SEE SHEET 2 FOR INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

FHWA TEXAS DIVISION	FEDERAL PROJECT NO.		SHEET NO.
	F 2022(895)		1
STATE	DISTRICT	COUNTY	
TEXAS	LFK	ANGELINA	
CONTROL	SECTION	JOB	HIGHWAY NO.
0176	02	125, ETC.	BU 59G

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENTS

DESIGN SPEED = N/A
ADT = N/A

PROJECT NO. F 2022(895)

BU 59G
ANGELINA COUNTY

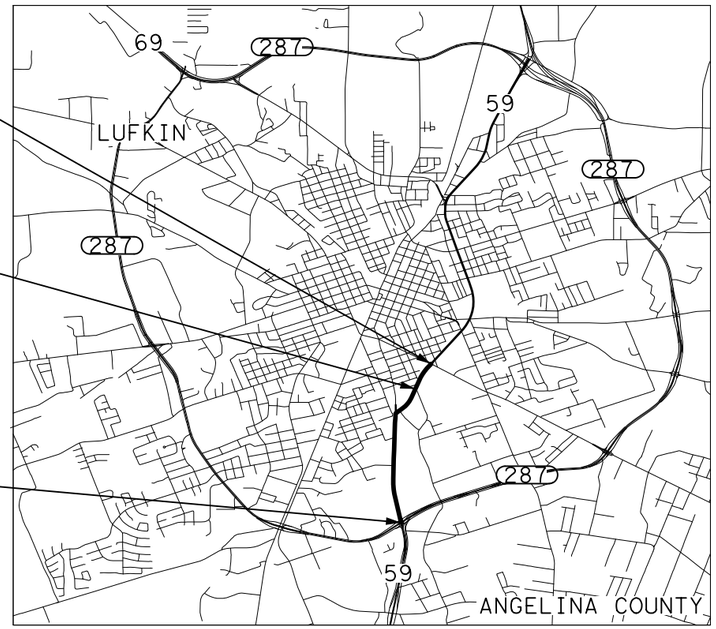
NET LENGTH OF PROJECT : 7,850.00 FT = 1.49 MILES
LIMITS: SS 278 TO JUST N OF TULANE DRIVE, ETC

FOR THE CONSTRUCTION OF SAFETY IMPROVEMENT PROJECTS
CONSISTING OF INSTALL SIDEWALK-LFK ROAD TO ZERO PROJECT-RTZ

BEGIN PROJECT
END CSJ:
0176-02-125
STA: 84+45.18
REF MRK: 388+1.090
LAT: 31°19′49.45"N
LONG: 94°43′22.08"W

END CSJ:
0176-03-138
BEGIN CSJ:
0176-02-125
STA: 71+00
REF MRK: 388+1.344
LAT: 31°19′38.01"N
LONG: 94°43′29.30"W

END PROJECT
BEGIN CSJ:
0176-03-138
STA: 5+22.36
REF MRK: 390+0.556
LAT: 31°18′37.60"N
LONG: 94°43′37.87"W



SCALE: 1" = 50,000′

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 _____

REGISTERED ACCESSIBILITY SPECIALIST (RAS) INSPECTION REQUIRED

TDLR NO. TABS 202201746

BARRICADES AND WARNING SIGNS

PROVIDE AND ERECT BARRICADES AND WARNING SIGNS IN ACCORDANCE WITH THE BARRICADE & CONSTRUCTION STANDARDS, TCP STANDARDS, THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND AS DIRECTED.

RECOMMENDED FOR LETTING: 5/26/2022
APPROVED FOR LETTING: 5/26/2022

DocuSigned by: _____ P.E.
AF852E728AEC4C0...
DISTRICT DESIGN ENGINEER

DocuSigned by: Kelly O. Morris, P.E.
F044211639424B4...
DISTRICT ENGINEER

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 CONTRACTS (FORM FHWA 1273, MAY 2012).

"NO EXCEPTIONS, NO EQUATIONS, NO RAILROAD CROSSING"

FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\01 General\LFK*COVER.dgn
DATE: 5/25/2022 1:34:22 PM

SHEET NO.	DESCRIPTION
	GENERAL
1	TITLE SHEET
2	INDEX OF SHEETS
3-4	PROJECT LAYOUT
5, 5A-5F	GENERAL NOTES
6-7	TYPICAL SECTIONS
8, 8A-8B	ESTIMATE & QUANTITY SHEET
9-12	QUANTITY SUMMARY
13	SUMMARY OF SMALL SIGNS
	TRAFFIC CONTROL PLAN
14	TRAFFIC CONTROL NARRATIVE
15	TRAFFIC CONTROL PLAN FOR RAIL RETROFIT AT HURRICANE CREEK
#16-27	BC(1)-21 THRU BC(12)-21
#28-29	LPCB-13
#30	TCP(1-1)-18
#31	TCP(1-4)-18
#32	TCP(2-5)-18
#33	WZ(BRK)-13
#34	WZ(BTS-1)-13
#35	WZ(BTS-2)-13
#36	WZ(RS)-22
	ROADWAY DETAILS
37-38	SURVEY CONTROL INDEX SHEET
39-40	HORIZONTAL & VERTICAL CONTROL SHEET
41-44	HORIZONTAL ALIGNMENT DATA
45-58	SIDEWALK PLAN & PROFILE
59	DRIVEWAY DETAILS
60-61	DRIVEWAY TABLE
62	MISCELLANEOUS DETAILS
#63	CCCG-21
#64-67	PED-18
#68	GF(31)-19
#69	GF(31)DAT-19
#70	MBGF(TR)-19
#70A-70B	GF(31)TR TL3-20
#71	GF(31)MS-19
#72	MBGF(SR)-19
#73	BED-14
74	SIDEWALK BRIDGE
	BRIDGE ITEMS
75	RAIL RETROFIT HURRICANE CREEK BRIDGE
76	TYPICAL SECTION HURRICANE CREEK BRIDGE
77	C-RAIL-R (MOD)
78-79	TYPE PR11 (MOD)
80	TRF (MOD)
#81-84	TYPE C402
	TRAFFIC ITEMS
85-86	PEDESTRIAN SIGNAL LAYOUT
#87	PEDESTRIAN SIGNAL DETAILS (LUFKIN DISTRICT STANDARD)
#88	TYPICAL PAVEMENT MARKING DETAILS (LUFKIN DISTRICT STANDARD)
#89	PM(1)-20
#90	SMD(GEN)-08
#91	SMD(SLIP-1)-08
#92	SMD(SLIP-2)-08
#93	SMD(TWT)-08
#94	TS-FD-12
	ENVIRONMENTAL ISSUES
95	EPIC
96	TXDOT SWP3 INDEX
97-103	SWP3 LAYOUT
#104	EC(1)-16
#105-107	EC(9)-16

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/27/2022

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THIS SHEET WITH A "#" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

, P.E. 5/27/2022
MORT T. TASHOOR PE DATE

Rev. No.	C.O. No.	Description	Date	By

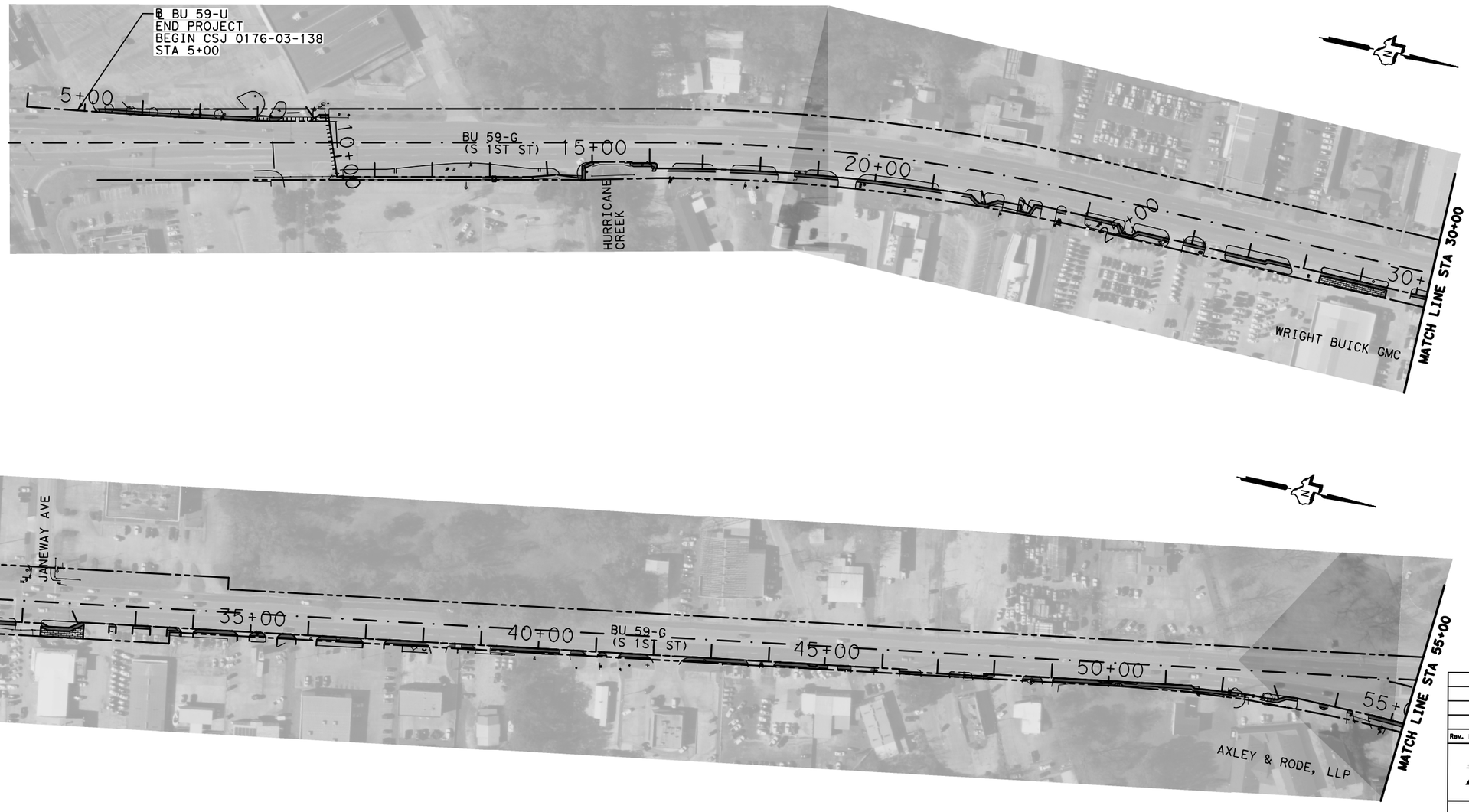
Texas Department of Transportation

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

INDEX OF SHEETS

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	2
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

DRAWING DATE: 5/27/2022 FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\01 General\LFK*INDEX*OF*SHEETS.dgn



0′ 100′ 200′

SCALE IN FEET

LEGEND:

EXIST R.O.W.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

PROJECT LAYOUT
(BEGIN PROJECT TO STA 55+00)

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	3
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\01 General\BU59*PROJECT LAYOUT*01.dgn

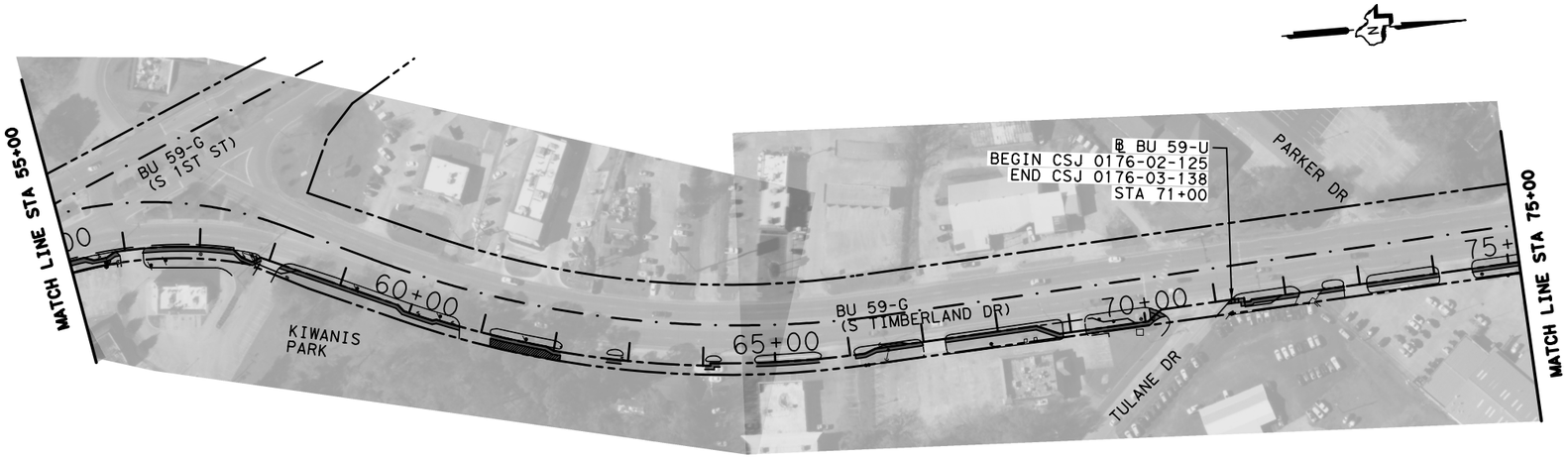
DRAWING DATE: 5/25/2022

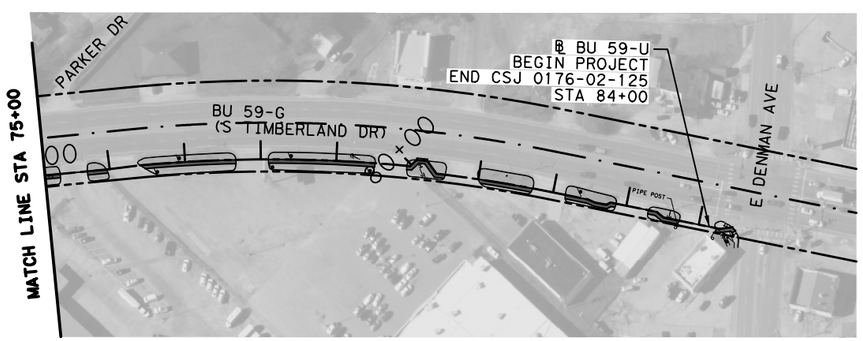
0′ 100′ 200′

SCALE IN FEET

LEGEND:

——– – —— EXIST R.O.W.





STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

PROJECT LAYOUT
(STA 55+00 TO END PROJECT)

SHEET 2 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	4
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

GENERAL NOTES:

The following standard detail sheets have been modified.

C-RAIL-R(MOD)

TYPE PR11(MOD)

TRF (MOD)

Existing regulatory, warning and guide signs within project limits are to remain visible to the traveling public at all times. If a sign must be repositioned during construction operations, move and install the sign to an approved location. Use care when working near existing signs and repair or replace signs damaged by work operations. All work involved repositioning existing signs will be subsidiary to various bid items.

Furnish materials and make repairs to the existing roadway at any location damaged by construction operations. This work shall be done in an approved manner and will be subsidiary to various bid items.

Ensure drainage structures and outfall channels constructed on this project are free of silt and debris at the time of project acceptance. Final clean out work will be subsidiary to various bid items.

Maintain adequate surface drainage throughout the project limits during all phases of construction.

Roadway cross slopes shall conform approximately to the existing surface, unless otherwise directed.

Provide suitable access at all times to adjacent businesses, private property and side roads.

When construction work necessitates the moving of mailboxes, temporarily relocate them as necessary to keep them clear of construction operations and convenient for the mail carrier. Mounts for temporarily relocating mailboxes shall conform to the Department's "Compliant Work Zone Traffic Control Device List" or the mailbox standard. Temporary relocation of mailboxes will be subsidiary to various bid items.

Remove dirt, silt, rocks, debris and other foreign matter that accumulates in structures due to the Contractor's operations as directed. Keep stream channels open at all times. This work will not be paid for directly, but will be subsidiary to pertinent Items.

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

Jesse Sisco. Area Engineer Jesse.Sisco@txdot.gov
Praveen Ramanathan, Asst. Area Engineer Praveen.Ramanathan@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals.

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:
https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/
All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

The contractor's attention is directed to the EPIC sheet(s) included in this plan set for additional information regarding environmental permits, issues, and commitments.

Project Mowing

Mow at locations where contract work, equipment or stockpiles conflict with TxDOT's mowing operations. Mowing will not be measured or paid for directly, but will be subsidiary to various bid items.

Litter Pickup

In addition to the requirements in Item 5, Section 11, Final Cleanup; remove litter from the right of way at locations where the Contractor may be required to mow. Litter pickup will not be measured or paid for directly, but will be subsidiary to various bid items.

The equipment used for litter pickup shall be approved.

Collect and dispose of all litter deposited by construction operations or the traveling public including cans, bottles, paper, plastic items, metal scraps, lumber, etc. from within the project right of way or as directed. Properly dispose of all collected litter. Do not dump or stockpile collected litter on State property.

For removal of large dead animals, contact nearest TxDOT maintenance section for disposal instructions. Do not bury animal carcasses on State property.

Item 5: Control of the Work

There are several existing sewer manholes within the right of way. Work around them with care to prevent damage to the sewer system.

In the event utility lines needing unforeseen adjustments are encountered during construction operations, alter operations and continue to prosecute the contract in such a manner that will allow utility adjustments to be made by others. An extension of working time may be granted for any delays caused by the utility adjustments if deemed necessary.

Electronic files (pdf only) containing cross-sections will be available upon request.

Texas Department of Licensing and Regulation (TDLR) will perform an inspection of sidewalks, pedestrian ramps and other pedestrian facilities upon completion of the project to verify conformance with Texas Accessibility Standards. Deficiencies found by TDLR shall be corrected as directed.

Precast Alternate Proposals.
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 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 7: Legal Relations and Responsibilities

No significant traffic generator events identified.

This project has a soil disturbance of 1 acre or more but less than 5 acres.

The Department will be considered a primary operator for Operational Control over Plans and Specifications as defined in TPDES GP TXR 150000 for construction activity in the right of way. The Department will post a small site notice along with other requirements as defined in TPDES GP TXR 150000 as the entity of having operational control over plans and specifications for work shown on the plans in the right of way.

The Contractor will be considered a Primary Operator for Day-to-Day Operational Control as defined in TPDES GP TXR 150000 for construction activity in the right of way. In addition to the Department's actions, the Contractor will post a small site notice along with other requirements as defined in TPDES GP TXR 150000 as the entity of having day-to-day operational control of the work shown on the plans in the right of way. This is in addition to the Contractor being responsible for TPDES GP TXR 150000 requirements for on- right of way and off- right of way PSL's. Adhere to all requirements of the SWP3 as shown on the plans. The Contractor will be responsible for Implement of the SWP3 for the project site in accordance with the plans and specifications, TPDES General Permit TXR150000, and as directed.

Dispose of all vegetative matter and any other materials removed from State Right of Way in accordance with applicable environmental laws, rules, regulations and requirements.

In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife Code and Migratory Bird Treaty Act (MBTA), construction activities that may affect nests (i.e. tree removal, tree limbing, bridge work) shall be conducted outside of the nesting season (March 15-Sept.15). In the event birds or active nests (i.e. eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work.

Burning locations must be approved by the Engineer prior to beginning. Burning activities must be conducted in compliance with Texas Commission on Environmental Quality (TCEQ) regulations. Notify the Engineer when burning activities will take place.

Kiwanis Park is adjacent to the project area located approximately between stations STA 58+00 and STA 63+00. No stockpiling of materials or storage of equipment within these limits or areas designated or labeled Kiwanis Park.

Item 8: Prosecution and Progress

For this project, working days will be computed and charged in accordance with Item 8, Section 3.1.4 "Standard Workweek".

Submit monthly progress schedules no later than the 20th calendar day of the month. Failure to comply with this deadline may result in the Engineer withholding progress (monthly) payments.

The maximum number of days the time charges on this contract may be suspended due to contractor mobilization, and material fabrication/accumulation or processing delays is 90 days. The Engineer and the Contractor may mutually agree, in writing, to decrease this maximum number of days.

Item 100: Preparing Right of Way

The equipment used to trim limbs shall be approved. A boom axe will not be allowed.

Item 105: Removing Treated and Untreated Base and Asphalt Pavement

Material removed by this operation will become the property of the Contractor.

Item 110: Excavation
Item 132: Embankment

Hauling materials with scrapers across or along existing roadways will not be permitted without written permission.

Drying of material deeper than 6 inches below subgrade elevations will not be permitted without written permission.

Grading required for shaping driveways and side road turnouts for pipe culverts at all access locations, will be subsidiary to various bid items.

All blading, rolling, and scraper work to construct and remove temporary slopes adjacent to pavement drop-offs, will be subsidiary to various bid items.

Compact embankment material used to reshape existing slopes to a density comparable with adjacent undisturbed material to the satisfaction of the Engineer.

Specification Data			
Description	**Soil Constants**		
	Max LL	**Max PI**	**Min PI**
Embankment (Type C)	40	20	5

Item 158: Specialized Excavation Work

Use specialized excavation work at structures to improve drainage as directed.

Item 162: Sodding for Erosion Control

Provide Bermuda block sod unless St. Augustine is the prevailing grass cover at particular placement locations. Provide St. Augustine block sod at those locations.

Item 166: Fertilizer

Fertilize all seeded or sodded areas.

Item 168: Vegetative Watering

Equip water trucks with sprinkler systems capable of watering all of the entire seeded or sodded areas from the roadway.

Water all newly placed sodded or seeded areas at the time of installation. Thereafter, maintain the sodded or seeded areas in a well-watered condition, at no time allow the areas to dry to a condition where water stress is evident.

Item 400: Excavation and Backfill for Structures

When cutting an existing roadway open to traffic, complete all operations including structural excavation, laying pipe and backfilling within daylight hours the day they are initiated.

Replace excavated material deemed unsuitable for backfilling with material approved by the Engineer, paid for under the pertinent bid items or as extra work. This provision does not apply to excavated materials that are too wet and are replaced for the contractor's convenience to expedite the work.

When excavation does not generate enough material to complete the backfill, additional material must be approved prior to use. Additional material will be subsidiary to various bid items.

Item 421: Hydraulic Cement Concrete

The Engineer will provide curing facilities and strength testing equipment for acceptance testing.

Item 427: Surface Finishes for Concrete

Provide a rub finish for Surface Area I.

Provide the following surface finish for the listed elements: *Sidewalks – Medium broom finish.*

Item 432: Riprap

Welded wire fabric will not be allowed for reinforcing concrete riprap. Reinforcing shall consist of No. 3 or 4 bars meeting the requirements of grade 60 reinforcing steel. Place bars on 12 in. centers in each direction, supported on reinforcing chairs.

Item 451: Retrofit Railing

Materials to be removed will become the property of the Contractor and shall be disposed of in accordance with all State and Federal regulations.

Item 502: Barricades, Signs, and Traffic Handling

Traffic Control Plan (TCP):

Ensure the Contractor's Responsible Person (CRP) or their alternate for Barricades, Signs and Traffic Handling is available at all times and able to receive instructions from the Engineer or authorized Department representative. The CRP shall be a person that is usually at the project site during normal working hours.

For protection of the traveling public, direct traffic through the work area using signs, flaggers and other devices. Required signs are shown in the plans on the Barricade and Construction Standards and Traffic Control Plan Sheets. The latest edition of the "Texas Manual on Uniform Traffic Control Devices" shall also be used as a guide for handling traffic on this project.

Use "Do Not Pass" (R4-1) signs to mark the beginnings of roadway sections where passing is prohibited and use "Pass With Care" (R4-2) signs to mark the beginnings of roadway sections where passing is permitted. Install signs at the time signing for project limits are erected. Sign placement shall be verified and approved.

Furnishing, erecting, relocating and removing temporary speed zone signs is subsidiary to Item 502.

When pavement work begins, use flashing arrow panels and flaggers 24 hr. per day during inclement weather or as directed.

Install "No Center Line" (CW8-12) signs at 2-mile intervals. Install "Loose Gravel" (CW8-7) and "Next XX Miles" (CW7-3aP) signs as directed prior to the start of surface treatment operations.

In general, restrict construction work to single lane widths. Control traffic in accordance with standard drawings WZ(BTS-1) "Traffic Signal Installation Typical Details"; WZ(BTS-2) "Traffic Signal Installation Barricades and Signs"; and, Part VI of the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways". Unless otherwise approved, use an advance warning, flashing arrow panel in addition to the necessary signs, barricades, or other traffic control devices at the work area.

Restrict construction work to single lane widths with only minor disruptions in traffic flow. Lane closures shall conform to the Traffic Control Plan for lane closures as shown in the plans. No overnight closures will be permitted other than at Hurricane Creek per TCP.

Limit lane closures for multilane roads (4 or more lanes) to 2 mi. in length, unless otherwise approved.

Lane closure lengths can exclude the end tapers.

Plan the sequence of work to minimize the time lane closures are in place. Install lane closures only where construction operations are anticipated to start within 1 hr. and limited to the amount of lane that can be reached by the construction activity within 2 hr. unless otherwise approved.

Provide flashing arrow panels to supplement required signs and devices for lane closures.

Provide a pilot car to lead traffic through the work area. The pilot car will not be paid for directly, but will be subsidiary to various bid items. Provide adequate flaggers to protect the traveling public when working on or near a roadway carrying traffic. All flaggers shall wear hardhats and reflective vests.

Install “Be Prepared to Stop” (CW3-4) and “Flagger Ahead” (CW20-7aD) signs when flaggers are present. Position the signs where good visibility and traffic control can be maintained.

Use a flashing arrow board in addition to the required signs to warn motorists of flaggers.

Use additional flaggers at roadway intersections to direct traffic entering the work area, when deemed necessary by the Engineer.

Open all traffic lanes to traffic at the close of work each day other than at Hurricane Creek per TCP.

Provide one high-intensity yellow, rotating dome-light on all equipment such as distributors, spreader boxes, lay-down machines, dump trucks, rollers, backhoes, road graders, loaders, etc. within the work zone. Mount lights high enough to be visible from all directions and operating when the equipment is in the work zone. On all other equipment such as automobiles, trailers, etc. use emergency flashers while within the work zone.

Install vertical panels or drums at 100-ft. spacings where drop-offs or construction work occurs along edges of existing pavement. Unless otherwise authorized, these shall remain in place until final striping.

Install "Slow Down on Wet Road" (CW8-5aT), "Shoulder Drop-Off" (CW8-17), “Uneven Lanes” (CW8-11), “Bump” (CW8-1) and "Soft Shoulder" (CW8-4) signs during construction as directed.

Restrict construction operations so that no drop off along the edge of pavement will remain overnight.

All blading, rolling and scraper work to construct and remove temporary slopes adjacent to pavement drop-offs, will be considered subsidiary to various bid items.

Notify the Engineer prior to placing any materials or equipment on the right of way. Locate equipment, stockpiles or other materials not in use as far as possible from the driving lanes and in no case closer than 30 ft. unless otherwise authorized. Any equipment, stockpiles, or materials placed within 30 ft. of the driving lane must have adequate signs, barricades or other warning devices as approved. As a minimum place an 8 ft. wide TY III Barricade or barrels on the approach side of each site that is within 30 ft. of the driving lane. Use TY III Barricade or barrels for the site similarly on the departure side if the location is within 30 ft. of the opposing traffic lane.

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.

Texas Transportation Code 547.105 authorizes the use of warning lights to promote safety and provides an effective means of gaining the travelling public’s attention as they drive in areas where construction crews are present. In order to influence the public to move over when high risk construction activities are taking place, minimize the utilization of blue warning lights. These lights must be used only while performing work on or near the travel lanes or shoulder where the travelling public encounters construction crews that are not protected by a standard work zone set up such as a lane closure, shoulder closure, or one-way traffic control. Refrain from leaving the warning lights engaged while travelling from one work location to another or while parked on the right of way away from the pavement or a work zone.

Provide an illuminated flagger station when nighttime work is performed.

Install "Stay Alert" (G20-10T) and "OBEY" (R20-3T) signs at the beginning of the construction zone at “T” intersections as directed.

All workers on TxDOT right-of-way shall wear reflective clothing meeting ANSI Class II requirements during the day and ANSI Class III requirements during the night.

Item 506: Temporary Erosion, Sedimentation, and Environmental Controls

Locations and types of BMPs may require adjustments prior to or after placement as directed by the Engineer. Adjustments should be made to ensure BMPs are working effectively and maintain compliance with the Construction General Permit. Notify the Engineer prior to making adjustments. Furnish compost for core material in biodegradable erosion control logs.

Item 528: Colored Textured Concrete and Landscape Pavers

Colored textured concrete shall have brick running pattern, color (22) coral red by Schofield. Contractor to provide 4'x4' concrete sample for color and texture approval. Sample is incidental to pay item.

Welded wire fabric will not be allowed for reinforcing concrete riprap. Reinforcing shall meet the requirements of grade 40 or 60 reinforcing steel. Bar size and spacing is shown in the plans. Bars shall be supported on reinforcing chairs.

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

Concrete curb for the metal beam guard fence transition shall have one No. 3 or No. 4 bar for longitudinal reinforcement. Dowel the curb into the pavement structure using 12 in. long No. 3 or No. 4 bars at 18 in spacing.

Item 530: Intersections, Driveways, and Turnouts

Welded wire fabric will not be allowed for reinforcing concrete driveways. Use reinforcing steel consisting of No. 3 or 4 bars meeting the requirements of grade 60 reinforcing steel. Place bars on 12 in. centers in each direction, supported on reinforcing chairs.

Unless otherwise directed, install 1/2 in. pre-molded expansion joint material between existing concrete and new concrete.

Item 531: Sidewalks

Welded wire fabric will not be allowed for reinforcing sidewalks. Use reinforcing steel consisting of No. 3 bars meeting the requirements of grade 60 reinforcing steel. Place bars on 18 in. centers in each direction, supported on reinforcing chairs.

Unless otherwise directed, install 1/2 in. pre-molded expansion joint material between existing concrete and new concrete.

Construct curb ramps and landings with a minimum depth of 4 inches, unless otherwise shown in the plans.

Item 540: Metal Beam Guard Fence

Use round timber posts.

Use timber post on all metal beam guard fence installations except where steel posts are required. Determine length of steel posts for low fill culvert post mounting in the field to insure proper metal beam guard fence height.

At the close of work each day, protect the ends of metal beam guard fence in an approved manner, so that no blunt ends are exposed to approaching traffic. Plastic drums will be required at these locations.

For existing non-mow strip to remain in place, backfill top 4" in an existing abandoned post hole with HMA and backfill below 4" with suitable earth material. This work will be subsidiary to Item 540.

The removal of existing HMA/Base to place MBGF posts is subsidiary to the various bid items.

Form or core holes and recesses. Percussion drilling is not permitted.

Existing installation removed under this item will not be salvaged. The Contractor shall take possession of all materials and be responsible for proper disposal.

Item 618: Conduit

When conduit is laid in a trench or bored, minimum depth to the top of the conduit shall be 3 ft. Where obstructions prevent laying conduit at this depth, place conduit at the maximum depth possible.

Where a trench for laying conduit is cut through pavement, surfaced shoulder, median or driveway, replace the base and surfacing with similar materials equal in appearance and quality to the original construction. Replacing base and surfacing will be subsidiary to Item 618.

Place conduit under existing pavement by boring unless otherwise directed. Pits for boring shall not be closer than 2 ft. from edge of pavement unless otherwise approved. Water jetting will not be permitted. At the close of work each day, cover all open pits and barricade for safety.

When boring is used for under-pavement conduit installations, maximum allowable overcut shall be 1 in. diameter.

Use of a pneumatically driven device for punching holes beneath pavement (commonly known as a "missile") will not be permitted on this project.

All underground conduit bends of 45° or more in PVC conduit systems, including bends into ground boxes, shall be made with rigid metal conduit. Where rigid metal conduit is exposed at any point and where rigid metal conduit extends into ground boxes, bond the metal conduit to the grounding conduction with grounding type bushings or by other approved UL listed grounding connectors. Rigid metal bends will not be paid for separately but will be incidental to the PVC conduit system.

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

Item 624: Ground Boxes

Location and estimated number of ground boxes are diagrammatic only. The location and number of ground boxes may vary to accommodate field conditions as directed.

Item 644: Small Roadside Sign Assemblies

Install adjacent signs with bottom edges at equal heights.

Sign placement shall be in accordance with the "Sign Crew Field Book" and 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. Stake all sign support locations for verification and approval.

Existing supports shall not be reused, and shall become the property of the Contractor.

Salvage all sign blanks to be removed and deliver the same day to TxDOT's facility at : Angelina County Maintenance Facility, 1410 Kurth Drive, Lufkin, TX 75901.

Place relocated signs as close as feasible to existing signs, unless placement conflicts with the Sign Crew Field Book.

Wrap red retroreflective tape (NGIP Code 801-49-87-1008) around the support post of all STOP, YIELD, and DO NOT ENTER signs. Tape shall be placed approximately 4 feet above the surface of the edge of the roadway adjacent to the sign and shall be wrapped to a height of 12 inches. The tape and the placement of the tape on the sign posts shall be subsidiary to the sign assembly.

Item 682: Vehicle and Pedestrian Signal Heads

Cover all signal heads securely with burlap and keep covered until placed in operation.

Provide necessary mounting hardware to ensure proper mounting of all signal heads.

Provide Articulating Brackets when required.

Alternate signal head mounting hardware may be used when approved.

Mount all signal heads so they hang level and plumb.

Use stainless steel for miscellaneous hardware not otherwise specified unless approved in writing.

Item 684: Traffic Signal Cables

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

Terminate all wiring from each signal head in the terminal block in the pole base where such terminal blocks are provided by the manufacturer. Otherwise, wire runs shall be continuous to the controller.

Furnish a written summary of the wire tests. This summary shall indicate a description of each wire run, length, and test readings for each test procedure. Additional information such as make, model and type of testing equipment used for each test and the name and title of the individual who performed the tests must be included. Certify the test results as being true and correct prior to submission to the Engineer. Upon detection of a failed wire run test, forward documentation of the failed test to the Engineer and replace the wire run.

Item 3076: Dense-Graded Hot-Mix Asphalt

Trial batches may be required whenever the design has not been produced in the previous 12 months. Trial batches will be subsidiary to the bid item.

TX-203 Will be ran on the complete mix and a requires minimum of 45%

No Department-owned RAP is available.

Provide a tack that meets the requirements of Item 300, Table 3A or Table 10A, unless otherwise approved by the engineer. Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed shall be slow enough so that stopping between trucks is not ordinarily required. If, in the opinion of the Engineer, sporadic delivery of material is adversely affecting the HMA placement, the Engineer may require paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

A material transfer vehicle (MTV) will be required for all courses of HMA on this project. An MTV is defined as a self-propelled, wheel-mounted vehicle capable of receiving HMA from the haul trucks separate from the paver. The MTV shall have a minimum storage capacity of approximately 25 tons and shall be equipped with a pivoting discharge conveyor and a means of completely remixing the HMA prior to placement. Add hydrated lime to all HMA mixtures at a minimum rate of 1.0% by weight of the total aggregate, except for those mixtures containing RAP and/or RAS. Mixtures that contain RAP and/or RAS shall be designed at a rate of minimum 0.5 % of lime by weight and the test results will be evaluated by the engineer to determine if lime or a liquid anti-strip additive will be used. The hydrated lime shall meet the requirements of DMS-6350, "Lime and Lime Slurry". The hydrated lime shall be added in accordance with the construction method in Item 301, "Asphalt Antistripping Agents". This lime will be subsidiary to this item.

Cover each load of mixture with waterproof tarpaulins.

Limit uneven pavement to 2 days production.

For HMA placements greater than 2 inches, construct longitudinal joints adjacent to travel ways with a maximum 1 inch vertical edge and an adjacent 3:1 maximum taper.

Along outside pavement edges construct a 3:1 maximum taper or backfill the same day as shown on the plans or as directed.

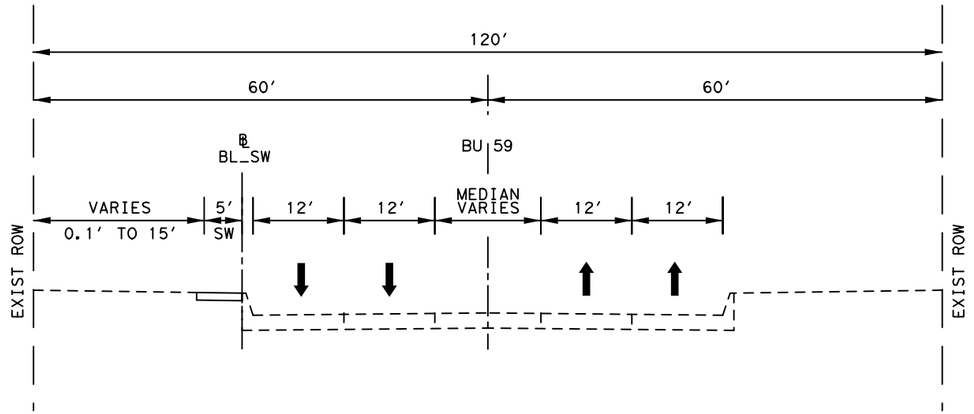
Remove and properly dispose of any piles of asphaltic concrete and all other debris left on the right of way daily.

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

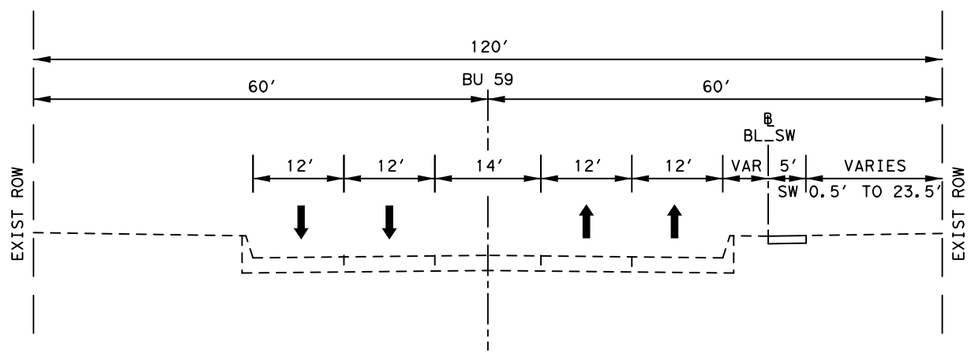
One (1) TMAs (stationary) will be required for this project. The contractor will be responsible for determining if multiple operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

County: ANGELINA **Sheet 5F**

Highway: BU 59-G **Control:** 0176-02-125, etc.



STA 05+00 TO STA 09+00



STA 10+35 TO STA 15+02

EXISTING SIDEWALK TO REMAIN
STA 10+57 TO STA 12+87
STA 13+55 TO STA 14+58

STA 15+60 TO STA 32+06
STA 46+30 TO STA 84+45

HORZ 0′ 10′ 20′

SCALE IN FEET

NOTE:

1. THE TYPICAL SECTIONS PROVIDED HERE ARE APPROXIMATE. FOR EXACT WIDTH AND LOCATION OF SIDEWALK, REFER TO THE PLAN & PROFILE SHEETS.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

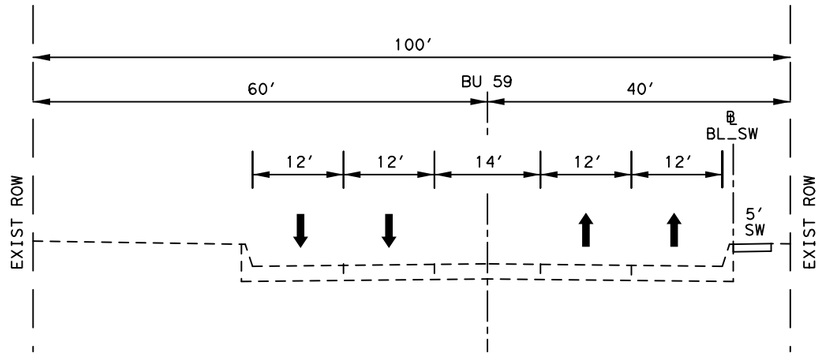
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

TYPICAL SECTIONS

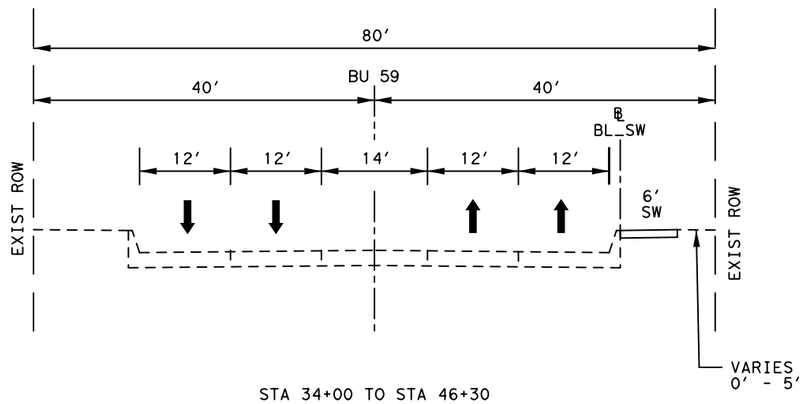
SHEET 1 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	6
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\02 Typical Sections\BU59*TYP*01.dgn
DRAWING DATE: 5/25/2022



STA 32+06 TO STA 34+00



STA 34+00 TO STA 46+30

HORZ 0′ 10′ 20′

SCALE IN FEET

NOTE:

1. THE TYPICAL SECTIONS PROVIDED HERE ARE APPROXIMATE. FOR EXACT WIDTH AND LOCATION OF SIDEWALK, REFER TO THE PLAN & PROFILE SHEETS.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

TYPICAL SECTIONS

SHEET 2 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	7
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\02 Typical Sections\BU59*TYP*02.dgn

DRAWING DATE: 5/25/2022

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0176-02-125 **DISTRICT** Lufkin **COUNTY** Angelina
HIGHWAY BU 59G

				CONTROL SECTION JOB	0176-02-125		0176-03-138		TOTAL EST.	TOTAL FINAL
				PROJECT ID	A00183448		A00183449			
				COUNTY	Angelina		Angelina			
				HIGHWAY	BU 59G		BU 59G			
ALT	BID CODE	DESCRIPTION	UNIT		EST.	FINAL	EST.	FINAL		
	100-6006	PREP ROW (TREE)(LESS THAN 24" DIA)	EA		6.000		13.000		19.000	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY		342.000		1,921.000		2,263.000	
	104-6021	REMOVING CONC (CURB)	LF		101.000		548.000		649.000	
	104-6022	REMOVING CONC (CURB AND GUTTER)	LF		14.000		2,321.000		2,335.000	
	104-6036	REMOVING CONC (SIDEWALK OR RAMP)	SY				49.000		49.000	
	104-6040	REMOVING CONC (PAVERS)	SY				34.000		34.000	
	105-6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY		586.000		1,036.000		1,622.000	
	158-6003	SPEC EXCAV WORK (HYD EXCAVATOR)	HR				20.000		20.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY		327.000		1,204.000		1,531.000	
	162-6002	BLOCK SODDING	SY		327.000		1,204.000		1,531.000	
	164-6011	BROADCAST SEED (TEMP) (COOL)	SY		327.000		1,204.000		1,531.000	
	168-6001	VEGETATIVE WATERING	MG		13.000		48.000		61.000	
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY		5.000		774.000		779.000	
	416-6002	DRILL SHAFT (24 IN)	LF				36.000		36.000	
	420-6066	CL C CONC (RAIL FOUNDATION)	CY				1.400		1.400	
	432-6001	RIPRAP (CONC)(4 IN)	CY				30.000		30.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY				2.000		2.000	
	451-6035	RETROFIT RAIL (TY C402)	LF				53.300		53.300	
	451-6066	RETROFIT RAIL (TY PR11)	LF				63.300		63.300	
	465-6233	INLET (COMP) (TY SIDEWALK BRIDGE)	EA				1.000		1.000	
	479-6001	ADJUSTING MANHOLES	EA				2.000		2.000	
	479-6003	ADJUSTING MANHOLES & INLETS	EA				1.000		1.000	
	479-6008	ADJUSTING MANHOLES (WATER METER)	EA				3.000		3.000	
	479-6010	ADJUSTING MANHOLES (ELECTRIC BOX)	EA				1.000		1.000	
	496-6099	REMOVE STR (RAIL)	LF				44.800		44.800	
	500-6001	MOBILIZATION	LS		0.500		0.500		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO		7.000				7.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF		805.000		3,245.000		4,050.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF		805.000		3,245.000		4,050.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF				86.000		86.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF				86.000		86.000	
	512-6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF				620.000		620.000	
	512-6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF				80.000		80.000	
	512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF				620.000		620.000	
	512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF				80.000		80.000	
	528-6001	COLORED TEXTURED CONC (4")	SY				295.000		295.000	
	529-6008	CONC CURB & GUTTER (TY II)	LF		14.000		2,321.000		2,335.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0176-02-125 **DISTRICT** Lufkin **COUNTY** Angelina
HIGHWAY BU 59G

				CONTROL SECTION JOB	0176-02-125		0176-03-138		TOTAL EST.	TOTAL FINAL
				PROJECT ID	A00183448		A00183449			
				COUNTY	Angelina		Angelina			
				HIGHWAY	BU 59G		BU 59G			
ALT	BID CODE	DESCRIPTION	UNIT		EST.	FINAL	EST.	FINAL		
	530-6004	DRIVEWAYS (CONC)	SY		331.000		1,844.000		2,175.000	
	530-6005	DRIVEWAYS (ACP)	SY		569.000		1,019.000		1,588.000	
	531-6002	CONC SIDEWALKS (5")	SY		477.000		2,411.000		2,888.000	
	531-6004	CURB RAMPS (TY 1)	EA				1.000		1.000	
	531-6009	CURB RAMPS (TY 6)	EA				1.000		1.000	
	531-6013	CURB RAMPS (TY 10)	EA				1.000		1.000	
	540-6014	SHORT RADIUS	LF				25.000		25.000	
	540-6023	MTL BEAM GD FEN TRANS(THRIE BEAM)28"	EA				1.000		1.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF				100.000		100.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA				1.000		1.000	
	550-6003	CHAIN LINK FENCE (REMOVE)	LF				67.000		67.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF				80.000		80.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF				139.000		139.000	
	620-6007	ELEC CONDR (NO.8) BARE	LF				292.000		292.000	
	624-6002	GROUND BOX TY A (122311)W/APRON	EA				4.000		4.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA				2.000		2.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA				1.000		1.000	
	644-6060	IN SM RD SN SUP&AM TYTWT(1)WS(P)	EA				2.000		2.000	
	644-6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA				1.000		1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA				5.000		5.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF				50.000		50.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF				372.000		372.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF				48.000		48.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF				50.000		50.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF				36.000		36.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA				1.000		1.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA				1.000		1.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF				100.000		100.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF				372.000		372.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA				1.000		1.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA				1.000		1.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA				7.000		7.000	
	684-6007	TRF SIG CBL (TY A)(12 AWG)(2 CONDR)	LF				484.000		484.000	
	684-6009	TRF SIG CBL (TY A)(12 AWG)(4 CONDR)	LF				519.000		519.000	
	687-6001	PED POLE ASSEMBLY	EA				6.000		6.000	
	688-6001	PED DETECT PUSH BUTTON (APS)	EA				7.000		7.000	
	3076-6035	D-GR HMA TY-D PG64-22	TON				12.000		12.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0176-02-125 **DISTRICT** Lufkin **COUNTY** Angelina
HIGHWAY BU 59G

			CONTROL SECTION JOB		**0176-02-125**		**0176-03-138**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00183448**		**A00183449**			
			COUNTY		**Angelina**		**Angelina**			
			HIGHWAY		**BU 59G**		**BU 59G**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN		EA	2.000		2.000		4.000	
	6185-6002	TMA (STATIONARY)		DAY	15.000		80.000		95.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)		LS	1.000				1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)		LS	1.000				1.000	

SUMMARY OF ROADWAY ITEMS

ITEM NO.	100 6006	104 6017	104 6021	104 6022	104 6036	104 6040	105 6046	351 6004	420 6066	432 6001	432 6045	451 6035	451 6066	465 6233	479 6001	479 6003	479 6008
LOCATION	PREP ROW (TREE) (LESS THAN 24" DIA)	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB)	REMOVING CONC (CURB AND GUTTER)	REMOVING CONC (SIDEWALK OR RAMP)	REMOVING CONC (PAVERS)	REMOVING STAB BASE & ASPH PAV (0"-10")	FLEXIBLE PAVEMENT STRUCTURE REPAIR (8")	CL C CONC (RAIL FOUNDATION)	RIPRAP (CONC) (4 IN) *	RIPRAP (MOW STRIP) (4 IN)	RETROFIT RAIL (TY C402)	RETROFIT RAIL (TY PR11)	INLET (COMP) (TY SIDEWALK BRIDGE)	ADJUSTING MANHOLES	ADJUSTING MANHOLES & INLETS *	ADJUSTING MANHOLES (WATER METER)
	EA	SY	LF	LF	SY	SY	SY	SY	CY	CY	CY	LF	LF	EA	EA	EA	EA
BEGIN TO STA 7+50	6			225				75									
STA 7+50 TO STA 12+50			18	33	9		185	11									
STA 12+50 TO STA 18+50		170		105	40		78	35	1.4		2	53.3	63.3	1			
STA 18+50 TO STA 24+50		172	40														
STA 24+50 TO STA 30+50		526	30														
STA 30+50 TO STA 36+50		227	137	472		20	213	157							1		
STA 36+50 TO STA 42+50		242	64	600				200									
STA 42+50 TO STA 48+50		62	76	347			189	116							1		
STA 48+50 TO STA 54+50		230	128	260		14		87									3
STA 54+50 TO STA 60+50	6	111	30	279			66	93									
STA 60+50 TO STA 66+50	1		5				305										
STA 66+50 TO STA 71+00		181	20														
CSJ: 0176-03-138 SUBTOTAL	**13**	**1921**	**548**	**2321**	**49**	**34**	**1036**	**774**	**1.4**	**30**	**2**	**53.3**	**63.3**	**1**	**2**	**1**	**3**
STA 71+00 TO STA 72+50	2						86										
STA 72+50 TO STA 78+50	2	342	50				266										
STA 78+50 TO END	2		51	14			234	5									
CSJ: 0176-02-125 SUBTOTAL	**6**	**342**	**101**	**14**	**0**	**0**	**586**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PROJECT TOTALS	**19**	**2263**	**649**	**2335**	**49**	**34**	**1622**	**779**	**1.4**	**30**	**2**	**53.3**	**63.3**	**1**	**2**	**1**	**3**

* FOR MISCELLANEOUS USE AS DIRECTED BY THE ENGINEER

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\03 Quantity Summaries\LFK*SUMM OF QUANTITES (ROADWAY).dgn

DRAWING DATE: 5/27/2022

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

QUANTITY SUMMARY (ROADWAY)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	9
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

SUMMARY OF ROADWAY ITEMS (CONT.)																
ITEM NO.	**479 6010**	**496 6099**	**528 6001**	**529 6008**	**530 6004**	**530 6005**	**531 6002**	**531 6004**	531 6009	531 6013	540 6023	540 6014	**542 6001**	**542 6002**	**550 6003**	**3076 6035**
LOCATION	ADJUSTING MANHOLES (ELECTRIC BOX) *	REMOVE STR (RAIL)	COLORED TEXTURED CONC (4")	CONC CURB & GUTTER (TY II)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP)	CONC SIDEWALKS (5")	CURB RAMPS (TY 1)	CURB RAMPS (TY 6)	CURB RAMPS (TY 10)	MTL BEAM GD FEN TRANS (THRIE BEAM) 28"	SHORT RADIUS	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	CHAIN LINK FENCE (REMOVE)	D-GR HMA TY-D PG64-22
	EA	LF	SY	LF	SY	SY	SY	EA	EA	EA	EA	LF	LF	EA	LF	TON
BEGIN TO STA 7+50				225			132									
STA 7+50 TO STA 12+50				33		177	59			1						
STA 12+50 TO STA 18+50		44.8		105	146	77	191				1	25	100	1	67	
STA 18+50 TO STA 24+50					161		234									
STA 24+50 TO STA 30+50			170		508		244									
STA 30+50 TO STA 36+50			110	472	203	209	214	1	1							
STA 36+50 TO STA 42+50				600	222		236									
STA 42+50 TO STA 48+50			3	347	58	187	201									
STA 48+50 TO STA 54+50			12	260	264		261									
STA 54+50 TO STA 60+50				279	105	66	306									
STA 60+50 TO STA 66+50						303	160									12
STA 66+50 TO STA 71+00					177		173									
CSJ: 0176-03-138 SUBTOTAL	**1**	**44.8**	**295**	**2321**	**1844**	**1019**	**2411**	**1**	**1**	**1**	**1**	**25**	**100**	**1**	**67**	**12**
STA 71+00 TO STA 72+50						83	50									
STA 72+50 TO STA 78+50					331	256	222									
STA 78+50 TO END				14		230	205									
CSJ: 0176-02-125 SUBTOTAL	**0**	**0**	**0**	**14**	**331**	**569**	**477**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PROJECT TOTALS	**1**	**44.8**	**295**	**2335**	**2175**	**1588**	**2888**	**1**	**1**	**1**	**1**	**25**	**100**	**1**	**67**	**12**

* FOR MISCELLANEOUS USE AS DIRECTED BY THE ENGINEER

SUMMARY OF EARTHWORK QUANTITIES		
ITEM NO.	110 6001	132 6005
LOCATION	EXCAVATION (ROADWAY) *	EMBANKMENT (FINAL) (ORD COMP) (TY C) *
	CY	CY
BEGIN TO STA 7+50	2	14
STA 7+50 TO STA 12+50		15
STA 12+50 TO STA 18+50	9	43
STA 18+50 TO STA 24+50	2	73
STA 24+50 TO STA 30+50		64
STA 30+50 TO STA 36+50		77
STA 36+50 TO STA 42+50		82
STA 42+50 TO STA 48+50		95
STA 48+50 TO STA 54+50	5	62
STA 54+50 TO STA 60+50	15	39
STA 60+50 TO STA 66+50	2	28
STA 66+50 TO STA 71+00	4	24
CSJ: 0176-03-138 SUBTOTAL	**39**	**616**
STA 71+00 TO STA 72+50	2	11
STA 72+50 TO STA 78+50	2	57
STA 78+50 TO END		47
CSJ: 0176-02-125 SUBTOTAL	**4**	**115**
PROJECT TOTALS	**43**	**731**

* FOR CONTRACTOR INFORMATION ONLY

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

QUANTITY SUMMARY (ROADWAY)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	10
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\03 Quantity Summaries\LFK*SUMM OF QUANTITES (ROADWAY).dgn
DRAWING DATE: 6/1/2022

SUMMARY OF SMALL SIGNS AND PAVEMENT MARKING ITEMS

ITEM NO.	644 6001	644 6004	644 6060	644 6068	644 6076	666 6036	668 6076	677 6001	677 6003	677 6007
LOCATION	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TYTWT(1)WS(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	REMOVE SM RD SN SUP&AM	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	PREFAB PAV MRK TY C (W) (24") (SLD)	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (24")
	EA	EA	EA	EA	EA	LF	LF	LF	LF	LF
BEGIN TO STA 7+00	1				1		282			
STA 7+00 TO STA 12+50			1		1					
STA 12+50 TO STA 18+50		1			1					
STA 18+50 TO STA 24+50										
STA 24+50 TO STA 30+50										
STA 30+50 TO STA 36+50			1		1	50	90	48	50	36
STA 36+50 TO STA 42+50										
STA 42+50 TO STA 48+50				1						
STA 48+50 TO STA 54+50	1				1					
STA 54+50 TO STA 60+50										
STA 60+50 TO STA 66+50										
STA 66+50 TO STA 71+00										
CSJ: 0176-03-138 SUBTOTAL	**2**	**1**	**2**	**1**	**5**	**50**	**372**	**48**	**50**	**36**
STA 71+00 TO STA 72+50										
STA 72+50 TO STA 78+50										
STA 78+50 TO END										
CSJ: 0176-02-125 SUBTOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PROJECT TOTALS	**2**	**1**	**2**	**1**	**5**	**50**	**372**	**48**	**50**	**36**

SUMMARY OF SMALL SIGNS AND PAVEMENT MARKING ITEMS (CONT.)

ITEM NO.	677 6008	677 6012	678 6004	678 6008	678 6009	678 6016
LOCATION	ELIM EXT PAV MRK & MRKS (ARROW)	ELIM EXT PAV MRK & MRKS (WORD)	PAV SURF PREP FOR MRK (8")	PAV SURF PREP FOR MRK (24")	PAV SURF PREP FOR MRK (ARROW)	PAV SURF PREP FOR MRK (WORD)
	EA	EA	LF	LF	EA	EA
BEGIN TO STA 7+00				282		
STA 7+00 TO STA 12+50						
STA 12+50 TO STA 18+50						
STA 18+50 TO STA 24+50						
STA 24+50 TO STA 30+50						
STA 30+50 TO STA 36+50	1	1	100	90	1	1
STA 36+50 TO STA 42+50						
STA 42+50 TO STA 48+50						
STA 48+50 TO STA 54+50						
STA 54+50 TO STA 60+50						
STA 60+50 TO STA 66+50						
STA 66+50 TO STA 71+00						
CSJ: 0176-03-138 SUBTOTAL	**1**	**1**	**100**	**372**	**1**	**1**
STA 71+00 TO STA 72+50						
STA 72+50 TO STA 78+50						
STA 78+50 TO END						
CSJ: 0176-02-125 SUBTOTAL	**0**	**0**	**0**	**0**	**0**	**0**
PROJECT TOTALS	**1**	**1**	**100**	**372**	**1**	**1**

SUMMARY OF PEDESTRIAN SIGNAL ITEMS

ITEM NO.	416 6002	618 6023	618 6047	620 6007	624 6002	682 6018	684 6007	684 6009	687 6001	688 6001	* 688 6003
LOCATION	DRILL SHAFT (24 IN)	CONDT (PVC) (SCH 40) (2")	CONDT (PVC) (SCH 80) (2") (BORE)	ELEC CONDR (NO.8) BARE	GROUND BOX TY A (122311)W/APRON	PED SIG SEC (LED)(COUNTDOWN)	TRF SIG CBL (TY A)(12 AWG)(2 CONDR)	TRF SIG CBL (TY A)(12 AWG)(4 CONDR)	PED POLE ASSEMBLY	PED DETECT PUSH BUTTON (APS)	PED DETECTOR CONTROLLER UNIT
	LF	LF	LF	LF	EA	EA	LF	LF	EA	EA	EA
BU-59 AT MALL ENTRANCE	18	50		50		3	193	208	3	3	1
BU-59 AT JANEWAY AVENUE	18	30	139	242	4	4	291	311	3	4	1
CSJ: 0176-03-138 SUBTOTAL	**36**	**80**	**139**	**292**	**4**	**7**	**484**	**519**	**6**	**7**	**2**
PROJECT TOTALS	**36**	**80**	**139**	**292**	**4**	**7**	**484**	**519**	**6**	**7**	**2**

* SUBSIDIARY TO ITEM 688 6001

I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

QUANTITY SUMMARY (TRAFFIC)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	11
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

SW3P SUMMARY TABLE									
ITEM NO.	158 6003	160 6003	162 6002	164 6011	168 6001	506 6038	506 6039	506 6040	506 6043
LOCATION	SPEC EXCAV WORK (HYD EXCAVATOR)	FURNISHING AND PLACING TOPSOIL (4")	BLOCK SODDING	BROADCAST SEED (TEMP) (COOL)	VEGETATIVE WATERING 10 GAL/SY 2 APP	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)
	HR	SY	SY	SY	MG	LF	LF	LF	LF
BEGIN TO STA 10+50	20	103	103	103	4	198	198		
STA 10+50 TO STA 16+50		17	17	17		17	17		
STA 16+50 TO STA 22+50		184	184	184	7	447	447	6	6
STA 22+50 TO STA 28+50		159	159	159	6	306	306	27	27
STA 28+50 TO STA 34+50		41	41	41	2	145	145	12	12
STA 34+50 TO STA 40+50		87	87	87	3	401	401	12	12
STA 40+50 TO STA 46+50		76	76	76	3	309	309	17	17
STA 46+50 TO STA 52+50		81	81	81	3	354	354		
STA 52+50 TO STA 58+50		251	251	251	10	378	378	12	12
STA 58+50 TO STA 64+50		100	100	100	4	339	339		
STA 64+50 TO STA 70+50		105	105	105	4	351	351		
CSJ: 0176-03-138 SUBTOTAL	**20**	**1204**	**1204**	**1204**	**48**	**3245**	**3245**	**86**	**86**
STA 70+50 TO STA 76+50		117	117	117	5	324	324		
STA 76+50 TO STA 81+50		150	150	150	6	353	353		
STA 81+50 TO END		60	60	60	2	128	128		
CSJ: 0176-02-125 SUBTOTAL	**0**	**327**	**327**	**327**	**13**	**805**	**805**	**0**	**0**
PROJECT TOTALS	**20**	**1531**	**1531**	**1531**	**61**	**4050**	**4050**	**86**	**86**

NOTE:

LOCATIONS AND TYPES OF BMPS MAY REQUIRE ADJUSTMENTS PRIOR TO OR AFTER PLACEMENT AS DIRECTED BY THE ENGINEER. ADJUSTMENTS SHOULD BE MADE TO ENSURE BMPS ARE WORKING EFFECTIVELY AND MAINTAIN COMPLIANCE WITH THE CONSTRUCTION GENERAL PERMIT. NOTIFY THE ENGINEER PRIOR TO MAKING ADJUSTMENTS.

SUMMARY OF TRAFFIC CONTROL PLAN ITEMS						
ITEM NO.	**512 6009**	**512 6010**	**512 6057**	**512 6058**	**6001 6002**	**6185 6002**
LOCATION	PORT CTB (FUR & INST) (LOW PROF) (TY 1)	PORT CTB (FUR & INST) (LOW PROF) (TY 2)	PORT CTB (REMOVE) (LOW PROF) (TY 1)	PORT CTB (REMOVE) (LOW PROF) (TY 2)	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)
	LF	LF	LF	LF	EA	DAY
BEGIN TO STA 7+50	58	20	58	20	1	80
STA 7+50 TO STA 12+50	248	40	248	40		
STA 12+50 TO STA 18+50	314	20	314	20		
STA 18+50 TO STA 24+50						
STA 24+50 TO STA 30+50						
STA 30+50 TO STA 36+50						
STA 36+50 TO STA 42+50						
STA 42+50 TO STA 48+50						
STA 48+50 TO STA 54+50						
STA 54+50 TO STA 60+50						
STA 60+50 TO STA 66+50						
STA 66+50 TO STA 71+00					1	
CSJ: 0176-03-138 SUBTOTAL	**620**	**80**	**620**	**80**	**2**	**80**
STA 71+00 TO STA 72+50					1	15
STA 72+50 TO STA 78+50						
STA 78+50 TO END					1	
CSJ: 0176-02-125 SUBTOTAL	**0**	**0**	**0**	**0**	**2**	**15**
PROJECT TOTALS	**620**	**80**	**620**	**80**	**4**	**95**

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

QUANTITY SUMMARY (SWP3)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	12
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

DRAWING DATE: 6/1/2022 FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\03 Quantity Summaries\LFK*SUMM OF QUANTITES (SWP3).dgn

DATE:
FILE:

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SEE LEGEND FOR CLARIFICATION	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 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
								FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
				JCT	21 X 15	A							
01/14	01	M2-1 M1-4(2 dgt) M1-6L	1 1	59	24 X 24	A		10BWG	1	SA	P		
				LOOP 287	24 X 24	A							
02/14	02	R5-1a	2 2	WRONG WAY	36 X 24	A		TWT	1	WS	P		
03/14	03	I-3	3 3	HURRICANE CREEK	48 X 18	A		10BWG	1	SA	T		
				BUSINESS	24 X 12								
06/14	04	M4-3 M1-4(2 dgt)	4 4	59		A		TWT	1	WS	P		
					24 X 24	A							
08/14	05	D26-1TR (L)	5	⇦ Downtown District	84 X 24	A		10BWG	2	SA	P		
		M3-1		NORTH	24 X 12	A							
		M4-3		BUSINESS	24 X 12	A							
09/14	06		6 6					10BWG	1	SA	P		
		M1-4(2 dgt)		59	24 X 24	A							
		M6-2R			21 X 15	A							

LEGEND:

- SIGN TO BE RELOCATED
- SIGN TO BE REMOVED
- SIGN TO BE INSTALLED
- SIGN TO REMAIN IN PLACE
- SIGN TO BE REMOVED AND REINSTALLED

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).

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	0176	02	125, ETC.	BU 59G
4-16 8-16	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		13

GENERAL:

1. ALL TRAFFIC CONTROL DEVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IN ACCORDANCE WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD), LATEST EDITION AND AMENDMENTS. ALL TRAFFIC CONTROL DEVICES SHALL ALSO COMPLY WITH THE CRASH WORTHINESS REQUIREMENTS OF THE AASHTO MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).

2. REFER TO TXDOT STANDARD BC(2)-21 FOR ADDITIONAL INFORMATION ON THE TYPICAL LOCATION OF CROSSROAD SIGNS. ALL SIDE STREETS WITHIN THE PROJECT LIMITS SHALL HAVE CROSSROAD SIGNS IN ACCORDANCE WITH THIS STANDARD. ALL PROJECT LIMIT WARNING SIGNS SHALL BE PLACED PRIOR TO CONSTRUCTION BEGINNING AT THE RELEVANT LOCATION AND ARE TO REMAIN IN PLACE AND ADJUSTED AS DIRECTED BY THE ENGINEER THROUGHOUT THE DURATION OF THE PROJECT UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

3. TRAFFIC MUST BE HANDLED APPROPRIATELY THROUGHOUT THE PROJECT DURING CONSTRUCTION, AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE FOR THE SAFETY OF THE TRAVELING PUBLIC AT ALL TIMES. CONTRACTOR RESPONSIBLE FOR COORDINATING TRAFFIC CONTROL WITH ADJACENT ROADWAY CONSTRUCTION PROJECTS AS REQUIRED.

4. AT POINTS WHERE IT IS NECESSARY FOR TRUCKS TO STOP AND UNLOAD, WARNING SIGNS AND FLAGGERS SHALL BE PROVIDED AS NECESSARY TO ADEQUATELY PROTECT THE TRAVELING PUBLIC.

5. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A DETAILED SCHEDULE OF WORK TO THE ENGINEER PRIOR TO THE BEGINNING OF CONSTRUCTION WHICH GENERALLY CONFORMS TO THE SEQUENCE SHOWN ON THE TCP SEQUENCE OF OPERATIONS.

6. THE CONTRACTOR MAINTAINS THE RESPONSIBILITY TO PROTECT THE UTILITIES DURING CONSTRUCTION.

7. CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE DURING CONSTRUCTION. TEMPORARY DRAINAGE WORK AND ITEMS (INCLUDING, BUT NOT LIMITED TO TEMPORARY CAPS AND PLUGS) SHALL BE SUBSIDIARY TO ITEM 502.

8. CONSTRUCTION IN ANY AREA THAT IS ADVERSELY AFFECTING TRAFFIC FLOW MUST BE PURSUED DILIGENTLY BY THE CONTRACTOR. IF, IN THE OPINION OF THE ENGINEER, CONSTRUCTION IS NOT PROCEEDING TOWARDS COMPLETION IN THESE AREAS, THE ENGINEER MAY REQUIRE THE CONTRACTOR TO ALTER THE WORK SCHEDULE TO EXPEDITE COMPLETION IN THE AREAS OF CONCERN.

9. THE USE OF ADVANCE WARNING FLASHING ARROW BOARDS ARE REQUIRED FOR THE CLOSING OF TRAFFIC LANES. THE CONTRACTOR SHALL BE REQUIRED TO FURNISH ONE STAND-BY. UNIT, IN GOOD WORKING CONDITION AT THE JOB SITE, READY FOR IMMEDIATE USE.

10. ALL TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE REMOVED AS SOON AS PRACTICAL WHEN THEY ARE NO LONGER NEEDED. WHEN WORK IS SUSPENDED FOR SHORT PERIODS OF TIME, TEMPORARY TRAFFIC CONTROL DEVICES THAT ARE NO LONGER APPROPRIATE SHALL BE REMOVED OR COVERED.

11. ACCESS TO ALL SIDE STREETS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES AT THE SOLE EXPENSE OF THE CONTRACTOR. THE CONTRACTOR WILL CONTACT THE BUSINESS OR PROPERTY OWNER AT LEAST 5 DAYS IN ADVANCE OF DRIVEWAY CONSTRUCTION. IF THE PROPERTY OWNER HAS MORE THAN ONE DRIVEWAY, CONSTRUCTION WILL ONLY BE PERMITTED ON ONE DRIVEWAY AT A TIME. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ADEQUATE TEMPORARY SURFACING FOR TRANSITIONS BETWEEN PAVEMENT ELEVATIONS FOR ALL DRIVEWAYS.

12. SEDIMENT CONTROLS SHALL BE IN PLACE PRIOR TO COMMENCING ANY SOIL DISTURBING ACTIVITIES.

13. ALL PERIMETER SEDIMENT CONTROLS AND INLET PROTECTION TO REMAIN UNTIL END OF CONSTRUCTION OR UNLESS OTHERWISE APPROVED BY TXDOT.

14. COORDINATE WITH SETH FRANKS (936-633-4486) WITH LUFKIN TRAFFIC OFFICE TO LOCATE SIGNAL LINES.

15. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN EXISTING PEDESTRIAN ACCESS DURING CONSTRUCTION. PEDESTRIAN DETOURS MUST MEET APPLICABLE PEDESTRIAN STANDARDS AS OUTLINED IN THE TMUTCD. TEMPORARY PEDESTRIAN DETOURS WILL NOT BE PAID FOR DIRECTLY, AND WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.

16. ACCESS TO PRIVATE PROPERTY WALKWAY AT ROW SHALL BE MAINTAINED AT ALL TIMES AND AS APPROVED BY ENGINEER.

SEQUENCE OF CONSTRUCTION:

1. PRIOR TO BEGINNING WORK AT EACH LOCATION, CONTRACTOR SHALL PLACE TEMPORARY EROSION CONTROL DEVICES AND ADVANCE WARNING SIGNS UTILIZING APPLICABLE TXDOT STANDARDS BC(1)-21 THRU BC(12)-21 AND THE TMUTCD.

2. REFER TO THE "TRAFFIC CONTROL PLAN FOR RAIL RETROFIT AT HURRICANE CREEK BRIDGE". CLOSE THE OUTSIDE NORTHBOUND LANE IN ACCORDANCE WITH THE APPLICABLE STANDARDS AND INSTALL PORTABLE CONCRETE SAFETY BARRIER, CRASH CUSHIONS, AND OTHER TRAFFIC CONTROL DEVICES SHOWN ON THE LAYOUT.

3. AFTER COMPLETION OF THE RAIL RETROFIT WORK AND INSTALLATION OF THE SHORT RADIUS METAL BEAM GUARD FENCE OBTAIN APPROVAL FROM THE ENGINEER. THEN REMOVE THE PORTABLE CONCRETE BARRIER, TEMPORARY CRASH CUSHIONS, AND OTHER TRAFFIC CONTROL DEVICES AS DIRECTED BY THE ENGINEER AND OPEN THE TRAFFIC LANE TO NORTHBOUND TRAFFIC.

4. FOR CONSTRUCTION OF THE SIDEWALK THROUGHOUT THE REST OF THE PROJECT (OUTSIDE OF THE LIMITS OF HURRICANE CREEK BRIDGE).REFER TO THE APPLICABLE BC, WZ, AND TCP (1-1) AND TCP (1-4A) FOR CLOSING OF LANES.

5. FULL ROADWAY CLOSURES WILL NOT BE ALLOWED FOR THE DURATION OF THE PROJECT.

6. INSTALL PROPOSED SMALL SIGNS AS SHOWN ON THE LAYOUTS.

7. CONSTRUCT THE PROPOSED SIGNAL MODIFICATIONS AT MALL INTERSECTION.

8. CONSTRUCT THE PROPOSED SIGNAL MODIFICATION AT JANEWAY AVE.

9. INSTALL PROPOSED PAVEMENT MARKING MODIFICATIONS AT JANEWAY AVE.

10. REMOVE EROSION CONTROL DEVICES AND PERFORM FINAL CLEAN UP.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

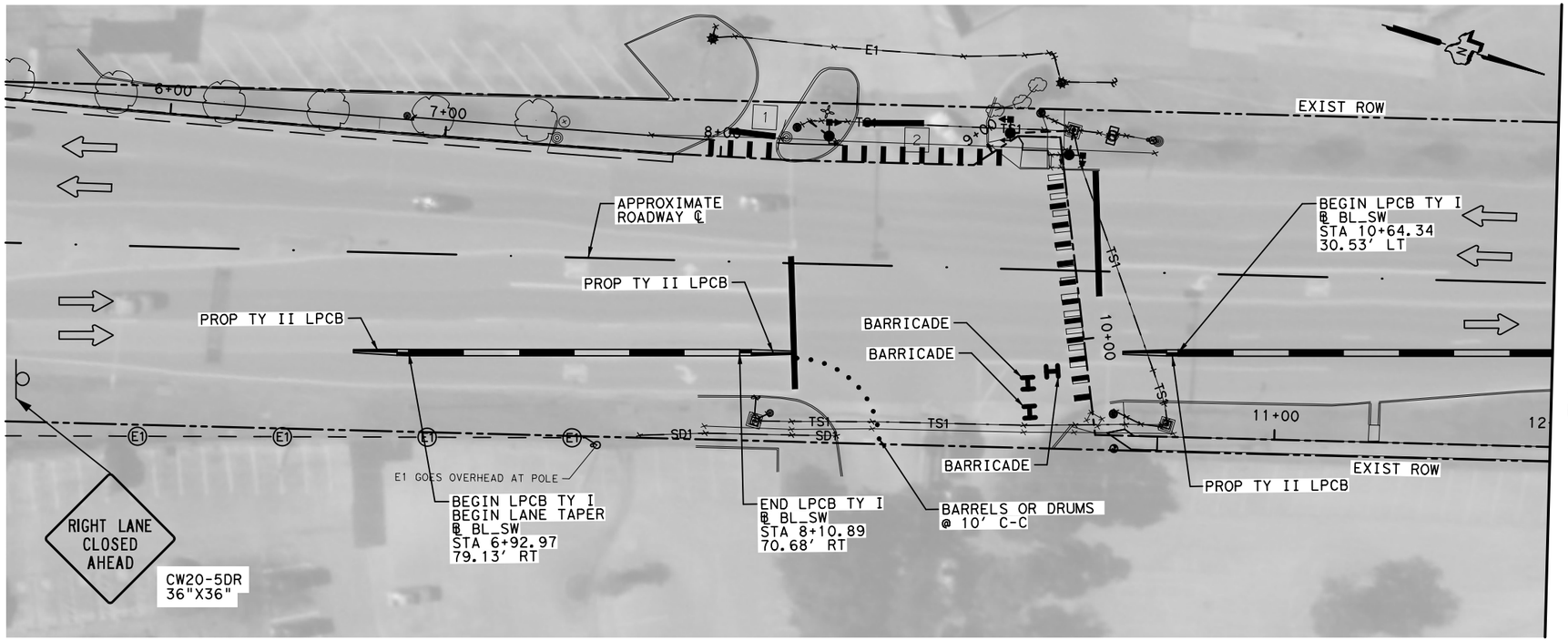
Texas Department of Transportation

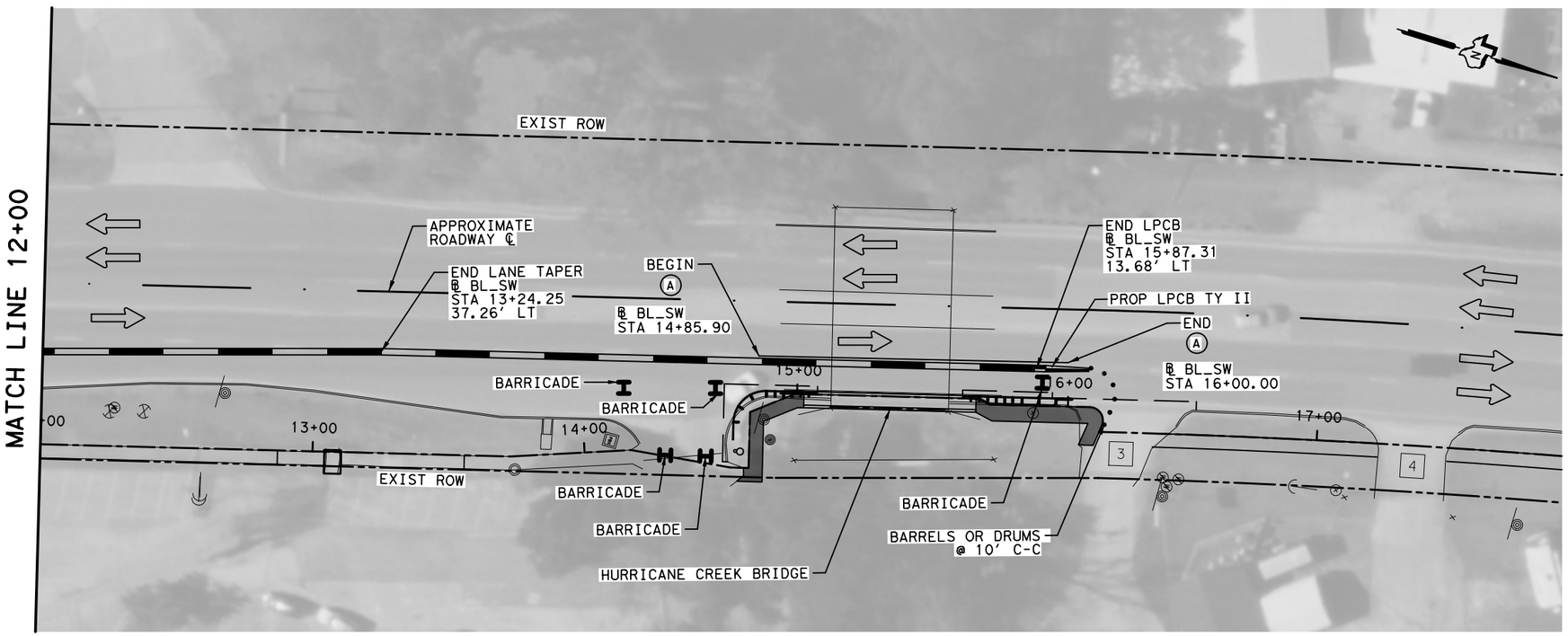
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

TRAFFIC CONTROL NARRATIVE

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	14
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\04 Traffic Control Plan\TRAFFIC CONTROL NARRARTIVE.dgn
DRAWING DATE: 5/25/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- LPCB
- TY II LPCB
- TEMP GROUND MOUNTED SIGN
- H — TYPE III BARRICADE
- EXIST R.O.W
- (A) — WK ZN PAV MRK REMOV (W) 4" (SLD)
- • • — BARRELS OR DRUMS

NOTES:

CONTRACTOR SHALL FOLLOW APPLICABLE STANDARDS FOR LANE CLOSURE AND ADVANCE WARNING SIGNS DETAILS.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Texas Department of Transportation

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

TRAFFIC CONTROL PLAN FOR RAIL RETROFIT AT HURRICANE CREEK

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	15
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\04 Traffic Control Plan\TCP RAIL RETROFIT AT HURRICANE CREEK.dgn
DRAWING DATE: 5/25/2022

DATE: 5/25/2022 1:44:14 PM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\bc-21 (1).dgn

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

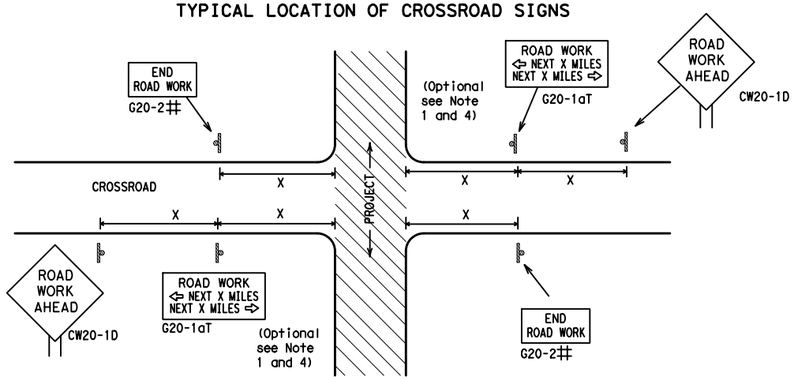
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	LFK	ANGELINA		16
5-10 5-21				

DATE: 5/25/2022 1:44:15 PM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\bc-21 (1).dgn

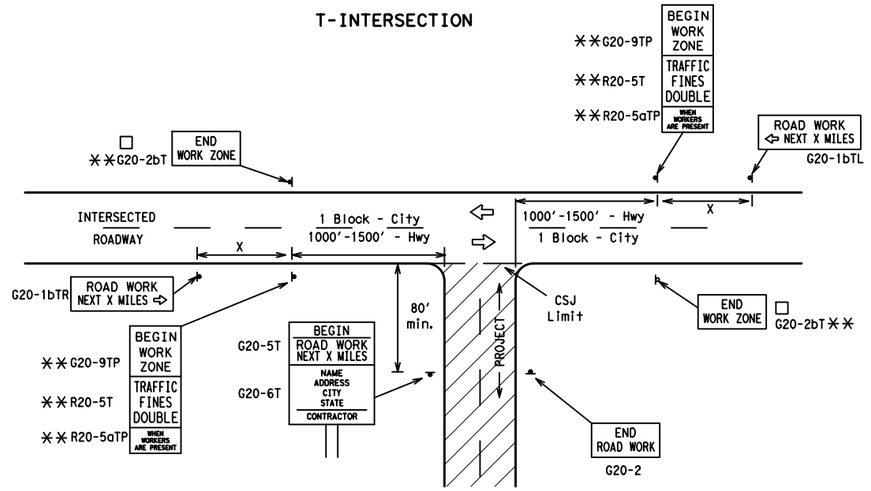
TYPICAL LOCATION OF CROSSROAD SIGNS



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.

