

FHWA TEXAS DIVISION	PROJECT NO.	SHEET NO.	
	F 2023 (012)	1	
STATE	DISTRICT	COUNTY	
TEXAS	LFK	ANGELINA	
CONTROL	SECTION	JOB	HIGHWAY NO.
3264	01	010	FM 326

SEE SHEET 2 FOR INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT F 2023 (012)

FM 326
ANGELINA COUNTY

NET LENGTH OF PROJECT = 2,699 FT. = 0.51 MI.

LIMITS FROM: 0.510 MILES NORTH OF US 69 TO: US 69

FUNCTIONAL CLASSIFICATION: RURAL MAJOR COLLECTOR
DESIGN SPEED = 30 M.P.H.
2019 ADT = 1,200
2039 ADT = 1,700

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 2022005567

BARRICADES AND WARNING SIGNS

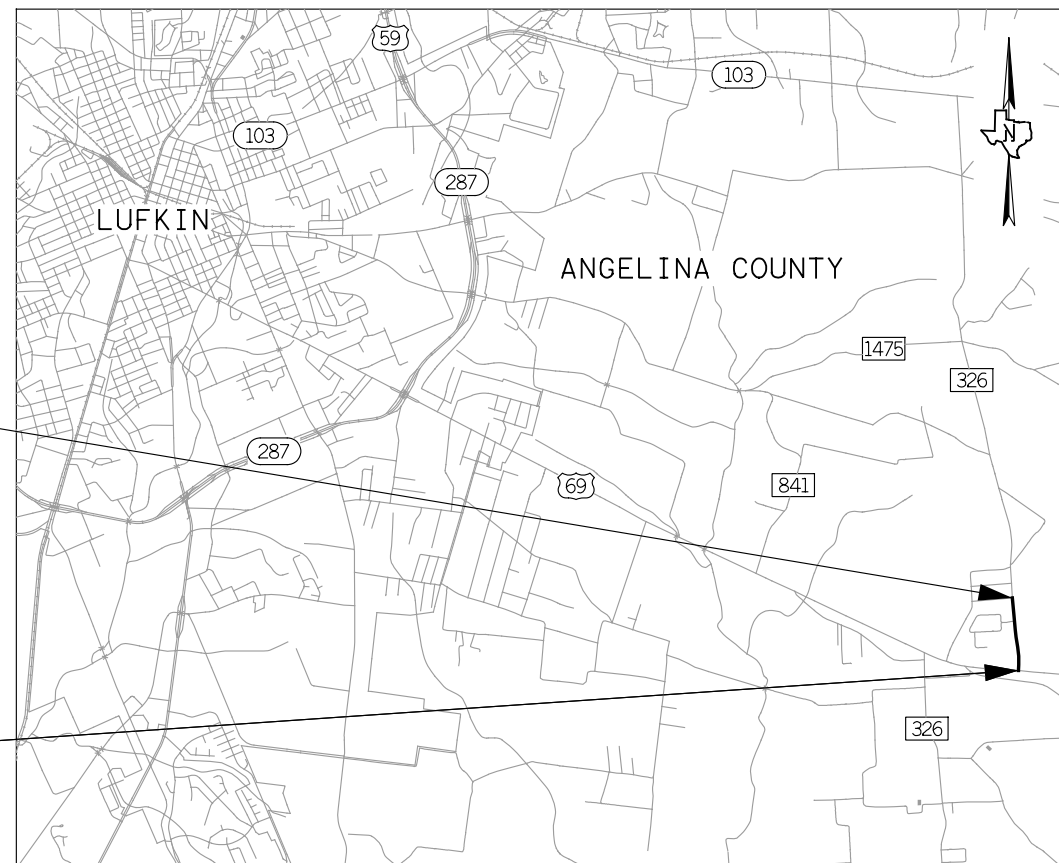
PROVIDE AND ERECT BARRICADES AND WARNING SIGNS IN ACCORDANCE WITH THE BARRICADE & CONSTRUCTION STANDARDS, TCP STANDARDS, THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND AS DIRECTED.



RTG RODRIGUEZ TRANSPORTATION GROUP
FIRM #587



FOR THE CONSTRUCTION OF REHABILITATION OF EXISTING ROAD
CONSISTING OF RECONSTRUCT AND WIDEN PAVEMENT



LOCATION MAP N. T. S.

BEGIN PROJECT

CSJ: 3264-01-010
REF MRK 360 +1.616
LAT: 31.294695°
LONG: -94.627260°
STA 27+28.00

PREVIOUS PROJECT TIE

PROJECT NO.: STP 1902 (160), ETC.
CSJ: 3264-01-009
TIE-IN STA: 27+28.00

END PROJECT

CSJ: 3264-01-010
REF MRK 362 +0.122
LAT: 31.287470°
LONG: -94.627029°
STA 0+29.00

PREVIOUS PROJECT TIE

PROJECT NO.: STP 1902 (160), ETC.
CSJ: 3264-01-009
TIE-IN STA: 0+29.00

RECOMMENDED FOR LETTING: 7/27/2022 APPROVED FOR LETTING: 7/27/2022

DocuSigned by:
Jennifer Adams
ADVANCE TRANSPORTATION
PLANNING DIRECTOR

DocuSigned by:
Kelly O. Morris, P.E.
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, JULY 2022).

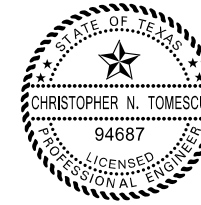
"NO EXCEPTIONS, NO EQUATIONS, NO RAILROAD CROSSINGS"

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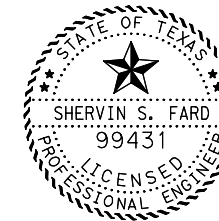
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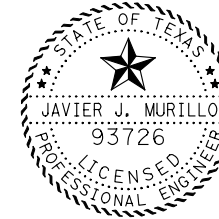
THE STANDARD SHEETS SPECIFICALLY IDENTIFIED BY "*" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT

Christopher N. Tomescu 6/17/2022
 CHRISTOPHER N. TOMESCU, P.E. DATE



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

Shervin S. Fard 6/17/2022
 SHERVIN S. FARD, P.E. DATE



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

Javier J. Murillo 6/17/2022
 JAVIER J. MURILLO, P.E. DATE



RTG RODRIGUEZ TRANSPORTATION GROUP
 FIRM #587

INDEX OF SHEETS

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.		
CHECKED:	6	TEXAS		FM 326		
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010	2

GENERAL NOTES:

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.

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.

Project Mowing

Mow the highway right of way within the project limits a maximum of 3 cycles per year as directed. Mowing will not be measured or paid for directly, but will be subsidiary to various bid items.

The equipment used for mowing shall consist of approved mowing units capable of mowing on slopes without marring finished slope surfaces or injuring existing growth. The minimum cutting width shall not be less than 5 ft., unless otherwise approved.

Mow all areas of existing vegetation and vegetation placed during the project as directed. The mowing height shall be 5 in. unless otherwise directed. Repair portions of sod or grass that are injured during mowing operations as directed.

Mow as close as possible to all fixed objects, exercising extreme care not to damage trees, plants, shrubs, signs, delineators or other appurtenances which are part of the facility. Hand trim around such objects, unless otherwise specified.

Use safety chains or other manufacturer's safety device to prevent damage to people or property caused by flying debris propelled out from under rotary mowers. Chains shall be a minimum size of 5/16 in. and links spaced side by side around the mower's front, sides and rear. When mowing at the specified cutting height, the chains shall be long enough to drag the ground. If at any time, it is determined mowing or trimming equipment is defective to the point that it may affect the quality of work or create an unsafe condition, then that equipment shall be immediately repaired or replaced.

Litter Pickup

Remove litter from the right of way in the limits of this project a maximum of 3 cycles per year as directed. 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 on FTP (https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting_Responses/) site 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.

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.

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.

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.

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 to September 15). In the event birds or active nests (eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work.

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.

Provide a Critical Path Method (CPM) Construction Schedule unless otherwise approved.

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.

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

County: Angelina

Highway: FM 326

Control: 3264-01-010

Item 150: Blading

Use blading to reshape slopes and ditches as directed.

Mix a minimum width of 6 ft. from the edge of pavement and a depth of 6 inches using approved equipment prior to blading operations to reshape front slopes. Mixing will be subsidiary to Item 150.

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 169: Soil Retention Blankets

In areas designated for soil retention blankets (SRB) in the plans, furnish only spray-on products listed on the Approved Product List for Erosion Control Products based upon the Class and Type specified in the plans. Any substitution to spray-on products must be approved in writing, be listed on the Approved Product List for Erosion Control Products based upon Class and Type, and shall not contain UV degradable, photodegradable or polypropylene materials.

Item 247: Flexible Base

Provide flexible base with a minimum plasticity index of 2.

Provide flexible base material with a minimum Bar Linear Shrinkage of 2% as determined by Test Method Tex-107-E, Part II.

Stockpiling of base material will not be required if testing has been performed and the material has been approved at the source. Deliver approved specified materials to the project.

Item 276: Cement Treatment (Plant-Mixed)

Cure with a mixture of emulsified asphalt and water as approved.

County: Angelina

Highway: FM 326

Control: 3264-01-010

Sheet 3B

Cement treated material shall be placed in lifts no greater than 5 inches, unless otherwise approved.

No strength requirement is specified. The target cement content is 3%.

Item 302: Aggregates for Surface Treatments

When using Type E, furnish Type E aggregate consisting of crushed stone or natural limestone rock asphalt.

When using Type PE aggregate, furnish Type PE aggregate consisting of pre-coated crushed stone or natural limestone rock asphalt.

Aggregate stockpile locations shall be approved prior to stockpiling.

Locate aggregate stockpiles off the highway right of way unless otherwise approved.

When directed, flush aggregate stockpiled for surface treatment with water to remove excessive dust particles, in such sequence that will permit free water to drain from the stockpiled aggregate prior to surfacing operations. This work will be subsidiary to various bid items.

No surface aggregate classification is required.

The target asphalt content for pre-coating will be 1.0%.

Item 316: Seal Coat

Apply the covered prime weekly.

Open season for asphalt placement is from May 1 thru August 31. Do not place asphalt outside the open season without written approval.

The uniformity and rate of distribution of asphaltic material will be checked periodically during construction. Apply the seal coat in lane widths unless otherwise directed. Where extra width of surfacing has been provided in transitions and climbing lanes, seal the entire surface width.

Resurface county road turnouts and intersection areas as directed.

Place surface on driveways and other road turnouts prior to placing the final roadway surface.

Cease application of asphalt 2 hr. before sunset unless otherwise directed.

Cure the first course of the surface treatment as directed prior to placing the second course.

Cure the surface treatment as directed prior to placement of the overlay.

Cure the covered prime a minimum of 14 days prior to placement of the surface treatment.

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Use precoated aggregate with AC-15P, and use non-precoated aggregate with RC-250 and CRS-2P.

Furnish medium pneumatic tire rollers in accordance Item 210, "Rolling". Provide enough rollers to perform the work as directed.

Sweep all roadways with a powered rotary broom prior to placement of the surface treatment to remove all loose or excess material or debris. After rolling, sweep as soon as aggregate has sufficiently bonded to remove excess. Use a vacuum broom on all roadway sections having curb and gutter and all roadway sections within the city limits of any city.

Item 320: Equipment for Asphalt Concrete Pavement

Cover each load of asphalt with waterproof tarpaulins.

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 420: Concrete Substructures

Limit work on structures crossing the roadway to one side of the roadway at a time. No work shall begin on the opposite side of the roadway until backfilling of the initially extended portion of the structure is completed.

Item 421: Hydraulic Cement Concrete

The Engineer will provide curing facilities and strength testing equipment for acceptance testing at Lufkin Area Engineer Office, 1805 N. Timberland Dr., Lufkin, TX 75907.

Item 427: Surface Finishes for Concrete

Provide a rub finish for Surface Area I.

Item 432: Riprap

Stone riprap will require the placement of filter fabric prior to placement of stones.

County: Angelina

Highway: FM 326

Sheet 3C

Control: 3264-01-010

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 464: Reinforced Concrete Pipe

Lay each private entrance or side road pipe culvert to the line and grade as directed.

Limit work on pipe culverts crossing the road to one side of the roadway at a time. No work shall begin on the opposite side of the roadway until backfilling the first side of the pipe culvert being extended is complete.

When excavation does not generate enough material to complete the backfill, additional material must be approved prior to use and will be paid for under Item 132.

Item 465: Junction Boxes, Manholes, and Inlets

All junction boxes, manholes, and inlets are to be precast unless otherwise shown on the plans or directed by the Engineer.

Construct inlets in a manner to allow drainage of the subgrade during construction.

Construct inlets in two stages, the top portion (stage two) shall be cast in place.

Item 466: Headwalls and Wingwalls

Provide cast-in-place headwalls and wingwalls.

Item 467: Safety End Treatment

Use Type II precast concrete units of the same style and design.

Provide 12 in. deep toewalls on Type II precast safety end treatments.

Check each location where safety end treatments are to be installed to verify pipe lengths shown will produce the desired slope. Extra pipe will be paid for, but removing and replacing safety end treatment units previously installed under this Contract will not be paid for.

Place safety end treatments along the same slope as the pipe.

Item 496: Removing Structures

Place salvageable county road pipe at the Right of Way line.

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.

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.

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.

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 temporary rumble strips as shown on work zone rumble strip standards.

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.

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 "Shoulder Drop-Off" (CW8-17) and "Uneven Lanes" (CW8-11) signs at one-half mile spacings as the hot mix asphalt is placed, unless otherwise directed. Maintain signs until the condition is eliminated.

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 Type 3 Barricade or barrels on the approach side of each site that is within 30 ft. of the driving lane. Use Type 3 Barricade or barrels for the site similarly on the departure side if the location is within 30 ft. of the opposing traffic lane.

Law enforcement assistance will be required for this project and is expected to be required for major traffic control changes and lane closures. Coordinate with local law enforcement and arrange for law enforcement as directed or agreed by the Engineer. Complete the weekly tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided.

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.

Temporary stop lines as shown on TCP (2-2)-18 should be omitted.

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 504: Field Office and Laboratory

Provide a Type D Structure. Asphalt content will be determined by the ignition method.

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.

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 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.

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

Item 560: Mailbox Assemblies

Repair and, if necessary, replace mailboxes damaged by construction operations.

The number and type of mailbox assemblies shown in the plans are for estimating purposes; actual quantities may vary.

Use 1 size 3 reflector mounted on the upstream and downstream sides of the post as directed for single and double mailbox assemblies.

Use 1 strip of reflective sheeting on the upstream and downstream sides of post for multiple mailbox assemblies in lieu of the Type 2 object marker shown on the mailbox standards. Each strip shall be approximately 12 in. wide. Use reflective sheeting conforming to DMS-8600.

Item 585: Ride Quality for Pavement Surfaces

Use Surface Test Type A.

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.

County: Angelina

Highway: FM 326

Control: 3264-01-010

Item 662: Work Zone Pavement Markings

Place standard work zone pavement markings before traffic is routed over detours.

Install standard work zone pavement markings on the level-up course of the overlay.

Standard work zone pavement markings shall be paint and glass beads or thermoplastic.

Install short term pavement markings (removable) on the hot mix asphalt immediately following final rolling.

Install short term pavement markings (removable) on the finish course of the overlay immediately following final rolling, offset from lane lines so there will be no conflict with permanent stripes.

Place short term pavement markings on the surface treatment and level-up course immediately following final rolling.

After placement of permanent striping on the finish course, remove all short term pavement markings.

Furnish Type II glass beads conforming to DMS-8290, "Glass Traffic Beads", for hot applied thermoplastic and traffic paint markings.

Item 666: Reflectorized Pavement Markings

Remove loose aggregate immediately prior to placing pavement markings.

Place reflectorized pavement markings no sooner than 3 days nor later than 14 days after placement of the surface treatment.

Type I markings must meet the minimum retroreflectivity values for edgeline markings, centerline or no passing barrier-line, and lane lines when measured any time after 3 days, but not later than 10 days after application.

Item 672: Raised Pavement Markers

Place permanent raised pavement markers after permanent striping has been completed.

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.

County: Angelina

Highway: FM 326

Control: 3264-01-010

Sheet 3F

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 3077: Superpave Mixtures

No Department-owned RAP is available.

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

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 minimum rate of 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.

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.

Provide a tack that meets the requirements of Item 300, Table 3A or Table 10A, unless otherwise approved by the engineer.

Cover each load of mixture with waterproof tarpaulins.

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.

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

County: Angelina

Sheet 3G

Highway: FM 326

Control: 3264-01-010

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

Two (2) TMA (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.

Two (2) TMAs (Mobile) will be required for each mobile operation. Quantities were estimated based on one mobile working operation, as per the number of working days. If multiple crews are utilized, additional TMAs will be required.



CONTROLLING PROJECT ID 3264-01-010

DISTRICT Lufkin
HIGHWAY FM 326

COUNTY Angelina

Estimate & Quantity Sheet

CONTROL SECTION JOB				3264-01-010		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00064342			
COUNTY				Angelina			
HIGHWAY				FM 326			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	940.000		940.000	
	104-6022	REMOVING CONC (CURB AND GUTTER)	LF	1,240.000		1,240.000	
	105-6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	1,559.000		1,559.000	
	110-6001	EXCAVATION (ROADWAY)	CY	2,132.000		2,132.000	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY	1,195.000		1,195.000	
	150-6001	BLADING	STA	24.140		24.140	
	162-6002	BLOCK SODDING	SY	5,097.000		5,097.000	
	164-6003	BROADCAST SEED (PERM) (RURAL) (CLAY)	SY	4,252.000		4,252.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)	SY	2,126.000		2,126.000	
	164-6011	BROADCAST SEED (TEMP) (COOL)	SY	2,126.000		2,126.000	
	168-6001	VEGETATIVE WATERING	MG	187.480		187.480	
	169-6003	SOIL RETENTION BLANKETS (CL 1) (TY C)	SY	4,252.000		4,252.000	
	276-6230	CEM TRT(PLNT MX) (CLN)(TYA)(GR1-2)(10")	SY	5,989.000		5,989.000	
	316-6060	ASPH (RC-250)	TON	6.300		6.300	
	316-6416	AGGR (TY E OR L, PE OR PL GR 4)	CY	131.000		131.000	
	316-6417	AGGR (TY E OR L GR 5)	CY	43.000		43.000	
	316-6530	ASPH (AC-15P OR CRS-2P)	TON	32.100		32.100	
	400-6005	CEM STABIL BKFL	CY	139.000		139.000	
	400-6008	CUT & RESTORE ASPH PAVING	SY	20.000		20.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	35.000		35.000	
	420-6071	CL C CONC (COLLAR)	EA	4.000		4.000	
	432-6011	RIPRAP (CONC) (CL B) (6")	CY	230.000		230.000	
	432-6033	RIPRAP (STONE PROTECTION)(18 IN)	CY	30.000		30.000	
	450-6051	RAIL (HANDRAIL)(TY E)	LF	86.000		86.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF	270.000		270.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	518.000		518.000	
	465-6168	INLET (COMPL)(TY A)	EA	1.000		1.000	
	466-6095	HEADWALL (CH - PW - 0) (DIA= 18 IN)	EA	1.000		1.000	
	466-6101	HEADWALL (CH - PW - 0) (DIA= 36 IN)	EA	1.000		1.000	
	466-6103	HEADWALL (CH - PW - 0) (DIA= 48 IN)	EA	1.000		1.000	
	467-6358	SET (TY II) (18 IN) (RCP) (4: 1) (C)	EA	3.000		3.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA	8.000		8.000	
	467-6389	SET (TY II) (24 IN) (RCP) (3: 1) (P)	EA	1.000		1.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA	12.000		12.000	
	474-6021	CAST-IN-PLACE TRENCH DRAIN	LF	6.000		6.000	
	480-6001	CLEAN EXIST CULVERTS	EA	2.000		2.000	
	496-6016	REMOV STR (PIPE)	EA	12.000		12.000	



DISTRICT	COUNTY	CCSJ	SHEET
Lufkin	Angelina	3264-01-010	4



CONTROLLING PROJECT ID 3264-01-010

DISTRICT Lufkin
HIGHWAY FM 326

COUNTY Angelina

Estimate & Quantity Sheet

CONTROL SECTION JOB				3264-01-010		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00064342			
COUNTY				Angelina			
HIGHWAY				FM 326			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	16.000		16.000	
	506-6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF	306.000		306.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	306.000		306.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	81.000		81.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	81.000		81.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1,636.000		1,636.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1,636.000		1,636.000	
	529-6008	CONC CURB & GUTTER (TY II)	LF	2,422.000		2,422.000	
	530-6004	DRIVEWAYS (CONC)	SY	820.000		820.000	
	530-6005	DRIVEWAYS (ACP)	SY	1,332.000		1,332.000	
	531-6001	CONC SIDEWALKS (4")	SY	1,290.000		1,290.000	
	531-6010	CURB RAMPS (TY 7)	EA	1.000		1.000	
	560-6015	MAILBOX INSTALL-S (TIM-POST) TY 5	EA	4.000		4.000	
	644-6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	1.000		1.000	
	644-6034	IN SM RD SN SUP&AM TYS80(1)SA(U-1EXT)	EA	1.000		1.000	
	644-6060	IN SM RD SN SUP&AM TYTWT(1)WS(P)	EA	3.000		3.000	
	644-6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA	1.000		1.000	
	644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA	1.000		1.000	
	644-6071	RELOCATE SM RD SN SUP&AM TY TWT	EA	5.000		5.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	1.000		1.000	
	658-6099	INSTL OM ASSM (OM-2Z)(WFLX)GND	EA	15.000		15.000	
	662-6004	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	LF	4,828.000		4,828.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	4,828.000		4,828.000	
	662-6050	WK ZN PAV MRK REMOV (REFL) TY II-A-A	EA	120.000		120.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	776.000		776.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	244.000		244.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	760.000		760.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	480.000		480.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	1,348.000		1,348.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	4,826.000		4,826.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	50.000		50.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	6.000		6.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	6.000		6.000	
	672-6007	REFL PAV MRKR TY I-C	EA	62.000		62.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	60.000		60.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	666.000		666.000	

DISTRICT	COUNTY	CCSJ	SHEET
Lufkin	Angelina	3264-01-010	4A



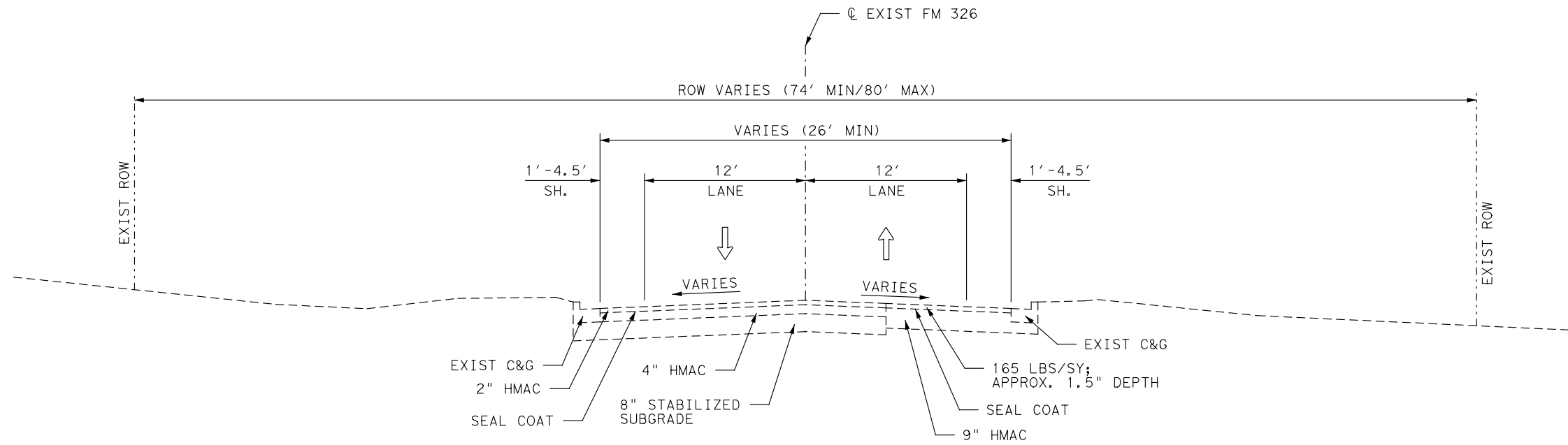
Estimate & Quantity Sheet

CONTROLLING PROJECT ID 3264-01-010

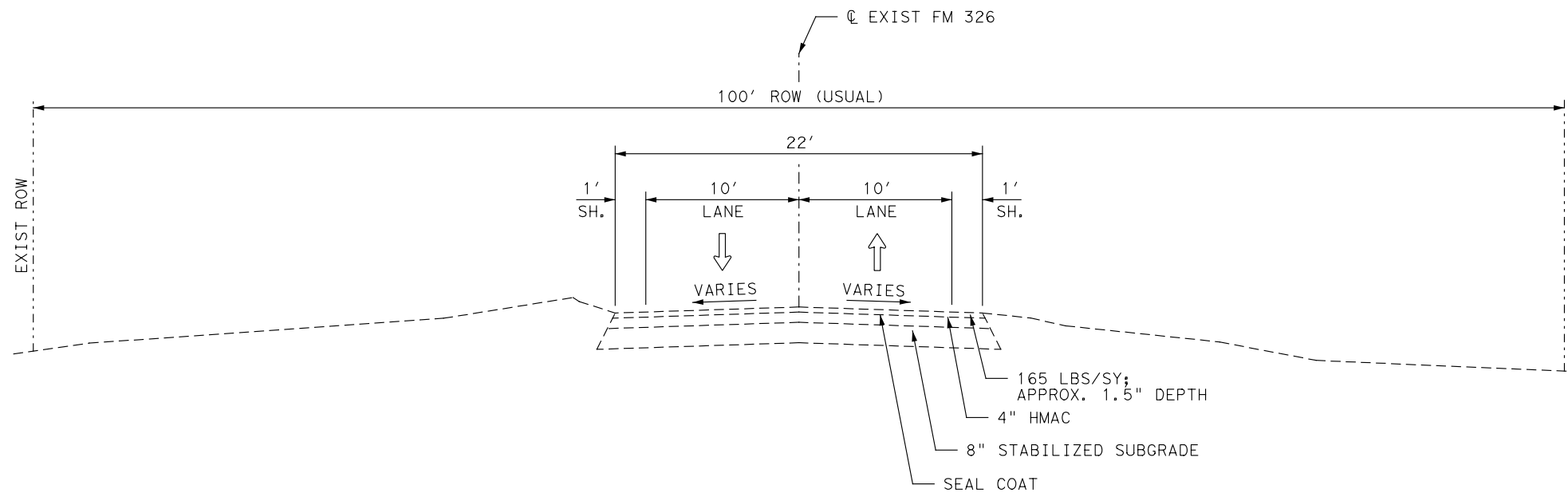
DISTRICT Lufkin
HIGHWAY FM 326

COUNTY Angelina

CONTROL SECTION JOB				3264-01-010		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00064342			
COUNTY				Angelina			
HIGHWAY				FM 326			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	685-6002	RELOCATE RDS FLASH BEACON ASSEMBLY	EA	1.000		1.000	
	3077-6021	SP MIXESSP-CPG70-22	TON	3,005.000		3,005.000	
	3077-6022	SP MIXESSP-CSAC-A PG70-22	TON	1,269.000		1,269.000	
	3077-6075	TACK COAT	GAL	2,648.000		2,648.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	3.000		3.000	
	6185-6002	TMA (STATIONARY)	DAY	171.000		171.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	7.000		7.000	
	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	



FM 326 EXISTING TYPICAL SECTION
STA 0+29.00 - STA 8+75.00



FM 326 EXISTING TYPICAL SECTION
STA 8+75.00 - STA 27+28.00

N. T. S.



Rick Peggart



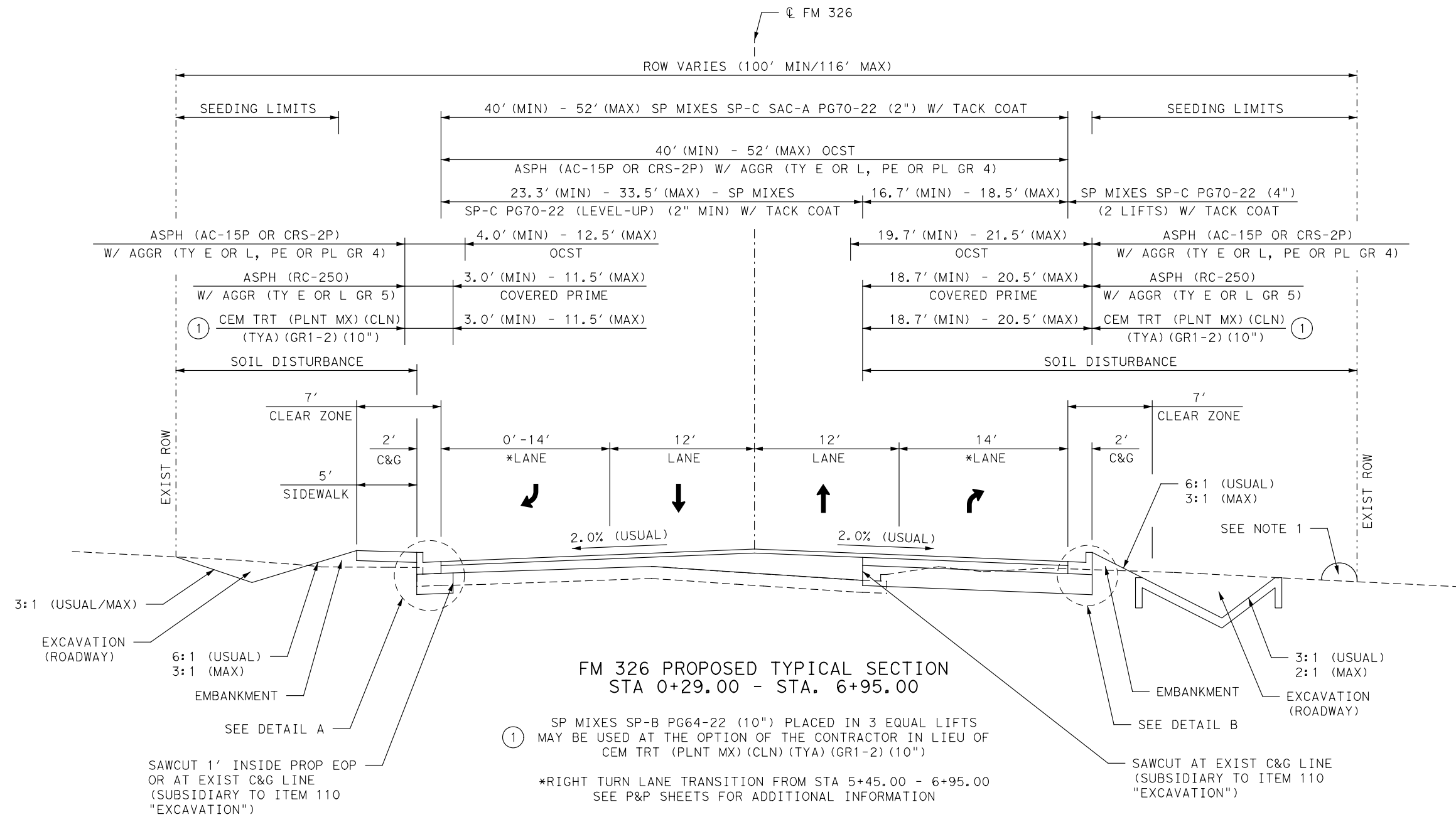
RTG RODRIGUEZ
TRANSPORTATION
GROUP
FIRM #587

TYPICAL SECTIONS
(EXISTING)

SHEET 1 OF 7

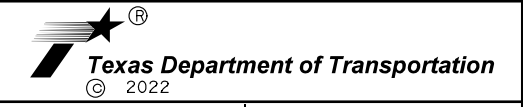
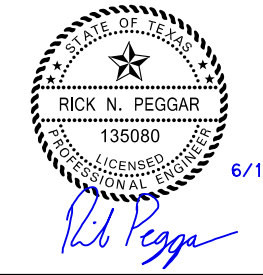
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- NOTES:
- BLADE 6" OF EXISTING TOPSOIL AND WINDROW OUTSIDE OF WORK AREA, THEN RETURN SLOPES UPON COMPLETION OF ROADWAY WORK. THIS OPERATION WILL BE PAID FOR UNDER ITEM 150, BLADING.

N. T. S.



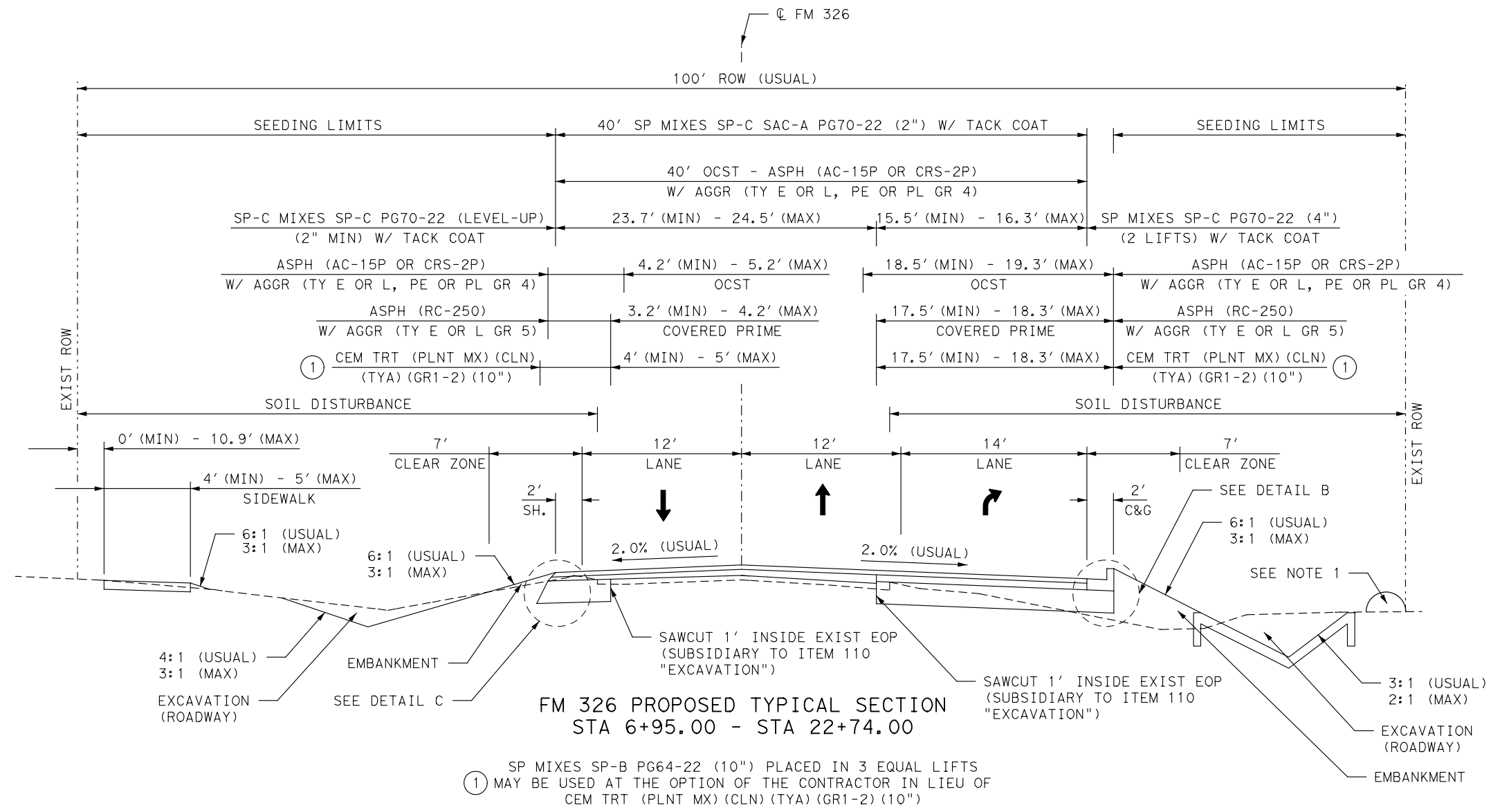
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 TRANSPORTATION
 GROUP
FIRM #587

TYPICAL SECTIONS
(PROPOSED)

SHEET 2 OF 7

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010
				SHEET No.
				6

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- NOTES:
- BLADE 6" OF EXISTING TOPSOIL AND WINDROW OUTSIDE OF WORK AREA, THEN RETURN SLOPES UPON COMPLETION OF ROADWAY WORK. THIS OPERATION WILL BE PAID FOR UNDER ITEM 150, BLADING.

N. T. S.

Texas Department of Transportation
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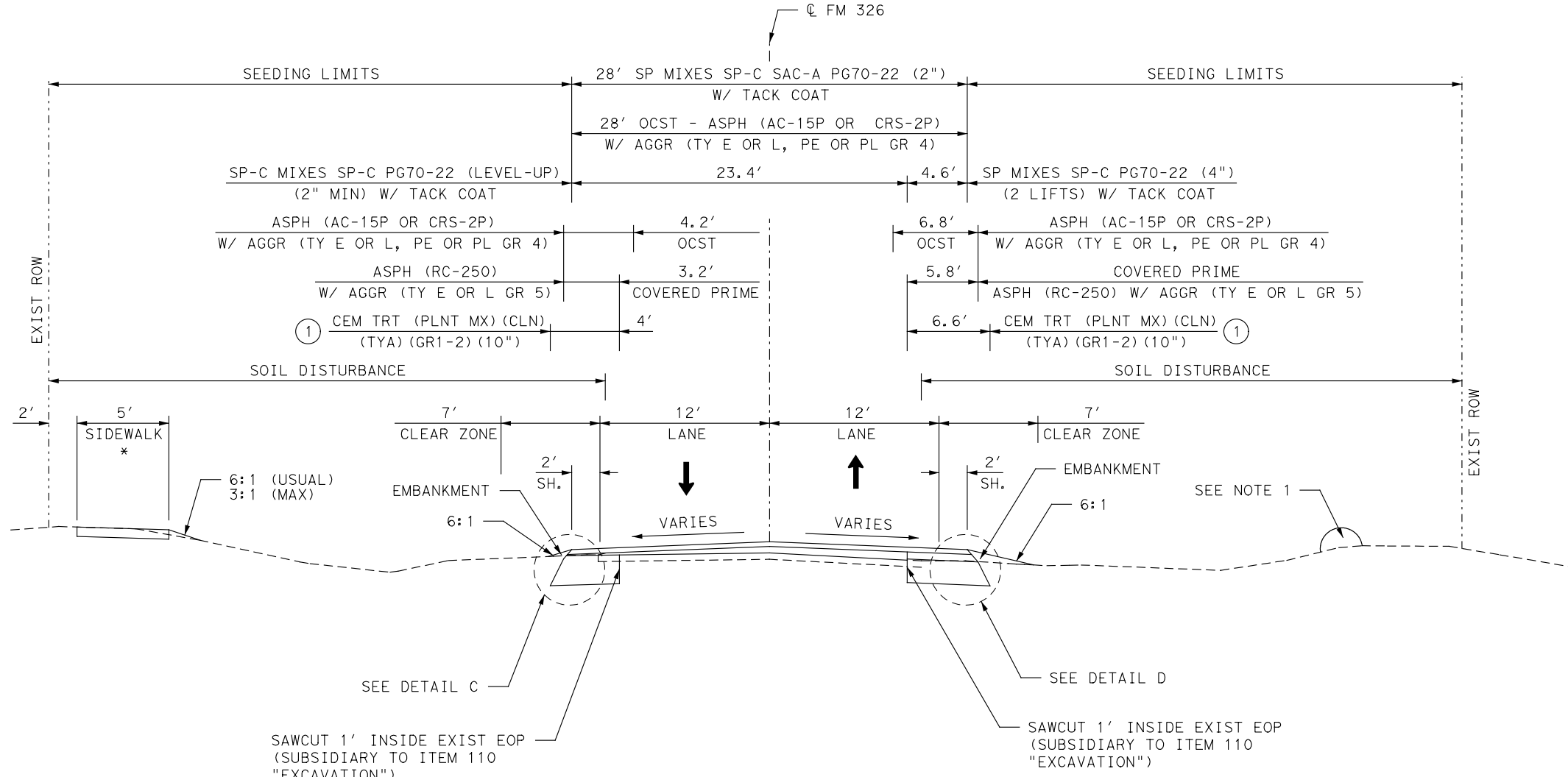
RODRIGUEZ TRANSPORTATION GROUP
FIRM #587

**TYPICAL SECTIONS
(PROPOSED)**

SHEET 3 OF 7

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.		
CHECKED:	6	TEXAS		FM 326		
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010	7

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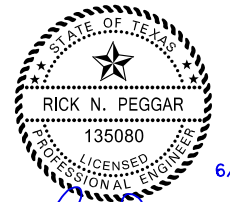
FM 326 PROPOSED TYPICAL SECTION
STA 22+74.00 - STA 24+43.00

① SP MIXES SP-B PG64-22 (10") PLACED IN 3 EQUAL LIFTS
 MAY BE USED AT THE OPTION OF THE CONTRACTOR IN LIEU OF
 CEM TRT (PLNT MX) (CLN) (TYA) (GR1-2) (10")

*SIDEWALK EXTENDS TO STA 27+28.00

- NOTES:
- BLADE 6" OF EXISTING TOPSOIL AND WINDROW OUTSIDE OF WORK AREA, THEN RETURN SLOPES UPON COMPLETION OF ROADWAY WORK. THIS OPERATION WILL BE PAID FOR UNDER ITEM 150, BLADING.

N. T. S.

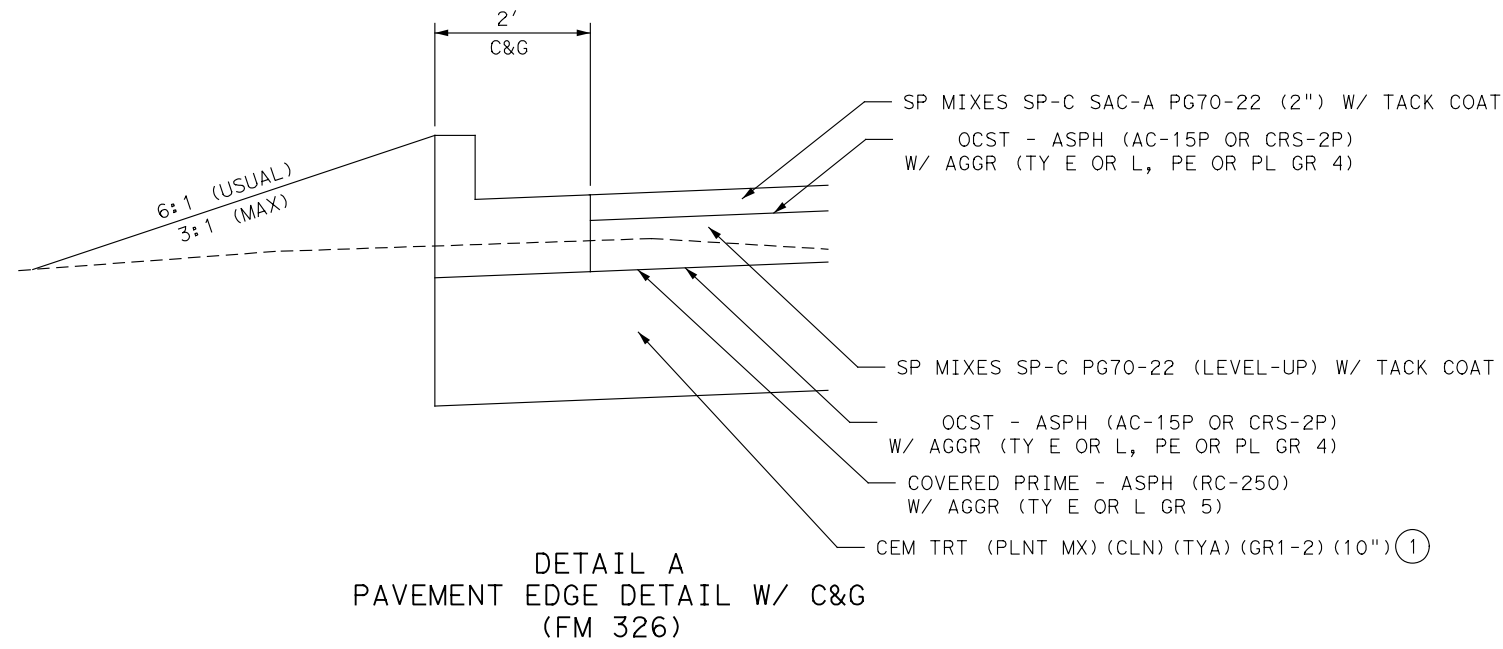


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 TRANSPORTATION
 GROUP
FIRM #587

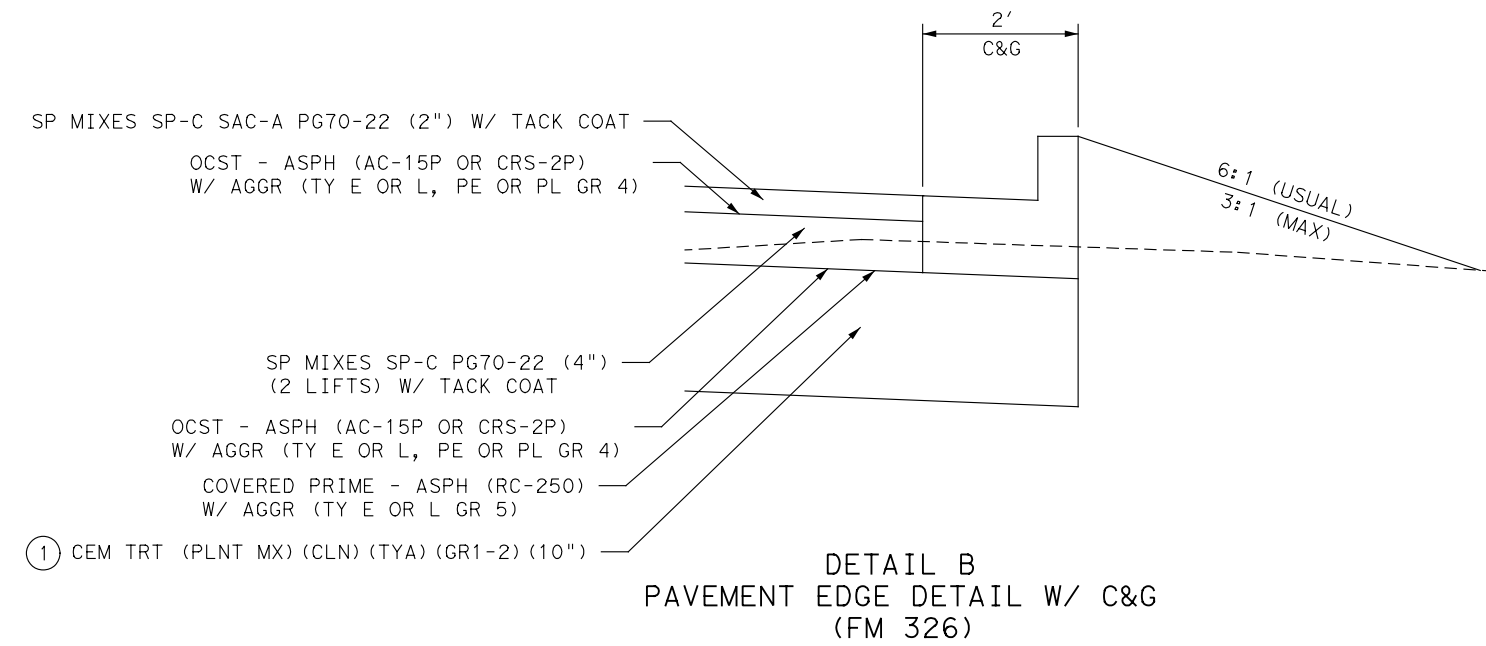
TYPICAL SECTIONS
(PROPOSED)

SHEET 4 OF 7

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CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010
				SHEET No.
				8



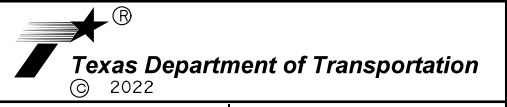
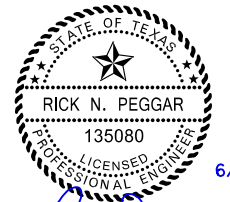
① SP MIXES SP-B PG64-22 (10") PLACED IN 3 EQUAL LIFTS
 MAY BE USED AT THE OPTION OF THE CONTRACTOR IN LIEU OF
 CEM TRT (PLNT MX) (CLN) (TYA) (GR1-2) (10")



① SP MIXES SP-B PG64-22 (10") PLACED IN 3 EQUAL LIFTS
 MAY BE USED AT THE OPTION OF THE CONTRACTOR IN LIEU OF
 CEM TRT (PLNT MX) (CLN) (TYA) (GR1-2) (10")

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N. T. S.



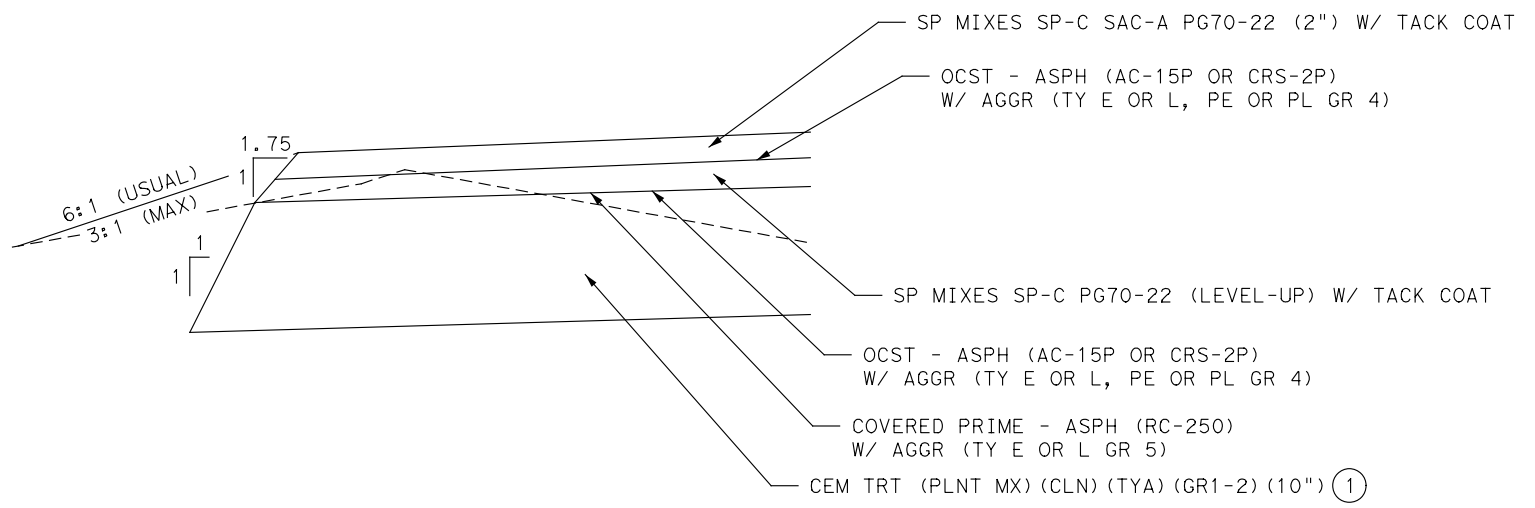
RTG RODRIGUEZ TRANSPORTATION GROUP
 FIRM #587

TYPICAL SECTIONS (PROPOSED)
 (PAVEMENT EDGE DETAILS)

SHEET 5 OF 7

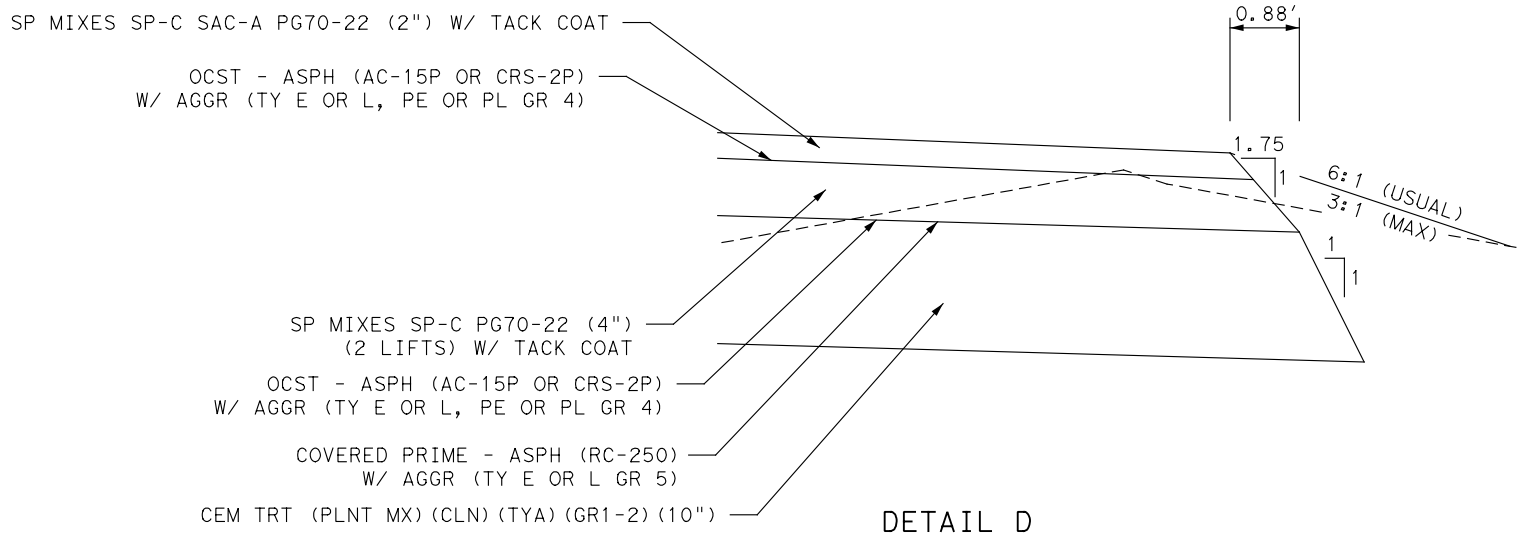
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CHECKED:	6	TEXAS		FM 326		
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010	9

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DETAIL C
PAVEMENT EDGE DETAIL W/O C&G
(FM 326)

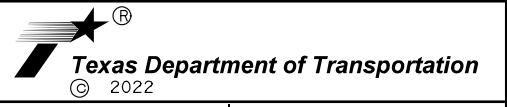
(1) SP MIXES SP-B PG64-22 (10") PLACED IN 3 EQUAL LIFTS
 (1) MAY BE USED AT THE OPTION OF THE CONTRACTOR IN LIEU OF
 CEM TRT (PLNT MX) (CLN) (TYA) (GR1-2) (10")



DETAIL D
PAVEMENT EDGE DETAIL W/O C&G
(FM 326)

(1) SP MIXES SP-B PG64-22 (10") PLACED IN 3 EQUAL LIFTS
 (1) MAY BE USED AT THE OPTION OF THE CONTRACTOR IN LIEU OF
 CEM TRT (PLNT MX) (CLN) (TYA) (GR1-2) (10")

N. T. S.



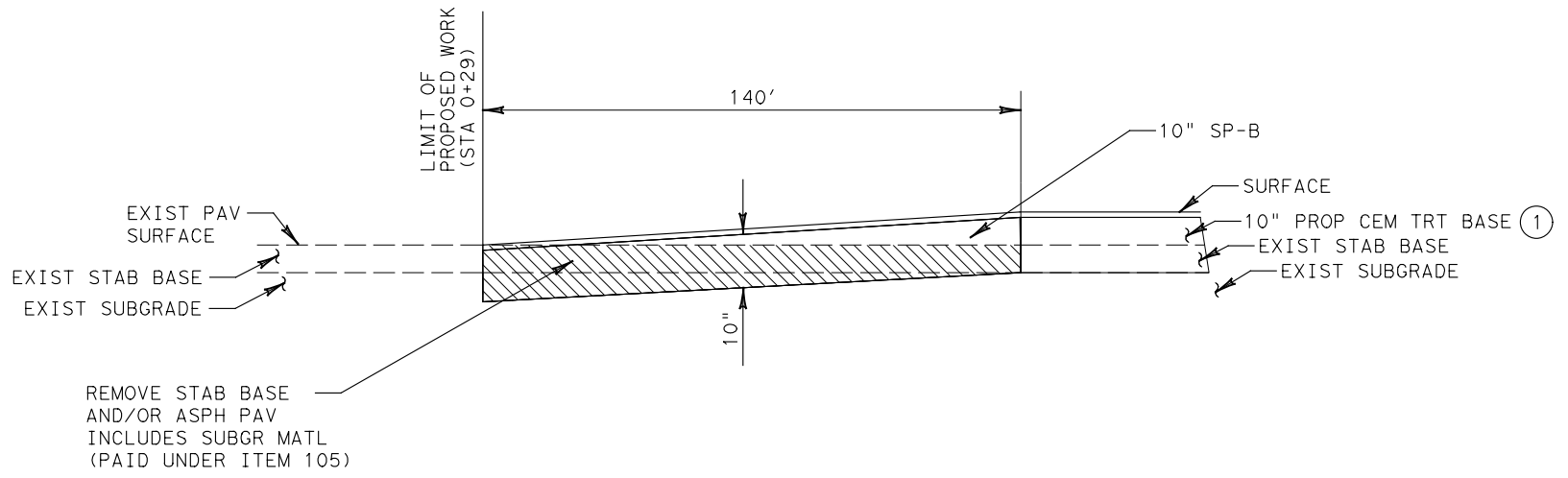
RTG RODRIGUEZ
 TRANSPORTATION
 GROUP FIRM #587

TYPICAL SECTIONS
(PROPOSED)
(PAVEMENT EDGE DETAILS)

SHEET 6 OF 7

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.		
CHECKED:	6	TEXAS		FM 326		
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010	10

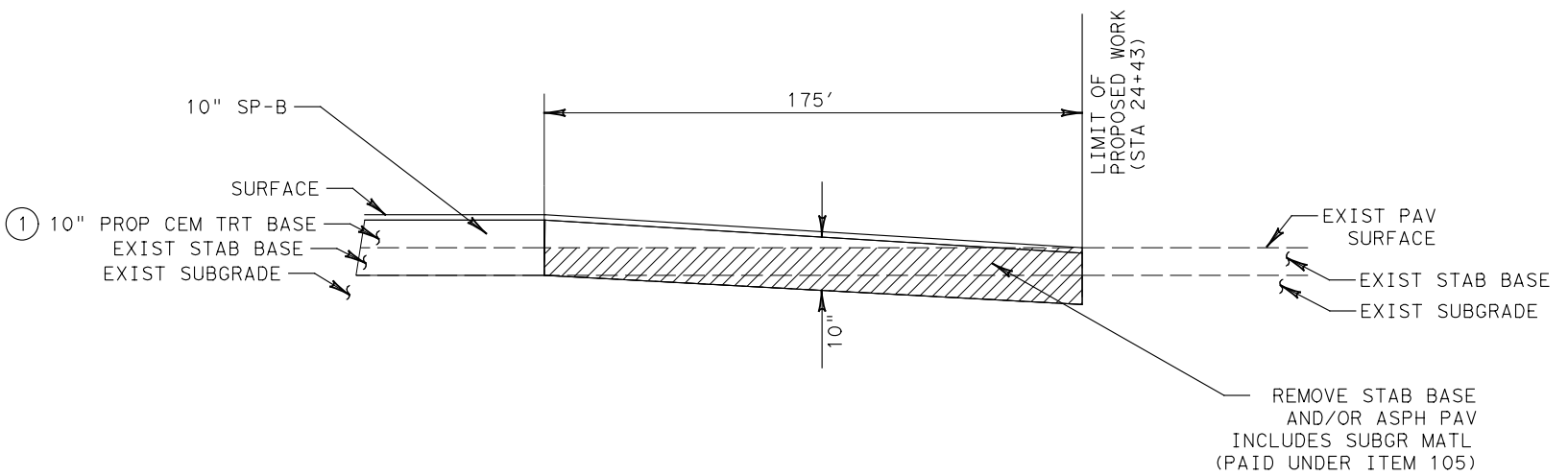
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PAVEMENT TAPER DETAIL AT STA 0+29

NOTE: PAVEMENT TAPER IS TO BE USED AT THE INTERSECTION OF US 69 AT END OF PROJECT.

① SP MIXES SP-B PG64-22 (10") PLACED IN 3 EQUAL LIFTS MAY BE USED AT THE OPTION OF THE CONTRACTOR IN LIEU OF CEM TRT (PLNT MX) (CLN) (TYA) (GR1-2) (10")

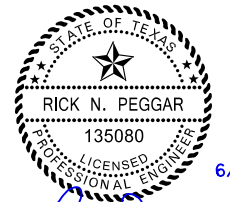


PAVEMENT TAPER DETAIL AT STA 24+43

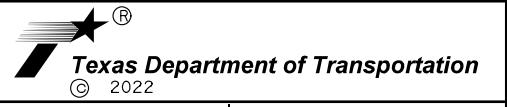
NOTE: PAVEMENT TAPER IS TO BE USED AT BEGIN OF PROJECT TO TIE TO EXISTING.

① SP MIXES SP-B PG64-22 (10") PLACED IN 3 EQUAL LIFTS MAY BE USED AT THE OPTION OF THE CONTRACTOR IN LIEU OF CEM TRT (PLNT MX) (CLN) (TYA) (GR1-2) (10")

N. T. S.



6/20/2022



RTG RODRIGUEZ TRANSPORTATION GROUP
FIRM #587



TYPICAL SECTIONS (PROPOSED)
(PAVEMENT TAPER DETAILS)

SHEET 7 OF 7

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.		
CHECKED:	6	TEXAS		FM 326		
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010	11

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 6/11/2022 10:22

SUMMARY OF EARTHWORK QUANTITIES			
ITEM NO.		110	132
BID CODE		6001	6006
FROM STATION	TO STATION	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (DENS CONT) (TY C)
		CY	CY
0+00	0+29	0	0
0+29	0+50	21	3
0+50	1+00	117	2
1+00	1+50	141	1
1+50	2+00	114	2
2+00	2+50	62	5
2+50	3+00	35	20
3+00	3+50	45	31
3+50	4+00	38	32
4+00	4+50	36	32
4+50	5+00	28	26
5+00	5+50	35	24
5+50	6+00	51	28
6+00	6+50	36	27
6+50	7+00	20	20
7+00	7+50	26	11
7+50	8+00	39	12
8+00	8+50	46	17
8+50	9+00	41	26
9+00	9+50	22	40
9+50	10+00	25	39
10+00	10+50	37	32
10+50	11+00	27	27
11+00	11+50	25	20
11+50	12+00	37	18
12+00	12+50	37	16
12+50	13+00	31	18
13+00	13+50	39	24
13+50	14+00	42	34
14+00	14+50	33	37
14+50	15+00	28	82
15+00	15+50	21	142
15+50	16+00	31	117
16+00	16+50	43	51
16+50	17+00	44	12
17+00	17+50	57	17
17+50	18+00	61	19
18+00	18+50	44	6
18+50	19+00	35	5
19+00	19+50	35	6
19+50	20+00	40	9
20+00	20+50	53	13
20+50	21+00	58	17
21+00	21+50	54	19
21+50	22+00	54	18
22+00	22+50	48	11
22+50	23+00	43	2
23+00	23+50	43	0
23+50	24+00	34	6
24+00	24+43	20	19
PROJECT TOTALS		2132	1195

 Texas Department of Transportation © 2022						
 RODRIGUEZ TRANSPORTATION GROUP <small>FIRM #587</small>						
QUANTITY SUMMARIES						
SHEET 1 OF 3						
DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.		
CHECKED:	6	TEXAS		FM 326		
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010	12

ROADWAY SUMMARY													
ITEM NO.		150		276		316					3077		
BID CODE		6001		(3) 6230		(1)	(2) 6060	6417	(1)	(2) 6530	6416	6021	6075
LOCATION	AVG. WIDTH	LENGTH	SURFACE AREA	BLADING	CEM TRT (PLNT MX) (CLN) (TYA) (GR1-2) (10")	COVERED PRIME			OCST			LEVEL-UP	
						ASPH (RC-250)	ASPH (RC-250)	AGGR (TY E OR L GR 5)	ASPH (AC-15P OR CRS-2P)	ASPH (AC-15P OR CRS-2P)	AGGR (TY E OR L, PE OR PL GR 4)	SP MIXES SP-C PG70-22 (4)	TACK COAT
						(0.25 GAL/SY)	(2)	(145 SY/CY)	(0.42 GAL/SY)	(2)	(135 SY/CY)	RATE VARIES	(0.08 GAL/SY)
	FT	LF	SY	STA	SY	GAL	TON	CY	GAL	TON	CY	TON	GAL
BEGIN TO STA 6+95	46	666	3879	6.66	1787	447	1.9	13	2446	10.4	42	676	361
STA 6+95 TO STA 22+74	40	1579	7087	15.79	3927	968	4.1	28	4737	20.1	82	1373	606
STA 22+74 TO END	34	169	606	1.69	275	67	0.3	2	385	1.6	7	2	64
PROJECT TOTALS				24.14	5989	1482	6.3	43	7568	32.1	131	2051	1031

- (1) FOR CONTRACTOR'S INFORMATION ONLY
- (2) ASPHALT ESTIMATED AT THE FOLLOWING RATES

$$\text{TONS} = \frac{(\text{RATE} * \text{SGA} * \text{SY})}{2000}$$

SPECIFIC GRAVITY OF ASPHALT (SGA) ESTIMATED AT 1.02 * 8.3268

- (3) FLEX BASE RATE = 135 LB/CF
- (4) SP MIX TO BE USED FOR LEVEL-UP

ROADWAY SUMMARY (CONTINUED)									
ITEM NO.		3077							
BID CODE		6021		6075		6022		6075	
LOCATION	AVG. WIDTH	LENGTH	SURFACE AREA	4" LAYER		FINAL 2" SURFACE			
				SP MIXES SP-C PG70-22	TACK COAT	SP MIXES SP-C SAC-A PG70-22	TACK COAT		
				(110 LB/SY-IN)	(0.08 GAL/SY)	(110 LB/SY-IN)	(0.08 GAL/SY)		
	FT	LF	SY	TON	GAL	TON	GAL		
BEGIN TO STA 6+95	46	666	3879	297	216	427	311		
STA 6+95 TO STA 22+74	40	1579	7087	620	451	774	563		
STA 22+74 TO END	34	169	606	37	27	68	49		
PROJECT TOTALS				954	694	1269	923		

MAILBOX SUMMARY		
ITEM NO.	560	
BID CODE	6015	
LOCATION (STATION)	OFFSET	MAILBOX INSTALL-S (TIM-POST) TY 5
		EA
1+71	LT	1
6+65	LT	2
22+58	LT	1
PROJECT TOTALS		4


REMOVAL SUMMARY		
ITEM NO.	104	
BID CODE	6022	
LOCATION	REMOVING CONC (CURB AND GUTTER)	REMOVING STAB BASE & ASPH PAV (0"-10")
	LF	SY
BEGIN TO STA 6+95	1240	926
STA 6+95 TO STA 22+74		
STA 22+74 TO END		633
PROJECT TOTALS		1559

MISCELLANEOUS CONCRETE SUMMARY								
ITEM NO.	474		529		531			
BID CODE	6021		6008		6001		6010	
LOCATION	CAST-IN-PLACE TRENCH DRAIN	CONC CURB & GUTTER (TY II)	CONC SIDEWALKS (4")	CURB RAMPS (TY 7)				
	LF	LF	SY	EA				
BEGIN TO STA 6+95		1058	252					
STA 6+95 TO STA 22+74	6	1350	798					
STA 22+74 TO END		14	240	1				
PROJECT TOTALS		6	2422	1290	1			

PEDESTRIAN RAIL SUMMARY		
ITEM NO.	450	
BID CODE	6051	
LOCATION	RAIL (HANDRAIL) (TY E)	
	LF	
BEGIN TO STA 6+95		
STA 6+95 TO STA 22+74	86	
STA 22+74 TO END		
PROJECT TOTALS		86

TRAFFIC CONTROL SUMMARY																		
ITEM NO.	662					677		6001		6185								
BID CODE	6004		6034		6050		6109		6111		6001		6002		6002		6005	
LOCATION	WK ZN PAV MRK NON-REMOV (W) 4" (SLD)	WK ZN PAV MRK NON-REMOV (Y) 4" (SLD)	WK ZN PAV MRK REMOV (REFL) TYII-A-A	WK ZN PAV MRK SHT TERM (TAB) TY W	WK ZN PAV MRK SHT TERM (TAB) TY Y-2	ELIM EXT PAV MRK & MRKS (4")	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)									
	LF	LF	EA	EA	EA	LF	EA	DAY	DAY									
BEGIN TO STA 6+95	1332	1332	33	696	66	666												
STA 6+95 TO STA 22+74	3158	3158	79	80	160													
STA 22+74 TO END	338	338	8		18													
PROJECT TOTALS		4828	4828	120	776	244	666	3	171	7								

- (5) OUTSIDE (W) NB LANE LINE TO BE REMOVED BEGINNING OF PHASE 2
- (6) TO BE PLACED IN PHASE 3 FOR LONG TERM WORK ZONE
- (7) TO BE PLACED IN INTERIM PRIOR TO PERMANENT STRIPING



RTG RODRIGUEZ TRANSPORTATION GROUP
FIRM #587

QUANTITY SUMMARIES

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.		
CHECKED:	6	TEXAS		FM 326		
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010	13

SHEET 2 OF 3


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CULVERT SUMMARY																		
CULVERT ID	EXISTING STRUCTURE	DESCRIPTION PROPOSED WORK	ITEM 400		ITEM 402	ITEM 420	ITEM 432		ITEM 464		ITEM 466			ITEM 467		ITEM 480	ITEM 496	
			BID CODE	6005	6008	6001	6071	6011	6033	6003	6005	6095	6101	6103	6358	6395	6001	6016
				CEM STABIL BKFL	CUT & RESTORE ASPH PAVING	TRENCH EXCAVATION PROTECTION	CL C CONC (COLLAR)	RIPRAP (CONC) (CL B) (6")	RIPRAP (STONE PROTECTION) (18 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	HEADWALL (CH-PW-0) (DIA= 18 IN)	HEADWALL (CH-PW-0) (DIA= 36 IN)	HEADWALL (CH-PW-0) (DIA= 48 IN)	SET (TY II) (18 IN) (RCP) (4: 1) (C)	SET (TY II) (24 IN) (RCP) (6: 1) (P)	CLEAN EXIST CULVERT	REMOV STR (PIPE)
	CY	SY	LF	EA	CY	CY	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA		
C1	3 - 18" RCP X 42 LF W/SET LT & RT	ADD 3 - SET (C) (18 IN) (RCP) (4:1) (C) LT; EXTEND W/18" X 20' RC PIPE (CL III) & ADD CONC COLLAR RT ADD CEM STABIL BKFL & ADD CH-PW-0 (DIA = 18 IN) RT CLEAN EXISTING CULVERT	71			3	15			60			1			3	1	
C2	2 - 24" RCP X 49 LF W/SET LT & RT	2 - 24" X 70' RC PIPE (CL III), ADD CEM STABIL BKFL & ADD CH-PW-0 (DIA = 36 IN) LT; ADD CEM STABIL BKFL & ADD CH-PW-0 (DIA = 48 IN) RT	68	20	35			30		140		1	1				2	
C5	1 - 24" RCP X 109 LF W/SET LT & RT	ADD CONC COLLAR & EXTEND W/24"X16' RC PIPE (CL III) (24 IN) REMOVE EXIST SET RT & ADD SET (C) (24 IN) (RCP) (6:1) (P) RT; ADD CEM STABIL BKFL, AND CLEAN EXISTING CULVERT				1				16						1	1	
DITCH & FLUME		STA 0+29.00 TO STA 24+43.00					215											
PROJECT TOTALS			139	20	35	4	230	30	60	156	1	1	1	3	1	2	2	

SUMMARY OF SIGNING & STRIPING																				
ITEM NO.	644							658	666				668			672		685		
BID CODE	6033	6034	6060	6068	6070	6071	6076	6099	6036	6306	6309	6321	6076	6077	6085	6007	6009	6002		
LOCATION	IN SM RD SN SUP&AM TYS80(1) SA (U)	IN SM RD SN SUP&AM TYS80(1) SA (U-1EXT)	IN SM RD SN SUP&AM TYTWT (1) WS (P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	RELOCATE SM RD SN SUP&AM TY TWT	REMOVE SM RD SN SUP&AM	INSTL OM ASSM (OM-2Z) (WFLX) GND	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	RE PM W/RET REQ TY I (W) 6" (BRK) (100MIL)	RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)	RE PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)	PREFAB PAV MRK TY C (W) (24") (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (WORD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	RELOCATE RDSO FLASH BEACON ASSEMBLY		
	EA	EA	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA		
STA 0+29.00 TO STA 24+43.00	1	1	3	1	1	5	1	15	760	480	1348	4826	50	6	6	62	60	1		
PROJECT TOTALS	1	1	3	1	1	5	1	15	760	480	1348	4826	50	6	6	62	60	1		

SUMMARY OF SWP3													
ITEM NO.	162	164			168	169	506						
BID CODE	6002	6003	6009	6011	6001	6003	6001	6011	6020	6024	6038	6039	
LOCATION	BLOCK SODDING	BROADCAST SEED (PERM) (RURAL) (CLAY)	BROADCAST SEED (TEMP) (WARM)	BROADCAST SEED (TEMP) (COOL)	(8) VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 1) (TY C)	ROCK FILTER DAMS (INSTALL) (TY 1)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	
	SY	SY	SY	SY	MG	SY	LF	LF	SY	SY	LF	LF	
STA 0+29.00 TO STA 24+43.00	4823	4252	2126	2126	182	4252	306	306	81	81	1636	1636	
PROJECT TOTALS	4823	4252	2126	2126	182	4252	306	306	81	81	1636	1636	

(8) 2 APPLICATIONS AT 10 GAL/SY PER APPLICATION



OMEGA ENGINEERS, INC.

16360 PARK TEN PLACE, Ste. #325
HOUSTON TEXAS, 77084
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:281 647 9182 F:281 647 9184

QUANTITY SUMMARIES

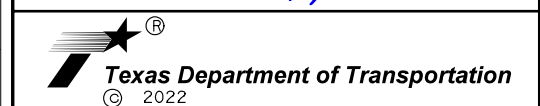
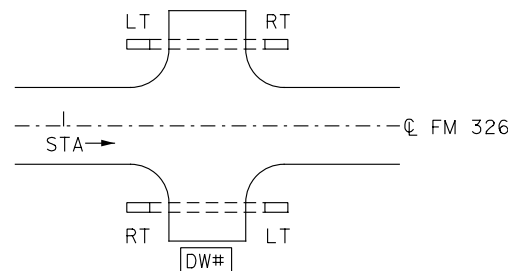
SHEET 3 OF 3					
DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.	
CHECKED:	6	TEXAS		FM 326	
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010
					SHEET No. 14

SUMMARY OF DRIVEWAY QUANTITIES

		ITEM NO.											530																		
		104											162		168		464		465		467			496		530					
		6017											6002		6001		6003		6005		6168		6363	6389	6395	6016	6004	6005			
ID	STA	OFFSET	EXIST SURF	PCR	AVG WIDTH	LENGTH	RADIUS		EXISTING STRUCTURE	OFFSET FROM CL		PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	RC PIPE (CL III)		INLET (COMPL) (TY A)	SET (TY II) (RCP) (1)			REMOV STR (PIPE)	DRIVEWAYS								
							FT	RT		EXIST	PROP					(18 IN)	(24 IN)		(18 IN) (6:1) (P)	(24 IN) (3:1) (P)	(24 IN) (6:1) (P)		(CONC)	(ACP) (3)							
																									SY	SY	MG	LF	LF	EA	EA
DW1	1+19	LT	ASPHALT	C	67.8	16.3	25	25	NO PIPE																						129
DW2	2+15	LT	ASPHALT	C	66.3	14.5	25	25	NO PIPE																						135
DW3	2+44	RT	GRASS	C	50.1	21.5	30	30	NO PIPE		44			22	0.44	56				2											104
DW4	5+18	LT	GRAVEL	R	41.2	23.8	25	25	NO PIPE		44			22	0.44	28				2											73
DW5	6+59	RT	ASPHALT	C	84.2	17.5	30	30	NO PIPE		37			26	0.52		80					2									163
DW6	7+32	LT	ASPHALT	C	64.1	31.6	25	25	EXIST 20"X41' STEEL PIPE	28	32			52	1.04	66				2			1								238
DW7	9+06	LT	GRAVEL	C	52.2	26.8	25	25	EXIST 20"X42' STEEL PIPE	30	26			26	0.52		36				1	1	1								111
DW8	11+37	LT	GRAVEL	C	70.6	26.3	35	35	EXIST 18"X32' CPP	32	28			22	0.44	60				2			1								169
DW8A	12+95	RT	GRAVEL	C	60	26.4	25	25	EXIST 2-6"X42' AND 2-8"X33' STEEL PIPES	30												4									203
DW9	16+62	RT	CONCRETE	C	78.7	24.5	30	30	EXIST 12"X85' PVC	31	44		340	26	0.52		64				2	1									174
DW10	17+91	LT	ASPHALT	R	29.3	33.7	15	15	EXIST 15"X23' CMP	28	32			26	0.52		28				2	1									65
DW11	18+44	LT	ASPHALT	R	31.6	33.8	15	15	EXIST 15"X21' CMP	29	32			26	0.52		28				2	1									73
DW12	18+76	RT	CONCRETE	C	74.2	24.3	30	15	NO PIPE		39		299	13	0.26		78					1									159
DW13	19+48	RT	CONCRETE	C	44.3	24.3	15	30	NO PIPE		39		130	13	0.26		48	1				1									82
DW14	22+28	LT	GRAVEL	R	31	34.3	15	15	EXIST 18"X26' RCP	29																					72
DW15	23+36	RT	CONCRETE	C	80.9	29.7	50	40	NO PIPE				171																		202
PROJECT TOTALS												940	274	5.48	210	362	1	8	1	11	10	820	1332								

- (1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S
- (2) 11 SY BLOCK SODDING EACH END OF 18" CULVERT
13 SY BLOCK SODDING EACH END OF 24" CULVERT
(SODDING QUANTITY ASSUMES MINIMUM SET LENGTH)
- (3) SP-C (440 LBS/SY)

R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD



DRIVEWAY SUMMARY

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No. SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010 15

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SUMMARY OF SMALL SIGNS

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

SIGNING AND PAVEMENT MARKING PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)		
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION			
										PREFABRICATED		1EXT or 2EXT = # of Ext	
1 OF 2	1	M3-1	<p style="text-align: center;">RELOCATE</p>	24" X 12"	✓		S80	1	SA	U	1 EXT		
		M1-4		24" X 24"	✓								
		M3-3		24" X 12"	✓								
		M3-1		24" X 12"	✓								
		M1-6F		24" X 24"	✓								
		M1-6F		24" X 24"	✓								
		M6-3		21" X 15"	✓								
		M6-1R		21" X 15"	✓								
1 OF 2	2	M3-1	<p style="text-align: center;">RELOCATE</p>	24" X 12"	✓		TWT	1	WS	P			
		M1-6F		24" X 24"	✓								
1 OF 2	3	R2-1	<p style="text-align: center;">RELOCATE</p>	30" X 36"	✓		TWT	1	WS	P			
1 OF 2	4	R3-7R	<p style="text-align: center;">PROPOSED</p>	36" X 36"	✓		TWT	1	WS	P			
1 OF 2	5	M3-1	<p style="text-align: center;">PROPOSED</p>	24" X 12"	✓		S80	1	SA	U	1 EXT		
		M1-4		24" X 24"	✓								
		M3-3		24" X 12"	✓								
		M3-3		24" X 12"	✓								
		M1-4		24" X 24"	✓								
		M1-6F		24" X 24"	✓								
		M6-1L		21" X 15"	✓								
		M6-1R		21" X 15"	✓								

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:**
- 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.
 - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
 - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).
 - All "STOP", "YIELD", and "DO NOT ENTER" sign supports wrapped in red retroreflective tape are considered subsidiary to item 644.



SUMMARY OF SMALL SIGNS

SOSS SHEET 1 OF 2

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
4-16	DIST	COUNTY	SHEET NO.	
8-16	LFK	ANGELINA	16	

SUMMARY OF SMALL SIGNS

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SIGNING AND PAVEMENT MARKING PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	
1 OF 2	6	R3-8LR	 PROPOSED	30" X 30"	✓		TWT	1	WS	P	
1 OF 2	7	M1-6F REF-MRK	 RELOCATE	24" X 24"	✓		TWT	1	WS	P	
				3" X 10"	✓						
1 OF 2	8	M1-6F M5-1R	 PROPOSED	24" X 24"	✓		TWT	1	WS	P	
				21" X 15"	✓						
1 OF 2	9	M2-1 M1-4	 RELOCATE	21" X 15"	✓		TWT	1	WS	P	
				24" X 24"	✓						
1 OF 2	10	R1-1	 RELOCATE	36" X 36"	✓		TWT	1	WS	P	
1 OF 2	11	W2-1aT	 RELOCATE	48" X 48"	✓		10BWG	1	SA	T	
1 OF 2	12	M3-1 M3-3 M1-6F M1-4 M6-1L M6-3	 PROPOSED	24" X 12"	✓		S80	1	SA	U	
				24" X 12"	✓						
				24" X 24"	✓						
				24" X 24"	✓						
				21" X 15"	✓						
				21" X 15"	✓						

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.
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- NOTE:**
- 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.
 - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
 - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).
 - All "STOP", "YIELD", and "DO NOT ENTER" sign supports wrapped in red retroreflective tape are considered subsidiary to item 644.



SUMMARY OF SMALL SIGNS

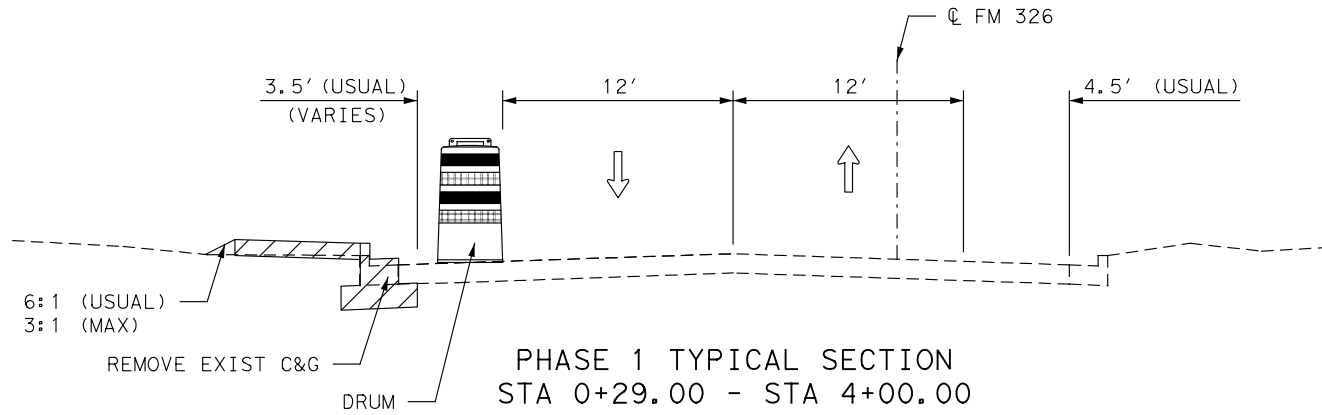
SOSS SHEET 2 OF 2

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
4-16	DIST	COUNTY	SHEET NO.	
8-16	LFK	ANGELINA	17	

CONSTRUCTION NARRATIVE - FM 326



PHASE 1

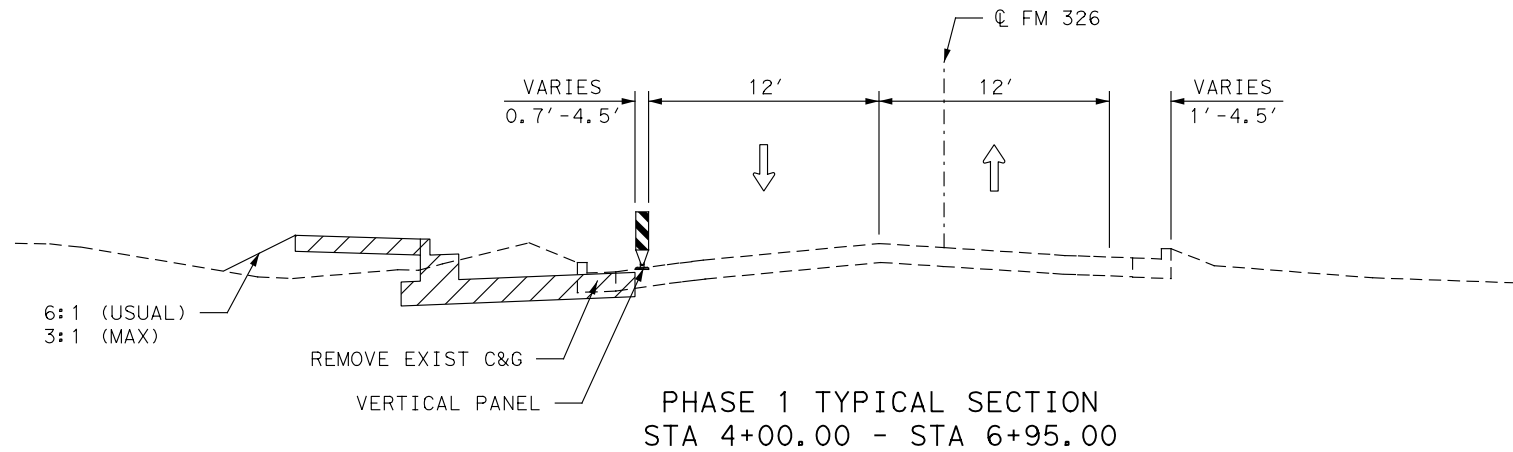
1. PLACE TEMPORARY EROSION CONTROL DEVICES. PLACE ADVANCE WARNING SIGNS IN ACCORDANCE WITH APPLICABLE TXDOT BC AND TCP STANDARDS AND TMUTCD.
2. BUILD CULVERTS C2 IN HALVES AND EXTEND EXISTING CULVERT C1 UTILIZING TXDOT STANDARD TCP (1-2)-18. REFER TO THE "CUT & RESTORE" DETAIL FOR MORE INFORMATION.
3. ON THE SOUTH END OF THE PROJECT, CLOSE SOUTHBOUND SHOULDER ACCORDING TO TXDOT STANDARD TCP (2-1)-18. REMOVE EXISTING CURB & GUTTER. WIDEN SUBGRADE AND CONSTRUCT CURB & GUTTER FROM STA 0+29.00 TO STA 6+95.00. CONSTRUCT SIDEWALK FROM STA 0+29.00 TO STA 27+28.00
4. ONCE SUBGRADE HAS BEEN WIDENED ON THE SOUTH END OF THE PROJECT, CLOSE THE SOUTHBOUND LANE ACCORDING TO TXDOT STANDARD TCP (1-2)-18 TO WIDEN THE REMAINING SOUTHBOUND SUBGRADE. LANE CLOSURES WILL BE ALLOWED ON A DAILY BASIS, AND ROADWAY SHALL BE OPENED TO 2 LANES AT THE END OF DAYS' OPERATIONS.



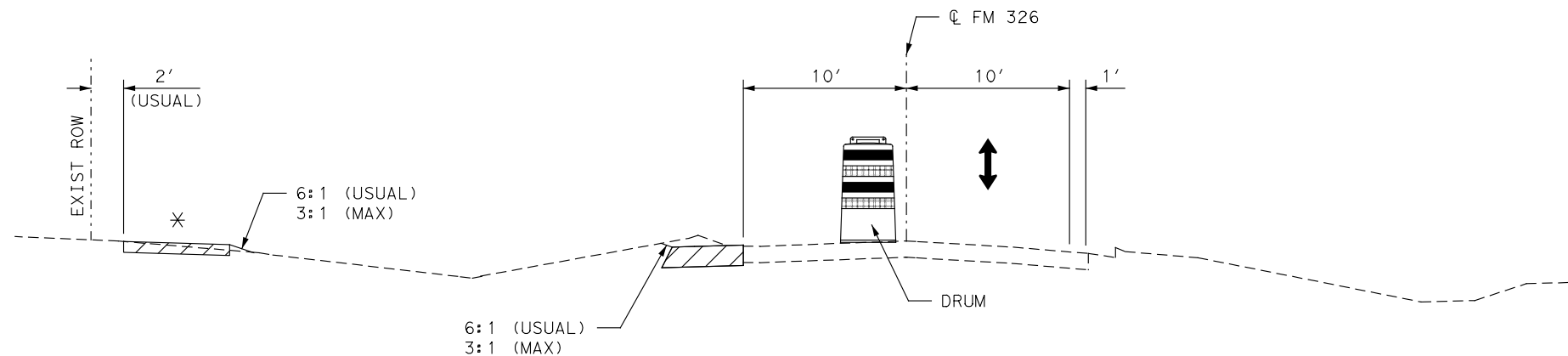
PHASE 1 TYPICAL SECTION
STA 0+29.00 - STA 4+00.00

LEGEND

-  PROPOSED CONSTRUCTION (THIS PHASE)
-  PREVIOUS CONSTRUCTION (PREVIOUS PHASE)



PHASE 1 TYPICAL SECTION
STA 4+00.00 - STA 6+95.00



PHASE 1 TYPICAL SECTION
STA 6+95.00 - STA 24+43.00

* SIDEWALK EXTENDS TO STA 27+28.00

N. T. S.



Rick Peggar



CONSTRUCTION NARRATIVE

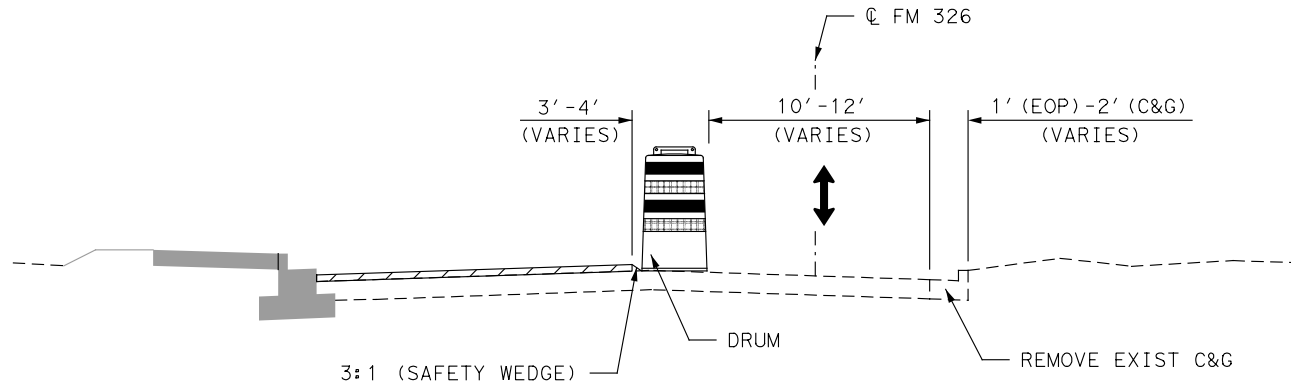
SHEET 1 OF 2

DESIGNED:	FED. RD DIV. No. 6	STATE TEXAS	FEDERAL AID PROJECT No.	HIGHWAY No. FM 326
CHECKED:				
DRAWN:	STATE DISTRICT LUFKIN	COUNTY ANGELINA	CONTROL No. 3264	SECTION No. 01
CHECKED:				JOB No. 010 SHEET No. 18

CONSTRUCTION NARRATIVE - FM 326

PHASE 2

1. REMOVE RIGHT SIDE CURB AND GUTTER. ELIMINATE EXISTING NB OUTSIDE LANE LINE. DURING DAYTIME OPERATIONS, PLACE LEVEL-UP USING ONE LANE TRAFFIC CONTROL ACCORDING TO TXDOT STANDARD TCP (1-2)-18. OPEN BOTH LANES AND PLACE A 3:1 SAFETY WEDGE BETWEEN NEWLY CONSTRUCTED PAVEMENT AND EXISTING PAVEMENT AT THE END OF EACH WORKING DAY. THIS WORK SHALL BE SUBSIDIARY TO VARIOUS BID ITEMS.



