R1 10600661.835 2728855.747
Tangential Direction: N17.682 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1113.382 R1 10600661.835 2728855.747
PI ( ) 1114.514 R1 10600662.905 2728856.116
Tangential Direction: N19.014 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1114.514 R1 10600662.905 2728856.116
PI ( ) 1115.645 R1 10600663.966 2728856.509
Tangential Direction: N20.346 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1115.645 R1 10600663.966 2728856.509
PI ( ) 1116.777 R1 10600665.018 2728856.927
Tangential Direction: N21.678 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1116.777 R1 10600665.018 2728856.927
PI ( ) 1117.909 R1 10600666.059 2728857.370
Tangential Direction: N23.010 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1117.909 R1 10600666.059 2728857.370
PI ( ) 1119.040 R1 10600667.090 2728857.836
Tangential Direction: N24.341 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1119.040 R1 10600667.090 2728857.836
PI ( ) 1120.172 R1 10600668.110 2728858.326
Tangential Direction: N25.673 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1120.172 R1 10600668.110 2728858.326
PI ( ) 1121.303 R1 10600669.118 2728858.840
Tangential Direction: N27.005 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1121.303 R1 10600669.118 2728858.840
PI ( ) 1122.435 R1 10600670.114 2728859.377
Tangential Direction: N28.337 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1122.435 R1 10600670.114 2728859.377
PI ( ) 1123.566 R1 10600671.097 2728859.937
Tangential Direction: N29.669 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1123.566 R1 10600671.097 2728859.937
PI ( ) 1124.698 R1 10600672.067 2728860.520
Tangential Direction: N31.001 ° E
Tangential Length: 1.132

STATE OF TEXAS
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09/18/2023

CITY OF EARLY

VOLKERT

F-12679

Texas Department of Transportation
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HORIZONTAL ALIGNMENT DATA

SHEET 2 OF 5

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		27

DATE: 18-SEP-2023 22:24
FILE: Projects\106608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Horizontal Alignment Sheet 2.dgn

Element: Linear
PI ( ) 1124.698 R1 10600672.067 2728860.520
PI ( ) 1125.830 R1 10600673.024 2728861.125
Tangential Direction: N32.332 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1125.830 R1 10600673.024 2728861.125
PI ( ) 1126.961 R1 10600673.965 2728861.753
Tangential Direction: N33.664 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1126.961 R1 10600673.965 2728861.753
PI ( ) 1128.093 R1 10600674.892 2728862.402
Tangential Direction: N34.996 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1128.093 R1 10600674.892 2728862.402
PI ( ) 1129.224 R1 10600675.804 2728863.072
Tangential Direction: N36.328 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1129.224 R1 10600675.804 2728863.072
PI ( ) 1130.356 R1 10600676.700 2728863.763
Tangential Direction: N37.660 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1130.356 R1 10600676.700 2728863.763
PI ( ) 1131.487 R1 10600677.579 2728864.475
Tangential Direction: N38.992 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1131.487 R1 10600677.579 2728864.475
PI ( ) 1132.619 R1 10600678.442 2728865.208
Tangential Direction: N40.323 ° E
Tangential Length: 1.132

Element: Linear
PI ( ) 1132.619 R1 10600678.442 2728865.208
PI ( ) 1133.750 R1 10600679.287 2728865.960
Tangential Direction: N41.655 ° E
Tangential Length: 1.132

Element: Linear
PI (BL CL-21) 1133.750 R1 10600679.287 2728865.960
PI ( ) 1978.222 R1 10601303.675 2729434.530
Tangential Direction: N42.321 ° E
Tangential Length: 844.471

Element: Linear
PI (BL CL-20) 1978.222 R1 10601303.675 2729434.530
PI ( ) 2675.450 R1 10601798.622 2729925.604
Tangential Direction: N44.775 ° E
Tangential Length: 697.228

Element: Linear
PI (BL CL-22) 2675.450 R1 10601798.622 2729925.604
PI ( ) 2927.472 R1 10601971.611 2730108.881
Tangential Direction: N46.654 ° E
Tangential Length: 252.023

Element: Linear
PI (BL CL-24) 2927.472 R1 10601971.611 2730108.881
POT ( ) 4864.907 R1 10603368.032 2731451.886
Tangential Direction: N43.883 ° E
Tangential Length: 1937.435

Alignment Name:1/64 LONGHORN PATH A
Alignment Description:1/64
Alignment Style:1/64 Alignment \ Baseline
Station Northing Easting

Element: Circular
PC ( ) 0.000 10601324.306 2729423.177
PI ( ) 14.493 10601334.607 2729433.371
CC ( ) 10601451.425 2729294.715
PT ( ) 28.924 10601346.402 2729441.793
Radius: 180.726
Delta: 9.170 ° Left
Degree of Curvature (Arc): 31.703 °
Length: 28.924

Tangent: 14.493
Chord: 28.893
Middle Ordinate: 0.578
External: 0.580
Back Tangent Direction: N44.699 ° E
Back Radial Direction: S45.301 ° E
Chord Direction: N40.114 ° E
Ahead Radial Direction: S54.471 ° E
Ahead Tangent Direction: N35.529 ° E

Element: Linear
PT ( ) 28.924 10601346.402 2729441.793
PC ( ) 33.913 10601350.431 2729444.736
Tangential Direction: N36.139 ° E
Tangential Length: 4.989

Element: Circular
PC ( ) 33.913 10601350.431 2729444.736
PI ( ) 57.948 10601369.689 2729459.116
CC ( ) 10601210.169 2729632.579
PT ( ) 81.815 10601385.629 2729477.104
Radius: 234.433
Delta: 11.707 ° Right
Degree of Curvature (Arc): 24.440 °
Length: 47.902

Tangent: 24.035
Chord: 47.818
Middle Ordinate: 1.222
External: 1.229
Back Tangent Direction: N36.749 ° E
Back Radial Direction: S53.251 ° E
Chord Direction: N42.602 ° E
Ahead Radial Direction: S41.544 ° E
Ahead Tangent Direction: N48.456 ° E

Element: Linear
PT ( ) 81.815 10601385.629 2729477.104
PC ( ) 91.939 10601392.343 2729484.682
Tangential Direction: N48.456 ° E
Tangential Length: 10.124

Element: Circular
PC ( ) 91.939 10601392.343 2729484.682
PI ( ) 108.850 10601403.559 2729497.339
CC ( ) 10601507.809 2729382.367
PRC ( ) 125.626 10601417.249 2729507.265
Radius: 154.274
Delta: 12.511 ° Left
Degree of Curvature (Arc): 37.139 °
Length: 33.687

Tangent: 16.911
Chord: 33.620
Middle Ordinate: 0.919
External: 0.924
Back Tangent Direction: N48.456 ° E
Back Radial Direction: S41.544 ° E
Chord Direction: N42.200 ° E
Ahead Radial Direction: S54.055 ° E
Ahead Tangent Direction: N35.945 ° E

Element: Circular
PRC ( ) 125.626 10601417.249 2729507.265
PI ( ) 137.131 10601426.563 2729514.019
CC ( ) 10601329.624 2729628.115
PT ( ) 148.591 10601434.733 2729522.120
Radius: 149.275
Delta: 8.814 ° Right
Degree of Curvature (Arc): 38.383 °
Length: 22.964

Tangent: 11.505
Chord: 22.942
Middle Ordinate: 0.441
External: 0.443
Back Tangent Direction: N35.945 ° E
Back Radial Direction: S54.055 ° E
Chord Direction: N40.352 ° E
Ahead Radial Direction: S45.241 ° E
Ahead Tangent Direction: N44.759 ° E

Element: Linear
PT ( ) 148.591 10601434.733 2729522.120
PC ( ) 180.937 10601457.701 2729544.896
Tangential Direction: N44.759 ° E
Tangential Length: 32.346

Element: Circular
PC ( ) 180.937 10601457.701 2729544.896
PI ( ) 187.216 10601462.160 2729549.317
CC ( ) 10601503.370 2729498.841
PRC ( ) 193.457 10601467.384 2729552.801
Radius: 64.859
Delta: 11.060 ° Left
Degree of Curvature (Arc): 88.339 °
Length: 12.520

Tangent: 6.279
Chord: 12.501
Middle Ordinate: 0.302
External: 0.303
Back Tangent Direction: N44.759 ° E
Back Radial Direction: S45.241 ° E
Chord Direction: N39.229 ° E
Ahead Radial Direction: S56.301 ° E
Ahead Tangent Direction: N33.699 ° E

Element: Circular
PRC ( ) 193.457 10601467.384 2729552.801
PI ( ) 202.669 10601475.048 2729557.913
CC ( ) 10601434.172 2729602.601
PT ( ) 211.738 10601480.821 2729565.092
Radius: 59.859
Delta: 17.499 ° Right
Degree of Curvature (Arc): 95.718 °
Length: 18.281

Tangent: 9.212
Chord: 18.210
Middle Ordinate: 0.697
External: 0.705
Back Tangent Direction: N33.699 ° E
Back Radial Direction: S56.301 ° E
Chord Direction: N42.448 ° E
Ahead Radial Direction: S38.802 ° E
Ahead Tangent Direction: N51.198 ° E

Element: Linear
PT ( ) 211.738 10601480.821 2729565.092
PC ( ) 228.905 10601491.579 2729578.470
Tangential Direction: N51.198 ° E
Tangential Length: 17.167

Element: Circular
PC ( ) 228.905 10601491.579 2729578.470
PI ( ) 234.947 10601495.364 2729583.178
CC ( ) 10601456.901 2729606.354
PT ( ) 240.914 10601497.758 2729588.725
Radius: 44.498
Delta: 15.463 ° Right
Degree of Curvature (Arc): 128.760 °
Length: 12.009

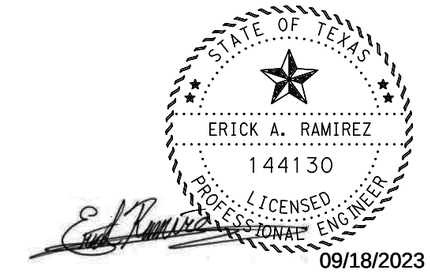
Tangent: 6.041
Chord: 11.973
Middle Ordinate: 0.405
External: 0.408
Back Tangent Direction: N51.198 ° E
Back Radial Direction: S38.802 ° E
Chord Direction: N58.929 ° E
Ahead Radial Direction: S23.339 ° E
Ahead Tangent Direction: N66.661 ° E

Element: Linear
PT ( ) 240.914 10601497.758 2729588.725
PC ( ) 244.570 10601499.067 2729592.139
Tangential Direction: N69.015 ° E
Tangential Length: 3.656

Element: Circular
PC ( ) 244.570 10601499.067 2729592.139
PI ( ) 251.190 10601501.182 2729598.411
CC ( ) 10601525.591 2729583.197
PT ( ) 257.570 10601505.882 2729603.072
Radius: 27.990
Delta: 26.610 ° Left
Degree of Curvature (Arc): 204.698 °
Length: 13.000

Tangent: 6.619
Chord: 12.883
Middle Ordinate: 0.751
External: 0.772
Back Tangent Direction: N71.370 ° E
Back Radial Direction: S18.630 ° E
Chord Direction: N58.064 ° E
Ahead Radial Direction: S45.241 ° E
Ahead Tangent Direction: N44.759 ° E

Element: Linear
PT ( ) 257.570 10601505.882 2729603.072
POT ( ) 259.172 10601507.019 2729604.200
Tangential Direction: N44.759 ° E
Tangential Length: 1.602



09/18/2023

CITY OF EARLY

VOLKERT

F-12679

Texas Department of Transportation

HORIZONTAL ALIGNMENT DATA

SHEET 3 OF 5

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		28

DATE: 18-SEP-2023 22:24
FILE: Projects\106608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Horizontal Alignment Sheet 3.dgn

Alignment Name:1/64 LONGHORN PATH B
Alignment Description:1/64
Alignment Style:1/64 Alignment\Baseline
Station Northing Easting

Element: Circular
PC ( ) 0.000 10601621.453 2729717.655
PI ( ) 12.300 10601630.204 2729726.298
CC ( ) 10601691.272 2729646.972
PRC ( ) 24.475 10601640.798 2729732.547
Radius: 99.351
Delta: 14.115 ° Left
Degree of Curvature (Arc): 57.670 °
Length: 24.475

Tangent: 12.300
Chord: 24.413
Middle Ordinate: 0.753
External: 0.758
Back Tangent Direction: N44.647 ° E
Back Radial Direction: S45.353 ° E
Chord Direction: N37.590 ° E
Ahead Radial Direction: S59.467 ° E
Ahead Tangent Direction: N30.533 ° E

Element: Circular
PRC ( ) 24.475 10601640.798 2729732.547
PI ( ) 40.861 10601654.912 2729740.872
CC ( ) 10601590.325 2729818.122
PT ( ) 56.955 10601665.606 2729753.288
Radius: 99.351
Delta: 18.731 ° Right
Degree of Curvature (Arc): 57.670 °
Length: 32.480

Tangent: 16.386
Chord: 32.336
Middle Ordinate: 1.324
External: 1.342
Back Tangent Direction: N30.533 ° E
Back Radial Direction: S59.467 ° E
Chord Direction: N39.898 ° E
Ahead Radial Direction: S40.736 ° E
Ahead Tangent Direction: N49.264 ° E

Element: Linear
PT ( ) 56.955 10601665.606 2729753.288
PI ( ) 63.594 10601669.938 2729758.319
Tangential Direction: N49.264 ° E
Tangential Length: 6.639

Element: Linear
PI ( ) 63.594 10601669.938 2729758.319
PC ( ) 75.834 10601677.925 2729767.593
Tangential Direction: N49.264 ° E
Tangential Length: 12.240

Element: Circular
PC ( ) 75.834 10601677.925 2729767.593
PI ( ) 103.617 10601696.056 2729788.645
CC ( ) 10601933.327 2729547.635
PT ( ) 131.274 10601717.388 2729806.444
Radius: 337.063
Delta: 9.424 ° Left
Degree of Curvature (Arc): 16.999 °
Length: 55.440

Tangent: 27.783
Chord: 55.378
Middle Ordinate: 1.139
External: 1.143
Back Tangent Direction: N49.264 ° E
Back Radial Direction: S40.736 ° E
Chord Direction: N44.552 ° E
Ahead Radial Direction: S50.160 ° E
Ahead Tangent Direction: N39.840 ° E

Element: Linear
PT ( ) 131.274 10601717.388 2729806.444
PC ( ) 134.230 10601719.564 2729808.445
Tangential Direction: N42.610 ° E
Tangential Length: 2.956

Element: Circular
PC ( ) 134.230 10601719.564 2729808.445
PI ( ) 139.153 10601723.021 2729811.949
CC ( ) 10601697.795 2729829.927
PT ( ) 143.992 10601725.205 2729816.360
Radius: 30.583
Delta: 18.287 ° Right
Degree of Curvature (Arc): 187.342 °
Length: 9.761

Tangent: 4.922
Chord: 9.720
Middle Ordinate: 0.389
External: 0.394
Back Tangent Direction: N45.380 ° E
Back Radial Direction: S44.620 ° E
Chord Direction: N54.524 ° E
Ahead Radial Direction: S26.333 ° E
Ahead Tangent Direction: N63.667 ° E

Element: Linear
PT ( ) 143.992 10601725.205 2729816.360
PC ( ) 146.697 10601726.297 2729818.836
Tangential Direction: N66.203 ° E
Tangential Length: 2.706

Element: Circular
PC ( ) 146.697 10601726.297 2729818.836
PI ( ) 150.845 10601727.801 2729822.702
CC ( ) 10601744.496 2729811.754
PT ( ) 154.872 10601730.746 2729825.622
Radius: 19.529
Delta: 23.982 ° Left
Degree of Curvature (Arc): 293.391 °
Length: 8.174

Tangent: 4.148
Chord: 8.114
Middle Ordinate: 0.426
External: 0.436
Back Tangent Direction: N68.738 ° E
Back Radial Direction: S21.262 ° E
Chord Direction: N56.747 ° E
Ahead Radial Direction: S45.244 ° E
Ahead Tangent Direction: N44.756 ° E

Alignment Name:1/64 LONGHORN PATH C
Alignment Description:1/64
Alignment Style:1/64 Alignment \ Baseline
Station Northing Easting

Element: Circular
PC ( ) 0.000 10601830.741 2729927.004
PI ( ) 8.466 10601836.528 2729933.182
CC ( ) 10601863.583 2729896.240
PT ( ) 16.736 10601844.165 2729936.835
Radius: 45.000
Delta: 21.308 ° Left
Degree of Curvature (Arc): 127.324 °
Length: 16.736

Tangent: 8.466
Chord: 16.639
Middle Ordinate: 0.776
External: 0.789
Back Tangent Direction: N46.872 ° E
Back Radial Direction: S43.128 ° E
Chord Direction: N36.218 ° E
Ahead Radial Direction: S64.436 ° E
Ahead Tangent Direction: N25.564 ° E

Element: Linear
PT ( ) 16.736 10601844.165 2729936.835
PC ( ) 20.011 10601847.081 2729938.329
Tangential Direction: N27.122 ° E
Tangential Length: 3.276

Element: Circular
PC ( ) 20.011 10601847.081 2729938.329
PI ( ) 28.740 10601854.739 2729942.518
CC ( ) 10601818.172 2729991.175
PT ( ) 37.349 10601860.893 2729948.709
Radius: 60.237
Delta: 16.491 ° Right
Degree of Curvature (Arc): 95.117 °
Length: 17.338

Tangent: 8.729
Chord: 17.278
Middle Ordinate: 0.623
External: 0.629
Back Tangent Direction: N28.680 ° E
Back Radial Direction: S61.320 ° E
Chord Direction: N36.925 ° E
Ahead Radial Direction: S44.829 ° E
Ahead Tangent Direction: N45.171 ° E

Element: Linear
PT ( ) 37.349 10601860.893 2729948.709
PC ( ) 42.609 10601864.601 2729952.439
Tangential Direction: N45.171 ° E
Tangential Length: 5.260

Element: Circular
PC ( ) 42.609 10601864.601 2729952.439
PI ( ) 49.393 10601869.384 2729957.251
CC ( ) 10601825.255 2729991.551
PRC ( ) 56.111 10601872.867 2729963.073
Radius: 55.478
Delta: 13.944 ° Right
Degree of Curvature (Arc): 103.276 °
Length: 13.501

Tangent: 6.784
Chord: 13.468
Middle Ordinate: 0.410
External: 0.413
Back Tangent Direction: N45.171 ° E
Back Radial Direction: S44.829 ° E
Chord Direction: N52.143 ° E
Ahead Radial Direction: S30.885 ° E
Ahead Tangent Direction: N59.115 ° E

Element: Circular
PRC ( ) 56.111 10601872.867 2729963.073
PI ( ) 69.419 10601879.698 2729974.495
CC ( ) 10601924.769 2729932.028
PT ( ) 82.311 10601890.694 2729981.993
Radius: 60.479
Delta: 24.821 ° Left
Degree of Curvature (Arc): 94.737 °
Length: 26.200

Tangent: 13.309
Chord: 25.996
Middle Ordinate: 1.413
External: 1.447
Back Tangent Direction: N59.115 ° E
Back Radial Direction: S30.885 ° E
Chord Direction: N46.704 ° E
Ahead Radial Direction: S55.707 ° E
Ahead Tangent Direction: N34.293 ° E

Element: Linear
PT ( ) 82.311 10601890.694 2729981.993
PC ( ) 95.770 10601901.813 2729989.576
Tangential Direction: N34.293 ° E
Tangential Length: 13.459

Tangent: 13.309
Chord: 25.996
Middle Ordinate: 1.413
External: 1.447
Back Tangent Direction: N59.115 ° E
Back Radial Direction: S30.885 ° E
Chord Direction: N46.704 ° E
Ahead Radial Direction: S55.707 ° E
Ahead Tangent Direction: N34.293 ° E

Element: Linear
PT ( ) 82.311 10601890.694 2729981.993
PC ( ) 95.770 10601901.813 2729989.576
Tangential Direction: N34.293 ° E
Tangential Length: 13.459

Element: Circular
PC ( ) 95.770 10601901.813 2729989.576
PI ( ) 111.776 10601915.037 2729998.595
CC ( ) 10601858.379 2730053.265
PRC ( ) 127.334 10601923.577 2730012.132
Radius: 77.089
Delta: 23.460 ° Right
Degree of Curvature (Arc): 74.324 °
Length: 31.564

Tangent: 16.006
Chord: 31.344
Middle Ordinate: 1.610
External: 1.644
Back Tangent Direction: N34.293 ° E
Back Radial Direction: S55.707 ° E
Chord Direction: N46.023 ° E
Ahead Radial Direction: S32.247 ° E
Ahead Tangent Direction: N57.753 ° E

Element: Circular
PRC ( ) 127.334 10601923.577 2730012.132
PI ( ) 138.355 10601929.477 2730021.442
CC ( ) 10602000.110 2729963.633
PRC ( ) 149.269 10601937.436 2730029.065
Radius: 90.606
Delta: 13.871 ° Left
Degree of Curvature (Arc): 63.236 °
Length: 21.935

Tangent: 11.021
Chord: 21.881
Middle Ordinate: 0.663
External: 0.668
Back Tangent Direction: N57.637 ° E
Back Radial Direction: S32.363 ° E
Chord Direction: N50.702 ° E
Ahead Radial Direction: S46.233 ° E
Ahead Tangent Direction: N43.767 ° E

Element: Circular
PRC ( ) 149.269 10601937.436 2730029.065
PI ( ) 164.386 10601947.796 2730040.075
CC ( ) 10601831.718 2730128.545
PT ( ) 179.396 10601955.665 2730052.984
Radius: 145.164
Delta: 11.891 ° Right
Degree of Curvature (Arc): 39.470 °
Length: 30.127

Tangent: 15.118
Chord: 30.073
Middle Ordinate: 0.781
External: 0.785
Back Tangent Direction: N46.741 ° E
Back Radial Direction: S43.259 ° E
Chord Direction: N52.687 ° E
Ahead Radial Direction: S31.368 ° E
Ahead Tangent Direction: N58.632 ° E

Element: Linear
PT ( ) 179.396 10601955.665 2730052.984
PC ( ) 189.570 10601960.654 2730061.851
Tangential Direction: N60.641 ° E
Tangential Length: 10.174

Element: Circular
PC ( ) 189.570 10601960.654 2730061.851
PI ( ) 195.925 10601963.574 2730067.496
CC ( ) 10602000.623 2730041.176
PT ( ) 202.198 10601967.943 2730072.112
Radius: 45.000
Delta: 16.079 ° Left
Degree of Curvature (Arc): 127.324 °
Length: 12.628

Tangent: 6.356
Chord: 12.587
Middle Ordinate: 0.442
External: 0.447
Back Tangent Direction: N62.649 ° E
Back Radial Direction: S27.351 ° E
Chord Direction: N54.609 ° E
Ahead Radial Direction: S43.430 ° E
Ahead Tangent Direction: N46.570 ° E

Element: Linear
PT ( ) 202.198 10601967.943 2730072.112
POT ( ) 207.969 10601971.911 2730076.303
Tangential Direction: N46.570 ° E
Tangential Length: 5.771

Alignment Name:1/64 LONGHORN PATH D
Alignment Description:1/64
Alignment Style:1/64 Alignment \ Baseline
Station Northing Easting

Element: Linear
POT ( ) 0.000 10602083.601 2730139.969
PC ( ) 22.611 10602100.269 2730155.248
Tangential Direction: N42.510 ° E
Tangential Length: 22.611

Element: Circular
PC ( ) 22.611 10602100.269 2730155.248
PI ( ) 36.125 10602110.231 2730164.379
CC ( ) 10602239.191 2730003.694
PT ( ) 49.600 10602121.302 2730172.128
Radius: 205.592
Delta: 7.521 ° Left
Degree of Curvature (Arc): 27.869 °
Length: 26.989

Tangent: 13.514
Chord: 26.969
Middle Ordinate: 0.443
External: 0.444
Back Tangent Direction: N42.510 ° E
Back Radial Direction: S47.490 ° E
Chord Direction: N38.749 ° E
Ahead Radial Direction: S55.011 ° E
Ahead Tangent Direction: N34.989 ° E

Element: Linear
PT ( ) 49.600 10602121.302 2730172.128
PC ( ) 51.384 10602122.760 2730173.157
Tangential Direction: N35.232 ° E
Tangential Length: 1.784

Element: Circular
PC ( ) 51.384 10602122.760 2730173.157
PI ( ) 79.786 10602145.890 2730189.641
CC ( ) 10602000.863 2730344.206
PT ( ) 107.846 10602163.811 2730211.675
Radius: 210.039
Delta: 15.402 ° Right
Degree of Curvature (Arc): 27.279 °
Length: 56.463

Tangent: 28.403
Chord: 56.293
Middle Ordinate: 1.894
External: 1.912
Back Tangent Direction: N35.475 ° E
Back Radial Direction: S54.525 ° E
Chord Direction: N43.177 ° E
Ahead Radial Direction: S39.122 ° E
Ahead Tangent Direction: N50.878 ° E

Element: Linear
PT ( ) 107.846 10602163.811 2730211.675
PC ( ) 123.468 10602173.668 2730223.795
Tangential Direction: N50.878 ° E
Tangential Length: 15.621

Element: Circular
PC ( ) 123.468 10602173.668 2730223.795
PI ( ) 158.051 10602195.489 2730250.624
CC ( ) 10602468.484 2729984.013
PT ( ) 192.444 10602221.795 2730273.074
Radius: 380.016
Delta: 10.400 ° Left
Degree of Curvature (Arc): 15.077 °
Length: 68.976

Tangent: 34.583
Chord: 68.882
Middle Ordinate: 1.564
External: 1.570
Back Tangent Direction: N50.878 ° E
Back Radial Direction: S39.122 ° E
Chord Direction: N45.678 ° E
Ahead Radial Direction: S49.522 ° E
Ahead Tangent Direction: N40.478 ° E

Element: Linear
PT ( ) 192.444 10602221.795 2730273.074
PC ( ) 260.653 10602273.679 2730317.352
Tangential Direction: N40.478 ° E
Tangential Length: 68.209

Element: Circular
PC ( ) 260.653 10602273.679 2730317.352
PI ( ) 318.987 10602318.051 2730355.220
CC ( ) 10601755.976 2730923.979
PT ( ) 377.112 10602356.440 2730399.140
Radius: 797.504
Delta: 8.367 ° Right
Degree of Curvature (Arc): 7.184 °
Length: 116.459

Tangent: 58.333
Chord: 116.356
Middle Ordinate: 2.125
External: 2.131
Back Tangent Direction: N40.478 ° E
Back Radial Direction: S49.522 ° E
Chord Direction: N44.661 ° E
Ahead Radial Direction: S41.155 ° E
Ahead Tangent Direction: N48.845 ° E

Element: Linear
PT ( ) 377.112 10602356.440 2730399.140
PC ( ) 394.160 10602367.659 2730411.976
Tangential Direction: N48.845 ° E
Tangential Length: 17.047

Element: Circular
PC ( ) 394.160 10602367.659 2730411.976
PI ( ) 432.235 10602392.716 2730440.644
CC ( ) 10602611.445 2730198.893
PRC ( ) 469.962 10602423.740 2730462.717
Radius: 323.784
Delta: 13.414 ° Left
Degree of Curvature (Arc): 17.696 °
Length: 75.802

Tangent: 38.075
Chord: 75.629
Middle Ordinate: 2.216
External: 2.231
Back Tangent Direction: N48.845 ° E
Back Radial Direction: S41.155 ° E
Chord Direction: N42.138 ° E
Ahead Radial Direction: S54.569 ° E
Ahead Tangent Direction: N35.431 ° E

Element: Circular
PRC ( ) 469.962 10602423.740 2730462.717
PI ( ) 487.242 10602437.820 2730472.734
CC ( ) 10602238.933 2730722.467
PT ( ) 504.488 10602450.734 2730484.215
Radius: 318.785
Delta: 6.205 ° Right
Degree of Curvature (Arc): 17.973 °
Length: 34.525

Tangent: 17.280
Chord: 34.509
Middle Ordinate: 0.467
External: 0.468
Back Tangent Direction: N35.431 ° E
Back Radial Direction: S54.569 ° E
Chord Direction: N38.534 ° E
Ahead Radial Direction: S48.364 ° E
Ahead Tangent Direction: N41.636 ° E

Element: Linear
PT ( ) 504.488 10602450.734 2730484.215
PC ( ) 596.632 10602519.601 2730545.436
Tangential Direction: N41.636 ° E
Tangential Length: 92.145

Element: Circular
PC ( ) 596.632 10602519.601 2730545.436
PI ( ) 618.788 10602536.159 2730560.156
CC ( ) 10602388.382 2730693.043
PT ( ) 640.758 10602549.045 2730578.179
Radius: 197.501
Delta: 12.801 ° Right
Degree of Curvature (Arc): 29.010 °
Length: 44.126

Tangent: 22.155
Chord: 44.034
Middle Ordinate: 1.231
External: 1.239
Back Tangent Direction: N41.636 ° E
Back Radial Direction: S48.364 ° E
Chord Direction: N48.037 ° E
Ahead Radial Direction: S35.563 ° E
Ahead Tangent Direction: N54.437 ° E

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER
09/18/2023

CITY OF EARLY

VOLKERT
F-12679

Texas Department of Transportation
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HORIZONTAL ALIGNMENT DATA

SHEET 4 OF 5

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN ER	0923	06	095	CS
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		29

DATE: 18-SEP-2023 22:24
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Horizontal Alignment Sheet 4.dgn

Element: Linear
PT ( ) 640.758 10602549.045 2730578.179
PC ( ) 667.555 10602564.629 2730599.977
Tangential Direction: N54.437 ° E
Tangential Length: 26.797

Element: Circular
PC ( ) 667.555 10602564.629 2730599.977
PI ( ) 705.440 10602586.663 2730630.796
CC ( ) 10602781.629 2730444.835
PT ( ) 742.821 10602616.406 2730654.261
Radius: 266.755
Delta: 16.166 ° Left
Degree of Curvature (Arc): 21.479 °
Length: 75.266

Tangent: 37.885
Chord: 75.017
Middle Ordinate: 2.650
External: 2.677
Back Tangent Direction: N54.437 ° E
Back Radial Direction: S35.563 ° E
Chord Direction: N46.354 ° E
Ahead Radial Direction: S51.729 ° E
Ahead Tangent Direction: N38.271 ° E

Element: Linear
PT ( ) 742.821 10602616.406 2730654.261
PC ( ) 834.351 10602688.265 2730710.953
Tangential Direction: N38.271 ° E
Tangential Length: 91.530

Element: Circular
PC ( ) 834.351 10602688.265 2730710.953
PI ( ) 872.078 10602717.883 2730734.321
CC ( ) 10602411.229 2731062.104
PRC ( ) 909.626 10602743.170 2730762.319
Radius: 447.275
Delta: 9.643 ° Right
Degree of Curvature (Arc): 12.810 °
Length: 75.275

Tangent: 37.727
Chord: 75.186
Middle Ordinate: 1.583
External: 1.588
Back Tangent Direction: N38.271 ° E
Back Radial Direction: S51.729 ° E
Chord Direction: N43.093 ° E
Ahead Radial Direction: S42.086 ° E
Ahead Tangent Direction: N47.914 ° E

Element: Circular
PRC ( ) 909.626 10602743.170 2730762.319
PI ( ) 929.909 10602756.764 2730777.371
CC ( ) 10603078.820 2730459.183
PT ( ) 950.164 10602771.651 2730791.146
Radius: 452.275
Delta: 5.135 ° Left
Degree of Curvature (Arc): 12.668 °
Length: 40.538

Tangent: 20.282
Chord: 40.524
Middle Ordinate: 0.454
External: 0.455
Back Tangent Direction: N47.914 ° E
Back Radial Direction: S42.086 ° E
Chord Direction: N45.346 ° E
Ahead Radial Direction: S47.222 ° E
Ahead Tangent Direction: N42.778 ° E

Element: Linear
PT ( ) 950.164 10602771.651 2730791.146
PC ( ) 960.017 10602778.883 2730797.839
Tangential Direction: N42.778 ° E
Tangential Length: 9.854

Element: Circular
PC ( ) 960.017 10602778.883 2730797.839
PI ( ) 1002.432 10602810.015 2730826.645
CC ( ) 10602010.457 2731628.290
PRC ( ) 1044.807 10602838.903 2730857.702
Radius: 1131.427
Delta: 4.294 ° Right
Degree of Curvature (Arc): 5.064 °
Length: 84.790

Tangent: 42.415
Chord: 84.770
Middle Ordinate: 0.794
External: 0.795
Back Tangent Direction: N42.778 ° E
Back Radial Direction: S47.222 ° E
Chord Direction: N44.925 ° E
Ahead Radial Direction: S42.928 ° E
Ahead Tangent Direction: N47.072 ° E

Element: Circular
PRC ( ) 1044.807 10602838.903 2730857.702
PI ( ) 1103.762 10602879.055 2730900.869
CC ( ) 10603671.010 2730083.709
PT ( ) 1162.610 10602923.458 2730939.650
Radius: 1136.428
Delta: 5.939 ° Left
Degree of Curvature (Arc): 5.042 °
Length: 117.803

Tangent: 58.954
Chord: 117.750
Middle Ordinate: 1.526
External: 1.528

Back Tangent Direction: N47.072 ° E
Back Radial Direction: S42.928 ° E
Chord Direction: N44.103 ° E
Ahead Radial Direction: S48.867 ° E
Ahead Tangent Direction: N41.133 ° E

Element: Linear
PT ( ) 1162.610 10602923.458 2730939.650
PC ( ) 1231.515 10602975.357 2730984.976
Tangential Direction: N41.133 ° E
Tangential Length: 68.905

Element: Circular
PC ( ) 1231.515 10602975.357 2730984.976
PI ( ) 1243.188 10602984.149 2730992.655
CC ( ) 10602906.419 2731063.909
PRC ( ) 1254.765 10602991.035 2731002.079
Radius: 104.800
Delta: 12.711 ° Right
Degree of Curvature (Arc): 54.672 °
Length: 23.250

Tangent: 11.673
Chord: 23.202
Middle Ordinate: 0.644
External: 0.648
Back Tangent Direction: N41.133 ° E
Back Radial Direction: S48.867 ° E
Chord Direction: N47.489 ° E
Ahead Radial Direction: S36.156 ° E
Ahead Tangent Direction: N53.844 ° E

Element: Circular
PRC ( ) 1254.765 10602991.035 2731002.079
PI ( ) 1267.961 10602998.821 2731012.734
CC ( ) 10603079.689 2730937.299
PT ( ) 1281.031 10603008.909 2731021.241
Radius: 109.800
Delta: 13.706 ° Left
Degree of Curvature (Arc): 52.182 °
Length: 26.266

Tangent: 13.196
Chord: 26.203
Middle Ordinate: 0.784
External: 0.790
Back Tangent Direction: N53.844 ° E
Back Radial Direction: S36.156 ° E
Chord Direction: N46.991 ° E
Ahead Radial Direction: S49.862 ° E
Ahead Tangent Direction: N40.138 ° E

Element: Linear
PT ( ) 1281.031 10603008.909 2731021.241
PC ( ) 1292.377 10603017.583 2731028.555
Tangential Direction: N40.138 ° E
Tangential Length: 11.346

Element: Circular
PC ( ) 1292.377 10603017.583 2731028.555
PI ( ) 1312.080 10603032.646 2731041.256
CC ( ) 10602918.083 2731146.556
PRC ( ) 1331.571 10603044.035 2731057.333
Radius: 154.352
Delta: 14.549 ° Right
Degree of Curvature (Arc): 37.120 °
Length: 39.194

Tangent: 19.703
Chord: 39.088
Middle Ordinate: 1.242
External: 1.252
Back Tangent Direction: N40.138 ° E
Back Radial Direction: S49.862 ° E
Chord Direction: N47.412 ° E
Ahead Radial Direction: S35.313 ° E
Ahead Tangent Direction: N54.687 ° E

Element: Circular
PRC ( ) 1331.571 10603044.035 2731057.333
PI ( ) 1346.577 10603052.709 2731069.578
CC ( ) 10603174.067 2730965.220
PT ( ) 1361.494 10603063.517 2731079.988
Radius: 159.352
Delta: 10.759 ° Left
Degree of Curvature (Arc): 35.955 °
Length: 29.923

Tangent: 15.006
Chord: 29.879
Middle Ordinate: 0.702
External: 0.705
Back Tangent Direction: N54.687 ° E
Back Radial Direction: S35.313 ° E
Chord Direction: N49.307 ° E
Ahead Radial Direction: S46.072 ° E
Ahead Tangent Direction: N43.928 ° E

Element: Linear
PT ( ) 1361.494 10603063.517 2731079.988
PC ( ) 1377.975 10603075.961 2731090.792
Tangential Direction: N40.963 ° E
Tangential Length: 16.480

Element: Circular
PC ( ) 1377.975 10603075.961 2731090.792
PI ( ) 1401.423 10603094.439 2731105.229
CC ( ) 10603048.257 2731126.253
PT ( ) 1421.208 10603093.193 2731128.644
Radius: 45.000
Delta: 55.046 ° Right
Degree of Curvature (Arc): 127.324 °
Length: 43.233

Tangent: 23.448
Chord: 41.589
Middle Ordinate: 5.093
External: 5.743
Back Tangent Direction: N37.999 ° E
Back Radial Direction: S52.001 ° E
Chord Direction: N65.522 ° E
Ahead Radial Direction: S3.045 ° W
Ahead Tangent Direction: S86.955 ° E

Alignment Name: 1/64 McCULLOUGH
Alignment Description: 1/64
Alignment Style: 1/64 Alignment \ Baseline
Station Northing Easting

Element: Linear
POT ( ) 1000.000 R1 10601311.852 2731469.430
POT ( ) 1443.219 R1 10601507.747 2731867.009
Tangential Direction: N63.770 ° E
Tangential Length: 443.219

Alignment Name: 1/64 OAK ST @ 377
Alignment Description: 1/64
Alignment Style: 1/64 Alignment \ Baseline
Station Northing Easting

Element: Linear
POT ( ) 900.000 R1 10600695.409 2725640.089
PI ( ) 2508.629 R1 10599596.748 2726815.091
Tangential Direction: S46.923 ° E
Tangential Length: 1608.629

Element: Linear
PI (BL Oak St @ HW 377) 2508.629 R1 10599596.748 2726815.091
POT ( ) 2508.635 R1 10599596.745 2726815.085
Tangential Direction: S63.784 ° W
Tangential Length: 0.006

Alignment Name: 1/64 ORCHARD DR1
Alignment Description: 1/64
Alignment Style: 1/64 Alignment \ Baseline
Station Northing Easting

Element: Linear
POT ( ) 1000.000 R1 10597467.019 2722597.936
PC ( ) 1194.311 R1 10597291.983 2722682.312
Tangential Direction: S25.736 ° E
Tangential Length: 194.311

Element: Circular
PC ( ) 1194.311 R1 10597291.983 2722682.312
PI ( ) 1262.434 R1 10597230.618 2722711.893
CC ( ) 10597339.841 2722781.593
PT ( ) 1316.344 R1 10597229.638 2722780.009
Radius: 110.215
Delta: 63.440 ° Left
Degree of Curvature (Arc): 51.986 °
Length: 122.033

Tangent: 68.123
Chord: 115.895
Middle Ordinate: 16.463
External: 19.354
Back Tangent Direction: S25.736 ° E
Back Radial Direction: S64.264 ° W
Chord Direction: S57.456 ° E
Ahead Radial Direction: S0.824 ° W
Ahead Tangent Direction: S89.176 ° E

Element: Linear
PT ( ) 1316.344 R1 10597229.638 2722780.009
POT ( ) 1680.035 R1 10597224.410 2723143.662
Tangential Direction: S89.176 ° E
Tangential Length: 363.691

Alignment Name: 1/64 SH 377 SEG 1
Alignment Description: 1/64
Alignment Style: 1/64 Alignment \ Baseline
Station Northing Easting

Element: Linear
POT ( ) 1000.000 R1 10599295.046 2726202.394
POT ( ) 1750.000 R1 10599626.368 2726875.244
Tangential Direction: N63.784 ° E
Tangential Length: 750.000

Alignment Name: 1/64 US 67-377
Alignment Description: 1/64
Alignment Style: 1/64 Alignment \ Baseline
Station Northing Easting

Element: Linear
POT ( ) 900.000 R1 10602103.644 2731861.400
PC ( ) 1074.261 R1 10602179.990 2732018.047
Tangential Direction: N64.017 ° E
Tangential Length: 174.261

Element: Circular
PC (BL CL-35) 1074.261 R1 10602179.990 2732018.047
PI ( ) 1264.206 R1 10602264.139 2732188.335
CC ( ) 10597987.643 2734089.741
PT ( ) 1453.943 R1 10602334.201 2732364.887
Radius: 4676.289
Delta: 4.652 ° Right
Degree of Curvature (Arc): 1.225 °
Length: 379.681

Tangent: 189.945
Chord: 379.577
Middle Ordinate: 3.853
External: 3.856
Back Tangent Direction: N63.703 ° E
Back Radial Direction: S26.297 ° E
Chord Direction: N66.029 ° E
Ahead Radial Direction: S21.645 ° E
Ahead Tangent Direction: N68.355 ° E

Element: Linear
PT (BL CL-36) 1453.943 R1 10602334.201 2732364.887
POT ( ) 1629.972 R1 10602401.997 2732527.336
Tangential Direction: N67.348 ° E
Tangential Length: 176.029

STATE OF TEXAS
ERICK A. RAMIREZ
144130
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PROFESSIONAL ENGINEER
09/18/2023

CITY OF EARLY

VOLKERT
F-12679

Texas Department of Transportation
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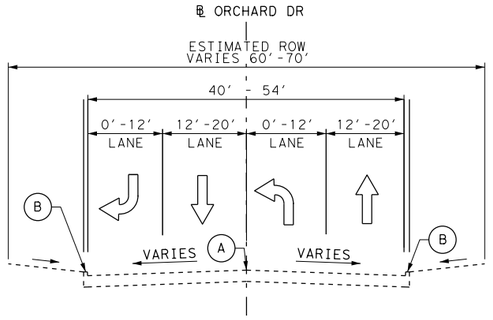
HORIZONTAL ALIGNMENT DATA

SHEET 5 OF 5

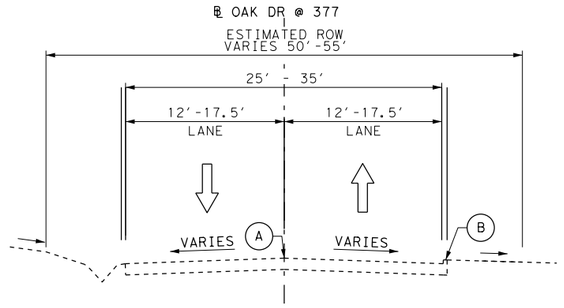
DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN ER	0923	06	095	CS
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		30

DATE: 18-SEP-2023 22:24
FILE: Projects\163608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Horizontal Alignment Sheet 5.dgn



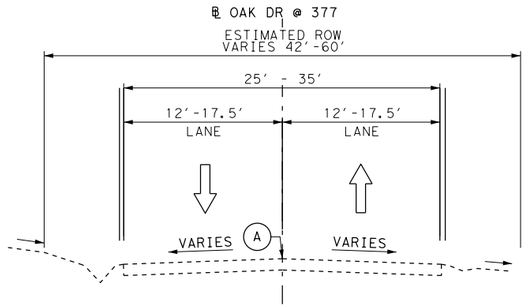
ORCHARD DR.

STA 10+00 TO STA 16+46



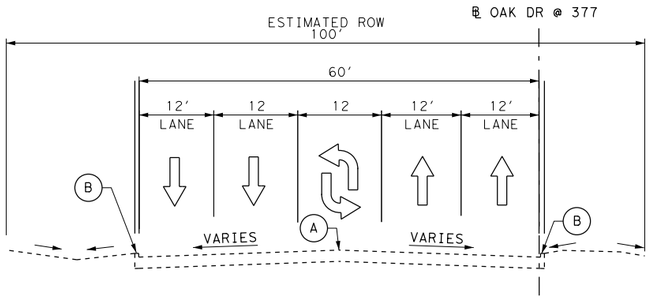
OAK ST

STA 9+00 TO STA 13+75



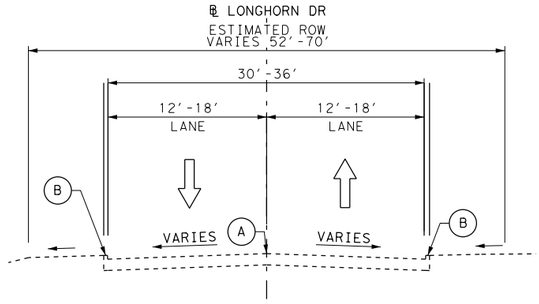
OAK ST

STA 13+75 TO STA 25+08



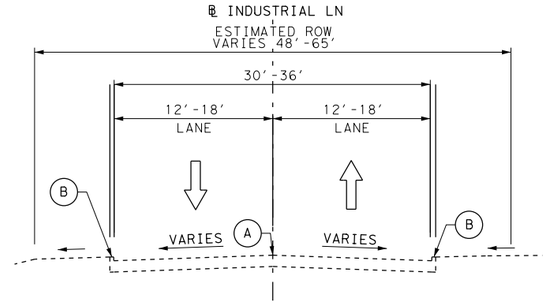
US 67-377

STA 25+08 TO STA 31+48



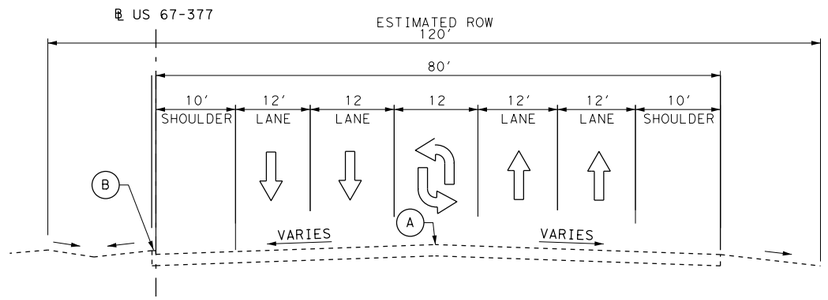
LONGHORN DR

STA 10+00 TO STA 47+50



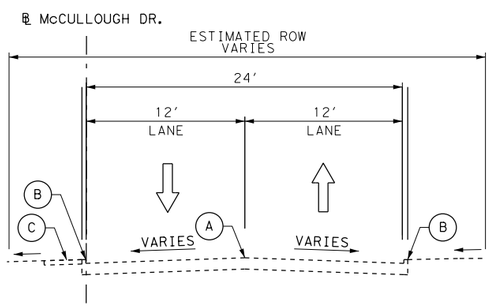
INDUSTRIAL LN

STA 10+00 TO STA 47+50



US 67-377

STA 9+00 TO STA 15+20



McCULLOUGH DR

STA 10+00 TO STA 14+40

LEGEND

- (A) EXISTING PAVEMENT
- (B) EXISTING TYPE II MONO CURB
- (C) EXISTING CONC SIDEWALK

STATE OF TEXAS
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09/18/2023

CITY OF EARLY

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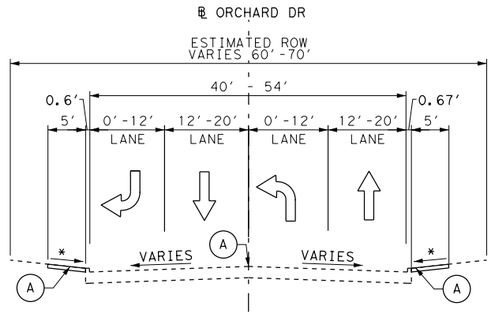
Texas Department of Transportation

TYPICAL SECTIONS EXISTING

SHEET 1 OF 1

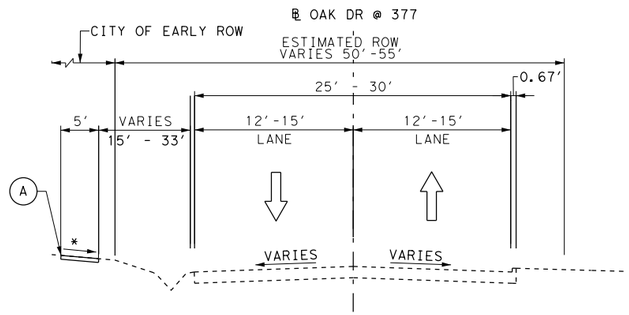
DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PE	BWD	BROWN		31

DATE: 18-SEP-2023 13:18
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Typical Section (Existing)



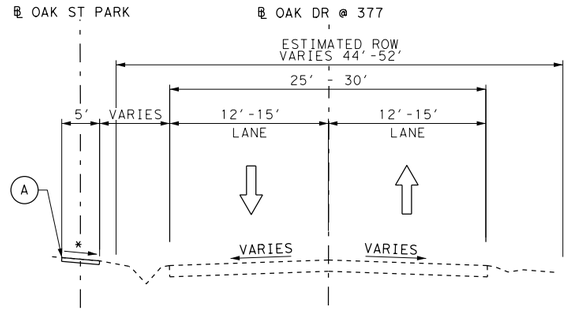
ORCHARD DR.