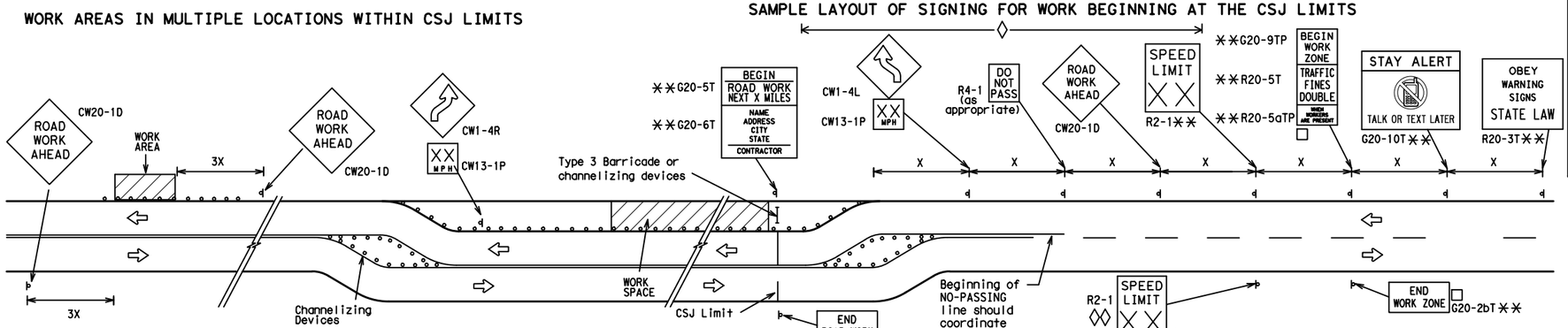
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

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.

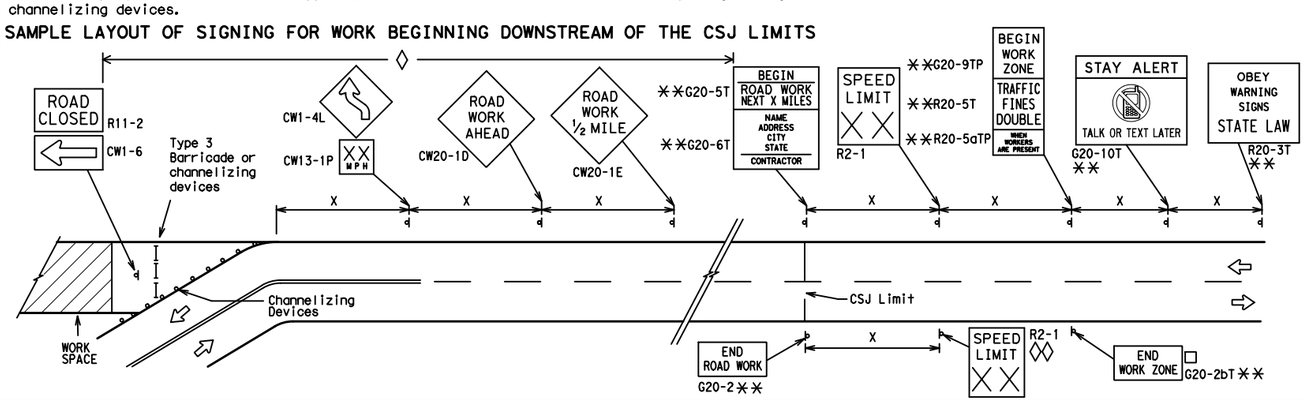
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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

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



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.

SHEET 2 OF 12

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	0176	02	125, ETC.	BU 59G
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	ANGELINA		17

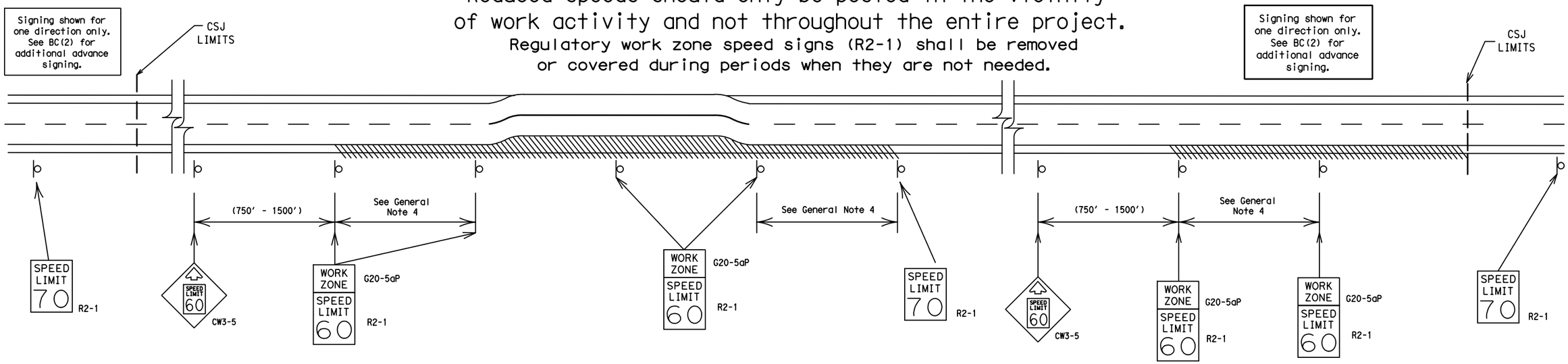
DATE: 5/25/2022 1:44:17 PM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Standard Plan\TxDOT Standards\bc-21 (1).dgn

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

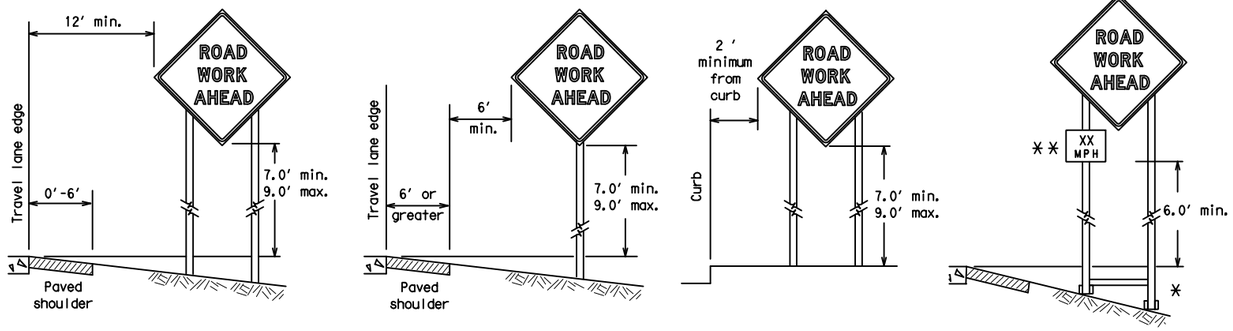
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		18

DATE: 5/25/2022 1:44:18 PM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\bc-21 (1).dgn

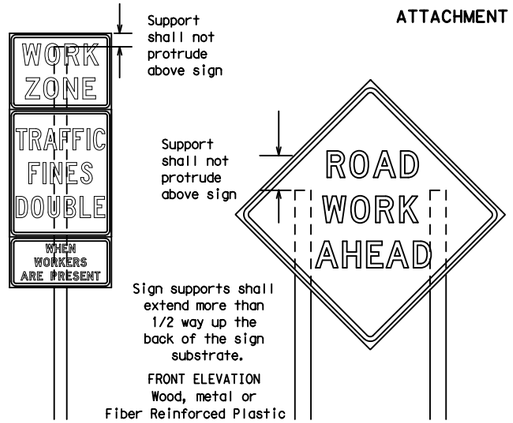
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

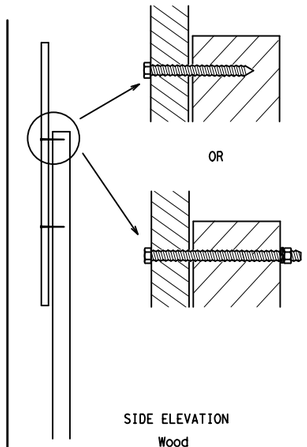


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





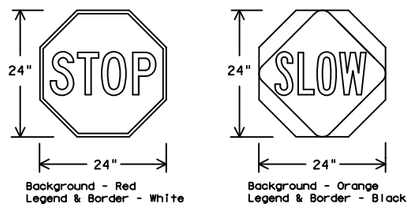
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

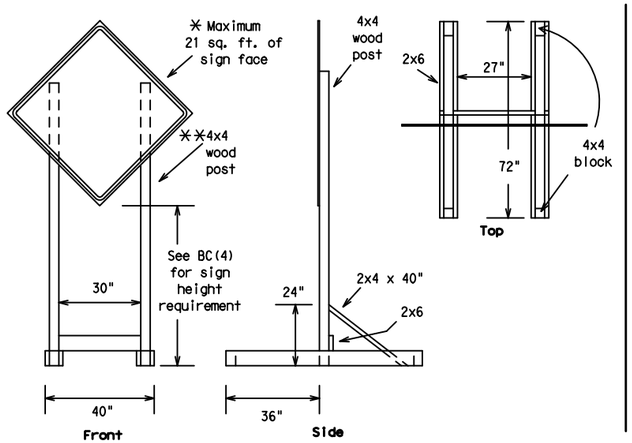
Texas Department of Transportation | Traffic Safety Division Standard

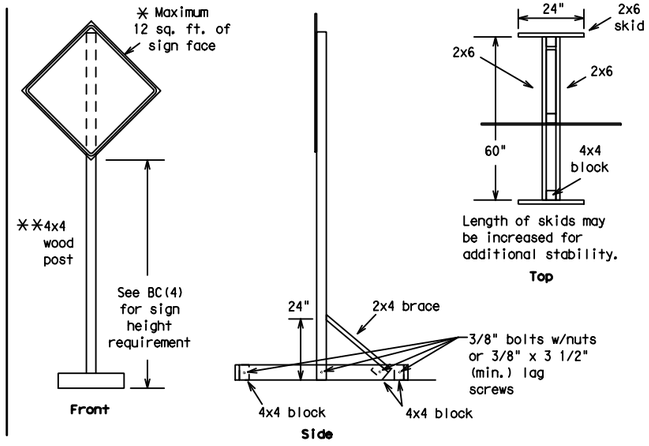
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	ANGELINA		19

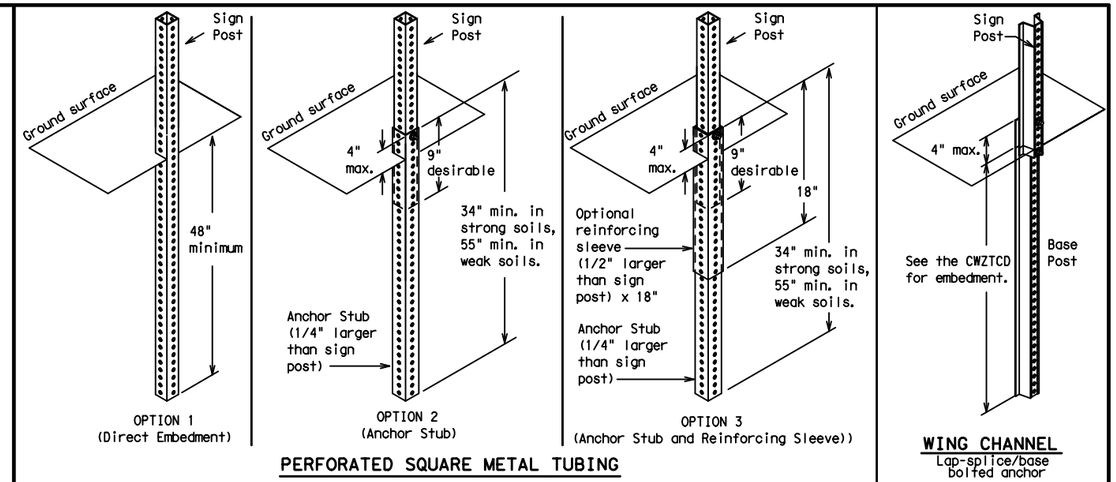
DATE: 5/25/2022 1:44:20 PM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\bc-21 (1).dgn





SKID MOUNTED WOOD SIGN SUPPORTS

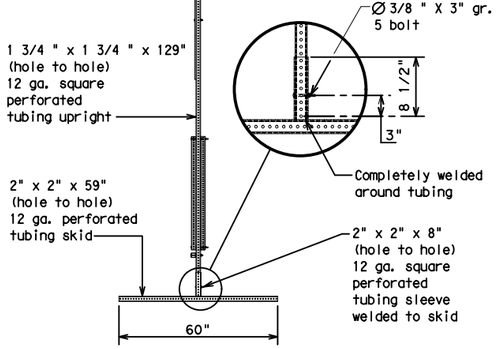
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	ANGELINA		20

DATE: 5/25/2022 1:44:21 PM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\bc-21 (1).dgn

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

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

** 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

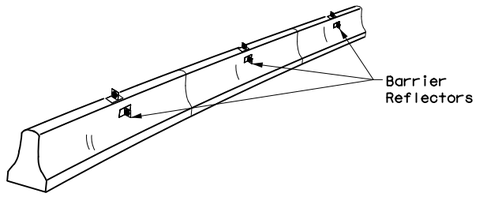
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	ANGELINA		21

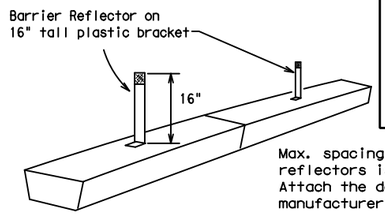
DATE: 5/25/2022 1:44:22 PM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\bc-21 (1).dgn

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.

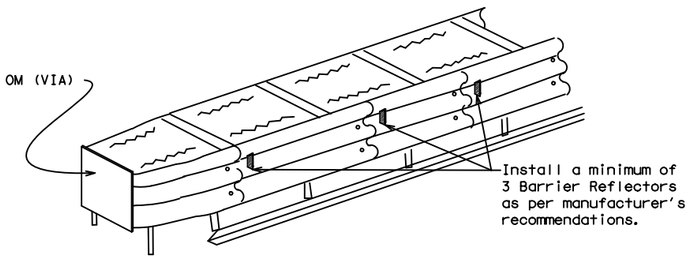


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) 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.

LOW PROFILE CONCRETE BARRIER (LPCB)

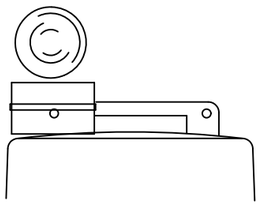


DELINEATION OF END TREATMENTS

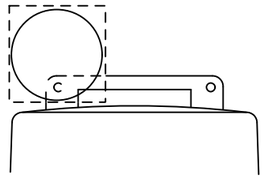
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

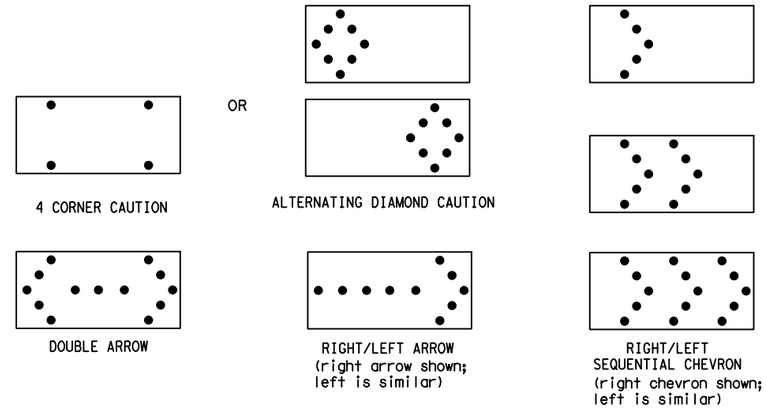
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	ANGELINA		22

DATE: 5/25/2022 1:44:24 PM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\bc-21 (1).dgn

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:

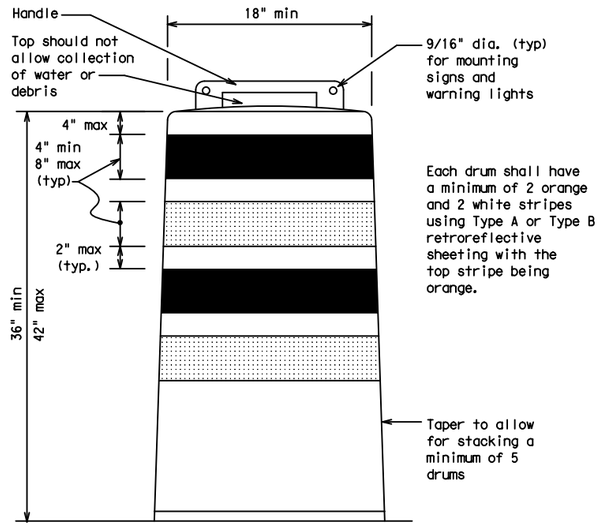
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

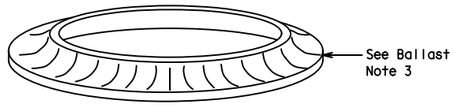
RETROREFLECTIVE SHEETING

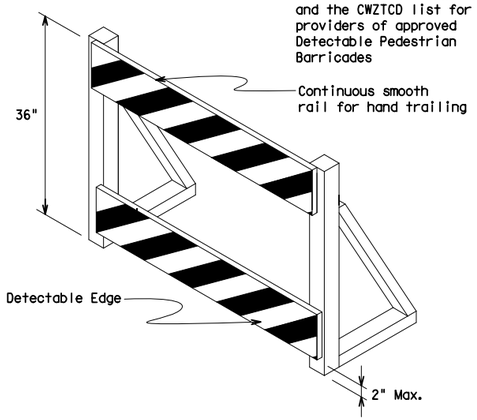
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

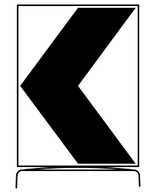




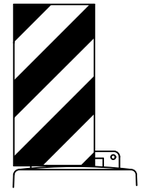


DETECTABLE PEDESTRIAN BARRICADES

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

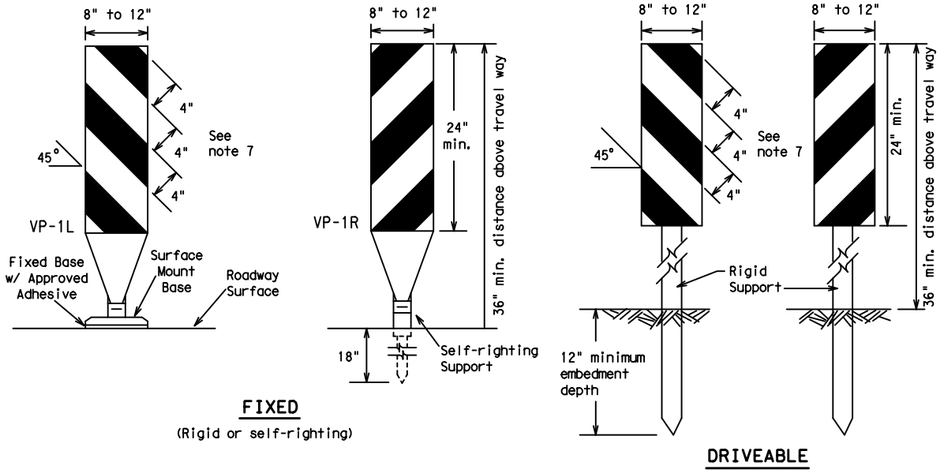
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	LFK	ANGELINA		23
7-13				

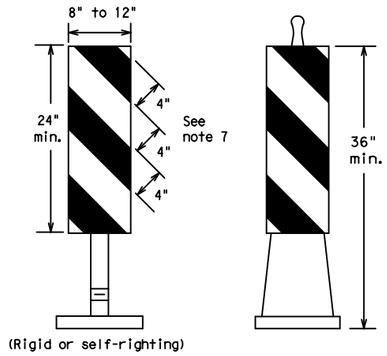
102

DATE: 5/25/2022 1:44:25 PM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\bc-21 (1).dgn



FIXED
(Rigid or self-righting)

DRIVEABLE

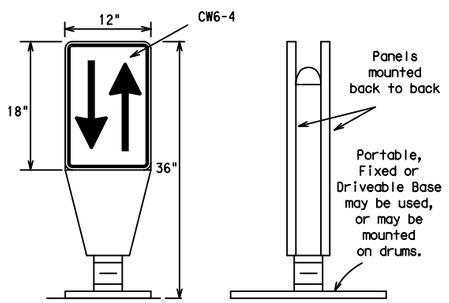


(Rigid or self-righting)

PORTABLE

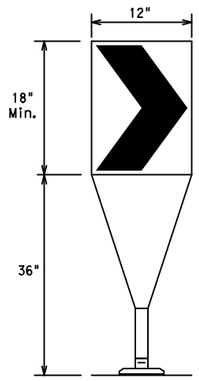
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



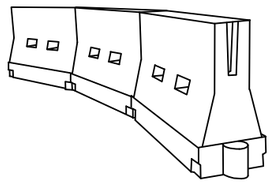
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

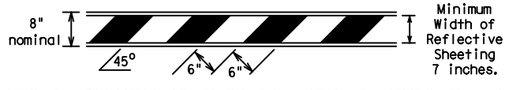
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	ANGELINA		24

DATE: 5/25/2022 1:44:27 PM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\bc-21 (1).dgn

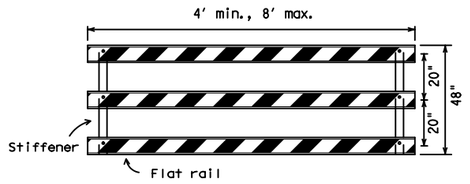
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



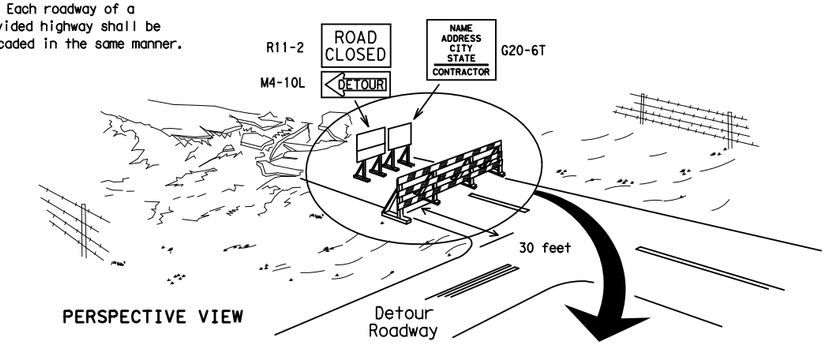
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

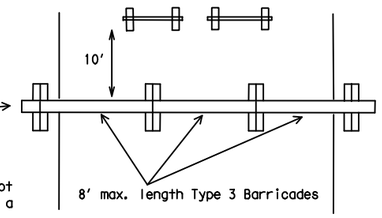
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

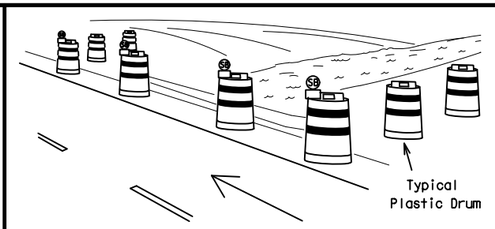
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

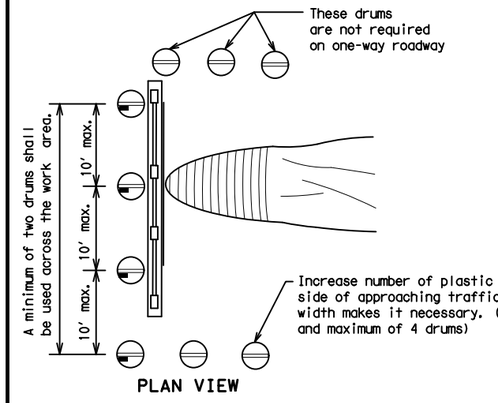
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

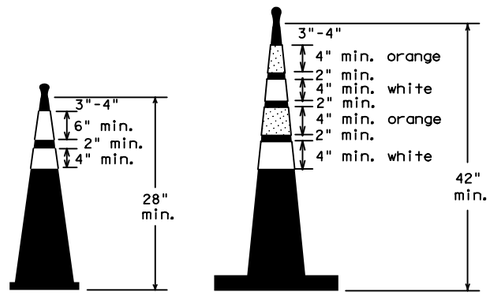
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



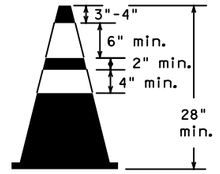
PLAN VIEW

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

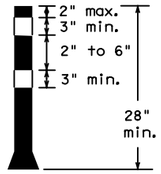
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

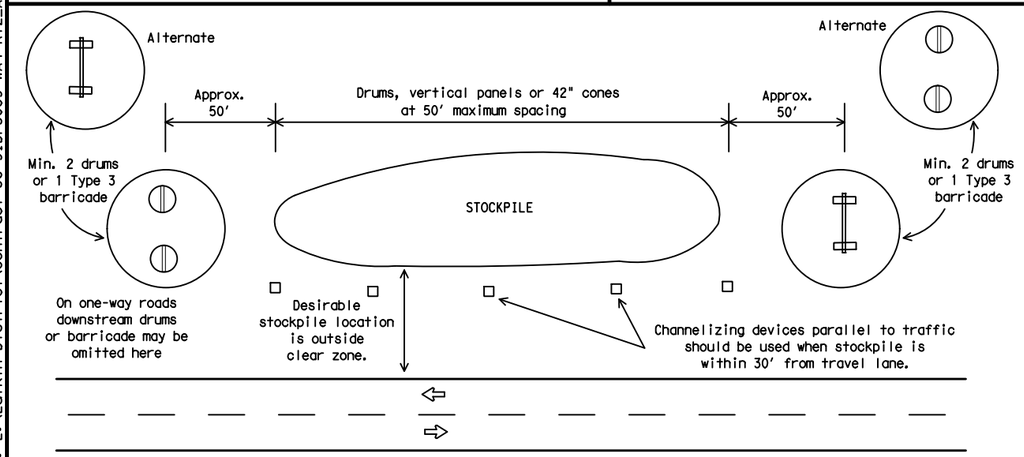


Tubular Marker

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

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

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers 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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		25

DATE: 5/25/2022 1:44:28 PM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\bc-21 (1).dgn

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

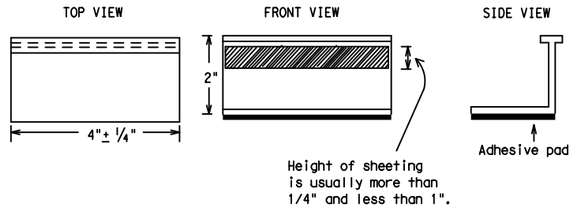
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

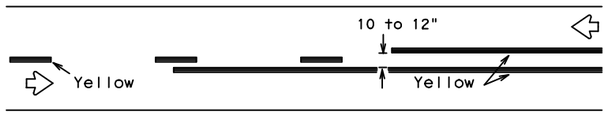
BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

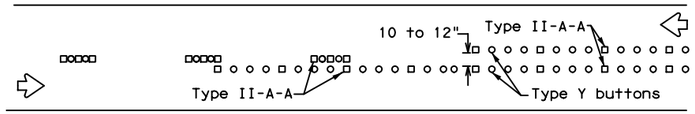
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-98 9-07 5-21	0176	02	125, ETC.	BU 59G
1-02 7-13	DIST	COUNTY		SHEET NO.
11-02 8-14	LFK	ANGELINA		26

DATE: 5/25/2022 1:44:29 PM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\bc-21 (1).dgn

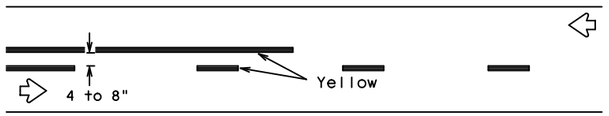
PAVEMENT MARKING PATTERNS



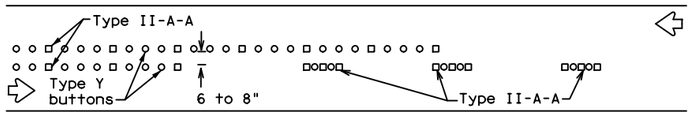
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



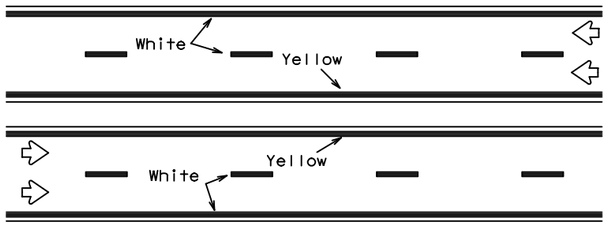
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



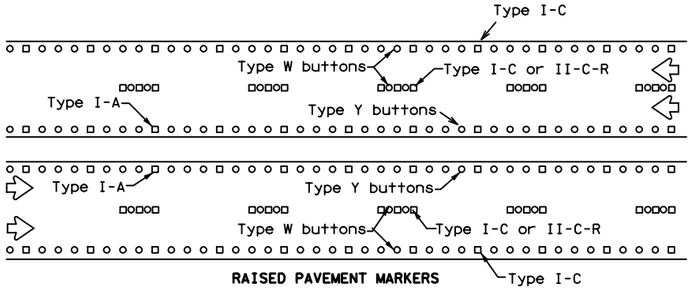
RAISED PAVEMENT MARKERS - PATTERN B

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



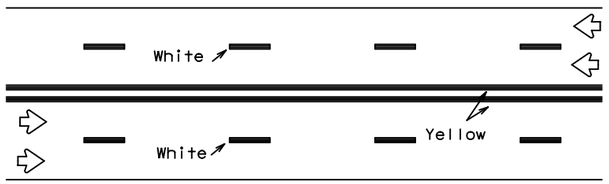
REFLECTORIZED PAVEMENT MARKINGS



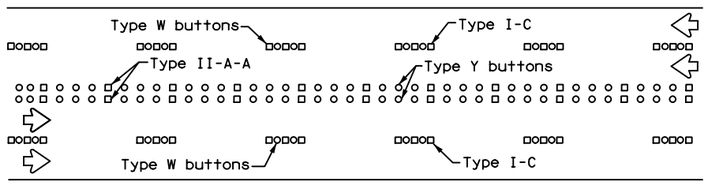
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



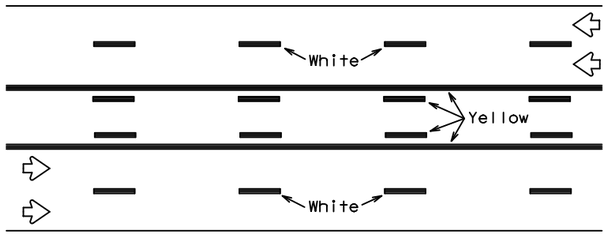
REFLECTORIZED PAVEMENT MARKINGS



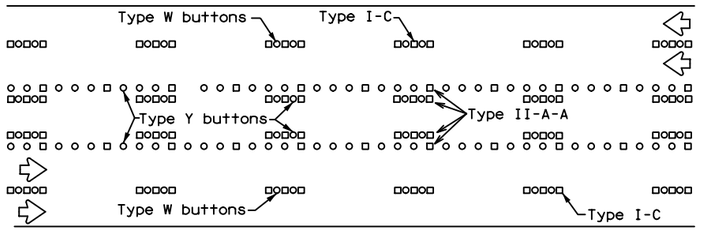
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



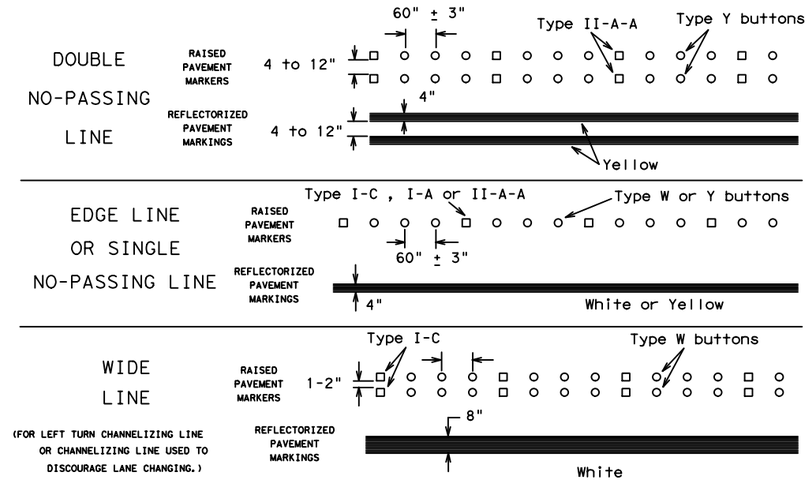
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

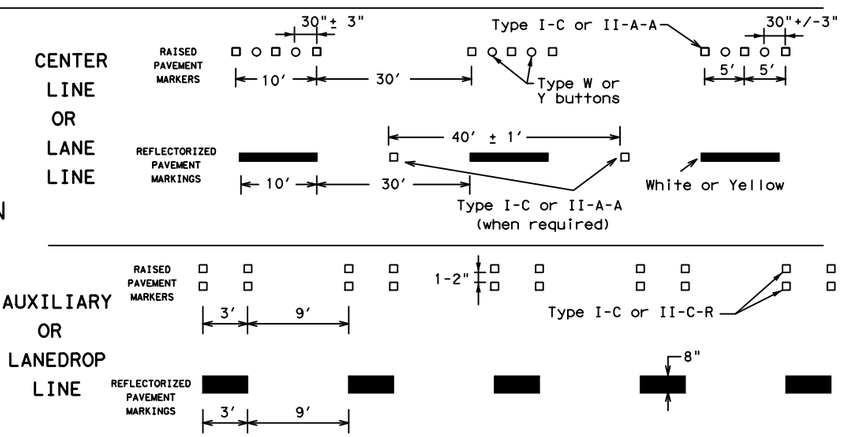
TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

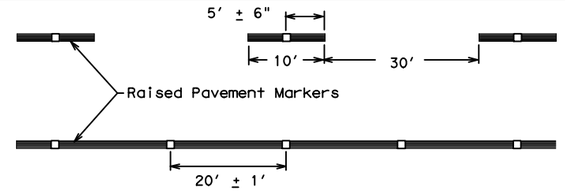


BROKEN LINES



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

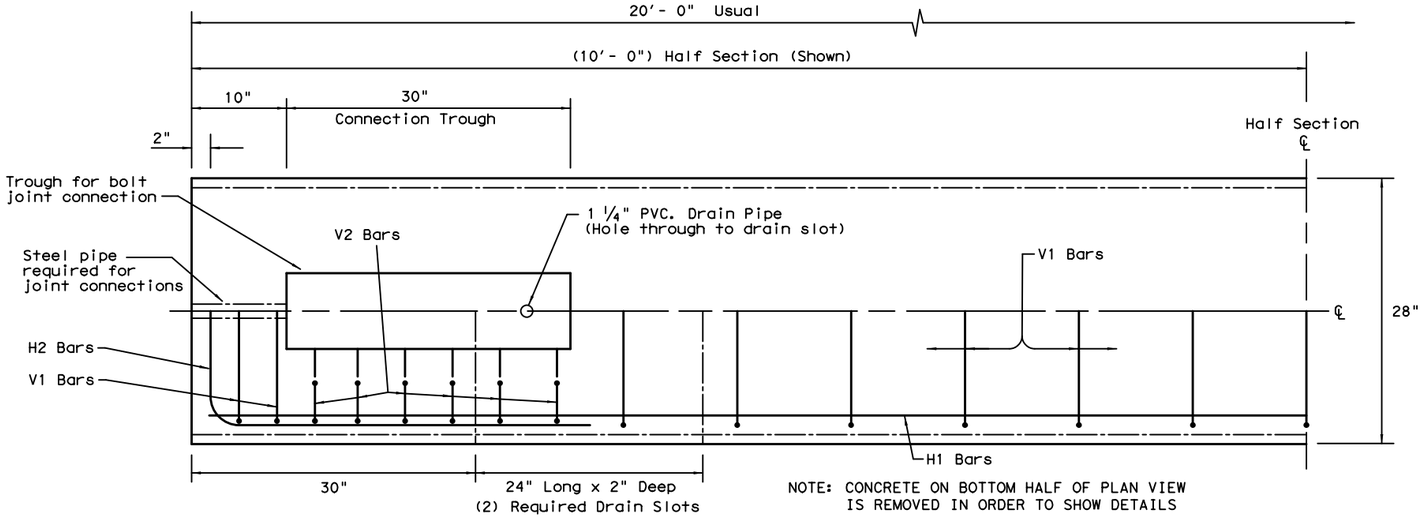
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

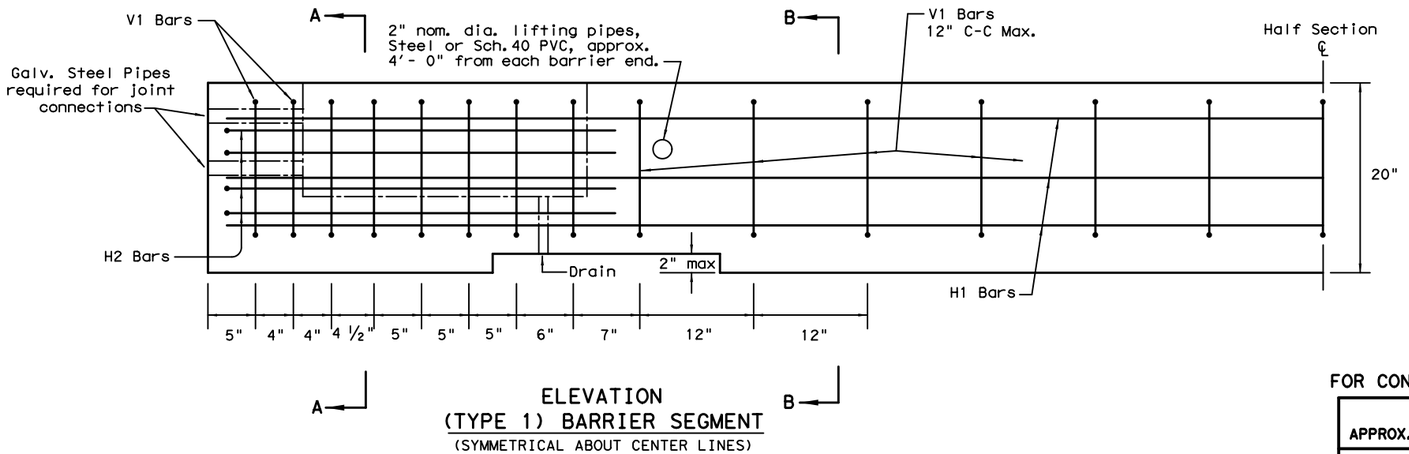
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		27

DATE: 5/25/2022
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\lpcb13.dgn

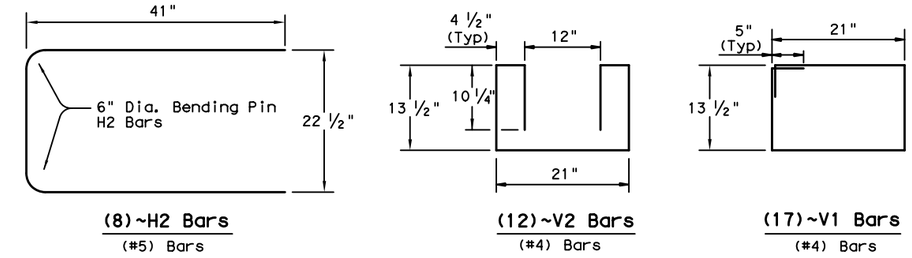


NOTE: CONCRETE ON BOTTOM HALF OF PLAN VIEW IS REMOVED IN ORDER TO SHOW DETAILS

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



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



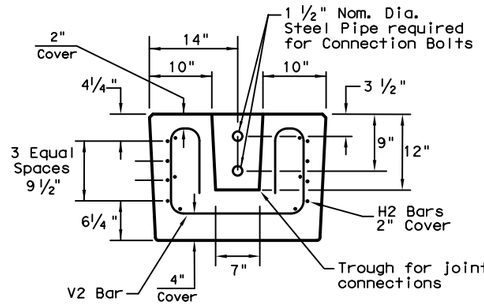
(8)~H2 Bars (#5) Bars

(12)~V2 Bars (#4) Bars

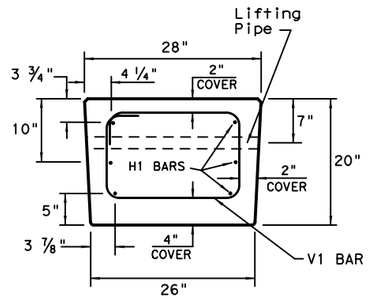
(17)~V1 Bars (#4) Bars

REINFORCING STEEL DETAILS
TYPE 1 - BARRIER SEGMENT

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



SECTION A-A



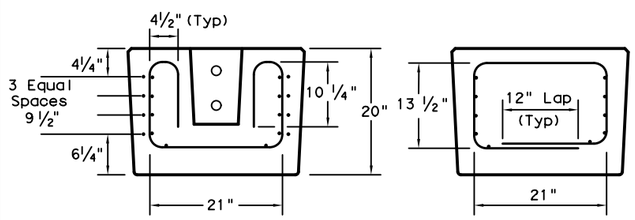
SECTION B-B

GENERAL NOTES

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

FOR CONTRACTORS INFORMATION ONLY

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



SECTION A-A SECTION B-B

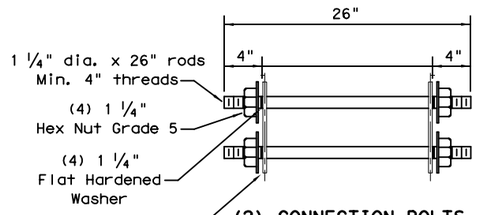
(WWR) GENERAL NOTES

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

REQUIRED (WWR) WIRE DESIGN

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

WELDED WIRE REINFORCEMENT (WWR)- OPTIONAL REINFORCING



(2) CONNECTION BOLTS
ASTM A36

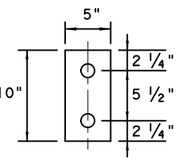


PLATE WASHER
5" x 10" x ⅜"

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

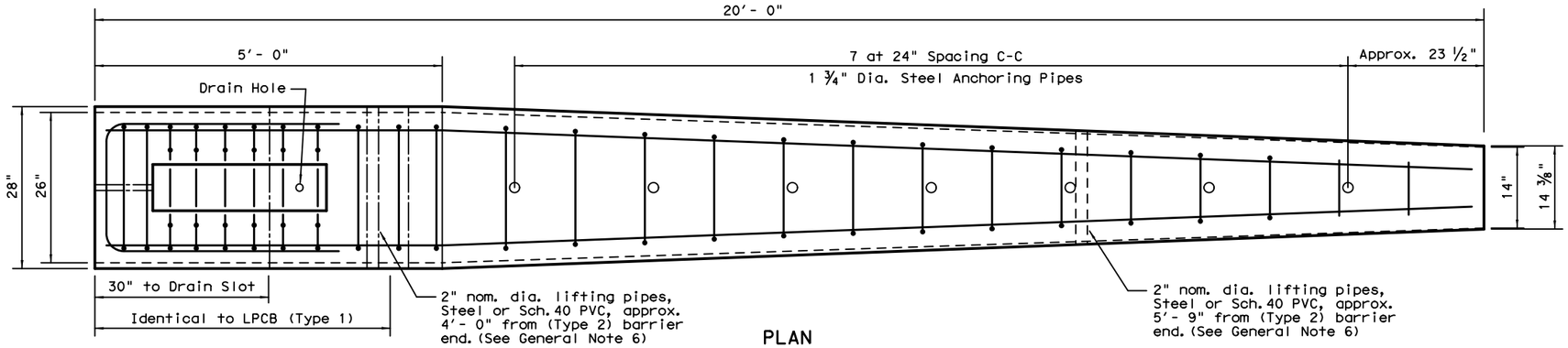
SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

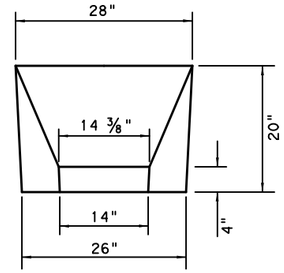
LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 1)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		28

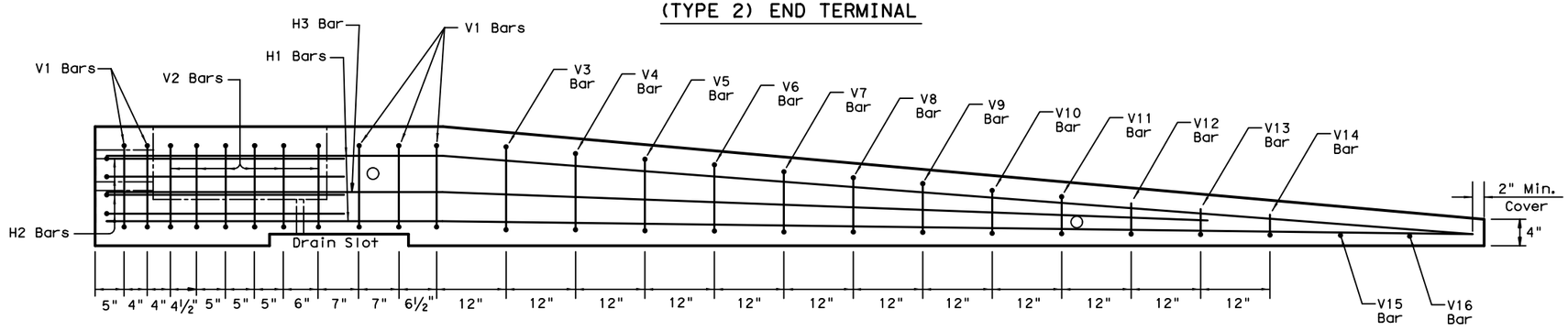
DATE: 5/25/2022
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standards\lpcb13.dgn



PLAN
(TYPE 2) END TERMINAL



APPROACH VIEW

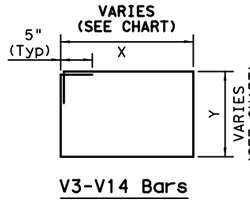


ELEVATION
(TYPE 2) END TERMINAL

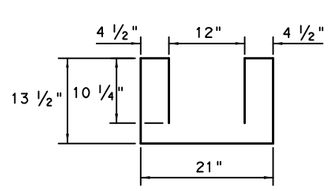
Note:
Anchoring pipes not shown in Elevation View

TYPE 2 - NOTES

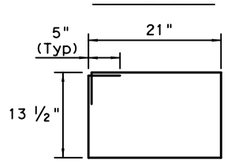
1. Welded wire reinforcment (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement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



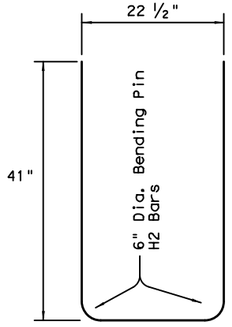
V3-V14 Bars



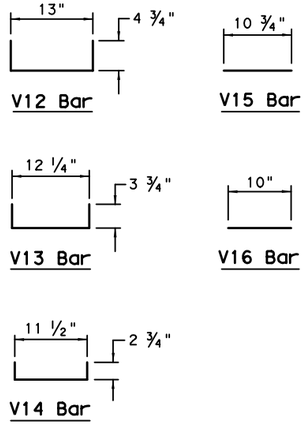
(6)~V2 Bars



(5)~V1 Bars



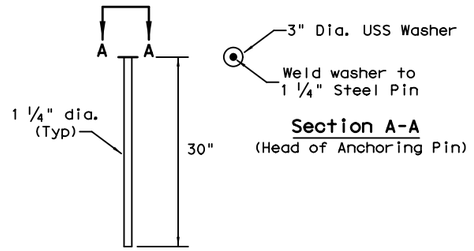
(4)~H2 Bars
(#5) Bars



Note: All V Bars are (#4)

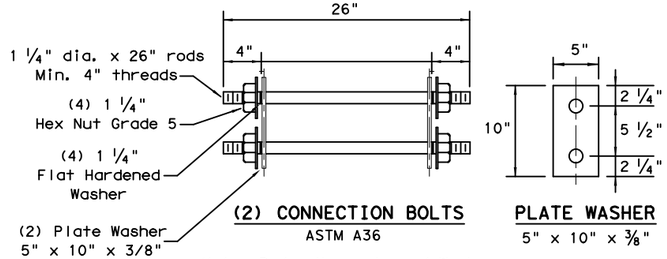
BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 ¼	14 ½
V4 BAR	19 ½	13 ½
V5 BAR	18 ½	12 ¼
V6 BAR	17 ½	11 ¼
V7 BAR	17	10 ¼
V8 BAR	16 ¼	9
V9 BAR	15 ½	8
V10 BAR	14 ½	7
V11 BAR	13 ¾	6

REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL



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

Section A-A
(Head of Anchoring Pin)

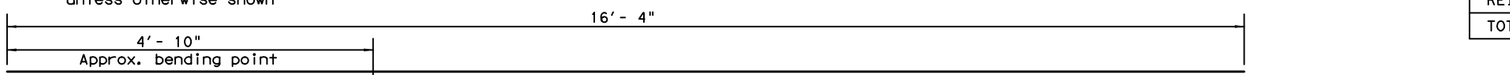


(2) CONNECTION BOLTS
ASTM A36

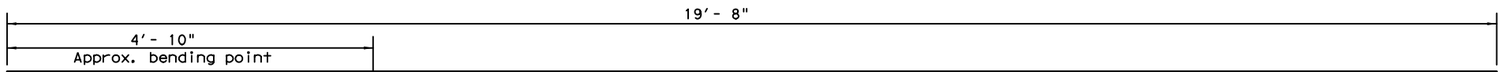
PLATE WASHER
5" x 10" x ⅜"

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

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



(2)~H3 Bars
(#5) Bar



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

(4)~H1 Bars
(#5) Bar

FOR CONTRACTORS INFORMATION ONLY

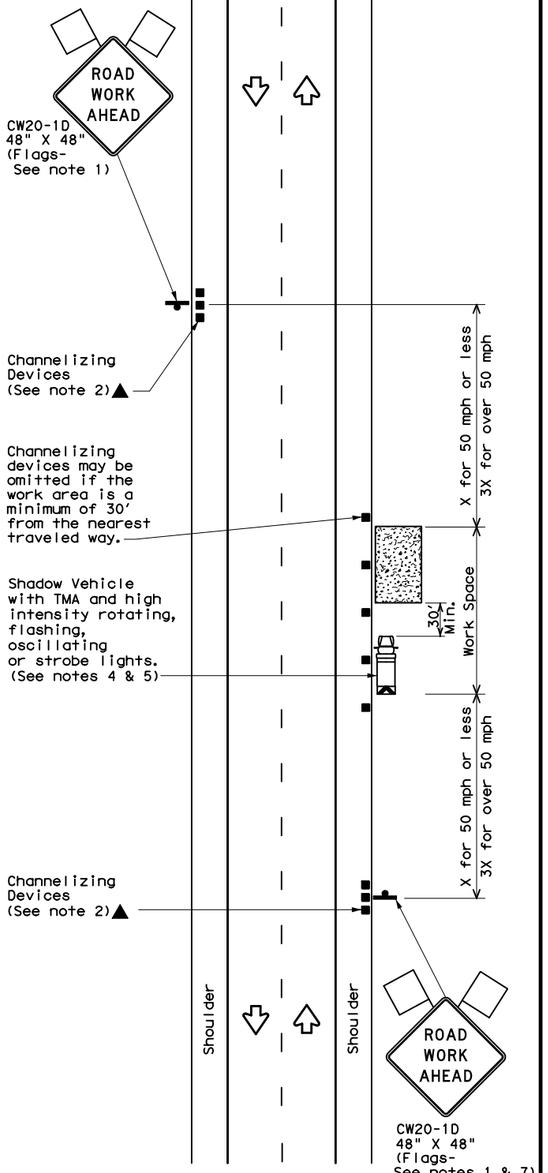
(TYPE 2) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000

Texas Department of Transportation
Design Division Standard

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

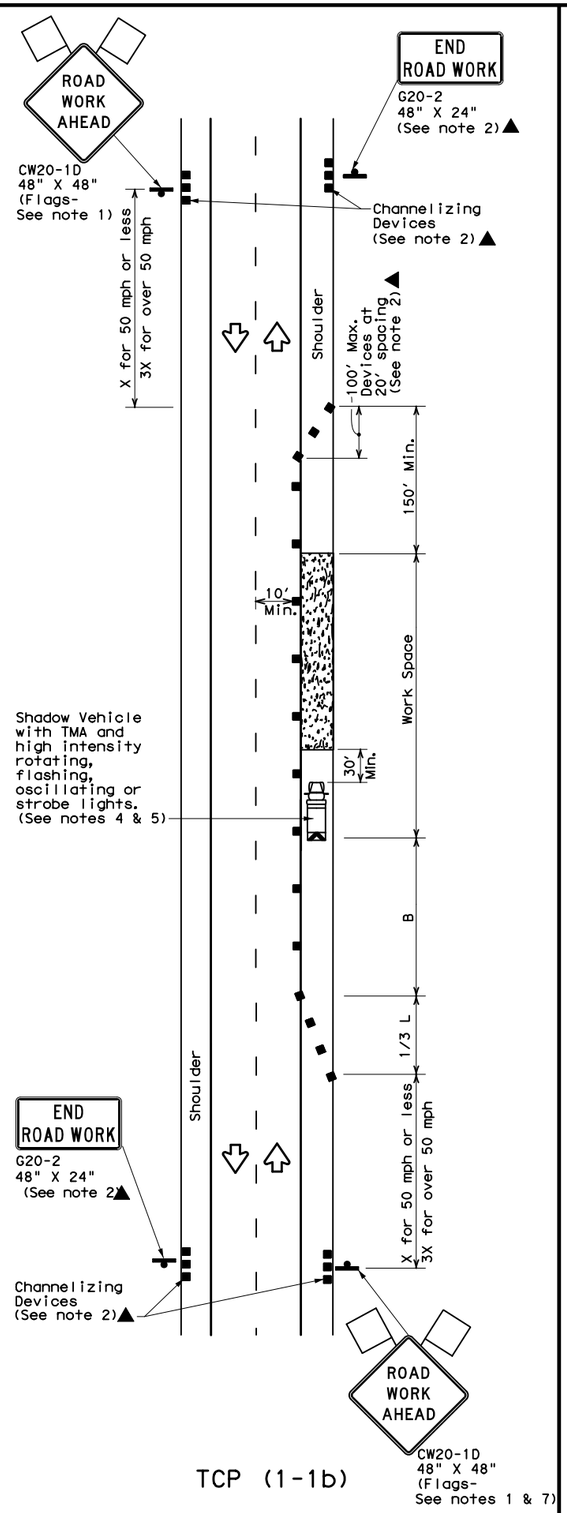
FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		29

DATE: 5/9/2022 9:32:12 AM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\04 TCP(1-1)-18.dgn



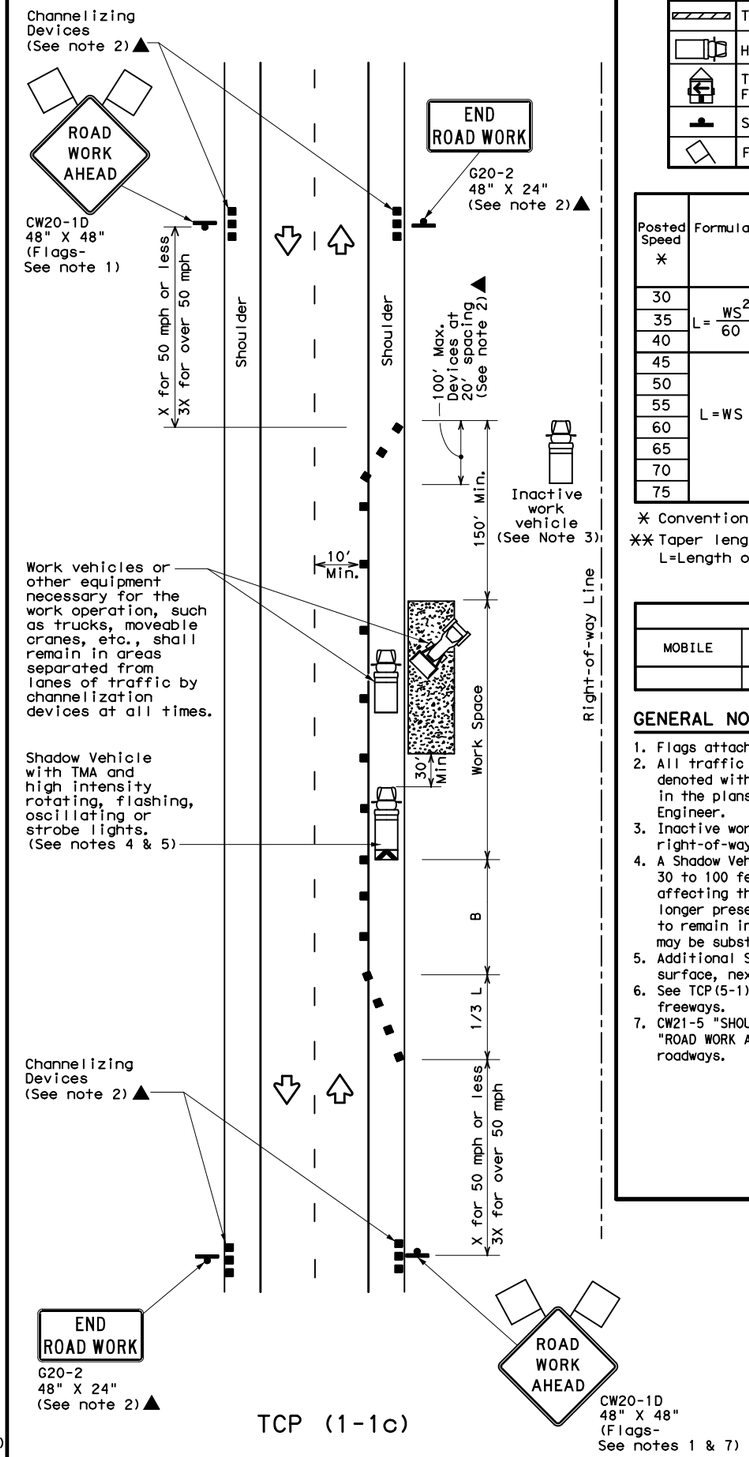
TCP (1-1a)

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

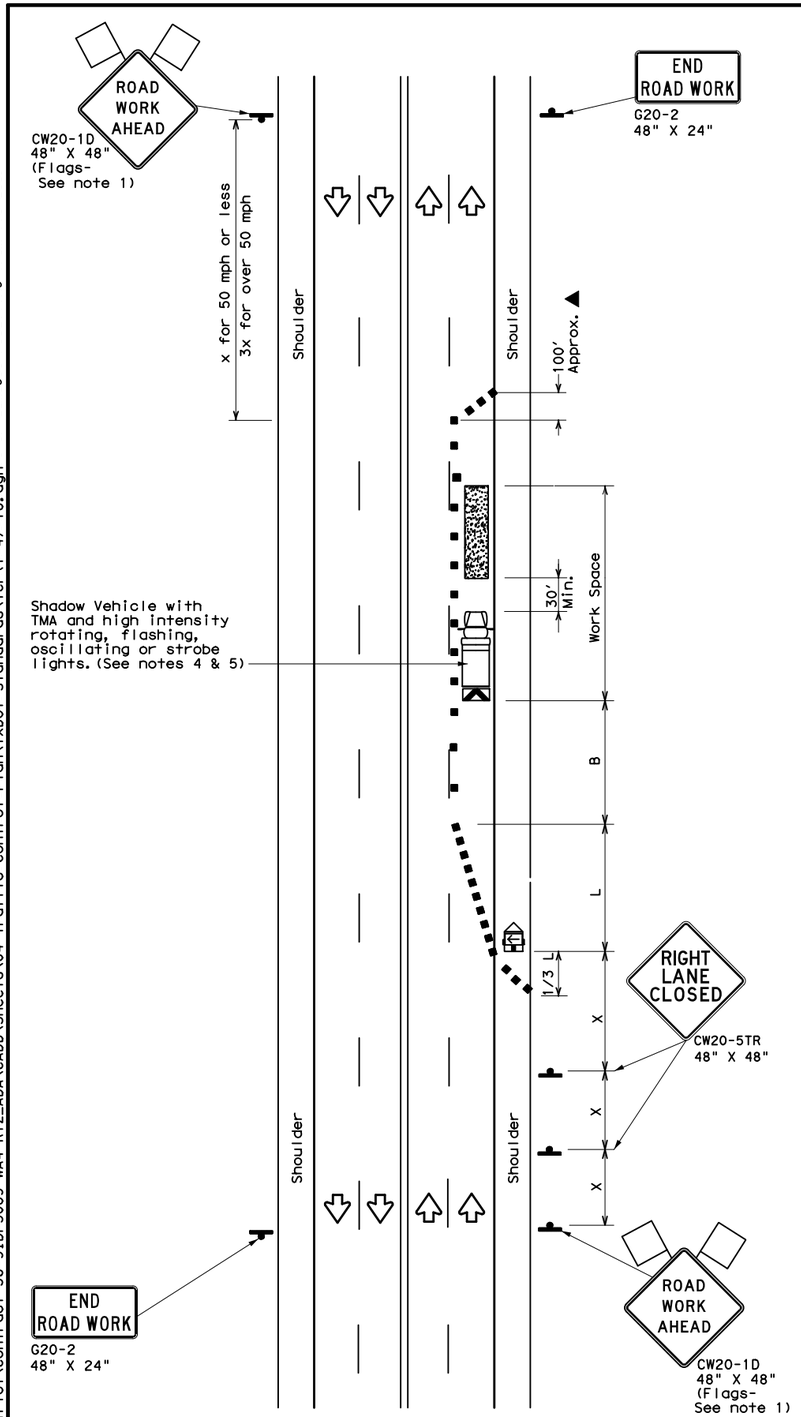
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

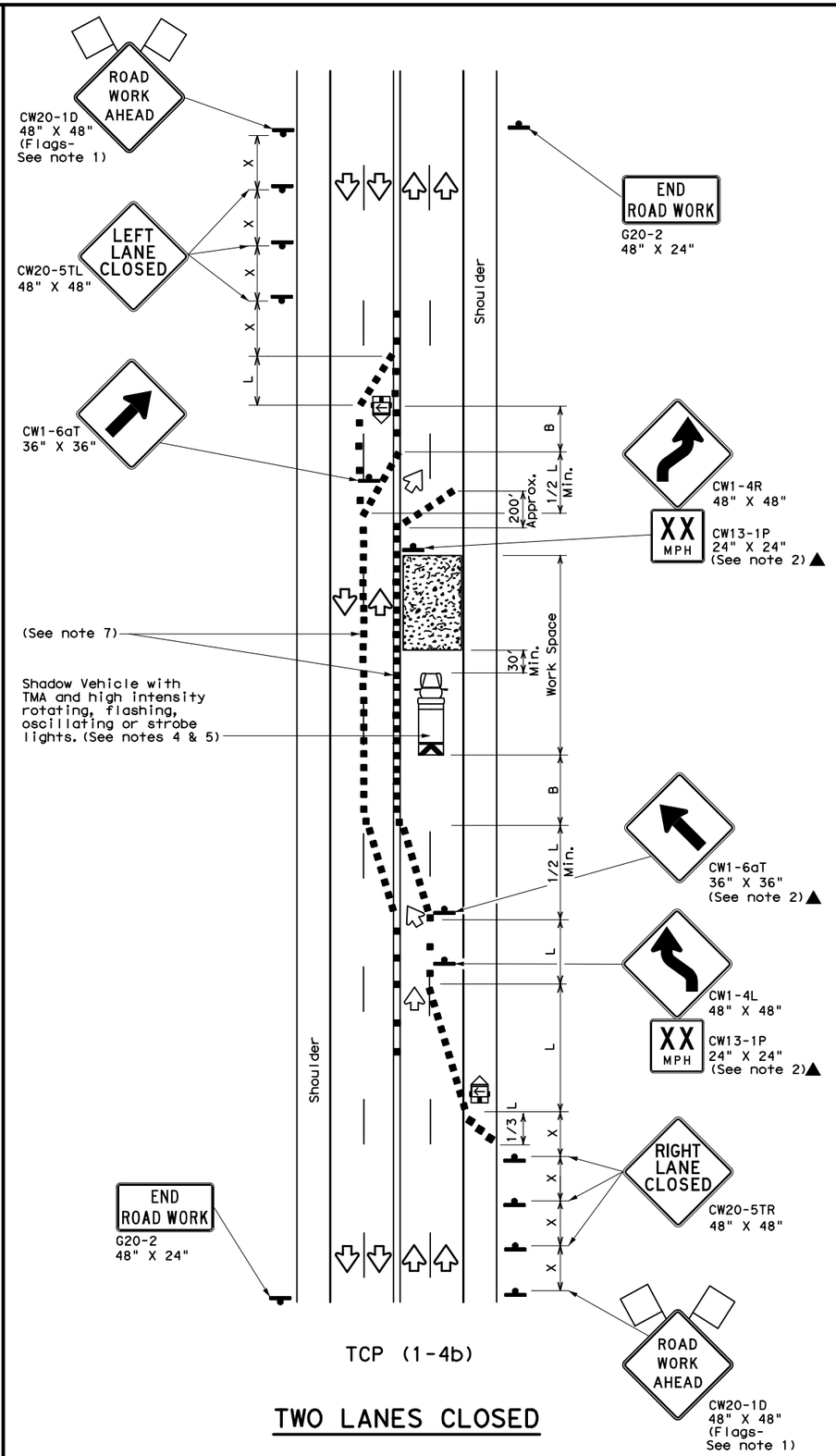
FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	LFK	ANGELINA		30
1-97 2-18				

DATE: 8/15/2012 1:44:36 PM
FILE: DGN:tcp1-4-18.dgn



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.

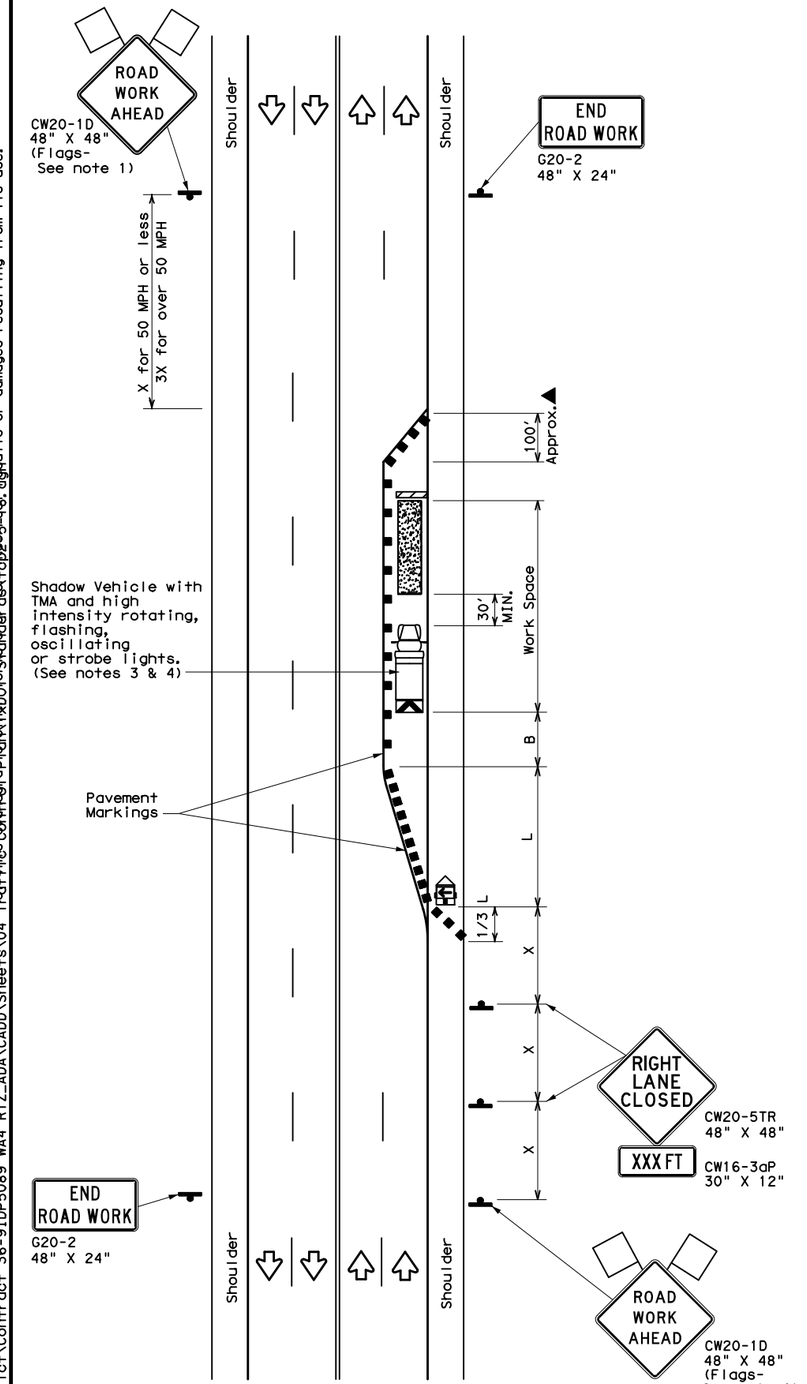
Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

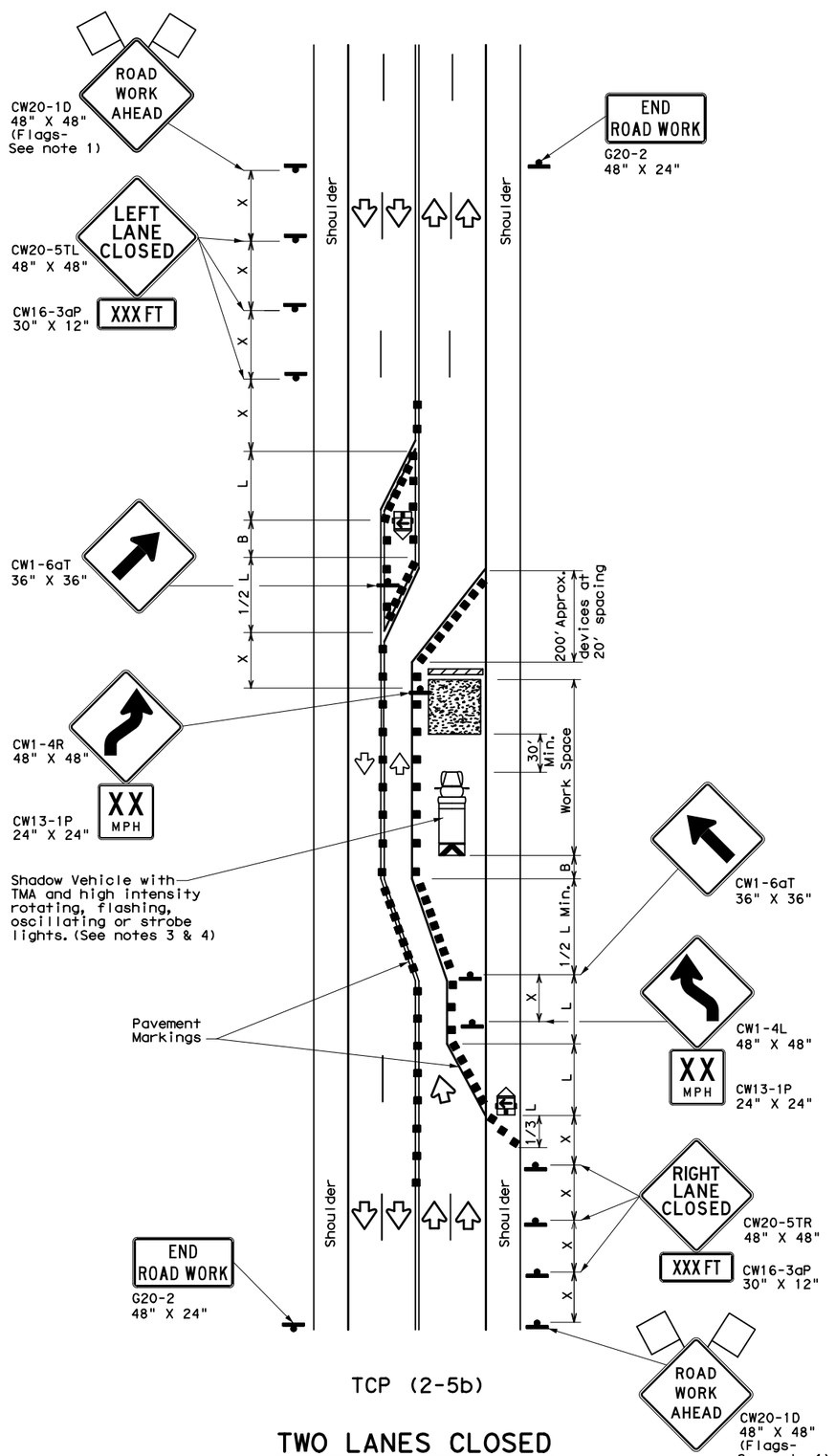
FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		31

DATE: 5/9/2022 9:32:15 AM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\04 TCP(2-5)-18.dgn



TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew eposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substitutued for the Shadow Vehicle and TMA.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

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

TCP (2-5b)

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

Texas Department of Transportation

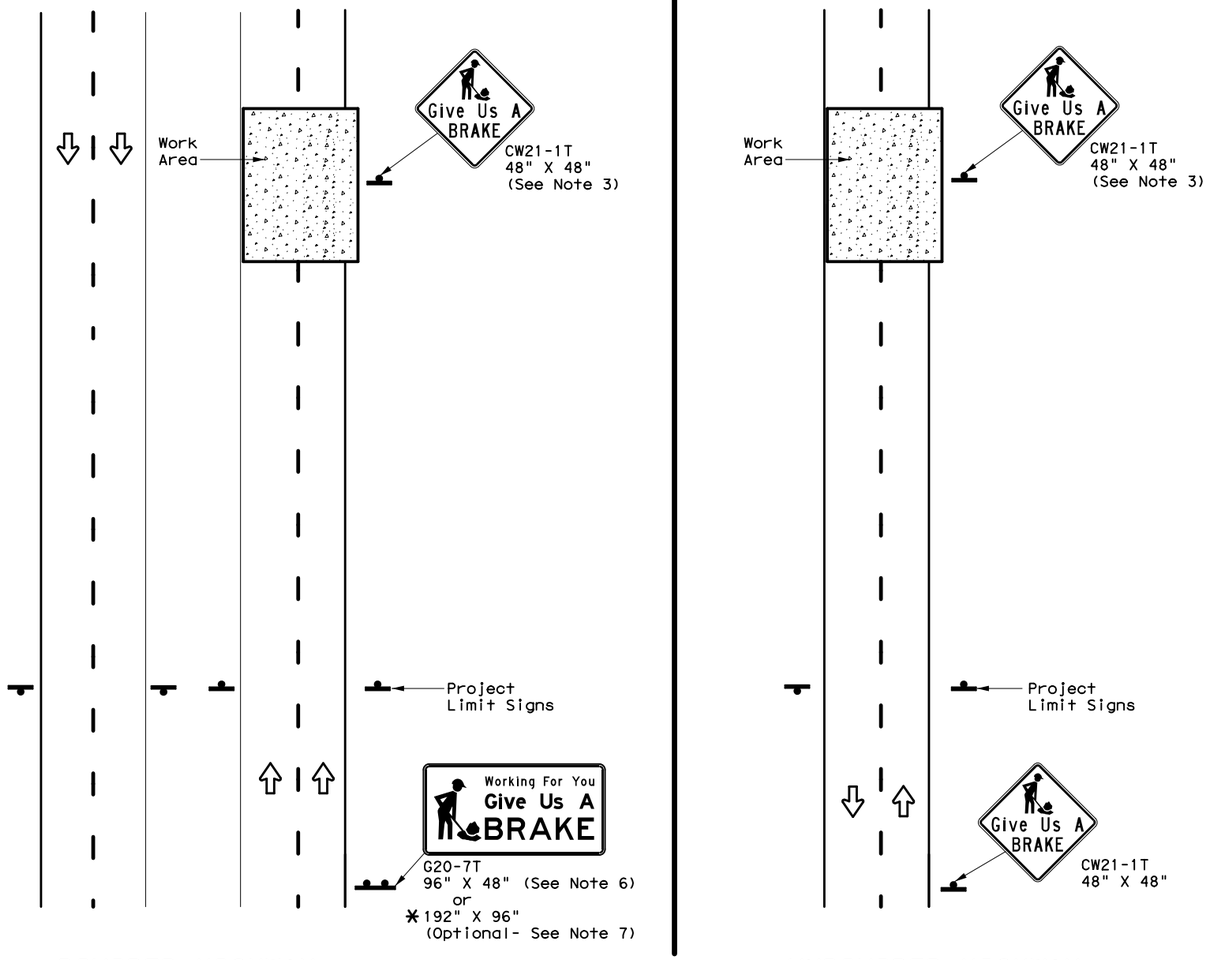
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12	0176	02	125, ETC.	BU 59G
1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	LFK	ANGELINA		32

DATE: 5/9/2022 9:32:17 AM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control\wzbrk-13.dgn



DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL}
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
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.

Texas Department of Transportation

Traffic Operations Division Standard

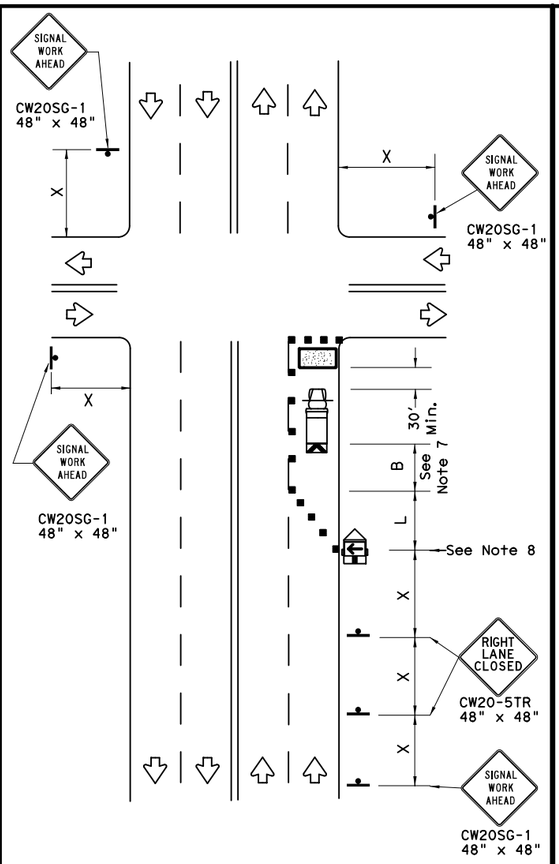
WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	LFK	ANGELINA		33

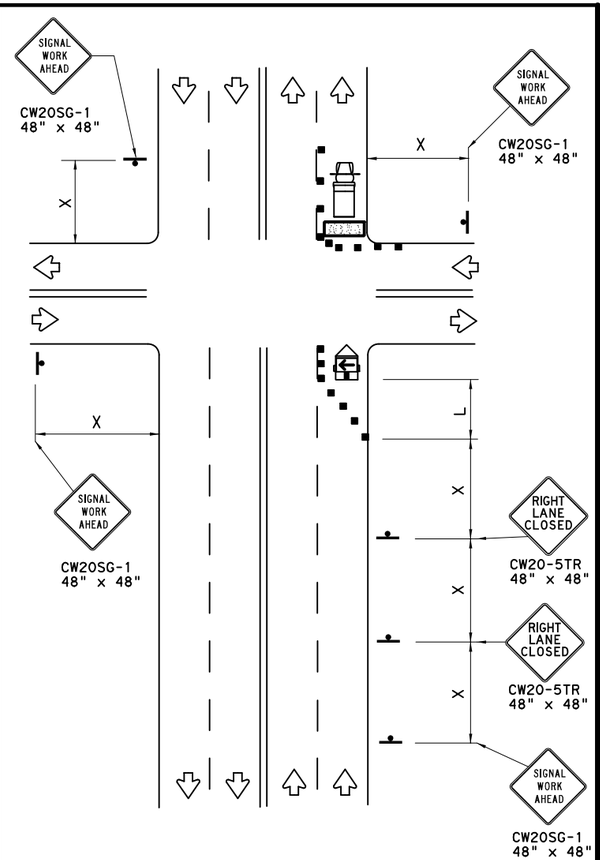
116

DATE: 5/25/2022 1:44:42 PM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control Plan\TxDOT Standard Drawings\wzbts-13.dgn



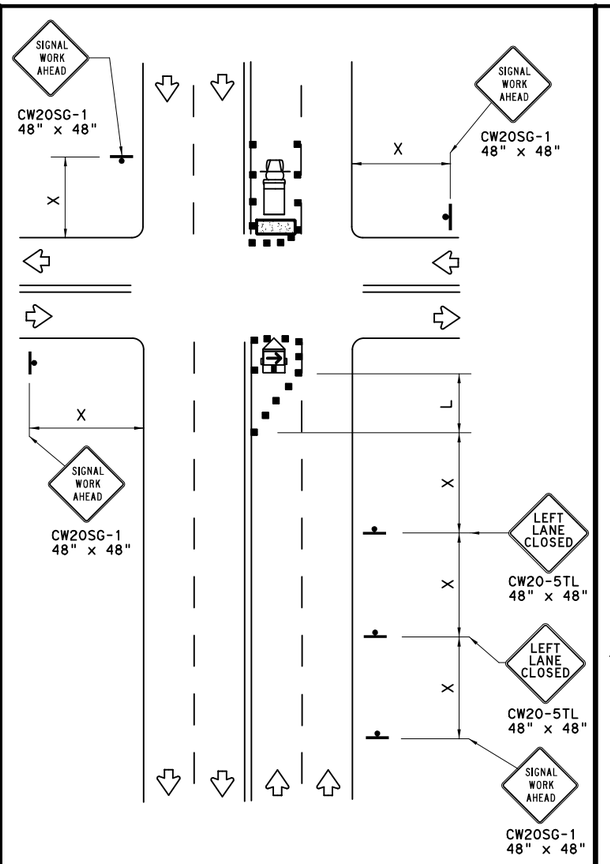
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



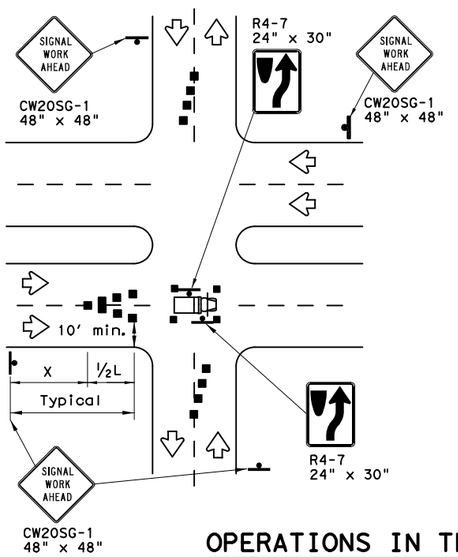
FAR SIDE RIGHT LANE CLOSURE

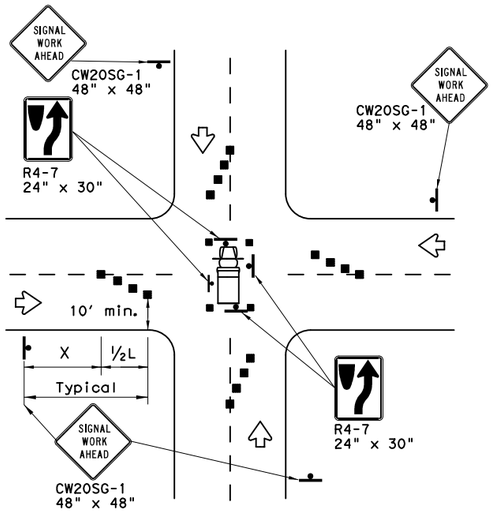
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

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

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

* Conventional Roads Only

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

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.

GENERAL NOTES

1. The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
2. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
4. Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
5. High level warning devices (flag trees) may be used at corners of the vehicle.
6. When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
9. Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.

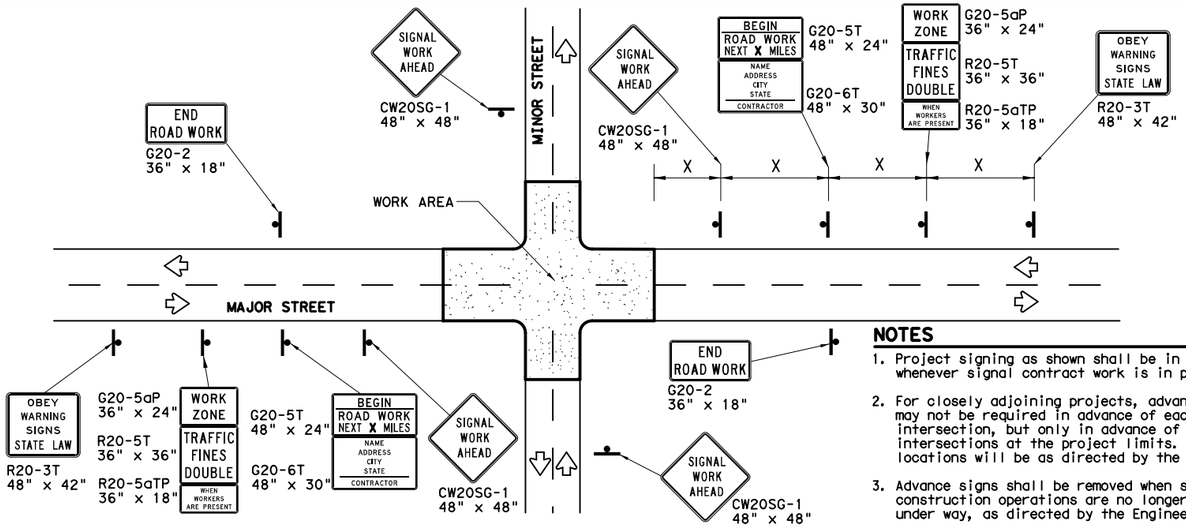
Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	LFK	ANGELINA		34

DATE: 5/25/2022 1:44:43 PM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\04 TRAFFIC CONTROL\wzbts-13.dgn



TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
4. Warning sign spacing shown is typical for both directions.
5. See the Table on sheet 1 of 2 for Typical warning sign spacing.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 6G.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night without damaging the sign sheeting. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

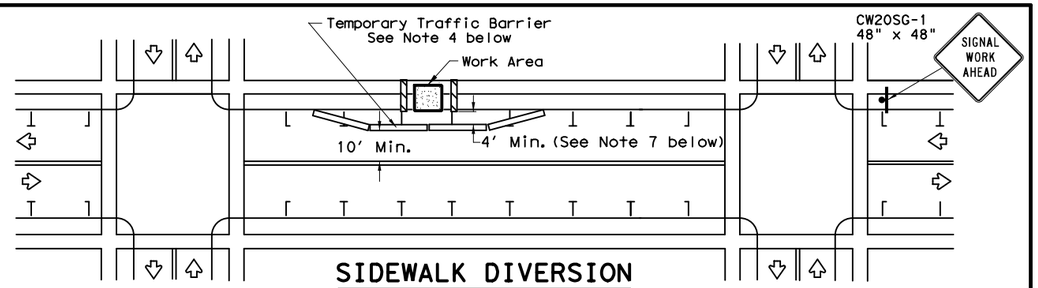
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

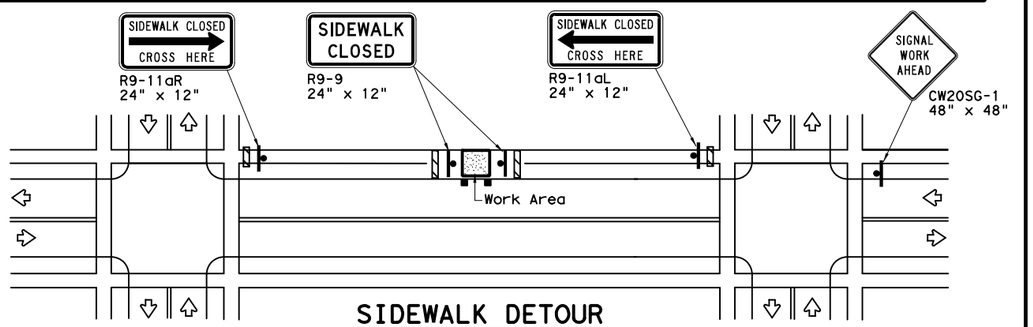
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
WHITE	BACKGROUND	TYPE A SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

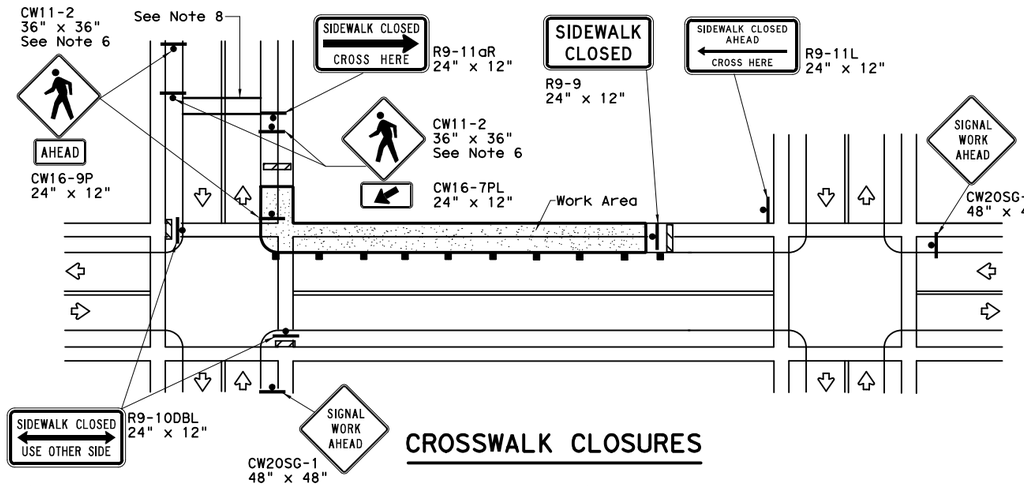
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

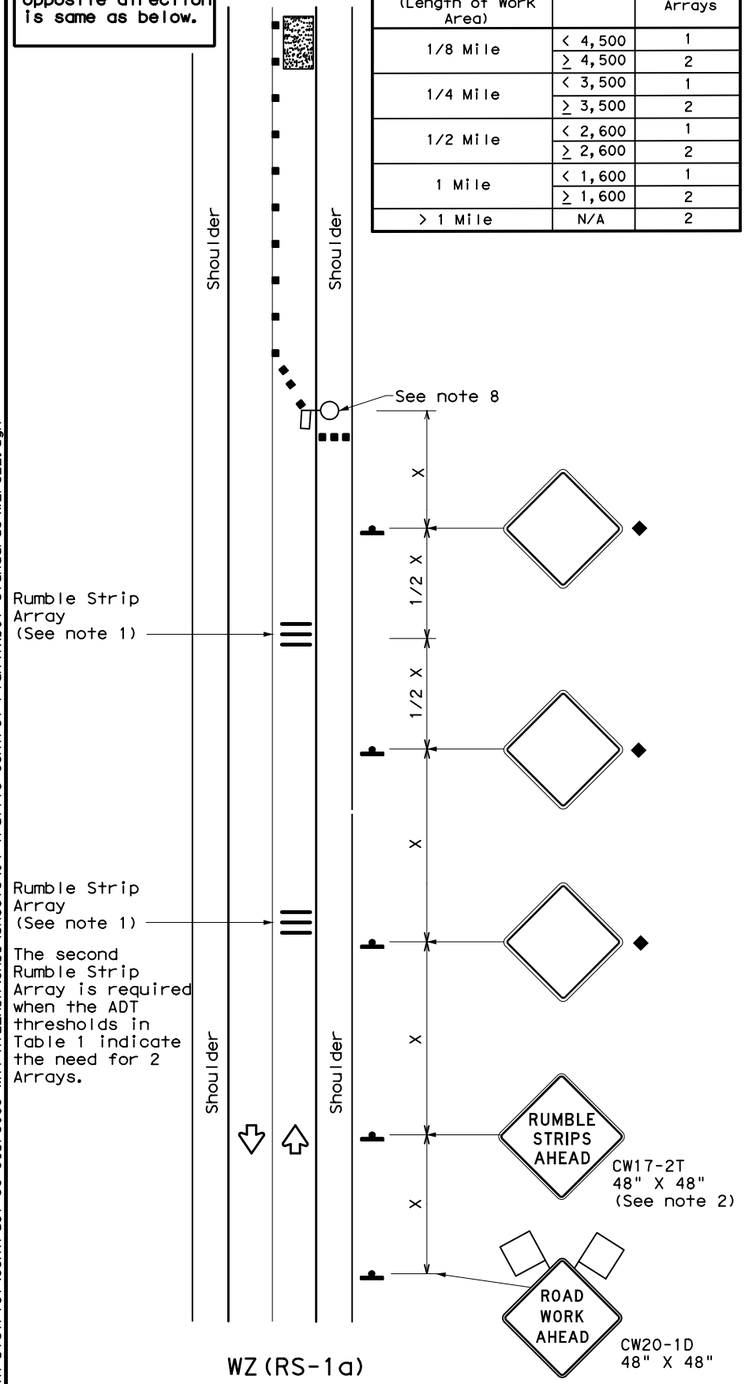
WZ(BTS-2)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	LFK	ANGELINA		35

DATE: 5/9/2022 9:32:21 AM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\04 Traffic Control\wzrs22_dgn

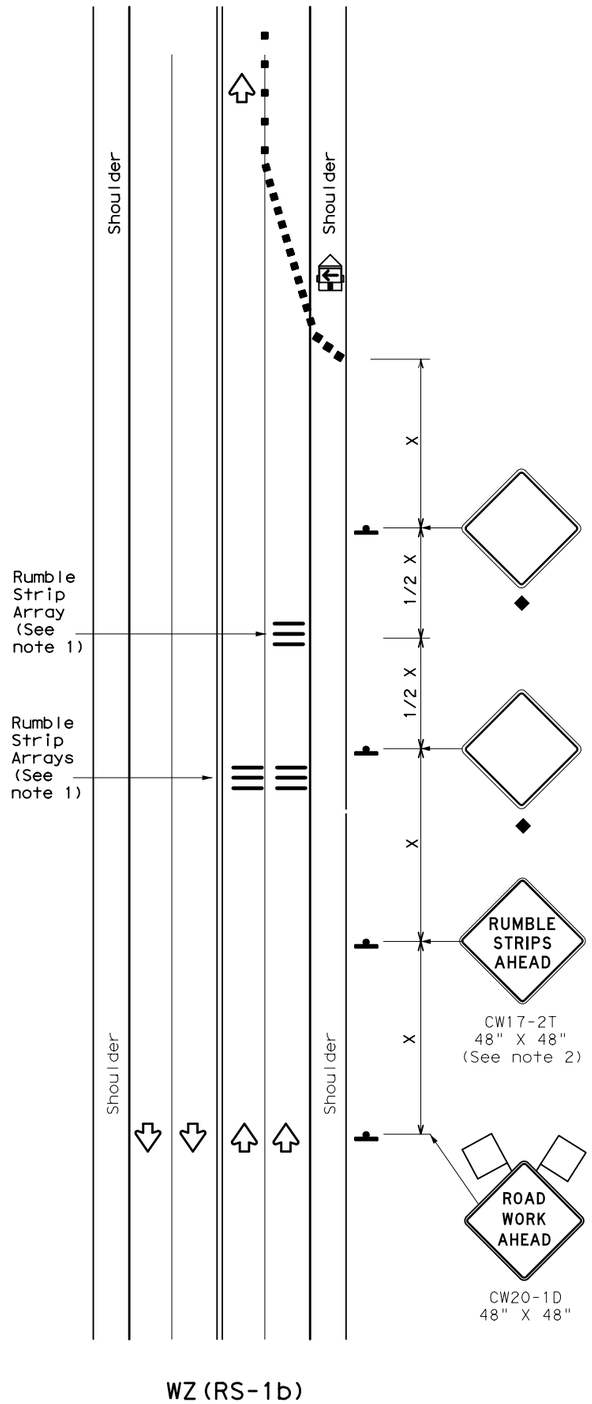
Warning sign and rumble strip sequence in opposite direction is same as below.

TABLE 1		
Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

1. Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
2. The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
3. Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
4. Remove Temporary Rumble Strips before removing the advanced warning signs.
5. Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
6. Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
7. This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
8. The one-lane two-way application may utilize a flagger, an Automated Flagger Assistance Device (AFAD) or a Portable Traffic Signal (PTS).
9. Replace defective Temporary Rumble Strips as directed by the Engineer.
10. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment and written direction from the Engineer.

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

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

* Conventional Roads Only

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

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

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.

* For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.

TABLE 2	
Speed	Approximate distance between strips in an array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
= 60 MPH	20'
≥ 65 MPH	* 35' +

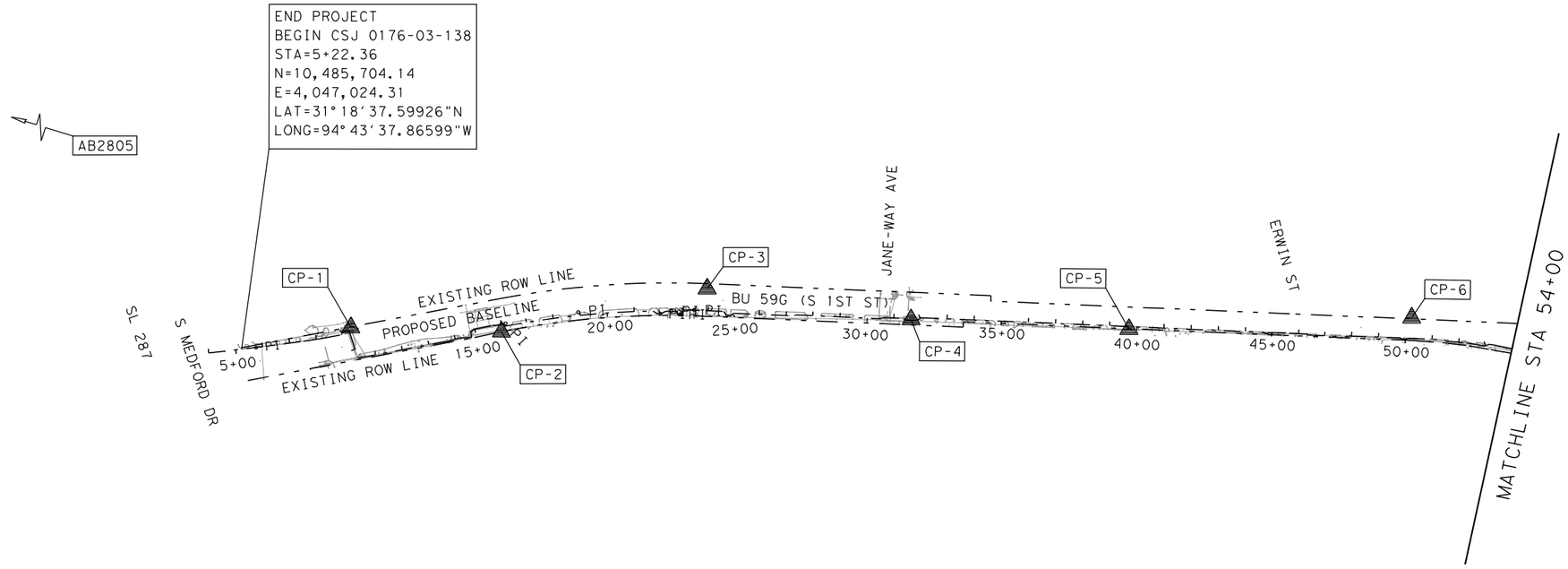
Texas Department of Transportation — Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		36

PI STATION	= 5+76.40	PI STATION	= 16+15.49	PI STATION	= 18+94.99		
DELTA	= 1° 45′ 49.87" (LT)	DELTA	= 112° 36′ 26.90" (RT)	DELTA	= 9° 43′ 35.99" (RT)		
DEGREE OF CURVE	= 0° 30′ 00.02"	DEGREE OF CURVE	= 1145° 54′ 56.12"	DEGREE OF CURVE	= 1° 46′ 23.84"		
TANGENT	= 176.40	TANGENT	= 7.50	TANGENT	= 274.92		
LENGTH	= 352.77	LENGTH	= 9.83	LENGTH	= 548.51		
RADIUS	= 11,459.00	RADIUS	= 5.00	RADIUS	= 3,231.04		
PC STATION	= 4+00.00	PC STATION	= 16+07.99	PC STATION	= 16+20.07		
PT STATION	= 7+52.77	PT STATION	= 16+17.82	PT STATION	= 21+68.58		
PI STATION	= 21+93.61	PI STATION	= 22+42.67	PI STATION	= 22+81.90	PI STATION	= 23+48.88
DELTA	= 0° 12′ 25.38" (RT)	DELTA	= 0° 44′ 19.89" (RT)	DELTA	= 0° 15′ 49.21" (RT)	DELTA	= 1° 28′ 11.97" (RT)
DEGREE OF CURVE	= 1° 46′ 46.65"	DEGREE OF CURVE	= 1° 46′ 26.81"	DEGREE OF CURVE	= 1° 46′ 48.64"	DEGREE OF CURVE	= 1° 46′ 15.95"
TANGENT	= 5.82	TANGENT	= 20.82	TANGENT	= 7.41	TANGENT	= 41.50
LENGTH	= 11.63	LENGTH	= 41.65	LENGTH	= 14.81	LENGTH	= 83.00
RADIUS	= 3,219.54	RADIUS	= 3,229.54	RADIUS	= 3,218.54	RADIUS	= 3,235.04
PC STATION	= 21+87.79	PC STATION	= 22+21.85	PC STATION	= 22+74.49	PC STATION	= 23+07.38
PT STATION	= 21+99.43	PT STATION	= 22+63.49	PT STATION	= 22+89.30	PT STATION	= 23+90.38



Point	North	East	Elevation	Station	Offset	Description
AB2805	10,456,929.63	4,039,686.11	277.01′	Off Chain	Off Chain	DATUM ROD IN SLV W/AC (LFK 1994)
CP-1	10,486,099.95	4,046,918.15	257.61′	9+26.35	12.59 LT	SET 5/8" IR W/RODS CAP
CP-2	10,486,655.36	4,046,896.51	255.51′	15+95.19	27.09 RT	SET 5/8" IR W/RODS CAP
CP-3	10,487,400.92	4,046,686.72	258.17′	23+92.94	80.69 LT	SET 5/8" IR W/RODS CAP
CP-4	10,488,158.84	4,046,749.93	259.51′	31+65.01	1.99 LT	SET MAG-NAIL W/RODS SHINER IN BRK ISL
CP-5	10,488,962.08	4,046,731.28	261.77′	39+70.95	10.00 RT	SET 5/8" IR W/RODS CAP
CP-6	10,489,999.22	4,046,619.38	269.17′	50+21.38	75.86 LT	SET 5/8" IR W/RODS CAP

From	To	Direction	Distance
CP-1	CP-2	N 02° 13′ 52" W	555.83′
CP-2	CP-3	N 15° 42′ 57" W	774.51′
CP-3	CP-4	N 04° 46′ 03" E	760.55′
CP-4	CP-5	N 01° 19′ 48" W	803.46′
CP-5	CP-6	N 06° 09′ 29" W	1,043.16′
CP-6	CP-7	N 12° 34′ 24" E	759.75′

NOTES:
1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (2011 ADJ.).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (GEOID 12B).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO NAD83 (GRID) VALUES BY DIVIDING BY 1.000120.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXLF DURING FEBRUARY 2022.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS, ADJUSTED WITH DIGITAL LEVELING.

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR
5-24-2022

THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
05/25/2022

RODS Surveying, Inc.
6810 LEE ROAD, STE.100
SPRING, TEXAS 77379
TEL (281) 257-4020
FAX (281) 257-4021
TBPELS SURVEYING FIRM
REG. No. 10030700

I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SURVEY CONTROL INDEX SHEET

(SHEET 1 OF 2)

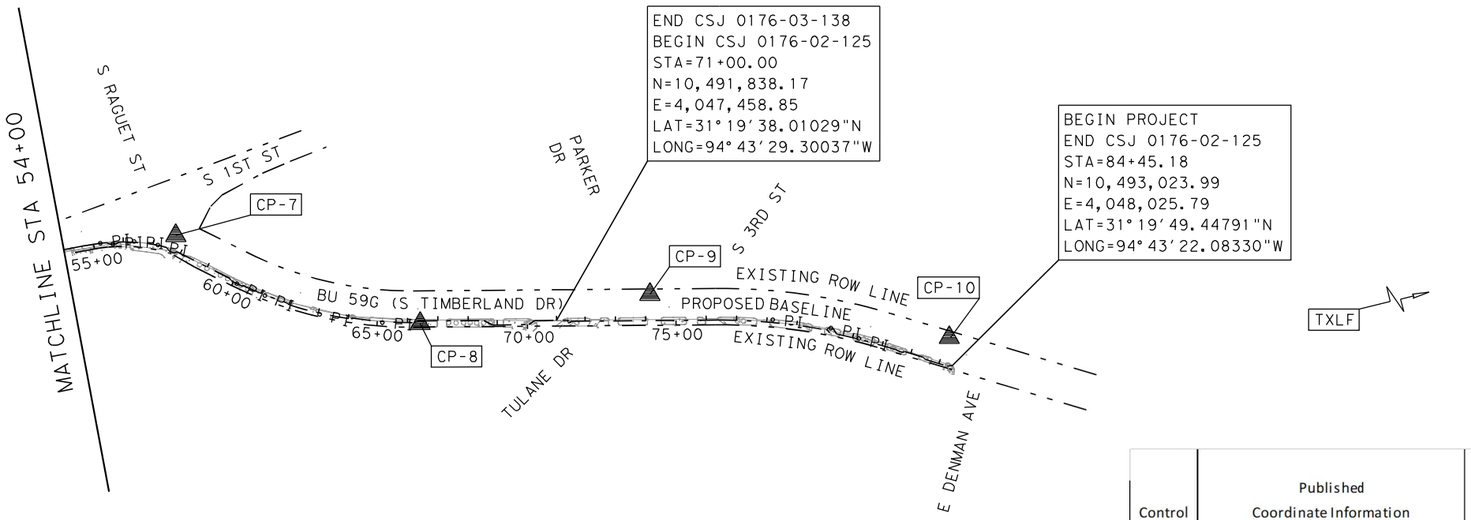
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	37
CONTROL	SECTION	JOB	
0176	02	125, ETC	

FILENAME: N:\I.S. Engineers 528\2194200 3\CAD\H&V Control\H&V Index Sheet 1.dgn
DRAWING DATE: 5/24/2022

PI STATION = 55+22.38	PI STATION = 55+64.59	PI STATION = 56+36.51
DELTA = 3° 51′ 16.07" (RT)	DELTA = 1° 38′ 55.26" (RT)	DELTA = 9° 35′ 54.37" (RT)
DEGREE OF CURVE = 9° 40′ 22.50"	DEGREE OF CURVE = 9° 46′ 18.85"	DEGREE OF CURVE = 9° 40′ 22.50"
TANGENT = 19.93	TANGENT = 8.44	TANGENT = 49.73
LENGTH = 39.85	LENGTH = 16.87	LENGTH = 99.23
RADIUS = 592.33	RADIUS = 586.33	RADIUS = 592.33
PC STATION = 55+02.45	PC STATION = 55+56.16	PC STATION = 55+86.78
PT STATION = 55+42.29	PT STATION = 55+73.03	PT STATION = 56+86.01

PI STATION = 57+15.65	PI STATION = 60+12.79	PI STATION = 61+13.82	PI STATION = 63+05.14
DELTA = 6° 57′ 49.12" (RT)	DELTA = 1° 43′ 45.74" (LT)	DELTA = 6° 33′ 37.23" (LT)	DELTA = 9° 07′ 11.48" (LT)
DEGREE OF CURVE = 11° 45′ 43.74"	DEGREE OF CURVE = 4° 20′ 23.29"	DEGREE OF CURVE = 4° 20′ 52.93"	DEGREE OF CURVE = 4° 20′ 11.46"
TANGENT = 29.64	TANGENT = 19.93	TANGENT = 75.52	TANGENT = 105.37
LENGTH = 59.20	LENGTH = 39.85	LENGTH = 150.88	LENGTH = 210.30
RADIUS = 487.12	RADIUS = 1,320.24	RADIUS = 1,317.74	RADIUS = 1,321.24
PC STATION = 56+86.01	PC STATION = 59+92.87	PC STATION = 60+38.29	PC STATION = 61+99.77
PT STATION = 57+45.22	PT STATION = 60+32.72	PT STATION = 61+89.17	PT STATION = 64+10.07

PI STATION = 65+16.93	PI STATION = 78+19.57	PI STATION = 80+16.65	PI STATION = 81+20.20
DELTA = 8° 58′ 10.93" (LT)	DELTA = 10° 57′ 51.33" (RT)	DELTA = 0° 26′ 12.38" (RT)	DELTA = 4° 40′ 49.84" (RT)
DEGREE OF CURVE = 4° 20′ 52.93"	DEGREE OF CURVE = 3° 03′ 14.68"	DEGREE OF CURVE = 3° 03′ 21.62"	DEGREE OF CURVE = 3° 04′ 50.34"
TANGENT = 103.36	TANGENT = 179.07	TANGENT = 7.15	TANGENT = 76.01
LENGTH = 206.29	LENGTH = 357.06	LENGTH = 14.29	LENGTH = 151.93
RADIUS = 1,317.74	RADIUS = 1,865.86	RADIUS = 1,874.86	RADIUS = 1,859.86
PC STATION = 64+13.57	PC STATION = 76+40.49	PC STATION = 80+09.51	PC STATION = 80+44.19
PT STATION = 66+19.87	PT STATION = 79+97.55	PT STATION = 80+23.80	PT STATION = 81+96.12



Control Name	Published Coordinate Information			Measured Coordinate Information			Deferent (Published - Measured		
	North	East	Elev.	North	East	Elev.	North	East	Elev.
AB2805	10,456,929.58	4,039,686.06	277.5	10,456,929.63	4,039,686.11	277.01	-0.05	-0.05	0.49

Notes:
1. Measured values are based on redundant GPS VRS observations from TXLF during February 2022.

2. NGS Monument AB2805 is a Primary Airport Control Station; published values are based on NAD83(2011 Adj), NAVD88 (Geoid 93).

From	To	Direction	Distance
CP-6	CP-7	N 12° 34′ 24" E	759.75′
CP-7	CP-8	N 38° 48′ 13" E	857.54′
CP-8	CP-9	N 11° 46′ 41" E	763.76′
CP-9	CP-10	N 27° 11′ 27" E	999.35′

Point	North	East	Elevation	Station	Offset	Description
CP-7	10,490,740.75	4,046,784.77	275.54′	16+17.02	4,074.50 LT	SET 5/8" IR W/RODS CAP
CP-8	10,491,409.03	4,047,322.15	270.97′	66+42.25	8.53 RT	SET 5/8" IR W/RODS CAP
CP-9	10,492,156.71	4,047,478.05	276.54′	74+14.41	86.70 LT	SET 5/8" IR W/RODS CAP
CP-10	10,493,045.62	4,047,934.71	276.38′	84+08.82	92.19 LT	SET MAG-NAIL W/RODS SHINER IN BRK ISL
TXLF	10,502,520.10	4,048,950.48	348.09′	Off Chain	Off Chain	CORS TXLF

NOTE: DUE TO THE IRREGULAR GEOMETRY OF THE ALIGNMENT THE STATION AND OFFSET VALUES FOR CP-7 SHOWN IN THE TABLE ABOVE MAY APPEAR TO BE IN ERROR HOWEVER THEY ARE MATHEMATICALLY CORRECT. FOR PRACTICAL PURPOSES, THE ACTUAL LOCATION OF CP-7 IS APPROXIMATELY 49.7′ LEFT OF STATION 57+46.

0 250 500 750
SCALE 1"=500′

NOTES:
1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (2011 ADJ.).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (GEOID 12B).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO NAD83 (GRID) VALUES BY DIVIDING BY 1.000120.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXLF DURING FEBRUARY 2022.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS, ADJUSTED WITH DIGITAL LEVELING.

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR
5-24-2022

THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
05/25/2022

RODS Surveying, Inc.
6810 LEE ROAD, STE.100
SPRING, TEXAS 77379
TEL (281) 257-4020
FAX (281) 257-4021
TBPELS SURVEYING FIRM
REG. No. 10030700

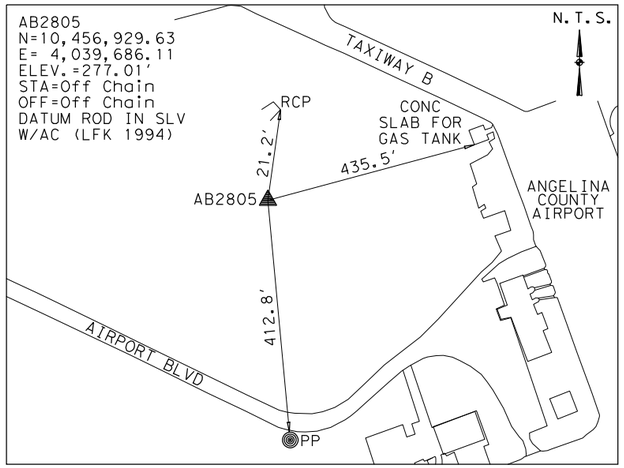
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SURVEY CONTROL INDEX SHEET

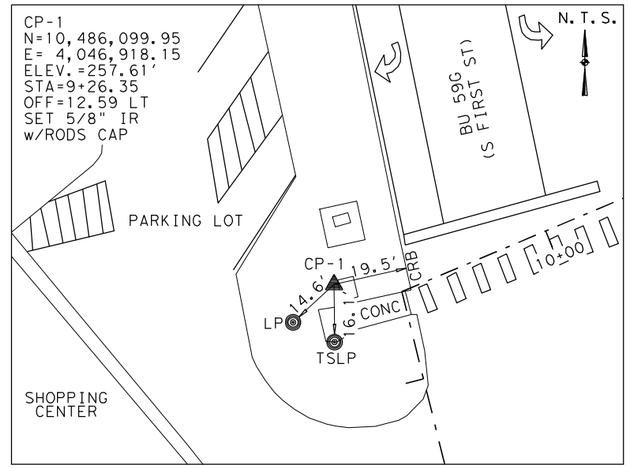
(SHEET 2 OF 2)

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	38
CONTROL	SECTION	JOB	
0176	02	125, ETC	

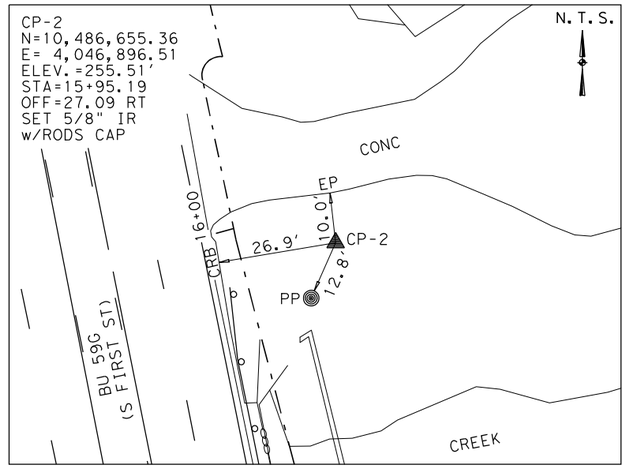
FILENAME: N:\I.S. Engineers 528\2194003\CAD\H&V Control\H&V Index Sheet 2.dgn
DRAWING DATE: 5/24/2022



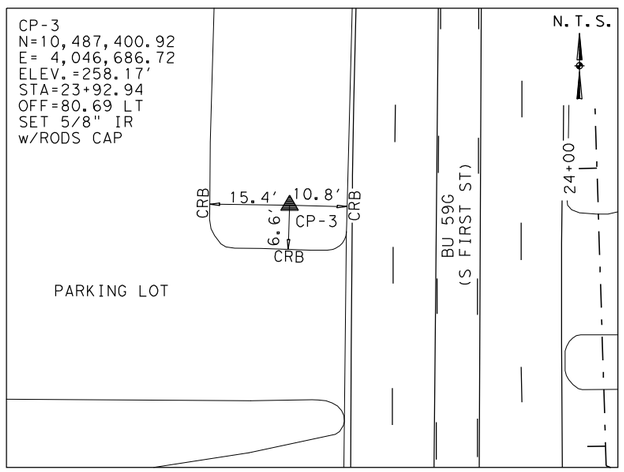
STATION IS LOCATED ON THE NORTHWEST SIDE OF ANGELINA COUNTY AIRPORT.



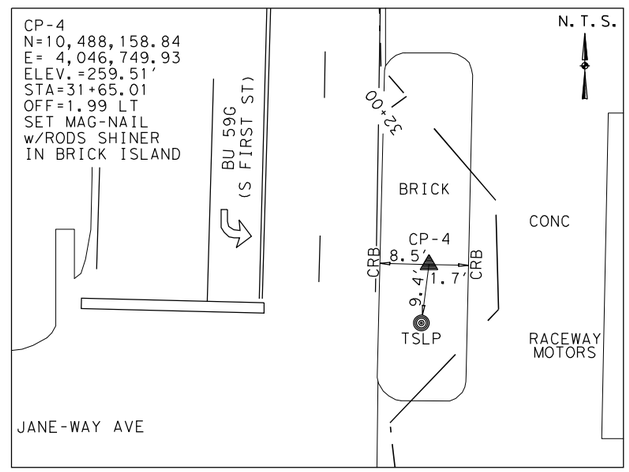
STATION IS LOCATED ON THE WEST SIDE OF BU 59G, AND LYING 0.12 MILE NORTH OF S MEDFORD DR.



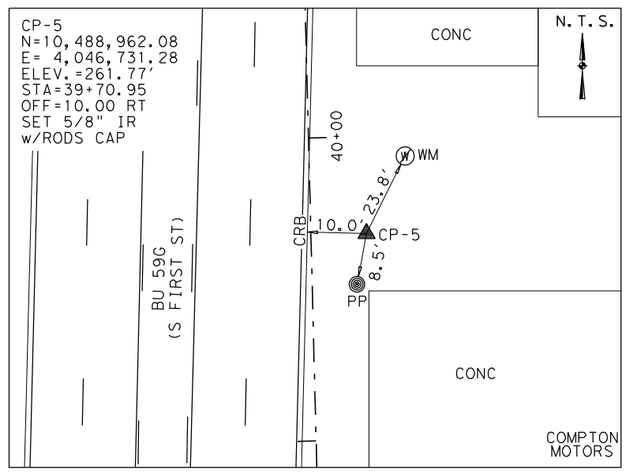
STATION IS LOCATED ON THE EAST SIDE OF BU 59G, AND LYING 0.22 MILE NORTH OF S MEDFORD DR.



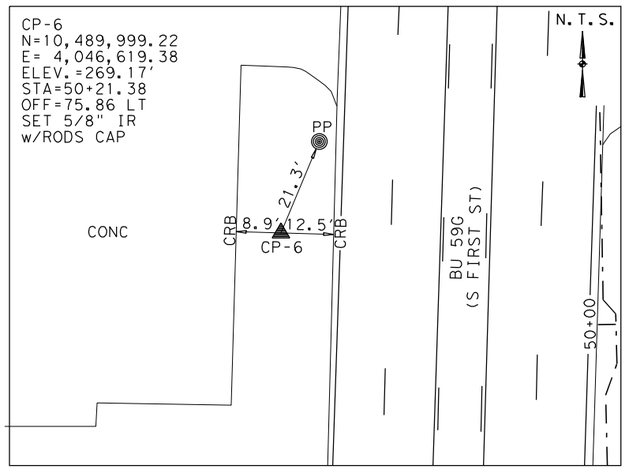
STATION IS LOCATED ON THE WEST SIDE OF BU 59G, AND LYING 0.36 MILE NORTH OF S MEDFORD DR.



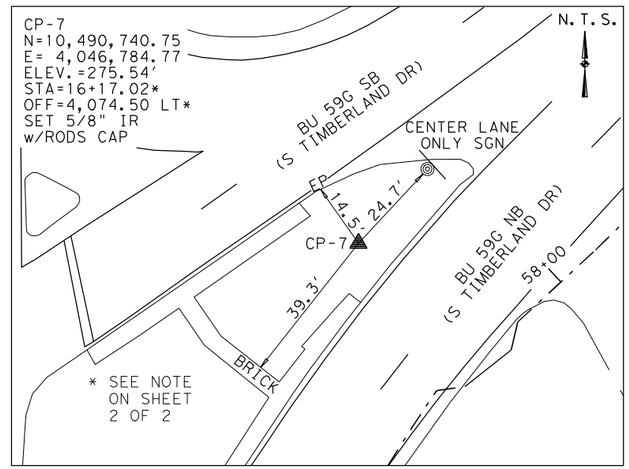
STATION IS LOCATED ON THE NORTHEAST SIDE OF THE INTERSECTION OF BU 59G AND JANE-WAY AVE.



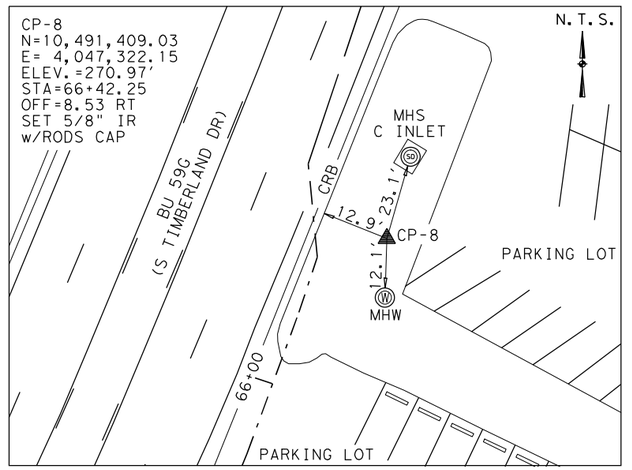
STATION IS LOCATED ON THE EAST SIDE OF BU 59G, AND LYING 0.16 MILE NORTH OF JANE-WAY AVE.



STATION IS LOCATED ON THE WEST SIDE OF BU 59G, AND LYING 0.10 MILE NORTH OF ERWIN ST.



STATION IS LOCATED ON THE NORTHEAST MEDIAN OF THE INTERSECTION OF BU 59G AND SL 266.



STATION IS LOCATED ON THE EAST SIDE OF BU 59G, AND LYING 0.18 MILE NORTH OF SL 266.

NOTES:

1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (2011 ADJ.).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (GEOID 12B).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO NAD83 (GRID) VALUES BY DIVIDING BY 1.000120.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXLF DURING FEBRUARY 2022.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS, ADJUSTED WITH DIGITAL LEVELING.

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

5-24-2022

THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER

05/25/2022

RODS
Surveying, Inc.
6810 LEE ROAD, STE.100
SPRING, TEXAS 77379
TEL (281) 257-4020
FAX (281) 257-4021
TBPELS SURVEYING FIRM
REG. No. 10030700

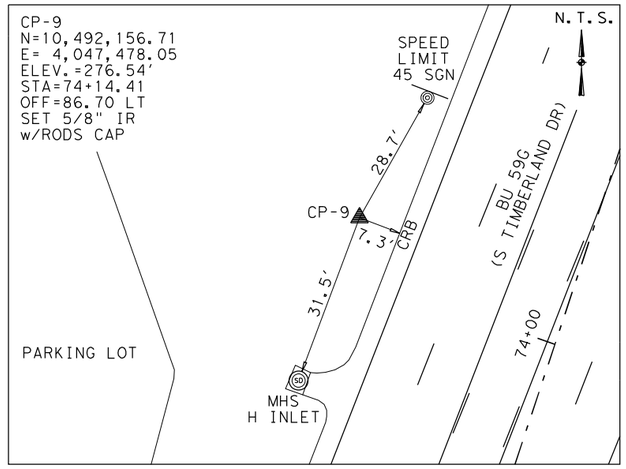
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

HORIZONTAL & VERTICAL CONTROL SHEET

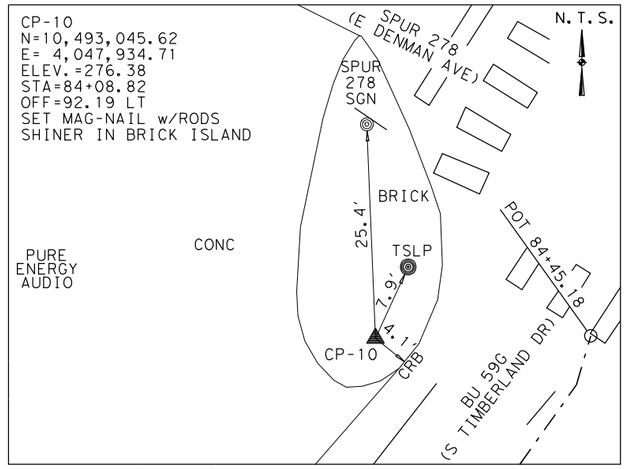
(SHEET 1 OF 2)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	39
CONTROL	SECTION	JOB	
0176	02	125, ETC	

FILENAME: N:\I.S. Engineers 528\21942003\CAD\H&V Control\H&V Sketches.dgn
DRAWING DATE: 5/24/2022



STATION IS LOCATED ON THE WEST SIDE OF BU 59G, AND LYING 91' NORTH OF PARKER DR.



STATION IS LOCATED ON THE WEST CORNER OF THE INTERSECTION OF BU 59G AND SPUR 278.

NOTE: DUE TO THE IRREGULAR GEOMETRY OF THE ALIGNMENT THE STATION AND OFFSET VALUES FOR CP-7 SHOWN HEREON MAY APPEAR TO BE IN ERROR HOWEVER, THEY ARE MATHEMATICALLY CORRECT. FOR PRACTICAL PURPOSES, THE ACTUAL LOCATION OF CP-7 IS APPROXIMATELY 49.7' LEFT OF STATION 57+46.

NOTES:
1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (2011 ADJ.).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (GEOID 12B).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO NAD83 (GRID) VALUES BY DIVIDING BY 1.000120.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXLF DURING FEBRUARY 2022.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS, ADJUSTED WITH DIGITAL LEVELING.

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

5-24-2022

THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER

05/25/2022

RODS Surveying, Inc.
6810 LEE ROAD, STE.100
SPRING, TEXAS 77379
TEL (281) 257-4020
FAX (281) 257-4021
TBPELS SURVEYING FIRM
REG. No. 10030700

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

HORIZONTAL & VERTICAL CONTROL SHEET

(SHEET 2 OF 2)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	40
CONTROL	SECTION	JOB	
0176	02	125, ETC	

FILENAME: N:\I.S. Engineers 528\21942003\CAD\H&V Control\H&V Sketches.dgn
DRAWING DATE: 5/24/2022

Beginning chain BL_SW description

			Curve Data			
Curve BL_SW1						
P.I. Station	5+76.40	N	10,485,757.4548	E	4,047,015.4890	
Delta =	1° 45′ 49.87"	(LT)				
Degree =	0° 30′ 00.02"					
Tangent =	176.3968					
Length =	352.7656					
Radius =	11,459.0000					
External =	1.3576					
Long Chord =	352.7517					
Mid. Ord. =	1.3575					
P.C. Station	4+00.00	N	10,485,583.7858	E	4,047,046.3905	
P.T. Station	7+52.77	N	10,485,930.0903	E	4,046,979.2566	
C.C.		N	10,483,576.3804	E	4,035,764.5908	
Back = N	10° 05′ 21.20" W					
Ahead = N	11° 51′ 11.07" W					
Chord Bear = N	10° 58′ 16.14" W					

Course from PT BL_SW1 to BLSW002 N 11° 51′ 11.07" W Dist 30.0709

Point BLSW002 N 10,485,959.5200 E 4,046,973.0800 Sta 7+82.84

Course from BLSW002 to BLSW003 N 12° 56′ 34.58" W Dist 43.1123

Point BLSW003 N 10,486,001.5370 E 4,046,963.4237 Sta 8+25.95

Course from BLSW003 to BLSW004 N 14° 36′ 12.43" W Dist 65.8716

Point BLSW004 N 10,486,065.2805 E 4,046,946.8156 Sta 8+91.82

Course from BLSW004 to BLSW005 N 49° 11′ 27.26" W Dist 19.2176

Point BLSW005 N 10,486,077.8400 E 4,046,932.2700 Sta 9+11.04

Course from BLSW005 to BLSW006 N 14° 36′ 12.43" W Dist 15.3110

Point BLSW006 N 10,486,092.6564 E 4,046,928.4097 Sta 9+26.35

Course from BLSW006 to BLSW007 N 67° 13′ 39.89" E Dist 11.0209

Point BLSW007 N 10,486,096.9222 E 4,046,938.5715 Sta 9+37.37

Course from BLSW007 to BLSW008 N 67° 13′ 39.89" E Dist 97.6462

Point BLSW008 N 10,486,134.7181 E 4,047,028.6062 Sta 10+35.02

Course from BLSW008 to BLSW009 N 14° 35′ 25.69" W Dist 337.5682

Point BLSW009 N 10,486,461.4000 E 4,046,943.5700 Sta 13+72.58

Course from BLSW009 to BLSW010 N 19° 10′ 33.01" W Dist 44.5096

Point BLSW010 N 10,486,503.4400 E 4,046,928.9500 Sta 14+17.09

Course from BLSW010 to BLSW011 N 6° 05′ 19.70" W Dist 36.8615

Point BLSW011 N 10,486,540.0936 E 4,046,925.0401 Sta 14+53.96

Course from BLSW011 to BLSW012 N 14° 36′ 12.44" W Dist 6.9020

Point BLSW012 N 10,486,546.7726 E 4,046,923.2999 Sta 14+60.86

Course from BLSW012 to BLSW013 S 75° 23′ 47.56" W Dist 20.5483

Point BLSW013 N 10,486,541.5918 E 4,046,903.4155 Sta 14+81.41

Course from BLSW013 to BLSW014 N 38° 11′ 22.24" W Dist 17.7275

Point BLSW014 N 10,486,555.5251 E 4,046,892.4552 Sta 14+99.13

Course from BLSW014 to BLSW015 N 14° 36′ 12.43" W Dist 67.5591

Point BLSW015 N 10,486,620.9016 E 4,046,875.4217 Sta 15+66.69

Course from BLSW015 to BLSW016 N 11° 57′ 41.75" E Dist 4.4721

Point BLSW016 N 10,486,625.2766 E 4,046,876.3486 Sta 15+71.16

Course from BLSW016 to PC BL_SW2 N 14° 36′ 12.43" W Dist 36.8292

			Curve Data			
Curve BL_SW2						
P.I. Station	16+15.49	N	10,486,668.1721	E	4,046,865.1724	
Delta =	112° 36′ 26.90"	(RT)				
Degree =	1145° 54′ 56.12"					
Tangent =	7.4982					
Length =	9.8269					
Radius =	5.0000					
External =	4.0124					
Long Chord =	8.3199					
Mid. Ord. =	2.2260					
P.C. Station	16+07.99	N	10,486,660.9161	E	4,046,867.0629	
P.T. Station	16+17.82	N	10,486,667.1280	E	4,046,872.5976	
C.C.		N	10,486,662.1767	E	4,046,871.9014	
Back = N	14° 36′ 12.43" W					
Ahead = S	81° 59′ 45.54" E					
Chord Bear = N	41° 42′ 01.01" E					

Course from PT BL_SW2 to PC BL_SW3 S 81° 59′ 45.58" E Dist 2.2509

			Curve Data			
Curve BL_SW3						
P.I. Station	18+94.99	N	10,486,932.8473	E	4,046,805.5083	
Delta =	9° 43′ 35.99"	(RT)				
Degree =	1° 46′ 23.84"					
Tangent =	274.9153					
Length =	548.5095					
Radius =	3,231.0445					
External =	11.6746					
Long Chord =	547.8511					
Mid. Ord. =	11.6325					
P.C. Station	16+20.07	N	10,486,666.8146	E	4,046,874.8266	
P.T. Station	21+68.58	N	10,487,206.7670	E	4,046,782.1323	
C.C.		N	10,487,481.5029	E	4,050,001.4752	
Back = N	14° 36′ 15.90" W					
Ahead = N	4° 52′ 39.91" W					
Chord Bear = N	9° 44′ 27.91" W					

Course from PT BL_SW3 to PC BL_SW4 N 32° 01′ 32.87" E Dist 19.2127

			Curve Data			
Curve BL_SW4						
P.I. Station	21+93.61	N	10,487,228.8542	E	4,046,791.8538	
Delta =	0° 12′ 25.38"	(RT)				
Degree =	1° 46′ 46.65"					
Tangent =	5.8172					
Length =	11.6345					
Radius =	3,219.5445					
External =	0.0053					
Long Chord =	11.6345					
Mid. Ord. =	0.0053					
P.C. Station	21+87.79	N	10,487,223.0557	E	4,046,792.3208	
P.T. Station	21+99.43	N	10,487,234.6543	E	4,046,791.4078	
C.C.		N	10,487,481.5029	E	4,050,001.4752	
Back = N	4° 36′ 15.63" W					
Ahead = N	4° 23′ 50.25" W					
Chord Bear = N	4° 30′ 02.94" W					

Course from PT BL_SW4 to PC BL_SW5 N 30° 42′ 38.86" W Dist 22.4179

			Curve Data			
Curve BL_SW5						
P.I. Station	22+42.67	N	10,487,274.7001	E	4,046,778.4915	
Delta =	0° 44′ 19.89"	(RT)				
Degree =	1° 46′ 26.81"					
Tangent =	20.8236					
Length =	41.6466					
Radius =	3,229.5445					
External =	0.0671					
Long Chord =	41.6463					
Mid. Ord. =	0.0671					
P.C. Station	22+21.85	N	10,487,253.9283	E	4,046,779.9588	
P.T. Station	22+63.49	N	10,487,295.4891	E	4,046,777.2921	
C.C.		N	10,487,481.5029	E	4,050,001.4752	
Back = N	4° 02′ 26.81" W					
Ahead = N	3° 18′ 06.92" W					
Chord Bear = N	3° 40′ 16.87" W					

Course from PT BL_SW5 to PC BL_SW6 N 86° 36′ 01.80" E Dist 11.0000

			Curve Data			
Curve BL_SW6						
P.I. Station	22+81.90	N	10,487,303.5348	E	4,046,787.8462	
Delta =	0° 15′ 49.21"	(RT)				
Degree =	1° 46′ 48.64"					
Tangent =	7.4057					
Length =	14.8114					
Radius =	3,218.5445					
External =	0.0085					
Long Chord =	14.8114					
Mid. Ord. =	0.0085					
P.C. Station	22+74.49	N	10,487,296.1414	E	4,046,788.2727	
P.T. Station	22+89.30	N	10,487,310.9301	E	4,046,787.4537	
C.C.		N	10,487,481.5029	E	4,050,001.4752	
Back = N	3° 18′ 05.72" W					
Ahead = N	3° 02′ 16.51" W					
Chord Bear = N	3° 10′ 11.12" W					

Course from PT BL_SW6 to PC BL_SW7 N 68° 51′ 30.50" W Dist 18.0775

			Curve Data			
Curve BL_SW7						
P.I. Station	23+48.88	N	10,487,358.8986	E	4,046,768.4884	
Delta =	1° 28′ 11.97"	(RT)				
Degree =	1° 46′ 15.95"					
Tangent =	41.5018					
Length =	82.9990					
Radius =	3,235.0445					
External =	0.2662					
Long Chord =	82.9967					
Mid. Ord. =	0.2662					
P.C. Station	23+07.38	N	10,487,317.4502	E	4,046,770.5930	
P.T. Station	23+90.38	N	10,487,400.3873	E	4,046,767.4478	
C.C.		N	10,487,481.5029	E	4,050,001.4752	
Back = N	2° 54′ 24.41" W					
Ahead = N	1° 26′ 12.43" W					
Chord Bear = N	2° 10′ 18.42" W					

Course from PT BL_SW7 to BLSW017 N 1° 26′ 12.43" W Dist 66.9027

Point BLSW017 N 10,487,467.2689 E 4,046,765.7702 Sta 24+57.28

Course from BLSW017 to BLSW018 N 54° 52′ 23.32" E Dist 18.0278

Point BLSW018 N 10,487,477.6419 E 4,046,780.5148 Sta 24+75.31

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation
©2022

I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	41
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

DRAWING DATE: 5/25/2022 FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\01 General\LFK*HAR DATA.dgn

Course from BLSW018 to BLSW019 N 1° 26′ 12.43" W Dist 15.9859

Point BLSW019 N 10,487,493.6228 E 4,046,780.1140 Sta 24+91.30

Course from BLSW019 to BLSW020 N 46° 26′ 12.44" W Dist 12.7277

Point BLSW020 N 10,487,502.3941 E 4,046,770.8913 Sta 25+04.02

Course from BLSW020 to BLSW021 N 1° 26′ 12.59" W Dist 226.3592

Point BLSW021 N 10,487,728.6822 E 4,046,765.2154 Sta 27+30.38

Course from BLSW021 to BLSW022 N 46° 26′ 12.33" W Dist 4.9498

Point BLSW022 N 10,487,732.0933 E 4,046,761.6287 Sta 27+35.33

Course from BLSW022 to BLSW023 N 1° 26′ 12.43" W Dist 315.3024

Point BLSW023 N 10,488,047.2966 E 4,046,753.7228 Sta 30+50.64

Course from BLSW023 to BLSW024 N 43° 34′ 07.19" W Dist 5.9627

Point BLSW024 N 10,488,051.6169 E 4,046,749.6132 Sta 30+56.60

Course from BLSW024 to BLSW025 N 1° 26′ 12.43" W Dist 79.7562

Point BLSW025 N 10,488,131.3479 E 4,046,747.6134 Sta 31+36.35

Course from BLSW025 to BLSW026 N 26° 17′ 25.32" E Dist 10.7466

Point BLSW026 N 10,488,140.9829 E 4,046,752.3733 Sta 31+47.10

Course from BLSW026 to BLSW027 N 1° 26′ 12.43" W Dist 35.8927

Point BLSW027 N 10,488,176.8644 E 4,046,751.4733 Sta 31+82.99

Course from BLSW027 to BLSW028 N 28° 00′ 06.62" W Dist 23.4787

Point BLSW028 N 10,488,197.5945 E 4,046,740.4501 Sta 32+06.47

Course from BLSW028 to BLSW029 N 1° 26′ 12.43" W Dist 1,259.3091

Point BLSW029 N 10,489,456.5077 E 4,046,708.8741 Sta 44+65.78

Course from BLSW029 to BLSW030 N 26° 53′ 11.77" E Dist 8.4309

Point BLSW030 N 10,489,464.0272 E 4,046,712.6868 Sta 44+74.21

Course from BLSW030 to BLSW031 N 1° 26′ 12.43" W Dist 9.0440

Point BLSW031 N 10,489,473.0683 E 4,046,712.4600 Sta 44+83.26

Course from BLSW031 to BLSW032 N 48° 16′ 40.11" W Dist 5.4835

Point BLSW032 N 10,489,476.7177 E 4,046,708.3672 Sta 44+88.74

Course from BLSW032 to BLSW033 N 1° 26′ 12.43" W Dist 141.5892

Point BLSW033 N 10,489,618.2624 E 4,046,704.8170 Sta 46+30.33

Course from BLSW033 to BLSW034 N 88° 33′ 47.57" E Dist 4.0000

Point BLSW034 N 10,489,618.3626 E 4,046,708.8157 Sta 46+34.33

Course from BLSW034 to BLSW035 N 1° 26′ 12.43" W Dist 151.1452

Point BLSW035 N 10,489,769.4603 E 4,046,705.0259 Sta 47+85.47

Course from BLSW035 to BLSW036 N 51° 10′ 56.36" W Dist 5.2412

Point BLSW036 N 10,489,772.7457 E 4,046,700.9422 Sta 47+90.72

Course from BLSW036 to BLSW037 N 1° 26′ 12.43" W Dist 188.5501

Point BLSW037 N 10,489,961.2366 E 4,046,696.2145 Sta 49+79.27

Course from BLSW037 to BLSW038 N 19° 48′ 05.22" E Dist 11.0422

Point BLSW038 N 10,489,971.6259 E 4,046,699.9552 Sta 49+90.31

Course from BLSW038 to BLSW039 N 1° 26′ 12.43" W Dist 13.4596

Point BLSW039 N 10,489,985.0813 E 4,046,699.6177 Sta 50+03.77

Course from BLSW039 to BLSW040 N 41° 40′ 24.45" W Dist 6.1925

Point BLSW040 N 10,489,989.7068 E 4,046,695.5004 Sta 50+09.96

Course from BLSW040 to BLSW041 N 1° 26′ 12.43" W Dist 135.4988

Point BLSW041 N 10,490,125.1630 E 4,046,692.1029 Sta 51+45.46

Course from BLSW041 to BLSW042 N 35° 45′ 48.02" E Dist 6.9521

Point BLSW042 N 10,490,130.8042 E 4,046,696.1660 Sta 51+52.41

Course from BLSW042 to BLSW043 N 1° 38′ 57.02" E Dist 75.4952

Point BLSW043 N 10,490,206.2681 E 4,046,698.3387 Sta 52+27.91

Course from BLSW043 to BLSW044 N 1° 11′ 25.11" E Dist 8.5078

Point BLSW044 N 10,490,214.7741 E 4,046,698.5155 Sta 52+36.41

Course from BLSW044 to BLSW045 N 5° 59′ 03.04" E Dist 43.9419

Point BLSW045 N 10,490,258.4765 E 4,046,703.0966 Sta 52+80.36

Course from BLSW045 to BLSW046 N 3° 26′ 52.97" E Dist 16.4261

Point BLSW046 N 10,490,274.8729 E 4,046,704.0845 Sta 52+96.78

Course from BLSW046 to BLSW047 N 23° 07′ 01.21" W Dist 16.5709

Point BLSW047 N 10,490,290.1132 E 4,046,697.5786 Sta 53+13.35

Course from BLSW047 to BLSW048 N 3° 26′ 52.97" E Dist 17.7684

Point BLSW048 N 10,490,307.8494 E 4,046,698.6473 Sta 53+31.12

Course from BLSW048 to BLSW049 N 8° 23′ 19.45" E Dist 40.6025

Point BLSW049 N 10,490,348.0175 E 4,046,704.5707 Sta 53+71.72

Course from BLSW049 to BLSW050 N 6° 59′ 00.80" E Dist 17.9997

Point BLSW050 N 10,490,365.8837 E 4,046,706.7592 Sta 53+89.72

Course from BLSW050 to BLSW051 N 8° 24′ 56.74" E Dist 74.9786

Point BLSW051 N 10,490,440.0549 E 4,046,717.7327 Sta 54+64.70

Course from BLSW051 to PC BL_SW8 N 9° 47′ 46.29" E Dist 37.7438

Curve Data

Curve BL_SW8

P.I. Station	55+22.38	N	10,490,496.8893	E	4,046,727.5458
Delta =	3° 51′ 16.07" (RT)				
Degree =	9° 40′ 22.50"				
Tangent =	19.9315				
Length =	39.8480				
Radius =	592.3319				
External =	0.3352				
Long Chord =	39.8405				
Mid. Ord. =	0.3351				
P.C. Station	55+02.45	N	10,490,477.2484	E	4,046,724.1546
P.T. Station	55+42.29	N	10,490,516.2578	E	4,046,732.2497
C.C.		N	10,490,376.4667	E	4,047,307.8498

Back = N 9° 47′ 46.29" E
Ahead = N 13° 39′ 02.36" E
Chord Bear = N 11° 43′ 24.32" E

Course from PT BL_SW8 to PC BL_SW9 N 39° 54′ 07.90" E Dist 13.8631

Curve Data

Curve BL_SW9

P.I. Station	55+64.59	N	10,490,535.0468	E	4,046,743.3070
Delta =	1° 38′ 55.26" (RT)				
Degree =	9° 46′ 18.85"				
Tangent =	8.4364				
Length =	16.8717				
Radius =	586.3319				
External =	0.0607				
Long Chord =	16.8711				
Mid. Ord. =	0.0607				
P.C. Station	55+56.16	N	10,490,526.8928	E	4,046,741.1426
P.T. Station	55+73.03	N	10,490,543.1352	E	4,046,745.7051
C.C.		N	10,490,376.4667	E	4,047,307.8498

Back = N 14° 51′ 56.58" E
Ahead = N 16° 30′ 51.83" E
Chord Bear = N 15° 41′ 24.21" E

Course from PT BL_SW9 to PC BL_SW10 N 8° 44′ 59.35" W Dist 13.7524

Curve Data

Curve BL_SW10

P.I. Station	56+36.51	N	10,490,604.1001	E	4,046,758.7475
Delta =	9° 35′ 54.37" (RT)				
Degree =	9° 40′ 22.50"				
Tangent =	49.7314				
Length =	99.2300				
Radius =	592.3319				
External =	2.0840				
Long Chord =	99.1140				
Mid. Ord. =	2.0767				
P.C. Station	55+86.78	N	10,490,556.7276	E	4,046,743.6131
P.T. Station	56+86.01	N	10,490,648.2859	E	4,046,781.5691
C.C.		N	10,490,376.4667	E	4,047,307.8498

Back = N 17° 43′ 03.01" E
Ahead = N 27° 18′ 57.38" E
Chord Bear = N 22° 31′ 00.19" E

Curve Data

Curve BL_SW11

P.I. Station	57+15.65	N	10,490,674.6193	E	4,046,795.1701
Delta =	6° 57′ 49.12" (RT)				
Degree =	11° 45′ 43.74"				
Tangent =	29.6384				
Length =	59.2038				
Radius =	487.1200				
External =	0.9008				
Long Chord =	59.1674				
Mid. Ord. =	0.8992				
P.C. Station	56+86.01	N	10,490,648.2859	E	4,046,781.5691
P.T. Station	57+45.22	N	10,490,699.1095	E	4,046,811.8634
C.C.		N	10,490,424.7481	E	4,047,214.3701

Back = N 27° 18′ 57.38" E
Ahead = N 34° 16′ 46.50" E
Chord Bear = N 30° 47′ 51.94" E

Course from PT BL_SW11 to BLSW052 N 69° 52′ 00.36" E Dist 14.9742

Point BLSW052 N 10,490,704.2637 E 4,046,825.9226 Sta 57+60.19

Course from BLSW052 to BLSW053 N 48° 35′ 38.61" E Dist 15.1477

Point BLSW053 N 10,490,714.2822 E 4,046,837.2840 Sta 57+75.34

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation
©2022

I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

HORIZONTAL ALIGNMENT DATA

SHEET 2 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	42
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\01 General\LFK*HAR DATA.dgn

DRAWING DATE: 5/25/2022

Course from BLSW053 to BLSW054 N 0° 48′ 24.60" W Dist 12.2678

Point BLSW054 N 10,490,726.5488 E 4,046,837.1112 Sta 57+87.60

Course from BLSW054 to BLSW055 N 45° 33′ 47.57" E Dist 194.0816

Point BLSW055 N 10,490,862.4296 E 4,046,975.6900 Sta 59+81.69

Course from BLSW055 to PC BL_SW-12 N 72° 07′ 41.74" E Dist 11.1803

Curve Data

Curve BL_SW-12					
P.I. Station	60+12.79	N	10,490,879.8113	E	4,047,000.5585
Delta =	1° 43′ 45.74" (LT)				
Degree =	4° 20′ 23.29"				
Tangent =	19.9261				
Length =	39.8491				
Radius =	1,320.2395				
External =	0.1504				
Long Chord =	39.8476				
Mid. Ord. =	0.1503				
P.C. Station	59+92.87	N	10,490,865.8607	E	4,046,986.3308
P.T. Station	60+32.72	N	10,490,894.1850	E	4,047,014.3586
C.C.		N	10,491,808.5425	E	4,046,062.0022
Back = N	45° 33′ 47.57" E				
Ahead = N	43° 50′ 01.83" E				
Chord Bear = N	44° 41′ 54.70" E				

Course from PT BL_SW-12 to PC BL_SW-13 N 17° 05′ 40.51" E Dist 5.5773

Curve Data

Curve BL_SW-13					
P.I. Station	61+13.82	N	10,490,954.1918	E	4,047,068.0966
Delta =	6° 33′ 37.23" (LT)				
Degree =	4° 20′ 52.93"				
Tangent =	75.5228				
Length =	150.8806				
Radius =	1,317.7395				
External =	2.1624				
Long Chord =	150.7982				
Mid. Ord. =	2.1589				
P.C. Station	60+38.29	N	10,490,899.5160	E	4,047,015.9981
P.T. Station	61+89.17	N	10,491,014.4618	E	4,047,113.6073
C.C.		N	10,491,808.5425	E	4,046,062.0022
Back = N	43° 37′ 02.17" E				
Ahead = N	37° 03′ 24.94" E				
Chord Bear = N	40° 20′ 13.56" E				

Course from PT BL_SW-13 to PC BL_SW-14 N 56° 07′ 35.03" E Dist 10.5965

Curve Data

Curve BL_SW-14					
P.I. Station	63+05.14	N	10,491,104.9395	E	4,047,185.2655
Delta =	9° 07′ 11.48" (LT)				
Degree =	4° 20′ 11.46"				
Tangent =	105.3744				
Length =	210.3037				
Radius =	1,321.2395				
External =	4.1954				
Long Chord =	210.0818				
Mid. Ord. =	4.1821				
P.C. Station	61+99.77	N	10,491,020.3679	E	4,047,122.4052
P.T. Station	64+10.07	N	10,491,198.4054	E	4,047,233.9265
C.C.		N	10,491,808.5425	E	4,046,062.0022
Back = N	36° 37′ 21.43" E				
Ahead = N	27° 30′ 09.95" E				
Chord Bear = N	32° 03′ 45.69" E				

Course from PT BL_SW-14 to PC BL_SW-15 N 62° 01′ 26.90" W Dist 3.5001

Curve Data

Curve BL_SW-15					
P.I. Station	65+16.93	N	10,491,291.7255	E	4,047,278.5631
Delta =	8° 58′ 10.93" (LT)				
Degree =	4° 20′ 52.93"				
Tangent =	103.3578				
Length =	206.2932				
Radius =	1,317.7395				
External =	4.0473				
Long Chord =	206.0826				
Mid. Ord. =	4.0349				
P.C. Station	64+13.57	N	10,491,200.0473	E	4,047,230.8354
P.T. Station	66+19.87	N	10,491,389.7240	E	4,047,311.4134
C.C.		N	10,491,808.5425	E	4,046,062.0022
Back = N	27° 30′ 05.43" E				
Ahead = N	18° 31′ 54.50" E				
Chord Bear = N	23° 00′ 59.96" E				

Course from PT BL_SW-15 to BLSW056 N 1° 51′ 08.90" E Dist 15.6493

Point BLSW056 N 10,491,405.3651 E 4,047,311.9193 Sta 66+35.52

Course from BLSW056 to BLSW057 N 18° 33′ 47.56" E Dist 216.4540

Point BLSW057 N 10,491,610.5576 E 4,047,380.8276 Sta 68+51.97

Course from BLSW057 to BLSW058 N 45° 07′ 15.35" E Dist 32.6549

Point BLSW058 N 10,491,633.5994 E 4,047,403.9668 Sta 68+84.63

Course from BLSW058 to BLSW059 N 18° 33′ 47.56" E Dist 118.9516

Point BLSW059 N 10,491,746.3622 E 4,047,441.8351 Sta 70+03.58

Course from BLSW059 to BLSW060 N 15° 11′ 23.69" W Dist 23.5775

Point BLSW060 N 10,491,769.1160 E 4,047,435.6574 Sta 70+27.15

Course from BLSW060 to BLSW061 N 18° 33′ 47.56" E Dist 111.1026

Point BLSW061 N 10,491,874.4383 E 4,047,471.0270 Sta 71+38.26

Course from BLSW061 to BLSW062 S 71° 26′ 12.43" E Dist 5.5000

Point BLSW062 N 10,491,872.6873 E 4,047,476.2408 Sta 71+43.76

Course from BLSW062 to BLSW063 N 18° 33′ 47.56" E Dist 7.9289

Point BLSW063 N 10,491,880.2037 E 4,047,478.7650 Sta 71+51.69

Course from BLSW063 to BLSW064 N 26° 26′ 12.45" W Dist 2.8284

Point BLSW064 N 10,491,882.7364 E 4,047,477.5058 Sta 71+54.51

Course from BLSW064 to BLSW065 N 18° 33′ 47.56" E Dist 440.9871

Point BLSW065 N 10,492,300.7803 E 4,047,617.8943 Sta 75+95.50

Course from BLSW065 to PC BL_SW16 N 17° 19′ 10.03" E Dist 44.9932

Curve Data

Curve BL_SW16					
P.I. Station	78+19.57	N	10,492,513.2037	E	4,047,689.1463
Delta =	10° 57′ 51.33" (RT)				
Degree =	3° 04′ 14.68"				
Tangent =	179.0745				
Length =	357.0553				
Radius =	1,865.8593				
External =	8.5736				
Long Chord =	356.5108				
Mid. Ord. =	8.5344				
P.C. Station	76+40.49	N	10,492,343.7335	E	4,047,631.2887
P.T. Station	79+97.55	N	10,492,668.5762	E	4,047,778.1804
C.C.		N	10,491,740.8891	E	4,049,397.0774
Back = N	18° 51′ 00.09" E				
Ahead = N	29° 48′ 51.42" E				
Chord Bear = N	24° 19′ 55.75" E				

Course from PT BL_SW16 to PC BL_SW17 N 18° 53′ 55.99" W Dist 11.9553

Curve Data

Curve BL_SW17					
P.I. Station	80+16.65	N	10,492,686.0723	E	4,047,777.8871
Delta =	0° 26′ 12.38" (RT)				
Degree =	3° 03′ 21.62"				
Tangent =	7.1462				
Length =	14.2922				
Radius =	1,874.8593				
External =	0.0136				
Long Chord =	14.2922				
Mid. Ord. =	0.0136				
P.C. Station	80+09.51	N	10,492,679.8870	E	4,047,774.3081
P.T. Station	80+23.80	N	10,492,692.2301	E	4,047,781.5132
C.C.		N	10,491,740.8891	E	4,049,397.0774
Back = N	30° 03′ 19.28" E				
Ahead = N	30° 29′ 31.66" E				
Chord Bear = N	30° 16′ 25.47" E				

Course from PT BL_SW17 to PC BL_SW18 N 78° 03′ 09.59" E Dist 20.3945

Curve Data

Curve BL_SW18					
P.I. Station	81+20.20	N	10,492,761.6613	E	4,047,840.5177
Delta =	4° 40′ 49.84" (RT)				
Degree =	3° 04′ 50.34"				
Tangent =	76.0085				
Length =	151.9325				
Radius =	1,859.8593				
External =	1.5525				
Long Chord =	151.8902				
Mid. Ord. =	1.5512				
P.C. Station	80+44.19	N	10,492,696.4520	E	4,047,801.4659
P.T. Station	81+96.12	N	10,492,823.4665	E	4,047,884.7604
C.C.		N	10,491,740.8891	E	4,049,397.0774
Back = N	30° 54′ 57.97" E				
Ahead = N	35° 35′ 47.80" E				
Chord Bear = N	33° 15′ 22.89" E				

Course from PT BL_SW18 to BLSW066 N 35° 35′ 47.80" E Dist 50.8678

Point BLSW066 N 10,492,864.8289 E 4,047,914.3692 Sta 82+46.99

Course from BLSW066 to BLSW067 N 46° 52′ 34.27" E Dist 10.2251

Point BLSW067 N 10,492,871.8185 E 4,047,921.8323 Sta 82+57.22

Course from BLSW067 to BLSW068 N 35° 35′ 47.81" E Dist 15.1099

Point BLSW068 N 10,492,884.1049 E 4,047,930.6274 Sta 82+72.33

Course from BLSW068 to BLSW069 N 3° 21′ 41.24" W Dist 6.3618

Point BLSW069 N 10,492,890.4558 E 4,047,930.2544 Sta 82+78.69

Course from BLSW069 to BLSW070 N 35° 35′ 47.80" E Dist 62.1683

Point BLSW070 N 10,492,941.0070 E 4,047,966.4410 Sta 83+40.86

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation
©2022

I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

HORIZONTAL ALIGNMENT DATA

SHEET 3 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	43
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

DRAWING DATE: 5/25/2022 FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\01 General\LFK*HAR DATA.dgn

```
Course from BLSW070 to BLSW071 N 63° 26′ 12.85" E Dist 11.7771
Point BLSW071          N  10,492,946.2735 E   4,047,976.9749 Sta      83+52.63
Course from BLSW071 to BLSW072 N 35° 35′ 47.80" E Dist 75.6289
Point BLSW072          N  10,493,007.7700 E   4,048,020.9966 Sta      84+28.26
Course from BLSW072 to BLSW073 N 16° 27′ 03.88" E Dist 16.9168
Point BLSW073          N  10,493,023.9943 E   4,048,025.7874 Sta      84+45.18
================================================================================
Ending chain BL_SW description
```


STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

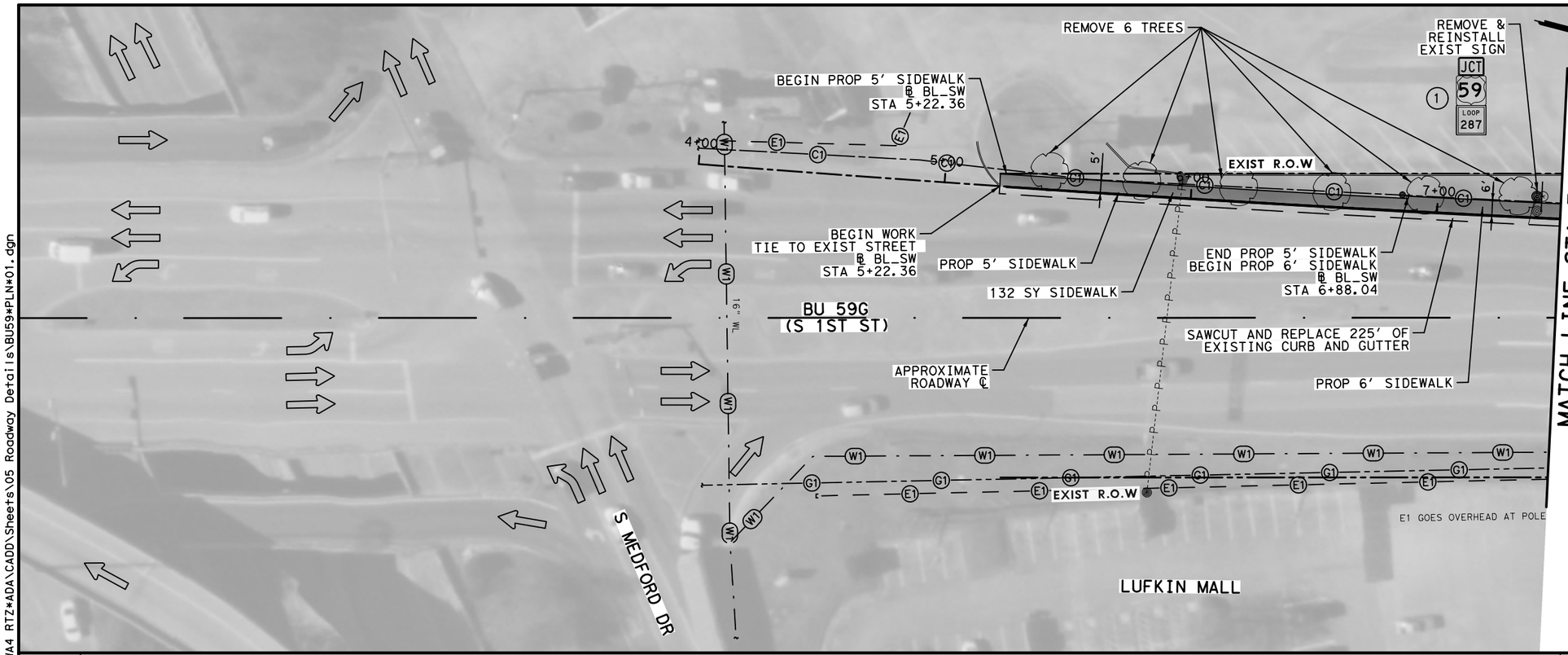
Rev. No.	C.O. No.	Description	Date	By

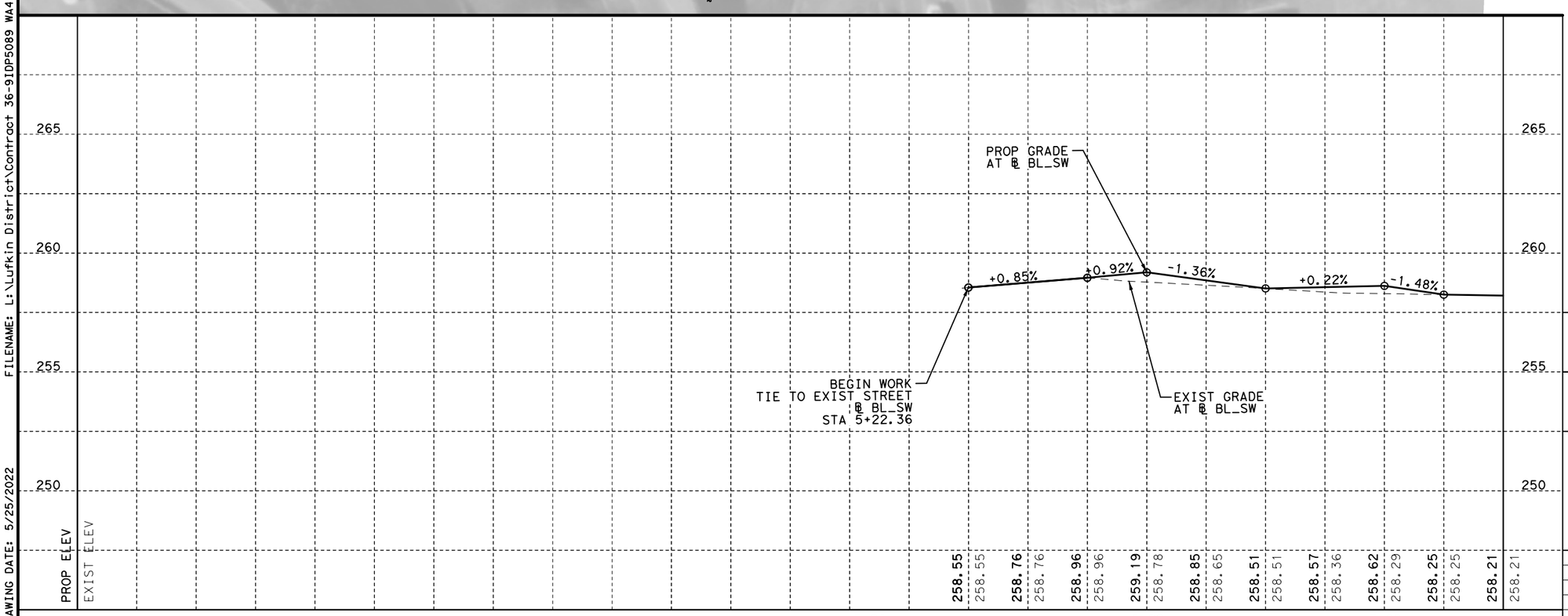
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

HORIZONTAL ALIGNMENT DATA

SHEET 4 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	44
CONTROL	SECTION	JOB	
0176	02	125, ETC.	





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- X — SMALL SIGN NUMBER
- X X — DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- C1 — CONSOLIDATED (TELE)
- E1 — ELECTRIC / POWER
- G1 — GAS
- W1 — POTABLE WATER
- P P P P P — ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Texas Department of Transportation

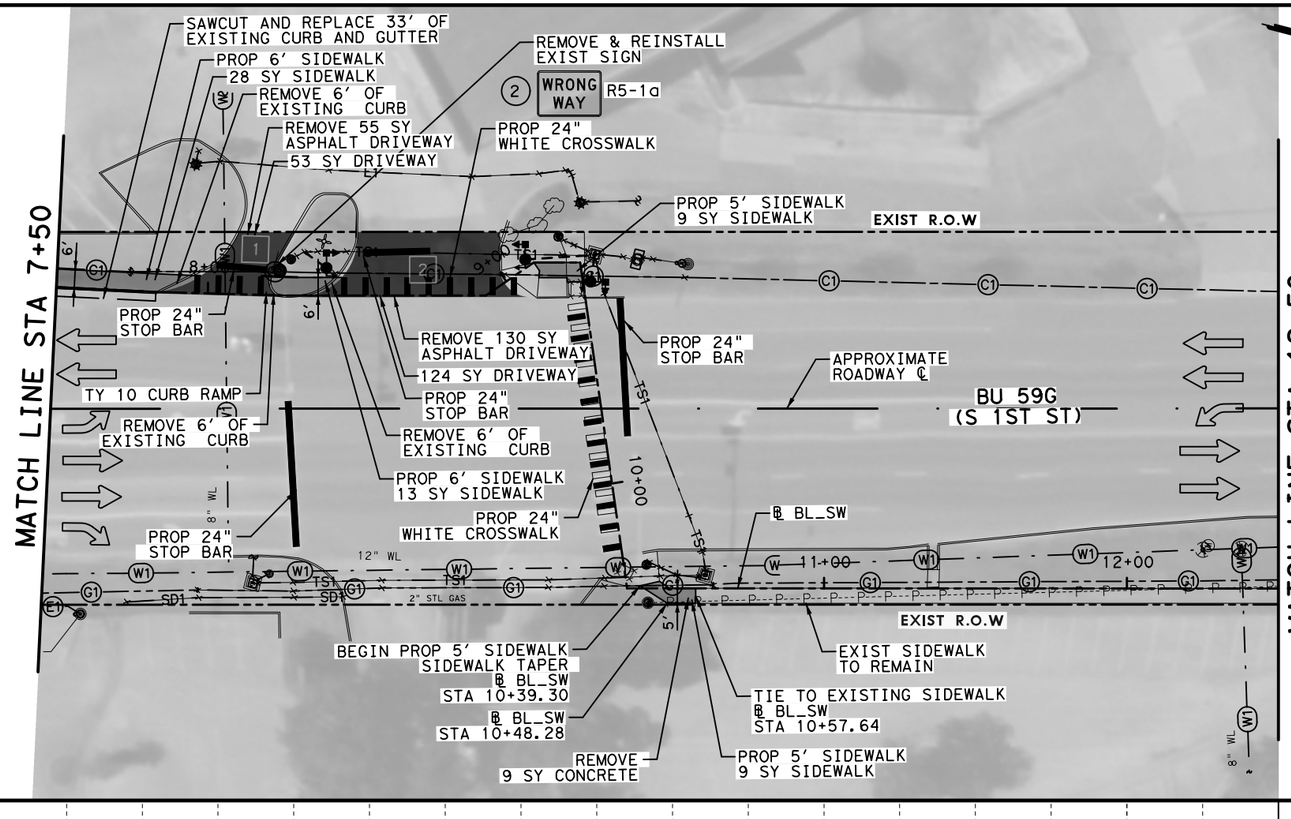
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SIDEWALK PLAN & PROFILE (BEGIN TO STA 7+50)

SHEET 1 OF 14

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	45
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*01.dgn
DRAWING DATE: 5/25/2022



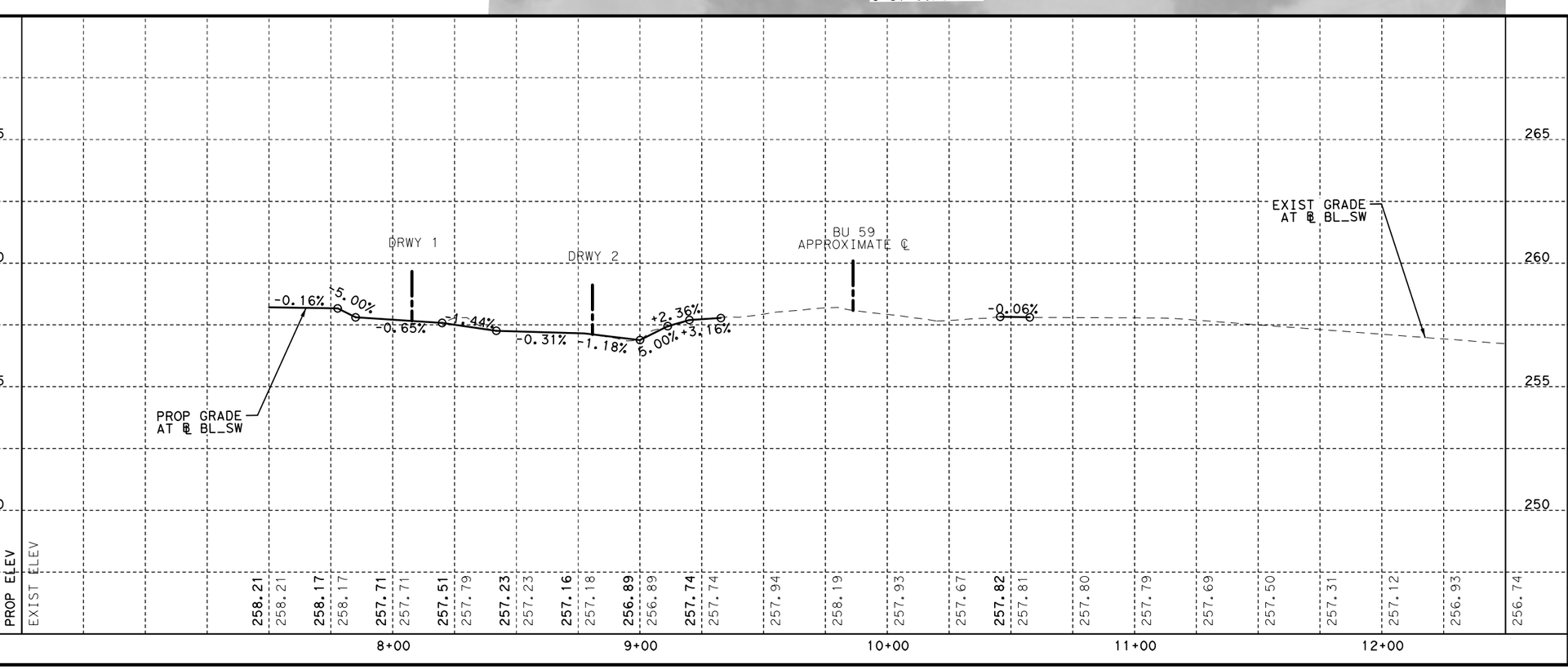
HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- SMALL SIGN NUMBER
- DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- CONSOLIDATED (TELE)
- ELECTRIC / POWER
- GAS
- POTABLE WATER
- ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.



STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Texas Department of Transportation
©2022

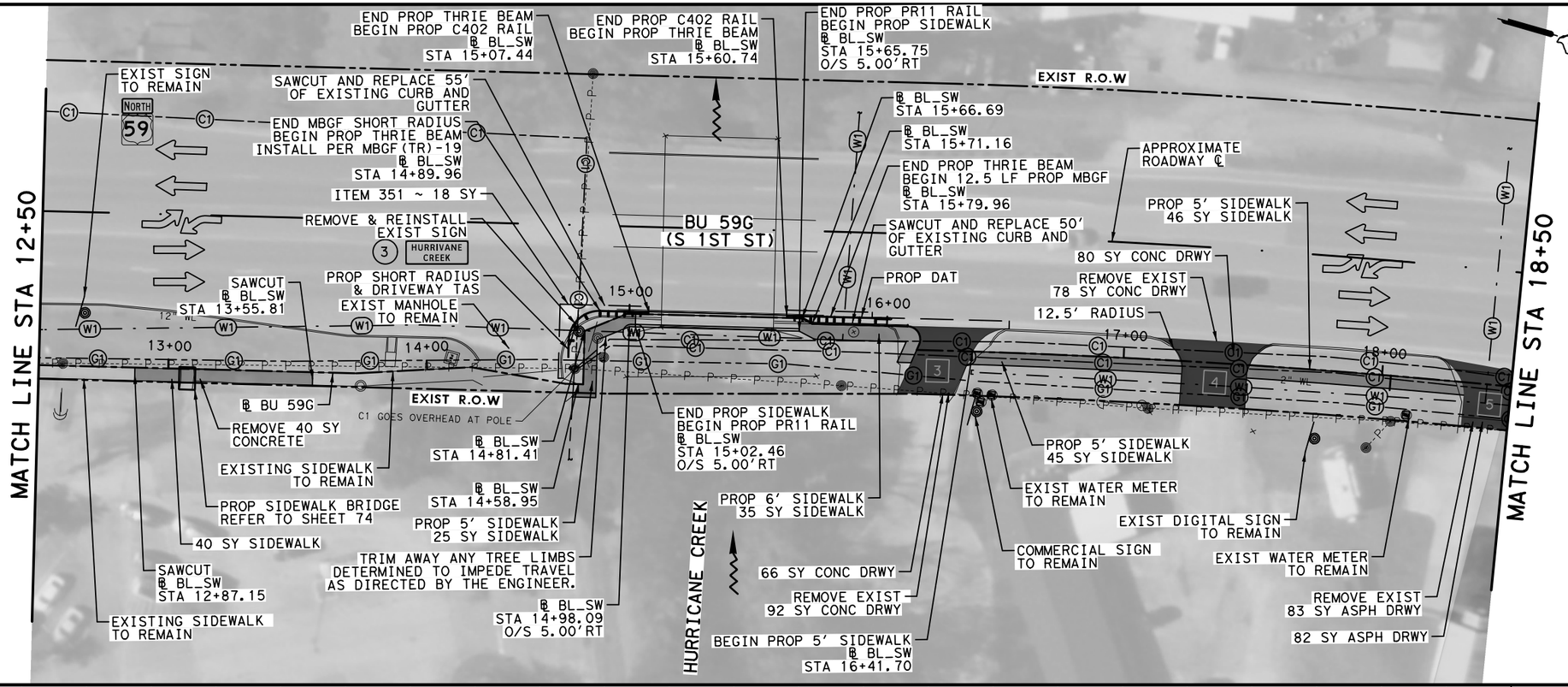
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

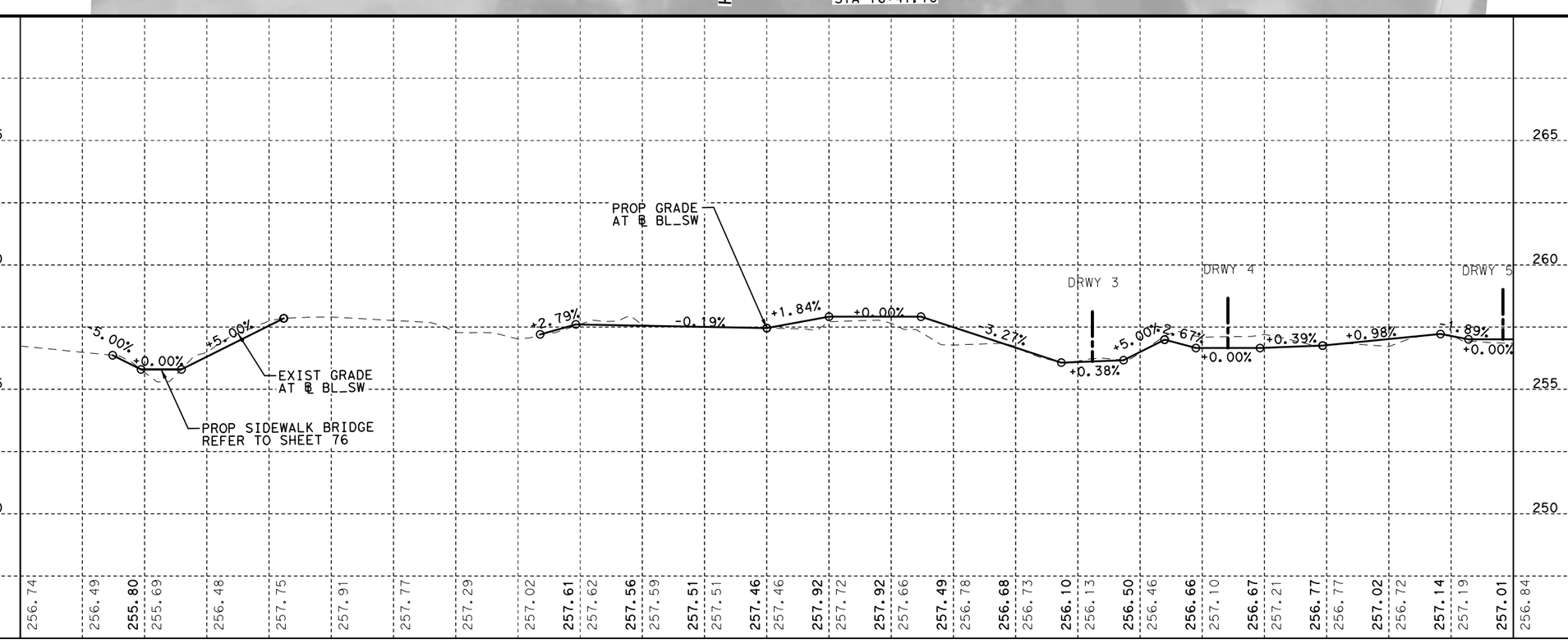
SIDEWALK
PLAN & PROFILE
(STA 7+50 TO STA 12+50)

SHEET 2 OF 14

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	46
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*02.dgn
DRAWING DATE: 5/25/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- X — SMALL SIGN NUMBER
- X X — DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- C1 — CONSOLIDATED (TELE)
- E1 — ELECTRIC / POWER
- G1 — GAS
- W1 — POTABLE WATER
- P P P P P — ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

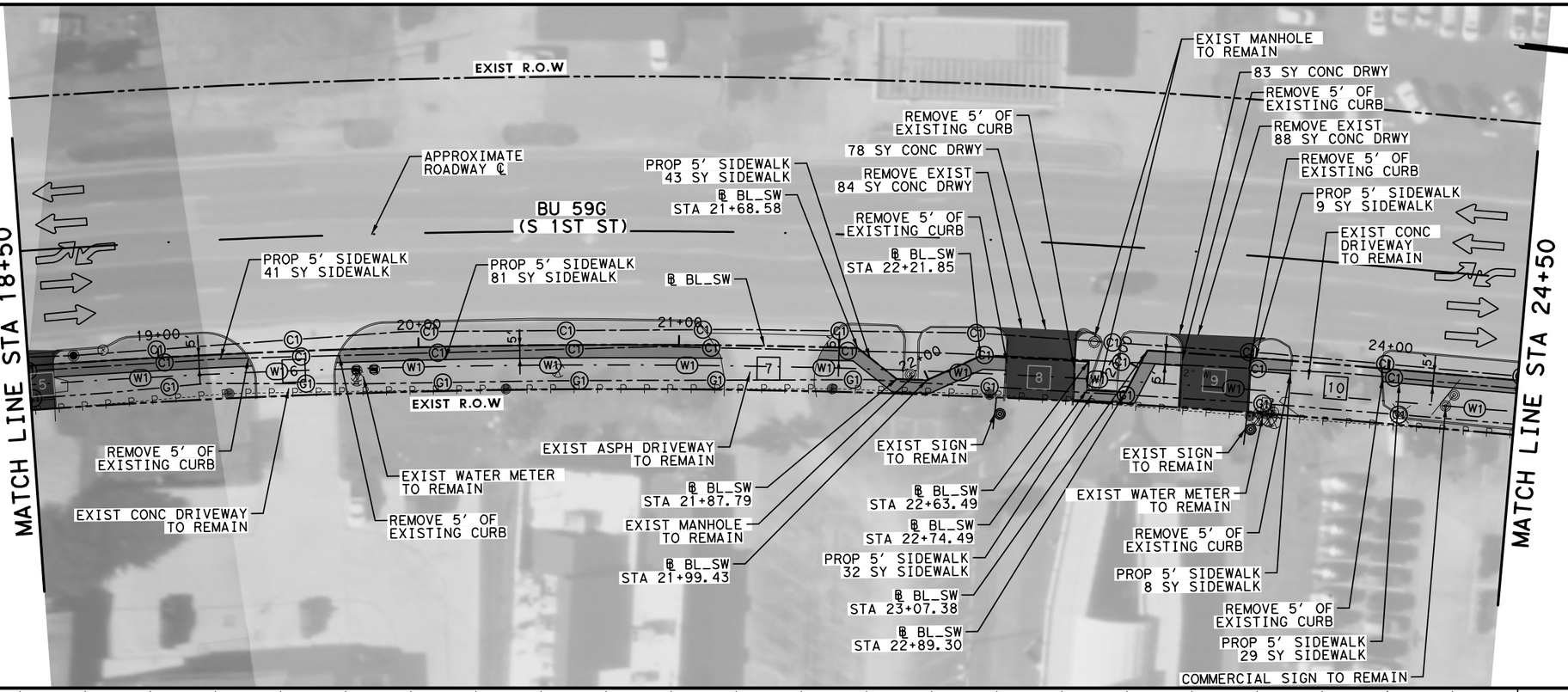
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

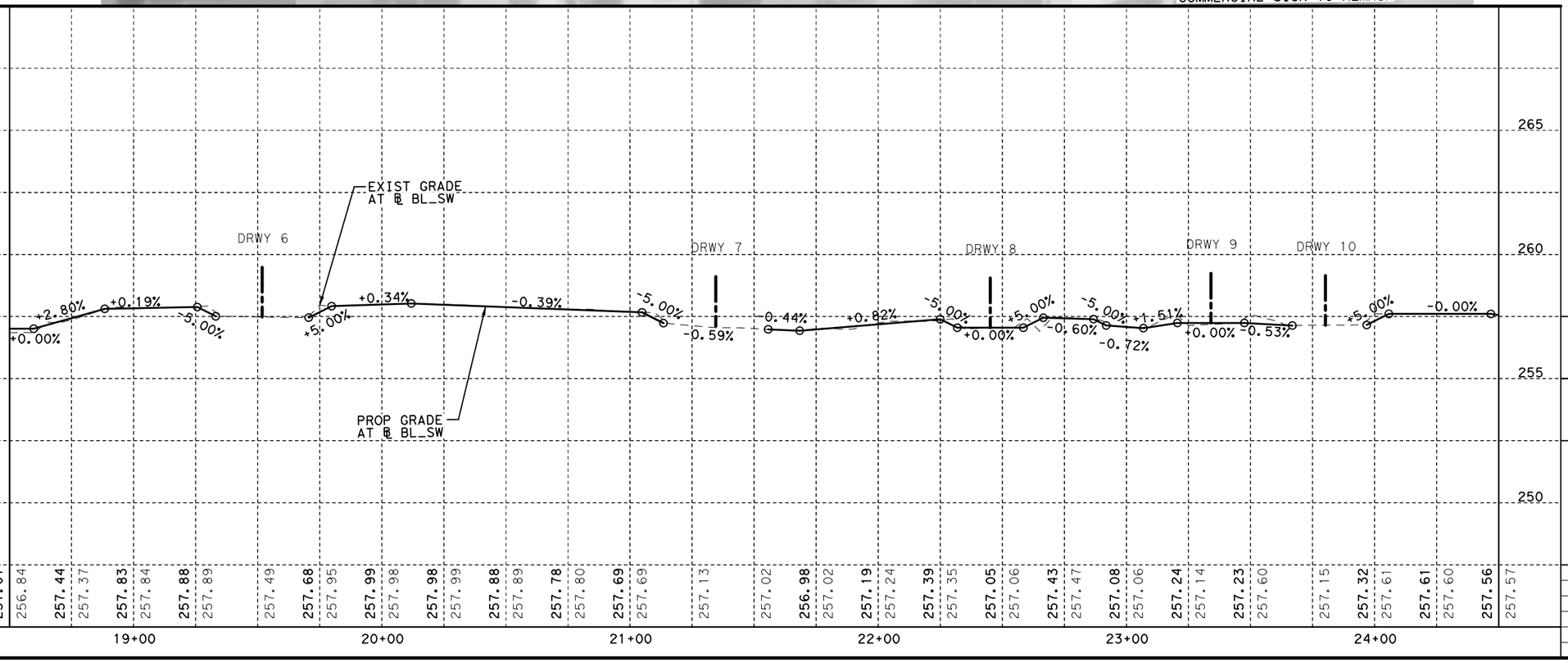
SIDEWALK
PLAN & PROFILE
(STA 12+50 TO STA 18+50)

SHEET 3 OF 14

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	47
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*03.dgn
DRAWING DATE: 5/25/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- X — SMALL SIGN NUMBER
- X X — DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- C1 — CONSOLIDATED (TELE)
- E1 — ELECTRIC / POWER
- G1 — GAS
- W1 — POTABLE WATER
- P — ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

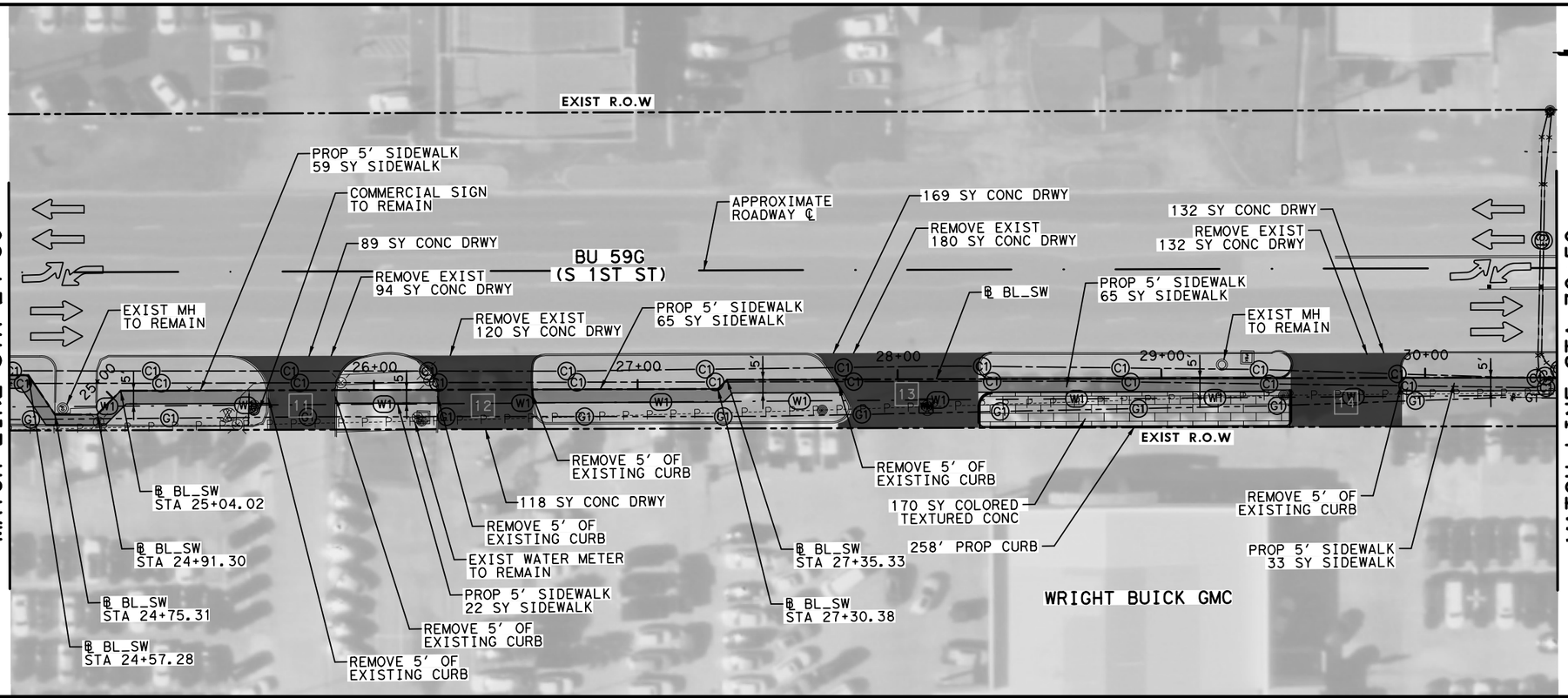
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

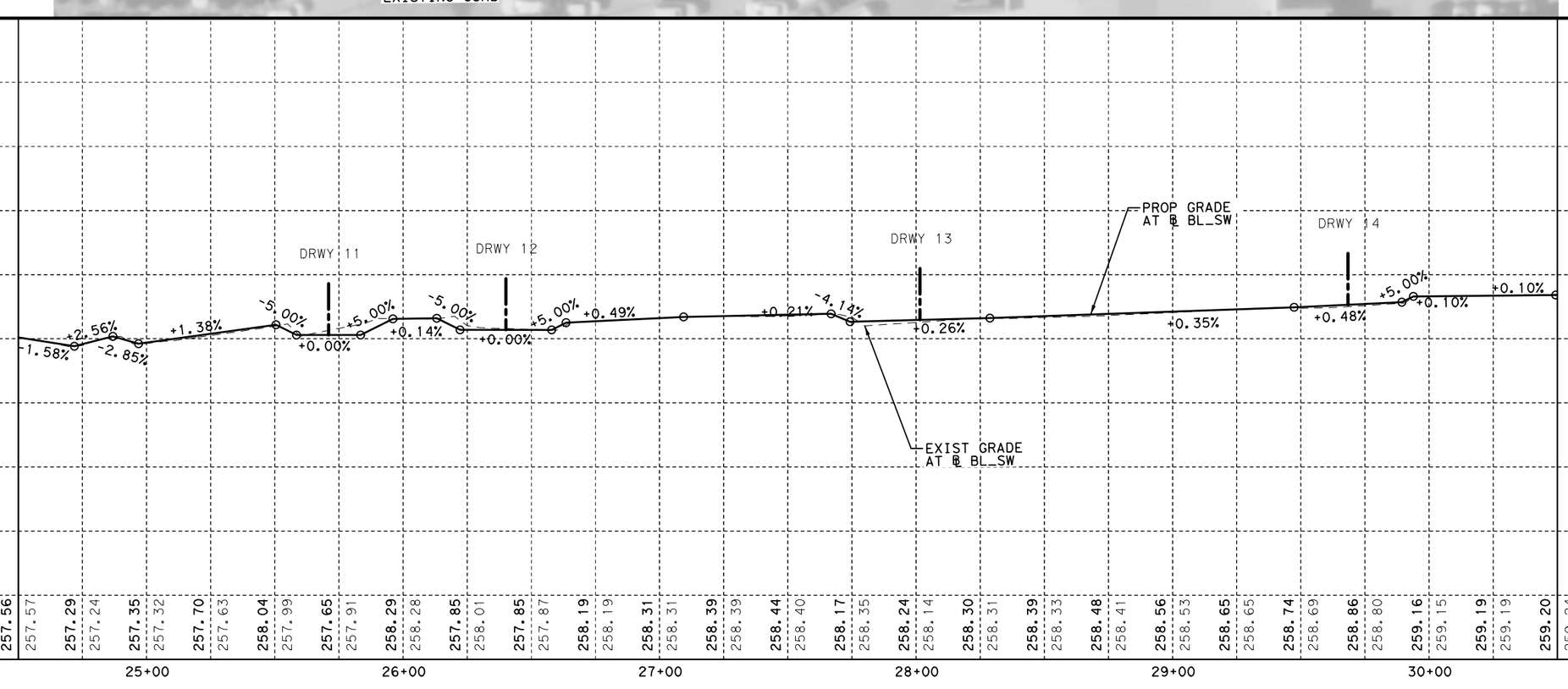
SIDEWALK
PLAN & PROFILE
(STA 18+50 TO STA 24+50)

SHEET 4 OF 14

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	48
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*04.dgn
DRAWING DATE: 5/25/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- SMALL SIGN NUMBER
- DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- C1 — CONSOLIDATED (TELE)
- E1 — ELECTRIC / POWER
- G1 — GAS
- W1 — POTABLE WATER
- P — ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

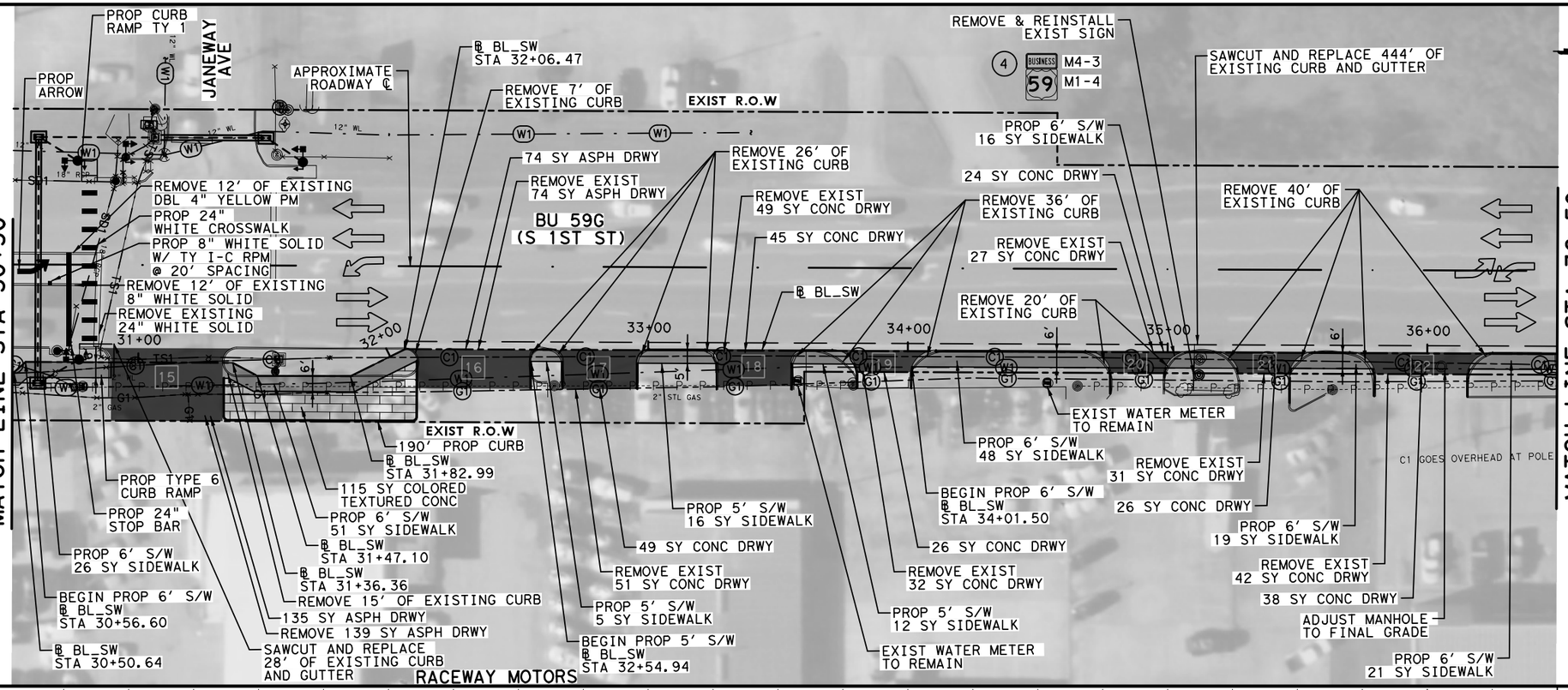
Texas Department of Transportation

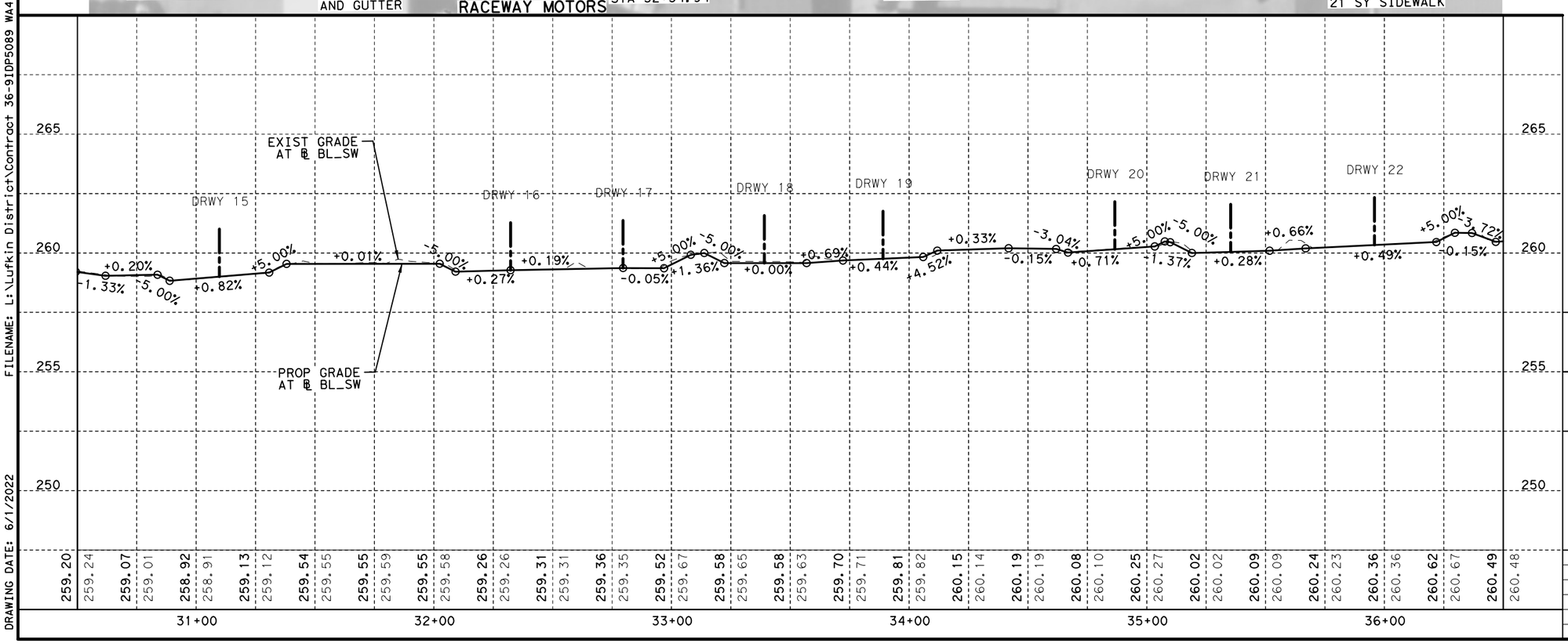
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SIDEWALK
PLAN & PROFILE
(STA 24+50 TO STA 30+50)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	49
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*05.dgn
DRAWING DATE: 5/25/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- X — SMALL SIGN NUMBER
- X X — DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- C1 — CONSOLIDATED (TELE)
- E1 — ELECTRIC / POWER
- G1 — GAS
- W1 — POTABLE WATER
- P — ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
6/1/2022

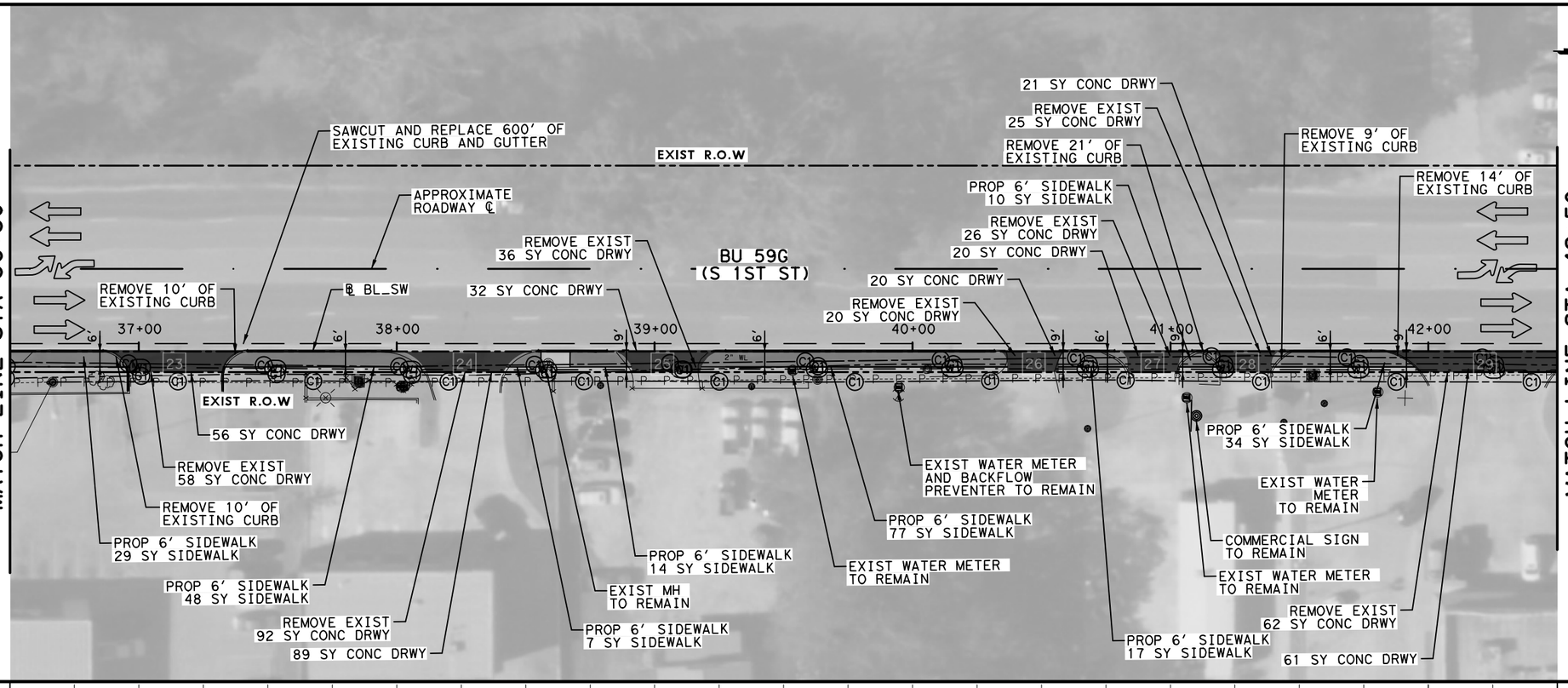
Texas Department of Transportation

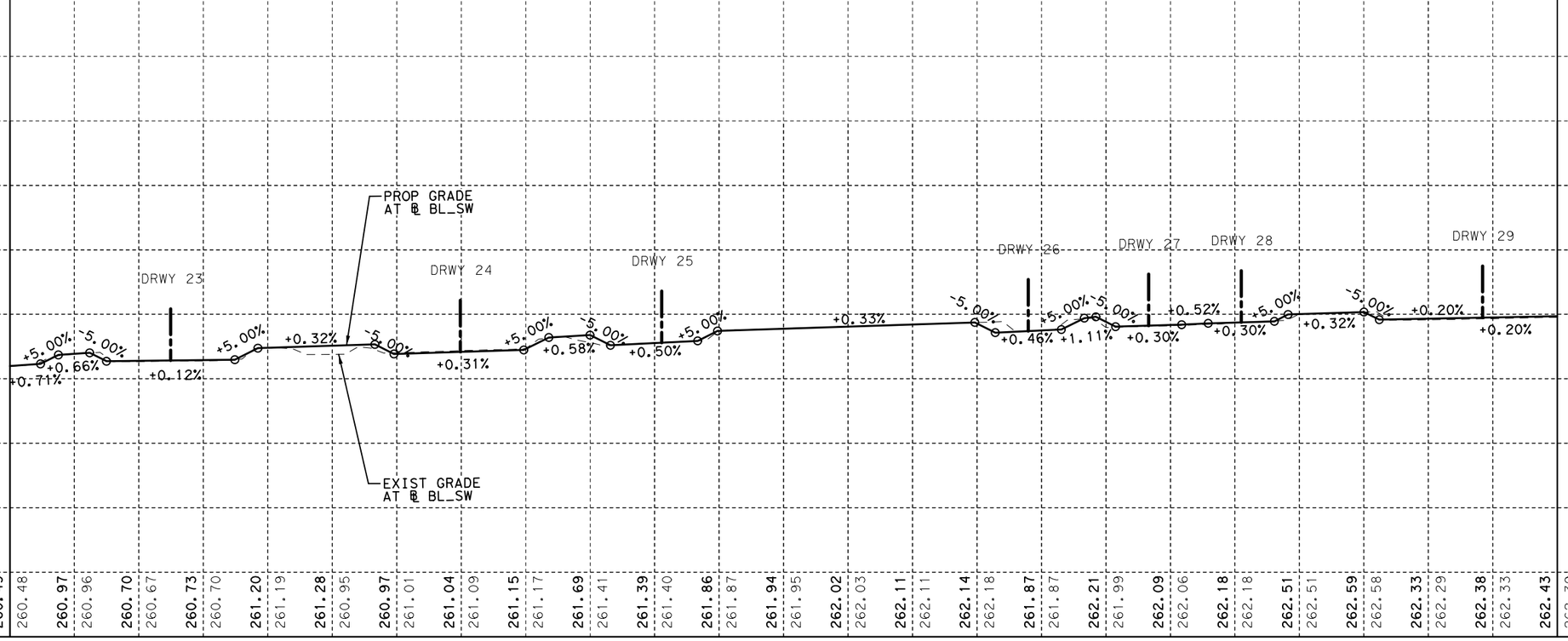
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SIDEWALK PLAN & PROFILE (STA 30+50 TO STA 36+50)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	50
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*06.dgn
DRAWING DATE: 6/1/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- X — SMALL SIGN NUMBER
- X X — DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- C1 — CONSOLIDATED (TELE)
- E1 — ELECTRIC / POWER
- G1 — GAS
- W1 — POTABLE WATER
- P — ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Texas Department of Transportation

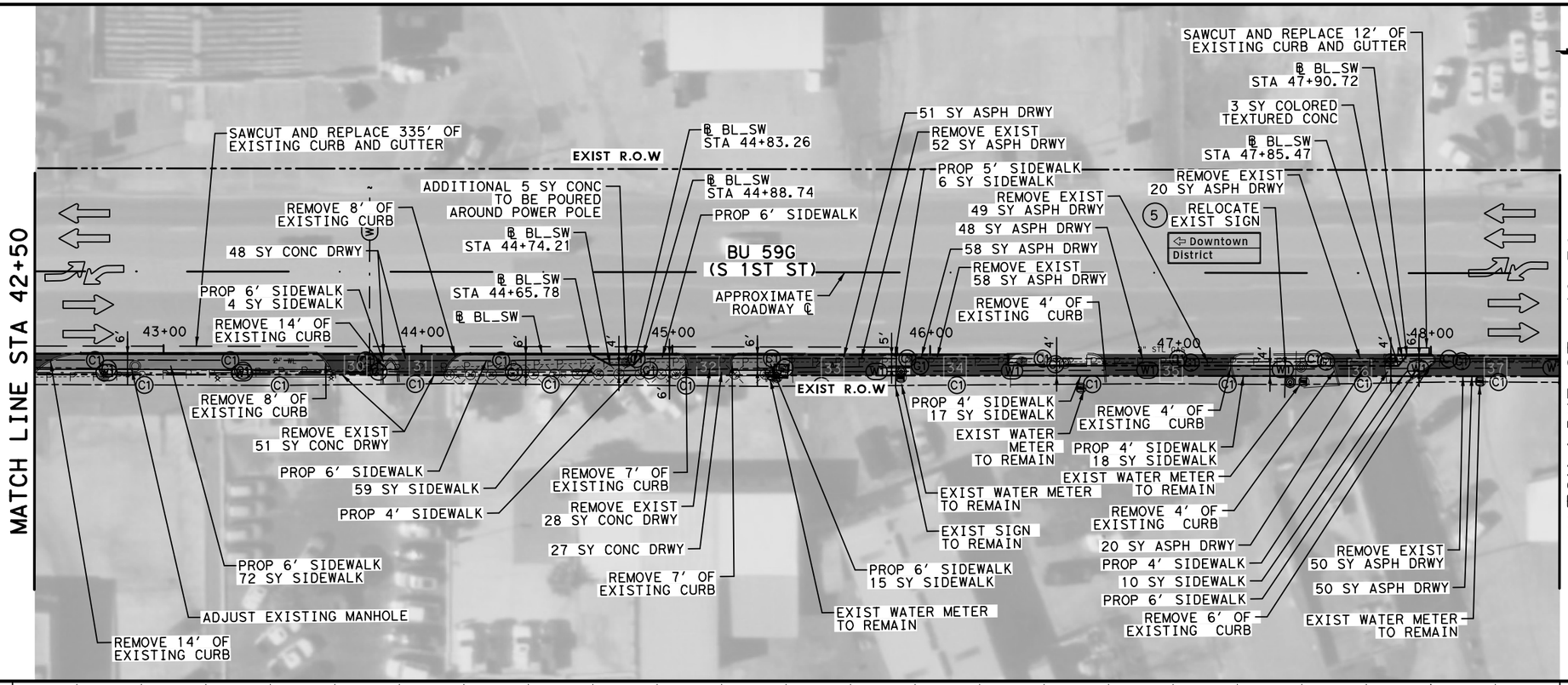
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

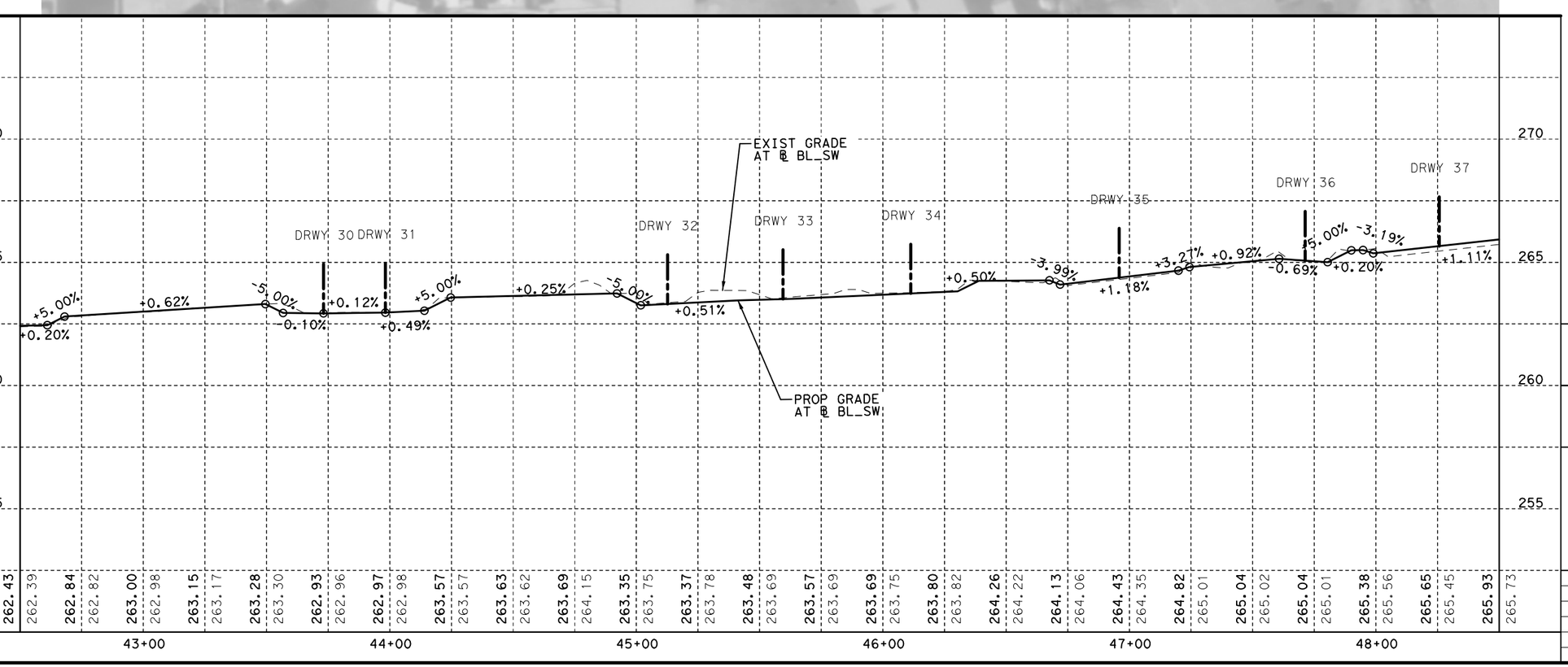
SIDEWALK PLAN & PROFILE (STA 36+50 TO STA 42+50)

SHEET 7 OF 14

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	51
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*07.dgn
DRAWING DATE: 5/25/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- X — SMALL SIGN NUMBER
- X X — DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- C1 — CONSOLIDATED (TELE)
- E1 — ELECTRIC / POWER
- G1 — GAS
- W1 — POTABLE WATER
- P P P P P — ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

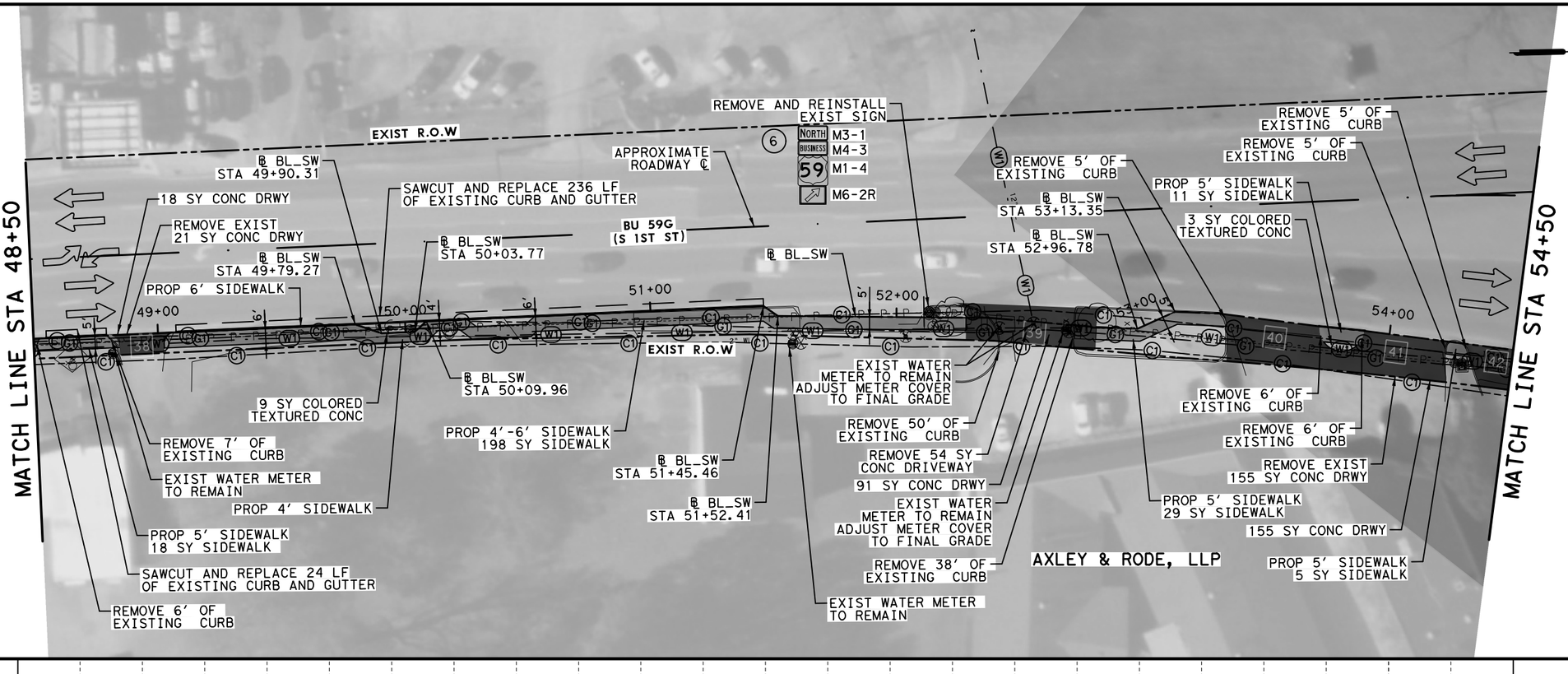
Texas Department of Transportation

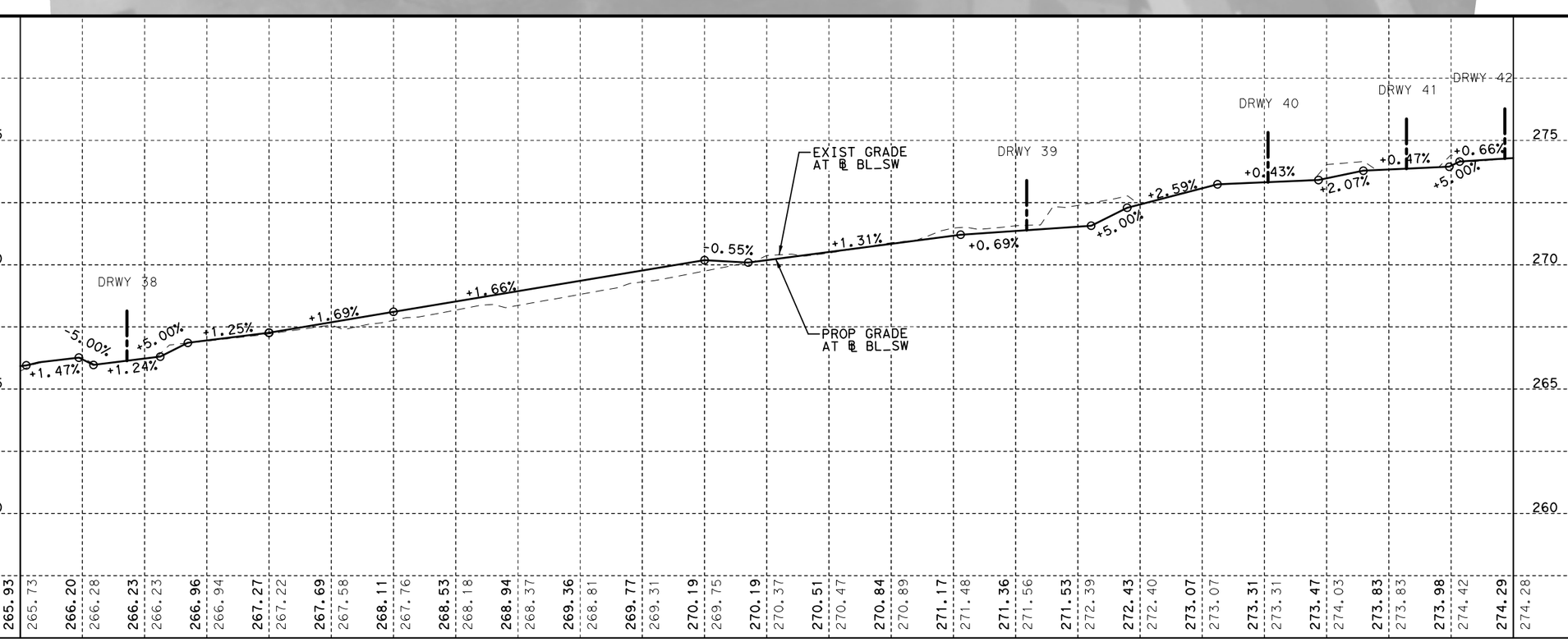
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SIDEWALK PLAN & PROFILE (STA 42+50 TO STA 48+50)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	52
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*08.dgn
DRAWING DATE: 5/25/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- X — SMALL SIGN NUMBER
- X X — DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- C1 — CONSOLIDATED (TELE)
- E1 — ELECTRIC / POWER
- G1 — GAS
- W1 — POTABLE WATER
- P P P P P — ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Texas Department of Transportation
©2022

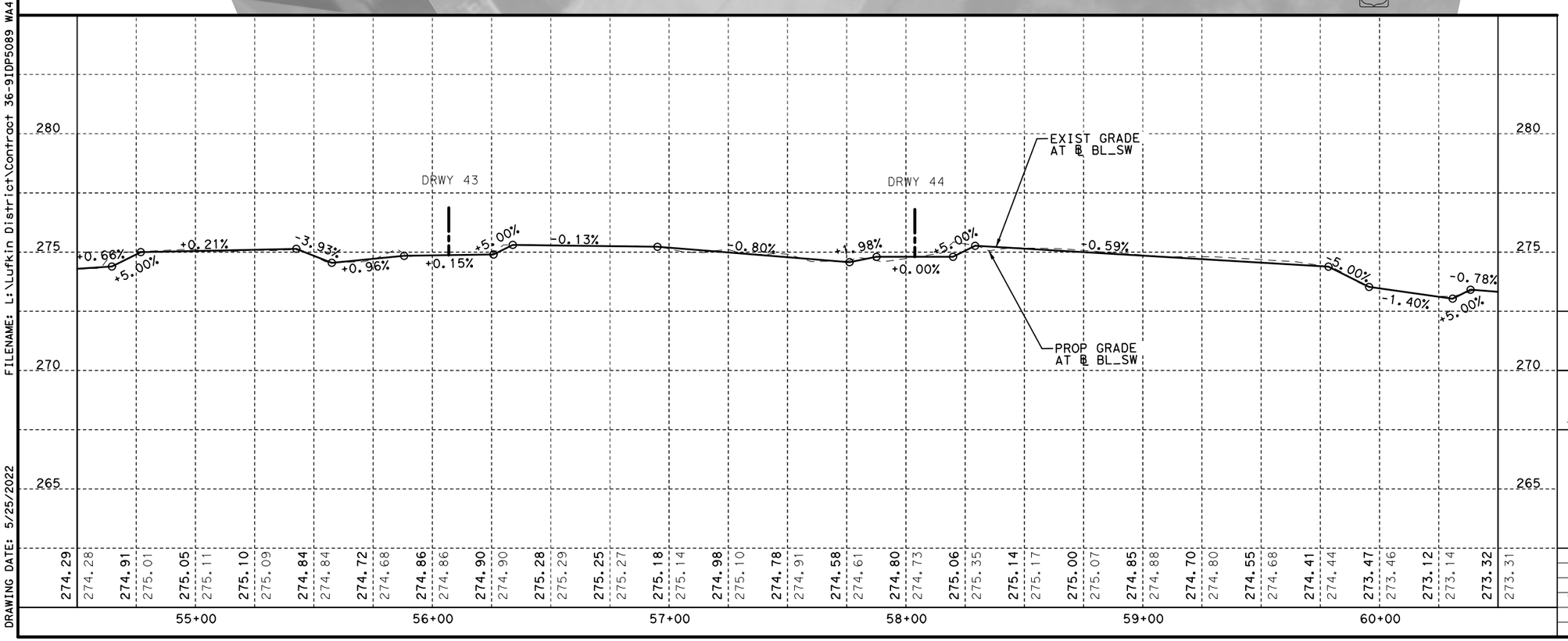
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SIDEWALK
PLAN & PROFILE
(STA 48+50 TO STA 54+50)

SHEET 9 OF 14

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	53
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

DRAWING DATE: 5/25/2022
FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*09.dgn



HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- SMALL SIGN NUMBER
- DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- CONSOLIDATED (TELE)
- ELECTRIC / POWER
- GAS
- POTABLE WATER
- ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

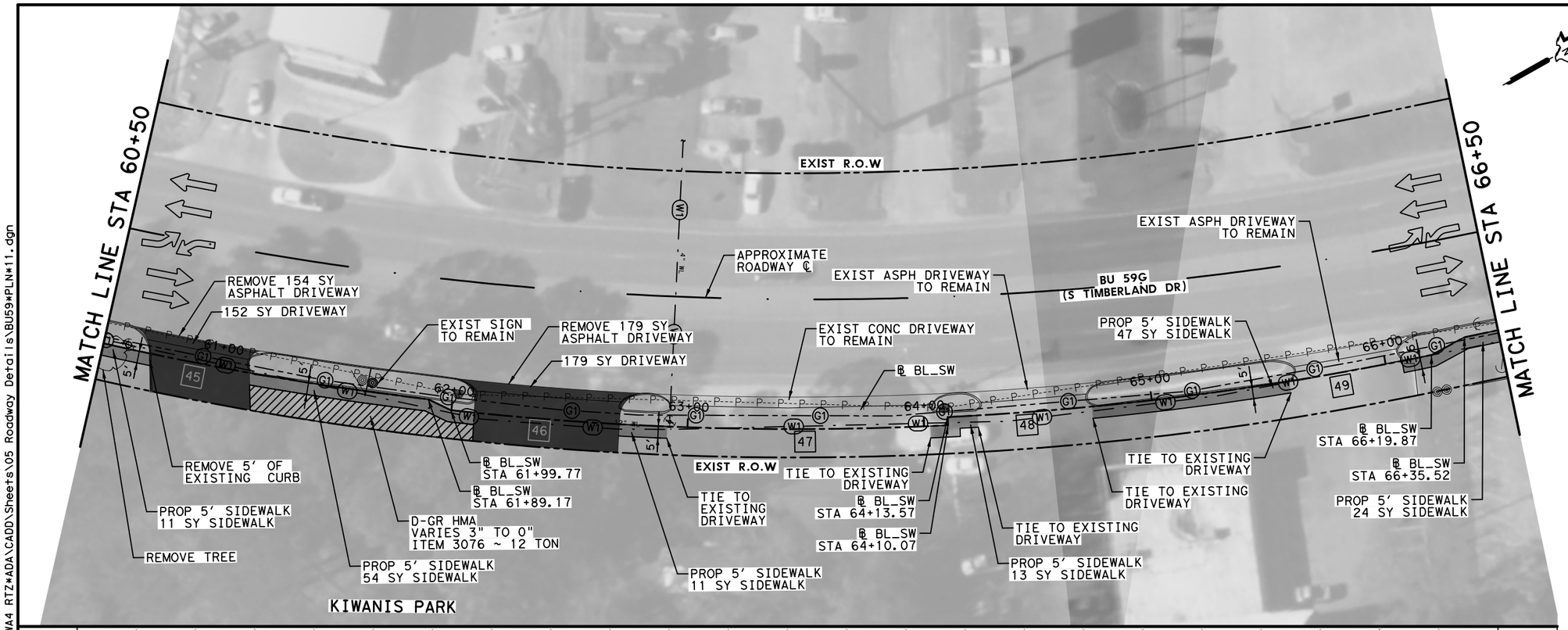
Texas Department of Transportation

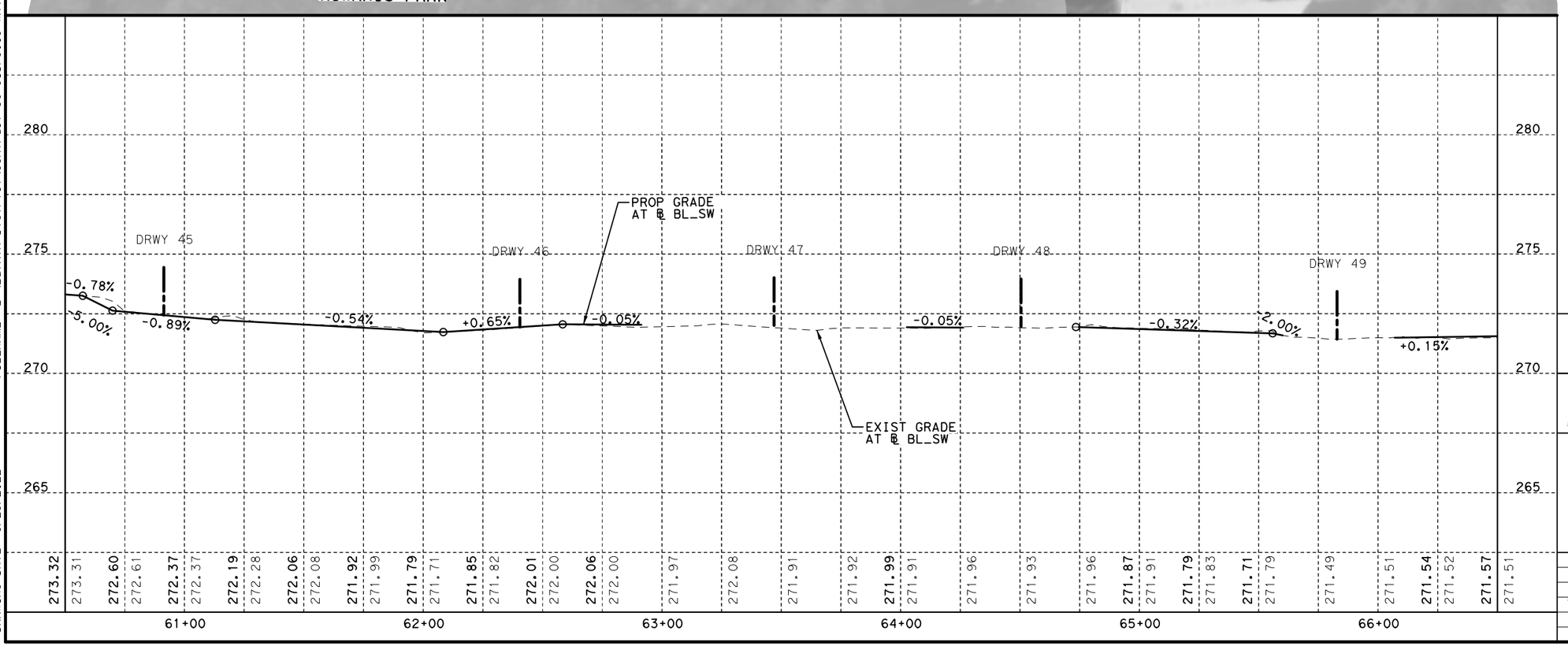
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SIDEWALK PLAN & PROFILE (STA 54+50 TO STA 60+50)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	54
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*10.dgn
DRAWING DATE: 5/25/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- SMALL SIGN NUMBER
- DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- CONSOLIDATED (TELE)
- ELECTRIC / POWER
- GAS
- POTABLE WATER
- ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Texas Department of Transportation

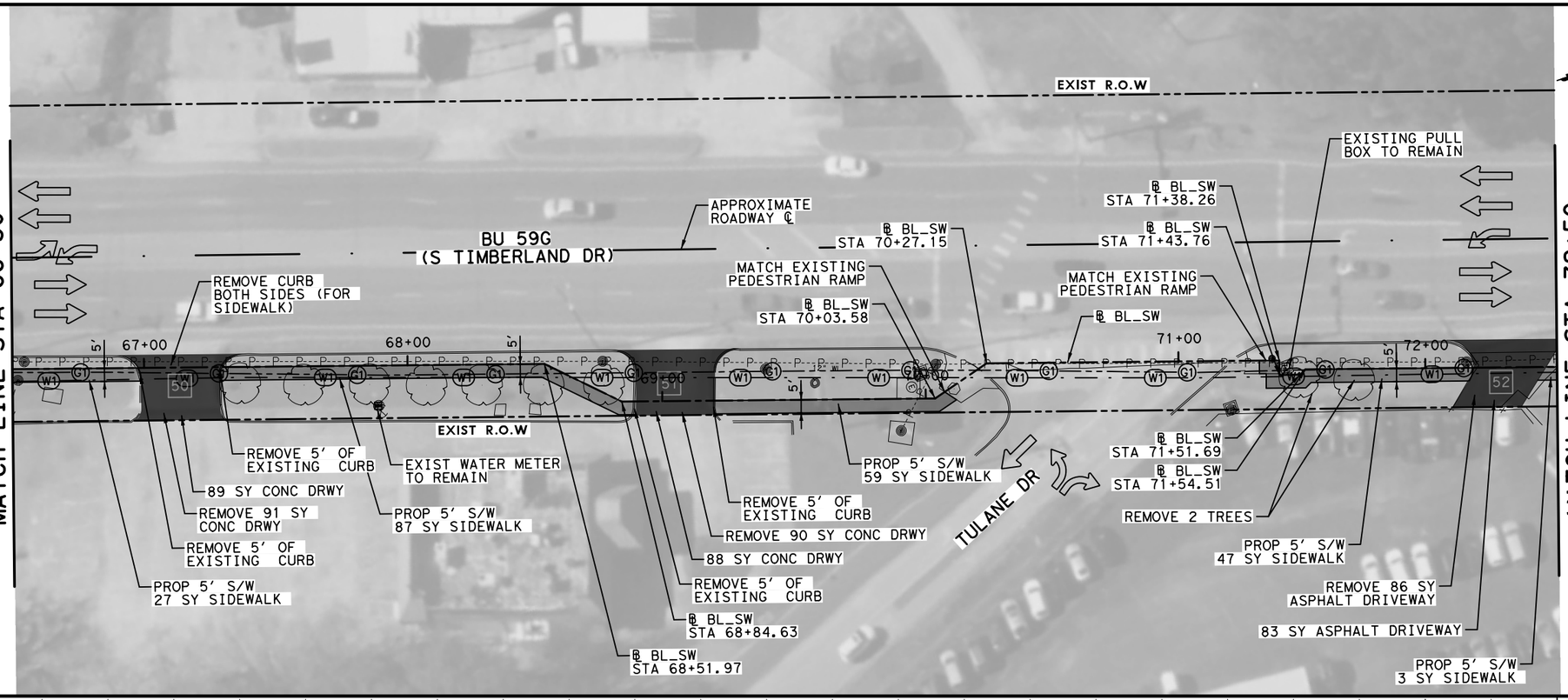
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

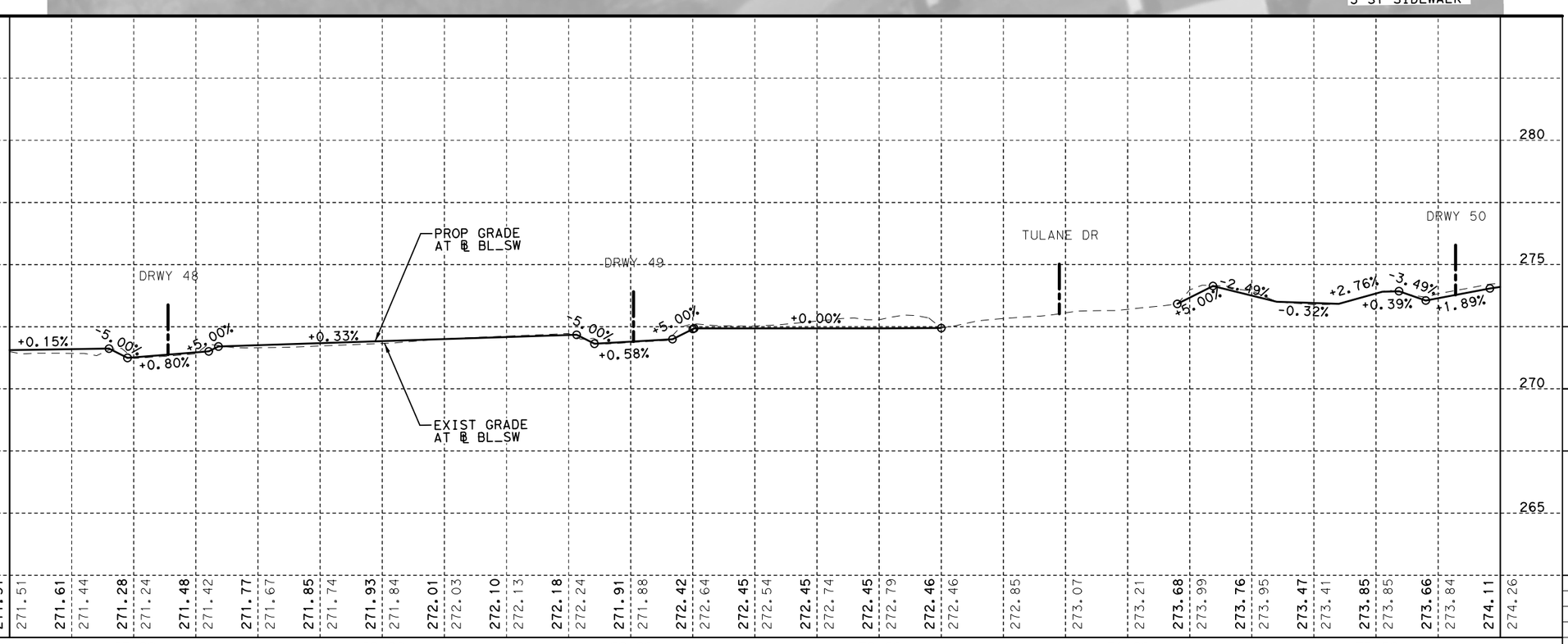
SIDEWALK PLAN & PROFILE (STA 60+50 TO STA 66+50)

SHEET 11 OF 14

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	55
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*11.dgn
DRAWING DATE: 5/25/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- X — SMALL SIGN NUMBER
- X X — DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- C1 — CONSOLIDATED (TELE)
- E1 — ELECTRIC / POWER
- G1 — GAS
- W1 — POTABLE WATER
- P P P P P — ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
6/1/2022

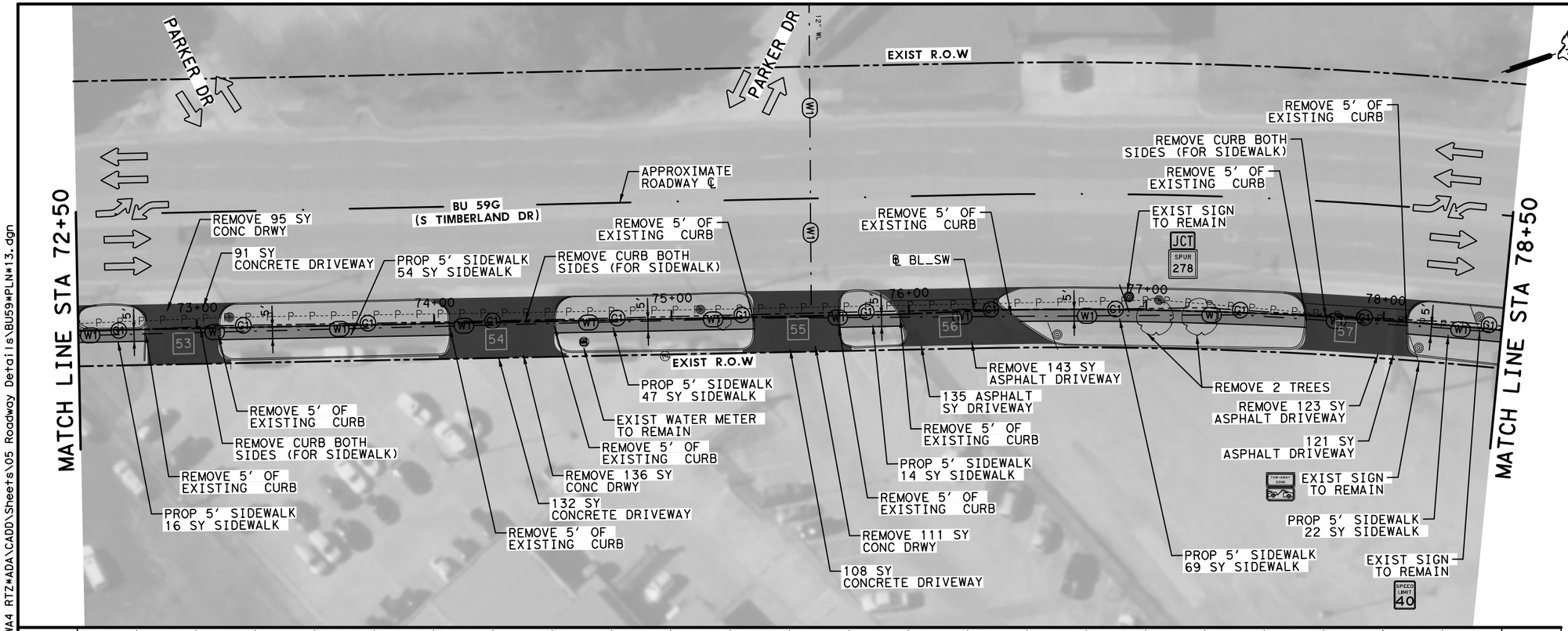
Texas Department of Transportation

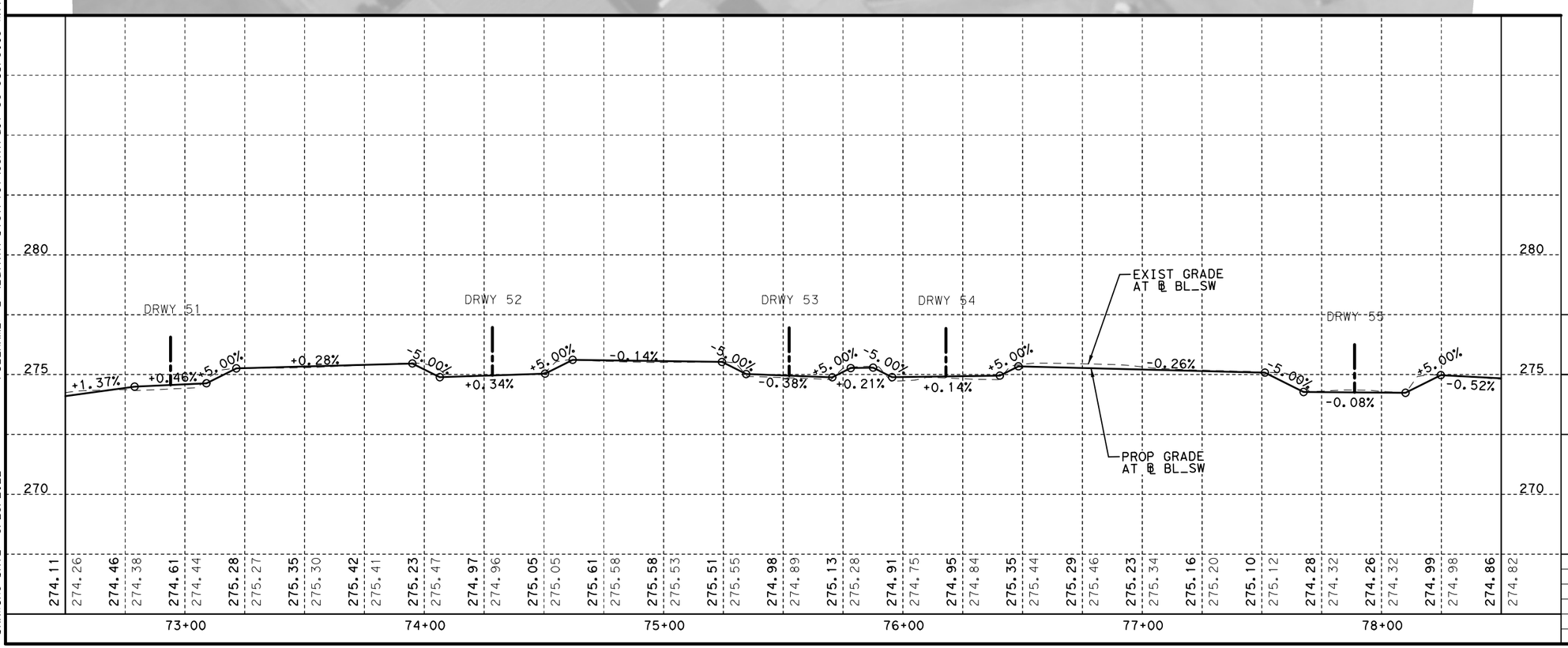
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SIDEWALK
PLAN & PROFILE
(STA 66+50 TO STA 72+50)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	56
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*12.dgn
DRAWING DATE: 6/1/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- X — SMALL SIGN NUMBER
- X X — DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- C1 — CONSOLIDATED (TELE)
- E1 — ELECTRIC / POWER
- G1 — GAS
- W1 — POTABLE WATER
- P P P P P — ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DIRECTIONS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

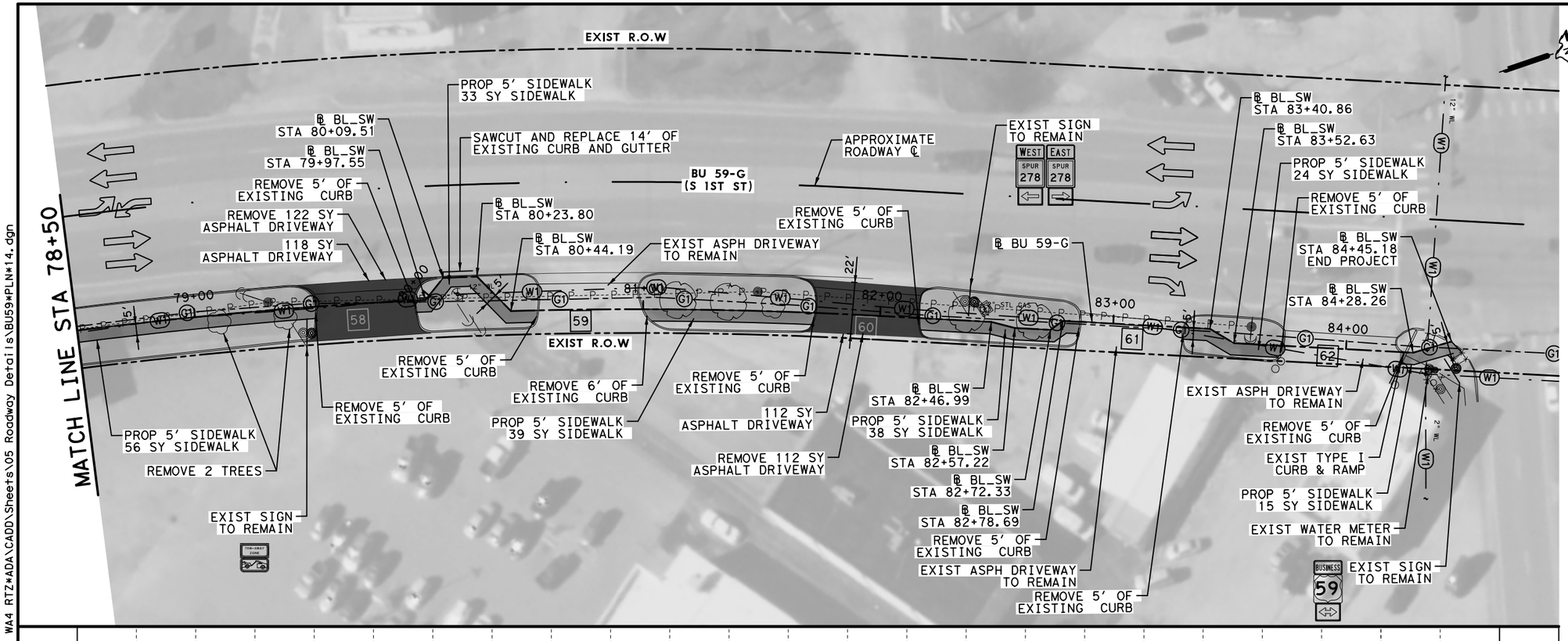
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

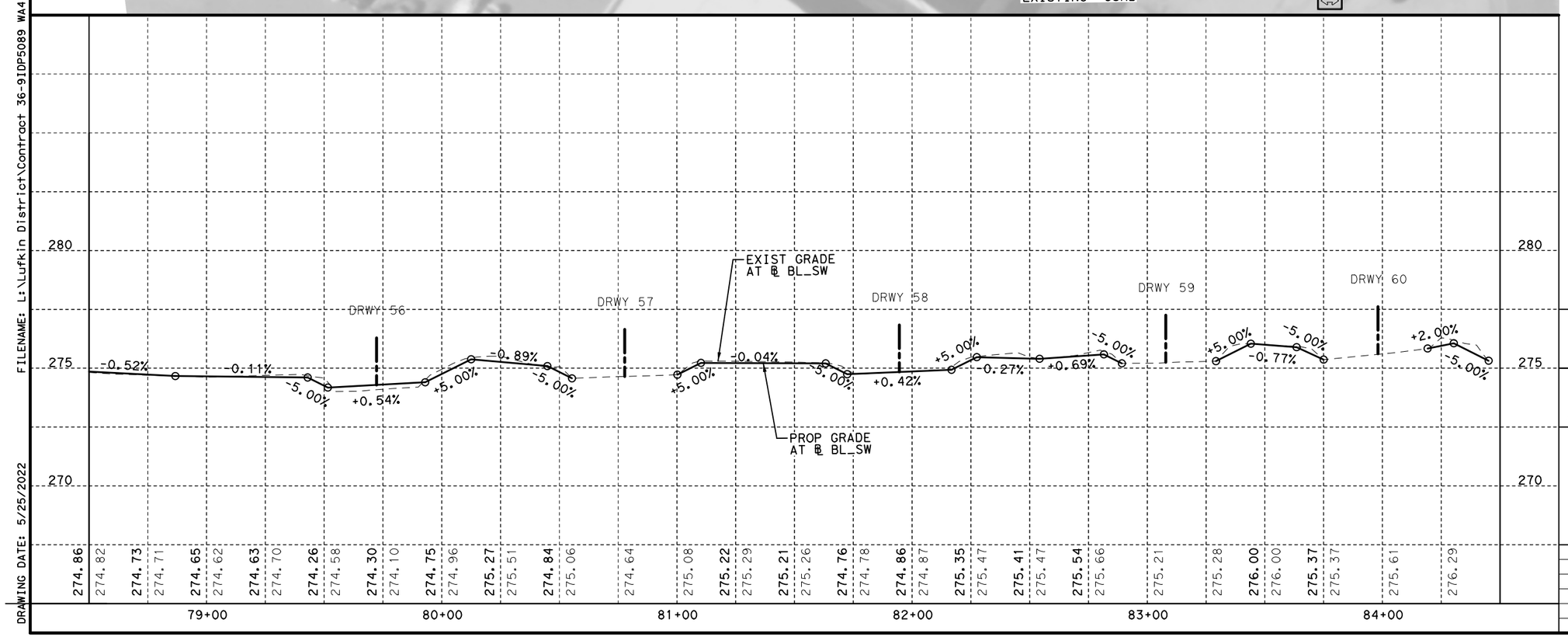
SIDEWALK PLAN & PROFILE (STA 72+50 TO STA 78+50)

SHEET 13 OF 14

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	57
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*13.dgn
DRAWING DATE: 5/25/2022





HORZ 0' 25' 50'
VERT 0' 2.5' 5'
SCALE IN FEET

LEGEND:

- TRAFFIC FLOW
- X — SMALL SIGN NUMBER
- X X — DRIVEWAY
- SIGN
- PROP SIDEWALK
- PROP DRIVEWAY
- APPROX EXIST R.O.W
- C1 — CONSOLIDATED (TELE)
- E1 — ELECTRIC / POWER
- G1 — GAS
- W1 — POTABLE WATER
- P — ELECTRIC POWER LINE

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR ADDITIONAL INFORMATION.
2. PROPOSED CURB RADII ON DRIVEWAYS SHALL MATCH EXISTING CURB RADIUS, UNLESS OTHERWISE NOTED.
3. SAWCUTS REQUIRED TO MATCH EXISTING PAVEMENT AND WILL BE SUBSIDIARY TO INSTALLING SIDEWALK/DRIVEWAYS.
4. SEE SOSS FOR MORE INFORMATION ON REPLACEMENT/RELOCATION OF SMALL SIGNS.
5. CONTRACTOR TO REMOVE ANY TREES, SHRUBS OR OTHER APPURTENANCES IN CONFLICT WITH PROPOSED CONSTRUCTION, CHECK WITH ENGINEER PRIOR TO TREE REMOVAL.
6. ALL REMOVAL QUANTITIES FOR EXISTING DRIVEWAYS AND CONCRETE SHOWN IN QUANTITY SUMMARY (ROADWAY) SHEET.
7. THE EXISTING RIGHT-OF-WAY LINE IS RECREATED FROM THE AVAILABLE RECORDS. NO RIGHT-OF-WAY SURVEY HAS BEEN PERFORMED FOR THIS PROJECT.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

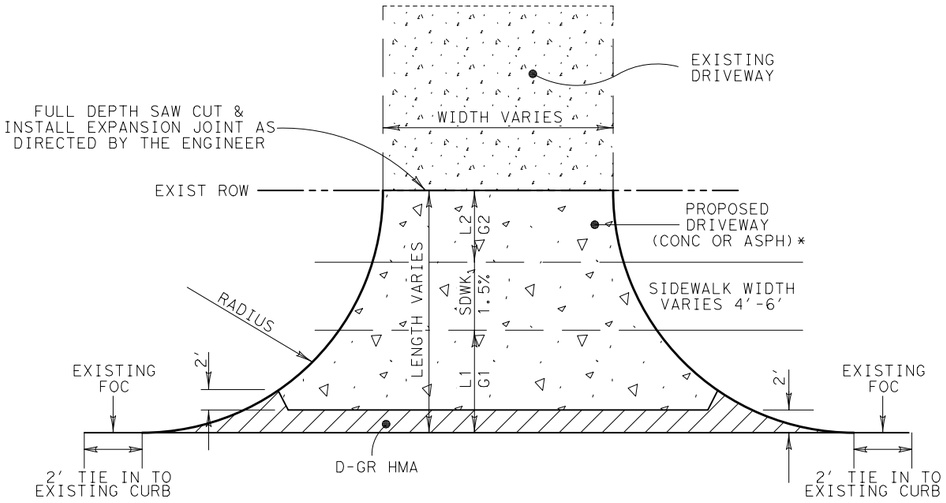
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SIDEWALK
PLAN & PROFILE
(STA 78+50 TO END)

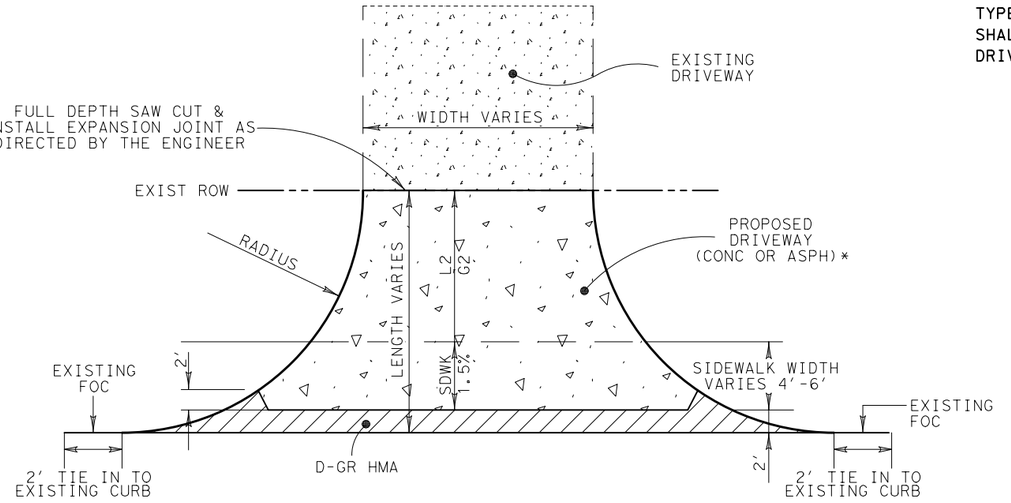
SHEET 14 OF 14

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	58
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\BU59*PLN*14.dgn
DRAWING DATE: 5/25/2022

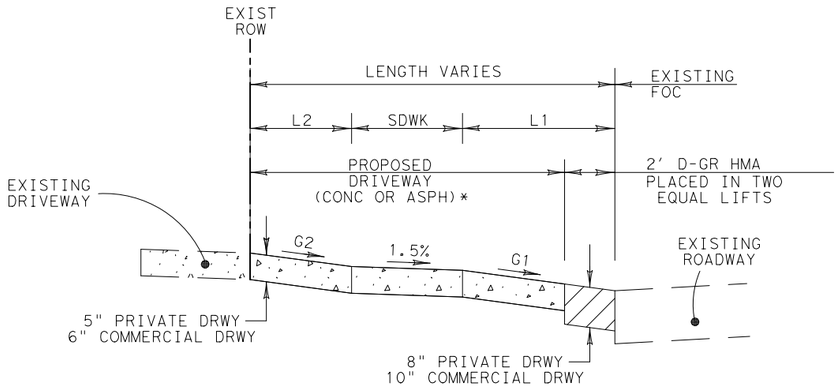


TYPICAL PLAN VIEW OF DRIVEWAYS
N. T. S.

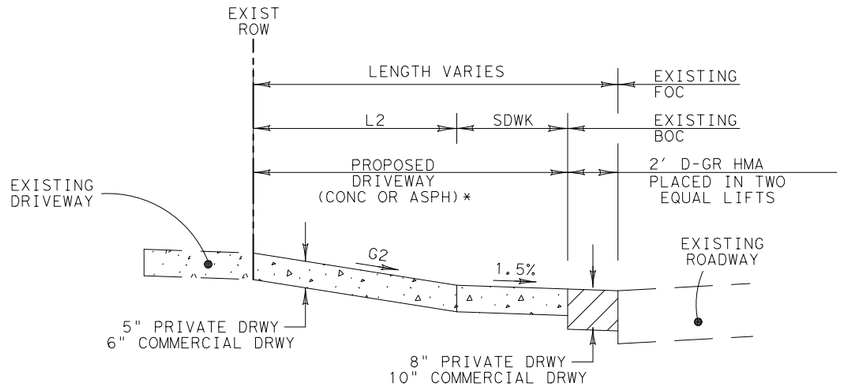


TYPICAL PLAN VIEW OF DRIVEWAYS
N. T. S.

* PROPOSED DRIVEWAY MATERIAL TYPE (CONCRETE OR ASPHALT) SHALL MATCH THE EXISTING DRIVEWAY TYPE



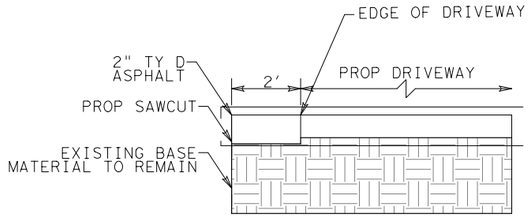
PROFILE OF DRIVEWAYS W/ SETBACK
N. T. S.



PROFILE OF DRIVEWAYS
N. T. S.

GENERAL NOTES:

1. CONCRETE SURFACE - USE REINFORCING STEEL CONSISTING OF NO.3 OR 4 BARS MEETING THE REQUIREMENTS OF GRADE 60 REINFORCING STEEL. PLACE BARS ON 12 INCH CENTERS IN EACH DIRECTION, SUPPORTED ON REINFORCING CHAIRS.
2. CONCRETE SURFACE - WELDED WIRE FABRIC WILL NOT BE ALLOWED FOR REINFORCING.
3. CONCRETE SURFACE - UNLESS OTHERWISE DIRECTED, INSTALL 1/2 INCH PREMOLDED EXPANSION JOINT MATERIAL BETWEEN EXISTING CONCRETE AND NEW CONCRETE.
4. PREPARATION AND CONSTRUCTION OF DRIVEWAYS SHALL BE PAID FOR UNDER ITEM 530 DRIVEWAYS. NO ADDITIONAL PAYMENT WILL BE MADE FOR REMOVAL OF EXISTING GRAVEL AND DIRT DRIVEWAYS. THE NECESSARY EXCAVATION, GRADING, COMPACTION, CONCRETE OR ASPHALT PAVEMENT AND INCIDENTALS WILL BE CONSIDERED SUBSIDIARY TO ITEM 530.
5. D-GR HMA TYPE & RATE AS SHOWN ELSEWHERE IN PLANS. FOR D-GR HMA THICKER THAN 4", PLACE IN 2 LIFTS.
6. WHEN EXCAVATION DOES NOT GENERATE ENOUGH MATERIAL TO COMPLETE THE BACKFILL, ADDITIONAL MATERIAL MUST BE APPROVED PRIOR TO USE. ADDITIONAL MATERIAL WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
7. SEE DRIVEWAY TABLE FOR MORE INFORMATION.



CONCRETE DRIVEWAY ALTERNATE TIE-IN
N. T. S.
(USE IF DIRECTED BY THE ENGINEER)

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

DRIVEWAY DETAILS

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	59
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

DRIVEWAY GEOMETRY DATA

DRIVEWAY NUMBER	STATION	GRADE			BORDER WIDTH COMPONENTS			NOTE FOR CONTRACTOR
		G1	S/W	G2	L1	SDWK	L2	
1	8+08.07	-	-1.5%	-3.4%	-	6.0′	18.1′	-
2	8+72.83	-	-1.5%	-3.0%	-	6.0′	15.5′	-
3	16+30.90	-5.0%	-1.5%	-5.0%	10.5′	5.0′	10.7′	-
4	17+35.14	-7.7%	-1.5%		9.5′	5.0′	11.2′	-
5	18+45.03	-8.0%	-1.5%	-8.0%	8.4′	6.0′	11.6′	CLA* NEEDED
6	19+52.12	-	-	-	-	-	-	EXIST DRWY TO REMAIN
7	21+35.20	-	-	-	-	-	-	EXIST DRWY TO REMAIN
8	22+45.09	2.8%	1.5%	-	22.0′	5.0′	-	-
9	23+34.62	3.3%	1.5%	3.3%	7.5′	5.0′	16.0′	-
10	23+80.82	-	-	-	-	-	-	EXIST DRWY TO REMAIN
11	25+72.66	1.7%	1.5%		13.6′	15.0′		-
12	26+42.13	2.3%	1.5%	1.5%	13.8′	5.0′	9.1′	-
13	28+08.48	2.6%	1.5%	2.5%	12.6′	5.0′	7.0′	-
14	29+70.96	2.6%	1.5%	1.2%	11.9′	6.0′	2.3′	-
15	31+13.13	-	1.5%	3.0%	-	11.7′	3.5′	TREAT 1ST 11.7′ AS S/W
16	32+33.66	-	1.5%	2.7%	-	6.0′	4.8′	-
17	32+82.26	-	1.5%	1.5%	-	6.0′	1.6′	-
18	33+41.92	-	1.5%	1.5%	-	6.0′	7.6′	-
19	33+90.89	-	1.5%	8.0%	-	6.0′	3.2′	CLA* NEEDED
20	34+89.24	-	1.5%	6.2%	-	6.0′	2.8′	-
21	35+37.17	-	1.5%	8.0%	-	6.0′	4.5′	CLA* NEEDED
22	35+97.64	-	1.5%	8.0%	-	6.0′	4.2′	CLA* NEEDED
23	37+14.16	-	1.5%	8.0%	-	6.0′	7.0′	CLA* NEEDED
24	38+26.47	-	1.5%	8.0%	-	6.0′	22.7′	CLA* NEEDED
25	39+04.56	-	1.5%	8.0%	-	6.0′	3.6′	CLA* NEEDED

DRIVEWAY GEOMETRY DATA

DRIVEWAY NUMBER	STATION	GRADE			BORDER WIDTH COMPONENTS			NOTE FOR CONTRACTOR
		G1	S/W	G2	L1	SDWK	L2	
26	40+46.72	-	1.5%	-5.1%	-	6.0′	2.5′	-
27	40+93.37	-	1.5%	2.1%	-	6.0′	2.3′	-
28	41+29.30	-	1.5%	8.0%	-	6.0′	2.7′	CLA* NEEDED
29	42+22.85	-	1.5%	1.5%	-	6.0′	1.5′	-
30	43+73.15	-	1.5%	2.9%	-	6.0′	2.8′	-
31	44+01.94	-	1.5%	8.0%	-	6.0′	6.0′	CLA* NEEDED
32	45+14.51	-	1.5%	8.0%	-	6.0′	8.1′	CLA* NEEDED
33	45+63.27	-	1.5%	8.0%	-	6.0′	7.3′	CLA* NEEDED
34	46+11.27	-	1.5%	8.0%	-	5.0′	8.4′	CLA* NEEDED
35	46+95.89	8.0%	1.5%	8.0%	4.7′	4.0′	0.2′	CLA* NEEDED
36	47+70.58	3.1%	1.5%	-	4.7′	4.1′	-	-
37	48+25.70	-	-1.5%	-2.2%	-	5.0′	4.4′	-
38	48+92.87	-	1.5%	8.0%	-	5.0′	3.7′	CLA* NEEDED
39	52+54.02	-6.1%	-1.5%	-6.1%	6.7′	5.0′	4.2′	-
40	53+51.42	-	-1.5%	-6.4%	-	5.0′	13.3′	-
41	54+07.08	-	-1.5%	-4.9%	-	5.0′	11.5′	-
42	54+46.57	-	-1.5%	-7.3%	-	5.0′	12.7′	-
43	56+08.08	-	-1.5%	-8.0%	-	6.0′	28.3′	CLA* NEEDED
44	58+03.18	-2.7%	-1.5%	-2.7%	6.3′	4.0′	11.0′	-
45	60+91.38	-8.0%	-1.5%	-8.0%	10.0′	5.0′	17.1′	CLA* NEEDED
46	62+40.48	-6.1%	-1.5%	-6.1%	13.5′	5.0′	7.0′	-
47	63+47.01	-	-	-	-	-	-	EXIST DRWY TO REMAIN
48	64+50.41	-	-	-	-	-	-	EXIST DRWY TO REMAIN
49	65+82.81	-	-	-	-	-	-	EXIST DRWY TO REMAIN
50	67+13.80	1.5%	1.5%	-3.1%	5.0′	5.0′	15.0′	-

* CLA: CONSTRUCTION LICENSE AGREEMENT

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Texas Department of Transportation

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

DRIVEWAY TABLE

SHEET 1 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	60
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\DRWYs\DRIVEWAY TABLE.dgn
DRAWING DATE: 5/25/2022

DRIVEWAY GEOMETRY DATA

DRIVEWAY NUMBER	STATION	GRADE			BORDER WIDTH COMPONENTS			NOTE FOR CONTRACTOR
		G1	S/W	G2	L1	SDWK	L2	
51	69+04.56	-0.9%	-1.5%	-0.9%	19.6′	5.0′	0.4′	-
52	72+32.02	-7.8%	-1.5%	-7.8%	12.2′	5.0′	12.4′	-
53	72+93.97	-5.0%	-1.5%	-5.0%	10.5′	5.0′	10.0′	-
54	74+28.49	-6.4%	-1.5%	-6.4%	10.5′	5.0′	8.4′	-
55	75+52.50	-7.1%	-1.5%	-7.2%	10.5′	5.0′	9.3′	-
56	76+17.08	-6.0%	-1.5%	-6.0%	12.9′	5.0′	13.4′	-
57	77+88.72	-6.3%	-1.5%	-6.3%	9.5′	5.0′	10.3′	-
58	79+72.28	-5.4%	-1.5%	-5.4%	9.5′	5.0′	9.1′	-
59	80+77.79	-	-	-	-	-	-	EXIST DRWY TO REMAIN
60	81+94.61	-2.3%	-1.5%	-2.3%	15.5′	5.0′	4.1′	-
61	83+07.88	-	-	-	-	-	-	EXIST DRWY TO REMAIN
62	83+98.13	-	-	-	-	-	-	EXIST DRWY TO REMAIN

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

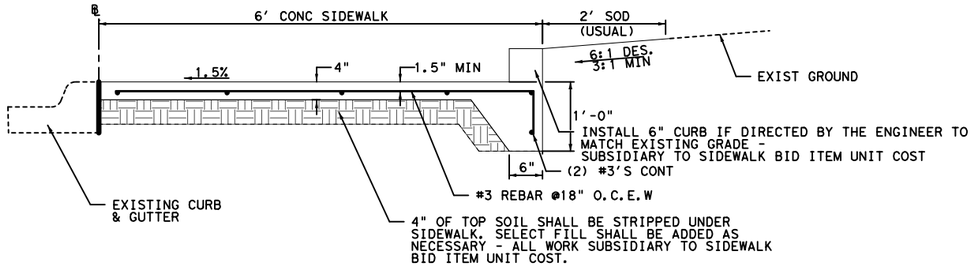
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

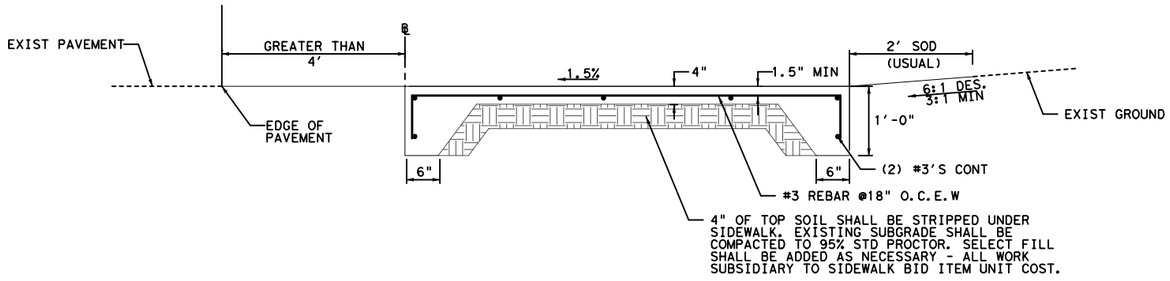
DRIVEWAY TABLE

SHEET 2 OF 2

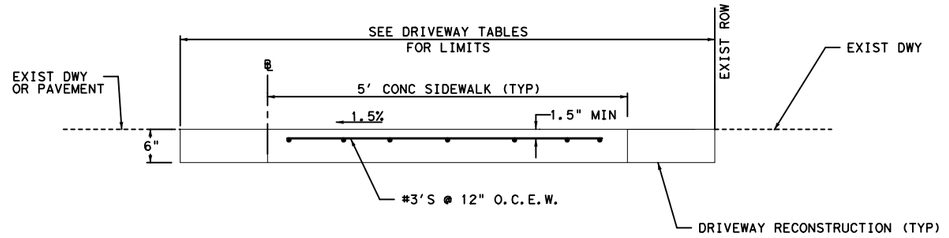
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	61
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

DRAWING DATE: 5/25/2022 FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\DRWYs\DRIVEWAY TABLE.dgn

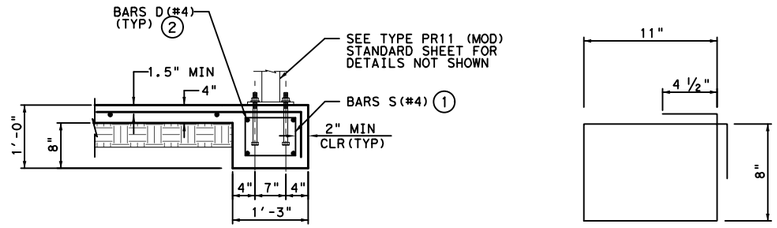




PROPOSED 5' SIDEWALK
WHERE SIDEWALK IS SETBACK FROM PAVEMENT

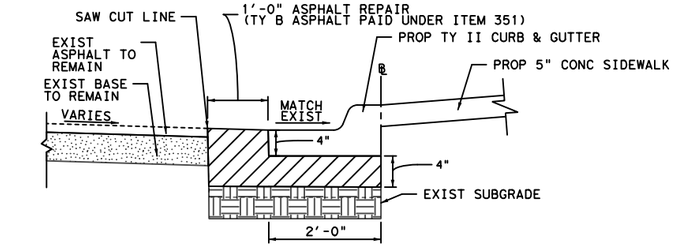


PROPOSED DRIVEWAY

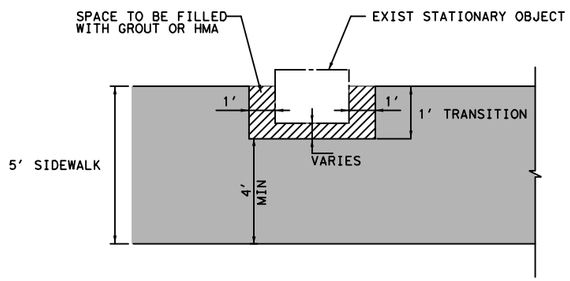


SECTION AT RAIL POST FOUNDATIONS

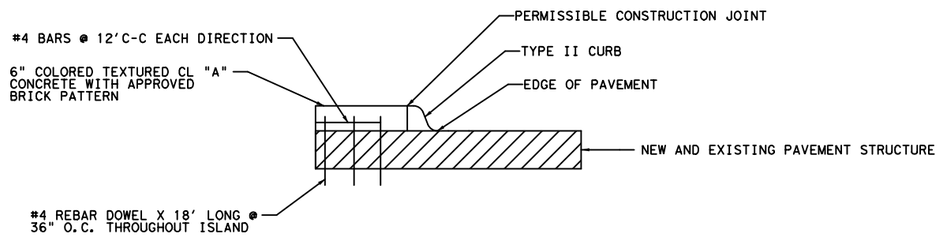
BARS S(#4)



PROPOSED
TY II CURB & GUTTER



PROPOSED SIDEWALK BLOCKOUT



CONCRETE ISLAND WITH PAVEMENT FOUNDATION DETAIL

(1) BARS S(#4) SPACED AT 12" MAX (SPACED 3" FROM OUTSIDE EDGE OF OVERALL LENGTH OF SIDEWALK.

(2) PROVIDE 1" END COVER TO BARS D(#4) FROM OUTSIDE EDGE OF OVERALL LENGTH OF SIDEWALK.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.
REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

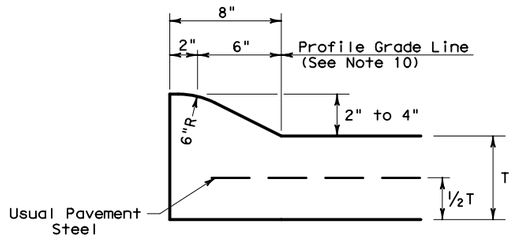
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

MISCELLANEOUS DETAILS

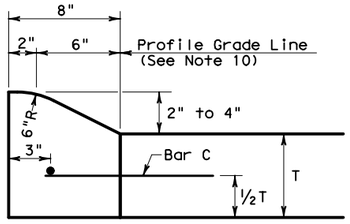
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	62
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\05 Roadway Details\DRWYs\LUFKIN SIDEWALK DETAILS.dgn
DRAWING DATE: 5/25/2022

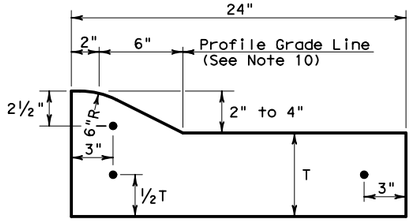
DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\ccg21.dgn



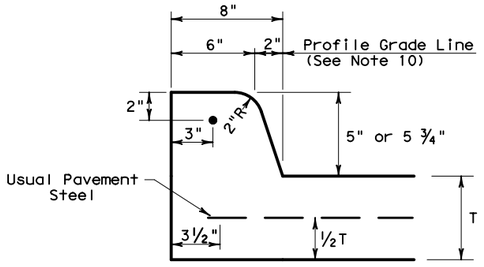
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



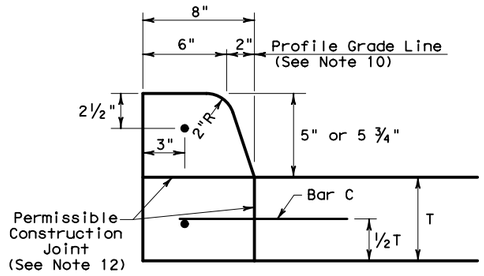
TYPE I CURB
2" - 4" HEIGHT



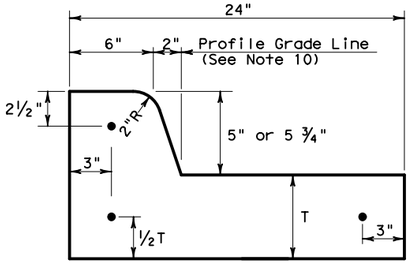
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



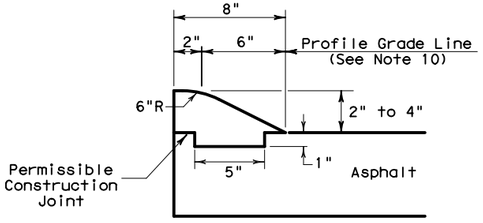
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



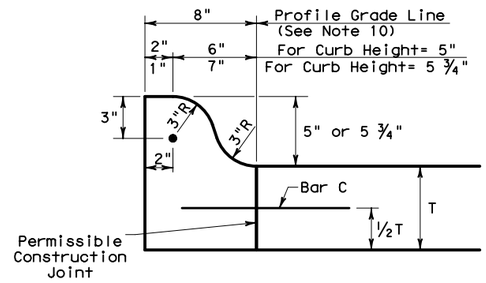
TYPE II CURB
5" - 5 ¾" HEIGHT



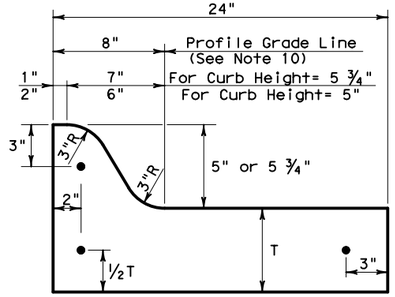
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



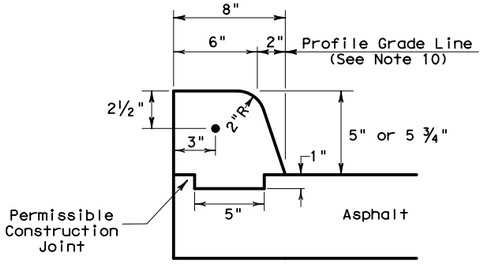
TYPE III CURB (KEYED)
2" - 4" HEIGHT



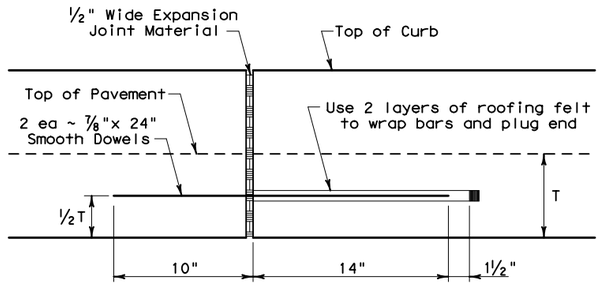
TYPE IIa CURB
5" - 5 ¾" HEIGHT



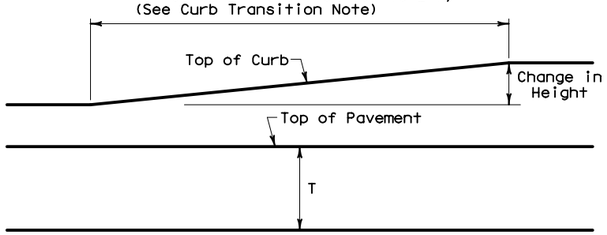
TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT



TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT

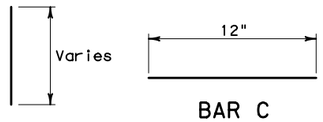


EXPANSION JOINT DETAIL



CURB TRANSITION
Note: To be paid for as Highest Curb

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.



BAR B

BAR C

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 the 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 used as needed to support curb reinforcing steel during concrete placement.

Texas Department of Transportation

Design Division Standard

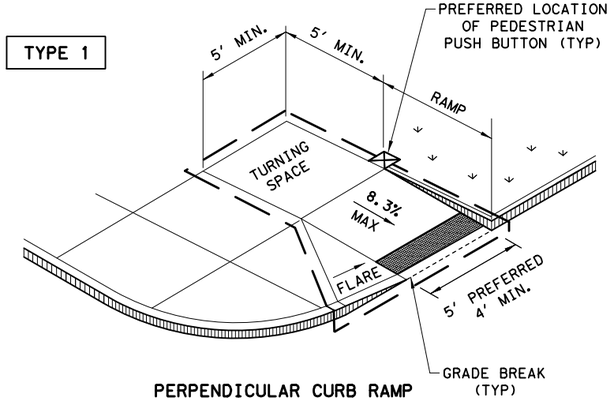
CONCRETE CURB AND CURB AND GUTTER

CCCG-21

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: SS	CK: KM
©TxDOT: FEBRUARY 2021 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		63

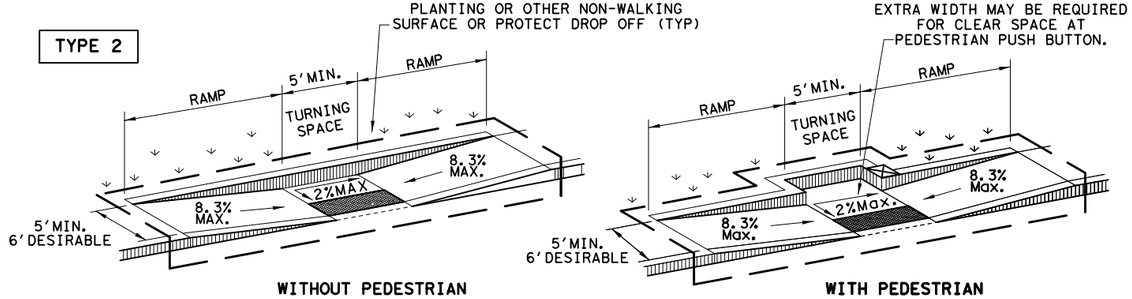
DATE: 5/25/2022
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\ped18.dgn

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

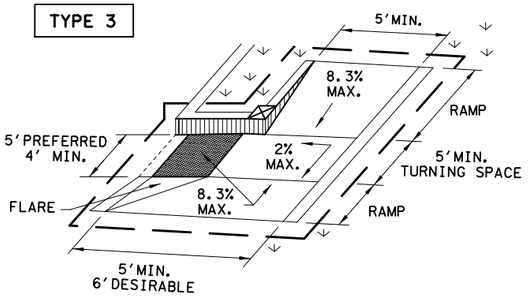


WITHOUT PEDESTRIAN PUSH BUTTON

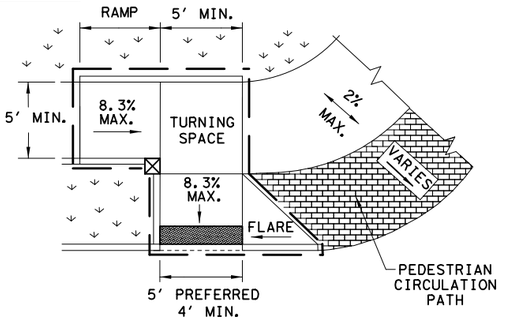
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

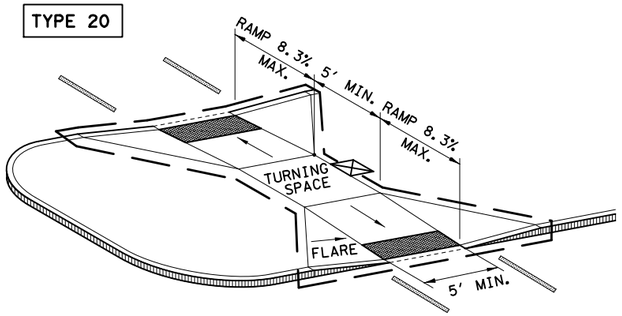


TYPE 6



COMBINATION CURB RAMPS

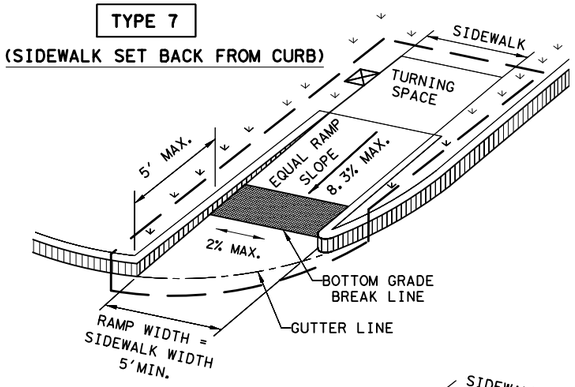
TYPE 20



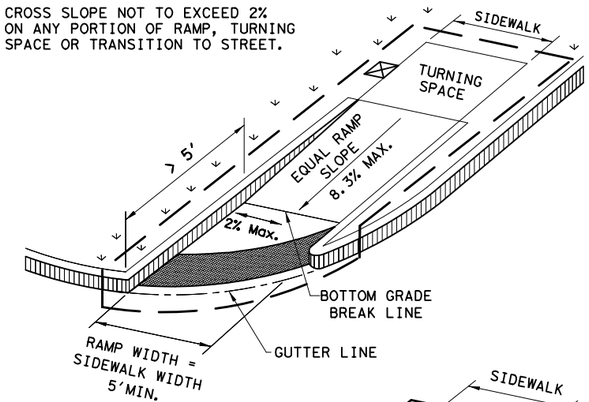
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

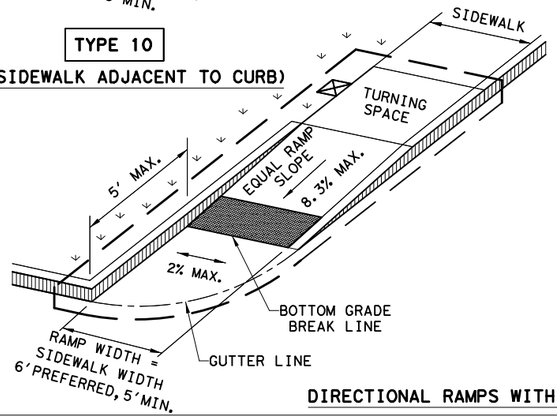


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

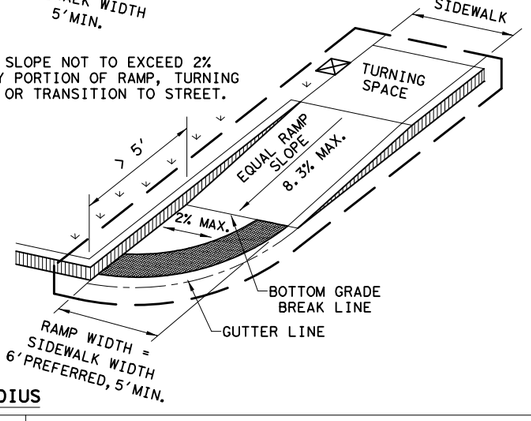


TYPE 10

(SIDEWALK ADJACENT TO CURB)

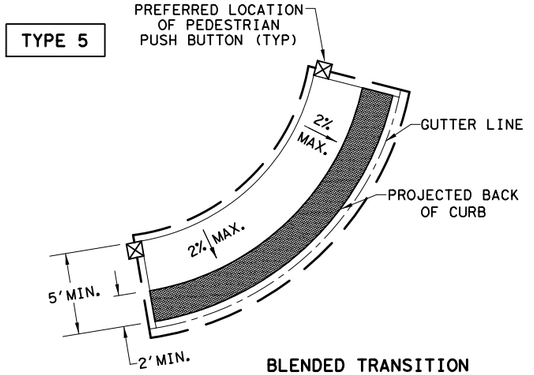


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

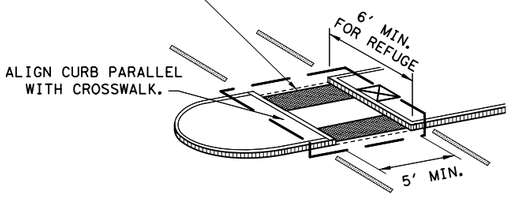
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

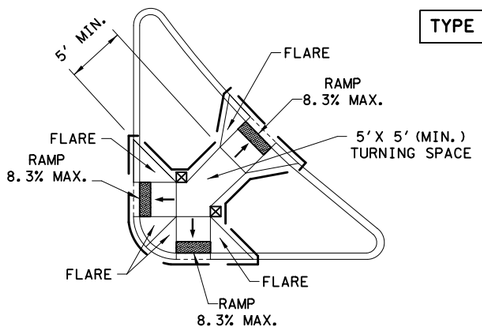
TYPE 21

INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.



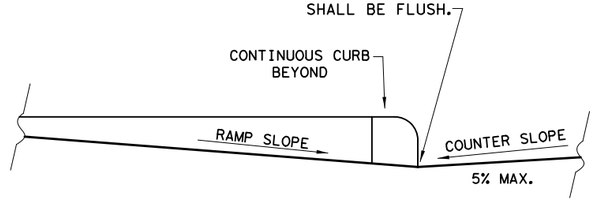
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

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

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0176	02	125, ETC.		BU 59G
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	LFK	ANGELINA			64

DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\ped18.dgn

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicable standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

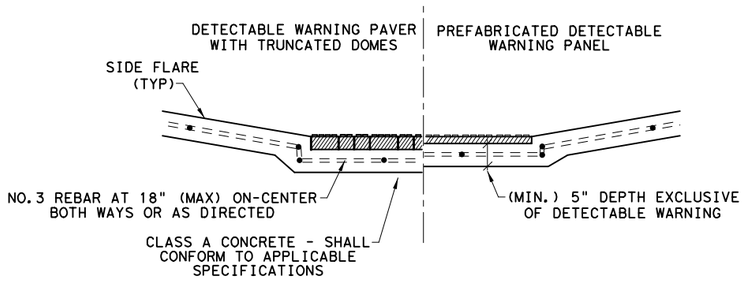
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material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

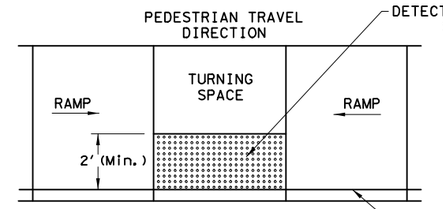
SIDEWALKS

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.



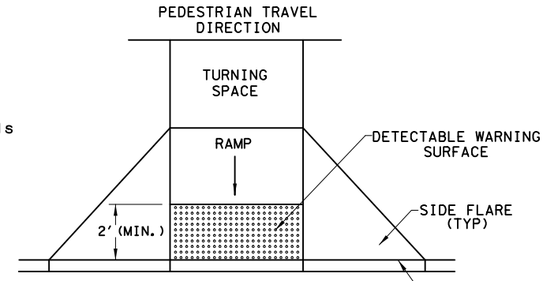
SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

DETECTABLE WARNING SURFACE DETAILS



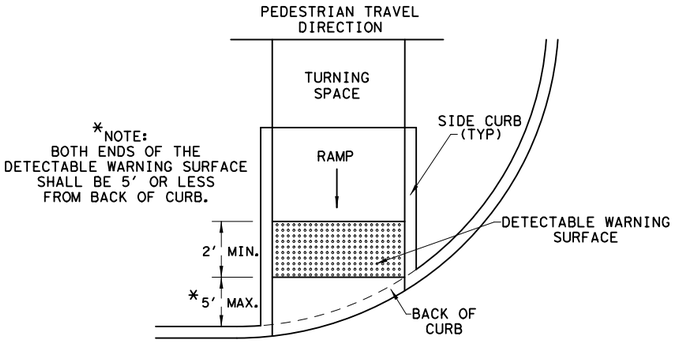
PARALLEL CURB RAMP

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

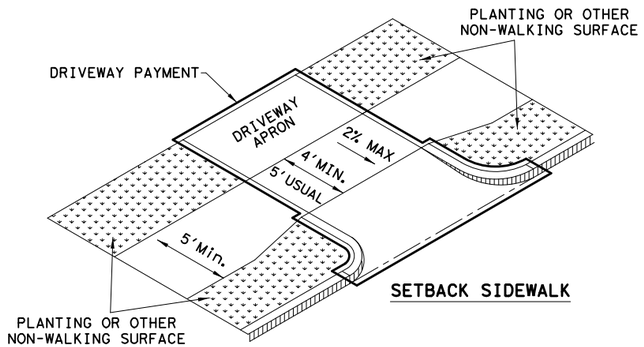
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

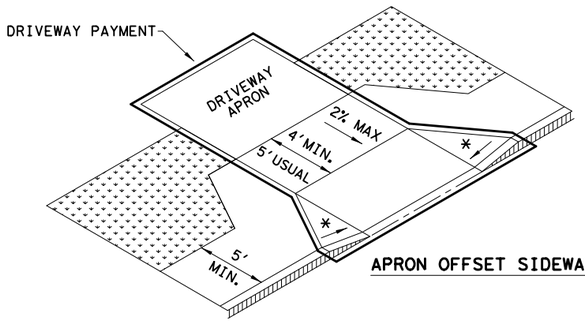
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0176	02	125, ETC.		BU 59G
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	LFK	ANGELINA			65

DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\ped18.dgn

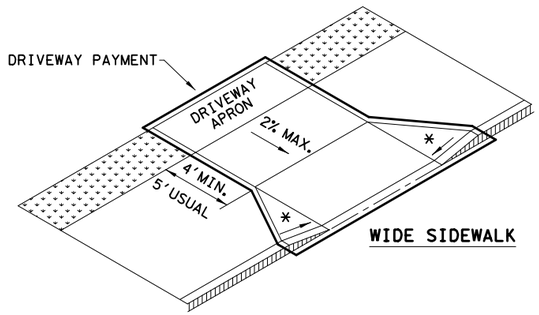
SIDEWALK TREATMENT AT DRIVEWAYS



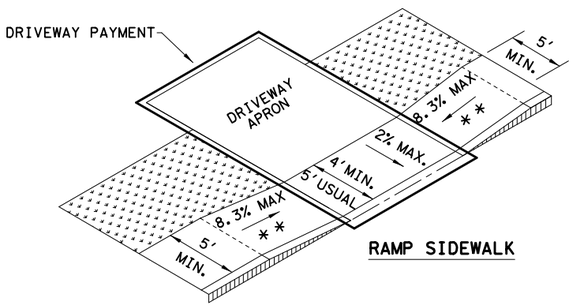
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

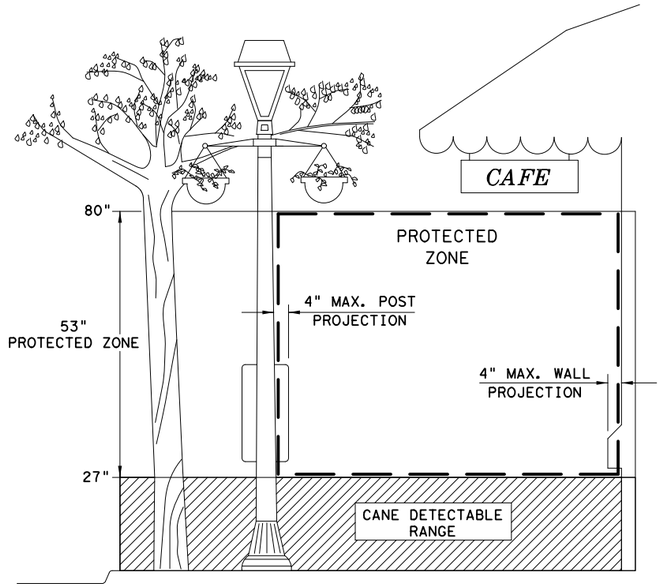


RAMP SIDEWALK

NOTES:

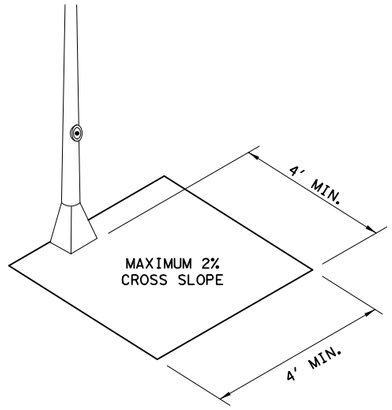
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

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

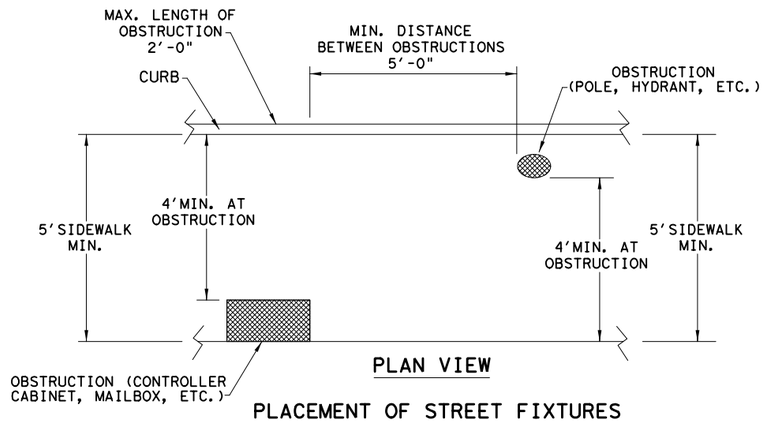


PROTECTED ZONE

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



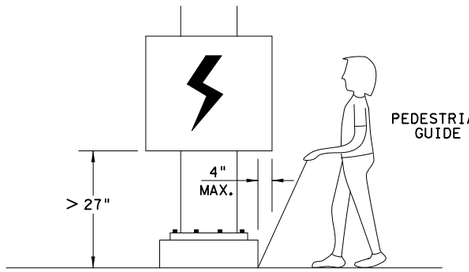
CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



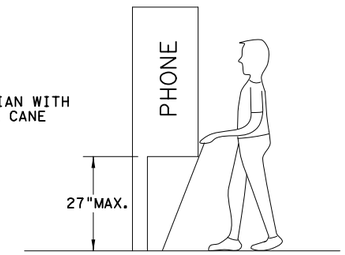
PLAN VIEW

PLACEMENT OF STREET FIXTURES

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



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

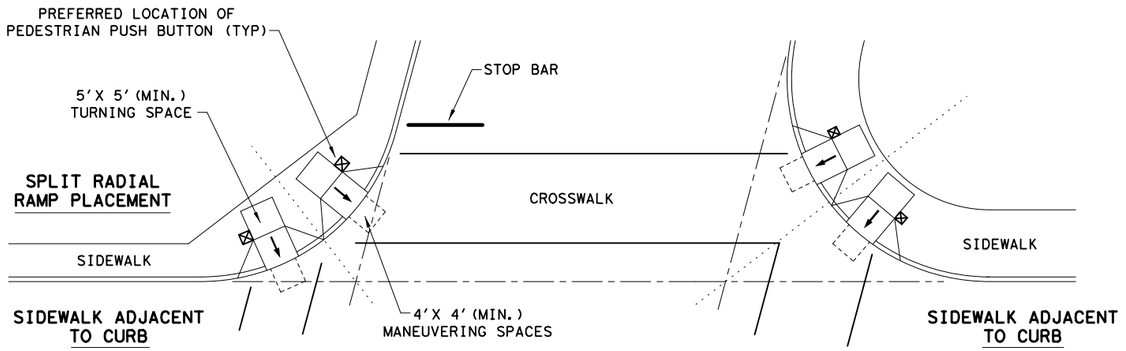
PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
	CONT	SECT	JOB		HIGHWAY
REVISIONS REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	0176	02	125, ETC.		BU 59G
	DIST	COUNTY			SHEET NO.
	LFK	ANGELINA			66

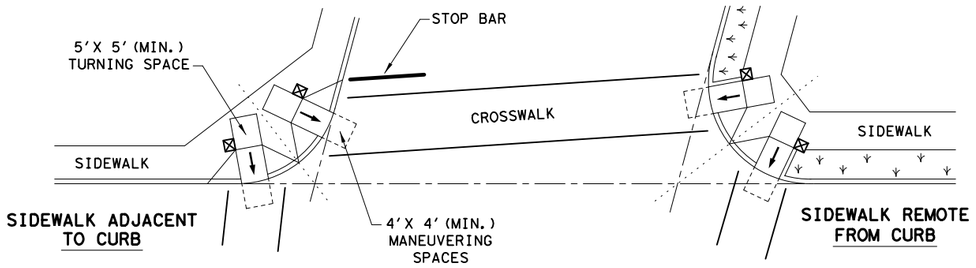
DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\ped18.dgn

TYPICAL CROSSING LAYOUTS

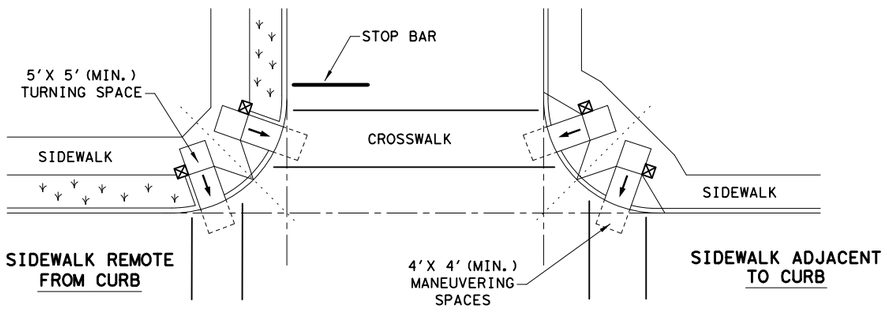
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



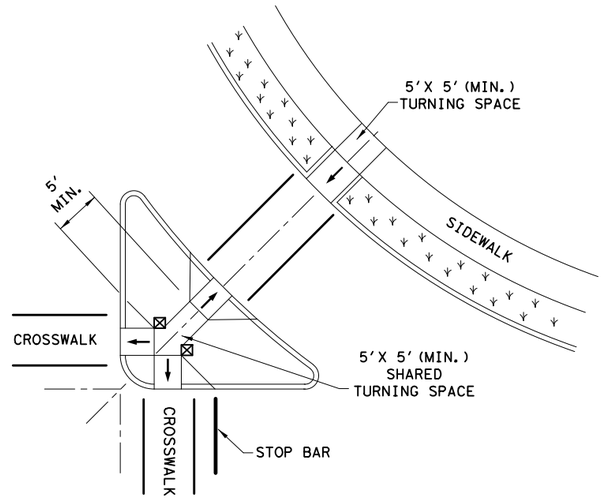
SKEWED INTERSECTION WITH "LARGE" RADIUS



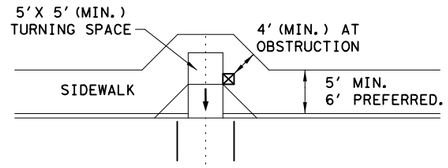
SKEWED INTERSECTION WITH "SMALL" RADIUS



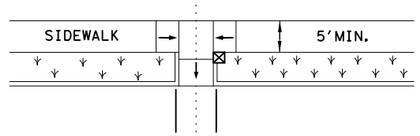
NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



SIDEWALK ADJACENT TO CURB



SIDEWALK REMOTE FROM CURB

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.

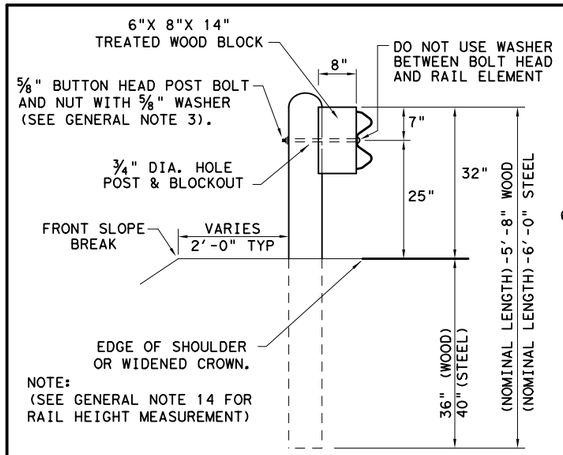
Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

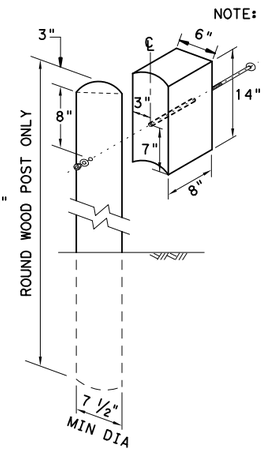
PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG	
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0176	02	125, ETC.	BU 59G	
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.	
	LFK	ANGELINA		67	

DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\gf3119 (1).dgn

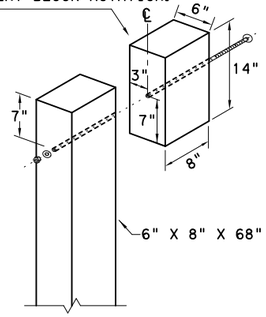


TYPICAL POST PLACEMENT

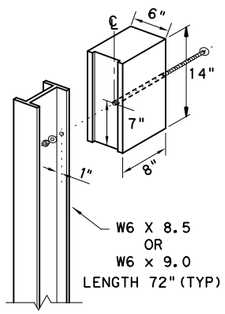


WOOD BLOCK TO ROUND WOOD POST

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

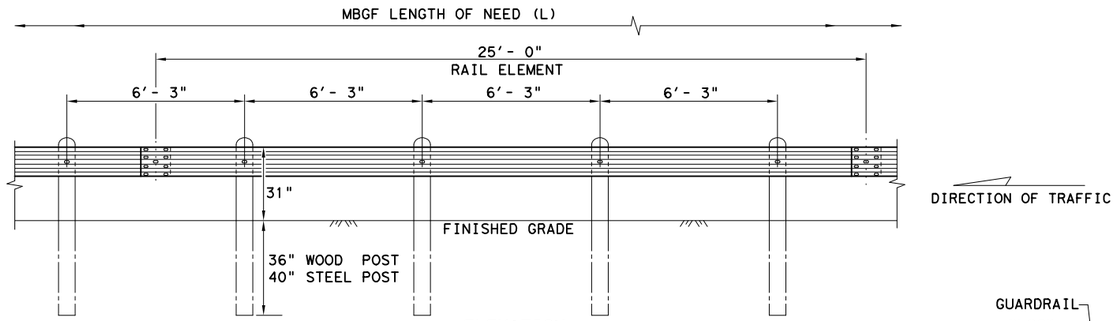


WOOD BLOCK TO RECTANGULAR WOOD POST



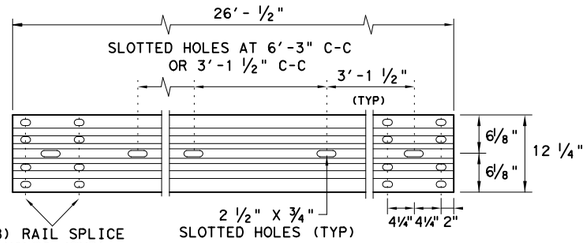
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



ELEVATION
MID-SPAN RAIL SPLICE

SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

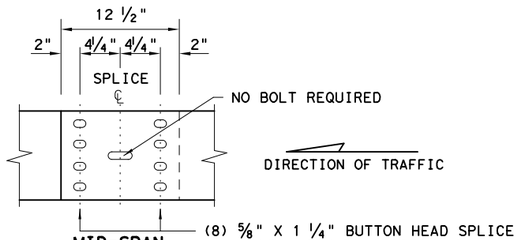
NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.

SPLICE BOLT LENGTH
FBBO1 = 1 1/4"
FBBO2 = 2"
VARIES
5/8"

POST & BLOCK LENGTH
FBBO3 = 10"
FBBO4 = 18"

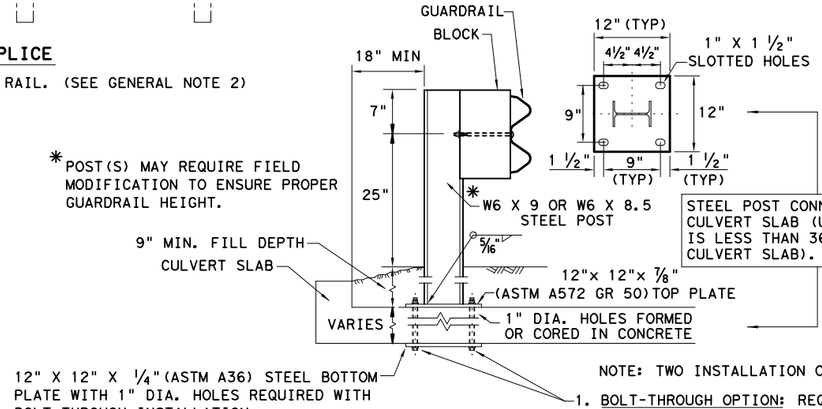
BUTTON HEAD BOLT

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.



* POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.

LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS 1/4" MIN. BEYOND NUT.

NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

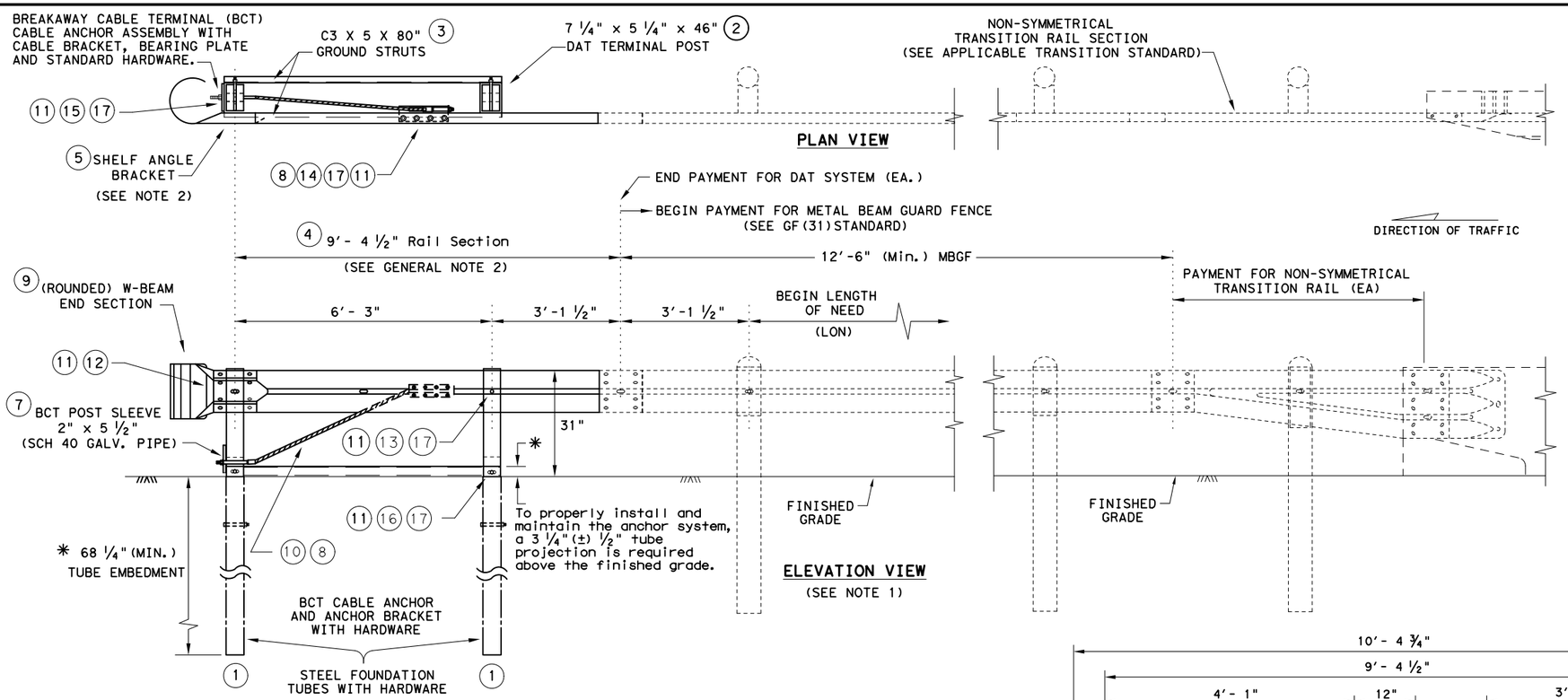
NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0176	02	125, ETC.	BU 59G	
	DIST	COUNTY		SHEET NO.	
	LFK	ANGELINA		68	

DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\gf31dat19 (1).dgn



DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

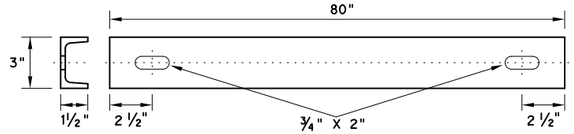
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

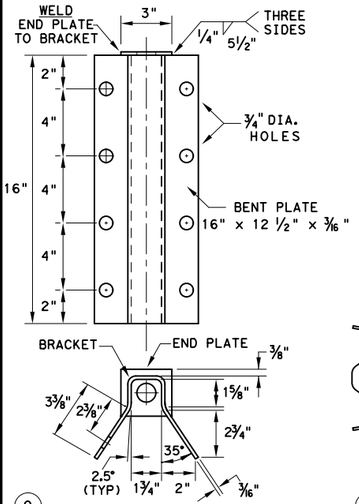
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED) W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 1/4" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	5/8" X 2" HEX HEAD BOLT	8
(15)	5/8" X 8" HEX HEAD BOLT	4
(16)	5/8" X 10" HEX HEAD BOLT	2
(17)	5/8" FLAT WASHER	18

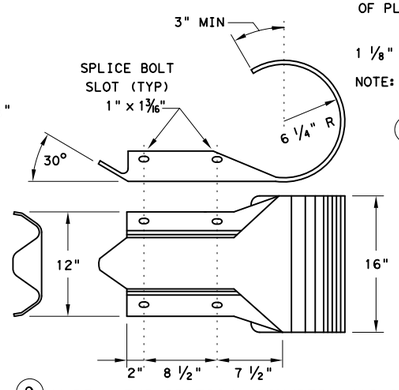
(4) TERMINAL RAIL ELEMENT FOR DAT



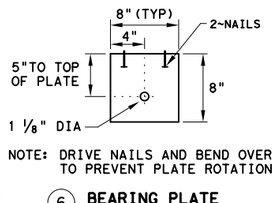
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

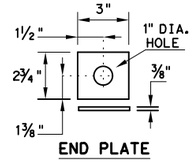


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

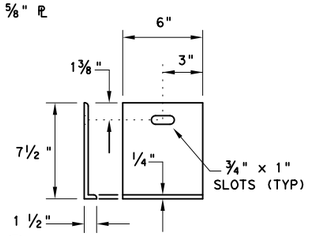


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

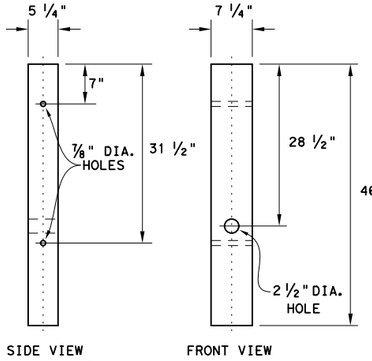
(6) BEARING PLATE
8"x 8"x 5/8" PL



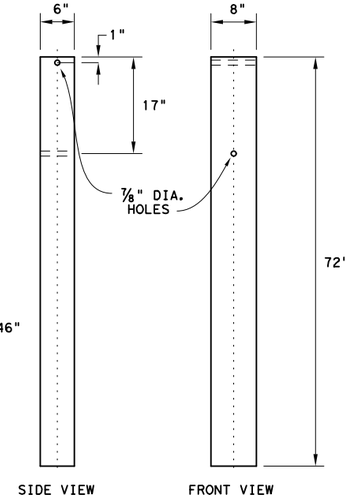
END PLATE



(5) SHELF ANGLE BRACKET



(2) TERMINAL POST
7 1/4"x 5 1/4"x 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

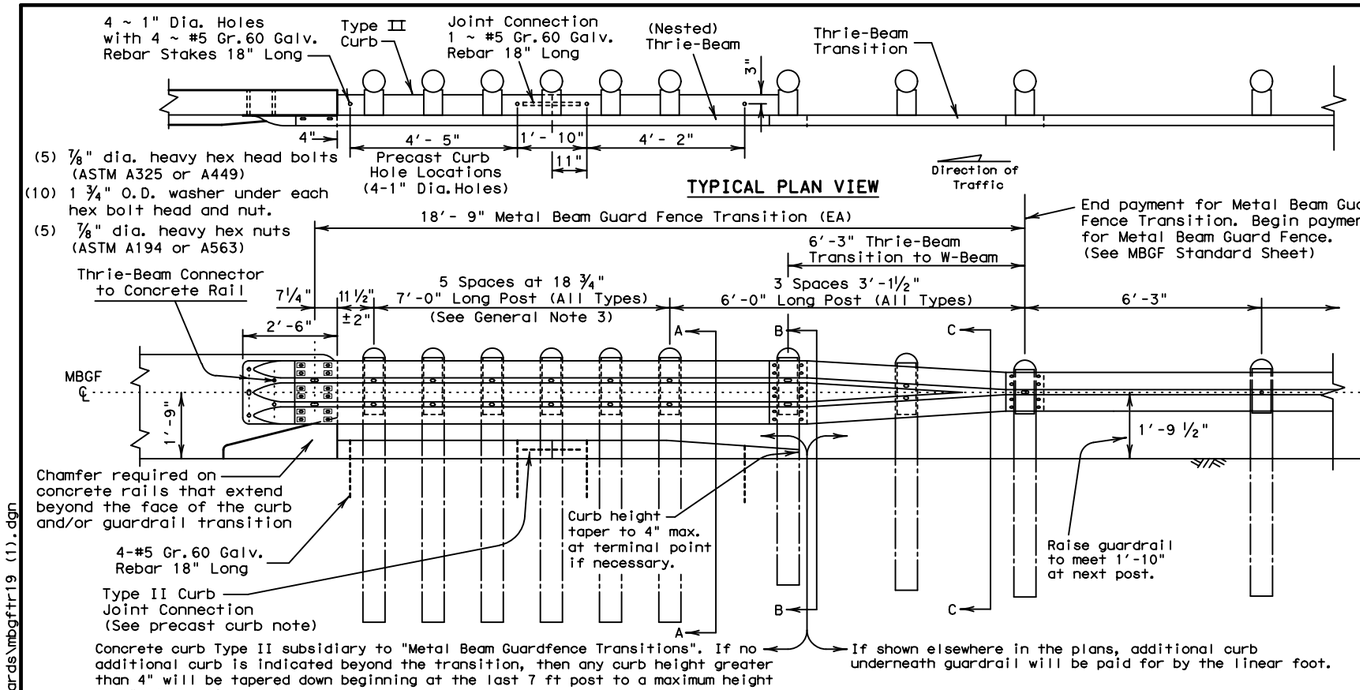
Texas Department of Transportation — Design Division Standard

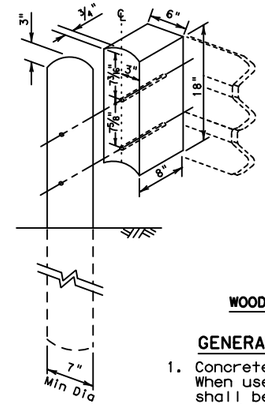
METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

GF(31)DAT-19

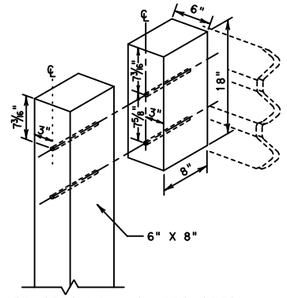
FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		69

DATE: 5/25/2022
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\mbgftr19 (1).dgn

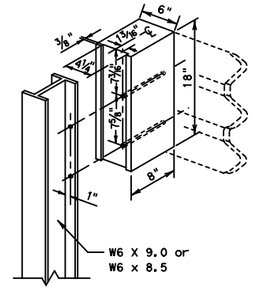




WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST



WOOD BLOCK TO STEEL POST

GENERAL NOTES

1. Concrete curb may be cast-in-place or precast as shown on this sheet. When used in conjunction with thrie-beam guard fence transitions, curb shall be Type II (Typically 5 3/4" height above surface; See CCCG standard sheet) unless otherwise shown in the plans. If other curb heights are shown in the plans in conjunction with the transition, the curb height may be from 4" to 8" with a relatively vertical face. Concrete curb shall be continuous to the seventh post.

   Contact the Design Division for drainage cut options needed within the curb section of the transition.

2. The type of post (round wood, rectangular wood or steel) will be shown elsewhere in the plans.

3. The post length shall be marked on all 7'- 0" long posts by the Manufacturer. The mark shall be located within the top 1 ft. region of the post, at least 5/8" in height, and visible after installation. Wooden posts shall be marked with a brand, and steel posts with a stencil before galvanizing.

4. Rail element shall meet the requirements of Item 540,"Metal Beam Guard Fence" except as modified on the plans. The thrie-beam terminal connector and the thrie-beam transition to w-beam shall be of the same material, but shall not be less than 10 gauge.

   Contractor shall verify that the locations of bolt holes match those in the thrie-beam terminal connector prior to ordering materials.

5. Unless otherwise shown in the plans, transitions shall be placed with the block face in front of or directly above the curb face.

6. Install terminal connector with (12) rectangular guardrail plate washers: (FWR03) and (12) 5/8" X 2" button head splice bolts with recessed nuts.

7. Button head "post bolts & nuts" shall meet the requirements of (ASTM A307), and shall be of sufficient length to extend through the full thickness of the nut and 5/8" washer (FWC16a) and not more than 1" beyond it. Trim remaining bolt length to meet required length.

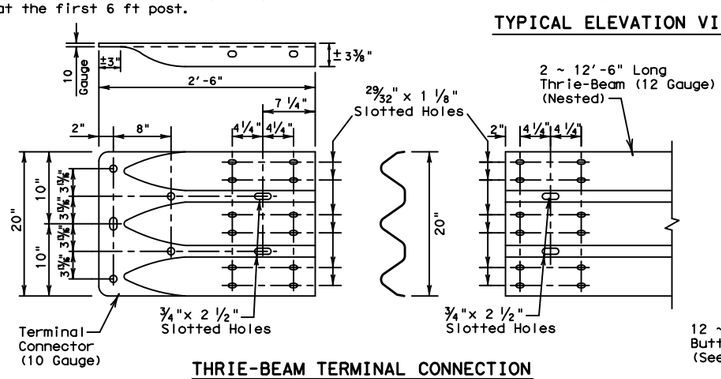
8. Fittings (bolts, nuts, and washers) shall be galvanized in accordance with Item 445,"Galvanizing". Fittings shall be subsidiary to the bid item.

9. Crown shall be widened to accommodate transitions.

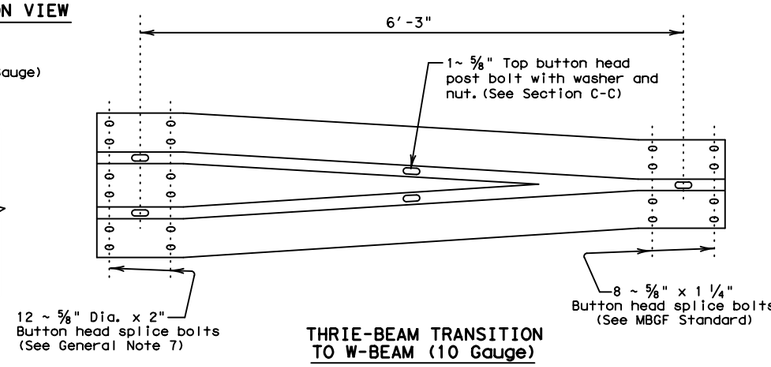
10. If solid rock is encountered. See the MBGF standard sheet for the proper installation guidance.

11. Posts shall not be set in concrete.

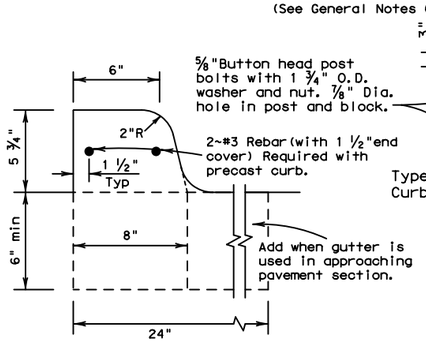
12. Unless otherwise shown in the plans, a composite material post and/or block that meets the requirements of DMS-7210,"Composite Material Posts and Blocks for Metal Beam Guard Fence" may be substituted for posts and/or blocks of similar dimensions. The Construction Division, TxDOT, maintains a Material Producer List (MPL) for producers of materials conforming to DMS-7210. Only producers on the MPL can furnish composite material posts and/or blocks.



THRIE-BEAM TERMINAL CONNECTION
(See General Notes 6 & 7 for required hardware)

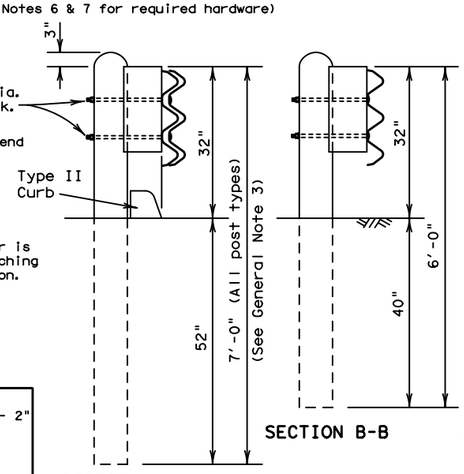


THRIE-BEAM TRANSITION TO W-BEAM (10 Gauge)

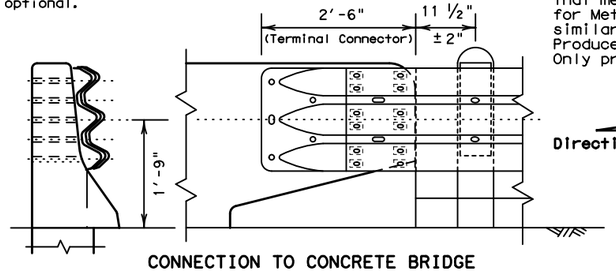


TYPE II CURB
Cast-in-Place or Precast

PRECAST CURB: Type II Precast Curb secured with 4~#5 Gr.60 Galv. Rebar stakes 18" long. The 12'- 2" section of curb may be cast in two sections.
Section ① 5'- 8" long
Section ② 6'- 6" long with the last 3'- 6" of curb tapered to a 4" height.
The Joint Connection is two 9" long 1" dia female ends connected with 1~#5 Gr.60 Galv.Rebar 18" long.



TRANSITION SECTIONS



CONNECTION TO CONCRETE BRIDGE RAIL AND TRAFFIC BARRIERS

NOTES:
(5) 7/8" dia. heavy hex bolts, length will vary depending on width of concrete rail, leave 1" of bolt length past the 5/8" hex nut. Trim as required.
See General Notes: 6 & 7 for additional connection details.

PLATE WASHER INSTRUCTIONS

BRIDGE APPROACH - UPSTREAM: THE NESTED RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.
BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.

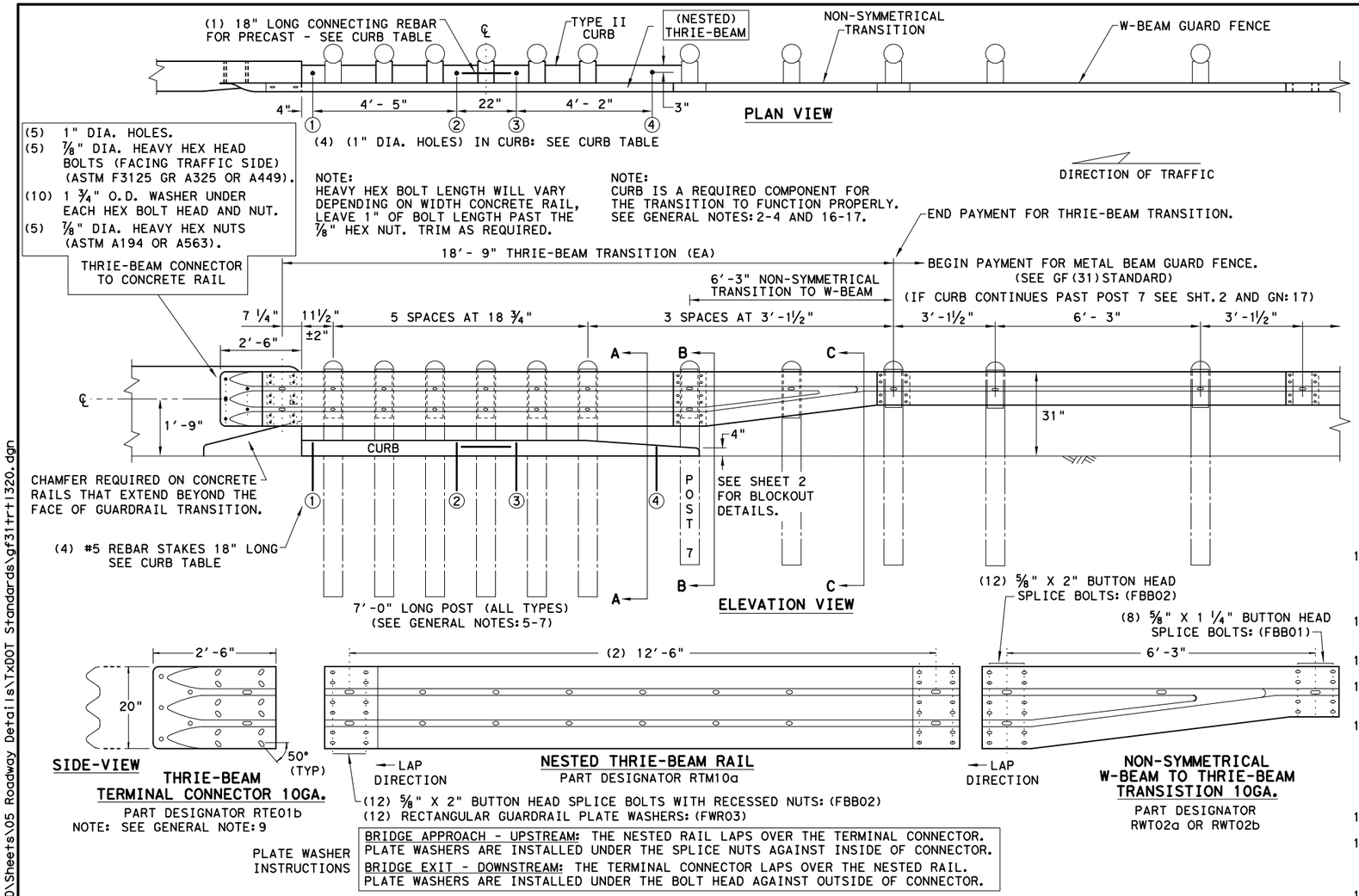
ONLY FOR USE IN MAINTENANCE REPAIRS.

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE TRANSITION (THRIE-BEAM TRANSITION) MBGF(TR)-19

FILE: mbgftr19.dgn	DN: TxDOT	CK: KM	DW: BD	CK: VP
©TxDOT NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		70

DATE: 5/25/2022
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\gf31tr1320.dgn



GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- ¾" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED) (TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED) (STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

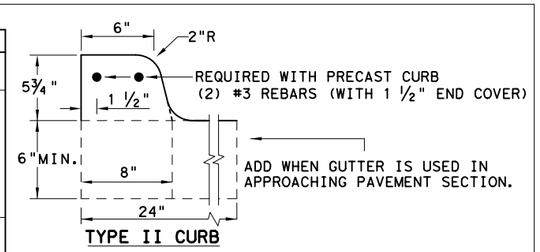
THRIE-BEAM TERMINAL - CURB TABLE

PRECAST CURB FULL LENGTH EQUALS 12'- 2"
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.

CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7

CONNECTING PRECAST CURB SECTIONS (1) & (2):
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END. USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.

SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND ½" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.



TYPE II CURB

NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

* NOTES: NOT NEEDED FOR CAST-IN-PLACE.
SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS.
PERCUSSION DRILLING IS NOT PERMITTED WITH:
TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.

TYPE II CURB DETAILS

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

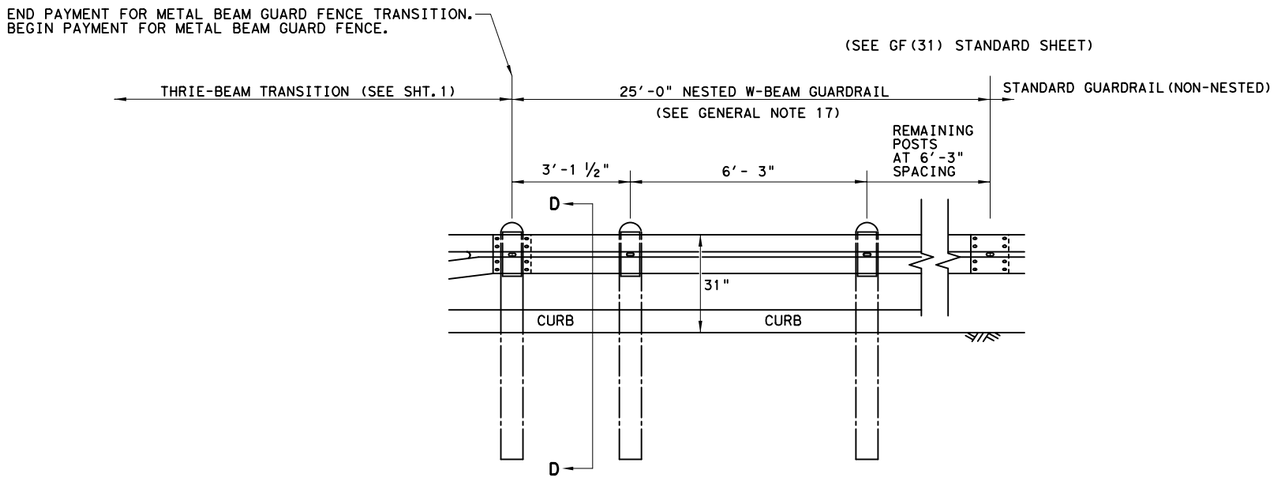
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

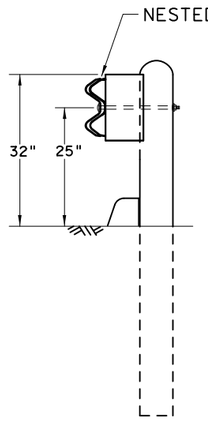
FILE: gf31tr1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0176	02	125, ETC.	BU 59G	
	DIST	COUNTY		SHEET NO.	
	LFK	ANGELINA		70A	

DATE: 5/25/2022
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\gf31trt1320.dgn

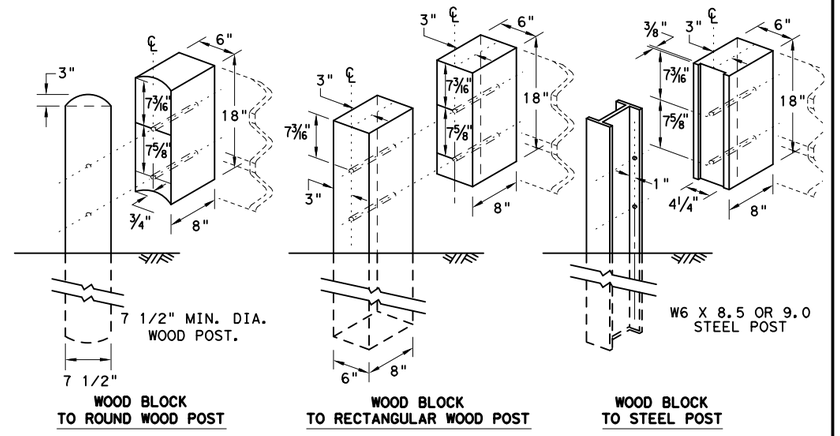
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

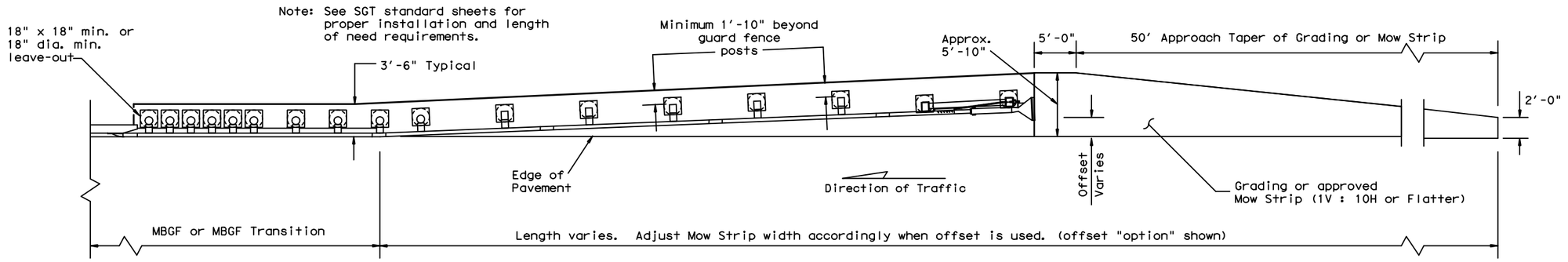
Texas Department of Transportation | Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

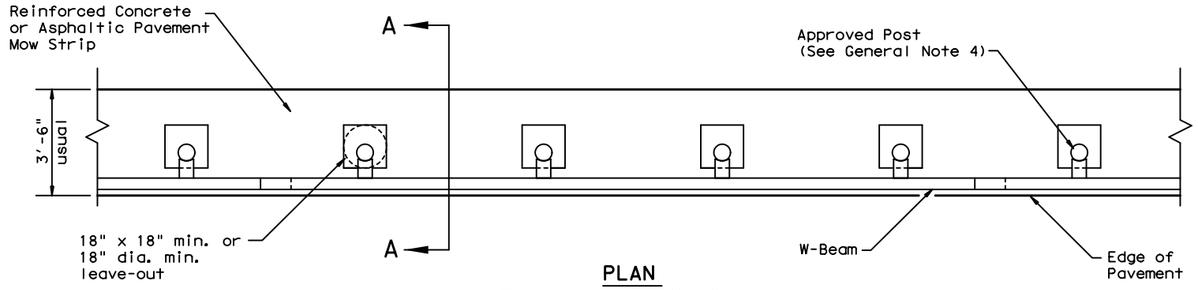
GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0176	02	125, ETC.	BU 59G	
	DIST	COUNTY		SHEET NO.	
	LFK	ANGELINA		70B	

DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\gf31ms19 (1).dgn

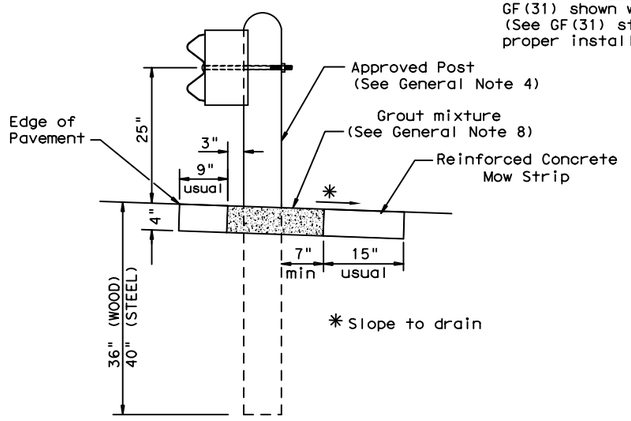


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



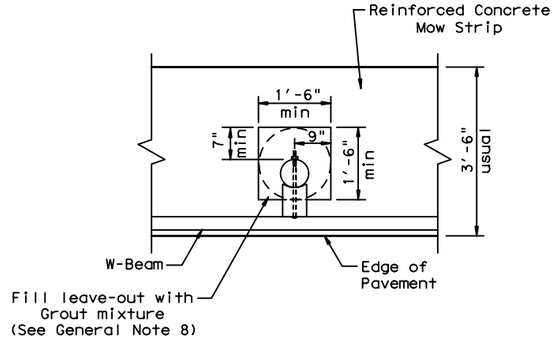
PLAN

GF(31) shown with Mow Strip
(See GF(31) standard sheet for proper installation)



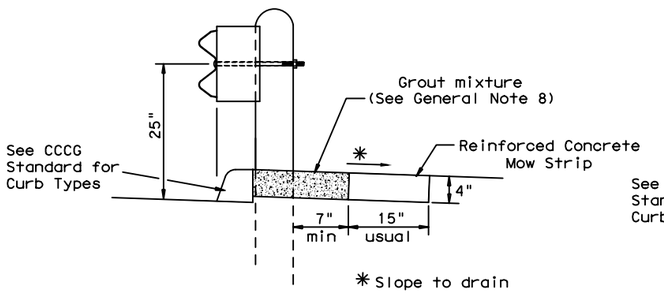
SECTION A-A

Typical



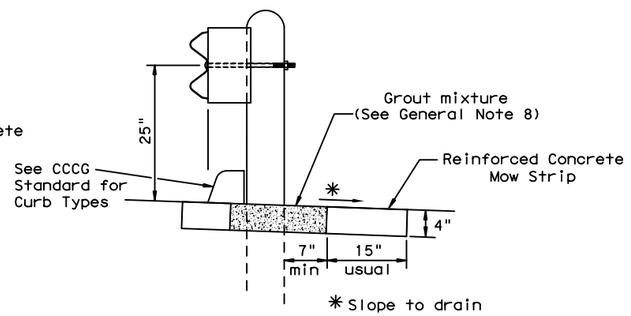
MOW STRIP DETAIL

Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.



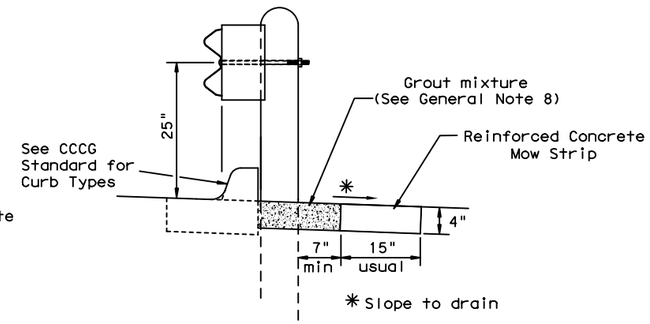
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type 1 or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

Texas Department of Transportation

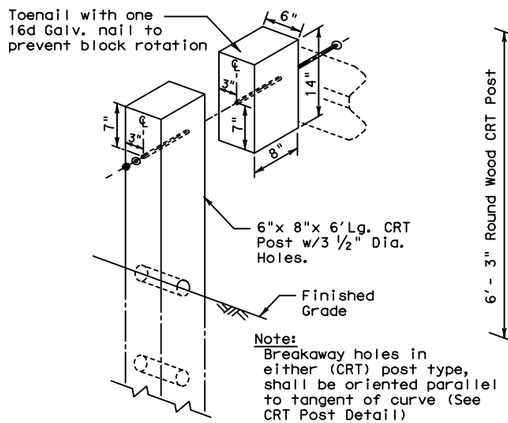
Design Division Standard

METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

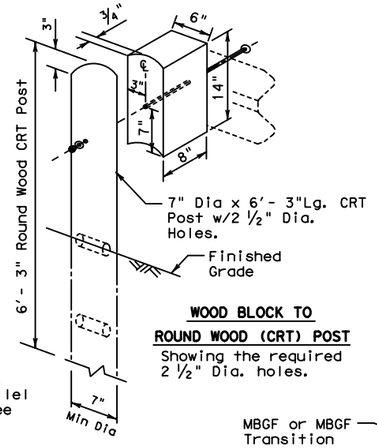
GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		71

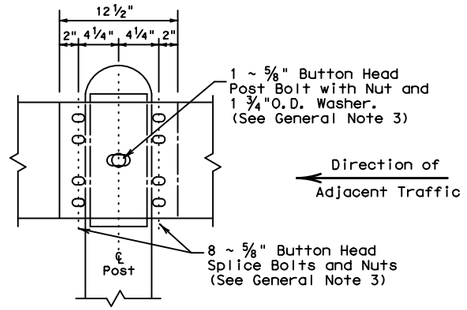
DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\mbgfsr19.dgn



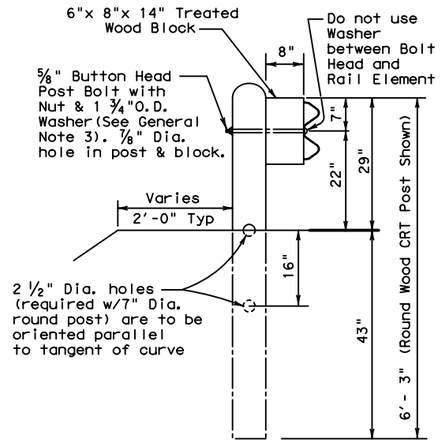
WOOD BLOCK TO RECTANGULAR WOOD (CRT) POST
Showing the required 3 ½" Dia. holes.



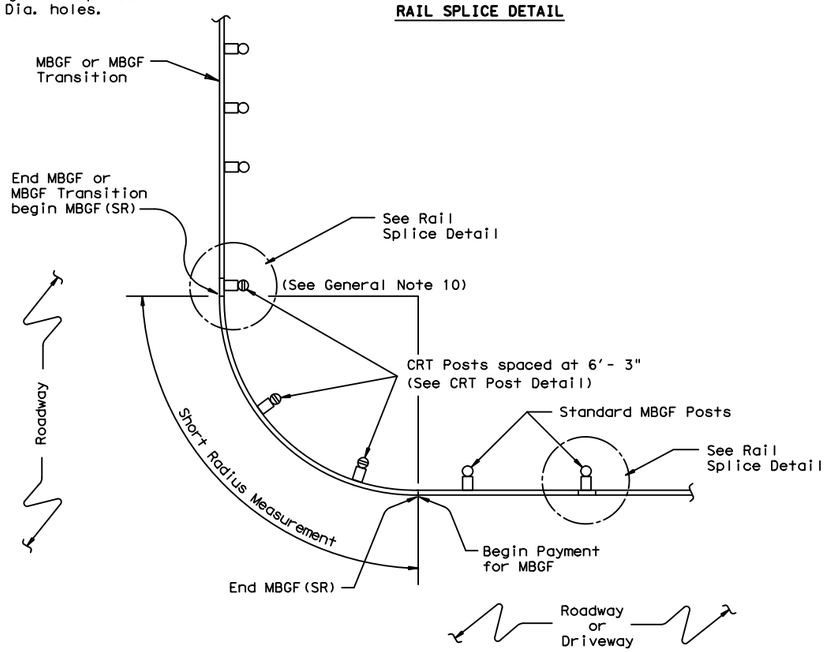
WOOD BLOCK TO ROUND WOOD (CRT) POST
Showing the required 2 ½" Dia. holes.



RAIL SPLICE DETAIL



(CRT) POST DETAIL
CONTROLLED RELEASE TERMINAL POST
Two or more wood CRT post(s) are required at any radius installation located at intersecting roadways or driveways.



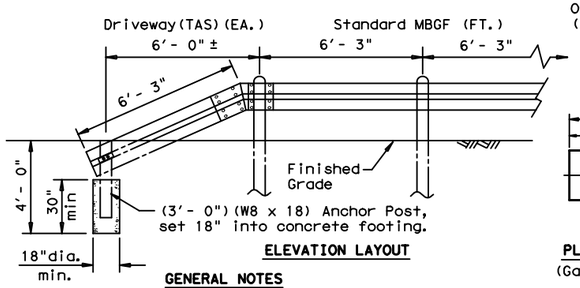
PLAN VIEW
SHOWING TYPICAL RADIUS
The required radius is shown elsewhere on the plans.

GENERAL NOTES

1. The type of (CRT) post (round wood post, or rectangular wood post) will be shown elsewhere in the plans. The exact position of MBGF shall be shown elsewhere in the plans or as directed by the Engineer.
2. Steel posts are not permitted at CRT post positions.
3. Rail element shall meet the requirements of Item 540,"Metal Beam Guard Fence" except as modified on the plans. The Contractor may furnish rail elements of 12 ½ or 25 foot nominal lengths.
4. Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and Type A (1 ¾" O.D.)washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) are ⅝" x 1 ¼" (or 2" long at triple rail splices) with a ⅝" double recessed nut (ASTM A563).
5. Fittings (bolts, nuts, and washers) shall be galvanized in accordance with Item 445, "Galvanizing." Fittings shall be subsidiary to the bid item.
6. Crown shall be widened to accommodate the Metal Beam Guard Fence.
7. The lateral approach to the guard fence, shall have a slope rate of not more than 1V:10H.
8. Unless otherwise shown in the plans, guard fence placed in the vicinity of curbs shall be positioned so that the face of curb is located directly below or behind the face of the block. Rail placed over curbs shall be installed so that the post bolt is located approximately 21 inches above the gutter pan or roadway surface.
9. If solid rock is encountered within 0 to 18" of the finished grade, drill a 22" dia. hole, 24" into the rock, or drill two 12" dia. front to back overlapping holes, 24" into the rock. If solid rock is encountered below 18",drill a 12" dia. hole, 12" into the rock or to the standard embedment depth, whichever is less. Any excess post length, after meeting these depths, may be field cut to ensure proper guardrail mounting height. Backfill with a cohesionless material.
10. Guardrail posts shall not be set in concrete, of any depth.
11. Special rail fabrication will be required at installations having a curvature of less than 150 ft. radius. The required radius shall be shown on the plans.
12. The terminal anchor section (TAS) post shall be set in Class A concrete (unless otherwise shown in the plans) in accordance with Item 421,"Hydraulic Cement Concrete." Concrete shall be subsidiary to the bid item requiring construction of the terminal anchor section (TAS). Terminal anchor post to be galvanized in accordance with Item 445, "Galvanizing."
13. Unless otherwise shown in the plans, a composite material post and/or block that meets the requirements of DMS-7210,"Composite Material Posts and Blocks for Metal Beam Guard Fence" may be substituted for posts and/or blocks of similar dimensions. The Construction Division, TxDOT maintains a Material Producer List (MPL) for producers of materials conforming to DMS-7210. Only producers on the MPL can furnish composite material posts and/or blocks.

"DRIVEWAY" TERMINAL ANCHOR SECTION

Only for use within driveway locations, where a standard (TAS) Terminal Anchor Section can not be installed.



ELEVATION LAYOUT

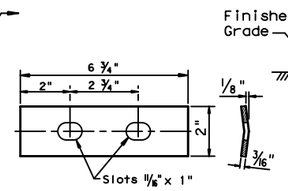
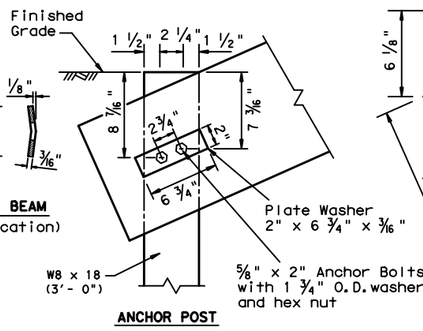
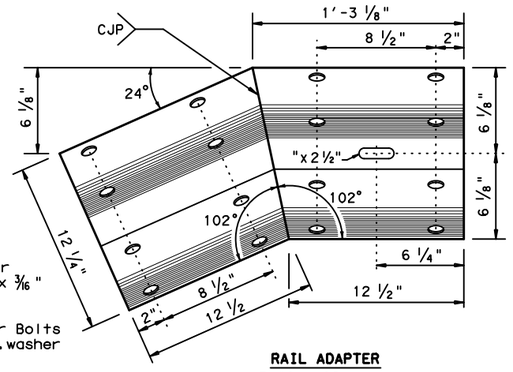


PLATE WASHER FOR METAL BEAM
(Galvanized after fabrication)



ANCHOR POST



RAIL ADAPTER
Rail - 10 gauge
(Galvanized after fabrication)

GENERAL NOTES

1. The "Driveway" Terminal Anchor Section is ONLY to be used within driveway locations, where the ROW is limited and a standard 25 ft.(TAS)Terminal Anchor Section,is too long.
2. Terminal anchor post shall be set in Class A concrete.
3. All steel shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."

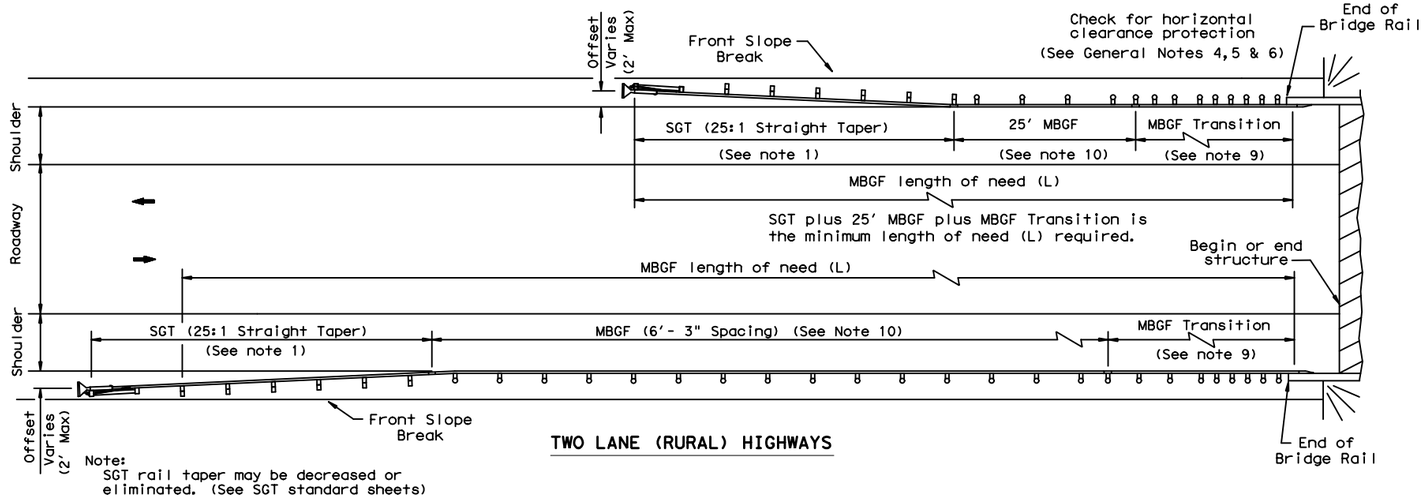
ONLY FOR USE IN MAINTENANCE REPAIRS OR HIGHLY CONSTRAINED SITE CONDITIONS.

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE
(SHORT RADIUS)
MBGF(SR)-19

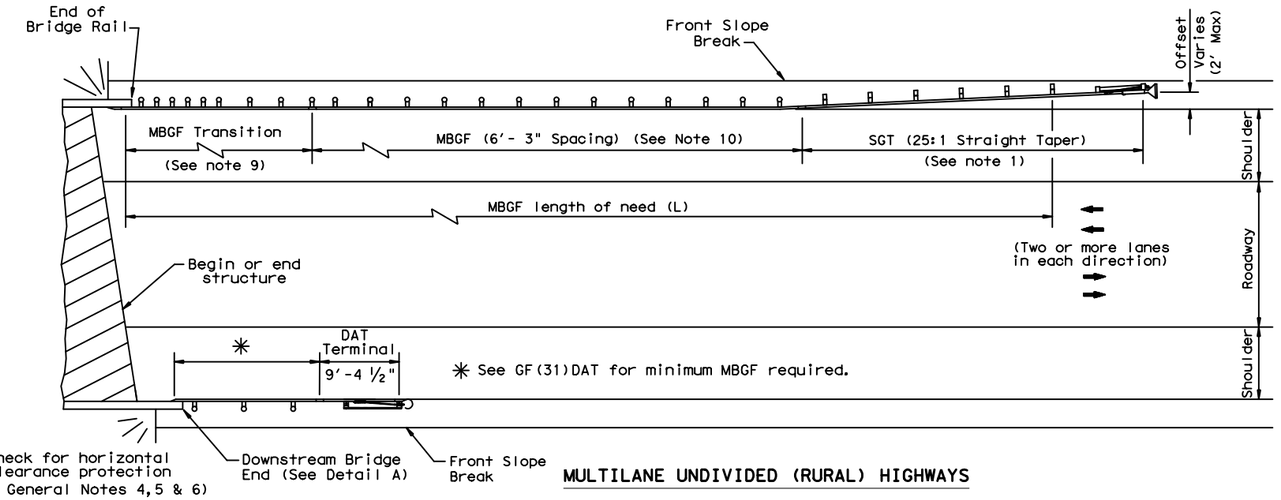
FILE: mbgfsr19.dgn	DN: TxDOT	CK: KM	DW: BD	CK: VP
©TxDOT NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		72

DATE: 5/9/2022 9:42:52 AM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\05 Roadway Details\TxDOT Standards\bed14.dgn

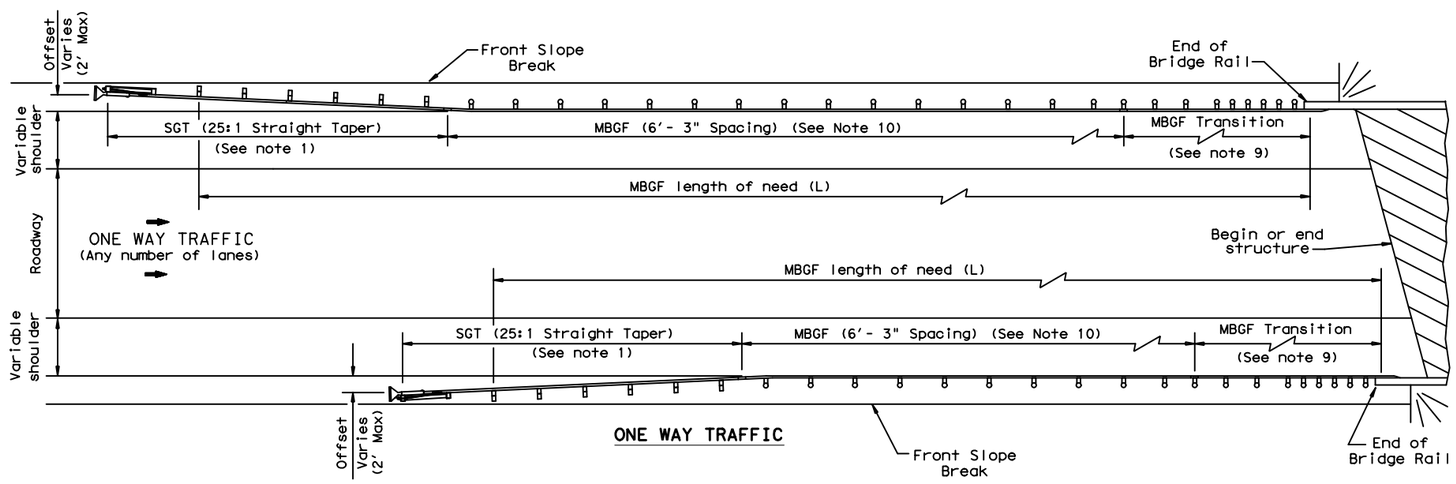


TWO LANE (RURAL) HIGHWAYS

Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)



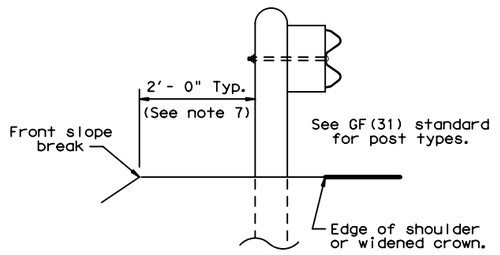
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



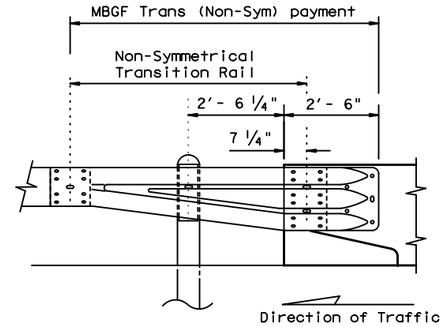
ONE WAY TRAFFIC

GENERAL NOTES

1. For more detail: See GF(31), SGT( )31, GF(31)TR, and GF(31)TL2 standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
3. Use average daily traffic (ADT) for the current year to determine MBGF length of need in accordance with the Roadway Design Manual unless otherwise specified. Where significant traffic volume growth is anticipated on low volume (0-750 ADT) highways, use length determinations for the higher volume category.
4. MBGF may not be required to shield departure end of bridge unless other obstacles within the horizontal clearance limits or opposing traffic indicate a MBGF consideration.
5. Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. Direct connection of MBGF to concrete rails are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (This requires a minimum of three standard line posts plus the DAT terminal, See Detail A)
7. The crown shall be widened to accommodate MBGF. Typically the "front slope" break should be 2'- 0" from the back of the MBGF post. This applies to new construction on new alignment or where existing roadway cross section is to be widened to increase roadway width. This does not apply to rehabilitation work where existing roadway crown width is to be retained (See Typical Cross Section at MBGF).
8. For restrictive bridge widths: The MBGF should be properly transitioned from the existing bridge rail to the adjoining MBGF (See MBGF Transition Standards). Metal beam guard fence at these bridge location(s) shall be flared at the rate of 25:1 or flatter, and be of the length necessary to locate the terminal end at the 2 ft. "maximum" offset from the shoulder edge in the approach direction.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.
10. A minimum 25' length of MBGF will be required.



TYPICAL CROSS SECTION AT MBGF



Note:
All rail elements shall be lapped in the direction of adjacent traffic.

DETAIL A

Showing Downstream Rail Attachment

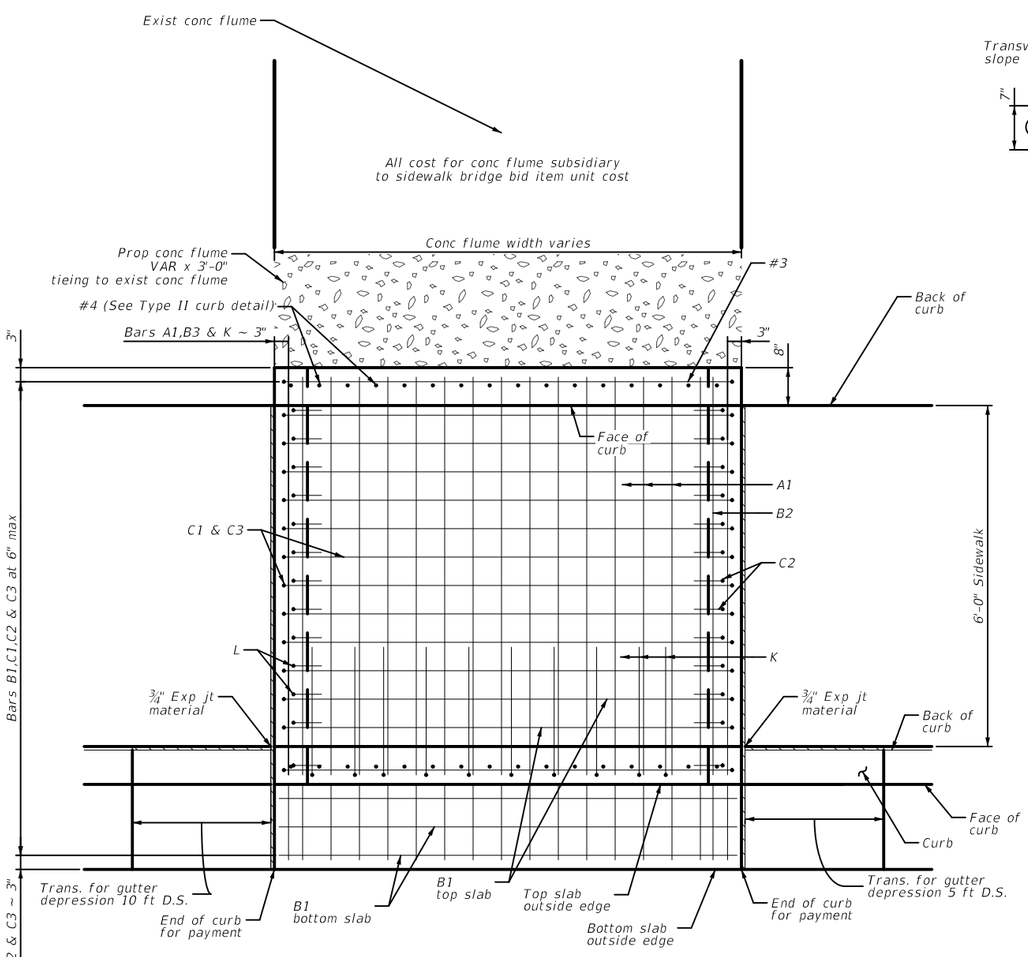
Texas Department of Transportation — Design Division Standard

BRIDGE END DETAILS

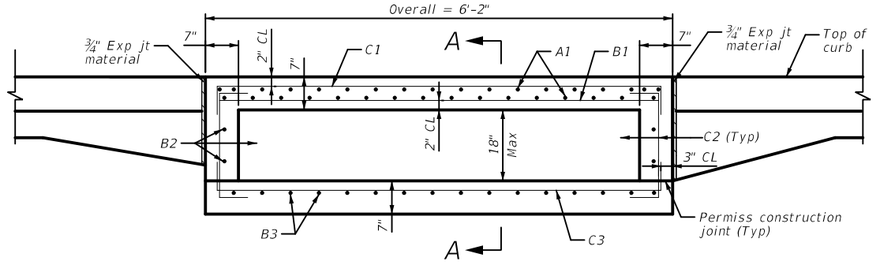
(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

BED-14

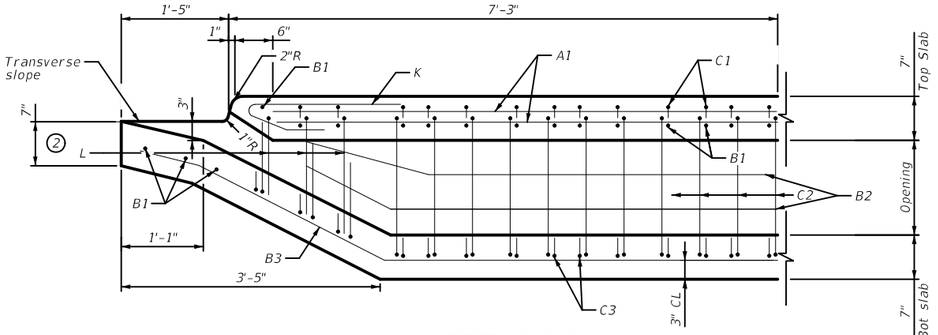
FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
© TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED APRIL 2014 SEE (MEMO 0414)	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		73



INSTALLATION PLAN

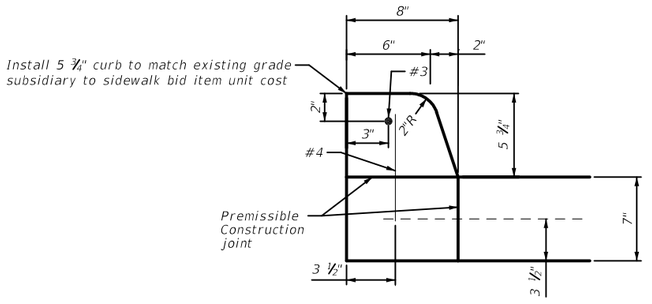


ELEVATION



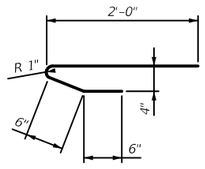
SECTION A-A

(Curb not shown for clarity)

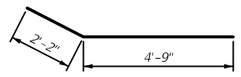


TYPE II CURB (MONOLITHIC) - 5 3/4"

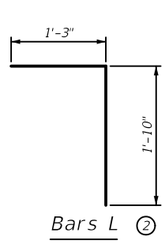
(See curb standard for Curb details not shown)



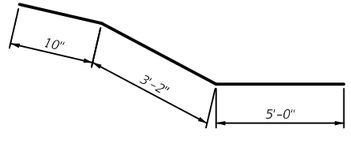
Bars K



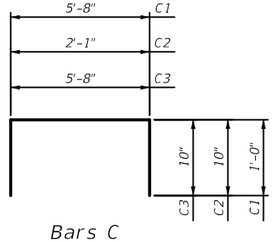
Bars B2 (1)



Bars L (2)



Bars B3



Bars C

TABLE OF ESTIMATED QUANTITIES

BARS	NO.	SIZE	LENGTH	WEIGHT
A1	24	#4	6'-5"	103
B1 (1)	16	#6	5'-8"	137
B2 (1)	4	#5	6'-11"	29
B3	12	#5	9'-0"	113
C1	15	#5	7'-8"	120
C2	24	#5	3'-9"	94
C3	12	#5	7'-4"	92
K	15	#4	3'-1"	31
L (2)	6	#5	3'-4"	21
Item			Unit	Quantity
Total Reinforcing Steel			LB	738
Class S Conc			CY	2.2

(1) Field bend to match slope as needed.

(2) Field cut as needed.

(3) Bottom slab of the sidewalk underdrain shall be level.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 8th Edition (2017).

Payment for sidewalk construction is in accordance with Item 420, "Concrete Substructures". Excavation and backfill is subsidiary to the bid item.

See "Concrete Curb and Curb and Gutter" sheet for curb information.

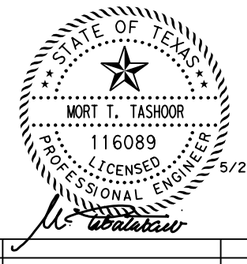
Cover dimensions are clear dimensions unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

MATERIAL NOTES:

Provide grade 60 reinforcing steel.

Provide class "S" concrete (f'c = 4000 psi).



Rev. No.	C.O. No.	Description	Date	By

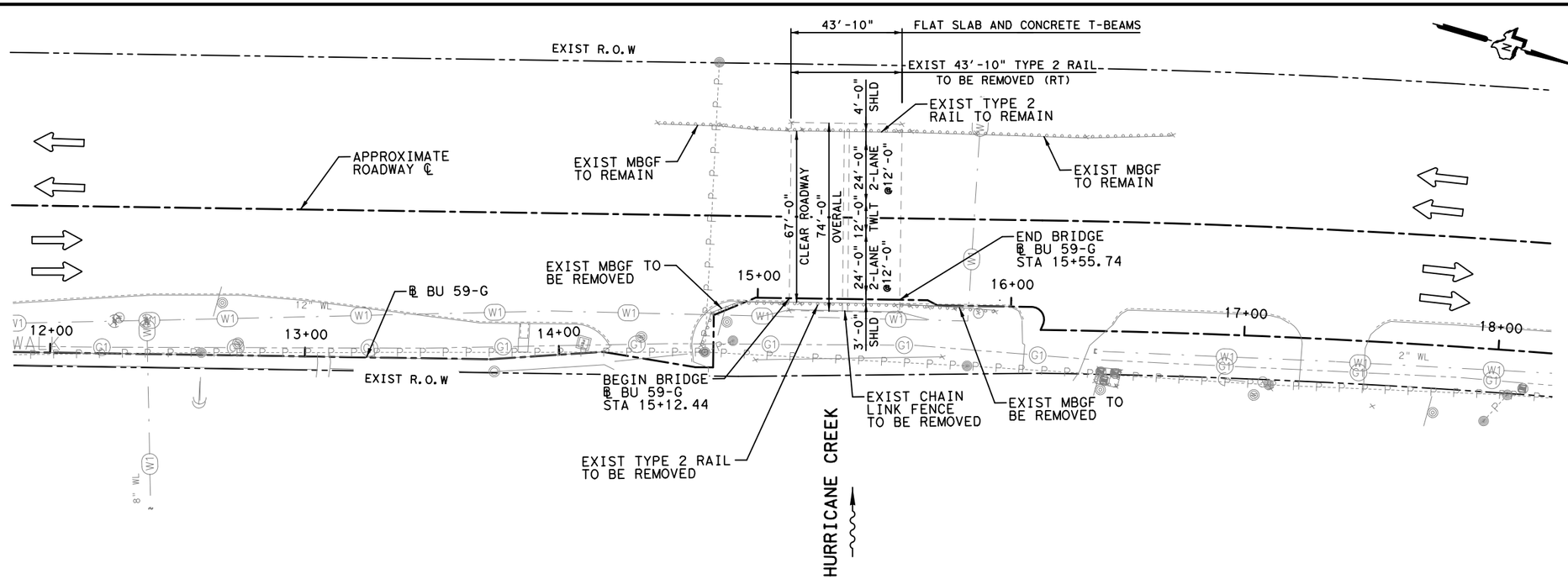
Texas Department of Transportation

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

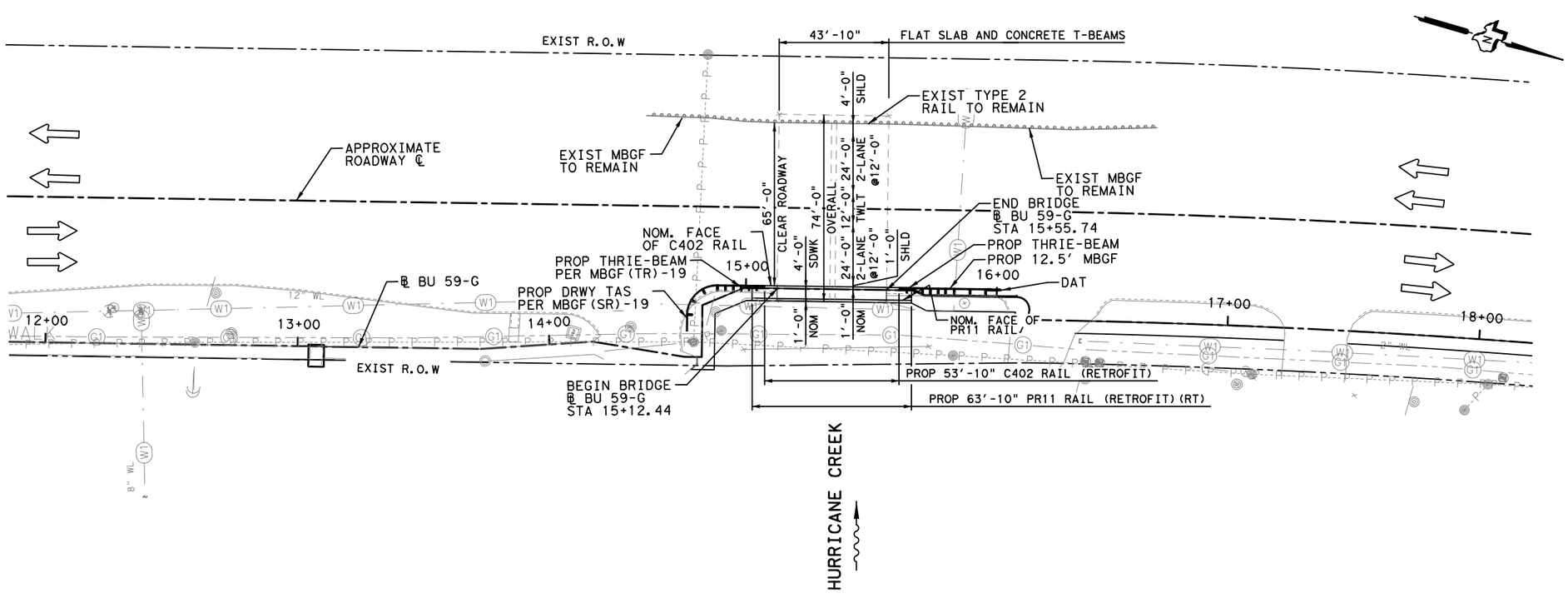
SIDEWALK BRIDGE

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	74
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\09 Bridges\Sidewalk*Bridge.dgn
DRAWING DATE: 5/25/2022



EXISTING PLAN
HURRICANE CREEK BRIDGE



PROPOSED PLAN
HURRICANE CREEK BRIDGE

HORZ 0' 25' 50'
SCALE IN FEET

HS 20 LOADING
NBI #: 11-003-0-0176-03-011

STATE OF TEXAS
SHAYAN SHARIFINEJAD
132306
LICENSED PROFESSIONAL ENGINEER
5/25/2022

J. Sharifi

Texas Department of Transportation
© 2022

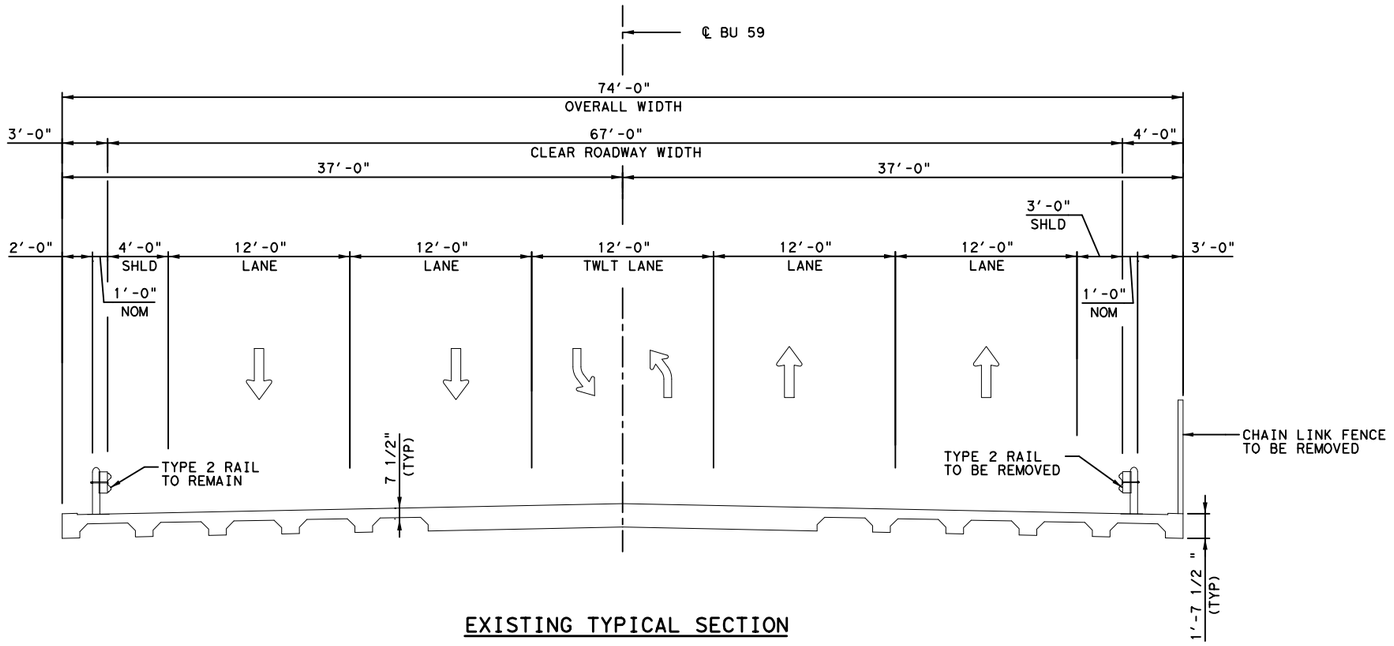
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

RAIL RETROFIT

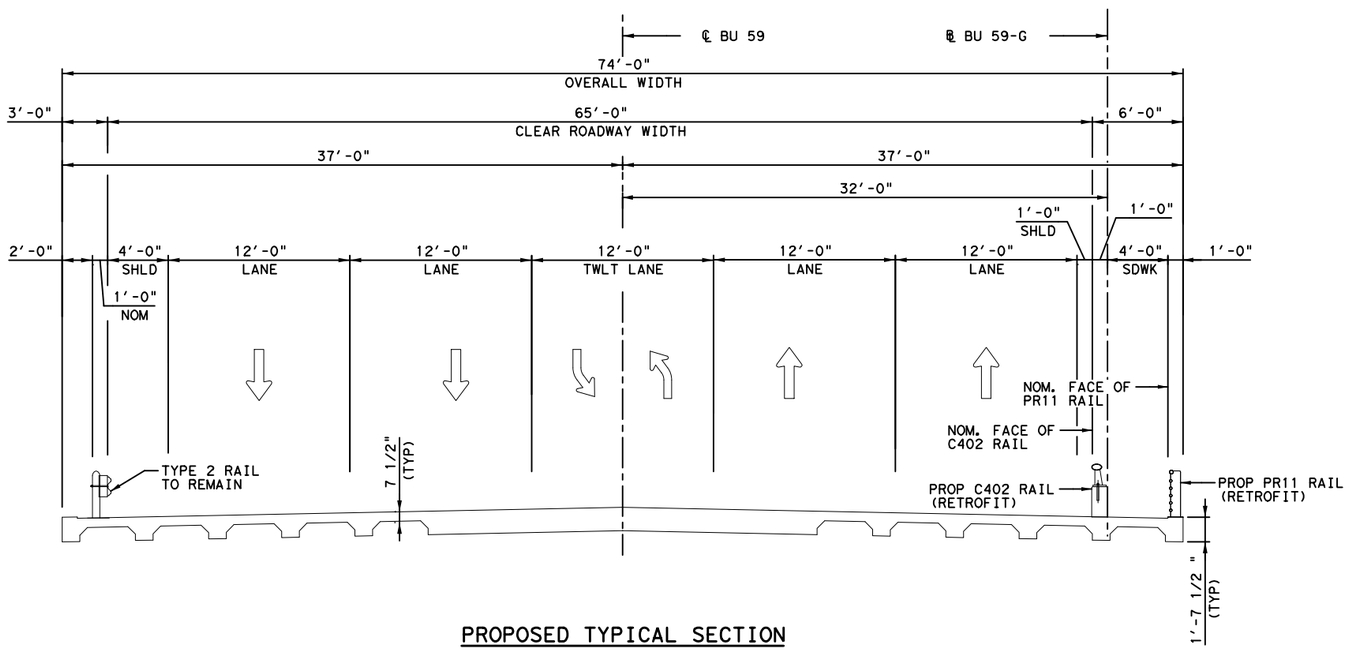
HURRICANE CREEK BRIDGE

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	75
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\09 Bridges\BU59*BRG*BL.dgn
DRAWING DATE: 5/25/2022



EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION

0′ 5′ 10′

SCALE IN FEET

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS PRIOR TO CONSTRUCTION.

NOTIFY THE ENGINEER IF THERE ARE ANY DISCREPANCIES.

HS 20 LOADING
NBI #: 11-003-0-0176-03-011

STATE OF TEXAS
SHAYAN SHARIFINEJAD
132306
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

S. Sharifi

Texas Department of Transportation

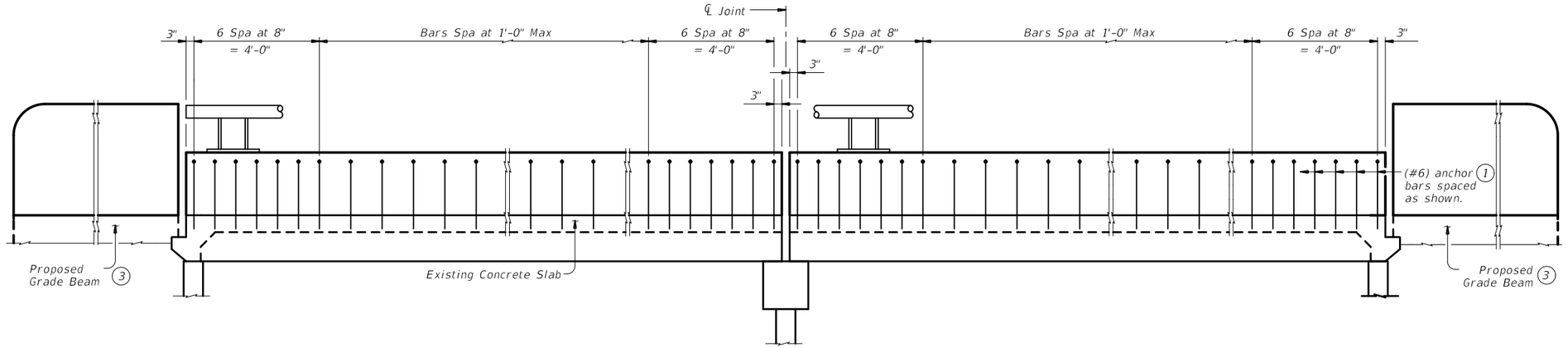
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

TYPICAL SECTION

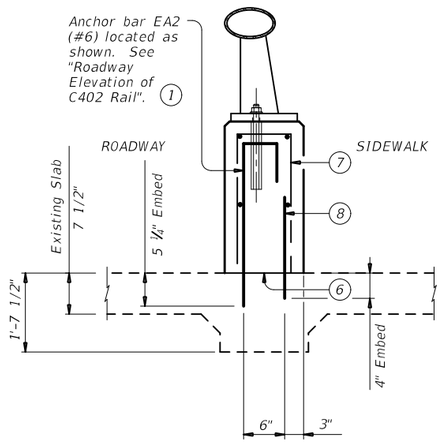
HURRICANE CREEK BRIDGE

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	76
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\09 Bridges\BU59*BRG*BL.dgn
DRAWING DATE: 5/25/2022

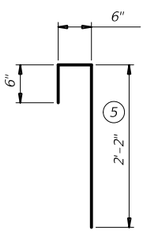


ROADWAY ELEVATION OF C402 RAIL RETROFIT (2)



C402 RAIL

RAIL RETROFIT SECTION ON CONCRETE SLABS USING ADHESIVE ANCHORS (5)



ANCHOR BAR EA2 (#6)

(1) Embed (#6) anchor bars with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 5 ¼". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 20 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

(2) Showing spacing of (#6) adhesive anchor in a rail retrofit condition. Secondary (#4) adhesive anchor in a rail retrofit not shown for clarity. Reinforcing steel and terminal connections not shown for clarity. See rail standard for details and notes not shown.

(3) See "Traffic Rail Foundation (TRF)(MOD)" Standard for details and notes not shown.

(4) Showing location or locations of anchor bars in a rail retrofit condition. See appropriate rail standard for details and notes not shown.

(5) Increase by amount of existing overlay/seal coat thickness, not to exceed 2". If thickness of existing overlay/seal coat is greater than 2" at toe of rail, taper overlay at a 1:10 or flatter slope over shoulder width to a thickness of 2" or less at toe of rail.

(6) Do not cast rails or parapet walls on top of overlays/seal coats.

(7) See appropriate rail standard for reinforcing steel. Modify length of vertical reinforcing bars as required to fit existing structure. Longitudinal reinforcing bars may be removed only if their position puts them in conflict with un-removed portions of existing structure.

(8) Embed secondary (#4) anchor bars 1'-4" in length with a Type III Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 4". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 10 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing". (#4) anchor bars spaced longitudinally along rail at 4 ft Max (Spaced 3" longitudinally from outside edge and edge of side slot drains).

CONSTRUCTION NOTES:

Field verify dimensions before commencing work and ordering materials.

By adding additional anchorage, welding can be performed at a minimum spacing of 3 ft between the cage and additional anchorage. By satisfying additional anchorage requirements slip forming is allowed. Do not weld to the required anchorage.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

(#6) and (#4) anchor bars used for the adhesive anchorage system must not be epoxy coated within the required embedment.

GENERAL NOTES:

Use of these retrofit details will result in a railing acceptable for the MASH Test Level indicated on the applicable rail standard.

Removal and replacement of backfill, subgrade, and asphalt or concrete pavement necessary for this installation is considered subsidiary to the retrofit railing.

Payment for a rail retrofit will be as per Item 451, "Retrofit Railing", by the type of the rail retrofit. All details shown herein are subsidiary to rail retrofit.

Reinforcing bar dimensions shown are out-to-out of bar.

STATE OF TEXAS
SHAYAN SHARIFINEJAD
132306
LICENSED
PROFESSIONAL ENGINEER
5/9/2022

SHEET 1 OF 1

Texas Department of Transportation

Bridge Division Standard

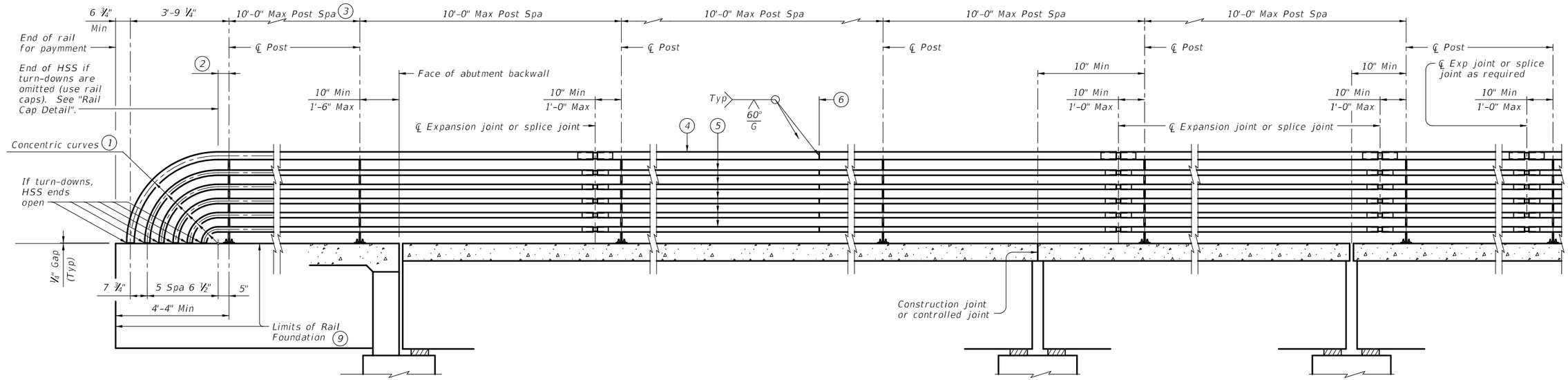
RETROFIT GUIDE FOR CONCRETE RAILS C402

SCALE: NTS

C-RAIL-R (MOD)

FILE: rlstd022-20.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
07-20: Text change from epoxy to adhesive and changed MASH Test Level note.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		77

DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\09 Bridges\BU59*BRG*RAIL.dgn



ROADWAY ELEVATION OF RAIL

SECTION A-A

Showing base plate detail.

WASHER PLATE DETAIL

SECTIONS THRU RAIL ON RAIL FOUNDATION (9)

(1) Portion of railing with turn-downs to be used or omitted as indicated on Bridge Layout.

(2) 10" Min ~ 1'-6" Max if turn-downs are omitted.

(3) Min of 2 posts required on wingwall.

(4) HSS 3.500 x 0.216 (Rail Member)

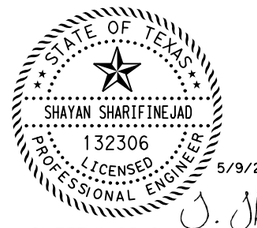
(5) HSS 2.375 x 0.154 (Rail Member)

(6) One shop splice per panel is permitted (with minimum 85 percent penetration). The weld may be square groove or single vee groove. Grind smooth.

(7) At Contractor's option, adhesive anchors may be used. Adhesive anchors must be ⅞" Dia ASTM A307 Grade A fully threaded rods. Minimum adhesive anchor embedment depth is 5" into slabs or culverts without curbs. See "Material Notes" for adhesive anchor requirements.

(8) At Contractor's option, adhesive anchors may be used. Adhesive anchors must be ⅞" Dia ASTM A307 Grade A fully threaded rods. Minimum adhesive anchor embedment depth is 7" into wingwalls or culverts with curbs. See "Material Notes" for adhesive anchor requirements.

(9) Rail foundation reinforcing steel not shown for clarity. See "Miscellaneous Details" sheet for details and notes not shown.



SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

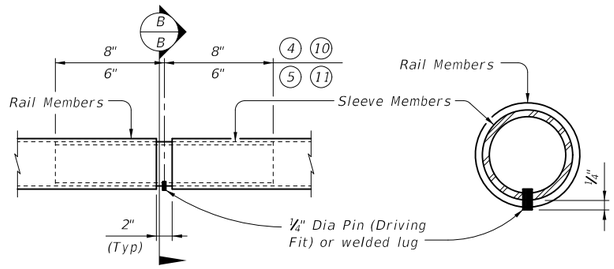
PEDESTRIAN RAIL

SCALE: NTS

TYPE PR11 (MOD)

FILE: rlstd028-19.dgn	DN: TAR	CK: TBE	DN: JTR	CK: TAR
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		78

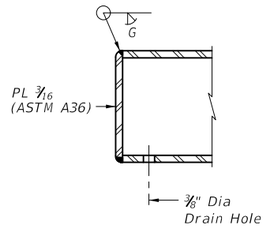
DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\09 Bridges\BU59*BRG*RAIL.dgn



AT SPLICES OR EXP JTS

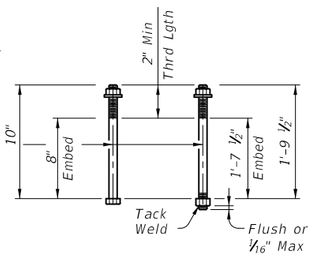
SECTION B-B

PIPE SPLICE DETAIL



RAIL CAP DETAIL

℄ ⅞" Dia hex head anchor bolt or threaded rod (ASTM A307 Gr A) with one hardened steel washer (ASTM F436) placed under each hex nut (ASTM A563). One additional hex nut must be furnished and tack welded for each threaded rod.



CAST-IN-PLACE & FORMED HOLE ANCHOR BOLT OPTIONS

4 HSS 3.500 x 0.216 (Rail Member)

5 HSS 2.375 x 0.154 (Rail Member)

10 HSS 2.875 x 0.203 (Sleeve Member)

11 HSS 1.900 x 0.145 (Sleeve Member)

CONSTRUCTION NOTES:

Panel lengths of railing must be attached to a minimum of three posts except at abutment wingwalls.

At the Contractor's option anchor bolts may be an adhesive anchorage system. See "Material Notes".

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

Face of rail and posts must be vertical transversely unless otherwise approved. Posts must be perpendicular to adjacent roadway grade. Use Type VIII epoxy mortar under post base plates if gaps larger than 1/16" exist.

For curved railing applications, fabricate the HSS rail to the radius when the radius is 600' or less. Submit shop drawings for approval when tubes are required to be fabricated to a radius. Shop drawings must be submitted to the Engineer for approval.

Round or chamfer all exposed edges of steel components 1/16" by grinding prior to galvanizing.

MATERIAL NOTES:

Provide ASTM A500 Gr B, A1085 or A53 Gr B for all HSS.

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over galvanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel". Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.

Anchor bolts must be ⅝" Dia ASTM A307 Gr A with one hardened steel washer (ASTM F436) placed under each hex nut or ASTM A307 Gr A threaded rods with one tack welded hex nut each and with one hex nut with one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements.

Optional adhesive anchorage system must be ⅝" Dia ASTM A307 Gr A fully threaded rods with one hex nut and one hardened steel washer (ASTM F436). Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into slab, wingwalls, or culvert curbs using a Type III, Class C, D, E, or F anchor adhesive. Anchor adhesive chosen must be able to achieve a nominal bond strength in tension, Na, of a single anchor of 10 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

For all rails, submit erection drawings showing section lengths, splice locations, rail post spacing and anchor bolt setting for approval.

Average weight of railing is 30 plf.

STATE OF TEXAS
SHAYAN SHARIFINEJAD
132306
LICENSED
PROFESSIONAL ENGINEER
5/9/2022

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

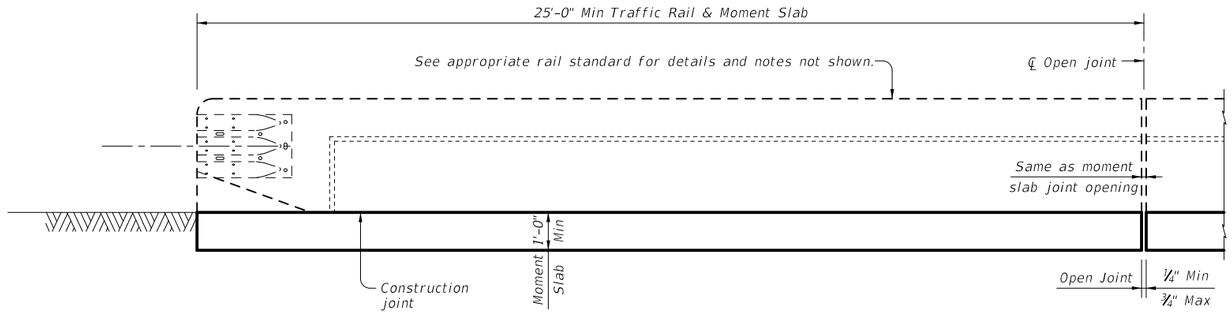
PEDESTRIAN RAIL

SCALE: NTS

TYPE PR11 (MOD)

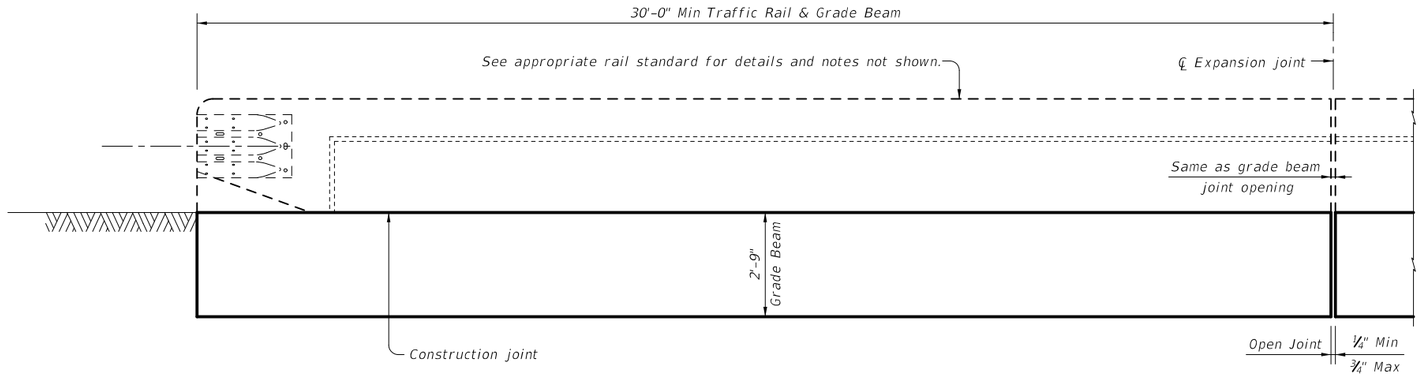
FILE: rlstd028-19.dgn	DN: TAR	CK: TBE	DW: JTR	CK: TAR
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		79

DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\09 Bridges\BU59*BRG*RAIL.dgn



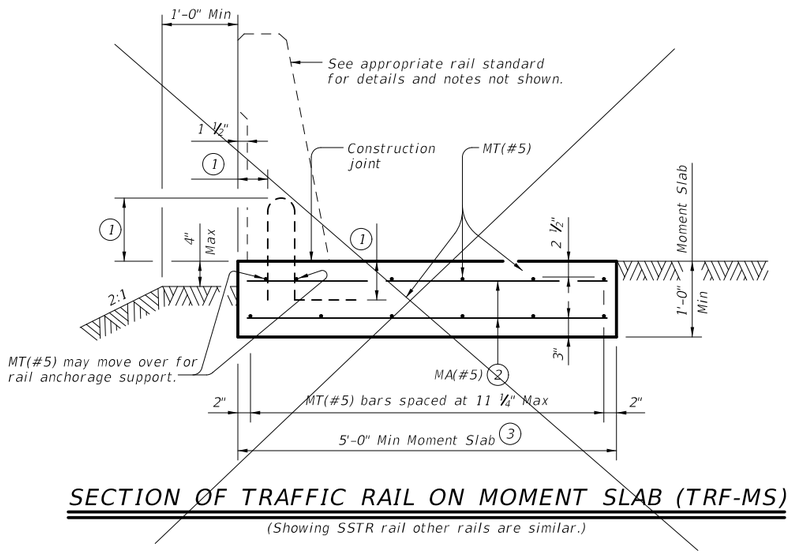
ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



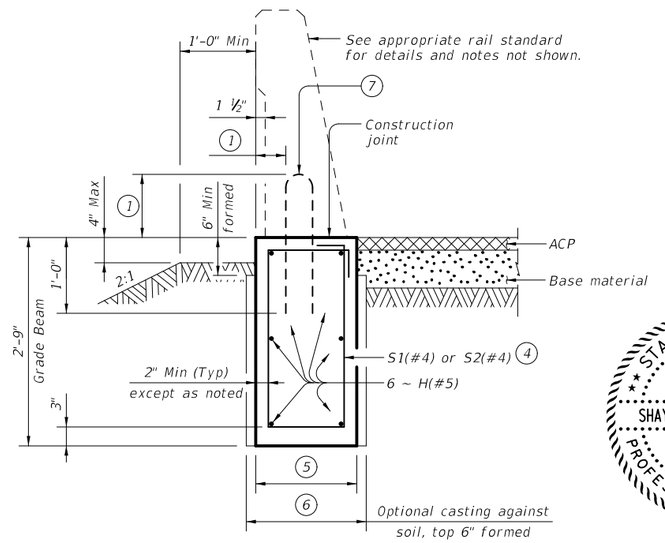
ROADWAY ELEVATION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



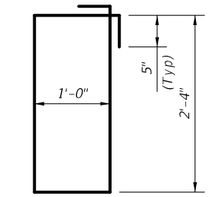
SECTION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar.)

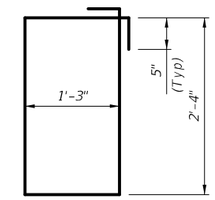


SECTION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar.)



BARS S1(#4)



BARS S2(#4)

1. See applicable bridge rail standard.
2. MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 ½" longitudinally from outside edge of moment slab).
3. Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.
4. S1(#4) or S2(#4) spaced longitudinally along grade beam at 8" Max. (Spaced 2 ½" longitudinally from outside edge of grade beam).
5. Use bar S1(#4) with 1'-4" grade beam width and bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS. Approximate grade beam concrete = 0.14 CY/LF and reinforcement = 13.8 LB/LF.

   Use bar S2(#4) with 1'-7" grade beam width and bridge rail types: T66 and C66. Approximate grade beam concrete = 0.16 CY/LF and reinforcement = 14.2 LB/LF.
6. 1'-6" for bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.

   1'-9" bridge rail types: T66 and C66.
7. Modify reinforcing on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically into traffic rail

CONSTRUCTION NOTES:

Align moment slab (TRF-MS) or grade beam (TRF-GB) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) or grade beam (TRF-GB) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for bars S1(#4), S2(#4) and H(#5) unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-4"
Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:

Use of these details will result in a moment slab (TRF-MS) or grade beam (TRF-GB) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.

See elsewhere in the plans for selected options between moment slab (TRF-MS) and/or grade beam (TRF-GB).

The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.

See appropriate rail standard for details and notes not shown.

This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.

Payment for moment slab (TRF-MS) and/or grade beam (TRF-GB) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.

The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.

Excavation will be subsidiary to other Items.

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

STATE OF TEXAS
SHAYAN SHARIFINEJAD
132306
LICENSED
PROFESSIONAL ENGINEER
5/9/2022

Texas Department of Transportation

Bridge Division Standard

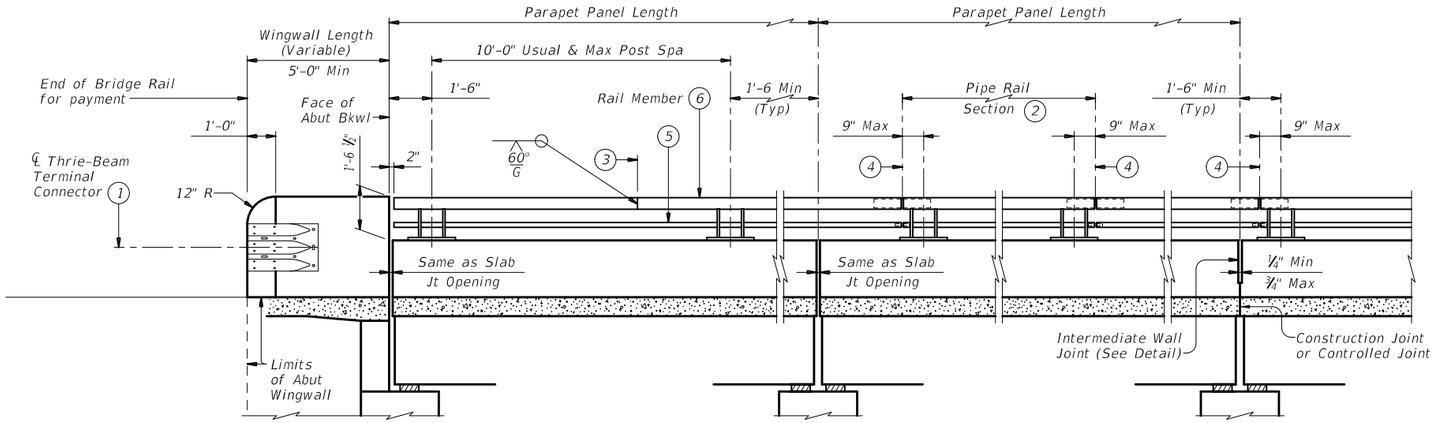
TRAFFIC RAIL FOUNDATIONS
FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS

TRF (MOD)

FILE: rlstd027-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS 07-20: Added moment slab with rail foundation lengths.	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		80

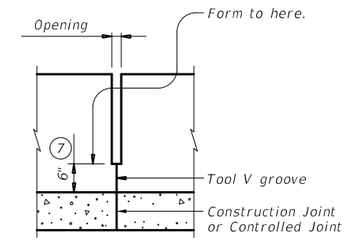
DATE: 5/9/2022 9:43:06 AM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\09 Bridges\TxDOT Standards\TRF.dgn

DATE: 5/9/2022 9:43:08 AM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\09 Bridges\TxDOT Standards\rlstd020-19.dgn



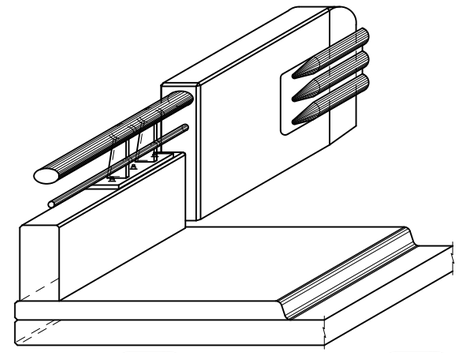
ROADWAY ELEVATION OF RAIL

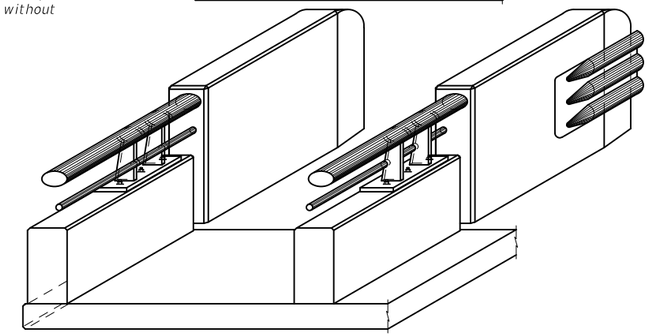
(Rail Member showing Elliptical Tube Option, Rectangular Tube Option similar).



INTERMEDIATE WALL JOINT DETAIL

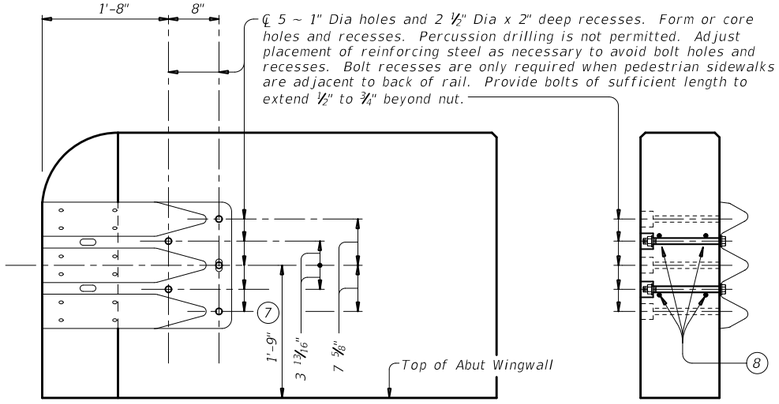
(Showing without raised sidewalk)
Provide at all interior bents without slab expansion joints.



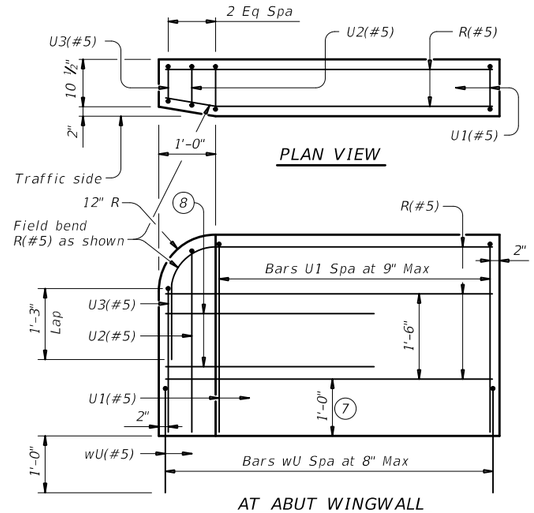


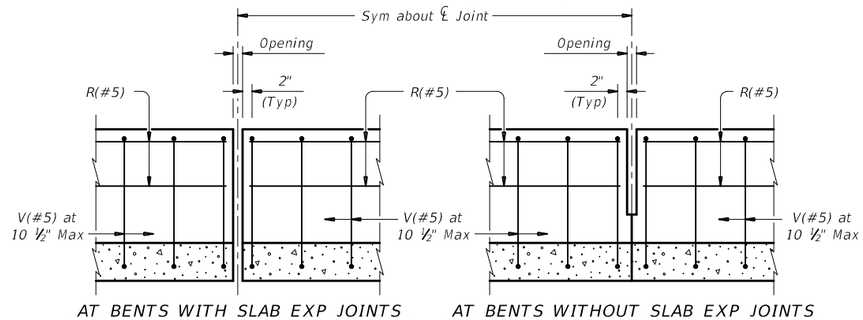
ISOMETRIC VIEWS AT END OF BRIDGE

(Rail Member showing Elliptical Tube Option, Rectangular Tube Option similar).



TERMINAL CONNECTION DETAILS





ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

(Showing without raised sidewalk)

1. Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
2. Pipe rail sections must have at least two posts but not more than four.
3. One shop splice per pipe rail section is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
4. ℄ Exp Jt or Splice Jt as required.
5. 2" Dia Std Pipe (2.375" 0.D., 0.154" wall thickness) (ASTM A53 Gr B, A1085 or A500 Gr B). Placed on either side of steel rail post.
6. Unless directed otherwise by the Engineer, the Fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.
7. Increase 2" for structures with overlay.
8. Place 4 additional Bars R(#5) 3'-8" in length inside Bars U(#5) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.

SHEET 1 OF 4

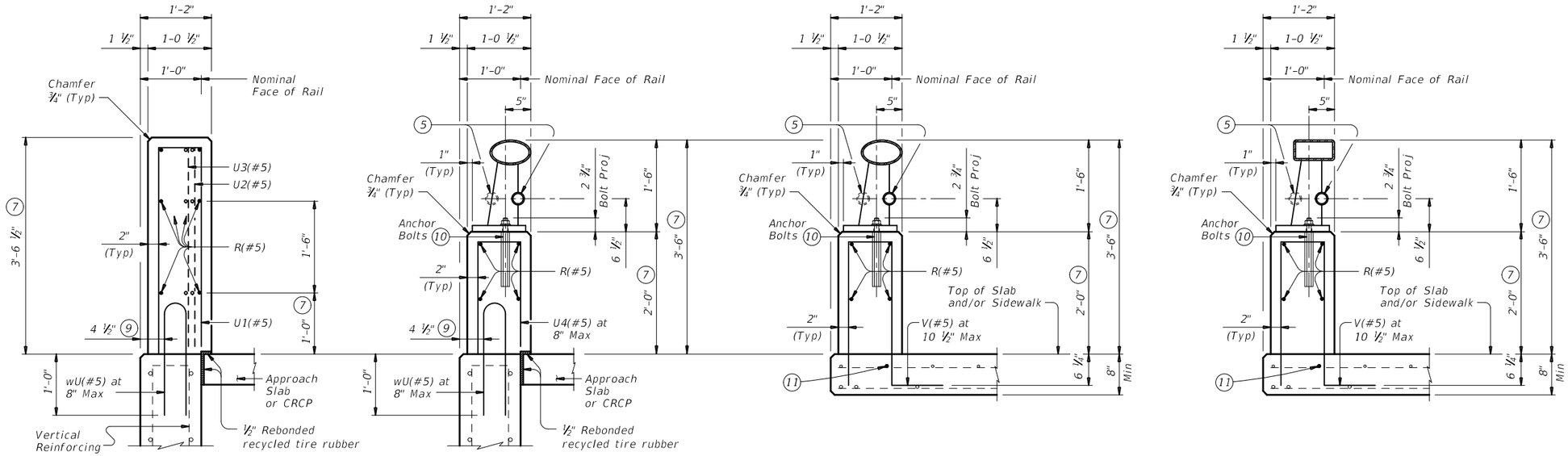
Texas Department of Transportation | Bridge Division Standard

COMBINATION RAIL

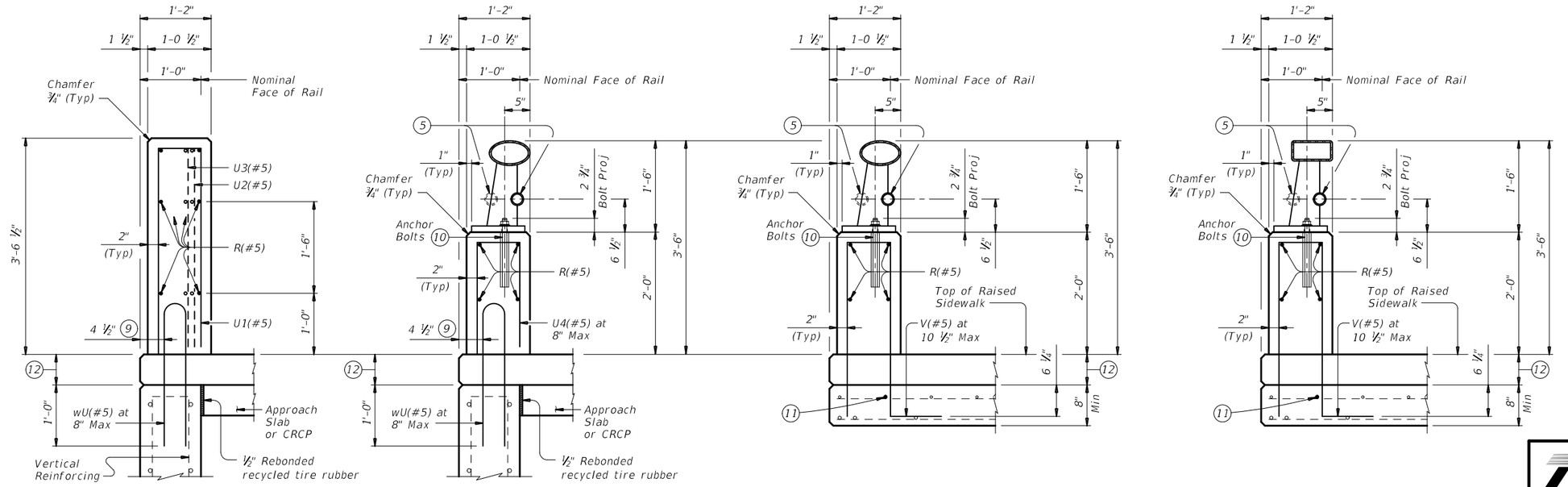
TYPE C402

FILE: rlstd020-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		81

DATE: 5/9/2022 9:43:09 AM
FILE: L:\Lufkin District\Contract 36-910P5089 WA4 RTZ_ADA\CADD\Sheets\09 Bridges\TxDOT Standards\C402\rlstd020-19.dgn



SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK (6)



SECTIONS THRU RAIL WITH RAISED SIDEWALK (6)

(5) 2" Dia Std Pipe (2.375" O.D., 0.154" wall thickness) (ASTM A53 Gr B, A1085 or A500 Gr B). Placed on either side of steel rail post.

(6) Unless directed otherwise by the Engineer, the Fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.

(7) Increase 2" for structures with overlay.

(9) 5 ½" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(10) See "Material Notes" for anchor bolt information.

(11) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(12) Raised Sidewalk

Texas Department of Transportation

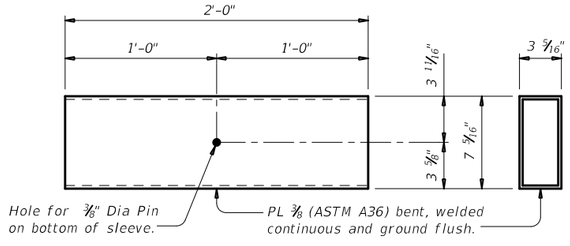
Bridge Division Standard

COMBINATION RAIL

TYPE C402

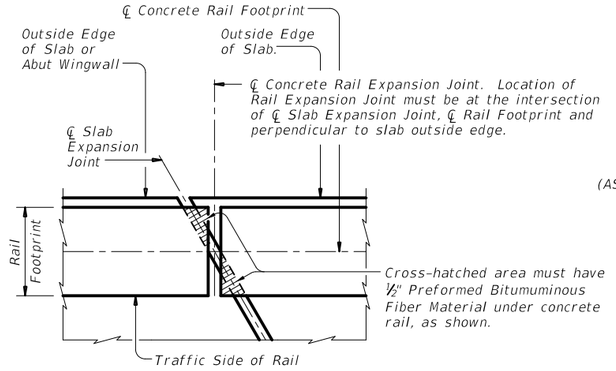
FILE: rlstd020-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		82

DATE: 5/9/2022 9:43:10 AM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\09 Bridges\rlstd020-19.dgn



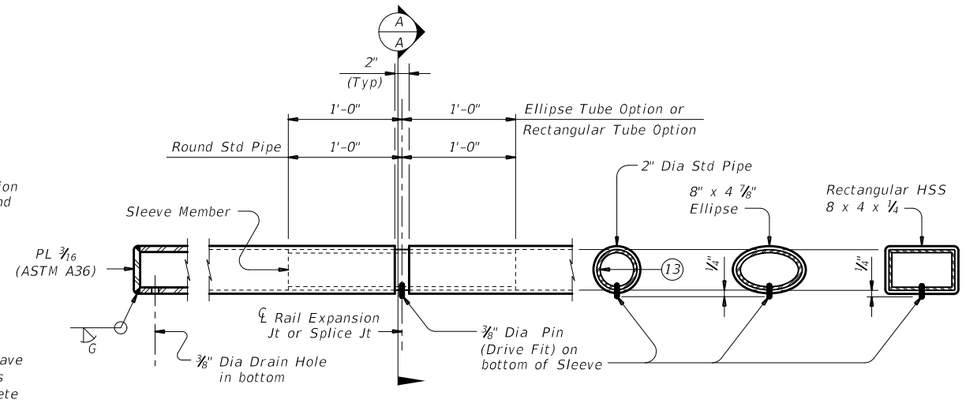
RECTANGULAR TUBE SLEEVE MEMBER DETAIL

(See Tube Fabrication Detail)



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

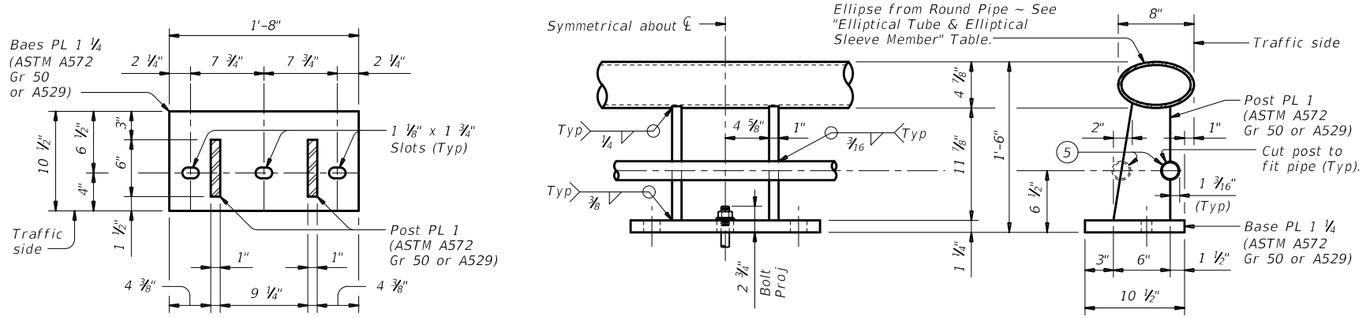


TUBE FABRICATION DETAILS (6)

ELLIPTICAL TUBE & ELLIPTICAL SLEEVE MEMBER

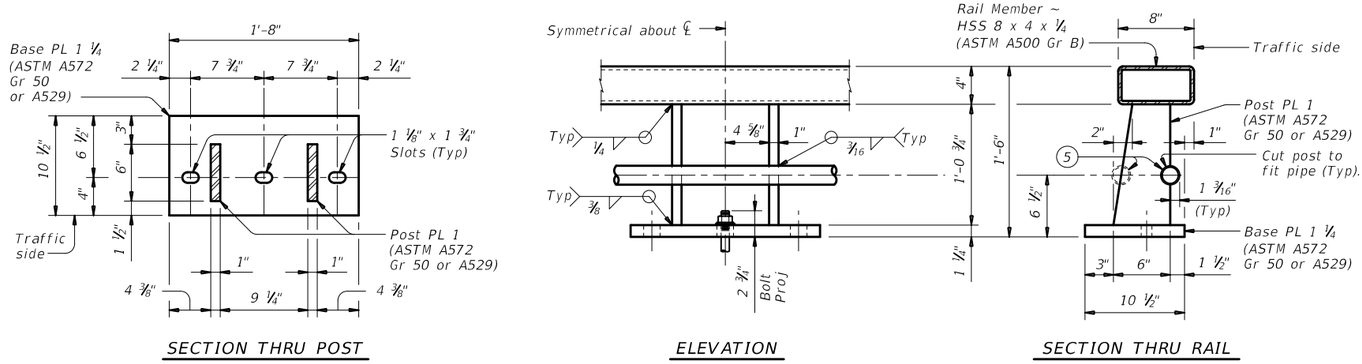
8" x 4 7/8" Ellipse	Elliptical Sleeve Member	
Material	Material	Thickness
6" Dia Std Pipe ASTM A53 E or S Gr B)	ASTM A53 Gr B	0.353"
	ASTM A36 or A500 Gr B	0.339"
	API-5LX52	0.224"
6 ⅝" O.D. Pipe x 0.188" API-5LX52	ASTM A53 Gr B	0.339"
	ASTM A36 or A500 Gr B	0.325"
	API-5LX52	0.188"

Notes: Other sections of equal or greater strength are acceptable for elliptical sleeves. The major and minor diameters of the rail member may vary +/- 0.1875" from plan dimension. However, the difference between the outside diameters of the elliptical sleeve and the inside diameters of the rail member must not exceed 0.25 inches.



ELLIPTICAL TUBE WITH RAIL POST & ANCHORAGE DETAILS

(Showing Elliptical Tube Option)



RECTANGULAR TUBE WITH RAIL POST & ANCHORAGE DETAILS (6)

(Showing Rectangular Tube Option)

(5) 2" Dia Std Pipe (2.375" O.D., 0.154" wall thickness) (ASTM A53 Gr B, A1085 or A500 Gr B). Placed on either side of steel rail post.

(6) Unless directed otherwise by the Engineer, the fabricator may use the rectangular tube in lieu of the elliptical tube for the rail member.

(13) Sleeve Member 1 ½" Dia Std Pipe (1.90" O.D., 0.145" wall thickness) (ASTM A53 Gr B or A500 Gr B).

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL

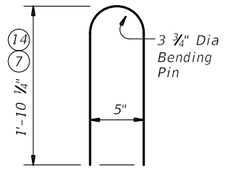
TYPE C402

FILE: rlstd020-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		83

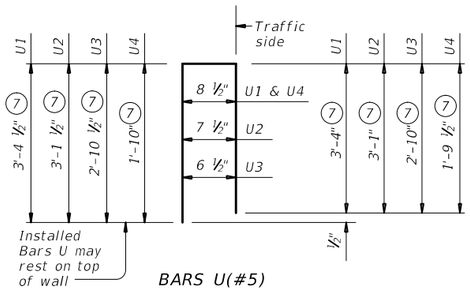
DATE: 5/9/2022 9:43:12 AM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\09 Bridges\TxDOT Standards\rlstd020-19.dgn

RAIL DATA FOR HORIZONTAL CURVES

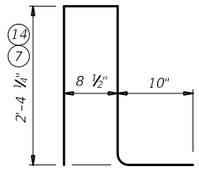
	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
Rail Members	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	To required radius or to chords shown (16)
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	To required radius (16)



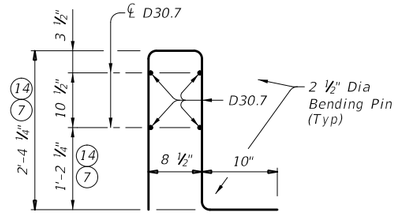
BARS wU(#5)



BARS U(#5)



BARS V(#5)



OPTIONAL WELDED WIRE REINFORCING (WWR)

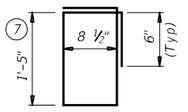
(7) Increase 2" for structures with overlay.

(10) See "Material Notes" for anchor bolt information.

(14) For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.

(15) Slots are not allowed in areas where there is a joint in the concrete parapet between rail post.

(16) Shop drawings for approval required for tubular steel sections.



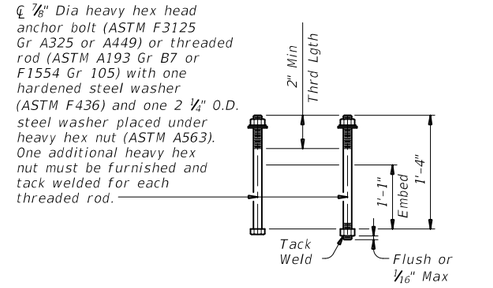
BARS S(#5)

ELEVATION

SECTION THRU SIDE SLOT DRAIN

OPTIONAL SIDE SLOT DRAIN DETAILS

Note: Center Side Slot Drains between rail posts within the limits shown. Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Do not place drains over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.



CAST-IN-PLACE ANCHOR BOLT OPTIONS (10)

CONSTRUCTION NOTES:

This rail may be slipformed if approved by the Engineer when adhesive anchor bolts are used.

At the Contractor's option anchor bolts may be cast with the parapet. See "Material Notes".

Slipforming parapet is not allowed if anchor bolts are cast with parapet wall.

If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a ⅜" width x ¼" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

Rail parapet must be plumb unless otherwise approved. Steel posts must be square to the top of parapet. Use Type VIII epoxy mortar under post base plates if gaps larger than 1/16" exist.

Cap all ends of tubular steel sections at parapet.

Pipe rail sections must have at least two posts but not more than four.

Round or chamfer all exposed edges of steel components 1/16" by grinding prior to galvanizing.

Chamfer all exposed concrete corners.

MATERIAL NOTES:

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over gavanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel". Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.

Anchor bolts must be ⅞" Dia ASTM A193 Gr B7 fully threaded rods with heavy hex nuts, one hardened steel washer (ASTM F436), and one (2 ¼" O.D.) steel washer each. Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into parapet wall with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 17 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing."

Optional cast-in-place anchor bolts must be ⅞" Dia ASTM F3125 Gr A325 or A449 bolts (or A193 Gr B7 or F1554 Gr 105 threaded rods with one tack welded heavy hex nut each) with one heavy hex nut and one hardened steel washer ASTM F436 plus one (2 ¼" O.D.) steel washer at each bolt. Nuts must conform to ASTM A563 requirements.

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcement (WWR) ASTM A1064 may be substituted for Bars R, and V, as shown. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows: Uncoated or galvanized ~ #5 = 2'-0"
Epoxy coated ~ #5 = 3'-0"

GENERAL NOTES:

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Submit erection drawings showing panel lengths, rail post spacing, and anchor bolt setting, to the Engineer for approval.

Average weight of railing with no overlay: 347 plf total
313 plf (Conc)
34 plf (Steel).

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

Texas Department of Transportation

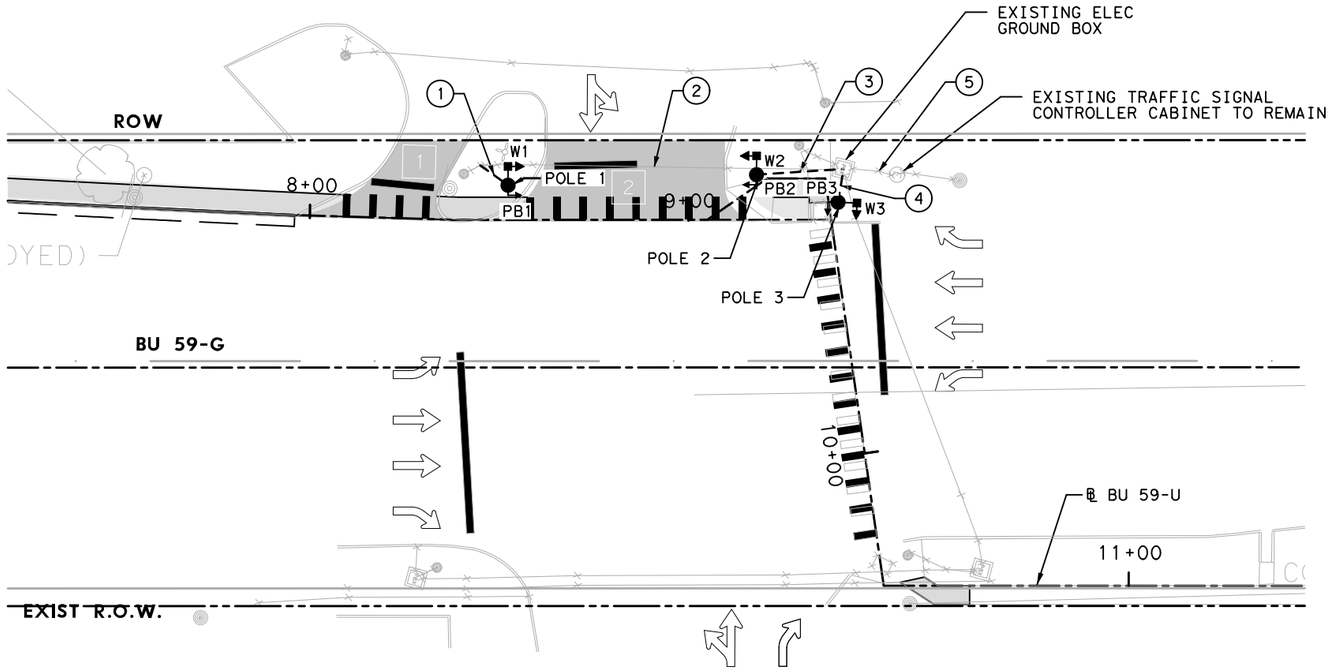
Bridge Division Standard

COMBINATION RAIL

TYPE C402

FILE: rlstd020-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		84

SIGNAL POLE AND CONTROLLER DATA CHART - BU 59						
POLE	FNDN TYPE	STA.	OFFSET	NO. OF HEADS	APS UNIT	DESCRIPTION
1	24-A	08+52.38	9.12′ LT	1	1	12′ PEDESTAL POLE W1, PB1
2	24-A	09+18.00	11.89′ LT	1	1	12′ PEDESTAL POLE W2, PB2
3	24-A	09+37.71	4.62′ LT	1	1	12′ PEDESTAL POLE W3, PB3



0′ 10′ 20′ 40′
SCALE IN FEET

LEGEND:

- EXIST ROW
- EXISTING DIRECTION OF TRAFFIC
- EXISTING TRAFFIC SIGNAL HEAD
- EXISTING TRAFFIC SIGNAL POLE
- EXISTING LUMINAIRE ARM
- PROPOSED TYPE A GROUND BOX WITH APRON
- PROPOSED PEDESTRIAN SIGNAL ASSEMBLY
- PROPOSED CONDUIT (BORED)
- PROPOSED CONDUIT (TRENCH)
- PROPOSED SIDEWALK

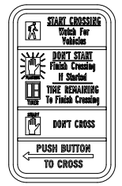
NOTES:

1. EXISTING GROUND BOXES AND CONTROLLER CABINET ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY LOCATIONS.
2. EXISTING CONDUIT LOCATION AND LENGTH IS APPROXIMATE. CONTRACTOR TO FIELD VERIFY LENGTHS.

CONDUIT AND CONDUCTOR RUNS										
EXISTING/ PROPOSED CONDUIT	RUN NO.	CONDUIT (618)		CONDUCTORS (620)		CABLES (684)			
		PVC		GROUND		PEDESTRIAN			
		2" (SCHD 40)		#6 BARE		#12/2C		#12/4C	
		(6023)		(6009)		(6007)		(6009)	
		NO.	TRENCH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
		EA	LF	EA	LF	EA	LF	EA	LF
P	1	1	12	1	12				
E	2					1	98	1	98
P	3	1	26	1	26	1	26	1	26
P	4	1	12	1	12	1	12	1	12
E	5					3	14	3	14
P	POLE 1					1	5	1	10
P	POLE 2					1	5	1	10
P	POLE 3					1	5	1	10
	TOTAL (LF)		50		50		193		208

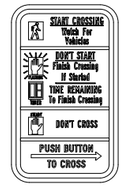
ONE WAY
COUNTDOWN PEDESTRIAN (LED)
SIGNAL HEAD
W1, W2, W3
18" x 16"

9" x 15"



R10-3e (L) SIGN w/
PEDESTRIAN PUSH BUTTON
TO BE INSTALLED
ON SIGNAL POLES
PB2

9" x 15"



R10-3e (R) SIGN w/
PEDESTRIAN PUSH BUTTON
TO BE INSTALLED
ON SIGNAL POLES
PB1, PB3

STATE OF TEXAS
ABDULLAH SBAITI
139401
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation
© 2022

I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

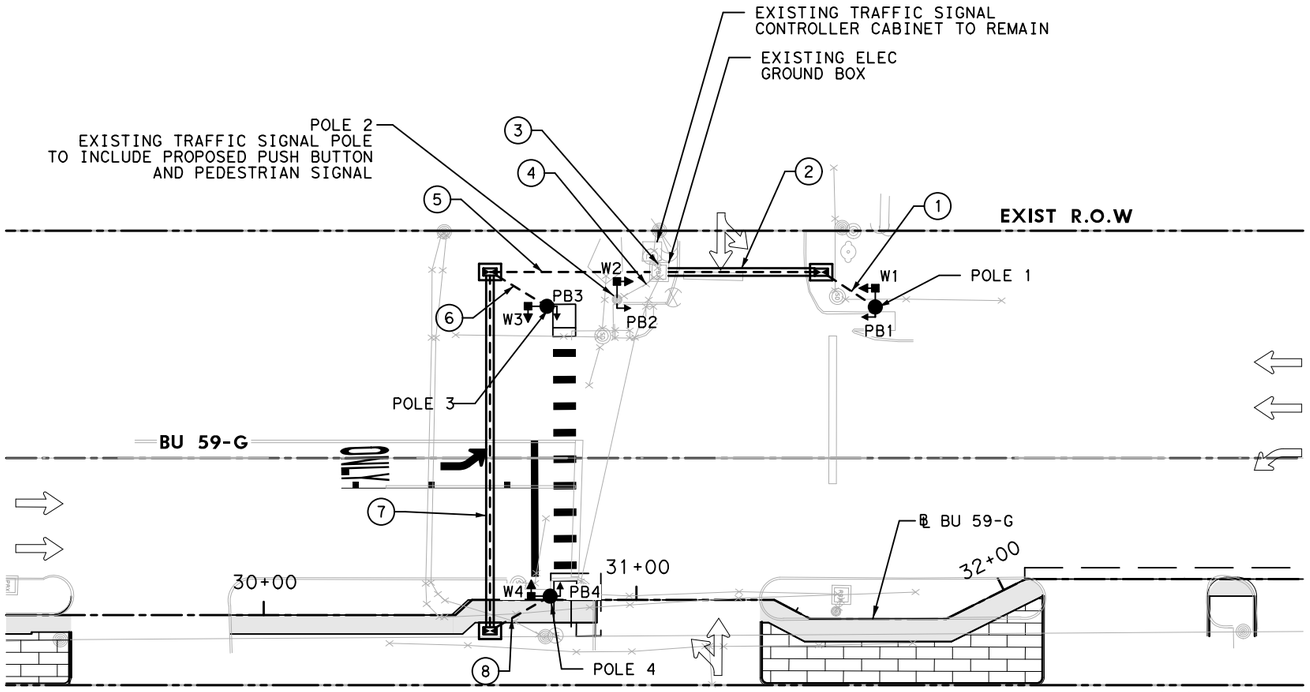
PEDESTRIAN SIGNAL LAYOUT (BU-59 AT LUFKIN MALL ENTRANCE)

SHEET 1 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	
CONTROL	SECTION	JOB	~~85~~
0176	02	125, ETC.	

DRAWING DATE: 5/25/2022 FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\10 Signing Striping and Signals\BU59*PED SIG*01.dgn

SIGNAL POLE AND CONTROLLER DATA CHART - BU 59						
POLE	FNDN TYPE	STA.	OFFSET	NO. OF HEADS	APS UNIT	DESCRIPTION
1	24-A	31+64.28	82.35' LT	1	1	12' PEDESTAL POLE: ADD W1, PB1
2	EXISTING	30+94.86	79.31' LT	1	1	EXSISTING TRAFFIC SIGNAL POLE, ADD: W2, PB2
3	24-A	30+76.35	77.54' LT	1	1	12' PEDESTAL POLE: ADD W3, PB3
4	24-A	30+77.19	1.00' LT	1	1	12' PEDESTAL POLE: ADD W4, PB4



0' 10' 20' 40'
SCALE IN FEET

LEGEND:

- EXIST ROW
- EXISTING DIRECTION OF TRAFFIC
- EXISTING TRAFFIC SIGNAL HEAD
- EXISTING TRAFFIC SIGNAL POLE
- EXISTING LUMINAIRE ARM
- PROPOSED TYPE A GROUND BOX WITH APRON
- PROPOSED PEDESTRIAN SIGNAL ASSEMBLY
- PROPOSED CONDUIT (BORED)
- PROPOSED CONDUIT (TRENCH)
- PROPOSED SIDEWALK

NOTES:

1. EXISTING GROUND BOXES AND CONTROLLER CABINET ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY LOCATIONS.
2. EXISTING CONDUIT LOCATION AND LENGTH IS APPROXIMATE. CONTRACTOR TO FIELD VERIFY LENGTHS.

STATE OF TEXAS
ABDULLAH SBAITI
139401
LICENSED PROFESSIONAL ENGINEER
5/25/2022

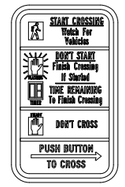
CONDUIT AND CONDUCTOR RUNS											
EXISTING/ PROPOSED CONDUIT OR POLE	RUN NO.	CONDUIT (618)				CONDUCTORS (620)					
		PVC				GROUND		PEDESTRIAN			
		2" (SCHD 40) (6023)		2" (SCHD 80) (6047)		#8 BARE (6009)		#12/2C (6007)		#12/4C (6009)	
		NO. EA	TRENCH LF	NO. EA	BORE LF	NO. EA	LENGTH LF	NO. EA	LENGTH LF	NO. EA	LENGTH LF
P	1					1	18	1	18	1	18
P	2			1	42	1	42	1	42	1	42
E	3							3	5	3	5
E	4							1	14	1	14
P	5	1	46			1	46	1	46	1	46
P	6	1	19			1	19	1	19	1	19
P	7			1	97	1	97	1	97	1	97
P	8	1	20			1	20	1	20	1	20
P	POLE 1							1	5	1	10
E	POLE 2							1	5	1	10
P	POLE 3							1	5	1	10
P	POLE 4							1	5	1	10
	TOTAL (LF)		85		139		242		291		311

ONE WAY
COUNTDOWN PEDESTRIAN (LED)
SIGNAL HEAD
W1, W2, W3, W4
18" x 16"

9" x 15"

R10-3e (L) SIGN w/
PEDESTRIAN PUSH BUTTON
TO BE INSTALLED
ON SIGNAL POLES
PB1, PB3

9" x 15"



R10-3e (R) SIGN w/
PEDESTRIAN PUSH BUTTON
TO BE INSTALLED
ON SIGNAL POLES
PB2, PB4

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

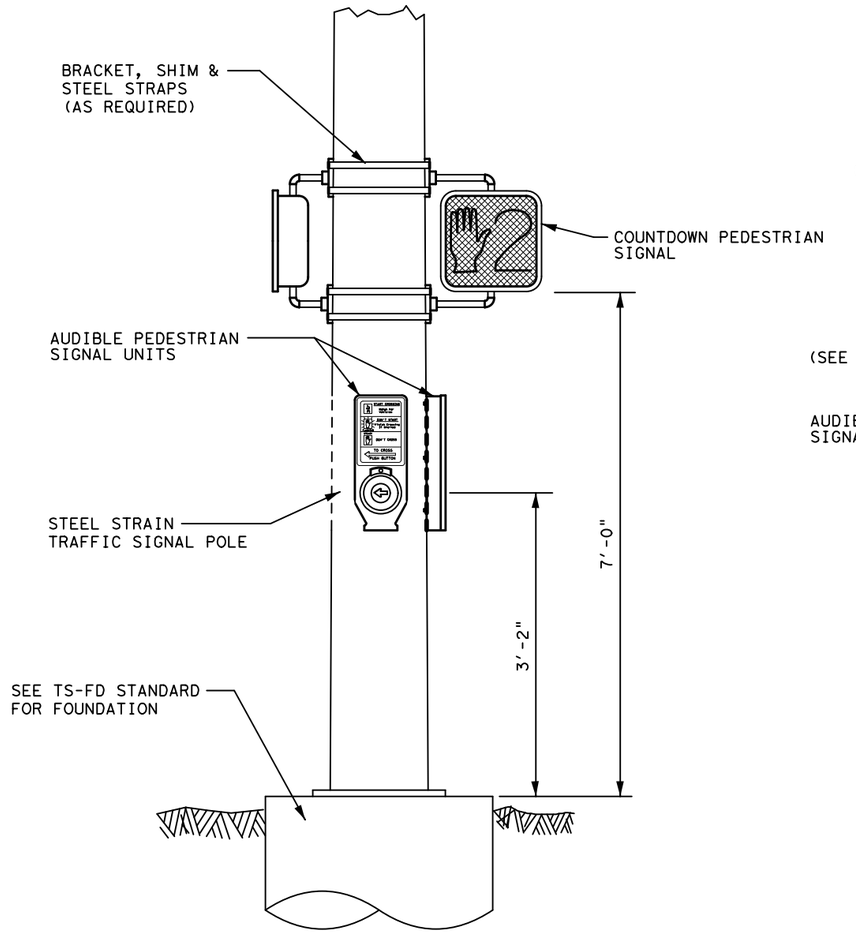
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

PEDESTRIAN SIGNAL LAYOUT (BU-59 AT LUFKIN AND JANEWAY AVE)

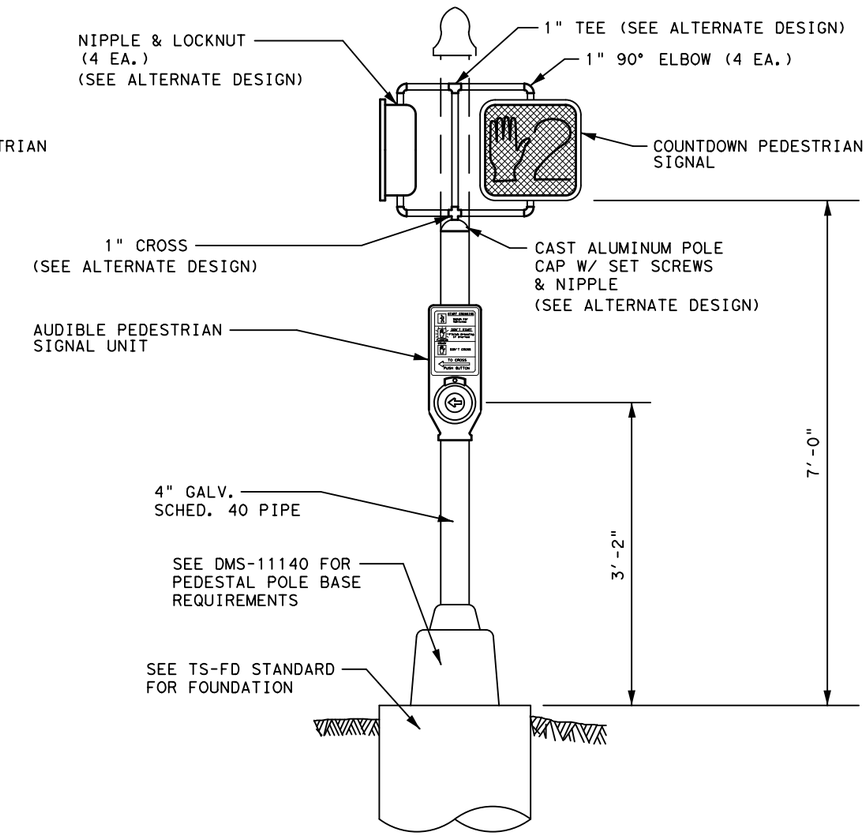
SHEET 2 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	86
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\10 Signing Striping and Signals\BU59*PED SIG*02.dgn
DRAWING DATE: 5/25/2022



TYPICAL PEDESTRIAN SIGNAL ASSEMBLY FOR STEEL STRAIN POLE



TYPICAL PEDESTRIAN SIGNAL POLE

NOTE:
ALL PEDESTRIAN SIGNAL HEADS AND PUSH BUTTONS SHALL MEET ADA STANDARD REQUIREMENTS.

ALTERNATE DESIGN

PEDESTRIAN SIGNAL MAY BE STRAPPED TO PEDESTRIAN SIGNAL POLE SIMILAR TO LARGER POLE ASSEMBLIES WITH AN ACORN CAP FOR TOP.

NOT TO SCALE

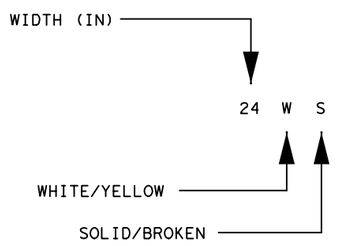
REV. 10-20-16 MODIFIED TITLE BLOCK
REV. 2-28-14 ADD COUNTDOWN PEDESTRIAN SIGNAL
REV. 5-10-11 ADD AUDIBLE PED SIG UNIT
ISSUED 01-09

LUFKIN DISTRICT STANDARD

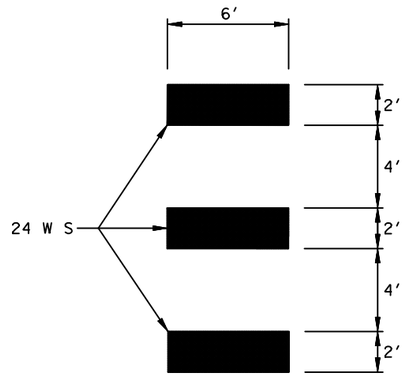
PEDESTRIAN SIGNAL DETAILS

CONT	SECT	JOB	HIGHWAY
0176	02	125, ETC.	BU 59G
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		87

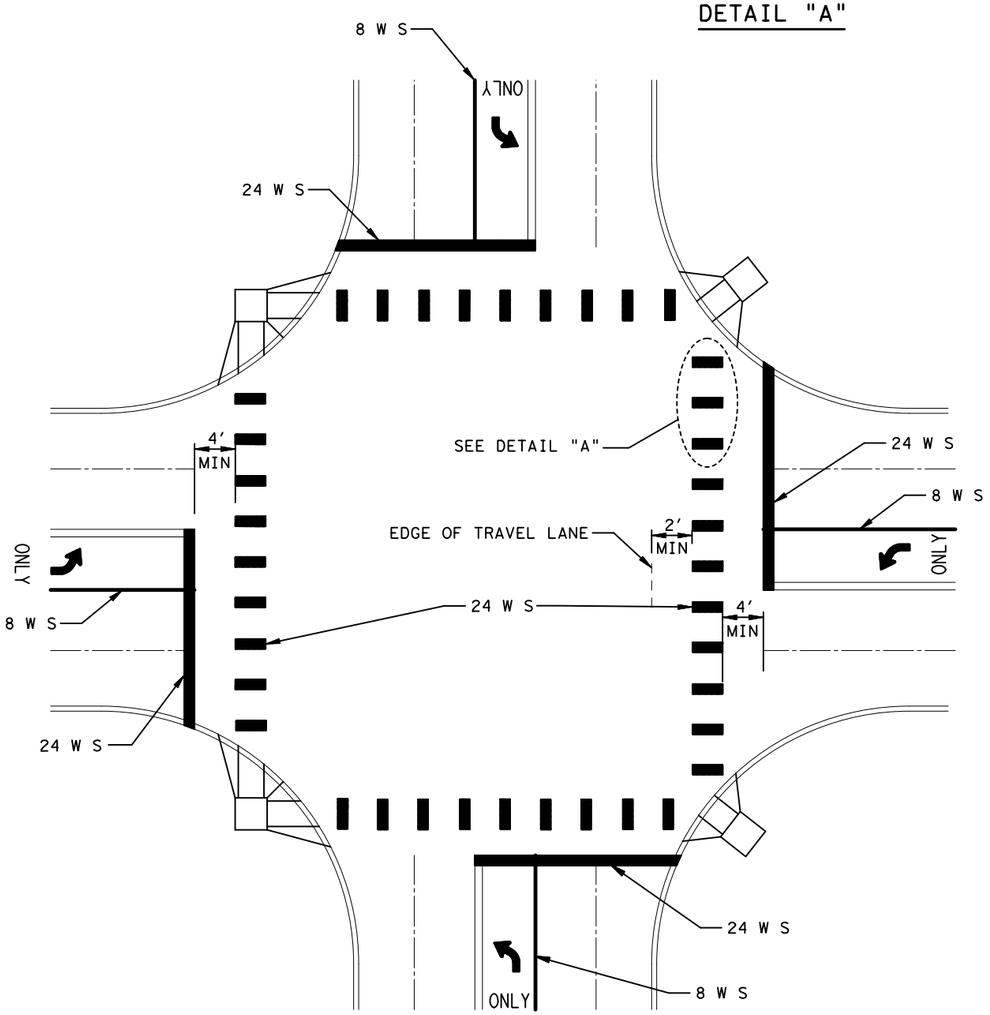
5/9/2022 9:43:20 AM
L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\10 Signing Striping and Signals\TxDOT Standards\PedSignalDet*DistStnd.dgn



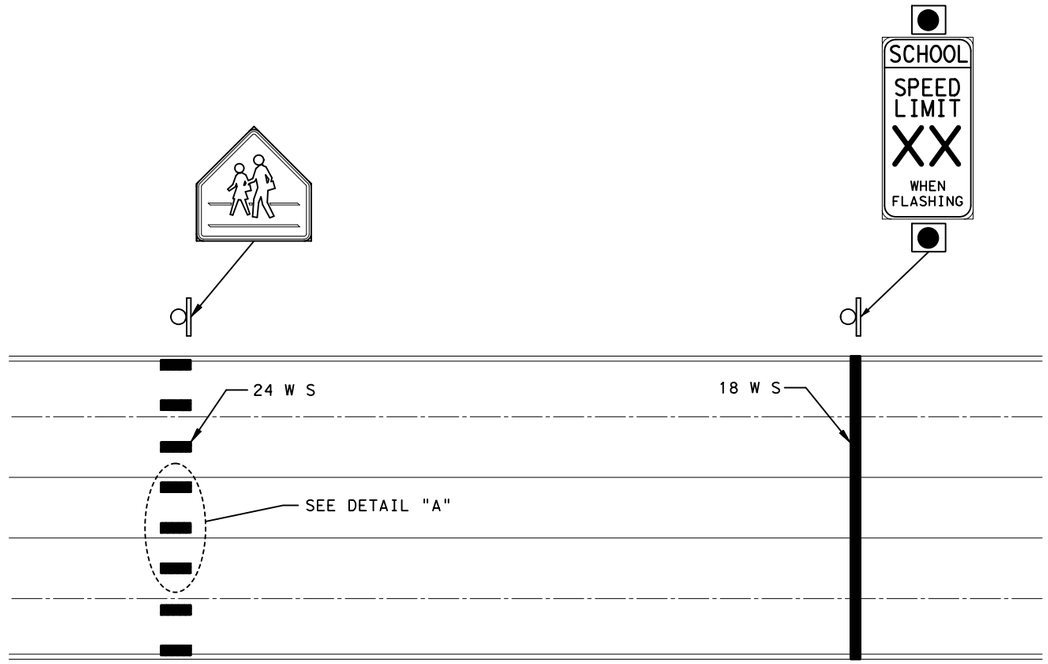
REFLECTIVE PAVEMENT MARKING



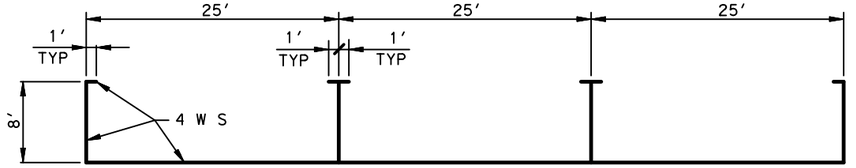
DETAIL "A"



TYPICAL INTERSECTION PAVEMENT MARKING DETAIL

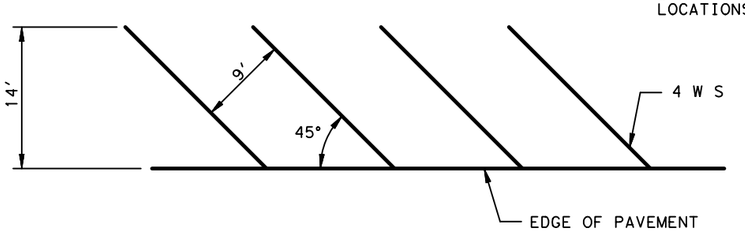


TYPICAL SCHOOL ZONE PAVEMENT MARKING DETAIL



TYPICAL PARALLEL PARKING DETAIL*

*DETAILS SHOWN FOR ILLUSTRATION ONLY.
STRIPES MAY BE PLACED AT EXISTING
LOCATIONS AS DIRECTED BY THE ENGINEER.



TYPICAL ANGLE PARKING DETAIL*

NOT TO SCALE

LUFKIN DISTRICT STANDARD

TYPICAL PAVEMENT MARKING DETAILS

TEXAS DEPARTMENT OF TRANSPORTATION
©2022

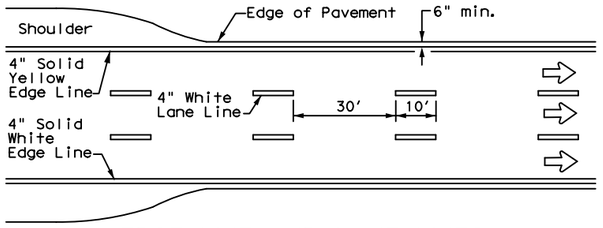
CONT	SECT	JOB	HIGHWAY
0176	02	125, ETC.	BU 59G

DIST	COUNTY	SHEET NO.
LFK	ANGELINA	88

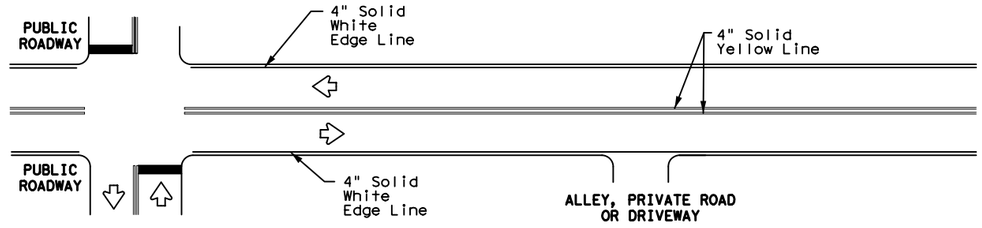
ISSUED 03-08
REVISED 10-20-2016: MODIFIED TITLE BLOCK

5/25/2022 1:56:35 PM
L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\10 Signing Striping and Signals\TxDOT Standards\TypPavMarkDet*DistStnd.dgn
06/09/2021 04:51 PM
pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\11 - LFK\Design Projects\00640043\4 - Design\Master Design Files\LFK_BorderSheet_Dist Rev.dgn

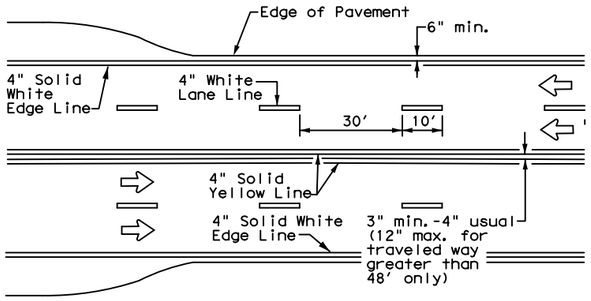
DATE: 5/9/2022 9:43:23 AM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\10 Striping and Signing\pm1-20.dgn



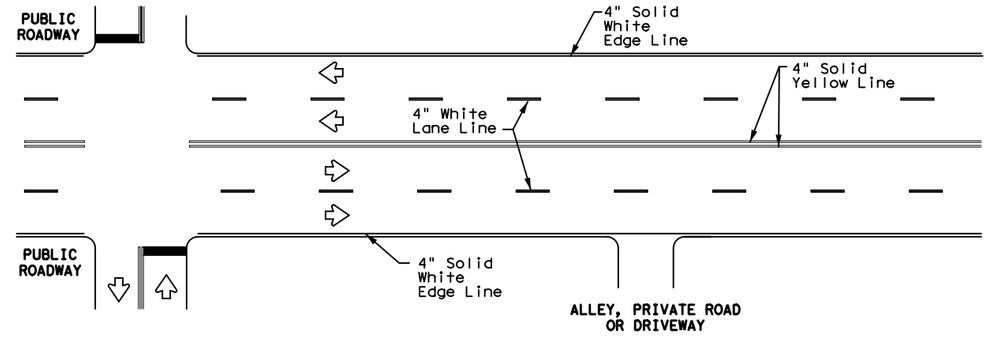
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



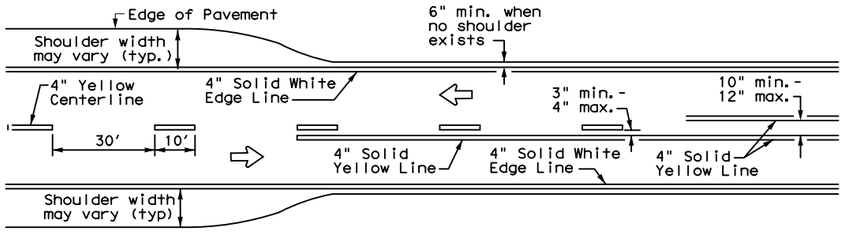
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



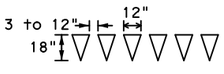
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



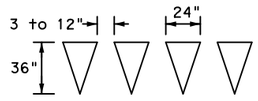
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

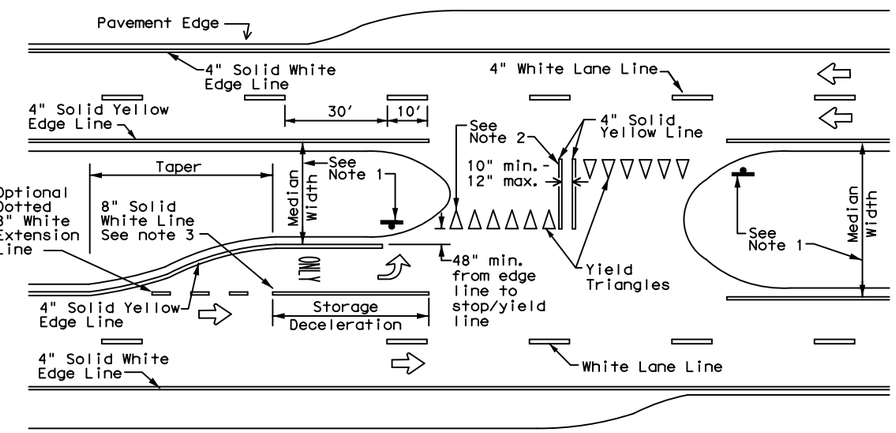


For posted speed on road being marked equal to or less than 40 MPH.



For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



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 are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles 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.

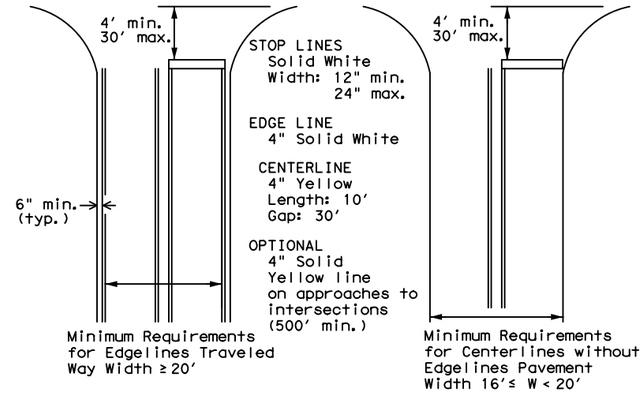
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

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

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0176	02	125, ETC.	BU 59G
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	LFK	ANGELINA		89

22A

DATE: 5/9/2022 9:43:25 AM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\10 Signing Striping and Signals\TxDOT Standards\SMD(GEN)-08.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

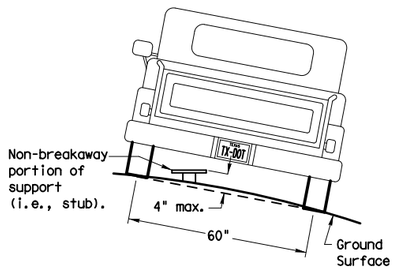
Anchor Type

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

Sign Mounting Designation

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

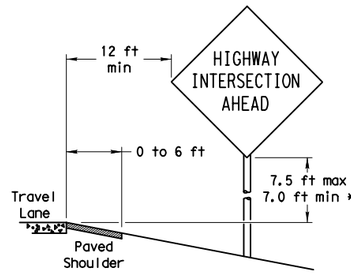
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

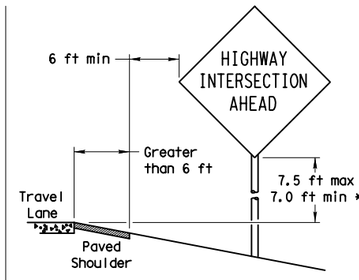
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

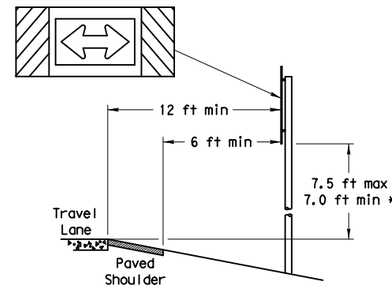
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



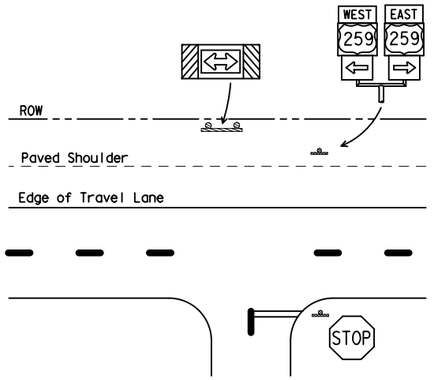
GREATER THAN 6 FT. WIDE

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

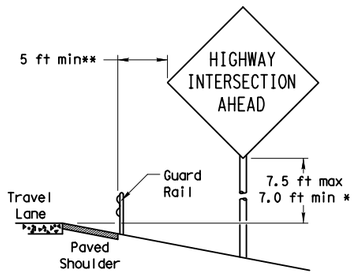
T-INTERSECTION



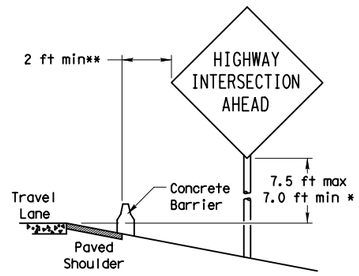
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



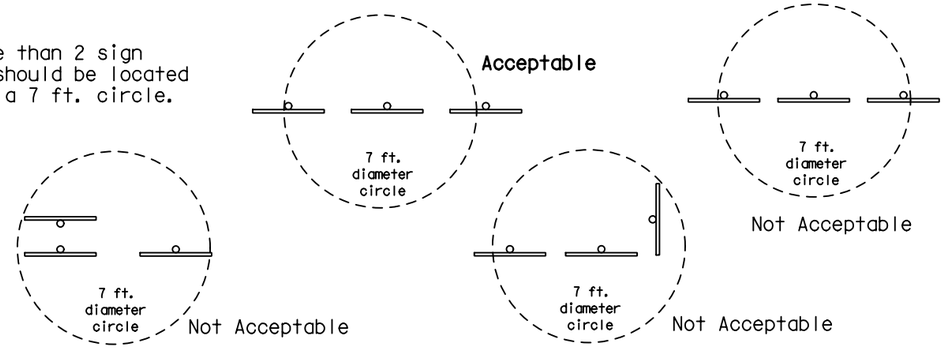
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

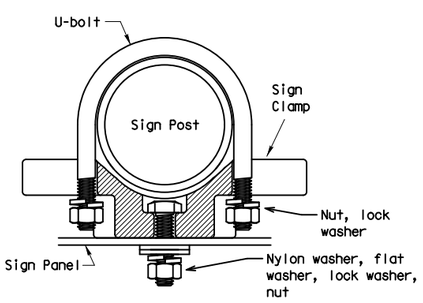
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

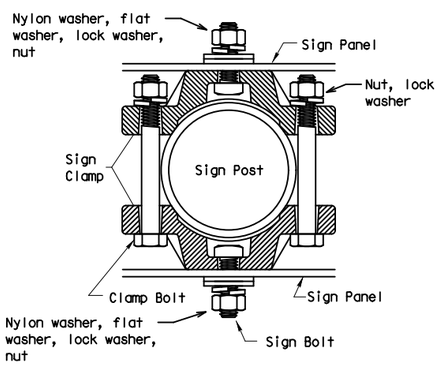


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

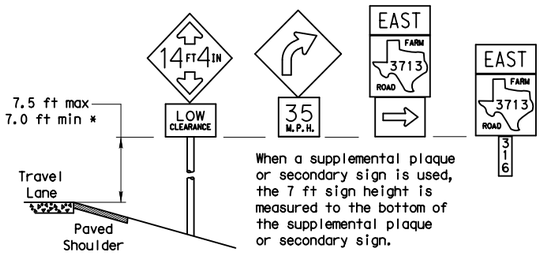
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



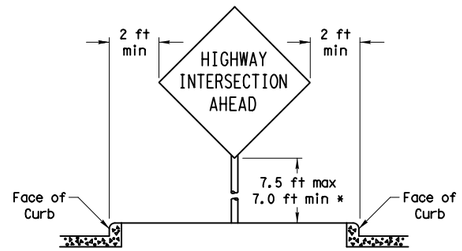
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



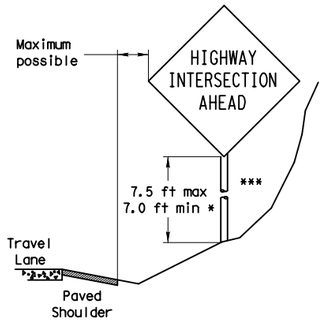
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

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

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

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

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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

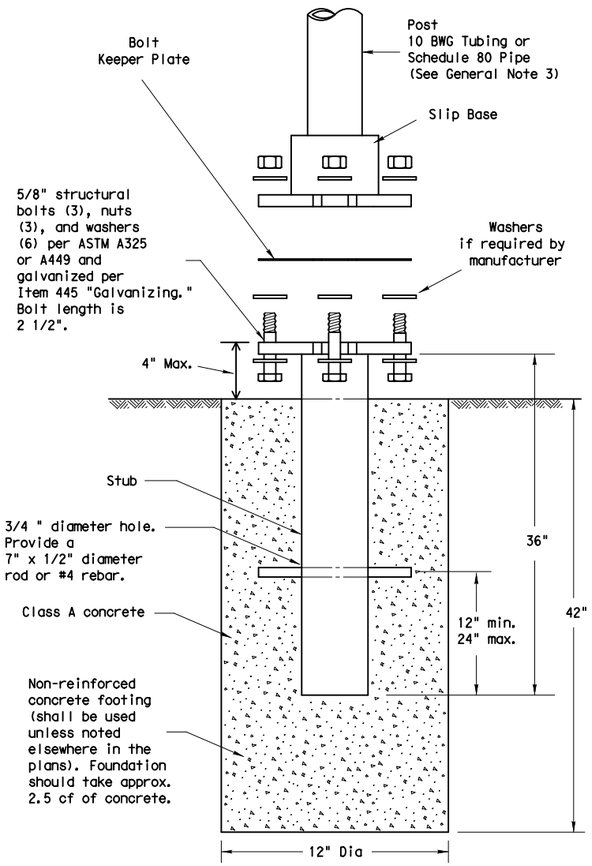
SMD(GEN)-08

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

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		90

DATE: 5/9/2022 9:43:26 AM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\10 Signing Striping and Signals\TxDOT Standards\SMD(SLIP-1)-08.dgn

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

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

GENERAL NOTES:

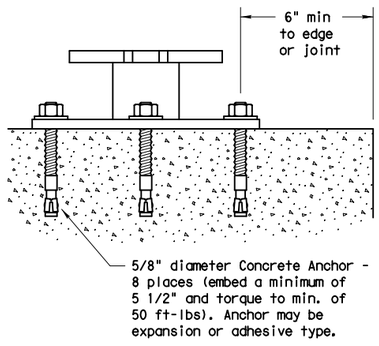
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)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

ASSEMBLY PROCEDURE

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

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

CONCRETE ANCHOR



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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

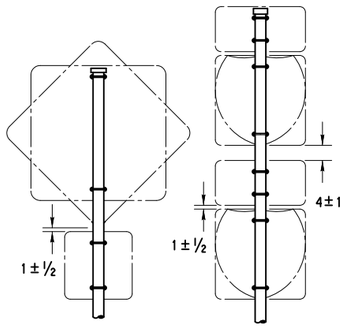
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

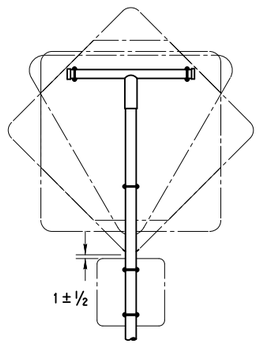
CONT	SECT	JOB	HIGHWAY
0176	02	125, ETC.	BU 59G

DIST	COUNTY	SHEET NO.
LFK	ANGELINA	91

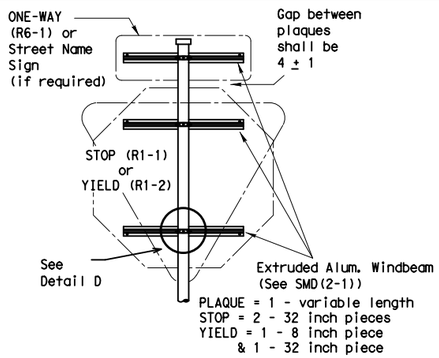
DATE: 5/9/2022 9:43:28 AM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\10 Signing Striping and Signals\TxDOT Standards\SMD(SLIP-2)-08.dgn



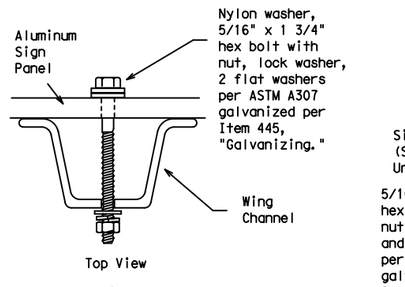
SM RD SGN ASSM TY XXXXX(1)XX(P)



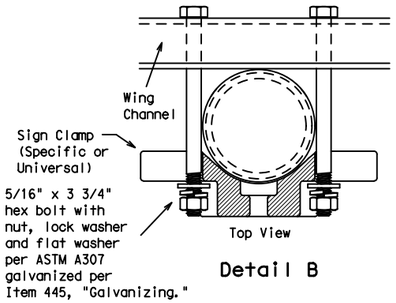
SM RD SGN ASSM TY XXXXX(1)XX(T)



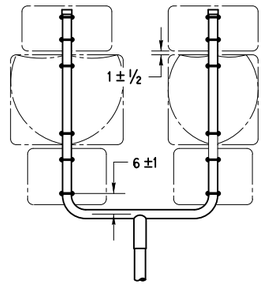
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



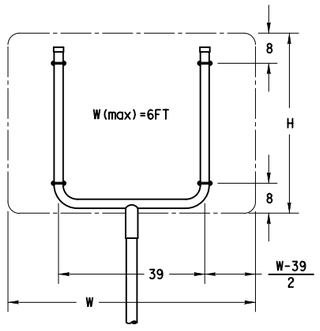
Detail A



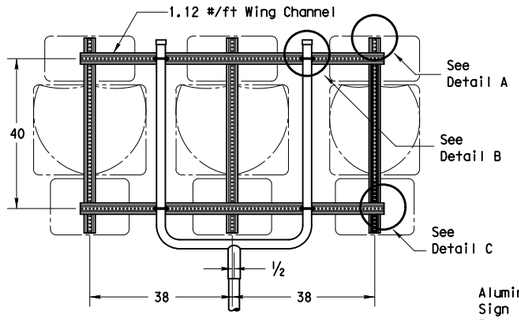
Detail B



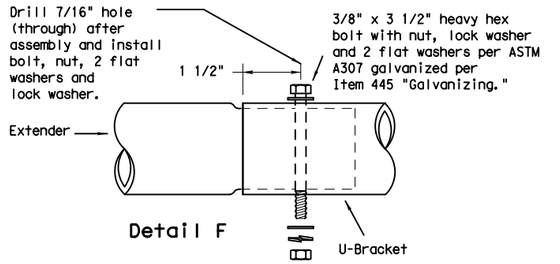
SM RD SGN ASSM TY XXXXX(1)XX(U)



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

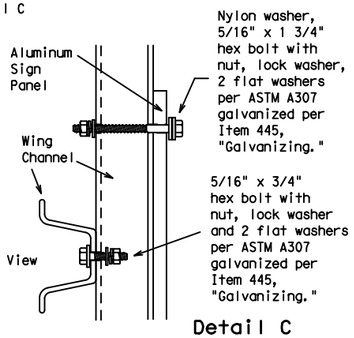


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

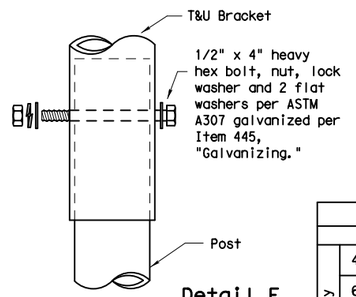


Detail F

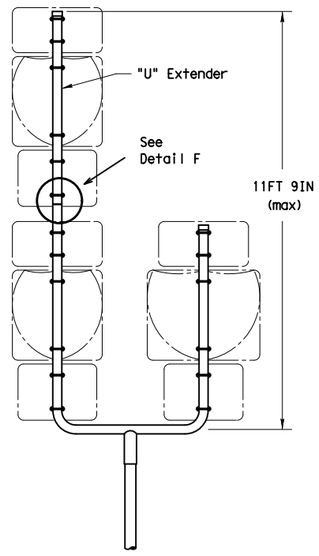
Splices shall only be allowed behind the sign substrate.



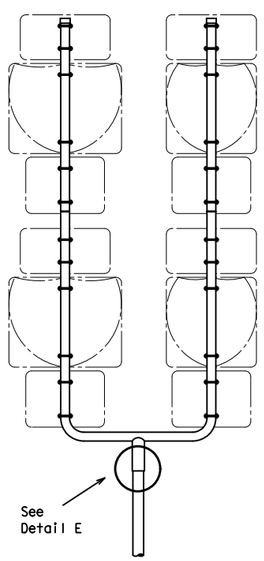
Detail C



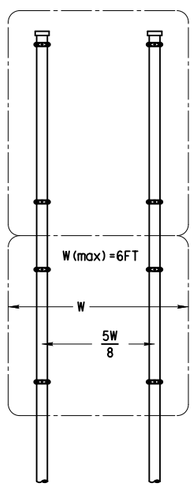
Detail E



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

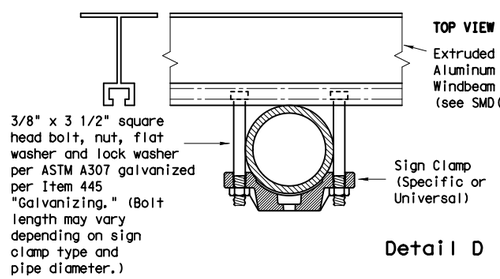


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

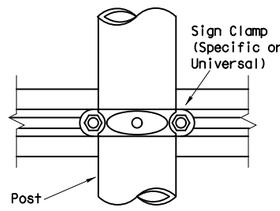


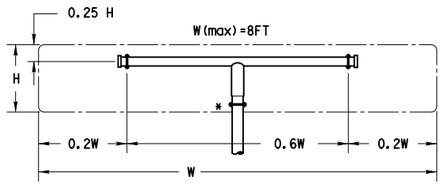
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D

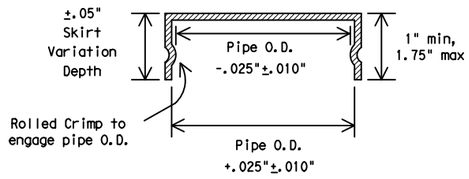




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



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

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

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

GENERAL NOTES:

1.

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

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

REQUIRED SUPPORT

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

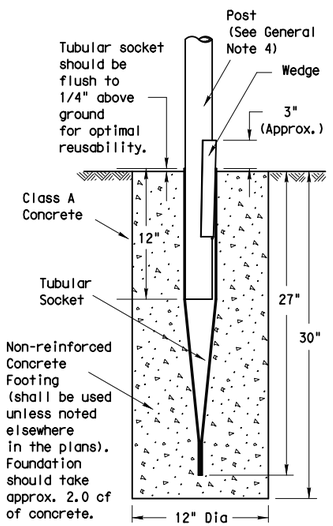
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0176	02	125, ETC.	BU 59G

DIST	COUNTY	SHEET NO.
LFK	ANGELINA	92

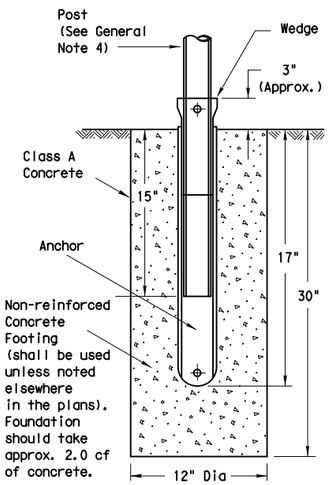
DATE: 5/9/2022 9:43:30 AM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\10 Signing Striping and Signals\TxDOT Standards\SMD(TWT)-08.dgn

Wedge Anchor Steel System



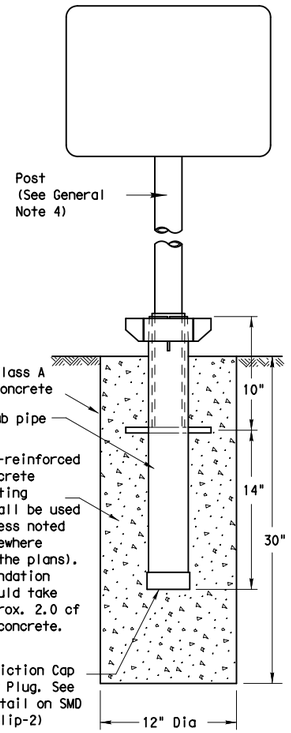
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

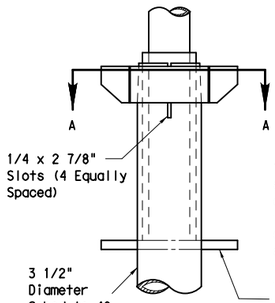


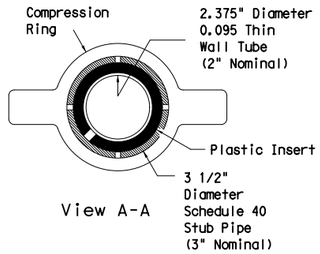
SMD RD SGN ASSM TY TWT(X)WP(X)

Universal Anchor System with Thin-Walled Tubing Post



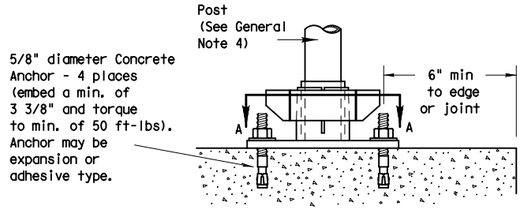
SM RD SGN ASSM TY TWT(X)UA(P)



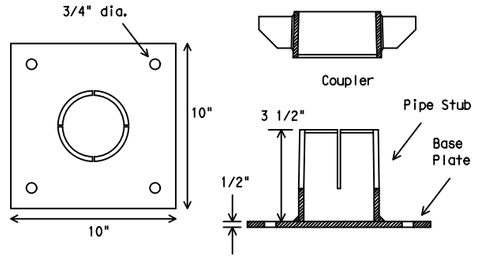


View A-A

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.

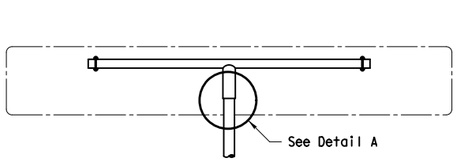


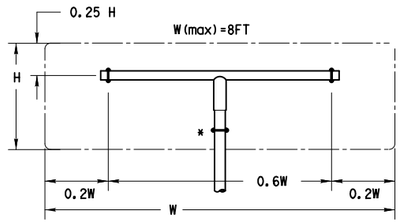
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized 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.



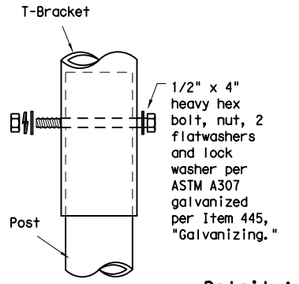
SM RD SGN ASSM TY TWT(X)UB(P)

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
0176	02	125, ETC.	BU 59G

DIST	COUNTY	SHEET NO.
LFK	ANGELINA	93

26E

DATE: 5/9/2022 9:43:31 AM
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\10 Signing Striping and Signals\TxDOT Standards\TS-FD-12.dgn

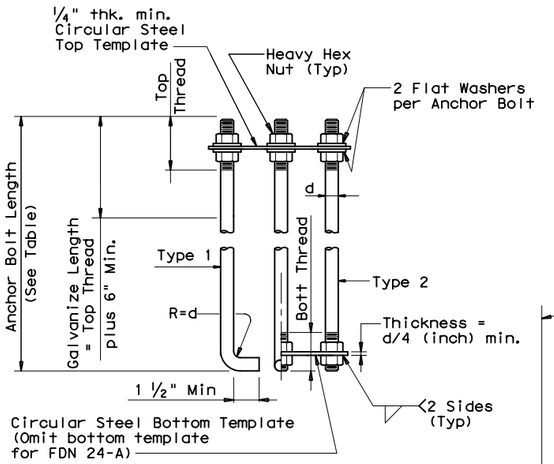
FOUNDATION DESIGN TABLE

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)

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

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

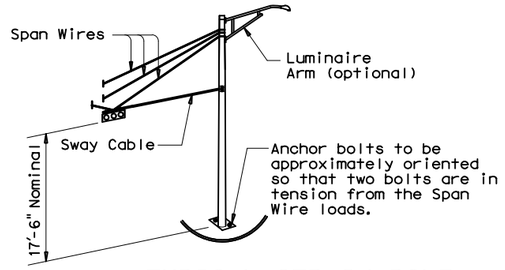
EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



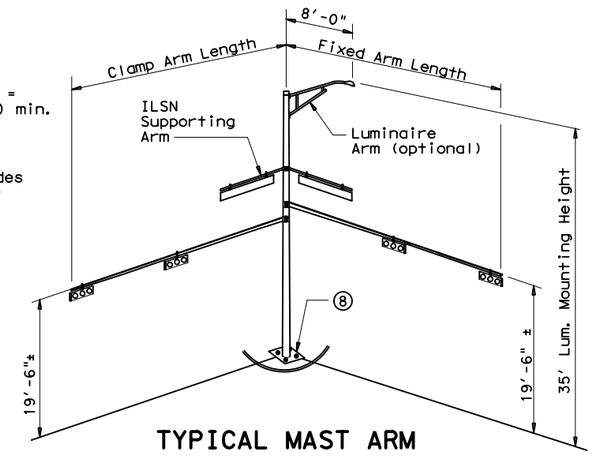
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

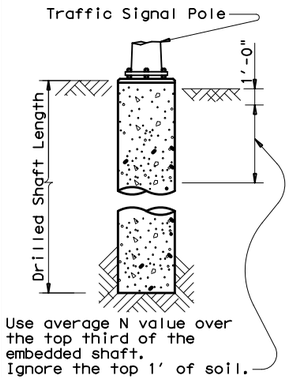
⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.

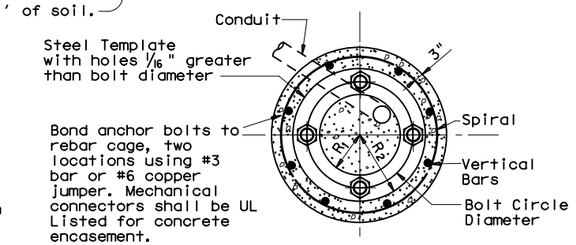


TYPICAL STRAIN POLE ASSEMBLY

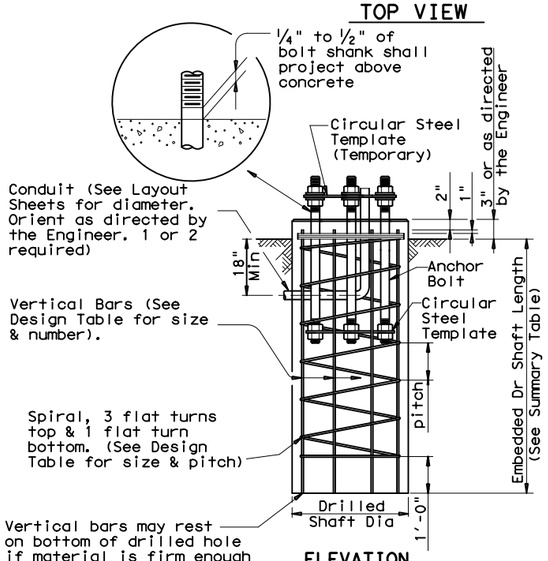


TYPICAL MAST ARM ASSEMBLY





TOP VIEW



ELEVATION

FOUNDATION DETAILS

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.

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
MALL ENTRANCE								
POLE 1	10	24-A	1	6				
POLE 2	10	24-A	1	6				
POLE 3	10	24-A	1	6				
JANEWAY AVE								
POLE 1	10	24-A	1	6				
POLE 3	10	24-A	1	6				
POLE 4	10	24-A	1	6				
TOTAL DRILLED SHAFT LENGTHS				36				

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

REVISIONS	DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB
5-96 11-98 1-12	CONT	SECT	JOB	HIGHWAY
	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		94

DATE: 5/25/2022 1:56:48 PM
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\14 MISC\EPIC.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. N/A

☐ No Action Required ☒ Required Action

Action No.

This project disturbs more than 1 acre of ground, but less than 5 acres; therefore, the following actions are required:

1. Prevent Stormwater Pollution by controlling erosion and sedimentation in accordance to TPDES CGP Permit TXR150000.

2. Comply with SWP3 site plan and revise when necessary to control pollution or required by Engineer.

3. Posting of Small Construction Site Notice with Cosntruction and SWP3 info on or near site accessible to the public and TCEQ, EPA, or other insptectors.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP#

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

Action No.

1. N/A

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☒ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☒ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☒ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1. N/A

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ No Action Required ☐ Required Action

Action No.

1. N/A

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately.

☐ No Action Required ☒ Required Action

Action No.

1. In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife Code and Migratory Bird Treaty Act (MBTA), construction activities that may affect nests(i.e. tree removal, tree limbing, bridg work)shall be conducted outside of the nesting season (March 15 to Septemeber 15). In the event birds or active nests(eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SWP3:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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.

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1. N/A

VII. OTHER ENVIRONMENTAL ISSUES

☐ No Action Required ☒ Required Action

Kiwanis Park is adjacent to the project area located approximately between stations STA 58+00 and STA 63+00. The following actions are required:

Action No.

1. NO stockpiling of materials or storage of equipment within the limits provided above or areas designated or labeled Kiwanis Park.

Texas Department of Transportation

Design Division Standard

EPIC

(ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	DIST	COUNTY		SHEET NO.
	LUF	ANGELINA		95

NOTES:
(1) THE PURPOSE OF THIS SHEET IS TO POINT THE USER TO THE APPROPRIATE LOCATIONS TO FIND THE REQUIRED CONTENT OF THE SWP3.
(2) THE PROJECT LIMITS SHOWN ON THE TITLE SHEET AND LIMITS OF TXDOT RIGHT OF WAY SHALL ALSO BE THE LIMITS OF COVERAGE OF THE SWP3.

PROJECT DESCRIPTION

A. NATURE OF ACTIVITY: CONSTRUCTION OF ADA SIDEWALK WITH CURB RAMPS AT STREETS, DRIVEWAYS, CULVERT EXTENSIONS AND INLET REPAIRS.

B. POTENTIAL POLLUTANTS AND THEIR SOURCES: (I.E. POLLUTANT: SEDIMENT, SOURCE: DISTURBED SOIL; POLLUTANT: OIL AND GREASE, SOURCE: VEHICLES)
POLLUTANT: SEDIMENT, SOURCE: DISTURBED SOIL
POLLUTANT: OIL AND GREASE, SOURCE: EQUIPMENT AND VEHICLES

C. INTENDED SEQUENCE OF ACTIVITIES: SEE CONSTRUCTION SCHEDULE FOR ESTIMATED START DATES AND DURATION OF SOIL-DISTURBING ACTIVITIES

D. TOTAL AREA OF SITE: 9.2 ACRES AREA TO BE DISTURBED: 2.1 ACRES

E. DATA DESCRIBING THE SOIL OR QUALITY OF ANY DISCHARGE FROM THE SITE:
96% Fuller-Urban land complex, 1 to 4 percent slopes: 0-23in Fine sandy loam, 23-60in silty clay-clay loam.
4% Koury-Urban land complex: 0-14in loam, 14-62in Silt loam.

F. GENERAL LOCATION MAP: SEE TITLE SHEET OF THE PROJECT PLANS

G. DETAILED SITE MAP/MAPS INDICATING THE FOLLOWING:
- i. DRAINAGE PATTERNS: SEE SWP3 LAYOUTS
- ii. ANTICIPATED SLOPES AFTER MAJOR GRADING ACTIVITIES: SEE CROSS SECTIONS
- iii. AREAS WHERE SOIL DISTURBANCE WILL OCCUR: SEE SW3P LAYOUTS
- iv. LOCATIONS OF ALL CONTROLS OR BUFFERS (PLANNED/IN PLACE): SEE SWP3 LAYOUTS
- v. LOCATIONS WHERE TEMPORARY OR PERMANENT STABILIZATION PRACTICES ARE EXPECTED TO BE USED: SEE SWP3 LAYOUTS
- vi. LOCATION OF CONSTRUCTION SUPPORT ACTIVITIES: SEE SWP3 LAYOUTS
- vii. SURFACE WATERS, INCLUDING WETLANDS, AT, ADJACENT, OR IN CLOSE PROXIMITY TO THE SITE (* INDICATES IMPAIRED WATERS): SEE SWP3 LAYOUTS
- viii. LOCATIONS WHERE STORMWATER DISCHARGES DIRECTLY TO A SURFACE WATER BODY OR MS4: SEE SWP3 LAYOUTS
- ix. VEHICLE WASH AREAS: N/A
- x. DESIGNATED POINTS ON THE SITE WHERE VEHICLES WILL EXIT FROM UNSTABLE DIRT TO PAVED ROAD: N/A

H. LOCATION AND DESCRIPTION OF CONSTRUCTION SUPPORT ACTIVITIES AUTHORIZED UNDER THE PERMITTEE'S NOI: CONSTRUCTION SUPPORT ACTIVITIES ARE NOT COVERED UNDER THIS SWP3 AS IT IS NOT AUTHORIZED UNDER THIS PERMITTEE'S CGP. THE PERMITTEE WILL MAKE REFERENCE TO CONSTRUCTION SUPPORT ACTIVITIES THAT ARE COVERED UNDER THE CONTRACTOR'S SWP3 AND CGP ON SWP3 LAYOUTS

I. NAME OF RECEIVING WATER(S) AT OR NEAR SITE: AN ASTERISK (*) INDICATES AN IMPAIRED WATER

*HURRICANE CREEK

NEAREST CLASSIFIED SEGMENT NUMBER: 0604

CLASSIFIED SEGMENT NAME: NECHES RIVER BELOW LAKE PALESTINE

J. COPY OF TPDES GENERAL PERMIT: SEE SWP3 FILE

K. NOI AND ACKNOWLEDGEMENT CERTIFICATE OR SITE NOTICE: SEE SWP3 FILE

L. STORMWATER AND ALLOWABLE NON-STORMWATER DISCHARGE LOCATIONS: SEE SWP3 LAYOUTS

M. LOCATIONS OF POLLUTANT GENERATING ACTIVITIES: ACTIVITIES AUTHORIZED UNDER THIS PERMITTEE'S CGP CAN BE FOUND ON SWP3 LAYOUTS. THIS SHEET WILL ALSO REFERENCE THE LOCATION OF POLLUTANT GENERATING ACTIVITIES THAT ARE COVERED BY THE CONTRACTOR'S CGP AND SWP3.

DESCRIPTION OF BMPS

A. GENERAL REQUIREMENTS: EROSION AND SEDIMENT CONTROLS SHOWN ON SWP3 LAYOUTS WERE DESIGNED TO RETAIN SEDIMENT ON-SITE TO THE EXTENT PRACTICABLE WITH CONSIDERATION OF LOCAL TOPOGRAPHY, SOIL TYPE, AND RAINFALL. THE EROSION AND SEDIMENT CONTROLS WILL BE INSTALLED AND MAINTAINED ACCORDING TO MANUFACTURER AND TXDOT STORM WATER MANAGEMENT GUIDELINES. CONTROLS TO MINIMIZE THE OFF-SITE TRANSPORT OF LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION MATERIALS INCLUDE: CONSTRUCTION MATERIALS TO BE STORED IN LOCATIONS THAT MINIMIZE THEIR EXPOSURE TO PRECIPITATION & STORM WATER RUNOFF; COLLECTION OF CONSTRUCTION DEBRIS IN RECEPTACLES WITH A SECURE COVER MEETING STATE AND LOCAL SOLID WASTE MANAGEMENT REGULATIONS; HAULING AND EMPTYING RECEPTACLES AT APPROVED LANDFILL SITES; PROHIBITING THE BURIAL OF CONSTRUCTION DEBRIS; COLLECTION OF SANITARY WASTE FROM PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATIONS BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

B. EROSION CONTROL AND STABILIZATION PRACTICES

T	TEMP/PERM SEEDING		PROTECTION OF TREES AND VEGETATION
	MULCHING (HAY OR STRAW)		GEOTEXTILES (SOIL RETENTION BLANKET)
	VEGETATIVE BUFFER STRIPS		SLOPE TEXTURING
	SOD STABILIZATION		TEMP VELOCITY DISSIPATION DEVICES
P	BLOCK SOD		FLOW DIVERSION MECHANISMS
	OTHER (CELLULAR FIBER MULCH)	T = TEMPORARY; P = PERMANENT	

DATES:
1. MAJOR GRADING ACTIVITIES: SEE CONSTRUCTION SCHEDULE FOR THESE DATES.
2. WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE: _____
3. WHEN STABILIZATION MEASURES ARE INITIATED: _____

INITIATE EROSION CONTROL AND STABILIZATION MEASURES IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. INITIATE STABILIZATION MEASURES THAT PROVIDE A PROTECTIVE COVER IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED. "IMMEDIATELY" MEANS NO LATER THAN THE NEXT WORK DAY FOLLOWING THE DAY WHEN THE SOIL-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. STABILIZATION MEASURES MUST BE COMPLETED NO MORE THAN 14 CALENDAR DAYS AFTER INITIATION BEGINS.

THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

C. SEDIMENT CONTROL PRACTICES

T	SILT FENCE		VEGETATIVE BUFFER STRIPS
T	OTHER (ROCK FILTER DAMS/SANDBAGS/EROSION CONTROL LOGS)		

IF SITE WILL DISTURB 10 OR MORE ACRES WITHIN A COMMON DRAINAGE LOCATION AND A SEDIMENTATION BASIN IS NOT FEASIBLE, PROVIDE REASON:

PROJECT DOES NOT DISTURB 10 OR MORE ACRES; THEREFORE, SEDIMENTATION BASIN NOT REQUIRED. THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

DESCRIPTION OF PERMANENT STORM WATER CONTROLS

PROVIDE A DESCRIPTION OF ANY MEASURES THAT WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL POLLUTANTS IN STORM WATER DISCHARGES THAT MAY OCCUR AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED: N/A

OTHER REQUIRED CONTROLS AND BMPS

TXDOT WILL UTILIZE ROCK AT CONSTRUCTION ENTRANCES AND SPRINKLING, AS NEEDED, TO MINIMIZE OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST.

SEE SECTION A ABOVE FOR DESCRIPTION OF CONSTRUCTION AND WASTE MATERIALS AND CONTROLS USED FOR THOSE THAT MAY BE STORED ON-SITE.

AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, FUELS, MOTOR OIL, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. STORE MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS. CONTACT THE SPILL COORDINATOR IMMEDIATELY IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS.

MAINTENANCE REQUIREMENTS

EFFECTIVELY MAINTAIN THE OPERATING CONDITIONS OF ALL EROSION AND SEDIMENT CONTROL AND OTHER PROTECTIVE MEASURES IDENTIFIED IN THE SWP3. IF SITE INSPECTIONS REQUIRED BY THIS PERMIT IDENTIFY BMP'S THAT ARE NOT OPERATING EFFECTIVELY, MAINTENANCE SHALL BE PERFORMED BEFORE THE NEXT ANTICIPATED STORM EVENT, OR AS NECESSARY TO MAINTAIN THE CONTINUED EFFECTIVENESS OF STORM WATER CONTROLS. IF MAINTENANCE PRIOR TO THE NEXT ANTICIPATED STORM EVENT IS UNPRACTICABLE, SCHEDULE AND ACCOMPLISH MAINTENANCE AS SOON AS PRACTICAL. CONTROLS THAT HAVE BEEN INTENTIONALLY DISABLED, RUN-OVER, REMOVED OR OTHERWISE RENDERED INEFFECTIVE MUST BE REPLACED OR CORRECTED IMMEDIATELY UPON DISCOVERY. IF A CONTROL HAS BEEN USED INCORRECTLY, IS PERFORMING INADEQUATELY OR IS DAMAGED, THE OPERATOR SHALL REPLACE OR MODIFY THE CONTROL AS SOON AS PRACTICABLE AFTER THE DISCOVERY.

INSPECTION OF CONTROLS

A) QUALIFIED PERSONNEL SHALL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE, ONCE EVERY 7 CALENDAR DAYS. DISTURBED AREAS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. SEDIMENT AND EROSION CONTROL MEASURES IDENTIFIED ON THE SWP3 SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING.

D) THE SWP3 MUST BE MODIFIED BASED ON THE RESULTS OF INSPECTION TO BETTER CONTROL POLLUTANTS IN RUNOFF. REVISIONS TO THE SWP3 MUST BE COMPLETED WITHIN 7 CALENDAR DAYS FOLLOWING THE INSPECTION. IF EXISTING BMPS ARE MODIFIED OR ADDITIONAL BMPS ARE NECESSARY, AN IMPLEMENTATION SCHEDULE MUST BE DESCRIBED IN THE SWP3. IMPLEMENTATION OF CHANGES SHOULD BE DONE PRIOR TO THE NEXT STORM EVENT IF POSSIBLE, OTHERWISE, THEY SHOULD BE DONE AS SOON AS PRACTICABLE.

E) A REPORT SUMMARIZING THE SCOPE, DATE, NAME AND QUALIFICATIONS OF INSPECTOR, AND MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE SWP3 SHALL BE PRODUCED AND RETAINED AS PART OF THE SWP3. MAJOR OBSERVATIONS INCLUDE: LOCATIONS OF DISCHARGES OF SEDIMENT OR OTHER POLLUTANTS FROM THE SITE, LOCATIONS OF BMPS THAT NEED TO BE MAINTAINED, LOCATIONS OF BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION AND LOCATIONS WHERE BMPS ARE NEEDED. ACTIONS TAKEN AS A RESULT OF INSPECTIONS MUST BE DESCRIBED WITHIN AND RETAINED AS PART OF THE SWP3. REPORTS MUST IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE. WHERE THE REPORT DOES NOT IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE, THE REPORT MUST CONTAIN A CERTIFICATION THAT THE SITE IS IN COMPLIANCE WITH THE SWP3 AND PERMIT.

OTHER SWP3 CONTENT

TXDOT WILL ENSURE THE APPROPRIATE POLLUTION PREVENTION MEASURES (I.E. VEGETATED BUFFER STRIPS, SILT FENCE, ETC.) ARE IDENTIFIED AND IMPLEMENTED FOR ALL ELIGIBLE NON-STORMWATER WATER COMPONENTS OF DISCHARGE SUCH AS WASHING OF VEHICLES, STRUCTURES, AND PAVEMENT WHERE SOAPS AND DETERGENTS ARE NOT USED AND THE PURPOSE IS TO REMOVE DIRT, MUD OR DUST; UNCONTAMINATED WATER USED FOR DUST CONTROL; AND LAWN WATERING AND SIMILAR IRRIGATION DRAINAGE.

CHECKLIST FOR CONTENTS OF AREA OFFICE SWP3 FILE:

- ☐ CONTACT FORM *
- ☐ NOI AND ACKNOWLEDGEMENT CERTIFICATE (IF EQUAL OR GREATER THAN 5 ACRES)
- ☐ APPLICABLE CONSTRUCTION SITE NOTICE *
- ☐ SWP3 CERTIFICATION STATEMENT (SIGNED BY AE)
- ☐ TPDES GENERAL PERMIT
- ☐ SWP3 PLAN
- ☐ INSPECTION AND MAINTENANCE REPORT
- ☐ INSPECTOR QUALIFICATION FORM
- ☐ DELEGATION OF SIGNATURE AUTHORITY (ALL INSPECTORS SIGNING REPORTS)
- ☐ NOTICE OF TERMINATION

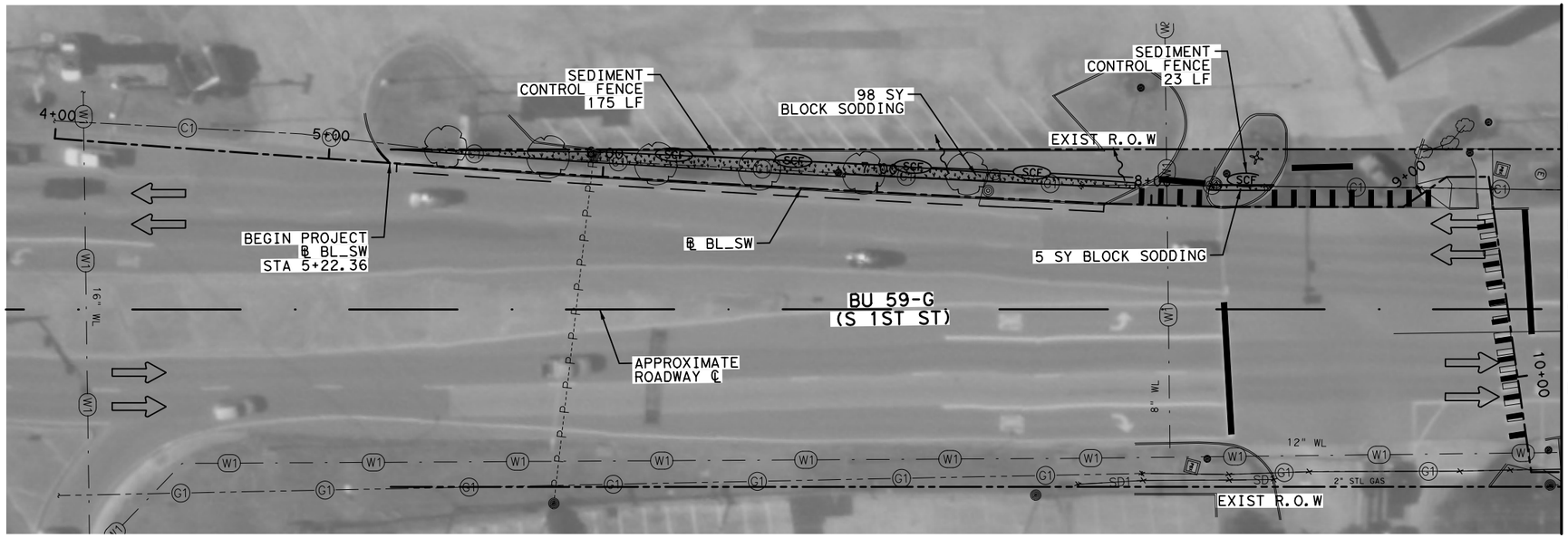
STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

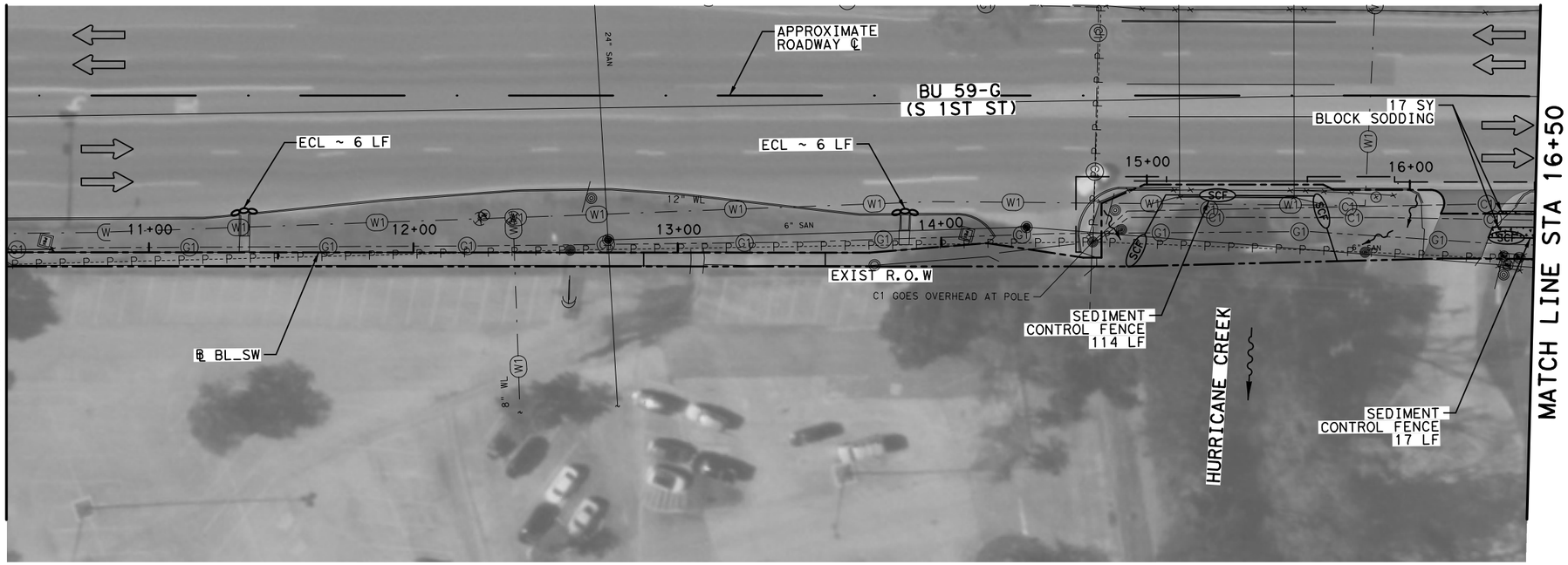
* SYMBOL INDICATES THAT THE INFORMATION SHOULD BE DISPLAYED ON THE PROJECT BULLETIN BOARD

ANY REPORTABLE QUANTITY OF HAZARDOUS MATERIAL RELEASE MUST BE REPORTED TO NATIONAL RESPONSE CENTER AT 1-800-424-8802 AND TO STATE OF TEXAS SPILL-REPORTING HOTLINE AT 1-800-832-8224

TXDOT SWP3 INDEX
(SWP3I)

CONT	SECT	JOB	HIGHWAY
0176	02	125, ETC.	BU 59G
DIST	CITY		SHEET NO.
LFK	ANGELINA		96





0′ 25′ 50′

SCALE IN FEET

LEGEND:

- FLOW ARROW
- SCF — TEMP SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS EC(9)-16
- BLOCK SODDING

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

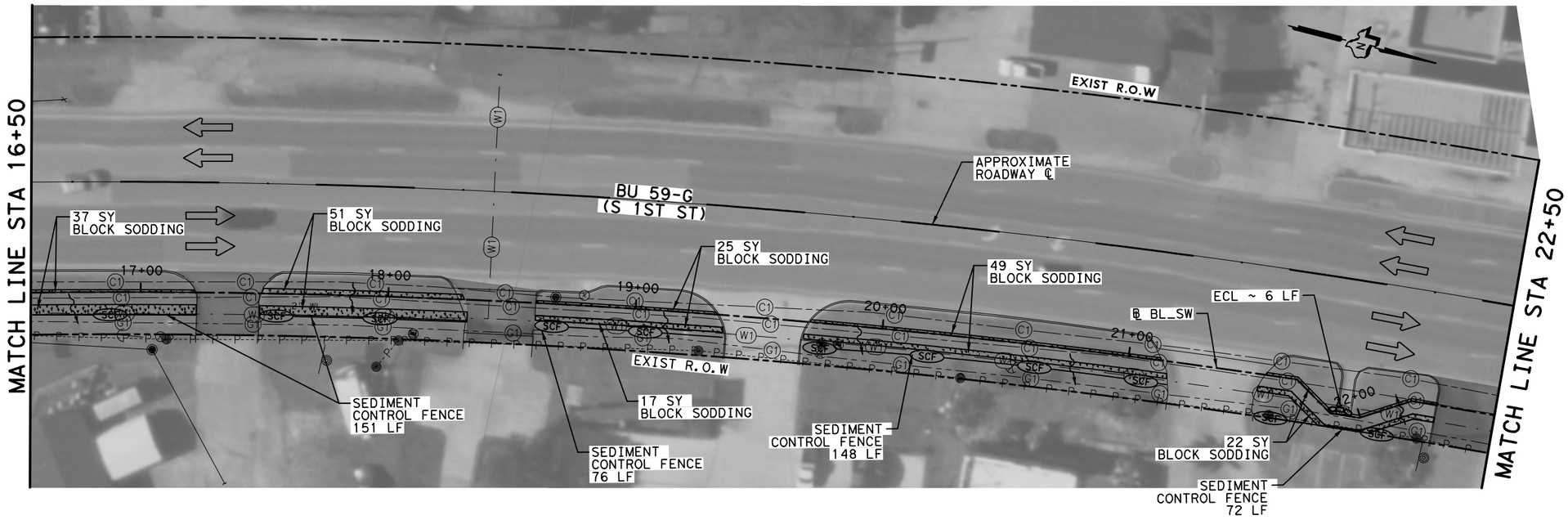
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

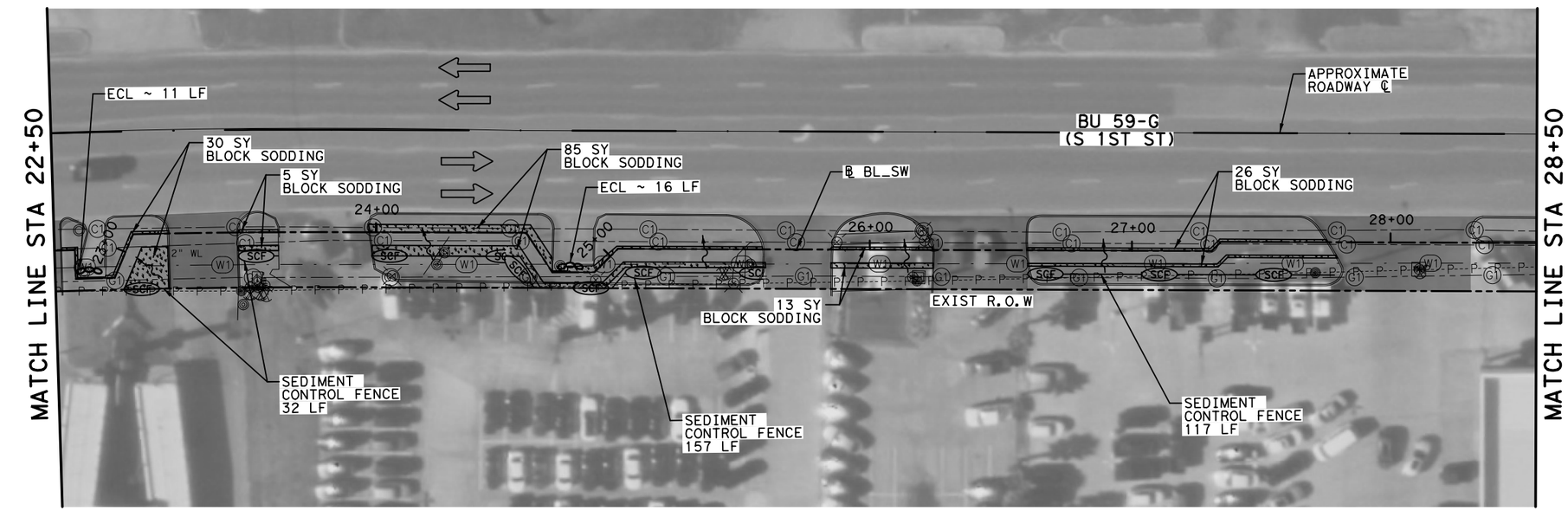
SWP3 LAYOUT

SHEET 1 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	97
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

DRAWING DATE: 5/25/2022
FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\11 Erosion Control Plan\BU59*SW3P*01.dgn





0′ 25′ 50′

SCALE IN FEET

LEGEND:

- FLOW ARROW
- SCF — TEMP SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS EC(9)-16
- BLOCK SODDING

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

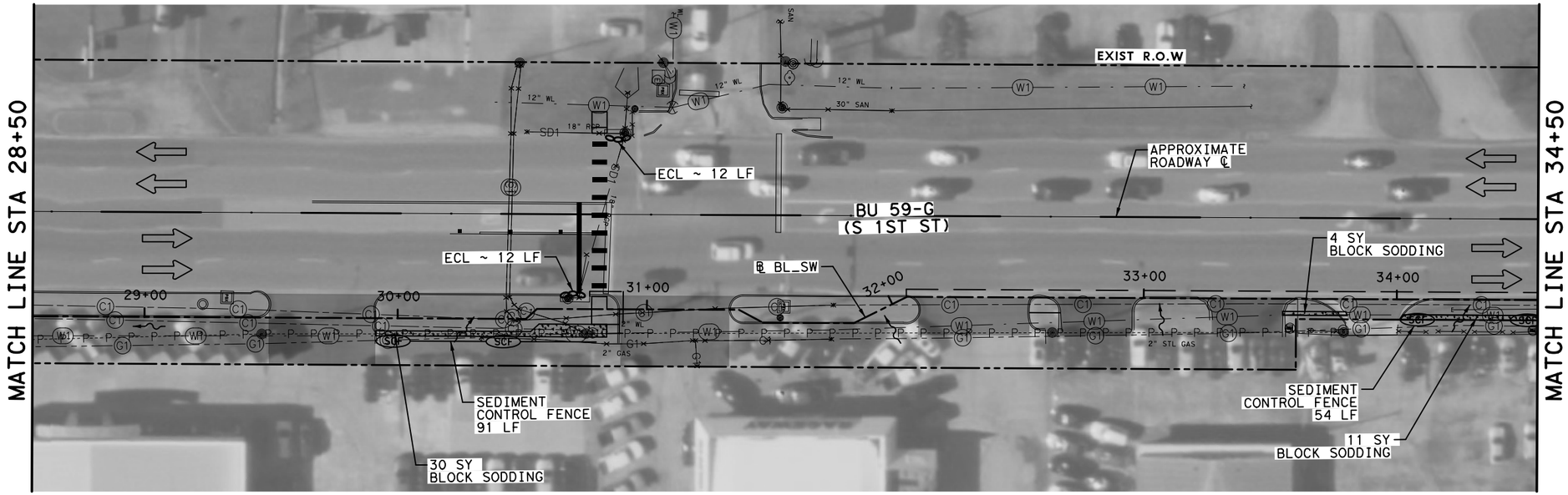
SWP3 LAYOUT

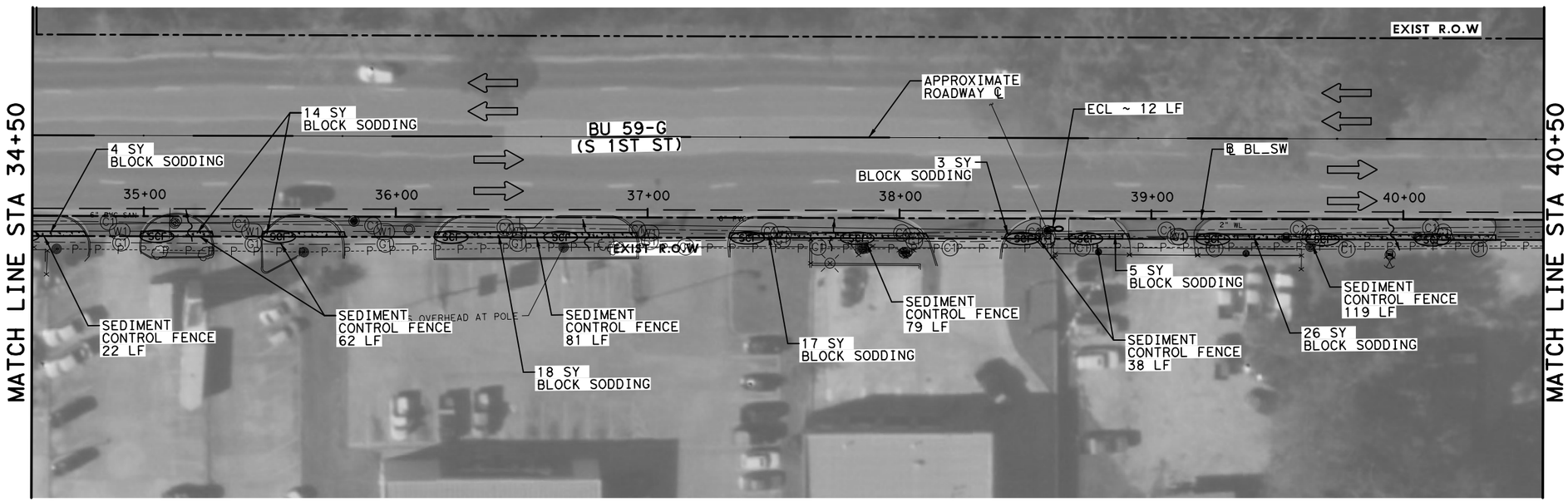
SHEET 2 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	98
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\11 Erosion Control Plan\BU59*SW3P*02.dgn

DRAWING DATE: 5/25/2022





0′ 25′ 50′

SCALE IN FEET

LEGEND:

- FLOW ARROW
- SCF — TEMP SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS EC(9)-16
- BLOCK SODDING

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

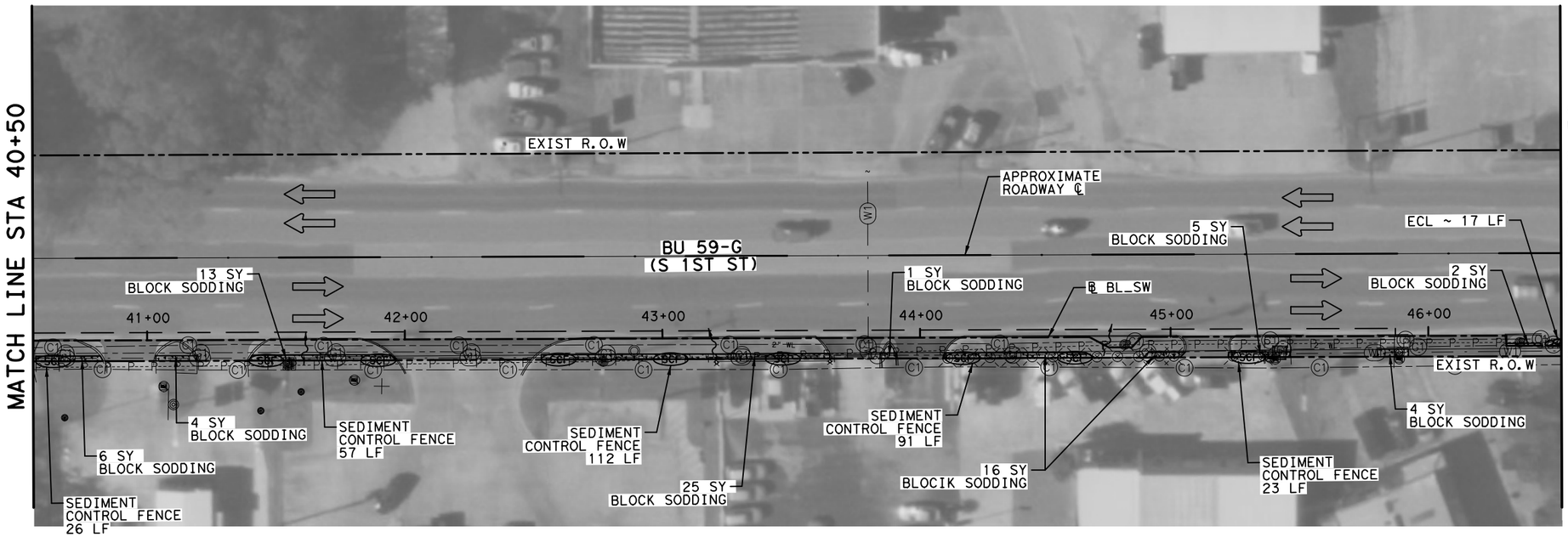
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

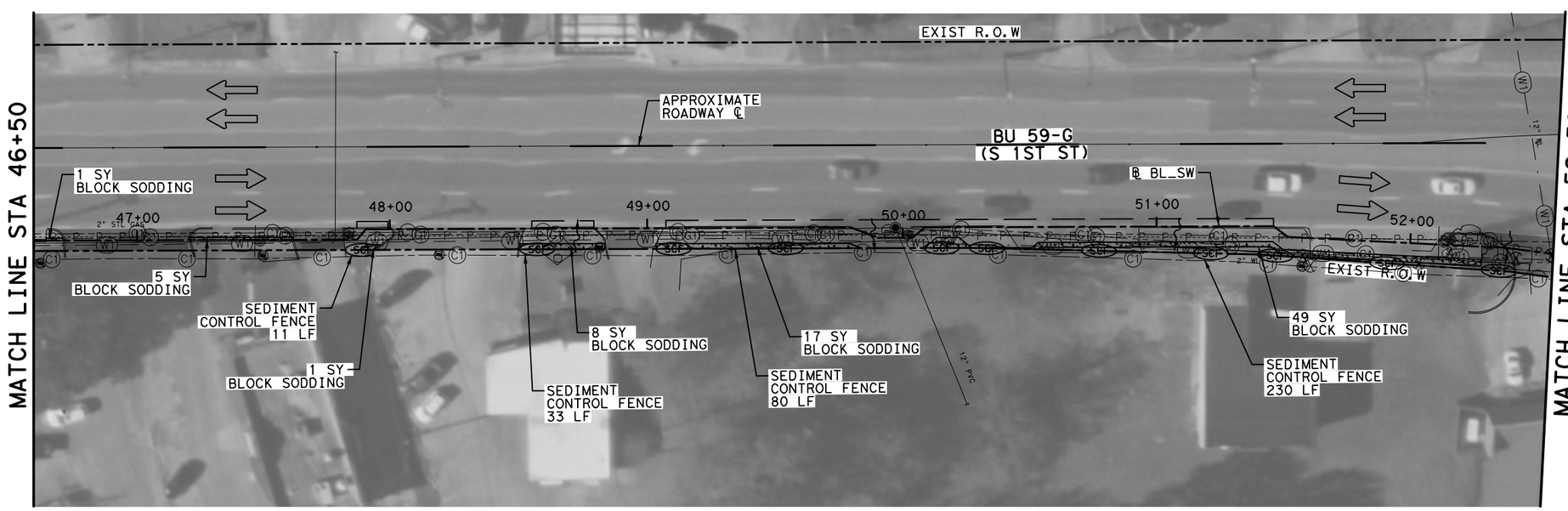
SWP3 LAYOUT

SHEET 3 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	99
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

DRAWING DATE: 5/25/2022 FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\11 Erosion Control Plan\BU59*SW3P*03.dgn





0′ 25′ 50′

SCALE IN FEET

LEGEND:

- FLOW ARROW
- (SCF) TEMP SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS EC(9)-16
- BLOCK SODDING

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

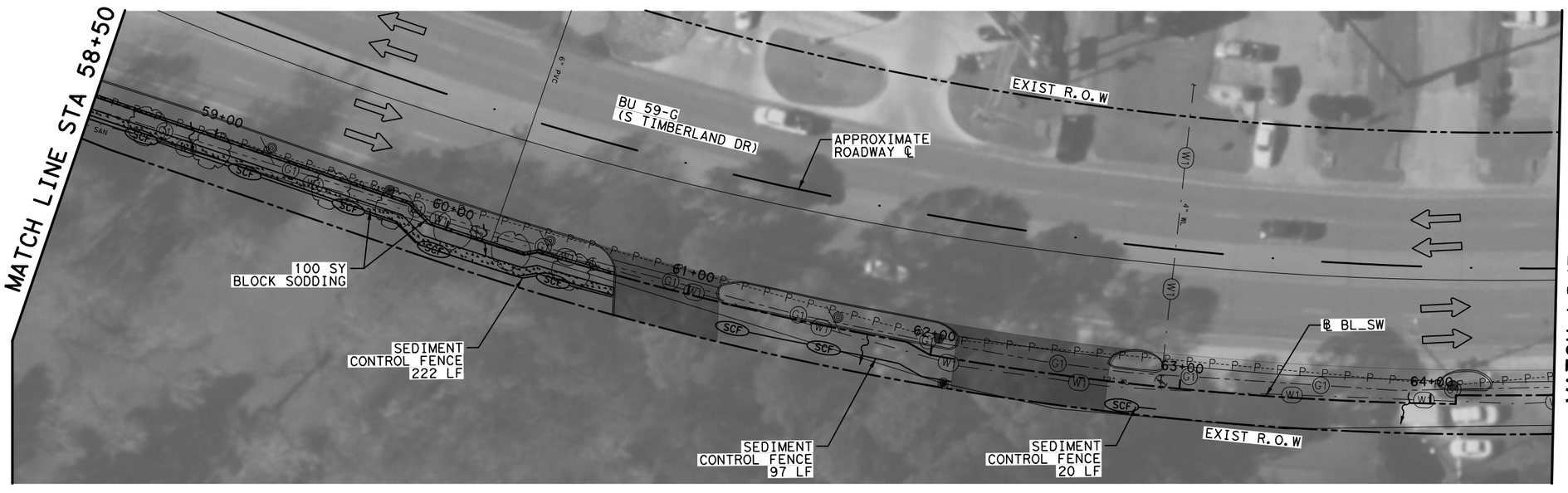
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SWP3 LAYOUT

SHEET 4 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	100
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\11 Erosion Control Plan\BU59*SW3P*04.dgn
DRAWING DATE: 5/25/2022



0′ 25′ 50′

SCALE IN FEET

LEGEND:

- FLOW ARROW
- SCF — TEMP SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS EC(9)-16
- BLOCK SODDING

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation
© 2022

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

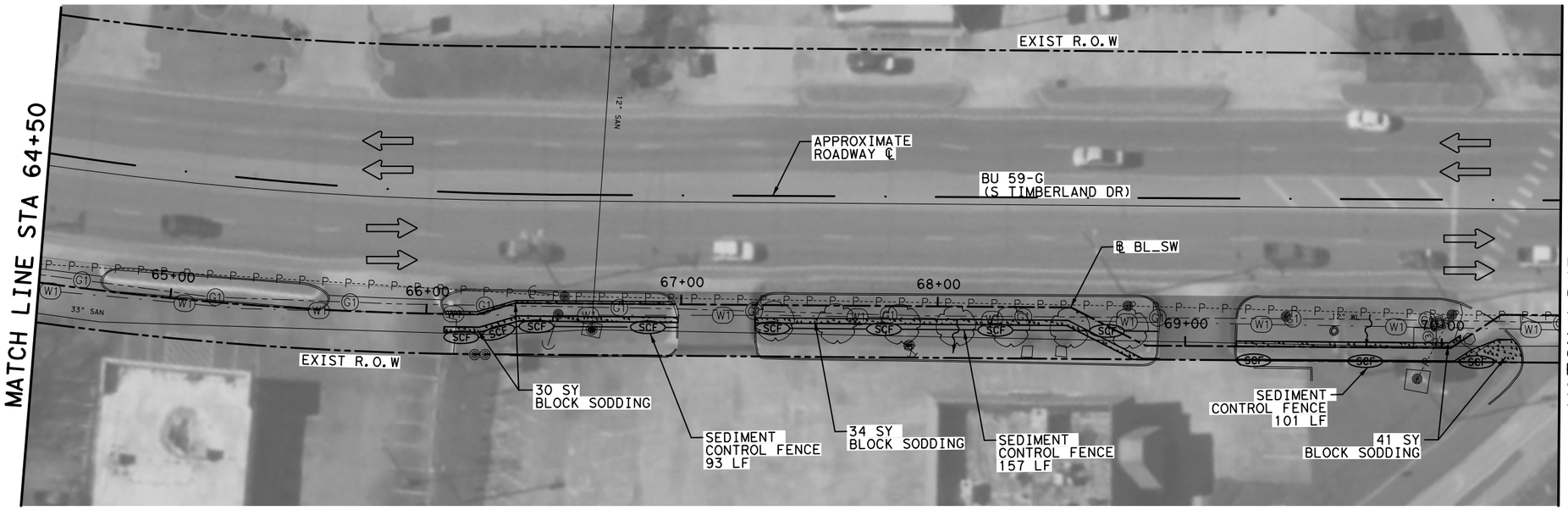
SWP3 LAYOUT

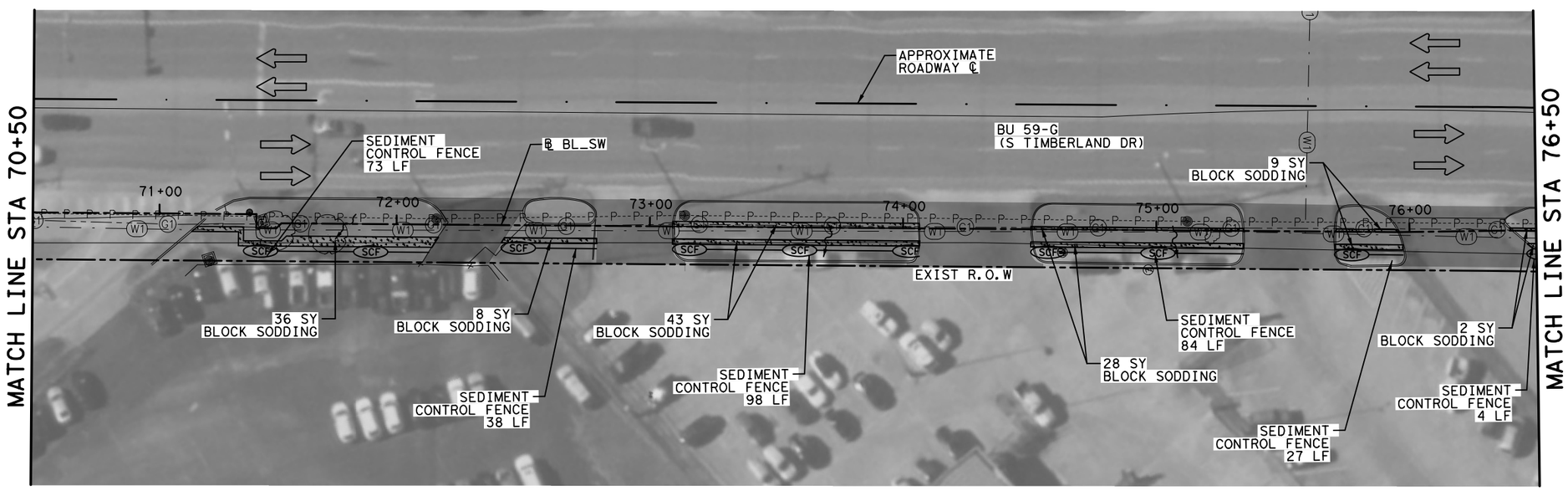
SHEET 5 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	101
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\11 Erosion Control Plan\BU59*SW3P*05.dgn

DRAWING DATE: 5/25/2022





0′ 25′ 50′

SCALE IN FEET

LEGEND:

- FLOW ARROW
- SCF — TEMP SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS EC(9)-16
- BLOCK SODDING

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

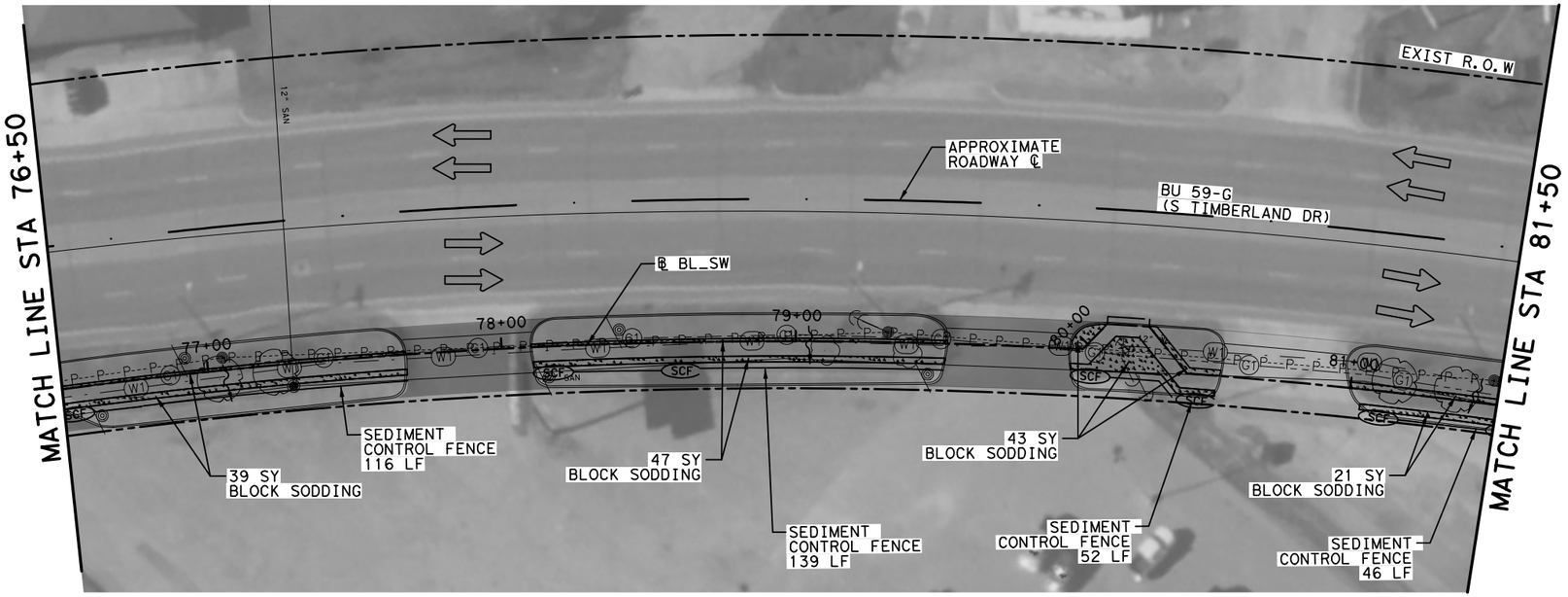
I.S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

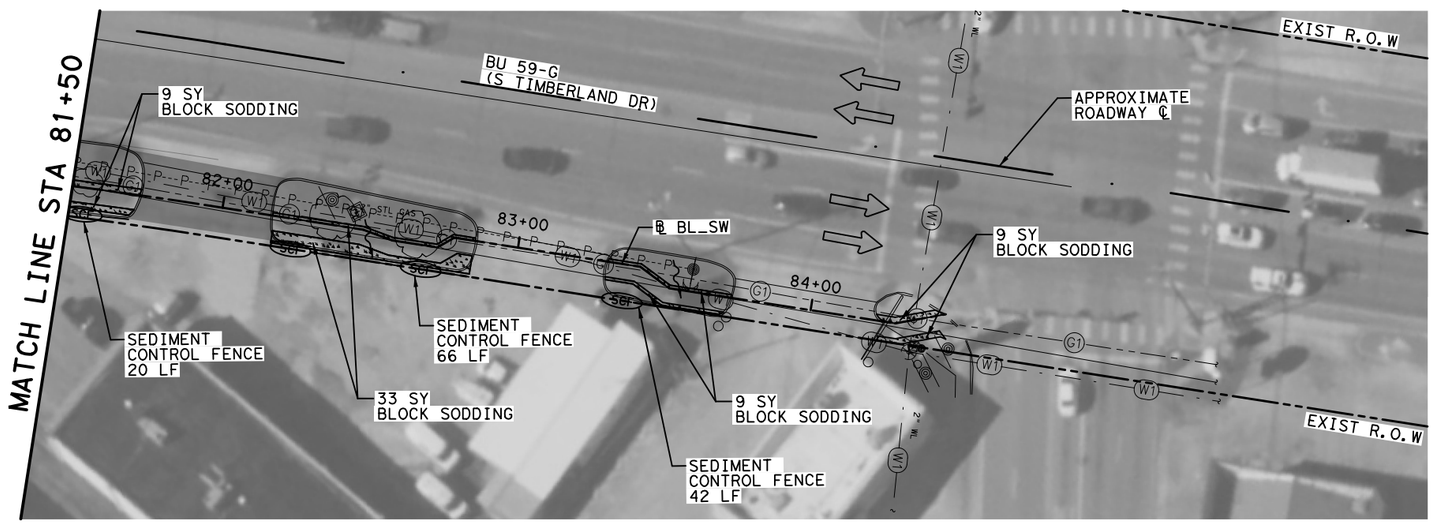
SWP3 LAYOUT

SHEET 6 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	102
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

DRAWING DATE: 5/25/2022 FILENAME: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ*ADA\CADD\Sheets\11 Erosion Control Plan\BU59*SW3P*06.dgn





0′ 25′ 50′

SCALE IN FEET

LEGEND:

- FLOW ARROW
- TEMP SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS EC(9)-16
- BLOCK SODDING

STATE OF TEXAS
MORT T. TASHOOR
116089
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

Rev. No.	C.O. No.	Description	Date	By

Texas Department of Transportation

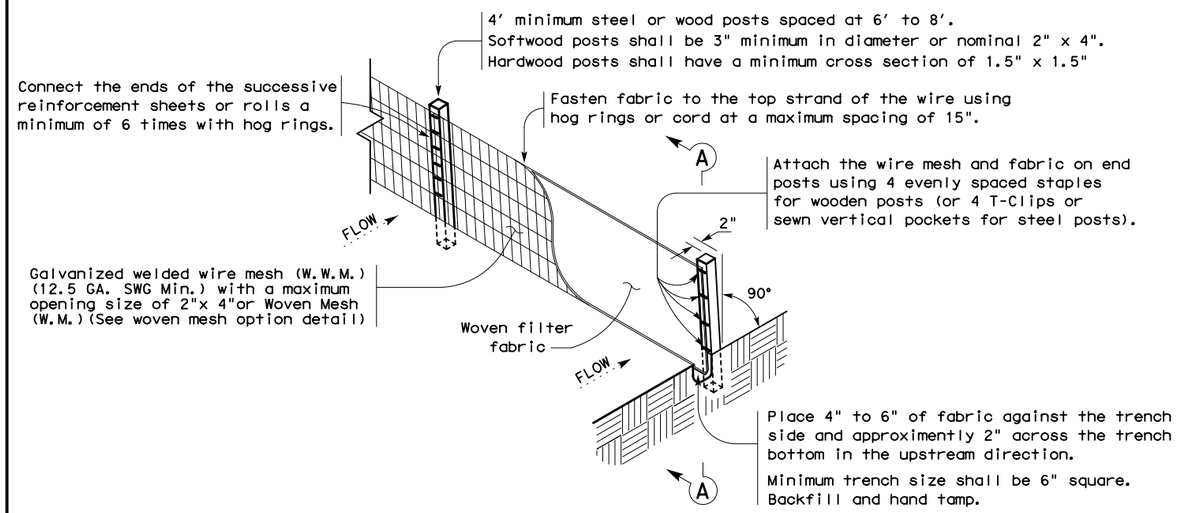
I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

SWP3 LAYOUT

SHEET 7 OF 7

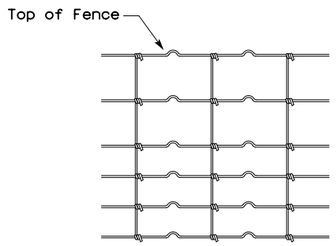
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			BU 59G
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	LFK	ANGELINA	103
CONTROL	SECTION	JOB	
0176	02	125, ETC.	

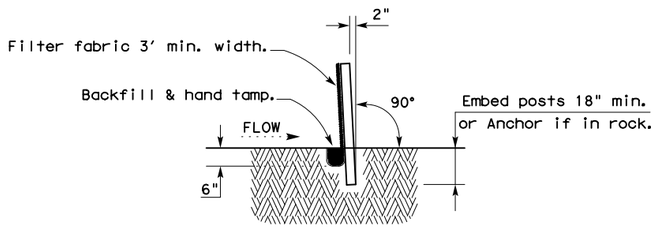
DRAWING DATE: 5/25/2022
FILENAME: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ*ADA\CADD\Sheets\11 Erosion Control Plan\BU59*SW3P*07.dgn



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.

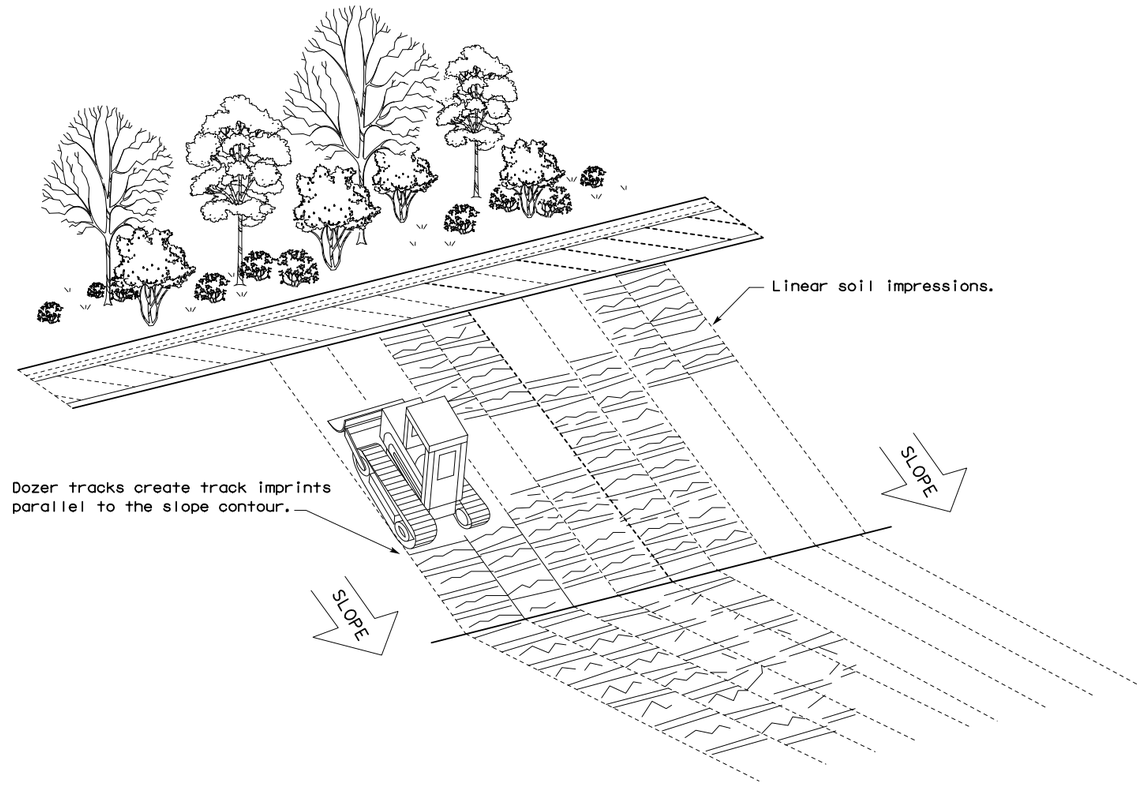
LEGEND

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

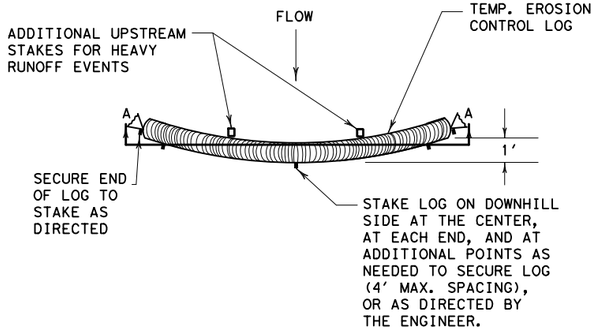
FENCE & VERTICAL TRACKING

EC(1)-16

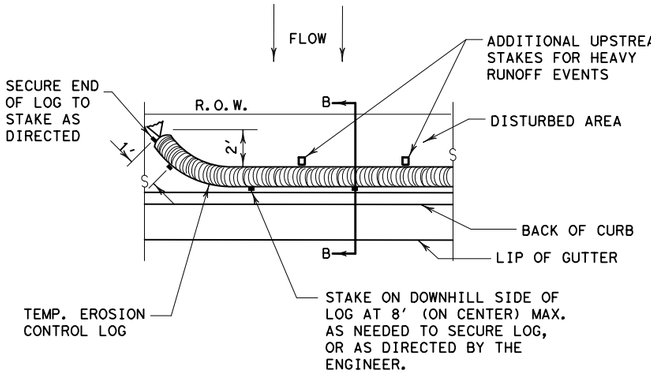
FILE: ec116	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0176	02	125, ETC.		BU 59G	
	DIST	COUNTY			SHEET NO.	
	LFK	ANGELINA			104	

5/31/2022
LFILE: Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\11 Erosion Control Plan\TxDOT Standards\EC(1)-16.dgn

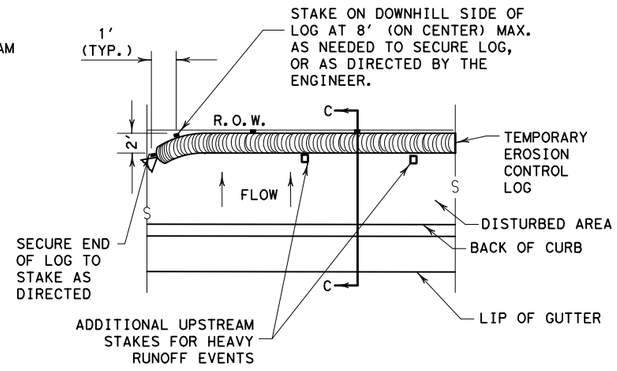
DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\11 Erosion Control Plan\TxDOT Standards\EC(9)-16.dgn



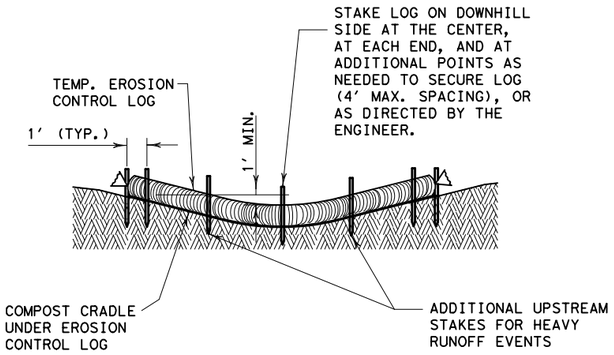
PLAN VIEW



PLAN VIEW



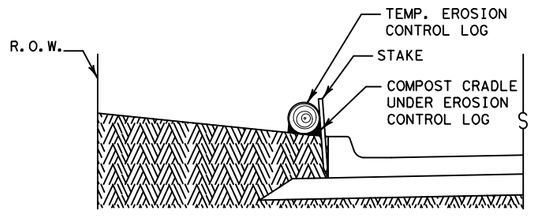
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

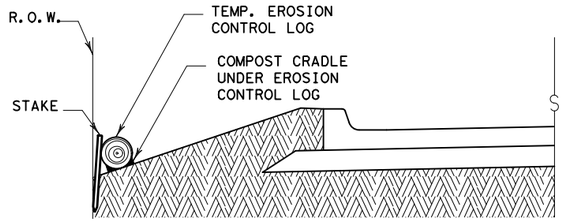
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

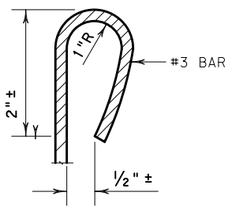
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

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

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.

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.

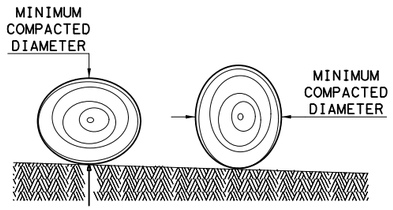
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

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.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation — Design Division Standard

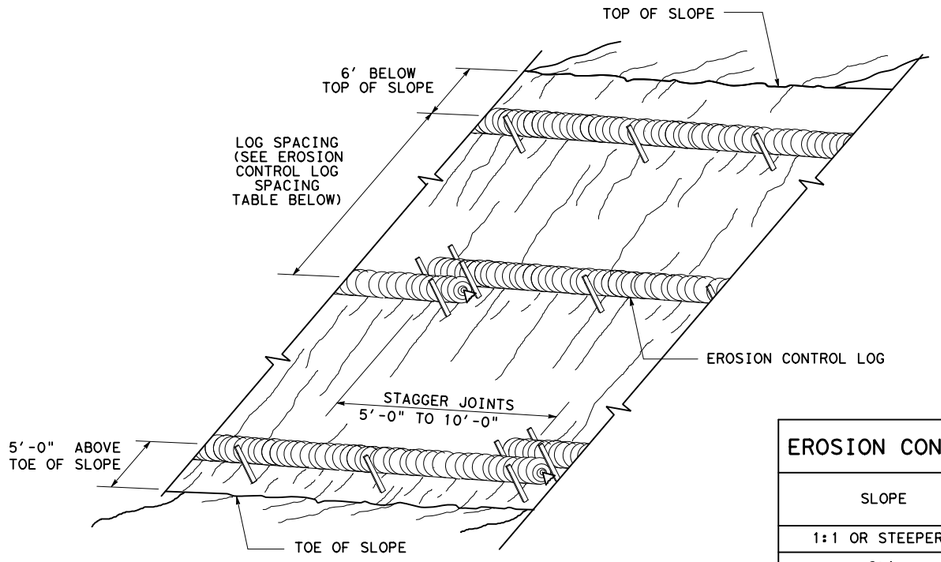
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

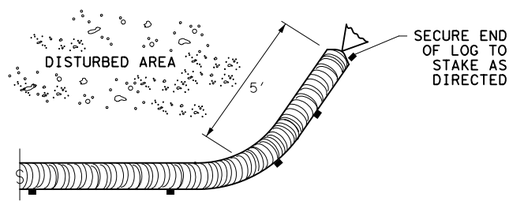
FILE: ec916		DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0176	02	125, ETC.		BU 59G	
		DIST		COUNTY			SHEET NO.
		LFK		ANGELINA			105

DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-91DP5089 WA4 RTZ_ADA\CADD\Sheets\11 Erosion Control Plan\TxDOT Standards\EC(9)-16.dgn



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

CL-SST

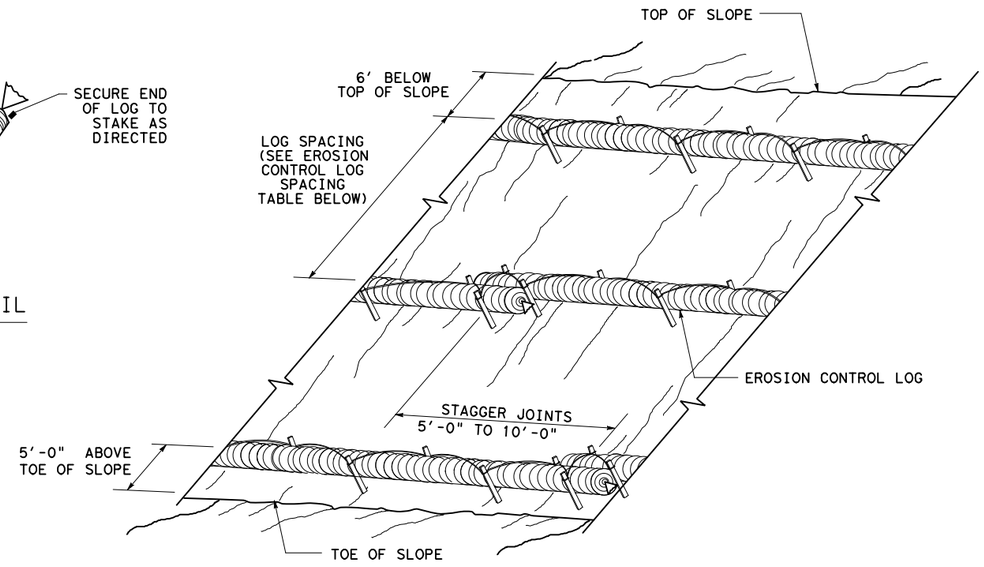


END SECTION RAP DETAIL

EROSION CONTROL LOG SPACING TABLE

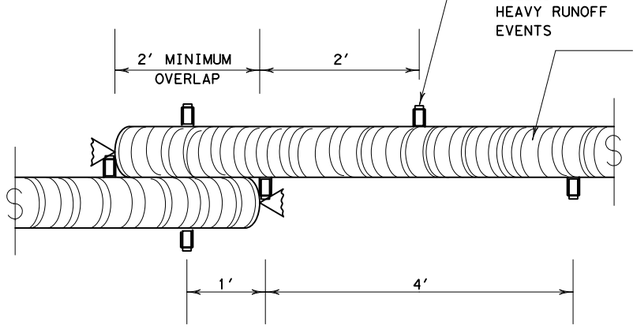
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

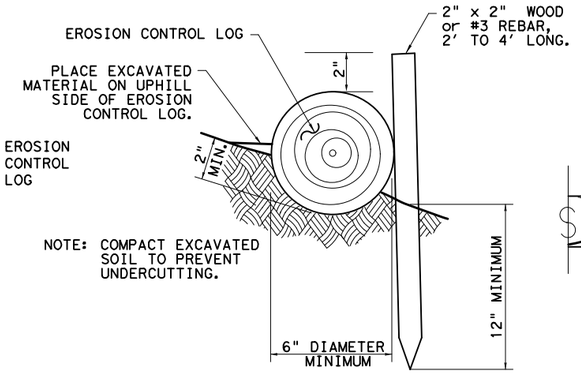
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL



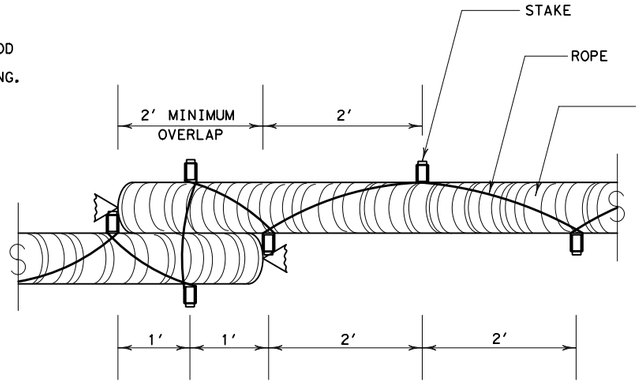


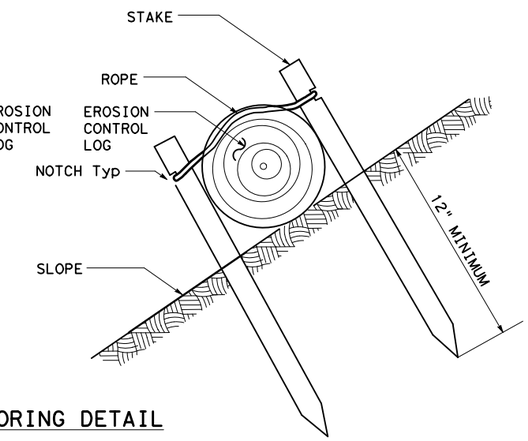
STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

TRENCH DEPTH TABLE

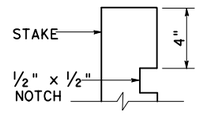
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



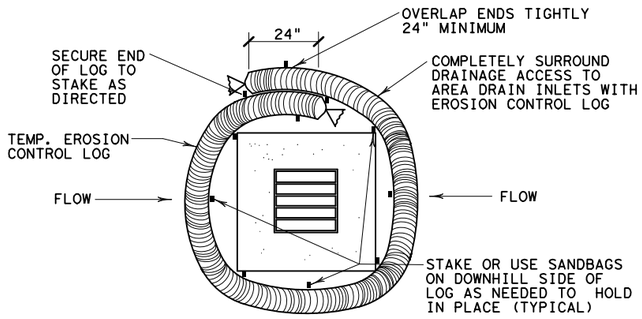
STAKE NOTCH DETAIL

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

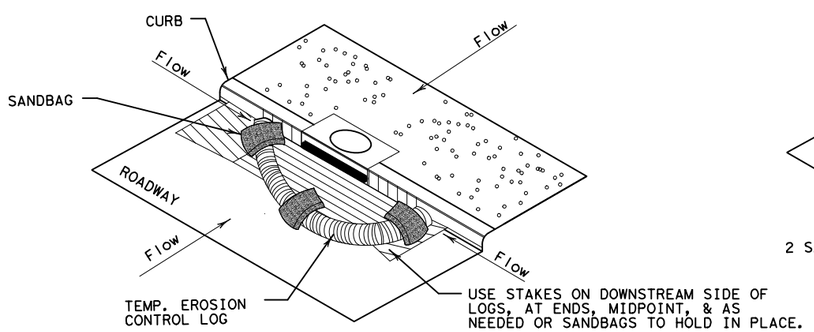
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0176	02	125, ETC.	BU 59G
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		106

DATE: 5/9/2022
FILE: L:\Lufkin District\Contract 36-9IDP5089 WA4 RTZ_ADA\CADD\Sheets\11 Erosion Control Plan\TxDOT Standards\EC(9)-16.dgn



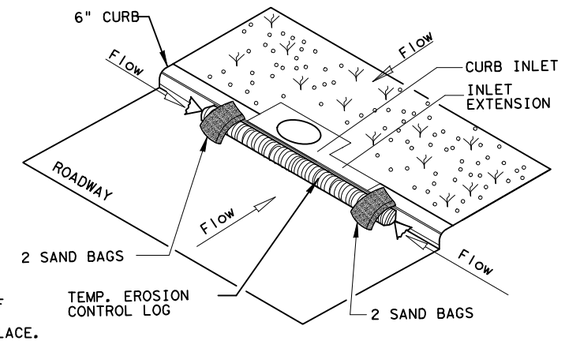
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

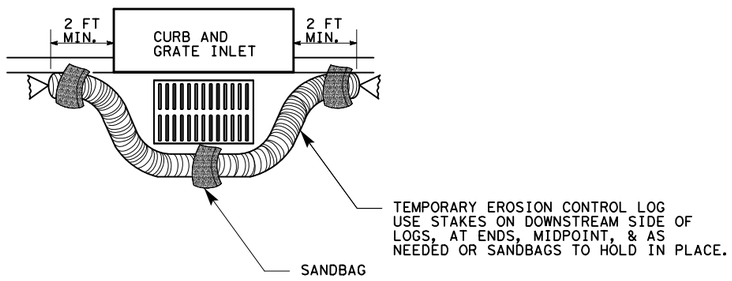
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

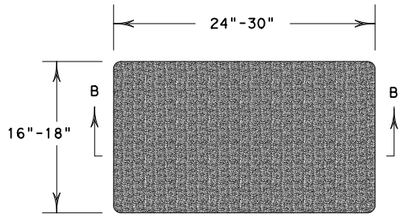
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



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	0176	02	125, ETC.		BU 59G		
	DIST	COUNTY			SHEET NO.		
	LFK	ANGELINA			107		