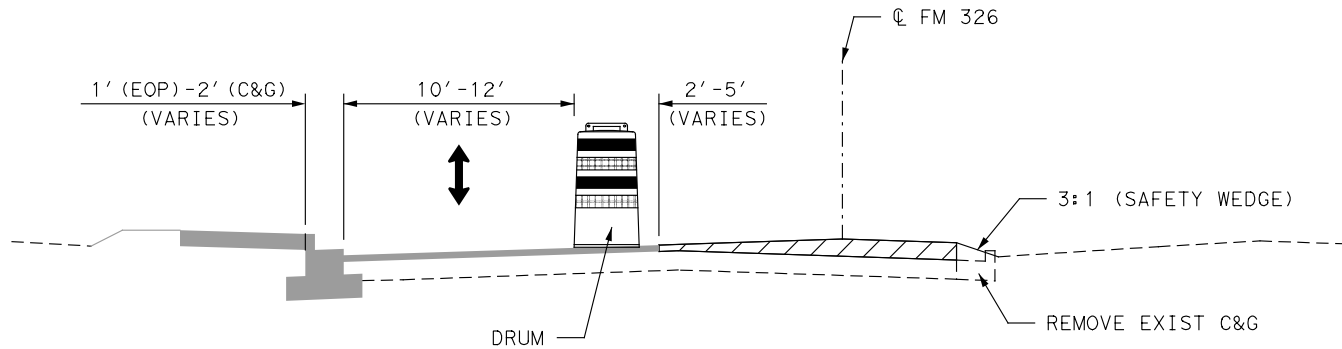
PHASE 2 TYPICAL SECTION
SB LANE CLOSURE
STA 0+29.00 - STA 24+43.00

PHASE 3

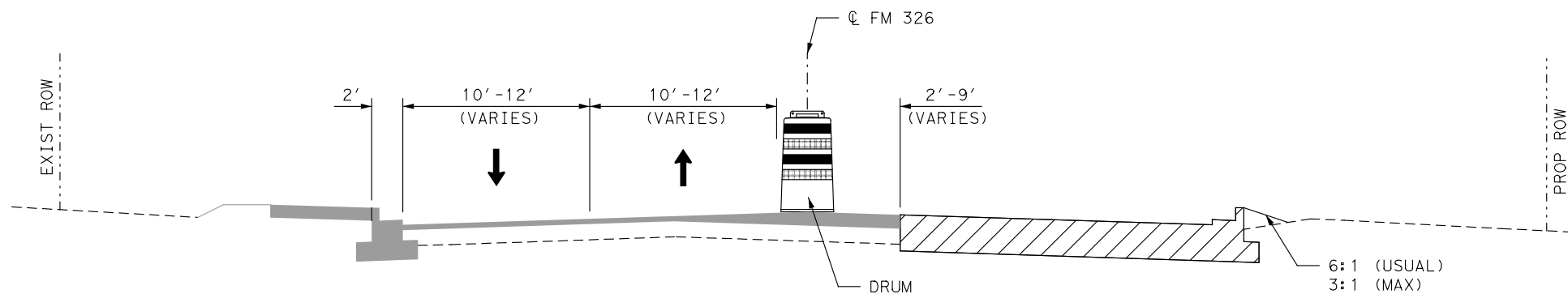
1. SHIFT TRAFFIC AND SET UP TRAFFIC CONTROL ACCORDING TO TXDOT STANDARD TCP (2-3)-18. WIDEN SUBGRADE, CONSTRUCT RIGHT TURN LANE WITH THE EXCEPTION OF THE FINAL 2" OF ASPHALT AND CONSTRUCT CURB AND GUTTER.

PHASE 4

1. SHIFT TRAFFIC AND SET UP TRAFFIC CONTROL ACCORDING TO TXDOT STANDARD TCP (1-3)-18. PLACE FINAL OCST AND 2" OF ASPHALT. COVER PHASE 3 PAVEMENT MARKINGS WITH THE OCST.
2. PLACE FINAL PAVEMENT MARKINGS AND PERMANENT SEEDING.
3. REMOVE EROSION CONTROL DEVICES.



PHASE 2 TYPICAL SECTION
NB LANE CLOSURE
STA 0+29.00 - STA 24+43.00



PHASE 3 TYPICAL SECTION
STA 0+29.00 - STA 24+43.00

LEGEND

- PROPOSED CONSTRUCTION (THIS PHASE)
- PREVIOUS CONSTRUCTION (PREVIOUS PHASE)

N. T. S.



Rick Peggart



CONSTRUCTION NARRATIVE

SHEET 2 OF 2

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010
				SHEET No.
				19

p:\rtg\pw.bentley.com\rtg-pw\Documents\9360503\CADD\PI on Sheets\TCP\FM 326\326-TCP-NARR02.dgn
 3/25/2022 1:15

DATE: 3/25/2022 1:15
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. 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).

<p>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov</p>
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

SHEET 1 OF 12



**BARRICADE AND CONSTRUCTION
 GENERAL NOTES
 AND REQUIREMENTS**

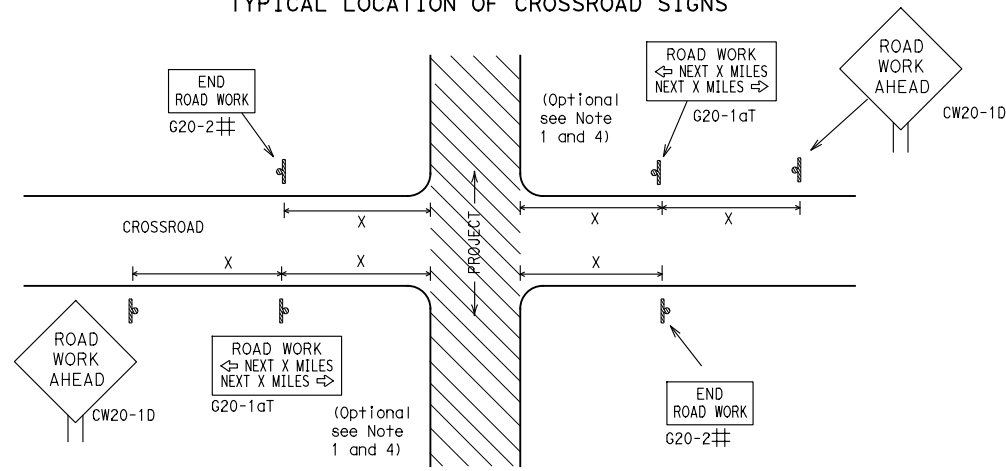
BC (1) -21

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS									
4-03	7-13	3264	01	010	FM 326				
9-07	8-14	DIST		COUNTY		SHEET NO.			
5-10	5-21	LUFKIN	ANGELINA			20			

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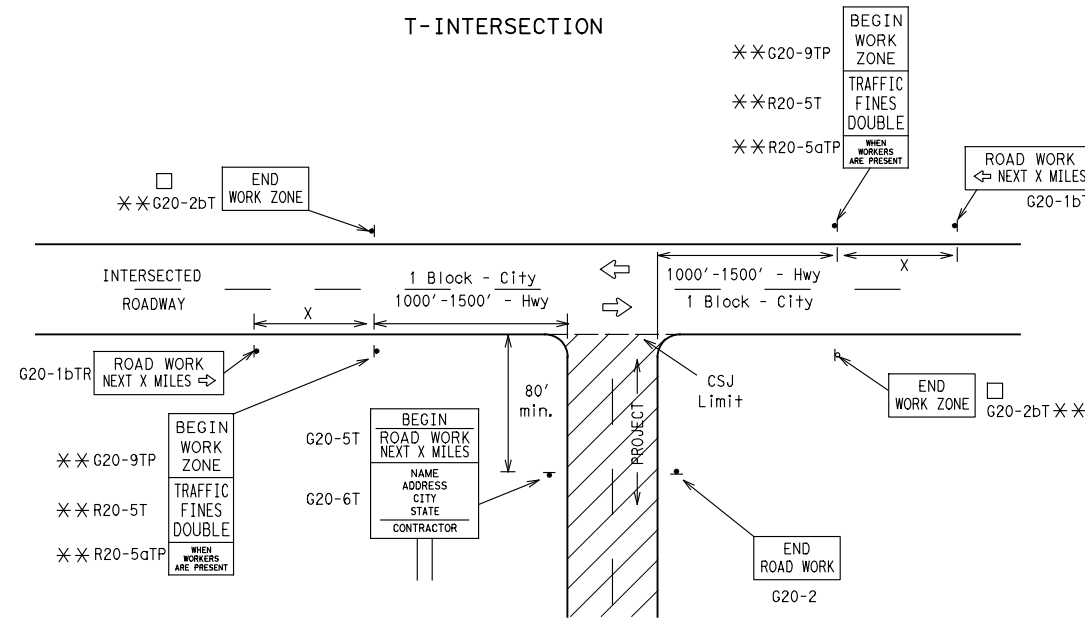
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TYPICAL LOCATION OF CROSSROAD SIGNS



- ## May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)
- 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.
 - 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.
 - 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.
 - 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.
 - Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
 - 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

- 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.
- 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}

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Δ Spacing "X" Feet (Apprx.)
CW20 ⁴	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	50	400
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	60	600 ²
			65	700 ²
			70	800 ²
			80	1000 ²
*			*	* ³

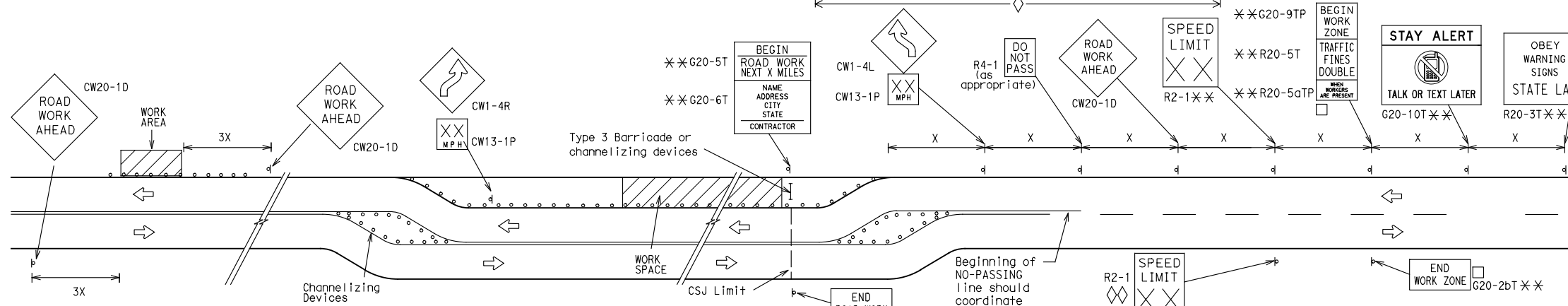
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

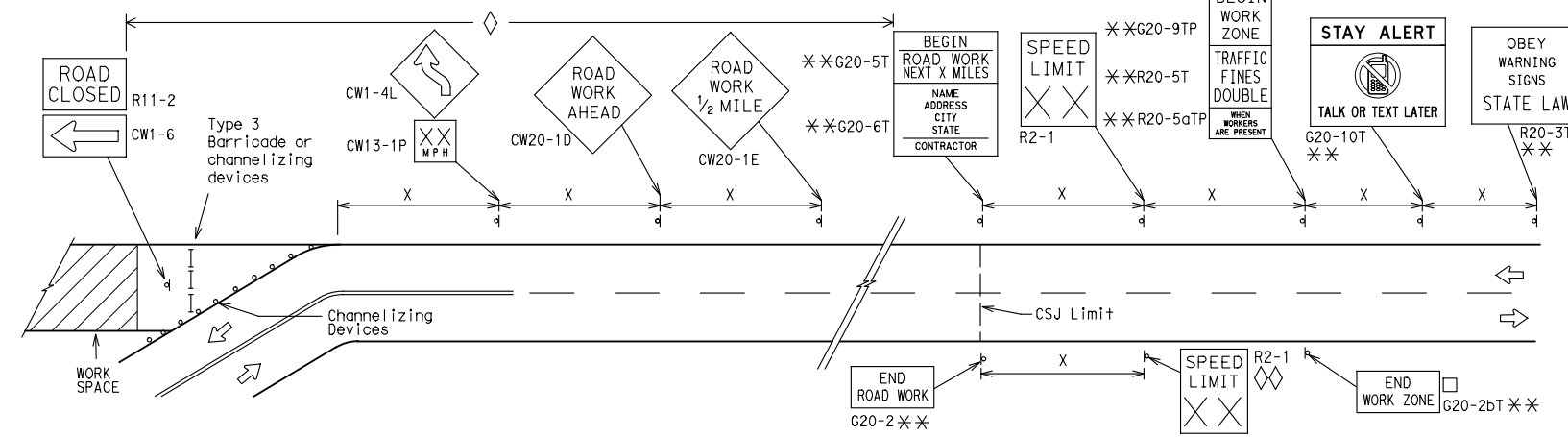
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be 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".
- Only diamond shaped warning sign sizes are indicated.
- See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

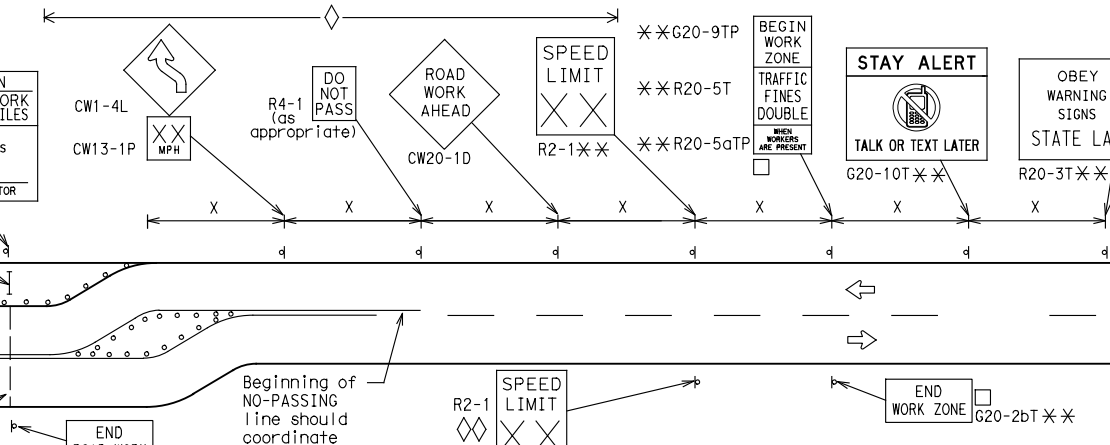


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



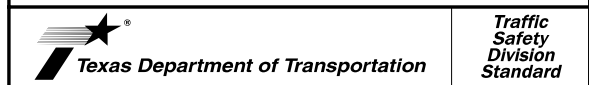
NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
 - ** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
 - ◇ Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
 - ◇◇ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

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

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

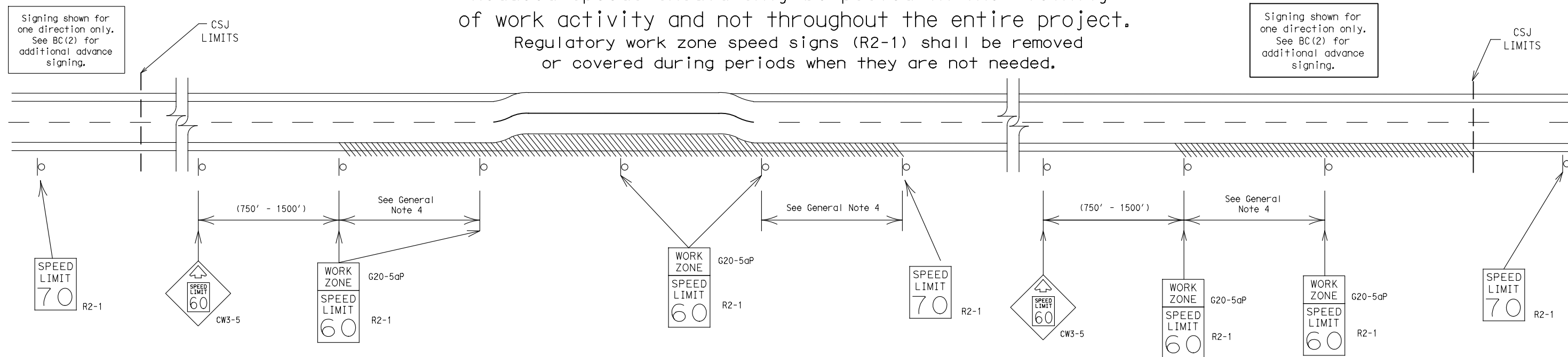
BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	LUFKIN	ANGELINA	21	

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:

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- 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

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- 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
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- 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.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
 - Law enforcement.
 - Flagger stationed next to sign.
 - Portable changeable message sign (PCMS).
 - Low-power (drone) radar transmitter.
 - Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

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SHEET 3 OF 12



BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

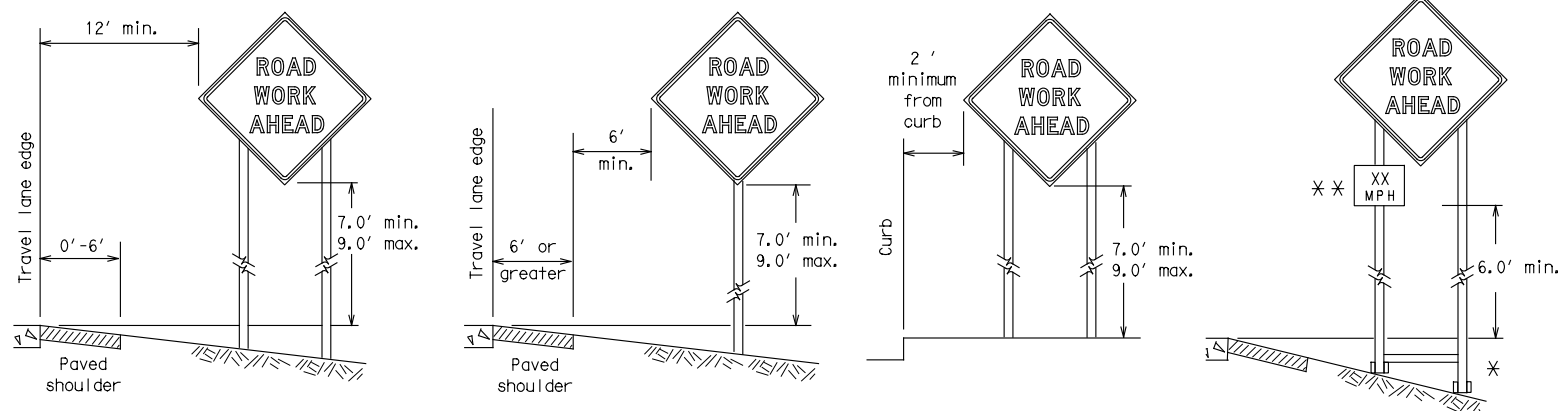
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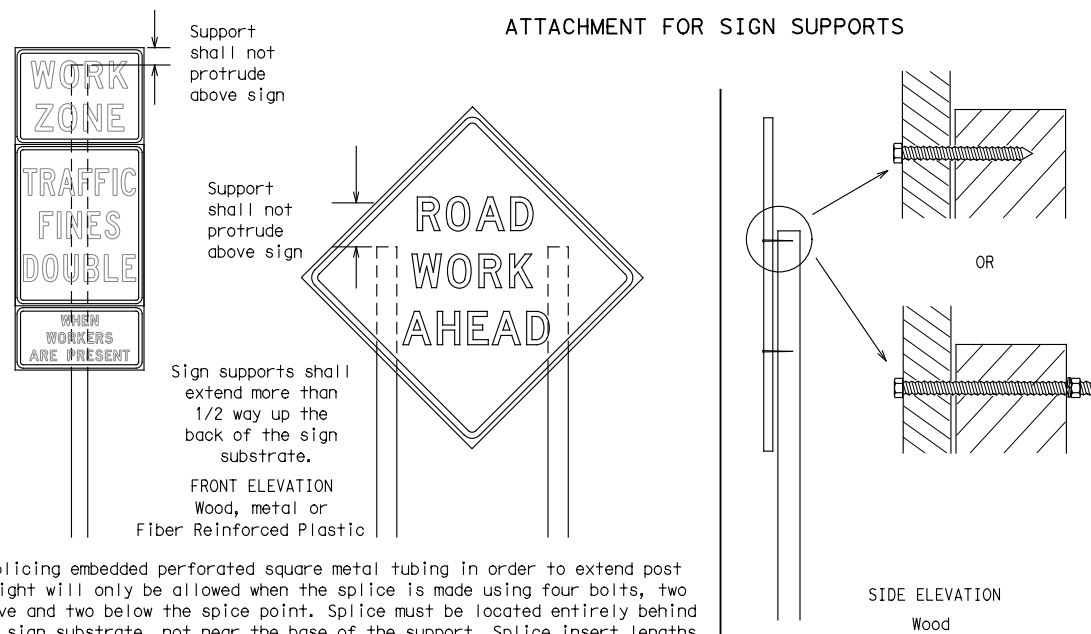
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

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

ATTACHMENT FOR SIGN SUPPORTS



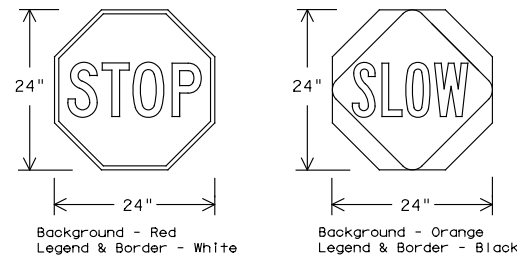
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the splice 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

- STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
- STOP/SLOW paddles shall be retroreflectORIZED when used at night.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- 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

- 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.
- 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.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- 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.
- 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.
- 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

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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)

- 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.
 - Long-term stationary - work that occupies a location more than 3 days.
 - 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.
 - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - Short, duration - work that occupies a location up to 1 hour.
 - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

- 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.
- 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.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- 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.
- 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

- 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

- 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.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- 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

- 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).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- 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

- 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

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- 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.
- 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.
- 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 shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- 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.
- 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.
- 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.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

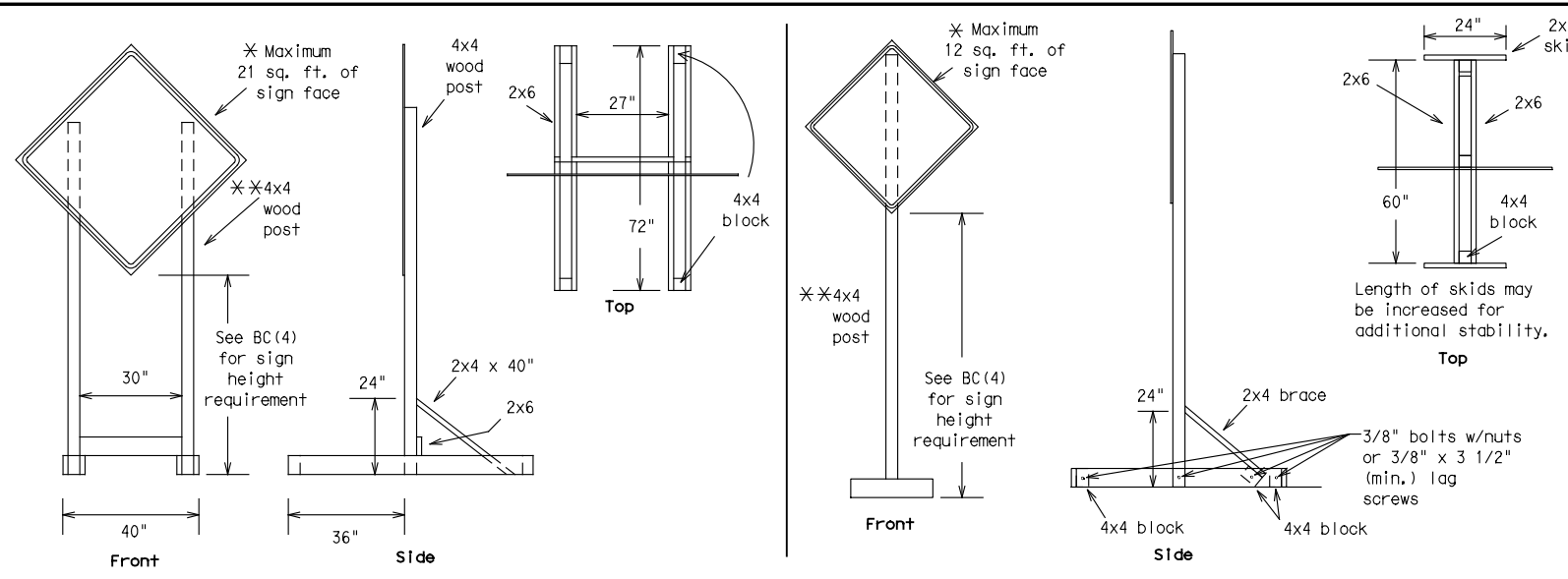
FLAGS ON SIGNS

- 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.

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES			
BC(4)-21			
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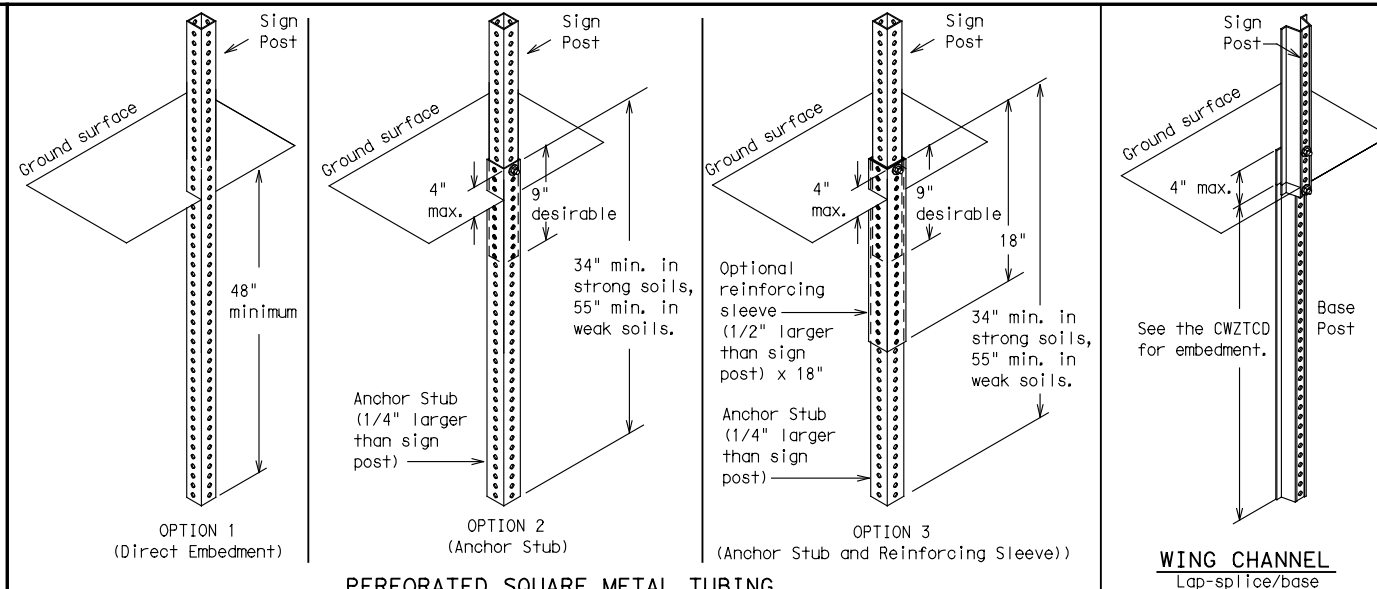
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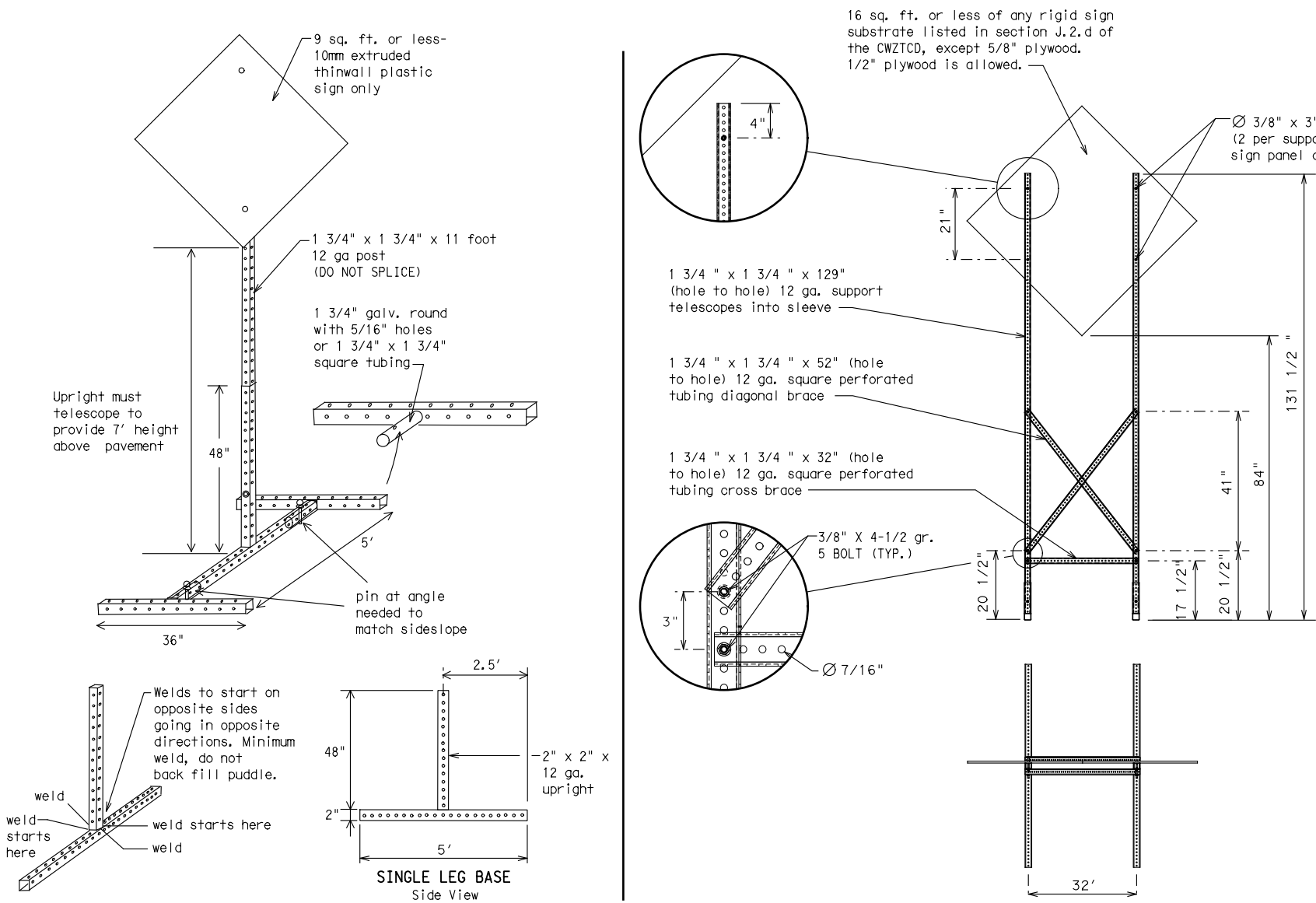
SKID MOUNTED WOOD SIGN SUPPORTS

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



GROUND MOUNTED SIGN SUPPORTS

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



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.

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- 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.
- 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.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- 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.
- 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.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 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.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- 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.
- 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.
- Each line of text should be centered on the message board rather than left or right justified.
- 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.

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WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Cannot	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLR
High-Occupancy Vehicle	HOV	Tuesday	TUES
Highway	HWY	Time Minutes	TIME MIN
Hour(s)	HR, HRS	Upper Level	UPR LEVEL
Information	INFO	Vehicles (s)	VEH, VEHS
It Is	ITS	Warning	WARN
Junction	JCT	Wednesday	WED
Left	LFT	Weight Limit	WT LIMIT
Left Lane	LFT LN	West	W
Lane Closed	LN CLOSED	Westbound	(route) W
Lower Level	LWR LEVEL	Wet Pavement	WET PVMT
Maintenance	MAINT	Will Not	WONT

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List		Other Condition List	
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *
XXXXXXXX BLVD CLOSED			

* 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		Location List	Warning List	** Advance Notice List
MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM-X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX-XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM-XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM-XX AM
STAY IN LANE *				

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- 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.
- 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

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- 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

- 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.
- 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.
- 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.
- 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.



BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

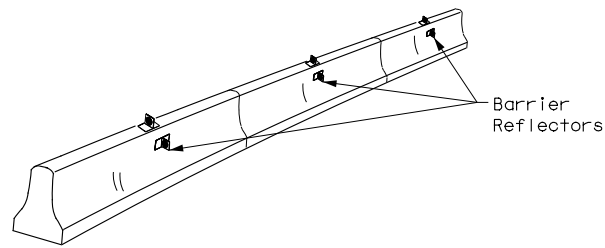
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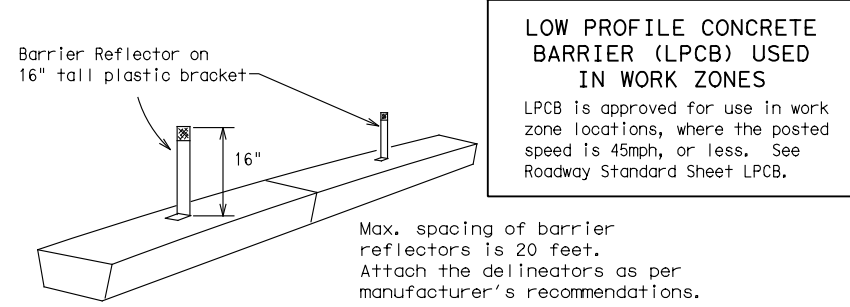
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



CONCRETE TRAFFIC BARRIER (CTB)

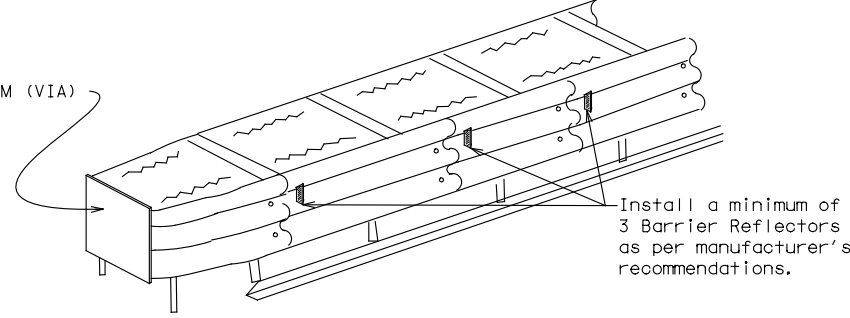
- Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector.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



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 appropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

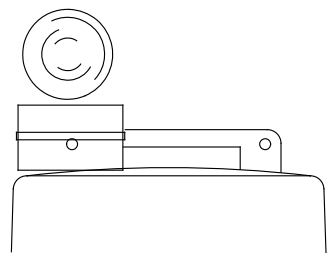
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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.
- 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".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- 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.
- 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.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

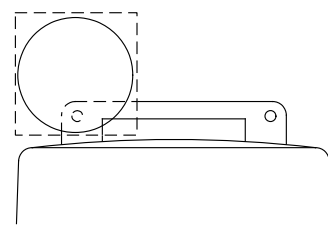
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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.
- 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.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- 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

- 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.
- 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.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- 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.
- 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.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.



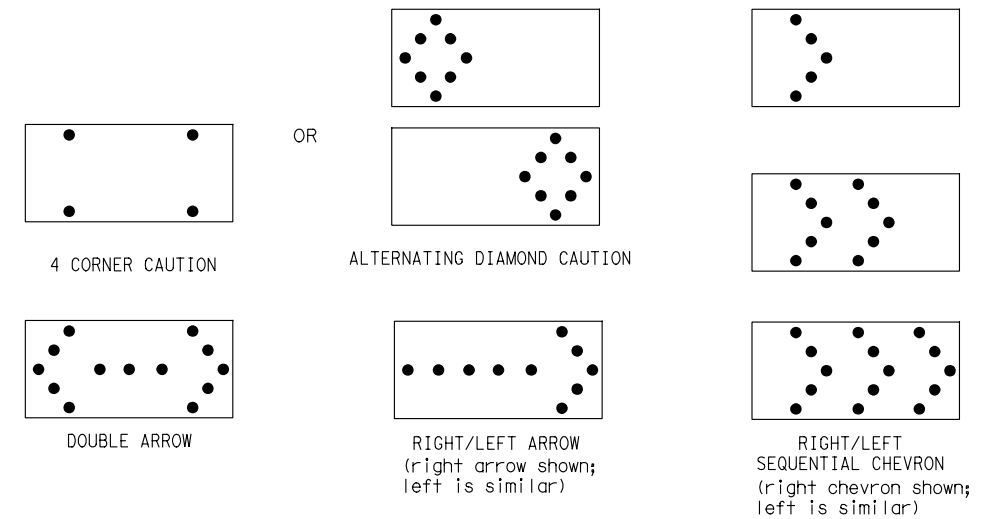
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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.

- 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.
- 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.
- 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.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- 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.
- 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.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- 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.
- Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

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

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

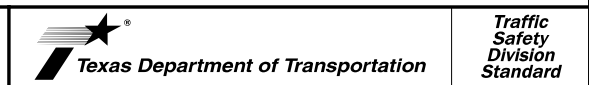
WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- 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.
- 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.



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

BC (7) -21

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©TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		3264	01	010	FM 326				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	LUFKIN	ANGELINA	26					

DATE: 3/25/2022 1:15
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GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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).
- 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.
- 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:

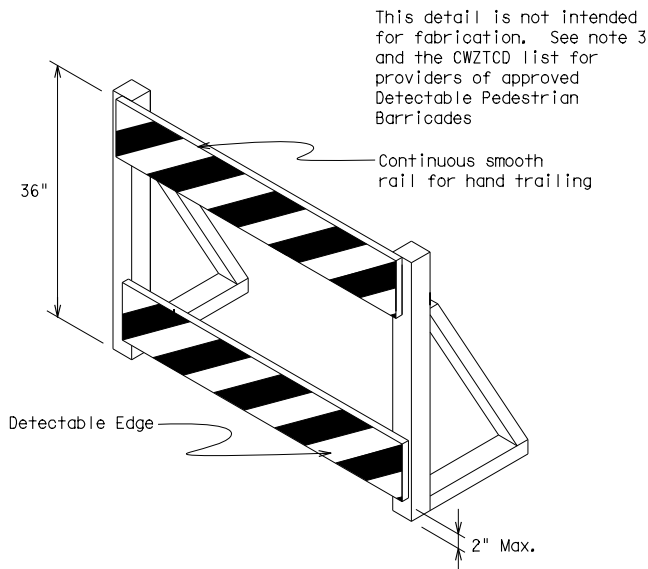
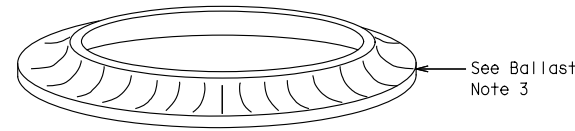
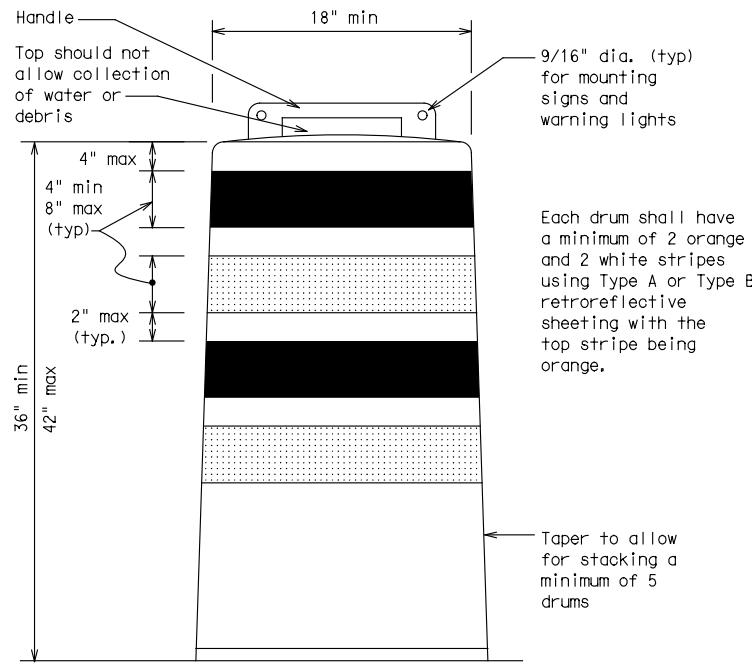
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
- 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.
- 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.
- 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.
- 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.
- 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.
- Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
- Drum body shall have a maximum unballasted weight of 11 lbs.
- Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

- 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.
- 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.

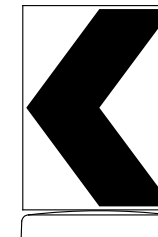
BALLAST

- 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.
- 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.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 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.
- 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.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

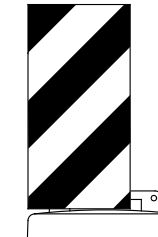


DETECTABLE PEDESTRIAN BARRICADES

- 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.
- 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.
- 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.
- 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.
- Warning lights shall not be attached to detectable pedestrian barricades.
- 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

- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- 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.
- 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.
- 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.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- 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.
- 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.

SHEET 8 OF 12



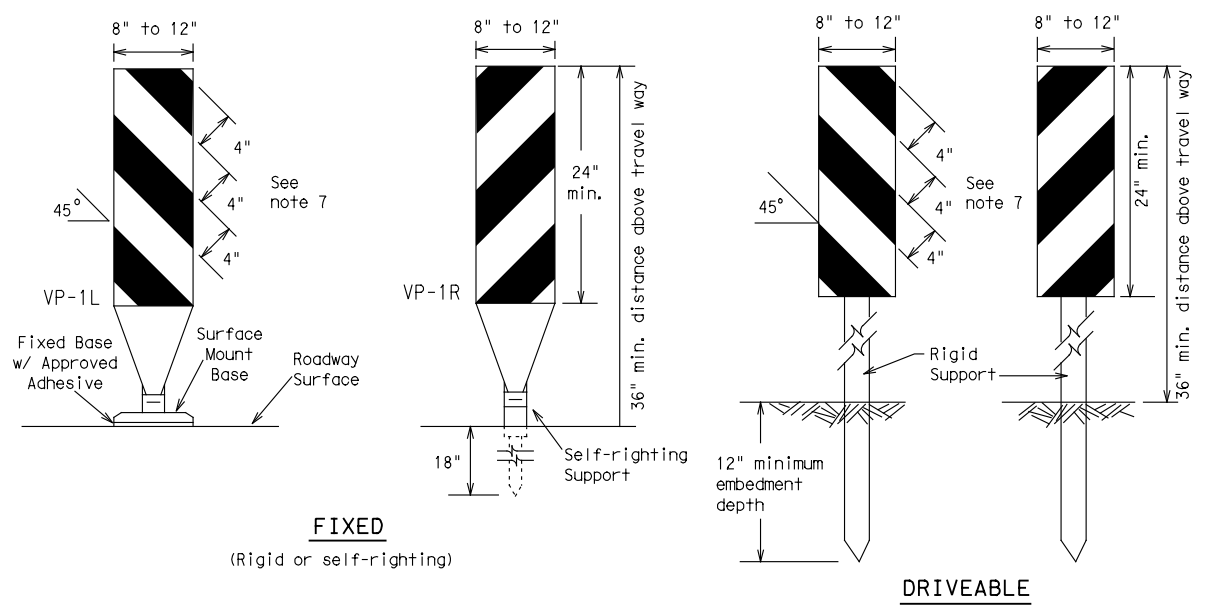
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
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9-07	5-21	LUFKIN	ANGELINA	27					
7-13									

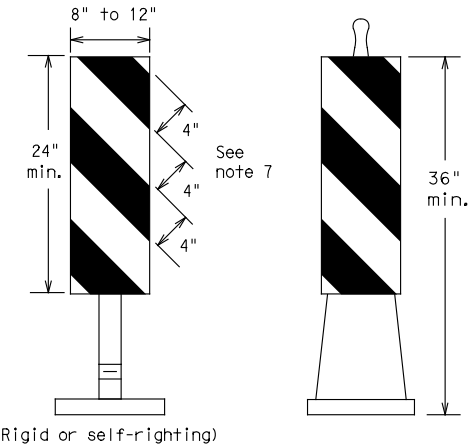
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FIXED
(Rigid or self-righting)

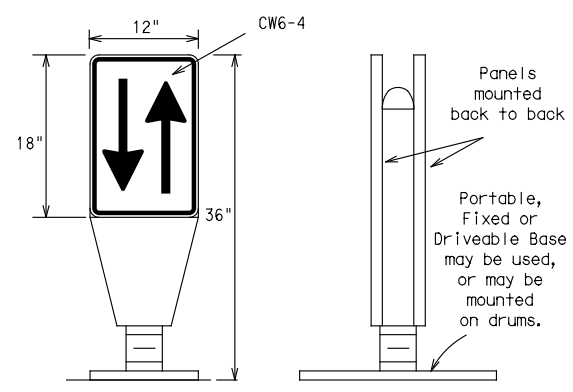
DRIVEABLE



PORTABLE

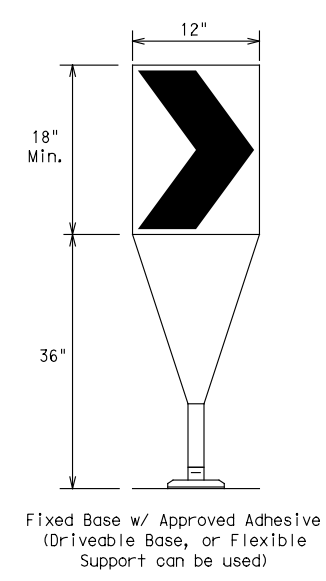
VERTICAL PANELS (VPs)

- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- 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.
- 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.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



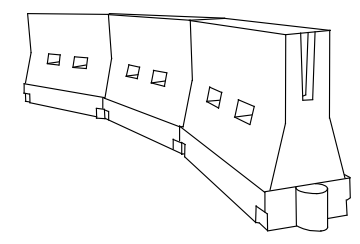
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

- 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.
- The OTLD may be used in combination with 42" cones or VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
- 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.



- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- 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.
- To be effective, the chevron should be visible for at least 500 feet.
- 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.
- For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 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

- 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.
- 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.
- 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.
- 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.
- When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

GENERAL NOTES

- 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).
- 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.
- 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).
- 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.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 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.
- The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

Posted Speed	Formula	Minimum Desirable Taper Lengths *X			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	L = 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'

*X 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



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

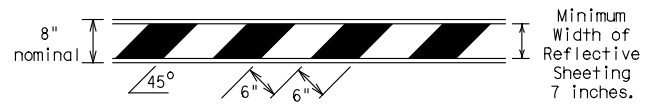
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	LUFKIN	ANGELINA	28	

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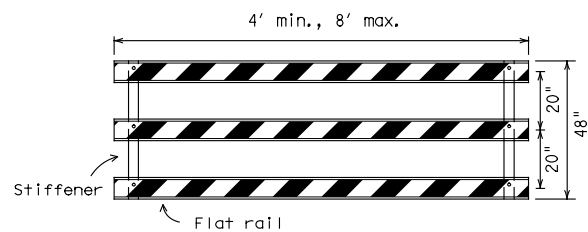
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.

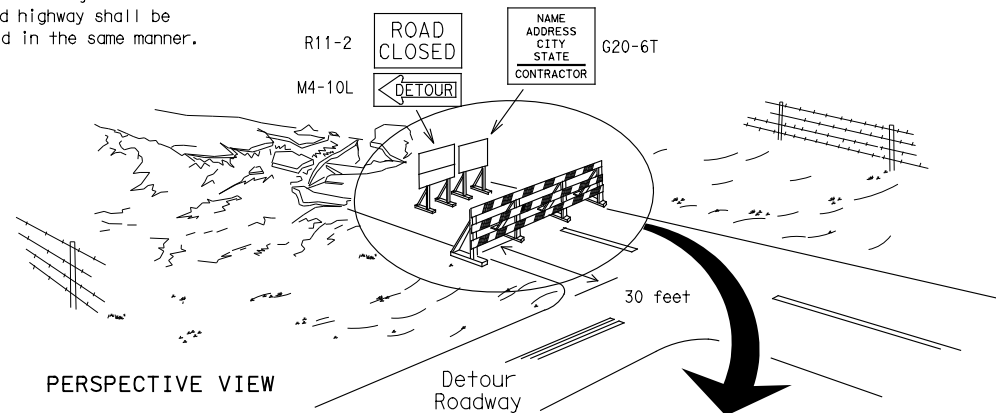


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

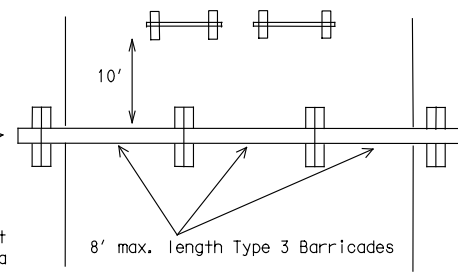
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

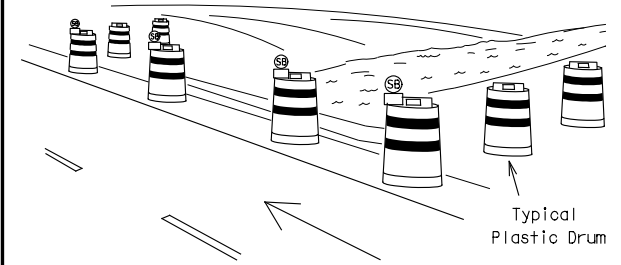
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

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.

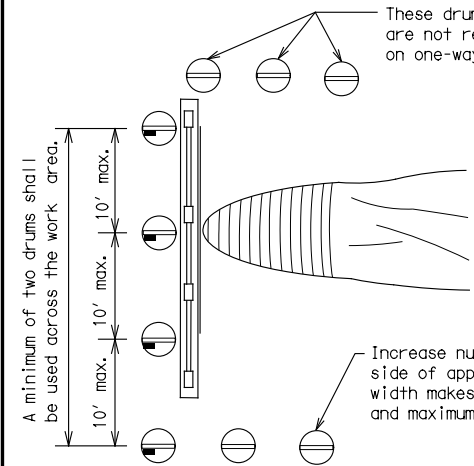


PLAN VIEW

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

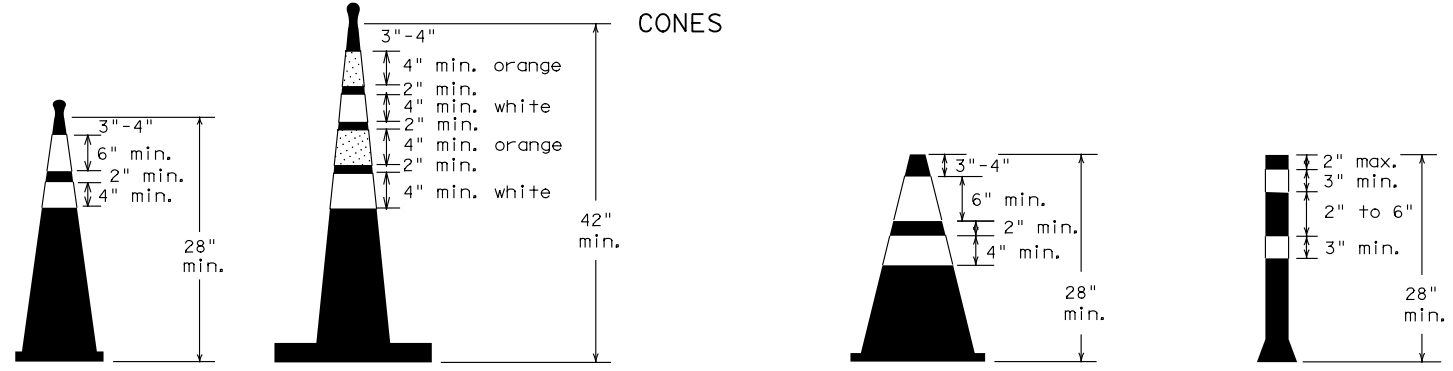


PLAN VIEW

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

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

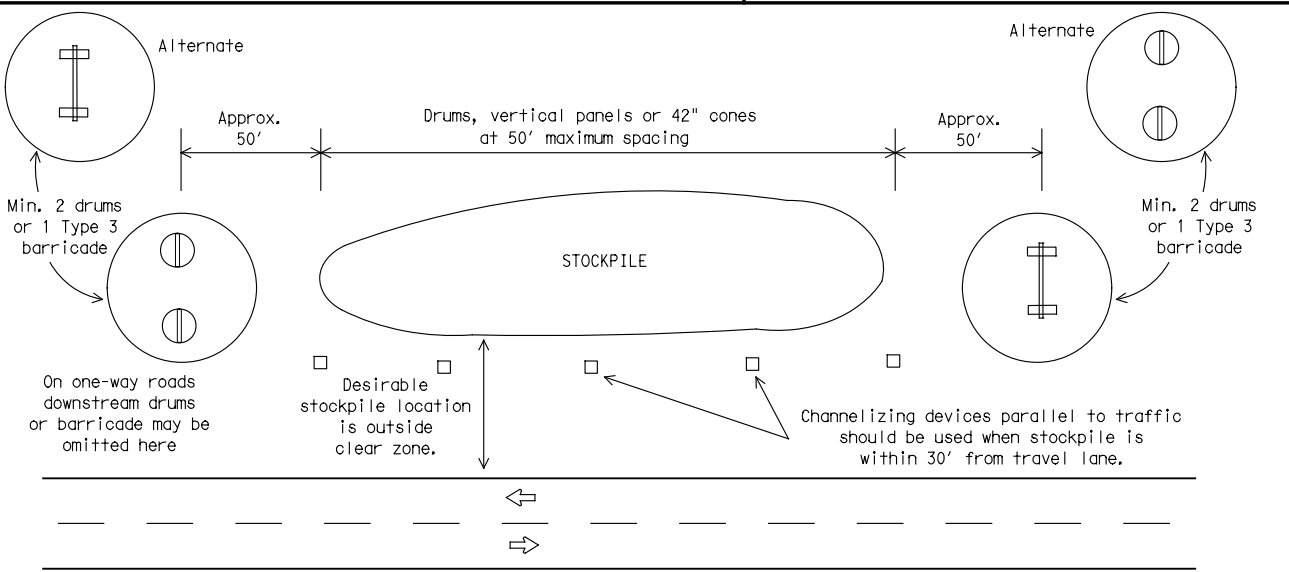


Two-Piece cones

One-Piece cones

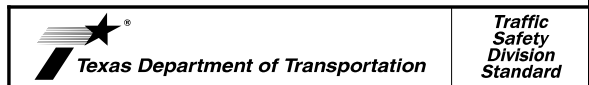
Tubular Marker

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.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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.



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	3264	01	010	FM 326
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	LUFKIN	ANGELINA	29	

WORK ZONE PAVEMENT MARKINGS

GENERAL

- 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.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- 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).
- 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.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- 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

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

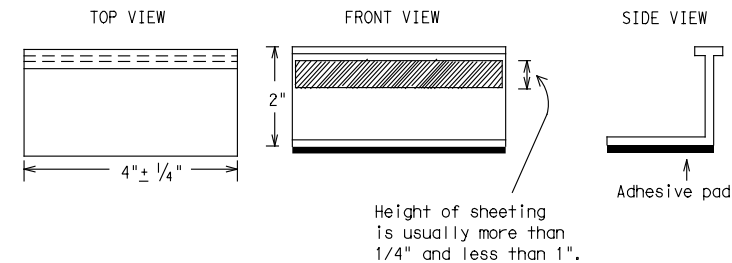
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- 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.
- 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.
- 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

- 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.
- 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.
- 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".
- The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- Over-painting of the markings SHALL NOT BE permitted.
- Removal of raised pavement markers shall be as directed by the Engineer.
- 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.
- 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**

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 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.
 - 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.
 - 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.
- Small design variances may be noted between tab manufacturers.
- 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

- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- 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).

SHEET 11 OF 12



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
	3264	01	010	FM 326
REVISIONS	DIST		COUNTY	SHEET NO.
2-98 9-07 5-21	LUFKIN		ANGELINA	30
1-02 7-13				
11-02 8-14				

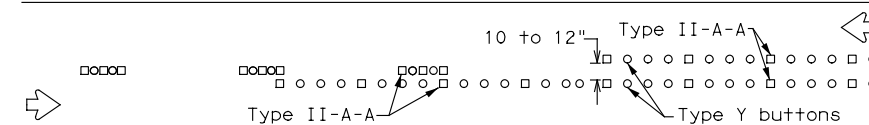
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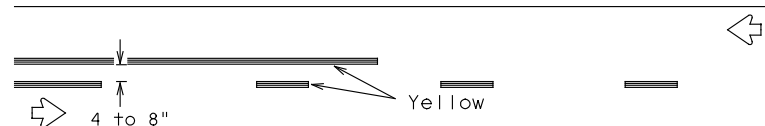
PAVEMENT MARKING PATTERNS



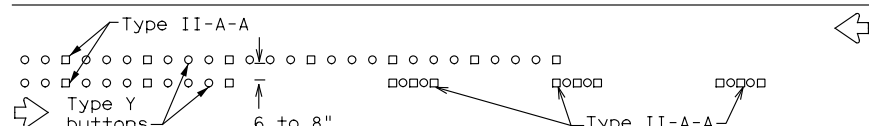
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



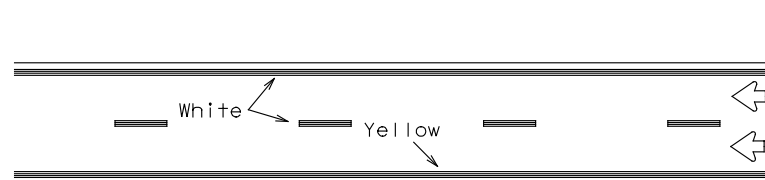
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



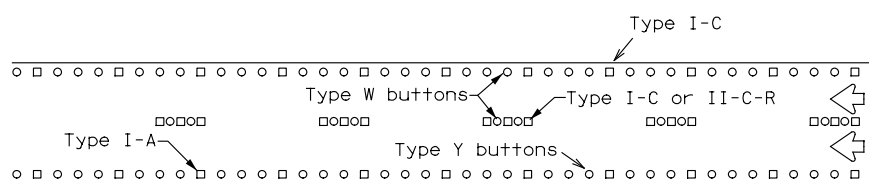
RAISED PAVEMENT MARKERS - PATTERN B

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

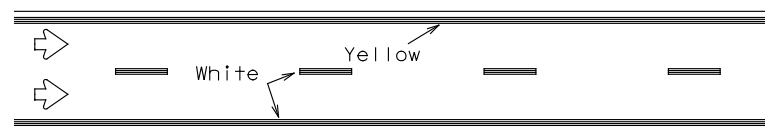
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



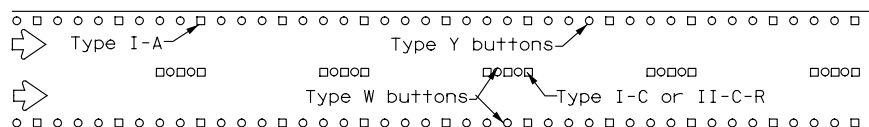
REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS



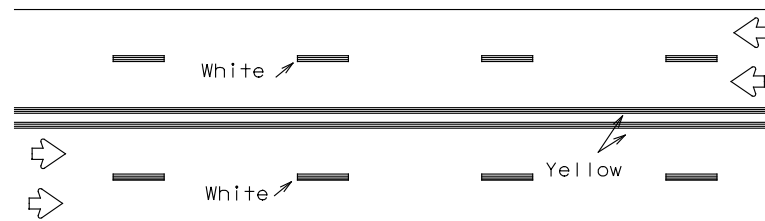
REFLECTORIZED PAVEMENT MARKINGS



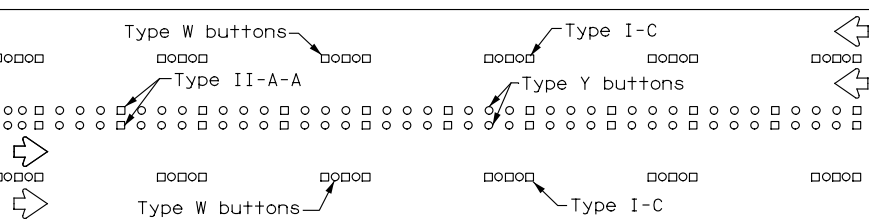
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



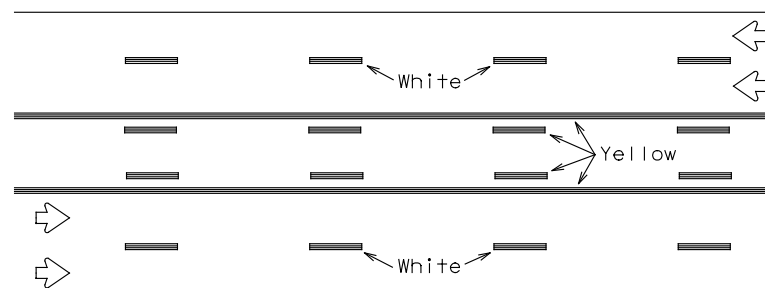
REFLECTORIZED PAVEMENT MARKINGS



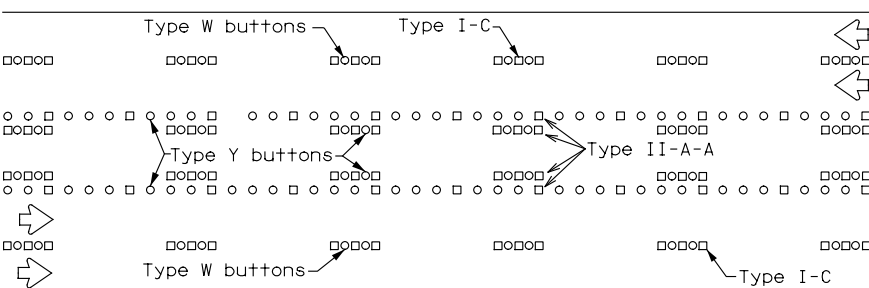
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

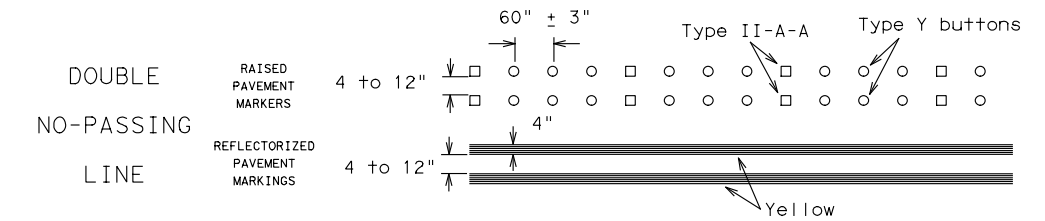


RAISED PAVEMENT MARKERS

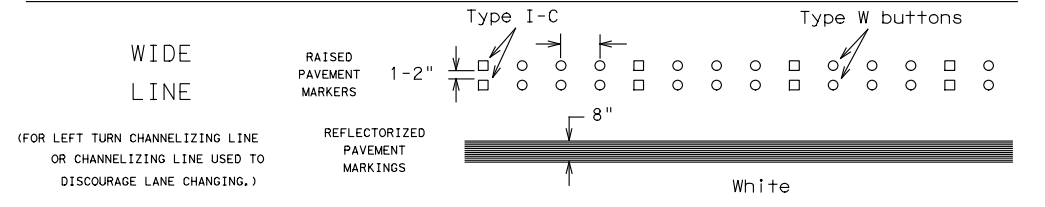
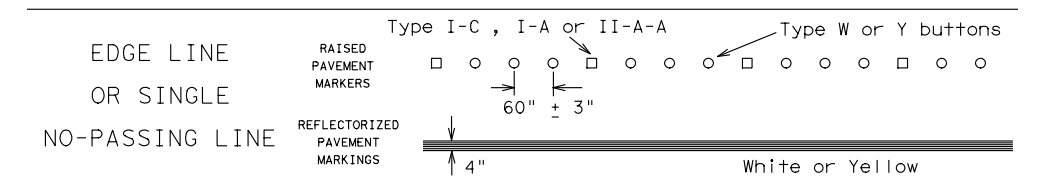
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

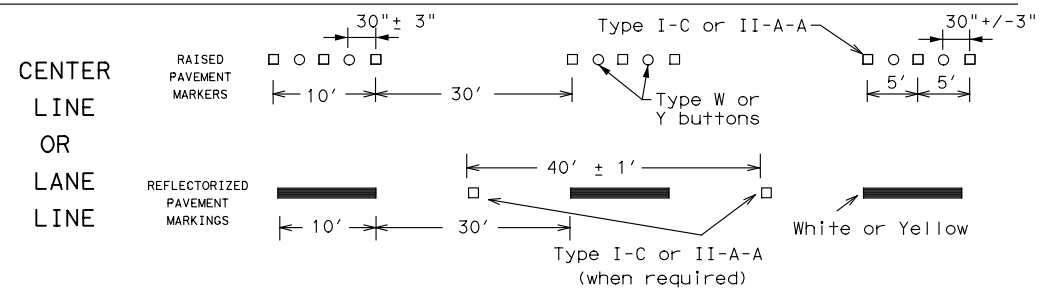
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



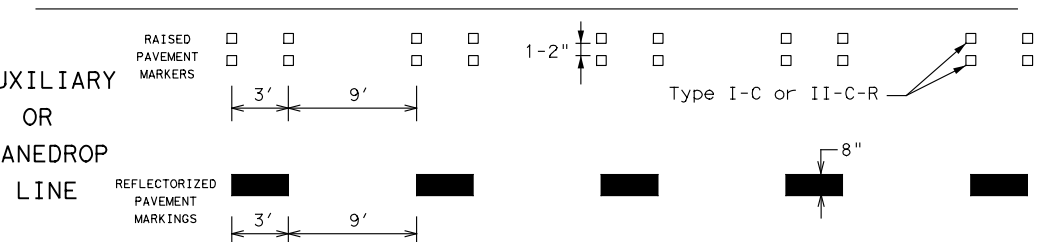
SOLID LINES



BROKEN LINES

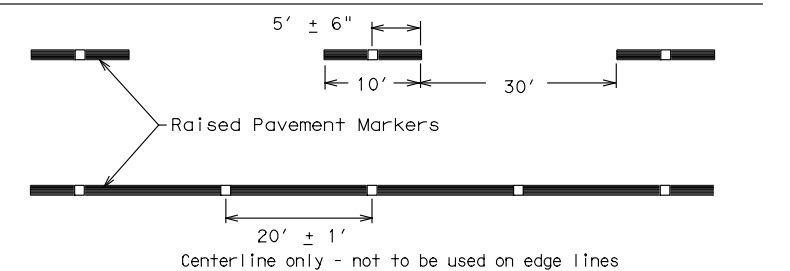


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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REVISIONS	3264	01	010	FM 326
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	LUFKIN	ANGELINA	31	
11-02 8-14				

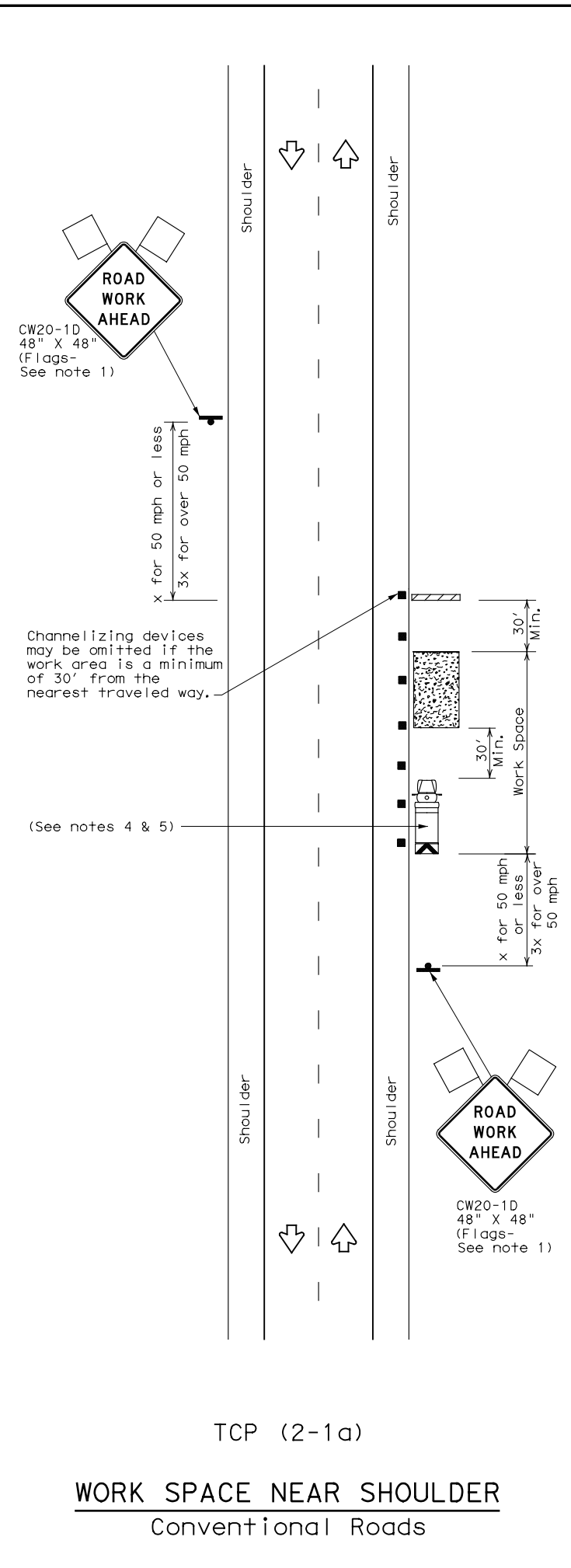
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FILE: pw://rtg-pw_bent ley.com:rtg-pw/Document/9360503/CADD/Standards/TCP/bc-21.dgn

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."

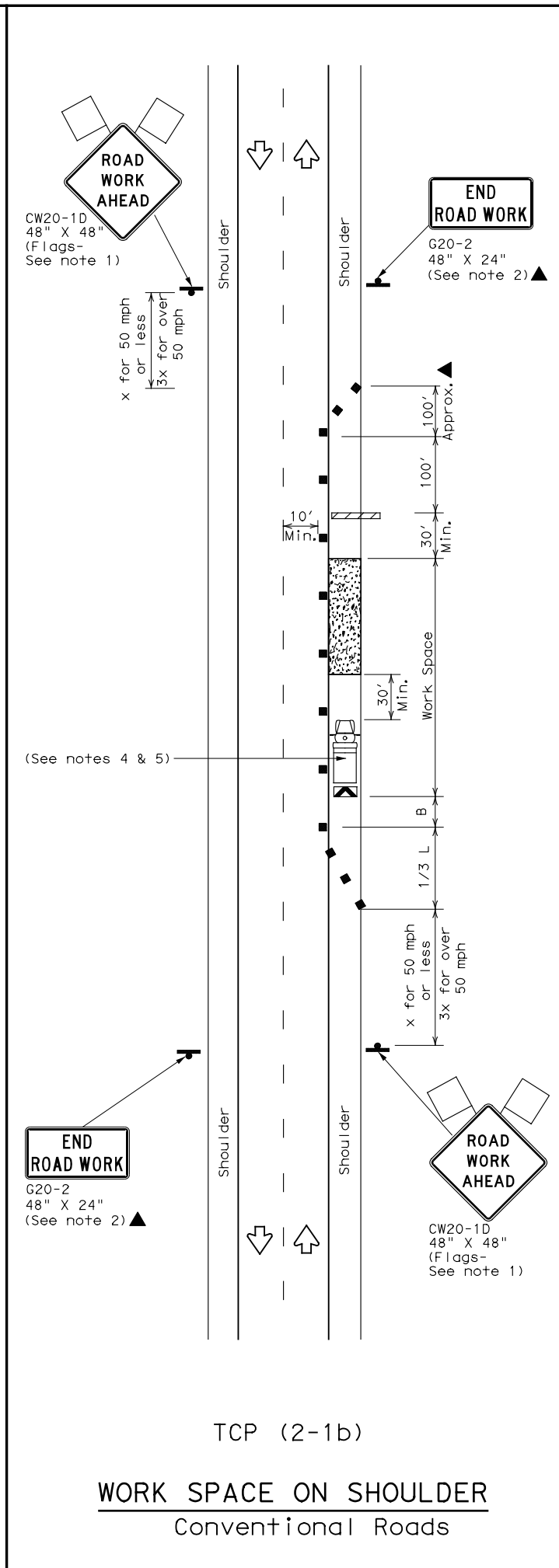
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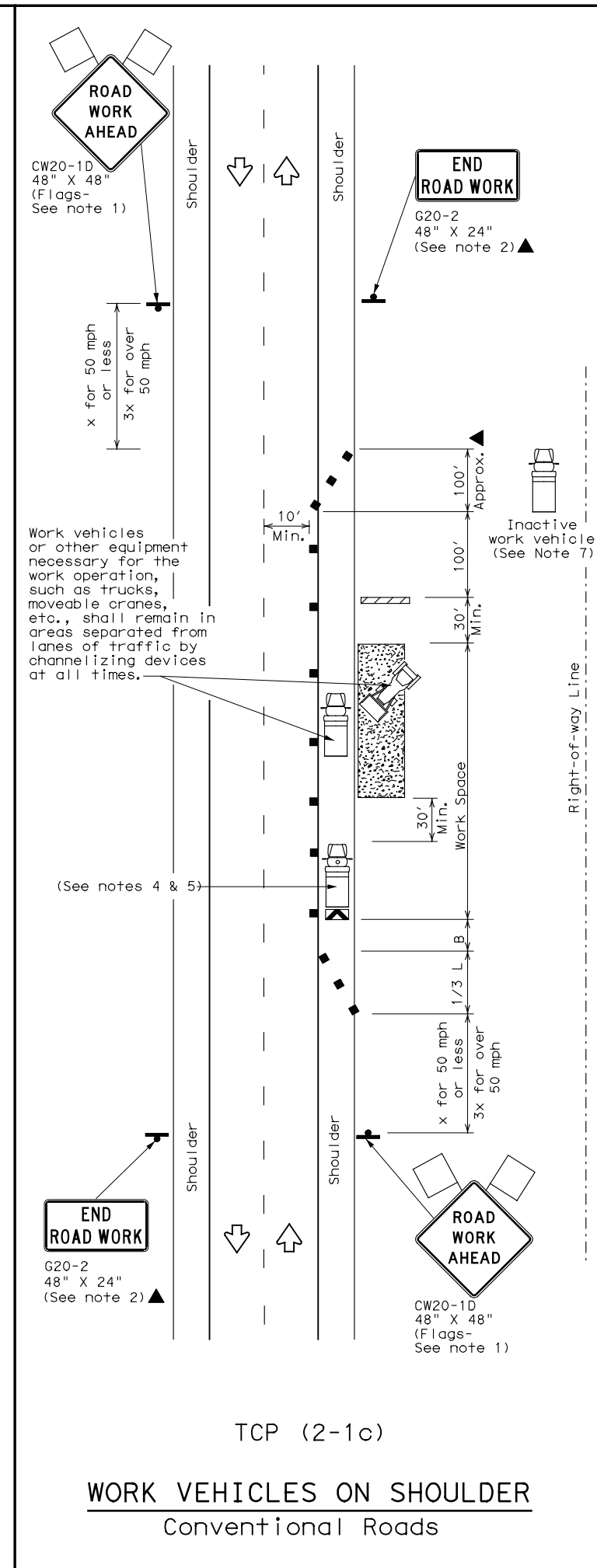
TCP (2-1a)

WORK SPACE NEAR SHOULDER
 Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
 Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
 Conventional Roads

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
 - Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
 - Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
 - See TCP (5-1) for shoulder work on divided highways, expressways and freeways.
 - Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
 - CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.



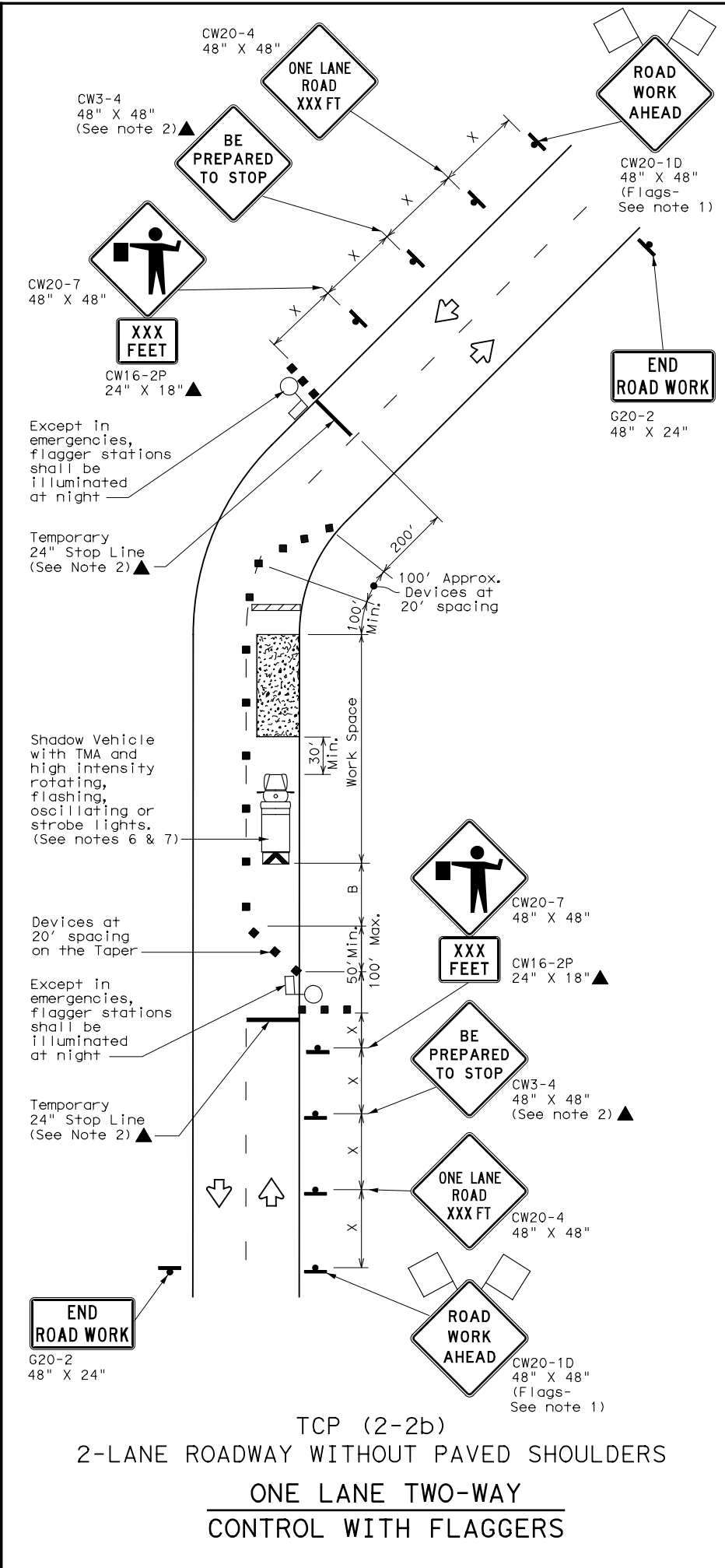
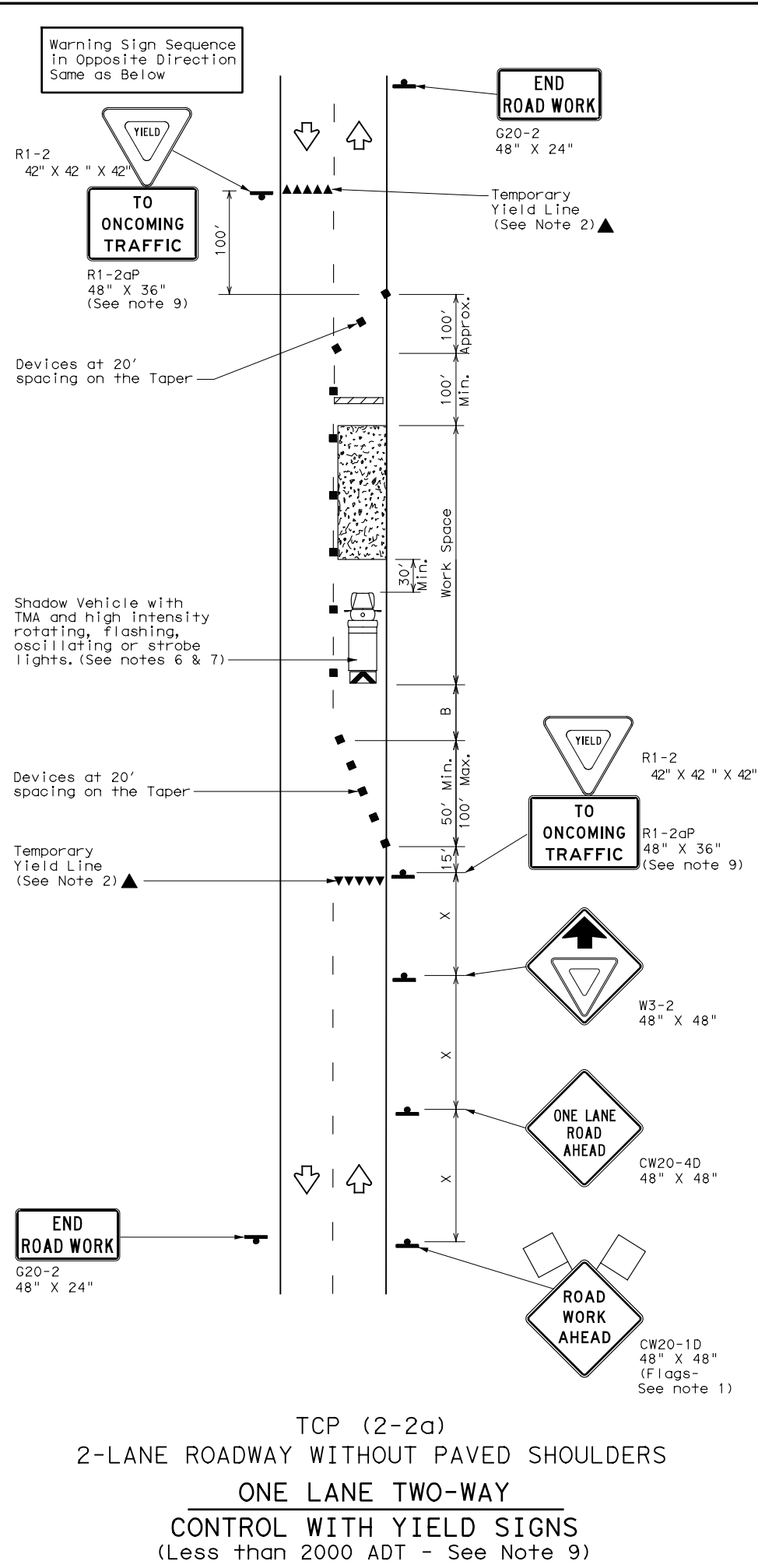
TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK

TCP (2-1) -18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	LUFKIN	ANGELINA	35	
1-97 2-18				

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LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L = WS ² / 60	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L = WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	575'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

TYPICAL USAGE

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

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - 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.
 - The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
 - Flaggers should use two-way radios or other methods of communication to control traffic.
 - Length of work space should be based on the ability of flaggers to communicate.
 - 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.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- TCP (2-2a)**
- The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
 - The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.
- TCP (2-2b)**
- Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
 - If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
 - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

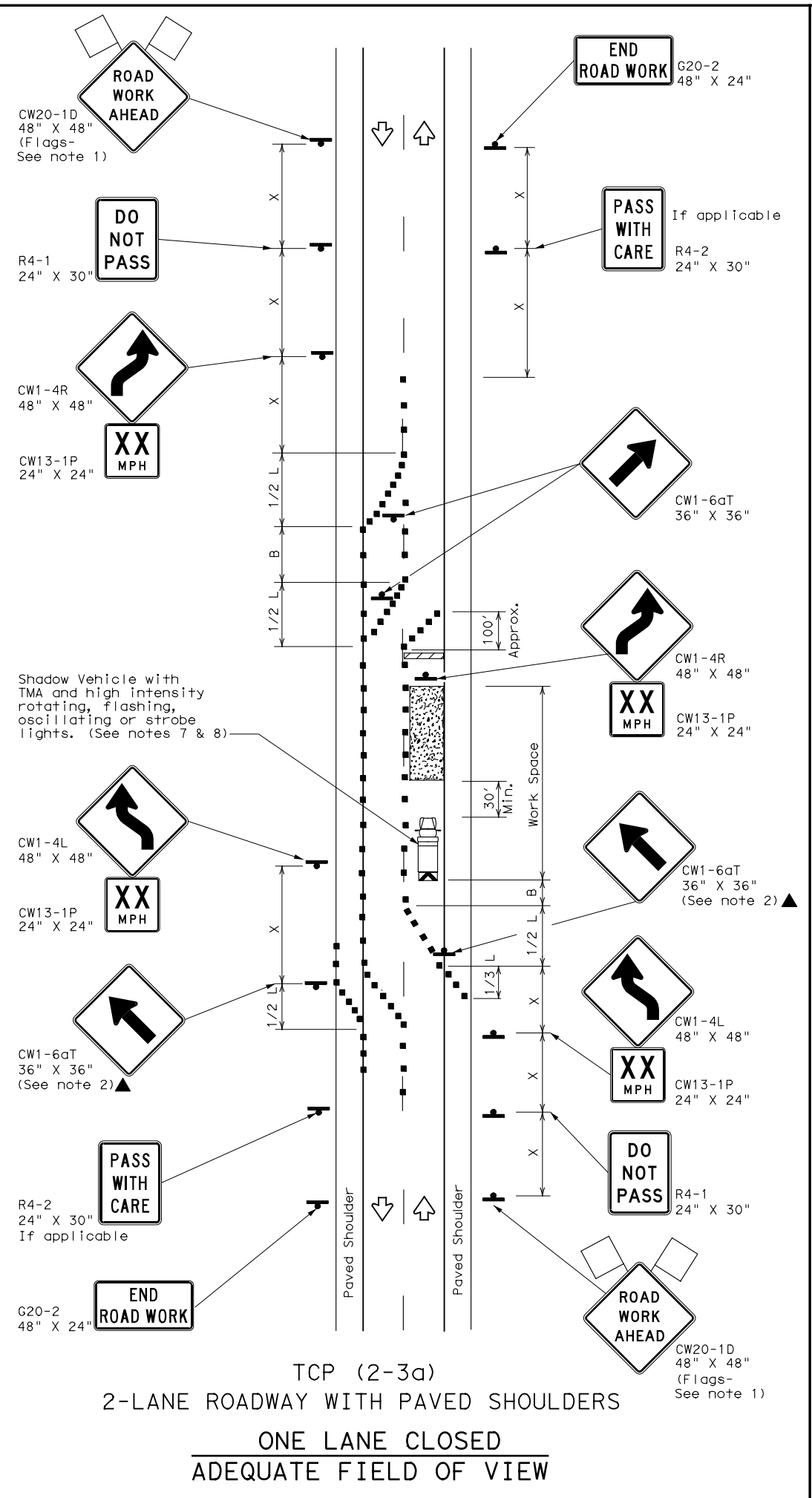
TCP (2-2) - 18

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1-97	2-12			LUFKIN	ANGELINA	SHEET NO.		36	
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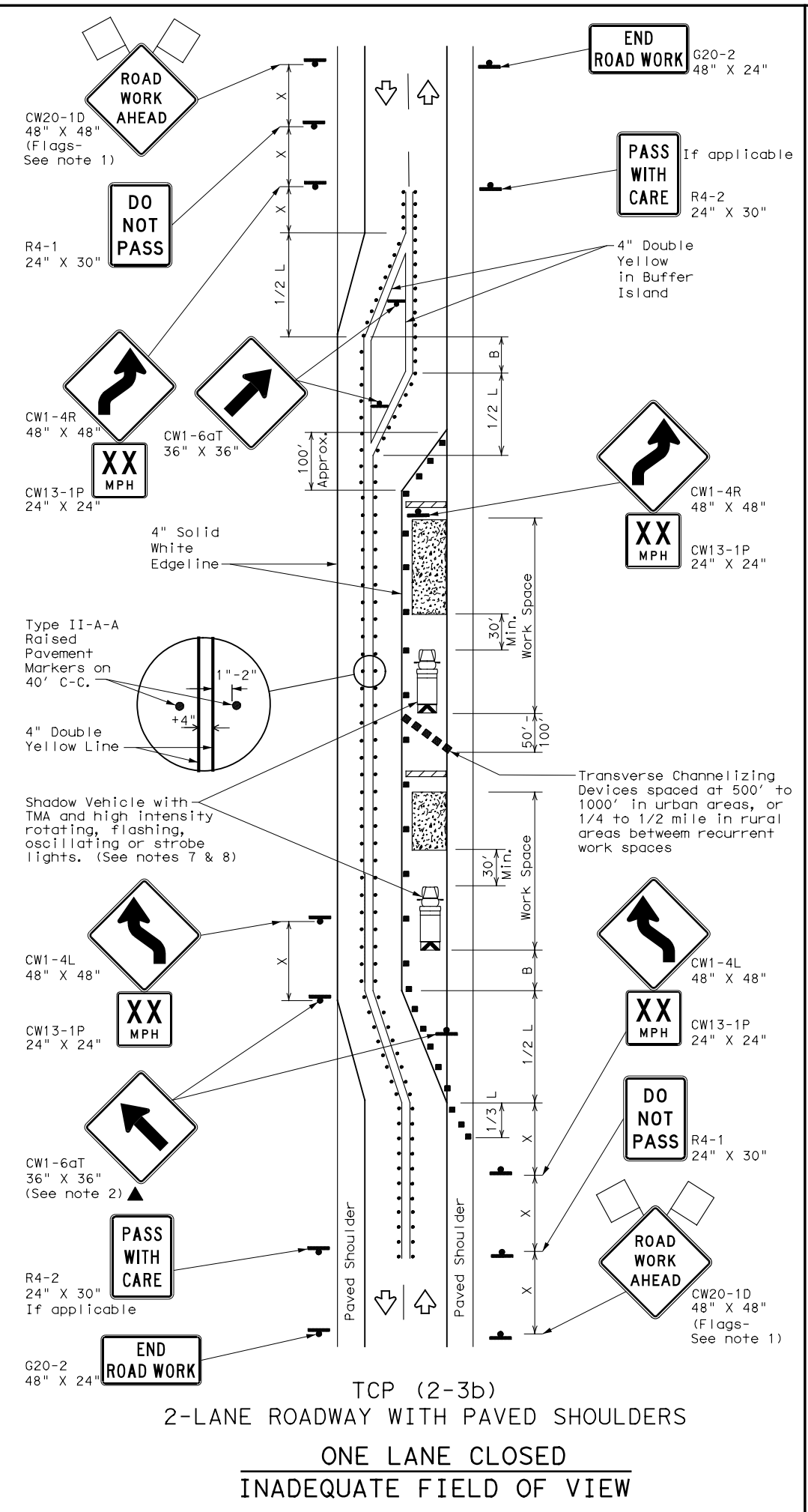
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TCP (2-3a)
 2-LANE ROADWAY WITH PAVED SHOULDERS
 ONE LANE CLOSED
 ADEQUATE FIELD OF VIEW



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

LEGEND

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

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

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

TYPICAL USAGE

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

TCP (2-3b) ONLY

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - 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.
 - When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
 - Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
 - The R4-1 "DO NOT PASS," R4-2 "PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
 - Conflicting pavement marking shall be removed for long term projects.
 - 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.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

- TCP (2-3a)**
- Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter device spacing is intended for the area of the conflicting markings, not the entire work zone.

