SEE SHEET 2 FOR INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NO. F 2023(668), ETC.

FM 58
ANGELINA COUNTY

CSJ 0576-02-068: NET LENGTH OF ROADWAY = 18,008.00 FT. = 3.392 MI.
CSJ 0576-02-075: NET LENGTH OF ROADWAY = 14,874.00 FT. = 2.817 MI.
PROJECT TOTAL = 32,882.00 FT. = 6.227 MI.

CSJ 0576-02-068: LIMITS FROM: 1.25 MILES SOUTH OF FM 2108 TO: 2.81 MILES NORTH OF FM 1818
CSJ 0576-02-075: LIMITS FROM: 2.81 MILES NORTH OF FM 1818 TO: FM 1818

CSJ: 0576-02-068
FOR THE CONSTRUCTION OF REHABILITATION OF EXISTING ROAD CONSISTING OF RECONSTRUCT AND WIDEN PAVEMENT TO 28'
CSJ: 0576-02-075
FOR THE CONSTRUCTION OF SAFETY IMPROVEMENT PROJECTS CONSISTING OF PROVIDE ADDITIONAL PAVED SURFACE WIDTH TO 28', PROFILE EDGELINE MARKINGS, AND PROFILE CENTERLINE MARKINGS

BEGIN PROJECT
BEGIN CSJ:0576-02-068
STA:312+00
REF MRK:364 +1.812
LAT: 31.2468589
LONG: -94.7001682

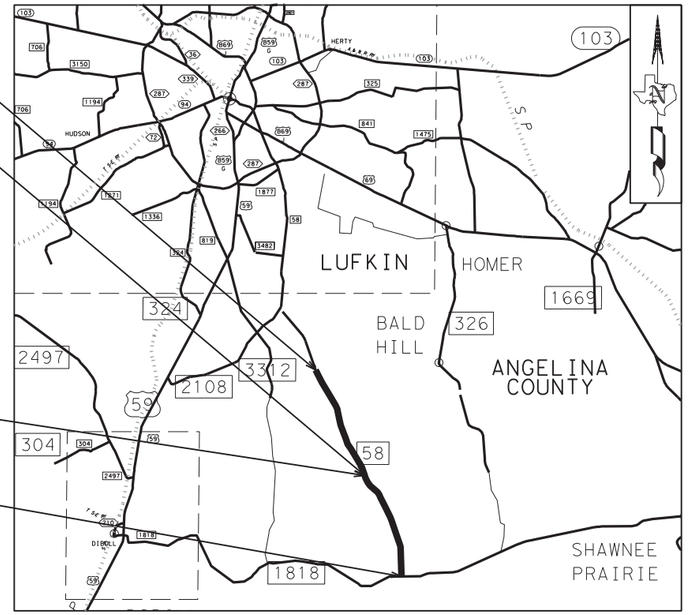
PREVIOUS PROJECT TIE:
PROJECT NO:8295
CSJ: 0576-02-048
STA: 312+00

END CSJ: 0576-02-068
STA:492+00
REF MRK:368 +1.270
LAT:31.2002404
LONG: -94.6791949

BEGIN CSJ: 0576-02-075
CSJ:0576-02-075
STA:492+00
REF MRK:368 +1.270
LAT: 31.2002404
LONG: -94.6791949

END PROJECT
END CSJ:0576-02-075
STA:640+74
REF MRK:718 +0.183
LAT:31.1626120
LONG: -94.6649616

PREVIOUS PROJECT TIE:
PROJECT NO:8295
CSJ: 0576-02-048
STA: 640+74



N.T.S.

EQUATION: STA 367+08 BK = STA 367+00 FWD = +8.0FT
NO EXCEPTIONS
NO RAILROAD CROSSINGS

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)

(0576-02-068) FM 58

FUNCTIONAL CLASS.: MAJOR COLLECTOR
DESIGN SPEED = 55
ADT (2021) = 771
ADT (2041) = 1079

(0576-02-075) FM 58

FUNCTIONAL CLASS.: MAJOR COLLECTOR
DESIGN SPEED = 55
ADT (2021) = 771
ADT (2041) = 1079

FHWA TEXAS DIVISION	PROJECT NO.		SHEET NO.
	F 2023(668), ETC.		1
STATE	DISTRICT	COUNTY	
TEXAS	LFK	ANGELINA	
CONTROL	SECTION	JOB	HIGHWAY NO.
0576	02	068, ETC.	FM 58

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 _____

BARRICADES AND WARNING SIGNS

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

RECOMMENDED FOR LETTING: 3/27/2023

DocuSigned by:
Jennifer H. Adams
CE1DDBE07C00426...
DISTRICT ADVANCE TRANSPORTATION PLANNING DIRECTOR

APPROVED FOR LETTING: 3/27/2023

DocuSigned by:
Kelly O. Morris, P.E.
F04421163942 4B4...
DISTRICT ENGINEER

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DATE: 3/24/2023 3:45:50 PM

SHEET NO.		DESCRIPTION
		GENERAL
	1	TITLE SHEET
	2	INDEX OF SHEETS
	3	TYPICAL SECTIONS
	4, 4A-4G	GENERAL NOTES
	5, 5A-5B	ESTIMATE & QUANTITY SHEET
	6-22	QUANTITY SUMMARIES
	23-27	SUMMARY OF SMALL SIGNS
		TRAFFIC CONTROL PLAN
#	28-39	BC(1)-21 THRU BC(12)-21
#	40	TCP(2-1)-18
#	41	TCP(2-2)-18
#	42	TCP(3-1)-13
#	43	TCP(3-3)-14
#	44	TCP(S-1)-08A
#	45	TCP(S-2)-08A
#	46	TCP(S-2c)-10
#	47	WZ(BRK)-13
#	48	WZ(RS)-22
#	49	WZ(STPM)-23
		ROADWAY DETAILS
	50-51	ROADWAY, DRIVEWAY, & SIDE ROAD DETAILS
	52	SUPERELEVATION DATA
#	53-56	MB(1)-21 THRU MB(4)-21
#	57-58	MBP(1)-22 THRU MBP(2)-22

SHEET NO.		DESCRIPTION
		DRAINAGE DETAILS
	59-60	DRAINAGE AREA MAP & HYDRAULIC DATA SHEET
	61-68	CULVERT LAYOUTS
	69	BCS
	70	CONCRETE COLLAR DETAILS
	71	CONCRETE RIPRAP DETAILS
	72	STONE RIPRAP DRAINAGE DETAILS
#	73	FW-0
#	74	PW
#	75	PSET-SC
#	76	PSET-SP
#	77-78	SCC-3 & 4
#	79	SCP-6
#	80	SCP-MD
#	81	PB
#	82	PDD
#	83	PAZD
		TRAFFIC ITEMS
	84-86	SIGN DETAILS
#	87	D & OM(1)-20
#	88	D & OM(2)-20
#	89	D & OM(4)-20
#	90-91	PM(1)-22 THRU PM(2)-22
#	92-93	RS(2)-23 AND RS(4)-23
#	94-96	TSR(3)-13 THRU TSR(5)-13
		ENVIRONMENTAL ISSUES
	97-98	STORMWATER POLLUTION PREVENTION PLAN (SWP3)
	99-100	EPIC
	101-114	ENVIRONMENTAL LAYOUT SHEETS
	115	BLOCK SOD DETAILS
	116	TREE REMOVAL AND TRIMMING DETAILS
#	117-119	EC(1)-16 THRU EC(3)-16

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

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

DocuSigned by: CHARLES M. BRAZIL, P.E. — 3/27/2023

CHARLES M. BRAZIL, P.E. — DATE

Texas Department of Transportation

INDEX OF SHEETS

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		2

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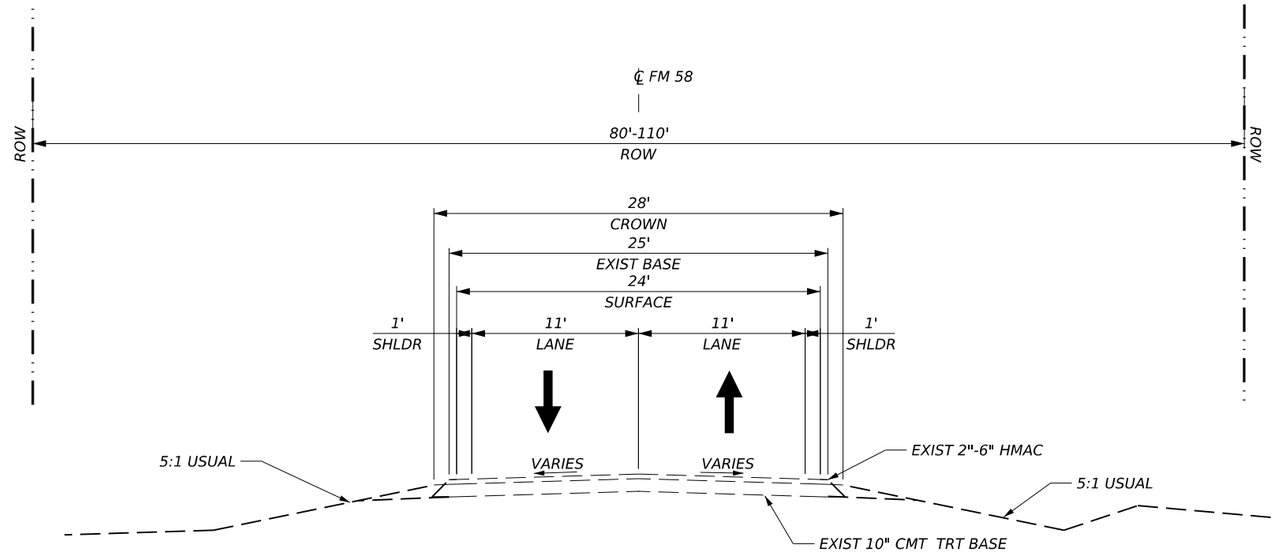
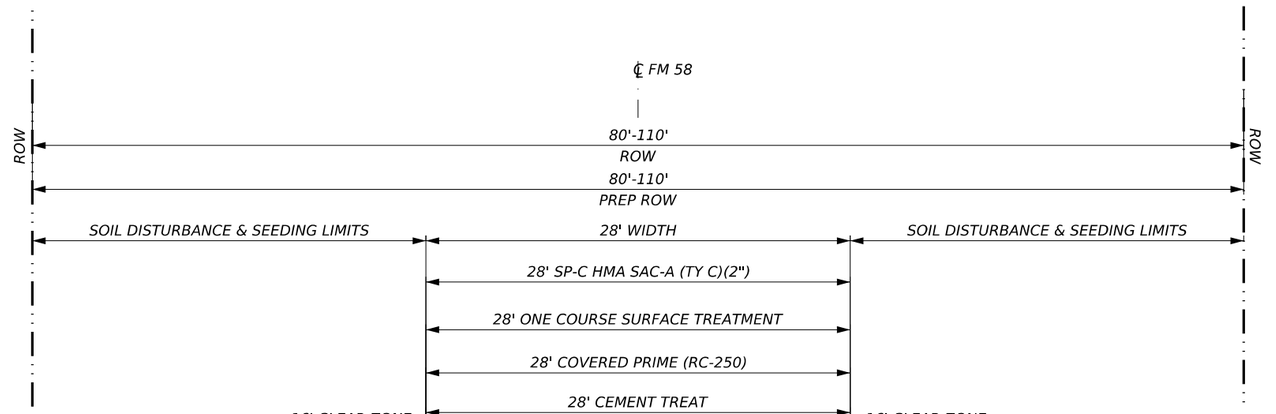


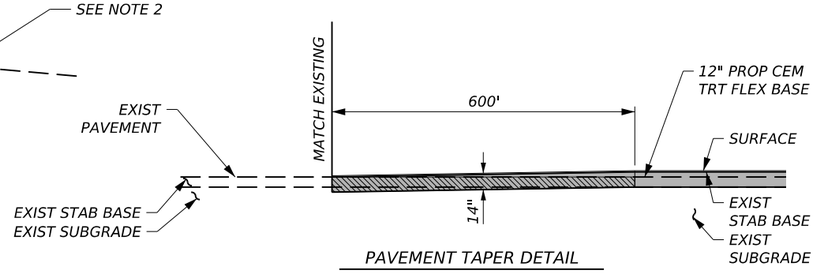
EXISTING TYPICAL SECTION

STA 312+00 TO STA 640+74



PROPOSED TYPICAL SECTION

STA 312+00 TO STA 640+74



PAVEMENT TAPER DETAIL

NOTE: THE PAVEMENT TAPER IS TO BE USED AT ANY LOCATION WHERE PROFILE IS TO BE ADJUSTED TO MATCH EXISTING GRADE

EQUATION: STA 367+08 BK = STA 367+00 FWD = + 8.0 FT

NOTE:

1. *USE CARE WHEN WIDENING & MIXING OVER CROSS-DRAINAGE STRUCTURES. DEPTH OF WIDENING MAY NEED TO BE REDUCED TO ACCOMMODATE DRAINAGE FEATURES.*
2. *BLADE 6" OF EXISTING TOPSOIL AND WINDROW OUTSIDE WORK AREA, THEN RETURN SLOPES UPON COMPLETION OF ROADWAY WORK. BLADE ALL DITCHES TO ENSURE POSITIVE DRAINAGE. THESE TWO OPERATION WILL BE PAID FOR ONCE UNDER ITEM 150, BLADING. IF ADDITIONAL MATERIAL IS NEEDED TO RETURN SLOPES, THIS WILL BE PAID FOR UNDER ITEM 132, EMBANKMENT (VEH)(ORD COMP)(TY B) AS DIRECTED.*
3. *REMOVAL OF EXISTING SURFACE AND/OR BASE WILL BE SUBSIDIARY TO ITEM 112 "SUBGRADE WIDENING".*
4. *PULVERIZE EXISTING BASE AND SURFACE AND SPREAD ACROSS WIDENED SUBGRADE. A MILLING MACHINE MAY BE REQUIRED TO BREAK DOWN STABILIZED MATERIAL OR HMA. THIS OPERATIONS WILL NOT BE PAID FOR DIRECTLY, BUT CONSIDERED SUBSIDIARY TO VARIOUS BID ITEMS.*
5. *MAINTAIN CROSS SLOPE AND RIDE QUALITY UNTIL FINAL ACCEPTANCE.*
6. *SEE TREE REMOVAL AND TRIMMING DETAILS.*

SEQUENCE OF CONSTRUCTION

1. WIDEN SUBGRADE LT & RT.
2. SCARIFY EXISTING MATERIAL AND SURFACE.
3. RESHAPE AND PROOF ROLL SCARIFIED MATERIAL TO A WIDTH AS SHOWN ON TYPICALS.
4. PLACE FL BS (RDWY DEL)(TY D GR 1-2 OR 5) CEMENT TREAT MIX EXIST MATERIAL & NEW BASE.
5. PLACE COVERED PRIME WEEKLY.
6. APPLY OCST, WORK ZONE PAV MARKINGS, SEED & FERTILIZE.
7. APPLY SP-C HMA (TY C).
8. PLACE FINAL PAVEMENT MARKINGS AND MARKERS.

N.T.S.

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
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3/27/2023

Texas Department of Transportation

TYPICAL SECTIONS

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		3

DATE: 3/24/2023 3:46:44 PM
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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.

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

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

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

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

Contractor questions on this project are to be addressed to the following individual(s):
Jesse Sisco. Area Engineer Jesse.Sisco@txdot.gov
Shannon Ramos, Director of Construction Shannon.Ramos@txdot.gov

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:
https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

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

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

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

Project Mowing

Mow 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

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.

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 6: Control of Materials

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

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

The Buy America Material Classification Sheet is located at the below link.

https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

Item 7: Legal Relations and Responsibilities

No significant traffic generator events identified.

This project has a soil disturbance of 5 acres or more.

The Department will be considered a primary operator for Operational Control Over Plans and Specifications as defined in TPDES GP TXR 150000 for construction activities in the right of way. The Department will post a large site notice, file a notice of intent (NOI), notice of change (NOC), if applicable, and a notice of termination (NOT) along with other requirements per TPDES GP TXR 150000 as the entity 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 activities in the right of way. In addition to the Department's actions, the Contractor shall file a NOI, NOC, if applicable, and NOT and post a large site notice along with other requirements 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.

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.

Official State Historical Markers and paved turnout is located on the west side of FM 58 at the Beulah Community Center between Stations 553+00 to 558+00. No storage of materials or equipment is allowed near the marker location. Contractor is responsible for preventing damage to the marker during the entire construction project. Contractor to repair or replace in kind, at his own expense, any historic marker damaged in the course of executing the work. Contractor is responsible for locating replacement sources for historic materials damaged in the course of work. If the marker is damaged, contact the Lufkin District Environmental Section at 1-800-687-8087. TxDOT - Environmental Affairs Division would be informed of proposed repairs to consult with Texas Historical Commission prior to execution of repair 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.

A 90-day delay has been included to allow the contractor time to order materials.

Item 100: Preparing Right of Way

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

Prep ROW shall be maintained until project acceptance.

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.

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 158: Specialized Excavation Work

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

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 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.

Compaction requirements for flexible base are ordinary compaction.

Item 275: Cement Treatment (Road-Mixed)

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

Compact and sprinkle pulverized sections for dust control as directed for traffic use.

Cement treat pulverized sections within 2 days, unless otherwise approved.

Pulverization and cement treatment of the existing roadway will not be allowed from October 1 through March 31 without written permission.

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 precoated 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.

Furnish aggregates for the final surfaces of travel lanes with a minimum class A surface aggregate classification.

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 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.

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

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

Blade the existing paved shoulders prior to surface treatment operations to remove existing overgrowth. This work will be subsidiary to Item 316.

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.

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. *Lufkin Area Office: 1805 N Timberland Drive Lufkin, Texas.*

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.

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 462: Concrete Box Culverts and Drains

Provide precast box culverts.

Limit work on box culverts 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 first side of the box culvert being extended is complete.

Item 464: Reinforced Concrete Pipe

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

At locations where existing driveway pipes are to be removed and replaced, replace the top 6 in. of the existing driveway with material equal to or better than the existing driveway material. This work will be subsidiary to various bid items.

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.

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.

To improve drainage, grade existing ditch within ten feet of proposed safety end treatment. This work shall be subsidiary to Item 467.

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.

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 480: Cleaning Existing Culverts

Certain box culverts will require cleaning to remove silt and other debris. Waters carried by these box culverts have been determined to be waters of the United States and are under jurisdiction of the U.S. Army Corps of Engineers. Silt and other debris removal shall be immediately hauled to an upland location for dumping. Material will not be side cast into either the water channel or its banks. Removal of the sediment is limited to the minimum necessary to restore the waterway to its configuration when the structure was built. No work will be allowed outside of the right-of-way. This work shall also be restricted to a distance of no more than 10 ft. from the end of the structure.

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.

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

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

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

Limit lane closures for 2 lane roads to 1 mi. in length, unless otherwise approved.

Lane closure lengths can exclude the end tapers.

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

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

Provide temporary rumble strips as shown on work zone rumble strip standards. Temporary rumble strips shall be a product listed on the Compliant Work Zone Traffic Control Devices and shall be a two-piece rumble strip that hinges in the middle.

Provide a pilot car to lead traffic through the work area. The pilot car will not be paid for directly, but will be subsidiary to various bid items.

Halt traffic during the time asphalt is being applied to the roadway. No vehicles will be allowed to pass the asphalt distributor during asphalt application.

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.

Install "Pavement Ends" (CW8-3) and "30 mph" (CW13-1P) signs where the paved surface of the road ends. Use flashing arrow panels to supplement these signs during nighttime hours.

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

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

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

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.

Place temporary sediment control fence at locations as directed.

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 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 644: Small Roadside Sign Assemblies

Install adjacent signs with bottom edges at equal heights.

Sign placement shall be in accordance with the “Sign Crew Field Book” and as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Stake all sign support locations for verification and approval.

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

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

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

Prior to ordering signs, advisory speeds at horizontal curves shall be verified by the department.

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

Item 658: Delineator and Object Marker Assemblies

Install delineators on the departure side of the posts when mounting to metal beam guard fence and guardrail end treatments.

Surface mount object markers shall be bolted to the concrete surface with galvanized lag bolts, 2 lag bolts minimum. Drilling may be necessary. Plastic shims shall be used as necessary to ensure posts are plum. This work will be subsidiary to Item 658, Object Markers.

Item 662: Work Zone Pavement Markings

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.

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. Need confirmation to delete this note. Testing requirements are in the specs.

Before construction operations begin, observe and mark existing passing/no passing zones. Passing/no passing zones shall be verified prior to placement of permanent pavement markings.

Place a minimum of 500 ft. of double yellow no passing lines on the approach to all stop condition intersections for two lane roads unless otherwise shown in the plans or directed.

Item 672: Raised Pavement Markers

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

Item 3077: Superpave Mixtures

Shoulders and ramps are not subject to in-place air void determination and pay adjustment.

No Department-owned RAP is available.

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.

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.

On Table 1 under 3077.2.1.3, the Sand equivalent, %, Min is void and not replaced. The minimum percent for the sand equivalent shall be 45 for the combined aggregate.

Class B aggregate meeting all other requirements in Table 1 may be blended with a Class A aggregate to meet requirements for Class A materials. Ensure that at least 60% by weight, or volume if required, of the material retained on the No. 4 sieve comes from the Class A aggregate source when blending Class A and B aggregates to meet a Class A requirement. Blend by volume if the bulk specific gravities of the Class A and B aggregates differ by more than 0.300. Coarse aggregate from RAP and Recycled Asphalt Shingles (RAS) will be considered as Class B aggregate for blending purposes.

The Engineer may perform tests at any time during production, when the Contractor blends Class A and B aggregates to meet a Class A requirement, to ensure that at least 60% by weight, or volume if required, of the material retained on the No. 4 sieve comes from the Class A aggregate source. The Engineer will use the Department's mix design template, when electing to verify conformance, to calculate the percent of Class A aggregate retained on the No. 4 sieve by inputting the bin percentages shown from readouts in the control room at the time of production and stockpile gradations measured at the time of production. The Engineer may determine the gradations based on either washed or dry sieve analysis from samples obtained from individual aggregate cold feed bins or aggregate stockpiles. The Engineer may perform spot checks using the gradations supplied by the Contractor on the mixture design report as an input for the template; however, a failing spot check will require confirmation with a stockpile gradation determined by the Engineer.

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

Two (2) TMAs (stationary) will be required for this project. The contractor will be responsible for determining if multiple operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

Three (3) TMAs will be required on all divided highways for mobile operations and two (2) TMAs will be required on all other roadways 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.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0576-02-068 **DISTRICT** Lufkin **COUNTY** Angelina
HIGHWAY FM 58

			CONTROL SECTION JOB		**0576-02-068**		**0576-02-075**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00065593**		**A00193115**			
			COUNTY		**Angelina**		**Angelina**			
			HIGHWAY		**FM 58**		**FM 58**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	100-6002	PREPARING ROW		STA	180.000		149.000		329.000	
	104-6017	REMOVING CONC (DRIVEWAYS)		SY	42.000				42.000	
	112-6001	SUBGRADE WIDENING (ORD COMP)		STA	179.000		149.000		328.000	
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)		CY	14,351.000		11,519.000		25,870.000	
	150-6001	BLADING		STA	179.000		149.000		328.000	
	158-6003	SPEC EXCAV WORK (HYD EXCAVATOR)		HR	80.000		95.000		175.000	
	162-6002	BLOCK SODDING		SY	2,008.000		1,344.000		3,352.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)		SY	20,000.000		16,527.000		36,527.000	
	164-6011	BROADCAST SEED (TEMP) (COOL)		SY	20,000.000		16,527.000		36,527.000	
	164-6054	BOND FBR MTRX SEED (PERM)(RURAL)(SAND)		SY	40,000.000		33,054.000		73,054.000	
	168-6001	VEGETATIVE WATERING		MG	1,648.000		1,353.000		3,001.000	
	204-6003	SPRINKLING (DUST CONTROL)		MG	560.000		463.000		1,023.000	
	247-6500	FL BS (RDWY DEL)(TY D GR 1-2 OR GR 5)		TON	5,330.000		4,511.000		9,841.000	
	275-6001	CEMENT		TON	1,003.000		833.000		1,836.000	
	275-6023	CEMENT TREAT(MX EXST MTL & NW BS)(12")		SY	56,025.000		46,275.000		102,300.000	
	316-6060	ASPH (RC-250)		TON	60.000		50.000		110.000	
	316-6401	AGGR (TY PE OR PL GR 4)		CY	415.000		343.000		758.000	
	316-6417	AGGR (TY E OR L GR 5)		CY	401.000		331.000		732.000	
	316-6530	ASPH (AC-15P OR CRS-2P)		TON	100.000		83.000		183.000	
	400-6005	CEM STABIL BKFL		CY	64.000		158.000		222.000	
	400-6007	CUT & RESTORE CONC PAVING		SY	62.000				62.000	
	402-6001	TRENCH EXCAVATION PROTECTION		LF			953.000		953.000	
	403-6001	TEMPORARY SPL SHORING		SF	132.000				132.000	
	420-6071	CL C CONC (COLLAR)		EA	12.000		4.000		16.000	
	432-6024	RIPRAP (STONE COMMON)(DRY)(12 IN)		CY	37.000		5.000		42.000	
	462-6002	CONC BOX CULV (3 FT X 3 FT)		LF	20.000				20.000	
	462-6004	CONC BOX CULV (4 FT X 3 FT)		LF	27.000				27.000	
	462-6010	CONC BOX CULV (6 FT X 3 FT)		LF			168.000		168.000	
	464-6003	RC PIPE (CL III)(18 IN)		LF	1,898.000		986.000		2,884.000	
	464-6005	RC PIPE (CL III)(24 IN)		LF	128.000		258.000		386.000	
	464-6007	RC PIPE (CL III)(30 IN)		LF	120.000		98.000		218.000	
	464-6008	RC PIPE (CL III)(36 IN)		LF			22.000		22.000	
	465-6158	INLET(COMPL)(PAZD)(FG)(3FTX3FT-3FTX3FT)		EA	1.000		1.000		2.000	
	466-6130	HEADWALL (CH - PW - S) (DIA= 24 IN)		EA	1.000				1.000	
	466-6150	WINGWALL (FW - 0) (HW=3 FT)		EA			2.000		2.000	
	466-6151	WINGWALL (FW - 0) (HW=4 FT)		EA	2.000		2.000		4.000	
	466-6155	WINGWALL (FW - 0) (HW=8 FT)		EA	1.000				1.000	

Estimate & Quantity Sheet

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HIGHWAY FM 58

			CONTROL SECTION JOB		**0576-02-068**		**0576-02-075**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00065593**		**A00193115**			
			COUNTY		**Angelina**		**Angelina**			
			HIGHWAY		**FM 58**		**FM 58**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	466-6193	WINGWALL (PW - 2) (HW=4 FT)		EA	2.000				2.000	
	466-6197	WINGWALL (PW - 2) (HW=8 FT)		EA	1.000				1.000	
	467-6358	SET (TY II) (18 IN) (RCP) (4: 1) (C)		EA	8.000				8.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)		EA	130.000		72.000		202.000	
	467-6390	SET (TY II) (24 IN) (RCP) (4: 1) (C)		EA	5.000		4.000		9.000	
	467-6394	SET (TY II) (24 IN) (RCP) (6: 1) (C)		EA			1.000		1.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)		EA	8.000		18.000		26.000	
	467-6419	SET (TY II) (30 IN) (RCP) (4: 1) (C)		EA	6.000				6.000	
	467-6423	SET (TY II) (30 IN) (RCP) (6: 1) (P)		EA			6.000		6.000	
	467-6454	SET (TY II) (36 IN) (RCP) (6: 1) (P)		EA			2.000		2.000	
	480-6001	CLEAN EXIST CULVERTS		EA	7.000		4.000		11.000	
	496-6016	REMOV STR (PIPE)		EA	67.000		44.000		111.000	
	500-6001	MOBILIZATION		LS	0.050		0.950		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING		MO	20.000				20.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)		LF	400.000		160.000		560.000	
	506-6011	ROCK FILTER DAMS (REMOVE)		LF	400.000		160.000		560.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)		SY	112.000		112.000		224.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)		SY	112.000		112.000		224.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)		LF	4,324.000		3,668.000		7,992.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)		LF	4,324.000		3,668.000		7,992.000	
	530-6004	DRIVEWAYS (CONC)		SY	627.000				627.000	
	530-6005	DRIVEWAYS (ACP)		SY	5,451.000		5,230.000		10,681.000	
	530-6009	TURNOUTS (SURF TREAT)		SY	879.000		635.000		1,514.000	
	533-6001	RUMBLE STRIPS (SHOULDER)		LF	36,016.000		29,748.000		65,764.000	
	533-6002	RUMBLE STRIPS (CENTERLINE)		LF	18,008.000		14,874.000		32,882.000	
	560-6003	MAILBOX INSTALL-M (TWG-POST) TY 1		EA	1.000		3.000		4.000	
	560-6007	MAILBOX INSTALL-S (WC-POST) TY 3		EA	30.000		16.000		46.000	
	560-6008	MAILBOX INSTALL-D (WC-POST) TY 3		EA	10.000		9.000		19.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)		EA			1.000		1.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)		EA	2.000		5.000		7.000	
	644-6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)		EA	5.000		2.000		7.000	
	644-6060	IN SM RD SN SUP&AM TYTWT(1)WS(P)		EA	7.000		14.000		21.000	
	644-6061	IN SM RD SN SUP&AM TYTWT(1)WS(T)		EA	8.000		7.000		15.000	
	644-6076	REMOVE SM RD SN SUP&AM		EA	22.000		29.000		51.000	
	658-6109	INSTL OM ASSM (OM-2Z)(WFLX)SRF(BI)		EA	33.000		9.000		42.000	
	662-6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)		LF	35,800.000		29,748.000		65,548.000	
	662-6098	WK ZN PAV MRK REMOV (Y)6"(SLD)		LF	35,800.000		29,748.000		65,548.000	

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CONTROLLING PROJECT ID 0576-02-068 **DISTRICT** Lufkin **COUNTY** Angelina
HIGHWAY FM 58

				CONTROL SECTION JOB	0576-02-068		0576-02-075		TOTAL EST.	TOTAL FINAL
				PROJECT ID	A00065593		A00193115			
				COUNTY	Angelina		Angelina			
				HIGHWAY	FM 58		FM 58			
ALT	BID CODE	DESCRIPTION	UNIT		EST.	FINAL	EST.	FINAL		
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA		1,802.000		1,490.000		3,292.000	
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF				85.000		85.000	
	666-6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF		36,016.000		29,600.000		65,616.000	
	666-6317	RE PM W/RET REQ TY I (Y)6"(BRK)(090MIL)	LF		3,460.000		2,331.000		5,791.000	
	666-6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF		21,384.000		14,261.000		35,645.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF				15.000		15.000	
	668-6108	PREFAB PAV MRK TY C (Y) (24") (SLD)	LF		71.000				71.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA		373.000		307.000		680.000	
	3077-6022	SP MIXESSP-CSAC-A PG70-22	TON		6,163.000		5,091.000		11,254.000	
	3084-6001	BONDING COURSE	GAL		2,802.000		2,314.000		5,116.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA				2.000		2.000	
	6185-6002	TMA (STATIONARY)	DAY				662.000		662.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY				10.000		10.000	
	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	

ROADWAY SUMMARY																	
ITEM NO.			112	132	150	204	247	275		316 (6)						3077	3084
BID CODE			6001	6019	6001	6003	6500 (2)	6001(3)	6023 (3) (4)	6029 (1)	6060 (7)	6417	6456 (1)	6530 (7)	6401	6022	6001
STATION LIMITS	LENGTH	WIDTH	SUBGRADE WIDENING (ORD COMP)	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	BLADING	SPRINKLING (DUST CONTROL)	FL BS (RDWY DEL) (TY D GR 1-2 OR GR 5)	CEMENT (3.0%)	CEMENT TREAT(MX EXST MTL & NW BS)(12")	COVERED PRIME			ONE COURSE SURFACE TREAT			SURFACE	
									12" PLACE	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 PE OR PL GR 4)	SP MIXES SP-C SAC-A PG70-22	BONDING COURSE
						10 GAL/SY		36 LB/SY	IN 2 EQUAL LIFTS	0.25 GAL/SY		1 CY/140 SY	0.42 GAL/SY		1 CY/135 SY	220 LB/SY	0.05 GAL/SY
	FT	FT	STA	CY	STA	MG	TON	TON	SY	GAL	TON	CY	GAL	TON	CY	TON	GAL
CSJ: 0576-02-068	18008	28	179	13506	179	560	5077	1003	56025	14007	60	401	23531	100	415	6163	2802
STA 312+00 TO STA 492+00																	
SUPERELEVATION CORRECTION				161			253										
CSJ: 0576-02-068 TOTALS	**18008**	**28**	**179**	**13667**	**179**	**560**	**5330**	**1003**	**56025**	**14007**	**60**	**401**	**23531**	**100**	**415**	**6163**	**2802**
CSJ: 0576-02-075	14874	28	149	11156	149	463	4217	833	46275	11569	50	331	19436	83	343	5091	2314
STA 492+00 TO STA 640+74																	
SUPERELEVATION CORRECTION				187			294										
CSJ: 0576-02-075 TOTALS	**14874**	**28**	**149**	**11343**	**149**	**463**	**4511**	**833**	**46275**	**11569**	**50**	**331**	**19436**	**83**	**343**	**5091**	**2314**
PROJECT TOTALS	**32882**	**56**	**328**	**25010**	**328**	**1023**	**9841**	**1836**	**102300**	**25576**	**110**	**732**	**42967**	**183**	**758**	**11254**	**5116**

(1) FOR CONTRACTORS INFORMATION ONLY.
(2) FLEX BASE UNIT WEIGHT ESTIMATE = 135 LBS/CF.
(3) 3% CEMENT IS ESTIMATED, ACTUAL PERCENT OF CEMENT TO BE DETERMINED FROM BLENDED SAMPLE.
(4) SCARIFY AND RESHAPE EXISTING MATERAL SUBSIDIARY TO ITEM 275.
(5) USE AS DIRECTED FOR CONSTRUCTING FRONT SLOPES.
(6) USE PRECOATED AGGREGATE WITH AC-15P. USE NON-PRECOATED AGGREGATE WITH CRS-2P.
(7)ASPHALTS ESTIMATED AT THE FOLLOWING RATES:
RC-250 AT 0.25 GAL/SY FOR GR 5 AGGREGATE
AC-15P OR CRS-2P AT 0.42 GAL/SY FOR GR 4 AGGREGATE

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

SPECIFIC GRAVITY OF ASPHALT
(SGA) ESTIMATED AT 1.02 * 8.34

SUMMARY OF TRUCK MOUNTED ATTENUATORS		
LIMITS	ITEM 6185	
	6002	6005
	TMA (STATIONARY)	TMA (MOBILE OPERATION)
CSJ: 0576-02-068 & 0576-02-075	DAY	DAY
STA 312+00 TO STA 640+74	662	10
PROJECT TOTALS	**662**	**10**

WORK ZONE PAVEMENT MARKINGS SUMMARY					
ITEM NO.			662		
BID CODE			6037 (2)	6098 (1)	6111(2)
CSJ	STATION TO STATION	LENGTH	WK ZN PAV MRK NON-REMOV (Y) 6"(SLD)	WK ZN PAV MRK REMOV (Y) 6"(SLD)	WK ZN PAV MRK SHT TERM (TAB)TY Y-2
		FT	LF	LF	EA
0576-02-068	312+00 TO 492+00	18000	35800	35800	1802
0576-02-075	492+00 TO 640+74	14874	29748	29748	1490
PROJECT TOTALS			**65548**	**65548**	**3292**

(1) ONE APPLICATION ON SURFACE
(2) ONE APPLICATION ON COVERED PRIME, ONE APPLICATION ON OCST

ITEM	6001
LIMITS	6002
	PORTABLE CHANGEABLE MESSAGE SIGN
CSJ: 0576-02-068 & 0576-02-075	EA
STA 312+00 TO STA 640+74	2
PROJECT TOTALS	**2**

PREP ROW SUMMARY		
ITEM NO.		100
BID CODE		6002
CSJ	LIMITS	PREPARING ROW
		STA
CSJ: 0576-02-068	STA 312+00 TO STA 492+00	180
CSJ: 0576-02-068 TOTALS		**180**
CSJ: 0576-02-075	STA 492+00 TO STA 640+74	149
CSJ: 0576-02-075 TOTALS		**149**
PROJECT TOTALS		**329**

EQUATION: STA 367+08 BK = STA 367+00 FWD = +8.0FT

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 1 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		6

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EROSION CONTROL SUMMARY										
ITEM NO.	164			168	506					
BID CODE	6009	6011	6054	6001	6002	6011	6020	6024	6038	6039
STATION LIMITS	BROADCAST SEED(TEMP) (WARM)	BROADCAST SEED(TEMP) (COOL)	BOND FBR MTRX SEED (PERM) (RURAL) (SAND)	VEGETATIVE WATERING 10 GAL/SY 2 APP	ROCK FILTER DAMS (INSTALL) (TY 2)	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	MG	LF	LF	SY	SY	LF	LF
CSJ: 0576-02-068	20000	20000	40000	1600	400	400	112	112	4324	4324
STA 312+00 TO STA 492+00										
CSJ: 0576-02-068 TOTALS	**20000**	**20000**	**40000**	**1600**	**400**	**400**	**112**	**112**	**4324**	**4324**
CSJ: 0576-02-075	16527	16527	33054	1323	160	160	112	112	3668	3668
STA 492+00 TO STA 640+74										
CSJ: 0576-02-075 TOTALS	**16527**	**16527**	**33054**	**1323**	**160**	**160**	**112**	**112**	**3668**	**3668**
PROJECT TOTALS	**36527**	**36527**	**73054**	**2923**	**560**	**560**	**224**	**224**	**7992**	**7992**

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

PERMANENT PAVEMENT MARKINGS & MARKERS SUMMARY									
ITEM NO.	533		666				668		672
BID CODE	6001(1)	6002	6035	6308	6317	6320	6076	6108	6009
STATION LIMITS	RUMBLE STRIPS (SHOULDER)	RUMBLE STRIPS (CENTERLINE)	REFL PAV MRK TY I (W) 8" (SLD) (090MIL)	RE PM W/RET REQ TY I (W) 6" (SLD) (090MIL)	RE PM W/RET REQ TY I (Y) 6" (BRK) (090MIL)	RE PM W/RET REQ TY I (Y) 6" (SLD) (090MIL)	PREFAB PAV MRK TY C (W) (24") (SLD)	PREFAB PAV MRK TY C (Y) (24") (SLD)	REFL PAV MRKR TY II-A-A
STA	LF	LF	LF	LF	LF	LF	LF	LF	EA
CSJ: 0576-02-068									
STA 312+00 TO STA 492+00	36,016	18,008		36,016	3,460	21,384		71	373
CSJ: 0576-02-068 TOTALS	**36,016**	**18,008**	**0**	**36,016**	**3,460**	**21,384**	**0**	**71**	**373**
CSJ: 0576-02-075									
STA 492+00 TO STA 640+74	29,748	14,874	85	29,600	2,331	14,261	15		307
CSJ: 0576-02-075 TOTALS	**29,748**	**14,874**	**85**	**29,600**	**2,331**	**14,261**	**15**	**0**	**307**
PROJECT TOTALS	**65,764**	**32,882**	**85**	**65,616**	**5,791**	**35,645**	**15**	**71**	**680**

(1) OPTION 3 - 8 INCHES

SUMMARY OF SMALL ROAD SIGNS							
ITEM NO.		644					
BID CODE		6001	6004	6007	6060	6061	6076
CSJ	STATION	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	IN SM RD SN SUP&AM TYTWT(1)WS(P)	IN SM RD SN SUP&AM TYTWT(1)WS(T)	REMOVE SM RD SN SUP&AM
		EA	EA	EA	EA	EA	EA
0576-02-068	STA 312+00 TO STA 492+00		2	5	7	8	22
0576-02-075	STA 492+00 TO STA 640+00	1	5	2	14	7	29
PROJECT TOTALS		**1**	**7**	**7**	**21**	**15**	**51**

EQUATION: STA 367+08 BK = STA 367+00 FWD = +8.0FT

Texas Department of Transportation

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		7

DATE: 3/24/2023 3:47:32 PM
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SUMMARY OF DRIVEWAY AND SIDEROADS (FM 58)

ID	(3) STATION	OFFSET	EXIST SURF	R C S	AVG WIDTH	OFFSET FROM CL		DESCRIPTION OF WORK	104	162	168	400	464				465	467 (1)				480	496	530		
						EXIST	PROP		6017	6002	6001	6007	6003	6005	6007	6008	6158	6363	6395	6423	6454	6001	6016	6004	6005	
									REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	INLET (COMPL) (PAZD) (FG) (3FTX3FT - 3FTX3FT)	SET (TY II) (RCP) (6:1) (P) (18 IN)	SET (TY II) (RCP) (6:1) (P) (24 IN)	SET (TY II) (RCP) (6:1) (P) (30 IN)	SET (TY II) (RCP) (6:1) (P) (36 IN)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)	DRIVEWAYS (CONC)	(ACP) (440 LBS/ SY)	(ACP) (660 LBS/ SY)
					FT	FT	FT		SY	SY	MG	SY	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	SY	SY	SY
CSJ: 0576-02-068 (FM 58)																										
1	314+90	R	GRAV	R	16.5	20	20	REMOVE 18" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		28					2					1		69	
2	326+50	R	ASPH	C	25	29	29	REMOVE 18" CMP, REPLACE W/ 18" X 50' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		50					2					1		158	
3	329+85	L	GRAV	C	18	25	25	REMOVE 18" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		28					2					1		67	
4	335+15	R	GRAV	C	59.2	20	20	REMOVE 18" CMP, REPLACE W/ 18" X 64' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		64					2					1		68	
5	337+50	R	CONC	R	26.6	18	18	REMOVE 18" CMP, REPLACE W/ 18" X 52' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END	15	22	0.5	10	52											52		
6	340+95	L	DIRT	C	18.5	26	26	CLEAN EA END														1			76	
7	341+10	R	DIRT	C	12.1	N/A	N/A	NO WORK																	56	
8	341+50	R	GRAV	C	8.2	22	22	REMOVE 18" CMP, REPLACE W/ 18" X 20' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		20					2					1		56	
9	348+30	R	DIRT	R	16.4	N/A	N/A	NO WORK																		107
10	348+75	R	ASPH	R	38.4	N/A	N/A	NO WORK																		104
11	353+78	R	CONC	R	11.7	22	22	REMOVE 18" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5	5	28					2							70		
12	354+25	R	CONC	R	11.9	22	22	REMOVE 18" CMP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END	5	22	0.5	5	24					2					1		72		
13	354+95	R	CONC	R	12	21	21	REMOVE 18" CMP, REPLACE W/ 18" X 22' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END	5	22	0.5	5	22					2					1		71		
14	356+50	R	CONC	R	12	23	23	REMOVE 18" CMP, REPLACE W/ 18" X 22' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END	5	22	0.5	5	22					2					1		71		
CSJ: 0576-02-068 SHEET TOTALS									**30**	**220**	**5**	**30**	**338**	**0**	**0**	**0**	**0**	**18**	**0**	**0**	**0**	**1**	**8**	**336**	**549**	**211**

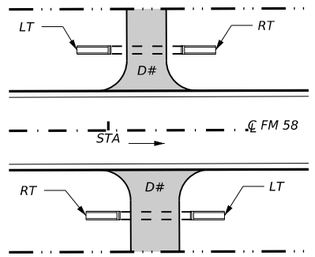
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SETS

2)

REQUIRED BLOCK SOD AT EACH SET END	
CULVERT SIZE	SY
18"	11
24"	13
30"	16
36"	18

3) A FULL TOPOGRAPHICAL SURVEY WAS NOT PREPARED. STATIONS WERE ACQUIRED USING A DIGITAL MEASURING INSTRUMENT (DMI). THE STATIONS SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT WORK.



DRIVEWAYS

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 3 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		8

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SUMMARY OF DRIVEWAY AND SIDEROADS (FM 58)(CONT.)

ID	(3) STATION	OFFSET	EXIST SURF	R C S	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	DESCRIPTION OF WORK	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	INLET (COMPL) (PAZD) (FG) (3FTX3FT - 3FTX3FT)	SET (TY II) (RCP) (6:1) (P) (18 IN)	SET (TY II) (RCP) (6:1) (P) (24 IN)	SET (TY II) (RCP) (6:1) (P) (30 IN)	SET (TY II) (RCP) (6:1) (P) (36 IN)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP) (440 LBS/ SY)	DRIVEWAYS (ACP) (660 LBS/ SY)
					FT	FT	FT		SY	SY	MG	SY	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	SY	SY	SY
CSJ 0576-02-068 (CONTINUED)																											
15	358+60	R	CONC	R	11.9	22	22	REMOVE 18" CMP, REPLACE W/ 18" X 32' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END	5	22	0.5	5	32					2					1	71		
16	360+15	R	CONC	R	17	25	25	REMOVE 18" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END	7	22	0.5	7	28					2					1	71		
17	365+15	L	GRAV	R	17	N/A	N/A	NO WORK																		144
18	366+40	R	DIRT	R	25.6	25	25	REMOVE 18" CMP, REPLACE W/ 18" X 40' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		40					2					1		92	
19	373+00	R	GRAV	R	21.4	24	24	NO WORK																	69	
20	380+00	R	DIRT	R	25.2	22	22	REMOVE 15" STEEL PIPE, REPLACE W/ 18" X 38' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA		22	0.5		38					2					1		107	
21	388+10	R	GRAV	R	16.1	22	22	REMOVE 18" CMP, REPLACE W/ 18" X 56' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		56					2					1		61	
22	389+00	L	DIRT	R	10.9	29	29	REMOVE 12" CMP, REPLACE W/ 18" X 20' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		20					2					1		53	
23	405+60	R	GRAV	R	10	20	20	REMOVE 15" CMP, REPLACE W/ 18" X 20' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		20					2					1		52	
24	407+80	R	GRAV	R	10.1	18	18	REMOVE 15" CMP, REPLACE W/ 18" X 20' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		20					2					1		48	
25	408+25	R	GRAV	R	12.4	18	18	REMOVE 15" CMP, REPLACE W/ 18" X 20' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		20					2					1		51	
26	410+10	L	DIRT	R	11.1	N/A	N/A	NO WORK																	56	
27	411+10	R	GRAV	R	9.8	23	23	REMOVE 15" CMP, REPLACE W/ 18" X 20' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		20					2					1		52	
28	411+15	L	ASPH	R	9.2	30	30	REMOVE 15" CMP, REPLACE W/ 18" X 20' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		20					2					1		56	
29	413+75	R	ASPH	R	17.9	26	26	REMOVE 15" CMP, REPLACE W/ 18" X 36' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		36					2					1		57	
CSJ: 0576-02-068 SHEET TOTALS									**12**	**264**	**6.0**	**12**	**350**	**0**	**0**	**0**	**0**	**24**	**0**	**0**	**0**	**0**	**12**	**142**	**753**	**144**
ITEM NO.									104	162	168	400	464				465	467 (1)				480	496	530		
BID CODE									6017	6002	6001	6007	6003	6005	6007	6008	6158	6363	6395	6423	6454	6001	6016	6004	6005	

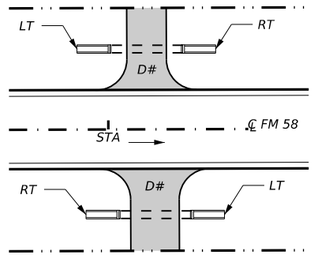
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SETS

2)

REQUIRED BLOCK SOD AT EACH SET END	
CULVERTSIZE	SY
18"	11
24"	13
30"	16
36"	18

3) A FULL TOPOGRAPHICAL SURVEY WAS NOT PREPARED. STATIONS WERE ACQUIRED USING A DIGITAL MEASURING INSTRUMENT (DMI). THE STATIONS SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT WORK.



DRIVEWAYS

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 4 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		9

DATE: 3/24/2023 3:47:33 PM
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SUMMARY OF DRIVEWAY AND SIDEROADS (FM 58)(CONT.)

ID	(3) STATION	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	DESCRIPTION OF WORK	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING	CUT & RESTORE CONC PAVING	RC PIPE (CL III)				INLET (COMPL) (PAZD) (FG) (3FTX3FT - 3FTX3FT)	SET (TY II) (RCP) (6:1) (P)				CLEAN EXIST CULVERTS	REMOV STR (PIPE)	DRIVEWAYS		
											(10 GAL/SY /2 APP)		(18 IN)	(24 IN)	(30 IN)	(36 IN)		(18 IN)	(24 IN)	(30 IN)	(36 IN)			DRIVEWAYS (CONC)	(ACP) (440 LBS/ SY)	(ACP) (660 LBS/ SY)
					FT	FT	FT		SY	SY	MG	SY	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	SY	SY	SY
								ITEM NO.	104	162	168	400	464				465	467 (1)				480	496	530		
								BID CODE	6017	6002	6001	6007	6003	6005	6007	6008	6158	6363	6395	6423	6454	6001	6016	6004	6005	
								CSJ 0576-02-068 (CONTINUED)																		
30	414+10	L	ASPH	R	6	27	27	REMOVE 15" CMP, REPLACE W/ 18" X 30' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		30					2					1		50	
31	416+80	L	GRAV	R	11	28	28	REMOVE 15" CMP, REPLACE W/ 18" X 34' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		34					2					1		56	
32	417+30	R	ASPH	R	24	26	26	REMOVE 15" CMP, REPLACE W/ 18" X 40' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		40					2					1		107	
33	419+90	R	GRAV	R	12	23	23	REMOVE 18" CMP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		24					2					1		75	
34	421+40	L	GRAV	R	10	28	28	REMOVE 15" CMP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		24					2					1		62	
35	422+10	R	GRAV	R	10	24	24	REMOVE 18" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		28					2					1		56	
36	422+60	L	GRAV	R	9	27	27	REMOVE 15" CMP, REPLACE W/ 18" X 22' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		22					2					1		60	
37	424+30	L	ASPH	R	8	28	28	REMOVE 15" CMP, REPLACE W/ 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		26					2					1		48	
38	424+90	R	ASPH	R	9	25	25	REMOVE 15" CMP, REPLACE W/ 18" X 30' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		30					2					1		52	
39	426+50	R	DIRT	R	12	21	21	REMOVE 15" CMP, REPLACE W/ 18" X 30' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		30					2					1		64	
40	426+75	L	GRAV	R	19	28	28	REMOVE 18" STEEL PIPE, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA		22	0.5		28					2					1		92	
41	427+85	L	ASPH	R	15	N/A	N/A	NO WORK																		148
42	429+80	R	DIRT	R	11	23	23	REMOVE 15" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		28					2					1		65	
43	431+75	R	GRAV	R	12	21	21	REMOVE 18" CMP, REPLACE W/ 18" X 38' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		38					2					1		67	
44	433+30	L	ASPH	R	16	28	28	REMOVE 15" CMP, REPLACE W/ 18" X 30' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		30					2					1		78	
								CSJ: 0576-02-068 SHEET TOTALS	**0**	**308**	**7.0**	**0**	**412**	**0**	**0**	**0**	**0**	**28**	**0**	**0**	**0**	**0**	**14**	**0**	**932**	**148**

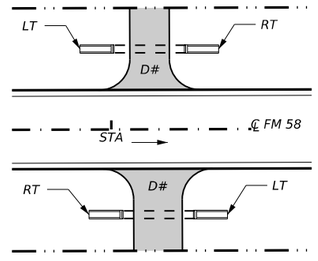
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SETS

2)

REQUIRED BLOCK SOD AT EACH SET END	
CULVERT SIZE	SY
18"	11
24"	13
30"	16
36"	18

3) A FULL TOPOGRAPHICAL SURVEY WAS NOT PREPARED. STATIONS WERE ACQUIRED USING A DIGITAL MEASURING INSTRUMENT (DMI). THE STATIONS SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT WORK.



DRIVEWAYS

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 5 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		10

DATE: 3/24/2023 3:47:33 PM
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SUMMARY OF DRIVEWAY AND SIDEROADS (FM 58)(CONT.)

ID	(3) STATION	OFFSET	EXIST SURF	R C S	AVG WIDTH	EXIST OFFS ET FROM CL	PROP OFFS ET FROM CL	DESCRIPTION OF WORK	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	INLET (COMPL) (PAZD) (FG) (3FTX3FT - 3FTX3FT)	SET (TY II) (RCP) (6:1) (P) (18 IN)	SET (TY II) (RCP) (6:1) (P) (24 IN)	SET (TY II) (RCP) (6:1) (P) (30 IN)	SET (TY II) (RCP) (6:1) (P) (36 IN)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP) (440 LBS/ SY)	DRIVEWAYS (ACP) (660 LBS/ SY)
ITEM NO.									104	162	168	400	464				465	467 (1)				480	496	530		
BID CODE									6017	6002	6001	6007	6003	6005	6007	6008	6158	6363	6395	6423	6454	6001	6016	6004	6005	
					FT	FT	FT		SY	SY	MG	SY	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	SY	SY	SY
CSJ 0576-02-068 (CONTINUED)																										
45	435+05	R	ASPH	R	9	21	21	REMOVE 18" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		28					2					1		49	
46	437+40	R	DIRT	R	19	22	22	REMOVE 18" CMP, REPLACE W/ 18" X 32' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		32					2					1		89	
47	439+40	R	GRAV	R	13	40	40	REMOVE 18" CMP, REPLACE W/ 18" X 34' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		34					2					1		134	
48	447+00	R	ASPH	R	12	22	22	REMOVE 12" STEEL PIPE, REPLACE W/ 18" X 36' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA		22	0.5		36					2					1		63	
49	447+65	L	DIRT	R	13	N/A	N/A	NO WORK																	69	
50	447+60	R	ASPH	R	10	21	21	REMOVE 15" CMP, REPLACE W/ 18" X 22' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		22					2					1		56	
51	449+50	R	DIRT	R	14	21	21	REMOVE 15" CMP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		24					2					1		68	
52	449+80	L	DIRT	R	12	23	23	REMOVE 15" CMP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		24					2					1		66	
53	451+20	L	GRAV	R	29	25	25	REMOVE 18" CMP, REPLACE W/ 18" X 40' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		40					2					1		133	
54	451+75	R	ASPH	R	9	20	20	REMOVE 15" CMP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		24					2					1		56	
55	452+20	L	DIRT	R	12	23	23	REMOVE 15" CMP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		24					2					1		66	
56	453+35	L	GRAV	R	9	25	25	REMOVE 15" CMP, REPLACE W/ 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		26					2					1		57	
57	454+15	L	DIRT	R	14	24	24	REMOVE 15" CMP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		24					2					1		71	
58	455+20	R	DIRT	R	17	19	36	REMOVE 18" CMP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) (LT) & INLET (RT) (CONNECT TO D60 PIPE)		22	0.5		24				1	1					1			80
59	455+55	R	DIRT	R	17	18	36	REMOVE 15" CMP, REPLACE W/ 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) (RT) & INLET (LT) (CONNECT TO D59 PIPE)		22	0.5		26					1					1		80	
CSJ: 0576-02-068 SHEET TOTALS									**0**	**308**	**7.0**	**0**	**388**	**0**	**0**	**0**	**1**	**26**	**0**	**0**	**0**	**0**	**14**	**0**	**1057**	**80**

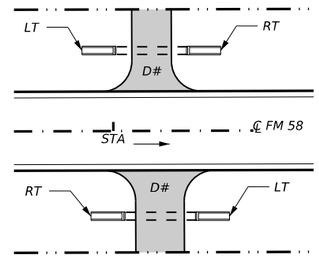
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SETS

2)

REQUIRED BLOCK SOD AT EACH SET END	
CULVERT SIZE	SY
18"	11
24"	13
30"	16
36"	18

3) A FULL TOPOGRAPHICAL SURVEY WAS NOT PREPARED. STATIONS WERE ACQUIRED USING A DIGITAL MEASURING INSTRUMENT (DMI). THE STATIONS SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT WORK.



DRIVEWAYS

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 6 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		11

DATE: 3/24/2023 3:47:34 PM
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SUMMARY OF DRIVEWAY AND SIDEROADS (FM 58)(CONT.)

ID	(3) STATION	OFFSET	EXIST SURF	R C S	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	DESCRIPTION OF WORK	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	INLET (COMPL) (PAZD) (FG) (3FTX3FT - 3FTX3FT)	SET (TY II) (RCP) (6:1) (P) (18 IN)	SET (TY II) (RCP) (6:1) (P) (24 IN)	SET (TY II) (RCP) (6:1) (P) (30 IN)	SET (TY II) (RCP) (6:1) (P) (36 IN)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP) (440 LBS/ SY)	DRIVEWAYS (ACP) (660 LBS/ SY)
					FT	FT	FT		SY	SY	MG	SY	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	SY	SY	SY
CSJ 0576-02-068 (CONTINUED)																										
60	456+30	R	GRAV	R	14	19	19	REMOVE 15" CMP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		24					2					1		73	
61	457+10	L	DIRT	R	21	27	27	REMOVE 3' JOINT ON EA END, REPLACE W/ 18" X 6' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P), CLEAN CULVERT ON EA END		22	0.5		12					2				1	1		101	
62	458+15	R	GRAV	R	14	22	22	REMOVE 18" CMP, REPLACE W/ 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		26					2					1		65	
63	459+95	L	ASPH	R	11	N/A	N/A	NO WORK																	62	
64	464+20	R	ASPH	R	8	21	21	REMOVE 24" CMP, REPLACE W/ 24" X 20' RCP (CL III) & ADD SET (TY II)(24 IN)(RCP)(6:1)(P) ON EA END		26	0.6			20					2				1		58	
65	464+95	L	DIRT	R	17	24	24	REMOVE 15" CMP, REPLACE W/ 18" X 20' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		20					2					1		78	
66	465+30	R	GRAV	R	13	23	23	REMOVE 3' JOINT ON EA END, REPLACE W/ 24" X 4' RCP (CL III) & ADD SET (TY II)(24 IN)(RCP)(6:1)(P), CLEAN CULVERT ON EA END		26	0.6			8					2				1	1		69	
67	466+50	R	GRAV	R	12	20	20	REMOVE 15" RCP, REPLACE W/ 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		26					2					1		72	
68	768+35	L	DIRT	R	20	28	28	REMOVE 24" CMP, REPLACE W/ 24" X 26' RCP (CL III) & ADD SET (TY II)(24 IN)(RCP)(6:1)(P) ON EA END		26	0.6			26					2				1		92	
69	469+10	R	DIRT	R	11	22	22	ADD 18" X 4' RCP (CL III) ON RT, ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		4					2					1		61	
70	470+40	R	ASPH	R	15	22	22	REMOVE 24" CMP, REPLACE W/ 24" X 36' RCP (CL III) & ADD SET (TY II)(24 IN)(RCP)(6:1)(P) ON EA END		26	0.6			36					2				1		142	
71	471+20	R	DIRT	R	14	21	21	REMOVE (2) 15" RCP, REPLACE W/ (2) 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		44	0.9		52					4					2		70	
72	471+80	R	DIRT	R	14	24	24	ADD (2) 18" X 4' RCP (CL III) ON RT, ADD SET (TY II)(18 IN)(RCP)(6:1)(P) & CLEAN CULVERT ON EA END		22	0.5		8					4				2			73	
73	472+65	R	DIRT	R	16	19	19	REMOVE (2) 15" RCP, REPLACE W/ (2) 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		44	0.9		48					4					2		77	
74	475+10	R	CONC	R	20	20	20	REMOVE (2) 18" CMP, REPLACE W/ (2) 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		44	0.9	16	52					4					2	92		
CSJ: 0576-02-068 SHEET TOTALS									**0**	**390**	**8.6**	**16**	**272**	**90**	**0**	**0**	**0**	**28**	**8**	**0**	**0**	**4**	**16**	**92**	**1092**	**0**

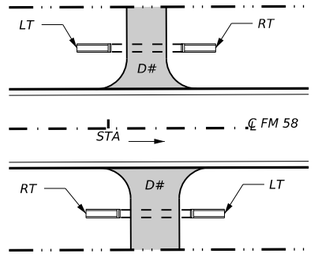
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SETS

2)

REQUIRED BLOCK SOD AT EACH SET END	
CULVERTSIZE	SY
18"	11
24"	13
30"	16
36"	18

3) A FULL TOPOGRAPHICAL SURVEY WAS NOT PREPARED. STATIONS WERE ACQUIRED USING A DIGITAL MEASURING INSTRUMENT (DMI). THE STATIONS SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT WORK.



DRIVEWAYS

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 7 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		12

DATE: 3/24/2023 3:47:35 PM
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SUMMARY OF DRIVEWAY AND SIDEROADS (FM 58)(CONT.)

ID	(3) STATION	OFFSET	EXIST SURF	R C S	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	DESCRIPTION OF WORK	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	INLET (COMPL) (PAZD) (FG) (3FTX3FT - 3FTX3FT)	SET (TY II) (RCP) (6:1) (P) (18 IN)	SET (TY II) (RCP) (6:1) (P) (24 IN)	SET (TY II) (RCP) (6:1) (P) (30 IN)	SET (TY II) (RCP) (6:1) (P) (36 IN)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP) (440 LBS/ SY)	DRIVEWAYS (ACP) (660 LBS/ SY)
					FT	FT	FT		SY	SY	MG	SY	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	SY	SY	SY
								CSJ 0576-02-068 (CONTINUED)																		
75	476+25	L	DIRT	R	11	32	32	REMOVE 8" STEEL PIPE, REPLACE W/ 18" X 32' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		32					2					1		64	
76	479+10	R	DIRT	R	16	23	23	REMOVE 4' JOINT ON EA END, REPLACE W/ 18" X 8' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P), CLEAN CULVERT ON EA END		22	0.5		16					2				1			78	
77	479+20	L	DIRT	R	11	N/A	N/A	NO WORK																	61	
78	480+05	R	DIRT	R	16	N/A	N/A	NO WORK																	77	
79	486+90	R	DIRT	R	14	N/A	N/A	NO WORK																	69	
80	487+60	R	CONC	R	10	20	20	REMOVE 4' JOINT ON EA END, REPLACE W/ 18" X 8' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P), CLEAN CULVERT ON EA END		22	0.5	4	16					2				1	1	57		
81	490+85	R	ASPH	R	15	N/A	N/A	NO WORK																		136
82	491+35	R	ASPH	R	12	N/A	N/A	NO WORK																	62	
								CSJ: 0576-02-068 SHEET TOTALS	***0***	***66***	***1.5***	***4***	***64***	***0***	***0***	***0***	***0***	***6***	***0***	***0***	***0***	***2***	***2***	***57***	***349***	***136***
								CSJ: 0576-02-068 TOTALS	***42***	***1556***	***35***	***62***	***1824***	***90***	***0***	***0***	***1***	***130***	***8***	***0***	***0***	***7***	***66***	***627***	***4732***	***719***
								CSJ 0576-02-075																		
83	493+95	L	GRAV	R	9	34	34	REMOVE 18" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		28					2					1		58	
84	497+35	L	DIRT	R	10	30	36	REMOVE 15" CMP, REPLACE W/ 18" X 22' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) (LT) & INLET (RT) (CONNECT TO D86 PIPE)		22	0.5		22				1	1					1		56	
85	497+65	L	GRAV	R	10	29	36	REMOVE 18" CMP, REPLACE W/ 18" X 30' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) (RT)) & INLET (LT) (CONNECT TO D85 PIPE)		22	0.5		30					1					1		56	
86	498+65	R	GRAV	R	11	23	23	REMOVE 18" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		28					2					1		69	
87	511+95	L	GRAV	R	10	25	25	REMOVE 15" CMP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		24					2					1		62	
88	514+00	L	GRAV	R	17	N/A	N/A	NO WORK																		284
89	517+00	L	DIRT	R	9	25	25	REMOVE 13" STEEL PIPE, REPLACE W/ 18" X 22' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA		22	0.5		22					2					1		53	
								SHEET TOTALS	***42***	***1688***	***38.1***	***62***	***1978***	***90***	***0***	***0***	***2***	***140***	***8***	***0***	***0***	***7***	***72***	***627***	***5086***	***1003***

R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SETS

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REQUIRED BLOCK SOD AT EACH SET END	
CULVERT SIZE	SY
18"	11
24"	13
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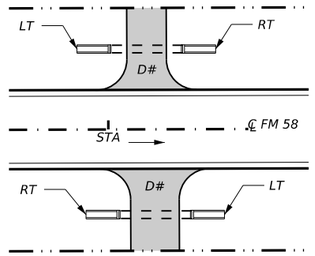

DRIVEWAYS

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 8 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		13

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SUMMARY OF DRIVEWAY AND SIDEROADS (FM 58)(CONT.)

ID	(3) STATION	OFFSET	EXIST SURF	R C S	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	DESCRIPTION OF WORK	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	464 RC PIPE (CL III) (18 IN)	464 RC PIPE (CL III) (24 IN)	464 RC PIPE (CL III) (30 IN)	464 RC PIPE (CL III) (36 IN)	465 INLET (COMPL) (PAZD) (FG) (3FTX3FT - 3FTX3FT)	467 (1) SET (TY II) (RCP) (6:1) (P) (18 IN)	467 (1) SET (TY II) (RCP) (6:1) (P) (24 IN)	467 (1) SET (TY II) (RCP) (6:1) (P) (30 IN)	467 (1) SET (TY II) (RCP) (6:1) (P) (36 IN)	480 CLEAN EXIST CULVERTS	496 REMOV STR (PIPE)	530 DRIVEWAYS DRIVEWAYS (CONC)	530 DRIVEWAYS (ACP) (440 LBS/ SY)	530 DRIVEWAYS (ACP) (660 LBS/ SY)
					FT	FT	FT		SY	SY	MG	SY	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	SY	SY	SY
CSJ 0576-02-075 (CONTINUED)																										
90	518+30	R	ASPH	R	17	N/A	N/A	NO WORK																		148
91	523+50	L	GRAV	R	16	N/A	N/A	NO WORK																	76	
92	524+30	L	GRAV	R	20	N/A	N/A	NO WORK																	92	
93	531+35	R	GRAV	R	17	N/A	N/A	NO WORK																	80	
94	353+70	L	DIRT	R	17	15	15	REMOVE 18" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		28					2					1		85	
95	538+65	L	DIRT	R	13	30	30	REMOVE 15" CMP, REPLACE W/ 18" X 38' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		38					2					1			150
96	548+65	L	DIRT	R	19	N/A	N/A	NO WORK																	94	
97	550+15	R	DIRT	R	20	N/A	N/A	NO WORK																	95	
98	553+70	R	ASPH	R	23	24	24	REMOVE 12" RCP, REPLACE W/ 18" X 48' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		48					2					1			186
99	555+10	R	ASPH	R	13	24	24	REMOVE 12" RCP, REPLACE W/ 18" X 34' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		34					2					1		80	
100	556+95	R	ASPH	R	18	17	17	REMOVE 12" RCP, REPLACE W/ 18" X 42' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		42					2					1		76	
101	557+85	R	ASPH	R	32	26	26	REMOVE 18" CMP, REPLACE W/ 18" X 46' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		46					2					1		132	
102	560+30	R	ASPH	R	10	70	70	REMOVE 18" CMP, REPLACE W/ 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		26					2					1			158
103	560+90	L	ASPH	R	10	N/A	N/A	NO WORK																	64	
104	561+95	R	GRAV	R	20	47	47	REMOVE 10" CMP, REPLACE W/ 18" X 38' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		38					2					1		88	
CSJ: 0576-02-075 SHEET TOTALS									**0**	**176**	**4.0**	**0**	**300**	**0**	**0**	**0**	**0**	**16**	**0**	**0**	**0**	**0**	**8**	**0**	**963**	**642**

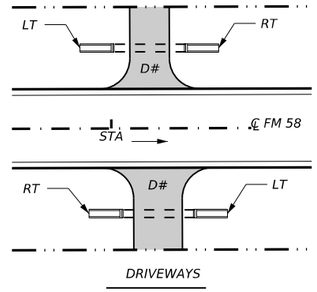
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SETS

2)

REQUIRED BLOCK SOD AT EACH SET END	
CULVERTSIZE	SY
18"	11
24"	13
30"	16
36"	18

3) A FULL TOPOGRAPHICAL SURVEY WAS NOT PREPARED. STATIONS WERE ACQUIRED USING A DIGITAL MEASURING INSTRUMENT (DMI). THE STATIONS SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT WORK.



DRIVEWAYS

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 9 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		14

DATE: 3/24/2023 3:47:36 PM
FILE: c:\txdotpw_online\txdot3\lauren.perry\d0509449\QUANTITY SUMMARIES.dgn

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 58)(CONT.)