STA 10+00 TO STA 16+24



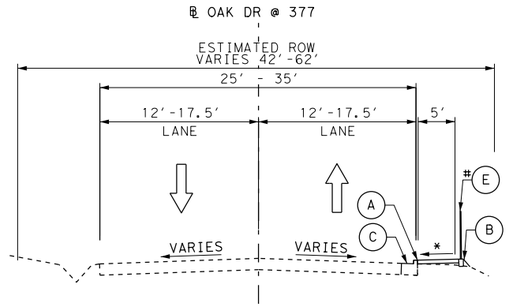
OAK ST

STA 10+00 TO STA 13+50



OAK ST

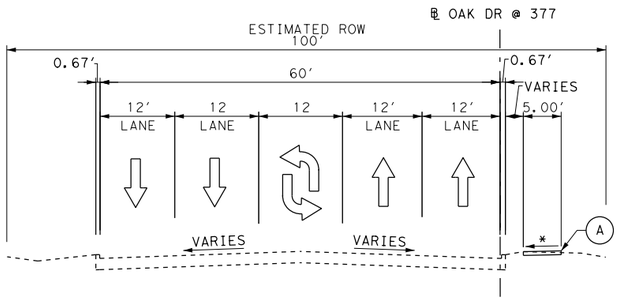
STA 13+50 TO STA 18+80



OAK ST

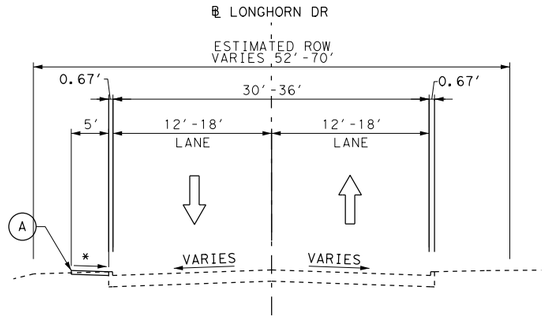
STA 18+80 TO STA 25+08

REFER TO PLAN SHEET FOR PED RAIL LIMITS AND INCREASE THE ADJACENT SIDEWALK WIDTH FROM 5FT TO 6 FT



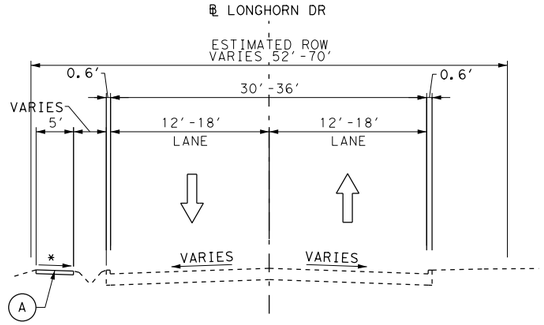
OAK ST TO US 67-377

STA 25+08 TO STA 31+48



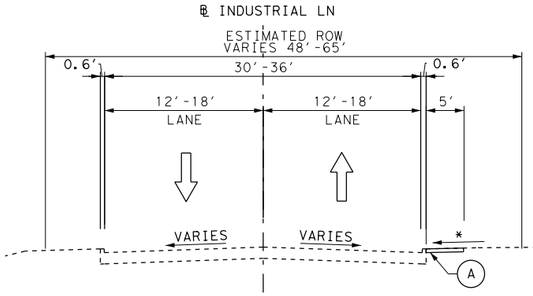
LONGHORN DR

STA 10+00 TO STA 29+75



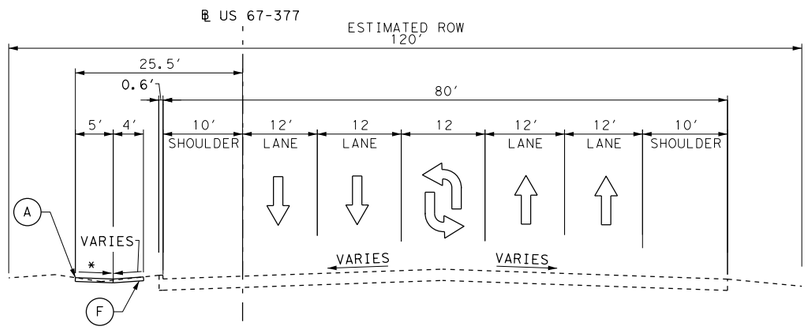
LONGHORN DR

STA 29+75 TO STA 47+30



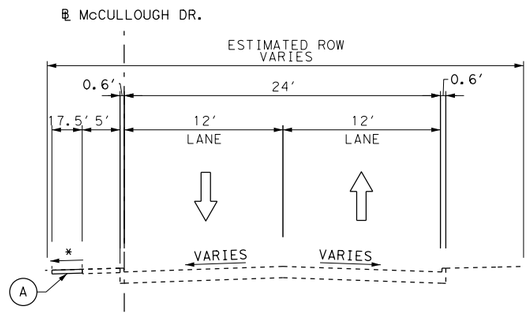
INDUSTRIAL LN

STA 10+64 TO STA 46+50



US 67-377

STA 10+75 TO STA 14+75



McCULLOUGH DR

STA 10+92

STA 13+32

LEGEND

- (A) CONC SIDEWALK (4IN)
- (B) RIPRAP (CONC 4IN)
- (C) TYPE II CONC CURB & GUTTER
- (D) TYPE II MONO CURB
- (E) PED RAIL
- (F) 4" SUPERPAVE MIXTURES SP-B PG64-22

* SIDEWALK CROSS SLOPES 1.5% USUAL, BUT NOT TO EXCEED 2% MAX. SEE PLANS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
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09/29/2023

CITY OF EARLY

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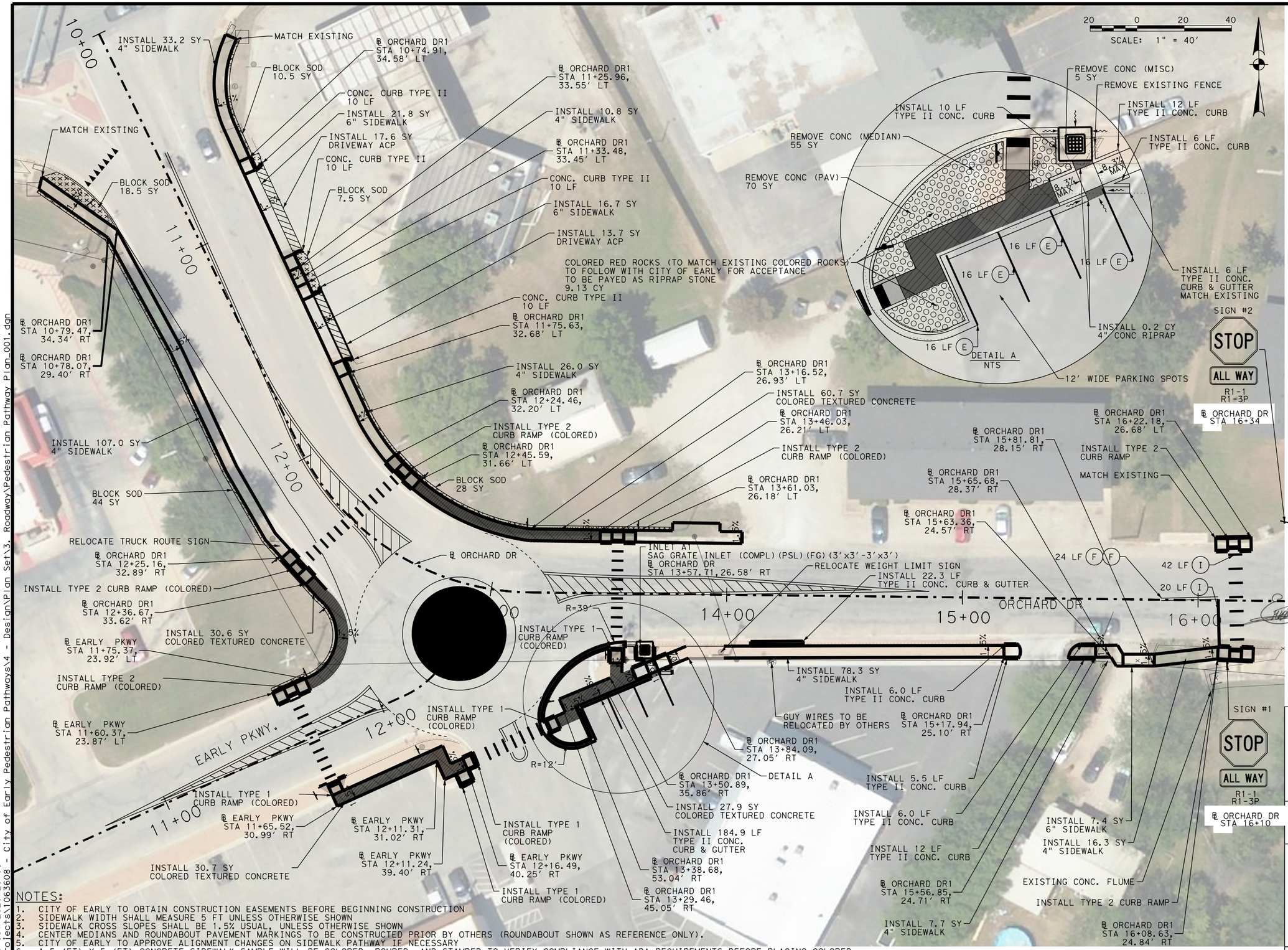
Texas Department of Transportation

TYPICAL SECTIONS PROPOSED

SHEET 1 OF 1

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN ER	0923	06	095	CS
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		32

DATE: 29-SEP-2023 04:20
FILE: Projects\063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Typical Section (Proposed).dgn



LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
- ILLUMINATION POLE (BY OTHERS)
- CONDUIT (BY OTHERS)
- (E) RE PM W/RET REQ TY I(W)6" (SLD)(100MIL)
- (F) RE PM W/RET REQ TY I(Y)6" (SLD)(100MIL)
- (G) REFL PAV MRK TY I(W)6" (DOT)(100MIL)
- (H) REF PAV MRK TY I(W)18" (YLD TRI)(100MIL)
- (I) REFL PAV MRK TY I(W)24" (SLD)(100MIL)
- (J) REFL PAV MRK TY I(Y) (ISLAND)(100MIL)
- DRIVEWAY ACP
- RIPRAP
- SOD
- COLORED GRAVEL
- PED RAIL
- STAMP & STAINED SIDEWALK

NOTES:

1. CITY OF EARLY TO OBTAIN CONSTRUCTION EASEMENTS BEFORE BEGINNING CONSTRUCTION
2. SIDEWALK WIDTH SHALL MEASURE 5 FT UNLESS OTHERWISE SHOWN
3. SIDEWALK CROSS SLOPES SHALL BE 1.5% USUAL, UNLESS OTHERWISE SHOWN
4. CENTER MEDIANS AND ROUNDABOUT PAVEMENT MARKINGS TO BE CONSTRUCTED PRIOR BY OTHERS (ROUNDABOUT SHOWN AS REFERENCE ONLY).
5. CITY OF EARLY TO APPROVE ALIGNMENT CHANGES ON SIDEWALK PATHWAY IF NECESSARY
6. A 5 (FT) X 5 (FT) CONCRETE SIDEWALK SAMPLE WILL BE COLORED, POURED, AND STAMPED TO VERIFY COMPLIANCE WITH ADA REQUIREMENTS BEFORE PLACING COLORED AND STAMPED SIDEWALK ON ORCHARD DR. THESE SAMPLES WILL BE SUBSIDIARY TO THE COLORED TEXTURED CONCRETE PAY ITEM.
7. TXDOT AND CITY OF EARLY TO BOTH APPROVE COLOR AND STAMP. INTEGRAL CONCRETE COLORANT SHALL BE REQUIRED. MAXIMUM GROUT LINE DEPTHS SHALL BE 1/8".
8. PEDESTRIAN RAMPS CALLED OUT AS COLORED SHALL HAVE INTEGRAL CONCRETE COLORANT AND SHALL NOT BE STAMPED. DETECTABLE WARNING SURFACES TO CONTRAST VISUALLY WITH ADJACENT WALKING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT.

STATE OF TEXAS
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10/26/2023

CITY OF EARLY

VOLKERT

F-12679

Texas Department of Transportation

PATHWAY PLAN ORCHARD DR

SHEET 1 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN	0923	06	095	CS
ER				
CHECKED	DIST	COUNTY		SHEET NO.
BB				
APPROVED	BWD	BROWN		33
PF				

DATE: 26-OCT-2023 20:58
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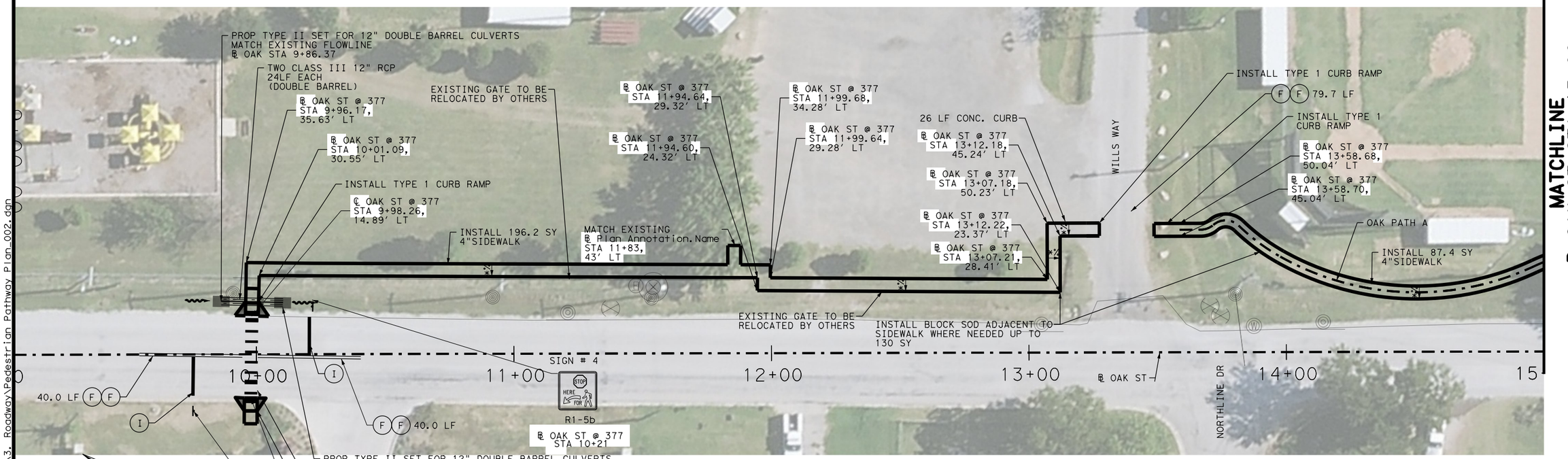


LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
- ILLUMINATION POLE (BY OTHERS)
- CONDUIT (BY OTHERS)
- (E) RE PM W/RET REQ TY I(W)6" (SLD)(100MIL)
- (F) RE PM W/RET REQ TY I(Y)6" (SLD)(100MIL)
- (G) REFL PAV MRK TY I(W)6" (DOT)(100MIL)
- (H) REF PAV MRK TY I(W)18" (YLD TRI)(100MIL)
- (I) REFL PAV MRK TY I(W)24" (SLD)(100MIL)
- (J) REFL PAV MRK TY I(Y) (ISLAND)(100MIL)
- DRIVEWAY ACP
- RIPRAP
- SOD
- COLORED GRAVEL
- PED RAIL

NOTES:

1. CITY OF EARLY TO OBTAIN CONSTRUCTION EASEMENTS BEFORE BEGINNING CONSTRUCTION
2. SIDEWALK WIDTH SHALL MEASURE 5 FT UNLESS OTHERWISE SHOWN
3. SIDEWALK CROSS SLOPES SHALL BE 1.5% USUAL, UNLESS OTHERWISE SHOWN
4. CITY OF EARLY TO APPROVE ALIGNMENT CHANGES ON SIDEWALK PATHWAY IF NECESSARY

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER
09/29/2023

CITY OF EARLY

VOLKERT

F-12679

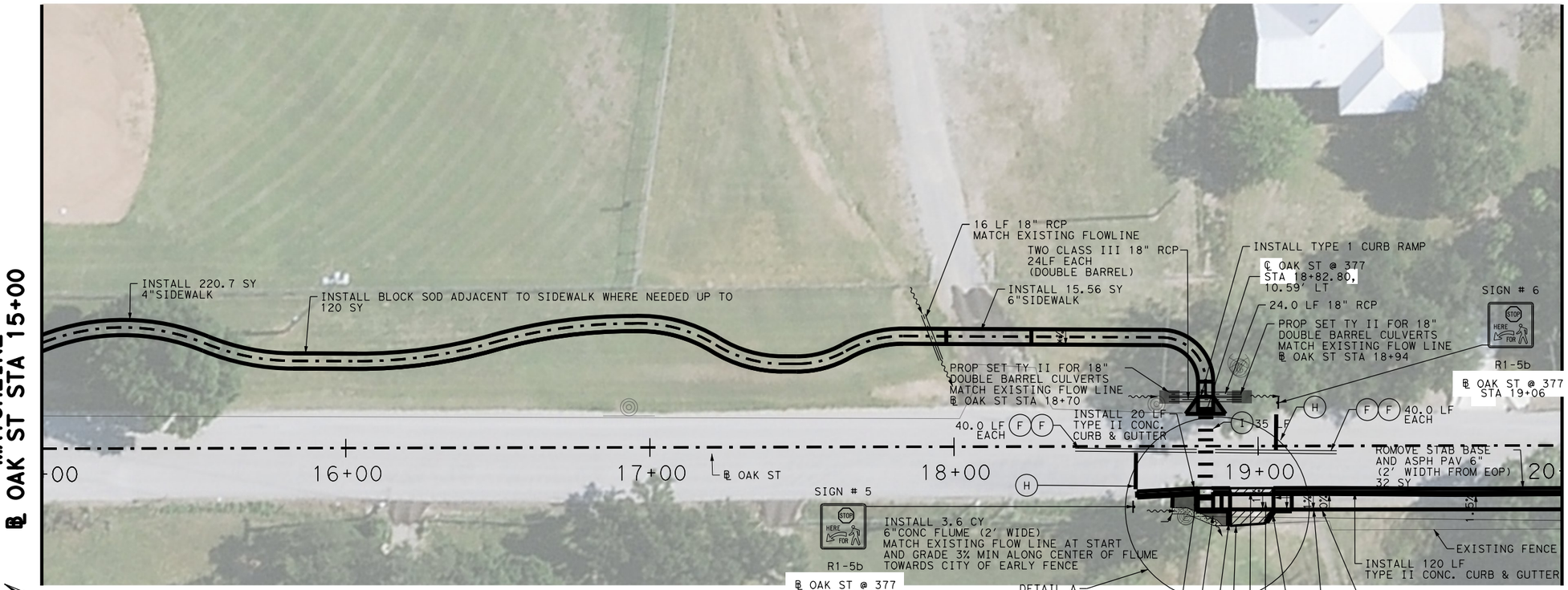
Texas Department of Transportation

PATHWAY PLAN
OAK ST

SHEET 2 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN	0923	06	095	CS
ER				
CHECKED	DIST	COUNTY		SHEET NO.
BB				
APPROVED	BWD	BROWN		34
PF				

DATE: 29-SEP-2023 04:16
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Pedestrian Pathway Plan_002.dgn



20 0 20 40

SCALE

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
- ILLUMINATION POLE (BY OTHERS)
- CONDUIT (BY OTHERS)
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- (F) RE PM W/RET REQ TY I(Y)6" (SLD)(100MIL)
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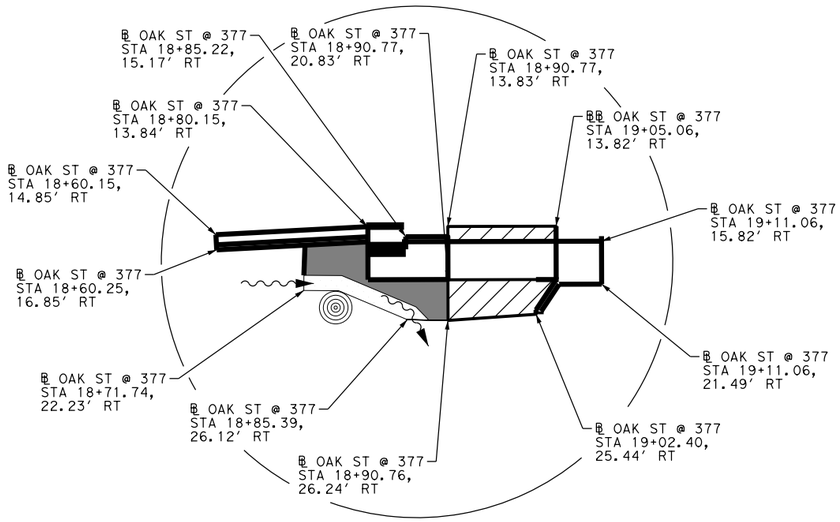
- (H) REF PAV MRK TY I(W)18" (YLD TRI)(100MIL)
- (I) REFL PAV MRK TY I(W)24" (SLD)(100MIL)
- (J) REFL PAV MRK TY I(Y) (ISLAND)(100MIL)

- DRIVEWAY ACP
- RIPRAP
- SOD
- COLORED GRAVEL
- PED RAIL



DETAIL A

CITY OF EARLY

VOLKERT

F-12679

Texas Department of Transportation

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER
09/29/2023

PATHWAY PLAN
OAK ST

SHEET 3 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN	0923	06	095	CS
ER				
CHECKED	DIST	COUNTY		SHEET NO.
BB				
APPROVED	BWD	BROWN		35
PF				

NOTES:

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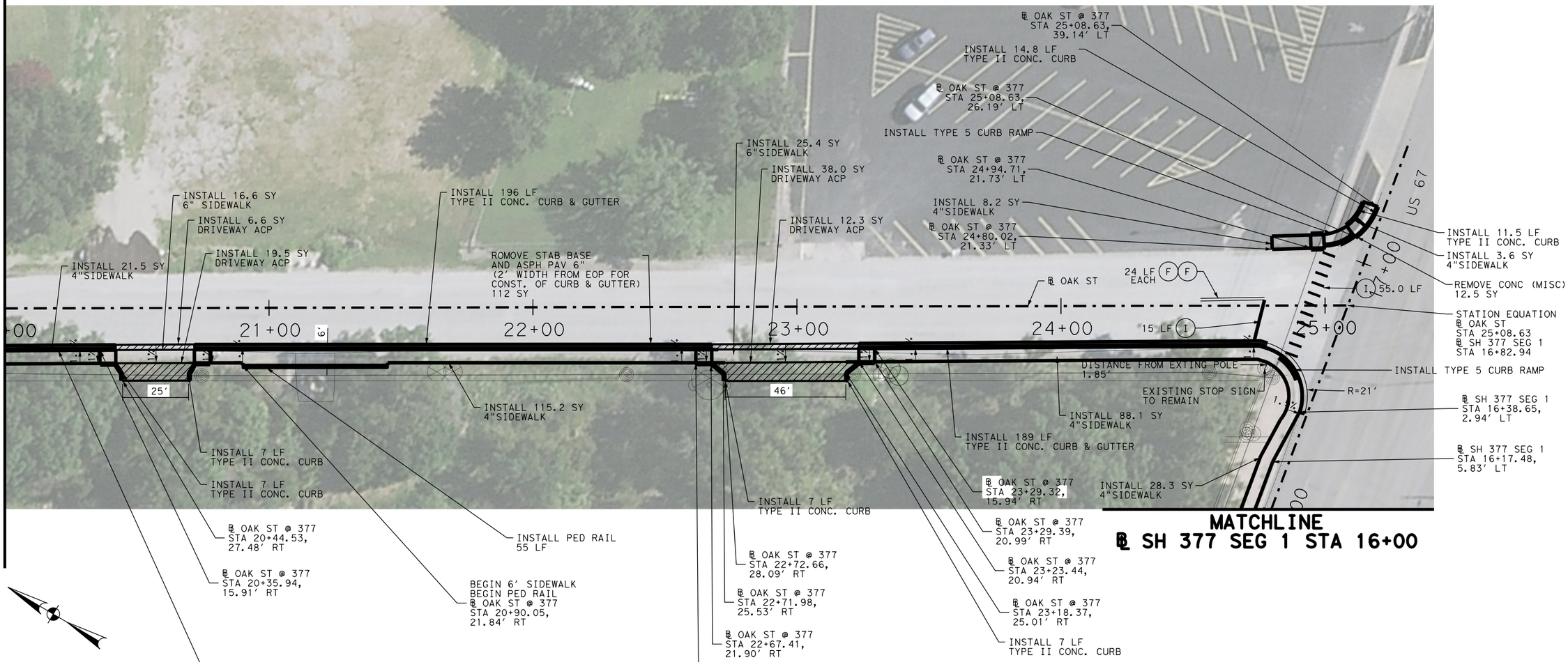
2. SIDEWALK WIDTH SHALL MEASURE 5 FT UNLESS OTHERWISE SHOWN
3. SIDEWALK CROSS SLOPES SHALL BE 1.5% USUAL, UNLESS OTHERWISE SHOWN
4. CITY OF EARLY TO APPROVE ALIGNMENT CHANGES ON SIDEWALK PATHWAY IF NECESSARY

DATE: 29-SEP-2023 04:16
FILE: Projects\063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Pedestrian Pathway Plan_003.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- (W) WATER METER
- (G) GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
- ILLUMINATION POLE (BY OTHERS)
- CONDUIT (BY OTHERS)
- (E) RE PM W/RET REQ TY I(W)6" (SLD)(100MIL)
- (F) RE PM W/RET REQ TY I(Y)6" (SLD)(100MIL)
- (G) REFL PAV MRK TY I(W)6" (DOT)(100MIL)
- (H) REF PAV MRK TY I(W)18" (YLD TRI)(100MIL)
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- (J) REFL PAV MRK TY I(Y) (ISLAND)(100MIL)
- DRIVEWAY ACP
- RIPRAP
- SOD
- COLORED GRAVEL
- PED RAIL

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09/29/2023

CITY OF EARLY

VOLKERT

F-12679

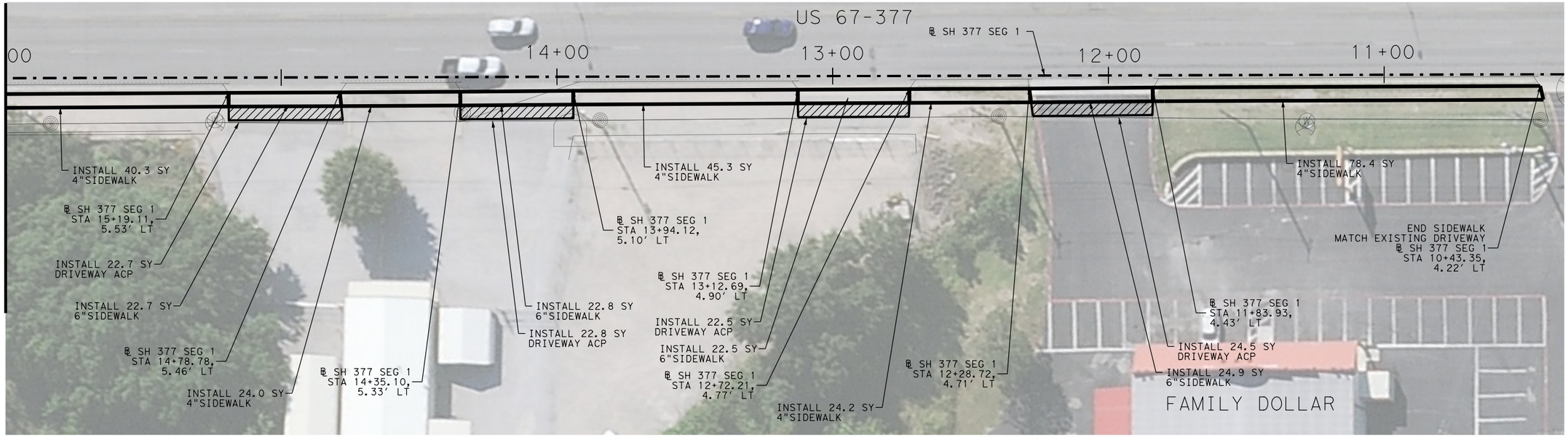
Texas Department of Transportation

PATHWAY PLAN
OAK ST

SHEET 4 OF 17

DESIGN ER	CONT	SECT	JOB	HIGHWAY
DRAWN ER	0923	06	095	CS
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		36

DATE: 29-SEP-2023 04:16
FILE: Projects\063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Pedestrian Pathway Plan_004.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
- ILLUMINATION POLE (BY OTHERS)
- CONDUIT (BY OTHERS)
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- (F) RE PM W/RET REQ TY I(Y)6" (SLD)(100MIL)
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- DRIVEWAY ACP
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- PED RAIL

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09/29/2023

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VOLKERT

F-12679

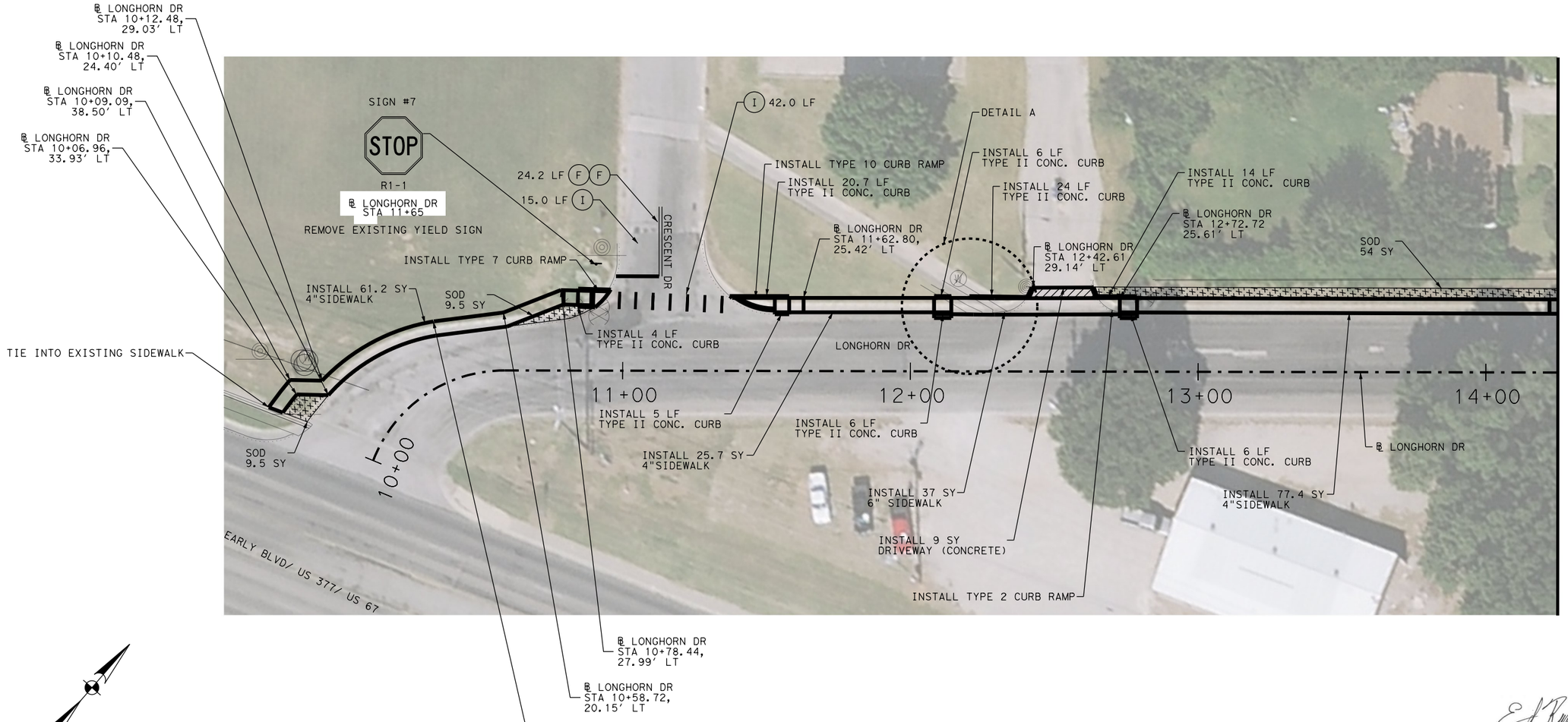
Texas Department of Transportation

PATHWAY PLAN
US 67

SHEET 5 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		37

DATE: 29-SEP-2023 04:16
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Pedestrian Pathway Plan_005.dgn



MATCH LINE STA 14+25
℄ LONGHORN DR

20 0 20 40
SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
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- ILLUMINATION POLE (BY OTHERS)
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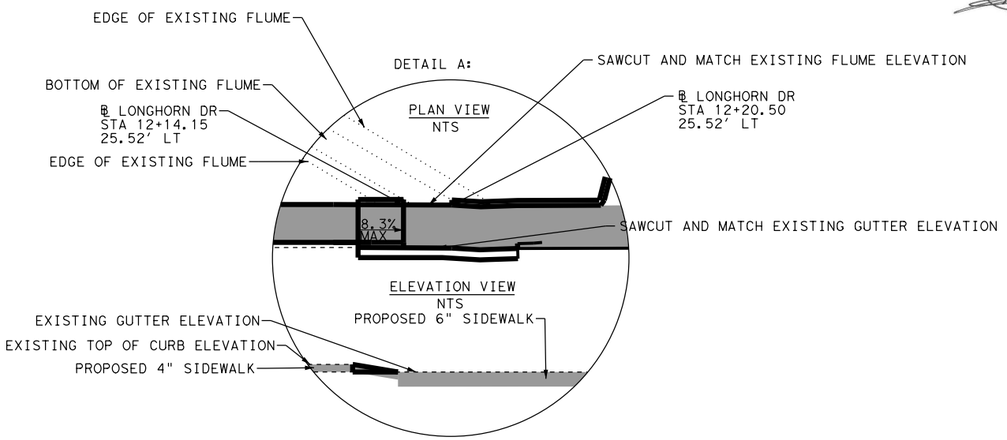
- DRIVEWAY ACP
- RIPRAP
- SOD
- COLORED GRAVEL
- PED RAIL



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STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED PROFESSIONAL ENGINEER
09/29/2023

CITY OF EARLY

VOLKERT

F-12679

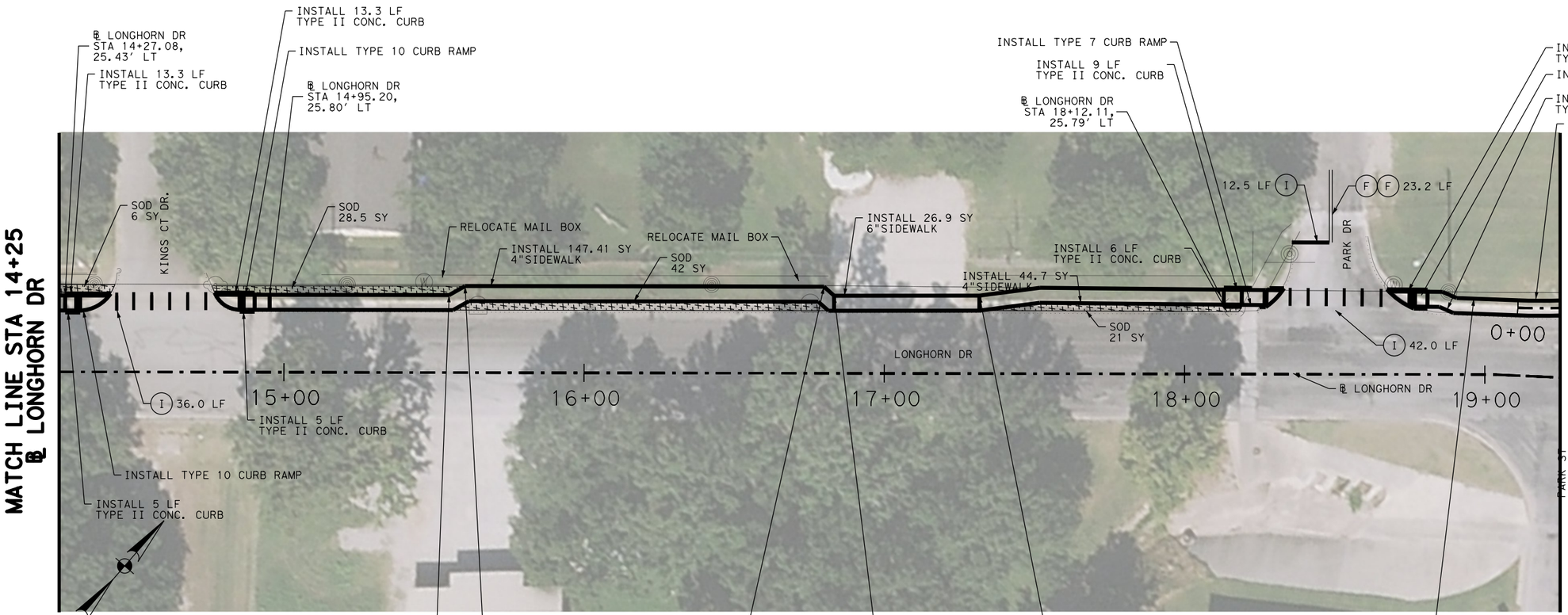
Texas Department of Transportation

PATHWAY PLAN LONGHORN DR

SHEET 6 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN ER	0923	06	095	CS
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		38

DATE: 29-SEP-2023 04:16
FILE: Projects\163608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Pedestrian Pathway Plan_006.dgn



NOTES:
1. SIDEWALK WIDTH SHALL MEASURE 5 FT UNLESS DIMESIONSED OTHERWISE

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
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09/29/2023

CITY OF EARLY

VOLKERT
F-12679

Texas Department of Transportation

PATHWAY PLAN
LONGHORN DR

SHEET 7 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		39

DATE: 29-SEP-2023 04:20
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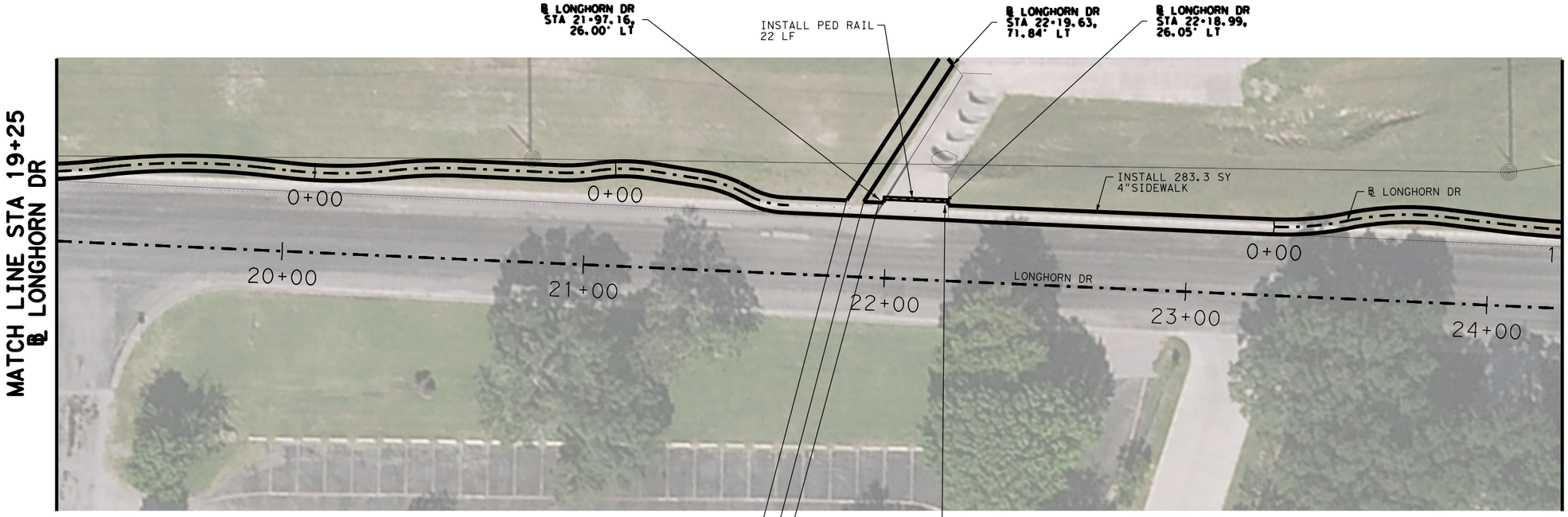

20 0 20 40
SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
- ILLUMINATION POLE (BY OTHERS)
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09/29/2023

CITY OF EARLY

VOLKERT

F-12679

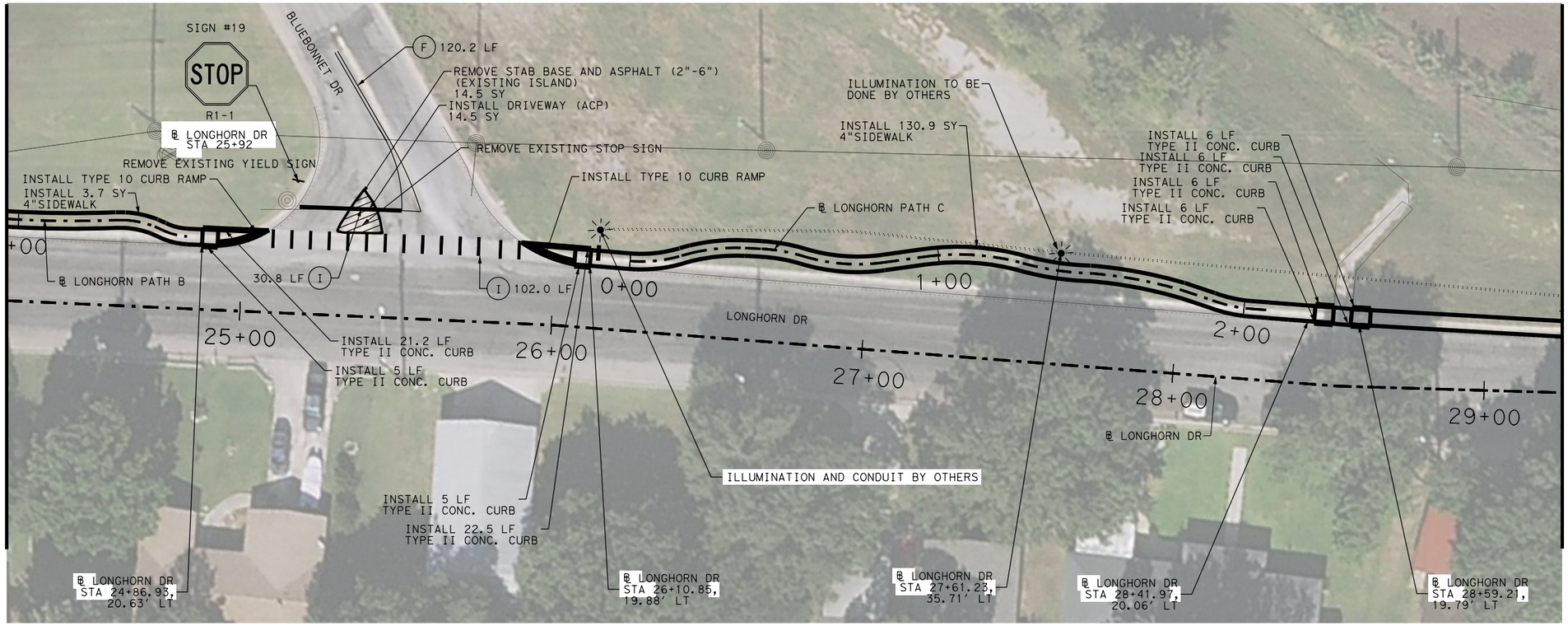
Texas Department of Transportation

PATHWAY PLAN
LONGHORN DR

SHEET 8 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN	0923	06	095	CS
ER				
CHECKED	DIST	COUNTY		SHEET NO.
BB				
APPROVED	BWD	BROWN		40
PF				

