FHWA TEXAS DIVISION	PROJECT NO.		SHEET NO.
	STP 2022(445)HES		1
STATE	DISTRICT	COUNTY	
TEXAS	LFK	ANGELINA, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0336	03	072,ETC	SH 103,ETC

SEE SHEET 2 FOR INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NO. STP 2022(445)HES

SH 103, ETC.
ANGELINA COUNTY, ETC.

SH 103(CSJ: 0336-03-072) NET LENGTH OF ROADWAY = 62668.32 FT. = 11.869 MI.
FM 2971(CSJ: 1678-02-007) NET LENGTH OF ROADWAY = 14102.88 FT. = 2.671 MI.
FM 2864(CSJ: 2891-01-018) NET LENGTH OF ROADWAY = 34980.00 FT. = 6.625 MI.
FM 3152(CSJ: 3220-01-013) NET LENGTH OF ROADWAY = 34742.40 FT. = 6.580 MI.
NET LENGTH OF PROJECT = 150226.56 FT. = 28.452 MI.

LIMITS: (CSJ: 0336-03-072) FROM SH 7 TO SL 287
(CSJ: 1678-02-007) FROM FM 83 TO 2.677 MI SOUTH OF FM 83
(CSJ: 2891-01-018) FROM 1.788 MI NORTH OF FM 2664 TO US 59
(CSJ: 3220-01-013) FROM US 190 TO FM 350

FOR THE CONSTRUCTION OF SAFETY IMPROVEMENT PROJECTS
CONSISTING OF SAFETY TREAT FIXED OBJECTS

SEE PROJECT LOCATION MAP
FOR INDIVIDUAL LOCATIONS

(CSJ: 0336-03-072)
FUNCTIONAL CLASS.: RURAL PRINCIPLE ARTERIAL
* DESIGN SPEED = 50 MPH
ADT (2020) = 14713
ADT (2040) = 20598

(CSJ: 1678-02-007)
FUNCTIONAL CLASS.: RURAL MINOR COLLECTOR
* DESIGN SPEED = 30 MPH
ADT (2020) = 367
ADT (2040) = 514

(CSJ: 2891-01-018)
FUNCTIONAL CLASS.: RURAL MAJOR COLLECTOR
* DESIGN SPEED = 40 MPH
ADT (2020) = 1360
ADT (2040) = 1904

(CSJ: 3220-01-013)
FUNCTIONAL CLASS.: RURAL MAJOR COLLECTOR
* DESIGN SPEED = 50 MPH
ADT (2020) = 1976
ADT (2040) = 2371

*DESIGN SPEED APPLICABLE ONLY TO THE DESIGN ELEMENTS AFFECTED BY THE SCOPE OF THE HSIP PROJECT.

NTS
NO EXCEPTIONS;

EQUATIONS:
(CSJ:0336-03-072) STA 1593+63.17 BK = STA 1595+42.4 FWD = -179.23'
(CSJ:0336-03-072) STA 2020+92.40 BK = STA 2021+08.3 FWD = - 15.90'
(CSJ:0336-03-072) STA 2218+55.30 BK = STA 2224+99.2 FWD = -643.90'
TOTAL = -839.03'
(CSJ:1678-02-007) NO EQUATIONS
(CSJ:2891-01-018) NO EQUATIONS
(CSJ:3220-01-013) STA 126+73.68 BK = STA 131+24.75 FWD = -451.07'

RAILROAD CROSSINGS: NONE

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 2012).

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: 3/31/2022

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DISTRICT DESIGN ENGINEER

APPROVED FOR LETTING: 3/31/2022

DocuSigned by:
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DISTRICT ENGINEER

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SHEET NO.	DESCRIPTION
	GENERAL
1	TITLE SHEET
2	INDEX OF SHEETS
3-4	LOCATION MAP
5, 5A-5F	GENERAL NOTES
6, 6A-6B	ESTIMATE & QUANTITY SHEET
7-61	QUANTITY SUMMARIES
62	SUMMARY OF SMALL SIGNS
63	CRASH CUSHION SUMMARY SHEET
	TRAFFIC CONTROL PLAN
# 64-75	BC(1)-21 THRU BC(12)-21
# 76	TCP(2-1)-18
# 77	TCP(2-2)-18
# 78	TCP(2-4)-18
# 79	TCP(3-1)-13
# 80	TCP(S-2c)-10
# 81	WZ(RS)-22
# 82	WZ(BRK)-13
# 83-84	WZ(BTS-1)-13 THRU WZ(BTS-2)-13
	ROADWAY DETAILS
85	NON-MOW STRIP DETAILS (LUFKIN DISTRICT STANDARD)
86-91	PLAN LAYOUT
92-115	MBGF LAYOUTS
# 116-119	MB(1)-21 THRU MB(4)-21
# 120	GF(31)-19
# 121-122	GF(31)TR TL3-20
# 123	SGT(11S)31-18
# 124	SGT(12S)31-18
# 125	SGT(15)31-20
# 126	QGELITE(M10) (N)-20
# 127	TAU-II-R (N)-16
# 128	CSB(2)-13
# 129	TRF
	DRAINAGE DETAILS
130-134	DRAINAGE AREA MAP & HYDRAULIC DATA SHEET
135-184	CULVERT LAYOUTS
185	BCS
# 186	CH-FW-O
# 187	CH-PW-O
# 188	CH-PW-S
# 189	SET-SC
# 190	SET-SP
# 191	FW-O
# 192	PW
# 193-194	SCC-5 & 6
# 195-196	SCC-8
# 197-198	SCC-9
# 199-201	SCC-10
# 202-203	SRR
# 204-205	MISCELLANEOUS DRAINAGE DETAILS
# 206	CONCRETE RIPRAP DETAILS (LUFKIN DISTRICT STANDARD)

SHEET NO.	DESCRIPTION
	BRIDGES
207	T2-T201TR(MOD)
	TRAFFIC ITEMS
# 208	D & OM(2)-20
# 209	D & OM(VIA)-20
	ENVIRONMENTAL ISSUES
210-213	TXDOT SWP3 INDEX
214-215	EPIC
216-272	SWP3 LAYOUTS
273	BLOCK SOD DETAILS
# 274	EC(1)-16
# 275	EC(2)-16
# 276	EC(3)-16

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
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.

Elizabeth Ortego, P.E. 4/25/2022

ELIZABETH A. ORTEGO, P.E. DATE

INDEX OF SHEETS

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		2

BEGIN PROJECT
CSJ 2891-01-018
STA 0+23
REF MRK = 328+0.0
LAT 31.7991228°
LONG -94.6533281°
PREVIOUS PROJECT TIE
STA 0+23
CSJ 2891-01-001

END PROJECT
CSJ 2891-01-018
STA 352+00
REF MRK 334+0.788
LAT 31.7085528°
LONG -94.6533281°
PREVIOUS PROJECT TIE
STA 352+00
CSJ 2891-01-007

BEGIN PROJECT
CSJ 0336-03-072
STA 1609+32
REF MRK = 700-0.25
LAT 31.398534196°
LONG -94.9586108°
PREVIOUS PROJECT TIE
STA 1609+32
CSJ 0336-03-042

END PROJECT
CSJ 0336-03-072
STA 2236+00
REF MRK 712+0.405
LAT 31.3612405°
LONG -94.7627324°
PREVIOUS PROJECT TIE
STA 2236+00
CSJ 0336-03-042

RUSK COUNTY
CHEROKEE COUNTY
ANGELINA COUNTY
HOUSTON COUNTY
TRINITY COUNTY
POLK COUNTY
TYLER COUNTY
JASPER COUNTY
SAN AUGUSTINE COUNTY
NACOGDOCHES
ANGELINA

SACUL
CUSHING
TRAWICK
LOONEYVILLE
LILBERT
APPLEBY
GARRISON
DOUGLASS
MARTINSVILLE
SWIFT
NACOGDOCHES
OAK RIDGE
ATTOYAC
MELROSE
CHIRENO
WODEN
POLLOK
REDTOWN
CENTRAL
REDLAND
CLAWSON
LUFKIN
HERTY
HUDSON
ETOILE
HOMER
HUNTINGTON
BALD HILL
SHAWNEE PRAIRIE
ZAVALLA
DIBOLL
SULPHUR SPRINGS

ATTOYAC BAYOU
ANGELINA RIVER
NECHES RIVER
SAM RAYBURN RESERVOIR

LOCATION MAP FOR ANGELINA & NACOGDOCHES COUNTY

NOT TO SCALE

LOCATION MAP

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC

DIST	COUNTY	SHEET NO.
LFK	ANGELINA, ETC	3

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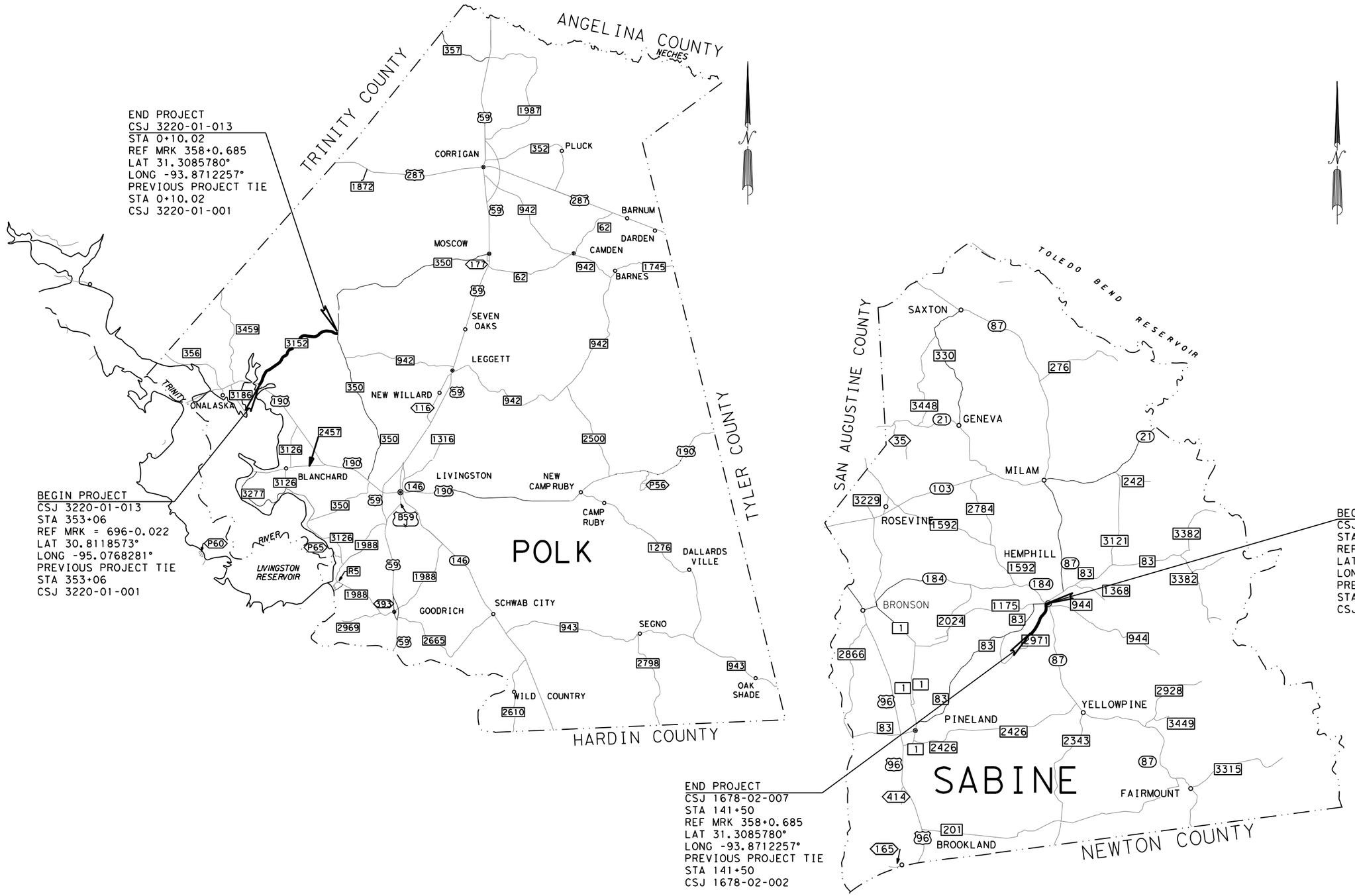

LOCATION MAP FOR POLK & SABINE COUNTY

NOT TO SCALE

LOCATION MAP

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		4

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GENERAL NOTES:

The following standard detail sheets have been modified.

T2-T201TR(MOD)

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

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

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

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

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

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

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

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

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

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

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:
https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

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

Project Mowing

Mow 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.

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

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.

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

The equipment used for litter pickup shall be approved.

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

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

Item 5: Control of the Work

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

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

Item 7: Legal Relations and Responsibilities

No significant traffic generator events identified.

This project consists of discrete construction projects separated a minimum 1/4 mile by undisturbed areas; therefore, they are treated as separate plans of development. FM 2971 (CSJ: 1678-02-007) disturbs less than 1 acre; therefore, TPDES CGP does not apply, however, the contractor shall place BMPs as directed by the Area Engineer. The disturbed area in the plans and the contractor project specific locations (PSLs) within 1 mile of the project limits will further establish the authorization requirements for storm water discharges. If the total area disturbed shown in the plans and PSLs within 1 mi. of the project limits exceeds 1 acre, the engineer will develop an SWP3 site plan and post a small construction site notice for the construction activities.

FM 2864 (CSJ: 2891-01-018) and FM 3152 (CSJ: 3220-01-013) have a soil disturbance of 1 acre or more, but less than 5 acres.

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

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

SH 103 (CSJ: 0336-03-072) 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.

CSJ: 1678-02-007: A portion of FM 2971 is within the Sabine National Forest (SNF) between stations STA 43+36.00 (31°19'51.60"N, 93°51'21.28"W) and STA 54+15.00 (31°19'42.49"N, 93°51'27.75"W) The following actions are required:

1. Area Engineer shall notify Sabine National Forest prior to starting work in this location.

2. NO tree removal or limbing shall occur in this location without the approval from the Area Engineer and Sabine National Forest.

3. NO stockpiling of materials or storage of equipment within the Sabine National Forest limits provided above.

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”.

No lane closures will be allowed after Noon on Fridays or on days preceding National Holidays unless otherwise approved. *SH 103*

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

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

Item 100: Preparing Right of Way

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

Item 105: Removing Treated and Untreated Base and Asphalt Pavement

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

Item 110: Excavation
Item 132: Embankment

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

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 158: Specialized Excavation Work

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

Item 162: Sodding for Erosion Control

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

Item 166: Fertilizer

Fertilize all seeded or sodded areas.

Item 168: Vegetative Watering

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

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

Item 169: Soil Retention Blankets

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

Item 400: Excavation and Backfill for Structures

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

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

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

Item 420: Concrete Substructures

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

Item 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 cast-in-place 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.

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

Item 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 20 ft. from the end of the structure.

Item 502: Barricades, Signs, and Traffic Handling

Traffic Control Plan (TCP):

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

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

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

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

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.

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.

Provide a lockable file cabinet, desk and chair in a contractor's field office for TxDOT use.

Item 506: Temporary Erosion, Sedimentation, and Environmental Controls

Locations and types of BMPs may require adjustments prior to or after placement as directed by the Engineer. Adjustments should be made to ensure BMPs are working effectively and maintain compliance with the Construction General Permit. Notify the Engineer prior to making adjustments

Furnish compost for core material in biodegradable erosion control logs.

Item 540: Metal Beam Guard Fence

Use round timber posts.

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

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

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

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

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

Item 545: Crash Cushion Attenuators

Trinity Highway Energy Absorption 24" Quadguard M10 or products being approved equal to be used approximate at SH 103 STA 1732+00, FM 2971 STA 110+00, and FM 2864 STA 146+50. Tension struct back-up to be constructed per manufacture's details in attaching THRIE beam as a transition to existing bridge type T203 rail. Concrete pad shall be constructed per manufacture's details. The work and cost of THRIE beam attachment & concrete pad will not be paid directly and shall be subsidiary to the crash cushion by each.

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 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.

Install CTB barrier reflectors on top of concrete bridge rail and concrete barriers.

Install D-SW delineators on the departure side of steel bridge rail posts.

Item 3076: Dense-Graded Hot-Mix Asphalt

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

No surface aggregate classification is required.

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

No Department-owned RAP is available.
RAP produced from this project may be used in the HMA mixtures. All RAP not utilized in the HMA shall be delivered to the TxDOT maintenance facility located at:

Angelina County Maintenance Facility, 1410 Kurth Drive, Lufkin, TX 75901;
Nacogdoches County Maintenance Facility, 918 Industrial Blvd, Nacogdoches, TX 75964;
Polk County Maintenance Facility, 3161 US Highway 59 N, Livingston, TX 77351;
Sabine County Maintenance Facility, 300 FM 83 W, Hemphill, TX 75948;

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.

Add hydrated lime to all HMA mixtures at a minimum rate of 1.0% by weight of the total aggregate, except for those mixtures containing RAP and/or RAS. Mixtures that contain RAP and/or RAS shall be designed at a rate of minimum 0.5 % of lime by weight and the test results

will be evaluated by the engineer to determine if lime or a liquid anti-strip additive will be used. The hydrated lime shall meet the requirements of DMS-6350, “Lime and Lime Slurry”. The hydrated lime shall be added in accordance with the construction method in Item 301, “Asphalt Antistripping Agents”. This lime will be subsidiary to this item.

Cover each load of mixture with waterproof tarpaulins.

Limit uneven pavement to 2 days production.

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

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

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

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

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.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0336-03-072 **DISTRICT** Lufkin **COUNTY** Angelina, Nacogdoches, Polk, Sabine
HIGHWAY FM 2864, FM 2971, FM 3152, SH 103

			CONTROL SECTION JOB	0336-03-072		1678-02-007		2891-01-018		3220-01-013		TOTAL EST.	TOTAL FINAL
			PROJECT ID	A00066553		A00066501		A00066490		A00066506			
			COUNTY	Angelina		Sabine		Nacogdoches		Polk			
			HIGHWAY	SH 103		FM 2971		FM 2864		FM 3152			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	100-6002	PREPARING ROW	STA			141.000		351.000		353.000		845.000	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	36.000				16.000				52.000	
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	2,308.400		318.900		693.300		1,317.400		4,638.000	
	158-6003	SPEC EXCAV WORK (HYD EXCAVATOR)	HR	11.000		6.000		9.000		2.000		28.000	
	162-6002	BLOCK SODDING	SY	4,957.800		1,371.000		4,171.000		794.000		11,293.800	
	164-6009	BROADCAST SEED (TEMP) (WARM)	SY	38,811.000		2,122.000		4,722.000		10,483.000		56,138.000	
	164-6011	BROADCAST SEED (TEMP) (COOL)	SY	38,811.000		2,122.000		4,722.000		10,483.000		56,138.000	
	164-6021	CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	77,622.000		4,244.000		9,444.000		20,966.000		112,276.000	
	168-6001	VEGETATIVE WATERING	MG	886.900		114.900		278.500		431.700		1,712.000	
	169-6002	SOIL RETENTION BLANKETS (CL 1) (TY B)	SY	33,467.000		798.000		1,593.000		7,829.000		43,687.000	
	400-6005	CEM STABIL BKFL	CY	119.000		191.800		198.400		4.000		513.200	
	400-6007	CUT & RESTORE CONC PAVING	SY	36.000				16.000				52.000	
	400-6008	CUT & RESTORE ASPH PAVING	SY	155.000		4.000		316.000		52.000		527.000	
	400-6012	CUT AND RESTORE PAV (FLEX BASE)	SY	178.000		53.000		31.000				262.000	
	403-6001	TEMPORARY SPL SHORING	SF	420.000		570.000		3,002.000		222.000		4,214.000	
	420-6071	CL C CONC (COLLAR)	EA	2.000		2.000				2.000		6.000	
	432-6002	RIPRAP (CONC)(5 IN)	CY			10.800				22.300		33.100	
	432-6026	RIPRAP (STONE COMMON)(DRY)(18 IN)	CY	49.800		135.300		72.700		17.900		275.700	
	432-6027	RIPRAP (STONE COMMON)(DRY)(24 IN)	CY	101.000								101.000	
	462-6019	CONC BOX CULV (8 FT X 4 FT)	LF			20.000						20.000	
	462-6051	CONC BOX CULV (5 FT X 3 FT)(EXTEND)	LF					12.000				12.000	
	462-6057	CONC BOX CULV (6 FT X 6 FT)(EXTEND)	LF					9.000				9.000	
	462-6070	CONC BOX CULV (9 FT X 7 FT)(EXTEND)	LF					17.000				17.000	
	462-6071	CONC BOX CULV (9 FT X 8 FT)(EXTEND)	LF					13.000				13.000	
	462-6074	CONC BOX CULV (10 FT X 6 FT)(EXTEND)	LF					24.000				24.000	
	462-6075	CONC BOX CULV (10 FT X 7 FT)(EXTEND)	LF			35.000						35.000	
	464-6002	RC PIPE (CL III)(15 IN)	LF	2,648.000		158.000		356.000		4.000		3,166.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF	724.000		234.000		1,688.000		312.000		2,958.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	208.000		104.000		172.000		38.000		522.000	
	464-6007	RC PIPE (CL III)(30 IN)	LF	12.000		88.000				22.000		122.000	
	464-6008	RC PIPE (CL III)(36 IN)	LF	36.000				152.000		22.000		210.000	
	464-6009	RC PIPE (CL III)(42 IN)	LF							12.000		12.000	
	464-6010	RC PIPE (CL III)(48 IN)	LF					14.000				14.000	
	466-6007	HEADWALL (CH - FW - 0) (DIA= 30 IN)	EA	1.000								1.000	
	466-6009	HEADWALL (CH - FW - 0) (DIA= 36 IN)	EA	2.000		1.000						3.000	
	466-6010	HEADWALL (CH - FW - 0) (DIA= 42 IN)	EA			2.000						2.000	
	466-6011	HEADWALL (CH - FW - 0) (DIA= 48 IN)	EA			1.000						1.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0336-03-072 **DISTRICT** Lufkin **COUNTY** Angelina, Nacogdoches, Polk, Sabine
HIGHWAY FM 2864, FM 2971, FM 3152, SH 103

				0336-03-072		1678-02-007		2891-01-018		3220-01-013		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB											
		PROJECT ID		**A00066553**		**A00066501**		**A00066490**		**A00066506**			
		COUNTY		**Angelina**		**Sabine**		**Nacogdoches**		**Polk**			
		HIGHWAY		**SH 103**		**FM 2971**		**FM 2864**		**FM 3152**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	466-6037	HEADWALL (CH - FW - 30) (DIA= 30 IN)	EA							1.000		1.000	
	466-6039	HEADWALL (CH - FW - 30) (DIA= 36 IN)	EA							1.000		1.000	
	466-6097	HEADWALL (CH - PW - 0) (DIA= 24 IN)	EA					1.000				1.000	
	466-6101	HEADWALL (CH - PW - 0) (DIA= 36 IN)	EA	1.000								1.000	
	466-6102	HEADWALL (CH - PW - 0) (DIA= 42 IN)	EA							1.000		1.000	
	466-6103	HEADWALL (CH - PW - 0) (DIA= 48 IN)	EA	2.000						1.000		3.000	
	466-6104	HEADWALL (CH - PW - 0) (DIA= 54 IN)	EA							1.000		1.000	
	466-6105	HEADWALL (CH - PW - 0) (DIA= 60 IN)	EA							1.000		1.000	
	466-6106	HEADWALL (CH - PW - 0) (DIA= 66 IN)	EA	2.000								2.000	
	466-6107	HEADWALL (CH - PW - 0) (DIA= 72 IN)	EA	1.000						1.000		2.000	
	466-6135	HEADWALL (CH - PW - S) (DIA= 42 IN)	EA					1.000		1.000		2.000	
	466-6136	HEADWALL (CH - PW - S) (DIA= 48 IN)	EA							4.000		4.000	
	466-6138	HEADWALL (CH - PW - S) (DIA= 60 IN)	EA			1.000						1.000	
	466-6139	HEADWALL (CH - PW - S) (DIA= 66 IN)	EA							1.000		1.000	
	466-6140	HEADWALL (CH - PW - S) (DIA= 72 IN)	EA							2.000		2.000	
	466-6152	WINGWALL (FW - 0) (HW=5 FT)	EA					2.000				2.000	
	466-6153	WINGWALL (FW - 0) (HW=6 FT)	EA			1.000						1.000	
	466-6155	WINGWALL (FW - 0) (HW=8 FT)	EA			1.000						1.000	
	466-6156	WINGWALL (FW - 0) (HW=9 FT)	EA			1.000						1.000	
	466-6185	WINGWALL (PW - 2) (HW=10 FT)	EA					2.000				2.000	
	466-6195	WINGWALL (PW - 2) (HW=6 FT)	EA			1.000						1.000	
	466-6197	WINGWALL (PW - 2) (HW=8 FT)	EA					4.000				4.000	
	466-6198	WINGWALL (PW - 2) (HW=9 FT)	EA			2.000		2.000				4.000	
	467-6341	SET (TY II) (15 IN) (RCP) (6: 1) (P)	EA	247.000		44.000		58.000				349.000	
	467-6358	SET (TY II) (18 IN) (RCP) (4: 1) (C)	EA					8.000				8.000	
	467-6362	SET (TY II) (18 IN) (RCP) (6: 1) (C)	EA					1.000				1.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA	74.000		16.000		158.000		18.000		266.000	
	467-6390	SET (TY II) (24 IN) (RCP) (4: 1) (C)	EA	2.000		2.000				8.000		12.000	
	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		10.000		16.000				34.000	
	467-6419	SET (TY II) (30 IN) (RCP) (4: 1) (C)	EA	1.000		5.000				1.000		7.000	
	467-6423	SET (TY II) (30 IN) (RCP) (6: 1) (P)	EA			4.000						4.000	
	467-6454	SET (TY II) (36 IN) (RCP) (6: 1) (P)	EA					8.000				8.000	
	467-6580	SET (REMOV & REINSTALL)	EA	24.000				14.000		8.000		46.000	
	480-6001	CLEAN EXIST CULVERTS	EA	43.000		7.000		19.000		10.000		79.000	
	496-6016	REMOV STR (PIPE)	EA	104.000		19.000		62.000		9.000		194.000	
	500-6001	MOBILIZATION	LS	0.010		0.500		0.010		0.480		1.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0336-03-072 **DISTRICT** Lufkin **COUNTY** Angelina, Nacogdoches, Polk, Sabine
HIGHWAY FM 2864, FM 2971, FM 3152, SH 103

													TOTAL EST.	TOTAL FINAL
			CONTROL SECTION JOB	**0336-03-072**		**1678-02-007**		**2891-01-018**		**3220-01-013**				
			PROJECT ID	**A00066553**		**A00066501**		**A00066490**		**A00066506**				
			COUNTY	**Angelina**		**Sabine**		**Nacogdoches**		**Polk**				
			HIGHWAY	**SH 103**		**FM 2971**		**FM 2864**		**FM 3152**				
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL			
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	59.000									59.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	650.000		800.000		590.000		1,035.000			3,075.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	650.000		800.000		590.000		1,035.000			3,075.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	1,000.000		1,000.000		1,000.000		1,000.000			4,000.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	1,000.000		1,000.000		1,000.000		1,000.000			4,000.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	16,540.000		1,765.000		568.000		21,353.000			40,226.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	16,540.000		1,765.000		568.000		21,353.000			40,226.000	
	514-6013	PERM CTB (F-SHAPE) (TY 1)	LF					30.000					30.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	11,887.500		150.000		350.000		3,050.000			15,437.500	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	16.000		2.000		1.000					19.000	
	540-6020	MTL W - BEAM GD FEN (LOW FILL CULVERT)	LF	50.000									50.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	12,570.000		490.000				1,420.000			14,480.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	69.000		3.000		3.000		12.000			87.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	63.000		4.000				2.000			69.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	1.000									1.000	
	545-6007	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA	1.000		1.000		1.000					3.000	
	560-6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	1.000									1.000	
	644-6060	IN SM RD SN SUP&AM TYTWT(1)WS(P)	EA	1.000									1.000	
	658-6101	INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	86.000		18.000		44.000		48.000			196.000	
	3076-6035	D-GR HMA TY-D PG64-22	TON	1,981.000		125.000		229.000		886.000			3,221.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000		2.000		2.000			8.000	
	6185-6002	TMA (STATIONARY)	DAY	153.000		123.000		208.000		199.000			683.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000									1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000									1.000	

SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	464 RC PIPE (CL III)						467 (1) SET (TY II) (RCP) (6:1) (P)					467	480	496
										ITEM NO.	104	162	168	400			6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
										BID CODE	6017	6002	6001	6007	6008	6012	(15 IN)	(18 IN)	(24 IN)	(30 IN)	(36 IN)	(48 IN)	(15 IN)	(18 IN)	(24 IN)	(30 IN)	(36 IN)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D294	1621+70	31.3985	-94.9522	LT	DIRT	R	16			N/A																				
D293	1624+40	31.3983	-94.9514	RT	DIRT	R	16	37	37	EXIST 15" X 26' RCP W/SET; CLEAN CULVERT																			1	
D292	1624+40	31.3985	-94.9514	LT	ASPH	C	17			N/A																				
D291	1628+60	31.3985	-94.9500	LT	DIRT	R	11	22	22	REM EXIST 12" X 28' CMP W/SET; INST 18" X 36' RCP W/SET EA END		28	0.6					36						2						1
D290	1637+35	31.3984	-94.9472	LT	GRAV	R	16	33	33	REM EXIST 12" X 20' RCP W/SET; INST 15" X 34' RCP W/SET EA END		26	0.6			5	34						2							1
D289	1640+05	31.3982	-94.9464	RT	GRAV	R	13			N/A																				
D288	1653+80	31.3983	-94.9420	LT	ASPH	R	9	33	33	EXIST 18" X 24' RCP W/SET; REM & REPL BROKEN SET ON RT		14	0.3											1						
D287	1656+00	31.3982	-94.9413	RT	DIRT	R	16			N/A																				
D286	1666+80	31.3981	-94.9378	RT	GRAV	C	15			N/A																				
D285	1673+85	31.3982	-94.9356	LT	ASPH	C	20			N/A																				
D284	1688+85	31.3977	-94.9308	LT	DIRT	R	29			N/A																				
D283	1711+00	31.3759	-94.8283	LT	DIRT	R	20			N/A																				
D282	1719+50	31.3983	-94.9513	RT	GRAV	R	16	38	38	REM EXIST 18" X 20' CGM W/SET; INST 18" X 22' RCP W/SET EA END		28	0.6			6		22						2						1
D281	1731+55	31.3953	-94.9174	LT	ASPH	C	41			N/A																				
D280	1746+20	31.3945	-94.9128	LT	GRAV	R	12			N/A																				
D279	1763+55	31.3933	-94.9074	RT	GRAV	C	11			N/A																				
D278	1722+50	31.3926	-94.9046	RT	GRAV	C	24			N/A																				
D277	1776+75	31.3925	-94.9033	LT	GRAV	R	15			N/A																				
D276	1784+35	31.3918	-94.9009	RT	DIRT	R	12			N/A																				
D275	1783+95	31.3920	-94.9010	LT	DIRT	R	40			N/A																				
D274	1798+05	31.3909	-94.8967	RT	GRAV	R	14			N/A																				
D273	1805+40	31.3904	-94.8944	RT	ASPH	C	16			N/A																				
D272	1806+70	31.3905	-94.8940	LT	GRAV	C	15			N/A																				
D271	1808+85	31.3903	-94.8933	LT	DIRT	R	30	27	27	EXIST 15" X 32' RCP W/SET; REM 15" X 4' RCP RT, INSTALL 15" X 10' LT & 15" X 6' RT, RELAY		26	0.6				12												2	1	
D270	1809+20	31.3901	-94.8932	RT	GRAV	R	17			N/A																				
D269	1810+50	31.3900	-94.8928	RT	DIRT	R	33	27	27	REM EXIST 12" X 36' RCP W/SET; INST 15" X 42' RCP W/SET EA END		26	0.6				42						2							1
CSJ: 0336-03-072 SHEET TOTAL:											**0**	**148**	**3.3**	**0**	**0**	**11**	**88**	**58**	**0**	**0**	**0**	**0**	**4**	**5**	**0**	**0**	**0**	**2**	**2**	**4**

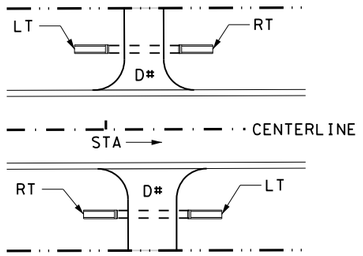
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		7

SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103) (CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	464 RC PIPE (CL III) (15 IN)	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)	464 RC PIPE (CL III) (48 IN)	467 (1) SET (TY II) (RCP) (6:1) (P) (15 IN)	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)	467 SET (REMOV & REINSTALL)	480 CLEAN EXIST CULVERTS	496 REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
										ITEM NO.	104	162	168	400	400	400	464	464	464	464	464	464	467 (1)	467 (1)	467 (1)	467 (1)	467 (1)	467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
D268	1811+15	31.3901	-94.8926	LT	GRAV	R	11	24	24	EXIST 15" X 30' RCP W/SET; INSTALL 15"X4' RCP-RT, RELAY SET-RT, CLEAN CULVERT		13	0.3				4												1	1	
D267	1811+95	31.3899	-94.9424	RT	DIRT	R	42	31	31	REM EXIST 12" X 50' RCP W/SET; INST 15" X 52' RCP W/SET EA END		26	0.6				52						2							1
D266	1813+75	31.3898	-94.8918	RT	GRAV	R	24	29	29	EXIST 15" X 40' RCP W/SET; NO WORK																				
D265	1813+65	31.3900	-94.8918	LT	GRAV	R	24	29	29	EXIST 18" X 30' RCP W/SET; REM 18" X 4' RCP-RT, INSTALL 18" X 6'RCP-RT, RELAY SET-RT, CLEAN		14	0.3						6										1	2	
D264	1814+85	31.3897	-94.8915	LT	DIRT	R	13	29	31	REM EXIST 18" X 18' CMP W/SET; INST 18" X 22' RCP W/SET EA END		28	0.6					22						2						1
D263	1814+95	31.3899	-94.8914	RT	ASPH	R	12	28	28	REM EXIST 18" X 23' CMP W/SET; INST 18" X 28' RCP W/SET EA END		28	0.6		5			28						2						1
D262	1816+90	31.3897	-94.8908	LT	DIRT	R	21	28	28	REM EXIST S18" X 26' CMP W/SET; INST 18" X 26' RCP W/SET EA END		28	0.6					26						2						1
D261	1817+35	31.3896	-94.8907	RT	DIRT	R	19	29	33	REM EXIST 12" X 22' RCP W/SET; INST 15" X 34' RCP W/SET EA END		26	0.6				34						2							1
D260	1820+75	31.3895	-94.8896	LT	ASPH	R	10			N/A																				
D259	1830+55	31.3888	-94.8866	LT	ASPH	R	10	29	29	REM EXIST 24" X 24' HDPE W/SET; INST 24" X 34' RCP W/SET EA END		34	0.7		4				34						2					1
D258	1832+55	31.3887	-94.8860	LT	DIRT	R	24	40	40	REM EXIST 18" X 30' HDPE W/SET; INST 18" X 36' RCP W/SET EA END		28	0.6					36						2						1
D257	1832+50	31.3885	-94.8860	RT	GRAV	C	33	30	30	REM EXIST 12" X 58' CMP W/SET; INST 15" X 86' RCP W/SET EA END		26	0.6			12	86						2							1
D256	1843+75	31.3879	-94.8825	LT	ASPH	R	13			N/A																				
D255	1844+90	31.3876	-94.8822	LT	ASPH	S	10			N/A																				
D254	1860+70	31.3867	-94.8772	RT	ASPH	R	26	32	32	REM EXIST 18" X 42' CMP W/SET; INST 18" X 48' RCP W/SET EA END		28	0.6		10			48						2						1
D253	1870+60	31.3860	-94.8741	LT	ASPH	S	15	27	29	EXIST 15" X 42' RCP W/SET; CLEAN CULVERT																			1	
D252	1897+70	31.3842	-94.8657	LT	ASPH	S	24			N/A																				
D251	1898+75	31.3841	-94.8654	LT	DIRT	R	20	29	29	EXIST 15" X 24' RCP W/SET; INSTALL 15" X 4'-LT 15" X 6'-RT, RELAY SET EA END		26	0.6				10											2	1	
D250	1898+85	31.3839	-94.8654	LT	CONC	C	38			N/A																				
D249	1901+15	31.3839	-94.8647	LT	ASPH	R	10	28	28	REM EXIST 18" X 26' CMP W/SET; INST 18" X 28' RCP W/SET EA END		28	0.6		4			28						2						1
D248	1902+45	31.3838	-94.8643	LT	DIRT	R	18			N/A																				
D247	1906+55	31.3835	-94.8630	LT	ASPH	R	16			N/A																				
										CSJ: 0336-03-072 SHEET TOTAL:	**0**	**333**	**7.3**	**0**	**23**	**12**	**186**	**188**	**40**	**0**	**0**	**0**	**6**	**12**	**2**	**0**	**0**	**4**	**5**	**10**

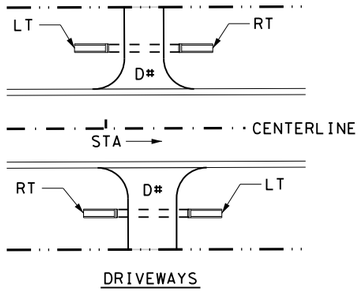
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 2 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		8

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SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III)						SET(TY II)(RCP)(6:1)(P)					SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
																	(15 IN)	(18 IN)	(24 IN)	(30 IN)	(36 IN)	(48 IN)	(15 IN)	(18 IN)	(24 IN)	(30 IN)	(36 IN)			
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D246	1930+40	31.3819	-94.8556	LT	ASPH	C	19			N/A																			
D245	1932+15	31.3816	-94.8551	RT	ASPH	C	14			N/A																			
D244	1939+85	31.3811	-94.8527	RT	ASPH	C	28			N/A																			
D243	1944+85	31.3809	-94.8511	LT	ASPH	C	30			N/A																			
D242	1946+25	31.3808	-94.8507	LT	ASPH	C	20			N/A																			
D241	1948+05	31.3807	-94.8501	LT	ASPH	R	28			N/A																			
D240	1948+80	31.3805	-94.8499	RT	ASPH	R	9	44	44	REM EXIST 12" X 28' RCP W/SET; INST 15" X 38' RCP W/SET EA END		26	0.6		3		38						2							1
D239	1950+20	31.3804	-94.8495	RT	ASPH	R	10	45	45	REM EXIST 12" X 26' RCP W/SET; INST 15" X 38' RCP W/SET EA END		26	0.6		3		38						2							1
D238	1950+25	31.3805	-94.8494	LT	ASPH	R	18	43	43	EXIST 18" X 28' RCP W/SET; NO WORK																			
D237	1951+00	31.3803	-94.8493	RT	ASPH	R	12	45	45	EXIST 15" X 26' RCP W/SET; INST 15" X 4' RCP-LT, 15" X 6'-RT, RELAY SET EA END,		26	0.6				10											2	1	
D236	1951+15	31.3805	-94.8492	LT	ASPH	R	12	42	42	EXIST 15" X 24' RCP W/SET; INST 15" X 4' RCP-RT, RELAY SET-RT		13	0.3				4											1		
D235	1954+55	31.3802	-94.8481	LT	ASPH	R	10	38	38	REM EXIST 12" X 24' RCP W/SET; INST 15" X 32' RCP W/SET EA END		26	0.6		3		32						2							1
D234	1957+00	31.3799	-94.8474	RT	ASPH	R	9	39	45	EXIST 24" X 32' RCP W/SET; NO WORK																			
D233	1960+10	31.3799	-94.8464	LT	ASPH	C	26	44	44	EXIST 42" X 48'HX60'W RCP W/SET; NO WORK																			
D232	1959+60	31.3797	-94.8466	RT	ASPH	C	15	48	48	EXIST 30" X 48' RCP W/SET; NO WORK																			
D231	1966+90	31.3794	-94.8443	LT	GRAV	R	15	48	48	REM EXIST 24" X 26' CMP W/SET; INST 24" X 52' RCP W/SET EA END		34	0.7			7			52						2				1
D230	1978+70	31.3784	-94.8407	RT	GRAV	R	26			N/A																			
D229	1980+80	31.3785	-94.8400	LT	ASPH	R	20			N/A																			
D228	2002+10	31.3771	-94.8333	LT	ASPH	R	18	43	43	EXIST 18" X 36' RCP W/SET; INST 18"X12' RCP-LT & 18"X4'-RT, RELAY SET EA END,		28	0.6					16										2	1	
D227	2005+35	31.3767	-94.8323	RT	DIRT	R	20	53	53	REM EXIST 24" X 34' HDPE W/SET; INST 24" X 60' RCP W/SET EA END		34	0.7						62						2				1
D226	2005+80	31.3767	-94.8322	RT	DIRT	R	15	50	50	REM EXIST 15" X 20' CMP W/SET; INST 24" X 28' RCP W/SET EA END		34	0.7				28						2							
D225	2011+40	31.3763	-94.8305	RT	GRAV	R	10	45	45	REM EXIST 12" X 20' CMP W/SET; INST 15" X 42' RCP W/SET EA END		26	0.6			3	42						2							1
D224	2013+80	31.3761	-94.8297	RT	ASPH	R	10			N/A																			
CSJ: 0336-03-072 SHEET TOTAL:											**0**	**273**	**6**	**0**	**9**	**10**	**192**	**16**	**114**	**0**	**0**	**0**	**10**	**0**	**4**	**0**	**0**	**5**	**2**	**6**

ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016

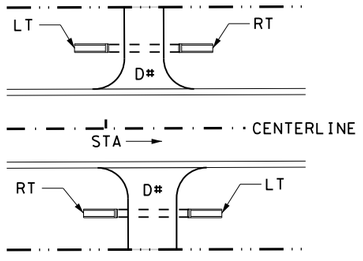
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 3 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		9

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SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	104 REMOVING CONC (DRIVEWAYS)	162 (2) BLOCK SODDING	168 VEGETATIVE WATERING (10 GAL/SY /2 APP)	400 CUT & RESTORE CONC PAVING	400 CUT & RESTORE ASPH PAVING	400 CUT AND RESTORE PAV (FLEX BASE)	464 RC PIPE (CL III) 6002 (15 IN)	6003 (18 IN)	6005 (24 IN)	6007 (30 IN)	6008 (36 IN)	6010 (48 IN)	467 (1) SET(TY II)(RCP)(6:1)(P) 6341 (15 IN)	6363 (18 IN)	6395 (24 IN)	6423 (30 IN)	6454 (36 IN)	467 SET (REMOV & REINSTALL)	480 CLEAN EXIST CULVERTS	496 REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D223	2014+20	31.3762	-94.8296	LT	ASPH	C	12			N/A																			
D222	2017+15	31.3758	-94.8287	RT	GRAV	R	12	38	38	REM EXIST 12" X 20' RCP W/SET; INST 15" X 32' RCP W/SET EA END		26	0.6			4	32						2							1
D221	2018+05	31.3757	-94.8285	RT	ASPH	R	10	40	40	REM EXIST 12" X 20' RCP W/SET; INST 15" X 28' RCP W/SET EA END		26	0.6			3	28						2							1
D220	2018+85	31.3757	-94.8282	RT	ASPH	R	9	35	35	EXIST 15" X 22' RCP W/SET; INST 15" X 4' RCP-LT, RELAY SET-LT, CLEAN CULVERT		13	0.3				4												1	1	
D219	2021+15	31.3755	-94.8275	RT	DIRT	R	18	36	36	REM EXIST 12" X 24' RCP W/SET; INST 15" X 34' RCP W/SET EA END		26	0.6				34						2							1
D218	2021+65	31.3756	-94.8274	LT	GRAV	R	12			N/A																				
D217	2026+15	31.3753	-94.8260	LT	ASPH	C	18	32	32	EXIST 18" X 40' RCP W/SET; NO WORK																				
D216	2033+65	31.3747	-94.8237	RT	GRAV	R	11	30	30	REM EXIST 18" X 26' CMP W/SET; INST 18" X 28' RCP W/SET EA END		26	0.6			4	28						2							1
D215	2036+45	31.3746	-94.8227	LT	DIRT	R	12			N/A																				
D214	2036+75	31.3744	-94.8227	RT	ASPH	C	28			N/A																				
D213	2038+05	31.3745	-94.8222	LT	ASPH	R	17			N/A																				
D212	2042+15	31.3742	-94.8210	LT	DIRT	R	10	34	34	REM EXIST 12" X 20' RCP W/SET; INST 15" X 28' RCP W/SET EA END		26	0.6				28						2							1
D211	2045+35	31.3738	-94.8200	RT	DIRT	R	10	42	42	REM EXIST 18" X 40' HDPE W/SET; INST 18" X 42' RCP W/SET EA END		28	0.6				42						2							1
D210	2051+90	31.3734	-94.8180	RT	ASPH	C	12	40	40	REM EXIST 15" X 20' CMP W/SET; INST 15" X 22' RCP W/SET EA END		26	0.6		4		22						2							1
D209	2052+45	31.3733	-94.8178	RT	ASPH	R	10	38	38	REM EXIST 18" X 24' CMP W/SET; INST 18" X 26' RCP W/SET EA END		28	0.6		4		26						2							1
D208	2053+05	31.3735	-94.8176	LT	GRAV	C	20			N/A																				
D207	2054+55	31.3732	-94.8172	RT	DIRT	R	14	33	33	REM EXIST 12" X 24' RCP W/SET; INST 15" X 26' RCP W/SET EA END		26	0.6				26						2							1
D206	2055+75	31.3731	-94.8168	RT	ASPH	R	13	32	32	REM EXIST 12" X 24' RCP W/SET; INST 15" X 26' RCP W/SET EA END		26	0.6		4		26						2							1
D205	2056+35	31.3731	-94.8166	RT	CONC	R	14	31	31	REM EXIST 18" X 25' HDPE W/SET; INST 18" X 26' RCP, RELAY SET EA END	5	28	0.6	5				26										2		1
D204	206+45	31.3728	-94.8154	RT	ASPH	C	16	32	32	EXIST 15" X 38' RCP W/SET; NO WORK																				
D203	2061+95	31.3726	-94.8149	RT	CONC	R	18	37	37	EXIST 18" X 26' RCP W/SET; NO WORK																				
										CSJ: 0336-03-072 SHEET TOTAL:	**5**	**305**	**6.9**	**5**	**12**	**11**	**296**	**26**	**0**	**0**	**0**	**0**	**20**	**0**	**0**	**0**	**0**	**3**	**1**	**11**

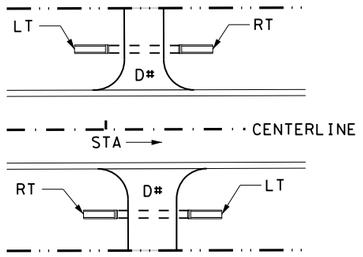
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 4 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		10

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SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET (TY II)(RCP)(6:1)(P) (15 IN)	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)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
D202	2066+85	31.3723	-94.8134	RT	ASPH	C	15	37	37	EXIST 18" X 30' RCP W/SET; INST 18" X 4' RCP-LT, RELAY SET-LT, CLEAN		14	0.3					4											1	1	
D201	2072+15	31.3719	-94.8118	RT	DIRT	R	15	31	31	REM EXIST 18" X 26' CMP W/SET; INST 18" X 28' RCP W/SET EA END		28	0.6					28						2							1
D200	2073+00	31.3718	-94.8115	RT	ASPH	R	22	45	45	REM EXIST 18" X 27' HDPE W/SET; INST 18" X 30' RCP W/SET EA END		28	0.6		9			30						2							1
D199	2076+55	31.3716	-94.8104	RT	ASPH	C	20			N/A																					
D198	2076+90	31.3715	-94.8103	RT	ASPH	R	12	36	36	REM EXIST 12" X 20' RCP W/SET; INST 15" X 22' RCP W/SET EA END		26	0.6		4		22						2								1
D197	2077+15	31.3719	-94.8102	LT	ASPH	R	11	34	34	REM EXIST 8" X 22' STEEL; INST 15" X 22' RCP W/SET EA END		26	0.6		3		22						2								1
D196	2078+50	31.3714	-94.8098	RT	DIRT	R	16	33	33	REM EXIST 12" X 28' RCP W/SET; INST 15" X 30' RCP W/SET EA END		26	0.6				30						2								1
D195	2078+80	31.3716	-94.8097	LT	ASPH	R	10			N/A																					
D194	2079+40	31.3714	-94.8095	RT	ASPH	R	12	36	36	REM EXIST 12" X 24' RCP W/SET; INST 15" X 26 ' RCP W/SET EA END		26	0.6		4		26						2								1
D193	2080+50	31.3715	-94.8091	LT	ASPH	R	18	31	31	EXIST 15" X 30' RCP W/SET; INST 15" X 4' RCP-LT, RELAY SET-LT, CLEAN		13	0.3				4											1	1	
D192	2081+05	31.3714	-94.8090	LT	ASPH	R	10	34	34	REM EXIST STR; INST 15" X 32' RCP W/SET EA END		26	0.6		3		32						2								1
D191	2081+35	31.3712	-94.8089	RT	ASPH	R	16	38	38	EXIST 15" X 32' RCP W/SET; NO WORK																					
D190	2082+00	31.3713	-94.8087	LT	ASPH	R	14	32	32	EXIST 15" X 24' RCP W/SET; INST 15" X 4' RCP-RT, RELAY SET-RT		13	0.3				4											1		
D189	2082+50	31.3713	-94.8085	LT	ASPH	R	15	36	36	EXIST 15" X 26' RCP W/SET; INST 15" X 4' RCP -RT, RELAY SET-RT		13	0.3				4											1		
D188	2082+95	31.3711	-94.8084	RT	ASPH	R	9	35	35	EXIST 15" X 30' RCP W/SET; INST 15" X 4' RCP-LT, RELAY SET-LT		13	0.3				4											1		
D187	2083+10	31.3713	-94.8083	LT	ASPH	C	24	34	34	EXIST 18" X 44' RCP W/SET; NO WORK																					
D186	2083+75	31.3710	-94.8082	RT	ASPH	R	9	37	37	REM EXIST 12" X 22' RCP W/SET; INST 15" X 26' RCP W/SET EA END		26	0.6		3		26						2								1
D185	2084+20	31.3712	-94.8080	LT	ASPH	R	9	32	32	EXIST 18" X 20' RCP W/SET; REM & REPL BROKEN SET EA END		28	0.6											2							
D184	2084+90	31.3711	-94.8078	LT	ASPH	R	12	32	32	18" X 28' RCP W/SET; INST 18" X 4' RCP-RT, RELAY SET-RT		14	0.3					8										1		
D183	2084+90	31.3710	-94.8078	RT	ASPH	R	14	38	38	18" X 26' RCP W/SET; NO WORK																					
D182	2086+00	31.3709	-94.8075	RT	GRAV	R	10	28	28	15" X 28' RCP W/SET; INST 15" X 8' RCP-LT, RELAY SET-LT		13	0.3				8											1		
D181	2085+15	31.3710	-94.8074	LT	ASPH	R	10	36	36	REM EXIST STR; INST 15" X 26' RCP W/SET EA END		26	0.6		4		26						2								1
										CSJ: 0336-03-072 SHEET TOTAL:	**0**	**359**	**8.1**	**0**	**30**	**0**	**208**	**70**	**0**	**0**	**0**	**0**	**14**	**6**	**0**	**0**	**0**	**7**	**2**	**9**

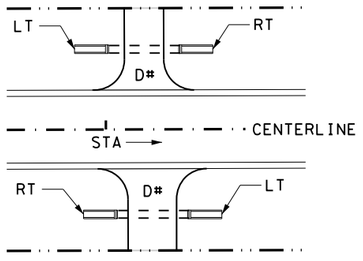
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 5 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		11

SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103) (CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET (TY II) (RCP) (6:1) (P) (15 IN)	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)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
D180	2087+25	31.3708	-94.8071	RT	ASPH	R	11	38	40	18" X 26' RCP W/SET; INST 18" X 4' RCP-LT, RELAY SET-LT,		14	0.3					4											1	1	
D179	2087+75	31.3709	-94.8069	LT	ASPH	R	13	35	35	18" X 28' RCP W/SET; INST 18" X 4' RCP-RT, RELAY SET-RT		14	0.3					4											1		
D178	2088+45	31.3707	-94.8067	RT	ASPH	R	10	34	38	15" X 34' RCP W/SET; NO WORK																					
D177	2088+55	31.0000	-94.8066	LT	ASPH	R	10	36	36	18" X 32' RCP W/SET; INST 18" X 4' RCP-RT, RELAY SET-RT		14	0.3					4											1		
D176	2089+05	31.3708	-94.8065	LT	ASPH	R	12	37	37	REM EXIST 15" X 22' CMP W/SET; INSTALL 15" X 24' RCP W/SET		26	0.6				24						2								1
D175	2090+30	31.3705	-94.8062	RT	ASPH	R	10	37	37	30" X 26' RCP W/SET; NO WORK																					
D174	2090+85	31.3705	-94.8060	RT	ASPH	R	12	37	37	30" X 26' RCP W/SET; NO WORK																					
D173	2090+70	31.3707	-94.8060	LT	ASPH	C	24	40	48	REM EXIST 15" X 40' CMP W/SET; INST 15" X 44' RCP W/SET EA END		26	0.6		9		44						2								1
D172	2092+50	31.3706	-94.8054	LT	ASPH	R	34	44	44	REM EXIST 18" X 50' CMP W/SET; INST 18" X 52' RCP W/SET EA END		26	0.6		13		52						2								1
D171	2093+65	31.3703	-94.8051	LT	ASPH	R	10	40	40	NO WORK																					
D170	2094+00	31.3705	-94.8050	RT	ASPH	R	9	44	44	EXIST 24"X45' RCP W/SET; CLEAN CULVERT																				1	
D169	2094+55	31.3702	-94.8049	LT	ASPH	C	28	40	40	EXIST 60"WX54'LX36"H' RCP W/SET; NO WORK																					
D168	2099+45	31.3701	-94.8033	LT	ASPH	R	11			N/A																					
D167	2101+55	31.3699	-94.8026	LT	ASPH	R	15	42	42	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2								
D166	2103+85	31.3698	-94.8019	LT	ASPH	R	12	42	42	REM EXIST 12" X 30' RCP W/SET; INST 15" X 36' RCP W/SET EA END		26	0.6		4		36						2								1
D165	2104+25	31.3695	-94.8019	RT	ASPH	C	150			N/A																					
D164	2104+75	31.3694	-94.8017	RT	ASPH	R	9			N/A																					
D163	2105+50	31.3694	-94.8015	RT	GRAV	R	15			N/A																					
D162	2106+55	31.3696	-94.8011	LT	DIRT	R	10			N/A																					
D161	2107+65	31.3695	-94.8007	RT	ASPH	C	18	42	42	EXIST 18" X 44' RCP; REM 18" CMP SET, INST SET EA END & CLEAN CULVERT														2						1	
D160	2108+30	31.3693	-94.8006	RT	DIRT	R	12	37	37	REM EXIST 12" X 28' RCP W/SET; INST 15" X 32' RCP W/SET EA END		26	0.6				32						2								1
D159	2108+85	31.3692	-94.8004	RT	ASPH	R	11	47	47	REM EXIST 12" X 28' RCP W/SET; INST 15" X 30' RCP W/SET EA END		26	0.6		4		30						2								1
D158	2110+00	31.3694	-94.8000	LT	DIRT	R	11	43	53	EXIST 18" X 58' RCP; INST SET LT		14	0.3										2	1					1		
D157	2110+70	31.3691	-94.7998	RT	GRAV	R	11	43	43	EXIST 18" X 28' RCP W/SET; REM 18" CMP SET, INST SET EA END		28	0.6											2							
										CSJ: 0336-03-072 SHEET TOTAL:	**0**	**266**	**6**	**0**	**30**	**0**	**218**	**12**	**0**	**0**	**0**	**0**	**16**	**5**	**0**	**0**	**0**	**3**	**4**	**6**

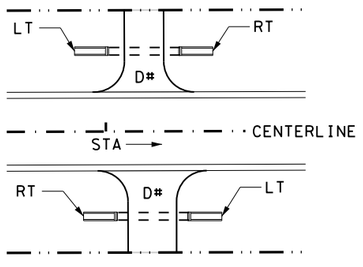
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 6 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		12

SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103) (CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	104 REMOVING CONC (DRIVEWAYS)	162 (2) BLOCK SODDING	168 VEGETATIVE WATERING (10 GAL/SY /2 APP)	400 CUT & RESTORE CONC PAVING	400 CUT & RESTORE ASPH PAVING	400 CUT AND RESTORE PAV (FLEX BASE)	464 RC PIPE (CL III) 6002 (15 IN)	6003 (18 IN)	6005 (24 IN)	6007 (30 IN)	6008 (36 IN)	6010 (48 IN)	467 (1) SET (TY II) (RCP) (6:1) (P) 6341 (15 IN)	6363 (18 IN)	6395 (24 IN)	6423 (30 IN)	6454 (36 IN)	467 SET (REMOV & REINSTALL) 6580	480 CLEAN EXIST CULVERTS 6001	496 REMOV STR (PIPE) 6016
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D156	2110+95	31.3693	-94.7997	RT	GRAV	R	28	39	39	EXIST 15" X 70' RCP; REM 15" CMP SET, INST SET RT		13	0.3										1							
D155	2111+40	31.3691	-94.7996	RT	GRAV	R	10	43	43	EXIST 18" X 28' RCP W/SET; REM 18" CMP SET, INST SET EA END		28	0.6											2						
D154	2111+70	31.3693	-94.7995	LT	ASPH	C	22	39	39	EXIST 18" X 48' RCP W/SET; NO WORK																				
D153	2112+05	31.3690	-94.7994	RT	GRAV	R	10	40	40	REM EXIST 16" X 25' CMP; INST 18" X 28' RCP W/SET EA END		28	0.6			4		28						2						1
D152	2112+90	31.3690	-94.7992	RT	GRAV	R	12	42	42	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST 15" X 4' RCP-RT, INST SET EA END		26	0.6				4						2							
D151	2113+35	31.3691	-94.7990	LT	GRAV	R	10	40	40	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D150	2114+00	31.3691	-94.7988	LT	ASPH	R	12	41	41	REM EXIST 12" X 30' RCP W/SET; INST 15" X 32' RCP W/SET EA END		26	0.6		4		32						2							1
D149	2114+15	31.3689	-94.7988	RT	GRAV	R	14	40	40	REM EXIST 12" X 28' RCP W/SET; INST 15" X 28' RCP W/SET EA END		26	0.6			5	28						2							1
D148	2115+50	31.3688	-94.7984	RT	DIRT	R	10			N/A																				
D147	2115+90	31.3690	-94.7982	LT	GRAV	R	15			N/A																				
D146	2117+80	31.3688	-94.7976	RT	GRAV	R	11	38	38	REM EXIST 18" X 22' CMP W/SET; INST 18" X 24' RCP W/SET EA END		28	0.6			4		24						2						
D145	2118+05	31.3686	-94.7976	RT	GRAV	R	12	41	41	REM EXIST 12" X 28' RCP W/SET; INST 15" X 32' RCP W/SET EA END		26	0.6			4	32						2							1
D144	2118+45	31.3686	-94.7974	RT	GRAV	R	15	44	44	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST 15" X 4' RCP-LT, INST SET EA END &		26	0.6				4						2						1	
D143	2118+35	31.3688	-94.7974	LT	ASPH	R	25	40	40	EXIST 18" X 50' RCP W/SET; REM 18" CMP SET, INST SET EA END		28	0.6											2						
D142	2119+40	31.3687	-94.7971	LT	ASPH	R	9	39	39	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST 15" X 4' RCP- RT, INST SET EA END		26	0.6				4						2							
D141	2119+45	31.3685	-94.7971	RT	ASPH	R	12	38	38	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D140	2120+20	31.3685	-94.7969	RT	GRAV	R	10	43	43	REM EXIST 16" X 23' STEEL; INST 18" X 24' RCP W/SET EA END		28	0.6			4		24						2						1
D139	2120+85	31.3686	-94.7966	LT	GRAV	R	14	41	41	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST 15" X 4' RCP-RT, INST SET EA END,		26	0.6				4						2							1
D138	2120+85	31.3684	-94.7967	RT	ASPH	R	12	39	39	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D137	2121+35	31.3684	-94.7965	RT	ASPH	R	12	43	43	EXISIT 15" X 28' RCP W/SET; REM 15" CMP SET, INST 15" X 4' RCP- LT, INST SET		26	0.6				4						2							1
D136	2122+55	31.3683	-94.7962	RT	GRAV	R	20	40	40	EXIST 18" X 30' RCP W/SET; NO WORK																				
										CSJ: 0336-03-072 SHEET TOTAL:	**0**	**439**	**9.9**	**0**	**4**	**21**	**112**	**76**	**0**	**0**	**0**	**0**	**23**	**10**	**0**	**0**	**0**	**0**	**1**	**7**

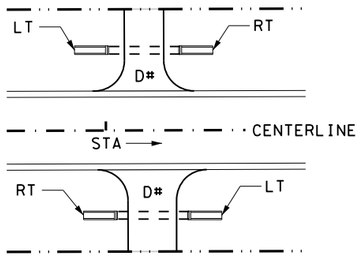
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		13

SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RSCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III)						SET(TY II)(RCP)(6:1)(P)					SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D135	2124+10	31.3682	-94.7957	RT	ASPH	R	8	39	39	EXIST 18" X 28' RCP W/SET; REM 18" CMP SET, INST SET EA END		28	0.6											2							
D134	2126+05	31.3681	-94.7951	RT	ASPH	R	15	42	42	EXIST 15" X 30' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D133	2126+95	31.3682	-94.7947	LT	DIRT	R	11	42	42	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D132	2127+15	31.3680	-94.7947	RT	ASPH	R	9	40	40	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D131	2128+05	31.3681	-94.7944	LT	ASPH	R	11	42	42	REM EXIST 12" X 30' RCP W/SET; INST 15" X 36' RCP W/SET EA END		26	0.6		4		36						2							1
D130	2129+10	31.3681	-94.7941	LT	ASPH	C	17	40	40	REM EXIST 12" X 32' RCP W/SET; INST 15" X 36' RCP W/SET EA END		26	0.6		6		36						2							1
D129	2129+85	31.3680	-94.7938	LT	GRAV	R	12	40	40	REM EXIST 12" X 30' RCP W/SET; INST 15" X 38' RCP W/SET EA END		26	0.6			4	38						2							1
D128	2129+75	31.3678	-94.7939	RT	GRAV	R	12	41	41	REM EXIST 12" X 28' RCP W/SET; INST 15" X 36' RCP W/SET EA END		26	0.6			4	36						2							1
D127	2130+60	31.3678	-94.7937	RT	ASPH	C	17	42	42	REM EXIST 12" X 26' RCP; INST 15" X 36' RCP W/SET EA END		26	0.6		6		36						2							1
D126	2130+75	31.3680	-94.7936	LT	GRAV	R	10	42	42	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST 15" X 6' RCP- LT, INST SET EA END &		26	0.6				6						2						1	
D125	2131+40	31.3677	-94.7934	LT	DIRT	R	12	39	39	REM EXIST 12" X 28' RCP W/SET; INST 15" X 32' RCP W/SET EA END		26	0.6				32						2							1
D124	2131+65	31.3679	-94.7933	LT	GRAV	R	12	39	39	EXIST 18" X 28' RCP W/SET; REM 18" CMP SET, INST 18" X 4' RCP-LT, 18" X 6'-RT, INST SET		28	0.6					10						2					1	
D123	2132+45	31.3676	-94.7931	RT	ASPH	R	10			N/A																				
D122	2132+85	31.3676	-94.7930	RT	GRAV	R	13			N/A																				
D121	2132+75	31.3678	-94.7929	LT	CONC	C	25			N/A																				
D120	2133+95	31.3678	-94.7926	LT	GRAV	C	12	42	42	REM EXIST 12" X 24' HDPE; INST 15" X 40' RCP W/SET EA END	7	26	0.6	7			40						2							
D119	2134+70	31.3677	-94.7923	LT	DIRT	R	12	40	40	REM EXIST 12" X 28' RCP W/SET; INST 15" X 36' RCP W/SET EA END		26	0.6				36						2							1
D118	2134+90	31.3675	-94.7923	RT	DIRT	R	14	38	38	REM EXIST 12" X 28' RCP W/SET; INST 15" X 30' RCP W/SET EA END		26	0.6				30						2							1
D117	2135+40	31.3674	-94.7922	RT	ASPH	R	9	41	45	REM EXIST STR; INST 15" X 32' RCP W/SET EA END		26	0.6		3		32						2							1
D116	2136+30	31.3674	-94.7919	RT	GRAV	R	15	40	40	REM EXIST 12" X 26' RCP W/SET; INST 15" X 36' RCP W/SET EA END		26	0.6			5	36						2							1
D115	2135+55	31.3676	-94.7921	LT	ASPH	C	40	45	45	NO WORK																				
										CSJ: 0336-03-072 SHEET TOTAL:	**7**	**446**	**10.2**	**7**	**19**	**13**	**394**	**10**	**0**	**0**	**0**	**0**	**30**	**4**	**0**	**0**	**0**	**0**	**2**	**10**

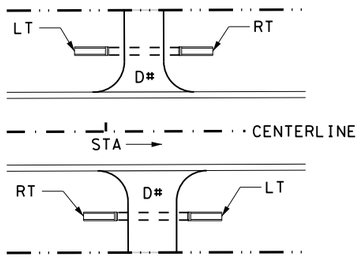
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 8 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		14

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SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET (TY II)(RCP)(6:1)(P) (15 IN)	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)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D113	2136+75	31.3676	-94.7917	LT	ASPH	R	10	52	52	NO WORK																				
D112	2136+85	31.3673	-94.7917	RT	CONC	R	15	39	39	REM EXIST 12" X 30' RCP W/SET; INST 15" X 36' RCP W/SET EA END	5	26	0.6	5			36						2							1
D111	2137+60	31.3673	-94.7915	RT	DIRT	R	12	42	42	EXIST 15" X 30' RCP W/SET; REM 15" CMP SET, INST 15" X 4'		26	0.6				4						2							1	
D110	2137+95	31.3673	-94.7914	RT	GRAV	R	10	39	39	EXIST 15" X 26' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D109	2138+35	31.3675	-94.7912	LT	DIRT	R	14	44	44	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D108	2138+50	31.3672	-94.7912	LT	GRAV	R	10	44	44	EXIST 18" X 28' RCP W/SET; REM 18" CMP SET, INST 18" X 4'		28	0.6					4						2					1	
D107	2138+75	31.3674	-94.7911	LT	GRAV	R	12	40	40	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D106	2139+30	31.3672	-94.7910	RT	CONC	R	9	41	41	EXIST 18" X 28' RCP W/SET; REM 18" CMP SET, INST SET EA END & CLEAN CULVERT		28	0.6											2					1	
D105	2139+70	31.3674	-94.7908	LT	GRAV	R	8	42	42	EXIST 15" X 24' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D104	2139+85	31.3671	-94.7908	RT	DIRT	R	13	40	40	REM EXIST 18" X 20' CMP; INST 18" X 22' RCP W/SET EA END		28	0.6					22						2						1
D103	2142+45	31.3672	-94.7899	LT	GRAV	C	20	42	42	REM EXIST 24" X 42' CMP W/SET; INST 24" X 48' RCP W/SET EA END		34	0.7			9			48						2					1
D102	2143+05	31.3671	-94.7897	LT	ASPH	R	12	41	45	EXIST 18" X 30' RCP W/SET; REM 18" CMP SET, INST 18" X 6' RCP-RT, INST SET EA END & CLEAN		28	0.6					6						2					1	
D101	2147+85	31.3666	-94.7883	RT	DIRT	R	12	42	42	NO WORK																				
D100	2148+55	31.3666	-94.7881	RT	GRAV	R	14	50	50	REM EXIST 12" X RCP & CMP W/SET; INST 15" X 26' RCP W/SET EA END		26	0.6			5		26					2							1
D99	2148+95	31.3665	-94.7880	RT	ASPH	C	12	43	43	EXIST 15" X 34' RCP W/SET; REM 15" CMP SET, INST SET EA END & CLEAN CULVERT		26	0.6										2						1	
D98	2151+20	31.3666	-94.7872	LT	GRAV	R	12	39	39	REM EXIST 12" X 28' RCP W/SET; INST 15" X 34' RCP W/SET EA END		26	0.6			4	34						2							1
D97	2151+10	31.3664	-94.7873	RT	CONC	C	27	45	45	REM EXIST 12" X 30' RCP W/SET; INST 15" X 44' RCP W/SETEA END	9	26	0.6	9			44						2							1
D96	2151+95	31.3663	-94.7870	RT	GRAV	R	12	42	42	REM EXIST 18" X 27' HDPE; INST 18" X 28' RCP W/SET EA END		28	0.6			5		28						2						1
D95	2152+40	31.3665	-94.7868	LT	ASPH	R	10	40	40	REM EXIST 12" X 28' RCP W/SET; INST 15" X 30' RCP W/SET EA END		26	0.6			3	30						2							1
D94	2152+65	31.3663	-94.7868	RT	ASPH	R	10			N/A																				
										CSJ: 0336-03-072 SHEET TOTAL:	**14**	**460**	**10.3**	**14**	**0**	**26**	**148**	**86**	**48**	**0**	**0**	**0**	**22**	**10**	**2**	**0**	**0**	**0**	**5**	**8**
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016

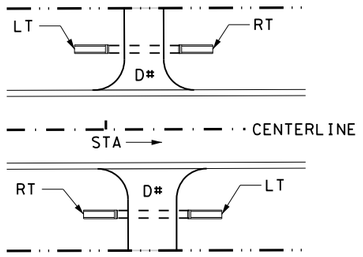
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 9 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		15

SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCRS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET (TY II) (RCP) (6:1) (P) (15 IN)	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)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
D93	2154+10	31.3664	-94.7863	LT	GRAV	R	57			N/A																				
D92	2155+55	31.3661	-94.7859	RT	ASPH	C	18			N/A																				
D91	2156+65	31.3662	-94.7855	LT	GRAV	C	33	43	43	REM 12" X 46' RCP, INST 15" X 46' RCP W/SET EA END		26					46						2							1
D90	2157+80	31.3659	-94.7852	RT	CONC	R	10	40	40	REM 18" X 25' CMP, INST 18" X 26' RCP W/SET EA END	2	28	0.6	2				26						2							1
D89	2157+70	31.3662	-94.7852	LT	GRAV	C	18	38	38	EXIST 15" X 44' RCP W/ CMP SET,REM & REPL 15" X 8' RCP LT, REM & REPL SET EA END		26	0.6			1	8						2							
D88	2158+35	31.3661	-94.7850	LT	DIRT	R	12	41	41	EXIST 15" X 22' RCP W/SET; REM 15" CMP SET, INST SET EA END & CLEAN CULVERT		26	0.6										2						1	
D87	2158+75	31.3661	-94.7849	LT	ASPH	C	12	39	39	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D86	2158+60	31.3659	-94.7849	RT	CONC	R	10	40	40	REM EXIST 18" X 25' CMP; INST 18" X 32' RCP W/SET EA END	4	28	0.6	4				32						2							1
D85	2159+80	31.3658	-94.7846	RT	ASPH	S	18	41	41	REM EXIST 18" X 32' CMP; INST 18" X 38' RCP W/SET EA END		28	0.6			5		38						2							1
D84	2160+00	31.3660	-94.7845	LT	ASPH	C	13	38	38	EXIST 18" X 20' CMP W/SET; REM 18" CMP SET, INST SET EA END		28	0.6											2							
D83	2161+05	31.3659	-94.7841	LT	ASPH	R	17			N/A																				
D82	2162+10	31.3659	-94.7838	LT	ASPH	R	52			N/A																				
D81	2162+80	31.3656	-94.7837	RT	ASPH	C	38			N/A																				
D80	2162+75	31.3658	-94.7836	LT	GRAV	R	15			N/A																				
D79	2164+35	31.3657	-94.7831	LT	ASPH	R	12			N/A																				
D78	2166+25	31.3654	-94.7826	RT	ASPH	R	12	38	38	EXIST 18" X 30' RCP W/SET; REM 18" CMP SET, INST SET EA END		28	0.6											2						
D77	2167+30	31.3653	-94.7822	RT	GRAV	R	12	39	39	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6											2						
D76	2167+50	31.3655	-94.7821	LT	ASPH	C	12	41	41	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6											2						
D75	2168+10	31.3653	-94.7820	RT	GRAV	R	9	39	39	EXIST 18" X 28' RCP W/SET; REM 18" CMP SET, INST SET EA END & CLEAN CULVERT		28	0.6											2					1	
D74	2168+55	31.3654	-94.7818	LT	GRAV	R	8	40	40	EXIST 15" X 28' RCP W/SET; REM & REPL BROKEN SET, REM 15" CMP SET, INST SET EA END		26	0.6											2						
D73	2168+85	31.3654	-94.7817	LT	GRAV	C	11	40	40	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6											2						
D72	2169+05	31.3652	-94.7817	RT	DIRT	R	12	39	39	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST 15" X 4' EA END, INST SET EA END & CLEAN		26	0.6				8							2						1	
D71	2170+25	31.3653	-94.7813	LT	GRAV	C	20	44	44	EXIST 15" X 30' RCP W/SET; REM 15" CMP SET, INST SET EA END & CLEAN CULVERT		26	0.6											2					1	
D70	2170+65	31.3651	-94.7812	RT	CONC	R	10	39	39	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6											2						
										CSJ: 0336-03-072 SHEET TOTAL:	**6**	**454**	**9.6**	**6**	**0**	**6**	**62**	**96**	**0**	**0**	**0**	**0**	**22**	**12**	**0**	**0**	**0**	**0**	**4**	**4**

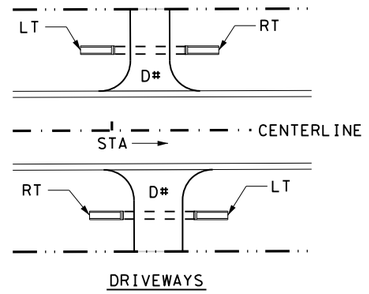
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 10 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		16

SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III)						SET(TY II)(RCP)(6:1)(P)					SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
							FT	FT	FT		SY	SY	MG	SY	SY	SY	(15 IN) LF	(18 IN) LF	(24 IN) LF	(30 IN) LF	(36 IN) LF	(48 IN) LF	(15 IN) EA	(18 IN) EA	(24 IN) EA	(30 IN) EA	(36 IN) EA	EA	EA	EA
D69	2171+05	31.3653	-94.7810	LT	ASPH	C	20			N/A																				
D68	2171+45	31.3652	-94.7809	LT	ASPH	C	22			N/A																				
D67	2172+00	31.3652	-94.7807	LT	GRAV	R	13			N/A																				
D66	2172+45	31.3652	-94.7806	LT	GRAV	R	26			N/A																				
D65	2172+65	31.3650	-94.7806	RT	DIRT	R	12	38	38	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END & CLEAN CULVERT		26	0.6										2						1	
D64	2172+95	31.3651	-94.7804	LT	GRAV	R	11			N/A																				
D63	2173+45	31.3649	-94.7804	RT	ASPH	C	10	40	40	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END & CLEAN CULVERT		26	0.6										2						1	
D62	2174+15	31.3648	-94.7801	RT	ASPH	C	12	40	40	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, REMOVE 15" X 4' RCP EA END, INSTALL 15" X 6' RCP EA END, INST SET EA END,		26	0.6				12						2							
D61	2174+15	31.3651	-94.7801	LT	GRAV	R	12	42	42	REM EXIST 12" X 28' RCP W/SET; INST 15" X 30' RCP W/SET EA END		26	0.6			4	30						2							1
D60	2175+00	31.3650	-94.7798	LT	GRAV	R	12	43	43	REM EXIST 12" X 28' RCP W/SET; INST 15" X 34' RCP W/SET EA END		26	0.6			4	34						2							1
D59	2175+05	31.3648	-94.7798	RT	DIRT	R	14	42	42	REM EXIST 12" X 28' RCP W/SET; INST 15" X 32' RCP W/SET EA END		26	0.6				32						2							1
D58	2175+85	31.3647	-94.7796	RT	DIRT	R	16	41	41	REM EXIST 12" X 28' RCP W/SET; INST 15" X 32' RCP W/SET EA END		26	0.6				32						2							1
D57	2176+55	31.3647	-94.7794	RT	GRAV	R	12	41	41	REM EXIST 12" X 28' RCP W/SET; INST 15" X 32' RCP W/SET EA END		26	0.6			4	32						2							1
D56	2176+85	31.3649	-94.7792	LT	GRAV	R	16	44	44	REM EXIST 15" X 26' RCP W/SET; INST 15" X 28' RCP W/SET EA END		26	0.6			6	28						2							1
D55	2177+35	31.3648	-94.7791	LT	GRAV	R	11	38	38	REM EXIST 15" X 20' HDPE; INST 15" X 20' RCP W/SET EA END		26	0.6			4	20						2							1
D54	2177+45	31.3646	-94.7791	RT	GRAV	R	9	40	40	REM EXIST 15" X 21' CMP; INST 15" X 22' RCP W/SET EA END		26	0.6			3	22						2							1
D53	2178+05	31.3646	-94.7789	RT	GRAV	R	13	40	40	REM EXIST 15" X 22' CMP W/SET; INST 15" X 24' RCP W/SET EA END		26	0.6			5	24						2							1
D52	2178+55	31.3648	-94.7787	LT	GRAV	R	15	40	40	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							1
D51	2178+55	31.3645	-94.7788	RT	ASPH	R	10	40	40	REM EXIST 12" X 28' RCP W/SET; INST 15" X 32' RCP W/SET EA END		26	0.6		3		32						2							1
D50	2179+40	31.3645	-94.7785	RT	GRAV	R	11	41	41	REM EXIST 12" X 24' RCP W/SET; INST 15" X 28' RCP W/SET EA END		26	0.6			4	28						2							1
										CSJ: 0336-03-072 SHEET TOTAL:	**0**	**390**	**9**	**0**	**3**	**34**	**326**	**0**	**0**	**0**	**0**	**0**	**30**	**0**	**0**	**0**	**0**	**0**	**2**	**12**

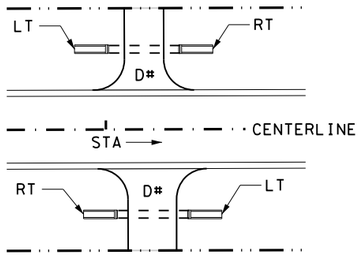
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 11 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		17

SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RSC	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III)						SET(TY II)(RCP)(6:1)(P)					SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
																	(15 IN)	(18 IN)	(24 IN)	(30 IN)	(36 IN)	(48 IN)	(15 IN)	(18 IN)	(24 IN)	(30 IN)	(36 IN)			
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
D49	2179+60	31.3647	-94.7784	LT	DIRT	R	15	39	39	EXIST 15" X 22' RCP W/SET; REM 15" CMP SET, INST SET EA END & CLEAN CULVERT		26	0.6										2						1	
D48	2181+35	31.3646	-94.7778	LT	ASPH	R	10	39	39	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							1
D47	2181+25	31.3644	-94.7779	RT	ASPH	R	11	43	43	REM EXIST 12" X 52' RCP W/SET; INST 15" X 54' RCP W/SET EA END		26	0.6		2		54						2							1
D46	2181+45	31.3644	-94.7778	RT	ASPH	R	13	40	40						2								2							
D45	2182+50	31.3645	-94.7775	LT	ASPH	R	8	39	39	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D44	2182+85	31.3642	-94.7774	RT	DIRT	R	67			N/A																				
D43	2183+50	31.3644	-94.7772	LT	ASPH	R	17	40	40	REM EXIST 12" X 26' RCP W/SET; INST 15" X 36' RCP W/SET EA END		26	0.6		6		36						2							1
D42	2184+36	31.3642	-94.7769	RT	GRAV	R	10	42	42	REM EXIST 12" X 32' RCP W/SET; INST 15" X 36' RCP W/SET EA END		26	0.6			3	36						2							1
D41	2184+75	31.3643	-94.7768	LT	ASPH	R	30			N/A																				
D40	2186+10	31.3640	-94.7764	RT	ASPH	R	20	44	44	REM EXIST 12" X 150' RCP, INSTL 15" X 88' RCP W/SET EA		26	0.6			9	88						2							1
D39	2186+85	31.3642	-94.7761	LT	ASPH	R	12	39	39	REM EXIST 12" X 28' RCP W/SET; INST 15" X 30' RCP W/SET EA END		26	0.6		4		30						2							1
D38	2187+75	31.3639	-94.7759	RT	GRAV	R	13	44	44	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, REMOVE 15" X 4' RCP-RT, INST 15" X 6'-RT, INST		26	0.6				6						2						1	
D37	2189+35	31.3640	-94.7753	LT	DIRT	R	12	39	39	REM EXIST 12" X 28' RCP W/SET; INST 15" X 30' RCP W/SET EA END		26	0.6										2							1
D36	2191+40	31.3639	-94.7747	LT	GRAV	R	13			N/A																				
D35	2193+20	31.3638	-94.7741	LT	CONC	R	11	39	39	REM EXIST 12" X 28' RCP W/SET; INST 15" X 30' RCP W/SET EA END	4	26	0.6	4			30						2							1
D34	2193+20	31.3636	-94.7742	RT	GRAV	R	13	42	42	REM EXIST 12" X 28' RCP W/SET; INST 15" X 30' RCP W/SET EA END		26	0.6			4	30						2							1
D33	2194+40	31.3637	-94.7738	LT	DIRT	R	12	38	38	REM EXIST 12" X 34' RCP W/SET; INST 15" X 38' RCP W/SET EA END		26	0.6				38						2							1
D32	2195+80	31.3636	-94.7733	LT	GRAV	R	12	40	40	EXIST 18" X 32' RCP W/SET; REM 18" CMP SET, INST SET EA END		28	0.6										2							
D31	2197+20	31.3635	-94.7729	LT	GRAV	R	12	39	41	REM EXIST 18" X 32' CMP; INST 18" X 36' RCP W/SET EA END		28	0.6			4	36						2							1
D30	2197+85	31.3633	-94.7728	RT	ASPH	C	9	39	39	EXIST 15" X 28' RCP W/SET; REM 15" CMP SET, INST SET EA END		26	0.6										2							
D29	2198+65	31.3634	-94.7725	LT	GRAV	R	13	38	38	REM EXIST 12" X 30' RCP; INST 15" X 34' RCP W/SET EA END		26	0.6			4	34						2							1
										CSJ: 0336-03-072 SHEET TOTAL:	**4**	**446**	**10.2**	**4**	**14**	**24**	**418**	**0**	**0**	**0**	**0**	**0**	**34**	**0**	**0**	**0**	**0**	**0**	**2**	**12**

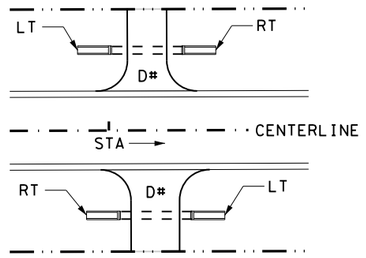
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 12 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		18

SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	R/C/S	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET (TY II)(RCP)(6:1)(P) (15 IN)	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)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D28	2199+40	31.3632	-94.7723	RT	GRAV	C	12	40	40	EXIST 18" X 28' RCP W/SET; REM 18" CMP SET, INST SET EA END & CLEAN CULVERT		28	0.6										2						1	
D27	2200+65	31.3633	-94.7718	LT	GRAV	R	10	38	38	EXIST 18" X 34' RCP; CLEAN CULVERT																			1	
D26	2201+35	31.3632	-94.7716	LT	ASPH	C	18	39	39	REM EXIST 18" X 24' CMP; INST 18" X 30' RCP W/SET EA END		28	0.6		7			30						2						1
D25	2202+45	31.3632	-94.7713	LT	DIRT	C	16	39	39	REM EXIST 18" X 24' CMP; INST 18" X 26' RCP W/SET EA END		28	0.6					26						2						1
D24	2203+35	31.3631	-94.7710	LT	ASPH	R	8	38	38	EXIST 15" X 32' RCP W/SET; REM 15" CMP SET, INST SET EA END & CLEAN CULVERT		26	0.6											2					1	
D23	2204+35	31.3630	-94.7707	LT	ASPH	C	15			N/A																				
D22	2204+65	31.3628	-94.7706	RT	GRAV	R	13			N/A																				
D21	2205+05	31.3630	-94.7705	LT	ASPH	R	9	37	37	EXIST 15" X 30' RCP W/SET; REM 15" CMP SET, INST SET EA END & CLEAN CULVERT		26	0.6										2						1	
D20	2205+35	31.3628	-94.7704	RT	CONC	R	17			N/A																				
D19	2205+90	31.3627	-94.7703	RT	CONC	R	16			N/A																				
D18	2206+10	31.3629	-94.7701	LT	GRAV	C	11	38	38	REM EXIST 18" X 26' CMP W/SET; INST 18" X 28' RCP W/SET EA END		28	0.6			4		28						2						1
D17	2208+35	31.3628	-94.7697	LT	GRAV	C	15	38	38	EXIST 15" X 30' RCP W/SET; REM 15" CMP SET, INST SET EA END & CLEAN CULVERT		26	0.6										2						1	
D16	2207+50	31.3626	-94.7698	RT	GRAV	R	13			N/A																				
D15	2208+35	31.3625	-94.7695	RT	GRAV	R	12			N/A																				
D14	2209+25	31.3625	-94.7692	RT	GRAV	R	12			N/A																				
D13	2209+75	31.3627	-94.7690	LT	DIRT	R	15	38	38	EXIST 15" X 32' RCP W/SET; REM 15" CMP SET, INST SET EA END & CLEAN CULVERT		26	0.6										2						1	
D12	2210+15	31.3624	-94.7689	RT	GRAV	R	54			N/A																				
D11	2210+45	31.3624	-94.7688	RT	GRAV	R	18			N/A																				
D10	2211+15	31.3626	-94.7686	LT	ASPH	R	12	36	36	REM EXIST 12" X 30' RCP W/SET; INST 15" X 31' RCP W/SET EA END		26	0.6		4								2							1
D9	2211+25	31.3624	-94.7686	RT	ASPH	C	11			N/A																				
D8	2211+90	31.3623	-94.7684	RT	GRAV	C	40			N/A																				
D7	2212+50	31.3625	-94.7681	LT	GRAV	R	20	38	38	EXIST 18" X 30' RCP W/SET; REM 15" CMP SET, INST SET EA END & CLEAN CULVERT		28	0.6										2						1	
D6	2213+80	31.3624	-94.7677	LT	ASPH	C	20			N/A																				
CSJ: 0336-03-072 SHEET TOTAL:											**0**	**270**	**6**	**0**	**11**	**4**	**0**	**84**	**0**	**0**	**0**	**0**	**12**	**8**	**0**	**0**	**0**	**0**	**7**	**4**

ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016

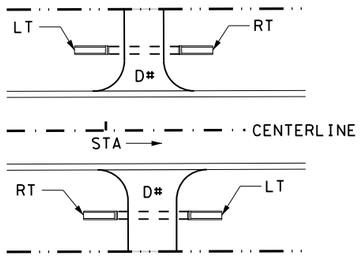
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 13 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		19

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SUMMARY OF DRIVEWAY AND SIDEROADS (SH 103)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III)						SET(TY II)(RCP)(6:1)(P)					SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D5	2214+15	31.3622	-94.7677	RT	ASPH	C	20	43	43	EXIST 18" X 44' RCP W/SET; REM 18" CMP SET, INST SET EA END & CLEAN CULVERT		28	0.6										2						1	
D4	2216+70	31.3620	-94.7669	RT	GRAV	R	15	42	42	REM EXIST 18" X 28' RCP W/SET; INST 18" X 28' RCP W/SET EA END		28	0.6			6		2						2						1
D3	2218+05	31.3619	-94.7665	RT	GRAV	R	20	45	45	EXIST 15" X 54' RCP; INST SET EA END		26	0.6										2							
D2	2233+60	31.3613	-94.7636	RT	ASPH	C	41			N/A																				
D1	2234+55	31.3612	-94.7634	RT	ASPH	C	17			N/A																				
CSJ: 0336-03-072 SHEET TOTAL:											**0**	**82**	**1.8**	**0**	**0**	**6**	**0**	**2**	**0**	**0**	**0**	**0**	**4**	**2**	**0**	**0**	**0**	**0**	**1**	**1**
CSJ: 0336-03-072 TOTALS:											**36**	**4671**	**104.6**	**36**	**155**	**178**	**2648**	**724**	**202**	**0**	**0**	**0**	**247**	**74**	**8**	**0**	**0**	**24**	**40**	**104**

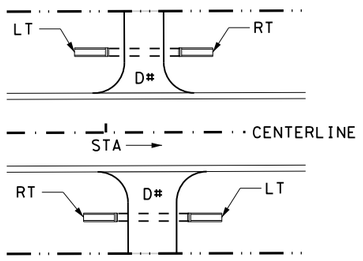
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		20

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 2971)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	104 REMOVING CONC (DRIVEWAYS)	162 (2) BLOCK SODDING	168 VEGETATIVE WATERING (10 GAL/SY /2 APP)	400 CUT & RESTORE CONC PAVING	400 CUT & RESTORE ASPH PAVING	400 CUT AND RESTORE PAV (FLEX BASE)	464 RC PIPE (CL III) 6002 (15 IN)	6003 (18 IN)	6005 (24 IN)	6007 (30 IN)	6008 (36 IN)	6010 (48 IN)	467 (1) SET(TY II)(RCP)(6:1)(P) 6341 (15 IN)	6363 (18 IN)	6395 (24 IN)	6423 (30 IN)	6454 (36 IN)	480 CLEAN EXIST CULVERTS	496 REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA
D1	2+50	31.5076	-93.8510	RT	GRAV	R	11			N/A																			
D2	3+2	31.3575	-93.8508	LT	CONC	C	46			N/A																			
D3	3+47	31.3407	-93.8510	RT	GRAV	R	18			N/A																			
D4	3+93	31.3406	-93.8510	RT	CONC	C	61			N/A																			
D5	4+15	31.3405	-93.8508	LT	GRAV	R	20			N/A																			
D6	8+40	31.3394	-93.8508	LT	DIRT	C	12	28	28	EXIST 15'' X 21' RCP; INST 15" X 4' & SET EA END		26	0.6				8						2						
D7	8+92	31.3392	-93.8510	RT	GRAV	R	19			N/A																			
D8	9+30	31.3391	-93.8508	LT	GRAV	R	9	28	28	EXIST 15'' X 20' RCP; INST 15" X 4'-LT & SET EA END		26	0.6				4						2						
D9	10+1	31.3389	-93.8528	LT	GRAV	R	11	28	28	EXIST 15'' X 20' RCP; NST 15" X 4'-LT, 15" X 6'-RT, & SET EA END		26	0.6				10						2						
D10	10+55	31.3388	-93.8509	RT	GRAV	R	50			N/A																			
D11	11+34	31.3386	-93.8508	LT	GRAV	R	15	21	21	EXIST 15'' X 36' RCP; INST 15" X 4'-LT & SET EA END		26	0.6				4						2						
D12	12+10	31.3383	-93.8509	RT	GRAV	R	25			N/A																			
D13	12+56	31.3382	-93.8509	RT	GRAV	R	14	24	24	EXIST 15'' X 20' RCP; INST SET EA END CLEAN		26	0.6										2					1	
D14	12+47	31.3382	-93.8508	LT	GRAV	R	9	20	20	EXIST 15'' X 20' RCP; INST 15" X 24'-RT & SET EA END		26	0.6				24						2						
D15	12+68	31.3382	-93.8508	LT	GRAV	R	8	20		REM EXIST 18'' X 21' CMP; REMOVE STRUCTURE						3													1
D16	13+58	31.3380	-93.8509	LT	GRAV	R	9	16	16	REM EXIST 18'' X 21' CMP; INST 18" X 22' RCP W/SET EA END		28	0.6			4		22						2					1
D17	13+97	31.3378	-93.8509	LT	DIRT	R	12	20	20	EXIST 15'' X 20' RCP; INST 15" X 4'-RT & SET EA END		26	0.6				4						2						
D18	14+89	31.3376	-93.8511	LT	DIRT	R	17	23	23	EXIST 15'' X 32' RCP; INST SET EA END & CLEAN CULVERT		26	0.6										2					1	
D19	15+42	31.3375	-93.8513	RT	GRAV	R	20	23	23	REM EXIST 12'' X 35' RCP & CMP; INST 18" X 38' RCP W/SET EA END		28	0.6			8		38						2					1
D20	15+90	31.3373	-93.8512	LT	ASPH	R	8	19	23	EXIST 15'' X 21' RCP; INST SET EA END		26	0.6										2						1
D21	17+2	31.3371	-93.8514	LT	GRAV	R	10	21	25	EXIST 15'' X 17' RCP; INST 15" X 4'-LT & SET EA END		26	0.6				4						2						1
D22	17+70	31.3370	-93.8515	LT	GRAV	R	11	23	23	EXIST 15'' X 35' RCP; INST SET EA END & CLEAN CULVERT		26	0.6										2					1	
D23	18+25	31.3368	-93.8516	LT	GRAV	R	15	26	30	REM EXIST 15'' X 28' RCP; INST 18" X 30' RCP W/SET EA END		28	0.6			5		30						2					1
D24	18+36	31.3368	-93.8518	RT	GRAV	R	19	25	25	REM EXIST 15'' X 32' CMP; INST 18" X 32' RCP W/SET EA END		28	0.6			7		32						2					1
D25	19+28	31.3366	-93.8518	LT	ASPH	R	14			N/A																			
										CSJ: 1678-02-007 SHEET TOTAL:	**0**	**398**	**9**	**0**	**0**	**27**	**58**	**122**	**0**	**0**	**0**	**0**	**22**	**8**	**0**	**0**	**0**	**3**	**7**

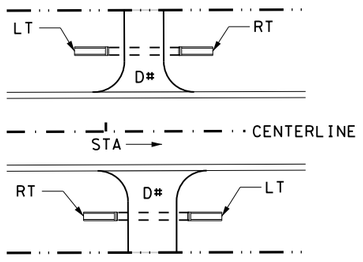
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 15 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		21

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 2971)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	ITEM NO.	104	162	168	400			464						467 (1)					480	496
											BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6001	6016
												REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III)						SET(TY II)(RCP)(6:1)(P)					CLEAN EXIST CULVERTS	REMOV STR (PIPE)
																		(15 IN)	(18 IN)	(24 IN)	(30 IN)	(36 IN)	(48 IN)	(15 IN)	(18 IN)	(24 IN)	(30 IN)	(36 IN)		
							FT	FT	FT			SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA
D26	25+30	31.3351	-93.8526	LT	GRAV	R	12			N/A																				
D27	27+70	31.3345	-93.8530	LT	GRAV	C	13	26	26	REM EXIST 12'' X 20' HDPE; INST 15" X 22' RCP W/SET EA END			26	0.6			5	22						2						1
D28	28+93	31.3342	-93.8532	LT	GRAV	C	10	26	26	REM EXIST 18'' X 24' HDPE; INST 15" X 24' RCP W/SET EA END			26	0.6			4	24						2						1
D29	30+89	31.3337	-93.8534	LT	GRAV	C	14	28	28	EXIST 15'' X 20' RCP; INST 15" X 4'-RT & SET EA END			26	0.6				4						2						
D30	36+37	31.3324	-93.8544	LT	GRAV	R	14	32	32	REM EXIST 23'' X 25' STEEL; INST 24" X 34' RCP W/SET EA END			34	0.7			6			34						2				1
D31	37+79	31.3324	-93.8544	LT	GRAV	R	15	34	34	REM EXIST 23'' X 25' STEEL; INST 24" X 34' RCP W/SET EA END			34	0.7			7			34						2				1
D32	39+77	31.3317	-93.8551	LT	DIRT	R	19	32	32	REM EXIST 14'' X 30' CMP; INST 18" X 30' RCP W/SET END			28	0.6					30						2					1
D33	40+32	31.3316	-93.8552	LT	DIRT	R	12	30	30	REM EXIST 15'' X 21' CMP; INST 18" X 26' RCP W/SET EA END			28	0.6					26						2					1
D34	47+79	31.3300	-93.8566	LT	CONC	R	18			N/A																				
D35	54+36	31.3285	-93.8578	RT	CONC	C	13	23	23	EXIST 15'' X 37' RCP; INST 15" X 6'-LT, 15" X 4'-RT, & SET EA END			26	0.6				10						2						
D36	54+41	31.3284	-93.8577	LT	DIRT	R	15	28	28	REM EXIST 15'' X 24' CMP; INST 18" X 28' RCP W/SET EA END			28	0.6					28						2					1
D37	55+25	31.3282	-93.8578	LT	GRAV	R	10	24	24	EXIST 15'' X 21' RCP; INST 15" X 4' & SET EA END			26	0.6				8						2						
D38	55+83	31.3280	-93.8580	RT	DIRT	R	13	20	20	EXIST 15'' X 24' RCP; REM 15" X 4', INST 15" X 6', & SET EA END			26	0.6				12						2						1
D39	57+84	31.3276	-93.8582	LT	GRAV	R	10			N/A																				
D40	65+34	31.3258	-93.8594	RT	DIRT	R	7	20	20	REM EXIST 15'' X 19' CMP; INST 18" X 24' RCP W/SET EA END			28	0.6					24						2					1
D41	66+74	31.3254	-93.8606	LT	GRAV	R	13			N/A																				
D42	66+79	31.3254	-93.8597	RT	CONC	R	14			N/A																				
D43	68+14	31.3251	-93.8600	RT	GRAV	R	12	20	20	EXIST 15'' X 25' RCP; INST SET EA END			26	0.6										2						
D44	68+82	31.3250	-93.8600	RT	DIRT	R	28	22	22	EXIST 15'' X 48' RCP; INST 15" X 6'-LT, SET EA END & CLEAN CULVERT			26	0.6				6						2					1	
D45	71+18	31.3244	-93.8604	RT	GRAV	R	14	21	21	EXIST 15'' X 29' RCP; INST SET EA END & CLEAN CULVERT			26	0.6										2					1	
D46	72+31	31.3241	-93.8604	LT	GRAV	R	9	26	26	EXIST 15'' X 20' RCP; INST 15" X 6'-LT, 15" X 4'-RT, SET EA END & CLEAN CULVERT			26	0.6				10						2					1	
											CSJ: 1678-02-007 SHEET TOTAL:	**0**	**440**	**9.8**	**0**	**0**	**22**	**96**	**108**	**68**	**0**	**0**	**0**	**20**	**8**	**4**	**0**	**0**	**3**	**9**

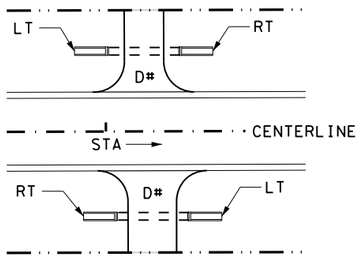
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 16 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		22

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SUMMARY OF DRIVEWAY AND SIDEROADS (FM 2971)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	PROPOSED STRUCTURE	REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET(TY II)(RCP)(6:1)(P) (15 IN)	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)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA
D47	74+22	31.3237	-93.8609	RT	GRAV	R	15	21	21	EXIST 18'' X 25' RCP W/SET; INST 18" X 4'-RT, REM & RESET SET-RT		28	0.6					4												
D48A	93+50	31.3195	-93.8645	RT	DIRT	R	9	24	24	EXIST 24'' X 15' RCP; INST 24" X 4' W/SET EA END		34	0.7						8						2				
D48B	93+50	31.3195	-93.8645	RT	DIRT	R	9	26	26	EXIST 24'' X 15' RCP; INST 24" X 4' W/SET EA END		34	0.7						8						2				
D49	110+27	31.3152	-93.8668	RT	GRAV	R	10	48	48	NO WORK																			
D50	123+10	31.3119	-93.8679	RT	GRAV	C	8	30	30	REM EXIST 30'' X 31 HDPE; INST 30" X 34' RCP W/SET EA END		34	0.7			4				34						2			1
D51	128+58	31.3104	-93.8683	RT	ASPH	R	8	30	30	REM EXIST 30'' X 25' RCP; INST 30" x 34' RCP W/SET EA END		44	0.9		4					34						2			1
D52	136+52	31.3086	-93.8696	LT	GRAV	C	15			N/A																			
D53	137+50	31.3087	-93.8700	RT	GRAV	C	9	21	21	EXIST 24'' X 30' RCP; INST 24" X 4'-LT W/SET EA END		34	0.7						4						2				
D54	139+12	31.3086	-93.8705	RT	GRAV	R	14	23	23	EXIST 15'' X 49' RCP; REM & REPL 15" X 4'-LT, INST SET EA END & CLEAN CULVERT		26	0.6				4						2					1	1
										CSJ: 1678-02-007 SHEET TOTAL:	**0**	**234**	**4.9**	**0**	**4**	**4**	**4**	**4**	**20**	**68**	**0**	**0**	**2**	**0**	**6**	**4**	**0**	**1**	**3**
										CSJ: 1678-02-007 TOTALS:	**0**	**1072**	**23.7**	**0**	**4**	**53**	**158**	**234**	**88**	**68**	**0**	**0**	**44**	**16**	**10**	**4**	**0**	**7**	**19**

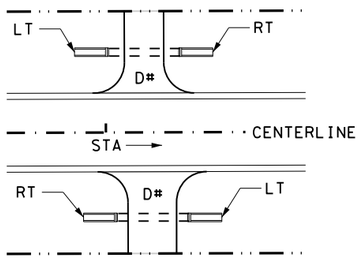
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 17 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		23

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 2864)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	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	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET (TY II) (RCP) (6:1) (P) (15 IN)	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)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
D1	1+72	31.7087	-94.6340	RT	ASPH	R	12	21	21	EXIST 24'' X 42' RCP; REM & REPL 24" X 6' RCP-LT, INST SET		36	0.8						6						2						
D2	4+50	31.7094	-94.6339	RT	GRAV	C	15			NO WORK																				
D3	8+68	31.7106	-94.6339	RT	ASPH	R	8	29	29	REM EXIST 18'' X 20' CMP, INST 18" X 24' RCP W/SET EA END		28	0.6		4			24						2						1
D4	10+3	31.7110	-94.6338	RT	GRAV	R	9	29	29	REM EXIST 16'' X 18' RCP, INST 18" X 26' RCP W/SET EA END		28	0.6			4		26						2						1
D5	11+67	31.7114	-94.6340	LT	ASPH	C	16	29	29	EXIST 18'' X 38' RCP W/SET; REM SET-LT, INST 18" X 6'-LT, RELAY SET-LT, CLEAN CULVERT		28	0.6					6											1	1	
D6	14+56	31.7122	-94.6338	RT	ASPH	R	10	20	20	REM EXIST 12'' X 24' RCP, INST 18" X 24' RCP W/SET EA END		28	0.6		4			24						2						1
D7	23+28	31.7146	-94.6338	RT	GRAV	C	20	32	32	EXIST 18 X 28' RCP; REM 18" X 6'-LT, INST 18" X 8'-RT & 18" X 6'-LT W/SET EA END, CLEAN		28	0.6					14						2						1	
D8	24+89	31.7151	-94.6338	RT	GRAV	R	10	23	23	EXIST 18'' X 20' RCP; INST SET EA END, CLEAN CULVERT		28	0.6											2						1	
D9	25+92	31.7154	-94.6338	RT	GRAV	R	9	31	31	EXIST 18'' X 20' RCP; INST 18" X 4' W/SET EA END		28	0.6					8						2							
D10	27+49	31.7158	-94.6338	RT	GRAV	R	10	30	30	REM EXIST 12'' X 24' CMP , INST 18" X 32' RCP W/SET EA END		28	0.6			4		32						2						1
D11	28+19	31.7160	-94.6173	LT	ASPH	R	10	27	27	EXIST 18'' X 20' RCP; INST 18" X 8'-RT W/SET EA END, CLEAN CULVERT		28	0.6					8						2						1	
D12	29+66	31.7164	-94.6338	RT	ASPH	R	13	28	28	EXIST 18'' X 32' RCP; NO WORK																					
D13	31+03	31.7168	-94.6338	RT	GRAV	R	10	30	30	REM EXIST 18'' X 22' CMP, INST 18" X 22' RCP W/SET EA END		28	0.6			5		22						2						1
D14	34+94	31.7178	-94.6345	RT	ASPH	R	10	28	28	REM EXIST 12'' X 24' RCP, INST 18" X 24' RCP W/SET EA END		28	0.6		4			24						2						1
D15	36+61	31.7183	-94.6338	RT	ASPH	R	10	27	27	REM EXIST 12'' X 24' CMP, INST 18" X 24' RCP W/SET EA END		28	0.6		4			24						2						1
D16	38+93	31.7189	-94.6339	LT	ASPH	R	13	28	28	REM EXIST 12'' X 30' RCP, INST 18" X 30' RCP W/SET EA END		28	0.6		6			30						2						1
D17	37+88	31.7187	-94.6338	RT	GRAV	R	12	21	21	REM EXIST 16'' X 24' CMP, INST 18" X 24' RCP W/SET EA END		28	0.6			6		24						2						1
D18	39+99	31.7192	-94.6338	RT	ASPH	R	10	21	21	NO WORK																				
D19	42+25	31.7199	-94.6338	RT	GRAV	R	11	28	28	REM EXIST 18'' X 38' CMP, INST 18" X 38' RCP W/SET EA END		28	0.6			6		38						2						1
D20	43+39	31.7202	-94.6338	RT	ASPH	R	10	26	26	REM EXIST 18'' X 21' CMP, INST 18" X 29' RCP W/SET EA END		28	0.6		5			38						2						1
D21	44+52	31.7205	-94.6338	RT	ASPH	R	18	28	28	18" X 44' RCP W/ SET; NO WORK																					
D22	44+72	31.7205	-94.6338	LT	ASPH	R	18	26	26	EXIST 18" X 38' RCP W/ SET; INST 18" X 8'-LT & 18" X 12'-RT, RELAY SET EA END,		28	0.6					20											2	1	
										CSJ: 2891-01-018 SHEET TOTAL:	**0**	**512**	**11.0**	**0**	**27**	**25**	**0**	**362**	**6**	**0**	**0**	**0**	**0**	**30**	**2**	**0**	**0**	**3**	**5**	**11**

R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
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36"	22
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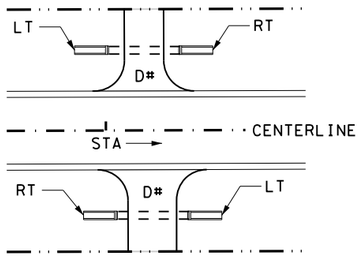


DRIVEWAYS

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		24

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 2864) (CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RSC	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	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET (TY II) (RCP) (6:1) (P) (15 IN)	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)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
D23	54+71	31.7233	-94.6339	RT	ASPH	R	10	26	26	EXIST 18" x 24' RCP; INST 18" X 4' RCP W/SET EA END, CLEAN CULVERT		28	0.6					8						2					1	
D24	54+87	31.7233	-94.6340	LT	ASPH	R	15	25	25	EXIST 18'' X 24' RCP; INST 18" X 4'-LT & INST SET EA END, CLEAN CULVERT		28	0.6					4						2					1	
D25	59+55	31.7246	-94.6340	LT	ASPH	C	14	17	17	NO WORK																				
D26	61+91	31.7253	-94.6341	LT	ASPH	C	10	26	26	REM EXIST 18" X 46' CMP, INST 18" X 46' RCP W/SET EA END		28	0.6		5			46						2						1
D27	64+85	31.7261	-94.6341	LT	ASPH	R	10	22	22	REM EXIST 12'' X 20' RCP, INST 18" X 24' RCP W/SET EA END		28	0.6		4			24						2						1
D28	65+69	31.7263	-94.6340	RT	ASPH	C	22	28	28	REM EXIST 18" X 46' HDPE, INST 18" X 46' RCP W/SET EA END		28	0.6		11			46						2						1
D29	67+45	31.7268	-94.6341	LT	ASPH	R	10	19	19	NO WORK																				
D30	67+52	31.7268	-94.6340	RT	ASPH	C	10	21	21	NO WORK																				
D31	68+57	31.7271	-94.6340	RT	ASPH	C	33	21	21	NO WORK																				
D32	69+55	31.7274	-94.6340	RT	ASPH	R	10	26	26	REM EXIST 12'' X 20' RCP, INST 18" X 26' RCP W/SET EA END		28	0.6		4			26						2						1
D33	72+42	31.7282	-94.6341	RT	ASPH	R	15	20	20	NO WORK																				
D34	74+67	31.7287	-94.6345	LT	ASPH	R	19	17	17	NO WORK																				
D35	80+32	31.7300	-94.6355	RT	ASPH	R	15	33	33	EXIST 24" X 20' RCP; INST 24" X 6'-LT & 24" X 12'-RT W/SET EA END, CLEAN CULVERT		36	0.8						18						2					1	
D36	85+62	31.7311	-94.6366	RT	ASPH	C	12	25	25	REM EXIST 18'' X 42' CMP, INST 18" X 42' RCP W/SET EA END		28	0.6		6			42						2						1
D37	98+73	31.7344	-94.6383	LT	ASPH	R	10	15	15	REM EXIST 12" X 42' CMP, INST 18" X 42' RCP W/SET EA END		28	0.6		4			42						2						1
D38	102+12	31.7353	-94.6385	RT	ASPH	R	12	19	19	NO WORK																				
D39	106+38	31.7364	-94.6390	LT	ASPH	C	16	44	44	EXIST 18'' X 40' RCP W/ SET; INST 18" X 6' & RELAY SET EA END, CLEAN CULVERT		28	0.6					12											2	1	
D40	111+97	31.7379	-94.6391	LT	ASPH	R	12	24	24	EXIST 15'' X 24' RCP; INST 15" X 34' W/SET EA END		28	0.6				8							2						1	
D41	112+52	31.7381	-94.6389	RT	ASPH	R	17	26	26	REM EXIST 15" X 47' RCP, INST 18" X 48' RCP W/SET EA END		28	0.6		8			48						2						1
D42	112+95	31.7382	-94.6391	LT	GRAV	R	10	21	21	EXIST 15'' X 20' RCP; INST SET EA END, CLEAN CULVERT		28	0.6											2						1	
D43	116+07	31.7390	-94.6389	RT	ASPH	R	15	26	26	REM EXIST 12" X 30' RCP, INST 18" X 30' RCP W/SET EA END		28	0.6		7			30						2						1
D44	128+82	31.7425	-94.6392	RT	ASPH	R	10	32	32	REM EXIST 18'' X 20' CMP, INST 18" X 20' RCP W/SET EA END		28	0.6		5			20						2						1
D45	130+58	31.7430	-94.6392	RT	ASPH	R	11	31	31	EXIST 15'' X 20' RCP; INST 15" X 4'-LT, INST SET EA END		28	0.6				4							2							
D46	132+17	31.7435	-94.6393	RT	ASPH	R	12	19	19	NO WORK																				
										CSJ: 2891-01-018 SHEET TOTAL:	**0**	**456**	**9.8**	**0**	**54**	**0**	**12**	**348**	**18**	**0**	**0**	**0**	**4**	**24**	**2**	**0**	**0**	**2**	**6**	**9**

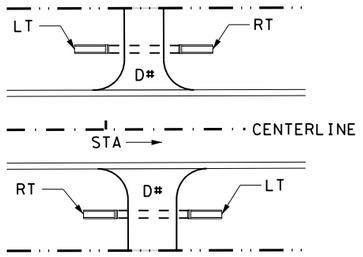
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		25

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 2864) (CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	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	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III)						SET (TY II) (RCP) (6:1) (P)					SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D47	134+89	31.7442	-94.6394	RT	ASPH	C	14	25	25	NO WORK																				
D48	138+30	31.7451	-94.6398	RT	ASPH	R	10	26	26	EXIST 15'' X 20' RCP; INST 15" X 6'-LT, RELAY SET-LT		28	0.6				6											1		
D49	141+10	31.7458	-94.6400	LT	ASPH	R	8	27	27	REM EXIST 16" X 24' STEEL, INST 18" X 28' RCP W/SET EA END		28	0.6		4			28						2						1
D50	144+86	31.7468	-94.6404	LT	ASPH	R	10	28	28	REM EXIST 18" X 24' CMP, INST 18" X 32' RCP W/SET EA END		28	0.6		5			32						2						1
D51	147+14	31.7474	-94.6405	LT	ASPH	R	13	11	11	NO WORK																				
D52	151+32	31.7486	-94.6407	LT	GRAV	C	48	23	23	EXIST 48" X 62' RCP W/ SET; INST 48" X 8'-LT, 48" X 6'-RT, RELAY SET EA END		56	1.2									14						2		
D53	154+14	31.7494	-94.6405	RT	GRASS	R	11	28	28	EXIST 15" X 20' RCP; INST SET EA END		28	0.6										2							
D54	155+12	31.7496	-94.6496	LT	ASPH	R	11	32	32	REM EXIST 30" X 20' RCP, INST 30" X 28' RCP W/SET EA END		44	0.9		7							28						2		1
D55	156+40	31.7500	-94.6406	LT	ASPH	R	18	32	32	REM EXIST 30" X 32' CMP, INST 30" X 38' RCP W/SET EA END		44	0.9		12							38						2		1
D56	157+55	31.7503	-94.6406	LT	ASPH	R	15	31	31	REM EXIST 30" X 20' RCP, INST 30" X 34' RCP W/SET EA END		44	0.9		10							34						2		1
D57	160+13	31.7510	-94.6405	RT	ASPH	R	10	22	22	NO WORK																				
D58	160+83	31.7512	-94.6406	LT	ASPH	R	12	31	31	EXIST 15" X 24' RCP; INST 15" X 6'-LT, 15" X 4'-RT, INST SET EA END		28	0.6				10						2							
D59	164+35	31.7522	-94.6407	LT	ASPH	R	15	27	27	EXIST 15" X 20' RCP; INST 15" X 4' & SET EA END		28	0.6				8						2							
D60	164+42	31.7522	-94.6405	RT	CONC	R	17	26	26	REM EXIST 18" X 24' CMP, INST 18" X 28' RCP W/SET EA END	9	28	0.6	9				28						2						1
D61	168+59	31.7533	-94.6409	RT	ASPH	R	12	17	17	NO WORK																				
D62	169+47	31.7535	-94.6411	LT	ASPH	C	14	27	27	NO WORK																				
D63	170+09	31.7537	-94.6410	RT	ASPH	R	12	31	31	EXIST 18" X 20' RCP; INST 18" X 4' W/SET EA END		28	0.6					8						2						
D64	179+80	31.7555	-94.6416	RT	ASPH	R	12	25	25	REM EXIST 18" X 22' CMP, INST 18" X 22' RCP W/SET EA END		28	0.6		6			22						2						1
D65	179+21	31.7561	-94.6417	LT	ASPH	C	15	20	20	NO WORK																				
D66	181+19	31.7567	-94.6416	LT	ASPH	R	12	27	27	EXIST 15" X 20' RCP; INST SET EA END, CLEAN CULVERT		28	0.6										2						1	
D67	185+02	31.7577	-94.6411	RT	ASPH	R	13	33	33	EXIST 18" X 28' RCP; INST 18" X 4'-RT & SET EA END		28	0.6					4						2						
D68	185+22	31.7577	-94.6412	LT	ASPH	R	10	28	28	EXIST 15" X 24' RCP; INST 15" X 4'-LT & SET EA END		28	0.6				4						2						1	
D69	185+57	31.7578	-94.6411	RT	CONC	R	12	32	32	EXIST 18" X 20' RCP; REM 4' EA END, INST 18" X 6' W/SET EA END		28	0.6					12						2						1
										CSJ: 2891-01-018 SHEET TOTAL:	**9**	**552**	**11.7**	**9**	**44**	**0**	**28**	**134**	**0**	**0**	**100**	**14**	**10**	**14**	**0**	**0**	**6**	**3**	**2**	**8**

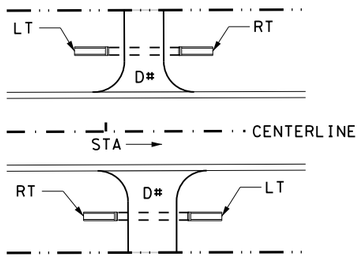
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		26

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 2864) (CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	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	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET (TY II) (RCP) (6:1) (P) (15 IN)	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)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
D70	186+14	31.7579	-94.6410	RT	ASPH	R	15	30	30	REM EXIST 24" X 25' CMP, INST 24" X 26' RCP W/SET EA END		36	0.8		9				26						2				1
D71	187+43	31.7583	-94.6410	LT	ASPH	R	11	22	22	EXIST 15" X 24' RCP; INST 15" X 4'-RT & SET EA END		28	0.6				4							2						
D72	187+64	31.7583	-94.6408	RT	ASPH	R	11	30	30	EXIST 18" X 20' RCP; INST 18" X 4' & SET EA END		28	0.6					8						2						
D73	189+43	31.7588	-94.6408	LT	ASPH	R	14	22	22	REM EXIST 18" X 45' CMP, INST 18" X 46' RCP W/SET EA END		28	0.6		7			46						2						1
D74	190+63	31.7591	-94.6406	RT	ASPH	R	12	30	30	REM EXIST 18" X 20' CMP, INST 18" X 20' RCP W/SET EA END		28	0.6		6			20						2						1
D75	192+03	31.7595	-94.6405	RT	GRAV	R	20	17	17	NO WORK																				
D76	192+74	31.7597	-94.6406	LT	ASPH	R	10	23	23	EXIST 15" X 20' RCP; INST 15" X 4' W/SET EA END		28	0.6				8						2							
D77	195+41	31.7605	-94.6406	LT	CONC	R	10	26	26	EXIST 18" X 24' RCP; INST 18" X 8'-LT, 18" X 10'-RT, & SET EA END		28	0.6					18						2						
D78	197+16	31.7609	-94.6405	RT	ASPH	R	9	34	34	REM EXIST 12" X 24' RCP, INST 18" X 32' RCP W/SET EA END		28	0.6		4			32						2						1
D79	197+74	31.7611	-94.6406	LT	ASPH	C	15	28	28	EXIST 18" X 22' RCP W/ SET; INST 18" X 4' RCP & RELAY SET EA END		28	0.6					8											2		
D80	199+17	31.7615	-94.6406	LT	ASPH	R	14	30	30	EXIST 24" X 20' RCP; INST SET EA END		36	0.8											2						
D81	199+69	31.7616	-94.6405	RT	CONC	R	16	40	40	EXIST 18" X 30' RCP; INST 18" X 4'-LT & INST SET EA END		28	0.6					4						2						
D82	200+17	31.7618	-94.6405	RT	ASPH	R	15	40	40	REM EXIST 18" X 24' CMP, INST 18" X 28' RCP W/SET EA END		28	0.6		8			28						2						1
D83	200+37	31.7618	-94.6406	LT	ASPH	R	10	17	32	REM EXIST 36" X 24' CMP, INST 36" X 52' RCP W/SET EA END		44	0.9								52						2			1
D84	201+11	31.7620	-94.6405	RT	CONC	R	14	35	35	REM EXIST 18" X 24' CMP, INST 18" X 36' RCP W/SET EA END	7	28	0.6	7				36						2						1
D85	203+24	31.7626	-94.6404	RT	ASPH	R	14	30	30	EXIST 18" X 16' RCP; INST 18" X 4'-LT & SET EA END		28	0.6					4						2						
D86	205+94	31.7633	-94.6403	RT	ASPH	C	25	27	27	EXIST 24" X 50' RCP W/ SET; NO WORK																				
D87	208+05	31.7639	-94.6404	LT	ASPH	R	10	22	22	EXIST 18" X 20' RCP; REM 6'-LT, INST 18" X 6'-LT, INST SET EA END		28	0.6					6						2						
D88	214+09	31.7655	-94.6408	LT	ASPH	R	15	24	24	EXIST 24" X 42' RCP; INST SET EA END		36	0.8											2						
D89	214+92	31.7658	-94.6407	RT	ASPH	R	30	26	26	REM EXIST 18" X 50' PLASTIC, INST 18" X 50' RCP W/SET EA END		28	0.6		16			50						2						1
D90	214+99	31.7658	-94.6408	LT	ASPH	C	15	23	23	EXIST 18" X 25' RCP W/ SET; INST 18" X 4' & RELAY SET EA END		28	0.6					8											2		
CSJ: 2891-01-018 SHEET TOTAL:											**7**	**572**	**12.3**	**7**	**50**	**0**	**12**	**268**	**26**	**0**	**52**	**0**	**2**	**24**	**6**	**0**	**2**	**4**	**0**	**8**

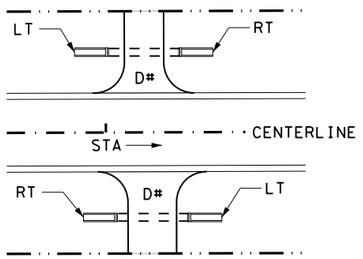
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 21 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		27

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SUMMARY OF DRIVEWAY AND SIDEROADS (FM 2864) (CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	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	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III)						SET (TY II) (RCP) (6:1) (P)					SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF (15 IN)	LF (18 IN)	LF (24 IN)	LF (30 IN)	LF (36 IN)	LF (48 IN)	EA (15 IN)	EA (18 IN)	EA (24 IN)	EA (30 IN)	EA (36 IN)	EA	EA	EA
D91	221+07	31.7674	-94.6413	LT	ASPH	R	10	26	26	EXIST 18" X 24' RCP; INST 18" X 4'-RT & SET EA END		28	0.6					4						2							
D92	222+38	31.7678	-94.6414	LT	ASPH	R	10	26	26	REM EXIST 24" X 24' CMP, INST 24" X 32' RCP W/SET EA END		36	0.8		6				32						2						1
D93	223+88	31.7682	-94.6414	RT	ASPH	R	12	26	26	EXIST 15" X 20' RCP; INST 15" X 4' & SET EA END		28	0.6				8						2							
D94	224+53	31.7684	-94.6414	RT	ASPH	C	25	20	20	24" X 48' RCP W/ SET; NO WORK																				
D95	224+29	31.7683	-94.6415	LT	ASPH	R	10	28	28	EXIST 15" X 24' RCP; INST 15" X 6'-LT, 15" X 4'-RT & SET EA END		28	0.6				10						2							
D96	225+30	31.7685	-94.6416	LT	ASPH	R	12	30	30	EXIST 18" X 20' RCP; INST 18" X 4'-RT & SET EA END		28	0.6					4						2						
D97	225+60	31.7686	-94.6415	RT	ASPH	R	10	17	26	EXIST 18" X 20' RCP; INST 18" X 6' RCP & SET EA END		28	0.6					12						2						
D98	227+55	31.7692	-94.6415	RT	ASPH	R	8	26	26	EXIST 18" X 20' RCP; INST 18" X 4' RCP & SET EA END		28	0.6					8						2						
D99	228+36	31.7694	-94.6415	RT	ASPH	R	10	30	30	EXIST 18" X 22' RCP; INST 18" X 4'-RT & SET EA END		28	0.6					4						2						
D100	229+94	31.7698	-94.6416	LT	ASPH	R	12	28	28	REM EXIST 24" X 24' CMP, INST 24" X 36' RCP W/SET EA END		36	0.8		7				36						2						1
D101	231+69	31.7703	-94.6416	LT	ASPH	R	15	28	28	REM EXIST 24" X 46' CMP, INST 24" X 50' RCP W/SET EA END		36	0.8		9				50						2						1
D102	234+16	31.7710	-94.6414	RT	ASPH	R	14	19	19	NO WORK																				
D103	235+70	31.7714	-94.6415	LT	ASPH	R	15	19	19	NO WORK																				
D104	236+12	31.7715	-94.6415	LT	ASPH	R	14	17	17	NO WORK																				
D105	236+75	31.7717	-94.6415	LT	ASPH		18	17	17	NO WORK																				
D106	237+35	31.7719	-94.6415	LT	ASPH	R	12	24	24	EXIST 15" X 30' RCP; INST SET EA END & CLEAN CULVERT		28	0.6										2						1	
D107	237+51	31.7719	-94.6414	RT	ASPH	R	16	18	18	NO WORK																				
D108	238+36	31.7721	-94.6415	LT	ASPH	R	16	17	17	NO WORK																				
D109	241+00	31.7729	-94.6414	LT	ASPH		15	17	17	NO WORK																				
D110	244+12	31.7737	-94.6413	RT	ASPH	R	12	24	24	REM EXIST 12" X 22' RCP, INST 18" X 28' RCP W/SET EA END		28	0.6		5			28						2						1
D111	246+55	31.7744	-94.6413	RT	GRASS	R	11	32	32	EXIST 18" X 26' RCP; INST 18" X 6'-LT & SET EA END		28	0.6					6						2						
D112	245+95	31.7742	-94.6414	LT	GRASS	R	10	32	32	EXIST 18" X 18' RCP; REM & REPL 18" X 6'-LT, INST SET EA END		28	0.6					6						2						1
D113	250+09	31.7754	-94.6415	LT	ASPH	R	12	24	24	EXIST 18" X 20' RCP; INST 18" X 4' RCP & SET EA END		28	0.6					8						2						
D114	251+10	31.7756	-94.6415	LT	ASPH	R	14	22	22	EXIST 15" X 26' RCP; INST SET EA END		28	0.6										2							
										CSJ: 2891-01-018 SHEET TOTAL:	**0**	**472**	**10.2**	**0**	**27**	**0**	**18**	**80**	**118**	**0**	**0**	**0**	**8**	**18**	**6**	**0**	**0**	**0**	**1**	**5**

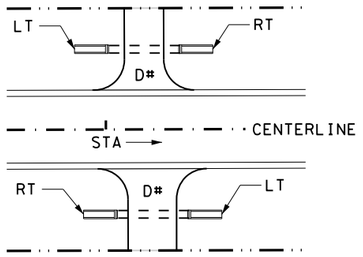
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 22 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		28

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 2864) (CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	DESCRIPTION OF WORK	ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
											BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
												REMOVING CONC (DRIVEWAYS)	(2) BLOCK SODDING	VEGETATIVE WATERING (10 GAL/SY /2 APP)	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET(TY II)(RCP)(6:1)(P) (15 IN)	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)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT			SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D115	252+61	31.7761	-94.6414	RT	ASPH	R	16	17	17	NO WORK																					
D116	254+22	31.7765	-94.6432	LT	GRAV	C	37	20	20	EXIST 18" X 50' RCP W/ SET; NO WORK																					
D117	255+82	31.7769	-94.6415	LT	ASPH	C	37	17	17	NO WORK																					
D118	255+83	31.7769	-94.6413	RT	ASPH	R	15	18	18	EXIST 15" X 24' RCP; INST 15" X 6'-LT & SET EA END			28	0.6				6						2							
D119	256+79	31.7772	-94.6415	LT	ASPH	C	25	42	42	NO WORK																					
D120	257+10	31.7773	-94.6415	LT	ASPH	C	30	20	20	NO WORK																					
D121	257+59	31.7774	-94.6413	RT	ASPH	C	30	20	20	NO WORK																					
D122	259+12	31.7779	-94.6413	LT	ASPH	C	16	22	22	EXIST 15" X 30' RCP; INST 15" X 4' RCP & SET EA END			28	0.6				8						2							
D123	259+25	31.7779	-94.6413	RT	ASPH	C	25	22	22	EXIST 18" X 25' RCP; INST 18" X 4'-LT & SET EA END			28	0.6					4						2						
D124	263+40	31.7790	-94.6414	RT	ASPH	C	10	22	22	EXIST 15" X 20' RCP W/ SET; REMOVE EXIST STR			28	0.6				4											1		
D125	263+69	31.7791	-94.6414	RT	CONC	R	10	20	20	EXIST 15" X 20' RCP;REM EXIST STR, INST 15" X 32'-LT, 15" X 32'-RT & SET EA END			28	0.6				6						2							
D126	263+79	31.7791	-94.6415	LT	ASPH	R	15	19	19	NO WORK																					
D127	268+19	31.7803	-94.6418	LT	ASPH	R	8	22	22	REM EXIST 15" X 51' CMP, INST 18" X 52' RCP W/SET EA END			28	0.6		4			52						2						1
D129	268+77	31.7805	-94.6418	RT	ASPH	C	26	20	20	EXIST 18" X 61' RCP W/ SET; INST 18" X 4'-RT; RELAY SET-RT			28	0.6					4										1		
D130	269+75	31.7807	-94.6420	LT	ASPH	R	11	24	24	REM EXIST 18" X 44' CMP, INST 18" X 44' RCP W/SET EA END			28	0.6		6			44						2						1
D131	272+29	31.7814	-94.6421	RT	ASPH	R	8	20	27	REM EXIST 15" X 28' RCP, INST 15" X 32' RCP W/SET EA END			28	0.6		4		32							2						1
D132	272+51	31.7814	-94.6422	LT	ASPH	R	10	22	22	REM EXIST 18" X 30' CMP, INST 18" X 30' RCP W/SET EA END			28	0.6		5			30						2						1
D133	274+99	31.7821	-94.6423	RT	ASPH	R	10	20	20	REM EXIST 18" X 24' CMP, INST 18" X 24' RCP W/SET EA END			28	0.6		5			24						2						1
D134	278+48	31.7829	-94.6430	RT	ASPH	R	12	20	20	EXIST 15" X 24' RCP; INST 15" X 6'-LT, 15" X 4'-RT & SET EA END			28	0.6				10						2							
D135	279+44	31.7830	-94.6434	LT	ASPH	R	14	17	17	NO WORK																					
D136	280+06	31.7831	-94.6434	RT	ASPH	R	16	17	17	NO WORK																					
D137	280+63	31.7832	-94.6437	LT	DIRT	R	14	22	22	REM EXIST 18" X 38' PLASTIC, INST 18" X 38' RCP W/SET EA END			28	0.6					38						2						1
D138	284+14	31.7838	-94.6445	RT	ASPH	R	14	26	26	EXIST 18" X 20' RCP; INST 18" X 6'-LT, 18" X 4'-RT & SET EA END			28	0.6					10						2						
D139	284+80	31.7839	-94.6447	RT	ASPH	R	14	24	24	EXIST 18" X 20' RCP; INST 18" X 4'-RT & SET EA END			28	0.6					4						2						
										CSJ: 2891-01-018 SHEET TOTAL:		**0**	**420**	**9.0**	**0**	**24**	**0**	**66**	**210**	**0**	**0**	**0**	**0**	**8**	**18**	**0**	**0**	**0**	**2**	**0**	**6**

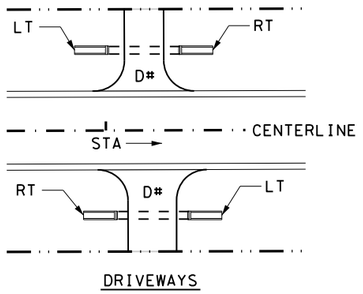
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION
©2022
SHEET 23 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		29

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 2864) (CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	DESCRIPTION OF WORK	104 REMOVING CONC (DRIVEWAYS)	162 (2) BLOCK SODDING	168 VEGETATIVE WATERING (10 GAL/SY /2 APP)	400 CUT & RESTORE CONC PAVING	400 CUT & RESTORE ASPH PAVING	400 CUT AND RESTORE PAV (FLEX BASE)	464 RC PIPE (CL III) (15 IN)	464 (18 IN)	464 (24 IN)	464 (30 IN)	464 (36 IN)	464 (48 IN)	467 (1) SET(TY II)(RCP)(6:1)(P) (15 IN)	467 (18 IN)	467 (24 IN)	467 (30 IN)	467 (36 IN)	467 SET (REMOV & REINSTALL)	480 CLEAN EXIST CULVERTS	496 REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D140	285+97	31.7841	-94.6450	RT	ASPH	R	14	19	19	REM EXIST 18" X 20' CMP, INST 18" X 26' RCP W/SET EA END		28	0.6		7			26						2						1
D141	286+61	31.7841	-94.6452	LT	ASPH	R	11	16	16	NO WORK																				
D142	292+51	31.7851	-94.6467	LT	ASPH	C	20	21	21	EXIST 15" X 43' RCP W/ SET; CLEAN CULVERT																			1	
D143	293+00	31.7853	-94.6467	RT	ASPH	R	20	17	17	NO WORK																				
D144	297+11	31.7863	-94.6472	LT	ASPH	R	14	17	22	REM EXIST 15" X 32' RCP, INST 15" X 40' RCP W/SET EA END		28	0.6		7		40						2						1
D145	298+71	31.7868	-94.6472	RT	ASPH	C	25	21	21	NO WORK																				
D146	298+93	31.7868	-94.6471	RT	GRAV	R	12	33	33	NO WORK																				
D147	303+35	31.7880	-94.6477	RT	ASPH	R	16	16	24	REM EXIST 18" X 26' RCP, INST 18" X 28' RCP W/SET EA END		28	0.6		8		28							2						1
D148	306+29	31.7887	-94.6481	LT	ASPH	R	11	20	20	EXIST 18" X 20' RCP; INST 18" X 4'-RT & SET EA END		28	0.6					4						2						
D149	306+61	31.7888	-94.6480	RT	ASPH	C	20	22	22	NO WORK																				
D150	307+66	31.7891	-94.6482	RT	ASPH	R	10	20	20	EXIST 18" X 24' RCP; INST SET EA END & CLEAN CULVERT		28	0.6											2					1	
D151	308+66	31.7893	-94.6484	RT	ASPH		16	22	22	EXIST 18" X 20' RCP; INST 18" X 4' RCP & SET EA END		28	0.6					8						2						
D152	310+54	31.7897	-94.6488	LT	ASPH	R	20	24	24	REM EXIST 18" X 20' PLASTIC, INST 18" X 20' RCP W/SET EA END		28	0.6		10			20						2						1
D153	314+64	31.7905	-94.6497	RT	ASPH	C	15	32	32	EXIST 18" X 36' RCP; INST 18" X 4'-RT & SET EA END		28	0.6					4						2						
D154	317+43	31.7910	-94.6504	LT	ASPH	R	14	32	32	REM EXIST 18" X 24' CMP, INST 18" X 28' RCP W/SET EA END		28	0.6		7			28						2						1
D155	318+00	31.8078	-94.6505	RT	ASPH	R	9	34	34	EXIST 18" X 20' RCP; REM & REPL 18" X 6'-RT, INST SET EA END		28	0.6		5			6						2						1
D156	319+07	31.7914	-94.6507	RT	ASPH	R	10	24	24	EXIST 15" X 20' RCP; REM 4'-LT, INST 15" X 6'-LT & SET EA END		28	0.6				10						2							1
D157	320+23	31.7915	-94.6511	LT	GRAV	R	11	22	22	REM EXIST 18" X 24' CMP, INST 18" X 30' RCP W/SET EA END		28	0.6			6		30						2						1
D158	332+34	31.7941	-94.6535	RT	ASPH	R	13	20	20	REM EXIST 16" X 30 CMP, INST 18" X 34' RCP W/SET EA END		28	0.6		6			34						2						1
D159	334+34	31.7946	-94.6538	RT	ASPH	R	13	24	24	EXIST 15" X 20' RCP; INST 15" X 4'-LT, 15" X 6'-RT & SET EA END		28	0.6				10						2							
D160	335+20	31.7948	-94.6539	RT	ASPH	R	13	24	25	REM EXIST STR, INST 15" X 32' RCP W/SET EA END		28	0.6		6		32						2							1
D161	335+40	31.7948	-94.6540	LT	ASPH	R	13	26	26	EXIST 15" X 20' RCP; REMOVE EXIST STR		28	0.6				10						2							
										CSJ: 2891-01-018 SHEET TOTAL:	**0**	**448**	**9.6**	**0**	**56**	**6**	**130**	**160**	**0**	**0**	**0**	**0**	**10**	**22**	**0**	**0**	**0**	**0**	**2**	**10**

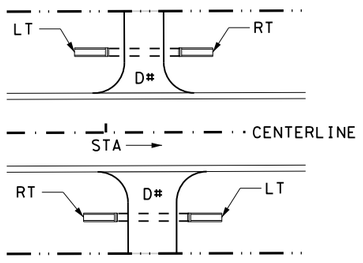
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

SHEET 24 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		30

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 2864) (CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	DESCRIPTION OF WORK	104 REMOVING CONC (DRIVEWAYS)	162 (2) BLOCK SODDING	168 VEGETATIVE WATERING (10 GAL/SY /2 APP)	400 CUT & RESTORE CONC PAVING	400 CUT & RESTORE ASPH PAVING	400 CUT AND RESTORE PAV (FLEX BASE)	464 RC PIPE (CL III) 6002 (15 IN)	464 6003 (18 IN)	464 6005 (24 IN)	464 6007 (30 IN)	464 6008 (36 IN)	464 6010 (48 IN)	467 (1) SET (TY II) (RCP) (6:1) (P) 6341 (15 IN)	6363 (18 IN)	6395 (24 IN)	6423 (30 IN)	6454 (36 IN)	467 6580 SET (REMOV & REINSTALL)	480 6001 CLEAN EXIST CULVERTS	496 6016 REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D162	335+76	31.7949	-94.6540	RT	ASPH	C	25	24	24	EXIST 15" X 42' RCP; REM 6'-LT, INST 15" X 4' & SET EA END		26	0.6				8						2							
D163	335+95	31.7949	-94.6541	LT	ASPH	R	50	22	22	EXIST 15" X 60' RCP; REM EXIST STR, INST 15" X 54' RCP LT; INST 15" X 54' RCP RT & SET EA END		26	0.6				8						2							
D164	336+75	31.7951		RT	CONC	R	16	22	22	EXIST 15" X 30' RCP; INST 15" X4' RCP & SET EA END		26	0.6				8						2							
D165	336+75	31.7951	-94.6542	LT	ASPH	C	14	17	17	EXIST 15" X 42' RCP W/ SET; NO																				
D166	337+23	31.7953	-94.6542	RT	CONC	R	14	26	26	EXIST 15" X 30' RCP; INST 15" X 4'-RT & SET EA END		26	0.6				4						2							
D167	338+51	31.7956	-94.6544	LT	ASPH	C	15	15	15	EXIST 15" X 42' RCP W/ SET; NO WORK																				
D168	339+88	31.7960	-94.6544	LT	ASPH	C	13	20	20	REM EXIST 18" X 50' CMP, INST 18" X 50' RCP W/SET EA END		28	0.6		7			50						2						1
D169	339+96	31.7960	-94.6543	RT	ASPH	R	12	12	16	REM EXIST 15" X 26' RCP, INST 15" X 30' RCP W/SET EA END		28	0.6		6		30						2							1
D170	341+30	31.7964	-94.6543	RT	ASPH	C	12	22	22	REM EXIST 15" X 20' RCP, INST 15" X 28' RCP W/SET EA END		28	0.6		6		28						2							1
D171	343+32	31.7969	-94.6541	RT	ASPH	R	18	22	22	REM EXIST 18" X 27' CMP, INST 18" X 28' RCP W/SET EA END		28	0.6		9			28						2						1
D172	345+54	31.7975	-94.6539	RT	ASPH	R	12	20	20	REM EXIST 16" X 24' CMP, INST 18" X 24' RCP W/SET EA END		28	0.6		6			24						2						1
D173	346+88	31.7978	-94.6537	RT	ASPH	R	25	19	19	NO WORK																				
D174	348+11	31.7982	-94.6536	RT	ASPH	R	14	19	19	NO WORK																				
D175	350+03	31.7987	-94.6534	RT	ASPH	R	12	22	22	EXIST 15" X 20' RCP; REMOVE EXIST STR		28	0.6										2							
D176	350+35	31.7987	-94.6534	RT	ASPH	R	13	22	22	EXIST 15" X 20' RCP;REM EXIST STR, INST 15" X 24'-LT , 15" X 24'-RT & SET EA END		28	0.6				4						2							
D177	351+36	31.7990	-94.6533	RT	ASPH	R	13	22	22	EXIST 18" X 28' RCP; INST 18" X 6'-LT & SET EA END		28	0.6					6						2					1	
CSJ: 2891-01-018 SHEET TOTAL:											**0**	**328**	**7.2**	**0**	**34**	**0**	**90**	**108**	**0**	**0**	**0**	**0**	**16**	**8**	**0**	**0**	**0**	**0**	**1**	**5**
CSJ: 2891-01-018 TOTALS:											**16**	**3760**	**80.8**	**16**	**316**	**31**	**356**	**1670**	**168**	**0**	**152**	**14**	**58**	**158**	**16**	**0**	**8**	**14**	**17**	**62**

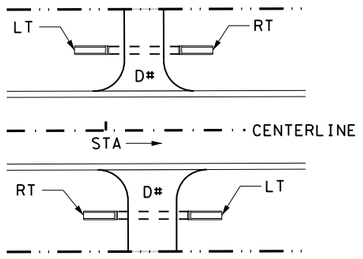
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 25 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		31

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 3152)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	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	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET (TY II) (RCP) (6:1) (P) (15 IN)	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)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
										ITEM NO.	104	162	168	400			464						467 (1)					467	480	496
										BID CODE	6017	6002	6001	6007	6008	6012	6002	6003	6005	6007	6008	6010	6341	6363	6395	6423	6454	6580	6001	6016
D2	350+47	30.8124	-95.0764	RT	ASPH	R	23	30	30	REM 15" X 24' CMP W/SET; INST 18" X 28' RCP W/SET EA END		28	0.3		8			28						2						1
D3	348+70	30.8128	-95.0761	RT	ASPH	C	20	31	31	EXIST 15" X 40' RCP W/SET; NO WORK																				
D4	348+59	30.8127	-95.0760	LT	ASPH	R	10	28	28	EXIST 18" X 31' RCP W/SET; NO WORK																				
D5	347+96	30.8130	-95.0760	RT	ASPH	R	11	32	32	EXIST 15" X 30' RCP W/SET; CLEAN CULVERT																			1	
D6	345+52	30.8135	-95.0755	RT	ASPH	R	14	31	31	REM 15" X 29' CMP W/SET; INST 18" X 30' RCP W/SET EA END		28	0.3		5			30						2						1
D7	341+43	30.8144	-95.0747	LT	ASPH	C	46			N/A																				
D8	340+87	30.8145	-95.0746	LT	ASPH	C	26			N/A																				
D9	340+27	30.8147	-95.0747	RT	CONC	R	33	34	34	EXIST 24" X 36' RCP W/SET; INST 24" X 6' & RELAY SET EA END		34	0.4						12									2		
D10	339+21	30.8150	-95.0744	LT	CONC	C	19	48	48	EXIST 24" X 40' RCP W/SET; NO WORK																				
D11	337+57	30.8154	-95.0743	LT	ASPH	R	16	31	31	15" X 28' RCP W/SET; INST 15" X 4'-RT & RELAY SET EA END		26	0.3				4												2		
D12	336+57	30.8157	-95.0743	RT	DIRT	R	17	31	31	REM 15" X 22' CMP; INST 18" X 22' RCP W/SET EA END		26	0.3		6			22						2						1
D13	335+11	30.8161	-95.0741	RT	ASPH	R	13	31	31	EXIST 18" X 24' RCP W/SET; NO WORK																				
D14	321+78	30.8195	-95.0727	RT	DIRT	R	16			N/A																				
D15	308+07	30.8228	-95.0705	RT	ASPH	C	42			N/A																				
D16	283+26	30.8264	-95.0638	LT	ASPH	C	22	36	36	REM 18" X 37' CMP W/SET; INST 18" X 42' RCP W/SET EA END		28	0.3		9			42						2						1
D17	279+92	30.8270	-95.0629	RT	DIRT	R	19			N/A																				
D18	279+36	30.8271	-95.0628	RT	ASPH	R	33			N/A																				
D19	262+26	30.8296	-95.0582	RT	DIRT	R	41			N/A																				
D20	262+02	30.8295	-95.0580	LT	DIRT	R	15			N/A																				
D21	235+15	30.8349	-95.0523	RT	ASPH	R	25	40	40	EXIST 15" X 43' RCP W/ SET; INST 15" X 4'-LT, 15" X 6'-RT & RELAY SET EA END		26	0.3					10										2		
D22	232+20	30.8355	-95.0517	RT	ASPH	R	11	30	30	EXIST 15" X 26' RCP W/SET; CLEAN CULVERT																			1	
D23	230+43	30.8358	-95.0512	RT	GRAV	R	78			N/A																				
D24	230+24	30.8357	-95.0512	LT	ASPH	R	11			N/A																				
D25	228+29	30.8361	-95.0507	RT	ASPH	R	13	49	49	EXIST 15" X 27' RCP W/SET; NO WORK																				
D26	224+79	30.8366	-95.0496	LT	ASPH	R	13	29	29	EXIST 15" X 35' RCP W/SET; CLEAN CULVERT																			1	
										CSJ: 3220-01-013 SHEET TOTAL:	**0**	**196**	**2.2**	**0**	**28**	**0**	**4**	**132**	**12**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**6**	**3**	**4**

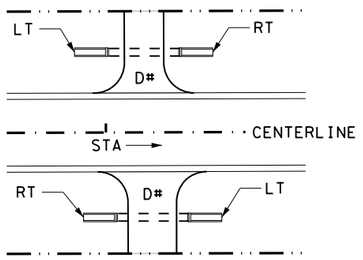
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 26 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		32

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 3152)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	OFFSET	EXIST SURF	RCS	AVG WIDTH	EXIST OFFSET FROM CL	PROP OFFSET FROM CL	DESCRIPTION OF WORK	104 REMOVING CONC (DRIVEWAYS)	162 (2) BLOCK SODDING	168 VEGETATIVE WATERING (10 GAL/SY /2 APP)	400 6007 CUT & RESTORE CONC PAVING	400 6008 CUT & RESTORE ASPH PAVING	400 6012 CUT AND RESTORE PAV (FLEX BASE)	464 RC PIPE (CL III) 6002 (15 IN)	6003 (18 IN)	6005 (24 IN)	6007 (30 IN)	6008 (36 IN)	6010 (48 IN)	467 (1) SET(TY II)(RCP)(6:1)(P) 6341 (15 IN)	6363 (18 IN)	6395 (24 IN)	6423 (30 IN)	6454 (36 IN)	467 SET (REMOV & REINSTALL)	480 CLEAN EXIST CULVERTS	496 REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D27	217+73	30.8378	-95.0479	LT	ASPH	R	14	37	37	EXIST 18" X 42' CMP W/SET; REM EXIST STR; INST 18" X 42' RCP W/SET EA END		28	0.3		5			42						2						1
D28	216+91	30.8380	-95.0478	RT	DIRT	R	12			N/A																				
D29	214+81	30.8384	-95.0474	RT	DIRT	R	16			N/A																				
D30	209+28	30.8397	-95.0464	RT	DIRT	R	12			N/A																				
D31	191+27	30.8429	-95.0422	LT	DIRT	R	16			N/A																				
D32	173+96	30.8464	-95.0385	RT	ASPH	R	14	29	29	EXIST 15" X 45' CMP W/SET; REM EXIST STR; INST 18" X 50' RCP W/SET EA END		28	0.3		5			50						2						1
D33	172+39	30.8467	-95.0381	LT	ASPH	R	12			N/A																				
D34	162+65	30.8489	-95.0363	LT	ASPH	R	17			N/A																				
D35	157+40	30.8500	-95.0353	LT	DIRT	R	11			N/A																				
D36	154+04	30.8508	-95.0347	LT	DIRT	R	13			N/A																				
D37	153+69	30.8509	-95.0347	RT	DIRT	R	14			N/A																				
D38	153+27	30.8509	-95.0345	LT	DIRT	R	19			N/A																				
D39	152+70	30.8511	-95.0345	RT	GRAV	R	16	32	32	EXIST 15" X 45' RCP W/SET; CLEAN CULVERT																			1	
D40	152+67	30.8511	-95.0344	LT	DIRT	R	17			N/A																				
D41	148+51	30.8521	-95.0337	RT	ASPH	R	14	28	28	EXIST 15" X 30' RCP W/SET; CLEAN CULVERT																			1	
D42	145+52	30.8527	-95.0332	RT	ASPH	R	13	29	29	EXIST 15" X 24' RCP W/SET; CLEAN CULVERT																			1	
D43	142+29	30.8533	-95.0324	LT	ASPH	R	13	31	31	EXIST 15" X 30' RCP W/SET; NO WORK																				
D44	139+92	30.8537	-95.0318	LT	ASPH	R	13	26	26	EXIST 15" X 32' RCP W/SET; CLEAN CULVERT																			1	
D45	139+51	30.8539	-95.0318	RT	CONC	R	10			N/A																				
D46	138+33	30.8540	-95.0314	RT	ASPH	R	11	30	30	EXIST 15" X 28' RCP W/SET; CLEAN CULVERT																			1	
D47	138+24	30.8539	-95.0314	LT	ASPH	R	21	27	27	EXIST 15" X 32' RCP W/SET; CLEAN CULVERT																			1	
D48	99+96	30.8538	-95.0208	RT	DIRT	R	9			N/A																				
D49	93+83	30.8536	-95.0188	LT	ASPH	R	32			N/A																				
D50	93+06	30.8537	-95.0186	RT	ASPH	R	30			N/A																				
D51	76+20	30.8556	-95.0139	RT	ASPH	R	26			N/A																				
D52	75+88	30.8556	-95.0137	LT	ASPH	R	16			N/A																				
D53	48+98	30.8587	-95.0062	RT	DIRT	R	12			N/A																				
CSJ: 3220-01-013 SHEET TOTAL:											**0**	**56**	**0.6**	**0**	**10**	**0**	**0**	**92**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**6**	**2**

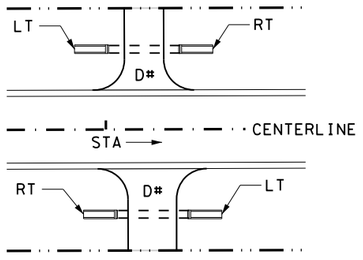
R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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



DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 27 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		33

SUMMARY OF DRIVEWAY AND SIDEROADS (FM 3152)(CONT.)

ID	STATION	LAT (DEGREES)	LONG (DEGREES)	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	CUT & RESTORE ASPH PAVING	CUT AND RESTORE PAV (FLEX BASE)	RC PIPE (CL III) (15 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (48 IN)	SET (TY II) (RCP) (6:1) (P) (15 IN)	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)	SET (REMOV & REINSTALL)	CLEAN EXIST CULVERTS	REMOV STR (PIPE)
							FT	FT	FT		SY	SY	MG	SY	SY	SY	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
D54	47+42	30.8585	-95.0058	LT	DIRT	R	13			N/A																				
D55	38+22	30.8584	-95.0028	RT	GRAV	R	14	29	29	REM 10" X 20' CMP; INST 18" X 20' RCP W/SET EA END		28	0.3		4			20						2						1
D56	37+95	30.8583	-95.0028	LT	DIRT	R	10	24	24	EXIST 18" X 21' RCP; INST 18" X 4'-LT & RELAY SET EA END		28	0.3					4											2		
D57	29+57	30.8580	-95.0001	LT	GRAV	R	16			N/A																				
D58	20+90	30.8570	-94.9976	LT	DIRT	R	14	28	28	REM 18" X 20' CMP; INST 18" X 20' RCP W/SET EA END		28	0.3		5			20						2						1
D59	19+62	30.8569	-94.9972	RT	GRAV	R	9	20	20	N/A																				
D60	15+28	30.8563	-94.9960	LT	GRAV	R	14	24	24	REM 18" X 44' CMP; INST 18" X 44' RCP W/SET EA END		28	0.3		5			44						2						1
D61	12+25	30.8560	-94.9951	LT	DIRT	R	17			N/A																				
CSJ: 3220-01-013 SHEET TOTAL:											**0**	**112**	**1.2**	**0**	**14**	**0**	**0**	**88**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**2**	**0**	**3**
CSJ: 3220-01-013 TOTALS:											**0**	**364**	**4.0**	**0**	**52**	**0**	**4**	**312**	**12**	**0**	**0**	**0**	**0**	**18**	**0**	**0**	**0**	**8**	**9**	**9**
PROJECT TOTALS:											**52**	**9867**	**213.1**	**52**	**527**	**262**	**3166**	**2940**	**470**	**68**	**152**	**14**	**349**	**266**	**34**	**4**	**8**	**46**	**73**	**194**

R - RESIDENTIAL
C - COMMERCIAL
S - SIDEROAD

1) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

2)

REQUIRED SEEDING AT EACH SET END	
CULVERT SIZE	SY
15"	13
18"	14
24"	17
30"	20
36"	22
48"	27

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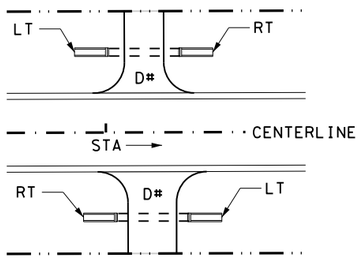

DRIVEWAYS

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		34

SUMMARY OF METAL BEAM GUARD FENCE AND NON-MOW STRIPS

ITEM NO.		132	3076		514	540			542	544		545	
BID CODE		6019	6035		6013	6001	6006	6020	6001	6001	6003	6007	6005
			NON-MOW STRIP		METAL BEAM GUARD FENCE								
STATION TO STATION	SIDE	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	D-GR HMA TY-D PG64-22 (5") (550 LBS/SY)	D-GR HMA TY-D PG64-22 (10") (1100 LBS/SY)	PERM CTB (F-SHAPE) (TY 1)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	MTL W - BEAM GD FEN (LOW FILL CULVERT)	REMOVE METAL BEAM GUARD FENCE	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	CRASH CUSH ATTEN (INSTL) (L) (N) (TL3)	CRASH CUSH ATTEN (REMOVE)
	LT/RT	CY	TON	TON	LF	LF	EA	LF	LF	EA	EA	EA	EA
CSJ:0336-03-072 (SH 103)													
1694+88 TO 1704+41	RT	37.7	106			800			825	2	2		
1695+19 TO 1704+83	LT	62.4	104			800			825	2	2		
1730+59 TO 1738+73	RT	52.8	68			450	2		250	2	2		
1731+90 TO 1738+85	LT	54.6	60			375	2		150	1	1	1	1
1790+85 TO 1796+75	RT	9.8	68			450			500	2	2		
1790+25 TO 1796+77	LT	38.0	74			500			500	2	2		
1798+28 TO 1804+36	RT	86.3	71			475			500	2	2		
1798+10 TO 1805+11	LT	104.3	90			650			650	2	2		
1817+43 TO 1821+48	RT	3.0	48			262.5			325	2	2		
1817+27 TO 1820+60	LT	16.9	40			187.5			200	2	2		
1822+00 TO 1826+07	RT	91.3	38			162.5	2		270	2	2		
1821+95 TO 1826+57	LT	91.3	44			225	2		270	2	2		
1845+40 TO 1849+24	RT	58.5	47			250			275	2	2		
1845+42 TO 1850+12	LT	48.1	68			450			475	2	2		
1854+49 TO 1862+88	RT	6.5	95			700			620	2	2		
1853+38 TO 1860+27	LT	32.5	76			525			575	2	2		
1868+92 TO 1873+57	RT	6.5	55			325			280	2	2		
1875+00 TO 1879+54	RT	6.5	52			300			320	2	2		
1876+03 TO 1879+43	LT	16.9	42			200			430	2	2		
1980+11 TO 1985+88	RT	22.1	56			325	2		340	2	2		
1981+20 TO 1984+90	LT	23.4	42			200	2		340	2	2		
1986+26 TO 1991+26	RT	172.9	46			237.5	2		330	2	2		
1986+39 TO 1993+64	LT	115.7	67			437.5	2		335	2	2		
2022+05 TO 2026+45	RT	32.5	52			300			300	2	2		
2021+77 TO 2026+00	LT	26.9	51			287.5			280	2	2		
2042+90 TO 2046+30	LT	36.4	42			200			375	2	2		
2046+48 TO 2051+01	RT	15.6	52			300			330	2	2		
2047+86 TO 2051+50	LT	76.7	44			225			275	2	2		
2095+00 TO 2100+11	RT	78.0	60			350		25	300	2	2		
2096+70 TO 2099+28	LT	62.4	34			112.5		25	200	2	1		
2140+94 TO 2146+08	RT	40.3	60			375			250	2	1		
2143+20 TO 2146+76	LT	28.6	44			225			225	2	1		
2152+73 TO 2155+20	RT	26.0	34			125			150	2	1		
2153+77 TO 2156+42	LT	26.0	28			75			150	2	1		
2212+40 TO 221400	RT		23			25			150	2	1		
CSJ:0336-03-072 TOTAL:		**1607.4**	**1981**	**0**	**0**	**11887.5**	**16**	**50**	**12570**	**69**	**63**	**1**	**1**

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		35

SUMMARY OF METAL BEAM GUARD FENCE AND NON-MOW STRIPS (CONTINUED)

ITEM NO.		132	3076		514	540			542	544		545	
BID CODE		6019	6035		6013	6001	6006	6020	6001	6001	6003	6007	6005
			NON-MOW STRIP		METAL BEAM GUARD FENCE								
STATION TO STATION	SIDE	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	D-GR HMA TY-D PG64-22 (5") (550 LBS/SY)	D-GR HMA TY-D PG64-22 (10") (1100 LBS/SY)	PERM CTB (F-SHAPE) (TY 1)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	MTL W - BEAM GD FEN (LOW FILL CULVERT)	REMOVE METAL BEAM GUARD FENCE	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	CRASH CUSH ATTEN (INSTL) (L)(N)(TL3)	CRASH CUSH ATTEN (REMOVE)
	LT/RT	CY	TON	TON	LF	LF	EA	LF	LF	EA	EA	EA	EA
CSJ: 1678-02-007 (FM 2971)													
107+32 TO 110+16	RT	65.0	28	19		50	1		215	1	2	1	
107+32 TO 111+16	LT	60.2	31	47		100	1		275	2	2		
CSJ: 1678-02-007 TOTAL:		**125.2**	**59**	**66**	**0**	**150**	**2**	**0**	**490**	**3**	**4**	**1**	**0**
CSJ: 3220-01-013 (FM 3152)													
22+62 TO 27+49	RT	19.5	62	70		425				2			
103+68 TO 109+44	RT	15.6	62	71		425			240	2			
104+44 TO 111+44	LT	6.8	75	86		550			200	2			
121+07 TO 133+82	RT	35.1	89	156		675			280	2	2		
312+82 TO 318+97	RT	104.0	67	38		475			350	2			
312+85 TO 319+37	LT	434.7	70	40		500			350	2			
CSJ: 3220-01-013 TOTAL:		**615.7**	**425**	**461**	**0**	**3050**	**0**	**0**	**1420**	**12**	**2**	**0**	**0**
CSJ: 2891-01-018 (FM 2864)													
144+73 TO 149+36	RT	210	50	85		150				2			
146+54 TO 149+95	LT	75	31	63	30	200	1			1		1	
CSJ: 2891-01-018 TOTAL:		**285**	**81**	**148**	**30**	**350**	**1**	**0**	**0**	**3**	**0**	**1**	**0**
PROJECT TOTAL:		**2633.3**	**2546**	**675**	**30**	**15437.5**	**19**	**50**	**14480**	**87**	**69**	**3**	**1**

SUMMARY OF DELINEATORS AND OBJECT MARKERS

ITEM NO.	658
BID CODE	6101
LOCATION	INSTL OM ASSM (OM-2Z) (WFLX)SRF)SRF)
PROJECT	EA
CSJ: 0336-03-072	86
CSJ: 1678-02-007	18
CSJ: 2891-01-018	44
CSJ: 3220-01-013	48
PROJECT TOTAL:	**196**

SUMMARY OF TMA

ITEM NO.	6185
BID CODE	6002
LOCATION	TMA (STATIONARY)
PROJECT	DAY
CSJ: 0336-03-072	153
CSJ: 1678-02-007	123
CSJ: 2891-01-018	208
CSJ: 3220-01-013	199
PROJECT TOTAL:	**683**

SUMMARY OF SIGNS

ITEM NO.			644
BID CODE			6060
LOCATION			IN SM RD SN SUP&AM TYTWT(1)WS(P)
STATION TO STATION			EA
CSJ: 0336-03-072 (SH 103)			
2212+00	TO	2212+50	1
CSJ: 0336-03-072 TOTAL			**1**
PROJECT TOTAL			**1**

SUMMARY OF PREP ROW

ITEM NO.			100
BID CODE			6002
LOCATION			PREPARING ROW
STATION			STA
CSJ: 1678-02-007 (FM2971)			
0+25	TO	141+41	141
CSJ: 1678-02-007 TOTAL:			**141**
CSJ: 2891-01-018 (FM 2864)			
0+00	TO	351+06	351
CSJ: 2891-01-018 TOTAL:			**351**
CSJ: 3220-01-013 (FM 3152)			
0+10	TO	352+67	353
CSJ: 3220-01-013 TOTAL:			**353**
PROJECT TOTAL:			**845**

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QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		36

SUMMARY OF SWP3 ITEMS

ITEM NO.			169	164			168	506					
BID CODE			6002	6009	6011	6021	6001	6038	6039	6002	6011	6020	6024
LOCATION			SOIL RETENTION BLANKETS (CL 1)) (TY B)	BROADCAST SEED (TEMP) (WARM)	BROADCAST SEED (TEMP) (COOL)	CELL FBR MLCH SEED(PERM) (RURAL) (SANDY)	VEGETATIVE WATERING (10 GAL/SY/2 APP)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY I)	CONSTRUCTION EXITS (REMOVE)
STATION TO STATION			SY	SY	SY	SY	MG	LF	LF	LF	LF	SY	SY
CSJ: 0336-03-072 (SH 103)													
1610+00	TO	2235+00	33467	38811	38811	77622	776.3	16540	16540	650	650	1000	1000
CSJ: 0336-03-072 TOTAL:			**33467**	**38811**	**38811**	**77622**	**776.3**	**16540**	**16540**	**650**	**650**	**1000**	**1000**
CSJ: 1678-02-007 (FM 2971)													
0+25	TO	141+41	798	2122	2122	4244	84.9	1765	1765	800	800	1000	1000
CSJ: 1678-02-007 TOTAL:			**798**	**2122**	**2122**	**4244**	**84.9**	**1765**	**1765**	**800**	**800**	**1000**	**1000**
CSJ: 2891-01-018 (FM 2864)													
0+00	TO	351+06	1593	4722	4722	9444	188.9	568	568	590	590	1000	1000
CSJ: 2891-01-018 TOTAL:			**1593**	**4722**	**4722**	**9444**	**188.9**	**568**	**568**	**590**	**590**	**1000**	**1000**
CSJ: 3220-01-013 (FM 3152)													
0+10	TO	352+67	7829	10483	10483	20966	419.4	21353	21353	1035	1035	1000	1000
CSJ: 3220-01-013 TOTAL:			**7829**	**10483**	**10483**	**20966**	**419.4**	**21353**	**21353**	**1035**	**1035**	**1000**	**1000**
PROJECT TOTAL:			**43687**	**56138**	**56138**	**112276**	**1469.5**	**40226**	**40226**	**3075**	**3075**	**4000**	**4000**

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

SUMMARY OF MAILBOXES

ITEM NO.		560
BID CODE		6003
LOCATION	SIDE	MAILBOX INSTALL-M (TWG-POST) TY 1
STATION	LT/RT	EA
CSJ: 0336-03-072 (SH 103)		
2212+00	LT	1
CSJ: 0336-03-072 TOTAL:		**1**
PROJECT TOTAL:		**1**

SUMMARY OF PORTABLE CHANGEABLE MESSAGE SIGN

ITEM NO.	6001
BID CODE	6002
LOCATION	PORTABLE CHANGEABLE MESSAGE SIGN
PROJECT	EA
CSJ: 0336-03-072	2
CSJ: 1678-02-007	2
CSJ: 2891-01-018	2
CSJ: 3220-01-013	2
PROJECT TOTAL:	**8**

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QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		37

SUMMARY OF CROSS CULVERTS

			ITEM NO.	132	158	162	168	400	403	420	432		
			BID ITEM	6019	6003	6002	6001	6005	6001	6071	6002	6026	6027
LOCATION	DESCRIPTION			EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	SPEC EXCAV WORK (HYD EXCAVATOR)	BLOCK SODDING	VEGATATIVE WATERING (10 GAL/SY/2 APP)	CEM STABIL BKFL	TEMPORARY SPL SHORING	CL C CONC (COLLAR)	RIPRAP (CONC) 5 IN	RIPRAP (STONE COMMON) (DRY) 18 IN	RIPRAP (STONE COMMON) (DRY) 24 IN
STATION	EXISTING	PROPOSED		CY	HR	SY	MG	CY	SF	EA	CY	CY	CY
CSJ:0336-03-072 (SH 103)													
1616+20	24" X 104' RCP @ 30° RFS	CLEAN CULVERT & ADD SET(TY II) (24 IN) (RCP) (6:1)(C) LT; ADD SET (TY II) (24 IN)(RCP) (4:1) (C) RT			1	34	0.7						
1640+57	2-8' X 7'X 88' MBC W/MCW-F2	CLEAN CULVERT											
1643+47	3-36" X 70' RCP W/SET(TY C)(4:1)	REMOVE EXIST RIPRAP SET, EXTEND W/3-36" X 4' RC PIPE (CL III)(36 IN), ADD CH-FW-0 (DIA=36 IN)(2:1)C) & ADD RIPRAP (STONE COMMON) (DRY) (18 IN) LT; REMOVE EXIST RIPRAP SET, EXTEND W/3-36" X 4' RC PIPE (CL III)(36 IN) & ADD CH-FW-0 (DIA=36 IN)(2:1) RT		111		44	0.9	6				14.5	
1656+69	30" X 68' RCP W/SET (TY C)(3:1)	REMOVE EXIST SET, EXTEND W/30" X 6' RC PIPE (CL III)(30 IN) & ADD CH-PW-0(DIA=48 IN)(2:1) LT;		65	1	28	0.6						
1671+00	24" X 80' RCP W/SET (TY C)(3:1)	REMOVE EXIST SET (TY C)(3:1)& 4' RC PIPE (CL III)(24 IN), EXTEND W/6' RC PIPE (CL III)(24 IN) & ADD SET (TY II) (24 IN) (RCP)(4:1)(C) LT; REMOVE EXIST SET (TY C)(3:1) & ADD CH-PW-0(DIA=48 IN)(2:1), ADD RIPRAP (STONE COMMON)(DRY)(12 IN) RT.		96	1	46	1					7	
1677+39	36" X 60' RCP W/SET (TY C) & (WS-P-N(MOD))	NO STRUCTURE WORK LT; REMOVE EXIST SET; ADD CH-PW-0(66 IN)(2:1) RT		50		28	0.6						
1700+15	8' X 8' RCP W/HDWL	NO STRUCTURE WORK											
1722+69	6'X 4' X 74' BOX W/SET	NO STRUCTURE WORK											
1729+00	24" X 64' RCP W/SET (TY C)	NO STRUCTURE WORK											
1746+39	3' X 2' BOX W/SWW	NO STRUCTURE WORK											
1792+96	30" X 136' RCP @ 45° RFS	NO STRUCTURE WORK											
1794+68	30" X 96' RCP	NO STRUCTURE WORK											
1798+78	8' X 8' RCP W/HDWL & WINGS	NO STRUCTURE WORK											
1801+29	4' X 3' BOX @ 30° RFS	NO STRUCTURE WORK											
1819+63	30" X 82' RCP W/HDWL & WINGS	REMOVE EXIST WINGWALL & 20' RC PIPE (CL III) (30 IN), ADD SPECIAL SHORING & TRENCH EXCAVATION, EXTEND W/24' RCP (CL III) (30 IN) & ADD CH-FW-0 (DIA=30 IN)(2:1) LT; NO STRUCTURE WORK RT.		200	2	10	0.2	110	420	1			
1847+32	3' X 3' X 132' BOX	NO STRUCTURE WORK											
1858+18	9' X 9' X 77' BOX	NO STRUCTURE WORK											
1871+64	24" X 76' RCP	NO STRUCTURE WORK											
1877+35	5' X 4' BOX W/HDWL	NO STRUCTURE WORK											
			CSJ:0336-03-072 SHEET TOTAL:	522	5	190	4	116	420	1	0	21.5	0

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY.
THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT.
DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7154144...
3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 32 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		38

SUMMARY OF CROSS CULVERTS (CONTINUED)

LOCATION	DESCRIPTION		ITEM NO.	132	158	162	168	400	403	420	432		
			BID ITEM	6019	6003	6002	6001	6005	6001	6071	6002	6026	6027
				EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	SPEC EXCAV WORK (HYD EXCAVATOR)	BLOCK SODDING	VEGATATIVE WATERING (10 GAL/SY/2 APP)	CEM STABIL BKFL	TEMPORARY SPL SHORING	CL C CONC (COLLAR)	RIPRAP (CONC) 5 IN	RIPRAP (STONE COMMON) (DRY) 18 IN	RIPRAP (STONE COMMON) (DRY) 24 IN
STATION	EXISTING	PROPOSED		CY	HR	SY	MG	CY	SF	EA	CY	CY	CY
CSJ:0336-03-072 (SH 103)													
1893+98	36" X 88' RCP	REMOVE EXIST SET; REMOVE & REPLACE 4' RCP (CL III) (36 IN), ADD CH-PW-0 (DIA=36 IN)(2:1) & RIPRAP (STONE COMMON)(DRY)(18 IN) LT; EXT 4' RCP (CL III)(36 IN) & ADD CH-PW-0(DIA=72 IN) (2:1), ADD RIPRAP (STONE COMMON)(DRY) (18 IN) RT		93	1	45	0.9					23.3	
1906+12	36" X 100' RCP @ 15° RFS	NO STRUCTURE WORK											
1920+05	7' X 7' X 90' BOX W/FW-15 WINGS @ 15° RFS	NO STRUCTURE WORK											
1921+83	36" X 94' RCP W/CH-6-B HDWLS	NO STRUCTURE WORK LT; REMOVE EXIST HDWL & WINGS, REMOVE AND REPLACE W/4' RC PIPE (CL III)(36 IN) AND ADD CH-PW-0 (DIA=66 IN)(2:1) RT. CLEAN CULVERT		3.5	2	36.8	0.8						
1934+00	3' X 3' X 80' BOX W/SET(TY C) (PIPE RUNNERS)	NO STRUCTURE WORK HOLE ADJACENT TO LT SET TO BE FILLED W/RIPRAP (STONE COMMON)(DRY)(24 IN); HOLE ON RT TO BE FILLED W/RIPRAP (STONE COMMON)(DRY)(24 IN).		8.5	2								101
1966+00	6' X 4' X 71' BOX W/HDWL & WINGS	NO STRUCTURE WORK											
2024+58	3' X 3' X 106' BOX	NO STRUCTURE WORK											
2030+00	30" X 68' RCP W/SET (TY C)	REMOVE EXIST SET (TY C), EXTEND W/30" X 6' RC PIPE (CL III)(30 IN), CONC COLLAR & SET (TY II) (30 IN) (RCP) (4:1) ,ADD RIPRAP (STONE COMMON)(DRY)(18 IN) LT; NO STRUCTURE WORK RT.		70	1	15	0.3	3		1		5	
2044+53	30" X 109' RCP W/CH-6B HDWLS & WINGS	NO STRUCTURE WORK											
2049+20.5	24" X 112' RCP W/CH-11 B-15° HDWL & WINGS @ 15° RFS	NO STRUCTURE WORK											
2070+20	2-24" X 62' RCP W/SET(TY C) (24") (4:1)	NO STRUCTURE WORK											
2098+18	4-5' X 5' X 94' BOX W/MCW-P	NO STRUCTURE WORK											
2102+65	36" X 84' RCP	NO STRUCTURE WORK											
2110+16	4' X 4' X 96' BOX @ 30° LFS	NO STRUCTURE WORK		4									
2123+88	3' X 3' X 85' BOX	NO STRUCTURE WORK											
2144+62	3-10' X 12' X 85' BOX	NO STRUCTURE WORK											
2154+50.50	8' X 4' X 136' BOX @ 45° RFS	NO STRUCTURE WORK											
2164+90	30" X 90' RCP	NO STRUCTURE WORK											
2188+00	24" X 126' RCP @ 45° RFS	NO STRUCTURE WORK											
		CSJ:0336-03-072 SHEET TOTAL:		**179**	**6**	**96.8**	**2**	**3**	**0**	**1**	**0**	**28.3**	**101**

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY.
THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT.
DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7151446...
3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 33 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		39

SUMMARY OF CROSS CULVERTS (CONTINUED)

LOCATION	DESCRIPTION		ITEM NO.	132	158	162	168	400	403	420	432		
			BID ITEM	6019	6003	6002	6001	6005	6001	6071	6002	6026	6027
				EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	SPEC EXCAV WORK (HYD EXCAVATOR)	BLOCK SODDING	VEGATATIVE WATERING (10 GAL/SY/2 APP)	CEM STABIL BKFL	TEMPORARY SPL SHORING	CL C CONC (COLLAR)	RIPRAP (CONC) 5 IN	RIPRAP (STONE COMMON) (DRY) 18 IN	RIPRAP (STONE COMMON) (DRY) 24 IN
STATION	EXISTING	PROPOSED		CY	HR	SY	MG	CY	SF	EA	CY	CY	CY
CSJ:0336-03-072 (SH 103)													
2194+90	3' X 3' X 90' BOX	NO STRUCTURE WORK											
2208+75	5' X 3' X 86' BOX	NO STRUCTURE WORK											
2213+86	6' X 3' X 113' BOX @ 30° LFS	NO STRUCTURE WORK											
		CSJ:0336-03-072 SHEET TOTAL:		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		CSJ: 0336-03-072 TOTAL:		**701**	**11**	**286.8**	**6**	**119**	**420**	**2**	**0**	**49.8**	**101**
CSJ:1678-02-007 (FM 2971)													
6+84	2-24" X 70' RCP W/ CONCRETE HEADWALLS	NO WORK LT; REMOVE EXISTING HEADWALL & ADD CH-PW-S (DIA=60 IN)(2:1) RT		35		13	0.3						
21+61	30" X 42' RCP	ADD SET (TY II)(30 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(30 IN)(RCP)(4:1)(C), ADD CEM STABIL BKFL & ADD RIPRAP (STONE COMMON)(DRY)(18 IN) RT		3	1	15	0.3	25				4.1	
34+40	10' X 7' X 39' BOX CULVERT W/FW	REMOVE FW-0 EXTEND 7' (SCC-10), ADD WINGWALL (PW-2)(HW=9 FT), ADD RIPRAP (STONE COMMON) (DRY)(18 IN) & CEM STAB BKFL LT; REMOVE FW-0 EXTEND 12' (SCC-10) & ADD WINGWALL (FW-0)(HW=7 FT, 9 IN) (2:1) & ADD RIPRAP (STONE COMMON) (DRY) (18 IN)		22		67	1.4	2.1	570		4.3	48.3	
44+23	18" & 24" X 62' RCP	REMOVE 4' RC PIPE (24 IN) & (18 IN), ADD CEM STABIL BKFL & ROCK RIPRAP, ADD CH-FW-0 (DIA=42 IN) (2:1) (C) LT; ADD CH-FW-0 (DIA=42 IN) (2:1) (C) RT		21	1	24	0.5	26				6.6	
53+00	30" X 46' RCP	EXTEND 4' RC PIPE (CL III)(30 IN), ADD SET (TY II)(30 IN)(RCP)(4:1)(C) & CEM STAB BKFL LT; REMOVE AND REPLACE 6' RC PIPE (CL III)(30 IN), ADD SET (TY II)(30 IN)(RCP)(4:1)(C) RT			1	15	0.3	0.5					
61+37	30" X 44' RCP	EXTEND 6' RC PIPE (CL III)(30 IN) & ADD CEM STABIL BKFL, ADD RIPRAP (STONE COMMON) (DRY) (18IN) & ADD CH-FW-0 (DIA=48 IN)(2:1)(C) LT; EXTEND 4' RC PIPE (CL III) (30 IN), ADD CEM STABIL BKFL, ADD CONC COLLAR & ADD SET (TY II) (30 IN) (RCP) (4:1) (C) RT		54	1	28	0.6	5		1		4	
96+94	(2) 24" X 46' RCP	EXTEND 4' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & ADD CH-FW-0 (DIA=36 IN)(2:1) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT		13	2	27	0.6			1			
102+90	10' X 7' X 39' BOX CULVERT W/FW	REMOVE FW-0, EXTEND 8' (SCC-10), ADD WINGWALL (PW-2)(HW=9 FT) ADD CEM STABIL BKFL & AND STONE RIPRAP LT; REMOVE FW-0, EXTEND 8' (SCC-10) & ADD WINGWALL (FW-0)(HW=9 FT)(2:1) RT		24.7		64	1.3	97.4			4.3	40.5	
115+15	8' x 4' x 36' BOX CULVERT W/FW	REMOVE FW-0 EXTEND 10' (SCC-8) & ADD WINGWALL (PW-2)(HW=6 FT), ADD RIPRAP (STONE COMMON) (DRY) (18 IN) & ADD CEM STABIL BKFL LT; REMOVE FW-0 EXTEND 10' (SCC-8), ADD WINGWALL (FW-0)(HW=6 FT)(2:1), ADD RIPRAP (STONE COMMON) (DRY)(18 IN) & ADD CEM STABIL BKFL RT		21		46	1	35.8			2.2	31.8	
		CSJ: 1678-02-007 TOTAL:		**193.7**	**6**	**299**	**6.3**	**191.8**	**570**	**2**	**10.8**	**135.3**	**0**

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY.
THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT.
DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

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ELIZABETH A. ORTEGO
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DocuSigned by:
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1B27AAE715F1448...
3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 34 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		40

SUMMARY OF CROSS CULVERTS (CONTINUED)