Texas Department of Transportation Traffic Operations Division Standard

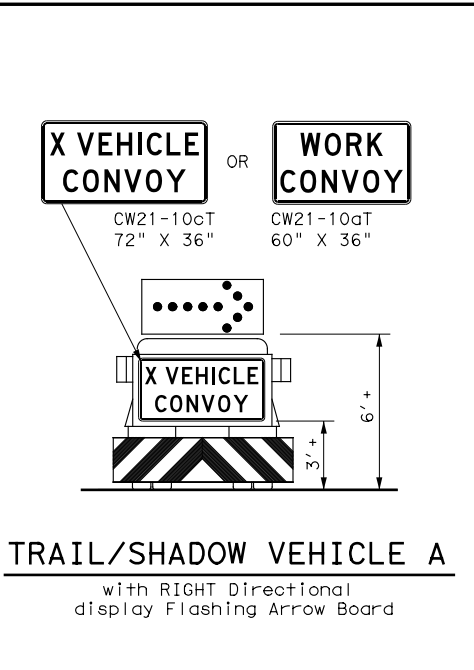
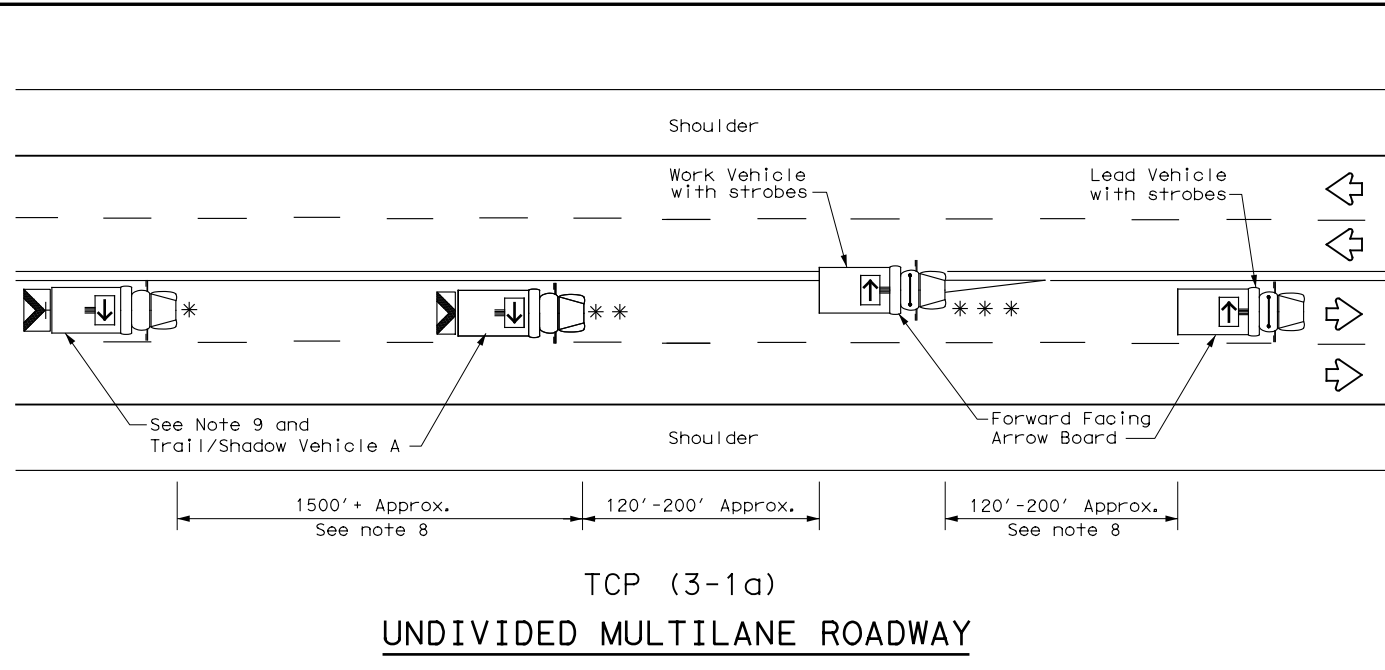
TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON
TWO-LANE ROADS

TCP (2-3) - 18

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1-97 2-12				SHEET NO.: 37
4-98 2-18				

163

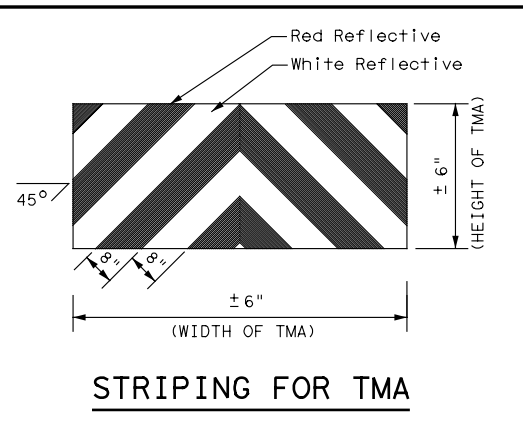
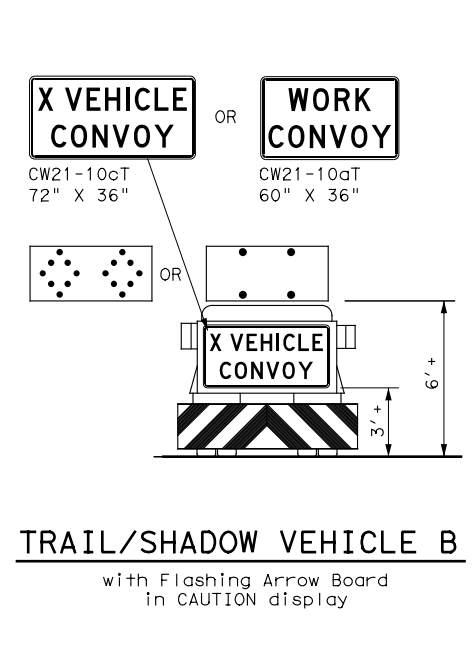
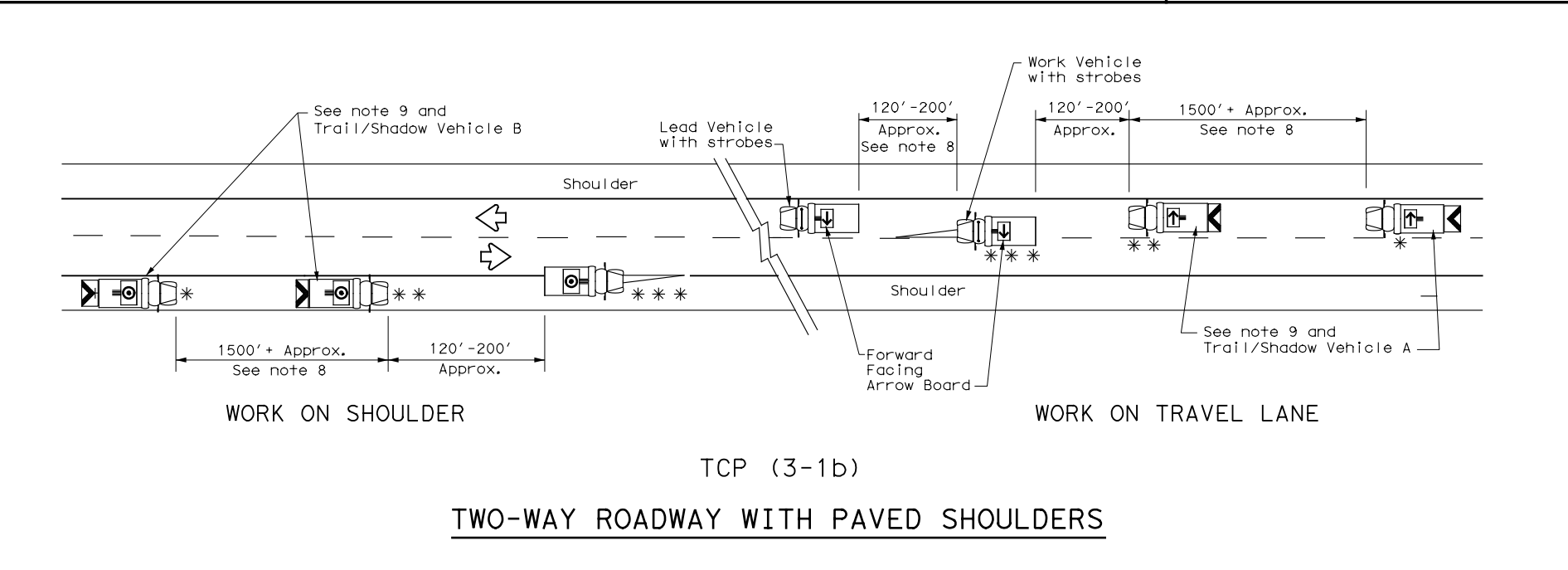
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LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
** *	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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



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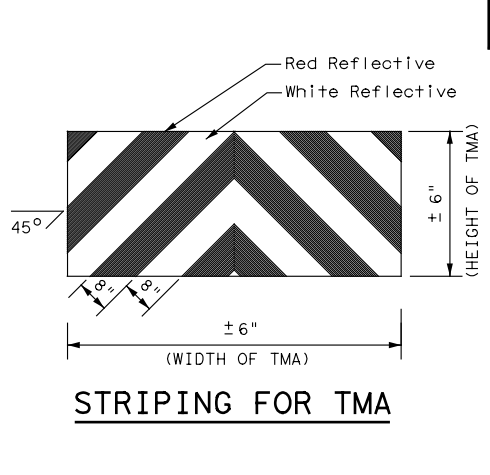
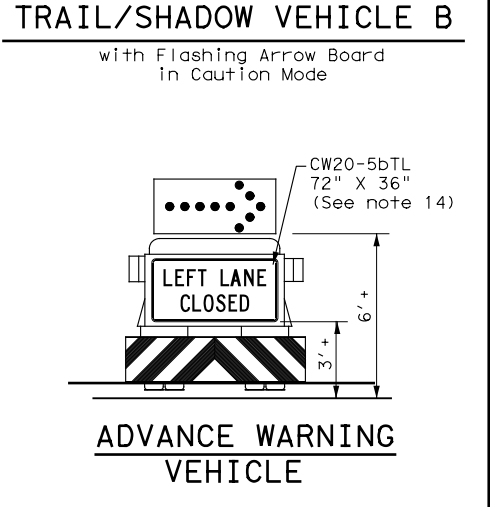
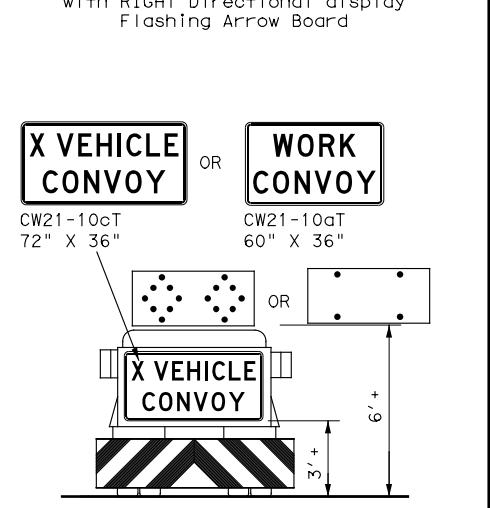
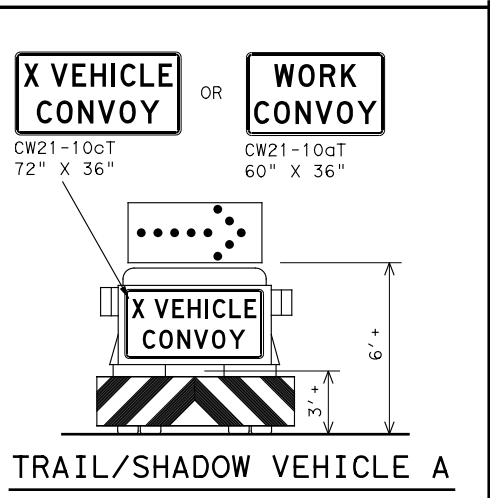
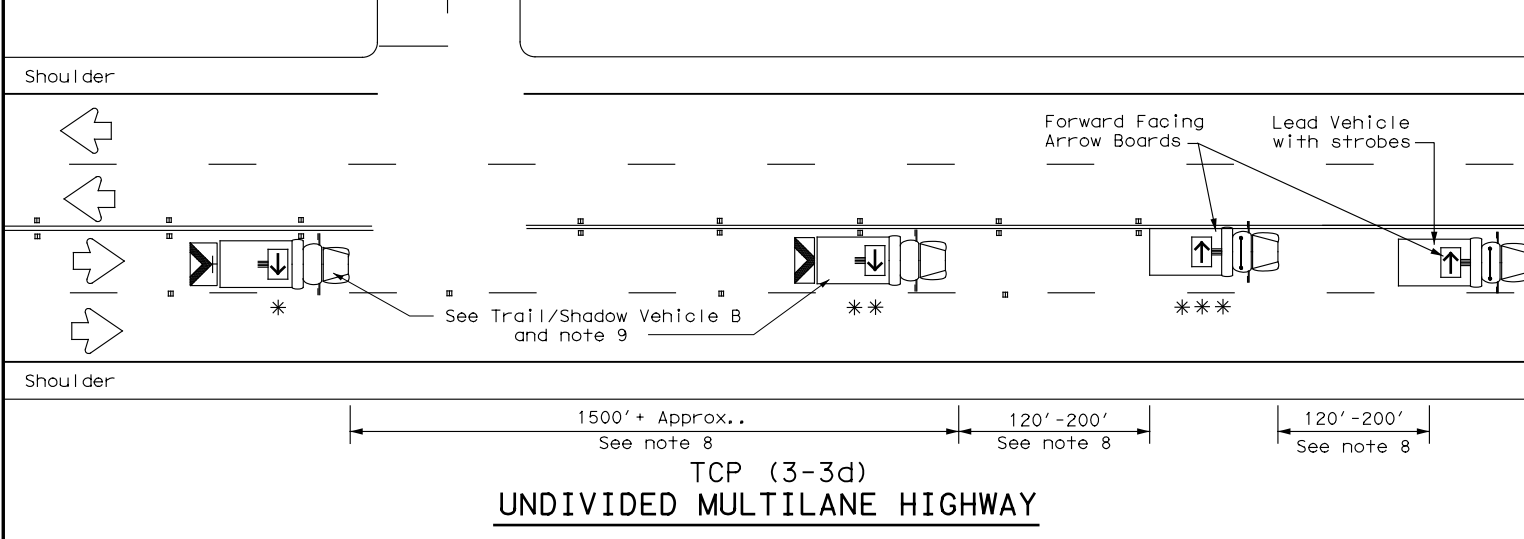
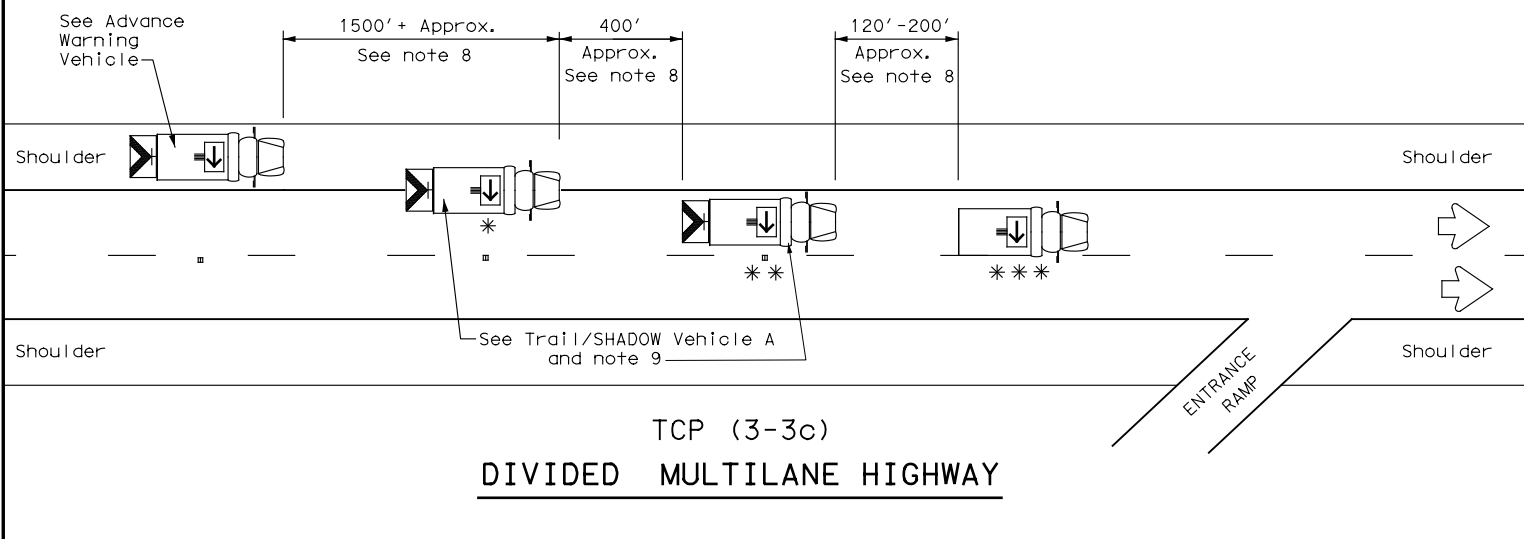
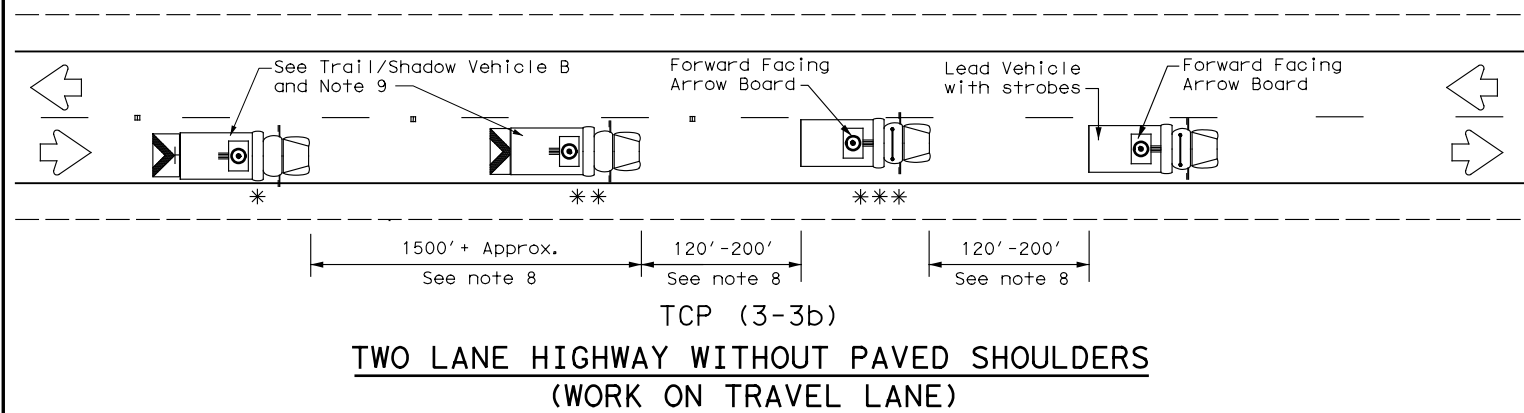
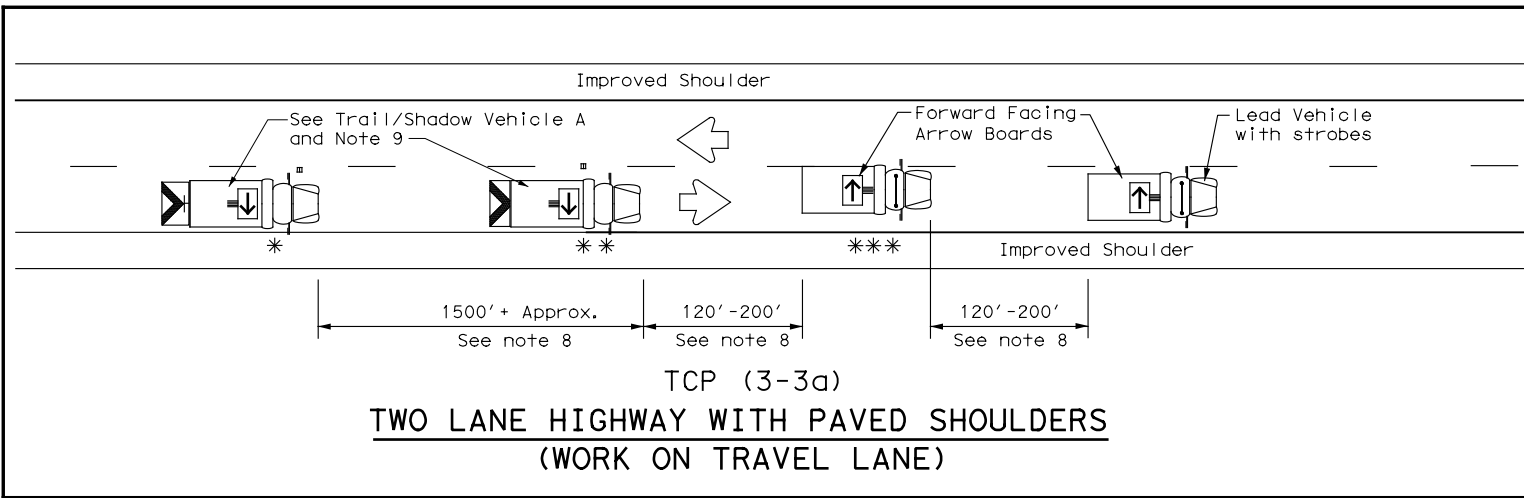
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
UNDIVIDED HIGHWAYS

TCP (3-1) - 13

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2-94	4-98			DIST	COUNTY	SHEET NO.			
8-95	7-13			LUFKIN	ANGELINA	38			
1-97									

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

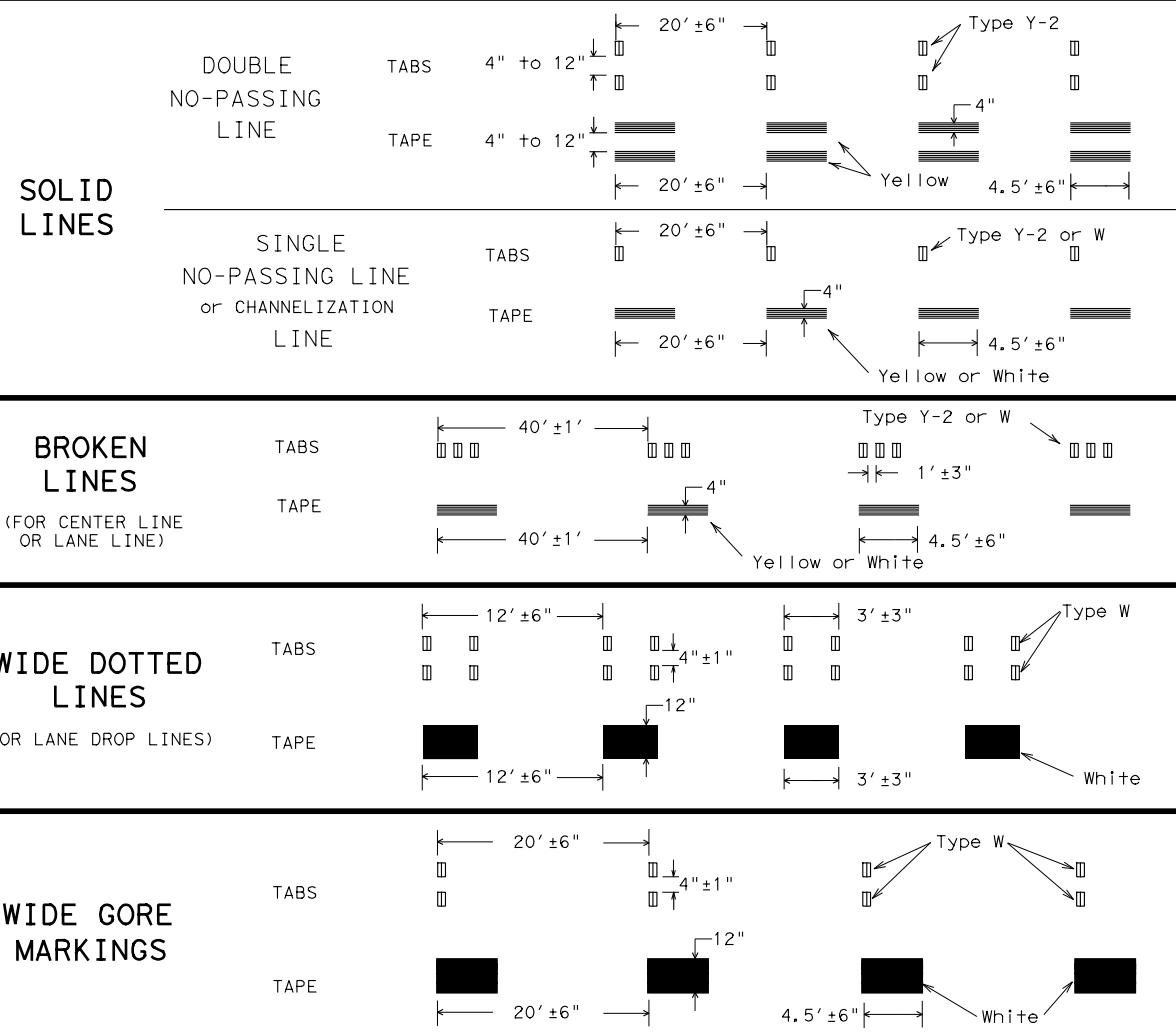
**TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
RAISED PAVEMENT
MARKER INSTALLATION/
REMOVAL
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2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	LUFKIN	ANGELINA	39	
1-97 7-14				

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WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



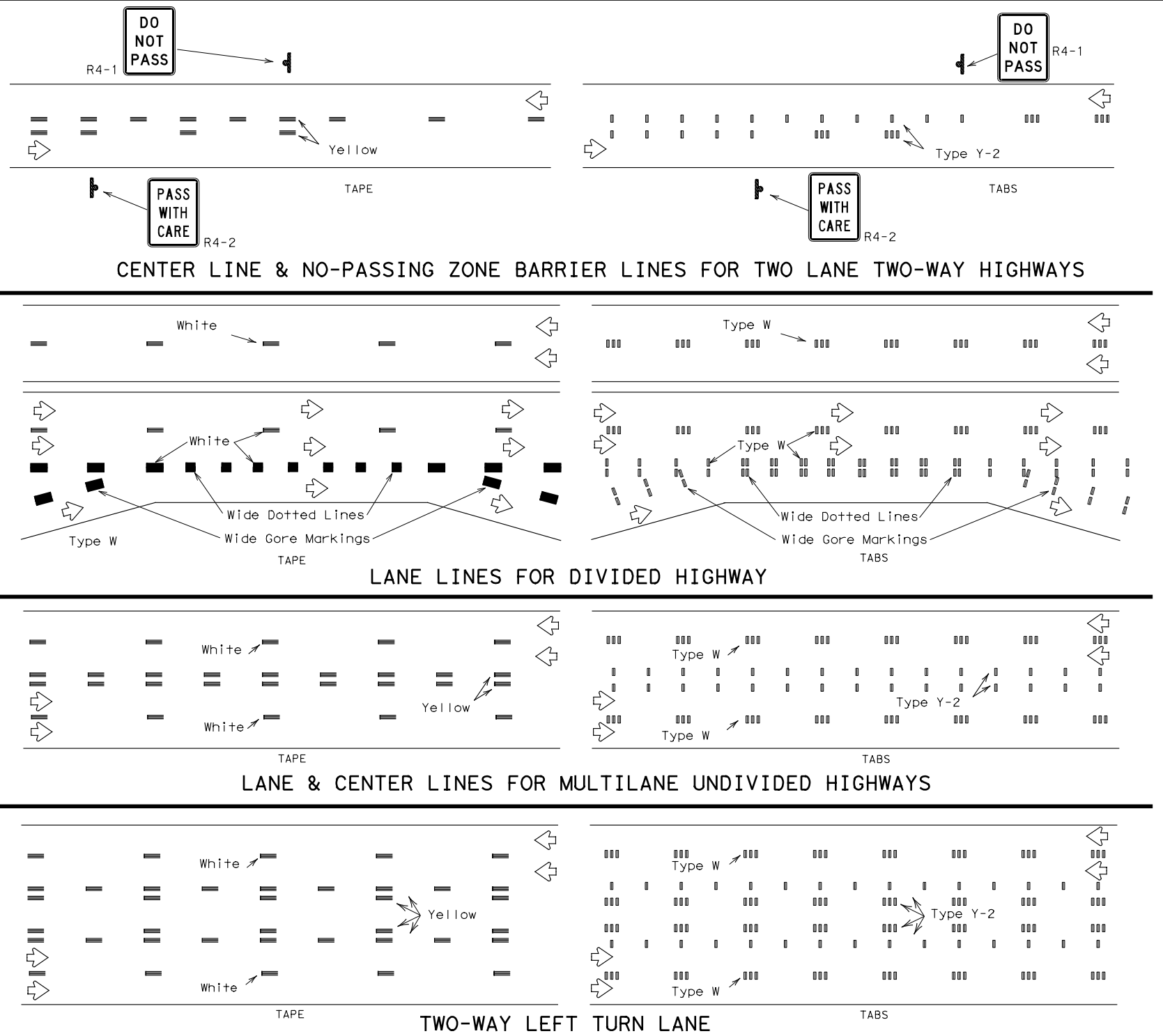
NOTES:

- Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible-reflective roadway marker tabs unless otherwise specified elsewhere in plans.
- Short term pavement markings shall NOT be used to simulate edge lines.
- Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
- Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
- No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
- For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
- For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
- For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

- Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
- Tabs shall meet requirements of Departmental Material Specification DMS-8242.
- When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
- No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



PREFABRICATED PAVEMENT MARKINGS

- Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
- Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Construction-Grade Prefabricated Pavement Markings."

RAISED PAVEMENT MARKERS

- All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.

DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

- DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:
http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

WORK ZONE SHORT TERM PAVEMENT MARKINGS

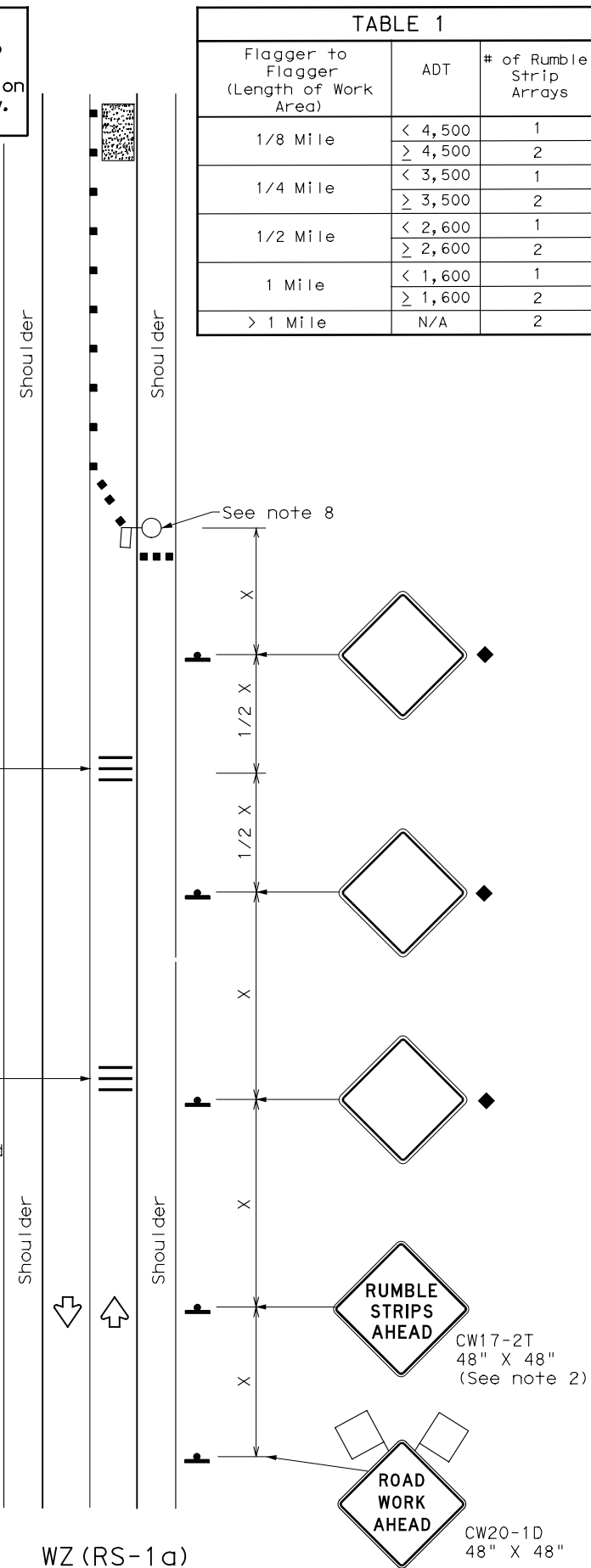
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7-13									

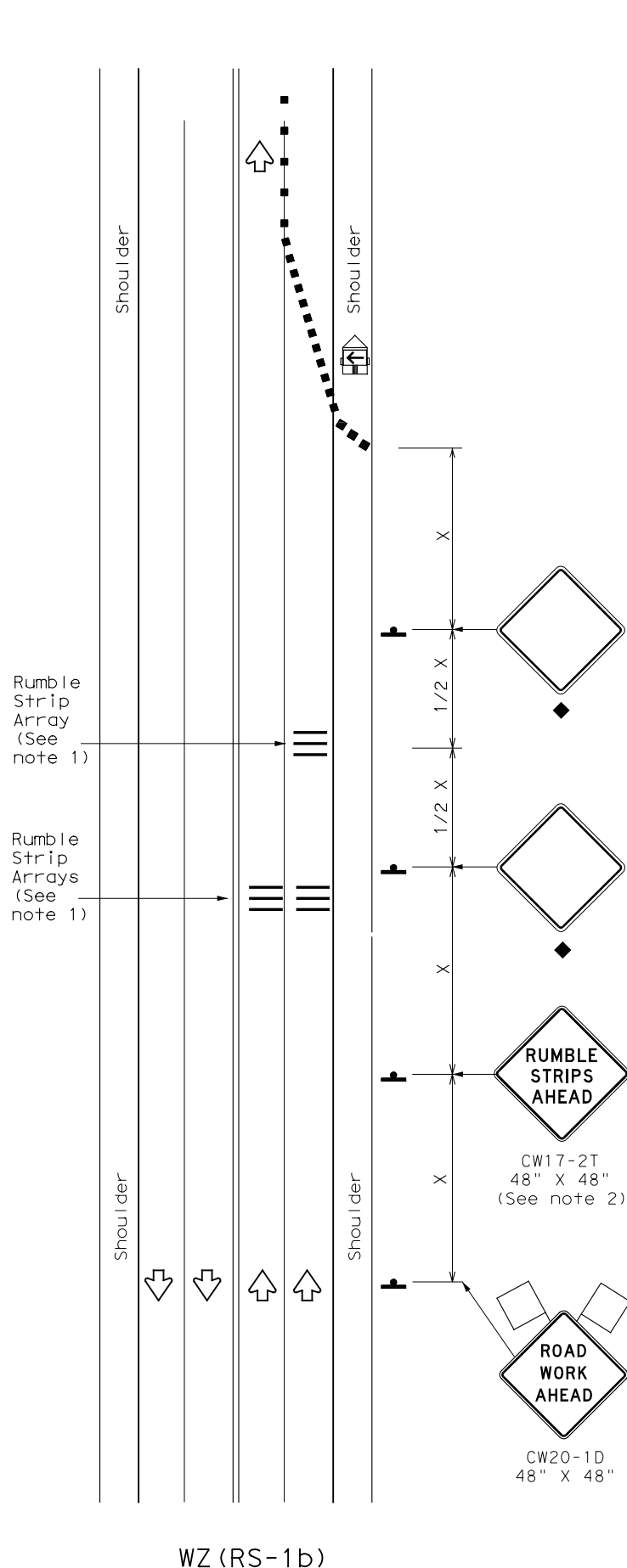
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Warning sign and rumble strip sequence in opposite direction is same as below.

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



RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

- 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.
- 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.
- Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
- Remove Temporary Rumble Strips before removing the advanced warning signs.
- Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
- Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
- This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
- The one-lane two-way application may utilize a flagger, an Automated Flagger Assistance Device (AFAD) or a Portable Traffic Signal (PTS).
- Replace defective Temporary Rumble Strips as directed by the Engineer.
- Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment and written direction from the Engineer.

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

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = 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.

Texas Department of Transportation
 Traffic Safety Division Standard

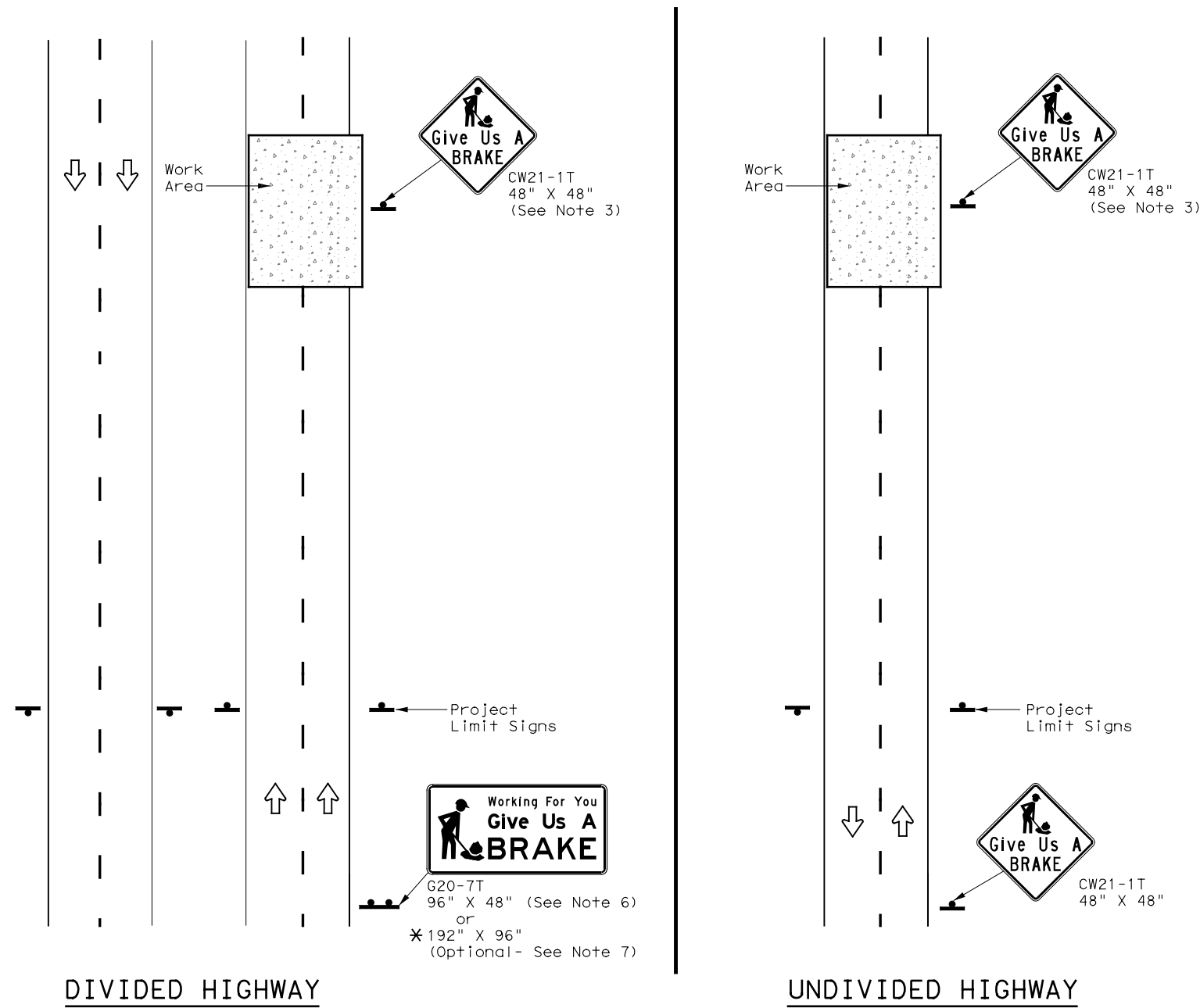
TEMPORARY RUMBLE STRIPS

WZ (RS) -22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
2-14 1-22	DIST	COUNTY	SHEET NO.	
4-16	LUFKIN	ANGELINA	41	

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

DATE: 3/25/2022 1:16
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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	
						Size	(LF)		24" DIA. (LF)
Orange	G20-7T		96" X 48"	Type B _{FL} or C _{FL}	32	▲	▲	▲	
Orange	G20-7T		192" X 96"	Type B _{FL} or C _{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

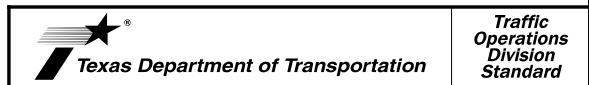
LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

- See BC and SMD sheets for additional sign support details.
- Sign locations shall be approved by the Engineer.
- 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.
- 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.
- Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barriades, Signs and Traffic Handling."
- 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.
- 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
- 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.

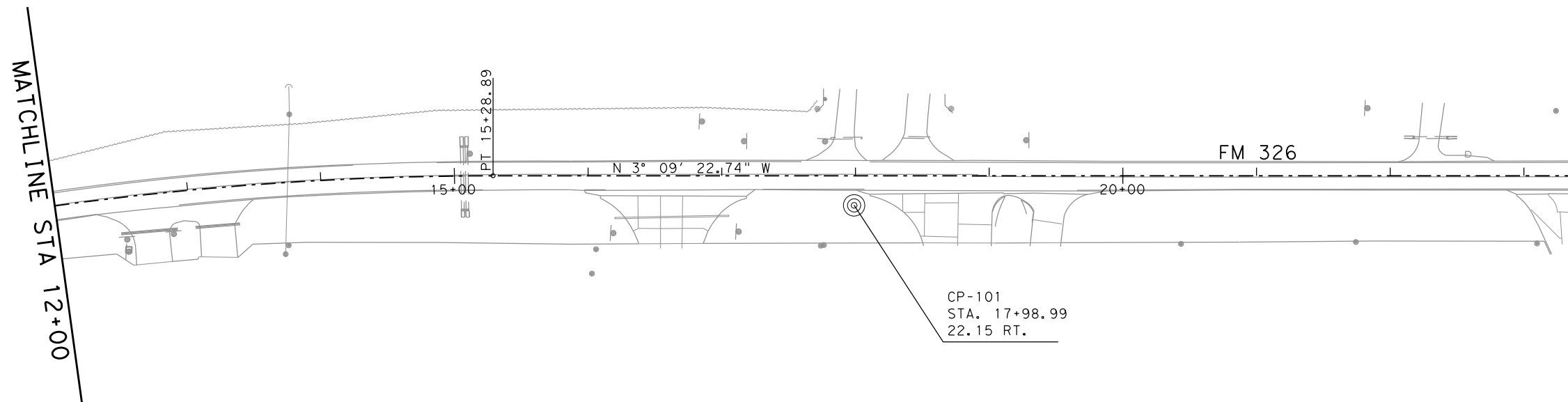
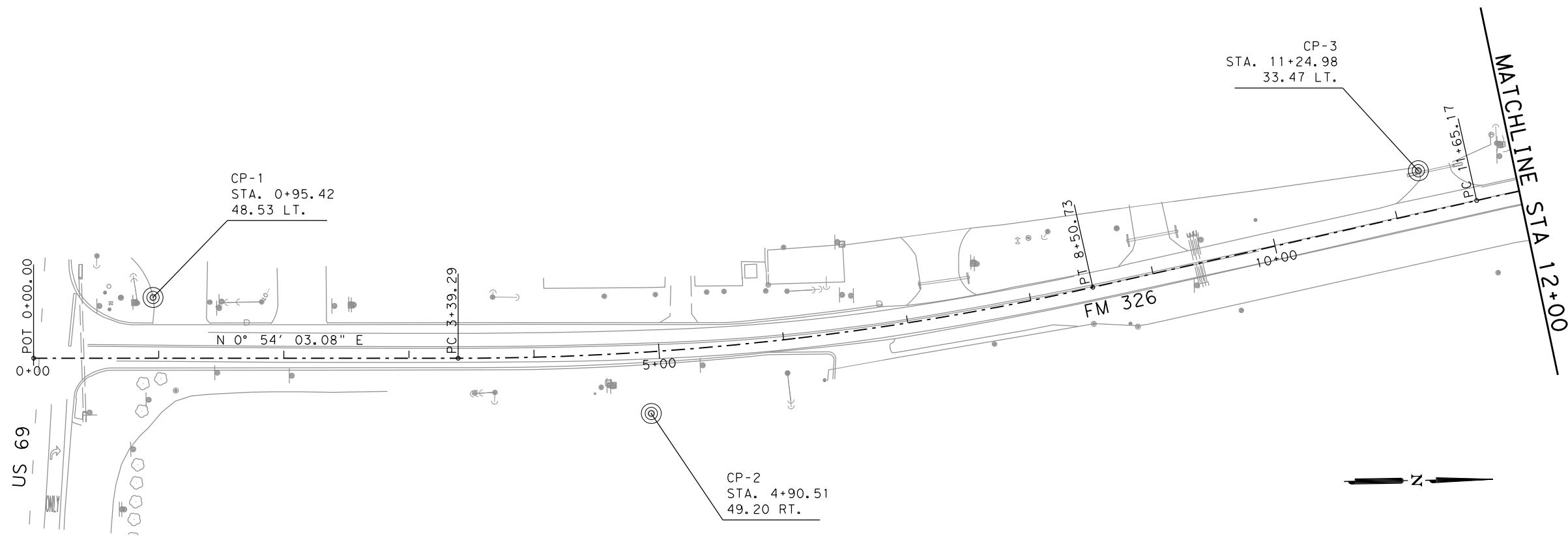


**WORK ZONE
 "GIVE US A BRAKE"
 SIGNS**

WZ (BRK) - 13

FILE: wZbrk-13.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT
© TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
6-96 5-98 7-13	DIST	COUNTY	SHEET NO.	
8-96 3-03	LUFKIN	ANGELINA	42	

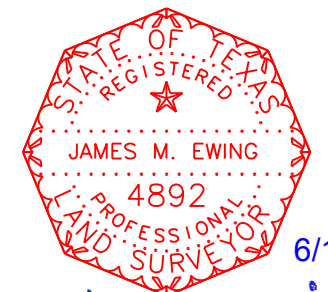
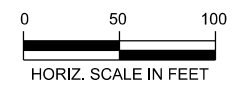
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1. COORDINATES AND DISTANCES ARE US SURVEY FEET DISPLAYED IN SURFACE VALUES USING A SURFACE FACTOR OF 1.00012.
2. HORIZONTAL CONTROL IS BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM NAD83(2011) (EPOCH2010.00) CENTRAL ZONE (4203).
3. ALL ELEVATIONS ARE BASED ON GPS DERIVED ELLIPSOID HEIGHTS UTILIZING NAVD 88, GEOID 12B.

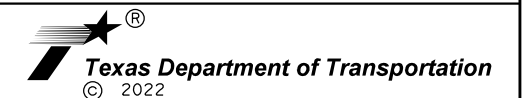


Chi Tomescu 3/29/2022



James M. Ewing 6/17/22
JAMES M. EWING
REGISTERED PROFESSIONAL LAND SURVEYOR
NO. 4892 TEXAS FIRM No. 10106902

GORRONDONA & ASSOCIATES, INC.
15710 JOHN F. KENNEDY BLVD., SUITE 200
HOUSTON, TEXAS 77032
TEXAS REGISTERED SURVEYING FIRM 10106900

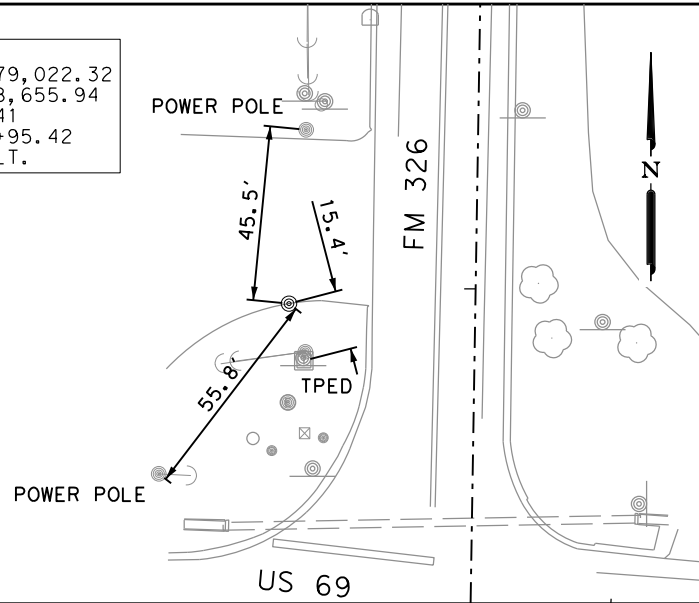


RTG RODRIGUEZ TRANSPORTATION GROUP
FIRM #587

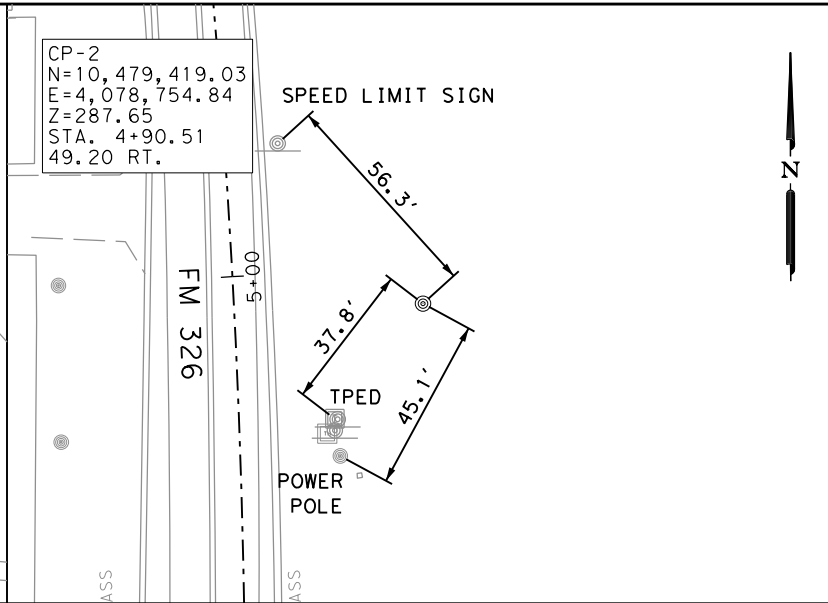
HORIZONTAL AND VERTICAL CONTROL INDEX SHEET

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.
CHECKED:	LUFKIN	ANGELINA	3264	01
				JOB No. SHEET No.
				010 43

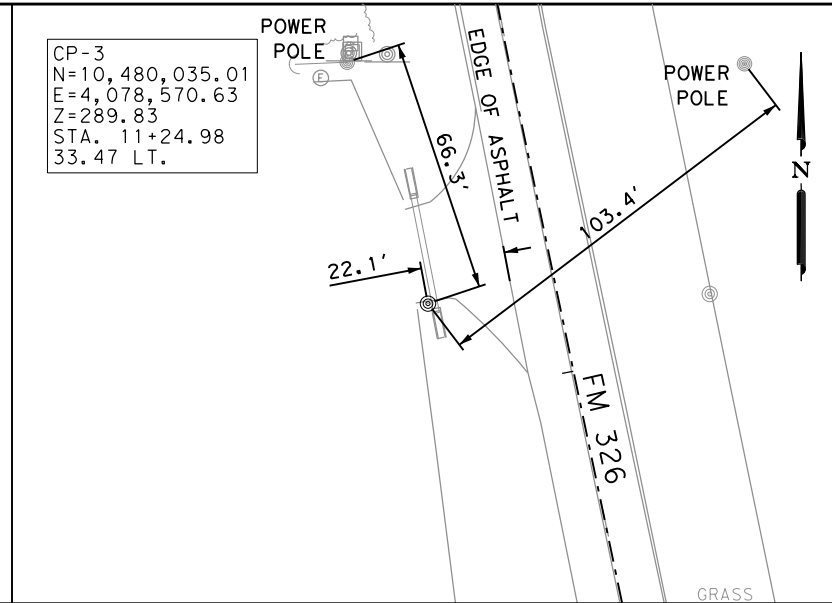
CP-1
 N=10,479,022.32
 E=4,078,655.94
 Z=295.41
 STA. 0+95.42
 48.53 LT.



CP-2
 N=10,479,419.03
 E=4,078,754.84
 Z=287.65
 STA. 4+90.51
 49.20 RT.



CP-3
 N=10,480,035.01
 E=4,078,570.63
 Z=289.83
 STA. 11+24.98
 33.47 LT.

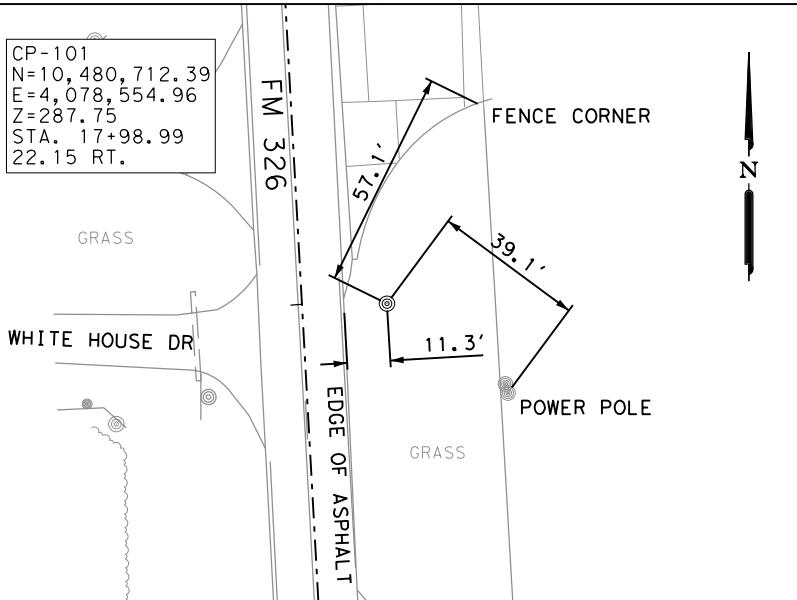


5/8" IRON ROD W/ TXDOT ALUMINUM CAP FOUND ON THE WEST SIDE OF FM 326, APPROXIMATELY 100' NORTHWEST OF THE FM 326 AND US 69 INTERSECTION.

5/8" IRON ROD W/ TXDOT ALUMINUM CAP FOUND ON THE EAST SIDE OF FM 326, APPROXIMATELY 494' NORTH OF THE FM 326 AND US 69 INTERSECTION.

5/8" IRON ROD W/ TXDOT ALUMINUM CAP FOUND ON THE WEST SIDE OF FM 326, APPROXIMATELY 1,111' NORTH OF THE FM 326 AND US 69 INTERSECTION.

CP-101
 N=10,480,712.39
 E=4,078,554.96
 Z=287.75
 STA. 17+98.99
 22.15 RT.

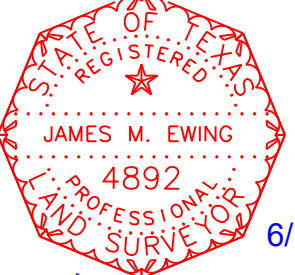


5/8" IRON ROD W/ CAP STAMPED "REFERENCE" SET ON THE EAST SIDE OF FM 326, APPROXIMATELY 22' EAST OF THE INTERSECTION OF FM 326 AND THE EAST BOUND ROAD OF WHITE HOUSE DRIVE.

- COORDINATES AND DISTANCES ARE US SURVEY FEET DISPLAYED IN SURFACE VALUES USING A SURFACE FACTOR OF 1.00012.
- HORIZONTAL CONTROL IS BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM NAD83(2011) (EPOCH2010.00) CENTRAL ZONE (4203).
- ALL ELEVATIONS ARE BASED ON GPS DERIVED ELLIPSOID HEIGHTS UTILIZING NAVD 88, GEOID 12B.

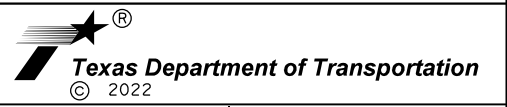


Chris Tomescu 3/29/2022



James M. Ewing
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 15710 JOHN F. KENNEDY BLVD., SUITE 200
 HOUSTON, TEXAS 77032
 TEXAS REGISTERED SURVEYING FIRM 10106900



RTG RODRIGUEZ TRANSPORTATION GROUP
 FIRM #587

HORIZONTAL AND VERTICAL CONTROL
 DETAIL SHEET

DESIGNED:	FED. RD. DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.
CHECKED:	LUFKIN	ANGELINA	3264	01
				JOB No.
				010
				SHEET No.
				44

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CHAIN FM326 (FM 326)

Chain FM326 contains:
502 CUR Z FM3261 CUR Z FM3262 503

Beginning chain FM326 description
=====

Point 502 X 4,078,702.9659 Y 10,478,926.1534 Sta 0+00.00

Course from 502 to PC Z FM3261 N 0° 54' 03.0775" E Dist 339.2926

Curve Data

Curve Z FM3261
P.I. Station = 5+96.07 X 4,078,712.3375 Y 10,479,522.1504
Delta = 12° 44' 25.9552" (LT)
Degree = 2° 29' 28.0351"
Tangent = 256.7780
Length = 511.4382
Radius = 2,300.0000
External = 14.2893
Long Chord = 510.3851
Mid. Ord. = 14.2011
P.C. Station = 3+39.29 X 4,078,708.3003 Y 10,479,265.4041
P.T. Station = 8+50.73 X 4,078,659.6533 Y 10,479,773.4656
C.C. = X 4,076,408.5846 Y 10,479,301.5653
Back = N 0° 54' 03.0775" E
Ahead = N 11° 50' 22.8777" W
Chord Bear = N 5° 28' 09.9001" W

Course from PT Z FM3261 to PC Z FM3262 N 11° 50' 22.8777" W Dist 314.4348

Curve Data

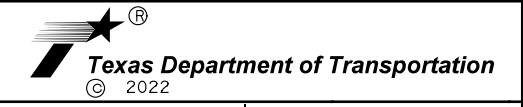
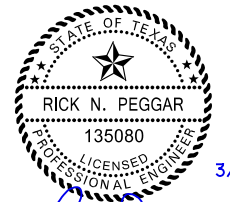
Curve Z FM3262
P.I. Station = 13+47.38 X 4,078,557.7540 Y 10,480,259.5474
Delta = 8° 41' 00.1413" (RT)
Degree = 2° 23' 14.3669"
Tangent = 182.2130
Length = 363.7283
Radius = 2,400.0000
External = 6.9071
Long Chord = 363.3803
Mid. Ord. = 6.8872
P.C. Station = 11+65.17 X 4,078,595.1394 Y 10,480,081.2109
P.T. Station = 15+28.89 X 4,078,547.7213 Y 10,480,441.4840
C.C. = X 4,080,944.0806 Y 10,480,573.6286
Back = N 11° 50' 22.8777" W
Ahead = N 3° 09' 22.7364" W
Chord Bear = N 7° 29' 52.8071" W

Course from PT Z FM3262 to 503 N 3° 09' 22.7364" W Dist 1,371.1065

Point 503 X 4,078,472.2279 Y 10,481,810.5107 Sta 29+00.00

Ending chain FM326 description
=====

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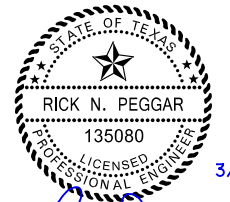
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FIRM #587

HORIZONTAL ALIGNMENT DATA

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CHECKED:	6	TEXAS		FM 326		
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010	45

STATION ON E	OFFSET DIST EXIST	STATION ON EXIST
0+00.00	7.3681	0+14.34
1+00.00	7.4171	1+14.34
2+00.00	7.4661	2+14.34
3+00.00	7.5151	3+14.34
3+39.29 PC	7.5344	3+53.63
3+69.97	7.3454	3+84.22 PC
4+00.00	6.9603	4+14.24
5+00.00	5.6811	5+13.96
6+00.00	4.4058	6+13.73
7+00.00	3.1367	7+13.56
8+00.00	1.8762	8+13.44
8+50.73 PT	1.2409	8+64.14
8+82.89	1.0645	8+96.28 PT
9+00.00	1.0907	9+13.39
10+00.00	1.2435	10+13.39
11+00.00	1.3962	11+13.39
11+11.32	1.4135	11+24.71 PC
11+65.17 PC	0.9896	11+75.58
12+00.00	0.4290	12+13.42
13+00.00	-0.7243	13+13.40
14+00.00	-1.2003	14+13.36
15+00.00	-0.9984	15+13.32
15+28.89 PT	-0.8139	15+42.21
15+46.46	-0.7383	15+59.77 PT
16+00.00	-0.6721	16+13.31
17+00.00	-0.5484	17+13.31
18+00.00	-0.4247	18+13.31
19+00.00	-0.3010	19+13.31
20+00.00	-0.1773	20+13.31
21+00.00	-0.0536	21+13.31
22+00.00	0.0701	22+13.31
23+00.00	0.1938	23+13.31
24+00.00	0.3175	24+13.31
25+00.00	0.4412	25+13.31
26+00.00	0.5649	26+13.31

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3/25/2022

Rick Pegg



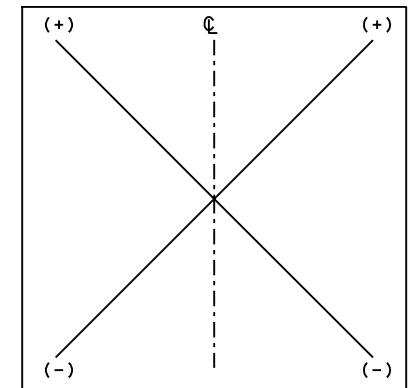
RTG RODRIGUEZ TRANSPORTATION GROUP
FIRM #587

ALIGNMENT RELATIONS

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.		
CHECKED:	6	TEXAS		FM 326		
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010	46

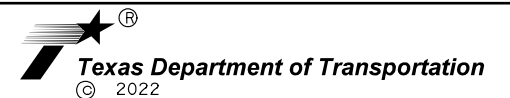
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FM 326		STATION	SLOPE LEFT	SLOPE RIGHT
BEGIN TRANSITION		0+29	0.33%	-1.15%
PARABOLIC TRANSITION		0+50	0.05%	-1.36%
		0+75	-0.99%	-1.60%
		1+00	-1.86%	-1.85%
END TRANSITION		1+15	-2.00%	-2.00%
BEGIN TRANSITION		10+35	-2.00%	-2.00%
PARABOLIC TRANSITION		10+50	-1.87%	-2.04%
		10+75	-1.10%	-2.29%
		11+00	0.37%	-2.76%
		11+25	2.20%	-3.35%
		11+50	3.34%	-3.74%
		11+75	3.89%	-3.90%
END TRANSITION		11+80	3.90%	-3.90%
BEGIN TRANSITION		15+10	3.90%	-3.90%
PARABOLIC TRANSITION		15+25	3.77%	-3.86%
		15+50	3.00%	-3.61%
		15+75	1.53%	-3.14%
		16+00	-0.30%	-2.55%
		16+25	-1.49%	-2.16%
		16+50	-1.99%	-2.00%
END TRANSITION		16+55	-2.00%	-2.00%
BEGIN TRANSITION		23+20	-2.00%	-2.00%
PARABOLIC TRANSITION		23+50	-1.61%	-1.83%
		23+75	-0.45%	-1.34%
		24+00	1.25%	-0.61%
		24+25	2.35%	-0.14%
END TRANSITION		24+43	2.68%	0.00%



3/25/2022

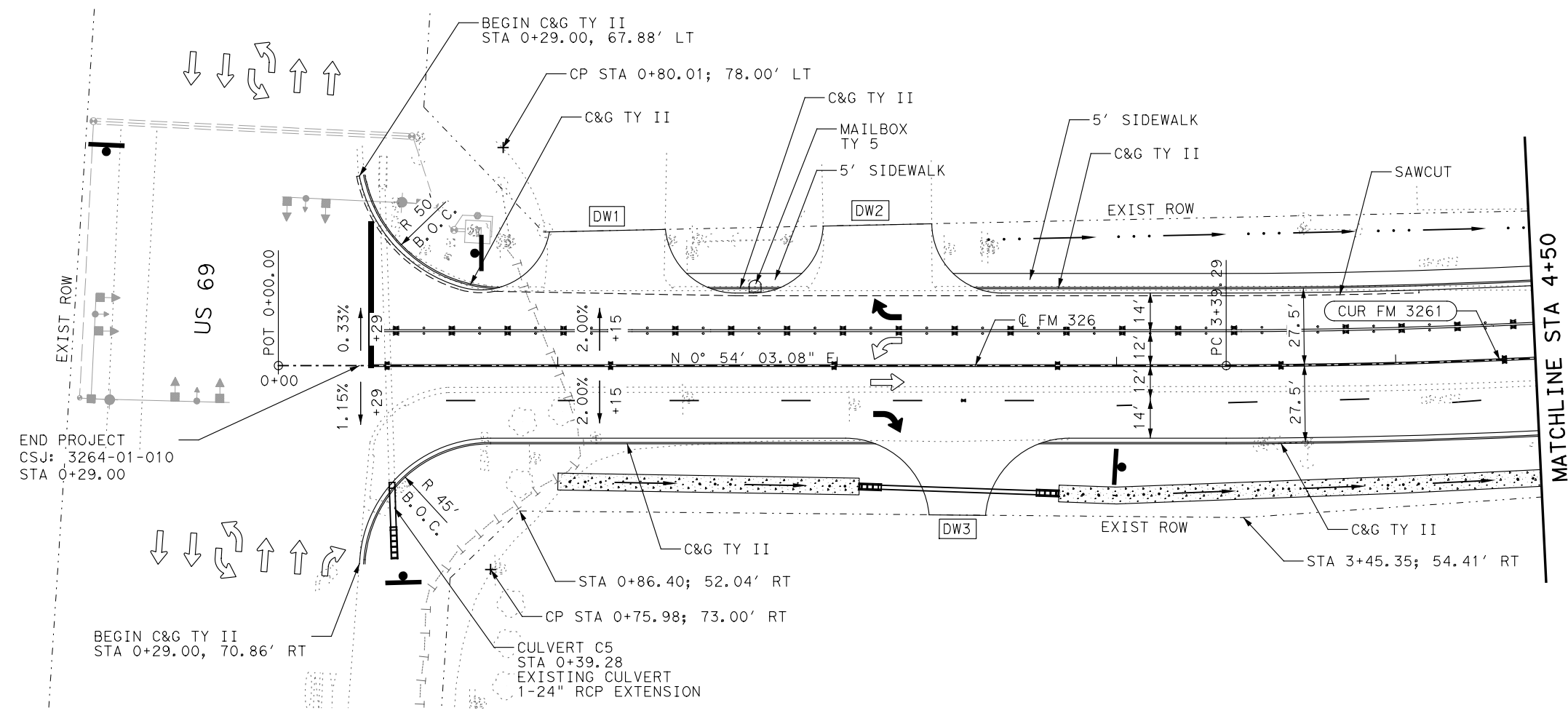
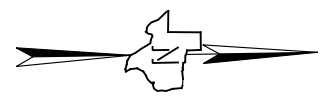
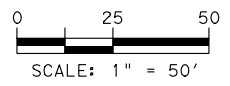
Rick Pegg



RTG RODRIGUEZ
TRANSPORTATION
GROUP
FIRM #587

TABLE OF CROSS SLOPES

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.		
CHECKED:	6	TEXAS		FM 326		
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010	47



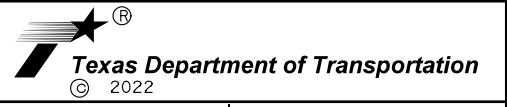
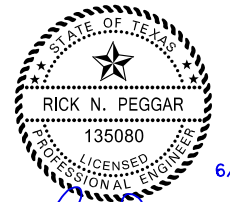
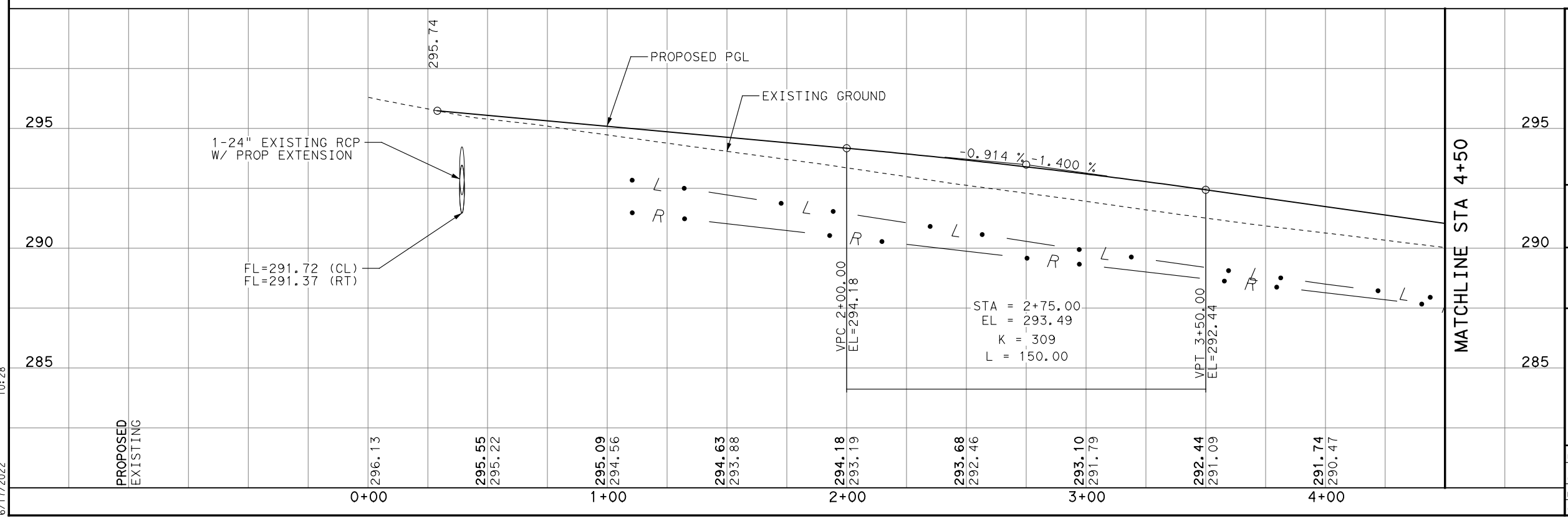
LEGEND

- PROPOSED E.O.P.
- PROPOSED DRAINAGE
- EXISTING PLANIMETRICS
- EXISTING UTILITIES
- DITCH FLOW
- PROPOSED MAILBOX
- DRIVEWAY NUMBER
- CURVE NAME
- CONCRETE DITCH
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- FLOW ARROW

NOTES:

1. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA AND ADDITIONAL INFO.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB, UNLESS NOTED OTHERWISE.

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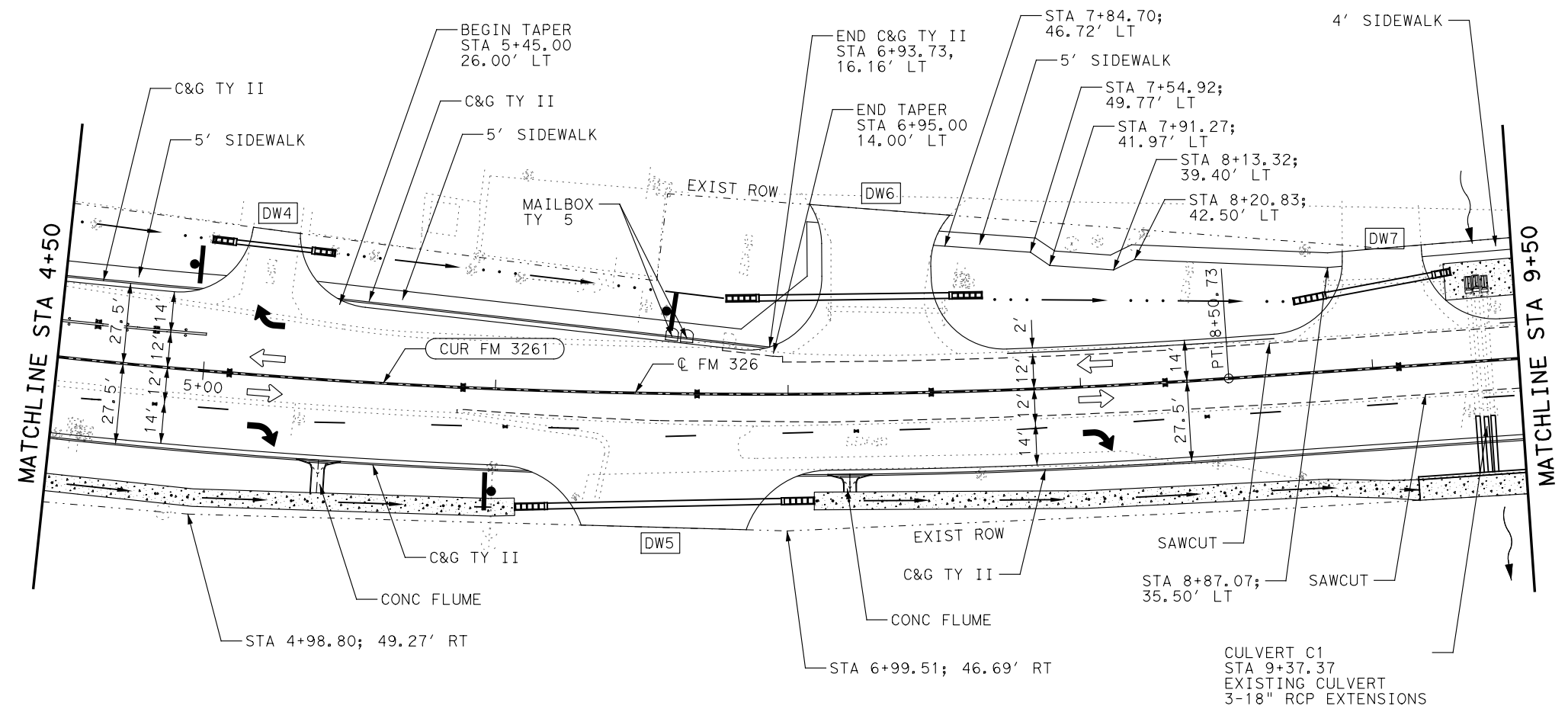
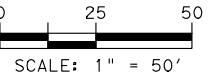


RTG RODRIGUEZ TRANSPORTATION GROUP
FIRM #587

PLAN & PROFILE

SHEET 1 OF 5

DESIGNED:	FED. RD DIV. No. 6	STATE TEXAS	FEDERAL AID PROJECT No.	HIGHWAY No. FM 326
CHECKED:				
DRAWN:	STATE DISTRICT LUFKIN	COUNTY ANGELINA	CONTROL No. 3264	SECTION No. 01
CHECKED:				JOB No. 010 SHEET No. 48



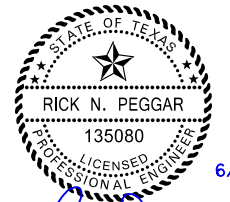
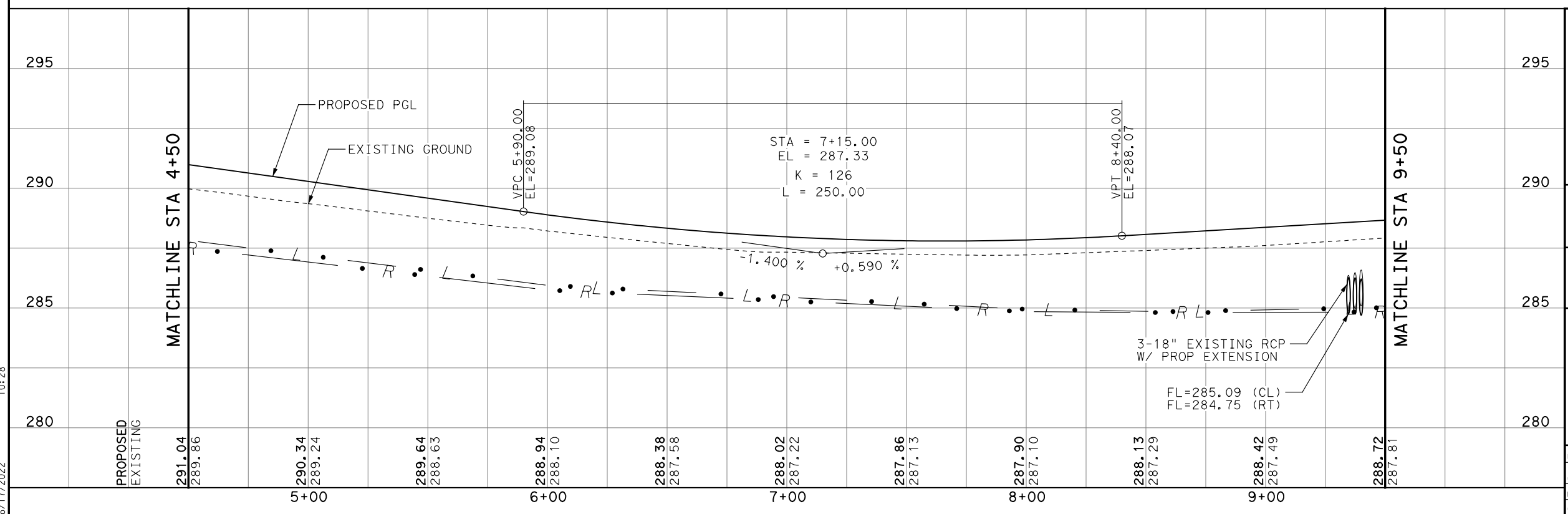
LEGEND

- PROPOSED E. O. P.
- PROPOSED DRAINAGE
- EXISTING PLANIMETRICS
- EXISTING UTILITIES
- DITCH FLOW
- PROPOSED MAILBOX
- DRIVEWAY NUMBER
- CURVE NAME
- CONCRETE DITCH
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- FLOW ARROW

NOTES:

1. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA AND ADDITIONAL INFO.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB, UNLESS NOTED OTHERWISE.

CULVERT C1
 STA 9+37.37
 EXISTING CULVERT
 3-18" RCP EXTENSIONS



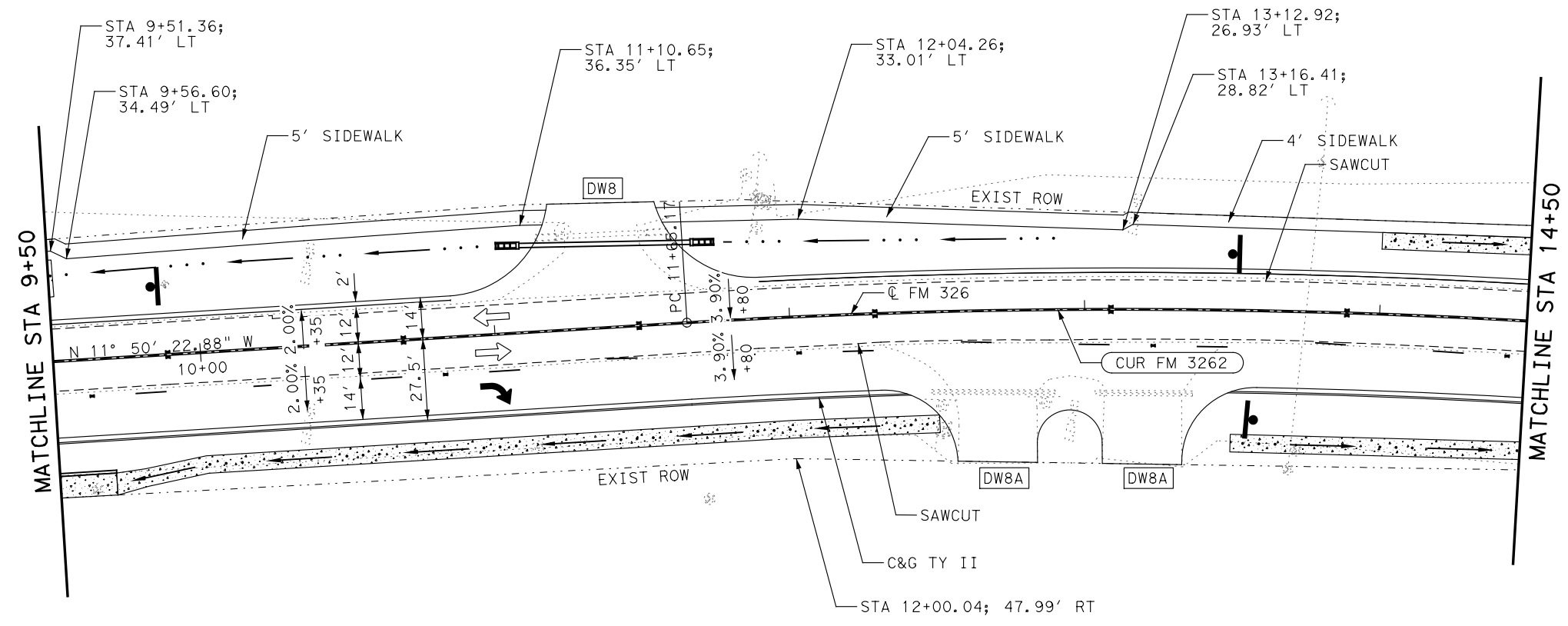
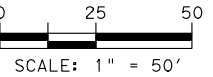
RTG RODRIGUEZ TRANSPORTATION GROUP
 FIRM #587

PLAN & PROFILE

SHEET 2 OF 5

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CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.
CHECKED:	LUFKIN	ANGELINA	3264	01
				JOB No.
				010
				SHEET No.
				49

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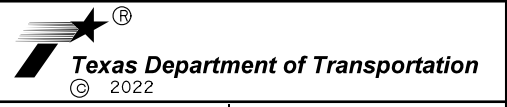
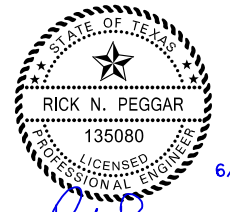
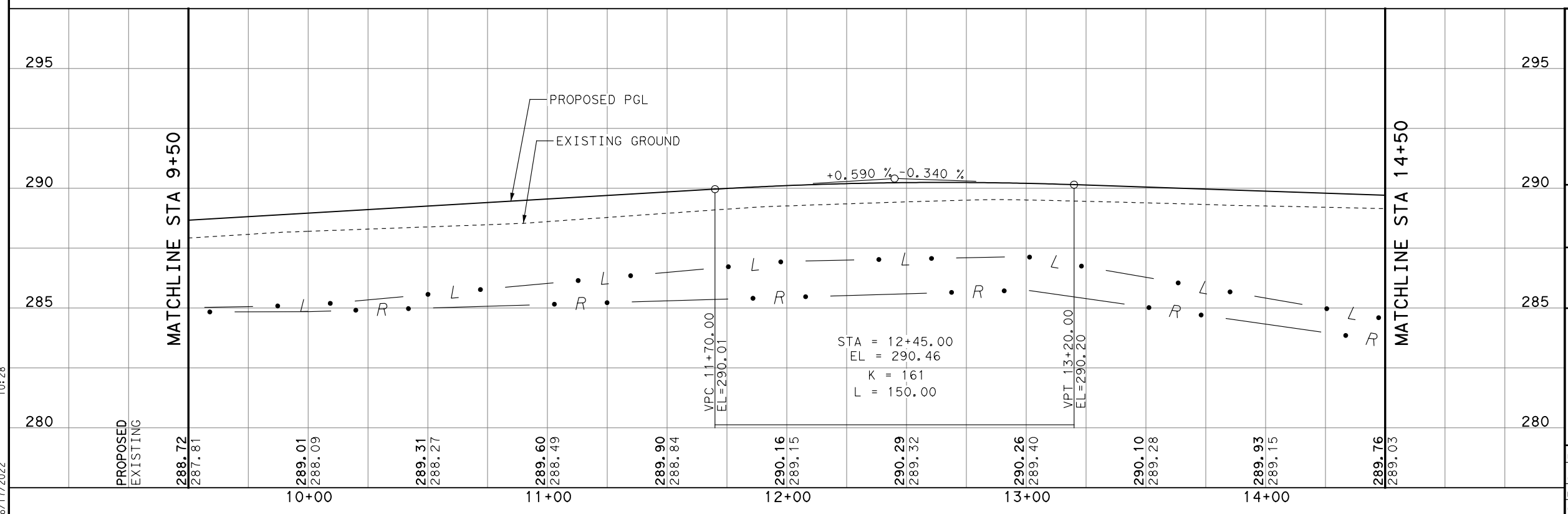
LEGEND

- PROPOSED E.O.P.
- PROPOSED DRAINAGE
- EXISTING PLANIMETRICS
- EXISTING UTILITIES
- DITCH FLOW
- PROPOSED MAILBOX
- DRIVEWAY NUMBER
- CURVE NAME
- CONCRETE DITCH
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- FLOW ARROW

NOTES:

1. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA AND ADDITIONAL INFO.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB, UNLESS NOTED OTHERWISE.

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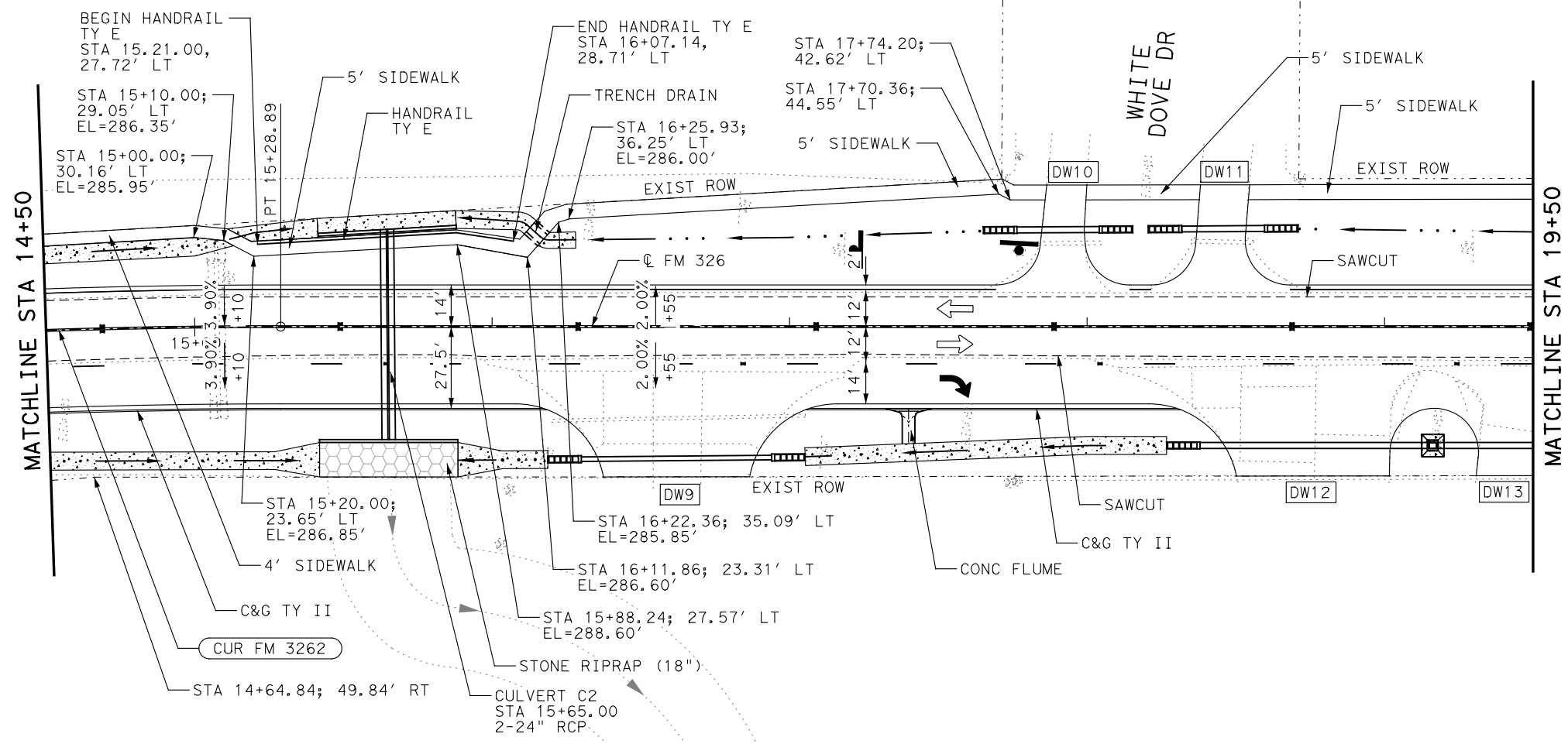
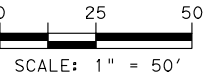


RTG RODRIGUEZ TRANSPORTATION GROUP
 FIRM #587

PLAN & PROFILE

SHEET 3 OF 5

DESIGNED:	FED. RD DIV. No. 6	STATE TEXAS	FEDERAL AID PROJECT No.	HIGHWAY No. FM 326
CHECKED:				
DRAWN:	STATE DISTRICT LUFKIN	COUNTY ANGELINA	CONTROL No. 3264	SECTION No. 01
CHECKED:				JOB No. 010
				SHEET No. 50

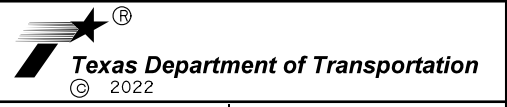
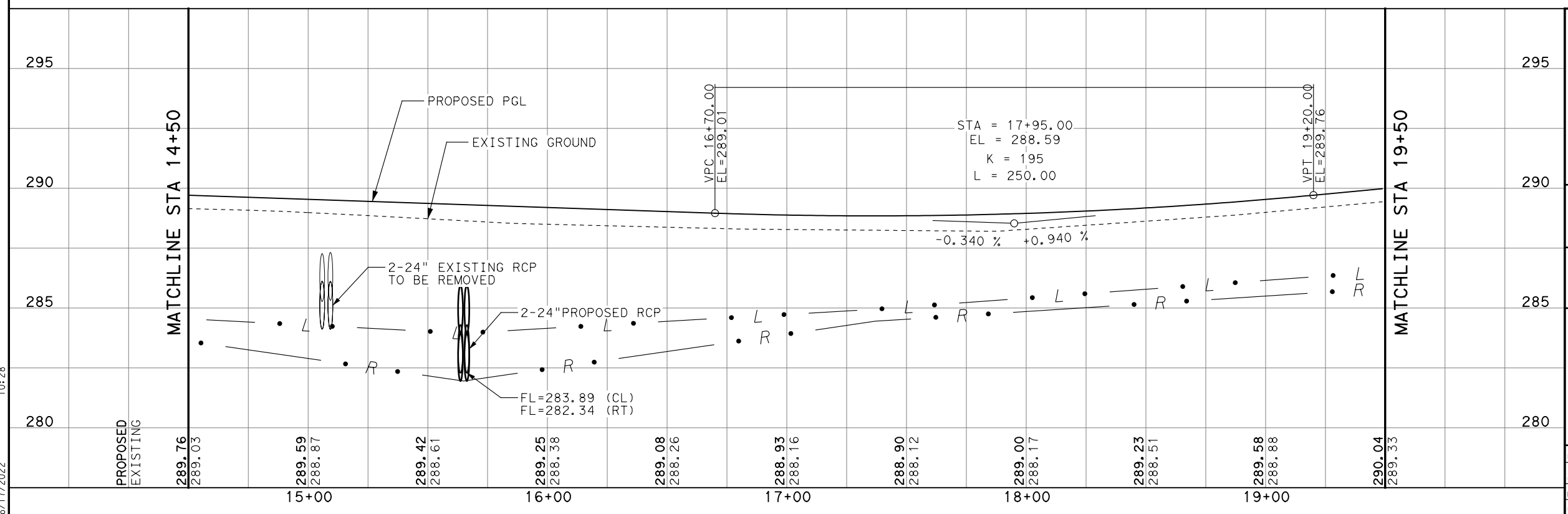


LEGEND

- PROPOSED E.O.P.
- PROPOSED DRAINAGE
- EXISTING PLANIMETRICS
- EXISTING UTILITIES
- DITCH FLOW
- PROPOSED MAILBOX
- DRIVEWAY NUMBER
- CURVE NAME
- CONCRETE DITCH
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- FLOW ARROW

- NOTES:**
- SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA AND ADDITIONAL INFO.
 - ALL DIMENSIONS ARE TO THE FACE OF CURB, UNLESS NOTED OTHERWISE.