ID	(3) STATION	OFFSET	EXIST SURF	R C S	AVG WIDTH	EXIST OFFS ET FROM CL	PROP OFFS ET FROM CL	DESCRIPTION OF WORK	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	INLET (COMPL) (PAZD) (FG) (3FTX3FT - 3FTX3FT)	SET (TY II) (RCP) (6:1) (P) (18 IN)	SET (TY II) (RCP) (6:1) (P) (24 IN)	SET (TY II) (RCP) (6:1) (P) (30 IN)	SET (TY II) (RCP) (6:1) (P) (36 IN)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP) (440 LBS/ SY)	DRIVEWAYS (ACP) (660 LBS/ SY)
ITEM NO.									104	162	168	400	464	464	464	464	465	467 (1)	467 (1)	467 (1)	467 (1)	480	496	530	530	530
BID CODE									6017	6002	6001	6007	6003	6005	6007	6008	6158	6363	6395	6423	6454	6001	6016	6004	6005	6005
					FT	FT	FT		SY	SY	MG	SY	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	SY	SY	SY
CSJ 0576-02-075 (CONTINUED)																										
105	563+50	R	GRAV	R	10	N/A	N/A	NO WORK																		118
106	564+30	L	DIRT	R	7	N/A	N/A	NO WORK																	60	
107	565+40	L	DIRT	R	9	25	25	REMOVE 15" RCP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		24					2					1		56	
108	570+35	L	ASPH	R	15	27	27	REMOVE 15" CMP, REPLACE W/ 18" X 30' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		30					2					1		76	
109	571+45	R	DIRT	R	12.1	12	12	REMOVE 12" RCP, REPLACE W/ 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		26					2					1		64	
110	572+25	R	DIRT	R	12	N/A	12	INSTALL 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		26					2							64	
111	573+75	L	ASPH	R	10	27	27	REMOVE 15" RCP, REPLACE W/ 18" X 22' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		22					2					1		56	
112	576+65	R	GRAV	R	12	N/A	N/A	NO WORK																	69	
113	577+90	L	GRAV	R	12	29	29	REMOVE 15" CPP, REPLACE W/ 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		26					2					1		65	
114	578+60	R	GRAV	R	7	23	23	REMOVE 15" CMP, REPLACE W/ 18" X 26' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		26					2					1		72	
115	580+65	R	GRAV	R	18	N/A	N/A	NO WORK																	86	
116	582+30	R	GRAV	R	14	23	23	ADD 18" X 4' RCP (CL III) ON LT, ADD SET (TY II) (18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		4					2							68	
117	583+40	L	GRAV	R	10	30	30	REMOVE 12" CMP, REPLACE W/ 18" X 20' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		20					2					1		61	
118	586+00	R	DIRT	R	8	22	22	REMOVE 15" CMP, REPLACE W/ 18" X 22' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		22					2					1		52	
119	587+80	R	DIRT	R	11	20	20	REMOVE 4' JOINT & ADD 18" X 4' RCP (CL III) ON RT, ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END, CLEAN CULVERT		22	0.5		4					2				1			60	
CSJ: 0576-02-075 SHEET TOTALS									**0**	**242**	**5.5**	**0**	**230**	**0**	**0**	**0**	**0**	**22**	**0**	**0**	**0**	**1**	**8**	**0**	**909**	**118**

R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SETS

2)

REQUIRED BLOCK SOD AT EACH SET END	
CULVERT SIZE	SY
18"	11
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30"	16
36"	18

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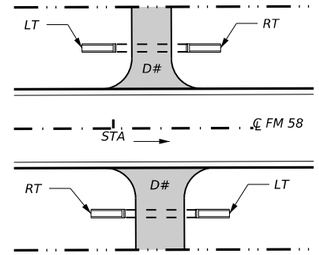

DRIVEWAYS

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 10 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		15

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SUMMARY OF DRIVEWAY AND SIDEROADS (FM 58)(CONT.)

ID	(3) STATION	OFFSET	EXIST SURF	R C S	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	DESCRIPTION OF WORK	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	INLET (COMPL) (PAZD) (FG) (3FTX3FT - 3FTX3FT)	SET (TY II) (RCP) (6:1) (P) (18 IN)	SET (TY II) (RCP) (6:1) (P) (24 IN)	SET (TY II) (RCP) (6:1) (P) (30 IN)	SET (TY II) (RCP) (6:1) (P) (36 IN)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP) (440 LBS/ SY)	DRIVEWAYS (ACP) (660 LBS/ SY)
					FT	FT	FT		SY	SY	MG	SY	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	SY	SY	SY
								CSJ 0576-02-075 (CONTINUED)																		
120	591+10	R	ASPH	R	15	20	20	REMOVE 18" CMP, REPLACE W/ 18" X 36' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		36					2					1		69	
121	591+80	R	ASPH	R	9	20	20	REMOVE 18" CMP, REPLACE W/ 18" X 36' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		36					2					1		53	
122	592+05	L	DIRT	R	17	28	28	REMOVE 18" CMP, REPLACE W/ 18" X 30' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		30					2					1		83	
123	594+90	R	DIRT	R	11	20	20	REMOVE 15" RCP, REPLACE W/ 18" X 24' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		24					2					1		80	
124	595+00	L	ASPH	R	15	26	26	REMOVE 18" CMP, REPLACE W/ 18" X 34' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		34					2					1			77
125	596+80	R	GRAV	R	11	24	24	REMOVE 4' JOINT ON EA END, REPLACE W/ 18" X 8' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P), CLEAN CULVERT ON EA END		22	0.5		16					2				1	1		59	
126	598+40	R	ASPH	R	17	38	38	REMOVE 30" CMP, REPLACE W/ 30" X 32' (CL III) & ADD SET (TY II)(30 IN)(RCP)(6:1)(P) ON EA END		32	0.7				32					2			1			152
127	605+20	R	GRAV	R	28	28	28	REMOVE 30" CMP, REPLACE W/ 30" X 34' (CL III) & ADD SET (TY II)(30 IN)(RCP)(6:1)(P) ON EA END		32	0.7				34					2			1		64	
128	607+65	R	GRAV	R	10	27	27	REMOVE 30" CMP, REPLACE W/ 30" X 32' (CL III) & ADD SET (TY II)(30 IN)(RCP)(6:1)(P) ON EA END		32	0.7				32					2			1		56	
129	609+50	R	ASPH	R	12	27	27	REMOVE 36" CMP, REPLACE W/ 36" X 22' (CL III) & ADD SET (TY II)(36 IN)(RCP)(6:1)(P) ON EA END		36	0.8					22					2		1			127
130	610+90	R	DIRT	R	10	33	33	ADD 2-24" X 6' RCP (CL III) ON RT, ADD SET (TY II)(24 IN)(RCP)(6:1)(P) ON EA END		52	1.1				12				4						59	
131	615+25	R	GRAV	R	17	30	30	REMOVE 24" CMP, REPLACE W/ 2- 24" X 34' RCP (CL III) & ADD SET (TY II)(24 IN)(RCP)(6:1)(P) ON EA END		52	1.1				68				4				1		85	
132	619+80	R	GRAV	R	12	31	31	REMOVE 24" CMP, REPLACE W/ 2- 24" X 34' RCP (CL III) & ADD SET (TY II)(24 IN)(RCP)(6:1)(P) ON EA END		52	1.1				68				4				1		69	
133	621+00	R	DIRT	R	14	34	34	REMOVE 24" CMP, REPLACE W/ 2- 24" X 26' RCP (CL III) & ADD SET (TY II)(24 IN)(RCP)(6:1)(P) ON EA END		52	1.1				52				4				1		75	
134	627+65	L	DIRT	R	19	35	35	REMOVE (2) 18" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		44	0.9		56				4					2		94	
								CSJ: 0576-02-075 SHEET TOTALS	**0**	**516**	**11.2**	**0**	**232**	**200**	**98**	**22**	**0**	**16**	**16**	**6**	**2**	**1**	**15**	**0**	**847**	**356**

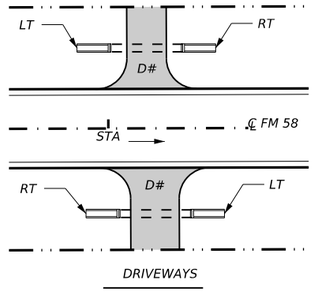
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SETS

2)

REQUIRED BLOCK SOD AT EACH SET END	
CULVERTSIZE	SY
18"	11
24"	13
30"	16
36"	18

3) A FULL TOPOGRAPHICAL SURVEY WAS NOT PREPARED. STATIONS WERE ACQUIRED USING A DIGITAL MEASURING INSTRUMENT (DMI). THE STATIONS SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT WORK.



DRIVEWAYS

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 11 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		16

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SUMMARY OF DRIVEWAY AND SIDEROADS (FM 58)(CONT.)

ID	(3) STATION	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	DESCRIPTION OF WORK	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	INLET (COMPL) (PAZD) (FG) (3FTX3FT - 3FTX3FT)	SET (TY II) (RCP) (6:1) (P) (18 IN)	SET (TY II) (RCP) (6:1) (P) (24 IN)	SET (TY II) (RCP) (6:1) (P) (30 IN)	SET (TY II) (RCP) (6:1) (P) (36 IN)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP) (440 LBS/ SY)	DRIVEWAYS (ACP) (660 LBS/ SY)
					FT	FT	FT		SY	SY	MG	SY	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	SY	SY	SY
								ITEM NO.	104	162	168	400	464	464	464	464	465	467 (1)	467 (1)	467 (1)	467 (1)	480	496	530	530	530
								BID CODE	6017	6002	6001	6007	6003	6005	6007	6008	6158	6363	6395	6423	6454	6001	6016	6004	6005	6005
								CSJ 0576-02-075 (CONTINUED)																			
135	628+45	R	ASPH	R	12	26	26	REMOVE 3' JOINT ON EA END, REPLACE W/ 18" X 8' RCP (CL III) ON LT, 18" X 8' RCP (CL III) ON RT & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END, CLEAN CULVERT		22	0.5		16					2					1		73	
136	629+45	L	ASPH	R	11	32	32	REMOVE 24" CMP, REPLACE W/ 24" X 34' RCP (CL III) & ADD SET (TY II)(24 IN)(RCP)(6:1)(P) ON EA END		26	0.6			34					2			1			152	
137	631+90	R	ASPH	R	11.5	26	26	REMOVE 15" RCP, REPLACE W/ 18" X 22' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		22					2					1		72	
138	634+80	R	DIRT	R	10	27	27	REMOVE 18" CMP, REPLACE W/ 18" X 28' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END		22	0.5		28					2					1		57	
139	636+45	R	GRAV	R	13	22	22	REMOVE 4' JOINT ON LT, REPLACE W/ 18" X 4' RCP (CL III) & ADD SET (TY II)(18 IN)(RCP)(6:1)(P) ON EA END, CLEAN CULVERT		22	0.5		4					2					1		68	
140	639+00	R	DIRT	R	10	N/A	N/A	NO WORK																	333	
								CSJ: 0576-02-075 TOTALS	**0**	**1180**	**26**	**0**	**986**	**234**	**98**	**22**	**1**	**72**	**18**	**6**	**2**	**2**	**42**	**0**	**3678**	**1552**
								PROJECT TOTALS	**42**	**2736**	**61**	**62**	**2810**	**324**	**98**	**22**	**2**	**202**	**26**	**6**	**2**	**9**	**108**	**627**	**8410**	**2271**

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C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SETS

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REQUIRED BLOCK SOD AT EACH SET END	
CULVERT SIZE	SY
18"	11
24"	13
30"	16
36"	18

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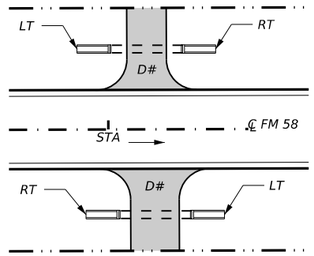

DRIVEWAYS

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 12 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		17

DATE: 3/24/2023 3:47:37 PM
FILE: c:\txdot\pw_online\txdot3\lauren.perry\d0509449\QUANTITY SUMMARIES.dgn

CSJ: 0576-02-068 MAILBOXES & MAILBOX TURNOUTS SUMMARY				
ITEM NO	530	560		
BID CODE	6009	6003	6007	6008
LOCATION (STATION)	TURNOUTS (SURF TREAT)	MAILBOX INSTALL-M (TWG-POST) TY 1	MAILBOX INSTALL-S (WC-POST) TY 3	MAILBOX INSTALL-D (WC-POST) TY 3
	SY	EA	EA	EA
325+95 LT	22		1	
354+10 LT	23		1	
356+05 LT	23		1	
358+40 LT	23		1	
359+95 LT	23		1	
373+15 LT	23		1	
387+90 LT	23		1	
405+65 LT	23		1	
408+05 LT	23		1	
410+90 LT	22		1	
411+30 LT	14		1	
413+85 LT	16			1
415+60 LT	16		1	
417+30 LT	23			1
419+65 LT	27			1
421+40 LT	28		1	
422+15 LT	28		1	
422+85 LT	14		1	
424+60 LT	18			1
426+40 LT	23			1
428+10 LT	24	1		
431+80 LT	23			1
433+50 LT	13		1	
434+85 LT	23		1	
448+00 LT	27		1	
449+90 LT	19		1	
453+50 LT	19		1	
455+40 LT	22			1
458+10 LT	22		1	
460+10 LT	18			1
464+55 LT	15		1	
465+40 LT	25			1
466+80 LT	23		1	
468+90 RT	15		1	
469+00 LT	23		1	
470+30 LT	23		1	
471+40 LT	23			1
475+50 LT	23		1	
478+90 LT	18		1	
488+90 LT	23		1	
491+50 LT	23		1	
CSJ TOTALS	**879**	**1**	**30**	**10**

CSJ: 0576-02-075 MAILBOXES & MAILBOX TURNOUTS SUMMARY				
ITEM NO	530	560		
BID CODE	6009	6003	6007	6008
LOCATION (STATION)	TURNOUTS (SURF TREAT)	MAILBOX INSTALL-M (TWG-POST) TY 1	MAILBOX INSTALL-S (WC-POST) TY 3	MAILBOX INSTALL-D (WC-POST) TY 3
	SY	EA	EA	EA
493+40 LT	29			1
497+85 LT	20			1
523+90 LT	27		1	
538+15 LT	19		1	
556+30 LT	23			1
560+30 LT	35			1
561+10 LT	21	1		
561+85 LT	23		1	
563+35 LT	23	1		
564+60 LT	21		1	
570+75 LT	21			1
573+75 LT	18		1	
576+55 LT	23			1
577+98 LT	16		1	
581+10 LT	23		1	
582+25 LT	23			1
583+60 LT	17		1	
586+10 LT	23		1	
587+95 LT	23		1	
592+35 LT	18		1	
594+60 LT	24		1	
596+50 LT	23		1	
607+30 LT	23			1
609+40 LT	26			1
628+90 LT	24	1		
631+40 LT	23		1	
634+70 LT	23		1	
636+30 LT	23		1	
CSJ TOTALS	**635**	**3**	**16**	**9**
PROJECT TOTALS	**1514**	**4**	**46**	**19**

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Texas Department of Transportation

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		18

SUMMARY OF CROSS DRAINAGE STRUCTURES

STATION	EXISTING STRUCTURE	PROPOSED STRUCTURE	ITEM NO 132 EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	158 SPEC EXCAV WORK (HYD EXCAVATOR)	162 BLOCK SODDING	168 VEGETATIVE WATERING (10 GAL/SY/2 APP)	400 CEM STABIL BKFL	402 TRENCH EXCAVATION PROTECTION	403 TEMPORARY SPL SHORING	420 CL C CONC (COLLAR)	432 RIPRAP (STONE COMMON) (DRY) (12 IN)	462 CONC BOX CULV (3FTX3FT)	462 CONC BOX CULV (4FTX3FT)	462 CONC BOX CULV (6FTX3FT)	464 RC PIPE (18 IN) (CL III)	464 RC PIPE (24 IN) (CL III)	464 RC PIPE (30IN) (CL III)	496 REMOV STR (PIPE)
		BID CODE	6019	6003	6002	6001	6005	6001	6001	6071	6024	6002	6004	6010	6003	6005	6007	6016
			CY	HR	SY	MG	CY	LF	SF	EA	CY	LF	LF	LF	LF	LF	LF	EA
CSJ: 0576-02-068																		
323+63	4'X3'X34' BC-1-W-2	REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 8' W/ CONC BOX CULV (4'X3'), ADD WINGWALL (FW-0)(HW=4FT)(2:1) LT; REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 11' W/ CONC BOX CULV (4'X3'), ADD WINGWALL (PW-2)(HW=4FT)(2:1) RT	115	15	36	1							19					
332+00	3'X3'X34 BC-1-W-2	REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 10' W/ CONC BOX CULV (3'X3'), ADD WINGWALL (FW-0)(HW=4FT)(2:1), ADD RIPRAP (STONE COMMON)(DRY)(12IN) LT; REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 10' W/ CONC BOX CULV (3'X3'), ADD WINGWALL (PW-2)(HW=4FT)(2:1) RT	90		36	1					7	20						
345+00	2-18"X36' RCP CH-6 TY B HDWL	REMOVE EXIST HDWL AND 2-3' RC PIPE, EXTEND W/ 2-18"X8' RC PIPE (CL III)(18IN), ADD 2-CONC COLLARS & ADD 2-SET (TY II)(RCP)(4:1)(C) LT; REMOVE EXIST HDWL AND 2-3' RC PIPE, EXTEND W/ 2-18"X10' RC PIPE (CL III)(18IN), ADD 2-CONC COLLARS & ADD 2-SET (TY II)(RCP)(4:1)(C) RT	71	**15**	56	2	3			2	2				36			
353+00	24"X36' RCP CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE DISJOINTED 9' RC PIPE, EXTEND W/ 24"X10' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & SET (TY II)(24 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X6' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & SET (TY II)(24 IN)(4:1)(C) RT	30	6	68	2				2						16		
369+00	4'X3'X43' BC-1-W-2	REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 2' W/ CONC BOX CULV (4'X3'), ADD WINGWALL (FW-0)(HW=8FT)(2:1) LT; REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 6' W/ CONC BOX CULV (4'X3'), ADD WINGWALL (PW-2)(HW=8FT)(2:1) RT	199	5	36	1							8					
396+00	18"X36' RCP CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 18"X8' RC PIPE (CL III)(18 IN), ADD CONC COLLAR & SET (TY II)(18 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 18"X8' RC PIPE (CL III)(18 IN), ADD CONC COLLAR & SET (TY II)(18 IN)(4:1)(C) RT	49	7	28	1				2					16			
405+20	18"X36' RCP CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 18"X4' RC PIPE (CL III)(18 IN), ADD CONC COLLAR & SET (TY II)(18 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE DISJOINTED 12' RC PIPE, EXTEND W/ 18"X18' RC PIPE (CL III)(18 IN), ADD CONC COLLAR, ADD SET (TY II)(18 IN)(4:1)(C) & ADD RIPRAP (STONE COMMON)(DRY)(12 IN) RT	49	10	28	1	8		132	2	4				22			
		CSJ: 0576-02-068 SHEET TOTALS	**603**	**58**	**288**	**9**	**11**	**0**	**132**	**8**	**13**	**20**	**27**	**0**	**74**	**16**	**0**	**0**

ALL CULVERTS WERE ORIGINALLY ANALYZED AT A 10 YEAR FREQUENCY AND THERE IS NO HISTORICAL DATA OF OVERTOPPING EVENTS FOR ANY CULVERT LOCATION IN THIS PROJECT. CULVERTS REQUIRING HYDRAULIC ANALYSIS WERE ANALYZED AT A 10 YEAR FREQUENCY. ALL OTHER CULVERTS WITHIN THE PROJECT LIMITS ARE OPERATING AT AN ESTIMATED 10 YEAR FREQUENCY. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATER AND VELOCITIES WITHIN THESE STRUCTURES. ADDITIONAL STUDIES NOT JUSTIFIED.

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STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
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3/27/2023

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 14 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		19

SUMMARY OF CROSS DRAINAGE STRUCTURES (CONT.)

STATION	EXISTING STRUCTURE	PROPOSED STRUCTURE	132 EMBANKMENT (VEHICLE) (ORD COMP) (TY B) CY	158 SPEC EXCAV WORK (HYD EXCAVATOR) HR	162 BLOCK SODDING SY	168 VEGETATIVE WATERING (10 GAL/SY/2 APP) MG	400 CEM STABIL BKFL CY	402 TRENCH EXCAVATION PROTECTION LF	403 TEMPORARY SPL SHORING SF	420 CL C CONC (COLLAR) EA	432 RIPRAP (STONE COMMON) (DRY) (12 IN) CY	462 CONC BOX CULV (3FTX3FT) LF	462 CONC BOX CULV (4FTX3FT) LF	462 CONC BOX CULV (6FTX3FT) LF	464 RC PIPE (18 IN) (CL III) LF	464 RC PIPE (24 IN) (CL III) LF	464 RC PIPE (30IN) (CL III) LF	496 REMOV STR (PIPE) EA
459+62	24"X46' RC PIPE 30* RT FWD SKEW CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE 1' RC PIPE, ADD SET (TY II)(24 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 1' RC PIPE, EXTEND W/ 24"X12' RC PIPE (CL III)(24IN), ADD CONC COLLAR, ADD CH-PW-S (DIA=24IN)(2:1) RT	48	14	34	1				2						12		
476+93	24"X36' RCP CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X6' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & SET (TY II)(24 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X4' RC PIPE (CL III)(24 IN), ADD CONC COLLAR, ADD SET (TY II)(24 IN)(4:1)(C), & ADD RIPRAP (STONE COMMON)(DRY)(12 IN) RT	20	8	34	1	1			2	4					10		
491+05	5'X2.5'X34' NC-7	REMOVE EXIST BOX CULV AND NC-7 WINGWALL, INSTALL 3-30"X40' RC PIPE (CL III)(30 IN), ADD 3-SET (TY II)(30IN)(RCP)(4:1)(C), ADD RIPRAP (STONE COMMON)(DRY)(12IN)	14		96	2	52				20						120	1
		CSJ: 0576-02-068 SHEET TOTALS:	**82**	**22**	**164**	**4**	**53**	**0**	**0**	**4**	**24**	**0**	**0**	**0**	**0**	**22**	**120**	**1**
		CSJ: 0576-02-068 TOTALS	**684**	**80**	**452**	**13**	**64**	**0**	**132**	**12**	**37**	**20**	**27**	**0**	**74**	**38**	**120**	**1**
		CSJ: 0576-02-075																
519+95	24"X36' RCP CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X6' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & SET (TY II)(24 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X6' RC PIPE (CL III)(24 IN), ADD CONC COLLAR, ADD SET (TY II)(24 IN)(4:1)(C) RT CLEAN CULVERT	20	3	34	1	1			2						12		
560+54	24"X36' RCP CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X8' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & SET (TY II)(24 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X4' RC PIPE (CL III)(24 IN), ADD CONC COLLAR, ADD SET (TY II)(24 IN)(4:1)(C) RT	32	4	34	1				2						12		
622+99	3-24"X40' CMP	REMOVE EXIST STRUCTURE, ADD 2-6'X3'X56' CONC BOX CULVERTS & ADD WINGWALL (FW-0)(HW=4FT)	74	**36**	48	1	109	713			5			112				1
625+87	24"X36' RCP	REMOVE 24"X36' RC PIPE, ADD 6'X3'X56' CONC BOX CULVERT, ADD WINGWALL (FW-0)(HW=3FT)	50	52	48	1	48	240						56				1
640+43	18"X228' RCP & SET	INSTALL SET (TY II)(24 IN)(RCP)(6:1) RT, CLEAN CULVERT																
		CSJ: 0576-02-075 TOTALS	**176**	**95**	**164**	**4**	**158**	**953**	**0**	**4**	**5**	**0**	**0**	**168**	**0**	**24**	**0**	**2**
		PROJECT TOTALS	**860**	**175**	**616**	**17**	**222**	**953**	**132**	**16**	**42**	**20**	**27**	**168**	**74**	**62**	**120**	**3**

ALL CULVERTS WERE ORIGINALLY ANALYZED AT A 10 YEAR FREQUENCY AND THERE IS NO HISTORICAL DATA OF OVERTOPPING EVENTS FOR ANY CULVERT LOCATION IN THIS PROJECT. CULVERTS REQUIRING HYDRAULIC ANALYSIS WERE ANALYZED AT A 10 YEAR FREQUENCY. ALL OTHER CULVERTS WITHIN THE PROJECT LIMITS ARE OPERATING AT AN ESTIMATED 10 YEAR FREQUENCY. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATER AND VELOCITIES WITHIN THESE STRUCTURES. ADDITIONAL STUDIES NOT JUSTIFIED.

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STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

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P.E.

3/27/2023

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 15 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		20

SUMMARY OF CROSS DRAINAGE STRUCTURES (CONT.)

ITEM			466						467				480	658
BID CODE			6130	6150	6151	6155	6193	6197	6358	6390	6394	6419	6001	6109
STATION	EXISTING STRUCTURE	PROPOSED STRUCTURE	HEADWALL (CH-PW-S)	WINGWALL (FW-0)			WINGWALL (PW-2)		SET (TY II)				CLEAN EXIST CULVERTS	INSTL OM ASSM (OM-2Z) (WFLX) SRF (BI)
			(DIA= 24IN)	(HW=3FT)	(HW=4FT)	(HW=8FT)	(HW=4FT)	(HW=8FT)	(18 IN) (RCP) (4:1) (C)	(24 IN) (RCP) (4:1) (C)	(24 IN) (RCP) (6:1) (C)	(30 IN) (RCP) (4:1) (C)		
			EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ: 0576-02-068														
323+63	4' X 3' X 34' BC-1-W-2	REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 8' W/ CONC BOX CULV (4'X3'), ADD WINGWALL (FW-0)(HW=4FT)(2:1) LT; REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 11' W/ CONC BOX CULV (4'X3'), ADD WINGWALL (PW-2)(HW=4FT)(2:1) RT			1		1							4
332+00	3' X 3' X 34' BC-1-W-2	REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 10' W/ CONC BOX CULV (3'X3'), ADD WINGWALL (FW-0)(HW=4FT)(2:1), ADD RIPRAP (STONE COMMON)(DRY)(12IN) LT; REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 10' W/ CONC BOX CULV (3'X3'),			1		1							4
345+00	2-18" X 36' RCP CH-6 TY B HDWL (MOD)	REMOVE EXIST HDWL AND 2-3' RC PIPE, EXTEND W/ 2-18"X8' RC PIPE (CL III)(18IN), ADD 2-CONC COLLARS & ADD 2-SET (TY II)(RCP)(4:1)(C) LT; REMOVE EXIST HDWL AND 2-3' RC PIPE, EXTEND W/ 2-18"X10' RC PIPE (CL III)(18IN), ADD 2-CONC COLLARS & ADD 2-SET (TY II)(RCP)(4:1)(C) RT							4					4
353+00	24"X36' RCP CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE DISJOINTED 9' RC PIPE, EXTEND W/ 24"X10' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & SET (TY II)(24 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X6' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & SET (TY II)(24 IN)(4:1)(C) RT								2				2
369+00	4' X 3' X 43' BC-1-W-2	REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 2' W/ CONC BOX CULV (4'X3'), ADD WINGWALL (FW-0)(HW=8FT)(2:1) LT; REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL, EXTEND 6' W/ CONC BOX CULV (4'X3'), ADD WINGWALL (PW-2)(HW=8FT)(2:1) RT				1		1						4
396+00	18" X 36' RCP CH-6 TY B HDWL (MOD)	REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 18"X8' RC PIPE (CL III)(18 IN), ADD CONC COLLAR & SET (TY II)(18 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 18"X8' RC PIPE (CL III)(18 IN), ADD CONC COLLAR & SET (TY II)(18 IN)(4:1)(C) RT							2					2
405+20	18" X 36' RCP CH-6 TY B HDWL (MOD)	REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 18"X4' RC PIPE (CL III)(18 IN), ADD CONC COLLAR & SET (TY II)(18 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE DISJOINTED 12' RC PIPE, EXTEND W/ 18"X18' RC PIPE (CL III)(18 IN), ADD CONC COLLAR, ADD SET (TY II)(18 IN)(4:1)(C) & ADD RIPRAP (STONE COMMON)(DRY)(12 IN) RT							2					2
CSJ: 0576-02-068 SHEET TOTALS			**0**	**0**	**2**	**1**	**2**	**1**	**8**	**2**	**0**	**0**	**0**	**22**

ALL CULVERTS WERE ORIGINALLY ANALYZED AT A 10 YEAR FREQUENCY AND THERE IS NO HISTORICAL DATA OF OVERTOPPING EVENTS FOR ANY CULVERT LOCATION IN THIS PROJECT. CULVERTS REQUIRING HYDRAULIC ANALYSIS WERE ANALYZED AT A 10 YEAR FREQUENCY. ALL OTHER CULVERTS WITHIN THE PROJECT LIMITS ARE OPERATING AT AN ESTIMATED 10 YEAR FREQUENCY. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATER AND VELOCITIES WITHIN THESE STRUCTURES. ADDITIONAL STUDIES NOT JUSTIFIED.

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STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

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P.E.

3/27/2023

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 16 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		21

SUMMARY OF CROSS DRAINAGE STRUCTURES (CONT.)

ITEM			466						467				480	658
BID CODE			6130	6150	6151	6155	6193	6197	6358	6390	6394	6419	6001	6109
STATION	EXISTING STRUCTURE	PROPOSED STRUCTURE	HEADWALL (CH-PW-S)	WINGWALL (FW-0)			WINGWALL (PW-2)		SET (TY II)				CLEAN EXIST CULVERTS	INSTL OM ASSM (OM-2Z) (WFLX) SRF (BI)
			(DIA= 24IN)	(HW=3FT)	(HW=4FT)	(HW=8FT)	(HW=4FT)	(HW=8FT)	(18 IN) (RCP) (4:1) (C)	(24 IN) (RCP) (4:1) (C)	(24 IN) (RCP) (6:1) (C)	(30 IN) (RCP) (4:1) (C)		
			EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
459+62	24"X46' RCP 30° RT FWD SKEW CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE 1' RC PIPE, ADD SET (TY II)(24 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 1' RC PIPE, EXTEND W/ 24"X12' RC PIPE (CL III)(24IN), ADD CONC COLLAR, ADD CH-PW-S (DIA=24IN)(2:1) RT	1							1				3
476+93	24" X 36' RCP CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X6' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & SET (TY II)(24 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X4' RC PIPE (CL III)(24 IN), ADD CONC COLLAR, ADD SET (TY II)(24 IN)(4:1)(C), & ADD RIPRAP (STONE COMMON)(DRY)(12 IN) RT								2				2
491+05	5' X 2.5' X 34' NC-7	REMOVE EXIST BOX CULV AND NC-7 WINGWALL, INSTALL 3-30"X40' RC PIPE (CL III)(30 IN), ADD 3-SET (TY II)(30IN)(RCP)(4:1)(C), ADD RIPRAP (STONE COMMON)(DRY)(12IN)										6		6
CSJ: 0576-02-068 SHEET TOTALS			**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**6**	**0**	**11**
CSJ: 0576-02-068 TOTALS			**1**	**0**	**2**	**1**	**2**	**1**	**8**	**5**	**0**	**6**	**0**	**33**
CSJ: 0576-02-075														
519+95	24" X 36' RCP CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X6' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & SET (TY II)(24 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X6' RC PIPE (CL III)(24 IN), ADD CONC COLLAR, ADD SET (TY II)(24 IN)(4:1)(C) RT CLEAN CULVERT								2			1	2
560+54	24" X 36' RCP CH-6 TY B HDWL	REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X8' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & SET (TY II)(24 IN)(4:1)(C) LT; REMOVE EXIST HDWL, REMOVE 3' RC PIPE, EXTEND W/ 24"X4' RC PIPE (CL III)(24 IN), ADD CONC COLLAR, ADD SET (TY II)(24 IN)(4:1)(C) RT								2				2
622+99	(3) 24" X 40' CMP	REMOVE EXIST STRUCTURE, ADD 2-6'X3'X56' CONC BOX CULVERTS & ADD WINGWALL (FW-0)(HW=4FT)			2									
625+87	24" X 36' RCP	REMOVE 24"X36' RC PIPE, ADD 6'X3'X56' CONC BOX CULVERT, ADD WINGWALL (FW-0)(HW=3FT)		2										4
640+43	18" X 228' RCP W/ 18" SET	INSTALL SET (TY II)(24 IN)(RCP)(6:1) RT, CLEAN CULVERT									1		1	1
CSJ: 0576-02-075 TOTALS			**0**	**2**	**2**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**2**	**9**
PROJECT TOTALS			**1**	**2**	**4**	**1**	**2**	**1**	**8**	**9**	**1**	**6**	**2**	**42**

ALL CULVERTS WERE ORIGINALLY ANALYZED AT A 10 YEAR FREQUENCY AND THERE IS NO HISTORICAL DATA OF OVERTOPPING EVENTS FOR ANY CULVERT LOCATION IN THIS PROJECT. CULVERTS REQUIRING HYDRAULIC ANALYSIS WERE ANALYZED AT A 10 YEAR FREQUENCY. ALL OTHER CULVERTS WITHIN THE PROJECT LIMITS ARE OPERATING AT AN ESTIMATED 10 YEAR FREQUENCY. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATER AND VELOCITIES WITHIN THESE STRUCTURES. ADDITIONAL STUDIES NOT JUSTIFIED.

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STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
AF852E728AEC4C0...
P.E.

3/27/2023

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 17 OF 17

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		22

SUMMARY OF SMALL SIGNS

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

ENV SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY = TYPE TY N TY S
1	1	D7-6ATL	HISTORICAL MARKER 1 MILE ON LEFT 8708	48 x 48	X		10BWG	1	SA	U		
1	2	M1-6F	<FM SHIELD> FARM ROAD (ROUTE #) FM 58	24 x 24	X		TWT	1	WS	P		
		D10-7aT	<3 DIGIT VERTICAL NUMBER> 366	3 x 10	X							
		D10-7aT	<3 DIGIT VERTICAL NUMBER> 366	3 x 10	X							
2	3	D21-1TR	(COUNTY ROAD NAME) <ARROW RIGHT> PLANTATION DR	84 x 12	X		TWT	1	WS	T		
2	4	R1-1	STOP	36 x 36	X		TWT	1	WS	P		
2	5	D21-1TL	(COUNTY ROAD NAME) <ARROW LEFT> PLANTATION DR	84 x 12	X		TWT	1	WS	T		
3	6	D7-7ATL	HISTORICAL MARKER <ARROW LEFT> 8708	48 x 48	X		10BWG	1	SA	U		
		D7-7ATR	HISTORICAL MARKER <ARROW RIGHT> 8708	48 x 48	X							
5	7	D14-4T	ADOPT A HWY NEXT (MI) MILES (GROUP NAME) (4) (ANGELINA COUNTY LANDFILL)	48 x 48	X		10BWG	1	SA	U		
5	8	D7-6ATR	HISTORICAL MARKER 1 MILE ON RIGHT 8708	48 x 48	X		10BWG	1	SA	U		
5	9	D21-1TL	(COUNTY ROAD NAME) <LEFT ARROW> CAVER RD	66 x 12	X		TWT	1	WS	T		
5	10	M1-6F	<FM SHIELD> FARM ROAD (ROUTE #) FM 58	24 x 24	X		TWT	1	WS	T		
		D10-7aT	<3 DIGIT VERTICAL NUMBER> 368	3 x 10	X							
		D10-7aT	<3 DIGIT VERTICAL NUMBER> 368	3 x 10	X							

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

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

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.

2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.

3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 1 OF 5

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©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0576	02	068, ETC.	FM 58
4-16 8-16		DIST	COUNTY		SHEET NO.
		LFK	ANGELINA		23

18

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY = TYPE TY N TY S
5	11	R1-1	STOP	36 x 36	X		TWT	1	WS	P		
6	12	D21-1TR	(COUNTY ROAD NAME) <ARROW RIGHT> CAVER RD	66 x 12	X		TWT	1	WS	T		
7	13	D21-1TR	(COUNTY ROAD NAME) <ARROW RIGHT> OLEN BLAKE RD	84 x 12	X		TWT	1	WS	T		
7	14	R1-1	STOP	36 x 36	X		TWT	1	WS	P		
7	15	D21-1TL	(COUNTY ROAD NAME) <ARROW LEFT> OLEN BLAKE RD	84 x 12	X		TWT	1	WS	T		
8	16	D21-1aTR	(COUNTY ROAD NAME) <ARROW RIGHT> RABE HAVARD RD	66 x 24	X		10BWG	1	SA	T		
8	17	R1-1	STOP	36 x 36	X		TWT	1	WS	P		
8	18	D21-1aTL	(COUNTY ROAD NAME) <ARROW LEFT> RABE HAVARD RD	54 x 24	X		TWT	1	WS	T		
9	19	D7-6ATR	HISTORICAL MARKER 1 MILE ON RIGHT 11653, 11654	48 x 48	X		10BWG	1	SA	U		
9	20	D21-1aTL	(COUNTY ROAD NAME) <ARROW LEFT> COTTON THOMPSON RD	72 x 24	X		10BWG	1	SA	T		
9	21	R1-1	STOP	36 x 36	X		TWT	1	WS	P		
9	22	D21-1aTR	(COUNTY ROAD NAME) <ARROW RIGHT> BUTTERMILK ROAD	54 x 24	X		TWT	1	WS	T		

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

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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

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Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

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REVISIONS		0576	02	068, ETC.	FM 58
4-16 8-16		DIST	COUNTY		SHEET NO.
		LFK	ANGELINA		24

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
9	23	D21-1aTR	(COUNTY ROAD NAME) <ARROW RIGHT> COTTON THOMPSON RD	84 x 24	X		10BWG	1	SA	T		
9	24	R1-1	STOP	36 x 36	X		TWT	1	WS	P		
9	25	D21-1TL	(COUNTY ROAD NAME) <ARROW LEFT> BUTTERMILK RD	84 x 12	X		TWT	1	WS	T		
10	26	M1-6F	<FM SHIELD> FARM ROAD (ROUTE #) FM 58	24 x 24	X		TWT	1	WS	P		
		D10-7aT	<3 DIGIT VERTICAL NUMBER> 370	3 x 10	X							
		D10-7aT	<3 DIGIT VERTICAL NUMBER> 370	3 x 10	X							
10	27	D21-1aTL	(COUNTY ROAD NAME) <ARROW LEFT> SHORTY POUNDS RD	54 x 24	X		TWT	1	WS	T		
10	28	R1-1	STOP	36 x 36	X		TWT	1	WS	P		
10	29	D21-1aTR	(COUNTY ROAD NAME) <ARROW RIGHT> SHORTY POUNDS RD	72 x 24	X		10BWG	1	SA	T		
11	30	D7-7aTR	HISTORICAL MARKER <ARROW RIGHT> 11653, 11654	48 x 48	X		10BWG	1	SA	U		
		D7-7aTL	HISTORICAL MARKER <ARROW LEFT> 11653, 11654	48 x 48	X		10BWG	1	SA	U		
11	31	D21-1aTR	(COUNTY ROAD NAME) <ARROW RIGHT> OLD BEULAH SCHOOL RD	66 x 24	X		10BWG	1	SA	T		
11	32	D21-1TR	(COUNTY ROAD NAME) <ARROW RIGHT> BEN WEEKS RD	84 x 12	X		TWT	1	WS	T		
11	33	R1-1	STOP	36 x 36	X		TWT	1	WS	P		

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"

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NOTE:

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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

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Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

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REVISIONS		0576	02	068, ETC.	FM 58
4-16		DIST	COUNTY		SHEET NO.
8-16		LFK	ANGELINA		25

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SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY = TYPE TY N TY S
11	34	D21-1aTL	(COUNTY ROAD NAME) <ARROW LEFT> OLD BEULAH SCHOOL RD	72 x 24	X		10BWG	1	SA	T		
11	35	D21-1TL	(COUNTY ROAD NAME) <ARROW LEFT> BEN WEEKS RD	84 x 12	X		TWT	1	WS	T		
12	36	D21-1aTR	(COUNTY ROAD NAME) <ARROW RIGHT> OLD BURKE RD	54 x 12	X		TWT	1	WS	T		
13	37	R1-1	STOP	36 x 36	X		TWT	1	WS	P		
13	38	D21-1aTL	(COUNTY ROAD NAME) <ARROW LEFT> OLD BURKE RD	48 x 12	X		TWT	1	WS	T		
13	39	D7-6aTL	HISTORICAL MARKER 1 MILE ON LEFT 11653, 11654	48 x 48	X		10BWG	1	SA	U		
13	40	W2-1aTL	HIGHWAY INTERSECTION AHEAD 2000 FT	48 x 48	X		10BWG	1	SA	T		
14	41	M1-6F	<FM SHIELD> FARM ROAD (ROUTE #) 1818	24 x 24	X		TWT	1	WS	P		
		M2-1	JCT <AUXILIARY SIGN>	21 x 15	X							
14	42	W3-1	SYMBOL - STOP AHEAD	36 x 36	X		TWT	1	WS	P		
14	43	R2-1	SPEED LIMIT (SPEED) 55	30 x 36	X		TWT	1	WS	P		
14	44	M1-6F	<FM SHIELD> FARM ROAD (ROUTE #) FM 58	24 x 24	X		TWT	1	WS	P		
		D10-7aT	<3 DIGIT VERTICAL NUMBER> 372	3 x 10	X							
		D10-7aT	<3 DIGIT VERTICAL NUMBER> 372	3 x 10	X							

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

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

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.

2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.

3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

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Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

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FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS		0576	02	068, ETC.	FM 58
4-16		DIST	COUNTY		SHEET NO.
8-16		LFK	ANGELINA		26

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
14	45	M1-6F	<FM SHIELD> FARM ROAD (ROUTE #) FM 58	24 x 24	X		TWT	1	WS	P		
		M3-1	NORTH <AUXILIARY SIGN>	24 x 12	X							
14	46	R1-2	YIELD	48 x 48 x 48	X		TWT	1	WS	P		
14	47	R1-1	STOP	48 x 48	X		10BWG	1	SA	P		

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

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

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.

2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.

3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

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Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 5 OF 5

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4-16		DIST	COUNTY		SHEET NO.
8-16		LFK	ANGELINA		27

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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).

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

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Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		28

DATE: 3/27/2023 10:13:49 AM
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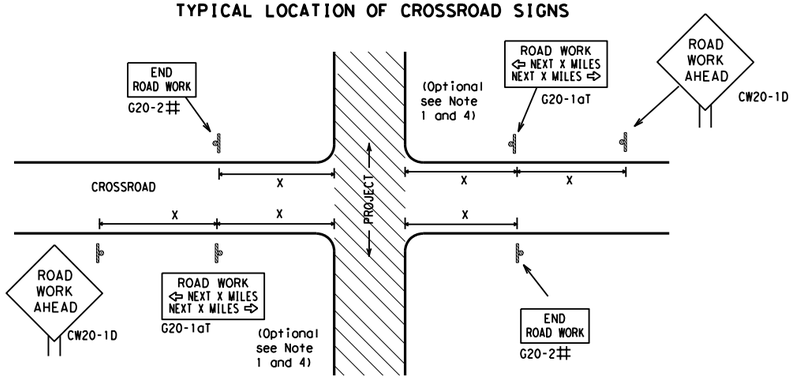
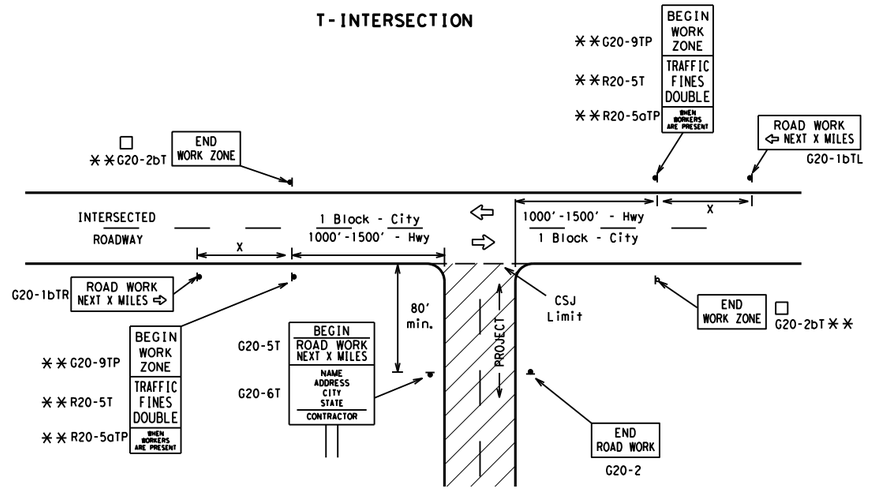
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

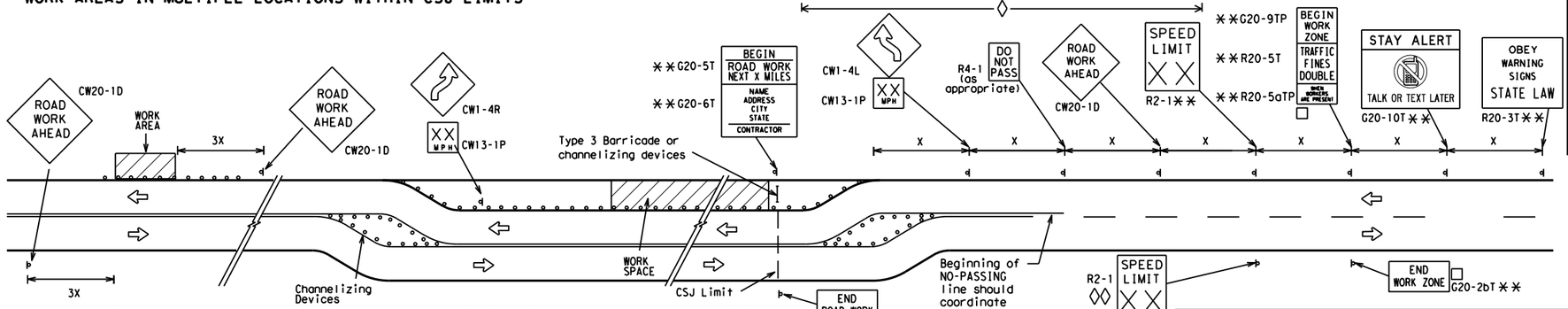
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

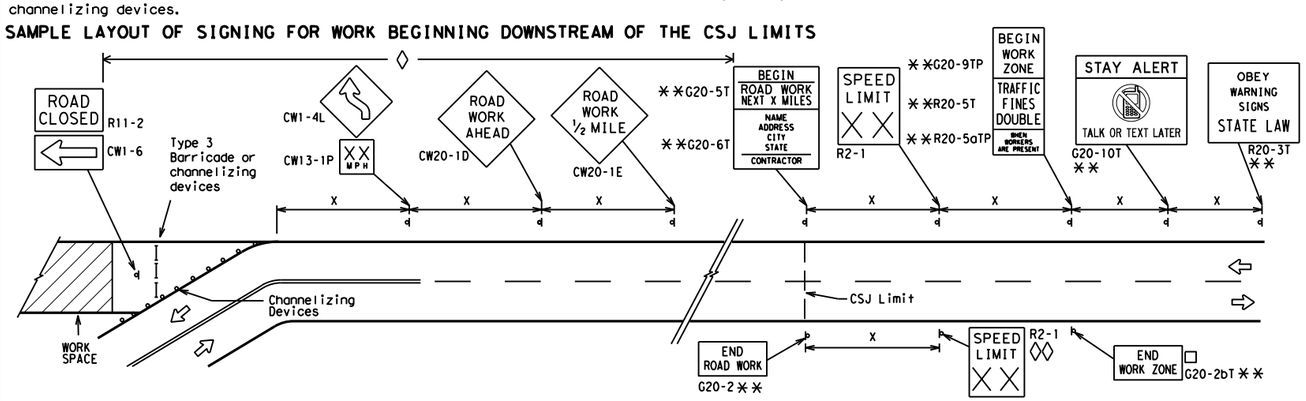
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

LEGEND

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

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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REVISIONS	0576	02	068, ETC.	FM 58
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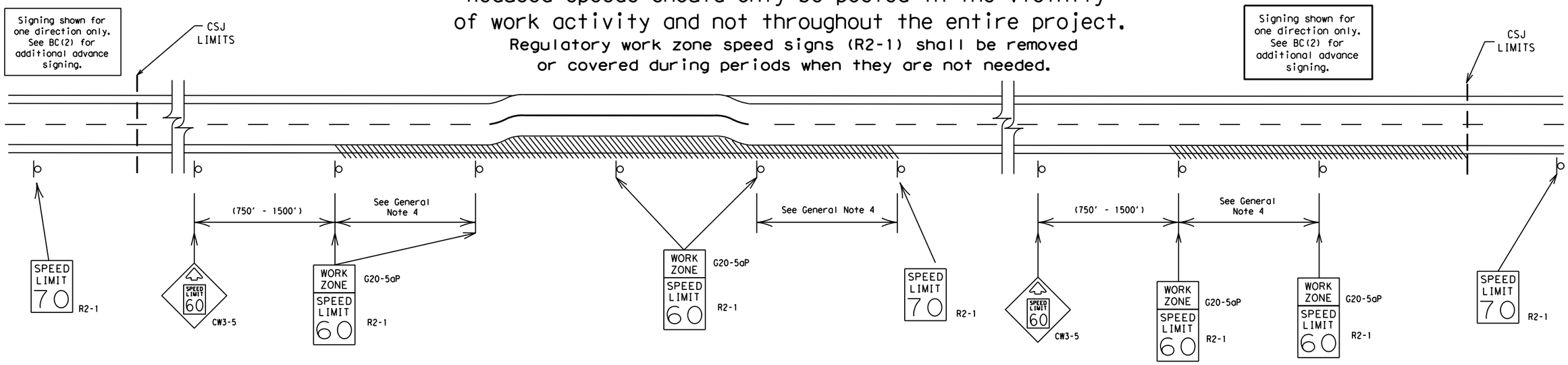
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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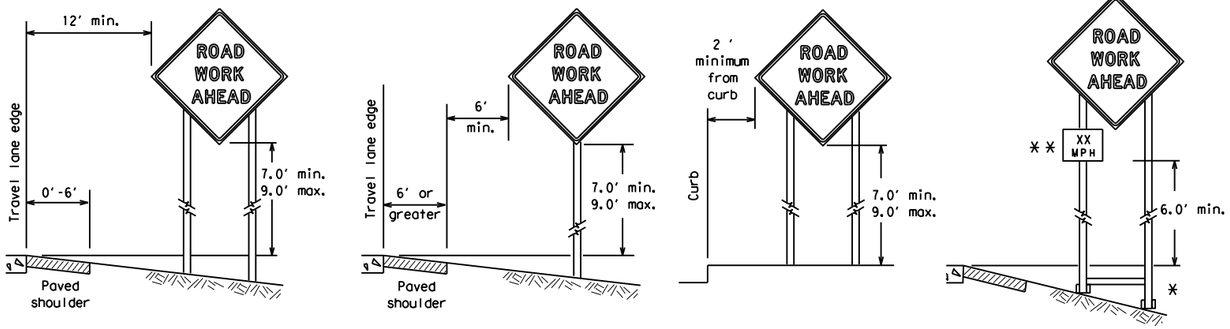
7-13 5-21	LFK	ANGELINA		30

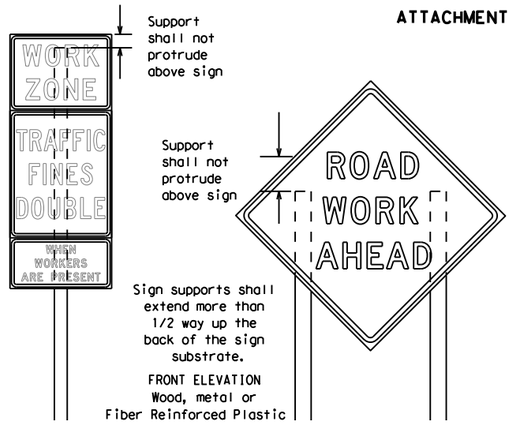
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

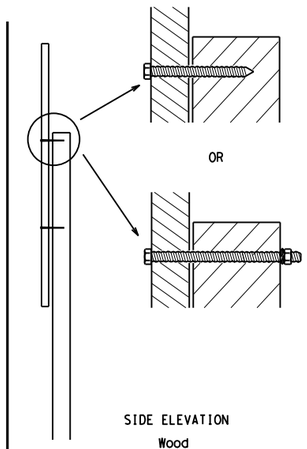


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





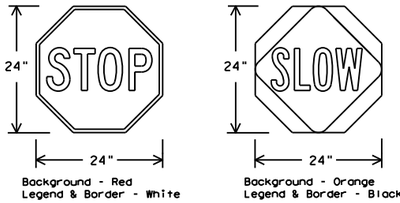
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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7-13 5-21	LFK	ANGELINA		31

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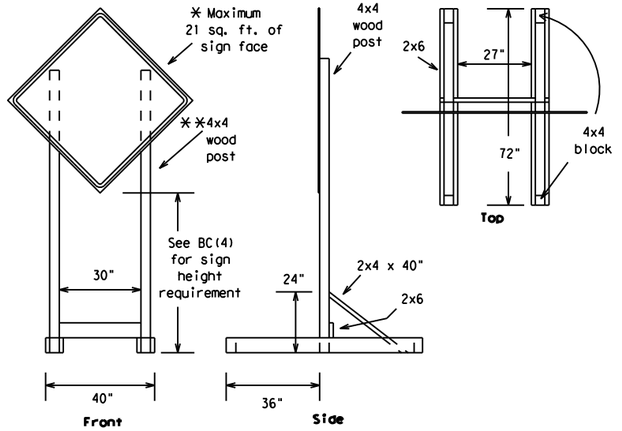
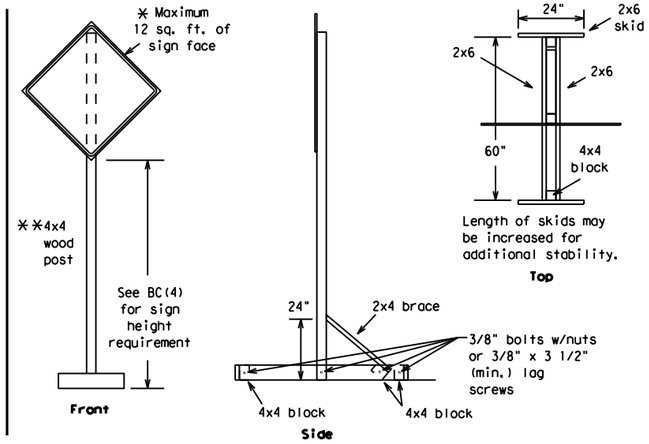
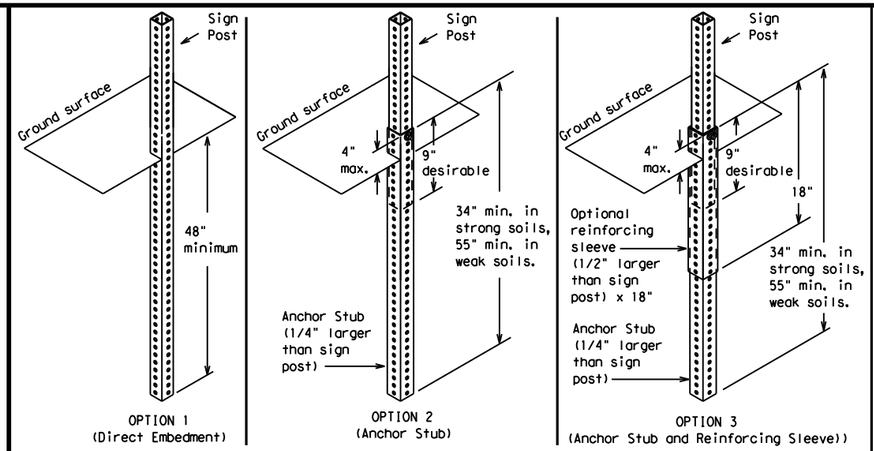




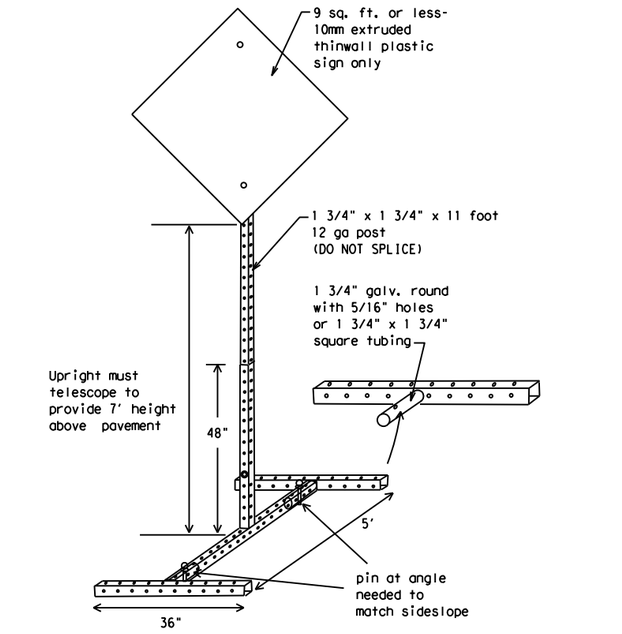
SKID MOUNTED WOOD SIGN SUPPORTS

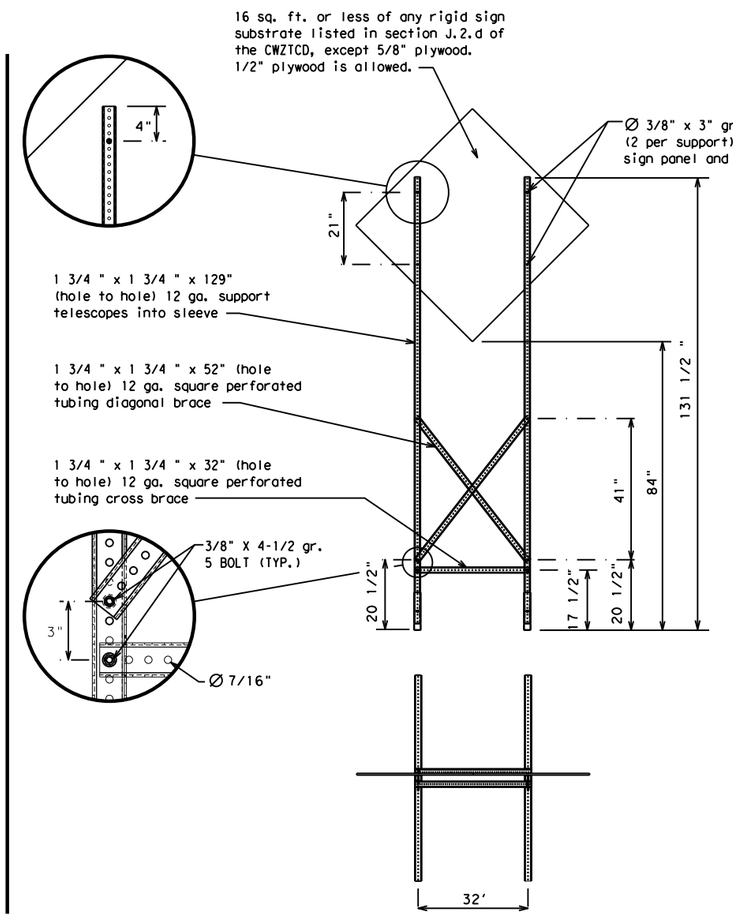
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

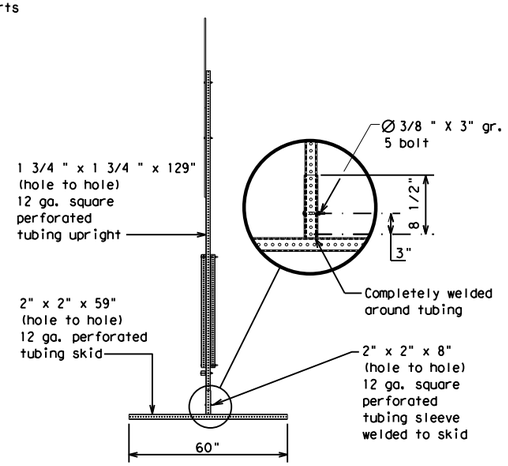


GROUND MOUNTED SIGN SUPPORTS

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.