LOCATION	DESCRIPTION		ITEM NO.	132	158	162	168	400	403	420	432		
			BID ITEM	6019	6003	6002	6001	6005	6001	6071	6002	6026	6027
				EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	SPEC EXCAV WORK (HYD EXCAVATOR)	BLOCK SODDING	VEGATATIVE WATERING (10 GAL/SY/2 APP)	CEM STABIL BKFL	TEMPORARY SPL SHORING	CL C CONC (COLLAR)	RIPRAP (CONC) 5 IN	RIPRAP (STONE COMMON) (DRY) 18 IN	RIPRAP (STONE COMMON) (DRY) 24 IN
STATION	EXISTING	PROPOSED		CY	HR	SY	MG	CY	SF	EA	CY	CY	CY
CSJ: 2891-01-018 (FM 2864)													
0+50	18" X 110' RCP	NO STRUCTURE WORK; CLEAN CULVERT											
21+50	48" X 92' @ 45° LT FWD SKEW	NO STRUCTURE WORK LT; ADD EMBANKMENT RT.		3									
48+00	9' X 8' x 46' BOX CULVERT W/SC-15 °A AND FW-15°	REMOVE FW-15°, EXTEND 7' (SCC-9) & ADD WINGWALL (PW-2)(HW=10 FT), ADD CEM STAB BFKL & RIPRAP (STONE COMMON)(DRY) (18 IN) LT; REMOVE FW-15°, EXTEND 6' (SCC-9) & ADD WINGWALL (PW-2)(HW=10 FT), ADD CEM STAB BFKL & RIPRAP (STONE COMMON)(DRY) (18 IN) RT.		42.6		66	1.4	68.3				17.2	
74+24	24" X 70' RCP @ 30°RT FWD SKEW	NO WORK PROPOSED LT; REMOVE AND RELAY 4' RCP (CL III)(24 IN) AND ADD CH-PW-0 (DIA=42 IN)(2:1) RT.		22.9		17	0.4						
78+00	6' x 6' X 42' BOX CULVERT W/ FW NON SKEWED	REMOVE FW-N, EXTEND 6' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT) LT; REMOVE FW-N, EXTEND 3' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT) RT.		101.7		58	1.2		880				
109+00	24" X 44' RCP	NO STRUCTURE WORK											
125+58	10' X 6' X 37' BOX CULVERT w/ FW 45°SKEWED	REMOVE FW-N, EXTEND 16' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT)(2:1), ADD CEM STAB BACKFILL LT; REMOVE FW-N, EXTEND 8' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT)(2:1), ADD CEM STAB BFKL & RIPRAP (STONE COMMON) (DRY)(18 IN) RT.		125.9		71	1.5	80.2	1200			14	
140+00	18" X 52' RCP	ADD SET(TY II)(18 IN)(RCP)(4:1)(C) LT; NO WORK PROPOSED RT.			1	10	0.2		20				
147+50	7' X 4' X 45' BOX W/HDWL & WINGS AT 30° LFS	NO STRUCTURE WORK, INSTALL MBGF LT; INSTALL MBGF RT											
155+71	18" X 50' RCP @ 30° RFS W/SET (TY II)	NO STRUCTURE WORK			2								
160+42	18" X 55' RCP ON 30° SKEW	ADD CEM STAB BKFL & RIPRAP (STONE)(COMMON DRY)(18 IN), INSTALL SET (TY II)(18 IN)(RCP)(4:1)(C) LT; INSTALL SET (TY II)(18 IN)(RCP)(4:1)(C) RT			2	21	0.5	1				5.1	
183+35	30" X 54' RCP W/SET (TY II)	NO STRUCTURE WORK											
202+40	5' X 3' X 42' CONC BOX	REMOVE FW-N, EXTEND 7' (SCC-5) & ADD WINGWALL (FW - 0)(HW=5 FT)(2:1), ADD CEM STAB BFKL LT; REMOVE FW-N, EXTEND 5' (SCC-5) & ADD WINGWALL (FW - 0)(HW=5 FT)(2:1), ADD CEM STAB BFKL & RIPRAP (STONECOMMON)(DRY) (18 IN) RT.		44.3		33	0.7	7.3				9.6	
232+00	(2) 30" X 50' RCP CL III	NO STRUCTURE WORK; CLEAN CULVERT											
239+00	18" X 58' RCP W/SET	NO STRUCTURE WORK LT; REMOVE EXIST SET, ADD SET (TY II) (18") (4:1) (C) RT.				10	0.2						
248+00	9' X 7' X 37' CONC BOX W/ FW	REMOVE FW EXTEND 10' (CRR-9) AND INSTALL WINGWALL (PW-2)(HW=9 FT), ADD CEM STAB BKFL & RIPRAP(STONE COMMON)(DRY)(18 IN) LT; REMOVE FW EXTEND 7' (CRR-9) AND INSTALL WINGWALL (PW-2)(HW=9 FT), ADD CEM STAB BKFL & RIPRAP(STONE COMMON)(DRY)(18 IN) RT.		50.8		58	1.2	38.5	902			20.5	
258+00	18" X 57' RCP (15° RFS)	ADD SET (TY II)(18")(4:1)(C) LT; REM JT, EXT W/BEND JT, ADD SET(TY II)(18")(6:1)(C) RT		11.6	3	20	0.4						
		CSJ: 2891-01-018 SHEET TOTAL:		**402.8**	**8**	**364**	**7.7**	**195.3**	**3002**	**0**	**0**	**66.4**	**0**

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY.
THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT.
DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7151448...
3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 35 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		41

SUMMARY OF CROSS CULVERTS (CONTINUED)

			132	158	162	168	400	403	420	432		
		ITEM NO.										
		BID ITEM	6019	6003	6002	6001	6005	6001	6071	6002	6026	6027
LOCATION	DESCRIPTION		EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	SPEC EXCAV WORK (HYD EXCAVATOR)	BLOCK SODDING	VEGATATIVE WATERING (10 GAL/SY/2 APP)	CEM STABIL BKFL	TEMPORARY SPL SHORING	CL C CONC (COLLAR)	RIPRAP (CONC) 5 IN	RIPRAP (STONE COMMON) (DRY) 18 IN	RIPRAP (STONE COMMON) (DRY) 24 IN
STATION	EXISTING	PROPOSED	CY	HR	SY	MG	CY	SF	EA	CY	CY	CY
CSJ: 2891-01-018 (FM 2864)												
265+73	18" X 66' RCP	REMOVE 18" X 8' RCP & REPLACE W/4' RCP (CL III)(18 IN), ADD CH-PW-0(DIA=24 IN)(2:1) LT; REMOVE 18" X 4' RCP & REPLACE W/4' RCP (CL III)(18 IN), ADD SET (TY II)(18")(4:1) & CEM STAB BKFL RT.	3.5		26	0.6	1					
284+53	18" X 55' RCP	ADD SET(TY II)(18")(RCP)(4:1)(C) LT; ADD SET(TY II)(18")(RCP)(4:1)(C) RT		1	21	0.5						
316+45	2-42" X 54' RCP W/SET & PIPE RUNNERS	NO STRUCTURE WORK LT; ADD CEM STAB BKFL & RIPRAP(STONE COMMON)(DRY)(18 IN) RT.					2.1				6.3	
323+67	24" X 52' RCP W/SET	NO STRUCTURE WORK	2									
342+36	18" X 74' RCP W/SET	NO STRUCTURE WORK										
		CSJ: 2891-01-018 SHEET TOTAL:	**5.5**	**1.0**	**47.0**	**1.1**	**3.1**	**0**	**0**	**0**	**6.3**	**0.0**
		CSJ: 2891-01-018 TOTAL:	**408.3**	**9.0**	**411.0**	**8.8**	**198.4**	**3002**	**0**	**0**	**72.7**	**0.0**
CSJ: 3220-01-013 (FM 3152)												
4+25	24" X 46' RCP	ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT			32	0.6						
25+48	48" X 96' RCP ON A SKEW	REMOVE 8' RC PIPE, ADD CH-PW-S (DIA=72 IN) (2:1) LT; INSTALL MBGF, ADD CH-PW-S (DIA=48 IN)(2:1), ADD CEM STABIL BKFL AND RIPRAP (STONE COMMON)(DRY)(18 IN) RT.	182		47	0.9	2				3.3	
30+10	36" X 54' RCP	ADD CH-PW-S (48 IN) (2:1), ADD CEM STAB BKFL & RIPRAP (STONE COMMON) (DRY) (18 IN) LT; REMOVE 4' RC PIPE (CL III) (36 IN) ADD REPLACE W/6' RC PIPE (CL III)(36 IN), ADD CH-PW-S (48 IN) (2:1) RT	12		46	0.9	1				5.6	
45+00	24" X 74' RCP	REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/4' RC PIPE (CL III)(24 IN), ADD CH-PW-0 (DIA=54 IN)(2:1) LT; REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/4' RC PIPE (CL III)(24 IN), ADD CH-PW-0 (DIA=60 IN)(2:1) RT.	175		57	1.1						
56+90	36" X 72' RCP 30 °RT FWD SKEW	REMOVE 4' RC PIPE (CL III)(36 IN) AND REPLACE W/ 8' RC PIPE (CL III)(36 IN), ADD CONC COLLAR & ADD CH-FW-30 (DIA=36 IN)(2:1) LT; REMOVE 10' RC PIPE, ADD CH-PW-S (DIA=48 IN)(2:1) RT	16.5		23	0.5			1			
61+82	42" X 82' RCP	REMOVE 6' RC PIPE (CL III)(42 IN) & REPLACE W/6' RC PIPE (CL III)(42 IN), ADD CH-PW-0 (DIA=48 IN)(2:1) LT; REMOVE 6' RC PIPE (CL III)(42 IN) & REPLACE W/6' RC PIPE (CL III)(42 IN), ADD TEMP SPL SHORING, ADD RIPRAP (CONC)(5"), ADD CH-PW-0 (DIA=48 IN)(2:1) RT.	96.4		56	1.1		138		22.3		
71+00	24" X 46' RCP	REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT.	6		22	0.4						
		CSJ: 3220-01-013 SHEET TOTAL:	**487.9**	**0**	**283**	**5.5**	**3**	**138**	**1**	**22.3**	**8.9**	**0**

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STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
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3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION
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SHEET 36 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		42

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SUMMARY OF CROSS CULVERTS (CONTINUED)

LOCATION	DESCRIPTION		ITEM NO.	132	158	162	168	400	403	420	432		
			BID ITEM	6019	6003	6002	6001	6005	6001	6071	6002	6026	6027
				EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	SPEC EXCAV WORK (HYD EXCAVATOR)	BLOCK SODDING	VEGATATIVE WATERING (10 GAL/SY/2 APP)	CEM STABIL BKFL	TEMPORARY SPL SHORING	CL C CONC (COLLAR)	RIPRAP (CONC) 5 IN	RIPRAP (STONE COMMON) (DRY) 18 IN	RIPRAP (STONE COMMON) (DRY) 24 IN
STATION	EXISTING	PROPOSED		CY	HR	SY	MG	CY	SF	EA	CY	CY	CY
CSJ: 3220-01-013 (FM 3152)													
92+75	24" X 50' RCP	ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT				11	0.2						
107+34	42" X 76' RCP	REMOVE AND REPLACE EXIST MBGF LT; REMOVE DISJOINTED 6' RCP JOINT, ADD CH-PW-0 (DIA=42 IN)(2:1), RIPRAP(STONE COMMON) (DRY) (18IN) REMOVE AND REPLACE EXIST MBGF RT.										1.8	
117+95	24" X 48' RCP	ADD SET TY(II)(24 IN)(RCP)(4:1)(C) LT; REMOVE 4' RC PIPE AND EXTEND W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II) (24 IN) (RCP) (4:1) (C) RT.		3		22	0.4						
125+86	30" X 84' RCP ON 30°RT FWD SKEW	REMOVE & REPLACE W/4' RC PIPE (CL III) (30 IN) & ADD CH-FW-S (DIA=30 IN) (2:1) LT; REMOVE AND REPLACE EXIST MBGF, REMOVE 8' RC PIPE, INSTALL CH-PW-S (DIA=72 IN) (2:1) & ADD RIPRAP (STONE COMMON)(DRY)(18IN) RT.		42	1	45	0.9					5.4	
143+51	36" X 94' RCP ON 30°LT FWD SKEW	REMOVE AND REPLACE W/4' RC PIPE (CL III) (36 IN), REMOVE SET TY(II)(36")(4:1) AND REPLACE W/CH-PW-S (DIA=66 IN)(2:1) LT; REMOVE AND REPLACE W/4' RC PIPE (CL III)(36 IN) & ADD CH-PW-S (DIA=42 IN)(2:1) RT		162.8		57	1.1						
182+07	30" x 52' RCP	REMOVE 18' RC PIPE (CLASS III)(30 IN) & REPLACE W/18' RC PIPE (CLASS III)(30 IN), ADD CONC COLLAR, REMOVE SET (TY II) (30 IN)(RCP) (3:1) (C) & INSTALL SET (TY II) (30 IN) (RCP) (4:1) (C) LT; NO WORK PROPOSED RT.			1	12	0.2		84	1			
205+00	24" X 48' RCP	NO WORK PROPOSED											
220+17	30" X 54' RCP	NO WORK PROPOSED											
235+30	18" X 81' RCP	NO PROPOSED WORK LT; GRADE FRONT SLOPE RT.		6									
257+00	24" X 48' RCP	NO WORK PROPOSED											
268+05	24" X 54' RCP	NO WORK PROPOSED											
276+75	CULVERT HAS BEEN REMOVED												
290+25	24" X 48' RCP	NO WORK PROPOSED											
316+40	42" X 80' RCP	REMOVE AND REPLACE EXIST MBGF LT; REMOVE AND REPLACE EXIST MBGF, ADD RIPRAP (STONE COMMON)(DRY)(18 IN) & CEM STAB BFKL RT.						1				1.8	
323+06	21" X 50' RCP	NO WORK PROPOSED											
332+10	18" X 41' RCP	NO WORK PROPOSED											
352+65	24" X 40' RCP	NO WORK PROPOSED											
CSJ: 3220-01-013 SHEET TOTAL:				**213.8**	**2**	**147**	**2.8**	**1**	**84**	**1**	**0**	**9**	**0**
CSJ: 3220-01-013 TOTAL:				**701.7**	**2**	**430**	**8.3**	**4**	**222**	**2**	**22.3**	**17.9**	**0**
PROJECT TOTALS:				**2004.7**	**28**	**1426.8**	**29.4**	**513.2**	**4214**	**6**	**33.1**	**275.7**	**101**

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY.
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STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7151A46...
3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 37 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		43

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SUMMARY OF CROSS CULVERTS (CONTINUED)

			ITEM NO.	462							464				
			BID ITEM	6051	6057	6070	6071	6019	6074	6075	6003	6005	6007	6008	6009
LOCATION	DESCRIPTION			CONC BOX CULV (5 FT X 3 FT) (EXTEND)	CONC BOX CULV (6 FT X 6 FT) (EXTEND)	CONC BOX CULV (9 FT X 7 FT) (EXTEND)	CONC BOX CULV (9 FT X 8 FT) (EXTEND)	CONC BOX CULV (8 FT X 4 FT)	CONC BOX CULV (10 FT X 6 FT) (EXTEND)	CONC BOX CULV (10 FT X 7 FT) (EXTEND)	RC PIPE (CL III)				
											18 IN	24 IN	30 IN	36 IN	42 IN
STATION	EXISTING	PROPOSED		LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF
CSJ:0336-03-072 (SH 103)															
1616+20	24" X 104' RCP @ 30° RFS	CLEAN CULVERT & ADD SET(TY II) (24 IN) (RCP) (6:1)(C) LT; ADD SET (TY II) (24 IN)(RCP) (4:1) (C) RT													
1640+57	2-8' X 7'X 88' MBC W/MCW-F2	CLEAN CULVERT													
1643+47	3-36" X 70' RCP W/SET(TY C)(4:1)	REMOVE EXIST RIPRAP SET, EXTEND W/3-36" X 4' RC PIPE (CL III)(36 IN), ADD CH-FW-0 (DIA=36 IN)(2:1)C) & ADD RIPRAP (STONE COMMON) (DRY) (18 IN) LT; REMOVE EXIST RIPRAP SET, EXTEND W/3-36" X 4' RC PIPE (CL III)(36 IN) & ADD CH-FW-0 (DIA=36 IN)(2:1) RT												24	
1656+69	30" X 68' RCP W/SET (TY C)(3:1)	REMOVE EXIST SET, EXTEND W/30" X 6' RC PIPE (CL III)(30 IN) & ADD CH-PW-0(DIA=48 IN)(2:1) LT;											6		
1671+00	24" X 80' RCP W/SET (TY C)(3:1)	REMOVE EXIST SET (TY C)(3:1)& 4' RC PIPE (CL III)(24 IN), EXTEND W/6' RC PIPE (CL III)(24 IN) & ADD SET (TY II) (24 IN) (RCP)(4:1)(C) LT; REMOVE EXIST SET (TY C)(3:1) & ADD CH-PW-0(DIA=48 IN)(2:1), ADD RIPRAP (STONE COMMON)(DRY)(12 IN) RT.										6			
1677+39	36" X 60' RCP W/SET (TY C) & (WS-P-N(MOD))	NO STRUCTURE WORK LT; REMOVE EXIST SET; ADD CH-PW-0(66 IN)(2:1) RT													
1700+15	8' X 8' RCP W/HDWL	NO STRUCTURE WORK													
1722+69	6'X 4' X 74' BOX W/SET	NO STRUCTURE WORK													
1729+00	24" X 64' RCP W/SET (TY C)	NO STRUCTURE WORK													
1746+39	3' X 2' BOX W/SWW	NO STRUCTURE WORK													
1792+96	30" X 136' RCP @ 45° RFS	NO STRUCTURE WORK													
1794+68	30" X 96' RCP	NO STRUCTURE WORK													
1798+78	8' X 8' RCP W/HDWL & WINGS	NO STRUCTURE WORK													
1801+29	4' X 3' BOX @ 30° RFS	NO STRUCTURE WORK													
1819+63	30" X 82' RCP W/HDWL & WINGS	REMOVE EXIST WINGWALL & 20' RC PIPE (CL III) (30 IN), ADD SPECIAL SHORING & TRENCH EXCAVATION, EXTEND W/24' RCP (CL III) (30 IN) & ADD CH-FW-0 (DIA=30 IN)(2:1) LT; NO STRUCTURE WORK RT.													
1847+32	3' X 3' X 132' BOX	NO STRUCTURE WORK													
1858+18	9' X 9' X 77' BOX	NO STRUCTURE WORK													
1871+64	24" X 76' RCP	NO STRUCTURE WORK													
1877+35	5' X 4' BOX W/HDWL	NO STRUCTURE WORK													
		CSJ:0336-03-072 SHEET TOTAL:		0	0	0	0	0	0	0	0	6	6	24	0

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QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 38 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		44

SUMMARY OF CROSS CULVERTS (CONTINUED)

ITEM NO.			462							464				
BID ITEM			6051	6057	6070	6071	6019	6074	6075	6003	6005	6007	6008	6009
LOCATION	DESCRIPTION		CONC BOX CULV (5 FT X 3 FT) (EXTEND)	CONC BOX CULV (6 FT X 6 FT) (EXTEND)	CONC BOX CULV (9 FT X 7 FT) (EXTEND)	CONC BOX CULV (9 FT X 8 FT) (EXTEND)	CONC BOX CULV (8 FT X 4 FT)	CONC BOX CULV (10 FT X 6 FT) (EXTEND)	CONC BOX CULV (10 FT X 7 FT) (EXTEND)	RC PIPE (CL III)				
										18 IN	24 IN	30 IN	36 IN	42 IN
STATION	EXISTING	PROPOSED	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF
CSJ:0336-03-072 (SH 103)														
1893+98	36" X 88' RCP	REMOVE EXIST SET; REMOVE & REPLACE 4' RCP (CL III) (36 IN), ADD CH-PW-0 (DIA=36 IN)(2:1) & RIPRAP (STONE COMMON)(DRY)(18 IN) LT; EXT 4' RCP (CL III)(36 IN) & ADD CH-PW-0(DIA=72 IN) (2:1), ADD RIPRAP (STONE COMMON)(DRY) (18 IN) RT											8	
1906+12	36" X 100' RCP @ 15° RFS	NO STRUCTURE WORK												
1920+05	7' X 7' X 90' BOX W/FW-15 WINGS @ 15° RFS	NO STRUCTURE WORK												
1921+83	36" X 94' RCP W/CH-6-B HDWLS	NO STRUCTURE WORK LT; REMOVE EXIST HDWL & WINGS, REMOVE AND REPLACE W/4' RC PIPE (CL III)(36 IN) AND ADD CH-PW-0 (DIA=66 IN)(2:1) RT. CLEAN CULVERT											4	
1934+00	3' X 3' X 80' BOX W/SET(TY C) (PIPE RUNNERS)	NO STRUCTURE WORK HOLE ADJACENT TO LT SET TO BE FILLED W/RIPRAP (STONE COMMON)(DRY)(24 IN); HOLE ON RT TO BE FILLED W/RIPRAP (STONE COMMON)(DRY)(24 IN).												
1966+00	6' X 4' X 71' BOX W/HDWL & WINGS	NO STRUCTURE WORK												
2024+58	3' X 3' X 106' BOX	NO STRUCTURE WORK												
2030+00	30" X 68' RCP W/SET (TY C)	REMOVE EXIST SET (TY C), EXTEND W/30" X 6' RC PIPE (CL III)(30 IN), CONC COLLAR & SET (TY II) (30 IN) (RCP) (4:1) ,ADD RIPRAP (STONE COMMON)(DRY)(18 IN) LT; NO STRUCTURE WORK RT.										6		
2044+53	30" X 109' RCP W/CH-6B HDWLS & WINGS	NO STRUCTURE WORK												
2049+20.5	24" X 112' RCP W/CH-11 B-15° HDWL & WINGS @ 15° RFS	NO STRUCTURE WORK												
2070+20	2-24" X 62' RCP W/SET(TY C) (24") (4:1)	NO STRUCTURE WORK												
2098+18	4-5' X 5' X 94' BOX W/MCW-P	NO STRUCTURE WORK												
2102+65	36" X 84' RCP	NO STRUCTURE WORK												
2110+16	4' X 4' X 96' BOX @ 30° LFS	NO STRUCTURE WORK												
2123+88	3' X 3' X 85' BOX	NO STRUCTURE WORK												
2144+62	3-10' X 12' X 85' BOX	NO STRUCTURE WORK												
2154+50.50	8' X 4' X 136' BOX @ 45° RFS	NO STRUCTURE WORK												
2164+90	30" X 90' RCP	NO STRUCTURE WORK												
2188+00	24" X 126' RCP @ 45° RFS	NO STRUCTURE WORK												
		CSJ:0336-03-072 SHEET TOTAL:	0	0	0	0	0	0	0	0	0	6	12	0

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY. THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7151144...
3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 39 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		45

SUMMARY OF CROSS CULVERTS (CONTINUED)

		ITEM NO.	462							464				
		BID ITEM	6051	6057	6070	6071	6019	6074	6075	6003	6005	6007	6008	6009
LOCATION	DESCRIPTION		CONC BOX CULV (5 FT X 3 FT) (EXTEND)	CONC BOX CULV (6 FT X 6 FT) (EXTEND)	CONC BOX CULV (9 FT X 7 FT) (EXTEND)	CONC BOX CULV (9 FT X 8 FT) (EXTEND)	CONC BOX CULV (8 FT X 4 FT)	CONC BOX CULV (10 FT X 6 FT) (EXTEND)	CONC BOX CULV (10 FT X 7 FT) (EXTEND)	RC PIPE (CL III)				
										18 IN	24 IN	30 IN	36 IN	42 IN
STATION	EXISTING	PROPOSED	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF
CSJ:0336-03-072 (SH 103)														
2194+90	3' X 3' X 90' BOX	NO STRUCTURE WORK												
2208+75	5' X 3' X 86' BOX	NO STRUCTURE WORK												
2213+86	6' X 3' X 113' BOX @ 30° LFS	NO STRUCTURE WORK												
CSJ:0336-03-072 SHEET TOTAL:			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CSJ: 0336-03-072 TOTAL:			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**12**	**36**	**0**
CSJ:1678-02-007 (FM 2971)														
6+84	2-24" X 70' RCP W/ CONCRETE HEADWALLS	NO WORK LT; REMOVE EXISTING HEADWALL & ADD CH-PW-S (DIA=60 IN)(2:1) RT									8			
21+61	30" X 42' RCP	ADD SET (TY II)(30 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(30 IN)(RCP)(4:1)(C), ADD CEM STABIL BKFL & ADD RIPRAP (STONE COMMON)(DRY)(18 IN) RT												
34+40	10' X 7' X 39' BOX CULVERT W/FW	REMOVE FW-0 EXTEND 7' (SCC-10), ADD WINGWALL (PW-2)(HW=9 FT), ADD RIPRAP (STONE COMMON) (DRY)(18 IN) & CEM STAB BKFL LT; REMOVE FW-0 EXTEND 12' (SCC-10) & ADD WINGWALL (FW-0)(HW=7 FT, 9 IN) (2:1) & ADD RIPRAP (STONE COMMON) (DRY) (18 IN)							19					
44+23	18" & 24" X 62' RCP	REMOVE 4' RC PIPE (24 IN) & (18 IN), ADD CEM STABIL BKFL & ROCK RIPRAP, ADD CH-FW-0 (DIA=42 IN) (2:1) (C) LT; ADD CH-FW-0 (DIA=42 IN) (2:1) (C) RT												
53+00	30" X 46' RCP	EXTEND 4' RC PIPE (CL III)(30 IN), ADD SET (TY II)(30 IN)(RCP)(4:1)(C) & CEM STAB BKFL LT; REMOVE AND REPLACE 6' RC PIPE (CL III)(30 IN), ADD SET (TY II)(30 IN)(RCP)(4:1)(C) RT										10		
61+37	30" X 44' RCP	EXTEND 6' RC PIPE (CL III)(30 IN) & ADD CEM STABIL BKFL, ADD RIPRAP (STONE COMMON) (DRY) (18IN) & ADD CH-FW-0 (DIA=48 IN)(2:1)(C) LT; EXTEND 4' RC PIPE (CL III) (30 IN), ADD CEM STABIL BKFL, ADD CONC COLLAR & ADD SET (TY II) (30 IN) (RCP) (4:1) (C) RT										10		
96+94	(2) 24" X 46' RCP	EXTEND 4' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & ADD CH-FW-0 (DIA=36 IN)(2:1) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT									8			
102+90	10' X 7' X 39' BOX CULVERT W/FW	REMOVE FW-0, EXTEND 8' (SCC-10), ADD WINGWALL (PW-2)(HW=9 FT) ADD CEM STABIL BKFL & AND STONE RIPRAP LT; REMOVE FW-0, EXTEND 8' (SCC-10) & ADD WINGWALL (FW-0)(HW=9 FT)(2:1) RT							16					
115+15	8' x 4' x 36' BOX CULVERT W/FW	REMOVE FW-0 EXTEND 10' (SCC-8) & ADD WINGWALL (PW-2)(HW=6 FT), ADD RIPRAP (STONE COMMON) (DRY) (18 IN) & ADD CEM STABIL BKFL LT; REMOVE FW-0 EXTEND 10' (SCC-8), ADD WINGWALL (FW-0)(HW=6 FT)(2:1), ADD RIPRAP (STONE COMMON) (DRY)(18 IN) & ADD CEM STABIL BKFL RT					20							
CSJ: 1678-02-007 TOTAL:			**0**	**0**	**0**	**0**	**20**	**0**	**35**	**0**	**16**	**20**	**0**	**0**

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY. THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

STATE OF TEXAS
ELIZABETH A. ORTEGO
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3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 40 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		46

SUMMARY OF CROSS CULVERTS (CONTINUED)

			ITEM NO.	462						464				
			BID ITEM	6051	6057	6070	6071	6019	6074	6075	6003	6005	6007	6008	6009
LOCATION	DESCRIPTION			CONC BOX CULV (5 FT X 3 FT) (EXTEND)	CONC BOX CULV (6 FT X 6 FT) (EXTEND)	CONC BOX CULV (9 FT X 7 FT) (EXTEND)	CONC BOX CULV (9 FT X 8 FT) (EXTEND)	CONC BOX CULV (8 FT X 4 FT)	CONC BOX CULV (10 FT X 6 FT) (EXTEND)	CONC BOX CULV (10 FT X 7 FT) (EXTEND)	RC PIPE (CL III)				
											18 IN	24 IN	30 IN	36 IN	42 IN
STATION	EXISTING	PROPOSED		LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF
CSJ: 2891-01-018 (FM 2864)															
0+50	18" X 110' RCP	NO STRUCTURE WORK; CLEAN CULVERT													
21+50	48" X 92' @ 45° LT FWD SKEW	NO STRUCTURE WORK LT; ADD EMBANKMENT RT.													
48+00	9' X 8' x 46' BOX CULVERT W/SC-15 °A AND FW-15°	REMOVE FW-15°, EXTEND 7' (SCC-9) & ADD WINGWALL (PW-2)(HW=10 FT), ADD CEM STAB BFKL & RIPRAP (STONE COMMON)(DRY) (18 IN) LT; REMOVE FW-15°, EXTEND 6' (SCC-9) & ADD WINGWALL (PW-2)(HW=10 FT), ADD CEM STAB BFKL & RIPRAP (STONE COMMON)(DRY) (18 IN) RT.					13								
74+24	24" X 70' RCP @ 30°RT FWD SKEW	NO WORK PROPOSED LT; REMOVE AND RELAY 4' RCP (CL III)(24 IN) AND ADD CH-PW-0 (DIA=42 IN)(2:1) RT.										4			
78+00	6' x 6' X 42' BOX CULVERT W/ FW NON SKEWED	REMOVE FW-N, EXTEND 6' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT) LT; REMOVE FW-N, EXTEND 3' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT) RT.			9										
109+00	24" X 44' RCP	NO STRUCTURE WORK													
125+58	10' X 6' X 37' BOX CULVERT w/ FW 45°SKEWED	REMOVE FW-N, EXTEND 16' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT)(2:1), ADD CEM STAB BACKFILL LT; REMOVE FW-N, EXTEND 8' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT)(2:1), ADD CEM STAB BFKL & RIPRAP (STONE COMMON) (DRY)(18 IN) RT.						24							
140+00	18" X 52' RCP	ADD SET(TY II)(18 IN)(RCP)(4:1)(C) LT; NO WORK PROPOSED RT.													
147+50	7' X 4' X 45' BOX W/HDWL & WINGS AT 30° LFS	NO STRUCTURE WORK, INSTALL MBGF LT; INSTALL MBGF RT													
155+71	18" X 50' RCP @ 30° RFS W/SET (TY II)	NO STRUCTURE WORK													
160+42	18" X 55' RCP ON 30° SKEW	ADD CEM STAB BKFL & RIPRAP (STONE)(COMMON DRY)(18 IN), INSTALL SET (TY II)(18 IN)(RCP)(4:1)(C) LT; INSTALL SET (TY II)(18 IN)(RCP)(4:1)(C) RT													
183+35	30" X 54' RCP W/SET (TY II)	NO STRUCTURE WORK													
202+40	5' X 3' X 42' CONC BOX	REMOVE FW-N, EXTEND 7' (SCC-5) & ADD WINGWALL (FW - 0)(HW=5 FT)(2:1), ADD CEM STAB BFKL LT; REMOVE FW-N, EXTEND 5' (SCC-5) & ADD WINGWALL (FW - 0)(HW=5 FT)(2:1), ADD CEM STAB BFKL & RIPRAP (STONECOMMON)(DRY) (18 IN) RT.		12											
232+00	(2) 30" X 50' RCP CL III	NO STRUCTURE WORK; CLEAN CULVERT													
239+00	18" X 58' RCP W/SET	NO STRUCTURE WORK LT; REMOVE EXIST SET, ADD SET (TY II) (18") (4:1) (C) RT.													
248+00	9' X 7' X 37' CONC BOX W/ FW	REMOVE FW EXTEND 10' (CRR-9) AND INSTALL WINGWALL (PW-2)(HW=9 FT), ADD CEM STAB BKFL & RIPRAP(STONE COMMON)(DRY)(18 IN) LT; REMOVE FW EXTEND 7' (CRR-9) AND INSTALL WINGWALL (PW-2)(HW=9 FT), ADD CEM STAB BKFL & RIPRAP(STONE COMMON)(DRY)(18 IN) RT.				17									
258+00	18" X 57' RCP (15° RFS)	ADD SET (TY II)(18")(4:1)(C) LT; REM JT, EXT W/BEND JT, ADD SET(TY II)(18")(6:1)(C) RT									10				
		CSJ: 2891-01-018 SHEET TOTAL:		12	9	17	13	0	24	0	10	4	0	0	0

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY. THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

STATE OF TEXAS
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3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 41 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		47

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SUMMARY OF CROSS CULVERTS (CONTINUED)

			ITEM NO.	462						464				
			BID ITEM	6051	6057	6070	6071	6019	6074	6075	6003	6005	6007	6008	6009
LOCATION	DESCRIPTION			CONC BOX CULV (5 FT X 3 FT) (EXTEND)	CONC BOX CULV (6 FT X 6 FT) (EXTEND)	CONC BOX CULV (9 FT X 7 FT) (EXTEND)	CONC BOX CULV (9 FT X 8 FT) (EXTEND)	CONC BOX CULV (8 FT X 4 FT)	CONC BOX CULV (10 FT X 6 FT) (EXTEND)	CONC BOX CULV (10 FT X 7 FT) (EXTEND)	RC PIPE (CL III)				
											18 IN	24 IN	30 IN	36 IN	42 IN
STATION	EXISTING	PROPOSED		LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF
CSJ: 2891-01-018 (FM 2864)															
265+73	18" X 66' RCP	REMOVE 18" X 8' RCP & REPLACE W/4' RCP (CL III)(18 IN), ADD CH-PW-0(DIA=24 IN)(2:1) LT; REMOVE 18" X 4' RCP & REPLACE W/4' RCP (CL III)(18 IN), ADD SET (TY II)(18")(4:1) & CEM STAB BKFL RT.									8				
284+53	18" X 55' RCP	ADD SET(TY II)(18")(RCP)(4:1)(C) LT; ADD SET(TY II)(18")(RCP)(4:1)(C) RT													
316+45	2-42" X 54' RCP W/SET & PIPE RUNNERS	NO STRUCTURE WORK LT; ADD CEM STAB BKFL & RIPRAP(STONE COMMON)(DRY)(18 IN) RT.													
323+67	24" X 52' RCP W/SET	NO STRUCTURE WORK													
342+36	18" X 74' RCP W/SET	NO STRUCTURE WORK													
		CSJ: 2891-01-018 SHEET TOTAL:		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**
		CSJ: 2891-01-018 TOTAL:		**12**	**9**	**17**	**13**	**0**	**24**	**0**	**18**	**4**	**0**	**0**	**0**
CSJ: 3220-01-013 (FM 3152)															
4+25	24" X 46' RCP	ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT													
25+48	48" X 96' RCP ON A SKEW	REMOVE 8' RC PIPE, ADD CH-PW-S (DIA=72 IN) (2:1) LT; INSTALL MBGF, ADD CH-PW-S (DIA=48 IN)(2:1), ADD CEM STABIL BKFL AND RIPRAP (STONE COMMON)(DRY)(18 IN) RT.													
30+10	36" X 54' RCP	ADD CH-PW-S (48 IN) (2:1), ADD CEM STAB BKFL & RIPRAP (STONE COMMON) (DRY) (18 IN) LT; REMOVE 4' RC PIPE (CL III) (36 IN) ADD REPLACE W/6' RC PIPE (CL III)(36 IN), ADD CH-PW-S (48 IN) (2:1) RT												6	
45+00	24" X 74' RCP	REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/4' RC PIPE (CL III)(24 IN), ADD CH-PW-0 (DIA=54 IN)(2:1) LT; REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/4' RC PIPE (CL III)(24 IN), ADD CH-PW-0 (DIA=60 IN)(2:1) RT.										8			
56+90	36" X 72' RCP 30 °RT FWD SKEW	REMOVE 4' RC PIPE (CL III)(36 IN) AND REPLACE W/ 8' RC PIPE (CL III)(36 IN), ADD CONC COLLAR & ADD CH-FW-30 (DIA=36 IN)(2:1) LT; REMOVE 10' RC PIPE, ADD CH-PW-S (DIA=48 IN)(2:1) RT												8	
61+82	42" X 82' RCP	REMOVE 6' RC PIPE (CL III)(42 IN) & REPLACE W/6' RC PIPE (CL III)(42 IN), ADD CH-PW-0 (DIA=48 IN)(2:1) LT; REMOVE 6' RC PIPE (CL III)(42 IN) & REPLACE W/6' RC PIPE (CL III)(42 IN), ADD TEMP SPL SHORING, ADD RIPRAP (CONC)(5"), ADD CH-PW-0 (DIA=48 IN)(2:1) RT.													12
71+00	24" X 46' RCP	REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT.										12			
		CSJ: 3220-01-013 SHEET TOTAL:		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**14**	**12**

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY. THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

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3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 42 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		48

SUMMARY OF CROSS CULVERTS (CONTINUED)

ITEM NO.			462							464				
BID ITEM			6051	6057	6070	6071	6019	6074	6075	6003	6005	6007	6008	6009
LOCATION	DESCRIPTION		CONC BOX CULV (5 FT X 3 FT) (EXTEND)	CONC BOX CULV (6 FT X 6 FT) (EXTEND)	CONC BOX CULV (9 FT X 7 FT) (EXTEND)	CONC BOX CULV (9 FT X 8 FT) (EXTEND)	CONC BOX CULV (8 FT X 4 FT)	CONC BOX CULV (10 FT X 6 FT) (EXTEND)	CONC BOX CULV (10 FT X 7 FT) (EXTEND)	RC PIPE (CL III)				
										18 IN	24 IN	30 IN	36 IN	42 IN
STATION	EXISTING	PROPOSED	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF
CSJ: 3220-01-013 (FM 3152)														
92+75	24" X 50' RCP	ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT												
107+34	42" X 76' RCP	REMOVE AND REPLACE EXIST MBGF LT; REMOVE DISJOINTED 6' RCP JOINT, ADD CH-PW-O (DIA=42 IN)(2:1), RIPRAP(STONE COMMON) (DRY) (18IN) REMOVE AND REPLACE EXIST MBGF RT.												
117+95	24" X 48' RCP	ADD SET TY(II)(24 IN)(RCP)(4:1)(C) LT; REMOVE 4' RC PIPE AND EXTEND W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II) (24 IN) (RCP) (4:1) (C) RT.									6			
125+86	30" X 84' RCP ON 30°RT FWD SKEW	REMOVE & REPLACE W/4' RC PIPE (CL III) (30 IN) & ADD CH-FW-S (DIA=30 IN) (2:1) LT; REMOVE AND REPLACE EXIST MBGF, REMOVE 8' RC PIPE, INSTALL CH-PW-S (DIA=72 IN) (2:1) & ADD RIPRAP (STONE COMMON)(DRY)(18IN) RT.										4		
143+51	36" X 94' RCP ON 30°LT FWD SKEW	REMOVE AND REPLACE W/4' RC PIPE (CL III) (36 IN), REMOVE SET TY(II)(36")(4:1) AND REPLACE W/CH-PW-S (DIA=66 IN)(2:1) LT; REMOVE AND REPLACE W/4' RC PIPE (CL III)(36 IN) & ADD CH-PW-S (DIA=42 IN)(2:1) RT											8	
182+07	30" x 52' RCP	REMOVE 18' RC PIPE (CLASS III)(30 IN) & REPLACE W/18' RC PIPE (CLASS III)(30 IN), ADD CONC COLLAR, REMOVE SET (TY II) (30 IN)(RCP) (3:1) (C) & INSTALL SET (TY II) (30 IN) (RCP) (4:1) (C) LT; NO WORK PROPOSED RT.										18		
205+00	24" X 48' RCP	NO WORK PROPOSED												
220+17	30" X 54' RCP	NO WORK PROPOSED												
235+30	18" X 81' RCP	NO PROPOSED WORK LT; GRADE FRONT SLOPE RT.												
257+00	24" X 48' RCP	NO WORK PROPOSED												
268+05	24" X 54' RCP	NO WORK PROPOSED												
276+75	CULVERT HAS BEEN REMOVED													
290+25	24" X 48' RCP	NO WORK PROPOSED												
316+40	42" X 80' RCP	REMOVE AND REPLACE EXIST MBGF LT; REMOVE AND REPLACE EXIST MBGF, ADD RIPRAP (STONE COMMON)(DRY)(18 IN) & CEM STAB BFKL RT.												
323+06	21" X 50' RCP	NO WORK PROPOSED												
332+10	18" X 41' RCP	NO WORK PROPOSED												
352+65	24" X 40' RCP	NO WORK PROPOSED												
CSJ: 3220-01-013 SHEET TOTAL:			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**22**	**8**	**0**
CSJ: 3220-01-013 TOTAL:			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**26**	**22**	**22**	**12**
PROJECT TOTALS:			**12**	**9**	**17**	**13**	**20**	**24**	**35**	**18**	**52**	**54**	**58**	**12**

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY. THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

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3/31/2022

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		49

SUMMARY OF CROSS CULVERTS (CONTINUED)

LOCATION	DESCRIPTION		ITEM NO.	466																		
			BID ITEM	6097	6101	6102	6103	6104	6105	6106	6107	6135	6136	6138	6139	6140	6007	6009	6010	6011	6037	6039
				HEADWALL																		
				(CH-PW-O)								(CH-PW-S)					(CH-FW-O)				(CH-FW-30)	
				(DIA= 24 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 54 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 30 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 30 IN)	(DIA= 36 IN)
STATION	EXISTING	PROPOSED		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ:0336-03-072 (SH 103)																						
1616+20	24" X 104' RCP @ 30° RFS	CLEAN CULVERT & ADD SET(TY II) (24 IN) (RCP) (6:1)(C) LT; ADD SET (TY II) (24 IN)(RCP) (4:1) (C) RT																				
1640+57	2-8' X 7'X 88' MBC W/MCW-F2	CLEAN CULVERT																				
1643+47	3-36" X 70' RCP W/SET(TY C)(4:1)	REMOVE EXIST RIPRAP SET, EXTEND W/3-36" X 4' RC PIPE (CL III)(36 IN), ADD CH-FW-O (DIA=36 IN)(2:1)C) & ADD RIPRAP (STONE COMMON) (DRY) (18 IN) LT; REMOVE EXIST RIPRAP SET, EXTEND W/3-36" X 4' RC PIPE (CL III)(36 IN) & ADD CH-FW-O (DIA=36 IN)(2:1) RT																2				
1656+69	30" X 68' RCP W/SET (TY C)(3:1)	REMOVE EXIST SET, EXTEND W/30" X 6' RC PIPE (CL III)(30 IN) & ADD CH-PW-O(DIA=48 IN)(2:1) LT;					1															
1671+00	24" X 80' RCP W/SET (TY C)(3:1)	REMOVE EXIST SET (TY C)(3:1)& 4' RC PIPE (CL III)(24 IN), EXTEND W/6' RC PIPE (CL III)(24 IN) & ADD SET (TY II) (24 IN) (RCP)(4:1)(C) LT; REMOVE EXIST SET (TY C)(3:1) & ADD CH-PW-O(DIA=48 IN)(2:1), ADD RIPRAP (STONE COMMON)(DRY)(12 IN) RT.					1															
1677+39	36" X 60' RCP W/SET (TY C) & (WS-P-N(MOD))	NO STRUCTURE WORK LT; REMOVE EXIST SET; ADD CH-PW-O(66 IN)(2:1) RT							1													
1700+15	8' X 8' RCP W/HDWL	NO STRUCTURE WORK																				
1722+69	6'X 4' X 74' BOX W/SET	NO STRUCTURE WORK																				
1729+00	24" X 64' RCP W/SET (TY C)	NO STRUCTURE WORK																				
1746+39	3' X 2' BOX W/SWW	NO STRUCTURE WORK																				
1792+96	30" X 136' RCP @ 45° RFS	NO STRUCTURE WORK																				
1794+68	30" X 96' RCP	NO STRUCTURE WORK																				
1798+78	8' X 8' RCP W/HDWL & WINGS	NO STRUCTURE WORK																				
1801+29	4' X 3' BOX @ 30° RFS	NO STRUCTURE WORK																				
1819+63	30" X 82' RCP W/HDWL & WINGS	REMOVE EXIST WINGWALL & 20' RC PIPE (CL III) (30 IN), ADD SPECIAL SHORING & TRENCH EXCAVATION, EXTEND W/24' RCP (CL III) (30 IN) & ADD CH-FW-O (DIA=30 IN)(2:1) LT; NO STRUCTURE WORK RT.															1					
1847+32	3' X 3' X 132'	NO STRUCTURE WORK																				
1858+18	9' X 9' X 77' BOX	NO STRUCTURE WORK																				
1871+64	24" X 76' RCP	NO STRUCTURE WORK																				
1877+35	5' X 4' BOX W/HDWL	NO STRUCTURE WORK																				
			CSJ:0336-03-072 SHEET TOTAL:	0	0	0	2	0	0	1	0	0	0	0	0	0	1	2	0	0	0	0

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY. THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

STATE OF TEXAS
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Elizabeth Ortego, P.E.
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3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 44 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		50

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SUMMARY OF CROSS CULVERTS (CONTINUED)

			ITEM NO.	466																	
			BID ITEM	6097	6101	6102	6103	6104	6105	6106	6107	6135	6136	6138	6139	6140	6007	6009	6010	6011	6037	6039
LOCATION	DESCRIPTION			HEADWALL																		
				(CH-PW-0)								(CH-PW-S)					(CH-FW-0)				(CH-FW-30)	
				(DIA= 24 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 54 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 30 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 30 IN)	(DIA= 36 IN)
STATION	EXISTING	PROPOSED		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ:0336-03-072 (SH 103)																						
1893+98	36" X 88' RCP	REMOVE EXIST SET; REMOVE & REPLACE 4' RCP (CL III) (36 IN), ADD CH-PW-0 (DIA=36 IN)(2:1) & RIPRAP (STONE COMMON)(DRY)(18 IN) LT; EXT 4' RCP (CL III)(36 IN) & ADD CH-PW-0(DIA=72 IN) (2:1), ADD RIPRAP (STONE COMMON)(DRY) (18 IN) RT			1						1											
1906+12	36" X 100' RCP @ 15° RFS	NO STRUCTURE WORK																				
1920+05	7' X 7' X 90' BOX W/FW-15 WINGS @ 15° RFS	NO STRUCTURE WORK																				
1921+83	36" X 94' RCP W/CH-6-B HDWLS	NO STRUCTURE WORK LT; REMOVE EXIST HDWL & WINGS, REMOVE AND REPLACE W/4' RC PIPE (CL III)(36 IN) AND ADD CH-PW-0 (DIA=66 IN)(2:1) RT. CLEAN CULVERT							1													
1934+00	3' X 3' X 80' BOX W/SET(TY C) (PIPE RUNNERS)	NO STRUCTURE WORK HOLE ADJACENT TO LT SET TO BE FILLED W/RIPRAP (STONE COMMON)(DRY)(24 IN); HOLE ON RT TO BE FILLED W/RIPRAP (STONE COMMON)(DRY)(24 IN).																				
1966+00	6' X 4' X 71' BOX W/HDWL & WINGS	NO STRUCTURE WORK																				
2024+58	3' X 3' X 106' BOX	NO STRUCTURE WORK																				
2030+00	30" X 68' RCP W/SET (TY C)	REMOVE EXIST SET (TY C), EXTEND W/30" X 6' RC PIPE (CL III)(30 IN), CONC COLLAR & SET (TY II) (30 IN) (RCP) (4:1) ,ADD RIPRAP (STONE COMMON)(DRY)(18 IN) LT; NO STRUCTURE WORK RT.																				
2044+53	30" X 109' RCP W/CH-6B HDWLS & WINGS	NO STRUCTURE WORK																				
2049+20.5	24" X 112' RCP W/CH-11 B-15° HDWL & WINGS @ 15° RFS	NO STRUCTURE WORK																				
2070+20	2-24" X 62' RCP W/SET(TY C) (24") (4:1)	NO STRUCTURE WORK																				
2098+18	4-5' X 5' X 94' BOX W/MCW-P	NO STRUCTURE WORK																				
2102+65	36" X 84' RCP	NO STRUCTURE WORK																				
2110+16	4' X 4' X 96' BOX @ 30° LFS	NO STRUCTURE WORK																				
2123+88	3' X 3' X 85' BOX	NO STRUCTURE WORK																				
2144+62	3-10' X 12' X 85'	NO STRUCTURE WORK																				
2154+50.50	8' X 4' X 136' BOX @ 45° RFS	NO STRUCTURE WORK																				
2164+90	30" X 90' RCP	NO STRUCTURE WORK																				
2188+00	24" X 126' RCP @ 45° RFS	NO STRUCTURE WORK																				
		CSJ:0336-03-072 SHEET TOTAL:		0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0

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STATE OF TEXAS
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Elizabeth Ortego, P.E.
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3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 45 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		51

SUMMARY OF CROSS CULVERTS (CONTINUED)

LOCATION	DESCRIPTION		ITEM NO.	466																	
			BID ITEM	6097	6101	6102	6103	6104	6105	6106	6107	6135	6136	6138	6139	6140	6007	6009	6010	6011	6037	6039
				HEADWALL																		
				(CH-PW-0)								(CH-PW-S)					(CH-FW-0)				(CH-FW-30)	
				(DIA= 24 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 54 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 30 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 30 IN)	(DIA= 36 IN)
STATION	EXISTING	PROPOSED		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ: 0336-03-072 (SH 103)																						
2194+90	3' X 3' X 90' BOX	NO STRUCTURE WORK RT; CEMENT STABILIZE TO BE ADDED AROUND SET LT.																				
2208+75	5' X 3' X 86' BOX	NO STRUCTURE WORK																				
2213+86	6' X 3' X 113' BOX @ 30° LFS	NO STRUCTURE WORK																				
		CSJ: 0336-03-072 SHEET TOTAL:		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		CSJ: 0336-03-072 TOTAL:		**0**	**1**	**0**	**2**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**
CSJ: 1678-02-007 (FM 2971)																						
6+84	2-24" X 70' RCP W/ CONCRETE HEADWALLS	NO WORK LT; REMOVE EXISTING HEADWALL & ADD CH-PW-S (DIA=60 IN)(2:1) RT												1								
21+61	30" X 42' RCP	ADD SET (TY II)(30 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(30 IN)(RCP)(4:1)(C), ADD CEM STABIL BKFL & ADD RIPRAP (STONE COMMON)(DRY)(18 IN) RT																				
34+40	10' X 7' X 39' BOX CULVERT W/FW	REMOVE FW-0 EXTEND 7' (SCC-10), ADD WINGWALL (PW-2)(HW=9 FT), ADD RIPRAP (STONE COMMON) (DRY)(18 IN) & CEM STAB BKFL LT; REMOVE FW-0 EXTEND 12' (SCC-10) & ADD WINGWALL (FW-0)(HW=7 FT, 9 IN) (2:1) & ADD RIPRAP (STONE COMMON) (DRY) (18 IN)																				
44+23	18" & 24" X 62' RCP	REMOVE 4' RC PIPE (24 IN) & (18 IN), ADD CEM STABIL BKFL & ROCK RIPRAP, ADD CH-FW-0 (DIA=42 IN) (2:1) (C) LT; ADD CH-FW-0 (DIA=42 IN) (2:1) (C) RT																	2			
53+00	30" X 46' RCP	EXTEND 4' RC PIPE (CL III)(30 IN), ADD SET (TY II)(30 IN)(RCP)(4:1)(C) & CEM STAB BKFL LT; REMOVE AND REPLACE 6' RC PIPE (CL III)(30 IN), ADD SET (TY II) (30 IN)(RCP)(4:1)(C) RT																				
61+37	30" X 44' RCP	EXTEND 6' RC PIPE (CL III)(30 IN) & ADD CEM STABIL BKFL, ADD RIPRAP (STONE COMMON) (DRY) (18IN) & ADD CH-FW-0 (DIA=48 IN)(2:1)(C) LT; EXTEND 4' RC PIPE (CL III) (30 IN), ADD CEM STABIL BKFL, ADD CONC COLLAR & ADD SET (TY II) (30 IN) (RCP) (4:1) (C) RT																		1		
96+94	(2) 24" X 46' RCP	EXTEND 4' RC PIPE (CL III)(24 IN), ADD CONC COLLAR & ADD CH-FW-0 (DIA=36 IN)(2:1) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT																1				
102+90	10' X 7' X 39' BOX CULVERT W/FW	REMOVE FW-0, EXTEND 8' (SCC-10), ADD WINGWALL (PW-2)(HW=9 FT) ADD CEM STABIL BKFL & AND STONE RIPRAP LT; REMOVE FW-0, EXTEND 8' (SCC-10) & ADD WINGWALL (FW-0)(HW=9 FT)(2:1) RT																				
115+15	8' x 4' x 36' BOX CULVERT W/FW	REMOVE FW-0 EXTEND 10' (SCC-8) & ADD WINGWALL (PW-2)(HW=6 FT), ADD RIPRAP (STONE COMMON) (DRY) (18 IN) & ADD CEM STABIL BKFL LT; REMOVE FW-0 EXTEND 10' (SCC-8), ADD WINGWALL (FW-0)(HW=6 FT)(2:1), ADD RIPRAP (STONE COMMON) (DRY)(18 IN) & ADD CEM STABIL BKFL RT																				
		CSJ: 1678-02-007 TOTAL:		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**2**	**1**	**0**	**0**

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STATE OF TEXAS
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3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 46 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		52

SUMMARY OF CROSS CULVERTS (CONTINUED)

ITEM NO.			466																		
BID ITEM			6097	6101	6102	6103	6104	6105	6106	6107	6135	6136	6138	6139	6140	6007	6009	6010	6011	6037	6039
LOCATION	DESCRIPTION		HEADWALL																		
			(CH-PW-0)								(CH-PW-S)					(CH-FW-0)				(CH-FW-30)	
			(DIA= 24 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 54 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 30 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 30 IN)	(DIA= 36 IN)
STATION	EXISTING	PROPOSED	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ: 2891-01-018 (FM 2864)																					
0+50	18" X 110' RCP	NO STRUCTURE WORK; CLEAN CULVERT																			
21+50	48" X 92' @ 45° LT FWD SKEW	NO STRUCTURE WORK LT; ADD EMBANKMENT RT.																			
48+00	9' X 8' x 46' BOX CULVERT W/SC-15 °A AND FW-15°	REMOVE FW-15°, EXTEND 7' (SCC-9) & ADD WINGWALL (PW-2)(HW=10 FT), ADD CEM STAB BFKL & RIPRAP (STONE COMMON)(DRY) (18 IN) LT; REMOVE FW-15°, EXTEND 6' (SCC-9) & ADD WINGWALL (PW-2)(HW=10 FT), ADD CEM STAB BFKL & RIPRAP (STONE COMMON)(DRY) (18 IN) RT.																			
74+24	24" X 70' RCP @ 30°RT FWD SKEW	NO WORK PROPOSED LT; REMOVE AND RELAY 4' RCP (CL III)(24 IN) AND ADD CH-PW-0 (DIA=42 IN)(2:1) RT.									1										
78+00	6' x 6' X 42' BOX CULVERT W/ FW NON SKEWED	REMOVE FW-N, EXTEND 6' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT) LT; REMOVE FW-N, EXTEND 3' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT) RT.																			
109+00	24" X 44' RCP	NO STRUCTURE WORK																			
125+58	10' X 6' X 37' BOX CULVERT w/ FW 45°SKEWED	REMOVE FW-N, EXTEND 16' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT)(2:1), ADD CEM STAB BACKFILL LT; REMOVE FW-N, EXTEND 8' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT)(2:1), ADD CEM STAB BFKL & RIPRAP (STONE COMMON) (DRY)(18 IN) RT.																			
140+00	18" X 52' RCP	ADD SET(TY II)(18 IN)(RCP)(4:1)(C) LT; NO WORK PROPOSED RT.																			
147+50	7' X 4' X 45' BOX W/HDWL & WINGS AT 30° LFS	NO STRUCTURE WORK, INSTALL MBGF LT; INSTALL MBGF RT																			
155+71	18" X 50' RCP @ 30° RFS W/SET (TY II)	NO STRUCTURE WORK																			
160+42	18" X 55' RCP ON 30° SKEW	ADD CEM STAB BKFL & RIPRAP (STONE)(COMMON DRY)(18 IN), INSTALL SET (TY II)(18 IN)(RCP)(4:1)(C) LT; INSTALL SET (TY II)(18 IN)(RCP)(4:1)(C) RT																			
183+35	30" X 54' RCP W/SET (TY II)	NO STRUCTURE WORK																			
202+40	5' X 3' X 42' CONC BOX	REMOVE FW-N, EXTEND 7' (SCC-5) & ADD WINGWALL (FW - 0)(HW=5 FT)(2:1), ADD CEM STAB BFKL LT; REMOVE FW-N, EXTEND 5' (SCC-5) & ADD WINGWALL (FW - 0)(HW=5 FT)(2:1), ADD CEM STAB BFKL & RIPRAP (STONECOMMON)(DRY) (18 IN) RT.																			
232+00	(2) 30" X 50' RCP CL III	NO STRUCTURE WORK; CLEAN CULVERT																			
239+00	18" X 58' RCP W/SET	NO STRUCTURE WORK LT; REMOVE EXIST SET, ADD SET (TY II) (18") (4:1) (C) RT.																			
248+00	9' X 7' X 37' CONC BOX W/ FW	REMOVE FW EXTEND 10' (CRR-9) AND INSTALL WINGWALL (PW-2)(HW=9 FT), ADD CEM STAB BKFL & RIPRAP(STONE COMMON)(DRY)(18 IN) LT; REMOVE FW EXTEND 7' (CRR-9) AND INSTALL WINGWALL (PW-2)(HW=9 FT), ADD CEM STAB BKFL & RIPRAP(STONE COMMON)(DRY)(18 IN) RT.																			
258+00	18" X 57' RCP (15° RFS)	ADD SET (TY II)(18")(4:1)(C) LT; REM JT, EXT W/BEND JT, ADD SET(TY II)(18")(6:1)(C) RT																			
CSJ: 2891-01-018 SHEET TOTAL:			0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

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QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 47 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		53

SUMMARY OF CROSS CULVERTS (CONTINUED)

LOCATION	DESCRIPTION		ITEM NO.	466																	
			BID ITEM	6097	6101	6102	6103	6104	6105	6106	6107	6135	6136	6138	6139	6140	6007	6009	6010	6011	6037	6039
				HEADWALL																		
				(CH-PW-0)								(CH-PW-S)					(CH-FW-0)				(CH-FW-30)	
				(DIA= 24 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 54 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 30 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 30 IN)	(DIA= 36 IN)
STATION	EXISTING	PROPOSED		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ: 2891-01-018 (FM 2864)																						
265+73	18" X 66' RCP	REMOVE 18" X 8' RCP & REPLACE W/4' RCP (CL III)(18 IN), ADD CH-PW-0(DIA=24 IN)(2:1) LT; REMOVE 18" X 4' RCP & REPLACE W/4' RCP (CL III)(18 IN), ADD SET (TY II)(18")(4:1) & CEM STAB BKFL RT.		1																		
284+53	18" X 55' RCP	ADD SET(TY II)(18")(RCP)(4:1)(C) LT; ADD SET(TY II)(18")(RCP)(4:1)(C) RT																				
316+45	2-42" X 54' RCP W/SET & PIPE	NO STRUCTURE WORK LT; ADD CEM STAB BKFL & RIPRAP(STONE																				
323+67	24" X 52' RCP W/SET	NO STRUCTURE WORK																				
342+36	18" X 74' RCP W/SET	NO STRUCTURE WORK																				
		CSJ: 2891-01-018 SHEET TOTAL:		**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		CSJ: 2891-01-018 TOTAL:		**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CSJ: 3220-01-013 (FM 3152)																						
4+25	24" X 46' RCP	ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT																				
25+48	48" X 96' RCP ON A SKEW	REMOVE 8' RC PIPE, ADD CH-PW-S (DIA=72 IN) (2:1) LT; INSTALL MBGF, ADD CH-PW-S (DIA=48 IN)(2:1), ADD CEM STABIL BKFL AND RIPRAP (STONE COMMON)(DRY)(18 IN) RT.										1			1							
30+10	36" X 54' RCP	ADD CH-PW-S (48 IN) (2:1), ADD CEM STAB BKFL & RIPRAP (STONE COMMON) (DRY) (18 IN) LT; REMOVE 4' RC PIPE (CL III) (36 IN) ADD REPLACE W/6' RC PIPE (CL III)(36 IN), ADD CH-PW-S (48 IN) (2:1) RT										2										
45+00	24" X 74' RCP	REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/4' RC PIPE (CL III)(24 IN), ADD CH-PW-0 (DIA=54 IN)(2:1) LT; REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/4' RC PIPE (CL III)(24 IN), ADD CH-PW-0 (DIA=60 IN)(2:1) RT.						1	1													
56+90	36" X 72' RCP 30 °RT FWD SKEW	REMOVE 4' RC PIPE (CL III)(36 IN) AND REPLACE W/ 8' RC PIPE (CL III)(36 IN), ADD CONC COLLAR & ADD CH-FW-30 (DIA=36 IN)(2:1) LT; REMOVE 10' RC PIPE, ADD CH-PW-S (DIA=48 IN)(2:1) RT										1										1
61+82	42" X 82' RCP	REMOVE 6' RC PIPE (CL III)(42 IN) & REPLACE W/6' RC PIPE (CL III)(42 IN), ADD CH-PW-0 (DIA=48 IN)(2:1) LT; REMOVE 6' RC PIPE (CL III)(42 IN) & REPLACE W/6' RC PIPE (CL III)(42 IN), ADD TEMP SPL SHORING, ADD RIPRAP (CONC)(5"), ADD CH-PW-0 (DIA=48 IN)(2:1) RT.					1			1												
71+00	24" X 46' RCP	REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT.																				
		CSJ: 3220-01-013 SHEET TOTAL:		**0**	**0**	**0**	**1**	**1**	**1**	**0**	**1**	**0**	**4**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY. THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7151A46...
3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 48 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		54

SUMMARY OF CROSS CULVERTS (CONTINUED)

LOCATION	DESCRIPTION		ITEM NO.	466																	
			BID ITEM	6097	6101	6102	6103	6104	6105	6106	6107	6135	6136	6138	6139	6140	6007	6009	6010	6011	6037	6039
				HEADWALL																		
				(CH-PW-0)								(CH-PW-S)					(CH-FW-0)				(CH-FW-30)	
				(DIA= 24 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 54 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 60 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 30 IN)	(DIA= 36 IN)	(DIA= 42 IN)	(DIA= 48 IN)	(DIA= 30 IN)	(DIA= 36 IN)
STATION	EXISTING	PROPOSED		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ: 3220-01-013 (FM 3152)																						
92+75	24" X 50' RCP	ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT																				
107+34	42" X 76' RCP	REMOVE AND REPLACE EXIST MBGF LT; REMOVE DISJOINTED 6' RCP JOINT, ADD CH-PW-0 (DIA=42 IN)(2:1), RIPRAP(STONE COMMON) (DRY) (18IN) REMOVE AND REPLACE EXIST MBGF RT.				1																
117+95	24" X 48' RCP	ADD SET TY(II)(24 IN)(RCP)(4:1)(C) LT; REMOVE 4' RC PIPE AND EXTEND W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II) (24 IN) (RCP) (4:1) (C) RT.																				
125+86	30" X 84' RCP ON 30°RT FWD SKEW	REMOVE & REPLACE W/4' RC PIPE (CL III) (30 IN) & ADD CH-FW-S (DIA=30 IN) (2:1) LT; REMOVE AND REPLACE EXIST MBGF, REMOVE 8' RC PIPE, INSTALL CH-PW-S (DIA=72 IN) (2:1) & ADD RIPRAP (STONE COMMON)(DRY)(18IN) RT.														1					1	
143+51	36" X 94' RCP ON 30°LT FWD SKEW	REMOVE AND REPLACE W/4' RC PIPE (CL III) (36 IN), REMOVE SET TY(II)(36")(4:1) AND REPLACE W/CH-PW-S (DIA=66 IN)(2:1) LT; REMOVE AND REPLACE W/4' RC PIPE (CL III)(36 IN) & ADD CH-PW-S (DIA=42 IN)(2:1) RT									1			1								
182+07	30" x 52' RCP	REMOVE 18' RC PIPE (CLASS III)(30 IN) & REPLACE W/18' RC PIPE (CLASS III)(30 IN), ADD CONC COLLAR, REMOVE SET (TY II) (30 IN)(RCP) (3:1) (C) & INSTALL SET (TY II) (30 IN) (RCP) (4:1) (C) LT; NO WORK PROPOSED RT.																				
205+00	24" X 48' RCP	NO WORK PROPOSED																				
220+17	30" X 54' RCP	NO WORK PROPOSED																				
235+30	18" X 81' RCP	NO PROPOSED WORK LT; GRADE FRONT SLOPE RT.																				
257+00	24" X 48' RCP	NO WORK PROPOSED																				
268+05	24" X 54' RCP	NO WORK PROPOSED																				
276+75	CULVERT HAS BEEN REMOVED																					
290+25	24" X 48' RCP	NO WORK PROPOSED																				
316+40	42" X 80' RCP	REMOVE AND REPLACE EXIST MBGF LT; REMOVE AND REPLACE EXIST MBGF, ADD RIPRAP (STONE COMMON)(DRY)(18 IN) & CEM STAB BFKL RT.																				
323+06	21" X 50' RCP	NO WORK PROPOSED																				
332+10	18" X 41' RCP	NO WORK PROPOSED																				
352+65	24" X 40' RCP	NO WORK PROPOSED																				
		CSJ: 3220-01-013 SHEET TOTAL:		**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**0**
		CSJ: 3220-01-013 TOTAL:		**0**	**0**	**1**	**1**	**1**	**1**	**0**	**1**	**1**	**4**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**1**	**1**
		PROJECT TOTALS:		**1**	**1**	**1**	**3**	**1**	**1**	**2**	**2**	**2**	**4**	**1**	**1**	**2**	**1**	**3**	**2**	**1**	**1**	**1**

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3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 49 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		55

SUMMARY OF CROSS CULVERTS (CONTINUED)

ITEM NO.			466								467					480
BID ITEM			6152	6153	6155	6156	6195	6197	6198	6185	6358	6390	6419	6362	6394	6001
LOCATION	DESCRIPTION		WINGWALL								SET (TY II) (RCP) (4:1)(C)			SET (TY II) (RCP) (6:1) (C)		CLEAN EXIST CULVERTS
			(FW-0)				(PW-2)									
			(HW=5 FT)	(HW=6 FT)	(HW=8 FT)	(HW=9 FT)	(HW=6 FT)	(HW=8 FT)	(HW=9 FT)	(HW=10 FT)	(18 IN)	(24 IN)	(30 IN)	(18 IN)	(24 IN)	
STATION	EXISTING	PROPOSED	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ:0336-03-072 (SH 103)																
1616+20	24" X 104' RCP @ 30° RFS	CLEAN CULVERT & ADD SET(TY II) (24 IN) (RCP) (6:1)(C) LT; ADD SET (TY II) (24 IN)(RCP) (4:1) (C) RT										1			1	1
1640+57	2-8' X 7'X 88' MBC W/MCW-F2	CLEAN CULVERT														1
1643+47	3-36" X 70' RCP W/SET(TY C)(4:1)	REMOVE EXIST RIPRAP SET, EXTEND W/3-36" X 4' RC PIPE (CL III)(36 IN), ADD CH-FW-0 (DIA=36 IN)(2:1)C) & ADD RIPRAP (STONE COMMON) (DRY) (18 IN) LT; REMOVE EXIST RIPRAP SET, EXTEND W/3-36" X 4' RC PIPE (CL III)(36 IN) & ADD CH-FW-0 (DIA=36 IN)(2:1) RT														
1656+69	30" X 68' RCP W/SET (TY C)(3:1)	REMOVE EXIST SET, EXTEND W/30" X 6' RC PIPE (CL III)(30 IN) & ADD CH-PW-0(DIA=48 IN)(2:1) LT;														
1671+00	24" X 80' RCP W/SET (TY C)(3:1)	REMOVE EXIST SET (TY C)(3:1)& 4' RC PIPE (CL III)(24 IN), EXTEND W/6' RC PIPE (CL III)(24 IN) & ADD SET (TY II) (24 IN) (RCP)(4:1)(C) LT; REMOVE EXIST SET (TY C)(3:1) & ADD CH-PW-0(DIA=48 IN)(2:1), ADD RIPRAP (STONE COMMON)(DRY)(12 IN) RT.										1				
1677+39	36" X 60' RCP W/SET (TY C) & (WS-P-N(MOD))	NO STRUCTURE WORK LT; REMOVE EXIST SET; ADD CH-PW-0(66 IN)(2:1) RT														
1700+15	8' X 8' RCP W/HDWL	NO STRUCTURE WORK														
1722+69	6'X 4' X 74' BOX W/SET	NO STRUCTURE WORK														
1729+00	24" X 64' RCP W/SET (TY C)	NO STRUCTURE WORK														
1746+39	3' X 2' BOX W/SWW	NO STRUCTURE WORK														
1792+96	30" X 136' RCP @ 45° RFS	NO STRUCTURE WORK														
1794+68	30" X 96' RCP	NO STRUCTURE WORK														
1798+78	8' X 8' RCP W/HDWL & WINGS	NO STRUCTURE WORK														
1801+29	4' X 3' BOX @ 30° RFS	NO STRUCTURE WORK														
1819+63	30" X 82' RCP W/HDWL & WINGS	REMOVE EXIST WINGWALL & 20' RC PIPE (CL III) (30 IN), ADD SPECIAL SHORING & TRENCH EXCAVATION, EXTEND W/24' RCP (CL III) (30 IN) & ADD CH-FW-0 (DIA=30 IN)(2:1) LT; NO STRUCTURE WORK RT.														
1847+32	3' X 3' X 132'	NO STRUCTURE WORK														
1858+18	9' X 9' X 77' BOX	NO STRUCTURE WORK														
1871+64	24" X 76' RCP	NO STRUCTURE WORK														
1877+35	5' X 4' BOX W/HDWL	NO STRUCTURE WORK														
		CSJ:0336-03-072 SHEET TOTAL:	0	0	0	0	0	0	0	0	0	2	0	0	1	2

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STATE OF TEXAS
ELIZABETH A. ORTEGO
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3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 50 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		56

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SUMMARY OF CROSS CULVERTS (CONTINUED)

LOCATION	DESCRIPTION		ITEM NO.	466								467					480
			BID ITEM	6152	6153	6155	6156	6195	6197	6198	6185	6358	6390	6419	6362	6394	6001
				WINGWALL								SET (TY II) (RCP) (4:1) (C)			SET (TY II) (RCP) (6:1) (C)		CLEAN EXIST CULVERT
				(FW-0)				(PW-2)									
				(HW=5 FT)	(HW=6 FT)	(HW=8 FT)	(HW=9 FT)	(HW=6 FT)	(HW=8 FT)	(HW=9 FT)	(HW=10 FT)	(18 IN)	(24 IN)	(30 IN)	(18 IN)	(24 IN)	
STATION	EXISTING	PROPOSED		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ:0336-03-072 (SH 103)																	
1893+98	36" X 88' RCP	REMOVE EXIST SET; REMOVE & REPLACE 4' RCP (CL III) (36 IN), ADD CH-PW-0 (DIA=36 IN)(2:1) & RIPRAP (STONE COMMON)(DRY)(18 IN) LT; EXT 4' RCP (CL III)(36 IN) & ADD CH-PW-0(DIA=72 IN) (2:1), ADD RIPRAP (STONE COMMON)(DRY) (18 IN) RT															
1906+12	36" X 100' RCP @ 15° RFS	NO STRUCTURE WORK															
1920+05	7' X 7' X 90' BOX W/FW-15 WINGS @ 15° RFS	NO STRUCTURE WORK															
1921+83	36" X 94' RCP W/CH-6-B HDWLS	NO STRUCTURE WORK LT; REMOVE EXIST HDWL & WINGS, REMOVE AND REPLACE W/4' RC PIPE (CL III)(36 IN) AND ADD CH-PW-0 (DIA=66 IN)(2:1) RT. CLEAN CULVERT															1
1934+00	3' X 3' X 80' BOX W/SET(TY C) (PIPE RUNNERS)	NO STRUCTURE WORK HOLE ADJACENT TO LT SET TO BE FILLED W/RIPRAP (STONE COMMON)(DRY)(24 IN); HOLE ON RT TO BE FILLED W/RIPRAP (STONE COMMON)(DRY)(24 IN).															
1966+00	6' X 4' X 71' BOX W/HDWL & WINGS	NO STRUCTURE WORK															
2024+58	3' X 3' X 106' BOX	NO STRUCTURE WORK															
2030+00	30" X 68' RCP W/SET (TY C)	REMOVE EXIST SET (TY C), EXTEND W/30" X 6' RC PIPE (CL III)(30 IN), CONC COLLAR & SET (TY II) (30 IN) (RCP) (4:1) ,ADD RIPRAP (STONE COMMON)(DRY)(18 IN) LT; NO STRUCTURE WORK RT.												1			
2044+53	30" X 109' RCP W/CH-6B HDWLS & WINGS	NO STRUCTURE WORK															
2049+20.5	24" X 112' RCP W/CH-11 B-15° HDWL & WINGS @ 15° RFS	NO STRUCTURE WORK															
2070+20	2-24" X 62' RCP W/SET(TY C) (24") (4:1)	NO STRUCTURE WORK															
2098+18	4-5' X 5' X 94' BOX W/MCW-P	NO STRUCTURE WORK															
2102+65	36" X 84' RCP	NO STRUCTURE WORK															
2110+16	4' X 4' X 96' BOX @ 30° LFS	NO STRUCTURE WORK															
2123+88	3' X 3' X 85' BOX	NO STRUCTURE WORK															
2144+62	3-10' X 12' X 85'	NO STRUCTURE WORK															
2154+50.50	8' X 4' X 136' BOX @ 45° RFS	NO STRUCTURE WORK															
2164+90	30" X 90' RCP	NO STRUCTURE WORK															
2188+00	24" X 126' RCP @ 45° RFS	NO STRUCTURE WORK															
		CSJ:0336-03-072 SHEET TOTAL:		0	0	0	0	0	0	0	0	0	0	1	0	0	1

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ELIZABETH A. ORTEGO
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3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 51 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		57

SUMMARY OF CROSS CULVERTS (CONTINUED)

ITEM NO.			466								467					480
BID ITEM			6152	6153	6155	6156	6195	6197	6198	6185	6358	6390	6419	6362	6394	6001
LOCATION	DESCRIPTION		WINGWALL (FW-0) (HW=5 FT)	WINGWALL (FW-0) (HW=6 FT)	WINGWALL (FW-0) (HW=8 FT)	WINGWALL (FW-0) (HW=9 FT)	WINGWALL (PW-2) (HW=6 FT)	WINGWALL (PW-2) (HW=8 FT)	WINGWALL (PW-2) (HW=9 FT)	WINGWALL (PW-2) (HW=10 FT)	SET (TY II) (RCP) (4:1)(C) (18 IN)	SET (TY II) (RCP) (4:1)(C) (24 IN)	SET (TY II) (RCP) (4:1)(C) (30 IN)	SET (TY II) (RCP) (6:1) (C) (18 IN)	SET (TY II) (RCP) (6:1) (C) (24 IN)	CLEAN EXIST CULVERT
STATION	EXISTING	PROPOSED	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ:0336-03-072 (SH 103)																
2194+90	3′ X 3′ X 90′ BOX	NO STRUCTURE WORK RT; CEMENT STABILIZE TO BE ADDED AROUND SET LT.														
2208+75	5′ X 3′ X 86′ BOX	NO STRUCTURE WORK														
2213+86	6′ X 3′ X 113′ BOX @ 30° LFS	NO STRUCTURE WORK														
CSJ:0336-03-072 SHEET TOTAL:			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CSJ: 0336-03-072 TOTAL:			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**1**	**3**
CSJ:1678-02-007 (FM 2971)																
6+84	2-24" X 70′ RCP W/ CONCRETE HEADWALLS	NO WORK LT; REMOVE EXISTING HEADWALL & ADD CH-PW-S (DIA=60 IN)(2:1) RT														
21+61	30" X 42′ RCP	ADD SET (TY II)(30 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(30 IN)(RCP)(4:1)(C), ADD CEM STABIL BKFL & ADD RIPRAP (STONE COMMON)(DRY)(18 IN) RT											2			
34+40	10′ X 7′ X 39′ BOX CULVERT W/FW	REMOVE FW-0 EXTEND 7′ (SCC-10), ADD WINGWALL (PW-2)(HW=9 FT), ADD RIPRAP (STONE COMMON) (DRY)(18 IN) & CEM STAB BKFL LT; REMOVE FW-0 EXTEND 12′ (SCC-10) & ADD WINGWALL (FW-0)(HW=7 FT, 9 IN) (2:1) & ADD RIPRAP (STONE COMMON) (DRY) (18 IN) RT			1				1							
44+23	18" & 24" X 62′ RCP	REMOVE 4′ RC PIPE (24 IN) & (18 IN), ADD CEM STABIL BKFL & ROCK RIPRAP, ADD CH-FW-0 (DIA=42 IN) (2:1) (C) LT; ADD CH-FW-0 (DIA=42 IN) (2:1) (C) RT														
53+00	30" X 46′ RCP	EXTEND 4′ RC PIPE (CL III)(30 IN), ADD SET (TY II)(30 IN)(RCP)(4:1)(C) & CEM STAB BKFL LT; REMOVE AND REPLACE 6′ RC PIPE (CL III)(30 IN), ADD SET (TY II) (30 IN)(RCP)(4:1)(C) RT											2			
61+37	30" X 44′ RCP	EXTEND 6′ RC PIPE (CL III)(30 IN) & ADD CEM STABIL BKFL, ADD RIPRAP (STONE COMMON) (DRY) (18IN) & ADD CH-FW-0 (DIA=48 IN)(2:1)(C) LT; EXTEND 4′ RC PIPE (CL III) (30 IN), ADD CEM STABIL BKFL, ADD CONC COLLAR & ADD SET (TY II) (30 IN) (RCP) (4:1) (C) RT											1			
96+94	(2) 24" X 46′ RCP	EXTEND 4′ RC PIPE (CL III)(24 IN), ADD CONC COLLAR & ADD CH-FW-0 (DIA=36 IN)(2:1) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT										2				
102+90	10′ X 7′ X 39′ BOX CULVERT W/FW	REMOVE FW-0, EXTEND 8′ (SCC-10), ADD WINGWALL (PW-2)(HW=9 FT) ADD CEM STABIL BKFL & AND STONE RIPRAP LT; REMOVE FW-0, EXTEND 8′ (SCC-10) & ADD WINGWALL (FW-0)(HW=9 FT)(2:1) RT				1			1							
115+15	8′ x 4′ x 36′ BOX CULVERT W/FW	REMOVE FW-0 EXTEND 10′ (SCC-8) & ADD WINGWALL (PW-2)(HW=6 FT), ADD RIPRAP (STONE COMMON) (DRY) (18 IN) & ADD CEM STABIL BKFL LT; REMOVE FW-0 EXTEND 10′ (SCC-8), ADD WINGWALL (FW-0)(HW=6 FT)(2:1), ADD RIPRAP (STONE COMMON) (DRY)(18 IN) & ADD CEM STABIL BKFL RT		1			1									
CSJ: 1678-02-007 TOTAL:			**0**	**1**	**1**	**1**	**1**	**0**	**2**	**0**	**0**	**2**	**5**	**0**	**0**	**0**

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4/22/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 52 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		58

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SUMMARY OF CROSS CULVERTS (CONTINUED)

LOCATION	DESCRIPTION		ITEM NO.	466								467					480
			BID ITEM	6152	6153	6155	6156	6195	6197	6198	6185	6358	6390	6419	6362	6394	6001
				WINGWALL								SET (TY II) (RCP) (4:1) (C)			SET (TY II) (RCP) (6:1) (C)		CLEAN EXIST CULVERT
				(FW-0)				(PW-2)									
				(HW=5 FT)	(HW=6 FT)	(HW=8 FT)	(HW=9 FT)	(HW=6 FT)	(HW=8 FT)	(HW=9 FT)	(HW=10 FT)	(18 IN)	(24 IN)	(30 IN)	(18 IN)	(24 IN)	
STATION	EXISTING	PROPOSED		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ:2891-01-018 (FM 2864)																	
0+50	18" X 110' RCP	NO STRUCTURE WORK; CLEAN CULVERT															1
21+50	48" X 92' @ 45° LT FWD SKEW	NO STRUCTURE WORK LT; ADD EMBANKMENT RT.															
48+00	9' X 8' x 46' BOX CULVERT W/SC-15 °A AND FW-15°	REMOVE FW-15°, EXTEND 7' (SCC-9) & ADD WINGWALL (PW-2)(HW=10 FT), ADD CEM STAB BFKL & RIPRAP (STONE COMMON)(DRY) (18 IN) LT; REMOVE FW-15°, EXTEND 6' (SCC-9) & ADD WINGWALL (PW-2)(HW=10 FT), ADD CEM STAB BFKL & RIPRAP (STONE COMMON)(DRY) (18 IN) RT.									2						
74+24	24" X 70' RCP @ 30°RT FWD SKEW	NO WORK PROPOSED LT; REMOVE AND RELAY 4' RCP (CL III)(24 IN) AND ADD CH-PW-0 (DIA=42 IN)(2:1) RT.															
78+00	6' x 6' X 42' BOX CULVERT W/ FW NON SKEWED	REMOVE FW-N, EXTEND 6' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT) LT; REMOVE FW-N, EXTEND 3' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT) RT.							2								
109+00	24" X 44' RCP	NO STRUCTURE WORK															
125+58	10' X 6' X 37' BOX CULVERT w/ FW 45°SKEWED	REMOVE FW-N, EXTEND 16' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT)(2:1), ADD CEM STAB BACKFILL LT; REMOVE FW-N, EXTEND 8' (SCC-6) & ADD WINGWALL(PW-2)(HW=8FT)(2:1), ADD CEM STAB BFKL & RIPRAP (STONE COMMON) (DRY)(18 IN) RT.							2								
140+00	18" X 52' RCP	ADD SET(TY II)(18 IN)(RCP)(4:1)(C) LT; NO WORK PROPOSED RT.										1					
147+50	7' X 4' X 45' BOX W/HDWL & WINGS AT 30° LFS	NO STRUCTURE WORK, INSTALL MBGF LT; INSTALL MBGF RT															
155+71	18" X 50' RCP @ 30° RFS W/SET (TY II)	NO STRUCTURE WORK															
160+42	18" X 55' RCP ON 30° SKEW	ADD CEM STAB BKFL & RIPRAP (STONE)(COMMON DRY)(18 IN), INSTALL SET (TY II)(18 IN)(RCP)(4:1)(C) LT; INSTALL SET (TY II)(18 IN)(RCP)(4:1)(C)										2					
183+35	30" X 54' RCP W/SET (TY II)	NO STRUCTURE WORK															
202+40	5' X 3' X 42' CONC BOX	REMOVE FW-N, EXTEND 7' (SCC-5) & ADD WINGWALL (FW - 0)(HW=5 FT)(2:1), ADD CEM STAB BFKL LT; REMOVE FW-N, EXTEND 5' (SCC-5) & ADD WINGWALL (FW - 0)(HW=5 FT)(2:1), ADD CEM STAB BFKL & RIPRAP (STONECOMMON)(DRY) (18 IN) RT.		2													
232+00	(2) 30" X 50' RCP CL III	NO STRUCTURE WORK; CLEAN CULVERT															1
239+00	18" X 58' RCP W/SET	NO STRUCTURE WORK LT; REMOVE EXIST SET, ADD SET (TY II) (18") (4:1) (C) RT.										1					
248+00	9' X 7' X 37' CONC BOX W/ FW	REMOVE FW EXTEND 10' (CRR-9) AND INSTALL WINGWALL (PW-2)(HW=9 FT), ADD CEM STAB BKFL & RIPRAP(STONE COMMON)(DRY)(18 IN) LT; REMOVE FW EXTEND 7' (CRR-9) AND INSTALL WINGWALL (PW-2)(HW=9 FT), ADD CEM STAB BKFL & RIPRAP(STONE COMMON)(DRY)(18 IN) RT.								2							
258+00	18" X 57' RCP (15° RFS)	ADD SET (TY II)(18")(4:1)(C) LT; REM JT, EXT W/BEND JT, ADD SET(TY II)(18")(6:1)(C) RT										1			1		
			CSJ:2891-01-018 SHEET TOTAL:	2	0	0	0	0	4	2	2	5	0	0	1	0	2

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 5 YEAR FREQUENCY. THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7151...
3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 53 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		59

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SUMMARY OF CROSS CULVERTS (CONTINUED)

ITEM NO.			466								467					480
BID ITEM			6152	6153	6155	6156	6195	6197	6198	6185	6358	6390	6419	6362	6394	6001
LOCATION	DESCRIPTION		WINGWALL (FW-0) (HW=5 FT)	WINGWALL (FW-0) (HW=6 FT)	WINGWALL (FW-0) (HW=8 FT)	WINGWALL (FW-0) (HW=9 FT)	WINGWALL (PW-2) (HW=6 FT)	WINGWALL (PW-2) (HW=8 FT)	WINGWALL (PW-2) (HW=9 FT)	WINGWALL (PW-2) (HW=10 FT)	SET (TY II) (RCP) (4:1)(C) (18 IN)	SET (TY II) (RCP) (4:1)(C) (24 IN)	SET (TY II) (RCP) (4:1)(C) (30 IN)	SET (TY II) (RCP) (6:1) (C) (18 IN)	SET (TY II) (RCP) (6:1) (C) (24 IN)	CLEAN EXIST CULVERT
STATION	EXISTING	PROPOSED	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ: 2891-01-018 (FM 2864)																
265+73	18" X 66' RCP	REMOVE 18" X 8' RCP & REPLACE W/4' RCP (CL III)(18 IN), ADD CH-PW-0(DIA=24 IN)(2:1) LT; REMOVE 18" X 4' RCP & REPLACE W/4' RCP (CL III)(18 IN), ADD SET (TY II)(18")(4:1) & CEM STAB BKFL RT.									1					
284+53	18" X 55' RCP	ADD SET(TY II)(18")(RCP)(4:1)(C) LT; ADD SET(TY II)(18")(RCP)(4:1)(C) RT									2					
316+45	2-42" X 54' RCP W/SET & PIPE	NO STRUCTURE WORK LT; ADD CEM STAB BKFL & RIPRAP(STONE														
323+67	24" X 52' RCP W/SET	NO STRUCTURE WORK														
342+36	18" X 74' RCP W/SET	NO STRUCTURE WORK														
CSJ: 2891-01-018 SHEET TOTAL:			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**
CSJ: 2891-01-018 TOTAL:			**2**	**0**	**0**	**0**	**0**	**4**	**2**	**2**	**8**	**0**	**0**	**1**	**0**	**2**
CSJ: 3220-01-013 (FM 3152)																
4+25	24" X 46' RCP	ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT										2				
25+48	48" X 96' RCP ON A SKEW	REMOVE 8' RC PIPE, ADD CH-PW-S (DIA=72 IN) (2:1) LT; INSTALL MBGF, ADD CH-PW-S (DIA=48 IN)(2:1), ADD CEM STABIL BKFL AND RIPRAP (STONE COMMON)(DRY)(18 IN) RT.														
30+10	36" X 54' RCP	ADD CH-PW-S (48 IN) (2:1), ADD CEM STAB BKFL & RIPRAP (STONE COMMON) (DRY) (18 IN) LT; REMOVE 4' RC PIPE (CL III) (36 IN) ADD REPLACE W/6' RC PIPE (CL III)(36 IN), ADD CH-PW-S (48 IN) (2:1) RT														
45+00	24" X 74' RCP	REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/4' RC PIPE (CL III)(24 IN), ADD CH-PW-0 (DIA=54 IN)(2:1) LT; REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/4' RC PIPE (CL III)(24 IN), ADD CH-PW-0 (DIA=60 IN)(2:1) RT.														
56+90	36" X 72' RCP 30 °RT FWD SKEW	REMOVE 4' RC PIPE (CL III)(36 IN) AND REPLACE W/ 8' RC PIPE (CL III)(36 IN), ADD CONC COLLAR & ADD CH-FW-30 (DIA=36 IN)(2:1) LT; REMOVE 10' RC PIPE, ADD CH-PW-S (DIA=48 IN)(2:1) RT														
61+82	42" X 82' RCP	REMOVE 6' RC PIPE (CL III)(42 IN) & REPLACE W/6' RC PIPE (CL III)(42 IN), ADD CH-PW-0 (DIA=48 IN)(2:1) LT; REMOVE 6' RC PIPE (CL III)(42 IN) & REPLACE W/6' RC PIPE (CL III)(42 IN), ADD TEMP SPL SHORING, ADD RIPRAP (CONC)(5"), ADD CH-PW-0 (DIA=48 IN)(2:1) RT.														
71+00	24" X 46' RCP	REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT.										2				
CSJ: 3220-01-013 SHEET TOTAL:			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**

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ELIZABETH A. ORTEGO
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PROFESSIONAL ENGINEER

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Elizabeth Ortego, P.E.
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3/31/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 54 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		60

SUMMARY OF CROSS CULVERTS (CONTINUED)

LOCATION	DESCRIPTION		ITEM NO.	466								467					480
			BID ITEM	6152	6153	6155	6156	6195	6197	6198	6185	6358	6390	6419	6362	6394	6001
				WINGWALL								SET (TY II) (RCP) (4:1)(C)			SET (TY II) (RCP) (6:1) (C)		CLEAN EXIST CULVERT
				(FW-0)				(PW-2)									
				(HW=5 FT)	(HW=6 FT)	(HW=8 FT)	(HW=9 FT)	(HW=6 FT)	(HW=8 FT)	(HW=9 FT)	(HW=10 FT)	(18 IN)	(24 IN)	(30 IN)	(18 IN)	(24 IN)	
STATION	EXISTING	PROPOSED		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ: 3220-01-013 (FM 3152)																	
92+75	24" X 50' RCP	ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT; ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT											2				1
107+34	42" X 76' RCP	REMOVE AND REPLACE EXIST MBGF LT; REMOVE DISJOINTED 6' RCP JOINT, ADD CH-PW-0 (DIA=42 IN)(2:1), RIPRAP(STONE COMMON)(DRY) (18IN) REMOVE AND REPLACE EXIST															
117+95	24" X 48' RCP	ADD SET TY(II)(24 IN)(RCP)(4:1)(C) LT; REMOVE 4' RC PIPE AND EXTEND W/6' RC PIPE (CL III)(24 IN), ADD SET (TY II) (24 IN) (RCP) (4:1) (C) RT.											2				
125+86	30" X 84' RCP ON 30°RT FWD SKEW	REMOVE & REPLACE W/4' RC PIPE (CL III) (30 IN) & ADD CH-FW-S (DIA=30 IN) (2:1) LT; REMOVE AND REPLACE EXIST MBGF, REMOVE 8' RC PIPE, INSTALL CH-PW-S (DIA=72 IN) (2:1) & ADD RIPRAP (STONE COMMON)(DRY)(18IN) RT.															
143+51	36" X 94' RCP ON 30°LT FWD SKEW	REMOVE AND REPLACE W/4' RC PIPE (CL III) (36 IN), REMOVE SET TY(II)(36")(4:1) AND REPLACE W/CH-PW-S (DIA=66 IN)(2:1) LT; REMOVE AND REPLACE W/4' RC PIPE (CL III)(36 IN) & ADD CH-PW-S (DIA=42 IN)(2:1) RT															
182+07	30" x 52' RCP	REMOVE 18' RC PIPE (CLASS III)(30 IN) & REPLACE W/18' RC PIPE (CLASS III)(30 IN), ADD CONC COLLAR, REMOVE SET (TY II) (30 IN)(RCP) (3:1) (C) & INSTALL SET (TY II) (30 IN) (RCP) (4:1) (C) LT; NO WORK PROPOSED RT.												1			
205+00	24" X 48' RCP	NO WORK PROPOSED															
220+17	30" X 54' RCP	NO WORK PROPOSED															
235+30	18" X 81' RCP	NO PROPOSED WORK LT; GRADE FRONT SLOPE RT.															
257+00	24" X 48' RCP	NO WORK PROPOSED															
268+05	24" X 54' RCP	NO WORK PROPOSED															
276+75	CULVERT HAS BEEN REMOVED																
290+25	24" X 48' RCP	NO WORK PROPOSED															
316+40	42" X 80' RCP	REMOVE AND REPLACE EXIST MBGF LT; REMOVE AND REPLACE EXIST MBGF, ADD RIPRAP (STONE COMMON)(DRY)(18 IN) & CEM STAB BFKL RT.															
323+06	21" X 50' RCP	NO WORK PROPOSED															
332+10	18" X 41' RCP	NO WORK PROPOSED															
352+65	24" X 40' RCP	NO WORK PROPOSED															
		CSJ: 3220-01-013 SHEET TOTAL:		0	0	0	0	0	0	0	0	0	4	1	0	0	1
		CSJ: 3220-01-013 TOTAL:		0	0	0	0	0	0	0	0	0	8	1	0	0	1
		PROJECT TOTALS:		2	1	1	1	1	4	4	2	8	12	7	1	1	6

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STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

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1B27AAE7151146...
4/1/2022

QUANTITY SUMMARIES

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 55 OF 55

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		61

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
	S1	M2-1	JCT <AUXILIARY SIGN>	21x 15	X		TWT	1	WS	P		
		M1-6L	LOOP 287	24 x 24	X							
		M1-6S	SPUR 339	24 x 24	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).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
4-16 8-16	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		62

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LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC.#	N	W	N	W	N	W
1		223	SH 103	STA 1731+00	TL-3	BI	ASPHALT	6"	CONCRETE BARRIER	24"	32"	27′	1	1			1					
2		90	FM 2971	STA 110+00	TL-3	BI	ASPHALT	6"	RAIL TY T-2	24"	32"	27′	1				1					
3		223	FM 2864	STA 147+50	TL-3	BI	ASPHALT	6"	PERMANENT CONCRETE TRAFFIC BARRIER (F SHAPE)(TY 1)	24"	32"	31′	1				1					
												TOTALS	3									

LEGEND:
L=LOW MAINTENANCE
R=REUSABLE
S=SACRIFICIAL
N=NARROW
W=WIDE

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwyise.htm

CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072, ETC	SH103, ETC
	DIST	COUNTY	
	LFK	ANGELINA, ETC	
	FEDERAL AID PROJECT		SHEET NO.
			63

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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

SHEET 1 OF 12

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	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		64

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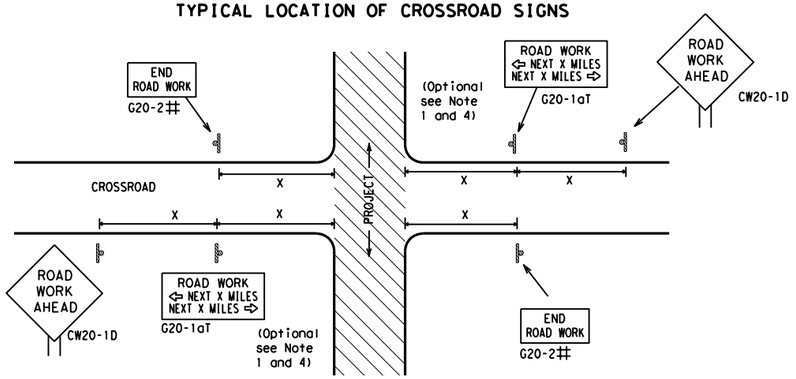
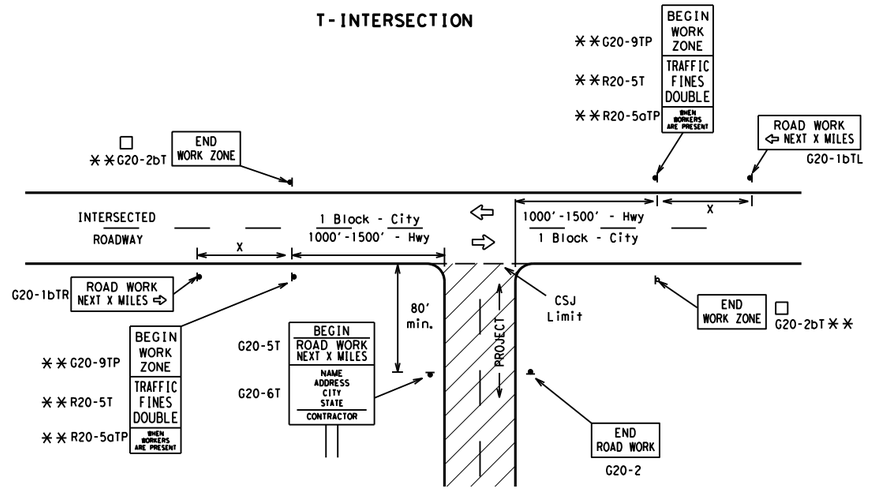
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

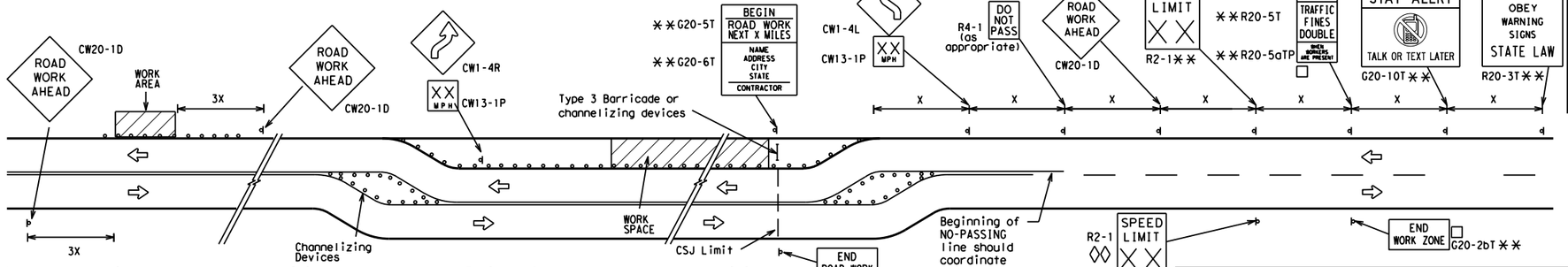
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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.

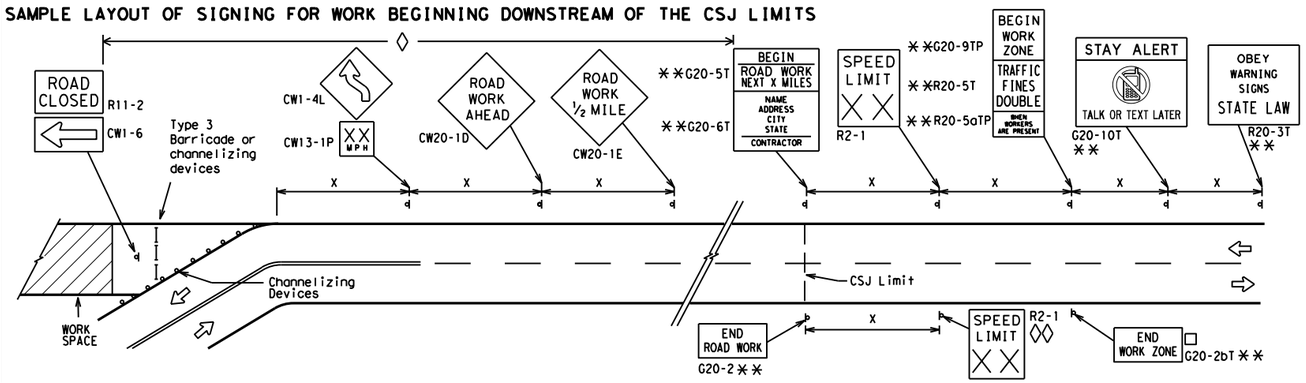
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	ANGELINA, ETC		65

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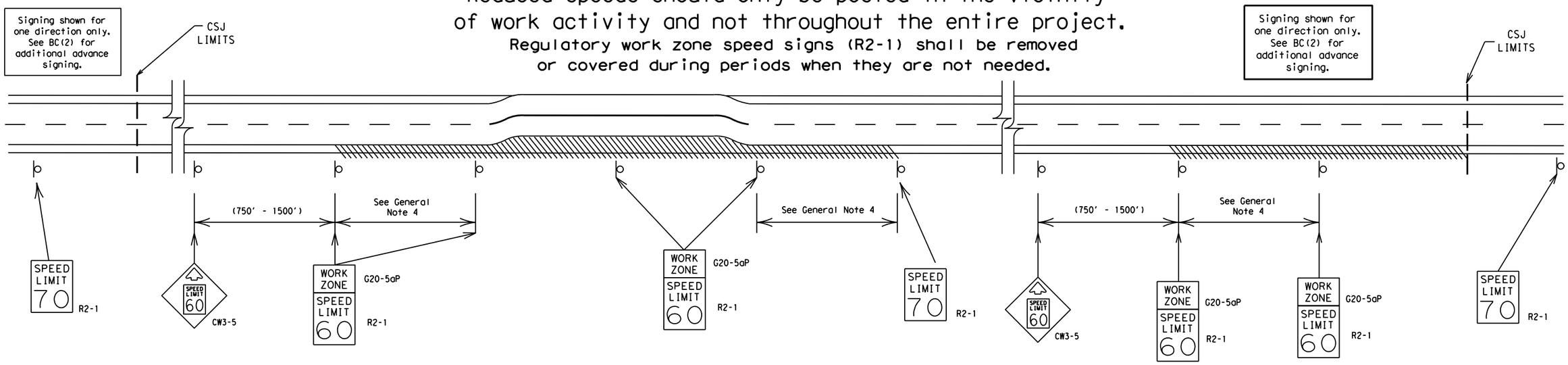
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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.

Texas Department of Transportation

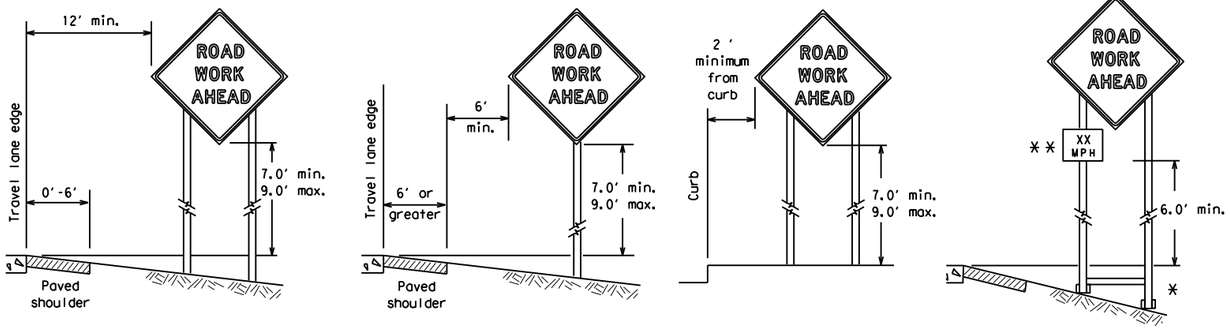
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	ANGELINA, ETC		66

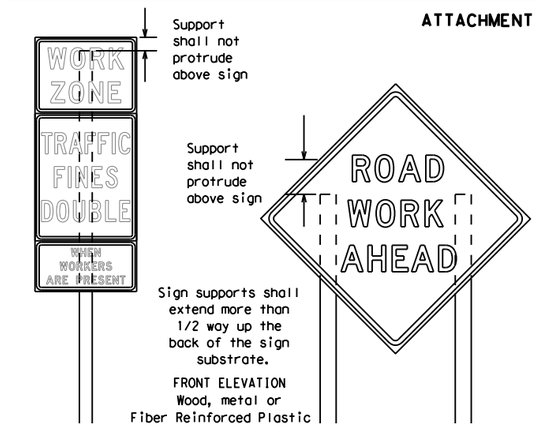
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

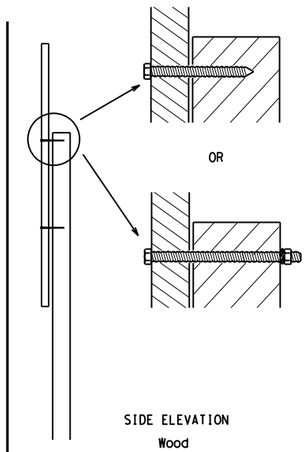


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





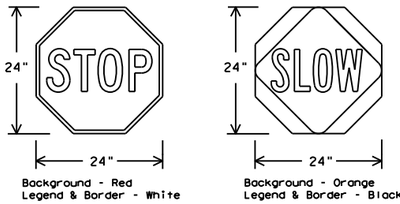
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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7-13 5-21	LFK	ANGELINA, ETC		67

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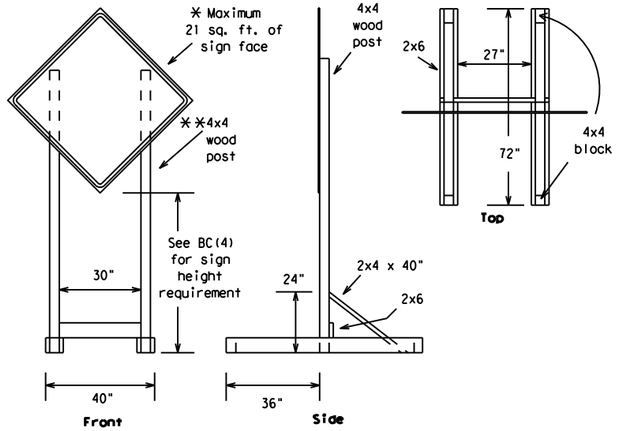
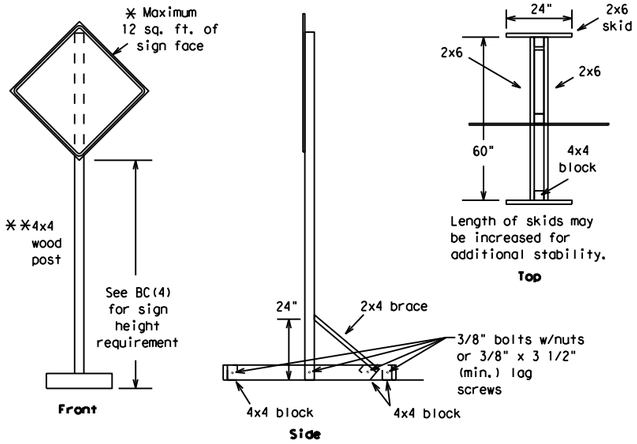
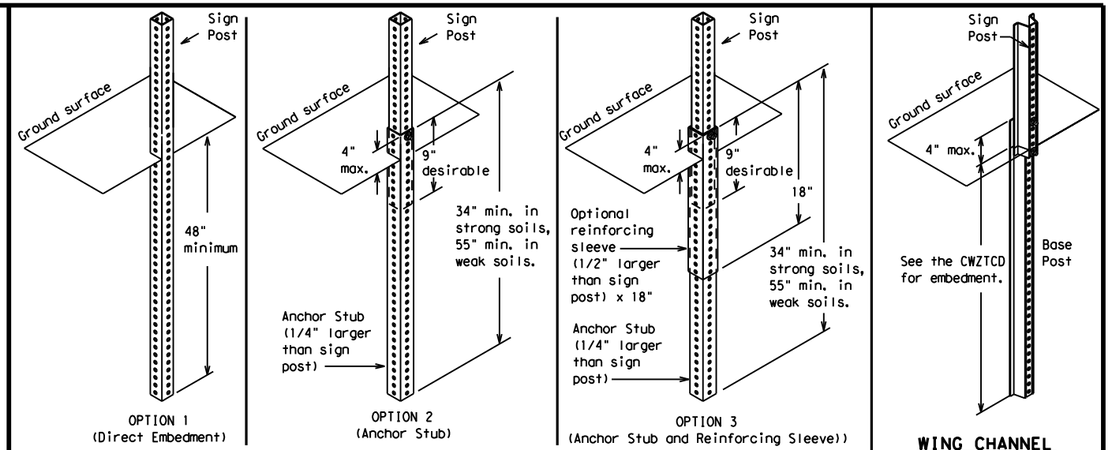




SKID MOUNTED WOOD SIGN SUPPORTS

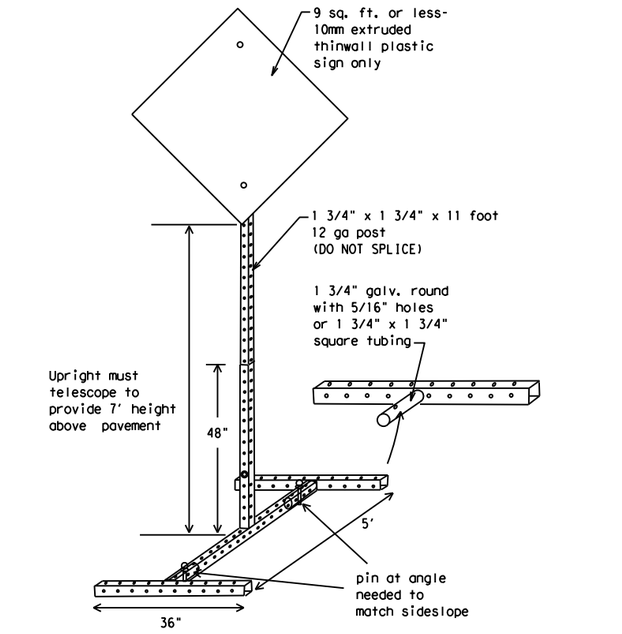
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

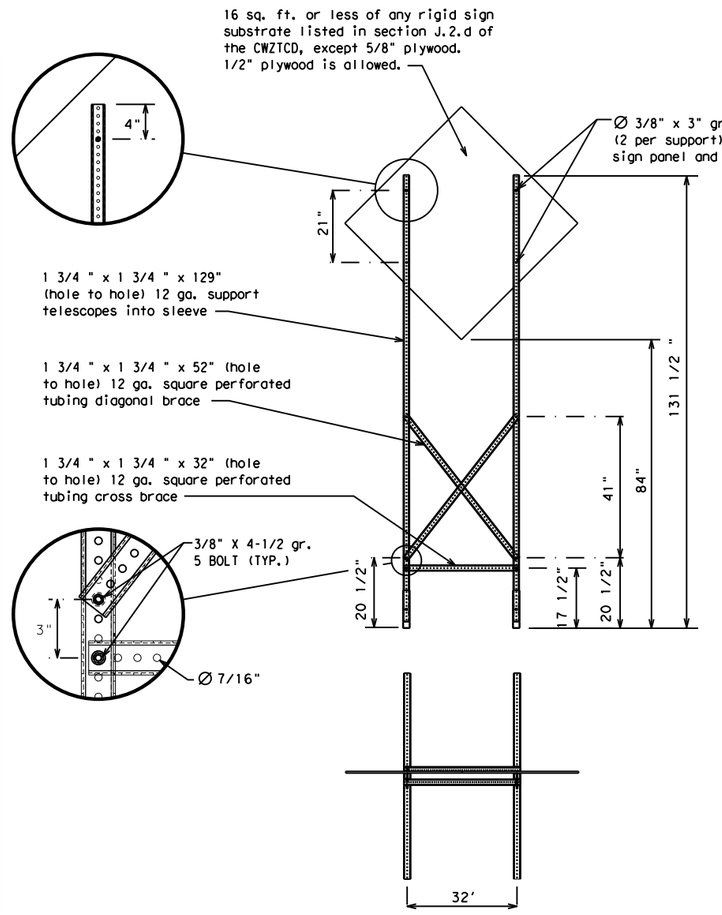


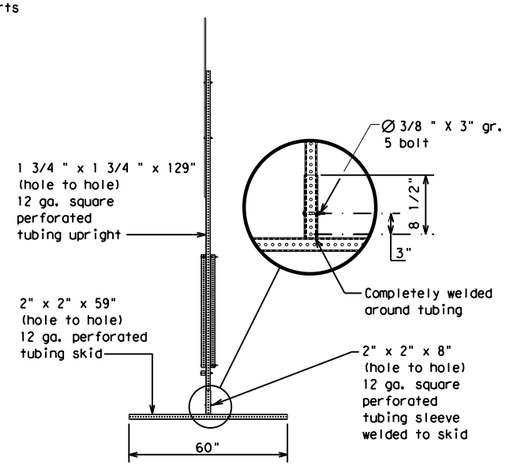
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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REVISIONS	0336	03	072, ETC	SH 103, ETC
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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS		0336	03	072, ETC	SH 103, ETC
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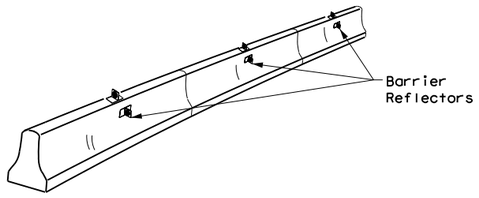
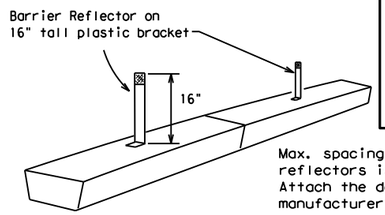
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

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

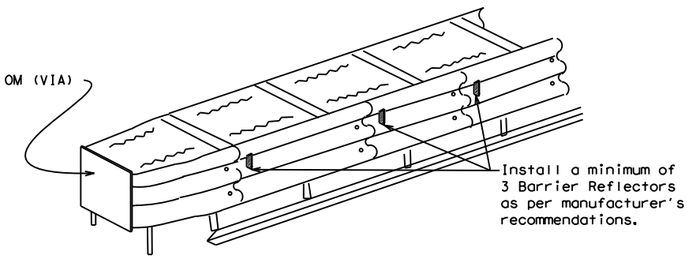


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) 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)

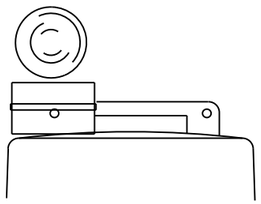


DELINEATION OF END TREATMENTS

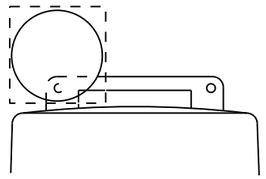
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

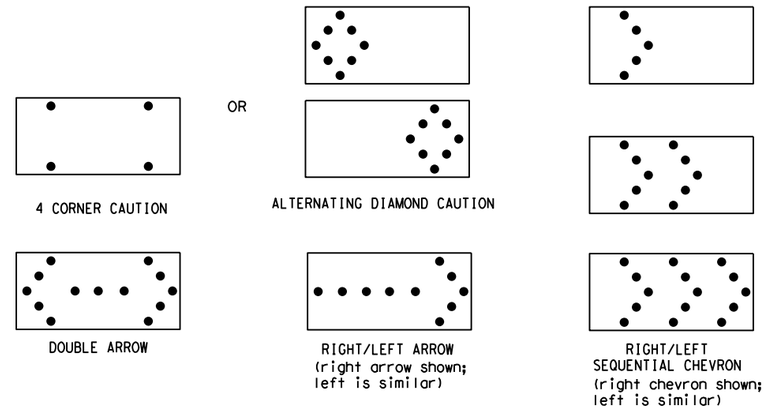
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	ANGELINA, ETC		70

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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:

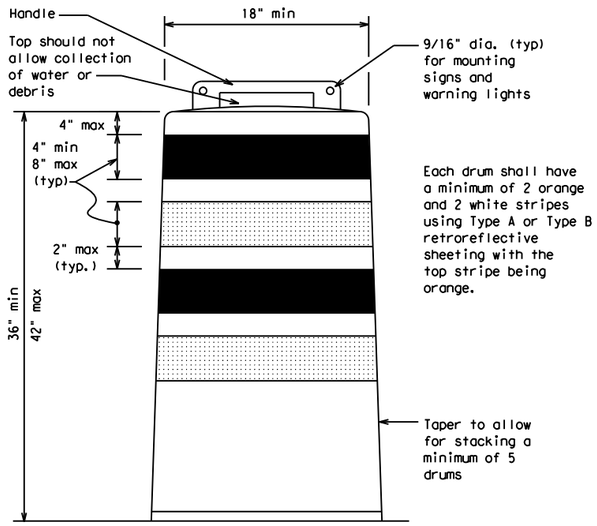
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

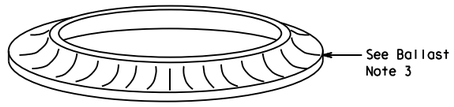
RETROREFLECTIVE SHEETING

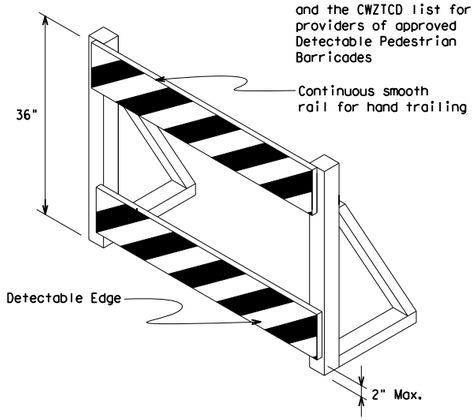
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

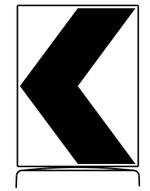




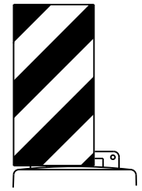


DETECTABLE PEDESTRIAN BARRICADES

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.

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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REVISIONS	0336	03	072,ETC	SH 103,ETC
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9-07 5-21	LFK	ANGELINA, ETC		71
7-13				

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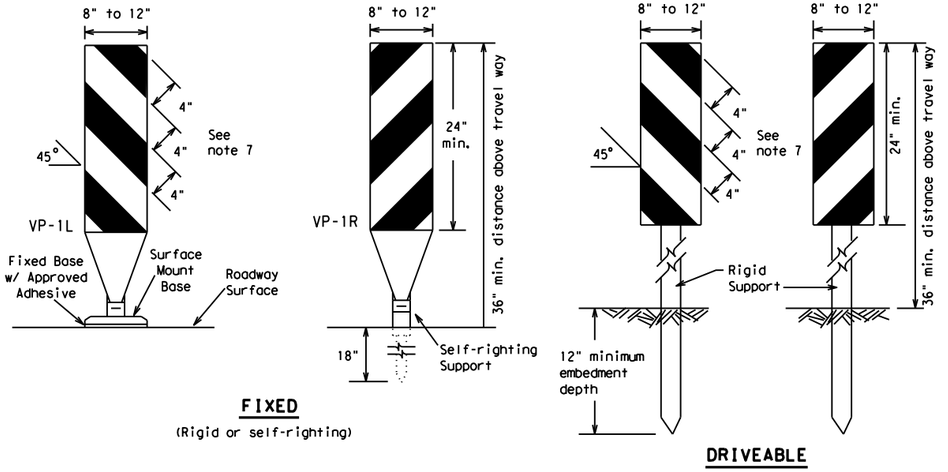
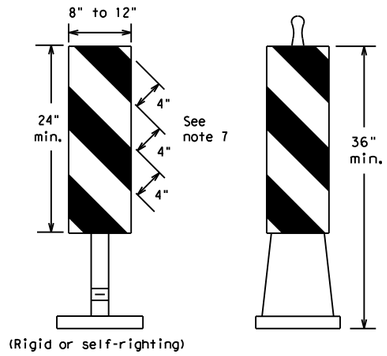


FIXED
(Rigid or self-righting)

DRIVEABLE

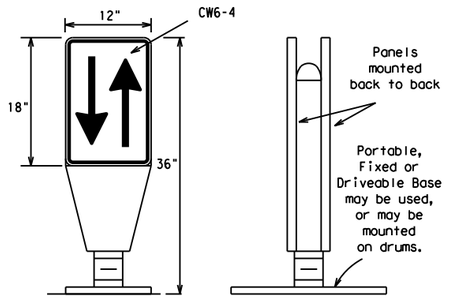


(Rigid or self-righting)

PORTABLE

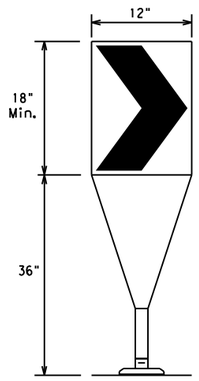
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



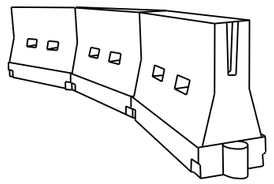
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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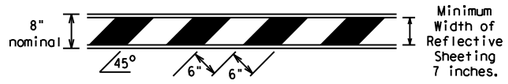
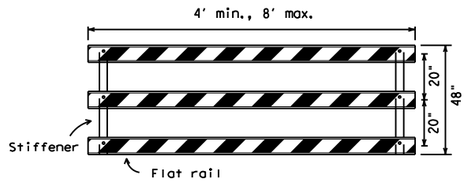
TYPE 3 BARRICADES

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.



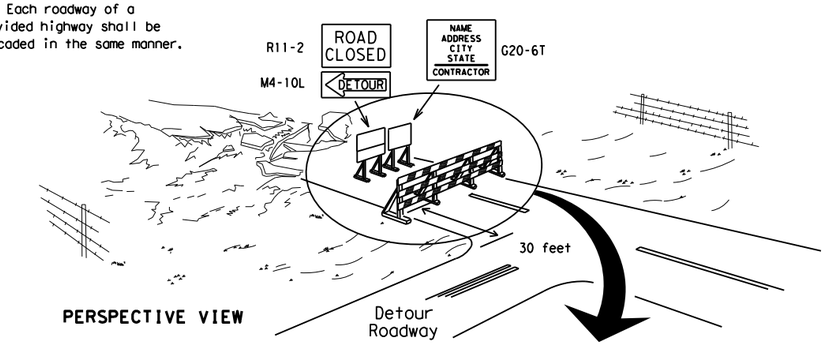
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

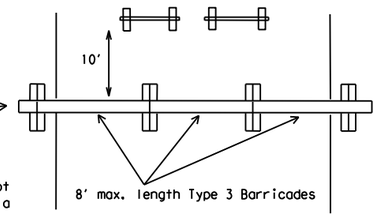
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

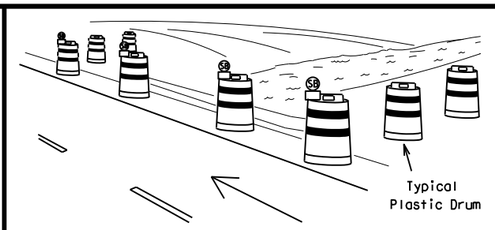
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

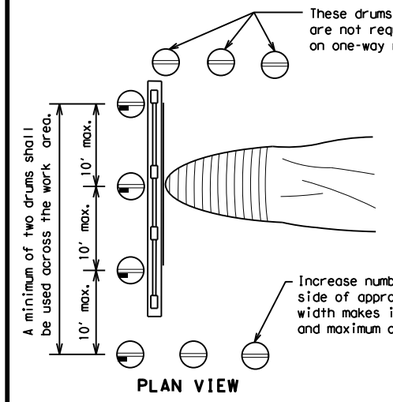
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

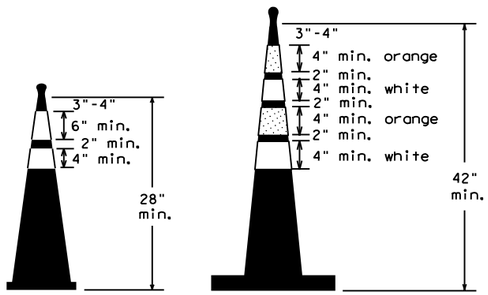
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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

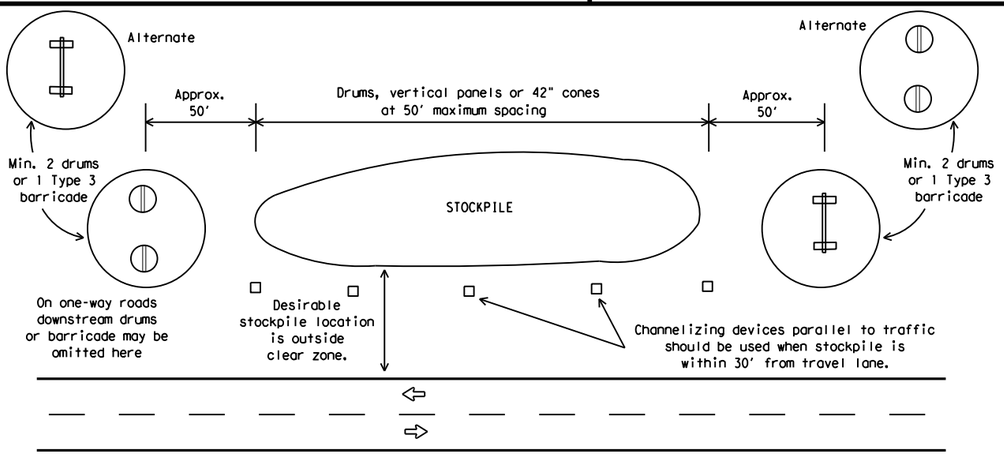
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

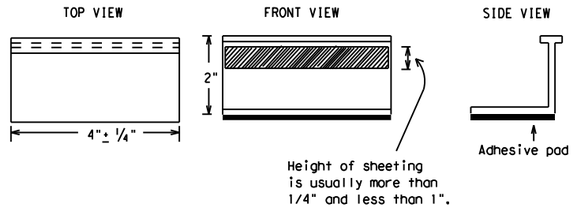
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

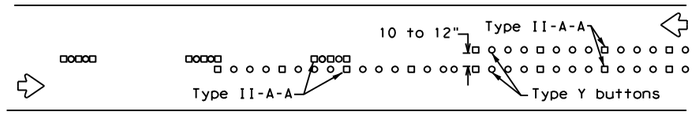
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	LFK	ANGELINA, ETC		74
11-02 8-14				

105

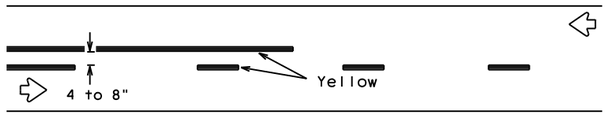
DATE: 3/30/2022 11:19:39 PM
FILE: c:\txdot\pw_online\txdot3\adrian.guerrero\d0313722\bc-21.dgn

PAVEMENT MARKING PATTERNS

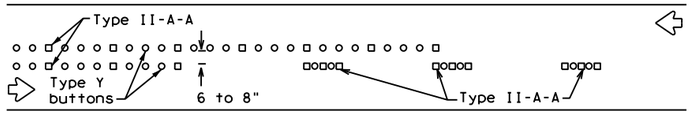
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



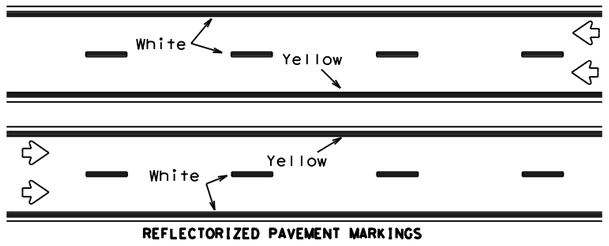
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



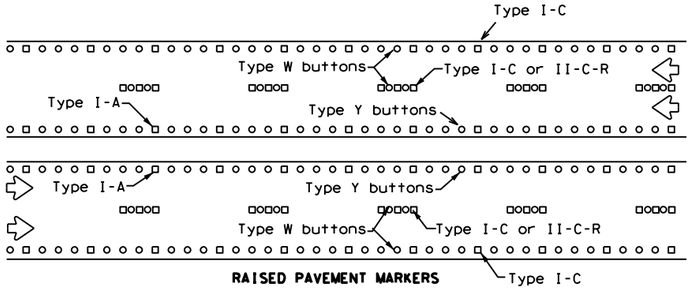
RAISED PAVEMENT MARKERS - PATTERN B

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

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



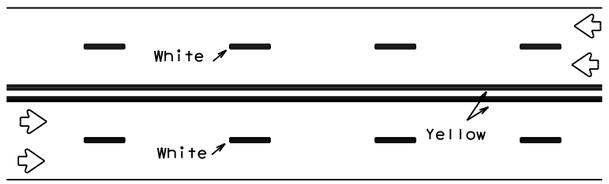
REFLECTORIZED PAVEMENT MARKINGS



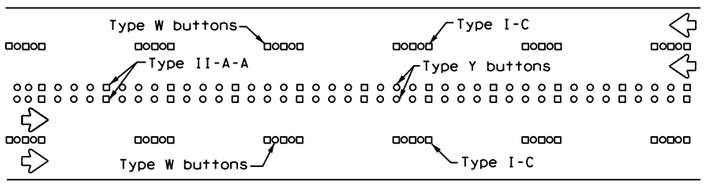
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



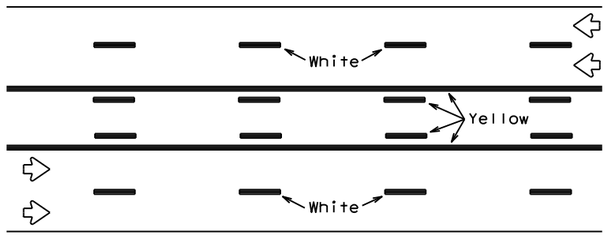
REFLECTORIZED PAVEMENT MARKINGS



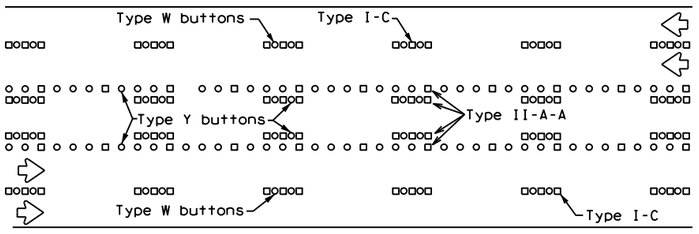
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

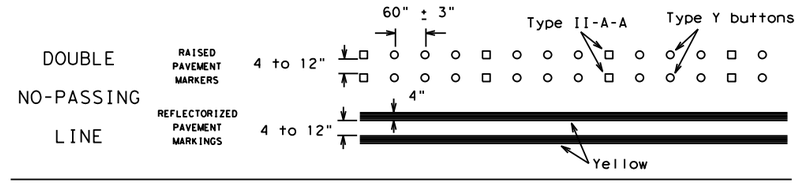
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

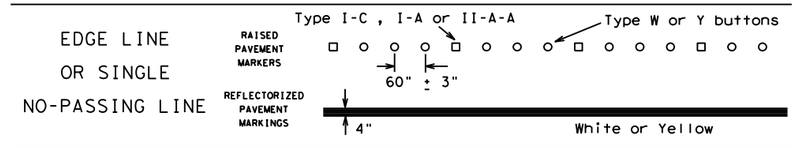
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

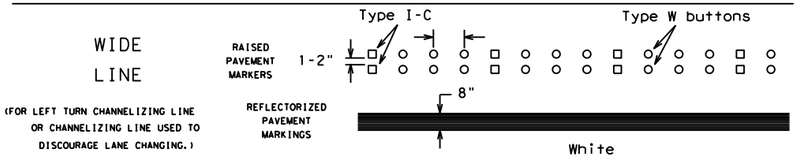


EDGE LINE OR SINGLE NO-PASSING LINE



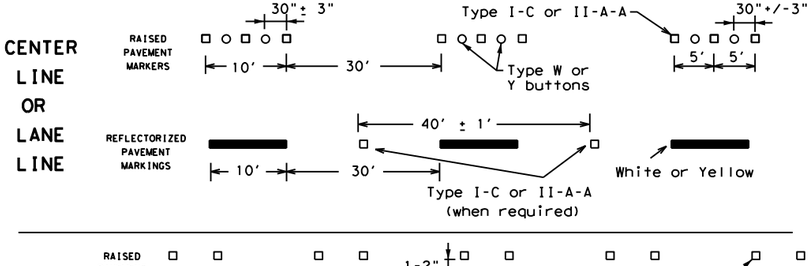
WIDE LINE

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

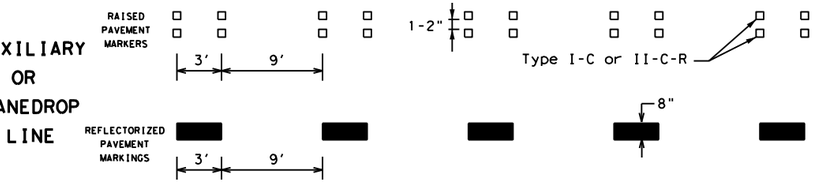


BROKEN LINES

CENTER LINE OR LANE LINE

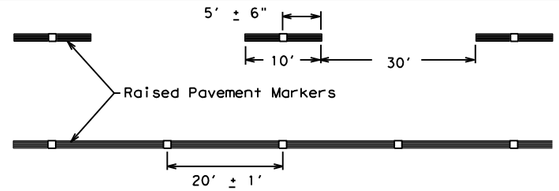


AUXILIARY OR LANEDROP LINE



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	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		75

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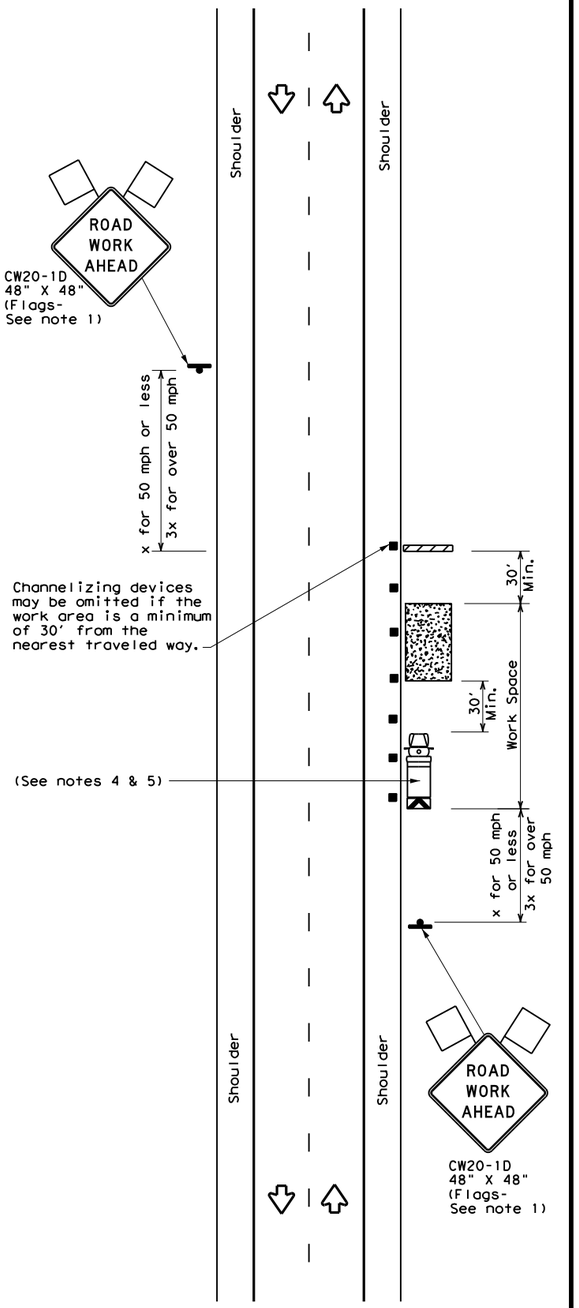
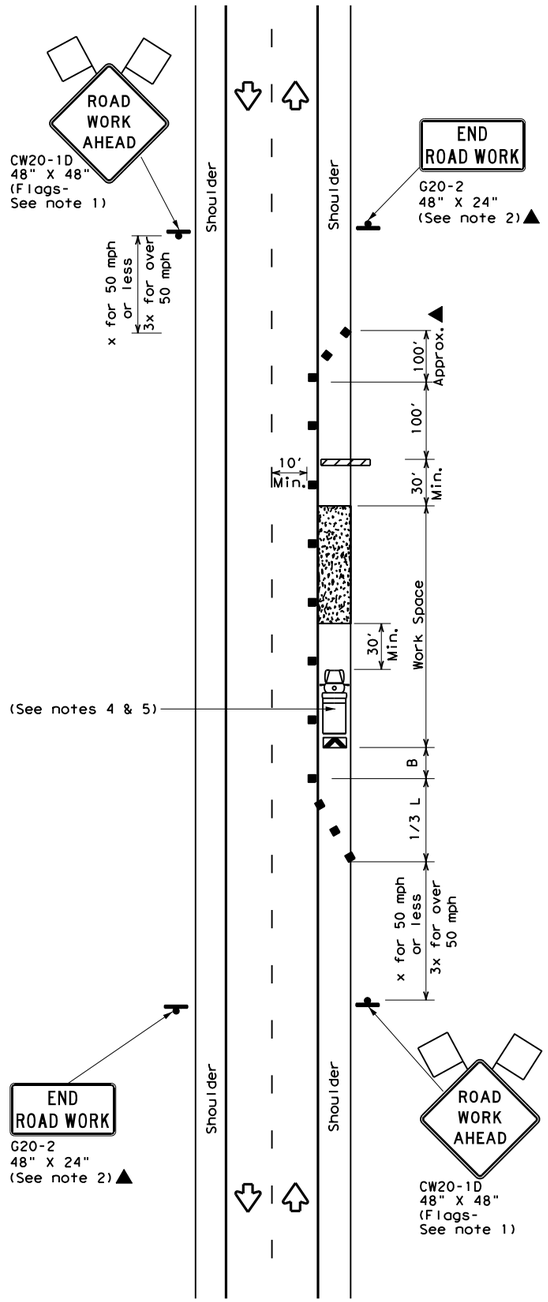


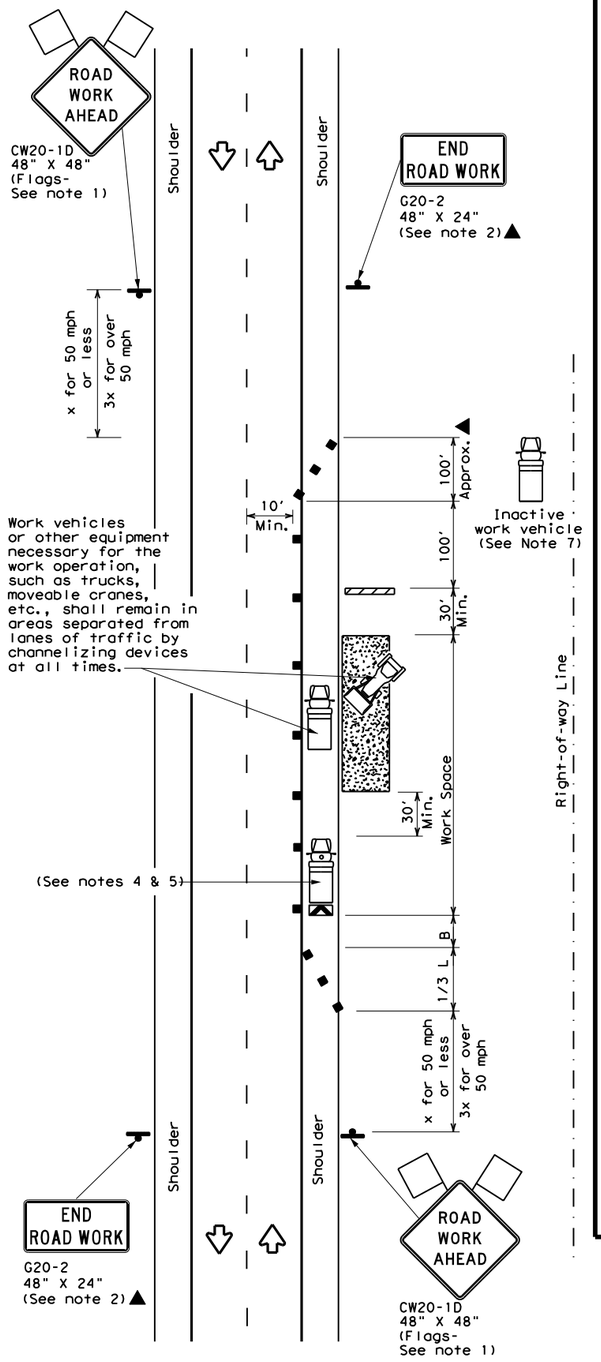
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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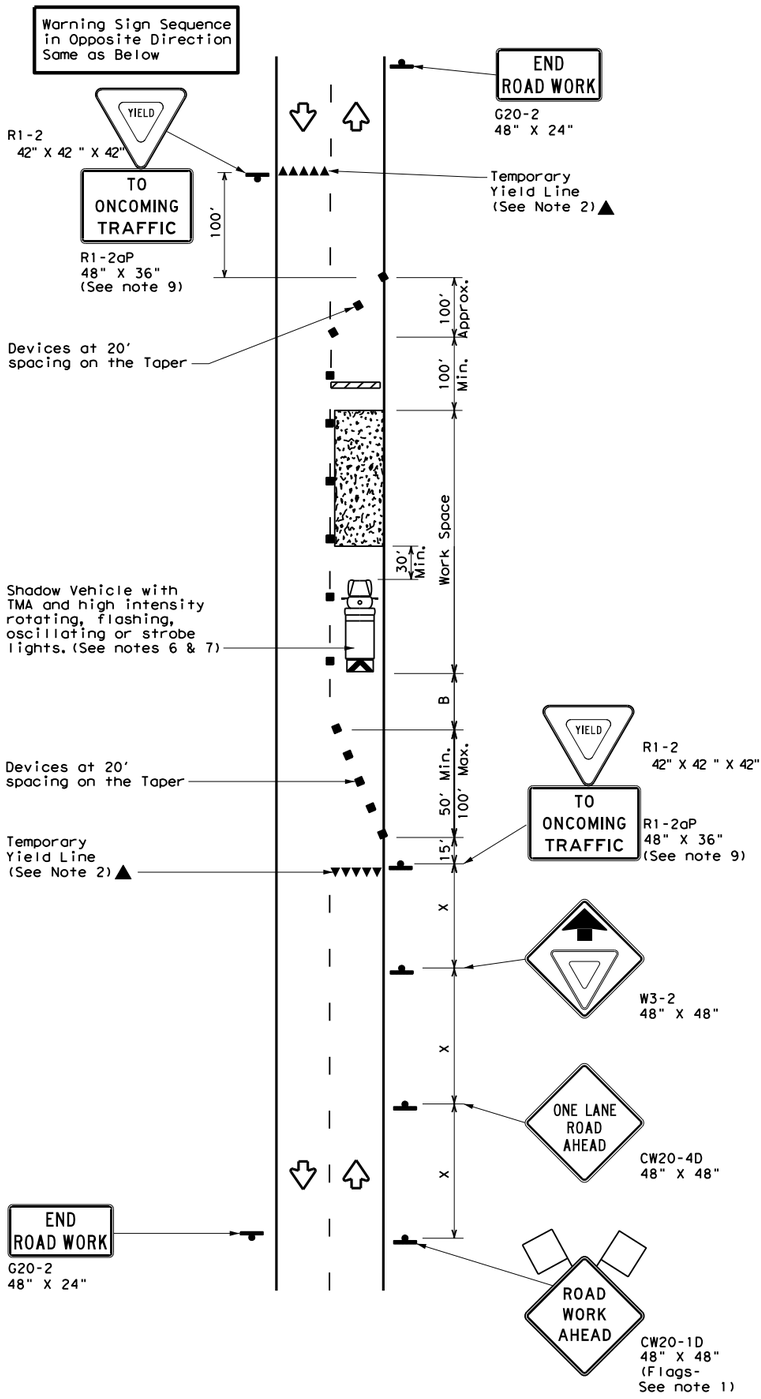
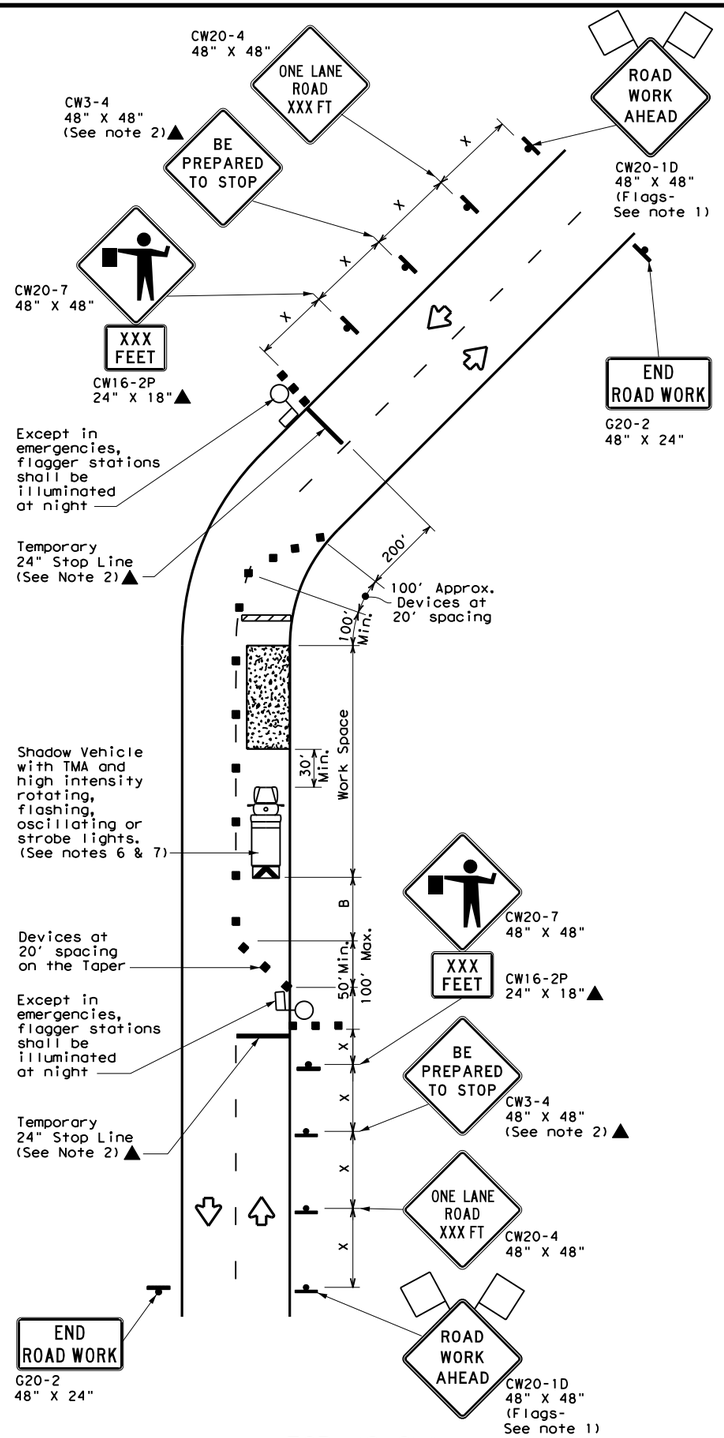
8-95 2-12	LFK	ANGELINA, ETC		76
1-97 2-18				



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
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8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	LFK	ANGELINA, ETC		77
4-98 2-18				

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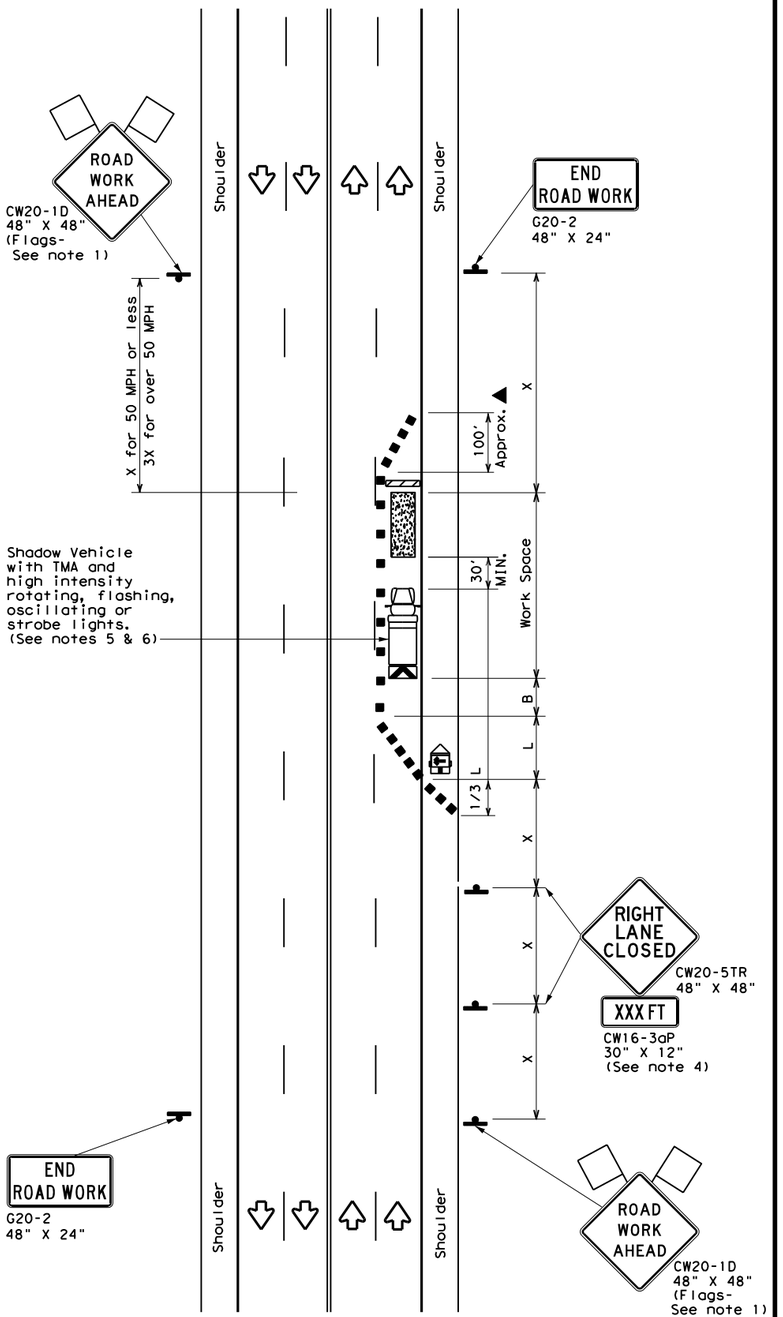
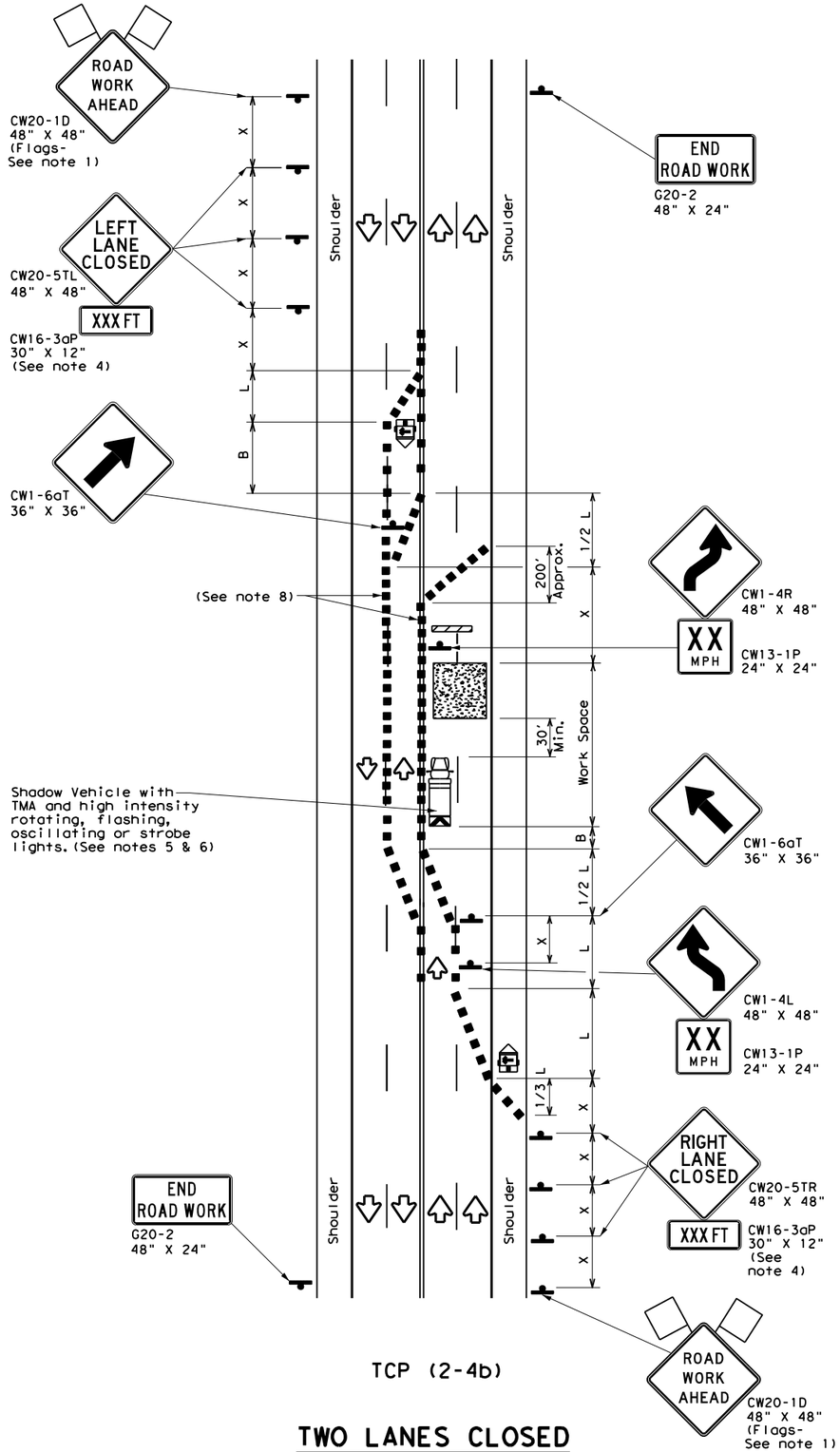


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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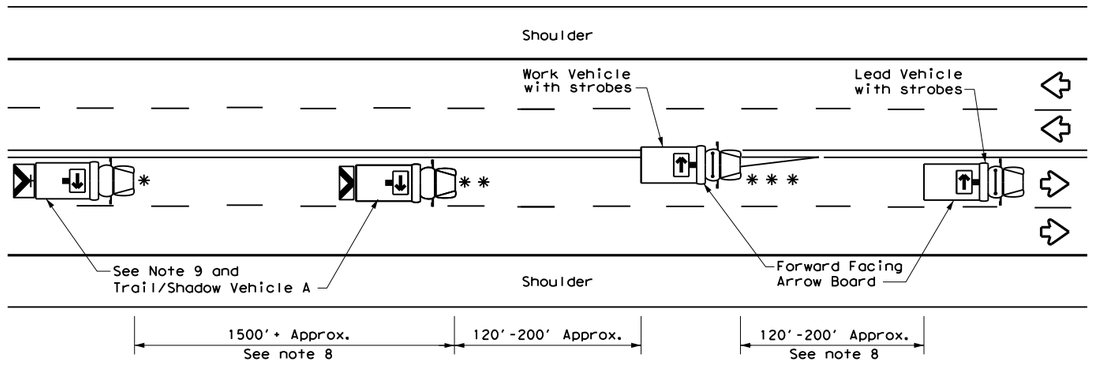
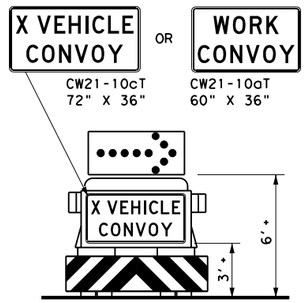
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	LFK	ANGELINA, ETC		78



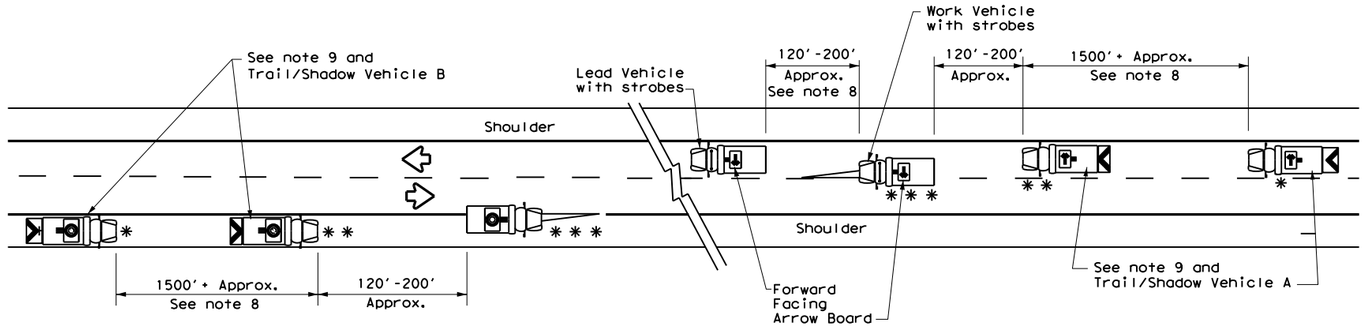
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

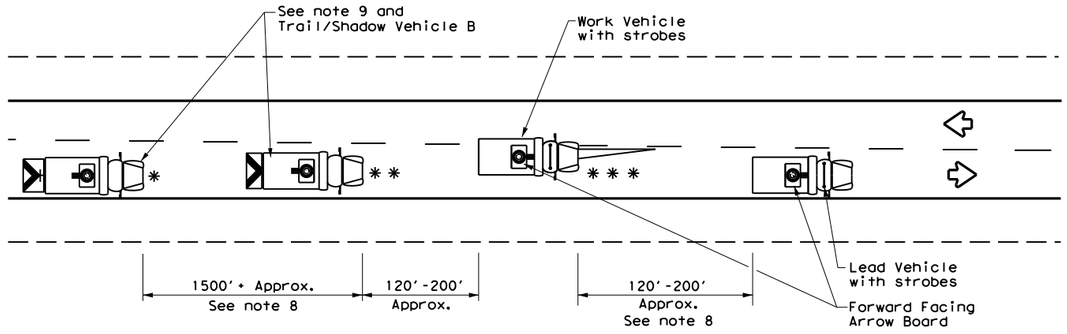


WORK ON SHOULDER

WORK ON TRAVEL LANE

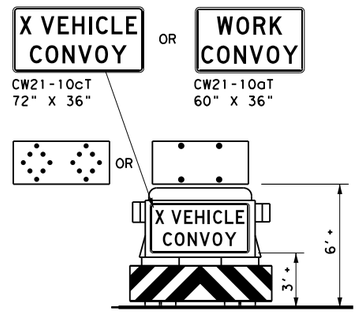
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

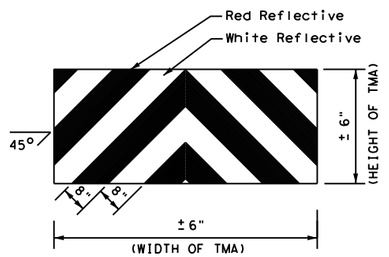
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		79

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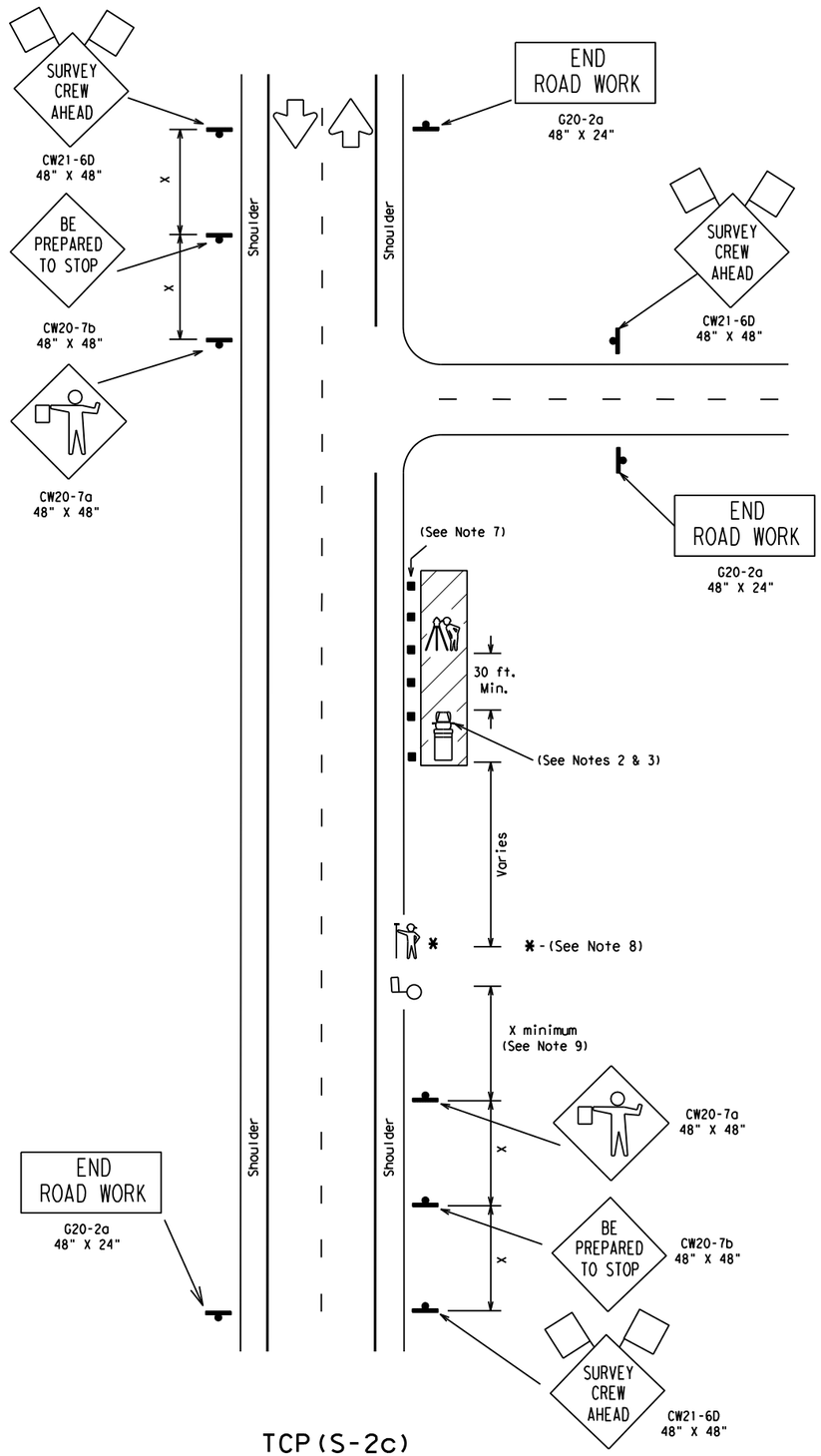

TCP(S-2c)

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
0336	03	072,ETC	SH 103,ETC

DIST	COUNTY	SHEET NO.
LFK	ANGELINA, ETC	80

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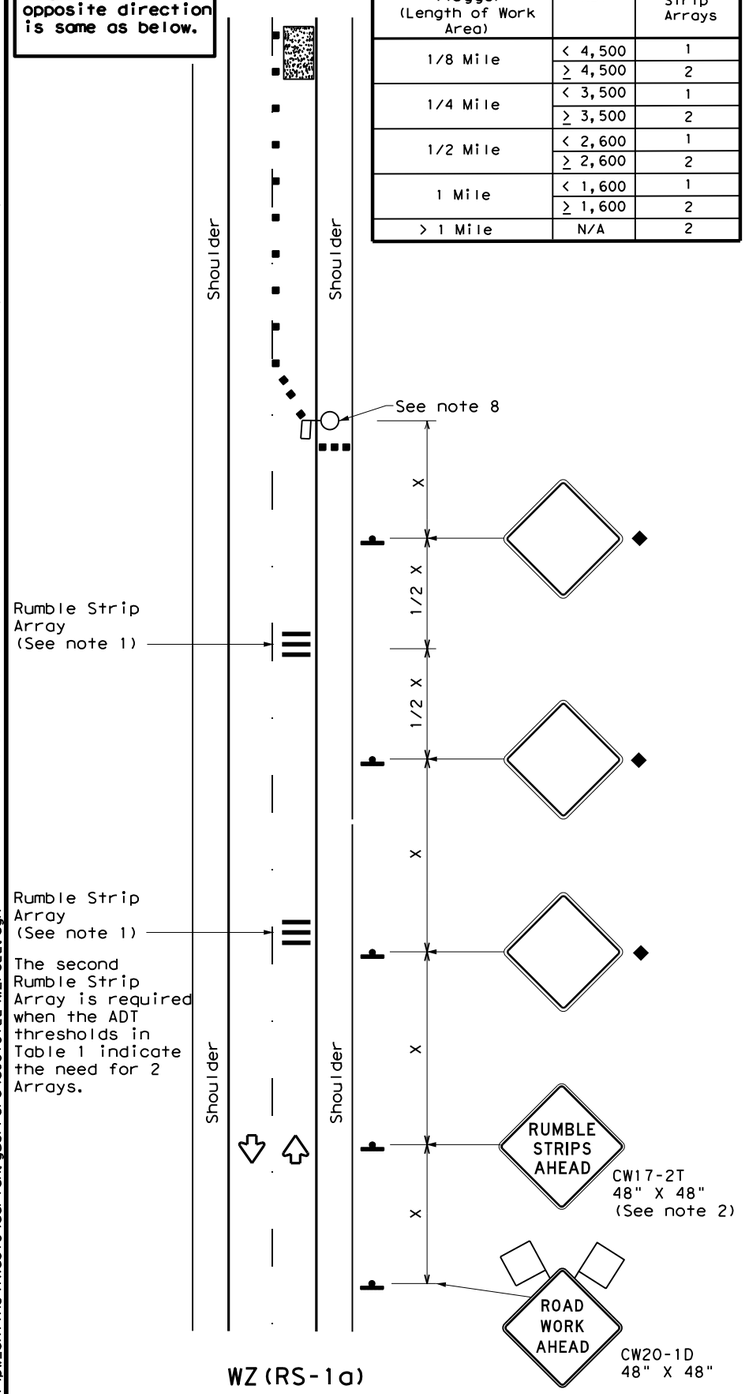
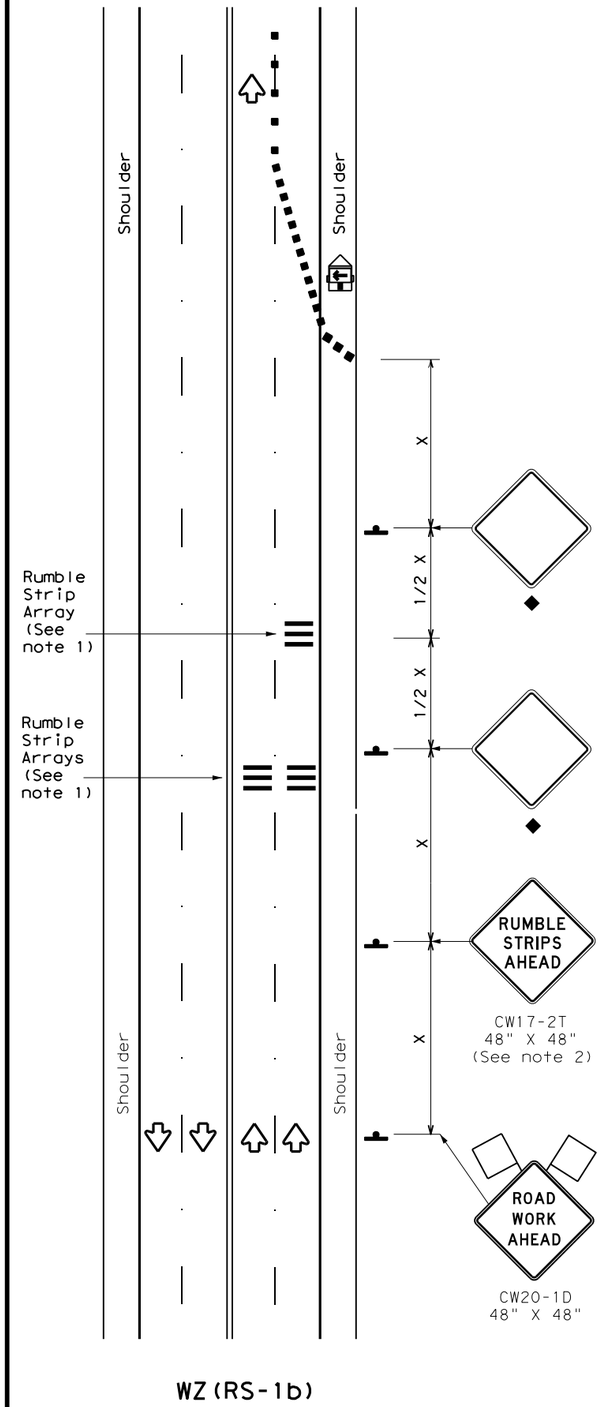
Warning sign and rumble strip sequence in opposite direction is same as below.

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	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		81

117

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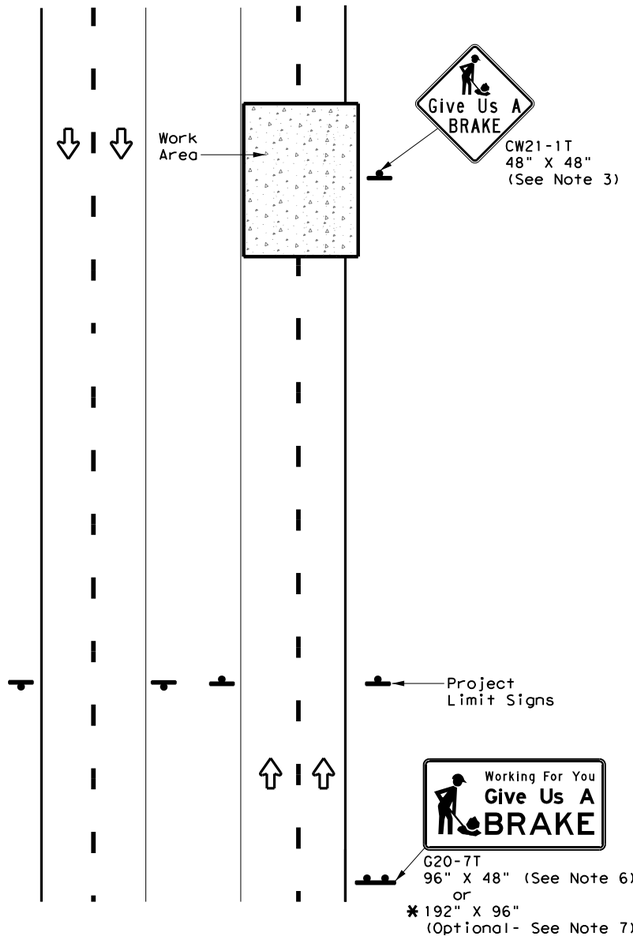
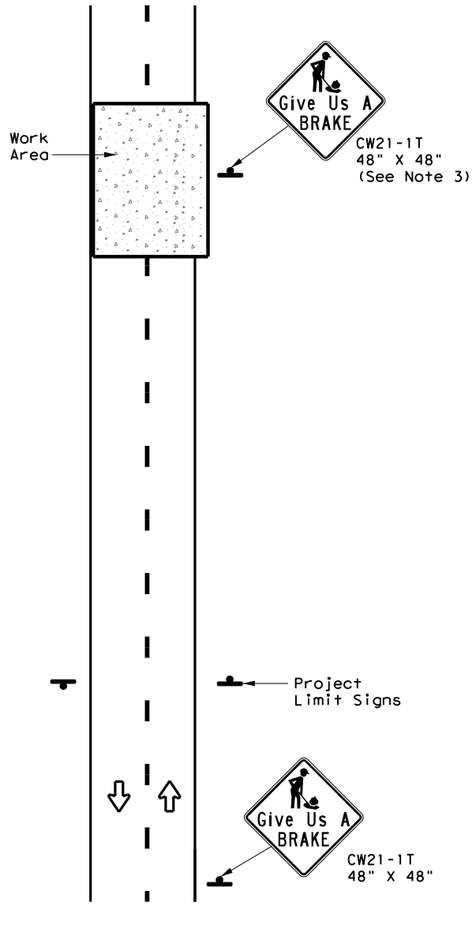


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 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

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©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
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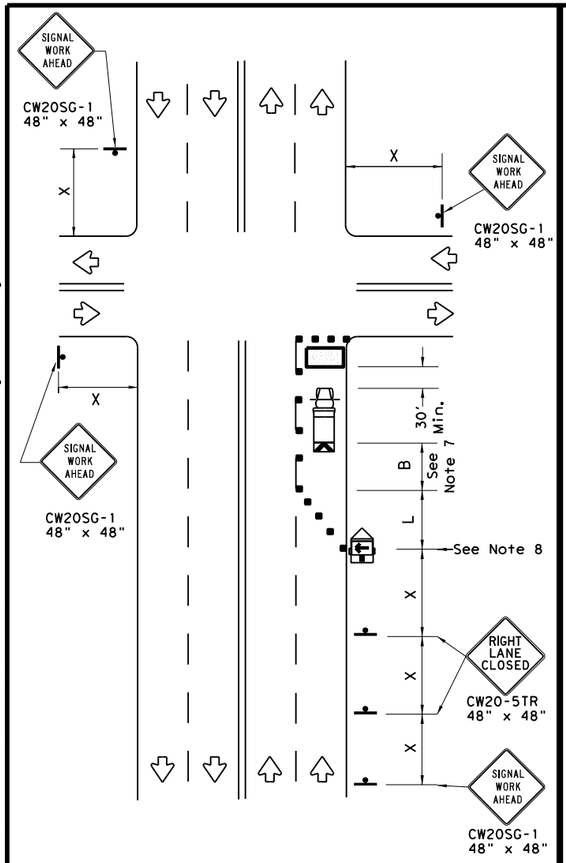
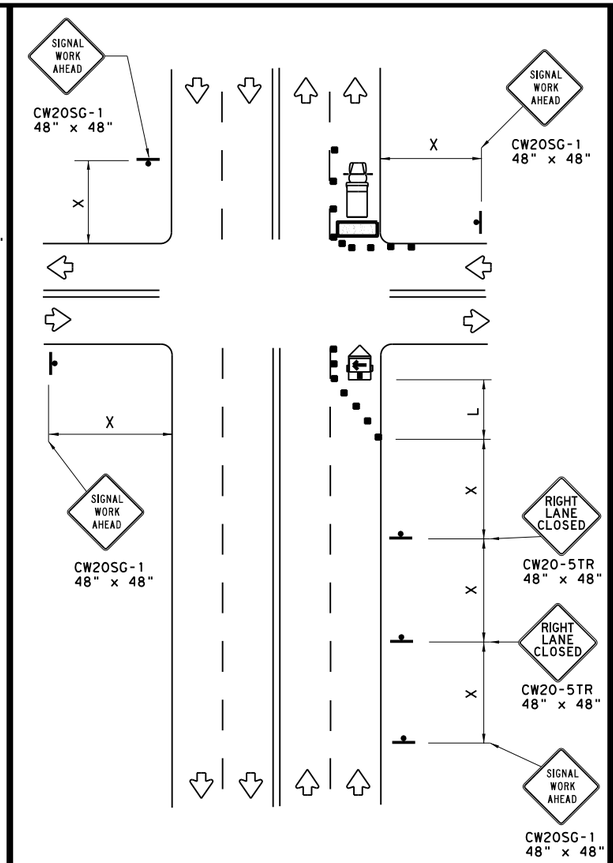
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	LFK	ANGELINA, ETC		82



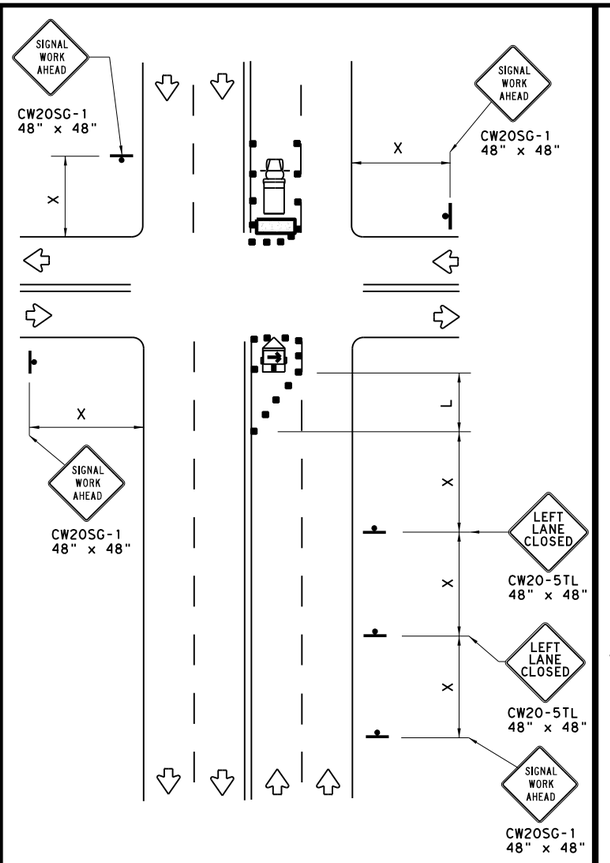
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE RIGHT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY

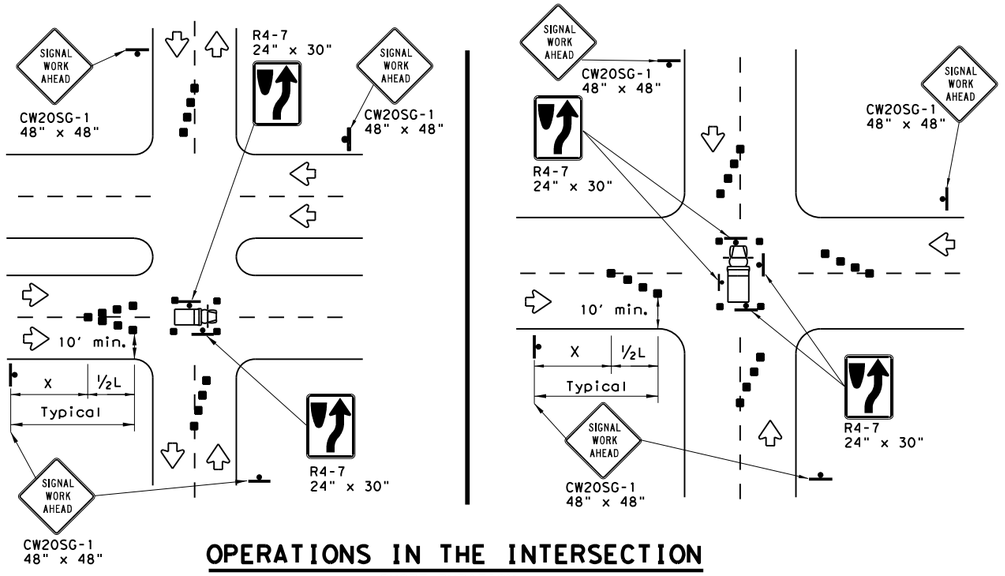
LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

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



OPERATIONS IN THE INTERSECTION

SHORT DURATION

GENERAL NOTES

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

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©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	LFK	ANGELINA, ETC		83

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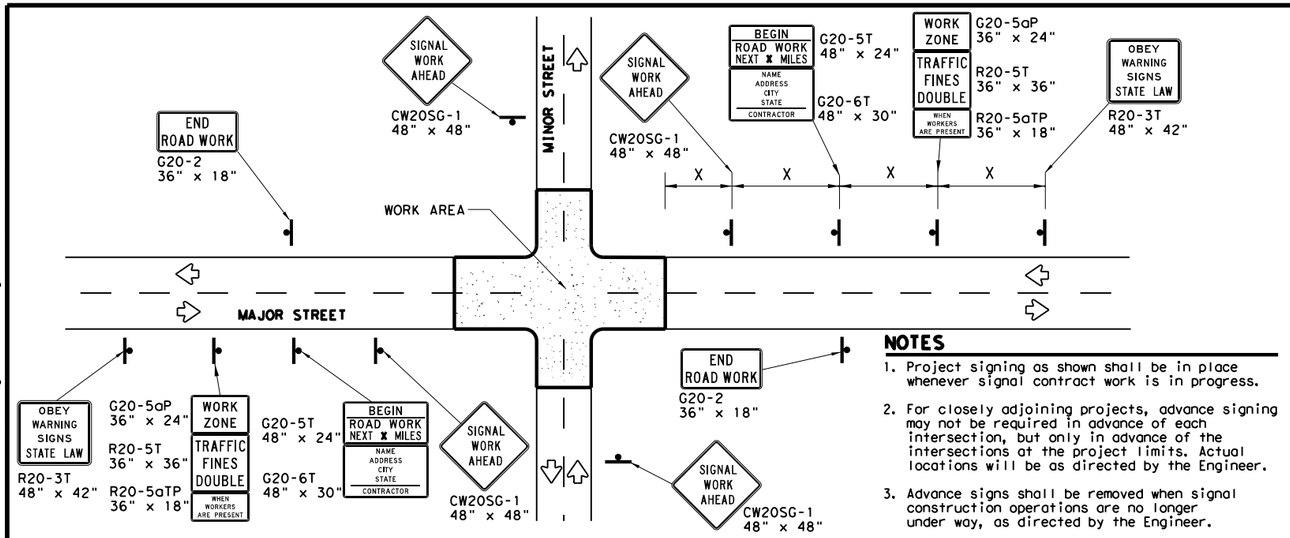

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TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

DURATION OF WORK

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

SIGN MOUNTING HEIGHT

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

REMOVING OR COVERING

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

REFLECTIVE SHEETING

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

SIGN SUPPORT WEIGHTS

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

LEGEND	
┻	Sign
■ ■	Channelizing Devices
▨	Type 3 Barricade

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

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

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

SIDEWALK DIVERSION

SIDEWALK DETOUR

CROSSWALK CLOSURES

PEDESTRIAN CONTROL

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

SHEET 2 OF 2

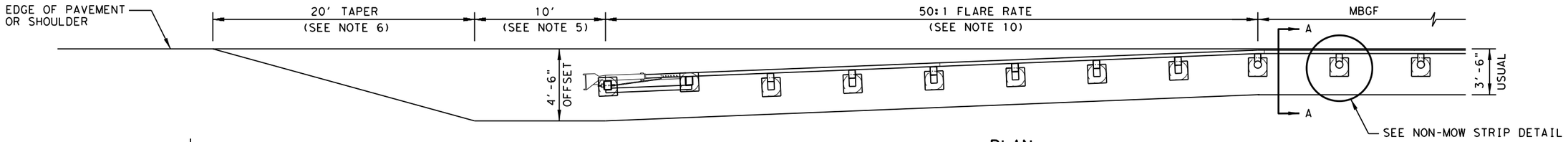
Texas Department of Transportation

Traffic Operations Division Standard

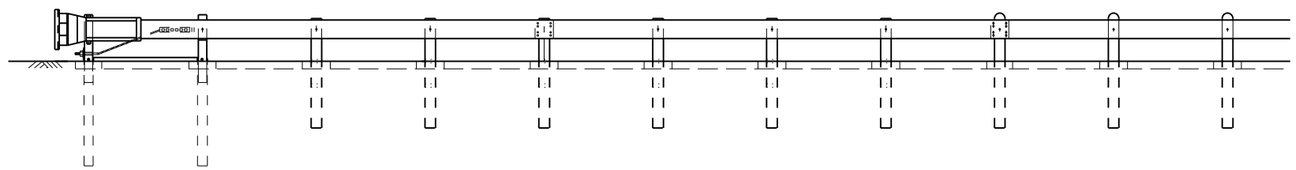
TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

FILE: wzbts-13.dgn		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB		HIGHWAY
REVISIONS	0336	03	072, ETC		SH 103, ETC
2-98 10-99 7-13 4-98 3-03	DIST	COUNTY			SHEET NO.
	LFK	ANGELINA, ETC			84



PLAN



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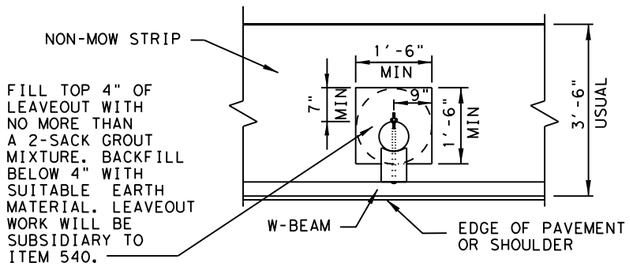
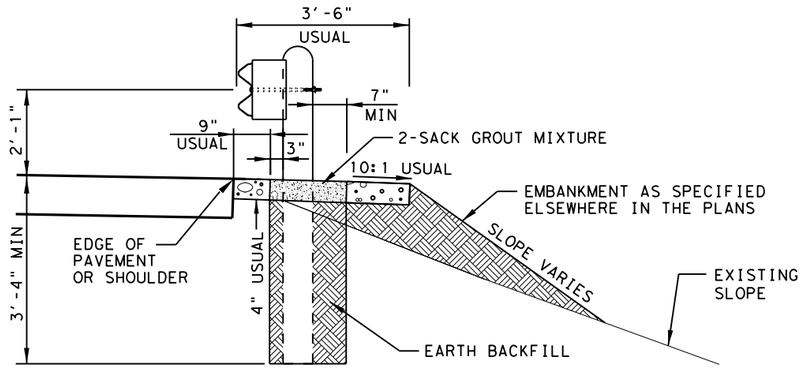


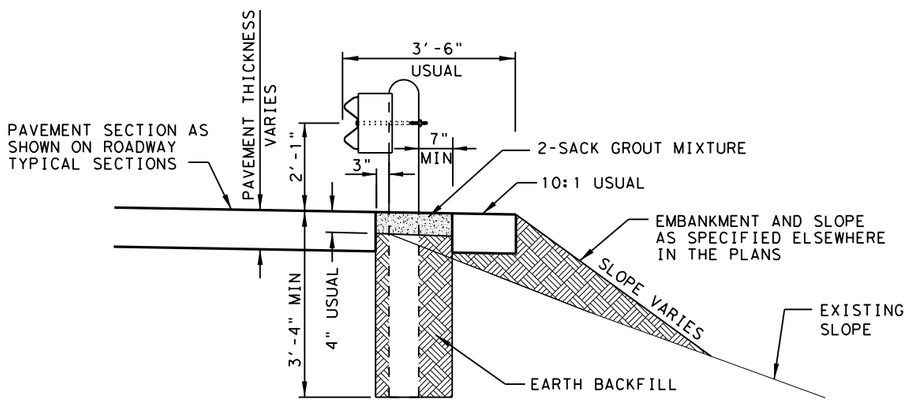
NON-MOW STRIP DETAIL

HOT MIX ASPHALTIC PAVEMENT NON-MOW STRIP
WITH 18"X18" OR 18" DIA. MINIMUM LEAVEOUT



SECTION A-A

ASPHALTIC NON-MOW STRIP



OPTIONAL SECTION A-A

WIDEN PAVEMENT SECTION

GENERAL NOTES

1. NON-MOW STRIPS SHALL BE HOT MIX ASPHALTIC PAVEMENT UNLESS OTHERWISE SHOWN ON THE PLANS. HOT MIX ASPHALTIC PAVEMENT SHALL MEET THE REQUIREMENTS OF AND BE PLACED IN ACCORDANCE WITH THE PERTINENT BID ITEM AS SHOWN ON THE PLANS. OTHER MATERIALS MAY BE USED AS INDICATED ELSEWHERE IN THE PLANS. MATERIALS FOR THE OPTIONAL WIDENED PAVEMENT SECTION SHALL BE AS SHOWN IN THE ROADWAY TYPICAL SECTIONS.
2. THE TYPE OF APPROVED POST WILL BE SHOWN ELSEWHERE IN THE PLANS. SEE THE APPLICABLE STANDARD SHEETS FOR ADDITIONAL DETAILS AND INFORMATION.
3. THE LIMITS OF PAYMENT FOR HOT MIX ASPHALTIC PAVEMENT WILL INCLUDE LEAVEOUTS FOR POST.
4. THE LEAVEOUTS SHALL BE FILLED WITH NO MORE THAN A 2-SACK GROUT MIXTURE AND PLACED IN ACCORDANCE WITH SECTION 421.2.7, "MORTAR AND GROUT". PAYMENT FOR FURNISHING AND PLACING THE GROUT MIXTURE WILL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.
5. THE NON-MOW STRIP SHALL BE EXTENDED FULL WIDTH FOR 10' IN ADVANCE OF THE GUARDRAIL END TREATMENT UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
6. A 20' TAPER WILL BE USED IN ADVANCE OF GUARDRAIL UNLESS OTHERWISE SHOWN IN THE PLANS, OR DIRECTED BY THE ENGINEER.
7. EXACT LOCATION OF MBGF PLACEMENT WILL BE SHOWN ELSEWHERE IN THE PLANS TO MEET APPROPRIATE CLEAR ROADWAY WIDTH AND CLEAR ZONE REQUIREMENTS.
8. EXCAVATION REQUIRED TO CONSTRUCT NON-MOW STRIP WILL NOT BE MEASURED OR PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO PERTINENT ITEMS.
9. THE FLARE RATE MAY BE DECREASED OR ELIMINATED IF DIRECTED BY THE ENGINEER.
10. WHEN THE EXISTING NON-MOW STRIP IS TO REMAIN IN PLACE, FILLING THE EXISTING POST HOLES WITH GROUT AND DIGGING NEW POST HOLES WILL BE SUBSIDIARY. THE TOP 4 INCHES OF A POST HOLE WITHIN AN EXISTING NON-MOW STRIP SHALL BE BACKFILLED WITH HMA. THIS WORK WILL NOT BE PAID FOR BUT WILL BE SUBSIDIARY TO ITEM 542.