DATE: 29-SEP-2023 04:16
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Pedestrian Pathway Plan_008.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
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STATE OF TEXAS
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09/29/2023

CITY OF EARLY

VOLKERT

F-12679

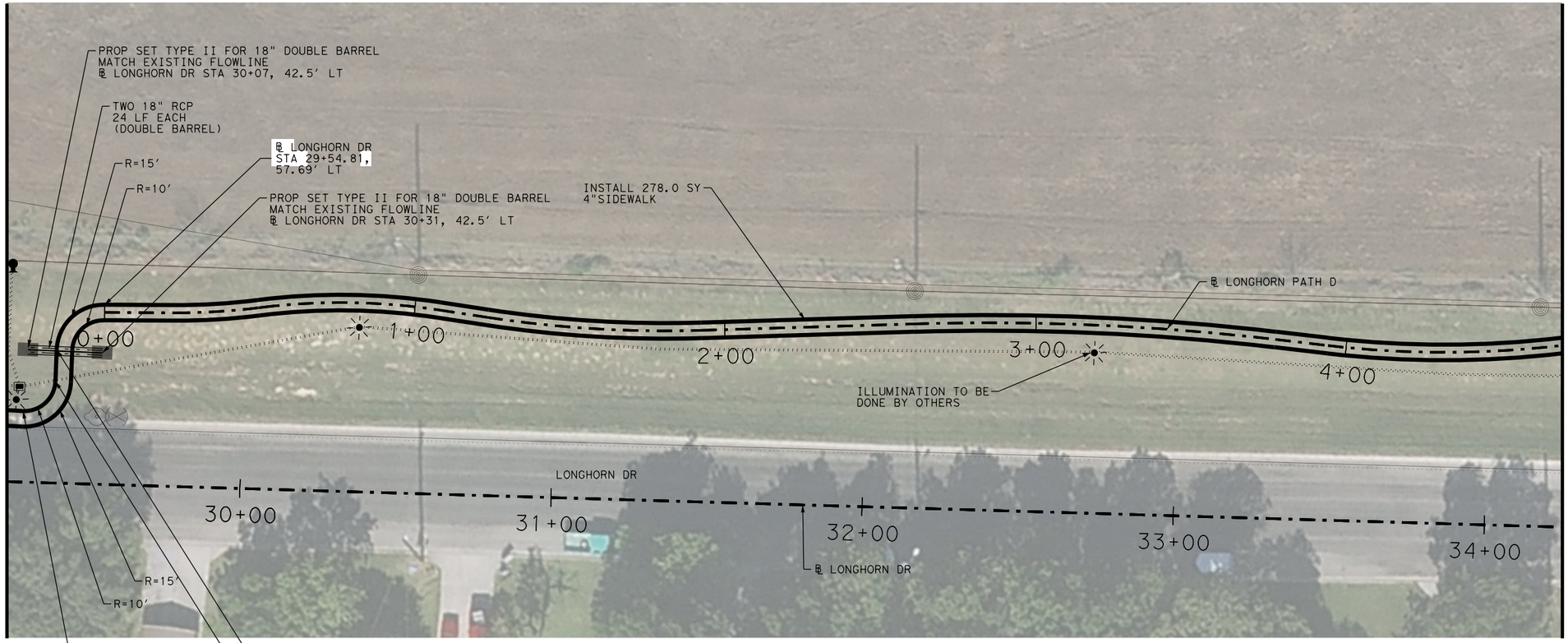
Texas Department of Transportation

PATHWAY PLAN
LONGHORN DR

SHEET 9 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN ER	0923	06	095	CS
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED EF	BWD	BROWN		41

DATE: 29-SEP-2023 04:18
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Pedestrian Pathway Plan_009.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
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STATE OF TEXAS
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09/29/2023

CITY OF EARLY

VOLKERT

F-12679

Texas Department of Transportation

PATHWAY PLAN
LONGHORN DR

SHEET 10 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN	0923	06	095	CS
ER				
CHECKED	DIST	COUNTY		SHEET NO.
BB				
APPROVED	BWD	BROWN		42
PF				

NOTES:

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2. SIDEWALK WIDTH SHALL MEASURE 5 FT UNLESS OTHERWISE SHOWN
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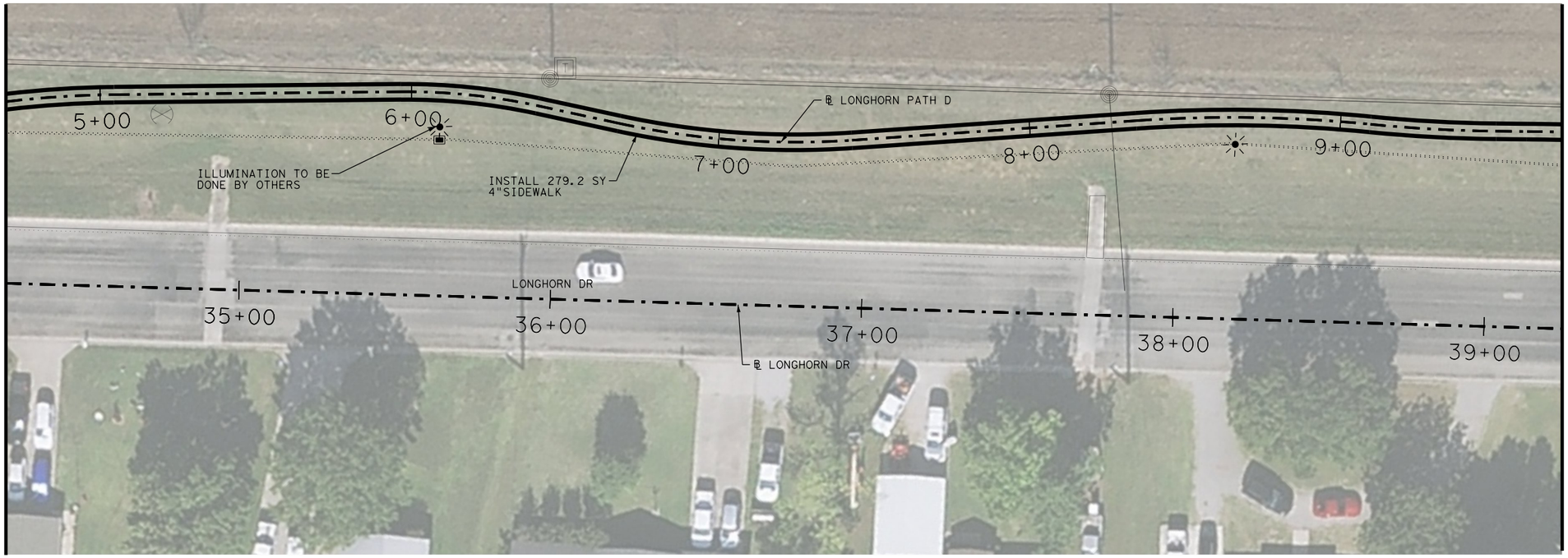
4. CITY OF EARLY TO APPROVE ALIGNMENT CHANGES ON SIDEWALK PATHWAY IF NECESSARY

DATE: 29-SEP-2023 04:19
FILE: Projects\063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Pedestrian Pathway Plan_010.dgn



20 0 20 40

SCALE: 1" = 20'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
- ILLUMINATION POLE (BY OTHERS)
- CONDUIT (BY OTHERS)
- (E) RE PM W/RET REQ TY I(W)6" (SLD)(100MIL)
- (F) RE PM W/RET REQ TY I(Y)6" (SLD)(100MIL)
- (G) REFL PAV MRK TY I(W)6" (DOT)(100MIL)
- (H) REF PAV MRK TY I(W)18" (YLD TRI)(100MIL)
- (I) REFL PAV MRK TY I(W)24" (SLD)(100MIL)
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09/29/2023

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Texas Department of Transportation

PATHWAY PLAN
LONGHORN DR

SHEET 11 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN	DIST	COUNTY		SHEET NO.
ER	BWD	BROWN		43
CHECKED				
BB				
APPROVED				
EF				

DATE: 29-SEP-2023 04:16
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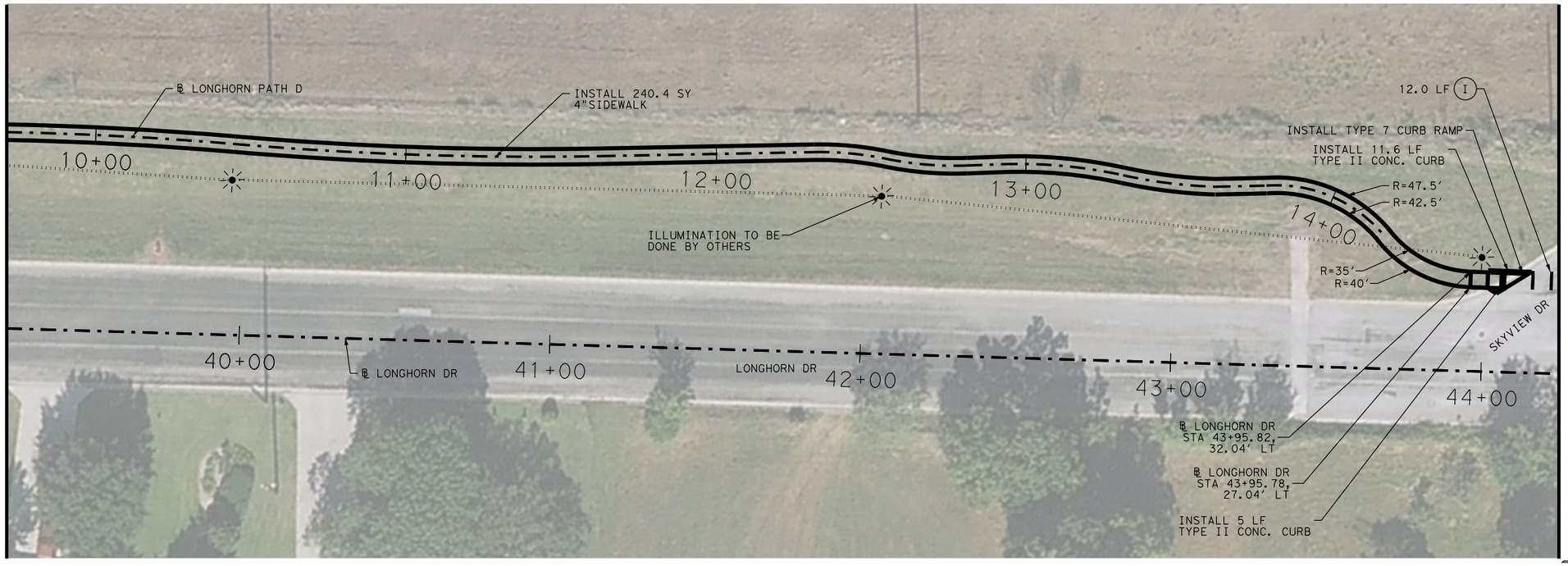


MATCH LINE STA 39+25 ℄ LONGHORN DR

MATCH LINE STA 44+25 ℄ LONGHORN DR

20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
- ILLUMINATION POLE (BY OTHERS)
- CONDUIT (BY OTHERS)
- (E) RE PM W/RET REQ TY I(W)6" (SLD)(100MIL)
- (F) RE PM W/RET REQ TY I(Y)6" (SLD)(100MIL)
- (G) REFL PAV MRK TY I(W)6" (DOT)(100MIL)
- (H) REF PAV MRK TY I(W)18" (YLD TRI)(100MIL)
- (I) REFL PAV MRK TY I(W)24" (SLD)(100MIL)
- (J) REFL PAV MRK TY I(Y) (ISLAND)(100MIL)

- DRIVEWAY ACP
- RIPRAP
- SOD
- COLORED GRAVEL
- PED RAIL

NOTES:

1. CITY OF EARLY TO OBTAIN CONSTRUCTION EASEMENTS BEFORE BEGINNING CONSTRUCTION
2. SIDEWALK WIDTH SHALL MEASURE 5 FT UNLESS OTHERWISE SHOWN
3. SIDEWALK CROSS SLOPES SHALL BE 1.5% USUAL, UNLESS OTHERWISE SHOWN
4. CITY OF EARLY TO APPROVE ALIGNMENT CHANGES ON SIDEWALK PATHWAY IF NECESSARY

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED PROFESSIONAL ENGINEER
09/29/2023

CITY OF EARLY

VOLKERT

F-12679

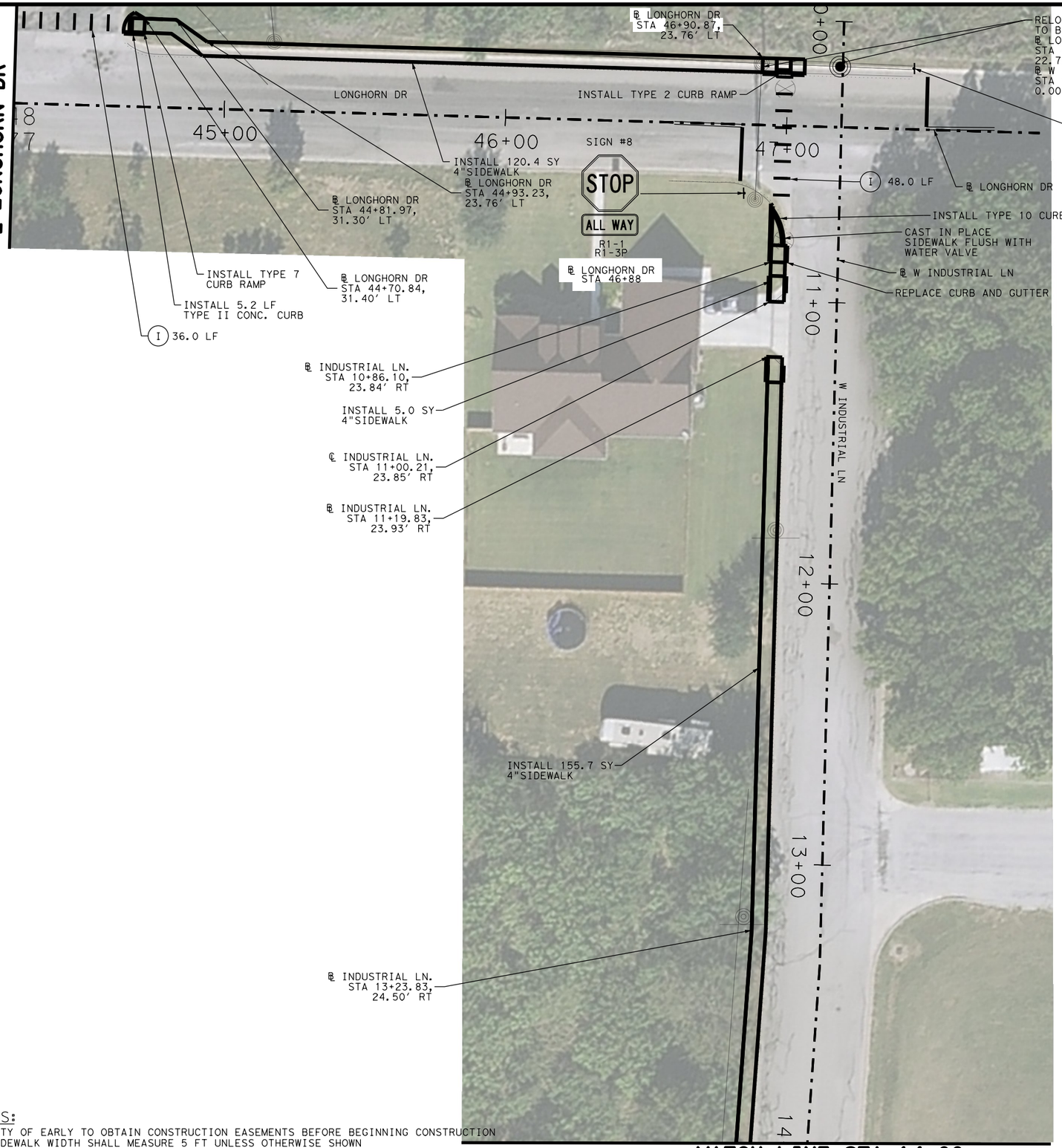
Texas Department of Transportation

PATHWAY PLAN LONGHORN DR

SHEET 12 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN	0923	06	095	CS
ER				
CHECKED	DIST	COUNTY		SHEET NO.
BB				
APPROVED	BWD	BROWN		44
EF				

DATE: 29-SEP-2023 04:19
FILE: Projects\163608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Pedestrian Pathway Plan_012.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- (W) WATER METER
- (G) GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
- ILLUMINATION POLE (BY OTHERS)
- CONDUIT (BY OTHERS)
- (E) RE PM W/RET REQ TY I(W)6" (SLD)(100MIL)
- (F) RE PM W/RET REQ TY I(Y)6" (SLD)(100MIL)
- (G) REFL PAV MRK TY I(W)6" (DOT)(100MIL)
- (H) REF PAV MRK TY I(W)18" (YLD TRI)(100MIL)
- (I) REFL PAV MRK TY I(W)24" (SLD)(100MIL)
- (J) REFL PAV MRK TY I(Y) (ISLAND)(100MIL)
- DRIVEWAY ACP
- RIPRAP
- SOD
- COLORED GRAVEL
- PED RAIL

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VOLKERT
F-12679

Texas Department of Transportation

PATHWAY PLAN
LONGHORN DR
AT W INDUSTRIAL LN

SHEET 13 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		45

DATE: 29-SEP-2023 04:22
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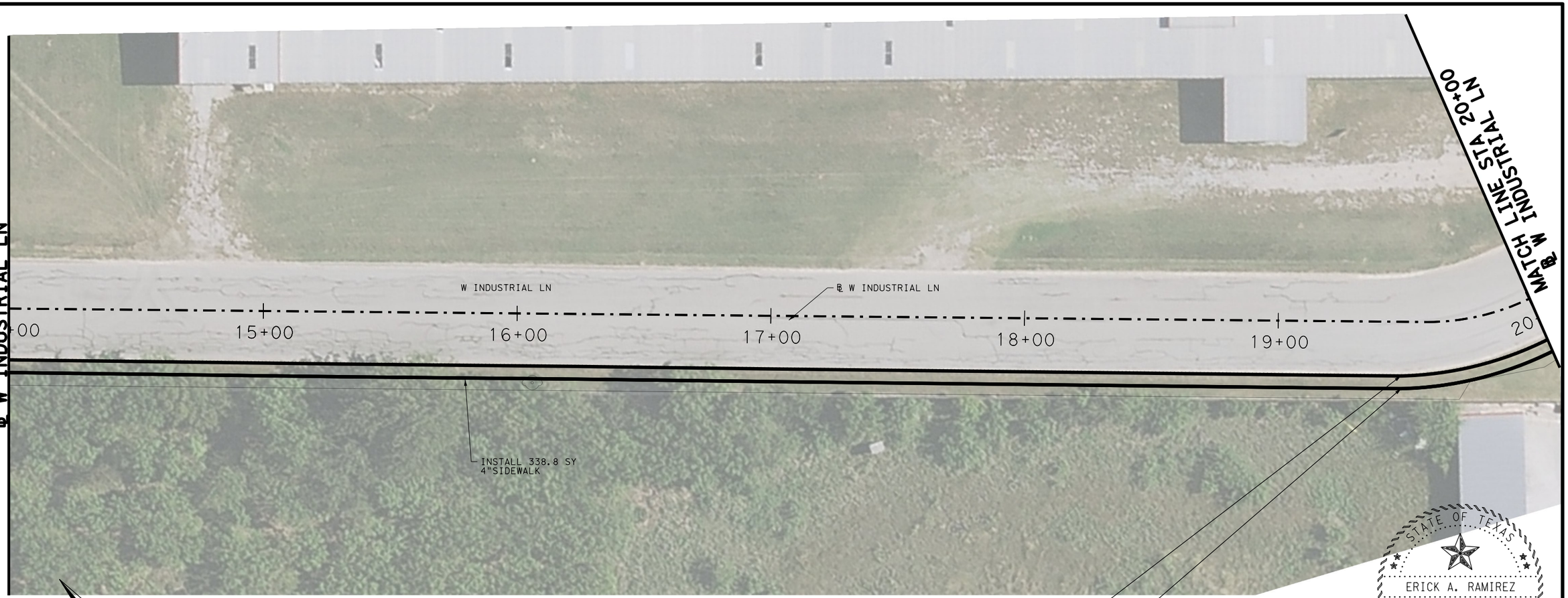

20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
- ILLUMINATION POLE (BY OTHERS)
- CONDUIT (BY OTHERS)
- (E) RE PM W/RET REQ TY I(W)6" (SLD)(100MIL)
- (F) RE PM W/RET REQ TY I(Y)6" (SLD)(100MIL)
- (G) REFL PAV MRK TY I(W)6" (DOT)(100MIL)
- (H) REF PAV MRK TY I(W)18" (YLD TRI)(100MIL)
- (I) REFL PAV MRK TY I(W)24" (SLD)(100MIL)
- (J) REFL PAV MRK TY I(Y) (ISLAND)(100MIL)
- DRIVEWAY ACP
- RIPRAP
- SOD
- COLORED GRAVEL
- PED RAIL

℄ INDUSTRIAL LN.
STA 19+48.50,
21.37' RT

℄ INDUSTRIAL LN.
STA 19+48.66,
26.37' RT

NOTES:

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STATE OF TEXAS
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PROFESSIONAL ENGINEER

09/29/2023

CITY OF EARLY

VOLKERT

F-12679

Texas Department of Transportation

PATHWAY PLAN
W INDUSTRIAL LN

SHEET 14 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN	DIST	COUNTY		SHEET NO.
ER	BWD	BROWN		46
CHECKED				
BB				
APPROVED				
PF				

DATE: 29-SEP-2023 04:22
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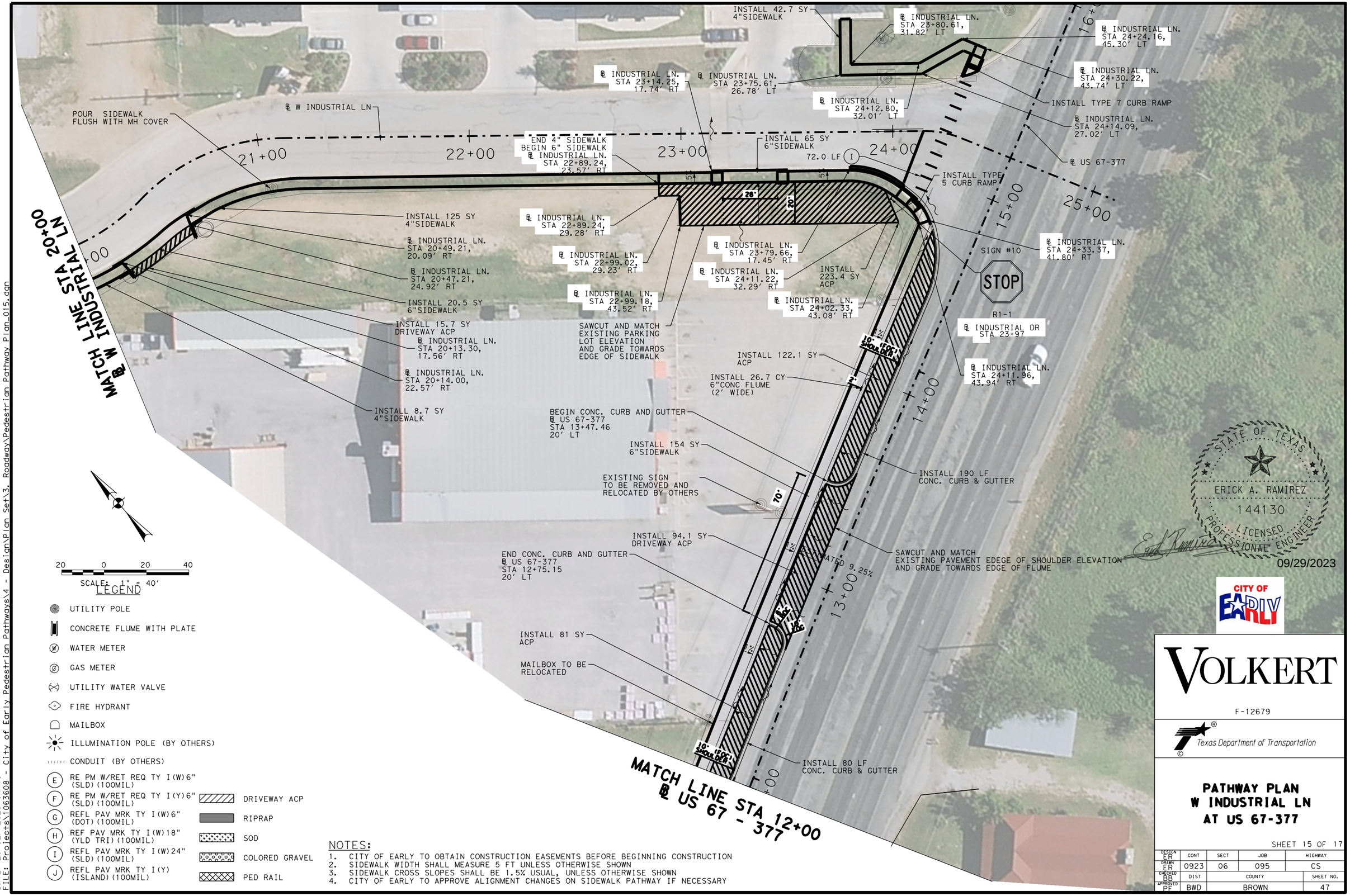

20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
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- (F) RE PM W/RET REQ TY I(Y)6" (SLD)(100MIL)
- (G) REFL PAV MRK TY I(W)6" (DOT)(100MIL)
- (H) REF PAV MRK TY I(W)18" (YLD TRI)(100MIL)
- (I) REFL PAV MRK TY I(W)24" (SLD)(100MIL)
- (J) REFL PAV MRK TY I(Y) (ISLAND)(100MIL)
- DRIVEWAY ACP
- RIPRAP
- SOD
- COLORED GRAVEL
- PED RAIL

NOTES:

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4. CITY OF EARLY TO APPROVE ALIGNMENT CHANGES ON SIDEWALK PATHWAY IF NECESSARY

STATE OF TEXAS
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09/29/2023

CITY OF EARLY

VOLKERT

F-12679

Texas Department of Transportation

PATHWAY PLAN W INDUSTRIAL LN AT US 67-377

SHEET 15 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		47

DATE: 29-SEP-2023 04:18
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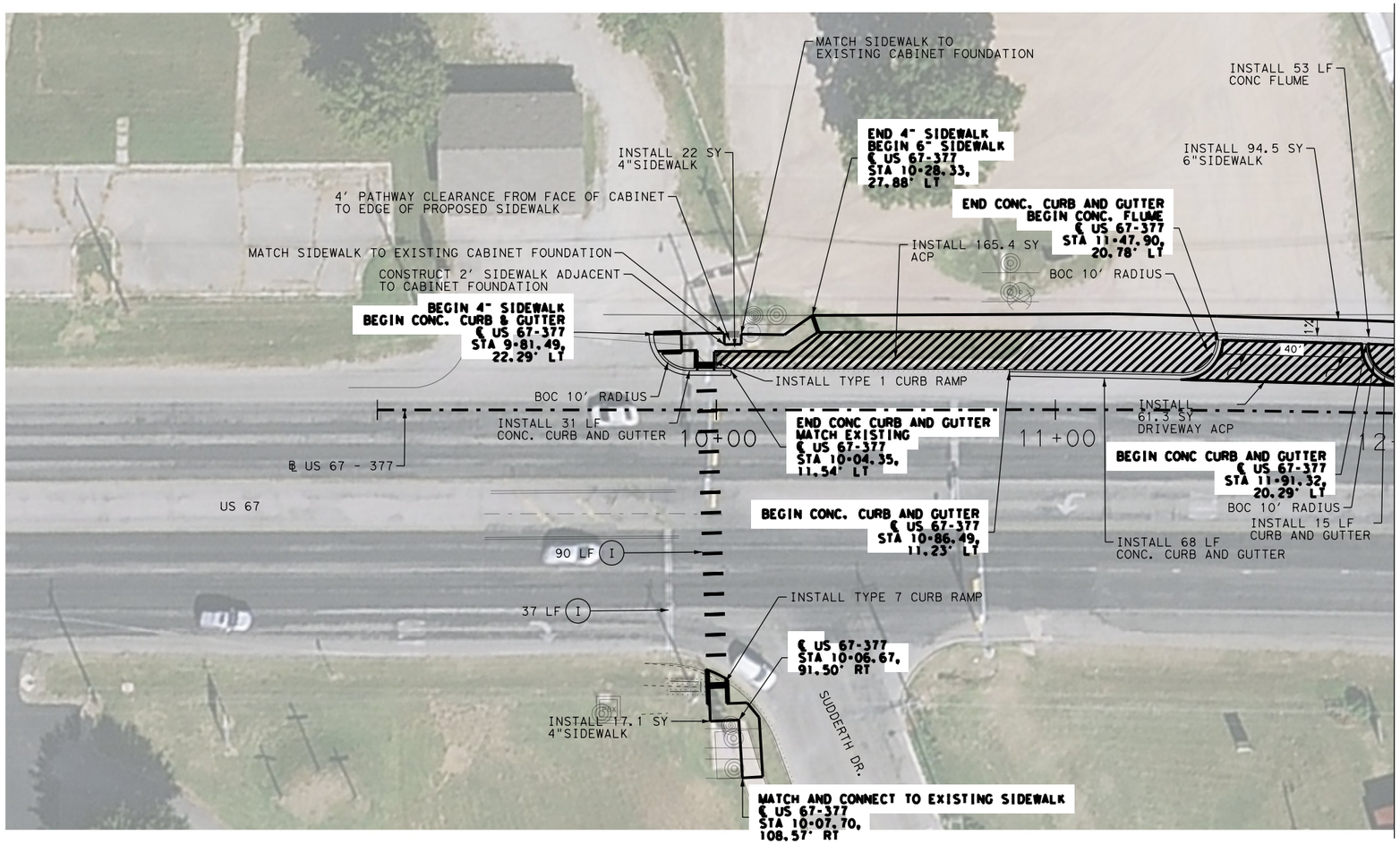

MATCH LINE STA 12+00 ℄ US 67 - 377

20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT
- MAILBOX
- ILLUMINATION POLE (BY OTHERS)
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- (E) RE PM W/RET REQ TY I(W)6" (SLD)(100MIL)
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- DRIVEWAY ACP
- RIPRAP
- SOD
- COLORED GRAVEL
- PED RAIL

STATE OF TEXAS
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09/29/2023

CITY OF EARLY

VOLKERT
F-12679

Texas Department of Transportation

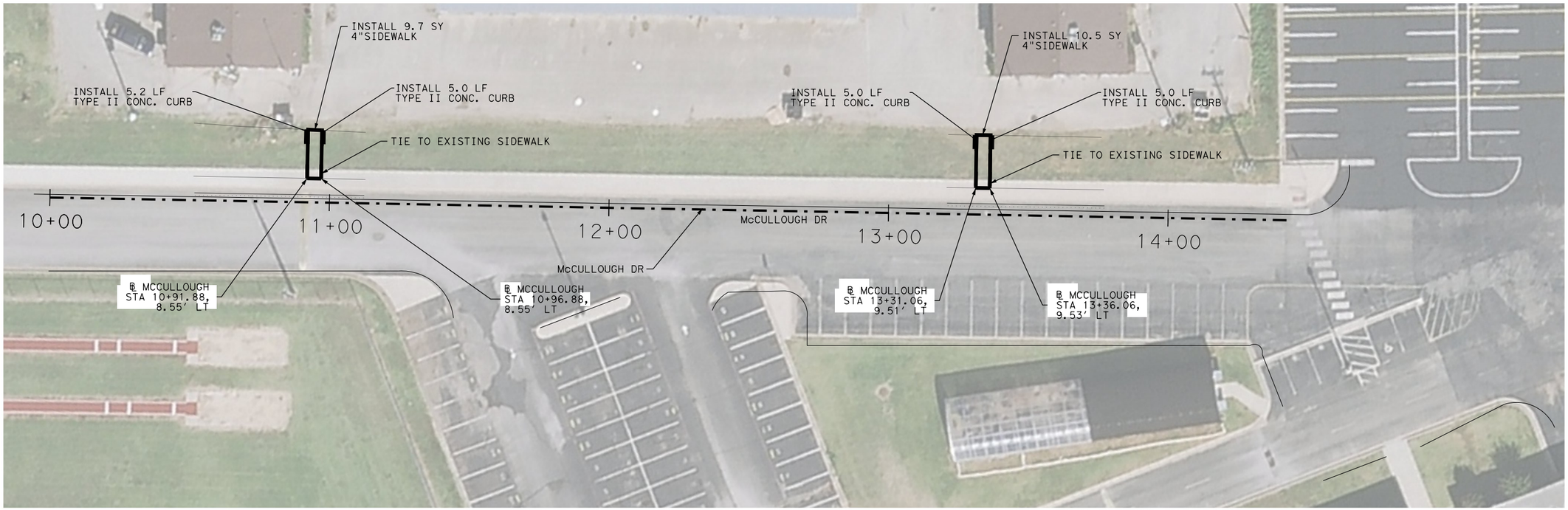
PATHWAY PLAN
US 67-377

SHEET 16 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER	DIST	COUNTY		SHEET NO.
CHECKED BB	BWD	BROWN		48
APPROVED PF				

NOTES:
1. CITY OF EARLY TO OBTAIN CONSTRUCTION EASEMENTS BEFORE BEGINNING CONSTRUCTION
2. SIDEWALK WIDTH SHALL MEASURE 5 FT UNLESS OTHERWISE SHOWN
3. *% - SIDEWALK CROSS SLOPES SHALL BE 1.5% USUAL, UNLESS OTHERWISE SHOWN
4. CITY OF EARLY TO APPROVE ALIGNMENT CHANGES ON SIDEWALK PATHWAY IF NECESSARY

DATE: 29-SEP-2023 04:22
FILE: Projects\063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\Pedestrian Pathway Plan_016.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- WATER METER
- GAS METER
- UTILITY WATER VALVE
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- (J) REFL PAV MRK TY I(Y) (ISLAND)(100MIL)
- DRIVEWAY ACP
- RIPRAP
- SOD
- COLORED GRAVEL
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NOTES:

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2. SIDEWALK WIDTH SHALL MEASURE 5 FT UNLESS OTHERWISE SHOWN
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4. CITY OF EARLY TO APPROVE ALIGNMENT CHANGES ON SIDEWALK PATHWAY

STATE OF TEXAS
ERICK A. RAMIREZ
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PROFESSIONAL ENGINEER
09/29/2023

CITY OF EARLY

VOLKERT

F-12679

Texas Department of Transportation

PATHWAY PLAN MCCULLOUGH DR

SHEET 17 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		49

DATE: 29-SEP-2023 04:19
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DATE:
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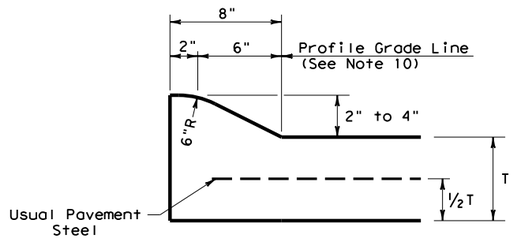
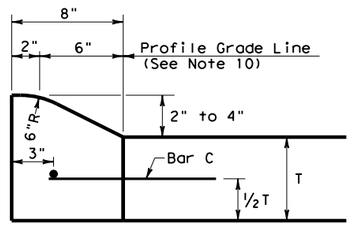
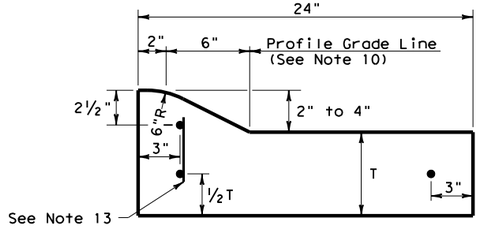


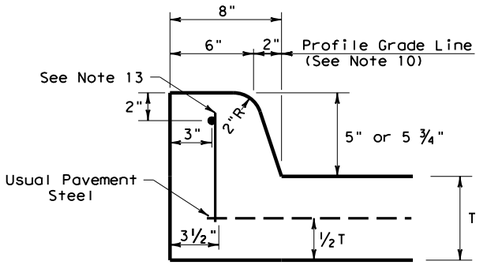
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



TYPE I CURB
2" - 4" HEIGHT



TYPE I CURB AND GUTTER
2" - 4" HEIGHT



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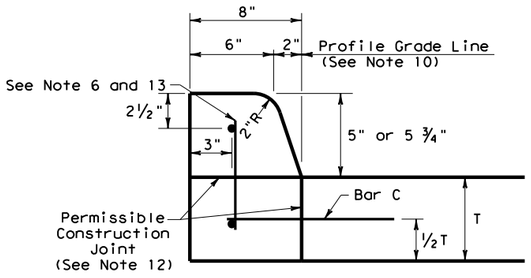
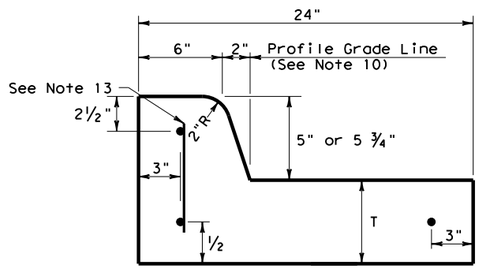
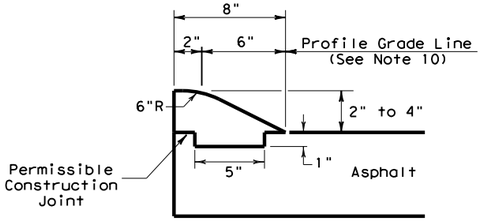
5" - 5 ¾" HEIGHT



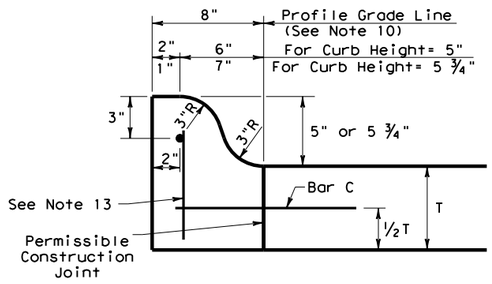
TYPE II CURB
5" - 5 ¾" HEIGHT



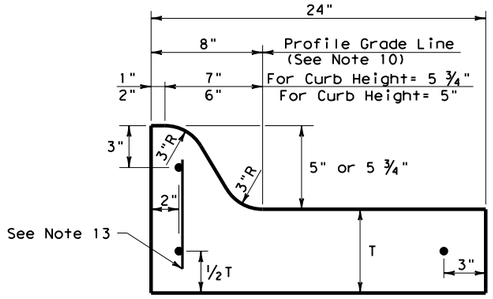
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



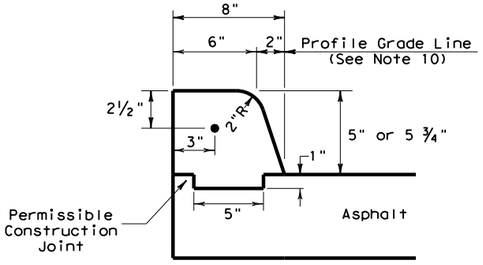
TYPE III CURB (KEYED)
2" - 4" HEIGHT



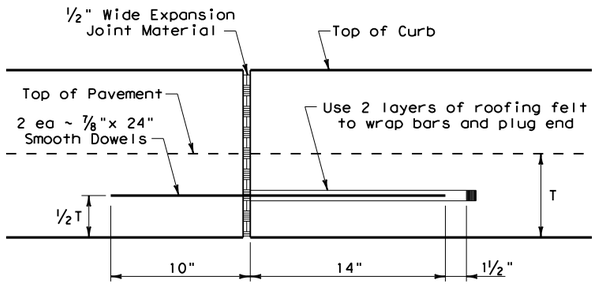
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

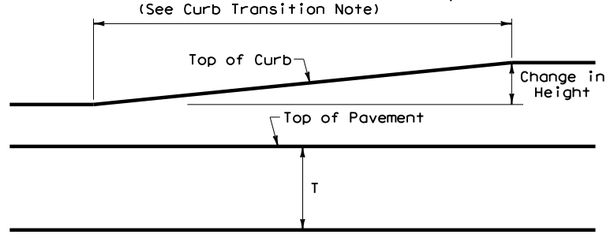


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

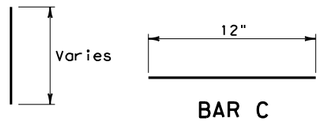
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



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

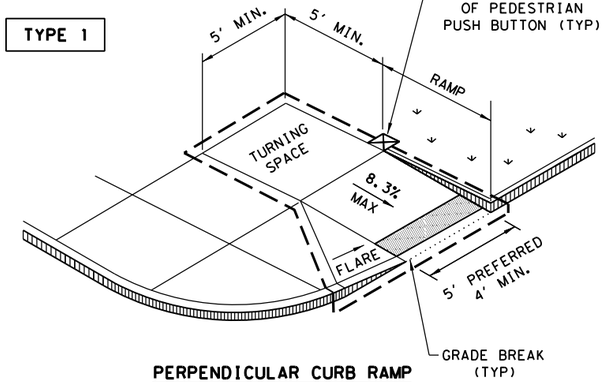
CONCRETE CURB AND CURB AND GUTTER

CCCG-22

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: CS	CK: KM
© TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		50

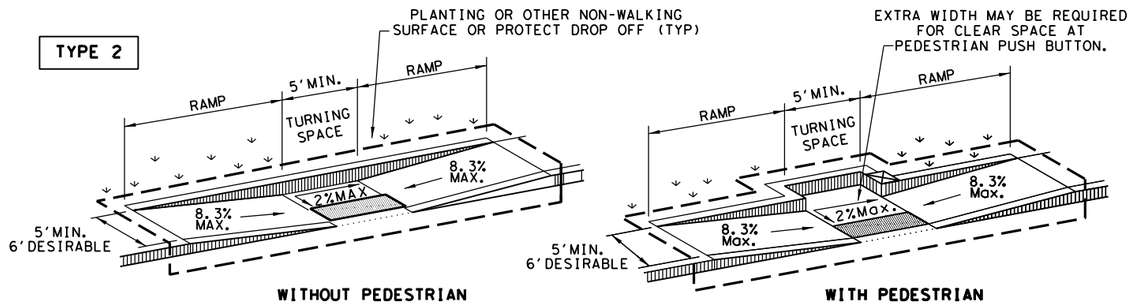
DATE:
FILE:

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

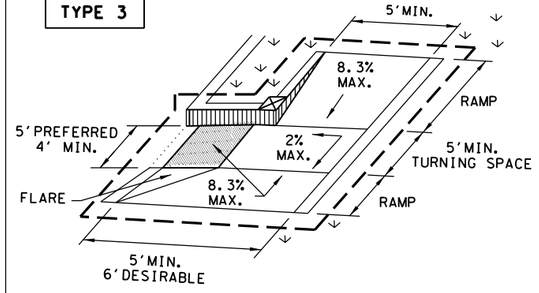


WITHOUT PEDESTRIAN PUSH BUTTON

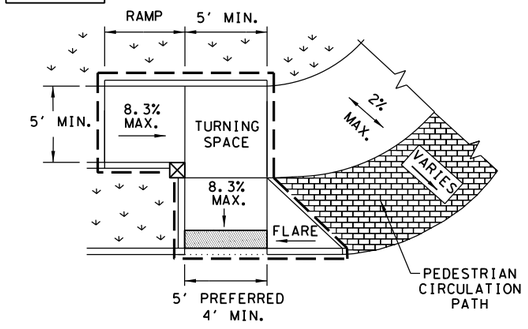
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

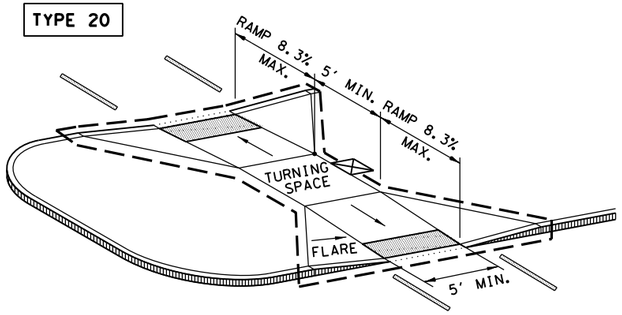


TYPE 6



COMBINATION CURB RAMPS

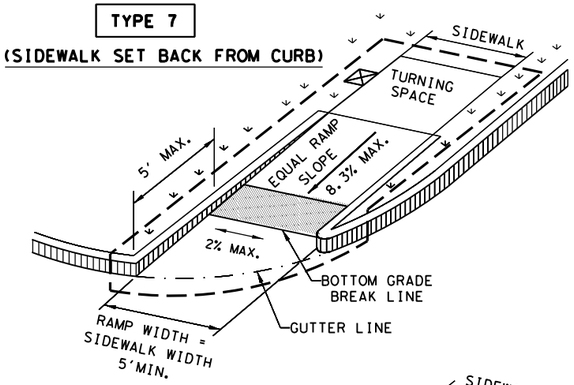
TYPE 20



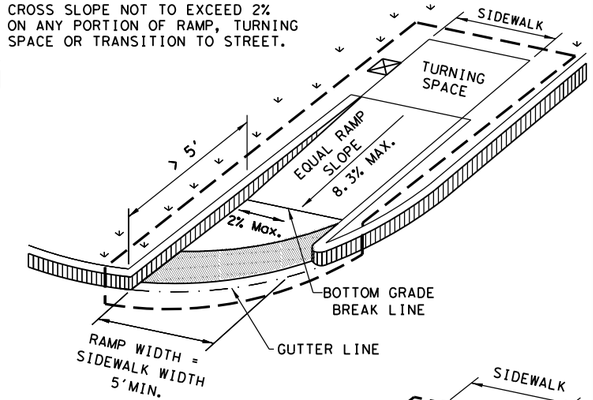
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

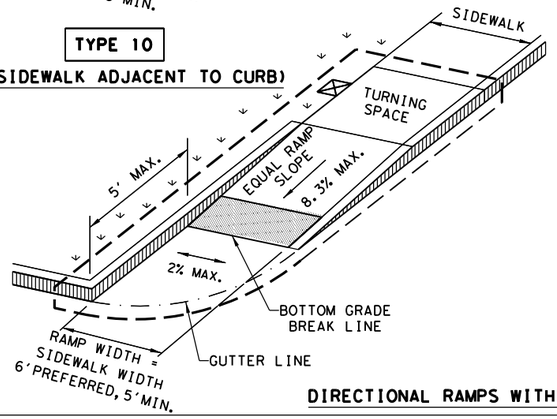


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

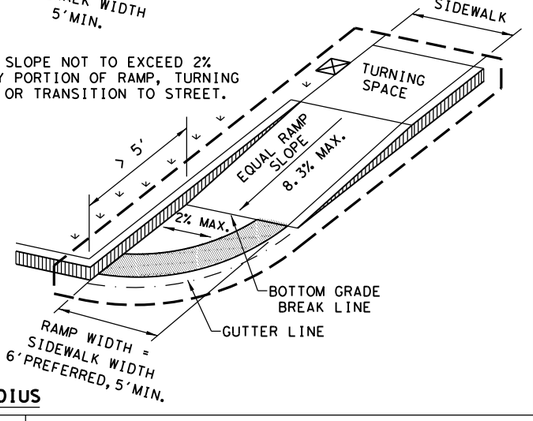


TYPE 10

(SIDEWALK ADJACENT TO CURB)

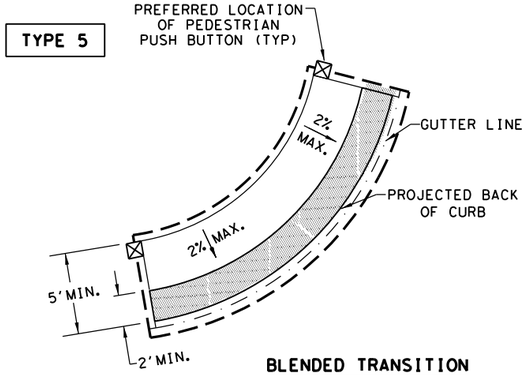


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

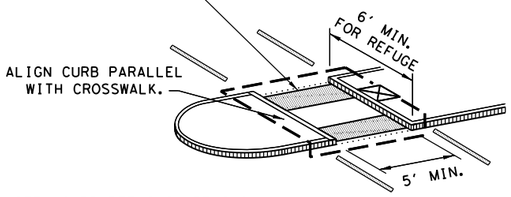
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

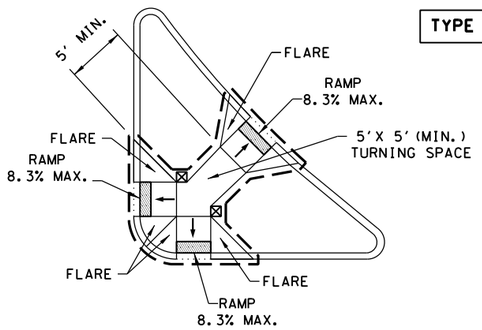
TYPE 21

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.