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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7-13 5-21	LFK	ANGELINA		32

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- FREEWAY CLOSED X MILE
- FRONTAGE ROAD CLOSED
- ROAD CLOSED AT SH XXX
- SHOULDER CLOSED XXX FT
- ROAD CLSD AT FM XXXX
- RIGHT LN CLOSED XXX FT
- RIGHT X LANES CLOSED
- RIGHT X LANES OPEN
- CENTER LANE CLOSED
- DAYTIME LANE CLOSURES
- NIGHT LANE CLOSURES
- I-XX SOUTH EXIT CLOSED
- VARIOUS LANES CLOSED
- EXIT XXX CLOSED X MILE
- EXIT CLOSED
- RIGHT LN TO BE CLOSED
- MALL DRIVEWAY CLOSED
- X LANES CLOSED TUE - FRI
- XXXXXXXX BLVD CLOSED

Other Condition List

- ROADWORK XXX FT
- ROAD REPAIRS XXXX FT
- FLAGGER XXXX FT
- LANE NARROWS XXXX FT
- RIGHT LN NARROWS XXXX FT
- TWO-WAY TRAFFIC XX MILE
- MERGING TRAFFIC XXXX FT
- CONST TRAFFIC XXX FT
- LOOSE GRAVEL XXXX FT
- UNEVEN LANES XXXX FT
- DETOUR X MILE
- ROUGH ROAD XXXX FT
- ROADWORK PAST SH XXXX
- ROADWORK NEXT FRI-SUN
- BUMP XXXX FT
- US XXX EXIT X MILES
- TRAFFIC SIGNAL XXXX FT
- LANES SHIFT *

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation — Traffic Safety Division Standard

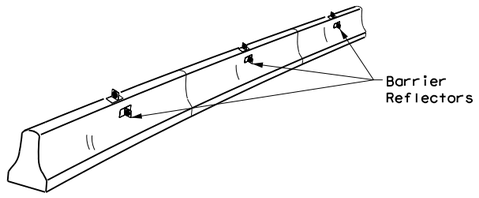
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	ANGELINA		33

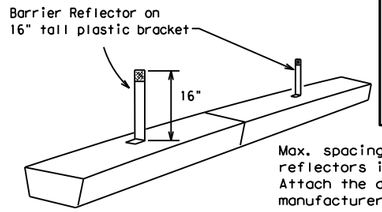
100

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



CONCRETE TRAFFIC BARRIER (CTB)

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

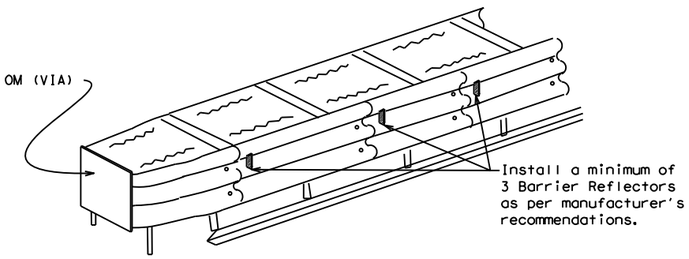


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

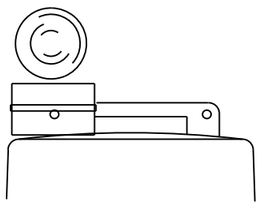


DELINEATION OF END TREATMENTS

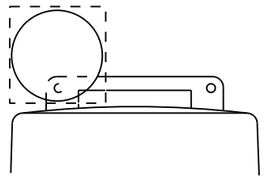
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

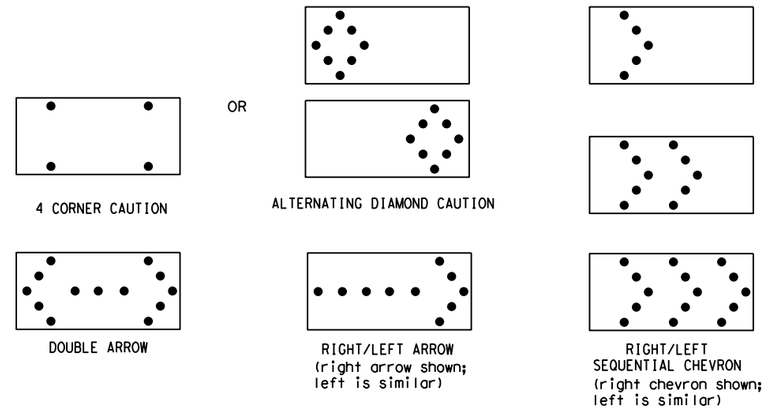
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	ANGELINA		34

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

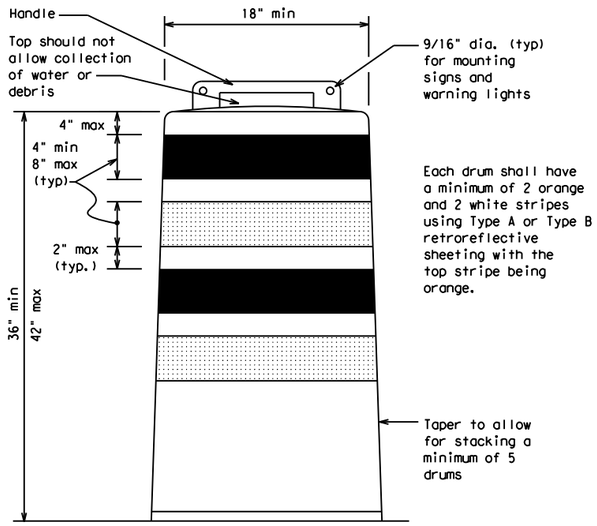
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

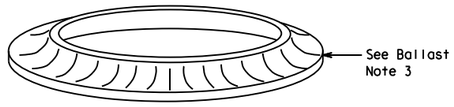
RETROREFLECTIVE SHEETING

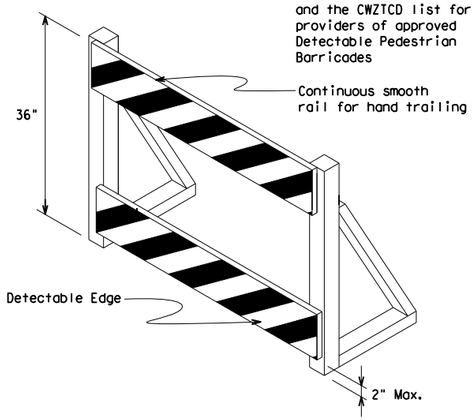
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

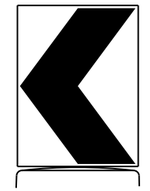




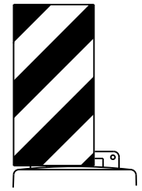


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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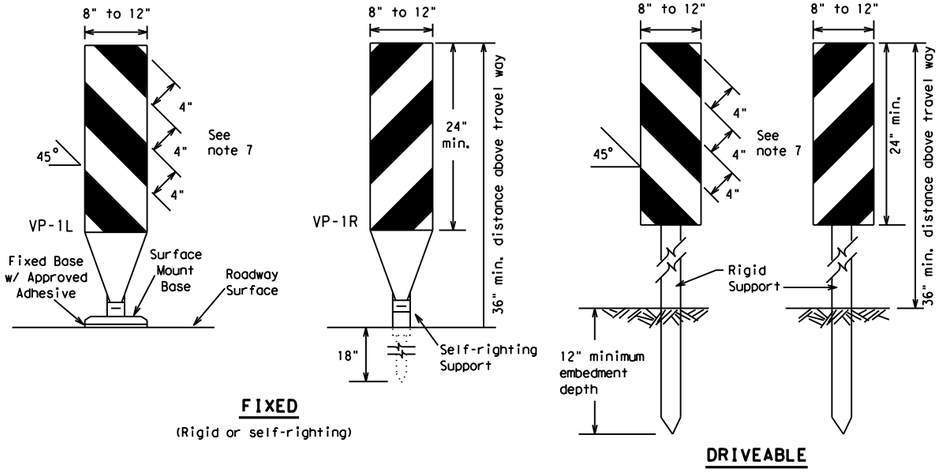
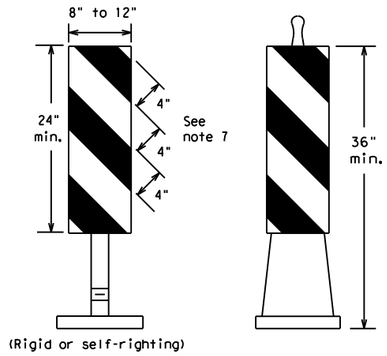


FIXED
(Rigid or self-righting)

DRIVEABLE

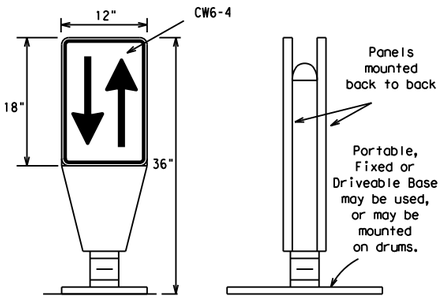


(Rigid or self-righting)

PORTABLE

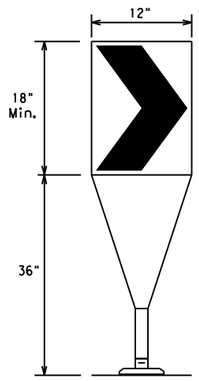
VERTICAL PANELS (VPs)

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



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



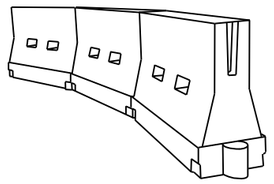
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

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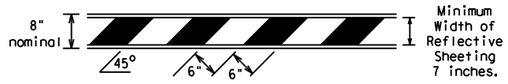
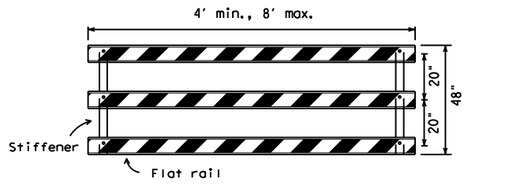
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



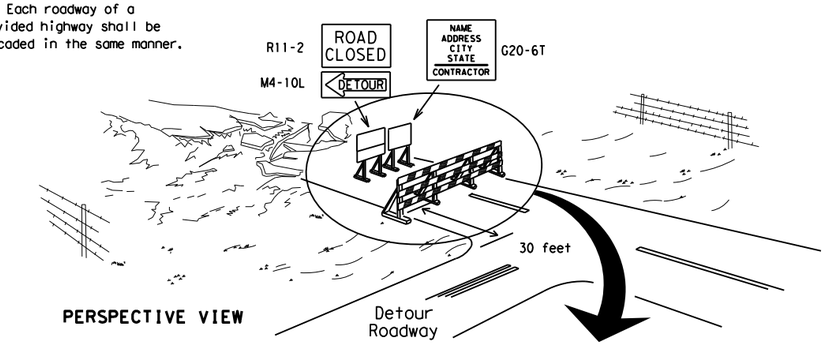
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

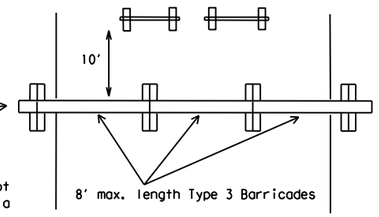
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

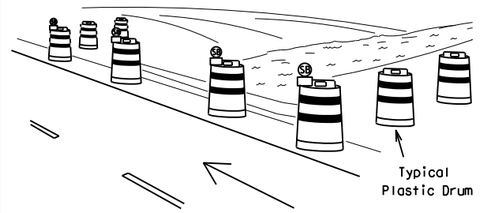
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

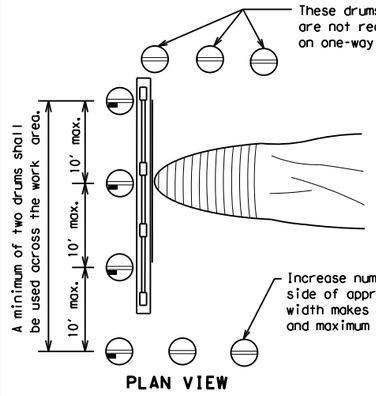
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

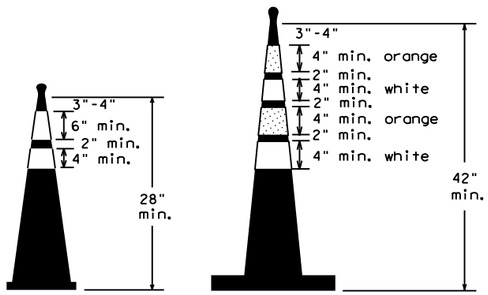
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

PLAN VIEW

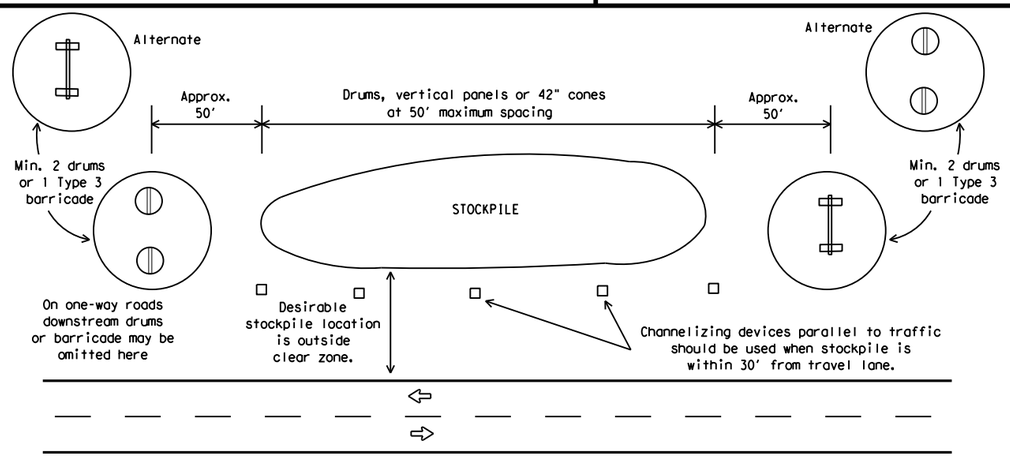
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

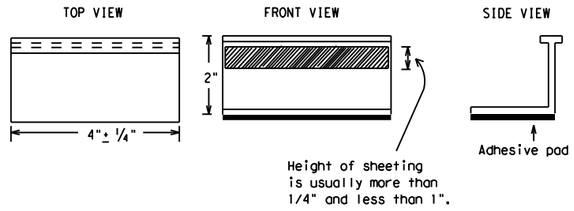
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

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BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

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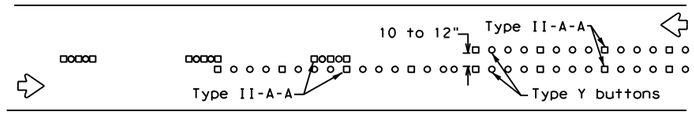
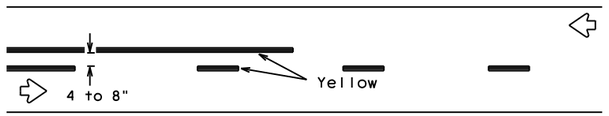
PAVEMENT MARKING PATTERNS

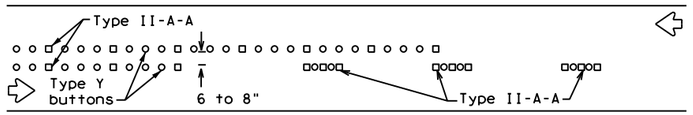
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



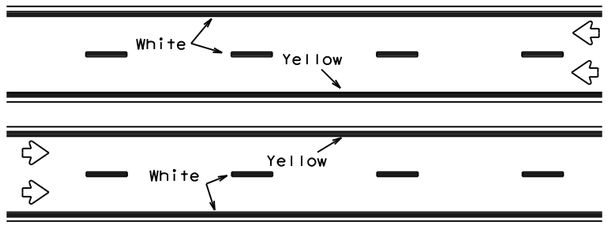
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



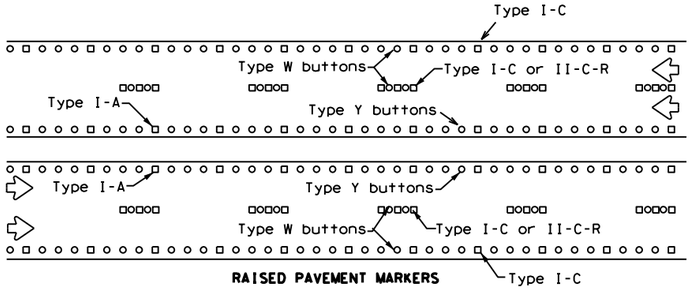
RAISED PAVEMENT MARKERS - PATTERN B

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

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



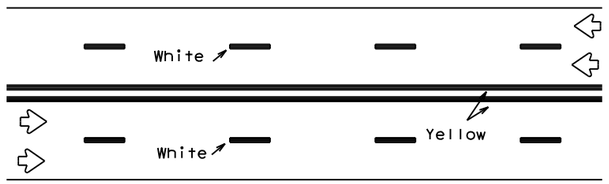
REFLECTORIZED PAVEMENT MARKINGS



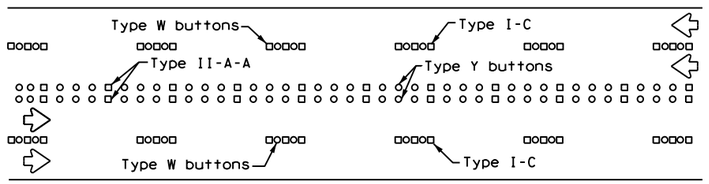
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



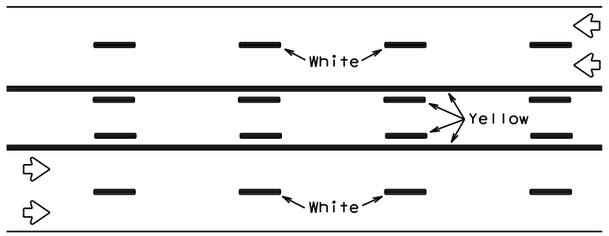
REFLECTORIZED PAVEMENT MARKINGS



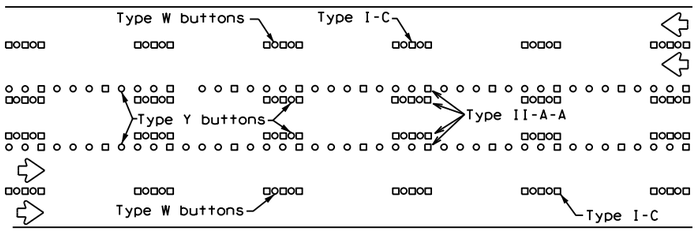
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

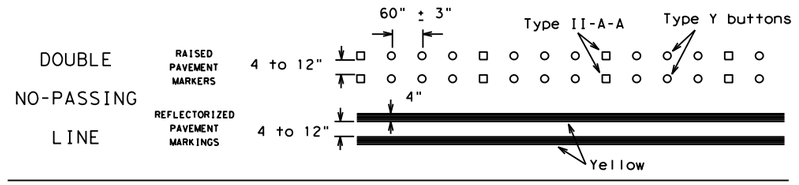
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

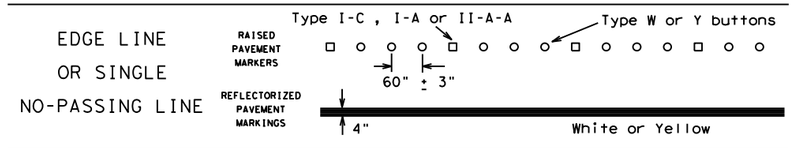
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

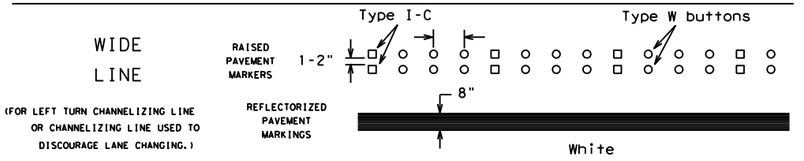


EDGE LINE OR SINGLE NO-PASSING LINE



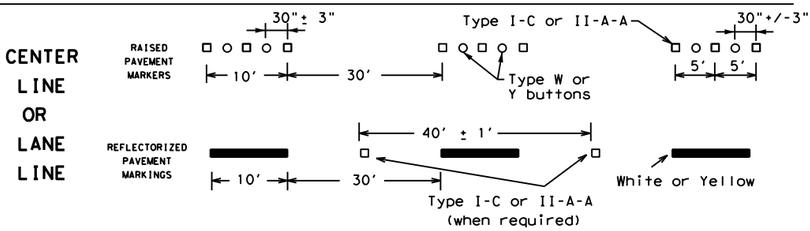
WIDE LINE

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

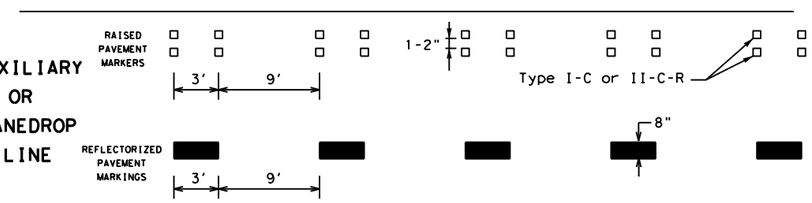


BROKEN LINES

CENTER LINE OR LANE LINE

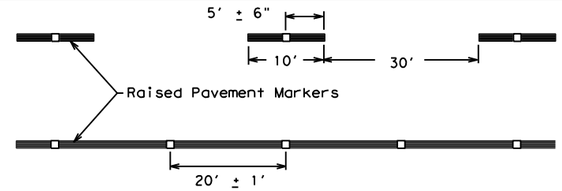


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

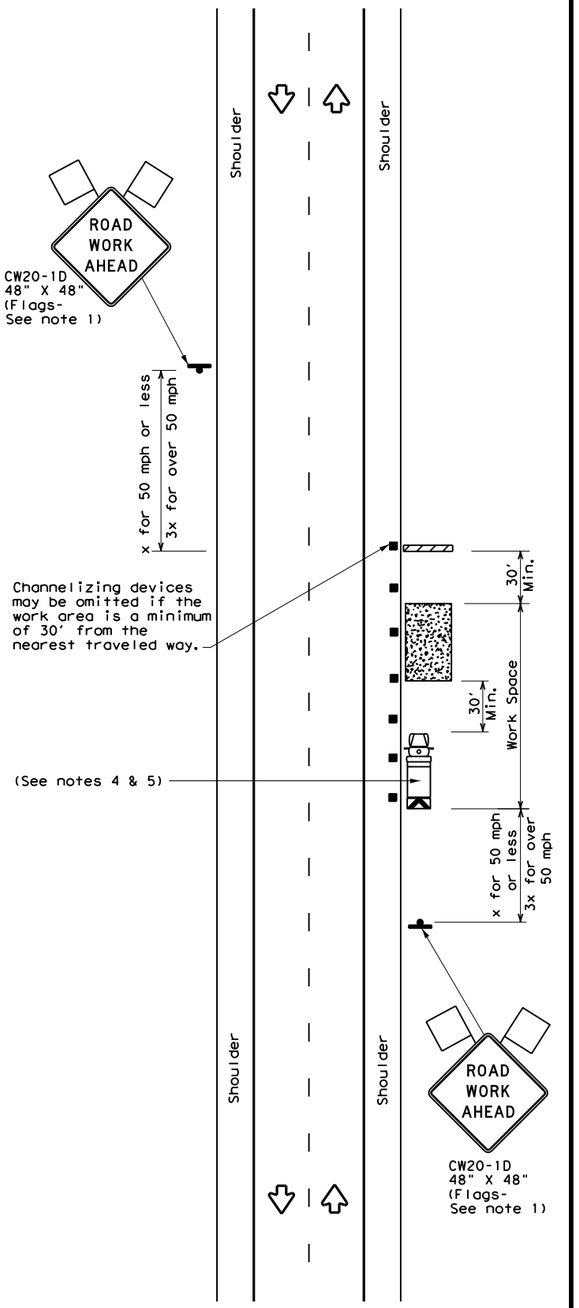
BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		39

106

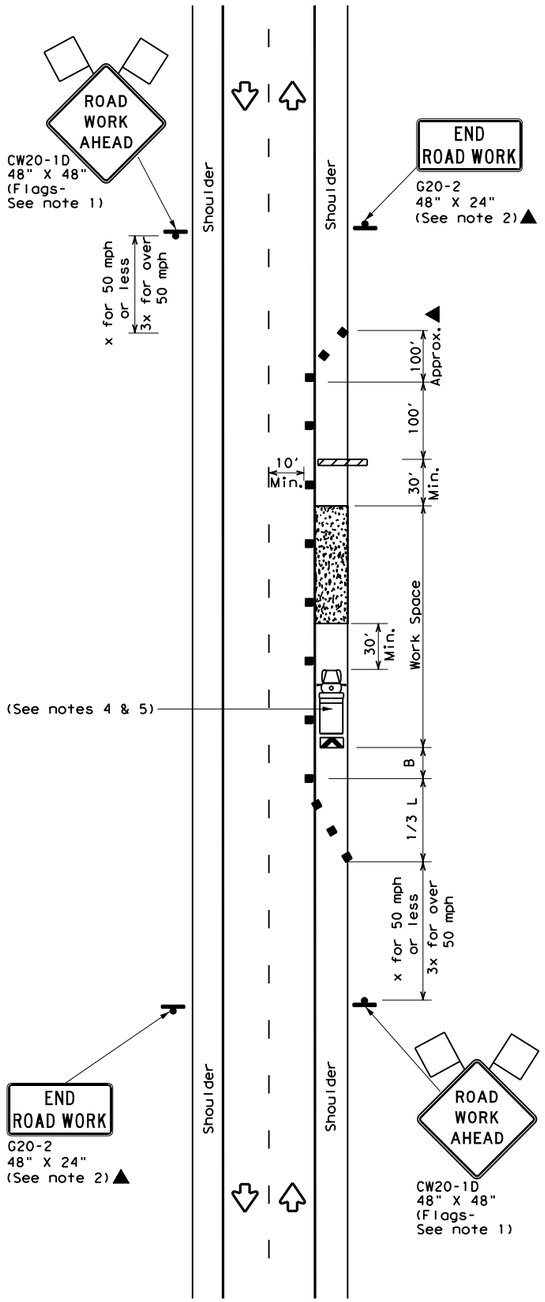
DATE: 3/27/2023 10:13:53 AM
FILE: c:\txdot\pw_online\txdot3\lauren.perry\d0509453\BC( )-21.dgn

DATE:
FILE:



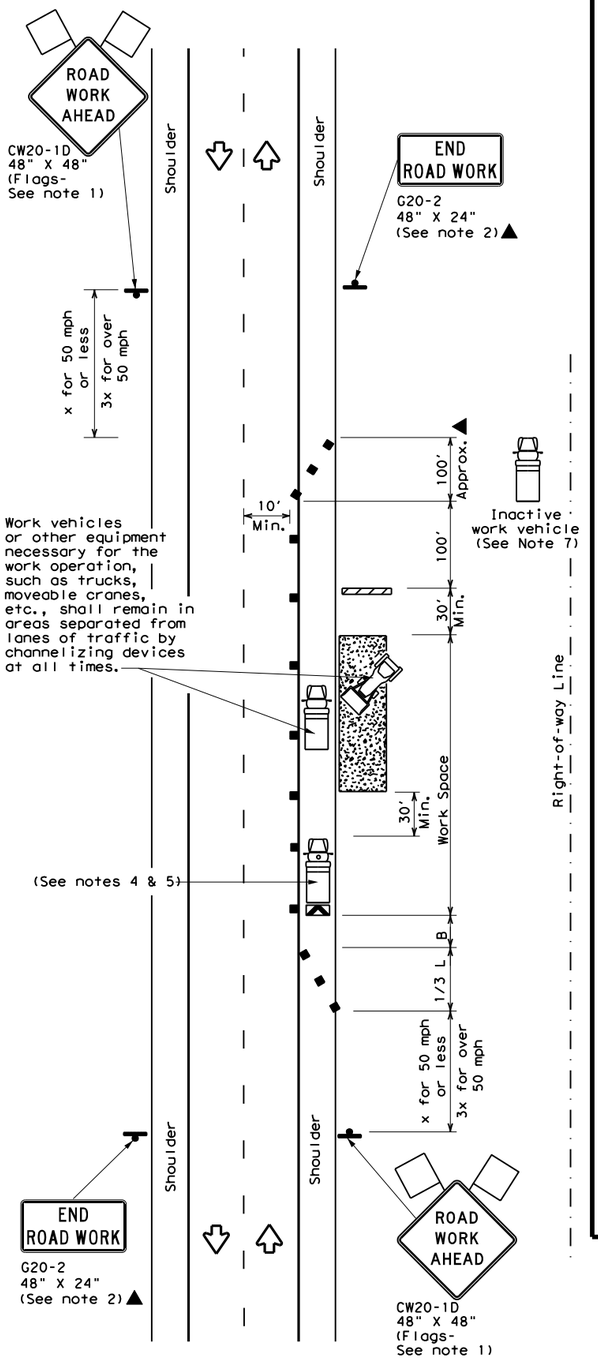
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

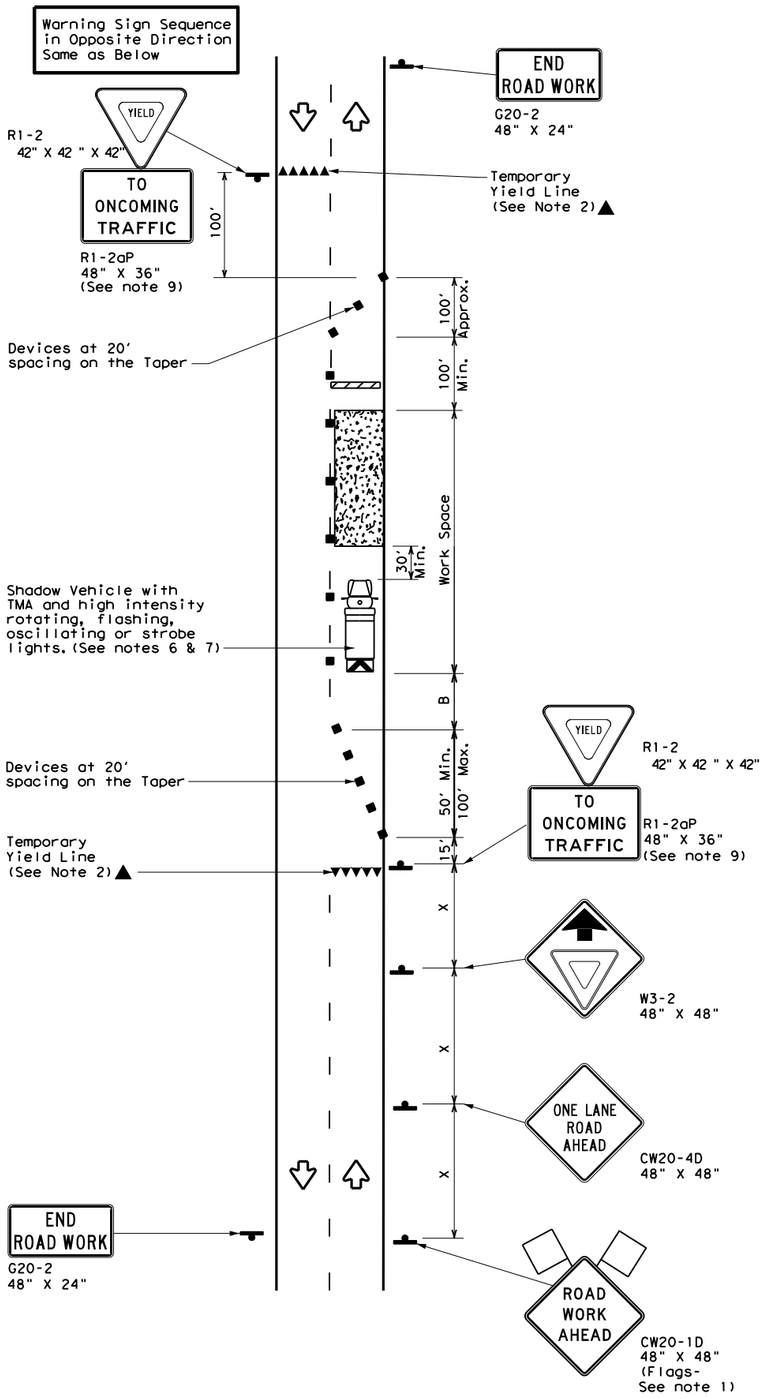
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

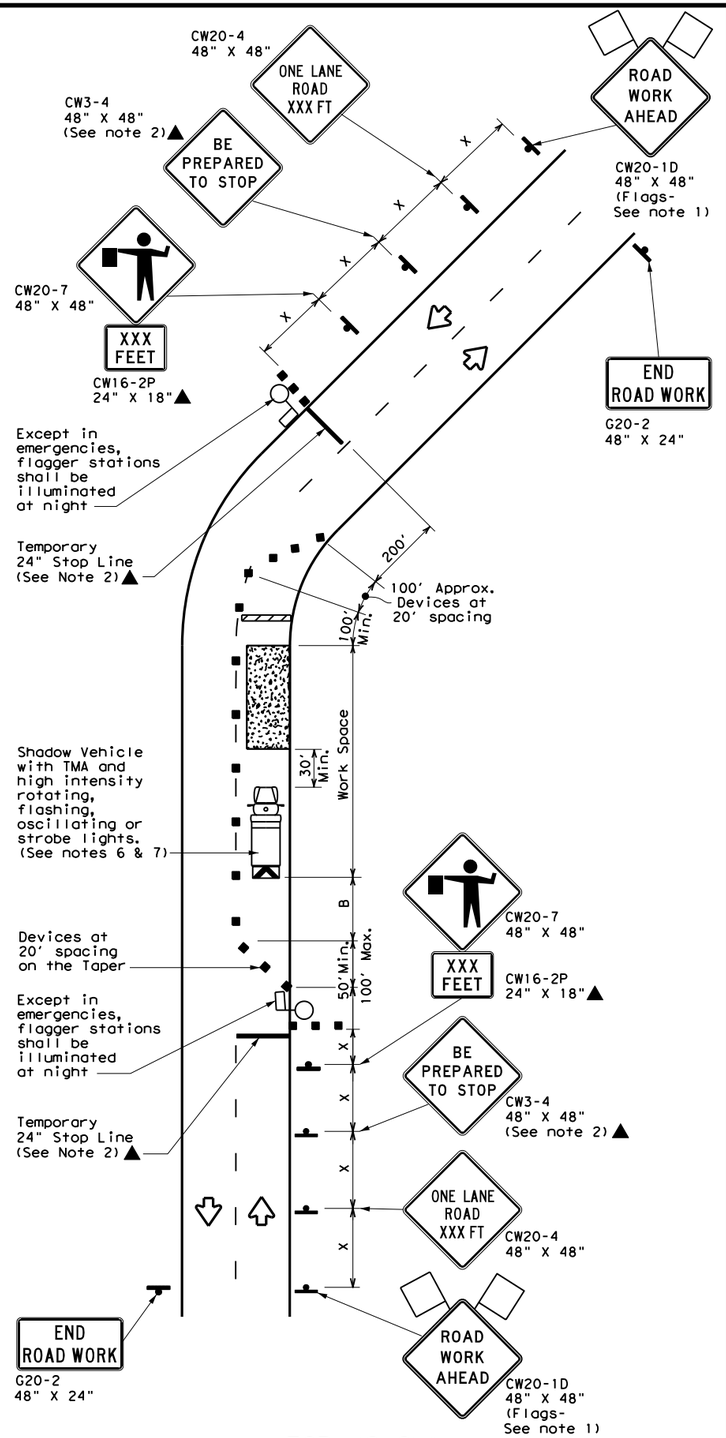
TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	LFK	ANGELINA		40
1-97 2-18				

DATE:
FILE:



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



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

LEGEND

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

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

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

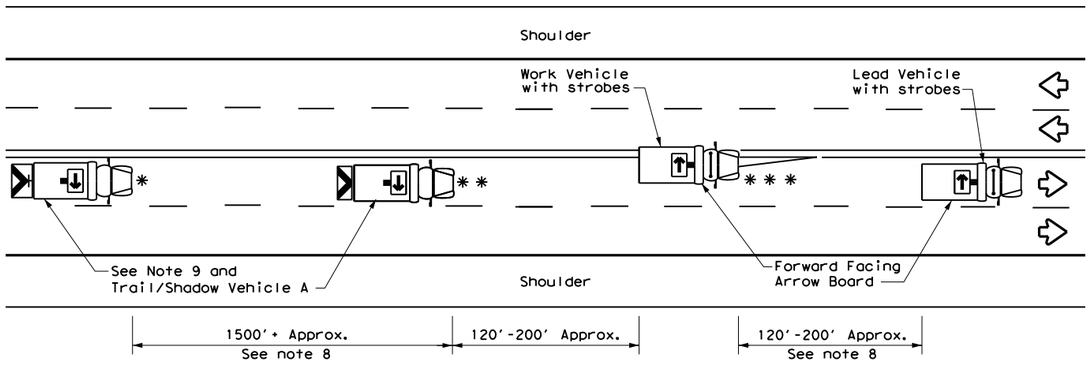
10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

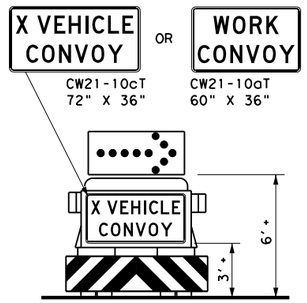
TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	LFK	ANGELINA		41
4-98 2-18				



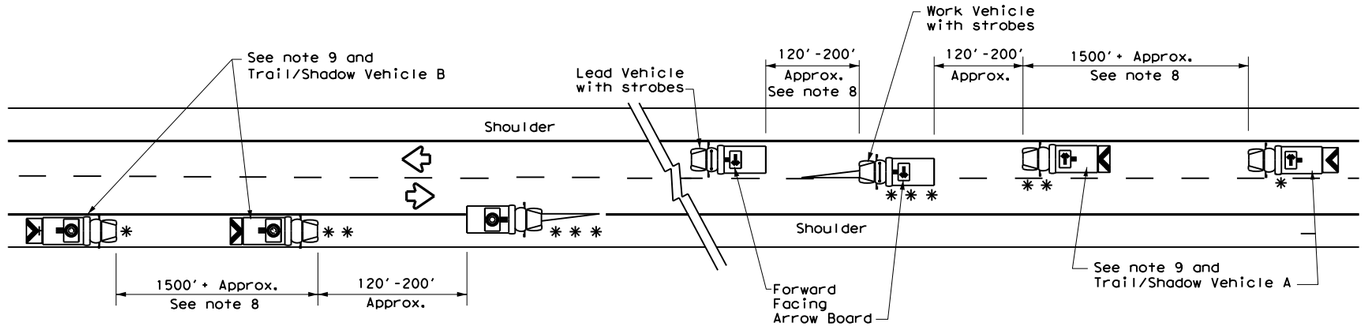
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

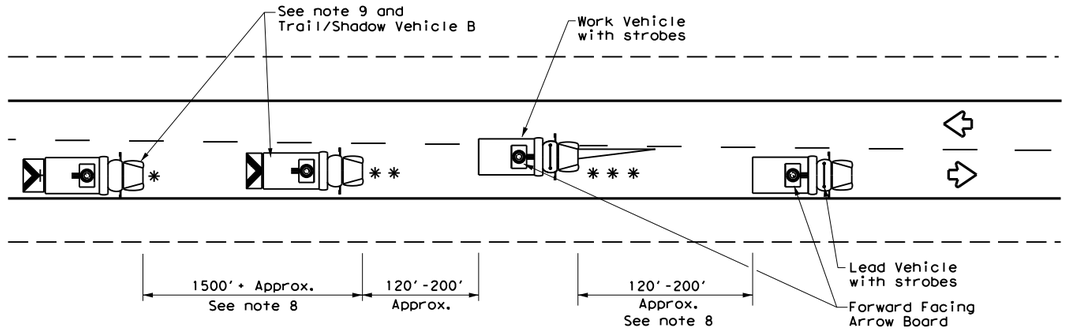


WORK ON SHOULDER

WORK ON TRAVEL LANE

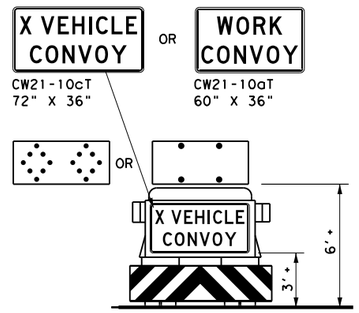
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

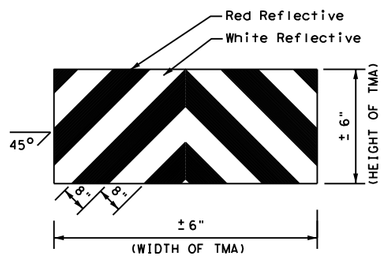
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

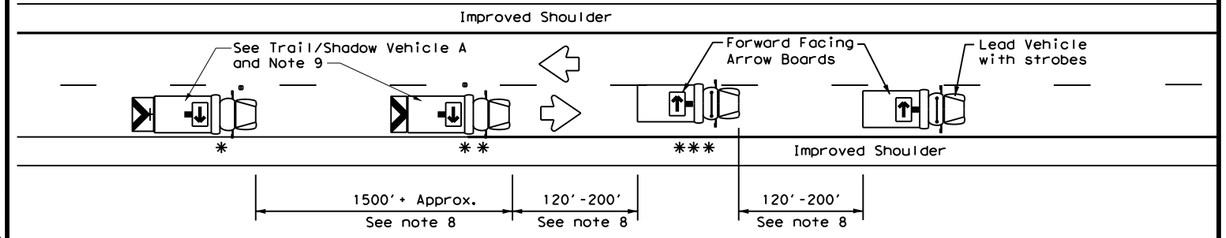
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

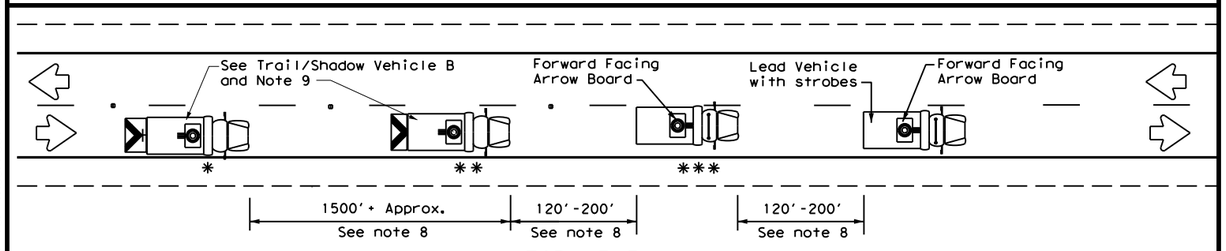
TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	LFK	ANGELINA		42
1-97				



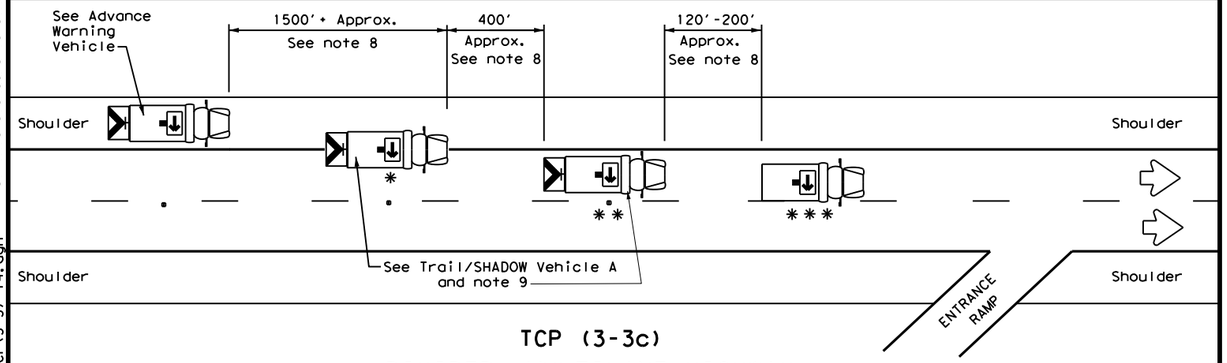
TCP (3-3a)

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



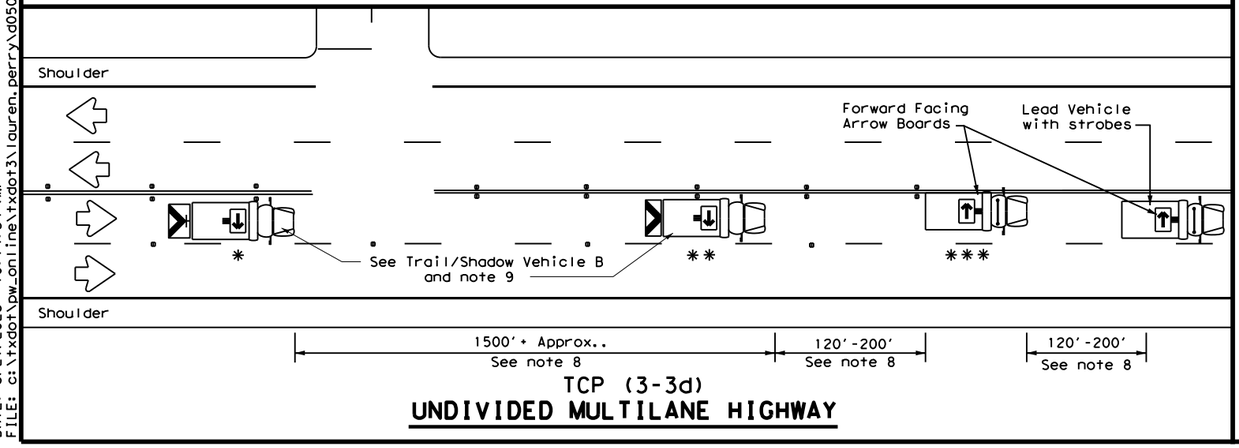
TCP (3-3b)

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



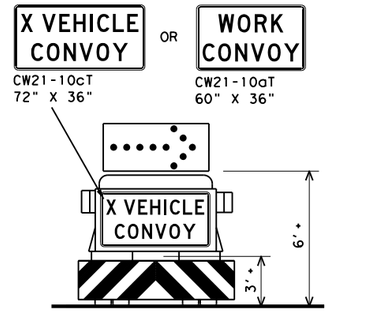
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



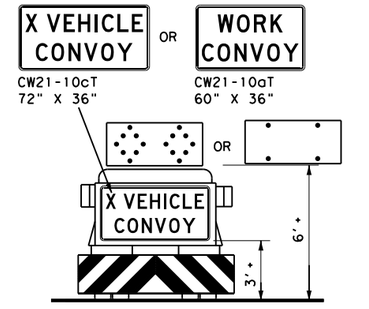
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



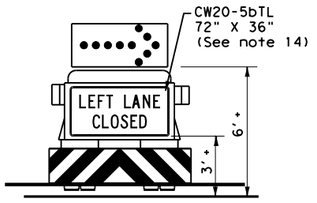
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

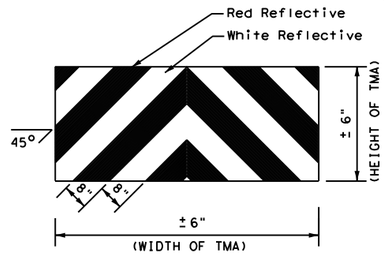


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL
TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	LFK	ANGELINA		43
1-97 7-14				

DATE: 3/27/2023 10:15:09 AM
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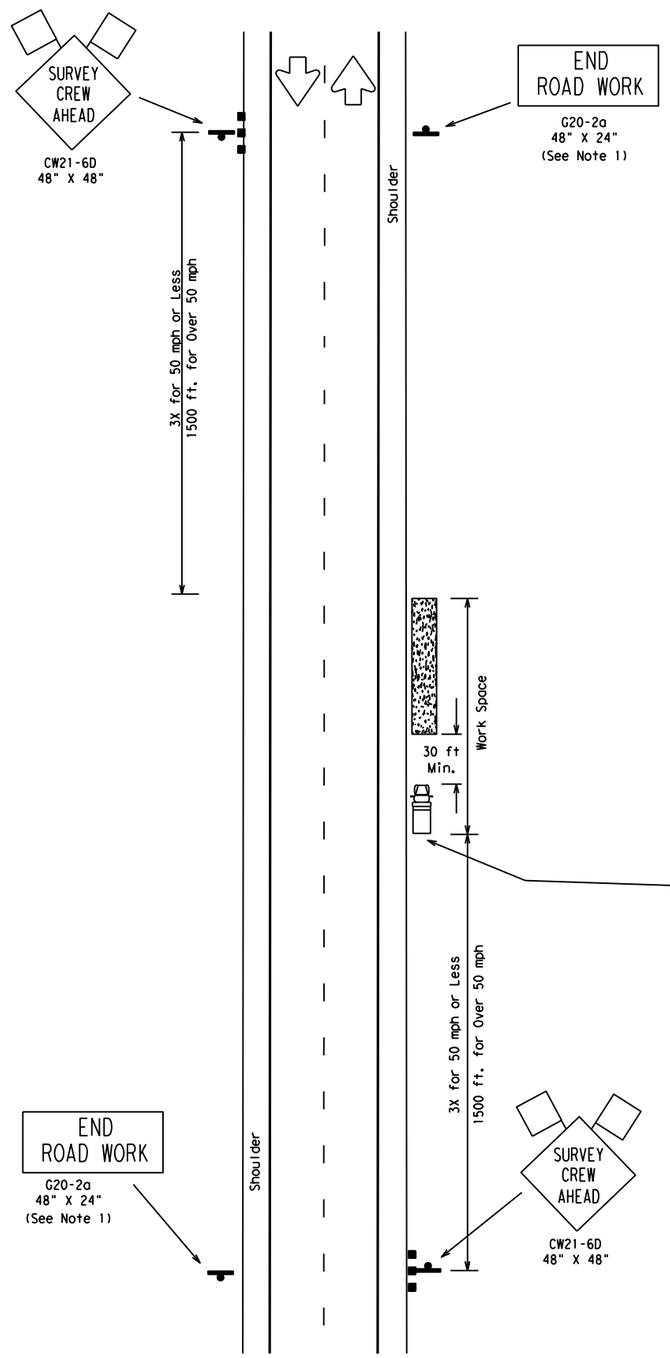
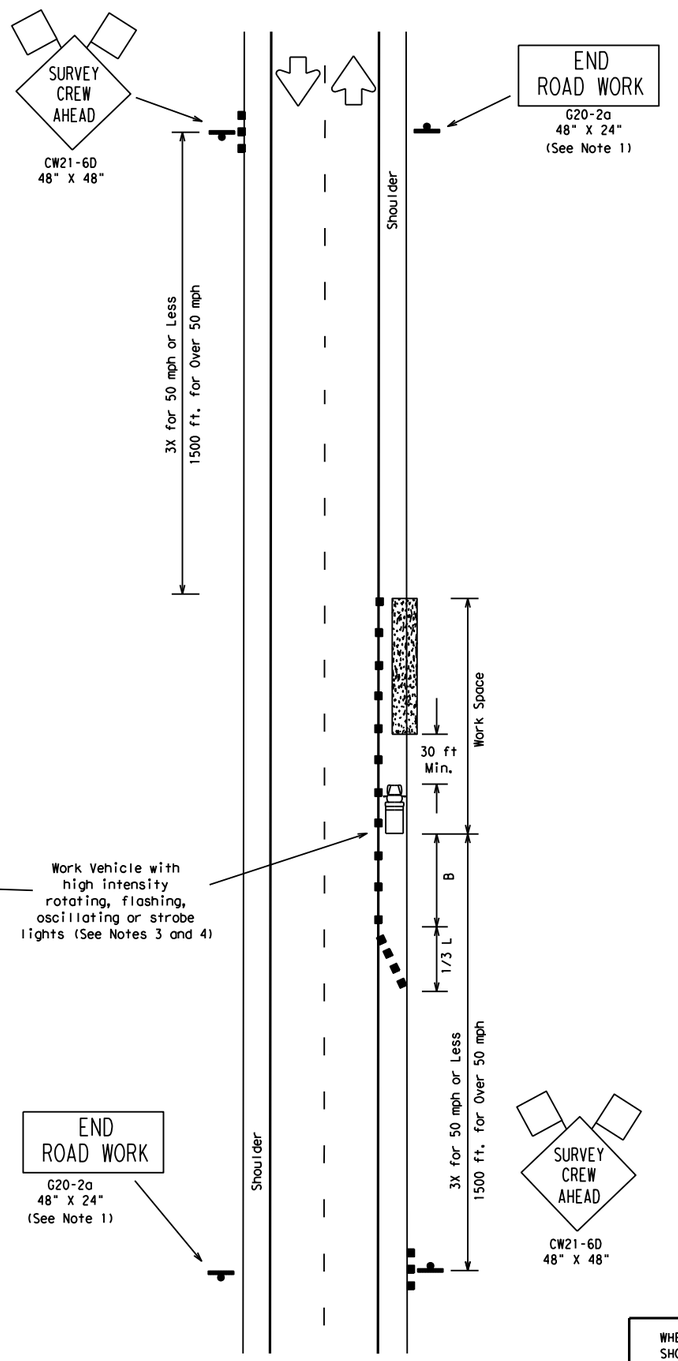


TCP (S-1a)
WORK OFF SHOULDER OR PAVED SURFACE



TCP (S-1b)
WORK ON SHOULDER

LEGEND

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

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

✳ Conventional Roads Only

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

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

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

GENERAL NOTES:

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

TCP(S-1a)

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

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

8-18-08 Revision
⚠ Corrected misspelling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

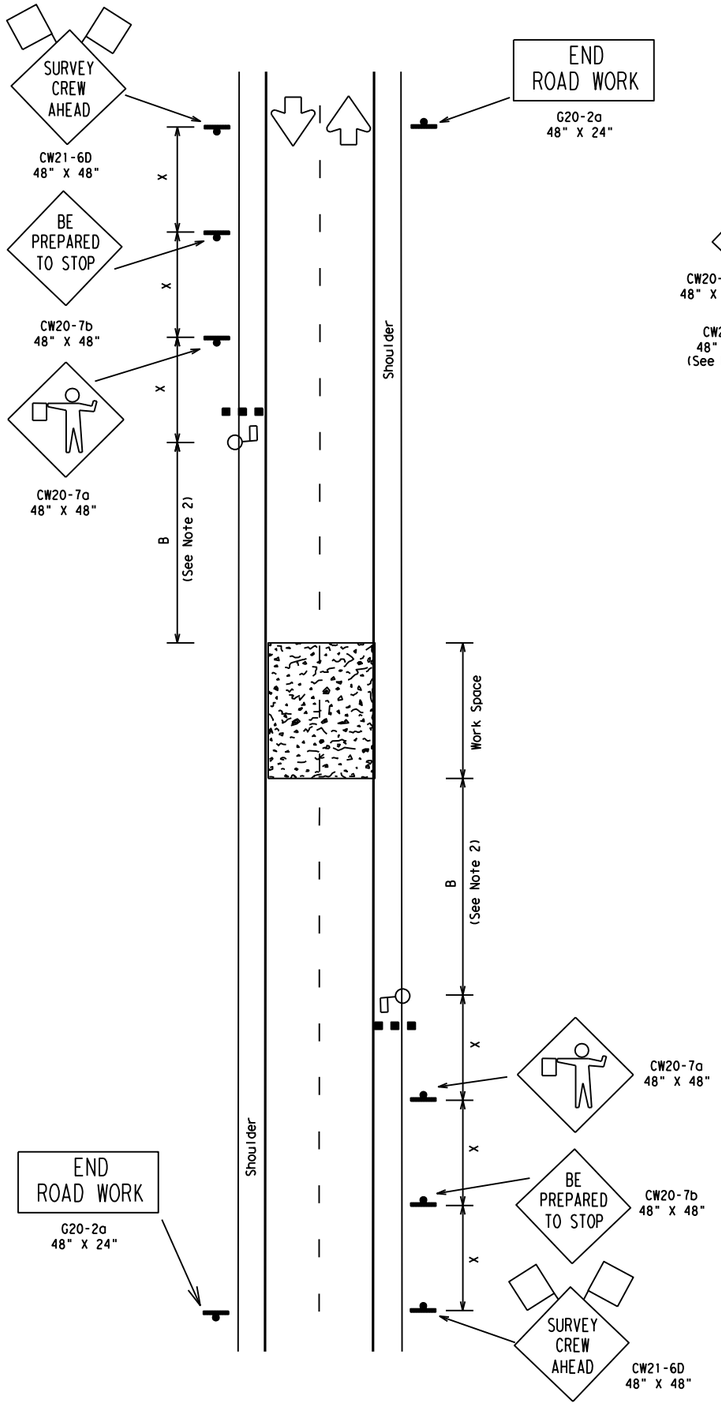
TCP(S-1)-08A

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

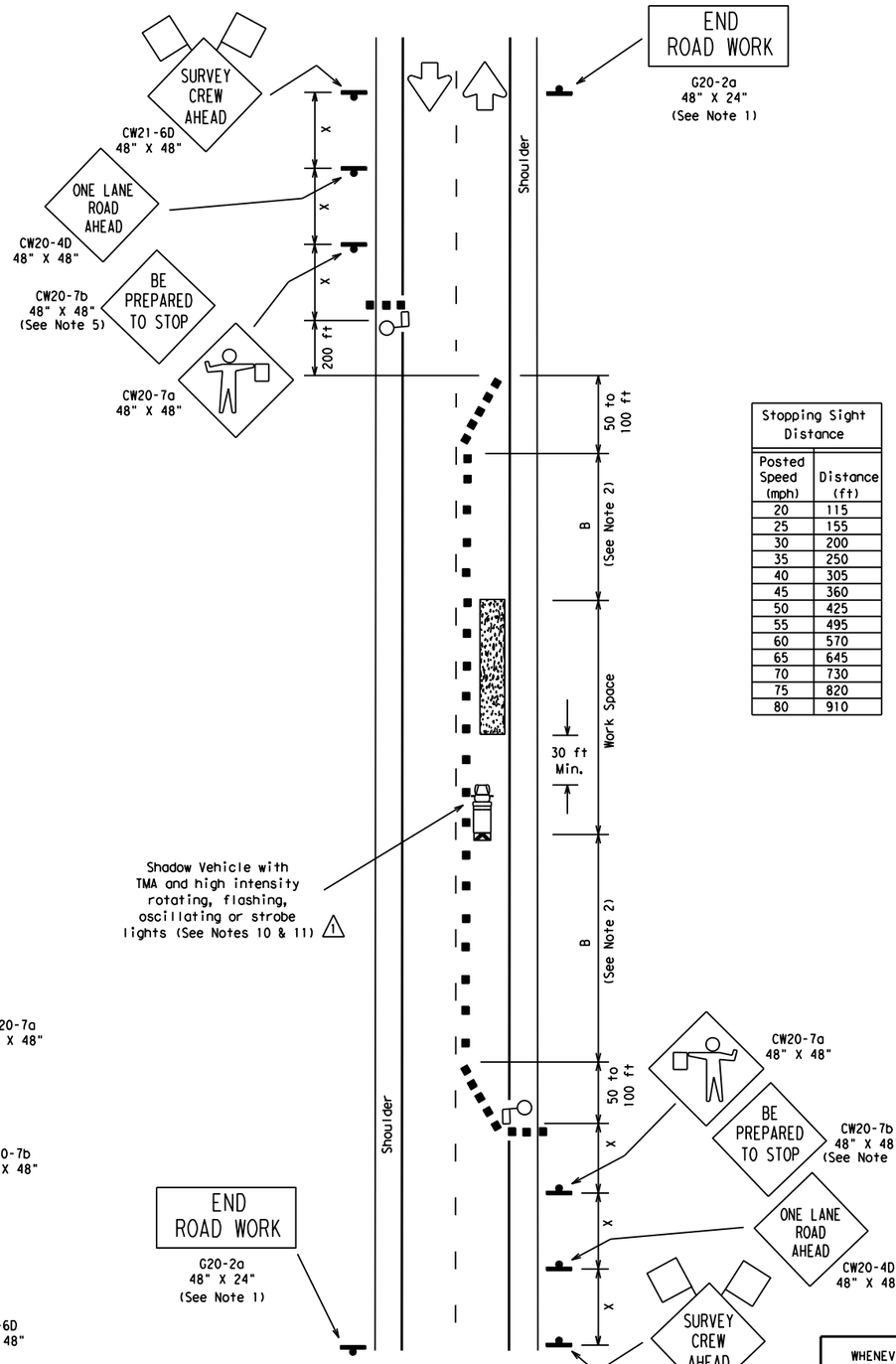
REVISIONS
8-08

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58

DIST	COUNTY	SHEET NO.
LFK	ANGELINA	44



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



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

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

LEGEND

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

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

✳ Conventional Roads Only

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

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

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

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

TCP(S-2a)

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

TCP (S-2B)

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

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

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-2)-08A

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

REVISIONS
8-08

CONT	SECT	JOB	HIGHWAY
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LFK	ANGELINA		45

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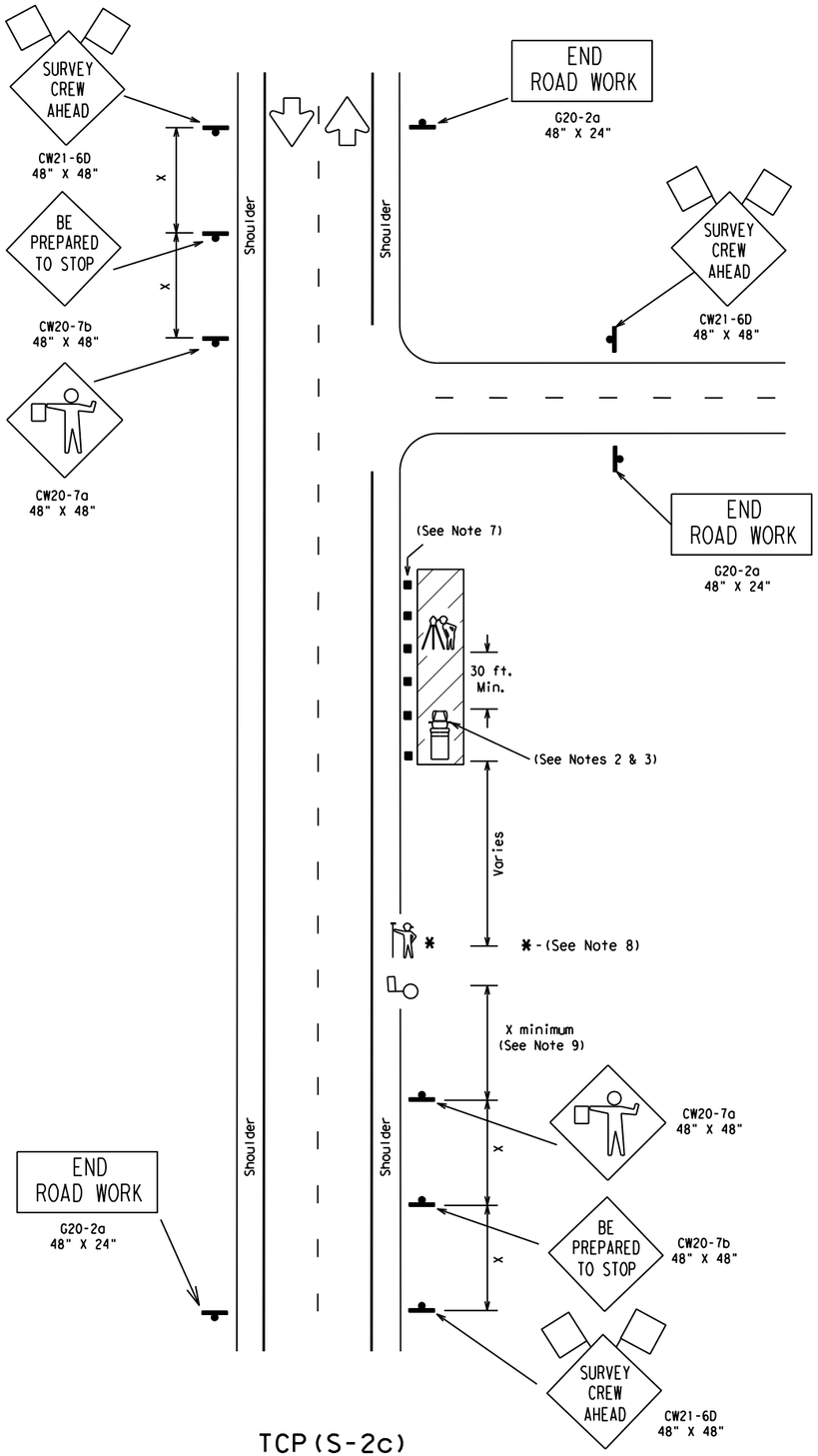

TCP(S-2c)

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

LEGEND

Type III Barricade ■ ■ Channelizing Devices Flag

Work Vehicle Truck Mounted Attenuator (TMA)

Flagger Sign Post Survey Rodman Instrument Person

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

* Conventional Roads Only

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

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

DEFINITIONS:

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

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

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

GENERAL NOTES:

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

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

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-2c)-10

REVISIONS

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

CONT	SECT	JOB	HIGHWAY
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LFK	ANGELINA		46

212A

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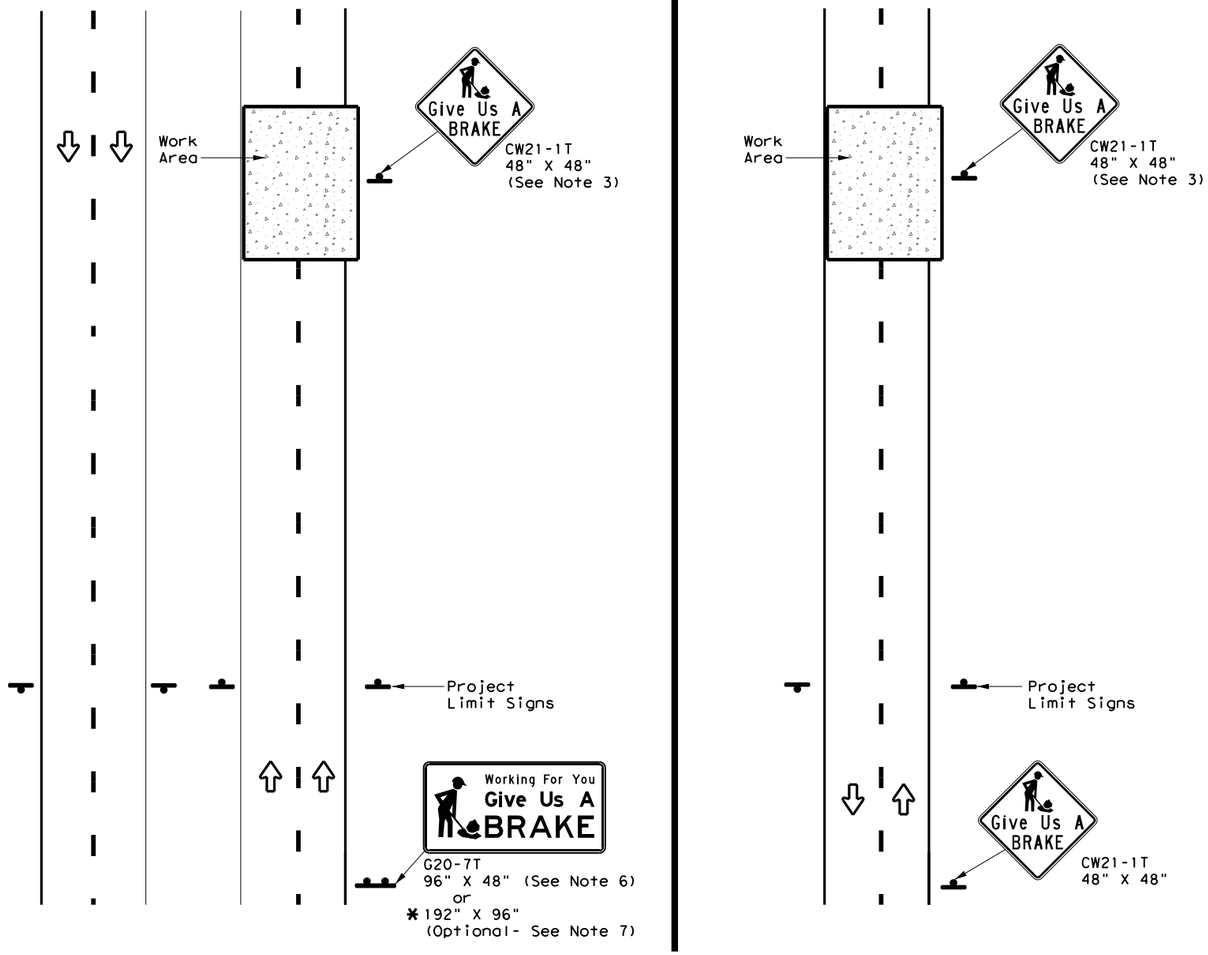

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	LFK	ANGELINA		47

116

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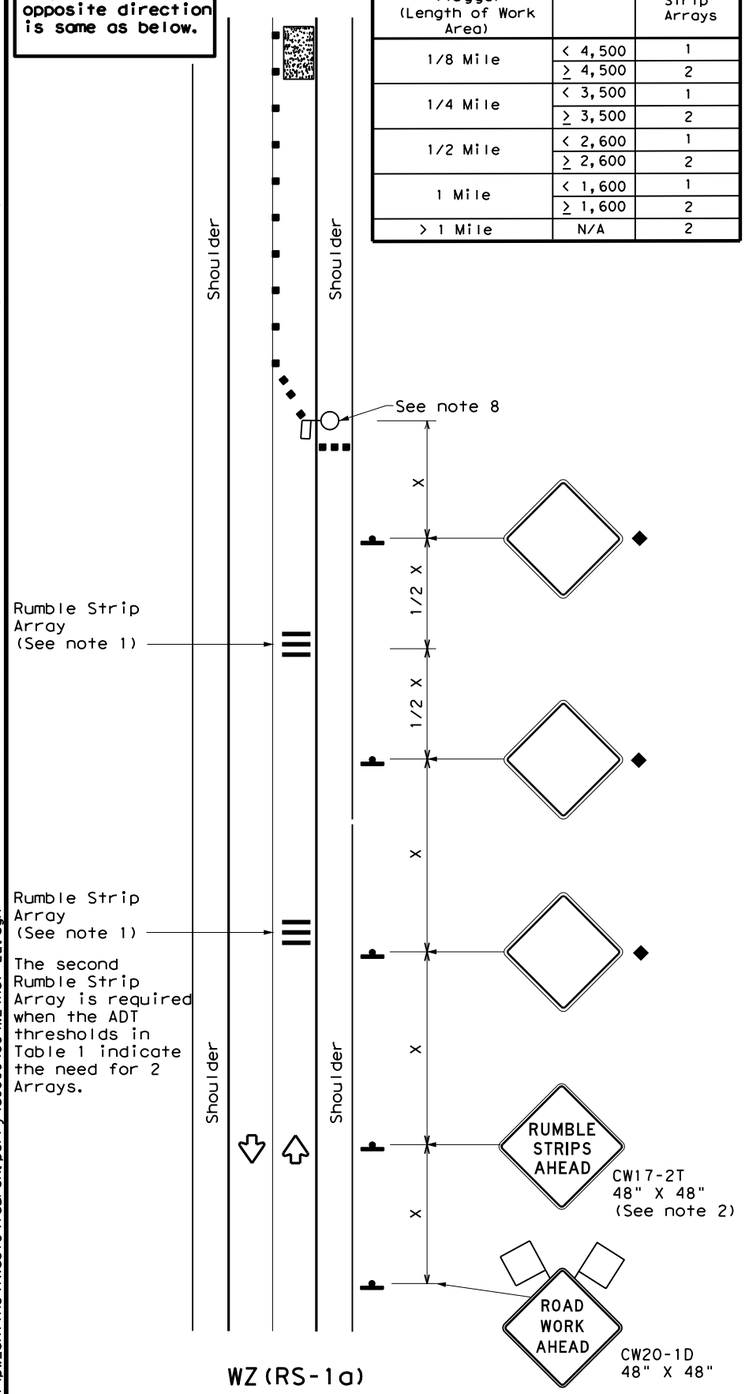
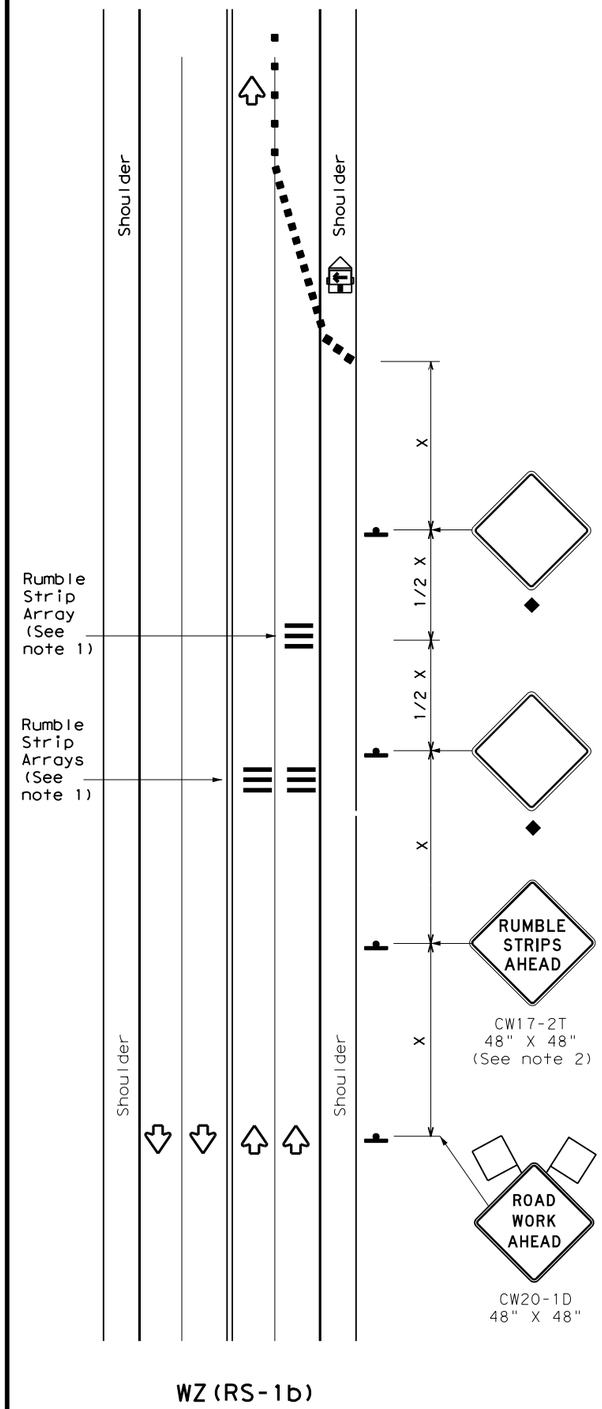
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

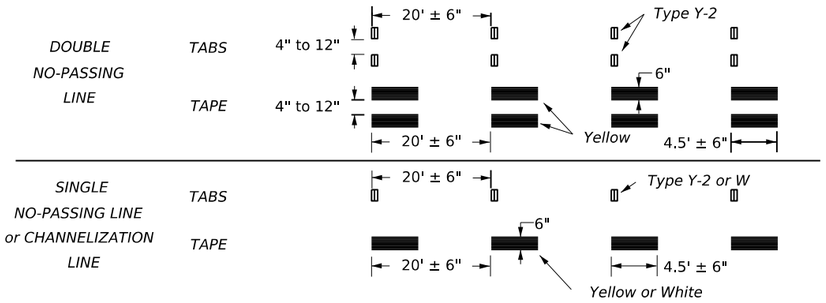
TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		48

117

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



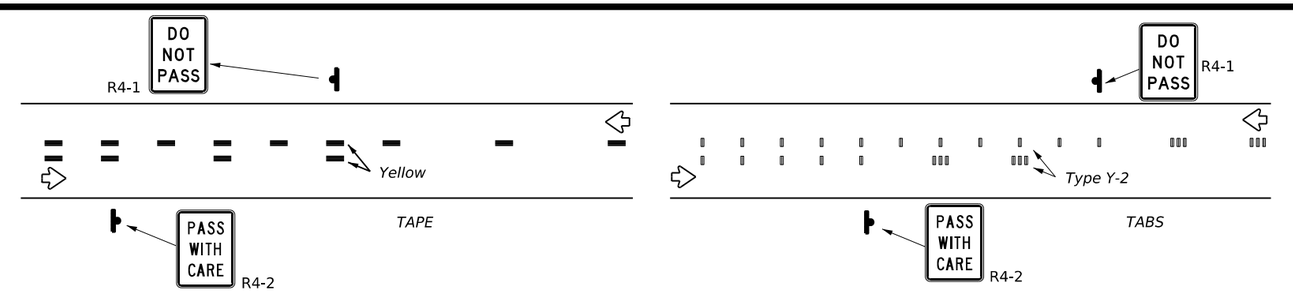
NOTES:

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

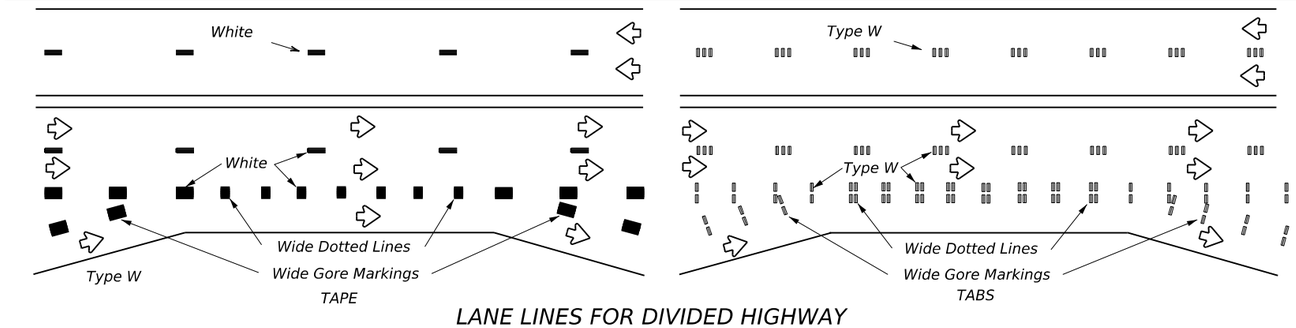
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

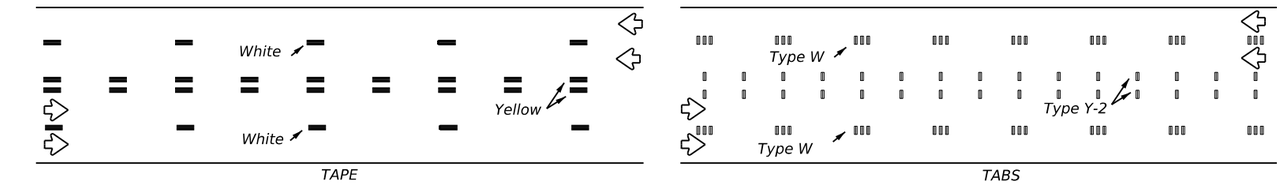
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



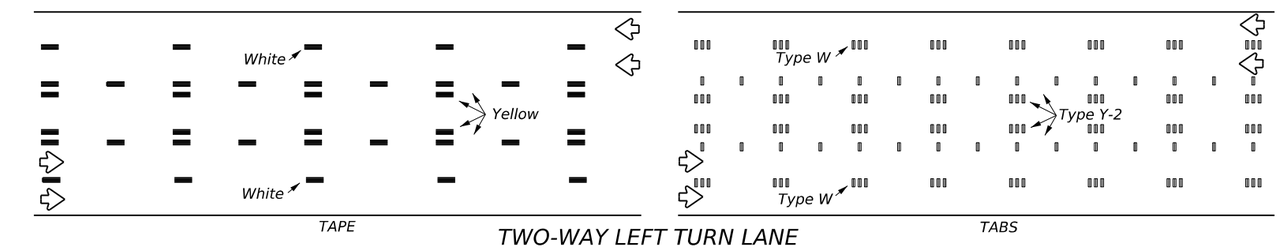
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



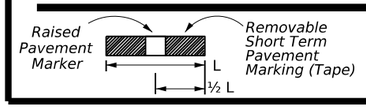
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

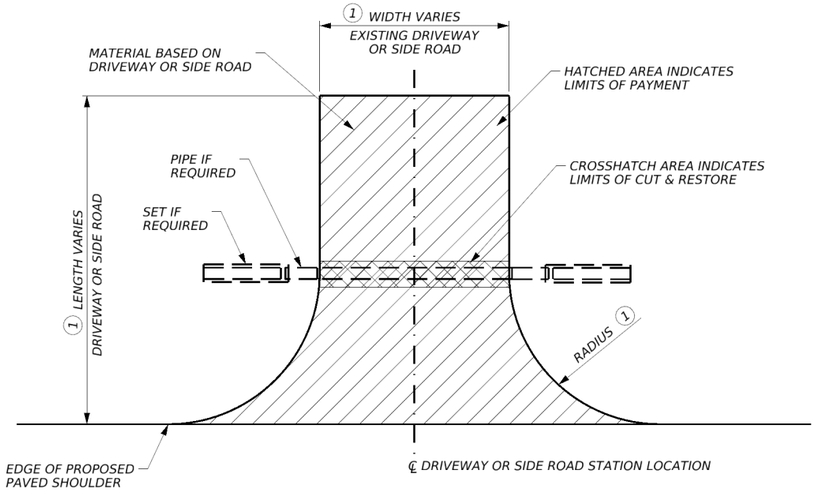
Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

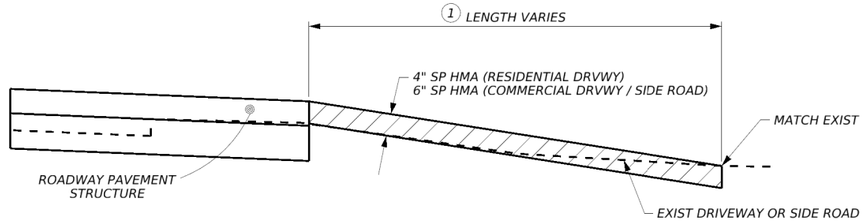
WZ(STPM)-23

FILE: wzstpm-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
4-92 7-13	DIST	COUNTY		SHEET NO.
1-97 2-23	LFK	ANGELINA		49
3-03				

DATE:
FILE:



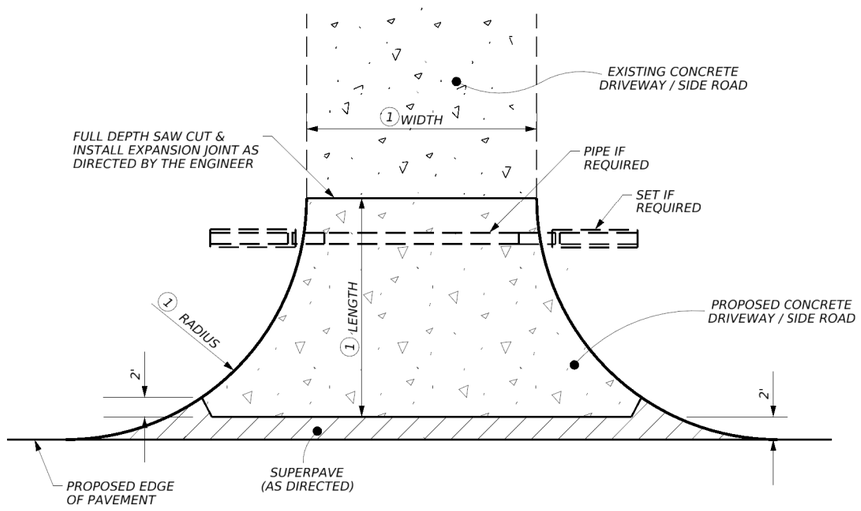
TYPICAL PLAN VIEW OF NON-CONC DRIVEWAY & SIDE ROAD



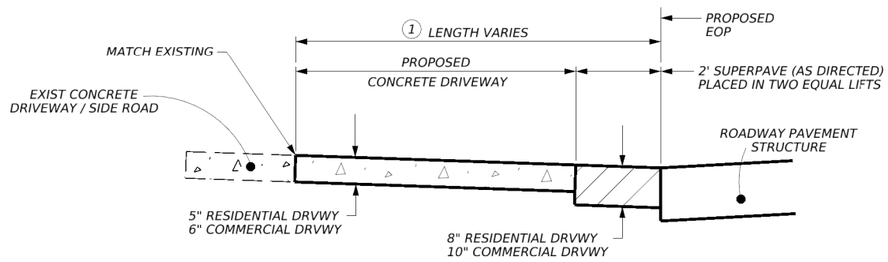
PROFILE (NON-CONCRETE)

DETAIL NOTES:

1 SEE SUMMARY ELSEWHERE IN PLANS FOR LENGTH, WIDTH, AND RADIUS



TYPICAL PLAN VIEW OF CONCRETE DRIVEWAY & SIDE ROAD



PROFILE (CONCRETE)

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 / SIDE ROADS SHALL BE PAID FOR UNDER ITEM 530 INTERSECTIONS, DRIVEWAYS, AND TURNOUTS. NO ADDITIONAL PAYMENT WILL BE MADE FOR REMOVAL OF EXISTING HMA, GRAVEL AND DIRT DRIVEWAYS. THE NECESSARY EXCAVATION, GRADING, COMPACTION, HMA AND INCIDENTALS WILL BE CONSIDERED SUBSIDIARY TO ITEM 530.
5. ESTABLISH AND MAINTAIN 6:1 SLOPE ALONG SIDES OF DRIVEWAYS AND SIDE ROADS. ADDITIONAL EMBANKMENT REQUIRED WILL BE PAID FOR UNDER ITEM 132, EMBANKMENT (VEHICLE).