NOT TO SCALE

REVISED: 2-19-09
ADDED EDGE OF PAVEMENT OR SHOULDER LINE TO PLAN VIEW AND DETAIL.
REVISED: 7-16-10
CHANGED DEPTH OF NON-MOW STRIP FROM 5" TO 4".
REVISED: 12-30-11
REVISED HEIGHT OF W-BEAM ABOVE PAVEMENT SURFACE
REVISED: 9-29-16
REVISED SLOPE BEHIND POSTS; REMOVED SLOPE GENERAL NOTE
REVISED: 10-20-2016
MODIFIED TITLE BLOCK
REVISED: 04-07-2017
ADDED NOTE 10
REVISED: 07-10-2017
REVISED SLOPE BEHIND MBGF
REVISED: 02-02-2018
REVISED SPECIFICATION REFERENCE IN NOTE 4

LUFKIN DISTRICT STANDARD

NON-MOW STRIP DETAILS

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		85

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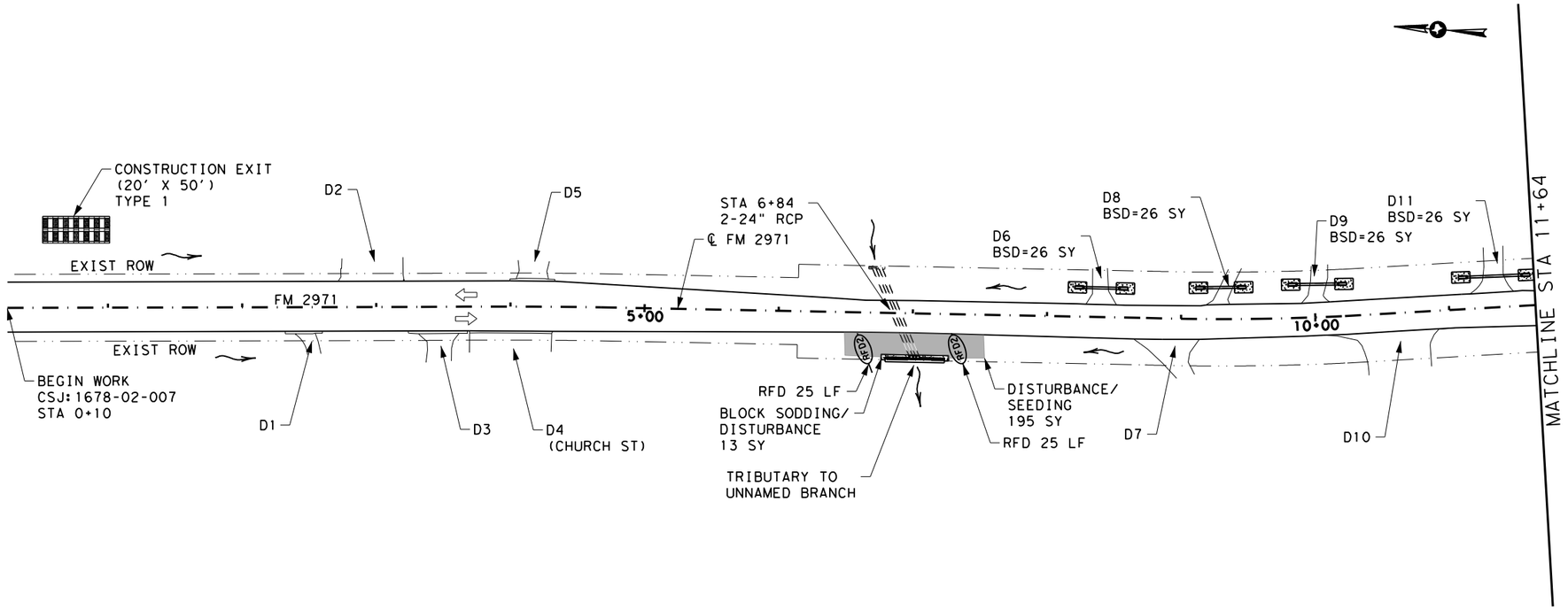

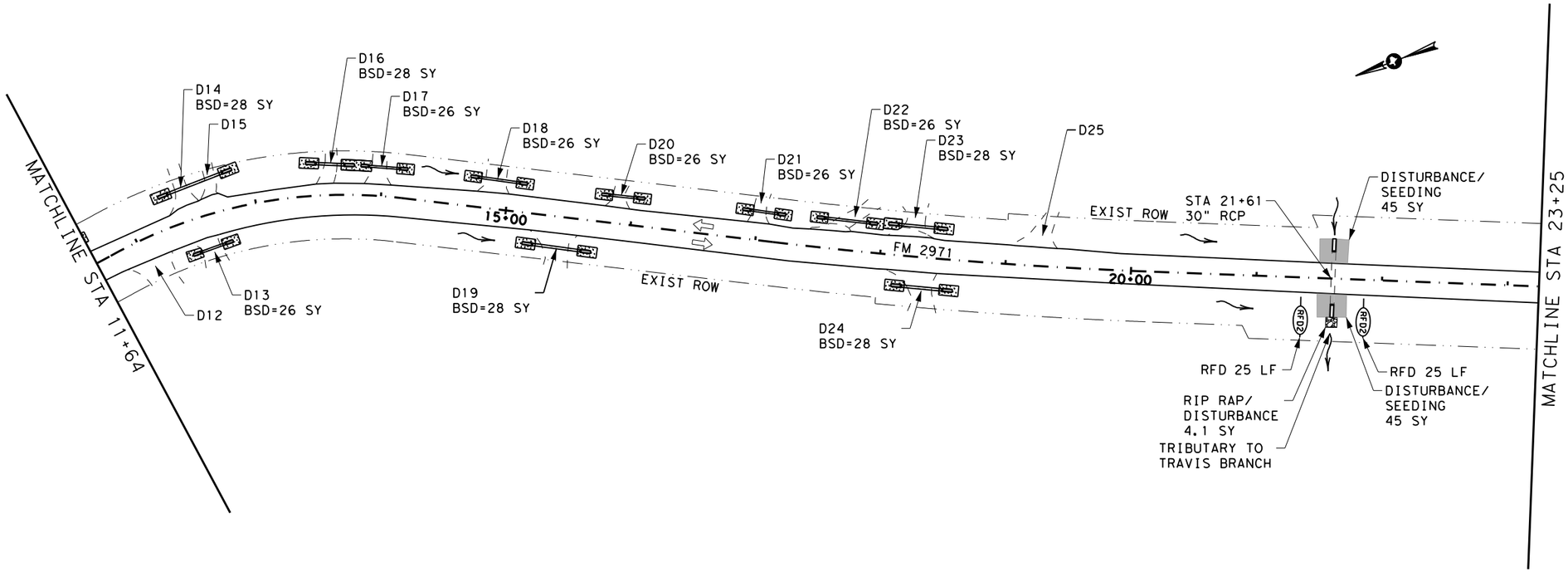

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER

BSD BLOCK SODDING/DISTURBANCE (ASSUMED FOR BOTH SIDES OF PIPE UNLESS OTHERWISE NOTED)

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

SCALE 1" = 100'

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

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Elizabeth Ortego, P.E.
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3/31/2022

PLAN LAYOUT (FM 2971)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		86

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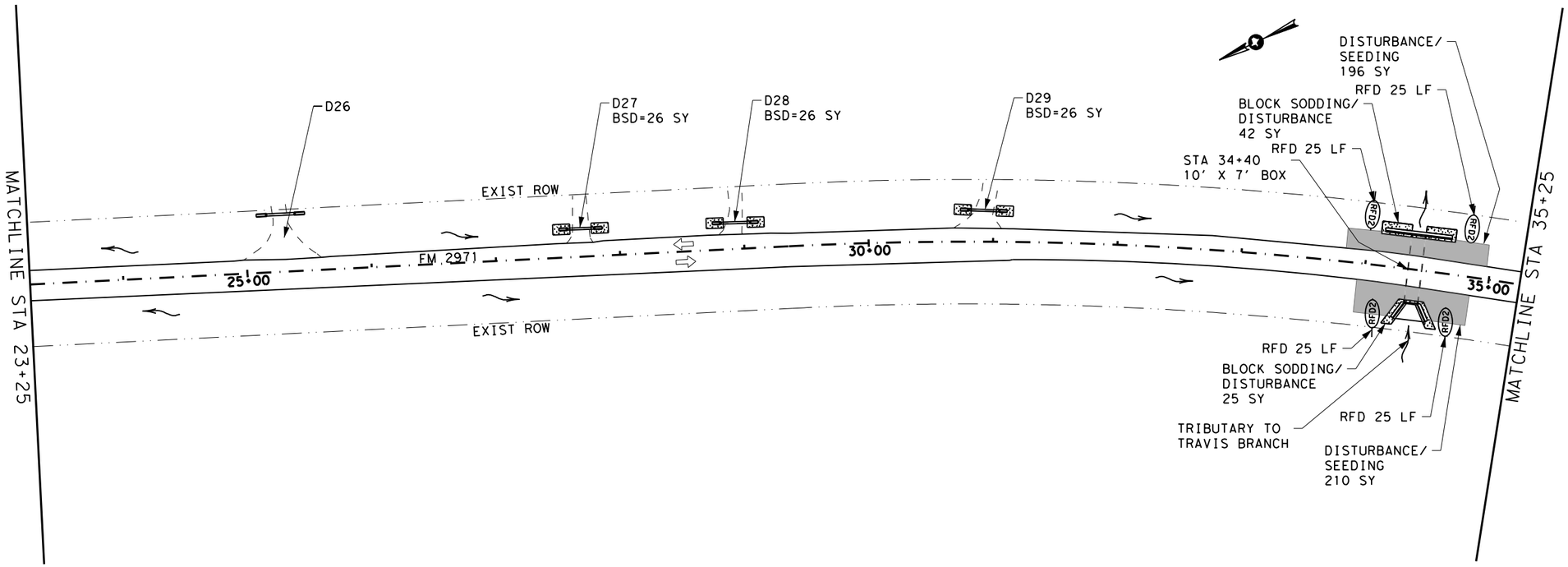

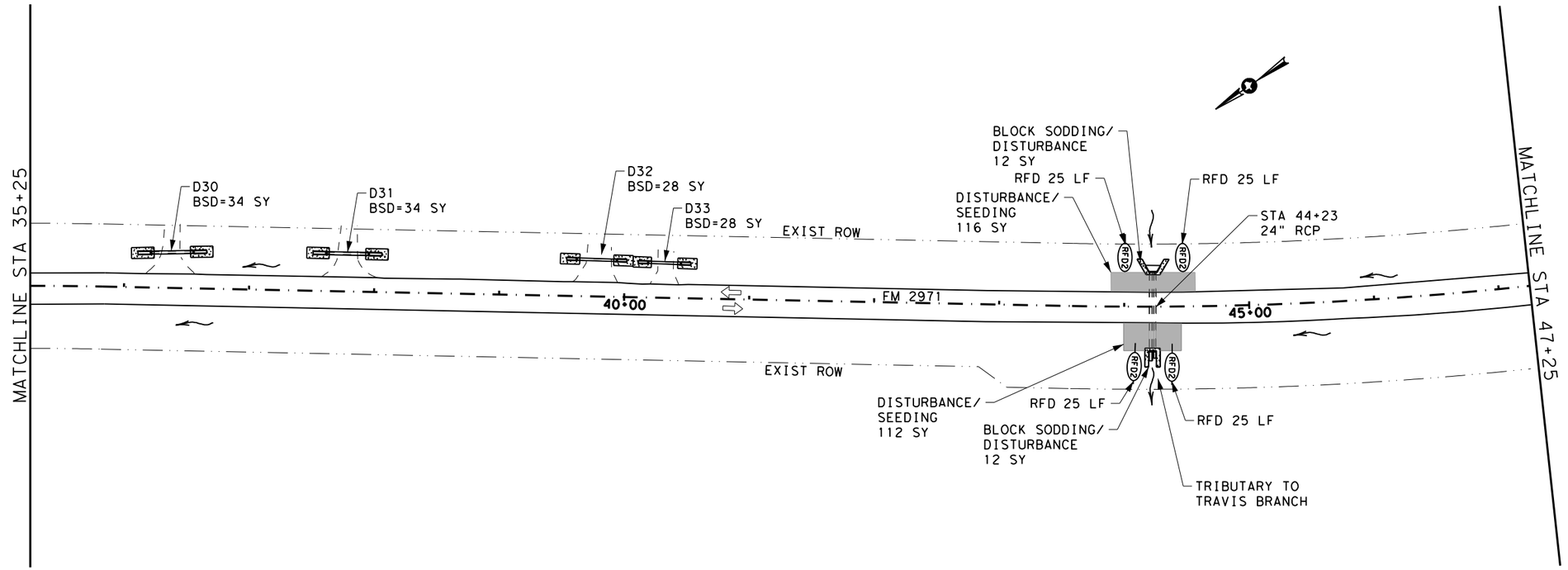

LEGEND

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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		87

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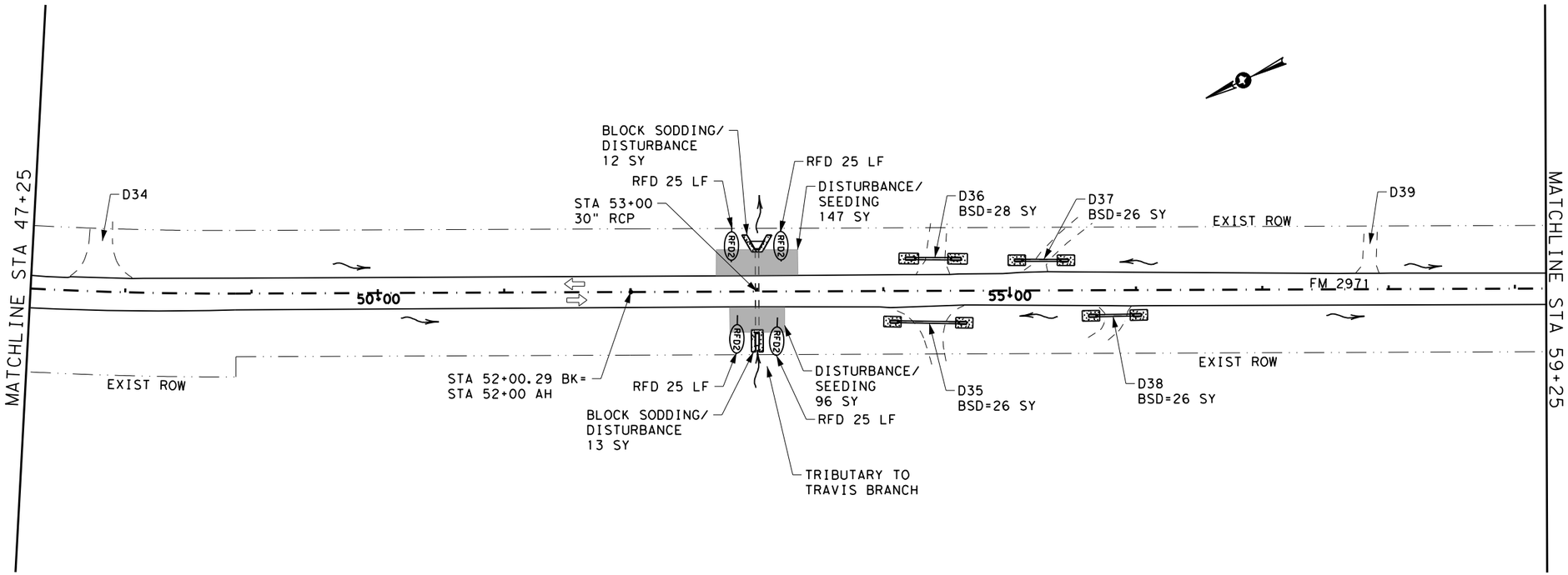

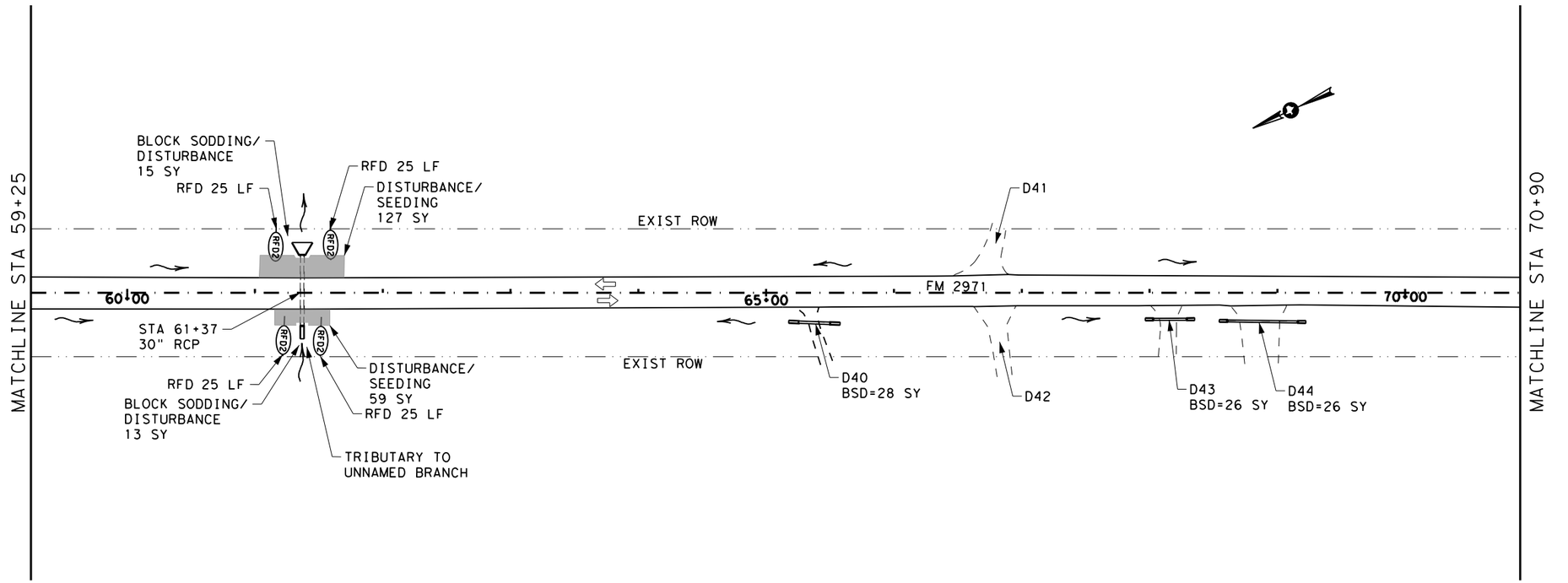

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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		88

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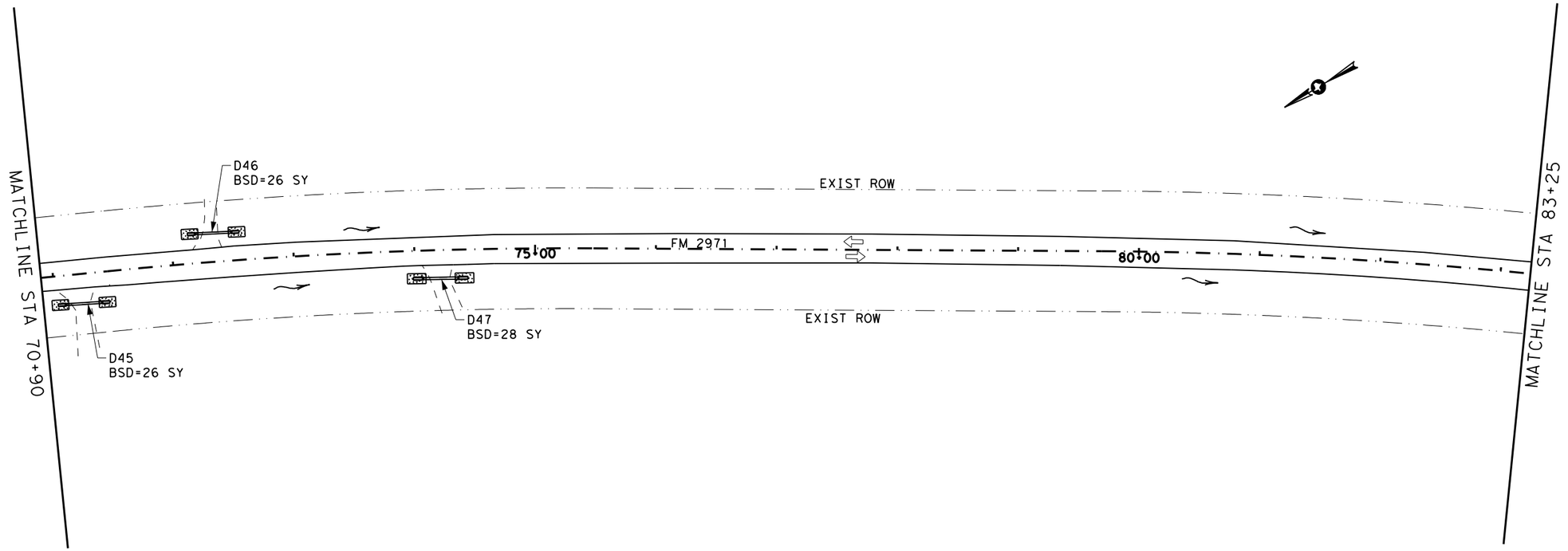

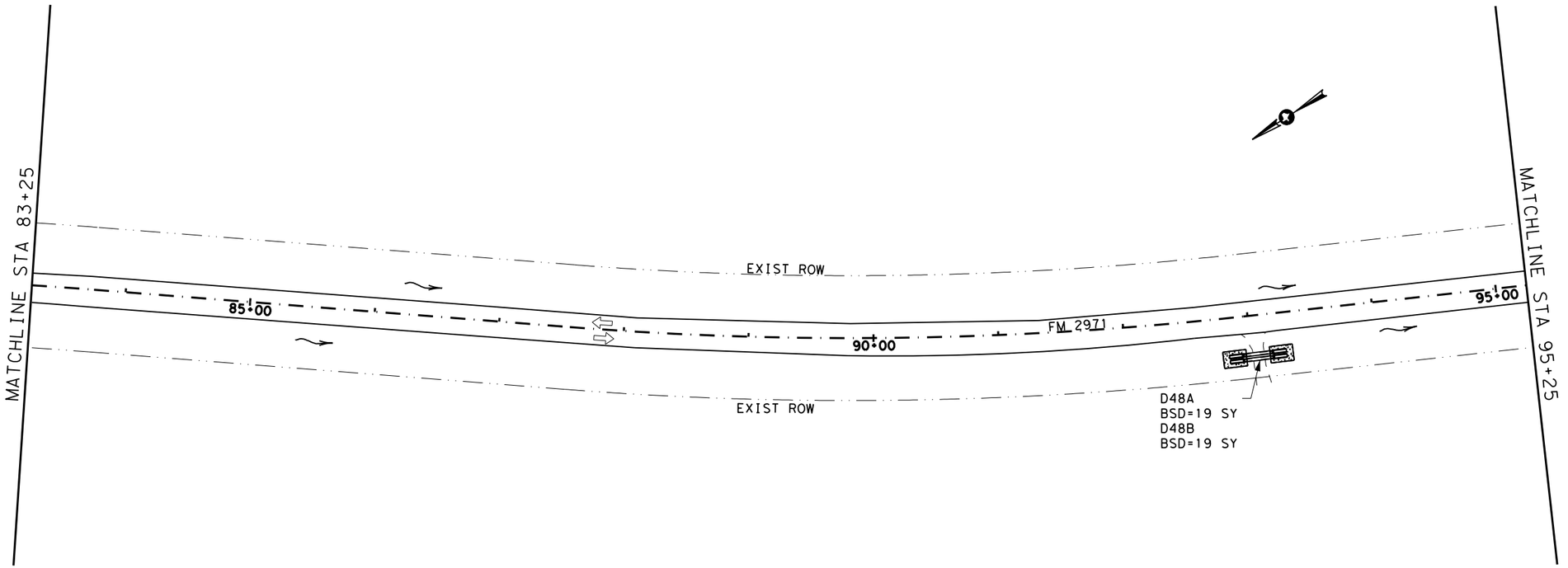

LEGEND

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TEXAS DEPARTMENT OF TRANSPORTATION
SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		89

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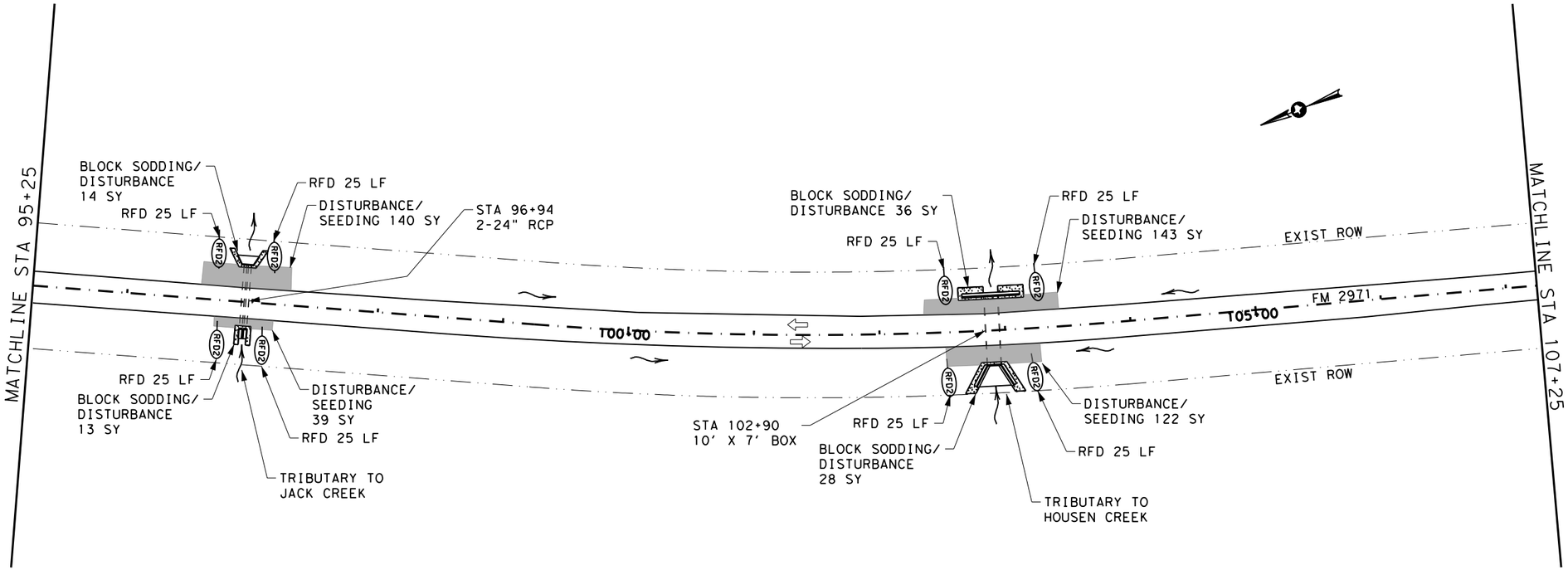

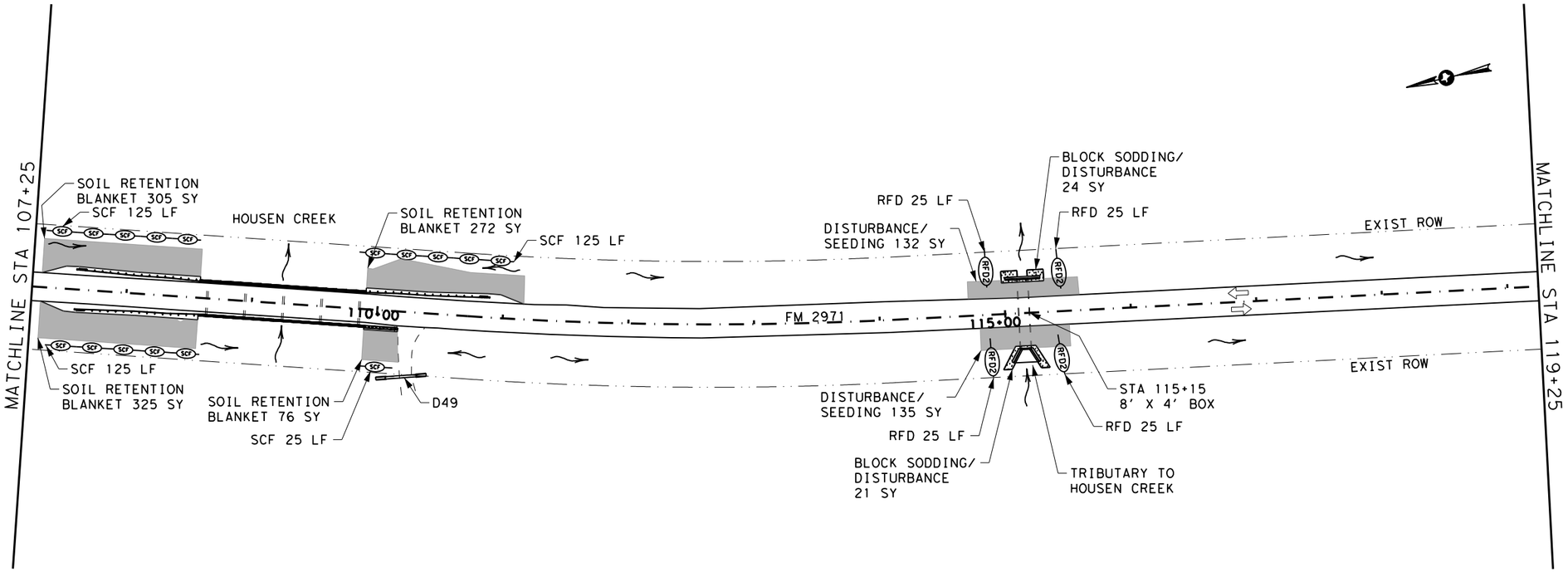

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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		90

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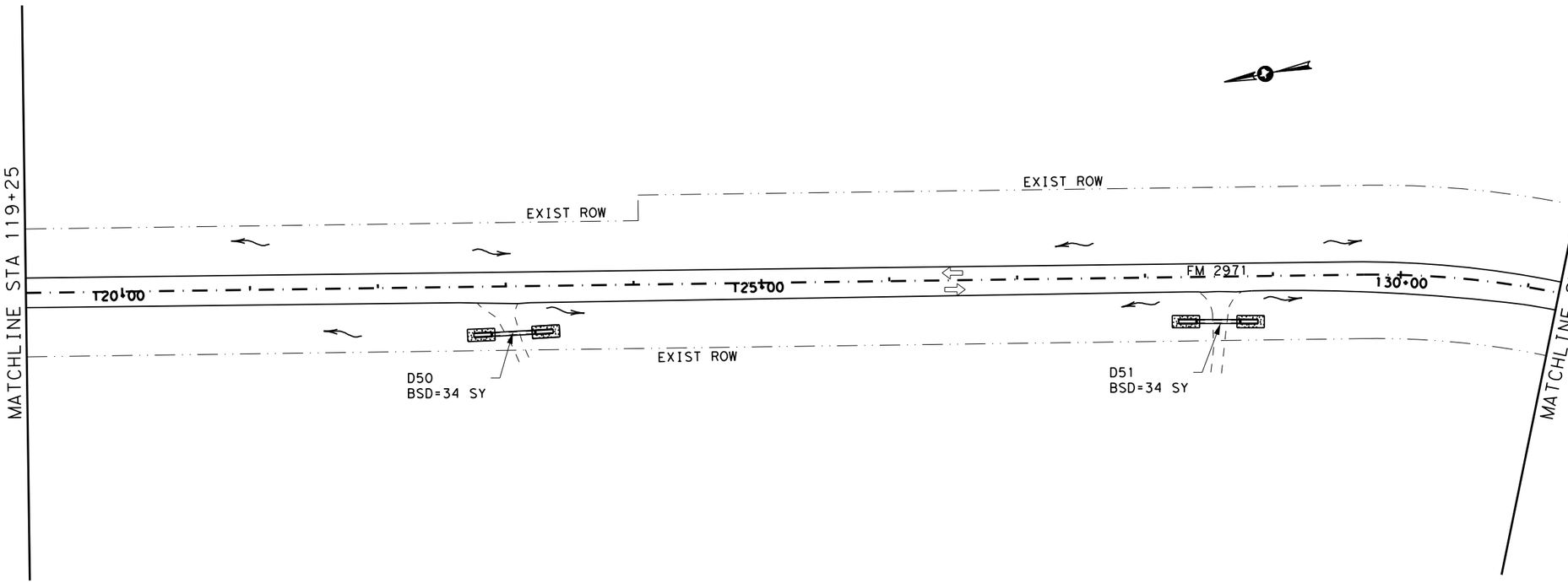

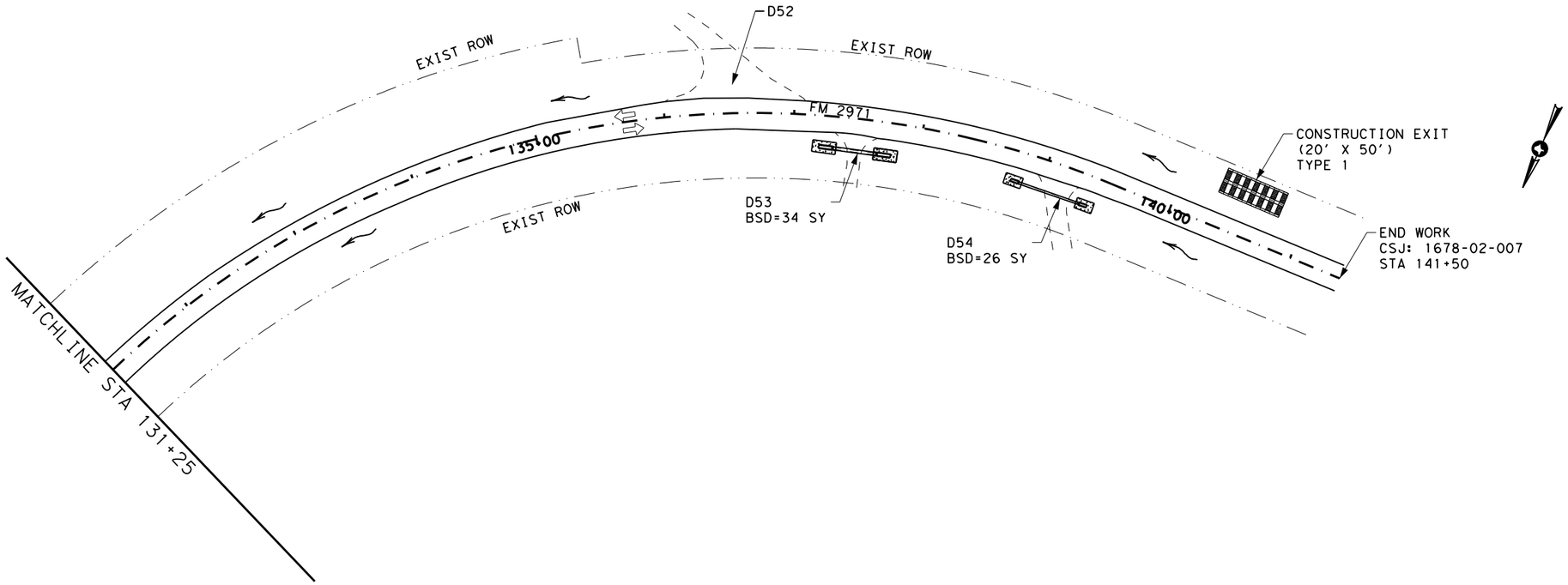

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
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- D# DRIVEWAY NUMBER
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NOTE: LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

SCALE 1" = 100'

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PLAN LAYOUT (FM 2971)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		91

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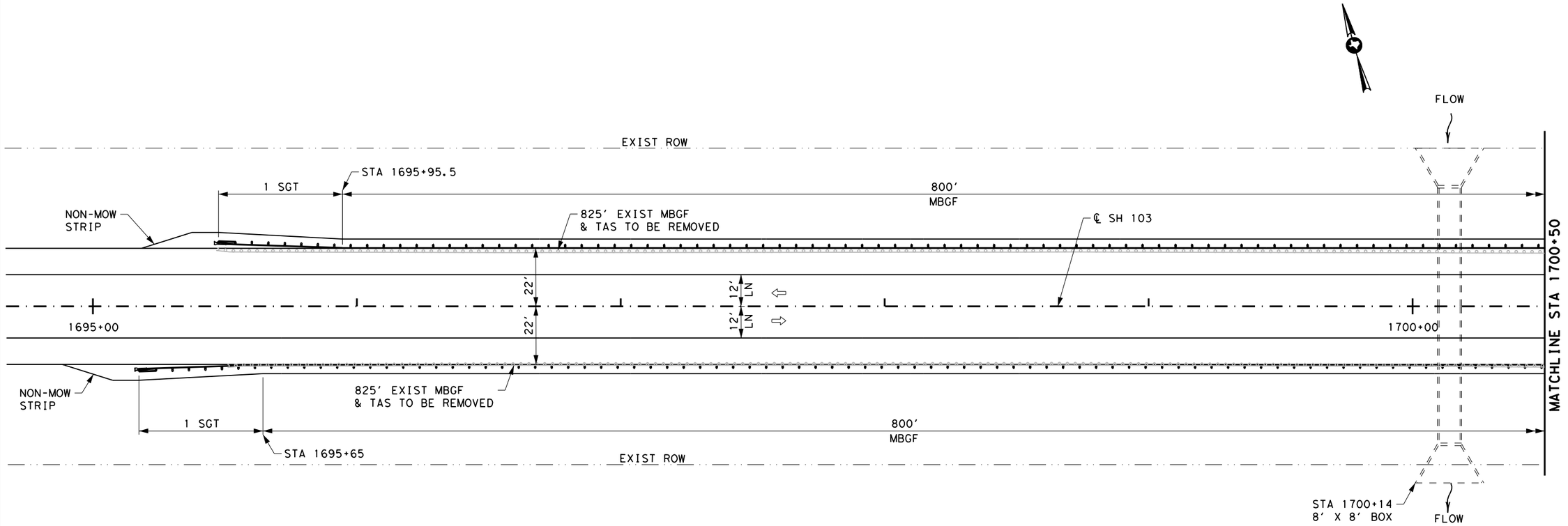

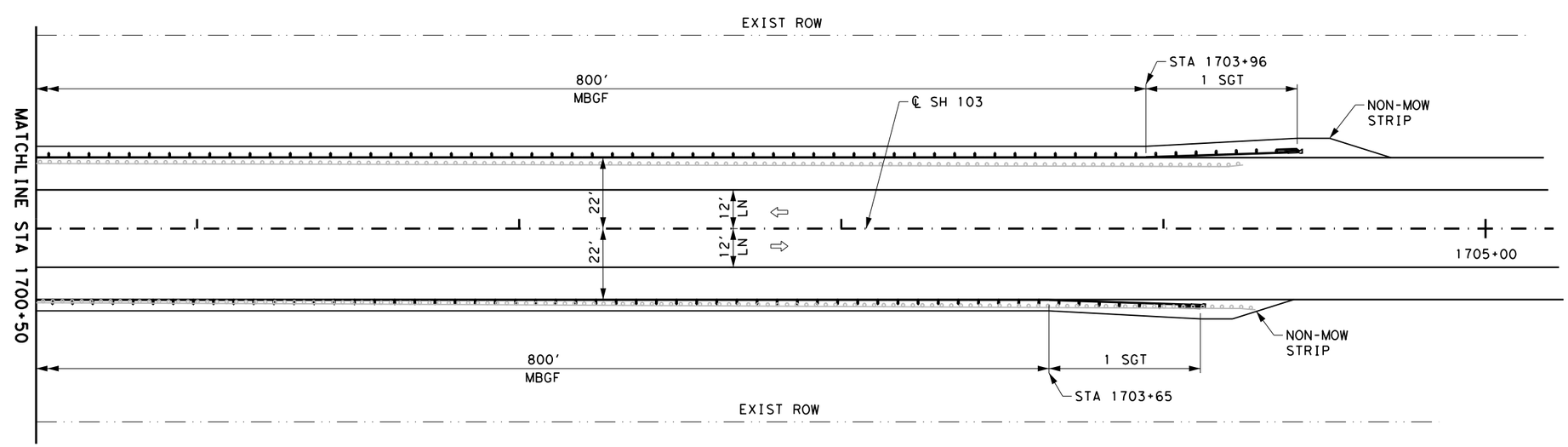

SCALE 1" = 40'

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3/31/2022

MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		92

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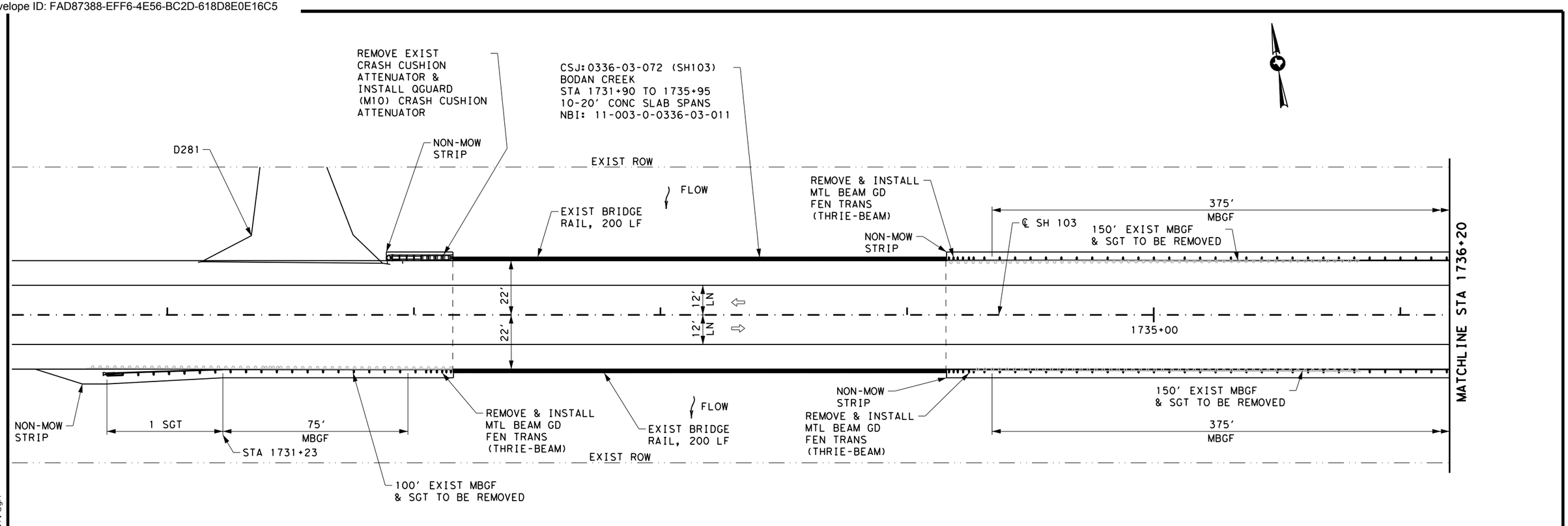

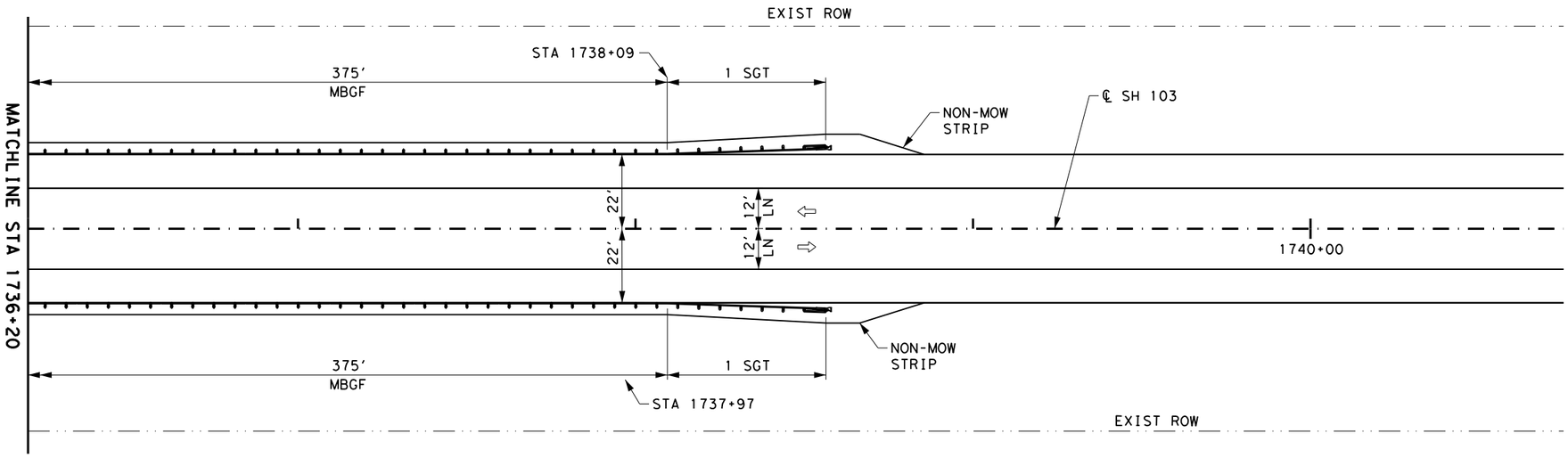

SCALE 1" = 40'

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91106
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Elizabeth Ortego, P.E.
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3/31/2022

MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 2 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		93

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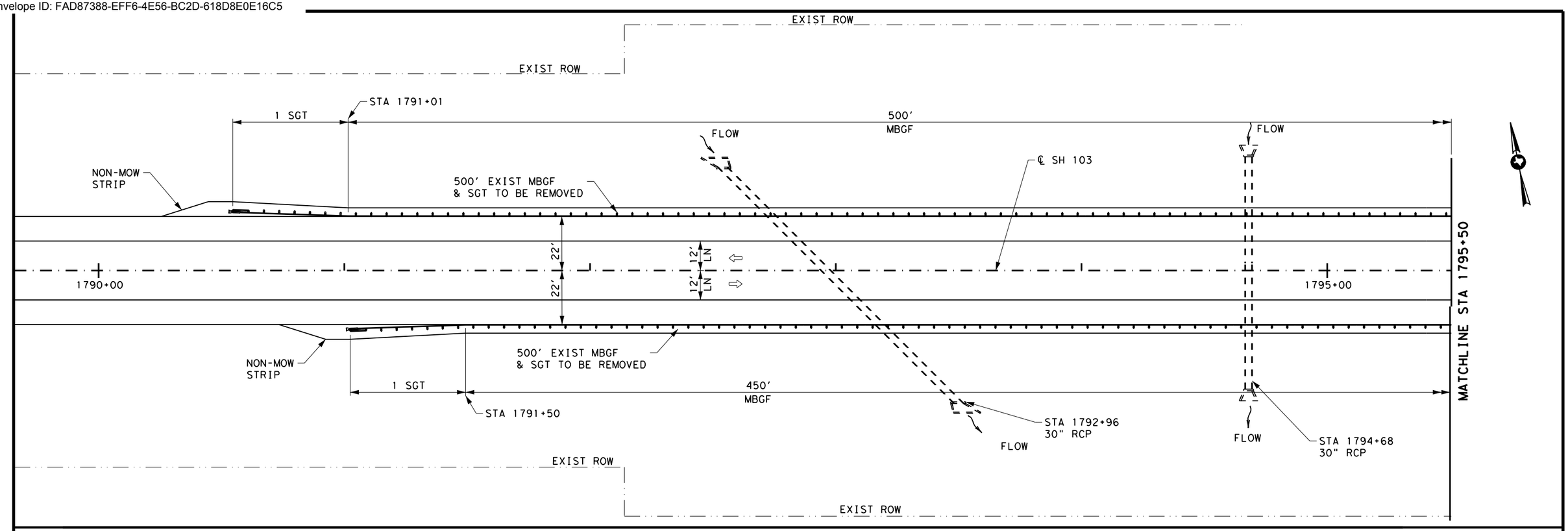

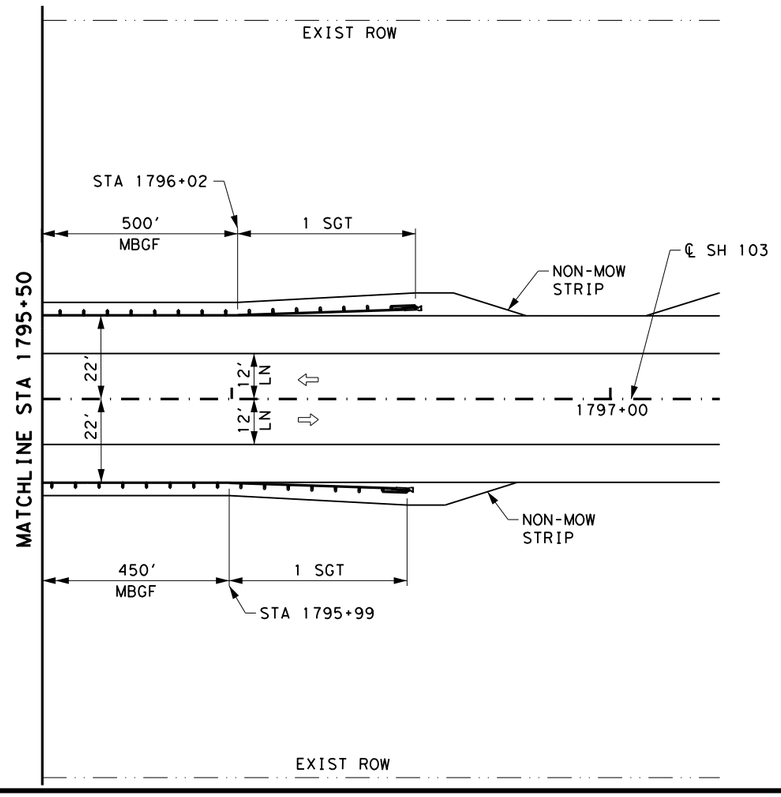

SCALE 1" = 40'

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91106
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DocuSigned by:
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1B27AAE715F1446...
3/31/2022

MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 3 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		94

3/31/2022 9:04:57 AM
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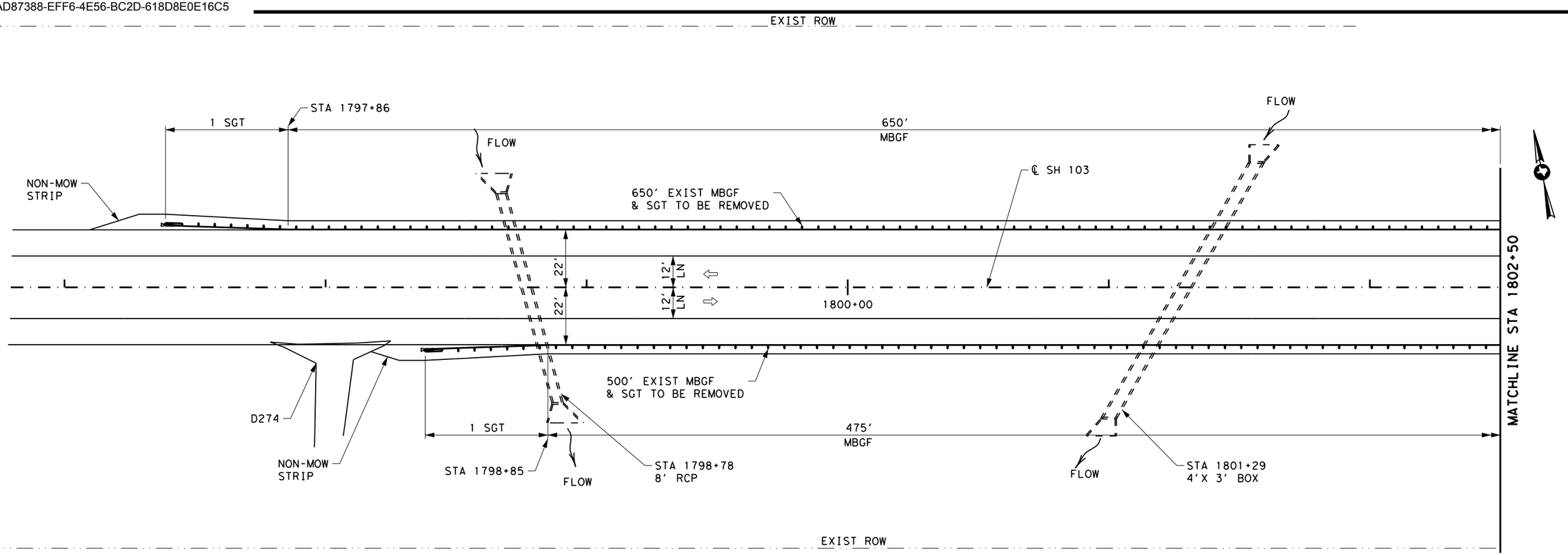

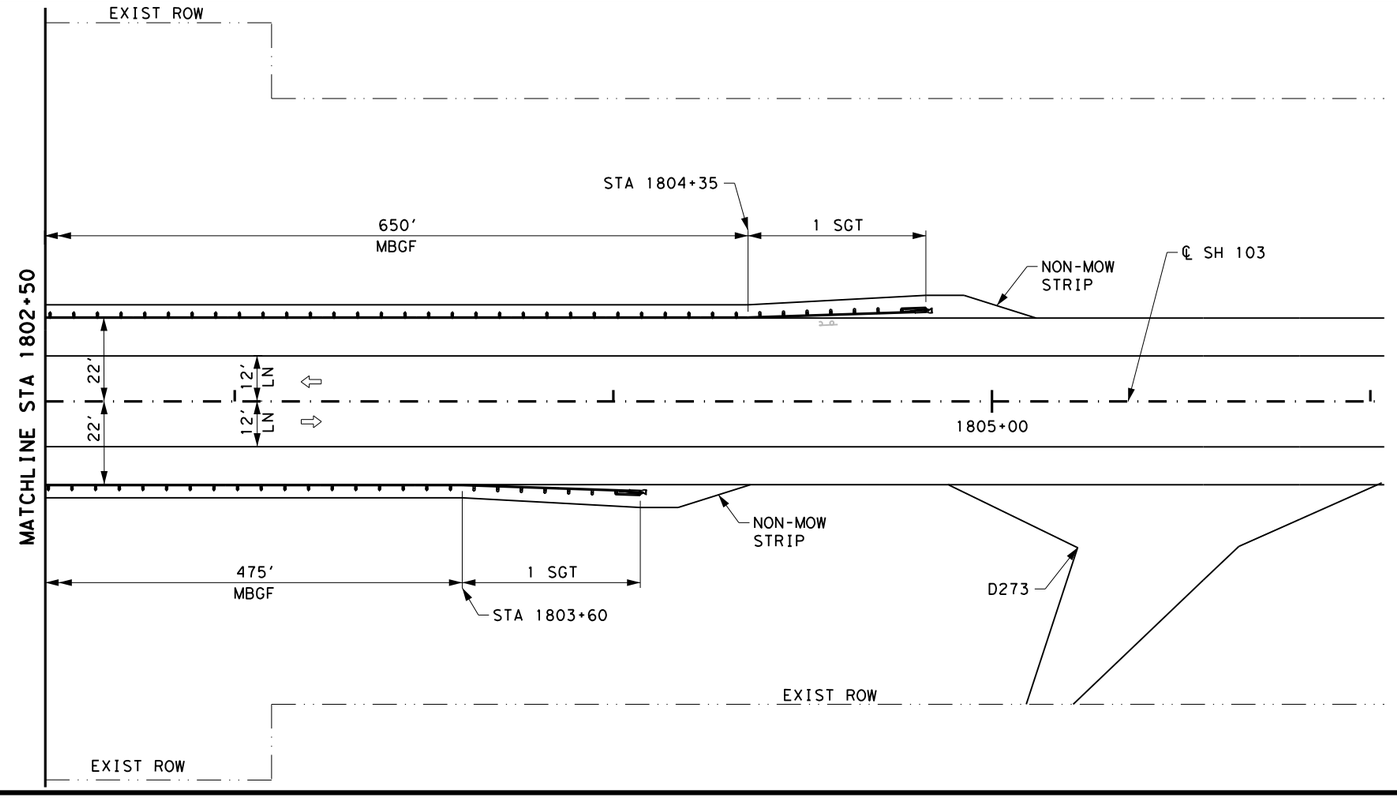

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 4 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		95

3/31/2022 9:05:04 AM
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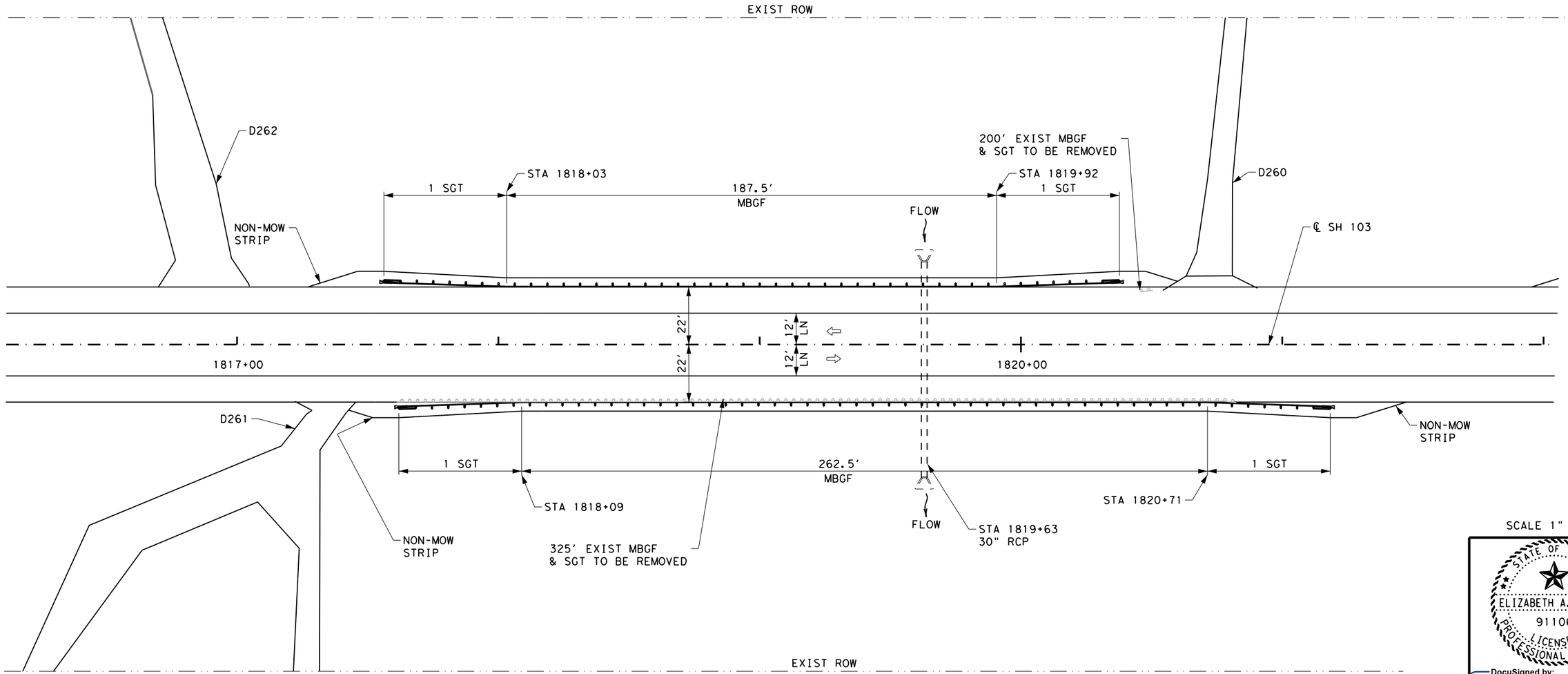

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 5 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		96

3/31/2022 9:05:11 AM
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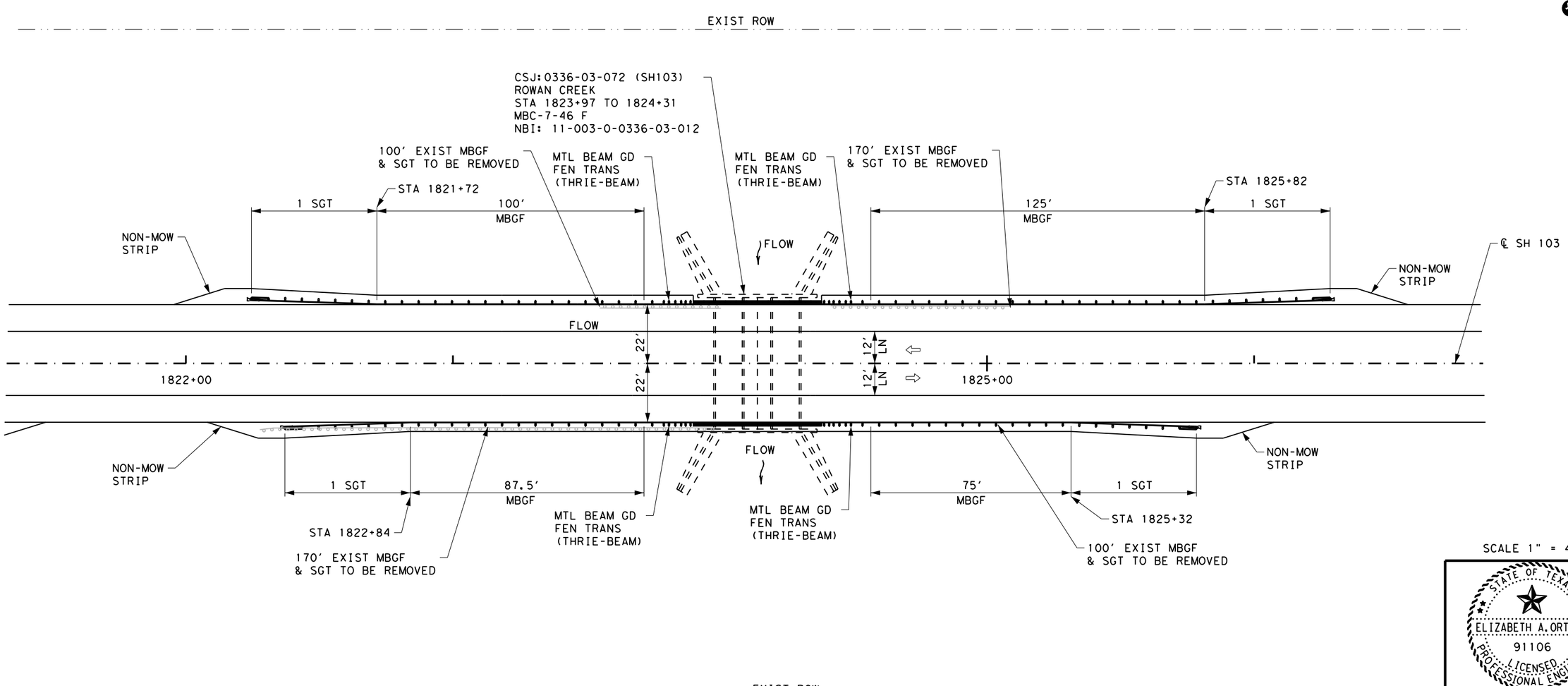

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 6 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		97

3/31/2022 9:05:19 AM
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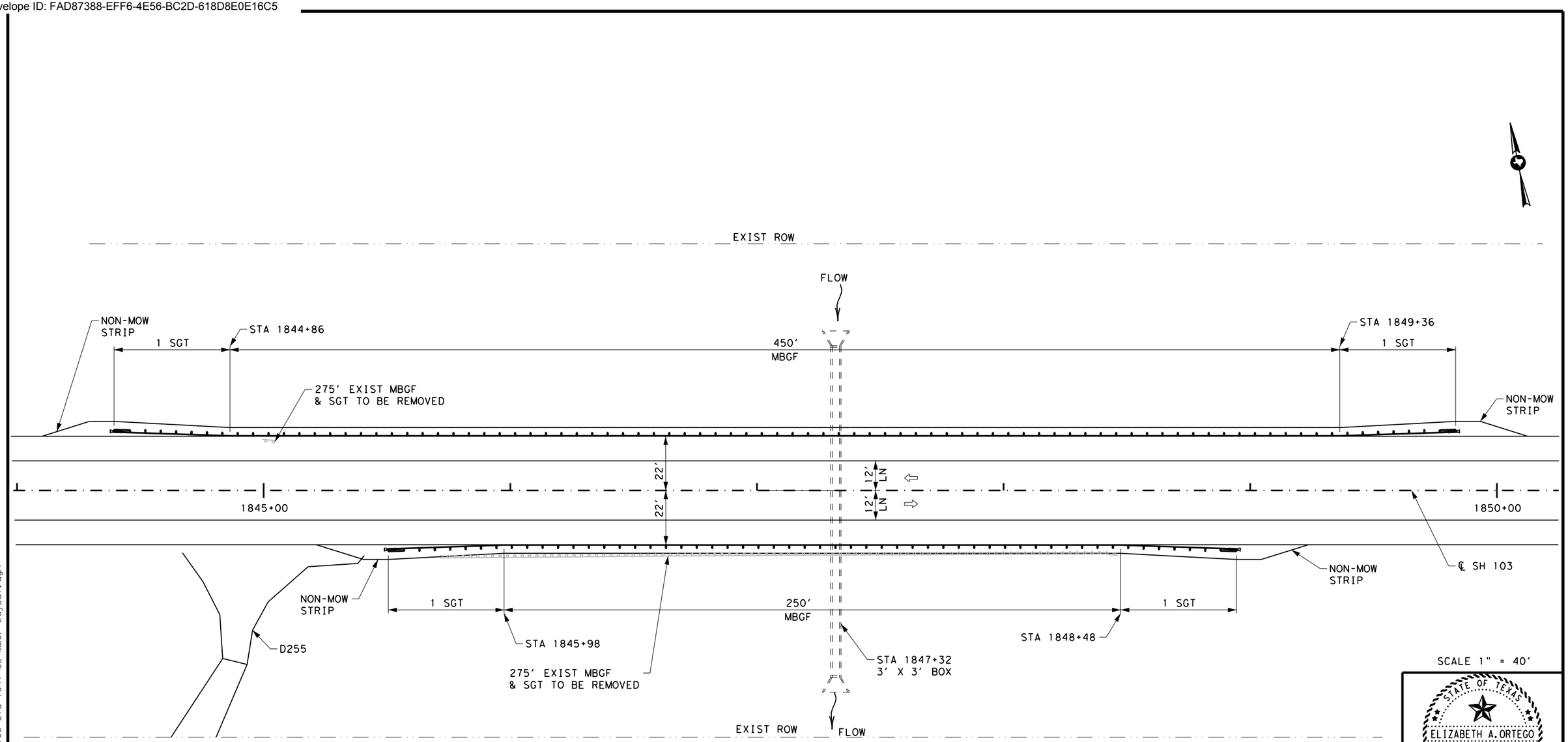

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 7 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		98

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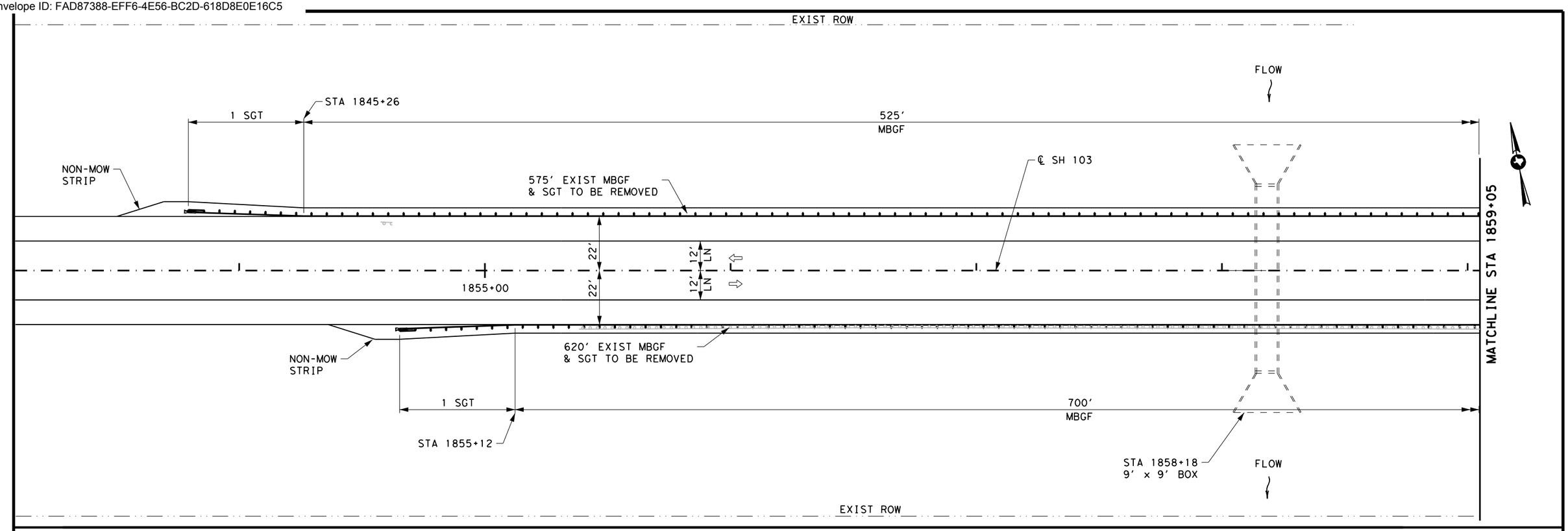

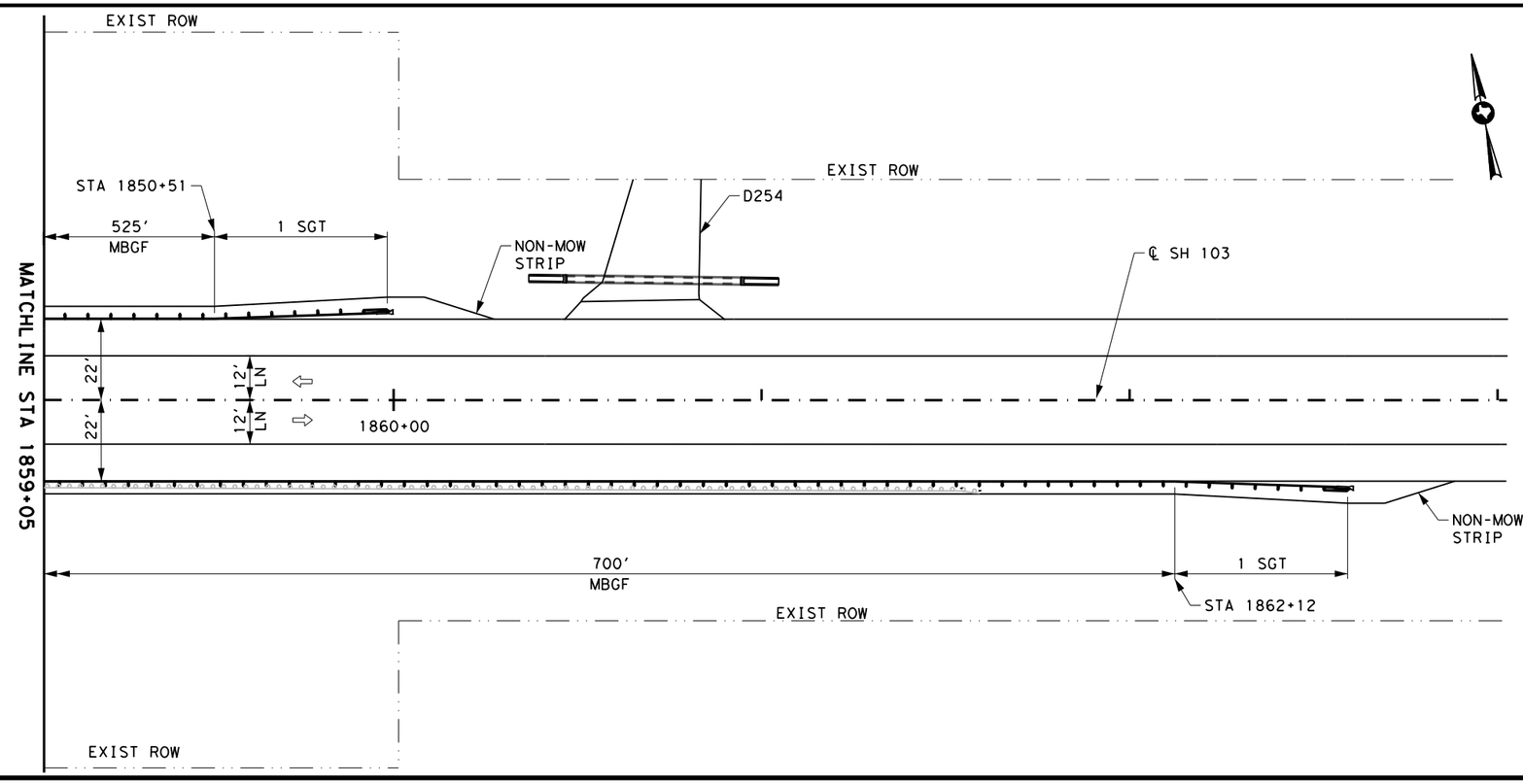

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 8 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		99

3/31/2022 9:05:30 AM
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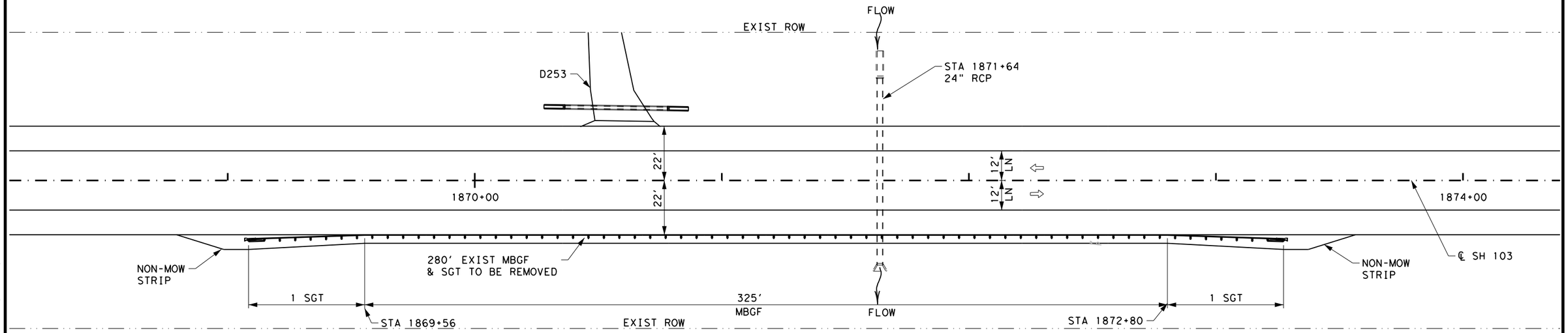

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 9 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		100

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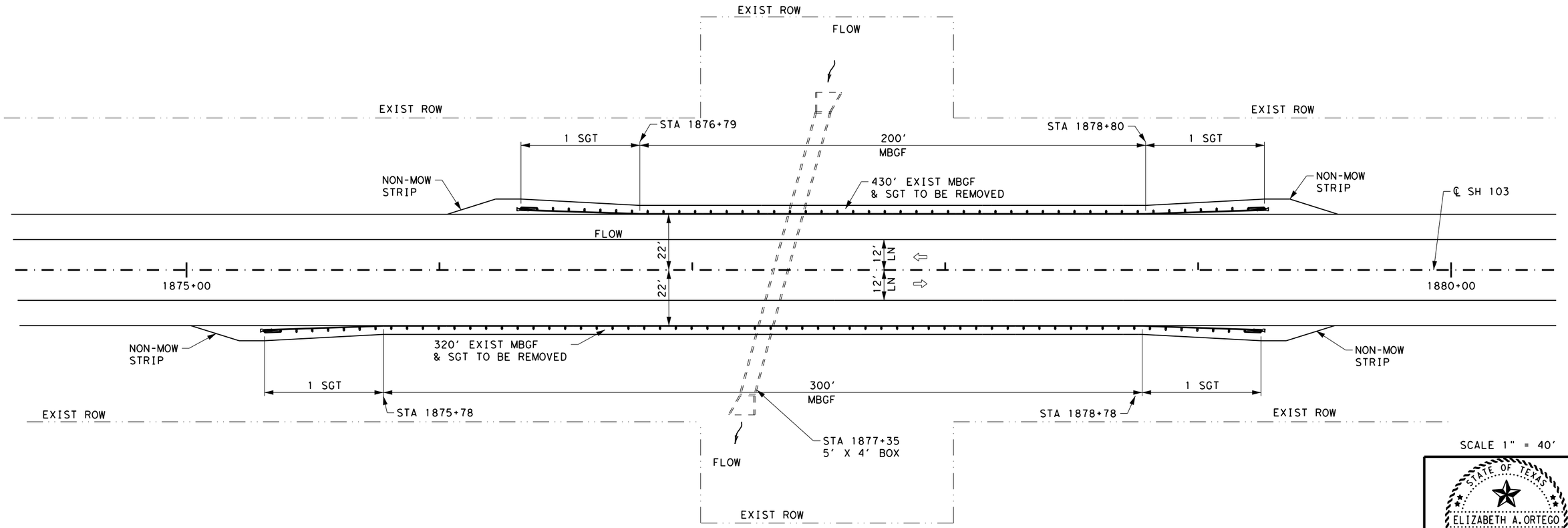

SCALE 1" = 40'

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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 10 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		101

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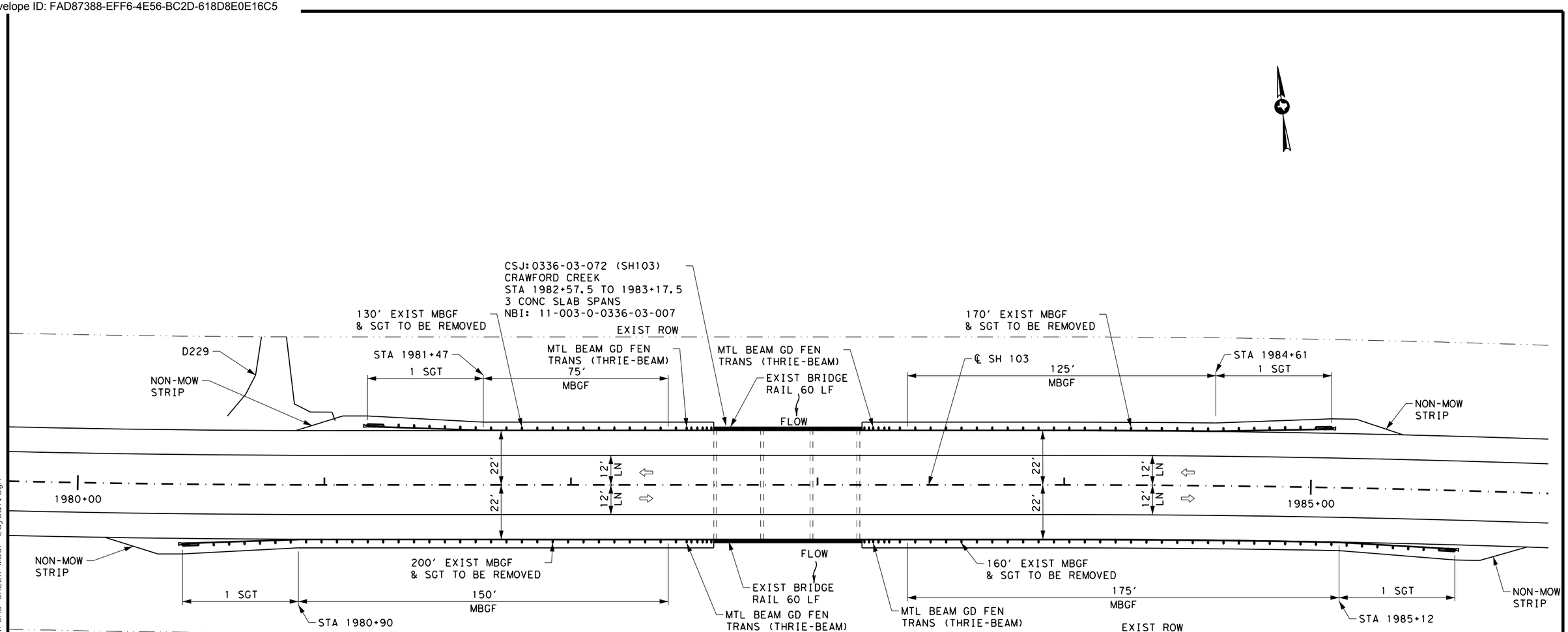

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 11 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		102

3/31/2022 9:05:46 AM
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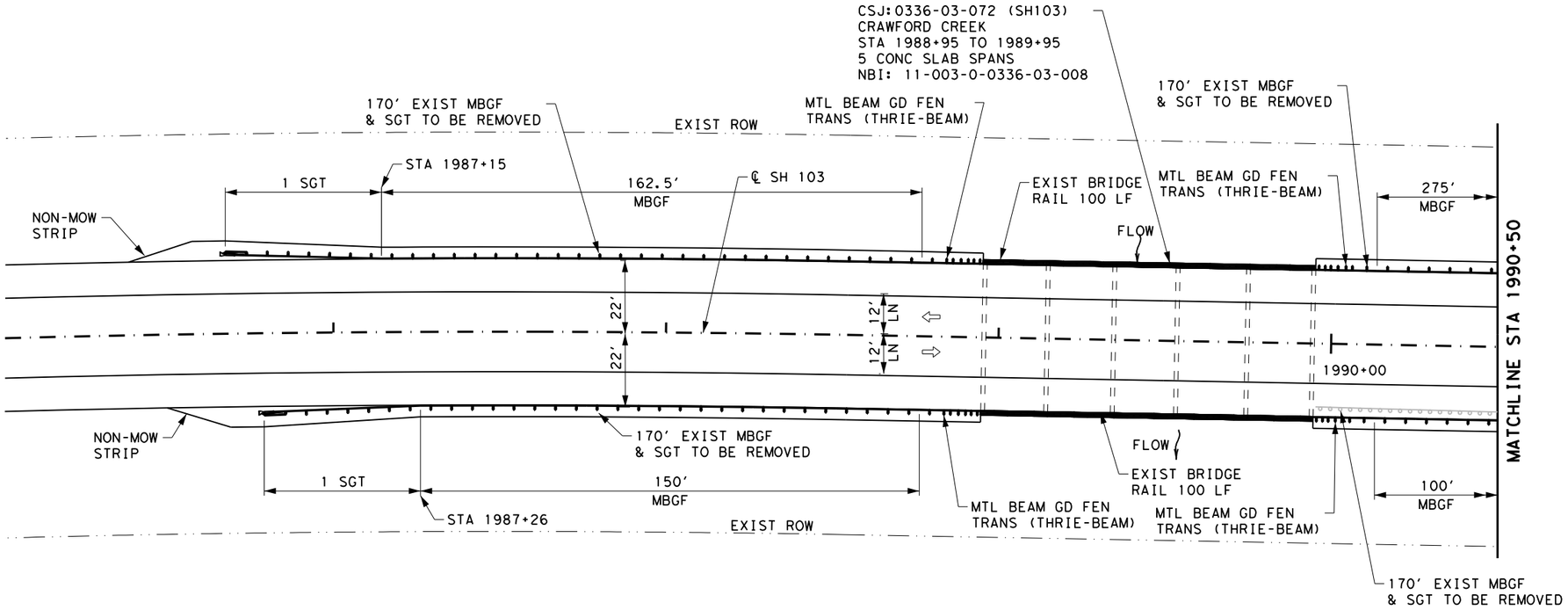

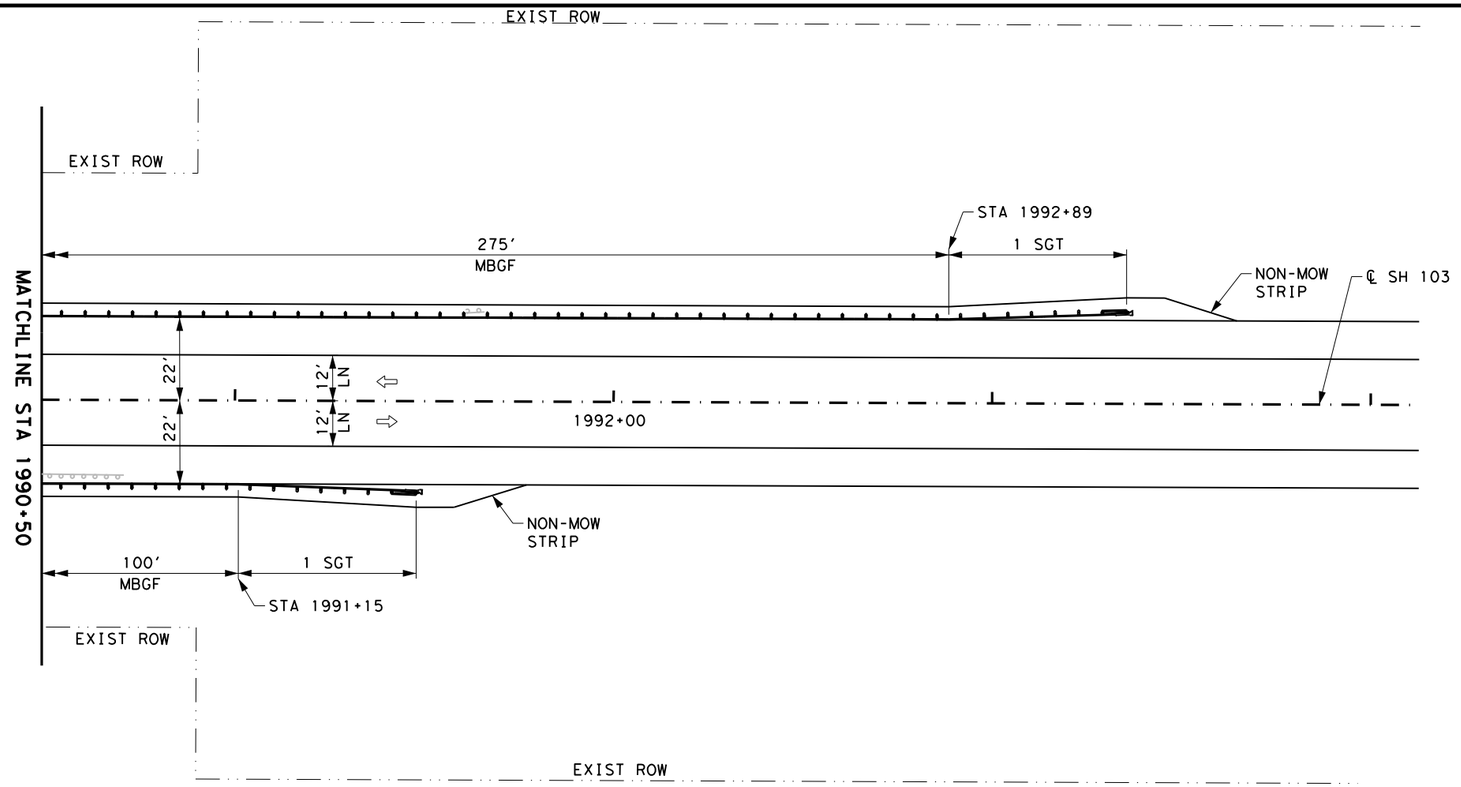

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 12 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		103

3/31/2022 9:05:51 AM
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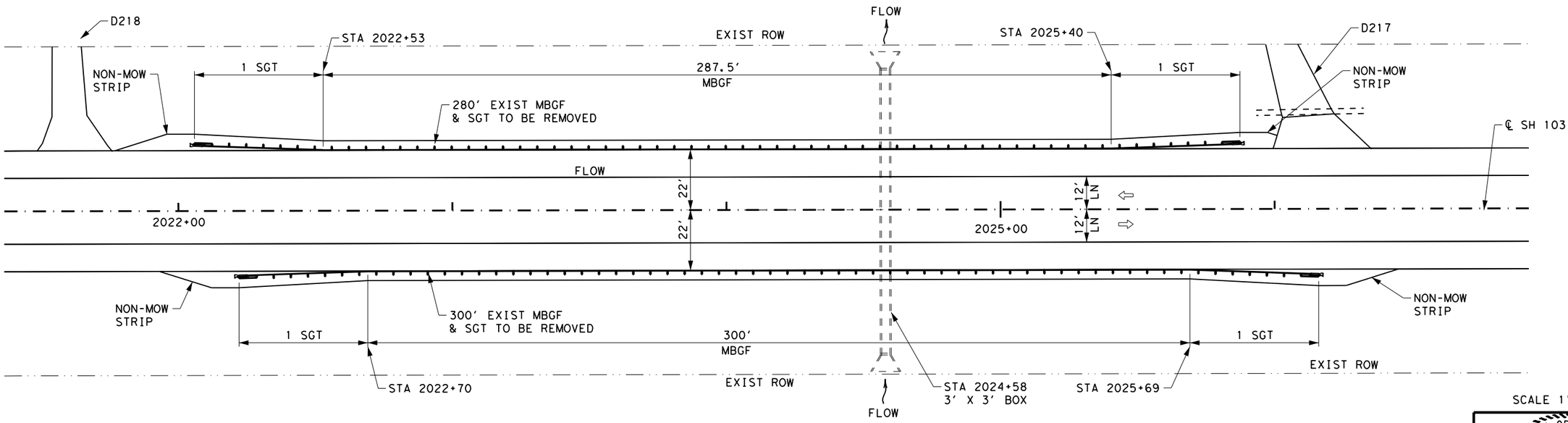

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 13 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		104

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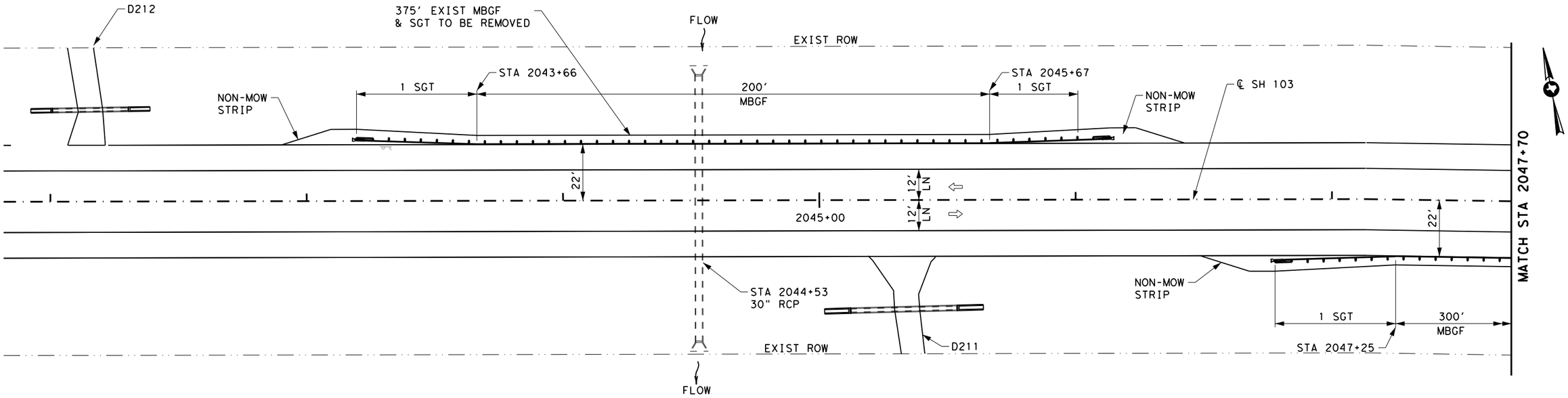

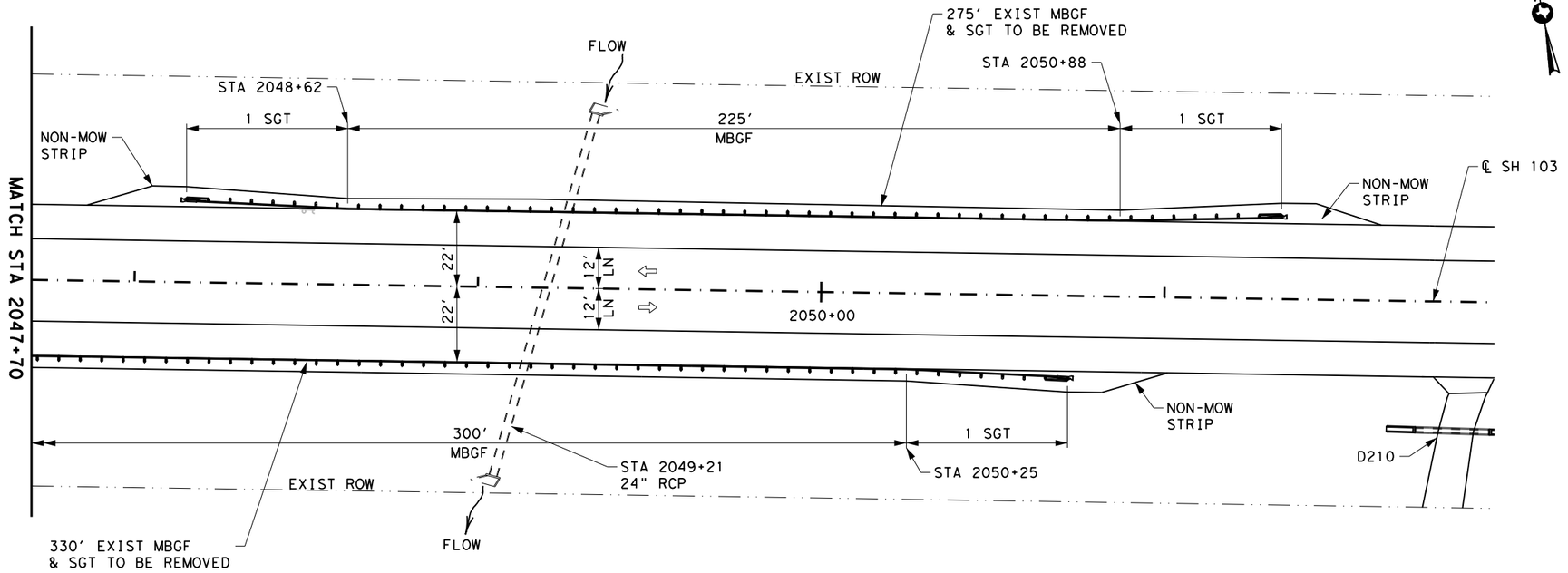

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 14 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		105

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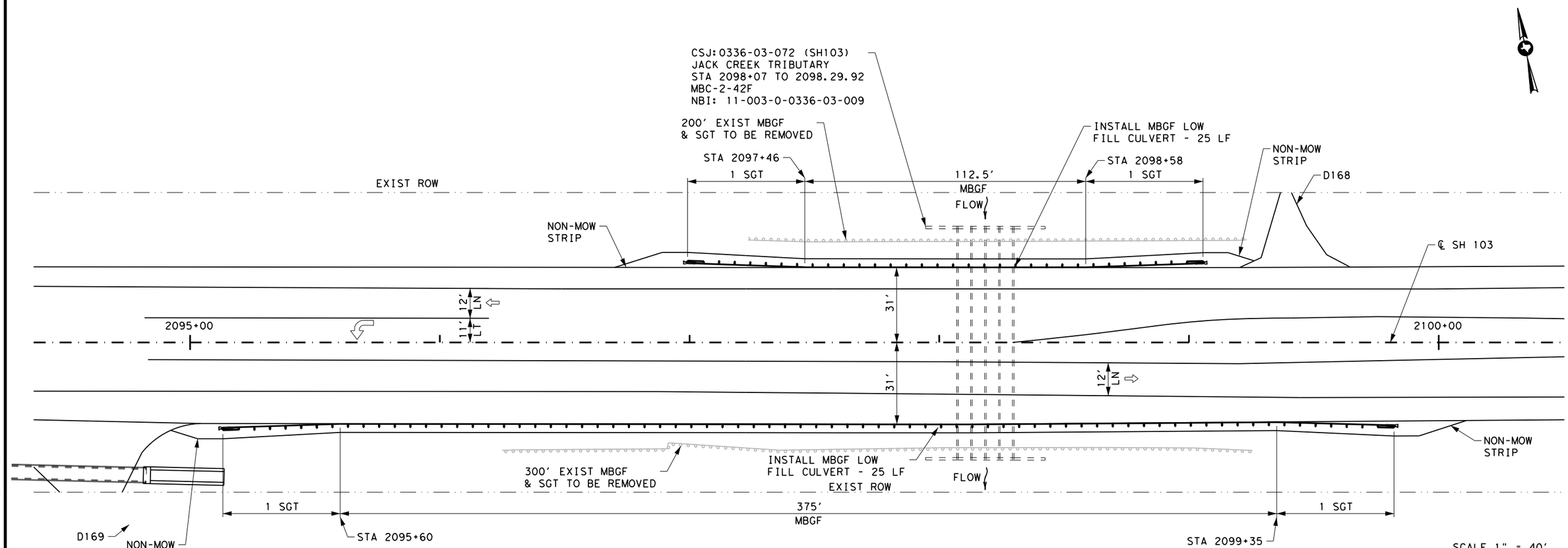

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 15 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		106

3/31/2022 9:06:06 AM
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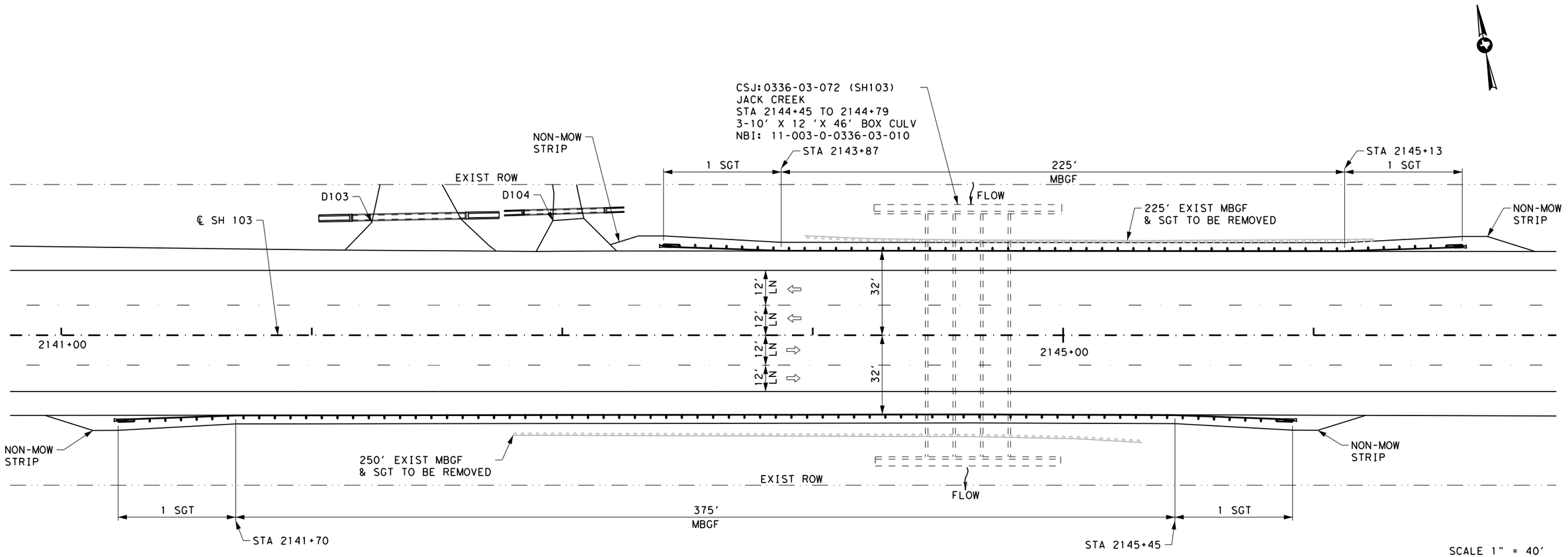

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 16 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		107

3/31/2022 9:06:11 AM
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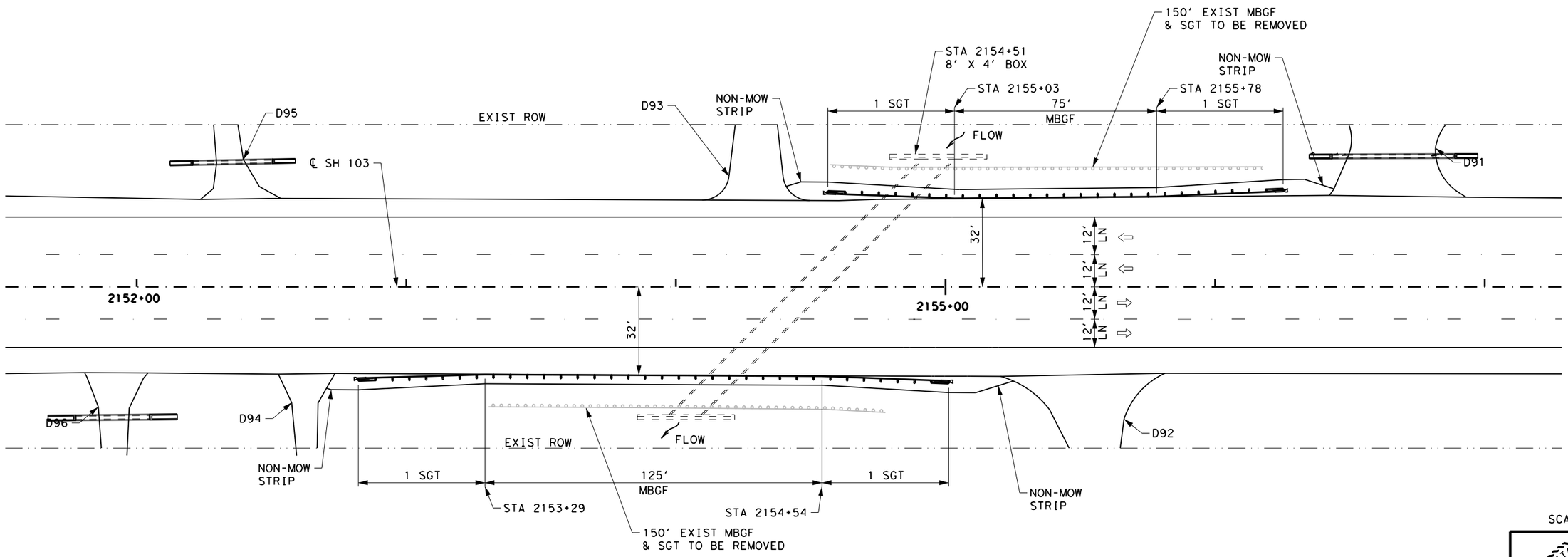

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 17 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		108

3/31/2022 9:06:16 AM
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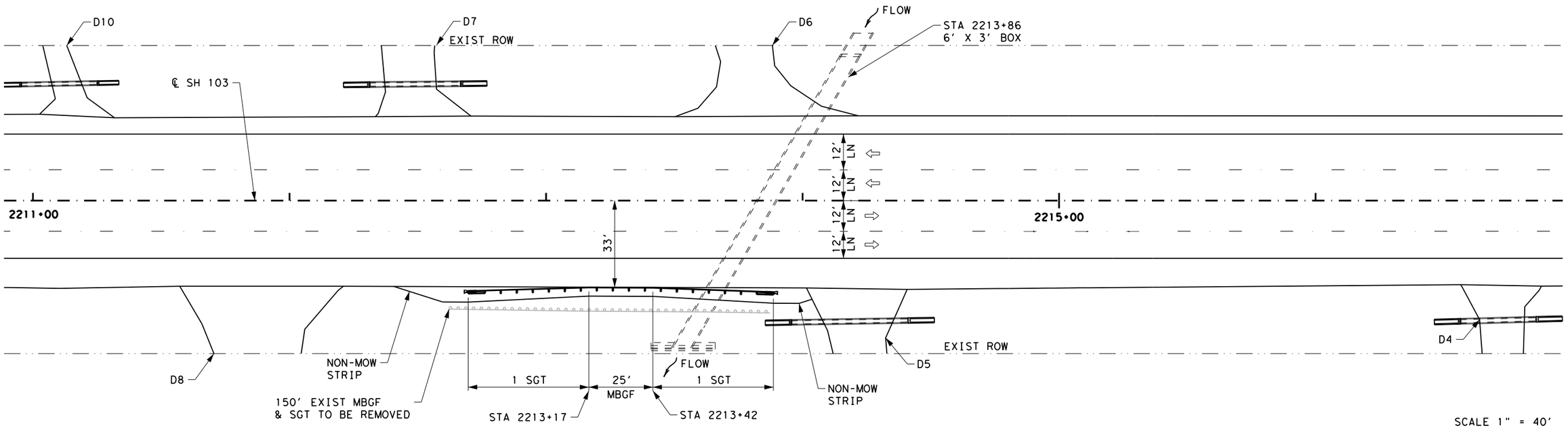

SCALE 1" = 40'

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MBGF LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 18 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		109

3/31/2022 9:06:21 AM
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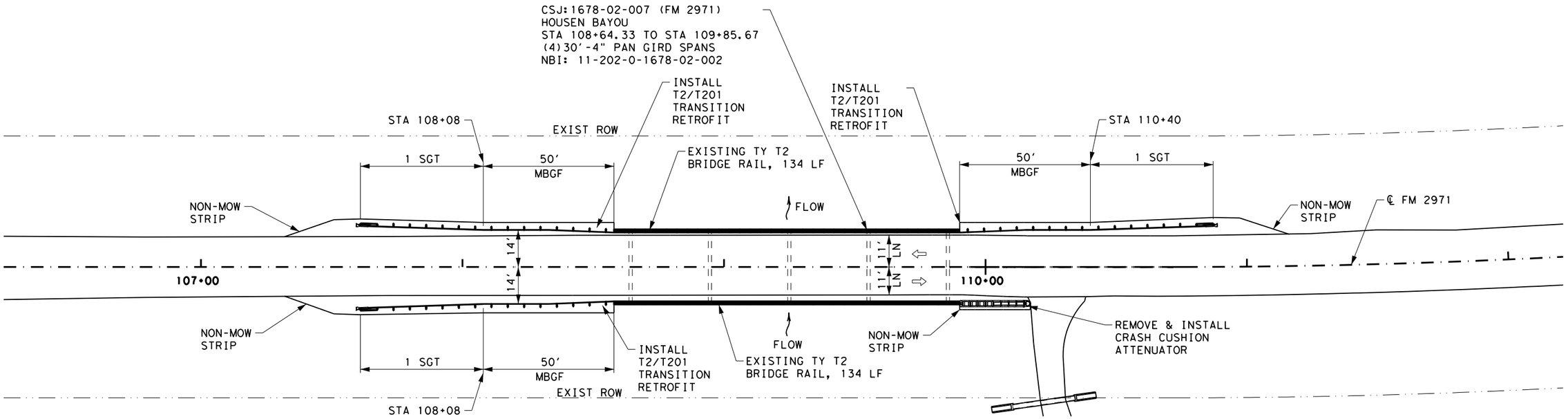

SCALE 1" = 40'

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MBGF LAYOUTS (FM 2971)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 19 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		110

3/31/2022 9:06:27 AM
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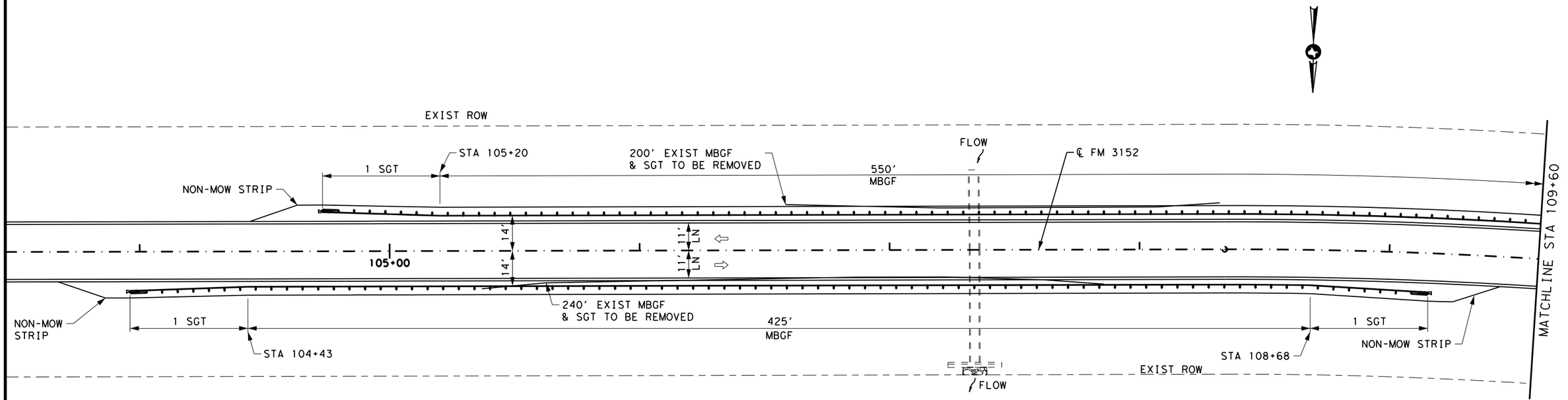

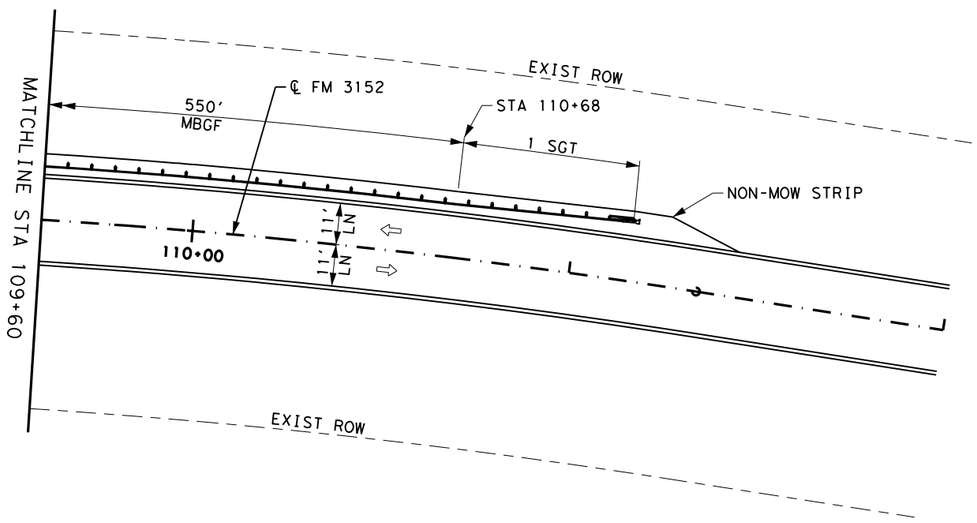

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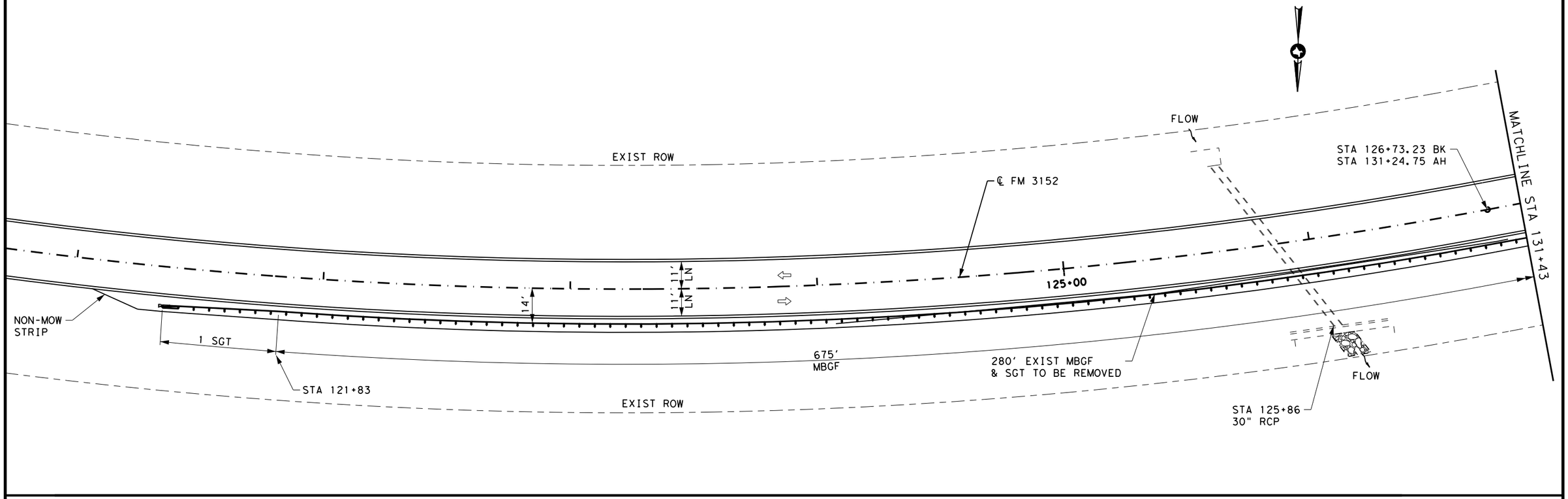
MBGF LAYOUTS (FM 3152)

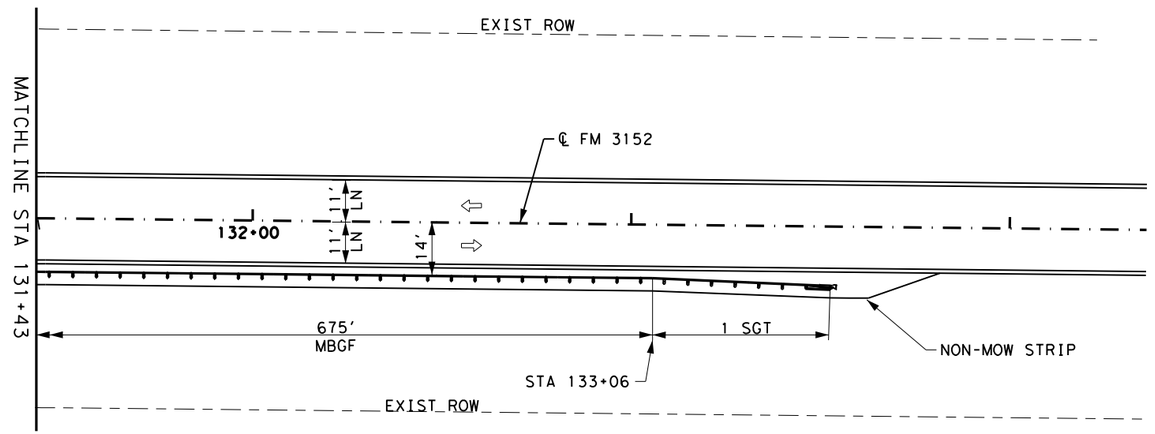
TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 20 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		111

3/31/2022 9:06:32 AM
c:\txdot\pw*online\txdot3\adrian.guerrero\d0466167\FM3152*Sta*107+34*MBGF*Layout*.dgn





SCALE 1" = 40'

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MBGF LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 21 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		112

3/31/2022 9:06:37 AM
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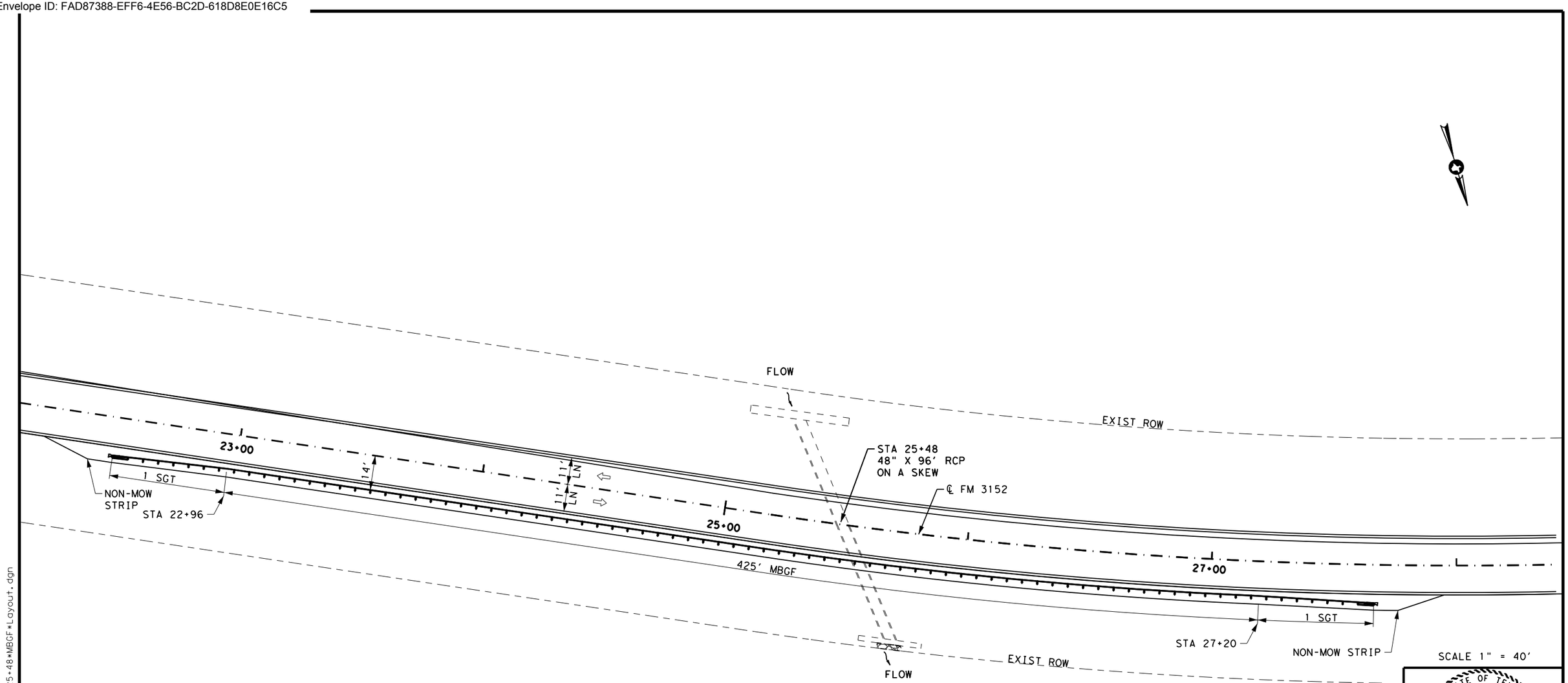

SCALE 1" = 40'

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MBGF LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 22 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		113

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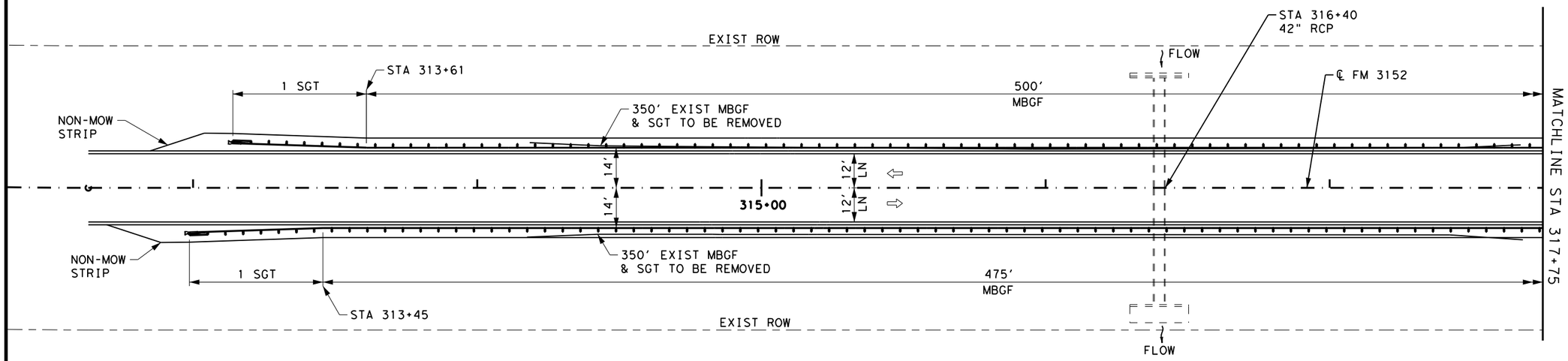

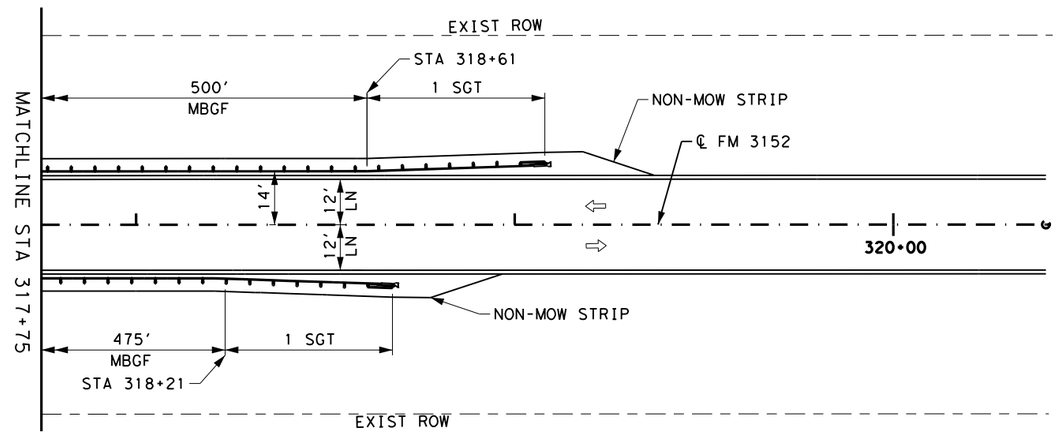

SCALE 1" = 40'

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7151F446...
3/31/2022

MBGF LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION
©2022
SHEET 23 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		114

3/31/2022 9:06:47 AM
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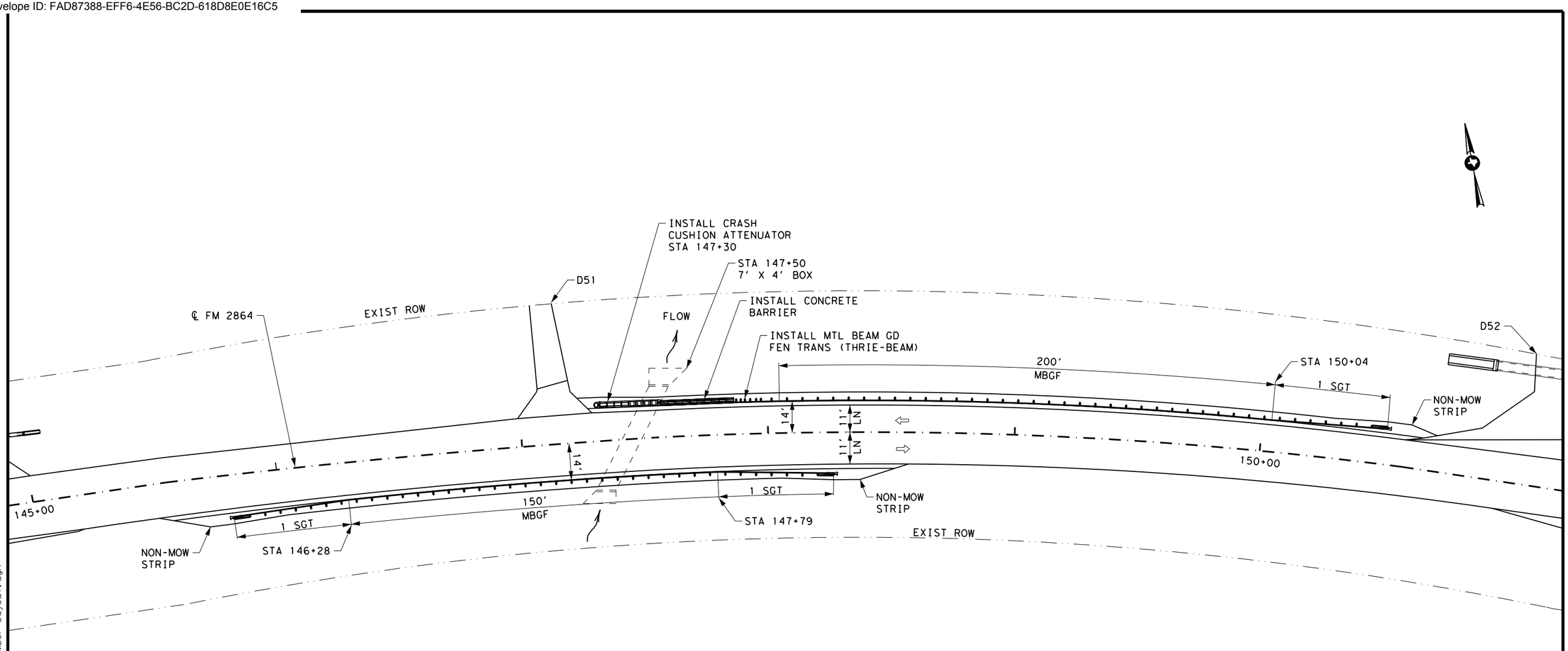

SCALE 1" = 40'

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7151448...
3/31/2022

MBGF LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 24 OF 24

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		115

3/31/2022 9:06:53 AM
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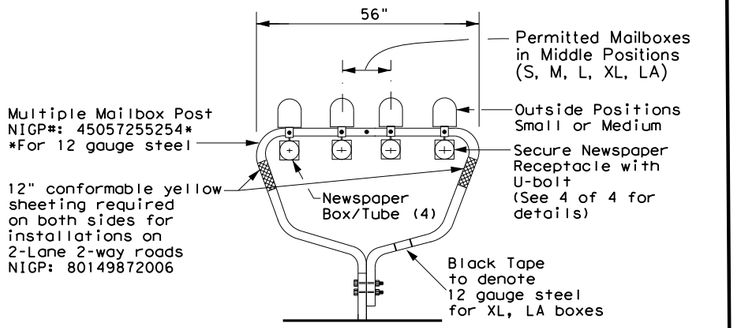
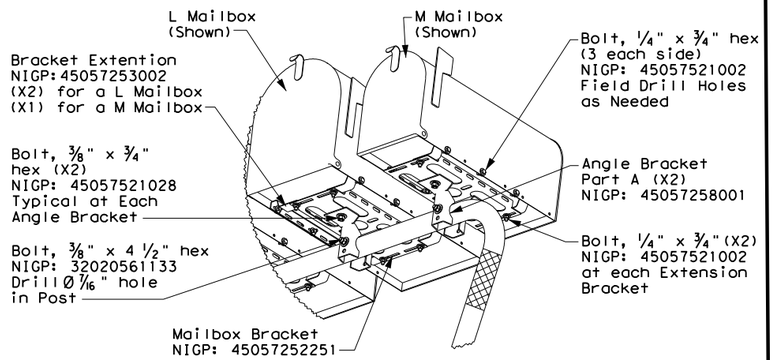
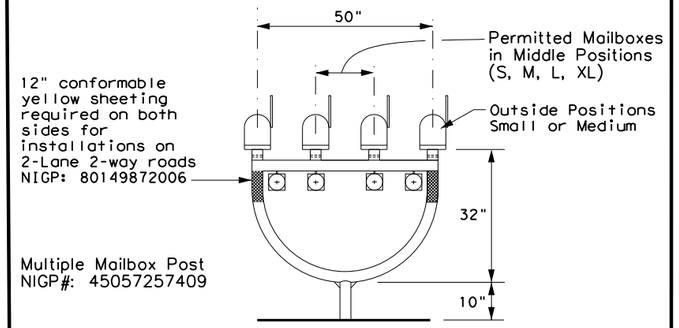
DATE: 03/05/2022 01:58 PM
FILE: DOCUMENT NAME

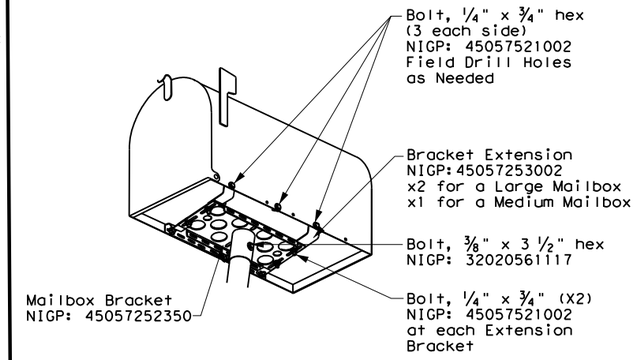
TYPE 1 - MULTIPLE





TYPE 4 - MULTIPLE





MAILBOX SIZES

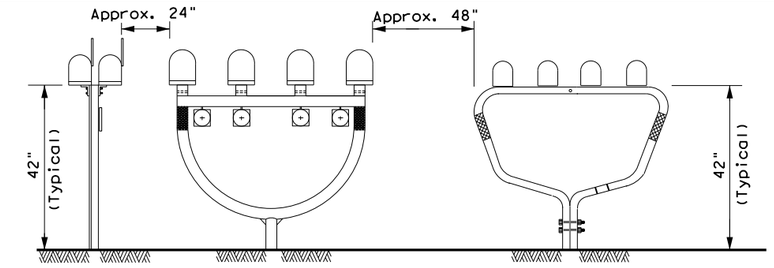
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX **
	LENGTH	WIDTH	HEIGHT	WEIGHT
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

* 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.

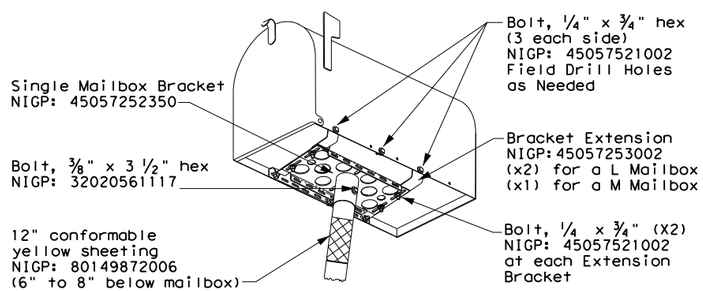
TYPICAL INSTALLATION MEASUREMENTS

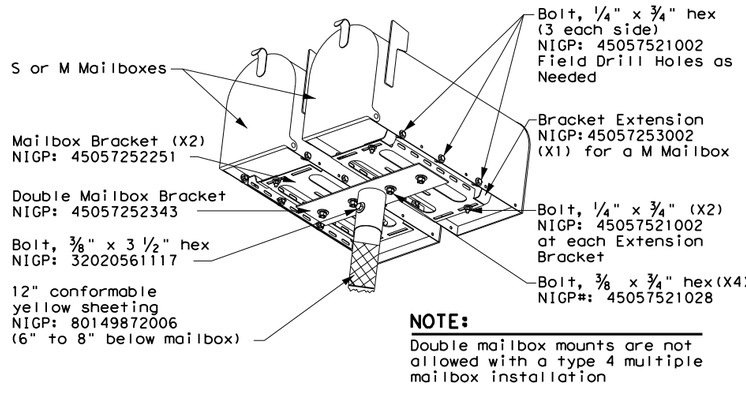


NOTE:

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

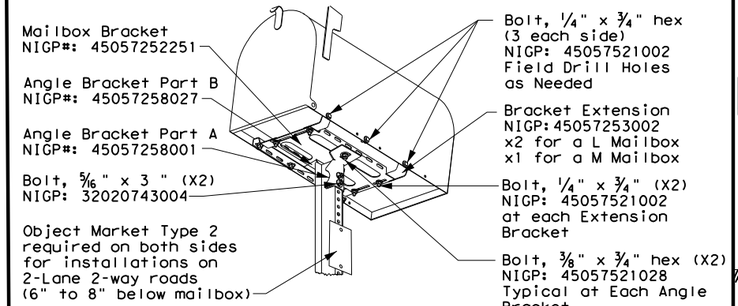


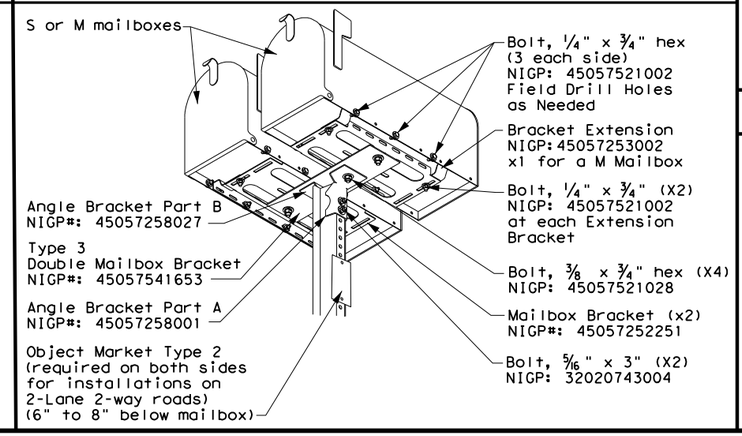


NOTE:

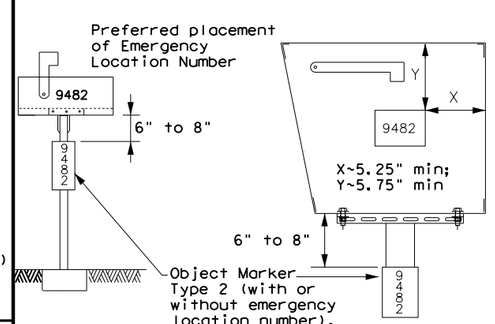
Double mailbox mounts are not allowed with a type 4 multiple mailbox installation

TYPE 3 - SINGLE/DOUBLE





PLACEMENT OF EMERGENCY LOCATION NUMBER

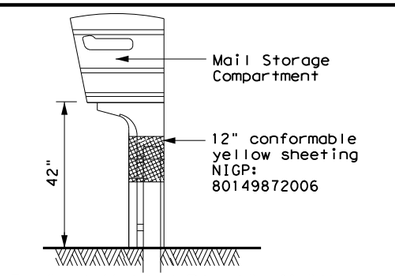


NOTES:

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: TxDOT
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0336	03	072, ETC.	SH 103, ETC
	DIST	COUNTY		SHEET NO.
	LFK	Angelina, etc.		116

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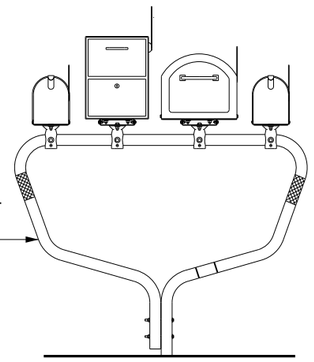
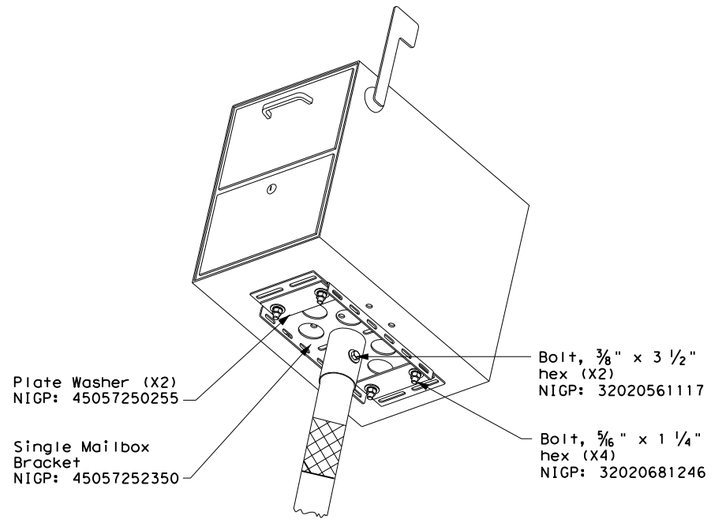
DATE: 03/05/2022 01:58 PM
FILE: DOCUMENT NAME

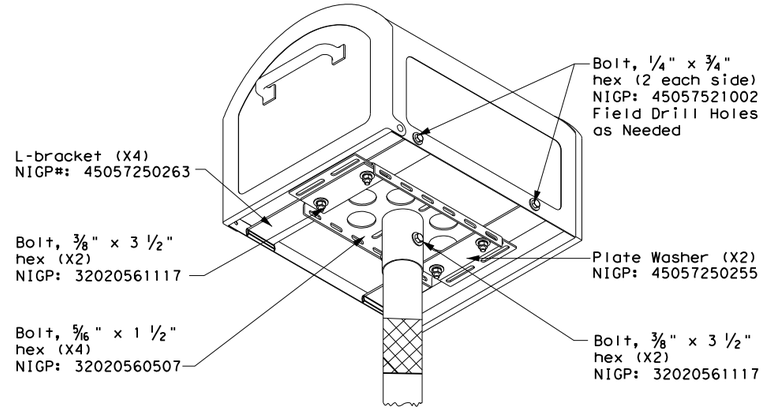
TYPE 1- MULTI LOCKABLE AND XL MAILBOX



TYPE 2/4 - SINGLE LOCKABLE MAILBOX

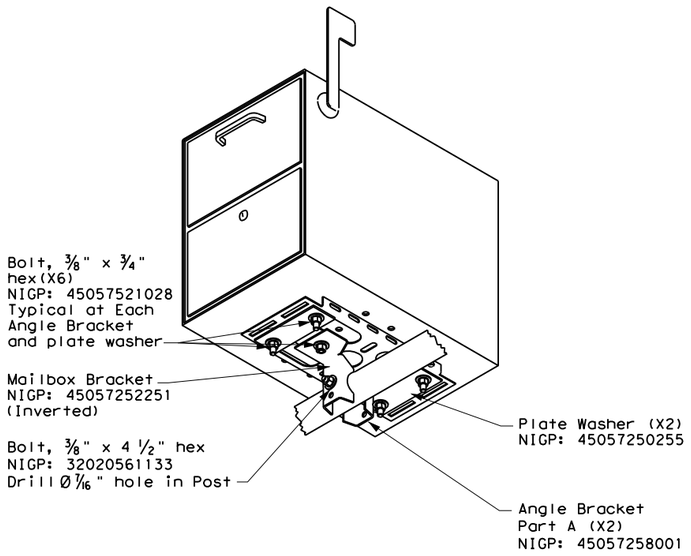


TYPE 2/4 - SINGLE XL MAILBOX

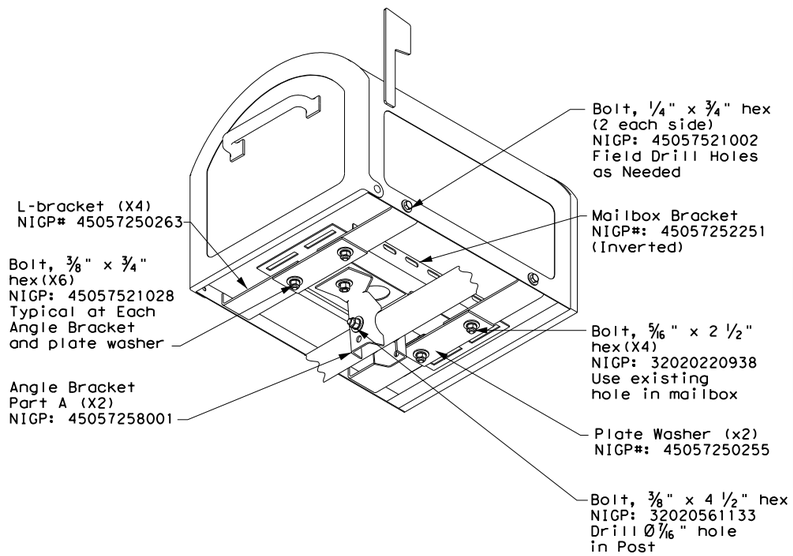


NOTE:
Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

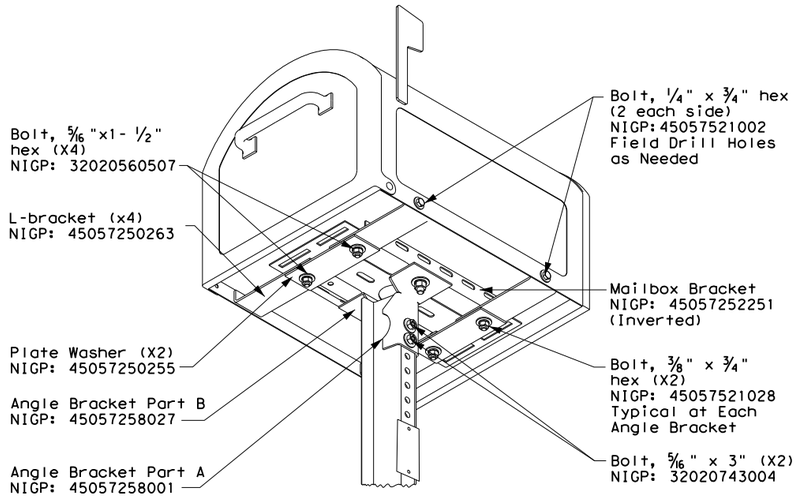
TYPE 1 MULTI – LOCKABLE ARCHITECTURAL (LA)



TYPE 1 MULTI – XL MAILBOX



TYPE 3 - XL MAILBOX MOUNTING



Texas Department of Transportation — Maintenance Division Standard

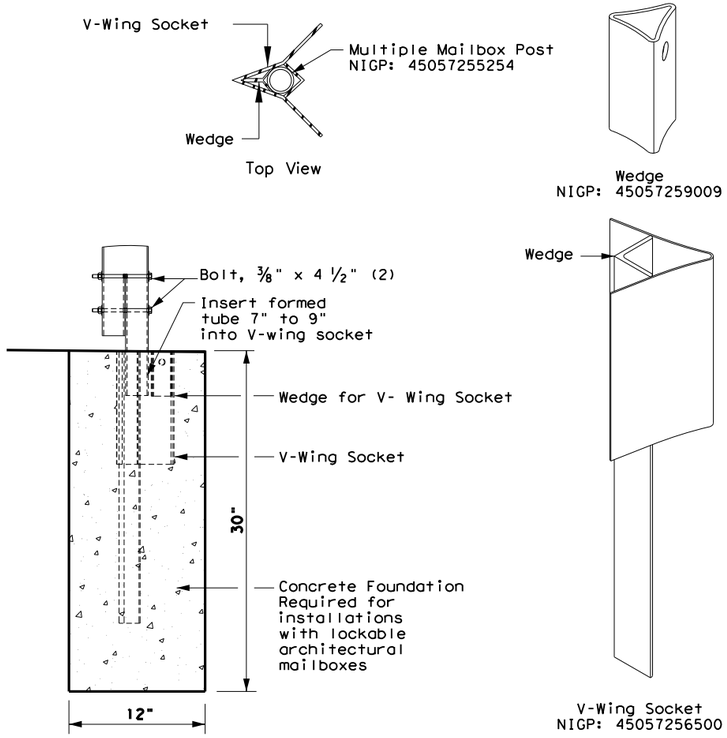
XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY

MB(2)-21

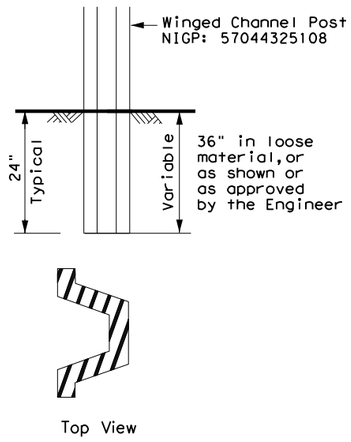
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0336	03	072, ETC.	SH 103, ETC
	DIST	COUNTY		SHEET NO.
	LFK	Angelina, etc.		117

DATE: 04/05/2022 01:58 PM
FILE: DOCUMENT NAME

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



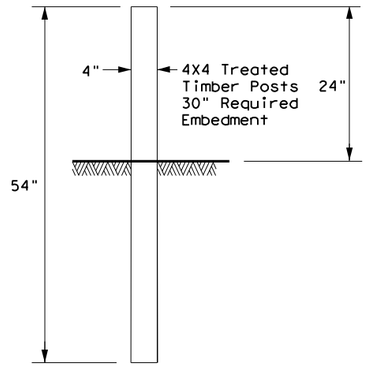
TYPE 3 - SUPPORT/FOUNDATION



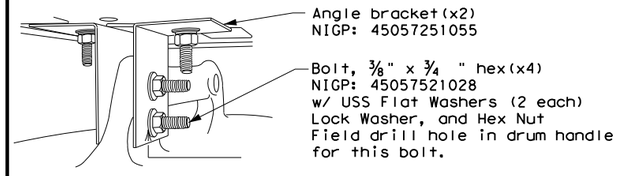
NOTES:

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

TYPE 5 - SUPPORT/FOUNDATION



TYPE 6 - TEMPORARY MAILBOX SUPPORT



Plastic Drum NIGP: 55093383655
Rubber Collar NIGP: 55093387102

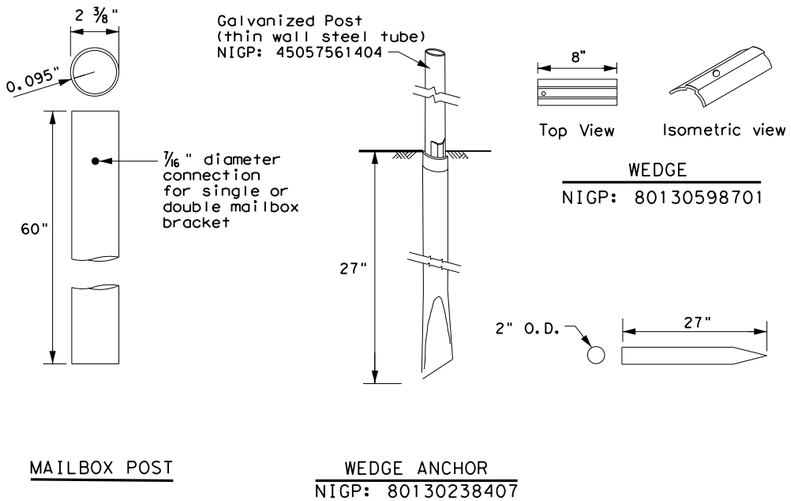
NOTES:

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

GENERAL NOTES:

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

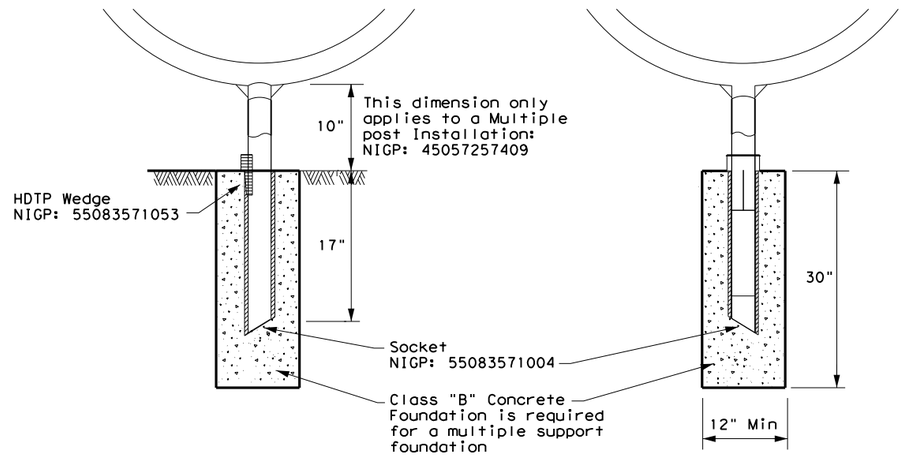
TYPE 2 - SUPPORT/FOUNDATION
Thin Wall Steel Tube w/Wedge Anchor System



MAILBOX POST

WEDGE ANCHOR
NIGP: 80130238407

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



SHEET 3 OF 4

Texas Department of Transportation | Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB(3)-21

FILE: MB-21.dgn	DN:	CK:	DW:	CK:
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0336	03	072, ETC.	SH 103, ETC
	DIST	COUNTY		SHEET NO.
	LFK	Angelina, etc.		118

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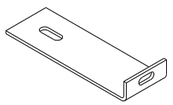
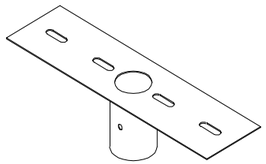
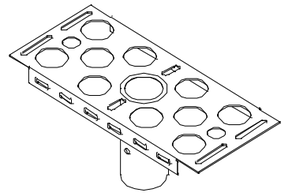
TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4			TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple	Single	Single
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: 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



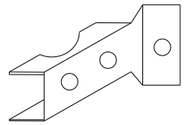
NIGP: 45057250263
L-Bracket x4 for
XL sized mailboxes



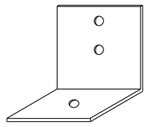
NIGP: 45057252343
Double Mailbox Bracket
For Type 2 and Type 4
double mount



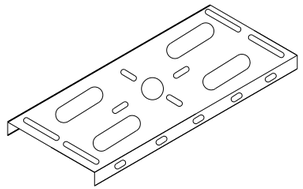
NIGP: 45057252350
Single Mailbox Bracket
For Type 2 single and for
Type 4 single and multi mount



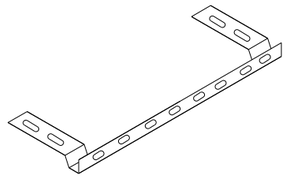
NIGP: 45057258001
Part "A" Angle Bracket
For Type 1 multi (2 per mailbox)
and Type 3 single and double



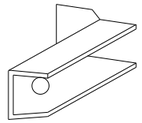
NIGP: 45057251055
Type 6 Angle Bracket
(2 per mailbox)



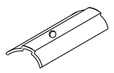
NIGP: 45057252251
Mailbox Bracket
For Type 1 multi and
any double mount (use 2)



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



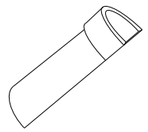
NIGP: 45057258027
Part "B" Angle Bracket
For Type 3 single
and double



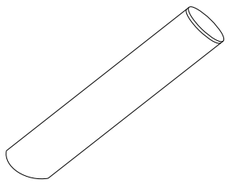
NIGP: 80130598701
Wedge for Type 2

NIGP: 45057250255
Plate Washer for Architecural
and XL Mailboxes

NIGP: 45057541653
Type 3 double mailbox bracket

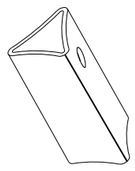


NIGP: 55083571053
Type 4 Mailbox Wedge

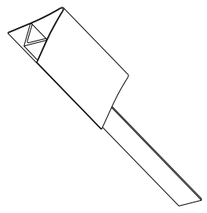


NIGP: 55083571004
Type 4 Mailbox Socket

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

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0336	03	072, ETC.	SH 103, ETC
	DIST	COUNTY		SHEET NO.
	LFK	Angelina, etc.		119

DATE: 03/05/2022 01:58 PM
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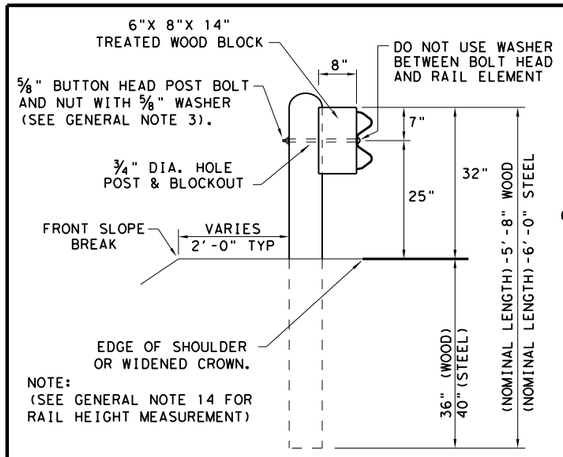
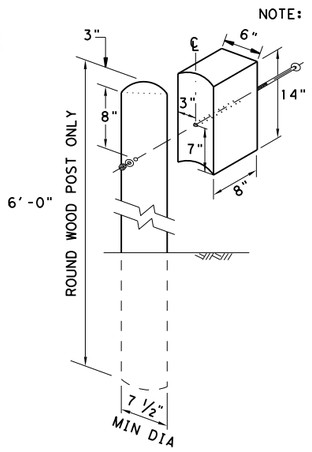
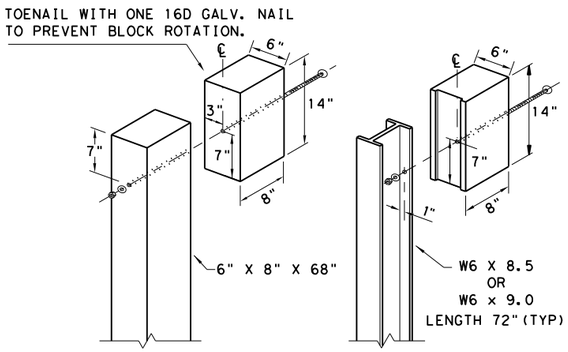
DATE: 3/30/2022
FILE: c:\txdot\pw_online\txdot3\adrian.guerrero\d0466903\gf3119.dgn



TYPICAL POST PLACEMENT



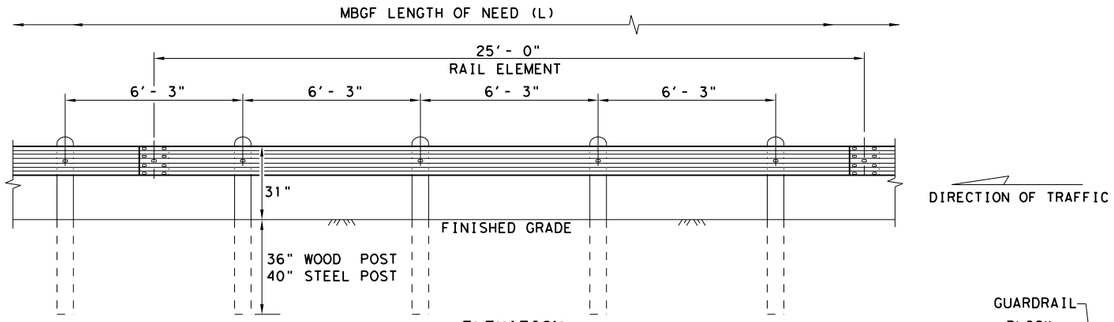
WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST

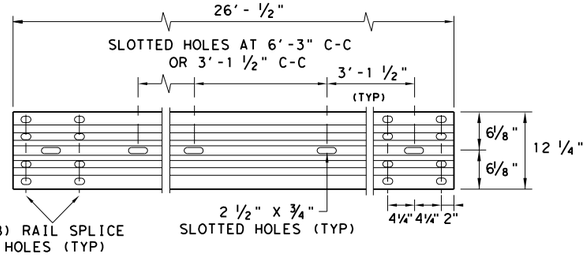
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



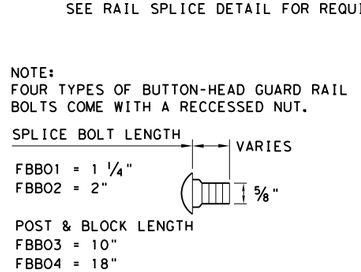
ELEVATION
MID-SPAN RAIL SPLICE

SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



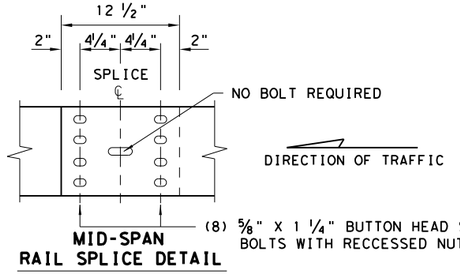
ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.



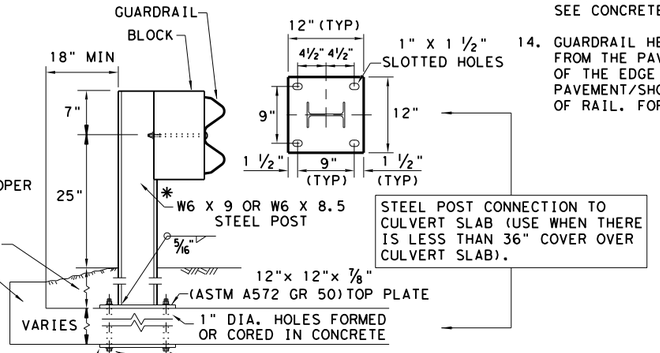
BUTTON HEAD BOLT

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. ⅞" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 ¼" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE ⅞" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS ¼" MIN. BEYOND NUT.

NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 ½" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		120

DATE: 3/30/2022
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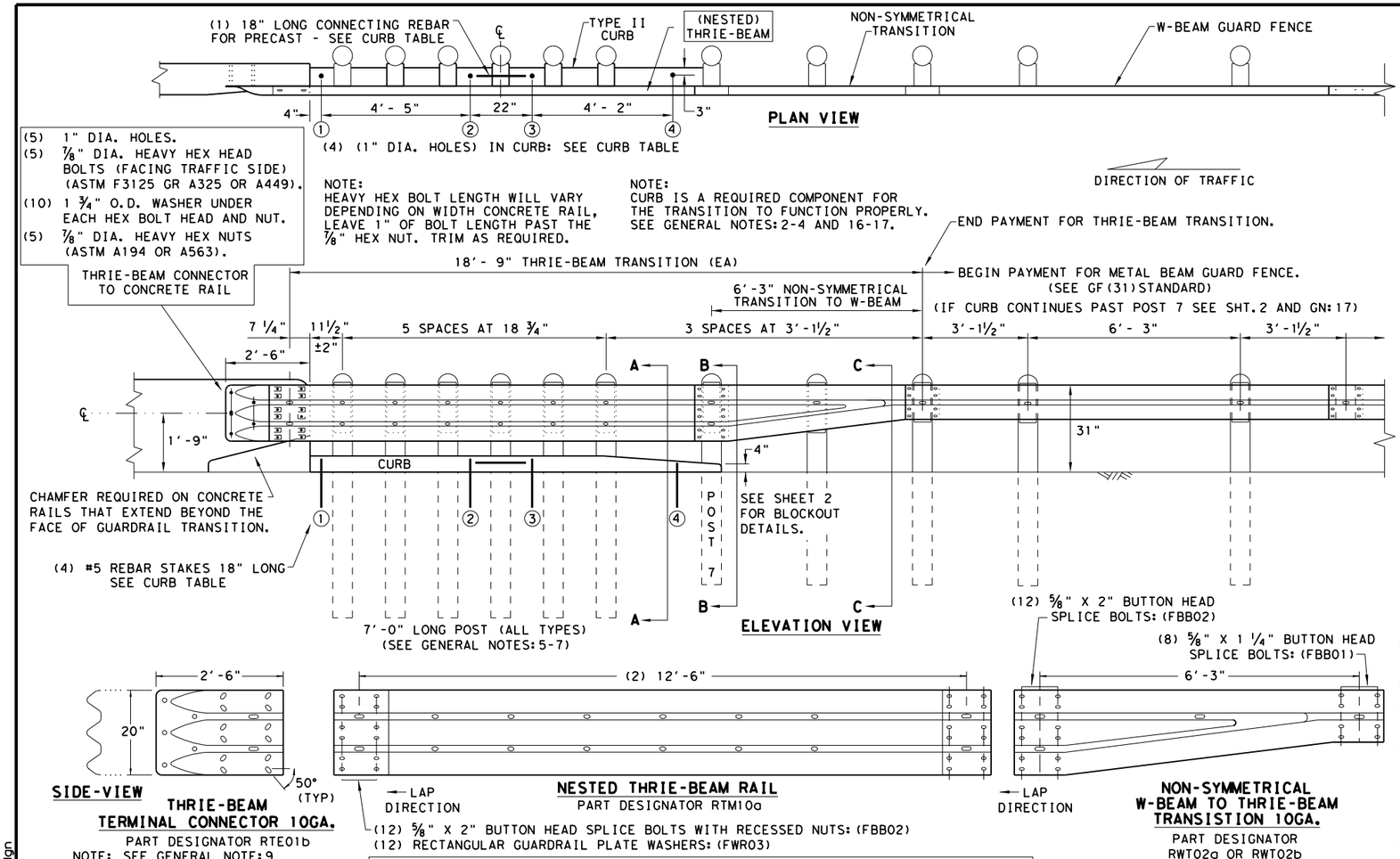


GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- 3/4" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 1/2" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST 5/8" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED)(TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED)(STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

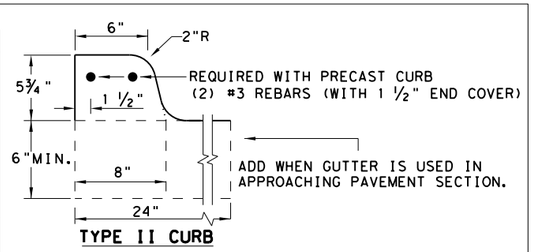
THRIE-BEAM TERMINAL - CURB TABLE

PRECAST CURB FULL LENGTH EQUALS 12'- 2"
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.

CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7

CONNECTING PRECAST CURB SECTIONS (1) & (2):
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END.
USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.

SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND 1/2" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.



TYPE II CURB

NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

* NOTES: NOT NEEDED FOR CAST-IN-PLACE.
SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS.
PERCUSSION DRILLING IS NOT PERMITTED WITH:
TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.

TYPE II CURB DETAILS

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

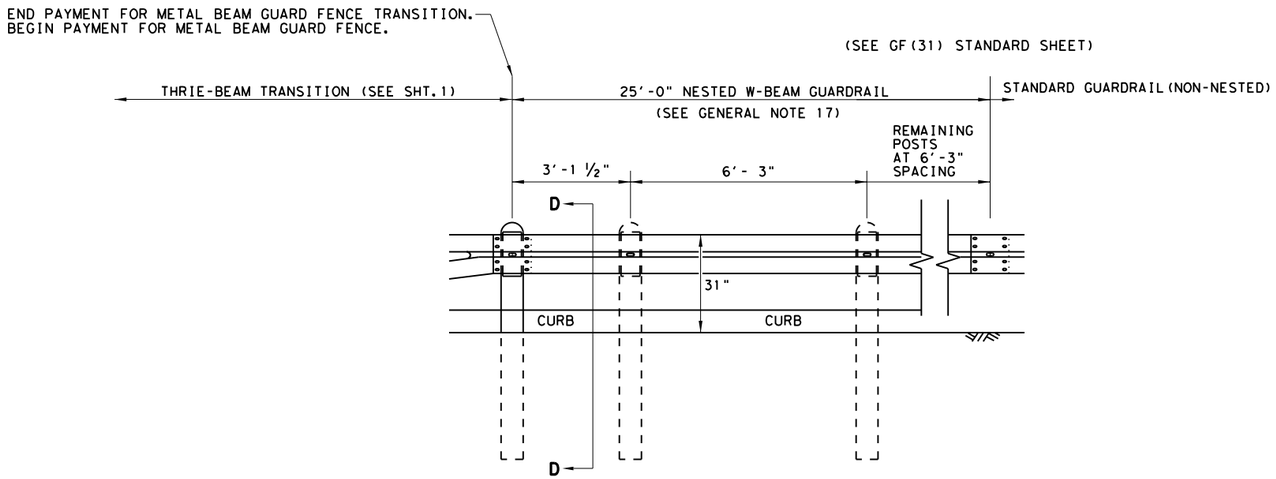
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

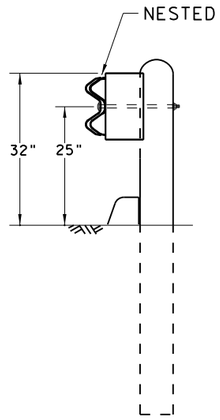
FILE: gf31tr-tl320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0336	03	072,ETC	SH 103,ETC	
	DIST	COUNTY		SHEET NO.	
	LFK	ANGELINA, ETC		121	

DATE: 3/30/2022
FILE: c:\txdot\pw_online\txdot3\adrian.guerrero\d0466903\gf31trt1320.dgn

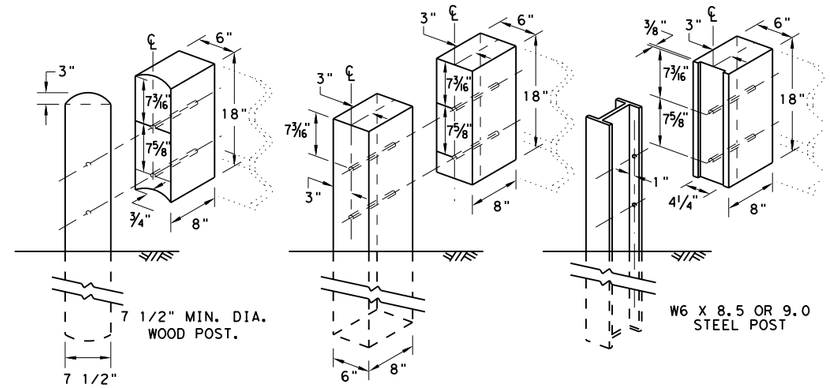
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG		
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY		
REVISIONS	0336	03	072,ETC	SH 103,ETC		
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	LFK	ANGELINA, ETC		122		

DATE: 3/30/2022
FILE: c:\txdot\pw_online\txdot3\adrian.guerrero\d0466903\sgt11s3118.dgn

(SEE GN NOTE 15)
STANDARD 31" MBGF

ITEM (6)
INNER SIDE SLIDER
(ISS) PANEL FOR RAIL 3

FIELD-SIDE
(RAIL 3)

NOTE:
RECESSED HEX NUTS FACING
TRAFFIC-SIDE **SEE DETAIL (C)**

REFERENCE LINE USED TO INSTALL
LINE POST(9) THRU POST(2)

POST 1 OFFSET DISTANCE MEASURED
7-⅝" FROM REFERENCE LINE

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2

RAIL 4 | RAIL 3 | RAIL 2 | RAIL 1

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

NO BLOCKOUT
AT (POST 1)

CABLES

ITEM (5)
TRAFFIC SIDE SLIDER
(TSS) PANEL FOR RAIL 2

NOTE: SECURE THE (TSS) PANEL TO OUTSIDE
OF RAIL 2 WITH THE PANEL ARROWS
POINTING TOWARDS THE HEAD.

NOTES:
1. ITEM (12) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST(9) THRU LINE POST(2).
2. DO NOT INSTALL A BLOCKOUT AT LINE POST(1).

PLAN VIEW

MBGF
RAIL 2

INSTALL GUARD FENCE RECESSED
HEX NUTS ON TRAFFIC-SIDE

MBGF
RAIL 1

DETAIL (C)

TRAFFIC FLOW

END PAYMENT (SGT) BY EACH

DO NOT BOLT
RAIL TO POST 6

BEGIN LENGTH OF NEED

INSTALLATION LENGTH 55'- ½"

49'-8 9/16"

6'-3" | 6'-3" | 6'-3" | 6'- ¾" | 6'-3" | 6'-3" | 6'-3" | 37 ½" | 5'-3 11/16"

ITEM (25)
MAX-TENSION HEAD
SEE DETAIL (A)

RAIL
HEIGHT
31"

ITEM (13) RAIL 4 | ITEM (13) RAIL 3 | ITEM (13) RAIL 2 | ITEM (13) RAIL 1

ARROWS

DETAIL (D)

RAIL
HEIGHT
31"

HEAD
HEIGHT

DETAIL (B)

A

32-¼"

68-⅛"

FINISHED
GRADE

CABLES

FINISHED
GRADE

ITEM (10)
CABLE
ASSEMBLY

ITEM (2)
GROUNDSTRUT

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2 | POST 1

ITEM (4)
I-BEAM
W6 X 9

NO BLOCKOUT
AT (POST 1)

SOIL
ANCHOR POST
ITEM (1)

(8) X-LITE LINE POST - ITEM (11)

ELEVATION VIEW

A

TSS PANEL
GALVANIZED
ITEM (5)

RSS PLATE
GALVANIZED
ITEM (8)

INSTALL THE TSS AND RSS
WITH THE ARROWS POINTING
TOWARDS THE MAX-HEAD

TSS PANEL AND RSS PLATE

DETAIL (D)

HEAD
HEIGHT
32-¼"

TOP OF POST

31-⅞"

FINISHED
GRADE

40-⅛"

68-⅛"
ANCHOR POST
DEPTH

ITEM (1)
ANCHOR

ITEM (11)
LINE POSTS
2 THRU 9
(NOTE: ITEM (4) POST 1 (NOT SHOWN),
TO BE INSTALLED AT SAME DEPTH
AS LINE POSTS.)

SOIL ANCHOR, POST 1
& LINE POST 2 THRU 9

SECTION VIEW A-A

NOTE:
USE THE MASH APPROVED
X-TENSION CABLE ASSEMBLY.

7 5/16"

2 ⅛"

UPPER CABLE
(BACK SIDE)

LOWER CABLE
(TRAFFIC SIDE)

DETAIL (B)

CABLE
FRICTION PLATE
HEAD UNIT
ITEM (9)

NOTE:
INSTALL ⅝" RECESSED HEX
NUTS ON TRAFFIC SIDE.

ITEM (24)
ITEM (21)

ITEM (20)
8X

ITEM (17)
8X

ITEM (23)
6X
3 SCREWS
EACH SIDE

(RAIL 1)

ITEM (22)
BRACKET
SHIPPED FLAT

ITEM (3)

ITEM (16)
4X

* ITEM (25)
HIGH INTENSITY
REFLECTIVE SHEETING

NOTE: DELINEATION MARKER IN
ACCORDANCE WITH TEXAS MUTCD.

SPLICE FOR IMPACT-HEAD
TO GUARD FENCE (RAIL1)

DETAIL (A)

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD
MBGF

2'-0"

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX.
RAIL OFFSET

APPROACH GRADING
(1V:10H OR FLATTER)
SEE PRODUCT ASSEMBLY MANUAL
FOR ADDITIONAL GUIDANCE.