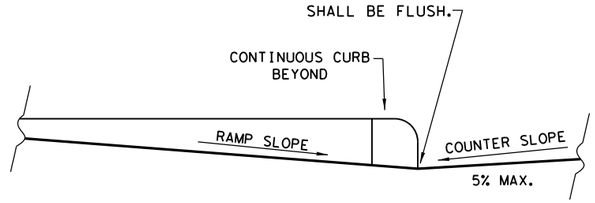
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

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

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	0923	06	095		(CS)
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY			SHEET NO.
	BWD	BROWN			51

DATE:
FILE:

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. 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

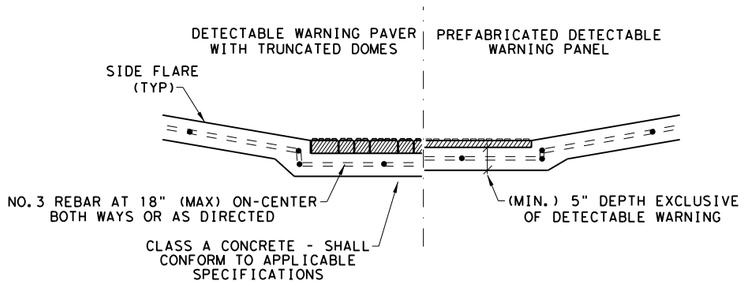
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material 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.

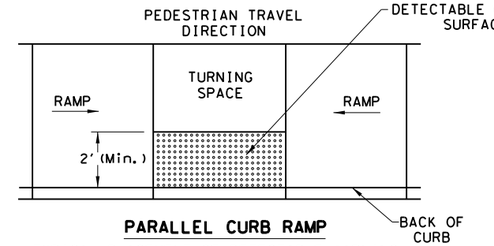
SIDEWALKS

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.

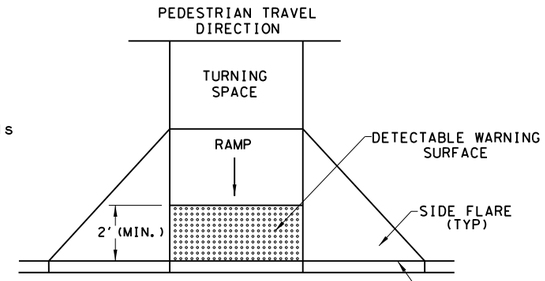


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

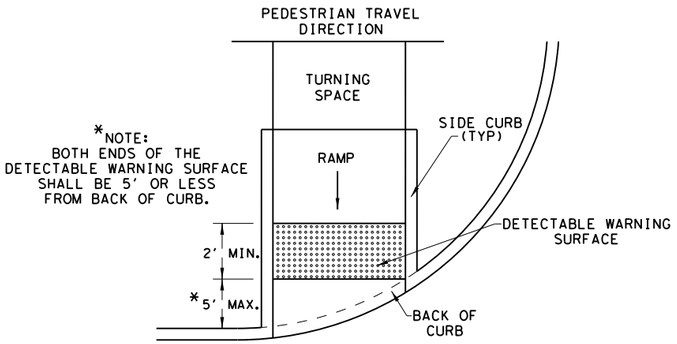
DETECTABLE WARNING SURFACE DETAILS



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

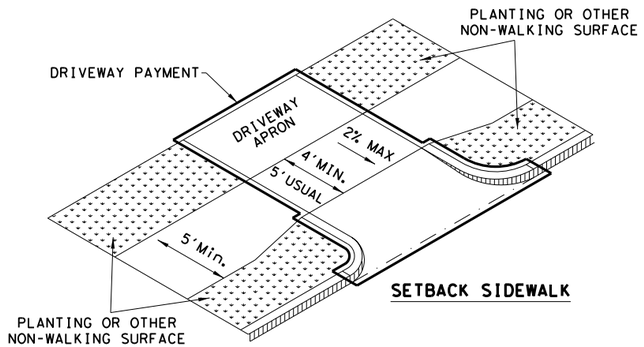
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

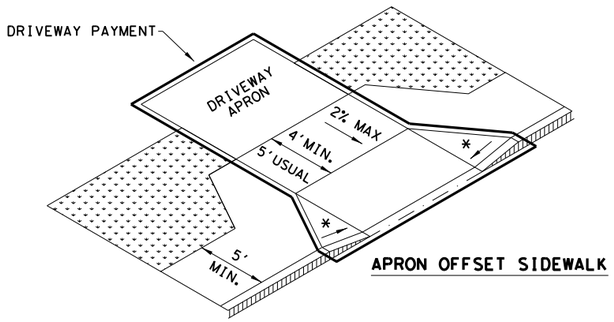
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0923	06	095		(CS)
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	BWD	BROWN			52

DATE:
FILE:

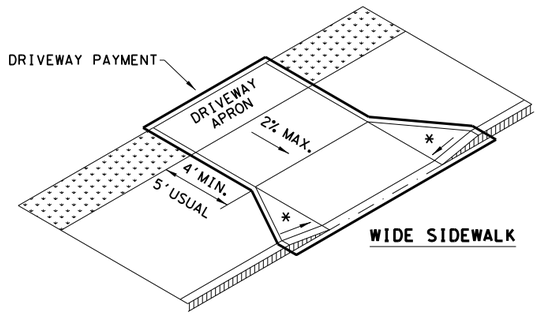
SIDEWALK TREATMENT AT DRIVEWAYS



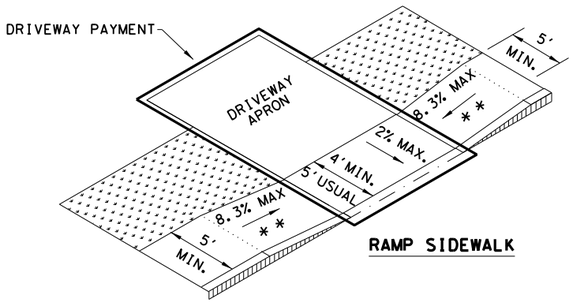
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

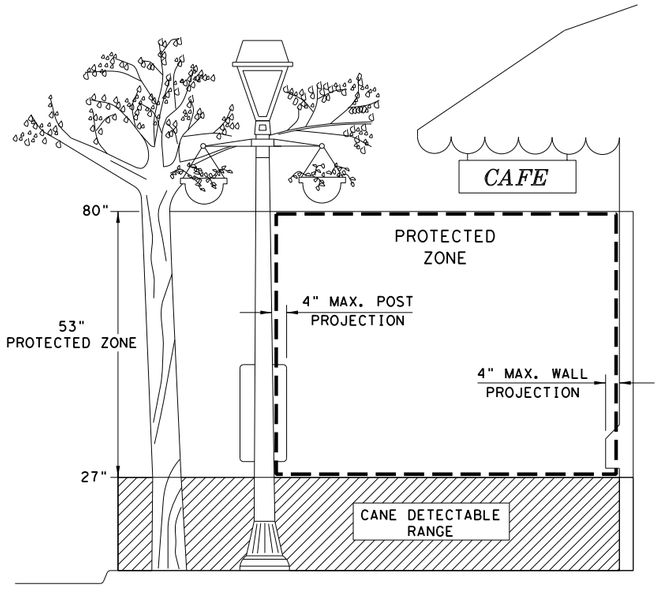


RAMP SIDEWALK

NOTES:

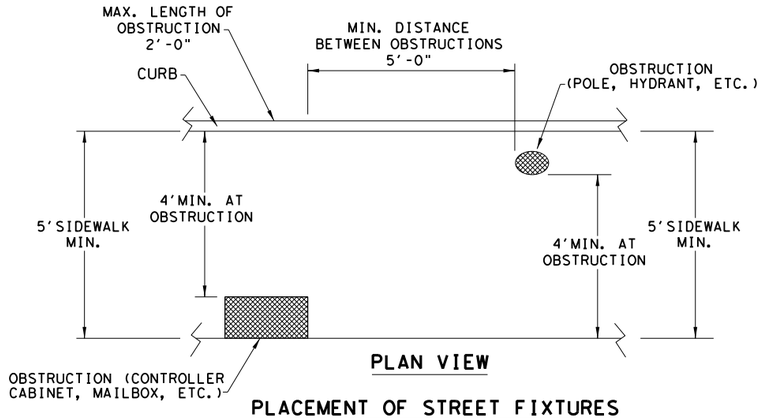
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



PROTECTED ZONE

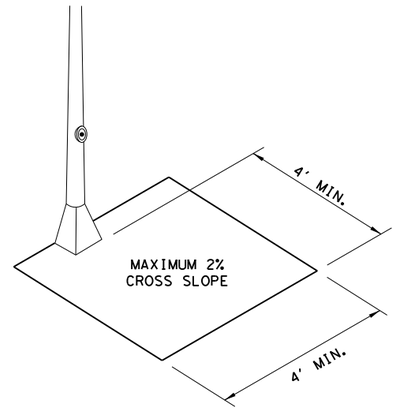
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



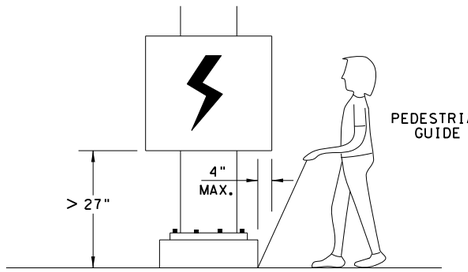
PLAN VIEW

PLACEMENT OF STREET FIXTURES

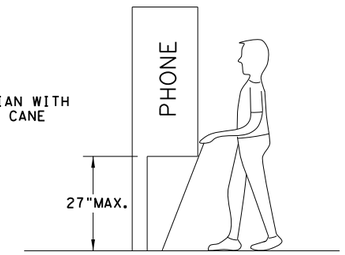
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

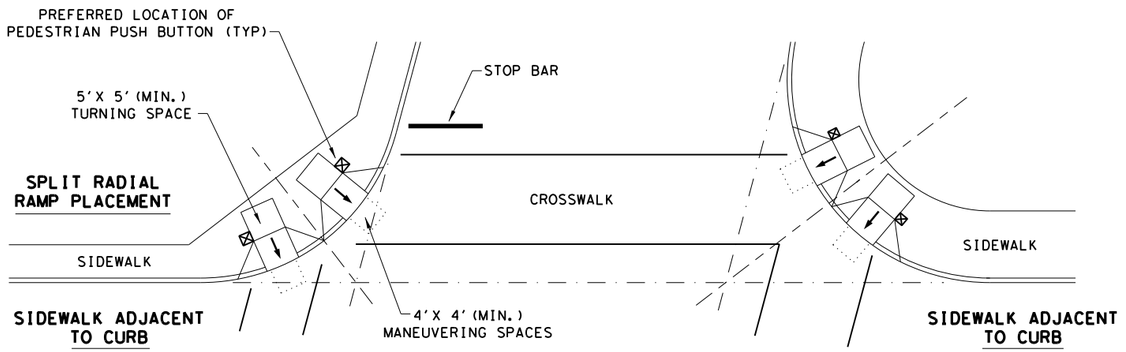
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

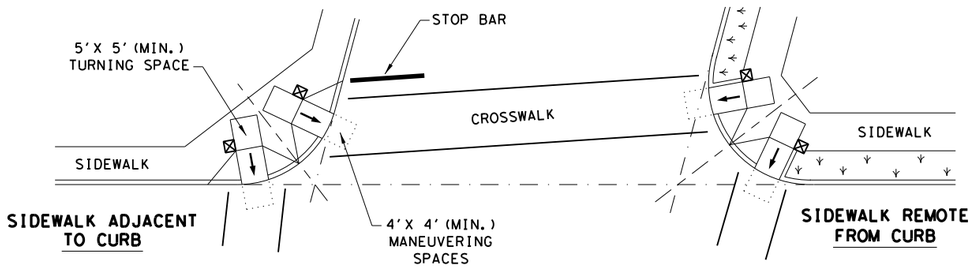
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0923	06	095		(CS)
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST		COUNTY		SHEET NO.
	BWD		BROWN		53

DATE:
FILE:

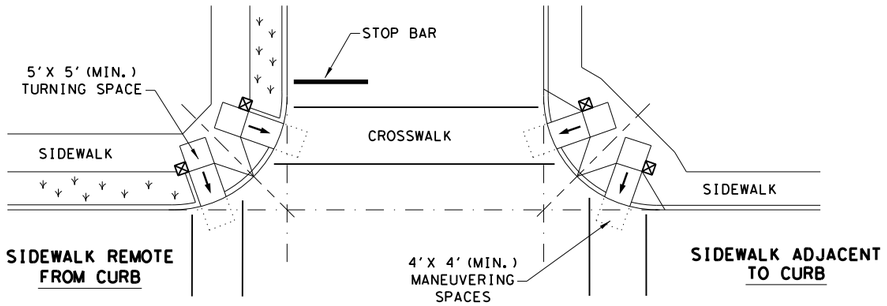
TYPICAL CROSSING LAYOUTS
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



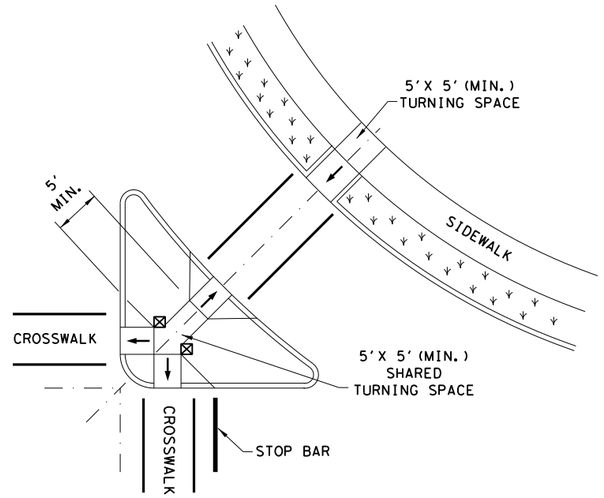
SKEWED INTERSECTION WITH "LARGE" RADIUS



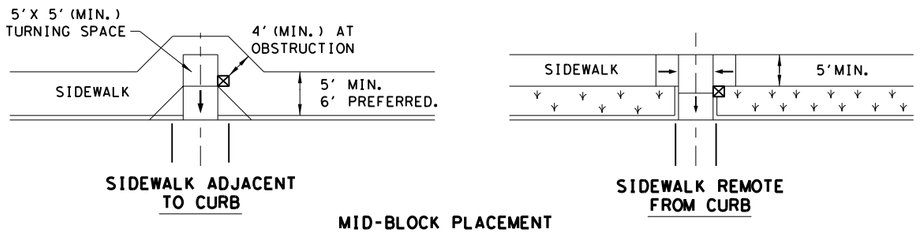
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ☒

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

SHEET 4 OF 4

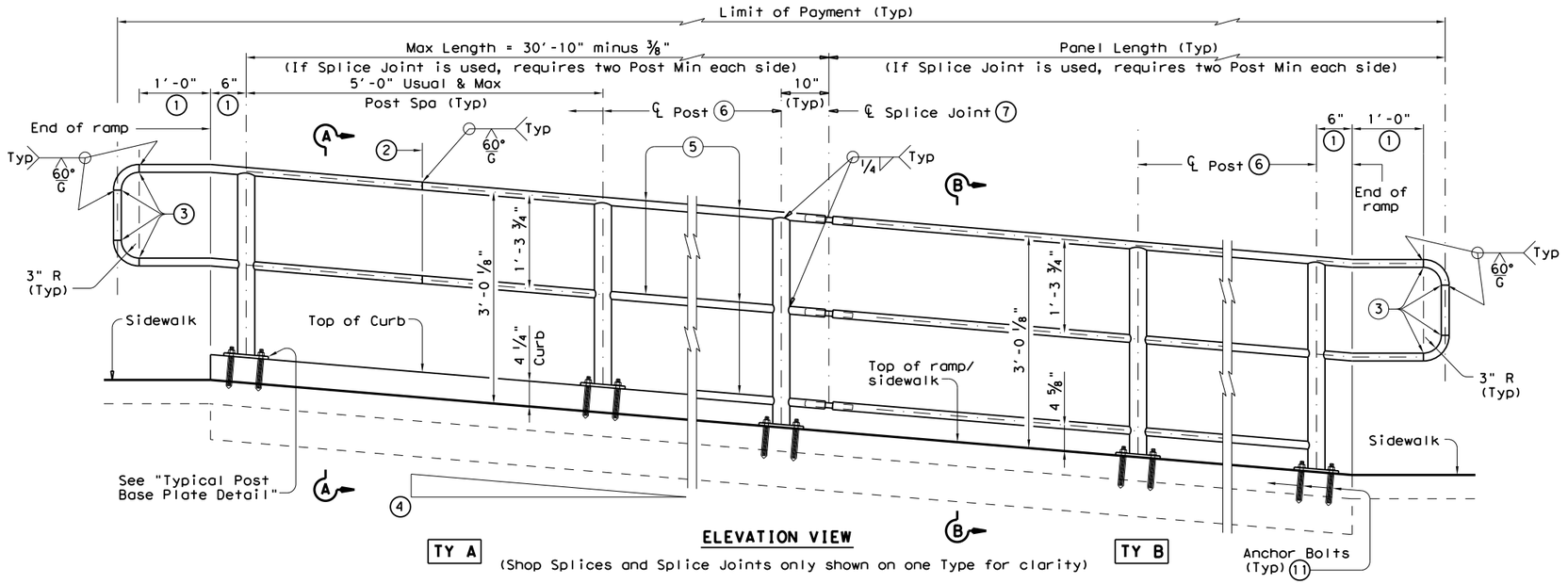
Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

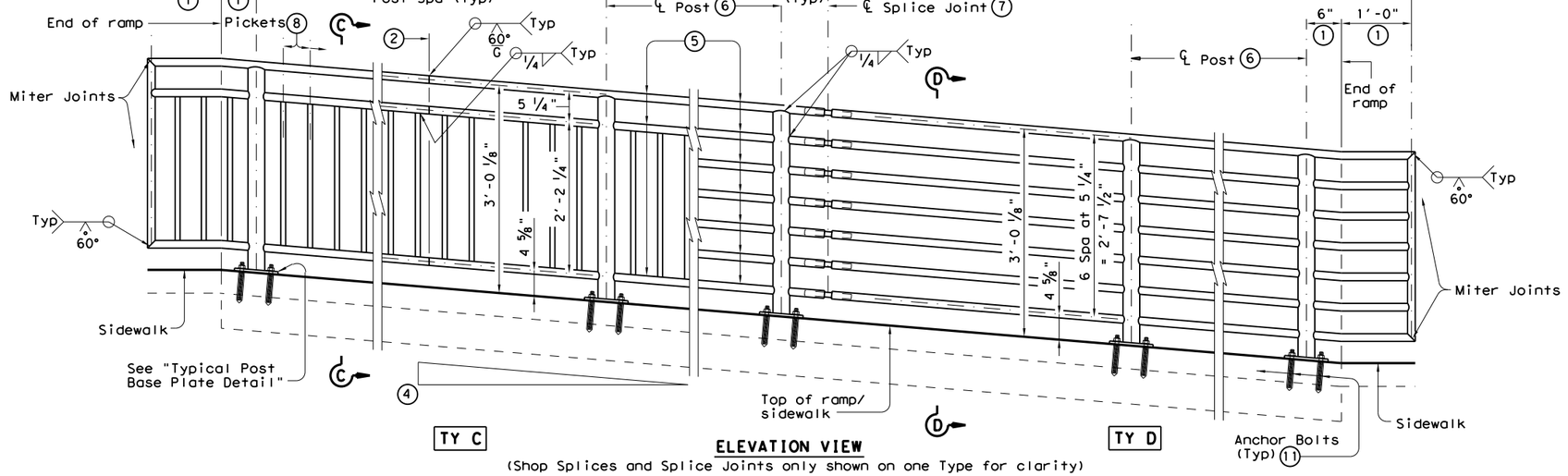
FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.
	BWD	BROWN		54

DATE:
FILE:



ELEVATION VIEW

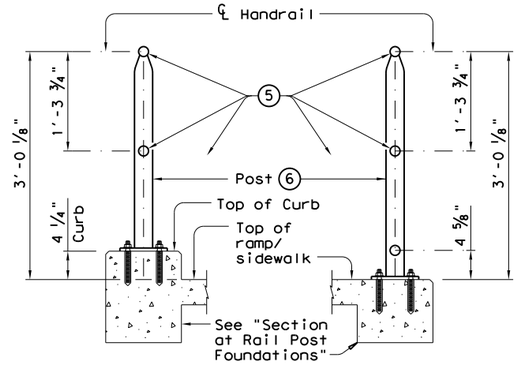
(Shop Splices and Splice Joints only shown on one Type for clarity)



ELEVATION VIEW

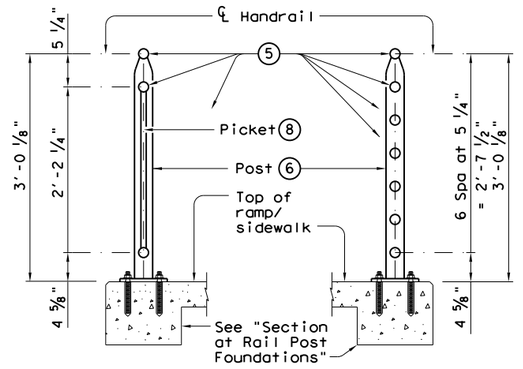
(Shop Splices and Splice Joints only shown on one Type for clarity)

RECOMMENDED USAGE ⑨⑩	
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.

SHEET 1 OF 3

Texas Department of Transportation

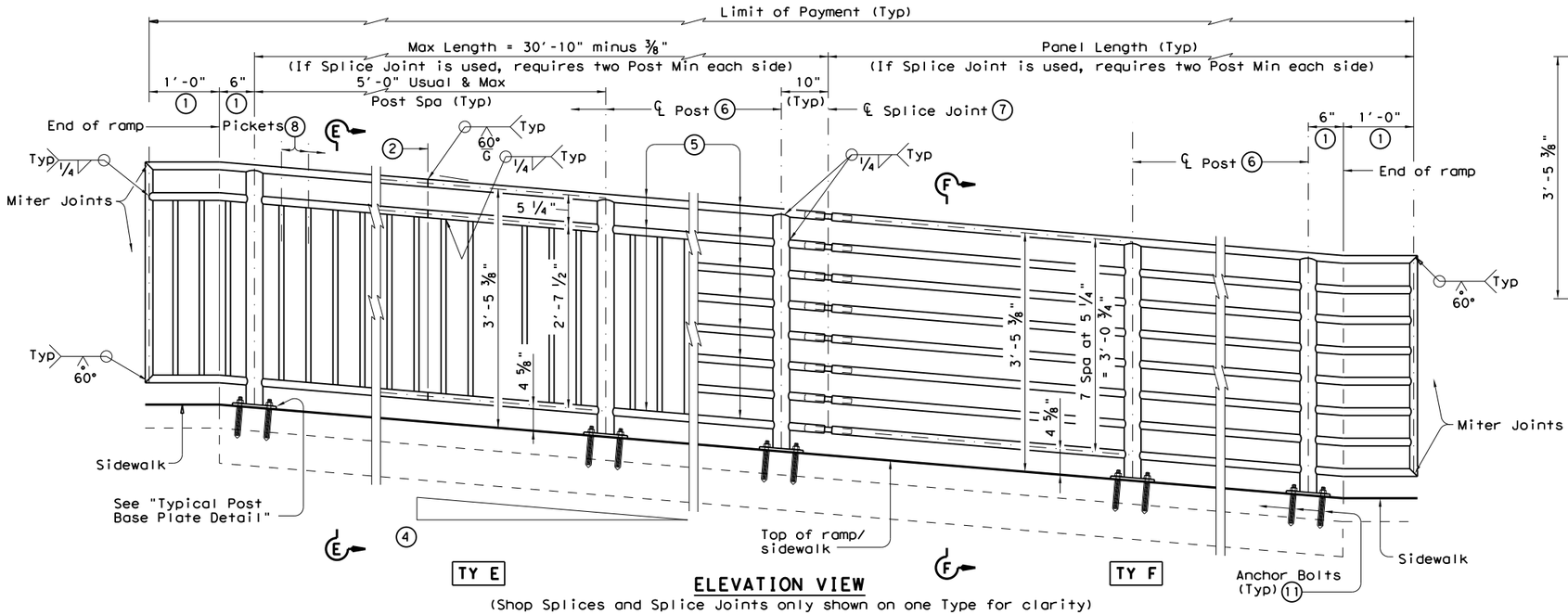
Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

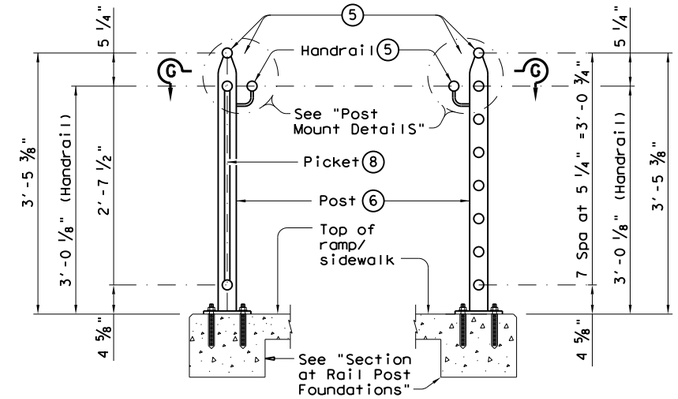
FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT Decmeber 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED MAY, 2013 (VP)	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		55

DATE:
FILE:



ELEVATION VIEW

(Shop Splices and Splice Joints only shown on one Type for clarity)

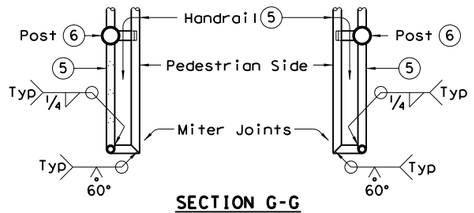


SECTION E-E

(Showing Handrail **TY E**)

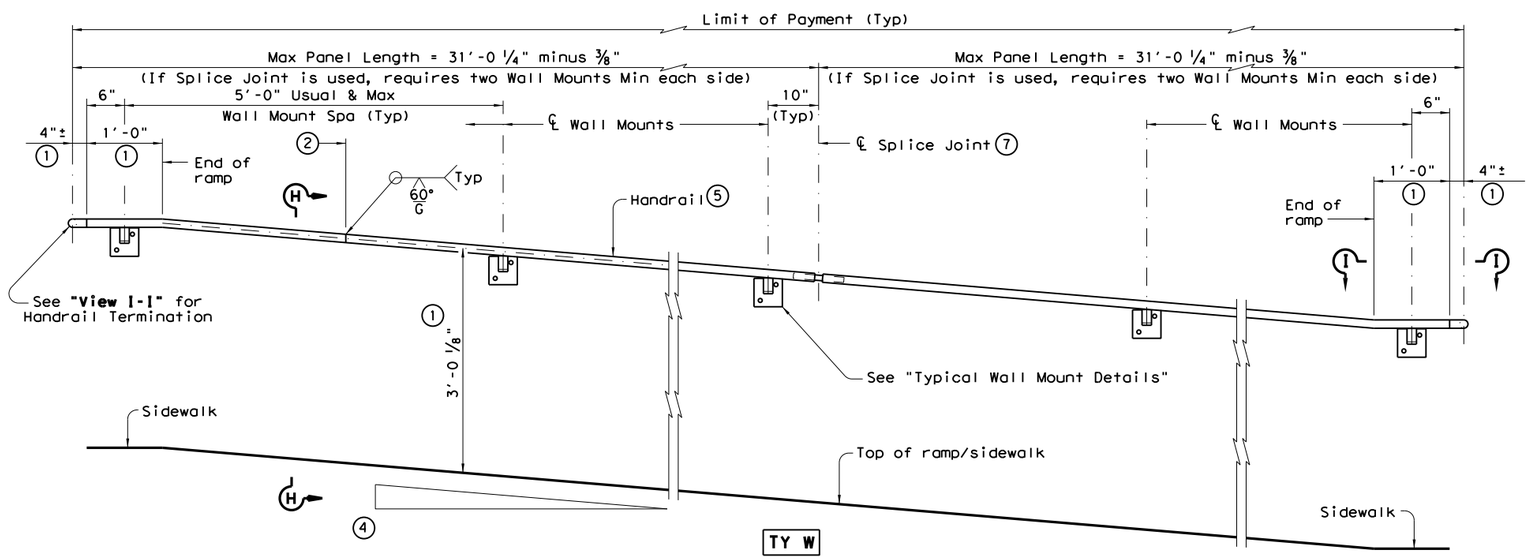
SECTION F-F

(Showing Handrail **TY F**)

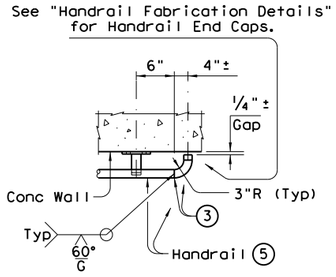


SECTION G-G

(Showing Handrail Termination)

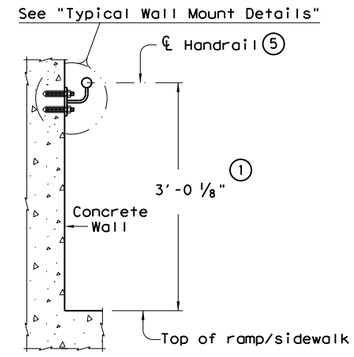


ELEVATION VIEW



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. ℄ ⅝" Dia. Round Bar equal spacing at 4 ½" Max. Plumb all pickets.
11. See "General Notes" for anchor bolt information.

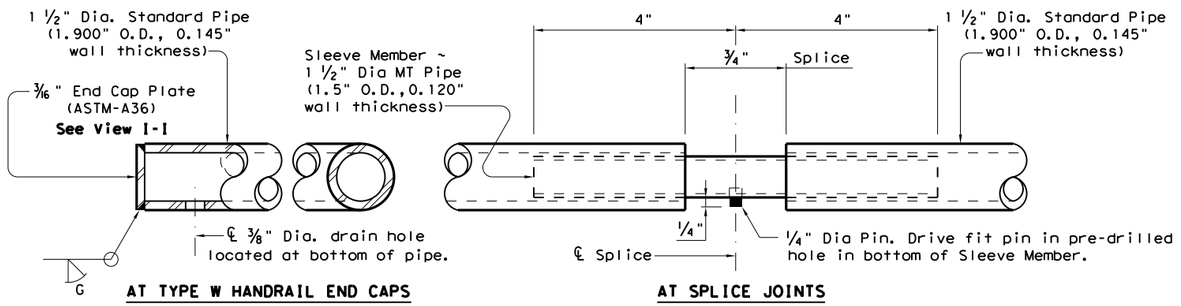
Texas Department of Transportation — Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

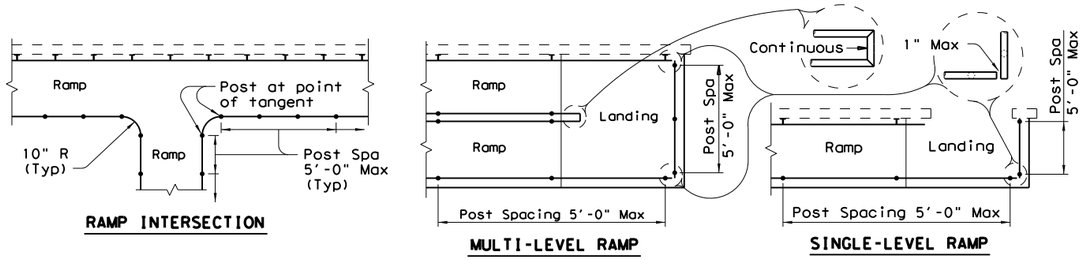
PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED MAY, 2013 (VP)	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		56

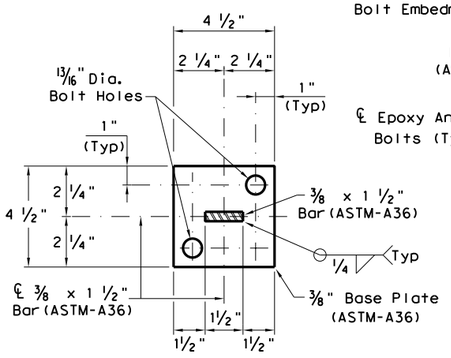
DATE:
FILE:

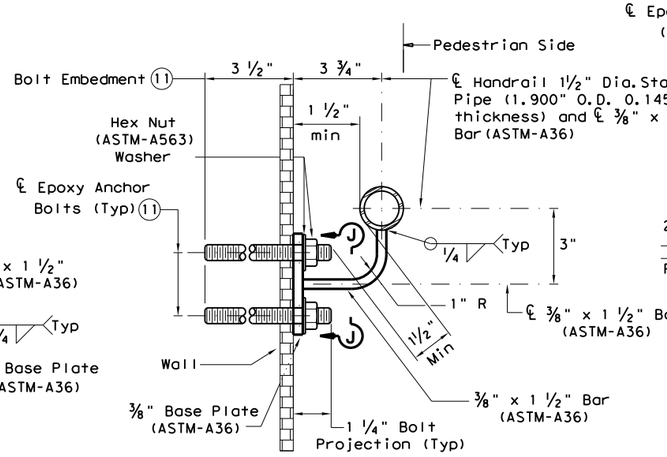


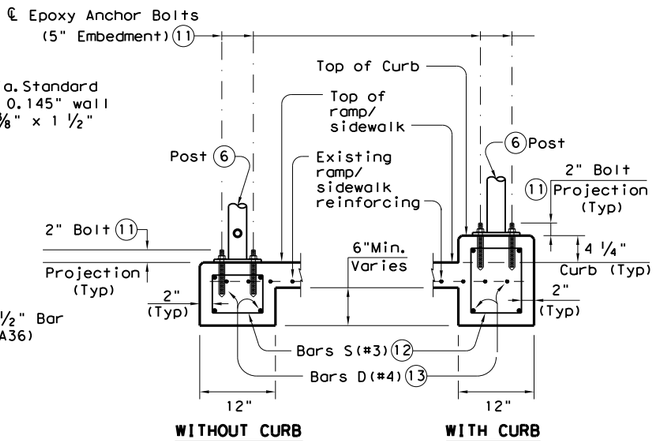
HANDRAIL FABRICATION DETAILS



PLAN SHOWING RAIL AT RAMP CONDITIONS







SECTION AT RAIL POST FOUNDATIONS

TYPICAL WALL MOUNT DETAILS

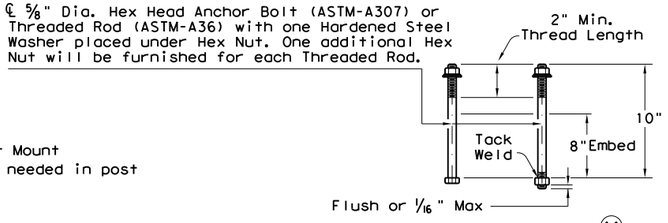
(5) 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp/sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.

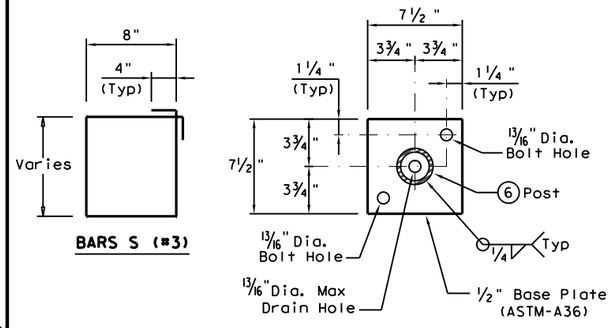
(6) 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). Plumb all posts. See "Post Mount Detail" for crimping and trimming post to fit the diamenter of top rail. Provide holes as needed in post for galvanizing drainage and venting.

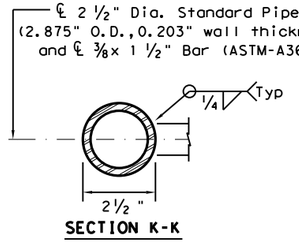
(11) See "General Notes" for anchor bolt information.

(12) Bars S(#3) spaced at 12" Max (Spaced 3" from outside edge of overall length of Ramp/Sidewalk).

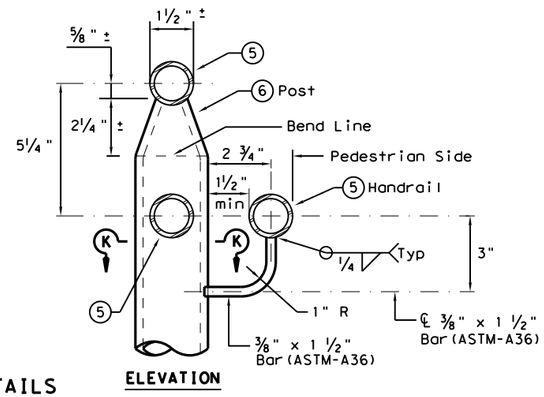
(13) Provide 1 ½" end cover to Bars D(#4) from outside edge of overall length of Ramp/Sidewalk.







POST MOUNT DETAILS



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 ⅝" Dia. ASTM A36 threaded rods with one hex nut and one hardened steel washer at each bolt. ⅝" 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 ⅝" 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 ⅛" by grinding.

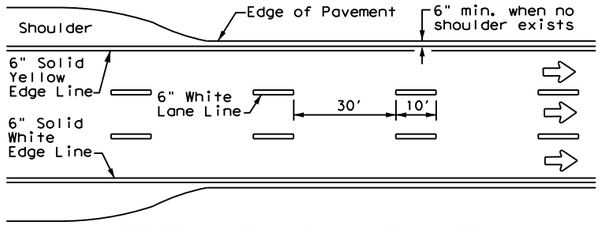
Texas Department of Transportation

Design Division Standard

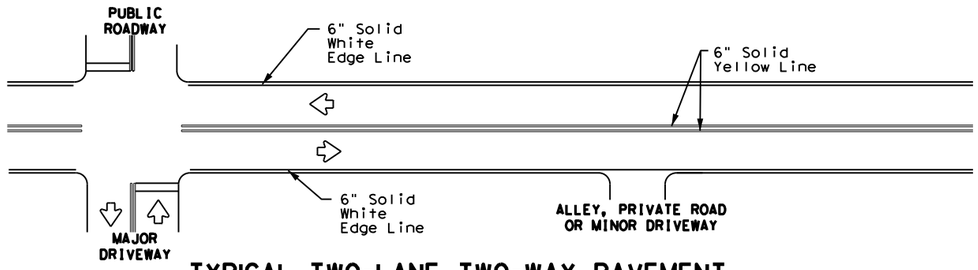
PEDESTRIAN HANDRAIL DETAILS

PRD-13

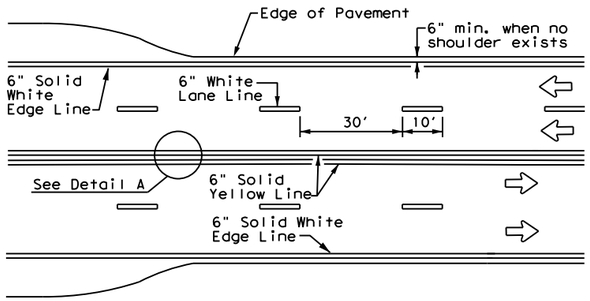
FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
REVISED MAY, 2013 (VP)	DIST	COUNTY		SHEET NO.
	BWD	BROWN		57

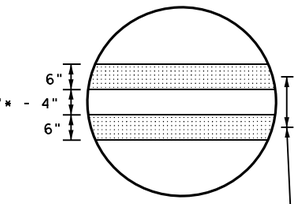


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

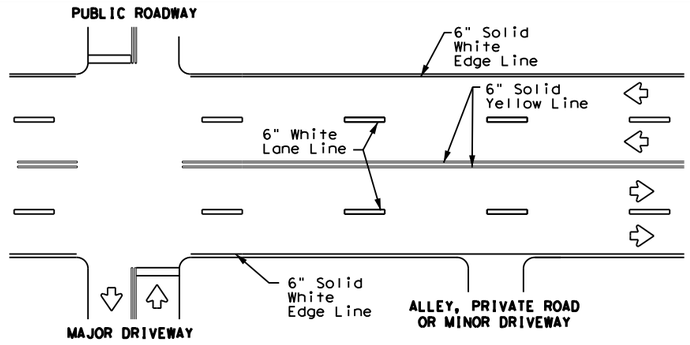




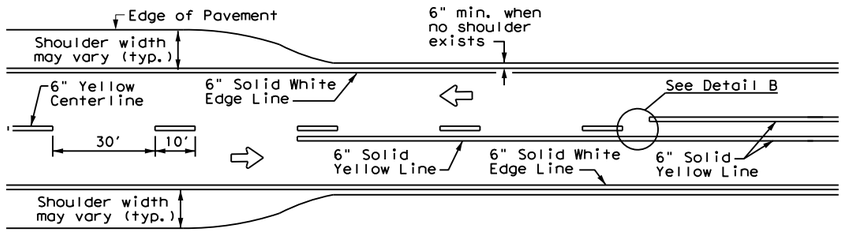
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

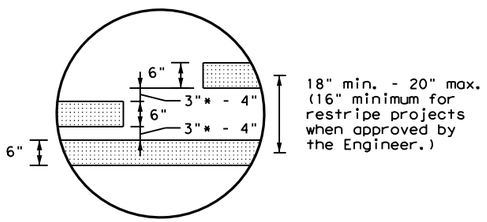
** 8" minimum for restripe projects when approved by the Engineer.



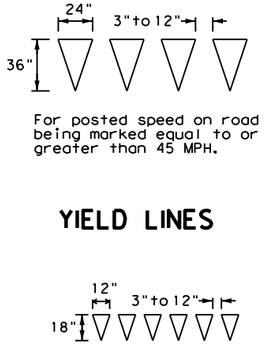
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

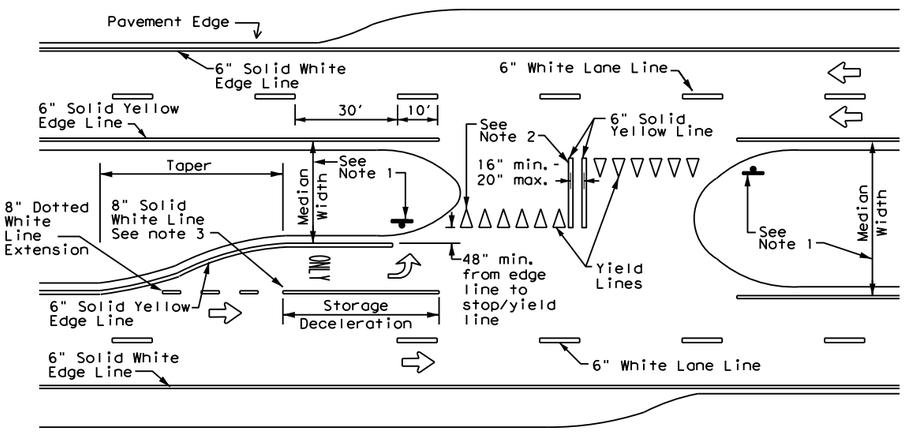


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



* 2" minimum for restripe projects when approved by the Engineer.