N.T.S.

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
AF852E728AEC4C0...
P.E.
3/27/2023

Texas Department of Transportation

ROADWAY, DRIVEWAY, & SIDE ROAD DETAILS (REHAB & WIDENING PROJECTS)

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		50

DATE: 3/27/2023 10:16:47 AM
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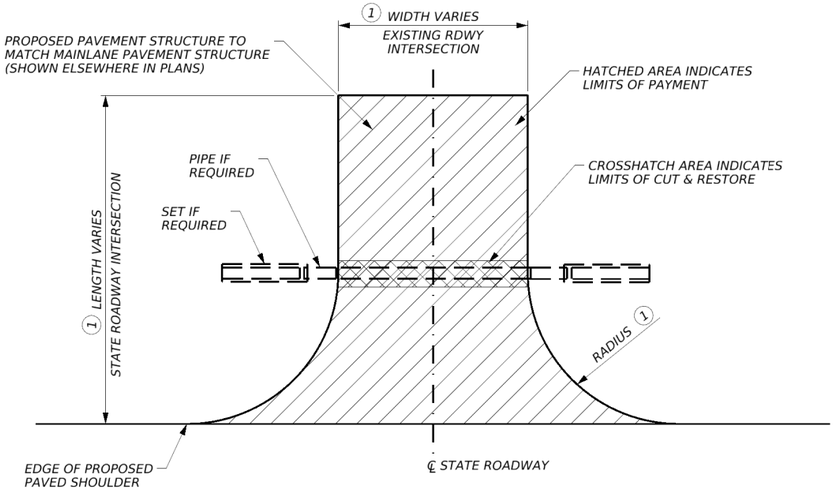
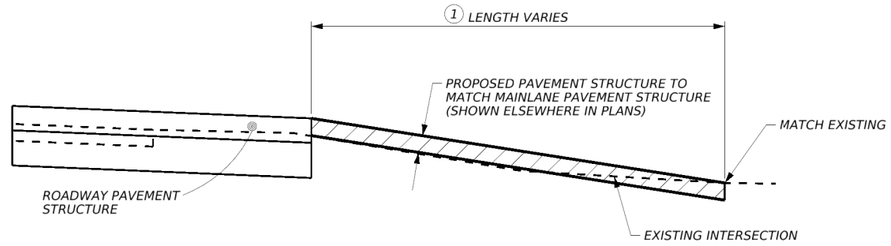


TYPICAL PLAN VIEW OF STATE ROADWAY INTERSECTIONS



PROFILE (STATE ROADWAY INTERSECTIONS)

DETAIL NOTES:

1. *SEE SUMMARY ELSEWHERE IN PLANS FOR LENGTH, WIDTH, AND RADIUS*

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 / SIDE ROADS SHALL BE PAID FOR UNDER ITEM 530 INTERSECTIONS, DRIVEWAYS, AND TURNOUTS. NO ADDITIONAL PAYMENT WILL BE MADE FOR REMOVAL OF EXISTINGHMS, GRAVEL AND DIRT DRIVEWAYS. THE NECESSARY EXCAVATION, GRADING, COMPACTION, HMA AND INCIDENTALS WILL BE CONSIDERED SUBSIDIARY TO ITEM 530.*
5. *ESTABLISH AND MAINTAIN 6:1 SLOPE ALONG SIDES OF DRIVEWAYS AND SIDE ROADS. ADDITIONAL EMBANKMENT REQUIRED WILL BE PAID FOR UNDER ITEM 132, EMBANKMENT (VEHICLE).*

N.T.S.

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
cmb P.E.
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3/27/2023

Texas Department of Transportation

ROADWAY, DRIVEWAY, & SIDE ROAD DETAILS (REHAB & WIDENING PROJECTS)

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		51

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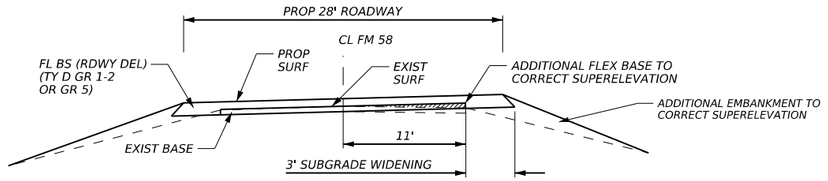
FM 58 SUPERELEVATION TABLE

STATION			SHOULDER CROSS SLOPE LEFT (%)	TRAVEL LANE CROSS SLOPE LEFT (%)	TRAVEL LANE CROSS SLOPE RIGHT (%)	SHOULDER CROSS SLOPE RIGHT (%)	
BEGIN PROJECT							
326+30	END NC	>	-2.00	-2.00	-2.00	-2.00	
SUPERELEVATION	TRANSITION						
327+62	BEGIN FS						
329+44	END FS	>	-4.00	-4.00	4.00	4.00	15.7 TONS FL BS
SUPERELEVATION	TRANSITION						
330+76	BEGIN NC						
351+67	END NC	>	-2.00	-2.00	-2.00	-2.00	
SUPERELEVATION	TRANSITION						
352+59	BEGIN FS						
358+10	END FS	>	-2.20	-2.20	2.20	2.20	25.8 TONS FL BS
SUPERELEVATION	TRANSITION						
359+03	BEGIN NC						
392+08	END NC	>	-2.00	-2.00	-2.00	-2.00	
SUPERELEVATION	TRANSITION						
393+40	BEGIN FS						
401+48	END FS	>	4.00	4.00	-4.00	-4.00	50.6 TONS FL BS
SUPERELEVATION	TRANSITION						
402+80	BEGIN NC						
437+37	END NC	>	-2.00	-2.00	-2.00	-2.00	
SUPERELEVATION	TRANSITION						
438+69	BEGIN FS						
445+56	END FS	>	-4.00	-4.00	4.00	4.00	50.1 TONS FL BS
SUPERELEVATION	TRANSITION						
446+88	BEGIN NC						
454+28	END NC	>	-2.00	-2.00	-2.00	-2.00	
SUPERELEVATION	TRANSITION						
455+60	BEGIN FS						
460+39	END FS	>	-4.00	-4.00	4.00	4.00	42.9 TONS FL BS
SUPERELEVATION	TRANSITION						
461+71	BEGIN NC						
472+29	END NC	>	-2.00	-2.00	-2.00	-2.00	
SUPERELEVATION	TRANSITION						
473+61	BEGIN FS						
482+16	END FS	>	4.00	4.00	-4.00	-4.00	67.9 TONS FL BS
SUPERELEVATION	TRANSITION						
483+48	BEGIN NC						
494+78	END NC	>	-2.00	-2.00	-2.00	-2.00	
SUPERELEVATION	TRANSITION						
496+10	BEGIN FS						
509+86	END FS	>	-4.00	-4.00	4.00	4.00	77.4 TONS FL BS
SUPERELEVATION	TRANSITION						
511+18	BEGIN NC						
517+46	END NC	>	-2.00	-2.00	-2.00	-2.00	
SUPERELEVATION	TRANSITION						
519+09	BEGIN FS						
524+82	END FS	>	5.40	5.40	-5.40	-5.40	77.2 TONS FL BS
SUPERELEVATION	TRANSITION						
526+45	BEGIN NC						
536+83	END NC	>	-2.00	-2.00	-2.00	-2.00	

FM 58 SUPERELEVATION TABLE

STATION			SHOULDER CROSS SLOPE LEFT (%)	TRAVEL LANE CROSS SLOPE LEFT (%)	TRAVEL LANE CROSS SLOPE RIGHT (%)	SHOULDER CROSS SLOPE RIGHT (%)	
536+83	END NC						
SUPERELEVATION	TRANSITION						
538+15	BEGIN FS						
539+85	END FS	>	-4.00	-4.00	4.00	4.00	25.9 TONS FL BS
SUPERELEVATION	TRANSITION						
541+17	BEGIN NC						
557+62	END NC	>	-2.00	-2.00	-2.00	-2.00	
SUPERELEVATION	TRANSITION						
558+94	BEGIN FS						
564+19	END FS	>	4.00	4.00	-4.00	-4.00	43.0 TONS FL BS
SUPERELEVATION	TRANSITION						
565+51	BEGIN NC						
589+85	END NC	>	-2.00	-2.00	-2.00	-2.00	
SUPERELEVATION	TRANSITION						
591+31	BEGIN FS						
597+63	END FS	>	4.60	4.60	-4.60	-4.60	70.2 TONS FL BS
SUPERELEVATION	TRANSITION						
599+09	BEGIN NC						
END PROJECT		>	-2.00	-2.00	-2.00	-2.00	

NC =NORMAL CROWN
FS =FULL SUPERELEVATION
NOTE: ALL TRANSITIONS ARE PARABOLIC

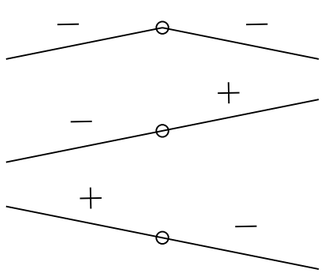


SUPERELEVATION CORRECTION DETAIL

STA 326+30 TO STA 599+09
(CURVES 01-11)

NOT TO SCALE

SIGN CONVENTION



○ = AXIS OF ROTATION

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
AF852E728AEC4C0...
P.E.

3/27/2023

Texas Department of Transportation

SUPERELEVATION DATA

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		52

DATE: 3/27/2023 10:17:11 AM
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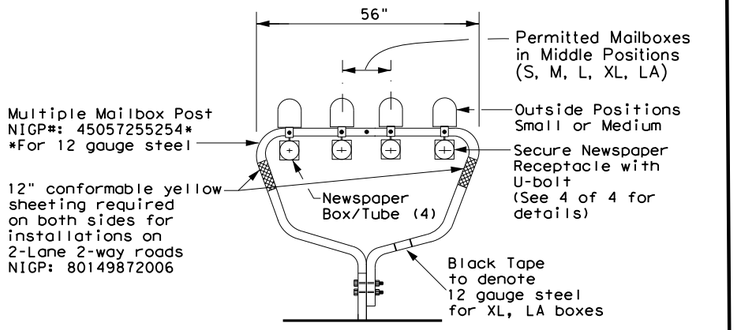

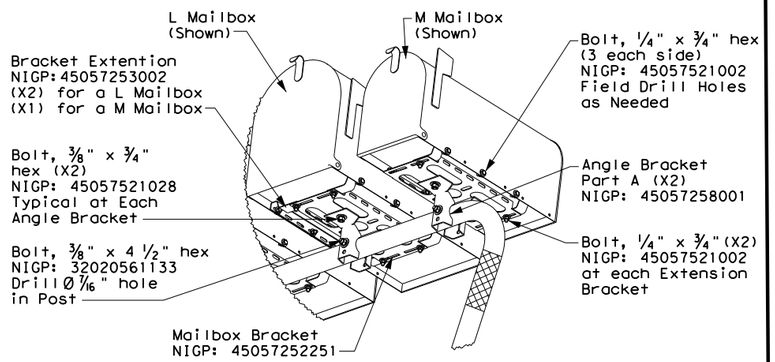

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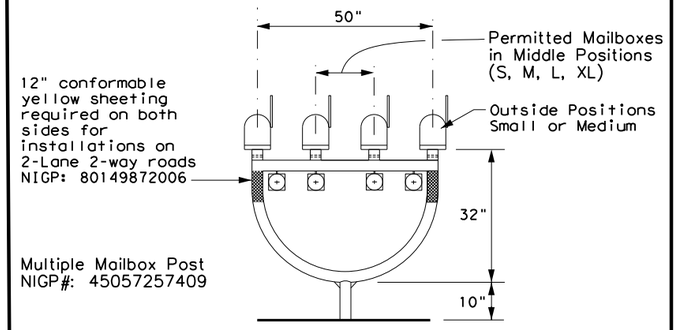
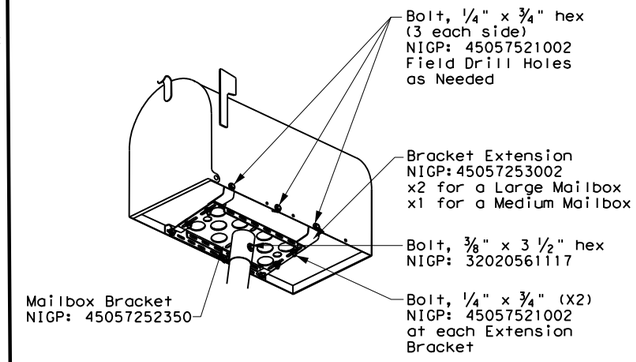




MAILBOX SIZES

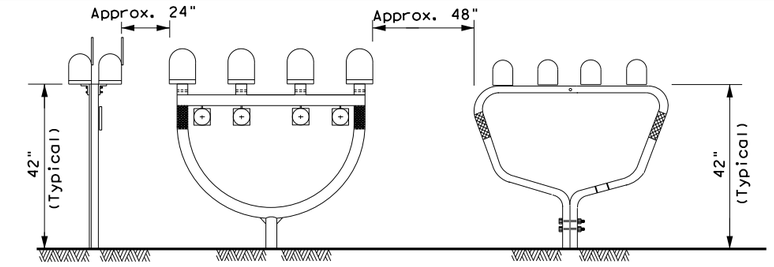
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX **
	LENGTH	WIDTH	HEIGHT	WEIGHT
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

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

GENERAL NOTES:

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

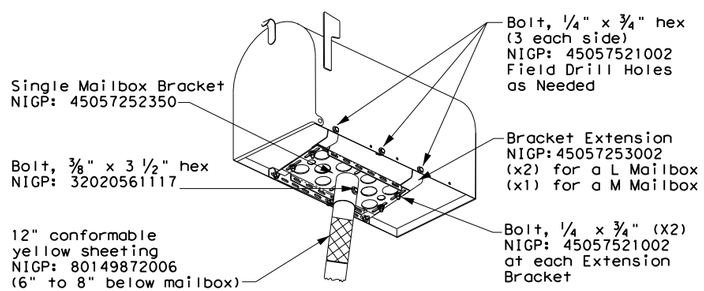
TYPICAL INSTALLATION MEASUREMENTS

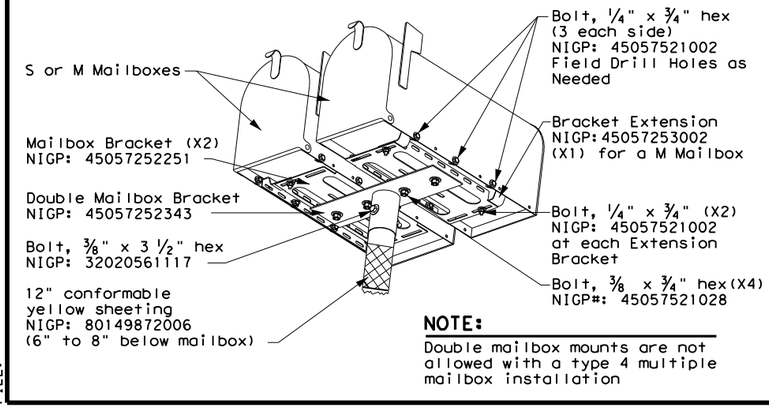


NOTE:

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

TYPE 2 and 4 - SINGLE/DOUBLE

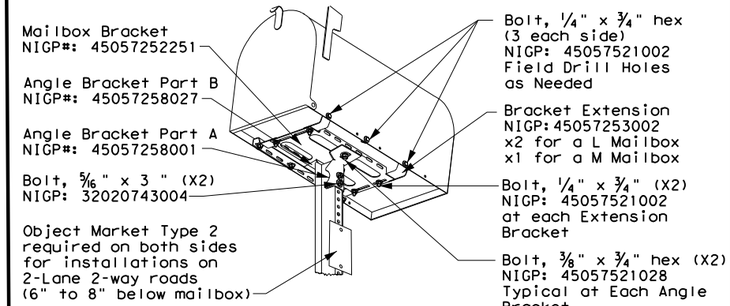


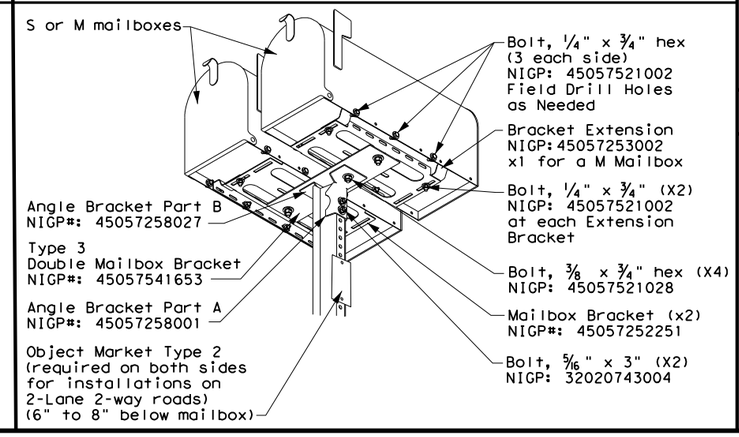


NOTE:

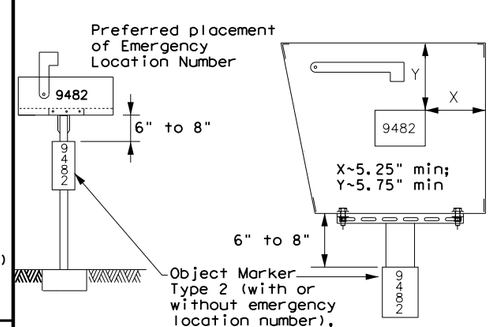
Double mailbox mounts are not allowed with a type 4 multiple mailbox installation

TYPE 3 - SINGLE/DOUBLE





PLACEMENT OF EMERGENCY LOCATION NUMBER

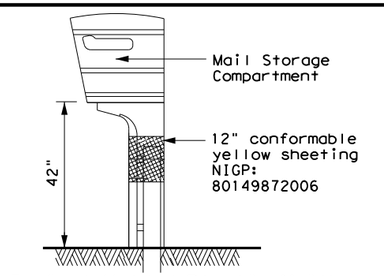


NOTES:

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

SHEET 1 OF 4

TYPE 5



Typical Molded Plastic Mailbox

Texas Department of Transportation

Maintenance Division Standard

MAILBOX MOUNTING AND ASSEMBLY

MB(1)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK:
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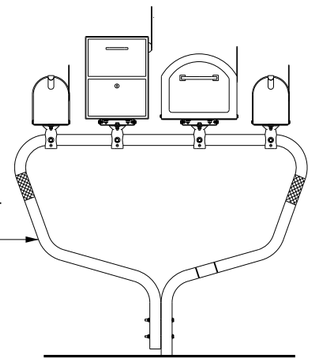
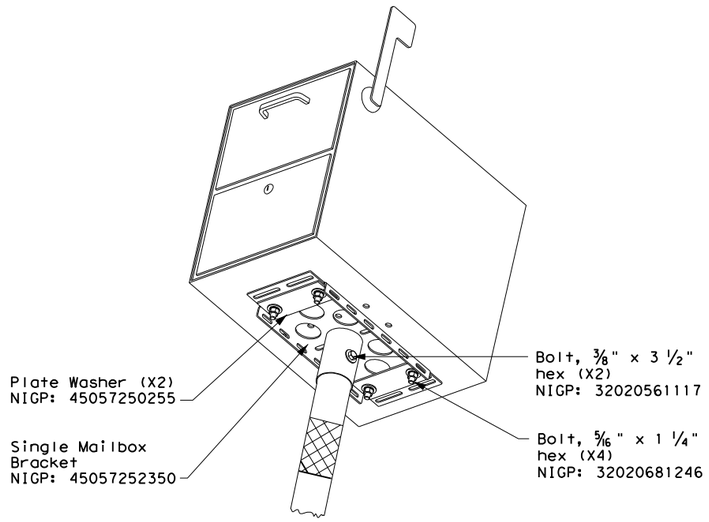
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		53

DATE:
FILE:

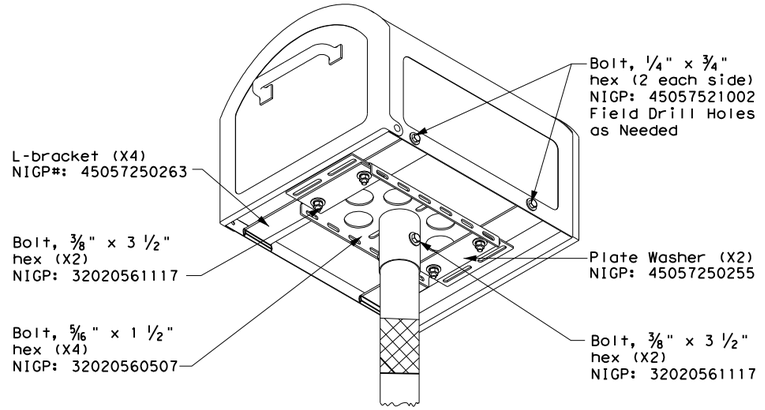
TYPE 1- MULTI LOCKABLE AND XL MAILBOX



TYPE 2/4 - SINGLE LOCKABLE MAILBOX

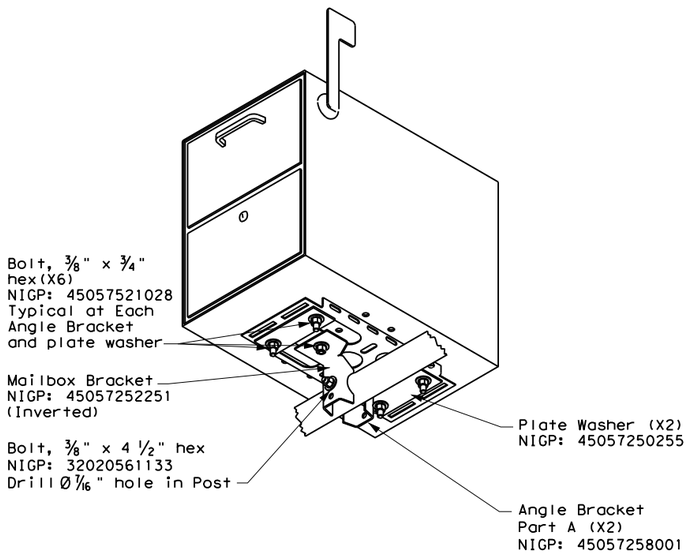


TYPE 2/4 - SINGLE XL MAILBOX

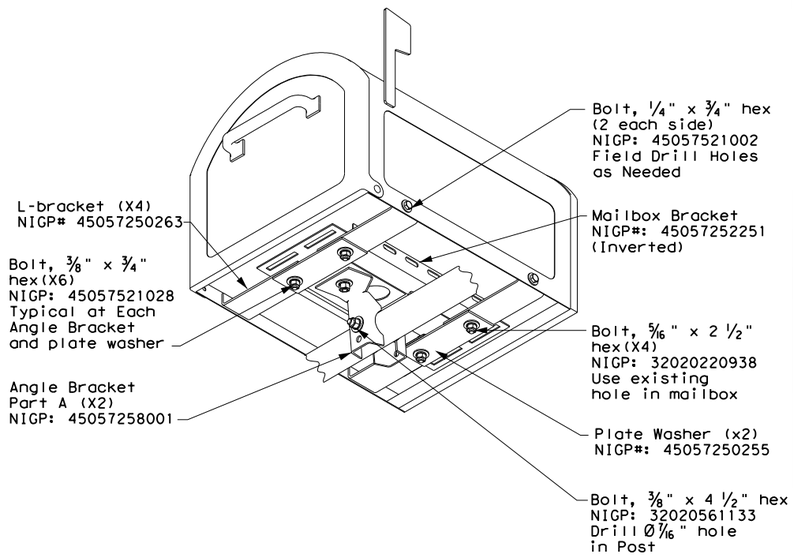


NOTE:
Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

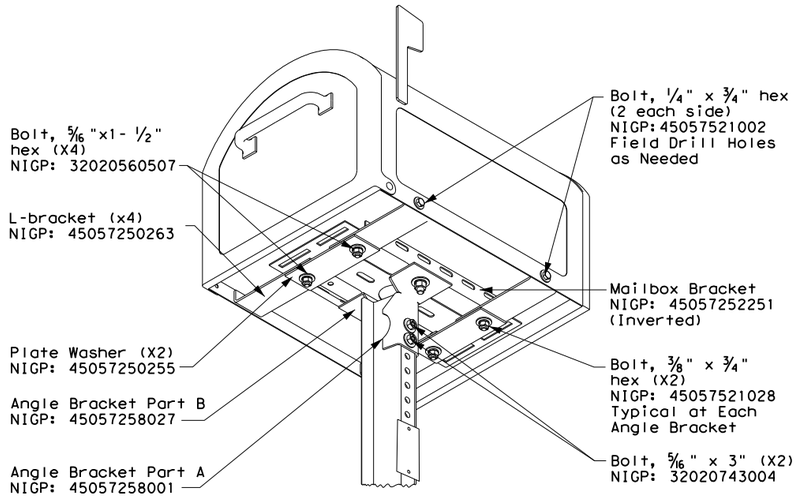
TYPE 1 MULTI – LOCKABLE ARCHITECTURAL (LA)



TYPE 1 MULTI – XL MAILBOX



TYPE 3 - XL MAILBOX MOUNTING



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Maintenance Division Standard

XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY

MB(2)-21

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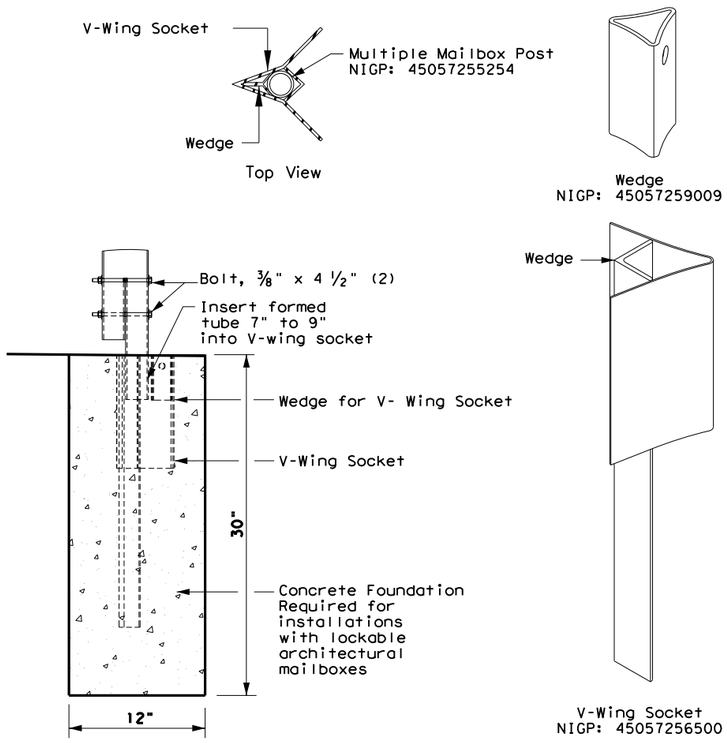
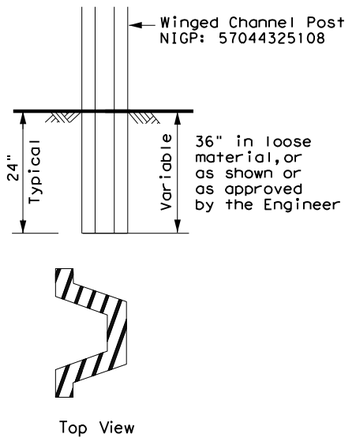
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		54

TYPE 1 - SUPPORT/FOUNDATION
Thin Wall Tube w/ V-LOC Anchorage

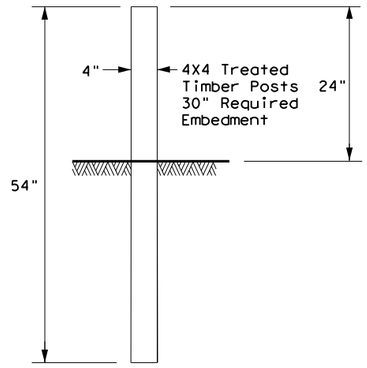


TYPE 3 - SUPPORT/FOUNDATION

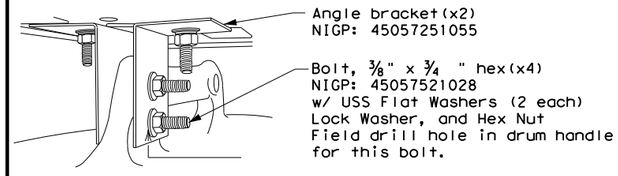


NOTES:
1. Attach Object Marker (OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

TYPE 5 - SUPPORT/FOUNDATION



TYPE 6 - TEMPORARY MAILBOX SUPPORT

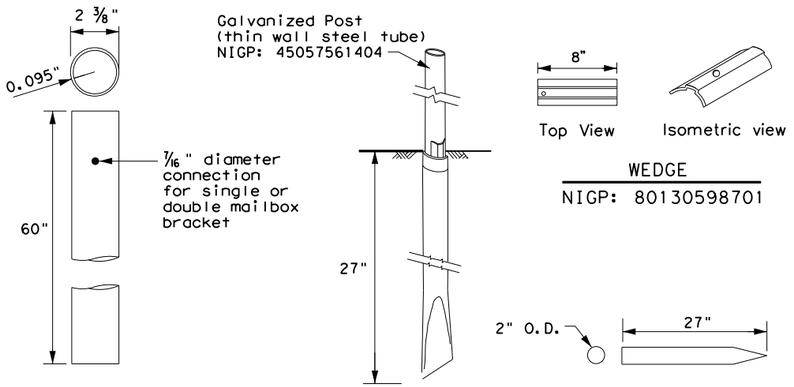


Plastic Drum NIGP: 55093383655
Rubber Collar NIGP: 55093387102

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

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

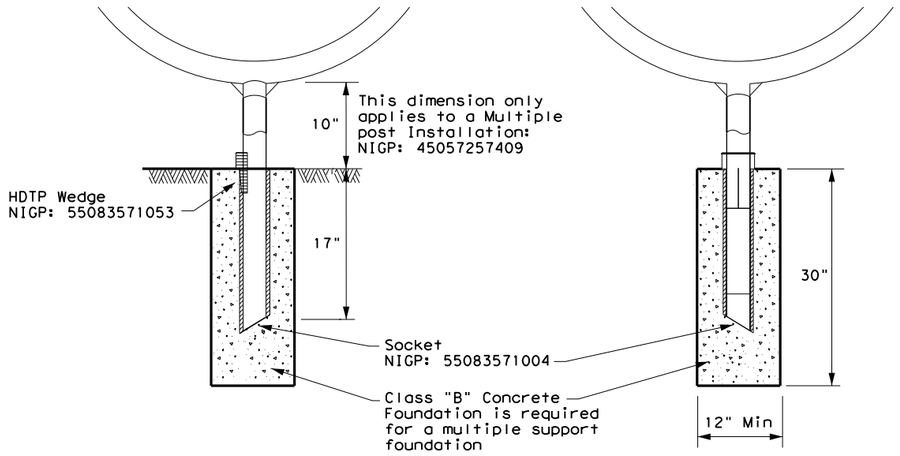
TYPE 2 - SUPPORT/FOUNDATION
Thin Wall Steel Tube w/Wedge Anchor System



MAILBOX POST

WEDGE ANCHOR
NIGP: 80130238407

TYPE 4 - SUPPORT/FOUNDATION
Whitecoated steel post NIGP: 45057561107
Multiple post NIGP: 45057257409
Recycled Rubber post (RR) NIGP: 45057561057



SHEET 3 OF 4

Texas Department of Transportation | Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB(3)-21

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	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		55

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FILE:

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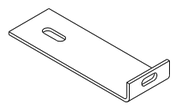
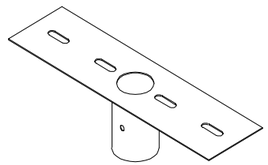
DATE:
FILE:

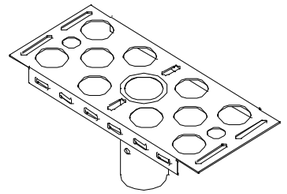
TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4			TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple	Single	Single
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: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



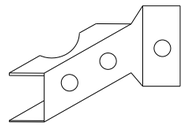
NIGP: 45057250263
L-Bracket x4 for
XL sized mailboxes



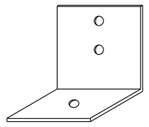
NIGP: 45057252343
Double Mailbox Bracket
For Type 2 and Type 4
double mount



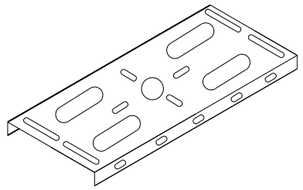
NIGP: 45057252350
Single Mailbox Bracket
For Type 2 single and for
Type 4 single and multi mount



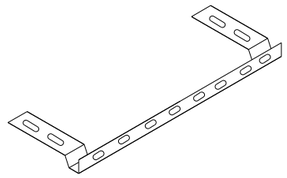
NIGP: 45057258001
Part "A" Angle Bracket
For Type 1 multi (2 per mailbox)
and Type 3 single and double



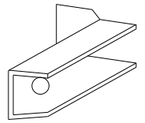
NIGP: 45057251055
Type 6 Angle Bracket
(2 per mailbox)



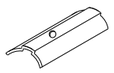
NIGP: 45057252251
Mailbox Bracket
For Type 1 multi and
any double mount (use 2)



NIGP: 45057253002
Bracket Extension
Use 1 for a medium Mailbox
Use 2 for a Large Mailbox



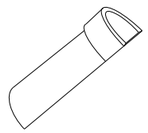
NIGP: 45057258027
Part "B" Angle Bracket
For Type 3 single
and double



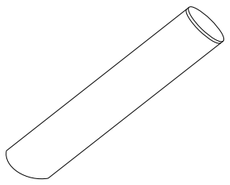
NIGP: 80130598701
Wedge for Type 2

NIGP: 45057250255
Plate Washer for Architecural
and XL Mailboxes

NIGP: 45057541653
Type 3 double mailbox bracket

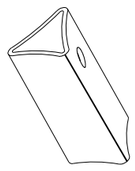


NIGP: 55083571053
Type 4 Mailbox Wedge

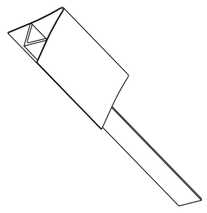


NIGP: 55083571004
Type 4 Mailbox Socket

NIGP: 80130238407
Type 2 Wedge Anchor



NIGP: 45057259009
Wedge for Type 1 V-wing Socket



NIGP: 45057256500
V-wing Socket for
Type 1 Foundation

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

NOTES:

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

BID CODES FOR CONTRACTS

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

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- MP = Molded Plastic

Type of Post
- WC = Winged Channel Post
- RR = Recycled Rubber
- TWW = Thin Walled White Tubing
- TWG = Thin Walled Galvanized Tubing
- TIM = Timber

Type of Foundation
- Ty 1 = V-Loc
- Ty 2 = Wedge Anchor Steel System
- Ty 3 = Winged Channel post
- Ty 4 = Wedge Anchor Plastic System
- Ty 5 = 4 X 4 Post

Texas Department of Transportation — Maintenance Division Standard

NIGP PARTS LIST AND COMPATIBILITY

MB(4)-21

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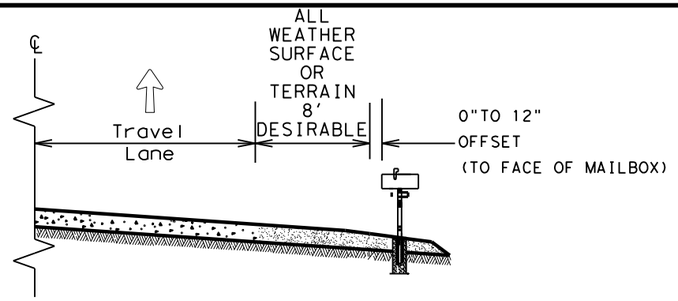
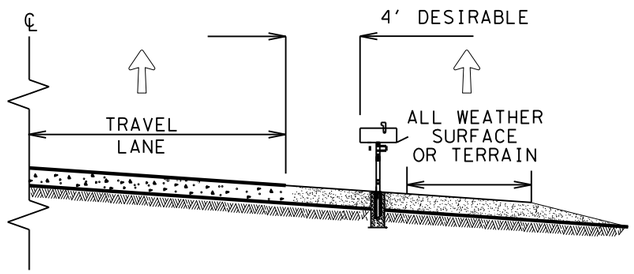
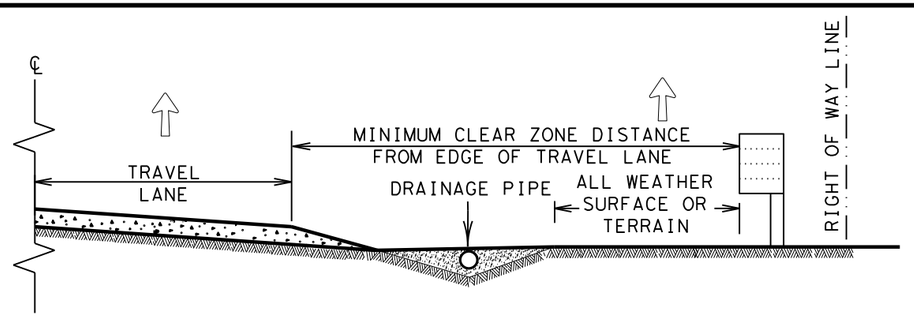
	LFK	ANGELINA		56



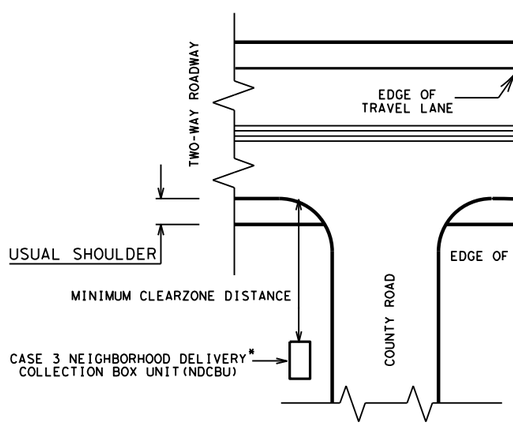
CASE 1. OFF TRAVEL WAY DELIVERY

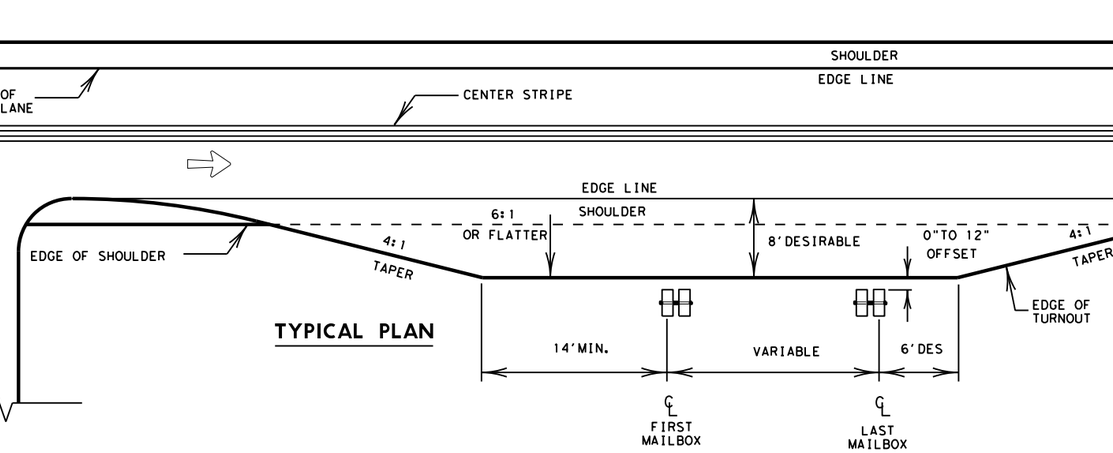


CASE 2. BACK SIDE DELIVERY

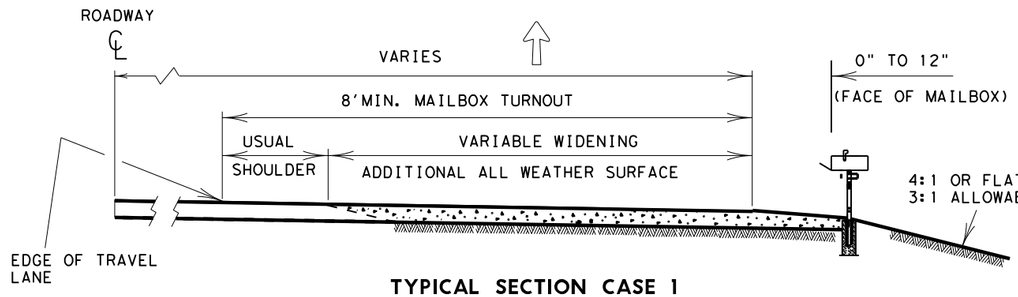


CASE 3. DELIVERY NEAR RIGHT OF WAY LINE





TYPICAL PLAN



TYPICAL SECTION CASE 1

GENERAL NOTES:

1. CASE 1 IS THE MOST COMMON METHOD.
2. TURN OUT BEHIND MAILBOX FOR CASE 2 WILL NORMALLY BE ALLOWED FOR NATURAL TERRAIN THAT WILL SERVE AS AN ALL WEATHER SURFACE.
3. ALL WEATHER DRIVEWAYS FOR CASE 3 MAILBOXES LOCATED AT THE RIGHT OF WAY LINE SHOULD NORMALLY BE PLACED IN CONJUNCTION WITH COUNTY ROADS OR OTHER CONNECTING COMMUNITY ROADS OR STREETS. WHEN 3 OR MORE MULTI-RACKS ARE ANTICIPATED, THE USE OF AN NDCBU IS RECOMMENDED. ONLY RURAL PATRONS LOCATED ON STATE MAINTAINED HIGHWAYS MAY HAVE A MAILBOX OR NDCBU SLOT ON TXDOT RIGHT OF WAY.

*NDCBU MAY BE INSTALLED ON COUNTY ROAD ROW WITH APPROVAL OF COUNTY.

MAIL DELIVERY VEHICLE TRAVEL DIRECTION

Texas Department of Transportation

Maintenance Division Standard

Guideline

MAILBOX SIDE ROAD PLACEMENT AND TURNOUTS

MBP(1)-22

FILE: MBP-22.DGN	DN: VS	CK:	DW: VS	CK:
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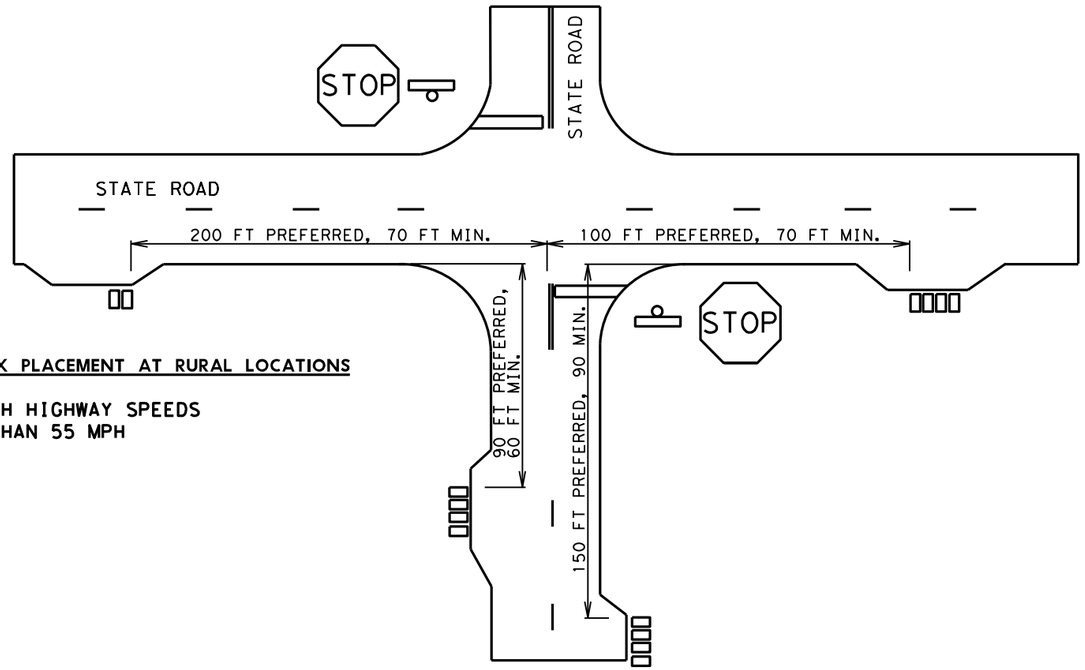
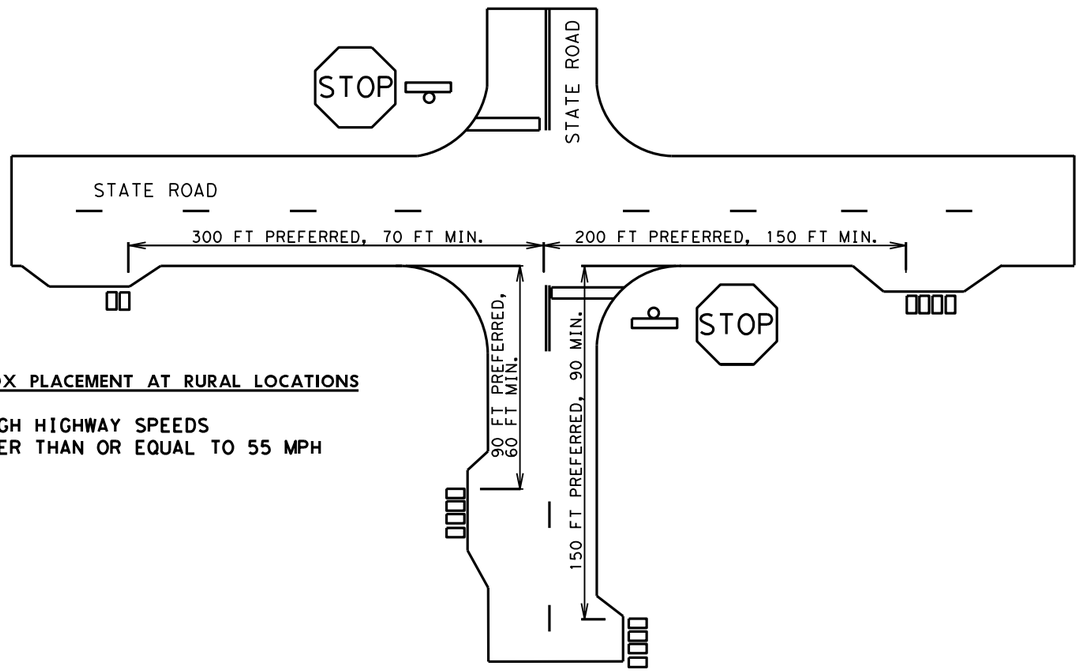
	LFK	ANGELINA		57

DATE: 02/28/2023 04:48 PM
FILE: DOCUMENT NAME



MAILBOX PLACEMENT AT RURAL LOCATIONS

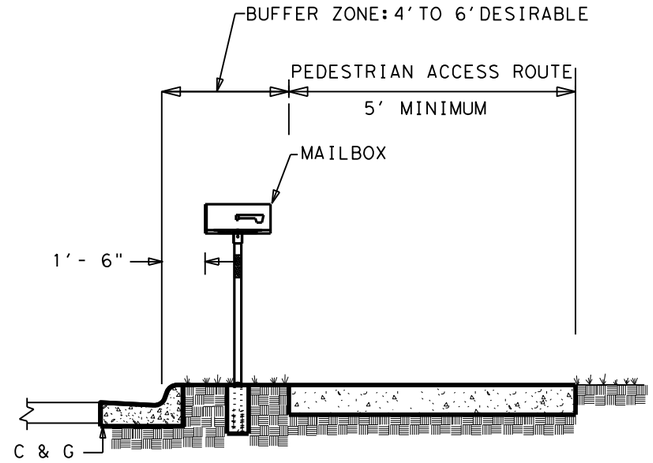
THROUGH HIGHWAY SPEEDS
LESS THAN 55 MPH



MAILBOX PLACEMENT AT RURAL LOCATIONS

THROUGH HIGHWAY SPEEDS
GREATER THAN OR EQUAL TO 55 MPH

CURB AND GUTTER MAILBOX INSTALLATION



NOTES:
1. A NON-TRAVERSABLE SURFACE MUST BE INSTALLED NEAR THE MAILBOX (NATURAL VEGETATION OR OTHER) IN THE BUFFER ZONE. ALTERNATIVELY, A BASE WITH A MINIMUM HEIGHT OF 2.5 INCHES MAY BE INSTALLED SO THAT THE EDGE OF THE MAILBOX DOES NOT EXTEND OUT MORE THAN 4 INCHES HORIZONTALLY BEYOND THE BASE.

2. THE SIDEWALK WIDTH MAY BE REDUCED TO 4 FOOT FOR SHORT DISTANCES AROUND THE MAILBOX IF NEEDED.

3. MAINTAIN A MINIMUM OF 5 FEET BETWEEN OBSTRUCTIONS IN THE PEDESTRIAN ACCESS ROUTE.

Texas Department of Transportation | Maintenance Division Standard

MAILBOX PLACEMENT CURBS & INTERSECTIONS

MBP(2)-22

FILE: MBP-22.DGN	DN: VS	CK:	DW: VS	CK:		
	CONT	SECT	JOB		HIGHWAY	
REVISIONS 12/2012 5/2014	0576	02	068, ETC.		FM 58	
	DIST	COUNTY			SHEET NO.	
	LFK	ANGELINA			58	

DATE: 02/28/2023 04:48 PM
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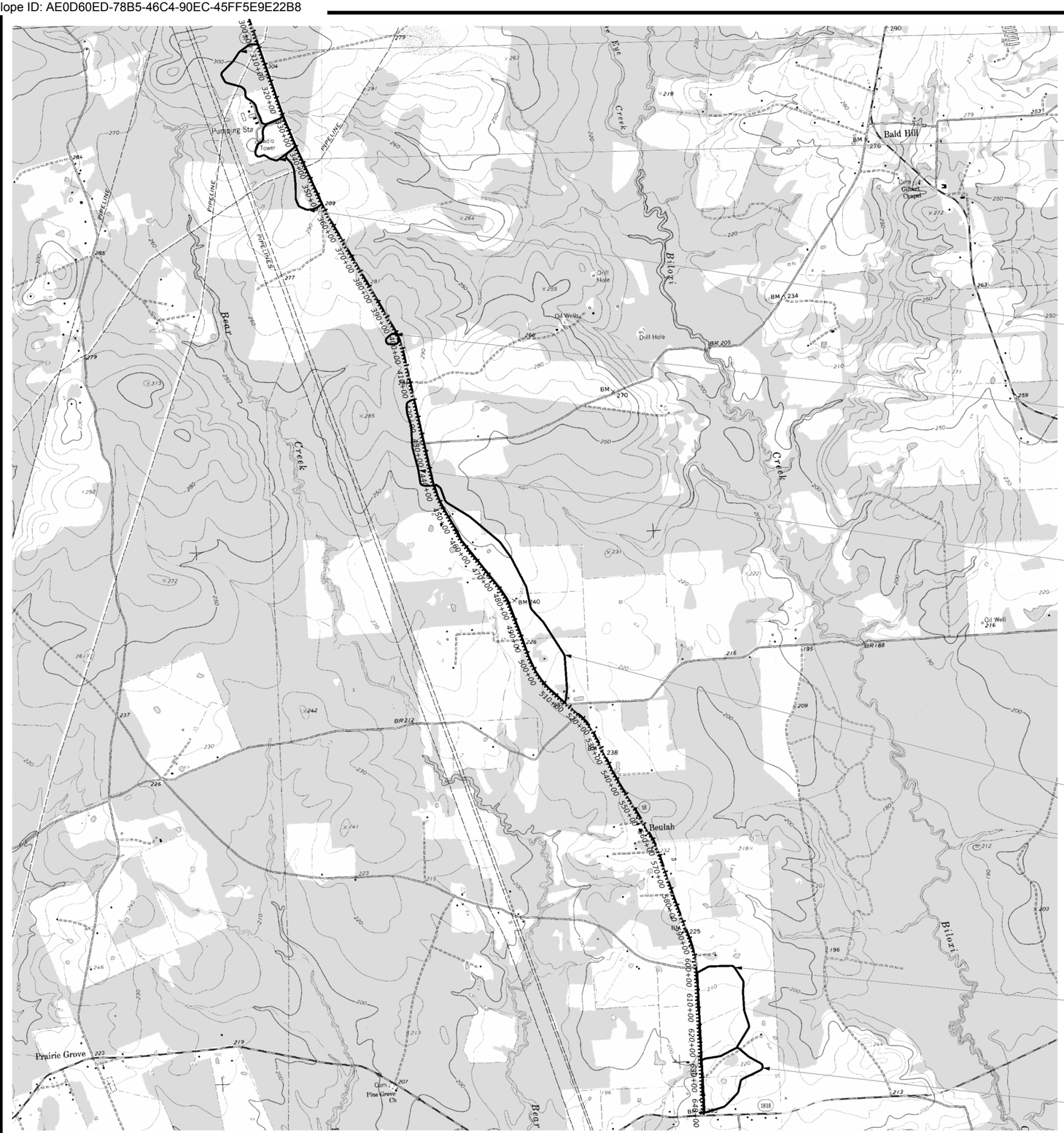

STA 323+63
35.11 ACRES
0.05 SQ MILES
4' X 3' X 53' BOX

STA 332+00
16.6 ACRES
0.026 SQ MILES
3' X 3' X 52' BOX

STA 345+00
16.64 ACRES
0.026 SQ MILES
3- 48" X 56' RCP

STA 396+00
0.25 ACRES
.0004 SQ MILES
18" X 52' RCP

STA 459+62
1.08 ACRES
0.002 SQ MILES
24" X 58' RCP

STA 491+05
101.6 ACRES
0.158 SQ MILES
(3) 30" X 40' RCP

STA 622+99
72 ACRES
0.11 SQ MILES
(2) 6' X 3' X 54' BOX

STA 625+87
42 ACRES
0.07 SQ MILES
5' X 2' X 54' BOX

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Texas Department of Transportation

DRAINAGE AREA MAP & HYDRAULIC DATA SHEET

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		59

DATE: 3/27/2023 4:17:08 PM
FILE: c:\txdot\pw onlinelt\xdot3\lauren.perry\d0509456\NEW DRAINAGE AREA MAP.dgn

HYDROLOGIC DATA								
STATION	METHOD	TIME OF CONCENTRATION	AREA	INTENSITY		RUNOFF COEFFICIENT	FLOW RATE	
				10 YR	100 YR		10 YR	100 YR
		MIN	ACRE	IN/HR			CFS	
323+63	RATIONAL	39	35.11	3.97	6.39	0.35	48.79	78.52
332+00	RATIONAL	20	16.6	5.74	9.00		33.35	52.29
345+00	RATIONAL	24	16.64	5.23	8.24		30.46	47.99
396+00	RATIONAL	13	0.25	6.96	10.72		0.61	0.94
459+62	RATIONAL	11	1.08	7.43	11.35		2.81	4.29
491+05	RATIONAL	53	101.6	3.26	5.32		115.93	189.18
622+99	RATIONAL	39	71.89	3.97	6.39		99.89	160.78
625+87	RATIONAL	11	42.13	7.43	11.35		109.56	167.36

HYDRAULIC DATA								
STATION	FREQUENCY	EXIST CULVERT			ALLOW HW	PROPOSED CULVERT		
		HW	TW	V (OUT)		HW	TW	V (OUT)
		FT	FT	FPS	FT	FT	FT	FPS
323+63	10-YR	286.99	280.90	7.35	288.49	282.74	280.90	7.35
	100-YR	288.05	281.30	8.61		283.90	281.32	8.61
332+00	10-YR	285.85	284.11	7.13	288.48	285.97	284.11	7.13
	100-YR	286.77	284.44	8.27		286.90	284.44	8.27
345+00	10-YR	286.02	284.79	11.37	288.05	286.11	284.79	11.83
	100-YR	287.43	285.08	15.43		287.52	285.08	15.70
396+00	10-YR	286.33	284.28	3.51	290.23	286.40	284.28	3.51
	100-YR	286.79	284.46	4.43		286.86	284.46	4.43
459+62	10-YR	241.21	240.37	3.68	244.69	241.25	240.37	3.68
	100-YR	241.46	240.47	4.14		241.51	240.47	4.14
491+05	10-YR	227.45	224.52	10.74	227.78	226.86	224.37	8.94
	100-YR	228.09	225.00	11.05		228.08	224.85	9.72
622+99	10-YR	199.46	194.44	12.01	199.17	196.77	194.44	10.96
	100-YR	200.09	194.68	12.39		197.59	194.68	12.25
625+87	10-YR	200.28	195.46	12.31	201.39	198.88	195.46	9.08
	100-YR	200.70	195.68	12.78		200.40	195.68	9.67

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DRAINAGE AREA MAP & HYDRAULIC DATA SHEET

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		60

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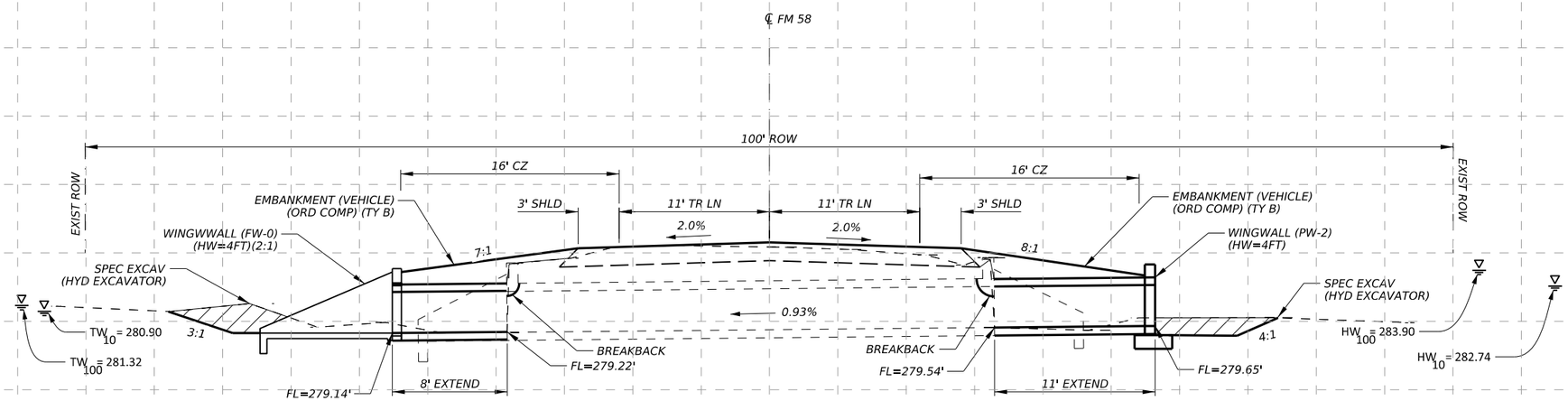
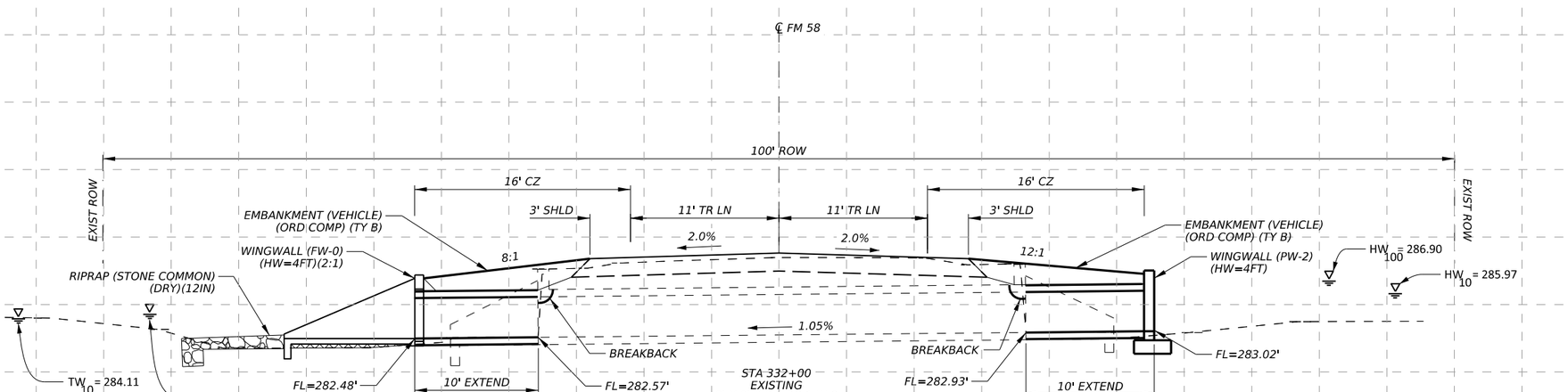


STA 323+63
EXISTING
4' X 3' X 34' BC-1-W-2

REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL,
EXTEND 8' W/ CONC BOX CULV (4'X3'), ADD
WINGWALL (FW-0)(HW=4FT)(2:1) LT;
REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL,
EXTEND 11' W/ CONC BOX CULV (4'X3'), ADD
WINGWALL (PW-2)(HW=4FT)(2:1) RT



STA 332+00
EXISTING
3' X 3' X 34' BC-1-W-2

PROPOSED
REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL,
EXTEND 10' W/ CONC BOX CULV (3'X3'), ADD
WINGWALL (FW-0)(HW=4FT)(2:1),
ADD RIPRAP (STONE COMMON)(DRY)(12IN) LT;
REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL,
EXTEND 10' W/ CONC BOX CULV (4'X3'), ADD
WINGWALL (PW-2)(HW=4FT)(2:1) RT

SCALE 1" = 10'

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CULVERT LAYOUTS

SHEET 1 OF 8

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		61

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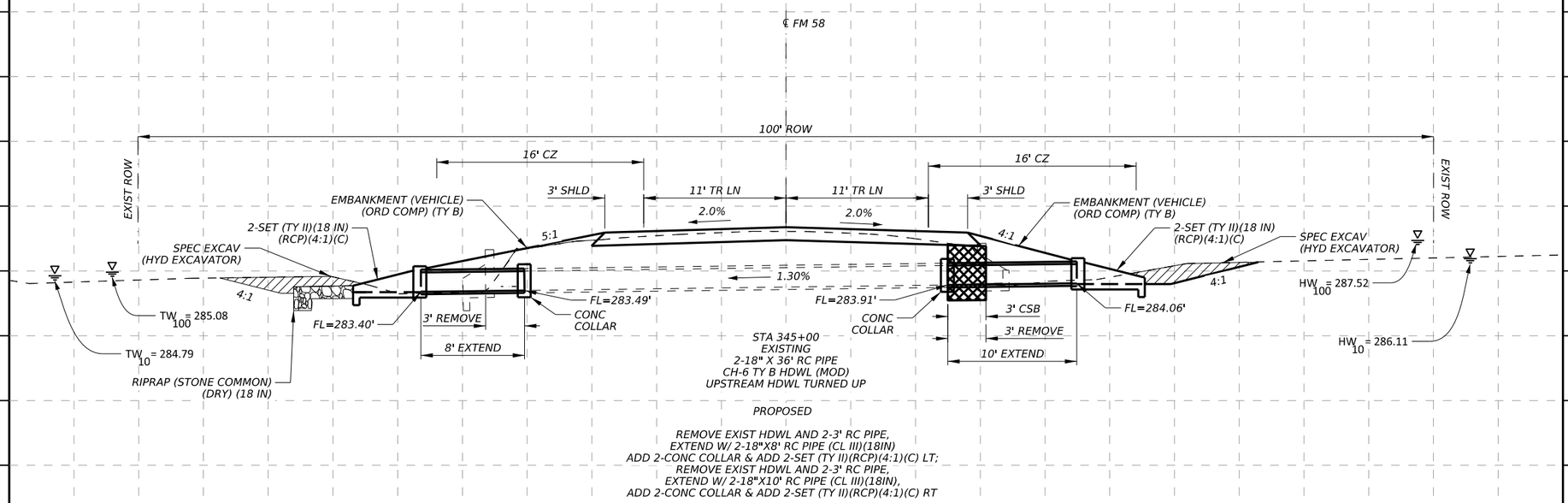

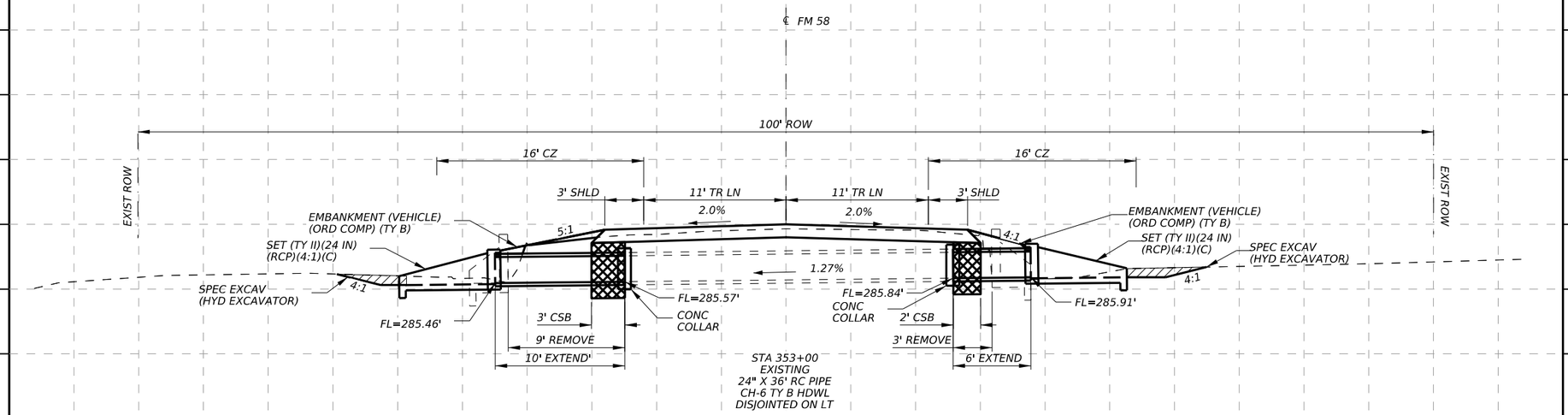

SCALE 1" = 10'

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CULVERT LAYOUTS

SHEET 2 OF 8

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		62

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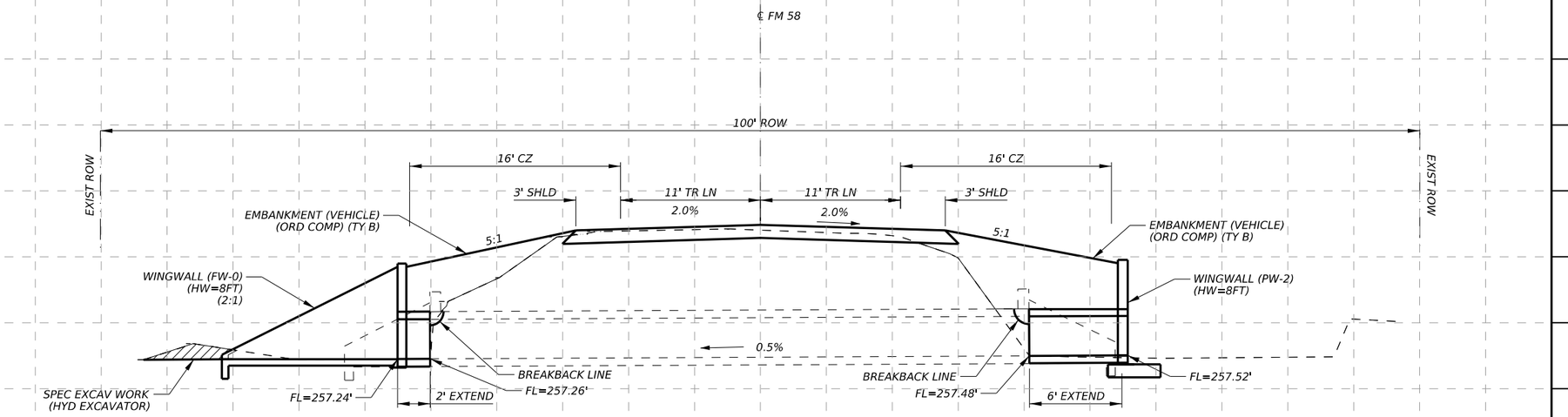
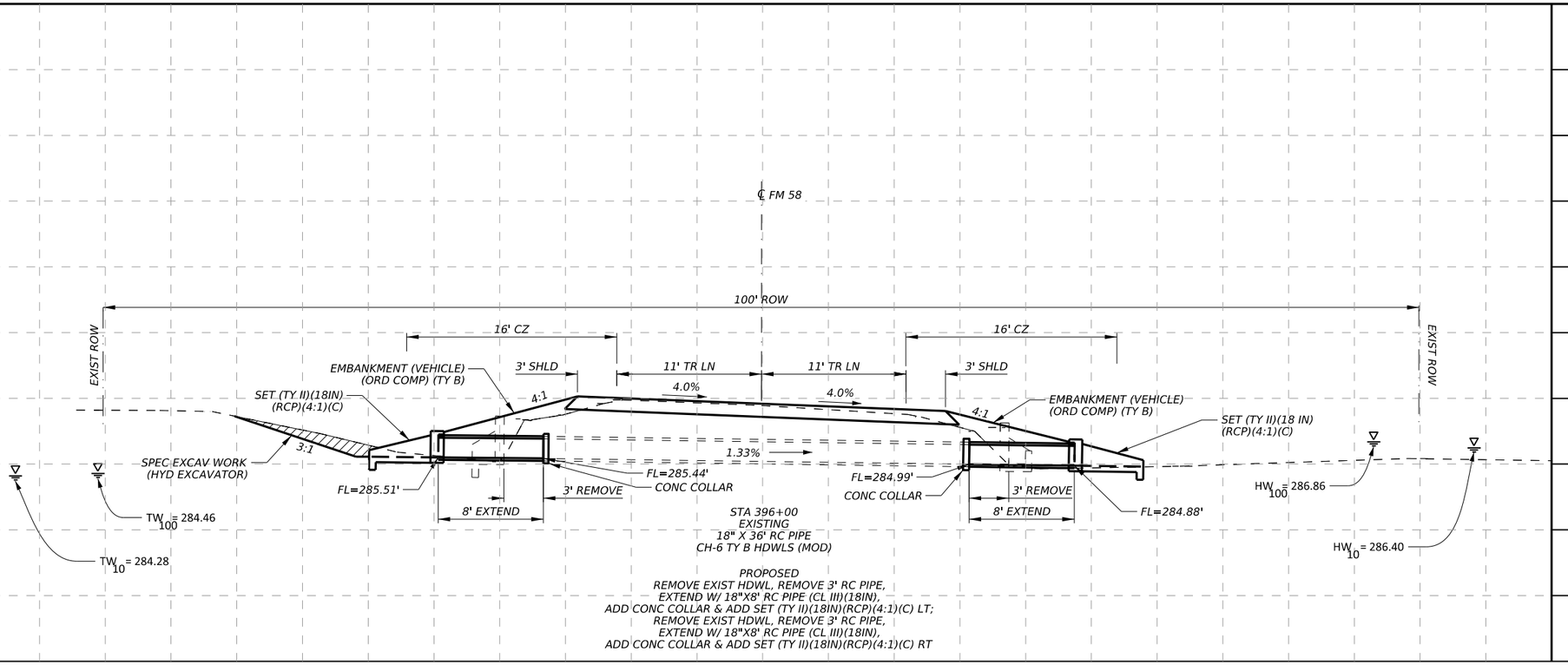


STA 369+00
EXISTING
4'X3'X43' BC-1-W-2

PROPOSED
REMOVE EXIST HDWL AND BC-1-W-2 WINGWALL,
EXTEND 2' W/ CONC BOX CULV (4'X3'),
ADD WINGWALL (FW-0)(HW=8FT)(2:1) LT;
REMOVE EXIST HWDL AND BC-1-W-2 WINGALL,
EXTEND 6' W/ CONC BOX CULV (4'X3'),
ADD WINGWALL (PW-2)(HW=8FT) RT

THIS WINGWALL SHALL BE PAID FOR UNDER ITEM 466 WINGWALL (FW-0). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR PIPE DIAMETER AS SHOWN ON THE STANDARD FW-0 EXCEPT FOR "B" DIMENSION (FLOW LINE TO TOP OF FOOT). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE SUBSIDIARY TO ITEM 466.

60 50 40 30 20 10 0 10 20 30 40 50 60



STA 396+00
EXISTING
18" X 36' RC PIPE
CH-6 TY B HDWLS (MOD)

PROPOSED
REMOVE EXIST HDWL, REMOVE 3' RC PIPE,
EXTEND W/ 18"X8' RC PIPE (CL III)(18IN),
ADD CONC COLLAR & ADD SET (TY II)(18IN)(RCP)(4:1)(C) LT;
REMOVE EXIST HDWL, REMOVE 3' RC PIPE,
EXTEND W/ 18"X8' RC PIPE (CL III)(18IN),
ADD CONC COLLAR & ADD SET (TY II)(18IN)(RCP)(4:1)(C) RT

60 50 40 30 20 10 0 10 20 30 40 50 60

SCALE 1" = 10'

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CULVERT LAYOUTS

SHEET 3 OF 8

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		63

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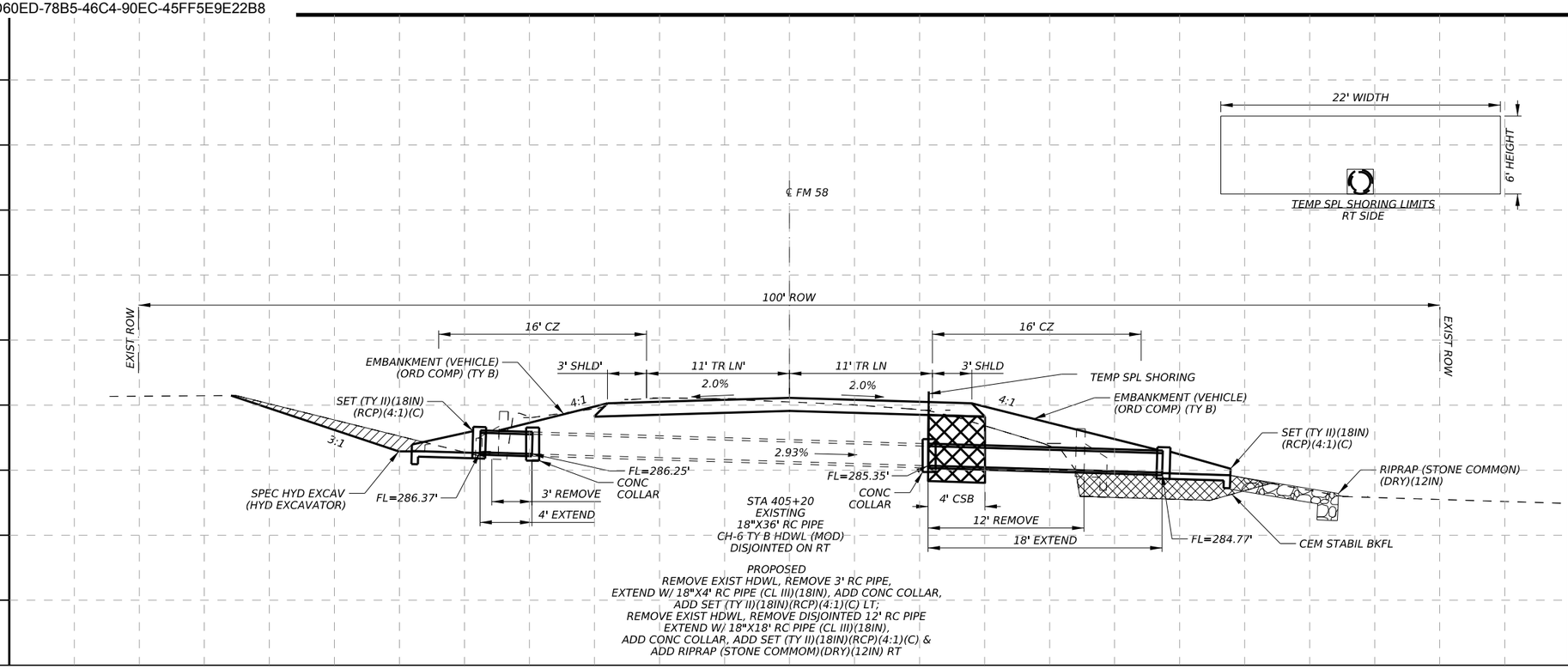

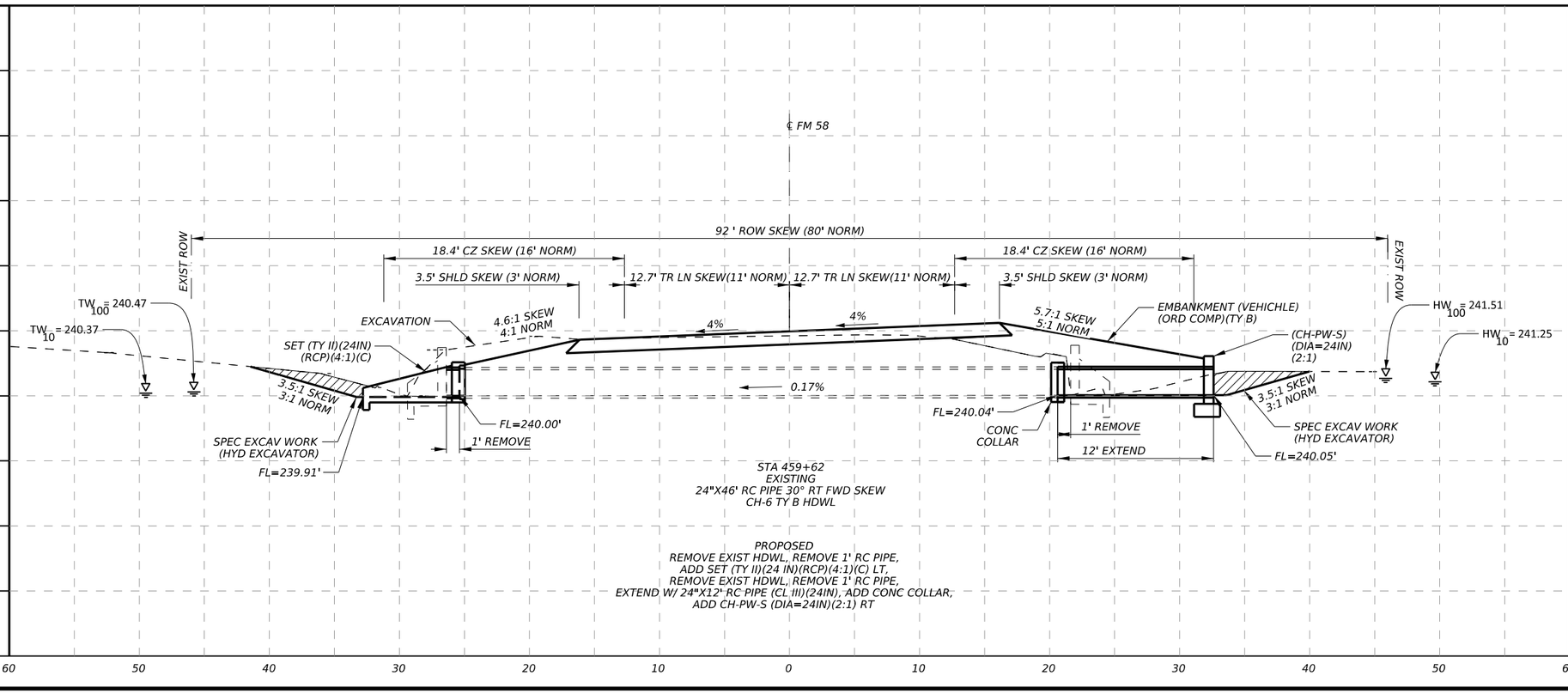

SCALE 1" = 10'

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CULVERT LAYOUTS

SHEET 4 OF 8

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		64

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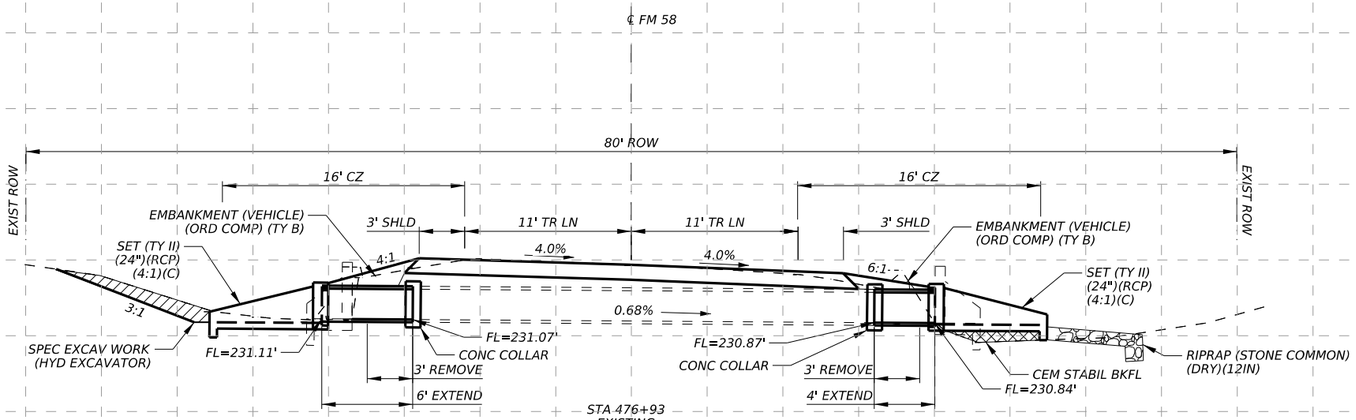
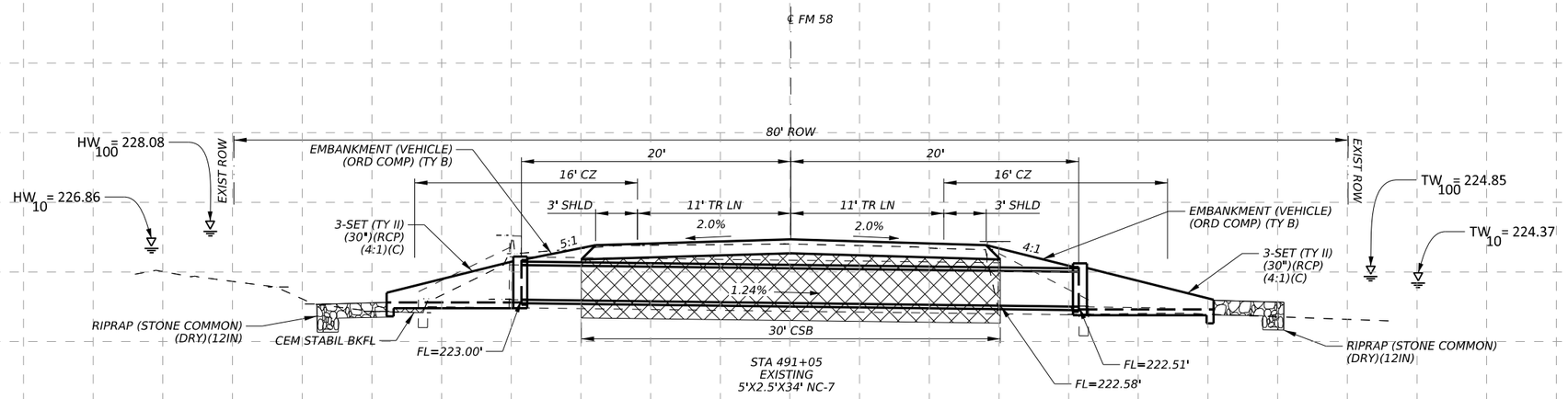


STA 476+93
EXISTING
24"X36' RC PIPE
CH-6 TY B HDWL

PROPOSED
REMOVE EXIST HDWL, REMOVE 3' RC PIPE,
EXTEND W/ 24"X6' RC PIPE (CL III)(24IN), ADD CONC COLLAR,
& ADD SET (TY II)(24")(RCP)(4:1)(C) LT;
REMOVE EXIST HDWL, REMOVE 3' RC PIPE,
EXTEND W/ 24"X4' RC PIPE (CL III)(24IN), ADD CONC COLLAR,
ADD SET (TY II)(24")(RCP)(C)
& ADD RIPRAP (STONE COMMON)(DRY)(12IN) RT



STA 491+05
EXISTING
5'X2.5'X34' NC-7

PROPOSED
REMOVE EXIST BOX CULV AND NC-7 WINGWALL,
INSTALL 3-30"X40' RC PIPE (CL III)(30IN),
ADD 3-SET (TY II)(30IN)(RCP)(4:1)(C)
ADD RIP RAP (STONE COMMON)(DRY)(12IN) RT & LT

SCALE 1" = 10'

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CULVERT LAYOUTS

SHEET 5 OF 8

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		65

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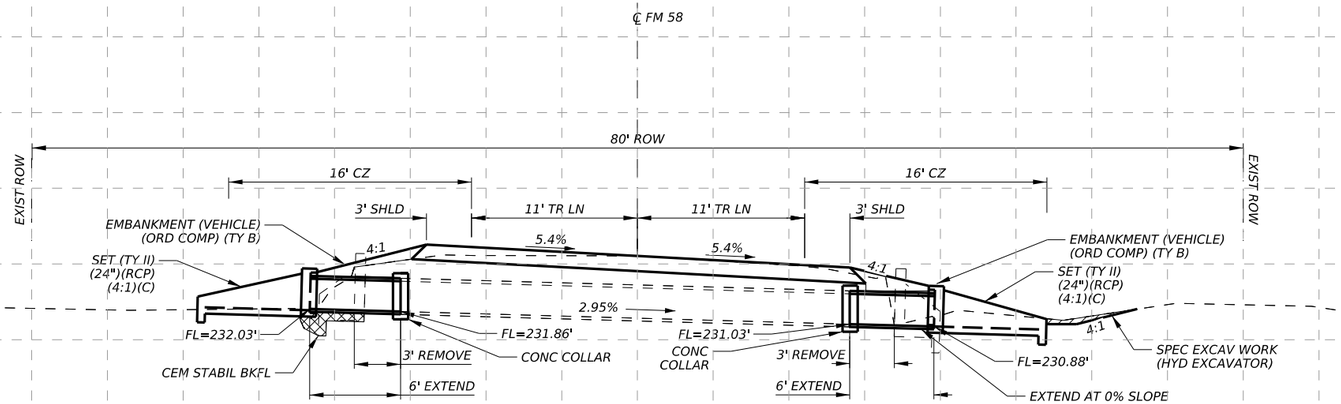
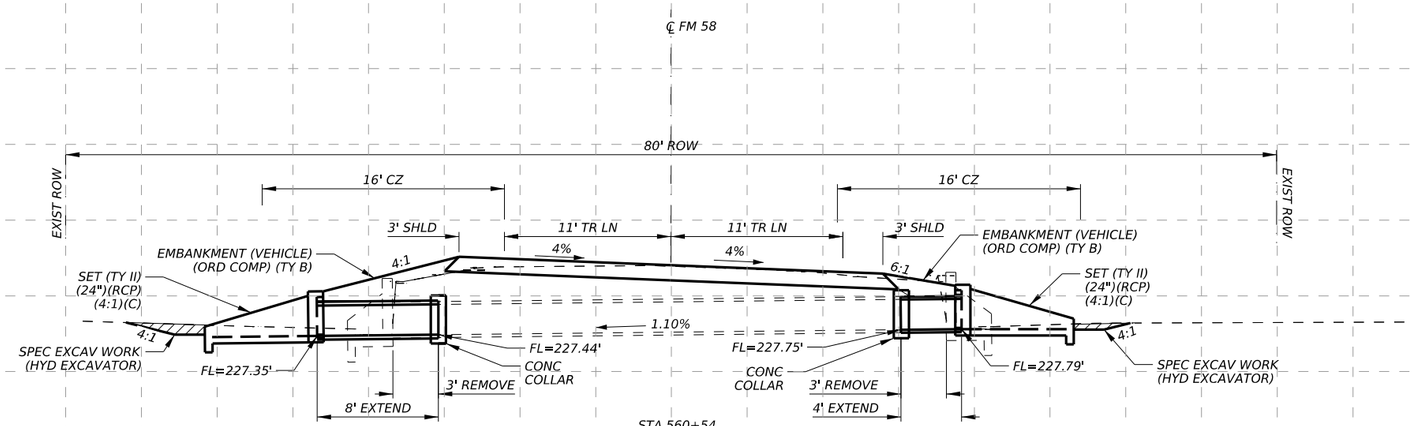


STA 519+95
EXISTING
24"X36' RC PIPE
CH-6 TY B HDWL

PROPOSED
REMOVE CH-6 TY B HDWL, REMOVE 3' RC PIPE,
EXTEND W/ 24"X6' RC PIPE (CL III)(24IN),
ADD CONC COLLAR, ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT;
REMOVE CH-6 TY B HDWL, REMOVE 3' RC PIPE,
EXTEND W/ 24"X6' RC PIPE (CL III)(24IN),
ADD CONC COLLAR, ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT
CLEAN CULVERT



STA 560+54
EXISTING
24"X36' RC PIPE
CH-6 TY B HDWL

PROPOSED
REMOVE CH-6 TY B HDWL, REMOVE 3' RC PIPE,
EXTEND W/ 24"X8' RC PIPE (CL III)(24 IN); ADD CONC COLLAR,
& ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT;
REMOVE CH-6 TY B HDWL, REMOVE 3' RC PIPE,
EXTEND 24"X4' RC PIPE (CL III)(24IN), ADD CONC COLLAR,
& ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT

SCALE 1" = 10'

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CULVERT LAYOUTS

SHEET 6 OF 8

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		66

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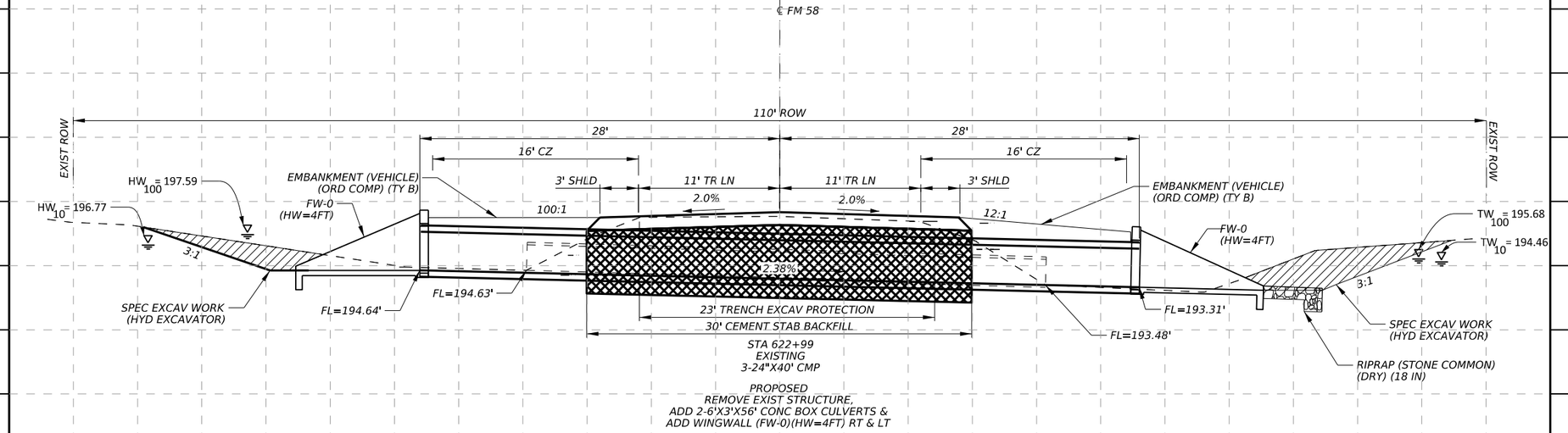

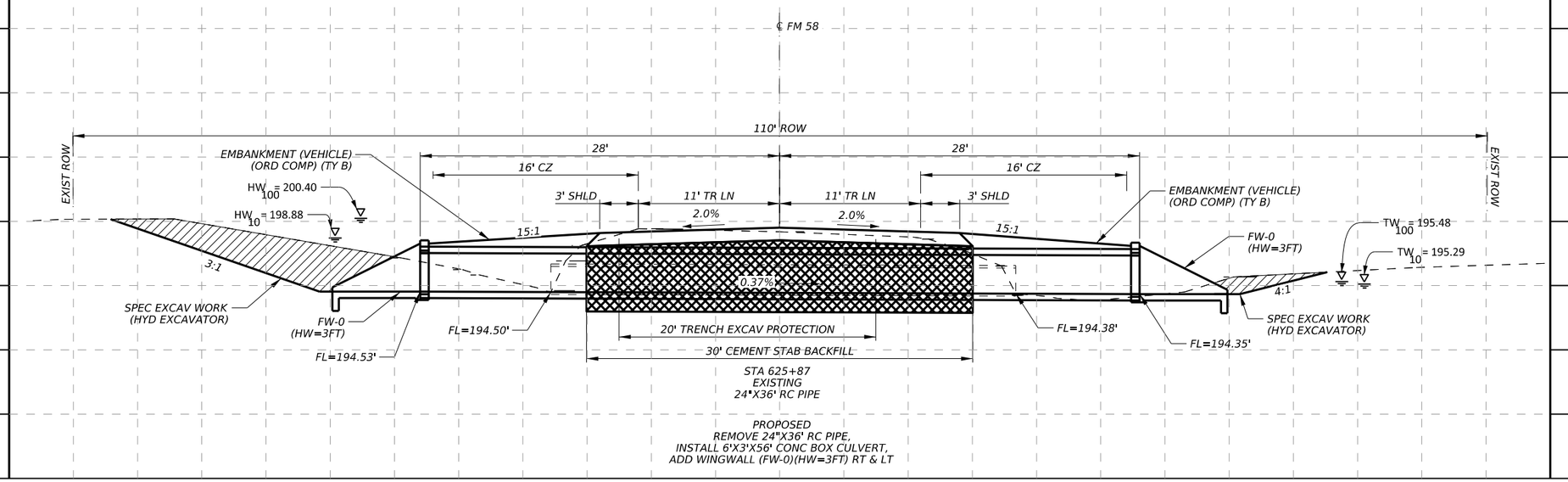

SCALE 1" = 10'

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CULVERT LAYOUTS

SHEET 7 OF 8

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		67

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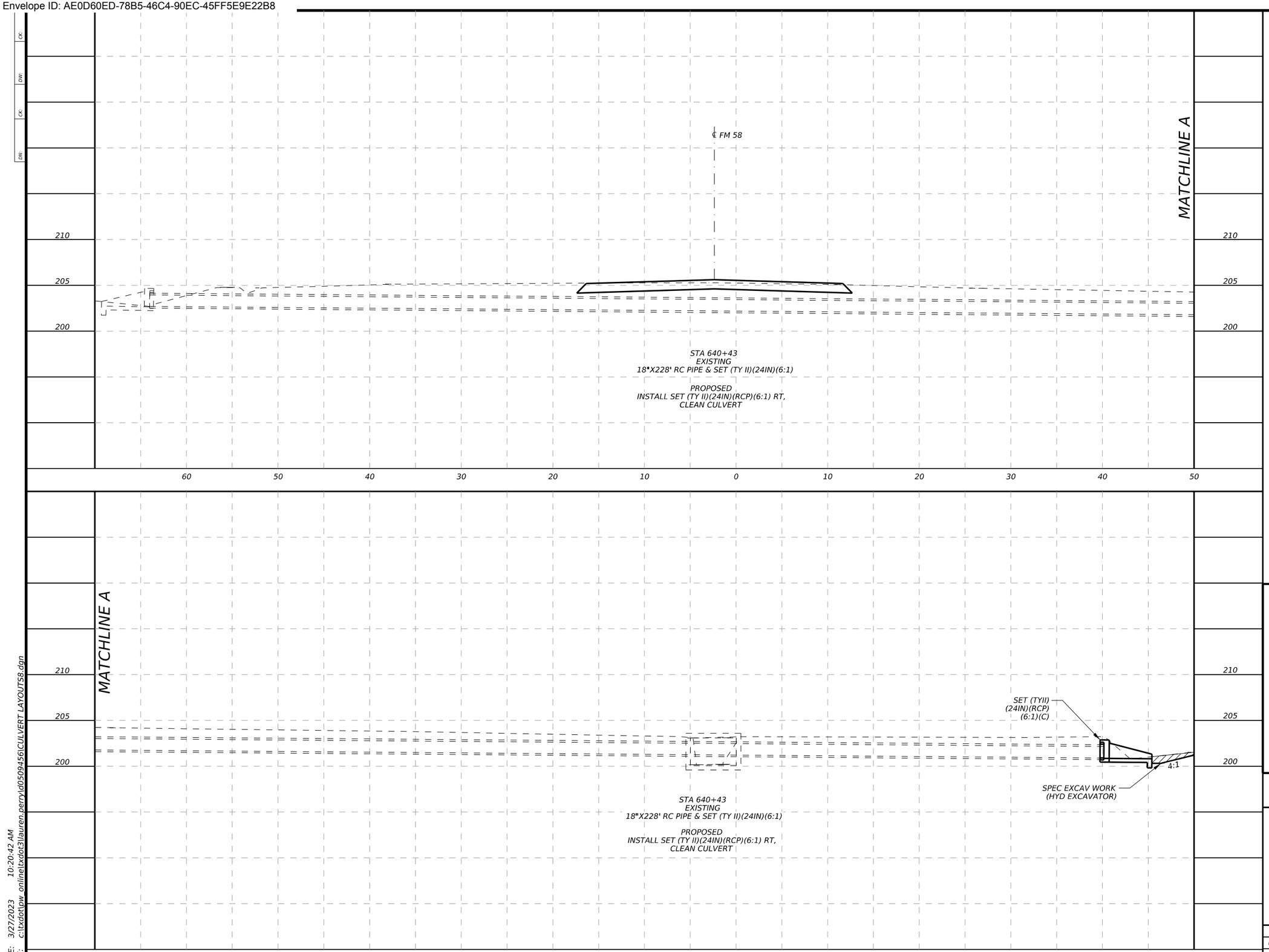

SCALE 1" = 10'

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CULVERT LAYOUTS

SHEET 8 OF 8

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		68

DATE: 3/27/2023 10:20:42 AM
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Culvert Station and/or Creek Name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans ~ Span X Height	Max Fill Height (Ft)	Applicable Box Culvert Standard (4)	Applicable Wingwall or End Treatment Standard	Skew Angle (0°,15°, 30° or 45°)	Side Slope or Channel Slope Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw Height of Wingwall (1) (Ft)	A Curb to End of Wingwall (Ft)	B Offset of End of Wingwall (Ft)	Lw Length of Longest Wingwall (Ft)	Ltw Culvert Toewall Length (Ft)	Atw Anchor Toewall Length (Ft)	Riprap Apron (CY)	Class "C" Conc (Curb) (2) (CY)	Class "C" Conc (Wingwall) (3) (CY)	Total Wingwall Area (SF)
STA 323+63 (Lt)	1 ~ 4'x 3'	30'	SCC-3&4	FW-0	0°	2:1	8"	7"	0.250'	3.667'	6.667'	3.849'	7.698'	5.167'	N/A	0.0	0.0	2.4	31
STA 323+63 (Rt)	1 ~ 4'x 3'	30'	SCC-3&4	PW-2	0°	2:1	8"	7"	0.250'	3.917'	N/A	N/A	6.833'	5.167'	N/A	0.0	0.0	3.9	52
STA 332+00 (Lt)	1 ~ 3'x 3'	30'	SCC-3&4	FW-0	0°	2:1	8"	7"	0.250'	3.667'	6.667'	3.849'	7.698'	N/A	N/A	0.7	0.0	2.2	31
STA 332+00 (Rt)	1 ~ 3'x 3'	30'	SCC-3&4	PW-2	0°	2:1	8"	7"	0.250'	3.917'	N/A	N/A	6.833'	4.167'	N/A	0.0	0.0	3.8	52
STA 369+00 (Lt)	1 ~ 4'x 3'	30'	SCC-3&4	FW-0	0°	2:1	8"	7"	0.250'	3.667'	6.667'	3.849'	7.698'	N/A	N/A	0.8	0.0	2.2	31
STA 369+00 (RT)	1 ~ 4'x 3'	30'	SCC-3&4	PW-2	0°	2:1	8"	7"	0.250'	3.917'	N/A	N/A	6.833'	5.167'	N/A	0.0	0.0	3.9	52
STA 622+99 (Both)	2 ~ 6'x 3'	30'	SCP-6	FW-0	0°	2:1	7"	7"	0.250'	3.583'	6.500'	3.753'	7.506'	N/A	N/A	4.0	0.2	4.2	58
STA 625+87 (Both)	1 ~ 6'x 3'	30'	SCP-6	FW-0	0°	2:1	7"	7"	0.250'	3.583'	6.500'	3.753'	7.506'	N/A	N/A	2.0	0.2	4.2	58

DATE:
FILE:

NOTES:
Skew = 0° on SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standard sheets;
30° maximum for safety end treatment

SL:1 = Horizontal : 1 Vertical
- Side slope at culvert for flared or straight wingwalls.
- Channel slope for parallel wingwalls.
- Slope must be 3:1 or flatter for safety end treatments.

T = Box culvert top slab thickness. Dimension can be found on the applicable box culvert standard sheet.

U = Box culvert wall thickness. Dimension can be found on the applicable box culvert standard sheet.

C = Curb height

See applicable wing or end treatment standard sheets for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.

Hw = Height of wingwall

A = Distance from face of curb to end of wingwall (not applicable to parallel or straight wingwalls)

B = Offset of end of wingwall (not applicable to parallel or straight wingwalls)

Lw = Length of longest wingwall.

Ltw = Length of culvert toewall (not applicable when using riprap apron)

Atw = Length of anchor toewall (applicable to safety end treatment only)
Total Wingwall Area = Wingwall area in sq. ft. for two wingwalls (one structure end) if Lt or Rt.
Area for four wingwalls (two structure ends) if Both.

(1) Round the wall heights shown to the nearest foot for bidding purposes.

(2) Concrete volume shown is for box culvert curb only. For curbs using the Box Culvert Rail Mounting Details (RAC) standard sheet quantities shown must be increased by a factor of 2.25. If Class S concrete is required for the top slab of the culvert, also provide Class S concrete for the curb. Curb concrete is considered part of the Box Culvert for payment.

(3) Concrete volume shown is total of wings, footings, culvert toewall (if any), anchor toewalls (if any) and wingwall toewalls. Riprap aprons, culverts, and curb quantities are not included.

(4) Regardless of the type of culvert shown on this sheet, the Contractor has the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it is the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

SPECIAL NOTE:

This sheet is a supplement to the box culvert standards. It is to be filled out by the culvert specifier and provides dimensions for the construction of the box culvert wingwalls and safety end treatments.

An Excel 2010 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

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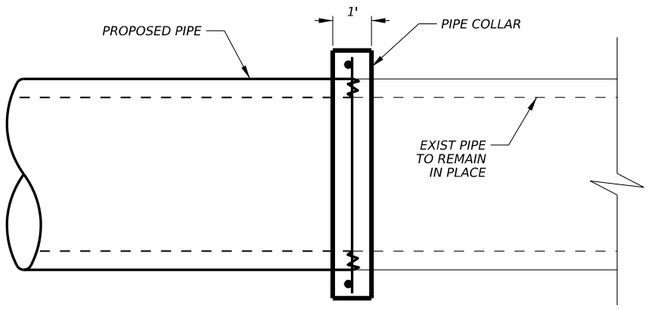
Texas Department of Transportation

Bridge Division Standard

BOX CULVERT SUPPLEMENT
WINGS AND END TREATMENTS

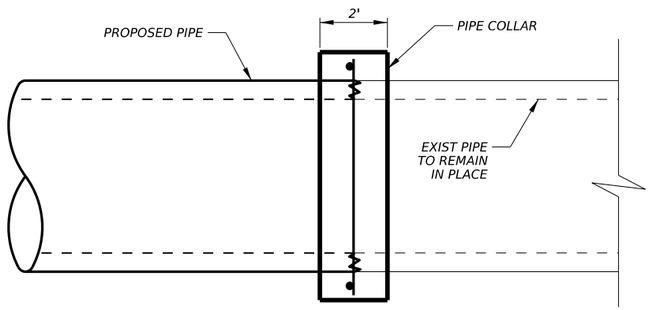
BCS

FILE: bcsstde1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		69



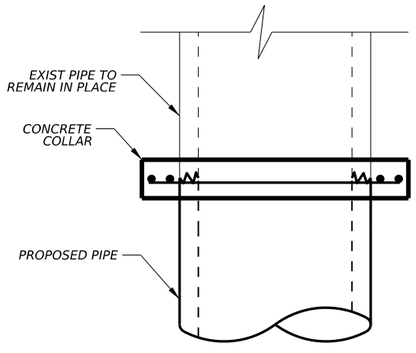
ELEVATION

FOR RCP LESS THAN 36" DIAMETER

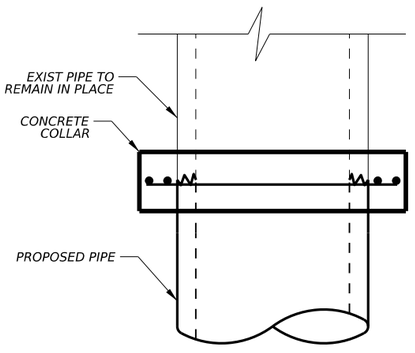


ELEVATION

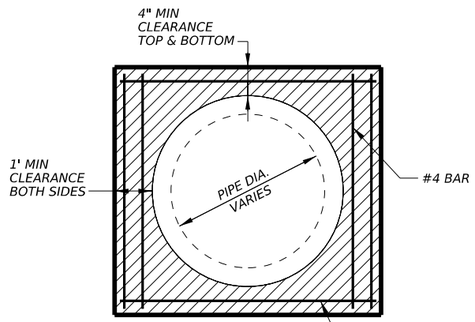
FOR RCP GREATER THAN OR EQUAL TO 36" DIAMETER



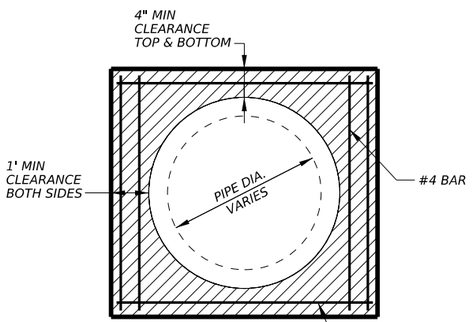
PLAN



PLAN



SECTION



SECTION

NOTES:

1. A CLASS "C" CONCRETE COLLAR SHALL BE USED WHERE CONNECTING PIPE TO EXISTING PIPE, WHEN INSTALLING VERTICAL PIPE BENDS AND AS DIRECTED BY THE ENGINEER.
2. REINFORCEMENT SHALL BE #4 BARS FIELD CUT TO FIT INSTALLATION.
3. REINFORCING BARS SHALL HAVE A MINIMUM OF 1 ½" OF CLEAR COVER.
4. CONCRETE COLLAR SHALL CONFORM TO THE OUTSIDE DIAMETER OF THE PIPE.

N.T.S.

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

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3/27/2023

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CONCRETE COLLAR DETAILS

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		70

DATE: 3/27/2023 10:21:17 AM
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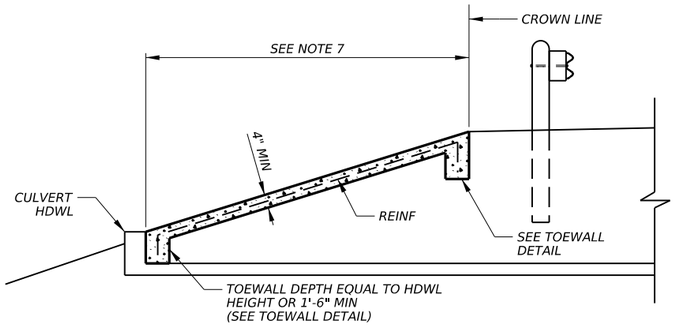
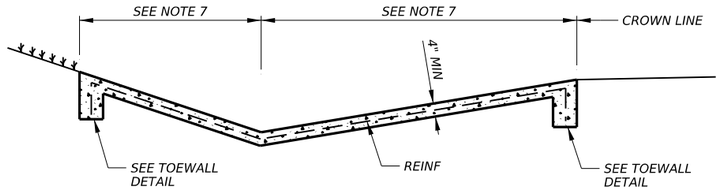
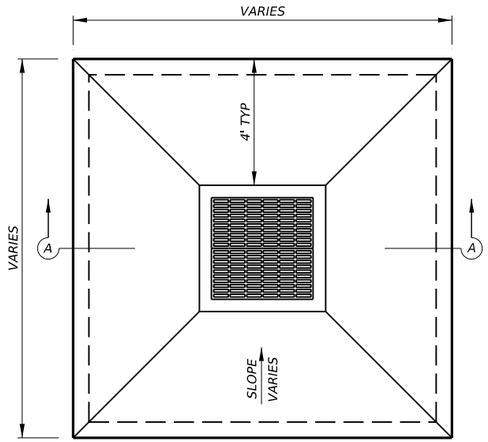


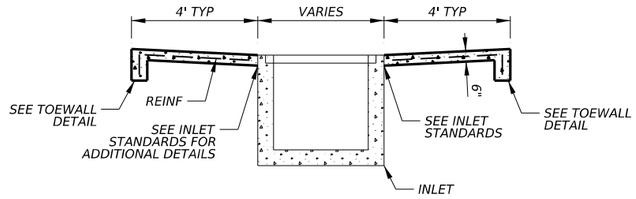
CONCRETE RIPRAP AT CULVERT SECTION



CONCRETE RIPRAP AT TYPICAL V-BOTTOM DITCH

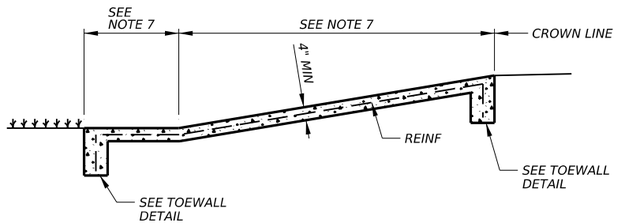


CONCRETE RIPRAP AT INLET

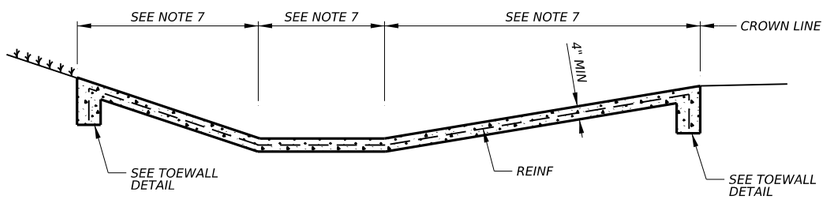


CONCRETE RIPRAP AT INLET
RIPRAP APRON DETAILS

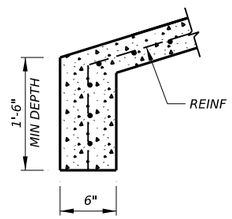
SECTION A-A



CONCRETE RIPRAP AT TYPICAL FILL SECTION



CONCRETE RIPRAP AT TYPICAL FLAT BOTTOM DITCH



TOEWALL DETAIL

GENERAL NOTES:

1. USE ALL CL A CONCRETE UNLESS OTHERWISE NOTED IN PLANS. USE CL A CONCRETE FOR RIPRAP APRON AROUND INLETS.
2. PROVIDE CONSTRUCTION JOINTS OR GROOVED JOINTS EXTENDING THE FULL SLANT SLOPE HEIGHT AT INTERVALS OF APPROXIMATELY 20 FEET UNLESS OTHERWISE DIRECTED.
3. PLACE PREMOLDED OR BOARD EXPANSION JOINTS VERTICALLY AND AT RIGHT ANGLES TO THE LONGITUDINAL AXIS OF THE RIPRAP IN NO LESS THAN 8 FEET IN WIDTH OR MORE THAN 40 FEET IN LENGTH.
4. RIPRAP MAY EXTEND BEYOND CROWN LINE, UP TO EDGE OF PAVEMENT.
5. USE NO.3 OR NO.4 BARS @ 12" O.C. IN BOTH DIRECTIONS SUPPORTED ON REINFORCING CHAIRS.
6. SEE QUANTITY SUMMARIES FOR RIPRAP LOCATIONS.
7. CONSTRUCT SLOPES TO THAT OF THE APPROPRIATE TYPICAL SECTION OR CROSS SECTION UNLESS OTHERWISE DIRECTED.
8. QUANTITY FOR 4" CONCRETE RIPRAP INCLUDES THE QUANTITY FOR THE 6" WIDE TOEWALL AND WILL BE PAID FOR UNDER ITEM 432, RIPRAP (CONC)(4 IN).

N.T.S.

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

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CONCRETE RIPRAP DETAILS

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		71

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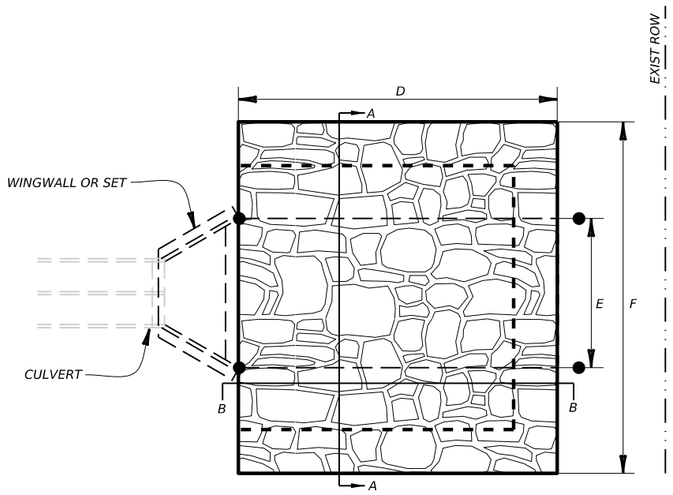
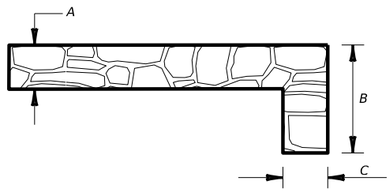


PLAN VIEW (FLARED WING OR SET)



SECTION B-B

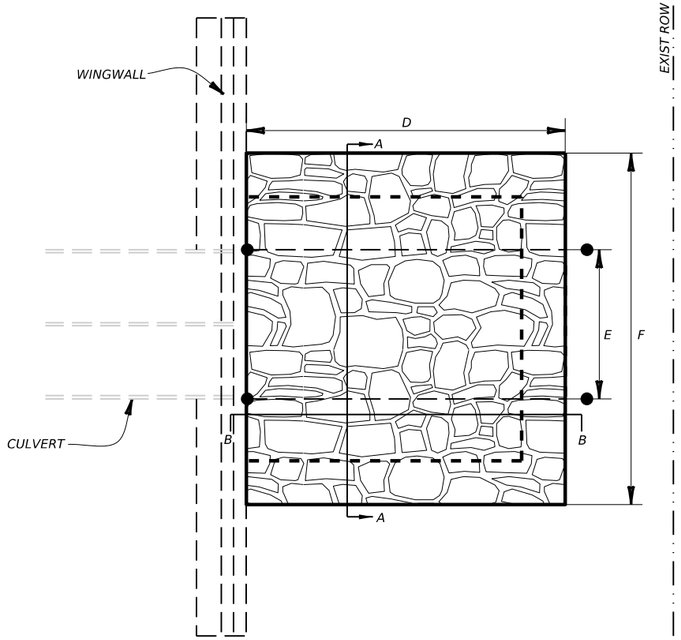
ELEVATION VIEW (FLARED WING OR SET)

RIPRAP DIMENSIONS

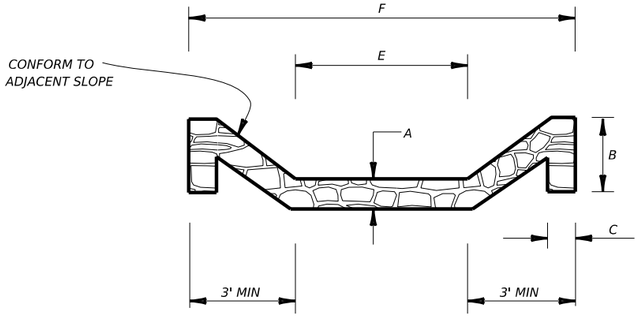
USUAL DIMENSIONS	A	B	C	RIPRAP SIZE
	1.0'	2.0'	1.5'	12"
LOCATION	① D	E	② F	CY
FM 58 (CSJ: 0576-02-068, ETC.)				
STA 332+00 (LT)	7'	16'	22'	7
STA 345+00 (LT)	4'	4'	10'	2
STA 405+20 (RT)	8'	2'	8'	4
STA 476+93 (RT)	9'	3'	9'	4
STA 491+05 (LT)	5'	10'	15'	10
STA 491+05 (LT)	5'	10'	15'	10
STA 622+99 (RT)	4'	22'	28'	5
PROJECT TOTAL				42

① ESTIMATED USING CULVERT LAYOUTS

② WIDTH OF CHANNEL TO BE VERIFIED IN THE FIELD



PLAN VIEW (PARALLEL WING)



SECTION A-A

ELEVATION VIEW (PARALLEL WING)

NOTE: CEMENT STABILIZE BACKFILL AS DIRECTED

N.T.S.

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
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STONE RIPRAP DRAINAGE DETAILS

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		72

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TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing length (2~wings) (3)	
					Bars J1		Bars J2			
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2~wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:
(All values are in feet.)

Hw = H + T + C – 0.250'
A = (Hw – 0.333') (SL)
B = (A) tangent (30°)
Lw = (A) ÷ cosine (30°)

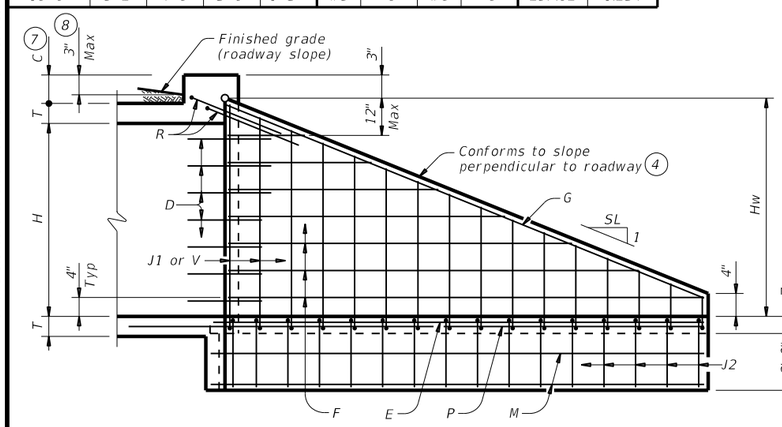
For cast-in-place culverts:
Ltw = (N) (S) + (N + 1) (U)

For precast culverts:
Ltw = (N) (2U + S) + (N – 1) (0.5')

Total wingwall area (two wings ~ SF) = (Hw + 0.333') (Lw)

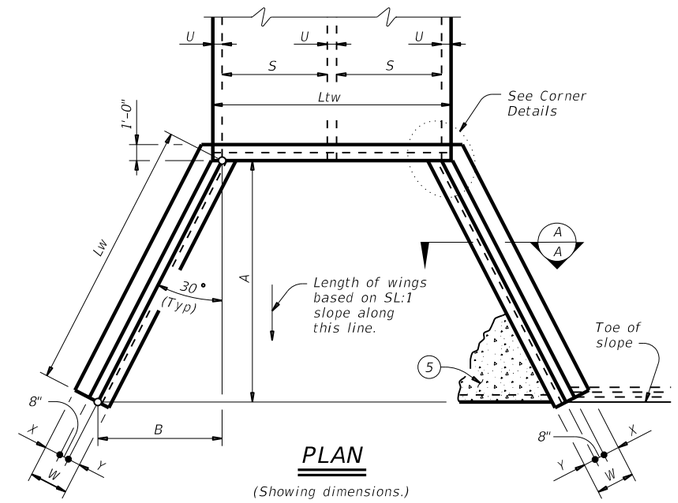
Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans

See applicable box culvert standard sheet for H, S, T, and U values.



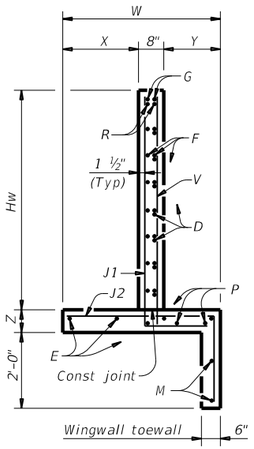
INSIDE ELEVATION

(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)

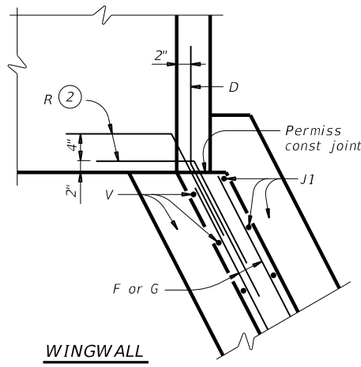


PLAN

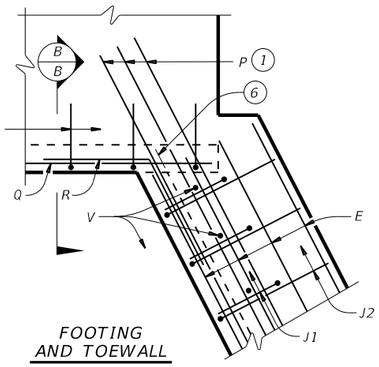
(Showing dimensions.)



SECTION A-A



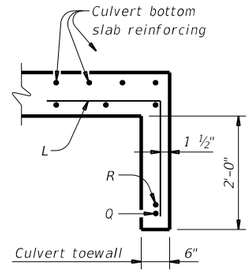
WINGWALL



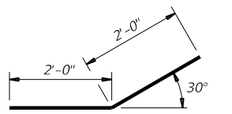
FOOTING AND TOEWALL

CORNER DETAILS

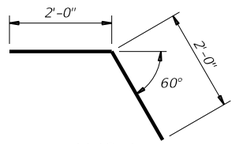
(Culvert and culvert toewall reinforcing not shown for clarity.)



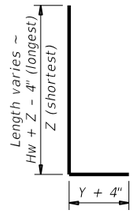
SECTION B-B (5)



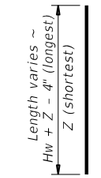
BARS D



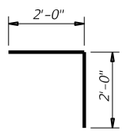
BARS R



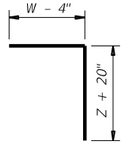
BARS J1



BARS V



BARS L



BARS J2

(1) Extend Bars P 3'-0" minimum into bottom slab of box culvert.

(2) Adjust as necessary to maintain 1 1#2" clear cover and 4" minimum between bars.

(3) Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.

(4) Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.

(5) When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.

(6) At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.

(7) 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

(8) For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

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

Texas Department of Transportation

Bridge Division Standard

CONCRETE WINGWALLS
WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS

FW-0

FILE: fw-0std-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		73

DATE:
FILE:

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

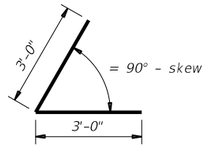
Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing (2–wings) (4)		Estimated Quantities per ft of Toewall (1–toewall)	
					Bars J1		Bars J2					
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'–6"	2'–10"	10"	1'–0"	7"	#4	1'–0"	#4	1'–0"	48.64	0.406	6.85	0.071
2'–9"	2'–10"	10"	1'–0"	7"	#4	1'–0"	#4	1'–0"	49.31	0.424	6.85	0.071
3'–0"	2'–10"	10"	1'–0"	7"	#4	1'–0"	#4	1'–0"	49.98	0.444	6.85	0.071
3'–3"	2'–10"	10"	1'–0"	7"	#4	1'–0"	#4	1'–0"	53.32	0.462	6.85	0.071
3'–6"	2'–10"	10"	1'–0"	7"	#4	1'–0"	#4	1'–0"	53.98	0.480	6.85	0.071
4'–0"	3'–2"	1'–2"	1'–0"	7"	#4	1'–0"	#4	1'–0"	55.77	0.532	6.85	0.071
4'–6"	3'–2"	1'–2"	1'–0"	7"	#4	1'–0"	#4	1'–0"	59.77	0.568	6.85	0.071
5'–0"	3'–9"	1'–7"	1'–2"	7"	#4	1'–0"	#4	1'–0"	63.45	0.632	6.96	0.075
5'–6"	3'–9"	1'–7"	1'–2"	7"	#4	1'–0"	#4	1'–0"	67.46	0.668	6.96	0.075
6'–0"	4'–4"	2'–0"	1'–4"	7"	#5	1'–0"	#5	1'–0"	80.67	0.730	7.07	0.078
6'–6"	4'–4"	2'–0"	1'–4"	7"	#5	1'–0"	#5	1'–0"	85.05	0.768	7.07	0.078
7'–0"	5'–0"	2'–3"	1'–9"	8"	#5	1'–0"	#5	1'–0"	92.15	0.864	8.07	0.093
7'–6"	5'–0"	2'–3"	1'–9"	8"	#5	1'–0"	#5	1'–0"	96.54	0.902	8.07	0.093
8'–0"	5'–6"	2'–8"	1'–10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'–6"	5'–6"	2'–8"	1'–10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'–6"	6'–0"	2'–10"	2'–2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'–6"	6'–5"	3'–0"	2'–5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'–6"	7'–2"	3'–6"	2'–8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'–6"	7'–8"	3'–9"	2'–11"	1'–0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'–6"	8'–2"	4'–0"	3'–2"	1'–2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'–6"	8'–10"	4'–5"	3'–5"	1'–4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'–6"	9'–6"	4'–10"	3'–8"	1'–6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'–0"	9'–11"	5'–0"	3'–11"	1'–7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING
(2–wings)

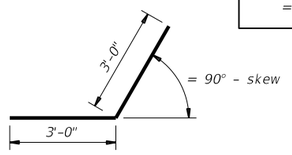
Bar	Size	No.	Spa
D1	#6	~	1'–0"
D2	#6	~	1'–0"
E1	#4	~	1'–0"
F	#4	~	1'–0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'–0"
V	#4	~	1'–0"

TABLE OF TOEWALL REINFORCING

Bar	Size	No.	Spa
J3	#4	~	1'–0"
M2	#4	2	~
E2	#4	~	1'–0"



BARS D1



BARS D2

WING DIMENSION FORMULAS:

(All values are in feet.)

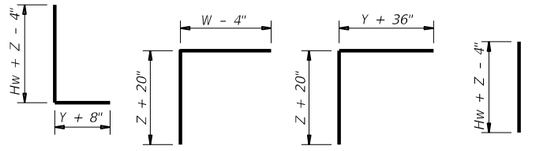
Hw = H + T + C
Lw = (Hw) (SL) ÷ cosine (θ) for Type PW–1
= (Hw – 1') (SL) ÷ cosine (θ) for Type PW–2 and Hw ≥ 4'
= (Hw – 0.5') (SL) ÷ cosine (θ) for Type PW–2 and Hw < 4'

For cast–in–place culverts:
Ltw = [(N) (S) + (N + 1) (U)] ÷ cosine (θ)

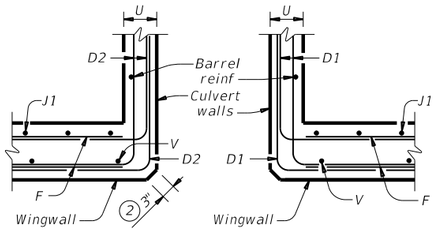
For precast culverts:
Ltw = [(N) (2 U + S) + (N – 1) (0.5')] ÷ cosine (θ)
Total Wingwall Area (two wings ~ SF)
= (2)(Hw)(Lw) for Type PW–1
= (2)(Hw)(Lw) – 6 SF for Type PW–2 and Hw ≥ 4'
= (2)(Hw)(Lw) – 1.5 SF for Type PW–2 and Hw < 4'

Hw = Height of wingwall
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans
SL:1 = Channel slope ratio. (horizontal: 1 vertical, usual value is 2:1)
θ = Culvert skew

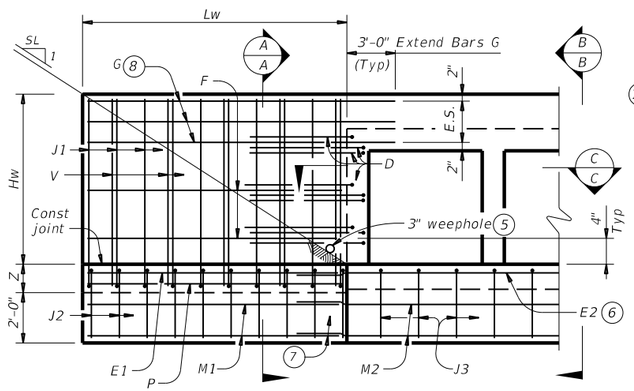
See applicable box culvert standard sheet for S, H, T, and U values.



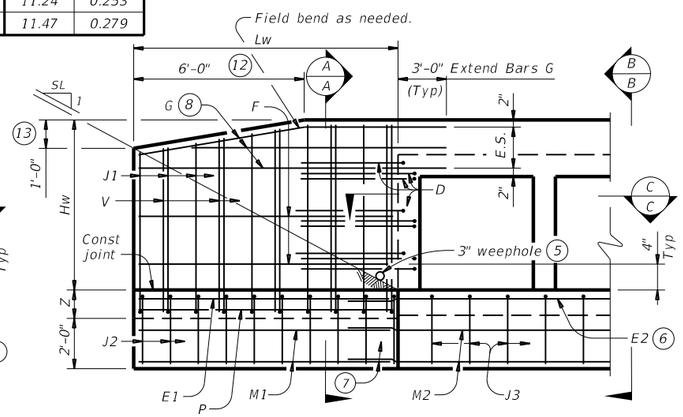
BARS J1 BARS J2 BARS J3 BARS V



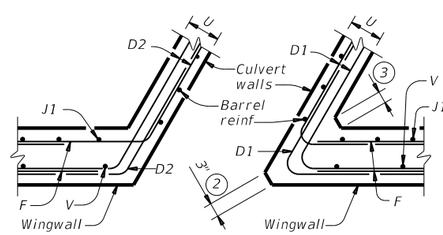
SECTION C-C - PW-1



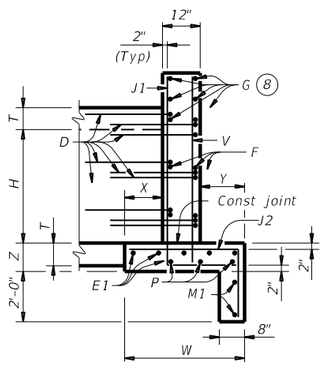
PARTIAL ELEVATION - PW-1



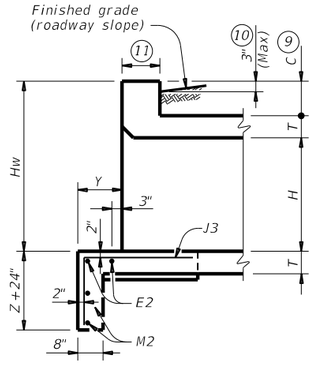
PARTIAL ELEVATION - PW-2



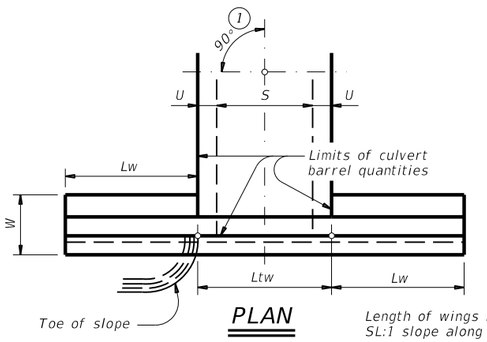
SECTION C-C - PW-2



SECTION A-A
(Showing wing reinforcement.)

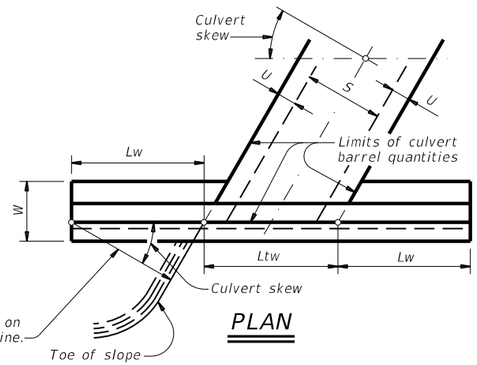


SECTION B-B
(Showing wing reinforcement.)



PLAN

DETAILS FOR NON-SKEWED BOX CULVERTS



PLAN

DETAILS FOR SKEWED BOX CULVERTS
(Showing 30° skew.)

1. Skew = 0°
2. At discharge end, chamfer may be ¾" minimum.
3. For 15° skew ~ 1"
   For 30° skew ~ 2"
   For 45° skew ~ 3"
4. Quantities shown are for two Type PW–1 wings. Adjust concrete volume for Type PW–2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
5. Provide weepholes for Hw = 5'–0" and greater. Fill around weepholes with coarse gravel.
6. Extend Bars E2 1'–6" minimum into the wingwall footing.
7. Lap Bars M1 1'–6" minimum with Bars M2.
8. Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
9. 0" Min to 5'–0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'–0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631–CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
10. For vehicle safety, the following requirements must be met:
    - For structures without bridge rail, construct curbs no more than 3" above finished grade.
    - For structures with bridge rail, construct curbs flush with finished grade.

    Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
11. 1'–0" typical. 2'–3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elswhere in the plans.
12. 3'–0" for Hw < 4'.
13. 6" for Hw < 4'.

DESIGNER NOTES:

Type PW–1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
Type PW–2 can only be used for applications without a railing mounted to the wingwall.

MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforing steel if required elsewhere in the plans.

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.
Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information.
Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

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

Texas Department of Transportation

Bridge Division Standard

CONCRETE WINGWALLS
WITH PARALLEL WINGS FOR BOX CULVERTS
TYPES PW-1 AND PW-2

PW

FILE: pwstde01-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		74

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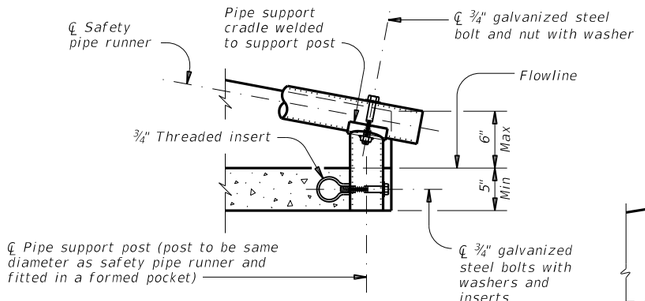
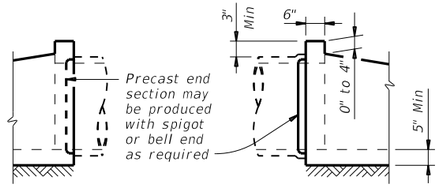
REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

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 ¼"	1.30"	20.50"	3:1	3' – 8"	≤ 45°	No	≤ 45°	No
				4:1	4' – 7"				
				6:1	6' – 5"				
18"	2 ½"	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"			> 30°	Yes
				6:1	11' – 3"				
30"	3 ½"	2.65"	38.50"	3:1	7' – 10"	= 15°	No	= 15°	No
				4:1	10' – 1"	> 15°	Yes	> 15°	Yes
				6:1	14' – 8"				
36"	4"	2.75"	45.50"	3:1	9' – 5"	= 0°	No	≥ 0°	Yes
				4:1	12' – 3"	> 0°	Yes		
				6:1	17' – 11"				
42"	4 ½"	2.7"	52.50"	3:1	11' – 1"	≥ 0°	Yes	≥ 0°	Yes
				4:1	14' – 5"				
				6:1	21' – 2"				



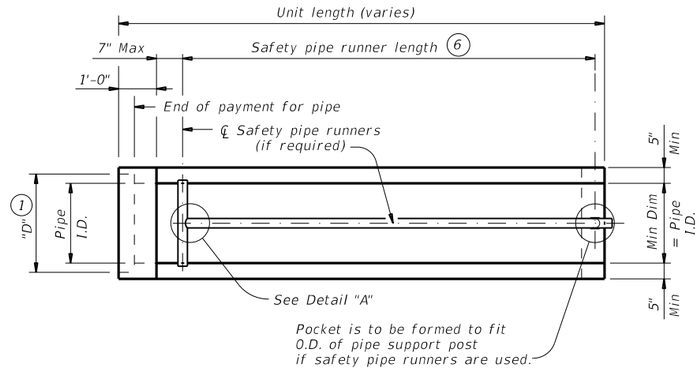
END DETAIL FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)



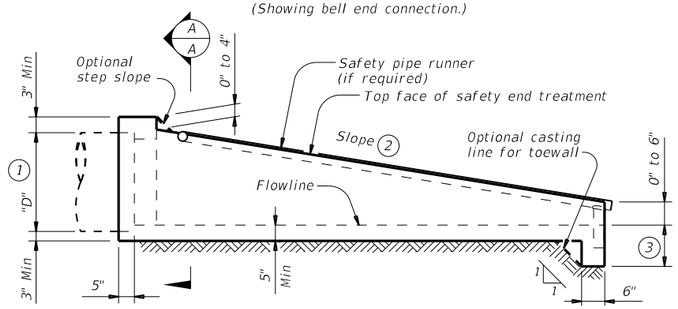
OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment)



PLAN

(Showing bell end connection.)

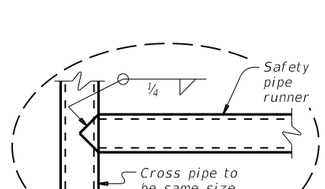


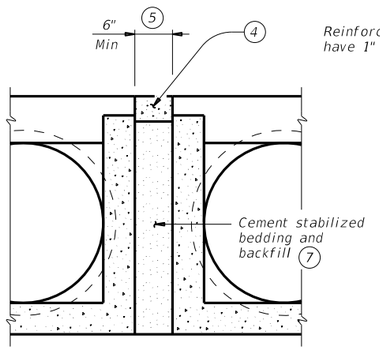
LONGITUDINAL ELEVATION

(Showing bell end connection.)

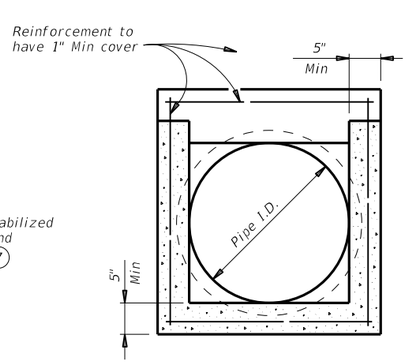
DETAIL A

(If required)

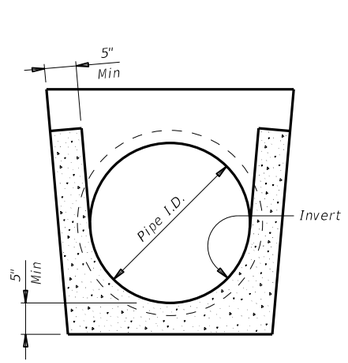




MULTIPLE PIPE INSTALLATION

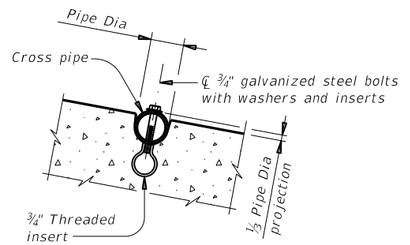


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

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 ½" STD	4.000"	3.548"
20' – 10"	4" STD	4.500"	4.026"
35' – 4"	5" STD	5.563"	5.047"

(1) Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.

(2) Slope as shown elsewhere in plans. Slope of 3:1 or flatter is required for vehicle safety.

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

(5) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(6) Measured along slope.

(7) 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.

(8) 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.

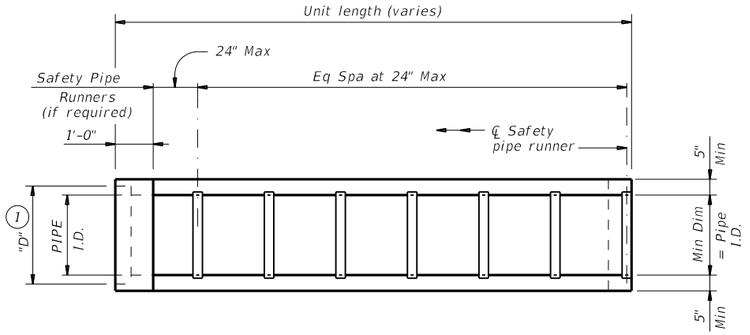
Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464 "Reinforced Concrete Pipe". Connect TP by grouting. See Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.

Texas Department of Transportation — Bridge Division Standard

PRECAST SAFETY END TREATMENT
TYPE II ~ CROSS DRAINAGE

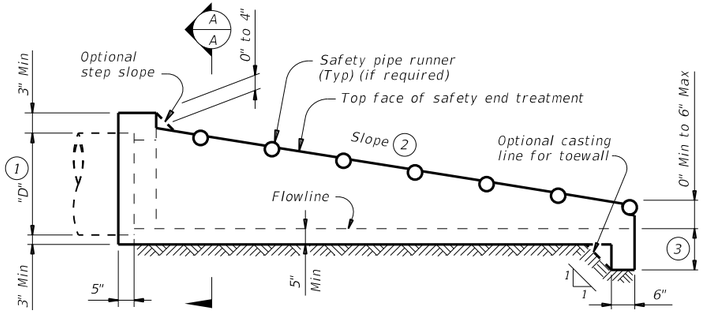
PSET-SC

FILE: psetscss-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		75



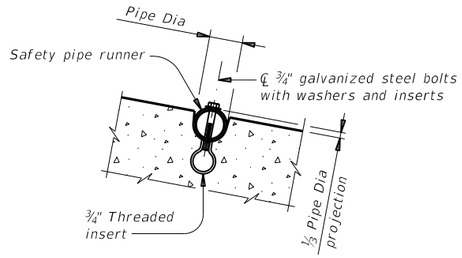
PLAN

(Showing bell end connection.)



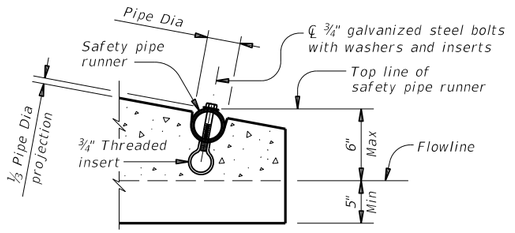
LONGITUDINAL ELEVATION

(Showing bell end connection.)

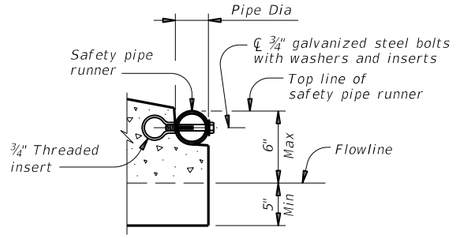


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



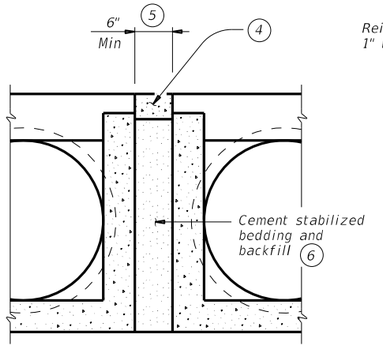
OPTION A



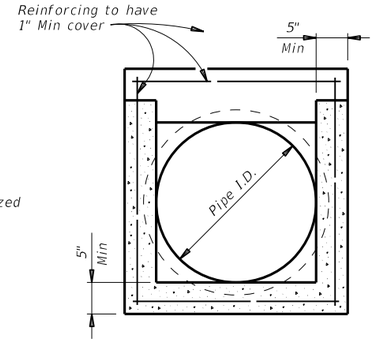
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

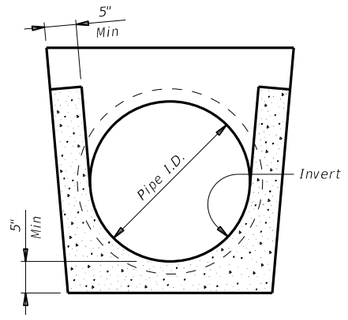
(If required)



MULTIPLE PIPE INSTALLATION

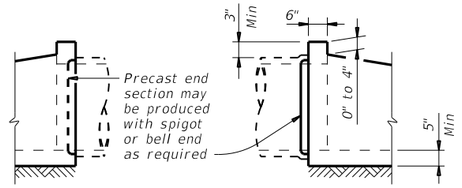


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



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 ¼"	1.30"	20.50"	6:1	6' – 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 ½"	1.60"	24.00"	6:1	8' – 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' – 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 ½"	2.65"	38.50"	6:1	14' – 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' – 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	2.7"	52.50"	6:1	21' – 2"	Yes	Yes	4" STD	4.500"	4.026"

(1) Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.

(2) Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

(5) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(6) Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(7) Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

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

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

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

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

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

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

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

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

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

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

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-SP

FILE: psetspss-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		76

DATE: 3/27/2023 10:22:58 AM
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DATE: 3/21/2023 10:23:14 AM
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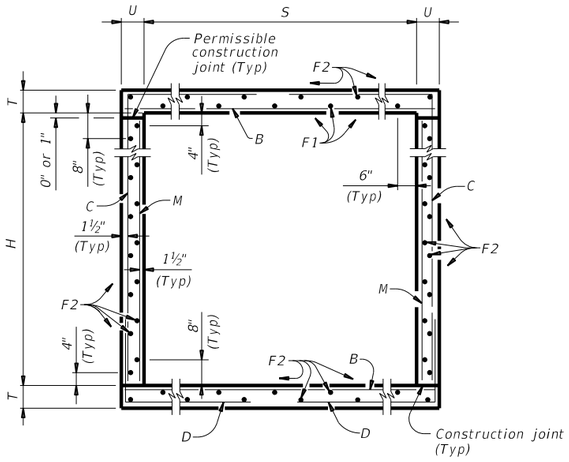
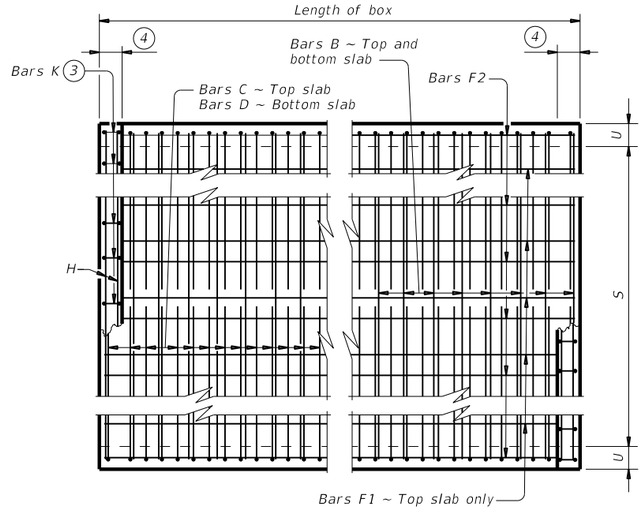
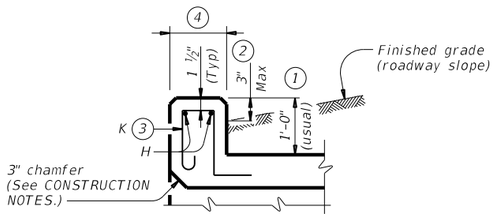


TYPICAL SECTION



PLAN OF REINF STEEL



SECTION THRU CURB

1. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

2. For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, construct curbs no more than 3" above finished grade.
   - For structures with bridge rail, construct curbs flush with finished grade.

   Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

3. For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

4. 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.
Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

Do not use permanent forms.

Chamfer the bottom edge of the top slab 3" at the entrance.

Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.

Provide galvanized reinforcing steel if required elsewhere in the plans.

Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:

- culverts with overlay,
- culverts with 1-to-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

Provide bar laps, where required, as follows:

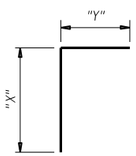
- Uncoated or galvanized ~ #4 = 1'-8" Min
- Uncoated or galvanized ~ #5 = 2'-1" Min

GENERAL NOTES:

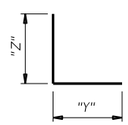
Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.

See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

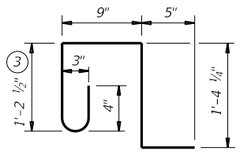
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



BARS C



BARS D



BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE
0' TO 30' FILL

SCC-3 & 4

FILE: scc34ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		77

SECTION DIMENSIONS				FILL HEIGHT (5)	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																										QUANTITIES					
					Bars B					Bars C							Bars D							Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total	
S	H	T	U		No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Wt	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
3' – 0"	2' – 0"	8"	7"	30'	108	#5	9"	3' – 11"	441	108	#4	9"	5' – 4"	385	2' – 6"	2' – 10"	108	#4	9"	5' – 1"	367	2' – 10"	2' – 3"	108	9"	2' – 0"	144	3	39' – 9"	80	19	39' – 9"	505	3' – 11"	10	10	28	0.292	48.1	0.3	38	12.0	1,960
3' – 0"	3' – 0"	8"	7"	30'	108	#5	9"	3' – 11"	441	108	#4	9"	6' – 4"	457	3' – 6"	2' – 10"	108	#4	9"	5' – 1"	367	2' – 10"	2' – 3"	108	9"	3' – 0"	216	3	39' – 9"	80	23	39' – 9"	611	3' – 11"	10	10	28	0.335	54.3	0.3	38	13.7	2,210
4' – 0"	2' – 0"	8"	7"	30'	108	#5	9"	4' – 11"	554	162	#4	6"	5' – 8"	613	2' – 6"	3' – 2"	162	#4	6"	5' – 5"	586	3' – 2"	2' – 3"	108	9"	2' – 0"	144	3	39' – 9"	80	21	39' – 9"	558	4' – 11"	13	12	33	0.342	63.4	0.4	46	14.1	2,581
4' – 0"	3' – 0"	8"	7"	30'	108	#5	9"	4' – 11"	554	162	#4	6"	6' – 8"	721	3' – 6"	3' – 2"	162	#4	6"	5' – 5"	586	3' – 2"	2' – 3"	108	9"	3' – 0"	216	3	39' – 9"	80	25	39' – 9"	664	4' – 11"	13	12	33	0.385	70.5	0.4	46	15.8	2,867
4' – 0"	4' – 0"	8"	7"	30'	108	#5	9"	4' – 11"	554	162	#4	6"	7' – 8"	830	4' – 6"	3' – 2"	162	#4	6"	5' – 5"	586	3' – 2"	2' – 3"	108	9"	4' – 0"	289	3	39' – 9"	80	25	39' – 9"	664	4' – 11"	13	12	33	0.428	75.1	0.4	46	17.5	3,049

(5) For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

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HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE
0' TO 30' FILL

SCC-3 & 4

FILE: scc34ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		78

DATE:
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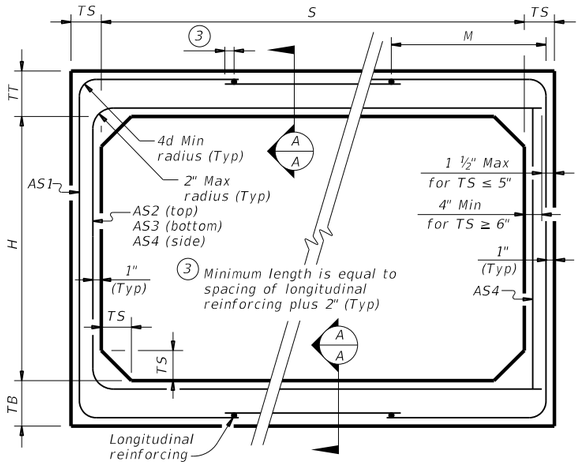
BOX DATA

SECTION DIMENSIONS					Fill Height	M (Min)	REINFORCING (sq. in. / ft.) (2)							(1) Lift Weight
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	(ft.)	(in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	(tons)
6	2	8	7	7	< 2	–	0.23	0.27	0.19	0.17	0.19	0.19	0.17	7.2
6	2	7	7	7	2 < 3	43	0.25	0.21	0.17	0.17	–	–	–	6.8
6	2	7	7	7	3 – 5	43	0.20	0.17	0.17	0.17	–	–	–	6.8
6	2	7	7	7	10	39	0.20	0.17	0.17	0.17	–	–	–	6.8
6	2	7	7	7	15	39	0.26	0.20	0.20	0.17	–	–	–	6.8
6	2	7	7	7	20	39	0.34	0.26	0.26	0.17	–	–	–	6.8
6	2	7	7	7	25	39	0.43	0.32	0.32	0.17	–	–	–	6.8
6	2	7	7	7	30	39	0.52	0.38	0.39	0.17	–	–	–	6.8
6	3	8	7	7	< 2	–	0.20	0.31	0.22	0.17	0.19	0.19	0.17	7.9
6	3	7	7	7	2 < 3	43	0.21	0.24	0.19	0.17	–	–	–	7.5
6	3	7	7	7	3 – 5	39	0.17	0.18	0.17	0.17	–	–	–	7.5
6	3	7	7	7	10	39	0.17	0.18	0.19	0.17	–	–	–	7.5
6	3	7	7	7	15	38	0.22	0.24	0.24	0.17	–	–	–	7.5
6	3	7	7	7	20	38	0.28	0.31	0.31	0.17	–	–	–	7.5
6	3	7	7	7	25	38	0.35	0.38	0.39	0.17	–	–	–	7.5
6	3	7	7	7	30	38	0.42	0.46	0.46	0.17	–	–	–	7.5
6	4	8	7	7	< 2	–	0.19	0.34	0.25	0.17	0.19	0.19	0.17	8.6
6	4	7	7	7	2 < 3	43	0.19	0.27	0.21	0.17	–	–	–	8.2
6	4	7	7	7	3 – 5	39	0.17	0.21	0.19	0.17	–	–	–	8.2
6	4	7	7	7	10	39	0.17	0.20	0.21	0.17	–	–	–	8.2
6	4	7	7	7	15	38	0.18	0.27	0.27	0.17	–	–	–	8.2
6	4	7	7	7	20	38	0.24	0.34	0.35	0.17	–	–	–	8.2
6	4	7	7	7	25	38	0.29	0.43	0.42	0.17	–	–	–	8.2
6	4	7	7	7	30	38	0.35	0.51	0.52	0.17	–	–	–	8.2
6	5	8	7	7	< 2	–	0.19	0.37	0.28	0.17	0.19	0.19	0.17	9.3
6	5	7	7	7	2 < 3	43	0.17	0.30	0.24	0.17	–	–	–	8.9
6	5	7	7	7	3 – 5	43	0.17	0.23	0.21	0.17	–	–	–	8.9
6	5	7	7	7	10	39	0.17	0.22	0.23	0.17	–	–	–	8.9
6	5	7	7	7	15	38	0.17	0.28	0.29	0.17	–	–	–	8.9
6	5	7	7	7	20	38	0.20	0.37	0.38	0.17	–	–	–	8.9
6	5	7	7	7	25	38	0.25	0.45	0.46	0.17	–	–	–	8.9
6	5	7	7	7	30	38	0.30	0.54	0.55	0.17	–	–	–	8.9
6	6	8	7	7	< 2	–	0.19	0.38	0.30	0.17	0.19	0.19	0.17	10
6	6	7	7	7	2 < 3	52	0.17	0.32	0.26	0.17	–	–	–	9.6
6	6	7	7	7	3 – 5	52	0.17	0.24	0.22	0.17	–	–	–	9.6
6	6	7	7	7	10	43	0.17	0.23	0.24	0.17	–	–	–	9.6
6	6	7	7	7	15	39	0.17	0.29	0.31	0.17	–	–	–	9.6
6	6	7	7	7	20	39	0.18	0.38	0.39	0.17	–	–	–	9.6
6	6	7	7	7	25	38	0.23	0.46	0.48	0.17	–	–	–	9.6
6	6	7	7	7	30	38	0.27	0.55	0.57	0.17	–	–	–	9.6

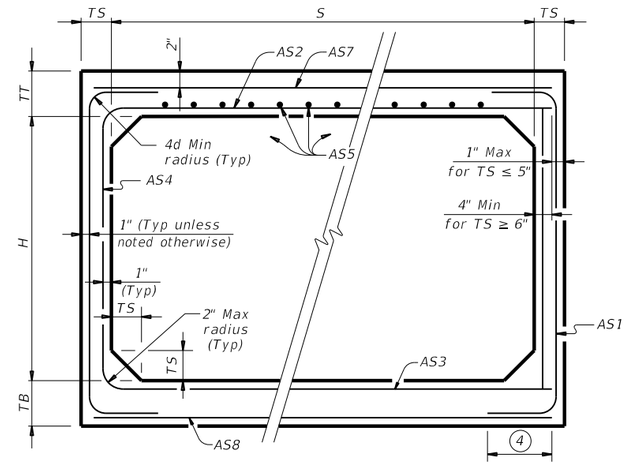
(1) For box length = 8'-0"

(2) AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.



CORNER OPTION "A" CORNER OPTION "B"

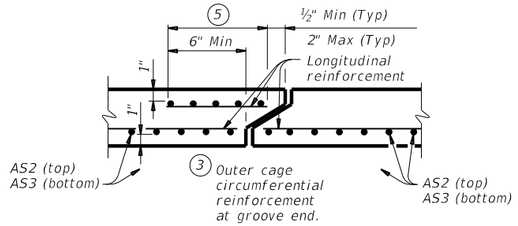
FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

(4) Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



SECTION A-A

(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.

Provide Class H concrete (f`c = 5,000 psi).

GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.

See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

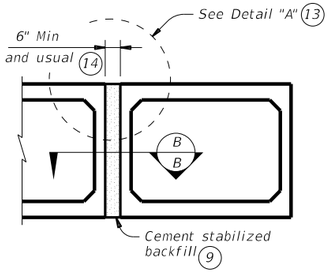
SINGLE BOX CULVERTS PRECAST

6'-0" SPAN

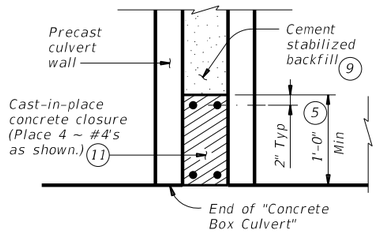
SCP-6

FILE: scp06sts-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		79

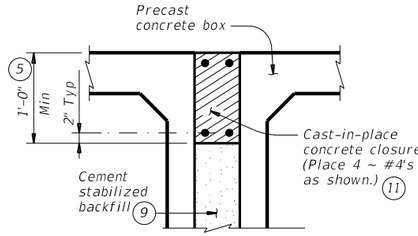
DATE:
FILE:



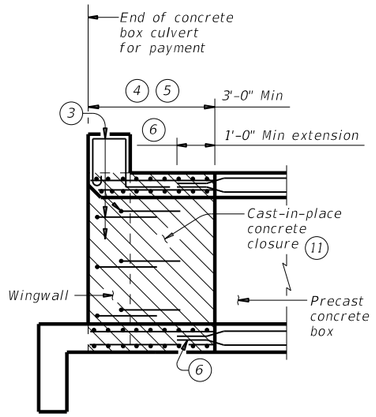
MULTIPLE UNIT PLACEMENT



SECTION B-B

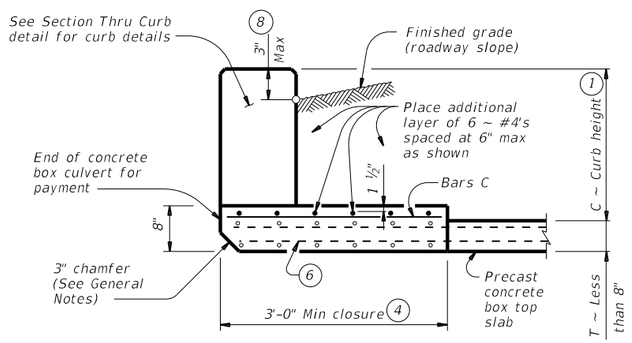


DETAIL "A" (13)

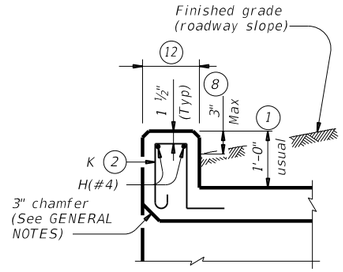


WINGWALL CONNECTION

(Also applies to safety end treatment.)

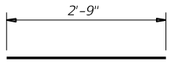


SECTION THRU TOP SLABS LESS THAN 8"

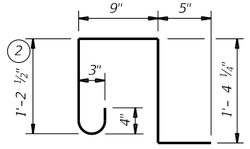


SECTION THRU CURB

QUANTITIES PER FOOT OF CURB (10)	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY



BARS C (#4)
(Spa = 1'–0" Max)



BARS K (#4)
(Spa = 1'–0" Max)
(Length = 4'–2")

1 Dimension 0" Min to 5'–0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'–0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631–CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

2 For curbs less than 1'–0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

3 Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.

4 Provide a 3'–0" Min cast–in–place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast–in–place closure flush with the inside and outside faces of the precast box section.

5 For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'–0" Min cast–in–place closure in the top slab, bottom slab, and exterior wall. See Section B–B detail when interior walls are cast full length.

6 Extend precast box reinforcing a minimum of 1'–0" into concrete closure (Typ).

7 Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.

8 For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

9 Cement stabilized backfill between boxes is considered part of the box culvert for payment.

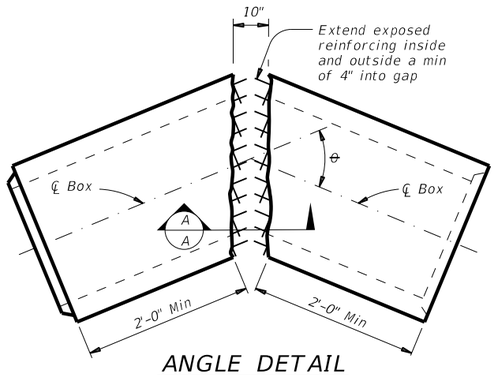
10 All curb concrete and reinforcing is considered part of the box culvert for payment.

11 Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.

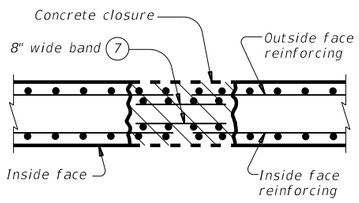
12 1'–0" typical. 2'–3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.

13 For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".

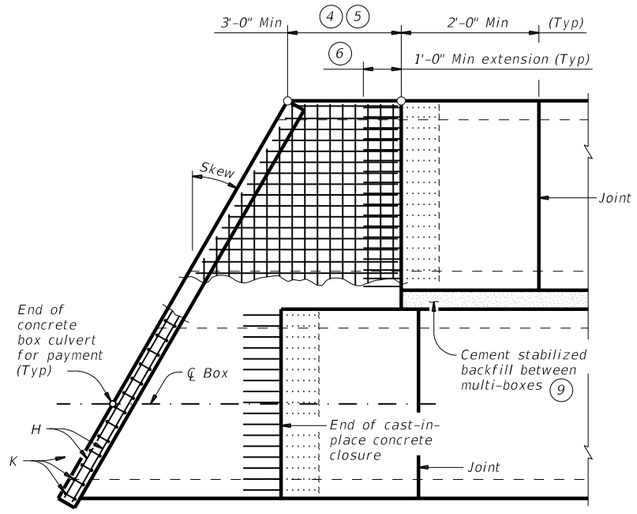
14 This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi–box placement.)

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide ASTM A1064 welded wire reinforcement.
Provide Class C concrete (f'c = 3,600 psi) for the closures.
Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
Any additional concrete required for the closures will be considered subsidiary to the box culvert.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

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

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Bridge Division Standard

BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

FILE: scpmdsts-20.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
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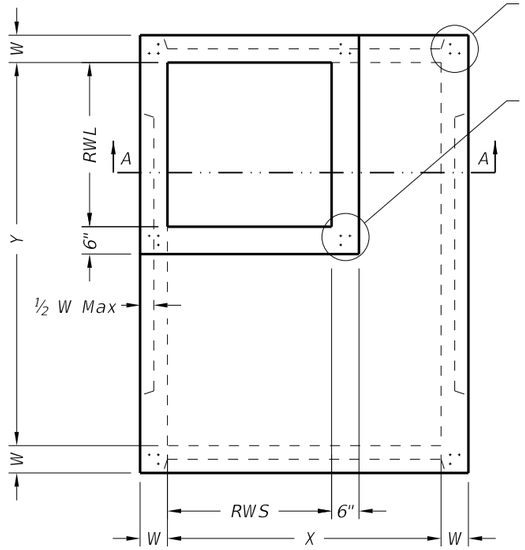
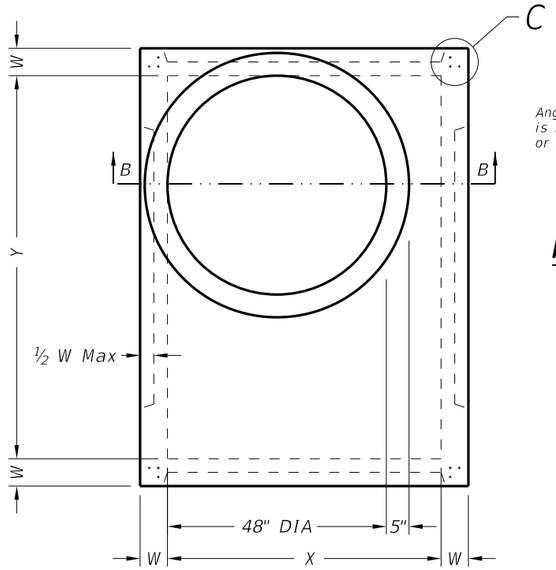
REVISIONS	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		80

DATE:
FILE:



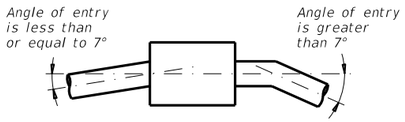
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



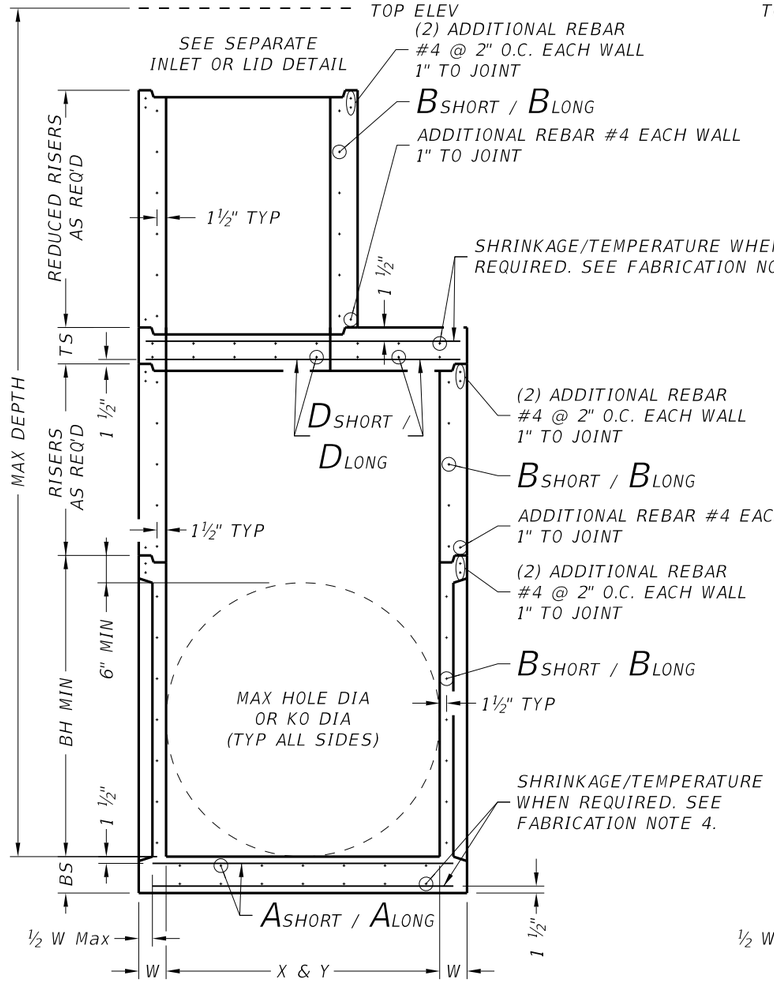
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



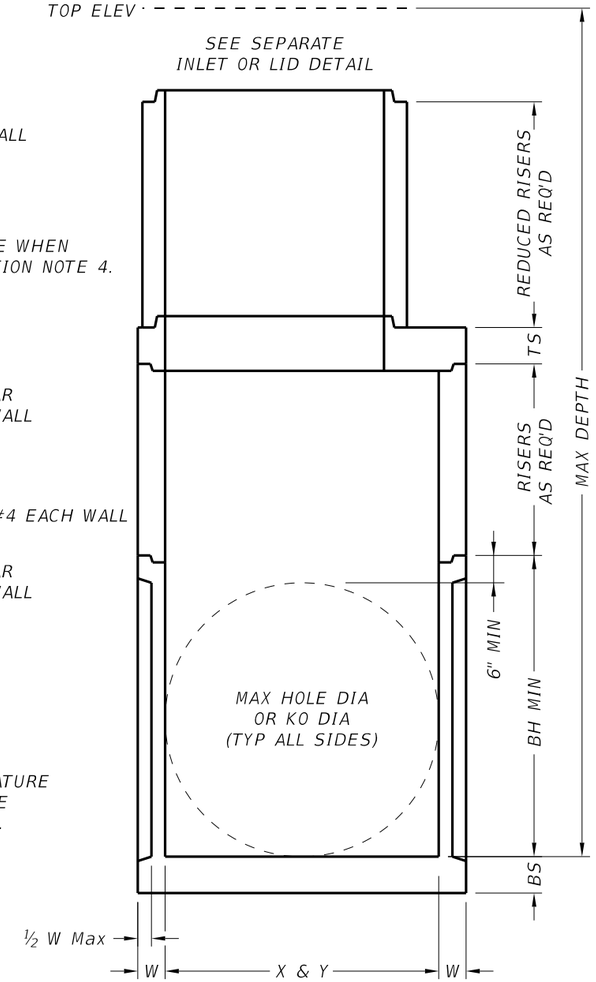
PIPE CONNECTION DETAIL

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



SECTION A-A

SQUARE REDUCED RISER OPTION



SECTION B-B

ROUND REDUCED RISER OPTION

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.

Cover dimensions are clear dimensions, unless noted otherwise.

INSTALLATION NOTES:

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

GENERAL NOTES:

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

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Texas Department of Transportation

Bridge Division Standard

PRECAST BASE

PB

FILE: prestd01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		81

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

** Unless otherwise indicated.

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

DATE:
FILE:

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

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

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

FILE: prestd10-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		82

DATE:
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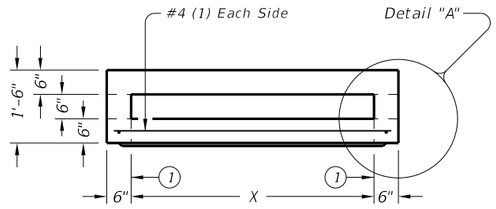
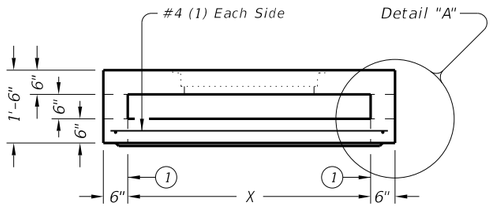


ELEVATION VIEW



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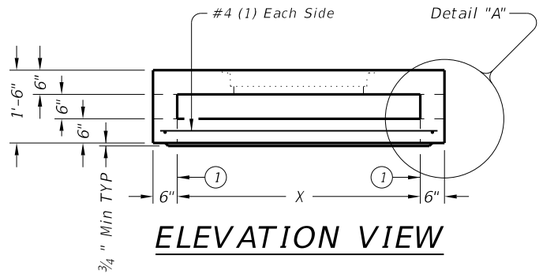

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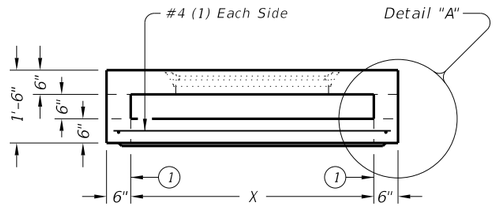

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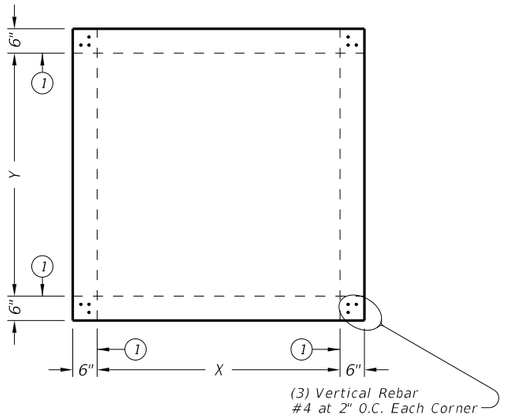
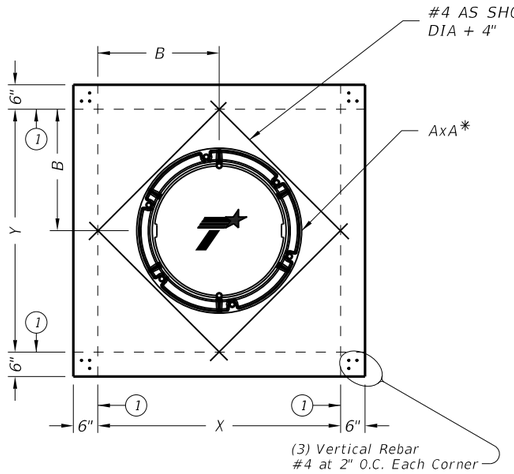


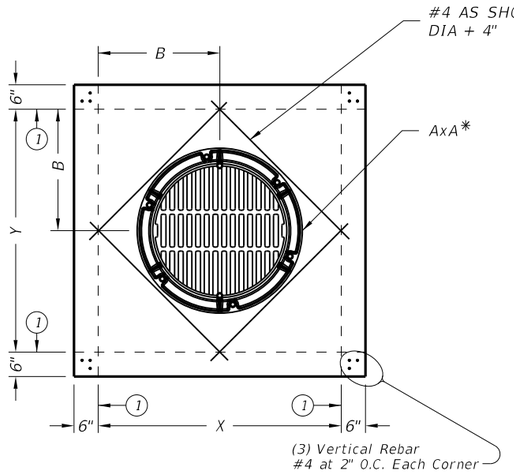
PLAN VIEW
NO OPENINGS

STYLE 'SL'



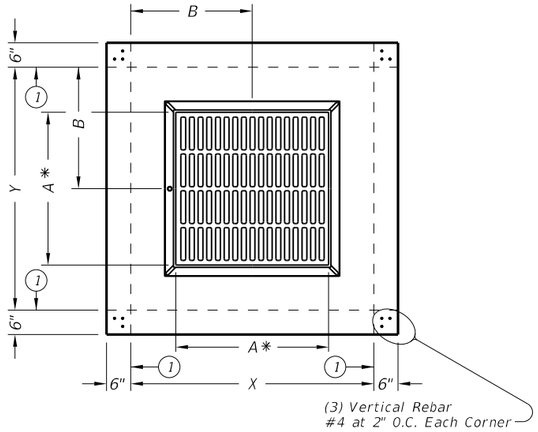
PLAN VIEW
32" DIA CAST-IN RING & COVER

STYLE 'RC'



PLAN VIEW
32" DIA CAST-IN RING & GRATE

STYLE 'RG'



PLAN VIEW
CAST-IN FRAME & GRATE

STYLE 'FG'

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

Style	Size (X x Y)	A x A*	B x B	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	n/a	n/a	0.37 in²/ft	0.37 in²/ft
RC,RG	3'x3'	32" Dia	1.5'x1.5'	0.37 in²/ft	0.37 in²/ft
FG	3'x3'	3'x3'	1.5'x1.5'	0.37 in²/ft	0.37 in²/ft
SL	4'x4'	n/a	n/a	0.34 in²/ft	0.34 in²/ft
RC,RG	4'x4'	32" Dia	2'x2'	0.34 in²/ft	0.34 in²/ft
FG	4'x4'	3'x3'	2'x2'	0.34 in²/ft	0.34 in²/ft
FG	4'x4'	4'x4'	2'x2'	0.34 in²/ft	0.34 in²/ft
SL	5'x5'	n/a	n/a	0.43 in²/ft	0.43 in²/ft
RC,RG	5'x5'	32" Dia	2.5'x2.5'	0.68 in²/ft	0.68 in²/ft
FG	5'x5'	3'x3'	2.5'x2.5'	0.43 in²/ft	0.43 in²/ft
FG	5'x5'	4'x4'	2.5'x2.5'	0.43 in²/ft	0.43 in²/ft

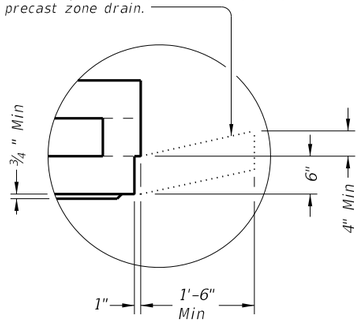
* Nominal frame/grate or ring/cover size.

FABRICATION NOTES:
1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide clear cover of ¾" to reinforcing from bottom of slab for structural reinforcement. Place short span reinforcing closest to surface.
4. No substitution is allowed for diagonal #4 bars around openings.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
6. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:
1. PAZD is for use in ditches and medians outside of the horizontal clearance (clear zone). Precast Area Zone Drain is not intended for direct traffic and may not be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.

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

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



DETAIL "A"

(Reinforcing not shown for clarity)

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

Texas Department of Transportation

Bridge Division Standard

PRECAST AREA ZONE DRAIN

PAZD

FILE: prestd08-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		83

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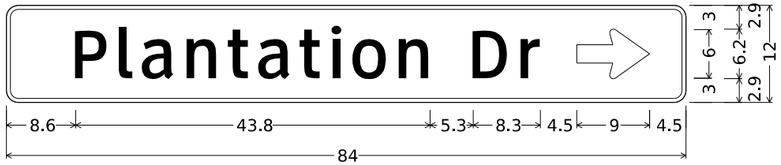

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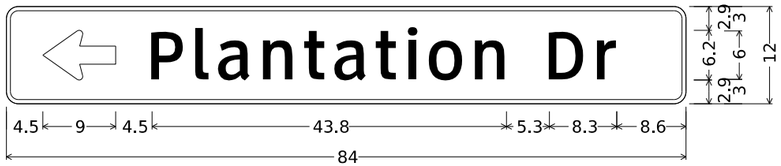
S5



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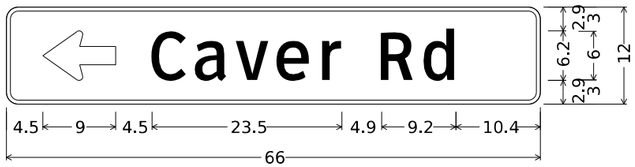
S9



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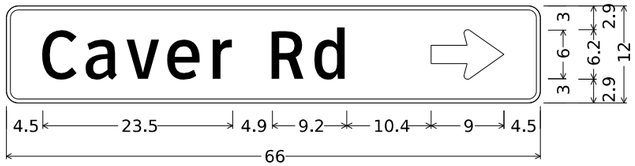
S12



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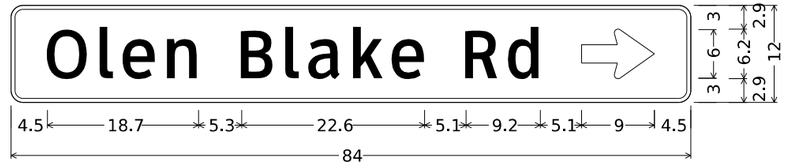

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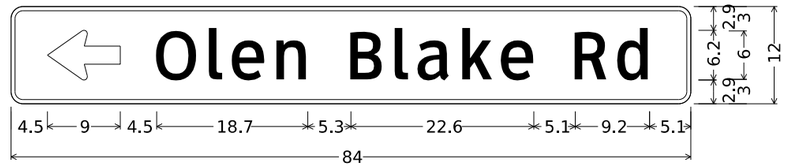

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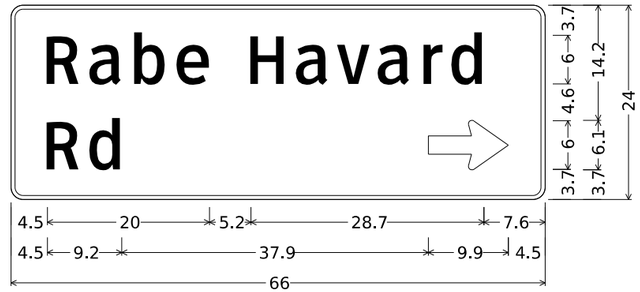
S16



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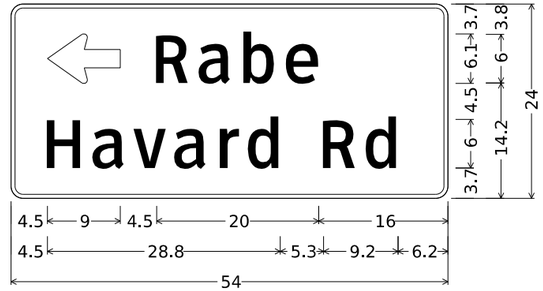
S18



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Standard Arrow Custom 9.0" X 6.1" 180°;
"Rabe", ClearviewHwy-3-W;
"Havard Rd", ClearviewHwy-3-W;

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CHARLES M. BRAZIL
112704
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PROFESSIONAL ENGINEER

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SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
LFK	ANGELINA		84

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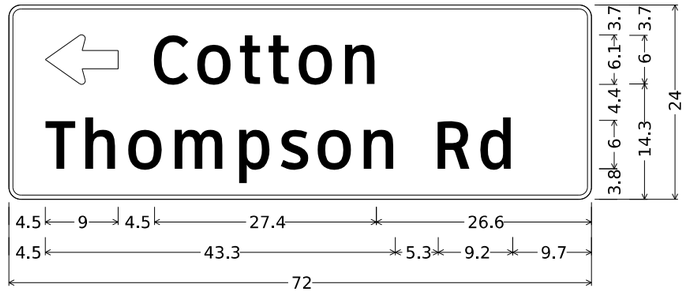

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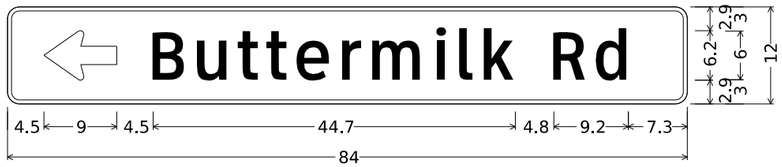
S25



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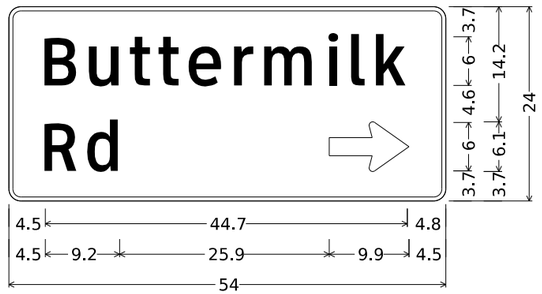
S22



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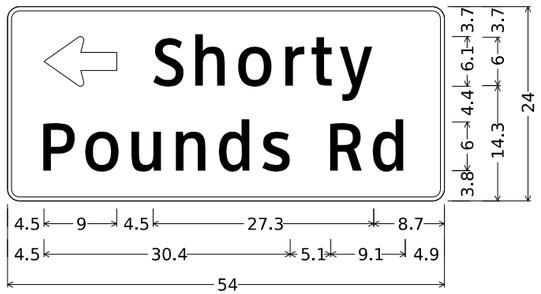
S27



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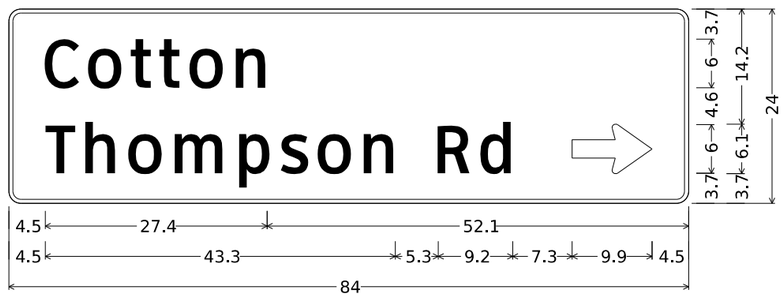
S23



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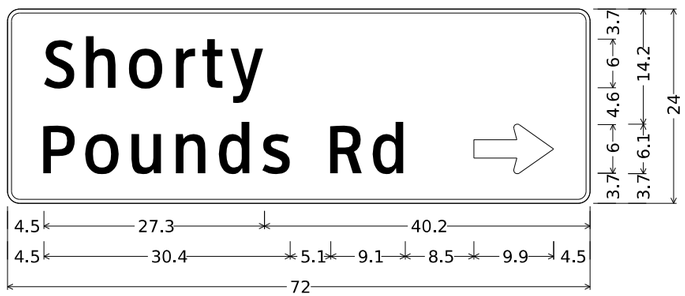

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Standard Arrow Custom 9.9" X 6.1" 0°;

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SHEET 2 OF 3

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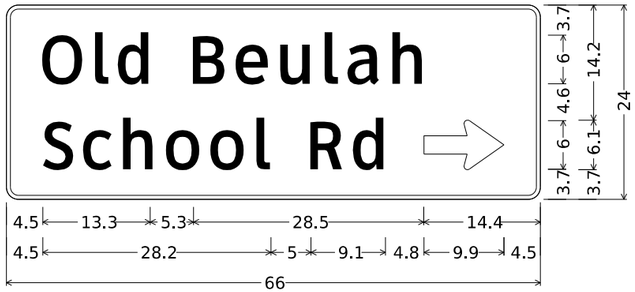

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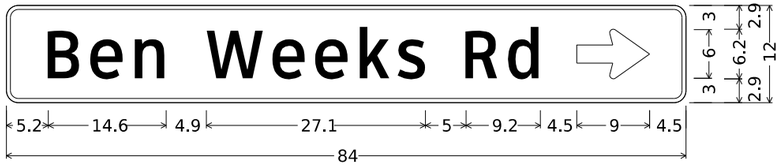
S32



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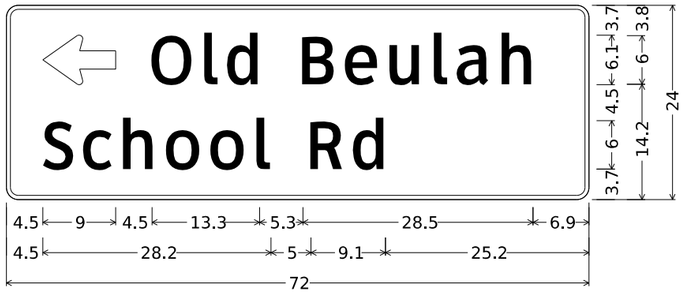

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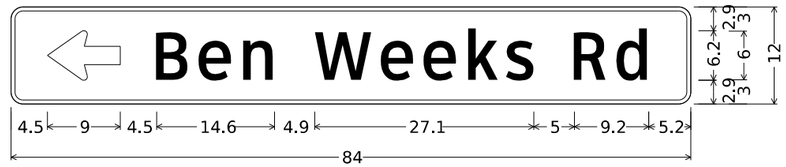
S35



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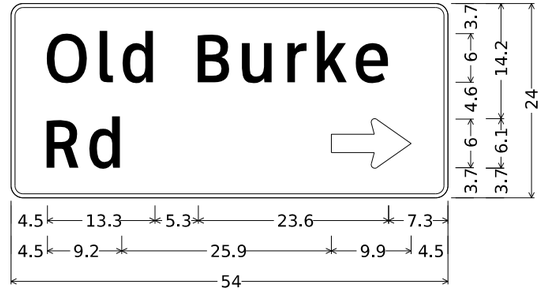
S36



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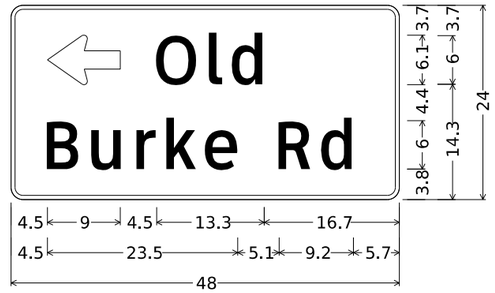
"Rd", ClearviewHwy-3-W;
Standard Arrow Custom 9.9" X 6.1" 0°;

S38



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Standard Arrow Custom 9.0" X 6.1" 180°;
"Old", ClearviewHwy-3-W;
"Burke Rd", ClearviewHwy-3-W;

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SHEET 3 OF 3

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LFK	ANGELINA		86

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DATE:
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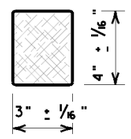
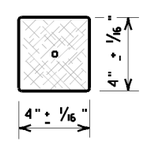
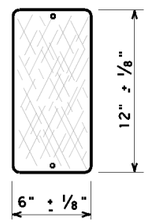
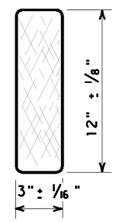
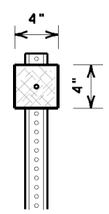
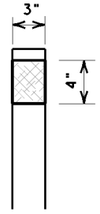
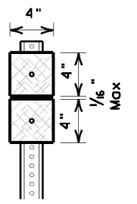
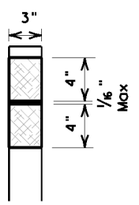
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			

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.

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

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

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

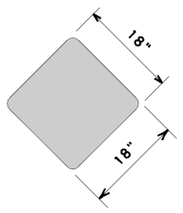
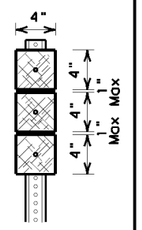
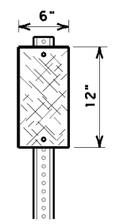
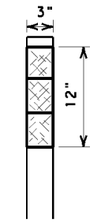
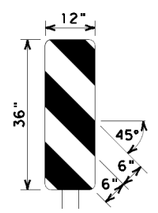
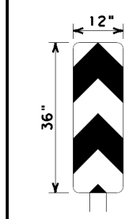
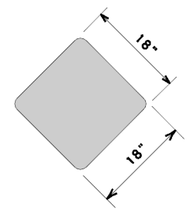
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

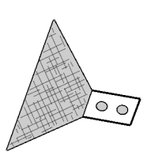
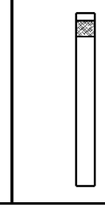
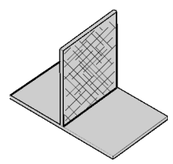
OBJECT MARKERS

	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
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective 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

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)

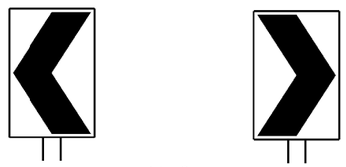
	GF1	GF2	CTB
DEVICE			

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.

SHEETING	Yellow, White, Red
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.

CHEVRONS

DEVICE



W1-8

SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

NOTE

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).

ONE DIRECTION LARGE ARROW

DEVICE

W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

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.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

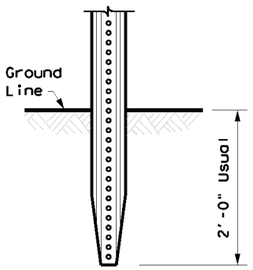
D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	LFK	ANGELINA		87

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

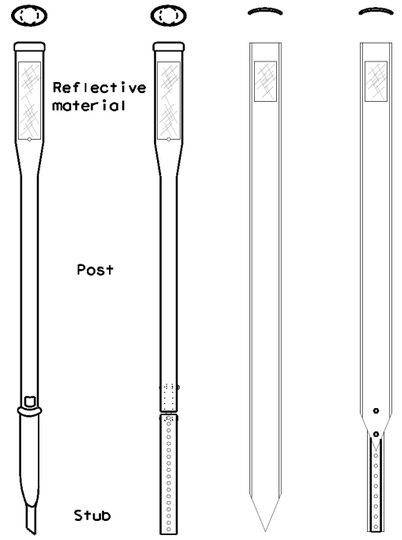


NOTES

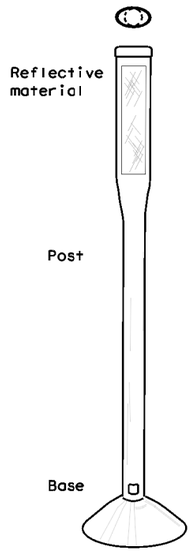
1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

FLEXIBLE POSTS (YFLX, WFLX)

GND



SRF



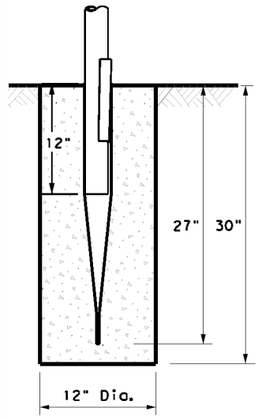
EMBEDDED | SURFACE MOUNT

NOTES

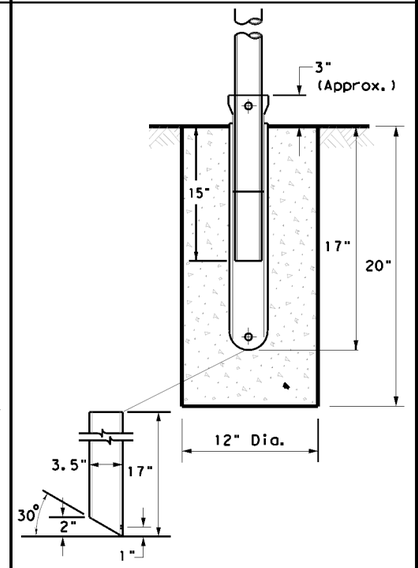
1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

WEDGE ANCHOR SYSTEMS

WAS



WAP



STEEL | PLASTIC

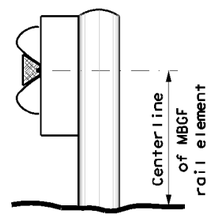
NOTE

1. Install per manufacturer's recommendations.

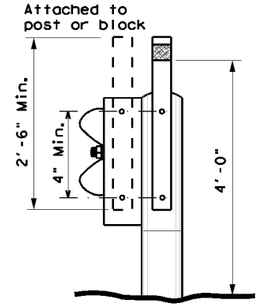
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

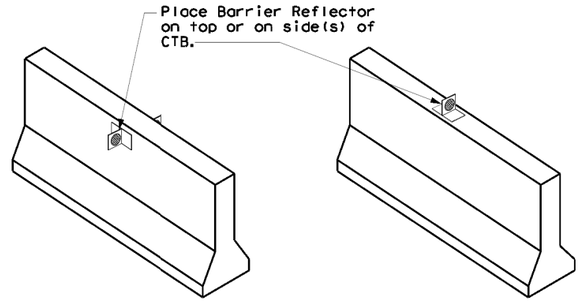
GF1



GF2



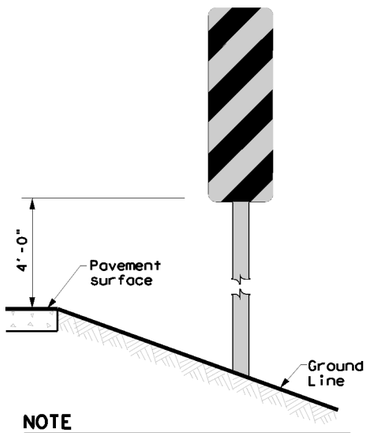
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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.

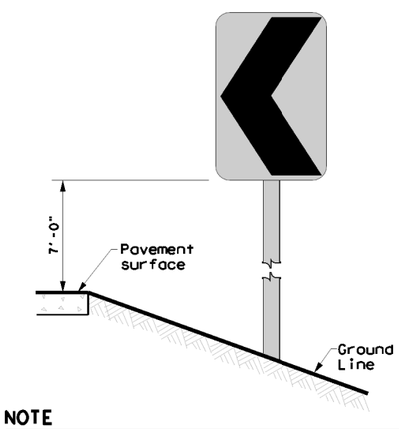
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



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)

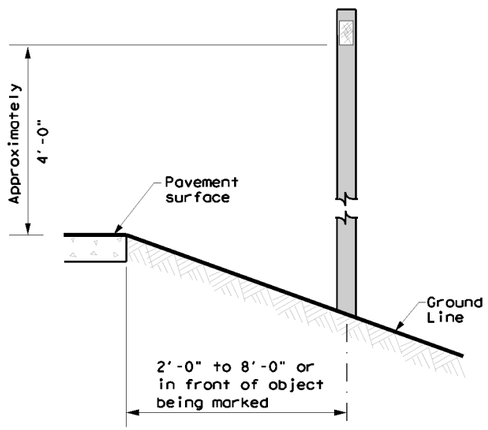
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



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.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

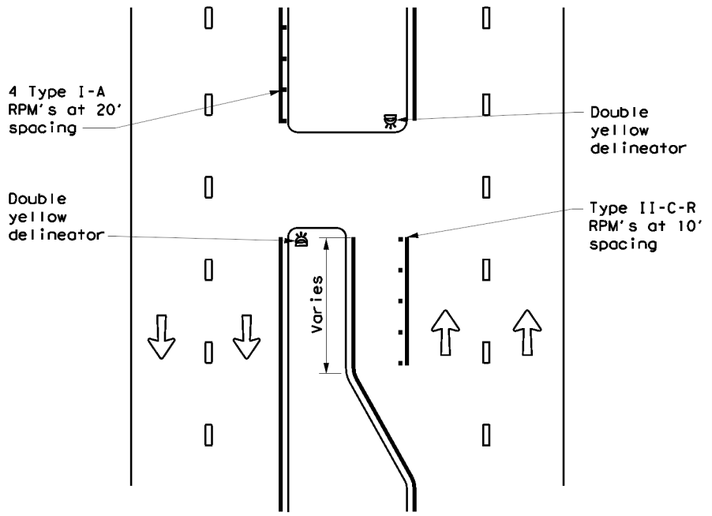
DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, etc.	FM 58
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	LFK	ANGELINA		88

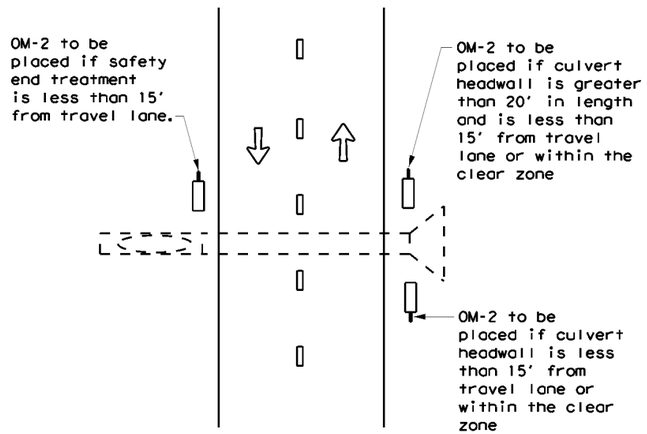
DATE:
FILE:

CROSSOVERS



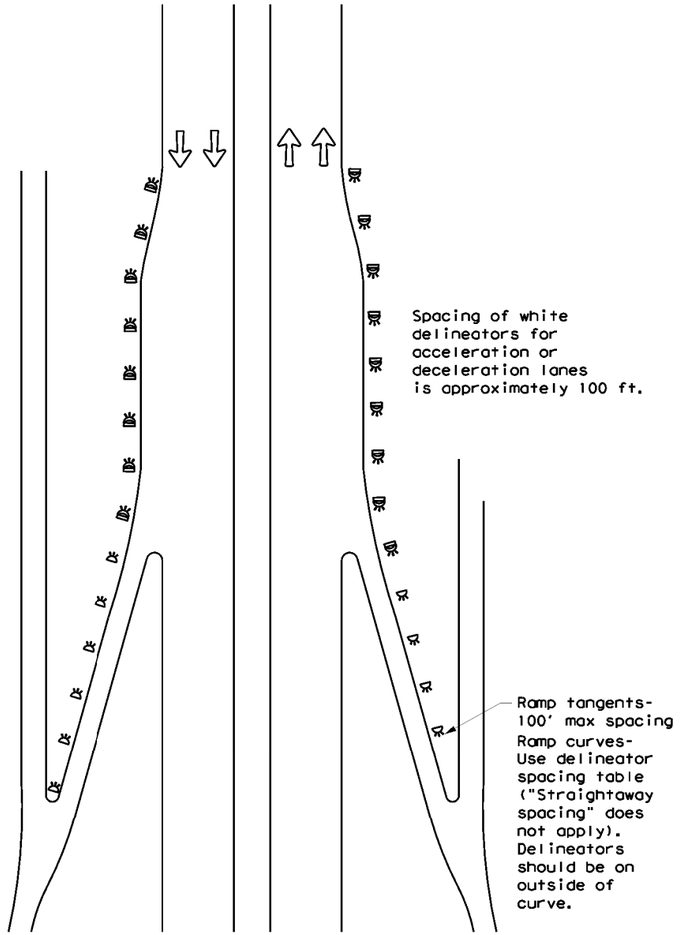
DETAIL 1

FOR CULVERTS WITHOUT MBGF



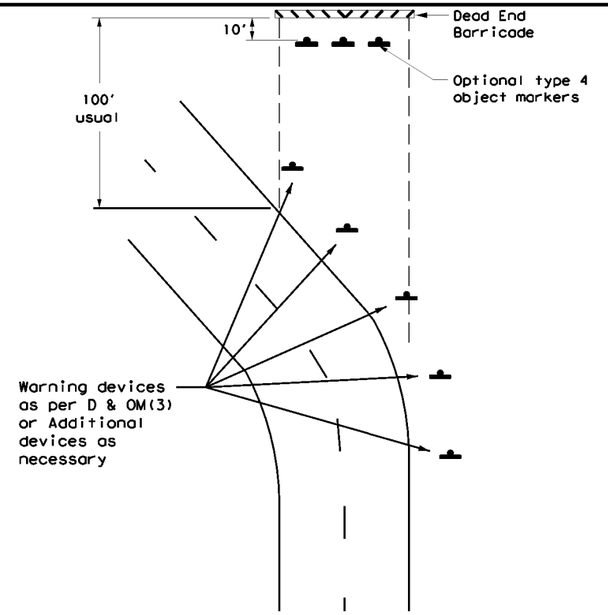
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



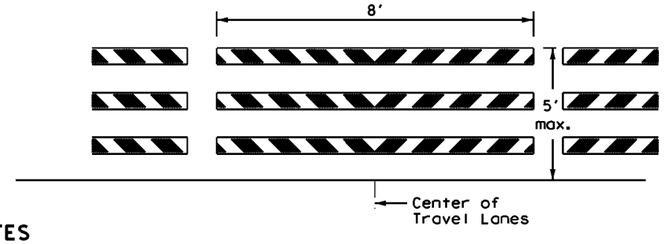
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. 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

Texas Department of Transportation

Traffic Safety Division Standard

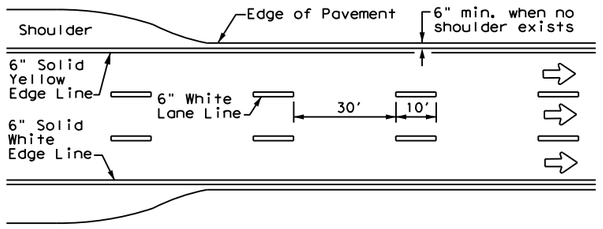
DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

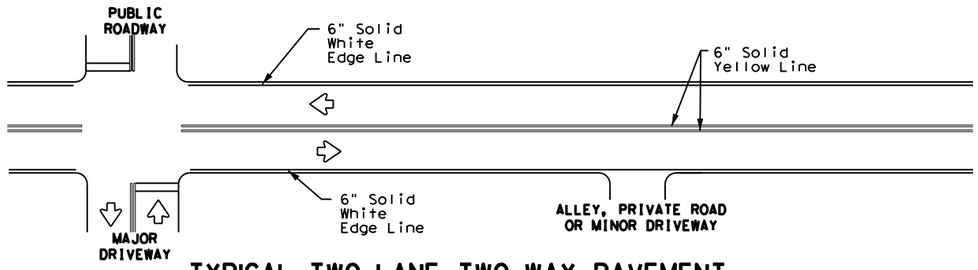
FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
3-15	DIST	COUNTY		SHEET NO.
7-20	LFK	ANGELINA		89

DATE:
FILE:

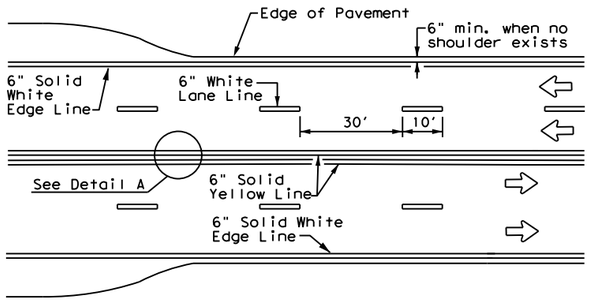
DATE:
FILE:

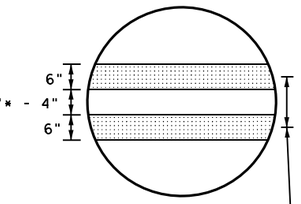


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





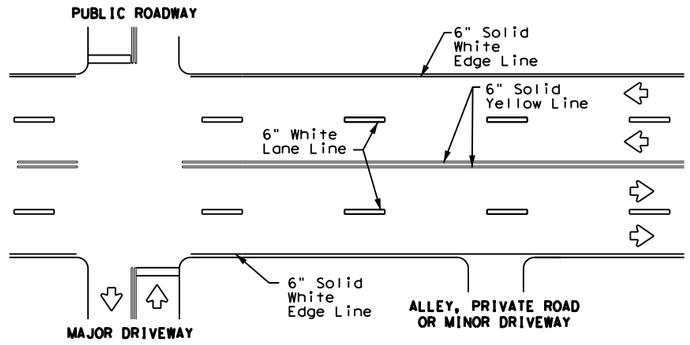
DETAIL "A"

9"** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

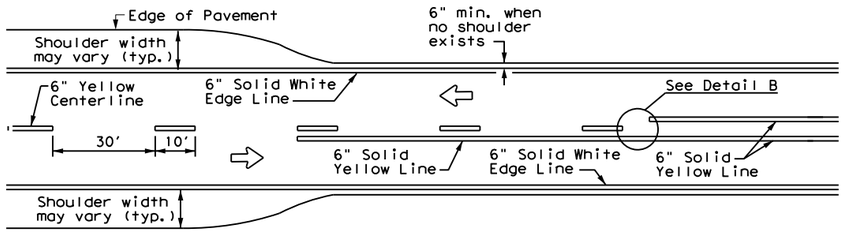
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

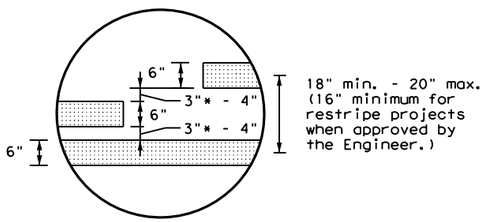
** 8" minimum for restripe projects when approved by the Engineer.



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

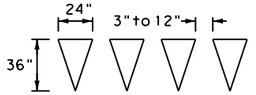


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



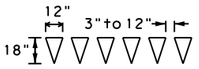
DETAIL "B"

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

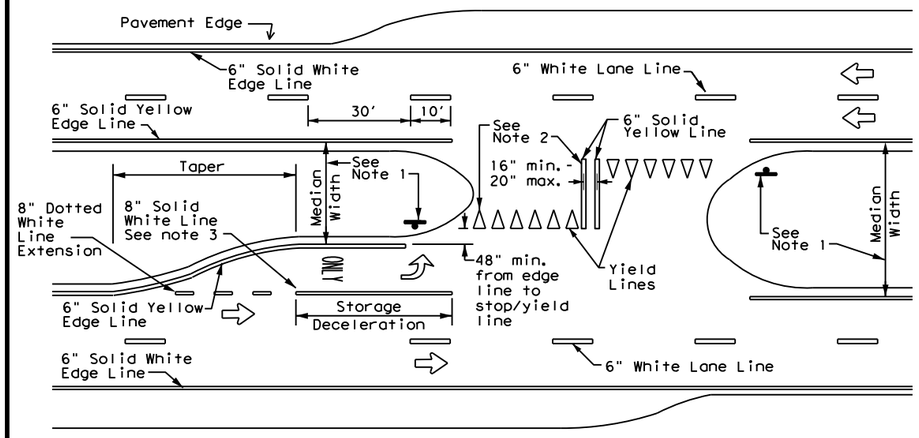


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

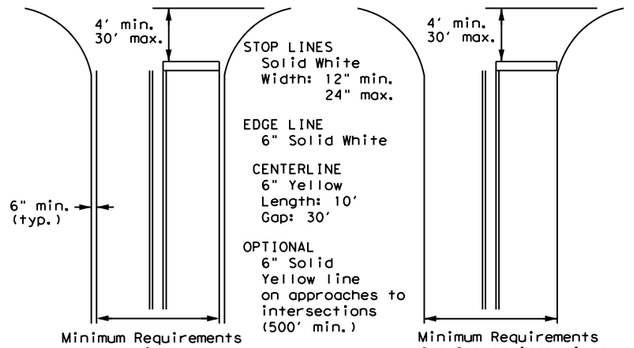
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections.
   Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

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

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



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

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Traffic Safety Division Standard

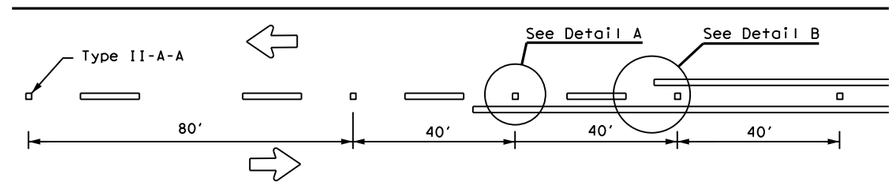
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

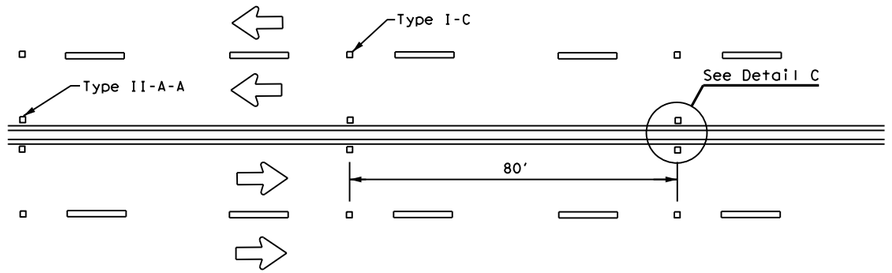
FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20	0576	02	068, ETC.	FM 58
8-95 3-03 12-22	DIST	COUNTY		SHEET NO.
5-00 2-12	LFK	ANGELINA		90

22A

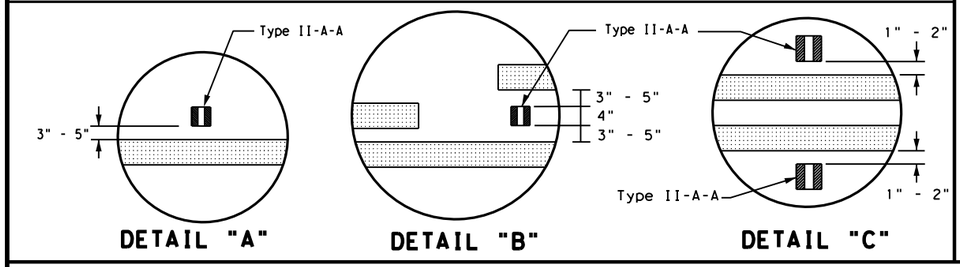
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

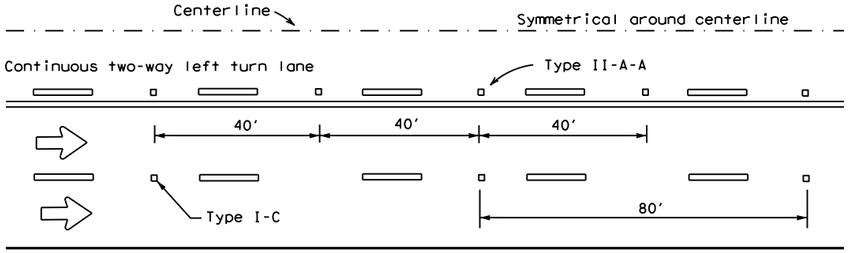


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

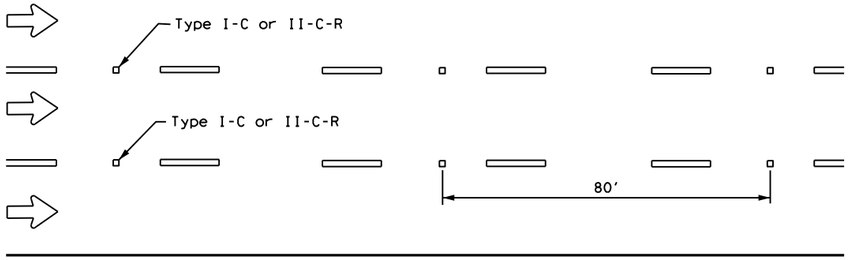


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





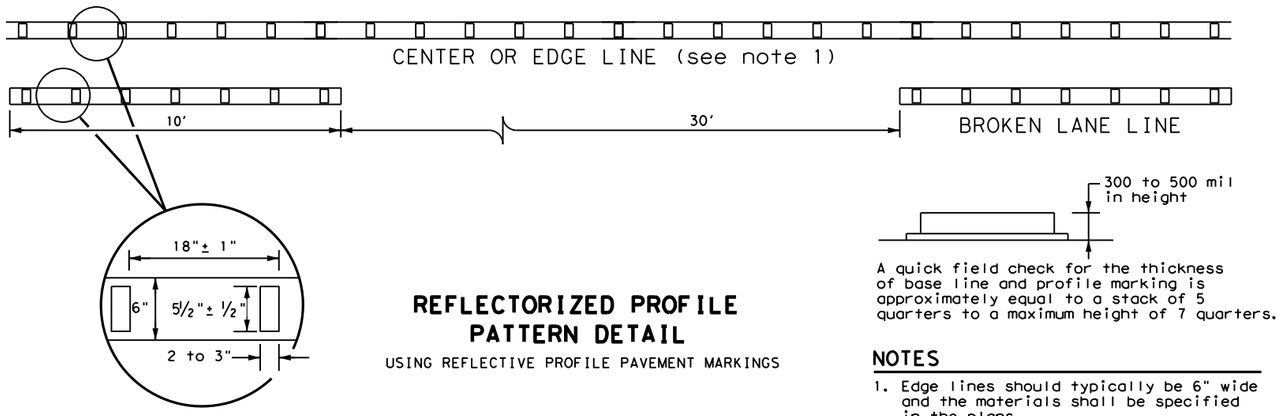
CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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

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

See Note 3.



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

NOTES

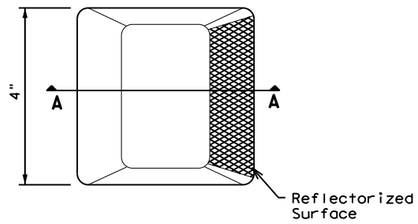
1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

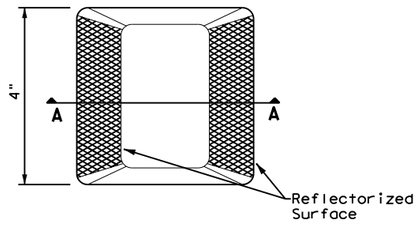
1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

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

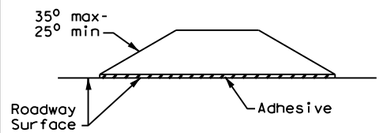
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

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Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
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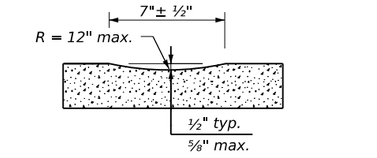
REVISIONS	0576	02	068, ETC.	FM 58
4-77 8-00 6-20	DIST	COUNTY		SHEET NO.
4-92 2-10 12-22	LFK	ANGELINA		91
5-00 2-12				

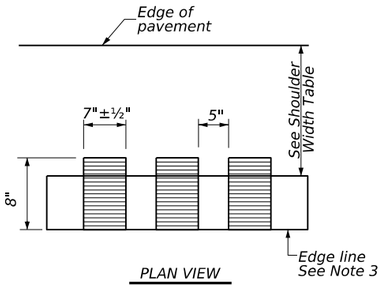
22B

DATE:
FILE:

DATE:
FILE:

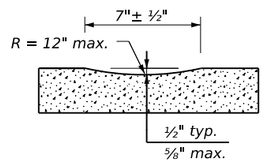


PROFILE VIEW
OPTION 1

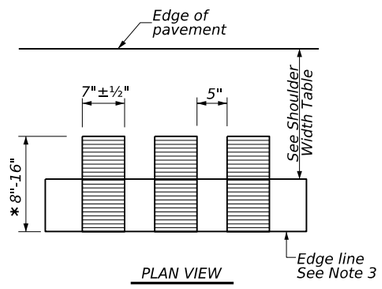


PLAN VIEW

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



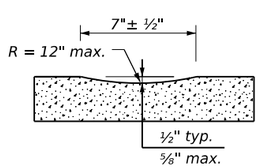
PROFILE VIEW
OPTION 2



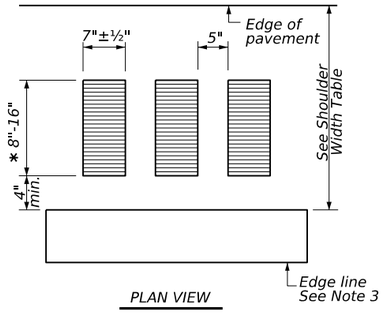
PLAN VIEW

∗ This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



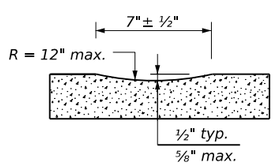
PROFILE VIEW
OPTION 3



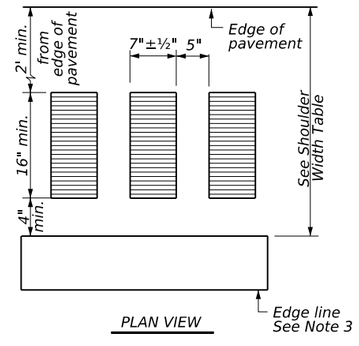
PLAN VIEW

∗ This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

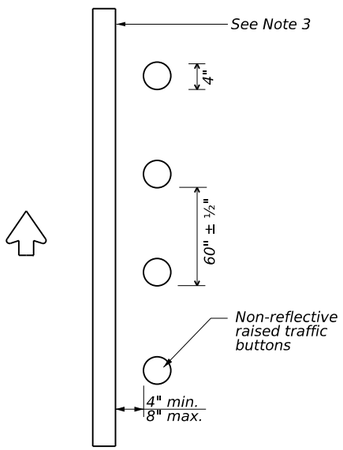


PROFILE VIEW
OPTION 4



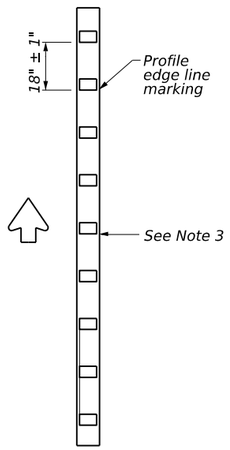
PLAN VIEW

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



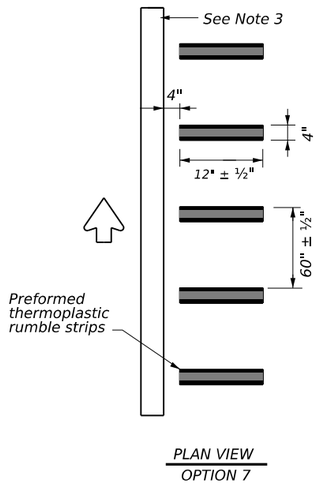
PLAN VIEW
OPTION 5

RAISED EDGE LINE (Rumble Strips)



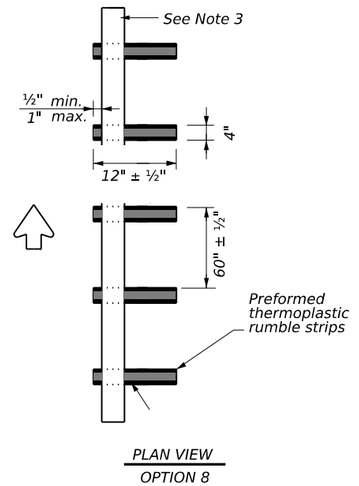
PLAN VIEW
OPTION 6

PROFILE EDGE LINE MARKINGS (Rumble Strips)



PLAN VIEW
OPTION 7

PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)



PLAN VIEW
OPTION 8

PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5, 6 or 8	Option 1, 2, 3 5, 6 or 7	Option 2, 4, 5 6 or 7

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use Standard Sheet PM(2) and FPM(1) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the Shoulder Width Table below for determining what options may be used for edge line rumble strips.
5. Breaks in edge line rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections, or driveways with high usage of large trucks when installed on conventional highways.
6. Rumble strips shall not be placed across exit or entrance ramps, acceleration or deceleration lanes, crossovers, gore areas, or intersections with other roadways.
7. Consideration should be given to noise levels when edgeline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

9. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
10. Pavement markings can be applied over milled shoulder rumble strips to create an edge line rumble strip.

WHEN INSTALLING RAISED OR PROFILE EDGE LINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edge line when used as a rumble strip. The color of the button should match the color of the adjacent edge line marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. The minimum distance between the edge line and the buttons should be used if the shoulder is less than 8 feet in width.
15. Raised profile thermoplastic markings used as edge lines may substitute for buttons.

Texas Department of Transportation

Traffic Safety Division Standard

EDGE LINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS
RS(2)-23

FILE: rs(2)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
10-13	DIST	COUNTY		SHEET NO.
1-23	LFK	ANGELINA		92

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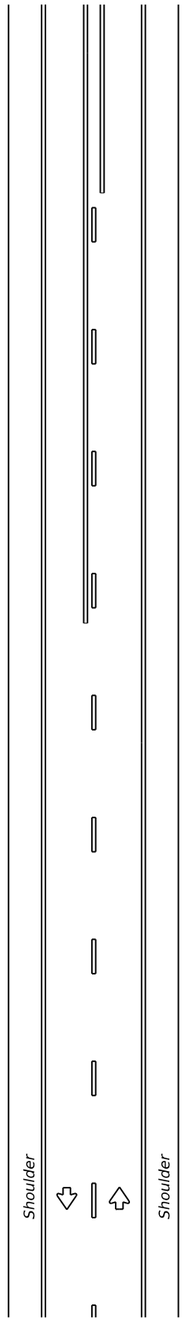
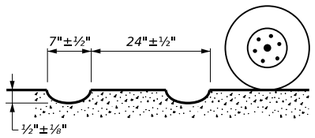
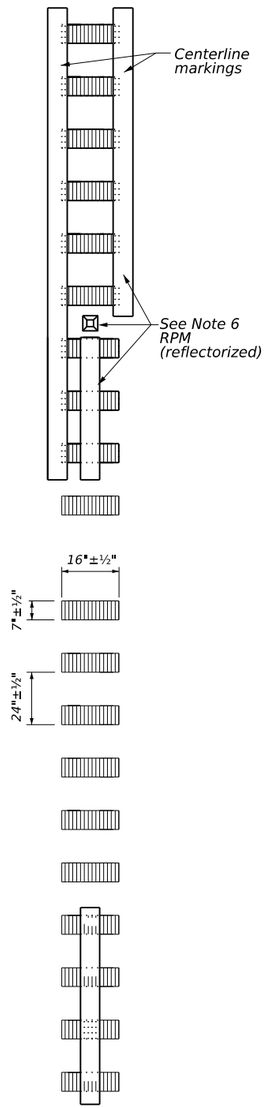
CENTERLINE RUMBLE STRIPS



TWO LANE TWO-WAY HIGHWAYS

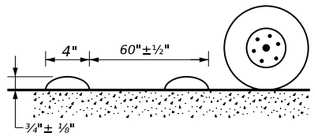


PROFILE VIEW

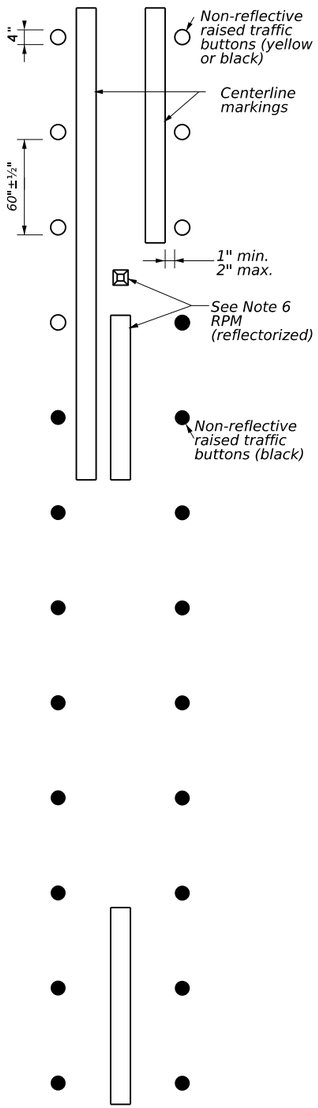


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

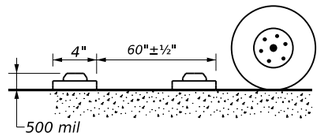


PROFILE VIEW

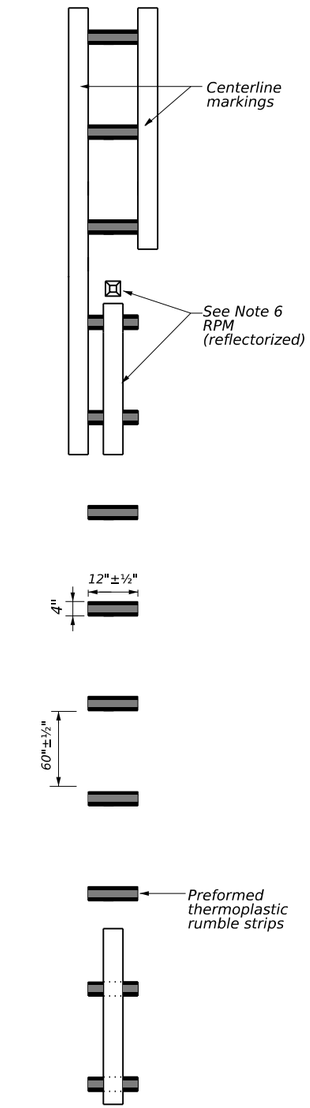


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

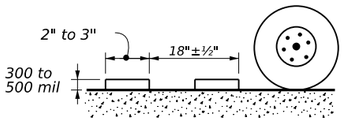


PROFILE VIEW

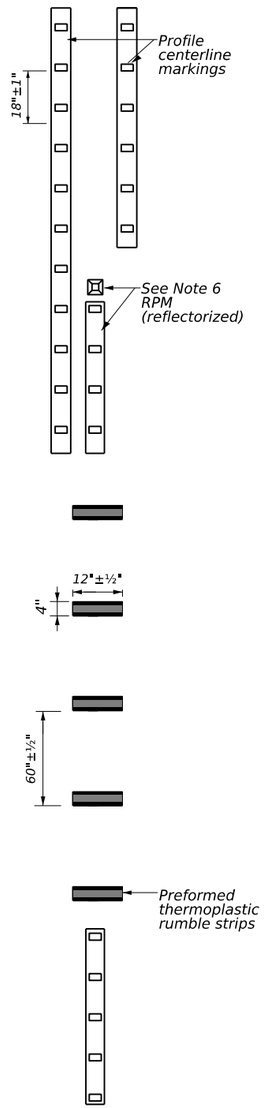


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edge line rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections or driveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.
12. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

13. See standard sheet RS(2).

Texas Department of Transportation

Traffic Safety Division Standard

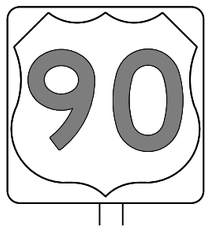
CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS RS(4)-23

FILE: rs(4)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
10-13 1-23	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA		93

DATE:
FILE:

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

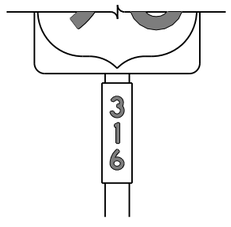
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING

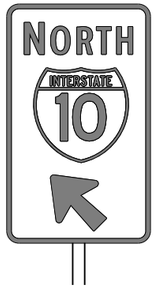


TYPICAL EXAMPLES

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

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





TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

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

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

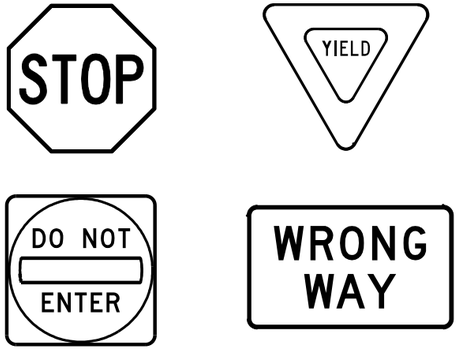
TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	LFK	ANGELINA		94

DATE:
FILE:

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

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



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

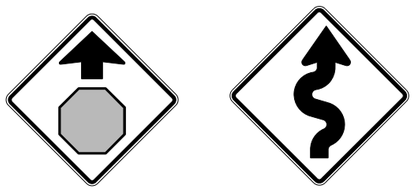
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

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

TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

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

GENERAL NOTES

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

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

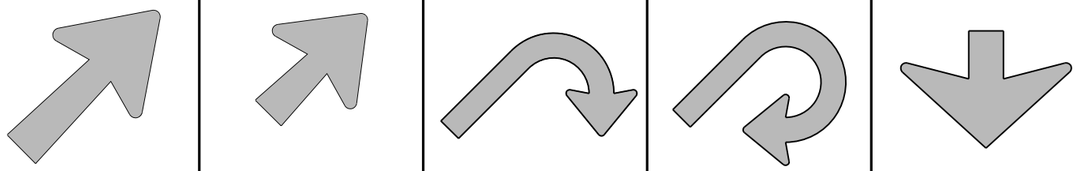
FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	LFK	ANGELINA		95

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

DATE:
FILE:

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

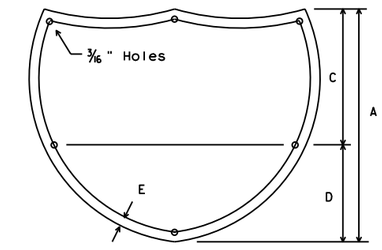
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

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

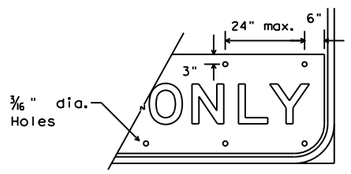
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

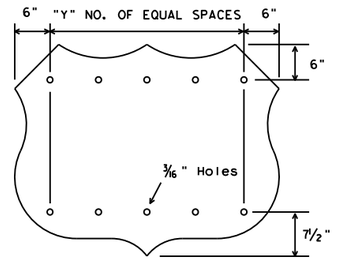


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

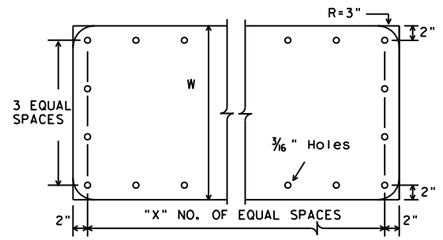


EXIT ONLY PANEL



U.S. ROUTE MARKERS

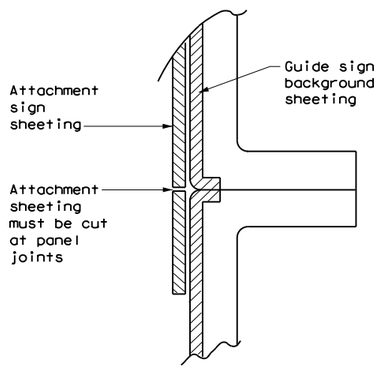
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

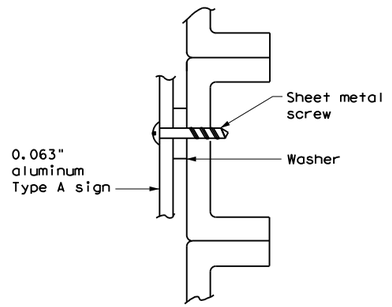
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



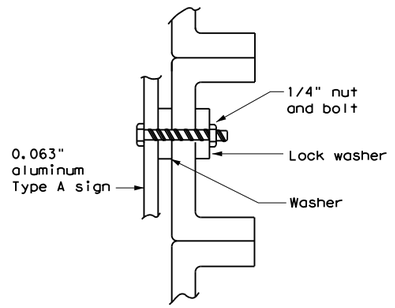
DIRECT APPLIED ATTACHMENT

NOTE:

1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



SCREW ATTACHMENT



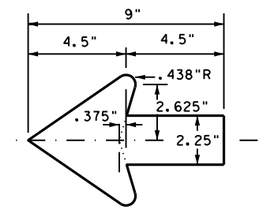
NUT/BOLT ATTACHMENT

NOTE:

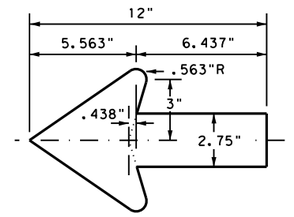
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0576	02	068, ETC.	FM 58
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	LFK	ANGELINA		96

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept in the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0576-02-068, ETC.

1.2 PROJECT LIMITS:
From: 1.25 Miles South of FM 2108

To: FM 1818

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 31.2468589 ,(Long) -94.7001682

END: (Lat) 31.1626120 ,(Long) -94.6649616

1.4 TOTAL PROJECT AREA (Acres): 60.24

1.5 TOTAL AREA TO BE DISTURBED (Acres): 45.18

1.6 NATURE OF CONSTRUCTION ACTIVITY:
Reconstruct and Widen Pavement to 28'.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Fine sandy loam	STA 313+00 TO STA 640+74

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):
PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☐ PSLs determined during preconstruction meeting
☐ PSLs determined during construction
☒ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

☒ Mobilization
☒ Install sediment and erosion controls
☐ Blade existing topsoil into windrows, prep ROW, clear and grub
☒ Remove existing pavement
☒ Grading operations, excavation, and embankment
☒ Excavate and prepare subgrade for proposed pavement widening
☒ Remove existing culverts, safety end treatments (SETs)
☐ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☒ Install culverts, culvert extensions, SETs
☐ Install mow strip, MBGF, bridge rail
☐ Place flex base
☒ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☒ Revegetation of unpaved areas
☒ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

☒ Sediment laden stormwater from stormwater conveyance over disturbed area
☒ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☒ Solvents, paints, adhesives, etc. from various construction activities
☒ Transported soils from offsite vehicle tracking
☒ Construction debris and waste from various construction activities
☒ Contaminated water from excavation or dewatering pump-out water
☒ Sanitary waste from onsite restroom facilities
☒ Trash from various construction activities/receptacles
☒ Long-term stockpiles of material and waste
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.11 RECEIVING WATERS:
Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
BEAR CREEK	0604
ONE EYE CREEK	0604
BILOXI CREEK	0604

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☐ Submit NOI/CSN to local MS4
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☐ Submit NOI/CSN to local MS4
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

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

MS4 Entity

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
AF852E728AEC4C0...
3/27/2023

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
		97

STATE	STATE DIST.	COUNTY	
TEXAS	LFK	ANGELINA	
CONT.	SECT.	JOB	HIGHWAY NO.
0576	02	068, ETC.	FM 58

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- ☐ ☐ Protection of Existing Vegetation
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☐ ☐ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☒ ☐ Temporary Seeding
- ☐ ☐ Permanent Planting, Sodding or Seeding
- ☐ ☐ Biodegradable Erosion Control Logs
- ☒ ☐ Rock Filter Dams/ Rock Check Dams
- ☒ ☐ Vertical Tracking
- ☐ ☐ Interceptor Swale
- ☒ ☐ Riprap
- ☐ ☐ Diversion Dike
- ☐ ☐ Temporary Pipe Slope Drain
- ☐ ☐ Embankment for Erosion Control
- ☐ ☐ Paved Flumes
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- ☐ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- ☒ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☒ ☐ Sediment Control Fence
- ☒ ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Vegetated Filter Strips
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

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

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- ☐ ☐ Sediment Trap
  - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - ☐ 3,600 cubic feet of storage per acre drained
- ☐ ☐ Sedimentation Basin
  - ☐ Not required (<10 acres disturbed)
  - ☐ Required (>10 acres) and implemented.
    - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - ☐ 3,600 cubic feet of storage per acre drained
  - ☒ Required (>10 acres), but not feasible due to:
    - ☒ Available area/Site geometry
    - ☒ Site slope/Drainage patterns
    - ☐ Site soils/Geotechnical factors
    - ☐ Public safety
    - ☐ Other: _____

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3 .

2.9 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
AF852E728AEC4C0...
P.E.

3/27/2023

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			98
STATE	STATE DIST.	COUNTY	
TEXAS	LFK	ANGELINA	
CONT.	SECT.	JOB	HIGHWAY NO.
0576	02	068, ETC.	FM 58

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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 has a soil disturbance of 5 acres or more; therefore, the following actions are required:

1. Prevent Stormwater Pollution by controlling erosion and sedimentation in accordanceto TPDES CGP Permit TXR150000.

2. Comply with SWP3 site plan and revise when necessary to control pollution or required by Engineer.

3. Posting of Large Construction Site Notice with Cosntruction and SWP3 info on or near site accessible to the public and TCEQ, EPA, or other insptectors. Notice of Intent (NOI) is required to be file with TCEQ and Notice of Termination (NOT) is required to be filed with TCEQ when final stabilization has been achieved.

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:_____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1. Un-named creeks and streams

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☒ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☒ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☒ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☐ No Action Required ☒ Required Action

Action No.

1. Official State Historical Markers and paved turnout is located on the west side of FM 58 at the Beulah Community Center between Stations 553+00 to 558+00. No storage of materials or equipment is allowed near the marker location. Contractor is responsible for preventing damage to the marker during the entire construction project. Contractor to repair or replace in kind, at his own expense, any historic marker damaged in the course of executing the work. Contractor is responsible for locating replacement sources for historic materials damaged in the course of work. If the marker is damaged, contact the Lufkin District Environmental Section at 1-800-687-8087. TxDOT - Environmental Affairs Division would be informed of proposed repairsto consult with Texas Historical Commission prior to execution of repair work.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ No Action Required ☐ Required Action

Action No.

1. N/A

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

☐ 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), construction activities that may affect nests (i.e. tree removal, 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.

1. Eastern box turtle, Timber rattlesnake and Neches Crayfish and may occur in the project area. Avoid harming species if encountered and allow them to safely leave the project area.

2. Inspect excavation areas, if any, prior to backfill for trapped wildlife. Examine heavy equipment stored on site before use, particularly after rain events, to ensure use will not harm wildlife that may be seeking refuge.

3. Avoid or minimize disturbing burrows, debris. or leaf litter, where feasible. Project specific locations (PSLs) proposed within the state-owned ROW should be located in uplands away from aquatic features.

4. Install and maintain Water Quality BMPs associated with Section 404 & 401 permits (i.e. silt fence, rock filter dams, avoid/minimize impacts to WOTUS, etc.) around creeks and streams that cross the project area to avoid impacts to aquatic wildlife.

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 constructionand making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.
Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.
Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1. N/A

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1. N/A

Texas Department of Transportation — Design Division Standard

EPIC

(ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)

SHEET 1 OF 2

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
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05-07-14 ADDED NOTE SECTION IV.	LFK	ANGELINA		99
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.				

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

Texas Department of Transportation

EPIC

(ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)

SHEET 2 OF 2

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
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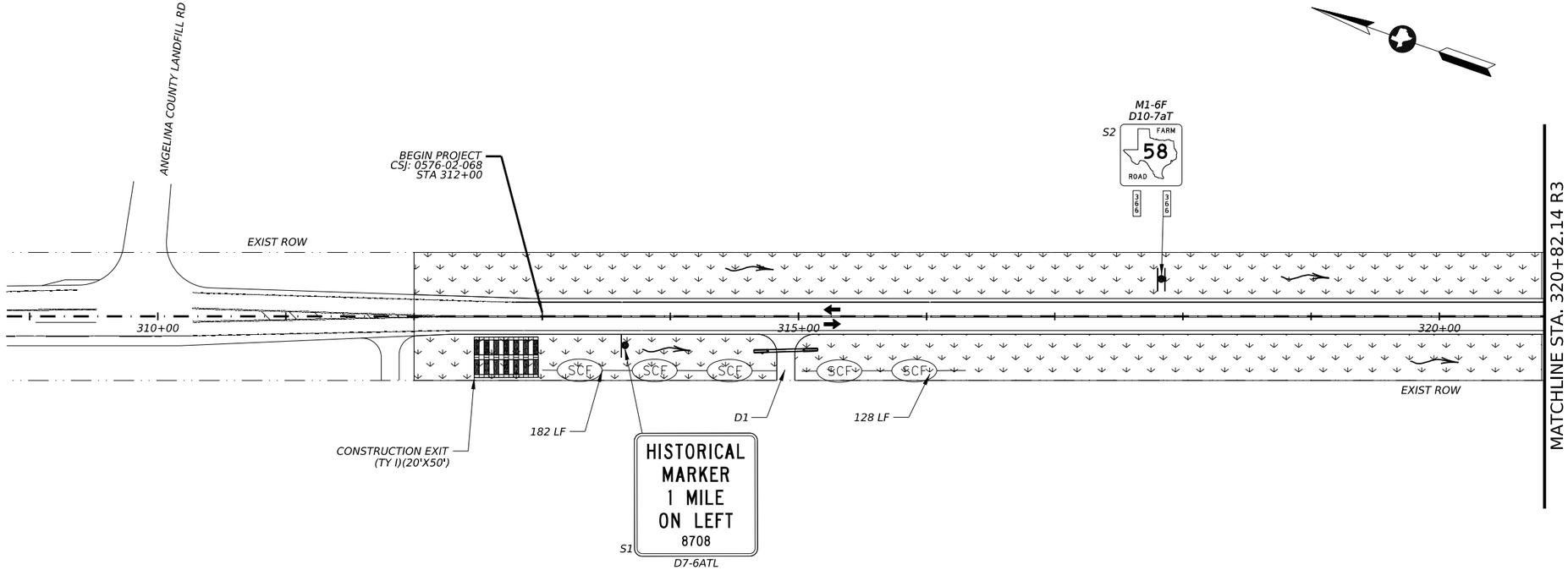

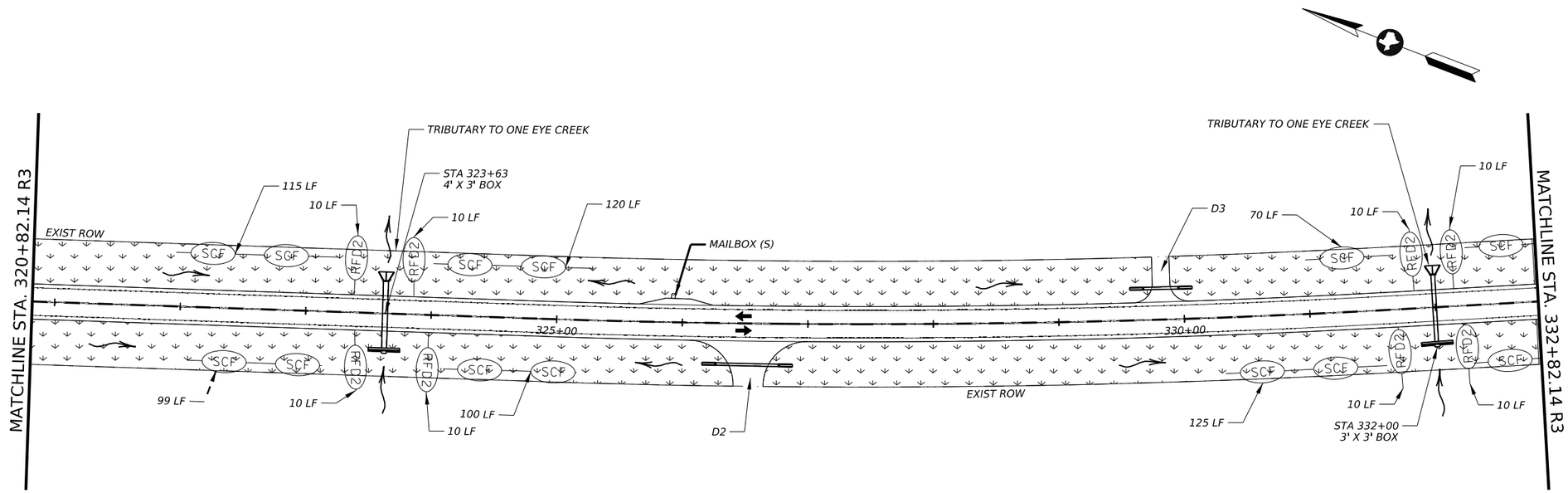

LEGEND

- SCF — SEDIMENT FENCE
- RFD2 — ROCK FILTER DAM (TY II)
- FLOW DIRECTION
- EXIST ROW
- LIMITS OF SEEDING/ AREA OF DISTURBANCE
- MAIL BOX
- D ## — DRIVEWAY ID
- S## — SIDE ROAD ID
- S## — SIGN ID
- CONSTRUCTION EXIT

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

2. 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.

SCALE 1" = 100'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

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3/27/2023

Texas Department of Transportation

ENVIRONMENTAL LAYOUT SHEETS

SHEET 1 OF 14

CONT	SECT	JOB	HIGHWAY
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LFK	ANGELINA		101

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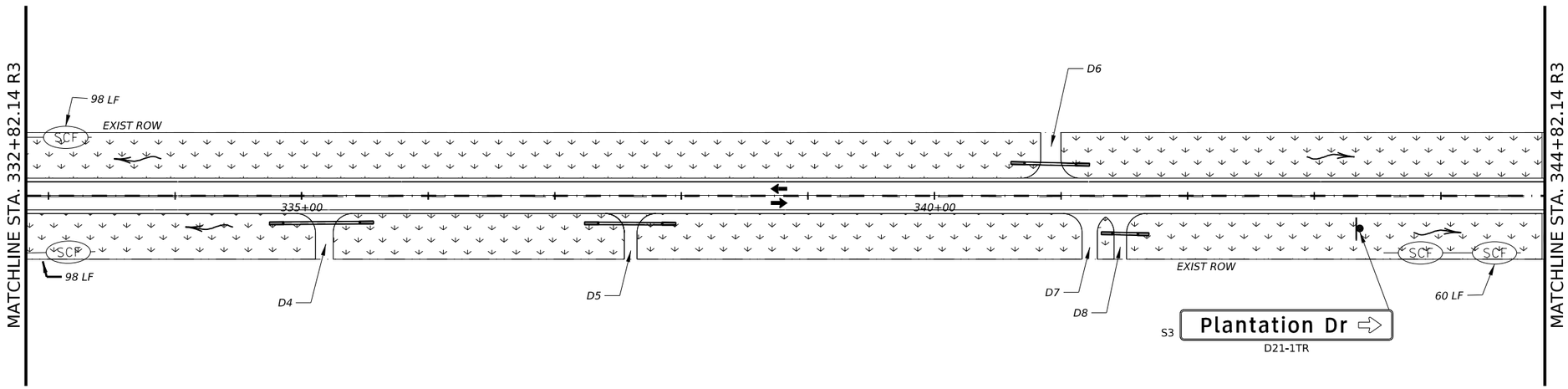

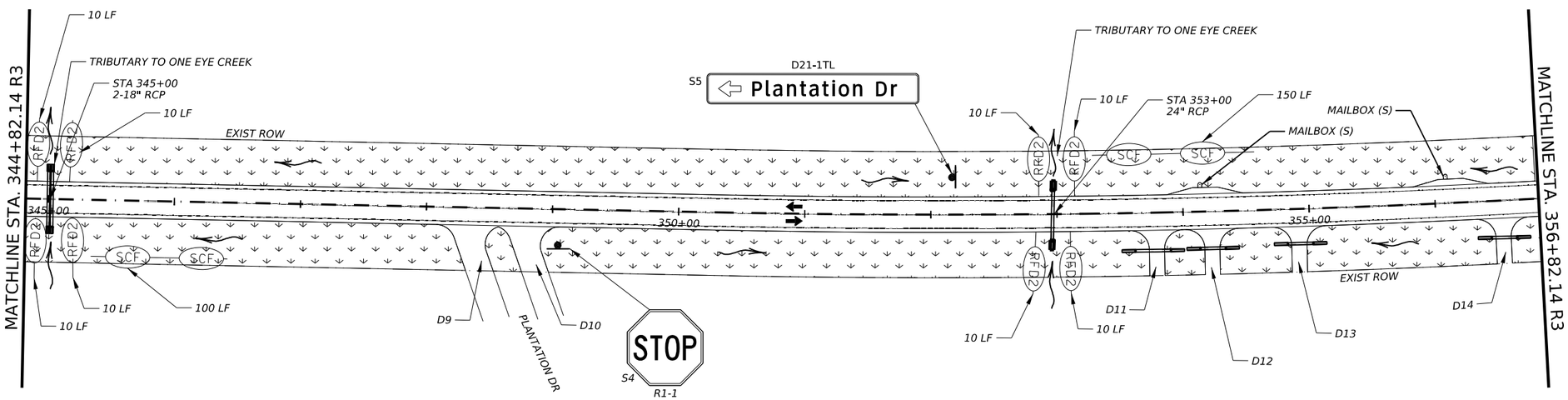

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ENVIRONMENTAL LAYOUT SHEETS

SHEET 2 OF 14

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LFK	ANGELINA		102

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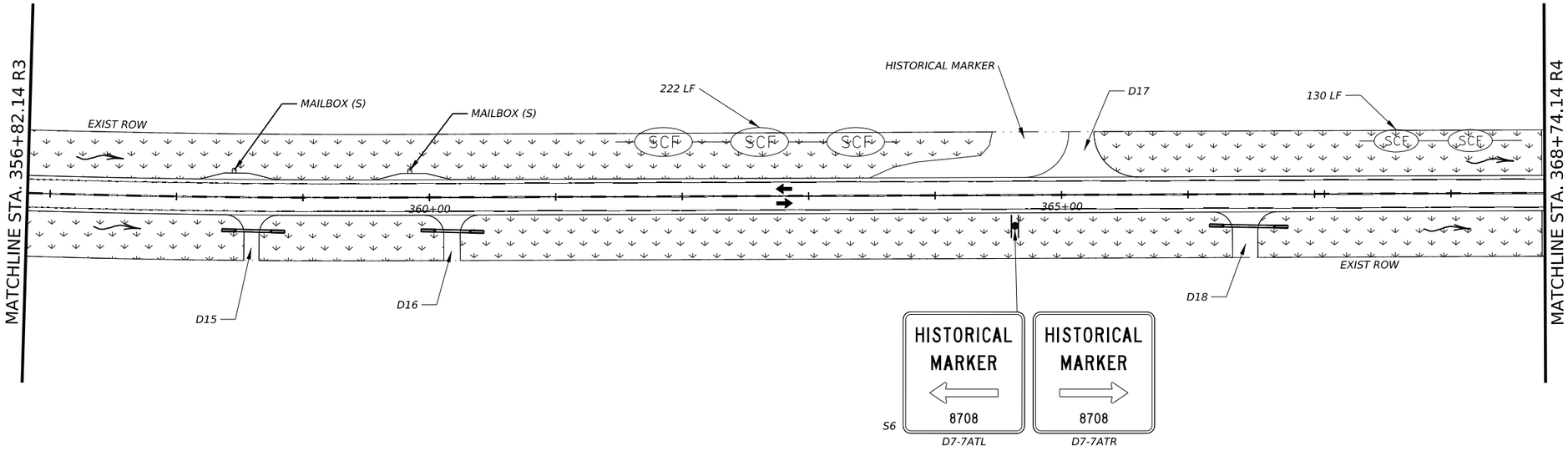

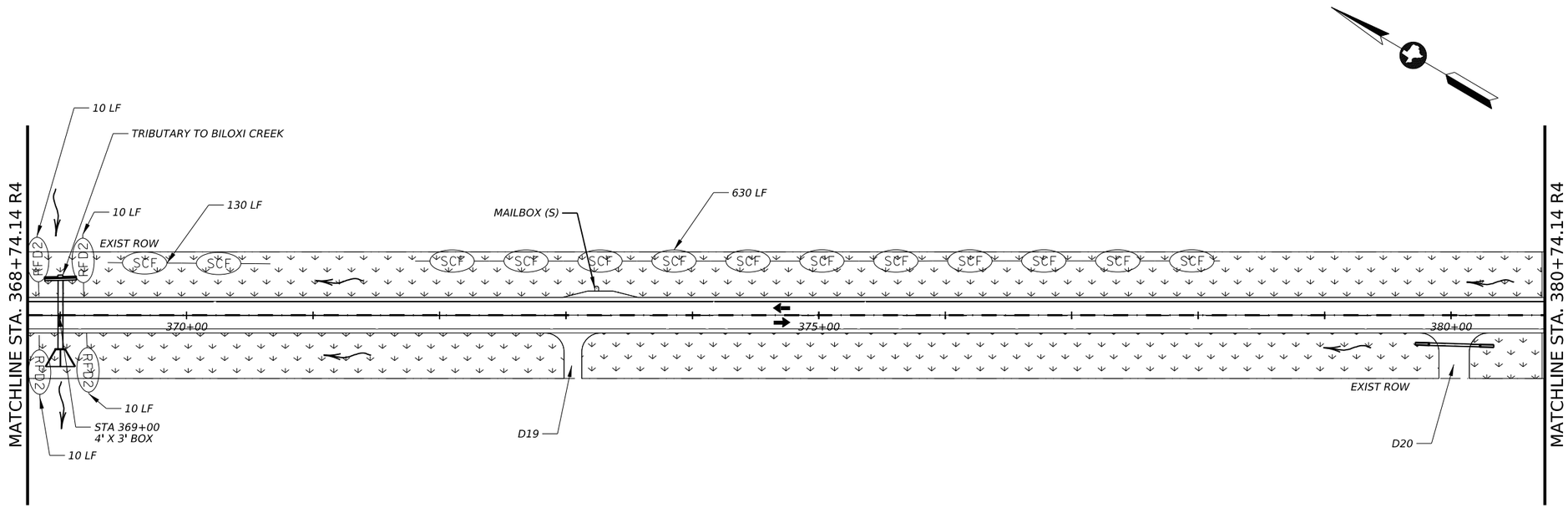

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ENVIRONMENTAL LAYOUT SHEETS

SHEET 3 OF 14

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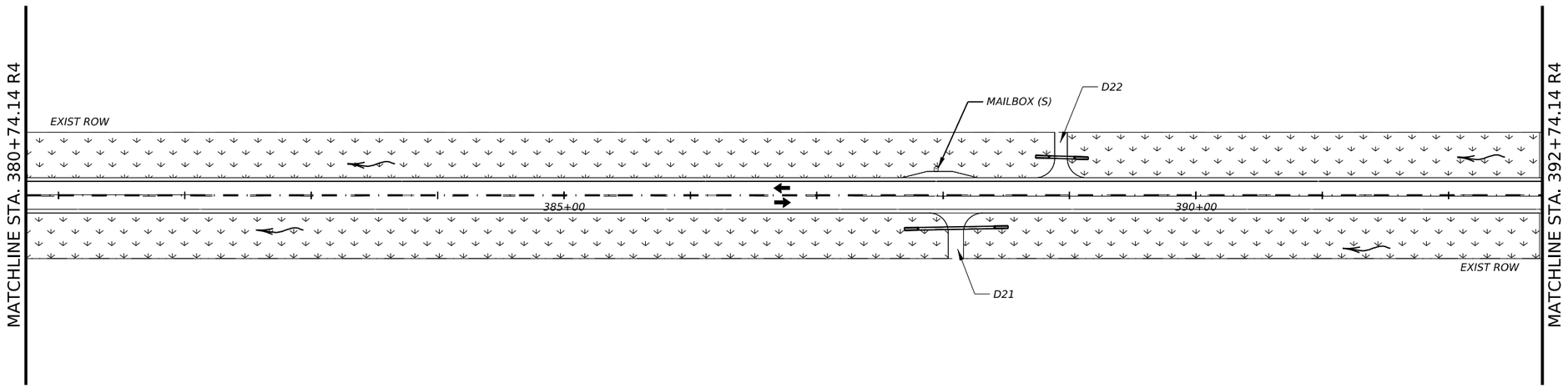

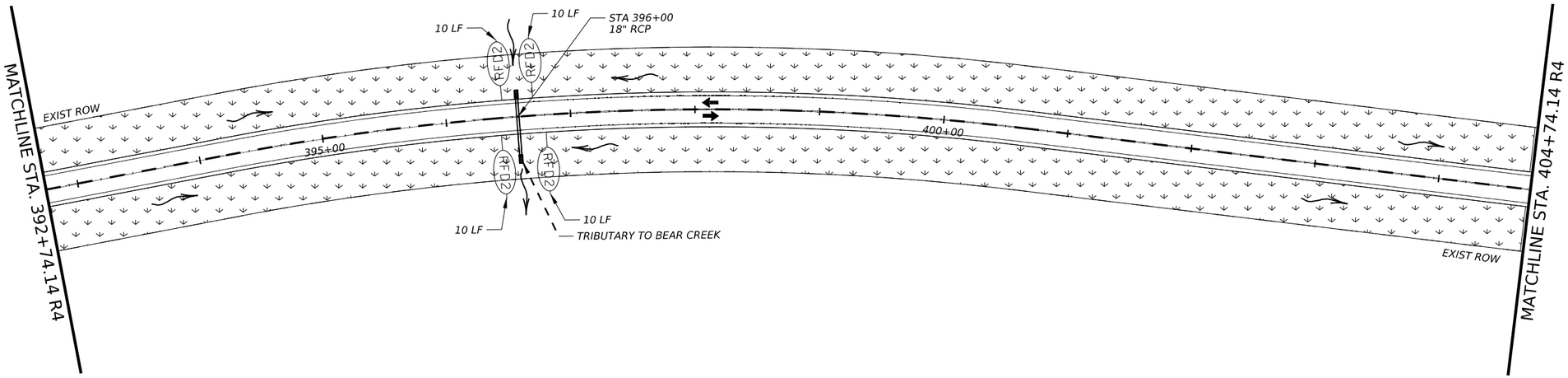

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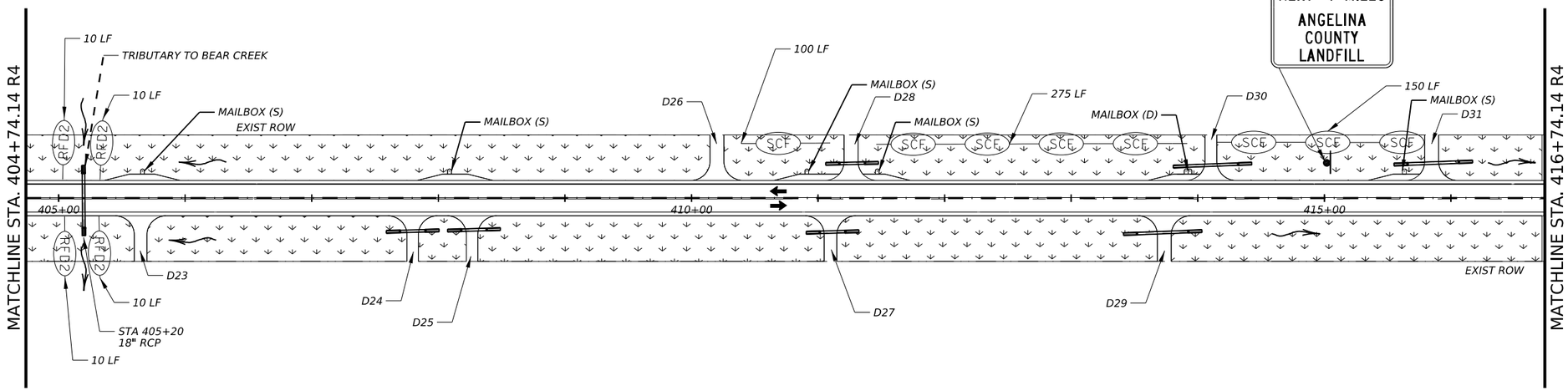

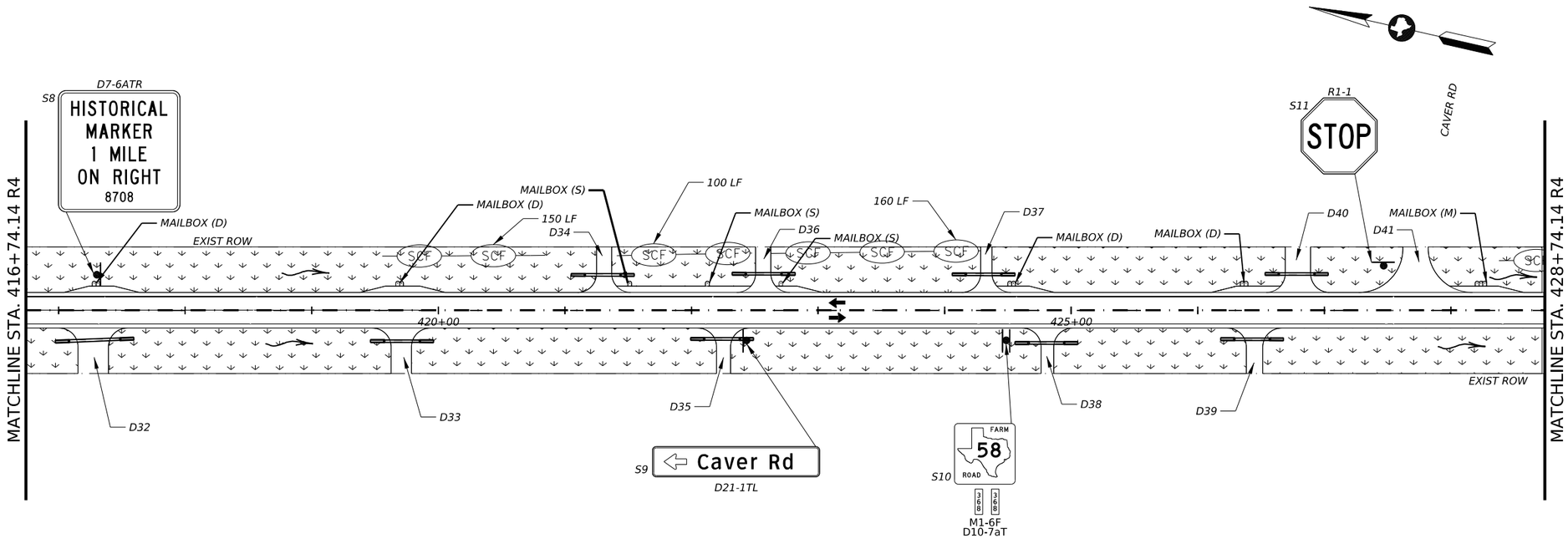

LEGEND

- SCF — SEDIMENT FENCE
- RFD2 — ROCK FILTER DAM (TY II)
- FLOW DIRECTION
- EXIST ROW
- LIMITS OF SEEDING/ AREA OF DISTURBANCE
- MAIL BOX
- D ## — DRIVEWAY ID
- S## — SIDE ROAD ID
- S## — SIGN ID
- CONSTRUCTION EXIT

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SCALE 1" = 100'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
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3/27/2023

Texas Department of Transportation

ENVIRONMENTAL LAYOUT SHEETS

SHEET 5 OF 14

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		105

DATE: 3/27/2023 10:30:05 AM
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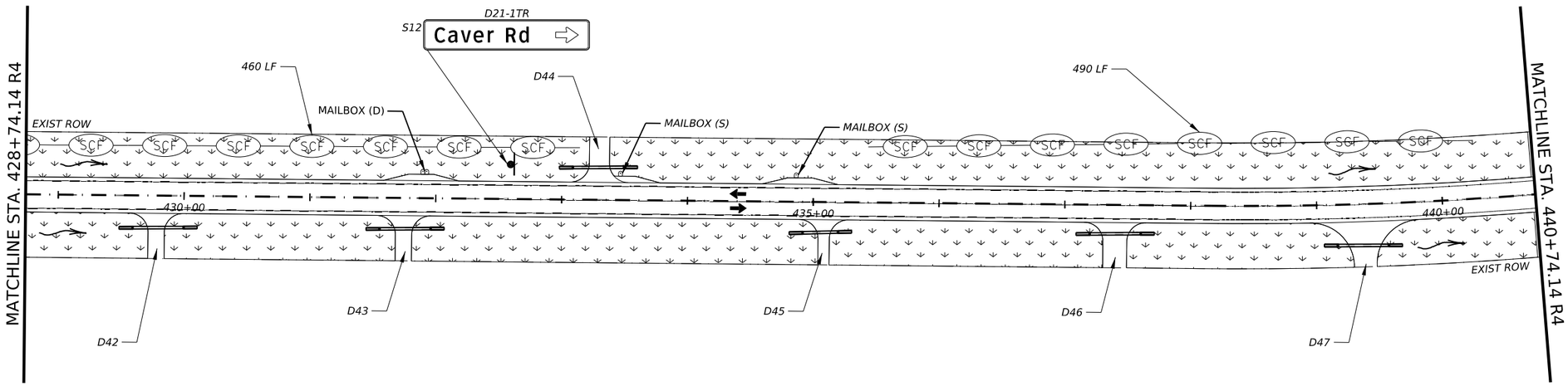

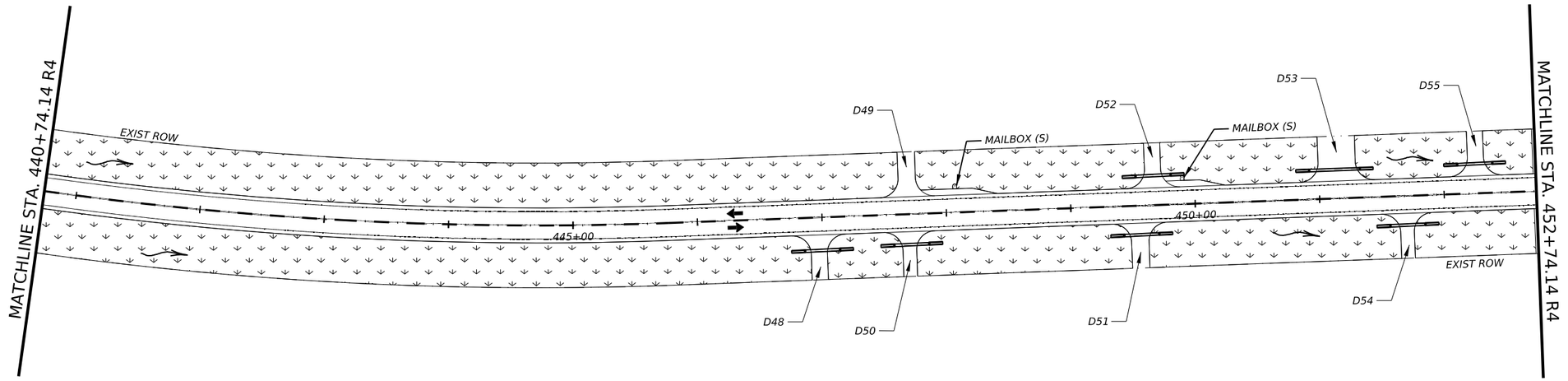

LEGEND

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ENVIRONMENTAL LAYOUT SHEETS

SHEET 6 OF 14

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		106

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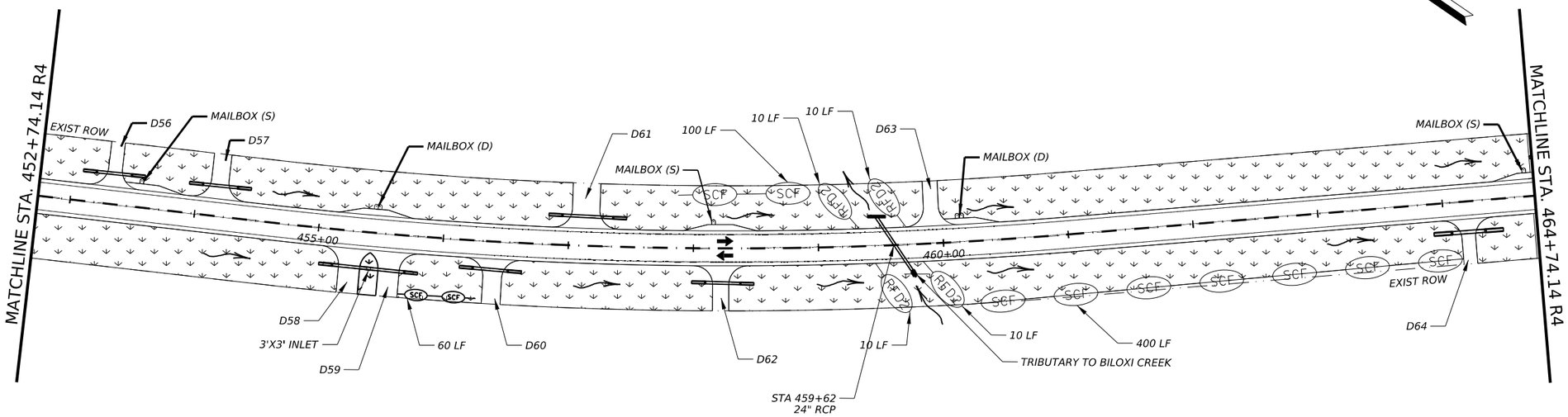

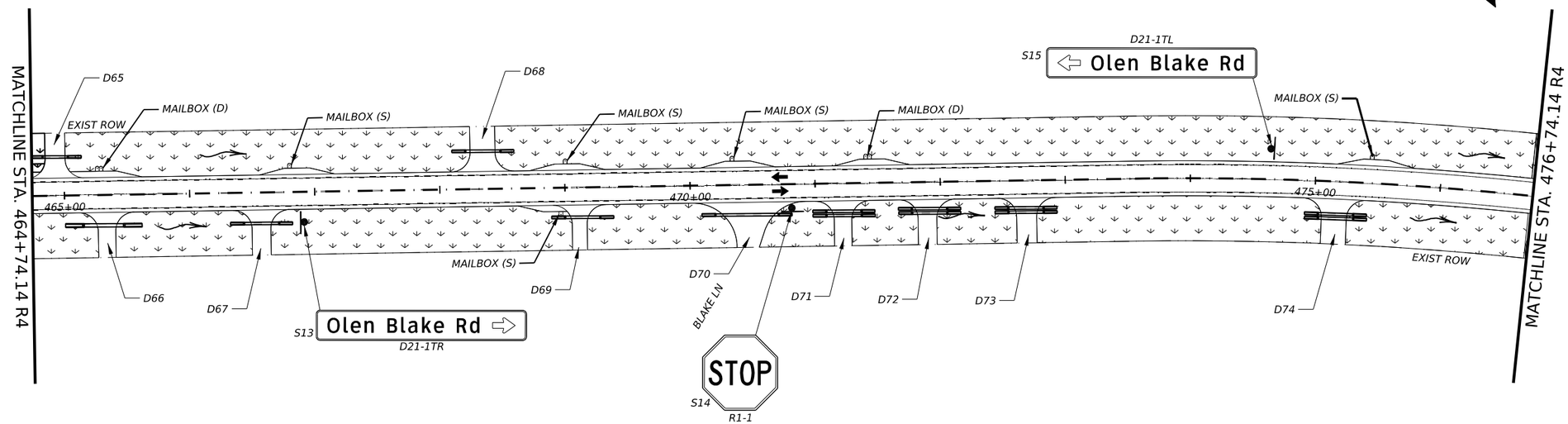

LEGEND

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ENVIRONMENTAL LAYOUT SHEETS

SHEET 7 OF 14

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		107

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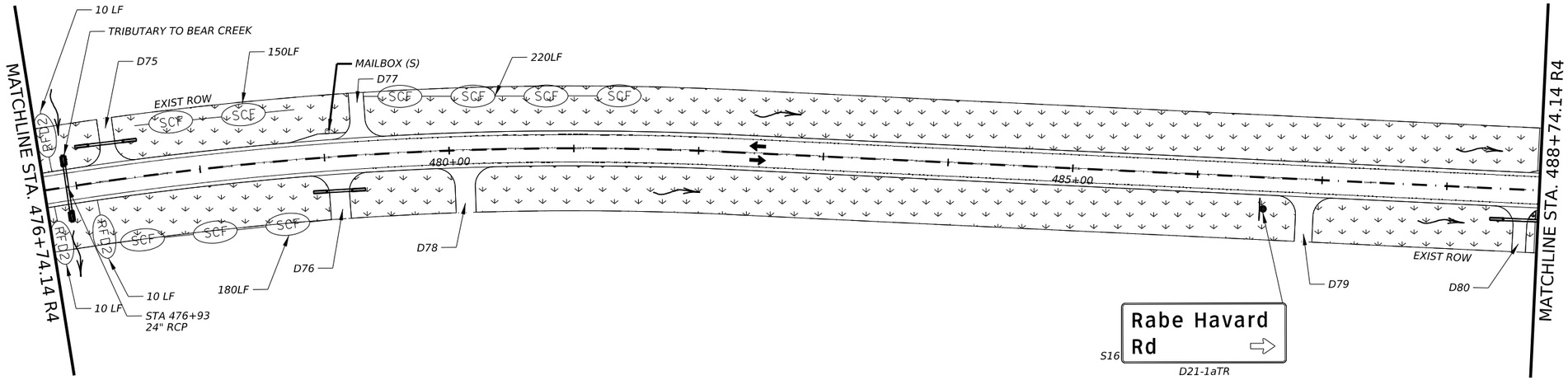

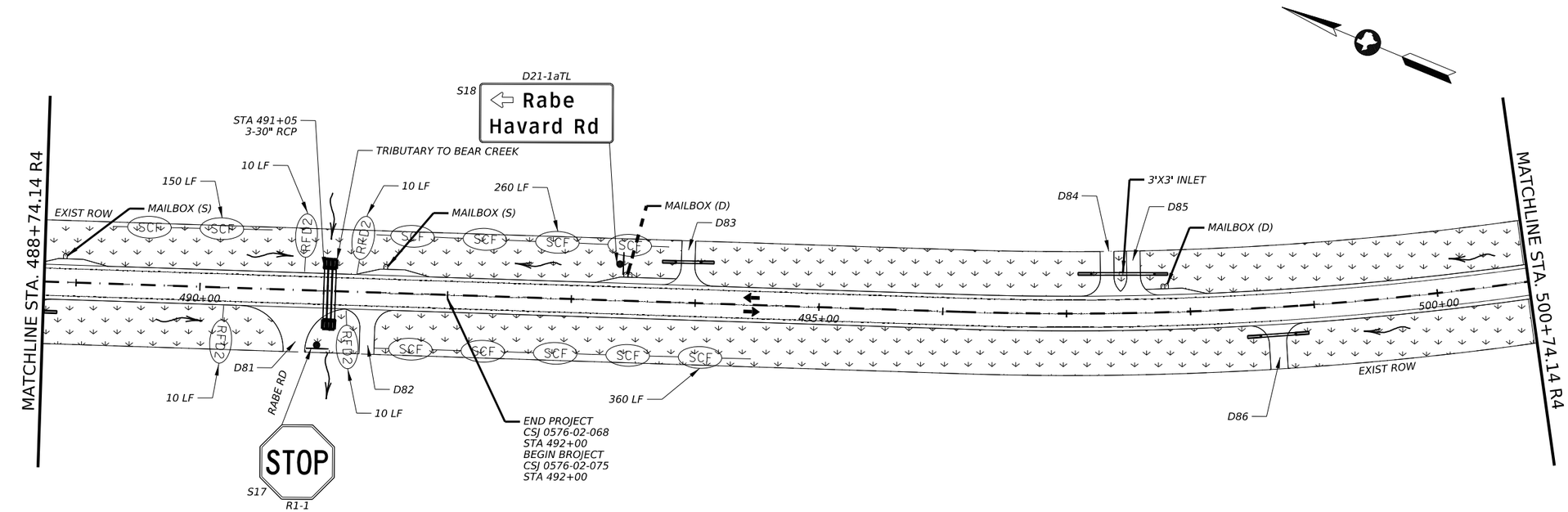

LEGEND

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- RFD2 — *ROCK FILTER DAM (TY II)*
- *FLOW DIRECTION*
- *EXIST ROW*
- *LIMITS OF SEEDING/ AREA OF DISTURBANCE*
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3/27/2023

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ENVIRONMENTAL LAYOUT SHEETS

SHEET 8 OF 14

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		108

DATE: 3/27/2023 10:30:58 AM
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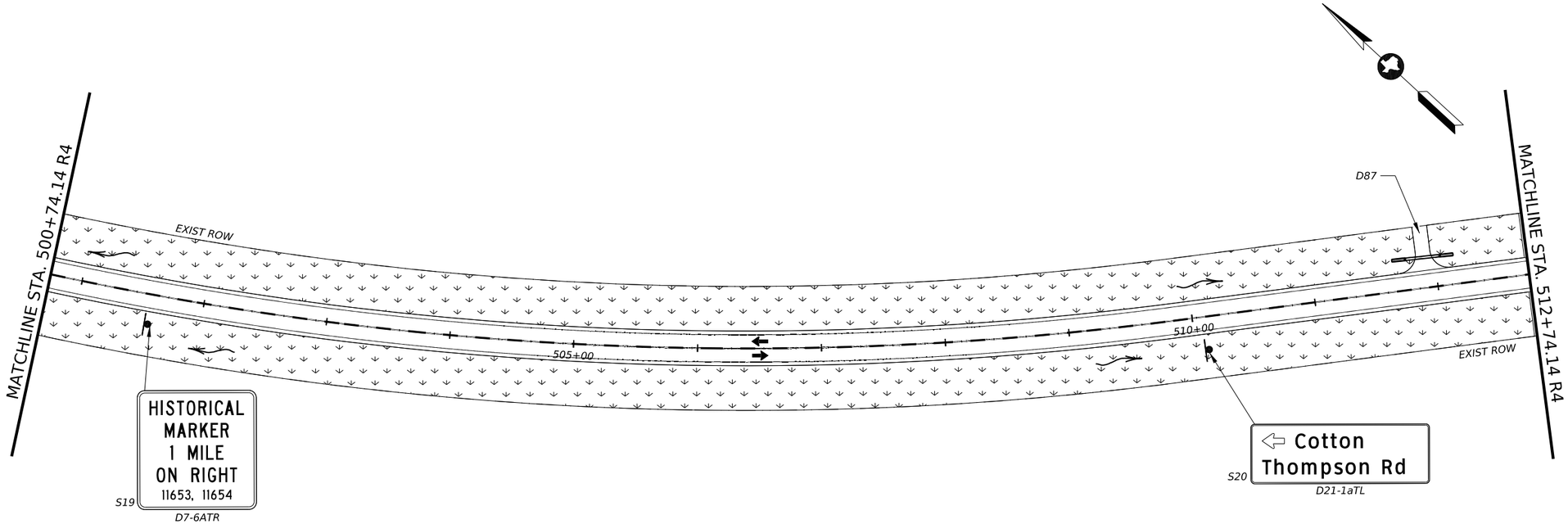

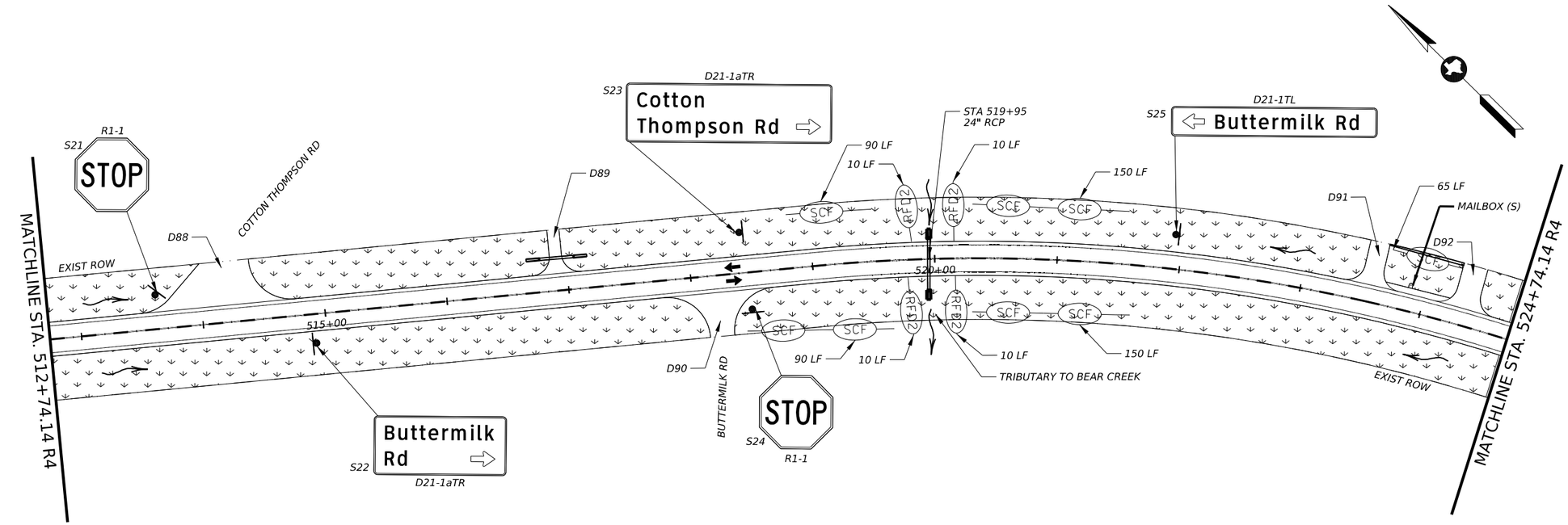

LEGEND

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3/27/2023

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ENVIRONMENTAL LAYOUT SHEETS

SHEET 9 OF 14

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		109

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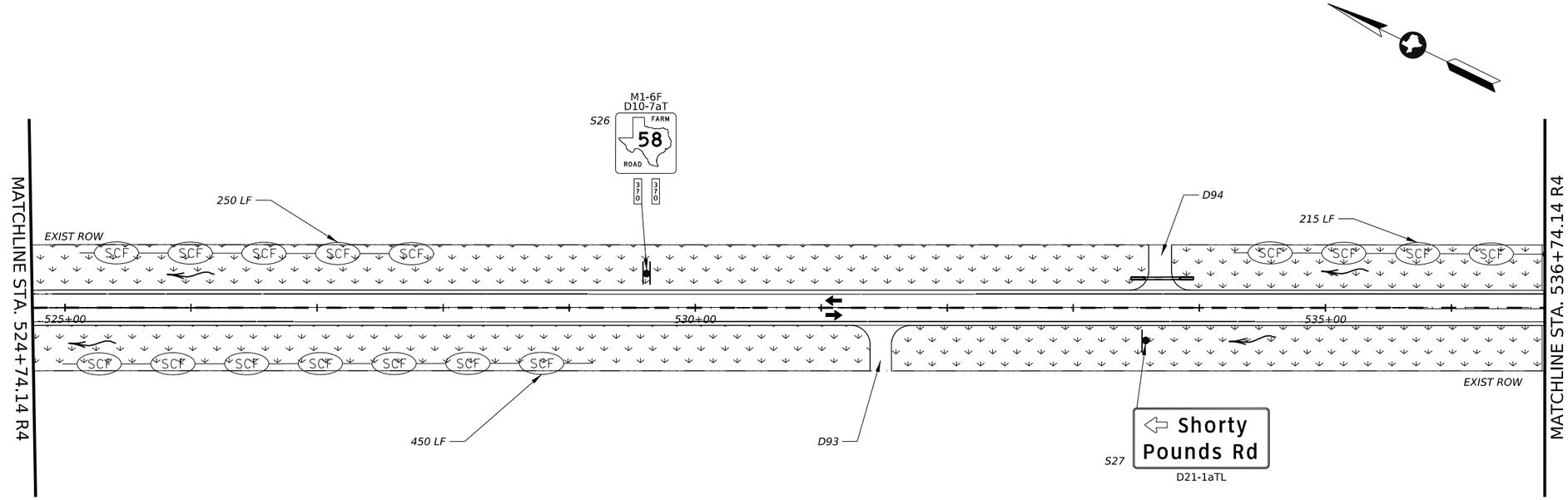

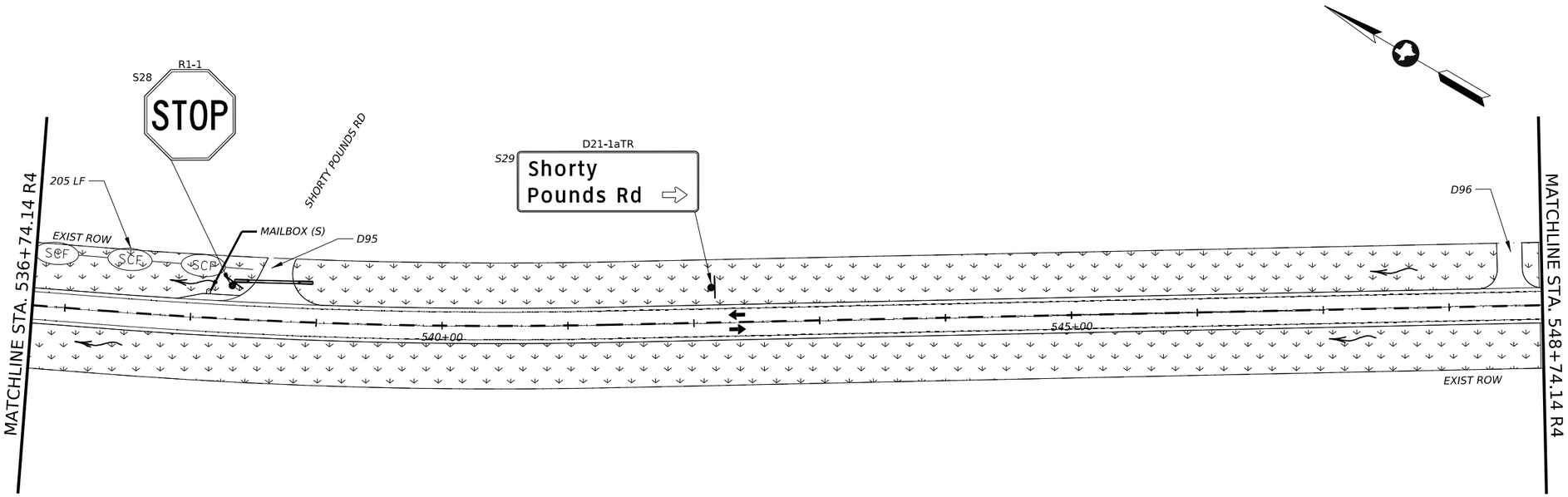

LEGEND

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ENVIRONMENTAL LAYOUT SHEETS

SHEET 10 OF 14

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		110

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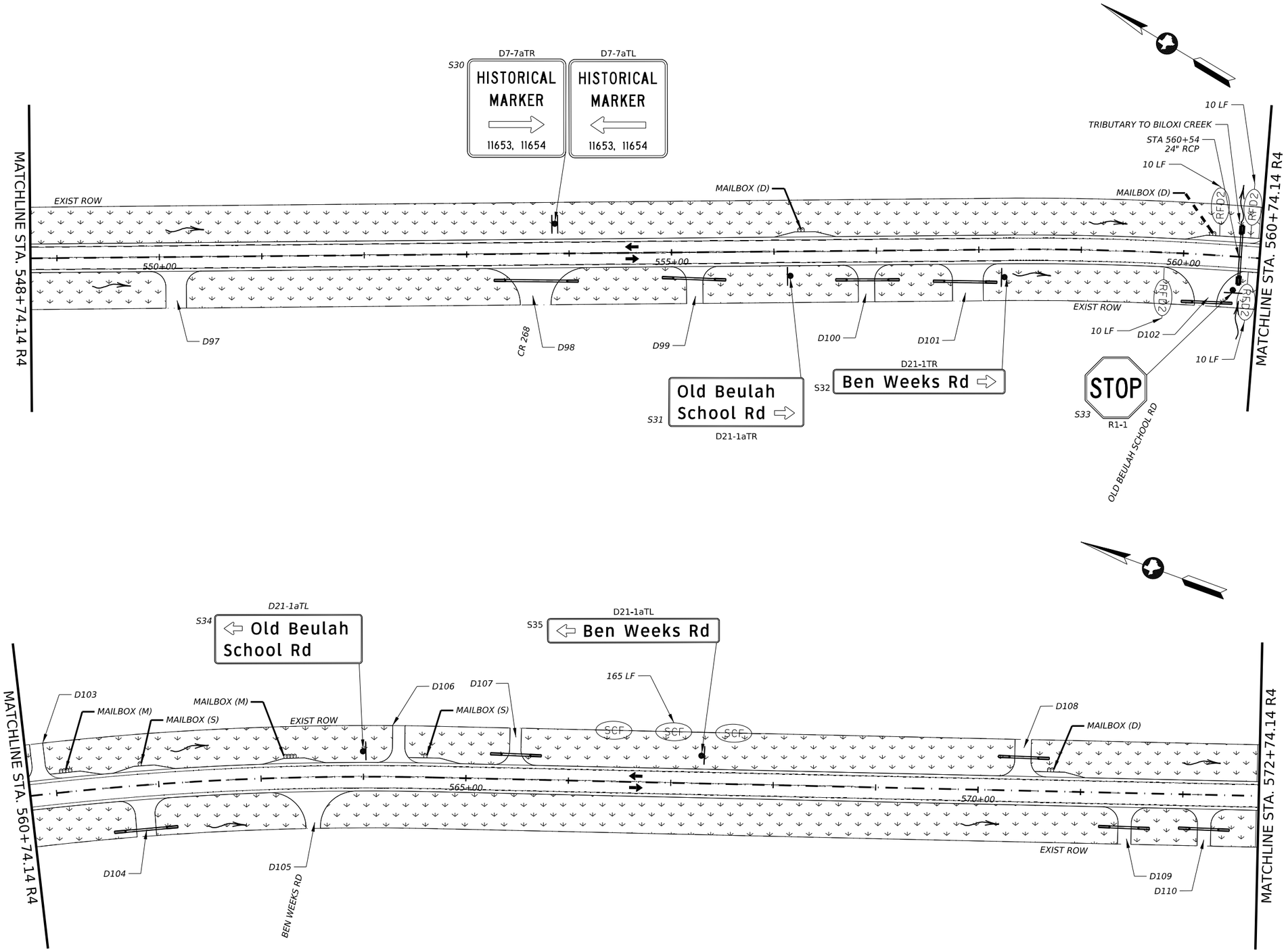

LEGEND

SCF	SEDIMENT FENCE
RFD2	ROCK FILTER DAM (TY II)
	FLOW DIRECTION
	EXIST ROW
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ENVIRONMENTAL LAYOUT SHEETS

SHEET 11 OF 14

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		111

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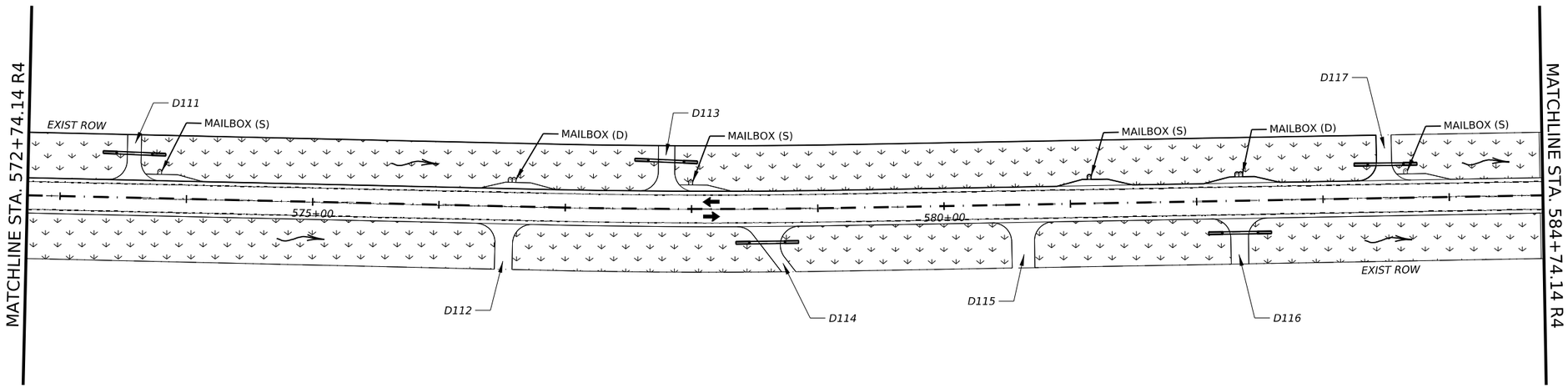

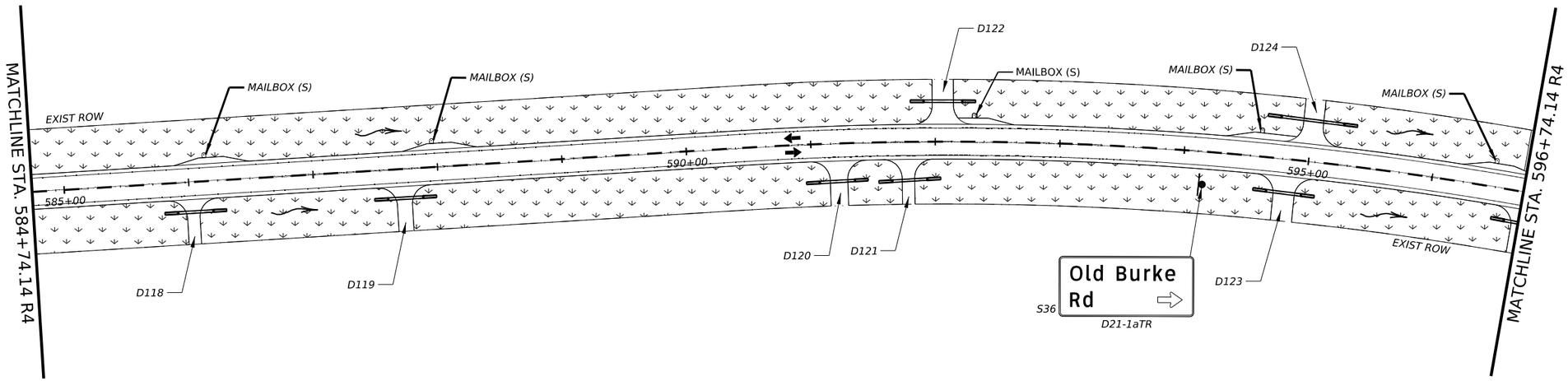

LEGEND

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3/27/2023

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ENVIRONMENTAL LAYOUT SHEETS

SHEET 12 OF 14

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		112

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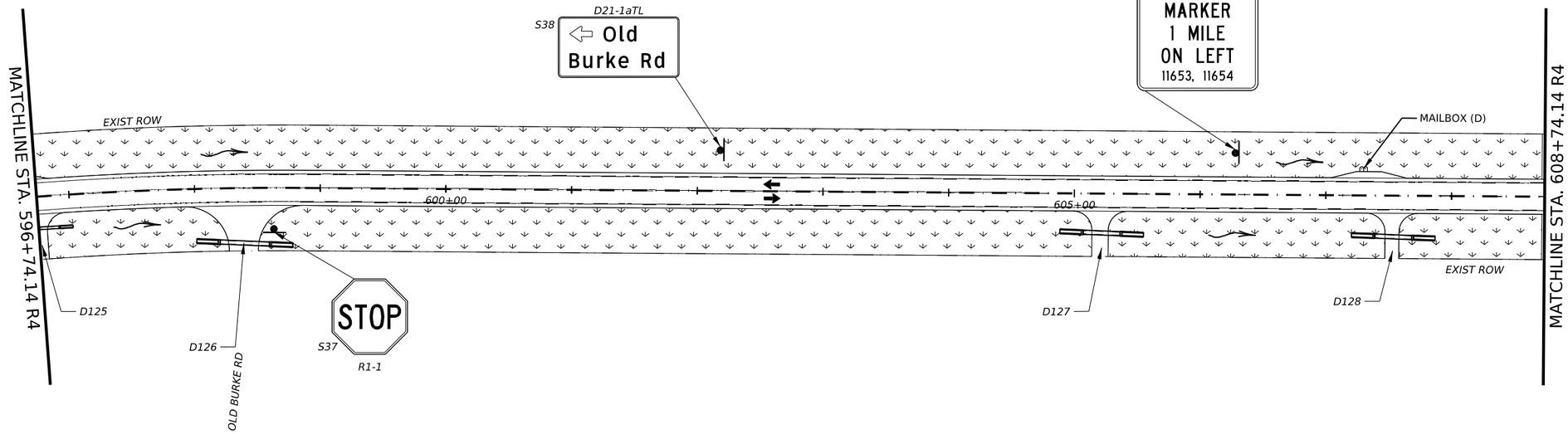

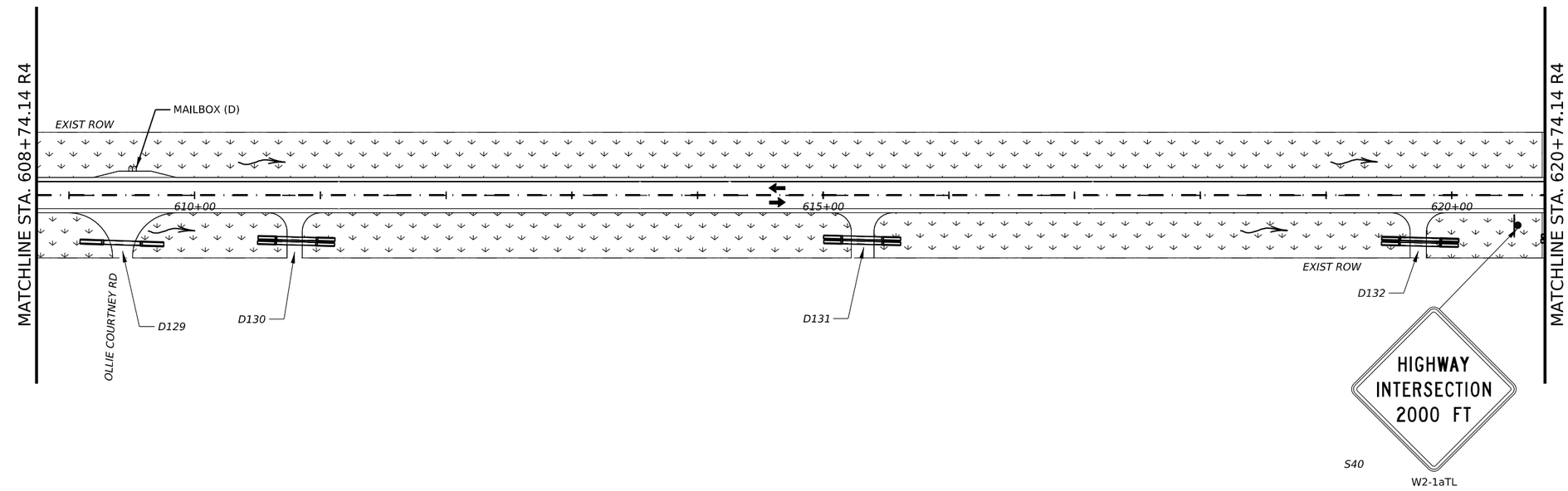

LEGEND

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ENVIRONMENTAL LAYOUT SHEETS

SHEET 13 OF 14

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		113

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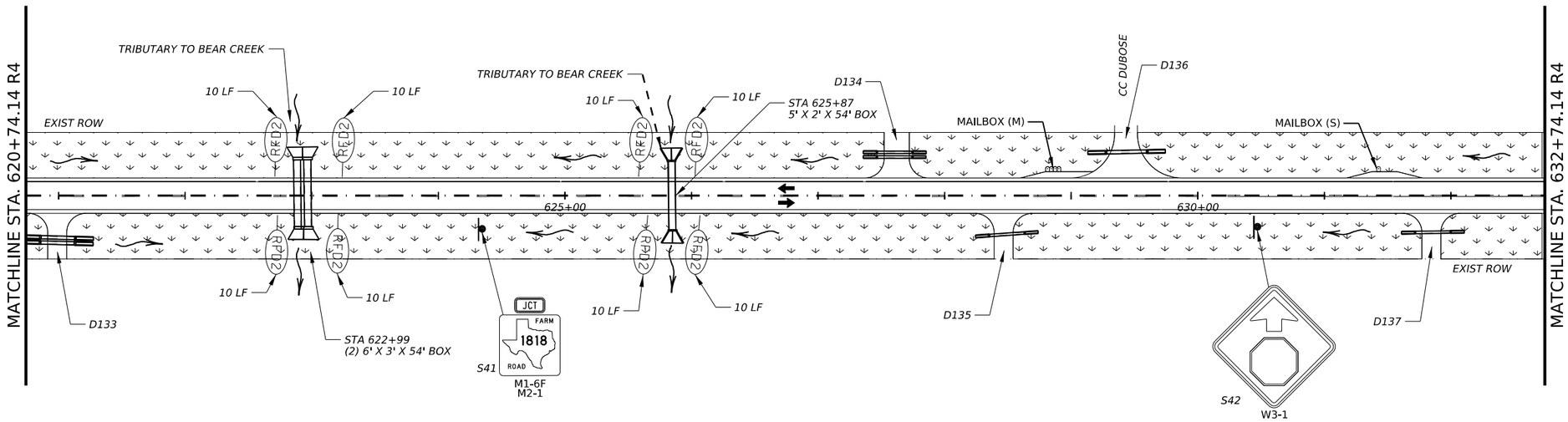

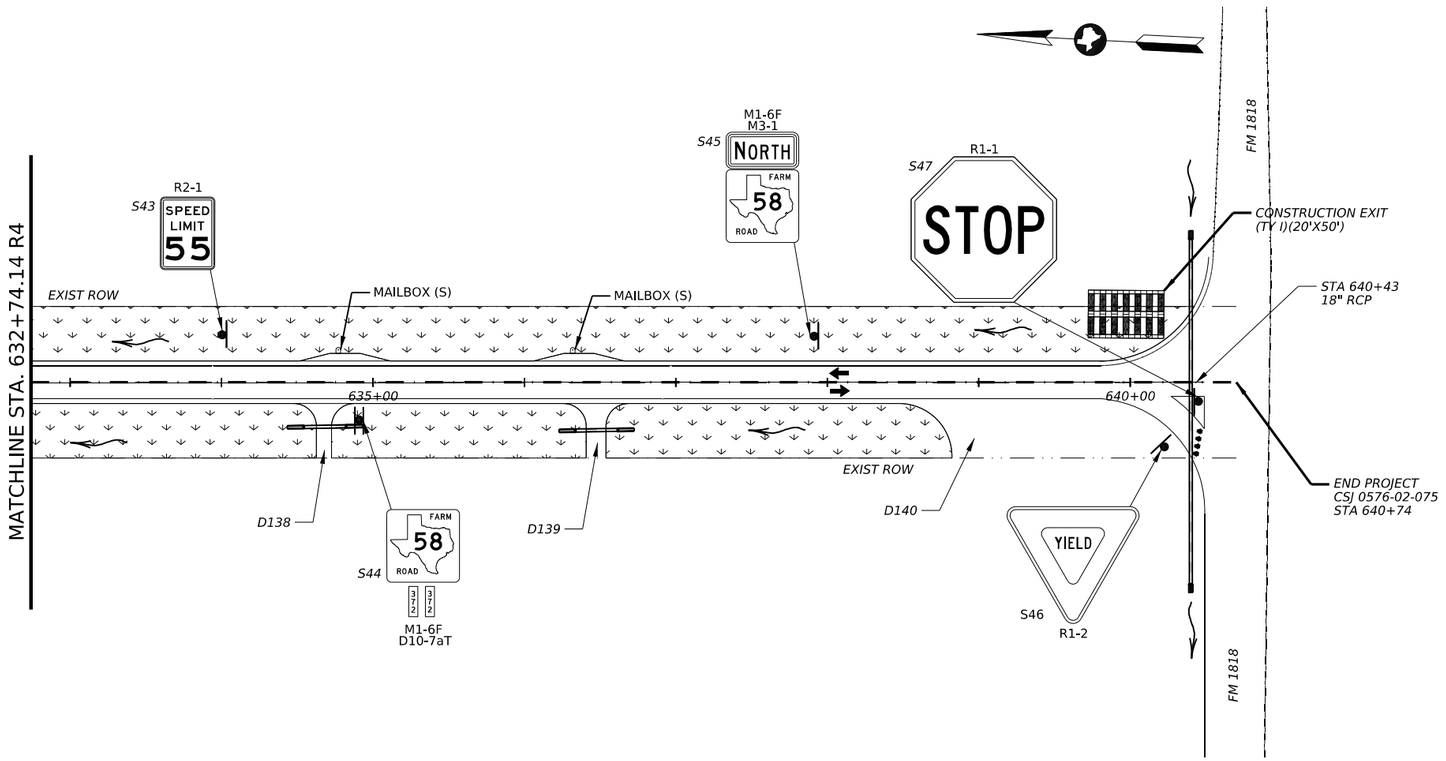

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ENVIRONMENTAL LAYOUT SHEETS

SHEET 14 OF 14

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		114

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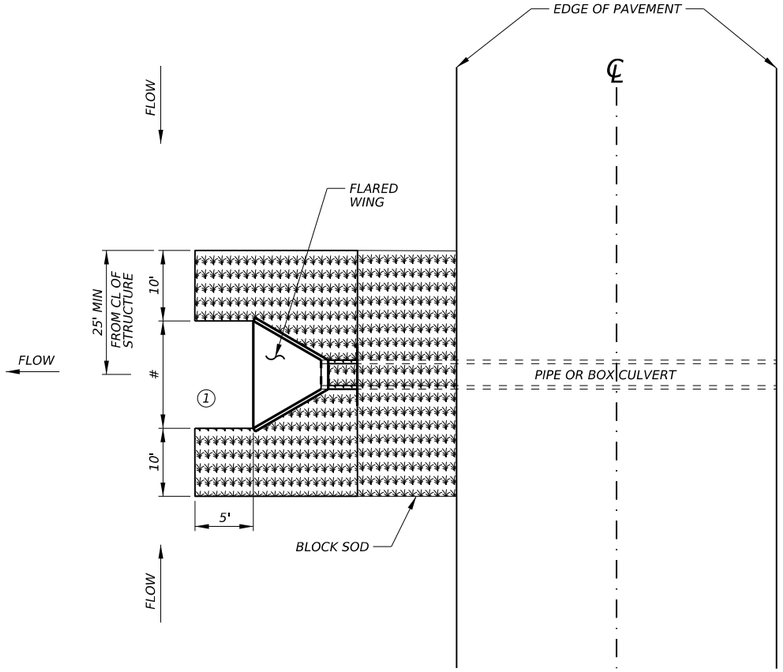
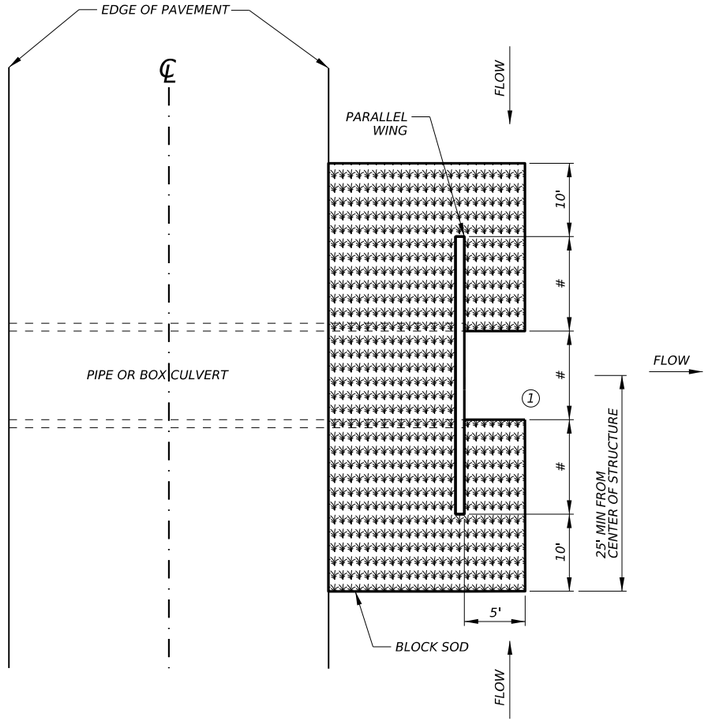


CROSSROAD CULVERT W/FLARED WING

PLACE AT ALL FLARED WING CROSS
DRAINAGE STRUCTURE WORK IS PROPOSED



CROSSROAD CULVERT W/PARALLEL WING

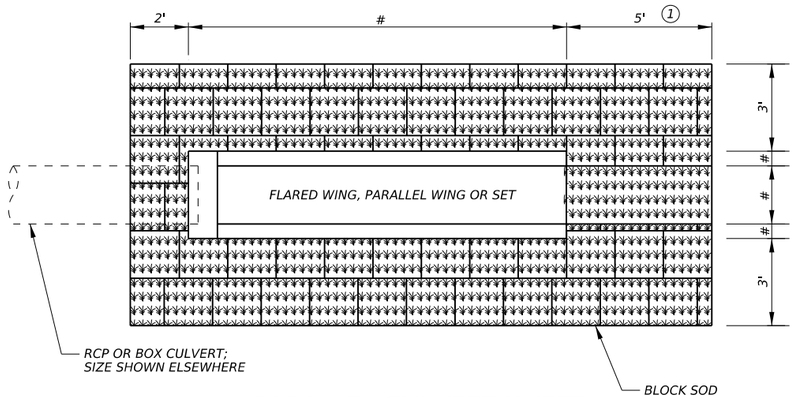
PLACE AT ALL PARALLEL WING CROSS
DRAINAGE STRUCTURE WORK IS PROPOSED

SYMBOL	DESCRIPTION
	BLOCK SODDING

1. DO NOT PLACE BLOCK SOD WHERE RIPRAP (STONE COMMON) IS INSTALLED.

DIMENSION VARIES

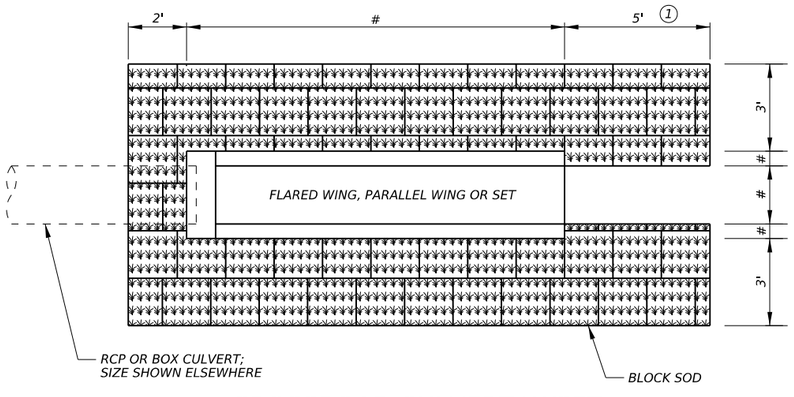
N.T.S.



PARALLEL CULVERT W/SET

PLACE AT ALL PARALLEL CULVERTS
WHERE WORK IS PROPOSED.

MIN REQUIRED SOD AREA	
WIDTH	SY
15"	13
18"	14
24"	17
30"	20
36"	22



CROSSROAD CULVERT W/SET

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

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BLOCK SOD DETAILS

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		115

DATE: 3/27/2023 10:33:02 AM
FILE: c:\txdot\pw_online\txdot31\lauren.perry\d0509456\Block Sod Details.dgn

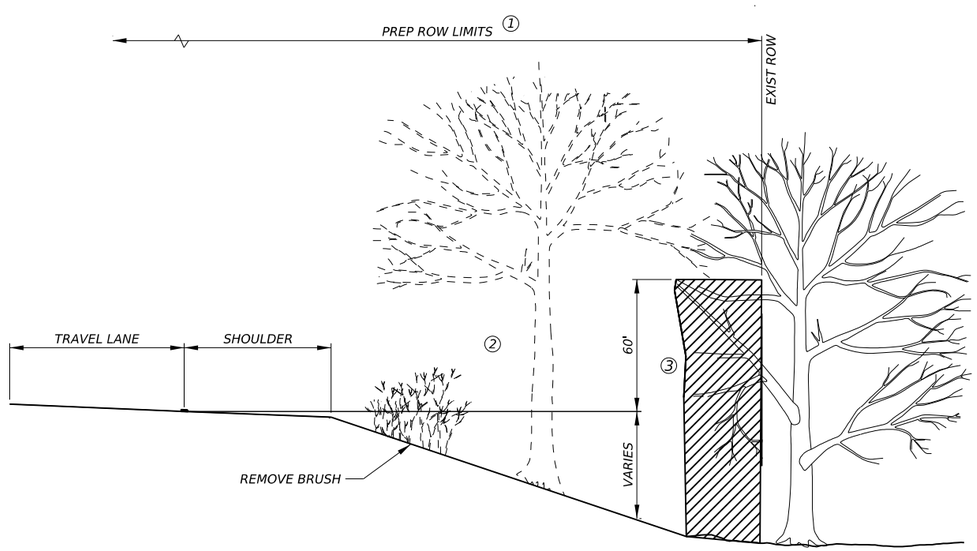
GENERAL NOTES:

1. REMOVE ALL TREES AND BRUSH WITHIN ROW.

2. REMOVE TREE AND ROOT SYSTEM IF ANY PART OF THE TRUNK IS WITHIN THE ROW.

3. TRIM TREE LIMBS INSIDE PREP ROW LIMITS FROM NAATURAL GROUND UP TO A MINIMUM HEIGHT OF 60' FROM THE OUTSIDE EDGE OF TRAVEL LANE.

4. PREP ROW SHALL BE MAINTAINED UNTIL FINAL ACCEPTANCE.



TYPICAL REMOVAL AND TRIM DETAIL

N.T.S.

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
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3/27/2023

Texas Department of Transportation

TREE REMOVAL AND TRIMMING DETAILS

CONT	SECT	JOB	HIGHWAY
0576	02	068, ETC.	FM 58
DIST	COUNTY		SHEET NO.
LFK	ANGELINA		116

DATE: 3/27/2023 10:33:20 AM
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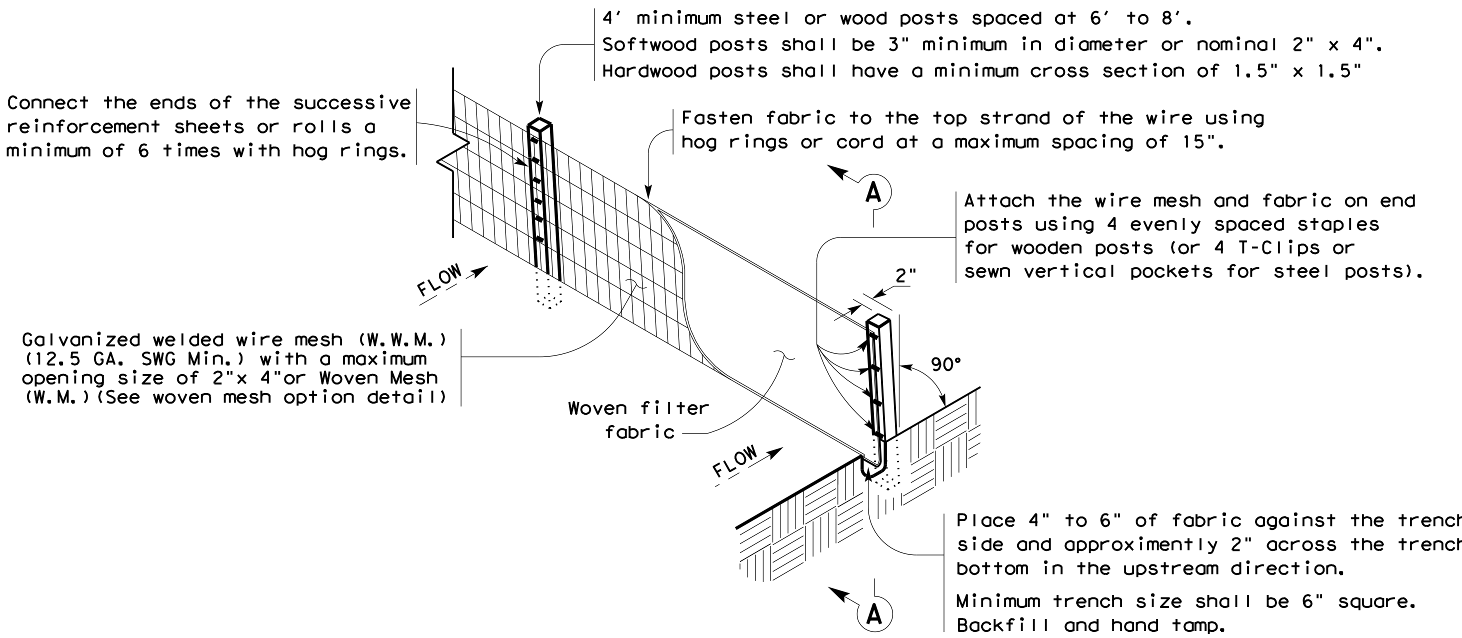
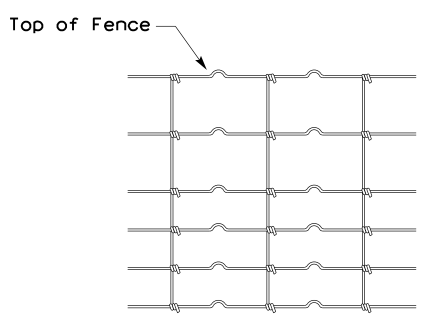
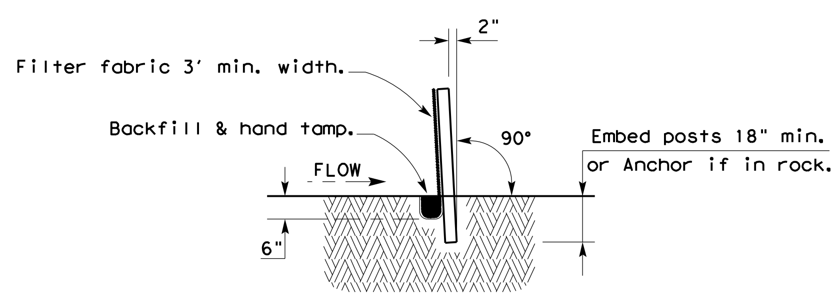


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

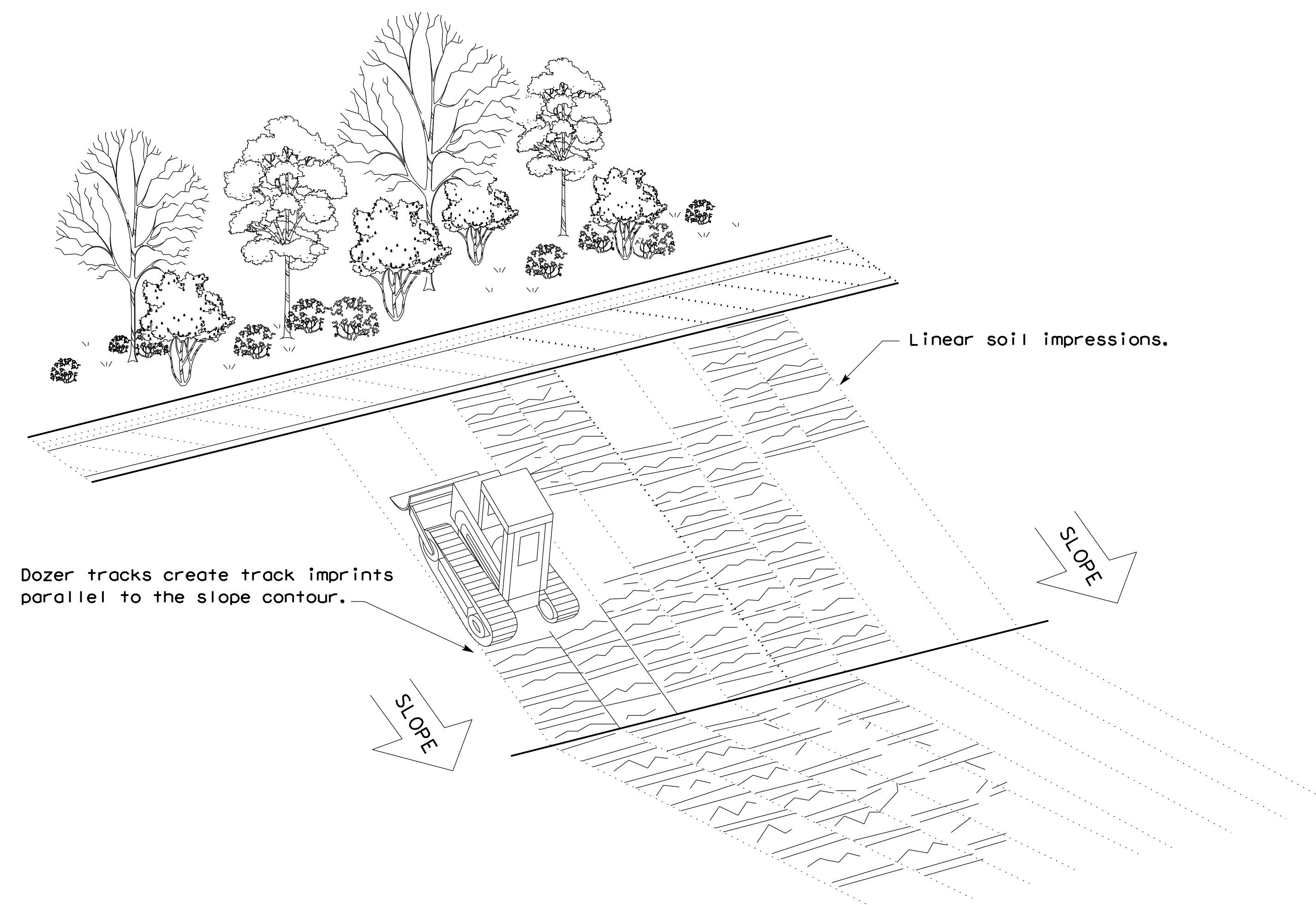
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP		DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY
REVISIONS	0576	02	068, ETC.		FM 58
	DIST		COUNTY		SHEET NO.
	LFK		ANGELINA		117

DATE:
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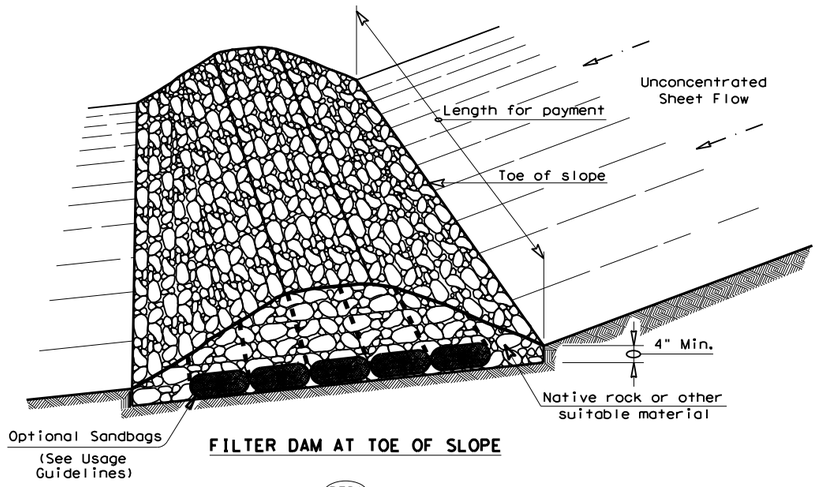
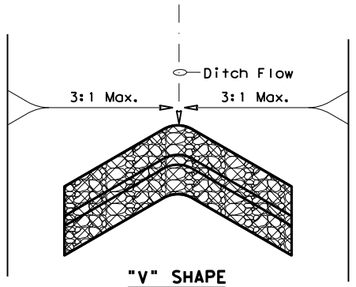


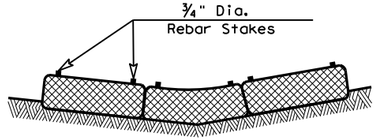
FILTER DAM AT TOE OF SLOPE

RFD1

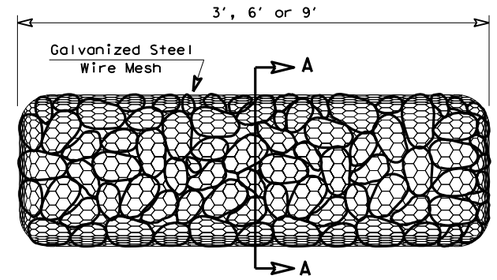


"V" SHAPE PLAN VIEW

PLAN VIEW

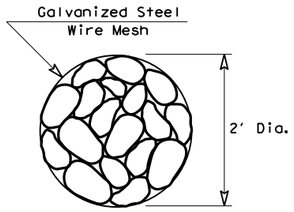


SECTION B-B

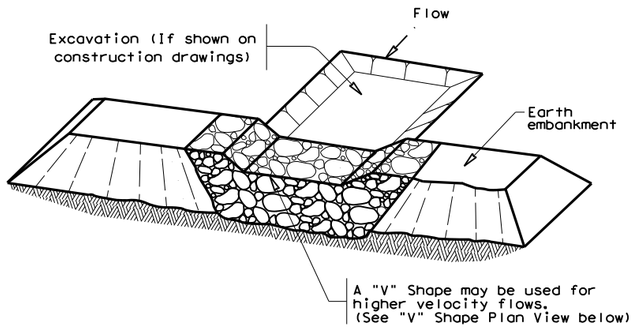


TYPE 4 (SACK GABIONS)

RFD4

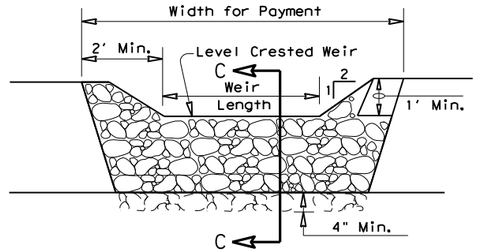


SECTION A-A



FILTER DAM AT SEDIMENT TRAP

RFD1 — OR — RFD2



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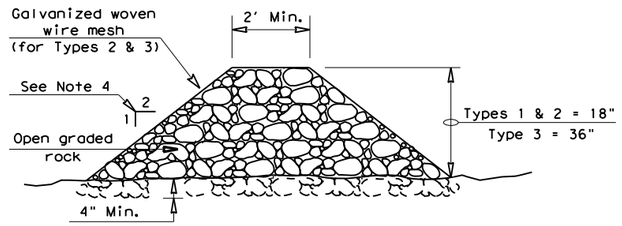
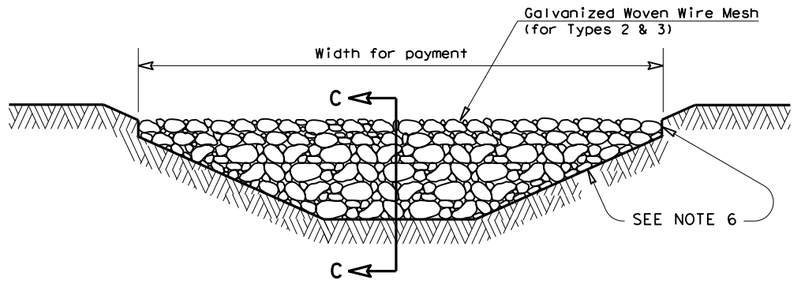


SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

ROCK FILTER DAM USAGE GUIDELINES

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

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

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

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

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

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

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS		
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0576	02	068, ETC.		FM 58	
	DIST	COUNTY			SHEET NO.	
	LFK	ANGELINA			118	

DATE: 3/27/2023
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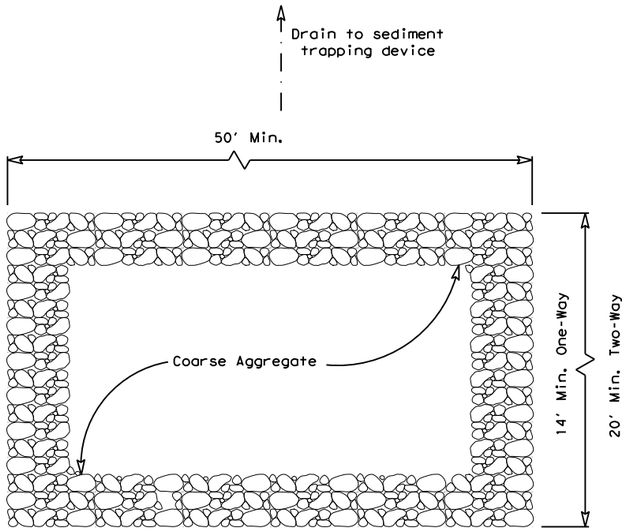
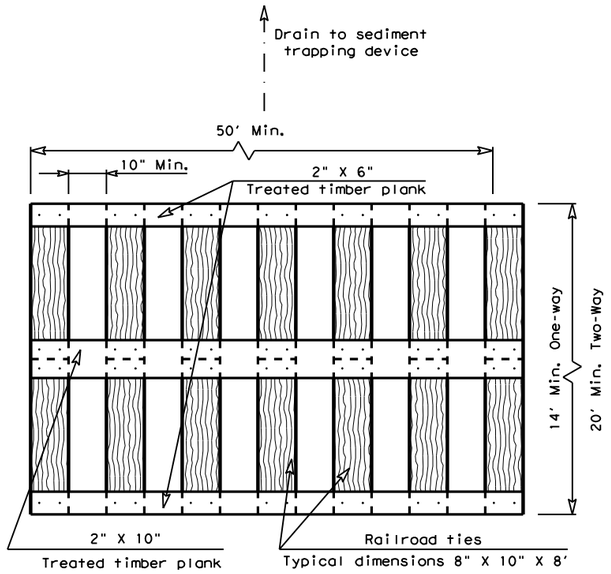


PLAN VIEW



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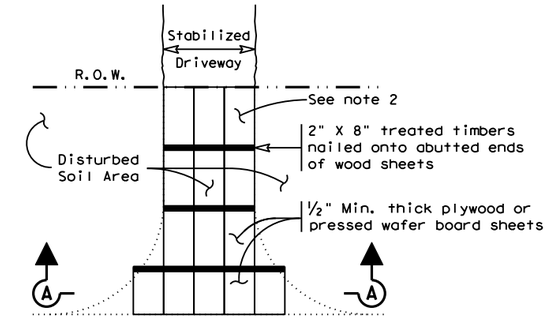

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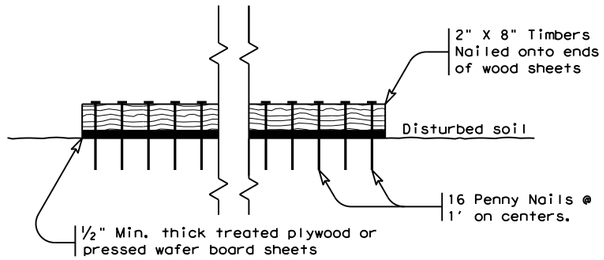
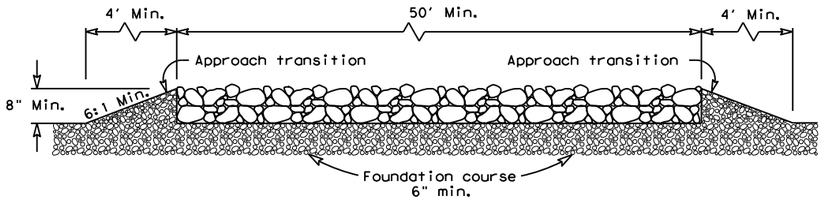


SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

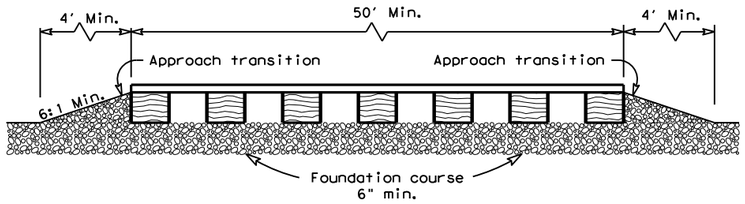
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

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

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

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

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0576	02	068, ETC.		FM 58	
	DIST	COUNTY				SHEET NO.
	LFK	ANGELINA				119