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT
USED FOR ALL TANGENT TYPE END TREATMENTS.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURE'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST(MPL)FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	⅝" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	¾" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	⅝" X 1 ¼" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	⅝" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	⅝" WASHER F436 STRUCTURAL MGAL	2
20	4001116	⅝" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	⅝" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	¼" X ¾" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
* 25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
** 26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
** 27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

** ALTERNATIVE ITEMS NOT SHOWN.
ITEM(26) 8" WOOD-BLOCKOUTS
ITEM(27) 25'GUARD FENCE PANELS

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

MAX-TENSION END TERMINAL
MASH - TL-3
SGT(11S)31-18

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		123

DATE: 3/30/2022
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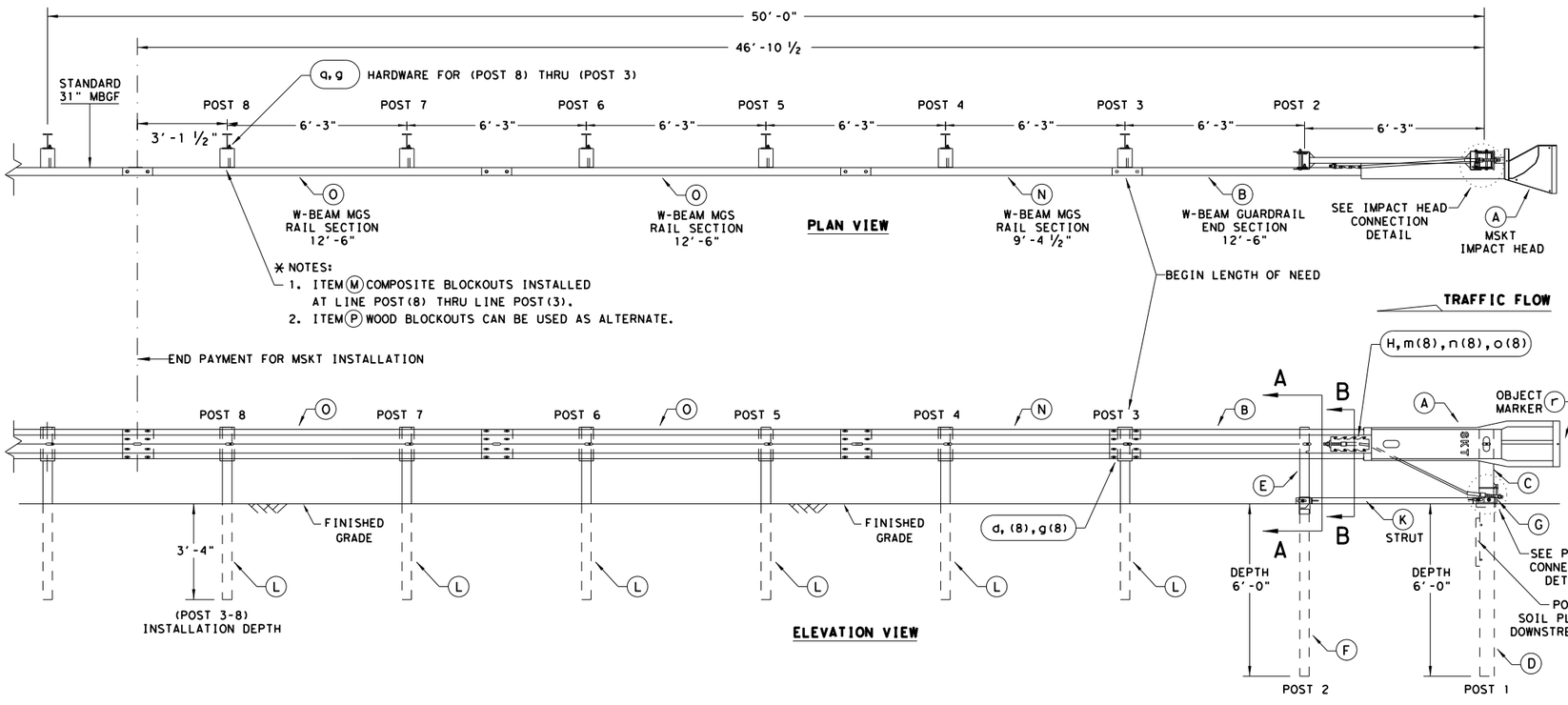
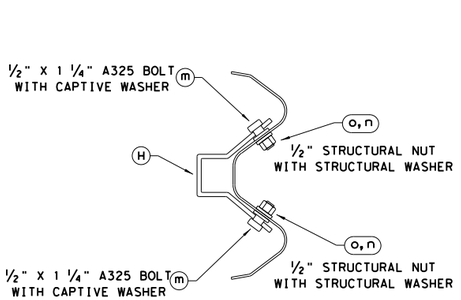
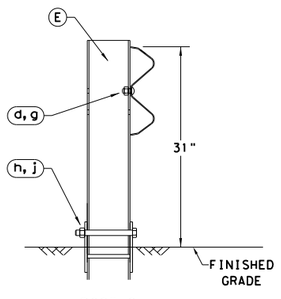


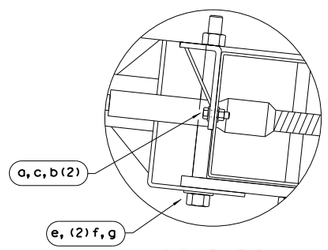
NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.



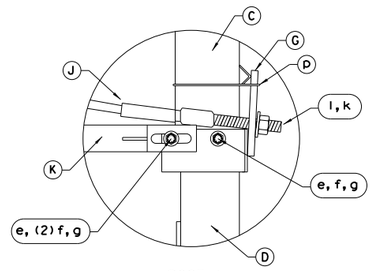
SECTION B-B
ANCHOR BRACKET



POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL

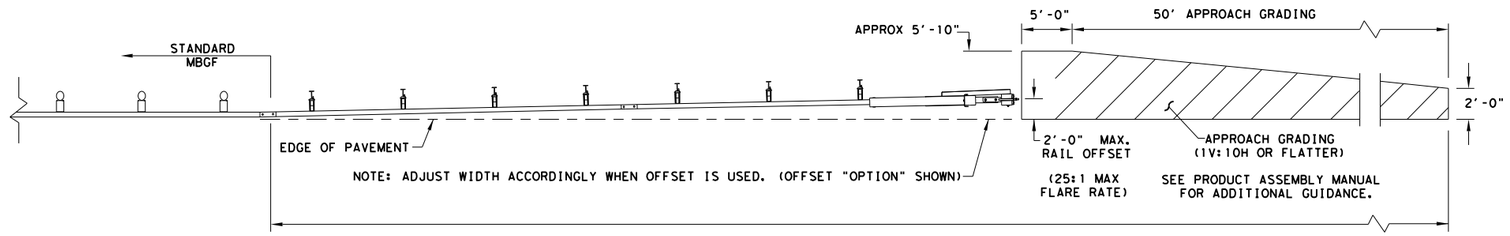
GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
7. A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
13. THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
14. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

SEE NOTES: *

ALTERNATIVE ITEMS NOT SHOWN. **
* ITEM(P) 8" WOOD-BLOCKOUT
** ITEM(Q) 25'GUARD FENCE PANEL

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X ⅛" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 ½")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
		SMALL HARDWARE	
a	2	⅝" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	⅝" WASHER	W0516
c	2	⅝" HEX NUT	N0516
d	25	⅝" Dia. x 1 ¼" SPLICE BOLT (POST 2)	B580122
e	2	⅝" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	⅝" WASHER	W050
g	33	⅝" Dia. H.G.R NUT	N050
h	1	¾" Dia. x 8 ½" HEX BOLT (GRD A449)	B340854A
j	1	¾" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	½" x 1 ¼" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	½" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 9/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	⅝" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL
MSKT-MASH-TL-3
SGT(12S)31-18

FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL		
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY		
REVISIONS	0336	03	072, ETC	SH 103, ETC		
	DIST	COUNTY		SHEET NO.		
	LFK	ANGELINA, ETC		124		

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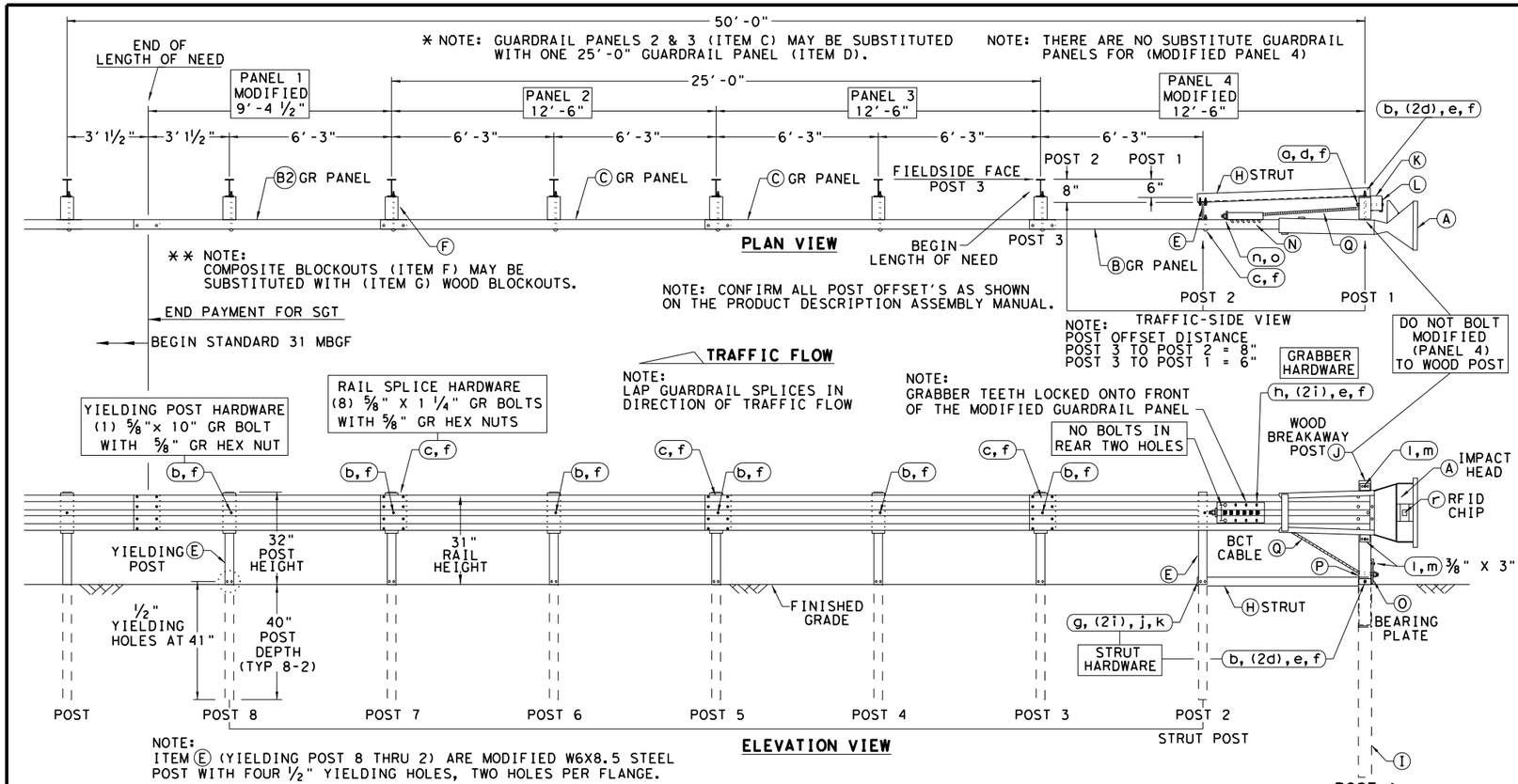
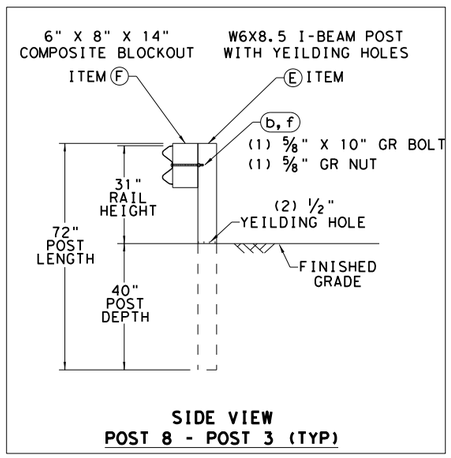


GENERAL NOTES

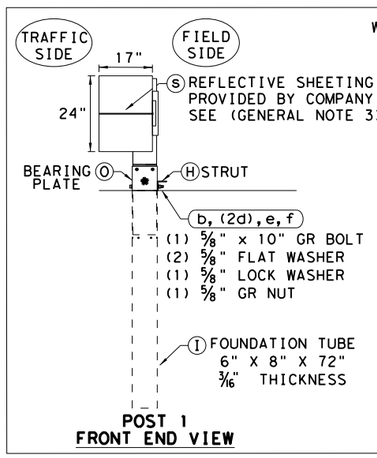
1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
3. MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
5. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
6. (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
7. POSTS SHALL NOT BE SET IN CONCRETE.
8. IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
9. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
10. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
11. THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE OFFSET BY TWO FEET AS SHOWN ON THE APPROACH GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G	6	WOOD BLOCKOUT 6" X 8" X 14"	WBO8
H	1	STRUT 3" X 3" X 80" x 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" x 3/16"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" x 7 1/2" x 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81
		SMALL HARDWARE	
a	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPLICE BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563DH HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M

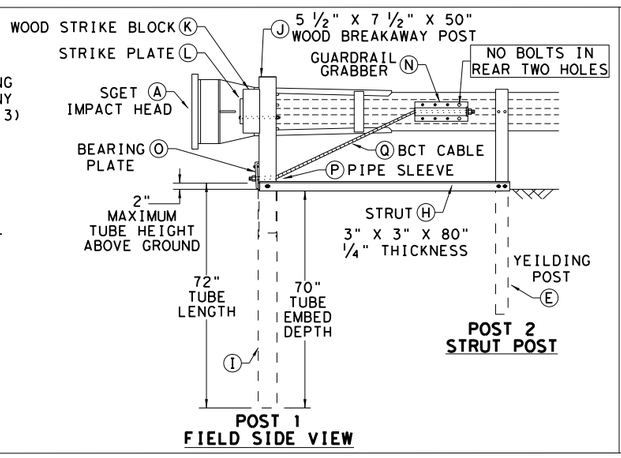
ALTERNATIVE ITEMS
* D
** G
NOTE: SEE PLAN VIEW



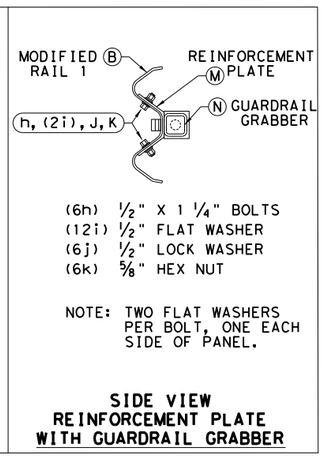
SIDE VIEW
POST 8 - POST 3 (TYP)



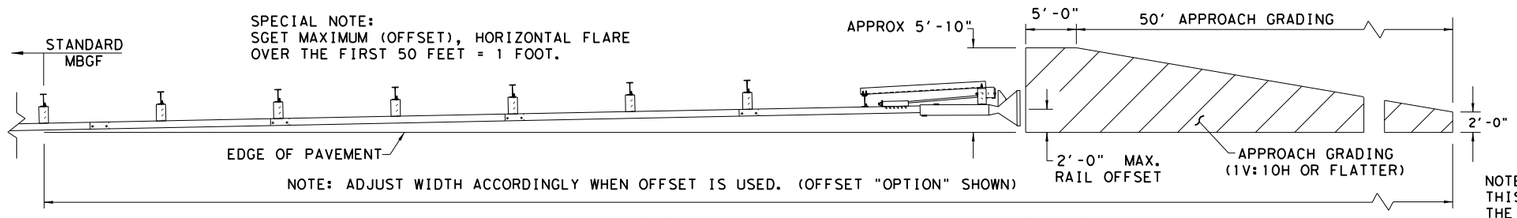
POST 1
FRONT END VIEW



POST 1
FIELD SIDE VIEW
POST 2
STRUT POST



SIDE VIEW
REINFORCEMENT PLATE
WITH GUARDRAIL GRABBER



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

Texas Department of Transportation
Design Division Standard

SPIG INDUSTRY, LLC
SINGLE GUARDRAIL TERMINAL
SGET - TL-3 - MASH
SGT(15)31-20

FILE: sgt153120.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP	
©TxDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY	
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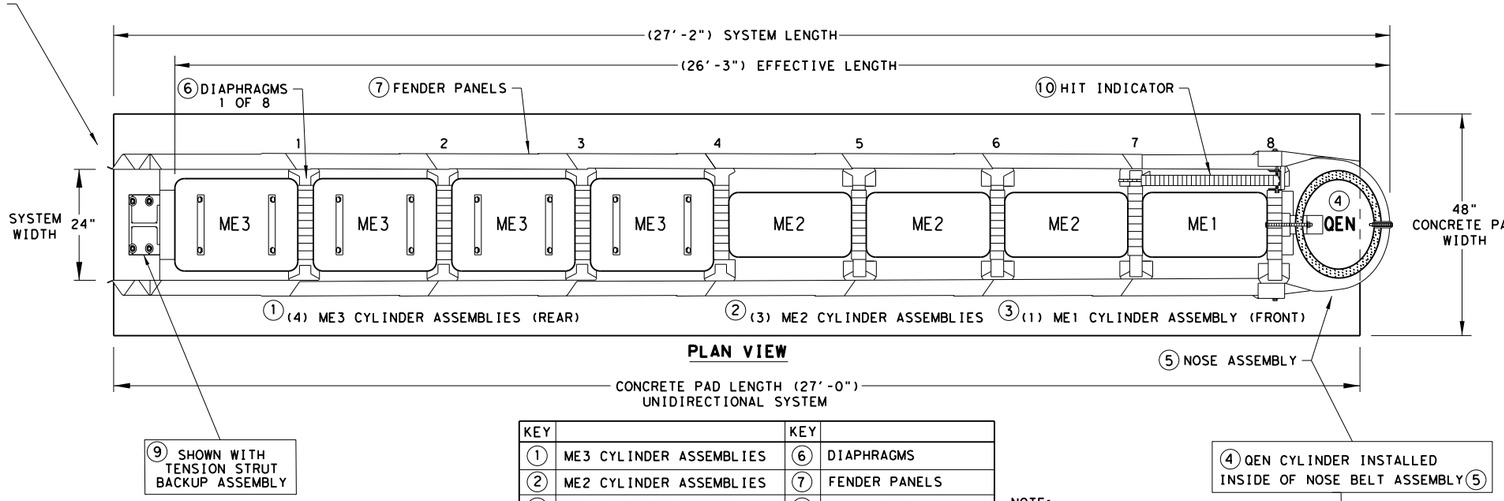
	DIST	COUNTY		SHEET NO.	
	LFK	ANGELINA, ETC		125	

DATE: 3/30/2022
FILE: c:\txdot\pw_online\txdot3\adrian.guerrero\d0466903\qgelitem10n20.dgn

NOTE:
A TRANSITION MAY BE REQUIRED TO INSTALL THE QUADGUARD ELITE M10 TO THE OBJECT BEING SHIELDED.

QUADGUARD ELITE M10 24" WIDE (8 BAY) SYSTEM



PLAN VIEW

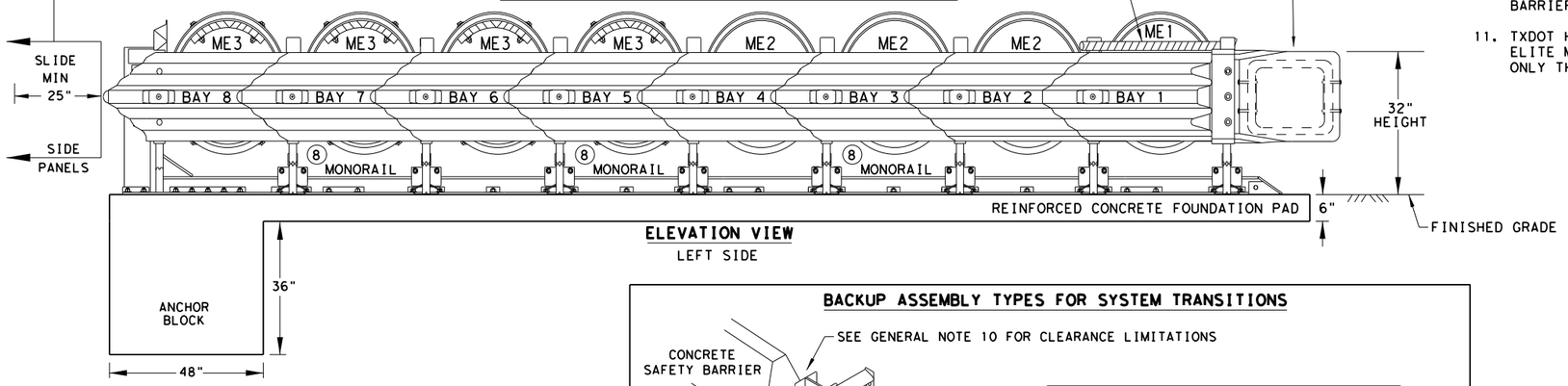
⑨ SHOWN WITH TENSION STRUT BACKUP ASSEMBLY

KEY		KEY	
①	ME3 CYLINDER ASSEMBLIES	⑥	DIAPHRAGMS
②	ME2 CYLINDER ASSEMBLIES	⑦	FENDER PANELS
③	ME1 CYLINDER ASSEMBLY	⑧	MONORAILS
④	QEN CYLINDER	⑨	TYPE OF BACKUP
⑤	NOSE BELT ASSEMBLY	⑩	HIT INDICATOR

④ QEN CYLINDER INSTALLED INSIDE OF NOSE BELT ASSEMBLY ⑤

NOTE:
HIT INDICATOR WILL RAISE UPON IMPACT.
⑩ HIT INDICATOR

NOTE:
PROVISION SHALL BE MADE FOR REAR FENDER SIDE PANELS TO SLIDE REARWARD UPON IMPACT, 25" MIN.



ELEVATION VIEW
LEFT SIDE

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR CONCRETE PAD AND ANCHOR BLOCK INSTALLATION REQUIREMENTS.

A MANUFACTURER'S DRAWING PACKAGE UNIQUE AND SPECIFIC FOR THE QUADGUARD ELITE M10 FIELD INSTALATION AND INFORMATION REGARDING THE TYPE OF BACKUP ASSEMBLY REQUIRED FOR THE TRANSITION WILL BE PROVIDED BY THE MANUFACTURER TO THE ENGINEER AND INSTALLER.

6" REINFORCED CONCRETE PAD REQUIRES THE INSTALLATION OF AN ANCHOR BLOCK AS SHOWN ON THE MANUFACTURER'S DRAWING PACKAGE.

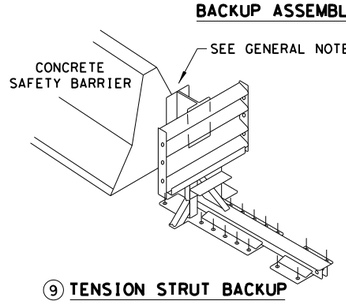
8" NON-REINFORCED CONCRETE PAD MAY NOT REQUIRE AN ANCHOR BLOCK, IF THE PAD IS INSTALLED AGAINST AN IMMOVABLE CONCRETE BACKUP.

CONCRETE PAD AND ANCHOR BLOCK COMBINATIONS SHALL BE CONFIRMED WITH THE MANUFACTURER BASED UPON SITE SPECIFIC DATA (SSD).

NOTE:
THE QUADGUARD ELITE M10 8-BAY, 24" WIDE - NARROW SYSTEM TESTED TO MASH TEST LEVEL 3.

TL-3 MODEL #	QM10024E	CYLINDER TYPES IN BAYS			
BAYS	8	TYPE-ME3	TYPE-ME2	TYPE-ME1	TYPE-QEN
DIAPHRAGMS	8	4	3	1	1
WIDTH	24"	REAR	FRONT		NOSE

BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS

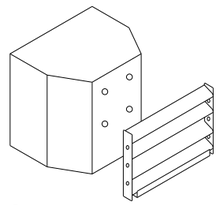


⑨ TENSION STRUT BACKUP

SYSTEM TRANSITIONS TYPES	
1	QUAD-BEAM TO CONCRETE SAFETY BARRIER
2	QUAD-BEAM TO CONCRETE BRIDGE RAIL
3	QUAD-BEAM TO CONCRETE END SHOE
4	QUAD-BEAM TO THRIE-BEAM RAIL
5	QUAD-BEAM TO W-BEAM RAIL

NOTE:
TRANSITION ASSEMBLIES FOR THE QUADGUARD ELITE M10 TO THRIE-BEAM OR W-BEAM FENCE REQUIRES I-BEAM POSTS:

ALL POSTS W6X8.5/9 I-BEAMS (78" LONG).



⑨ CONCRETE BACKUP

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR THE CORRECT BACKUP ASSEMBLY AND TRANSITION PANELS OR SIDE PANELS USED FOR STANDARD AND BI-DIRECTIONAL INSTALLATIONS: AT DIVIDED-HIGHWAY MEDIANS OR UNDIVIDED ROADWAYS WHERE THE SYSTEM IS EXPOSED TO IMPACTS FROM ONE OR TWO DIFFERENT DIRECTIONS OF TRAFFIC FLOW.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE QUADGUARD ELITE M10 SYSTEM AND IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY - ENERGY ABSORPTION INC. AT 1(888)323-6374.
2. SEE THE RECENT QUADGUARD ELITE M10 PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS AND THE DRAWING PACKAGE FOR THE NARROW 24" SYSTEM BEFORE INSTALLING THE QUADGUARD ELITE M10 AT ANY GIVEN LOCATION.
3. FOR BI-DIRECTIONAL TRAFFIC: THE LOCATION AND OR WIDTH OF THE QUADGUARD ELITE M10 IS RESTRICTED. AS BI-DIRECTIONAL TRAFFIC APPROACHES THE REAR OF THE QUADGUARD ELITE M10, THE QUADGUARD ELITE M10 SHOULD NOT EXTEND FURTHER INTO THE TRAFFIC-SIDE OF THE BARRIER THAN THE OBSTACLE. ANY TRANSITION INSTALLED MUST EITHER BE TANGENT TO BOTH QUADGUARD ELITE M10 AND OBSTACLE OR MUST ANGLE TOWARD FIELD SIDE OF THE BARRIER.
4. SYSTEM TRANSITION: APPROPRIATE TRANSITION PANELS OR SIDE PANELS WILL BE REQUIRED FOR PROPER IMPACT PERFORMANCE. THE CORRECT PANEL(S) TO USE WILL DEPEND ON THE DIRECTION OF TRAFFIC FLOW AND WHAT TYPE OF BARRIER OR ROAD FEATURE THE QUADGUARD ELITE M10 SYSTEM IS SHIELDING. SEE THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL FOR FURTHER DETAILS.
5. COMPONENTS FOR THE QUADGUARD ELITE (M10) BACKUP AND REINFORCING DETAILS ARE SHOWN ON THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL.
6. CONCRETE PAD SHALL BE 6" MIN. REINFORCED 28MPa [4,000 PSI] (P.C.) OR 8" MIN. NON-REINFORCED 28MPa [4,000 PSI] CONCRETE ROADWAY MEASURING AT LEAST 12'-0" WIDE BY 50'-0" LONG. ANCHOR BLOCK IS NOT REQUIRED WHEN USING 8" CONCRETE PAD INSTALLED AGAINST AN IMMOVABLE STRUCTURE, E.G. CONCRETE WALL.
7. IF THE CROSS-SLOPE VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
8. THE INSTALLATION AREA SHOULD BE FREE OF CURBS, ELEVATED OBJECTS,OR DEPRESSIONS.
9. THE QUADGUARD ELITE M10 SYSTEM SHOULD BE INSTALLED APPROXIMATELY PARALLEL WITH THE BARRIER.
10. FOR THE TENSION STRUT BACKUP THE DISTANCE BETWEEN THE BACK OF BACKUP AND THE BARRIER WALL SHOULD NOT EXCEED 7" IN ANY CASE.
11. TXDOT HAS ONLY APPROVED THE 24" WIDE QUADGUARD ELITE M10 SYSTEM. THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION AND ASSEMBLY MANUAL INCLUDES SYSTEM WIDTH OF 24". ONLY THE 24" SYSTEM IS ALLOWED TO BE INSTALLED ON TEXAS ROADWAYS.

FOUNDATION & ANCHORING REQUIREMENTS FOUNDATION TYPES: A, B, C, & D	
FOUNDATION TYPE: A	REINFORCED CONCRETE PAD OR ROADWAY
FOUNDATION:	6" MINIMUM DEPTH (P.C.C.)
ANCHORAGE:	7" STUDS EMBEDDED 5 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: B	ASPHALT OVER P.C.C.
FOUNDATION:	3" MIN. (A.C.) OVER 3" MIN. (P.C.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: C	ASPHALT OVER SUBBASE
FOUNDATION:	6" MIN. (A.C.) OVER 6" MIN. (C.S.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: D	ASPHALT ONLY
FOUNDATION:	8" MIN. (A.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE

KEY:
ASPHALT CONCRETE (A.C.)
COMPACTED SUBBASE (C.S.)
PORTLAND CEMENT CONCRETE (P.C.C.)

NOTE: SEE TRINITY'S PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR THE APPROVED ADHESIVE.

IF THE UNIT IS ANCHORED TO ASPHALTIC CONCRETE, IT SHOULD BE RELOCATED TO FRESH, UNDISTURBED ASPHALT AND RE-ANCHORED AFTER EACH IMPACT TO ENSURE ADEQUATE FUTURE PERFORMANCE.

TENSION STRUT BACKUP MAY BE USED IN CONSTRUCTION ZONES ON ASPHALT CONCRETE (A.C.) FOR TEMPORARY USE ONLY.

LOW MAINTENANCE

Texas Department of Transportation
Design Division Standard

TRINITY HIGHWAY ENERGY ABSORPTION QUADGUARD ELITE M10 (MASH TL-3)

QGELITE(M10)(N)-20

FILE: qgelitem10n20.dgn	DN: TxDOT	CK: KM	DW: VP	CK: AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		126

DATE: 4/25/2022
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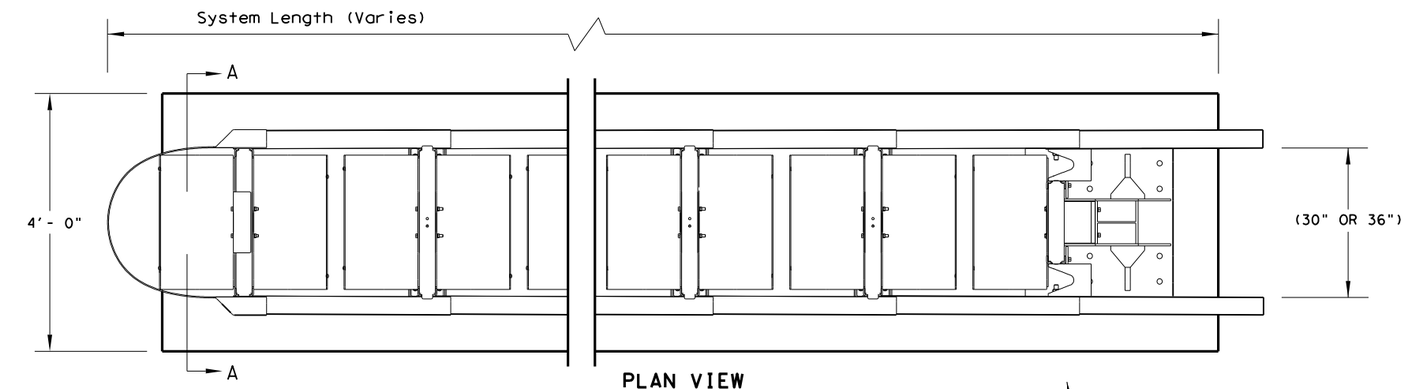
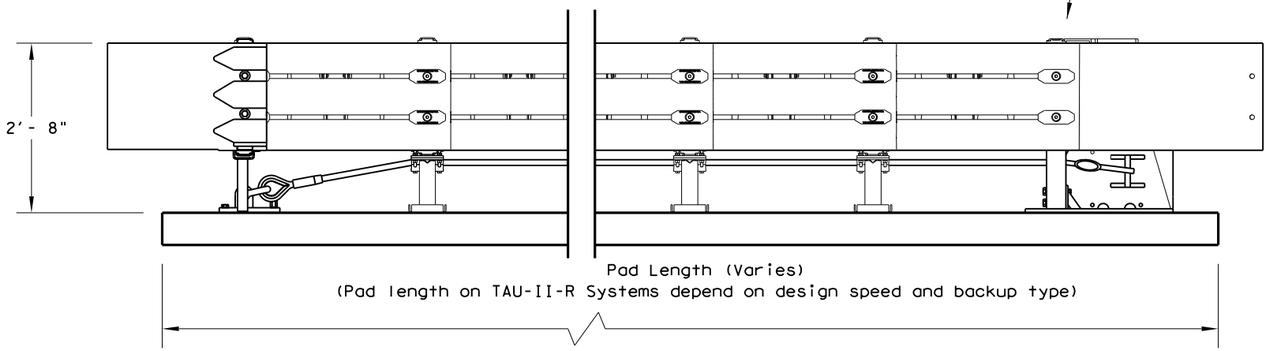


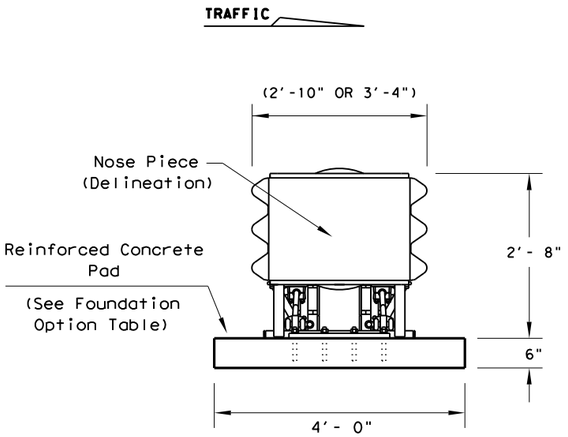
PLAN VIEW

Attachments and transitions to various barrier shapes, barrier railings and bi-directional traffic flows are available.

(SEE MANUFACTURER'S PRODUCT MANUAL)



ELEVATION VIEW



SECTION A-A

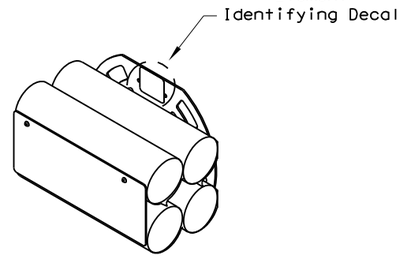
Nose Piece delineation orientation, is shown elsewhere on the plans.

TRANSITION OPTIONS
Vertical Wall
Concrete Traffic Barriers
W-Beam Guardrail
Thrie Beam Guardrail

For bi-directional transition panel and end shoe details.
(See manufacturer's product manual.)

FOUNDATION OPTIONS
6" Reinforced Concrete
8" Unreinforced Concrete
Asphalt over Concrete with Minimum 6" Embedment in Concrete
6" Asphalt over 6" Compact Subbase
8" Minimum Asphalt

For steel placement in concrete foundations.
(See manufacturer's product manual)



ENERGY ABSORBING ELEMENTS (EAE)

BACKUP SUPPORT OPTIONS
Compact (Stand Alone)
Flush Mount
PCB (Concrete Barrier)

TAU-II-R (NARROW) SYSTEM LENGTHS			
BACKSTOP	TL-2	TL-3	70 mph
PCB	13'-7"	27'-10"	30'-7"
Flush Mount	14'-0"	28'-3"	31'-0"
Compact	15'-3"	29'-6"	32'-3"

Backup and Transition types are shown elsewhere on the plans, (i.e. Attenuator location details or in the general notes).

Note: System lengths are ± 2"

GENERAL NOTES

1. For specific information regarding installation and technical guidance of the system, contact: Lindsay Transportation Solutions - Barrier Systems, Inc. at (707) 374-6800. 180 River Road, Rio Vista, CA 94571
2. For bi-directional traffic, appropriate transition panels will be required.
3. Additional details for the backup support option, transition options and foundation option will be shown on the manufacturer's shop drawings furnished to the Engineer.
4. Concrete shall be class "S" with a minimum compressive strength of 4,000 psi.
5. Maximum permissible cross-slope is 8%.
6. The installation area should be free from curbs, elevated objects, or depressions.
7. The TAU-II-R system should be approximately parallel with the barrier or center of merging barriers.
8. Refer to Universal TAU-II-R configuration chart for specific systems configuration number and location of each type of energy absorbing element.
9. 30-inch (30") model shown, also available in 36-inch (36") configuration.

BILL OF MATERIAL

PRODUCT CODE	QTY	DESCRIPTION
B030704	1	Front Support
B030703	TBD	Mid Support
TBD	1	Backstop Assembly (See Table)
TBD	1	Front Cable Anchor
TBD	1	Nose Assembly
B010202	TBD	Sliding Panel
B010659	2	End Panel
K001003	1	Slider Assembly Kit
BSI-1202006-KT	TBD	TAU-II-R Slider Kit
BSI-1107131-KT	TBD	TAU-II-R EAE Mounting Hw Kit
BSI-1012069-00	TBD	Energy Absorbing Element, Type 1
BSI-1012070-00	TBD	Energy Absorbing Element, Type 2
BSI-1012071-00	TBD	Energy Absorbing Element, Type 3
BSI-1110009-00	TBD	Energy Absorbing Element, Type 3N
TBD	TBD	Cable Assembly
K001004	TBD	Cable Guide Kit
K001005	2	Front Support Leg Kit
B010651	4	Pipe Panel Mount
TBD	1	Anchoring Package

(TBD) = To Be Determined, depending on Backup Type and System Length.

(See manufacturer's product manual for details)

Texas Department of Transportation

Design Division Standard

LTS-BARRIER SYSTEMS CRASH CUSHION (R-NARROW)

TAU-II-R(N)-16

LOW MAINTENANCE

FILE: tauiirnl6.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL
©TxDOT: January 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 06,2013 (VP) REVISED 03,2016 (VP)	0336	03	072,ETC	SH 103,ETC
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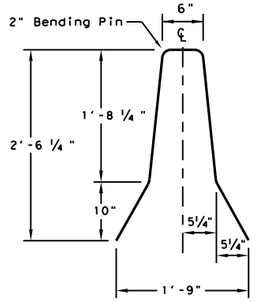
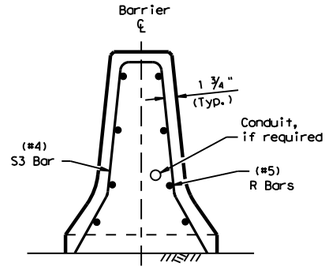
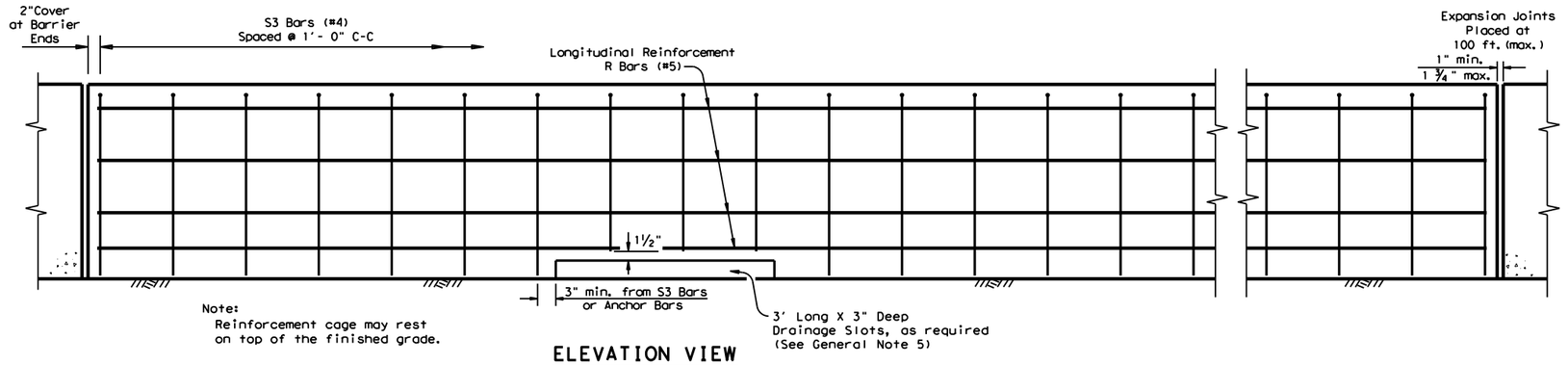


S3 Bar
(#4) Bar



END VIEW
Cast-in-Place (CIP) Barrier
Barrier is Symmetrical About the Center Line

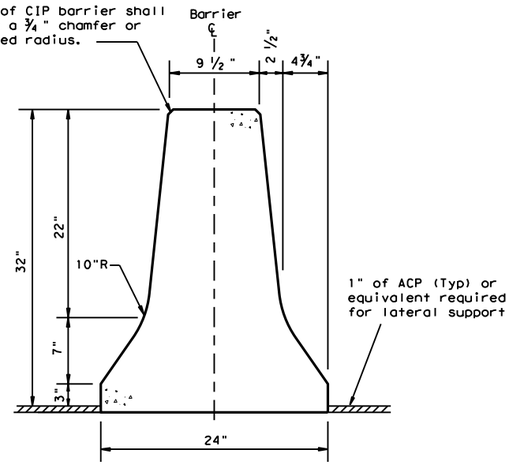


Note:
Reinforcement cage may rest on top of the finished grade.

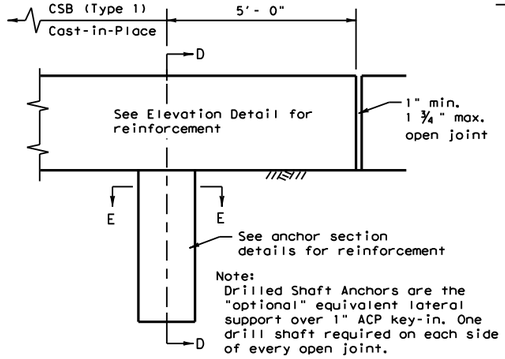
ELEVATION VIEW
Cast-in-Place (CSB) on Flexible Pavement

GENERAL NOTES

1. Concrete shall be Class C, unless otherwise specified in the plans.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. Axis of cast-in-place barrier shall be vertical, except where roadway is superelevated, then axis is normal to roadway surface.
4. Top edges of cast-in-place barrier shall have a ¾" chamfer or tooled radius.
5. Drainage slot depths may be increased 1" to accommodate ACP. Slot locations (12'- 0", C-C Min. Spacing) are shown elsewhere, or as directed by the Engineer.
6. Cast-in-place barrier may be slip formed. Bracing may be tied or tack welded to the reinforcement cage to provide cage stability. Do not weld to anchor bars. The reinforcement cage may rest on top of the finished grade.
7. For locations where lighting is required, see the CSB(4) sheet for the proper reinforcement and anchorage.

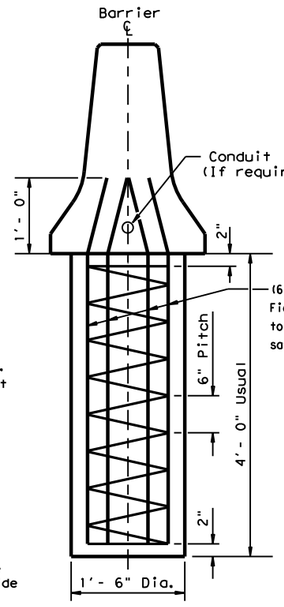


CONCRETE SAFETY BARRIER (CSB)

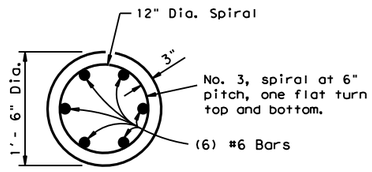


Note:
Drilled Shaft Anchors are the "optional" equivalent lateral support over 1" ACP key-in. One drill shaft required on each side of every open joint.

DRILLED SHAFT ANCHOR LOCATION DETAIL



SECTION D-D DRILLED SHAFT ANCHOR



SECTION E-E DRILLED SHAFT ANCHOR
See drilled shaft anchor location detail

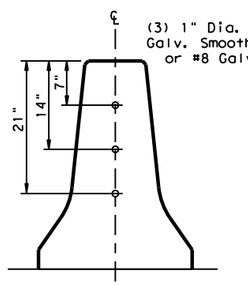
Cast-In-Place or Slip-Formed (CSB)

Cast-in-Place barrier may be connected to precast CSB. Joint connection "Types" may be used in Cast-in-Place barrier, to match the precast barrier connection. (See required connection "Type" elsewhere in the plans)

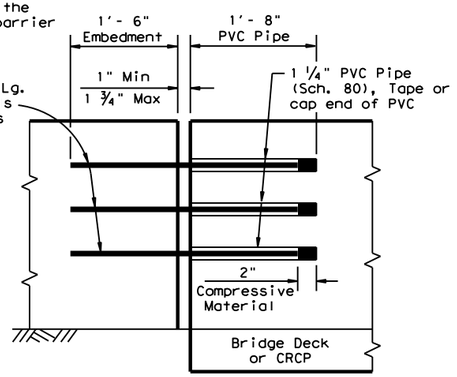
The weight of Cast-in-Place (CSB)(F-Shape) is approx. 440 lbs per ft.

EXPANSION JOINT (Dowel Location)

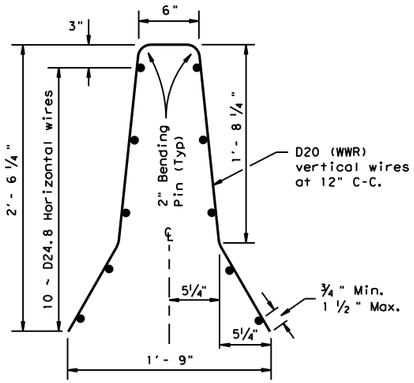
Dowels may be used as directed by the Engineer, in locations where the barrier could be laterally displaced.



END VIEW
Dowel locations



WELDED WIRE REINFORCEMENT (WWR) OPTION FOR BARS S AND R



(WWR) General Notes

1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. The welded wire cage at the drainage slots may be cut or bent to accommodate the edge and top clearances, as directed by the Engineer.
3. The welded wire splice locations shall have a "minimum" splice lap length of 12".
4. Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".

Texas Department of Transportation

Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)
CAST-IN-PLACE (TYPE 1) (FLEXIBLE PAVEMENT)
CSB(2)-13

FILE: csb213.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		128

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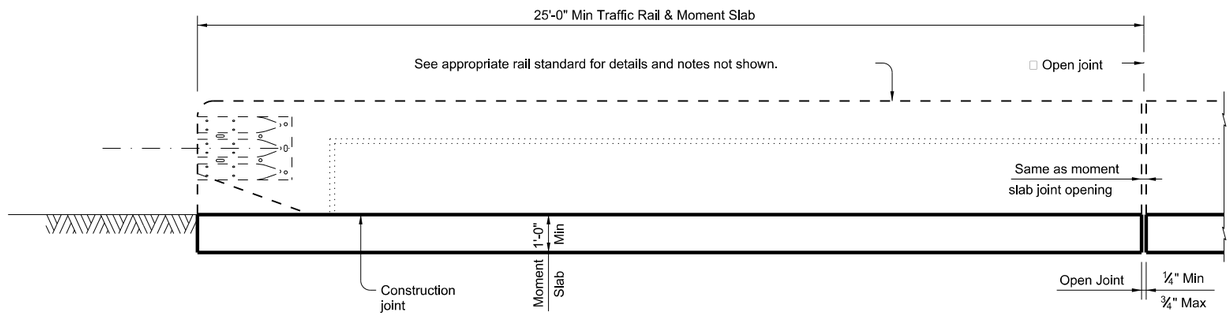
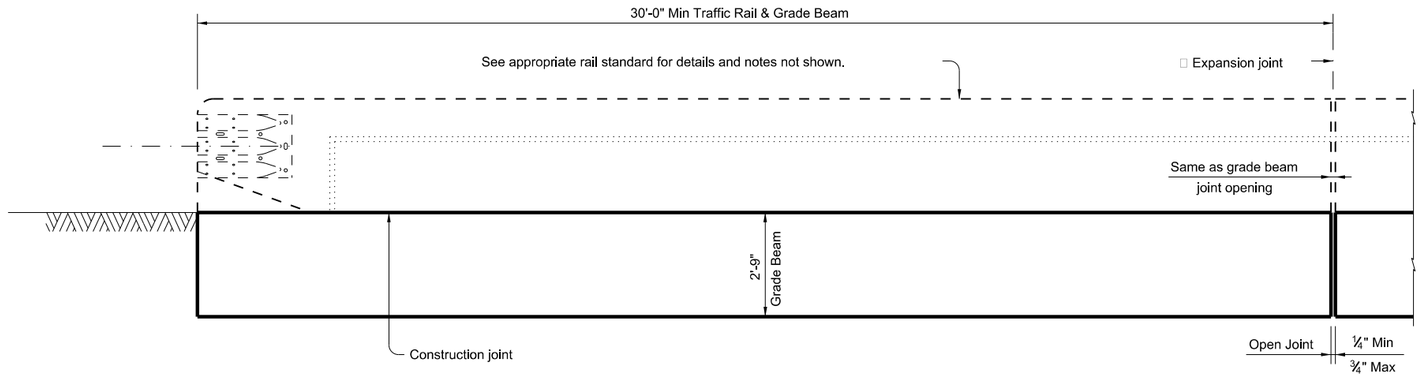


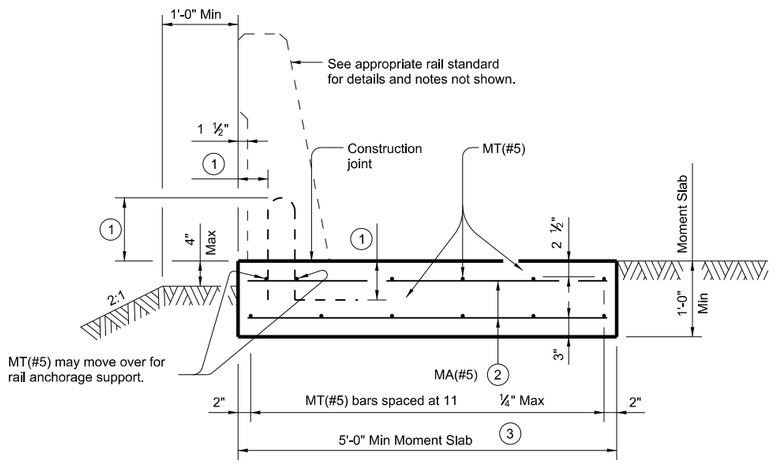
ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



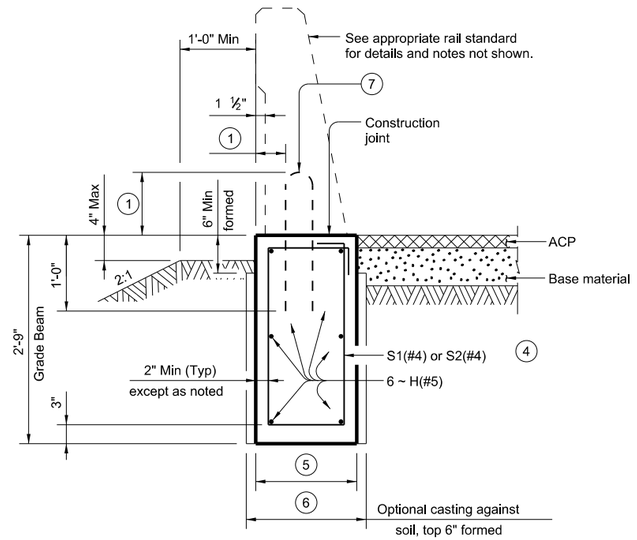
ROADWAY ELEVATION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



SECTION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar.)



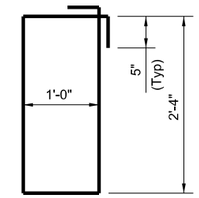
SECTION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar.)

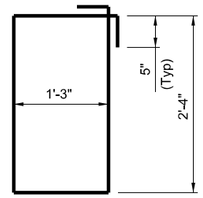
1. See applicable bridge rail standard.
2. MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 ½" longitudinally from outside edge of moment slab).
3. Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.
4. S1(#4) or S2(#4) spaced longitudinally along grade beam at 8" Max. (Spaced 2 ½" longitudinally from outside edge of grade beam).
5. Use bar S1(#4) with 1'-4" grade beam width and bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.
   Approximate grade beam concrete = 0.14 CY/LF and reinforcement = 13.8 LB/LF.

   Use bar S2(#4) with 1'-7" grade beam width and bridge rail types: T66 and C66.
   Approximate grade beam concrete = 0.16 CY/LF and reinforcement = 14.2 LB/LF.
6. 1'-6" for bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.

   1'-9" bridge rail types: T66 and C66.
7. Modify reinforcing on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically into traffic rail



BARS S1(#4)



BARS S2(#4)

CONSTRUCTION NOTES:

Align moment slab (TRF-MS) or grade beam (TRF-GB) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) or grade beam (TRF-GB) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for bars S1(#4), S2(#4) and H(#5) unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

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

Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:

Use of these details will result in a moment slab (TRF-MS) or grade beam (TRF-GB) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.

See elsewhere in the plans for selected options between moment slab (TRF-MS) and/or grade beam (TRF-GB).

The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.

See appropriate rail standard for details and notes not shown.

This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.

Payment for moment slab (TRF-MS) and/or grade beam (TRF-GB) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.

The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.

Excavation will be subsidiary to other items.

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

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL FOUNDATIONS

FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS

TRF

FILE: rlstd027-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS 07-20: Added moment slab with rail foundation lengths.	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		129

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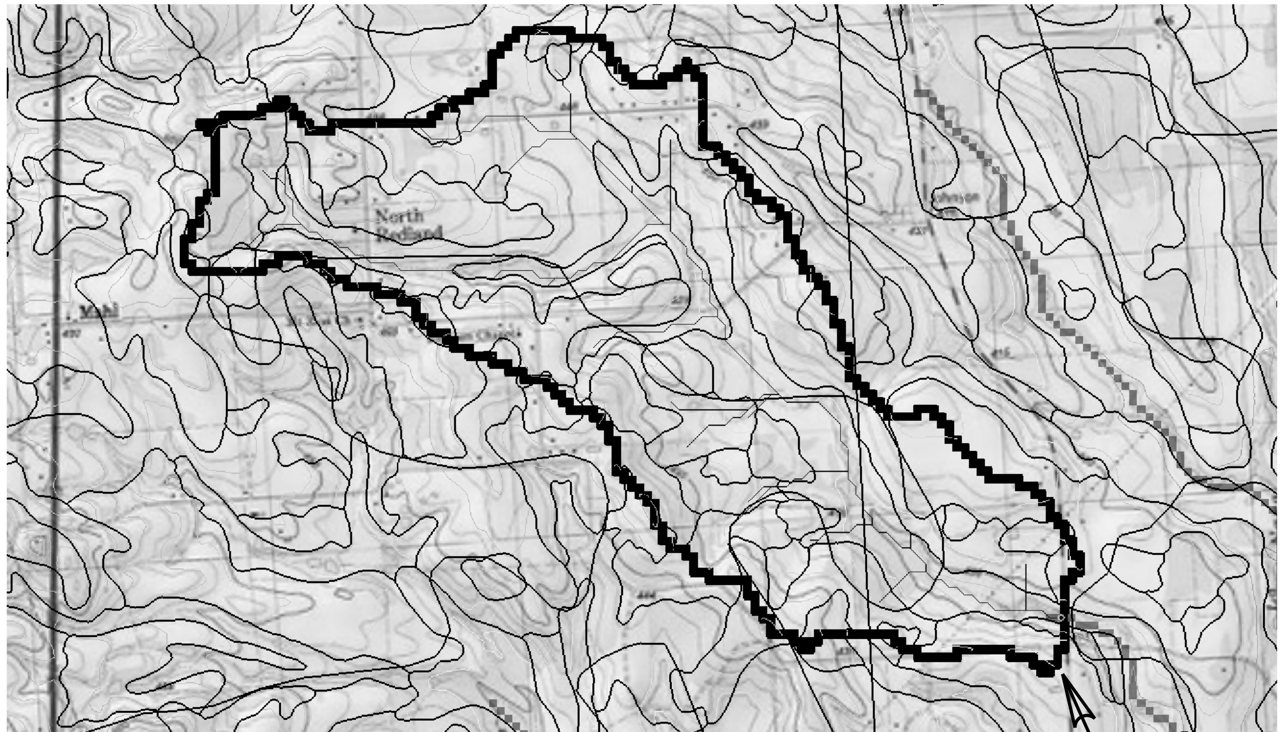

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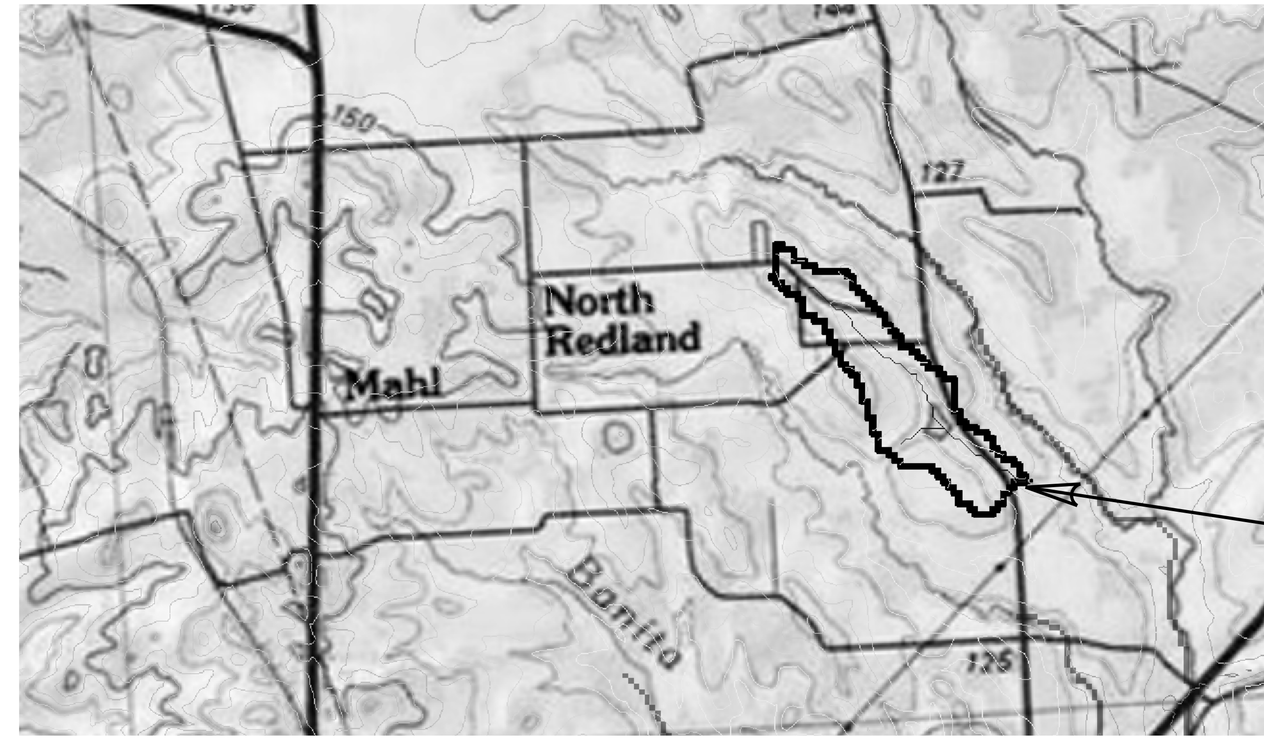
PROJECT LOCATION

FM 2864
STA 48+00



N

PROJECT LOCATION

FM 2864
STA 78+00

HYDROLOGIC DATA

ROADWAY	STATION	METHOD	TIME OF CONCENTRATION	AREA	INTENSITY		RUNOFF COEFFICIENT	FLOW RATE	
					10 YR	100 YR		10 YR	100 YR
			MIN	ACRE	IN/HR			CFS	CFS
FM 2864	48+00	RATIONAL	88.2	1014.36	2.24	3.53	0.3	681.6	1074.2
FM 2864	78+00	RATIONAL	43.0	188.99	3.57	5.53	0.3	202.4	313.5

HYDRAULIC COMPUTATIONS

ROADWAY	STATION	HYDRAULIC DATA (HY-8)								
		FREQUENCY	EXISTING CULVERT			PROP ALLOW HW ELEV	PROPOSED CULVERT			FLOW RATE
			HW	TW	V (OUT)		HW	TW	V (OUT)	
		YR	FT	FT	FPS	FT	FT	FT	FPS	CFS
FM 2864	48+00	10	394.98	394.43	4.75	399.61	394.98	394.43	4.72	681.6
		100	397.12	395.75	7.49	399.61	397.12	395.75	7.44	1074.2
	78+00	10	409.00	408.79	2.83	405.98	409.00	408.79	2.80	202.4
		100	410.02	409.54	4.37	405.98	410.02	409.54	4.34	313.5

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DRAINAGE AREA MAP & HYDRAULIC DATA SHEET

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC

DIST	COUNTY	SHEET NO.
LFK	ANGELINA, ETC	130

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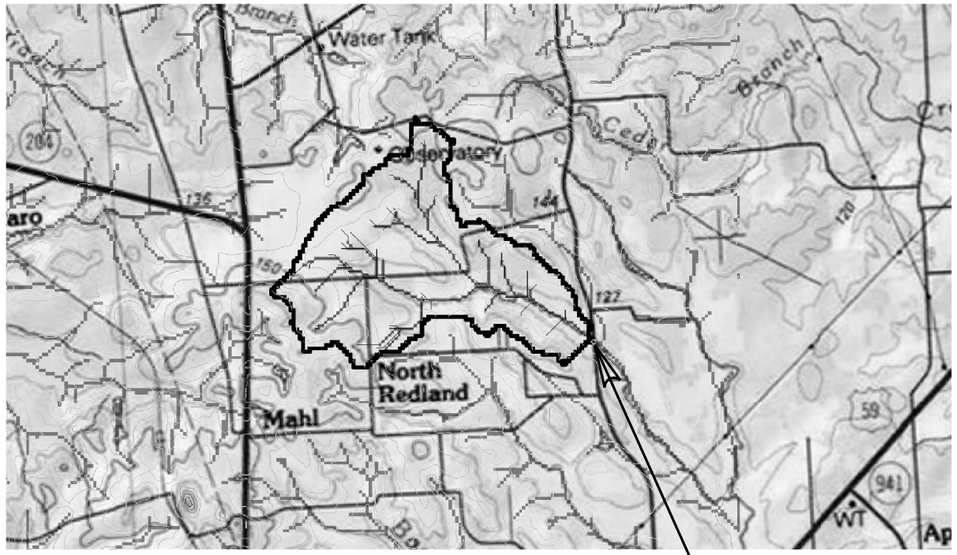
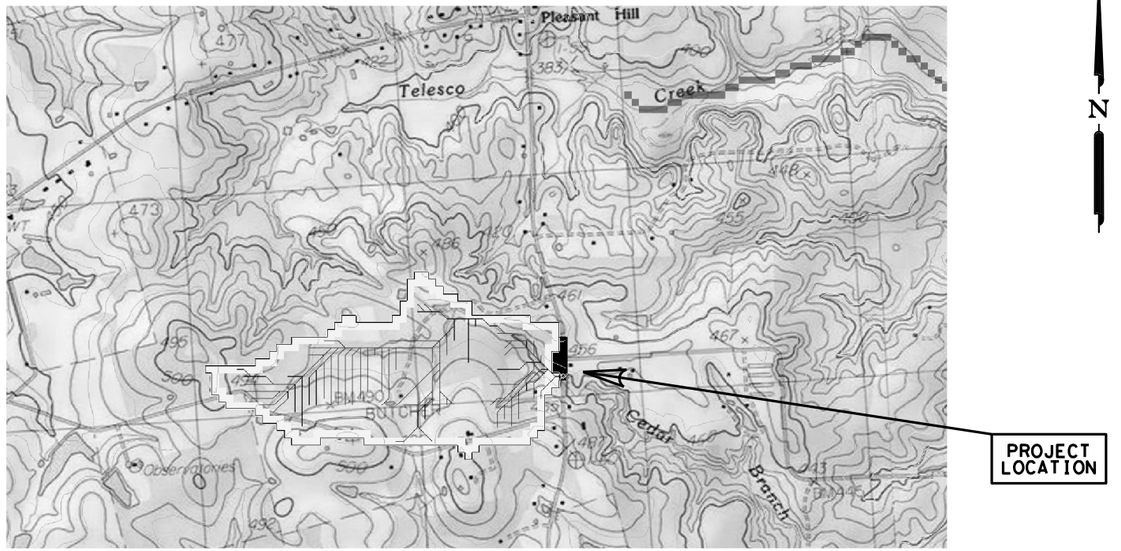


FM 2864
STA 125+58



FM 2864
STA 202+40

HYDRAULIC DATA

ROADWAY	STATION	METHOD	TIME OF CONCENTRATION	AREA	INTENSITY		RUNOFF COEFFICIENT	FLOW RATE	
					10 YR	100 YR		10 YR	100 YR
			MIN	ACRE	IN/HR			CFS	CFS
FM 2864	125+58	RATIONAL	79.8	892.85	2.39	3.77	0.28	597.5	942.5
FM 2864	202+40	RATIONAL	37.6	154.18	3.44	5.34	0.28	148.5	230.5

HYDRAULIC COMPUTATIONS

ROADWAY	STATION	HYDRAULIC DATA (HY-8)								
		FREQUENCY	EXISTING CULVERT			PROP ALLOW HW ELEV	PROPOSED CULVERT			FLOW RATE
			HW	TW	V (OUT)		HW	TW	V (OUT)	
		YR	FT	FT	FPS	FT	FT	FT	FPS	CFS
FM 2864	125+58	10	415.77	415.15	5.01	416.94	415.77	415.15	4.95	597.5
		100	417.72	416.20	7.84	416.94	417.72	416.20	7.73	942.5
	202+40	10	447.90	447.25	4.99	448.34	447.90	447.25	4.91	148.5
		100	449.34	447.84	7.53	448.34	449.34	447.84	7.42	230.5

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DRAINAGE AREA MAP & HYDRAULIC DATA SHEET

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		131

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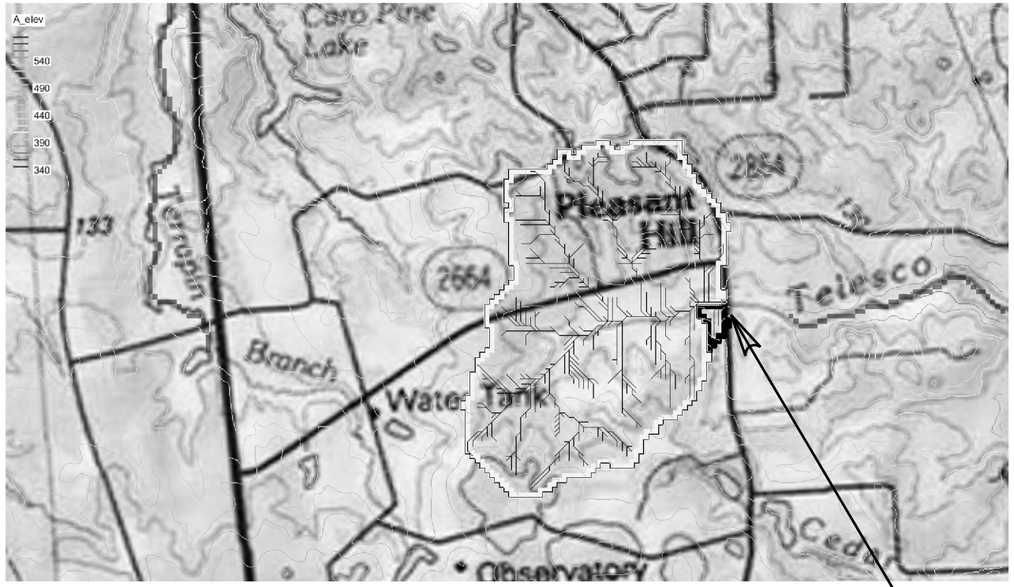
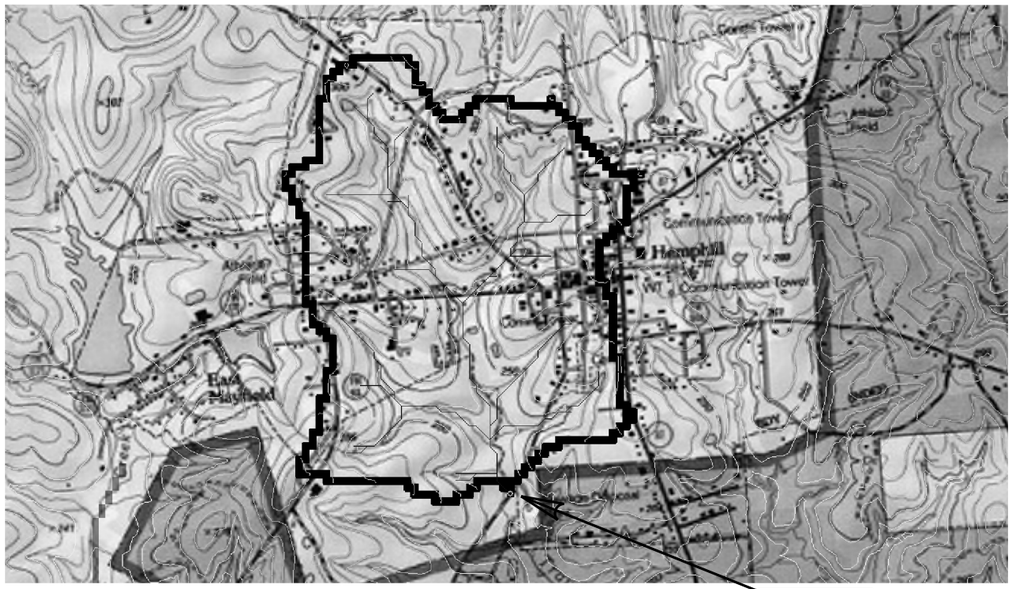


FM 2864
STA 248+00

PROJECT LOCATION

N



FM 2971
STA 34+40

PROJECT LOCATION

N

HYDRAULIC DATA

ROADWAY	STATION	METHOD	TIME OF CONCENTRATION	AREA	INTENSITY		RUNOFF COEFFICIENT	FLOW RATE	
					10 YR	100 YR		10 YR	100 YR
			MIN	ACRE	IN/HR			CFS	CFS
FM 2864	248+00	RATIONAL	54.6	765.99	3.07	4.80	0.28	658.4	1029.5
FM 2971	34+40	RATIONAL	49.1	636.18	3.24	4.91	0.28	577.1	874.6

HYDRAULIC COMPUTATIONS

ROADWAY	STATION	HYDRAULIC DATA (HY-8)								
		FREQUENCY	EXISTING CULVERT			PROP ALLOW HW ELEV	PROPOSED CULVERT			FLOW RATE
			HW	TW	V (OUT)		HW	TW	V (OUT)	
		YR	FT	FT	FPS	FT	FT	FT	FPS	CFS
FM 2864	248+00	10	391.30	391.26	5.25	393.11	391.30	391.26	5.20	658.4
		100	394.00	392.37	8.19	393.11	394.00	392.37	8.12	1029.5
FM 2971	34+40	10	229.05	228.63	4.14	230.42	229.05	228.63	4.10	577.1
		100	230.42	229.46	6.28	230.42	230.42	229.46	6.22	874.6

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DRAINAGE AREA MAP & HYDRAULIC DATA SHEET

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		132

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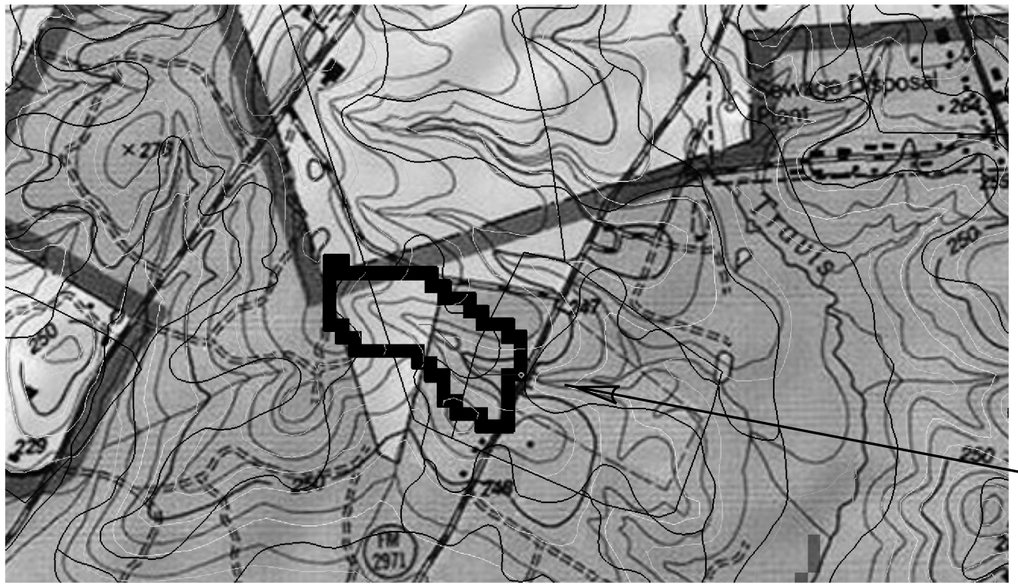

FM 2971
STA 61+37

HYDRAULIC DATA

ROADWAY	STATION	METHOD	TIME OF CONCENTRATION	AREA	INTENSITY		RUNOFF COEFFICIENT	FLOW RATE	
					10 YR	100 YR		10 YR	100 YR
			MIN	ACRE	IN/HR			CFS	CFS
FM 2971	61+37	RATIONAL	16.5	31.44	5.82	8.63	0.28	51.2	76

HYDRAULIC COMPUTATIONS

ROADWAY	STATION	HYDRAULIC DATA (HY-8)								
		FREQUENCY	EXISTING CULVERT			PROP ALLOW HW ELEV	PROPOSED CULVERT			FLOW RATE
			HW	TW	V (OUT)		HW	TW	V (OUT)	
		YR	FT	FT	FPS	FT	FT	FT	FPS	CFS
FM 2971	61+37	10	243.97	241.94	12.73	247.39	243.97	241.94	13.03	51.20
		100	245.24	242.29	13.79	247.39	245.24	242.29	7.59	76.00

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DRAINAGE AREA MAP & HYDRAULIC DATA SHEET

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		133

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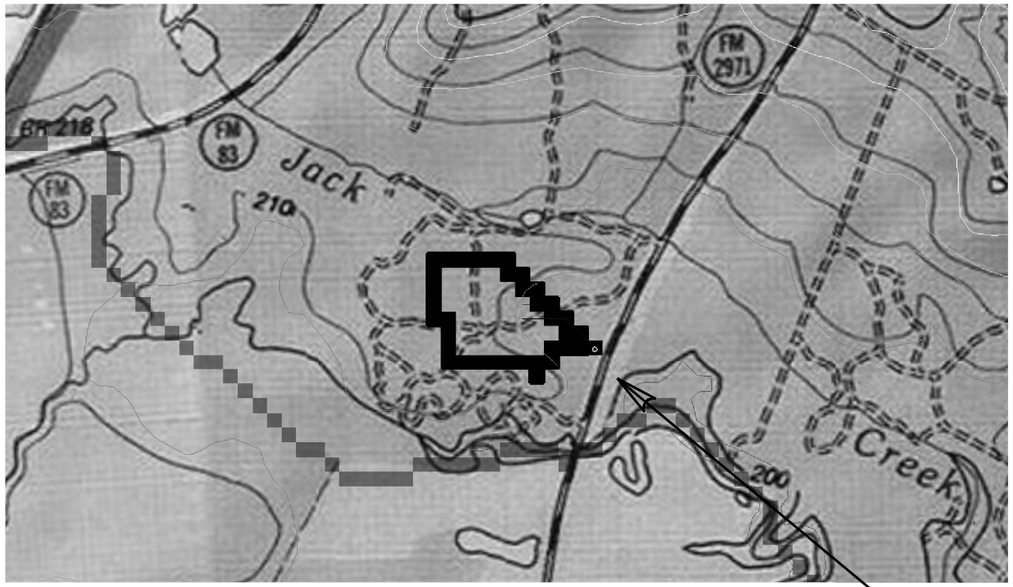
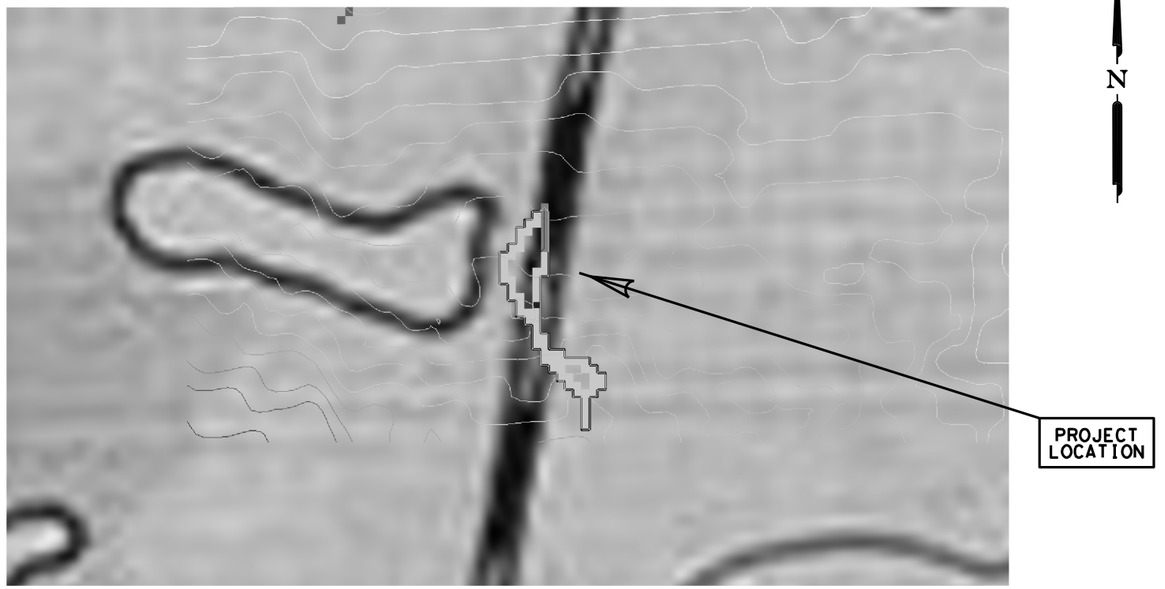


FM 2971
STA 102+90



FM 2971
STA 115+15

HYDRAULIC DATA

ROADWAY	STATION	METHOD	TIME OF CONCENTRATION	AREA	INTENSITY		RUNOFF COEFFICIENT	FLOW RATE	
					10 YR	100 YR		10 YR	100 YR
			MIN	ACRE	IN/HR			CFS	CFS
FM 2971	102+90	RATIONAL	14.0	17.33	6.25	9.25	0.3	32.5	48.1
FM 2971	115+15	RATIONAL	8.8	0.68	7.44	10.93	0.3	1.5	2.2

HYDRAULIC COMPUTATIONS

ROADWAY	STATION	HYDRAULIC DATA (HY-8)								
		FREQUENCY	EXISTING CULVERT			PROP ALLOW HW ELEV	PROPOSED CULVERT			FLOW RATE
			HW	TW	V (OUT)		HW	TW	V (OUT)	
		YR	FT	FT	FPS	FT	FT	FT	FPS	CFS
FM 2971	102+90	10	200.54	200.53	0.32	204.71	200.54	200.53	0.32	32.5
		100	200.65	200.65	0.47	204.71	200.65	200.65	0.46	48.1
	115+15	10	200.22	200.13	0.72	205.03	200.22	200.13	1.32	1.5
		100	200.25	200.19	0.77	205.03	200.25	200.19	0.44	2.2

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DRAINAGE AREA MAP & HYDRAULIC DATA SHEET

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		134

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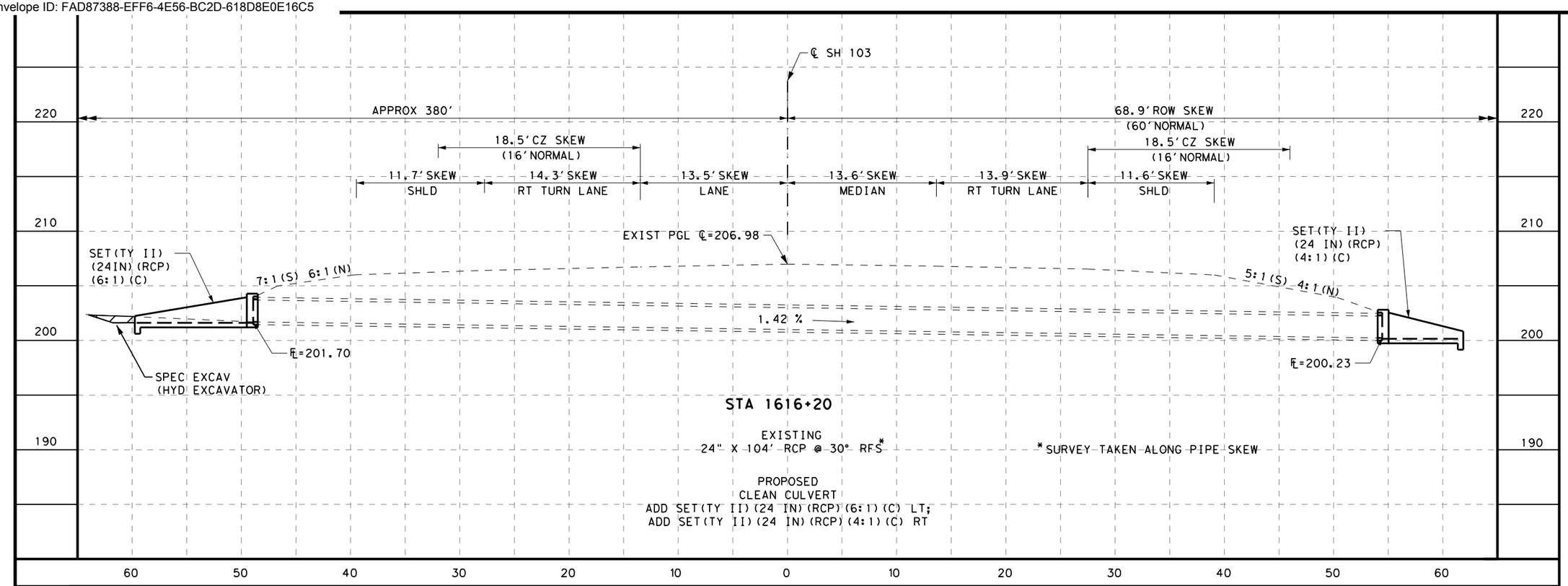

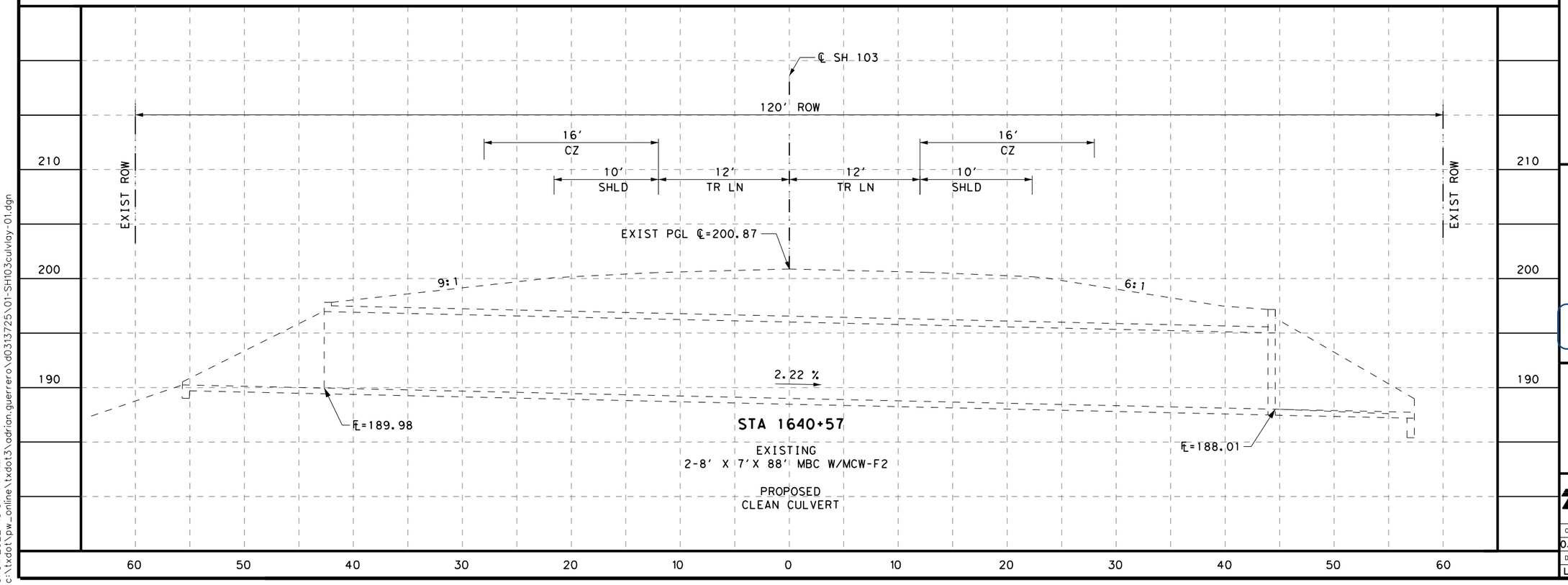

SCALE 1" = 10'

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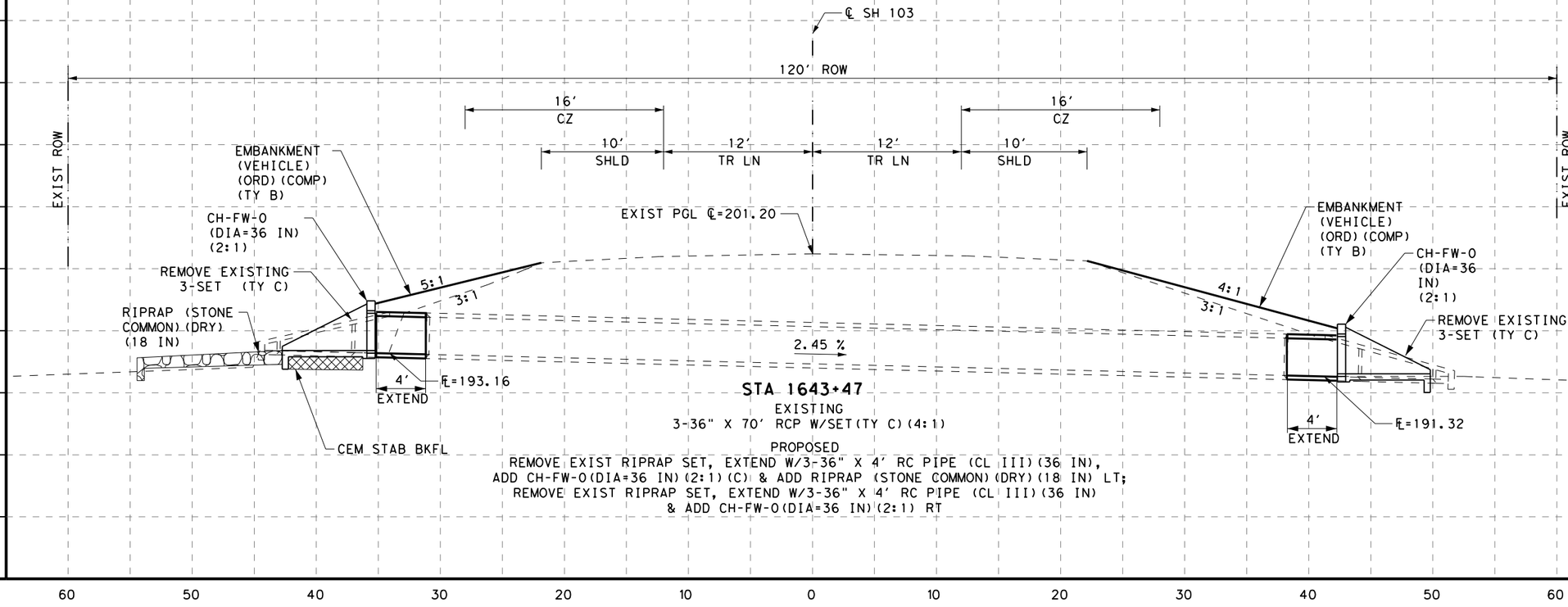
CULVERT LAYOUTS (SH 103)

SHEET 1 OF 50

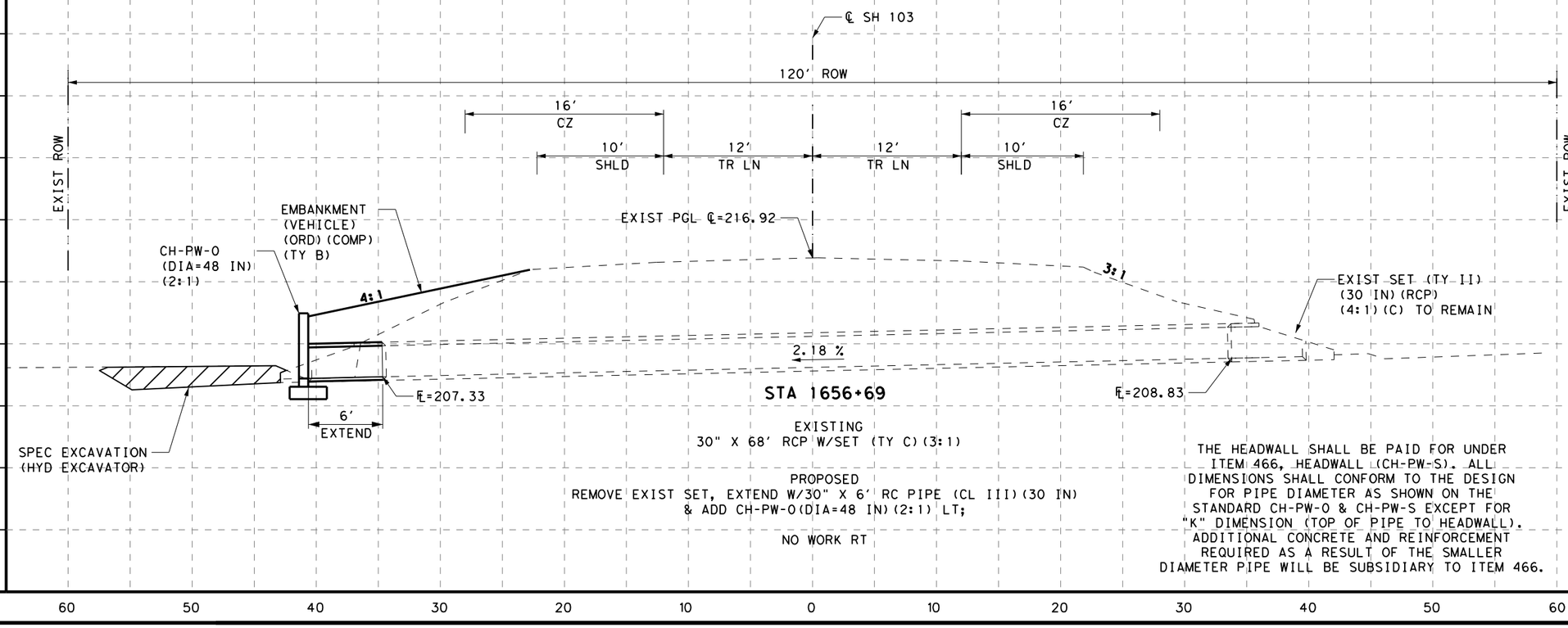
CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		135



STA 1643+47

EXISTING
3-36" X 70' RCP W/SET(TY C)(4:1)

PROPOSED
REMOVE EXIST RIPRAP SET, EXTEND W/3-36" X 4' RC PIPE (CL III)(36 IN),
ADD CH-FW-0(DIA=36 IN)(2:1)(C) & ADD RIPRAP (STONE COMMON)(DRY)(18 IN) LT;
REMOVE EXIST RIPRAP SET, EXTEND W/3-36" X 4' RC PIPE (CL III)(36 IN)
& ADD CH-FW-0(DIA=36 IN)(2:1) RT



STA 1656+69

EXISTING
30" X 68' RCP W/SET (TY C)(3:1)

PROPOSED
REMOVE EXIST SET, EXTEND W/30" X 6' RC PIPE (CL III)(30 IN)
& ADD CH-PW-0(DIA=48 IN)(2:1) LT;

NO WORK RT

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

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 2 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC

DIST	COUNTY	SHEET NO.
LFK	ANGELINA, ETC	136

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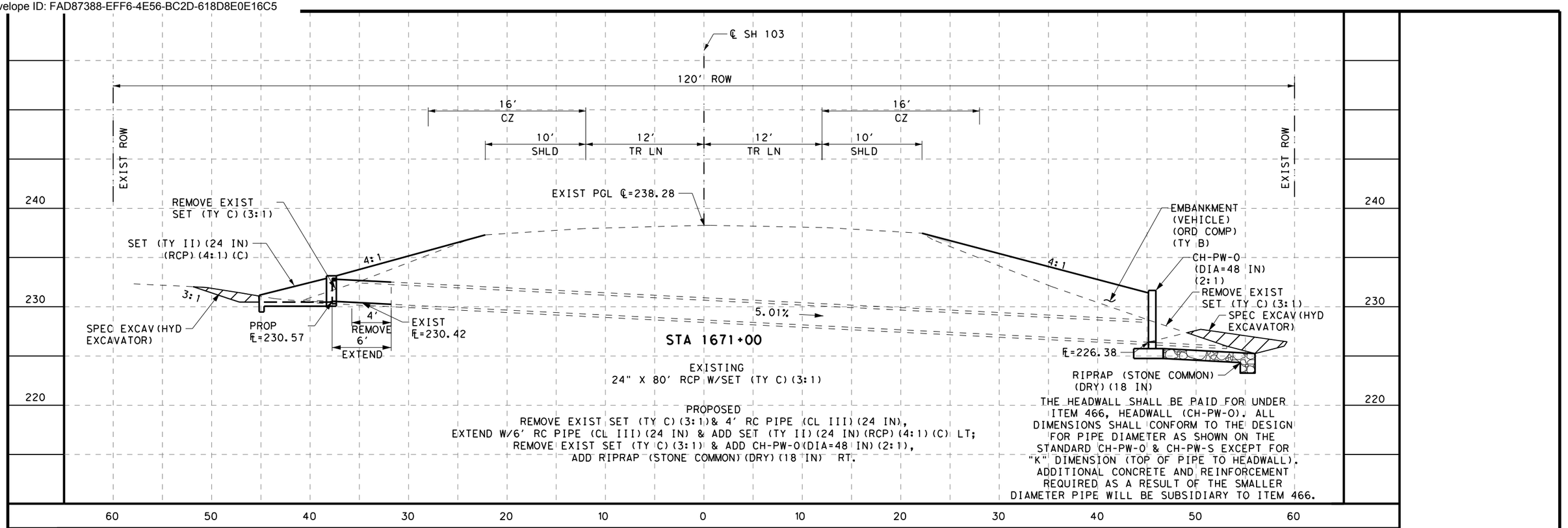

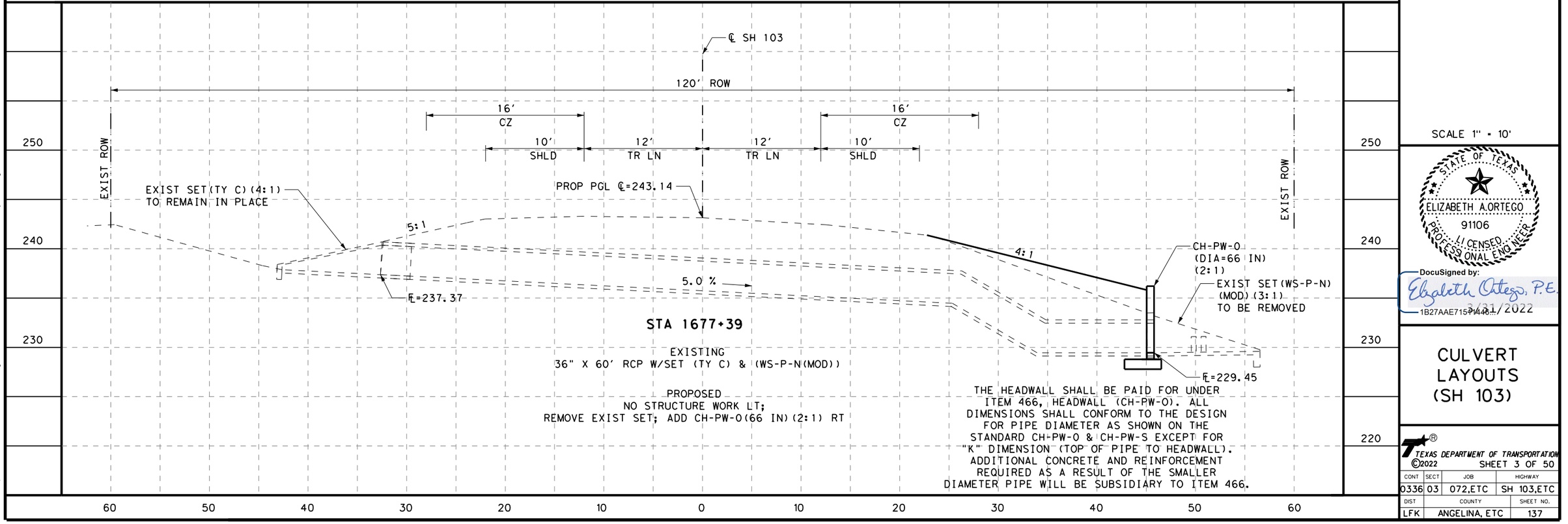

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 3 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		137

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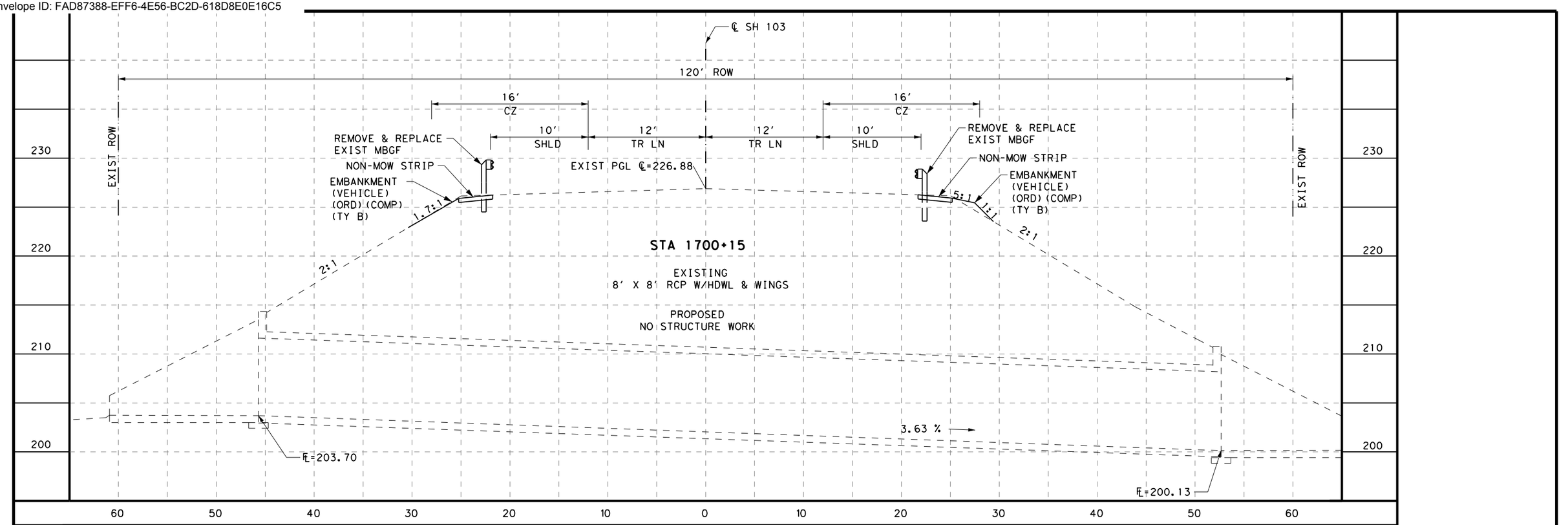

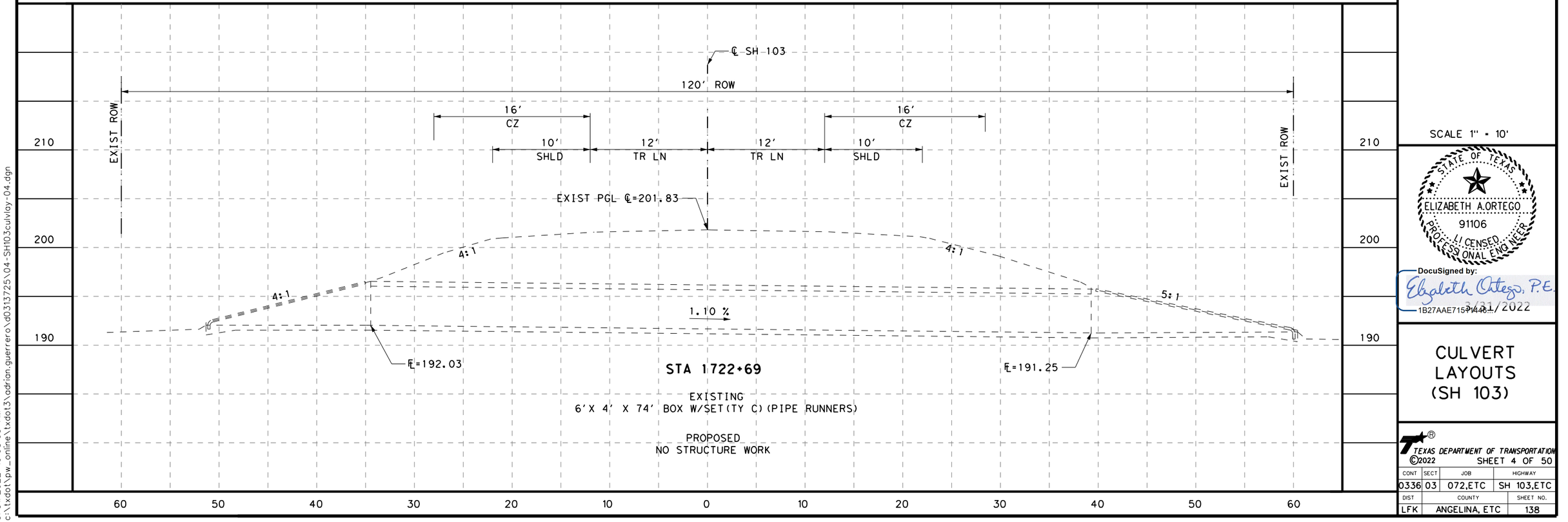

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 4 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		138

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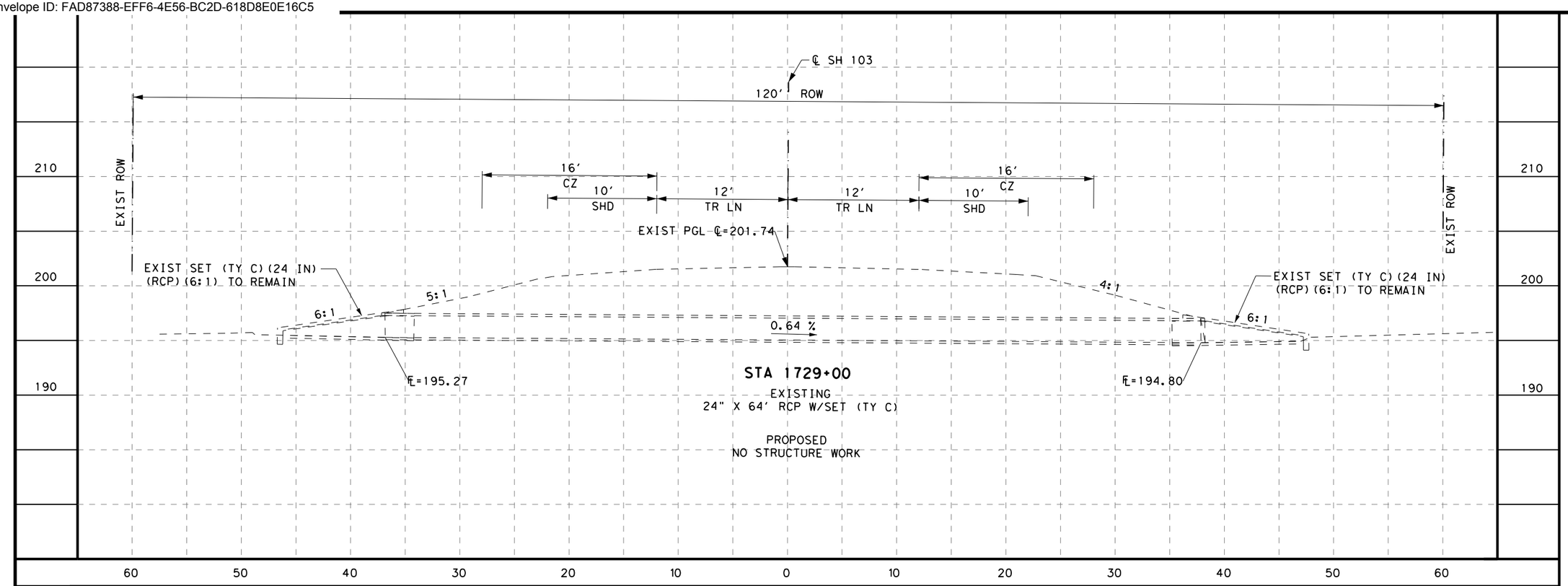

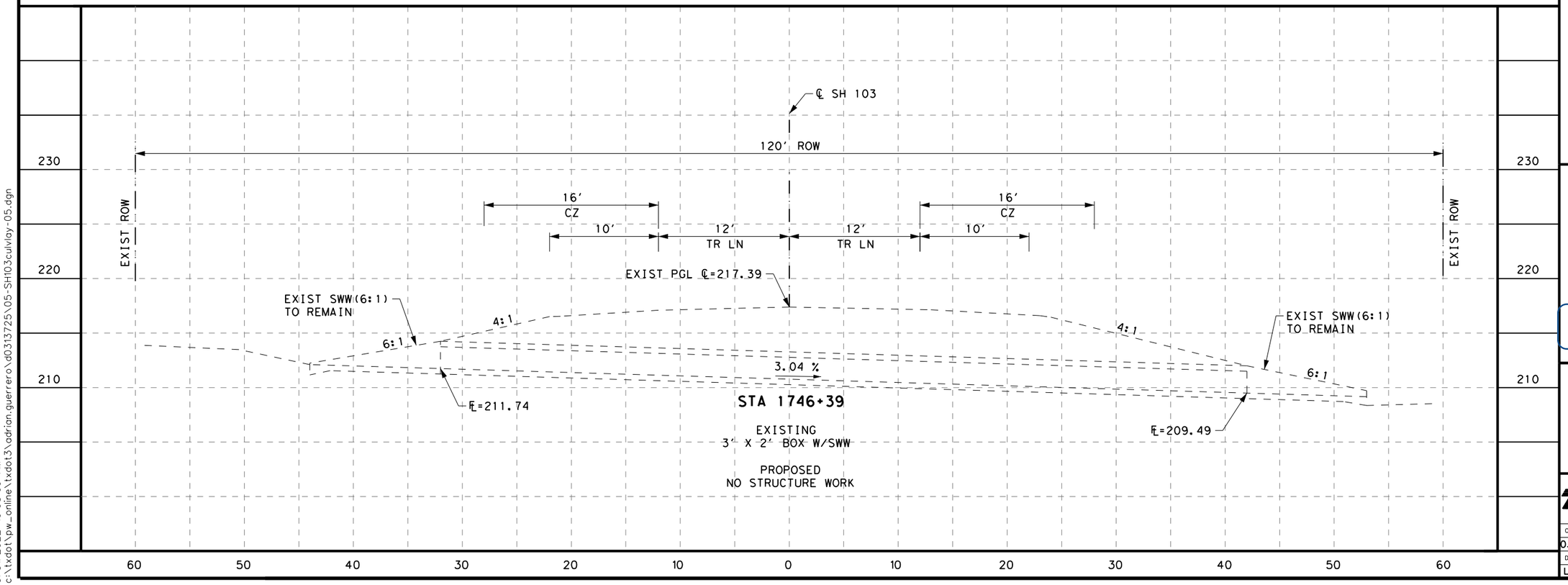

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 5 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		139

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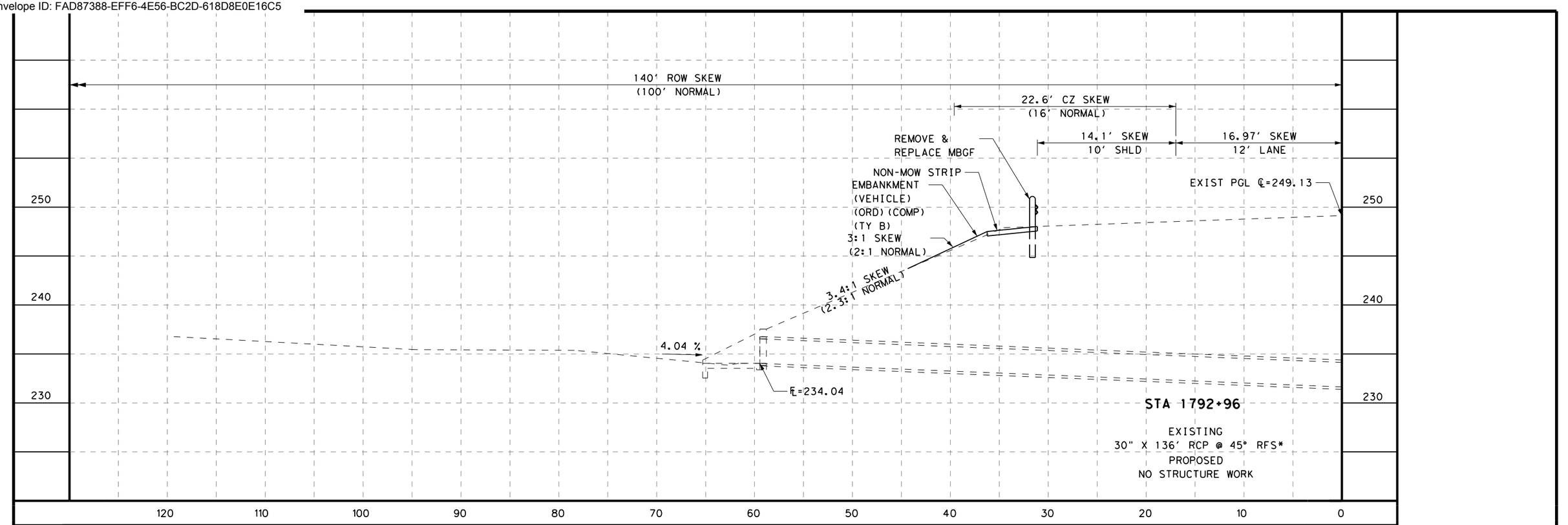

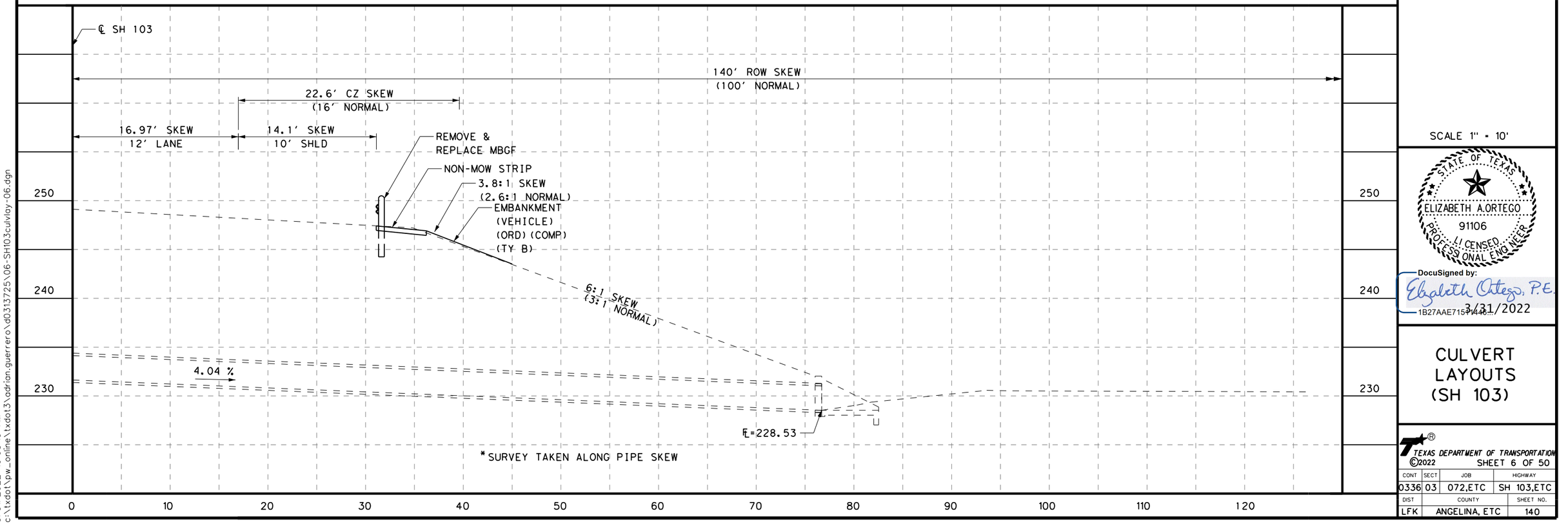

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 6 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC

DIST	COUNTY	SHEET NO.
LFK	ANGELINA, ETC	140

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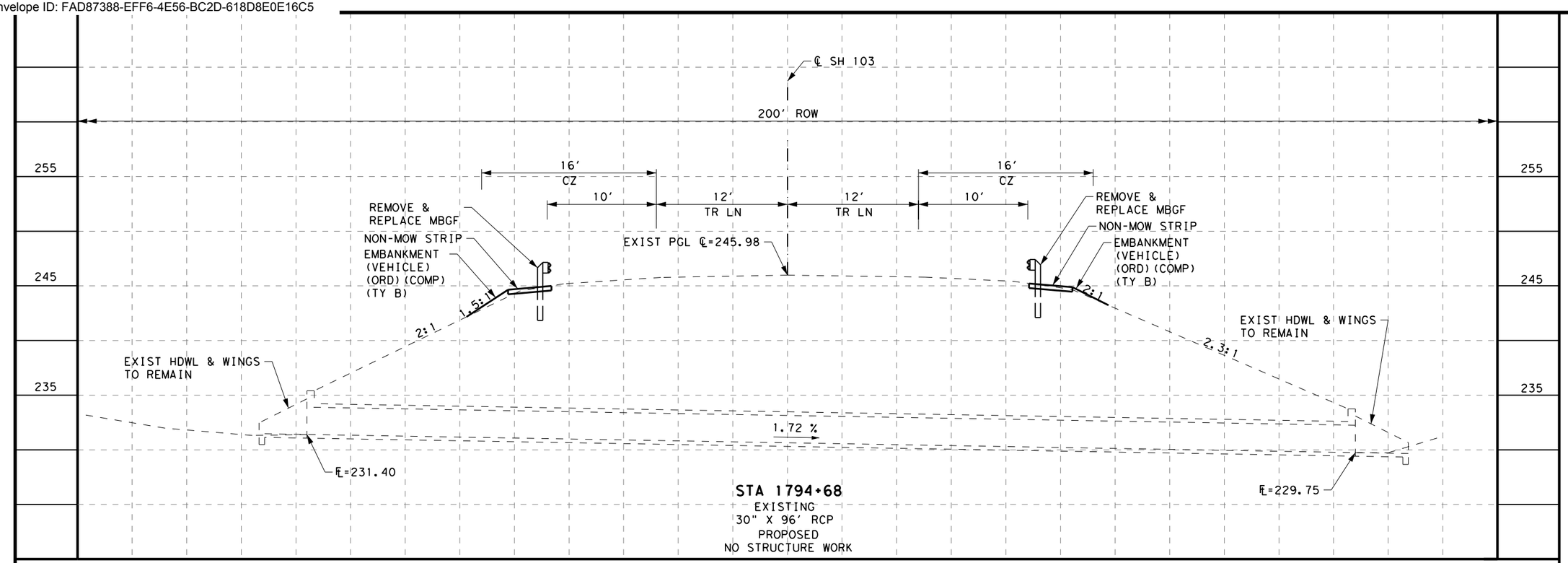

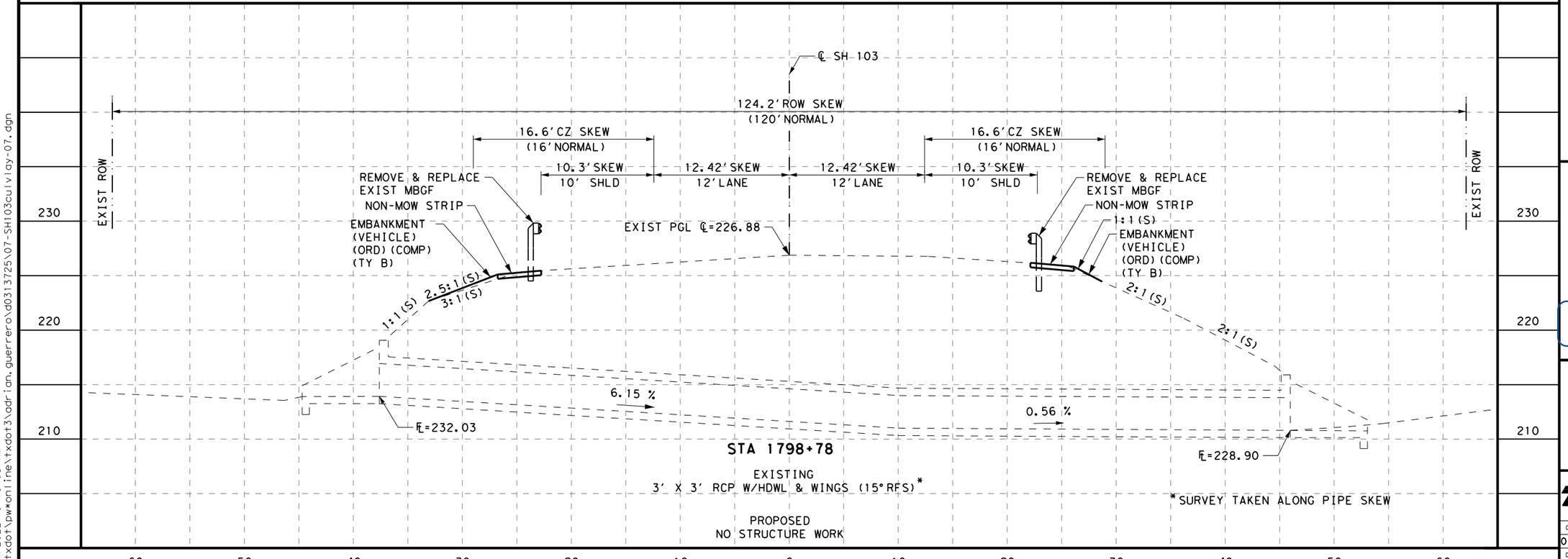

SCALE 1" = 10'

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 7 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		141

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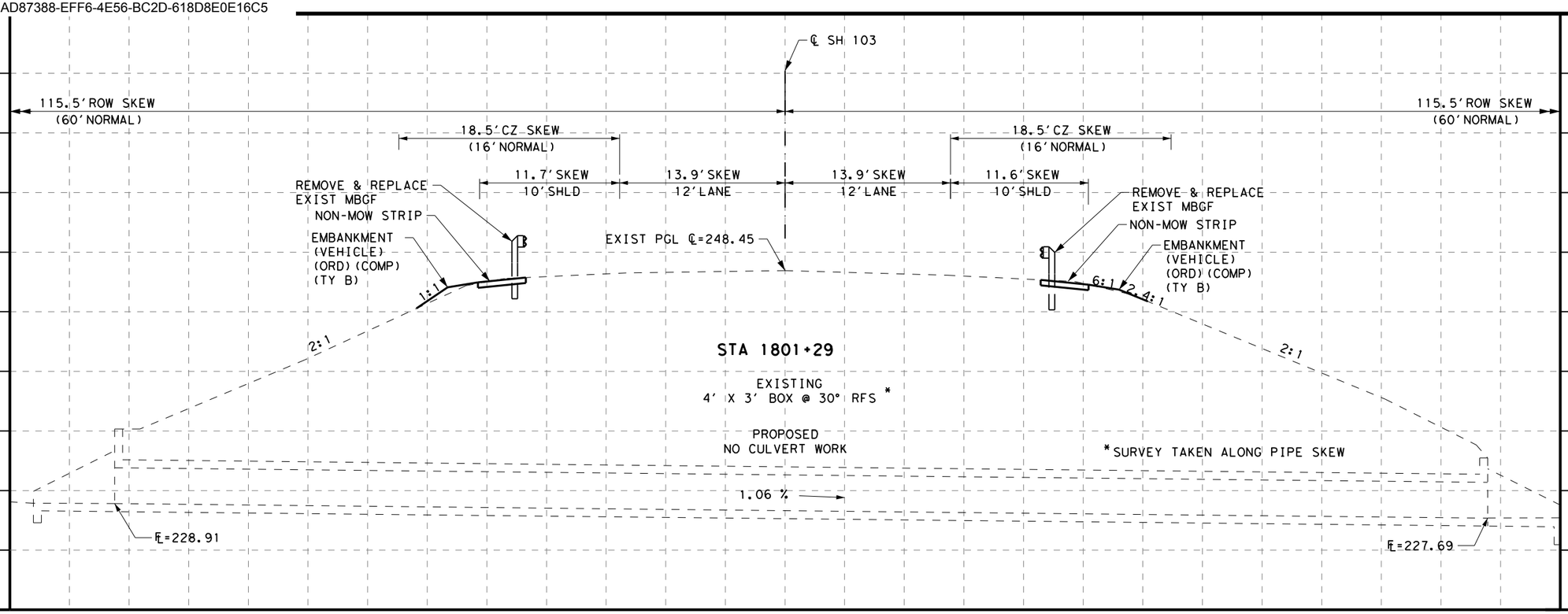

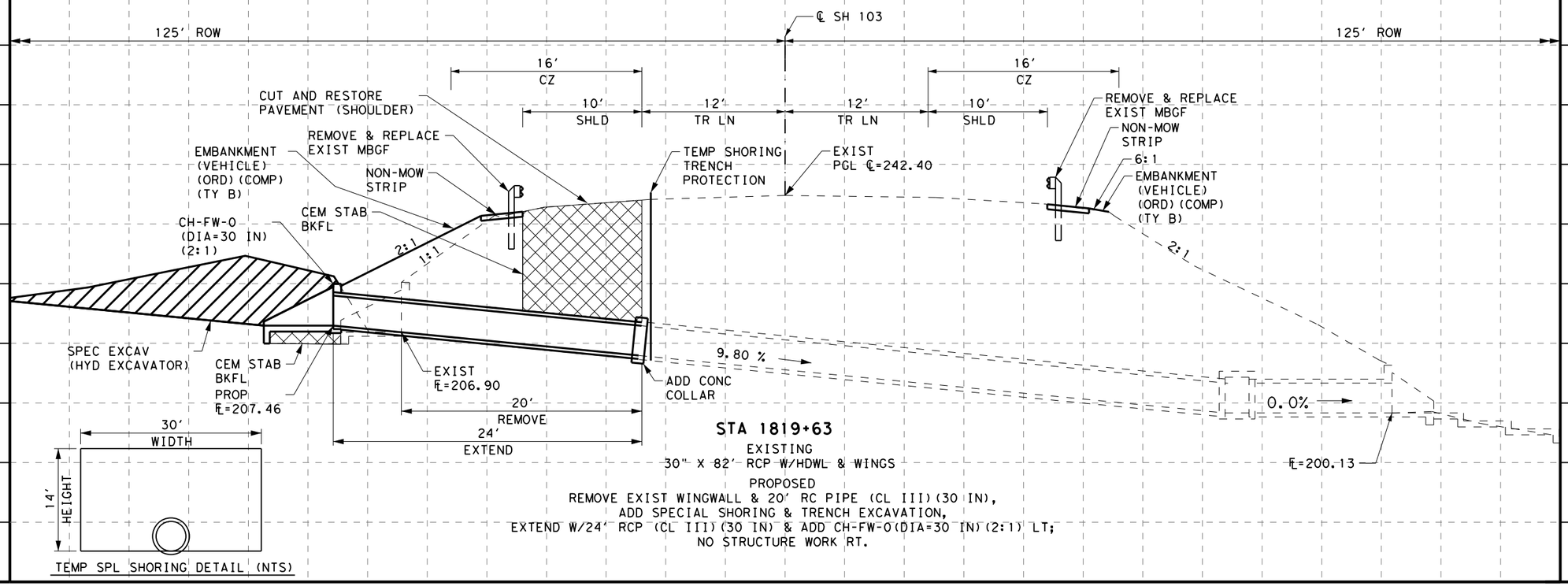

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 8 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		142

3/31/2022 10:13:14 AM
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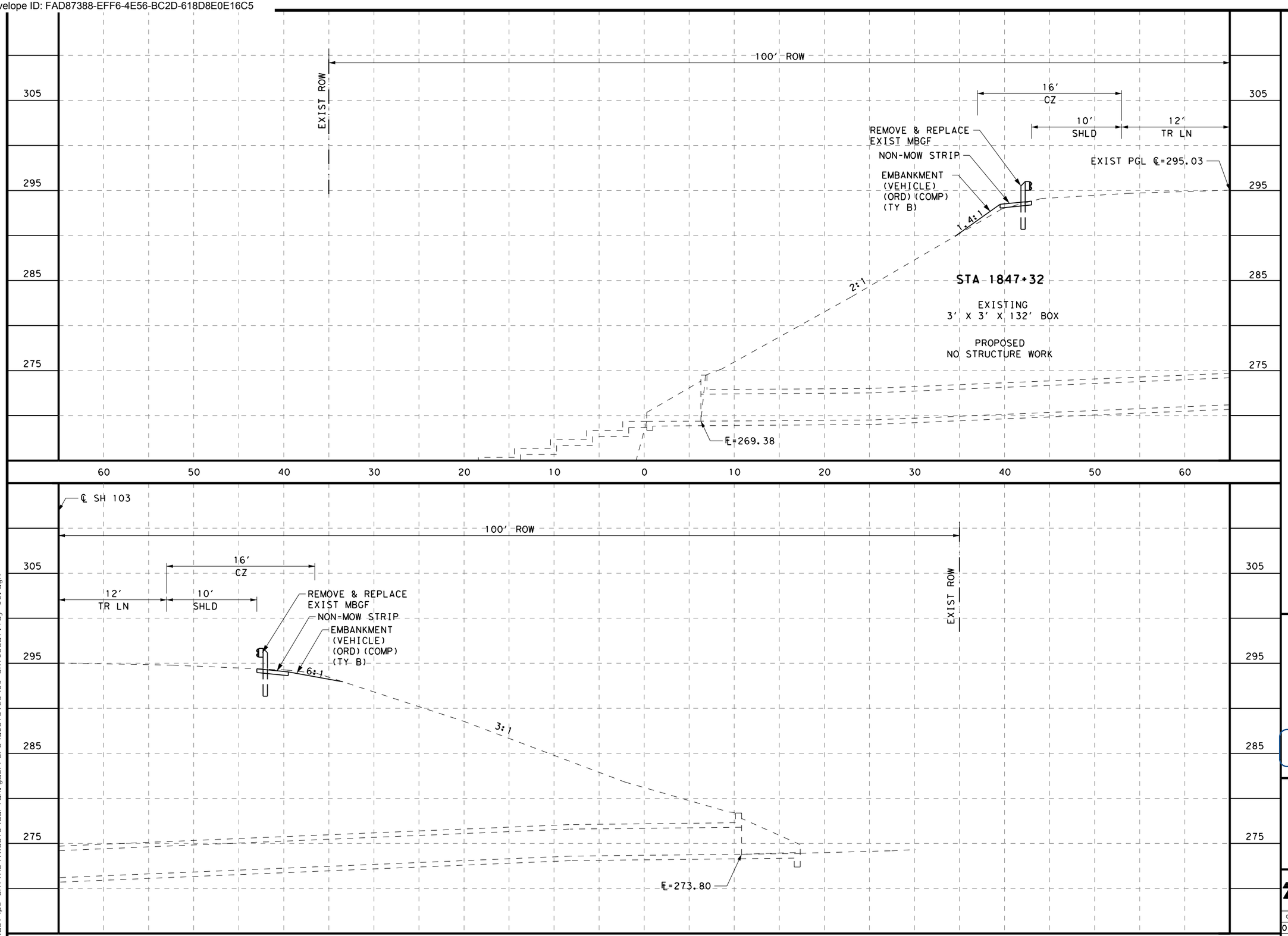

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 9 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		143

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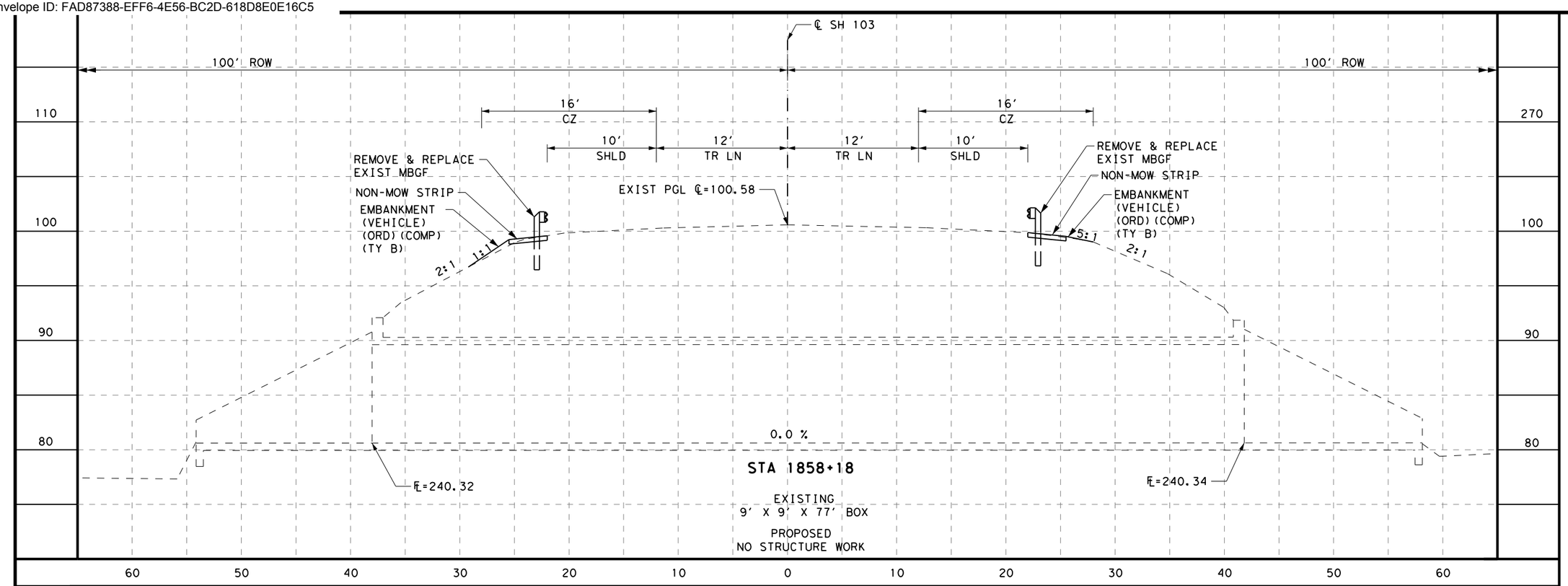

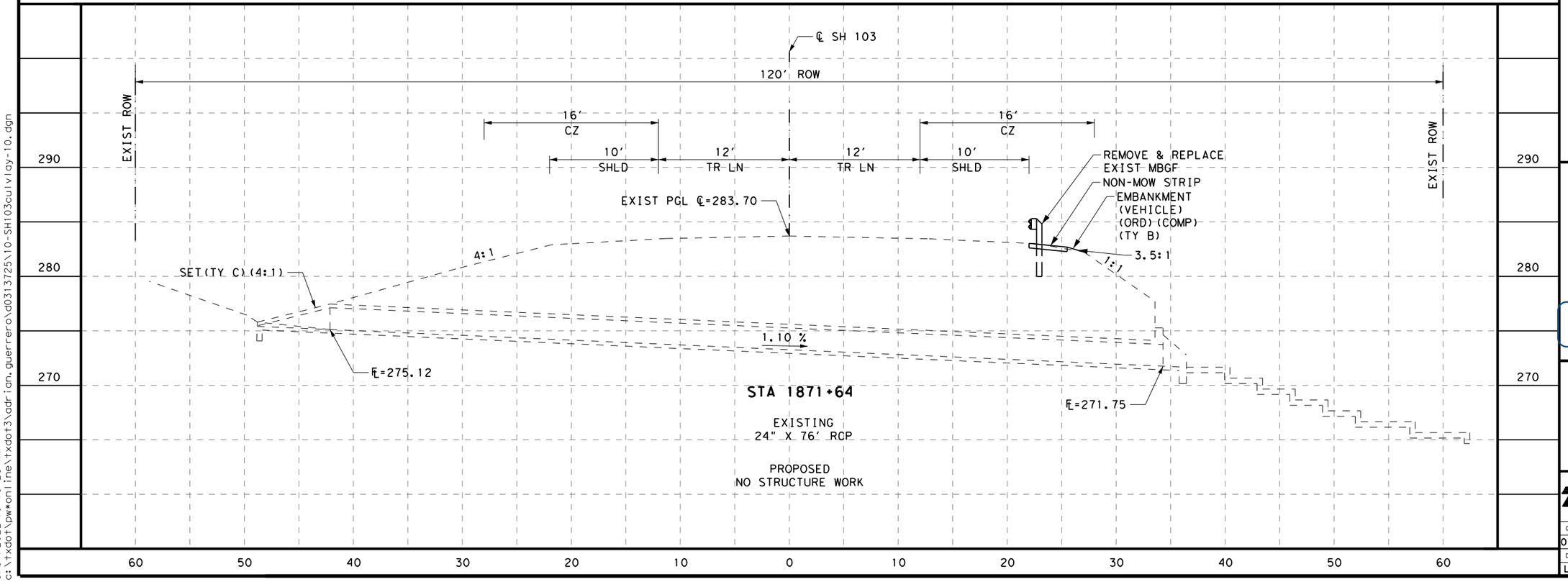

SCALE 1" = 10'

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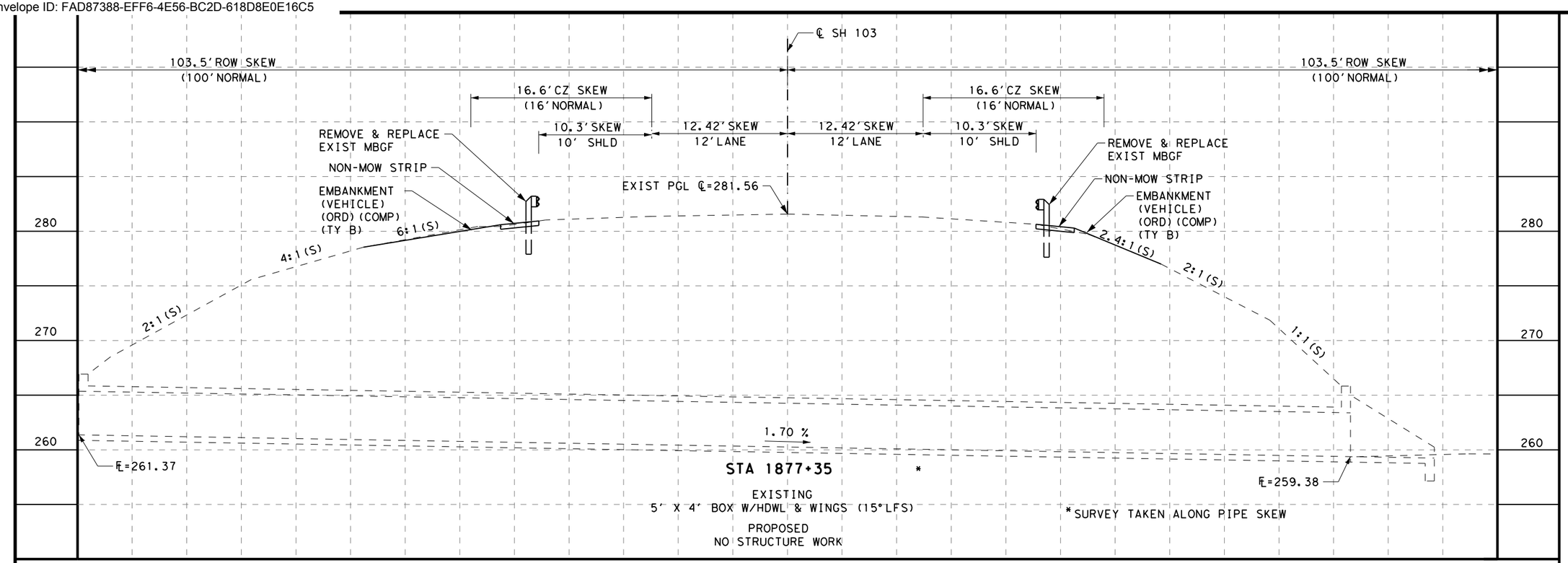
CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 10 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		144



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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 11 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		145

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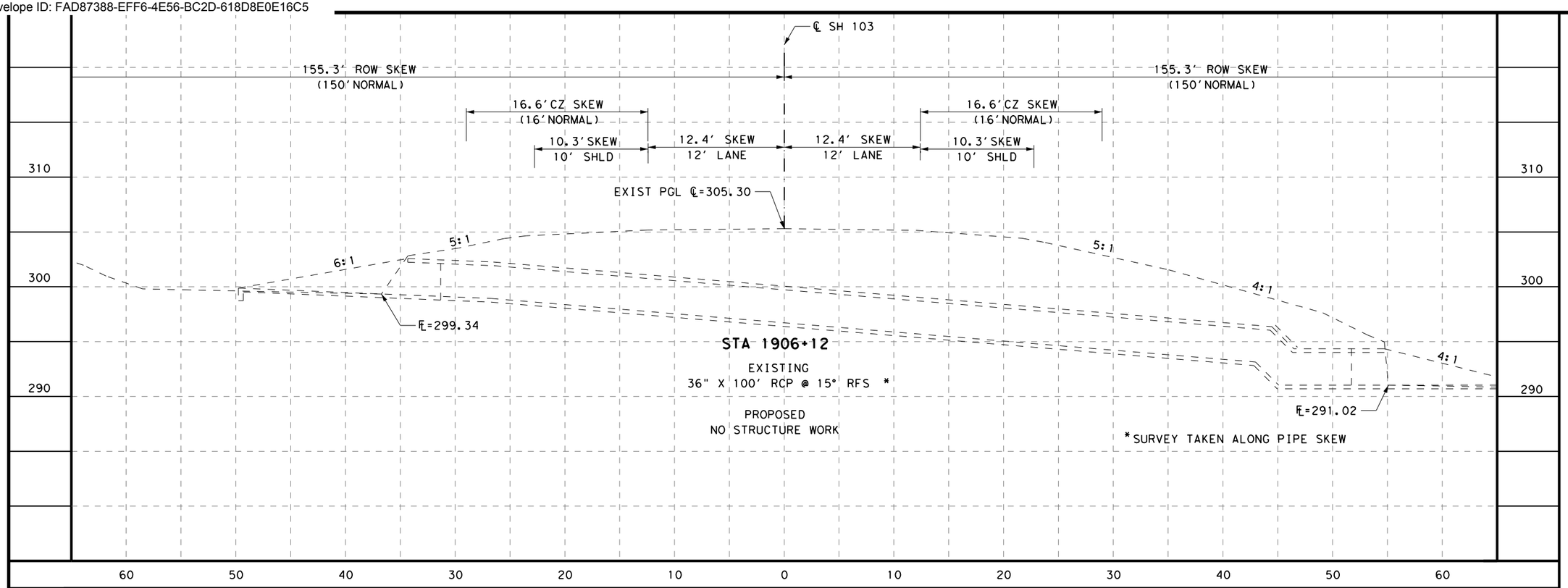

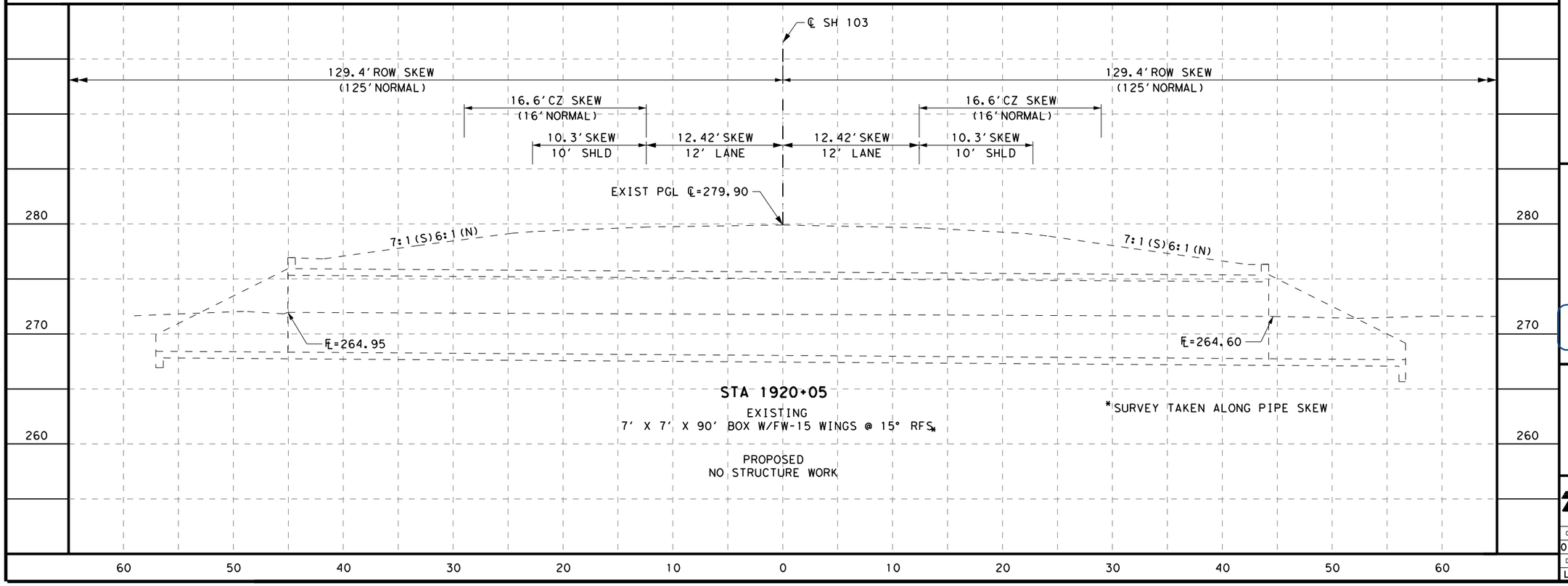

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 12 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		146

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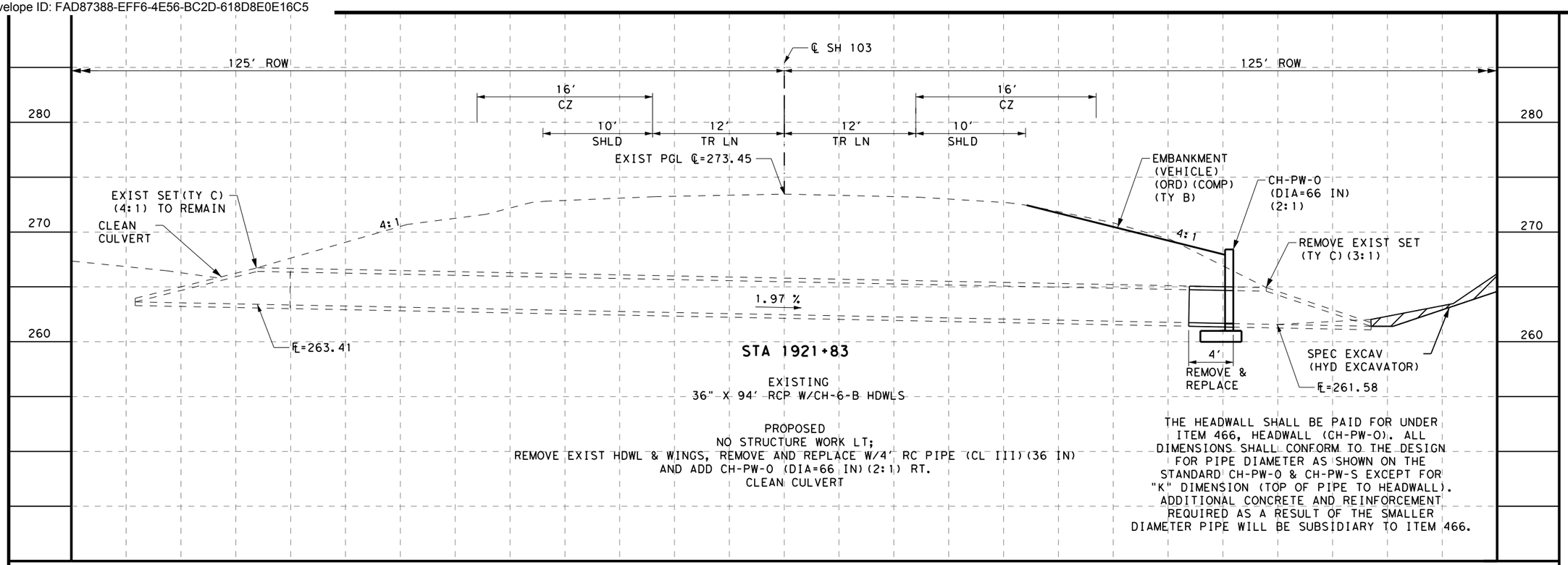

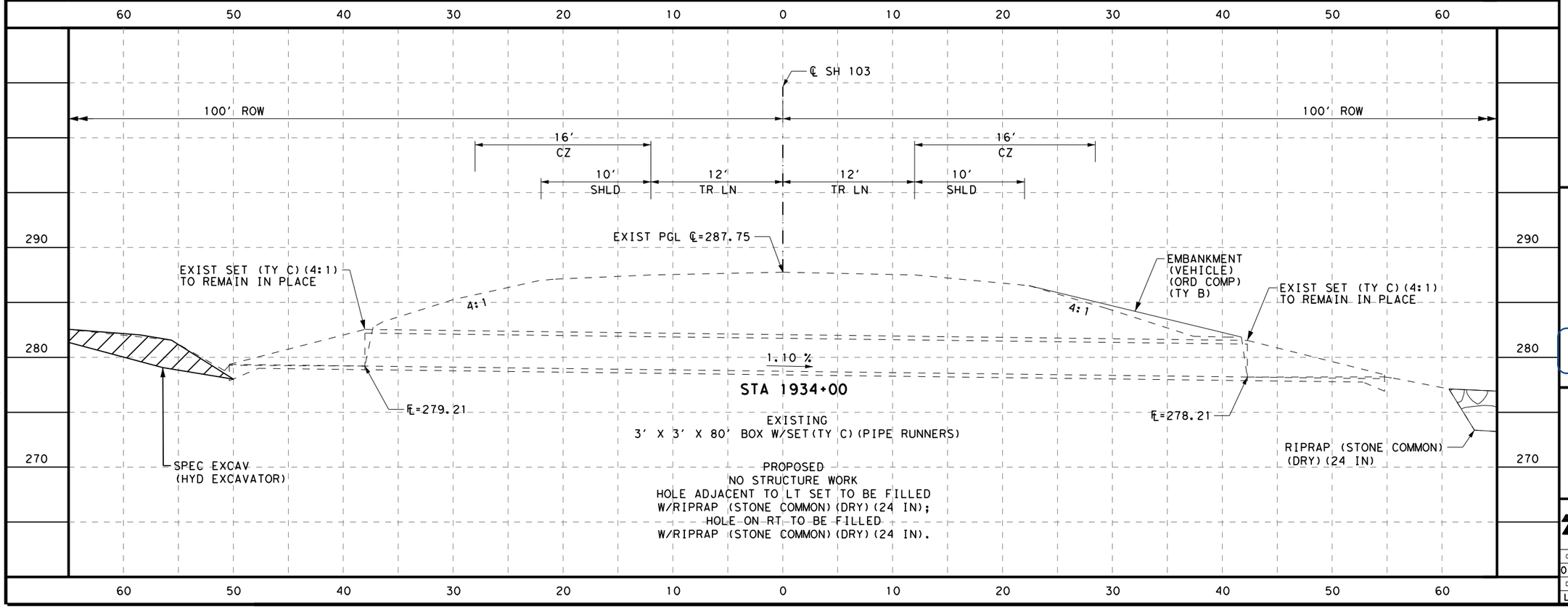

SCALE 1" = 10'

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 13 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		147

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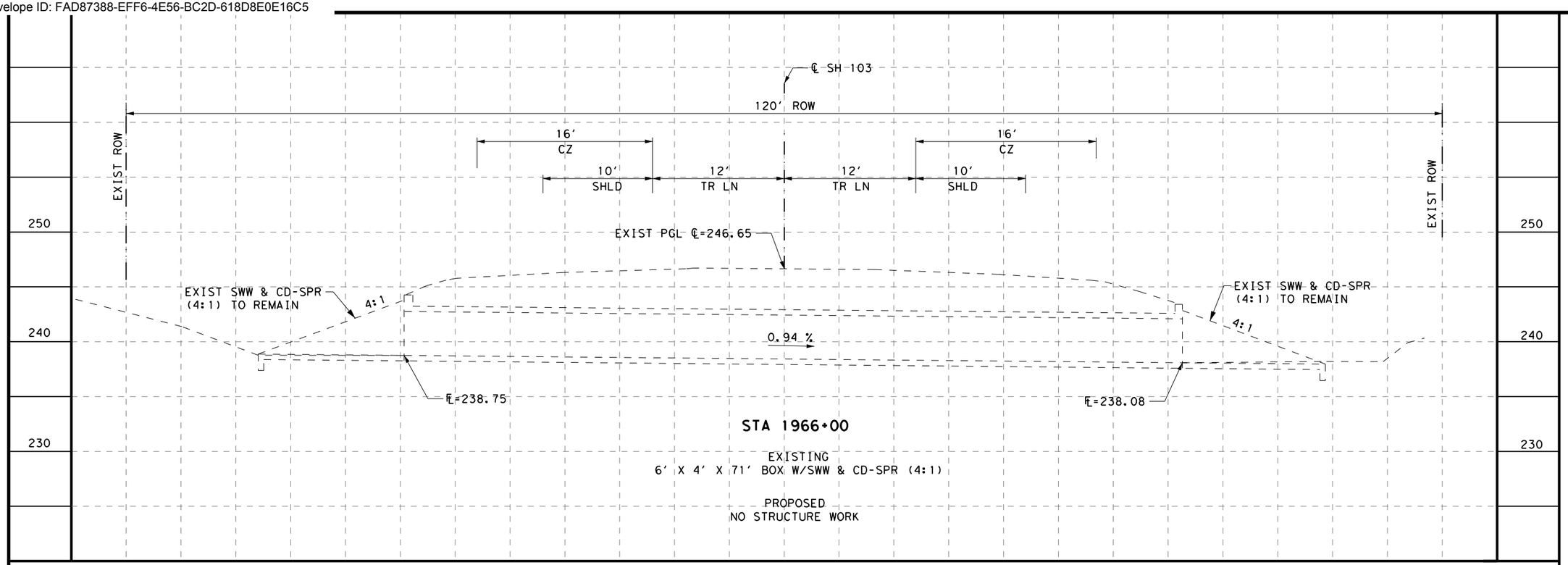

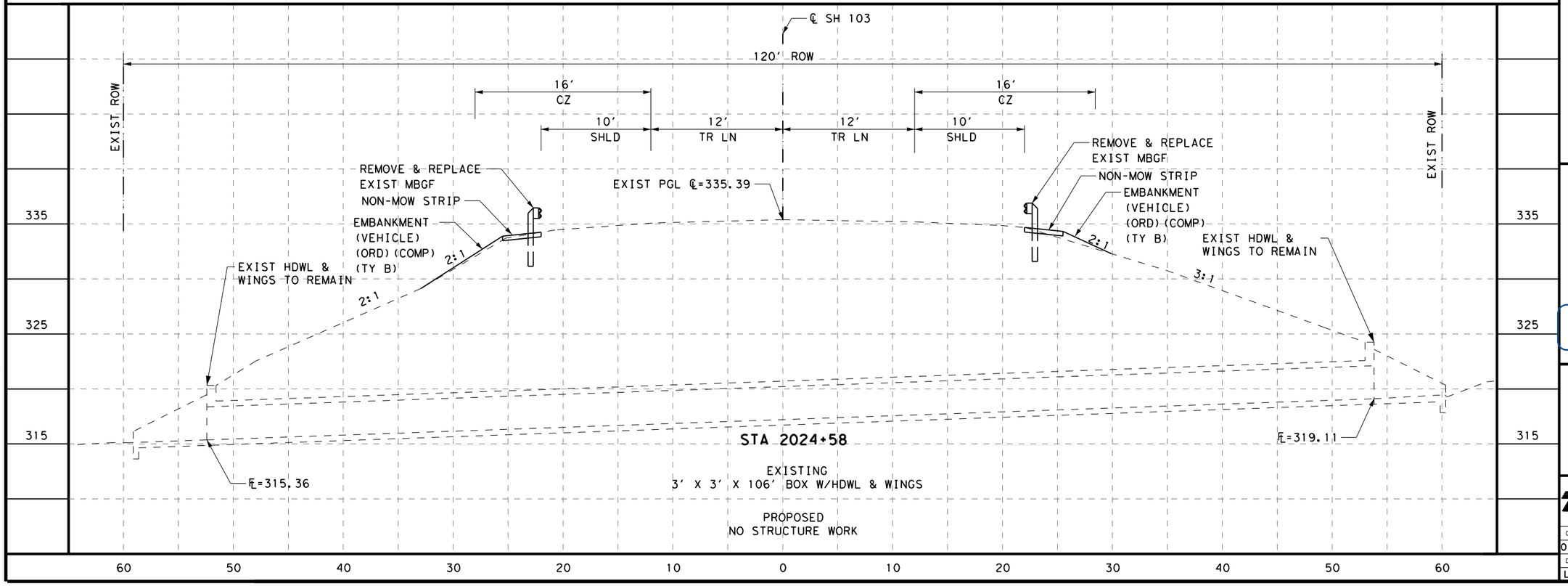

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 14 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		148

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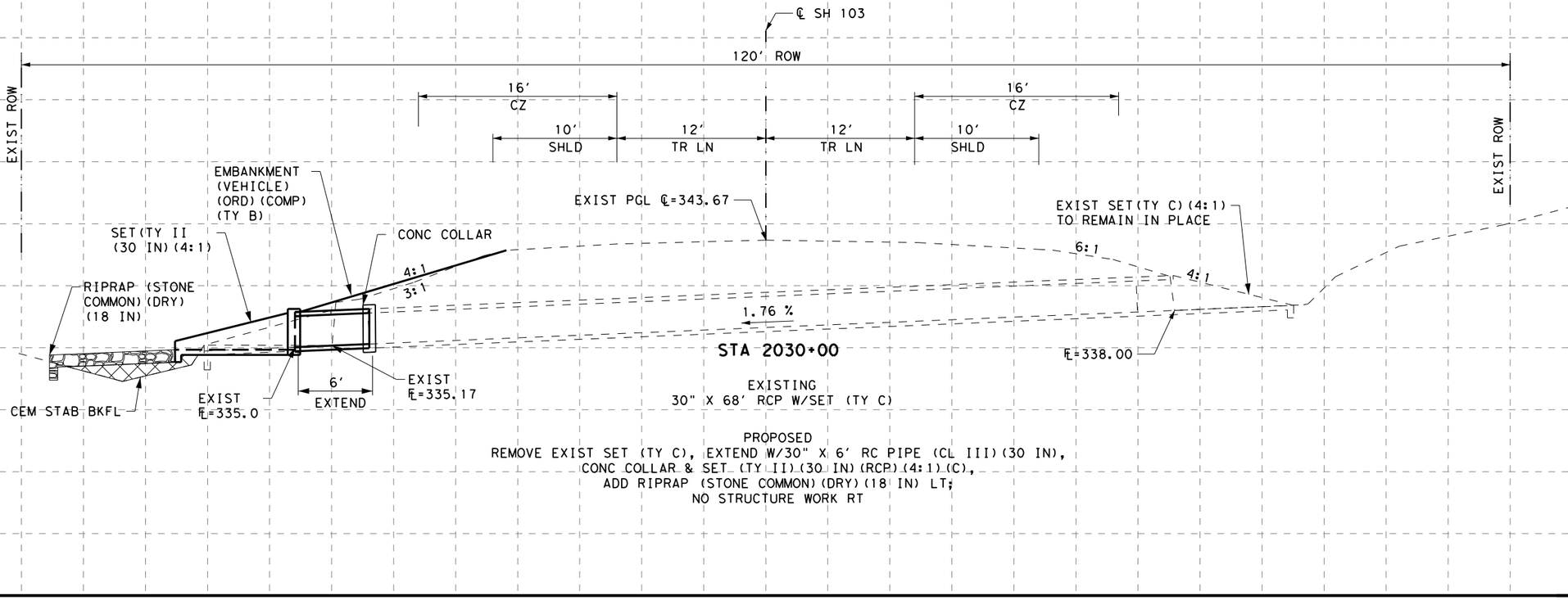

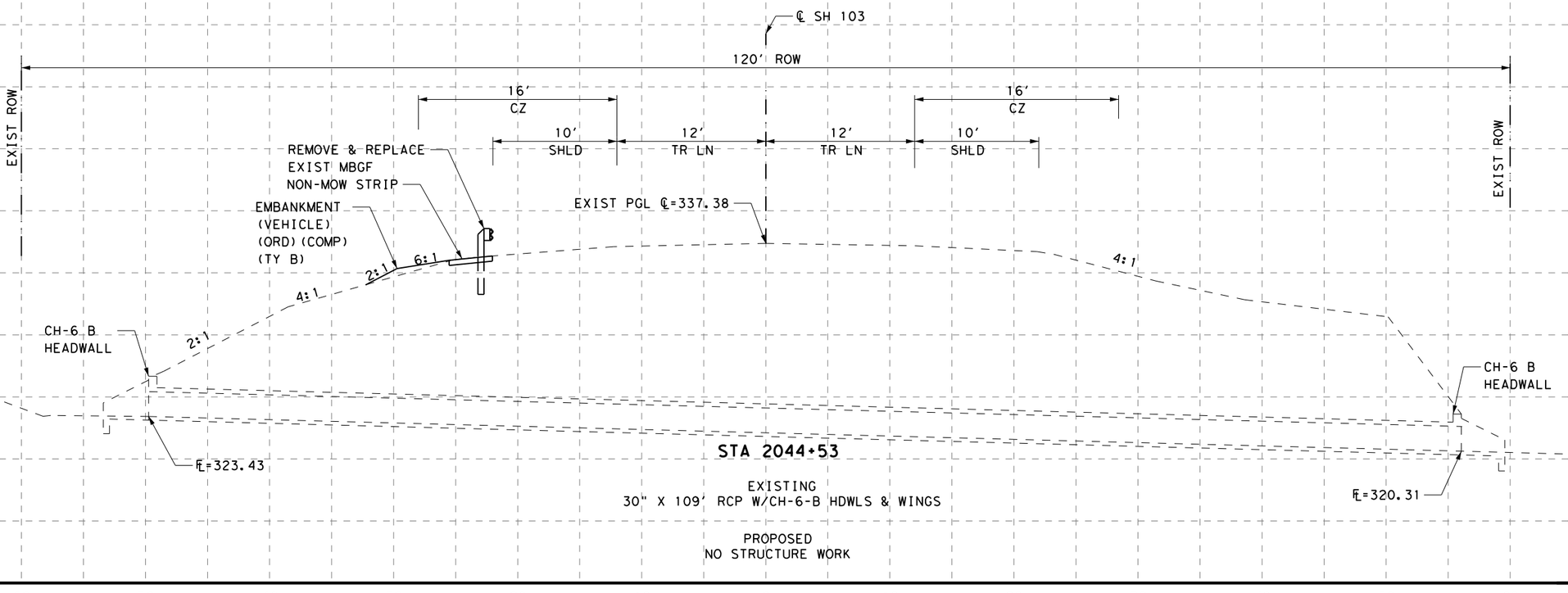

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 15 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		149

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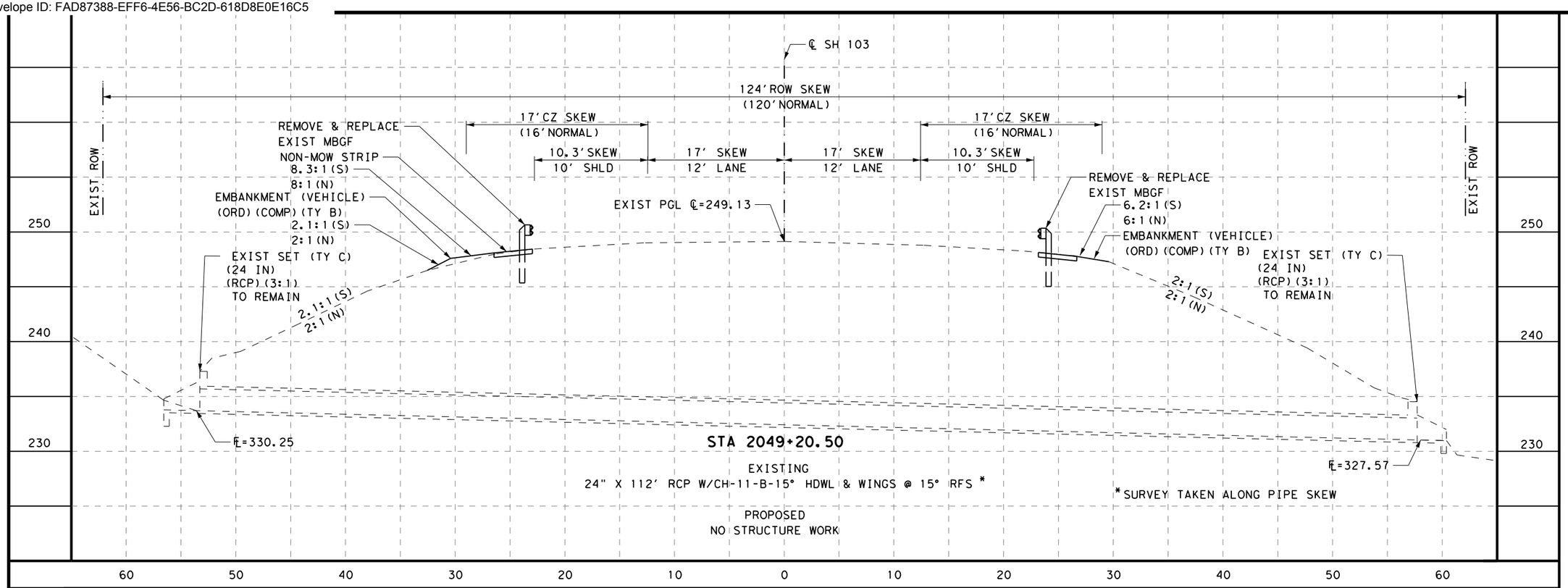

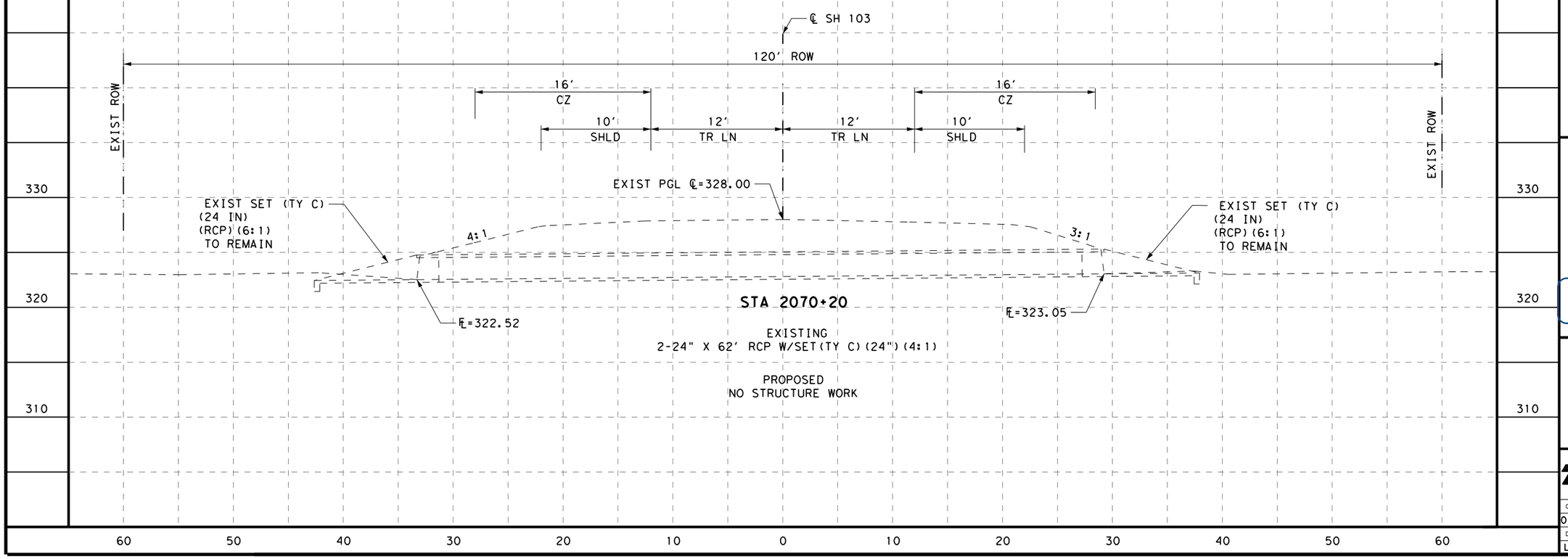

SCALE 1" = 10'

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 16 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		150

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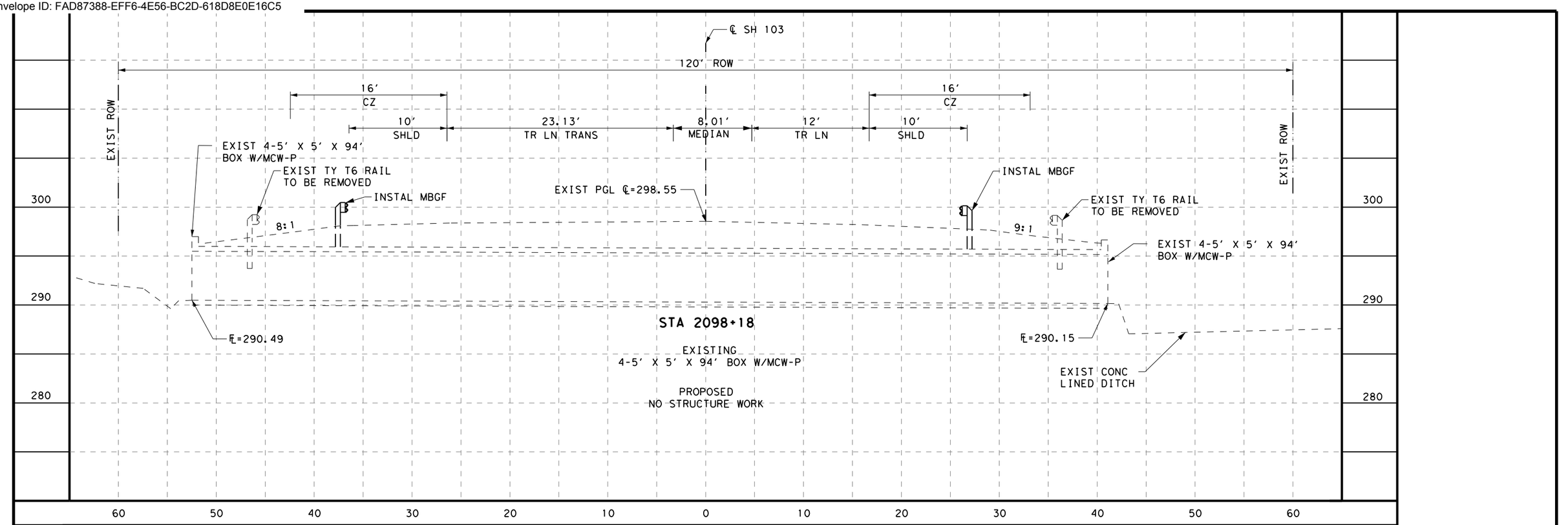

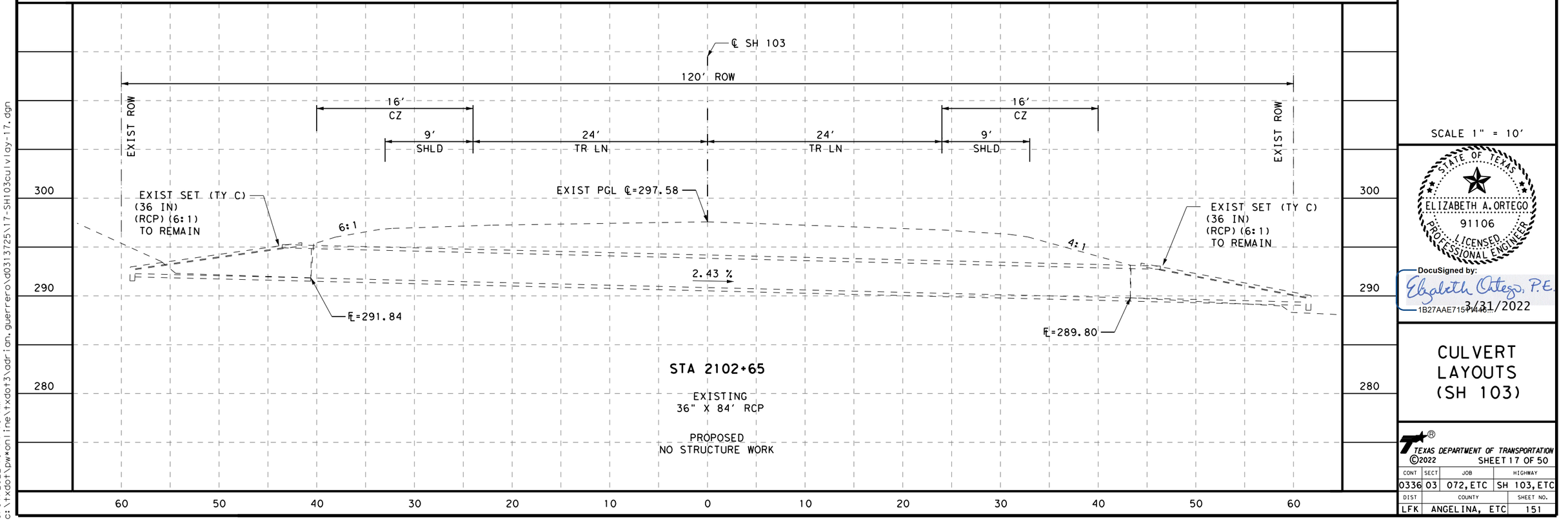

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 17 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		151

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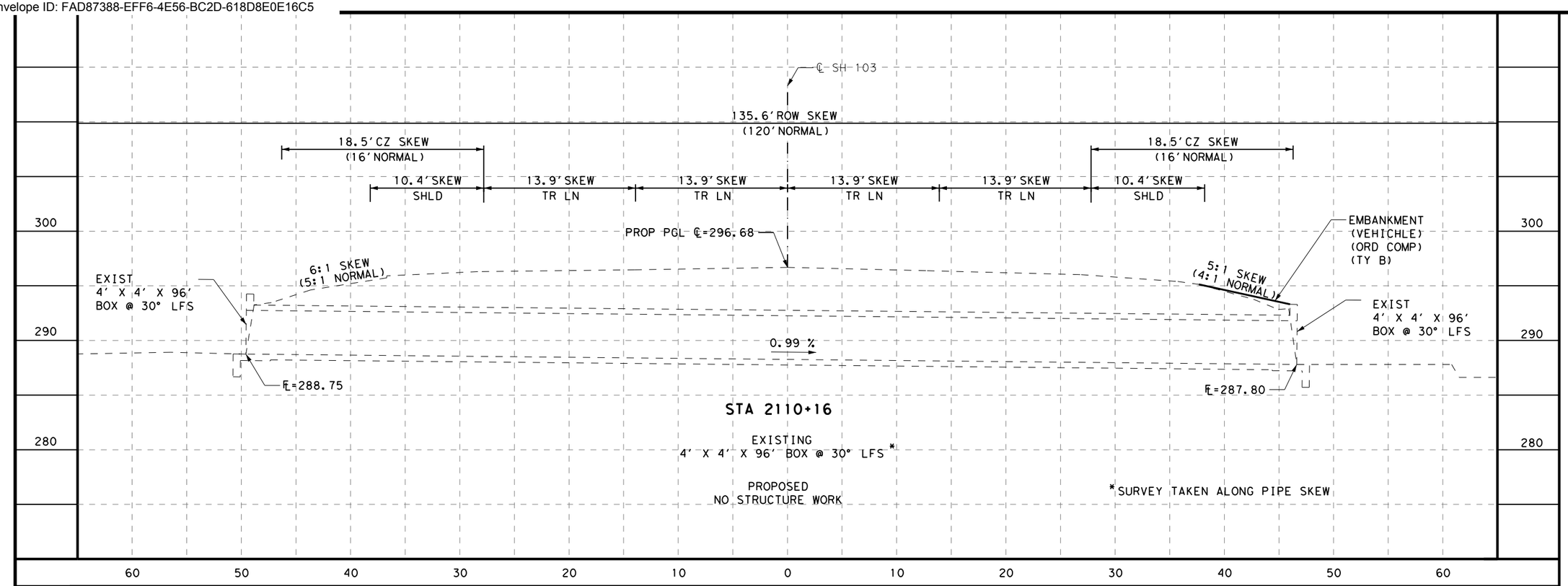

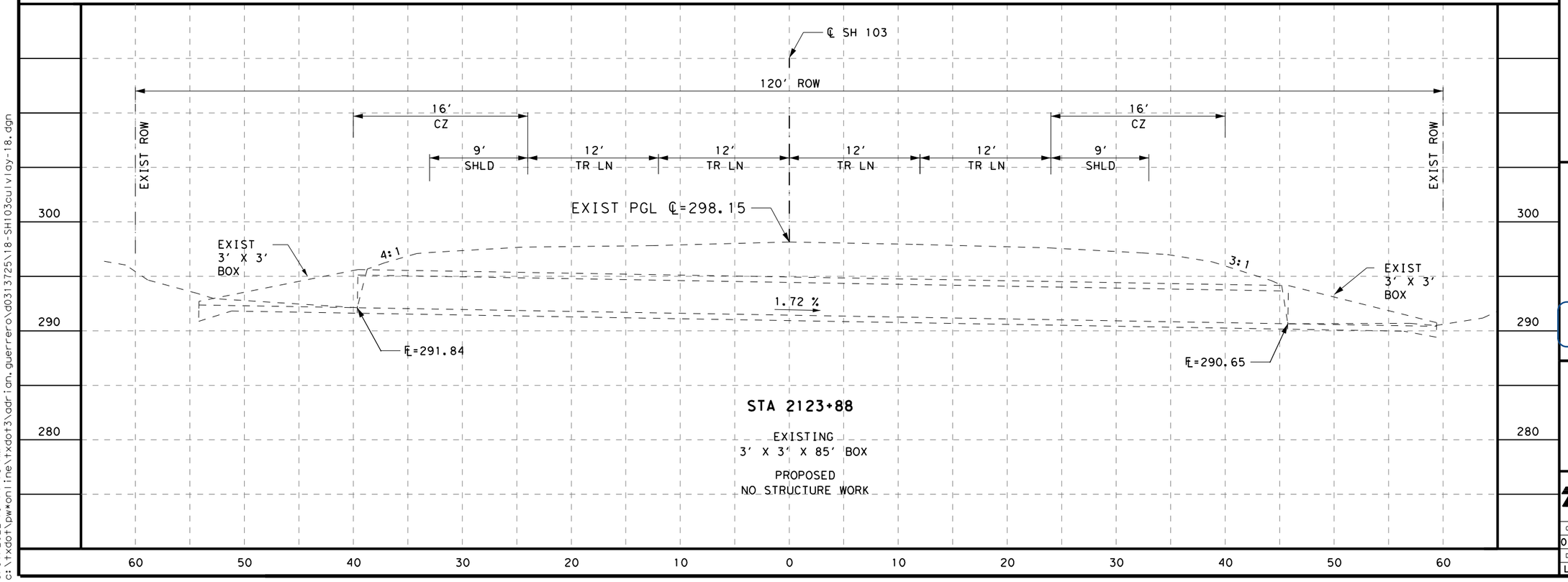

SCALE 1" = 10'

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 18 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		152

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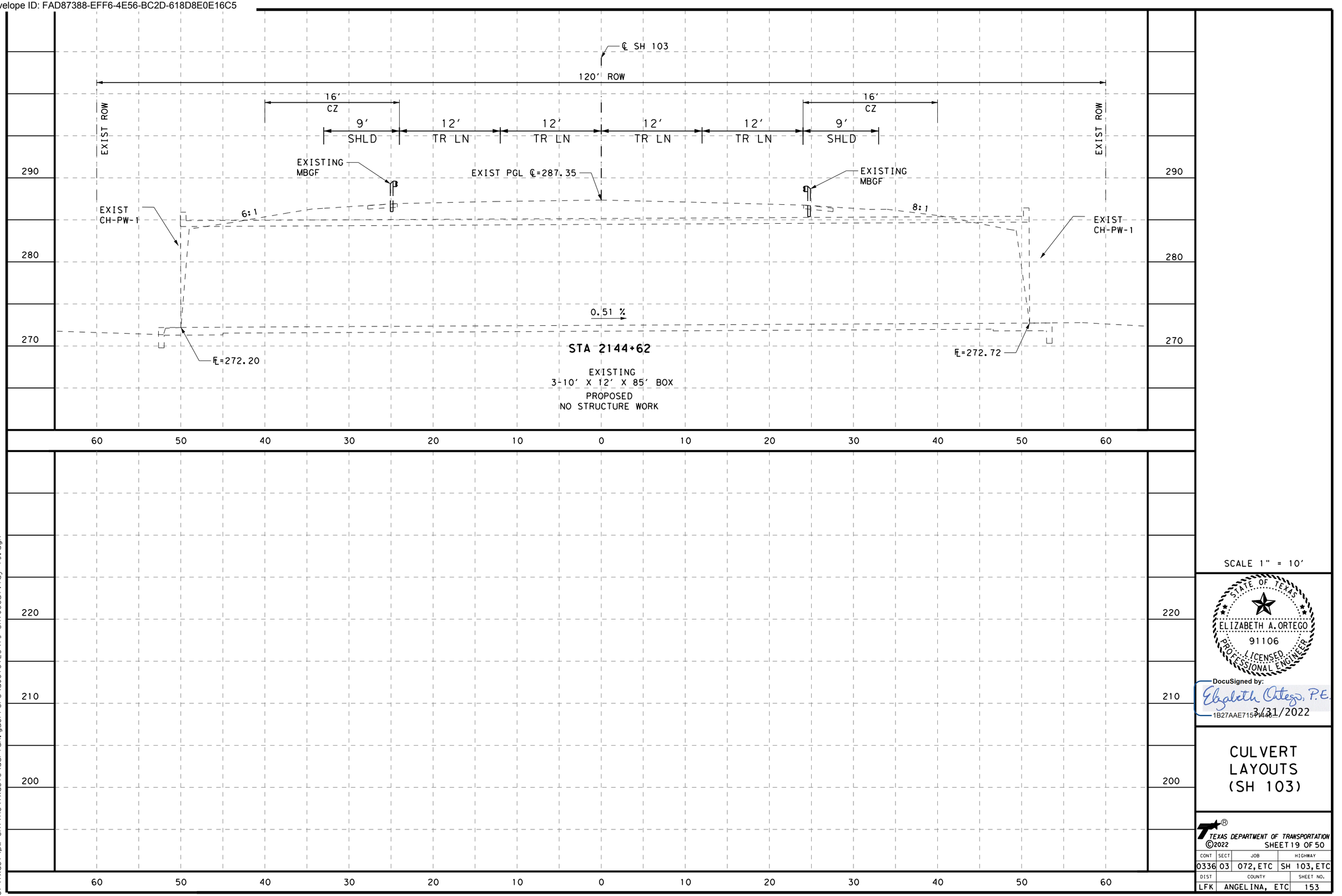