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

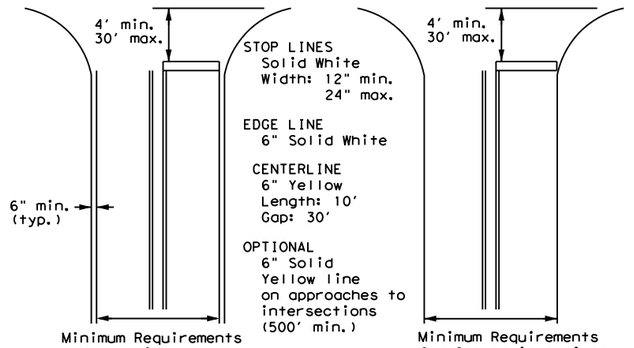
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling 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
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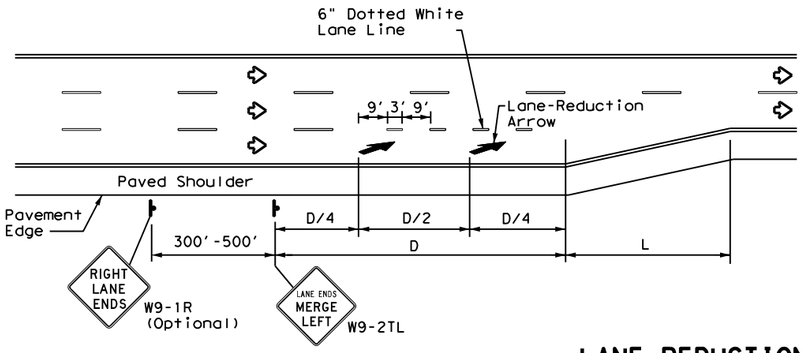
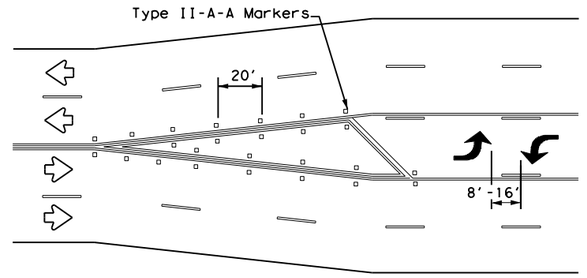


LANE REDUCTION

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.

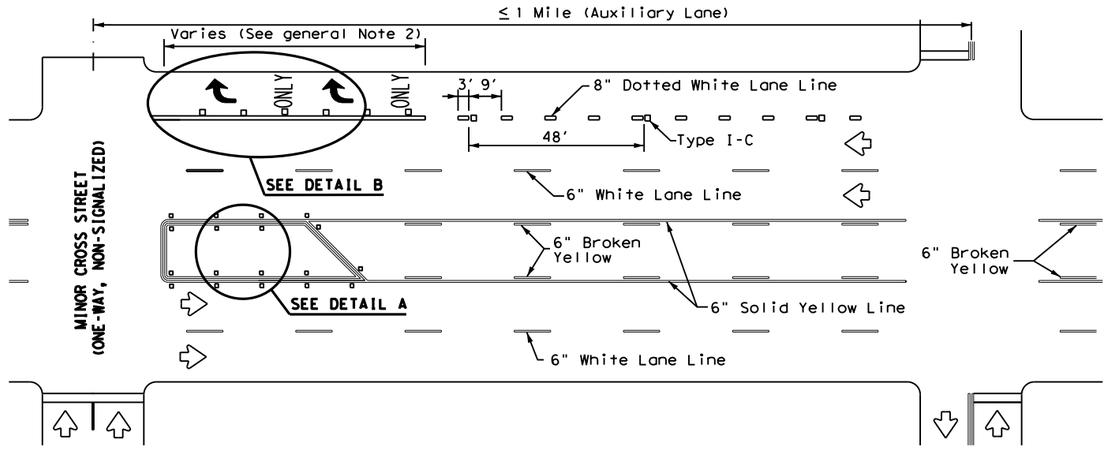
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

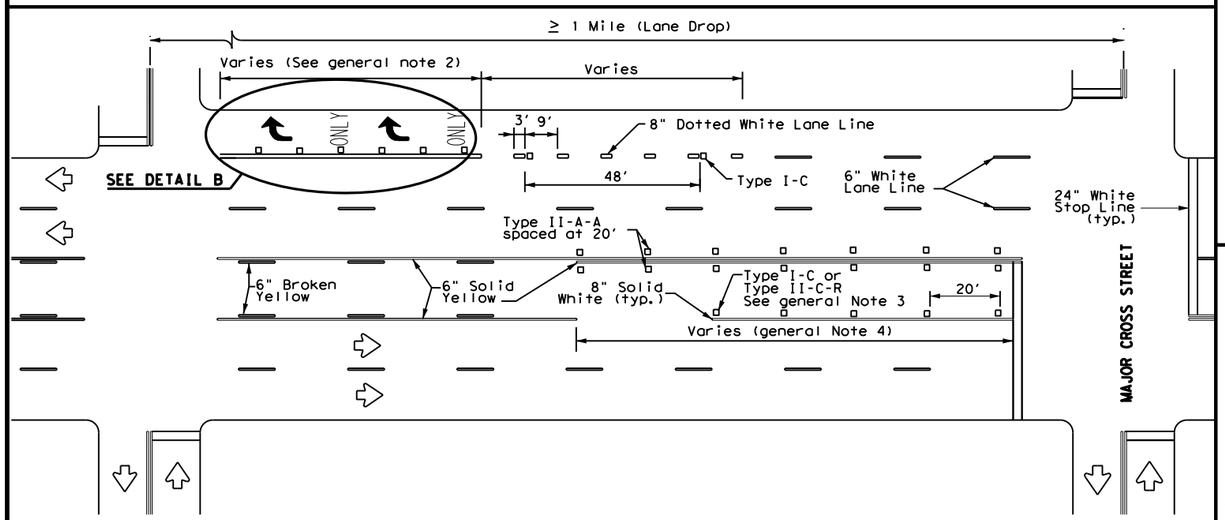
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn 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

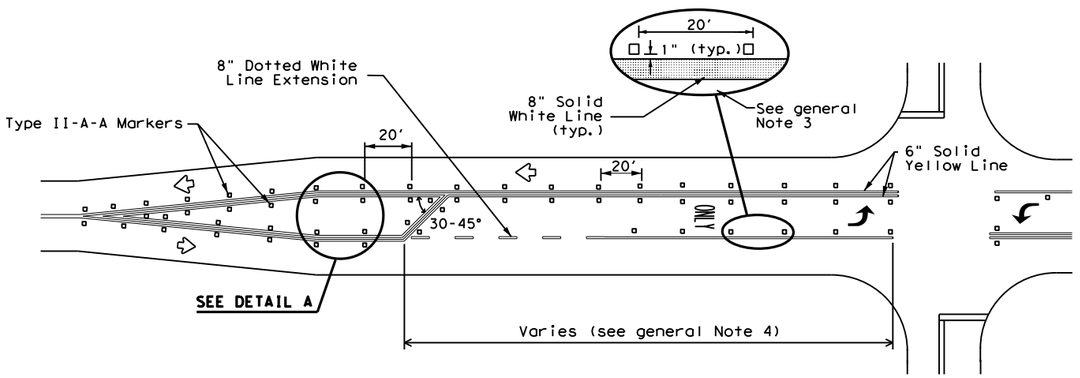
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



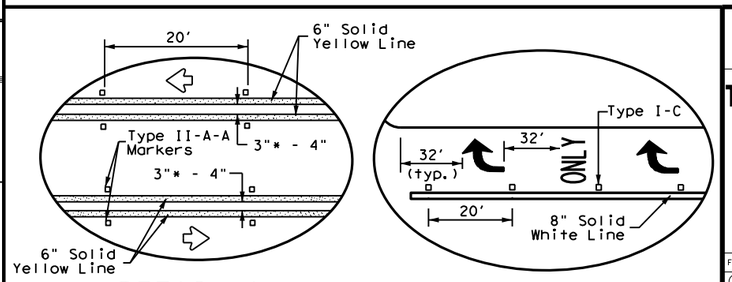
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		59

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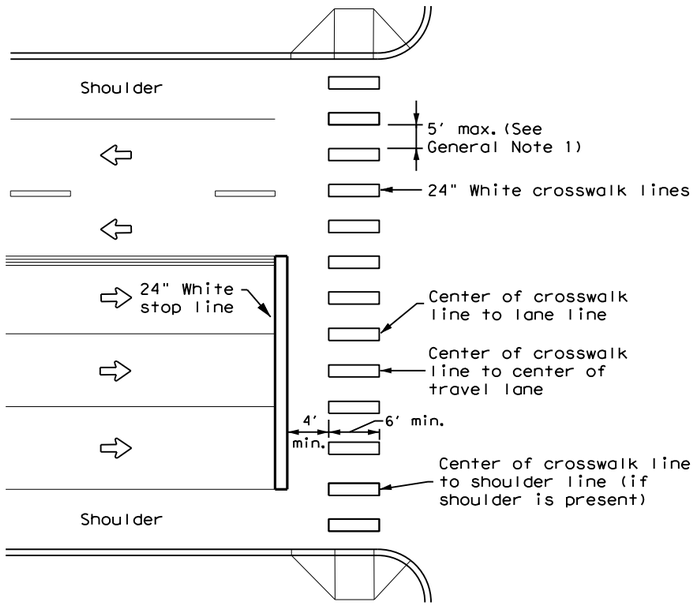


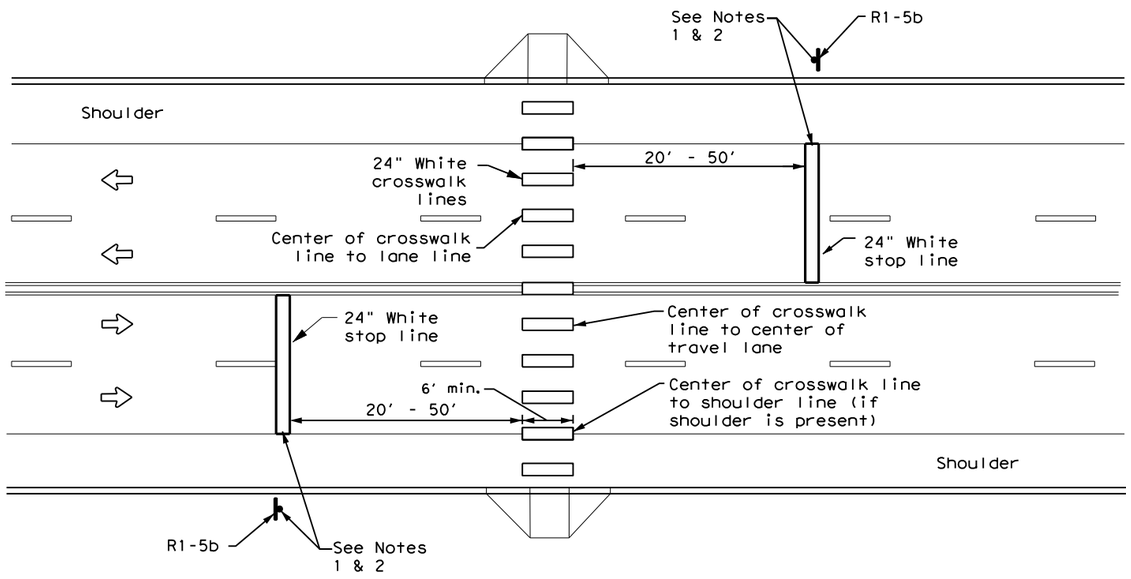
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

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
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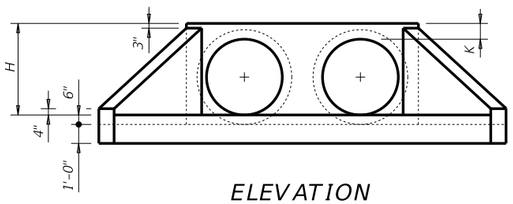
6-20	DIST	COUNTY		SHEET NO.
6-22	BWD	BROWN		60
12-22				
22D				

DATE:
FILE:

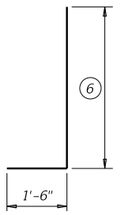
TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

Slope	Dia of Pipe (D)	Values for One Pipe						Values to be Added for Each Addt'l Pipe		
		W	X	Y	L	Reinf (Lbs)	Conc (CY) (1)	X and W	Reinf (Lbs)	Conc (CY) (1)
2:1	12"	4' - 7 1/2"	2' - 6"	2' - 10"	3' - 3 1/4"	88	0.6	1' - 9"	20	0.2
	15"	5' - 5 3/4"	2' - 9 1/2"	3' - 4"	3' - 10 1/4"	103	0.7	2' - 2"	24	0.3
	18"	6' - 4 1/4"	3' - 1"	3' - 10"	4' - 5"	124	0.9	2' - 8"	32	0.3
	21"	7' - 2 3/4"	3' - 4 1/2"	4' - 4"	5' - 0"	143	1.1	3' - 1"	43	0.4
	24"	8' - 2 1/2"	3' - 9 1/2"	4' - 10"	5' - 7"	164	1.3	3' - 7"	50	0.5
	27"	9' - 1"	4' - 1"	5' - 4"	6' - 2"	179	1.5	3' - 11"	56	0.6
	30"	9' - 11 1/2"	4' - 4 1/2"	5' - 10"	6' - 8 3/4"	203	1.7	4' - 4"	65	0.8
	33"	10' - 10"	4' - 8"	6' - 4"	7' - 3 3/4"	224	2.0	4' - 8"	71	0.9
	36"	11' - 8 1/4"	4' - 11 1/2"	6' - 10"	7' - 10 3/4"	249	2.2	5' - 1"	81	1.0
	42"	13' - 5 1/4"	5' - 6 1/2"	7' - 10"	9' - 0 1/2"	298	2.8	5' - 10"	97	1.3
	48"	15' - 9"	6' - 1 1/2"	9' - 4"	10' - 9 1/4"	360	3.8	6' - 7"	117	1.7
	54"	17' - 5 3/4"	6' - 8 1/2"	10' - 4"	11' - 11 1/4"	427	4.5	7' - 6"	151	2.1
	60"	19' - 2 3/4"	7' - 3 1/2"	11' - 4"	13' - 1"	481	5.3	8' - 3"	174	2.5
	66"	20' - 11 1/2"	7' - 10 1/2"	12' - 4"	14' - 3"	544	6.2	8' - 9"	194	2.9
	72"	22' - 8 1/2"	8' - 5 1/2"	13' - 4"	15' - 4 3/4"	601	7.1	9' - 4"	213	3.3
3:1	12"	6' - 3"	2' - 6"	4' - 3"	4' - 11"	118	0.8	1' - 9"	22	0.2
	15"	7' - 5"	2' - 9 1/2"	5' - 0"	5' - 9 1/4"	137	1.1	2' - 2"	28	0.3
	18"	8' - 6 3/4"	3' - 1"	5' - 9"	6' - 7 3/4"	170	1.3	2' - 8"	37	0.5
	21"	9' - 8 3/4"	3' - 4 1/2"	6' - 6"	7' - 6"	195	1.6	3' - 1"	48	0.6
	24"	11' - 0"	3' - 9 1/2"	7' - 3"	8' - 4 1/2"	227	2.0	3' - 7"	58	0.7
	27"	12' - 2"	4' - 1"	8' - 0"	9' - 2 3/4"	251	2.3	3' - 11"	67	0.8
	30"	13' - 4"	4' - 4 1/2"	8' - 9"	10' - 1 1/4"	293	2.7	4' - 4"	77	1.0
	33"	14' - 5 3/4"	4' - 8"	9' - 6"	10' - 11 3/4"	318	3.1	4' - 8"	84	1.2
	36"	15' - 7 3/4"	4' - 11 1/2"	10' - 3"	11' - 10"	351	3.5	5' - 1"	96	1.4
	42"	17' - 11 1/2"	5' - 6 1/2"	11' - 9"	13' - 6 3/4"	432	4.5	5' - 10"	119	1.7
	48"	21' - 1 3/4"	6' - 1 1/2"	14' - 0"	16' - 2"	537	6.1	6' - 7"	146	2.3
	54"	23' - 5 1/2"	6' - 8 1/2"	15' - 6"	17' - 10 3/4"	630	7.3	7' - 6"	186	2.9
	60"	25' - 9 1/4"	7' - 3 1/2"	17' - 0"	19' - 7 1/2"	719	8.7	8' - 3"	219	3.4
	66"	28' - 1"	7' - 10 1/2"	18' - 6"	21' - 4 1/4"	811	10.1	8' - 9"	242	3.9
	72"	30' - 4 3/4"	8' - 5 1/2"	20' - 0"	23' - 1 1/4"	924	11.7	9' - 4"	272	4.4
4:1	12"	7' - 10 3/4"	2' - 6"	5' - 8"	6' - 6 1/2"	148	1.1	1' - 9"	24	0.3
	15"	9' - 4"	2' - 9 1/2"	6' - 8"	7' - 8 1/2"	181	1.5	2' - 2"	32	0.4
	18"	10' - 9 1/2"	3' - 1"	7' - 8"	8' - 10 1/4"	221	1.9	2' - 8"	42	0.5
	21"	12' - 2 3/4"	3' - 4 1/2"	8' - 8"	10' - 0"	260	2.3	3' - 1"	57	0.7
	24"	13' - 9 1/2"	3' - 9 1/2"	9' - 8"	11' - 2"	301	2.8	3' - 7"	67	0.9
	27"	15' - 3"	4' - 1"	10' - 8"	12' - 3 3/4"	334	3.3	3' - 11"	77	1.0
	30"	16' - 8 1/4"	4' - 4 1/2"	11' - 8"	13' - 5 3/4"	385	3.8	4' - 4"	89	1.3
	33"	18' - 1 3/4"	4' - 8"	12' - 8"	14' - 7 1/2"	425	4.5	4' - 8"	101	1.4
	36"	19' - 7"	4' - 11 1/2"	13' - 8"	15' - 9 1/4"	472	5.1	5' - 1"	115	1.7
	42"	22' - 5 3/4"	5' - 6 1/2"	15' - 8"	18' - 1"	583	6.5	5' - 10"	141	2.1
	48"	26' - 6 1/4"	6' - 1 1/2"	18' - 8"	21' - 6 3/4"	730	8.9	6' - 7"	175	2.8
	54"	29' - 5"	6' - 8 1/2"	20' - 8"	23' - 10 1/4"	875	10.7	7' - 6"	226	3.6
	60"	32' - 3 3/4"	7' - 3 1/2"	22' - 8"	26' - 2"	996	12.7	8' - 3"	264	4.3
	66"	35' - 2 1/2"	7' - 10 1/2"	24' - 8"	28' - 5 3/4"	1,140	14.9	8' - 9"	300	4.9
	72"	38' - 1 1/4"	8' - 5 1/2"	26' - 8"	30' - 9 1/2"	1,297	17.3	9' - 4"	334	5.6
6:1	12"	11' - 2"	2' - 6"	8' - 6"	9' - 9 3/4"	224	1.9	1' - 9"	28	0.4
	15"	13' - 2 1/4"	2' - 9 1/2"	10' - 0"	11' - 6 1/2"	268	2.5	2' - 2"	37	0.5
	18"	15' - 2 1/2"	3' - 1"	11' - 6"	13' - 3 1/4"	330	3.2	2' - 8"	50	0.7
	21"	17' - 2 3/4"	3' - 4 1/2"	13' - 0"	15' - 0 1/4"	387	3.9	3' - 1"	69	0.9
	24"	19' - 4 1/2"	3' - 9 1/2"	14' - 6"	16' - 9"	453	4.8	3' - 7"	80	1.2
	27"	21' - 4 3/4"	4' - 1"	16' - 0"	18' - 5 3/4"	512	5.7	3' - 11"	96	1.4
	30"	23' - 5 1/4"	4' - 4 1/2"	17' - 6"	20' - 2 1/2"	593	6.7	4' - 4"	110	1.7
	33"	25' - 5 1/2"	4' - 8"	19' - 0"	21' - 11 1/4"	675	7.8	4' - 8"	127	2.0
	36"	27' - 5 3/4"	4' - 11 1/2"	20' - 6"	23' - 8"	735	9.0	5' - 1"	144	2.3
	42"	31' - 6 1/4"	5' - 6 1/2"	23' - 6"	27' - 1 1/2"	922	11.5	5' - 10"	179	3.0
	48"	37' - 3 1/2"	6' - 1 1/2"	28' - 0"	32' - 4"	1,191	15.9	6' - 7"	231	4.0
	54"	41' - 4 1/4"	6' - 8 1/2"	31' - 0"	35' - 9 1/2"	1,424	19.2	7' - 6"	300	5.0
	60"	45' - 4 3/4"	7' - 3 1/2"	34' - 0"	39' - 3"	1,631	22.9	8' - 3"	353	6.0

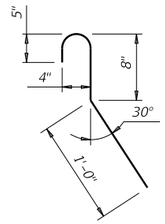


ELEVATION

(Showing dimensions.)

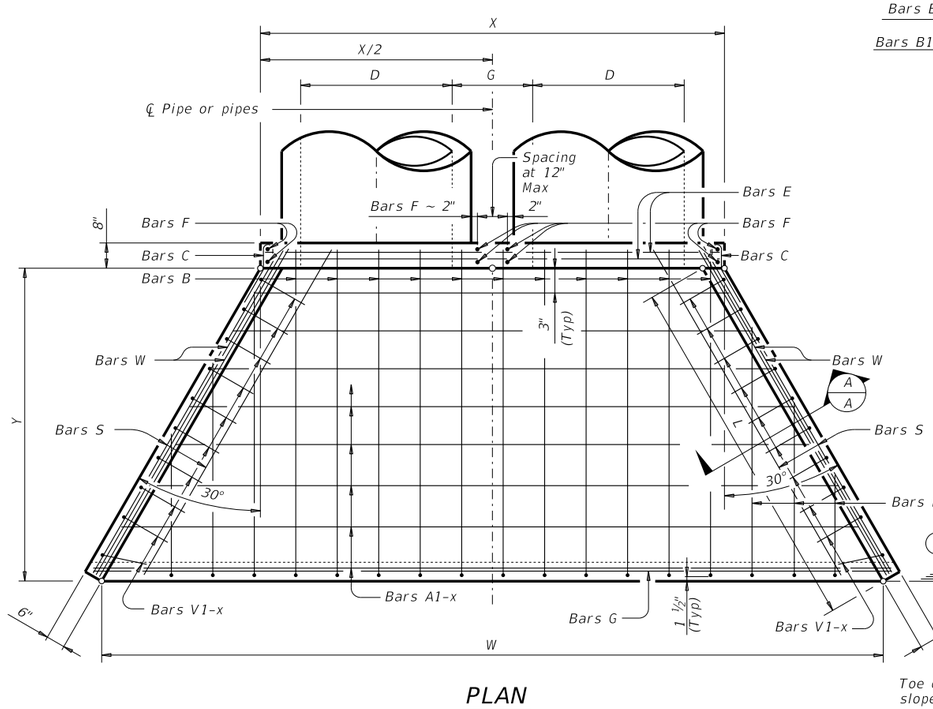


BARS V

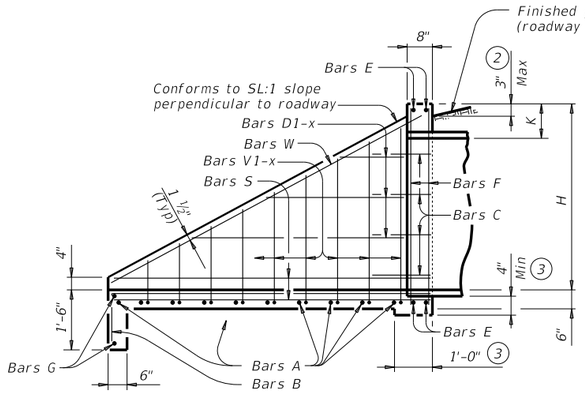


BARS CL

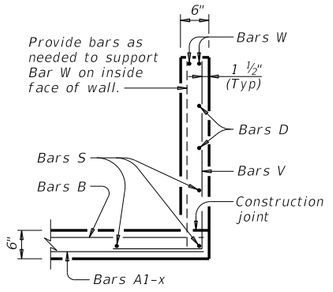
(Length = 2'-5")



PLAN



TYPICAL WING ELEVATION



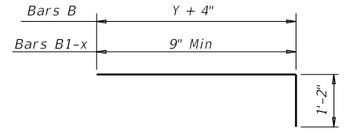
SECTION A-A

TABLE OF (5) REINFORCING STEEL

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

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (4)	H
12"	0' - 9"	1' - 0"	2' - 0"
15"	0' - 11"	1' - 0"	2' - 3"
18"	1' - 2"	1' - 0"	2' - 6"
21"	1' - 4"	1' - 0"	2' - 9"
24"	1' - 7"	1' - 0"	3' - 0"
27"	1' - 8"	1' - 0"	3' - 3"
30"	1' - 10"	1' - 0"	3' - 6"
33"	1' - 11"	1' - 0"	3' - 9"
36"	2' - 1"	1' - 0"	4' - 0"
42"	2' - 4"	1' - 0"	4' - 6"
48"	2' - 7"	1' - 3"	5' - 3"
54"	3' - 0"	1' - 3"	5' - 9"
60"	3' - 3"	1' - 3"	6' - 3"
66"	3' - 3"	1' - 3"	6' - 9"
72"	3' - 4"	1' - 3"	7' - 3"



BARS B and B1-x

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

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

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

(4) Dimensions shown are usual and maximum.

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

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

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

(7) Lengths of wings based on SL:1 slope along this line.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

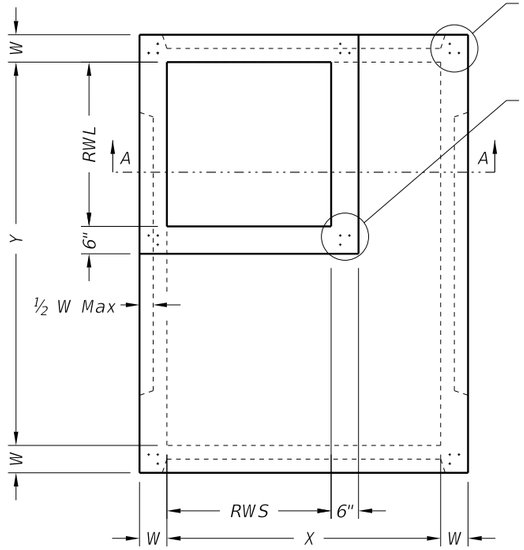
Texas Department of Transportation

Bridge Division Standard

CONCRETE HEADWALLS WITH FLARED WINGS FOR 0° SKEW PIPE CULVERTS

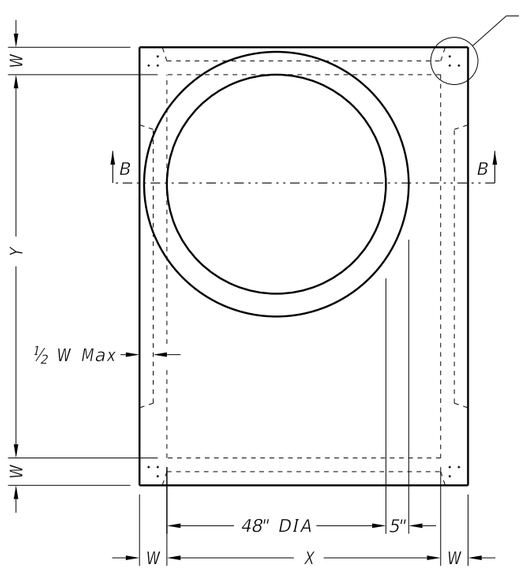
CH-FW-0

FILE: CD-CH-FW0-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		61



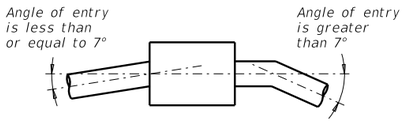
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



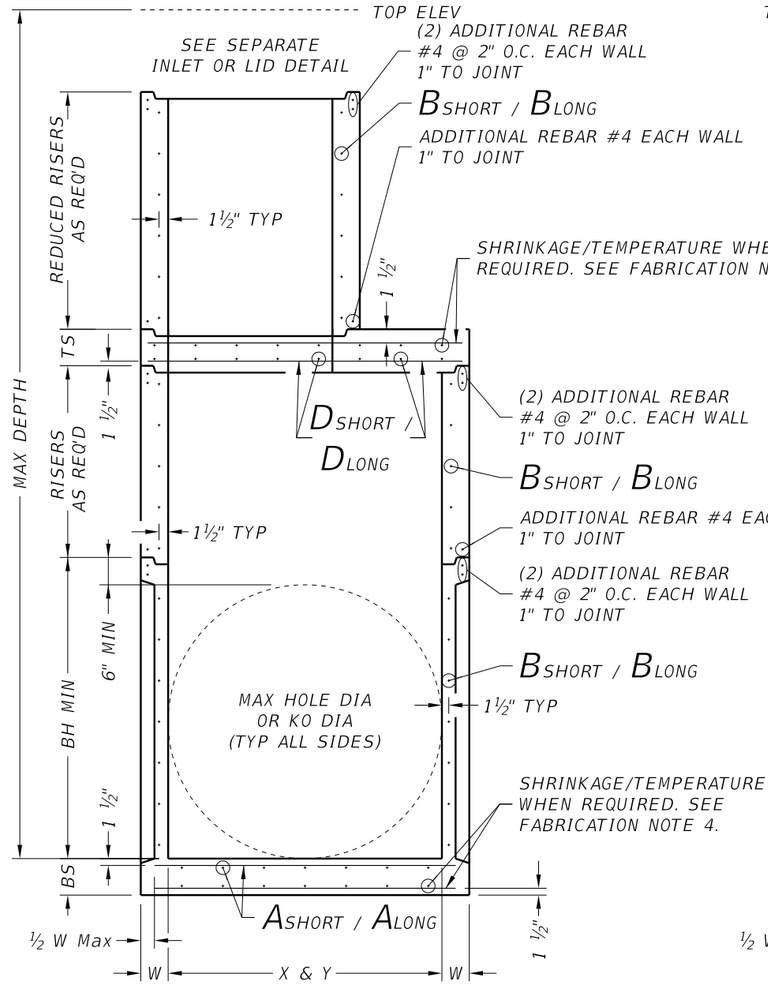
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



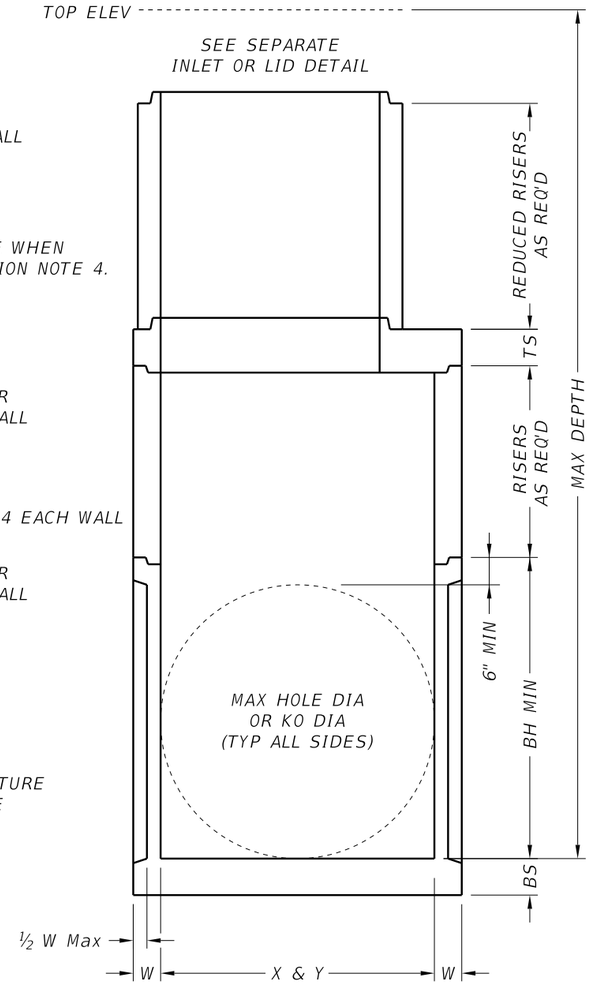
PIPE CONNECTION DETAIL

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



SECTION A-A

SQUARE REDUCED RISER OPTION



SECTION B-B

ROUND REDUCED RISER OPTION

FABRICATION NOTES:

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

INSTALLATION NOTES:

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

GENERAL NOTES:

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

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

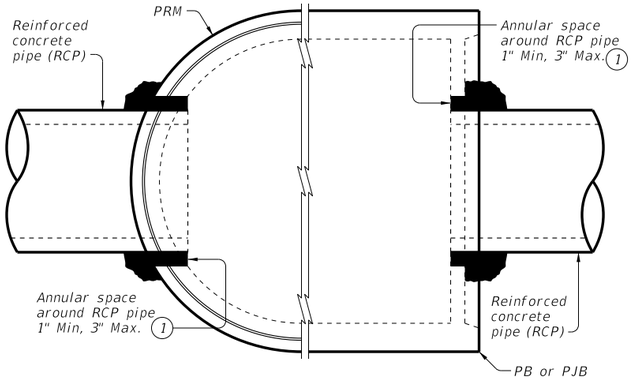
Bridge Division Standard

PRECAST BASE

PB

FILE: CD-PB-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		62

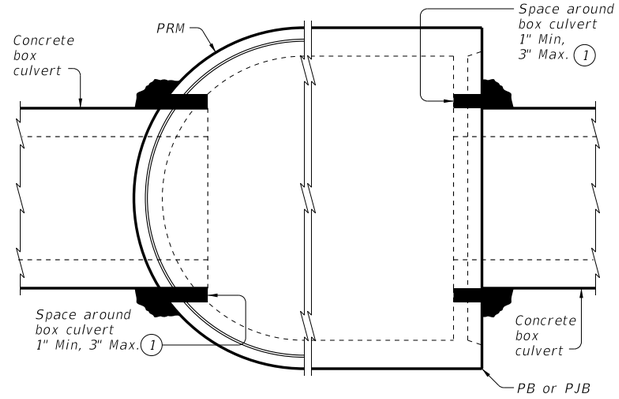
DATE:
FILE:



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

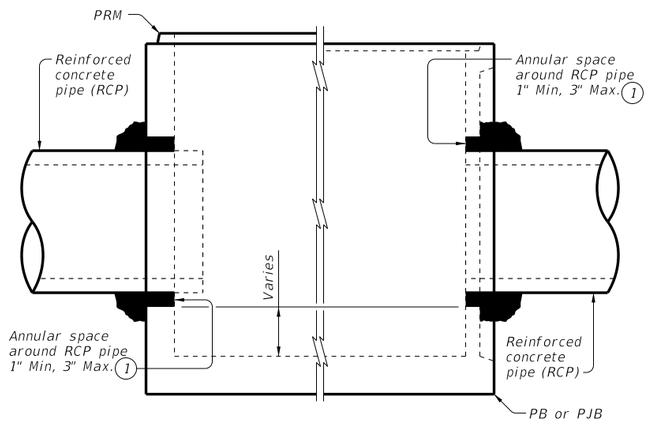
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

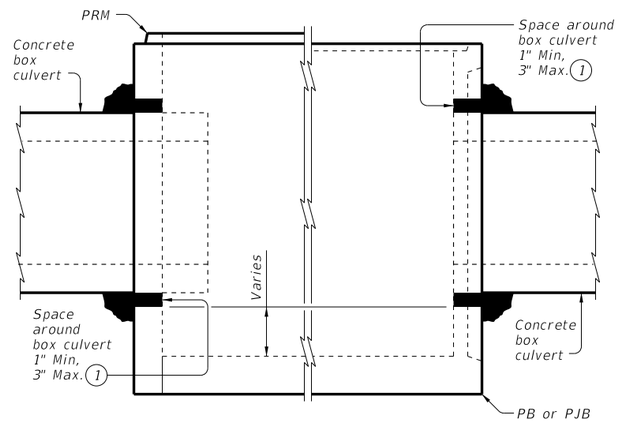
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

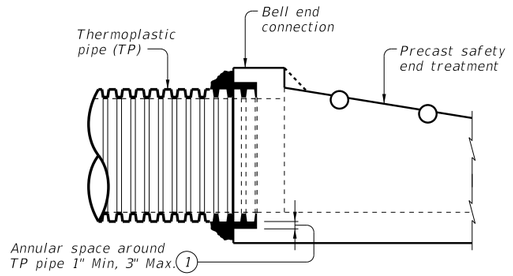
TYPICAL HALF ELEVATION



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF ELEVATION



TYPICAL PARTIAL ELEVATION OF PRECAST SAFETY END TREATMENTS

Showing square PSET for parallel drainage, cross drainage shown similar.

(1) Completely fill the void between the precast structure and the connecting pipe or box with cementitious grouts and mortars in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application."

CONSTRUCTION NOTES:

Do not grout rubber gasket joints without Manufacturer's recommendations.

Do not use bricks, masonry blocks, native stone, or similar materials in conjunction with grouted connections when filling void spaces around pipes or box culverts.

MATERIAL NOTES:

Provide grouted connections in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application."

GENERAL NOTES:

See applicable standards for notes and details not shown:

- Precast Base (PB)
- Precast Junction Box (PJB)
- Precast Round Manhole (PRM)
- Precast Safety End Treatments C/D Square (PSET-SC)
- Precast Safety End Treatments P/D Square (PSET-SP)

Provide Concrete Box Culverts in accordance with Item 462 "Concrete Box Culverts and Drains."

Provide Reinforced Concrete Pipe (RCP) in accordance with Item 464 "Reinforced Concrete Pipe."

Provide Thermoplastic Pipe (TP) in accordance with Special Specification Thermoplastic Pipe.

Payment for grouted connections is considered subsidiary to other bid Items.

Texas Department of Transportation

Bridge Division Standard

PIPE AND BOX GROUTED CONNECTIONS FOR PRECAST STRUCTURES

PBGC

FILE: CD-PBGC-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		63

DATE:
FILE:

DATE:
FILE:

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

** Unless otherwise indicated.

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

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

HL93 LOADING

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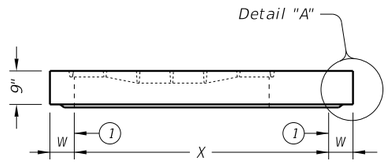
DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

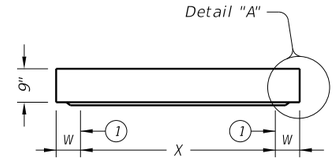
PDD

FILE: CD-PDD-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		64

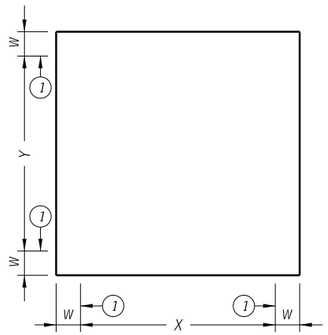
DATE:
FILE:



STYLE 'FG'



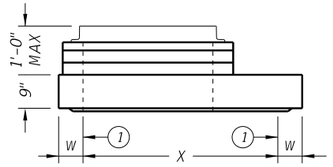
ELEVATION VIEW



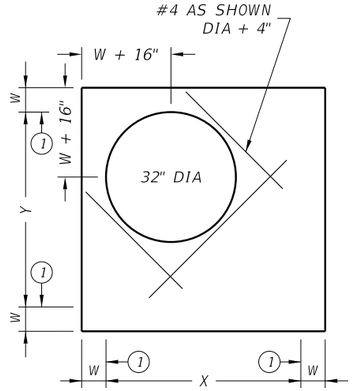
PLAN VIEW

NO OPENINGS

STYLE 'SL'



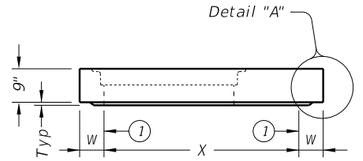
ELEVATION VIEW



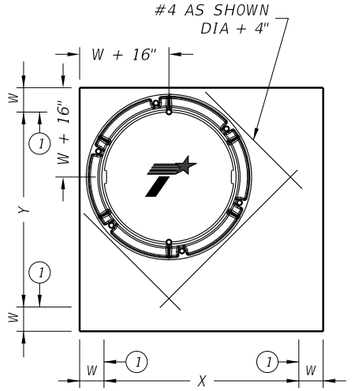
PLAN VIEW

SHIP LOOSE RING & COVER

STYLE 'RH'



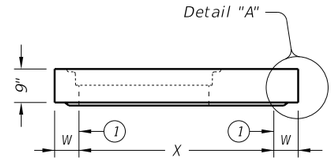
ELEVATION VIEW



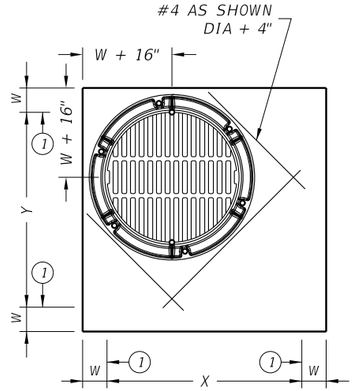
PLAN VIEW

32" DIA CAST-IN RING & COVER

STYLE 'RC'



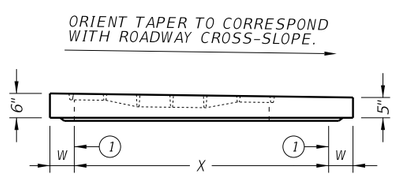
ELEVATION VIEW



PLAN VIEW

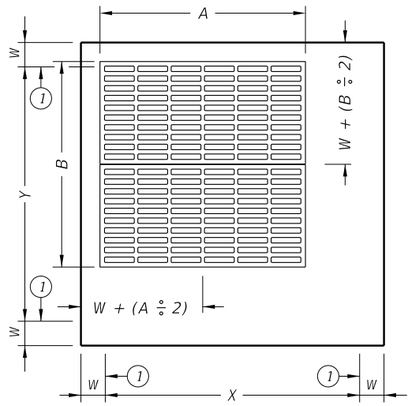
32" DIA CAST-IN RING & GRATE

STYLE 'RG'



STYLE 'SFG'

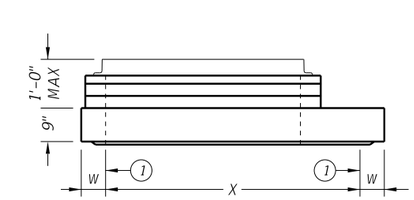
ELEVATION VIEW



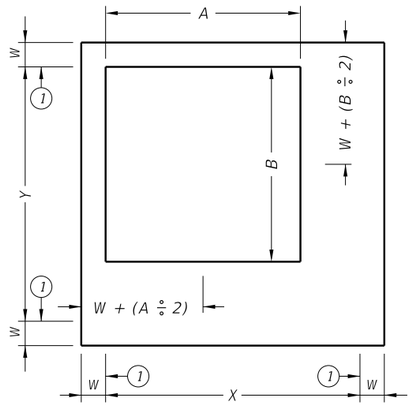
PLAN VIEW

CAST-IN FRAME & GRATE

STYLES 'FG' & 'SFG'



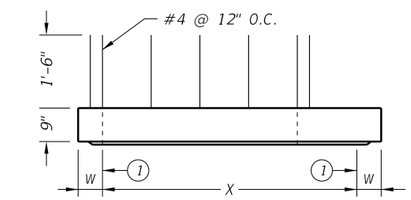
ELEVATION VIEW



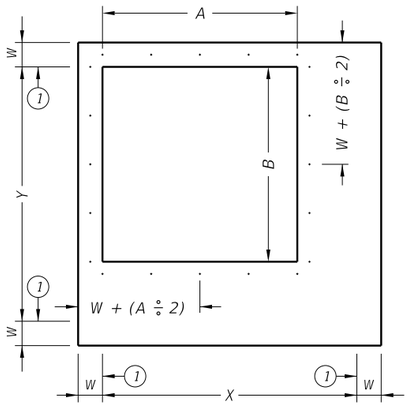
PLAN VIEW

SHIP LOOSE FRAME & GRATE

STYLE 'SH'



ELEVATION VIEW



PLAN VIEW

EXPOSED REBAR

STYLE 'S1'

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

HL93 LOADING

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Bridge Division Standard

PRECAST SLAB LID

PSL

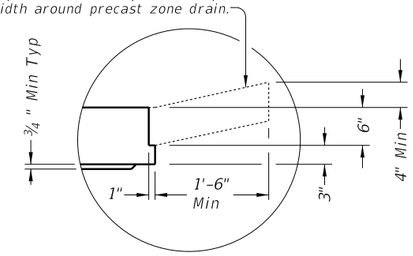
FILE: CD-PSL-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		65

DATE:
FILE:

Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in²/ft	0.37 in²/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in²/ft	0.37 in²/ft
SFG	3'x3'	6"	3'x3'	0.32 in²/ft	0.32 in²/ft
SL	4'x4'	6"	n/a	0.34 in²/ft	0.34 in²/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in²/ft	0.41 in²/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in²/ft	0.41 in²/ft
SFG	4'x4'	6"	4'x4'	0.32 in²/ft	0.32 in²/ft
SL	3'x5'	6"	n/a	0.39 in²/ft	0.39 in²/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in²/ft	0.48 in²/ft
SFG	3'x5'	6"	3'x5'	0.32 in²/ft	0.32 in²/ft
SL	4'x5'	6"	n/a	0.42 in²/ft	0.42 in²/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in²/ft	0.42 in²/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in²/ft	0.66 in²/ft
SL	5'x5'	6"	n/a	0.36 in²/ft	0.36 in²/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in²/ft	0.43 in²/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in²/ft	0.63 in²/ft
SL	5'x6'	6"/8"	n/a	0.48 in²/ft	0.48 in²/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in²/ft	0.60 in²/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in²/ft	0.60 in²/ft
SL	6'x6'	6"/8"	n/a	0.43 in²/ft	0.43 in²/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in²/ft	0.59 in²/ft
SL	8'x8'	8"/10"	n/a	0.45 in²/ft	0.45 in²/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in²/ft	0.45 in²/ft

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

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



DETAIL "A"

(Reinforcing not shown for clarity)

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

FABRICATION NOTES:

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

INSTALLATION NOTES:

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

GENERAL NOTES:

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

Cover dimensions are clear dimensions, unless noted otherwise.