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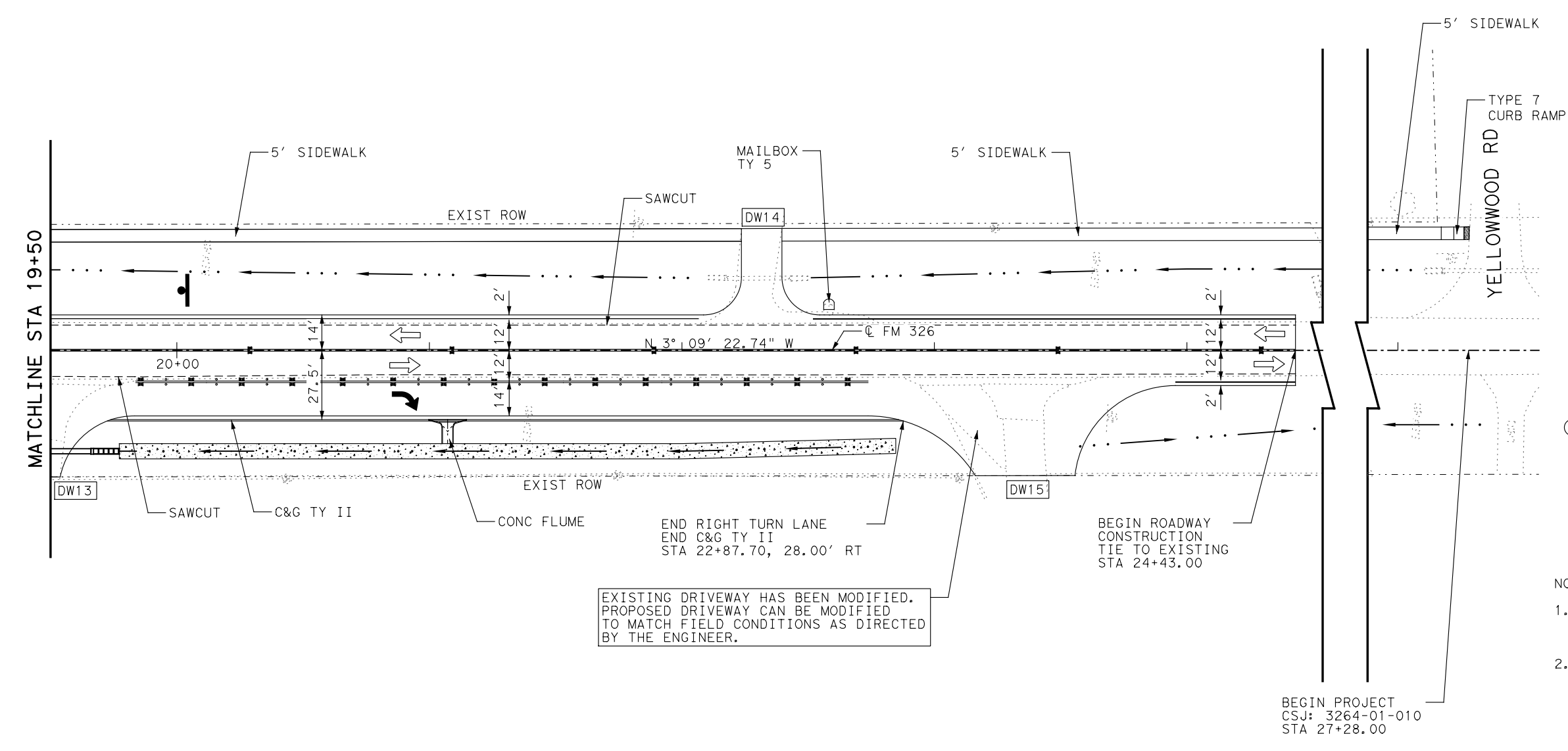
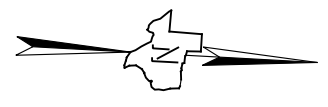
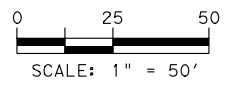


RTG RODRIGUEZ TRANSPORTATION GROUP
FIRM #587

PLAN & PROFILE

SHEET 4 OF 5

DESIGNED:	FED. RD DIV. No. 6	STATE TEXAS	FEDERAL AID PROJECT No.	HIGHWAY No. FM 326
CHECKED:				
DRAWN:	STATE DISTRICT LUFKIN	COUNTY ANGELINA	CONTROL No. 3264	SECTION No. 01
CHECKED:				JOB No. 010
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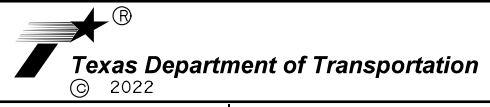
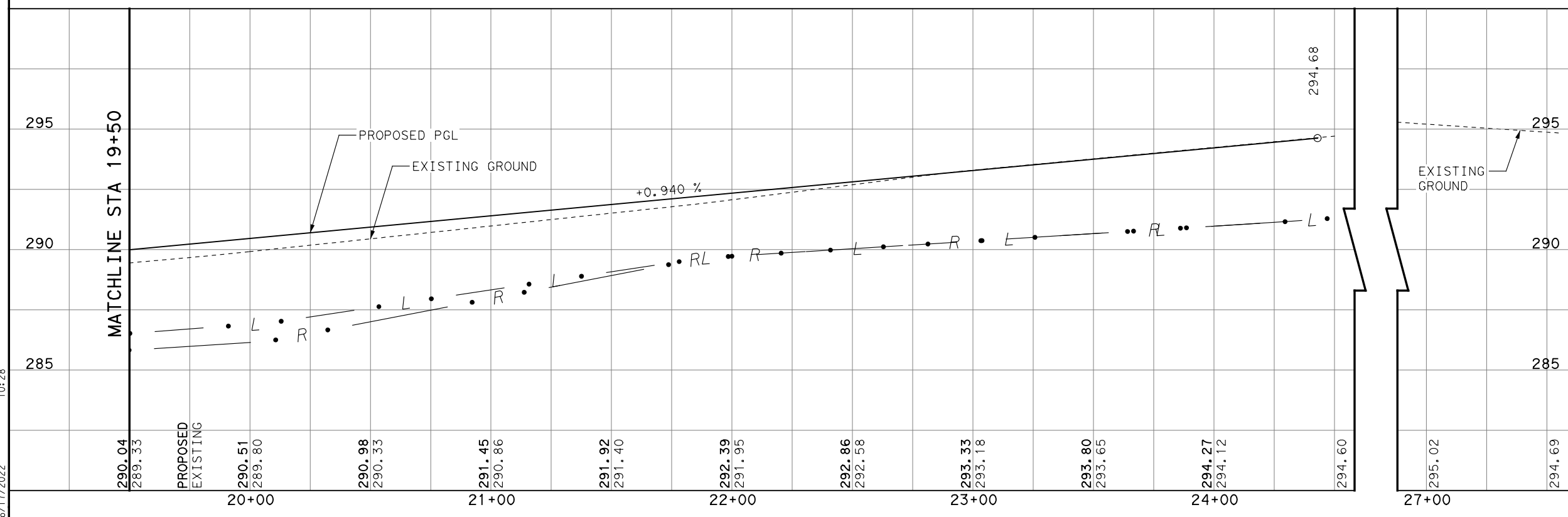


- LEGEND**
- PROPOSED E.O.P.
 - PROPOSED DRAINAGE
 - - - EXISTING PLANIMETRICS
 - - - TuG EXISTING UTILITIES
 - DITCH FLOW
 - PROPOSED MAILBOX
 - DWX DRIVEWAY NUMBER
 - CUR FM 326X CURVE NAME
 - CONC DITCH
 - PROPOSED TRAFFIC FLOW
 - EXISTING TRAFFIC FLOW
 - ↷ FLOW ARROW

- NOTES:**
- SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA AND ADDITIONAL INFO.
 - ALL DIMENSIONS ARE TO THE FACE OF CURB, UNLESS NOTED OTHERWISE.

EXISTING DRIVEWAY HAS BEEN MODIFIED. PROPOSED DRIVEWAY CAN BE MODIFIED TO MATCH FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.

BEGIN PROJECT
CSJ: 3264-01-010
STA 27+28.00



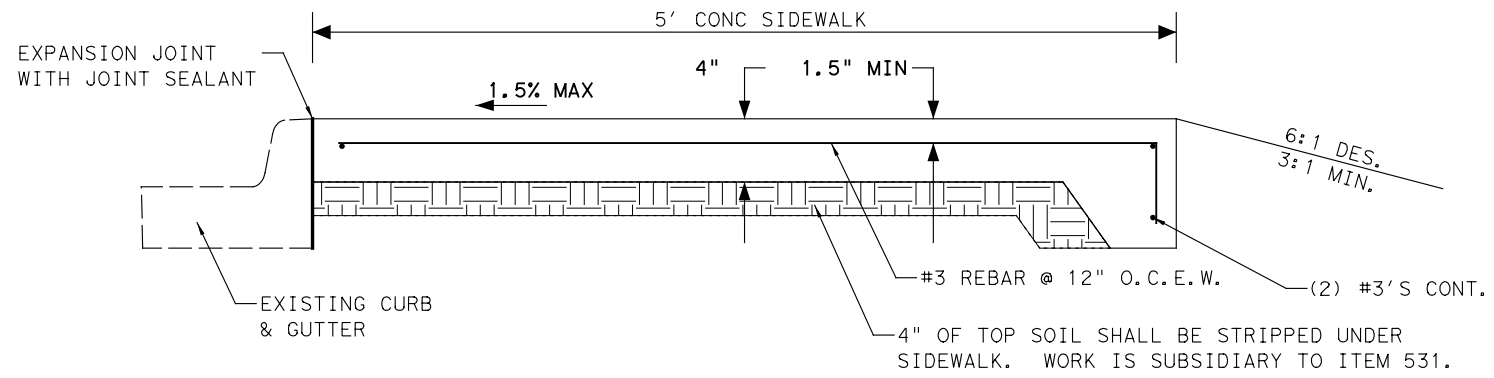
RTG RODRIGUEZ TRANSPORTATION GROUP
FIRM #587

PLAN & PROFILE

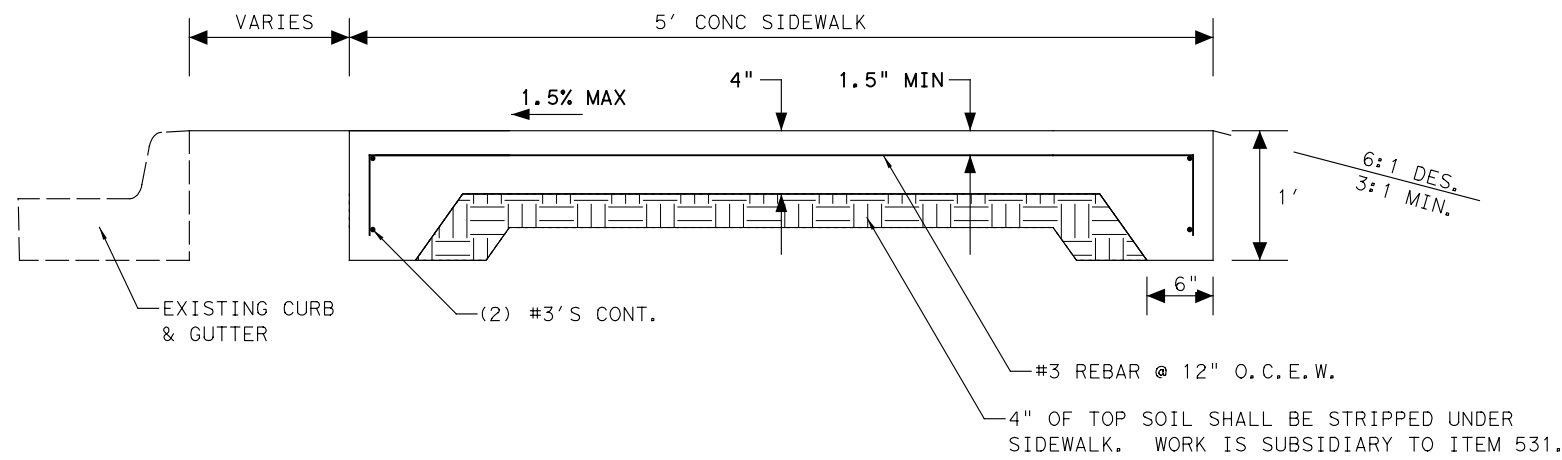
SHEET 5 OF 5

DESIGNED:	FED. RD DIV. No. 6	STATE TEXAS	FEDERAL AID PROJECT No.	HIGHWAY No. FM 326
CHECKED:	STATE DISTRICT LUFKIN	COUNTY ANGELINA	CONTROL No. 3264	SECTION No. 01
DRAWN:			JOB No. 010	SHEET No. 52
CHECKED:				

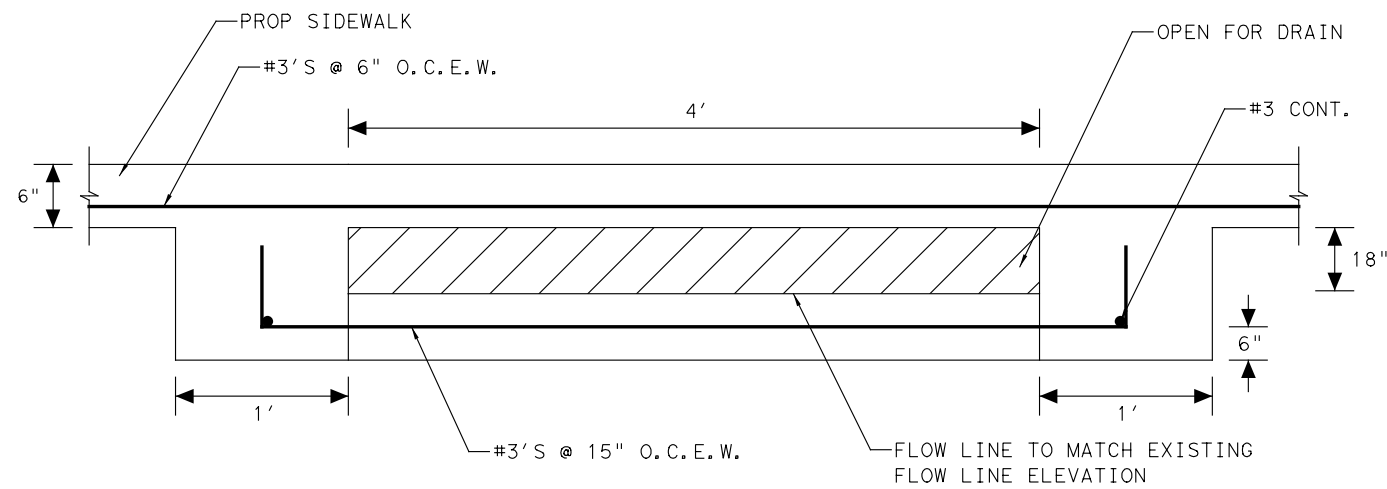
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PROPOSED 5' SIDEWALK
WHERE SIDEWALK TIES TO CURB



PROPOSED 5' SIDEWALK
WHERE SIDEWALK IS SETBACK FROM CURB



SIDEWALK TRENCH DRAIN
N. T. S. (PAID FOR UNDER ITEM 474)

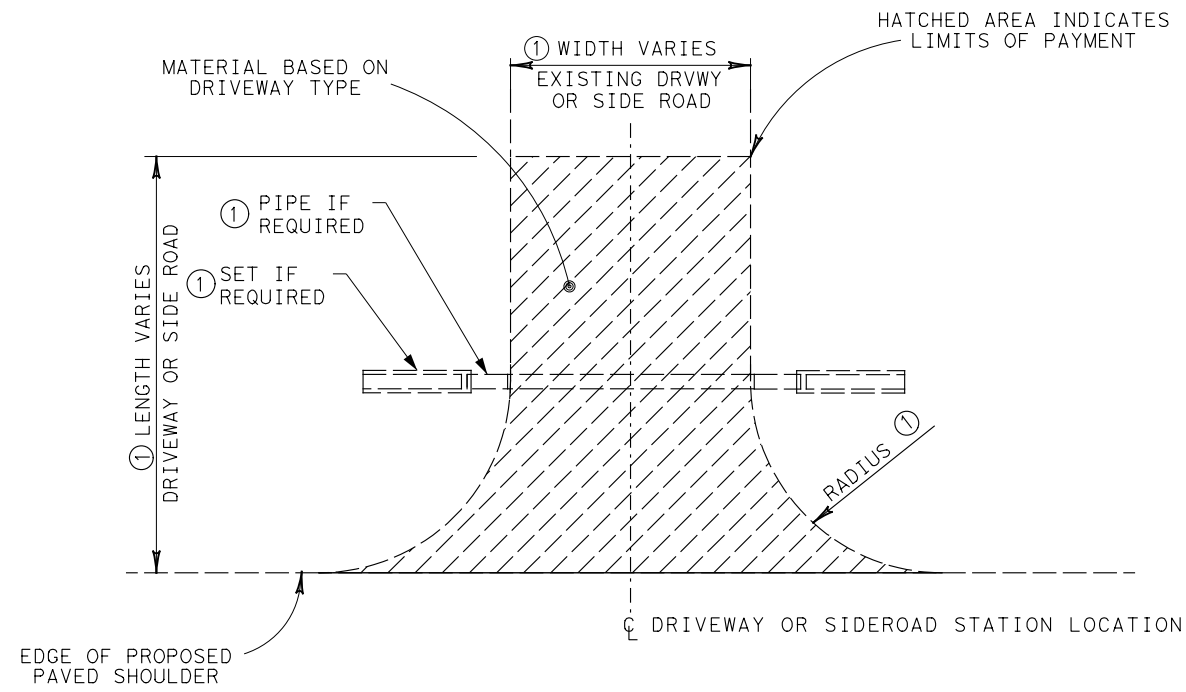


RTG RODRIGUEZ
TRANSPORTATION
GROUP
FIRM #587

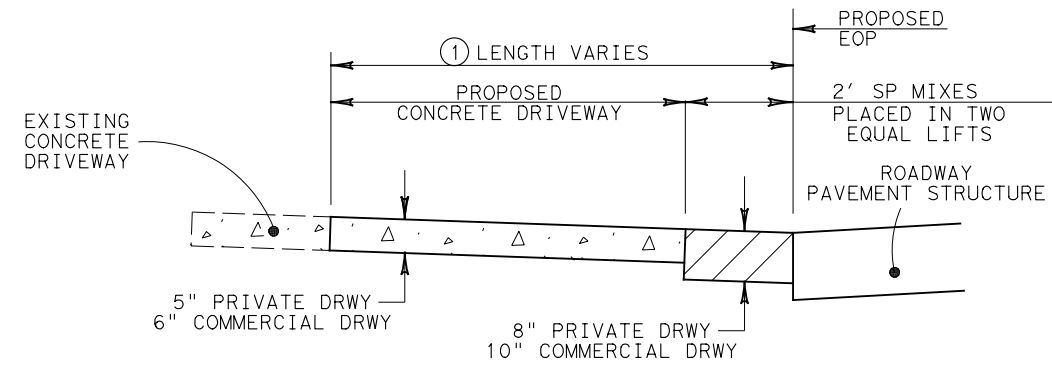
MISCELLANEOUS SIDEWALK
DETAILS

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.
CHECKED:	LUFKIN	ANGELINA	3264	01
				JOB No.
				010
				SHEET No.
				53

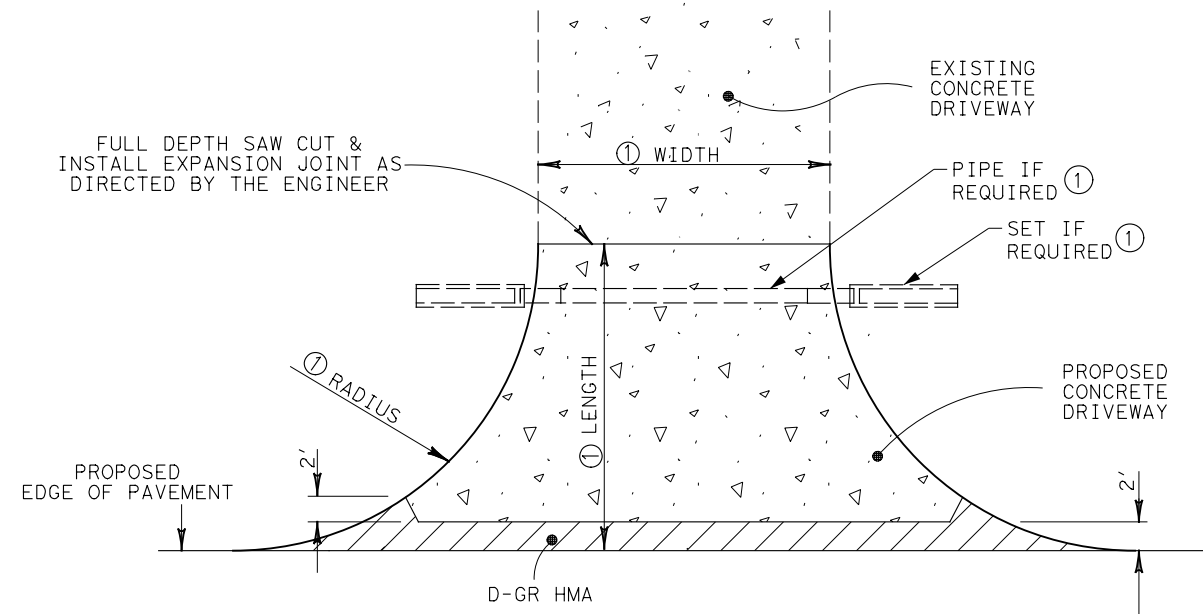
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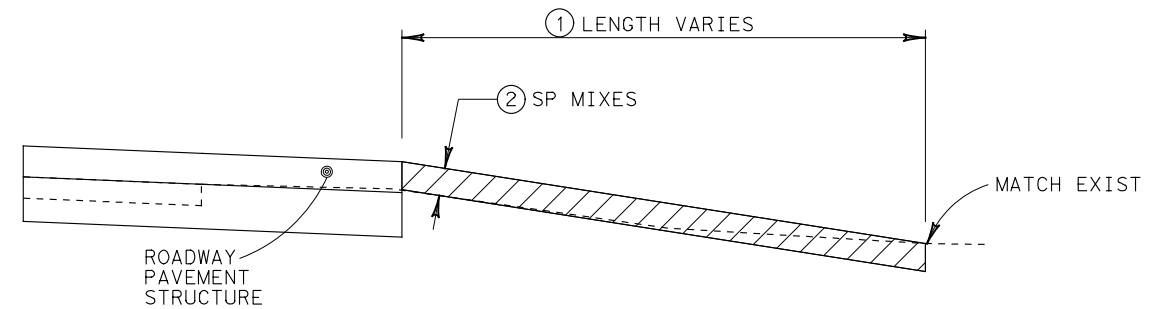
TYPICAL PLAN VIEW OF ASPHALT DRIVEWAYS



PROFILE OF CONCRETE DRIVEWAYS



TYPICAL PLAN VIEW OF CONCRETE DRIVEWAYS



PROFILE OF ASPHALT DRIVEWAY

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/SIDEROADS SHALL BE PAID FOR UNDER ITEM 530 INTERSECTIONS, DRIVEWAYS, AND TURNOUTS. NO ADDITIONAL PAYMENT WILL BE MADE FOR REMOVAL OF EXISTING GRAVEL AND DIRT DRIVEWAYS. THE NECESSARY EXCAVATION, GRADING, COMPACTION, HMA AND INCIDENTALS WILL BE CONSIDERED SUBSIDIARY TO ITEM 530.
5. SP MIXES TYPE & RATE AS SHOWN ELSEWHERE IN PLANS. FOR SP MIXES THICKER THAN 4", PLACE IN 2 LIFTS.

DETAIL NOTES:

- ① REFER TO "DRIVEWAY SUMMARY" FOR ADDITIONAL INFORMATION.
- ② 4" THICKNESS TYPICAL.
- ③ FULL DEPTH HMA MAY BE USED IN LIEU OF FLEX BASE, COVERED PRIME & ONE CST.



6/17/2022

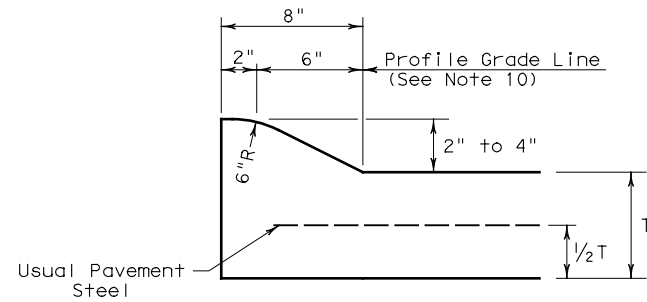
Rick N. Peggar

DRIVEWAY DETAILS

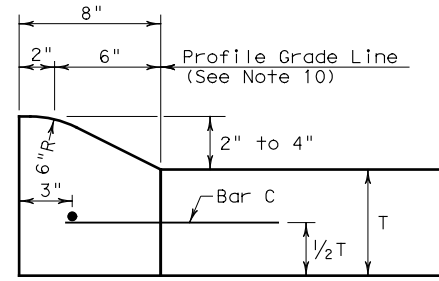
TEXAS DEPARTMENT OF TRANSPORTATION ©2022			
CONT	SECT	JOB	HIGHWAY
3264	01	010	FM 326
DIST	COUNTY	SHEET NO.	
LUFKIN	ANGELINA	54	

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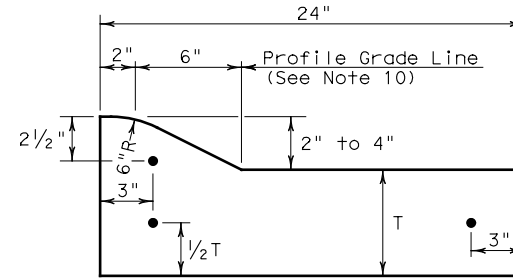
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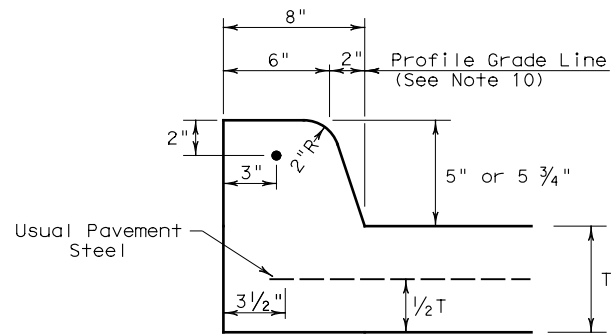
TYPE I CURB (MONOLITHIC)
 2" - 4" HEIGHT



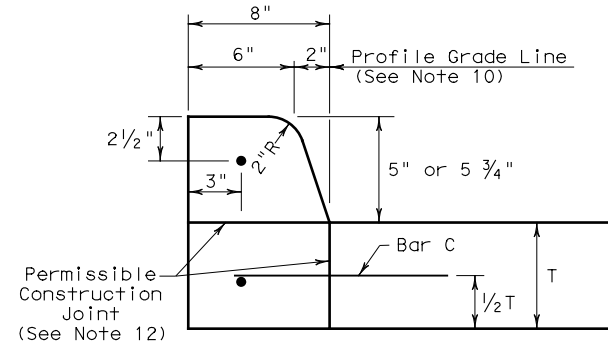
TYPE I CURB
 2" - 4" HEIGHT



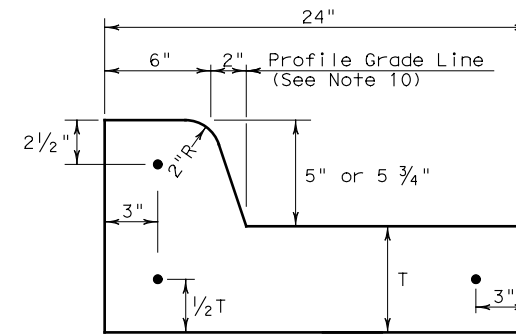
TYPE I CURB AND GUTTER
 2" - 4" HEIGHT



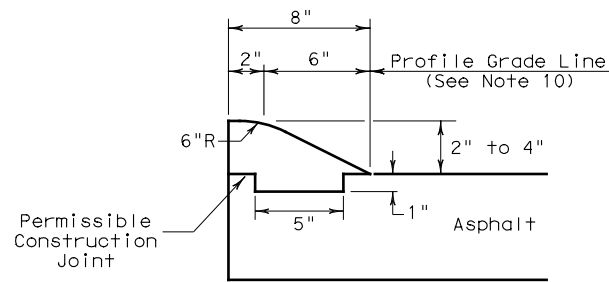
TYPE II CURB (MONOLITHIC)
 5" - 5 3/4" HEIGHT



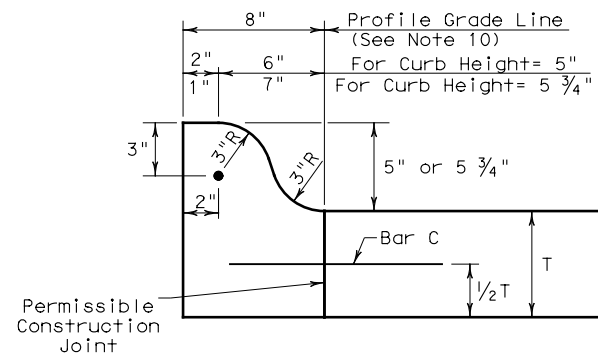
TYPE II CURB
 5" - 5 3/4" HEIGHT



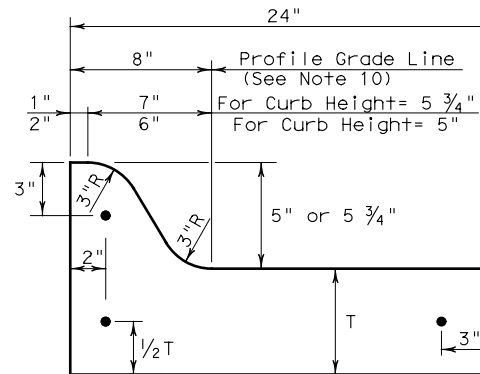
TYPE II CURB AND GUTTER
 5" - 5 3/4" HEIGHT



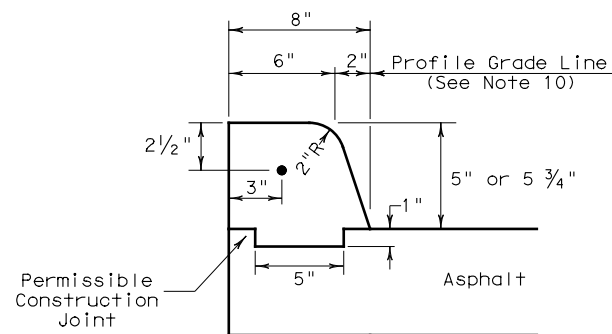
TYPE III CURB (KEYED)
 2" - 4" HEIGHT



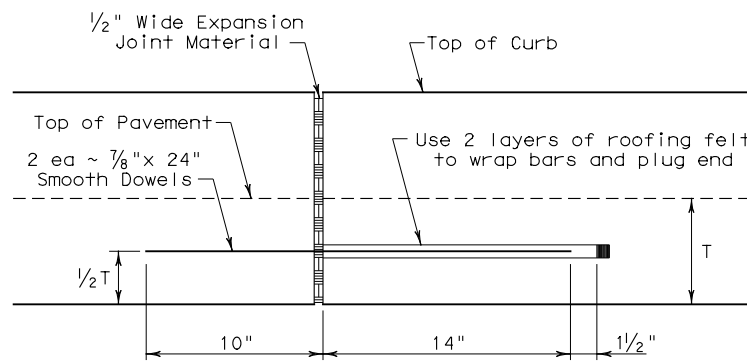
TYPE IIa CURB
 5" - 5 3/4" HEIGHT



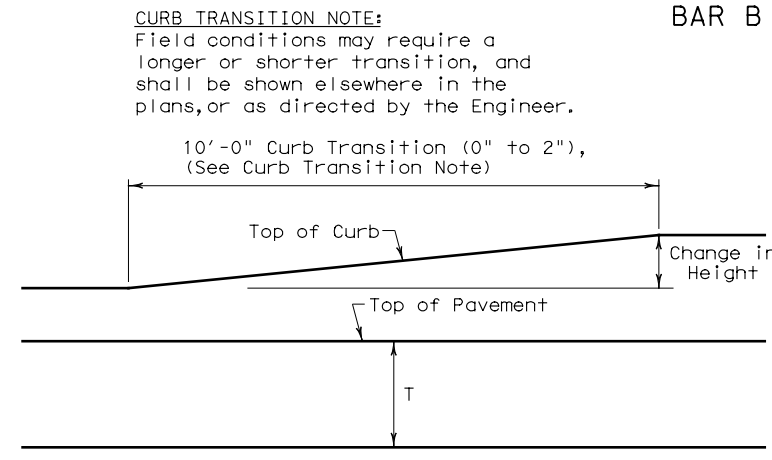
TYPE IIa CURB AND GUTTER
 5" - 5 3/4" HEIGHT



TYPE IV CURB (KEYED)
 5" - 5 3/4" HEIGHT



EXPANSION JOINT DETAIL

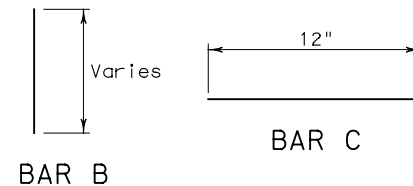


CURB TRANSITION

Note: To be paid for as Highest Curb

GENERAL NOTES

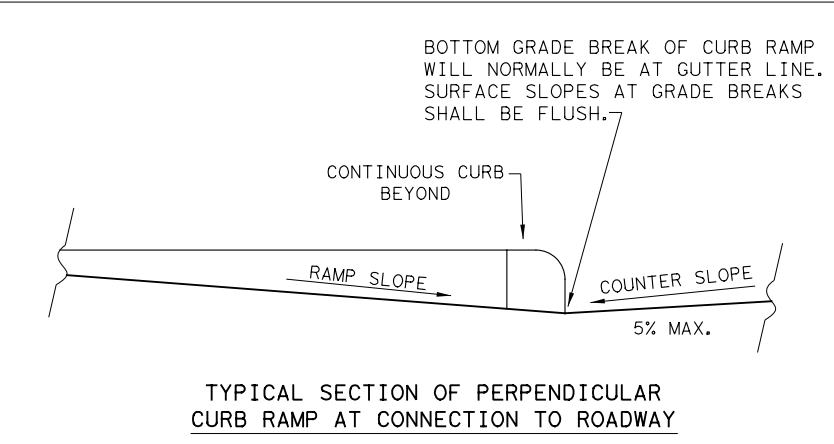
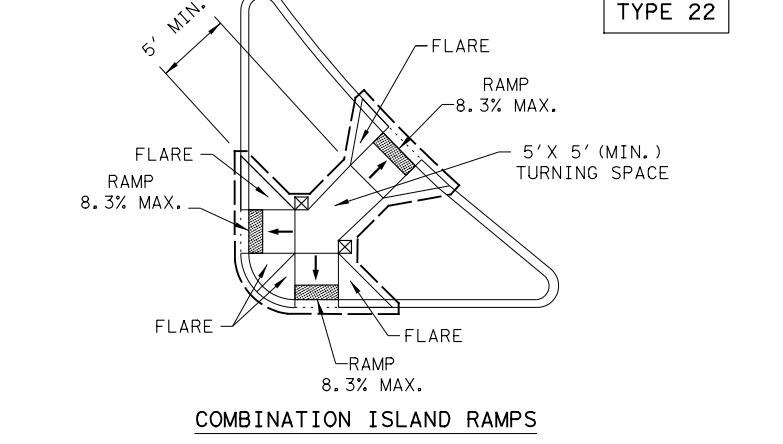
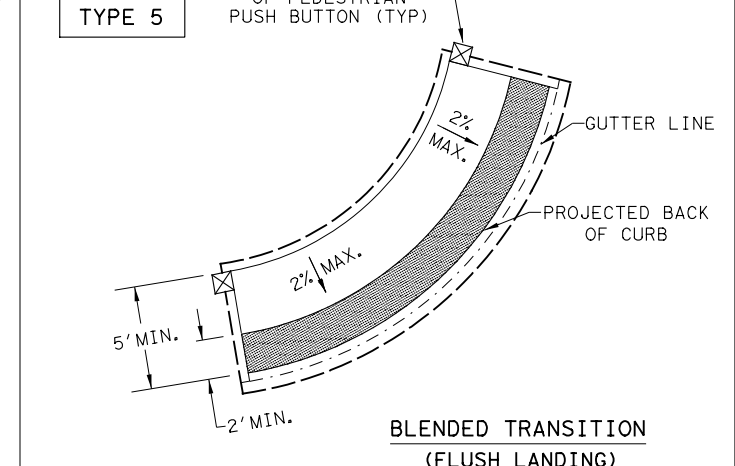
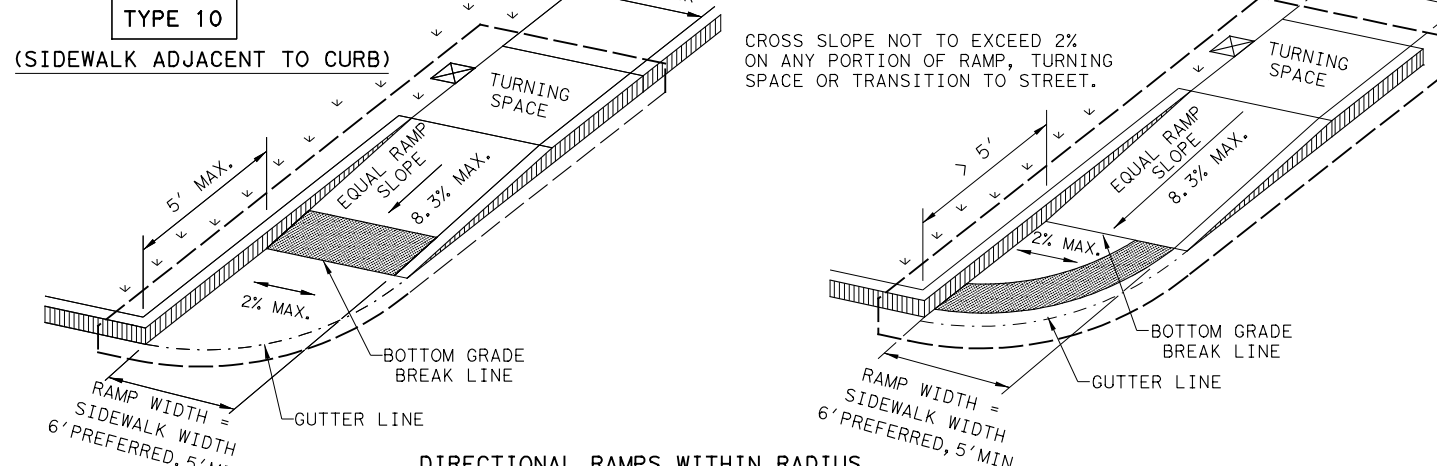
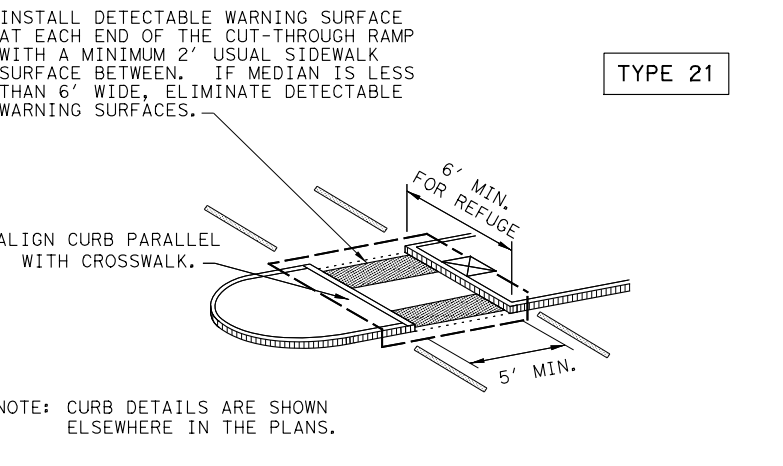
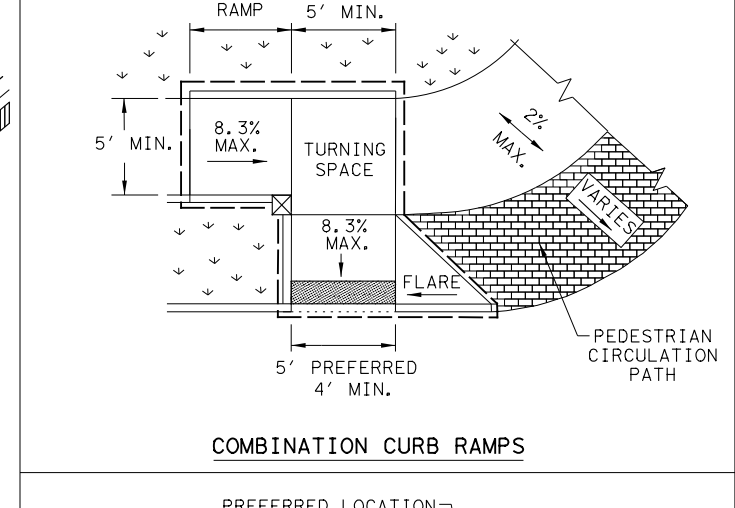
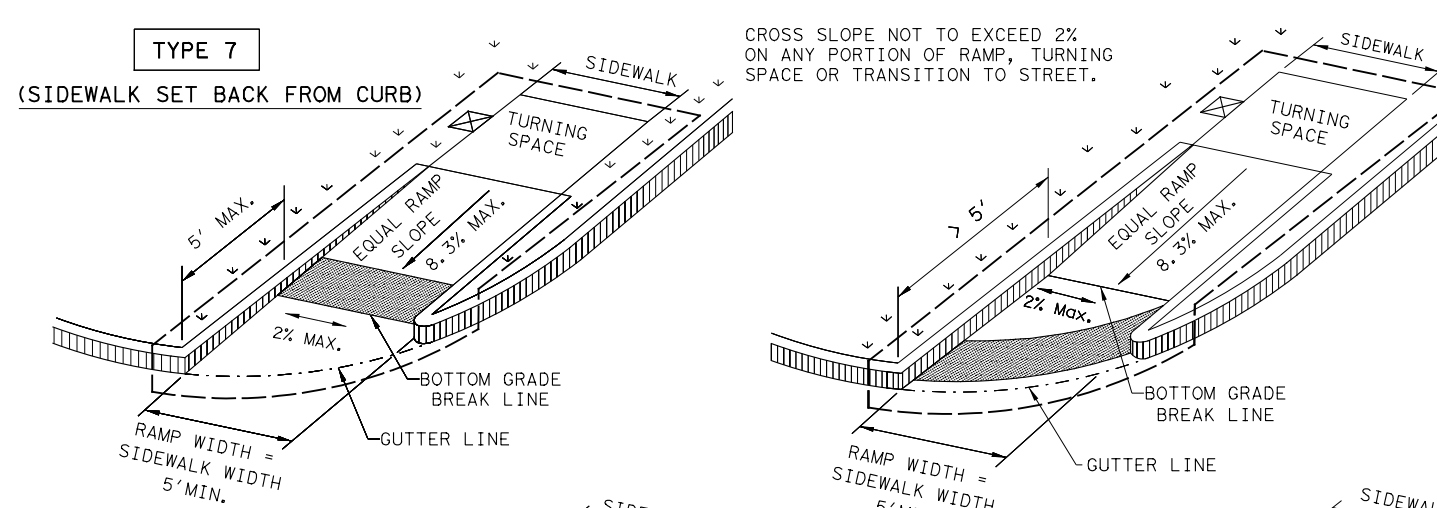
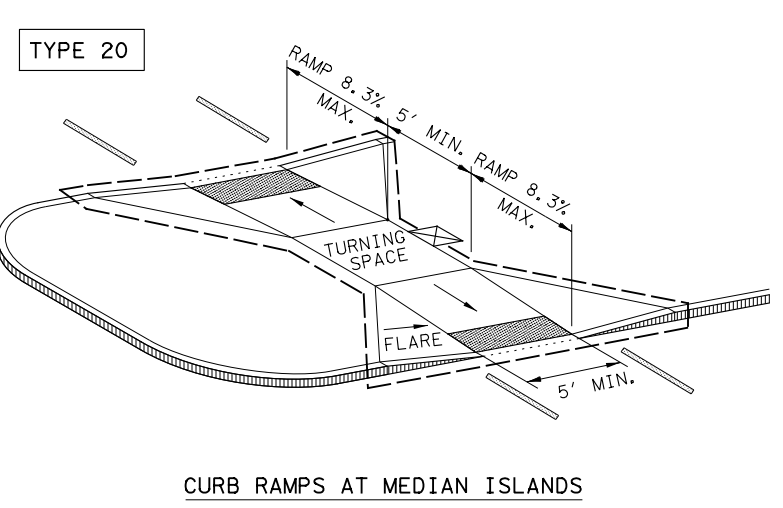
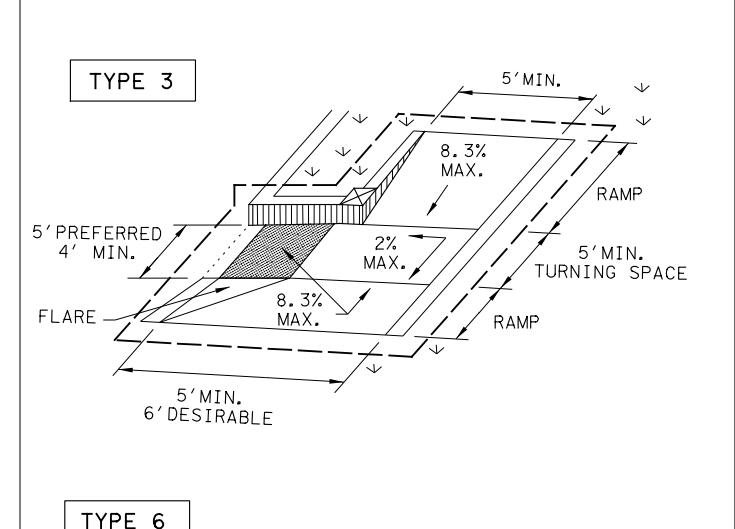
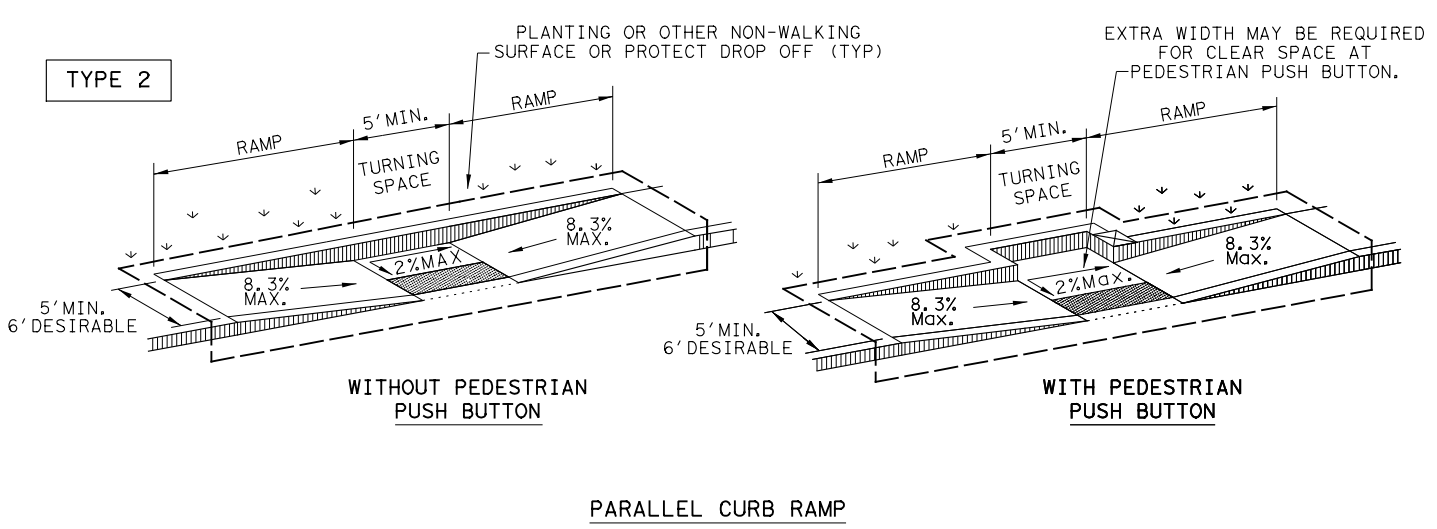
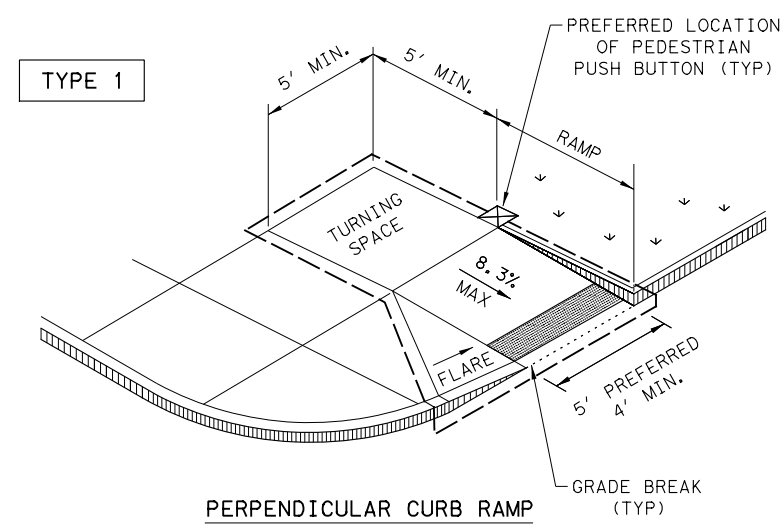
- All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
- Concrete shall be Class A.
- When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is 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."
- Round exposed sharp edges with a rounding tool, to a minimum radius of 1/4 inch.
- All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
- 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.
- 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.
- Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C-C.
- Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
- Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
- One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
- 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.
- Bar B used as needed to support curb reinforcing steel during concrete placement.



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.

				Design Division Standard
<h2>CONCRETE CURB AND GUTTER</h2> <h3>CCCG-21</h3>				
FILE: cccg21.dgn	DN: TxDOT	CK: AN	DW: SS	CK: KM
© TxDOT: FEBRUARY 2021	CONT: 3264	SECT: 01	JOB: 010	HIGHWAY: FM 326
REVISIONS	DIST: LUFKIN	COUNTY: ANGELINA	SHEET NO. 55	

DATE: 3/25/2022
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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

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	3264	01	010	FM 326
REVISED 08, 2009	DIST	COUNTY	SHEET NO.	
REVISED 06, 2012	LUFKIN	ANGELINA	56	
REVISED 01, 2018				

DATE: 3/25/2022
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GENERAL NOTES

CURB RAMP

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

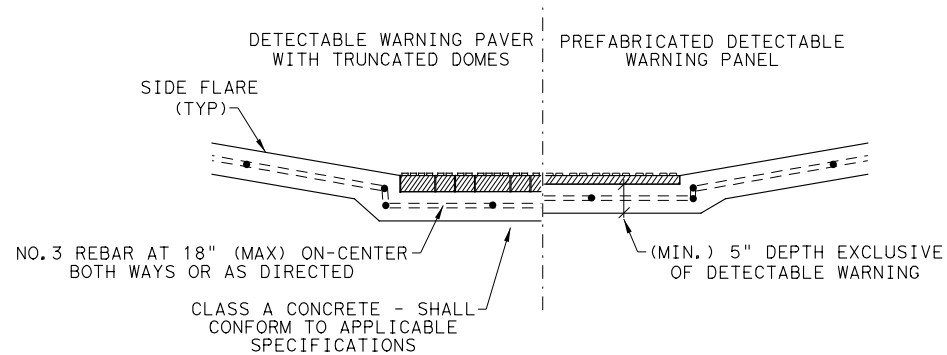
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material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

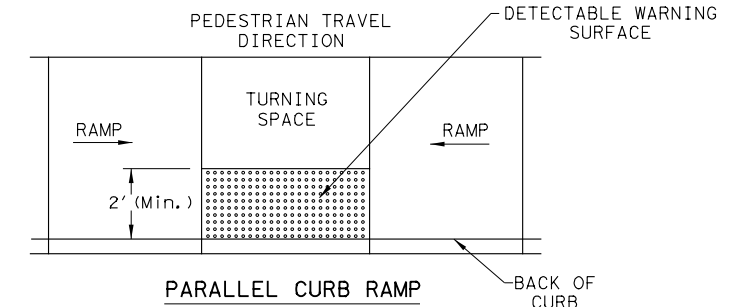
SIDEWALKS

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.

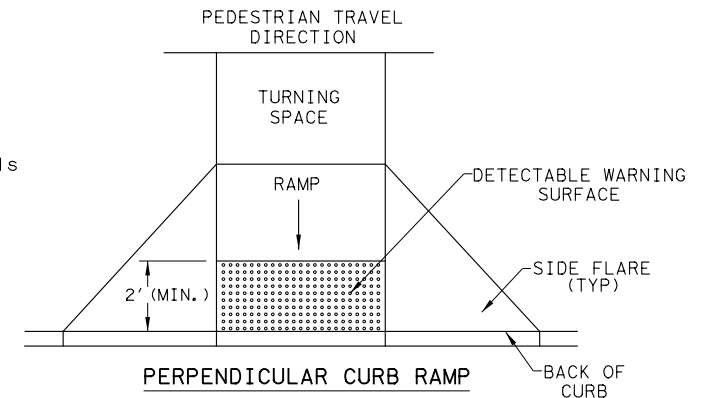


**SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS**

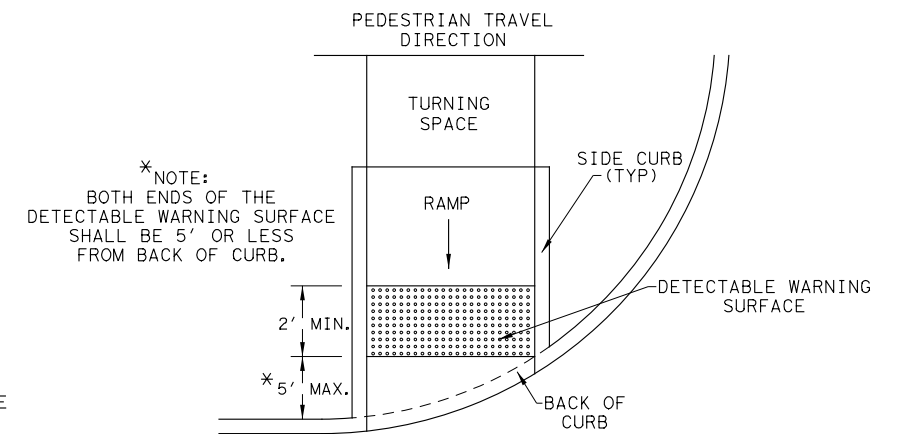
DETECTABLE WARNING SURFACE DETAILS



**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.**



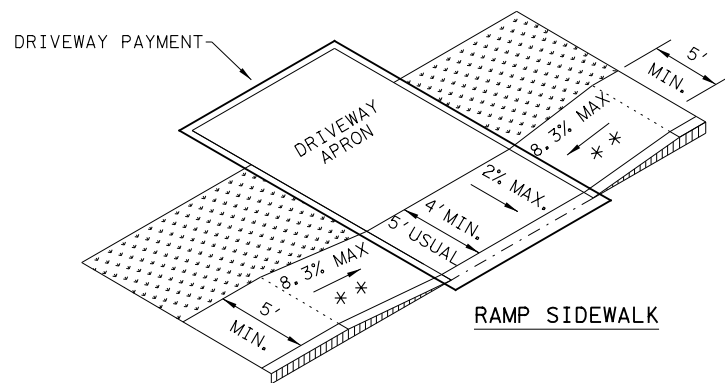
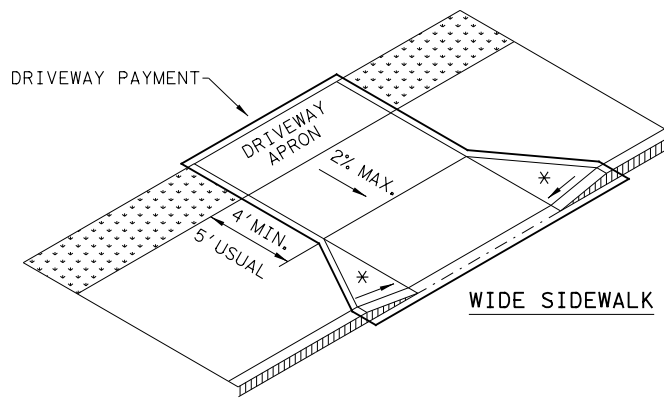
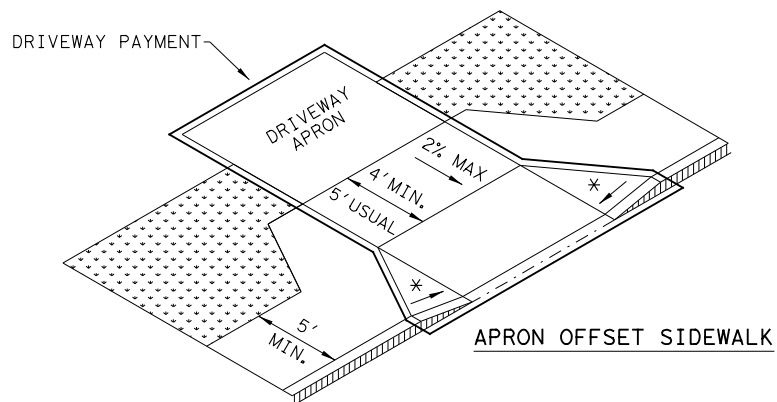
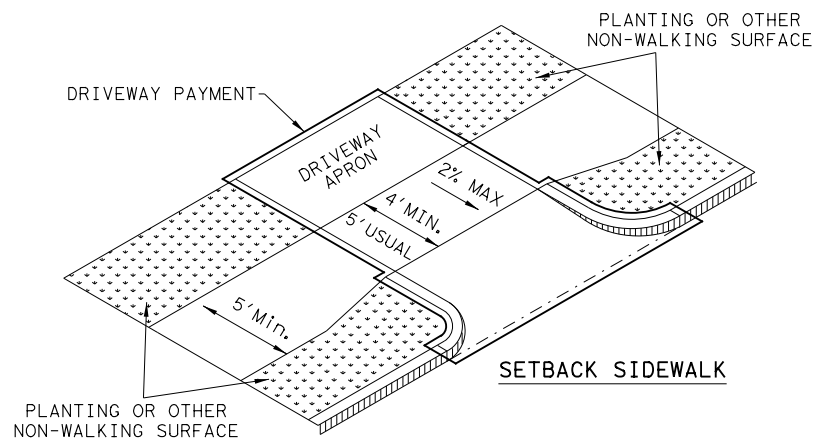
**DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.**

SHEET 2 OF 4

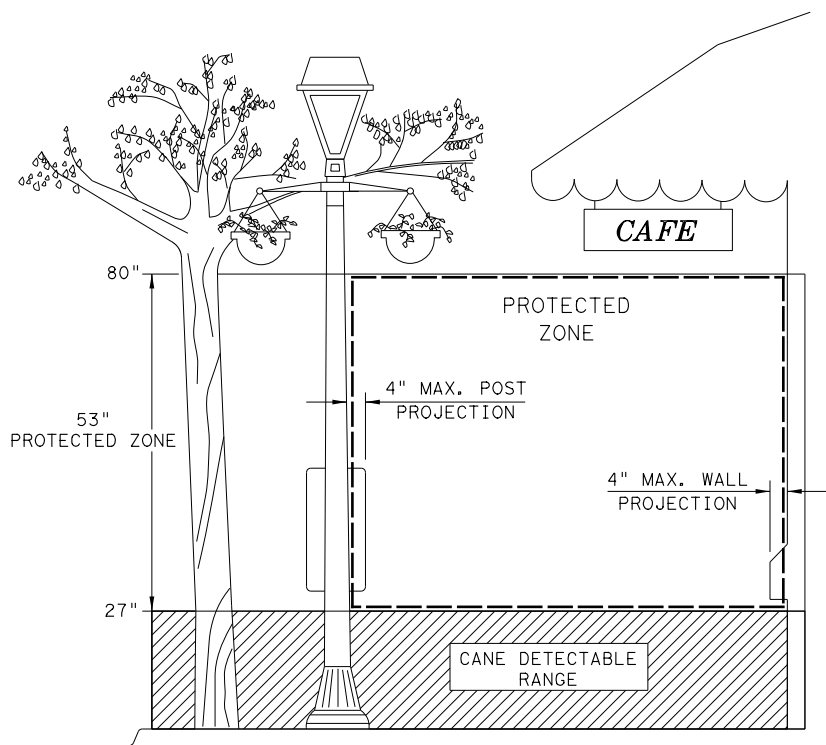
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FILE: ped18	DN: TxDOT	DW: VP	CK: KM
© TxDOT: MARCH, 2002	CONT	SECT	JOB
REVISIONS	3264	01	010
REVISED 08, 2005	DIST	COUNTY	SHEET NO.
REVISED 06, 2012	LUFKIN	ANGELINA	57
REVISED 01, 2018			

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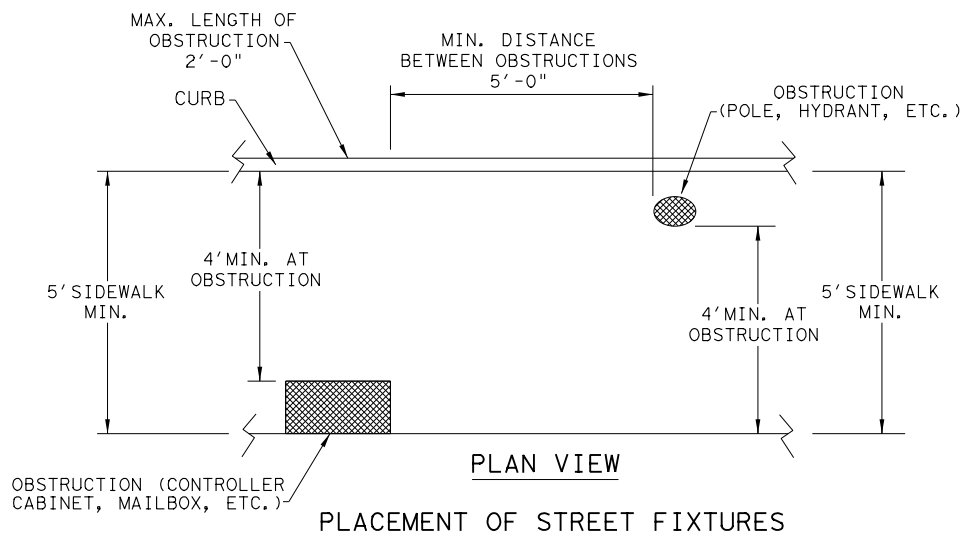
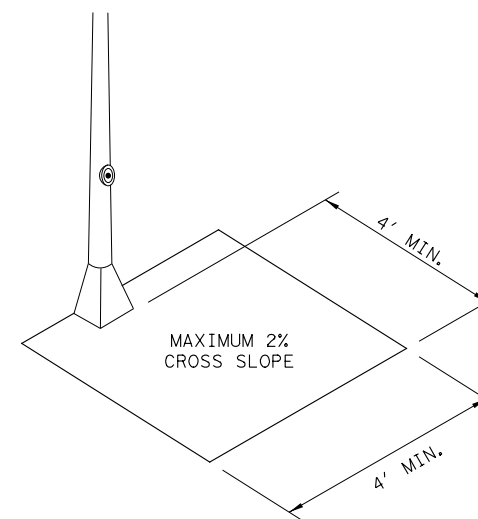
SIDEWALK TREATMENT AT DRIVEWAYS



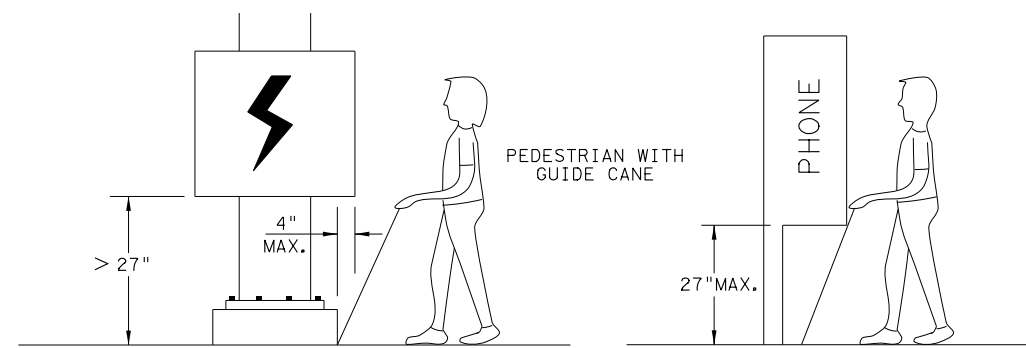
NOTES:
 * WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.
 * * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



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



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.

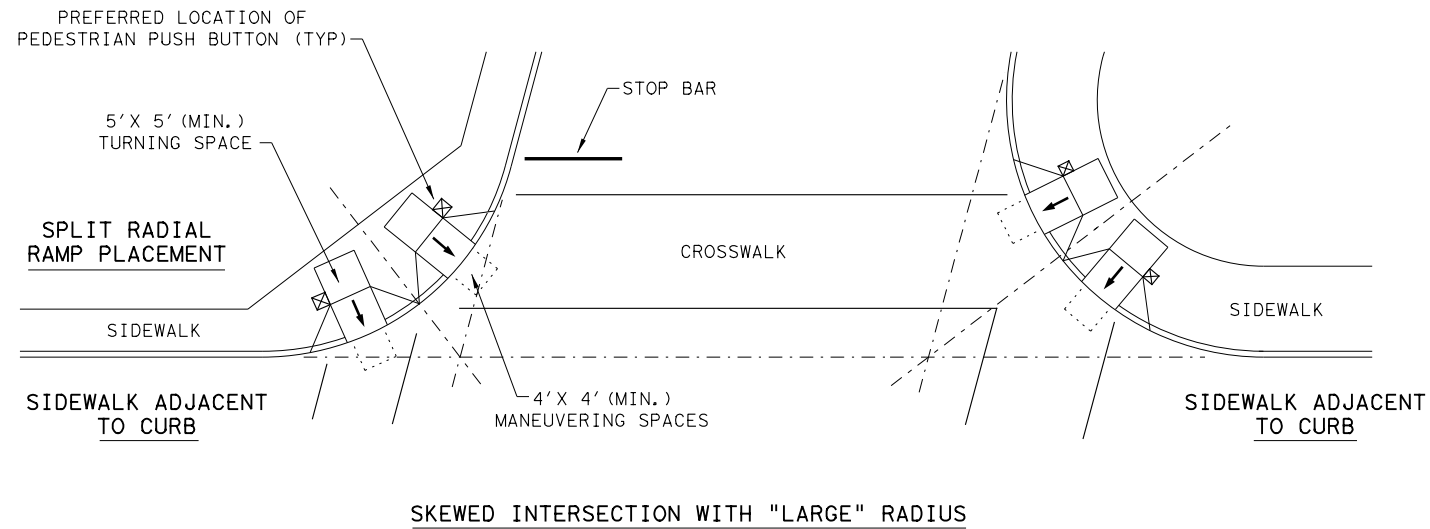
SHEET 3 OF 4

		Design Division Standard	
PEDESTRIAN FACILITIES CURB RAMPS PED-18			
FILE: ped18	DN: TxDOT	DW: VP	CK: KM
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<small>REVISOR</small>		010	FM 326
<small>REVISED 08, 2005</small> <small>REVISED 06, 2012</small> <small>REVISED 01, 2018</small>	DIST	COUNTY	SHEET NO.
	LUFKIN	ANGELINA	58

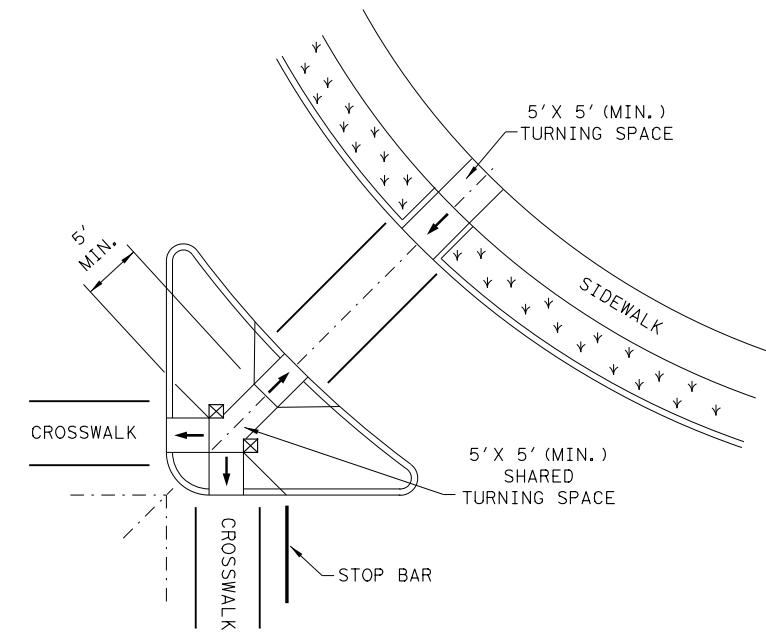
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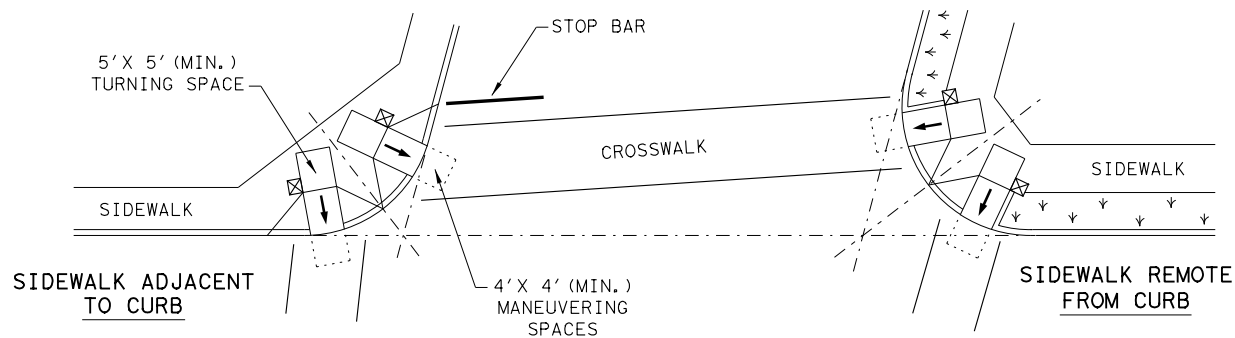
TYPICAL CROSSING LAYOUTS
 SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



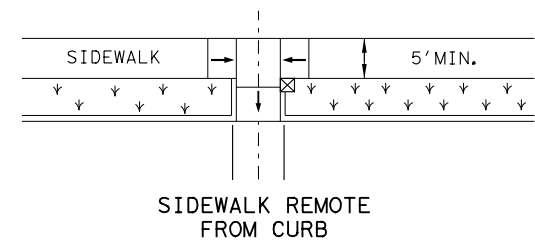
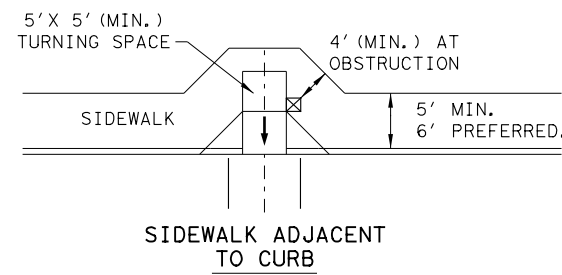
SKewed INTERSECTION WITH "LARGE" RADIUS



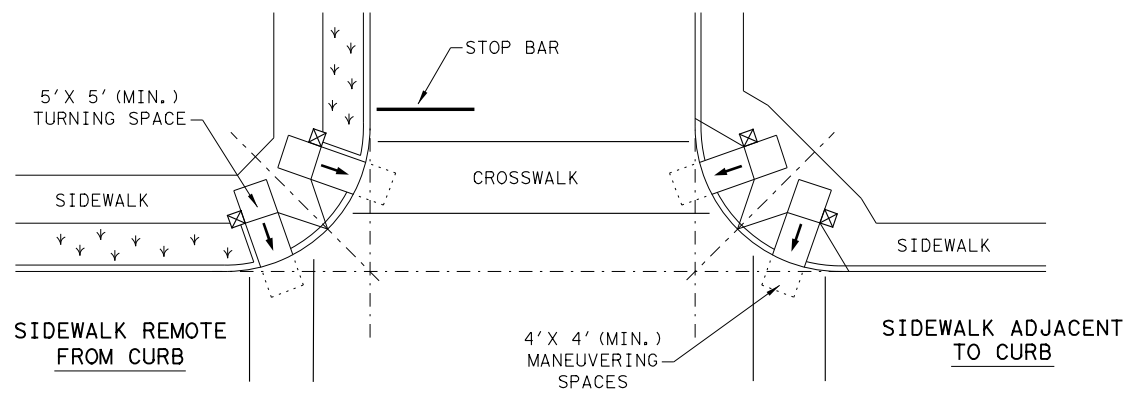
AT INTERSECTION
 W/FREE RIGHT TURN & ISLAND



SKewed INTERSECTION WITH "SMALL" RADIUS



MID-BLOCK PLACEMENT
 PERPENDICULAR RAMPS



NORMAL INTERSECTION WITH "SMALL" RADIUS

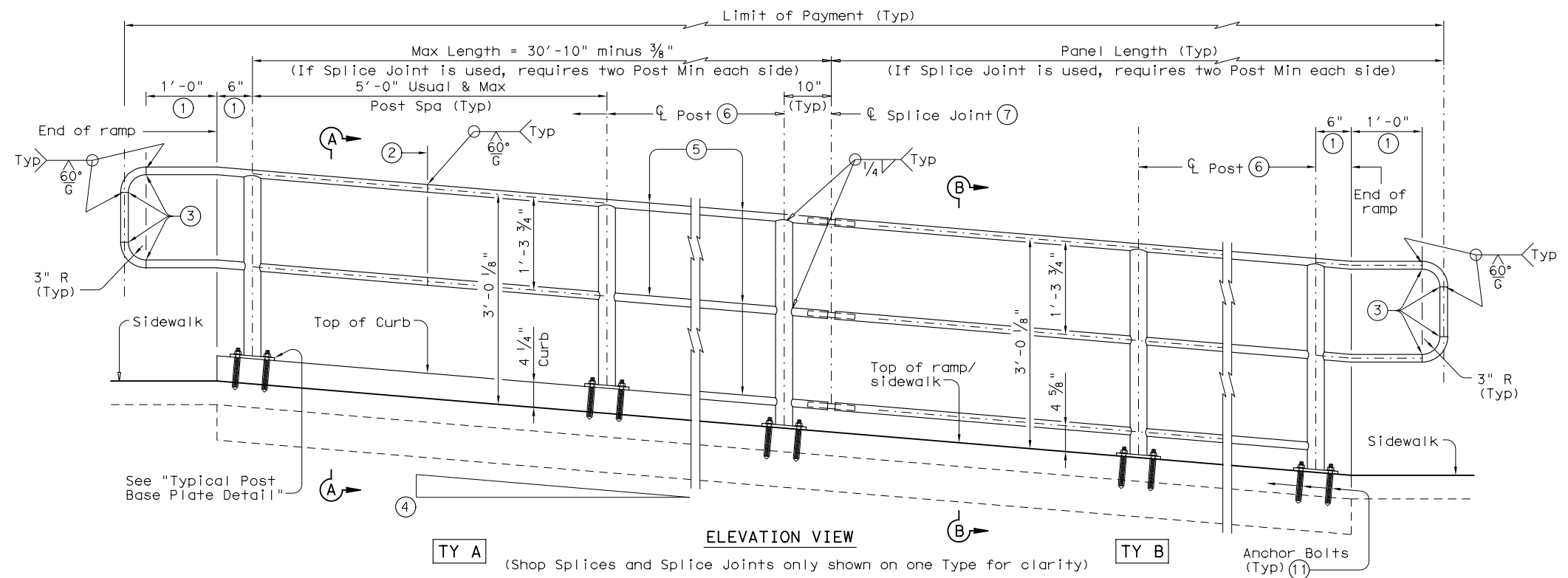
LEGEND:

- SHOWS DOWNWARD SLOPE. →
- DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ☒
- DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH. ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

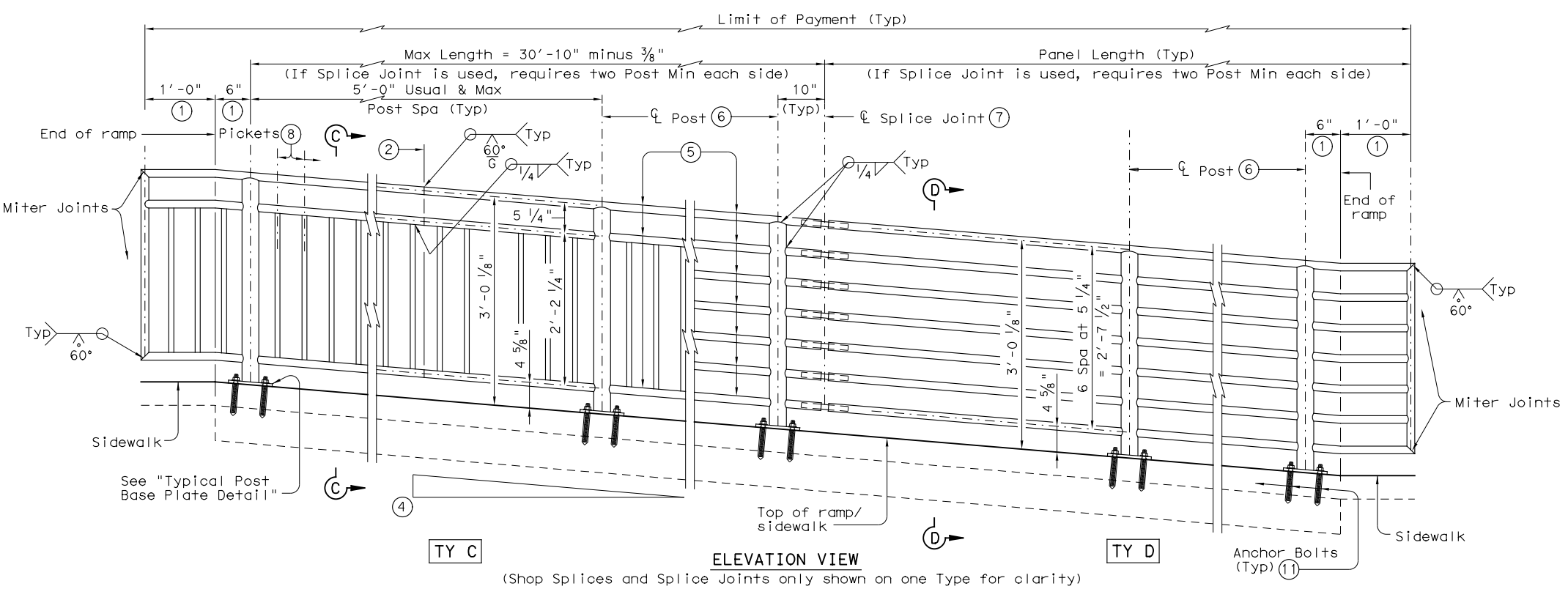
		Design Division Standard		
<h2>PEDESTRIAN FACILITIES</h2> <h3>CURB RAMPS</h3> <h1>PED-18</h1>				
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© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
REVISED 08, 2005	DIST	COUNTY	SHEET NO.	
REVISED 06, 2012	LUFKIN	ANGELINA	59	
REVISED 01, 2018				

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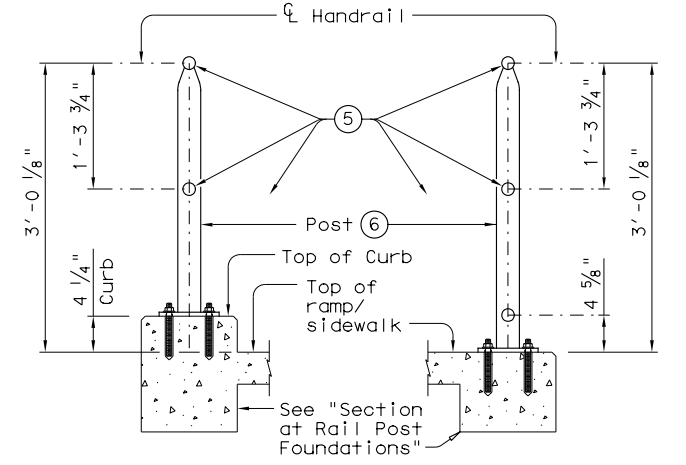


TY A (Shop Splices and Splice Joints only shown on one Type for clarity) **TY B**

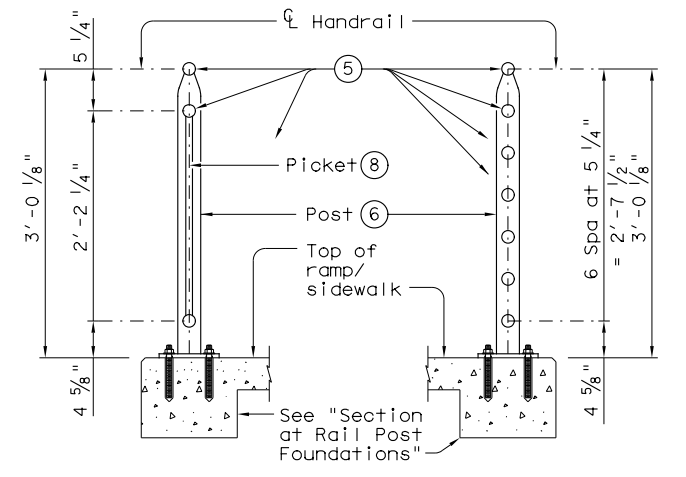


TY C (Shop Splices and Splice Joints only shown on one Type for clarity) **TY D**

RECOMMENDED USAGE (9) (10)	
Dropoff Height/Condition	Recommended Rail Options
< 30" dropoff	TY A, TY B, TY C, or TY D
≥ 30" dropoff, or along Bike Path	TY E or TY F



SECTION A-A (Showing Handrail TY A) **SECTION B-B** (Showing Handrail TY B)



SECTION C-C (Showing Handrail TY C) **SECTION D-D** (Showing Handrail TY D)

SHEET 1 OF 3

- ① Parallel to ground.
- ② One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ③ Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ④ See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
- ⑤ 1 1/2" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 1/2" Dia. pipe for galvanizing drainage and venting.
- ⑥ 2 1/2" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
- ⑦ See "Handrail Fabrication Details" for Splice Joints.
- ⑧ 5/8" Dia. Round Bar equal spacing at 4 1/2" Max. Plumb all pickets.
- ⑨ When needed for accessibility (grade > 5 percent) or as needed for pedestrian safety.
- ⑩ Not to be used on bridges.
- ⑪ See "General Notes" for anchor bolt information.



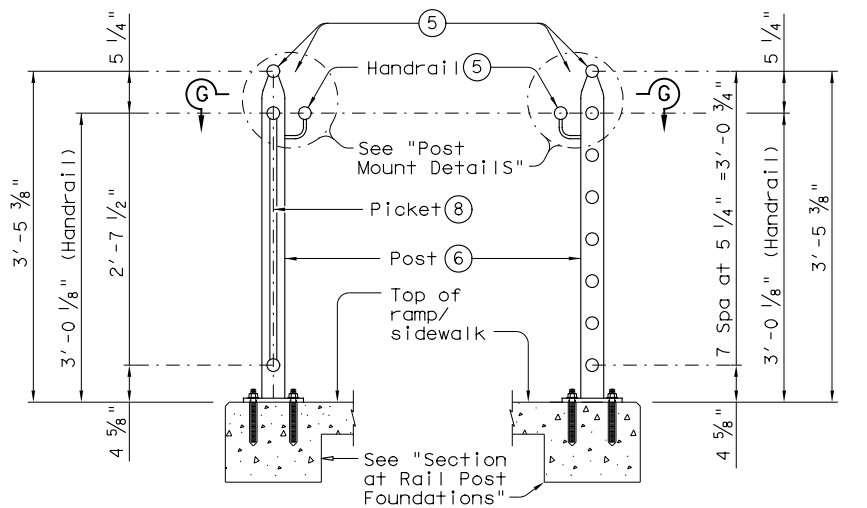
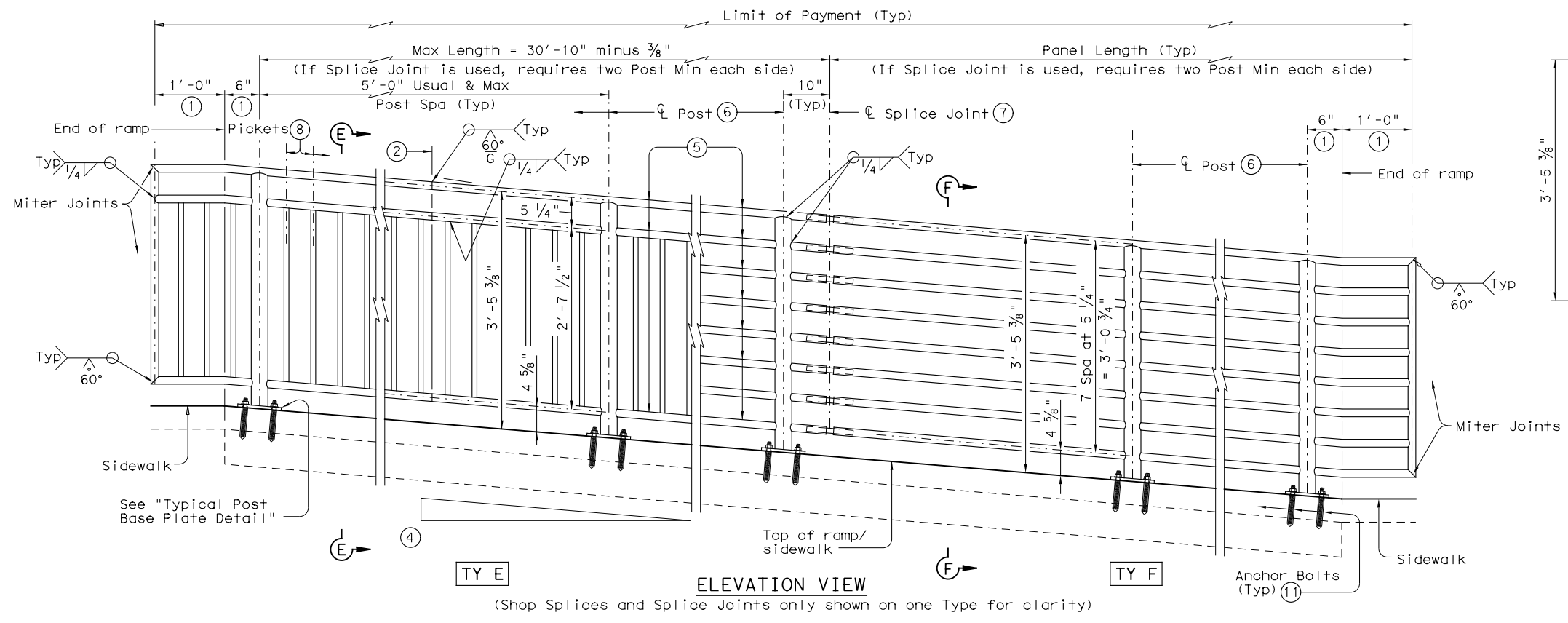
PEDESTRIAN HANDRAIL DETAILS

PRD-13

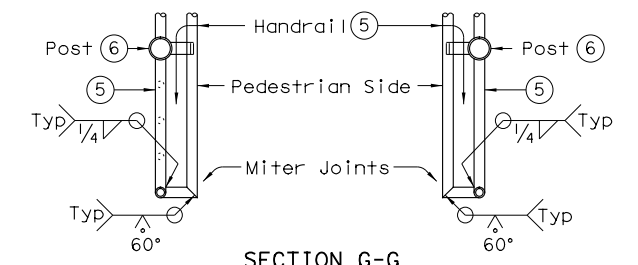
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REVISIONS	3264	01	010	FM 326
REVISED MAY, 2013 (VP)	DIST	COUNTY	SHEET NO.	
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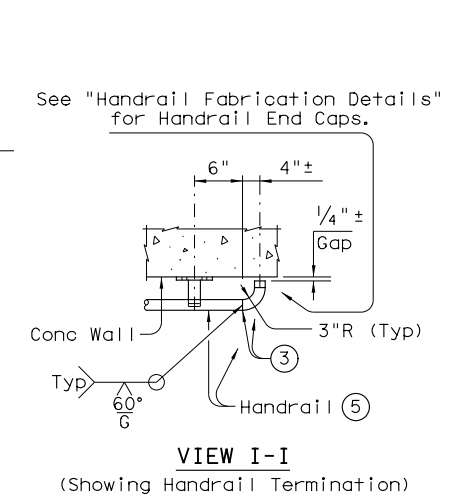
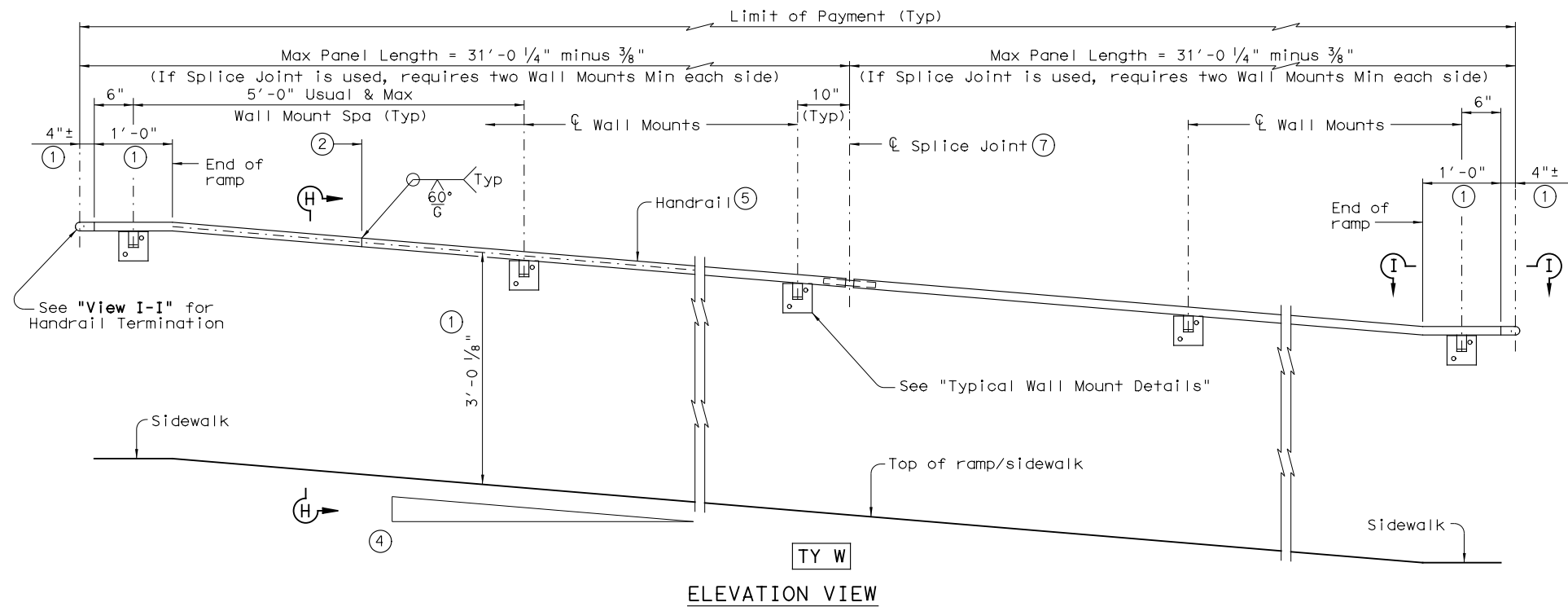
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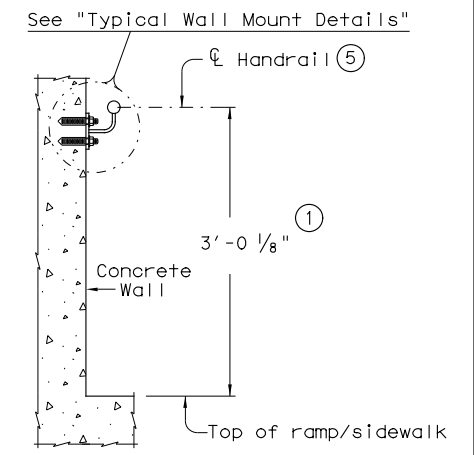
SECTION E-E (Showing Handrail TY E)
 SECTION F-F (Showing Handrail TY F)



SECTION G-G (Showing Handrail Termination)



VIEW I-I (Showing Handrail Termination)



SECTION H-H (Showing Handrail TY W)

SHEET 2 OF 3

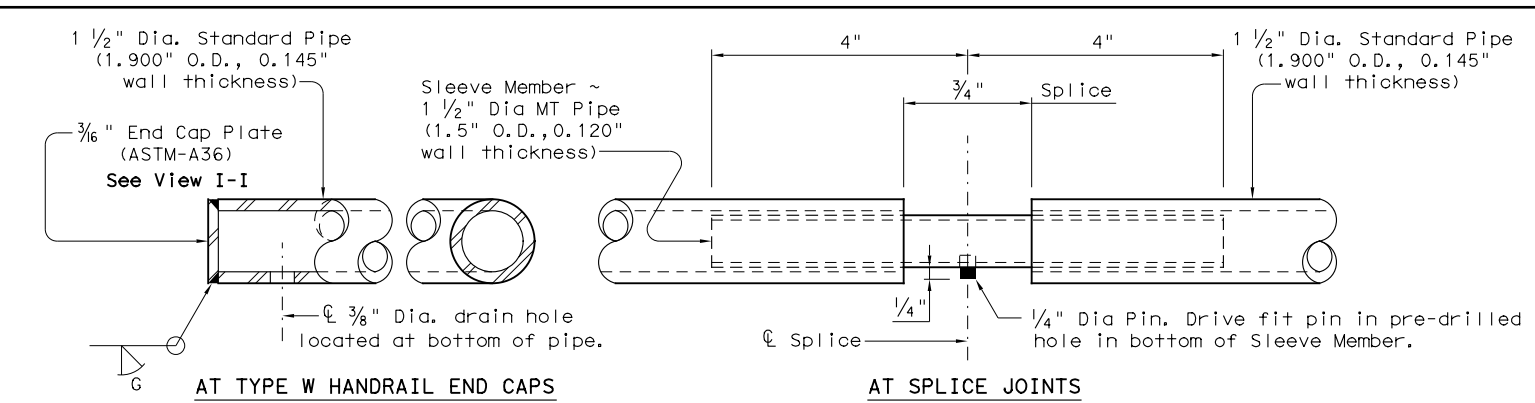
- ① Parallel to ground.
- ② One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ③ Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ④ See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
- ⑤ 1 1/2" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 1/2" Dia. pipe for galvanizing drainage and venting.
- ⑥ 2 1/2" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
- ⑦ See "Handrail Fabrication Details" for Splice Joints.
- ⑧ 5/8" Dia. Round Bar equal spacing at 4 1/2" Max. Plumb all pickets.
- ⑪ See "General Notes" for anchor bolt information.