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 19 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		153

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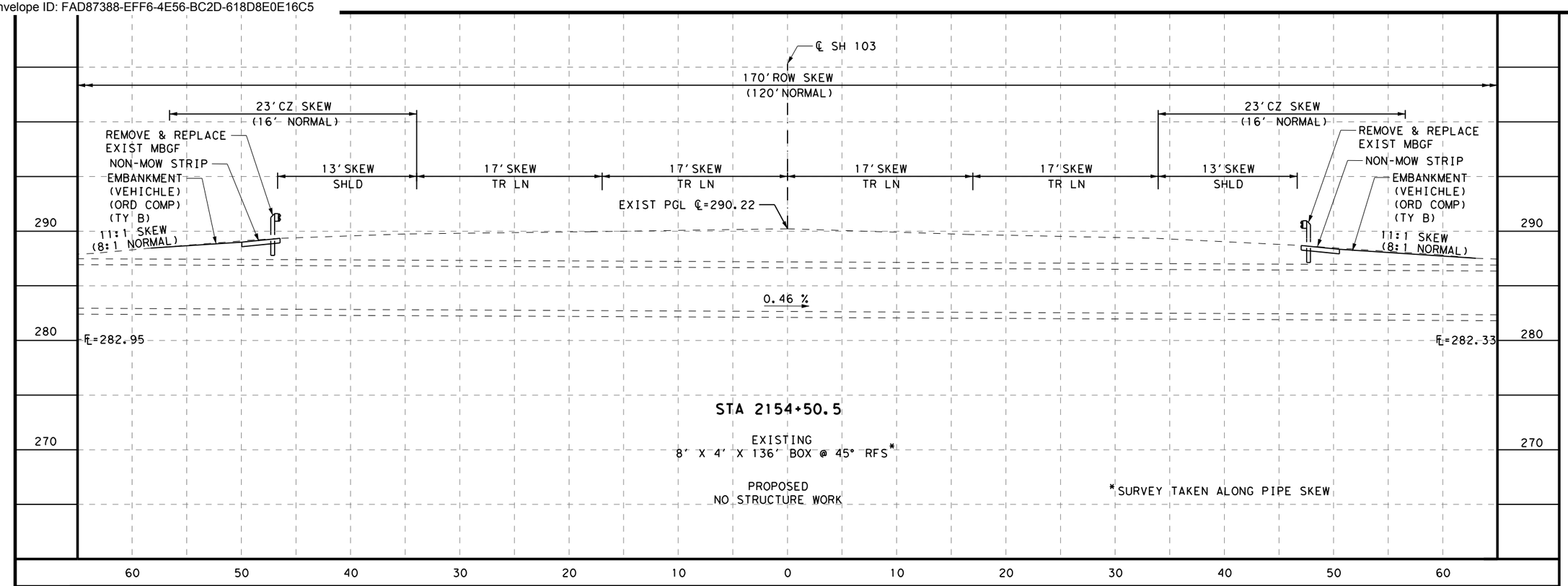

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 20 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		154

3/31/2022 10:14:29 AM
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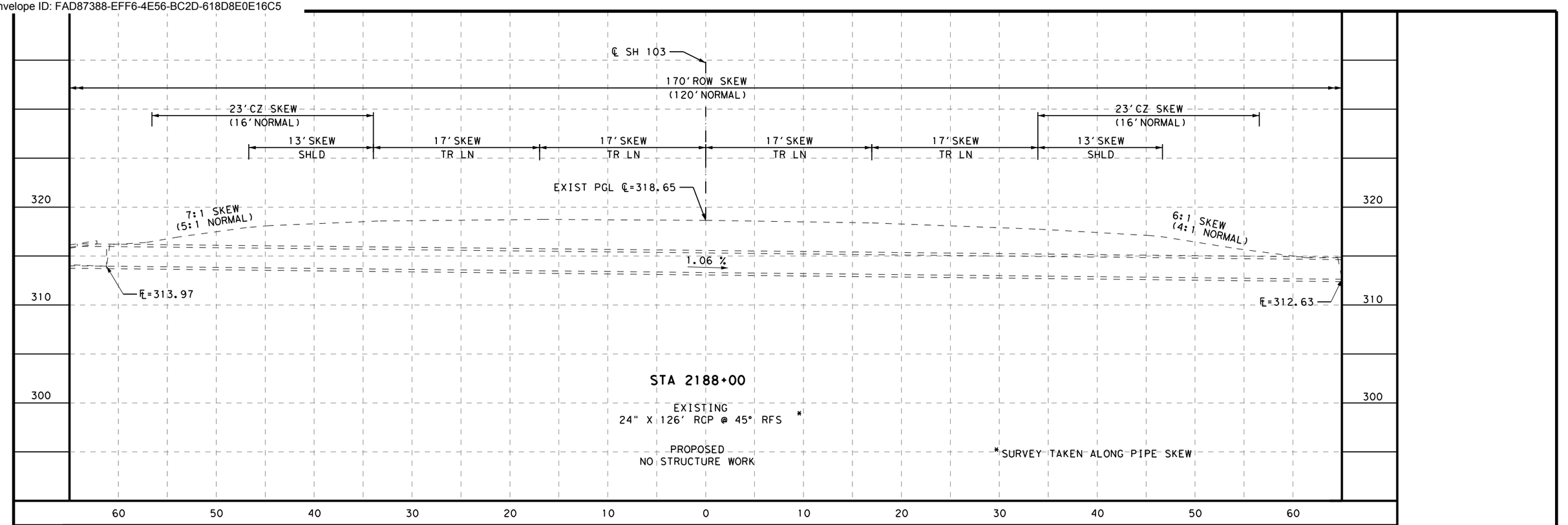

SCALE 1" = 10'

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CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 21 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		155

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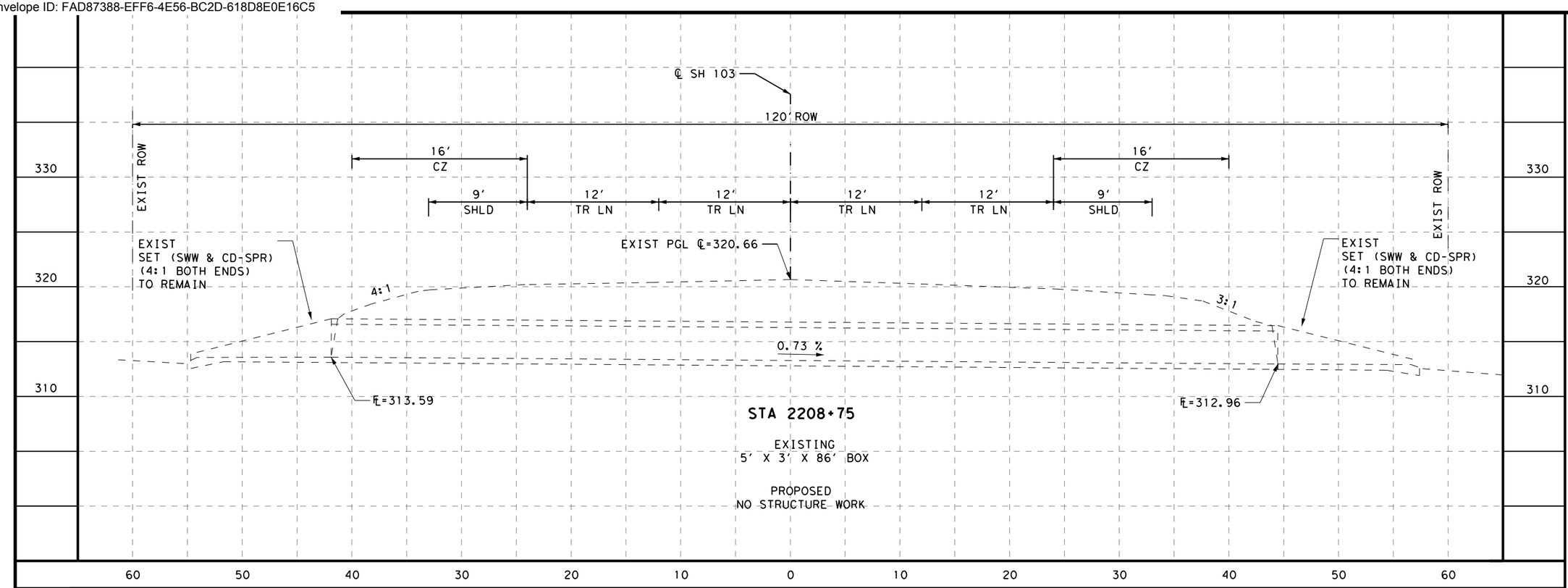

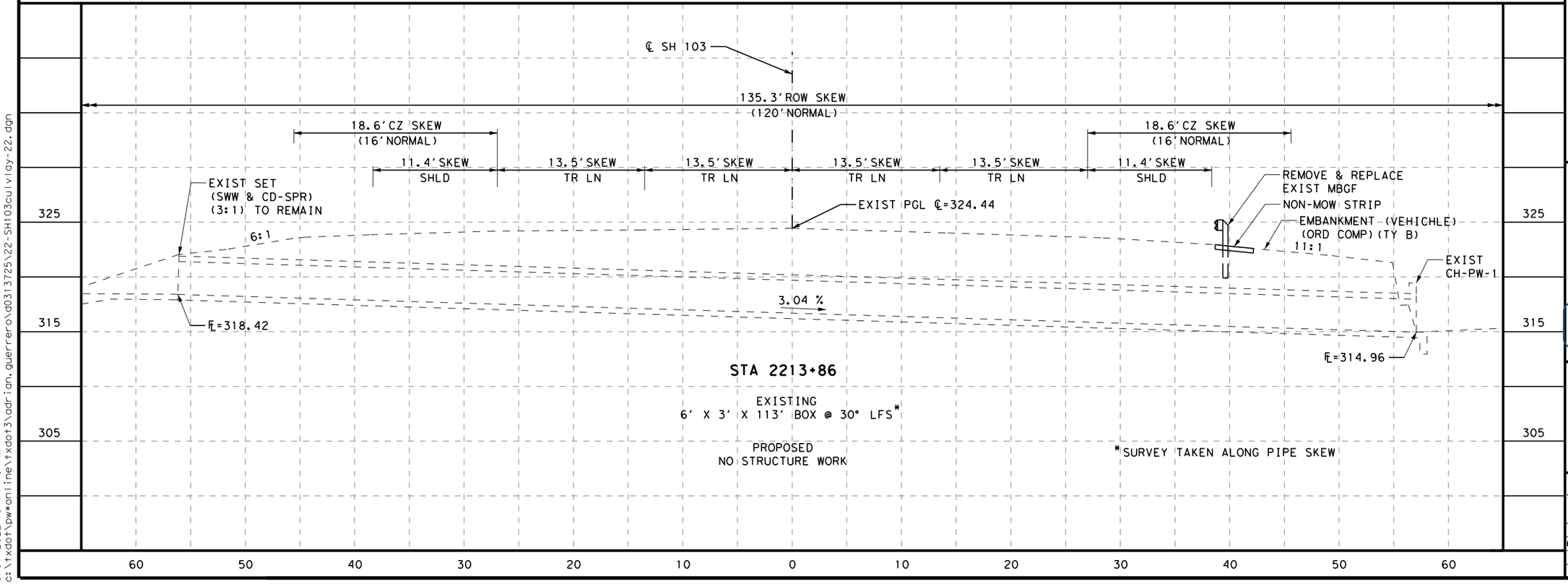

SCALE 1" = 10'

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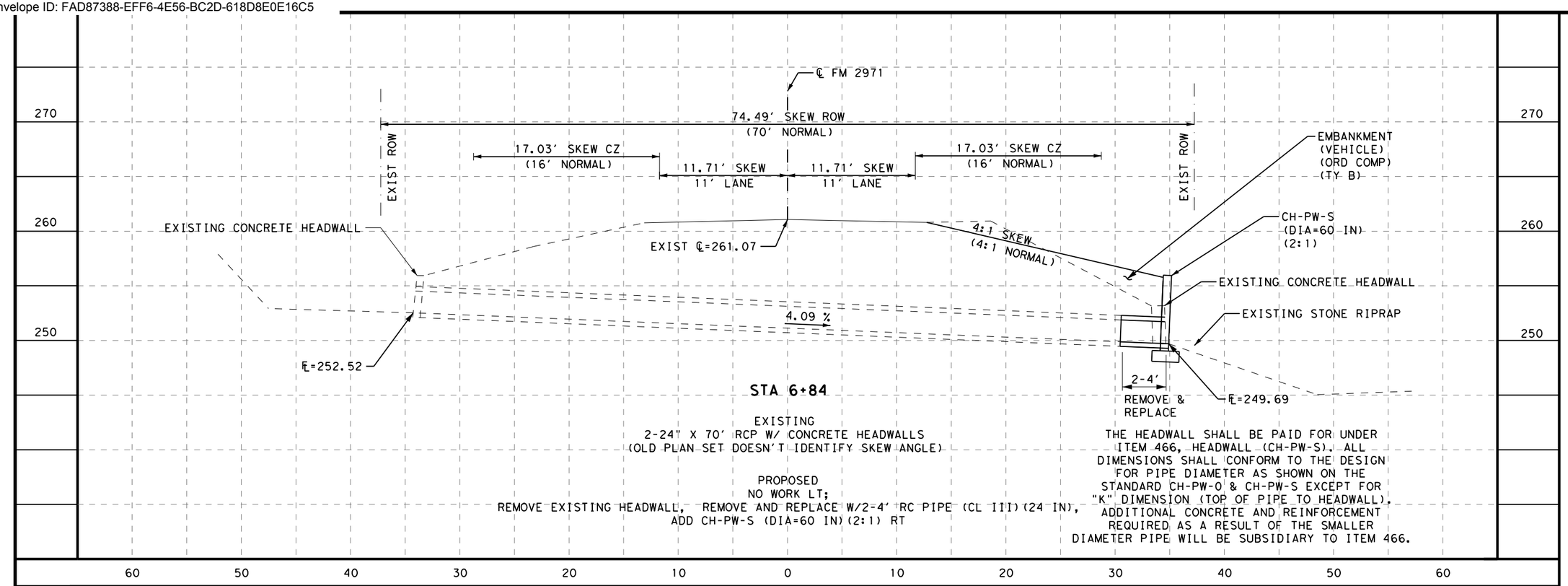
CULVERT LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 22 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		156

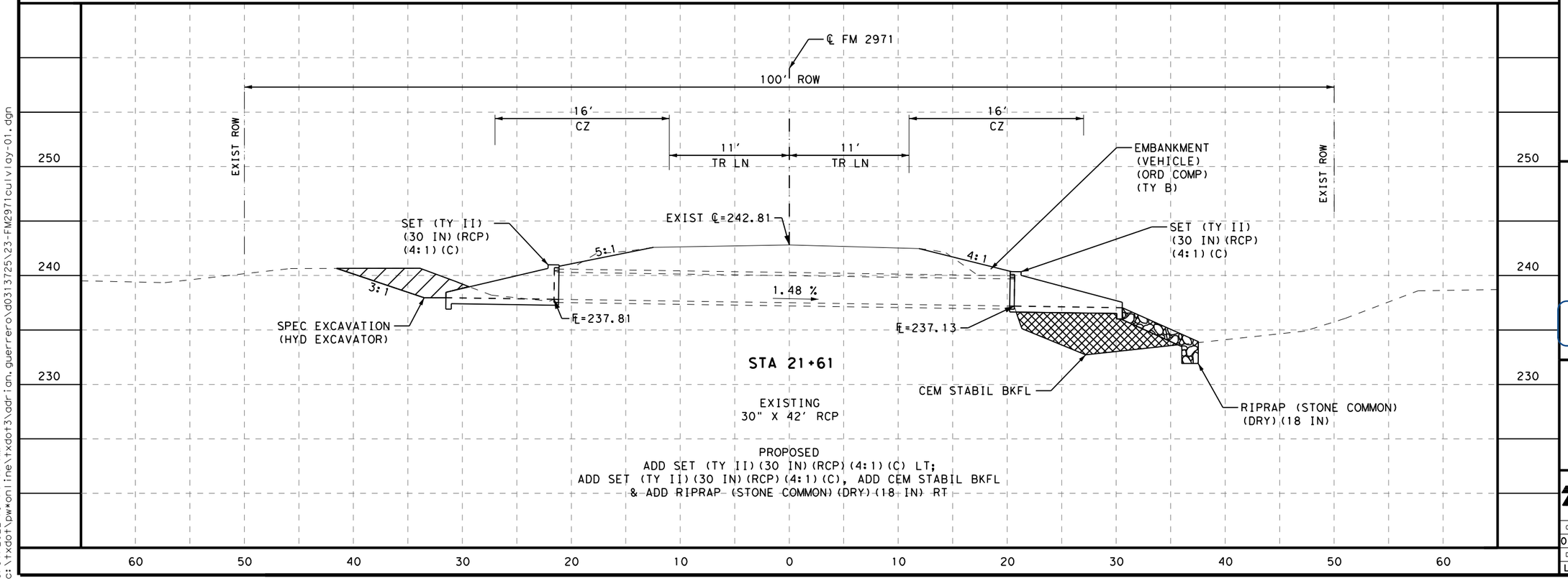


STA 6+84

EXISTING
2-24" X 70' RCP W/ CONCRETE HEADWALLS
(OLD PLAN SET DOESN'T IDENTIFY SKEW ANGLE)

PROPOSED
NO WORK LT;
REMOVE EXISTING HEADWALL, REMOVE AND REPLACE W/2-4' RC PIPE (CL III)(24 IN),
ADD CH-PW-S (DIA=60 IN)(2:1) RT

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



STA 21+61

EXISTING
30" X 42' RCP

PROPOSED
ADD SET (TY II)(30 IN)(RCP)(4:1)(C) LT;
ADD SET (TY II)(30 IN)(RCP)(4:1)(C), ADD CEM STABIL BKFL
& ADD RIPRAP (STONE COMMON)(DRY)(18 IN) RT

SCALE 1" = 10'

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CULVERT LAYOUTS (FM 2971)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 23 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		157

3/31/2022 10:14:47 AM
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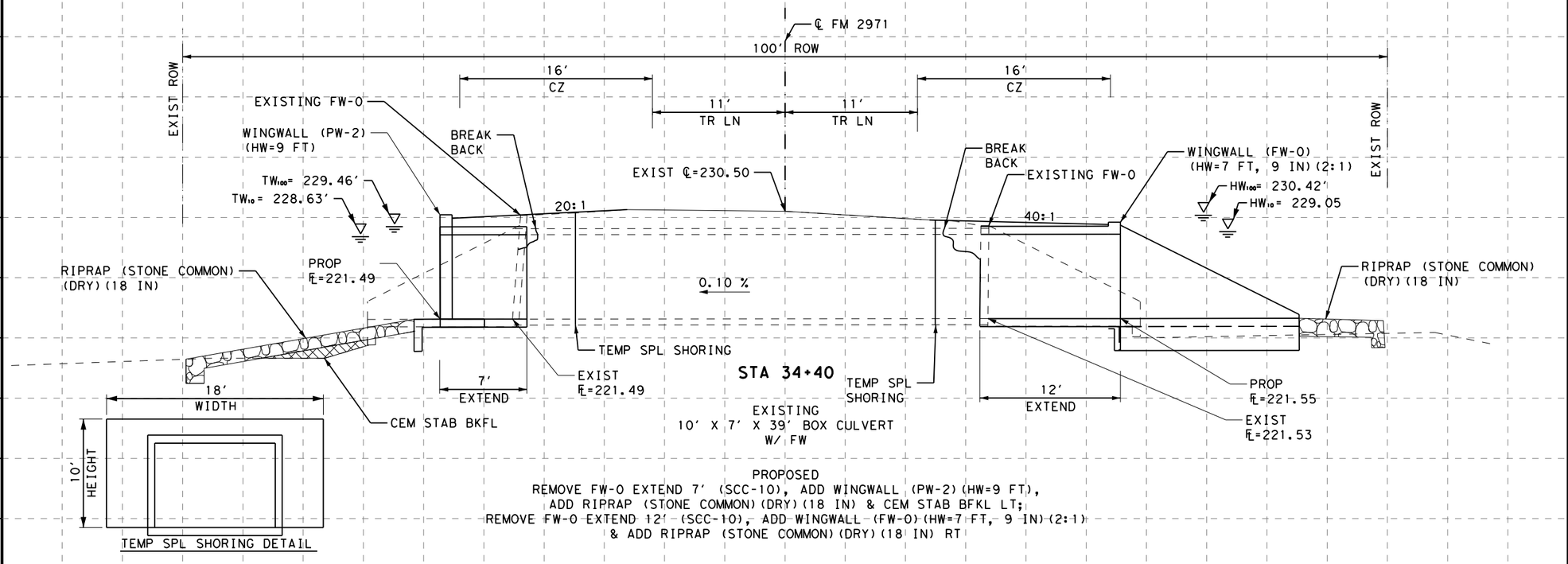

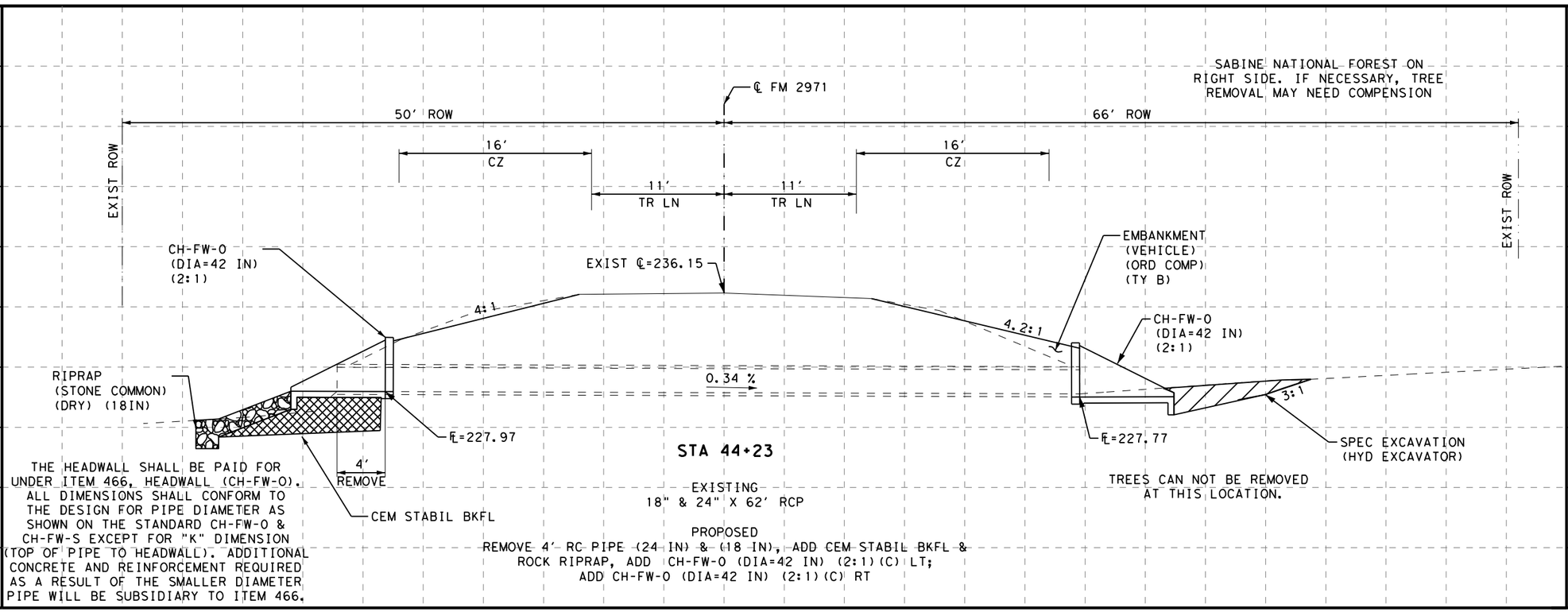

SCALE 1" = 10′

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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 24 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		158

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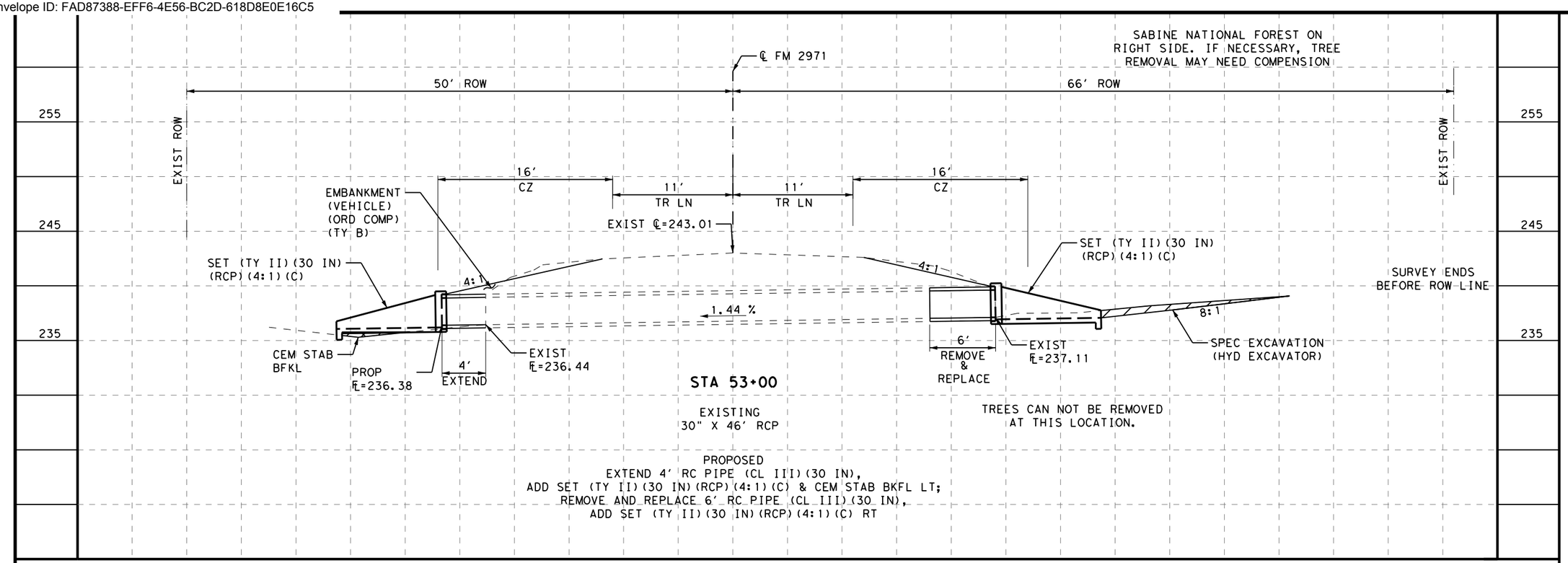

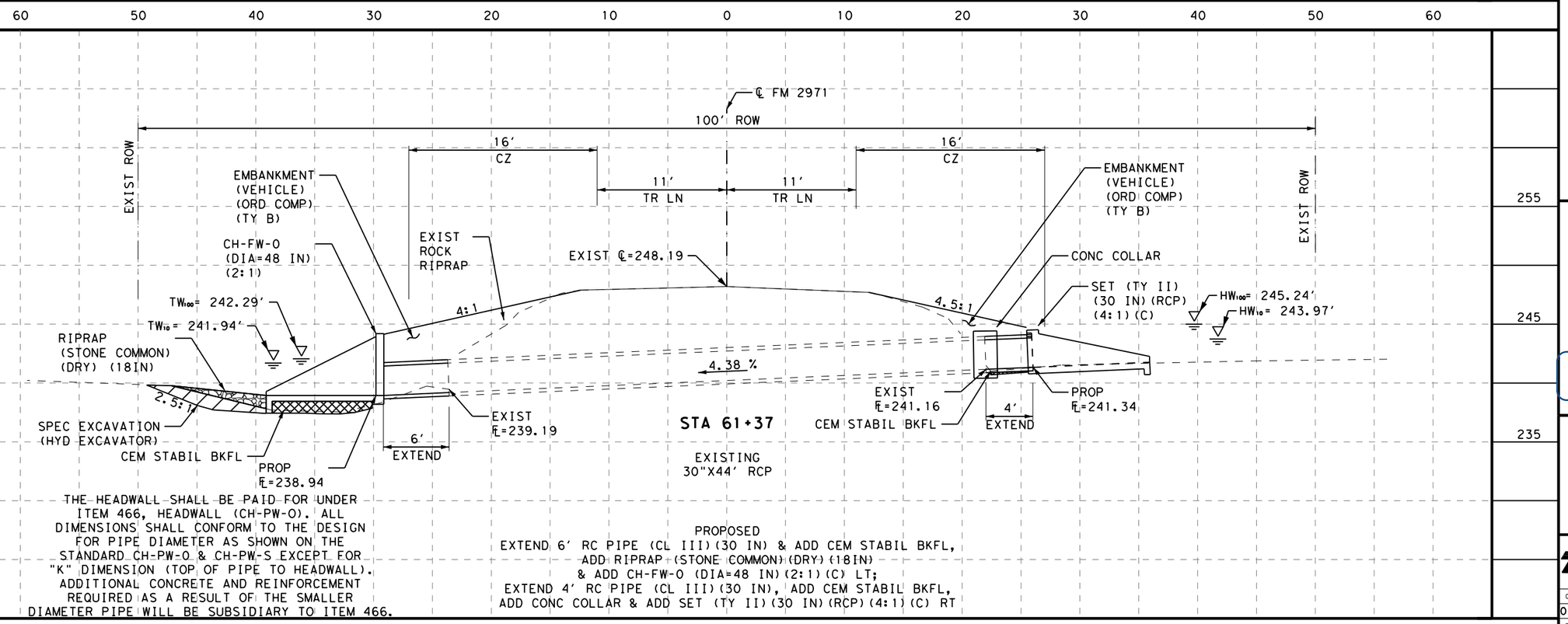

SCALE 1" = 10′

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ELIZABETH A. ORTEGO
91106
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PROFESSIONAL ENGINEER

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CULVERT LAYOUTS (FM 2971)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 25 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		159

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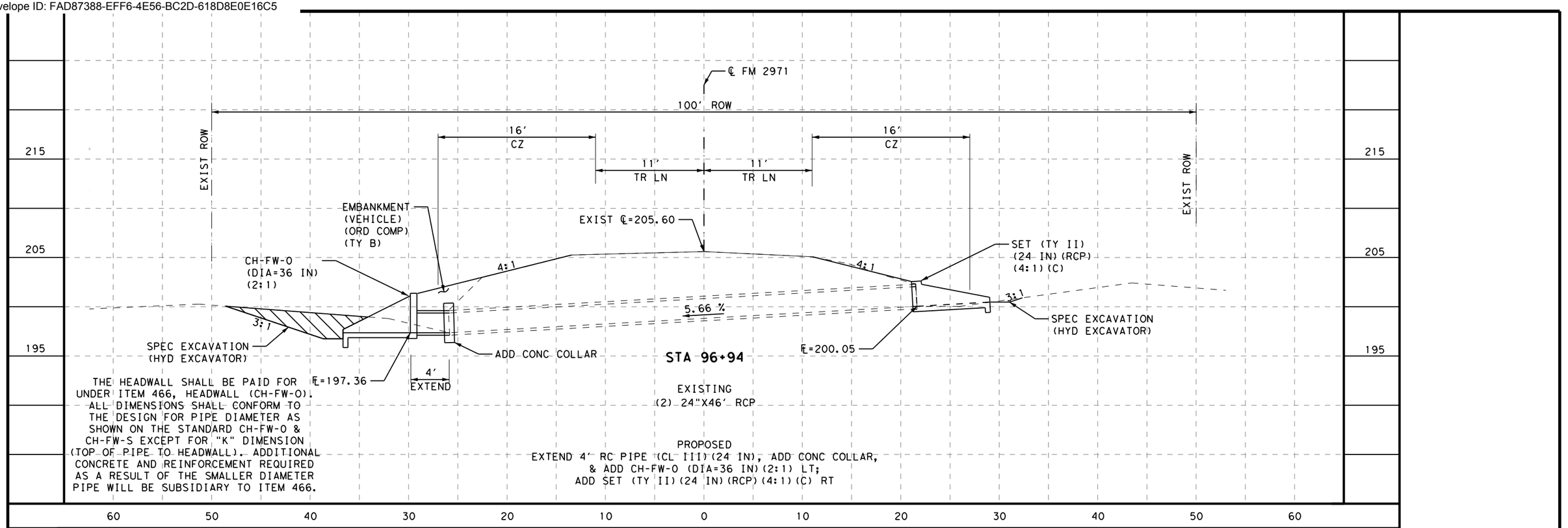

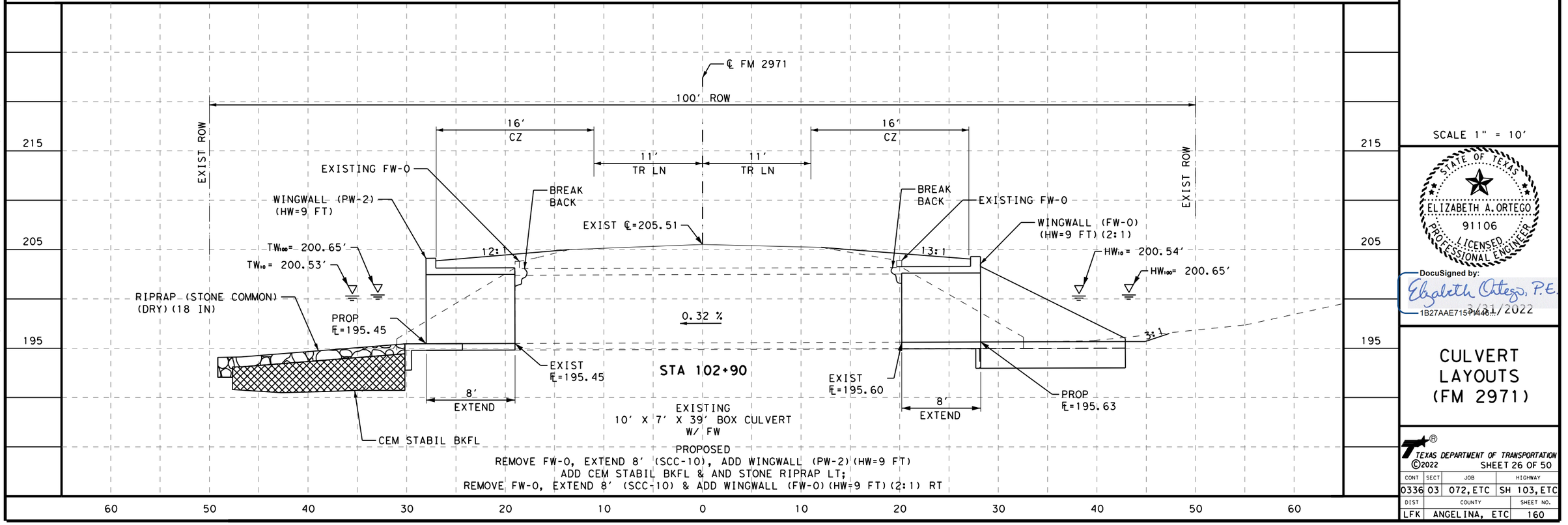

SCALE 1" = 10'

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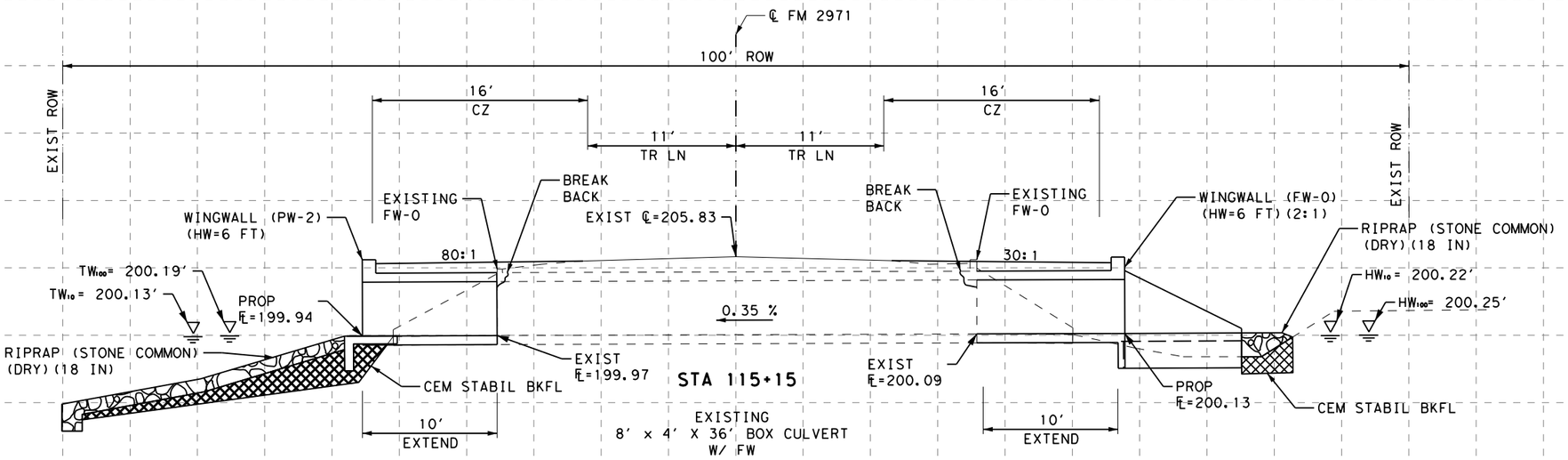
SHEET 26 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		160



PROPOSED
REMOVE FW-0 EXTEND 10′ (SCC-8) & ADD WINGWALL (PW-2) (HW=6 FT)
ADD RIPRAP (STONE COMMON) (DRY) (18 IN) & ADD CEM STABIL BKFL LT;
REMOVE FW-0 EXTEND 10′ (SCC-8), ADD WINGWALL (FW-0) (HW=6 FT) (2:1),
ADD RIPRAP (STONE COMMON) (DRY) (18 IN) & ADD CEM STABIL BKFL RT

SCALE 1" = 10′

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SHEET 27 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		161

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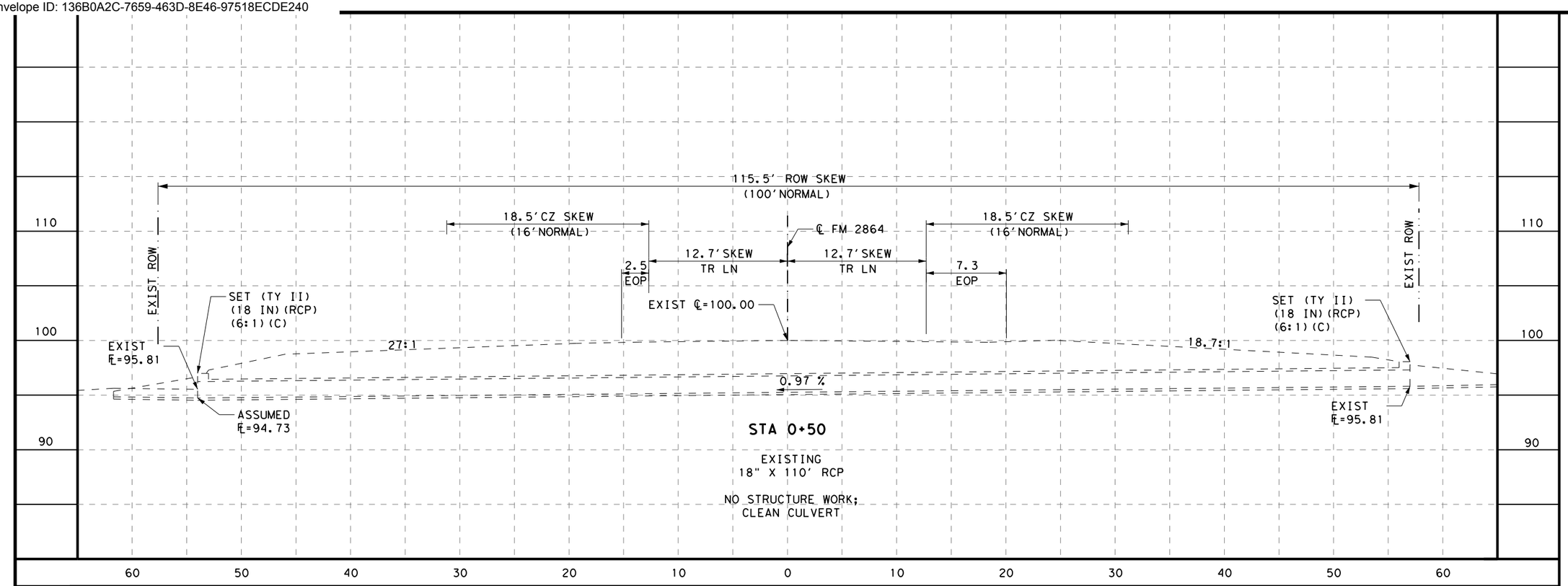

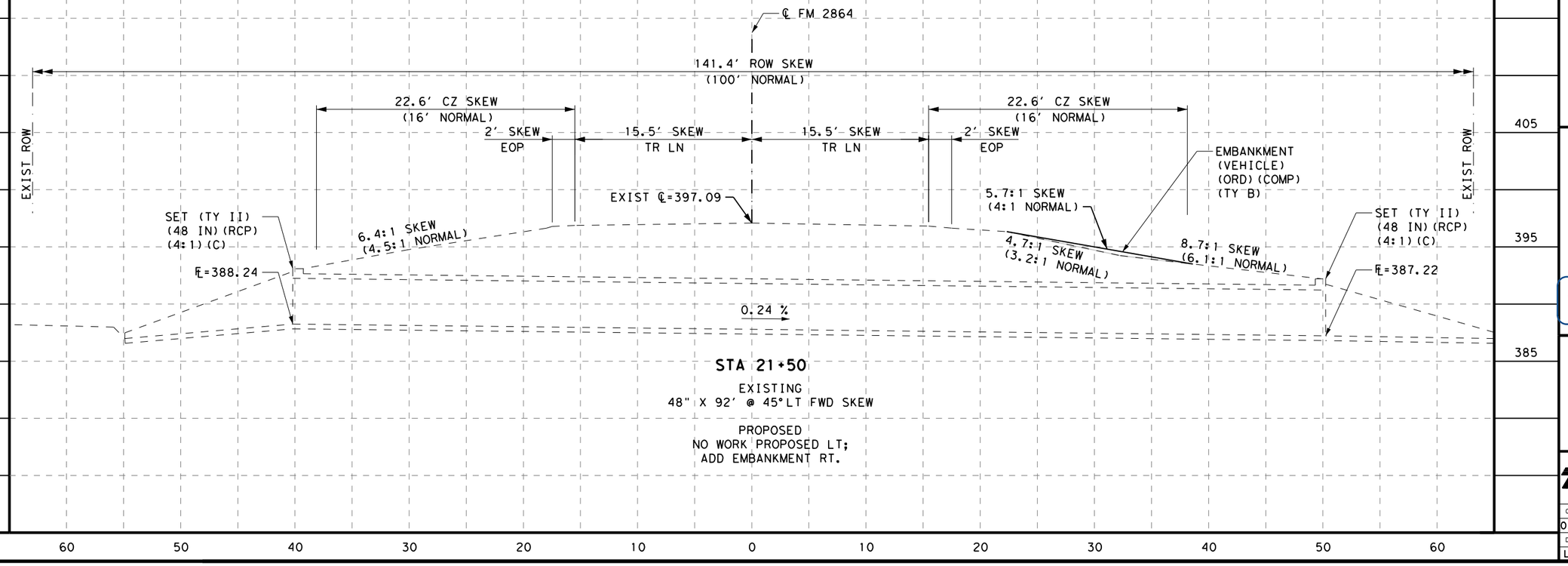

SCALE 1" = 10'

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CULVERT LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 28 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		162

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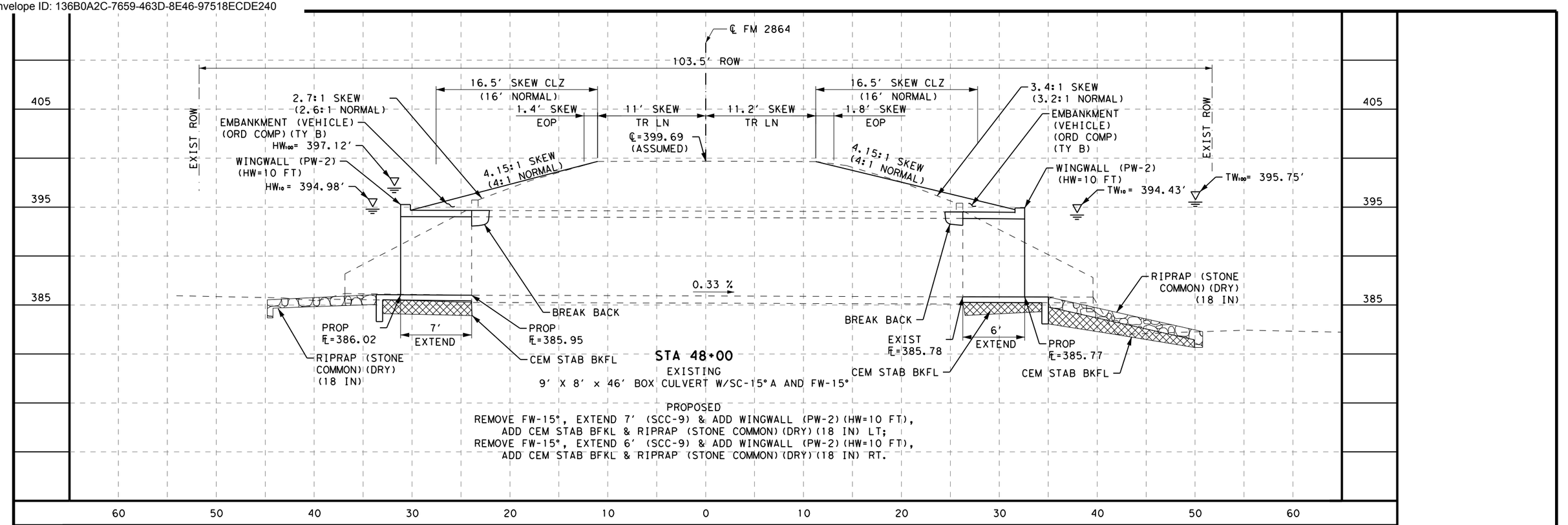

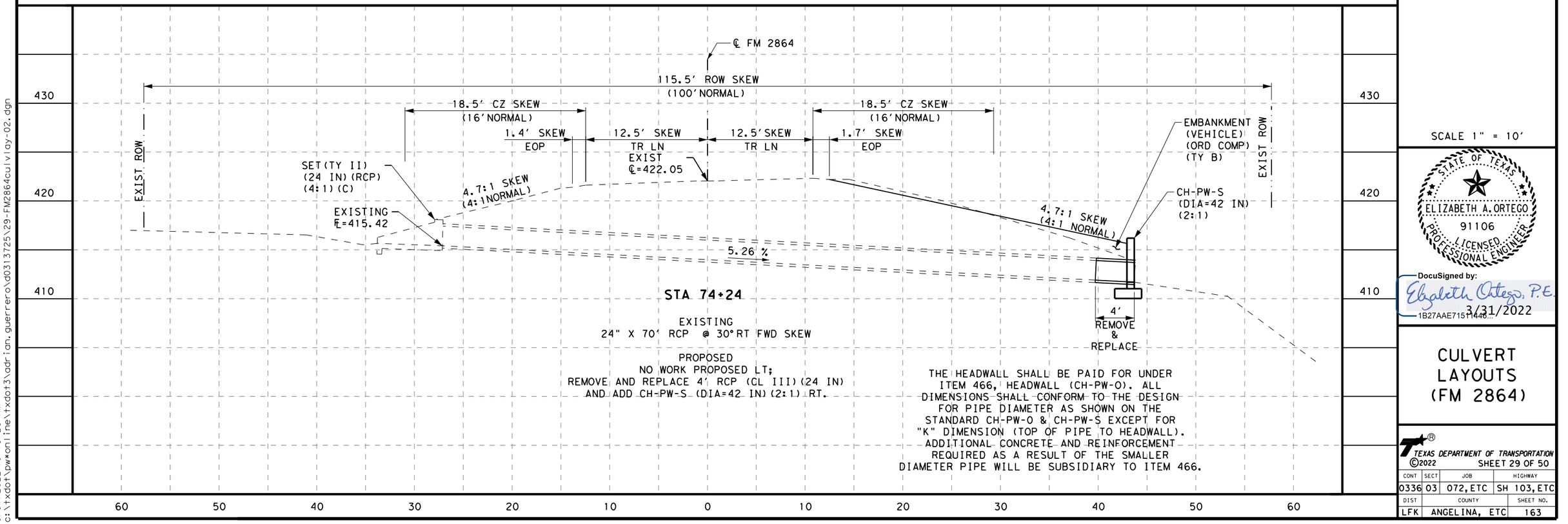

SCALE 1" = 10'

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SHEET 29 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		163

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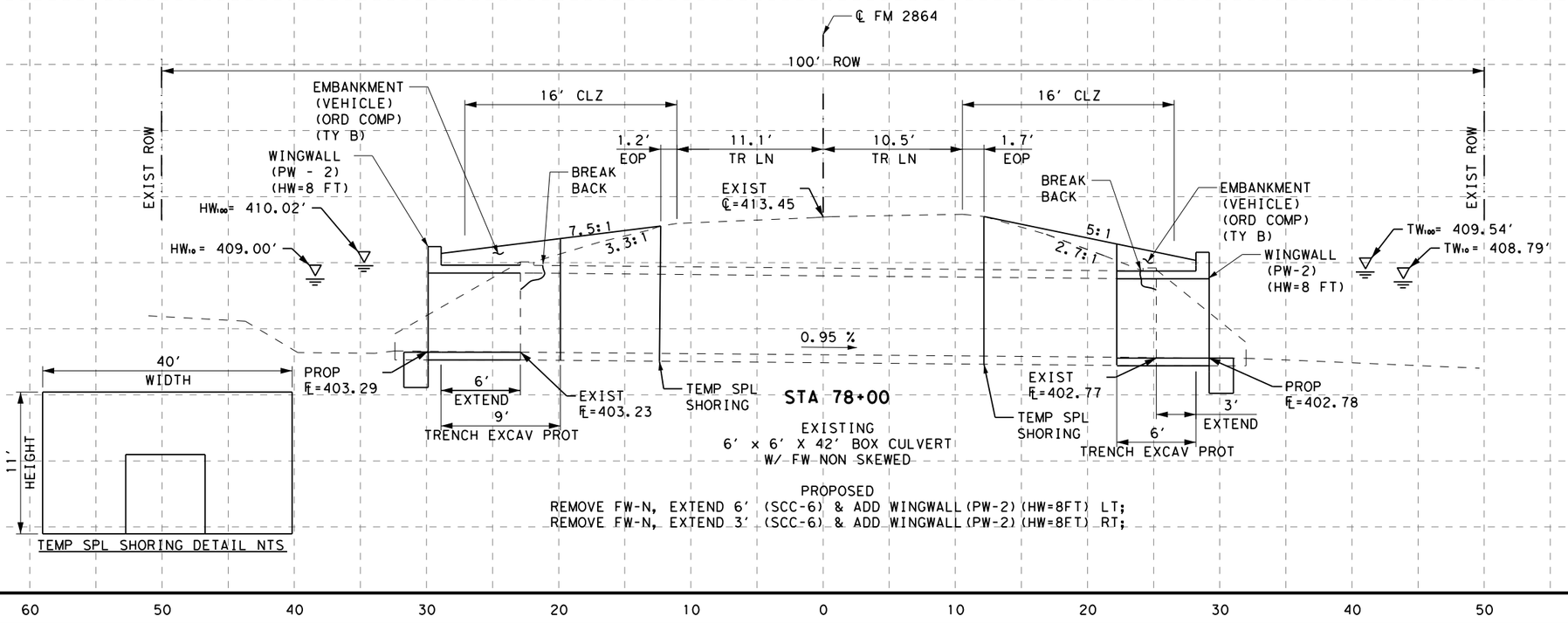

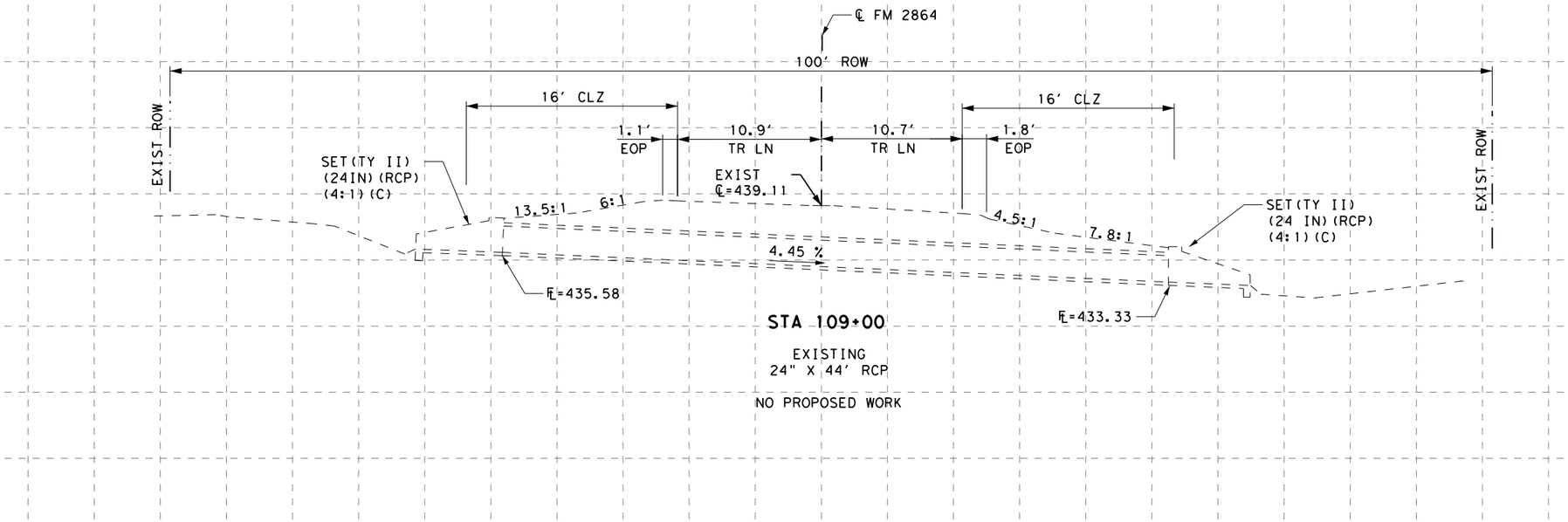

SCALE 1" = 10'

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CULVERT LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 30 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		164

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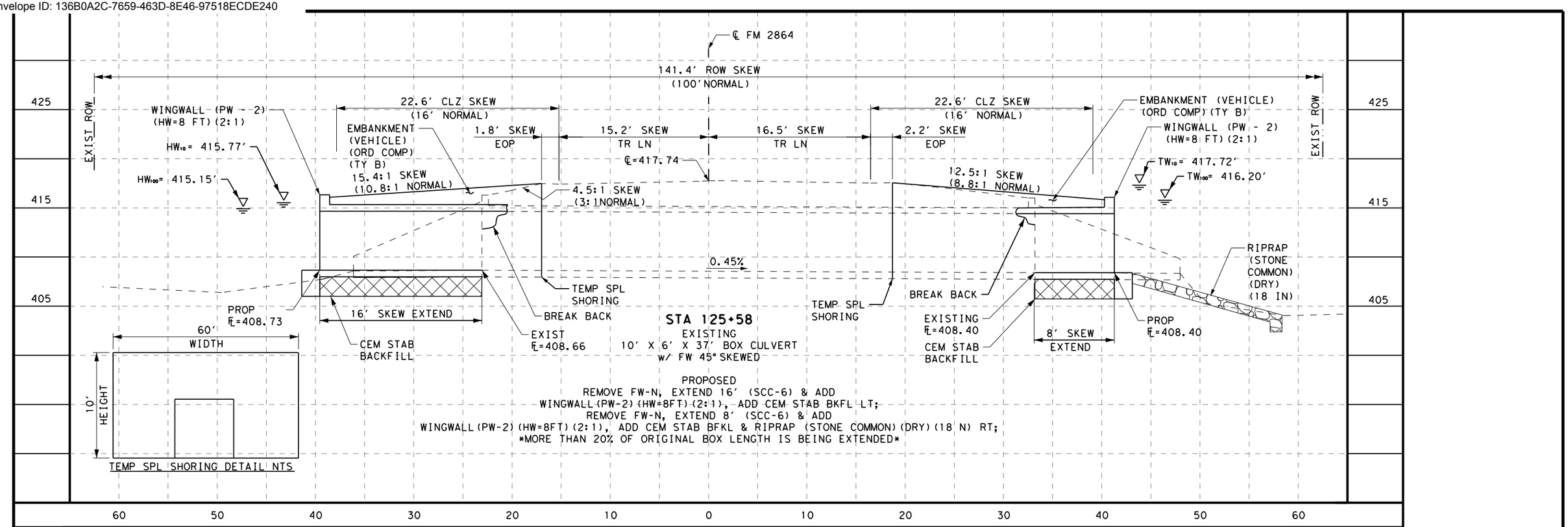

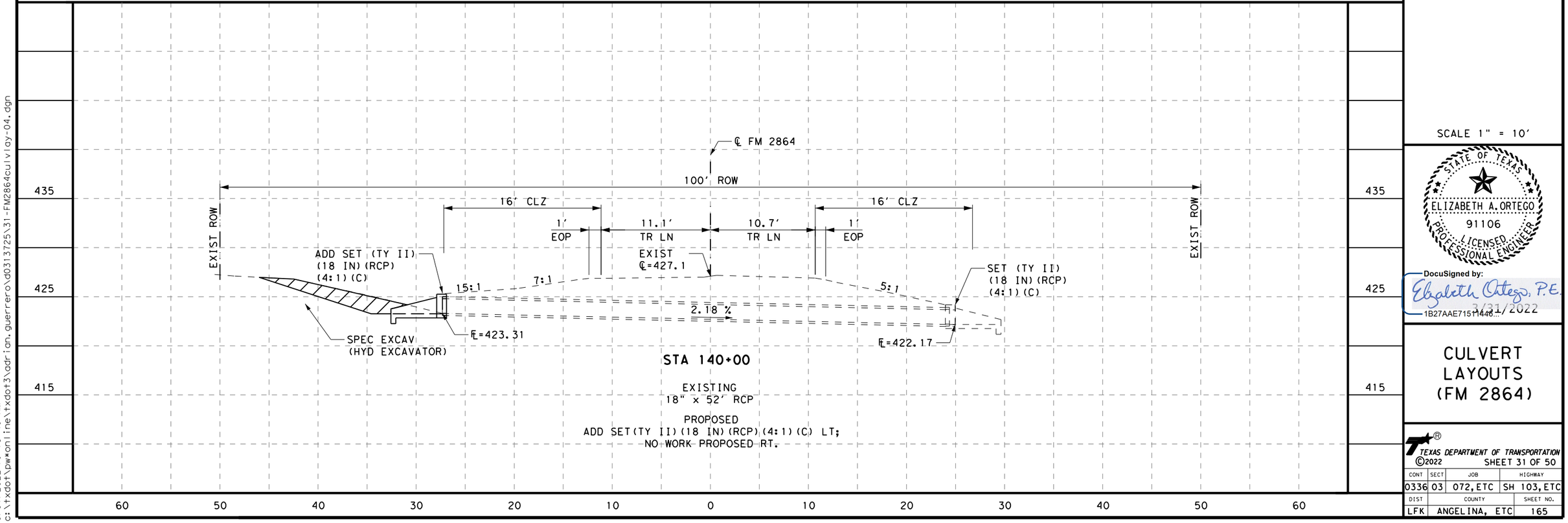

SCALE 1" = 10′

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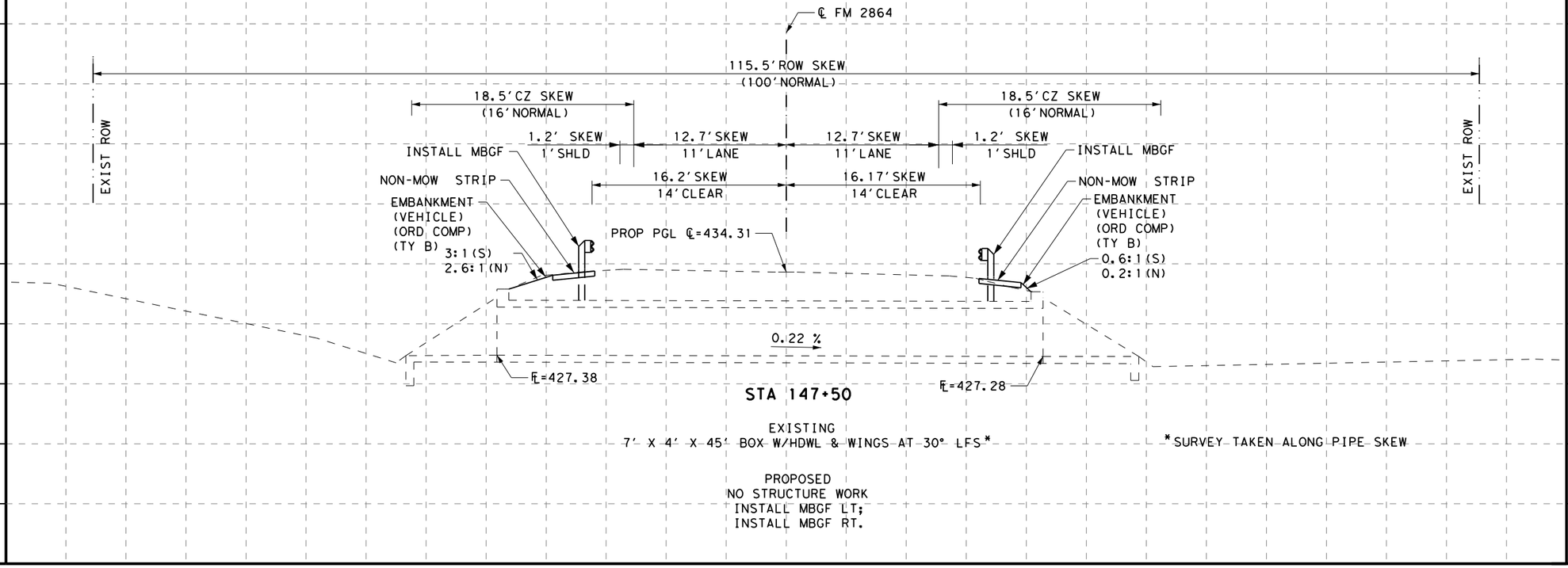
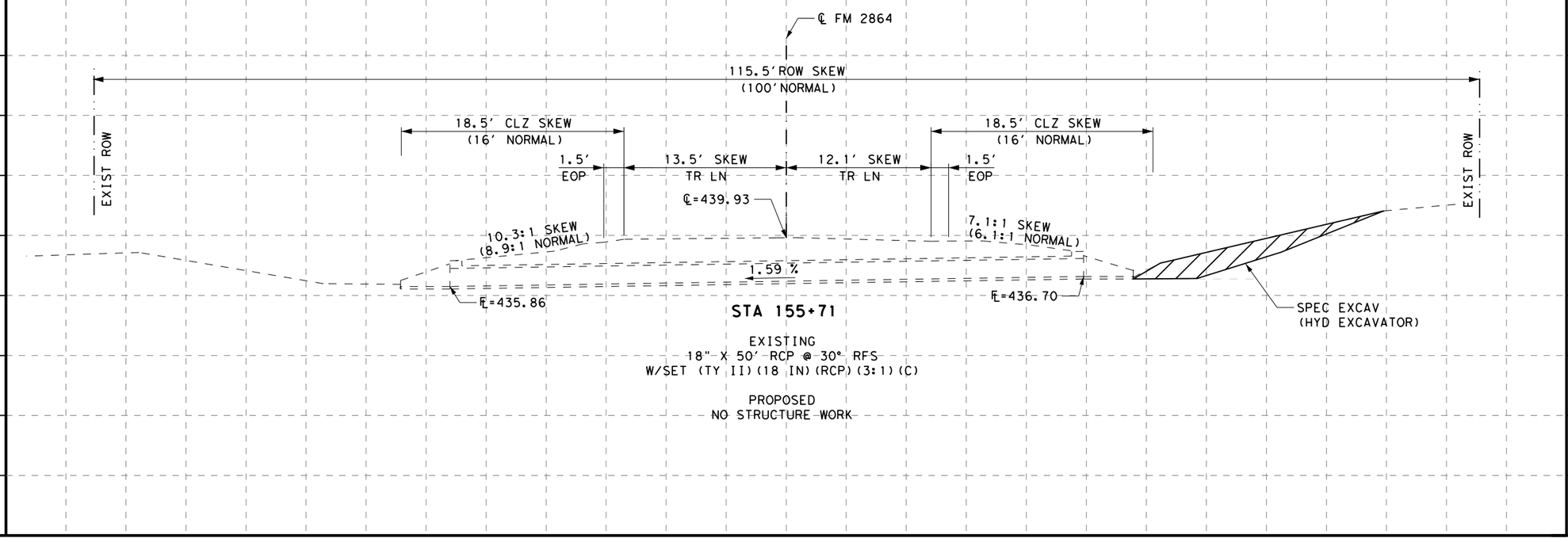
SHEET 31 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		165





SCALE 1" = 10'

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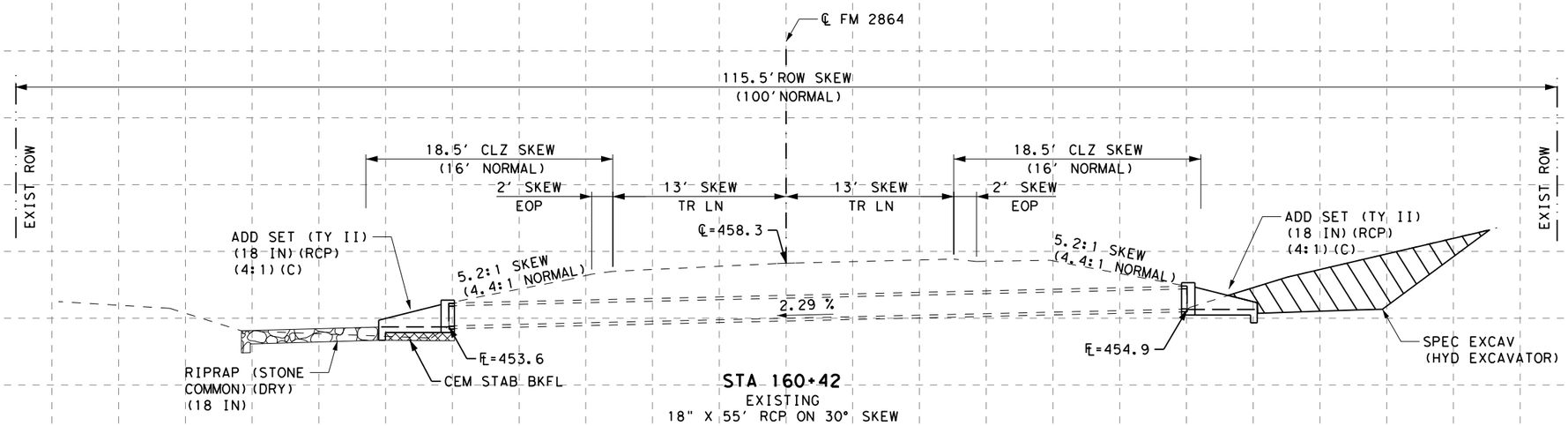
SHEET 32 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		166

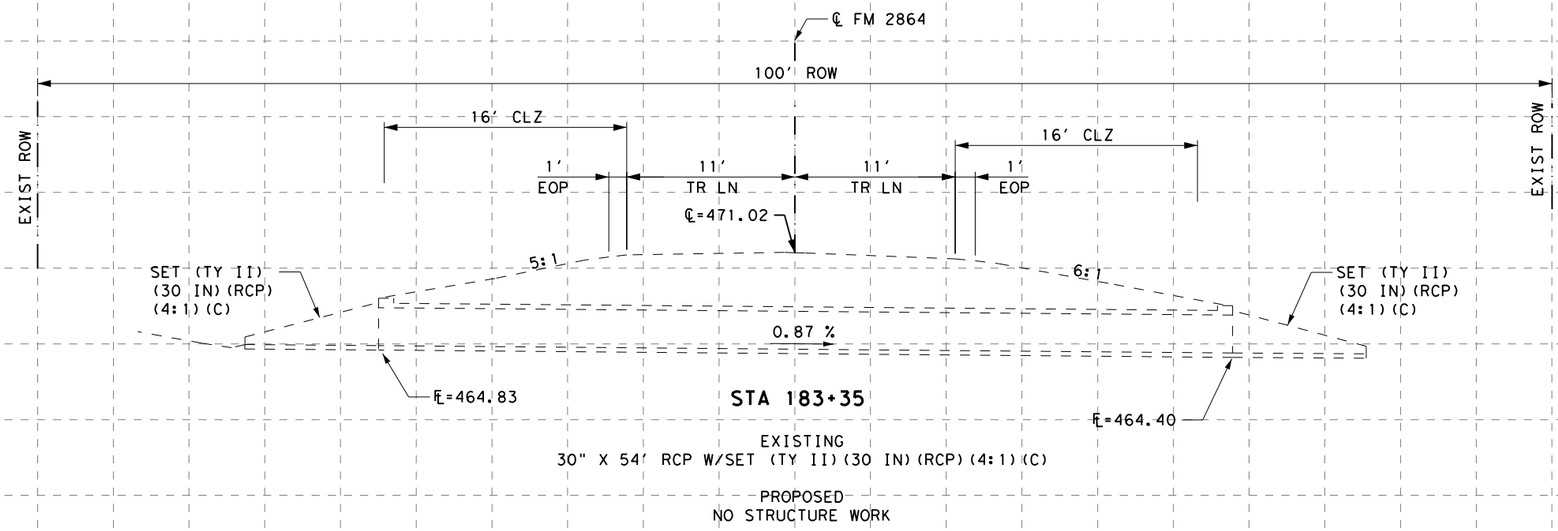


STA 160+42

EXISTING
18" X 55′ RCP ON 30° SKEW

PROPOSED WORK
ADD CEM STAB BKFL & RIPRAP (STONE)(COMMON DRY)(18 IN),
INSTALL SET (TY II)(18 IN)(RCP)(4:1)(C) LT;
INSTALL SET (TY II)(18 IN)(RCP)(4:1)(C) RT.

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



STA 183+35

EXISTING
30" X 54′ RCP W/SET (TY II)(30 IN)(RCP)(4:1)(C)

PROPOSED
NO STRUCTURE WORK

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

SCALE 1" = 10′

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TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 33 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		167

3/31/2022 10:15:54 AM
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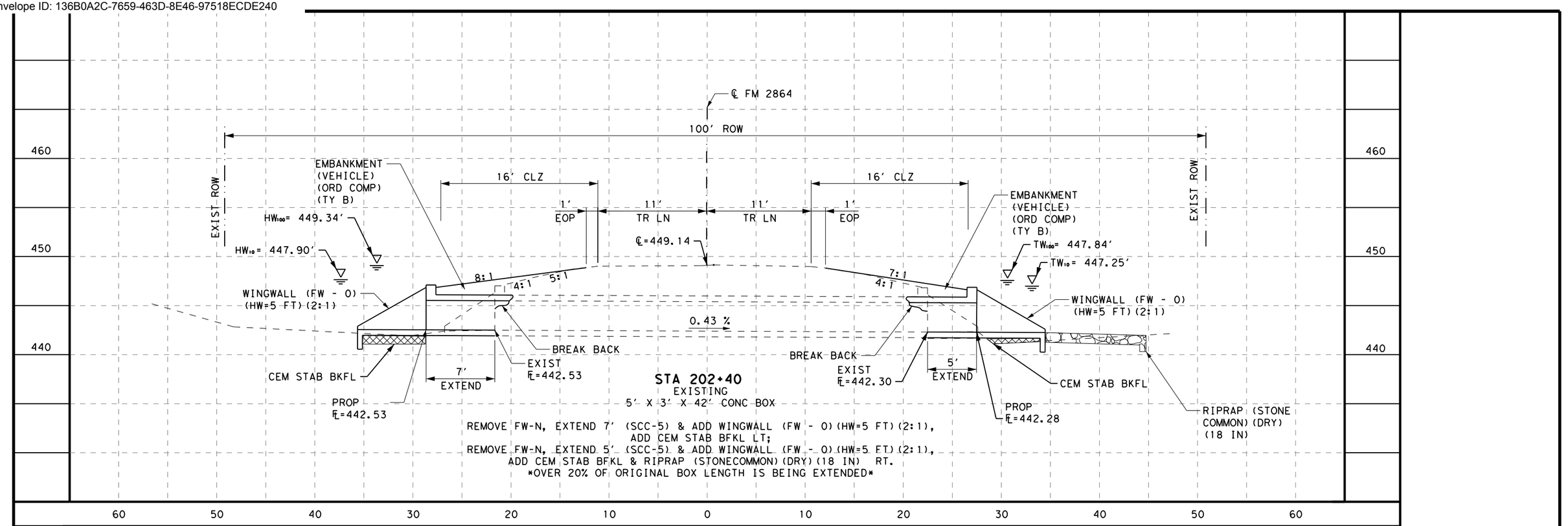

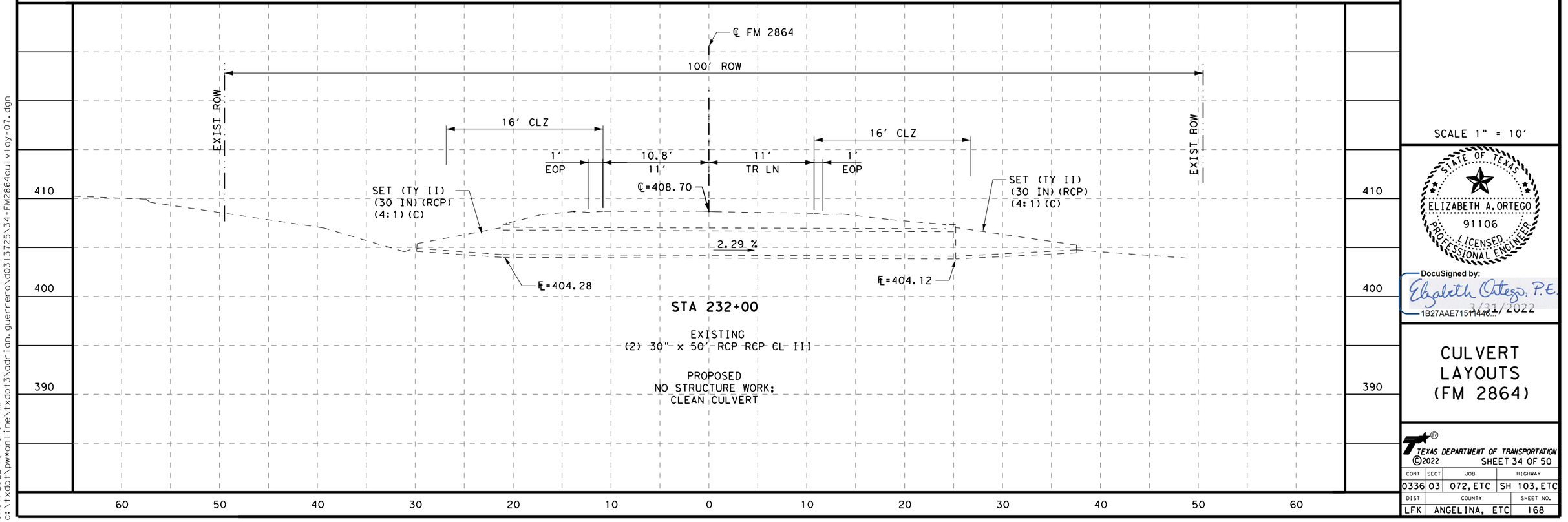

SCALE 1" = 10′

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CULVERT LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 34 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		168

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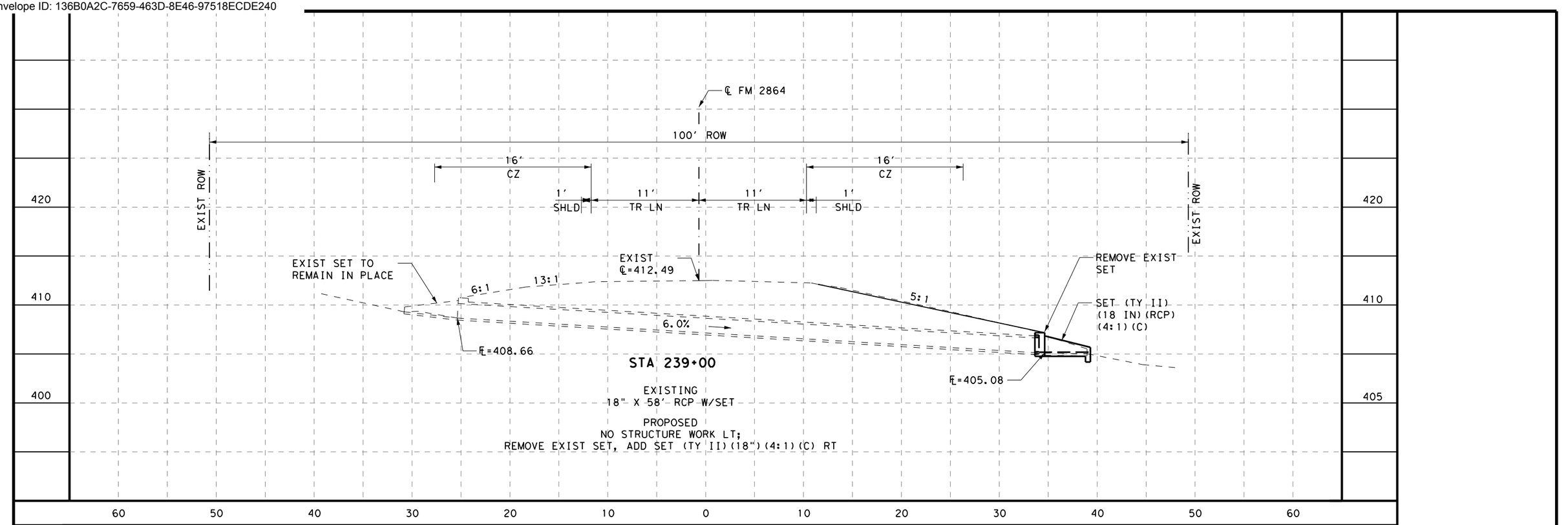

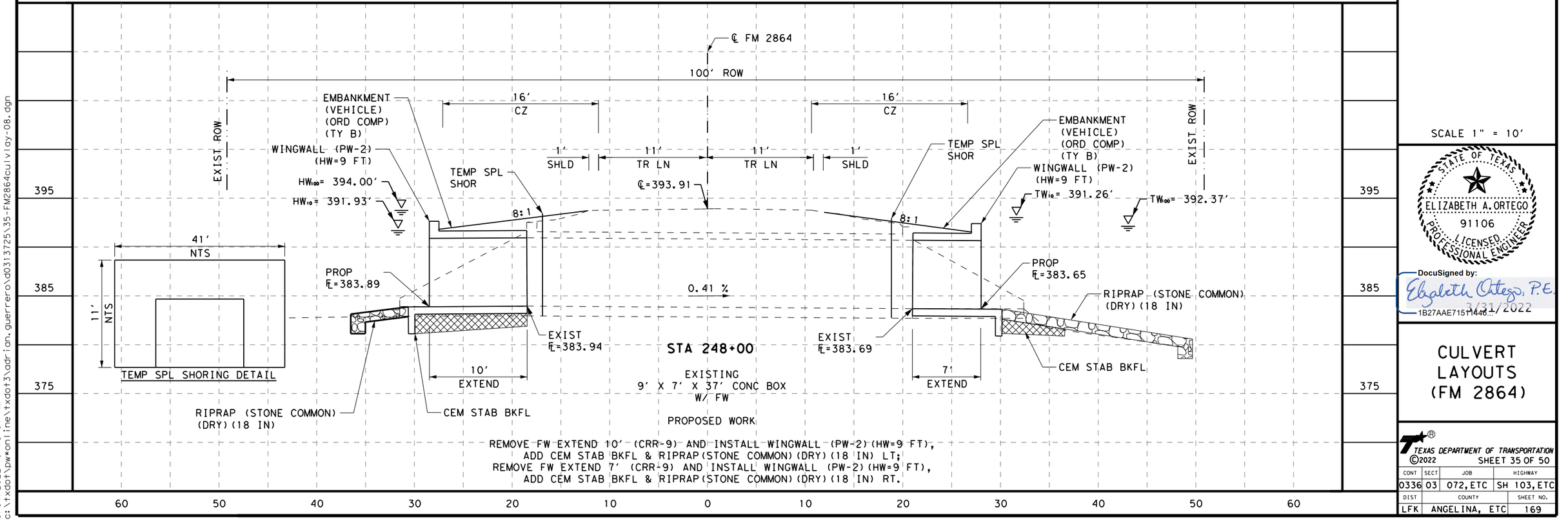

SCALE 1" = 10′

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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 35 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		169

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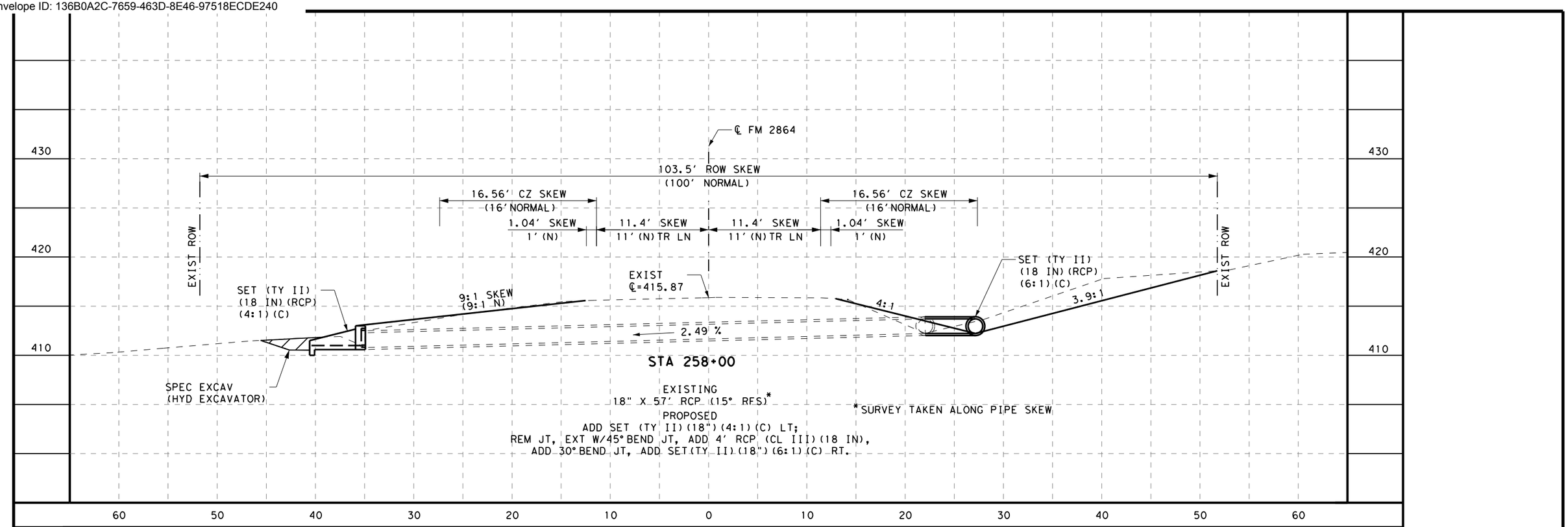

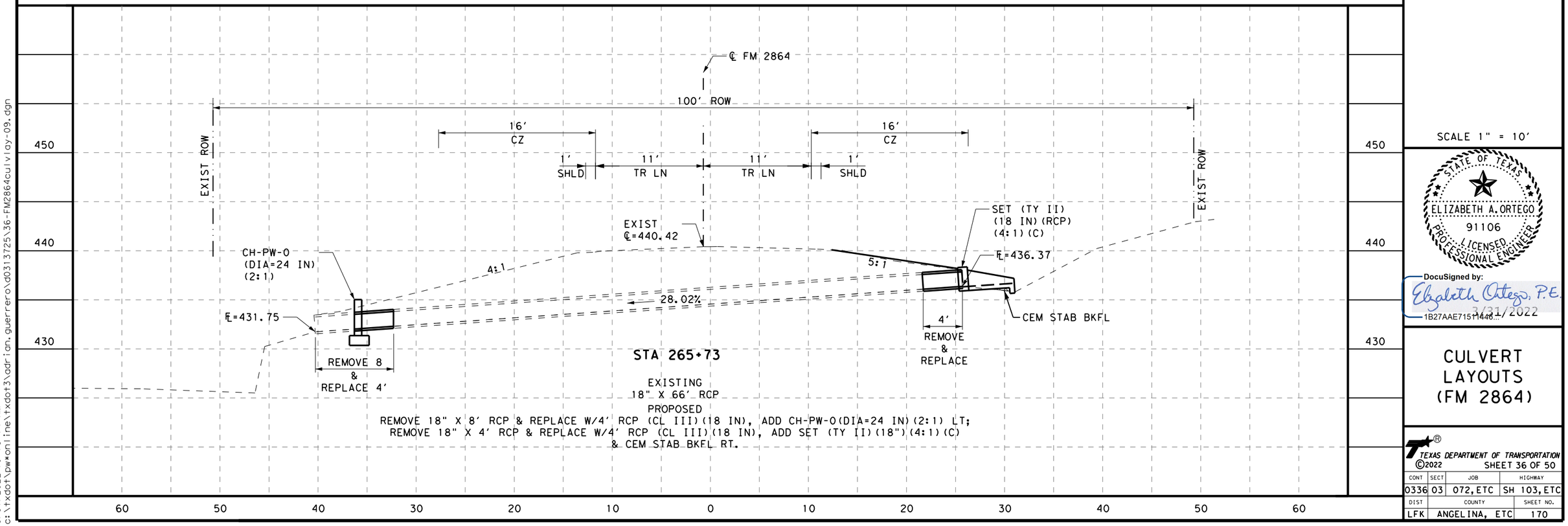

SCALE 1" = 10′

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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 36 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		170

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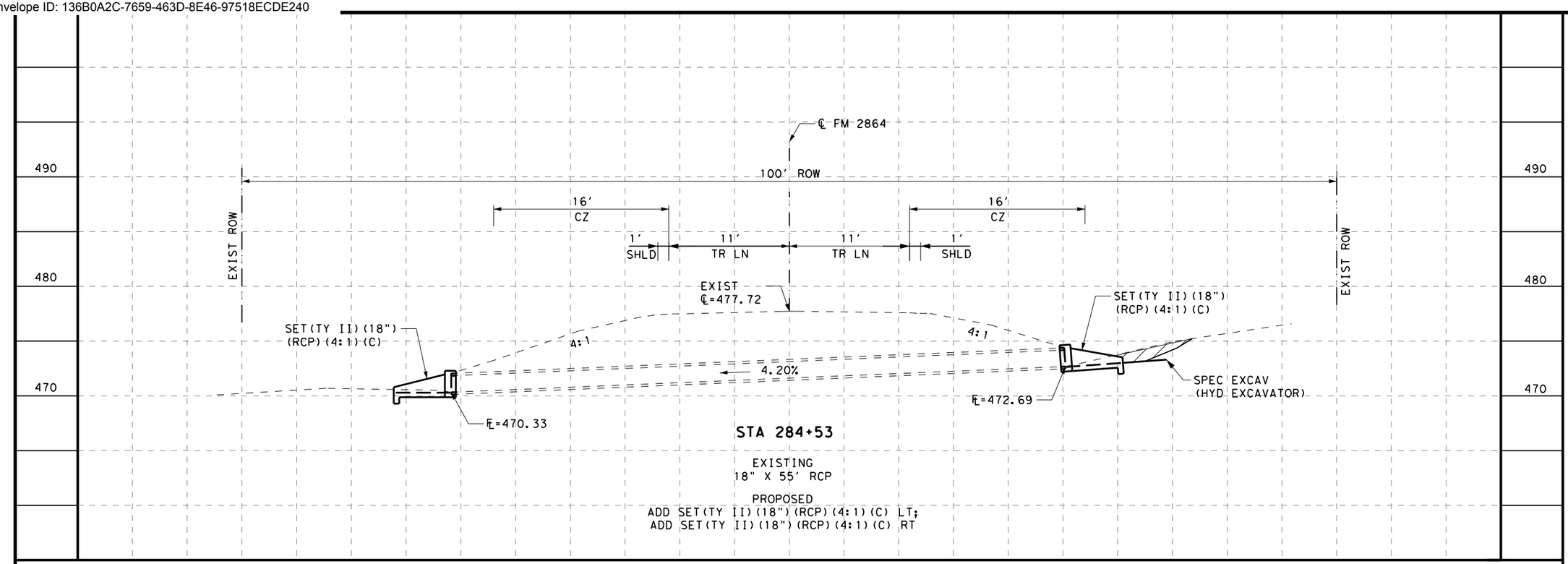
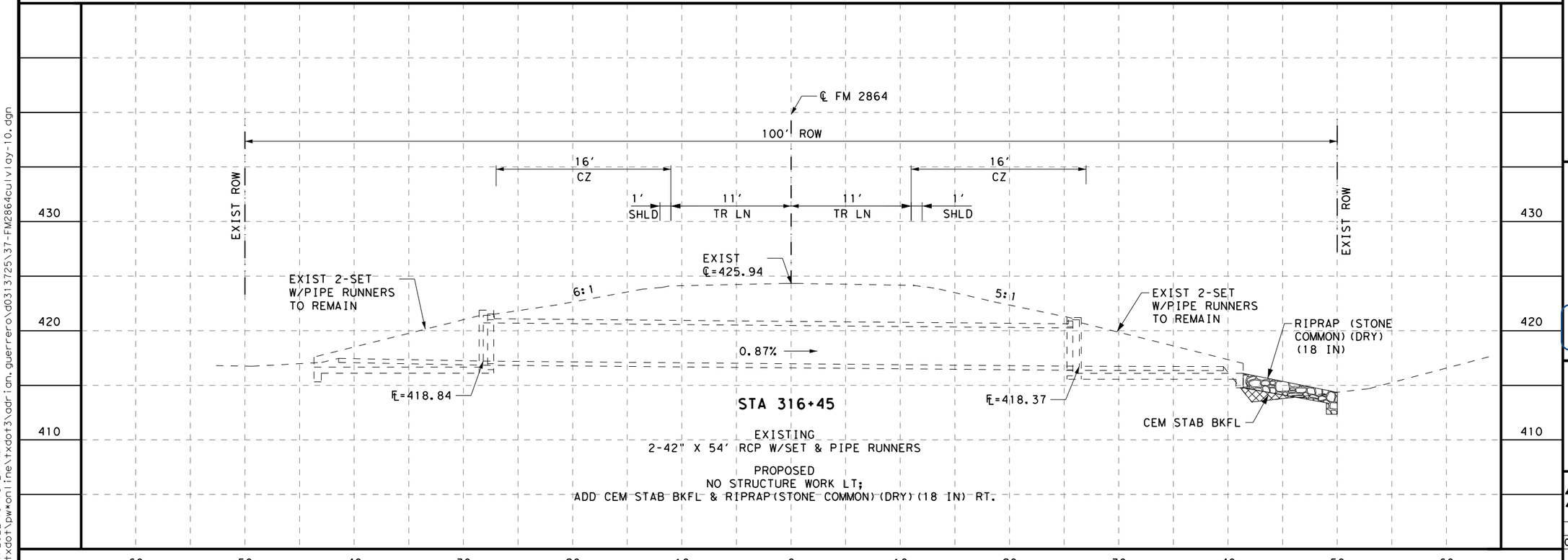


STA 284+53

EXISTING
18" X 55′ RCP

PROPOSED
ADD SET (TY II) (18") (RCP) (4:1) (C) LT;
ADD SET (TY II) (18") (RCP) (4:1) (C) RT



STA 316+45

EXISTING
2-42" X 54′ RCP W/SET & PIPE RUNNERS

PROPOSED
NO STRUCTURE WORK LT;
ADD CEM STAB BKFL & RIPRAP (STONE COMMON) (DRY) (18 IN) RT.

SCALE 1" = 10′

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SHEET 37 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		171

3/31/2022 10:16:21 AM
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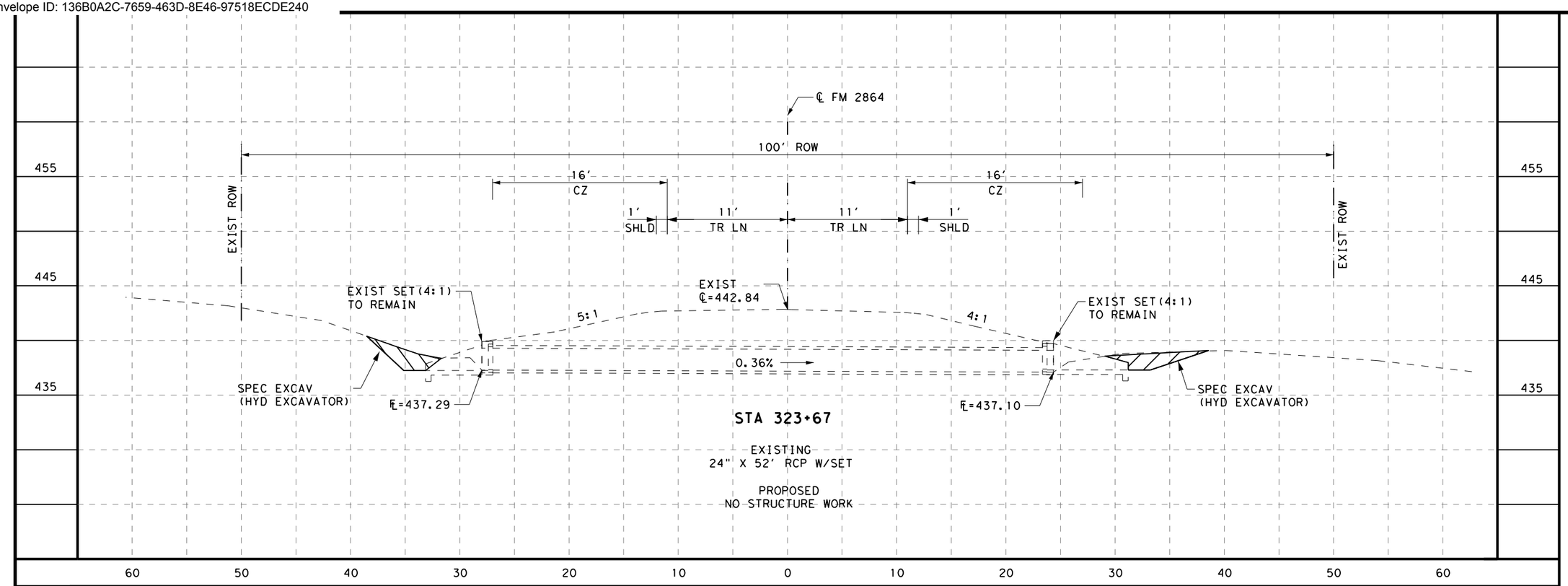

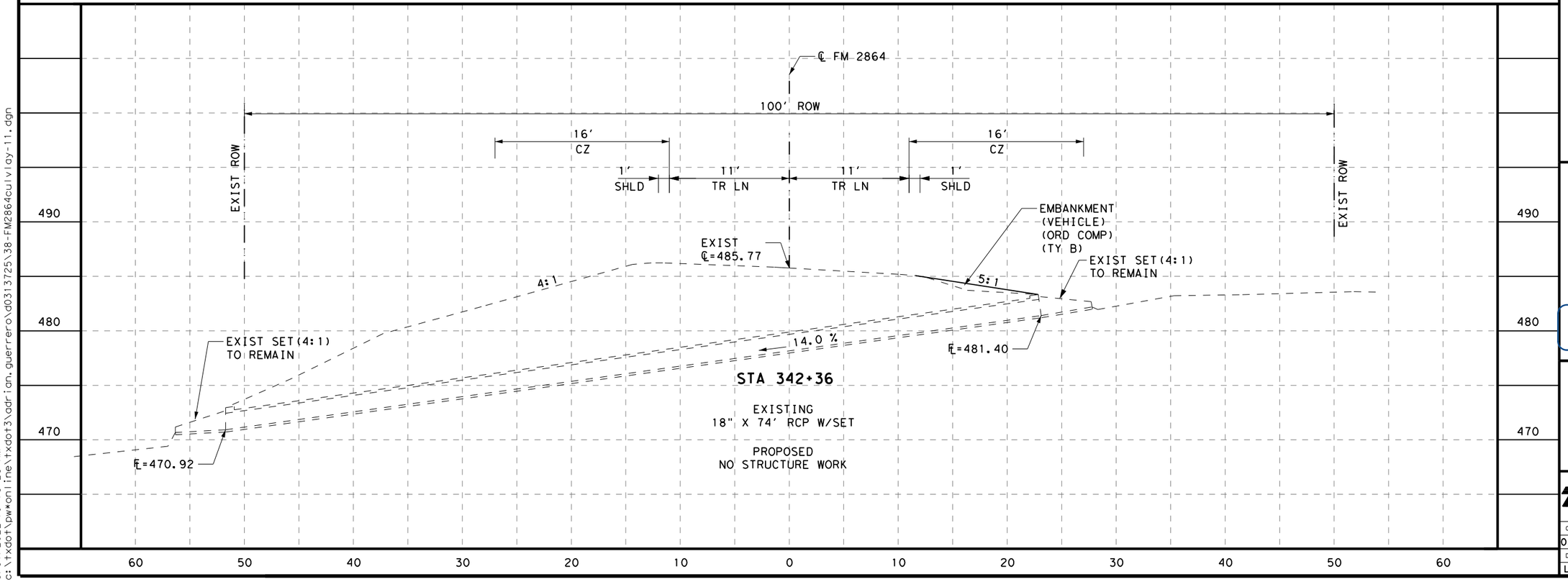

SCALE 1" = 10′

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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 38 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		172

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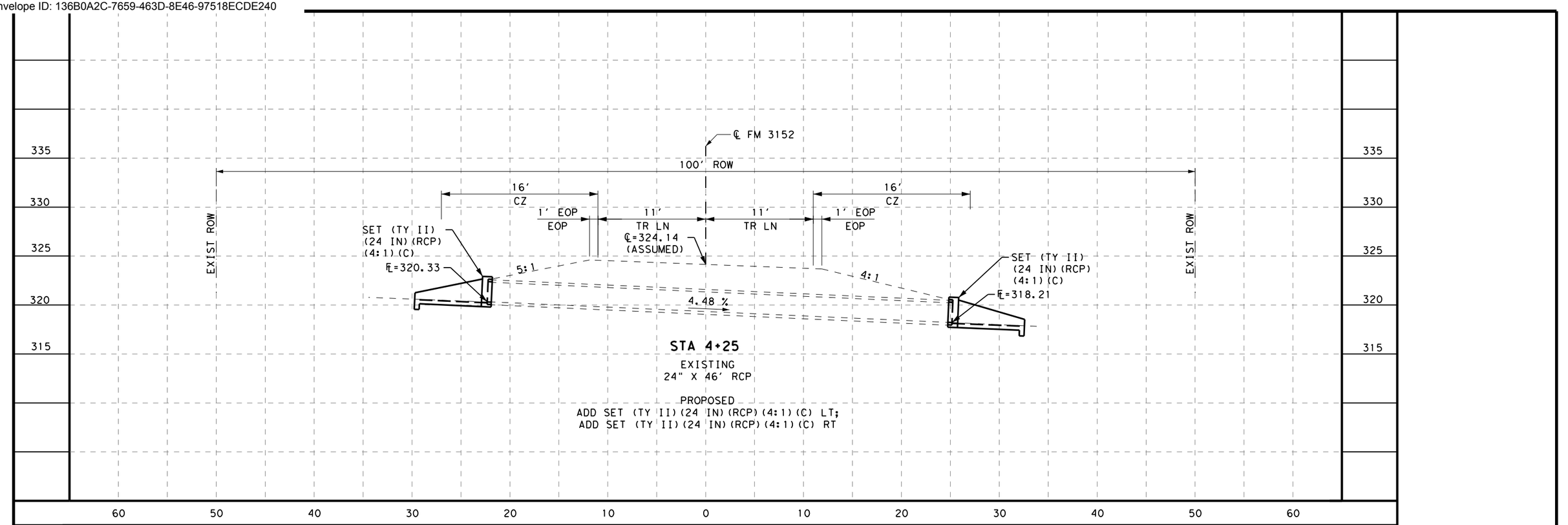
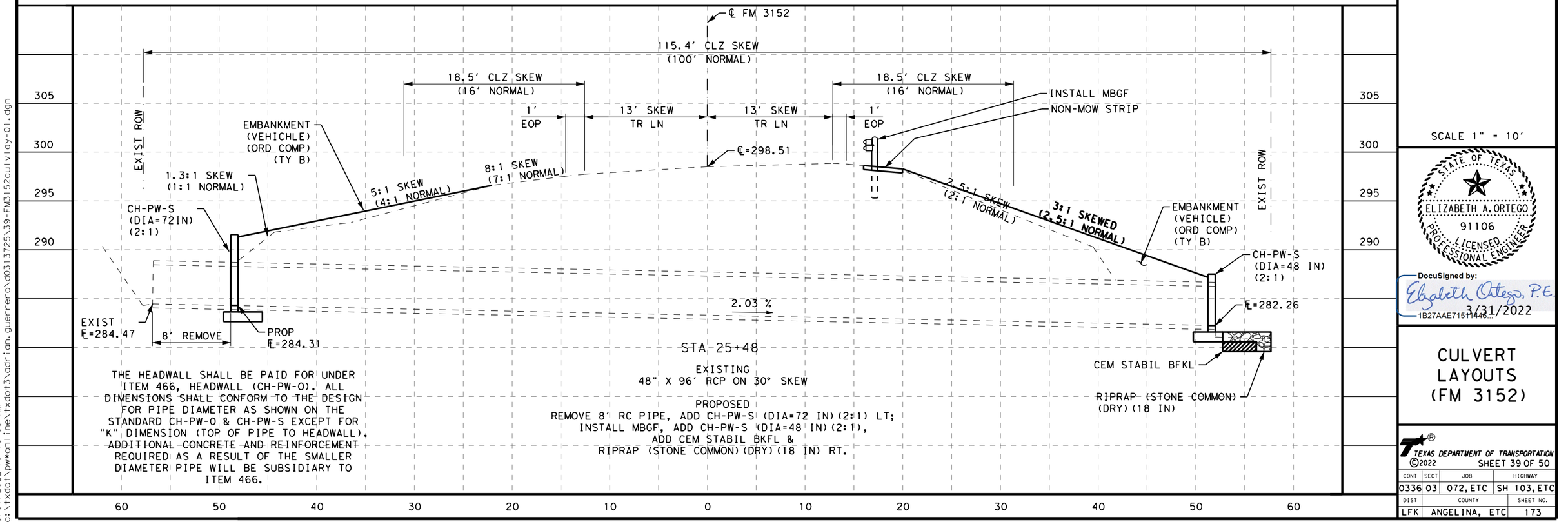


STA 4+25

EXISTING
24" X 46′ RCP

PROPOSED
ADD SET (TY II) (24 IN) (RCP) (4:1) (C) LT;
ADD SET (TY II) (24 IN) (RCP) (4:1) (C) RT



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

STA 25+48

EXISTING
48" X 96′ RCP ON 30° SKEW

PROPOSED
REMOVE 8′ RC PIPE, ADD CH-PW-S (DIA=72 IN) (2:1) LT;
INSTALL MBGF, ADD CH-PW-S (DIA=48 IN) (2:1),
ADD CEM STABIL BKFL &
RIPRAP (STONE COMMON) (DRY) (18 IN) RT.

SCALE 1" = 10′

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CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 39 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		173

3/31/2022 10:16:33 AM
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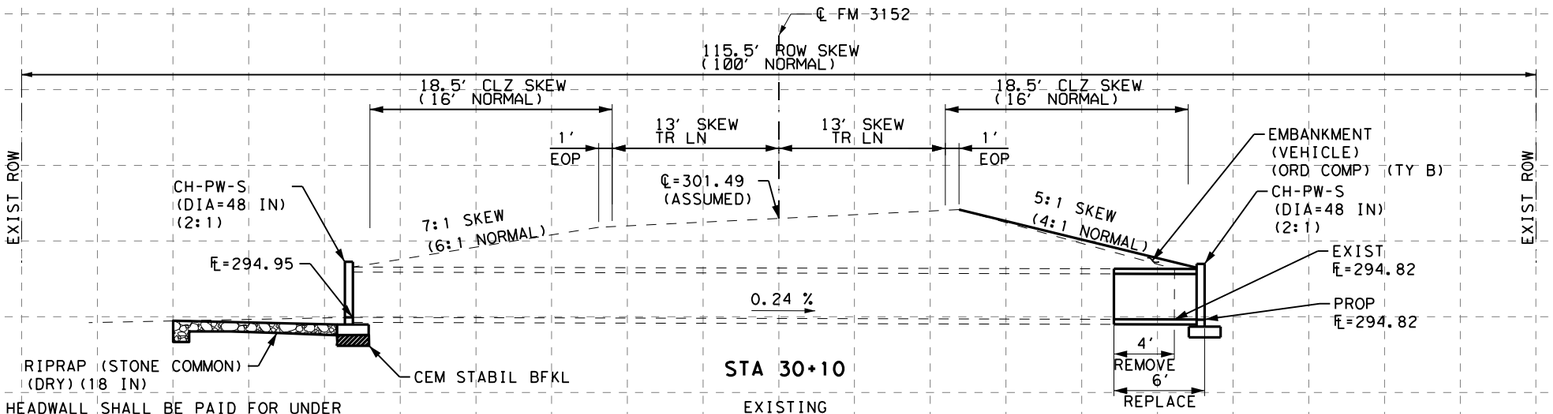
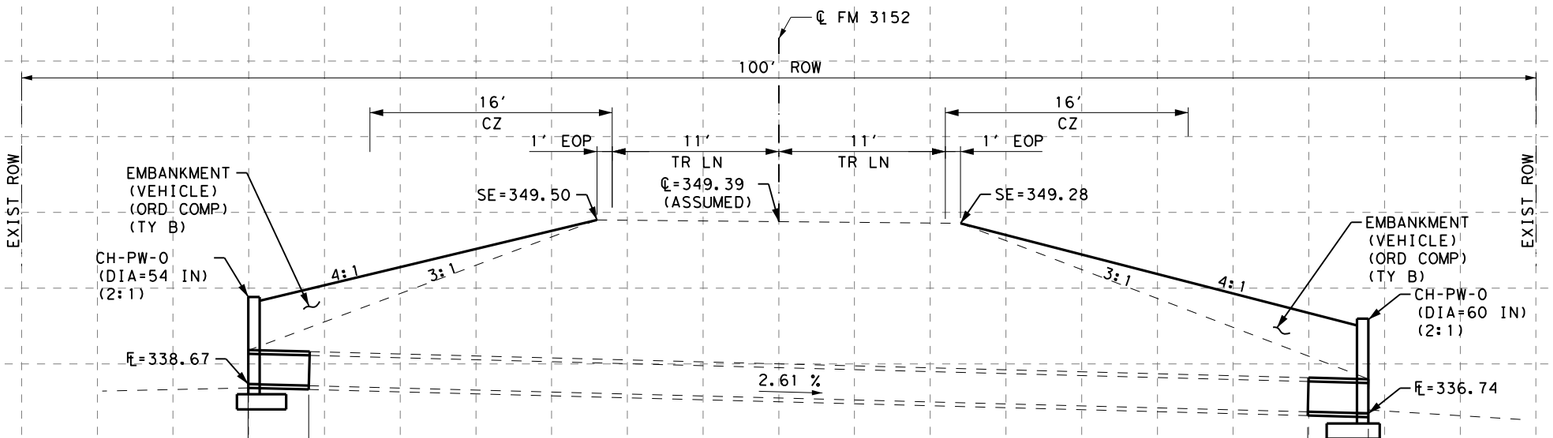


THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-O). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR PIPE DIAMETER AS SHOWN ON THE STANDARD CH-PW-O & CH-PW-S EXCEPT FOR "K" DIMENSION (TOP OF PIPE TO HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER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

STA 30+10

EXISTING
36" X 54' RCP 30 °RT FWD SKEW

PROPOSED
ADD CH-PW-S (48 IN) (2:1), ADD CEM STAB BKFL &
RIPRAP(STONE COMMON)(DRY)(18 IN) LT;
REMOVE 4' RC PIPE (CL III)(36 IN) ADD REPLACE W/6' RC PIPE (CL III)(36 IN),
ADD CH-PW-S (48 IN) (2:1) RT;



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

STA 45+00

EXISTING
24" X 74' RCP

PROPOSED
REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/4' RC PIPE (CL III)(24 IN),
ADD CH-PW-O (DIA=54 IN)(2:1) LT;
REMOVE 4' RC PIPE (CL III)(24 IN) AND REPLACE W/4' RC PIPE (CL III)(24 IN),
ADD CH-PW-O (DIA=60 IN)(2:1) RT.

SCALE 1" = 10'

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PROFESSIONAL ENGINEER

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3/31/2022

CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION
©2022 SHEET 40 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		174

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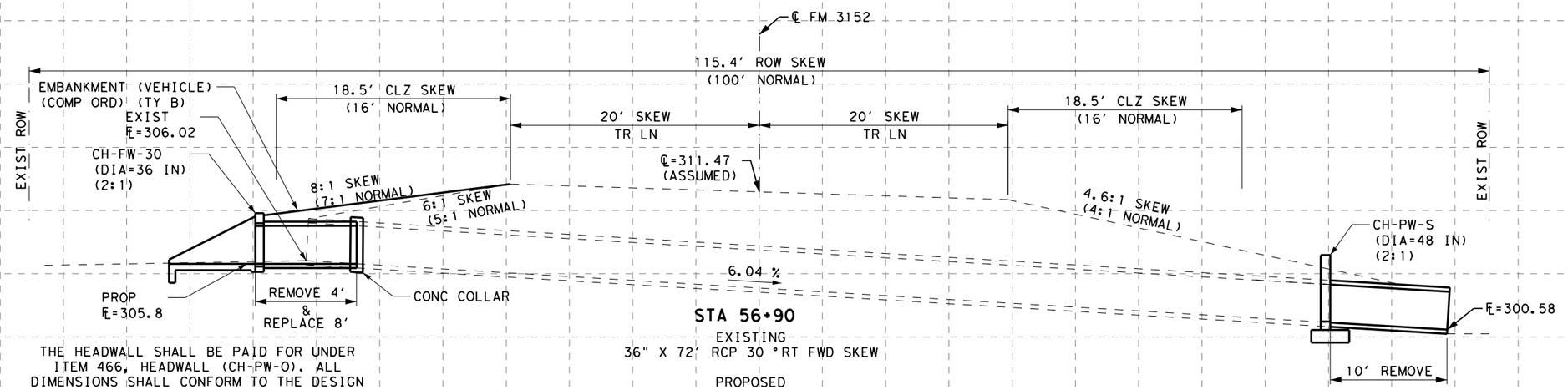

THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-O). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR PIPE DIAMETER AS SHOWN ON THE STANDARD CH-PW-O & CH-PW-S EXCEPT FOR "K" DIMENSION (TOP OF PIPE TO HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER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

STA 56+90

EXISTING
36" X 72' RCP 30 °RT FWD SKEW

PROPOSED
REMOVE 4' RC PIPE (CL III)(36 IN) AND REPLACE W/ 8' RC PIPE (CL III)(36 IN),
ADD CONC COLLAR & ADD CH-FW-30 (DIA=36 IN)(2:1) LT;
REMOVE 10' RC PIPE, ADD CH-PW-S (DIA=48 IN)(2:1) RT.

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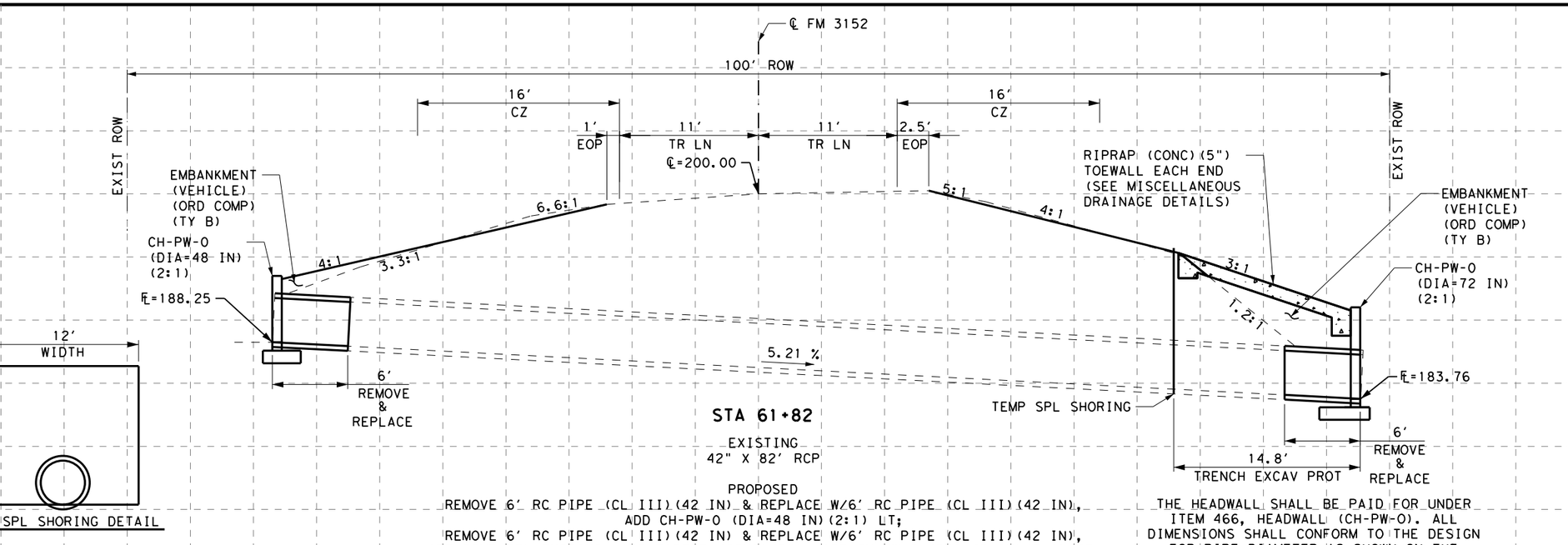

STA 61+82

EXISTING
42" X 82' RCP

PROPOSED
REMOVE 6' RC PIPE (CL III)(42 IN) & REPLACE W/6' RC PIPE (CL III)(42 IN),
ADD CH-PW-0 (DIA=48 IN)(2:1) LT;
REMOVE 6' RC PIPE (CL III)(42 IN) & REPLACE W/6' RC PIPE (CL III)(42 IN),
ADD TEMP SPL SHORING, ADD RIPRAP (CONC)(5"), ADD CH-PW-0 (DIA=48 IN)(2:1) RT.

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

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

SCALE 1" = 10'

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CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 41 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		175

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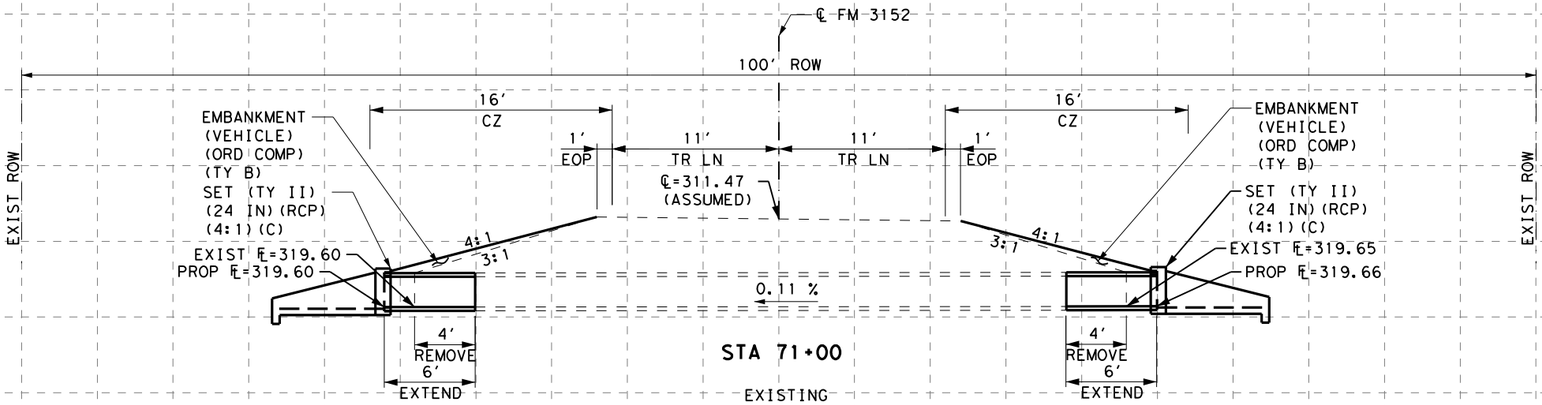
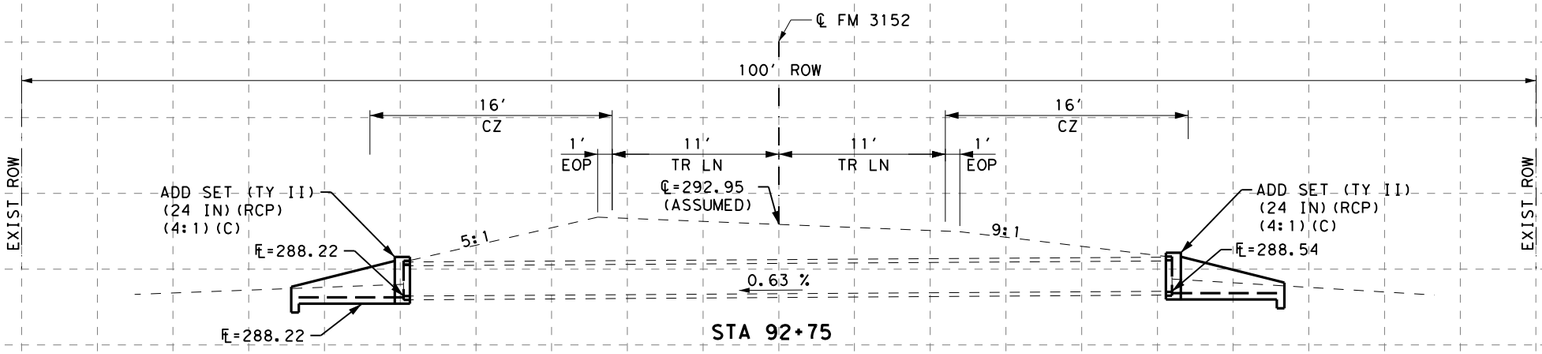


STA 71+00

EXISTING
24" X 46′ RCP

PROPOSED
REMOVE 4′ RC PIPE (CL III)(24 IN) AND REPLACE W/6′ RC PIPE (CL III)(24 IN),
ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT;
REMOVE 4′ RC PIPE (CL III)(24 IN) AND REPLACE W/6′ RC PIPE (CL III)(24 IN),
ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT;



STA 92+75

EXISTING
24" X 50′ RCP

PROPOSED
CLEAN CULVERT
ADD SET (TY II)(24 IN)(RCP)(4:1)(C) LT;
ADD SET (TY II)(24 IN)(RCP)(4:1)(C) RT

SCALE 1" = 10′

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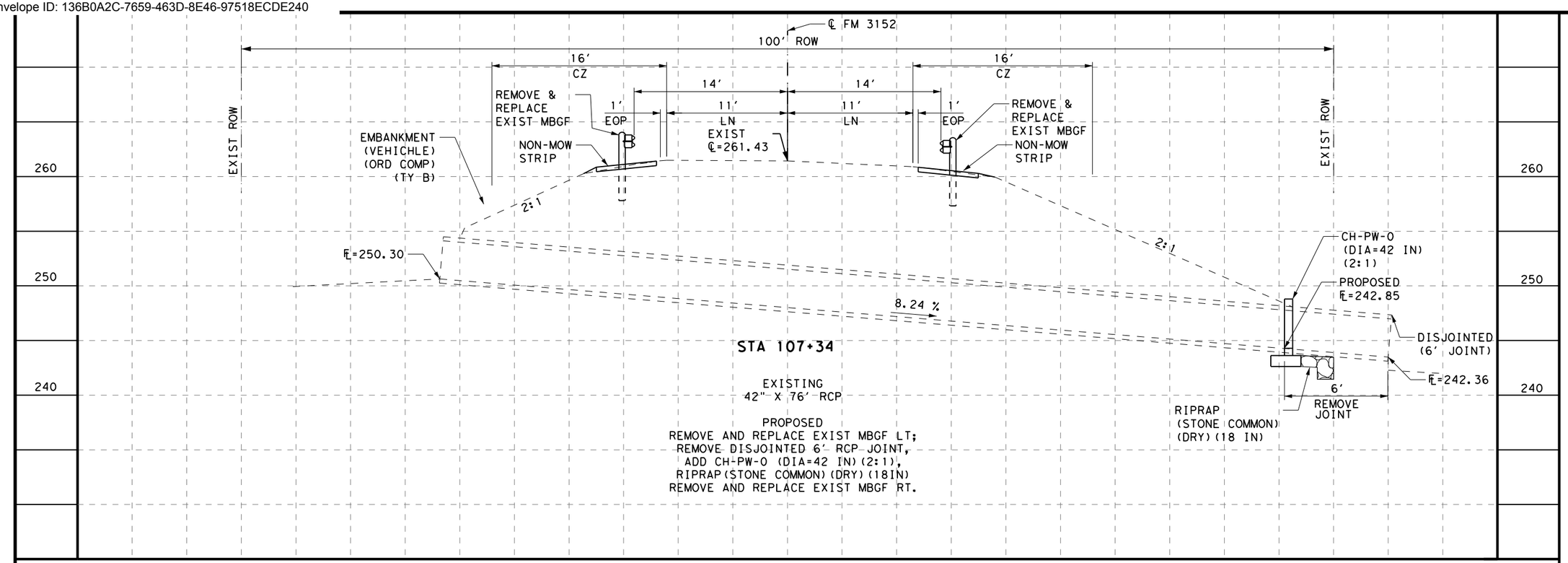
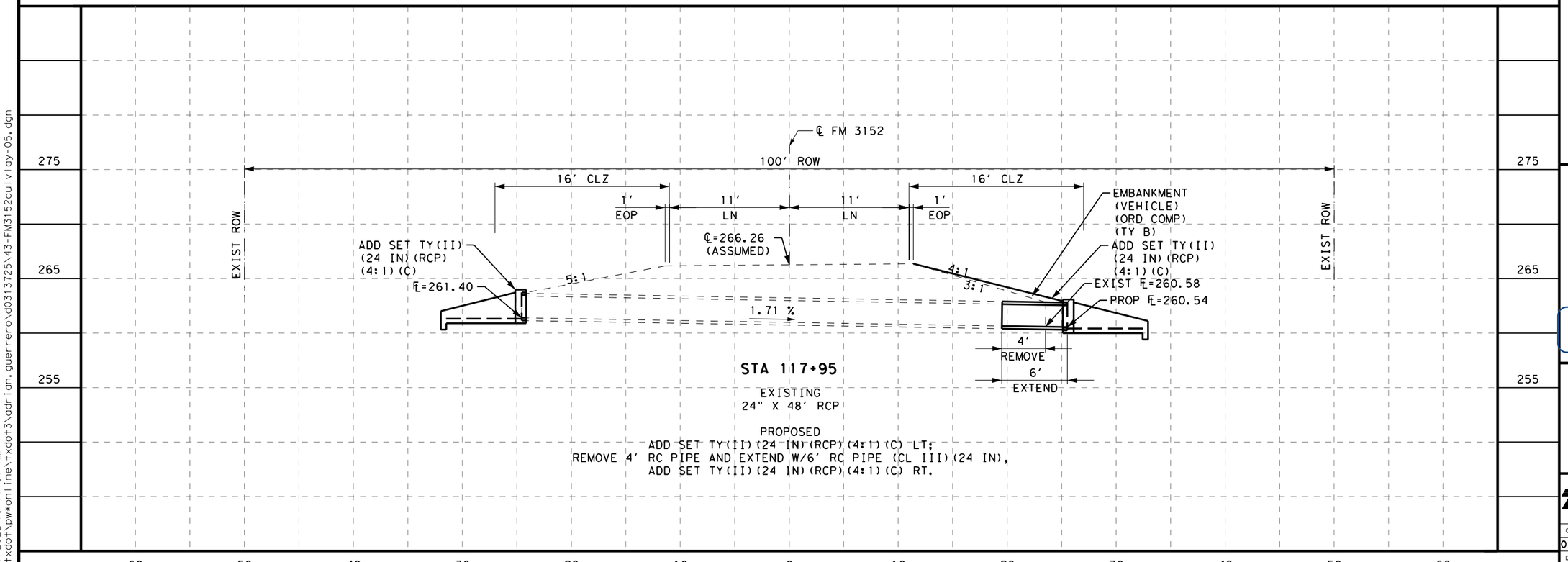
CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 42 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		176





SCALE 1" = 10'

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CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 43 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		177

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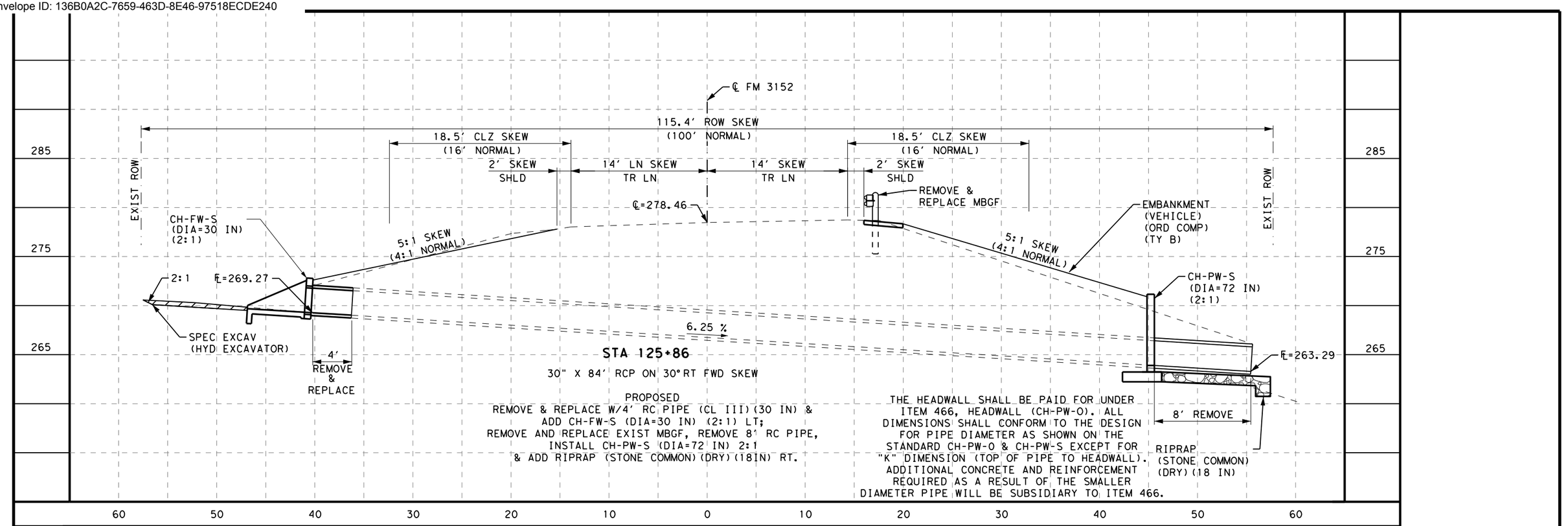
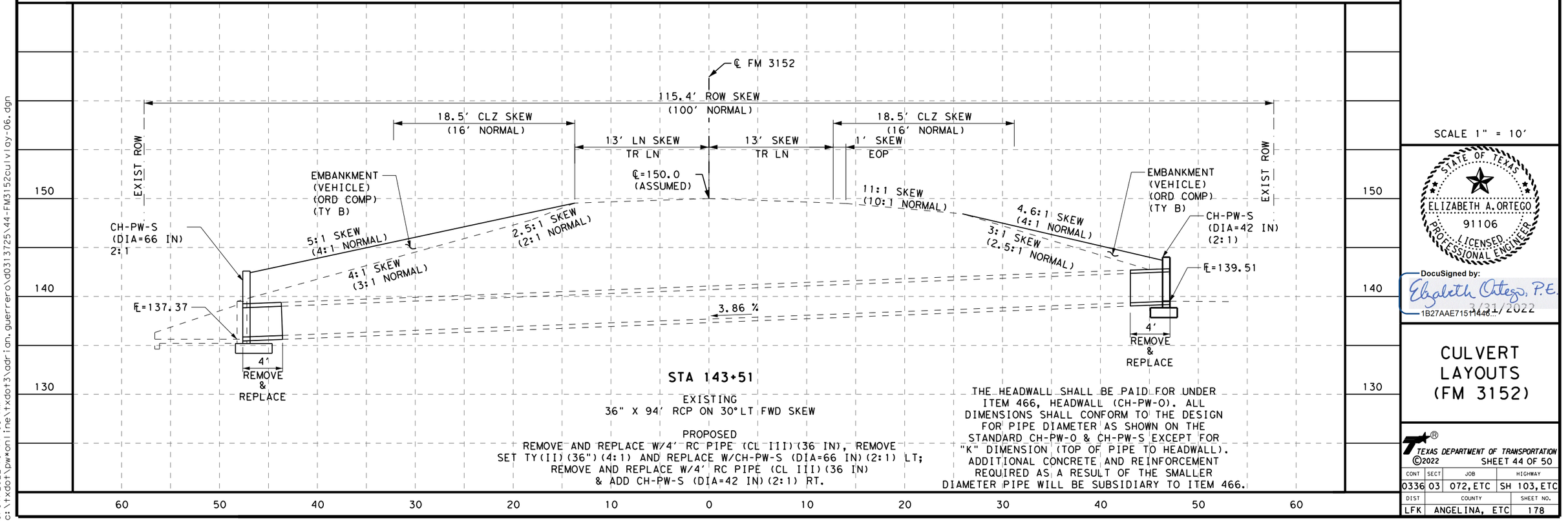


STA 125+86

30" X 84' RCP ON 30°RT FWD SKEW

PROPOSED
REMOVE & REPLACE W/4' RC PIPE (CL III)(30 IN) &
ADD CH-FW-S (DIA=30 IN) (2:1) LT;
REMOVE AND REPLACE EXIST MBGF, REMOVE 8' RC PIPE,
INSTALL CH-PW-S (DIA=72 IN) 2:1
& ADD RIPRAP (STONE COMMON)(DRY)(18IN) RT.

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



STA 143+51

EXISTING
36" X 94' RCP ON 30°LT FWD SKEW

PROPOSED
REMOVE AND REPLACE W/4' RC PIPE (CL III)(36 IN), REMOVE
SET TY(II)(36")(4:1) AND REPLACE W/CH-PW-S (DIA=66 IN)(2:1) LT;
REMOVE AND REPLACE W/4' RC PIPE (CL III)(36 IN)
& ADD CH-PW-S (DIA=42 IN)(2:1) RT.

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

SCALE 1" = 10'

ELIZABETH A. ORTEGO
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STATE OF TEXAS

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Elizabeth Ortego, P.E.
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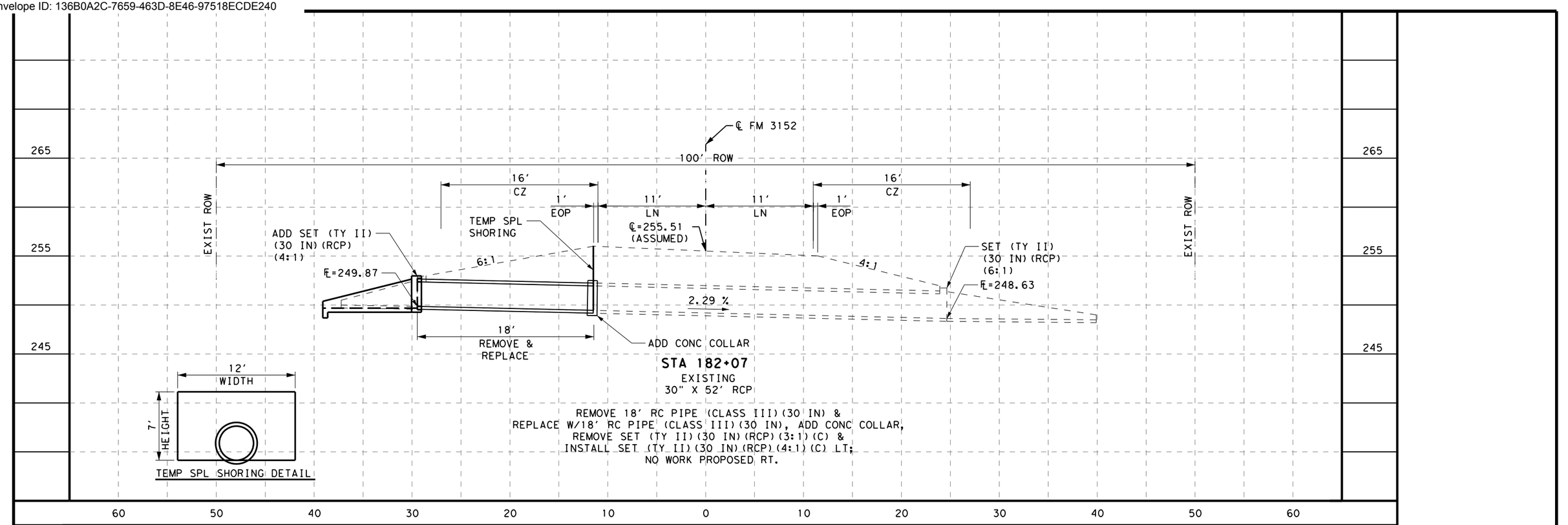
3/31/2022

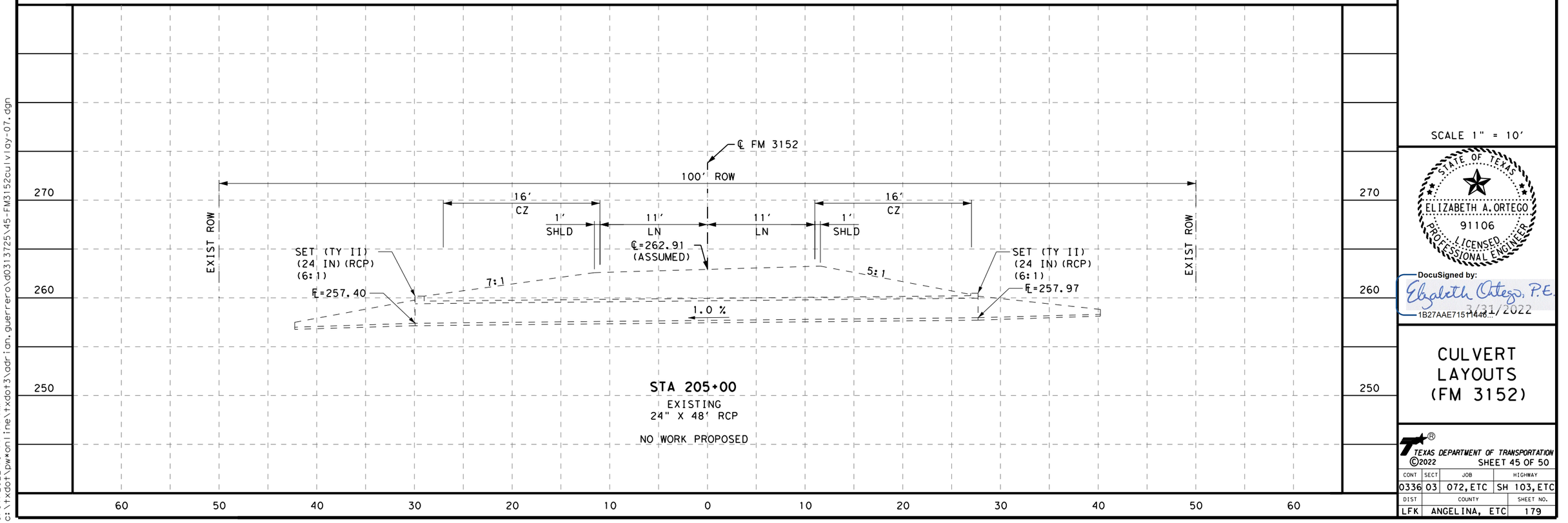
CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 44 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		178





SCALE 1" = 10′

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CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 45 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		179

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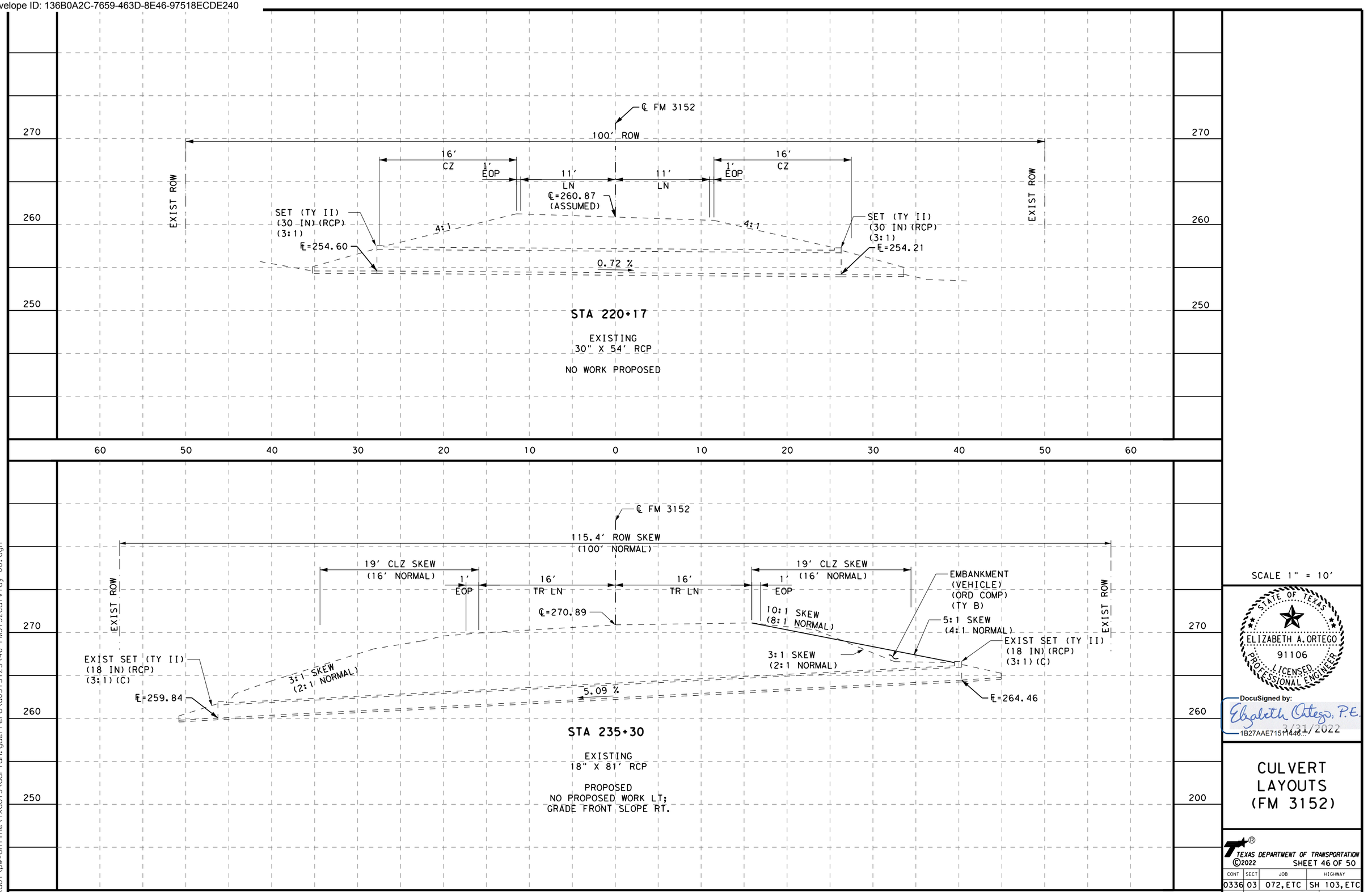

SCALE 1" = 10'

STATE OF TEXAS
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CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 46 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		180

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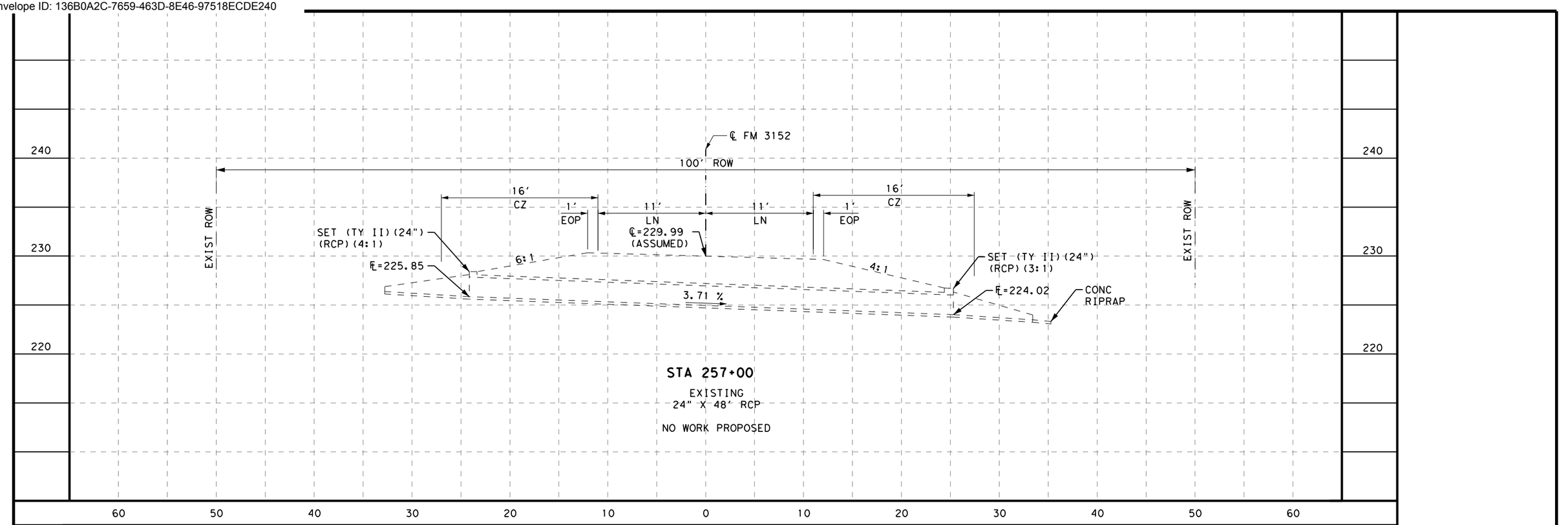
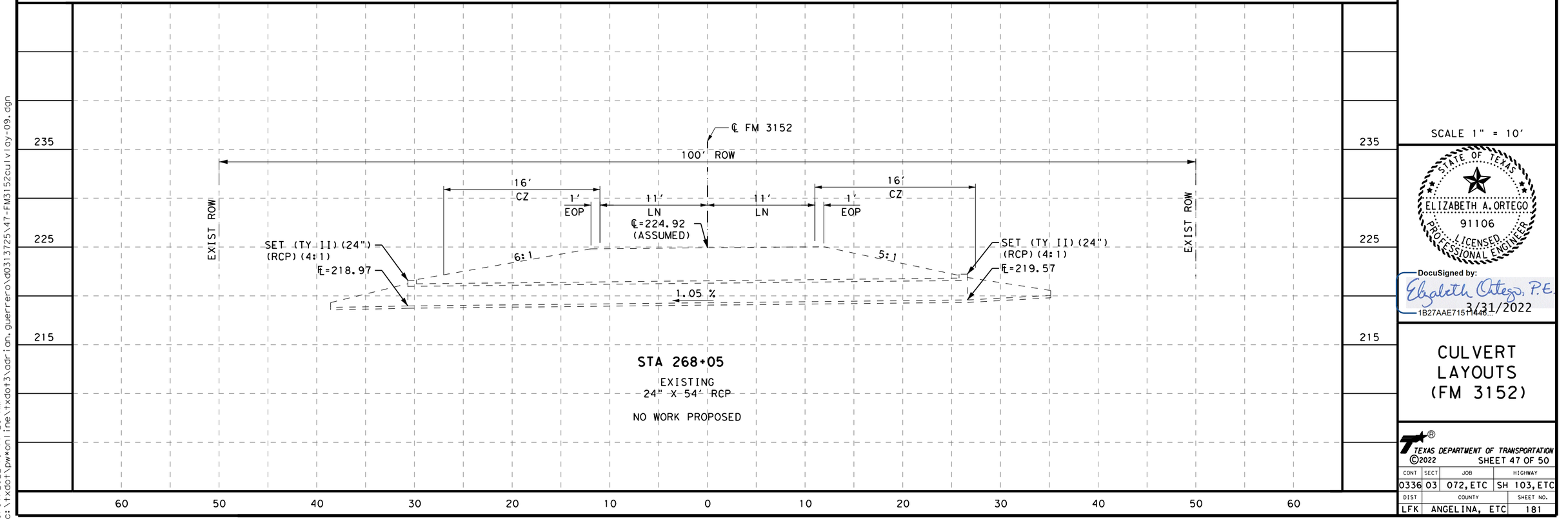


STA 257+00

EXISTING
24" X 48' RCP

NO WORK PROPOSED



STA 268+05

EXISTING
24" X 54' RCP

NO WORK PROPOSED

SCALE 1" = 10'

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CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 47 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		181

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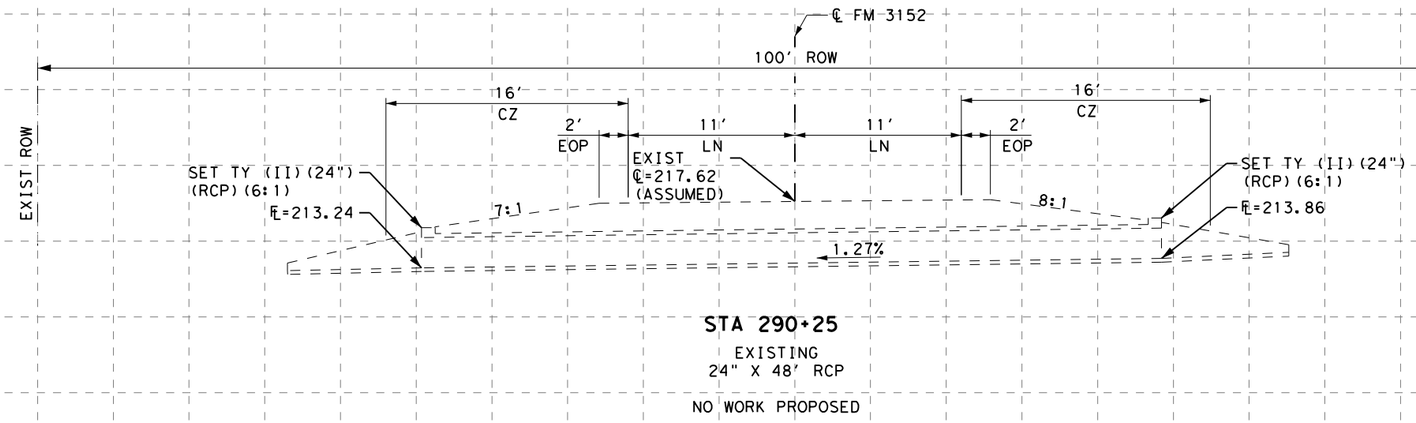

STA 290+25

EXISTING
24" X 48' RCP

NO WORK PROPOSED

SCALE 1" = 10'

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3/31/2022

CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 48 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		182

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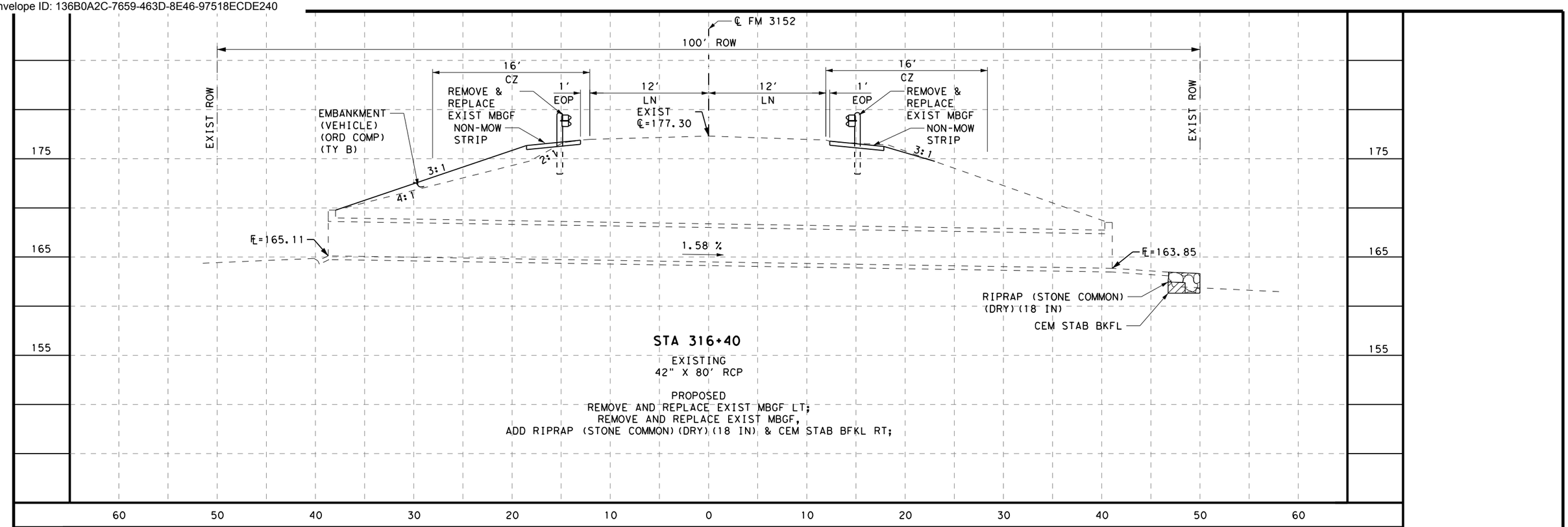

SCALE 1" = 10′

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3/31/2022

CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 49 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		183

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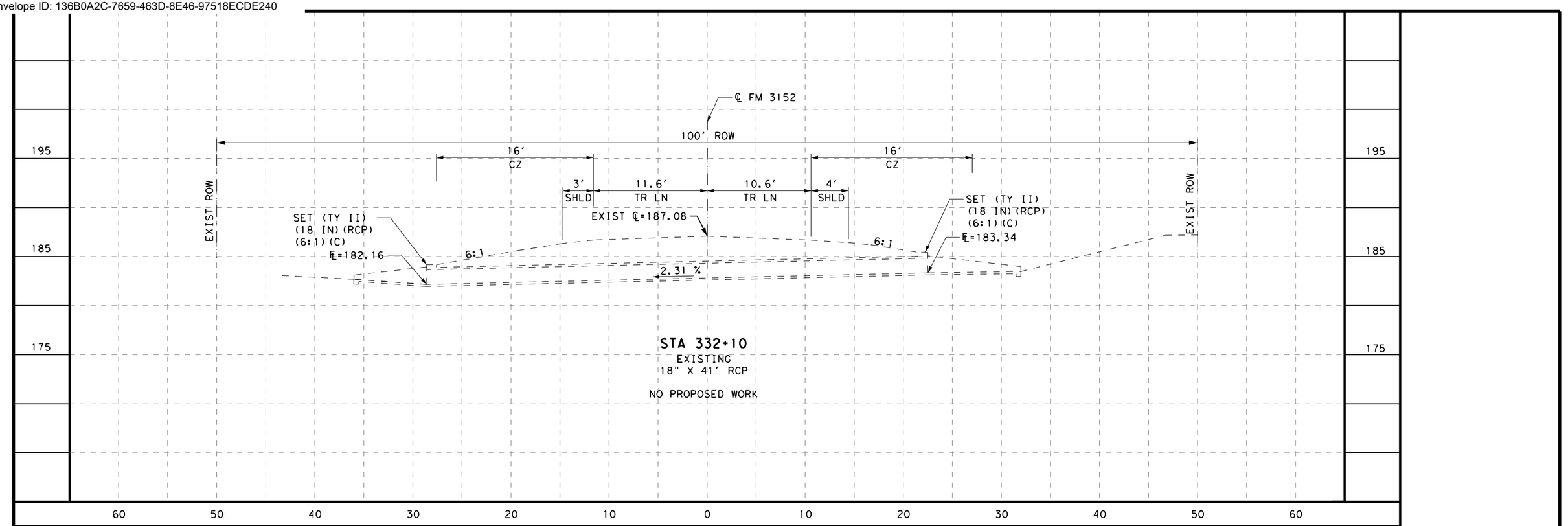

SCALE 1" = 10'

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3/31/2022

CULVERT LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 50 OF 50

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		184

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)
CSJ:1678-02-007																			
STA 34+40 (Rt)	1 ~ 10' X 7'	2'	SCC-10	FW-0	0°	2:1	8"	7"	1.000'	8.417'	16.167'	9.334'	18.668'	N/A	N/A	4.3	0.4	10.0	163
STA 34+40 (Lt)	1 ~ 10' X 7'	2'	SCC-10	PW-2	0°	2:1	8"	7"	1.000'	8.667'	N/A	N/A	15.333'	11.167'	N/A	0.0	0.4	18.4	260
STA 102+90 (Rt)	1 ~ 10' X 7'	2.5'	SCC-10	FW-0	0°	2:1	8"	7"	1.000'	8.417'	16.167'	9.334'	18.668'	N/A	N/A	4.3	0.4	10.0	163
STA 102+90 (Lt)	1 ~ 10' X 7'	2.5'	SCC-10	PW-2	0°	2:1	8"	7"	1.000'	8.667'	N/A	N/A	15.333'	11.167'	N/A	0.0	0.4	18.4	260
STA 115+15 (Rt)	1 ~ 8' X 4'	1.5'	SCC-8	FW-0	0°	2:1	8"	7"	1.000'	5.417'	10.167'	5.870'	11.739'	N/A	N/A	2.2	0.3	4.2	68
STA 115+15 (Lt)	1 ~ 8' X 4'	1.5'	SCC-8	PW-2	0°	2:1	8"	7"	1.000'	5.667'	N/A	N/A	9.333	9.167'	N/A	0.0	0.3	7.3	100
CSJ:2891-01-018																			
STA 48+00 (Both)	1 ~ 9' X 8'	5.5'	SCC-9	PW-1	15°	2:1	8"	7"	1.000'	9.667'	N/A	N/A	20.015'	10.525'	N/A	0.0	0.8	51.8	774
STA 78+00 (Both)	1 ~ 6' X 6'	4.5'	SCC-5&6	PW-2	0°	2:1	8"	7"	1.000'	7.667'	N/A	N/A	13.333'	7.167'	N/A	0.0	0.6	26.6	396
STA 125+58 (Both)	1 ~ 10' X 6'	3'	SCC-10	PW-2	45°	2:1	8"	7"	1.000'	7.667'	N/A	N/A	18.856'	15.792'	N/A	0.0	1.2	38.8	566
STA 202+40 (Both)	1 ~ 5' X 3'	3.5'	SCC-5&6	FW-0	0°	2:1	8"	7"	1.000'	4.417'	8.167'	4.715'	9.430'	N/A	N/A	2.4	0.4	6.2	90
STA 248+00 (Both)	1 ~ 9' X 7'	3'	SCC-9	PW-2	0°	2:1	8"	7"	1.000'	8.667'	N/A	N/A	15.333'	10.167'	N/A	0.0	0.8	36.6	520

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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
ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE715114A1...
4/1/2022

Texas Department of Transportation

Bridge Division Standard

BOX CULVERT SUPPLEMENT
WINGS AND END TREATMENTS

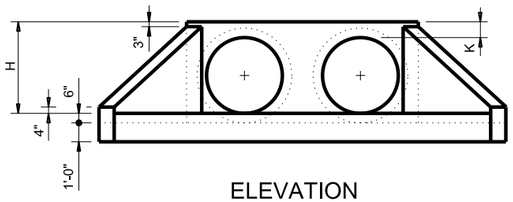
BCS

FILE:	bcsstde1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS		0336	03	072,ETC	SH 103,ETC
		DIST	COUNTY		SHEET NO.
		LFK	ANGELINA, ETC		185

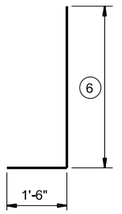
DATE: 3/30/2022 11:42:32 PM
FILE: c:\txdot\pw_online\txdot3\adrian.guerrero\d0474438\chfw00se-20.dgn

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

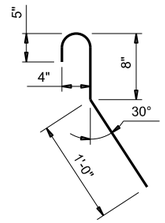
Slope	Dia of Pipe (D)	Values for One Pipe W	X	Y	L	Reinf (Lbs)	Conc (CY) (1)	Values to be Added for Each Addt'l Pipe X and W	Reinf (Lbs)	Conc (CY) (1)
2:1	12"	4' - 7 ½"	2' - 6"	2' - 10"	3' - 3 ¼"	88	0.6	1' - 9"	20	0.2
	15"	5' - 5 ¾"	2' - 9 ½"	3' - 4"	3' - 10 ¼"	103	0.7	2' - 2"	24	0.3
	18"	6' - 4 ¼"	3' - 1"	3' - 10"	4' - 5"	124	0.9	2' - 8"	32	0.3
	21"	7' - 2 ¾"	3' - 4 ½"	4' - 4"	5' - 0"	143	1.1	3' - 1"	43	0.4
	24"	8' - 2 ½"	3' - 9 ½"	4' - 10"	5' - 7"	164	1.3	3' - 7"	50	0.5
	27"	9' - 1"	4' - 1"	5' - 4"	6' - 2"	179	1.5	3' - 11"	56	0.6
	30"	9' - 11 ½"	4' - 4 ½"	5' - 10"	6' - 8 ¾"	203	1.7	4' - 4"	65	0.8
	33"	10' - 10"	4' - 8"	6' - 4"	7' - 3 ¾"	224	2.0	4' - 8"	71	0.9
	36"	11' - 8 ¼"	4' - 11 ½"	6' - 10"	7' - 10 ¾"	249	2.2	5' - 1"	81	1.0
	42"	13' - 5 ¼"	5' - 6 ½"	7' - 10"	9' - 0 ½"	298	2.8	5' - 10"	97	1.3
	48"	15' - 9"	6' - 1 ½"	9' - 4"	10' - 9 ¼"	360	3.8	6' - 7"	117	1.7
	54"	17' - 5 ¾"	6' - 8 ½"	10' - 4"	11' - 11 ¼"	427	4.5	7' - 6"	151	2.1
	60"	19' - 2 ¾"	7' - 3 ½"	11' - 4"	13' - 1"	481	5.3	8' - 3"	174	2.5
	66"	20' - 11 ½"	7' - 10 ½"	12' - 4"	14' - 3"	544	6.2	8' - 9"	194	2.9
	72"	22' - 8 ½"	8' - 5 ½"	13' - 4"	15' - 4 ¾"	601	7.1	9' - 4"	213	3.3
3:1	12"	6' - 3"	2' - 6"	4' - 3"	4' - 11"	118	0.8	1' - 9"	22	0.2
	15"	7' - 5"	2' - 9 ½"	5' - 0"	5' - 9 ¼"	137	1.1	2' - 2"	28	0.3
	18"	8' - 6 ¾"	3' - 1"	5' - 9"	6' - 7 ¾"	170	1.3	2' - 8"	37	0.5
	21"	9' - 8 ¾"	3' - 4 ½"	6' - 6"	7' - 6"	195	1.6	3' - 1"	48	0.6
	24"	11' - 0"	3' - 9 ½"	7' - 3"	8' - 4 ½"	227	2.0	3' - 7"	58	0.7
	27"	12' - 2"	4' - 1"	8' - 0"	9' - 2 ¾"	251	2.3	3' - 11"	67	0.8
	30"	13' - 4"	4' - 4 ½"	8' - 9"	10' - 1 ¼"	293	2.7	4' - 4"	77	1.0
	33"	14' - 5 ¾"	4' - 8"	9' - 6"	10' - 11 ¾"	318	3.1	4' - 8"	84	1.2
	36"	15' - 7 ¾"	4' - 11 ½"	10' - 3"	11' - 10"	351	3.5	5' - 1"	96	1.4
	42"	17' - 11 ½"	5' - 6 ½"	11' - 9"	13' - 6 ¾"	432	4.5	5' - 10"	119	1.7
	48"	21' - 1 ¾"	6' - 1 ½"	14' - 0"	16' - 2"	537	6.1	6' - 7"	146	2.3
	54"	23' - 5 ½"	6' - 8 ½"	15' - 6"	17' - 10 ¾"	630	7.3	7' - 6"	186	2.9
	60"	25' - 9 ¼"	7' - 3 ½"	17' - 0"	19' - 7 ½"	719	8.7	8' - 3"	219	3.4
	66"	28' - 1"	7' - 10 ½"	18' - 6"	21' - 4 ¼"	811	10.1	8' - 9"	242	3.9
	72"	30' - 4 ¾"	8' - 5 ½"	20' - 0"	23' - 1 ¼"	924	11.7	9' - 4"	272	4.4
4:1	12"	7' - 10 ¾"	2' - 6"	5' - 8"	6' - 6 ½"	148	1.1	1' - 9"	24	0.3
	15"	9' - 4"	2' - 9 ½"	6' - 8"	7' - 8 ½"	181	1.5	2' - 2"	32	0.4
	18"	10' - 9 ½"	3' - 1"	7' - 8"	8' - 10 ¼"	221	1.9	2' - 8"	42	0.5
	21"	12' - 2 ¾"	3' - 4 ½"	8' - 8"	10' - 0"	260	2.3	3' - 1"	57	0.7
	24"	13' - 9 ½"	3' - 9 ½"	9' - 8"	11' - 2"	301	2.8	3' - 7"	67	0.9
	27"	15' - 3"	4' - 1"	10' - 8"	12' - 3 ¾"	334	3.3	3' - 11"	77	1.0
	30"	16' - 8 ¼"	4' - 4 ½"	11' - 8"	13' - 5 ¾"	385	3.8	4' - 4"	89	1.3
	33"	18' - 1 ¾"	4' - 8"	12' - 8"	14' - 7 ½"	425	4.5	4' - 8"	101	1.4
	36"	19' - 7"	4' - 11 ½"	13' - 8"	15' - 9 ¼"	472	5.1	5' - 1"	115	1.7
	42"	22' - 5 ¾"	5' - 6 ½"	15' - 8"	18' - 1"	583	6.5	5' - 10"	141	2.1
	48"	26' - 6 ¼"	6' - 1 ½"	18' - 8"	21' - 6 ¾"	730	8.9	6' - 7"	175	2.8
	54"	29' - 5"	6' - 8 ½"	20' - 8"	23' - 10 ¼"	875	10.7	7' - 6"	226	3.6
	60"	32' - 3 ¾"	7' - 3 ½"	22' - 8"	26' - 2"	996	12.7	8' - 3"	264	4.3
	66"	35' - 2 ½"	7' - 10 ½"	24' - 8"	28' - 5 ¾"	1,140	14.9	8' - 9"	300	4.9
	72"	38' - 1 ¼"	8' - 5 ½"	26' - 8"	30' - 9 ½"	1,297	17.3	9' - 4"	334	5.6
6:1	12"	11' - 2"	2' - 6"	8' - 6"	9' - 9 ¾"	224	1.9	1' - 9"	28	0.4
	15"	13' - 2 ¼"	2' - 9 ½"	10' - 0"	11' - 6 ½"	268	2.5	2' - 2"	37	0.5
	18"	15' - 2 ½"	3' - 1"	11' - 6"	13' - 3 ¼"	330	3.2	2' - 8"	50	0.7
	21"	17' - 2 ¾"	3' - 4 ½"	13' - 0"	15' - 0 ¼"	387	3.9	3' - 1"	69	0.9
	24"	19' - 4 ½"	3' - 9 ½"	14' - 6"	16' - 9"	453	4.8	3' - 7"	80	1.2
	27"	21' - 4 ¾"	4' - 1"	16' - 0"	18' - 5 ¾"	512	5.7	3' - 11"	96	1.4
	30"	23' - 5 ¼"	4' - 4 ½"	17' - 6"	20' - 2 ½"	593	6.7	4' - 4"	110	1.7
	33"	25' - 5 ½"	4' - 8"	19' - 0"	21' - 11 ¼"	675	7.8	4' - 8"	127	2.0
	36"	27' - 5 ¾"	4' - 11 ½"	20' - 6"	23' - 8"	735	9.0	5' - 1"	144	2.3
	42"	31' - 6 ¼"	5' - 6 ½"	23' - 6"	27' - 1 ½"	922	11.5	5' - 10"	179	3.0
	48"	37' - 3 ½"	6' - 1 ½"	28' - 0"	32' - 4"	1,191	15.9	6' - 7"	231	4.0
	54"	41' - 4 ¼"	6' - 8 ½"	31' - 0"	35' - 9 ½"	1,424	19.2	7' - 6"	300	5.0
	60"	45' - 4 ¾"	7' - 3 ½"	34' - 0"	39' - 3"	1,631	22.9	8' - 3"	353	6.0



ELEVATION
(Showing dimensions.)



BARS V



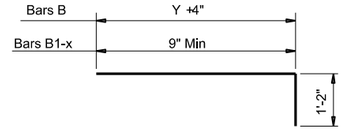
BARS CL
(Length = 2'-5")

TABLE OF REINFORCING STEEL (5)

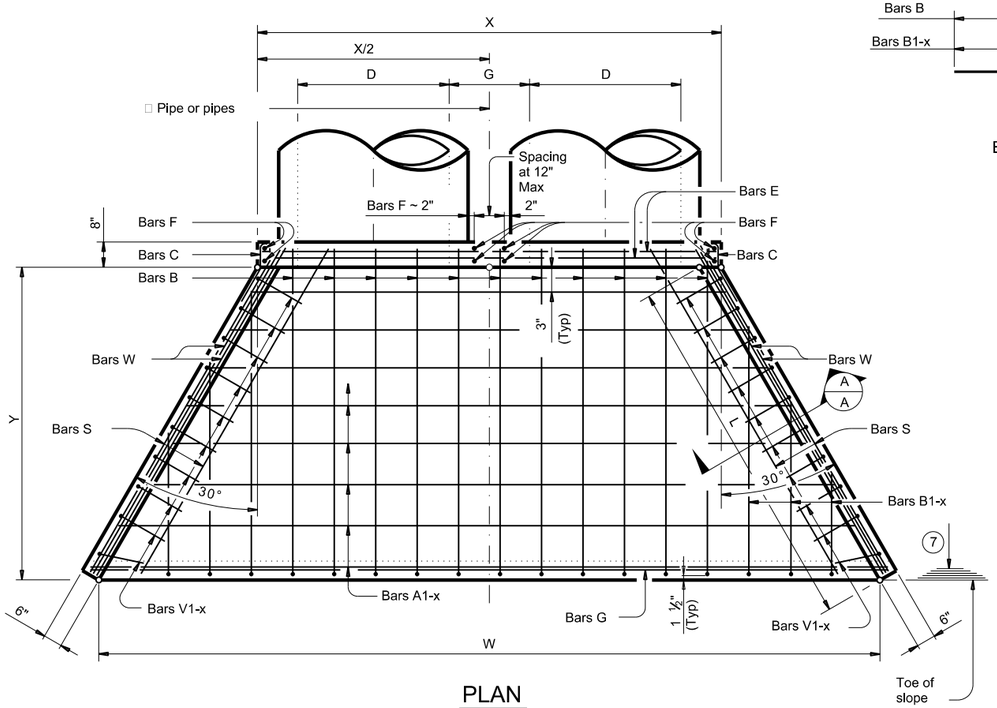
Bar	Size	Spa	No.
A	#4	1' - 0"	~
B	#3	1' - 6"	~
C	#4	1' - 0"	~
D	#3	1' - 0"	~
E	#5	~	4
F	#5	~	~
G	#3	~	2
S	#4	~	6
V	#4	1' - 0"	~
W	#5	~	4

TABLE OF CONSTANT DIMENSIONS

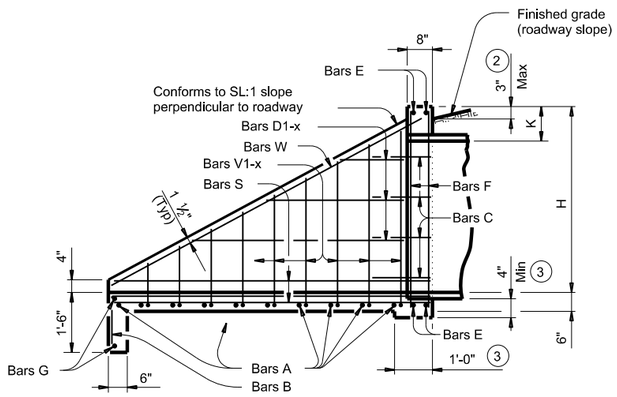
Dia of Pipe (D)	G	K (4)	H
12"	0' - 9"	1' - 0"	2' - 0"
15"	0' - 11"	1' - 0"	2' - 3"
18"	1' - 2"	1' - 0"	2' - 6"
21"	1' - 4"	1' - 0"	2' - 9"
24"	1' - 7"	1' - 0"	3' - 0"
27"	1' - 8"	1' - 0"	3' - 3"
30"	1' - 10"	1' - 0"	3' - 6"
33"	1' - 11"	1' - 0"	3' - 9"
36"	2' - 1"	1' - 0"	4' - 0"
42"	2' - 4"	1' - 0"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



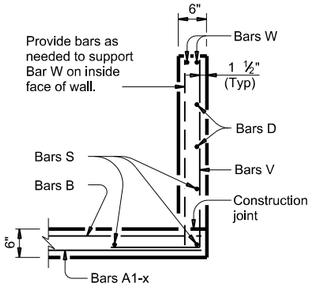
BARS B and B1-x



PLAN



TYPICAL WING ELEVATION



SECTION A-A

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

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

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

(4) Dimensions shown are usual and maximum.

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

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

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

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

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

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

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

Texas Department of Transportation

Bridge Division Standard

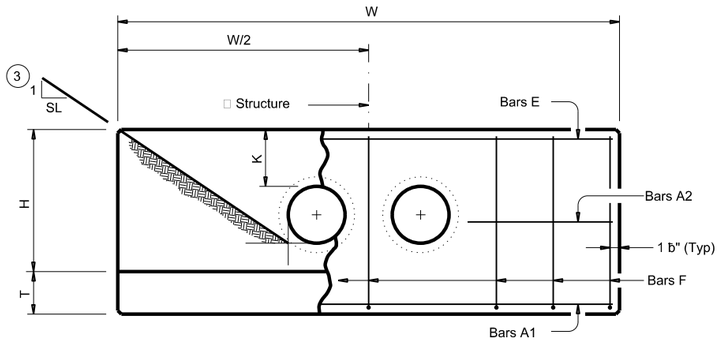
CONCRETE HEADWALLS
WITH FLARED WINGS FOR 0° SKEW PIPE CULVERTS

CH-FW-0

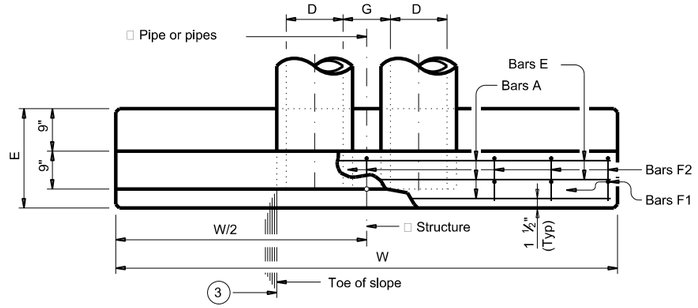
FILE: chfw00se-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072, ETC	SH 103, ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		186

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

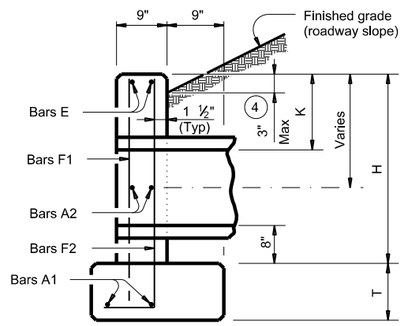
Slope	Dia of Pipe (D)	Values for One Pipe			Values To Be Added for Each Addt'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' - 0"	122	1.1	1' - 9"	15	0.2
	15"	10' - 3"	136	1.3	2' - 2"	16	0.2
	18"	11' - 6"	163	1.5	2' - 8"	19	0.3
	21"	12' - 9"	200	1.8	3' - 1"	31	0.4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



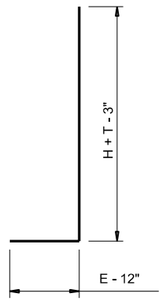
ELEVATION



PLAN OF NON-SKEWED PIPES



SECTION AT CENTER OF PIPE



BARS F2

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

TABLE OF CONSTANT DIMENSIONS

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

TABLE OF REINFORCING STEEL (6)

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

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

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

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

Texas Department of Transportation

Bridge Division Standard

CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS

CH-PW-0

FILE: chpw0ste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		187

DATE: 3/30/2022 11:42:36 PM
FILE: c:\txdot\pw_online\txdot3\adrian.guerrero\d0474438\chpw0ste-20.dgn

DATE: 3/30/2022 11:42:42 PM
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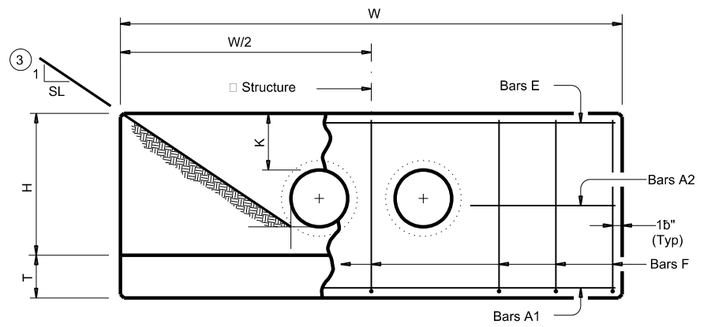
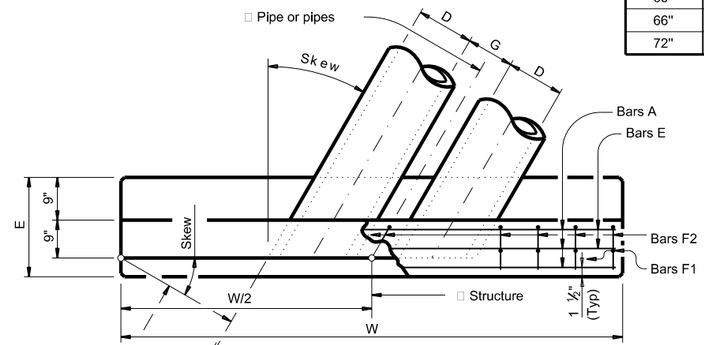
TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

Slope	Dia of Pipe (D)	15° Skew						30° Skew						45° Skew					
		Values for One Pipe			Values To Be Added for Each Addt'l Pipe			Values for One Pipe			Values To Be Added for Each Addt'l Pipe			Values for One Pipe			Values To Be Added for Each Addt'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' - 4"	124	1.1	1' - 9 ¾"	15	0.2	10' - 5"	130	1.2	2' - 0"	16	0.2	12' - 9"	159	1.5	2' - 5 ¾"	17	0.3
	15"	10' - 7"	136	1.3	2' - 3"	17	0.2	11' - 10"	159	1.5	2' - 6"	18	0.2	14' - 6"	191	1.8	3' - 0 ¾"	20	0.3
	18"	11' - 11"	165	1.5	2' - 9"	19	0.3	13' - 3"	174	1.7	3' - 1"	29	0.3	16' - 3"	207	2.1	3' - 9 ¼"	33	0.4
	21"	13' - 2"	203	1.9	3' - 2 ¼"	31	0.4	14' - 9"	233	2.1	3' - 6 ¾"	33	0.4	18' - 0"	276	2.6	4' - 4 ¼"	36	0.5
	24"	14' - 6"	240	2.1	3' - 8 ¼"	34	0.4	16' - 2"	251	2.4	4' - 1 ¾"	36	0.5	19' - 10"	318	2.9	5' - 0 ¾"	39	0.6
	27"	15' - 9"	258	2.5	4' - 0 ¾"	38	0.5	17' - 7"	292	2.8	4' - 6 ¼"	39	0.6	21' - 7"	342	3.4	5' - 6 ¼"	44	0.7
	30"	17' - 1"	297	2.8	4' - 5 ¾"	40	0.6	19' - 1"	311	3.1	5' - 0"	42	0.6	23' - 4"	388	3.8	6' - 1 ¾"	47	0.8
	33"	18' - 5"	320	3.3	4' - 9 ¾"	43	0.6	20' - 6"	358	3.6	5' - 4 ¾"	46	0.7	25' - 1"	439	4.4	6' - 7 ¼"	51	0.9
	36"	19' - 8"	401	4.0	5' - 3"	47	0.9	21' - 11"	422	4.5	5' - 10 ¾"	50	0.9	26' - 10"	517	5.5	7' - 2 ¼"	55	1.2
	42"	22' - 3"	476	5.0	6' - 0 ¾"	53	1.1	24' - 10"	528	5.6	6' - 8 ¾"	56	1.2	30' - 5"	634	6.9	8' - 3"	76	1.4
	48"	25' - 11"	577	6.6	6' - 9 ¾"	60	1.3	28' - 10"	637	7.3	7' - 7 ¼"	79	1.5	35' - 4"	791	9.0	9' - 3 ¾"	88	1.8
	54"	28' - 6"	711	7.8	7' - 9"	83	1.6	31' - 9"	781	8.7	8' - 8"	81	1.8	38' - 11"	958	10.7	10' - 7 ¼"	97	2.2
	60"	31' - 1"	805	9.2	8' - 6 ¼"	91	1.9	34' - 8"	881	10.2	9' - 6 ¼"	97	2.1	42' - 5"	1,113	12.5	11' - 8"	124	2.6
	66"	33' - 8"	907	10.6	9' - 0 ¾"	98	2.1	37' - 6"	1,028	11.8	10' - 1 ¼"	102	2.4	46' - 0"	1,235	14.5	12' - 4 ¼"	132	2.9
	72"	36' - 3"	1,071	12.1	9' - 8"	105	2.4	40' - 5"	1,207	13.5	10' - 9 ¼"	110	2.6	49' - 6"	1,446	16.6	13' - 2 ¼"	141	3.2
3:1	12"	13' - 6"	178	1.6	1' - 9 ¾"	15	0.2	15' - 0"	189	1.8	2' - 0"	15	0.2	18' - 5"	237	2.2	2' - 5 ¾"	17	0.2
	15"	15' - 3"	212	1.9	2' - 3"	17	0.2	17' - 0"	223	2.1	2' - 6"	17	0.3	20' - 10"	276	2.6	3' - 0 ¾"	20	0.3
	18"	17' - 1"	231	2.3	2' - 9"	19	0.3	19' - 1"	259	2.5	3' - 1"	29	0.3	23' - 4"	318	3.1	3' - 9 ¼"	32	0.4
	21"	18' - 11"	306	2.7	3' - 2 ¼"	31	0.4	21' - 1"	339	3.0	3' - 6 ¾"	33	0.4	25' - 10"	413	3.7	4' - 4 ¼"	36	0.5
	24"	20' - 8"	345	3.1	3' - 8 ¾"	35	0.4	23' - 1"	384	3.5	4' - 1 ¾"	36	0.5	28' - 3"	462	4.2	5' - 0 ¾"	40	0.6
	27"	22' - 6"	376	3.7	4' - 0 ¾"	38	0.5	25' - 1"	438	4.1	4' - 6 ¼"	39	0.6	30' - 9"	522	5.0	5' - 6 ¼"	44	0.7
	30"	24' - 4"	422	4.1	4' - 5 ¾"	40	0.6	27' - 2"	466	4.6	5' - 0"	42	0.6	33' - 3"	578	5.6	6' - 1 ¾"	47	0.8
	33"	26' - 2"	476	4.8	4' - 10"	43	0.6	29' - 2"	522	5.3	5' - 4 ¾"	46	0.7	35' - 9"	644	6.5	6' - 7 ¼"	51	0.9
	36"	27' - 11"	590	5.9	5' - 3"	47	0.8	31' - 2"	645	6.6	5' - 10 ¾"	50	0.9	38' - 2"	787	8.0	7' - 2 ¼"	56	1.2
	42"	31' - 7"	684	7.3	6' - 0 ¼"	53	1.1	35' - 3"	776	8.2	6' - 8 ¾"	56	1.2	43' - 2"	933	10.0	8' - 3"	79	1.4
	48"	36' - 9"	880	9.6	6' - 9 ¾"	61	1.3	41' - 0"	953	10.7	7' - 7 ¼"	81	1.5	50' - 2"	1,166	13.1	9' - 3 ¾"	88	1.8
	54"	40' - 5"	1,065	11.4	7' - 9"	85	1.6	45' - 0"	1,185	12.7	8' - 8"	89	1.8	55' - 2"	1,435	15.5	10' - 7 ¼"	97	2.2
	60"	44' - 0"	1,224	13.3	8' - 6 ¼"	93	1.9	49' - 1"	1,356	14.8	9' - 6 ¼"	96	2.1	60' - 1"	1,635	18.2	11' - 8"	124	2.6
	66"	47' - 7"	1,357	15.4	9' - 1"	98	2.1	53' - 1"	1,497	17.2	10' - 1 ¼"	103	2.3	65' - 1"	1,892	21.1	12' - 4 ¼"	130	2.9
	72"	51' - 3"	1,624	17.7	9' - 8"	105	2.3	57' - 2"	1,787	19.7	10' - 9 ¼"	109	2.6	70' - 0"	2,218	24.1	13' - 2 ¼"	139	3.2
4:1	12"	17' - 7"	232	2.1	1' - 9 ¾"	15	0.2	19' - 8"	259	2.4	2' - 0"	16	0.2	24' - 0"	314	2.9	2' - 5 ¾"	18	0.2
	15"	19' - 11"	272	2.5	2' - 3"	17	0.2	22' - 3"	301	2.8	2' - 6"	18	0.3	27' - 3"	361	3.5	3' - 0 ¾"	21	0.3
	18"	22' - 3"	313	3.0	2' - 9"	19	0.3	24' - 10"	344	3.3	3' - 1"	29	0.3	30' - 5"	427	4.0	3' - 9 ¼"	32	0.4
	21"	24' - 7"	407	3.6	3' - 2 ¼"	31	0.4	27' - 5"	446	4.0	3' - 6 ¾"	33	0.4	33' - 7"	549	4.9	4' - 4 ¼"	36	0.5
	24"	26' - 11"	455	4.1	3' - 8 ¾"	35	0.4	30' - 0"	499	4.5	4' - 1 ¾"	36	0.5	36' - 9"	609	5.6	5' - 0 ¾"	40	0.6
	27"	29' - 3"	514	4.8	4' - 0 ¾"	38	0.5	32' - 7"	562	5.4	4' - 6 ¼"	40	0.6	39' - 11"	703	6.6	5' - 6 ¼"	43	0.7
	30"	31' - 7"	568	5.4	4' - 5 ¾"	40	0.6	35' - 3"	620	6.0	5' - 0"	42	0.6	43' - 2"	768	7.4	6' - 1 ¾"	49	0.8
	33"	33' - 11"	634	6.2	4' - 10"	43	0.7	37' - 10"	710	7.0	5' - 4 ¾"	46	0.7	46' - 4"	848	8.5	6' - 7 ¼"	52	0.9
	36"	36' - 3"	776	7.7	5' - 3"	48	0.9	40' - 5"	868	8.6	5' - 10 ¾"	49	0.9	49' - 6"	1,058	10.6	7' - 2 ¼"	56	1.1
	42"	40' - 11"	921	9.6	6' - 0 ¼"	53	1.0	45' - 7"	1,022	10.7	6' - 8 ¾"	57	1.2	55' - 10"	1,262	13.1	8' - 3"	78	1.4
	48"	47' - 7"	1,152	12.6	6' - 10"	61	1.3	53' - 1"	1,268	14.0	7' - 7 ¼"	80	1.5	65' - 1"	1,587	17.2	9' - 3 ¾"	86	1.8
	54"	52' - 3"	1,416	14.9	7' - 9 ¼"	86	1.6	58' - 4"	1,589	16.6	8' - 8"	89	1.8	71' - 5"	1,924	20.4	10' - 7 ¼"	95	2.2
	60"	56' - 11"	1,606	17.5	8' - 6 ¾"	92	1.9	63' - 6"	1,806	19.5	9' - 6 ¼"	95	2.1	77' - 9"	2,192	23.9	11' - 8"	122	2.6
	66"	61' - 7"	1,819	20.2	9' - 0 ¾"	97	2.1	68' - 8"	2,019	22.5	10' - 1 ¼"	101	2.4	84' - 2"	2,472	27.6	12' - 4 ¼"	131	2.9
	72"	66' - 3"	2,150	23.2	9' - 8"	104	2.4	73' - 11"	2,379	25.9	10' - 9 ¼"	108	2.6	90' - 6"	2,937	31.7	13' - 2 ¼"	138	3.2
6:1	12"	25' - 11"	342	3.1	1' - 9 ¾"	15	0.2	28' - 10"	374	3.5	2' - 0"	16	0.2	35' - 4"	456	4.3	2' - 5 ¾"	17	0.2
	15"	29' - 3"	390	3.7	2' - 3"	17	0.2	32' - 7"	442	4.2	2' - 6"	18	0.2	39' - 11"	549	5.1	3' - 0 ¾"	20	0.3
	18"	32' - 7"	459	4.4	2' - 9"	20	0.3	36' - 4"	515	4.9	3' - 1"	29	0.3	44' - 7"	629	6.0	3' - 9 ¼"	33	0.4
	21"	36' - 0"	608	5.3	3' - 2 ¼"	31	0.4	40' - 2"	660	5.9	3' - 6 ¾"	33	0.4	49' - 2"	823	7.2	4' - 4 ¼"	38	0.5
	24"	39' - 4"	672	6.0	3' - 8 ¾"	35	0.4	43' - 11"	748	6.7	4' - 1 ¾"	36	0.5	53' - 9"	920	8.2	5' - 0 ¾"	42	0.6
	27"	42' - 8"	770	7.1	4' - 0 ¾"	38	0.5	47' - 8"	852	8.0	4' - 6 ¼"	41	0.5	58' - 4"	1,039	9.7	5' - 6 ¼"	45	0.7
	30"	46' - 1"	839	8.0	4' - 5 ¾"	40	0.6	51' - 5"	949	8.9	5' - 0"	44	0.6	62' - 11"	1,162	10.9	6' - 1 ¾"	48	0.8
	33"	49' - 5"	947	9.2	4' - 10"	45	0.7	55' - 2"	1,040	10.3	5' - 4 ¾"	48	0.7	67' - 6"	1,292	12.6	6' - 7 ¼"	50	0.9
	36"	52' - 10"	1,151	11.4	5' - 3"	49	0.8	58' - 11"	1,287	12.7	5' - 10 ¾"	51	1.0	72' - 1"	1,583	15.6	7' - 2 ¼"	55	1.1
	42"	59' - 6"	1,365	14.2	6' - 0 ¼"	55	1.0	66' - 5"	1,530	15.8	6' - 8 ¾"	57	1.2	81' - 4"	1,875	19.4	8' - 3"	76	1.4
	48"	69' - 4"	1,737	18.5	6' - 10"	59	1.3	77' - 4"	1,942	20.7	7' - 7 ¼"	79	1.5	94' - 9"	2,368	25.3	9' - 3 ¾"	86	1.8
	54"	76' - 1"	2,138	22.0	7' - 9 ¼"	83	1.6	84' - 10"	2,378	24.6	8' - 8"	87	1.8	103' - 11"	2,912	30.1	10' - 7 ¼"	95	2.2
	60"	82' - 10"	2,426	25.8	8' - 6 ¾"	90	1.9	92' - 5"	2,681	28.8	9' - 6 ¼"	94	2.1	113' - 2"	3,294	35.3	11' - 8"	122	2.6
	66"	89' - 7"	2,730	29.9	9' - 0 ¾"	96	2.1	99' - 11"	3,038	33.3	10' - 1 ¼"	101	2.4	122' - 4"	3,697	40.8	12' - 4 ¼"	130	2.9
	72"	96' - 3"	3,218	34.2	9' - 8"	102	2.4	107' - 5"	3,580	38.2	10' - 9 ¼"	108	2.6	131' - 6"	4,372	46.8	13' - 2 ¼"	139	3.2



ELEVATION

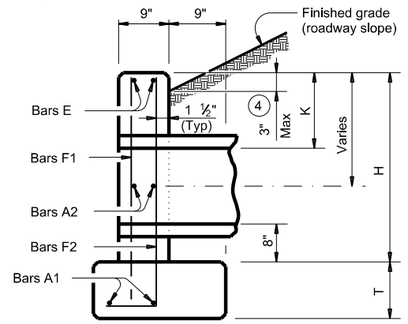


Lengths of wings based on SL:1 slope along this line.

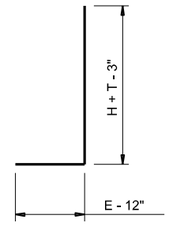
3 Toe of slope

PLAN OF SKEWED PIPES

Showing 30° skew.



SECTION AT CENTER OF PIPE



BARS F2

TABLE OF CONSTANT DIMENSIONS

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

TABLE OF REINFORCING STEEL (6)

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

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

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

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

(1) Total quantites include one 3'-1" lap for bars over 60' in length.

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

(3) Indicated slope is perpendicular to centerline pipe or pipes.

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

(5) Dimensions shown are usual and maximum.

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

Texas Department of Transportation

Bridge Division Standard

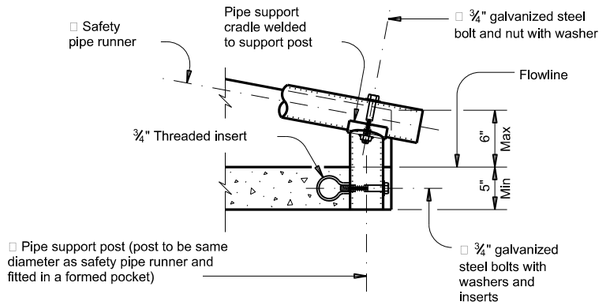
CONCRETE HEADWALLS WITH PARALLEL WINGS FOR SKEWED PIPE CULVERTS

CH-PW-S

FILE: chpwsste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		188

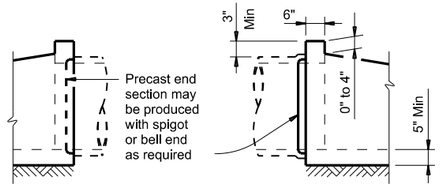
REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

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"				



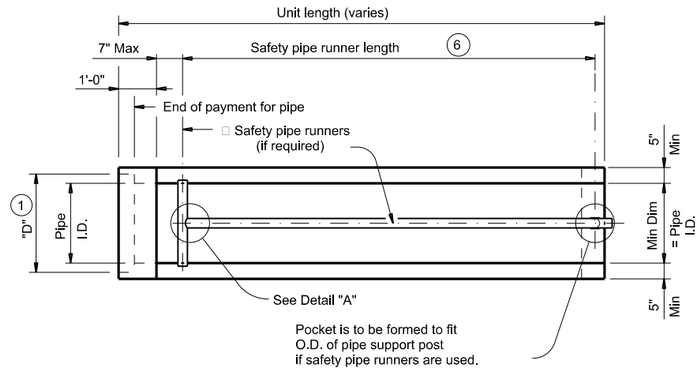
END DETAIL FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)



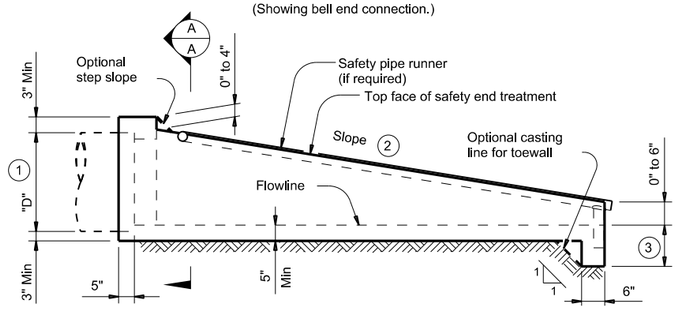
OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment)



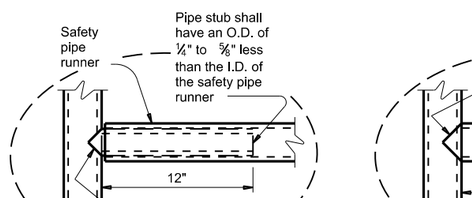
PLAN

(Showing bell end connection.)

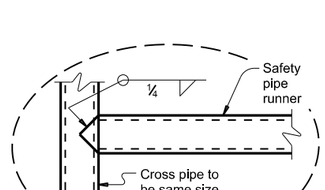


LONGITUDINAL ELEVATION

(Showing bell end connection.)



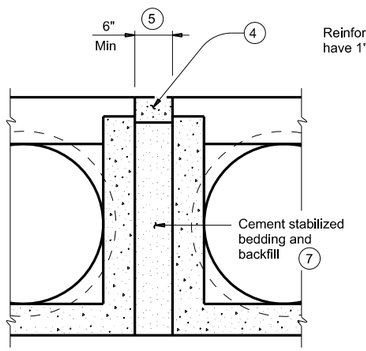
OPTION A



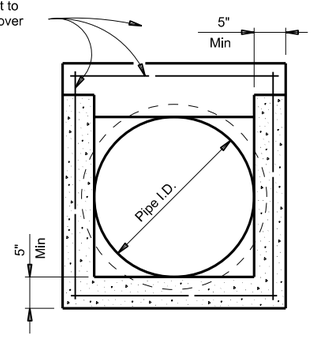
OPTION B

DETAIL A

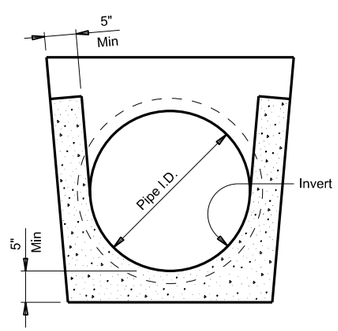
(If required)



MULTIPLE PIPE INSTALLATION

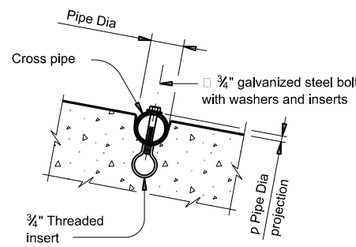


OPTION WITH SQUARE BOTTOM



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	0336	03	072, ETC	SH 103, ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		189

DATE: 3/30/2022 11:42:48 PM
FILE: c:\txdot\pw_online\txdot3\adrian.guerrero\d0474438\psetscss-21.dgn

DATE: 3/30/2022 11:42:53 PM
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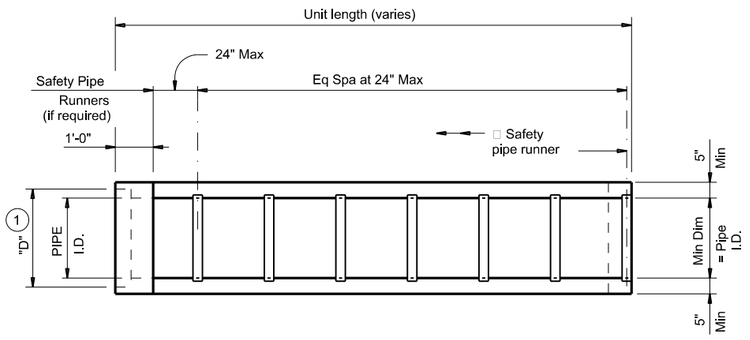
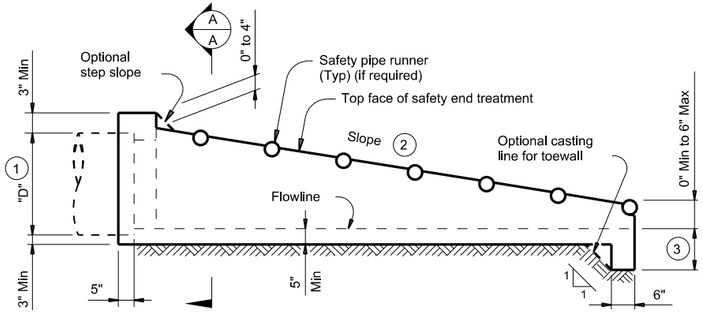


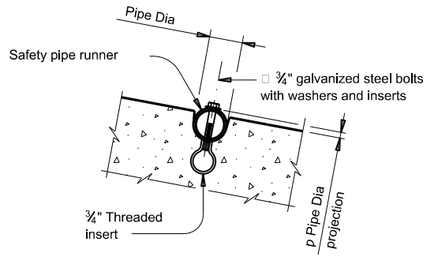
PLAN

(Showing bell end connection.)



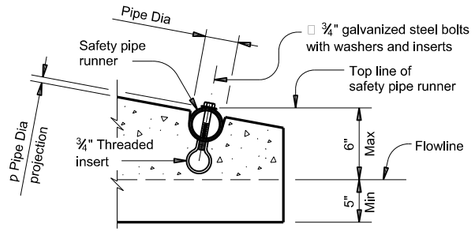
LONGITUDINAL ELEVATION

(Showing bell end connection.)

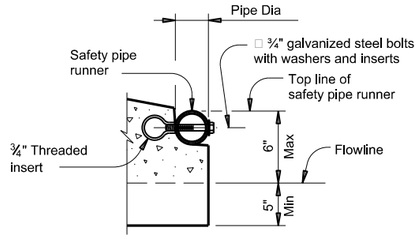


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



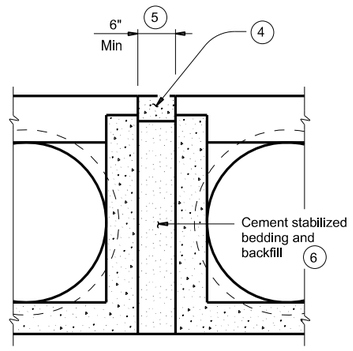
OPTION A



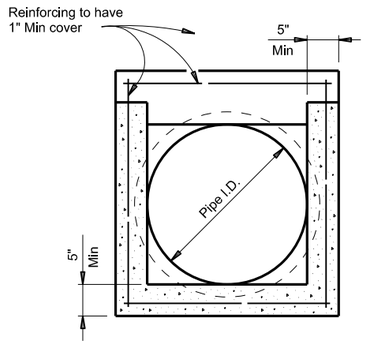
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

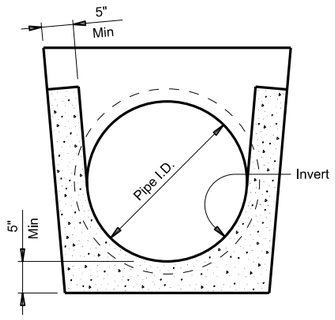
(If required)



MULTIPLE PIPE INSTALLATION

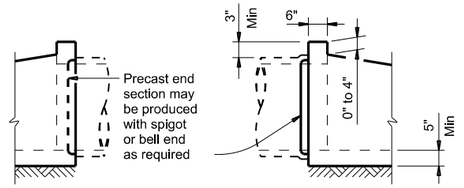


OPTION WITH SQUARE BOTTOM



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	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		190

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

Maximum Wingwall Height Hw	Dimensions W	X	Y	Z	Variable Reinforcing Bars J1 Size	Bars J1 Spa	Bars J2 Size	Bars J2 Spa	Estimated Quantities per ft of wing length (2~wings) (3) 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°)

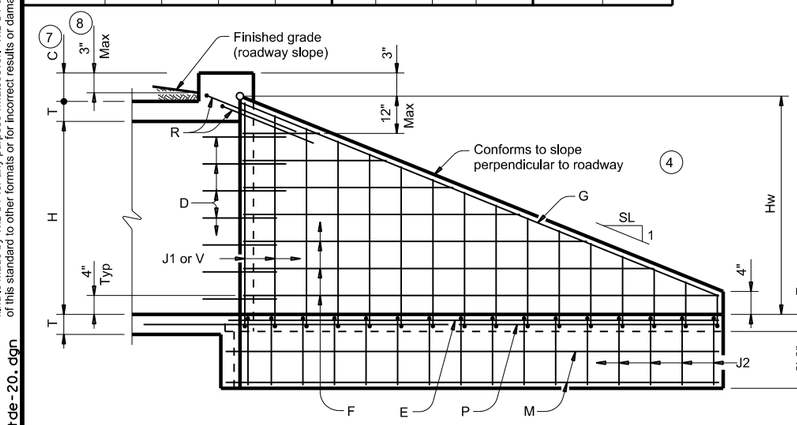
For cast-in-place culverts:
Ltw = (N) (S) + (N + 1) (U)

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

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

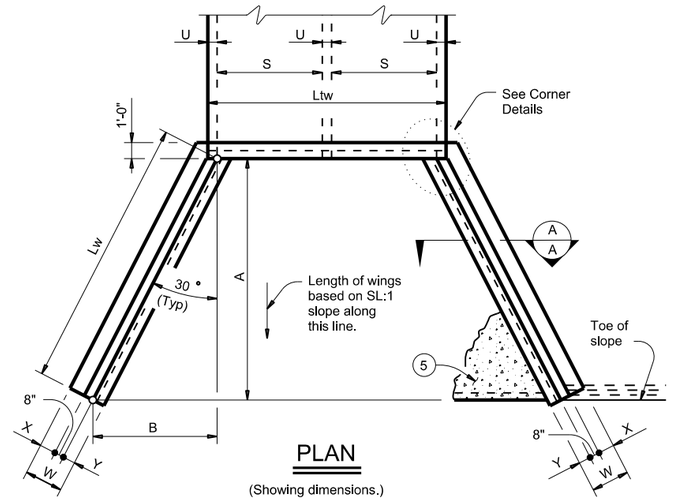
Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans

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



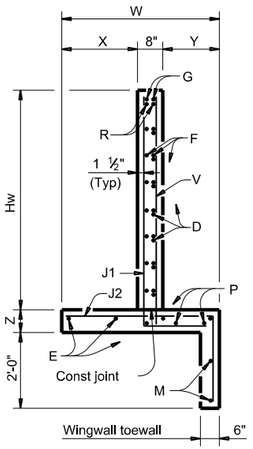
INSIDE ELEVATION

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

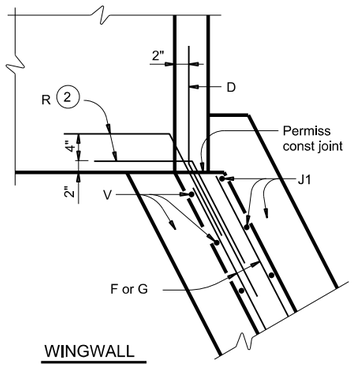


PLAN

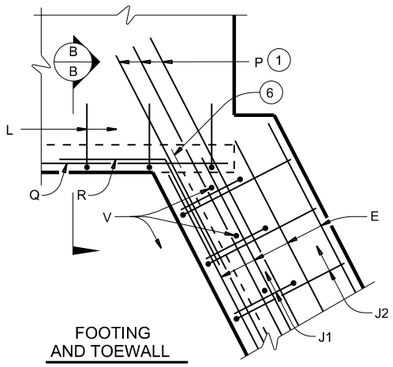
(Showing dimensions.)



SECTION A-A



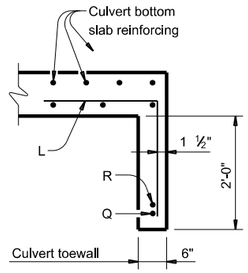
WINGWALL



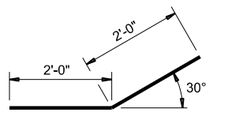
FOOTING AND TOEWALL

CORNER DETAILS

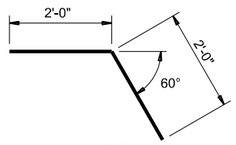
(Culvert and culvert toewall reinforcing not shown for clarity.)



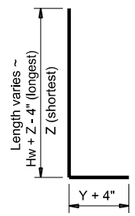
SECTION B-B (5)



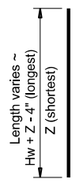
BARS D



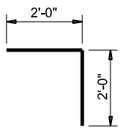
BARS R



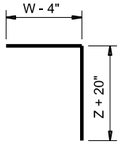
BARS J1



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-0stde-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		191

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

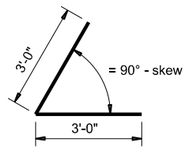
Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing (2~wings) (4)		Estimated Quantities per ft of Toewall (1~toewall)	
Maximum Wingwall Height Hw	W	X	Y	Z	Bars J1		Bars J2					
					Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#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)

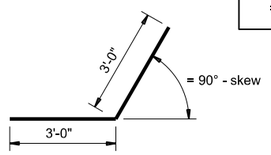
Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

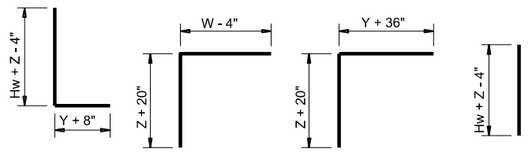
Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



BARS D1



BARS D2



BARS J1 BARS J2 BARS J3 BARS V

WING DIMENSION FORMULAS:

(All values are in feet.)

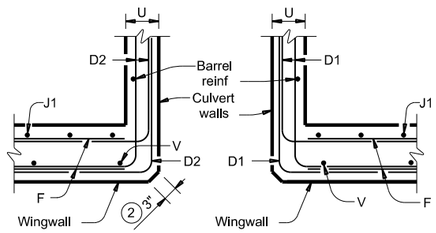
Hw = H + T + C
Lw = (Hw) (SL) ÷ cosine (θ) for Type PW-1
= (Hw - 1') (SL) ÷ cosine (θ) for Type PW-2 and Hw 4' ≥
= (Hw - 0.5') (SL) ÷ cosine (θ) for Type PW-2 and Hw 4' <

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

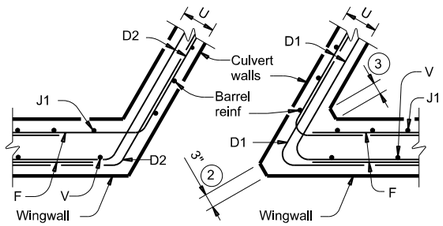
For precast culverts:
Ltw = [(N) (2 U + S) + (N - 1) (0.5')] ÷ cosine (θ)
Total Wingwall Area (two wings ~ SF)
= (2)(Hw)(Lw) for Type PW-1
= (2)(Hw)(Lw) - 6 SF for Type PW-2 and Hw 4' ≥
= (2)(Hw)(Lw) - 1.5 SF for Type PW-2 and Hw 4' <

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

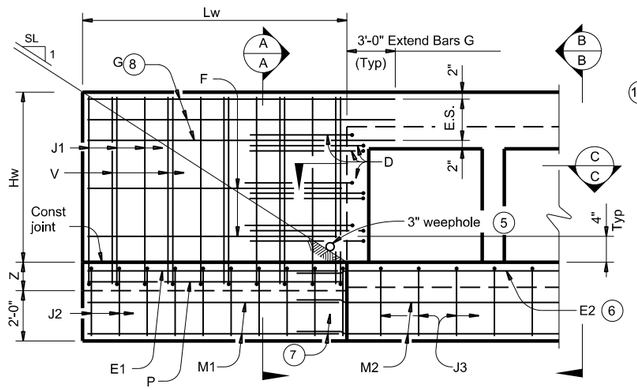
See applicable box culvert standard sheet for S, H, T, and U values.



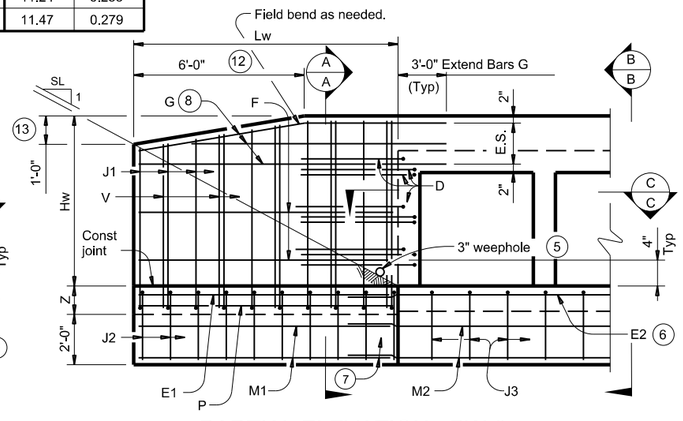
SECTION C-C - PW-1



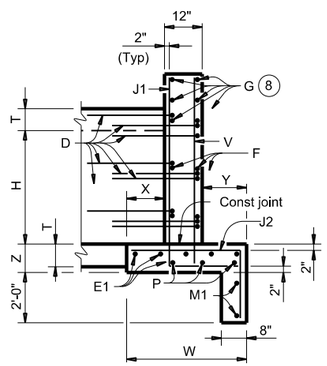
SECTION C-C - PW-2



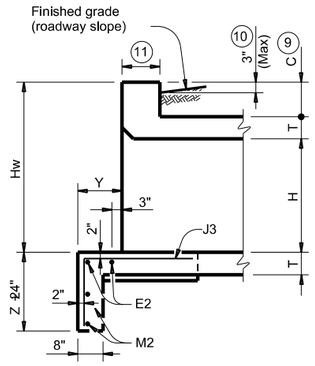
PARTIAL ELEVATION - PW-1



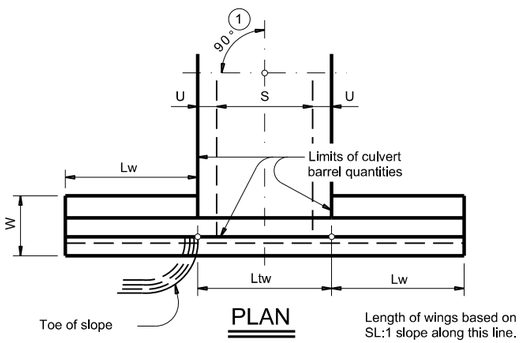
PARTIAL ELEVATION - PW-2



SECTION A-A
(Showing wing reinforcement.)



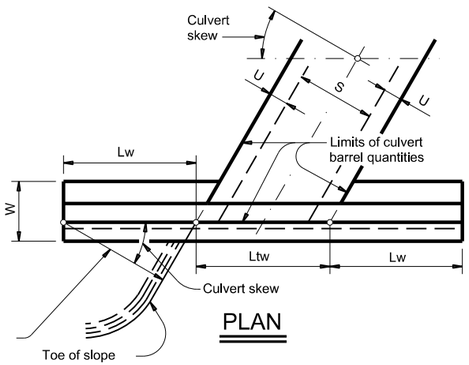
SECTION B-B
(Showing wing reinforcement.)



PLAN

Length of wings based on SL:1 slope along this line.

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
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	LFK	ANGELINA, ETC		192

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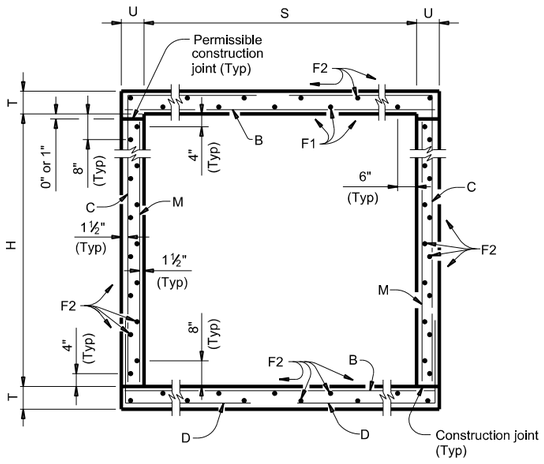
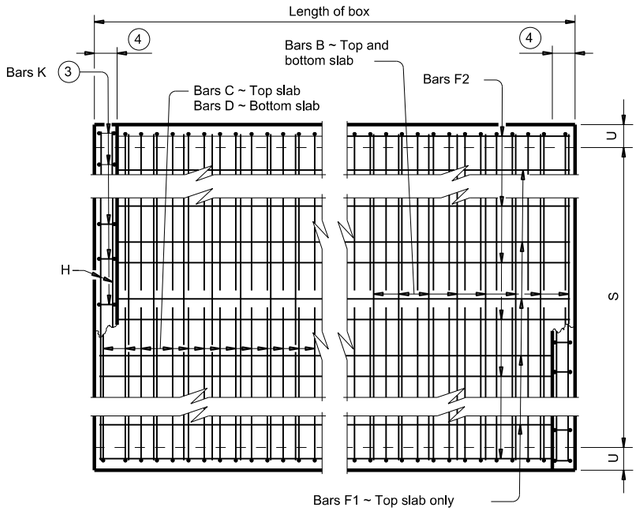
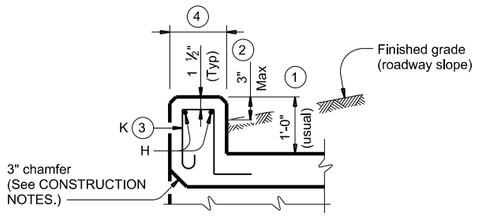


TYPICAL SECTION



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.

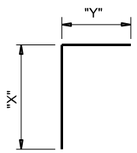
MATERIAL NOTES:

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
· Uncoated or galvanized ~ #6 = 2'-6" Min

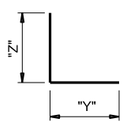
GENERAL NOTES:

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.

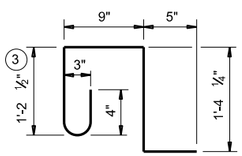
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



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-5 & 6

FILE: scc56ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		193

SECTION DIMENSIONS				⑤ FILL HEIGHT	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	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
5' - 0"	2' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	6' - 3"	704	2' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	2' - 0"	144	4	39' - 9"	106	22	39' - 9"	584	5' - 11"	16	14	39	0.391	80.5	0.5	55	16.1	3,276
5' - 0"	2' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	6' - 4"	713	2' - 7"	3' - 9"	108	#5	9"	6' - 6"	732	3' - 9"	2' - 9"	108	9"	2' - 0"	144	4	39' - 9"	106	22	39' - 9"	584	5' - 11"	16	14	39	0.429	81.0	0.5	55	17.6	3,294
5' - 0"	3' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	7' - 3"	817	3' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	3' - 0"	216	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.434	87.8	0.5	55	17.8	3,567
5' - 0"	3' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	7' - 4"	826	3' - 7"	3' - 9"	108	#5	9"	6' - 6"	732	3' - 9"	2' - 9"	108	9"	3' - 0"	216	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.472	88.3	0.5	55	19.3	3,585
5' - 0"	4' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	8' - 3"	929	4' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	4' - 0"	289	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.477	92.4	0.5	55	19.5	3,752
5' - 0"	4' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	8' - 4"	939	4' - 7"	3' - 9"	108	#5	9"	6' - 6"	732	3' - 9"	2' - 9"	108	9"	4' - 0"	289	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.515	92.9	0.5	55	21.1	3,771
5' - 0"	5' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	9' - 3"	1,042	5' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	5' - 0"	361	4	39' - 9"	106	30	39' - 9"	797	5' - 11"	16	14	39	0.521	99.7	0.5	55	21.3	4,044
5' - 0"	5' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	9' - 4"	1,051	5' - 7"	3' - 9"	108	#5	9"	6' - 6"	732	3' - 9"	2' - 9"	108	9"	5' - 0"	361	4	39' - 9"	106	30	39' - 9"	797	5' - 11"	16	14	39	0.559	100.2	0.5	55	22.8	4,062
6' - 0"	2' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	6' - 7"	742	2' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	2' - 0"	144	5	39' - 9"	133	25	39' - 9"	664	6' - 11"	18	16	45	0.440	89.1	0.5	63	18.1	3,628
6' - 0"	2' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	6' - 8"	1,126	2' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	2' - 0"	144	5	39' - 9"	133	25	39' - 9"	664	6' - 11"	18	16	45	0.485	108.6	0.5	63	19.9	4,407
6' - 0"	2' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	6' - 10"	1,155	2' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	2' - 0"	110	5	39' - 9"	133	25	39' - 9"	664	7' - 1"	19	18	50	0.551	109.9	0.5	69	22.6	4,463
6' - 0"	3' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	7' - 7"	854	3' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	3' - 0"	216	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.484	96.4	0.5	63	19.9	3,918
6' - 0"	3' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	7' - 8"	1,295	3' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	3' - 0"	216	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.528	117.3	0.5	63	21.6	4,754
6' - 0"	3' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	7' - 10"	1,324	3' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	3' - 0"	164	5	39' - 9"	133	29	39' - 9"	770	7' - 1"	19	18	50	0.601	118.1	0.5	69	24.6	4,792
6' - 0"	4' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	8' - 7"	967	4' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	4' - 0"	289	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.527	101.0	0.5	63	21.6	4,104
6' - 0"	4' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	8' - 8"	1,464	4' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	4' - 0"	289	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.571	123.3	0.5	63	23.4	4,996
6' - 0"	4' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	8' - 10"	1,493	4' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	4' - 0"	219	5	39' - 9"	133	29	39' - 9"	770	7' - 1"	19	18	50	0.650	123.7	0.5	69	26.5	5,016
6' - 0"	5' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	9' - 7"	1,080	5' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	5' - 0"	361	5	39' - 9"	133	33	39' - 9"	876	6' - 11"	18	16	45	0.570	108.3	0.5	63	23.3	4,395
6' - 0"	5' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	9' - 8"	1,633	5' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	5' - 0"	361	5	39' - 9"	133	33	39' - 9"	876	6' - 11"	18	16	45	0.614	132.0	0.5	63	25.1	5,343
6' - 0"	5' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	9' - 10"	1,661	5' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	5' - 0"	274	5	39' - 9"	133	33	39' - 9"	876	7' - 1"	19	18	50	0.700	131.9	0.5	69	28.5	5,345
6' - 0"	6' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	10' - 7"	1,192	6' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	6' - 0"	433	5	39' - 9"	133	37	39' - 9"	982	6' - 11"	18	16	45	0.613	115.6	0.5	63	25.0	4,685
6' - 0"	6' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	10' - 8"	1,802	6' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	6' - 0"	433	5	39' - 9"	133	37	39' - 9"	982	6' - 11"	18	16	45	0.657	140.7	0.5	63	26.8	5,690
6' - 0"	6' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	10' - 10"	1,830	6' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	6' - 0"	329	5	39' - 9"	133	37	39' - 9"	982	7' - 1"	19	18	50	0.749	140.2	0.5	69	30.5	5,675

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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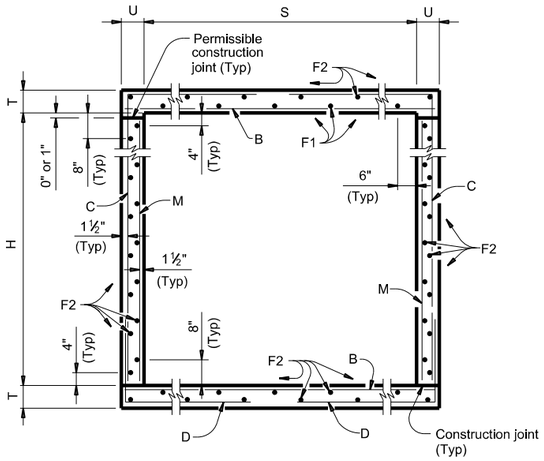
HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation — Bridge Division Standard

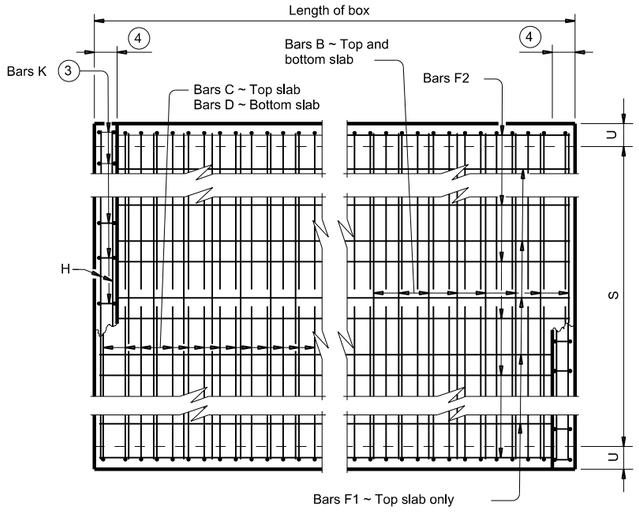
SINGLE BOX CULVERTS CAST-IN-PLACE
0' TO 30' FILL

SCC-5 & 6

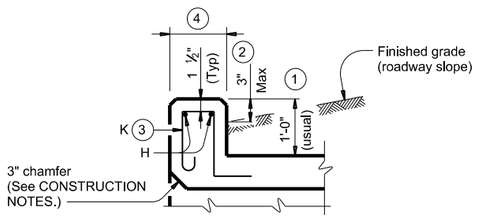
FILE: scc56ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072, ETC	SH 103, ETC
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		194



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.

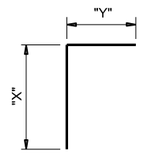
MATERIAL NOTES:

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
· Uncoated or galvanized ~ #6 = 2'-6" Min

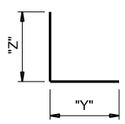
GENERAL NOTES:

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.

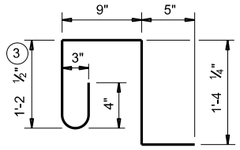
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



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-8

FILE: scc08ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072, ETC	SH 103, ETC
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		195

DATE: 3/30/2022 11:43:17 PM
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SECTION DIMENSIONS				⑤ FILL HEIGHT	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	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
8' - 0"	3' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	8' - 8"	1,406	3' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	3' - 0"	216	6	39' - 9"	159	32	39' - 9"	850	8' - 11"	24	20	56	0.582	153.5	0.7	80	24.0	6,219
8' - 0"	3' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	108	#6	9"	8' - 8"	1,406	3' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	3' - 0"	216	6	39' - 9"	159	32	39' - 9"	850	8' - 11"	24	20	56	0.582	153.5	0.7	80	24.0	6,219
8' - 0"	3' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	108	#6	9"	8' - 10"	1,433	3' - 8"	5' - 2"	108	#6	9"	8' - 5"	1,365	5' - 2"	3' - 3"	82	12"	3' - 0"	164	6	39' - 9"	159	32	39' - 9"	850	9' - 1"	24	22	61	0.724	154.5	0.7	85	29.6	6,266
8' - 0"	3' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	108	#6	9"	8' - 11"	1,446	3' - 9"	5' - 2"	108	#6	9"	8' - 6"	1,379	5' - 2"	3' - 4"	82	12"	3' - 0"	164	6	39' - 9"	159	32	39' - 9"	850	9' - 1"	24	22	61	0.782	155.2	0.7	85	32.0	6,293
8' - 0"	3' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	108	#6	9"	9' - 2"	1,487	3' - 11"	5' - 3"	108	#6	9"	8' - 9"	1,419	5' - 3"	3' - 6"	108	9"	3' - 0"	216	6	39' - 9"	159	32	39' - 9"	850	9' - 3"	25	22	61	0.929	159.6	0.7	86	37.9	6,468
8' - 0"	4' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	9' - 8"	1,568	4' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	4' - 0"	289	6	39' - 9"	159	32	39' - 9"	850	8' - 11"	24	20	56	0.626	159.4	0.7	80	25.7	6,454
8' - 0"	4' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	108	#6	9"	9' - 8"	1,568	4' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	4' - 0"	289	6	39' - 9"	159	32	39' - 9"	850	8' - 11"	24	20	56	0.626	159.4	0.7	80	25.7	6,454
8' - 0"	4' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	108	#6	9"	9' - 10"	1,595	4' - 8"	5' - 2"	108	#6	9"	8' - 5"	1,365	5' - 2"	3' - 3"	82	12"	4' - 0"	219	6	39' - 9"	159	32	39' - 9"	850	9' - 1"	24	22	61	0.774	160.0	0.7	85	31.6	6,483
8' - 0"	4' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	108	#6	9"	9' - 11"	1,609	4' - 9"	5' - 2"	108	#6	9"	8' - 6"	1,379	5' - 2"	3' - 4"	82	12"	4' - 0"	219	6	39' - 9"	159	32	39' - 9"	850	9' - 1"	24	22	61	0.831	160.7	0.7	85	33.9	6,511
8' - 0"	4' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	108	#6	9"	10' - 2"	1,649	4' - 11"	5' - 3"	108	#6	9"	8' - 9"	1,419	5' - 3"	3' - 6"	108	9"	4' - 0"	289	6	39' - 9"	159	32	39' - 9"	850	9' - 3"	25	22	61	0.985	165.4	0.7	86	40.1	6,703
8' - 0"	5' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	10' - 8"	1,730	5' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	5' - 0"	361	6	39' - 9"	159	36	39' - 9"	956	8' - 11"	24	20	56	0.669	167.9	0.7	80	27.4	6,794
8' - 0"	5' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	108	#6	9"	10' - 8"	1,730	5' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	5' - 0"	361	6	39' - 9"	159	36	39' - 9"	956	8' - 11"	24	20	56	0.669	167.9	0.7	80	27.4	6,794
8' - 0"	5' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	108	#6	9"	10' - 10"	1,757	5' - 8"	5' - 2"	108	#6	9"	8' - 5"	1,365	5' - 2"	3' - 3"	82	12"	5' - 0"	274	6	39' - 9"	159	36	39' - 9"	956	9' - 1"	24	22	61	0.823	168.0	0.7	85	33.6	6,806
8' - 0"	5' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	108	#6	9"	10' - 11"	1,771	5' - 9"	5' - 2"	108	#6	9"	8' - 6"	1,379	5' - 2"	3' - 4"	82	12"	5' - 0"	274	6	39' - 9"	159	36	39' - 9"	956	9' - 1"	24	22	61	0.881	168.7	0.7	85	35.9	6,834
8' - 0"	5' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	108	#6	9"	11' - 2"	1,811	5' - 11"	5' - 3"	108	#6	9"	8' - 9"	1,419	5' - 3"	3' - 6"	108	9"	5' - 0"	361	6	39' - 9"	159	36	39' - 9"	956	9' - 3"	25	22	61	1.040	173.9	0.7	86	42.3	7,043
8' - 0"	6' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	11' - 8"	1,893	6' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	6' - 0"	433	6	39' - 9"	159	40	39' - 9"	1,062	8' - 11"	24	20	56	0.712	176.4	0.7	80	29.2	7,135
8' - 0"	6' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	108	#6	9"	11' - 8"	1,893	6' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	6' - 0"	433	6	39' - 9"	159	40	39' - 9"	1,062	8' - 11"	24	20	56	0.712	176.4	0.7	80	29.2	7,135
8' - 0"	6' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	108	#6	9"	11' - 10"	1,920	6' - 8"	5' - 2"	108	#6	9"	8' - 5"	1,365	5' - 2"	3' - 3"	82	12"	6' - 0"	329	6	39' - 9"	159	40	39' - 9"	1,062	9' - 1"	24	22	61	0.872	176.1	0.7	85	35.6	7,130
8' - 0"	6' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	108	#6	9"	11' - 11"	1,933	6' - 9"	5' - 2"	108	#6	9"	8' - 6"	1,379	5' - 2"	3' - 4"	82	12"	6' - 0"	329	6	39' - 9"	159	40	39' - 9"	1,062	9' - 1"	24	22	61	0.930	176.8	0.7	85	37.9	7,157
8' - 0"	6' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	108	#6	9"	12' - 2"	1,974	6' - 11"	5' - 3"	108	#6	9"	8' - 9"	1,419	5' - 3"	3' - 6"	108	9"	6' - 0"	433	6	39' - 9"	159	40	39' - 9"	1,062	9' - 3"	25	22	61	1.096	182.5	0.7	86	44.5	7,384
8' - 0"	7' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	12' - 8"	2,055	7' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	7' - 0"	505	6	39' - 9"	159	40	39' - 9"	1,062	8' - 11"	24	20	56	0.755	182.2	0.7	80	30.9	7,369
8' - 0"	7' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	162	#6	6"	12' - 8"	3,082	7' - 6"	5' - 2"	162	#6	6"	8' - 3"	2,007	5' - 2"	3' - 1"	108	9"	7' - 0"	505	6	39' - 9"	159	40	39' - 9"	1,062	8' - 11"	24	20	56	0.755	224.6	0.7	80	30.9	9,065
8' - 0"	7' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	162	#6	6"	12' - 10"	3,123	7' - 8"	5' - 2"	162	#6	6"	8' - 5"	2,048	5' - 2"	3' - 3"	82	12"	7' - 0"	383	6	39' - 9"	159	40	39' - 9"	1,062	9' - 1"	24	22	61	0.922	224.6	0.7	85	37.6	9,070
8' - 0"	7' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	162	#6	6"	12' - 11"	3,143	7' - 9"	5' - 2"	162	#6	6"	8' - 6"	2,068	5' - 2"	3' - 4"	82	12"	7' - 0"	383	6	39' - 9"	159	40	39' - 9"	1,062	9' - 1"	24	22	61	0.979	225.6	0.7	85	39.8	9,110
8' - 0"	7' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	162	#6	6"	13' - 2"	3,204	7' - 11"	5' - 3"	162	#6	6"	8' - 9"	2,129	5' - 3"	3' - 6"	108	9"	7' - 0"	505	6	39' - 9"	159	40	39' - 9"	1,062	9' - 3"	25	22	61	1.151	232.8	0.7	86	46.7	9,396
8' - 0"	8' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	13' - 8"	2,217	8' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	8' - 0"	577	6	39' - 9"	159	44	39' - 9"	1,168	8' - 11"	24	20	56	0.798	190.7	0.7	80	32.6	7,709
8' - 0"	8' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	162	#6	6"	13' - 8"	3,325	8' - 6"	5' - 2"	162	#6	6"	8' - 3"	2,007	5' - 2"	3' - 1"	108	9"	8' - 0"	577	6	39' - 9"	159	44	39' - 9"	1,168	8' - 11"	24	20	56	0.798	235.2	0.7	80	32.6	9,486
8' - 0"	8' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	162	#6	6"	13' - 10"	3,366	8' - 8"	5' - 2"	162	#6	6"	8' - 5"	2,048	5' - 2"	3' - 3"	108	9"	8' - 0"	577	6	39' - 9"	159	44	39' - 9"	1,168	9' - 1"	24	22	61	0.971	238.2	0.7	85	39.5	9,613
8' - 0"	8' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	162	#6	6"	13' - 11"	3,386	8' - 9"	5' - 2"	162	#6	6"	8' - 6"	2,068	5' - 2"	3' - 4"	162	6"	8' - 0"	866	6	39' - 9"	159	44	39' - 9"	1,168	9' - 1"	24	22	61	1.029	246.4	0.7	85	41.8	9,942
8' - 0"	8' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	162	#6	6"	14' - 2"	3,447	8' - 11"	5' - 3"	162	#6	6"	8' - 9"	2,129	5' - 3"	3' - 6"	162	6"	8' - 0"	866	6	39' - 9"	159	44	39' - 9"	1,168	9' - 3"	25	22	61	1.207	250.5	0.7	86	49.0	10,106

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

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE

0' TO 30' FILL

SCC-8

FILE: scc08ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072, ETC	SH 103, ETC
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		196

DATE: 3/30/2022 11:43:18 PM
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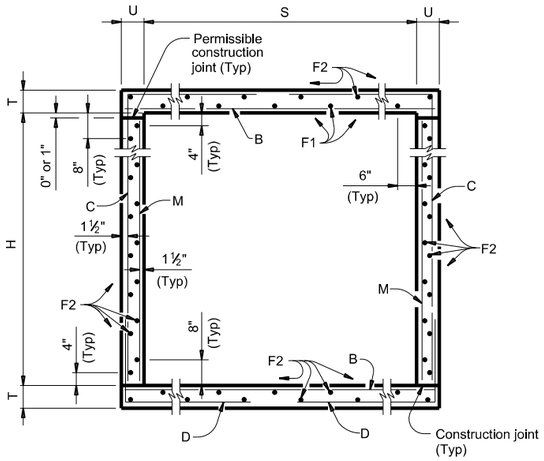
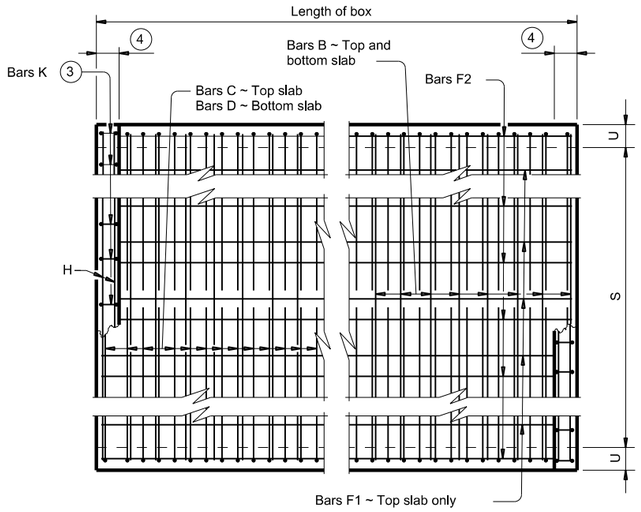
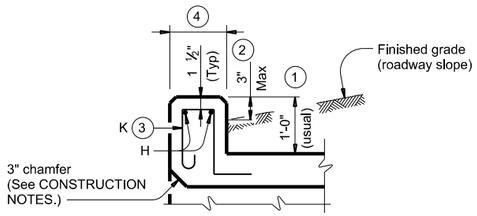


TYPICAL SECTION



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.

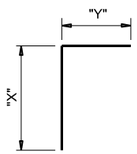
MATERIAL NOTES:

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
· Uncoated or galvanized ~ #6 = 2'-6" Min

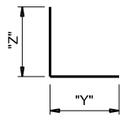
GENERAL NOTES:

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.

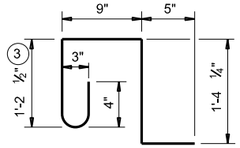
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



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-9

FILE: scc09ste-20.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		197

SECTION DIMENSIONS				(5) FILL HEIGHT	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	Wt	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
9' - 0"	4' - 0"	8"	7"	10'	162	#6	6"	9' - 11"	2,413	108	#6	9"	10' - 0"	1,622	4' - 6"	5' - 6"	108	#6	9"	8' - 7"	1,392	5' - 6"	3' - 1"	108	9"	4' - 0"	289	7	39' - 9"	186	35	39' - 9"	929	9' - 11"	26	22	61	0.675	170.8	0.8	87	27.8	6,918
9' - 0"	4' - 0"	8"	7"	13'	162	#6	6"	9' - 11"	2,413	162	#6	6"	10' - 0"	2,433	4' - 6"	5' - 6"	162	#6	6"	8' - 7"	2,089	5' - 6"	3' - 1"	108	9"	4' - 0"	289	7	39' - 9"	186	35	39' - 9"	929	9' - 11"	26	22	61	0.675	208.5	0.8	87	27.8	8,426
9' - 0"	4' - 0"	9"	8"	16'	162	#6	6"	10' - 1"	2,454	162	#6	6"	10' - 2"	2,474	4' - 7"	5' - 7"	162	#6	6"	8' - 9"	2,129	5' - 7"	3' - 2"	82	12"	4' - 0"	219	7	39' - 9"	186	35	39' - 9"	929	10' - 1"	27	24	67	0.772	209.8	0.8	94	31.6	8,485
9' - 0"	4' - 0"	11"	8"	20'	162	#6	6"	10' - 1"	2,454	162	#6	6"	10' - 4"	2,514	4' - 9"	5' - 7"	162	#6	6"	8' - 11"	2,170	5' - 7"	3' - 4"	82	12"	4' - 0"	219	7	39' - 9"	186	35	39' - 9"	929	10' - 1"	27	24	67	0.899	211.8	0.8	94	36.7	8,566
9' - 0"	4' - 0"	12"	9"	23'	162	#6	6"	10' - 3"	2,494	162	#6	6"	10' - 5"	2,535	4' - 10"	5' - 7"	162	#6	6"	9' - 0"	2,190	5' - 7"	3' - 5"	108	9"	4' - 0"	289	7	39' - 9"	186	35	39' - 9"	929	10' - 3"	27	24	67	1.000	215.6	0.8	94	40.8	8,717
9' - 0"	4' - 0"	13"	10"	26'	162	#6	6"	10' - 5"	2,535	162	#6	6"	10' - 7"	2,575	4' - 11"	5' - 8"	162	#6	6"	9' - 2"	2,230	5' - 8"	3' - 6"	108	9"	4' - 0"	289	7	39' - 9"	186	35	39' - 9"	929	10' - 5"	28	24	67	1.103	218.6	0.8	95	44.9	8,839
9' - 0"	4' - 0"	14"	11"	30'	162	#6	6"	10' - 7"	2,575	162	#6	6"	10' - 9"	2,616	5' - 0"	5' - 9"	162	#6	6"	9' - 4"	2,271	5' - 9"	3' - 7"	108	9"	4' - 0"	289	7	39' - 9"	186	35	39' - 9"	929	10' - 7"	28	24	67	1.208	221.7	0.8	95	49.1	8,961
9' - 0"	5' - 0"	8"	7"	10'	162	#6	6"	9' - 11"	2,413	108	#6	9"	11' - 0"	1,784	5' - 6"	5' - 6"	108	#6	9"	8' - 7"	1,392	5' - 6"	3' - 1"	108	9"	5' - 0"	361	7	39' - 9"	186	39	39' - 9"	1,036	9' - 11"	26	22	61	0.718	179.3	0.8	87	29.5	7,259
9' - 0"	5' - 0"	8"	7"	13'	162	#6	6"	9' - 11"	2,413	162	#6	6"	11' - 0"	2,677	5' - 6"	5' - 6"	162	#6	6"	8' - 7"	2,089	5' - 6"	3' - 1"	108	9"	5' - 0"	361	7	39' - 9"	186	39	39' - 9"	1,036	9' - 11"	26	22	61	0.718	219.1	0.8	87	29.5	8,849
9' - 0"	5' - 0"	9"	8"	16'	162	#6	6"	10' - 1"	2,454	162	#6	6"	11' - 2"	2,717	5' - 7"	5' - 7"	162	#6	6"	8' - 9"	2,129	5' - 7"	3' - 2"	82	12"	5' - 0"	274	7	39' - 9"	186	39	39' - 9"	1,036	10' - 1"	27	24	67	0.821	219.9	0.8	94	33.6	8,890
9' - 0"	5' - 0"	11"	8"	20'	162	#6	6"	10' - 1"	2,454	162	#6	6"	11' - 4"	2,758	5' - 9"	5' - 7"	162	#6	6"	8' - 11"	2,170	5' - 7"	3' - 4"	82	12"	5' - 0"	274	7	39' - 9"	186	39	39' - 9"	1,036	10' - 1"	27	24	67	0.949	222.0	0.8	94	38.7	8,972
9' - 0"	5' - 0"	12"	9"	23'	162	#6	6"	10' - 3"	2,494	162	#6	6"	11' - 5"	2,778	5' - 10"	5' - 7"	162	#6	6"	9' - 0"	2,190	5' - 7"	3' - 5"	108	9"	5' - 0"	361	7	39' - 9"	186	39	39' - 9"	1,036	10' - 3"	27	24	67	1.056	226.1	0.8	94	43.0	9,139
9' - 0"	5' - 0"	13"	10"	26'	162	#6	6"	10' - 5"	2,535	162	#6	6"	11' - 7"	2,819	5' - 11"	5' - 8"	162	#6	6"	9' - 2"	2,230	5' - 8"	3' - 6"	108	9"	5' - 0"	361	7	39' - 9"	186	39	39' - 9"	1,036	10' - 5"	28	24	67	1.165	229.2	0.8	95	47.4	9,262
9' - 0"	5' - 0"	14"	11"	30'	162	#6	6"	10' - 7"	2,575	162	#6	6"	11' - 9"	2,859	6' - 0"	5' - 9"	162	#6	6"	9' - 4"	2,271	5' - 9"	3' - 7"	108	9"	5' - 0"	361	7	39' - 9"	186	39	39' - 9"	1,036	10' - 7"	28	24	67	1.276	232.2	0.8	95	51.8	9,383
9' - 0"	6' - 0"	8"	7"	10'	162	#6	6"	9' - 11"	2,413	108	#6	9"	12' - 0"	1,947	6' - 6"	5' - 6"	108	#6	9"	8' - 7"	1,392	5' - 6"	3' - 1"	108	9"	6' - 0"	433	7	39' - 9"	186	43	39' - 9"	1,142	9' - 11"	26	22	61	0.761	187.8	0.8	87	31.2	7,600
9' - 0"	6' - 0"	8"	7"	13'	162	#6	6"	9' - 11"	2,413	162	#6	6"	12' - 0"	2,920	6' - 6"	5' - 6"	162	#6	6"	8' - 7"	2,089	5' - 6"	3' - 1"	108	9"	6' - 0"	433	7	39' - 9"	186	43	39' - 9"	1,142	9' - 11"	26	22	61	0.761	229.6	0.8	87	31.2	9,270
9' - 0"	6' - 0"	9"	8"	16'	162	#6	6"	10' - 1"	2,454	162	#6	6"	12' - 2"	2,960	6' - 7"	5' - 7"	162	#6	6"	8' - 9"	2,129	5' - 7"	3' - 2"	82	12"	6' - 0"	329	7	39' - 9"	186	43	39' - 9"	1,142	10' - 1"	27	24	67	0.870	230.0	0.8	94	35.6	9,294
9' - 0"	6' - 0"	11"	8"	20'	162	#6	6"	10' - 1"	2,454	162	#6	6"	12' - 4"	3,001	6' - 9"	5' - 7"	162	#6	6"	8' - 11"	2,170	5' - 7"	3' - 4"	82	12"	6' - 0"	329	7	39' - 9"	186	43	39' - 9"	1,142	10' - 1"	27	24	67	0.998	232.1	0.8	94	40.7	9,376
9' - 0"	6' - 0"	12"	9"	23'	162	#6	6"	10' - 3"	2,494	162	#6	6"	12' - 5"	3,021	6' - 10"	5' - 7"	162	#6	6"	9' - 0"	2,190	5' - 7"	3' - 5"	108	9"	6' - 0"	433	7	39' - 9"	186	43	39' - 9"	1,142	10' - 3"	27	24	67	1.111	236.7	0.8	94	45.2	9,560
9' - 0"	6' - 0"	13"	10"	26'	162	#6	6"	10' - 5"	2,535	162	#6	6"	12' - 7"	3,062	6' - 11"	5' - 8"	162	#6	6"	9' - 2"	2,230	5' - 8"	3' - 6"	108	9"	6' - 0"	433	7	39' - 9"	186	43	39' - 9"	1,142	10' - 5"	28	24	67	1.226	239.7	0.8	95	49.8	9,683
9' - 0"	6' - 0"	14"	11"	30'	162	#6	6"	10' - 7"	2,575	162	#6	6"	12' - 9"	3,102	7' - 0"	5' - 9"	162	#6	6"	9' - 4"	2,271	5' - 9"	3' - 7"	108	9"	6' - 0"	433	7	39' - 9"	186	43	39' - 9"	1,142	10' - 7"	28	24	67	1.344	242.7	0.8	95	54.6	9,804
9' - 0"	7' - 0"	8"	7"	10'	162	#6	6"	9' - 11"	2,413	108	#6	9"	13' - 0"	2,109	7' - 6"	5' - 6"	108	#6	9"	8' - 7"	1,392	5' - 6"	3' - 1"	108	9"	7' - 0"	505	7	39' - 9"	186	43	39' - 9"	1,142	9' - 11"	26	22	61	0.805	193.7	0.8	87	33.0	7,834
9' - 0"	7' - 0"	8"	7"	13'	162	#6	6"	9' - 11"	2,413	162	#6	6"	13' - 0"	3,163	7' - 6"	5' - 6"	162	#6	6"	8' - 7"	2,089	5' - 6"	3' - 1"	108	9"	7' - 0"	505	7	39' - 9"	186	43	39' - 9"	1,142	9' - 11"	26	22	61	0.805	237.5	0.8	87	33.0	9,585
9' - 0"	7' - 0"	9"	8"	16'	162	#6	6"	10' - 1"	2,454	162	#6	6"	13' - 2"	3,204	7' - 7"	5' - 7"	162	#6	6"	8' - 9"	2,129	5' - 7"	3' - 2"	82	12"	7' - 0"	383	7	39' - 9"	186	43	39' - 9"	1,142	10' - 1"	27	24	67	0.920	237.5	0.8	94	37.6	9,592
9' - 0"	7' - 0"	11"	8"	20'	162	#6	6"	10' - 1"	2,454	162	#6	6"	13' - 4"	3,244	7' - 9"	5' - 7"	162	#6	6"	8' - 11"	2,170	5' - 7"	3' - 4"	82	12"	7' - 0"	383	7	39' - 9"	186	43	39' - 9"	1,142	10' - 1"	27	24	67	1.047	239.5	0.8	94	42.6	9,673
9' - 0"	7' - 0"	12"	9"	23'	162	#6	6"	10' - 3"	2,494	162	#6	6"	13' - 5"	3,265	7' - 10"	5' - 7"	162	#6	6"	9' - 0"	2,190	5' - 7"	3' - 5"	108	9"	7' - 0"	505	7	39' - 9"	186	43	39' - 9"	1,142	10' - 3"	27	24	67	1.167	244.6	0.8	94	47.5	9,876
9' - 0"	7' - 0"	13"	10"	26'	162	#6	6"	10' - 5"	2,535	162	#6	6"	13' - 7"	3,305	7' - 11"	5' - 8"	162	#6	6"	9' - 2"	2,230	5' - 8"	3' - 6"	108	9"	7' - 0"	505	7	39' - 9"	186	43	39' - 9"	1,142	10' - 5"	28	24	67	1.288	247.6	0.8	95	52.3	9,998
9' - 0"	7' - 0"	14"	11"	30'	162	#6	6"	10' - 7"	2,575	162	#6	6"	13' - 9"	3,346	8' - 0"	5' - 9"	162	#6	6"	9' - 4"	2,271	5' - 9"	3' - 7"	108	9"	7' - 0"	505	7	39' - 9"	186	43	39' - 9"	1,142	10' - 7"	28	24	67	1.412	250.6	0.8	95	57.3	10,120
9' - 0"	8' - 0"	8"	7"	10'	162	#6	6"	9' - 11"	2,413	108	#6	9"	14' - 0"	2,271	8' - 6"	5' - 6"	108	#6	9"	8' - 7"	1,392	5' - 6"	3' - 1"	108	9"	8' - 0"	577	7	39' - 9"	186	47	39' - 9"	1,248	9' - 11"	26	22	61	0.848	202.2	0.8	87	34.7	8,174
9' - 0"	8' - 0"	8"	7"	13'	162	#6	6"	9' - 11"	2,413	162	#6	6"	14' - 0"	3,407	8' - 6"	5' - 6"	162	#6	6"	8' - 7"	2,089	5' - 6"	3' - 1"	108	9"	8' - 0"	577	7	39' - 9"	186	47	39' - 9"	1,248	9' - 11"	26	22	61	0.848	248.0	0.8	87	34.7	10,007
9' - 0"	8' - 0"	9"	8"	16'	162	#6	6"	10' - 1"	2,454	162	#6	6"	14' - 2"	3,447	8' - 7"	5' - 7"	162	#6	6"	8' - 9"	2,129	5' - 7"	3' - 2"	108	9"	8' - 0"	577	7	39' - 9"	186	47	39' - 9"	1,248	10' - 1"	27	24	67	0.969	251.0	0.8	94	39.5	10,135
9' - 0"	8' - 0"	11"	8"	20'	162	#6	6"	10' - 1"	2,454	162	#6	6"	14' - 4"	3,488	8' - 9"	5' - 7"	162	#6	6"	8' - 11"	2,170	5' - 7"	3' - 4"	108	9"	8' - 0"	577	7	39' - 9"	186	47	39' - 9"	1,248	10' - 1"	27	24	67	1.097	253.1	0.8	94	44.6	10,217
9' - 0"	8' - 0"	12"	9"	23'	162	#6	6"	10' - 3"	2,494	162	#6	6"	14' - 5"	3,508	8' - 10"	5' - 7"	162	#6	6"	9' - 0"	2,190	5' - 7"	3' - 5"	108	9"	8' - 0"	577	7	39' - 9"	186	47	39' - 9"	1,248	10' - 3"	27	24	67	1.222	255.1	0.8	94	49.7	10,297
9' - 0"	8' - 0"	13"	10"	26'	162	#6	6"	10' - 5"	2,535	162	#6	6"	14' - 7"	3,548	8' - 11"	5' - 8"	162	#6	6"	9' - 2"	2,230	5' - 8"	3' - 6"	108	9"	8' - 0"	577	7	39' - 9"	186	47	39' - 9"	1,248	10' - 5"	28	24	67	1.350	258.1	0.8	95	54.8	10,419
9' - 0"	8' - 0"	14"	11"	30'	162	#6	6"	10' - 7"	2,575	162	#6	6"	14' - 9"	3,589	9' - 0"	5' - 9"	162	#6	6"	9' - 4"	2,271	5' - 9"	3' - 7"	108	9"	8' - 0"	577	7	39' - 9"	186	47	39' - 9"	1,248	10' - 7"	28	24	67	1.479	261.2	0.8	95	60.0	10,541
9' - 0"	9' - 0"	8"	7"	10'	162	#6	6"	9' - 11"	2,413	108	#6	9"	15' - 0"	2,433	9' - 6"	5' - 6"	108	#6	9"	8' - 7"	1,392	5' - 6"	3' - 1"	162	6"	9' - 0"	974	7	39' - 9"	186	51	39' - 9"	1,354	9' - 11"	26	22	61	0.891	218.8	0.8	87	36.4	8,839
9' - 0"	9' - 0"	8"	7"	13'	162	#6	6"	9' - 11"	2,413	162	#6	6"	15' - 0"	3,650	9' - 6"	5' - 6"	162	#6	6"	8' - 7"	2,089	5' - 6"	3' - 1"	162	6"	9' - 0"	974	7	39' - 9"	186	51	39' - 9"	1,354	9' - 11"	26	22	61	0.891	266.7	0.8	87	36.4	10,753
9' - 0"	9' - 0"	9"	8"	16'	162	#6	6"	10' - 1"	2,454	162	#6	6"	15' - 2"	3,690	9' - 7"	5' - 7"	162	#6	6"	8' - 9"	2,129	5' - 7"	3' - 2"	162	6"	9' - 0"	974	7	39' - 9"	186	51	39' - 9"	1,354	10' - 1"	27	24	67	1.019	269.7	0.8	94	41.5	10,881
9' - 0"	9' - 0"	11"	8"	20'	162	#6	6"	10' - 1"	2,454	162	#6	6"	15' - 4"	3,731	9' - 9"	5' - 7"	162	#6	6"	8' - 11"	2,170	5' - 7"	3' - 4"	162	6"	9' - 0"	974	7	39' - 9"	186	51	39' - 9"	1,354	10' - 1"	27	24	67	1.146	271.7	0.8	94	46.6	10,963
9' - 0"	9' - 0"	12"	9"	23'	162	#6	6"	10' - 3"	2,494	162	#6	6"	15' - 5"	3,751	9' - 10"	5' - 7"	162	#6	6"	9' - 0"	2,190	5' - 7"	3' - 5"	162	6"	9' - 0"	974	7	39' - 9"	186	51	39' - 9"	1,354	10' - 3"	27	24	67	1.278	273.7	0.8	94	51.9	11,043
9' - 0"	9' - 0"	13"	10"	26'	162	#6	6"	10' - 5"	2,535	162	#6	6"	15' - 7"	3,792	9' - 11"	5' - 8"	162	#6	6"	9' - 2"	2,230	5' - 8"	3' - 6"	162	6"	9' - 0"	974	7	39' - 9"	186	51	39' - 9"	1,354	10' - 5"	28	24	67	1.412	276.8	0.8	95	57.3	11,166
9' - 0"	9' - 0"	14"	11"	30'	162	#6	6"	10' - 7"	2,575	162	#6	6"	15' - 9"	3,832	10' - 0"	5' - 9"	162	#6	6"	9' - 4"	2,271	5' - 9"	3' - 7"	162	6"	9' - 0"	974	7	39' - 9"	186	51	39' - 9"	1,354	10' - 7"	28	24	67	1.547	279.8	0.8	95	62.7	11,287

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

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

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

SCC-9

FILE: scc09ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072, ETC	SH 103, ETC
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		198

DATE: 3/30/2022 11:43:25 PM
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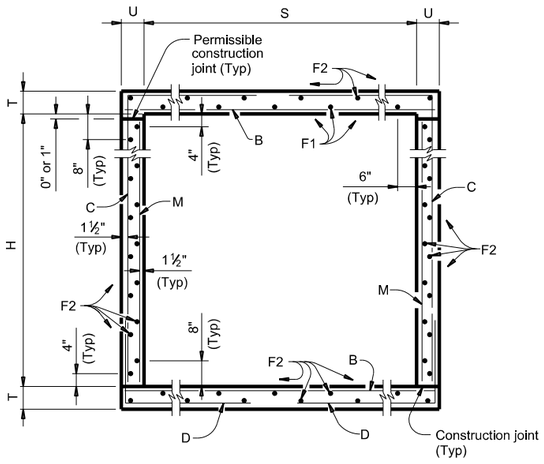
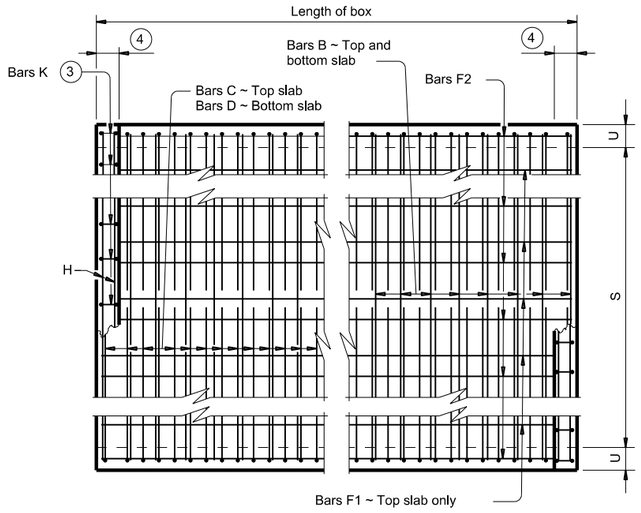


TYPICAL SECTION



PLAN OF REINF STEEL

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.

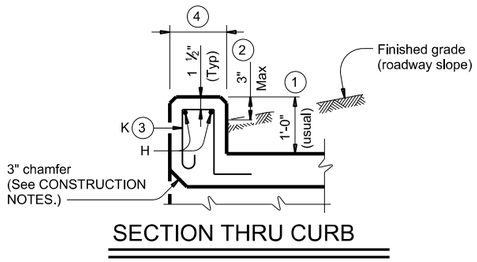
2. For vehicle safety, the following requirements must be met:
   · For structures without bridge rail, construct curbs no more than 3" above finished grade.
   · For structures with bridge rail, construct curbs flush with finished grade.
   Reduce curb heights, if necessary, to meet the above requirements. 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).



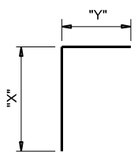
SECTION THRU CURB

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.

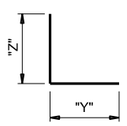
MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
· culverts with 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
· Uncoated or galvanized ~ #6 = 2'-6" Min
· Uncoated or galvanized ~ #7 = 3'-3" 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.

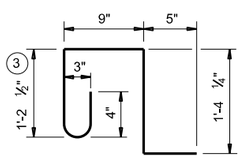
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



BARS C



BARS D



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

HL93 LOADING SHEET 1 OF 3

Texas Department of Transportation

Bridge Division Standard

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

SCC-10

FILE: scc10ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		199

DATE: 3/30/2022 11:43:30 PM
FILE: c:\txdot\pw_online\txdot3\adrian.guerrero\d0474438\scc10ste-21.dgn

SECTION DIMENSIONS				⑤ FILL HEIGHT	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	Wt	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
10' - 0"	4' - 0"	8"	7"	7'	162	#6	6"	10' - 11"	2,656	162	#6	6"	10' - 4"	2,514	4' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	108	9"	4' - 0"	289	7	39' - 9"	186	37	39' - 9"	982	10' - 11"	29	24	67	0.724	219.9	0.8	96	29.8	8,893
10' - 0"	4' - 0"	9"	7"	10'	162	#6	6"	10' - 11"	2,656	162	#6	6"	10' - 5"	2,535	4' - 7"	5' - 10"	162	#6	6"	9' - 0"	2,190	5' - 10"	3' - 2"	108	9"	4' - 0"	289	7	39' - 9"	186	37	39' - 9"	982	10' - 11"	29	24	67	0.793	221.0	0.8	96	32.5	8,934
10' - 0"	4' - 0"	10"	8"	13'	162	#6	6"	11' - 1"	2,697	162	#6	6"	10' - 7"	2,575	4' - 8"	5' - 11"	162	#6	6"	9' - 2"	2,230	5' - 11"	3' - 3"	82	12"	4' - 0"	219	7	39' - 9"	186	37	39' - 9"	982	11' - 1"	30	26	72	0.897	222.2	0.8	102	36.7	8,991
10' - 0"	4' - 0"	11"	8"	16'	162	#6	6"	11' - 1"	2,697	162	#6	6"	10' - 8"	2,595	4' - 9"	5' - 11"	162	#6	6"	9' - 3"	2,251	5' - 11"	3' - 4"	82	12"	4' - 0"	219	7	39' - 9"	186	37	39' - 9"	982	11' - 1"	30	26	72	0.967	223.3	0.8	102	39.5	9,032
10' - 0"	4' - 0"	12"	9"	20'	162	#6	6"	11' - 3"	2,737	162	#6	6"	10' - 10"	2,636	4' - 10"	6' - 0"	162	#6	6"	9' - 5"	2,291	6' - 0"	3' - 5"	108	9"	4' - 0"	289	7	39' - 9"	186	37	39' - 9"	982	11' - 3"	30	26	72	1.074	228.0	0.8	102	43.8	9,223
10' - 0"	4' - 0"	13"	10"	23'	162	#6	6"	11' - 5"	2,778	162	#6	6"	10' - 11"	2,656	4' - 11"	6' - 0"	162	#6	6"	9' - 6"	2,312	6' - 0"	3' - 6"	108	9"	4' - 0"	289	7	39' - 9"	186	37	39' - 9"	982	11' - 5"	31	26	72	1.183	230.1	0.9	103	48.2	9,306
10' - 0"	4' - 0"	14"	11"	26'	162	#6	6"	11' - 7"	2,819	162	#6	6"	11' - 1"	2,697	5' - 0"	6' - 1"	162	#6	6"	9' - 8"	2,352	6' - 1"	3' - 7"	108	9"	4' - 0"	289	7	39' - 9"	186	37	39' - 9"	982	11' - 7"	31	26	72	1.294	233.1	0.9	103	52.6	9,428
10' - 0"	4' - 0"	15"	12"	30'	162	#6	6"	11' - 9"	2,859	162	#6	6"	11' - 3"	2,737	5' - 1"	6' - 2"	162	#6	6"	9' - 10"	2,393	6' - 2"	3' - 8"	108	9"	4' - 0"	289	7	39' - 9"	186	37	39' - 9"	982	11' - 9"	31	26	72	1.407	236.2	0.9	103	57.2	9,549
10' - 0"	5' - 0"	8"	7"	7'	162	#6	6"	10' - 11"	2,656	162	#6	6"	11' - 4"	2,758	5' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	108	9"	5' - 0"	361	7	39' - 9"	186	41	39' - 9"	1,089	10' - 11"	29	24	67	0.767	230.5	0.8	96	31.5	9,316
10' - 0"	5' - 0"	9"	7"	10'	162	#6	6"	10' - 11"	2,656	162	#6	6"	11' - 5"	2,778	5' - 7"	5' - 10"	162	#6	6"	9' - 0"	2,190	5' - 10"	3' - 2"	108	9"	5' - 0"	361	7	39' - 9"	186	41	39' - 9"	1,089	10' - 11"	29	24	67	0.836	231.5	0.8	96	34.3	9,356
10' - 0"	5' - 0"	10"	8"	13'	162	#6	6"	11' - 1"	2,697	162	#6	6"	11' - 7"	2,819	5' - 8"	5' - 11"	162	#6	6"	9' - 2"	2,230	5' - 11"	3' - 3"	82	12"	5' - 0"	274	7	39' - 9"	186	41	39' - 9"	1,089	11' - 1"	30	26	72	0.947	232.4	0.8	102	38.7	9,397
10' - 0"	5' - 0"	11"	8"	16'	162	#6	6"	11' - 1"	2,697	162	#6	6"	11' - 8"	2,839	5' - 9"	5' - 11"	162	#6	6"	9' - 3"	2,251	5' - 11"	3' - 4"	82	12"	5' - 0"	274	7	39' - 9"	186	41	39' - 9"	1,089	11' - 1"	30	26	72	1.016	233.4	0.8	102	41.5	9,438
10' - 0"	5' - 0"	12"	9"	20'	162	#6	6"	11' - 3"	2,737	162	#6	6"	11' - 10"	2,879	5' - 10"	6' - 0"	162	#6	6"	9' - 5"	2,291	6' - 0"	3' - 5"	108	9"	5' - 0"	361	7	39' - 9"	186	41	39' - 9"	1,089	11' - 3"	30	26	72	1.130	238.6	0.8	102	46.0	9,645
10' - 0"	5' - 0"	13"	10"	23'	162	#6	6"	11' - 5"	2,778	162	#6	6"	11' - 11"	2,900	5' - 11"	6' - 0"	162	#6	6"	9' - 6"	2,312	6' - 0"	3' - 6"	108	9"	5' - 0"	361	7	39' - 9"	186	41	39' - 9"	1,089	11' - 5"	31	26	72	1.245	240.7	0.9	103	50.7	9,729
10' - 0"	5' - 0"	14"	11"	26'	162	#6	6"	11' - 7"	2,819	162	#6	6"	12' - 1"	2,940	6' - 0"	6' - 1"	162	#6	6"	9' - 8"	2,352	6' - 1"	3' - 7"	108	9"	5' - 0"	361	7	39' - 9"	186	41	39' - 9"	1,089	11' - 7"	31	26	72	1.362	243.7	0.9	103	55.4	9,850
10' - 0"	5' - 0"	15"	12"	30'	162	#7	6"	11' - 9"	3,891	162	#6	6"	12' - 3"	2,981	6' - 1"	6' - 2"	162	#6	6"	9' - 10"	2,393	6' - 2"	3' - 8"	108	9"	5' - 0"	361	7	39' - 9"	186	41	39' - 9"	1,089	11' - 9"	31	26	72	1.481	272.5	0.9	103	60.1	11,004
10' - 0"	6' - 0"	8"	7"	7'	162	#6	6"	10' - 11"	2,656	162	#6	6"	12' - 4"	3,001	6' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	108	9"	6' - 0"	433	7	39' - 9"	186	45	39' - 9"	1,195	10' - 11"	29	24	67	0.811	241.0	0.8	96	33.3	9,737
10' - 0"	6' - 0"	8"	7"	10'	162	#6	6"	10' - 11"	2,656	162	#6	6"	12' - 4"	3,001	6' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	108	9"	6' - 0"	433	7	39' - 9"	186	45	39' - 9"	1,195	10' - 11"	29	24	67	0.811	241.0	0.8	96	33.3	9,737
10' - 0"	6' - 0"	9"	8"	13'	162	#6	6"	11' - 1"	2,697	162	#6	6"	12' - 6"	3,042	6' - 7"	5' - 11"	162	#6	6"	9' - 1"	2,210	5' - 11"	3' - 2"	82	12"	6' - 0"	329	7	39' - 9"	186	45	39' - 9"	1,195	11' - 1"	30	26	72	0.926	241.5	0.8	102	37.9	9,761
10' - 0"	6' - 0"	10"	8"	16'	162	#6	6"	11' - 1"	2,697	162	#6	6"	12' - 7"	3,062	6' - 8"	5' - 11"	162	#6	6"	9' - 2"	2,230	5' - 11"	3' - 3"	82	12"	6' - 0"	329	7	39' - 9"	186	45	39' - 9"	1,195	11' - 1"	30	26	72	0.996	242.5	0.8	102	40.7	9,801
10' - 0"	6' - 0"	12"	9"	20'	162	#6	6"	11' - 3"	2,737	162	#6	6"	12' - 10"	3,123	6' - 10"	6' - 0"	162	#6	6"	9' - 5"	2,291	6' - 0"	3' - 5"	108	9"	6' - 0"	433	7	39' - 9"	186	45	39' - 9"	1,195	11' - 3"	30	26	72	1.185	249.1	0.8	102	48.2	10,067
10' - 0"	6' - 0"	13"	10"	23'	162	#6	6"	11' - 5"	2,778	162	#6	6"	12' - 11"	3,143	6' - 11"	6' - 0"	162	#6	6"	9' - 6"	2,312	6' - 0"	3' - 6"	108	9"	6' - 0"	433	7	39' - 9"	186	45	39' - 9"	1,195	11' - 5"	31	26	72	1.307	251.2	0.9	103	53.1	10,150
10' - 0"	6' - 0"	14"	11"	26'	162	#6	6"	11' - 7"	2,819	162	#6	6"	13' - 1"	3,183	7' - 0"	6' - 1"	162	#6	6"	9' - 8"	2,352	6' - 1"	3' - 7"	108	9"	6' - 0"	433	7	39' - 9"	186	45	39' - 9"	1,195	11' - 7"	31	26	72	1.430	254.2	0.9	103	58.1	10,271
10' - 0"	6' - 0"	15"	12"	30'	162	#7	6"	11' - 9"	3,891	162	#6	6"	13' - 3"	3,224	7' - 1"	6' - 2"	162	#6	6"	9' - 10"	2,393	6' - 2"	3' - 8"	108	9"	6' - 0"	433	7	39' - 9"	186	45	39' - 9"	1,195	11' - 9"	31	26	72	1.556	283.1	0.9	103	63.1	11,425
10' - 0"	7' - 0"	8"	7"	7'	162	#6	6"	10' - 11"	2,656	162	#6	6"	13' - 4"	3,244	7' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	108	9"	7' - 0"	505	7	39' - 9"	186	45	39' - 9"	1,195	10' - 11"	29	24	67	0.854	248.9	0.8	96	35.0	10,052
10' - 0"	7' - 0"	8"	7"	10'	162	#6	6"	10' - 11"	2,656	162	#6	6"	13' - 4"	3,244	7' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	108	9"	7' - 0"	505	7	39' - 9"	186	45	39' - 9"	1,195	10' - 11"	29	24	67	0.854	248.9	0.8	96	35.0	10,052
10' - 0"	7' - 0"	9"	8"	13'	162	#6	6"	11' - 1"	2,697	162	#6	6"	13' - 6"	3,285	7' - 7"	5' - 11"	162	#6	6"	9' - 1"	2,210	5' - 11"	3' - 2"	82	12"	7' - 0"	383	7	39' - 9"	186	45	39' - 9"	1,195	11' - 1"	30	26	72	0.975	248.9	0.8	102	39.8	10,058
10' - 0"	7' - 0"	10"	8"	16'	162	#6	6"	11' - 1"	2,697	162	#6	6"	13' - 7"	3,305	7' - 8"	5' - 11"	162	#6	6"	9' - 2"	2,230	5' - 11"	3' - 3"	82	12"	7' - 0"	383	7	39' - 9"	186	45	39' - 9"	1,195	11' - 1"	30	26	72	1.045	249.9	0.8	102	42.6	10,098
10' - 0"	7' - 0"	12"	9"	20'	162	#6	6"	11' - 3"	2,737	162	#6	6"	13' - 10"	3,366	7' - 10"	6' - 0"	162	#6	6"	9' - 5"	2,291	6' - 0"	3' - 5"	108	9"	7' - 0"	505	7	39' - 9"	186	45	39' - 9"	1,195	11' - 3"	30	26	72	1.241	257.0	0.8	102	50.5	10,382
10' - 0"	7' - 0"	13"	10"	23'	162	#6	6"	11' - 5"	2,778	162	#6	6"	13' - 11"	3,386	7' - 11"	6' - 0"	162	#6	6"	9' - 6"	2,312	6' - 0"	3' - 6"	108	9"	7' - 0"	505	7	39' - 9"	186	45	39' - 9"	1,195	11' - 5"	31	26	72	1.368	259.1	0.9	103	55.6	10,465
10' - 0"	7' - 0"	14"	11"	26'	162	#6	6"	11' - 7"	2,819	162	#6	6"	14' - 1"	3,427	8' - 0"	6' - 1"	162	#6	6"	9' - 8"	2,352	6' - 1"	3' - 7"	108	9"	7' - 0"	505	7	39' - 9"	186	45	39' - 9"	1,195	11' - 7"	31	26	72	1.498	262.1	0.9	103	60.8	10,587
10' - 0"	7' - 0"	15"	12"	30'	162	#7	6"	11' - 9"	3,891	162	#6	6"	14' - 3"	3,467	8' - 1"	6' - 2"	162	#6	6"	9' - 10"	2,393	6' - 2"	3' - 8"	108	9"	7' - 0"	505	7	39' - 9"	186	45	39' - 9"	1,195	11' - 9"	31	26	72	1.630	290.9	0.9	103	66.1	11,740
10' - 0"	8' - 0"	8"	7"	7'	162	#6	6"	10' - 11"	2,656	162	#6	6"	14' - 4"	3,488	8' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	108	9"	8' - 0"	577	7	39' - 9"	186	49	39' - 9"	1,301	10' - 11"	29	24	67	0.897	259.5	0.8	96	36.7	10,474
10' - 0"	8' - 0"	8"	7"	10'	162	#6	6"	10' - 11"	2,656	162	#6	6"	14' - 4"	3,488	8' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	108	9"	8' - 0"	577	7	39' - 9"	186	49	39' - 9"	1,301	10' - 11"	29	24	67	0.897	259.5	0.8	96	36.7	10,474
10' - 0"	8' - 0"	9"	8"	13'	162	#6	6"	11' - 1"	2,697	162	#6	6"	14' - 6"	3,528	8' - 7"	5' - 11"	162	#6	6"	9' - 1"	2,210	5' - 11"	3' - 2"	82	12"	8' - 0"	438	7	39' - 9"	186	49	39' - 9"	1,301	11' - 1"	30	26	72	1.025	259.0	0.8	102	41.8	10,462
10' - 0"	8' - 0"	10"	8"	16'	162	#6	6"	11' - 1"	2,697	162	#6	6"	14' - 7"	3,548	8' - 8"	5' - 11"	162	#6	6"	9' - 2"	2,230	5' - 11"	3' - 3"	82	12"	8' - 0"	438	7	39' - 9"	186	49	39' - 9"	1,301	11' - 1"	30	26	72	1.095	260.0	0.8	102	44.6	10,502
10' - 0"	8' - 0"	12"	9"	20'	162	#6	6"	11' - 3"	2,737	162	#6	6"	14' - 10"	3,609	8' - 10"	6' - 0"	162	#6	6"	9' - 5"	2,291	6' - 0"	3' - 5"	108	9"	8' - 0"	577	7	39' - 9"	186	49	39' - 9"	1,301	11' - 3"	30	26	72	1.296	267.5	0.8	102	52.7	10,803
10' - 0"	8' - 0"	13"	10"	23'	162	#6	6"	11' - 5"	2,778	162	#6	6"	14' - 11"	3,630	8' - 11"	6' - 0"	162	#6	6"	9' - 6"	2,312	6' - 0"	3' - 6"	108	9"	8' - 0"	577	7	39' - 9"	186	49	39' - 9"	1,301	11' - 5"	31	26	72	1.430	269.6	0.9	103	58.1	10,887
10' - 0"	8' - 0"	14"	11"	26'	162	#6	6"	11' - 7"	2,819	162	#6	6"	15' - 1"	3,670	9' - 0"	6' - 1"	162	#6	6"	9' - 8"	2,352	6' - 1"	3' - 7"	108	9"	8' - 0"	577	7	39' - 9"	186	49	39' - 9"	1,301	11' - 7"	31	26	72	1.566	272.6	0.9	103	63.5	11,008
10' - 0"	8' - 0"	15"	12"	30'	162	#7	6"	11' - 9"	3,891	162	#6	6"	15' - 3"	3,711	9' - 1"	6' - 2"	162	#6	6"	9' - 10"	2,393	6' - 2"	3' - 8"	108	9"	8' - 0"	577	7	39' - 9"	186	49	39' - 9"	1,301	11' - 9"	31	26	72	1.704	301.5	0.9	103	69.0	12,162

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

HL93 LOADING SHEET 2 OF 3

Texas Department of Transportation

Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE

0' TO 30' FILL

SCC-10

FILE: scc10ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072, ETC	SH 103, ETC
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		200

DATE: 3/30/2022 11:43:32 PM
FILE: c:\txdot\pw_online\txdot3\adrian.guerrero\d0474438\scc10ste-21.dgn

SECTION DIMENSIONS				(5) FILL HEIGHT	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	Wt	No.	Size	Spa	Length	Wt	" X "	" Y "	No.	Size	Spa	Length	Wt	" Y "	" Z "	No.	Spa	Length	Wt	No.	Length	Wt	No.	Length	Wt	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
10' - 0"	9' - 0"	8"	7"	7'	162	#6	6"	10' - 11"	2,656	162	#6	6"	15' - 4"	3,731	9' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	108	9"	9' - 0"	649	7	39' - 9"	186	53	39' - 9"	1,407	10' - 11"	29	24	67	0.940	270.0	0.8	96	38.4	10,895
10' - 0"	9' - 0"	8"	7"	10'	162	#6	6"	10' - 11"	2,656	162	#6	6"	15' - 4"	3,731	9' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	108	9"	9' - 0"	649	7	39' - 9"	186	53	39' - 9"	1,407	10' - 11"	29	24	67	0.940	270.0	0.8	96	38.4	10,895
10' - 0"	9' - 0"	9"	8"	13'	162	#6	6"	11' - 1"	2,697	162	#6	6"	15' - 6"	3,772	9' - 7"	5' - 11"	162	#6	6"	9' - 1"	2,210	5' - 11"	3' - 2"	108	9"	9' - 0"	649	7	39' - 9"	186	53	39' - 9"	1,407	11' - 1"	30	26	72	1.074	273.0	0.8	102	43.8	11,023
10' - 0"	9' - 0"	10"	8"	16'	162	#6	6"	11' - 1"	2,697	162	#6	6"	15' - 7"	3,792	9' - 8"	5' - 11"	162	#6	6"	9' - 2"	2,230	5' - 11"	3' - 3"	162	6"	9' - 0"	974	7	39' - 9"	186	53	39' - 9"	1,407	11' - 1"	30	26	72	1.144	282.2	0.8	102	46.6	11,388
10' - 0"	9' - 0"	12"	9"	20'	162	#6	6"	11' - 3"	2,737	162	#6	6"	15' - 10"	3,853	9' - 10"	6' - 0"	162	#6	6"	9' - 5"	2,291	6' - 0"	3' - 5"	162	6"	9' - 0"	974	7	39' - 9"	186	53	39' - 9"	1,407	11' - 3"	30	26	72	1.352	286.2	0.8	102	54.9	11,550
10' - 0"	9' - 0"	13"	10"	23'	162	#6	6"	11' - 5"	2,778	162	#6	6"	15' - 11"	3,873	9' - 11"	6' - 0"	162	#6	6"	9' - 6"	2,312	6' - 0"	3' - 6"	162	6"	9' - 0"	974	7	39' - 9"	186	53	39' - 9"	1,407	11' - 5"	31	26	72	1.492	288.3	0.9	103	60.5	11,633
10' - 0"	9' - 0"	14"	11"	26'	162	#6	6"	11' - 7"	2,819	162	#6	6"	16' - 1"	3,913	10' - 0"	6' - 1"	162	#6	6"	9' - 8"	2,352	6' - 1"	3' - 7"	162	6"	9' - 0"	974	7	39' - 9"	186	53	39' - 9"	1,407	11' - 7"	31	26	72	1.634	291.3	0.9	103	66.2	11,754
10' - 0"	9' - 0"	15"	12"	30'	162	#7	6"	11' - 9"	3,891	162	#6	6"	16' - 3"	3,954	10' - 1"	6' - 2"	162	#6	6"	9' - 10"	2,393	6' - 2"	3' - 8"	162	6"	9' - 0"	974	7	39' - 9"	186	53	39' - 9"	1,407	11' - 9"	31	26	72	1.778	320.1	0.9	103	72.0	12,908
10' - 0"	10' - 0"	8"	7"	7'	162	#6	6"	10' - 11"	2,656	162	#6	6"	16' - 4"	3,974	10' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	162	6"	10' - 0"	1,082	7	39' - 9"	186	53	39' - 9"	1,407	10' - 11"	29	24	67	0.984	286.9	0.8	96	40.2	11,571
10' - 0"	10' - 0"	8"	7"	10'	162	#6	6"	10' - 11"	2,656	162	#6	6"	16' - 4"	3,974	10' - 6"	5' - 10"	162	#6	6"	8' - 11"	2,170	5' - 10"	3' - 1"	162	6"	10' - 0"	1,082	7	39' - 9"	186	53	39' - 9"	1,407	10' - 11"	29	24	67	0.984	286.9	0.8	96	40.2	11,571
10' - 0"	10' - 0"	9"	8"	13'	162	#6	6"	11' - 1"	2,697	162	#6	6"	16' - 6"	4,015	10' - 7"	5' - 11"	162	#6	6"	9' - 1"	2,210	5' - 11"	3' - 2"	162	6"	10' - 0"	1,082	7	39' - 9"	186	53	39' - 9"	1,407	11' - 1"	30	26	72	1.123	289.9	0.8	102	45.8	11,699
10' - 0"	10' - 0"	10"	8"	16'	162	#6	6"	11' - 1"	2,697	162	#6	6"	16' - 7"	4,035	10' - 8"	5' - 11"	162	#6	6"	9' - 2"	2,230	5' - 11"	3' - 3"	162	6"	10' - 0"	1,082	7	39' - 9"	186	53	39' - 9"	1,407	11' - 1"	30	26	72	1.193	290.9	0.8	102	48.6	11,739
10' - 0"	10' - 0"	12"	9"	20'	162	#6	6"	11' - 3"	2,737	162	#6	6"	16' - 10"	4,096	10' - 10"	6' - 0"	162	#6	6"	9' - 5"	2,291	6' - 0"	3' - 5"	162	6"	10' - 0"	1,082	7	39' - 9"	186	53	39' - 9"	1,407	11' - 3"	30	26	72	1.407	295.0	0.8	102	57.1	11,901
10' - 0"	10' - 0"	13"	10"	23'	162	#6	6"	11' - 5"	2,778	162	#6	6"	16' - 11"	4,116	10' - 11"	6' - 0"	162	#6	6"	9' - 6"	2,312	6' - 0"	3' - 6"	162	6"	10' - 0"	1,082	7	39' - 9"	186	53	39' - 9"	1,407	11' - 5"	31	26	72	1.553	297.0	0.9	103	63.0	11,984
10' - 0"	10' - 0"	14"	11"	26'	162	#6	6"	11' - 7"	2,819	162	#6	6"	17' - 1"	4,157	11' - 0"	6' - 1"	162	#6	6"	9' - 8"	2,352	6' - 1"	3' - 7"	162	6"	10' - 0"	1,082	7	39' - 9"	186	53	39' - 9"	1,407	11' - 7"	31	26	72	1.702	300.1	0.9	103	69.0	12,106
10' - 0"	10' - 0"	15"	12"	30'	162	#7	6"	11' - 9"	3,891	162	#6	6"	17' - 3"	4,197	11' - 1"	6' - 2"	162	#6	6"	9' - 10"	2,393	6' - 2"	3' - 8"	162	6"	10' - 0"	1,082	7	39' - 9"	186	53	39' - 9"	1,407	11' - 9"	31	26	72	1.852	328.9	0.9	103	75.0	13,259

(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 3 OF 3

Texas Department of Transportation

Bridge Division Standard

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

SCC-10

FILE: scc10ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072, ETC	SH 103, ETC
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		201

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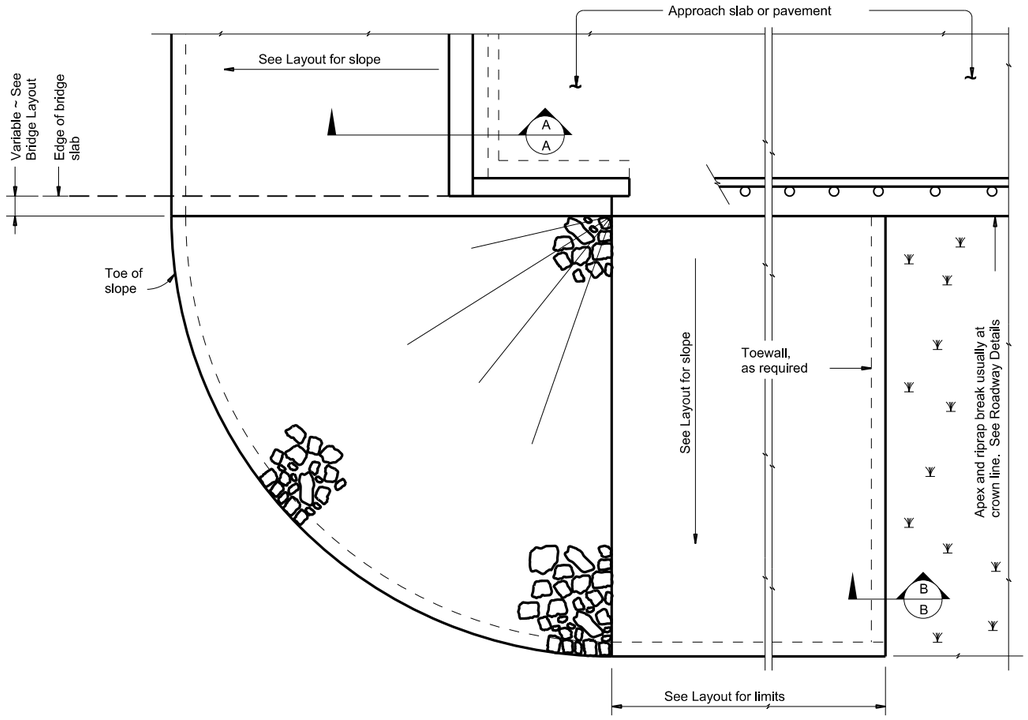
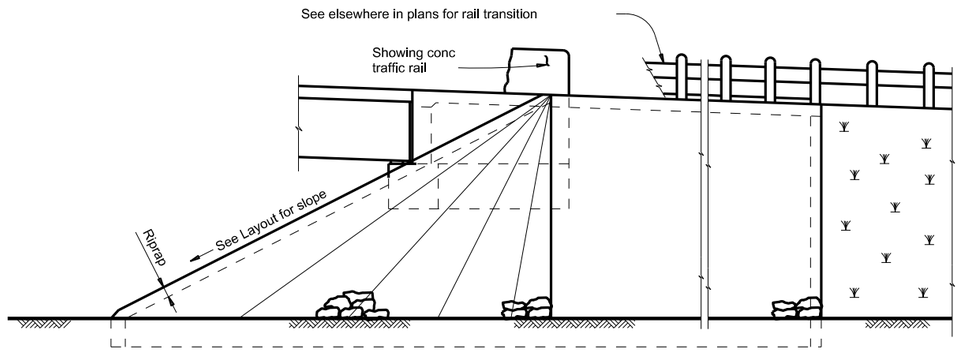
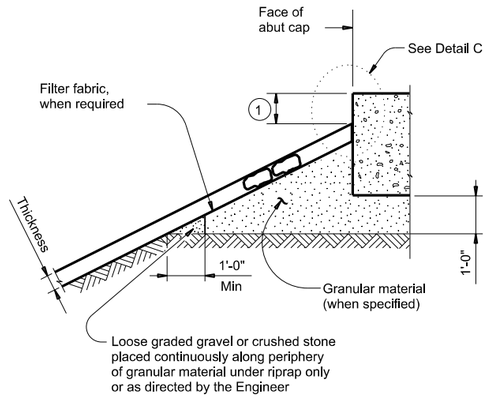


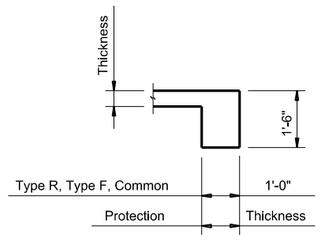
PLAN



ELEVATION

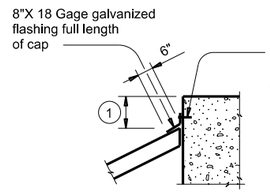


SECTION A-A AT CAP

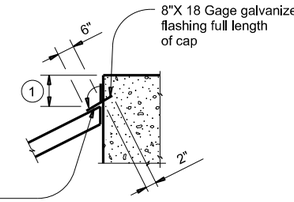


SECTION B-B

Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A



CAP OPTION B

DETAIL C

(1) Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

GENERAL NOTES:
Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
See elsewhere in plans for locations and details of shoulder drains.

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072, ETC	SH 103, ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		202

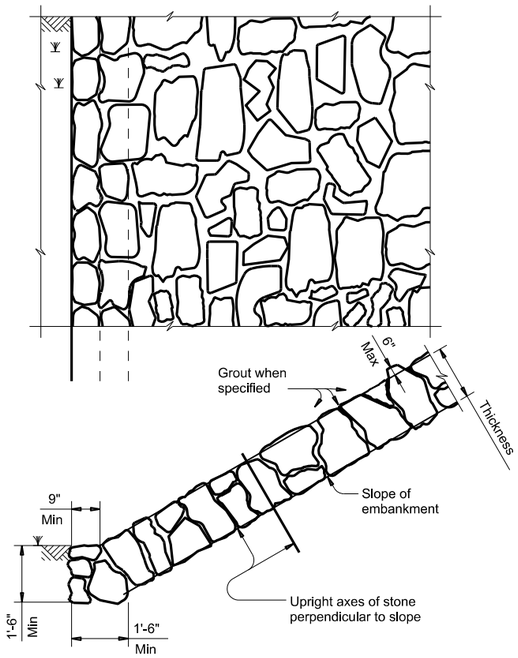


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

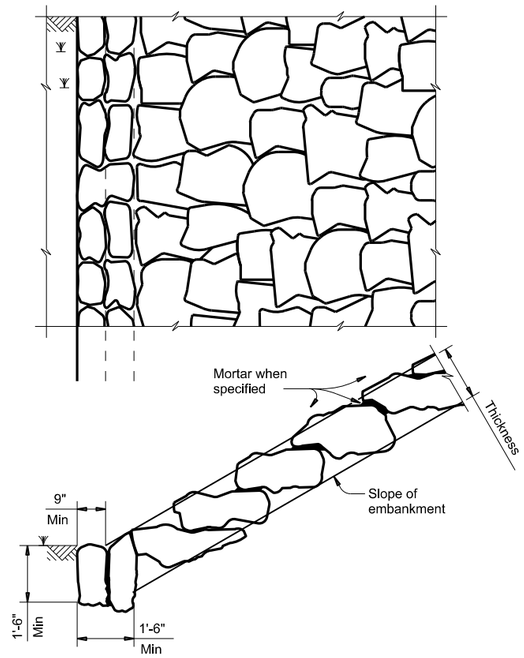


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

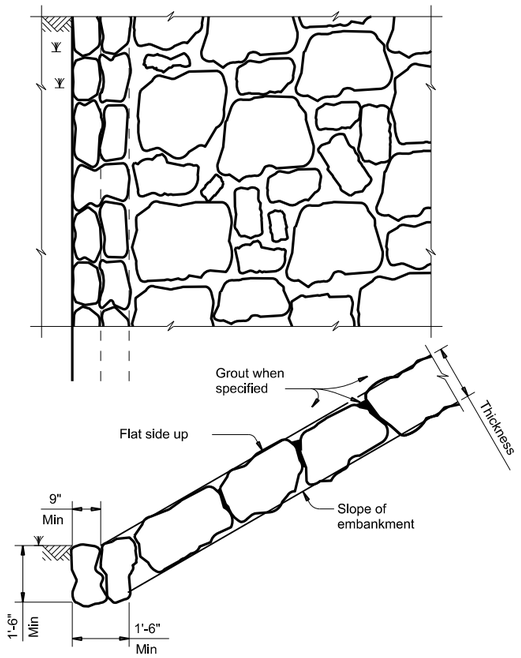


FIGURE 3 ~ TYPE F STONE RIPRAP

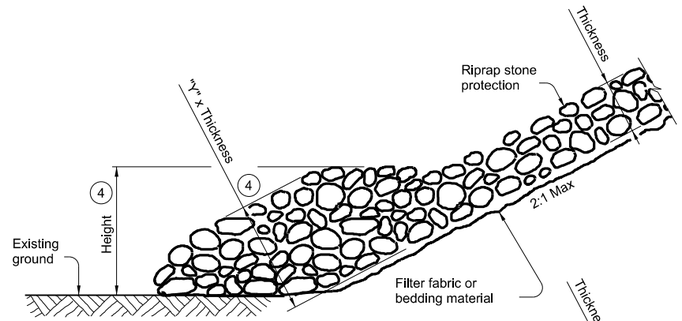
grouted

2 Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.

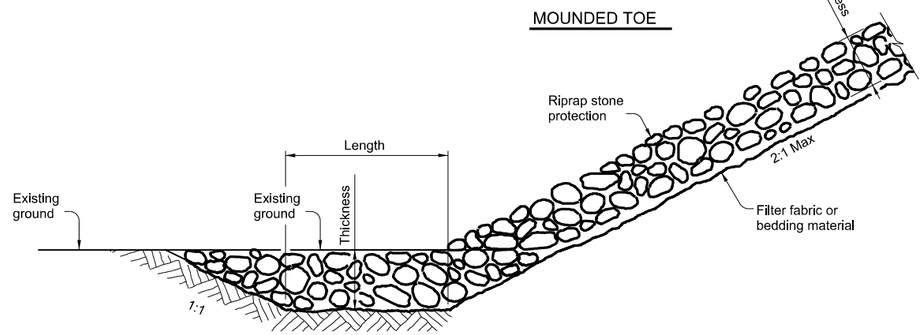
3 Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

4 "Y" and Height need to be defined. See layout or detail sheet for values if this option is used.

5 List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS (5)

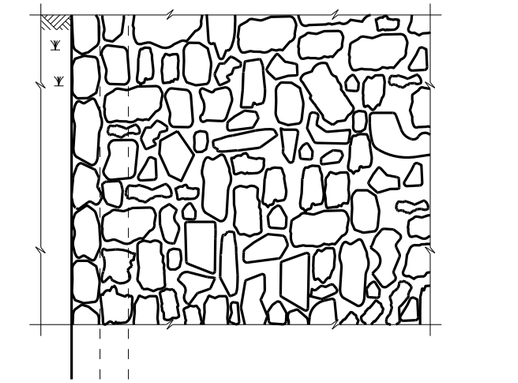


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

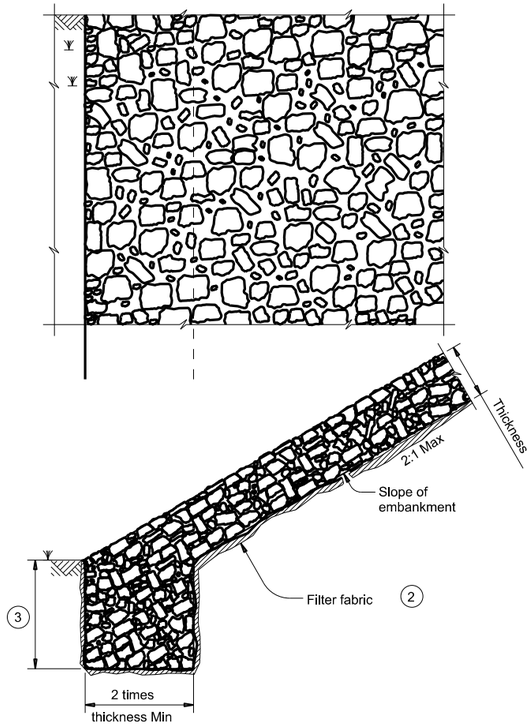


FIGURE 5 ~ PROTECTION STONE RIPRAP (5)

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072, ETC	SH 103, ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		203

DATE: 3/30/2022 11:43:40 PM
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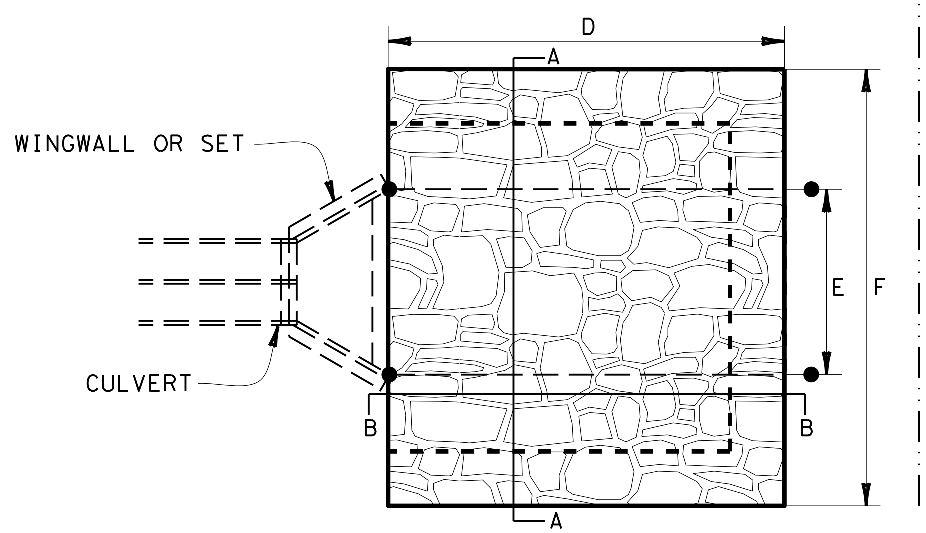
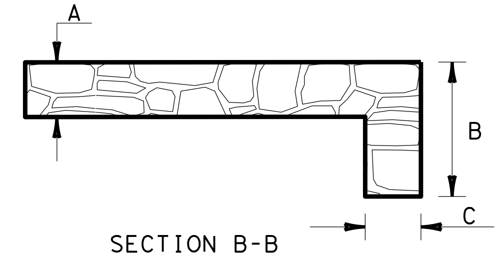
10" CUT & RESTORE PAVEMENT
D-GR HMA (TY D)(SQ)(PG 64-22)
PLACE IN 2 LIFTS W/OCST
ASPH (AC-15P) OR (AC-10-2TR) OR (CRS-2P)
AGGR (TY-E GR3 OR TY-L GR3)

RIPRAP DETAIL

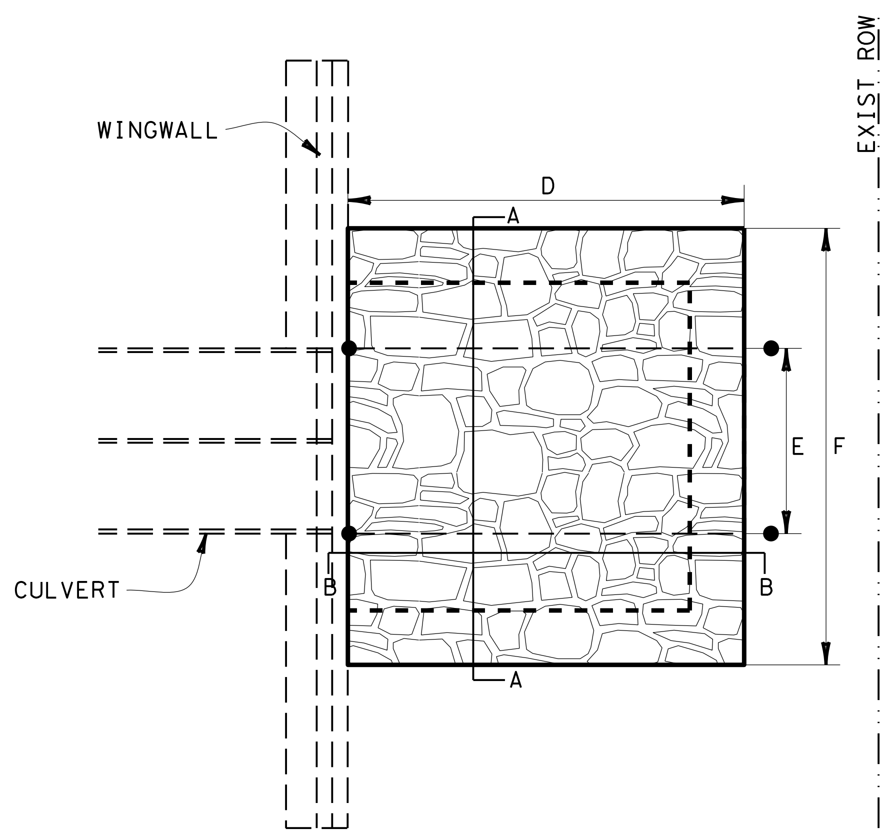
NOT TO SCALE



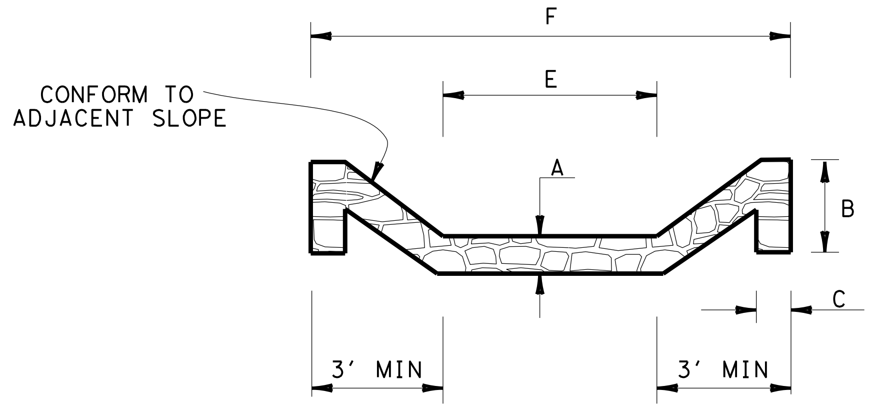
PLAN VIEW (FLARED WING OR SET)



SECTION B-B



PLAN VIEW (PARALLEL WING)



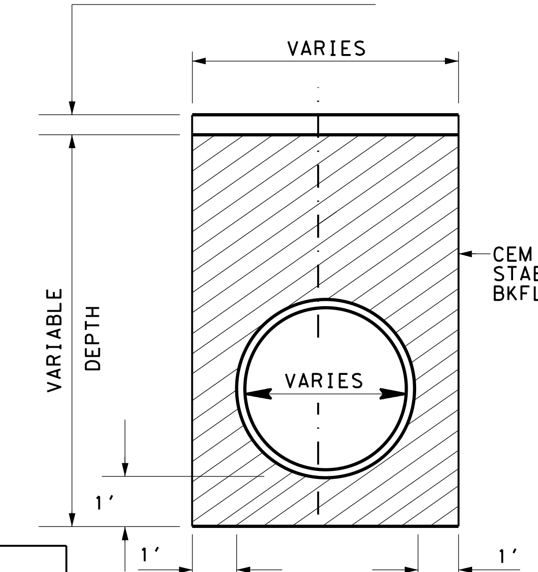
SECTION A-A

ELEVATION VIEWS

NOTE: CEMENT STABILIZE BACKFILL AS DIRECTED

① ESTIMATED USING CULVERT LAYOUTS

② WIDTH OF CHANNEL TO BE VERIFIED IN THE FIELD



CUT & RESTORE PAVEMENT (UNDER EXISTING PAVEMENT) DETAIL

NTS

RIPRAP DIMENSIONS				
USUAL DIMENSIONS	A	B	C	Riprap Size
	1.0'	2.0'	1.5'	18"
LOCATION	① D	E	② F	CY
SH 103 (CSJ:0336-03-072)				
STA 1643+47 (LT)	12'	22'	28'	14.5
STA 1671+00 (RT)	9'	10'	16'	7.0
STA 1893+98 (RT)	8.5'	35'	41'	14.4
STA 1893+98 (LT)	8'	19'	25'	8.9
STA 2030+00 (LT)	10'	3'	9'	5.0
FM 2971 (CSJ:1678-02-007)				
STA 21+61 (RT)	8'	3'	9'	4.1
STA 34+40 (LT)	19'	10'	47'	35.7
STA 34+40 (RT)	7'	10'	44'	12.6
STA 44+23 (LT)	9'	9'	15'	6.6
STA 102+90 (LT)	14'	10'	47'	40.5
STA 115+15 (LT)	21'	8'	30'	31.8
FM 3152 (CSJ:3220-01-013)				
STA 25+48 (RT)	6'	4'	10'	3.3
STA 30+10 (LT)	11'	3'	9'	5.6
STA 107+34 (RT)	3'	3.5'	9.5'	1.8
STA 125+86 (RT)	11'	2.5'	8.5	5.4
STA 316+40 (RT)	3'	3.5'	9.5'	1.8
FM 2864 (CSJ:2891-01-018)				
STA 48+00 (RT)	11'	10.5'	16.5'	8.6
STA 48+00 (LT)	11'	10.5'	16.5'	8.6
STA 125+58 (RT)	16'	13'	19'	14.0
STA 160+42 (LT)	10'	2.5'	8.5'	4.9
STA 202+40 (RT)	10.3'	14.5'	20.5'	9.6
STA 248+00 (RT)	20'	10.5'	16.5'	15.8
STA 248+00 (LT)	6'	10.5'	16.5'	4.7
STA 316+45 (RT)	8.5'	9'	15'	6.3
PROJECT TOTAL				328.3

N.T.S.

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE71511446...
3/31/2022

MISCELLANEOUS DRAINAGE DETAILS

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		204

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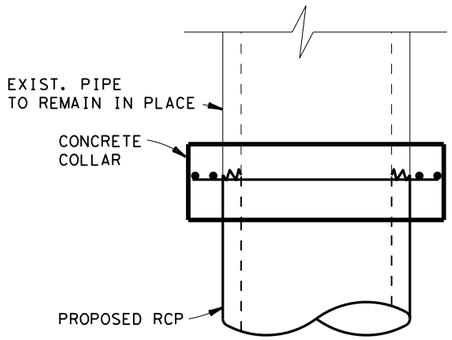
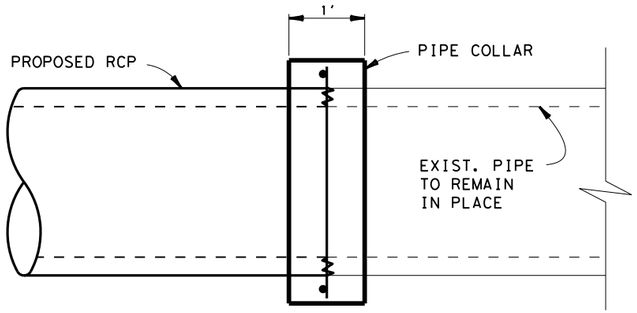
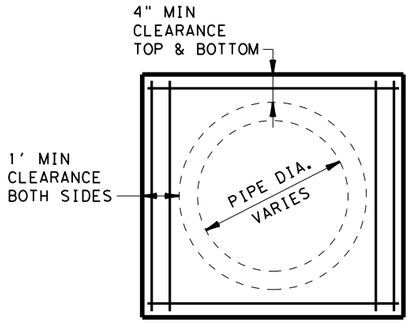


PLAN



ELEVATION



SECTION

CONCRETE COLLAR NOTES:

1. A CLASS "C" CONCRETE COLLAR SHALL BE USED WHERE CONNECTING RCP TO EXISTING CMP & RCP, WHEN INSTALLING VERTICAL RCP 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 RCP.

CONCRETE COLLAR

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

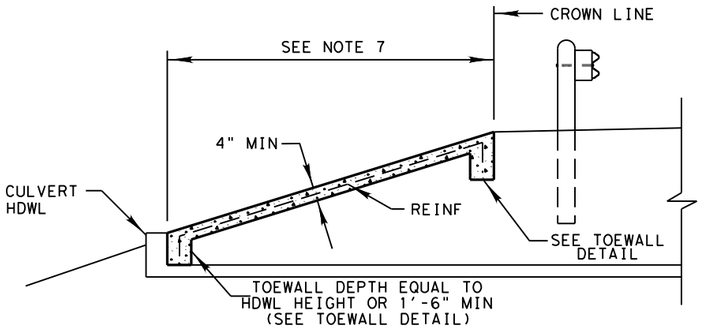
DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE715114A8...
3/31/2022

MISCELLANEOUS DRAINAGE DETAILS

TEXAS DEPARTMENT OF TRANSPORTATION

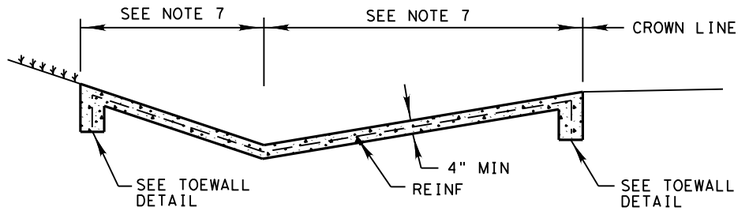
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		205



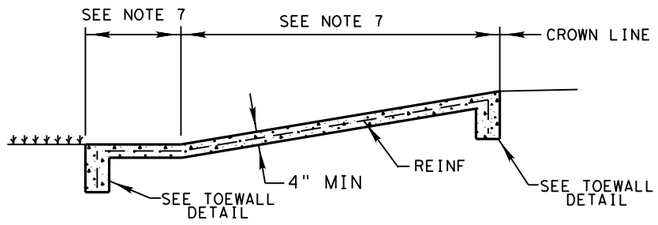
CONCRETE RIPRAP AT CULVERT SECTION

QUANTITY FOR 4" CONC RIPRAP INCLUDES THE QUANTITY FOR THE 6" WIDE TOEWALL AND WILL BE PAID FOR UNDER ITEM 432, RIPRAP (CONC)(4 IN).



CONCRETE RIPRAP AT TYPICAL V-BOTTOM DITCH

QUANTITY FOR 4" CONC RIPRAP INCLUDES THE QUANTITY FOR THE 6" WIDE TOEWALL AND WILL BE PAID FOR UNDER ITEM 432, RIPRAP (CONC)(4 IN).



CONCRETE RIPRAP AT TYPICAL FILL SECTION

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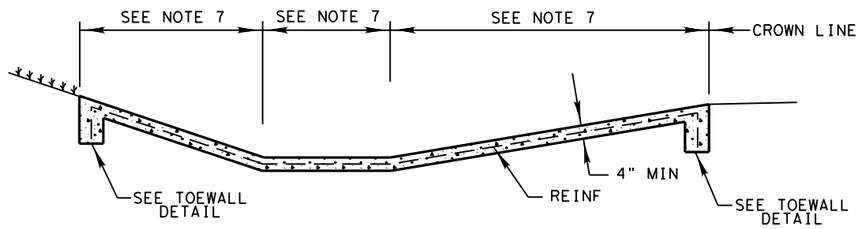

CONCRETE RIPRAP AT TYPICAL FLAT BOTTOM DITCH

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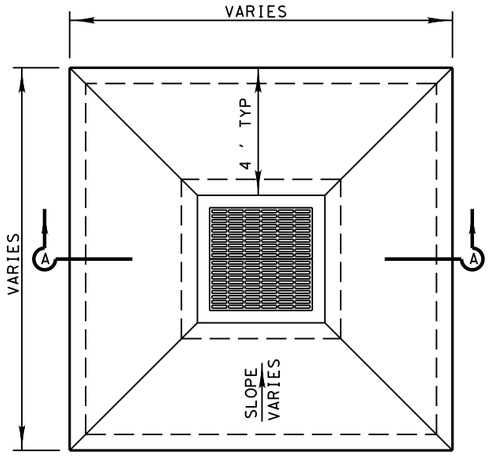
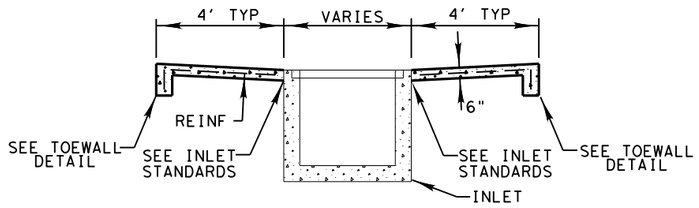
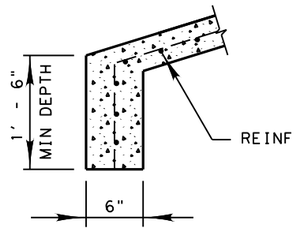


CONCRETE RIPRAP AT INLET



CONCRETE RIPRAP AT INLET RIPRAP APRON DETAILS

SECTION A-A



TOEWALL DETAIL

GENERAL NOTES:

1. USE CL B 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 SECTIONS 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.

NOT TO SCALE

LUFKIN DISTRICT STANDARD

CONCRETE RIPRAP DETAILS

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		206

ISSUED 01-09
REVISED 03-14
REVISED 10/20/2016: MODIFIED TITLE BLOCK
REVISED 04/03/2017: MODIFIED NOTES FOR PAYMENT

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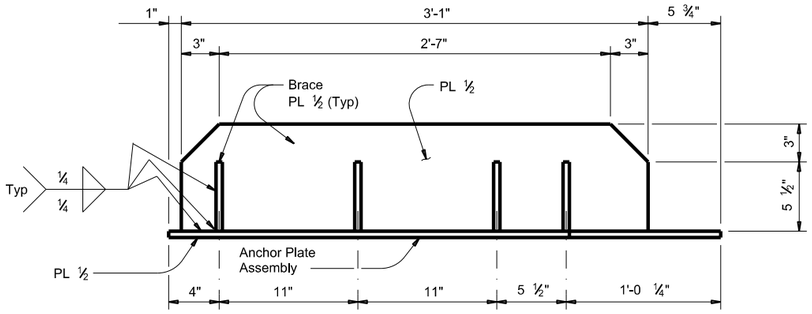
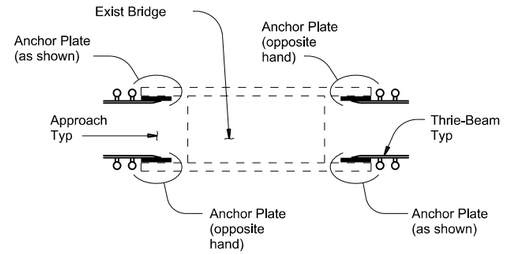
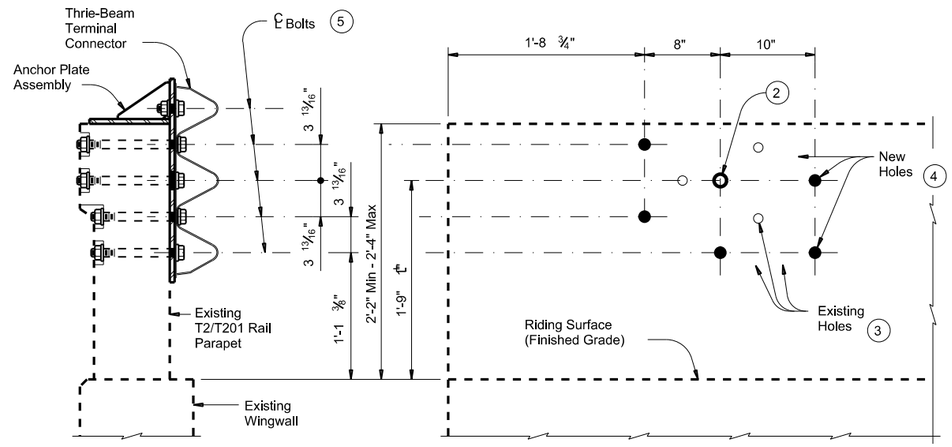


PLAN



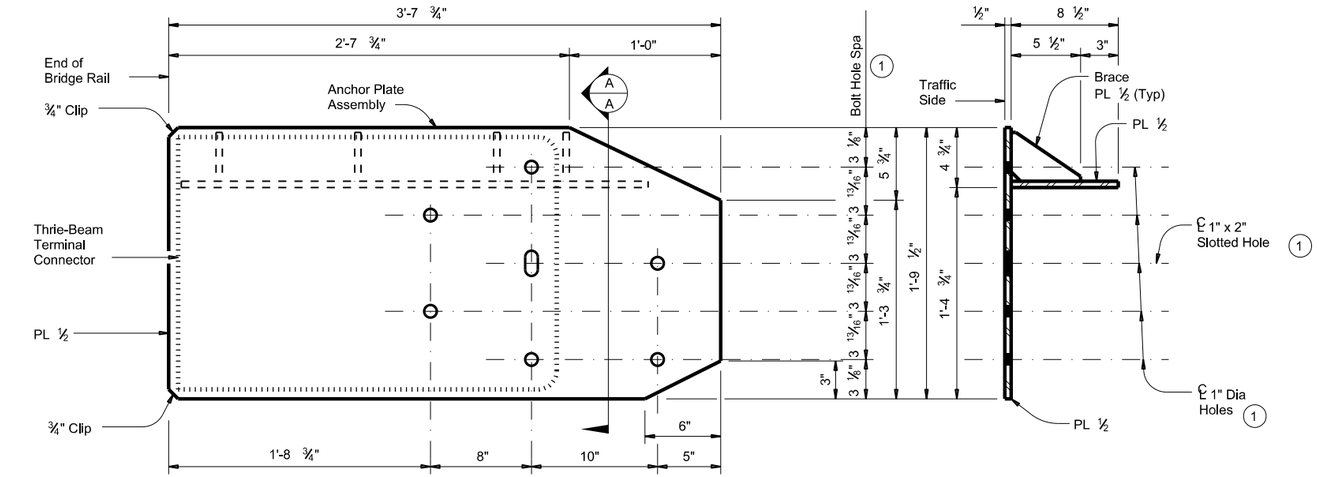
LOCATION DETAILS



SECTION
Showing completed installation

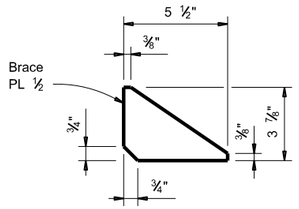
ROADSIDE ELEVATION
Anchor Plate assembly and Thrie-Beam Terminal Connector not shown for clarity

THRIE-BEAM TERMINAL CONNECTION DETAILS (1)



ROADSIDE ELEVATION

SECTION A-A



BRACE PLATE DETAIL

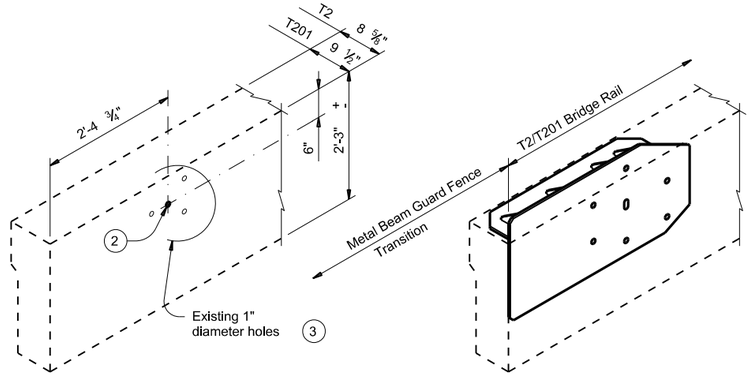
CONSTRUCTION NOTES:
Field verify dimensions before commencing work and ordering materials.
On T2 rail remove any MBGF (W-beam) and attachment hardware, from the face of rail if present, prior to installation of new MBGF Transition. Dispose of these materials as directed by the Engineer. Plugging of newly exposed existing bolt holes is not necessary except as stated here in or otherwise indicated on the plans. This work is considered subsidiary to the pertinent bid items.
Attach the MBGF Transition to the existing parapet using the Anchor Plate assembly and the Thrie-Beam Terminal Connection. Splice the Thrie-Beam Terminal Connection and Thrie-Beam with the normal 12 connection bolts. Refer to Metal Beam Guard Fence Transition and Metal Beam Guard Fence detail sheets for additional details and information not shown herein.

MATERIAL NOTES:
Fabricate Anchor Plate assembly with steel conforming to either ASTM A36 or A572 Gr 50. Anchor Plate assembly must be free of burrs, sharp edges and weld splatter. Grind edges and corners to a 1/16" flat or radius. Hot-dip galvanize Anchor Plate assembly in accordance with Item 445, "Galvanizing". Anchor bolts, nuts, and washers must conform to Item 449, "Anchor Bolts".

GENERAL NOTES:
These details are for retrofitting existing rails only, not new construction, with a Thrie-Beam Terminal Connection.
Shop drawings are not required for this installation.
Payment for materials, fabrication, and installation of this assembly are to be included in unit price bid in accordance with Item 540 "Mtl Bm Gd Fen Trans (Anchor Plate)".
Estimated weight of a single Anchor Plate assembly, including bolts, nuts, and washers, but not including the Thrie-Beam Terminal Connector = 190 Lbs.

ANCHOR PLATE DETAILS

Anchor Plate shown is detailed for one end of one side of rail only. For other side, Anchor Plate must be built opposite hand.



EXISTING PARAPET
Shown after removal of existing MBGF Transition connector and prior to coring new bolt holes

ANCHOR PLATE PLACEMENT

INSTALLATION DETAILS

(1) The Contractor must verify that locations of bolt holes match those in the Thrie-Beam Terminal Connector to be installed in that location, prior to fabrication of Anchor Plate assembly and prior to coring bolt holes in the existing T2/T201 parapet.

(2) If the existing holes are aligned as expected, use the indicated existing 1" diameter hole in the installation of the Anchor Plate assembly and the Thrie-Beam Terminal Connector.

(3) If the existing holes are not aligned as expected, holes that cannot be utilized in the installation and are within 3" of a new bolt hole must be filled with epoxy grout prior to coring new holes.

(4) Drill new 1" diameter holes, each with a 2 ½" diameter x 1" deep recess, through existing railing parapet. Note that recesses are only required when pedestrian sidewalks are adjacent to back of rail unless directed otherwise by the Engineer. Holes should be perpendicular to the roadside face of the parapet. Drill holes and recesses with coring type equipment. Percussion drilling is not allowed. Patch spalls, when directed by the Engineer, in accordance with Item 429, "Concrete Structure Repair", at the Contractor's expense.

(5) 7 ~ ⅞" diameter ASTM F3125 Gr A325 Hex Head Anchor Bolts each with 2 ~ 1 ¾" O.D. washers. Place washer under each head and nut. Provide bolts of sufficient length to extend a minimum of ½" beyond nut. Cut excess bolt length and paint cut surface with zinc-rich paint if directed by the Engineer.

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7151144
3/31/2022

Texas Department of Transportation

Bridge Division Standard

T2/T201 TRANSITION RETROFIT GUIDE

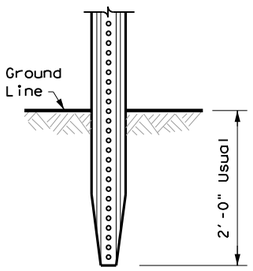
T2-T201TR(MOD)

FILE:	tlstd025-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS		0336	03	072,ETC	SH 103,ETC
		DIST	COUNTY		SHEET NO.
		LFK	ANGELINA, ETC		207

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

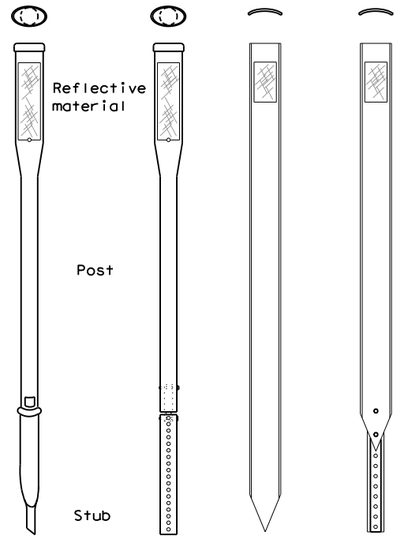


NOTES

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.

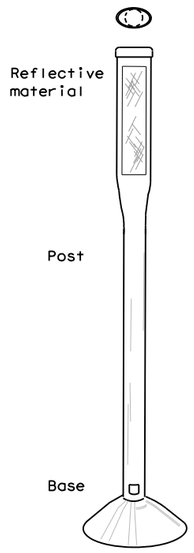
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



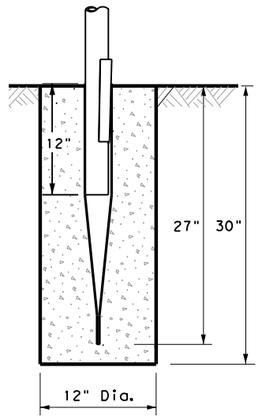
SURFACE MOUNT

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.

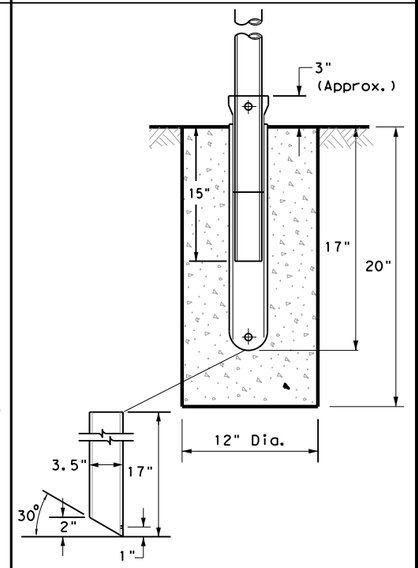
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

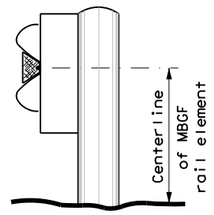
NOTE

1. Install per manufacturer's recommendations.

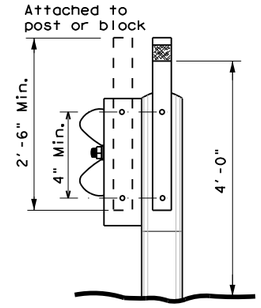
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

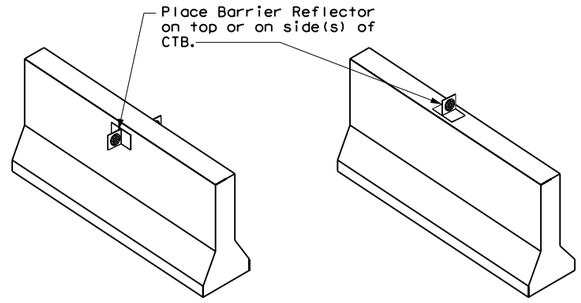
GF1



GF2



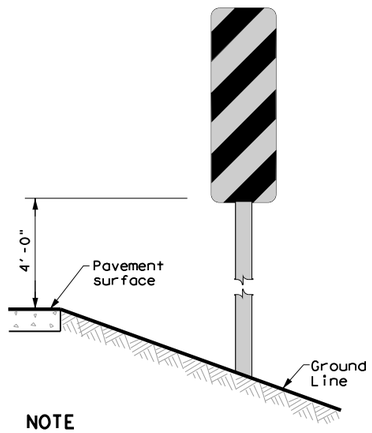
CONCRETE TRAFFIC BARRIER (CTB)



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.

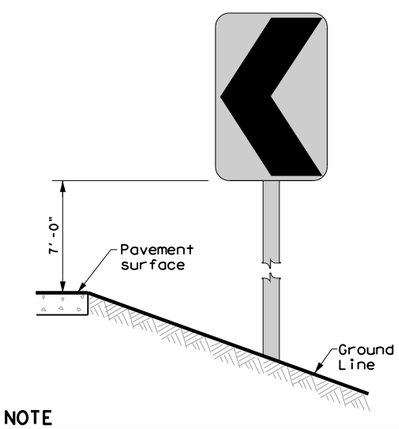
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



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)

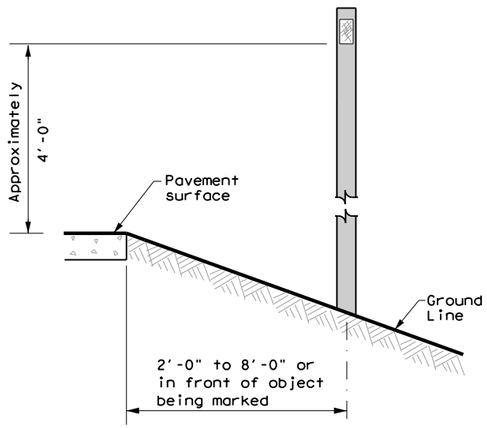
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



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	0336	03	072,ETC	SH 103,ETC
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	LFK	ANGELINA, ETC		208

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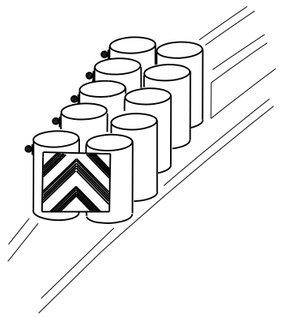
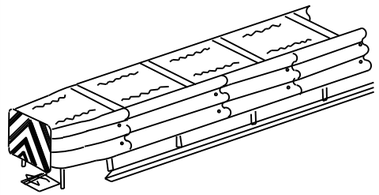
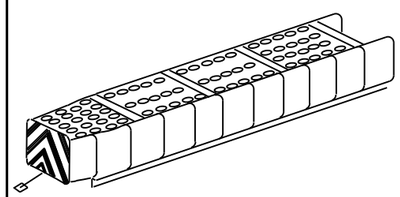
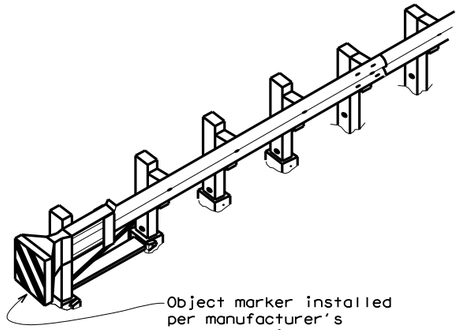
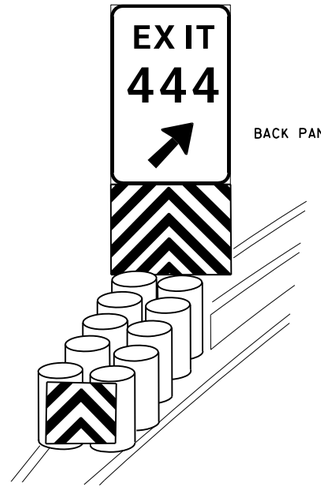
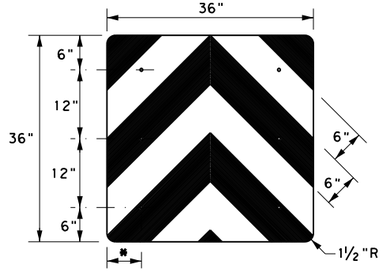


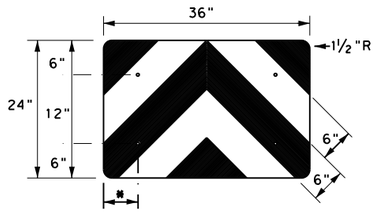




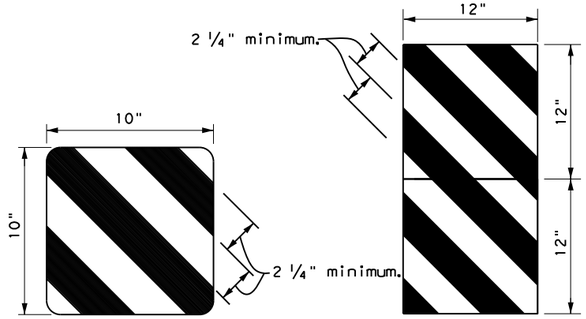




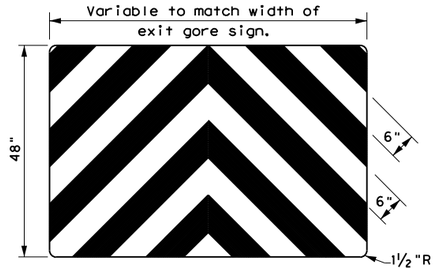


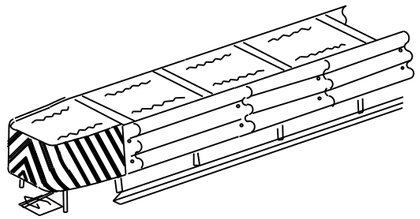


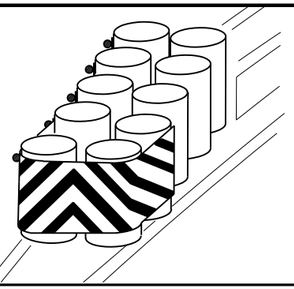
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

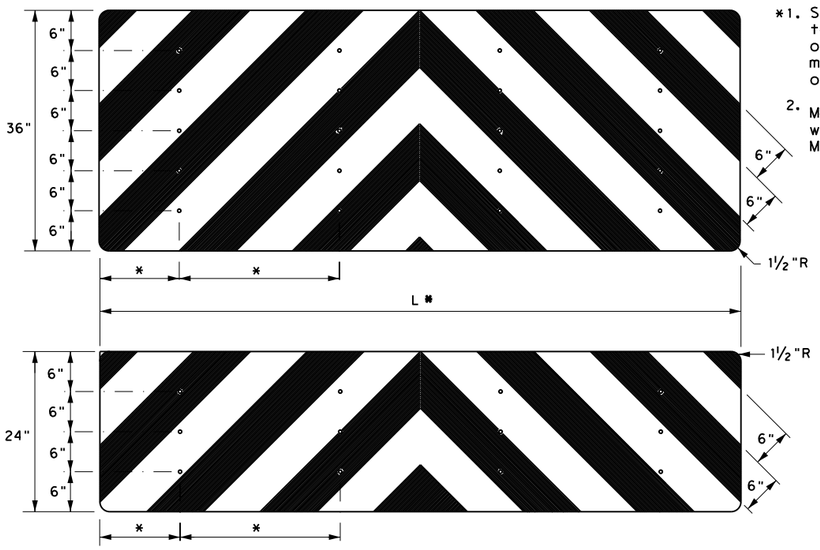


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

*1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.

2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.

3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 ¼".

4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	0336	03	072,ETC	SH 103,ETC
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	LFK	ANGELINA, ETC		209
4-98 7-20				

20G

DATE: 3/30/2022 11:44:33 PM
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NOTES:
(1) THE PURPOSE OF THIS SHEET IS TO POINT THE USER TO THE APPROPRIATE LOCATIONS TO FIND THE REQUIRED CONTENT OF THE SWP3.
(2) THE PROJECT LIMITS SHOWN ON THE TITLE SHEET AND LIMITS OF TXDOT RIGHT OF WAY SHALL ALSO BE THE LIMITS OF COVERAGE OF THE SWP3.

PROJECT DESCRIPTION

A. NATURE OF ACTIVITY: For construction of safety improvement project along SH 103. Consisting of improvement of guardrail to design standards and safety treat fixed objects.

B. POTENTIAL POLLUTANTS AND THEIR SOURCES:

Pollutant: Sediment , Source: Disturbed Soil
Pollutant: Oil and Grease , Source: Equipment and Vehicles

C. INTENDED SEQUENCE OF ACTIVITIES: SEE CONSTRUCTION SCHEDULE FOR ESTIMATED START DATES AND DURATION OF SOIL-DISTURBING ACTIVITIES

D. TOTAL AREA OF SITE: 172.17 ACRE AREA TO BE DISTURBED: 6.89 ACRE

E. DATA DESCRIBING THE SOIL OR QUALITY OF ANY DISCHARGE FROM THE SITE:

I.E. Sandy Loam, Loamy Fine Sand, Loam, Clay

F. GENERAL LOCATION MAP: SEE TITLE SHEET OF THE PROJECT PLANS

G. DETAILED SITE MAP/MAPS INDICATING THE FOLLOWING:
- i. DRAINAGE PATTERNS: SEE SWP3 LAYOUTS
- ii. ANTICIPATED SLOPES AFTER MAJOR GRADING ACTIVITIES: SEE TYPICAL SECTIONS
- iii. AREAS WHERE SOIL DISTURBANCE WILL OCCUR: SEE SWP3 LAYOUTS
- iv. LOCATIONS OF ALL CONTROLS OR BUFFERS (PLANNED/IN PLACE): SEE SWP3 LAYOUTS
- v. LOCATIONS WHERE TEMPORARY OR PERMANENT STABILIZATION PRACTICES ARE EXPECTED TO BE USED: SEE SWP3 LAYOUTS
- vi. LOCATION OF CONSTRUCTION SUPPORT ACTIVITIES: SEE SWP3 LAYOUTS
- vii. SURFACE WATERS, INCLUDING WETLANDS, AT, ADJACENT, OR IN CLOSE PROXIMITY TO THE SITE (* INDICATES IMPAIRED WATERS): SEE SWP3 LAYOUTS
- viii. LOCATIONS WHERE STORMWATER DISCHARGES DIRECTLY TO A SURFACE WATER BODY OR MS4: SEE SWP3 LAYOUTS
- ix. VEHICLE WASH AREAS: N/A
- x. DESIGNATED POINTS ON THE SITE WHERE VEHICLES WILL EXIT FROM UNSTABLE DIRT TO PAVED ROAD: See SWP3 (Construction Exits)

H. LOCATION AND DESCRIPTION OF CONSTRUCTION SUPPORT ACTIVITIES AUTHORIZED UNDER THE PERMITTEE'S NOI: CONSTRUCTION SUPPORT ACTIVITIES ARE NOT COVERED UNDER THIS SWP3 AS IT IS NOT AUTHORIZED UNDER THIS PERMITTEE'S CGP. THE PERMITTEE WILL MAKE REFERENCE TO CONSTRUCTION SUPPORT ACTIVITIES THAT ARE COVERED UNDER THE CONTRACTOR'S SWP3 AND CGP ON SWP3 LAYOUTS

I. NAME OF RECEIVING WATER(S) AT OR NEAR SITE:
AN ASTERISK (*) INDICATES AN IMPAIRED WATER

Durham Creek, McAdam Spring Branch, Bodan Creek, Rowan Creek, Conner Spring Branch, Crawford Creek, *Jack Creek(Impaired stream), and unnamed tributaries

NEAREST CLASSIFIED SEGMENT NUMBER:

CLASSIFIED SEGMENT NAME: 0604 Neches River Below Lake Palestine

J. COPY OF TPDES GENERAL PERMIT: SEE SWP3 FILE

K. NOI AND ACKNOWLEDGEMENT CERTIFICATE OR SITE NOTICE: SEE SWP3 FILE

L. STORMWATER AND ALLOWABLE NON-STORMWATER DISCHARGE LOCATIONS: SEE SWP3 LAYOUTS

M. LOCATIONS OF POLLUTANT GENERATING ACTIVITIES: ACTIVITIES AUTHORIZED UNDER THIS PERMITTEE'S CGP CAN BE FOUND ON SWP3 LAYOUTS. THIS SHEET WILL ALSO REFERENCE THE LOCATION OF POLLUTANT GENERATING ACTIVITIES THAT ARE COVERED BY THE CONTRACTOR'S CGP AND SWP3.

DESCRIPTION OF BMPS

A. GENERAL REQUIREMENTS: EROSION AND SEDIMENT CONTROLS SHOWN ON SWP3 LAYOUTS WERE DESIGNED TO RETAIN SEDIMENT ON-SITE TO THE EXTENT PRACTICABLE WITH CONSIDERATION OF LOCAL TOPOGRAPHY, SOIL TYPE, AND RAINFALL. THE EROSION AND SEDIMENT CONTROLS WILL BE INSTALLED AND MAINTAINED ACCORDING TO MANUFACTURER AND TXDOT STORM WATER MANAGEMENT GUIDELINES. CONTROLS TO MINIMIZE THE OFF-SITE TRANSPORT OF LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION MATERIALS INCLUDE: CONSTRUCTION MATERIALS TO BE STORED IN LOCATIONS THAT MINIMIZE THEIR EXPOSURE TO PRECIPITATION & STORM WATER RUNOFF; COLLECTION OF CONSTRUCTION DEBRIS IN RECEPTACLES WITH A SECURE COVER MEETING STATE AND LOCAL SOLID WASTE MANAGEMENT REGULATIONS; HAULING AND EMPTYING RECEPTACLES AT APPROVED LANDFILL SITES; PROHIBITING THE BURIAL OF CONSTRUCTION DEBRIS; COLLECTION OF SANITARY WASTE FROM PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATIONS BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

B. EROSION CONTROL AND STABILIZATION PRACTICES

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

DATES:
1. MAJOR GRADING ACTIVITIES: SEE CONSTRUCTION SCHEDULE FOR THESE DATES
2. WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE: _____
3. WHEN STABILIZATION MEASURES ARE INITIATED: _____

INITIATE EROSION CONTROL AND STABILIZATION MEASURES IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. INITIATE STABILIZATION MEASURES THAT PROVIDE A PROTECTIVE COVER IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED. "IMMEDIATELY" MEANS NO LATER THAN THE NEXT WORK DAY FOLLOWING THE DAY WHEN THE SOIL-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. STABILIZATION MEASURES MUST BE COMPLETED NO MORE THAN 14 CALENDAR DAYS AFTER INITIATION BEGINS.

THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

C. SEDIMENT CONTROL PRACTICES

T	SILT FENCE	P	VEGETATIVE BUFFER STRIPS
T	OTHER (ROCK FILTER DAM)		

IF SITE WILL DISTURB 10 OR MORE ACRES WITHIN A COMMON DRAINAGE LOCATION AND A SEDIMENTATION BASIN IS NOT FEASIBLE, PROVIDE REASON:
Site does not disturb 10 or more acres; therefore, sed. basin is not required.

THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

DESCRIPTION OF PERMANENT STORM WATER CONTROLS

PROVIDE A DESCRIPTION OF ANY MEASURES THAT WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL POLLUTANTS IN STORM WATER DISCHARGES THAT MAY OCCUR AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED: N/A

OTHER REQUIRED CONTROLS AND BMPS

TXDOT WILL UTILIZE ROCK AT CONSTRUCTION ENTRANCES AND SPRINKLING, AS NEEDED, TO MINIMIZE OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST.

SEE SECTION A ABOVE FOR DESCRIPTION OF CONSTRUCTION AND WASTE MATERIALS AND CONTROLS USED FOR THOSE THAT MAY BE STORED ON-SITE.

AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, FUELS, MOTOR OIL, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. STORE MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS. CONTACT THE SPILL COORDINATOR IMMEDIATELY IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS.

MAINTENANCE REQUIREMENTS

EFFECTIVELY MAINTAIN THE OPERATING CONDITIONS OF ALL EROSION AND SEDIMENT CONTROL AND OTHER PROTECTIVE MEASURES IDENTIFIED IN THE SWP3. IF SITE INSPECTIONS REQUIRED BY THIS PERMIT IDENTIFY BMP'S THAT ARE NOT OPERATING EFFECTIVELY, MAINTENANCE SHALL BE PERFORMED BEFORE THE NEXT ANTICIPATED STORM EVENT, OR AS NECESSARY TO MAINTAIN THE CONTINUED EFFECTIVENESS OF STORM WATER CONTROLS. IF MAINTENANCE PRIOR TO THE NEXT ANTICIPATED STORM EVENT IS UNPRACTICABLE, SCHEDULE AND ACCOMPLISH MAINTENANCE AS SOON AS PRACTICAL. CONTROLS THAT HAVE BEEN INTENTIONALLY DISABLED, RUN-OVER, REMOVED OR OTHERWISE RENDERED INEFFECTIVE MUST BE REPLACED OR CORRECTED IMMEDIATELY UPON DISCOVERY. IF A CONTROL HAS BEEN USED INCORRECTLY, IS PERFORMING INADEQUATELY OR IS DAMAGED, THE OPERATOR SHALL REPLACE OR MODIFY THE CONTROL AS SOON AS PRACTICABLE AFTER THE DISCOVERY.

INSPECTION OF CONTROLS

A) QUALIFIED PERSONNEL SHALL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE, ONCE EVERY 7 CALENDAR DAYS. DISTURBED AREAS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. SEDIMENT AND EROSION CONTROL MEASURES IDENTIFIED ON THE SWP3 SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING.

D) THE SWP3 MUST BE MODIFIED BASED ON THE RESULTS OF INSPECTION TO BETTER CONTROL POLLUTANTS IN RUNOFF. REVISIONS TO THE SWP3 MUST BE COMPLETED WITHIN 7 CALENDAR DAYS FOLLOWING THE INSPECTION. IF EXISTING BMPS ARE MODIFIED OR ADDITIONAL BMPS ARE NECESSARY, AN IMPLEMENTATION SCHEDULE MUST BE DESCRIBED IN THE SWP3. IMPLEMENTATION OF CHANGES SHOULD BE DONE PRIOR TO THE NEXT STORM EVENT IF POSSIBLE, OTHERWISE, THEY SHOULD BE DONE AS SOON AS PRACTICABLE.

E) A REPORT SUMMARIZING THE SCOPE, DATE, NAME AND QUALIFICATIONS OF INSPECTOR, AND MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE SWP3 SHALL BE PRODUCED AND RETAINED AS PART OF THE SWP3. MAJOR OBSERVATIONS INCLUDE: LOCATIONS OF DISCHARGES OF SEDIMENT OR OTHER POLLUTANTS FROM THE SITE, LOCATIONS OF BMPS THAT NEED TO BE MAINTAINED, LOCATIONS OF BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION AND LOCATIONS WHERE BMPS ARE NEEDED. ACTIONS TAKEN AS A RESULT OF INSPECTIONS MUST BE DESCRIBED WITHIN AND RETAINED AS PART OF THE SWP3. REPORTS MUST IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE. WHERE THE REPORT DOES NOT IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE, THE REPORT MUST CONTAIN A CERTIFICATION THAT THE SITE IS IN COMPLIANCE WITH THE SWP3 AND PERMIT.

OTHER SWP3 CONTENT

TXDOT WILL ENSURE THE APPROPRIATE POLLUTION PREVENTION MEASURES (I.E. VEGETATED BUFFER STRIPS, SILT FENCE, ETC.) ARE IDENTIFIED AND IMPLEMENTED FOR ALL ELIGIBLE NON-STORMWATER WATER COMPONENTS OF DISCHARGE SUCH AS WASHING OF VEHICLES, STRUCTURES, AND PAVEMENT WHERE SOAPS AND DETERGENTS ARE NOT USED AND THE PURPOSE IS TO REMOVE DIRT, MUD OR DUST; UNCONTAMINATED WATER USED FOR DUST CONTROL; AND LAWN WATERING AND SIMILAR IRRIGATION DRAINAGE.

CHECKLIST FOR CONTENTS OF AREA OFFICE SWP3 FILE:

- ☐ CONTACT FORM *
- ☐ NOI AND ACKNOWLEDGEMENT CERTIFICATE (IF EQUAL OR GREATER THAN 5 ACRES)
- ☐ APPLICABLE CONSTRUCTION SITE NOTICE *
- ☐ SWP3 CERTIFICATION STATEMENT (SIGNED BY AE)
- ☐ TPDES GENERAL PERMIT
- ☐ SWP3 PLAN
- ☐ INSPECTION AND MAINTENANCE REPORT
- ☐ INSPECTOR QUALIFICATION FORM
- ☐ DELEGATION OF SIGNATURE AUTHORITY (ALL INSPECTORS SIGNING REPORTS)
- ☐ NOTICE OF TERMINATION

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE71511446...
3/31/2022

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

ANY REPORTABLE QUANTITY OF HAZARDOUS MATERIAL RELEASE MUST BE REPORTED TO NATIONAL RESPONSE CENTER AT 1-800-424-8802 AND TO STATE OF TEXAS SPILL-REPORTING HOTLINE AT 1-800-832-8224

TXDOT SWP3 INDEX (SWP3I)

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		210

(REVISED OCTOBER 30, 2013)

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THIS PROJECT CONSISTS OF DISCRETE CONSTRUCTION PROJECTS SEPARATED A MINIMUM 1/4 MILE BY UNDISTURBED AREAS; THEREFORE, THEY ARE TREATED AS SEPARATE PLANS OF DEVELOPMENT. FM 2971 (CSJ: 1678-02-007) DISTURBS LESS THAN 1 ACRE; THEREFORE, TPDES CGP DOES NOT APPLY. HOWEVER, THE CONTRACTOR SHALL PLACE BMPS AS DIRECTED BY THE AREA ENGINEER. THE DISTURBED AREA IN THE PLANS AND THE CONTRACTOR PROJECT SPECIFIC LOCATIONS (PSLS) WITHIN 1 MILE OF THE PROJECT LIMITS WILL FURTHER ESTABLISH THE AUTHORIZATION REQUIREMENTS FOR STORM WATER DISCHARGES. IF THE TOTAL AREA DISTURBED SHOWN IN THE PLANS AND PSLS WITHIN 1 MI. OF THE PROJECT LIMITS EXCEEDS 1 ACRE, THE ENGINEER WILL DEVELOP AN SWP3 SITE PLAN AND POST A SMALL CONSTRUCTION SITE NOTICE FOR THE CONSTRUCTION ACTIVITIES.

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE715144B...
3/31/2022

TXDOT SWP3 INDEX

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC

DIST	COUNTY	SHEET NO.
LFK	ANGELINA, ETC	211

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NOTES:
(1) THE PURPOSE OF THIS SHEET IS TO POINT THE USER TO THE APPROPRIATE LOCATIONS TO FIND THE REQUIRED CONTENT OF THE SWP3.
(2) THE PROJECT LIMITS SHOWN ON THE TITLE SHEET AND LIMITS OF TXDOT RIGHT OF WAY SHALL ALSO BE THE LIMITS OF COVERAGE OF THE SWP3.

PROJECT DESCRIPTION

A. NATURE OF ACTIVITY: For construction of safety improvement project along FM 2864. Consisting of improvement of guardrail to design standards and safety treat fixed objects.

B. POTENTIAL POLLUTANTS AND THEIR SOURCES:

Pollutant: Sediment , Source: Disturbed Soil
Pollutant: Oil and Grease , Source: Equipment and Vehicles

C. INTENDED SEQUENCE OF ACTIVITIES: SEE CONSTRUCTION SCHEDULE FOR ESTIMATED START DATES AND DURATION OF SOIL-DISTURBING ACTIVITIES

D. TOTAL AREA OF SITE: 64.47 ACRE AREA TO BE DISTURBED: 1.36 ACRE

E. DATA DESCRIBING THE SOIL OR QUALITY OF ANY DISCHARGE FROM THE SITE:

I.E. Sandy Loam, Clay Loam

F. GENERAL LOCATION MAP: SEE TITLE SHEET OF THE PROJECT PLANS

G. DETAILED SITE MAP/MAPS INDICATING THE FOLLOWING:
- i. DRAINAGE PATTERNS: SEE SWP3 LAYOUTS
- ii. ANTICIPATED SLOPES AFTER MAJOR GRADING ACTIVITIES: SEE TYPICAL SECTIONS
- iii. AREAS WHERE SOIL DISTURBANCE WILL OCCUR: SEE SWP3 LAYOUTS
- iv. LOCATIONS OF ALL CONTROLS OR BUFFERS (PLANNED/IN PLACE): SEE SWP3 LAYOUTS
- v. LOCATIONS WHERE TEMPORARY OR PERMANENT STABILIZATION PRACTICES ARE EXPECTED TO BE USED: SEE SWP3 LAYOUTS
- vi. LOCATION OF CONSTRUCTION SUPPORT ACTIVITIES: SEE SWP3 LAYOUTS
- vii. SURFACE WATERS, INCLUDING WETLANDS, AT, ADJACENT, OR IN CLOSE PROXIMITY TO THE SITE (* INDICATES IMPAIRED WATERS): SEE SWP3 LAYOUTS
- viii. LOCATIONS WHERE STORMWATER DISCHARGES DIRECTLY TO A SURFACE WATER BODY OR MS4: SEE SWP3 LAYOUTS
- ix. VEHICLE WASH AREAS: N/A
- x. DESIGNATED POINTS ON THE SITE WHERE VEHICLES WILL EXIT FROM UNSTABLE DIRT TO PAVED ROAD: See SWP3 (Construction Exits)

H. LOCATION AND DESCRIPTION OF CONSTRUCTION SUPPORT ACTIVITIES AUTHORIZED UNDER THE PERMITTEE'S NOI: CONSTRUCTION SUPPORT ACTIVITIES ARE NOT COVERED UNDER THIS SWP3 AS IT IS NOT AUTHORIZED UNDER THIS PERMITTEE'S CGP. THE PERMITTEE WILL MAKE REFERENCE TO CONSTRUCTION SUPPORT ACTIVITIES THAT ARE COVERED UNDER THE CONTRACTOR'S SWP3 AND CGP ON SWP3 LAYOUTS

I. NAME OF RECEIVING WATER(S) AT OR NEAR SITE:
AN ASTERISK (*) INDICATES AN IMPAIRED WATER

Rider Branch, Telesco Creek, Cedar Branch, Bayou La Nana Tributary, Bayou La Nana, and unnamed tributaries.

NEAREST CLASSIFIED SEGMENT NUMBER:

CLASSIFIED SEGMENT NAME:

0612 Attoyac Bayou and 0611 Angelina River above Sam Rayburn Reservior

J. COPY OF TPDES GENERAL PERMIT: SEE SWP3 FILE

K. NOI AND ACKNOWLEDGEMENT CERTIFICATE OR SITE NOTICE: SEE SWP3 FILE

L. STORMWATER AND ALLOWABLE NON-STORMWATER DISCHARGE LOCATIONS: SEE SWP3 LAYOUTS

M. LOCATIONS OF POLLUTANT GENERATING ACTIVITIES: ACTIVITIES AUTHORIZED UNDER THIS PERMITTEE'S CGP CAN BE FOUND ON SWP3 LAYOUTS. THIS SHEET WILL ALSO REFERENCE THE LOCATION OF POLLUTANT GENERATING ACTIVITIES THAT ARE COVERED BY THE CONTRACTOR'S CGP AND SWP3.

DESCRIPTION OF BMPS

A. GENERAL REQUIREMENTS: EROSION AND SEDIMENT CONTROLS SHOWN ON SWP3 LAYOUTS WERE DESIGNED TO RETAIN SEDIMENT ON-SITE TO THE EXTENT PRACTICABLE WITH CONSIDERATION OF LOCAL TOPOGRAPHY, SOIL TYPE, AND RAINFALL. THE EROSION AND SEDIMENT CONTROLS WILL BE INSTALLED AND MAINTAINED ACCORDING TO MANUFACTURER AND TXDOT STORM WATER MANAGEMENT GUIDELINES. CONTROLS TO MINIMIZE THE OFF-SITE TRANSPORT OF LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION MATERIALS INCLUDE: CONSTRUCTION MATERIALS TO BE STORED IN LOCATIONS THAT MINIMIZE THEIR EXPOSURE TO PRECIPITATION & STORM WATER RUNOFF; COLLECTION OF CONSTRUCTION DEBRIS IN RECEPTACLES WITH A SECURE COVER MEETING STATE AND LOCAL SOLID WASTE MANAGEMENT REGULATIONS; HAULING AND EMPTYING RECEPTACLES AT APPROVED LANDFILL SITES; PROHIBITING THE BURIAL OF CONSTRUCTION DEBRIS; COLLECTION OF SANITARY WASTE FROM PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATIONS BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

B. EROSION CONTROL AND STABILIZATION PRACTICES

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

T = TEMPORARY; P = PERMANENT

DATES:
1. MAJOR GRADING ACTIVITIES: SEE CONSTRUCTION SCHEDULE FOR THESE DATES
2. WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE: _____
3. WHEN STABILIZATION MEASURES ARE INITIATED: _____

INITIATE EROSION CONTROL AND STABILIZATION MEASURES IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. INITIATE STABILIZATION MEASURES THAT PROVIDE A PROTECTIVE COVER IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED. "IMMEDIATELY" MEANS NO LATER THAN THE NEXT WORK DAY FOLLOWING THE DAY WHEN THE SOIL-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. STABILIZATION MEASURES MUST BE COMPLETED NO MORE THAN 14 CALENDAR DAYS AFTER INITIATION BEGINS.

THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

C. SEDIMENT CONTROL PRACTICES

T	SILT FENCE	P	VEGETATIVE BUFFER STRIPS
T	OTHER (ROCK FILTER DAM)		

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

Site does not disturb 10 or more acres; therefore, sed. basin is not required.

THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

DESCRIPTION OF PERMANENT STORM WATER CONTROLS

PROVIDE A DESCRIPTION OF ANY MEASURES THAT WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL POLLUTANTS IN STORM WATER DISCHARGES THAT MAY OCCUR AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED: N/A

OTHER REQUIRED CONTROLS AND BMPS

TXDOT WILL UTILIZE ROCK AT CONSTRUCTION ENTRANCES AND SPRINKLING, AS NEEDED, TO MINIMIZE OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST.

SEE SECTION A ABOVE FOR DESCRIPTION OF CONSTRUCTION AND WASTE MATERIALS AND CONTROLS USED FOR THOSE THAT MAY BE STORED ON-SITE.

AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, FUELS, MOTOR OIL, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. STORE MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS. CONTACT THE SPILL COORDINATOR IMMEDIATELY IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS.

MAINTENANCE REQUIREMENTS

EFFECTIVELY MAINTAIN THE OPERATING CONDITIONS OF ALL EROSION AND SEDIMENT CONTROL AND OTHER PROTECTIVE MEASURES IDENTIFIED IN THE SWP3. IF SITE INSPECTIONS REQUIRED BY THIS PERMIT IDENTIFY BMP'S THAT ARE NOT OPERATING EFFECTIVELY, MAINTENANCE SHALL BE PERFORMED BEFORE THE NEXT ANTICIPATED STORM EVENT, OR AS NECESSARY TO MAINTAIN THE CONTINUED EFFECTIVENESS OF STORM WATER CONTROLS. IF MAINTENANCE PRIOR TO THE NEXT ANTICIPATED STORM EVENT IS UNPRACTICABLE, SCHEDULE AND ACCOMPLISH MAINTENANCE AS SOON AS PRACTICAL. CONTROLS THAT HAVE BEEN INTENTIONALLY DISABLED, RUN-OVER, REMOVED OR OTHERWISE RENDERED INEFFECTIVE MUST BE REPLACED OR CORRECTED IMMEDIATELY UPON DISCOVERY. IF A CONTROL HAS BEEN USED INCORRECTLY, IS PERFORMING INADEQUATELY OR IS DAMAGED, THE OPERATOR SHALL REPLACE OR MODIFY THE CONTROL AS SOON AS PRACTICABLE AFTER THE DISCOVERY.

INSPECTION OF CONTROLS

A) QUALIFIED PERSONNEL SHALL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE, ONCE EVERY 7 CALENDAR DAYS. DISTURBED AREAS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. SEDIMENT AND EROSION CONTROL MEASURES IDENTIFIED ON THE SWP3 SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING.

D) THE SWP3 MUST BE MODIFIED BASED ON THE RESULTS OF INSPECTION TO BETTER CONTROL POLLUTANTS IN RUNOFF. REVISIONS TO THE SWP3 MUST BE COMPLETED WITHIN 7 CALENDAR DAYS FOLLOWING THE INSPECTION. IF EXISTING BMPS ARE MODIFIED OR ADDITIONAL BMPS ARE NECESSARY, AN IMPLEMENTATION SCHEDULE MUST BE DESCRIBED IN THE SWP3. IMPLEMENTATION OF CHANGES SHOULD BE DONE PRIOR TO THE NEXT STORM EVENT IF POSSIBLE, OTHERWISE, THEY SHOULD BE DONE AS SOON AS PRACTICABLE.

E) A REPORT SUMMARIZING THE SCOPE, DATE, NAME AND QUALIFICATIONS OF INSPECTOR, AND MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE SWP3 SHALL BE PRODUCED AND RETAINED AS PART OF THE SWP3. MAJOR OBSERVATIONS INCLUDE: LOCATIONS OF DISCHARGES OF SEDIMENT OR OTHER POLLUTANTS FROM THE SITE, LOCATIONS OF BMPS THAT NEED TO BE MAINTAINED, LOCATIONS OF BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION AND LOCATIONS WHERE BMPS ARE NEEDED. ACTIONS TAKEN AS A RESULT OF INSPECTIONS MUST BE DESCRIBED WITHIN AND RETAINED AS PART OF THE SWP3. REPORTS MUST IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE. WHERE THE REPORT DOES NOT IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE, THE REPORT MUST CONTAIN A CERTIFICATION THAT THE SITE IS IN COMPLIANCE WITH THE SWP3 AND PERMIT.

OTHER SWP3 CONTENT

TXDOT WILL ENSURE THE APPROPRIATE POLLUTION PREVENTION MEASURES (I.E. VEGETATED BUFFER STRIPS, SILT FENCE, ETC.) ARE IDENTIFIED AND IMPLEMENTED FOR ALL ELIGIBLE NON-STORMWATER WATER COMPONENTS OF DISCHARGE SUCH AS WASHING OF VEHICLES, STRUCTURES, AND PAVEMENT WHERE SOAPS AND DETERGENTS ARE NOT USED AND THE PURPOSE IS TO REMOVE DIRT, MUD OR DUST; UNCONTAMINATED WATER USED FOR DUST CONTROL; AND LAWN WATERING AND SIMILAR IRRIGATION DRAINAGE.