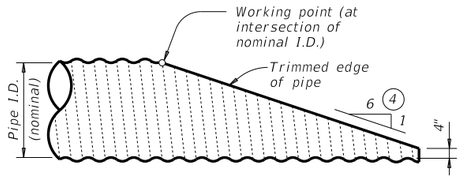
Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

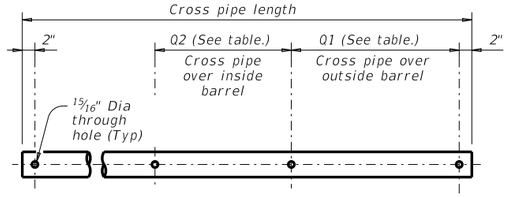
FILE: CD-PSL-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		66



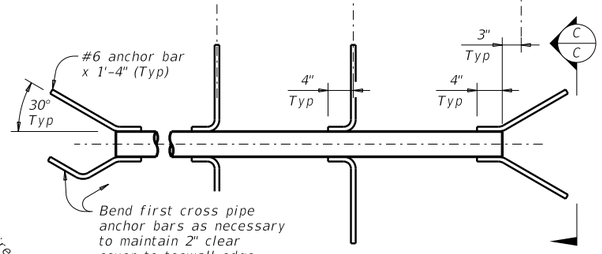
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

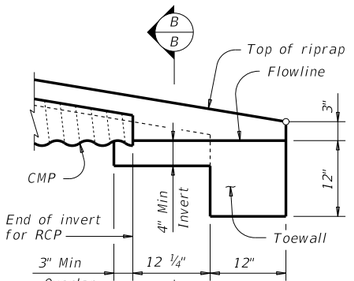
(Showing corrugated metal pipe (CMP) culvert Details at reinforced concrete pipe (RCP) culvert are similar.)



PIPE WITH BOLTED ANCHOR

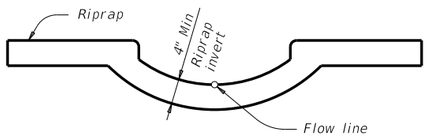


PIPE WITH ANCHOR BARS



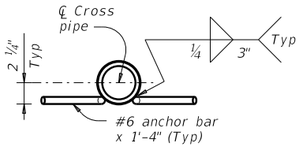
DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



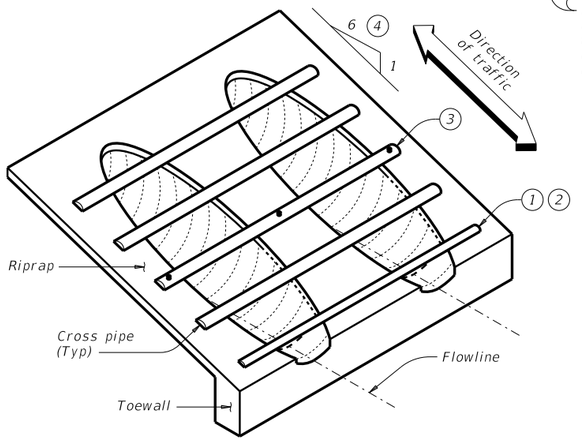
SECTION B-B

(Cross pipes not shown for clarity.)

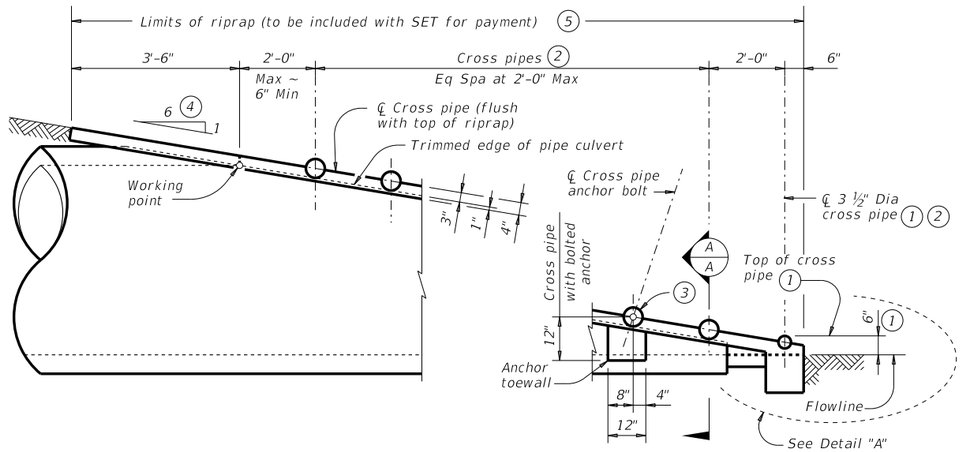


SECTION C-C

CROSS PIPE DETAILS

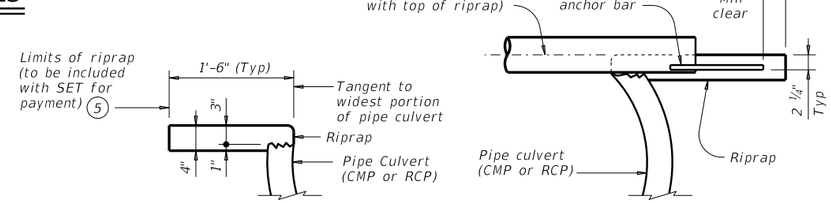


ISOMETRIC VIEW OF TYPICAL INSTALLATION



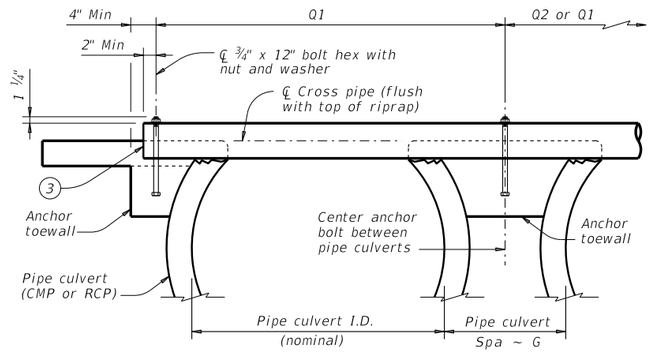
SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SHOWING CROSS PIPE WITH ANCHOR BAR



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

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 ½" 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.

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: CD-SETP-PD-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
	DIST	COUNTY		SHEET NO.
	BWD	BROWN		67

DATE:
FILE:

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

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

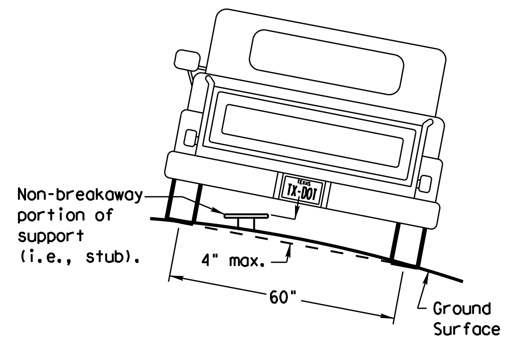
Anchor Type

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

Sign Mounting Designation

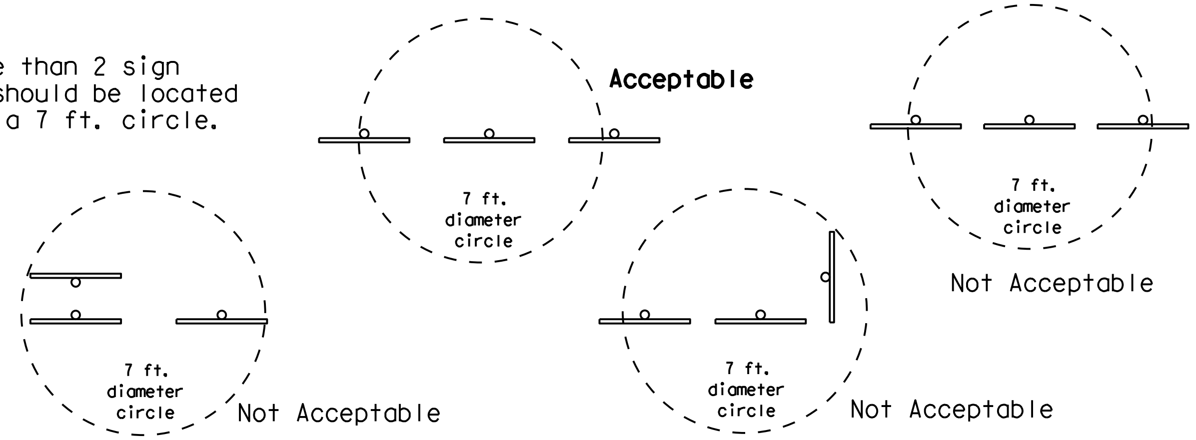
P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))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

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



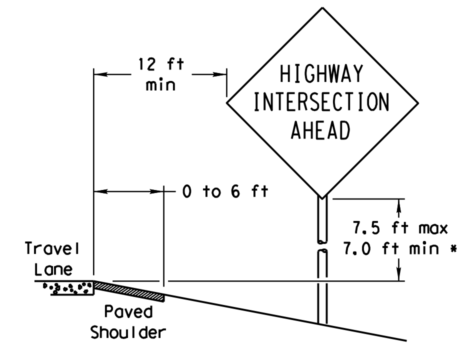
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

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



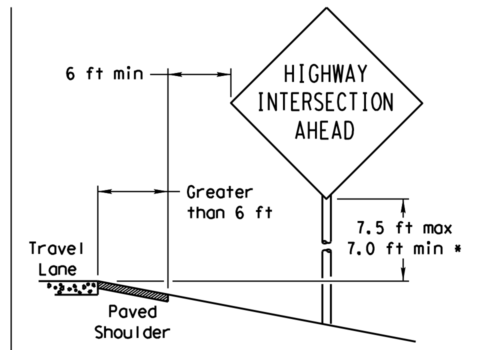
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

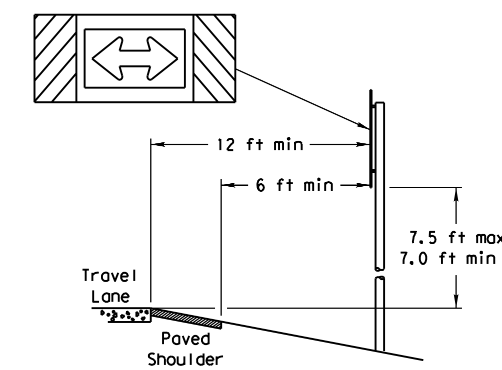
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



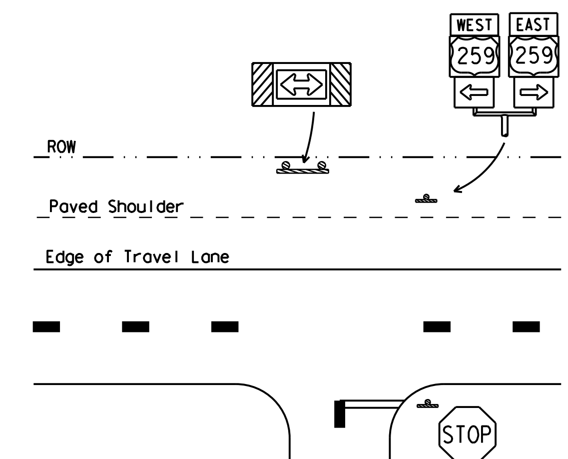
GREATER THAN 6 FT. WIDE

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.

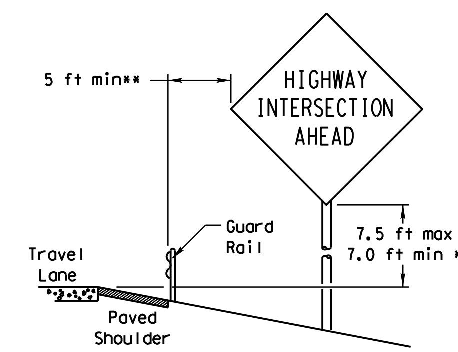
T-INTERSECTION



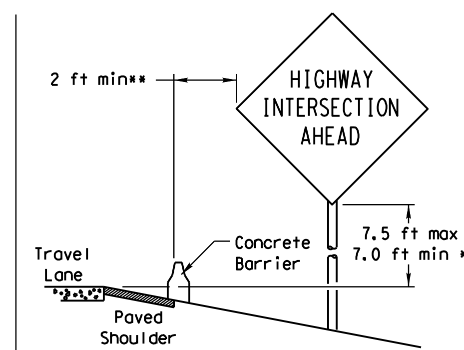
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

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

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

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

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

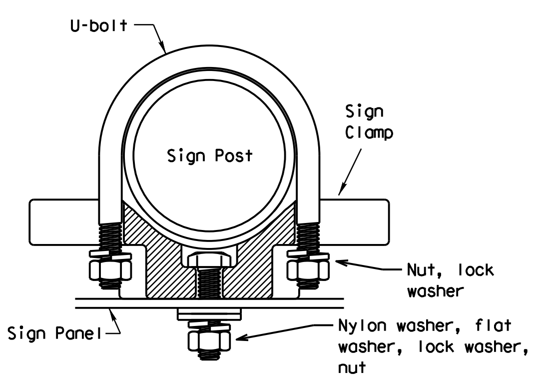
The maximum values may be increased when directed by the Engineer.

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

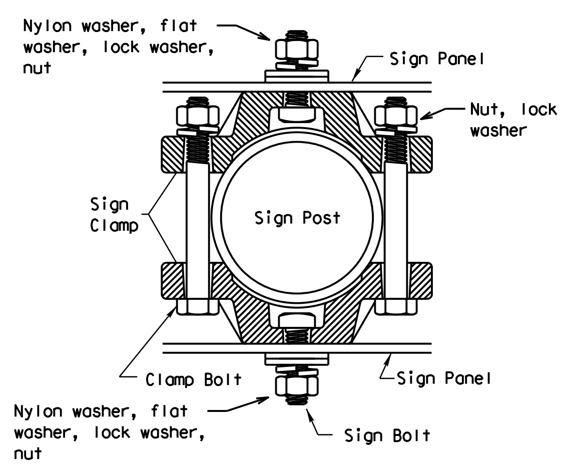
The website address is:
http://www.txdot.gov/publications/traffic.htm

TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



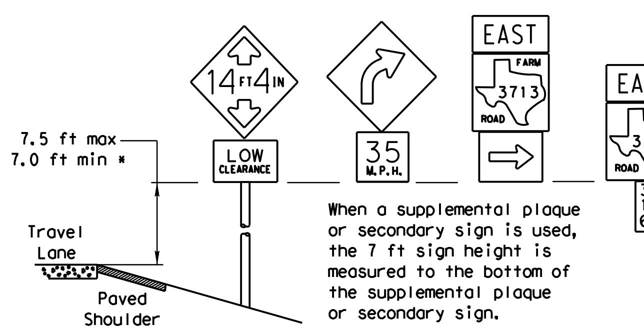
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

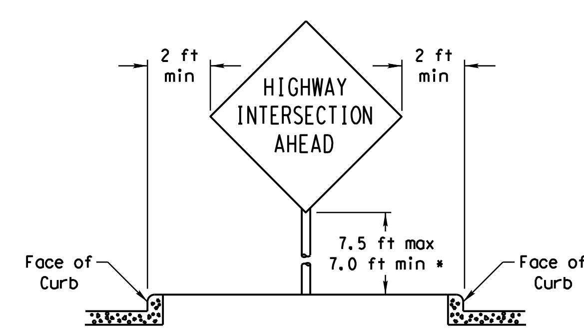
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



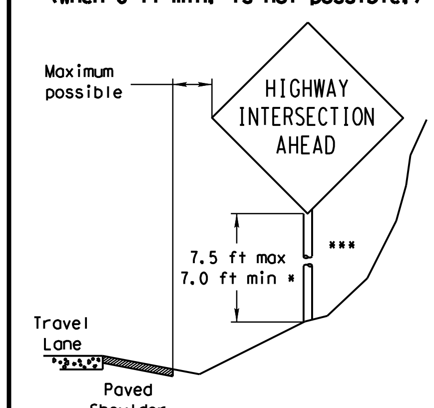
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

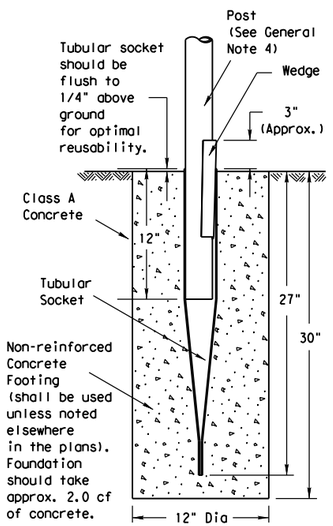
SMD(GEN)-08

©TxDOT July 2002	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0923	06	095	(CS)
	DIST		COUNTY	SHEET NO.
	BWD		BROWN	68

26A

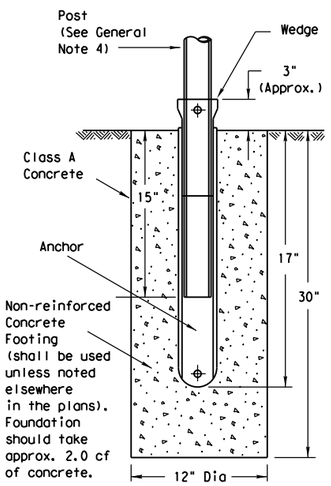
DATE:
FILE:

Wedge Anchor Steel System



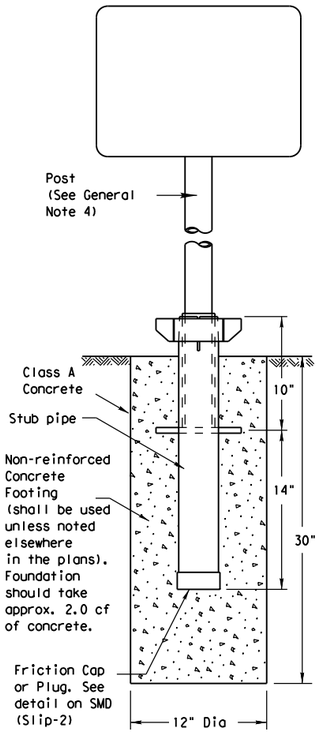
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

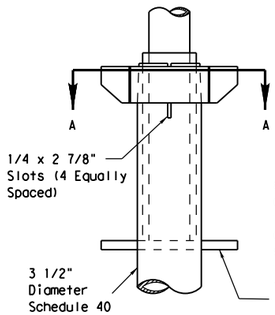


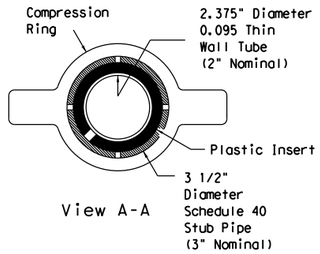
SMD RD SGN ASSM TY TWT(X)WP(X)

Universal Anchor System with Thin-Walled Tubing Post



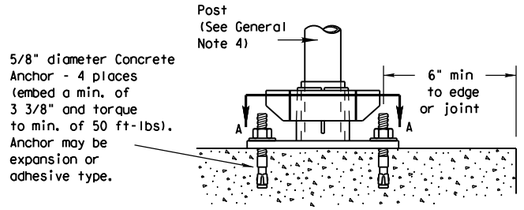
SM RD SGN ASSM TY TWT(X)UA(P)



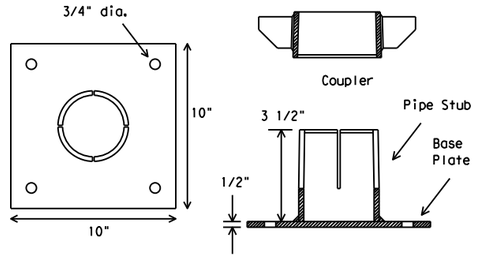


View A-A

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

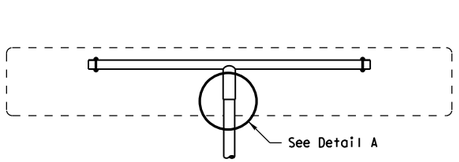


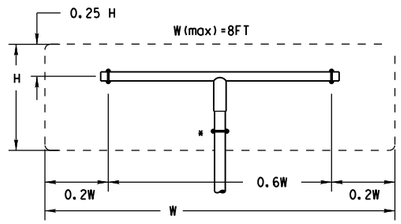
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.



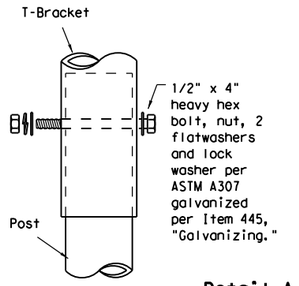
SM RD SGN ASSM TY TWT(X)UB(P)

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





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



Detail A

9/16" hole may need to be drilled through post to accommodate bolt.

NOTE

The devices shall be installed per manufacturer's recommendations.
Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer list.htm
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (2.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   18% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of .083" to .099"
   Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
   Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: http://www.txdot.gov/publications/traffic.htm

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

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

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

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

Texas Department of Transportation
Traffic Operations Division

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

SMD(TWT)-08

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

9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
0923	06	095	(CS)

DIST	COUNTY	SHEET NO.
BWD	BROWN	69

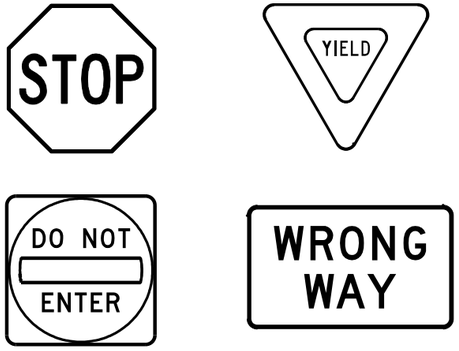
26E

DATE:
FILE:

DATE:
FILE:

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

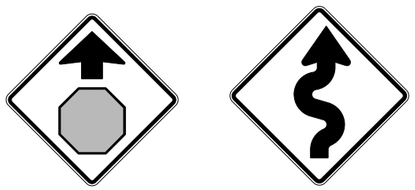
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

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

GENERAL NOTES

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

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

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

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

http://www.txdot.gov/

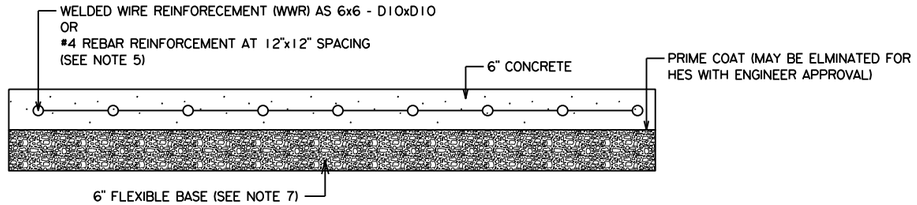
Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

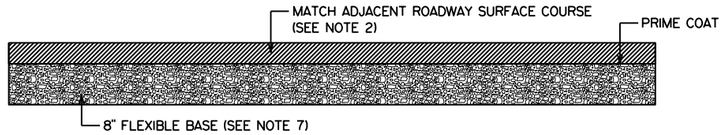
TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	06	095	(CS)
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	BWD	BROWN		70



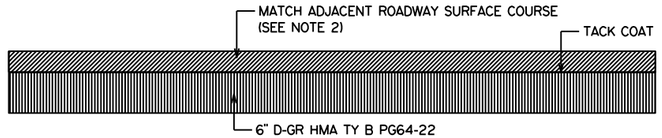
TYPICAL CONCRETE DRIVEWAY

• NOTE: STEEL SHALL BE CENTERED VERTICALLY IN CONCRETE.
PAID AS 'DRIVEWAYS CONC (HES)' OR 'DRIVEWAYS (CONC)'



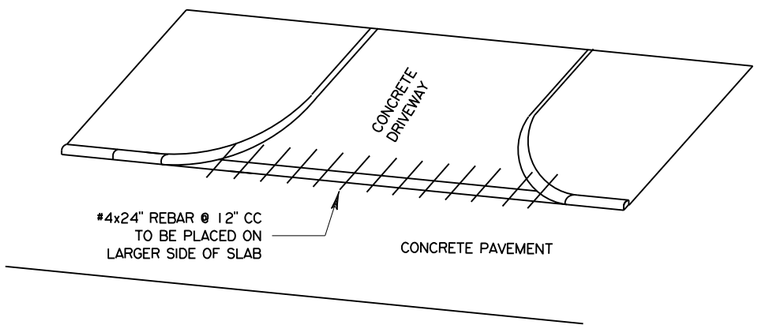
TYPICAL ROADWAY DRIVEWAY (TYPE 1)

PAID AS DRIVEWAYS ACP (TYPE 1)

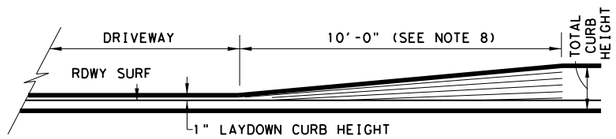


TYPICAL ROADWAY DRIVEWAY (TYPE 2)

PAID AS DRIVEWAYS ACP (TYPE 2)



TIE BAR PLACEMENT WITH CRCP



LAYDOWN CURB AT DRIVEWAYS DETAIL

NOTES:

1. USE CLASS A CONCRETE UNLESS OTHERWISE NOTED.
2. DENSE GRADED HMA MAY BE USED WHEN APPROVED BY THE ENGINEER IF THE ROADWAY SURFACE COURSE IS A PERFORMANCE MIX.
3. REFER TO PLAN SHEETS FOR GEOMETRIC DESIGN DETAILS.
4. FOR CONCRETE DRIVEWAYS, PROVIDE EXPANSION JOINT 20 FT C-C FOR WIDTH OR LENGTH OVER 25 FT.
5. FIBER REINFORCEMNT IS NOT ALLOWED.
6. MACHINE LAID HMA IS REQUIRED UNLESS OTHERWISE APPROVED BY THE ENGINEER.
7. FURNISH BASE MEETING THE REQUIREMENTS FOR ANY TYPE OF GRADE IN ACCORDANCE WITH ITEM 247. FLEXIBLE BASE COMPRESSIVE STRENGTHS ARE WAIVED. BASE IS SUBSIDIARY TO THE ITEM.
8. WHERE SIDEWALK IS PRESENT, SLOPE AND LENGTH OF CURB TRANSITION SHOULD MATCH THE SIDEWALK AND MEET ADA REQUIREMENTS.
9. IF ROOTS ARE ENCOUNTERED VERIFY WITH THE ENGINEER PRIOR TO ACCOMODATING OR REMOVING 2 IN. DIAMETER OR LARGER ROOTS. ROOT REMOVAL MUST BE IN ACCORDANCE WITH ITEM 752.4.2. ROOTS MAY REMAIN IN THE BASE. FOR IMPROVEMENTS WITHIN 6 IN. OF A ROOT, THE CONCRETE THICKNESS MAY BE REDUCED BY 1 IN. AND THE BASE INCREASED BY 1 IN. TO MINIMIZE THE IMPACT TO THE ROOTS. ADJUST BASE AND SURFACE PROFILE TO PROVIDE A 1 IN. BASE CUSHION AROUND THE ROOTS. THE SURFACE PROFILE MAY BE ADJUSTED TO THE EXTENT ALLOWED BY ADA. THIS WORK IS SUBSIDIARY.
10. REMOVAL OF EXISTING PAVEMENT TO BE SUBSIDIARY OF THIS PAY ITEM

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER

09/18/2023

Texas Department of Transportation
San Antonio District

DRIVEWAY DETAILS

San Antonio District Standard
Sheet (1 of 1) (MOD)

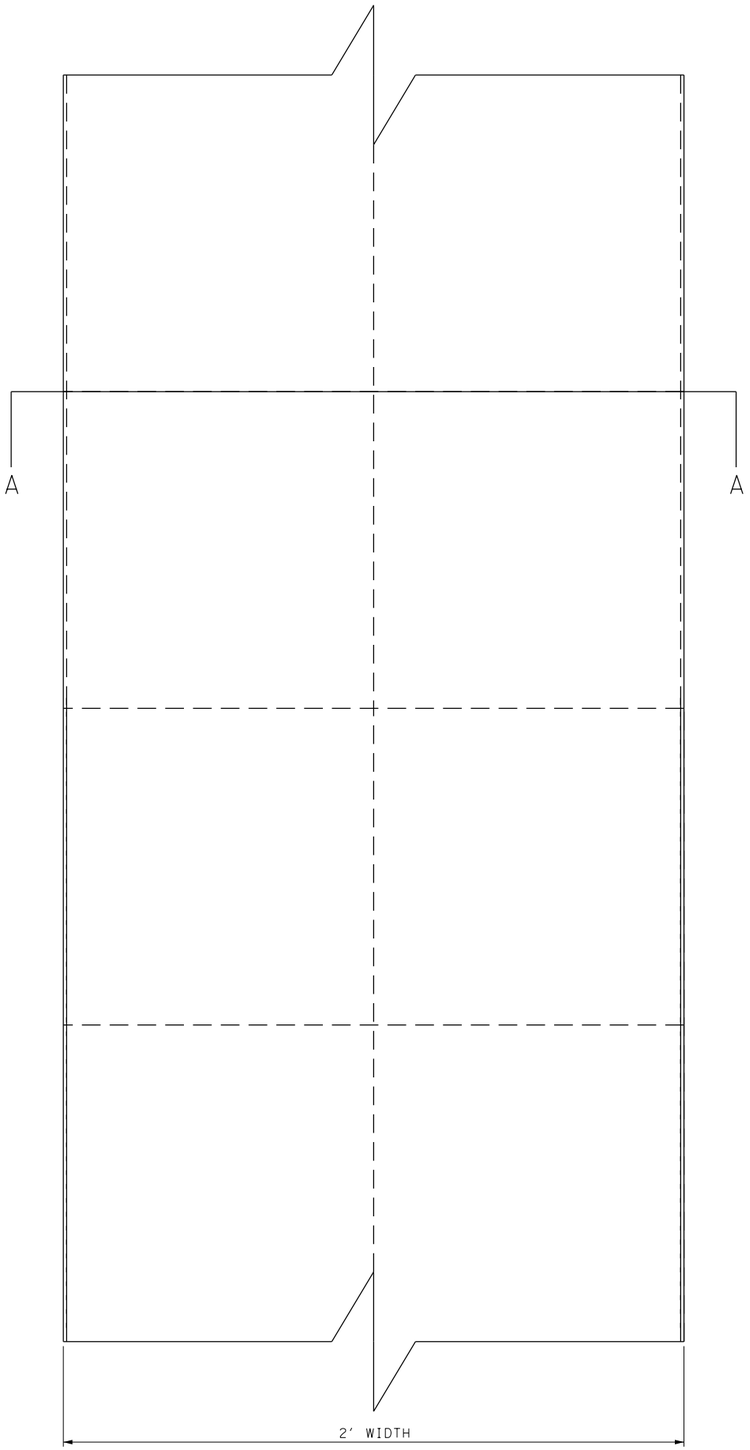
T:Engdata/Standards/Drivewaydetails.dgn
ORIGINAL DRAWING DATE: 8/1/2020
REVISIONS
REVISED 09, 2023

PREPARED BY AND/OR FOR THE OFFICE OF TxDoT.

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT #	SHEET
BWD	6	STP 2023(213)TAPS	71

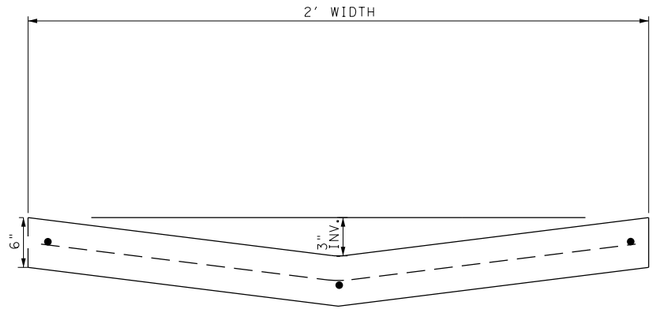
COUNTY	CONTROL	SECTION	JOB	HIGHWAY
BROWN	0923	06	095	CS

$TIME$
$DATE$
$FILE$



CONCRETE FLUME

NTS



CROSS SECTION A-A

NTS

NOTES

1. REINFORCING SHALL CONFORM TO ASTM GRADE 60 #4 REBAR AND SPACED 12" ON CENTER BOTH WAYS
2. USE CLASS "A" CONCRETE
3. REMOVAL OF EXISTING PAVEMENT TO BE SUBSIDIARY OF THIS ITEM

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER

09/18/2023

CITY OF EARLY

VOLKERT

F-12679

Texas Department of Transportation

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CONCRETE FLUME DETAILS

SHEET 1 OF 1

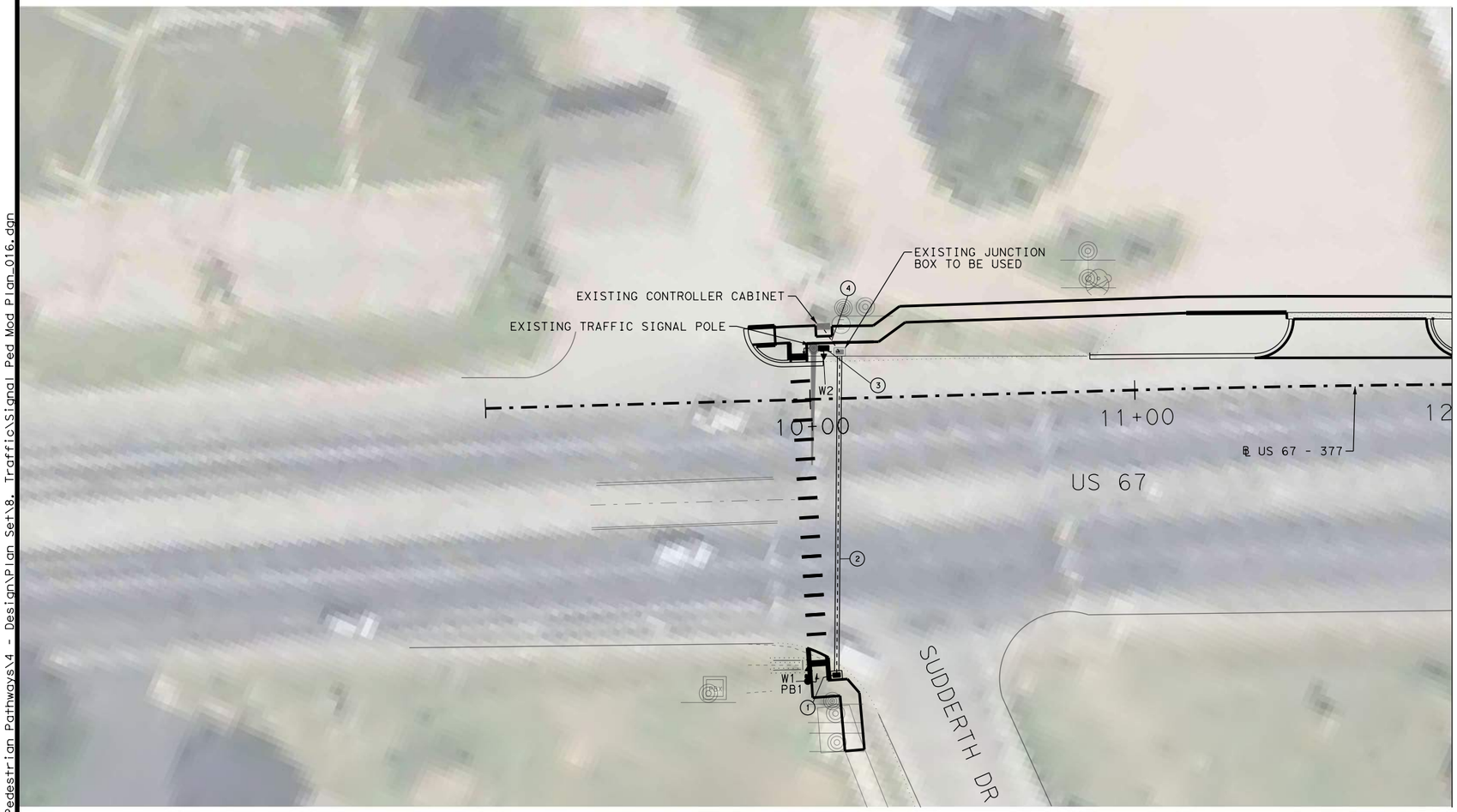
DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN	DIST	COUNTY		SHEET NO.
ER	BWD	BROWN		72
CHECKED				
PF				
APPROVED				
PF				

DATE: 18-SEP-2023 13:19
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\3. Roadway\CONCRETE FLUME DETAILS

POLE NO.	BASELINE STATION	OFFSET	FDN TYPE	DESCRIPTION	VEHICLE SIGNAL	PED SIGNAL HEADS	PUSH BUTTONS
P-1	9+97.46	85.70 RT.	24-A	10' PEDESTAL POLE	-	W1	Pb1
ESERV			-	ELEC SRV TY D	-	-	-
-	-			EXISTING SIGNAL CONTROLLER	-	-	-

PROPOSED PEDESTRIAN PUSH BUTTON LEGEND
(ACCESSIBLE PEDESTRIAN SIGNAL (APS)UNITS)

PB1, PB2



PROPOSED ELECTRICAL SCHEDULE								
ITEM	TOTAL QUANTITY (LF)	RUN NUMBER	1	2	3	4	P-1	P-2
		INSTALLATION METHOD**	T	B	T	T	P	P
		RUN LENGTH (LF)	10	100	8	10	10	10
GROUND	128	1/C - #6 BARE	1	1	1	1		
SIGNAL CABLE	158	4/ C #12	1	1	1	2	1	1
CONDUIT	18	2"	1		1		IN POLE	IN POLE
	110	3"		1		1		

* LOAD CENTER/CONTROLLER SERVICE INTERCONNECT.
** T = TRENCHED, B = BORED, P = IN POLE

NOTES:

1. THE PURPOSE OF THIS SHEET IS TO SHOW THE MODIFICATION NEEDED TO THE TRAFFIC SIGNAL TO FACILITATE PEDESTRIAN CROSSING. THE EXISTING SIGNAL OPERATION MUST NOT BE AFFECTED DUE TO THIS CHANGE, EXCEPT CHANGES IN SIGNAL TIMING AS DIRECTED BY CITY OF EARLY. MINIMUM 28 SECONDS SHALL BE ALLOWED FOR PROPOSED CONCURRENT PEDESTRIAN PHASE.
2. PEDESTRIAN SIGNAL HEADS SHALL BE ALIGNED WITH CROSSWALKS.
3. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES AS TO THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT WITH OR DAMAGE TO THESE UTILITIES.
4. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.

20 0 20 40
SCALE: 1" = 40'

LEGEND

- PROP SIGNAL HEAD W/ BACKPLATE
- PROP GROUND MOUNTED CABINET AND CONTROLLER
- PROP OVERHEAD SIGN
- PROP MAST ARM SIGNAL POLE
- PROP RADAR PRESENCE DETECTOR
- PROP RADAR ADVANCE DETECTOR
- PROP LUMINAIRE
- PROP PEDESTRIAN POLE
- W# PROP PEDESTRIAN SIGNAL HEAD
- PB# PROP PEDESTRIAN PUSH BUTTON
- PROP TYPE D GROUND BOX
- PROP TYPE D GROUND BOX W/APRON
- PROP CONDUIT (TRENCH)
- PROP CONDUIT (BORE)
- PROP SERVICE METER AND DISCONNECT
- PROP DIRECTION OF TRAFFIC
- EXIST DIRECTION OF TRAFFIC
- (X) RUN NUMBER

9/18/2023

CITY OF EARLY

VOLKERT
F-12679

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PEDESTRIAN CROSSING

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0923	06	095	CS
DIST	COUNTY		SHEET NO.
BWD	BROWN		73

DATE: 15-SEP-2023 14:03
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\8. Traffic\Signal Ped Mod Plan_016.dgn

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.

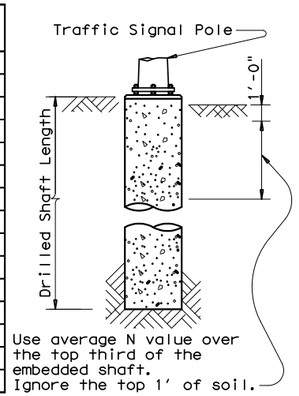
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

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	42-A
P-1	10	24-A	1	6				
TOTAL DRILLED SHAFT LENGTHS								

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'

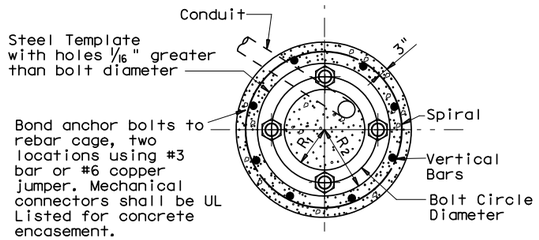


Use average N value over the top third of the embedded shaft. Ignore the top 1' of soil.

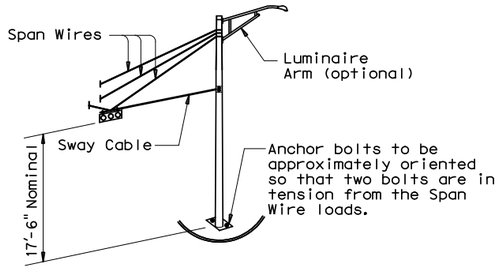
ANCHOR BOLT & TEMPLATE SIZES

BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	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"

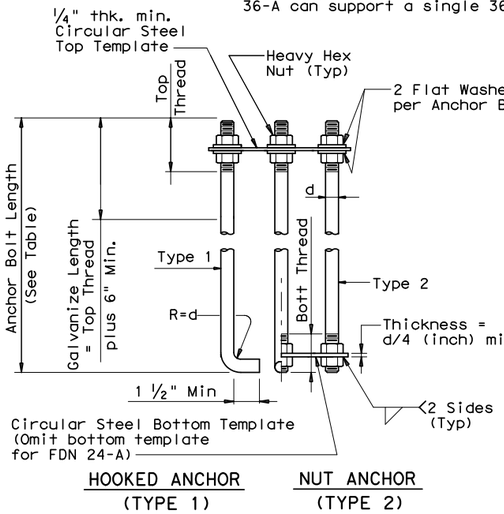
⑦ Min dimensions given, longer bolts are acceptable.



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.

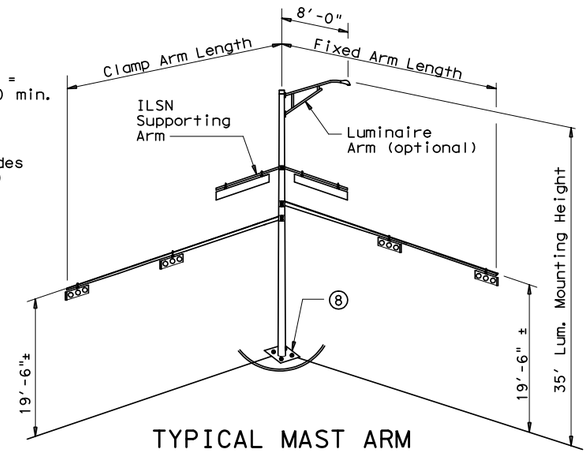


TYPICAL STRAIN POLE ASSEMBLY



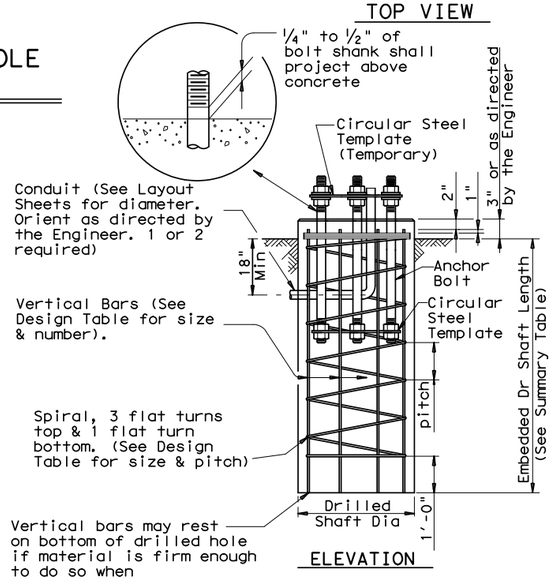
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY



⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.

TYPICAL MAST ARM ASSEMBLY



FOUNDATION DETAILS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

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
0923	06	095	(CS)

DIST	COUNTY	SHEET NO.
BWD	BROWN	74

DATE:
FILE:

UPDATED 6/22/2017

During the planning phase of project development the following environmental permits, issues, and commitments have been developed during coordination with resource agencies, local governmental entities, and the general public. Any change orders and/or deviations from the final design must be reported to the Engineer prior to the commencement of construction activities, as additional environmental clearances may be required.

I. Clean Water Act, Sec. 402 Texas Pollutant Discharge Elimination System

(Addresses CGP and MS4 Storm Water requirements for the project.)

(In the event that the Contractor implements a PSL on or within one mile of the project, a Site Notice and/or a NOI will apply.)

☐ No Action Required ☑ Required Action

Action No. 1
The project disturbs more than one acre but less than five acres of surface area. The contractor is responsible for the PSL as defined in the Standard Specifications for construction and Maintenance of Highways, Street, and Bridges (2014 Edition, Section 7.7.6, Page 42). The total disturbed acreage is the combined acreage to be disturbed on the project and the contractor's PSL.

This EPIC must be updated if the disturbed area increases to five or more acres during the course of construction (refer to following section). It may become necessary to post a site notice and NOI for the project and/or PSL. The EPIC must be updated if the disturbed area increases to one or more

Identify all MS4 Permit holders that may be impacted by the project:

Commitment No. 1
Comply with TPDES CGP. TxDOT must post a Small Site Notice and send a copy to any non-TxDOT MS4 operator that receives discharge from the project. Refer to the SW3P Plan Sheet, BMPs and Detail.

Commitment No. 2
The contractor must stabilize the project site as stated in the SW3P.

MS4 operators that receives discharge from the project: -N/A-

II. Clean Water Act, Section 401 and 404 Compliance

(Addresses Nationwide Permits, Individual Permits, and Wetlands.)

(Filling, dredging, or excavating in any water bodies, rivers, creeks, streams, wetlands, or wet area is prohibited unless specified in the USACE permit and approved by the Engineer.)

(When temporary fill is implemented, only stated TxDOT standards will be used unless written authorization for an alternative is obtained from the Engineer. No equipment is allowed in any stream channel below the Ordinary High Water Mark except on temporary stream crossings or drill pads.)