Texas Department of Transportation
 Design Division Standard

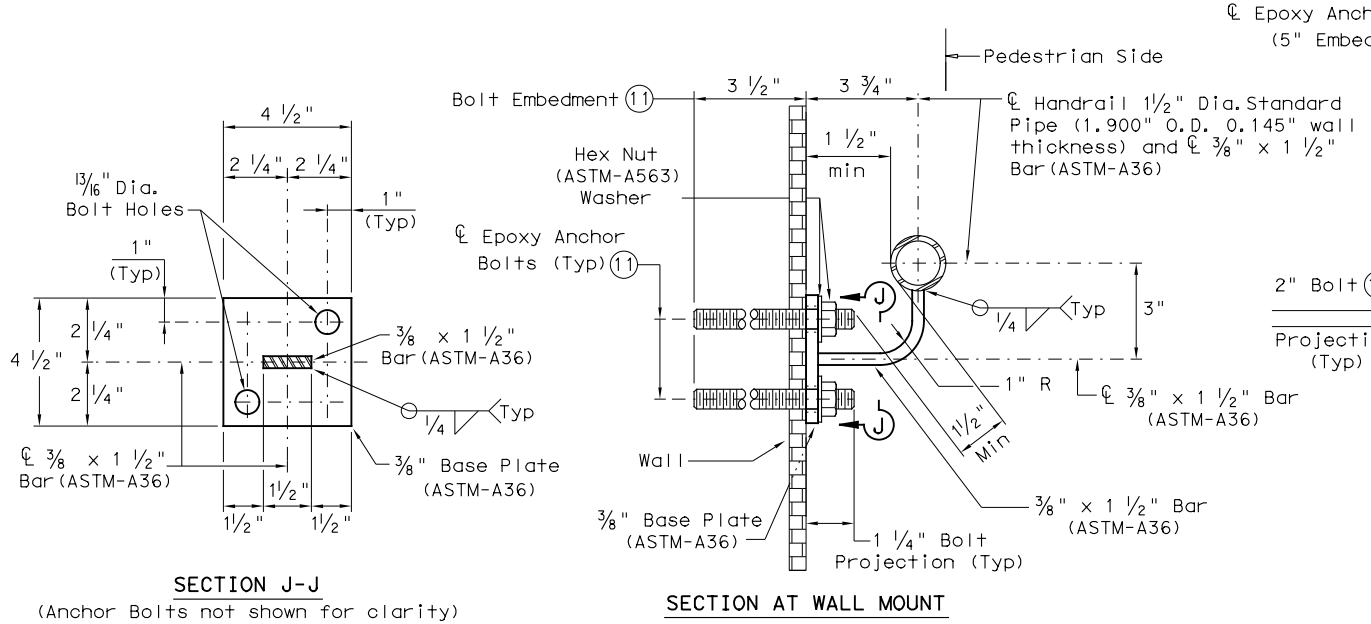
PEDESTRIAN HANDRAIL
 DETAILS
 PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
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REVISIONS	3264	01	010	FM 326
REVISED MAY, 2013 (VP)	DIST	COUNTY	SHEET NO.	
	LUFKIN	ANGELINA	61	

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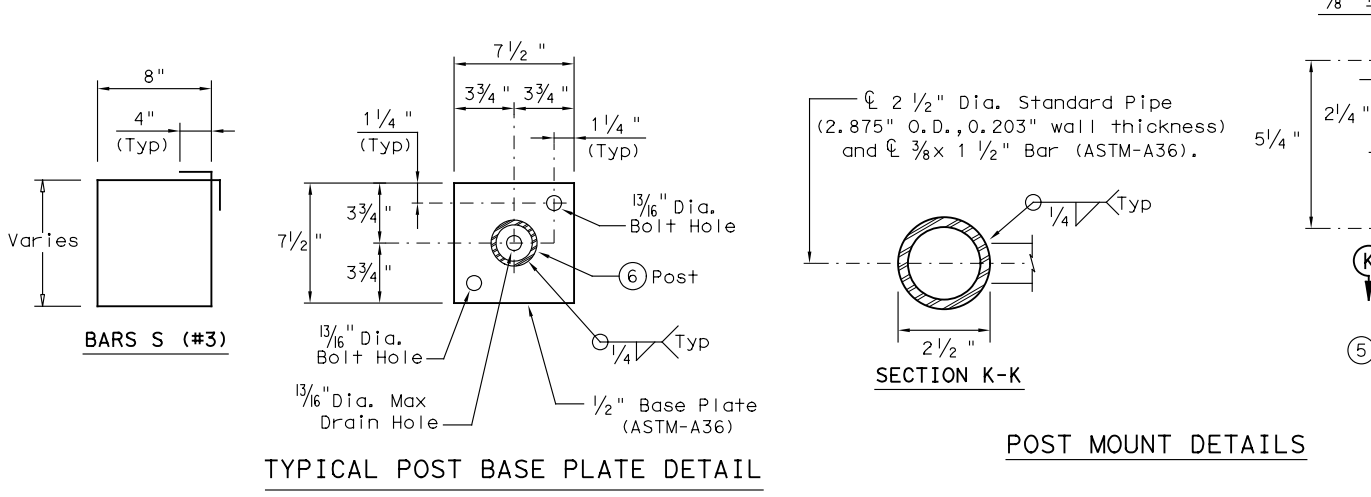


HANDRAIL FABRICATION DETAILS

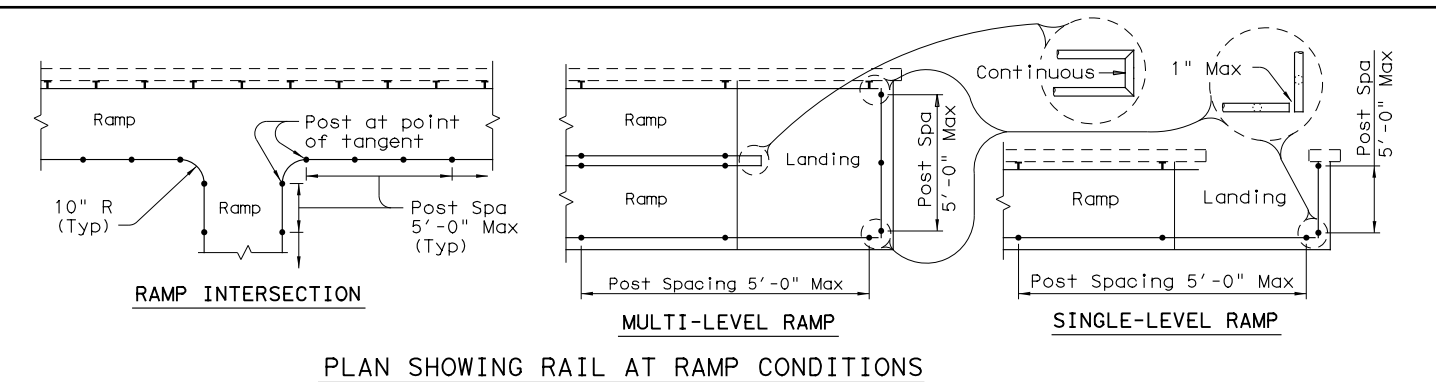


TYPICAL WALL MOUNT DETAILS

- (5) 1 1/2" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp/sidewalk. Provide holes as needed in 1 1/2" Dia. pipe for galvanizing drainage and venting.
- (6) 2 1/2" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). Plumb all posts. See "Post Mount Detail" for crimping and trimming post to fit the diameter of top rail. Provide holes as needed in post for galvanizing drainage and venting.
- (11) See "General Notes" for anchor bolt information.
- (12) Bars S(#3) spaced at 12" Max (Spaced 3" from outside edge of overall length of Ramp/Sidewalk).
- (13) Provide 1 1/2" end cover to Bars D(#4) from outside edge of overall length of Ramp/Sidewalk.



POST MOUNT DETAILS



PLAN SHOWING RAIL AT RAMP CONDITIONS

GENERAL NOTES

Designed according to ADAAG, Texas Accessibility Standards, Uniform Building Code, and AASHTO LRFD Specifications.

Handrail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Pipe will conform to ASTM-A53 Grade B or A500 Grade B. Steel plates and steel bars will conform to ASTM-A36. Mechanical tubing (MT) will conform to ASTM A513 Grade 1015 or higher. Galvanize all steel components except reinforcing steel unless noted otherwise.

Concrete for foundations will be in accordance with Item 531 "Sidewalks". All reinforcing steel must be Grade 60. Bar laps, where required, will be as follows: Uncoated ~ #4 = 1'-5" Epoxy coated ~ #4 = 2'-1"

When the plans require painted steel, follow the requirements for painting galvanized steel in Item 446, "Cleaning and Painting Steel". Sleeve Members will receive galvanization and only get field painted after installation unless directed otherwise by Engineer.

Epoxy Anchor bolts for wall mount and post base plate will be 5/8" Dia. ASTM A36 threaded rods with one hex nut and one hardened steel washer at each bolt. 5/8" Dia. threaded rod embedment depth for wall mounts is 3 1/2" and embedment depth for post base plate is 5".

Embed threaded rods into concrete with a Type III (Class C) epoxy meeting the requirements of DMS-6100, "Epoxyes and Adhesives". Mix and dispense adhesive with the manufacturer's static mixing nozzle/dual cartridge system. Core drill holes (percussion drilling not permitted).

At the contractor's option the post base plate anchor bolts may be cast with the Ramp/Sidewalk (See Cast-in-Place Anchor Bolt Options).

Optional cast-in-place anchor bolts will be 5/8" Dia ASTM A307 Grade A bolts (or A36 threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt. Embedment depth of cast-in-place bolt will be 8" for post base plate.

Handrails and any wall or other surface adjacent to them will be free of any sharp or abrasive elements.

Submit shop drawings to the Engineer unless otherwise noted. For curved handrail applications, fabricate the handrail to the curve if radius is less than 600 ft. Shop drawings are required when rail is fabricated to the curve.

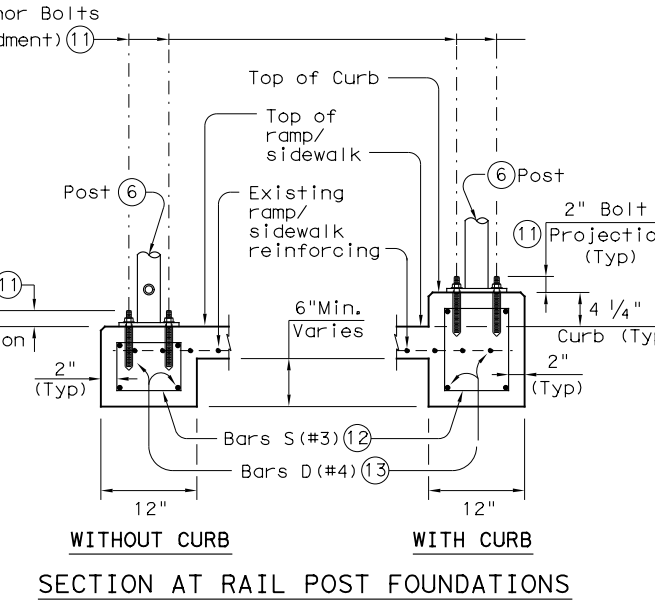
For all handrails, erection drawings will be submitted to the Engineer for approval to ensure proper installation.

Drawings will show handrail mount locations with bolts setting, spacing, ramp slope, and/or splice joint locations, and handrail lengths with identification showing where each handrail goes on the layout.

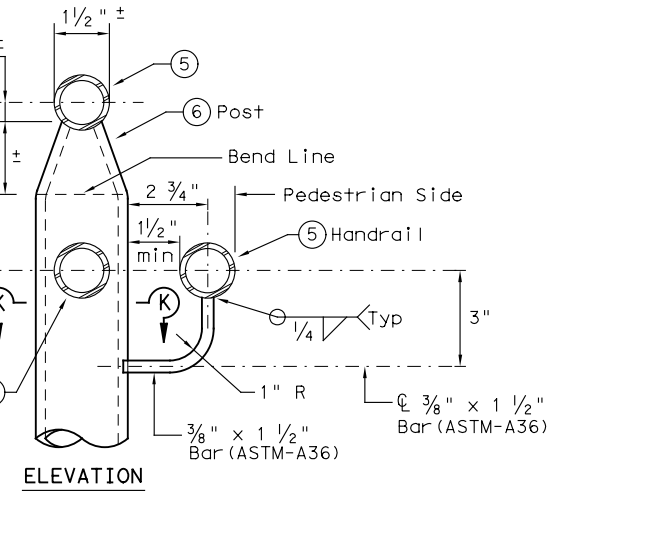
Payment for concrete sidewalks or curb ramps will be paid for in accordance with Item 531 "Sidewalks".

Payment for all items shown is to be included in unit price bid in accordance with Item 450 "Railing" of the type specified.

All exposed edges will be rounded or chamfered to approximately 1/8" by grinding.



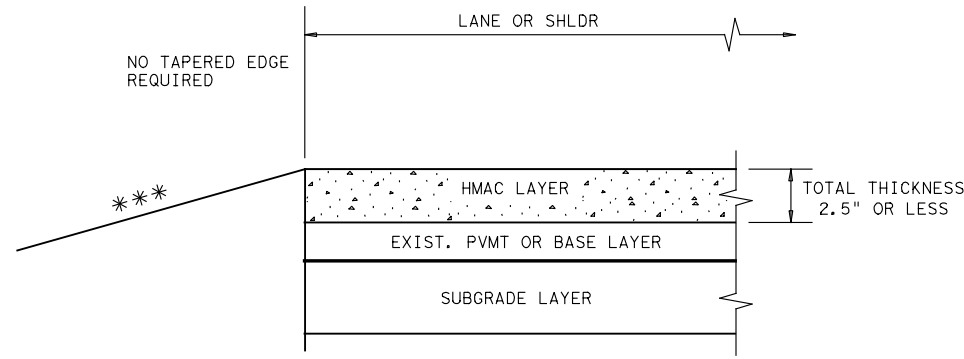
CAST-IN-PLACE ANCHOR BOLT OPTIONS
 (Used for Post Base Plate only)



		Design Division Standard	
<h1>PEDESTRIAN HANDRAIL DETAILS</h1> <h2>PRD-13</h2>			
FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR
© TxDOT December 2006	CONT SECT	JOB	HIGHWAY
REVISIONS	3264 01	010	FM 326
REVISED MAY, 2013 (VP)	DIST	COUNTY	SHEET NO.
	LUFKIN	ANGELINA	62

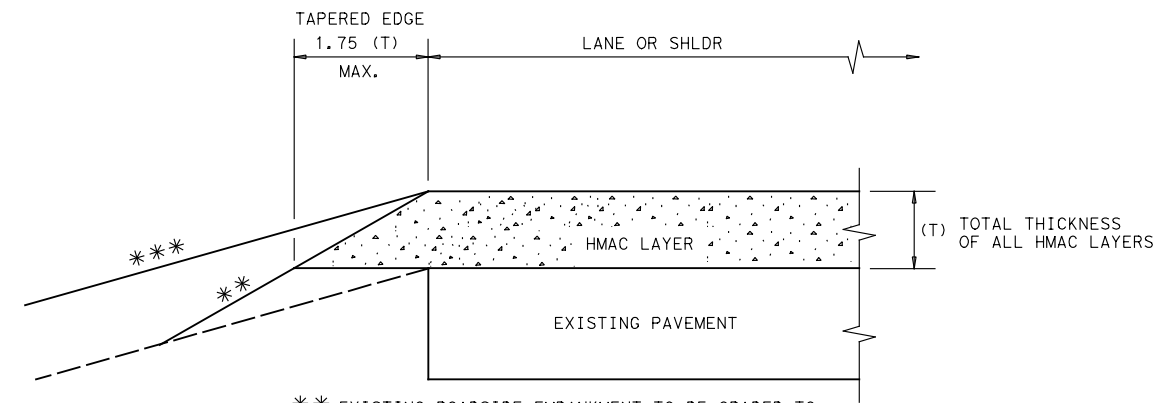
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 3/25/2022
 FILE: pw://rtg-pw_bent1ey.com:rtg-pw/Documents/9360503/CADD/Standards/Roadway/tehmac11.dgn



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

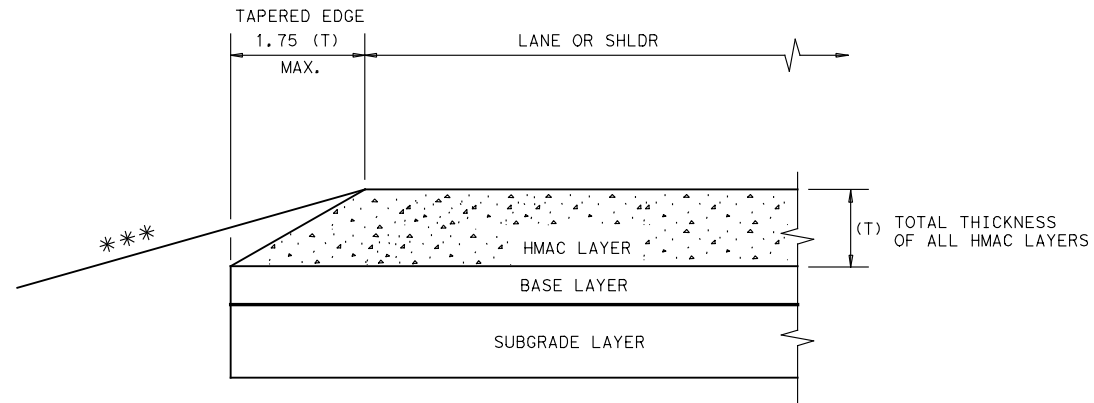
CONDITION - 1
 THIN HMAC SURFACES OR HMAC OVERLAY
 WITH THICKNESS OF 2.5" OR LESS



** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

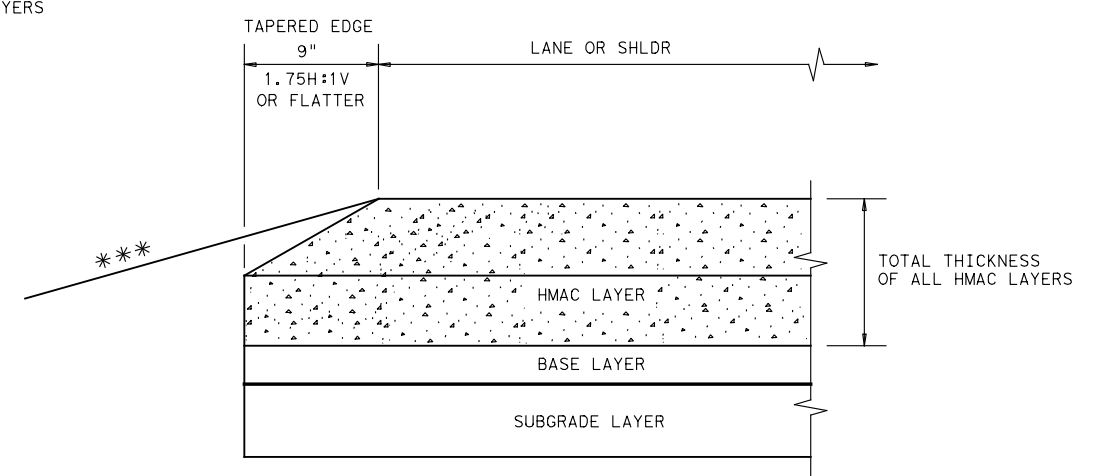
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2
 OVERLAY OF EXISTING PAVEMENT
 HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3
 NEW OR RECONSTRUCTED PAVEMENT
 HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4
 NEW OR RECONSTRUCTED PAVEMENT
 HMAC THICKNESS 5" OR GREATER

GENERAL NOTES

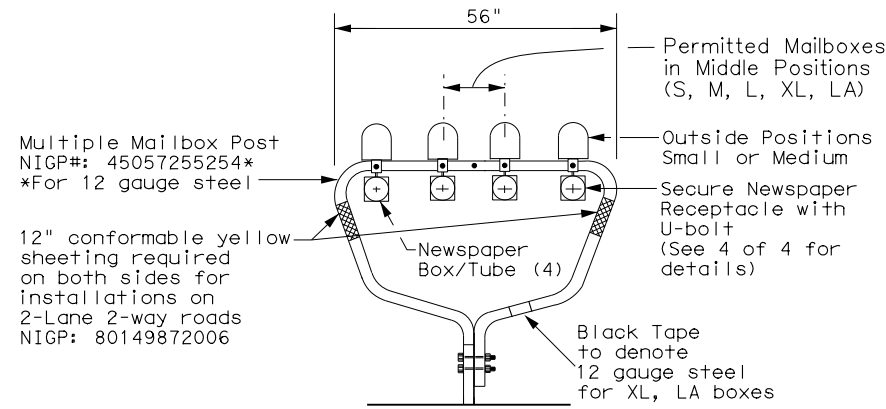
1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

(NOT TO SCALE)

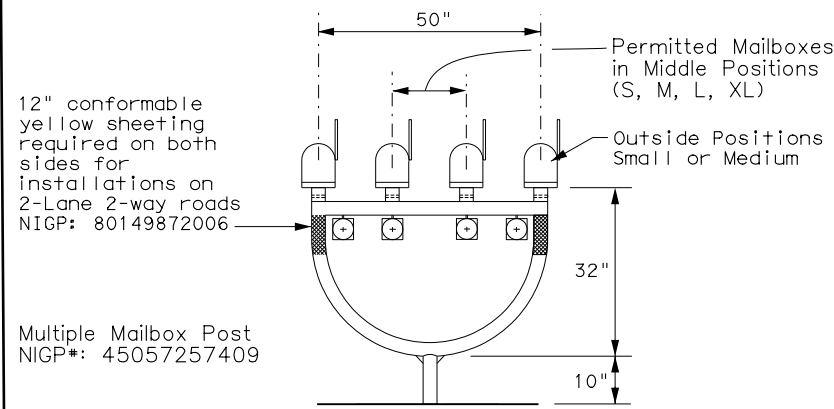
					Design Division Standard
TAPERED EDGE DETAILS HMAC PAVEMENT TE (HMAC) - 11					
FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:	
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY	
REVISIONS		3264	01	010	FM 326
	DIST	COUNTY		SHEET NO.	
	LUFKIN	ANGELINA		63	

DATE: 3/25/2022 1:18
 FILE: D:\rta-pw_bentley.com\rta-pw_documents\9360503\CADD\Standards\Roadside\MB(1)-21.dgn
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TYPE 1 - MULTIPLE



TYPE 4 - MULTIPLE



MAILBOX SIZES

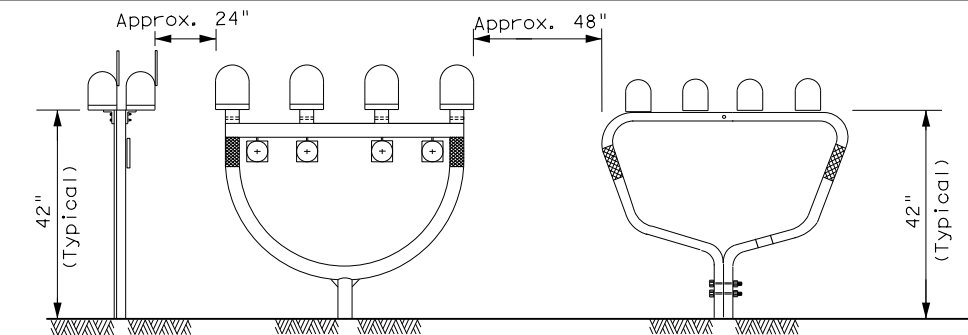
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX ** WEIGHT
	LENGTH	WIDTH	HEIGHT	
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

GENERAL NOTES:

- Dimensions shown (length, width, and height) are typical, not maximums. However, anytime a medium size mailbox is mounted on a single/double mount or on the outside position on a multi mount, the dimensions shown are maximums.
- Mailboxes shall be made of light weight sheet metal or light weight plastic. Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.

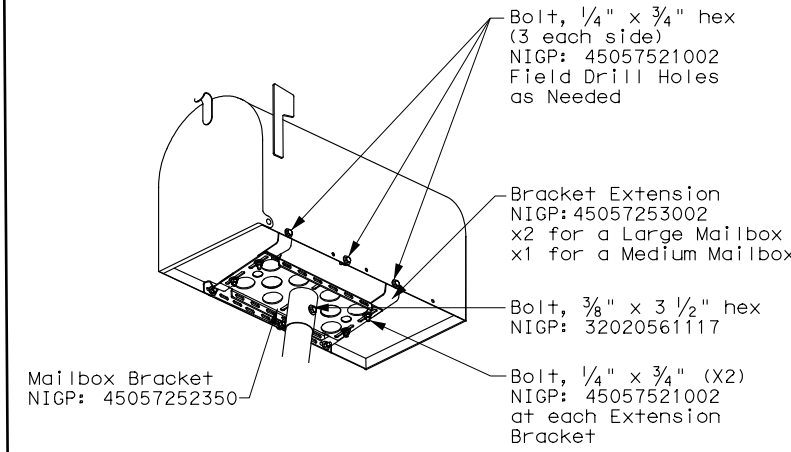
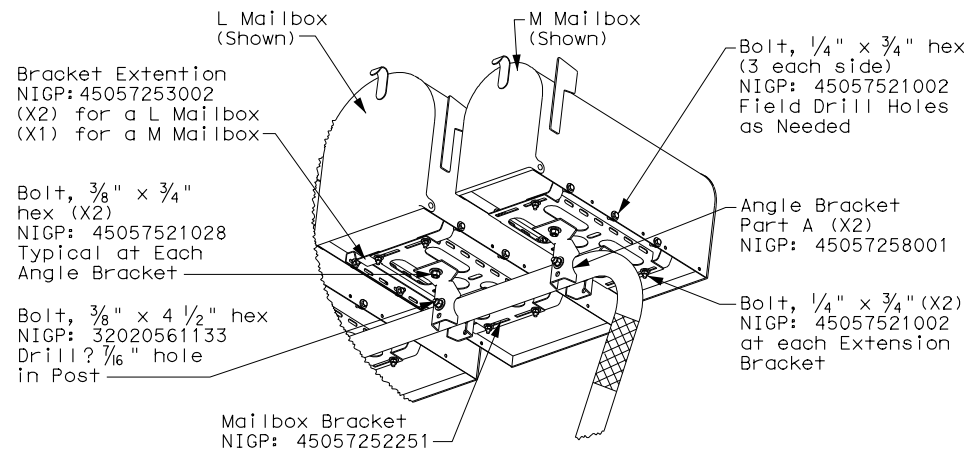
* See Note 1.
 ** Excluding Molded Plastic on 4 X 4 Post

TYPICAL INSTALLATION MEASUREMENTS

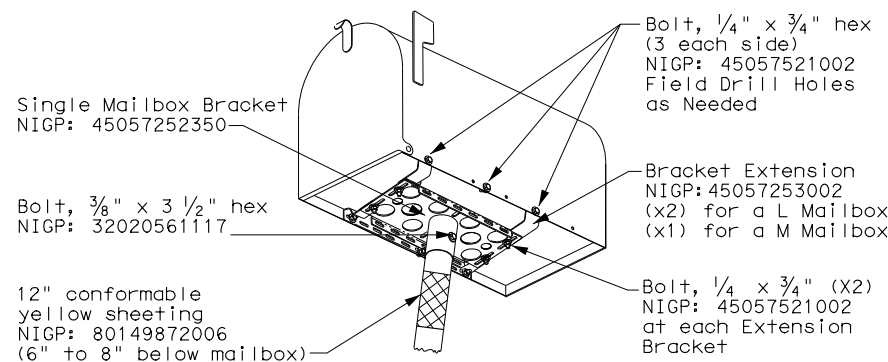


NOTE:

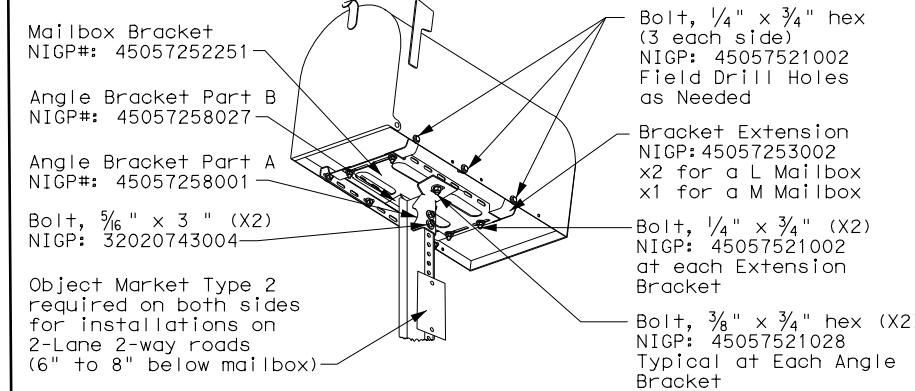
Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Design Standard sheets PED-Pedestrian Facilities Curb Ramps.



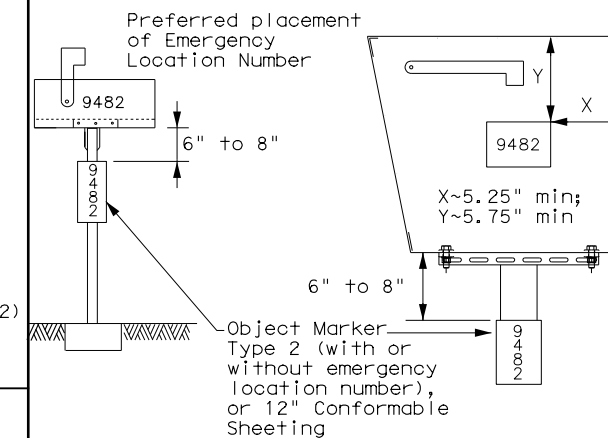
TYPE 2 and 4 - SINGLE/DOUBLE



TYPE 3 - SINGLE/DOUBLE



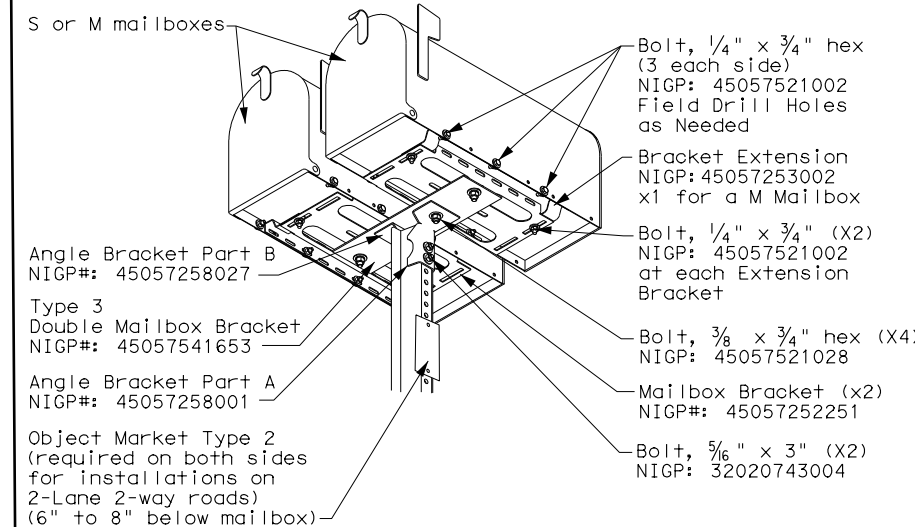
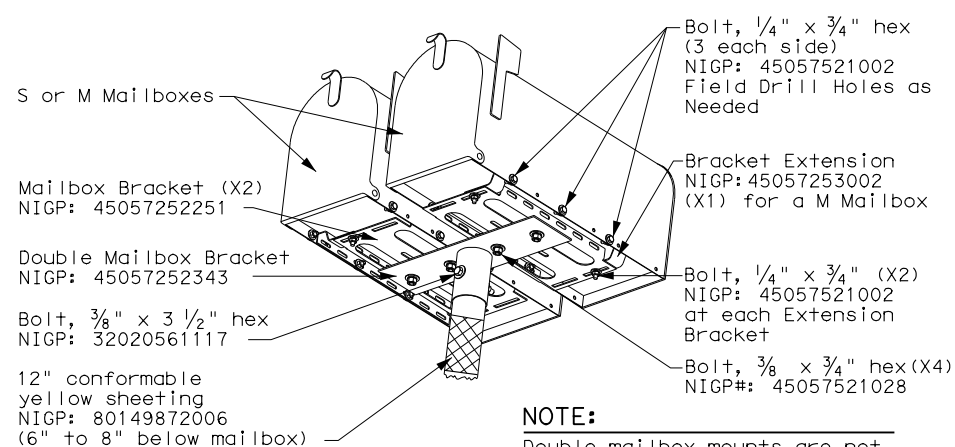
PLACEMENT OF EMERGENCY LOCATION NUMBER



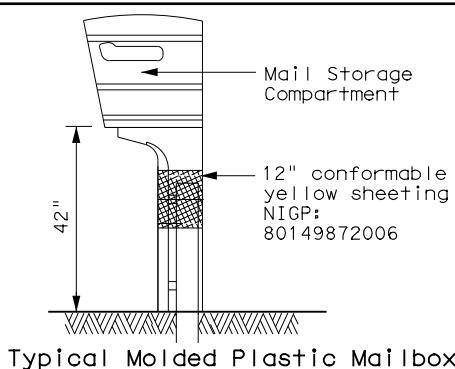
NOTES:

- Location numbers are provided by homeowner. Minimum size 1" height.
- Location number is typically placed on the mailbox in a contrasting color.
- Black numbers may be placed on the Type 2 object marker if the numbers cannot be placed on the mailbox.
- Alternatively, a green or blue plate with white numbers attached may be mounted below the object marker. Other contrasting color configuration, as approved, may be used.
- See 3 of 4 for Foundation details.
- See 4 of 4 for Hardware details.

SHEET 1 OF 4



TYPE 5



MAILBOX MOUNTING AND ASSEMBLY

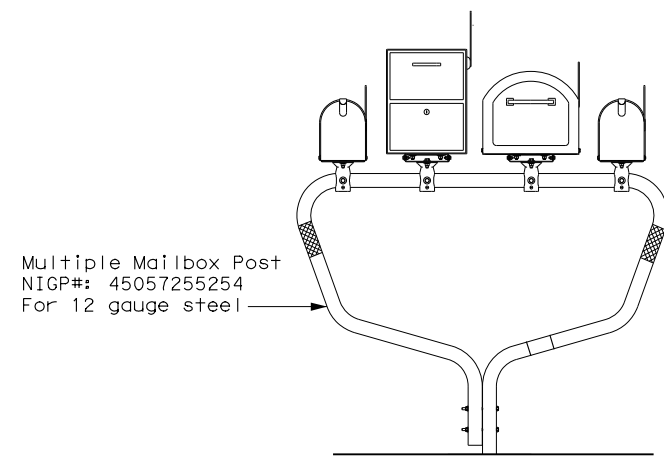
MB(1)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
2/2005	REVISIONS	3264	01	010
6/2005	11/2009	4/2015	DIST	COUNTY
11/2006	1/2011	7/2014	LUFKIN	ANGELINA
				SHEET NO. 64

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 FILE: D:\rtg-pw_bentley.com\rtg-pw\Documents\9360503\CADD\Standards\Roadside\MB(2)-21.dgn

TYPE 1 - MULTI LOCKABLE AND XL MAILBOX



Multiple Mailbox Post
 NIGP#: 45057255254
 For 12 gauge steel

TYPE 2/4 - SINGLE LOCKABLE MAILBOX

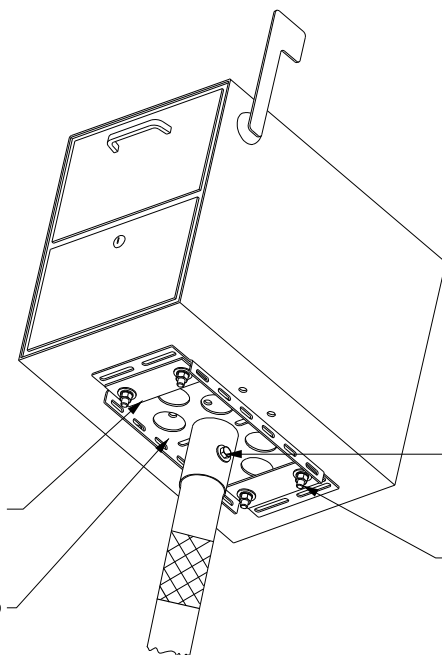


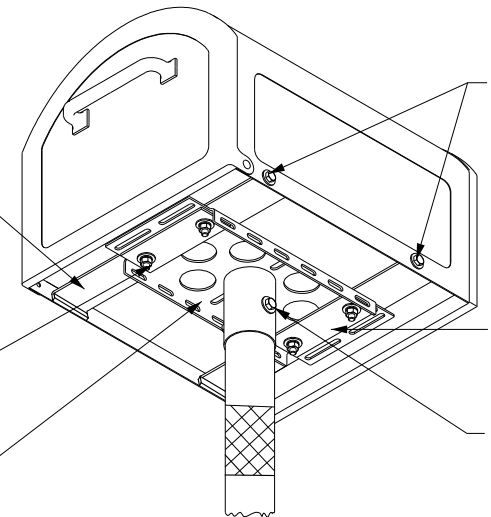
Plate Washer (X2)
 NIGP: 45057250255

Single Mailbox Bracket
 NIGP: 45057252350

Bolt, 3/8" x 3 1/2" hex (X2)
 NIGP: 32020561117

Bolt, 5/16" x 1 1/4" hex (X4)
 NIGP: 32020681246

TYPE 2/4 - SINGLE XL MAILBOX



L-bracket (X4)
 NIGP#: 45057250263

Bolt, 3/8" x 3 1/2" hex (X2)
 NIGP: 32020561117

Bolt, 5/16" x 1 1/2" hex (X4)
 NIGP: 32020560507

Single Mailbox Bracket
 NIGP: 45057252350

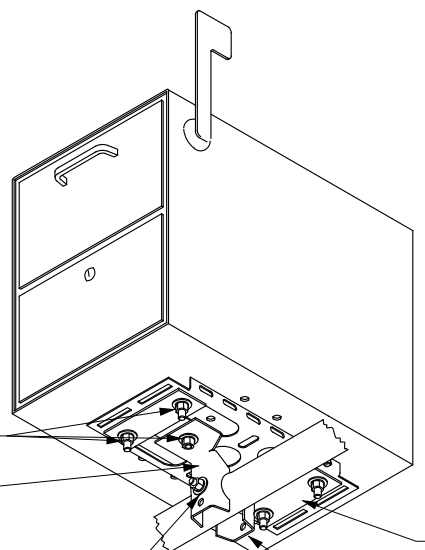
Bolt, 1/4" x 3/4" hex (2 each side)
 NIGP: 45057521002
 Field Drill Holes as Needed

Plate Washer (X2)
 NIGP: 45057250255

Bolt, 3/8" x 3 1/2" hex (X2)
 NIGP: 32020561117

NOTE:
 Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

TYPE 1 MULTI - LOCKABLE ARCHITECTURAL (LA)



Bolt, 3/8" x 3/4" hex (X6)
 NIGP: 45057521028
 Typical at Each Angle Bracket and plate washer

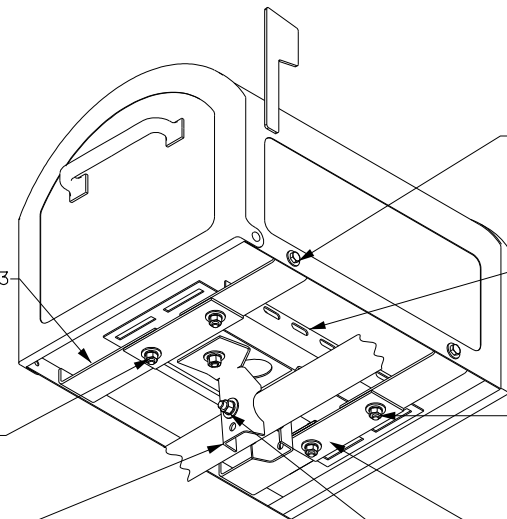
Mailbox Bracket
 NIGP: 45057252251 (Inverted)

Bolt, 3/8" x 4 1/2" hex
 NIGP: 32020561133
 Drill 1/16" hole in Post

Plate Washer (X2)
 NIGP: 45057250255

Angle Bracket Part A (X2)
 NIGP: 45057258001

TYPE 1 MULTI - XL MAILBOX



L-bracket (X4)
 NIGP# 45057250263

Bolt, 3/8" x 3/4" hex (X6)
 NIGP: 45057521028
 Typical at Each Angle Bracket and plate washer

Angle Bracket Part A (X2)
 NIGP: 45057258001

Bolt, 1/4" x 3/4" hex (2 each side)
 NIGP: 45057521002
 Field Drill Holes as Needed

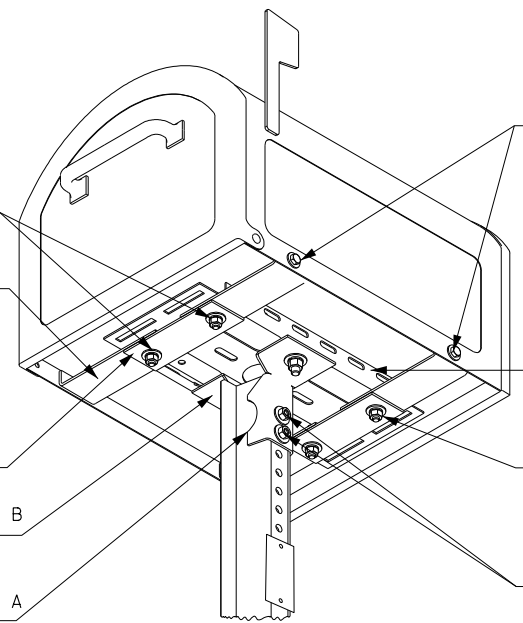
Mailbox Bracket
 NIGP#: 45057252251 (Inverted)

Bolt, 5/16" x 2 1/2" hex (X4)
 NIGP: 32020220938
 Use existing hole in mailbox

Plate Washer (x2)
 NIGP#: 45057250255

Bolt, 3/8" x 4 1/2" hex
 NIGP: 32020561133
 Drill 1/16" hole in Post

TYPE 3 - XL MAILBOX MOUNTING



Bolt, 5/16" x 1 1/2" hex (X4)
 NIGP: 32020560507

L-bracket (x4)
 NIGP: 45057250263

Plate Washer (X2)
 NIGP: 45057250255

Angle Bracket Part B
 NIGP: 45057258027

Angle Bracket Part A
 NIGP: 45057258001

Bolt, 1/4" x 3/4" hex (2 each side)
 NIGP: 45057521002
 Field Drill Holes as Needed

Mailbox Bracket
 NIGP: 45057252251 (Inverted)

Bolt, 3/8" x 3/4" hex (X2)
 NIGP: 45057521028
 Typical at Each Angle Bracket

Bolt, 5/16" x 3" (X2)
 NIGP: 32020743004

SHEET 2 OF 4

Texas Department of Transportation Maintenance Division Standard

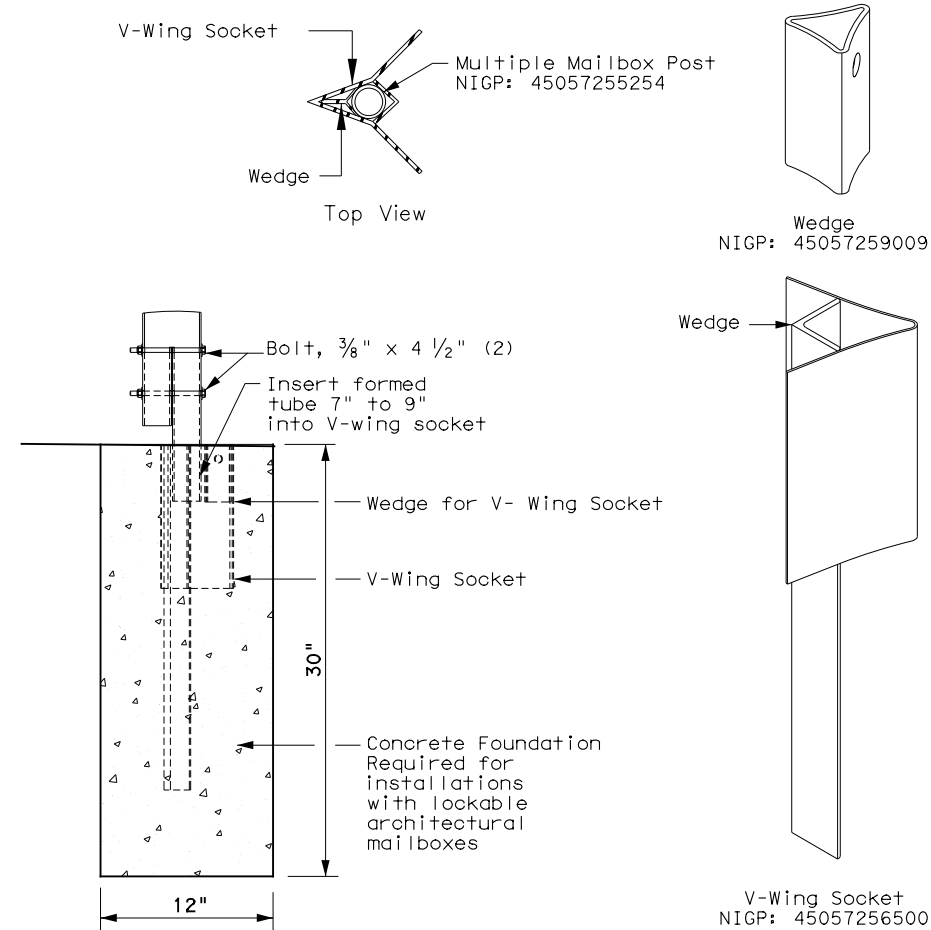
XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY
 MB(2)-21

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© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
2/2005	11/2009	4/2015	3264 01	010 FM 326
6/2005	1/2011		DIST	COUNTY SHEET NO.
11/2006	7/2014		LUFKIN	ANGELINA 65

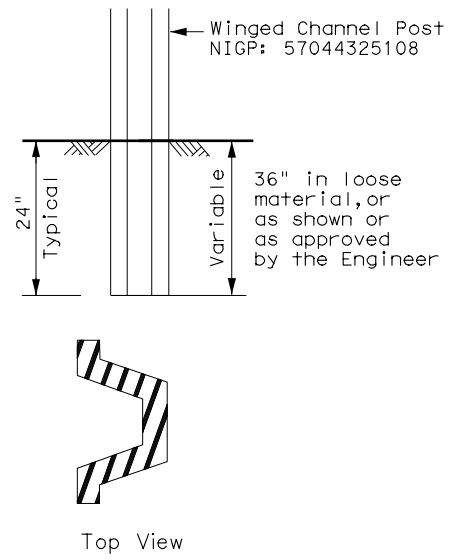
DATE: 3/25/2022 1:18
 FILE: pw://rtg-pw_bent ley. com: rtg-pw/ Documents/9360503/CADD/Standards/Roadway/this_21.mxd
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TYPE 1 - SUPPORT/FOUNDATION

Thin Wall Tube w/ V-LOC Anchorage



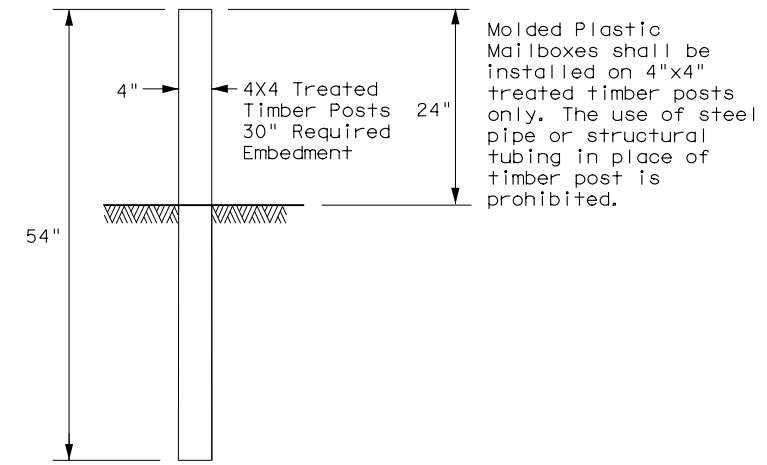
TYPE 3 - SUPPORT/FOUNDATION



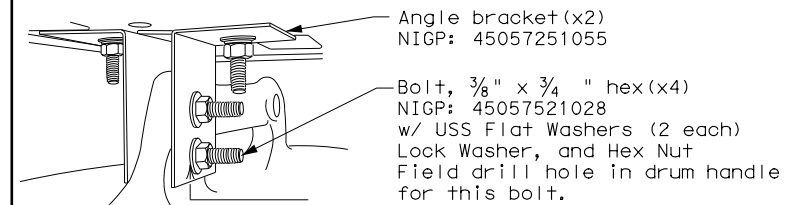
NOTES:

1. Attach Object Marker (OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

TYPE 5 - SUPPORT/FOUNDATION



TYPE 6 - TEMPORARY MAILBOX SUPPORT

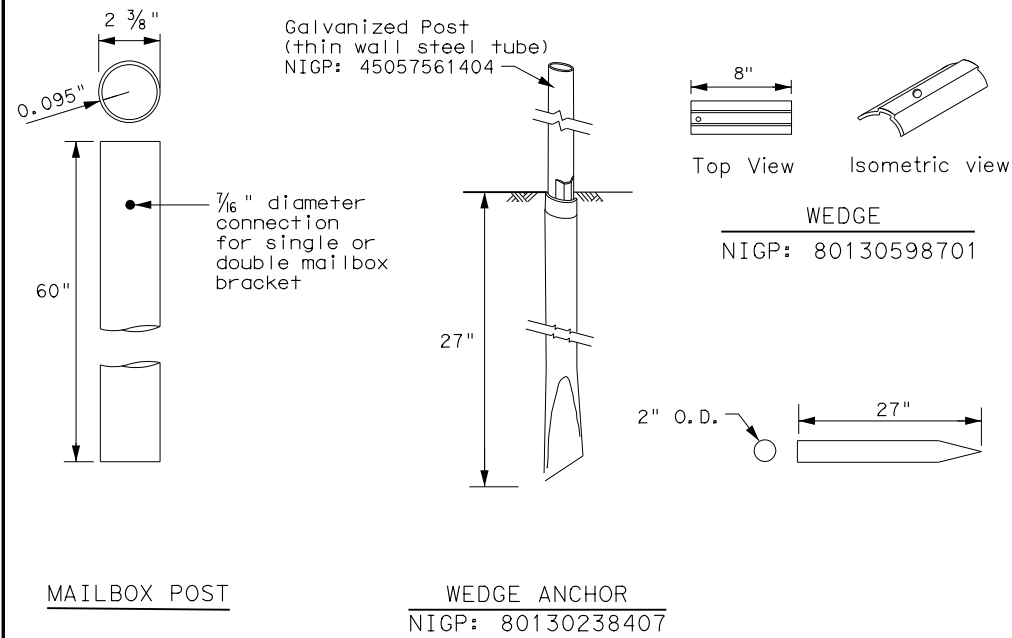


NOTES:

1. Place on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
2. Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

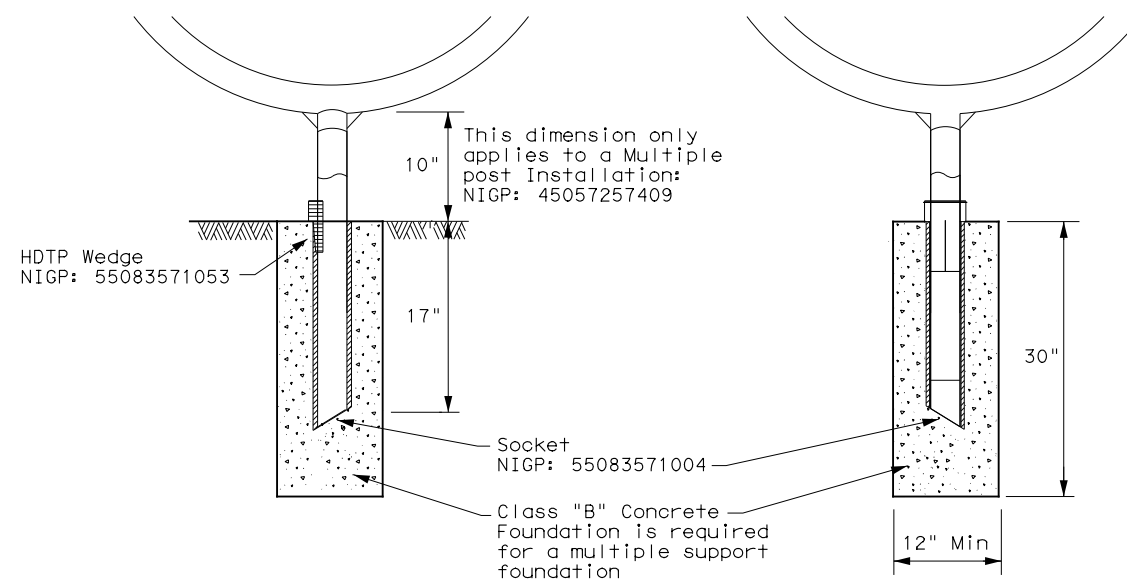
TYPE 2 - SUPPORT/FOUNDATION

Thin Wall Steel Tube w/Wedge Anchor System



TYPE 4 - SUPPORT/FOUNDATION

Whitecoated steel post NIGP: 45057561107
 Multiple post NIGP: 45057257409
 Recycled Rubber post (RR) NIGP: 45057561057



GENERAL NOTES:

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition, only on Type 1, Type 2, and Type 4

SHEET 3 OF 4



MAILBOX SUPPORT AND FOUNDATION

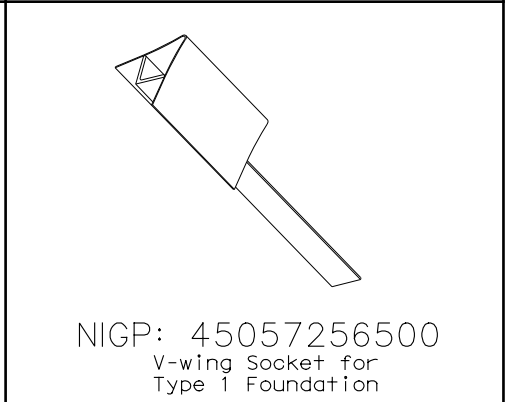
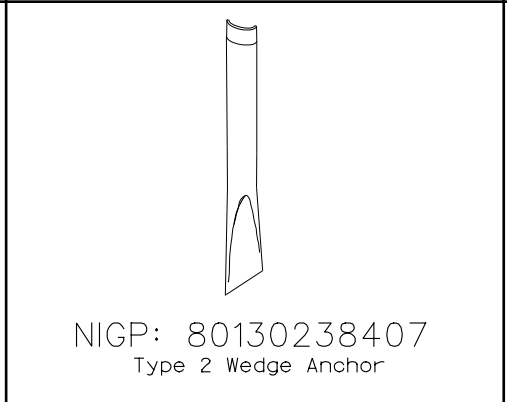
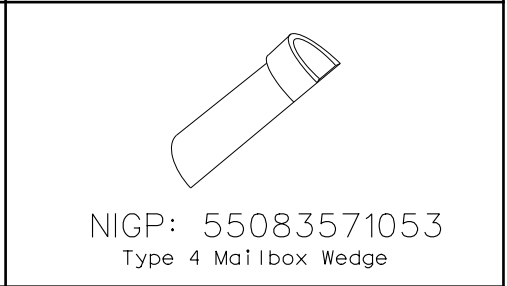
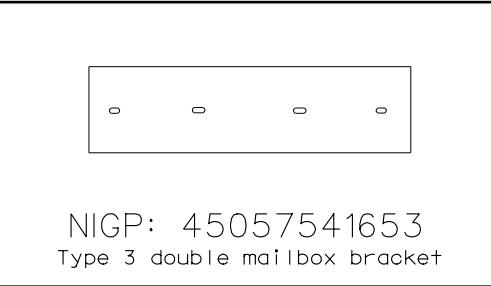
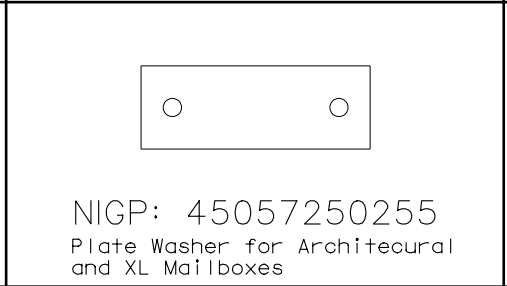
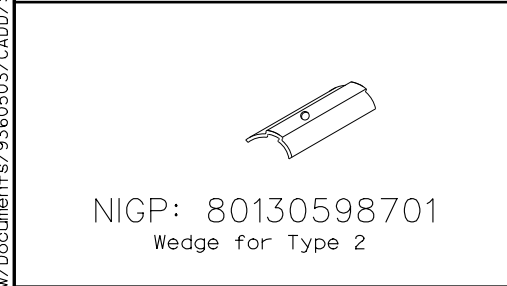
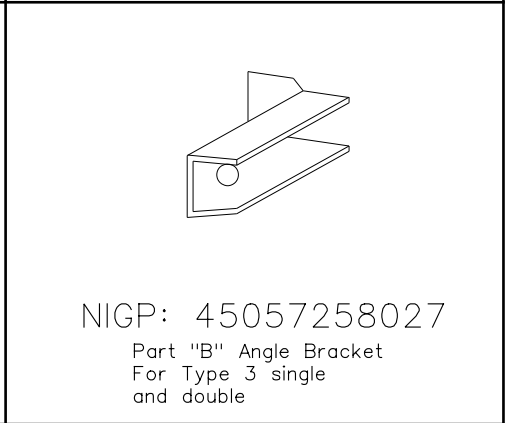
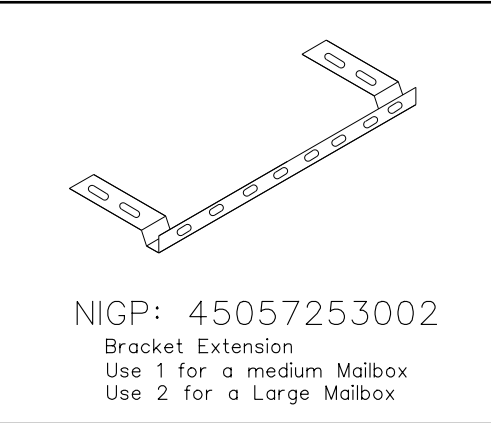
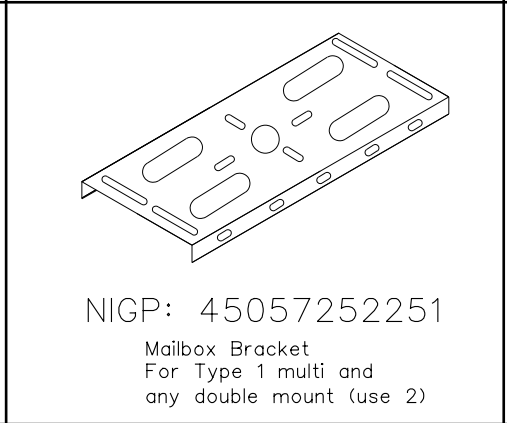
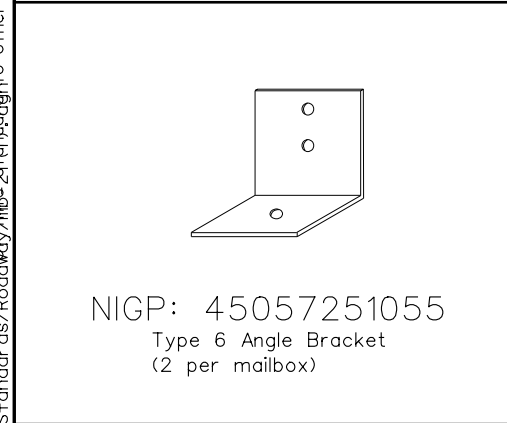
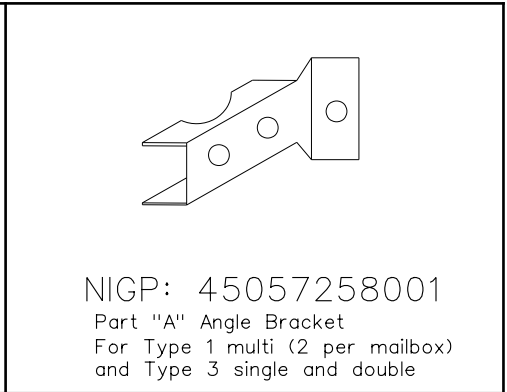
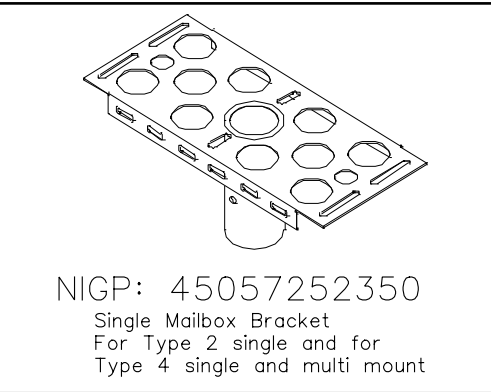
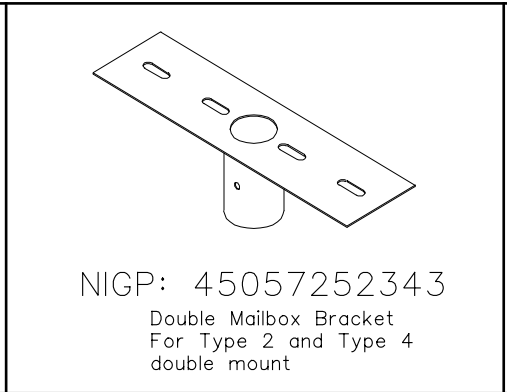
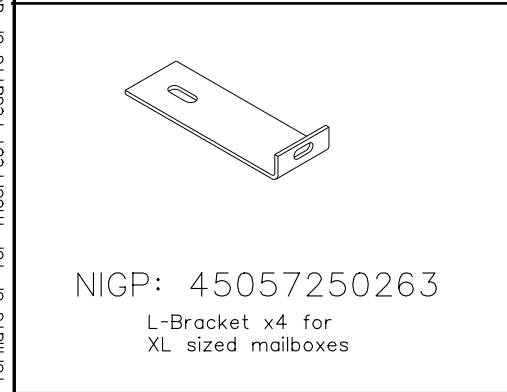
MB (3) -21

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© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
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6/2005	1/2011		DIST	COUNTY SHEET NO.
11/2006	7/2014		LUFKIN	ANGELINA 66

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DATE: 3/25/2022 1:18
 FILE: pw://rtg-pw_bent ley.com:rtg-pw/Documents/9360503/CADD/Standards/Roadway/

TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: SS, SM, MM	S, M, L, XL, or LA	SS, SM, or MM	Outside Position: S or M Inside Position: S, M, L, or XL
Mailbox Post NIGP #	45057255254 (Galvanized Multiple)	45057561404 (Thin Walled Gavanize)	57044325108 (Wing Channel Post)	45057561107 (Thin walled white powder coated) 45057561057 (Recycled Rubber Post: S or M only)	45057561107 (Thin Walled White Powder Coated)	45057257409 (White Powder Coated Multiple)
Post and Mailbox Hardware NIGP #	45057259009 (Wedge) 45057256500 (V-Wing Socket) 45057253002 (Bracket Extension) 45057252251 (Mailbox Bracket) 45057258001 (Part A Angle Bracket x2) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	80130598701 (Wedge) 80130238407 (Wedge Anchor) 45057253002 (Bracket Extension) 45057252343 (Double MB Bracket) 45057252350 (S. Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	45057541653 (Type 3 Double Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057253002 (Bracket Extension) 45057258001 (Part A Angle Bracket) 45057258027 (Part B Angle Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057252350 (Single Mailbox Bracket) 45057253002 (Bracket Extension) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252343 (Double Mount Bracket) 45057252251 (Mailbox Bracket x2) 45057250263 (L-Bracket for XL x4)	45057251055 Angle Bracket (x2)
Foundation Used	Class B Concrete (Required for LA Mailboxes)	Class B Concrete (Required for LA Mailboxes)	None	Class B Concrete (not used with recycled rubber post, required for LA Mailboxes)	Class B Concrete (not required)	Class B Concrete None



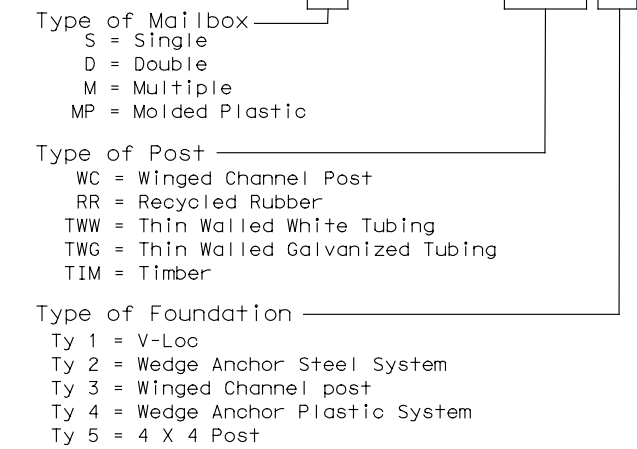
NIGP #	OBJECT MARKERS AND CONFORMABLE SHEETING
55008311759	Type 2 OM 4"x4" (3 Needed) for Type 3 Wing Channel Post
55008312906	Type 2 OM 6"x12" (1 needed) for Type 3 Wing Channel Post
80149872006	12" Conformable Reflective Yellow Sheeting for Flexible Posts

NOTES:

- Type 2 object marker in accordance with Traffic Engineering Standard Delineators & Object Markers.
- A light weight receptacle for newspaper delivery can be attached to mailbox posts if the receptacle does not touch the mailbox, present a hazard to traffic or delivery of the mail, extend beyond the front of the mailbox, or display advertising, except the publication title.

BID CODES FOR CONTRACTS

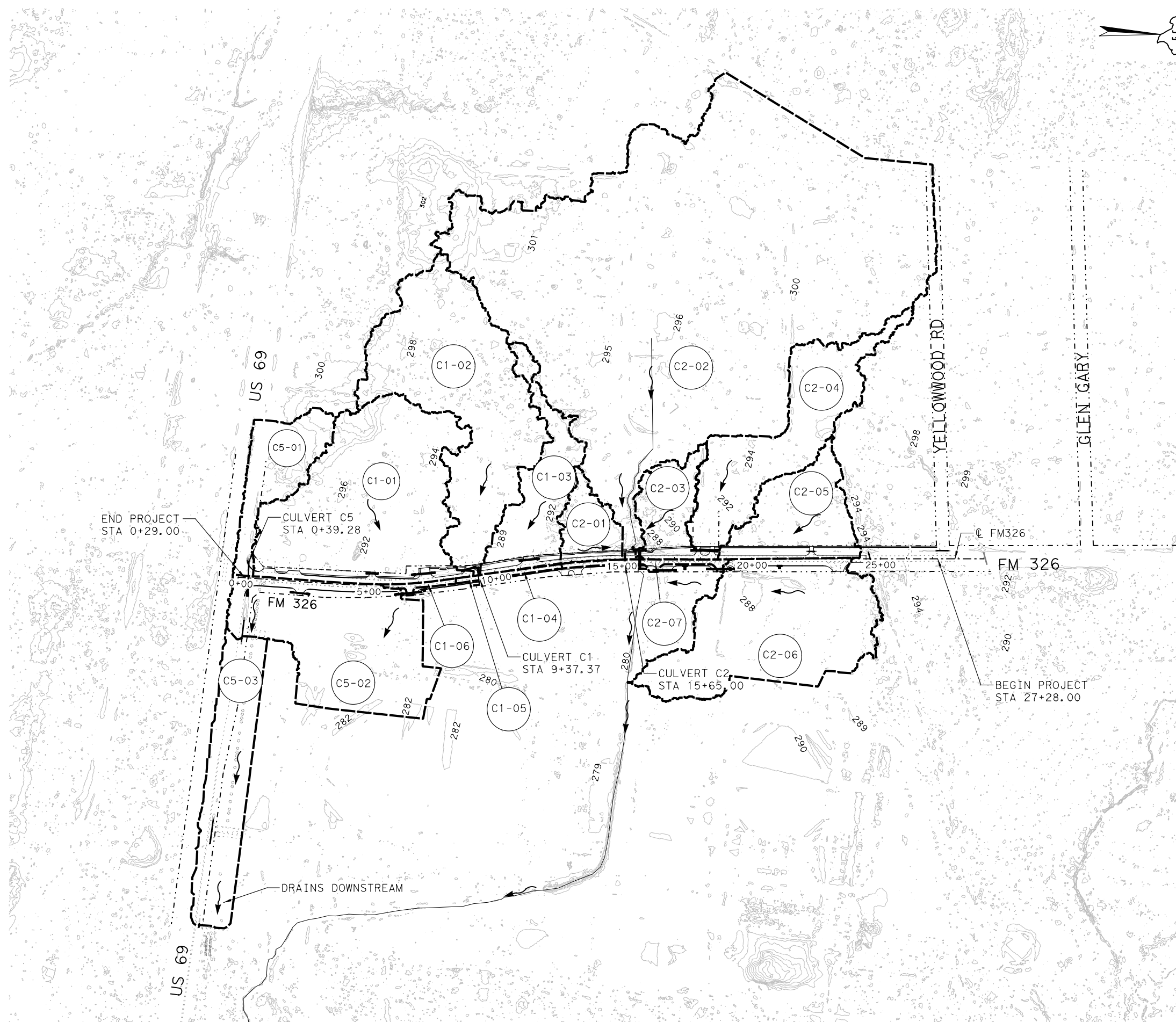
MB-(X) ASSM TY (XXX) (X)



SHEET 4 OF 4

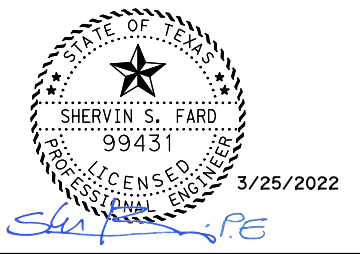
				Maintenance Division Standard	
<h2>NIGP PARTS LIST AND COMPATIBILITY</h2> <h3>MB(4)-21</h3>					
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY	
2/2005 6/2005 11/2009 1/2011 4/2015 7/2014	3264	01	010	FM 326	
	DIST	COUNTY		SHEET NO.	
	LUFKIN	ANGEL INA		67	

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LEGEND

- CROSS CULVERT
- DIRECTION OF FLOW
- OVERALL DRAINAGE BOUNDARY
- SYSTEM ID



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DRAINAGE AREA MAP

DESIGNED:	FED. RD DIV. No. 6	STATE TEXAS	FEDERAL AID PROJECT No.	HIGHWAY No. FM 326
CHECKED:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.
DRAWN:	LUFKIN	ANGELINA	3264	01
CHECKED:	JOB No. 010	SHEET No. 68		

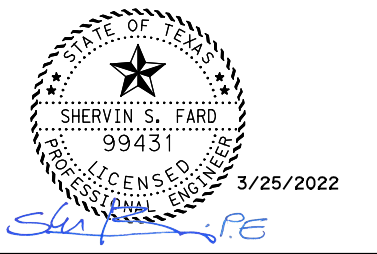
DRAINAGE AREA COMPUTATION DATA										
Subarea ID	Area Sq.ft	Area (Acres)	PROP C	PROP TC (min)	I 5 (in/hr)	I 10 (in/hr)	I 100 (in/hr)	Q 5 (CFS)	Q 10 (CFS)	Q100 (CFS)
C1-01	430161.86	9.88	0.42	14.00	5.66	6.56	9.91	23.28	27.01	40.80
C1-02	416353.36	9.56	0.37	30.00	3.90	4.52	6.76	13.68	15.86	23.72
C1-03	139515.86	3.20	0.41	23.00	4.47	5.19	7.78	5.84	6.77	10.16
C1-04	5870.22	0.13	0.90	10.00	6.54	7.56	11.46	0.79	0.92	1.39
C1-05	1880.66	0.04	0.90	10.00	6.54	7.56	11.46	0.25	0.29	0.45
C1-06	5813.36	0.13	0.90	10.00	6.54	7.56	11.46	0.78	0.91	1.38
C2-01	58677.85	1.35	0.33	13.00	5.85	6.78	10.25	2.60	3.01	4.56
C2-02	1751367.00	40.21	0.36	22.00	4.57	5.31	7.96	66.65	77.38	116.07
C2-03	84752.91	1.95	0.35	16.00	5.32	6.18	9.31	3.59	4.17	6.29
C2-04	230390.88	5.29	0.43	19.00	4.91	5.70	8.57	11.25	13.06	19.64
C2-05	143270.23	3.29	0.35	13.00	5.85	6.78	10.25	6.67	7.73	11.69
C2-06	341802.21	7.85	0.56	15.00	5.48	6.36	9.60	24.02	27.88	42.08
C2-07	14626.77	0.34	0.90	10.00	6.54	7.56	11.46	1.97	2.28	3.46
C5-01	105751.13	2.43	0.46	19.00	4.91	5.70	8.57	5.52	6.41	9.63
C5-02	308170.51	7.07	0.47	17.00	5.17	6.01	9.05	17.07	19.82	29.86
C5-03	187244.89	4.30	0.49	10.00	6.54	7.56	11.46	13.80	15.95	24.18

CULVERT FLOWS									
ID	Area (Acres)	TC (min)	C (weighted)	I 5 (in/hr)	I 10 (in/hr)	I 100 (in/hr)	Q100 (CFS)	10-yr Outlet Velocity	100-yr Outlet Velocity
C1-02	22.64	30.00	0.39	3.90	4.52	6.76	60.36	7.97	8.45
C2-02	52.08	22.00	0.37	4.57	5.31	7.96	152.32	14.10	14.34
C5-01	2.43	19.00	0.46	4.91	5.70	8.57	9.63	6.05	6.80

NOTES:

- DESIGN FREQUENCY FOR ROADSIDE DITCHES IS 5-YEAR.
- DESIGN FREQUENCY FOR CULVERTS IS 5-YEAR.

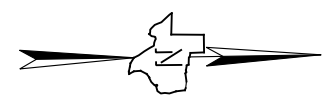
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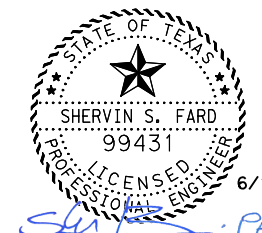
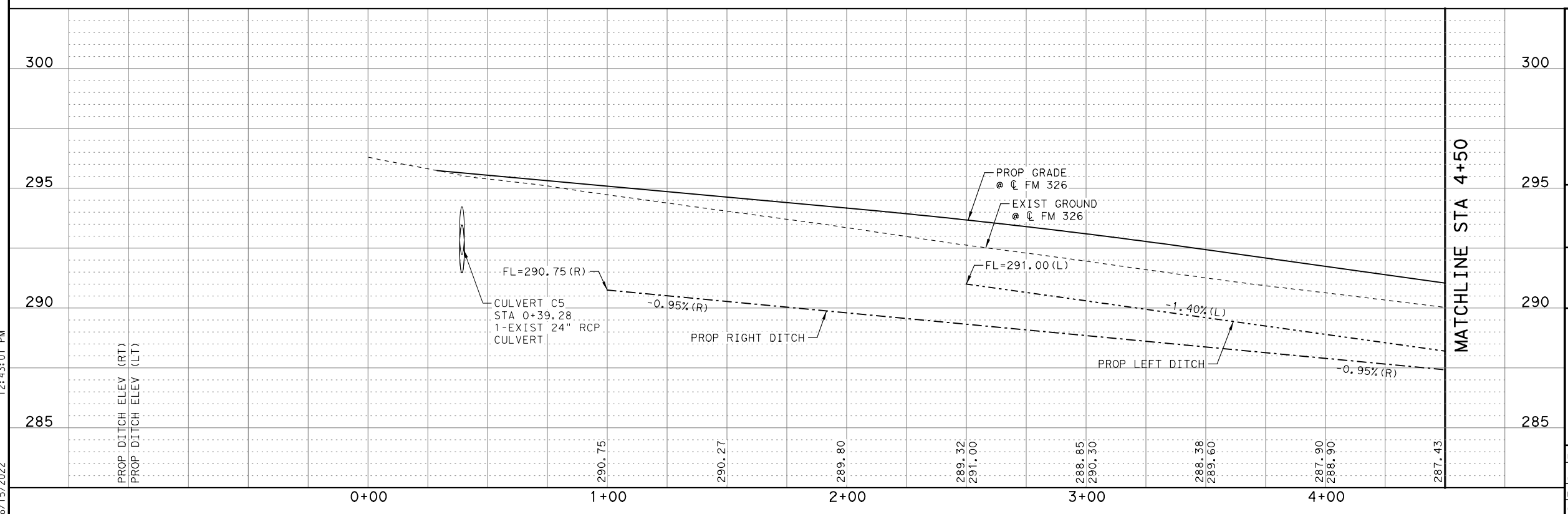
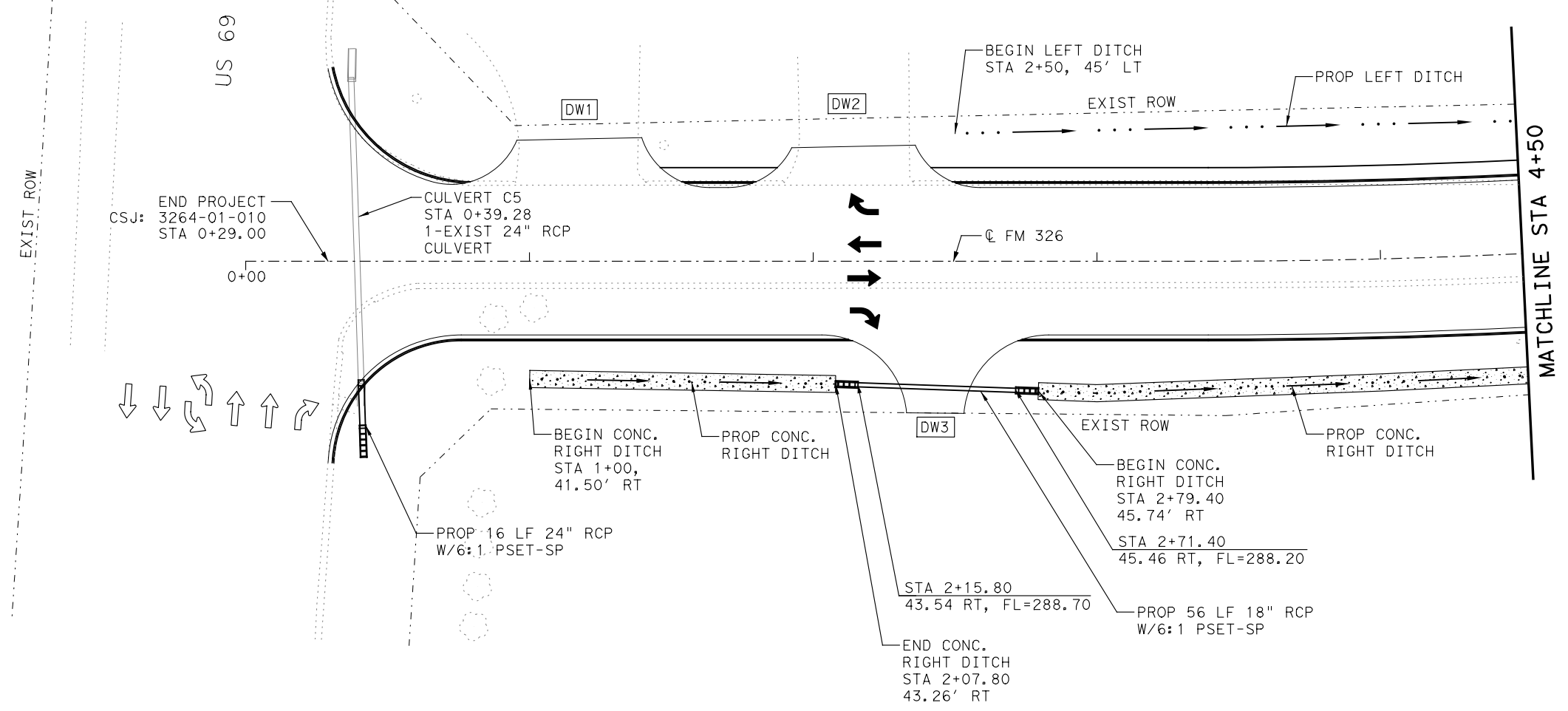
HYDRAULIC DATA SHEET

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.		
CHECKED:	6	TEXAS		FM 326		
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264	01	010	69



LEGEND

- PROPOSED V-DITCH
- PROPOSED ROW
- PROPOSED STORM SEWER
- SAFETY END TREATMENT
- 6" CONCRETE DITCH
- STONE RIPRAP (18")
- DRIVEWAY NUMBER
- DRAINAGE FLOW DIRECTION



6/15/2022
Shervin S. Fard : PE



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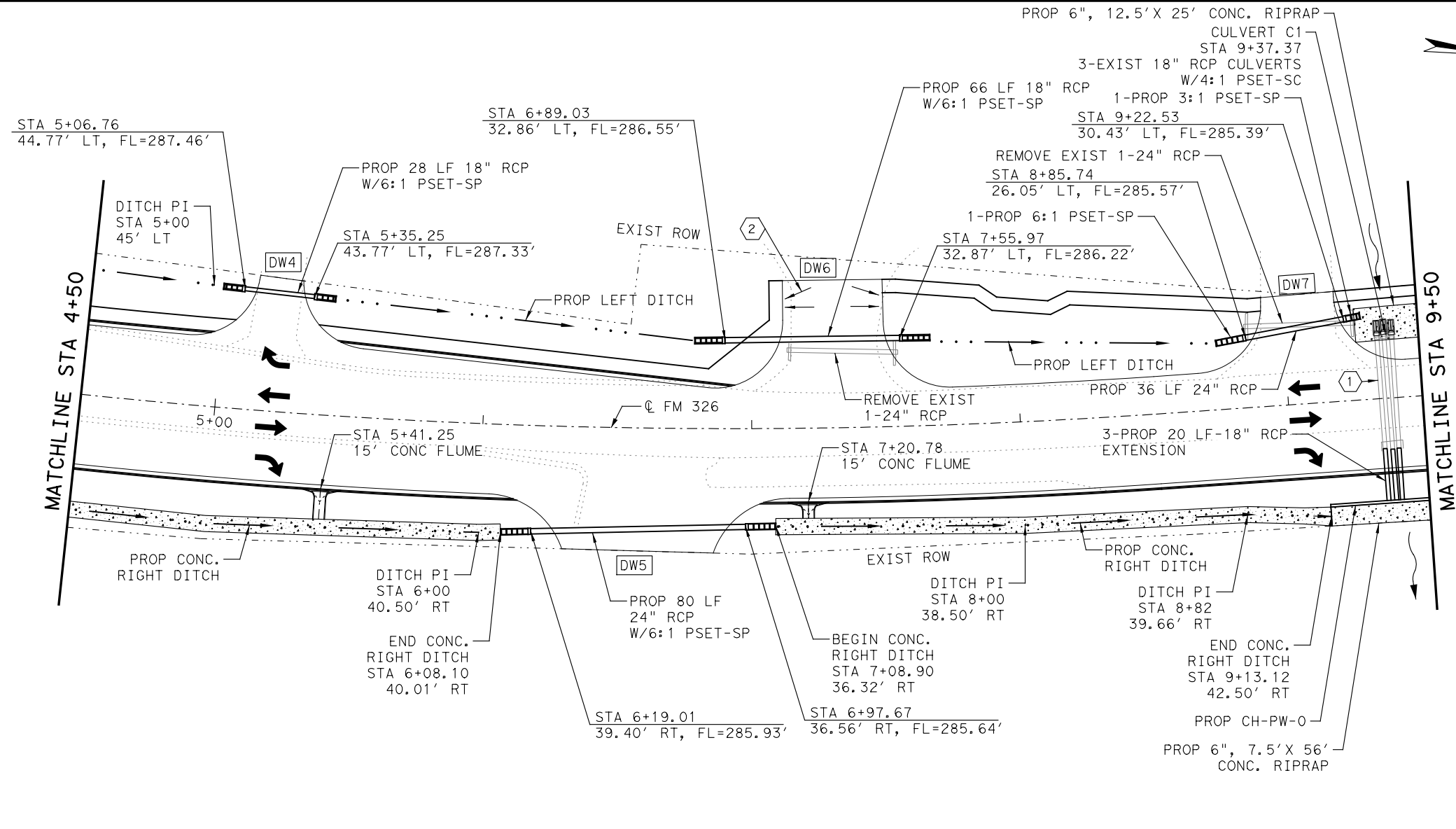
DRAINAGE PLAN & PROFILE

SHEET 1 OF 5

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010
				SHEET No. 70

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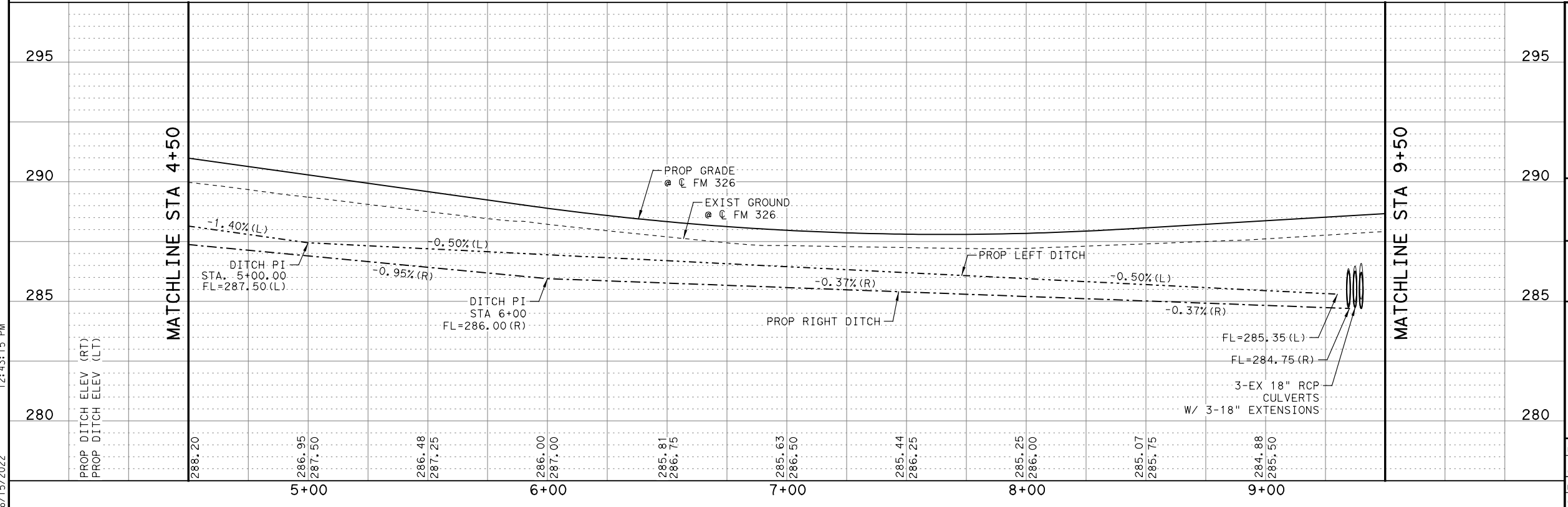
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LEGEND

- PROPOSED V-DITCH
- - - PROPOSED ROW
- ===== PROPOSED STORM SEWER
- SAFETY END TREATMENT
- ▨ 6" CONCRETE DITCH
- ▩ STONE RIPRAP (18")
- [DWX] DRIVEWAY NUMBER
- DRAINAGE FLOW DIRECTION

NOTE:
 ① - EXISTING DESIGNATED PIPES ARE TO BE REPAIRED. ALL WORK ASSOCIATED WITH THE REPAIRS WILL BE SUBSIDIARY TO ITEM 464.
 ② - GRADE TO DRAIN TO ADJACENT DITCH




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DRAINAGE PLAN & PROFILE

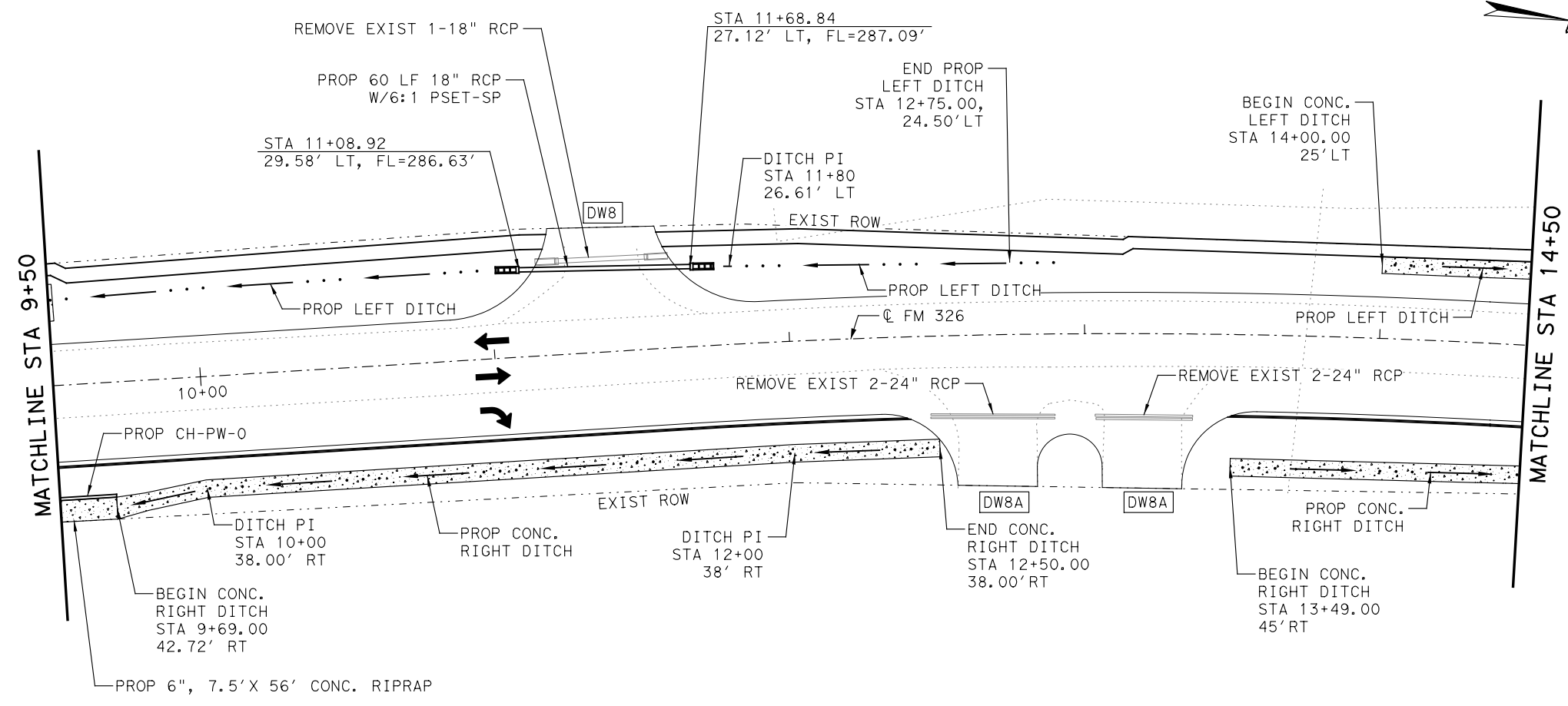
SHEET 2 OF 5

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010
				SHEET No. 71

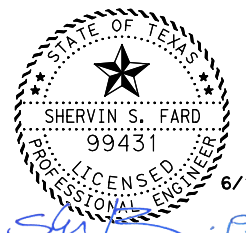
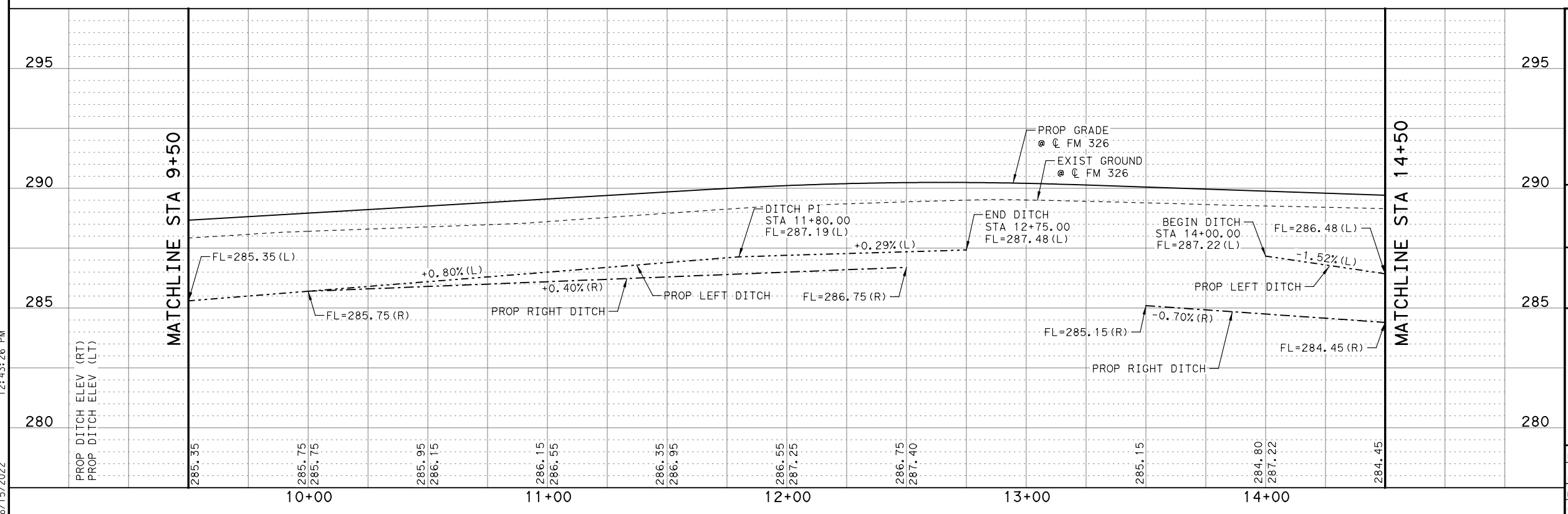


LEGEND

- PROPOSED V-DITCH
- PROPOSED ROW
- PROPOSED STORM SEWER
- SAFETY END TREATMENT
- 6" CONCRETE DITCH
- STONE RIPRAP (18")
- DRIVEWAY NUMBER
- DRAINAGE FLOW DIRECTION



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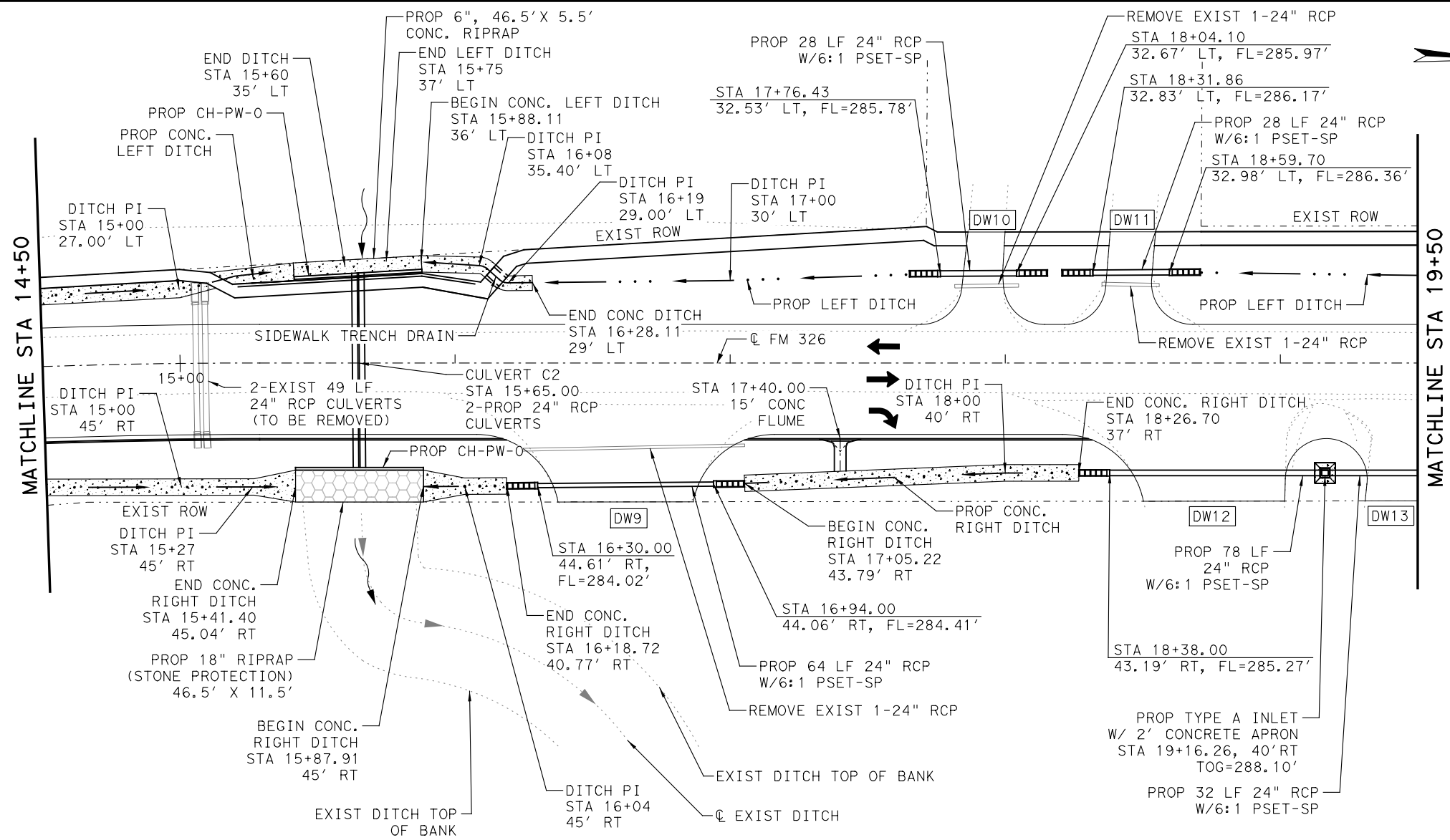
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DRAINAGE PLAN & PROFILE

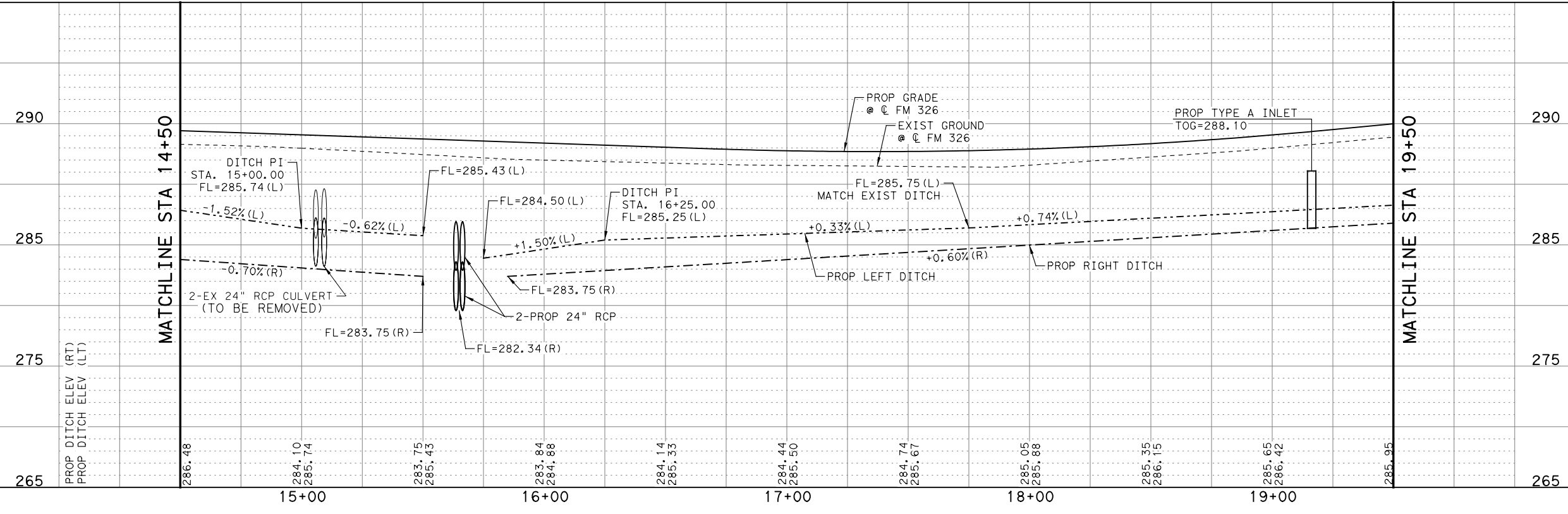
SHEET 3 OF 5

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010
				SHEET No. 72

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LEGEND
 - - - - - PROPOSED V-DITCH
 - - - - - PROPOSED ROW
 - - - - - PROPOSED STORM SEWER
 SAFETY END TREATMENT
 6" CONCRETE DITCH
 STONE RIPRAP (18")
 DRIVEWAY NUMBER
 DRAINAGE FLOW DIRECTION



SHERVIN S. FARD
 99431
 LICENSED PROFESSIONAL ENGINEER
 6/15/2022

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DRAINAGE PLAN & PROFILE

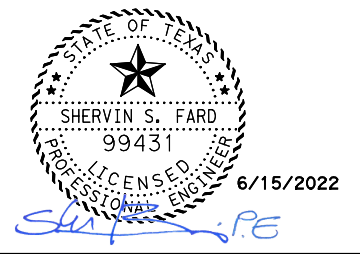
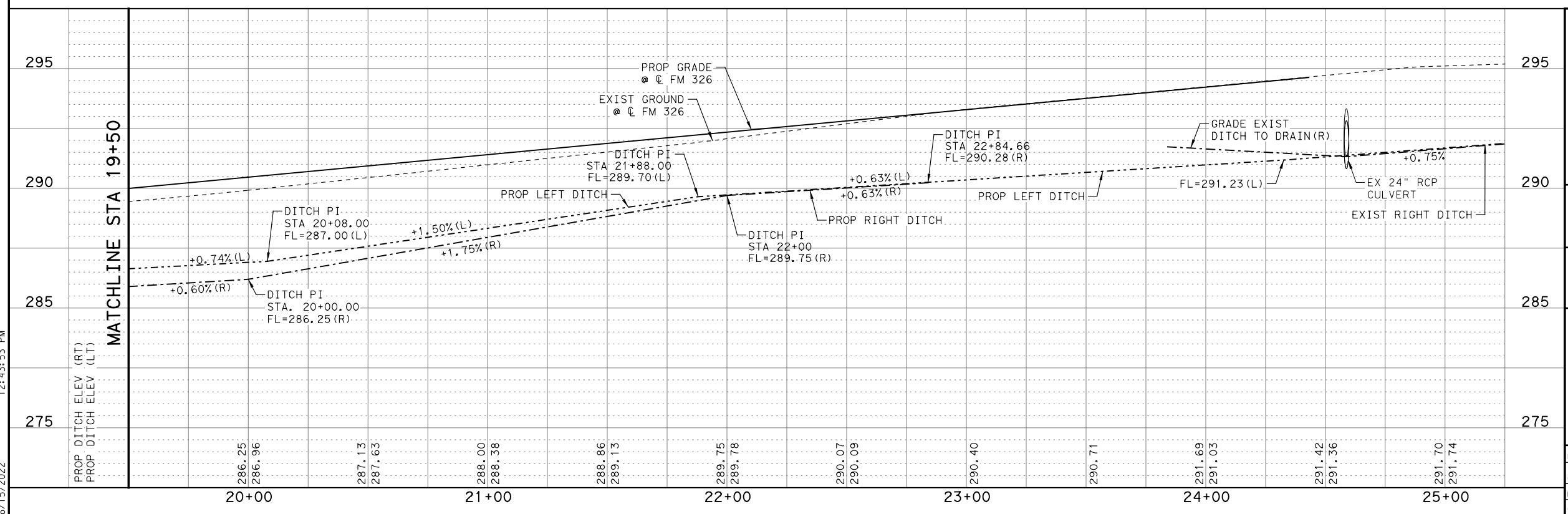
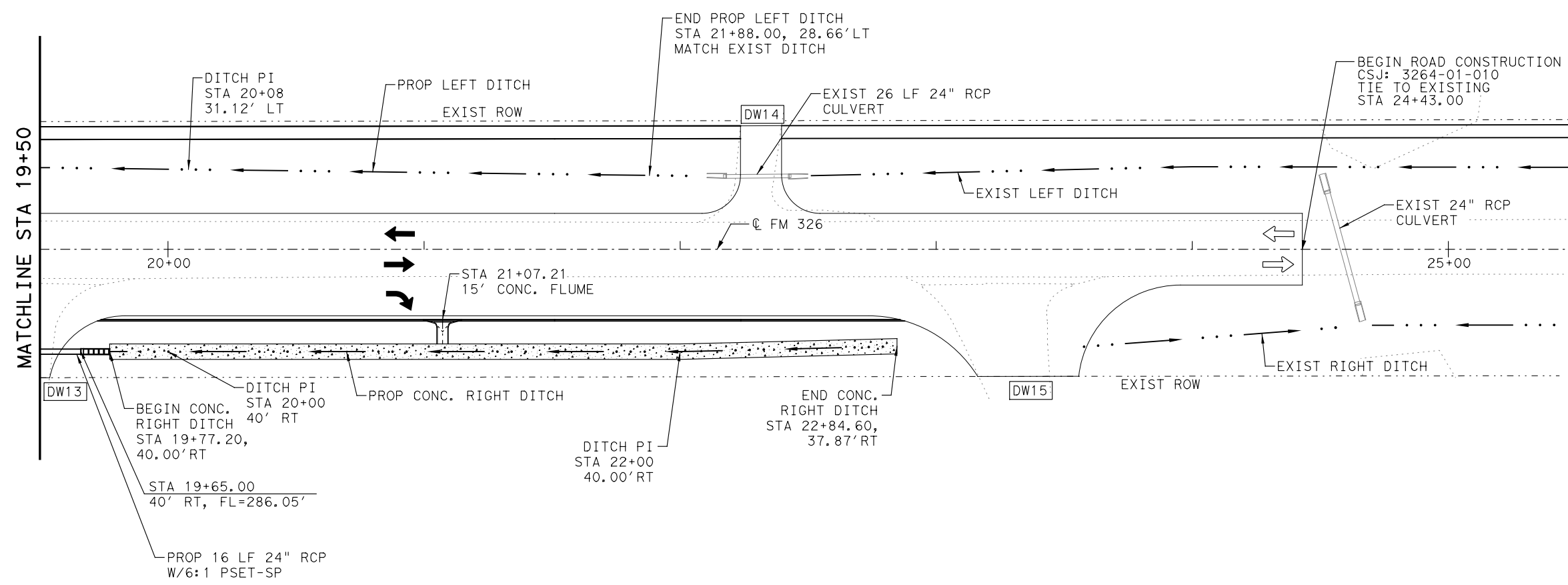
SHEET 4 OF 5

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CHECKED:				
DRAWN:	STATE DISTRICT LUFKIN	COUNTY ANGELINA	CONTROL No. 3264	SECTION No. 01
CHECKED:				
				JOB No. 010
				SHEET No. 73



LEGEND

- · · · PROPOSED V-DITCH
- - - - - PROPOSED ROW
- ==== PROPOSED STORM SEWER
- SAFETY END TREATMENT
- ▨ 6" CONCRETE DITCH
- ▩ STONE RIPRAP (18")
- DW# DRIVEWAY NUMBER
- ↔ DRAINAGE FLOW DIRECTION



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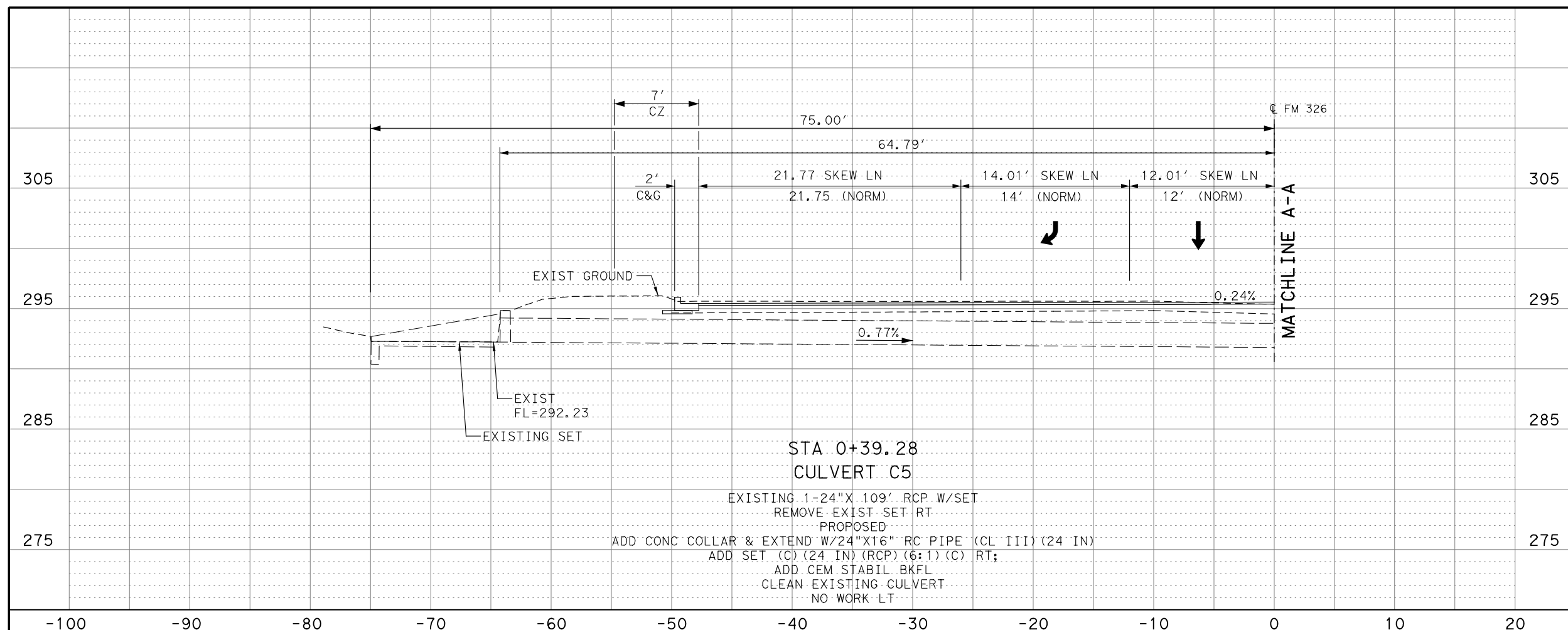
DRAINAGE PLAN & PROFILE

SHEET 5 OF 5

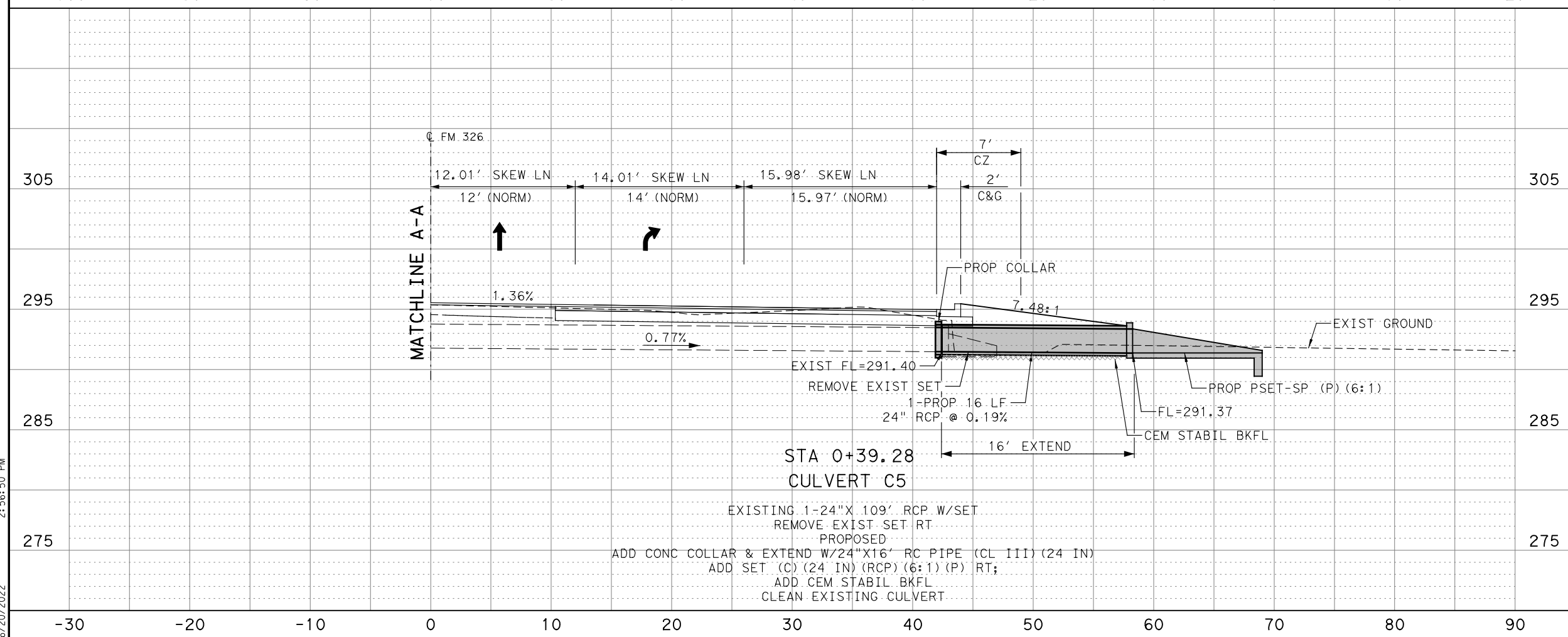
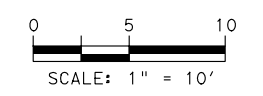
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CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.
CHECKED:	LUFKIN	ANGELINA	3264	01
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				010
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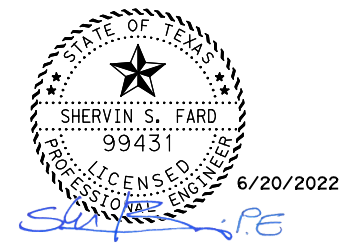
NOTE:
ALL SIDE SLOPES SHOWN ARE NORMAL TO ROADWAY PAVEMENT.



STA 0+39.28
CULVERT C5
EXISTING 1-24"X 109' RCP W/SET
REMOVE EXIST SET RT
PROPOSED
ADD CONC COLLAR & EXTEND W/24"X16" RC PIPE (CL III) (24 IN)
ADD SET (C) (24 IN) (RCP) (6:1) (C) RT;
ADD CEM STABIL BKFL
CLEAN EXISTING CULVERT
NO WORK LT



STA 0+39.28
CULVERT C5
EXISTING 1-24"X 109' RCP W/SET
REMOVE EXIST SET RT
PROPOSED
ADD CONC COLLAR & EXTEND W/24"X16" RC PIPE (CL III) (24 IN)
ADD SET (C) (24 IN) (RCP) (6:1) (P) RT;
ADD CEM STABIL BKFL
CLEAN EXISTING CULVERT



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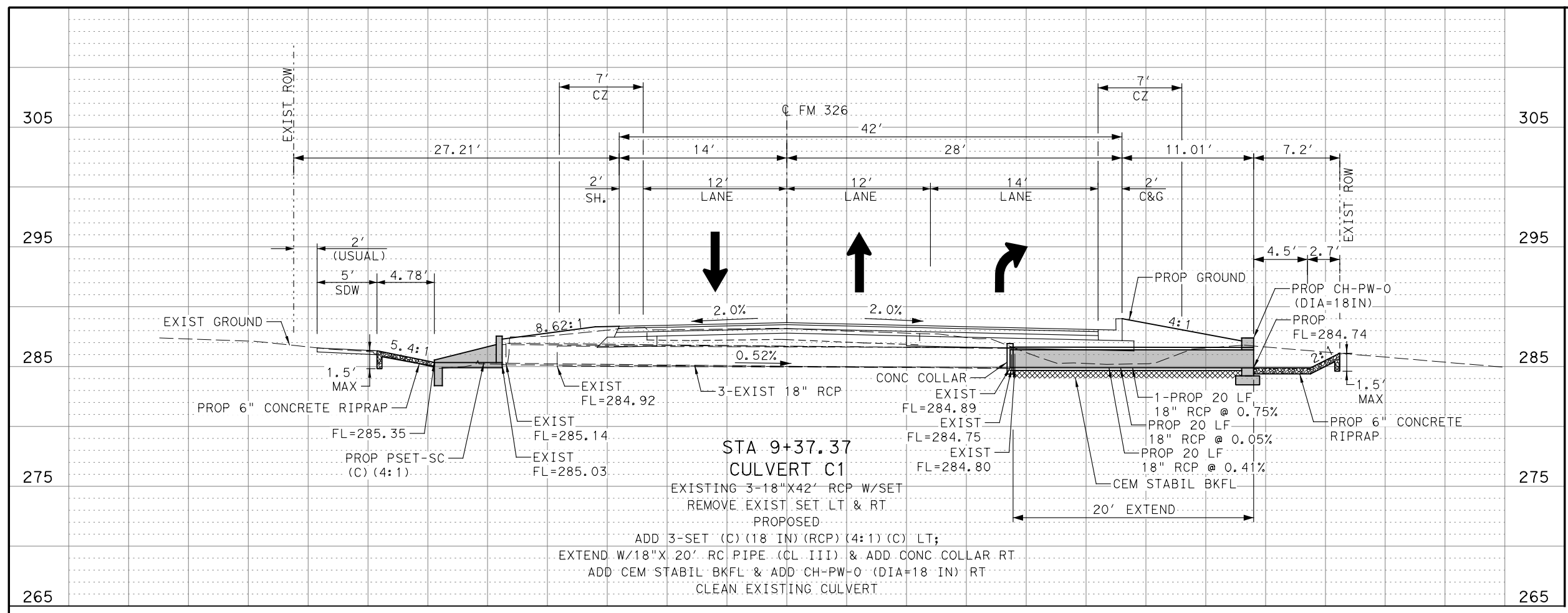
CULVERT PROFILE

SHEET 1 OF 2

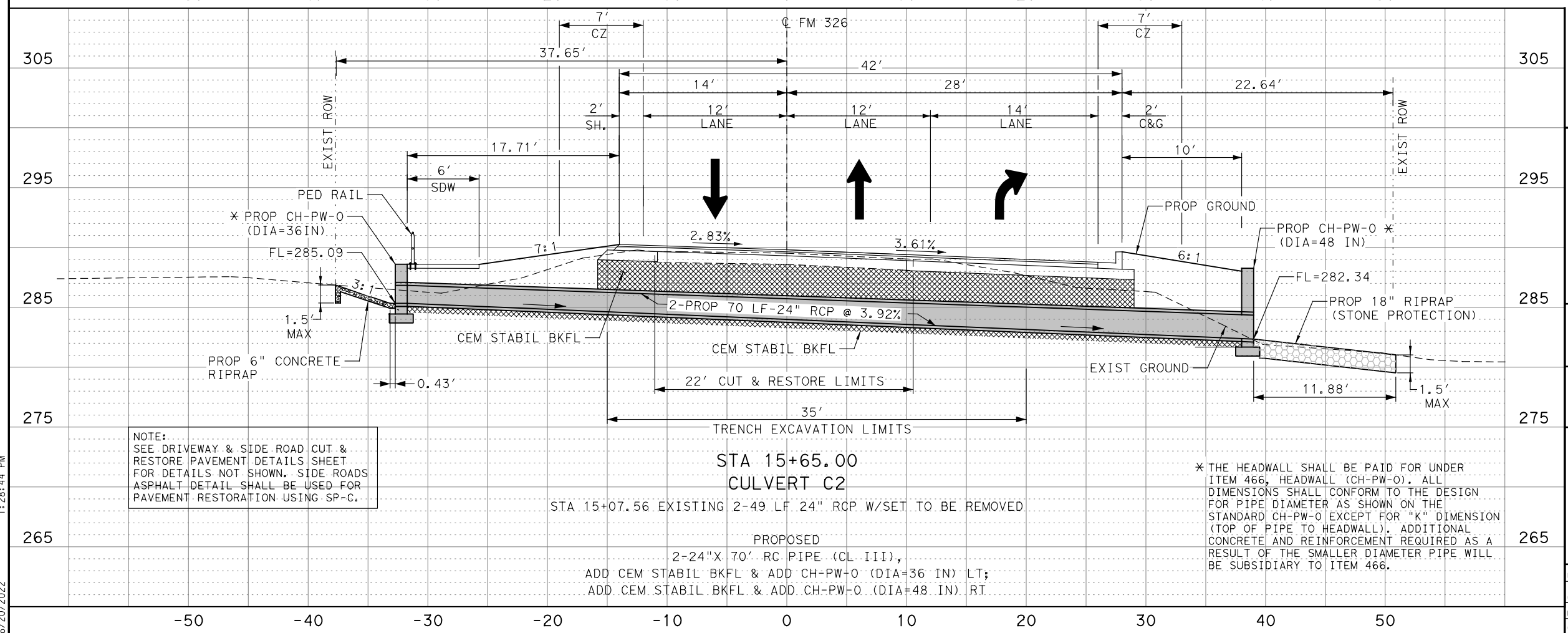
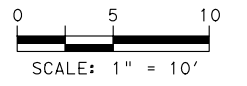
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CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.
CHECKED:	LUFKIN	ANGELINA	3264	01
				JOB No.
				010
				SHEET No.
				75

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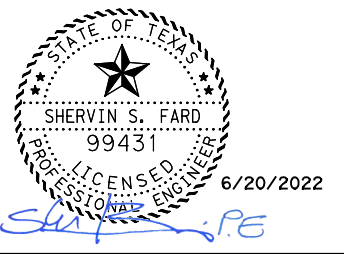


NOTES:
 ALL SIDE SLOPES SHOWN ARE NORMAL TO ROADWAY PAVEMENT.



NOTE:
 SEE DRIVEWAY & SIDE ROAD CUT & RESTORE PAVEMENT DETAILS SHEET FOR DETAILS NOT SHOWN. SIDE ROADS ASPHALT DETAIL SHALL BE USED FOR PAVEMENT RESTORATION USING SP-C.

* THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-0). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR PIPE DIAMETER AS SHOWN ON THE STANDARD CH-PW-0 EXCEPT FOR "K" DIMENSION (TOP OF PIPE TO HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE SUBSIDIARY TO ITEM 466.

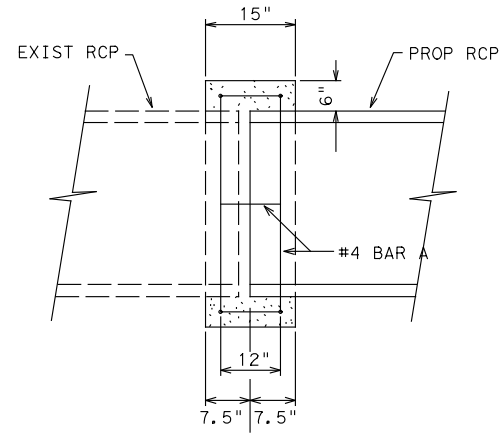


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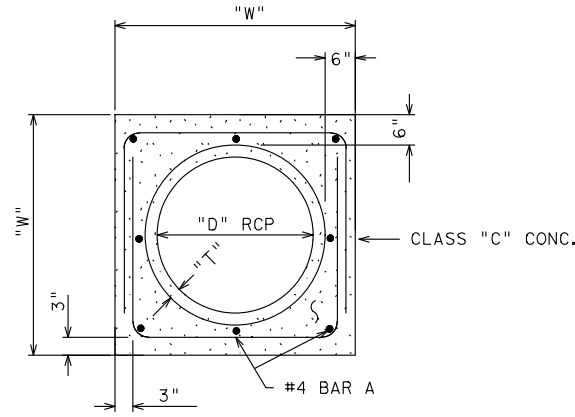
CULVERT PROFILE

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010
				SHEET No. 76

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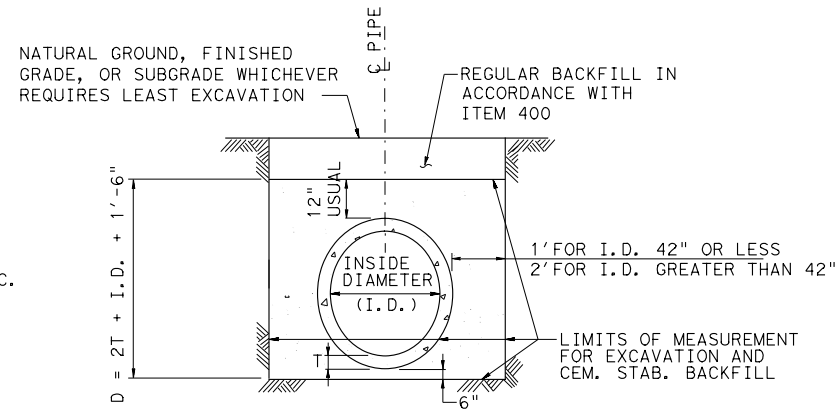
SIDE VIEW



FRONT SECTION

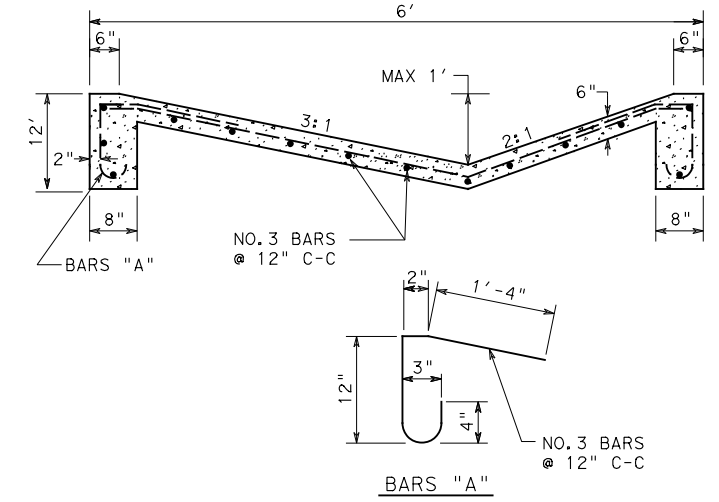
CONCRETE COLLAR DETAIL

NOTE:
CONCRETE COLLARS SHALL BE USED AT LOCATIONS AS SHOWN ON PLANS, OR AS DIRECTED BY THE ENGINEER, IN ORDER TO ENSURE A PROPER WATER TIGHT SEAL ON ALL REINFORCED CONCRETE PIPE CONNECTIONS AS DIRECTED BY THE ENGINEER. ALL LABOR, MATERIALS AND INCIDENTALS REQUIRED TO ACCOMPLISH THIS WORK SHALL BE PAID UNDER ITEM 420-6071 "CL C CONC (COLLAR)".



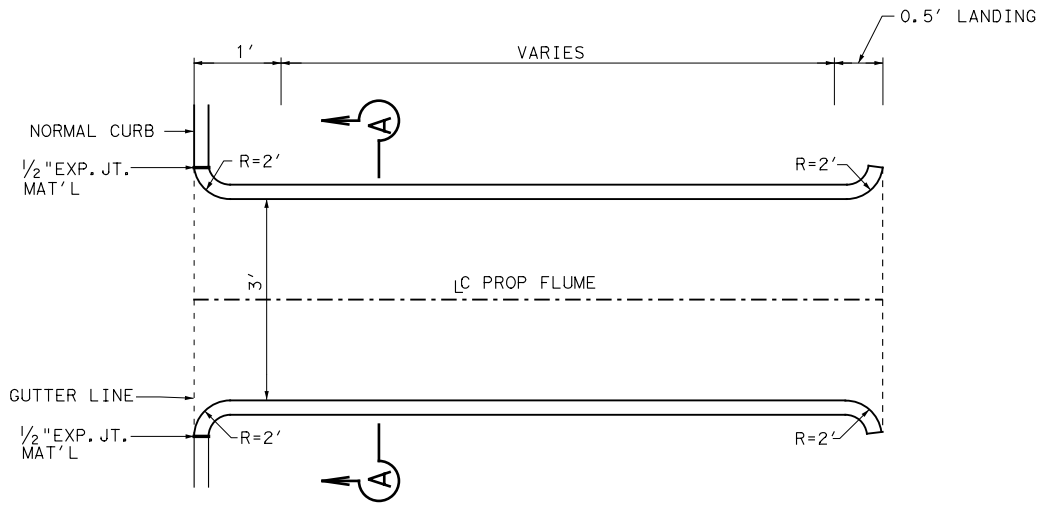
EXCAVATION & BACKFILL DETAIL

REINFORCED CONCRETE PIPE
IN A GRADED OR PAVED AREA

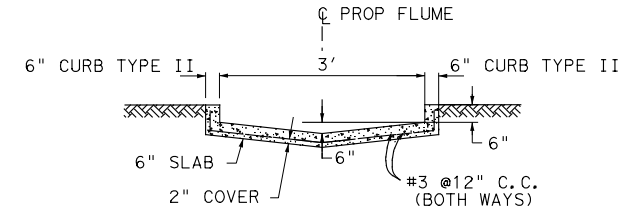


CONCRETE DITCH DETAIL

N. T. S.



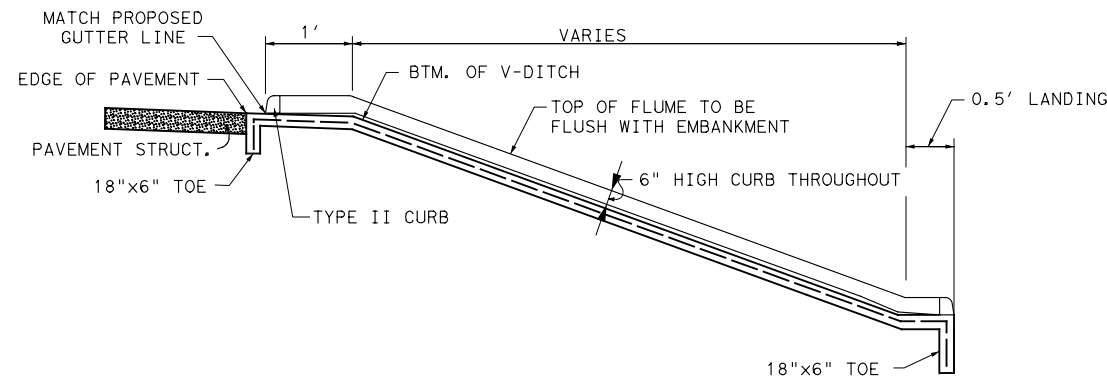
PLAN
N. T. S.



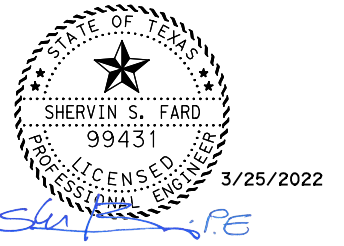
SECTION A-A
N. T. S.

CONCRETE FLUME DETAIL

NOTES:
1. FLUME WILL BE PAID UNDER ITEM 432 RIPRAP (CONC) (CL B) (6").
2. SEE DRAINAGE PLANS FOR LOCATIONS.



PROFILE
N. T. S.



OMEGA ENGINEERS, INC.
16360 PARK TEN PLACE, Ste. #325
HOUSTON TEXAS, 77084
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:281 647 9182 F:281 647 9184

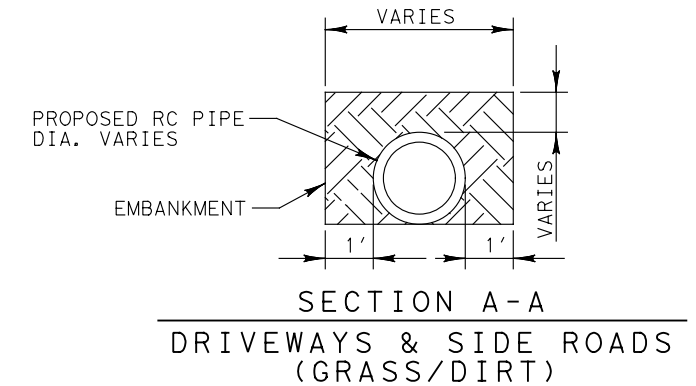
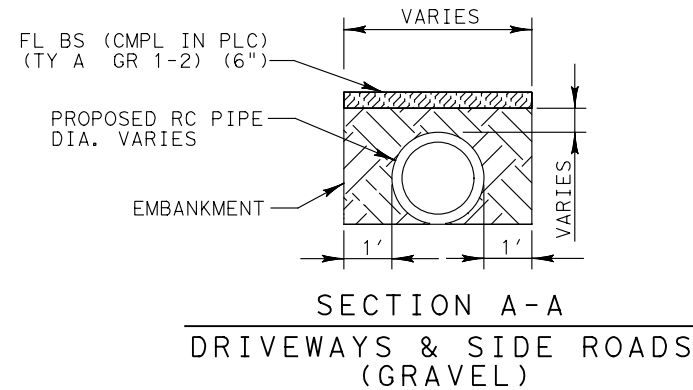
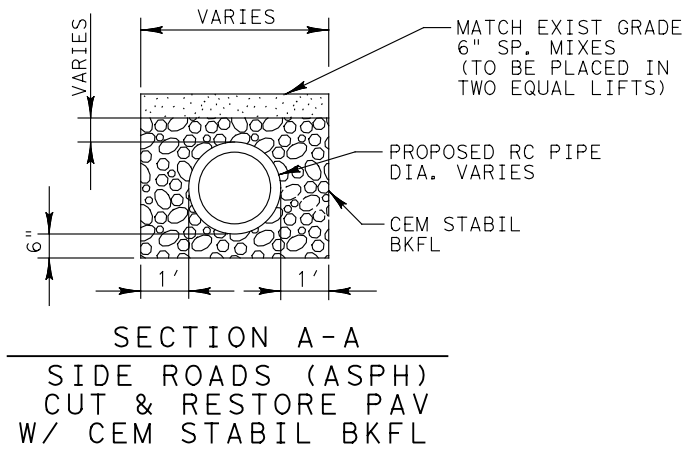
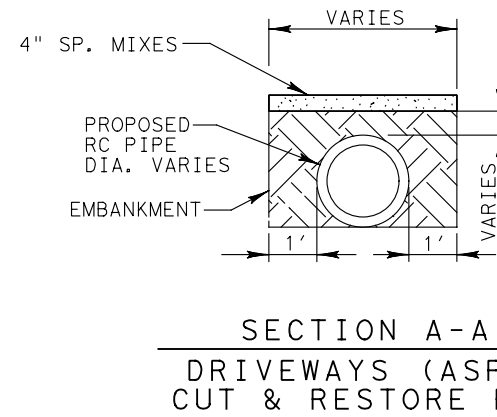
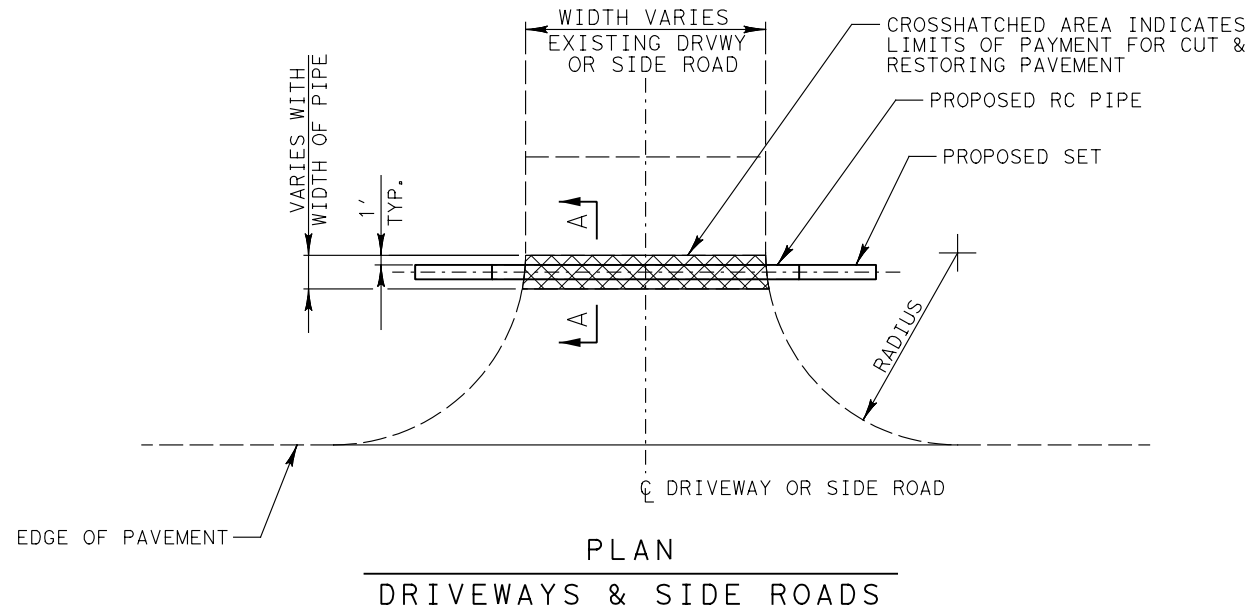
MISCELLANEOUS
DRAINAGE DETAILS

NOT TO SCALE

DESIGNED:	FED. RD DIV. No. 6	STATE TEXAS	FEDERAL AID PROJECT No.	HIGHWAY No. FM 326
CHECKED:				
DRAWN:	STATE DISTRICT LUFKIN	COUNTY ANGELINA	CONTROL No. 3264	SECTION No. 01
CHECKED:				JOB No. 010 SHEET No. 77

p:\11\19\pw_bentley.com\11\19\pw\Documents\93888833\CADD\Plan_Sheets\Drawings\FK25-DRG\15ND\75.dgn

DISCLAIMER: THIS DETAIL IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. NO WARRANTY OF ANY KIND IS MADE BY TxDOT FOR ANY PURPOSE WHATSOEVER. TxDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS DETAIL TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

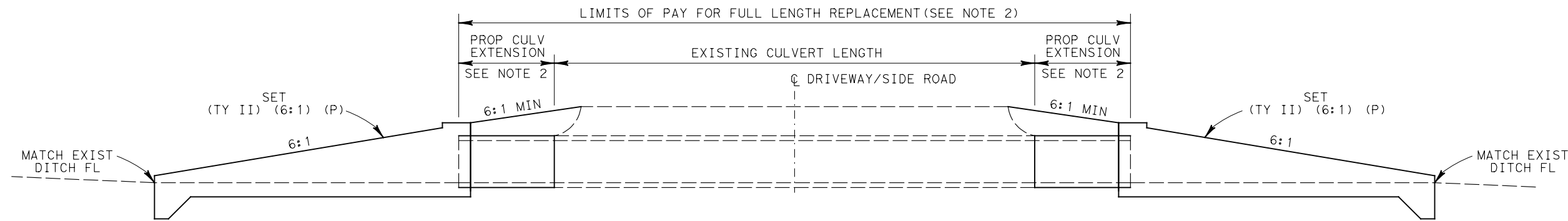


CONCRETE DRIVEWAY NOTES:

1. 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. INSTALL DOWELS SIX INCHES INTO EXISTING CONCRETE USING EPOXY GROUT.
2. WELDED WIRE FABRIC WILL NOT BE ALLOWED FOR REINFORCING.
3. UNLESS OTHERWISE DIRECTED, INSTALL 1/2 INCH PREMOLDED EXPANSION JOINT MATERIAL BETWEEN EXISTING CONCRETE AND NEW CONCRETE.
4. UNLESS OTHERWISE DIRECTED, CUT & RESTORE CONCRETE DRIVEWAYS AND SIDEROADS AS SHOWN ABOVE OR TO THE NEAREST JOINT.

DRIVEWAY NOTES:

1. LIMITS OF STRUCTURAL EXCAVATION SHOULD BE DEFINED BY SAWCUTTING AT ASPHALT AND CONCRETE DRIVEWAYS. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO ITEM 400.
2. SP. MIXES TYPE & RATE AS SHOWN ELSEWHERE IN THE PLANS.



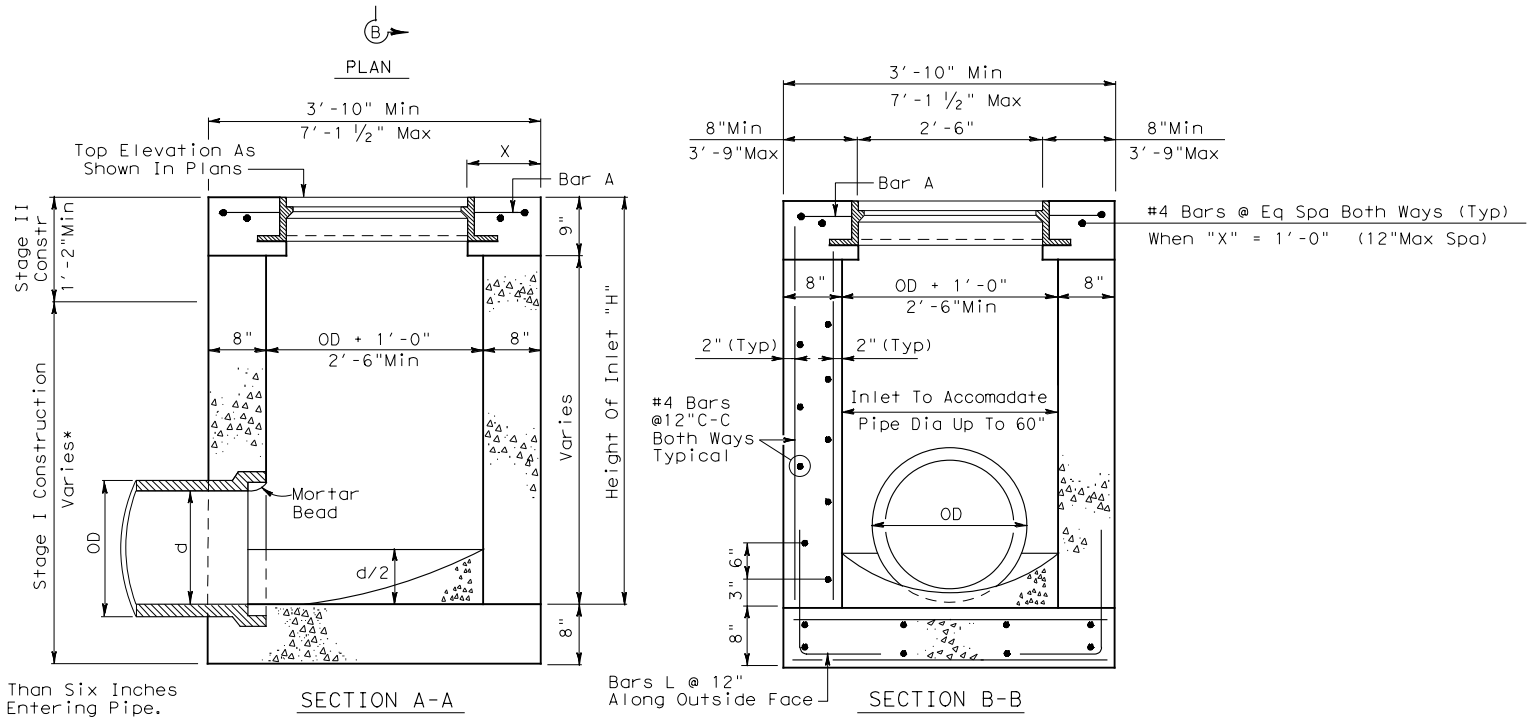
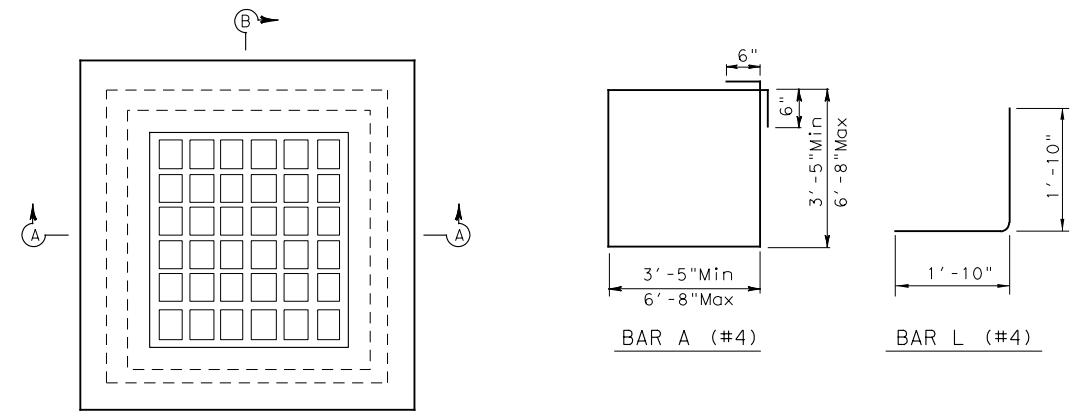
CULVERT NOTES:

1. PLACE FULL LENGTH CULVERT REPLACEMENTS SYMMETRICAL ABOUT DRIVEWAY/SIDE ROAD CENTERLINE & AT THE SAME HORIZONTAL OFFSET AS THE ORIGINAL PIPE UNLESS OTHERWISE DIRECTED.
2. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONSTRUCT THE PROPOSED PARALLEL SETS IN SUCH A MANNER AS TO PROVIDE A MINIMUM SIDE SLOPE OF 6:1 BETWEEN THE EDGE OF THE DRIVEWAY OR SIDE ROAD PAVEMENT AND THE TOP OF THE SET HEADWALL. ADDITIONAL PIPE NEEDED TO ACQUIRE 6:1 MIN SLOPE WILL BE PAID FOR UNDER ITEM 464.

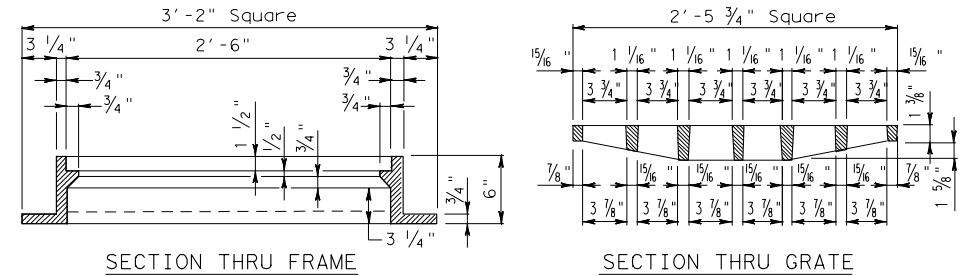
TYPICAL DETAIL FOR EXTENDING OR REPLACING PIPE CULVERTS AT DRIVEWAYS & SIDE ROADS

REVISED 12-17
ISSUED 04-09

©2009 Texas Department of Transportation LUFKIN DISTRICT STANDARD			
DRIVEWAY & SIDE ROAD CUT & RESTORE PAVEMENT DETAILS			
NOT TO SCALE			
FED. NO. DIV. NO.	PROJECT NO.		SHEET NO.
6			78
STATE	DISTRICT	COUNTY	
TEXAS	LFK	ANGELINA	
CONTROL	SECTION	JOB	HIGHWAY NO.
3264	01	010	FM 326



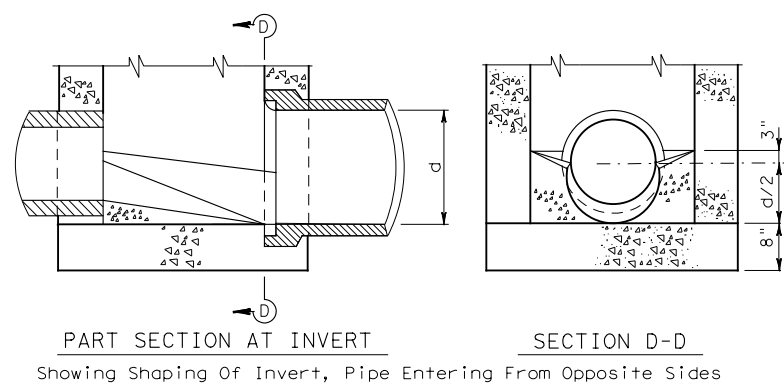
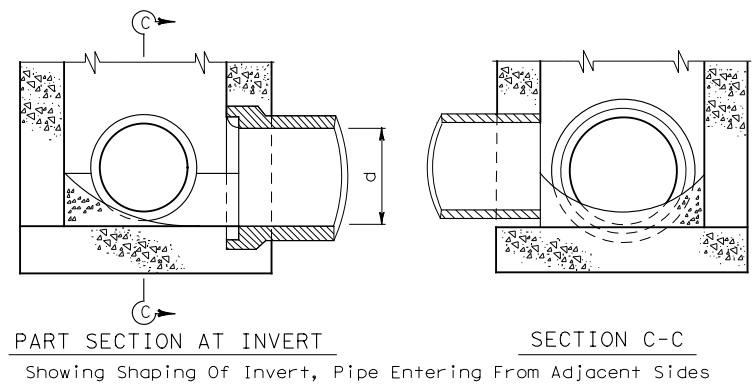
TYPE A INLET



FRAME AND GRATE

Neenah No. R3418-A
EJIW No. V-4880-1

* But Not Less Than Six Inches Over Highest Entering Pipe.



GENERAL NOTES:

Alternate designs shall conform to special provisions for Item 465.

Where Size Of Pipes Passing Thru Inlet Exceeds 30" Increase Inside Width To Outside Diameter Of Pipe Plus 1'-0" (OD + 1'-0").

Cast Iron Manhole Steps (See Manhole Details) Spaced At 16" Centers And Located On Wall Specified By The Engineer Shall Be Provided And Installed Where "D" Exceeds 5'-0".

See Standard or Detail Sheet For Excavation and Backfill Diagrams.

Inlets Shall Be Built To Stage I And Finished After All Grading Operations Are Substantially Completed.

Frames And Grates May Be Gray Cast Iron.

Shop Drawings Will Be Required For Precast Construction Of Inlets.

NOT FOR TRAFFIC LOADS



INLET TYPE A

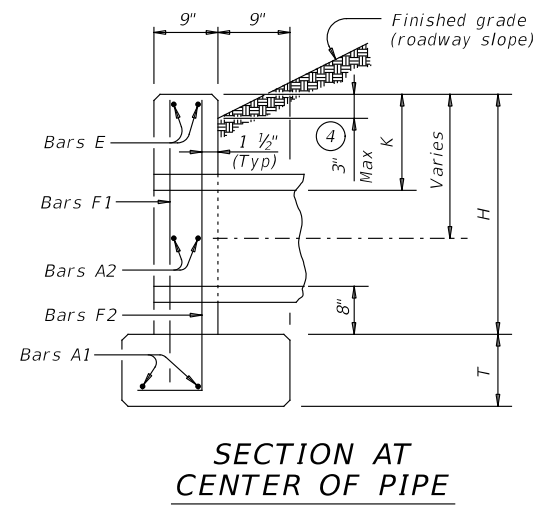
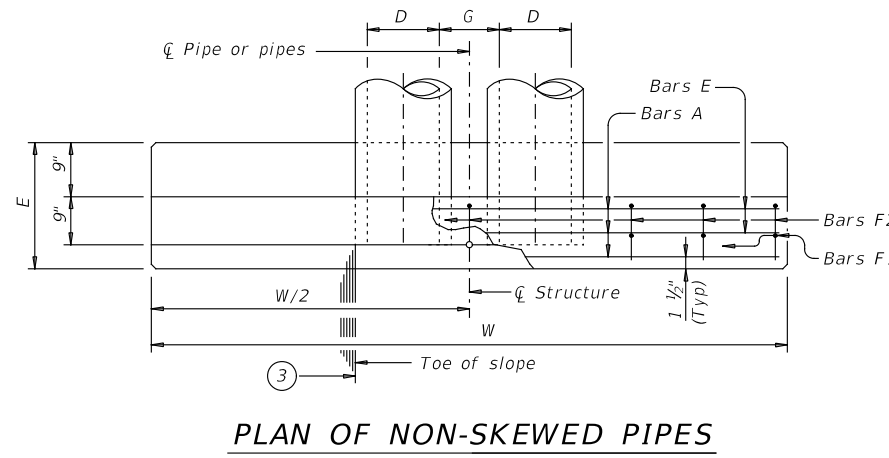
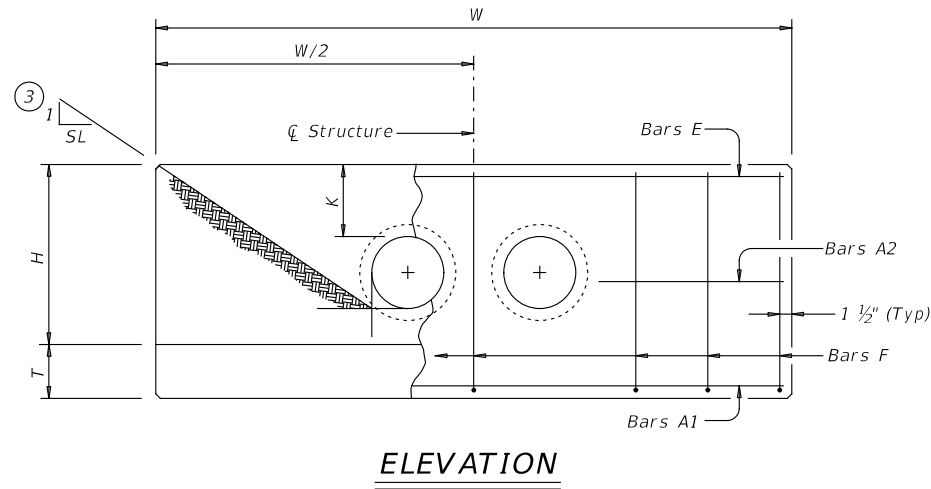
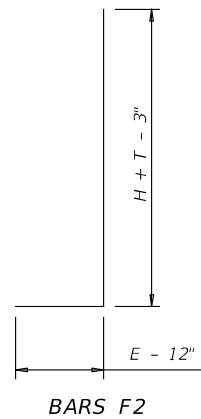
FILE:	STDD4.DGN	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT	STD:
© TxDOT	Feb 2010	DIST:	LFK	FED REG:	6	PROJECT NO.:		SHEET:	79	
REVISIONS		COUNTY		CONTROL		SECT		JOB		HIGHWAY
12/2008 Updated abbreviation of Std. title.		ANGELINA		3264		01		010		FM 326
2/2010 Note for alternate design added.										

d = Diameter

DATE: 3/25/2022
 FILE: c:\bms\pwe-useast-008\mi.ke.schu\1z\dms22937\FM326_DRNG_STND_78.dgn
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TABLE OF VARIABLE DIMENSIONS (5) AND QUANTITIES FOR ONE HEADWALL

Slope	Dia of Pipe (D)	Values for One Pipe			Values To Be Added for Each Add'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9'-0"	122	1.1	1'-9"	15	0.2
	15"	10'-3"	136	1.3	2'-2"	16	0.2
	18"	11'-6"	163	1.5	2'-8"	19	0.3
	21"	12'-9"	200	1.8	3'-1"	31	0.4
	24"	14'-0"	217	2.1	3'-7"	34	0.4
	27"	15'-3"	254	2.4	3'-11"	37	0.5
	30"	16'-6"	272	2.7	4'-4"	40	0.6
	33"	17'-9"	314	3.1	4'-8"	43	0.6
	36"	19'-0"	371	3.9	5'-1"	46	0.8
	42"	21'-6"	442	4.9	5'-10"	52	1.0
	48"	25'-0"	569	6.4	6'-7"	59	1.3
	54"	27'-6"	701	7.5	7'-6"	82	1.6
60"	30'-0"	794	8.8	8'-3"	90	1.8	
66"	32'-6"	894	10.2	8'-9"	96	2.0	
72"	35'-0"	1,055	11.7	9'-4"	103	2.3	
3:1	12"	13'-0"	175	1.6	1'-9"	14	0.2
	15"	14'-9"	193	1.9	2'-2"	17	0.2
	18"	16'-6"	228	2.2	2'-8"	19	0.3
	21"	18'-3"	299	2.6	3'-1"	31	0.4
	24"	20'-0"	323	3.0	3'-7"	33	0.4
	27"	21'-9"	371	3.5	3'-11"	37	0.5
	30"	23'-6"	415	4.0	4'-4"	40	0.5
	33"	25'-3"	469	4.6	4'-8"	43	0.6
	36"	27'-0"	556	5.7	5'-1"	46	0.8
	42"	30'-6"	675	7.1	5'-10"	52	1.0
	48"	35'-6"	837	9.2	6'-7"	59	1.3
	54"	39'-0"	1,015	11.0	7'-6"	84	1.6
60"	42'-6"	1,171	12.9	8'-3"	91	1.8	
66"	46'-0"	1,298	14.9	8'-9"	98	2.0	
72"	49'-6"	1,561	17.1	9'-4"	103	2.3	
4:1	12"	17'-0"	229	2.0	1'-9"	15	0.2
	15"	19'-3"	266	2.4	2'-2"	17	0.2
	18"	21'-6"	308	2.9	2'-8"	19	0.3
	21"	23'-9"	382	3.5	3'-1"	31	0.3
	24"	26'-0"	430	3.9	3'-7"	34	0.4
	27"	28'-3"	486	4.7	3'-11"	37	0.5
	30"	30'-6"	539	5.2	4'-4"	40	0.6
	33"	32'-9"	603	6.0	4'-8"	42	0.6
	36"	35'-0"	738	7.5	5'-1"	47	0.8
	42"	39'-6"	881	9.3	5'-10"	52	1.0
	48"	46'-0"	1,102	12.1	6'-7"	61	1.3
	54"	50'-6"	1,364	14.4	7'-6"	84	1.6
60"	55'-0"	1,547	16.9	8'-3"	91	1.8	
66"	59'-6"	1,741	19.5	8'-9"	98	2.0	
72"	64'-0"	2,077	22.4	9'-4"	102	2.3	
6:1	12"	25'-0"	336	3.0	1'-9"	14	0.2
	15"	28'-3"	384	3.6	2'-2"	17	0.2
	18"	31'-6"	452	4.2	2'-8"	19	0.3
	21"	34'-9"	581	5.1	3'-1"	31	0.4
	24"	38'-0"	644	5.8	3'-7"	34	0.4
	27"	41'-3"	737	6.9	3'-11"	37	0.5
	30"	44'-6"	807	7.7	4'-4"	39	0.6
	33"	47'-9"	912	8.9	4'-8"	44	0.6
	36"	51'-0"	1,108	11.0	5'-1"	48	0.8
	42"	57'-6"	1,318	13.7	5'-10"	54	1.0
	48"	67'-0"	1,682	17.9	6'-7"	59	1.3
	54"	73'-6"	2,072	21.3	7'-6"	83	1.6
60"	80'-0"	2,351	24.9	8'-3"	89	1.8	
66"	86'-6"	2,643	28.9	8'-9"	96	2.0	
72"	93'-0"	3,121	33.1	9'-4"	101	2.3	



- ① Total quantities include one 3'-1" lap for bars over 60' in length.
- ② Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
- ③ Indicated slope is perpendicular to centerline pipe or pipes.
- ④ For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ⑤ Dimensions shown are usual and maximum.
- ⑥ Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0'-9"	1'-0"	2'-8"	0'-9"	1'-9"
15"	0'-11"	1'-0"	2'-11"	0'-9"	1'-9"
18"	1'-2"	1'-0"	3'-2"	0'-9"	1'-9"
21"	1'-4"	1'-0"	3'-5"	0'-9"	2'-0"
24"	1'-7"	1'-0"	3'-8"	0'-9"	2'-0"
27"	1'-8"	1'-0"	3'-11"	0'-9"	2'-3"
30"	1'-10"	1'-0"	4'-2"	0'-9"	2'-3"
33"	1'-11"	1'-0"	4'-5"	0'-9"	2'-6"
36"	2'-1"	1'-0"	4'-8"	1'-0"	2'-6"
42"	2'-4"	1'-0"	5'-2"	1'-0"	2'-9"
48"	2'-7"	1'-3"	5'-11"	1'-0"	3'-0"
54"	3'-0"	1'-3"	6'-5"	1'-0"	3'-3"
60"	3'-3"	1'-3"	6'-11"	1'-0"	3'-6"
66"	3'-3"	1'-3"	7'-5"	1'-0"	3'-9"
72"	3'-4"	1'-3"	7'-11"	1'-0"	4'-0"

TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1'-6"	~
E	#5	~	2
F	#5	1'-0"	~

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

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

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

Bridge Division Standard

CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS

CH-PW-0

FILE: chpw0ste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		80

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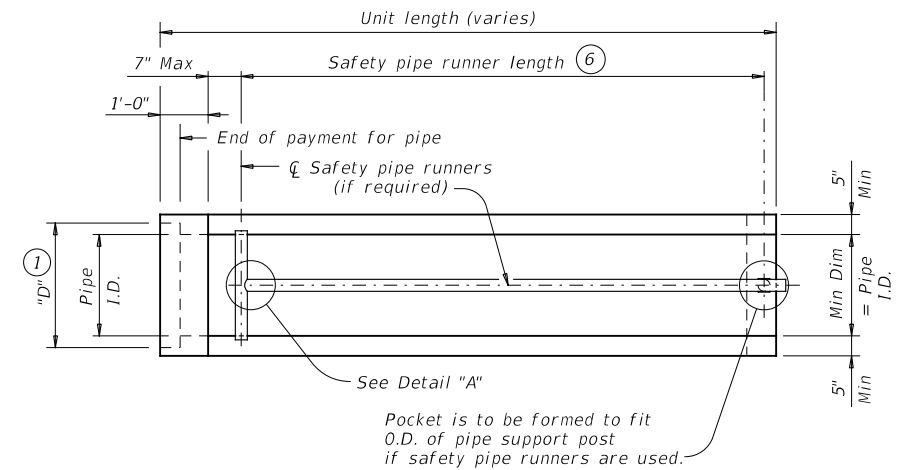
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REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (8)	"D" (1)	Slope	Min Length of Unit	Single Pipe		Multiple Pipes	
						Skew	Pipe Runners Required	Skew	Pipe Runners Required
12"	2"	1.15"	17.00"	3:1	2' - 11"	≤ 45°	No	≤ 45°	No
				4:1	3' - 6"				
				6:1	4' - 9"				
15"	2 1/4"	1.30"	20.50"	3:1	3' - 8"	≤ 45°	No	≤ 45°	No
				4:1	4' - 7"				
				6:1	6' - 5"				
18"	2 1/2"	1.60"	24.00"	3:1	4' - 6"	≤ 45°	No	≤ 45°	No
				4:1	5' - 8"				
				6:1	8' - 0"				
24"	3"	1.95"	31.00"	3:1	6' - 2"	≤ 45°	No	= 30°	No
				4:1	7' - 10"				
				6:1	11' - 3"				
30"	3 1/2"	2.65"	38.50"	3:1	7' - 10"	= 15°	No	= 15°	No
				4:1	10' - 1"				
				6:1	14' - 8"				
36"	4"	2.75"	45.50"	3:1	9' - 5"	= 0°	No	= 0°	Yes
				4:1	12' - 3"				
				6:1	17' - 11"				
42"	4 1/2"	2.7"	52.50"	3:1	11' - 1"	≥ 0°	Yes	≥ 0°	Yes
				4:1	14' - 5"				
				6:1	21' - 2"				

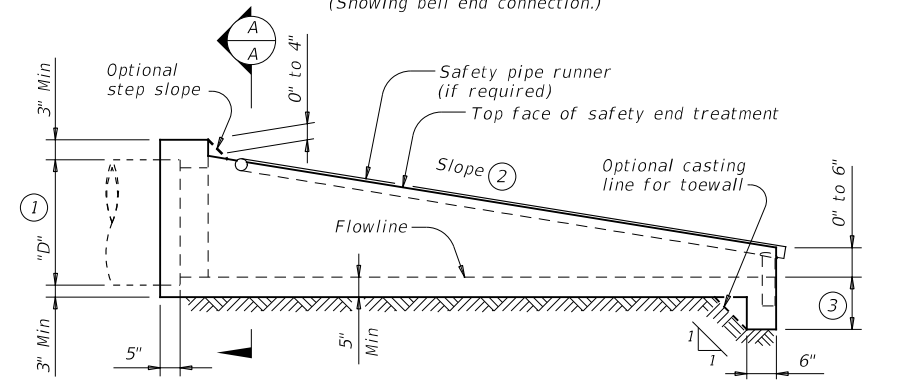
SAFETY PIPE RUNNER DIMENSIONS

Max Safety Pipe Runner Length	Required Pipe Runner Size		
	Pipe Size	Pipe O.D.	Pipe I.D.
11' - 2"	3" STD	3.500"	3.068"
15' - 6"	3 1/2" STD	4.000"	3.548"
20' - 10"	4" STD	4.500"	4.026"
35' - 4"	5" STD	5.563"	5.047"



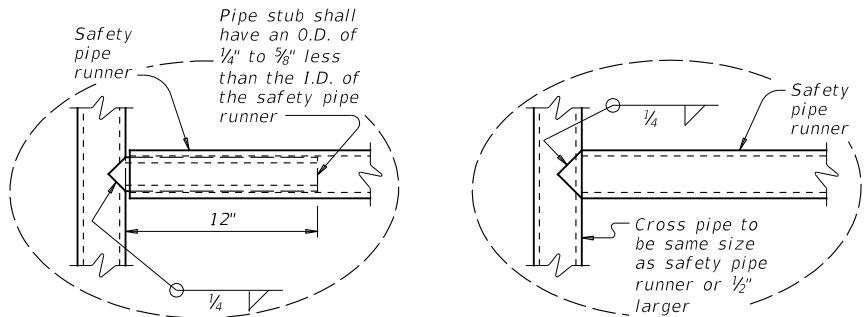
PLAN

(Showing bell end connection.)



LONGITUDINAL ELEVATION

(Showing bell end connection.)

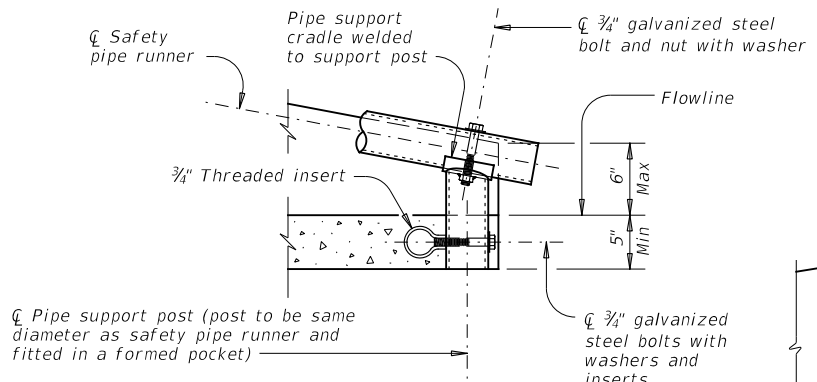


OPTION A

DETAIL A

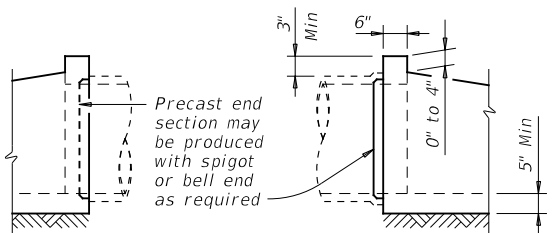
OPTION B

(If required)



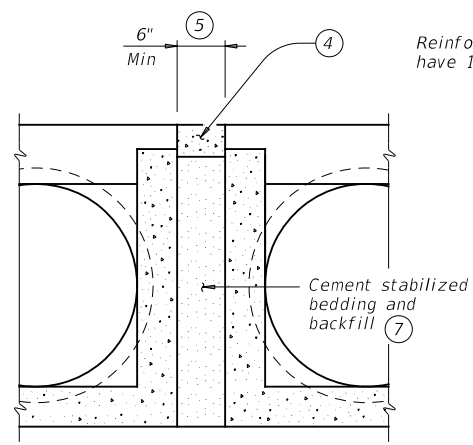
END DETAIL FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

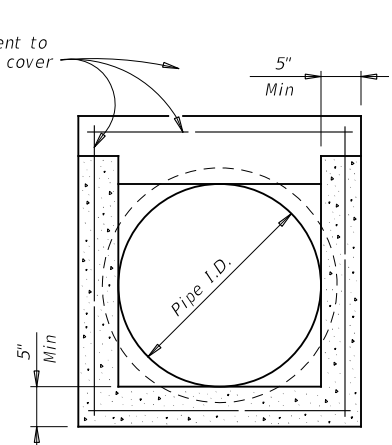


OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment)

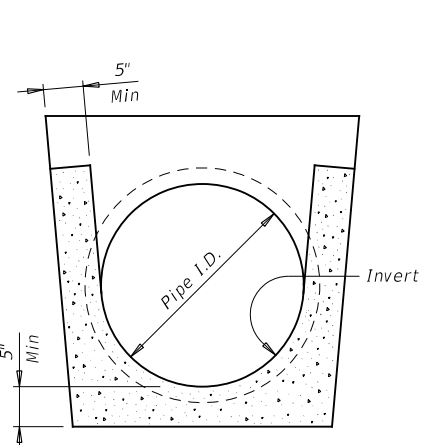


MULTIPLE PIPE INSTALLATION

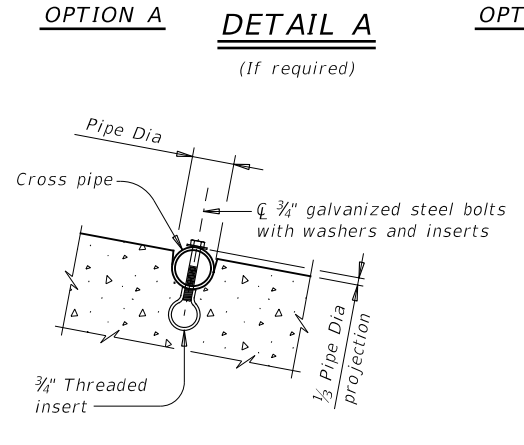


OPTION WITH SQUARE BOTTOM

SECTION A-A



OPTION WITH INVERT BOTTOM



INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

- Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.
- Slope as shown elsewhere in plans. Slope of 3:1 or flatter is required for vehicle safety.
- Toewall to be used only when dimension is shown elsewhere in the plans.
- Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".
- Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
- Measured along slope.
- Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.
- Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below:

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" - D12 x D12 or 5"x5" - D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).

At the option and expense of the Contractor, the next larger size of safety end treatment may be furnished as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 1,800 Lbs at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

Provide safety pipe runners, cross pipes, pipe support posts, and pipe stubs meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464 "Reinforced Concrete Pipe". Connect TP by grouting. See Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.

Texas Department of Transportation
 Bridge Division Standard

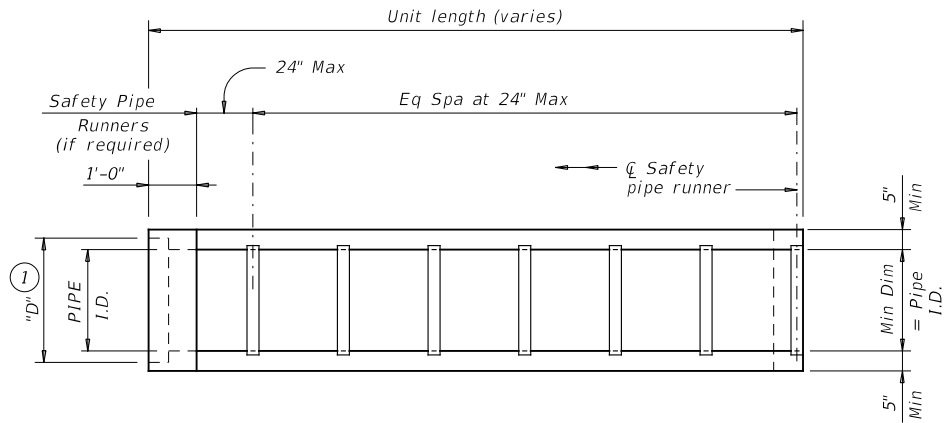
PRECAST SAFETY END TREATMENT TYPE II ~ CROSS DRAINAGE

PSET-SC

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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
12-21: Added 42" TP	DIST	COUNTY	SHEET NO.	
	LFK	ANGELINA	81	

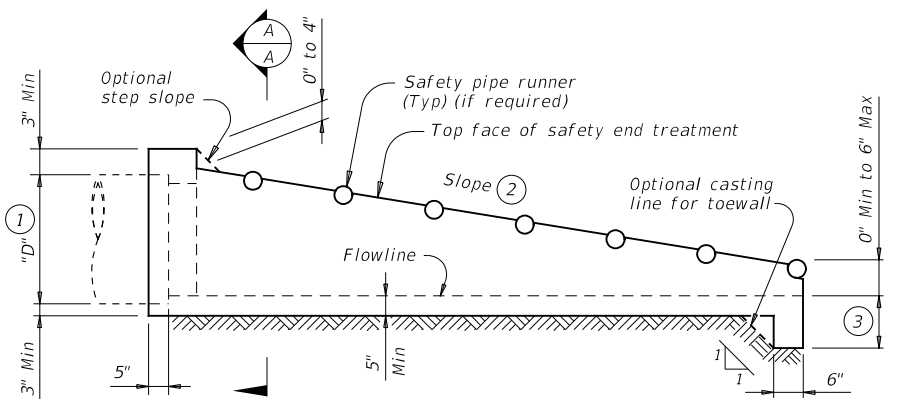
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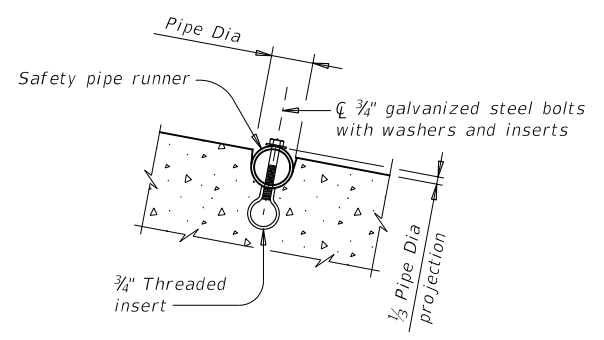
PLAN

(Showing bell end connection.)



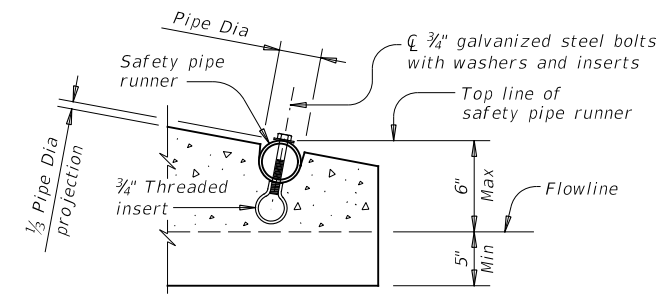
LONGITUDINAL ELEVATION

(Showing bell end connection.)

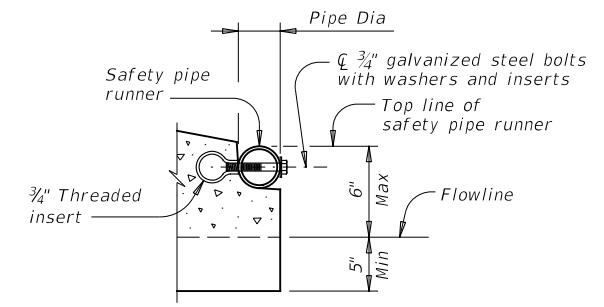


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



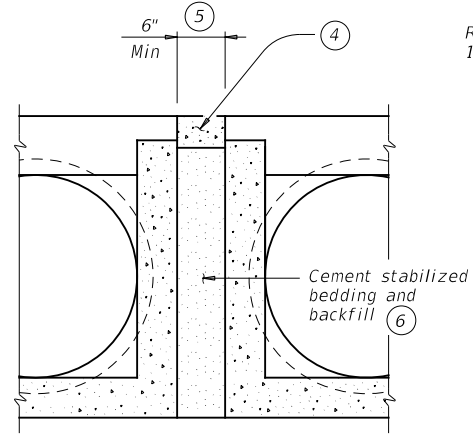
OPTION A



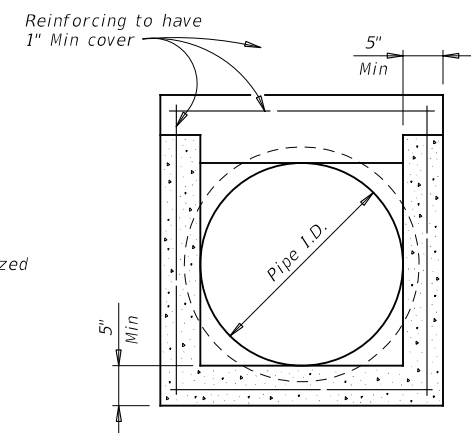
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

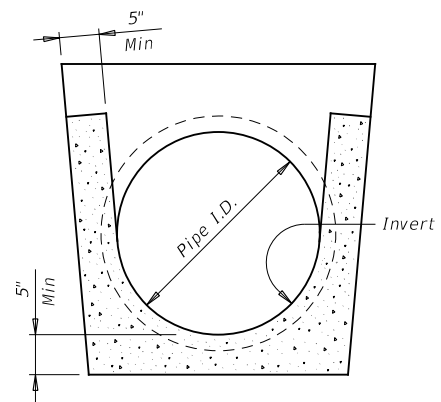


MULTIPLE PIPE INSTALLATION

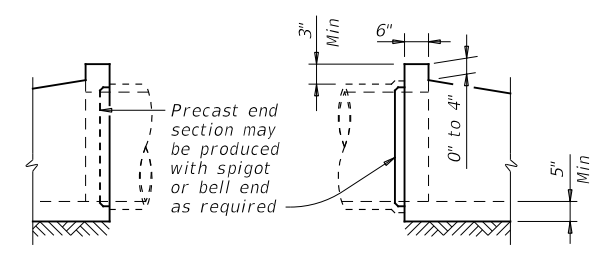


OPTION WITH SQUARE BOTTOM

SECTION A-A



OPTION WITH INVERT BOTTOM



OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment.)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (7)	"D" (1)	Slope	Min Length	Pipe Runners Required		Required Pipe Runner Size		
						Single Pipe	Multiple Pipe	Nominal Dia.	O.D.	I.D.
12"	2"	1.15"	17.00"	6:1	4' - 9"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
15"	2 1/4"	1.30"	20.50"	6:1	6' - 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 1/2"	1.60"	24.00"	6:1	8' - 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' - 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 1/2"	2.65"	38.50"	6:1	14' - 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' - 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 1/2"	2.7"	52.50"	6:1	21' - 2"	Yes	Yes	4" STD	4.500"	4.026"

- Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.
- Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.
- Toewall to be used only when dimension is shown elsewhere in the plans.
- Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".
- Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
- Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.
- Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".
 When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.
 Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
 Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below:
 A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" - D12 x D12 or 5"x5" - D10 x D10 welded wire reinforcement (WWR).
 B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).
 At the option and expense of the Contractor the next larger size of safety end treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.
 Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.
 Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.
 Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.
 Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464, "Reinforced Concrete Pipe". Connect TP by grouting. See Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.

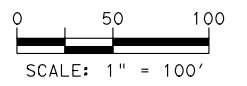
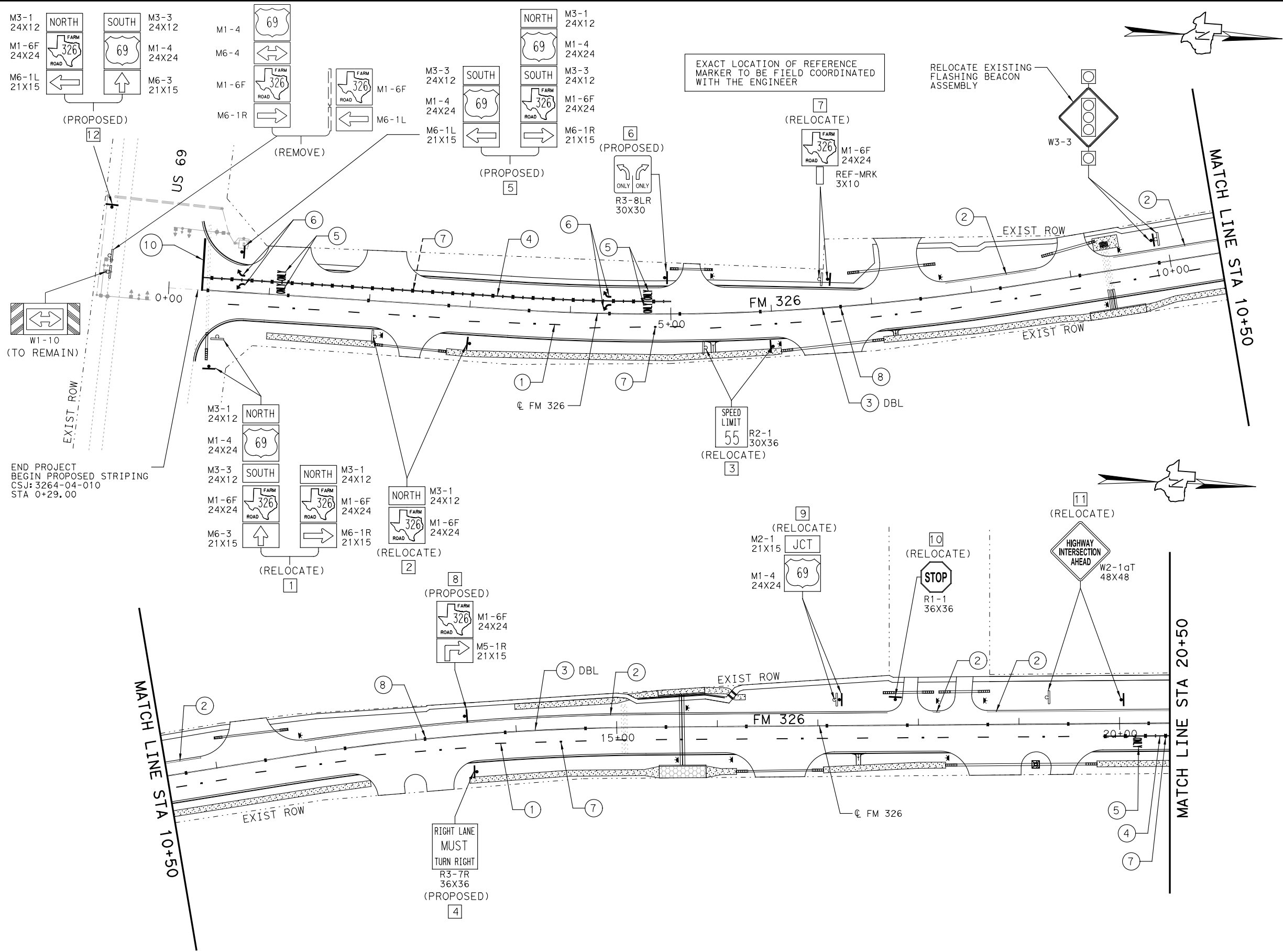
Texas Department of Transportation
 Bridge Division Standard

PRECAST SAFETY END TREATMENT TYPE II ~ PARALLEL DRAINAGE

PSET-SP

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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
12-21: Added 42" TP	DIST	COUNTY	SHEET NO.	
	LFK	ANGELINA	82	

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6/20/2022 10:54:10 AM



- LEGEND:**
- ① 6" WHITE (BROKEN) PAV MKR
 - ② 6" WHITE (SOLID) PAV MKR
 - ③ 6" YELLOW (SOLID) PAV MKR
 - ④ 8" WHITE (SOLID) PAV MKR
 - ⑤ WHITE "ONLY" PVMT MKR
 - ⑥ WHITE (ARROW) PAV MKR
 - ⑦ 4"x4" SQ. 1-WAY REFLECTORIZED WHITE RAISED PVMT MKR (TYPE I-C)
 - ⑧ 4"x4" SQ. 2-WAY REFLECTORIZED YELLOW PVMT MKR (TYPE II-A-A)
 - ⑨ 24" WHITE (SOLID) PAV MKR
 - # PROPOSED SIGN NUMBER
 - ▬ PROPOSED SMALL SIGN
 - ▬ EXISTING SMALL SIGN
 - PROP EDGE OF PAVEMENT
 - * PROP OBJECT MARKER OM-2Z

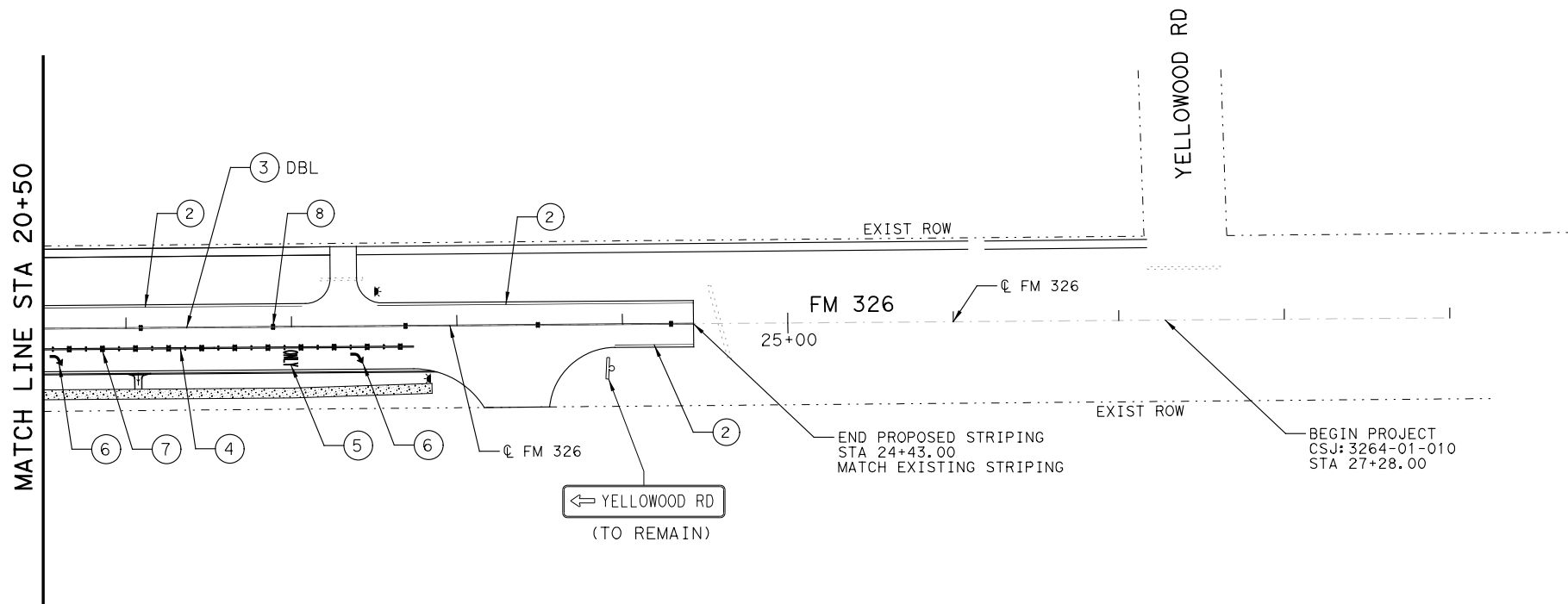
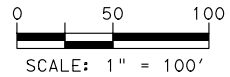


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OMEGAENGINEERS.COM TX PE Firm Reg. No. F-2147 P:281 647 9182 F:281 647 9184

SIGNING AND PAVEMENT MARKING PLAN

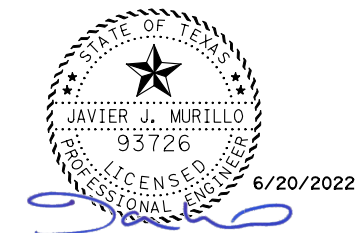
SHEET 1 OF 2

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No. SHEET No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010 83



- LEGEND:**
- ① 6" WHITE (BROKEN) PAV MRK
 - ② 6" WHITE (SOLID) PAV MRK
 - ③ 6" YELLOW (SOLID) PAV MRK
 - ④ 8" WHITE (SOLID) PAV MRK
 - ⑤ WHITE "ONLY" PVMT MRK
 - ⑥ WHITE (ARROW) PAV MRK
 - ⑦ 4"x4" SQ. 1-WAY REFLECTORIZED WHITE RAISED PVMT MRK (TYPE I-C)
 - ⑧ 4"x4" SQ. 2-WAY REFLECTORIZED YELLOW PVMT MRK (TYPE II-A-A)
 - ⑨ 24" WHITE (SOLID) PAV MRK
 - # PROPOSED SIGN NUMBER
 - ⊣ PROPOSED SMALL SIGN
 - ⊢ EXISTING SMALL SIGN
 - PROP EDGE OF PAVEMENT
 - * PROP OBJECT MARKER OM-2Z

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SIGNING AND PAVEMENT MARKING PLAN

SHEET 2 OF 2

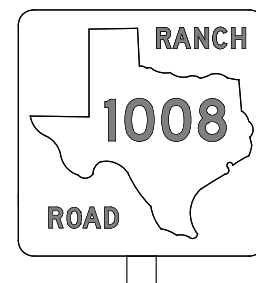
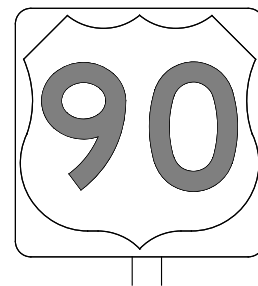
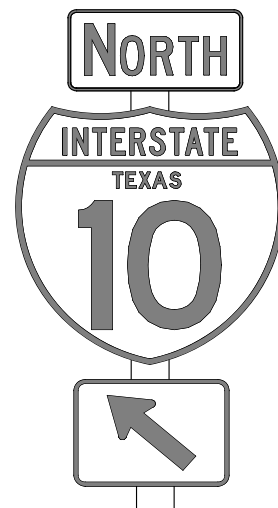
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DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010
				SHEET No.
				84

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DATE: DATE TIME
FILE: DOCUMENT NAME

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

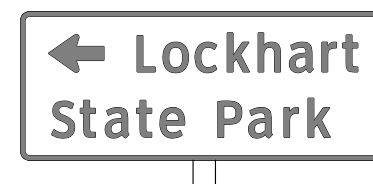
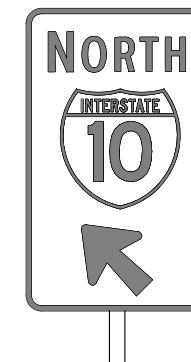
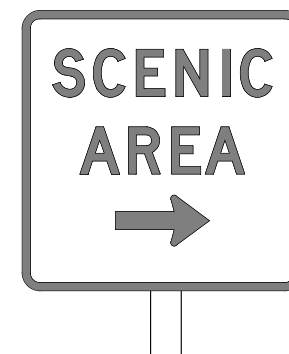
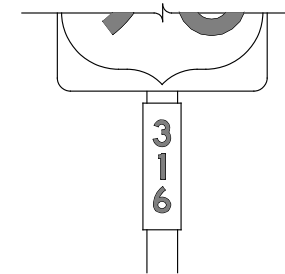
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

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

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



TYPICAL EXAMPLES

GENERAL NOTES

- Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
- White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

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

- Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).
- Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
- Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.
- Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
<http://www.txdot.gov/>



TYPICAL SIGN REQUIREMENTS

TSR(3) - 13

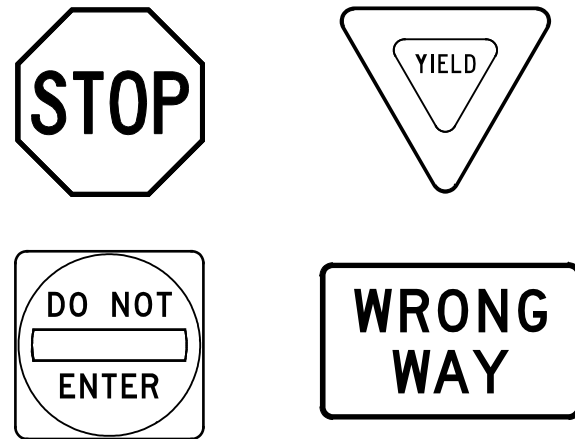
FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	LFK	ANGELINA		85

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DATE: DATE TIME
 FILE: DOCUMENT NAME

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

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



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

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



TYPICAL EXAMPLES

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

GENERAL NOTES

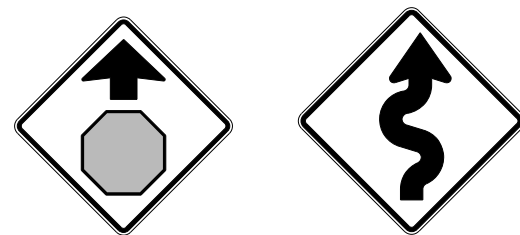
- Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
- Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway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

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

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:
<http://www.txdot.gov/>

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS



TYPICAL EXAMPLES

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



TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE:	tsr4-13.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY				
REVISIONS		3264	01	010	FM 326				
12-03	7-13	DIST	COUNTY		SHEET NO.				
9-08		LFK	ANGELINA		86				

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DATE: 3/25/2022
 FILE: c:\bms\pwe-useast-008\mi.ke.schul\1z\dms22937\FM326_TRF_STND_04.dgn

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS				DELINEATORS				D & OM DESCRIPTIVE CODES		
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SINGLE		DOUBLE			
SHEETING	Yellow, White or Red Type B or C reflective sheeting				Yellow, White or Red Type B or C Reflective Sheeting				INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX (XX) NUMBER OF REFLECTORS S = Single D = Double COLOR OF REFLECTORS W = White Y = Yellow R = Red REFLECTOR UNIT SIZE 1 or 2 TYPE OF POST OR DELINEATOR WC = Wing Channel Post YFLX = Yellow Flexible Post WFLX = White Flexible Post BRF = Barrier Reflector TYPE OF MOUNT GND = Embedded (drivable or set in concrete) CTB = Concrete Barrier Mount GF1 or GF2 = Guard Fence Attachment SRF = Surface Mount DIRECTION If Required BI = Bi-Directional BR = Bi-Directional with red on back	
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.				POST TYPE	WC	YFLX, WFLX	WC		YFLX, WFLX
					MOUNT TYPE	GND	GND, SRF	GND		GND, SRF

OBJECT MARKERS								D & OM DESCRIPTIVE CODES	
DEVICE	Type 1 (OM-1)		Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4	
SHEETING	Yellow-Type B _{FL} or C _{FL} Sheeting		Yellow - Type B or C Sheeting			Alternating acrylic black and retroreflective yellow - Type B _{FL} or C _{FL} Sheeting			Red -Type B _{FL} or C _{FL} Sheeting
POST TYPE	TWT		WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP		GND	GND	GND, SRF	WAS, WAP			WAS, WAP
									INSTL OM ASSM (OM-XX) (XXXX)XXX (XX) TYPE OF OBJECT MARKER 1, 2, 3, or 4 NUMBER OF REFLECTORS OR DIRECTION X = 3-Size 2 reflector units (Type 2 only) Y = 1-Size 3 reflector unit (Type 2 only) Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only) L = Left Side (Type 3 Object Marker only) R = Right Side (Type 3 Object Marker only) C = Center (Type 3 Object Marker only) TYPE OF POST WC = Wing Channel Post WFLX = White Flexible Post TWT = Thin Walled Tubing TYPE OF MOUNT GND = Embedded (drivable) SRF = Surface Mount WAS = Wedge Anchor Steel WAP = Wedge Anchor Plastic DIRECTION If Required BI = Bi-Directional

DEPARTMENTAL MATERIAL SPECIFICATIONS	
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)			CHEVRONS				ONE DIRECTION LARGE ARROW		NOTE: Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.
DEVICE	GF1	GF2	CTB	W1-8				W1-6	
SHEETING	Yellow, White, Red			MOUNTING HEIGHT				MOUNTING HEIGHT	
NOTE	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.			1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).				48" x 24" (Conventional) 60" x 30" (Expressway & Freeway)	
				SIZE (W x L)	18" x 24" (Conventional)	24" x 30" (Conventional Oversize)	30" x 36" (Expressway)	36" x 48" (Freeway)	48" x 24" (Conventional) 60" x 30" (Expressway & Freeway)
				MOUNTING HEIGHT	4'-0" or 7'-0"			7'-0" Only	7'-0"
				NOTE					

Texas Department of Transportation Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION
D & OM(1)-20

FILE: dcm1-20.dgn	DN: TXDOT	CK: TXDOT	DN: TXDOT	CK: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	LFK	ANGELINA		87

20A

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 FILE: c:\bms\pwe-useast-008\mi.ke.schu\12\dms22937\FM326_TRE_STND_05.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS				TYPE OF BARRIER MOUNTS																										
WING CHANNEL (WC)	FLEXIBLE POSTS (YFLX, WFLX)		WEDGE ANCHOR SYSTEMS		GUARD FENCE ATTACHMENT																									
GND	GND	SRF	WAS	WAP	GF1																									
	<p>NOTES</p> <ol style="list-style-type: none"> 1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only. 2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499. 		<p>NOTES</p> <ol style="list-style-type: none"> 1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices. 2. Install per manufacturer's recommendations. 3. Post length may vary to meet field conditions. 4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow. 		<p>CONCRETE TRAFFIC BARRIER (CTB)</p>																									
<p>GENERAL NOTES</p> <ol style="list-style-type: none"> 1. Place delineators on a section of roadway at a consistent distance from the edge of pavement. 2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction. 3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible. 4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation. 5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface. 6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane. 		<p>NOTE</p> <ol style="list-style-type: none"> 1. Install per manufacturer's recommendations. 																												
<p>TYPES 1,3, AND 4 OBJECT MARKERS AND CHEVRONS</p> <p>NOTE Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)</p>		<p>CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN</p> <p>NOTE Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.</p>		<p>DELINEATORS AND TYPE 2 OBJECT MARKERS</p> <p>See general notes 1, 2 and 3.</p>																										
				<p>DELINEATOR & OBJECT MARKER INSTALLATION</p> <p>D & OM(2)-20</p> <table border="1"> <tr> <td>FILE: dom2-20.dgn</td> <td>DN: TxDOT</td> <td>CK: TxDOT</td> <td>DN: TxDOT</td> <td>CK: TxDOT</td> </tr> <tr> <td>© TxDOT August 2004</td> <td>CONT</td> <td>SECT</td> <td>JOB</td> <td>HIGHWAY</td> </tr> <tr> <td>REVISIONS</td> <td>3264</td> <td>01</td> <td>010</td> <td>FM 326</td> </tr> <tr> <td>10-09 3-15</td> <td>DIST</td> <td>COUNTY</td> <td colspan="2">SHEET NO.</td> </tr> <tr> <td>4-10 7-20</td> <td>LFK</td> <td>ANGELINA</td> <td colspan="2">88</td> </tr> </table> <p>20B</p>		FILE: dom2-20.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT	© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY	REVISIONS	3264	01	010	FM 326	10-09 3-15	DIST	COUNTY	SHEET NO.		4-10 7-20	LFK	ANGELINA	88	
FILE: dom2-20.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT																										
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY																										
REVISIONS	3264	01	010	FM 326																										
10-09 3-15	DIST	COUNTY	SHEET NO.																											
4-10 7-20	LFK	ANGELINA	88																											

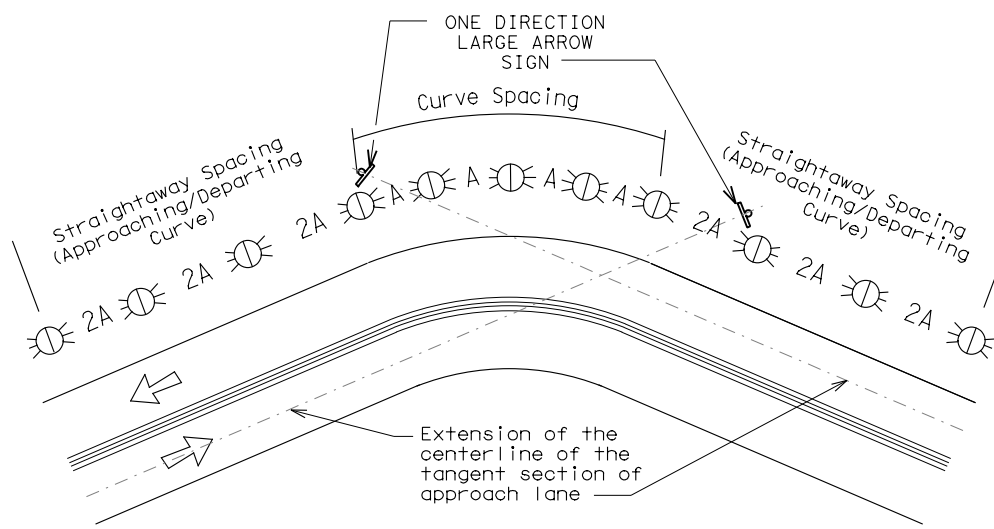
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MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	<ul style="list-style-type: none"> • RPMs 	<ul style="list-style-type: none"> • RPMs
15 MPH & 20 MPH	<ul style="list-style-type: none"> • RPMs and One Direction Large Arrow sign 	<ul style="list-style-type: none"> • RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	<ul style="list-style-type: none"> • RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons 	<ul style="list-style-type: none"> • RPMs and Chevrons

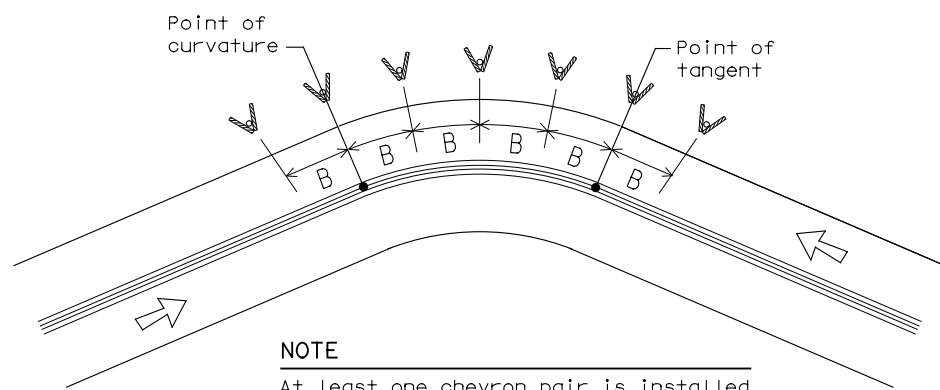
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN				
Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN			
Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp. Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete) and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100' max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100' max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign



DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

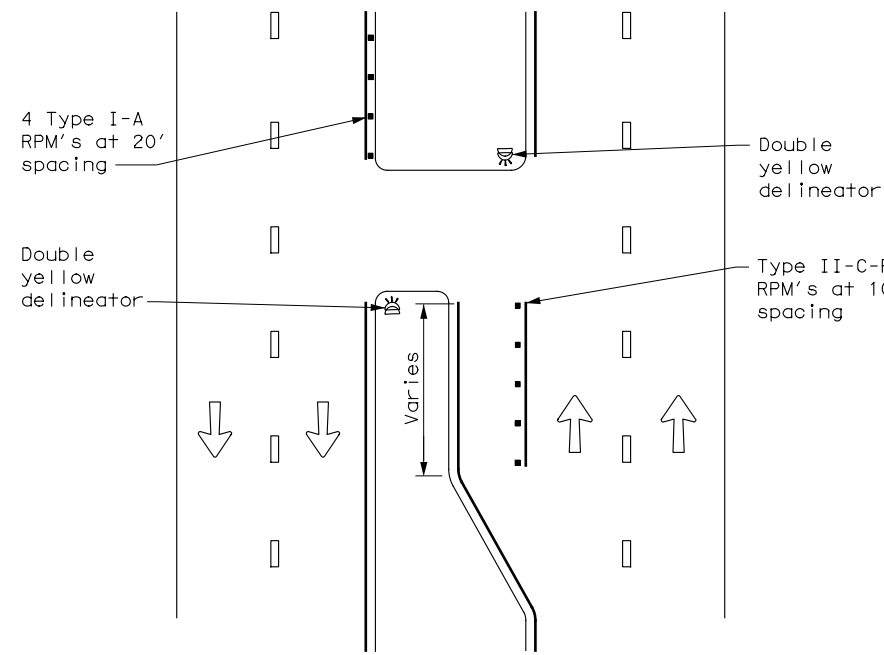
D & OM(3)-20

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© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
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3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	LFK	ANGELINA		89

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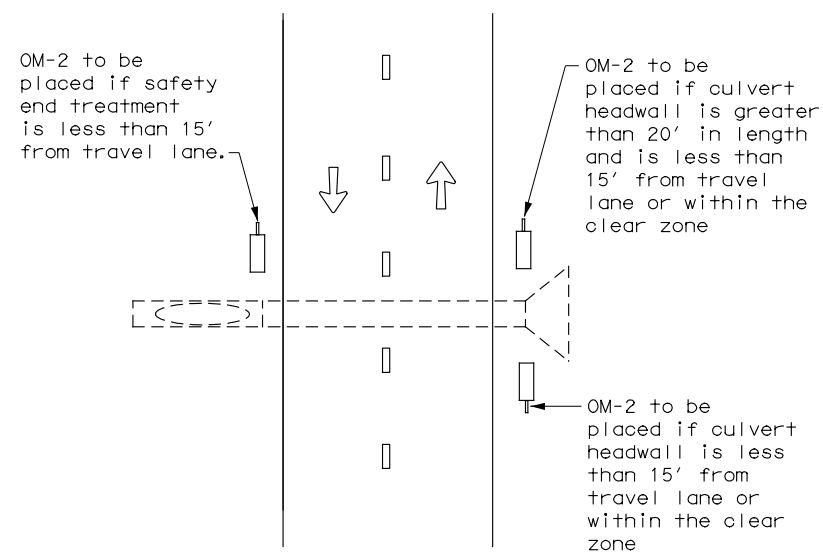
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CROSSOVERS



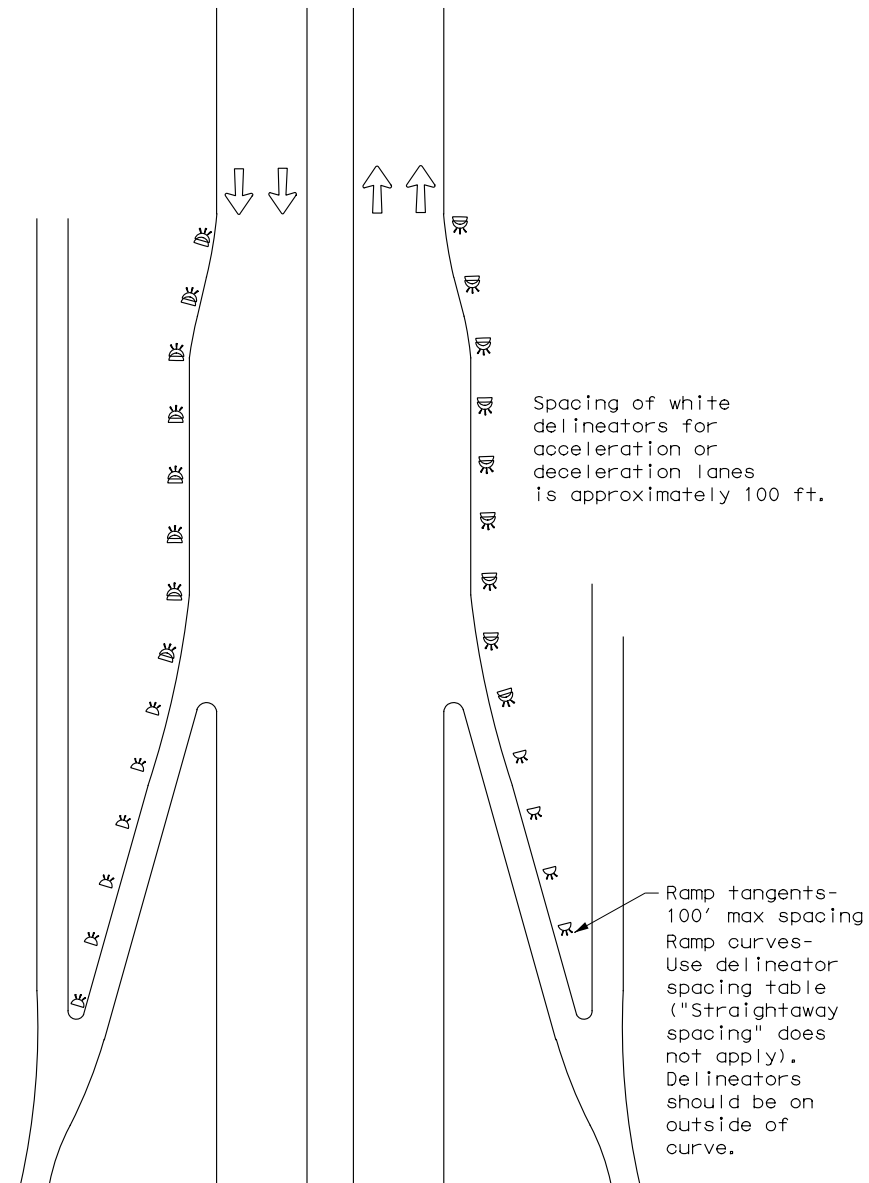
DETAIL 1

FOR CULVERTS WITHOUT MBGF



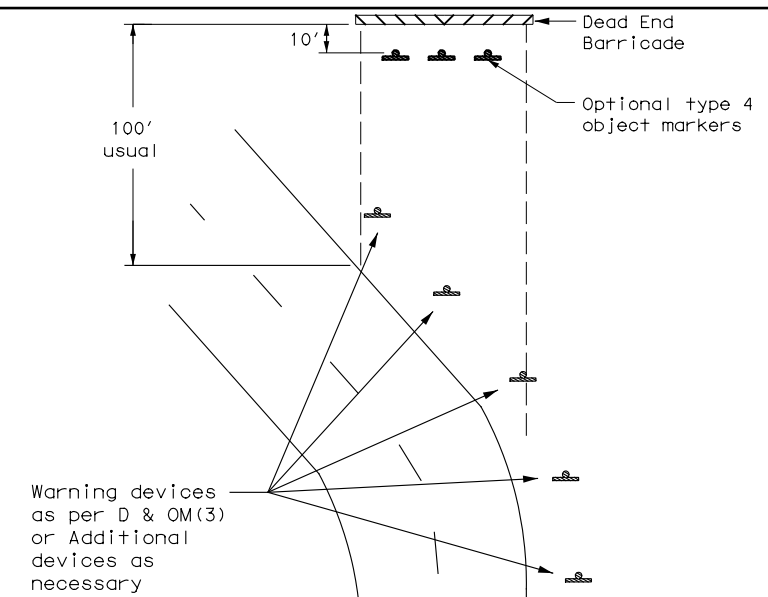
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



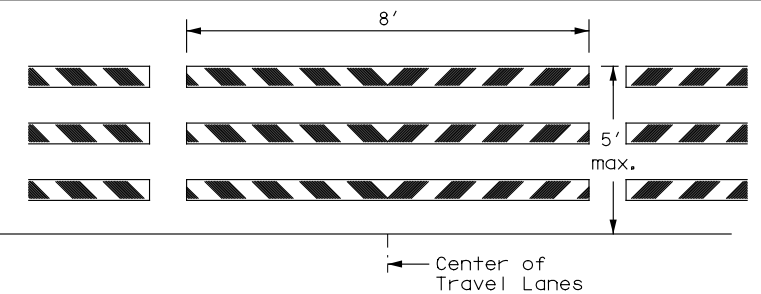
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

- Barricade striping shall be red and white reflective sheeting for all permanent road closures.
- Barricade striping is red and white sloping toward the center of the roadway.
- Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator



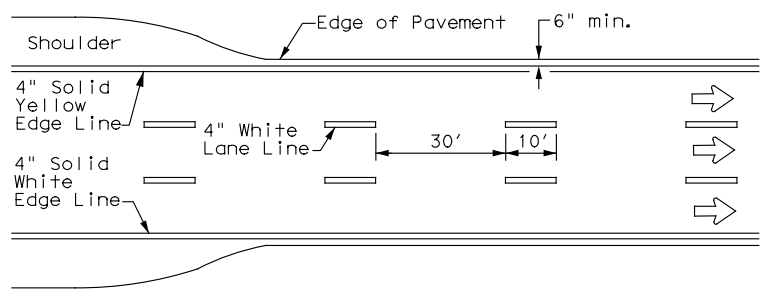
DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

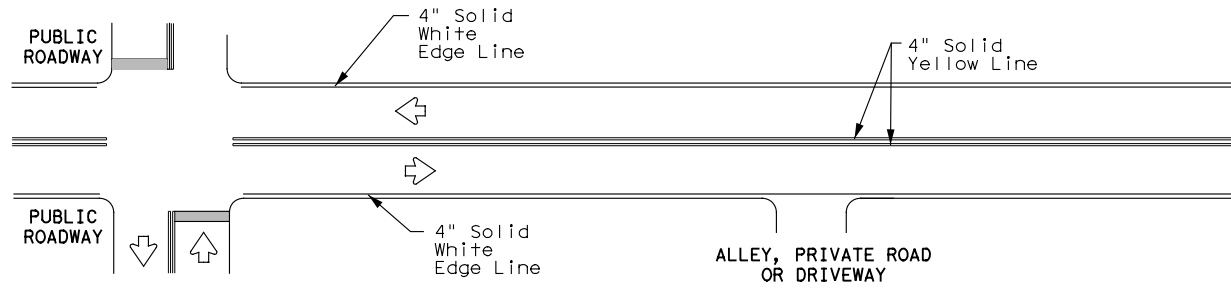
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3-15	DIST	COUNTY		SHEET NO.
7-20	LFK	ANGELINA		90

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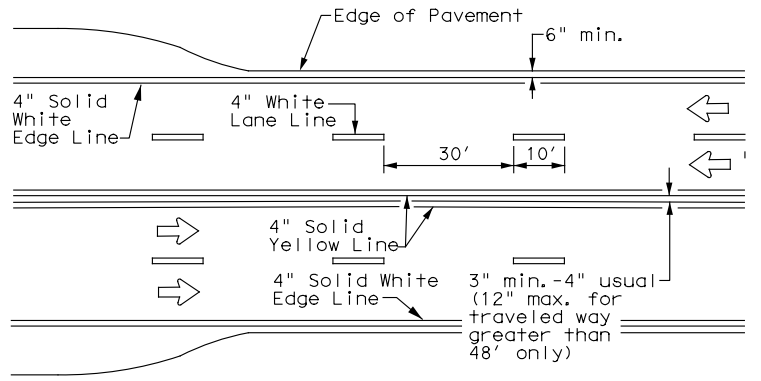
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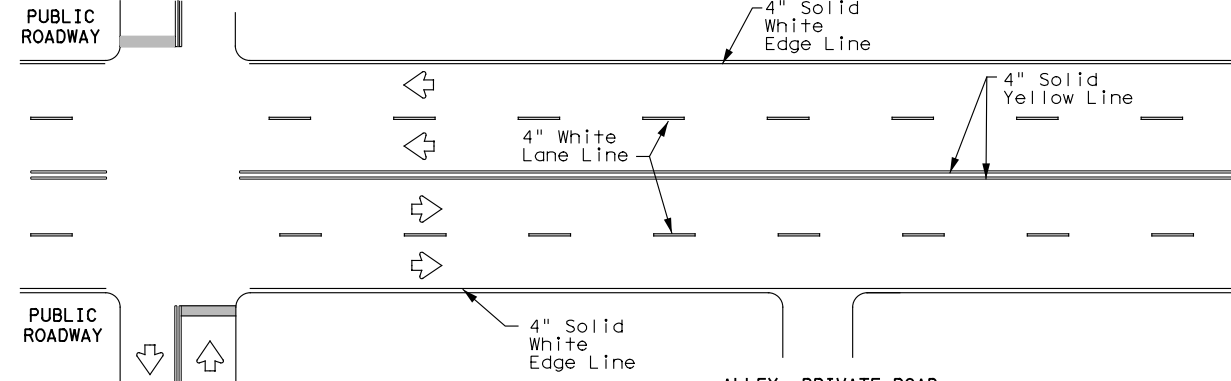
**EDGE LINE AND LANE LINES
 ONE-WAY ROADWAY
 WITH OR WITHOUT SHOULDERS**



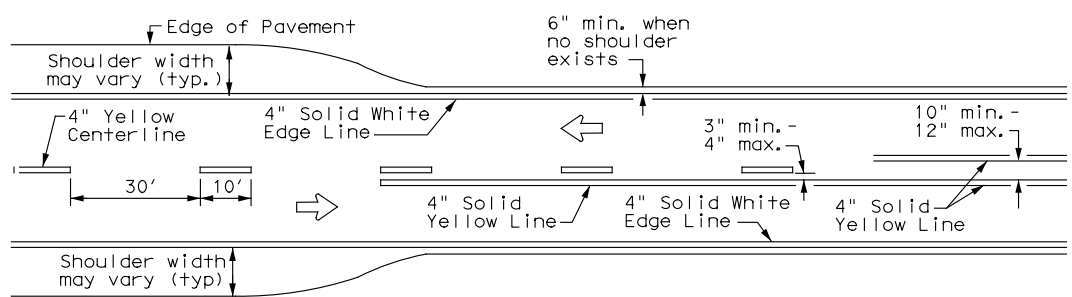
**TYPICAL TWO-LANE, TWO-WAY PAVEMENT
 MARKINGS THROUGH INTERSECTIONS**



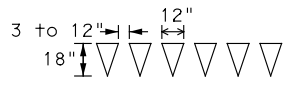
**CENTERLINE AND LANE LINES
 FOUR LANE TWO-WAY ROADWAY
 WITH OR WITHOUT SHOULDERS**



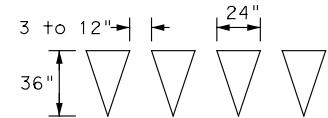
**TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
 MARKINGS THROUGH INTERSECTIONS**



**TWO LANE TWO-WAY ROADWAY
 WITH OR WITHOUT SHOULDERS**

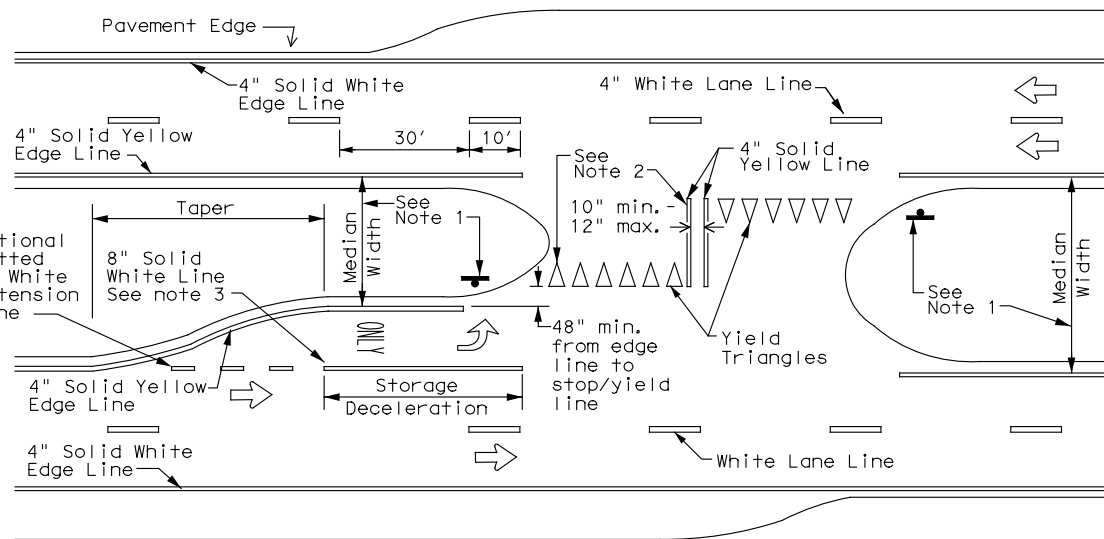


For posted speed on road being marked equal to or less than 40 MPH.



For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

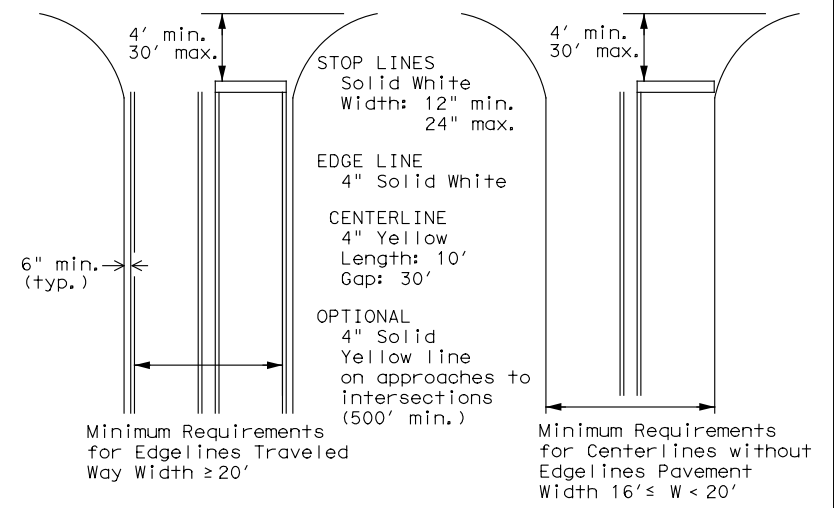
- Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.
- 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 triangles shall only be used with yield signs.
- 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

- Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed 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.
- 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.

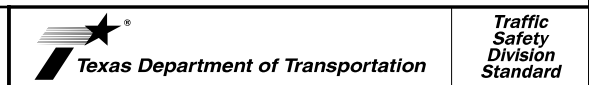
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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



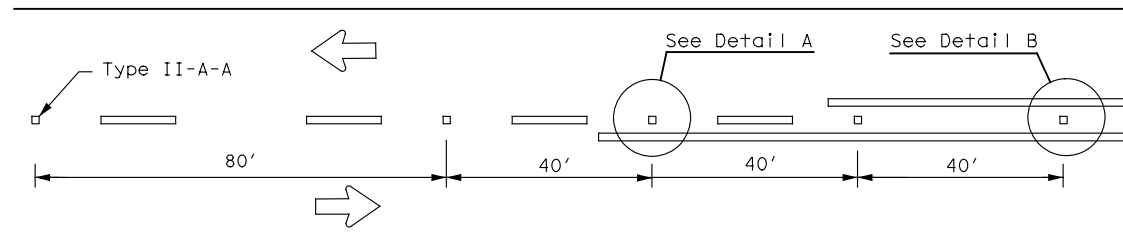
**TYPICAL STANDARD
 PAVEMENT MARKINGS**

PM(1)-20

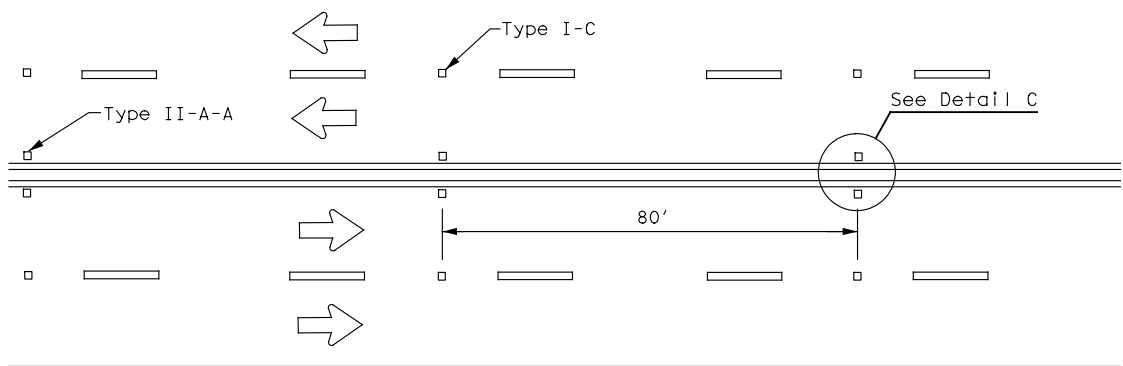
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8-95 3-03 REVISIONS	3264	01	010	FM 326
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	LFK	ANGELINA	91	

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

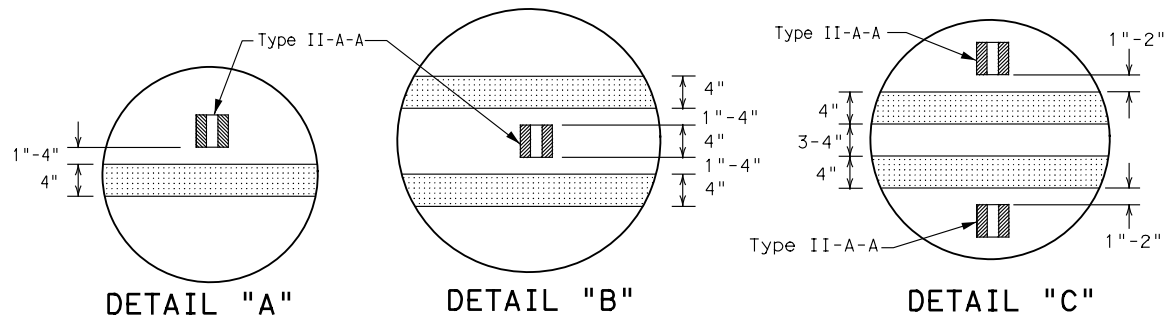
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CENTERLINE FOR ALL TWO LANE ROADWAYS



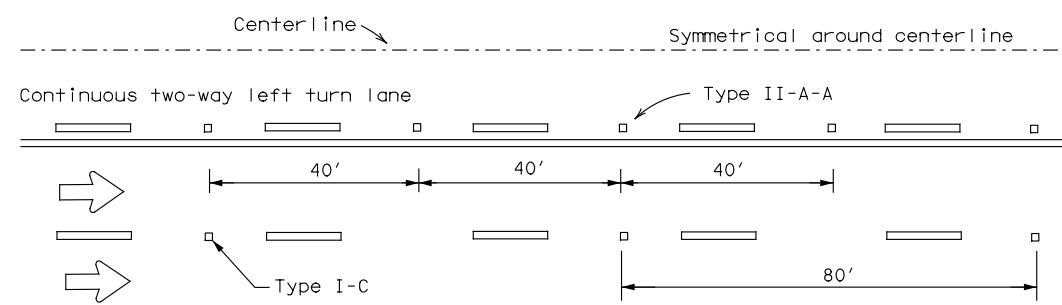
**CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY HIGHWAYS**



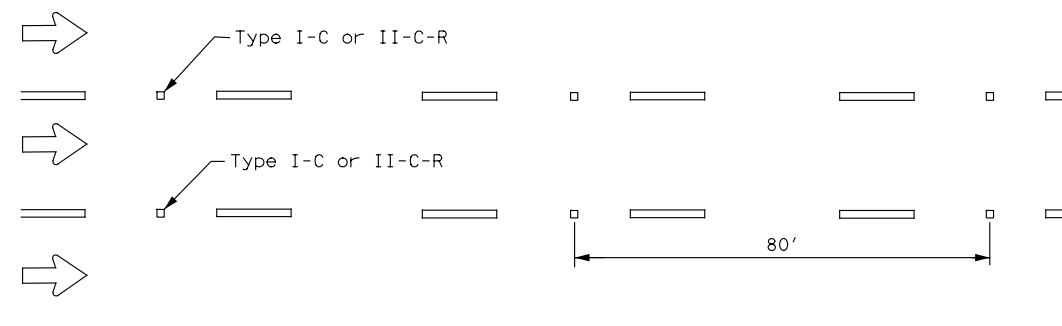
DETAIL "A"

DETAIL "B"

DETAIL "C"

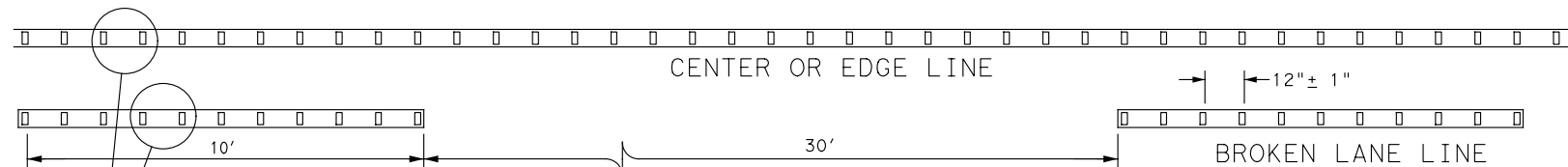


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



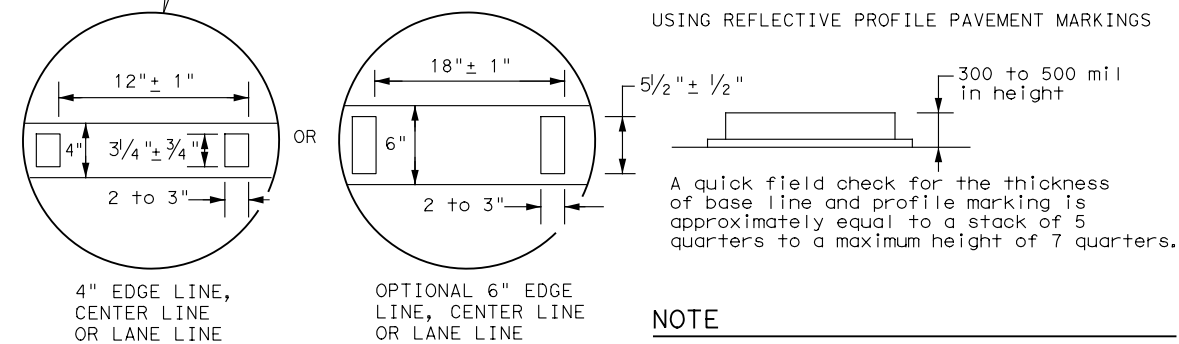
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.



**REFLECTORIZED PROFILE
PATTERN DETAIL**

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



**4" EDGE LINE,
CENTER LINE
OR LANE LINE**

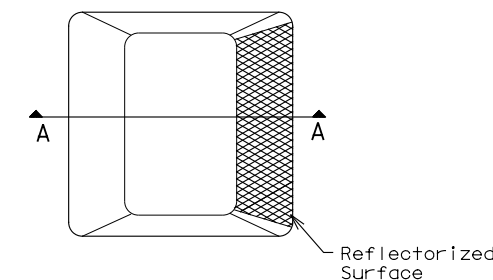
**OPTIONAL 6" EDGE
LINE, CENTER LINE
OR LANE LINE**

NOTE

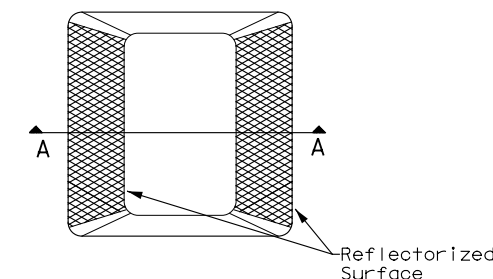
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

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

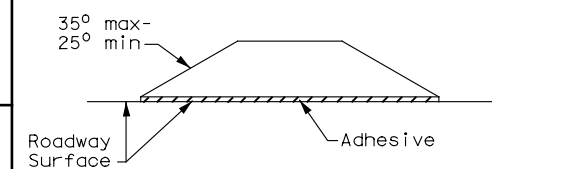
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

GENERAL NOTES

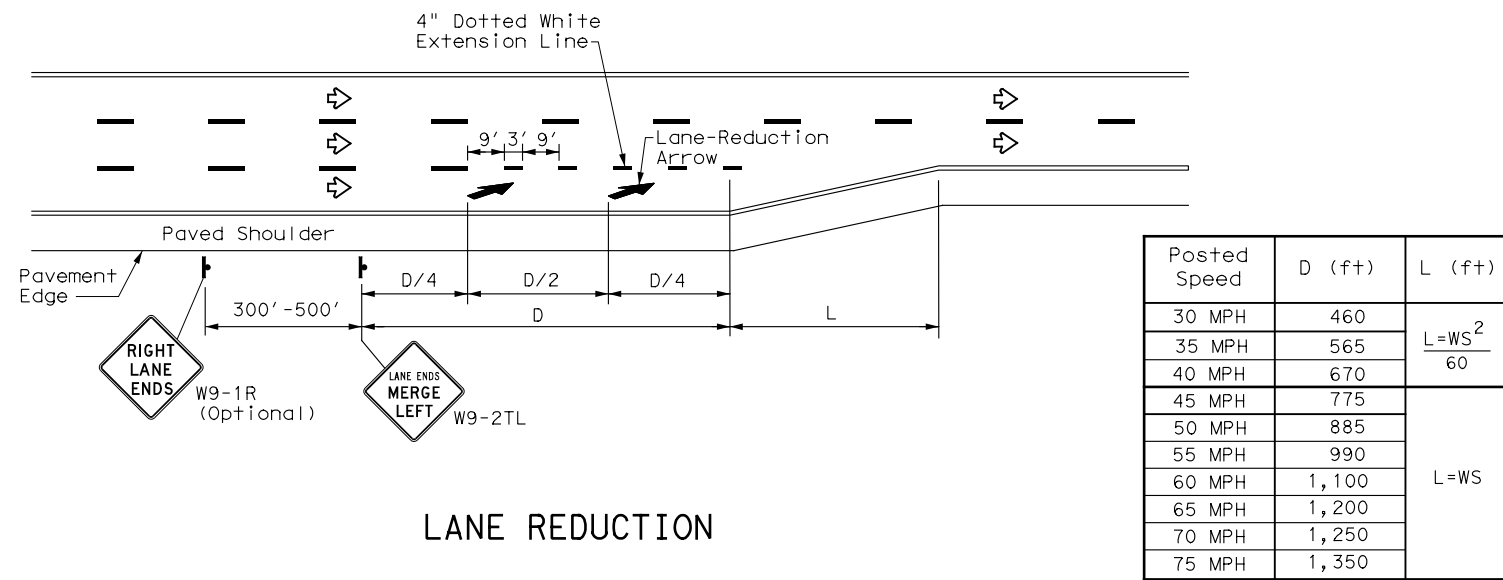
- All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.



**POSITION GUIDANCE USING
RAISED MARKERS
REFLECTORIZED PROFILE
MARKINGS
PM(2) - 20**

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
4-92 2-10	3264	01	010	FM 326
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	LFK	ANGELINA		92

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LANE REDUCTION

NOTES

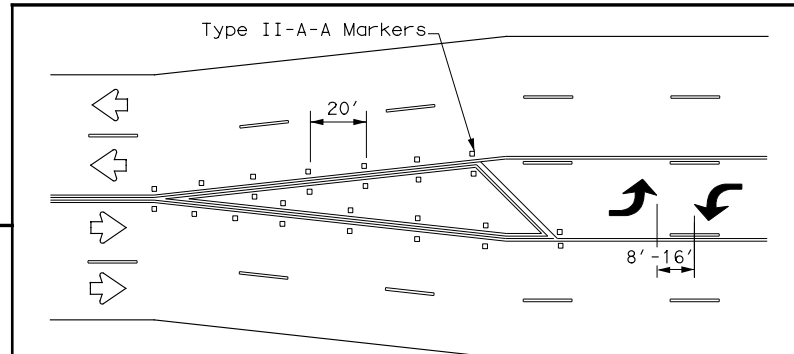
- Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
- On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
- Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
- For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

GENERAL NOTES

- Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
- When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
- Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

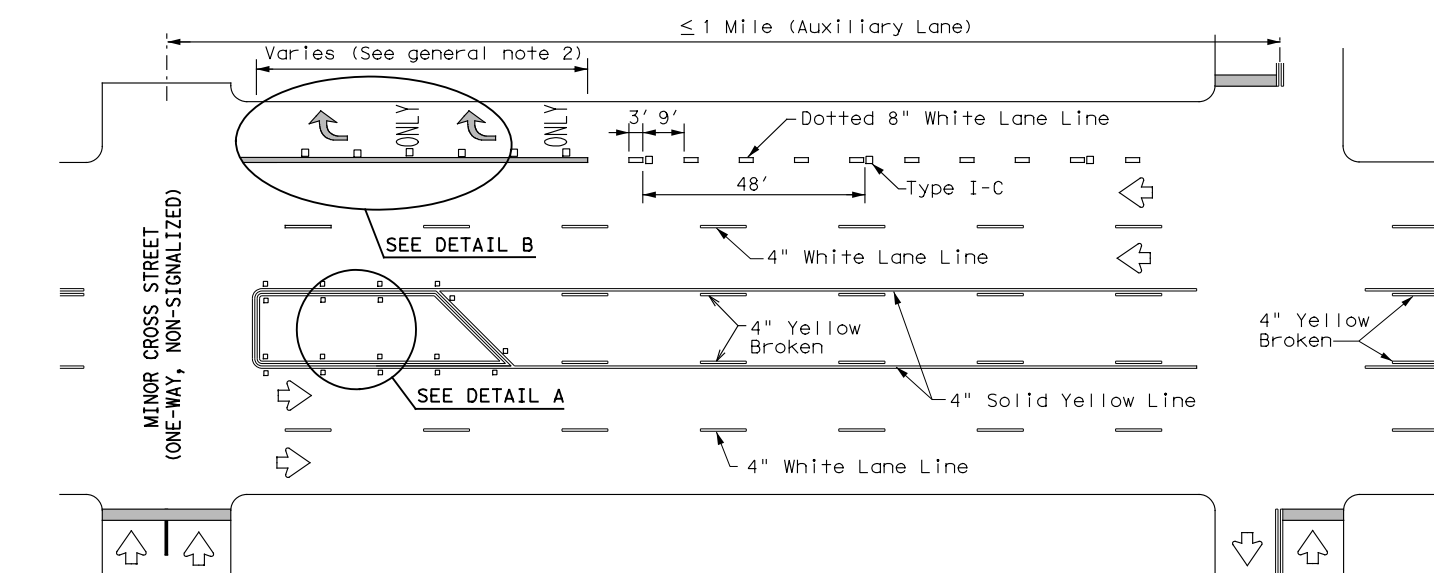
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

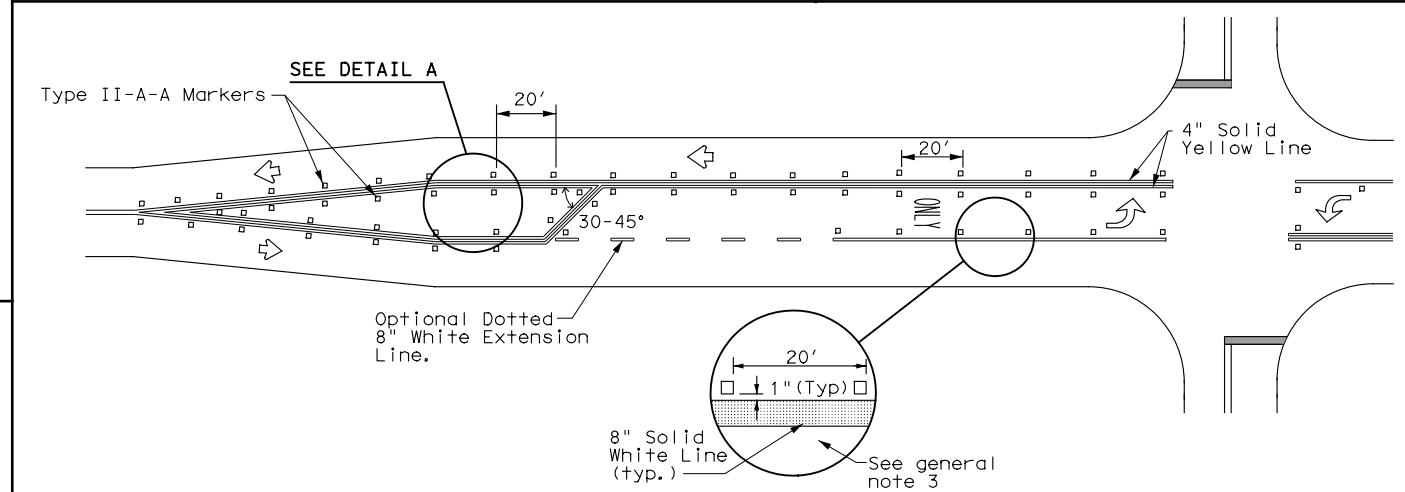


A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

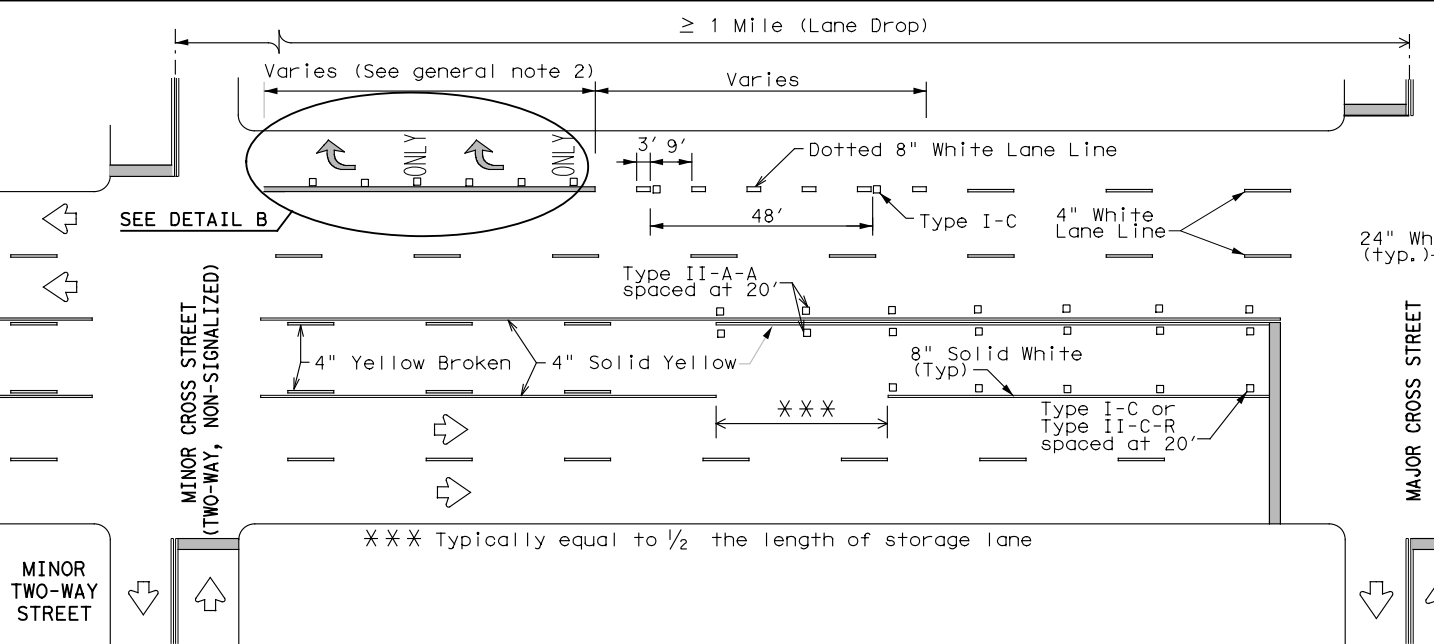
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



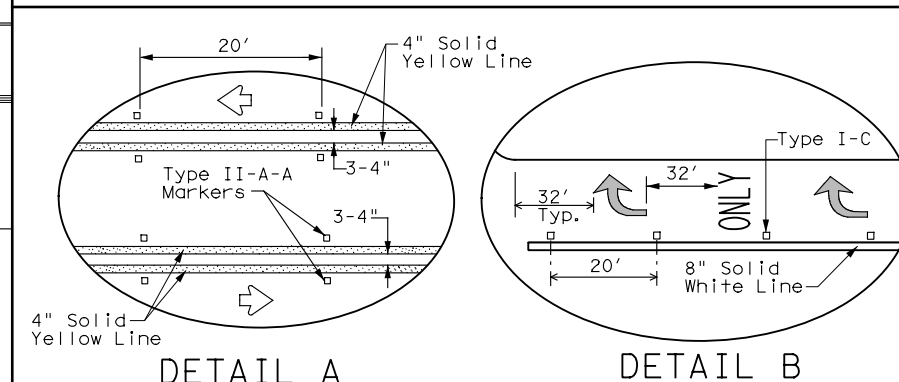
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



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



DETAIL A

DETAIL B

Texas Department of Transportation
Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	3264	01	010	FM 326
5-00 2-10	DIST	COUNTY	SHEET NO.	
8-00 2-12	LFK	ANGELINA	93	
3-03 6-20				

22C

DATE: DATE TIME
FILE: DOCUMENT NAME

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DATE: 3/25/2022
 FILE: c:\bms\pwe-useast-008\mike.schul\z\dms22937\FM326_TRF_STND_11.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

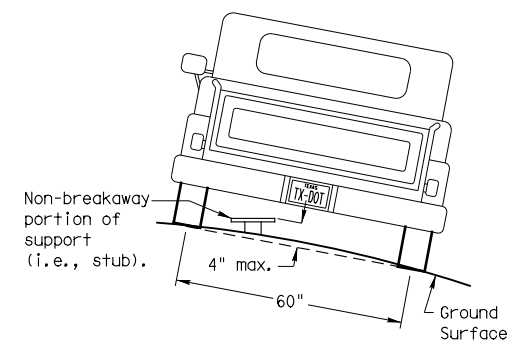
Post Type
 FRP = Fiberglass Reinforced Plastic Pipe (see SMD (FRP))
 TWT = Thin-Walled Tubing (see SMD (TWT))
 10BWG = 10 BWG Tubing (see SMD (SLIP-1) to (SLIP-3))
 S80 = Schedule 80 Pipe (see SMD (SLIP-1) to (SLIP-3))

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-3))

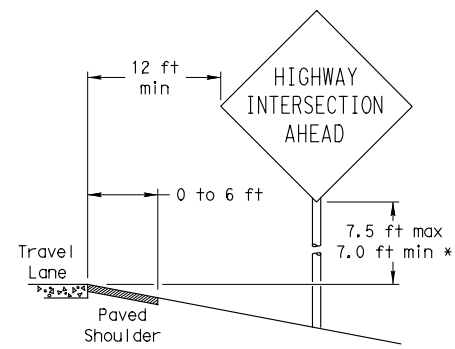
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

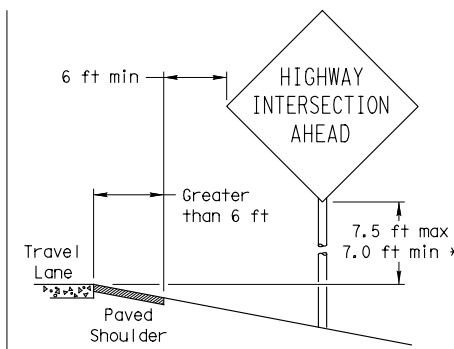
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

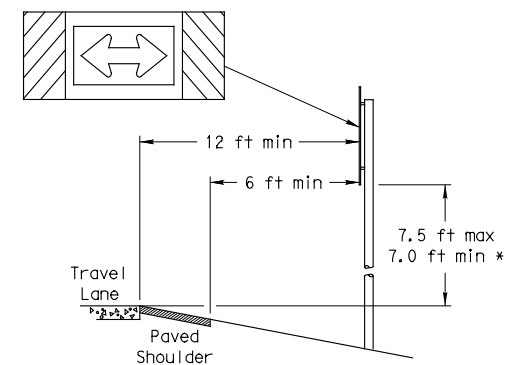
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

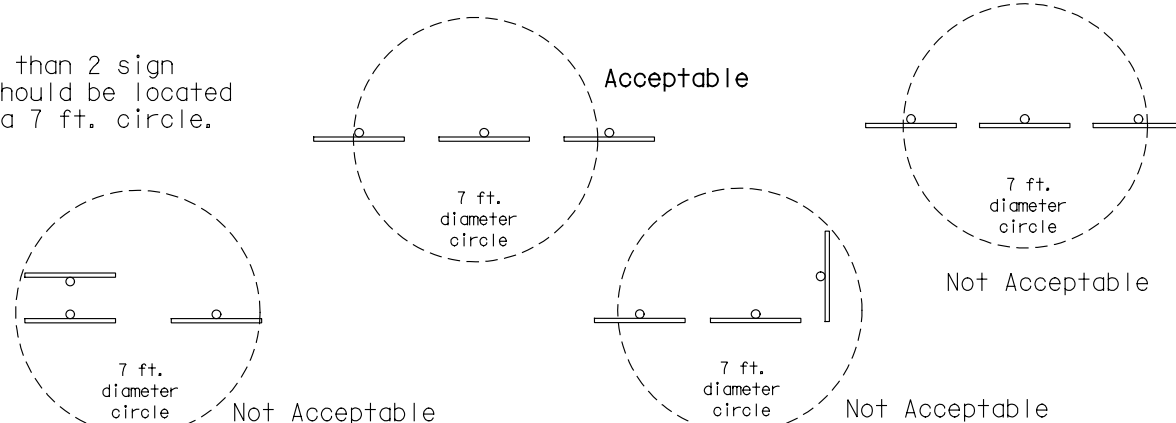
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

T-INTERSECTION

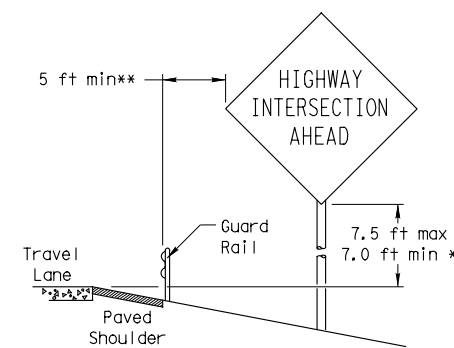


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

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

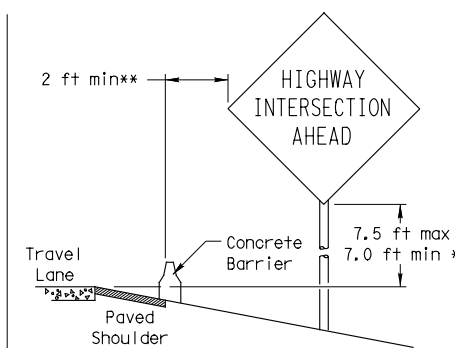


BEHIND BARRIER



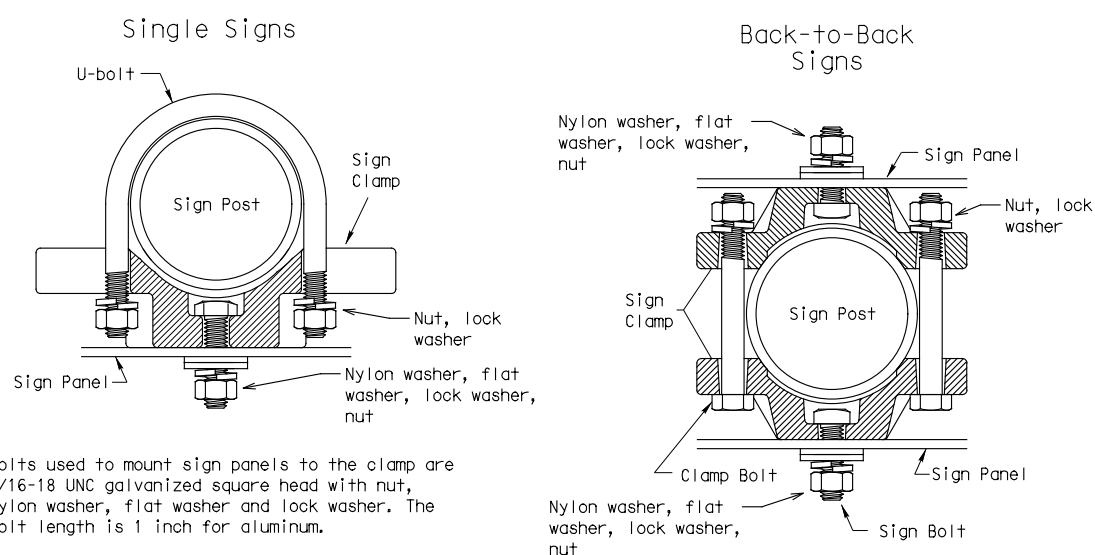
BEHIND GUARDRAIL

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



BEHIND CONCRETE BARRIER

TYPICAL SIGN ATTACHMENT DETAIL



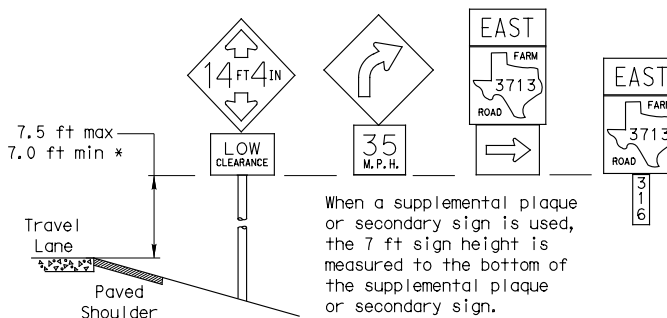
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

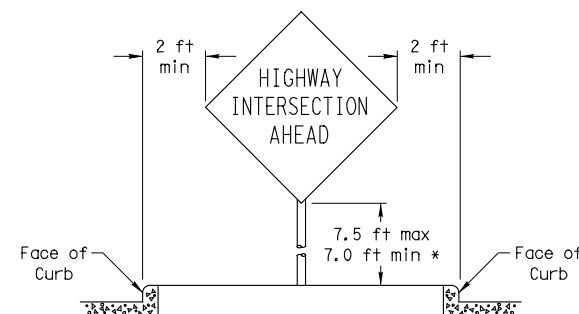
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

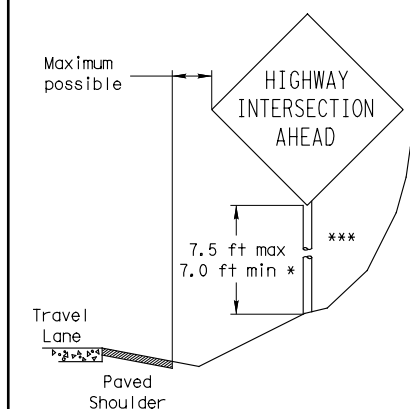


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY (When 6 ft min. is not possible.)



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

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

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

- * 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>



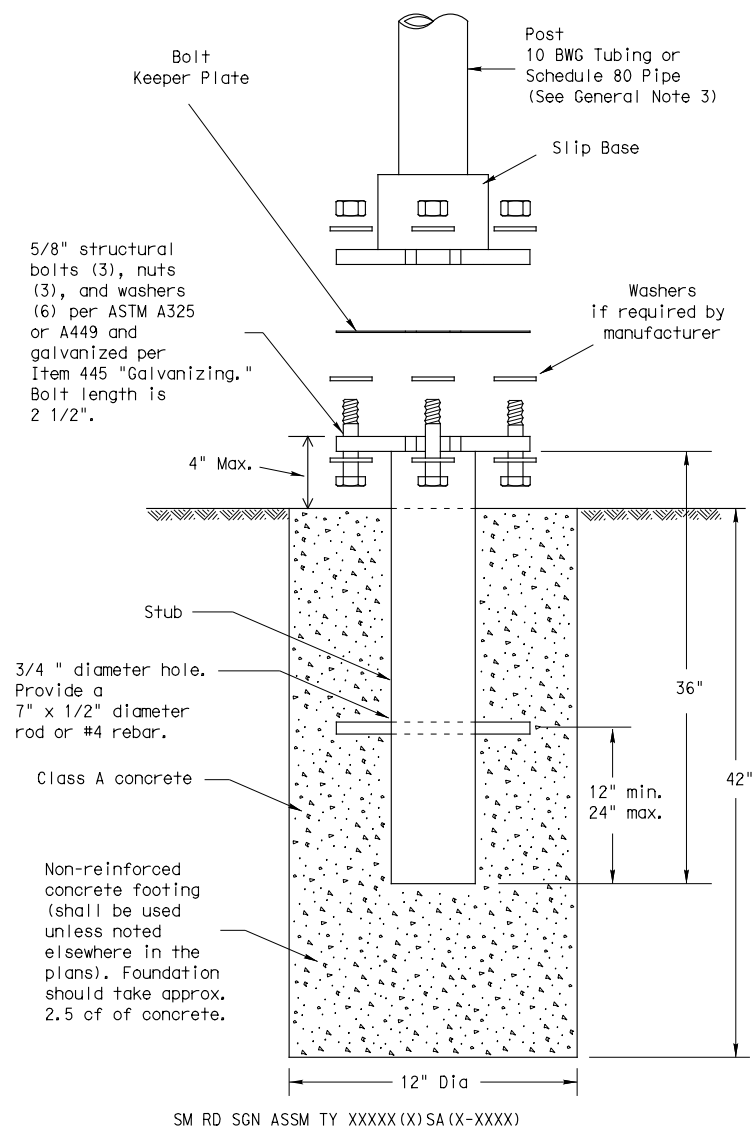
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS SMD (GEN) -08

© TxDOT July 2002		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		3264	01	010	FM 326
		DIST	COUNTY		SHEET NO.
		LFK	ANGELINA		94

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DATE: 3/25/2022
 FILE: c:\bms\pwe-useast-008\mike.schul\12\dms22937\FM326_TRF_STND_12.dgn

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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:

- 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.
- 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
- 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>
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

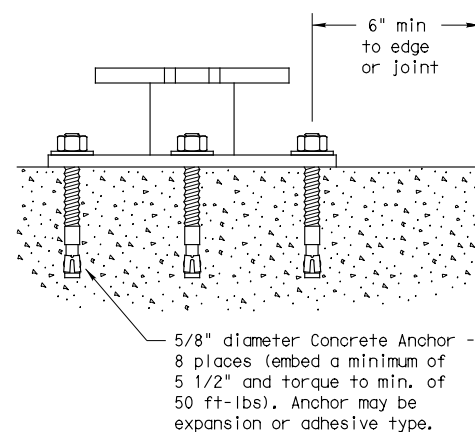
Foundation

- 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.
- 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.
- 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.
- Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
- The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

- 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.
- 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



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, "Epoxyes and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
 Traffic Operations Division

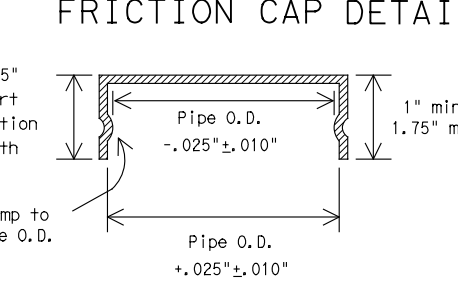
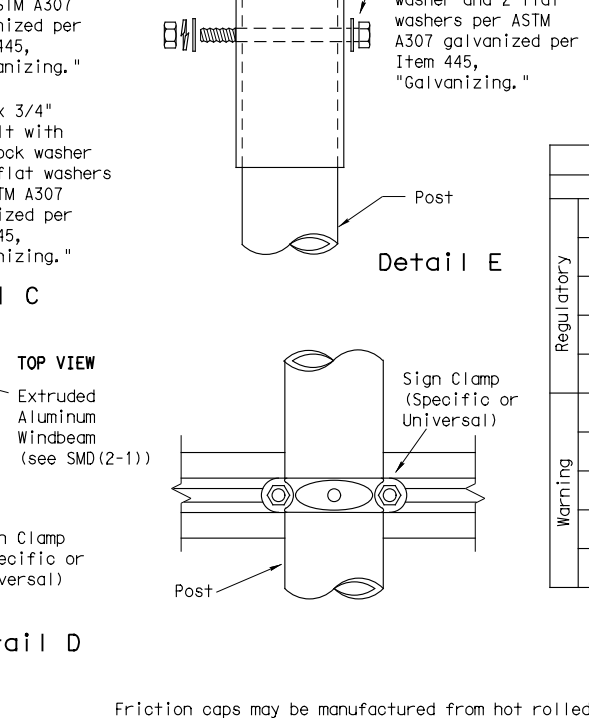
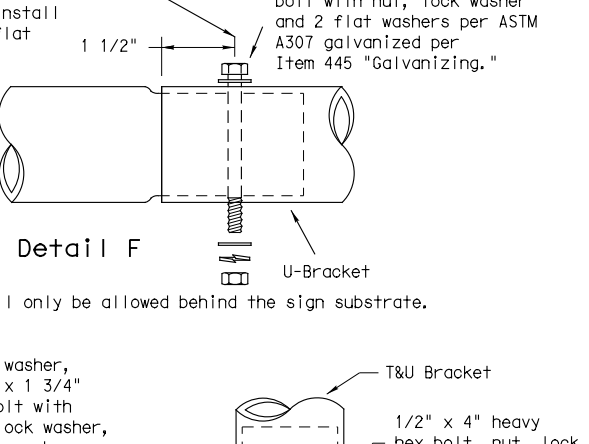
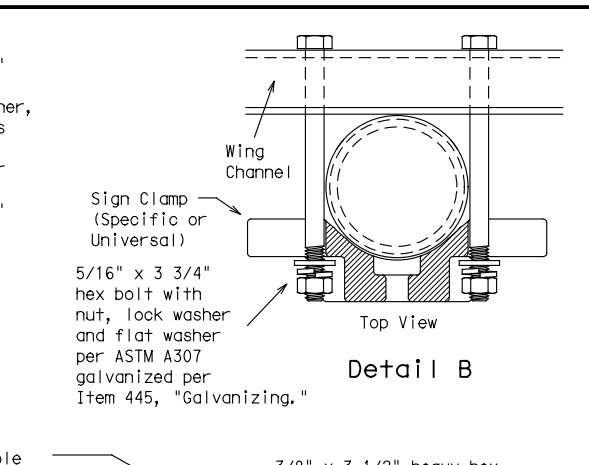
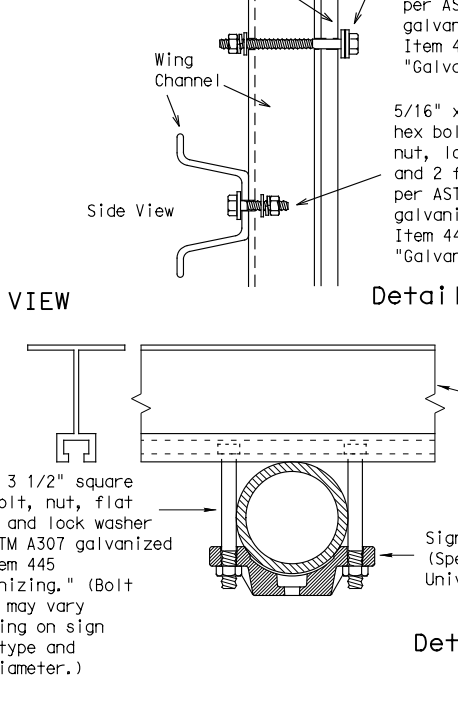
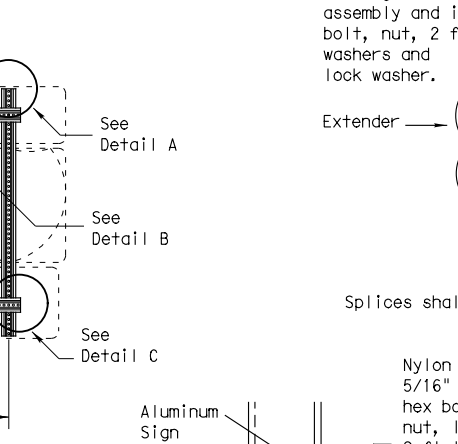
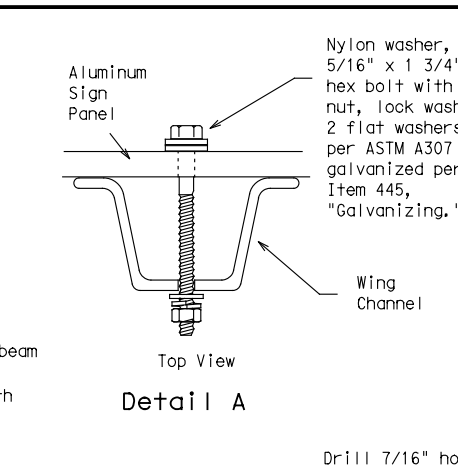
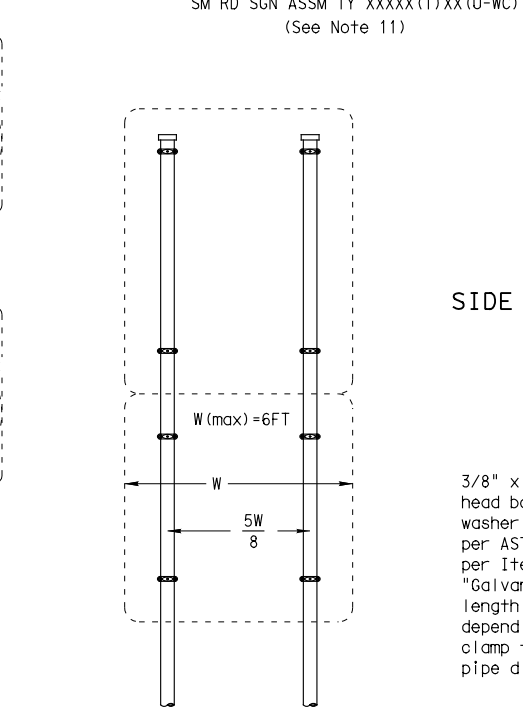
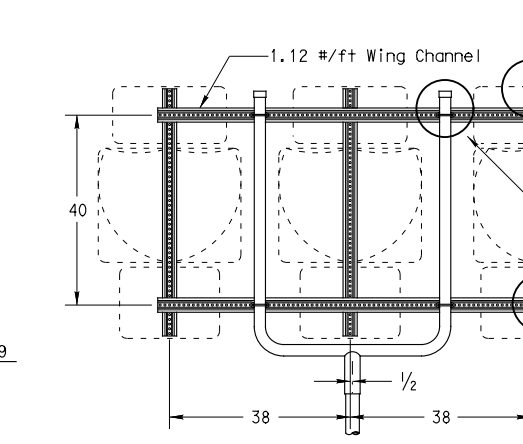
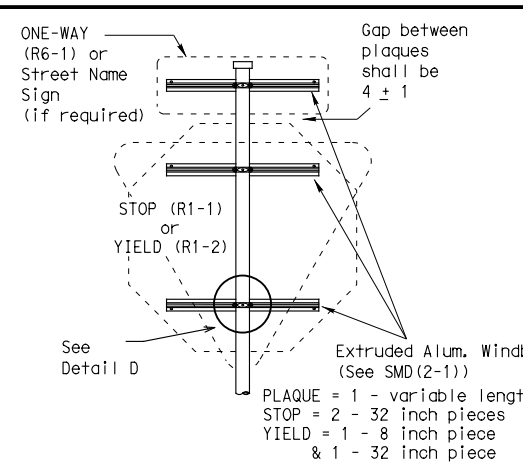
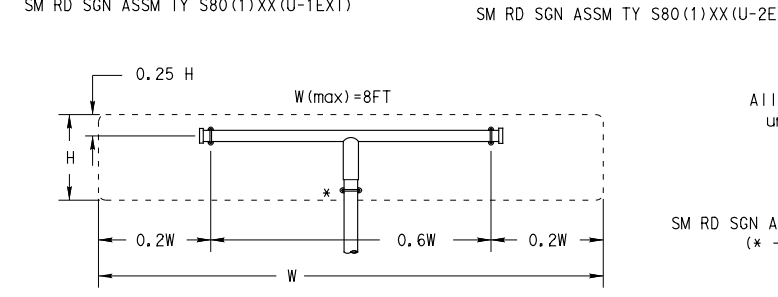
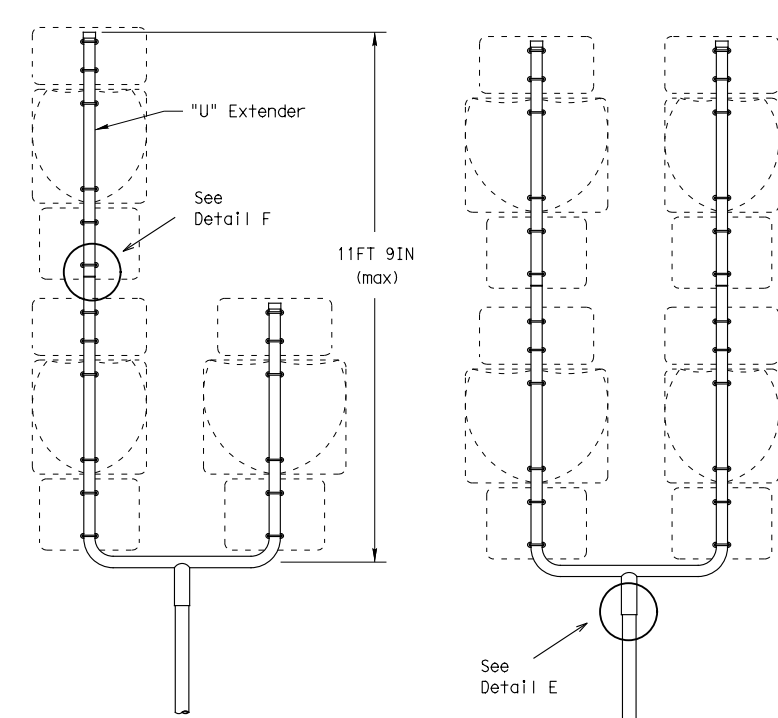
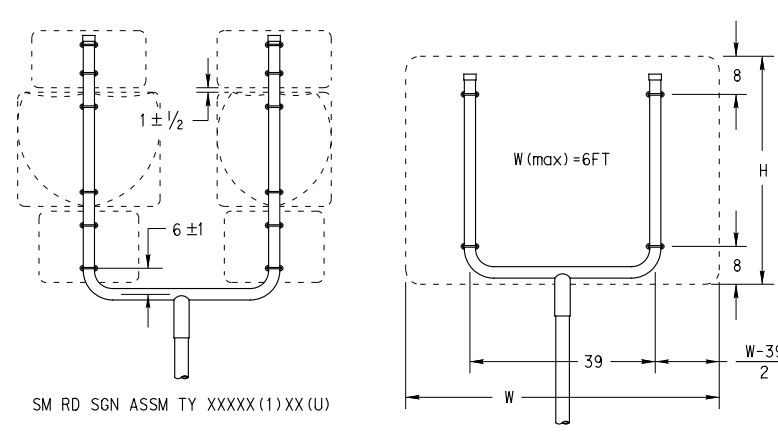
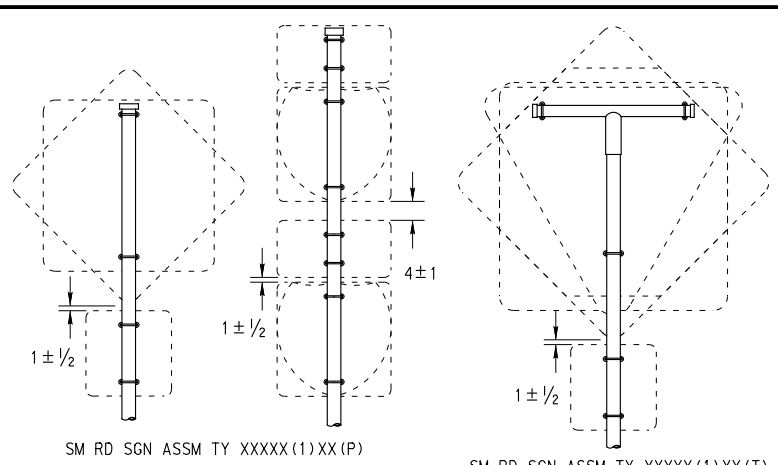
SIGN MOUNTING DETAILS
 SMALL ROADSIDE SIGNS
 TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		3264	01	010	FM 326
		DIST	COUNTY		SHEET NO.
		LFK	ANGELINA		95

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DATE: 3/25/2022
 FILE: c:\bms\pwe-useast-008\mi.ke.schul\12\dms22937\FM326_TRF_STND_13.dgn



- 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)
Warning	48x60-inch signs	TY S80(1)XX(T)
	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)	

All dimensions are in english unless detailed otherwise.

Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes. The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture. Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

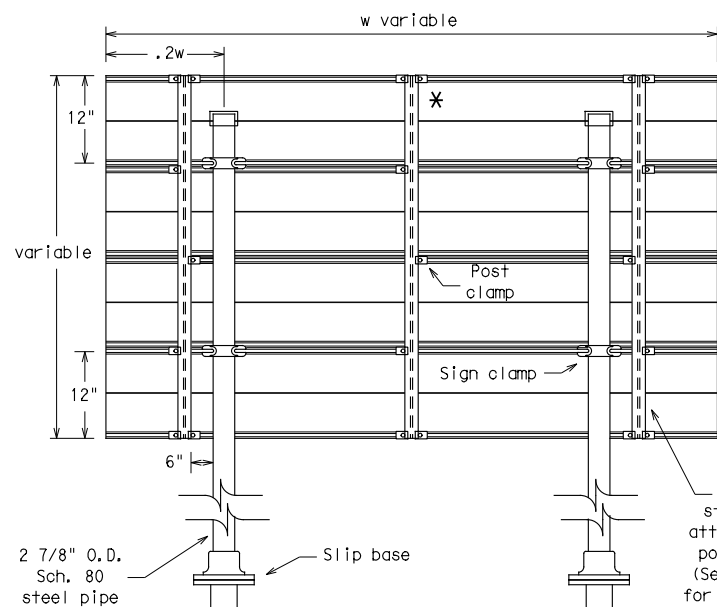
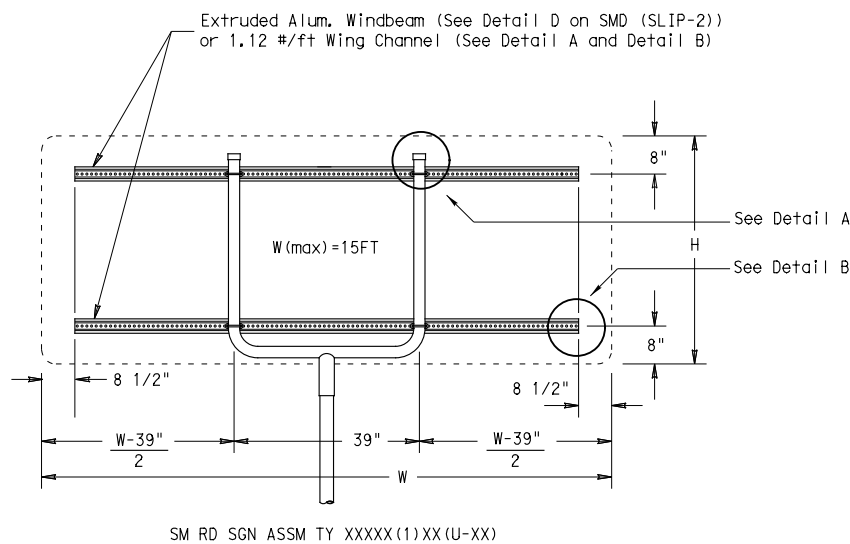
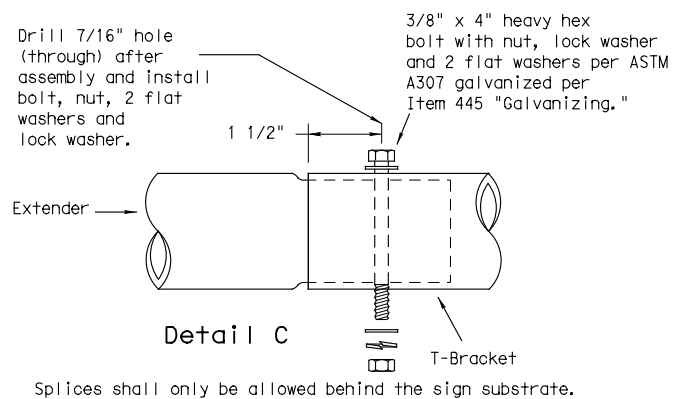
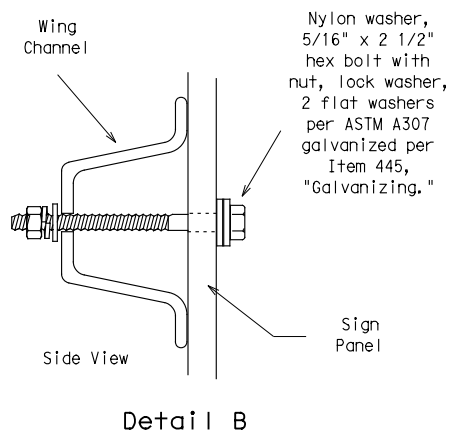
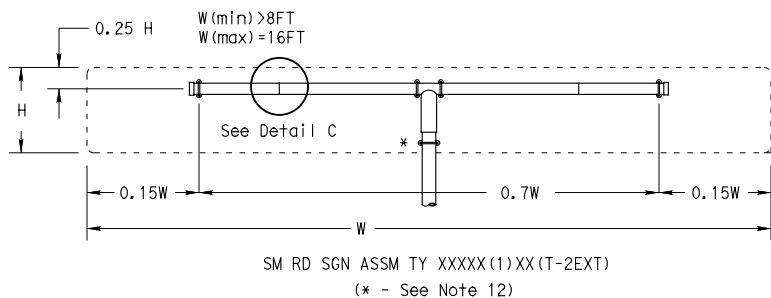
Texas Department of Transportation
 Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-2)-08

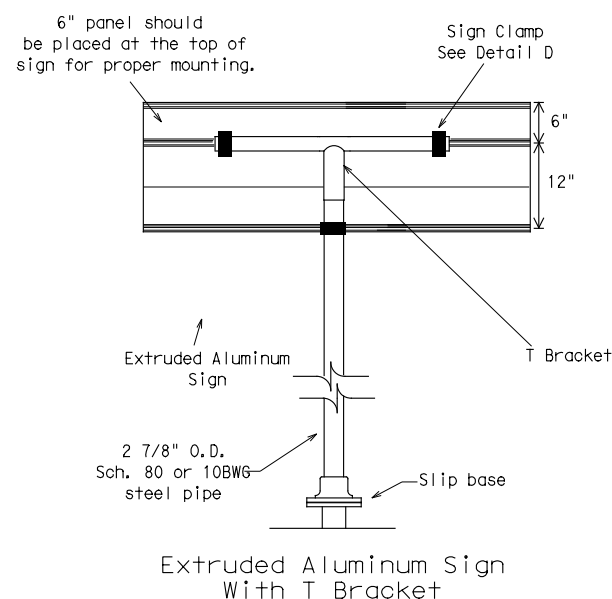
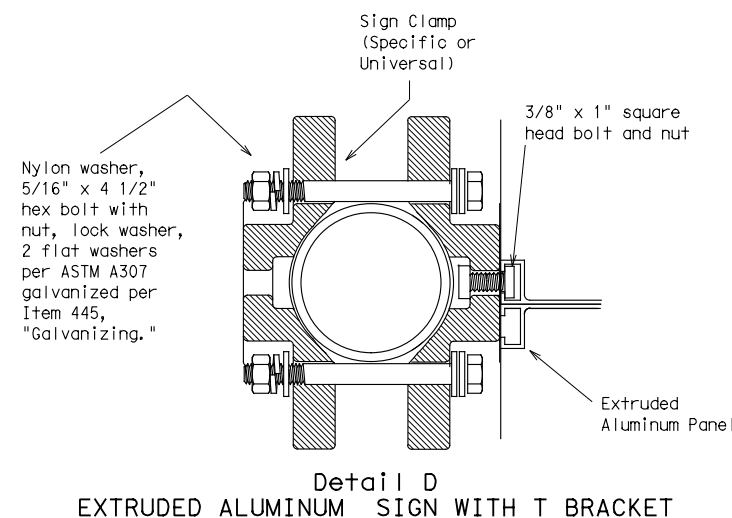
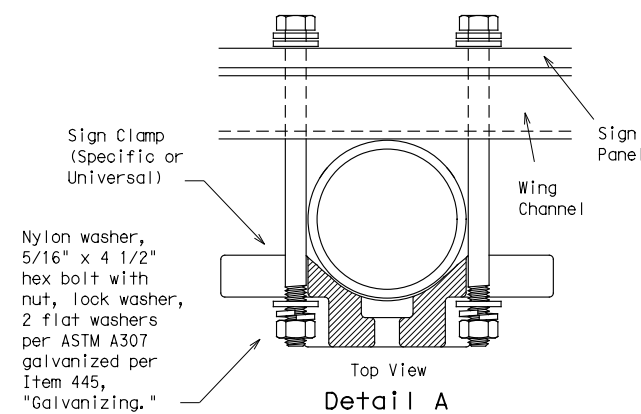
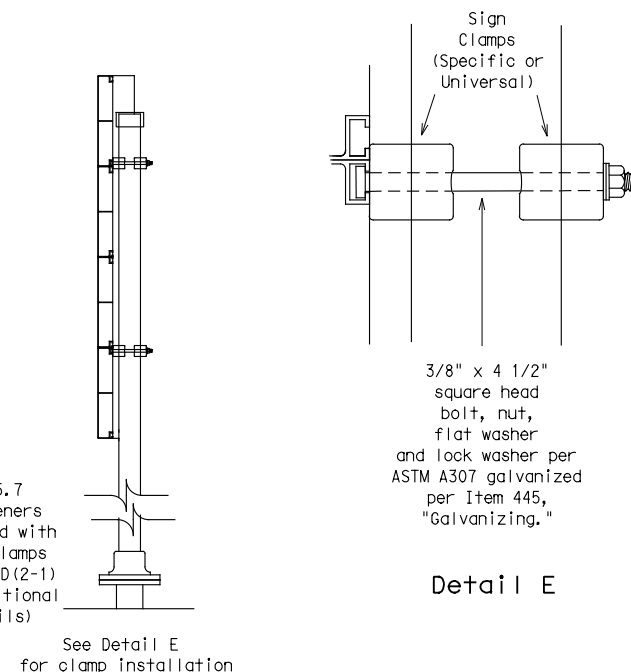
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9-08	REVISONS	CONT	SECT	JOB	HIGHWAY
		3264	01	010	FM 326
		DIST	COUNTY		SHEET NO.
		LFK	ANGELINA		96

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



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

GENERAL NOTES:

- | 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 |
- 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.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- 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.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- 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.
- 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.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- 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."
- Sign blanks shall be the sizes and shapes shown on the plans.
- Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
- Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY S80(1)XX(T)
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	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)

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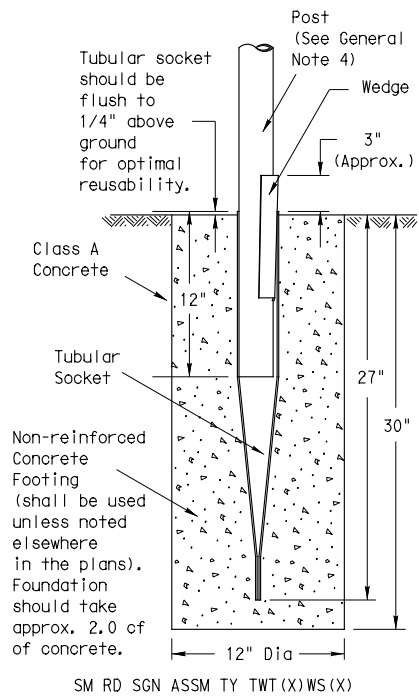
SIGN MOUNTING DETAILS
 SMALL ROADSIDE SIGNS
 TRIANGULAR SLIPBASE SYSTEM
 SMD(SLIP-3)-08

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		3264	01	010	FM 326
		DIST	COUNTY		SHEET NO.
		LFK	ANGELINA		97

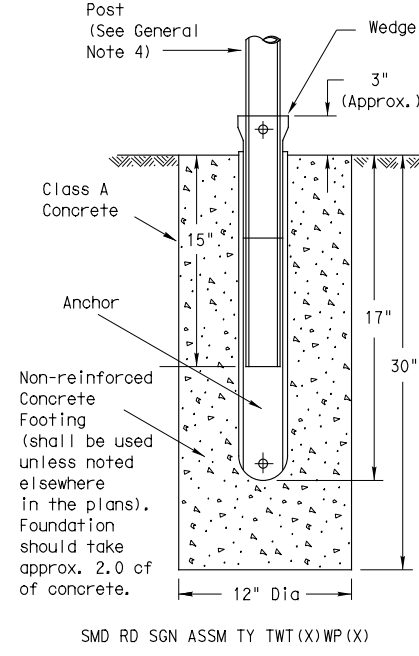
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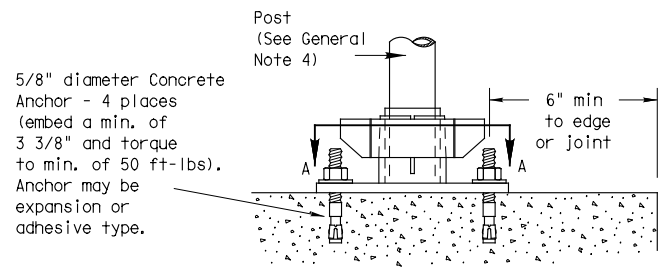
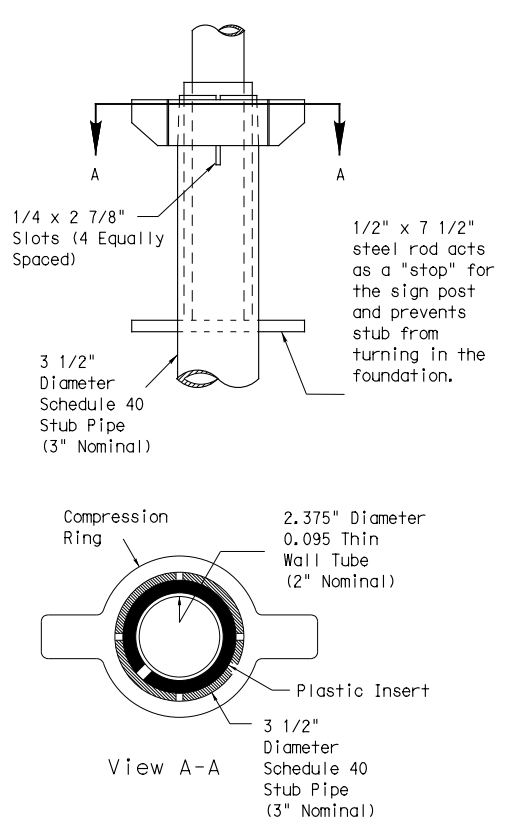
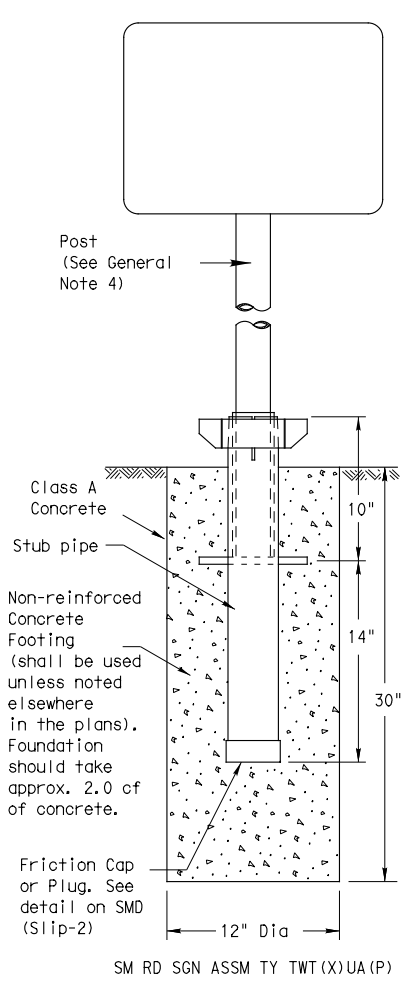
Wedge Anchor Steel System



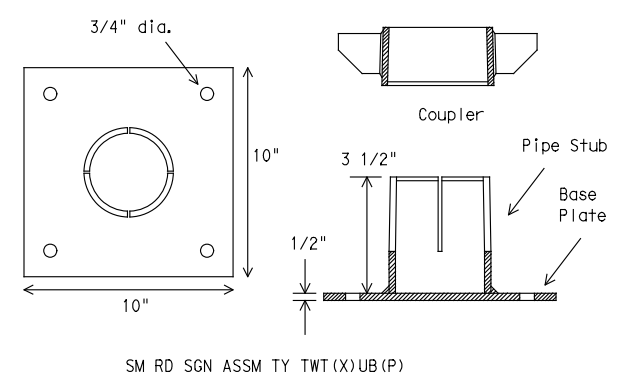
Wedge Anchor High Density Polyethylene (HDPE) System



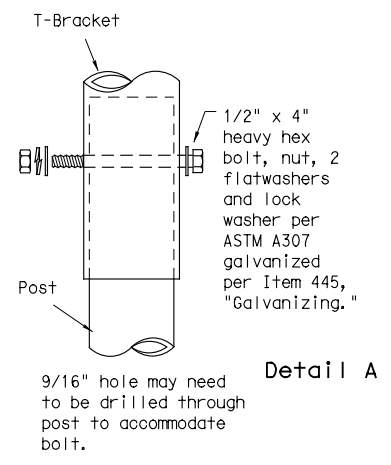
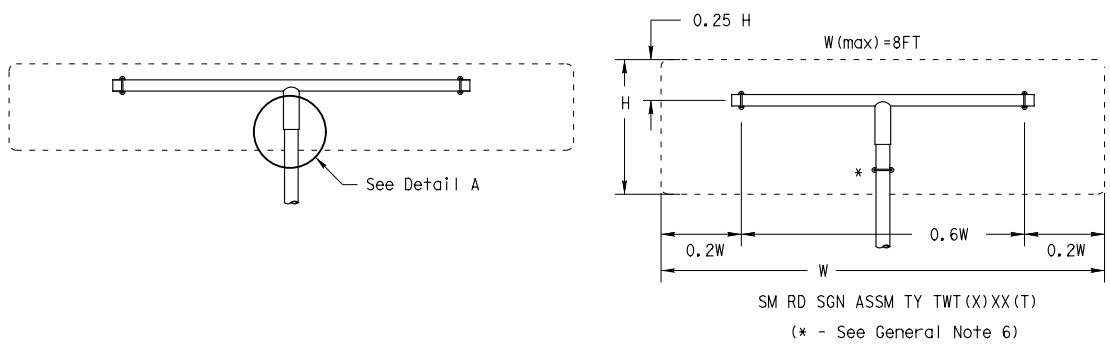
Universal Anchor System with Thin-Walled Tubing Post



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, "Epoxyes and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.



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



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

- GENERAL NOTES:
- 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.
 - 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.
 - 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
 - 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.
 - Sign blanks shall be the sizes and shapes shown on the plans.
 - Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
 - Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
 - 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
- 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.
 - 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.
 - Insert tubular socket into concrete until top of socket is approximately 1/4" above the concrete footing.
 - Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer.
 - Attach the sign to the sign post.
 - Insert the sign post into socket and align sign face with roadway.
 - Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

- UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE
- 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.
 - Insert base post in hole to depths shown and backfill hole with concrete.
 - 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.
 - Attach the sign to the sign post.
 - Install plastic insert around bottom of post.
 - Insert sign post into base post. Lower until the post comes to rest on steel rod.
 - Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
 - Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

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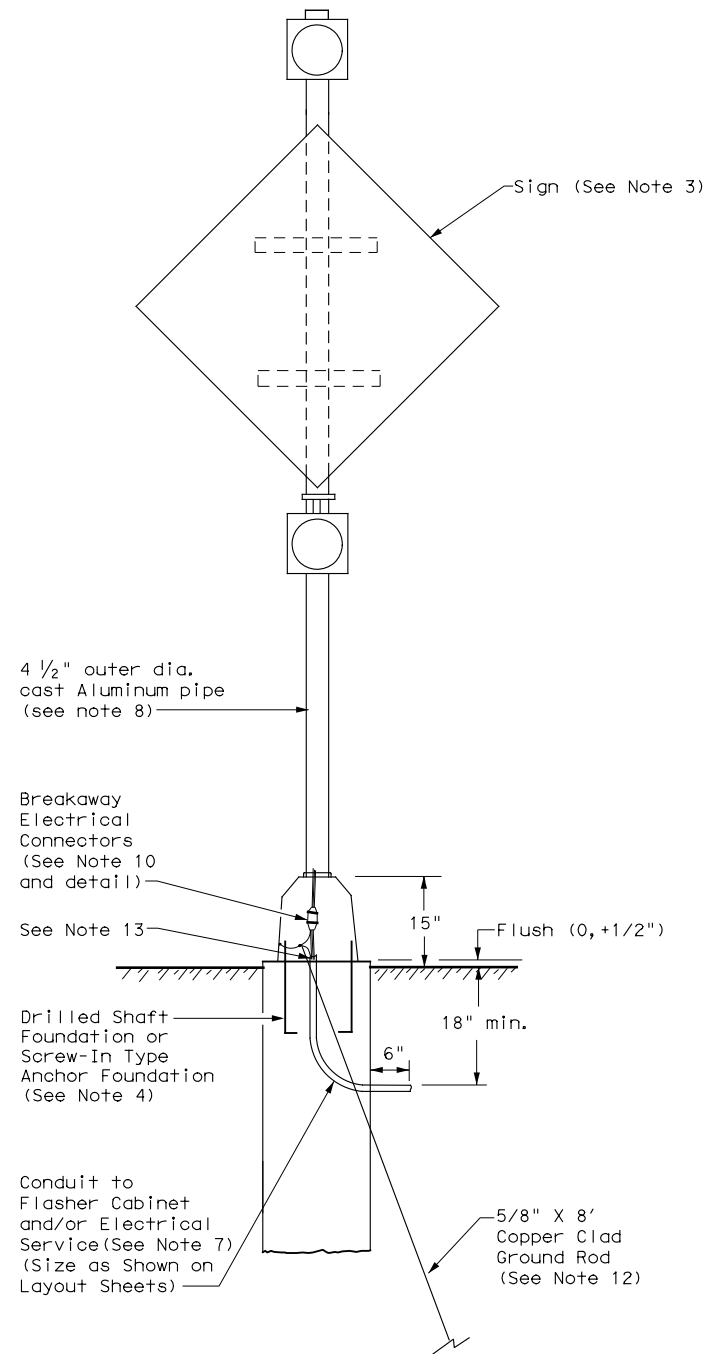
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST SMD (TWT) -08

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		3264	01	010	FM 326
		DIST	COUNTY		SHEET NO.
		LFK	ANGELINA		98

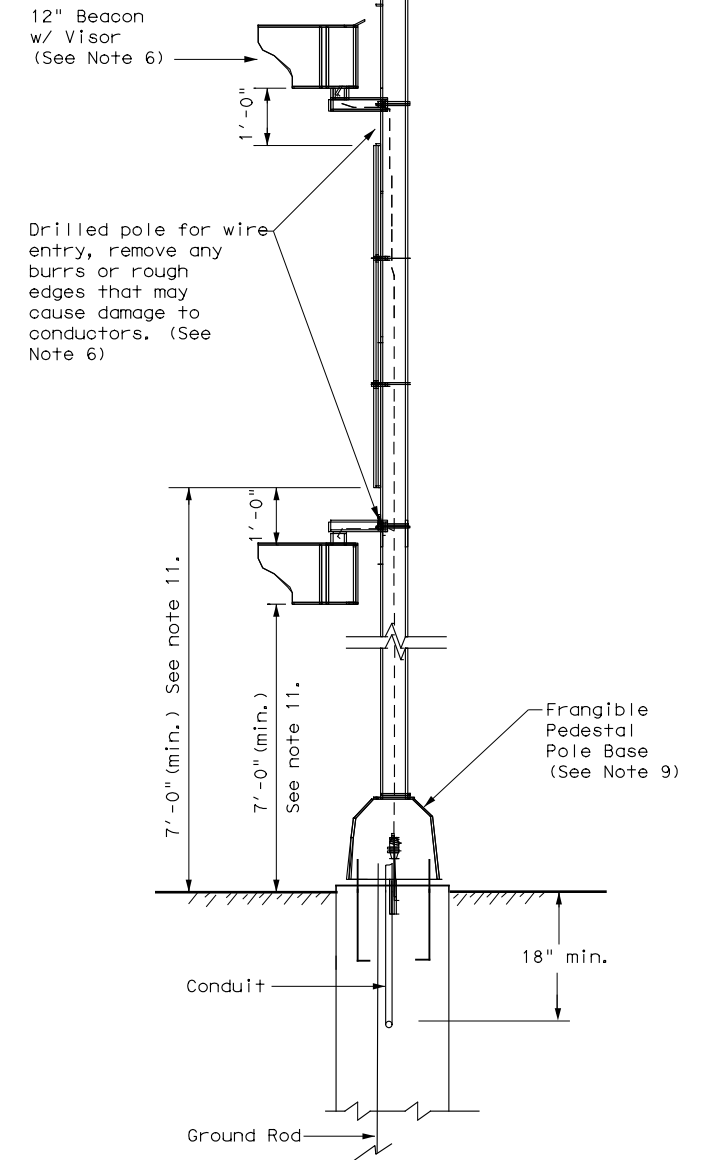
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GENERAL NOTES:

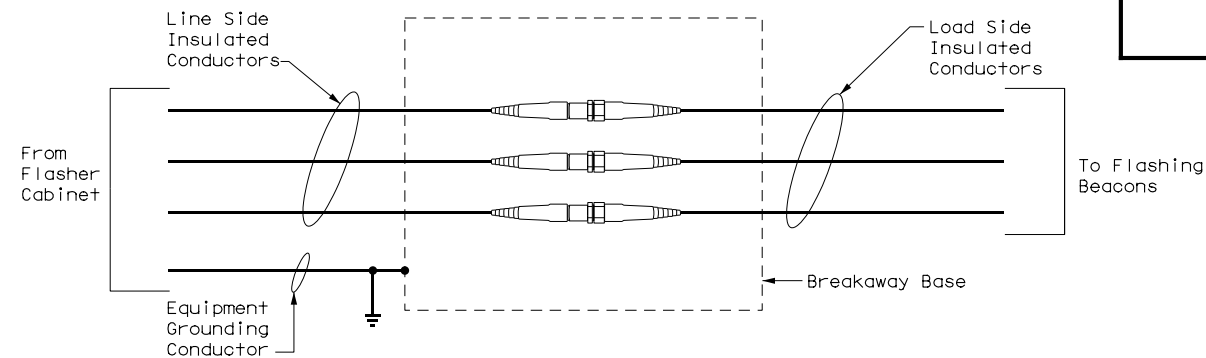
- Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon.
- See Item 685, "Roadside Flashing Beacon Assemblies" for further requirements.
- See SMD standard sheets for lateral and vertical clearances and sign mounting details. Install signs as shown on the sign layout sheets.
- Use either a Screw-In Type Anchor Foundation or a Drilled Shaft Foundation as shown elsewhere in the plans. When plans require a Drilled Shaft Foundation, see standard sheet TS-FD. Install the Screw-In Type Anchor Foundation as per manufacturer's recommendations. On a slope, install one edge at ground level. Screw-In/Drilled Shaft Foundation is subsidiary to Item 685. Installation of a ground rod is not required for solar powered flashing beacon assemblies.
- When used, provide Screw-In Type Anchor Foundations as shown on TxDOT's Material Producer List (MPL) in the file "Highway Traffic Signals".
- Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.
- Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."
- Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.
- Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening of connection.
- Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies." Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse slug. For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).
- Provide clearance as shown above the sidewalk or pavement grade at the edge of the road. When a bottom beacon is not used, mount the bottom of the sign at least 7 ft. above the sidewalk or pavement grade at the edge of the road.
- Make connections to ground rods according to NEC. Ground rod clamps shall be listed for their intended purpose.
- Ensure height of conduit and ground rod is below top of anchor bolts.



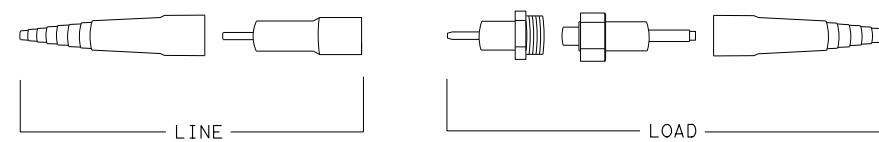
FRONT



SIDE



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



**NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS
EXPLODED VIEW**

**ROADSIDE FLASHING
BEACON ASSEMBLY**

RFBA-13

FILE: rfb-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 1992	CONT	SECT	JOB	HIGHWAY
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5-93 12-04	DIST	COUNTY	SHEET NO.	
10-93 3-13	LFK	ANGELINA	99	
4-98				

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DATE: 3/31/2022 3:43
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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 but less than 5 acres of soil

- Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
- Comply with the SWP3 and revise when necessary to control pollution or required by the Engineer.
- Post Construction Site Notice (CSN) with SWP3 information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.

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.

- Unnamed tributary to Buck Creek (STA. 15+65.00).
- Refer to EPIC 2 of 2 for Nationwide Permit (NWP) #14 non-PCN requirements in regard to work activities and stream flow.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
<input checked="" type="checkbox"/> Temporary Vegetation	<input checked="" type="checkbox"/> Silt Fence	<input type="checkbox"/> Vegetative Filter Strips
<input checked="" type="checkbox"/> Blankets/Matting	<input type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input checked="" type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Mulch Filter Berm and Socks
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<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input checked="" type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input type="checkbox"/> Sediment Basins	<input type="checkbox"/> 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.

2.

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.

2.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

- No Action Required Required Action

Action No.

In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife Code and Migratory Bird Treaty Act (MBTA), ROW clearing activities shall be conducted outside of the nesting season (March 15 to September 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.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)


- No Action Required Required Action

Action No.

1.

2.

3.

 Texas Department of Transportation		Design Standard	
<h1>EPIC</h1> (ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)			
SHEET 1 OF 2			
FILE: epic.dgn	DN: TxDOT	CK: RG	DN: VP
©TxDOT: February 2015	CONT	SECT	JOB
12-12-2011 (DS)	3264	01	010
05-07-14 ADDED NOTE SECTION IV. TO ITEM 506, ADDED GRASSY SWALES.	DIST	COUNTY	SHEET NO.
	LUFKIN	ANGELINA	100

NWP GENERAL CONDITIONS

AS APPLICABLE TO
THIS PROJECT

2. AQUATIC LIFE MOVEMENTS. NO ACTIVITY MAY SUBSTANTIALLY DISRUPT THE NECESSARY LIFE CYCLE MOVEMENTS OF THOSE SPECIES OF AQUATIC LIFE INDIGENOUS TO THE WATERBODY, INCLUDING THOSE SPECIES THAT NORMALLY MIGRATE THROUGH THE AREA, UNLESS THE ACTIVITY'S PRIMARY PURPOSE IS TO IMPOUND WATER.
3. SPAWNING AREAS. ACTIVITIES IN SPAWNING AREAS DURING SPAWNING SEASONS MUST BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE. ACTIVITIES THAT RESULT IN THE PHYSICAL DESTRUCTION (E.G., THROUGH EXCAVATION, FILL, OR DOWNSTREAM SMOTHERING BY SUBSTANTIAL TURBIDITY) OF AN IMPORTANT SPAWNING AREA ARE NOT AUTHORIZED.
6. SUITABLE MATERIAL. NO ACTIVITY MAY USE UNSUITABLE MATERIAL (E.G., TRASH, DEBRIS, CAR BODIES, ASPHALT, ETC.). MATERIAL USED FOR CONSTRUCTION OR DISCHARGED MUST BE FREE FROM TOXIC POLLUTANTS IN TOXIC AMOUNTS (SEE SECTION 307 OF THE CLEAN WATER ACT).
8. ADVERSE EFFECTS FROM IMPOUNDMENTS. IF THE ACTIVITY CREATES AN IMPOUNDMENT OF WATER, ADVERSE EFFECTS TO THE AQUATIC SYSTEM DUE TO ACCELERATING THE PASSAGE OF WATER, AND/OR RESTRICTING ITS FLOW MUST BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE.
9. MANAGEMENT OF WATER FLOWS. TO THE MAXIMUM EXTENT PRACTICABLE, THE PRE-CONSTRUCTION COURSE, CONDITION, CAPACITY, AND LOCATION OF OPEN WATERS MUST BE MAINTAINED FOR EACH ACTIVITY, INCLUDING STREAM CHANNELIZATION AND STORM WATER MANAGEMENT ACTIVITIES, EXCEPT AS PROVIDED BELOW. THE ACTIVITY MUST BE CONSTRUCTED TO WITHSTAND EXPECTED HIGH FLOWS. THE ACTIVITY MUST NOT RESTRICT OR IMPEDE THE PASSAGE OF NORMAL OR HIGH FLOWS, UNLESS THE PRIMARY PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER OR MANAGE HIGH FLOWS. THE ACTIVITY MAY ALTER THE PRE-CONSTRUCTION COURSE, CONDITION, CAPACITY, AND LOCATION OF OPEN WATERS IF IT BENEFITS THE AQUATIC ENVIRONMENT (E.G., STREAM RESTORATION OR RELOCATION ACTIVITIES).
11. EQUIPMENT. HEAVY EQUIPMENT WORKING IN WETLANDS OR MUD FLATS MUST BE PLACED ON MATS, OR OTHER MEASURES MUST BE TAKEN TO MINIMIZE SOIL DISTURBANCE.
12. SOIL EROSION AND SEDIMENT CONTROLS. APPROPRIATE SOIL EROSION AND SEDIMENT CONTROLS MUST BE USED AND MAINTAINED IN EFFECTIVE OPERATING CONDITION DURING CONSTRUCTION, AND ALL EXPOSED SOIL AND OTHER FILLS, AS WELL AS ANY WORK BELOW THE ORDINARY HIGH WATER MARK OR HIGH TIDE LINE, MUST BE PERMANENTLY STABILIZED AT THE EARLIEST PRACTICABLE DATE. PERMITTEES ARE ENCOURAGED TO PERFORM WORK WITHIN WATERS OF THE UNITED STATES DURING PERIODS OF LOW-FLOW OR NO-FLOW.
13. REMOVAL OF TEMPORARY FILLS. TEMPORARY FILLS MUST BE REMOVED IN THEIR ENTIRETY AND THE AFFECTED AREAS RETURNED TO PRE-CONSTRUCTION ELEVATIONS. THE AFFECTED AREAS MUST BE REVEGETATED, AS APPROPRIATE.
14. PROPER MAINTENANCE. ANY AUTHORIZED STRUCTURE OR FILL SHALL BE PROPERLY MAINTAINED, INCLUDING MAINTENANCE TO ENSURE PUBLIC SAFETY AND COMPLIANCE WITH APPLICABLE NWP GENERAL CONDITIONS, AS WELL AS ANY ACTIVITY-SPECIFIC CONDITIONS ADDED BY THE DISTRICT ENGINEER TO AN NWP AUTHORIZATION.
23. MITIGATION. THE DISTRICT ENGINEER WILL CONSIDER SEVERAL FACTORS WHEN DETERMINING APPROPRIATE AND PRACTICABLE MITIGATION NECESSARY TO ENSURE THAT ADVERSE EFFECTS ON THE AQUATIC ENVIRONMENT ARE MINIMAL.
25. WATER QUALITY. WHERE STATES AND AUTHORIZED TRIBES, OR EPA WHERE APPLICABLE, HAVE NOT PREVIOUSLY CERTIFIED COMPLIANCE OF AN NWP WITH CWA SECTION 401, INDIVIDUAL 401 WATER QUALITY CERTIFICATION MUST BE OBTAINED OR WAIVED (SEE 33 CFR 330.4(C)). THE DISTRICT ENGINEER OR STATE OR TRIBE MAY REQUIRE ADDITIONAL WATER QUALITY MANAGEMENT MEASURES TO ENSURE THAT THE AUTHORIZED ACTIVITY DOES NOT RESULT IN MORE THAN MINIMAL DEGRADATION OR WATER QUALITY.
27. REGIONAL AND CASE-BY-CASE CONDITIONS. THE ACTIVITY MUST COMPLY WITH ANY REGIONAL CONDITIONS THAT MAY HAVE BEEN ADDED BY THE DIVISION ENGINEER (SEE 33 CFR 330.4(E)) AND WITH ANY CASE SPECIFIC CONDITIONS ADDED BY THE CORPS OR BY THE STATE, INDIAN TRIBE, OR U.S. EPA IN ITS SECTION 401 WATER QUALITY CERTIFICATION, OR BY THE STATE IN ITS COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION.

FOR A COMPLETE LIST OF GENERAL CONDITIONS GO TO:

<http://www.swf.usace.army.mil/Missions/Regulatory/Permitting/NationwideGeneralPermits.aspx>

USACE - PERMIT #14

AS APPLICABLE TO
THIS PROJECT

ACTIVITIES REQUIRED FOR CROSSINGS OF WATERS OF THE UNITED STATES ASSOCIATED WITH THE CONSTRUCTION, EXPANSION, MODIFICATION, OR IMPROVEMENT OF LINEAR TRANSPORTATION PROJECTS (E.G., ROADS, HIGHWAYS, RAILWAYS, TRAILS, AIRPORT RUNWAYS, AND TAXIWAYS) IN WATERS OF THE U.S. FOR LINEAR TRANSPORTATION PROJECTS IN NON-TIDAL WATERS, THE DISCHARGE CANNOT CAUSE THE LOSS OF GREATER THAN 1/2-ACRE OF WATERS OF THE U.S. ANY STREAM CHANNEL MODIFICATION, INCLUDING BANK STABILIZATION, IS LIMITED TO THE MINIMUM NECESSARY TO CONSTRUCT OR PROTECT THE LINEAR TRANSPORTATION PROJECT; SUCH MODIFICATIONS MUST BE IN THE IMMEDIATE VICINITY OF THE PROJECT.

THIS NWP ALSO AUTHORIZES TEMPORARY STRUCTURES, FILLS, AND WORK NECESSARY TO CONSTRUCT THE LINEAR TRANSPORTATION PROJECT. APPROPRIATE MEASURES MUST BE TAKEN TO MAINTAIN DOWNSTREAM FLOWS AND MINIMIZE FLOODING TO THE MAXIMUM EXTENT PRACTICABLE, WHEN TEMPORARY STRUCTURES, WORK, AND DISCHARGES, INCLUDING COFFERDAMS, ARE NECESSARY FOR CONSTRUCTION ACTIVITIES, ACCESS FILLS, OR DEWATERING OF CONSTRUCTION SITES. TEMPORARY FILLS MUST CONSIST OF MATERIALS, AND BE PLACED IN A MANNER THAT WILL NOT BE ERODED BY EXPECTED HIGH FLOWS. TEMPORARY FILLS MUST BE REMOVED IN THEIR ENTIRETY AND THE AFFECTED AREAS RETURNED TO PRE-CONSTRUCTION ELEVATIONS. THE AREAS AFFECTED BY TEMPORARY FILLS MUST BE REVEGETATED, AS APPROPRIATE.

THIS NWP CANNOT BE USED TO AUTHORIZE NON-LINEAR FEATURES COMMONLY ASSOCIATED WITH TRANSPORTATION PROJECTS, SUCH AS VEHICLE MAINTENANCE OR STORAGE BUILDINGS, PARKING LOTS, TRAIN STATIONS, OR AIRCRAFT HANGARS.


NOTIFICATION: THE PERMITTEE MUST SUBMIT A PRE-CONSTRUCTION NOTIFICATION (PCN) TO THE DISTRICT ENGINEER PRIOR TO COMMENCING THE ACTIVITY IF: (1) THE LOSS OF WATERS OF THE U.S. EXCEEDS 1/10-ACRE; OR (2) THERE IS A DISCHARGE IN A SPECIAL AQUATIC SITE, INCLUDING WETLANDS.

NOTE:

THE PROJECT CROSSES JURISDICTIONAL WATERS OF THE U.S. AND A NWP #14 WITH NO PCN HAS BEEN UTILIZED. THIS PERMIT AUTHORIZES THE ACTIVITIES WHICH WILL IMPACT WATERS OF THE U.S. THE NWP GENERAL CONDITIONS AND THE NWP #14 LIMITS MUST BE FOLLOWED IN ORDER TO MAINTAIN COMPLIANCE WITH THE NWP. NO COORDINATION HAS TAKEN PLACE WITH THE USACE BECAUSE IMPACTS WILL NOT EXCEED THE ABOVE CRITERIA. IF COORDINATION MAY BE NEEDED, CONTACT THE TXDOT LUFKIN DISTRICT ENVIRONMENTAL SECTION AT 1-800-687-8087.

ENVIRONMENTAL PERMITS,
ISSUES AND COMMITMENTS (EPIC) □

USACE

		Design Standard	
<p>EPIC (ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)</p>			
SHEET 2 OF 2			
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP
© TxDOT: February 2015	CONT	SECT	JOB
12-12-2011 (DS) REVISIONS	3264	01	010
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	LUFKIN	ANGELINA	101

DATE: 6/15/2022 3:13:09 PM
 FILE: c:\bms\pwe-useast-008\mi.ke.schul\z\dms22937\FM326_2017NWP14_EPIC_101.dgn

3/25/2022 c:\bms\pwe-useast-008\mi\ke.schul\tz\dms22937\FM326*SWP3*STND*101.dgn

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: THIS PROJECT CONSISTS OF THE RECONSTRUCTION AND WIDENING OF AN EXISTING ROADWAY, INCLUDING THE GRADING OF ROADSIDE DITCHES AND CONSTRUCTION OF PARALLEL AND CROSS CULVERT DRAINAGE STRUCTURES
- B. POTENTIAL POLLUTANTS AND THEIR SOURCES: 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: 5.38 ACRE AREA TO BE DISTURBED: 4.02 ACRE
- E. DATA DESCRIBING THE SOIL OR QUALITY OF ANY DISCHARGE FROM THE SITE: 75% FINE SANDY LOAM SOMEWHAT POORLY DRAINED AND 25% SANDY LOAM MODERATELY WELL DRAINED
- 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 TYPICAL SECTIONS
 - iii. AREAS WHERE SOIL DISTURBANCE WILL OCCUR: SEE SWP3 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: SEE SWP3 LAYOUTS (CONSTRUCTION EXITS)
- 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: UNNAMED TRIBUTARY TO BUCK CREEK
 - AN ASTERISK (*) INDICATES AN IMPAIRED WATER
 - 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

<u> </u> T/P	TEMP/PERM SEEDING	<u> </u>	PROTECTION OF TREES AND VEGETATION
<u> </u>	MULCHING (HAY OR STRAW)	<u> </u>	GEOTEXTILES
<u> </u>	VEGETATIVE BUFFER STRIPS	<u> </u> P	SLOPE TEXTURING
<u> </u>	SOD STABILIZATION	<u> </u>	TEMP VELOCITY DISSIPATION DEVICES
<u> </u> P	BLOCK SOD	<u> </u>	FLOW DIVERSION MECHANISMS
<u> </u>	OTHER	<u> </u> 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

- SILT FENCE
- OTHER (ROCK FILTER DAMS)
- VEGETATIVE BUFFER STRIPS

IF SITE WILL DISTURB 10 OR MORE ACRES WITHIN A COMMON DRAINAGE LOCATION AND A SEDIMENTATION BASIN IS NOT FEASIBLE, PROVIDE REASON:

N/A. PROJECT DOES NOT DISTURB 10 OR MORE ACRES

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

* SYMBOL INDICATES THAT THE INFORMATION SHOULD BE DISPLAYED ON THE PROJECT BULLETIN BOARD

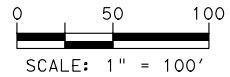


TXDOT SWP3 INDEX (SWP3I)

© 2022 Texas Department of Transportation			
CONT	SECT	JOB	HIGHWAY
3264	01	010	FM 326
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		102

(REVISED OCTOBER 30, 2013)

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

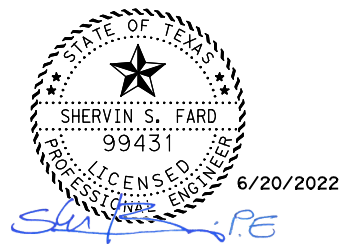
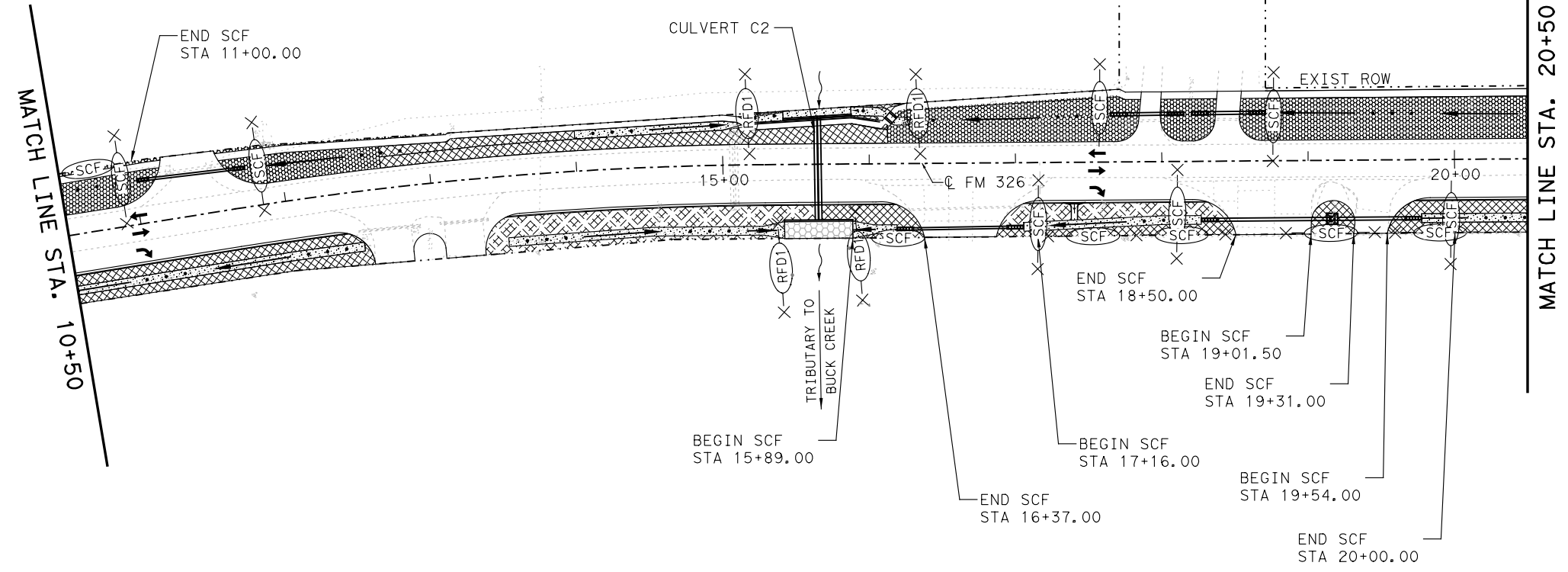
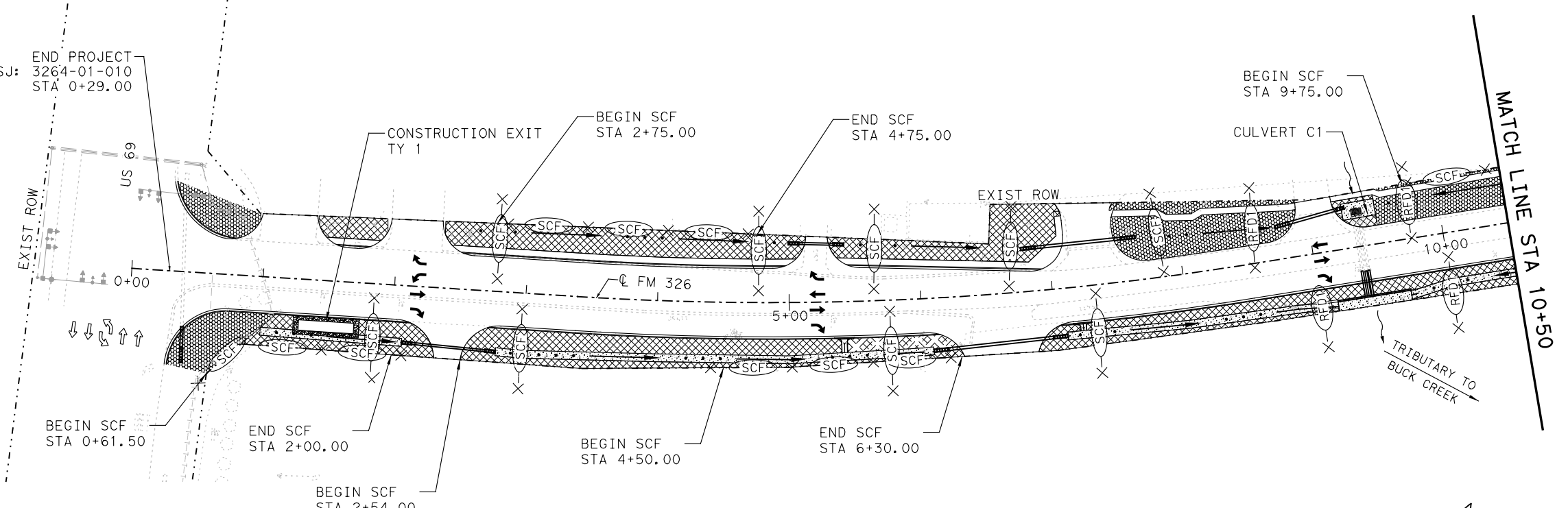


LEGEND

- ⊗-SCF-⊗ TEMP SEDMT CONT FENCE
- ⊗-RFD1-⊗ ROCK FILTER DAM (TY 1)
- SEDIMENT CONTROL FENCE AROUND INLET
- ▭ CONSTRUCTION EXIT (TY 1)
- ⋯ PROPOSED DITCH
- - - EXISTING ROW
- PROPOSED STORM SEWER
- ▬ SAFETY END TREATMENT
- ➔ DIRECTION OF TRAFFIC FLOW
- ▨ BLOCK SOD
- ▩ BROADCAST SEED W/SOIL RETENTION BLANKET
- FLOW ARROW

NOTE:
LOCATIONS OF THE CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

END PROJECT
CSJ: 3264-01-010
STA 0+29.00



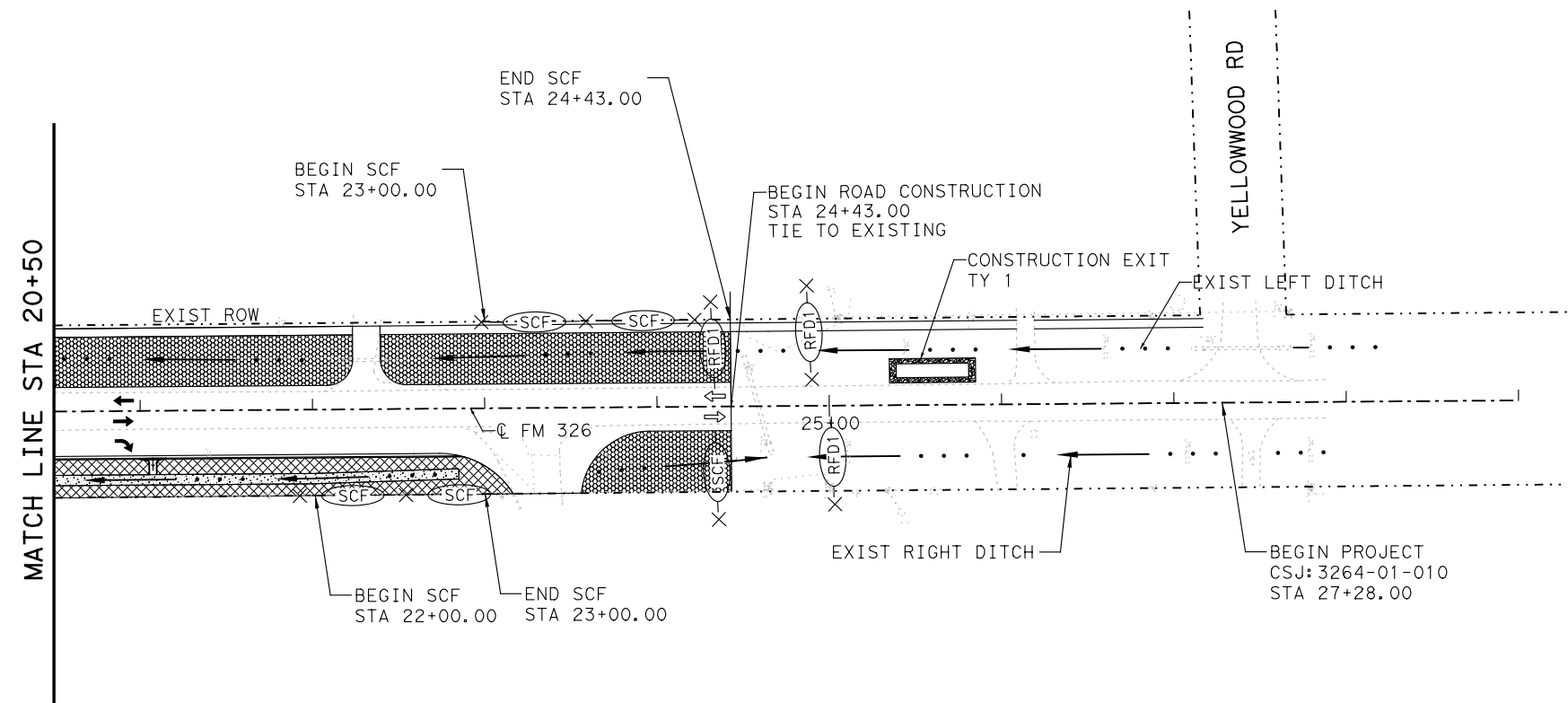
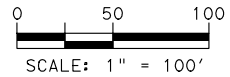
OMEGA ENGINEERS, INC. 16360 PARK TEN PLACE, Ste. #325 HOUSTON TEXAS, 77084
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:281 647 9182 F:281 647 9184

SWP3 LAYOUT

SHEET 1 OF 2

DESIGNED:	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010
				SHEET No. 103

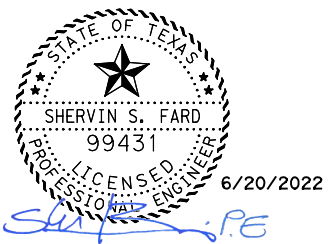
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- LEGEND**
- ⊗-SCF-⊗ TEMP SEDMT CONT FENCE
 - ⊗-RFD1-⊗ ROCK FILTER DAM (TY 1)
 - SEDIMENT CONTROL FENCE AROUND INLET
 - ▭ CONSTRUCTION EXIT (TY 1)
 - ⋯ PROPOSED DITCH
 - - - EXISTING ROW
 - PROPOSED STORM SEWER
 - ▬ SAFETY END TREATMENT
 - ➔ DIRECTION OF TRAFFIC FLOW
 - ▧ BLOCK SOD
 - ▨ BROADCAST SEED W/SOIL RETENTION BLANKET
 - FLOW ARROW

NOTE:
 LOCATIONS OF THE CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

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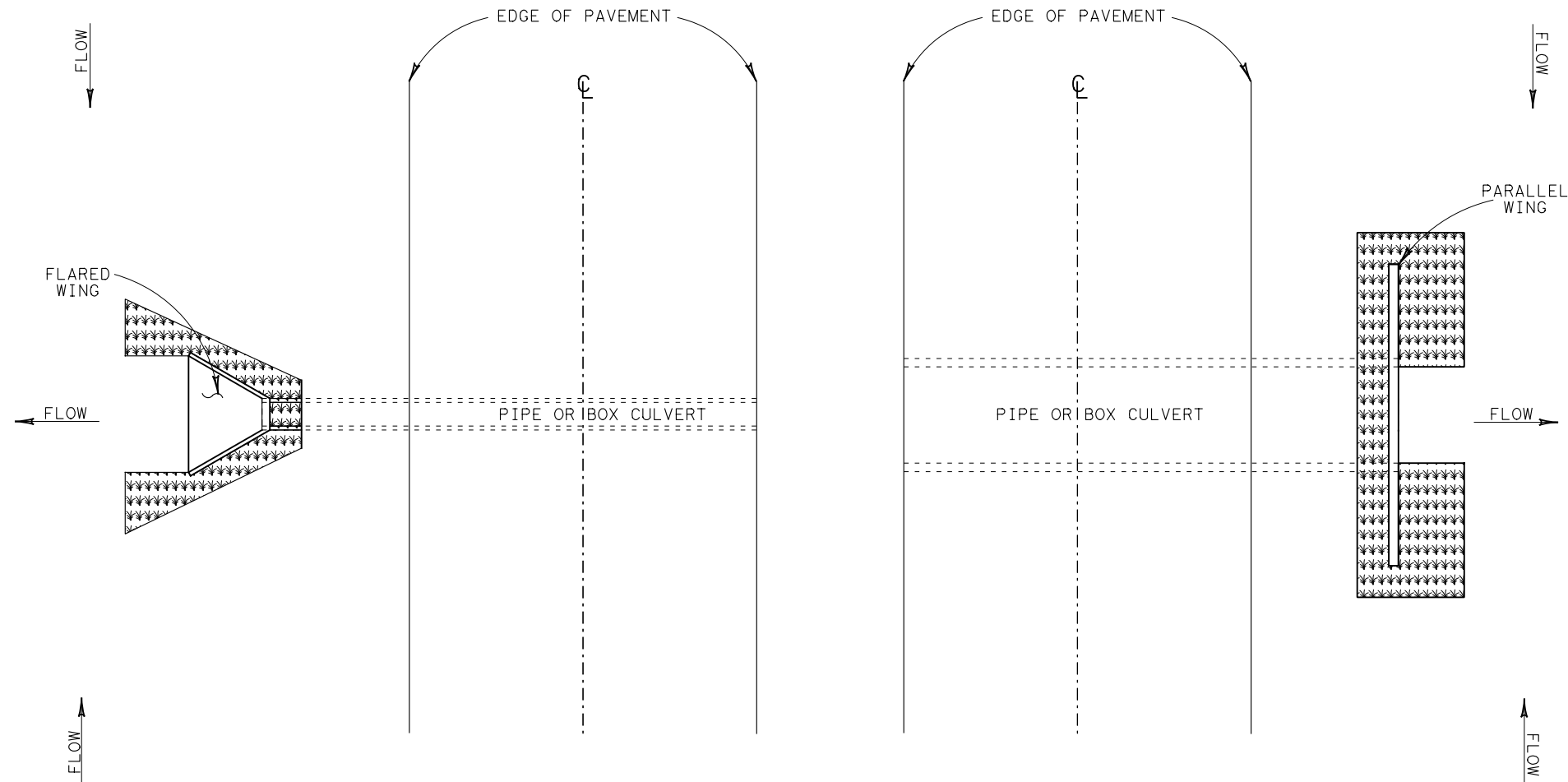


OMEGA ENGINEERS, INC. 16360 PARK TEN PLACE, Ste. #325
 HOUSTON TEXAS, 77084
 OMEGAENGINEERS.COM
 TX PE Firm Reg. No. F-2147
 P:281 647 9182 F:281 647 9184

SWP3 LAYOUT

SHEET 2 OF 2

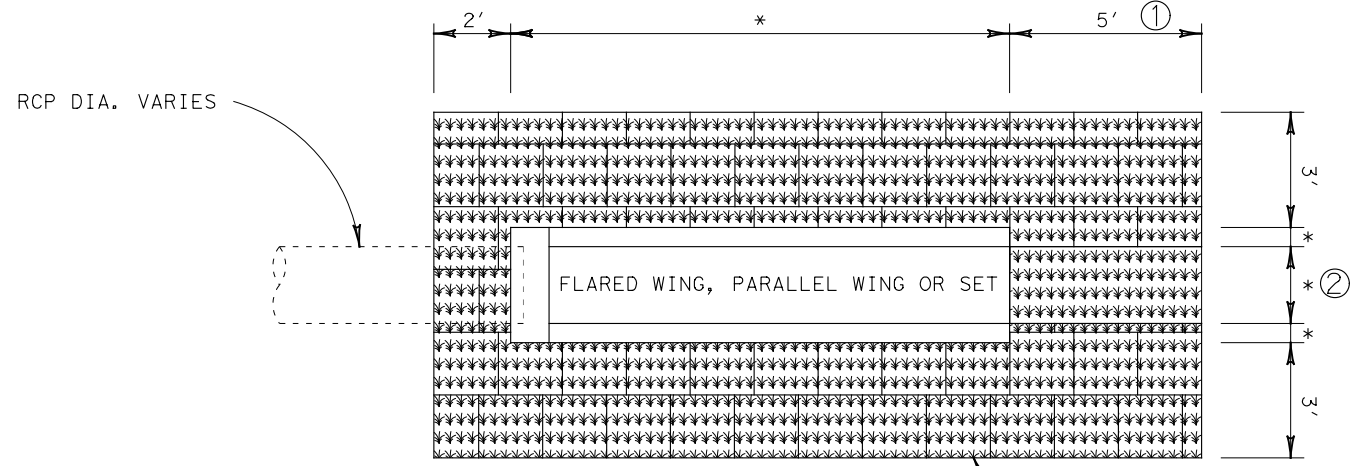
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CHECKED:	6	TEXAS		FM 326
DRAWN:	STATE DISTRICT	COUNTY	CONTROL SECTION No.	JOB No.
CHECKED:	LUFKIN	ANGELINA	3264 01	010
				SHEET No.
				104



SYMBOL	DESCRIPTION
	BLOCK SODDING

FLARED WING CROSS DRAINAGE DETAIL ①

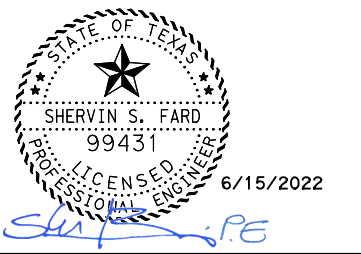
PARALLEL WING CROSS DRAINAGE DETAIL ①



BLOCK SOD DETAIL

PLACE AT ALL PARALLEL & CROSSROAD CULVERTS WHERE WORK IS PROPOSED. DO NOT PLACE SOD DIRECTLY IN THE CHANNEL.

- ① DO NOT PLACE BLOCK SOD WHERE RIPRAP (STONE COMMON) IS INSTALLED.
- ② FOR PARALLEL CULVERTS WHERE WORK IS PROPOSED ONLY. DO NOT PLACE BLOCK SODDING DIRECTLY IN CHANNEL AT CROSSROAD CULVERTS.



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BLOCK SOD DETAILS

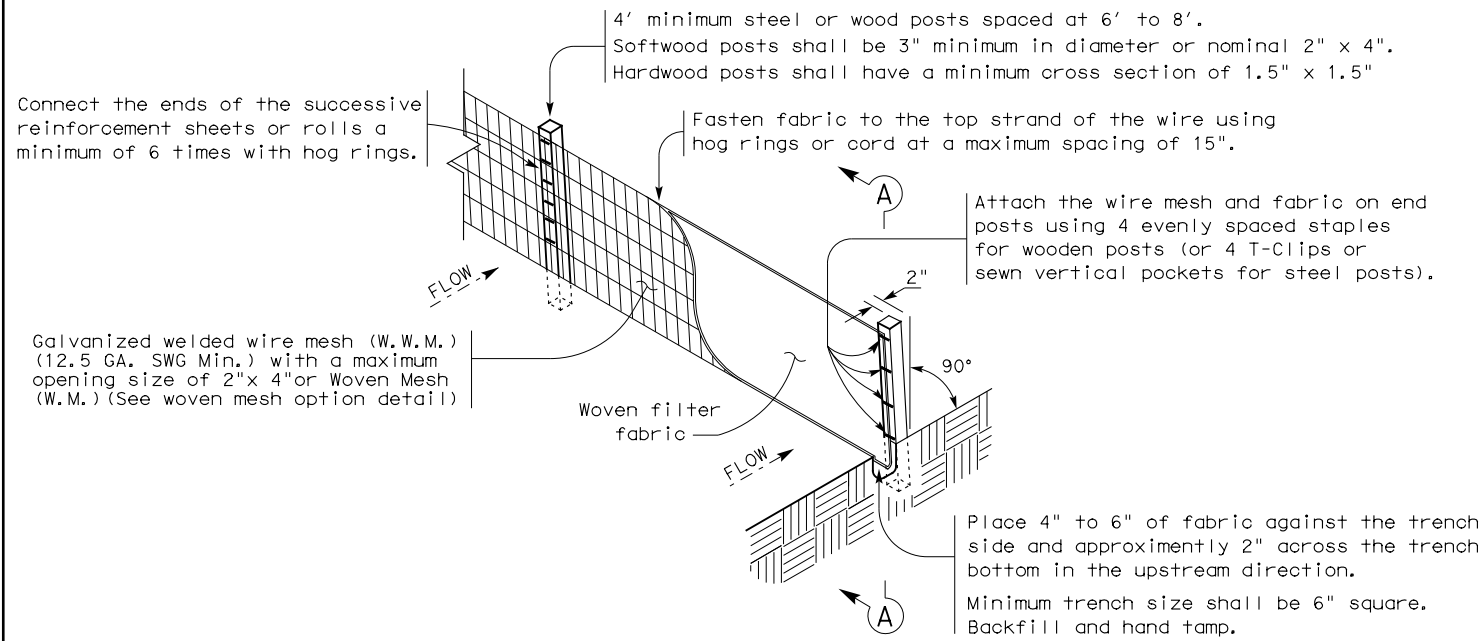
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DRAWN:	JOB No. 010	SHEET No. 105		
CHECKED:				

NOT TO SCALE

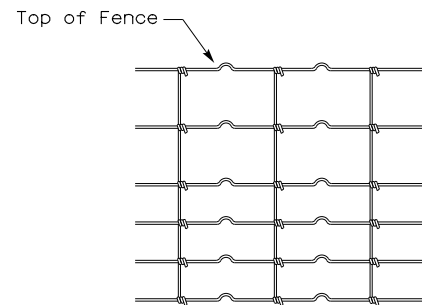
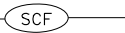
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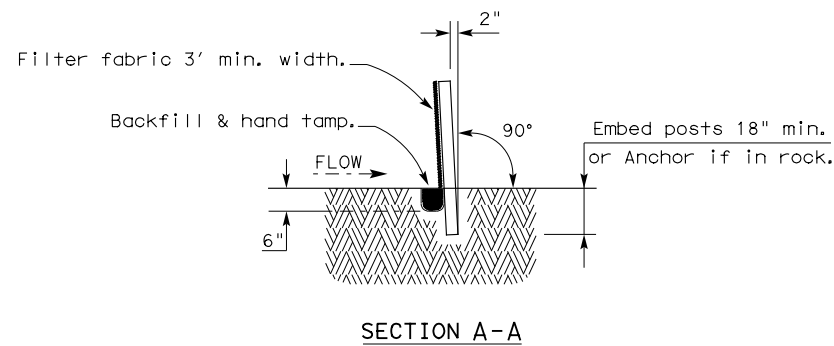


TEMPORARY SEDIMENT CONTROL FENCE



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/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

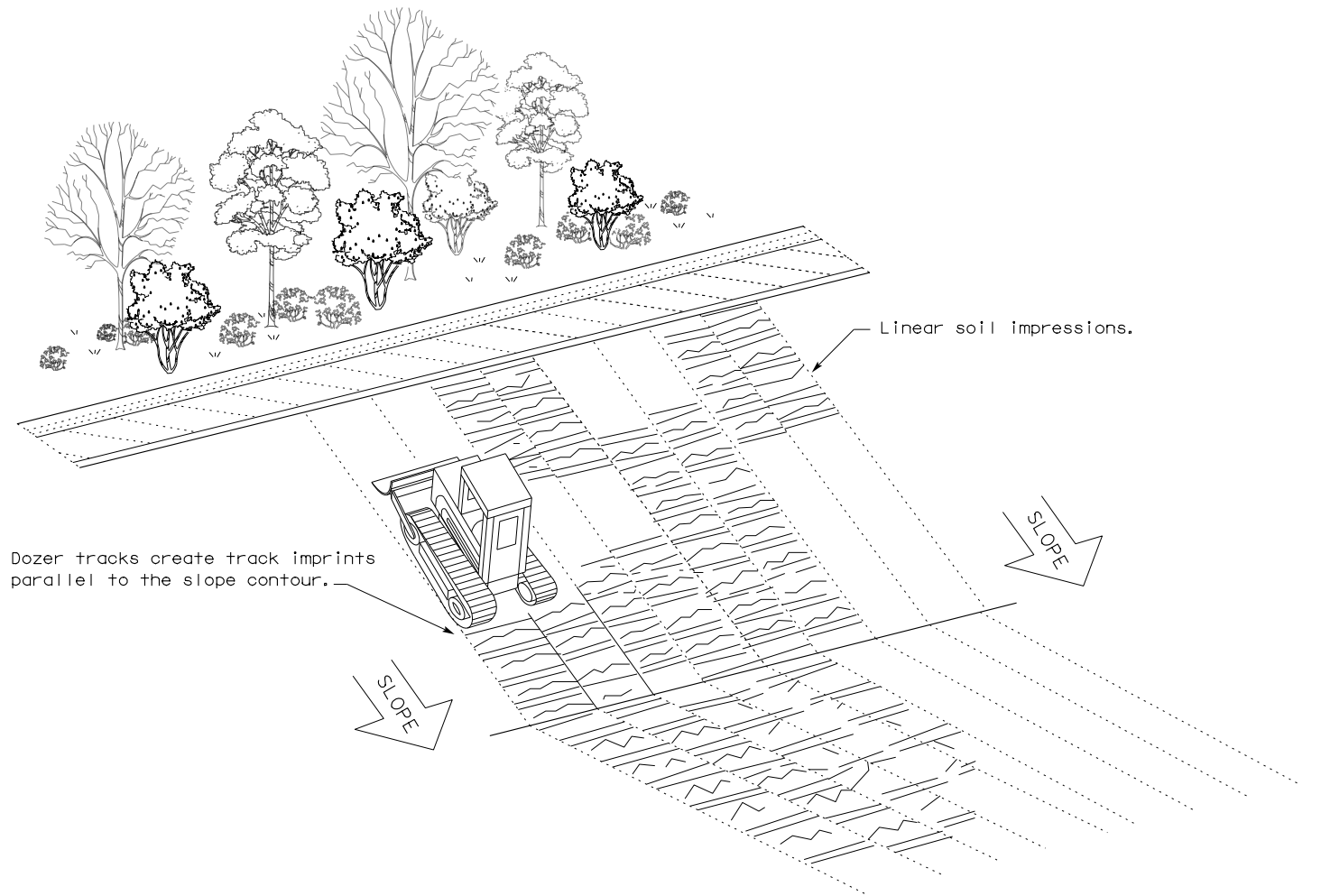
LEGEND

Sediment Control Fence



GENERAL NOTES

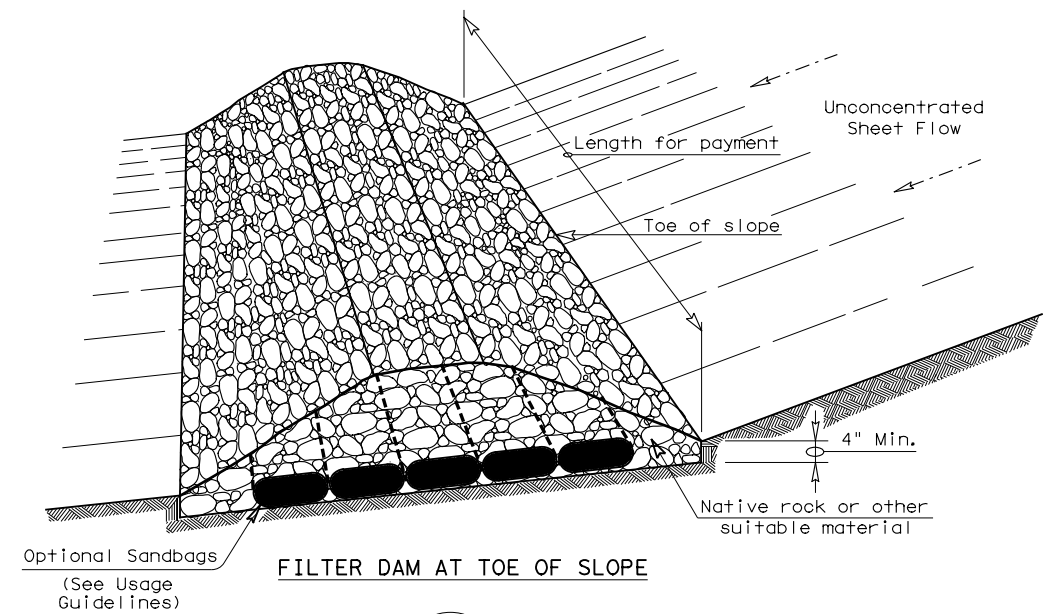
1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum 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 continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

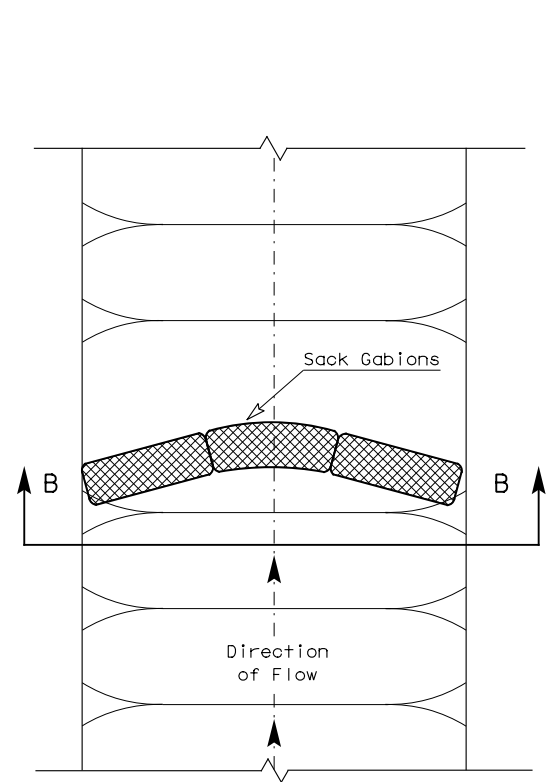
				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING					
EC(1)-16					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS		3264	01	010	FM 326
	DIST	COUNTY		SHEET NO.	
	LFK	ANGELINA		106	

DATE: 3/25/2022
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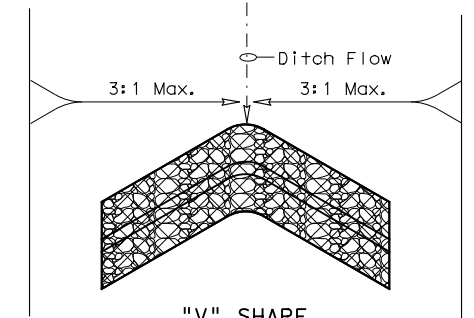


FILTER DAM AT TOE OF SLOPE

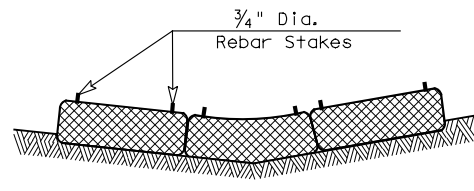
— (RFD1) —



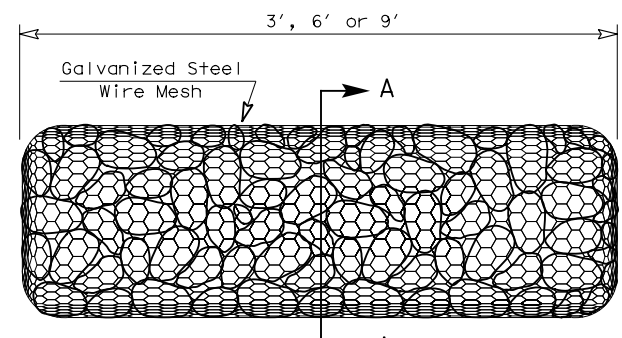
PLAN VIEW



"V" SHAPE PLAN VIEW

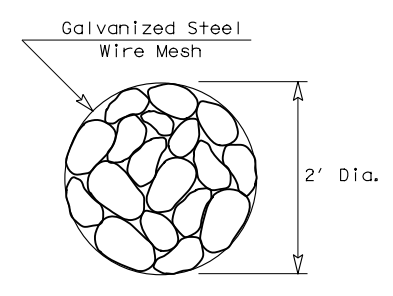


SECTION B-B

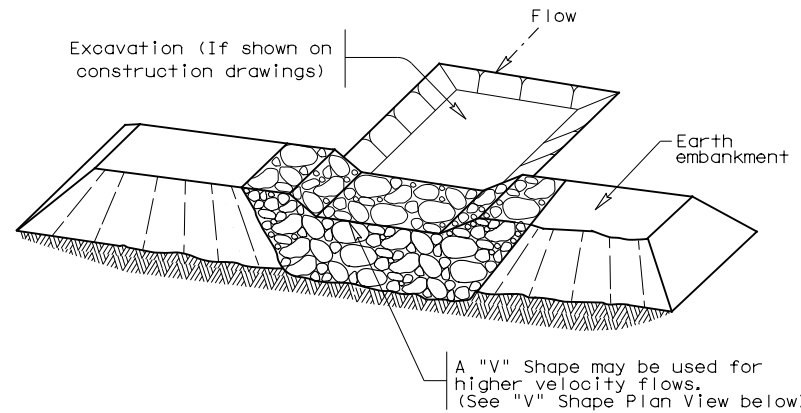


TYPE 4 (SACK GABIONS)

— (RFD4) —

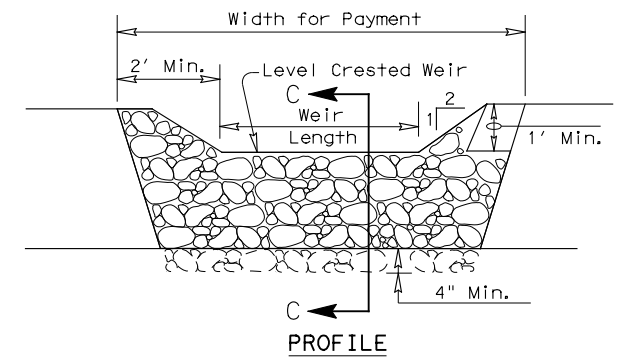


SECTION A-A

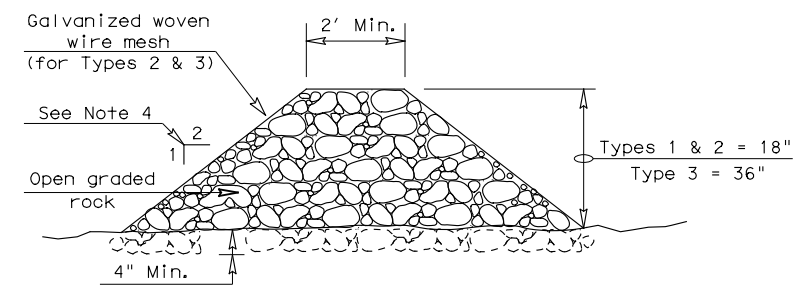


FILTER DAM AT SEDIMENT TRAP

— (RFD1) — OR — (RFD2) —



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT² of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

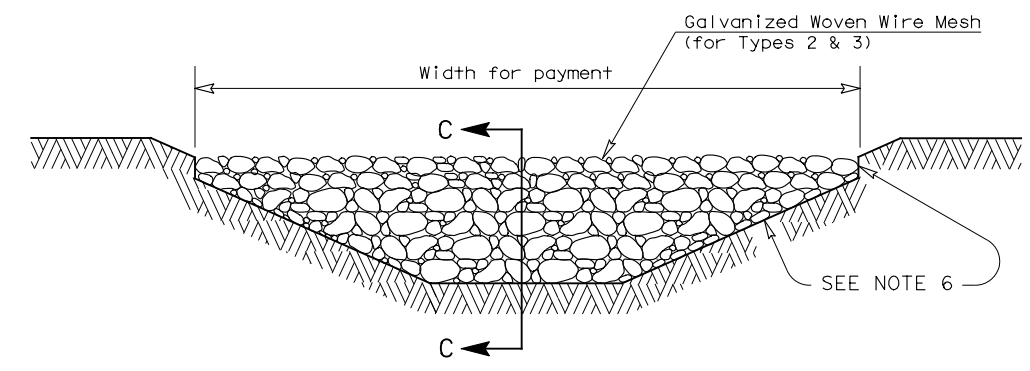
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximately 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.



FILTER DAM AT CHANNEL SECTIONS

— (RFD1) — OR — (RFD2) — OR — (RFD3) —

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4".
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

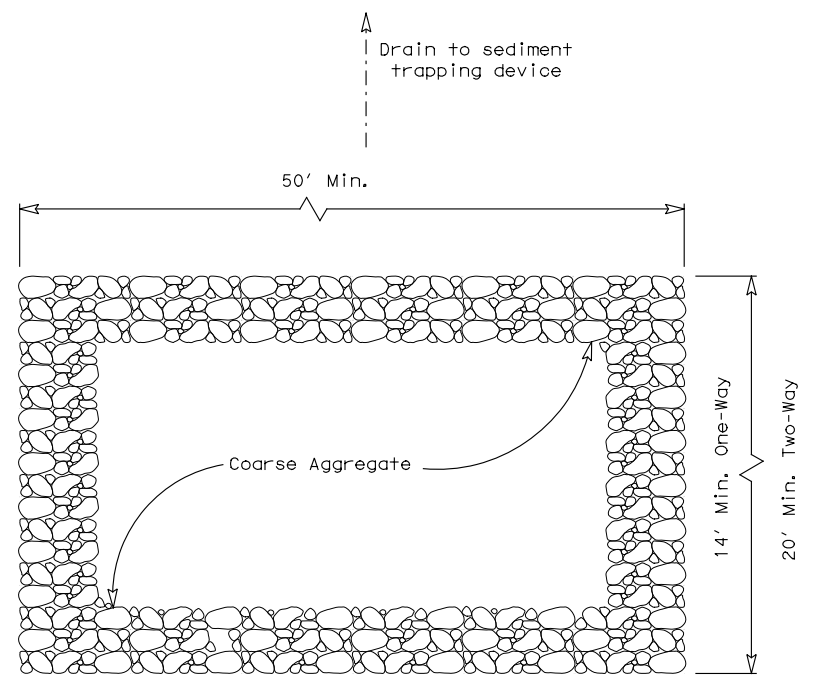
PLAN SHEET LEGEND

- Type 1 Rock Filter Dam — (RFD1) —
- Type 2 Rock Filter Dam — (RFD2) —
- Type 3 Rock Filter Dam — (RFD3) —
- Type 4 Rock Filter Dam — (RFD4) —

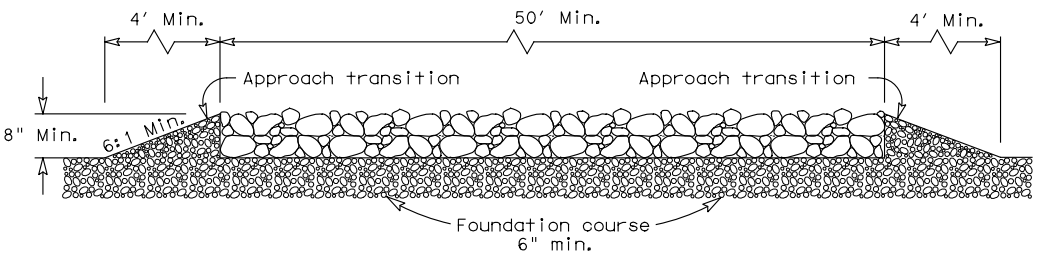
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TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES ROCK FILTER DAMS EC (2) - 16			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT: 3264	SECT: 01	JOB: 010
REVISIONS		DIST: LFK	COUNTY: ANGELINA
		DW: VP	DN/CK: LS
		HIGHWAY: FM 326	SHEET NO.: 107

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PLAN VIEW

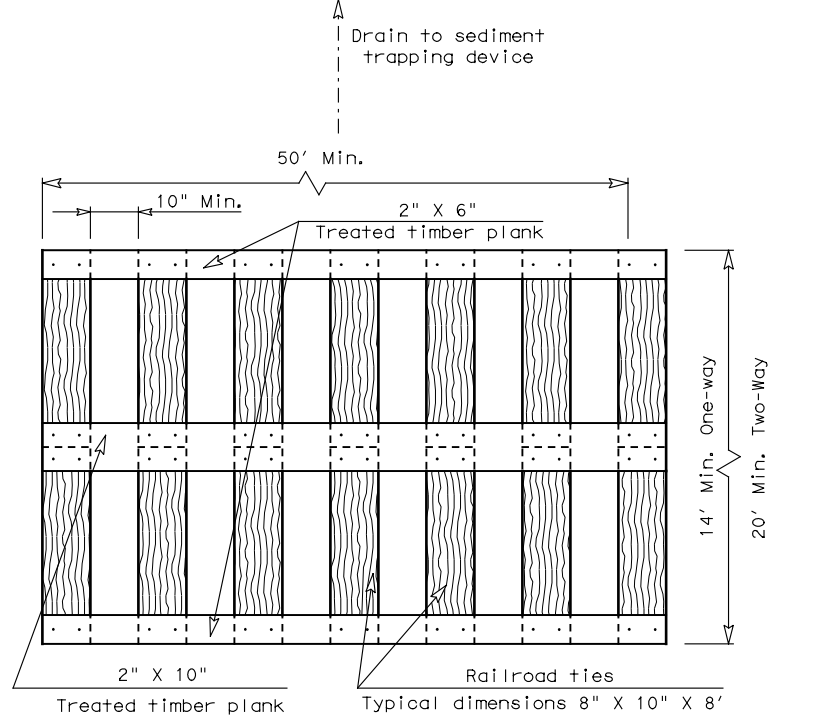


ELEVATION VIEW

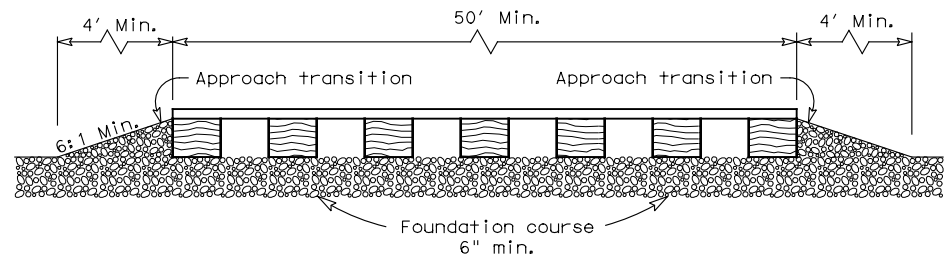
CONSTRUCTION EXIT (TYPE 1)
 ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

- The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
- The coarse aggregate should be open graded with a size of 4" to 8".
- The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
- The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materials approved by the Engineer.
- The construction exit shall be graded to allow drainage to a sediment trapping device.
- The guidelines shown hereon are suggestions only and may be modified by the Engineer.
- Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.



PLAN VIEW

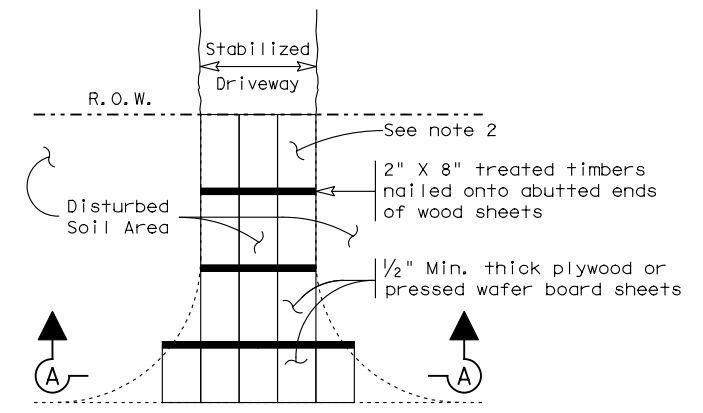


ELEVATION VIEW

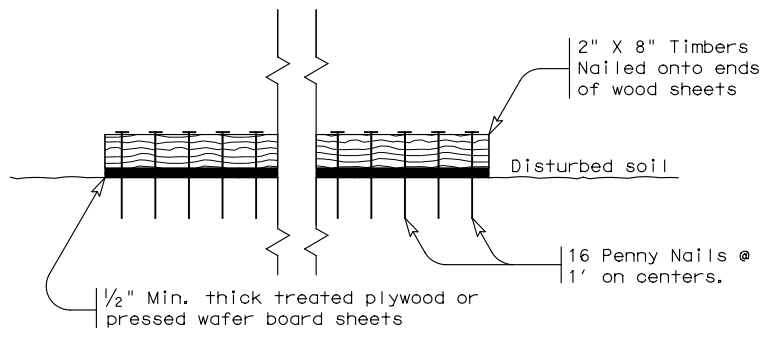
CONSTRUCTION EXIT (TYPE 2)
 TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

- The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
- The treated timber planks shall be attached to the railroad ties with 1/2" x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
- The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
- The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
- The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
- The construction exit should be graded to allow drainage to a sediment trapping device.
- The guidelines shown hereon are suggestions only and may be modified by the Engineer.
- Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.



PLAN VIEW



SECTION A-A
 CONSTRUCTION EXIT (TYPE 3)
 SHORT TERM

GENERAL NOTES (TYPE 3)

- The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
- The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
- The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
- The guidelines shown hereon are suggestions only and may be modified by the Engineer.

				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS EC (3) - 16					
FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
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	LFK	ANGELINA		108	