CHECKLIST FOR CONTENTS OF AREA OFFICE SWP3 FILE:

- ☐ CONTACT FORM *
- ☐ NOI AND ACKNOWLEDGEMENT CERTIFICATE (IF EQUAL OR GREATER THAN 5 ACRES)
- ☐ APPLICABLE CONSTRUCTION SITE NOTICE *
- ☐ SWP3 CERTIFICATION STATEMENT (SIGNED BY AE)
- ☐ TPDES GENERAL PERMIT
- ☐ SWP3 PLAN
- ☐ INSPECTION AND MAINTENANCE REPORT
- ☐ INSPECTOR QUALIFICATION FORM
- ☐ DELEGATION OF SIGNATURE AUTHORITY (ALL INSPECTORS SIGNING REPORTS)
- ☐ NOTICE OF TERMINATION

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE71511446... 3/31/2022

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

ANY REPORTABLE QUANTITY OF HAZARDOUS MATERIAL RELEASE MUST BE REPORTED TO NATIONAL RESPONSE CENTER AT 1-800-424-8802 AND TO STATE OF TEXAS SPILL-REPORTING HOTLINE AT 1-800-832-8224

TXDOT SWP3 INDEX (SWP3I)

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		212

(REVISED OCTOBER 30, 2013)

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NOTES:
(1) THE PURPOSE OF THIS SHEET IS TO POINT THE USER TO THE APPROPRIATE LOCATIONS TO FIND THE REQUIRED CONTENT OF THE SWP3.
(2) THE PROJECT LIMITS SHOWN ON THE TITLE SHEET AND LIMITS OF TXDOT RIGHT OF WAY SHALL ALSO BE THE LIMITS OF COVERAGE OF THE SWP3.

PROJECT DESCRIPTION

A. NATURE OF ACTIVITY: For construction of safety improvement project along FM 3152. Consisting of improvement of guardrail to design standards and safety treat fixed objects.

B. POTENTIAL POLLUTANTS AND THEIR SOURCES:
Pollutant: Sediment , Source: Disturbed Soil
Pollutant: Oil and Grease , Source: Equipment and Vehicles

C. INTENDED SEQUENCE OF ACTIVITIES: SEE CONSTRUCTION SCHEDULE FOR ESTIMATED START DATES AND DURATION OF SOIL-DISTURBING ACTIVITIES

D. TOTAL AREA OF SITE: 63.22 ACRE AREA TO BE DISTURBED: 2.39 ACRE

E. DATA DESCRIBING THE SOIL OR QUALITY OF ANY DISCHARGE FROM THE SITE:
I.E. Sandy Loam, Clay Loam

F. GENERAL LOCATION MAP: SEE TITLE SHEET OF THE PROJECT PLANS

G. DETAILED SITE MAP/MAPS INDICATING THE FOLLOWING:
i. DRAINAGE PATTERNS: SEE SWP3 LAYOUTS
ii. ANTICIPATED SLOPES AFTER MAJOR GRADING ACTIVITIES: SEE TYPICAL SECTIONS
iii. AREAS WHERE SOIL DISTURBANCE WILL OCCUR: SEE SWP3 LAYOUTS
iv. LOCATIONS OF ALL CONTROLS OR BUFFERS (PLANNED/IN PLACE): SEE SWP3 LAYOUTS
v. LOCATIONS WHERE TEMPORARY OR PERMANENT STABILIZATION PRACTICES ARE EXPECTED TO BE USED: SEE SWP3 LAYOUTS
vi. LOCATION OF CONSTRUCTION SUPPORT ACTIVITIES: SEE SWP3 LAYOUTS
vii. SURFACE WATERS, INCLUDING WETLANDS, AT, ADJACENT, OR IN CLOSE PROXIMITY TO THE SITE (* INDICATES IMPAIRED WATERS): SEE SWP3 LAYOUTS
viii. LOCATIONS WHERE STORMWATER DISCHARGES DIRECTLY TO A SURFACE WATER BODY OR MS4: SEE SWP3 LAYOUTS
ix. VEHICLE WASH AREAS: N/A
x. DESIGNATED POINTS ON THE SITE WHERE VEHICLES WILL EXIT FROM UNSTABLE DIRT TO PAVED ROAD: See SWP3 (Construction Exits)

H. LOCATION AND DESCRIPTION OF CONSTRUCTION SUPPORT ACTIVITIES AUTHORIZED UNDER THE PERMITTEE'S NOI: CONSTRUCTION SUPPORT ACTIVITIES ARE NOT COVERED UNDER THIS SWP3 AS IT IS NOT AUTHORIZED UNDER THIS PERMITTEE'S CGP. THE PERMITTEE WILL MAKE REFERENCE TO CONSTRUCTION SUPPORT ACTIVITIES THAT ARE COVERED UNDER THE CONTRACTOR'S SWP3 AND CGP ON SWP3 LAYOUTS

I. NAME OF RECEIVING WATER(S) AT OR NEAR SITE:
AN ASTERISK (*) INDICATES AN IMPAIRED WATER
Mainer Branch, unnamed tributaries to Sandy Creek, and unnamed tributaries to Rocky Creek
NEAREST CLASSIFIED SEGMENT NUMBER: 0803
CLASSIFIED SEGMENT NAME: Lake Livingston

J. COPY OF TPDES GENERAL PERMIT: SEE SWP3 FILE

K. NOI AND ACKNOWLEDGEMENT CERTIFICATE OR SITE NOTICE: SEE SWP3 FILE

L. STORMWATER AND ALLOWABLE NON-STORMWATER DISCHARGE LOCATIONS: SEE SWP3 LAYOUTS

M. LOCATIONS OF POLLUTANT GENERATING ACTIVITIES: ACTIVITIES AUTHORIZED UNDER THIS PERMITTEE'S CGP CAN BE FOUND ON SWP3 LAYOUTS. THIS SHEET WILL ALSO REFERENCE THE LOCATION OF POLLUTANT GENERATING ACTIVITIES THAT ARE COVERED BY THE CONTRACTOR'S CGP AND SWP3.

DESCRIPTION OF BMPS

A. GENERAL REQUIREMENTS: EROSION AND SEDIMENT CONTROLS SHOWN ON SWP3 LAYOUTS WERE DESIGNED TO RETAIN SEDIMENT ON-SITE TO THE EXTENT PRACTICABLE WITH CONSIDERATION OF LOCAL TOPOGRAPHY, SOIL TYPE, AND RAINFALL. THE EROSION AND SEDIMENT CONTROLS WILL BE INSTALLED AND MAINTAINED ACCORDING TO MANUFACTURER AND TXDOT STORM WATER MANAGEMENT GUIDELINES. CONTROLS TO MINIMIZE THE OFF-SITE TRANSPORT OF LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION MATERIALS INCLUDE: CONSTRUCTION MATERIALS TO BE STORED IN LOCATIONS THAT MINIMIZE THEIR EXPOSURE TO PRECIPITATION & STORM WATER RUNOFF; COLLECTION OF CONSTRUCTION DEBRIS IN RECEPTACLES WITH A SECURE COVER MEETING STATE AND LOCAL SOLID WASTE MANAGEMENT REGULATIONS; HAULING AND EMPTYING RECEPTACLES AT APPROVED LANDFILL SITES; PROHIBITING THE BURIAL OF CONSTRUCTION DEBRIS; COLLECTION OF SANITARY WASTE FROM PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATIONS BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

B. EROSION CONTROL AND STABILIZATION PRACTICES

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

DATES:
1. MAJOR GRADING ACTIVITIES: SEE CONSTRUCTION SCHEDULE FOR THESE DATES
2. WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE: _____
3. WHEN STABILIZATION MEASURES ARE INITIATED: _____

INITIATE EROSION CONTROL AND STABILIZATION MEASURES IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. INITIATE STABILIZATION MEASURES THAT PROVIDE A PROTECTIVE COVER IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED. "IMMEDIATELY" MEANS NO LATER THAN THE NEXT WORK DAY FOLLOWING THE DAY WHEN THE SOIL-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. STABILIZATION MEASURES MUST BE COMPLETED NO MORE THAN 14 CALENDAR DAYS AFTER INITIATION BEGINS.

THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

C. SEDIMENT CONTROL PRACTICES

T	SILT FENCE	P	VEGETATIVE BUFFER STRIPS
T	OTHER (ROCK FILTER DAM)		

IF SITE WILL DISTURB 10 OR MORE ACRES WITHIN A COMMON DRAINAGE LOCATION AND A SEDIMENTATION BASIN IS NOT FEASIBLE, PROVIDE REASON:
Site does not disturb 10 or more acres; therefore, sed. basin is not required.

THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

DESCRIPTION OF PERMANENT STORM WATER CONTROLS

PROVIDE A DESCRIPTION OF ANY MEASURES THAT WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL POLLUTANTS IN STORM WATER DISCHARGES THAT MAY OCCUR AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED: N/A

OTHER REQUIRED CONTROLS AND BMPS

TXDOT WILL UTILIZE ROCK AT CONSTRUCTION ENTRANCES AND SPRINKLING, AS NEEDED, TO MINIMIZE OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST.

SEE SECTION A ABOVE FOR DESCRIPTION OF CONSTRUCTION AND WASTE MATERIALS AND CONTROLS USED FOR THOSE THAT MAY BE STORED ON-SITE.

AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, FUELS, MOTOR OIL, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. STORE MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS. CONTACT THE SPILL COORDINATOR IMMEDIATELY IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS.

MAINTENANCE REQUIREMENTS

EFFECTIVELY MAINTAIN THE OPERATING CONDITIONS OF ALL EROSION AND SEDIMENT CONTROL AND OTHER PROTECTIVE MEASURES IDENTIFIED IN THE SWP3. IF SITE INSPECTIONS REQUIRED BY THIS PERMIT IDENTIFY BMP'S THAT ARE NOT OPERATING EFFECTIVELY, MAINTENANCE SHALL BE PERFORMED BEFORE THE NEXT ANTICIPATED STORM EVENT, OR AS NECESSARY TO MAINTAIN THE CONTINUED EFFECTIVENESS OF STORM WATER CONTROLS. IF MAINTENANCE PRIOR TO THE NEXT ANTICIPATED STORM EVENT IS UNPRACTICABLE, SCHEDULE AND ACCOMPLISH MAINTENANCE AS SOON AS PRACTICAL. CONTROLS THAT HAVE BEEN INTENTIONALLY DISABLED, RUN-OVER, REMOVED OR OTHERWISE RENDERED INEFFECTIVE MUST BE REPLACED OR CORRECTED IMMEDIATELY UPON DISCOVERY. IF A CONTROL HAS BEEN USED INCORRECTLY, IS PERFORMING INADEQUATELY OR IS DAMAGED, THE OPERATOR SHALL REPLACE OR MODIFY THE CONTROL AS SOON AS PRACTICABLE AFTER THE DISCOVERY.

INSPECTION OF CONTROLS

A) QUALIFIED PERSONNEL SHALL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE, ONCE EVERY 7 CALENDAR DAYS. DISTURBED AREAS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. SEDIMENT AND EROSION CONTROL MEASURES IDENTIFIED ON THE SWP3 SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING.

D) THE SWP3 MUST BE MODIFIED BASED ON THE RESULTS OF INSPECTION TO BETTER CONTROL POLLUTANTS IN RUNOFF. REVISIONS TO THE SWP3 MUST BE COMPLETED WITHIN 7 CALENDAR DAYS FOLLOWING THE INSPECTION. IF EXISTING BMPS ARE MODIFIED OR ADDITIONAL BMPS ARE NECESSARY, AN IMPLEMENTATION SCHEDULE MUST BE DESCRIBED IN THE SWP3. IMPLEMENTATION OF CHANGES SHOULD BE DONE PRIOR TO THE NEXT STORM EVENT IF POSSIBLE, OTHERWISE, THEY SHOULD BE DONE AS SOON AS PRACTICABLE.

E) A REPORT SUMMARIZING THE SCOPE, DATE, NAME AND QUALIFICATIONS OF INSPECTOR, AND MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE SWP3 SHALL BE PRODUCED AND RETAINED AS PART OF THE SWP3. MAJOR OBSERVATIONS INCLUDE: LOCATIONS OF DISCHARGES OF SEDIMENT OR OTHER POLLUTANTS FROM THE SITE, LOCATIONS OF BMPS THAT NEED TO BE MAINTAINED, LOCATIONS OF BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION AND LOCATIONS WHERE BMPS ARE NEEDED. ACTIONS TAKEN AS A RESULT OF INSPECTIONS MUST BE DESCRIBED WITHIN AND RETAINED AS PART OF THE SWP3. REPORTS MUST IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE. WHERE THE REPORT DOES NOT IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE, THE REPORT MUST CONTAIN A CERTIFICATION THAT THE SITE IS IN COMPLIANCE WITH THE SWP3 AND PERMIT.

OTHER SWP3 CONTENT

TXDOT WILL ENSURE THE APPROPRIATE POLLUTION PREVENTION MEASURES (I.E. VEGETATED BUFFER STRIPS, SILT FENCE, ETC.) ARE IDENTIFIED AND IMPLEMENTED FOR ALL ELIGIBLE NON-STORMWATER WATER COMPONENTS OF DISCHARGE SUCH AS WASHING OF VEHICLES, STRUCTURES, AND PAVEMENT WHERE SOAPS AND DETERGENTS ARE NOT USED AND THE PURPOSE IS TO REMOVE DIRT, MUD OR DUST; UNCONTAMINATED WATER USED FOR DUST CONTROL; AND LAWN WATERING AND SIMILAR IRRIGATION DRAINAGE.

CHECKLIST FOR CONTENTS OF AREA OFFICE SWP3 FILE:

- ☐ CONTACT FORM *
- ☐ NOI AND ACKNOWLEDGEMENT CERTIFICATE (IF EQUAL OR GREATER THAN 5 ACRES)
- ☐ APPLICABLE CONSTRUCTION SITE NOTICE *
- ☐ SWP3 CERTIFICATION STATEMENT (SIGNED BY AE)
- ☐ TPDES GENERAL PERMIT
- ☐ SWP3 PLAN
- ☐ INSPECTION AND MAINTENANCE REPORT
- ☐ INSPECTOR QUALIFICATION FORM
- ☐ DELEGATION OF SIGNATURE AUTHORITY (ALL INSPECTORS SIGNING REPORTS)
- ☐ NOTICE OF TERMINATION

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE71511446...3/31/2022

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

ANY REPORTABLE QUANTITY OF HAZARDOUS MATERIAL RELEASE MUST BE REPORTED TO NATIONAL RESPONSE CENTER AT 1-800-424-8802 AND TO STATE OF TEXAS SPILL-REPORTING HOTLINE AT 1-800-832-8224

TXDOT SWP3 INDEX (SWP3I)

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		213

(REVISED OCTOBER 30, 2013)

3/30/2022 11:44:59 PM
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DATE: 3/30/2022 11:45:04 PM
FILE: c:\txdot\pw_online\txdot3\adrian.guerrero\d0313729\0336-03-072,etc_ EPIC(1 of 2).dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. N/A

[ ] No Action Required [X] Required Action

Action No.

1. Prevent Stormwater Pollution by controlling erosion and sedimentation in accordance to TPDES CGP Permit TXR150000.
2. Comply with SWP3 site plan and revise when necessary to control pollution or required by Engineer.
3. CSJ: 2891-01-018 FM 2864; 3220-01-013 FM 3152: This project area has a soil disturbance of 1 acre or more, but less than 5 acres. Posting of Small Construction Site Notice with SWP3 info on or near site accessible to the public and TCEQ, EPA or other inspectors.
4. CSJ: 0336-03-072 SH 103: This project area has a soil disturbance of 5 acres or more. Posting of Large Construction Site Notice with 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

[X] Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

[ ] Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

[ ] Individual 404 Permit Required

[ ] Other Nationwide Permit Required: NWP#

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1. CSJ: 3220-01-013 FM 3152 contains Mainer Branch and various unnamed tributaries.
2. CSJ: 1678-02-007 FM 2971 contains Travis Branch, Jack Creek, Housen Bayou, and various unnamed tributaries.
3. CSJ: 2891-01-018 FM 2864 contains Bayou La Nana, Telesco Creek, Cedar Branch, Rider Branch, and various unnamed tributaries.
4. CSJ: 0336-03-076 SH 103 contains Durham Creek, McAdam Spring Branch, Bodan Creek, Rowan Creek, Conner Spring Branch, Crawford Creek, Jack Creek, and various unnamed tributaries.
5. Refer to EPIC 2 of 2 for Nationwide Permit #14 non-PCN requirements for work activities, stream flow, and conditions.
6. Work activities MUST be conducted within the existing ROW.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
[ ] Temporary Vegetation	[X] Silt Fence	[ ] Vegetative Filter Strips
[X] Blankets/Matting	[X] Rock Berm	[ ] Retention/Irrigation Systems
[ ] Mulch	[ ] Triangular Filter Dike	[ ] Extended Detention Basin
[X] 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	[X] 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.

[X] No Action Required [ ] Required Action

Action No.

1. N/A

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

[X] No Action Required [ ] Required Action

Action No.

1. N/A

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

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately.

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

[ ] No Action Required [X] Required Action

Action No.

1. CSJ: 2891-01-018 FM 2864: Sabine shinner, Mississippi silvery minnow, and Blackspot shinner may occur in the project area.

2. Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.

3. 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 construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

[ ] Yes [X] 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:

[X] No Action Required [ ] Required Action

Action No.

1. N/A

VII. OTHER ENVIRONMENTAL ISSUES

CSJ: 1678-02-007: A portion of FM 2971 is within the Sabine National Forest (SNF) between stations STA 43+36.00 and STA 54+15.00. The following actions area required:

[ ] No Action Required [X] Required Action

Action No.

1. Area Engineer shall notify Sabine National Forest prior to starting work in this location.
2. NO tree removal or limbing shall occur in this location without the approval from the Area Engineer and Sabine National Forest.
3. NO stockpiling of materials or storage of equipment within the Sabine National Forest limits provided above.

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
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0336	03	072,ETC	SH 103,ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		214

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
REVISIONS	0336	03	072, ETC	SH 103, ETC
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.
05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	LFK	ANGELINA, ETC		215

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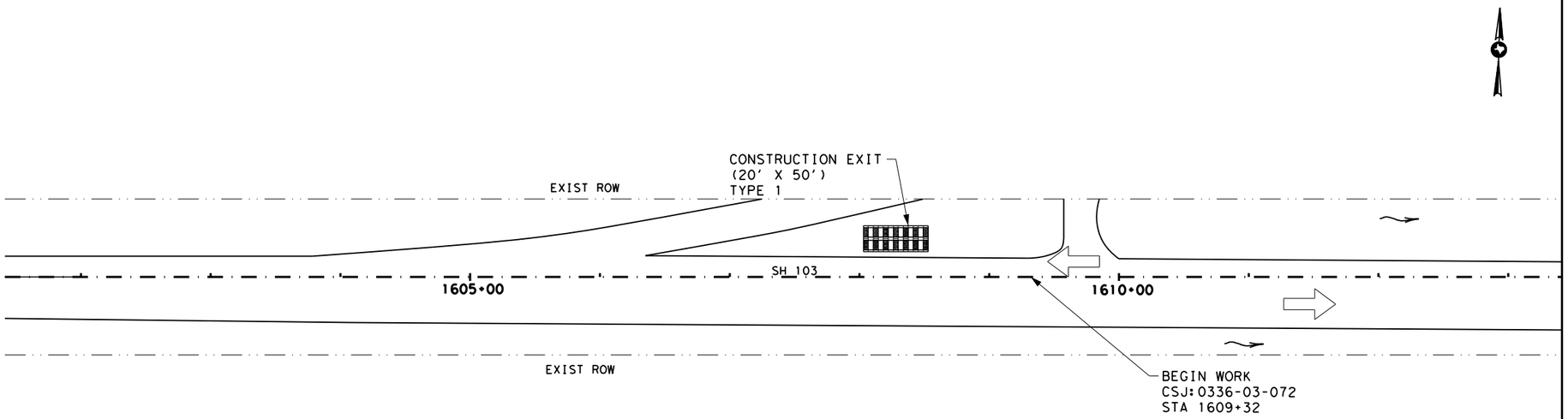
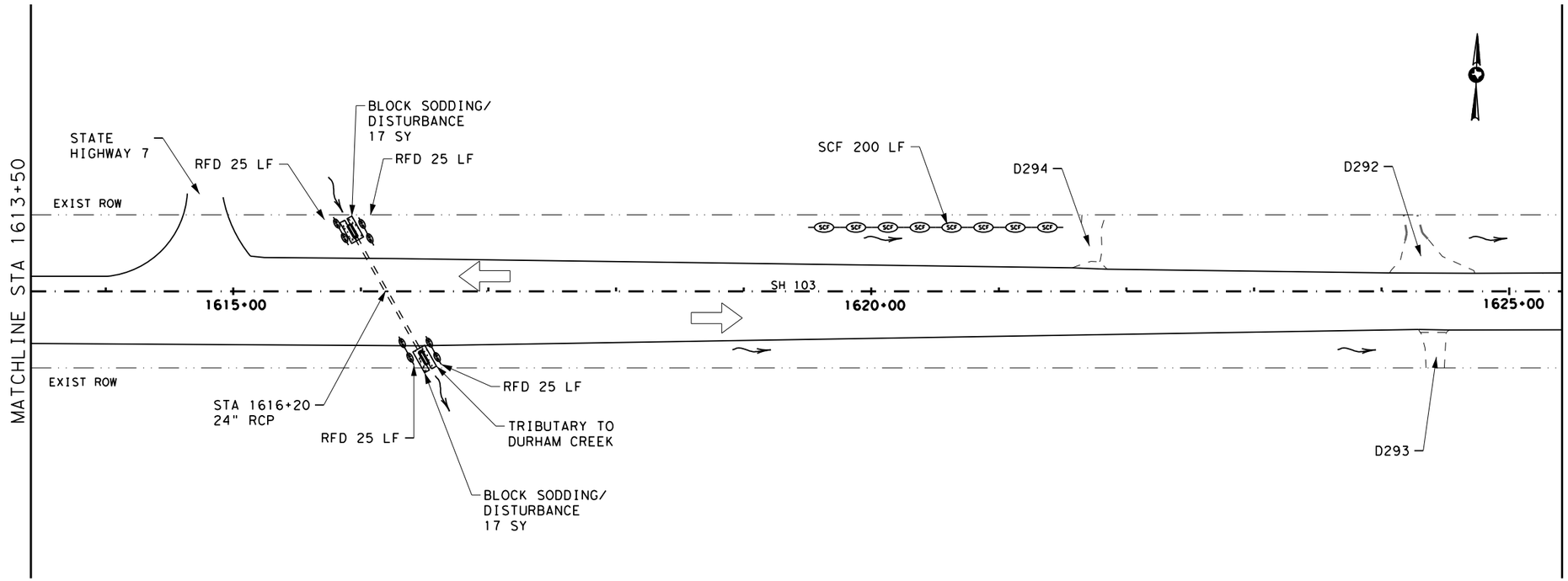


LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER

BSD BLOCK SODDING/DISTURBANCE (ASSUMED FOR BOTH SIDES OF PIPE UNLESS OTHERWISE NOTED)

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



SCALE 1" = 100'

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE715144...
3/31/2022

SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		216

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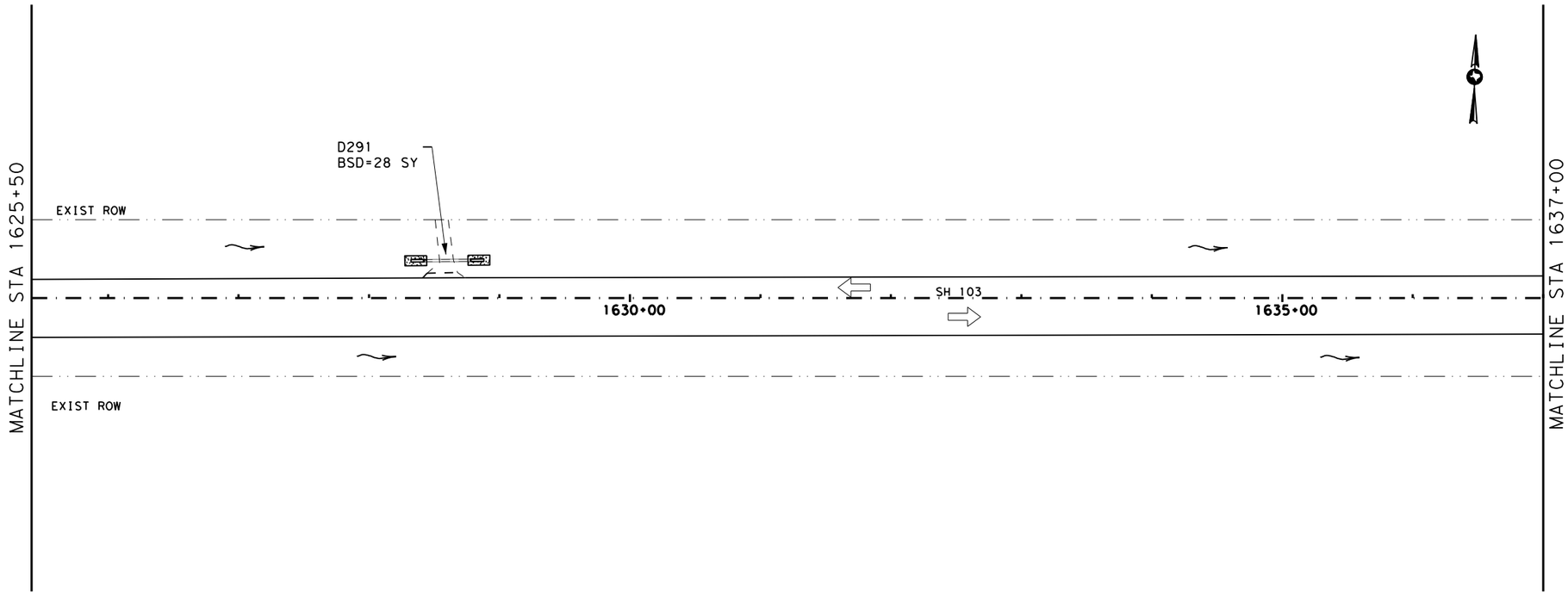

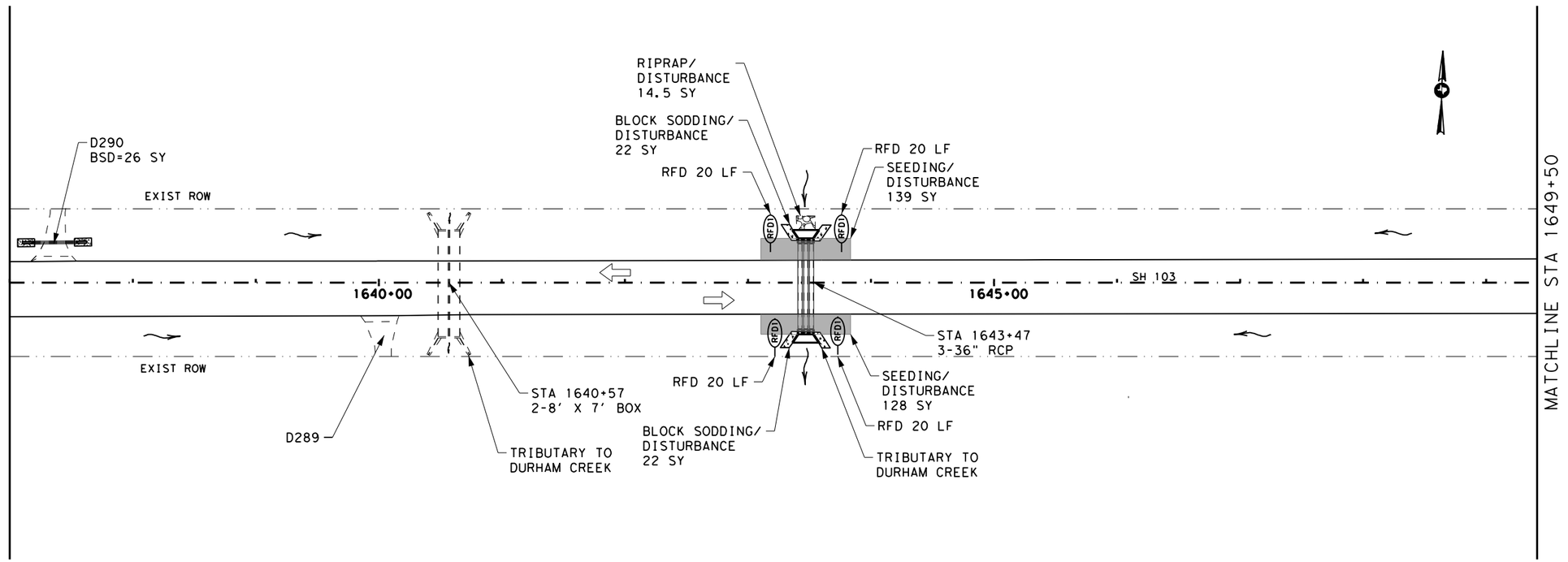

LEGEND

- ROCK FILTER DAM (TY 2) (RFD2)
- SEDIMENT CONT FENCE (SCF)
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
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3/31/2022
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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 2 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		217

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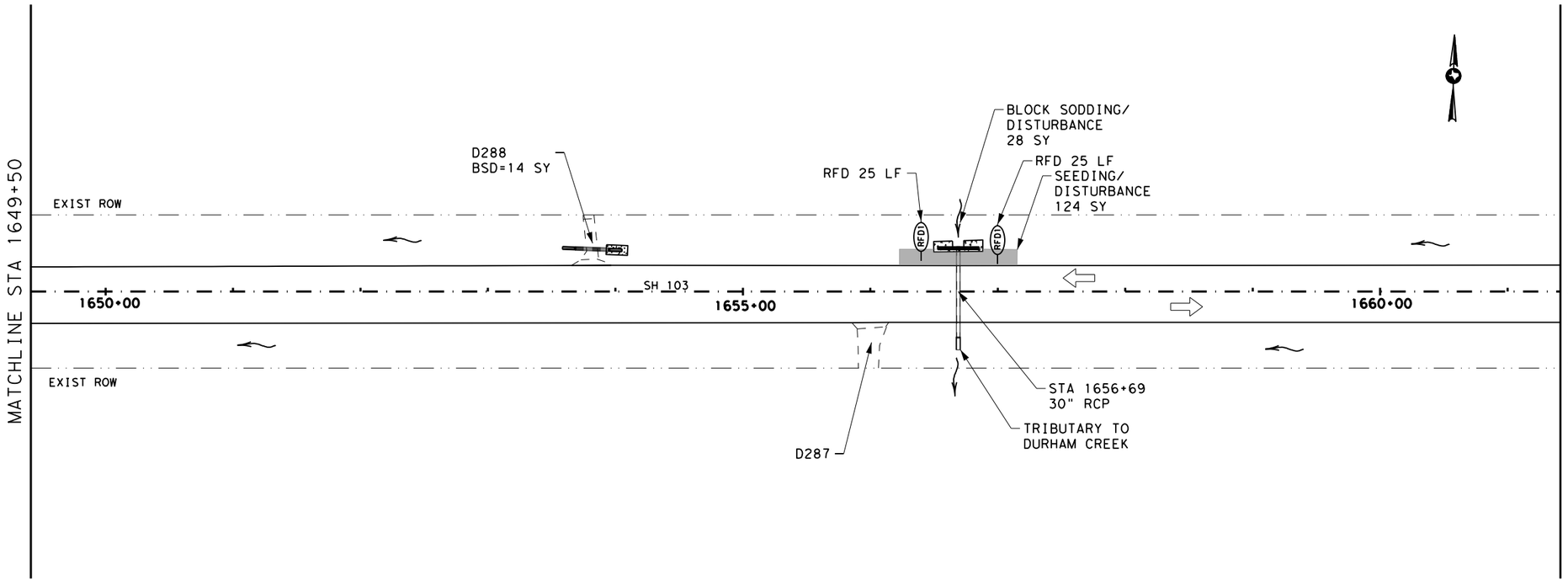

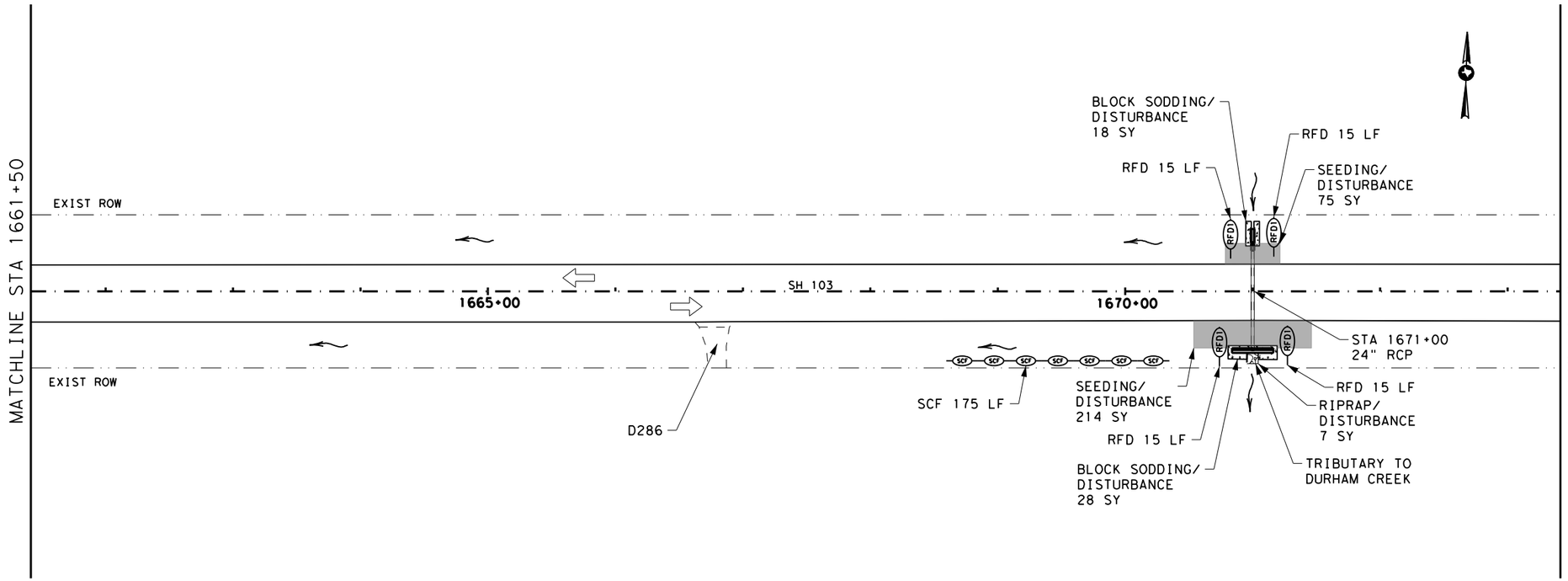

LEGEND

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Elizabeth Ortego, P.E.
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3/31/2022

SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 3 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		218

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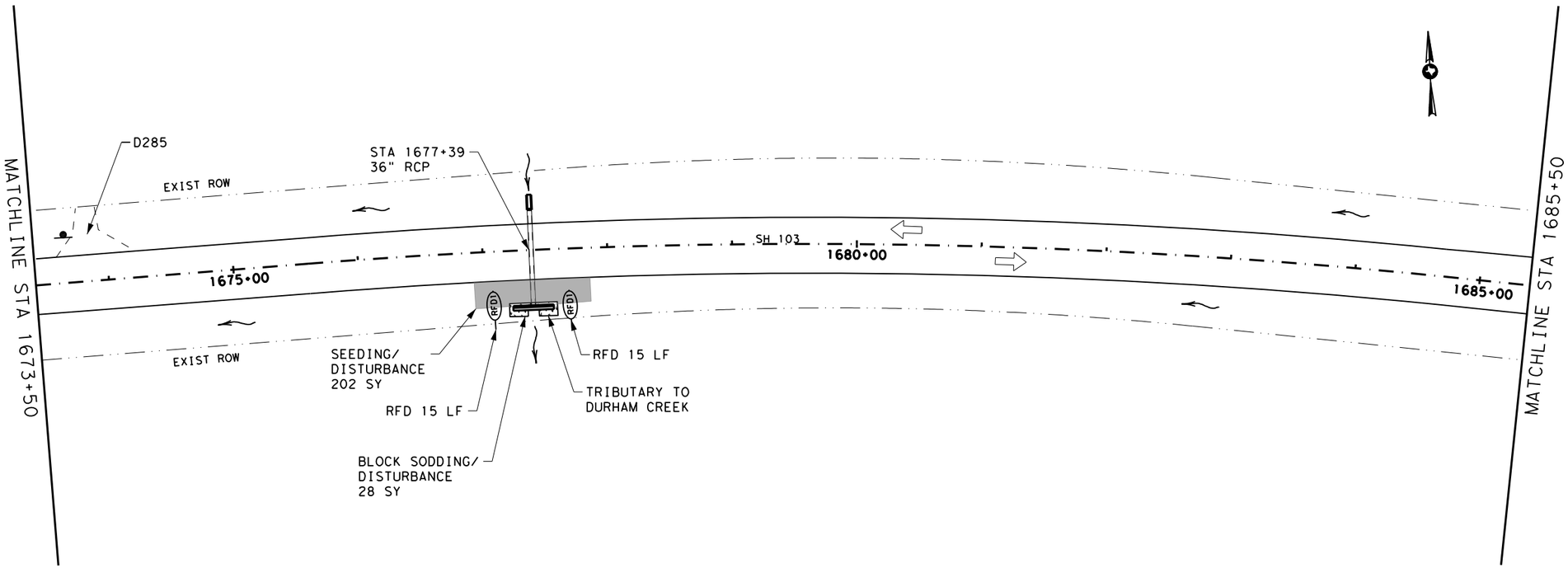

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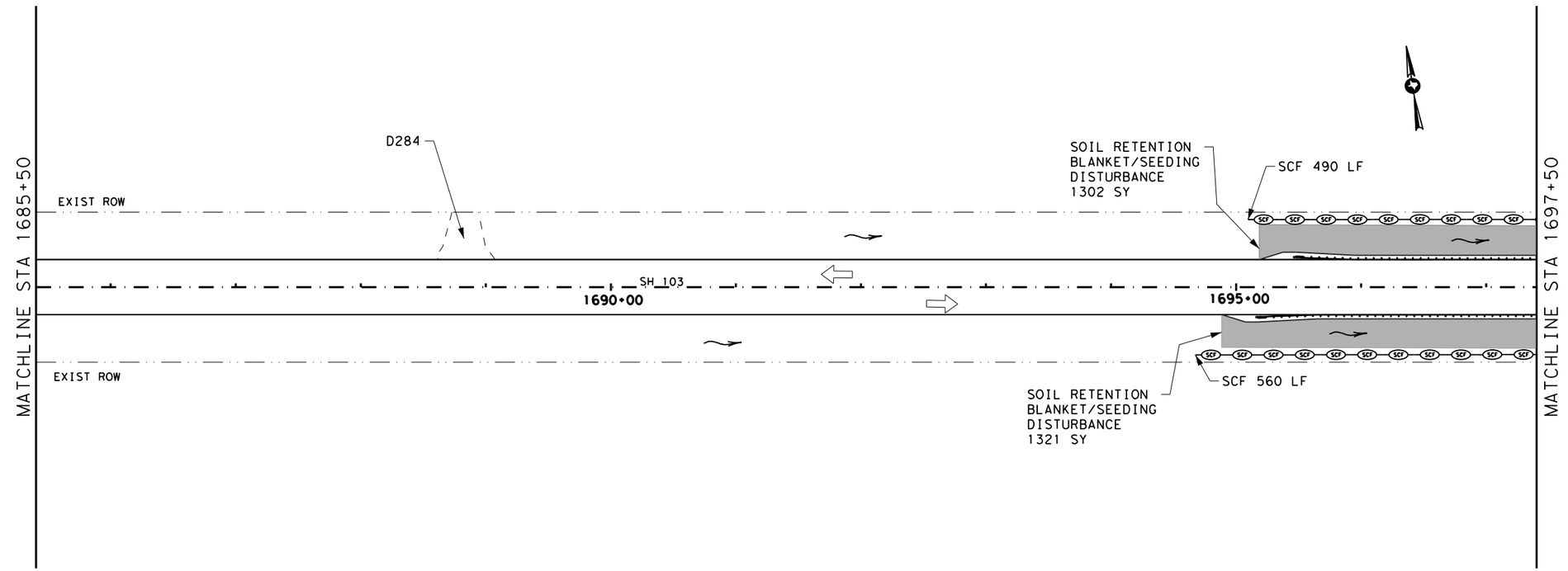

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STATE OF TEXAS
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3/31/2022

SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 4 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		219

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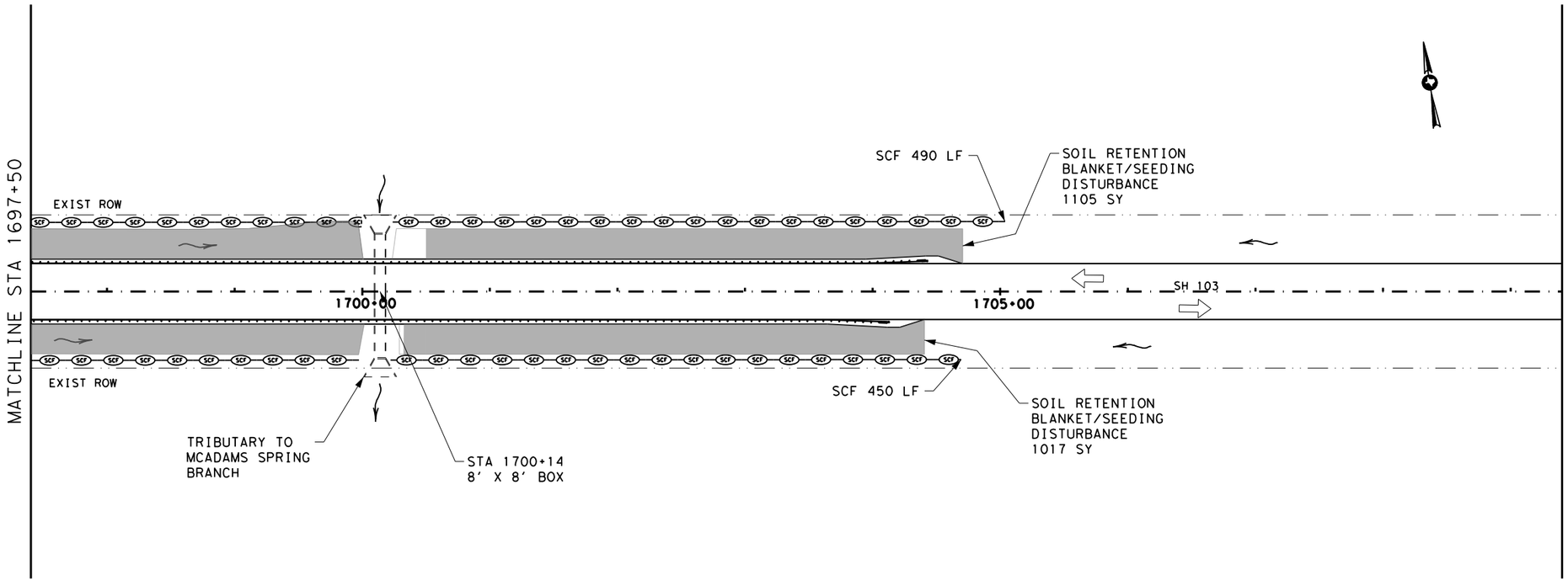

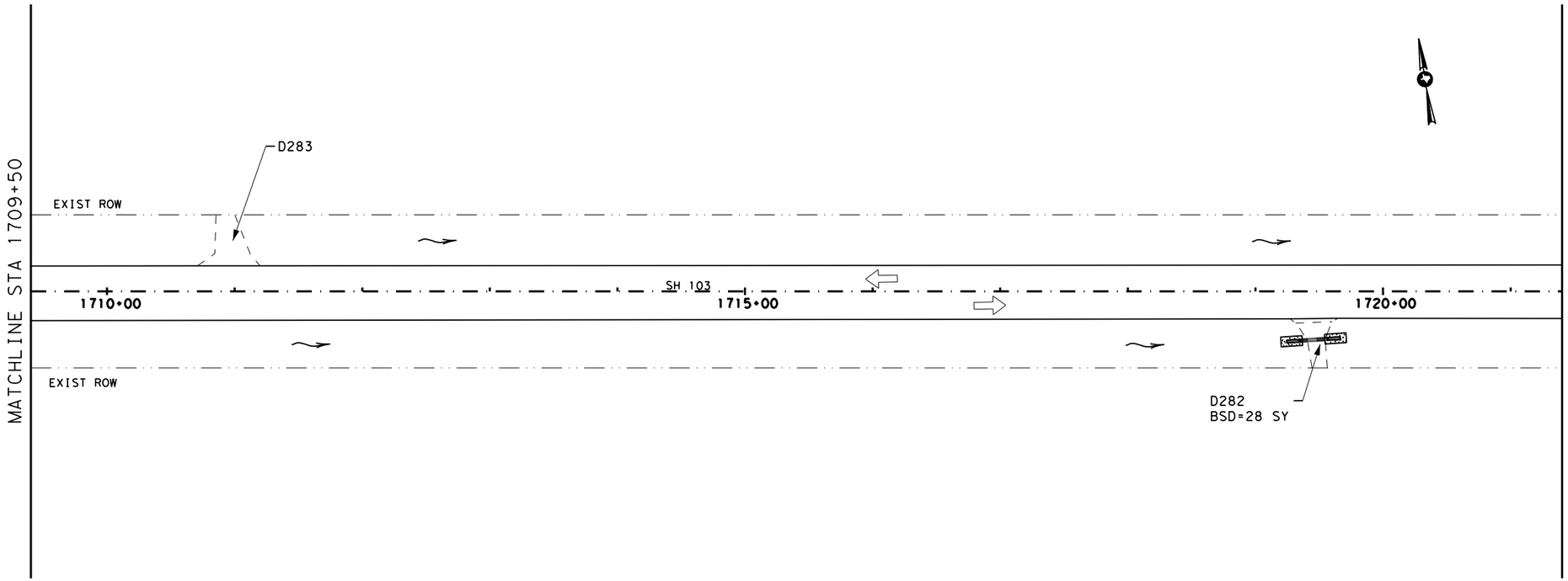

LEGEND

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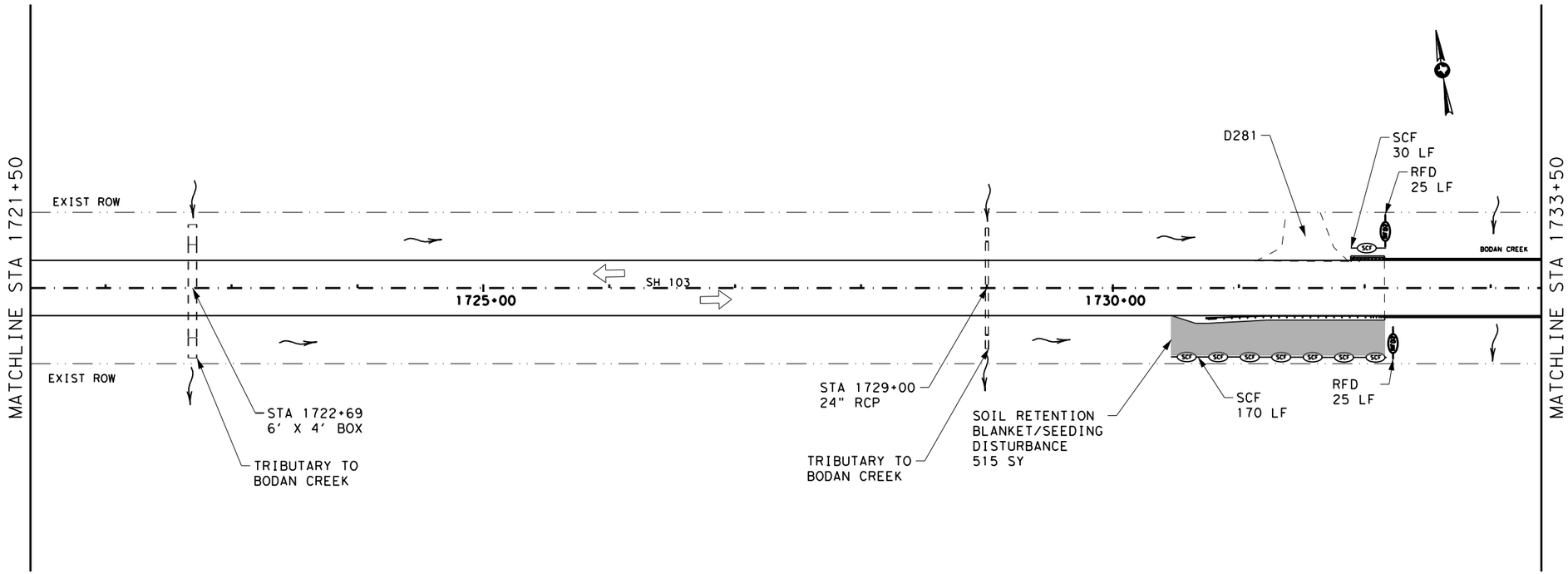
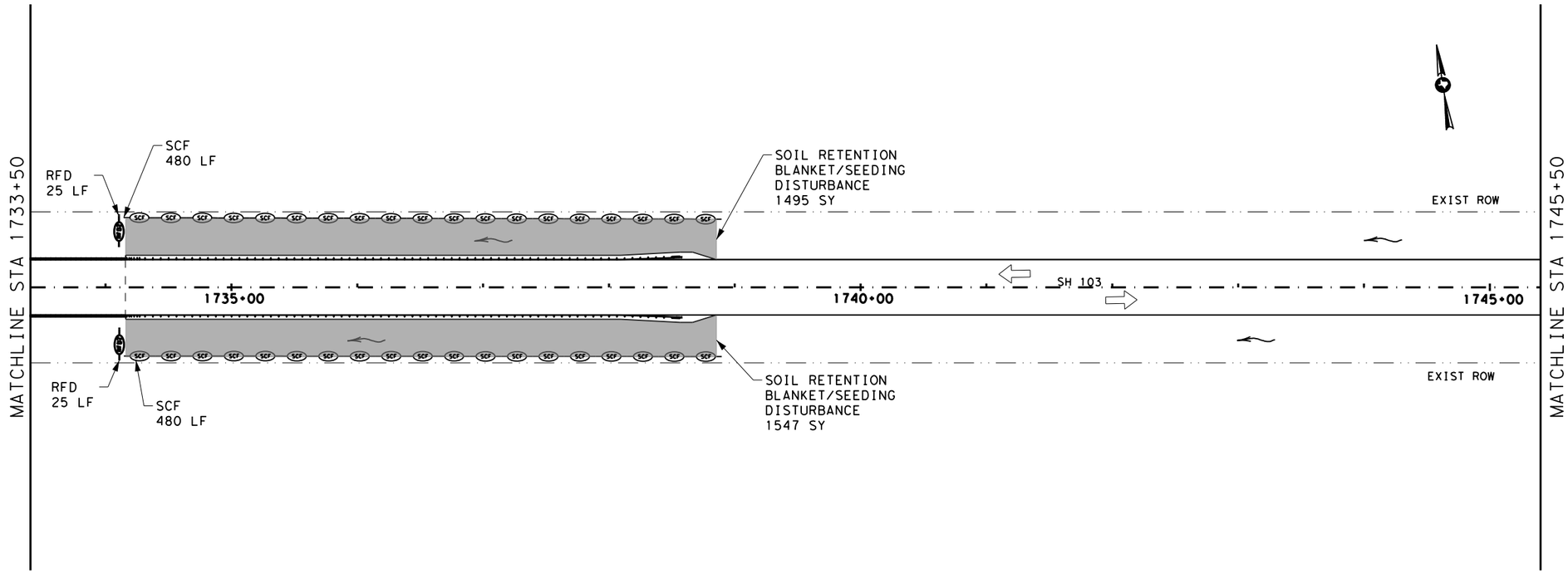
SWP3 LAYOUTS (SH 103)

SHEET 5 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		220





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STATE OF TEXAS
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3/31/2022

SWP3 LAYOUTS (SH 103)

SHEET 6 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		221

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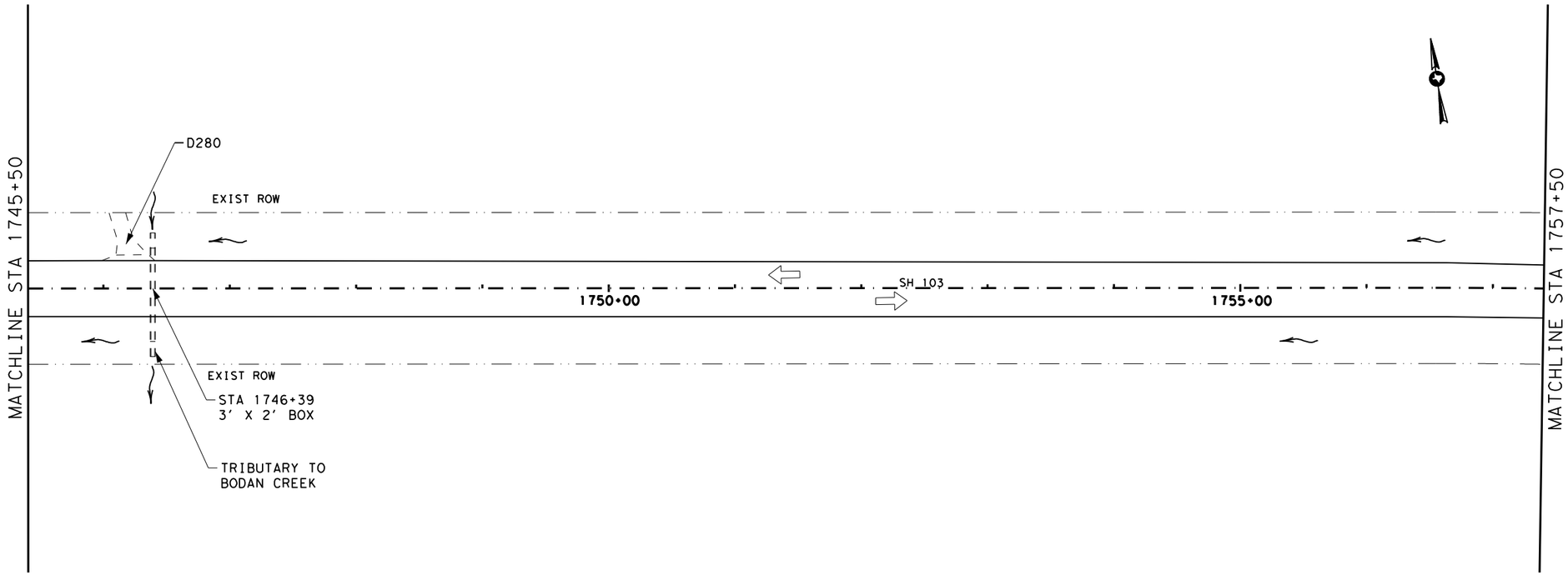

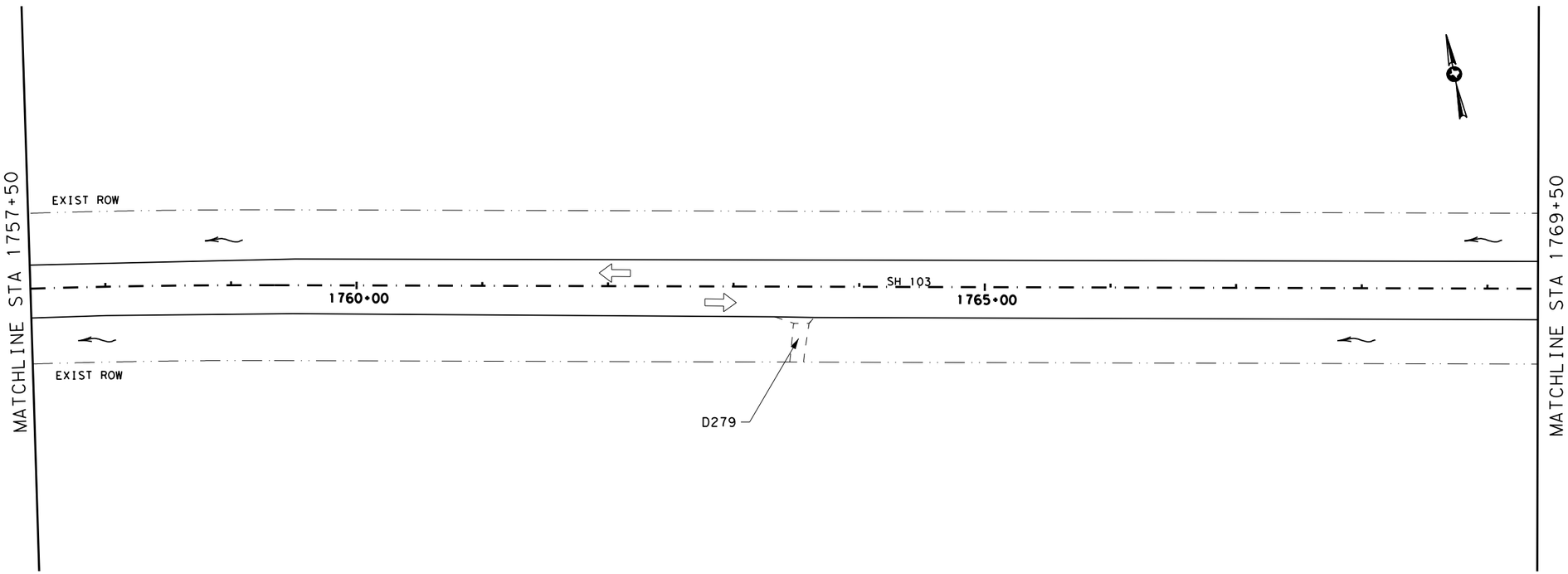

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1B27AAE7151448...
3/31/2022

SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 7 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		222

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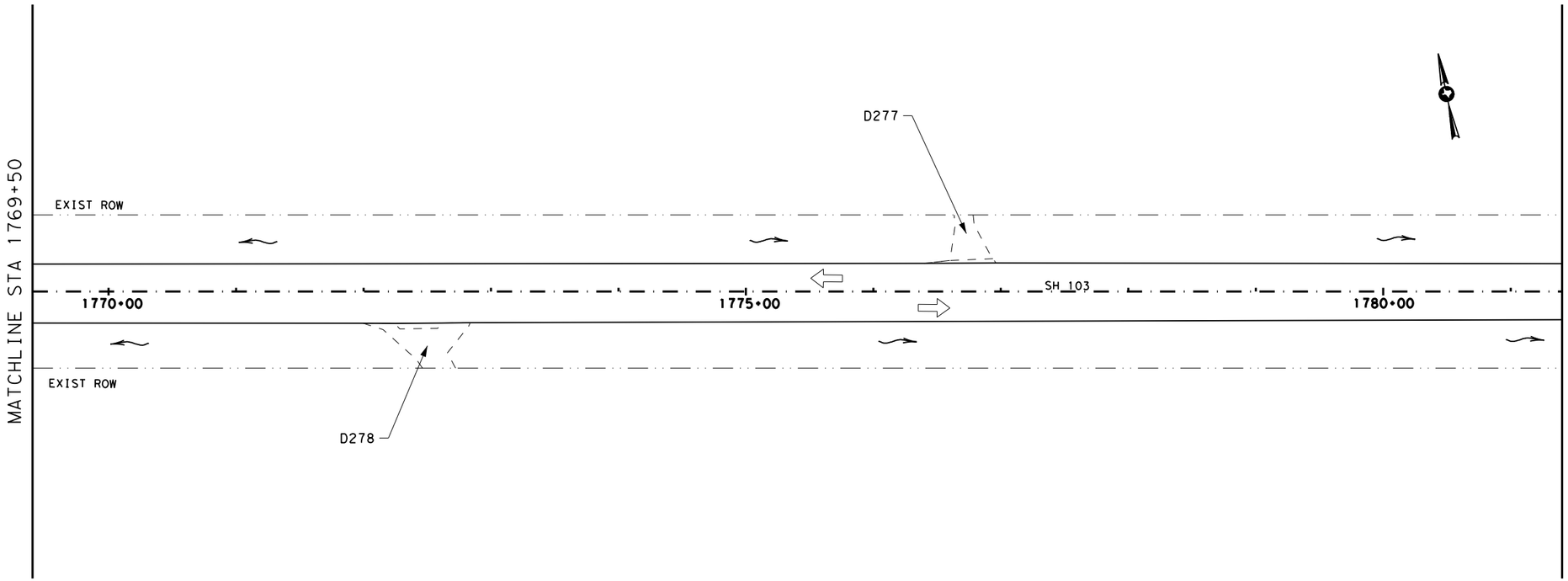

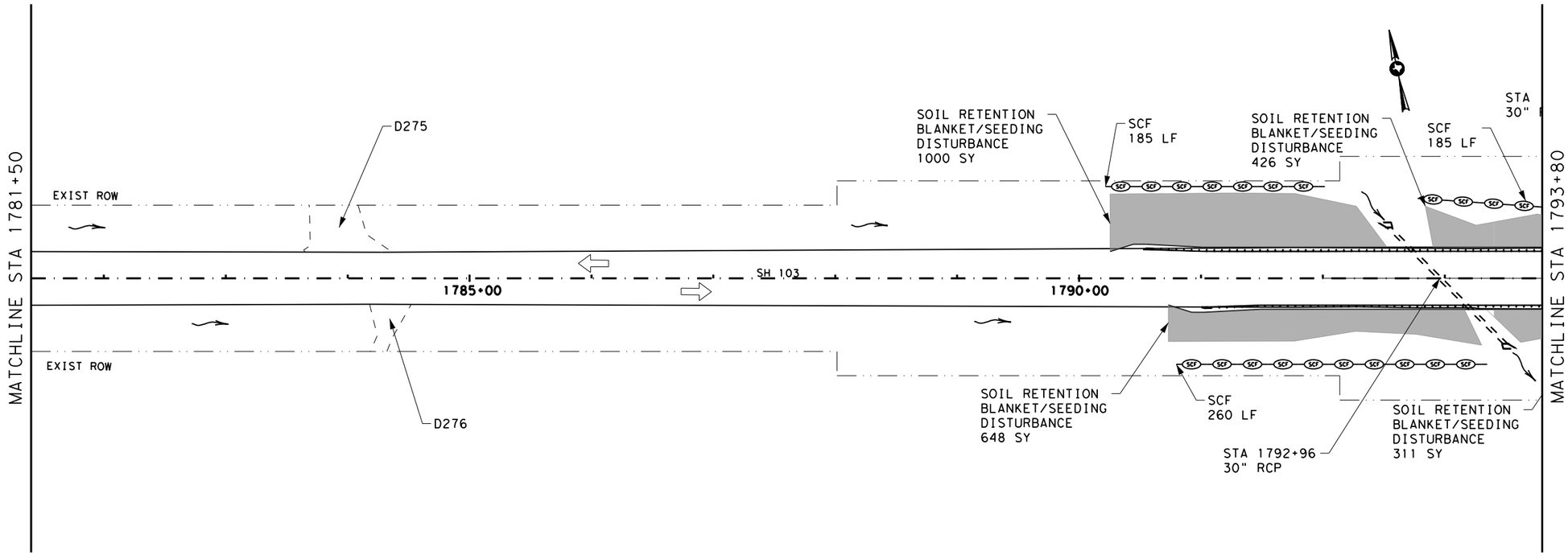

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SCALE 1" = 100'

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7151144B...
3/31/2022

SWP3 LAYOUTS (SH 103)

SHEET 8 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		223

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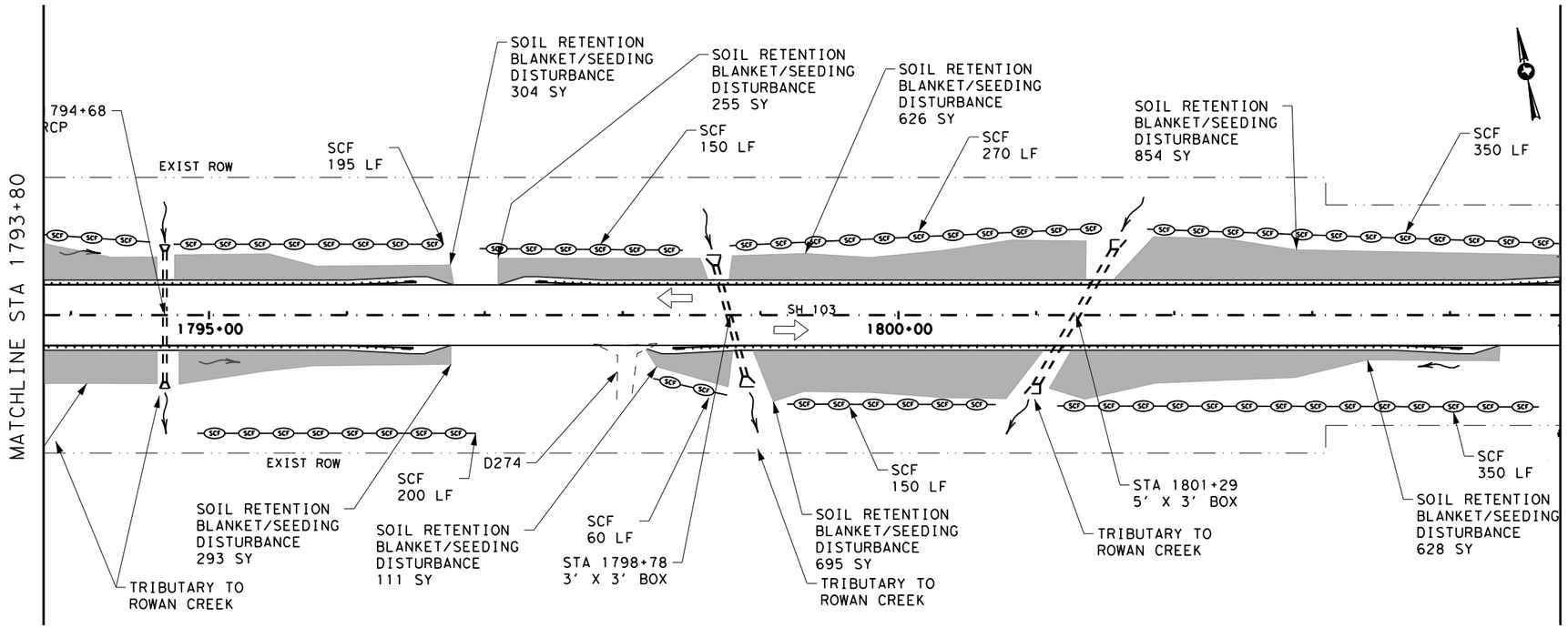

LEGEND

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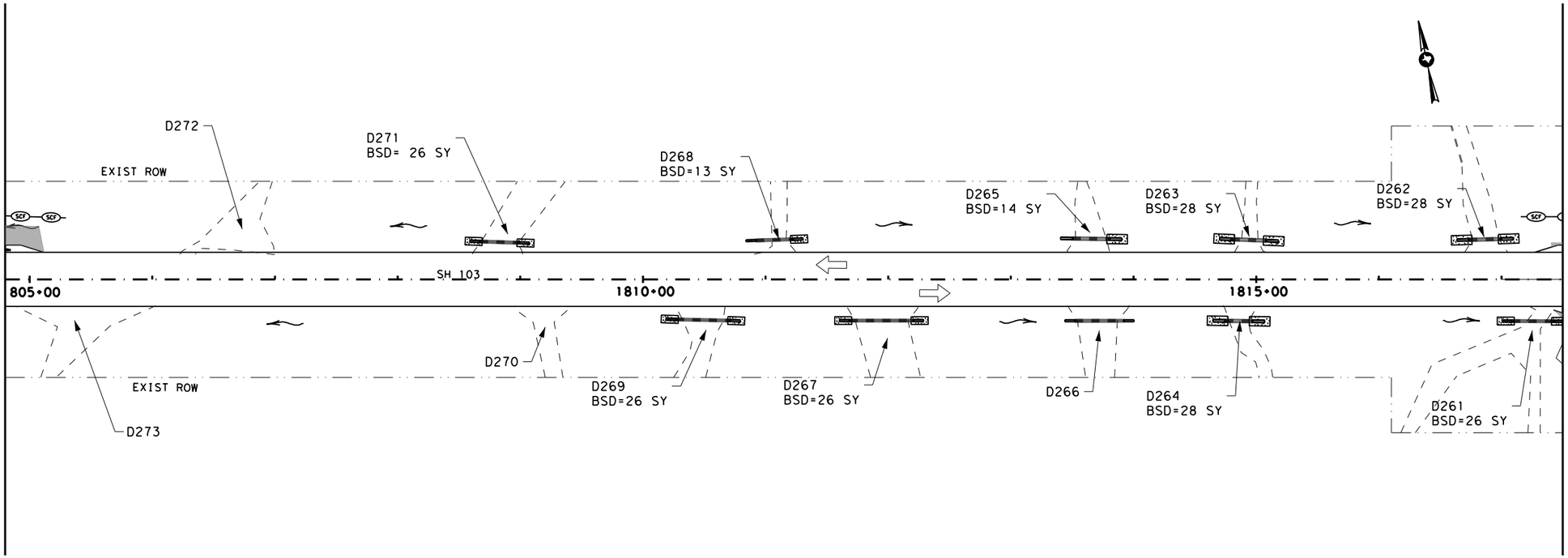

SCALE 1" = 100'

STATE OF TEXAS
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Elizabeth Ortego, P.E.
1B27AAE715144A8...
3/31/2022

SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 9 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		224

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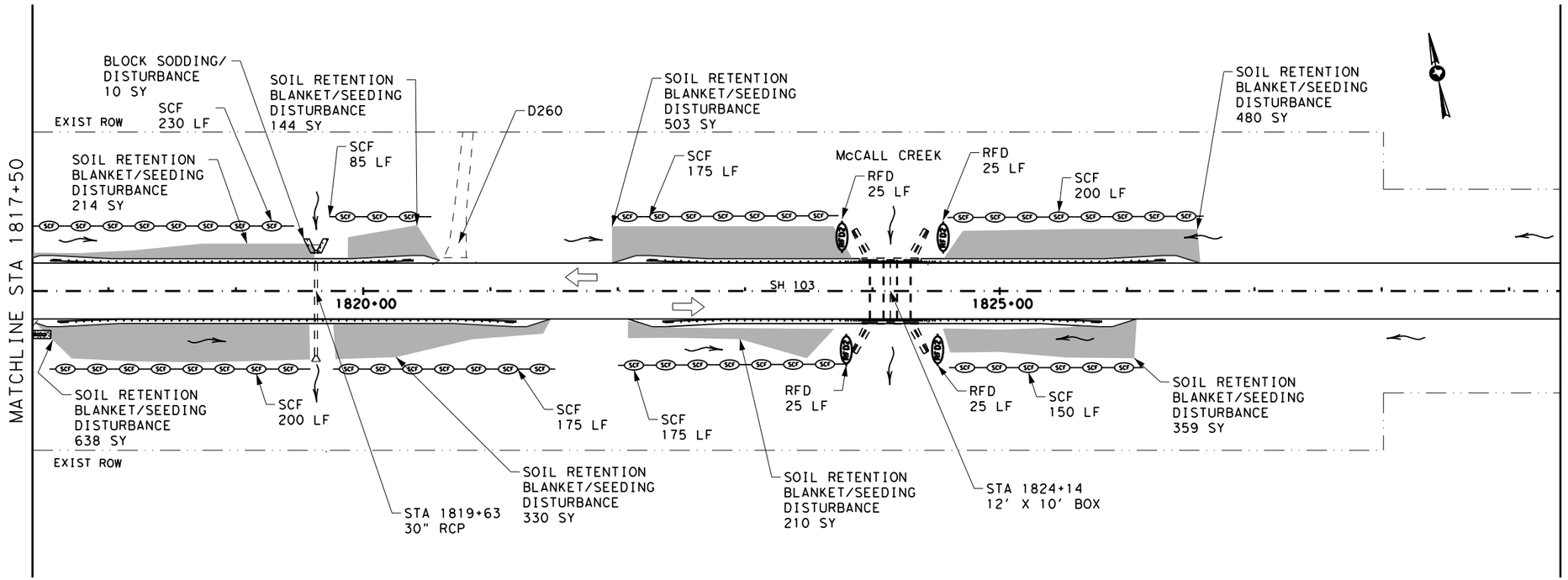

LEGEND

- ROCK FILTER DAM (TY 2)
- SEDIMENT CONT FENCE
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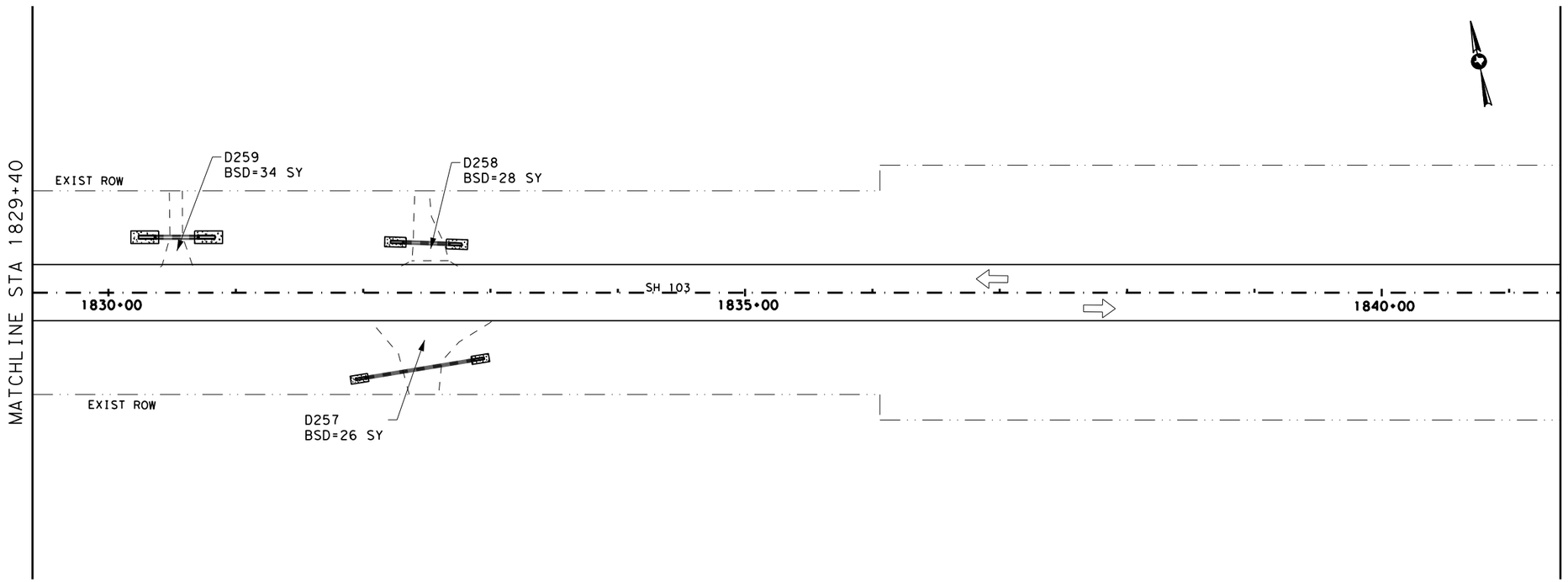

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1B27AAE7151144B...
3/31/2022

SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 10 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		225

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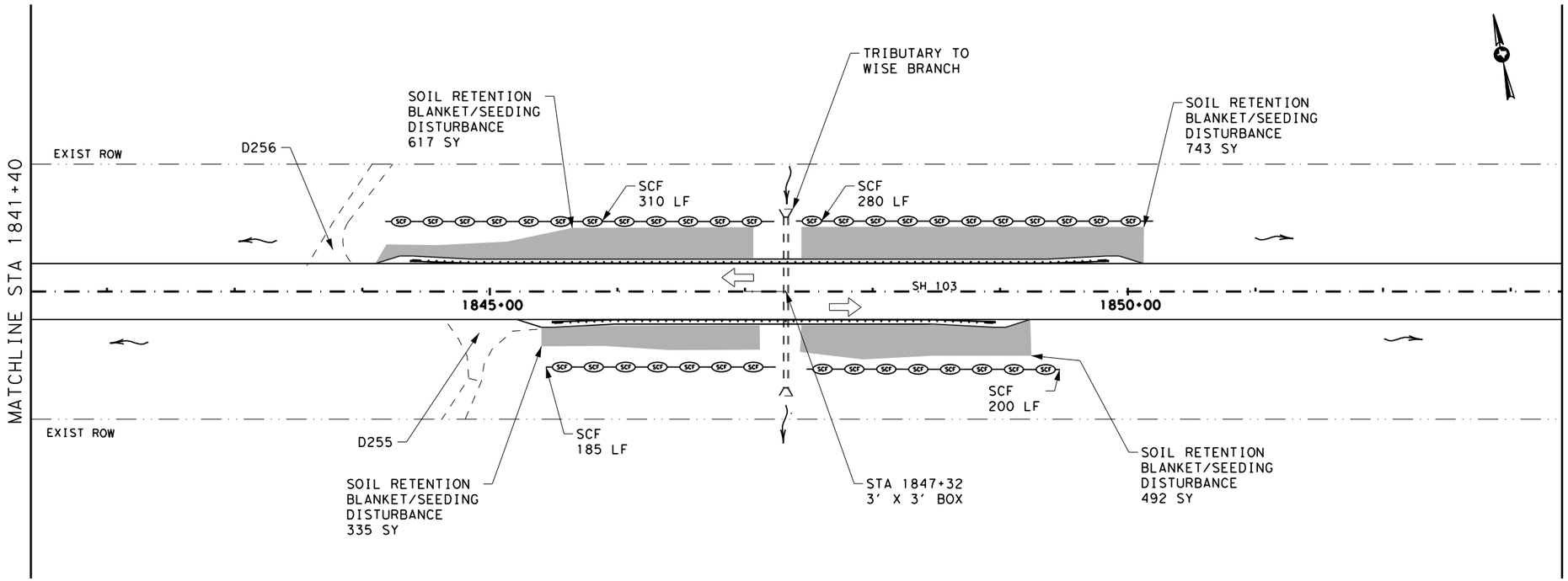

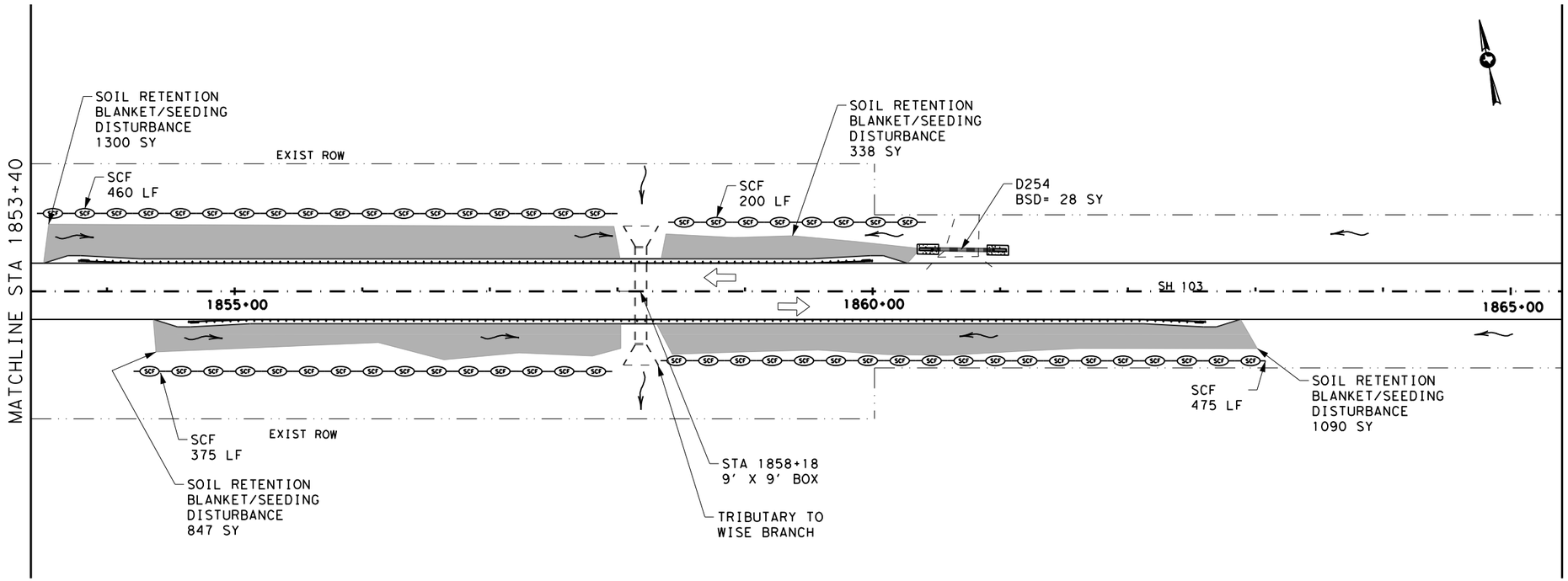

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DocuSigned by:
Elizabeth Ortego, P.E.
1B27AAE7151144B...
3/31/2022

SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 11 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		226

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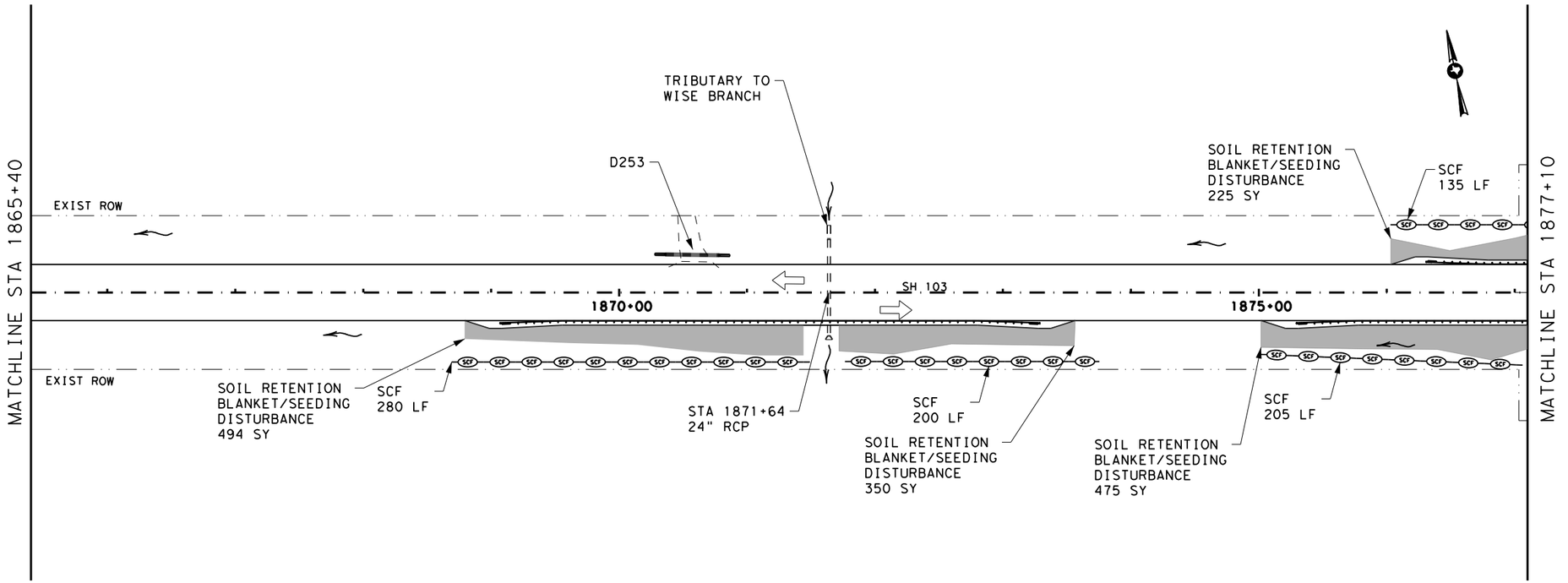

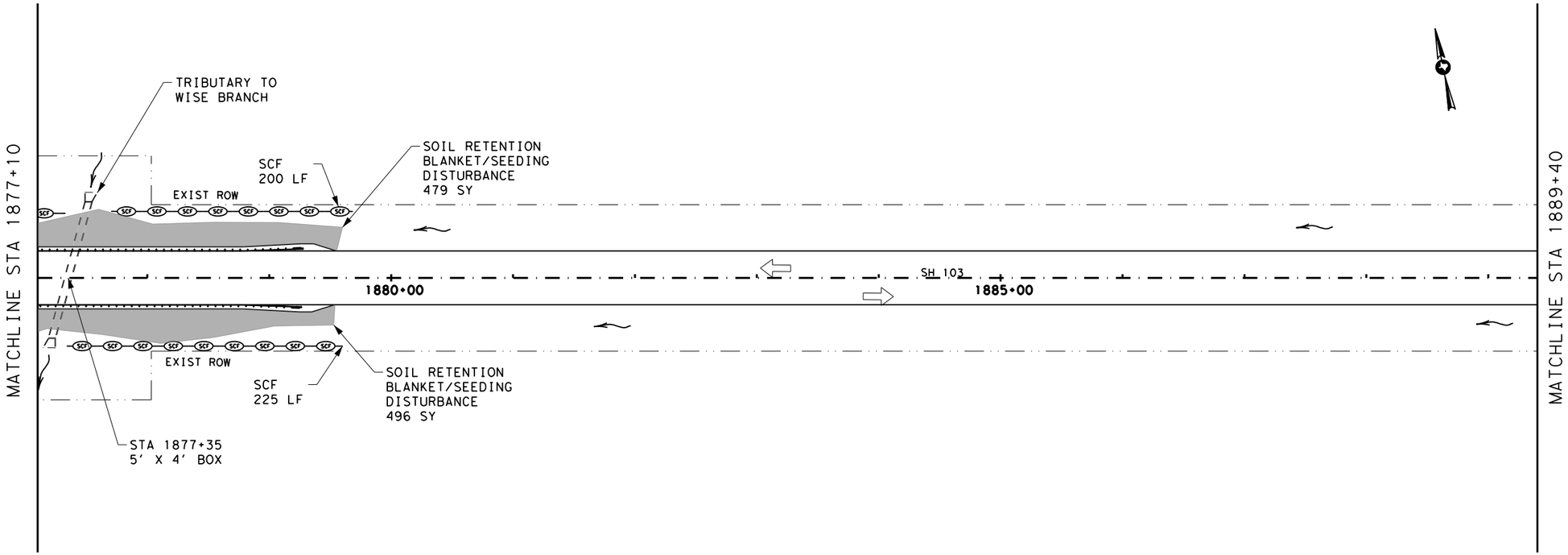

LEGEND

- ROCK FILTER DAM (TY 2)
- SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER
- BSD BLOCK SODDING/DISTURBANCE (ASSUMED FOR BOTH SIDES OF PIPE UNLESS OTHERWISE NOTED)

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

SCALE 1" = 100'

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

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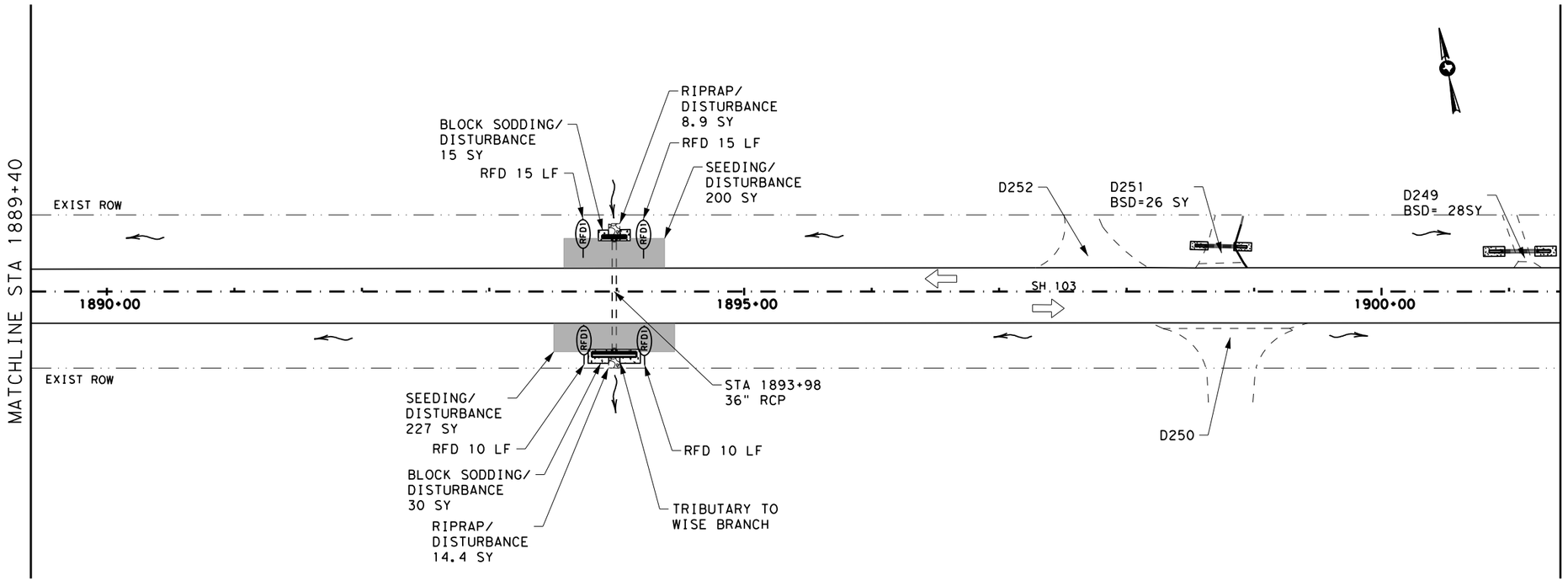
3/31/2022

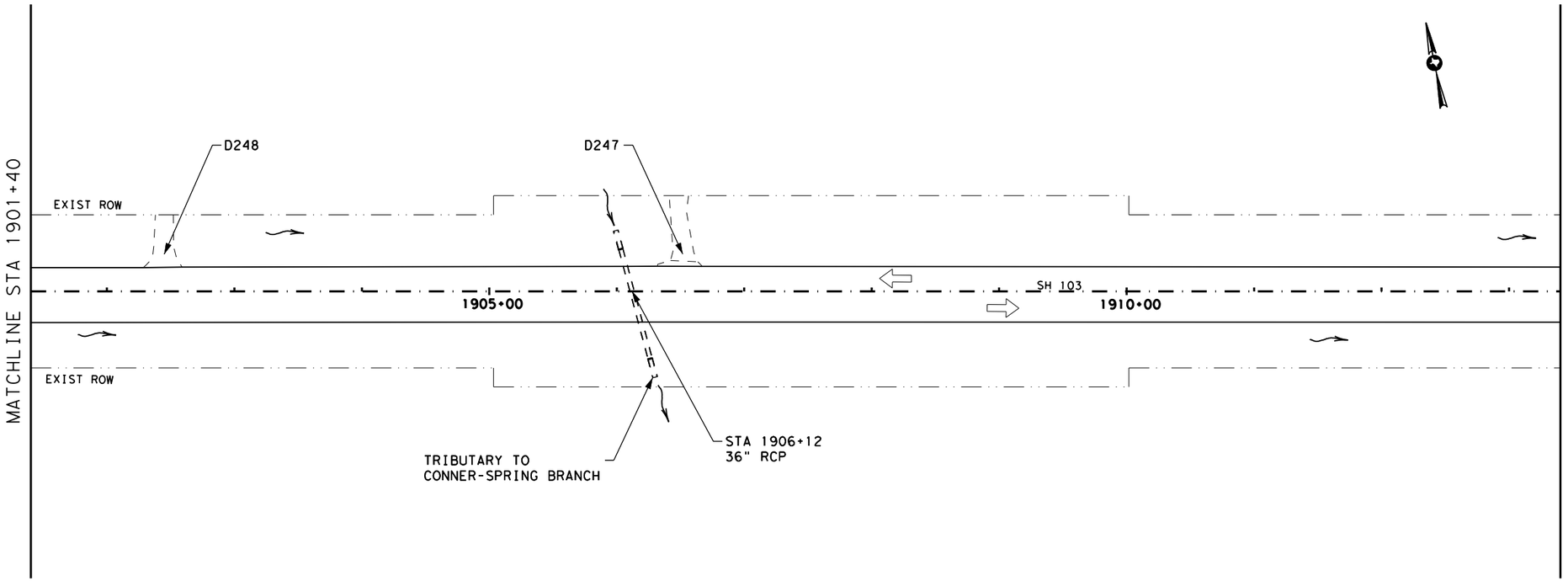
SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 12 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		227





LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER

BSD BLOCK SODDING/DISTURBANCE (ASSUMED FOR BOTH SIDES OF PIPE UNLESS OTHERWISE NOTED)

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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 13 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		228

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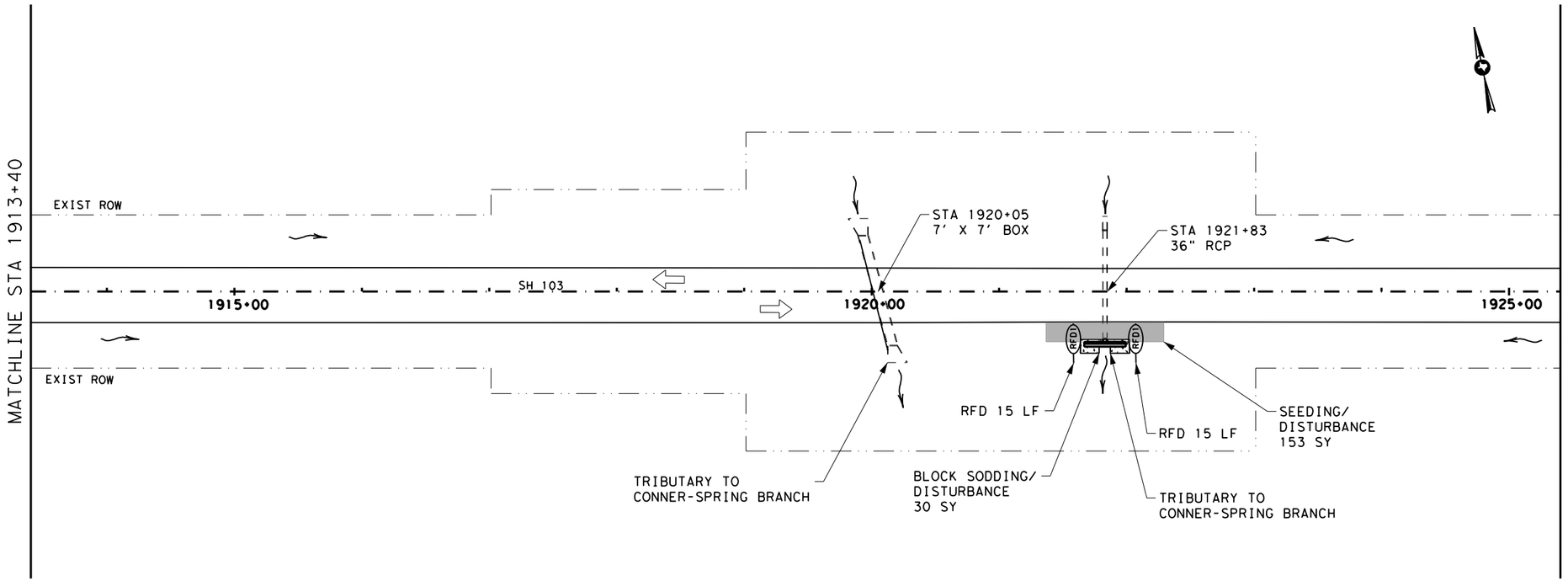

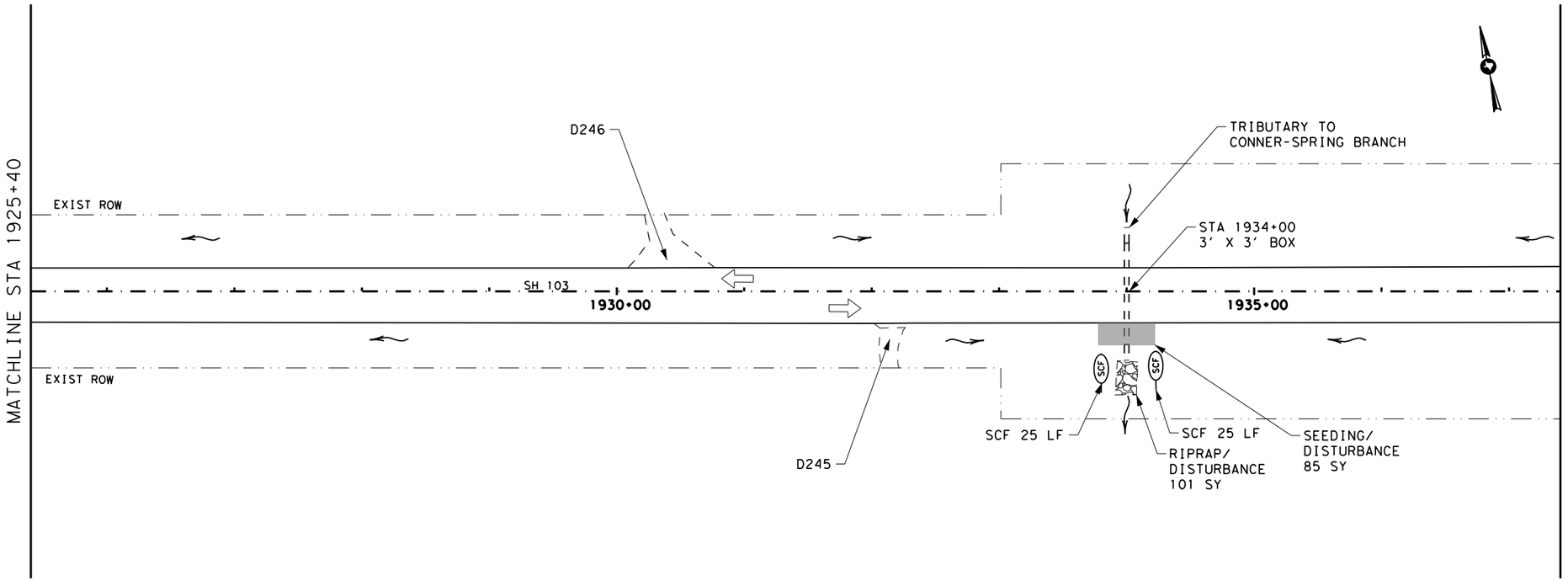

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER
- BSD BLOCK SODDING/DISTURBANCE (ASSUMED FOR BOTH SIDES OF PIPE UNLESS OTHERWISE NOTED)

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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 14 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		229

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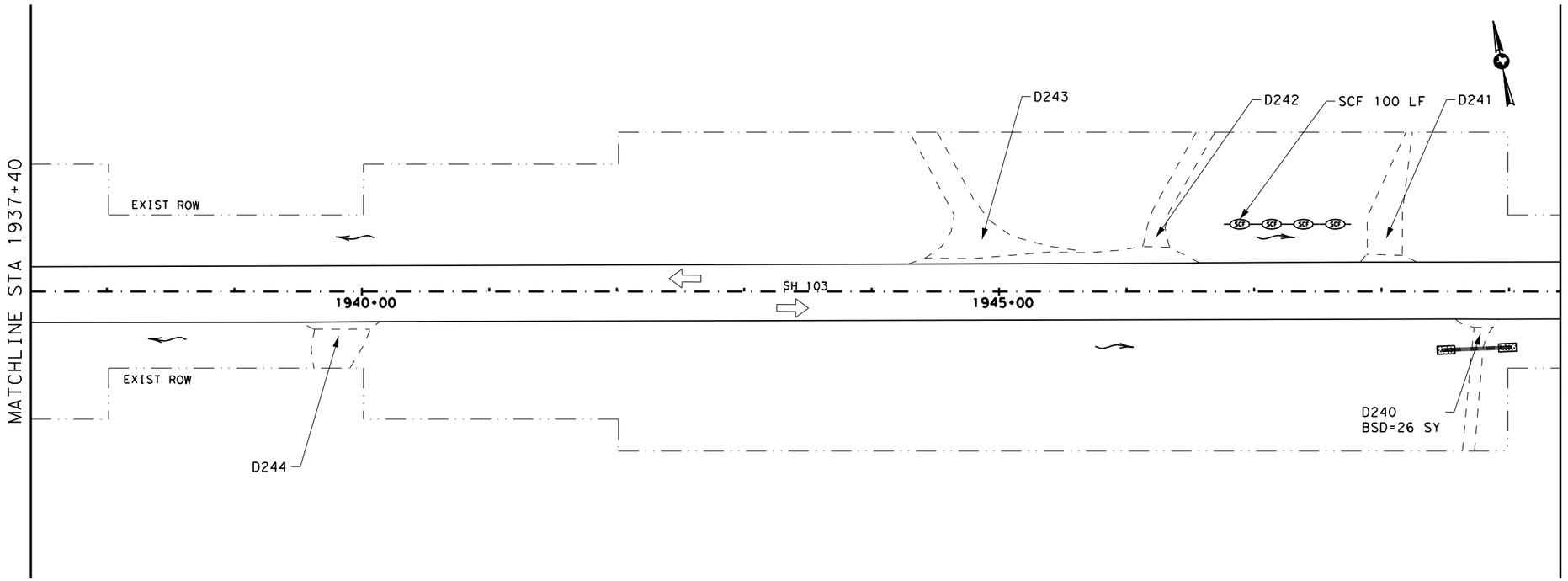

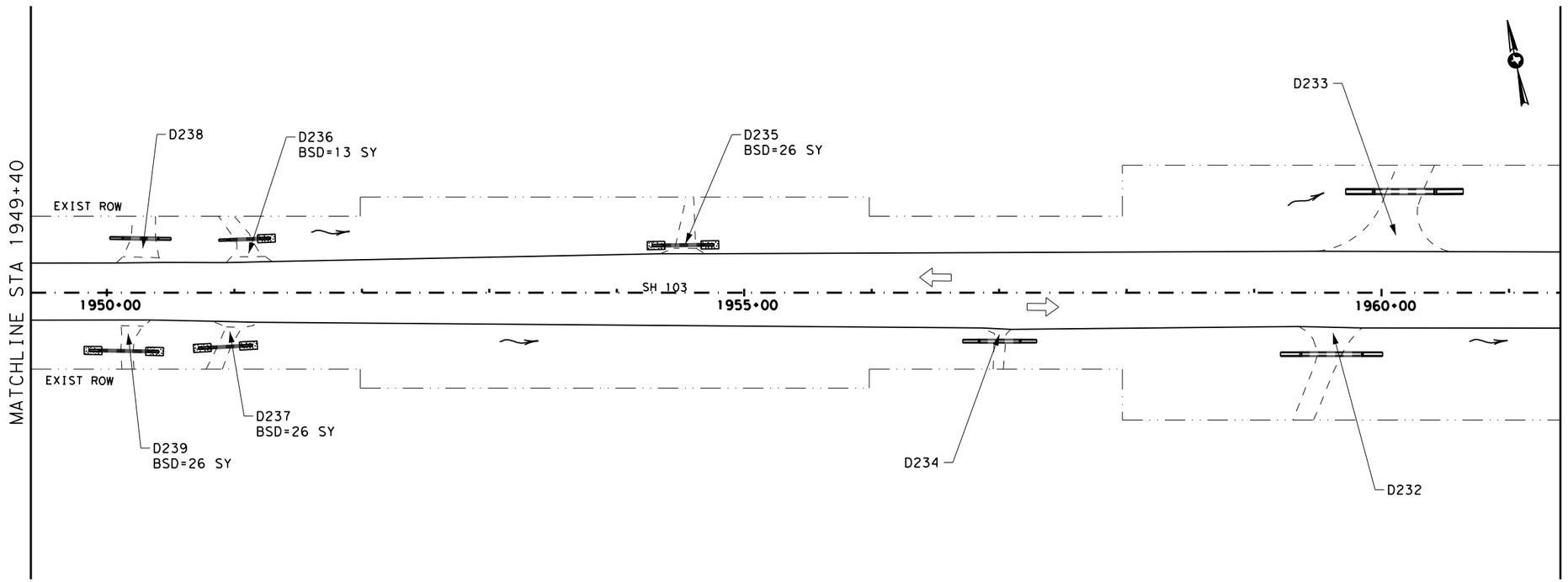

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER

BSD BLOCK SODDING/DISTURBANCE (ASSUMED FOR BOTH SIDES OF PIPE UNLESS OTHERWISE NOTED)

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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 15 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		230

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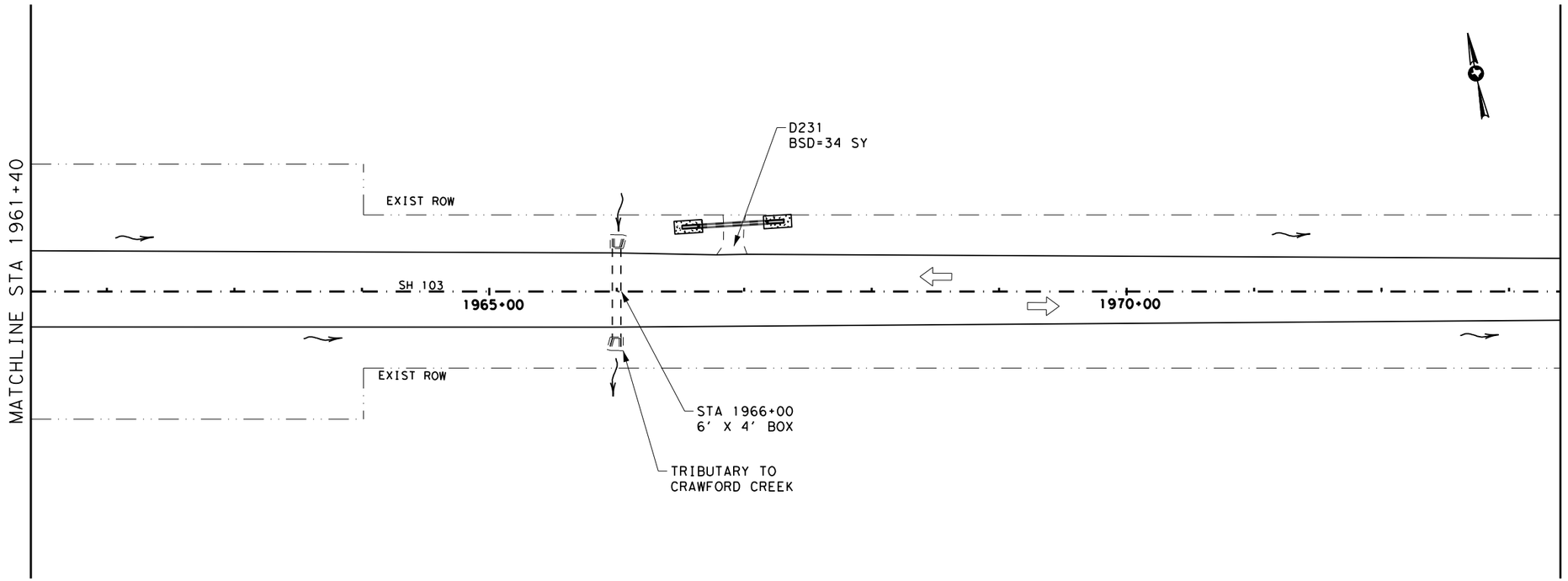

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
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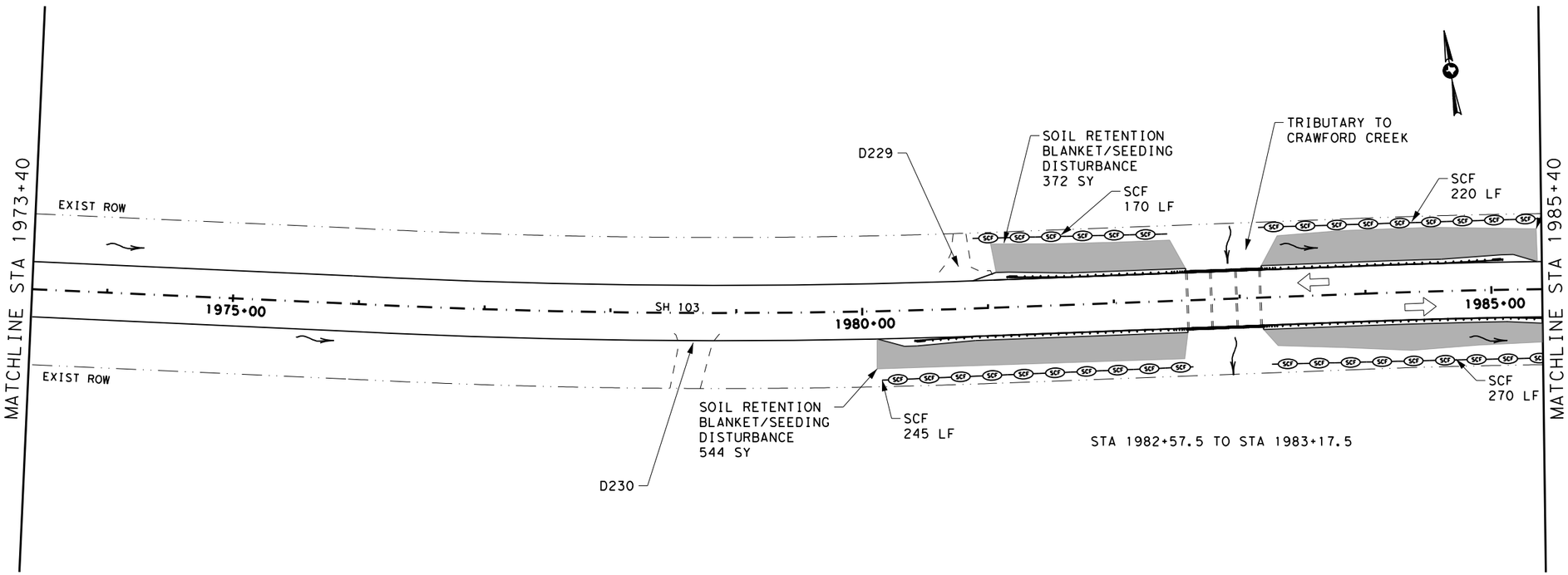

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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 16 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		231

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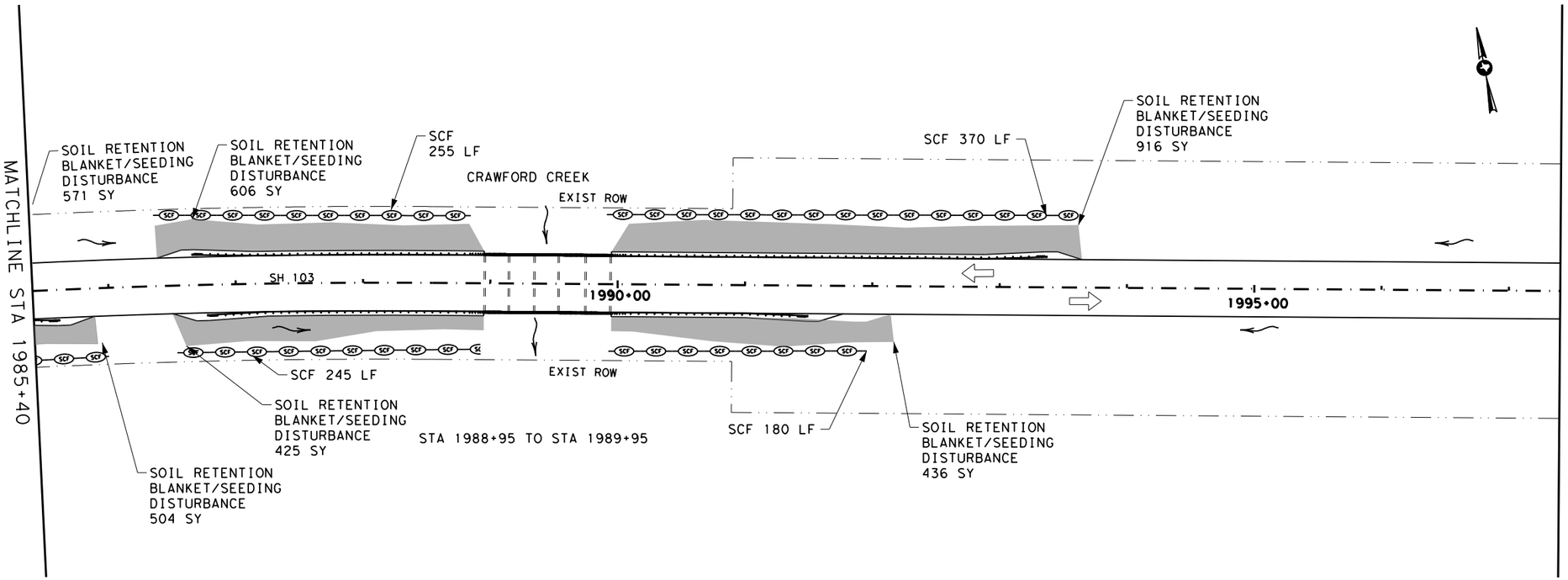

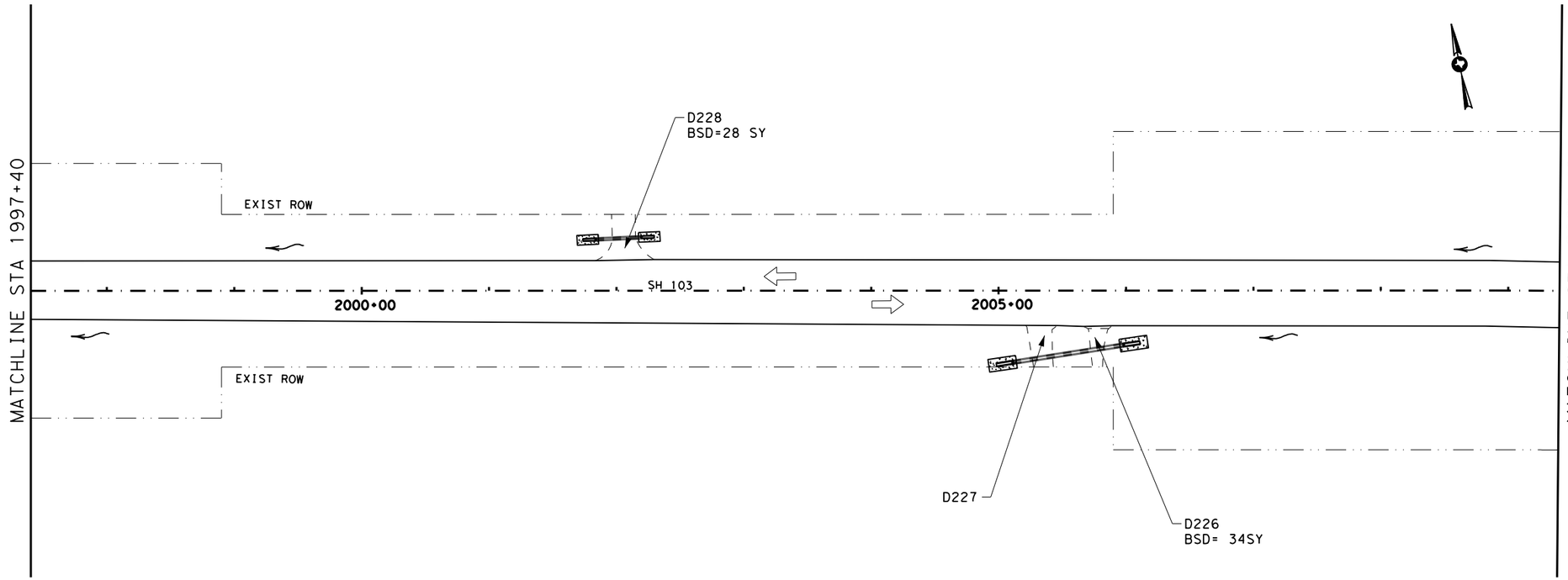

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
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- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 17 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		232

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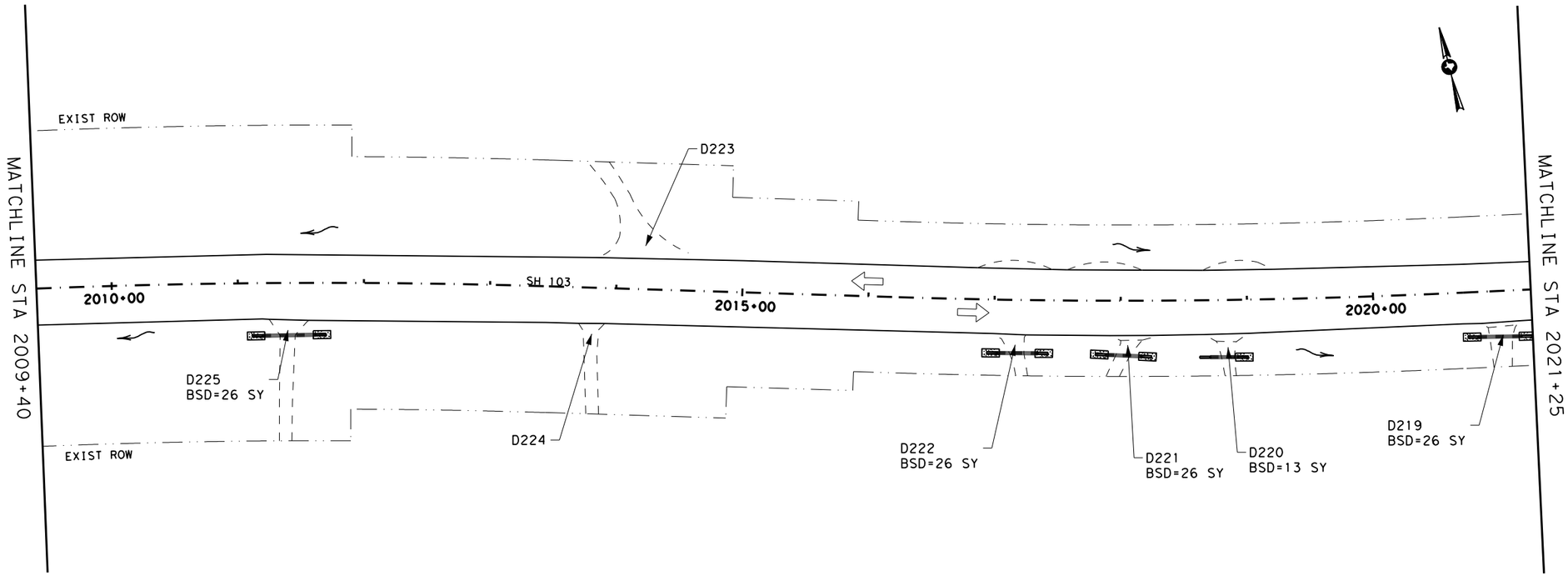

LEGEND

- (RFD2) ROCK FILTER DAM (TY 2)
- (SCF) SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
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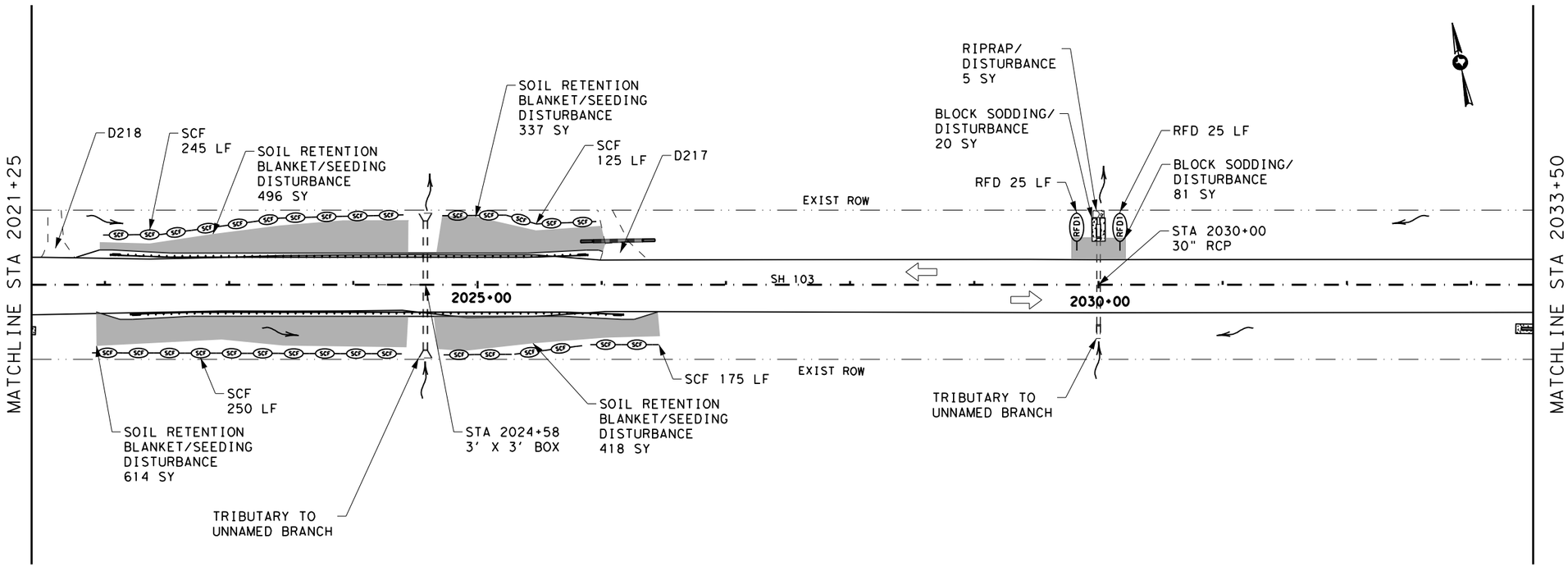

SCALE 1" = 100'

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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 18 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		233

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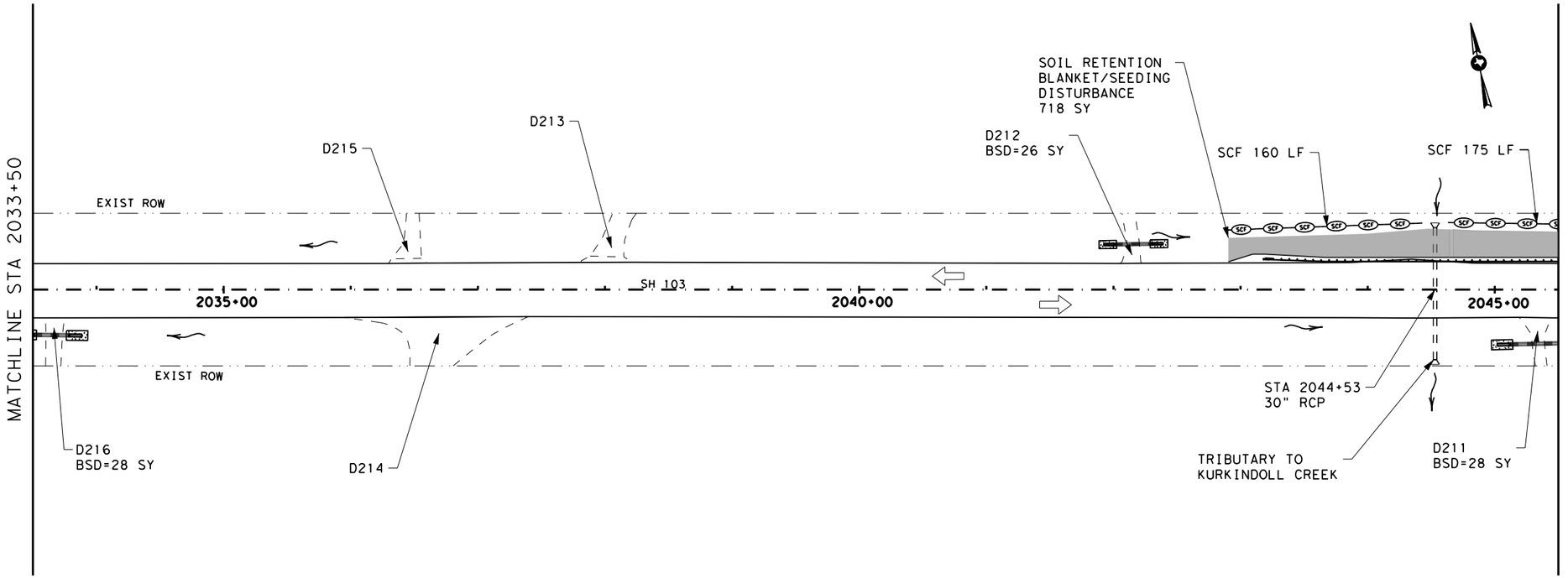

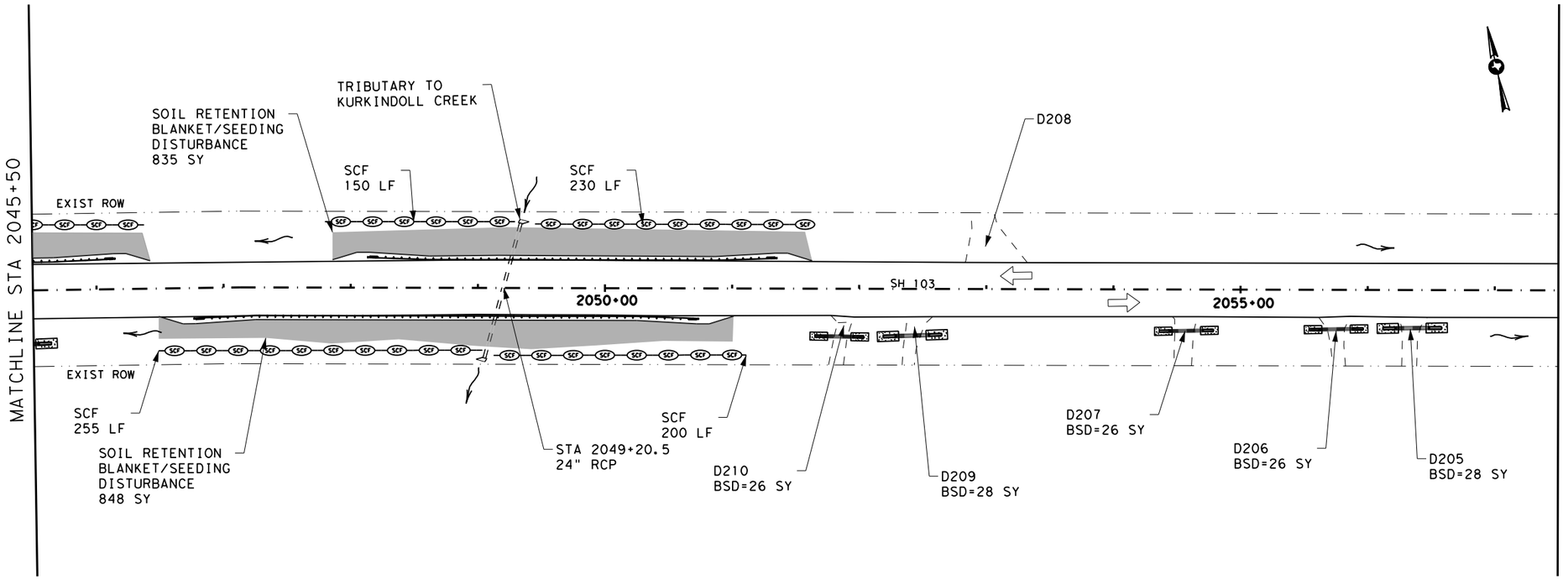

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 19 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		234

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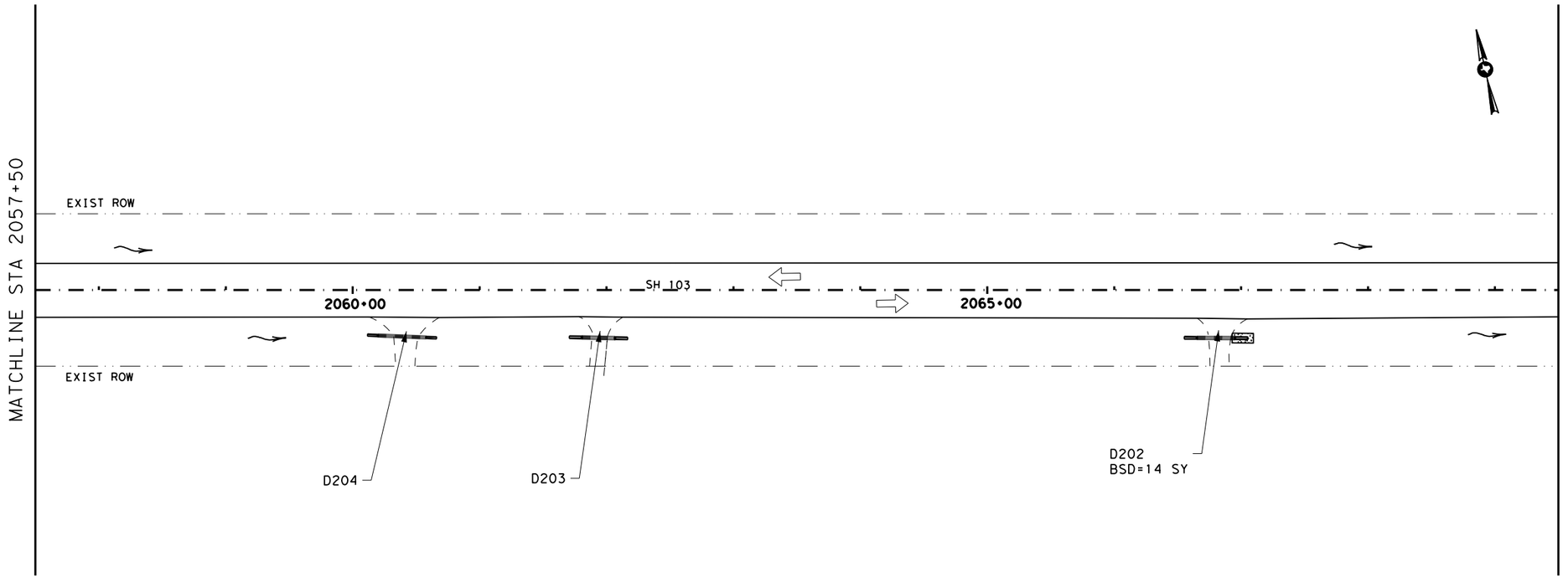

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
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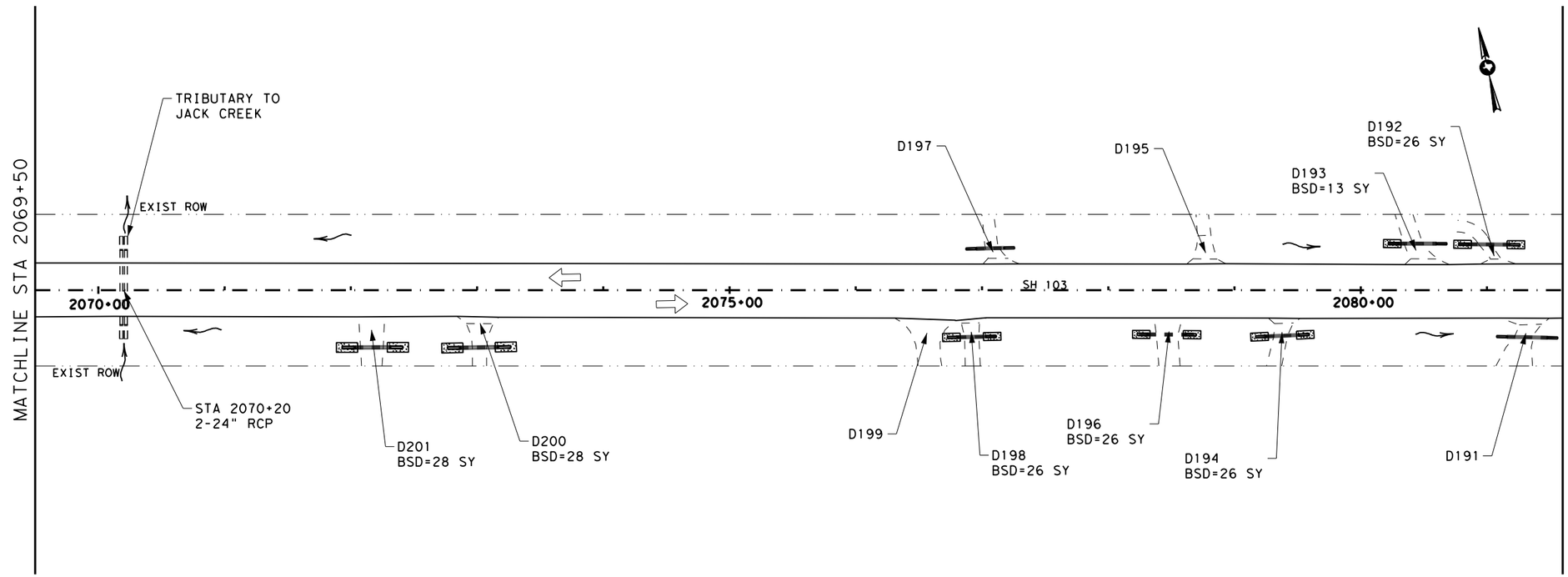

SCALE 1" = 100'

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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 20 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		235

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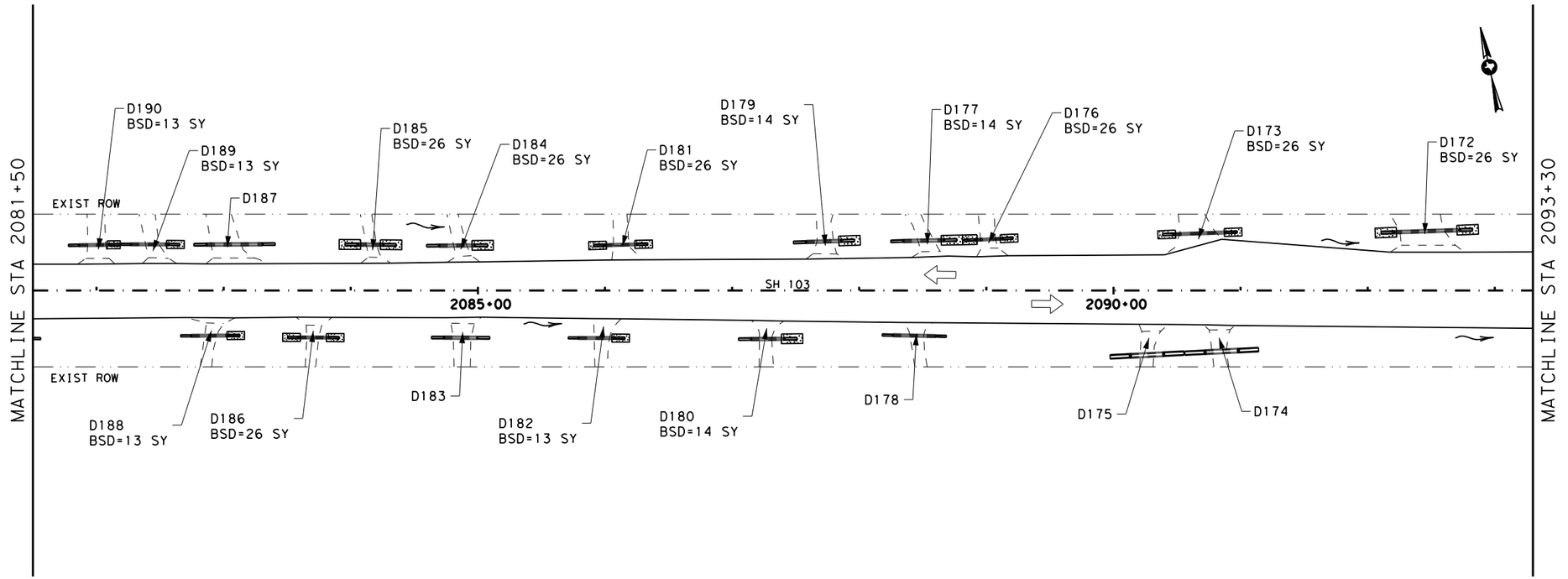

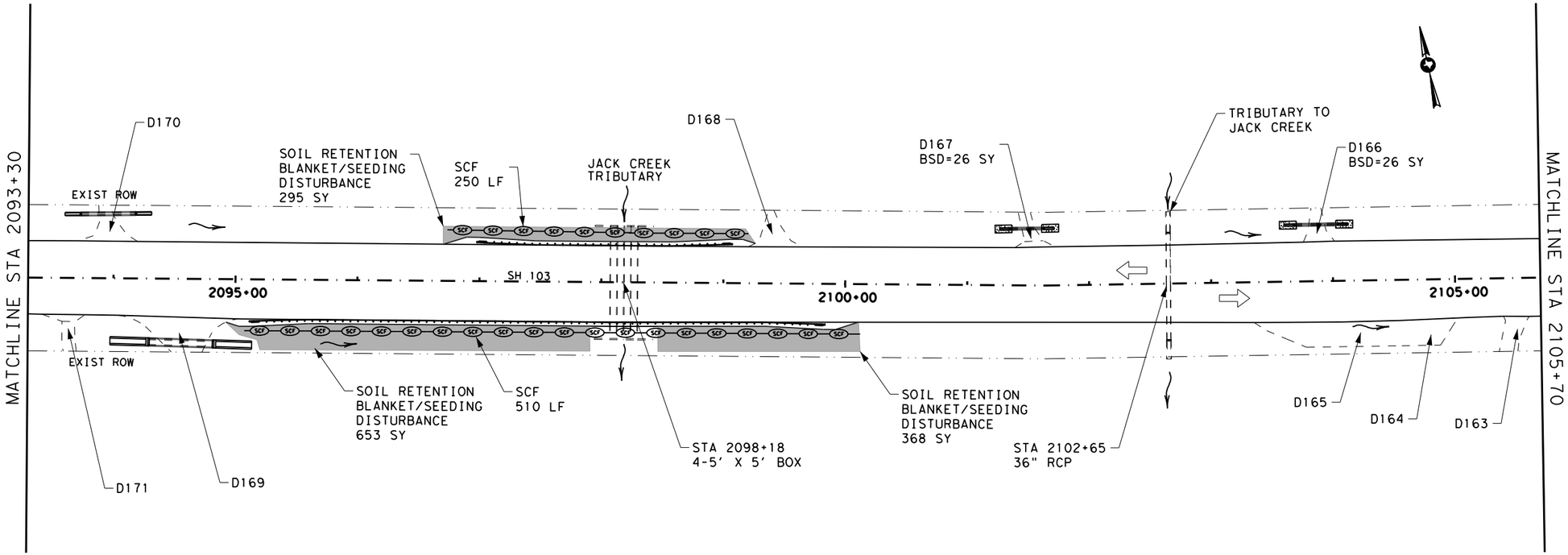

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER

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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 21 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		236

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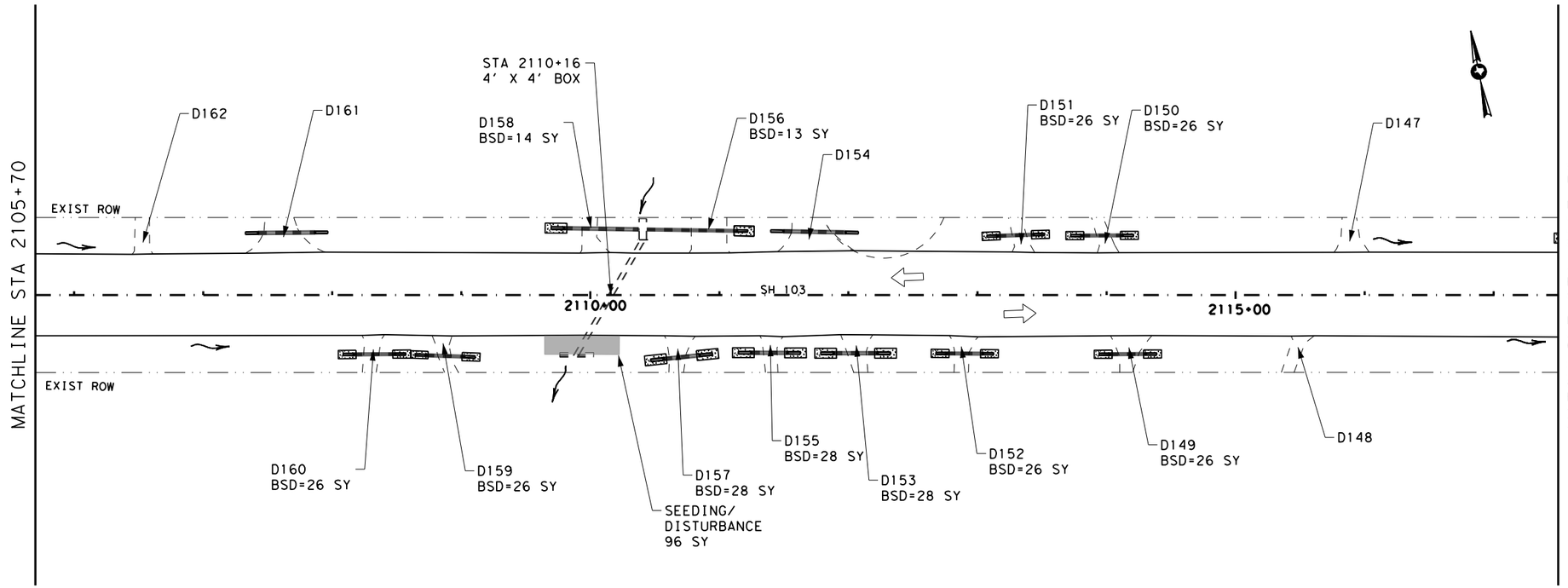

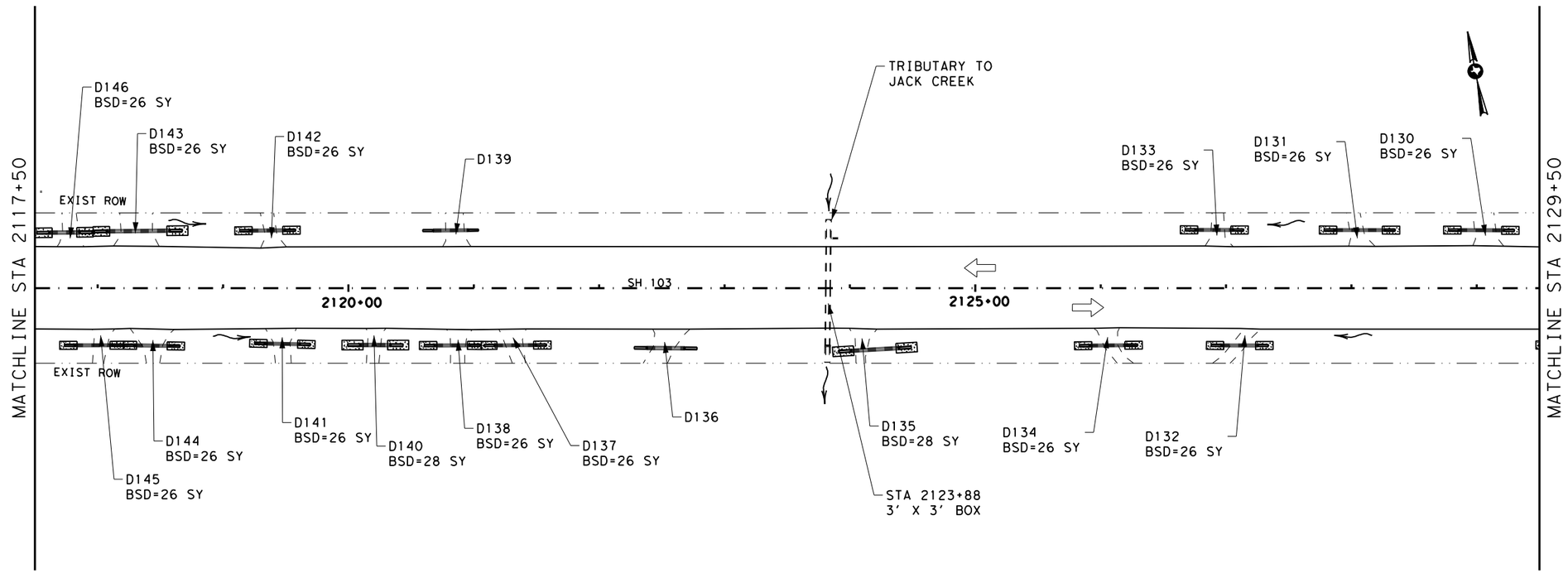

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER

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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 22 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		237

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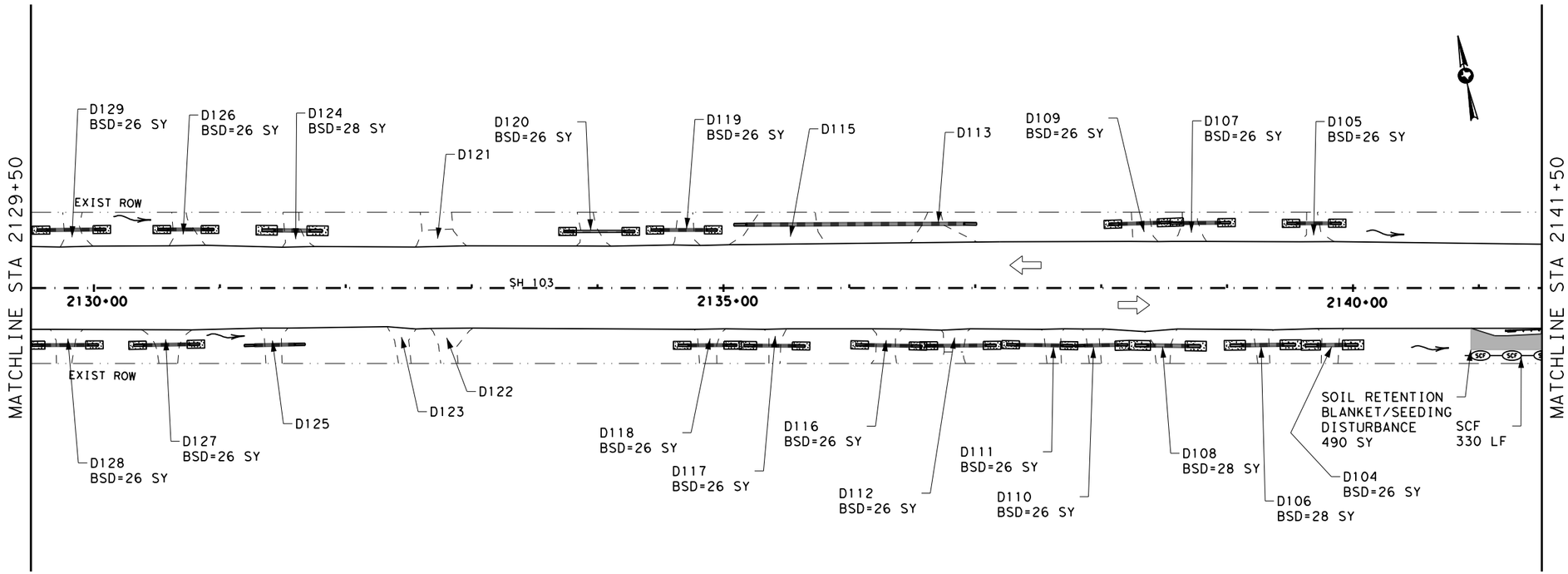

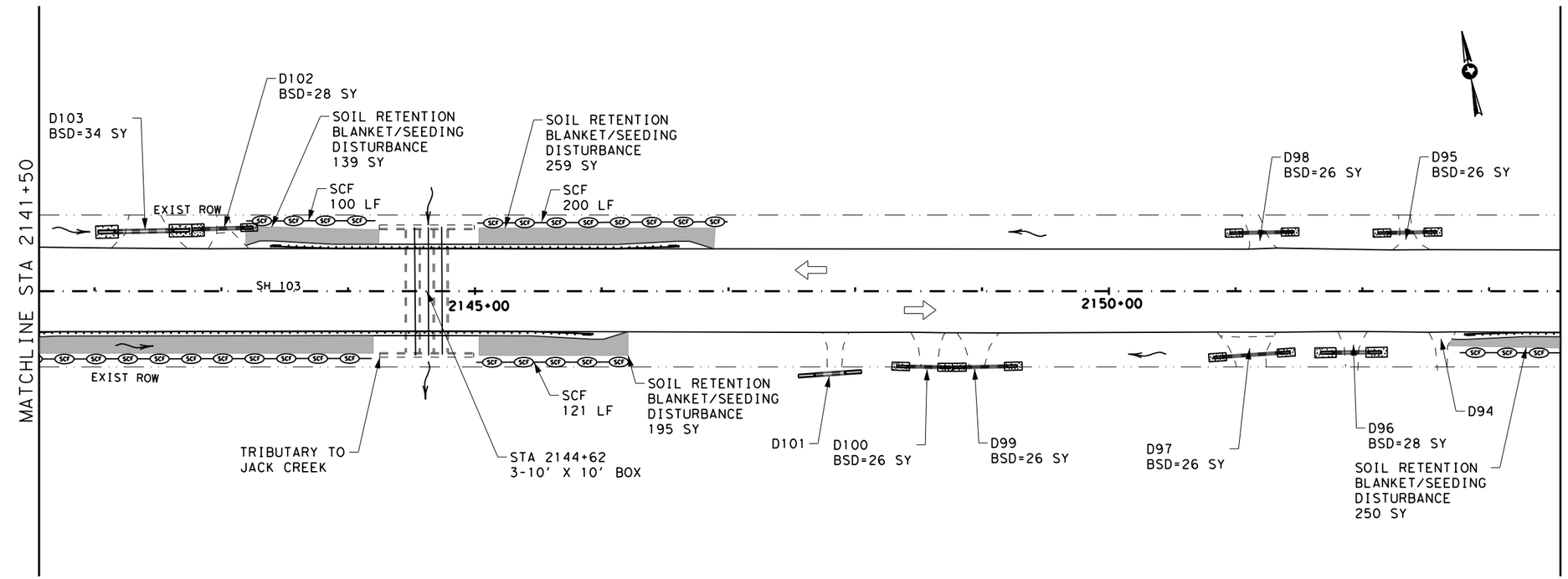

LEGEND

- ROCK FILTER DAM (TY 2) (RFD2)
- SEDIMENT CONT FENCE (SCF)
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER

BSD BLOCK SODDING/DISTURBANCE (ASSUMED FOR BOTH SIDES OF PIPE UNLESS OTHERWISE NOTED)

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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 23 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		238

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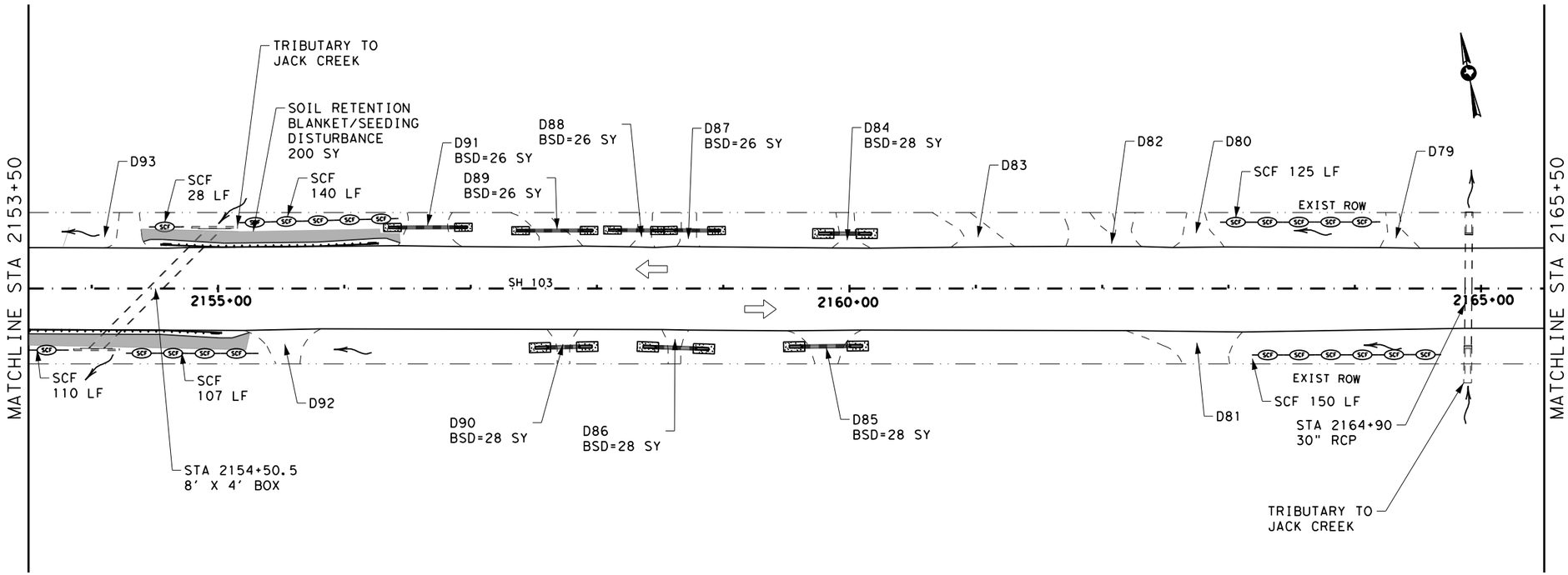

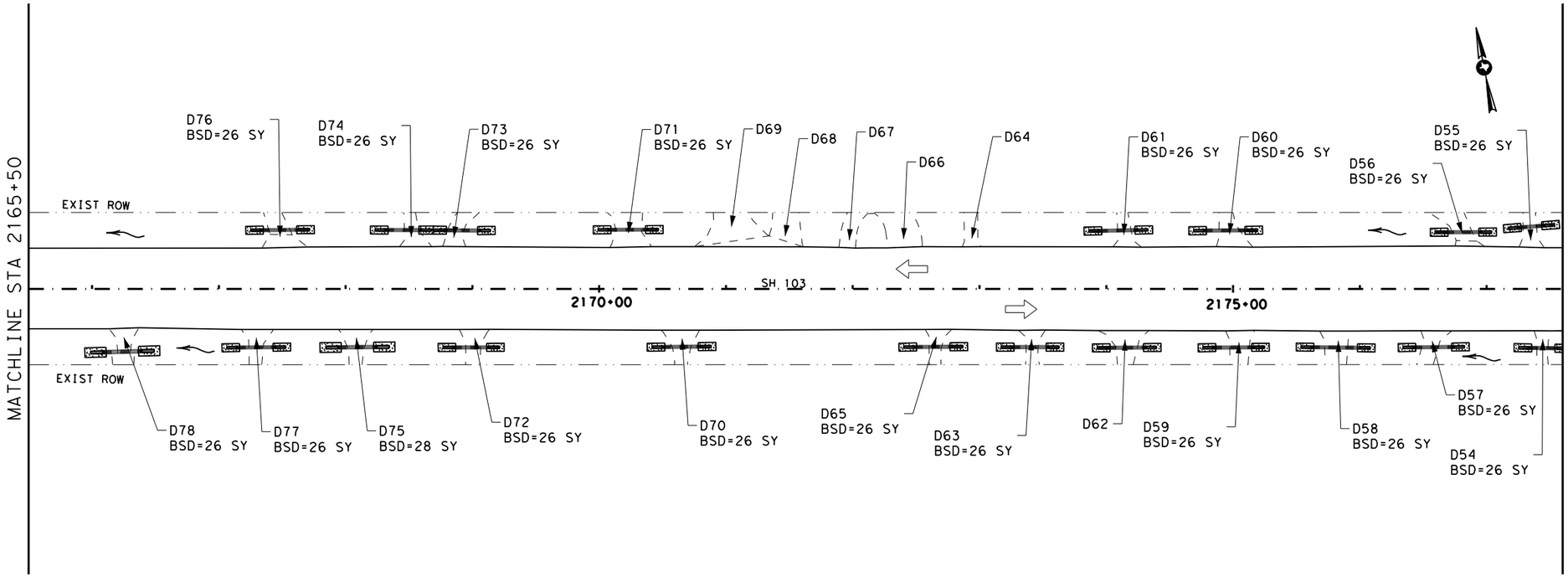

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER

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3/31/2022

SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 24 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		239

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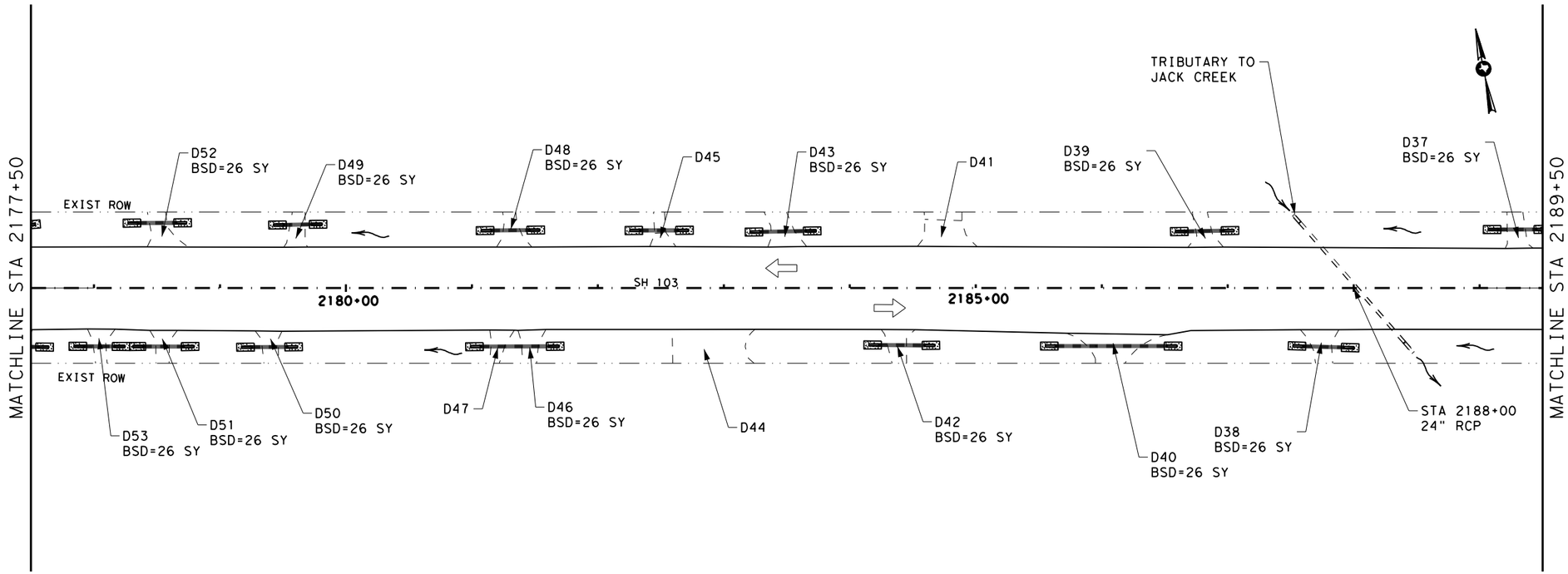
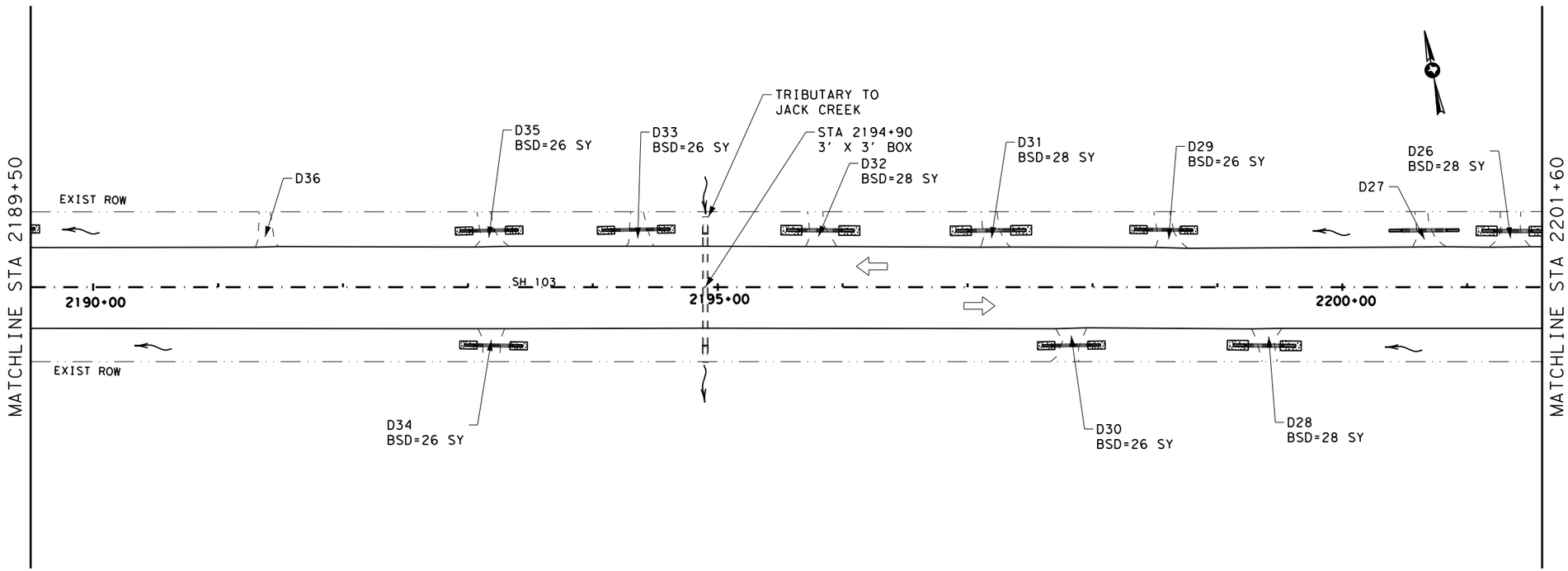


LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER

BSD BLOCK SODDING/DISTURBANCE (ASSUMED FOR BOTH SIDES OF PIPE UNLESS OTHERWISE NOTED)

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



SCALE 1" = 100'

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ELIZABETH A. ORTEGO
91106
LICENSED PROFESSIONAL ENGINEER

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3/31/2022

SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 25 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		240

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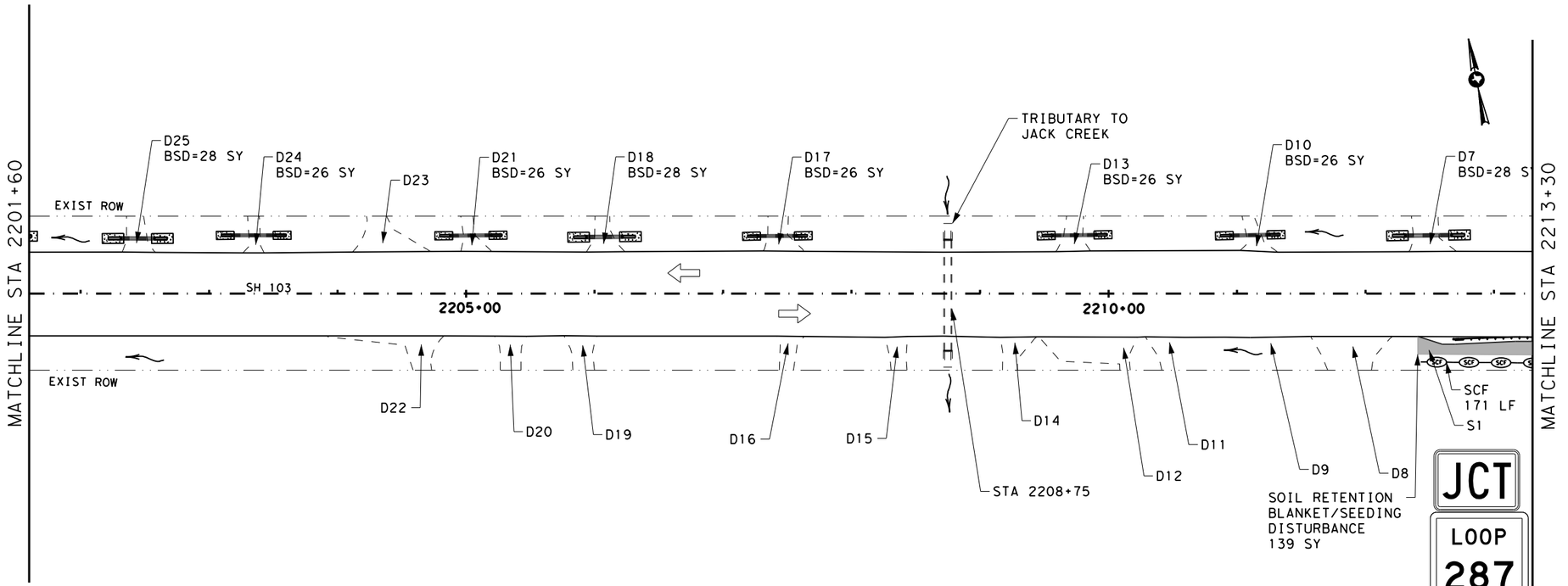

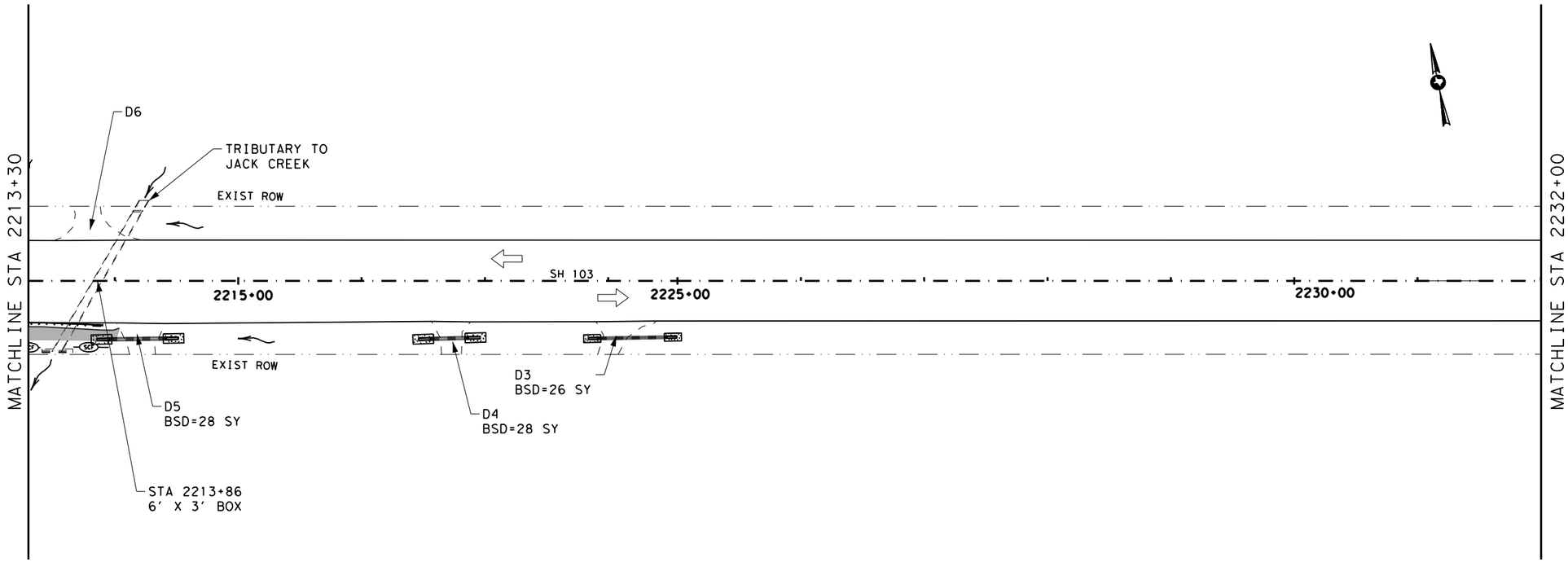

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER

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SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 26 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		241

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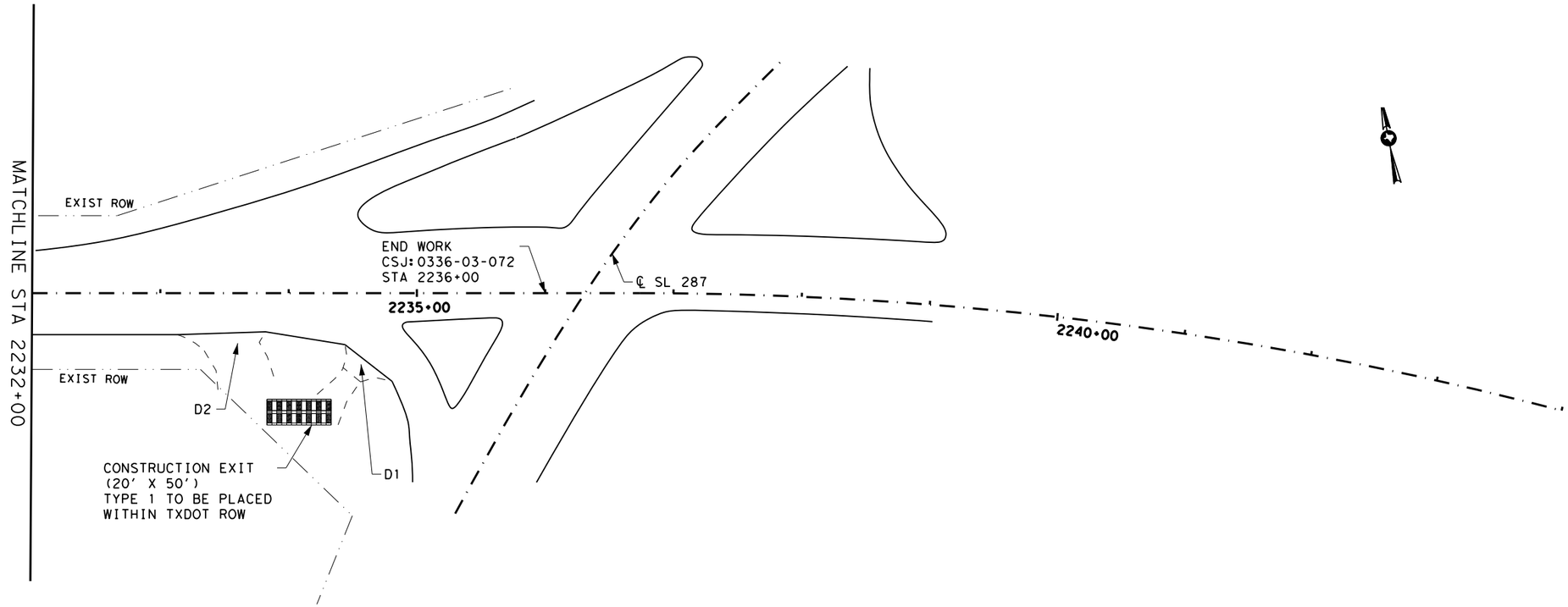

LEGEND

- (RFD2) ROCK FILTER DAM (TY 2)
- (SCF) SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER
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3/31/2022

SWP3 LAYOUTS (SH 103)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 27 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		242

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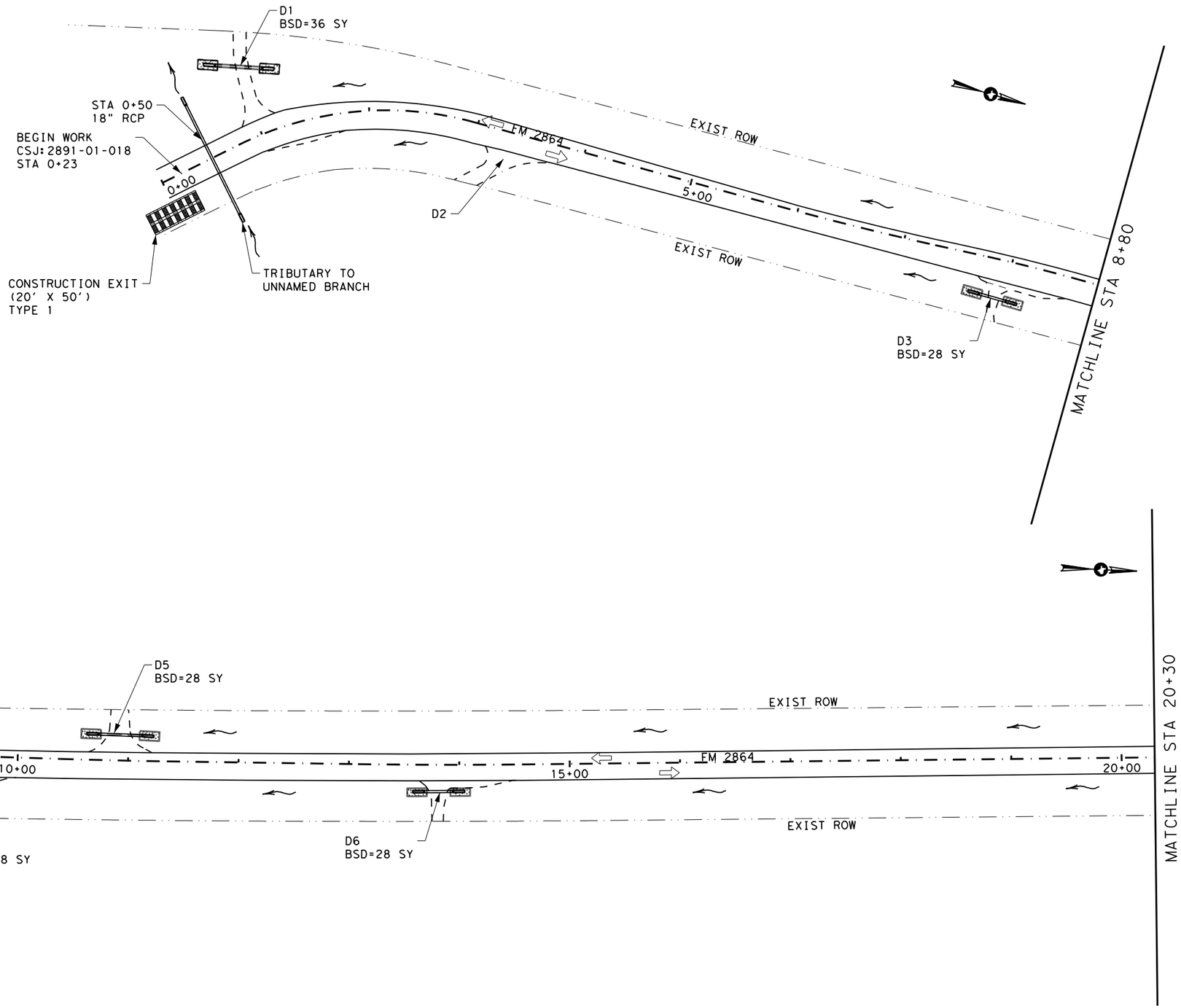

LEGEND

- (RFD2) ROCK FILTER DAM (TY 2)
- (SCF) SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
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SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 28 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		243

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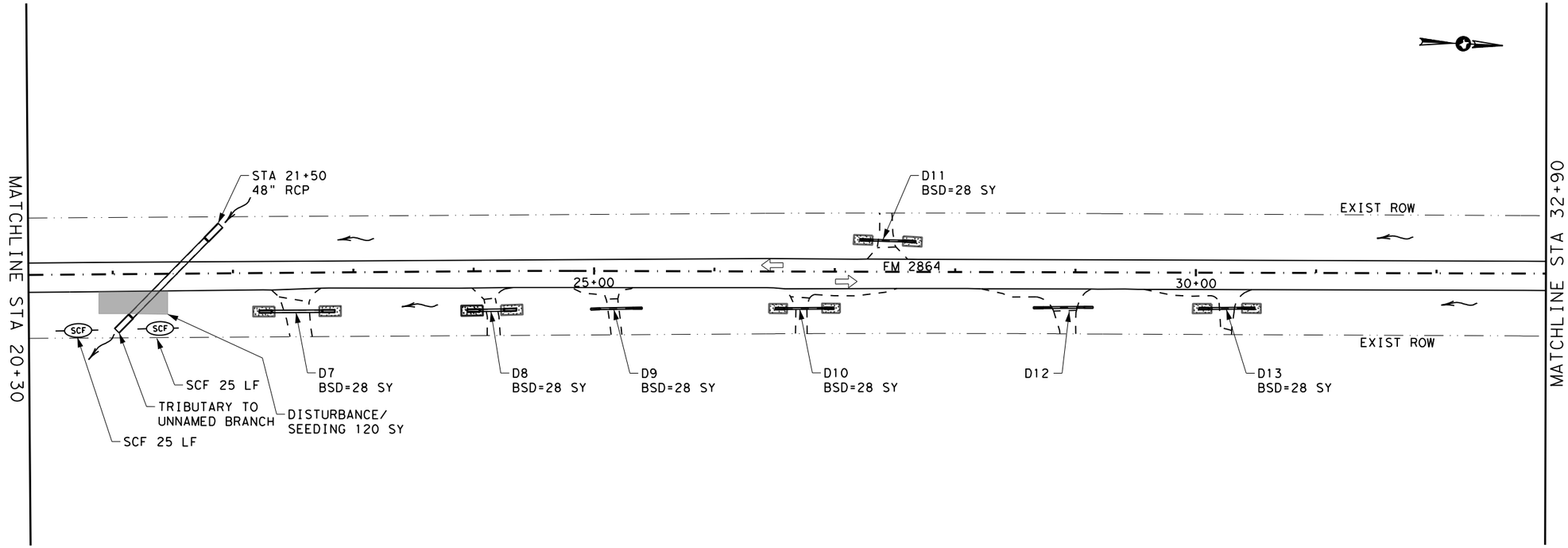

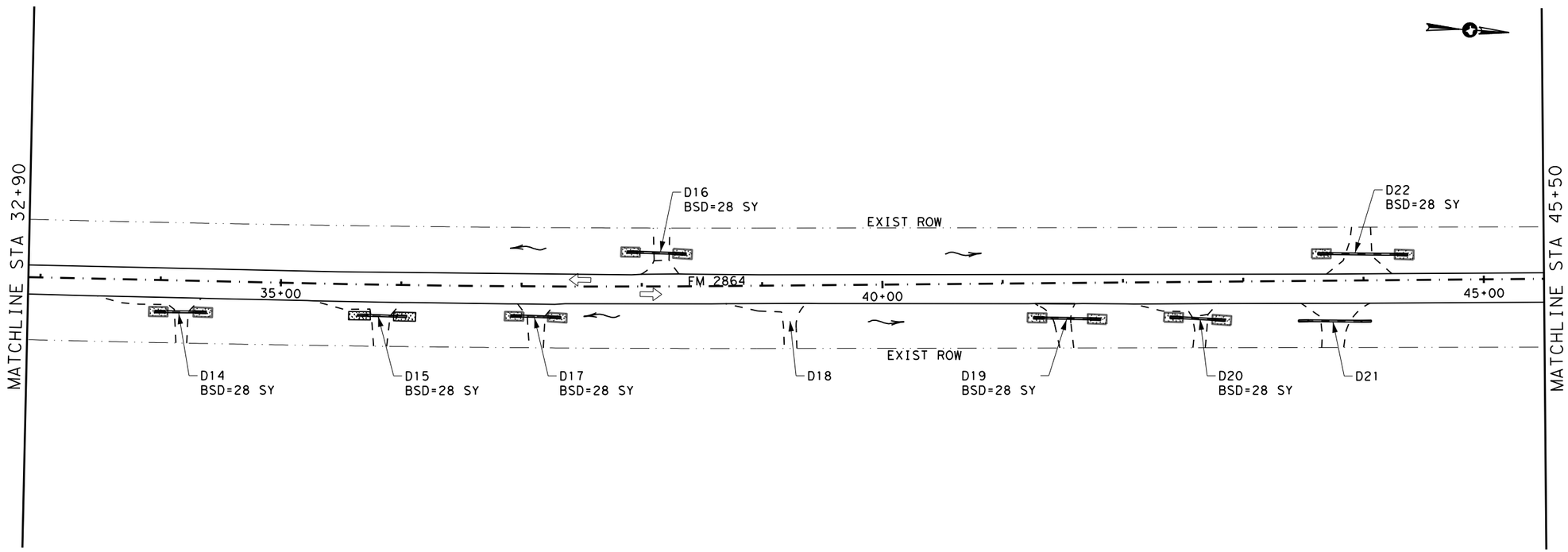

LEGEND

- ROCK FILTER DAM (TY 2)
- SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
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SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 29 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		244