☑ No Action Required ☐ 404 Permit and 401 Certification Required

Permit	Required Action	Waters of the US	App. Plan Sheet(s)
NWP 14	Comply with general conditions of the permit; no preconstruction notification is required.	various streams	SW3P Layouts

Best Management Practices for applicable 401 General Conditions:

General Condition 12 - Categories I and II BMPs required

Category I (Erosion Control)

- ☑ Temporary Vegetation
- ☐ Mulch
- ☐ Interceptor Swale
- ☐ Erosion Control Compost
- ☐ Compost Filter Berms and Socks
- ☐ Blankets, Matting
- ☑ Sod
- ☐ Diversion Dike
- ☑ Mulch Filter Berms and Socks
- ☐ Compost Blankets

Category II (Sedimentation Control)

- ☐ Sand Bag Berm
- ☑ Silt Fence
- ☐ Triangular Filter Dike
- ☐ Stone Outlet Sediment Traps
- ☐ Erosion Control Compost
- ☐ Compost Filter Berms and Socks
- ☐ Rock Berm
- ☐ Hay Bale Dike
- ☐ Brush Berms
- ☐ Sediment Basins
- ☐ Mulch Filter Berms and Socks

General Condition 25 - Category III BMPs required

Category III (Post-Construction TSS Control)

- ☐ Retention/Irrigation
- ☐ Extended Detention Basin
- ☐ Vegetative Filter Strips
- ☐ Grassy Swales
- ☐ Erosion Control Compost
- ☐ Compost Filter Berms and Socks
- ☐ Constructed Wetlands
- ☐ Wet Basins
- ☐ Vegetation-Lined Ditches
- ☐ Sand Filter Systems
- ☐ Mulch filter Berms and Socks
- ☐ Sedimentation Chambers

Prepared by **********
DATE:
FILE:

III. Cultural Resources

(Addresses any special circumstances associated with cultural resources, such as archeological or historic sites.)

(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.	Station (Rt/Lt)	Commitment
1.	---	---

IV. Vegetation Resources

(Addresses any special circumstances associated with vegetation, such as large trees to be avoided, or mitigation that will occur as part of the project.)

☐ No Action Required ☑ Required Action

Action No.	Station (Rt/Lt)	Commitment
1.	All	Avoid non-mow locations for stockpiles and equipment parking/storage.
2.	Project Limits	Preserve native vegetation to the extent practical. Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

V. Federal Listed, Proposed, Threatened, Endangered Species, Critical Habitat, State Listed Species, Candidate Species, and Migratory Bird Treaty Act (MBTA)

(Addresses any special habitat that may need to be avoided, lists any threatened or endangered species where habitat was observed and might be impacted within the project area, and lists any precautions such as nesting seasons for migratory birds.)

☐ No Action Required ☑ Required Action

Species Potentially within Project Area & Description	Habitat Description
---	---

The Migratory Bird Treaty Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. Migration patterns would not be affected by the proposed project. The contractor will remove all old migratory bird nests from any structure where work would be done from September 1 through the end of February. In addition, the contractor will be prepared to prevent migratory birds from building nests between March 1 and August 31, per the Environmental Permits, Issues, and Commitments (EPIC) plans. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young shall be avoided.

VI. Hazardous Material or Contamination Issues

(Addresses any previously identified high risk sites associated with hazardous materials that may be encountered during construction.)

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.

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.

Contractor will follow all applicable storage and management requirements for liquid oil products, liquid petroleum products, and other chemical liquids as per 40 CFR 112 (a.k.a. SPCC) and/or TCEQ Construction General Permit for storm water management.

Contact the Engineer if any of the following are detected:
- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canisters, barrels, etc.
- Undesirable smells/odors
- Underground storage tanks
- Evidence of leaching or seepage of substances
- Any other evidence indicating possible hazardous materials or contamination discovered on-site

---

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structure not including box culverts)?

☐ Yes ☑ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing an asbestos assessment/inspection.
Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a Texas Department of State Health Services (DSHS) licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 10 working days prior to scheduled abatement and/or demolition.

If "No", then TxDOT is still required to notify DSHS 10 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.

Bridges on this project may contain Lead-Containing Paint (LCP) or other items that contain lead. The location of (LCP) is identified in the General Notes. Item 6.10.1.2 in the 2014 TxDOT Standard Specifications shall be utilized for this project.

VII. Other Environmental Issues

(Addresses any other environmental issues that may not have been covered in other sections.)

☑ No Action Required ☐ Required Action

Action No.	Station (Rt/Lt)	Commitment
1.	---	---

LIST OF ABBREVIATIONS

BMP: Best Management Practice
CGP: Construction General Permit
DSHS: Texas Department of State Health Services
FEMA: Federal Emergency Management Agency
FHWA: Federal Highway Administration
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
MS4: Municipal Separate Stormwater Sewer System
MBTA: Migratory Bird Treaty Act
NOI: Notice of Intent
NOT: Notice of Termination
NWP: Nationwide Permit
SPCC: Spill Prevention Control and Countermeasure
SW3P: Storm Water Pollution Prevention Plan
PCN: Pre-Construction Notification
PSL: Project Specific Location
TCEQ: Texas Commission on Environmental Quality
TPDES: Texas Pollutant Discharge Elimination System
TPWD: Texas Parks and Wildlife Department
TxDOT: Texas Department of Transportation
T&E: Threatened and Endangered Species
USACE: U.S. Army Corp of Engineers
USFWS: U.S. Fish and Wildlife Service

ENVIRONMENTAL PERMITS, ISSUES, AND COMMITMENTS (EPIC) 1 TO 5 ACRES

Texas Department of Transportation
BROWNWOOD DISTRICT

CONT	SECT	JOB	HIGHWAY
0923	06	095	CS
DIST	COUNTY		SHEET NO.
BWD	BROWN		75

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):
0923-06-095

1.2 PROJECT LIMITS:
From: **Various**

To: **Various**

1.3 PROJECT COORDINATES:

BEGIN: (Lat) **31.735065** ,(Long) **-98.963112**

END: (Lat) **31.748436** ,(Long) **-98.931123**

1.4 TOTAL PROJECT AREA (Acres): 1.5

1.5 TOTAL AREA TO BE DISTURBED (Acres): 1.5

1.6 NATURE OF CONSTRUCTION ACTIVITY:

Construction of sidewalks, illumination, striping, and signage

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Sagerton-Urban land Complex, 0 to 3% slopes	Well drained, medium runoff, medium/low erosion potential
Winters fine sandy loam Complex, 0 to 1% slopes	Well drained, low runoff, medium erosion potential
Winters-Urban land Complex, 1 to 3% slopes	Well drained, medium runoff, medium erosion potential
Palopinto-Speck Complex, 1 to 5% slopes, rubbly	Well drained, Very high runoff, low erosion potential

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
TBD	

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
- ☒ 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: _____
- ☐ Other: _____
- ☐ Other: _____

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
Various unnamed tributaries	SID 1432 upper Pecan Bayou Colorado River Basin

* 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: _____
- ☐ Other: _____

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: _____
- ☐ Other: _____

1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:

MS4 Entity
No MS4s receive stormwater discharge from this site.

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
	STP 2023(213)TAPS		76
STATE	STATE DIST.	COUNTY	
TEXAS	BWD	BROWN	
CONT.	SECT.	JOB	HIGHWAY NO.
0923	06	095	(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
- ☐ ☐ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☐ ☐ Temporary Seeding
- ☐ ☐ Permanent Planting, Sodding or Seeding
- ☒ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ 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

- ☒ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☒ ☐ Sediment Control Fence
- ☐ ☐ 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
- ☐ ☐ 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
  - ☐ Required (>10 acres), but not feasible due to:
    - ☐ Available area/Site geometry
    - ☐ Site slope/Drainage patterns
    - ☐ Site soils/Geotechnical factors
    - ☐ Public safety
    - ☐ Other: _____

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
No permanent controls are planned		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- ☒ Excess dirt/mud on road removed daily
- ☐ Haul roads dampened for dust control
- ☐ Loaded haul trucks to be covered with tarpaulin
- ☐ Stabilized construction exit
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- ☒ Chemical Management
- ☒ Concrete and Materials Waste Management
- ☒ Debris and Trash Management
- ☒ Dust Control
- ☒ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

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
Silt control fence or logs will be added as necessary to prevent runoff	**Longhorn STA 16+50**	**Longhorn STA 18+20**
Silt control fence or logs will be added as necessary to prevent runoff	**OAK STA 21+00**	**OAK STA 21+50**

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- ☒ Fire hydrant flushings
- ☒ Irrigation drainage
- ☒ Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- ☒ Potable water sources
- ☒ Springs
- ☒ Uncontaminated groundwater
- ☒ Water used to wash vehicles or control dust
- ☒ Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

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 .

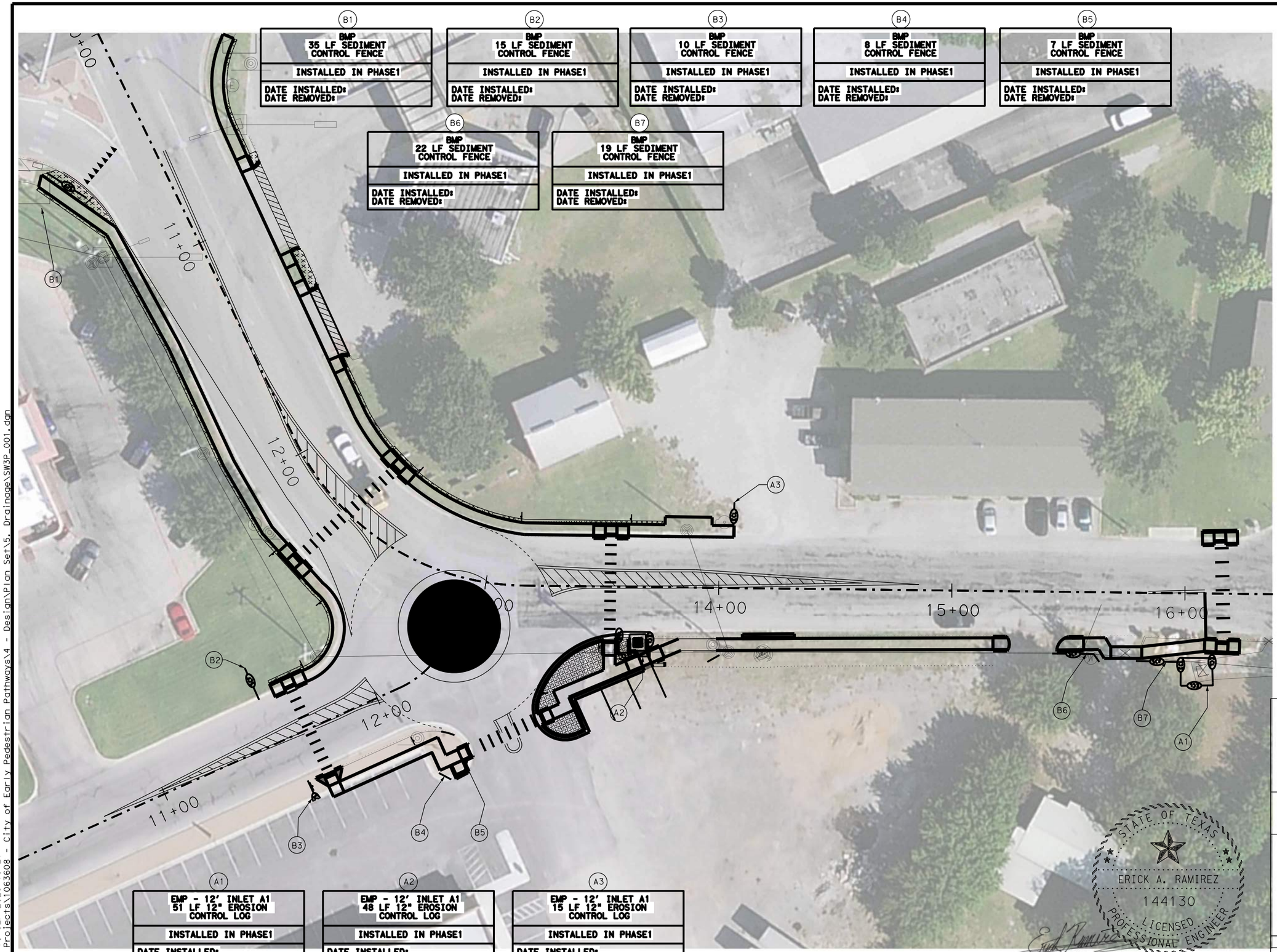
2.9 MAINTENANCE:

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.

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			77
STATE	STATE DIST.	COUNTY	
TEXAS	BWD	BROWN	
CONT.	SECT.	JOB	HIGHWAY NO.
0923	06	095	(CS)



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

NOTES:

1. EXISTING STORM SEWER INLETS SHALL BE SUFFICIENTLY PROTECTED UNTIL NEW SEWER SYSTEM IS PLACED IN SERVICE AND EXISITNG FACILITIES HAVE BEEN DECOMMISSIONED.
2. BMP'S TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED 2 WEEKS (MAX) PRIOR TO SOIL DISTURBANCE.
3. SWPPP QUANTITIES ARE BEING INCREASED BY 10% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO DAMAGE OR DIFFERING SITE CONDITIONS.

CITY OF EARLY

VOLKERT

F-12679

Texas Department of Transportation

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED PROFESSIONAL ENGINEER

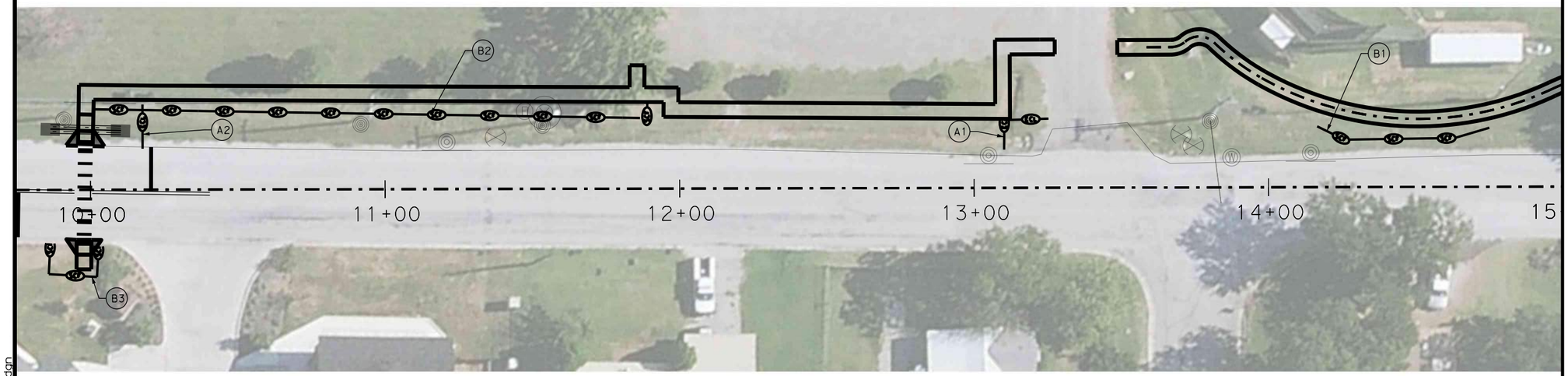
09/18/2023

SW3P
ORCHARD DR

SHEET 1 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN ER	0923	06	095	CS
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		78

DATE: 18-SEP-2023 13:21
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_001.dgn



MATCHLINE
OAK ST STA 15+00

20 0 20 40
SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

NOTES:

1. EXISTING STORM SEWER INLETS SHALL BE SUFFICIENTLY PROTECTED UNTIL NEW SEWER SYSTEM IS PLACED IN SERVICE AND EXISITNG FACILITIES HAVE BEEN DECOMMISSIONED.
2. BMP'S TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED 2 WEEKS (MAX) PRIOR TO SOIL DISTURBANCE.
3. SWPPP QUANTITIES ARE BEING INCREASED BY 10% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO DAMAGE OR DIFFERING SITE CONDITIONS.

(B1)	(B2)	(B3)	(A1)	(A2)
BMP 62 LF SEDIMENT CONTROL FENCE	BMP 194 LF SEDIMENT CONTROL FENCE	BMP 37 LF SEDIMENT CONTROL FENCE	BMP - EXISTING OUTFALL 25 LF 12" EROSION CONTROL LOG	BMP - EXISTING OUTFALL 15 LF 12" EROSION CONTROL LOG
INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER
09/18/2023

CITY OF EARLY

VOLKERT
F-12679

Texas Department of Transportation

SW3P
OAK ST

SHEET 2 OF 17

DESIGN ER	CONT	SECT	JOB	HIGHWAY
DRAWN ER	0923	06	095	CS
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		79

DATE: 18-SEP-2023 13:22
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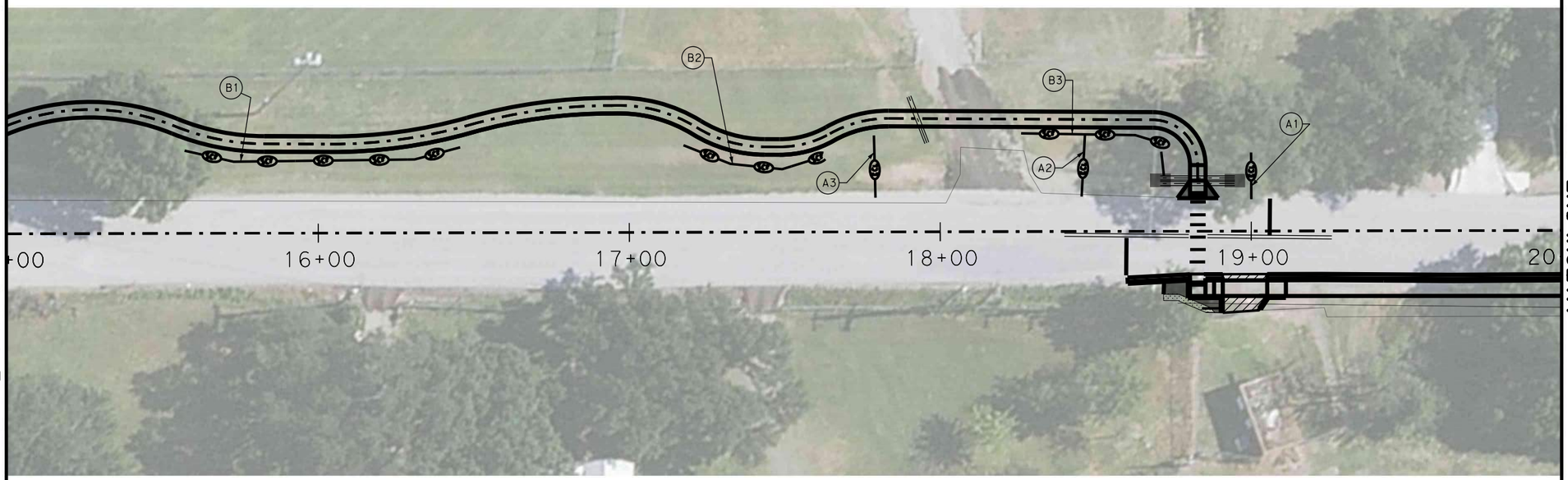


20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

NOTES:

1. EXISTING STORM SEWER INLETS SHALL BE SUFFICIENTLY PROTECTED UNTIL NEW SEWER SYSTEM IS PLACED IN SERVICE AND EXISITNG FACILITIES HAVE BEEN DECOMMISSIONED.
2. BMP'S TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED 2 WEEKS (MAX) PRIOR TO SOIL DISTURBANCE.
3. SWPPP QUANTITIES ARE BEING INCREASED BY 10% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO DAMAGE OR DIFFERING SITE CONDITIONS.

A1	A2	A3
BMP - EXISTING OUTFALL 15 LF 12" EROSION CONTROL LOG	BMP - EXISTING OUTFALL 20 LF 12" EROSION CONTROL LOG	BMP - EXISTING OUTFALL 20 LF 12" EROSION CONTROL LOG
INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:

B1	B2	B3
BMP 90 LF SEDIMENT CONTROL FENCE	BMP 48 LF SEDIMENT CONTROL FENCE	BMP 56 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER

09/18/2023

CITY OF EARLY

VOLKERT

F-12679

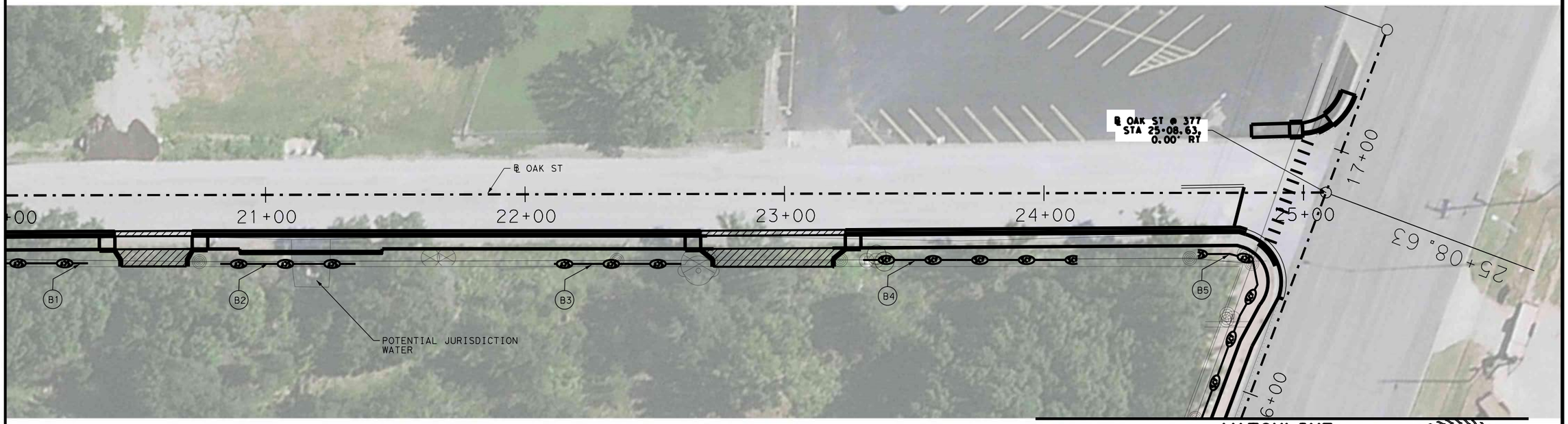
Texas Department of Transportation

SW3P
OAK ST

SHEET 3 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN	DIST	COUNTY		SHEET NO.
ER	BWD	BROWN		80
CHECKED				
BB				
APPROVED				
PF				

DATE: 18-SEP-2023 13:19
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_003.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

NOTES:

1. EXISTING STORM SEWER INLETS SHALL BE SUFFICIENTLY PROTECTED UNTIL NEW SEWER SYSTEM IS PLACED IN SERVICE AND EXISITNG FACILITIES HAVE BEEN DECOMMISSIONED.
2. BMP'S TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED 2 WEEKS (MAX) PRIOR TO SOIL DISTURBANCE.
3. SWPPP QUANTITIES ARE BEING INCREASED BY 10% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO DAMAGE OR DIFFERING SITE CONDITIONS.

B1	B2	B3	B4	B5
BMP 32 LF SEDIMENT CONTROL FENCE	BMP 52 LF SEDIMENT CONTROL FENCE	BMP 50 LF SEDIMENT CONTROL FENCE	BMP 83 LF SEDIMENT CONTROL FENCE	BMP 88 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:

STATE OF TEXAS
ERICK A. RAMIREZ
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PROFESSIONAL ENGINEER
09/18/2023

CITY OF EARLY

VOLKERT
F-12679

Texas Department of Transportation

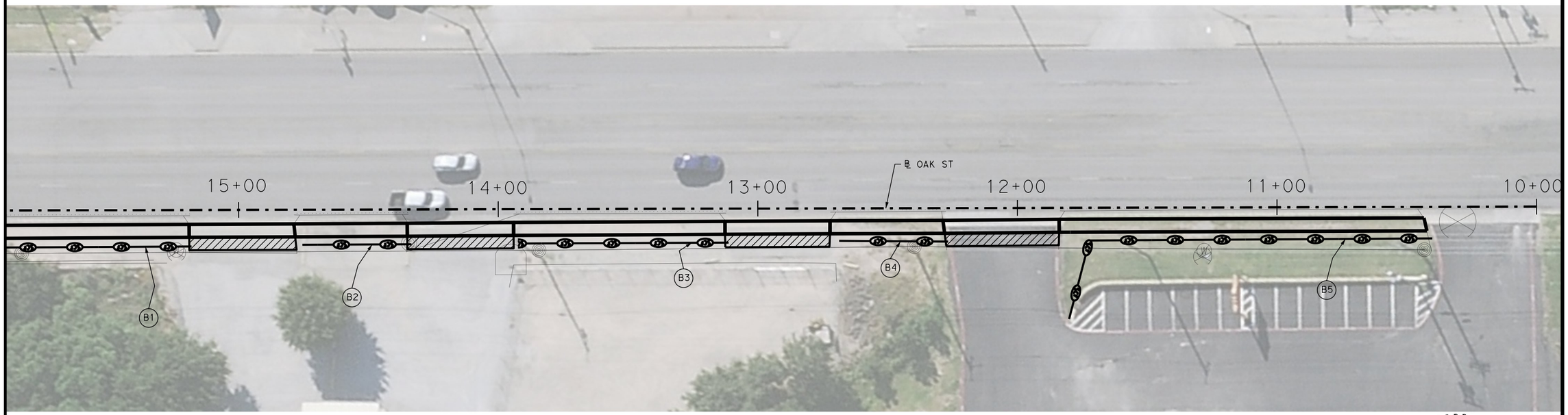
SW3P
OAK ST

SHEET 4 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER	DIST	COUNTY		SHEET NO.
CHECKED BB	BWD	BROWN		81
APPROVED PF				

DATE: 18-SEP-2023 13:23
FILE: Projects\063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_004.dgn

MATCHLINE
℄ SH 377 SEG 1 STA 15+90



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

NOTES:

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2. BMP'S TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED 2 WEEKS (MAX) PRIOR TO SOIL DISTURBANCE.
3. SWPPP QUANTITIES ARE BEING INCREASED BY 10% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO DAMAGE OR DIFFERING SITE CONDITIONS.

(B1)	(B2)	(B3)	(B4)	(B5)
BMP 71 LF SEDIMENT CONTROL FENCE	BMP 43 LF SEDIMENT CONTROL FENCE	BMP 81 LF SEDIMENT CONTROL FENCE	BMP 44 LF SEDIMENT CONTROL FENCE	BMP 163 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER
09/29/2023

CITY OF EARLY

VOLKERT

F-12679

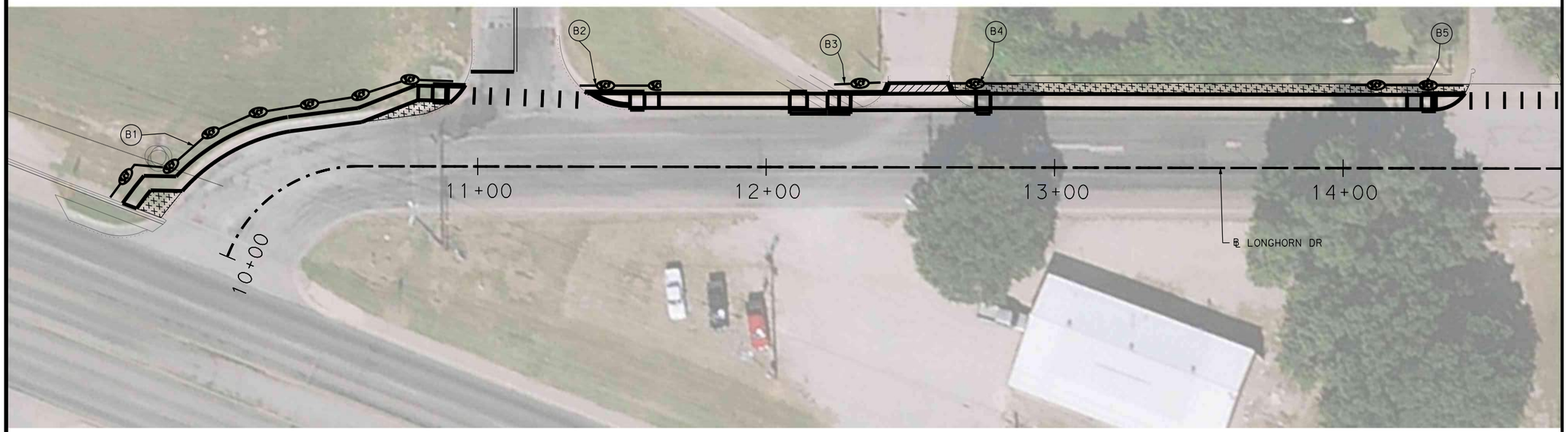
Texas Department of Transportation

SW3P
US-67 NEAR
OAK ST

SHEET 5 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER				
DRAWN	0923	06	095	CS
ER				
CHECKED	DIST	COUNTY		SHEET NO.
BB				
APPROVED	BWD	BROWN		82
PF				

DATE: 29-SEP-2023 06:10
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_005.dgn



MATCH LINE STA 15+00
℄ LONGHORN DR

20 0 20

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

NOTES:

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3. SWPPP QUANTITIES ARE BEING INCREASED BY 10% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO DAMAGE OR DIFFERING SITE CONDITIONS.

B1	B2	B3	B4	B5
BMP 134 LF SEDIMENT CONTROL FENCE	BMP 29 LF SEDIMENT CONTROL FENCE	BMP 16 LF SEDIMENT CONTROL FENCE	BMP 17 LF SEDIMENT CONTROL FENCE	BMP 40 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:

STATE OF TEXAS
ERICK A. RAMIREZ
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LICENSED PROFESSIONAL ENGINEER
09/18/2023

CITY OF EARLY

VOLKERT

F-12679

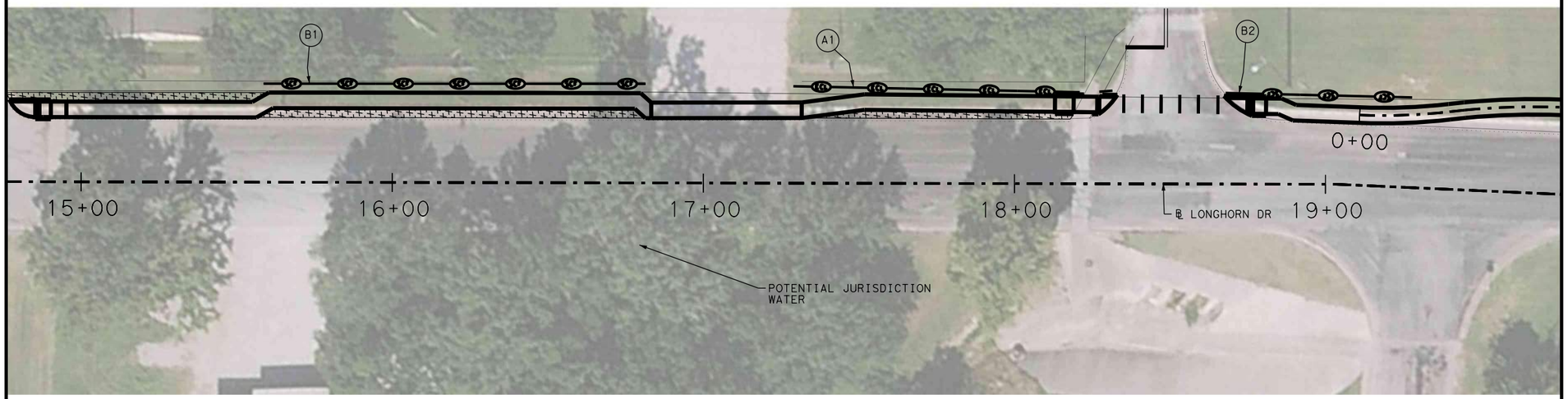
Texas Department of Transportation

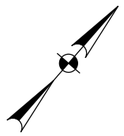
SW3P
LONGHORN DR

SHEET 6 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		83

DATE: 18-SEP-2023 13:26
FILE: Projects\106608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_006.dgn





20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

A1	B1	B2
BMP - EXISTING OUTFALL 92 LF 12" EROSION CONTROL LOG	BMP 123 LF SEDIMENT CONTROL FENCE	BMP 61 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:

NOTES:

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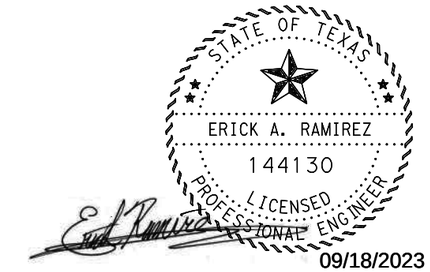
2. BMP'S TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED 2 WEEKS (MAX) PRIOR TO SOIL DISTURBANCE.
3. SWPPP QUANTITIES ARE BEING INCREASED BY 10% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO DAMAGE OR DIFFERING SITE CONDITIONS.



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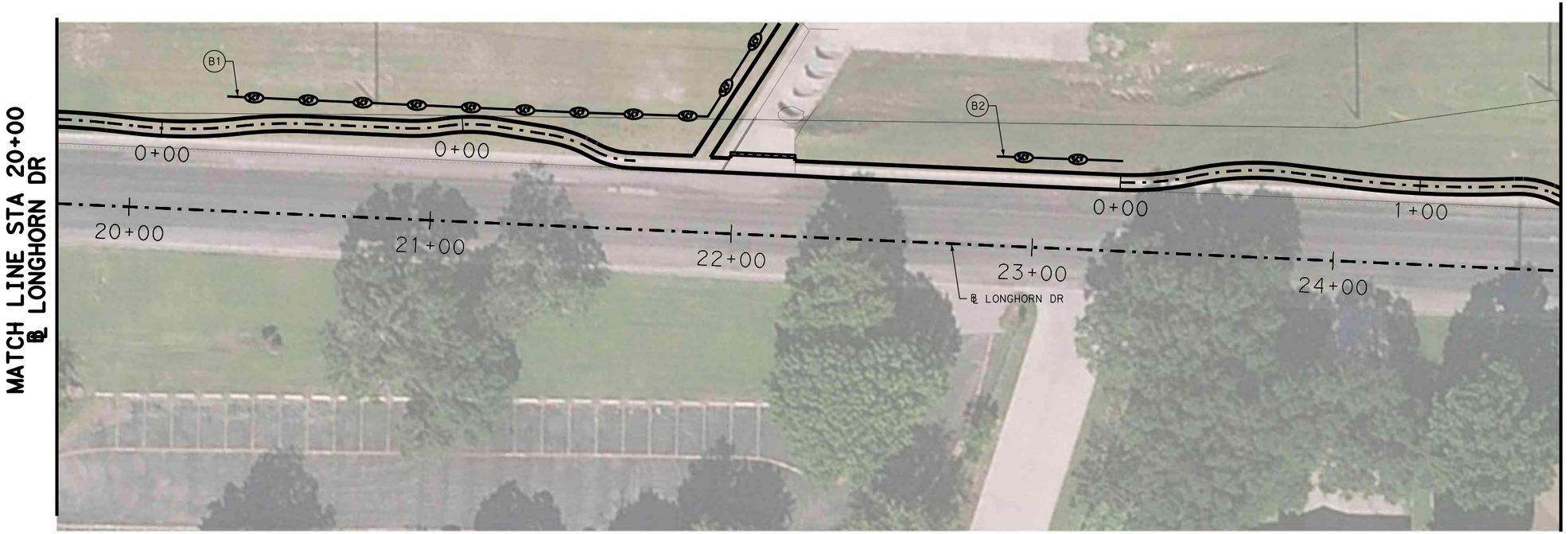
Texas Department of Transportation

SW3P
LONGHORN DR

SHEET 7 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		84

DATE: 18-SEP-2023 13:20
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_007.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- G — GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

B1
BMP 197 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

B2
BMP 43 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

NOTES:

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3. SWPPP QUANTITIES ARE BEING INCREASED BY 10% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO DAMAGE OR DIFFERING SITE CONDITIONS.

STATE OF TEXAS
ERICK A. RAMIREZ
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LICENSED
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09/18/2023

CITY OF EARLY

VOLKERT

F-12679

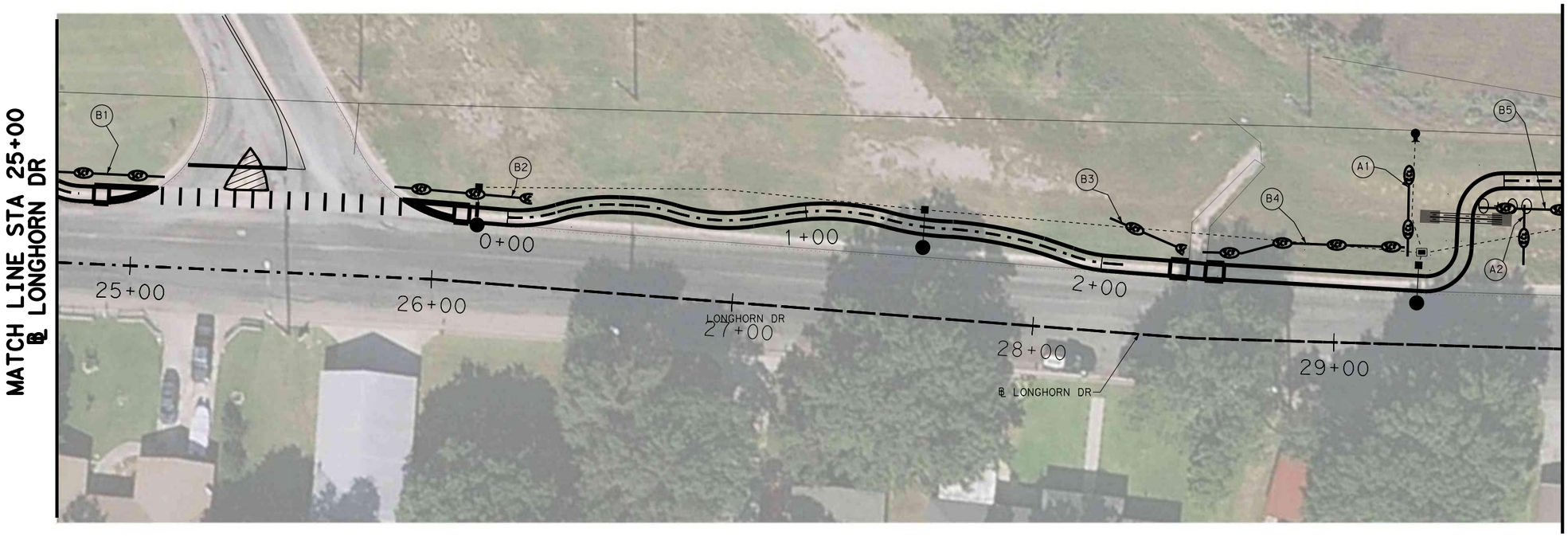
Texas Department of Transportation

SW3P
LONGHORN DR

SHEET 8 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN	DIST	COUNTY		SHEET NO.
ER	BWD	BROWN		85
CHECKED				
BB				
APPROVED				
PF				

DATE: 18-SEP-2023 13:23
FILE: Projects\106608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_008.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

NOTES:

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A1	B1	B2	B3	B4	B5
BMP - EXISTING OUTFALL 30 LF 12" EROSION CONTROL LOG	BMP 35 LF SEDIMENT CONTROL FENCE	BMP 46 LF SEDIMENT CONTROL FENCE	BMP 28 LF SEDIMENT CONTROL FENCE	BMP 68 LF SEDIMENT CONTROL FENCE	BMP 13 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:

A2
BMP - EXISTING OUTFALL 20 LF 12" EROSION CONTROL LOG
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

STATE OF TEXAS
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144130
LICENSED PROFESSIONAL ENGINEER

09/18/2023

CITY OF EARLY

VOLKERT

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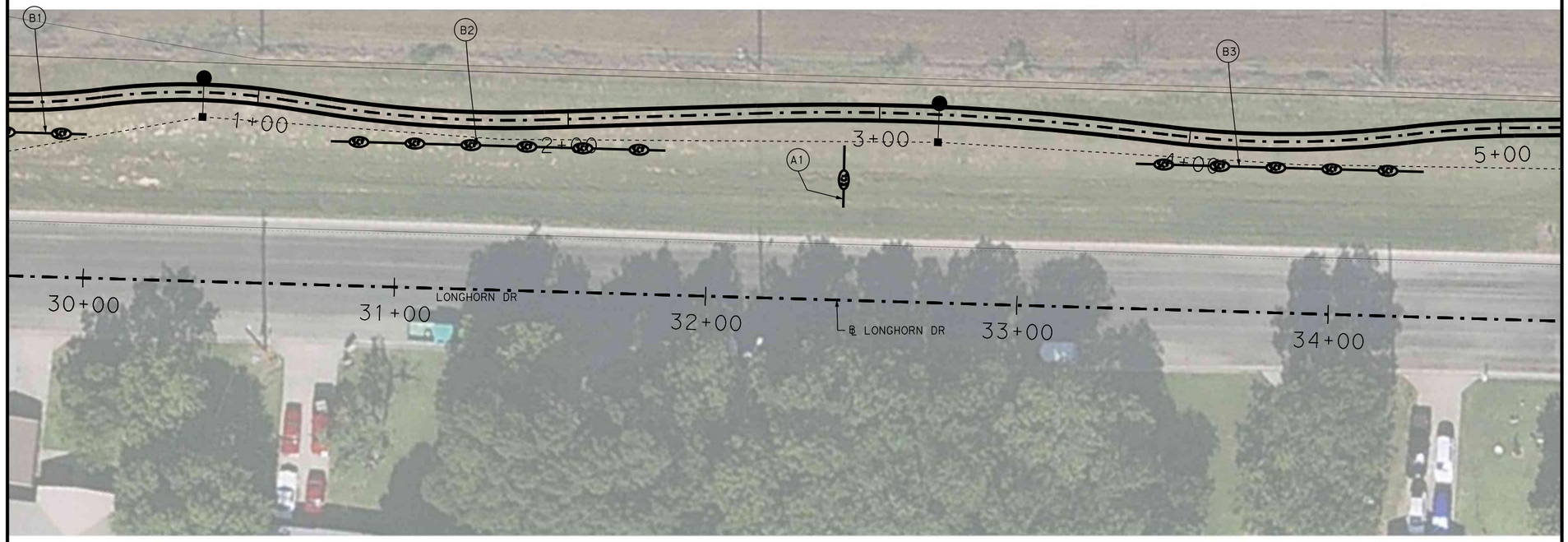
Texas Department of Transportation

SW3P
LONGHORN DR

SHEET 9 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		86

DATE: 18-SEP-2023 13:23
FILE: Projects\106608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_009.dgn



MATCH LINE STA 30+00
℄ LONGHORN DR

MATCH LINE STA 35+00
℄ LONGHORN DR

20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

NOTES:

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(A1)
BMP - EXISTING OUTFALL 20 LF 12" EROSION CONTROL LOG
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

(B1)
BMP 26 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

(B2)
BMP 108 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

(B3)
BMP 93 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

STATE OF TEXAS
ERICK A. RAMIREZ
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LICENSED PROFESSIONAL ENGINEER
09/18/2023

CITY OF EARLY

VOLKERT
F-12679

Texas Department of Transportation

SW3P
LONGHORN DR

SHEET 10 OF 17

DESIGN ER	CONT	SECT	JOB	HIGHWAY
DRAWN ER	0923	06	095	CS
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		87

DATE: 18-SEP-2023 13:23
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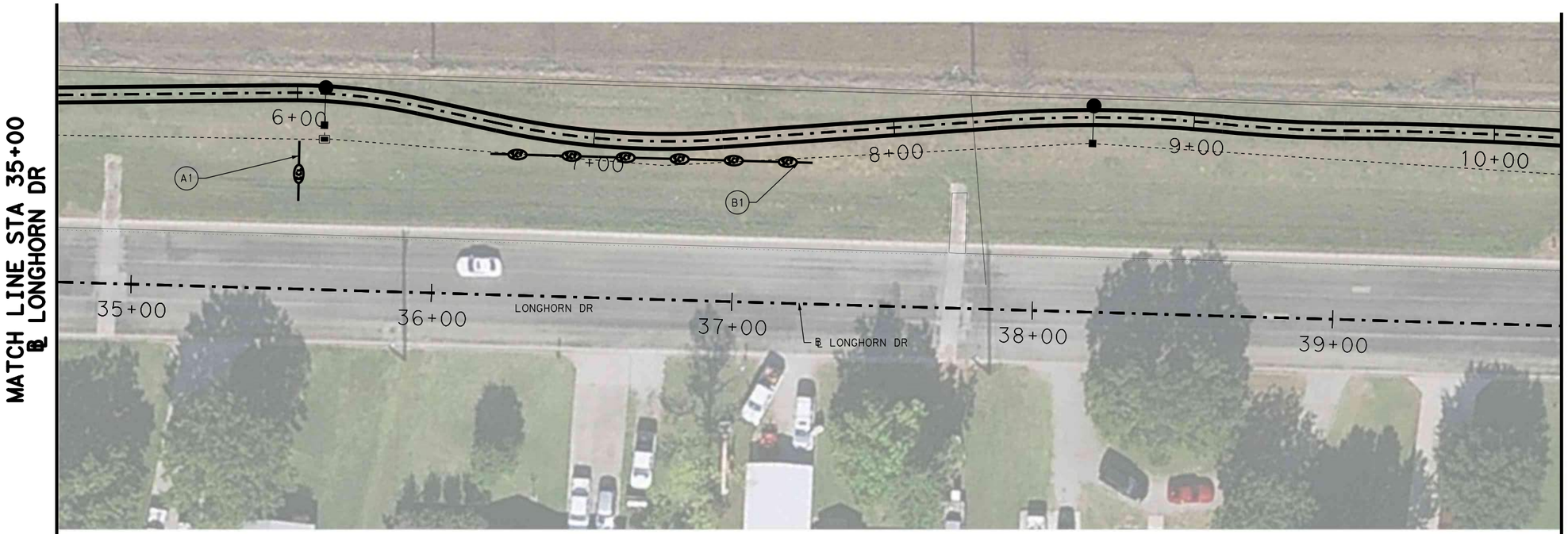

20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- G — GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

NOTES:

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(A1)

BMP - EXISTING OUTFALL 20 LF 12" EROSION CONTROL LOG
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

(B1)

BMP 108 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER
09/18/2023

CITY OF EARLY

VOLKERT
F-12679

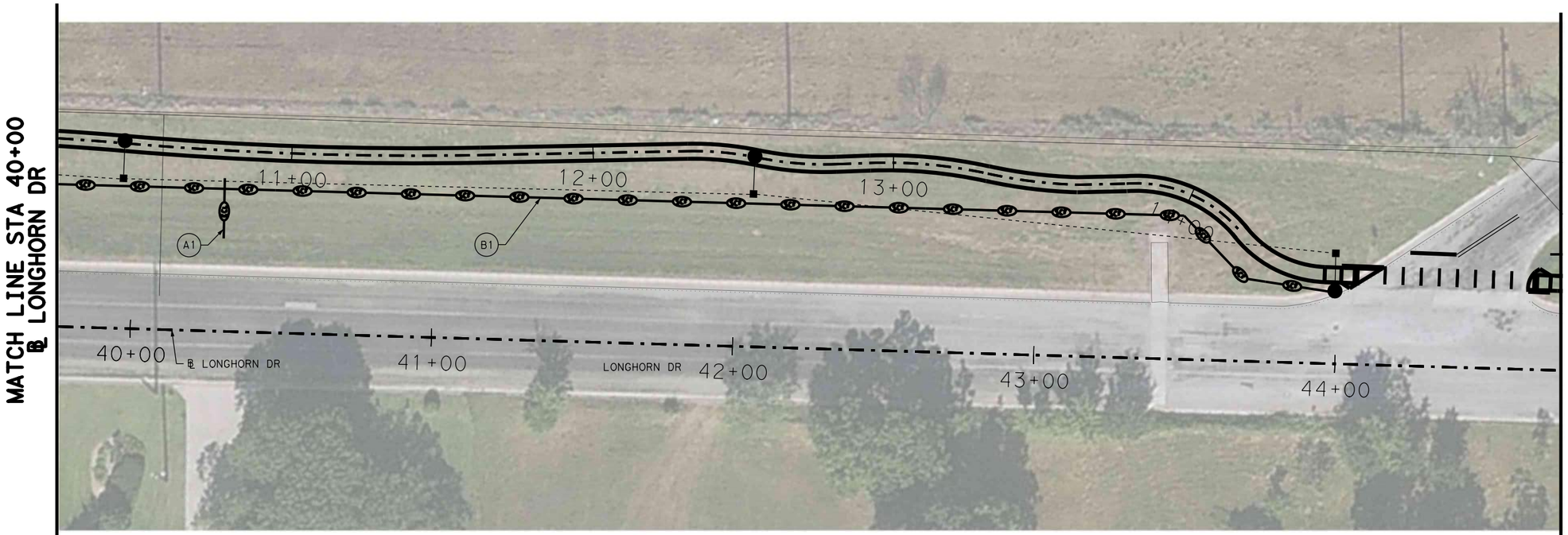
Texas Department of Transportation

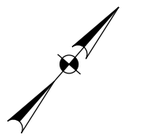
SW3P
LONGHORN DR

SHEET 11 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		88

DATE: 18-SEP-2023 13:20
FILE: Projects\106608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_011.dgn





20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- G — GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

A1

BMP - EXISTING OUTFALL 20 LF 12" EROSION CONTROL LOG
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

B1

BMP 431 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

NOTES:

1. EXISTING STORM SEWER INLETS SHALL BE SUFFICIENTLY PROTECTED UNTIL NEW SEWER SYSTEM IS PLACED IN SERVICE AND EXISITNG FACILITIES HAVE BEEN DECOMMISSIONED.
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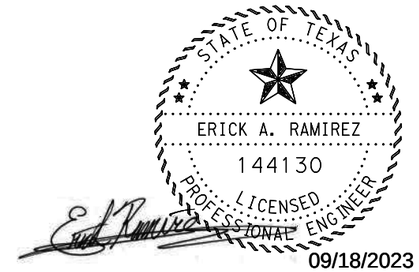
3. SWPPP QUANTITIES ARE BEING INCREASED BY 10% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO DAMAGE OR DIFFERING SITE CONDITIONS.