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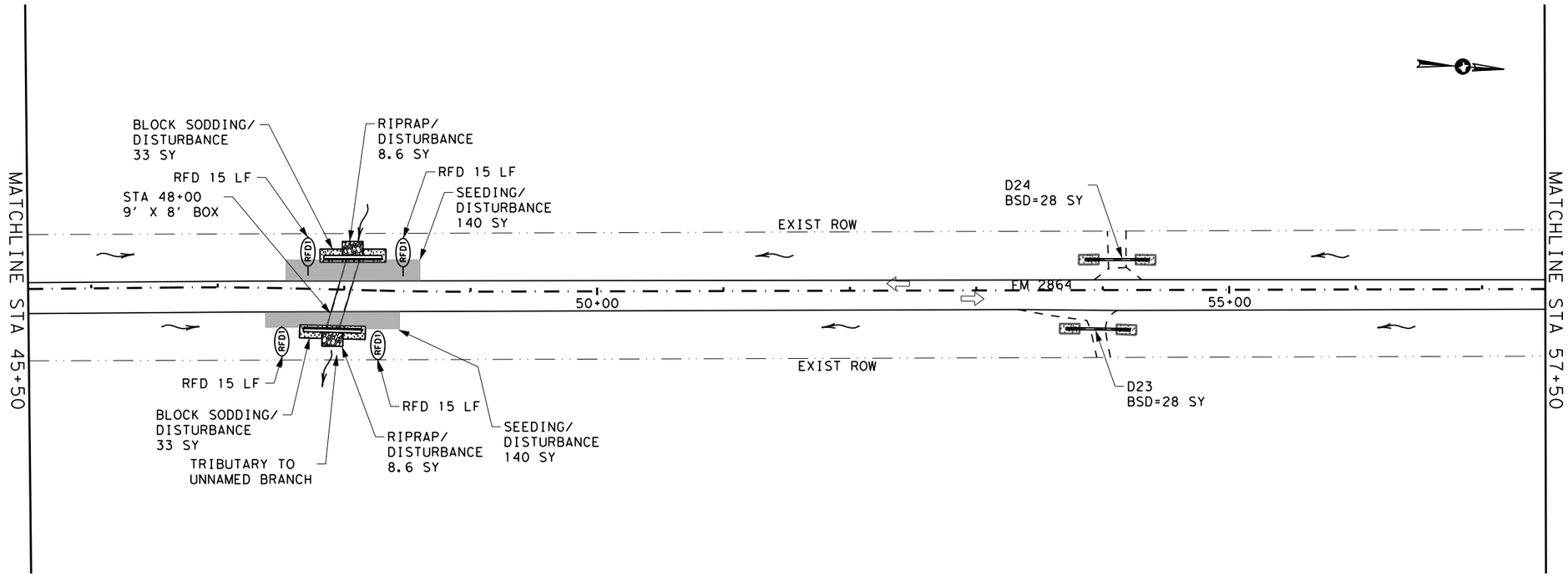

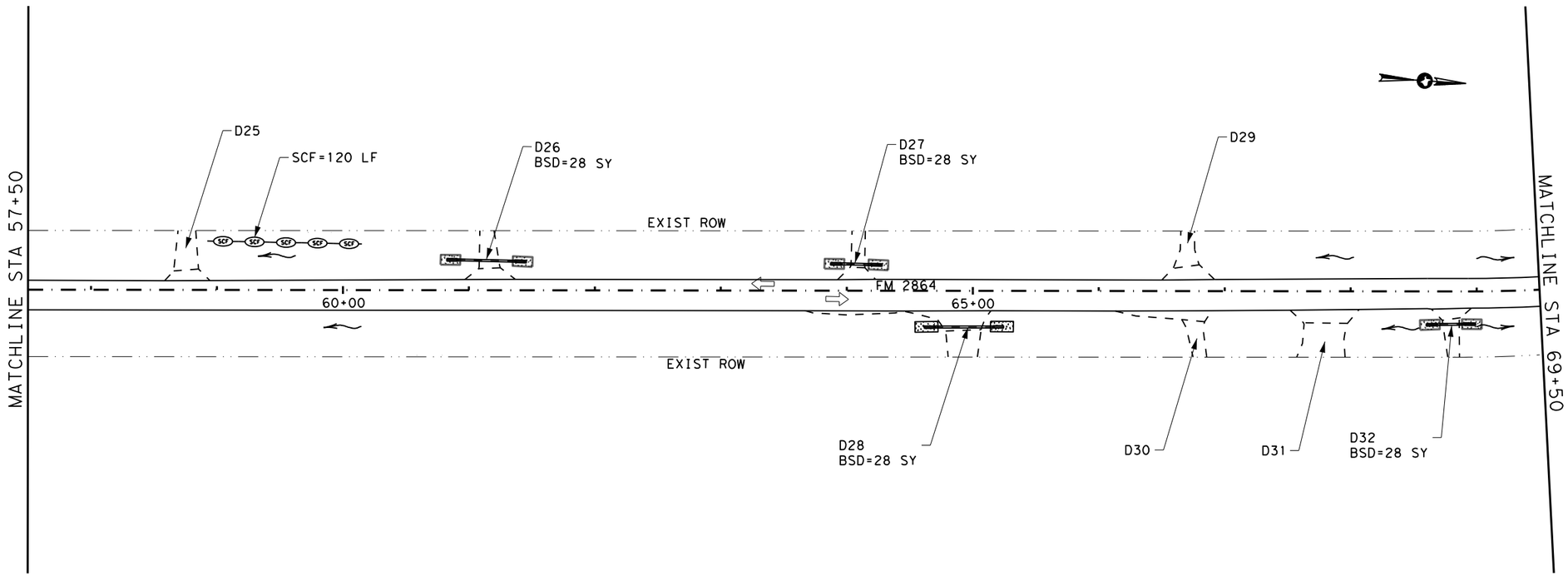

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
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SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION
SHEET 30 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		245

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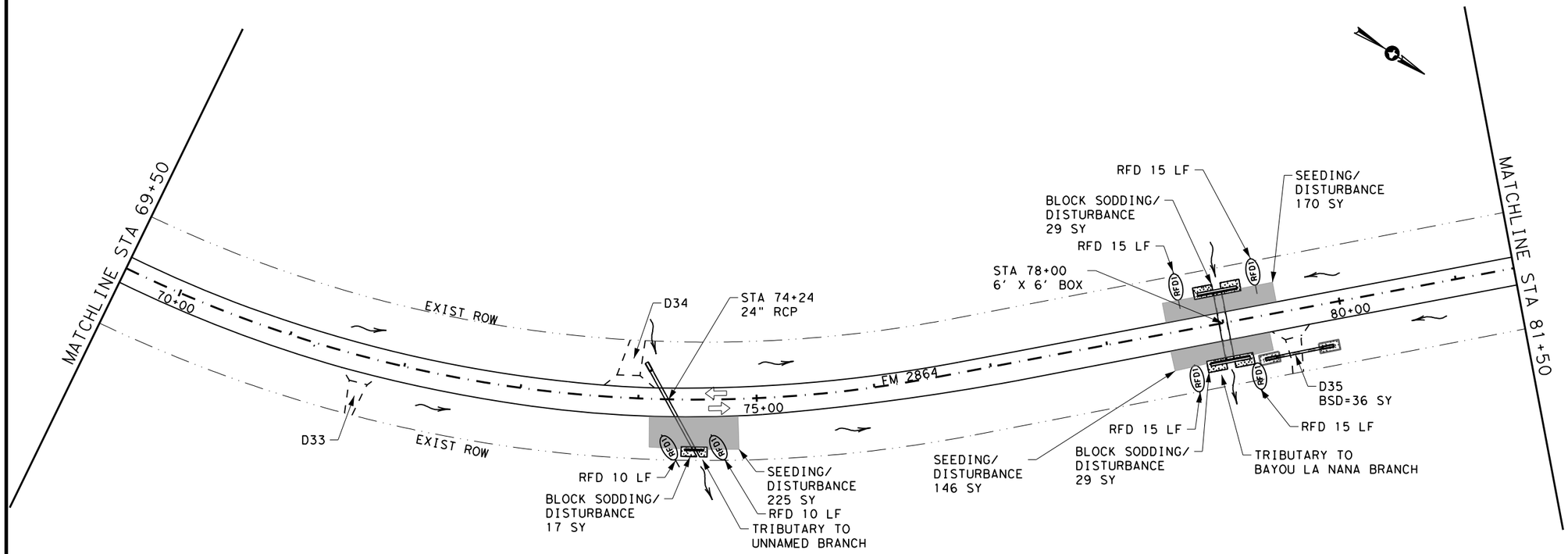

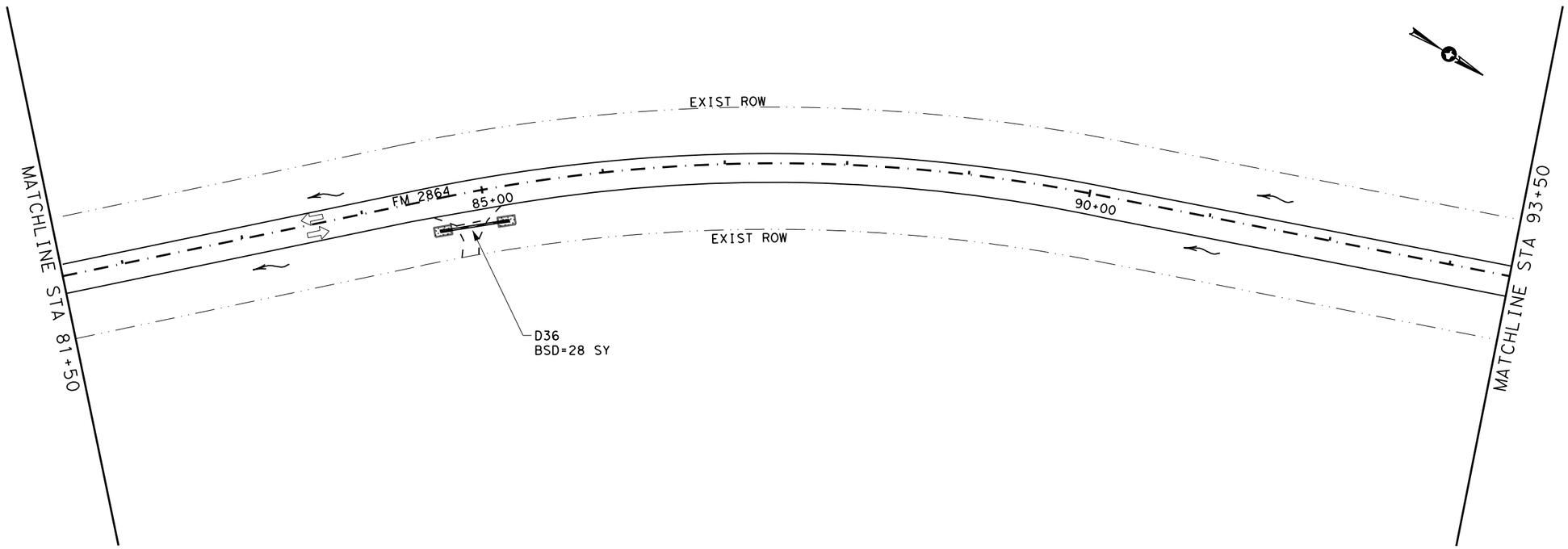

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
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SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 31 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		246

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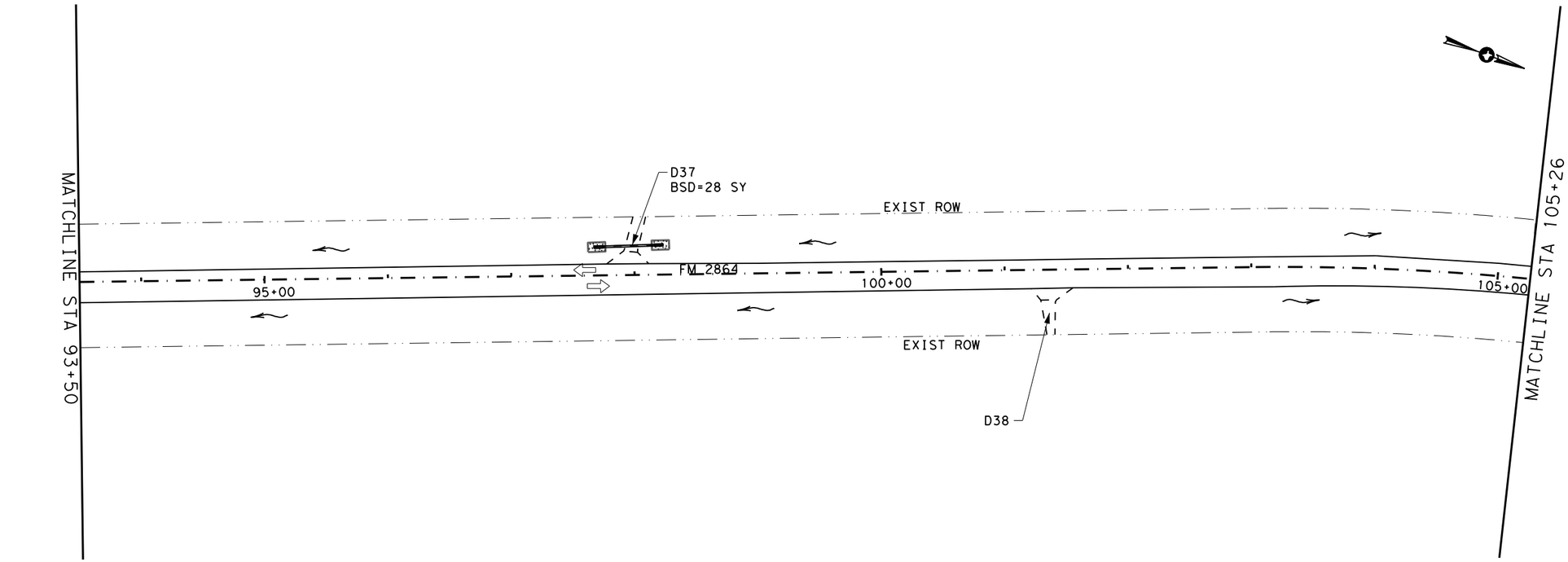

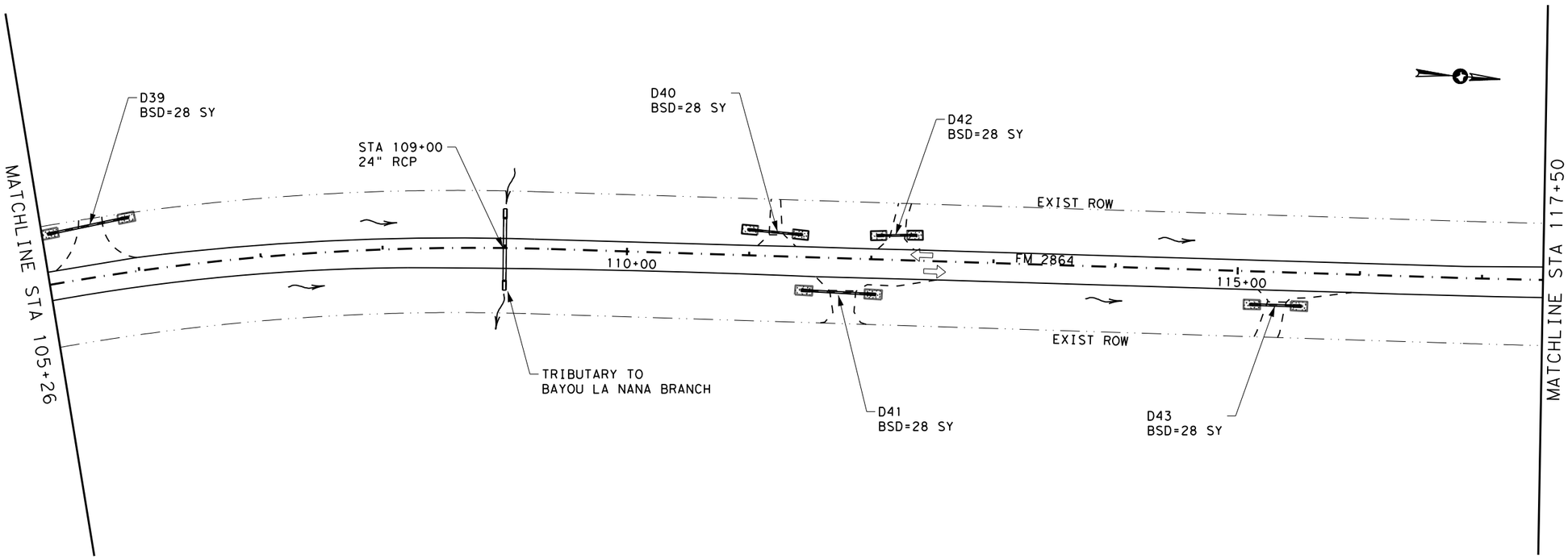

LEGEND

- (RFD2) ROCK FILTER DAM (TY 2)
- (SCF) SEDIMENT CONT FENCE
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SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 32 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		247

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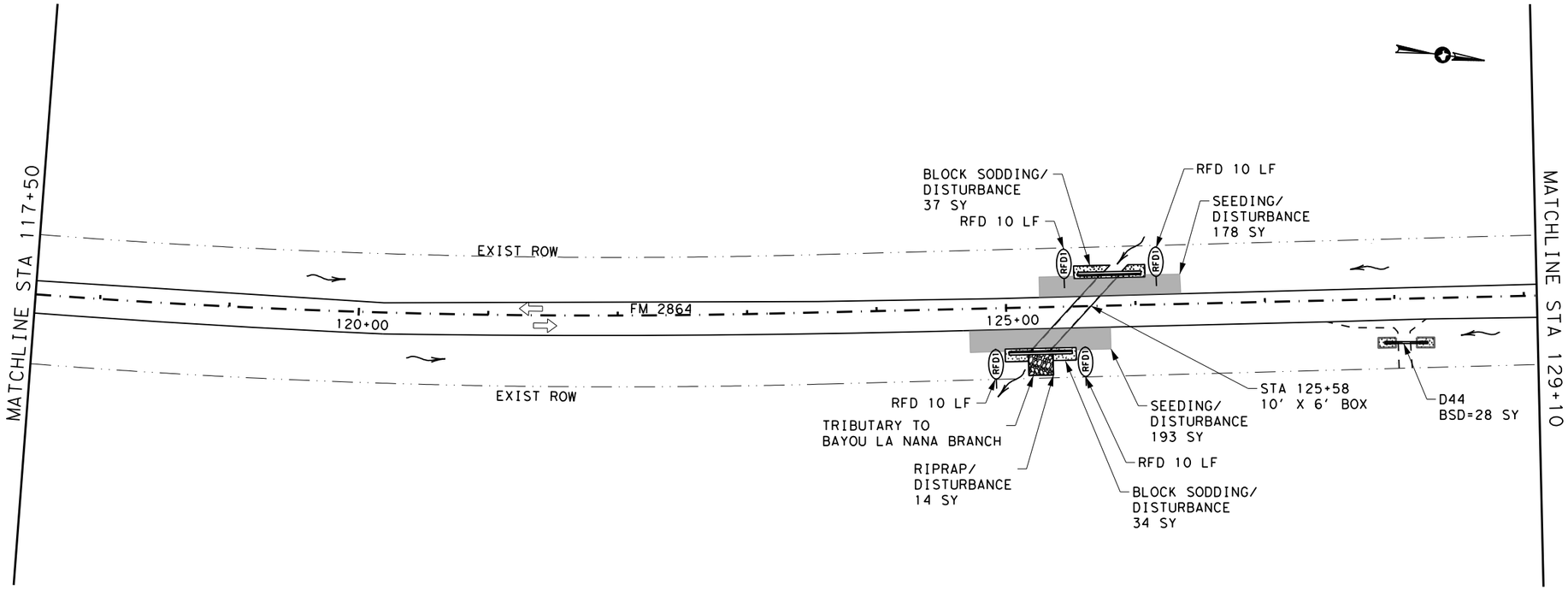

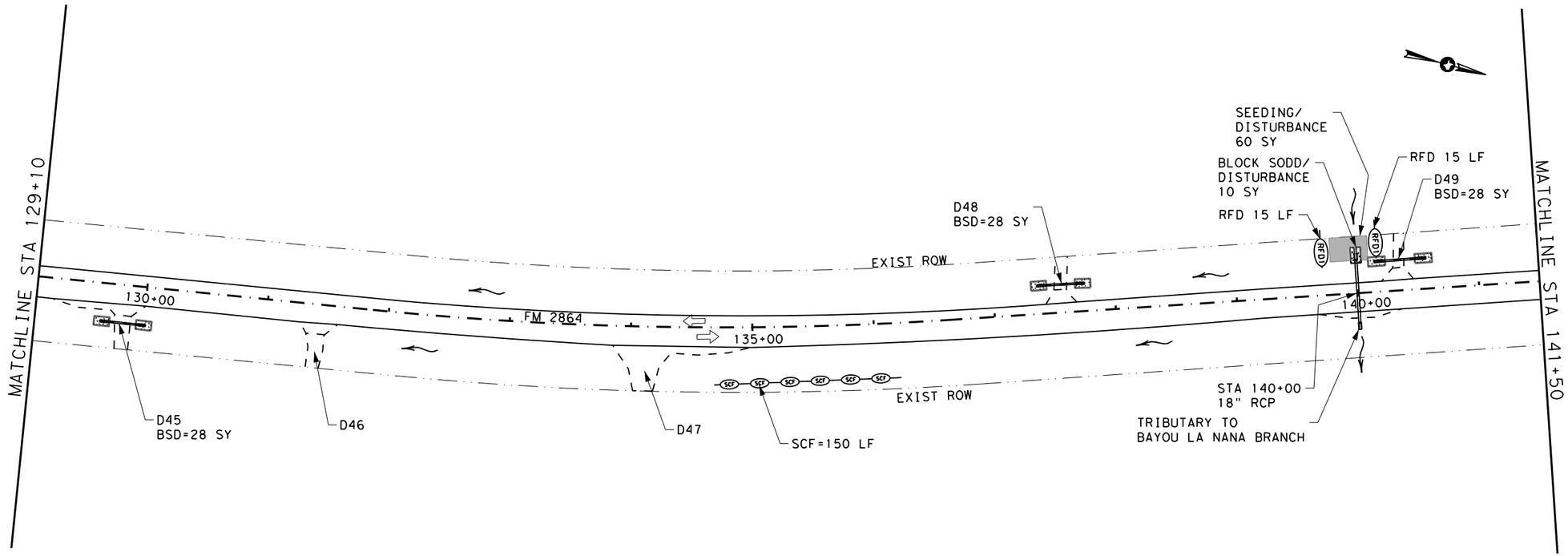

LEGEND

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SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 33 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		248

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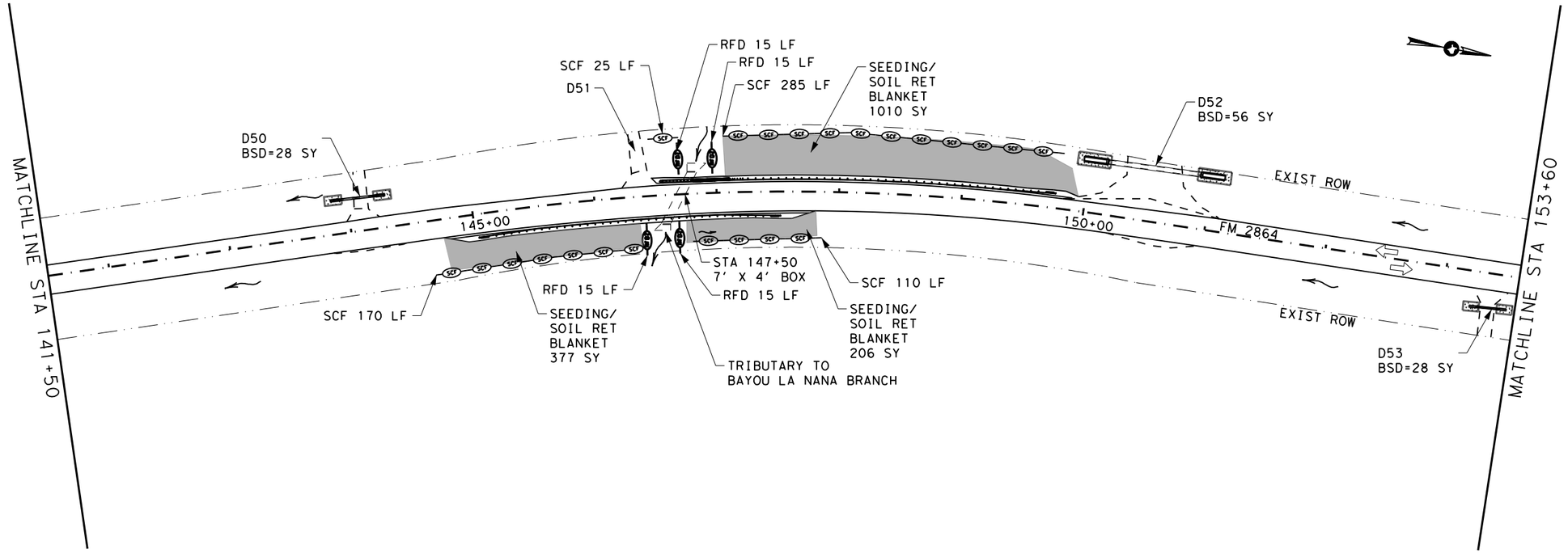

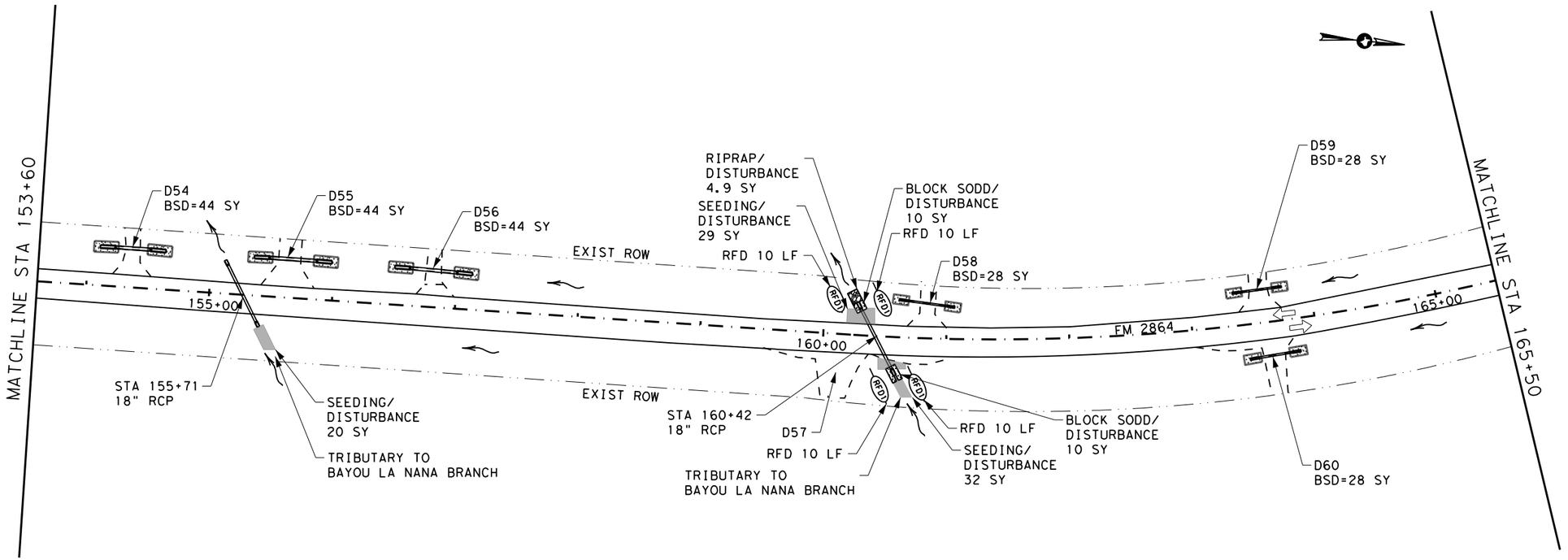

LEGEND

- ROCK FILTER DAM (TY 2)
- SEDIMENT CONT FENCE
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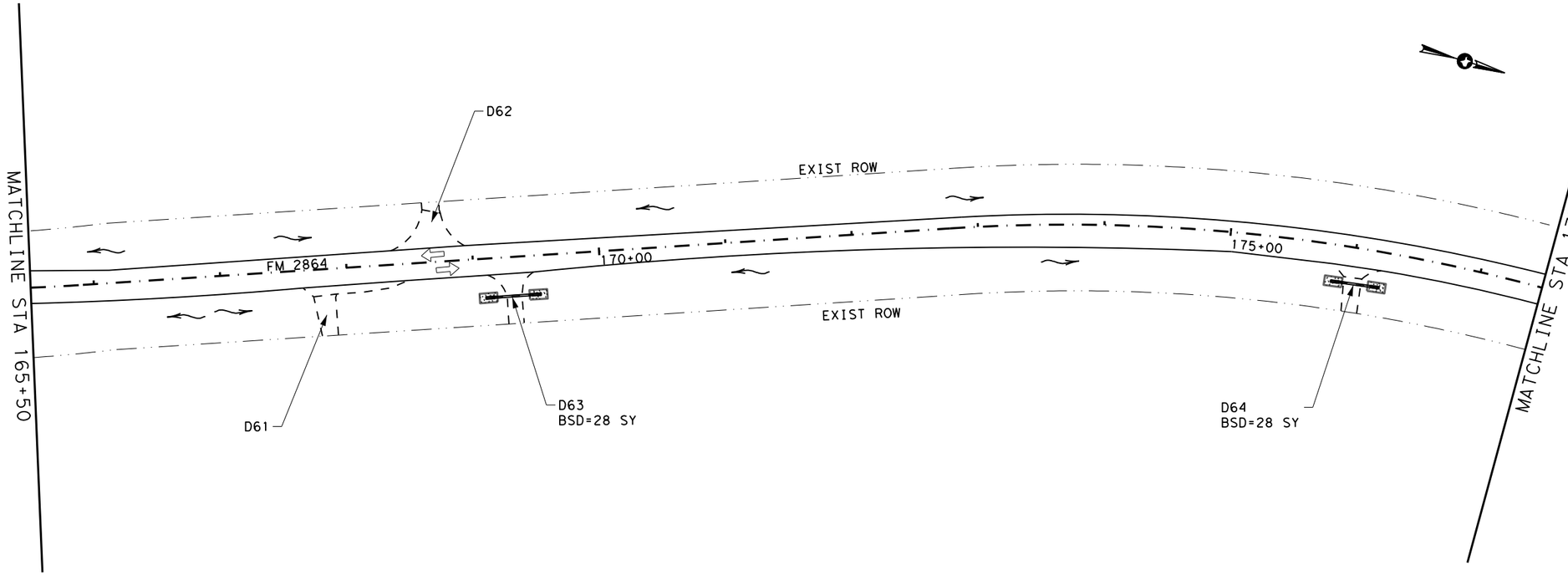
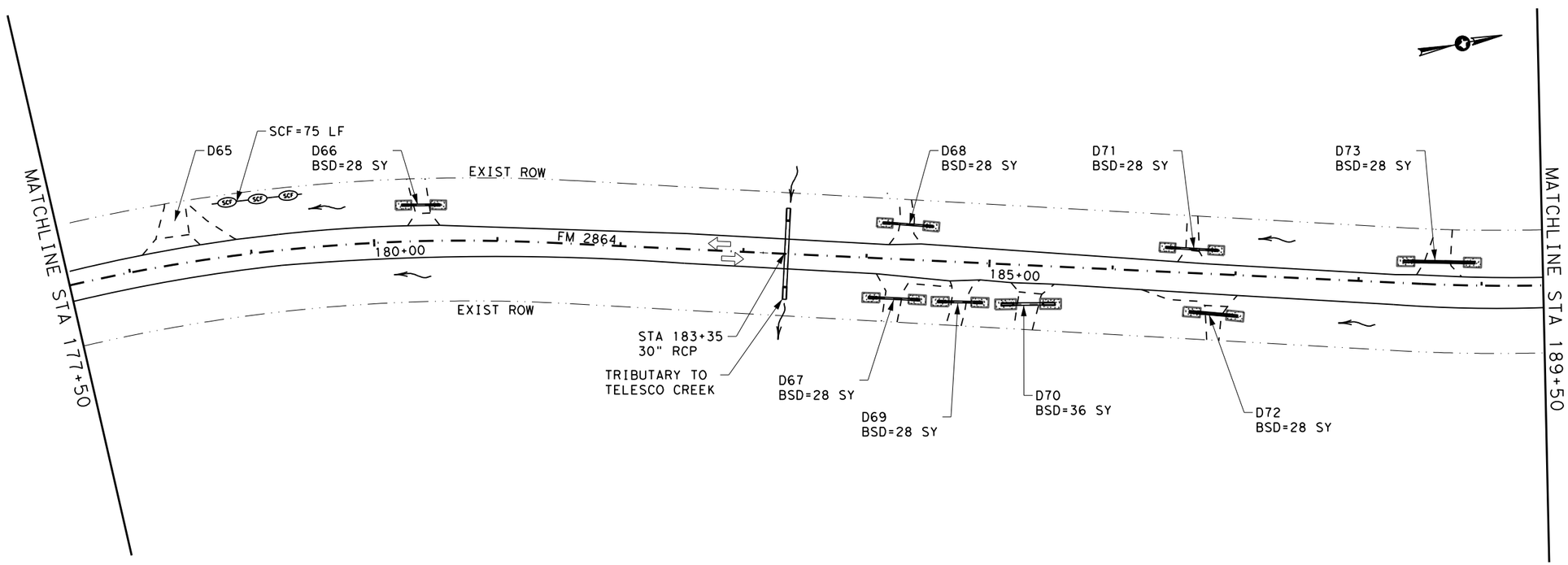
SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 34 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		249





LEGEND

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3/31/2022

SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 35 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		250

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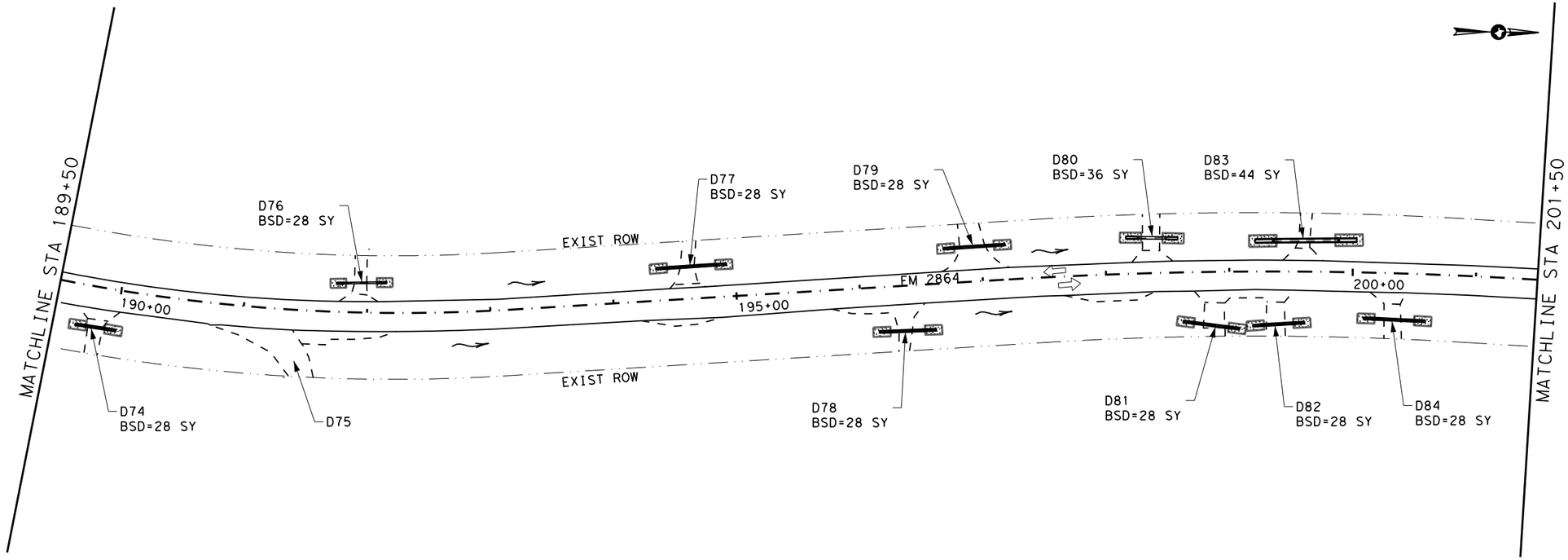

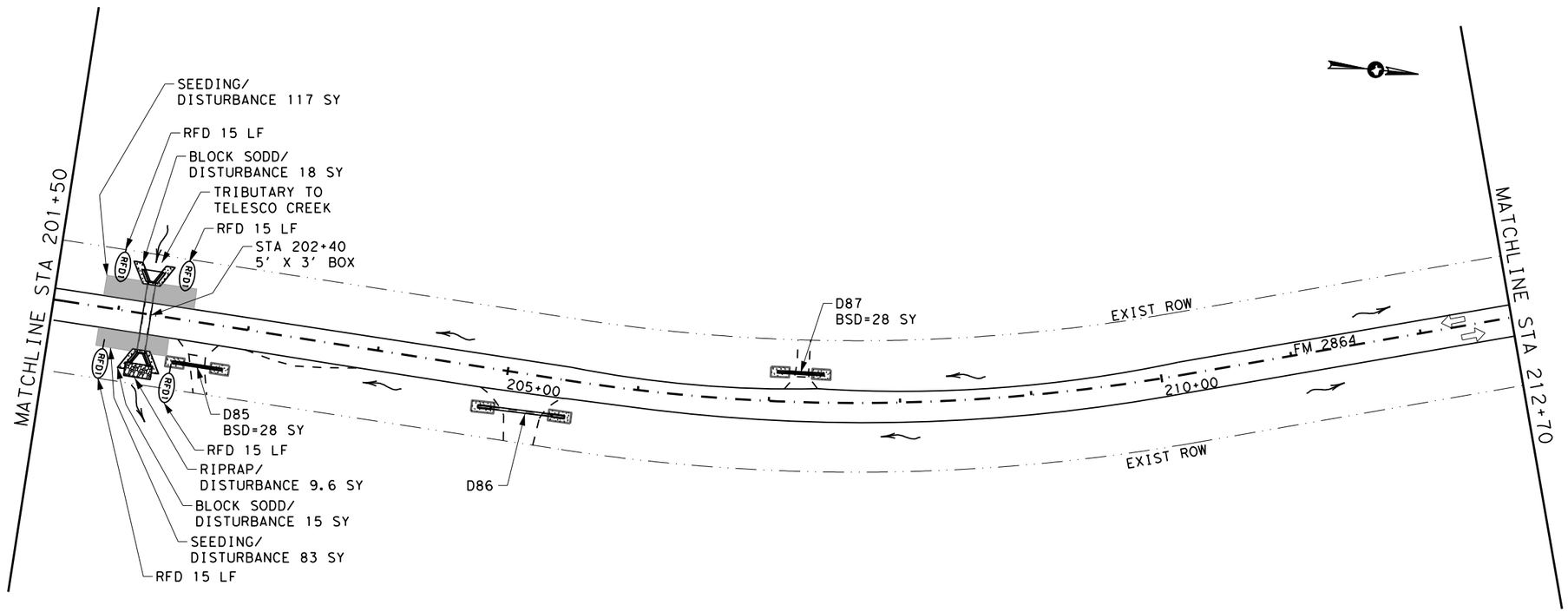

LEGEND

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3/31/2022

SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 36 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		251

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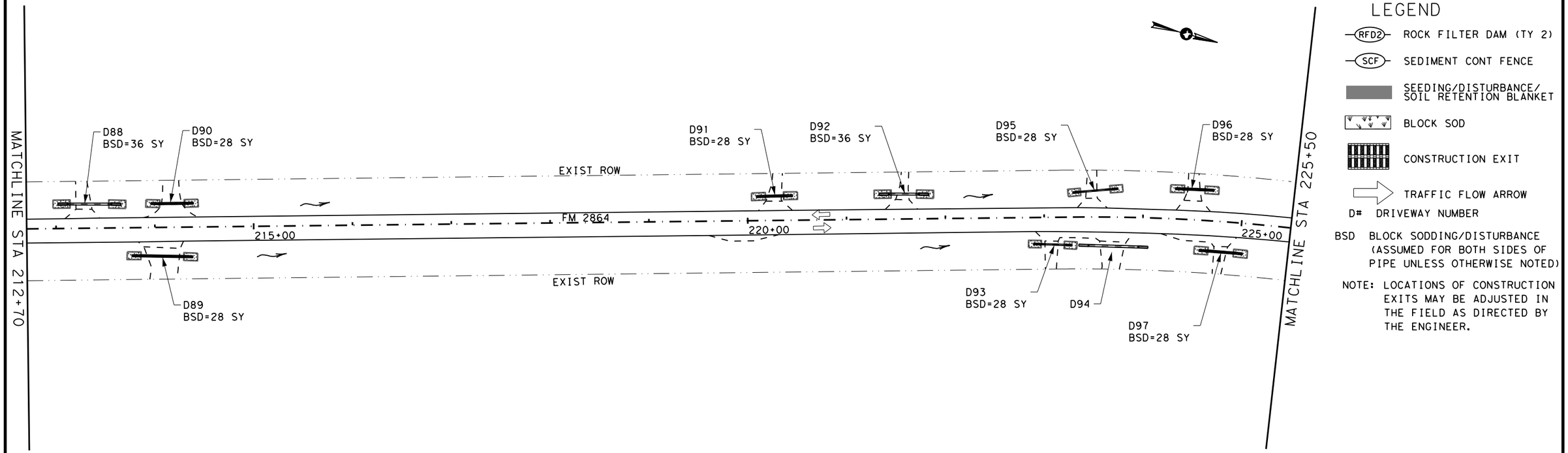

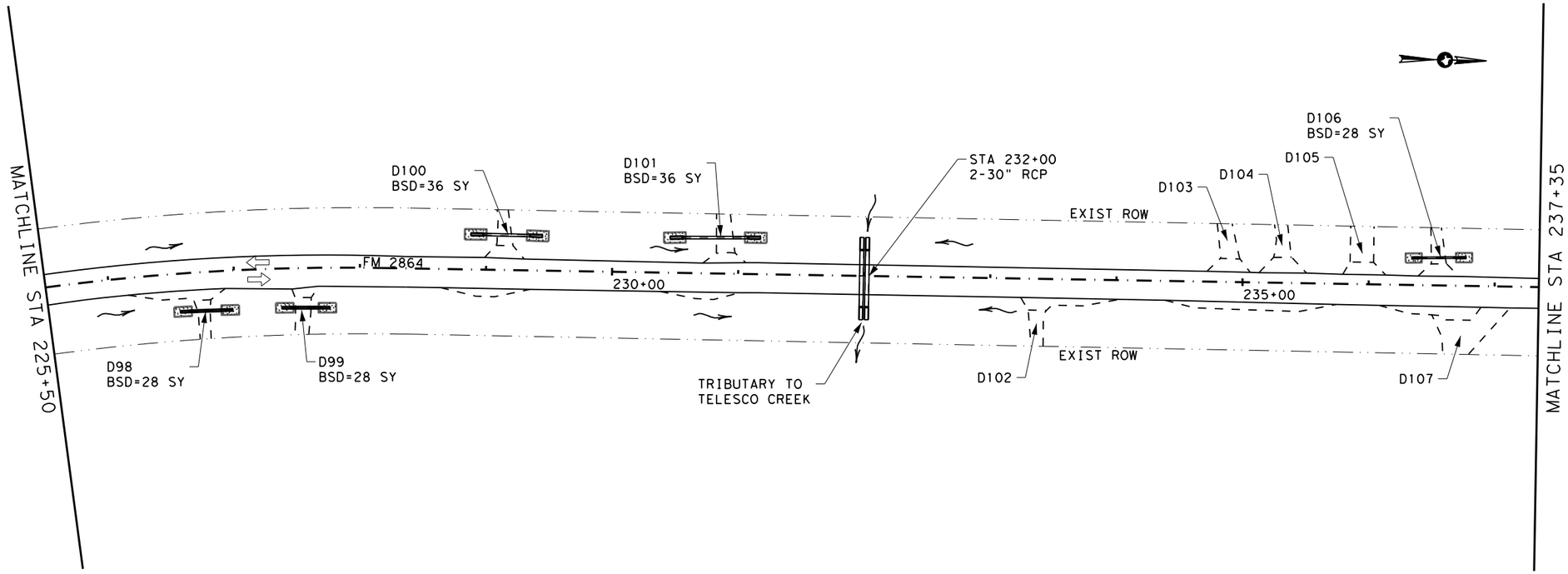

LEGEND

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- BLOCK SOD
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SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 37 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		252

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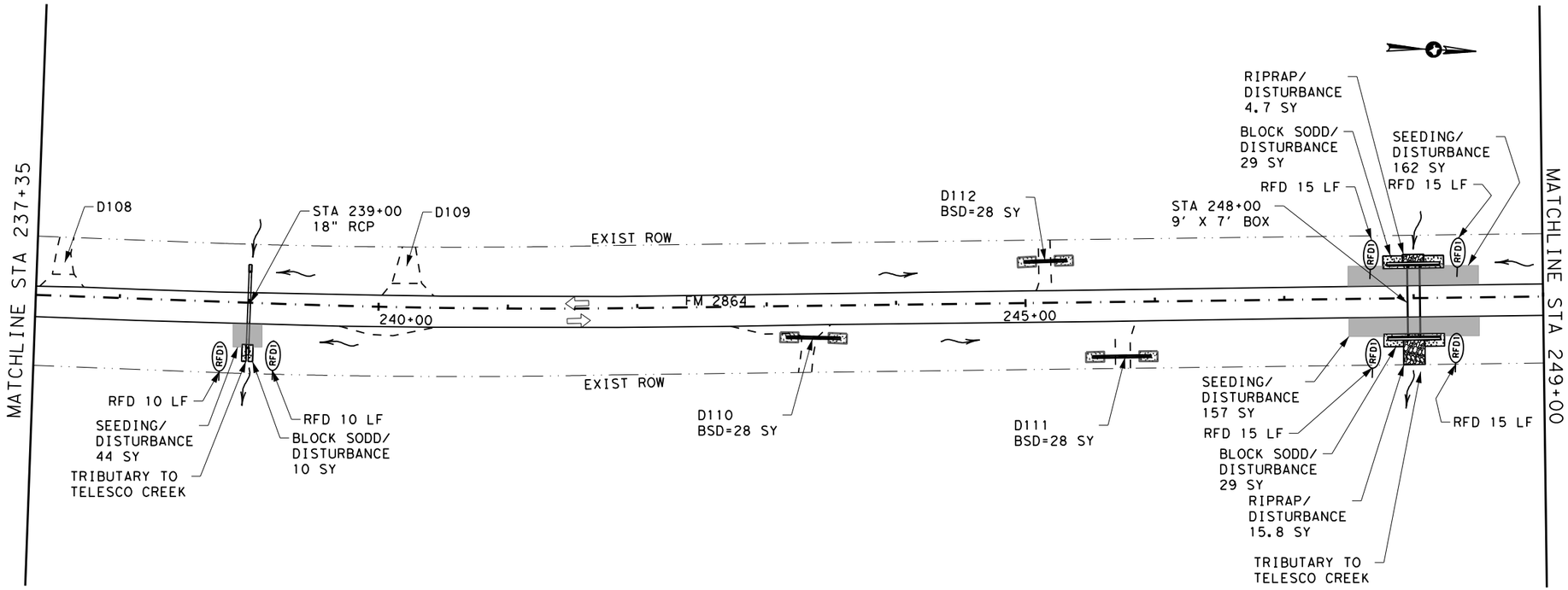

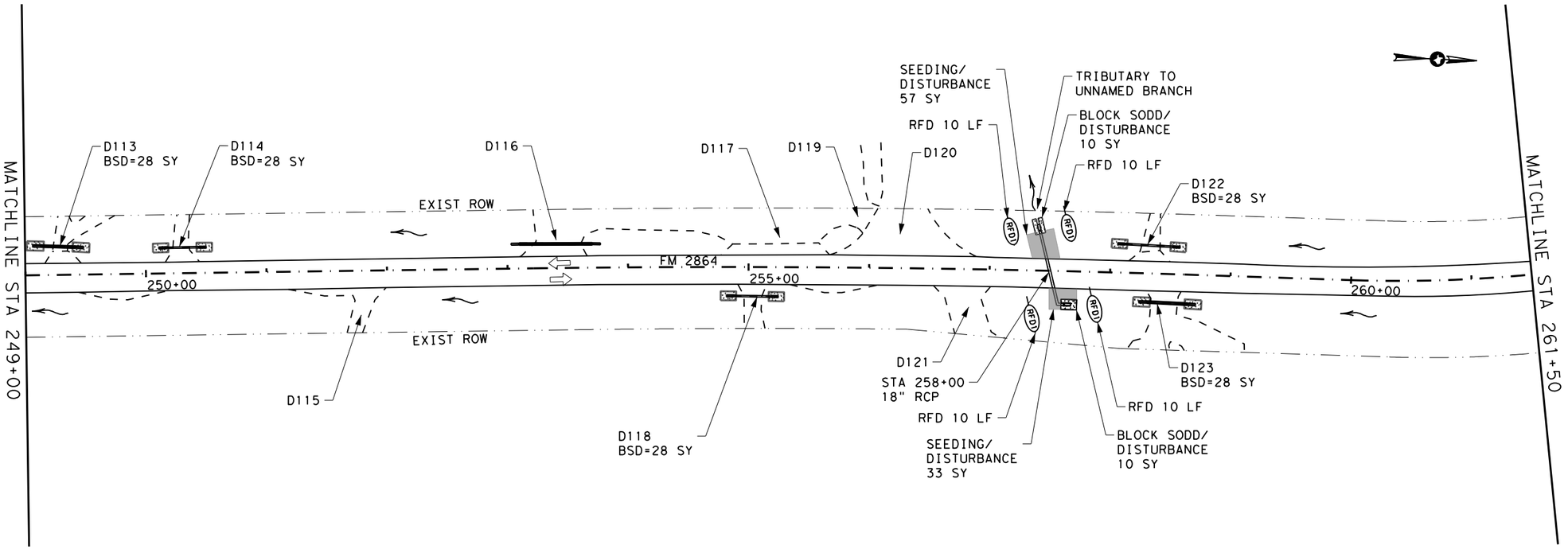

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER

BSD BLOCK SODDING/DISTURBANCE (ASSUMED FOR BOTH SIDES OF PIPE UNLESS OTHERWISE NOTED)

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

SCALE 1" = 100'

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ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

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3/31/2022

SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 38 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		253

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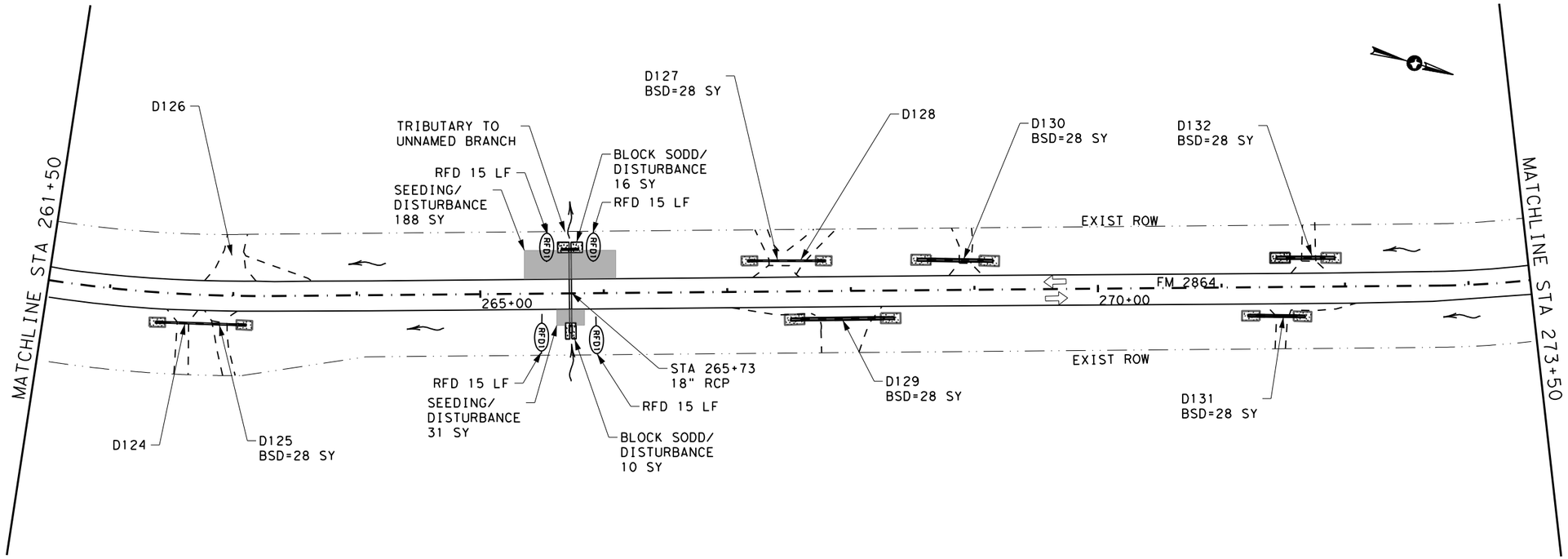

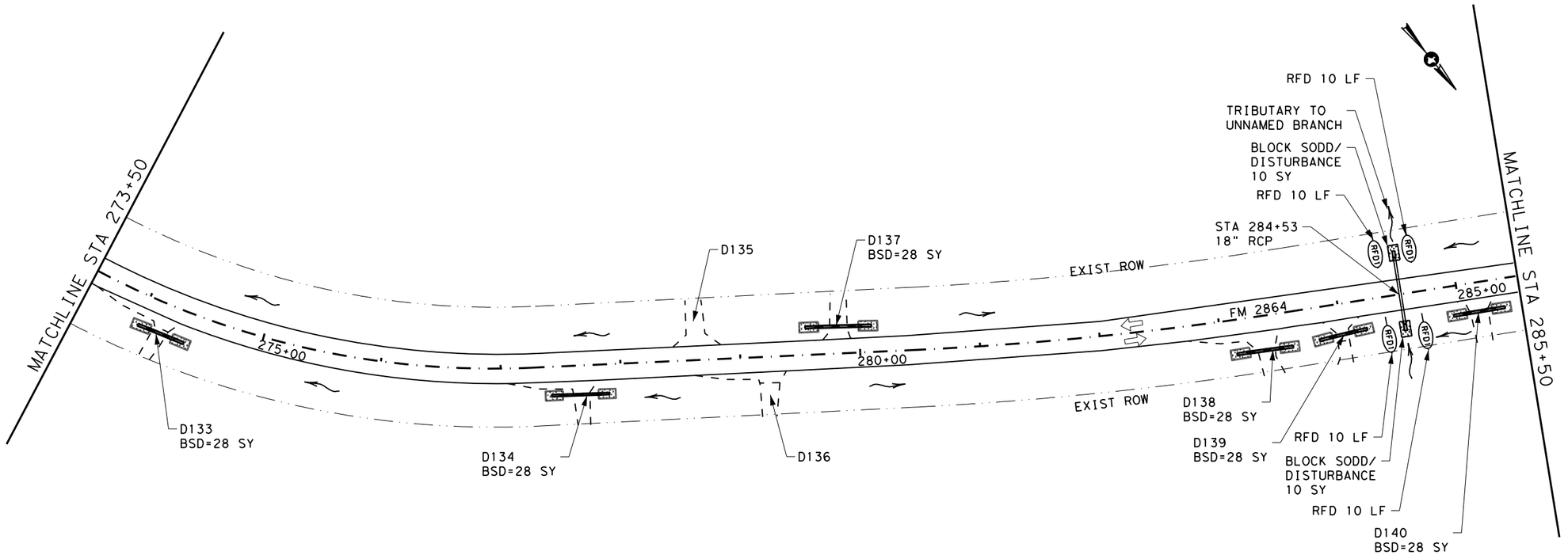

LEGEND

- ROCK FILTER DAM (TY 2)
- SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
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SWP3 LAYOUTS (FM 2864)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 39 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		254

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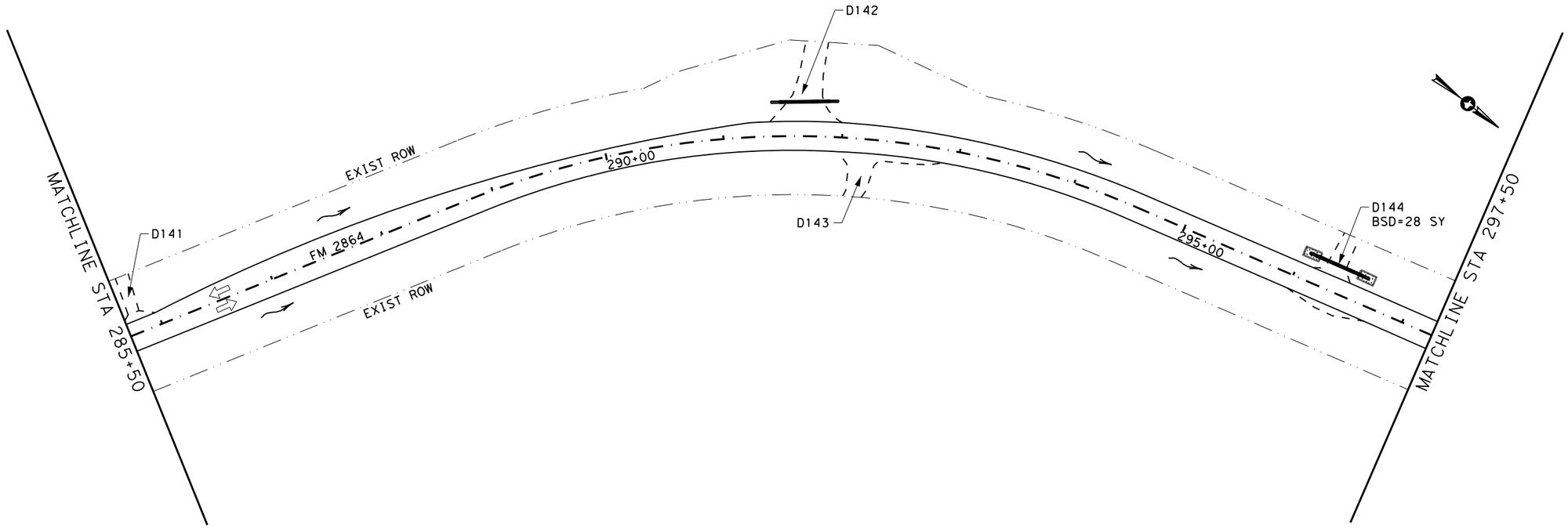

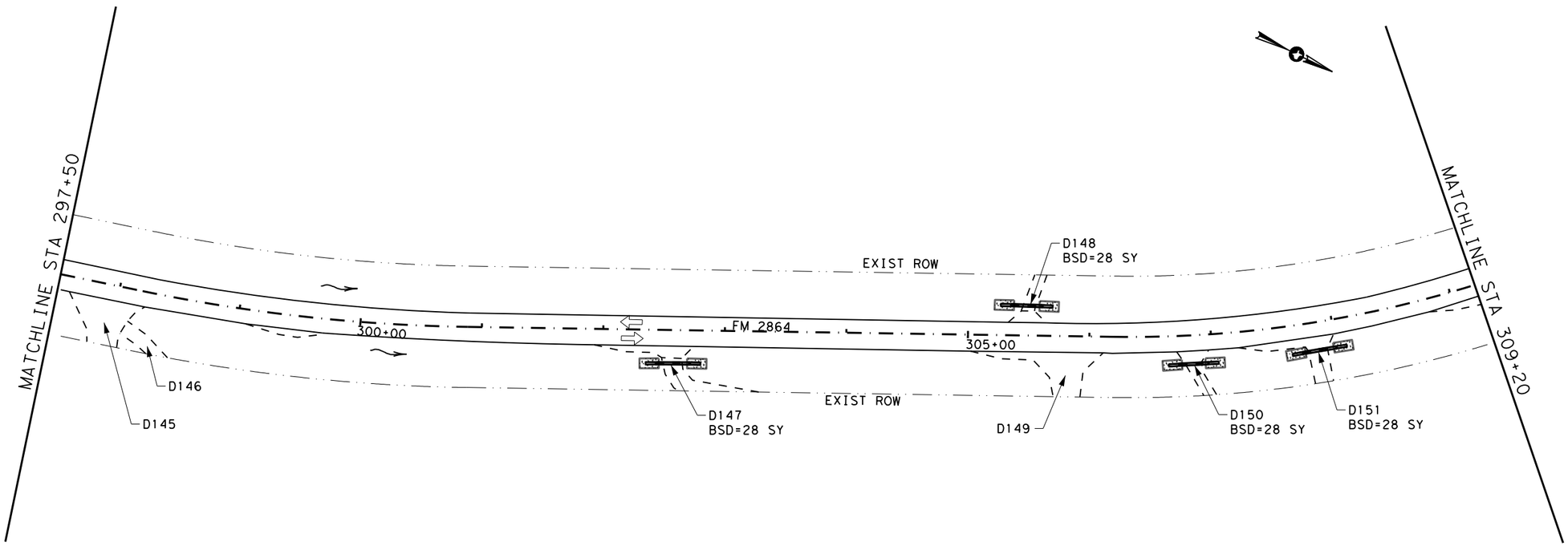

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 40 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		255

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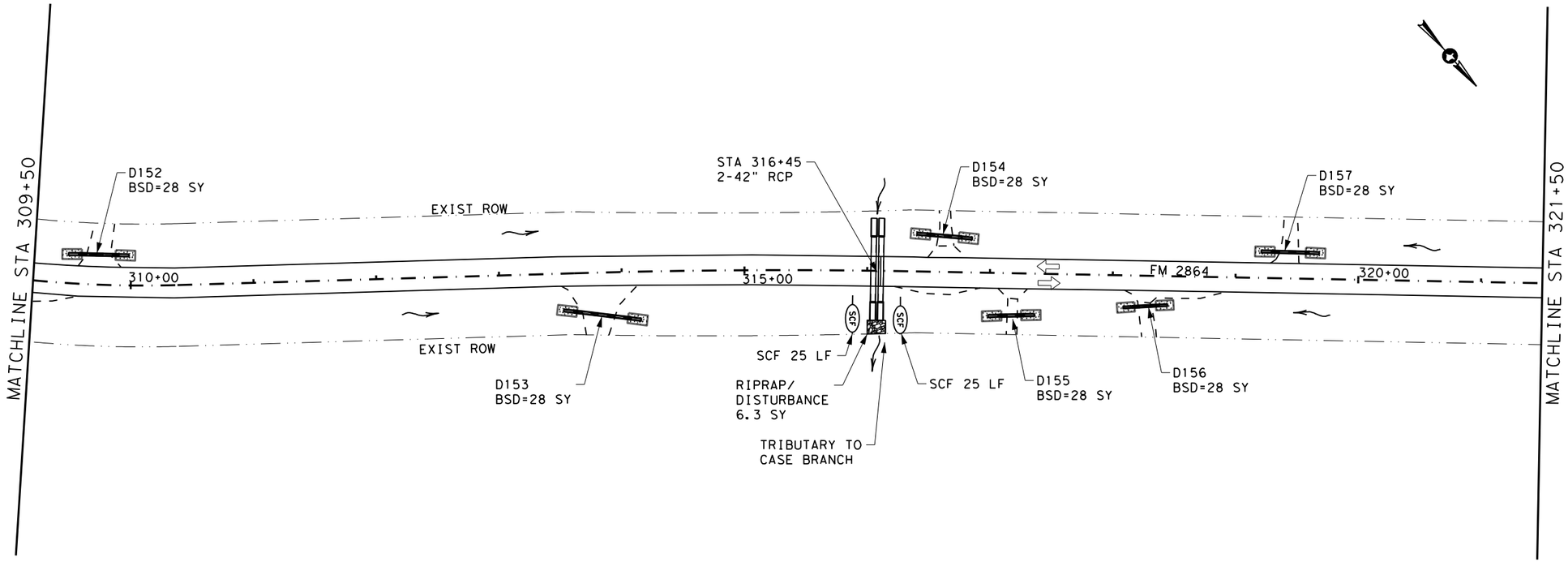

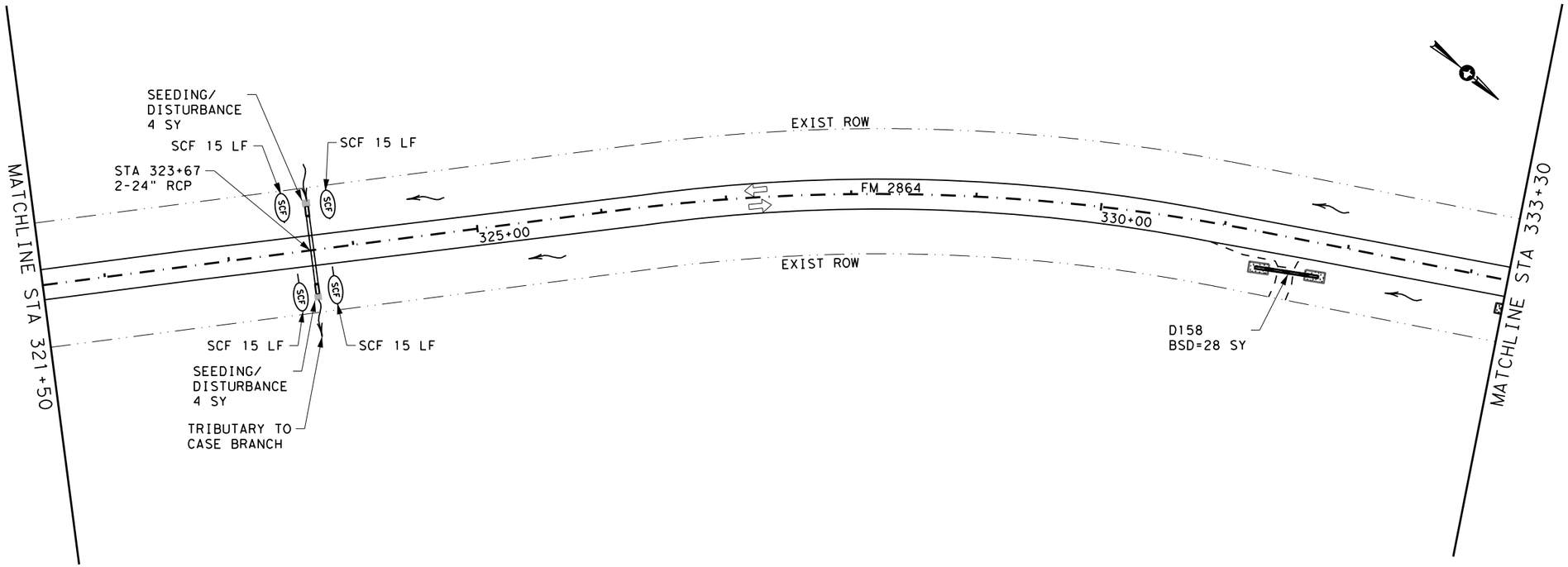

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 41 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		256

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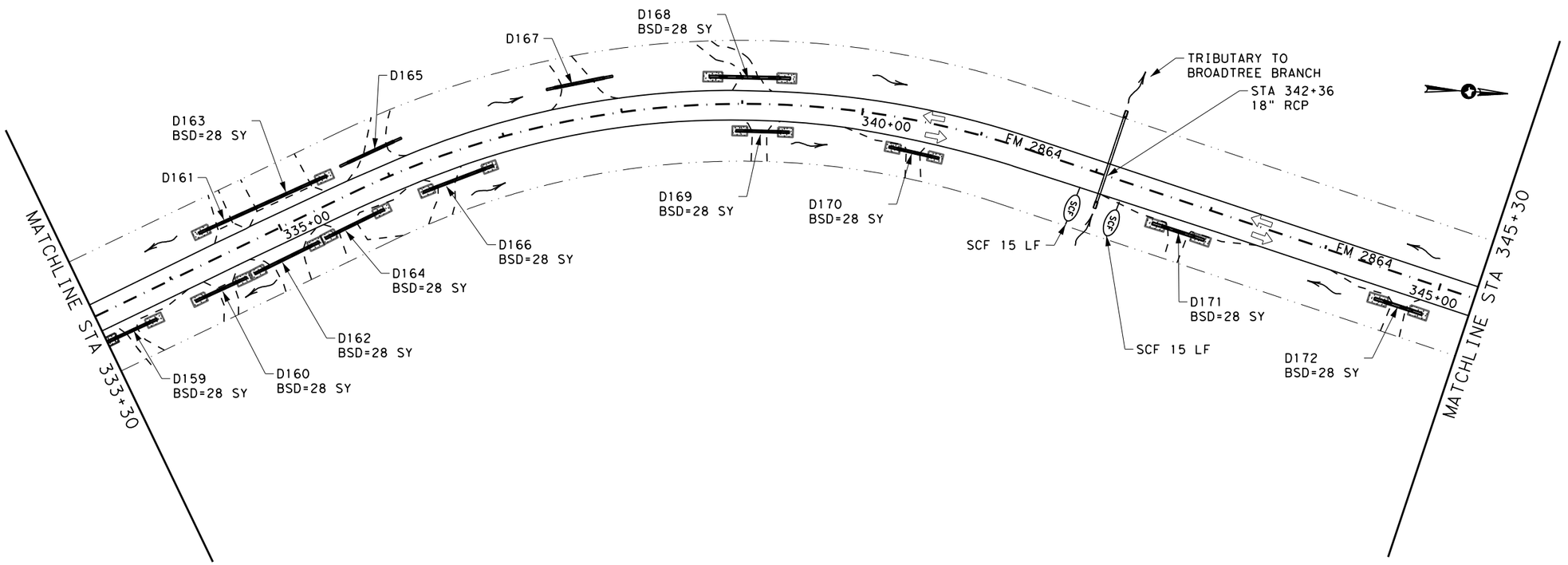

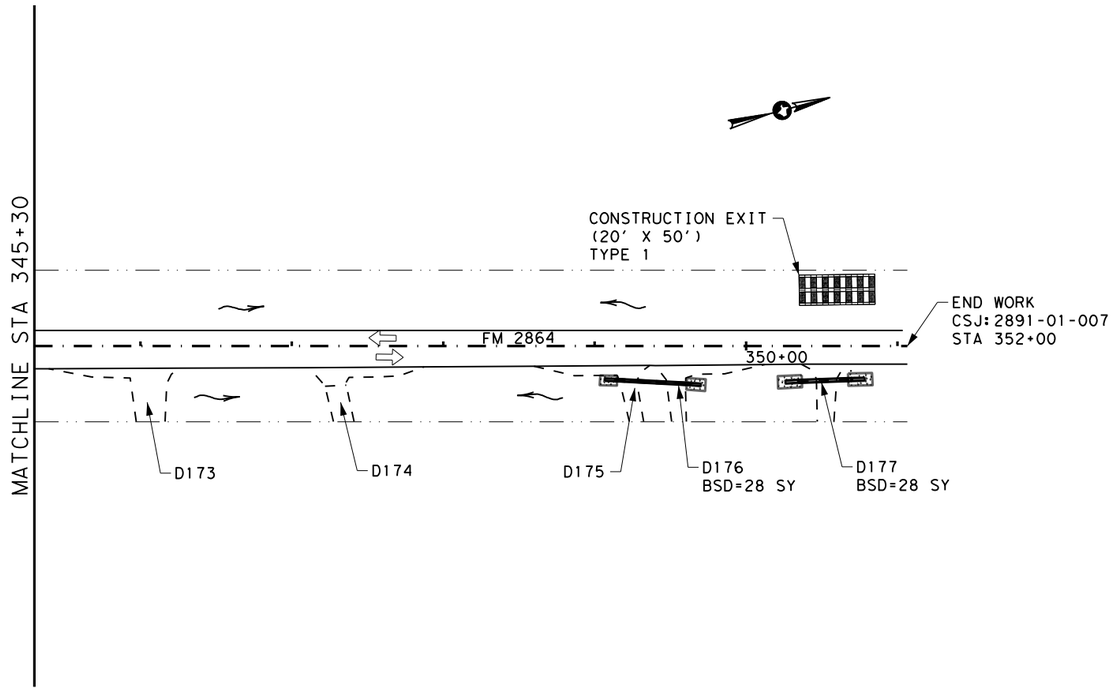

LEGEND

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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 42 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		257

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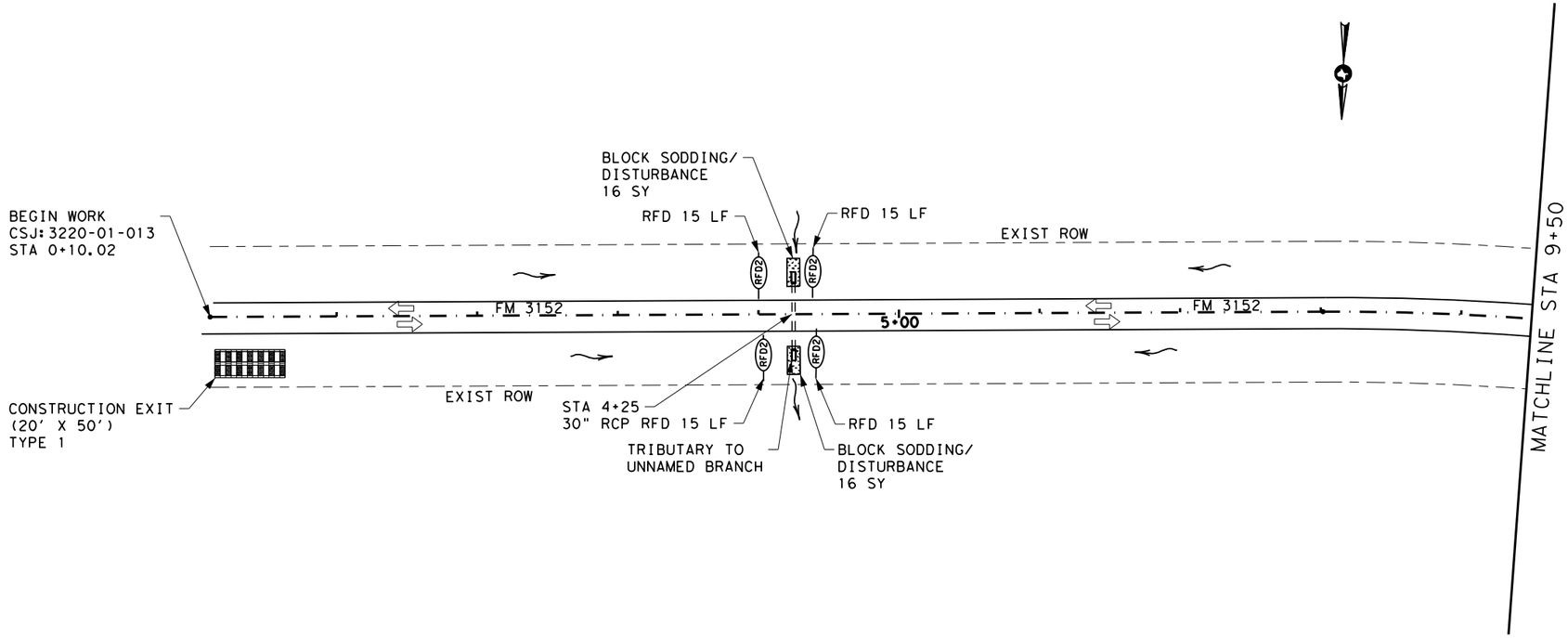

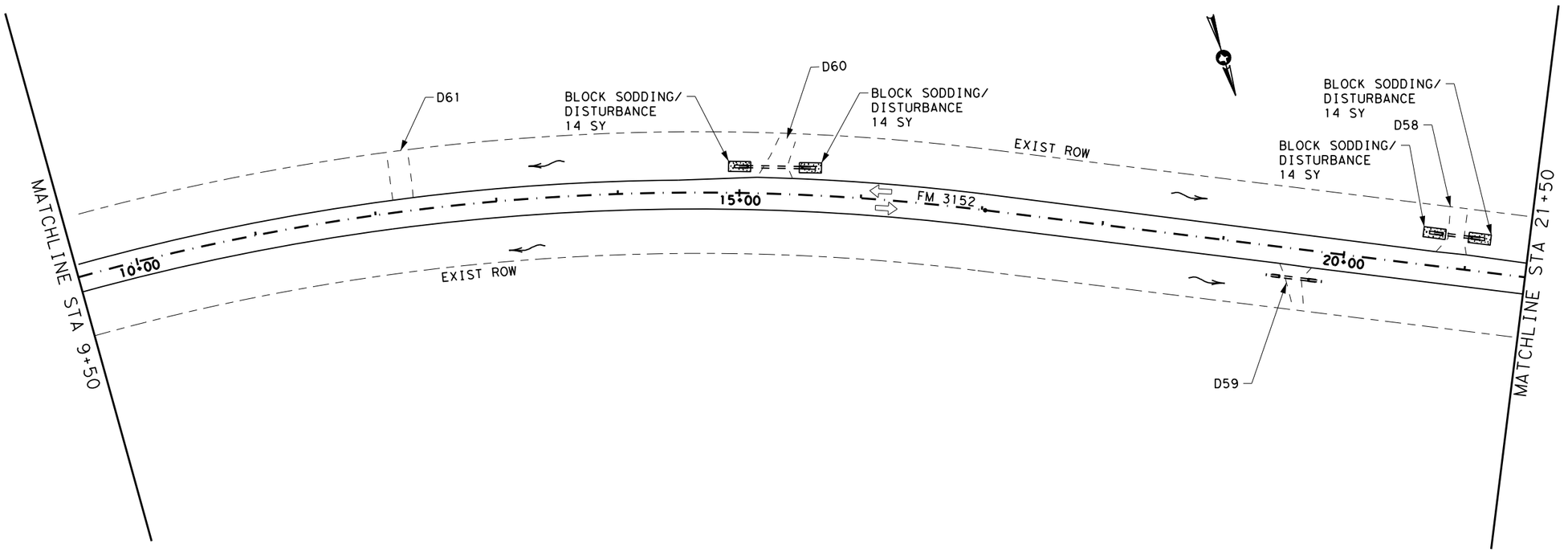

SCALE 1" = 100'

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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 43 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		258

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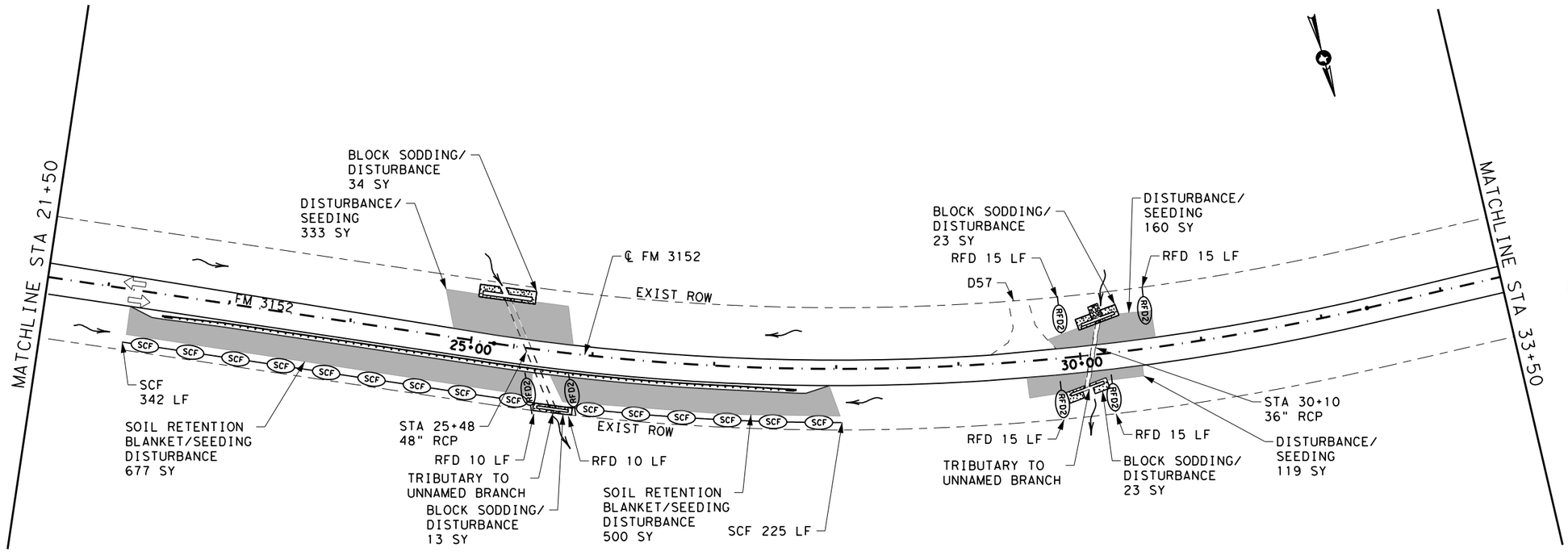

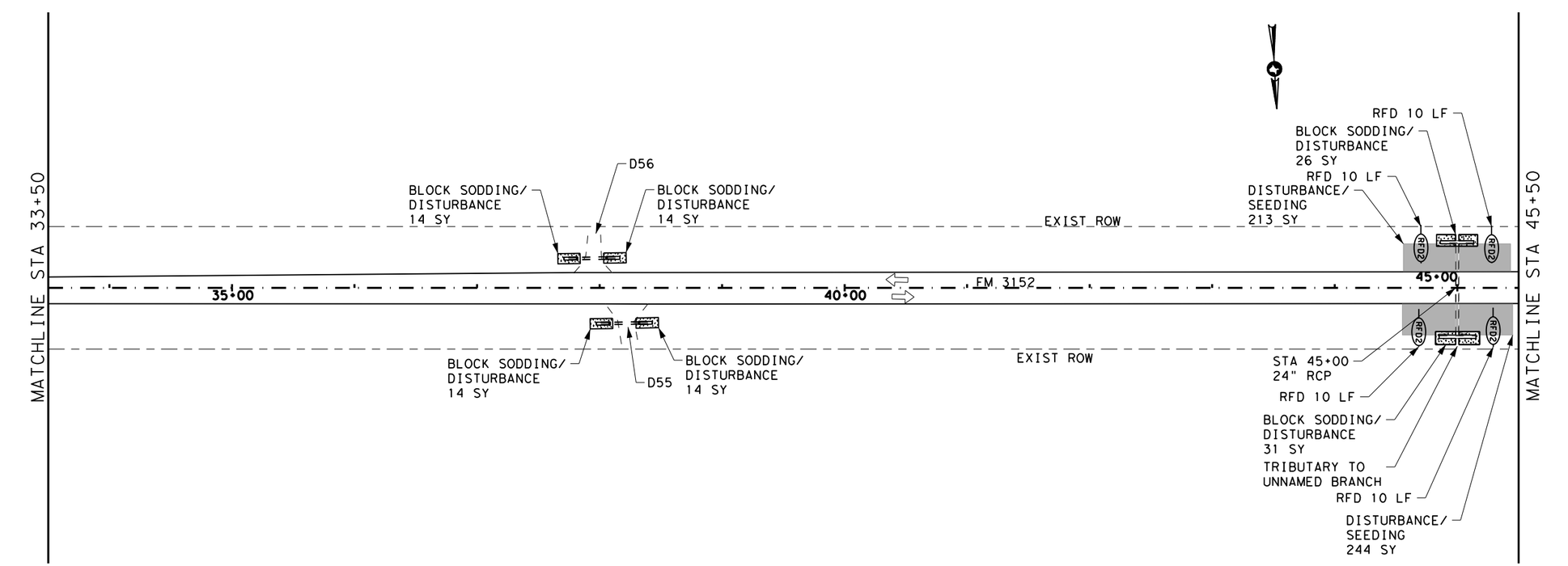

LEGEND

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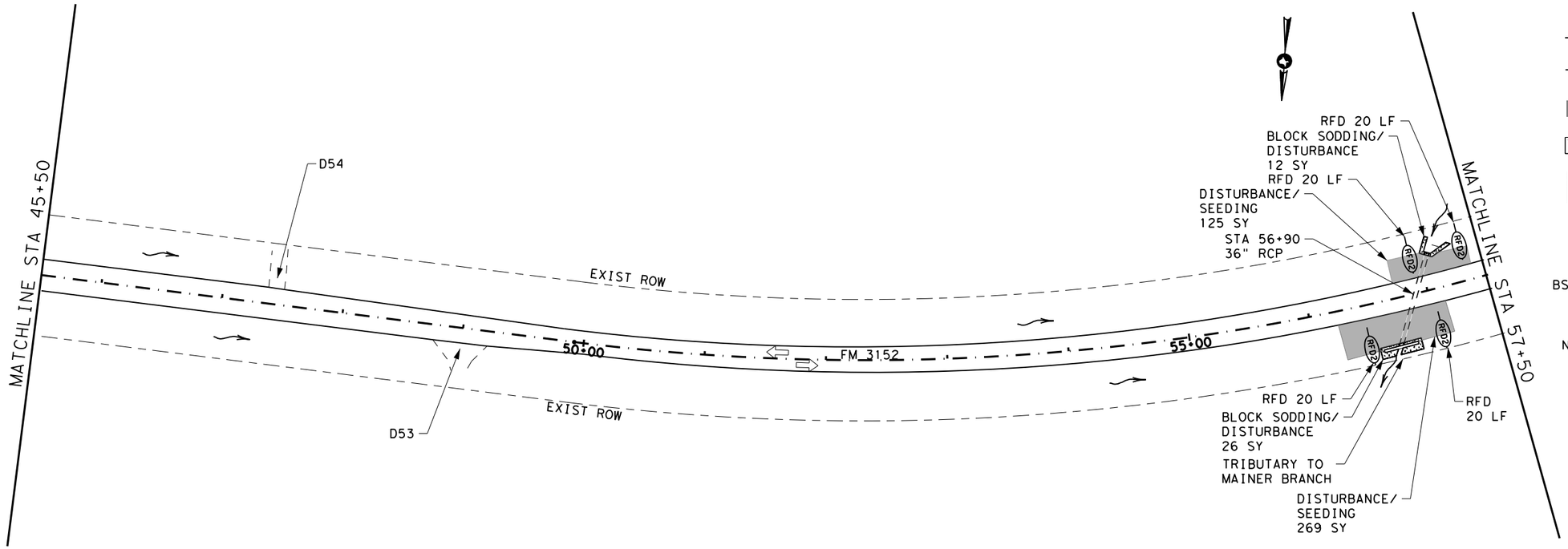
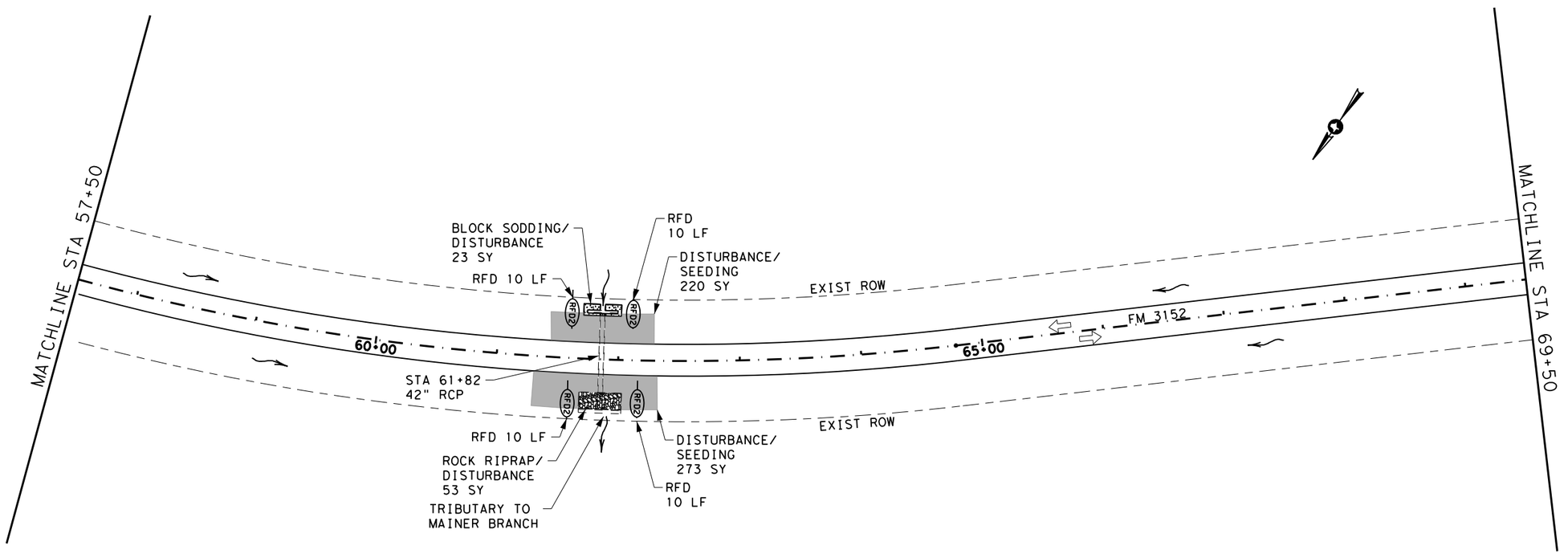
SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 44 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		259





LEGEND

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SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 45 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		260

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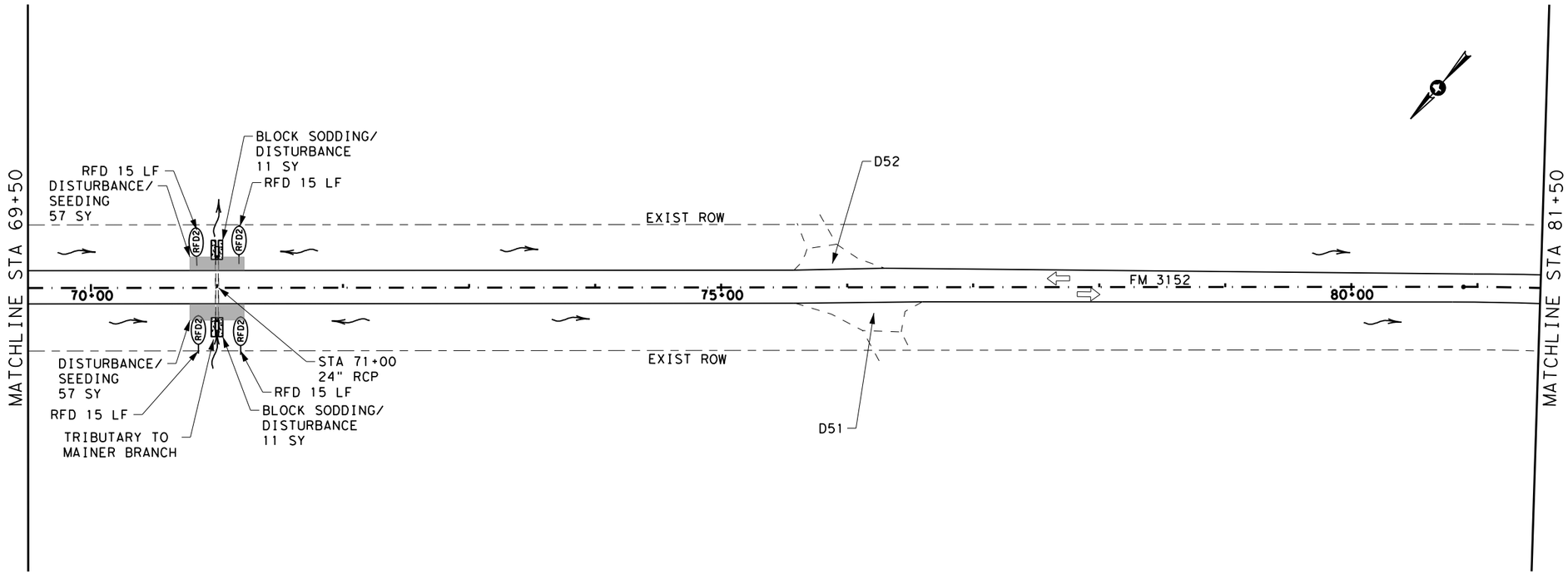

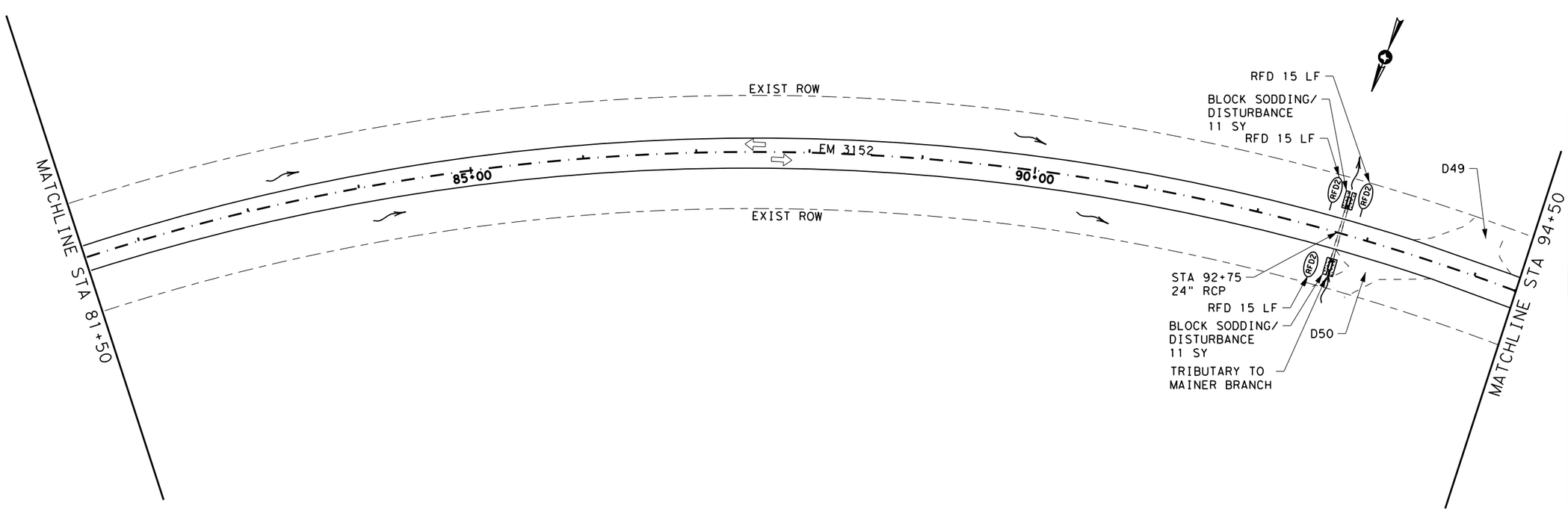

LEGEND

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SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 46 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		261

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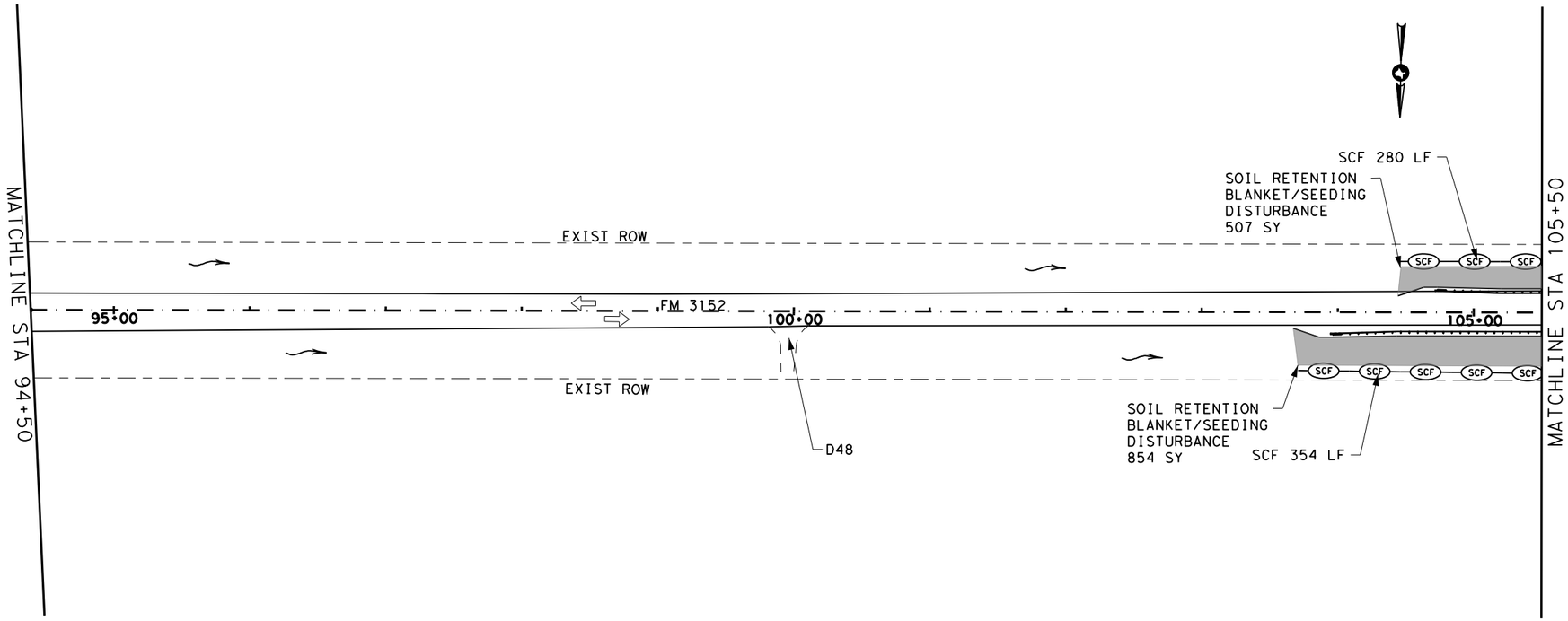

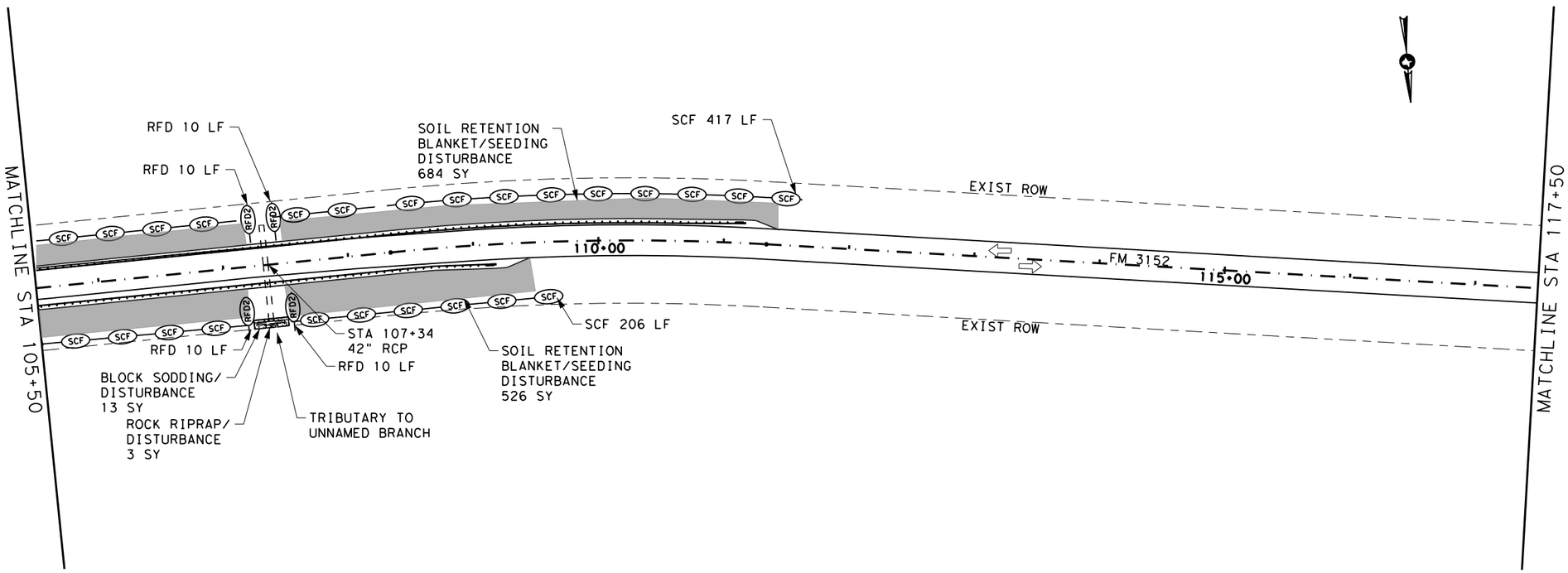

LEGEND

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SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 47 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		262

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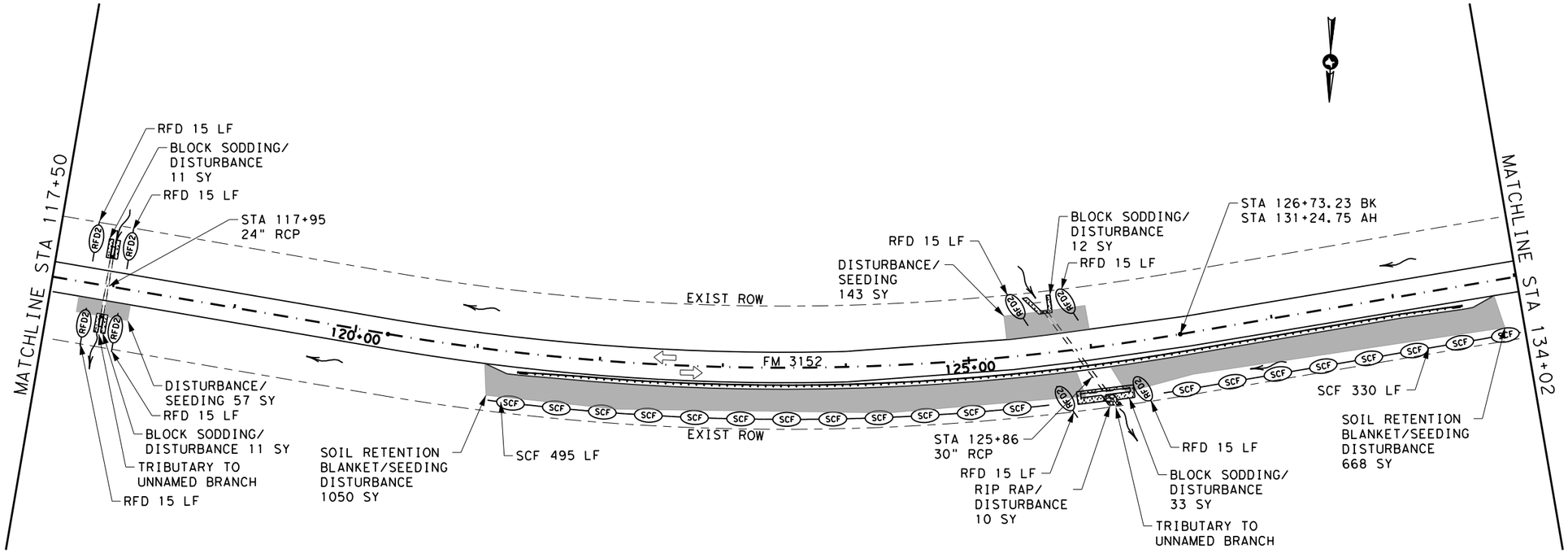

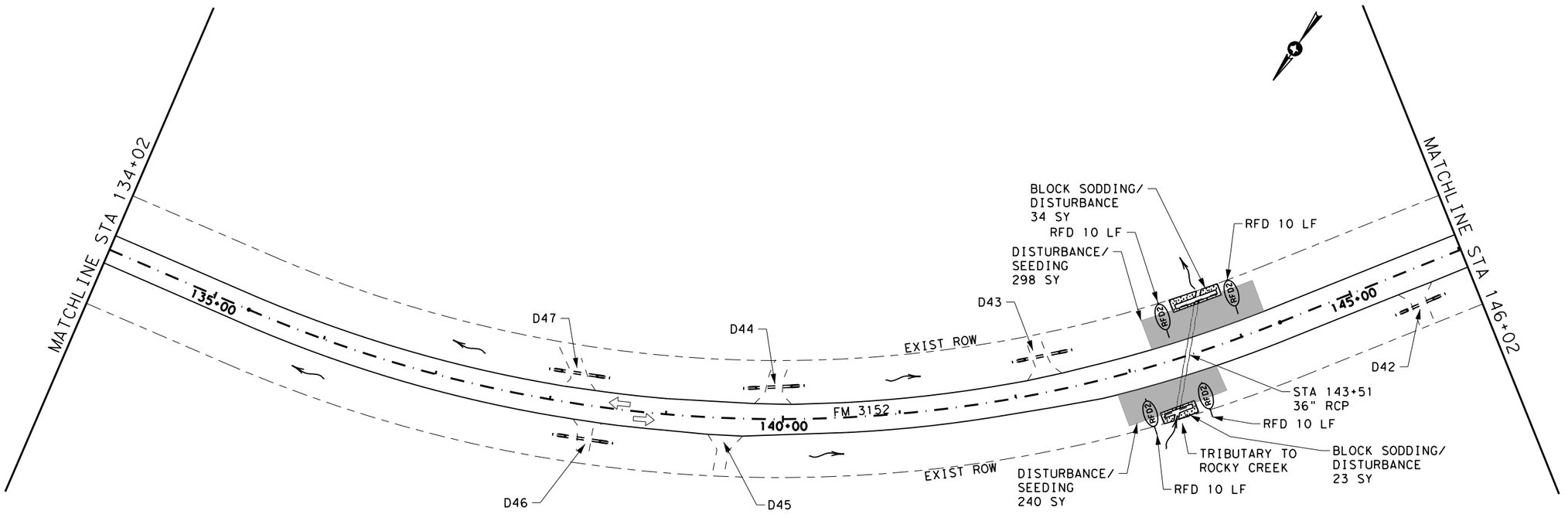

LEGEND

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SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 48 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		263

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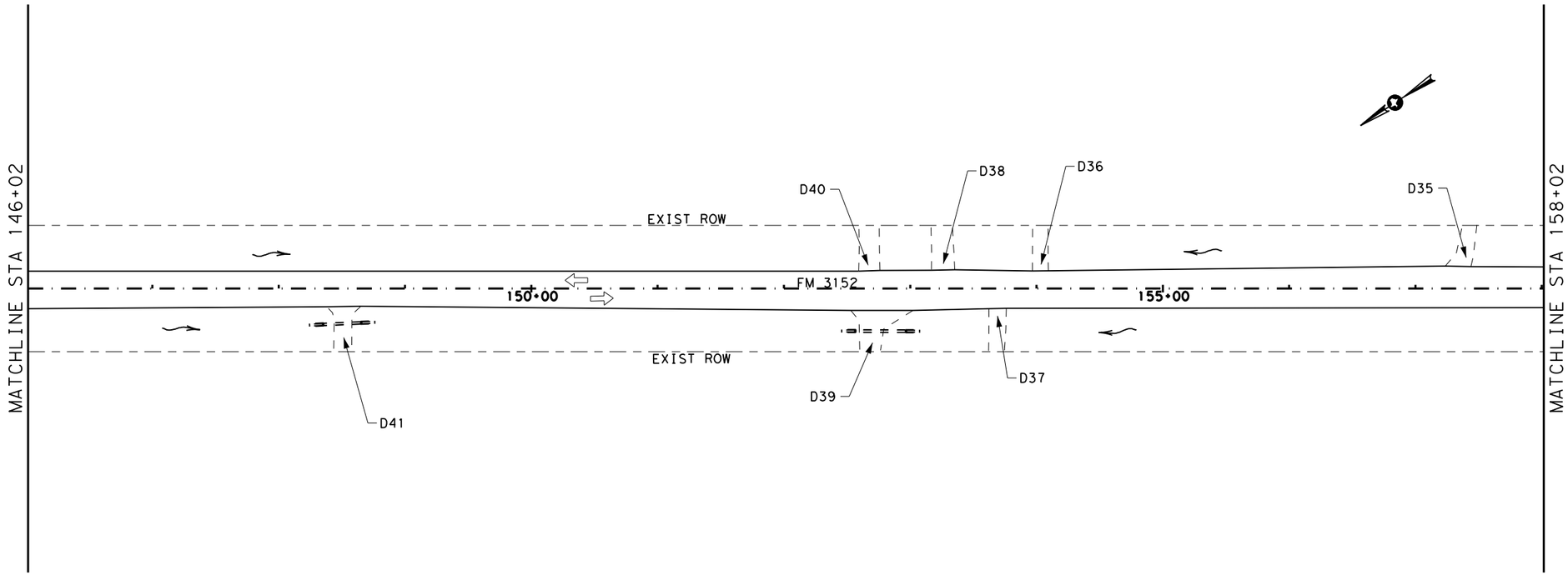

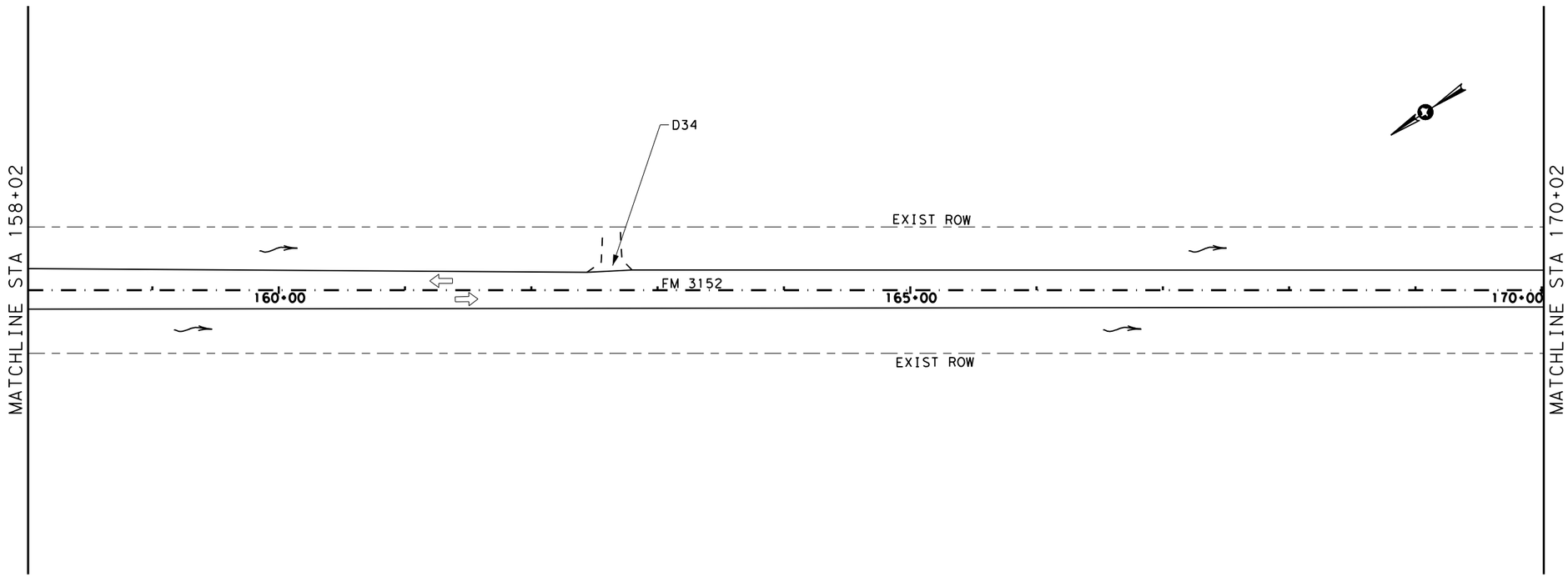

LEGEND

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SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 49 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		264

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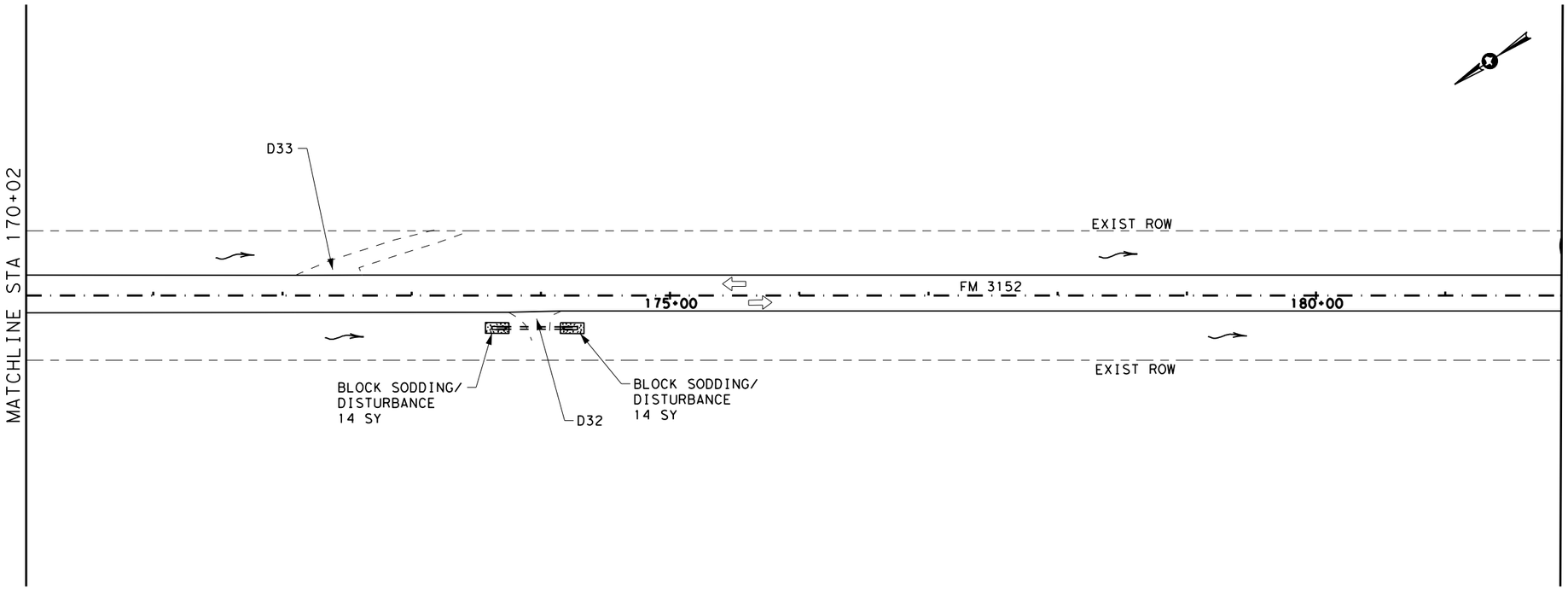

LEGEND

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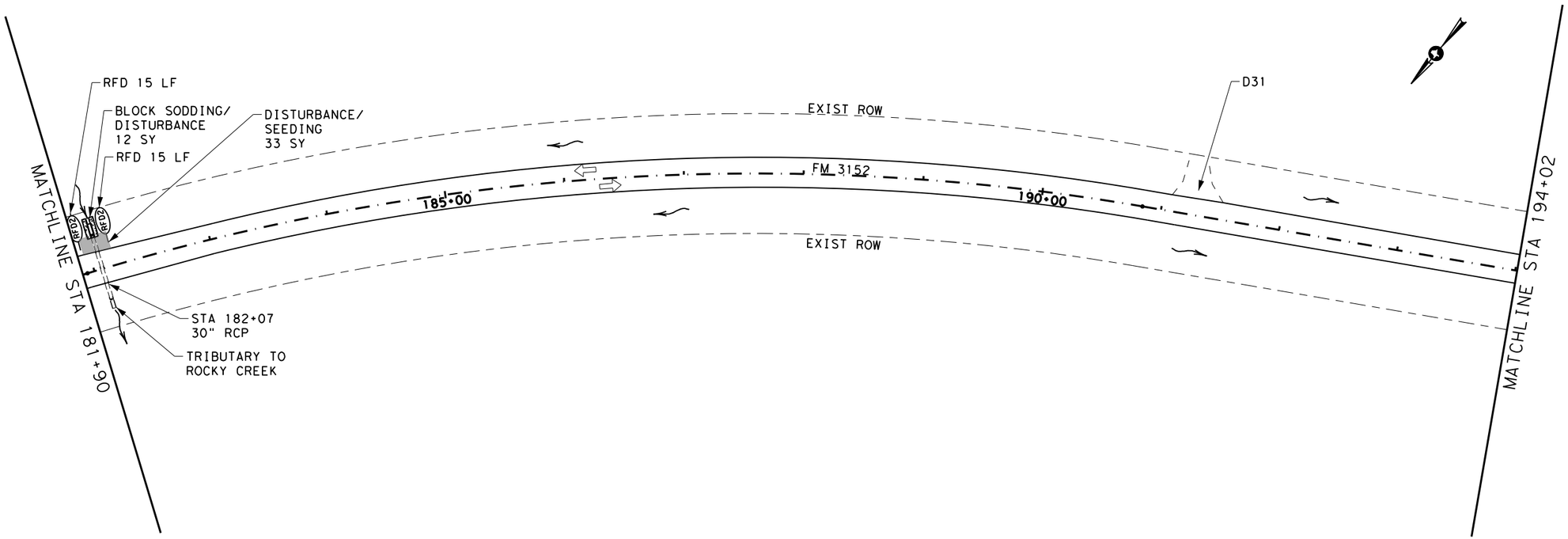

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SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 50 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		265

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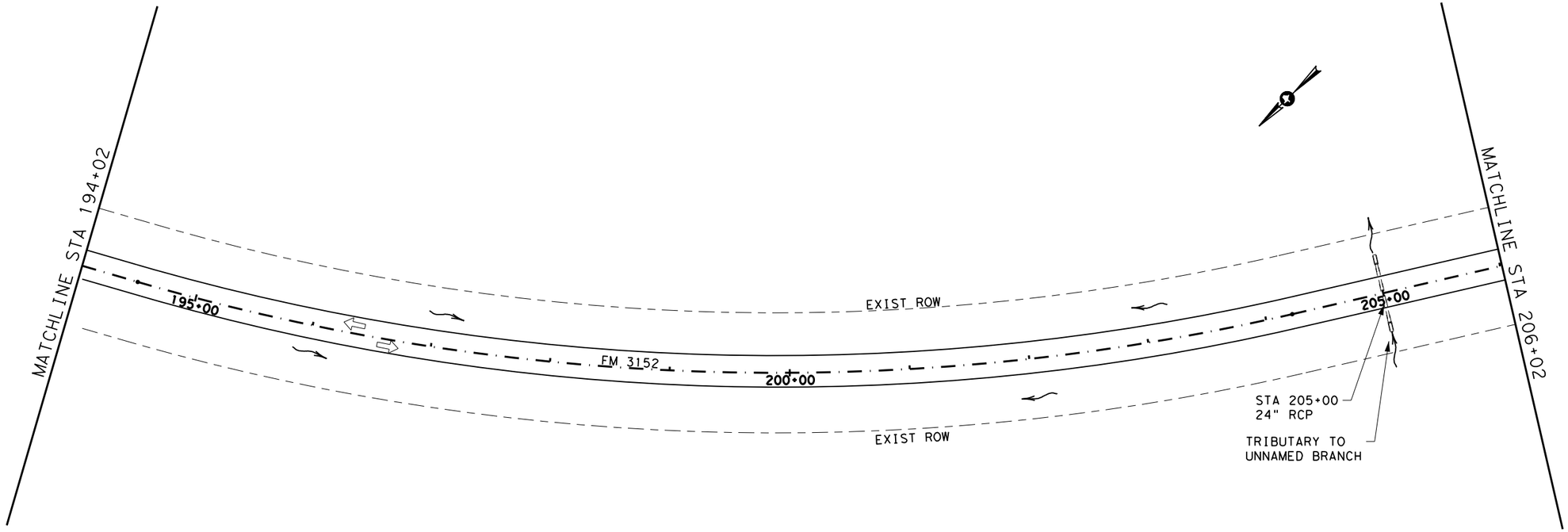

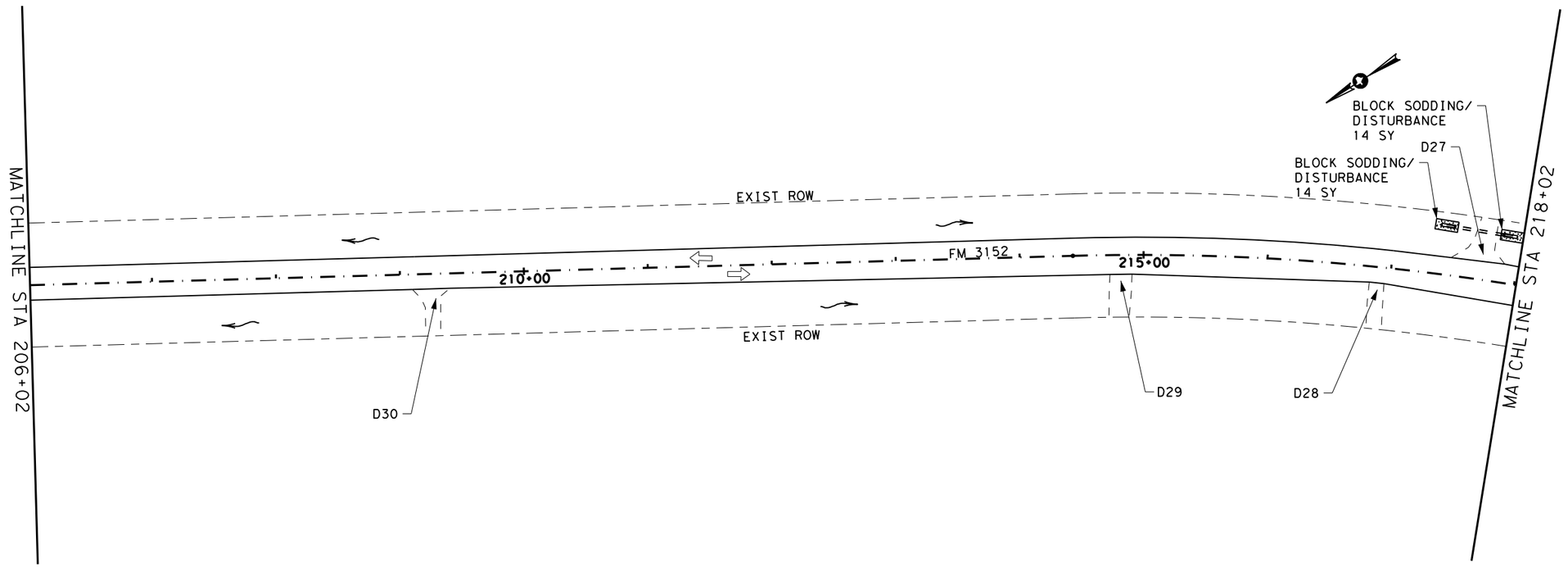

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER
- BSD BLOCK SODDING/DISTURBANCE (ASSUMED FOR BOTH SIDES OF PIPE UNLESS OTHERWISE NOTED)

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

SCALE 1" = 100'

STATE OF TEXAS
ELIZABETH A. ORTEGO
91106
LICENSED
PROFESSIONAL ENGINEER

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Elizabeth Ortego, P.E.
1B27AAE715144...
3/31/2022

SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 51 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		266

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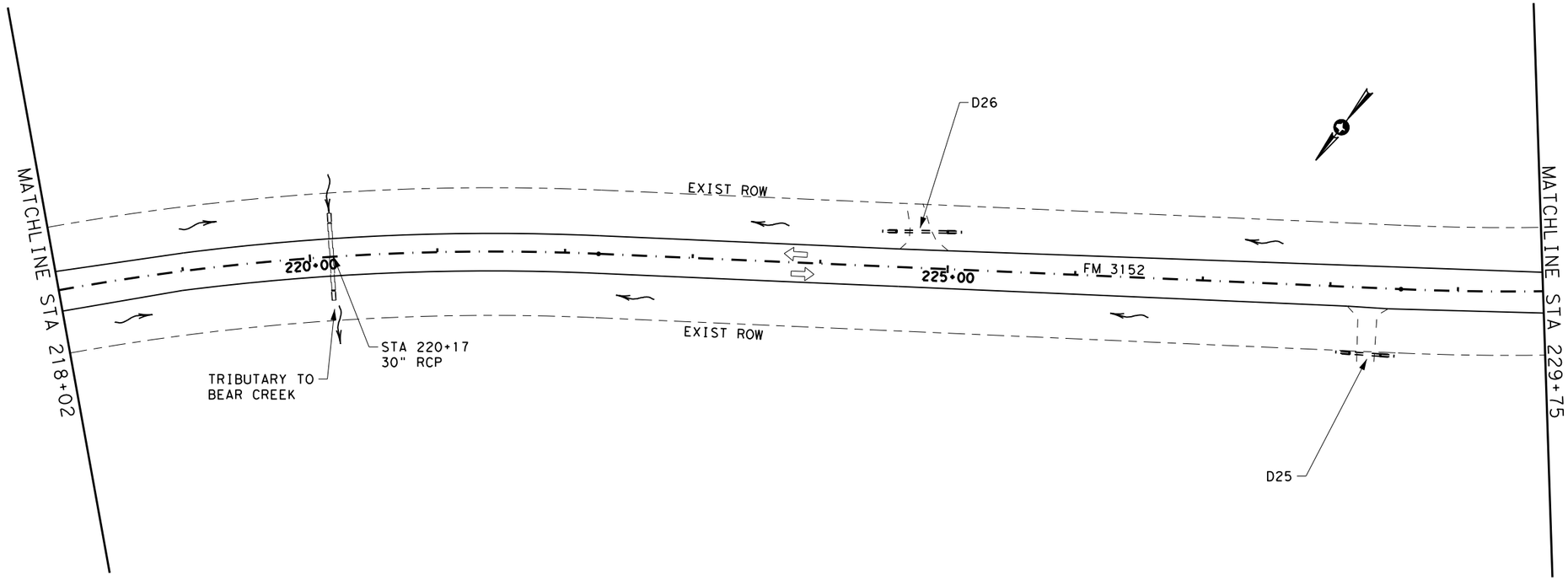

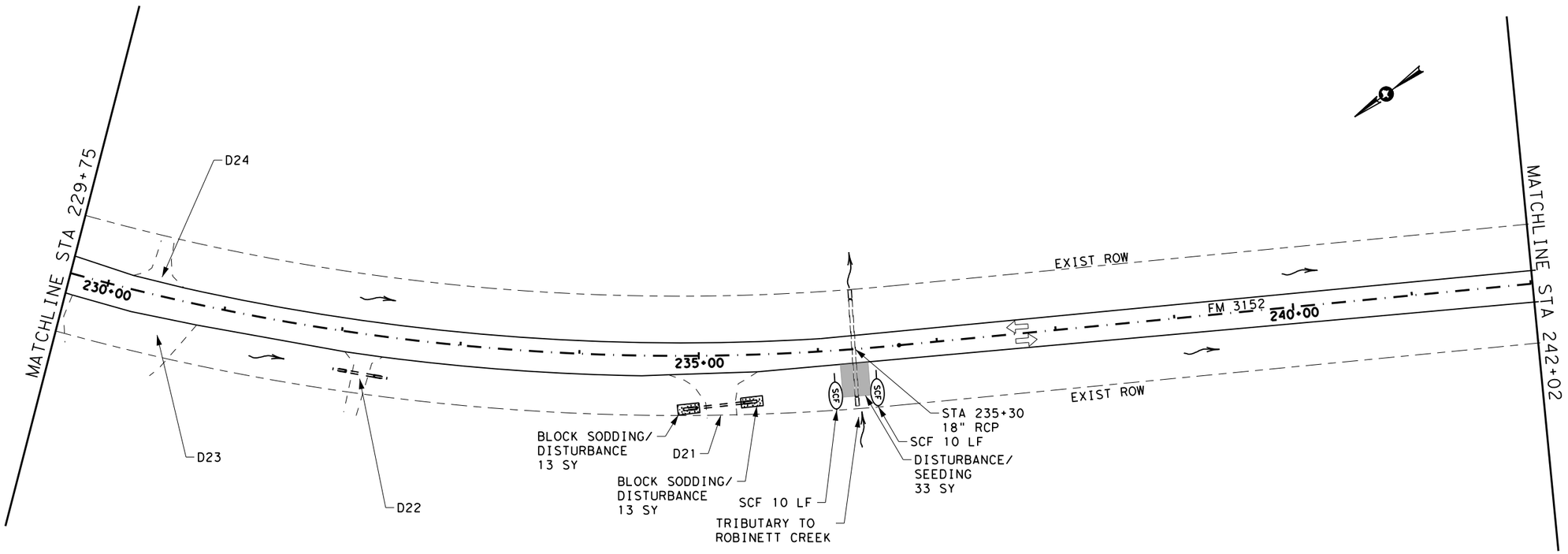

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
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- D# DRIVEWAY NUMBER
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SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 52 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		267

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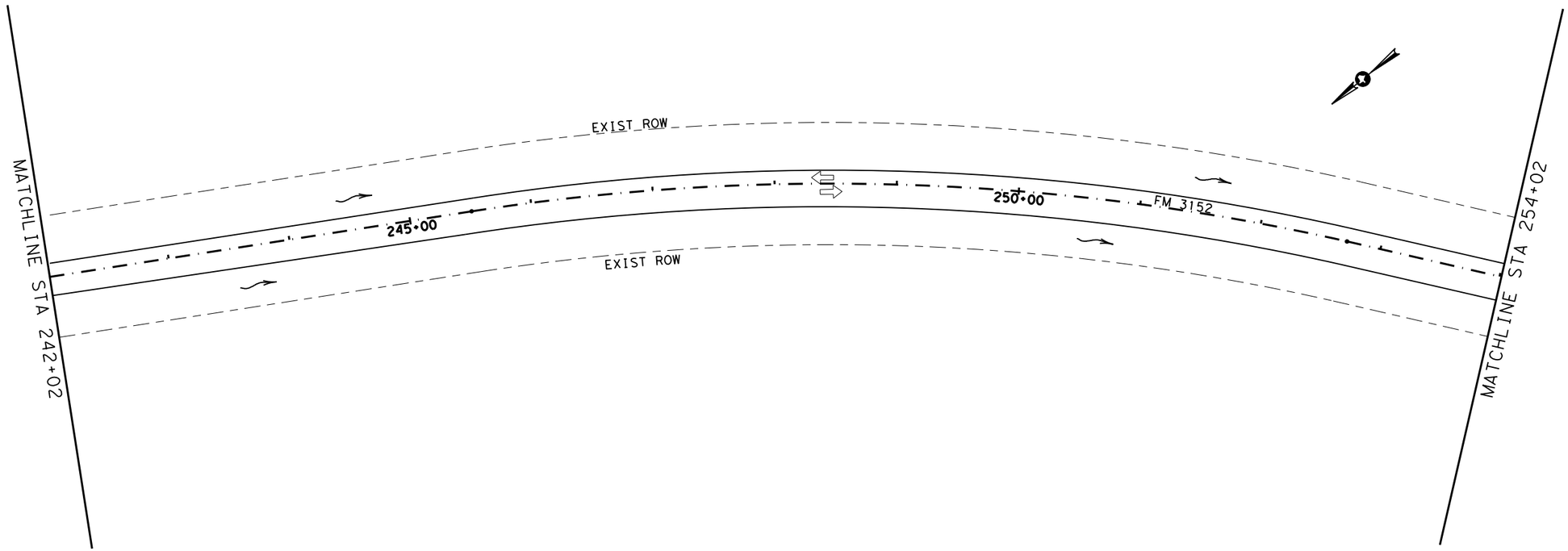

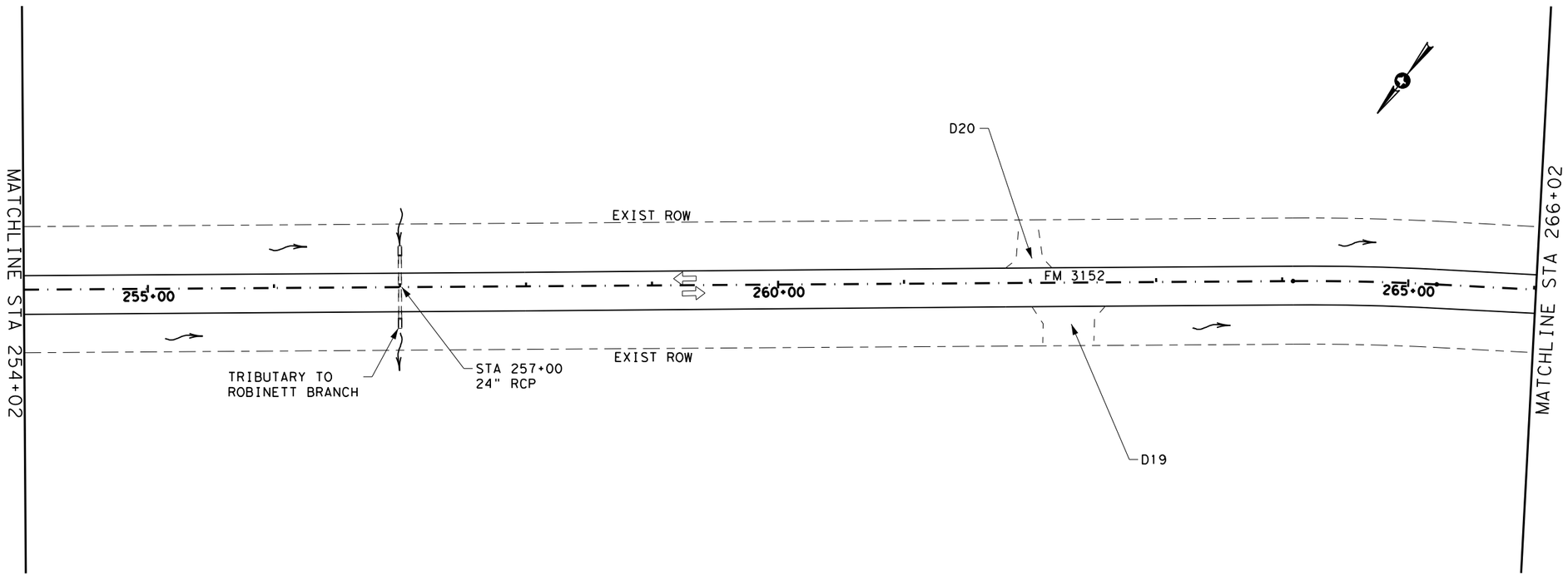

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER
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TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 53 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		268

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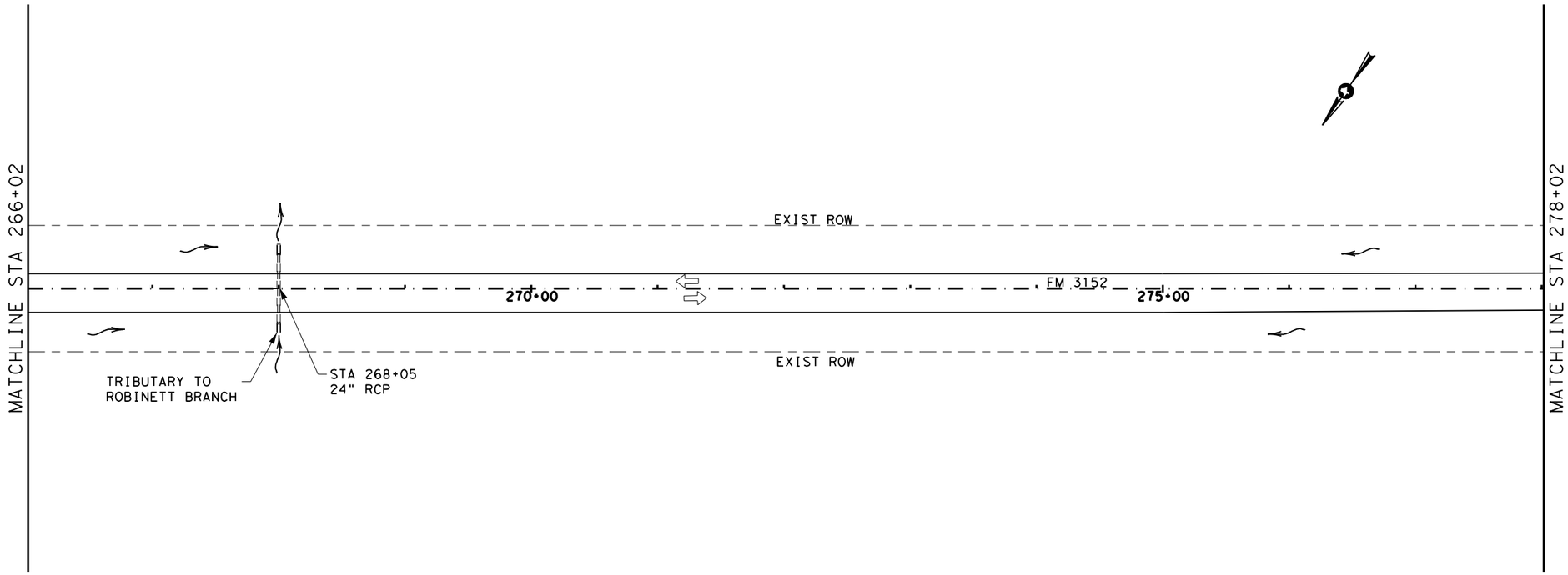

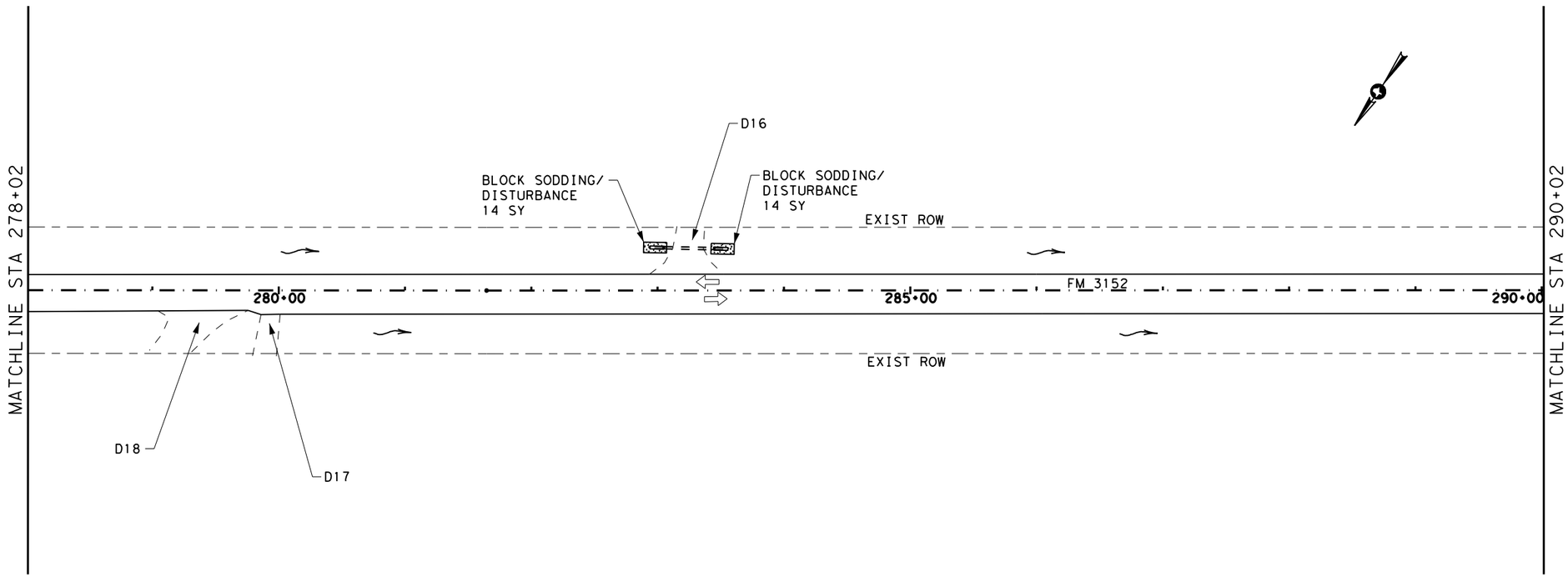

LEGEND

- (RFD2) ROCK FILTER DAM (TY 2)
- (SCF) SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
- D# DRIVEWAY NUMBER
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SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 54 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		269

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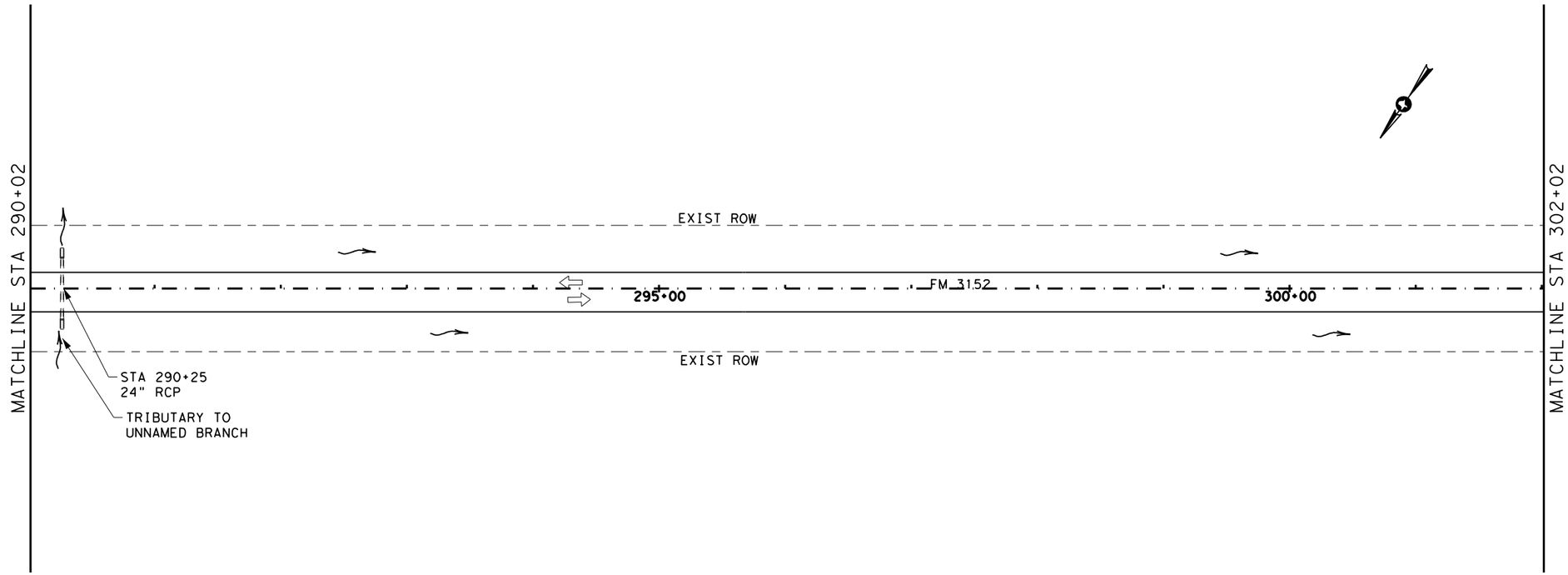

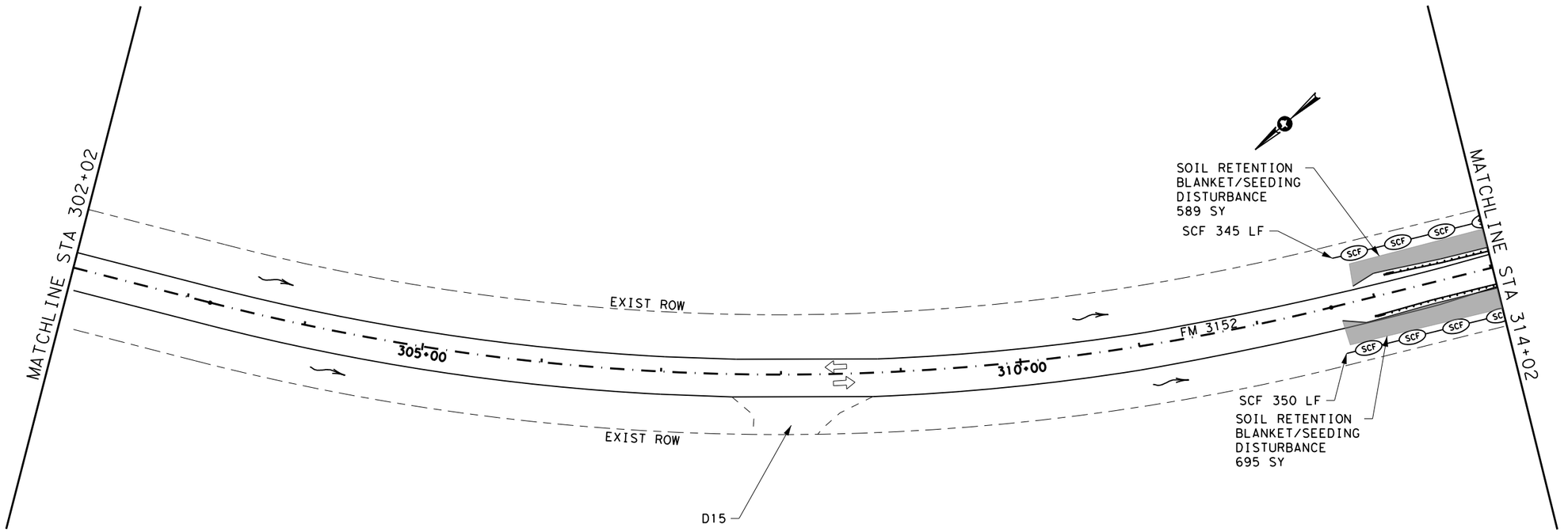

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
- TRAFFIC FLOW ARROW
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SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 55 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		270

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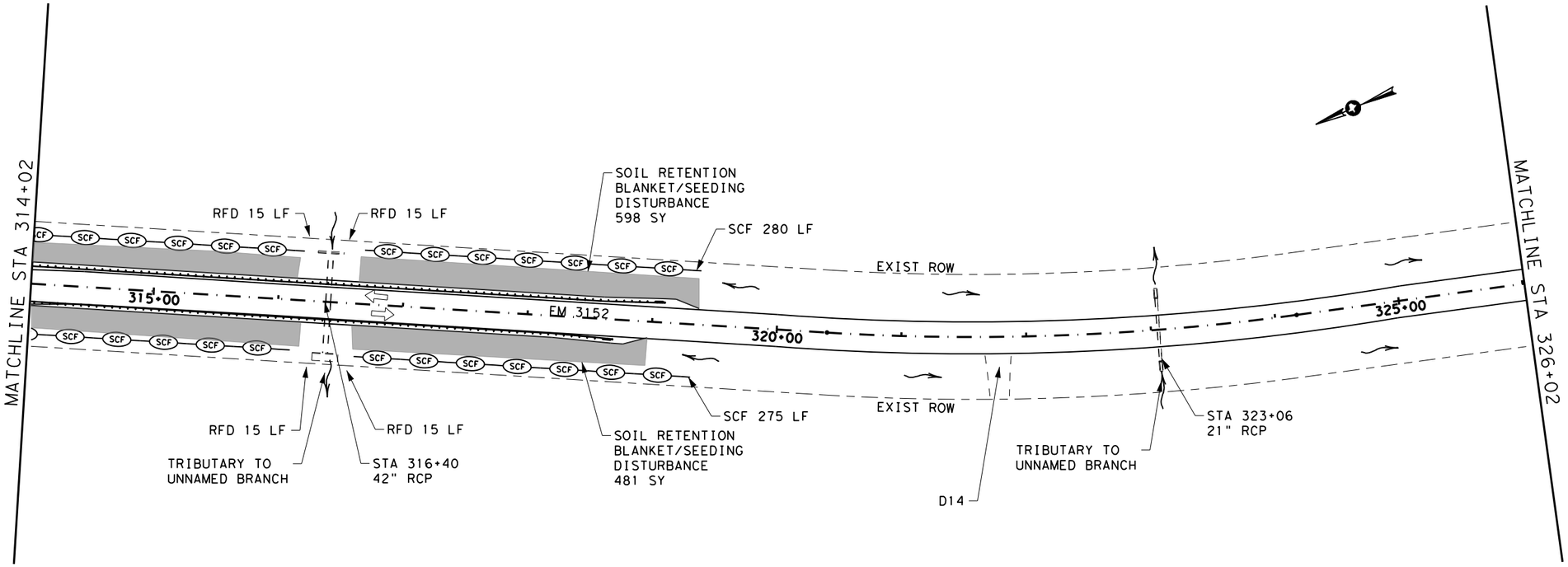

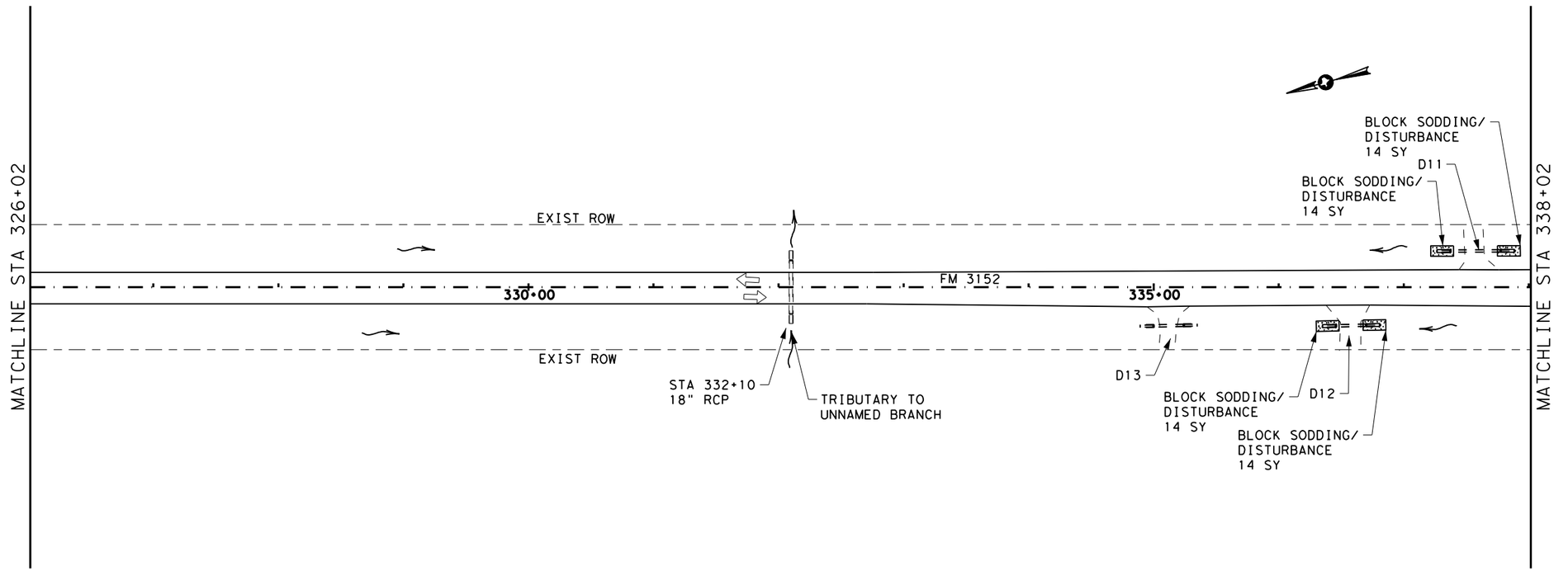

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
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NOTE: LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

SCALE 1" = 100'

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3/31/2022

SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 56 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072,ETC	SH 103,ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		271

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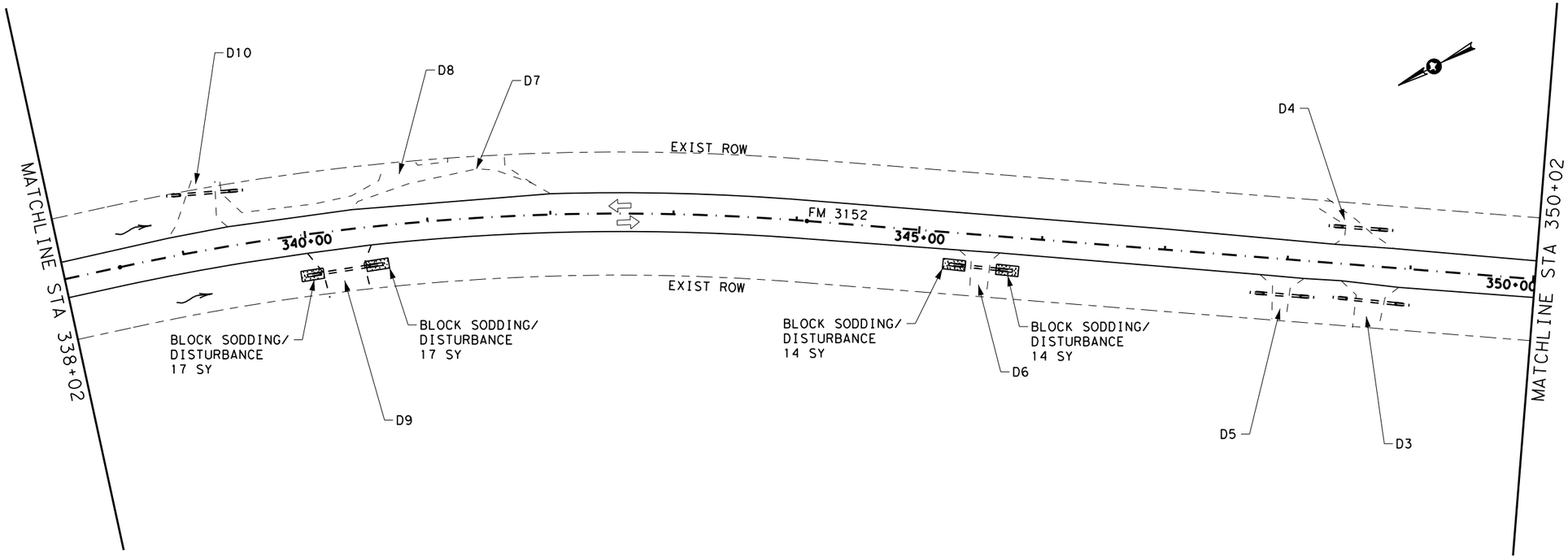

LEGEND

- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONT FENCE
- SEEDING/DISTURBANCE/ SOIL RETENTION BLANKET
- BLOCK SOD
- CONSTRUCTION EXIT
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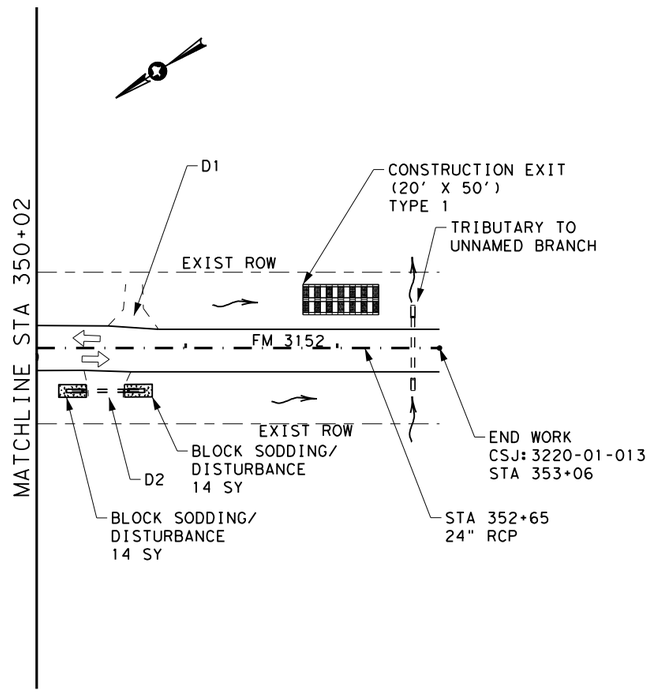
NOTE: LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



SCALE 1" = 100'

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4/1/2022

SWP3 LAYOUTS (FM 3152)

TEXAS DEPARTMENT OF TRANSPORTATION

SHEET 57 OF 57

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		272

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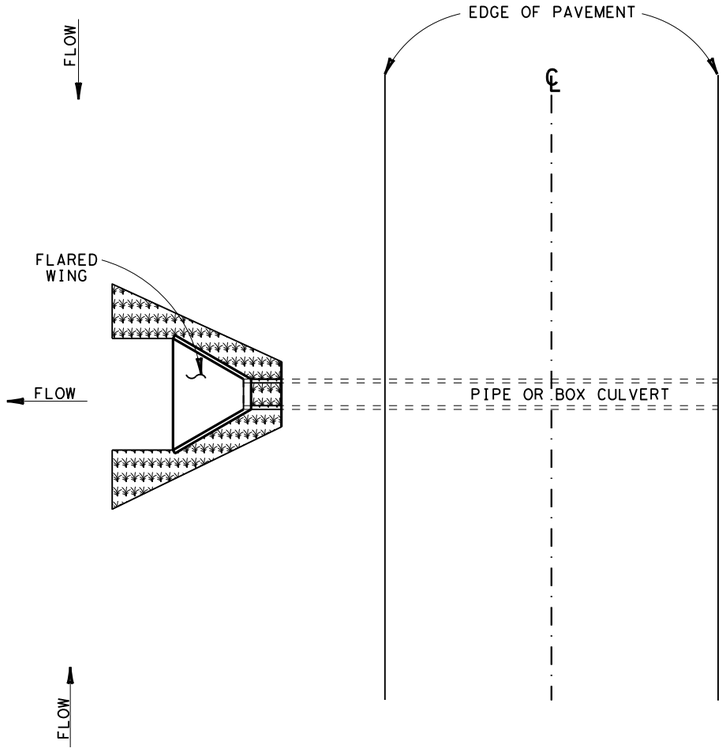
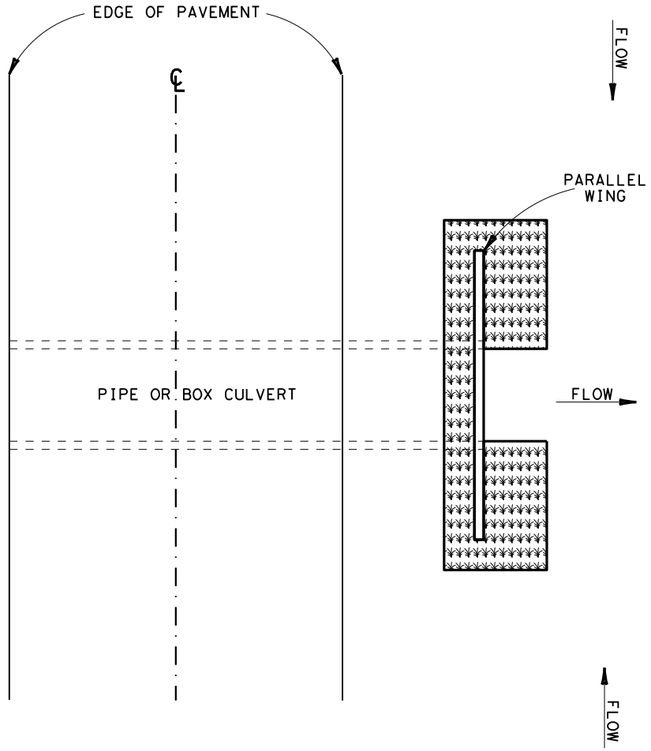
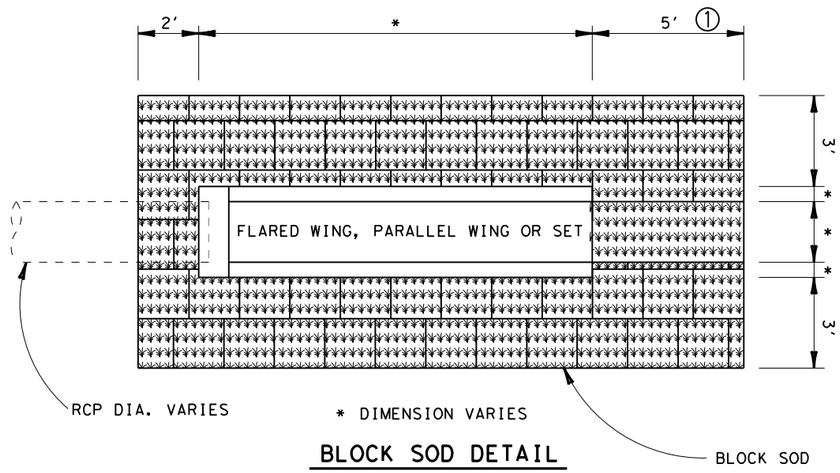




SYMBOL	DESCRIPTION
	BLOCK SODDING

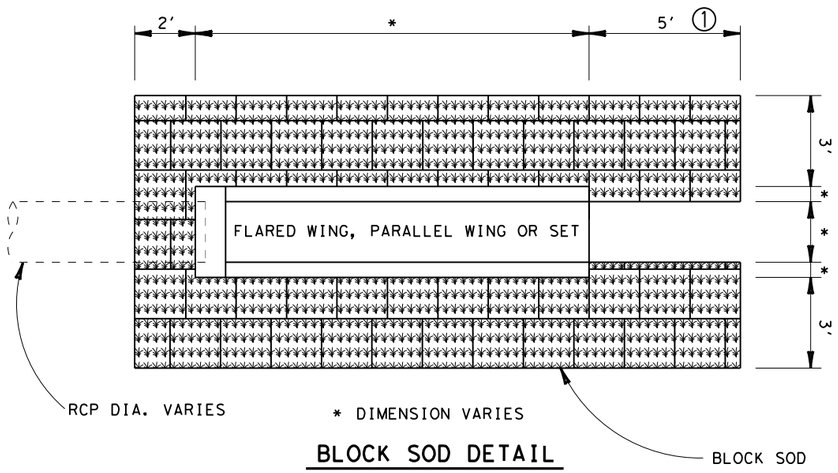
FLARED WING CROSS DRAINAGE DETAIL ①



BLOCK SOD DETAIL

PLACE AT ALL PARALLEL CULVERTS WHERE WORK IS PROPOSED.

PARALLEL WING CROSS DRAINAGE DETAIL ①



BLOCK SOD DETAIL

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

① DO NOT PLACE BLOCK SOD WHERE RIPRAP (STONE COMMON) IS INSTALLED.

N. T. S.

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Elizabeth Ortego, P.E.
1B27AAE7151144F...
4/1/2022

BLOCK SOD DETAILS

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0336	03	072, ETC	SH 103, ETC
DIST	COUNTY		SHEET NO.
LFK	ANGELINA, ETC		273

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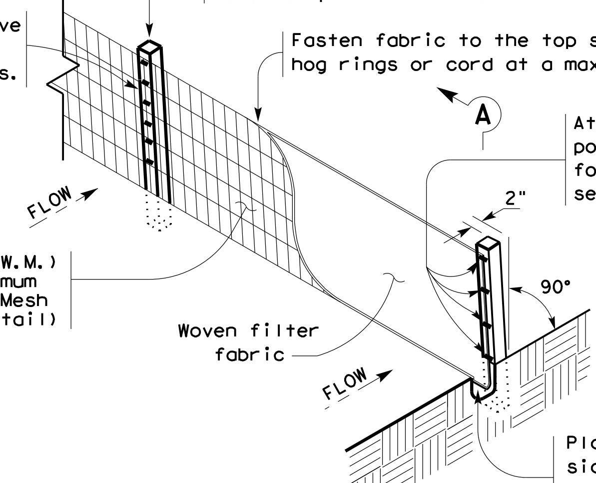
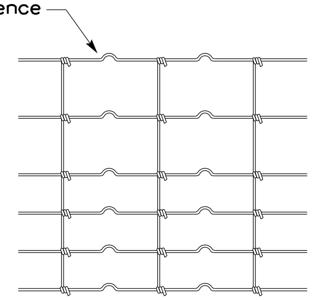
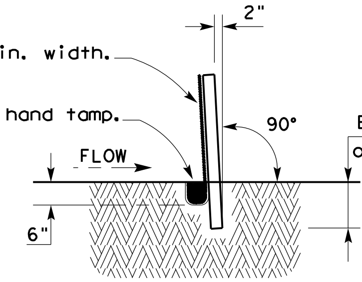


TEMPORARY SEDIMENT CONTROL FENCE

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.

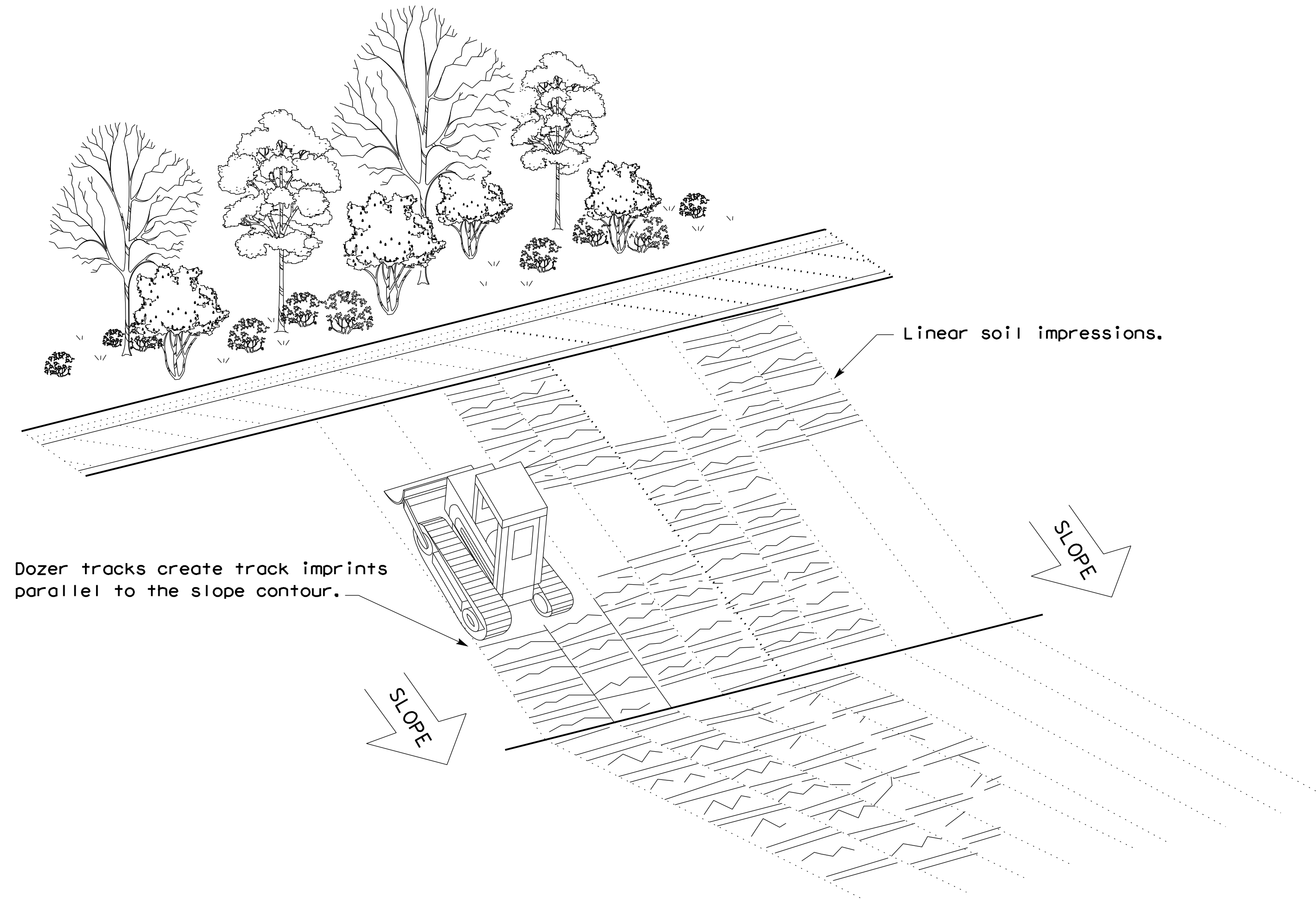
LEGEND

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	0336	03	072, ETC	SH 103, ETC
	DIST		COUNTY	SHEET NO.
	LFK		ANGELINA, ETC	274

3/30/2022
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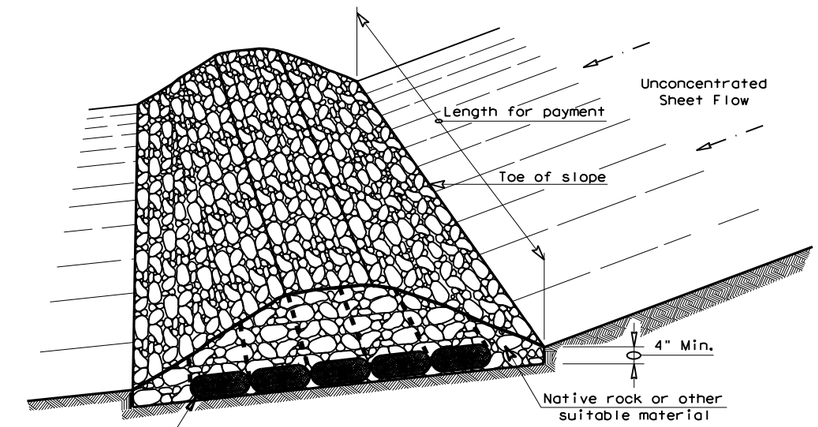
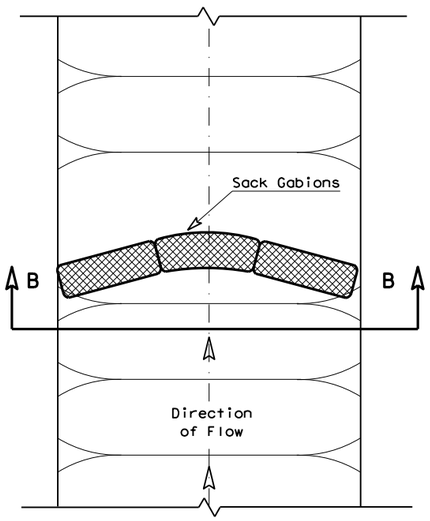
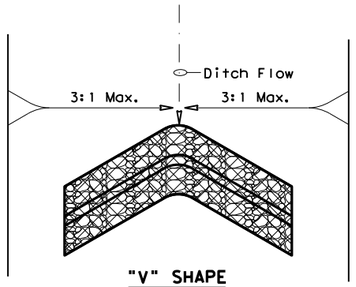


FILTER DAM AT TOE OF SLOPE

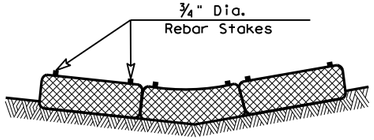
RFD1



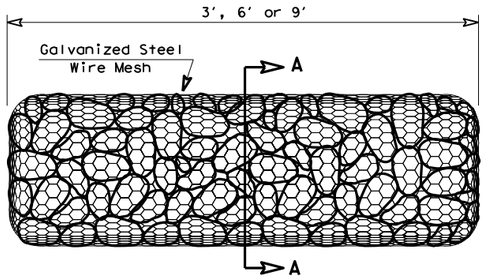
PLAN VIEW



"V" SHAPE PLAN VIEW

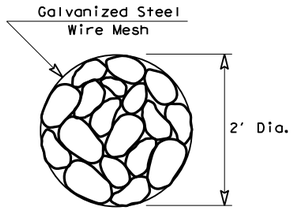


SECTION B-B

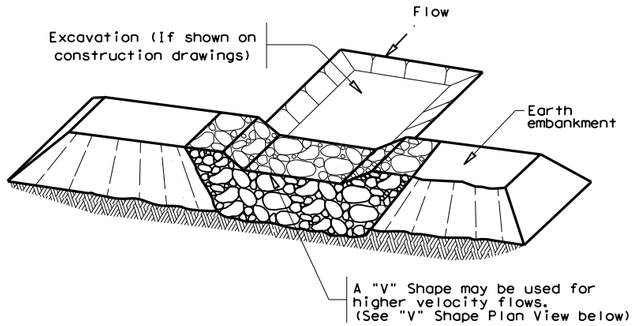


TYPE 4 (SACK GABIONS)

RFD4

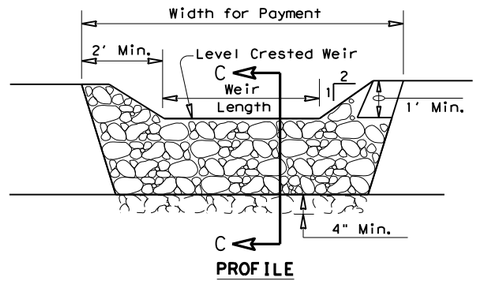


SECTION A-A

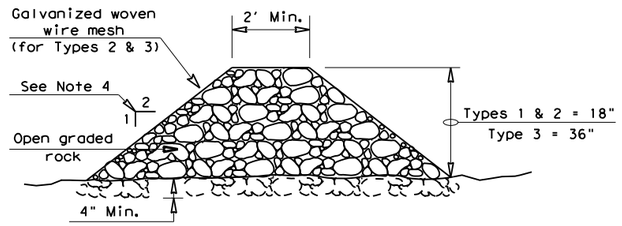


FILTER DAM AT SEDIMENT TRAP

RFD1 OR RFD2



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

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

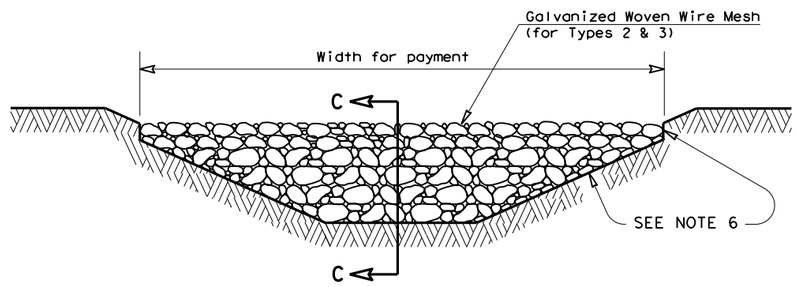
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity 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.



FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

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	0336	03	072, ETC	SH 103, ETC
	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		275

DATE: 3/30/2022
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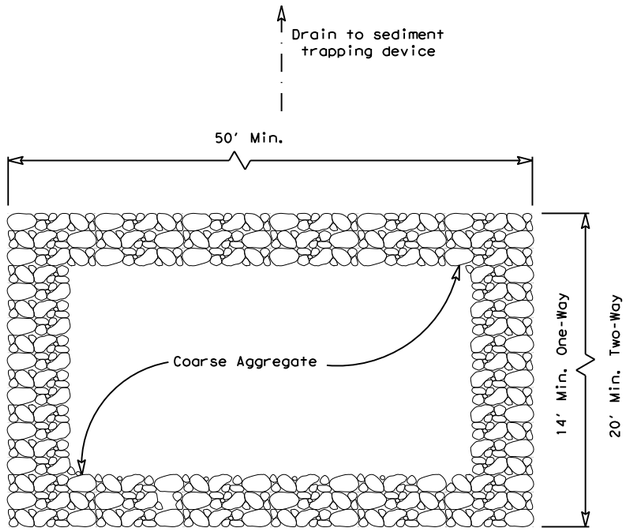
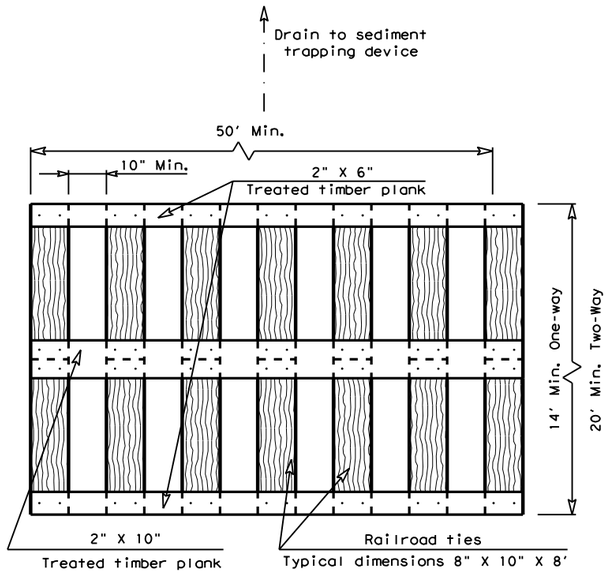
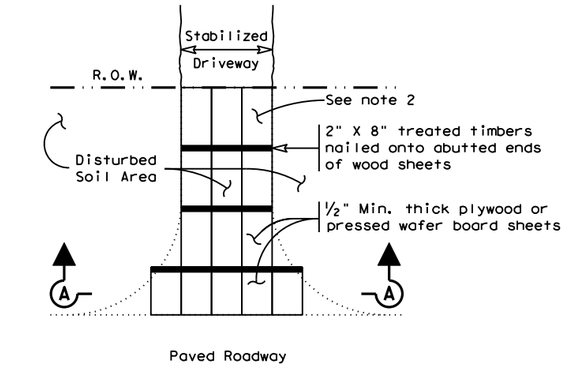


PLAN VIEW



PLAN VIEW



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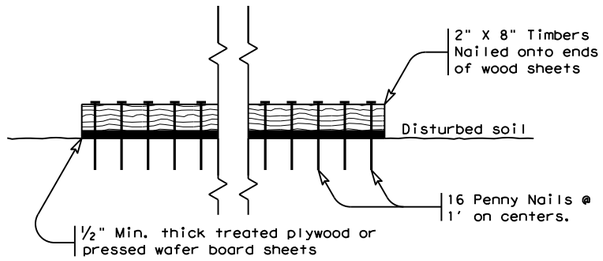
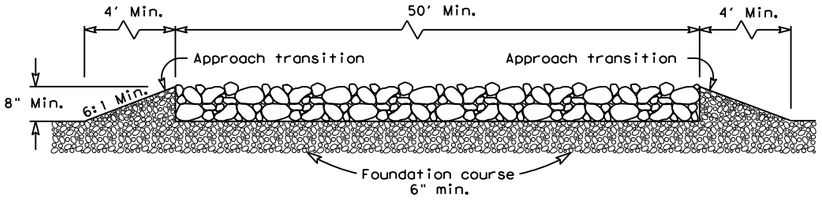


SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

SHORT TERM



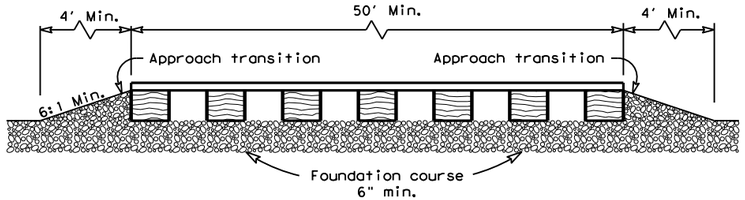
ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK 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.



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

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

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	DIST	COUNTY		SHEET NO.
	LFK	ANGELINA, ETC		276