CITY OF EARLY

VOLKERT

F-12679

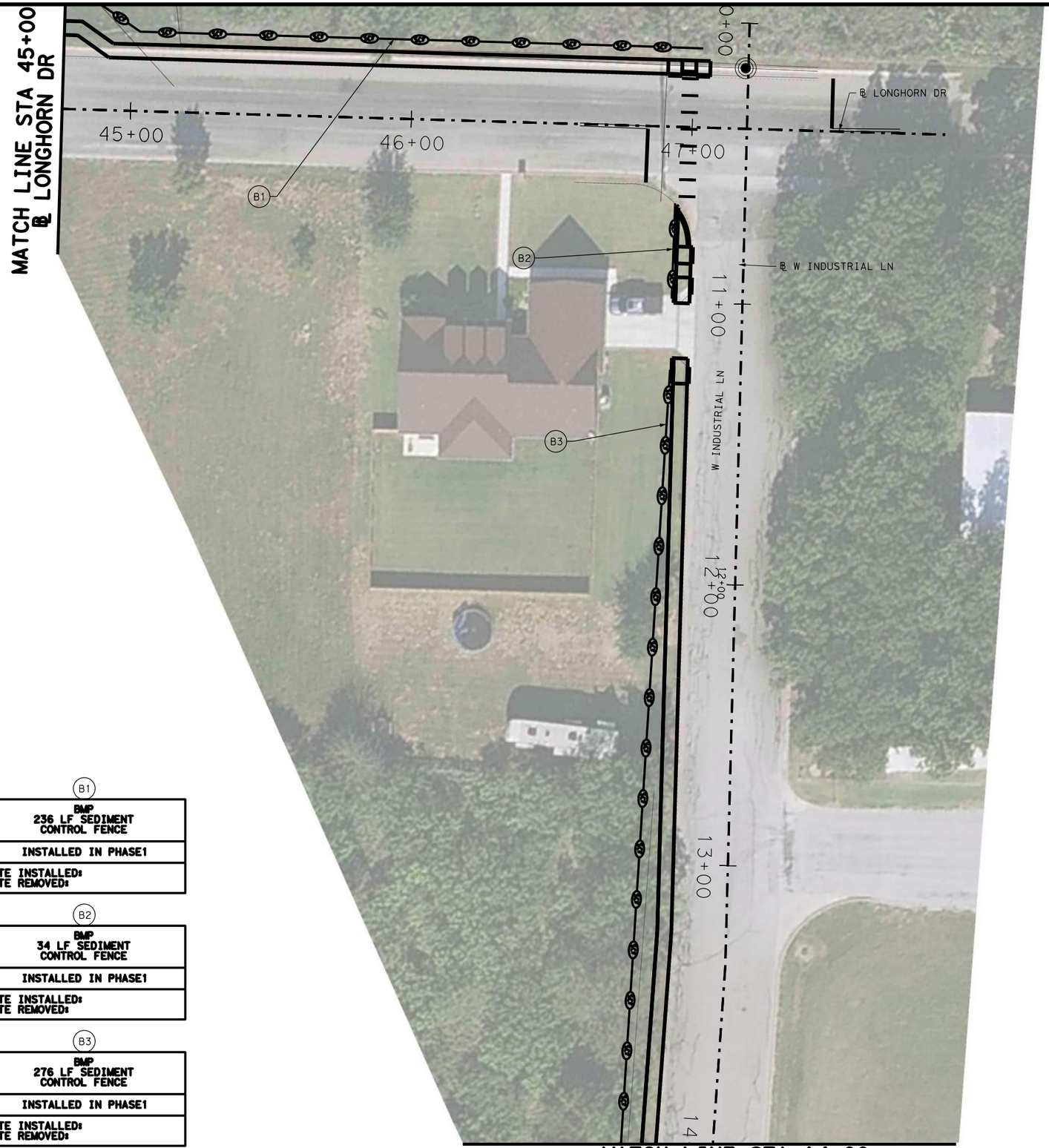
Texas Department of Transportation

SW3P
LONGHORN DR

SHEET 12 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		89

DATE: 18-SEP-2023 13:23
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_012.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

NOTES:

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B1

BMP
236 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

B2

BMP
34 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

B3

BMP
276 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

STATE OF TEXAS
ERICK A. RAMIREZ
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09/18/2023

CITY OF EARLY

VOLKERT

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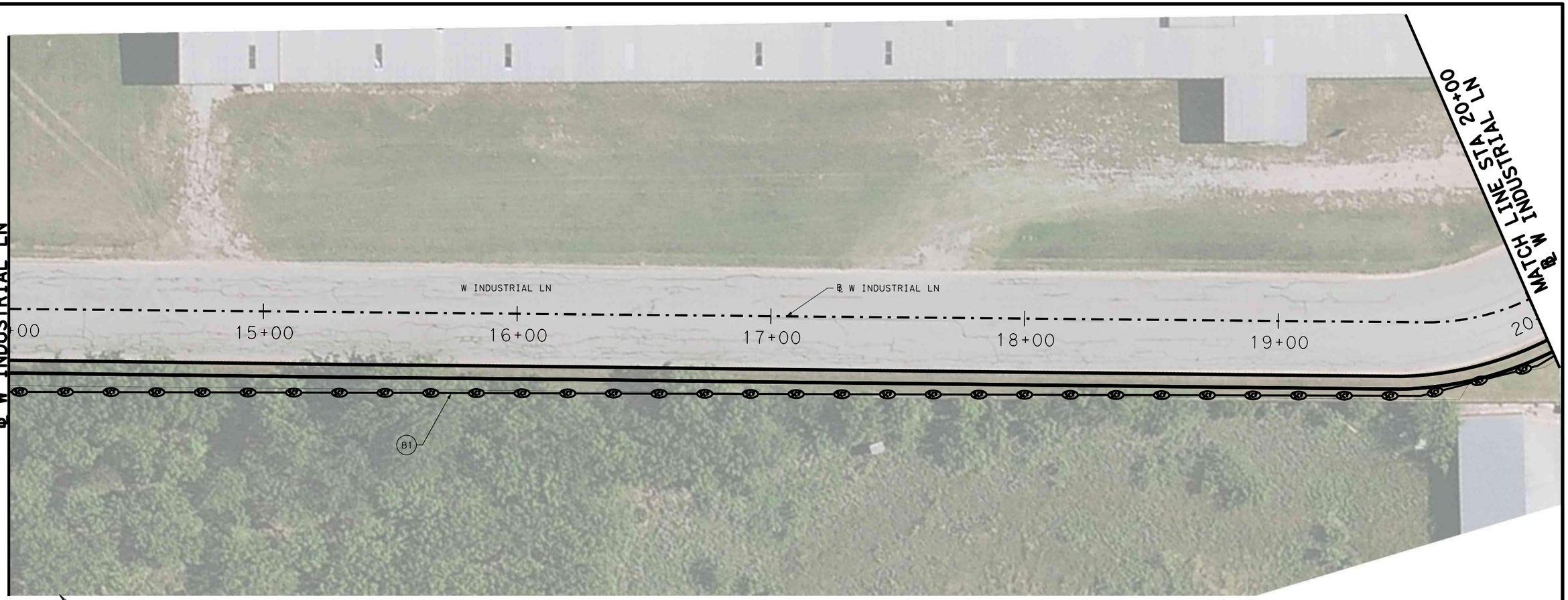
SW3P
LONGHORN DR
AT W INDUSTRIAL

SHEET 13 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		90

DATE: 18-SEP-2023 13:21
FILE: Projects\163608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_013.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

B1

BMP
612 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED:
DATE REMOVED:

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED PROFESSIONAL ENGINEER

09/18/2023

NOTES:

1. EXISTING STORM SEWER INLETS SHALL BE SUFFICIENTLY PROTECTED UNTIL NEW SEWER SYSTEM IS PLACED IN SERVICE AND EXISITNG FACILITIES HAVE BEEN DECOMMISSIONED.
2. BMP'S TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED 2 WEEKS (MAX) PRIOR TO SOIL DISTURBANCE.
3. SWPPP QUANTITIES ARE BEING INCREASED BY 10% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO DAMAGE OR DIFFERING SITE CONDITIONS.

CITY OF EARLY

VOLKERT

F-12679

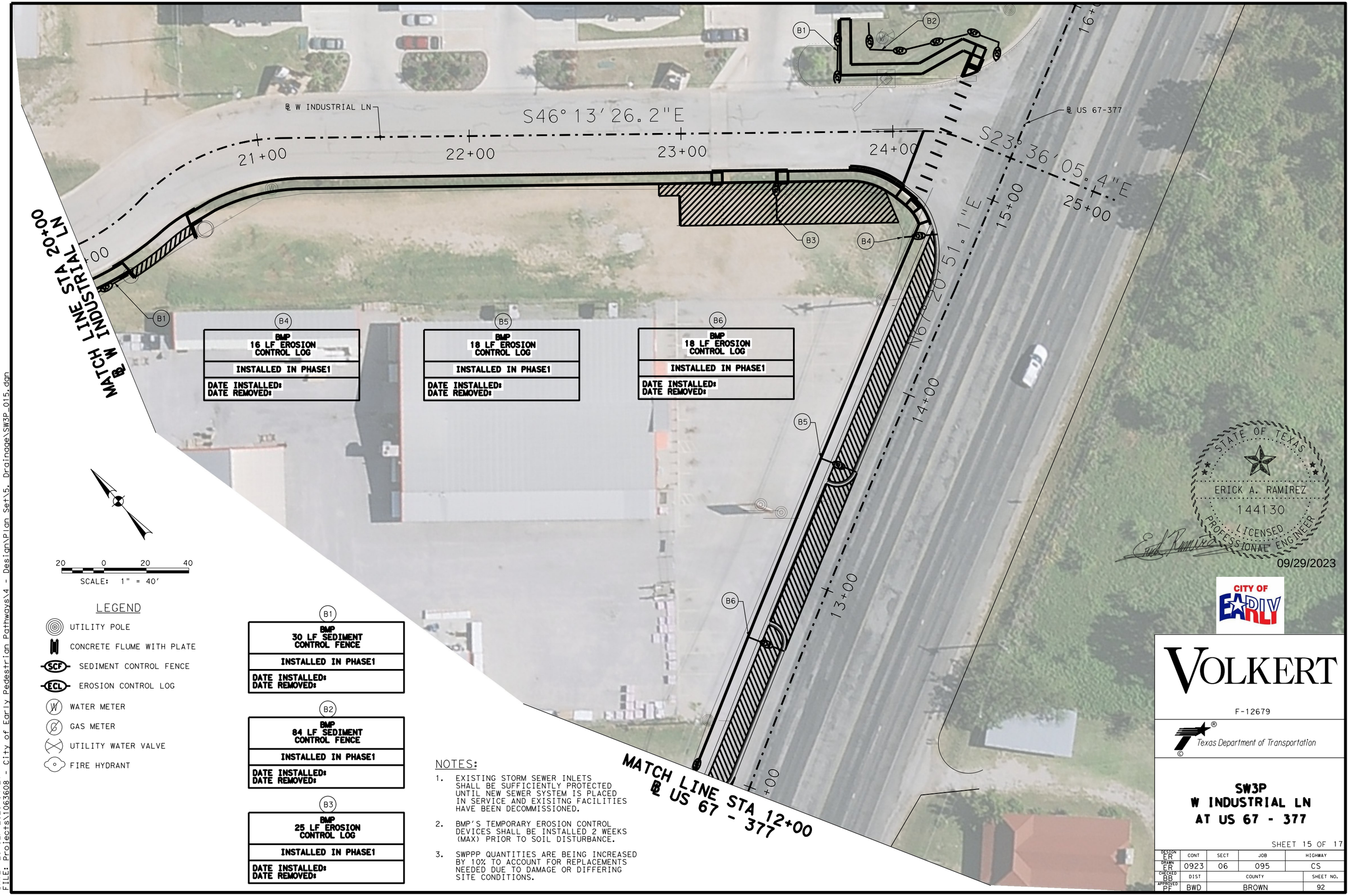
Texas Department of Transportation

SW3P
W INDUSTRIAL LN

SHEET 14 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER	DIST	COUNTY		SHEET NO.
CHECKED BB	BWD	BROWN		91
APPROVED PF				

DATE: 18-SEP-2023 13:21
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_014.dgn



20 0 20 40

SCALE: 1" = 40′

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

B1
BMP
30 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED:
DATE REMOVED:

B2
BMP
84 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED:
DATE REMOVED:

B3
BMP
25 LF EROSION CONTROL LOG
INSTALLED IN PHASE1
DATE INSTALLED:
DATE REMOVED:

NOTES:

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STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED PROFESSIONAL ENGINEER
09/29/2023

CITY OF EARLY

VOLKERT

F-12679

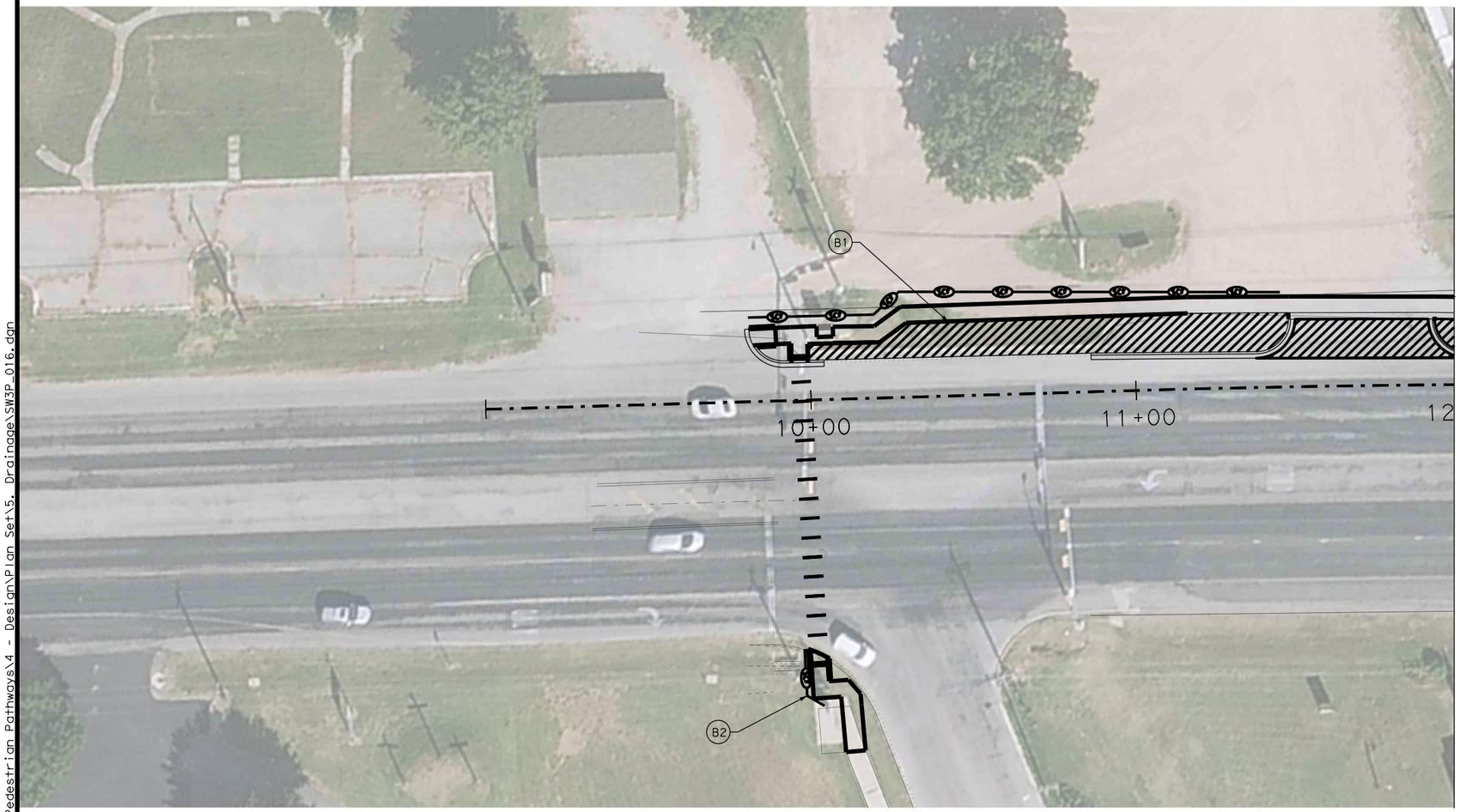
Texas Department of Transportation

SW3P
W INDUSTRIAL LN
AT US 67 - 377

SHEET 15 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		92

DATE: 29-SEP-2023 04:21
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - DesignPlan Set\5. Drainage\SW3P_015.dgn



MATCH LINE STA 12+00
@ US 67 - 377

20 0 20 40
SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- G — GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

NOTES:

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B1
BMP 88 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

B2
BMP 21 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER
09/18/2023

CITY OF EARLY

VOLKERT
F-12679

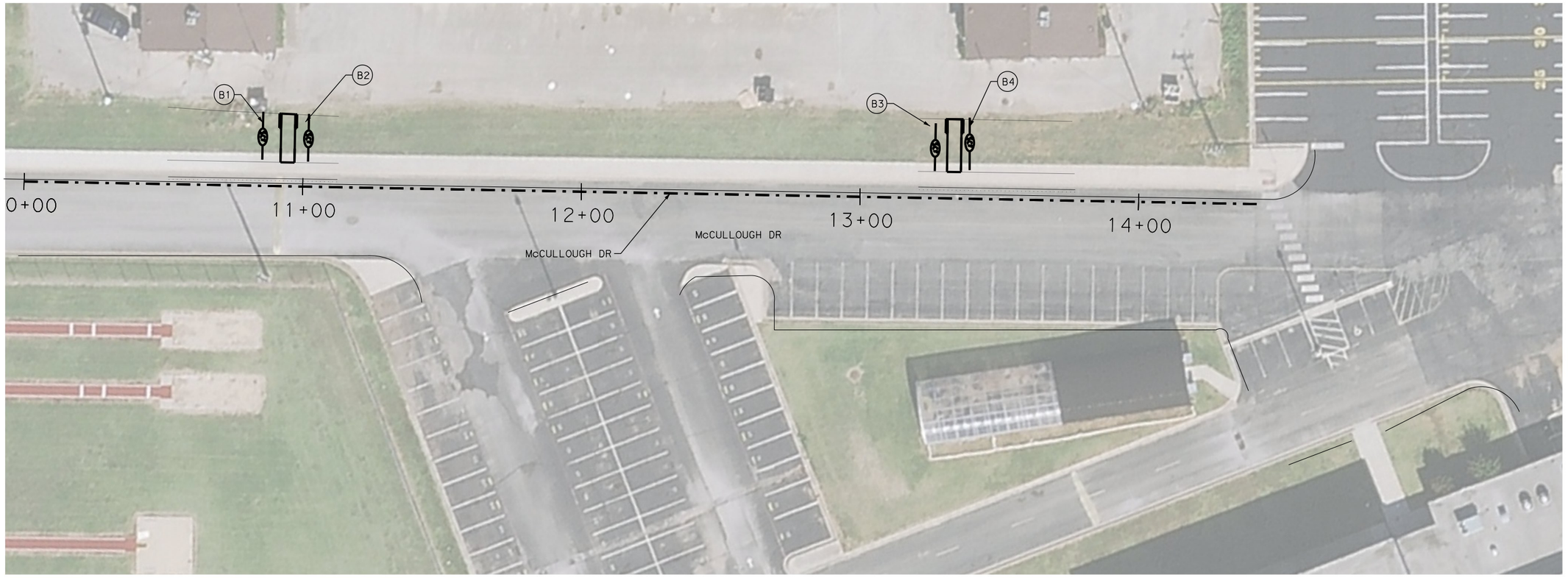
Texas Department of Transportation

SW3P
US 67 - 377

SHEET 16 OF 17

DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER	DIST	COUNTY		SHEET NO.
CHECKED BB	BWD	BROWN		93
APPROVED PF				

DATE: 18-SEP-2023 13:22
FILE: Projects\106608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_016.dgn



20 0 20 40

SCALE: 1" = 40'

LEGEND

- UTILITY POLE
- CONCRETE FLUME WITH PLATE
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG
- W — WATER METER
- GAS METER
- UTILITY WATER VALVE
- FIRE HYDRANT

B1	B2	B3	B4
BMP 18 LF SEDIMENT CONTROL FENCE	BMP 18 LF SEDIMENT CONTROL FENCE	BMP 19 LF SEDIMENT CONTROL FENCE	BMP 19 LF SEDIMENT CONTROL FENCE
INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1	INSTALLED IN PHASE1
DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:	DATE INSTALLED: DATE REMOVED:

STATE OF TEXAS
ERICK A. RAMIREZ
144130
LICENSED
PROFESSIONAL ENGINEER

09/29/2023

NOTES:

1. EXISTING STORM SEWER INLETS SHALL BE SUFFICIENTLY PROTECTED UNTIL NEW SEWER SYSTEM IS PLACED IN SERVICE AND EXISITNG FACILITIES HAVE BEEN DECOMMISSIONED.
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3. SWPPP QUANTITIES ARE BEING INCREASED BY 10% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO DAMAGE OR DIFFERING SITE CONDITIONS.

CITY OF EARLY

VOLKERT

F-12679

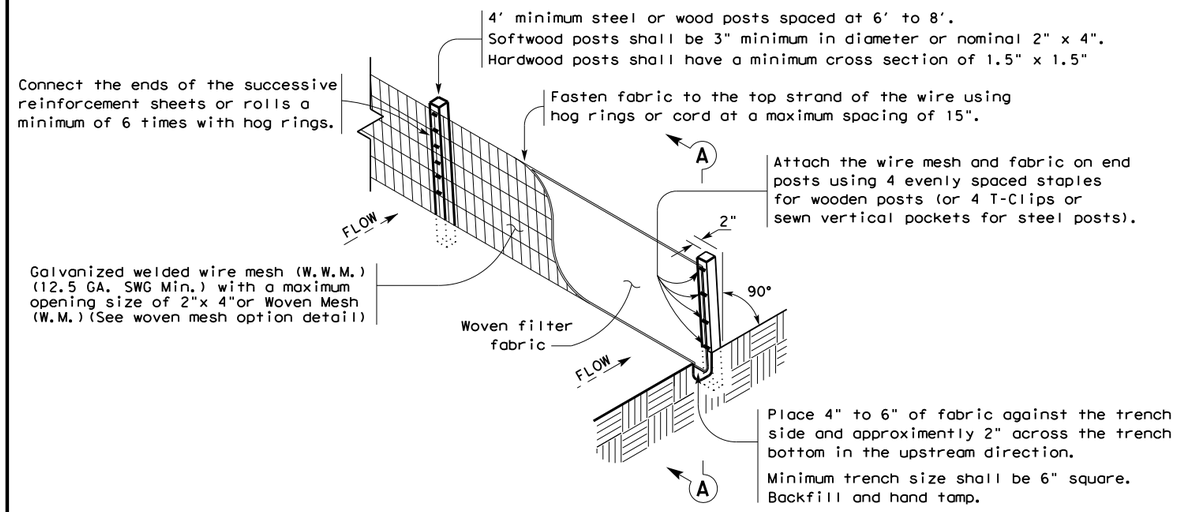
Texas Department of Transportation

SW3P
MCCULLOUGH

SHEET 17 OF 17

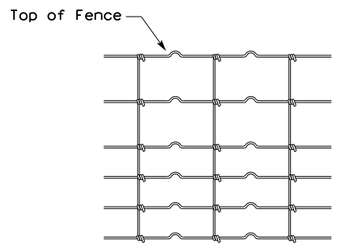
DESIGN	CONT	SECT	JOB	HIGHWAY
ER	0923	06	095	CS
DRAWN ER				
CHECKED BB	DIST	COUNTY		SHEET NO.
APPROVED PF	BWD	BROWN		94

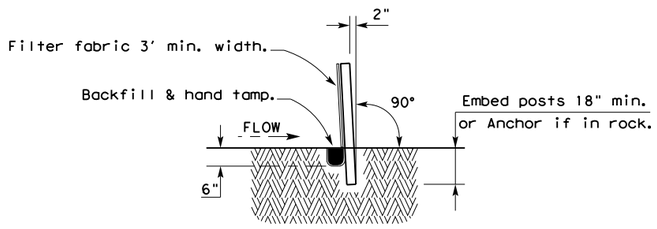
DATE: 29-SEP-2023 04:19
FILE: Projects\1063608 - City of Early Pedestrian Pathways\4 - Design\Plan Set\5. Drainage\SW3P_017.dgn



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.

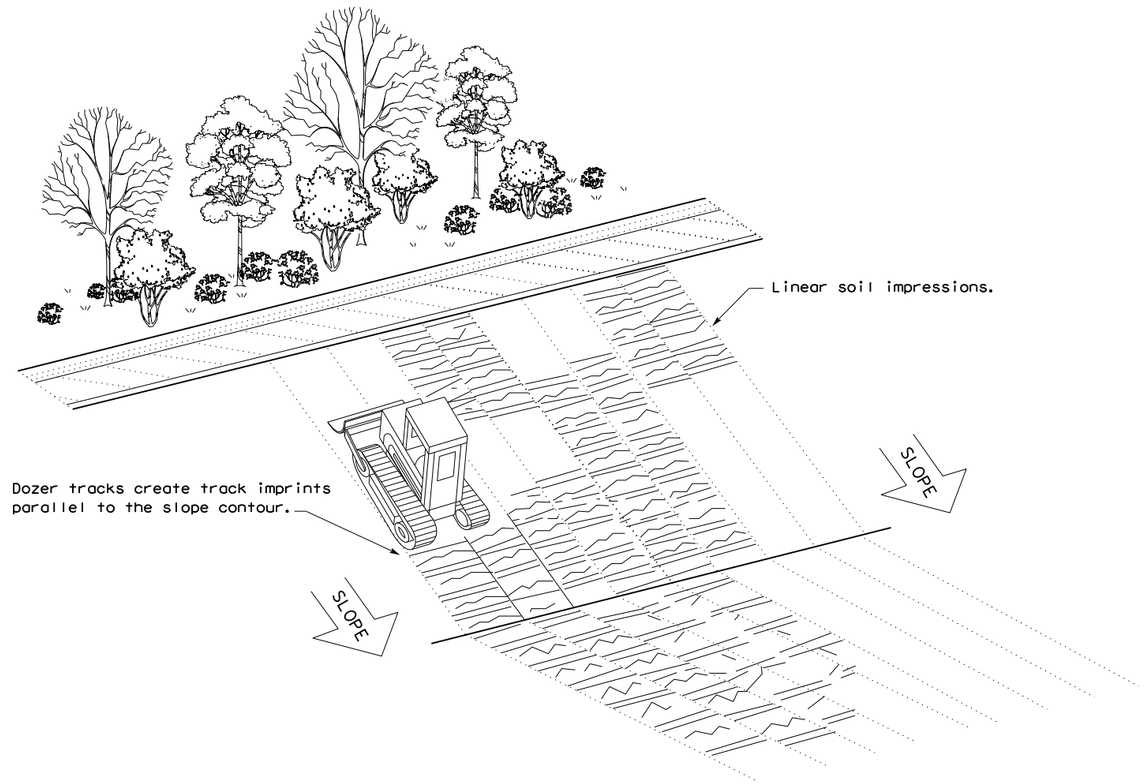
LEGEND

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

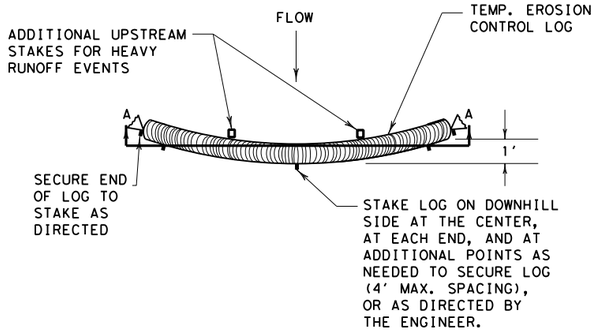
FENCE & VERTICAL TRACKING

EC(1)-16

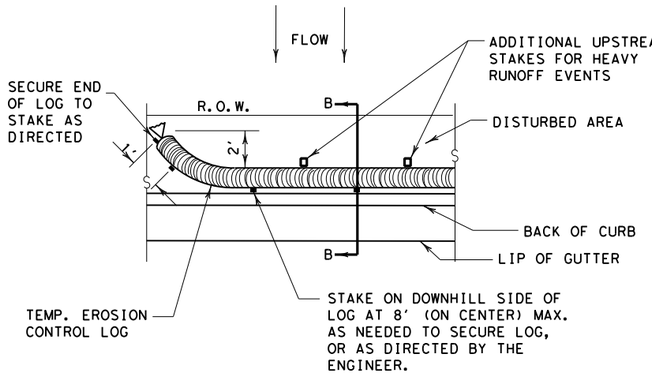
FILE: ec116	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0923	06	095		CS	
	DIST	COUNTY			SHEET NO.	
	BWD	BROWN			95	

DATE
FILE

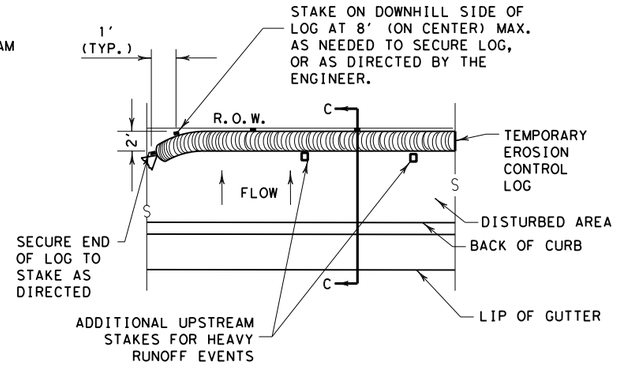
DATE:
FILE:



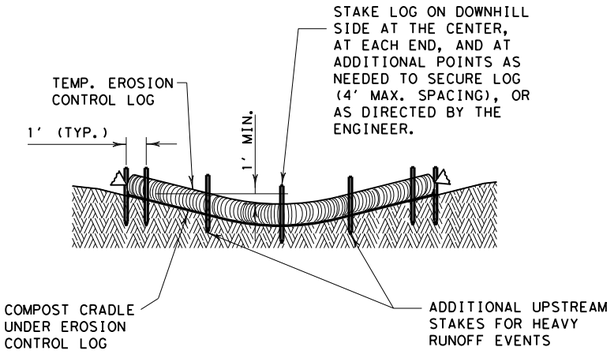
PLAN VIEW



PLAN VIEW



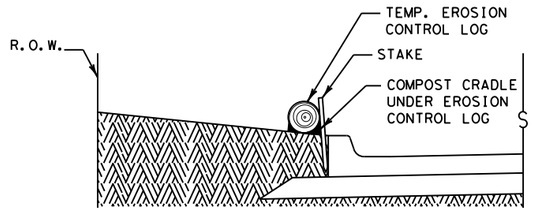
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

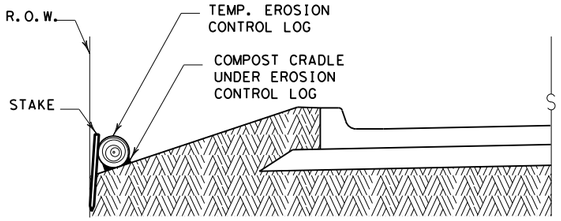
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

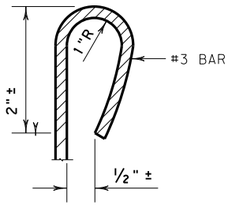
CL-BOC



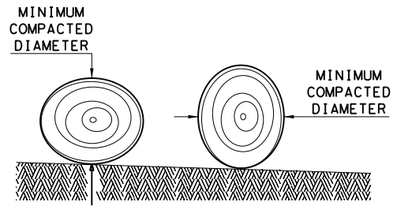
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

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.

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

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

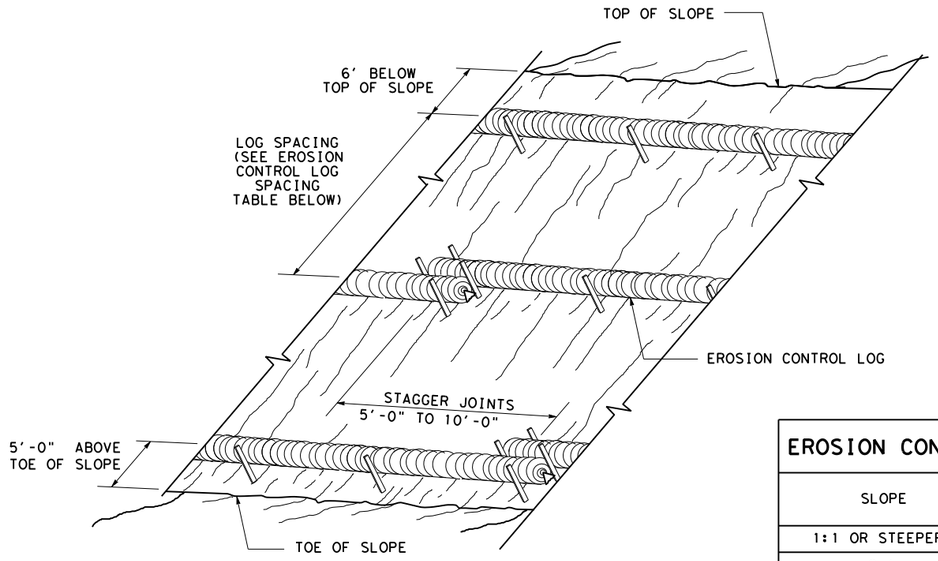
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

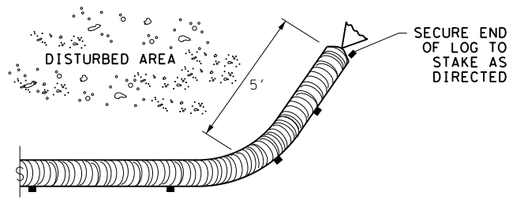
FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0923	06	095		(CS)		
	DIST	COUNTY					SHEET NO.
	BWD	BROWN					96

DATE:
FILE:



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

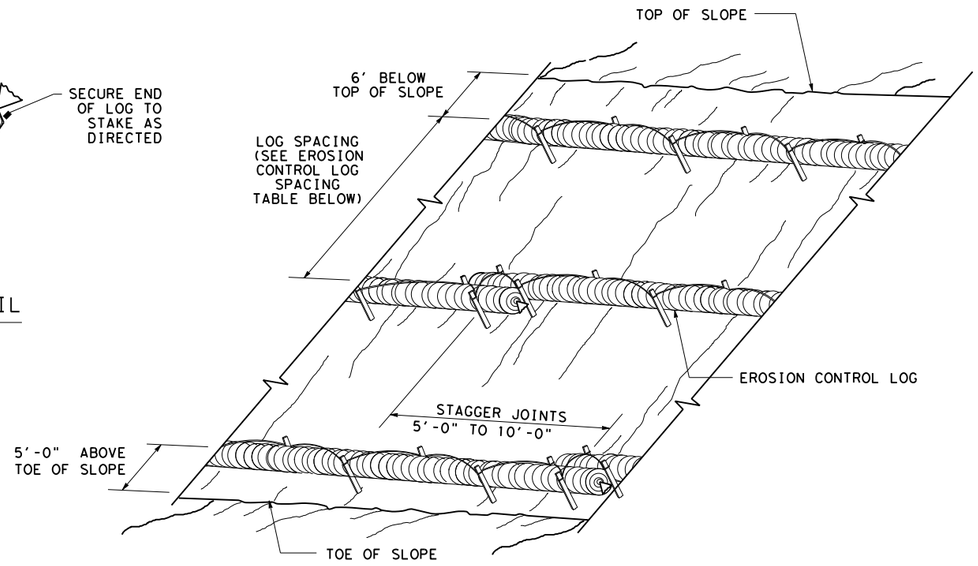
CL-SST



END SECTION RAP DETAIL

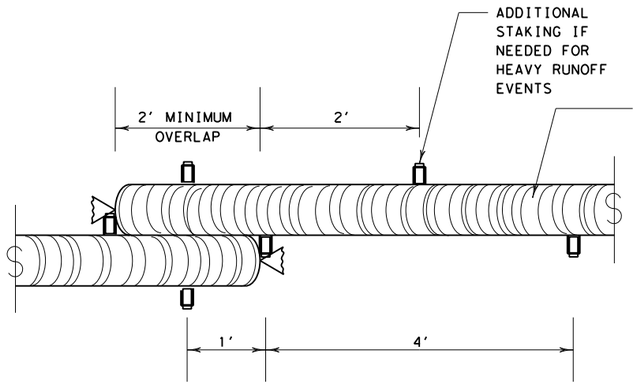
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

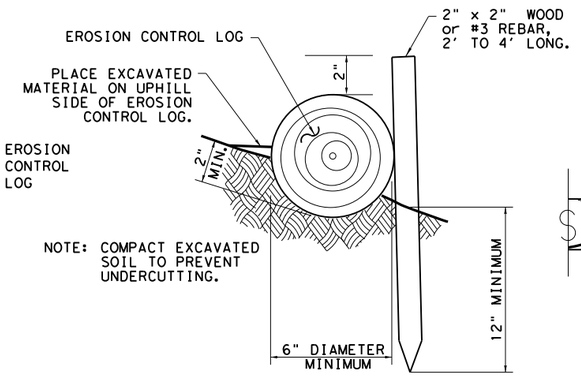
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

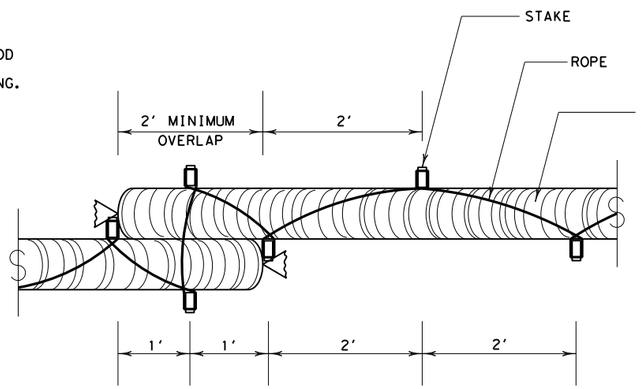


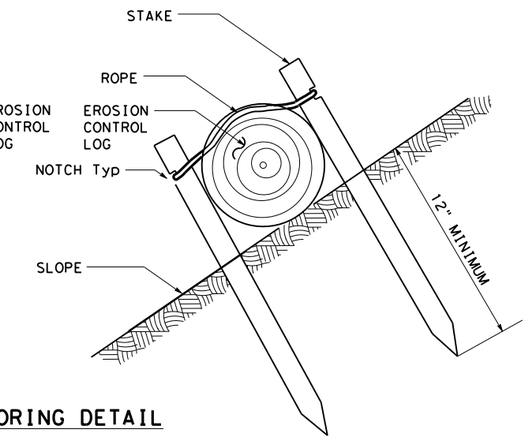


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

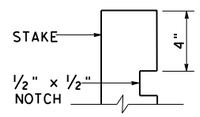
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



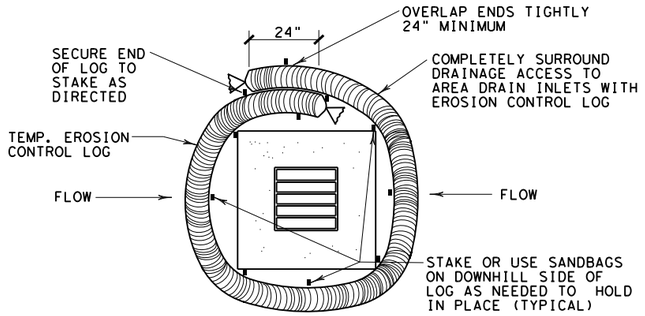
STAKE NOTCH DETAIL

Texas Department of Transportation

Design Division Standard

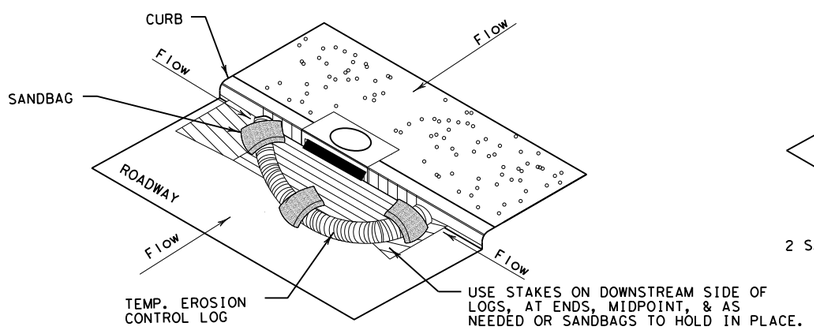
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0923	06	095	(CS)	
	DIST	COUNTY		SHEET NO.	
	BWD	BROWN		97	



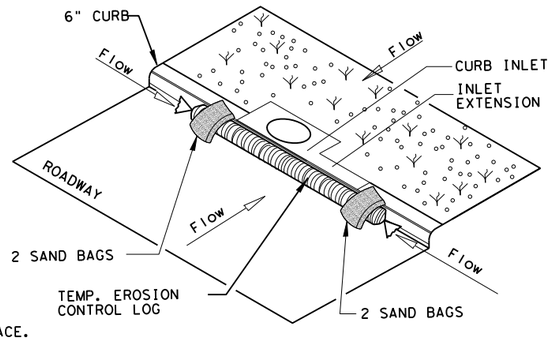
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

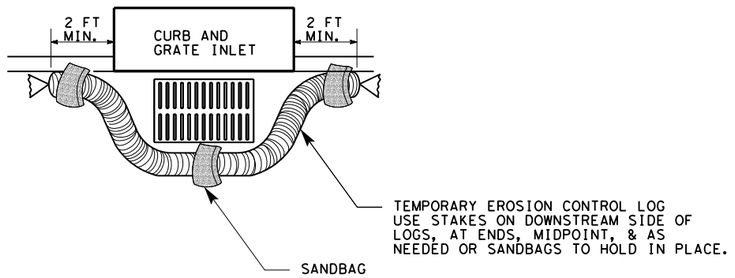
CL-CI



EROSION CONTROL LOG AT CURB INLET

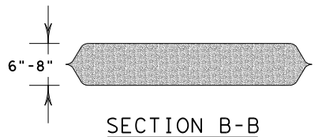
CL-CI

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.

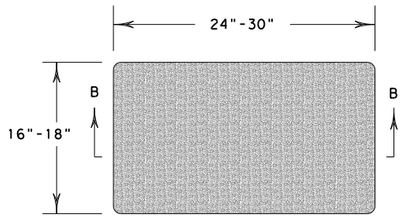


EROSION CONTROL LOG AT CURB & GRADE INLET

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	0923	06	095		(CS)		
	DIST	COUNTY				SHEET NO.	
	BWD	BROWN				98	

DATE:
FILE: