DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	F2024(335)		SH 204
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	TYLER	CHEROKEE	1
	CONTROL	SECTION	JOB	
CHECK	0450	01	013	

INDEX OF SHEETS

FINAL PLANS

DATE CONTRACT LETTING: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK COMPLETED AND ACCEPTED: _____
CONTRACTOR: _____
USED ___ OF ___ ALOTTED DAYS: _____
FINAL CONSTRUCTION COST: $ _____

FINAL AS BUILT PLANS

THE CONSTRUCTION WAS PERFORMED UNDER MY SUPERVISION IN ACCORDANCE WITH THE PLANS AND CONTRACT

_____ DATE

_____ AREA ENGINEER

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NO. F2024(335)

CSJ: 0450-01-013

SH 204
CHEROKEE COUNTY

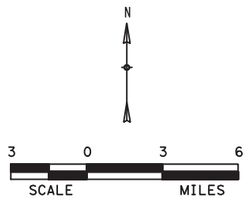
LIMITS: FROM SH 110, SE TO RUSK COUNTY LINE IN REKLAW

NET LENGTH OF PROJECT = 33,405.53 FT. = 6.327 MI.

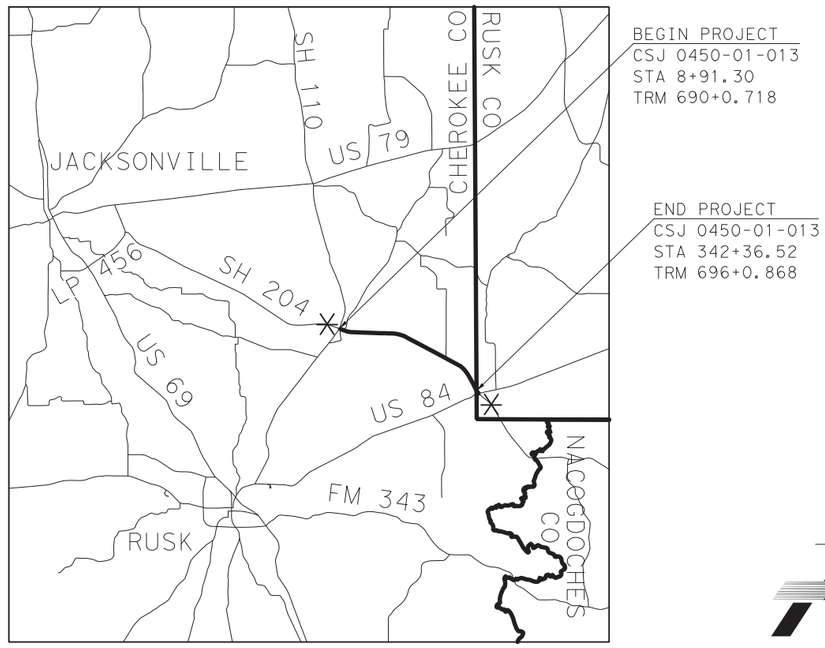
TYPE: FOR THE CONSTRUCTION OF SUPER-2 HIGHWAY

CONSISTING OF: GRADING, BASE, ASPHALT PAVEMENT, DRAINAGE, REMOVALS, SW3P, SIGNING, AND PAVEMENT MARKINGS.

DESIGN SPEED:
SH 204 = 40 MPH
ADT:
2,534 (2017)
4,610 (2037)
FUNCTIONAL CLASSIFICATION:
RURAL MINOR ARTERIAL (SH 204)



TYLER DISTRICT



BEGIN PROJECT
CSJ 0450-01-013
STA 8+91.30
TRM 690+0.718

END PROJECT
CSJ 0450-01-013
STA 342+36.52
TRM 696+0.868

✳ SIGN IN ACCORDANCE WITH THE STANDARD BC SHEETS AND PART 6 OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

NOTE:

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, 10/23/2023)

DESIGN EXCEPTION: SAG VERTICAL CURVE K-VALUE
NO RAILROADS
EQUATIONS: STA 165+60.31 BK = STA 165+00.00 AH = +60.31'

CP&Y
FIRM REGISTRATION No. F-1741

PREPARED BY _____
Robin R Handel, PE
CONSULTANT DESIGN ENGINEER
OR PROJECT MANAGER

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
9/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

9/1/2023
SUBMITTED FOR LETTING _____
DocuSigned by: Rolando Mendez, P.E.
8F5FF128D87C484...
DISTRICT DESIGN ENGINEER

9/1/2023
APPROVED FOR LETTING: _____
DocuSigned by:
614918AABC65461...
, P.E.
DISTRICT ENGINEER

TEMPLATE REVISED: 10-23-02

I. GENERAL

II. TRAFFIC CONTROL PLAN

III. ROADWAY DETAILS

IV. DRAINAGE DETAILS

V. TRAFFIC ITEMS

VI. ENVIRONMENTAL ISSUES

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

ROBIN R. HANDEL, P.E. , P.E. 8/23/2023 DATE

SHEET 1 OF 1

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER
8/23/2023

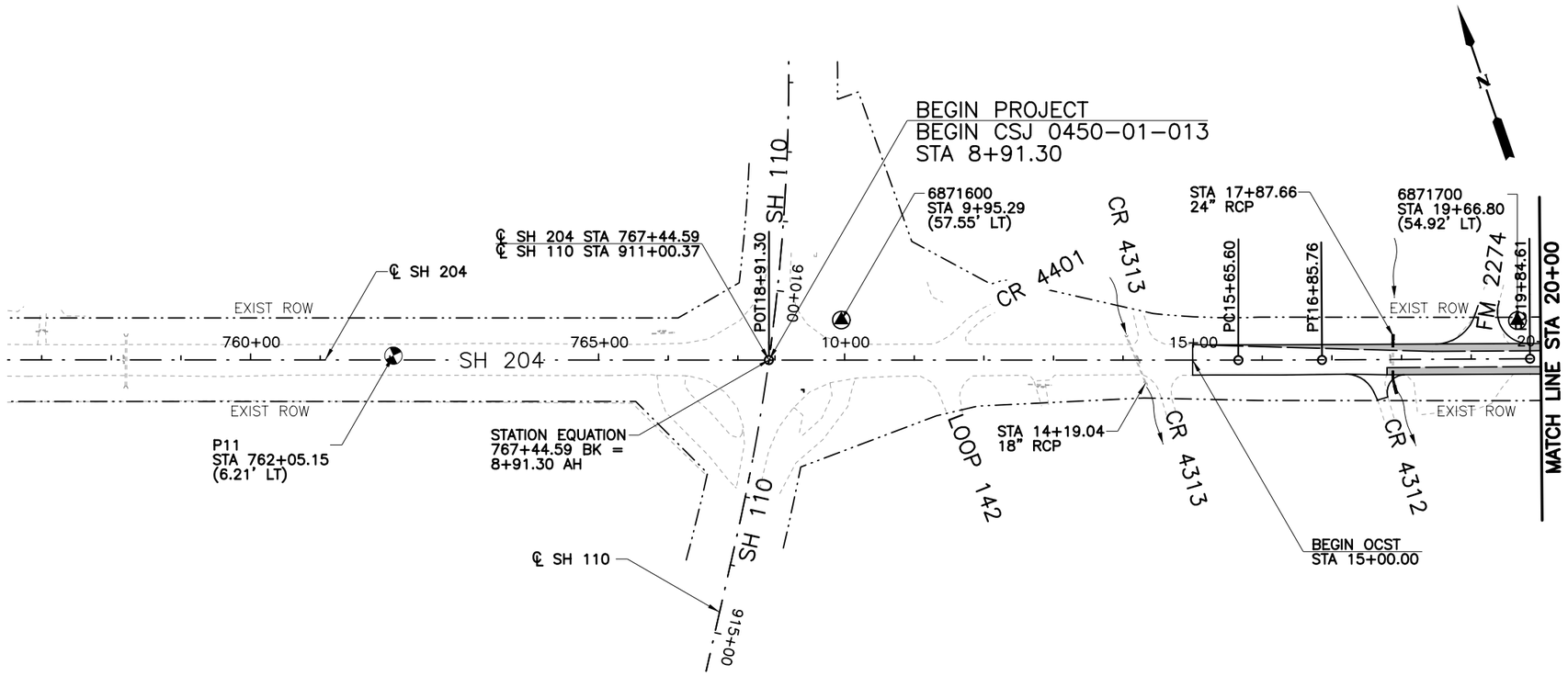
NO.	REVISION	BY	DATE

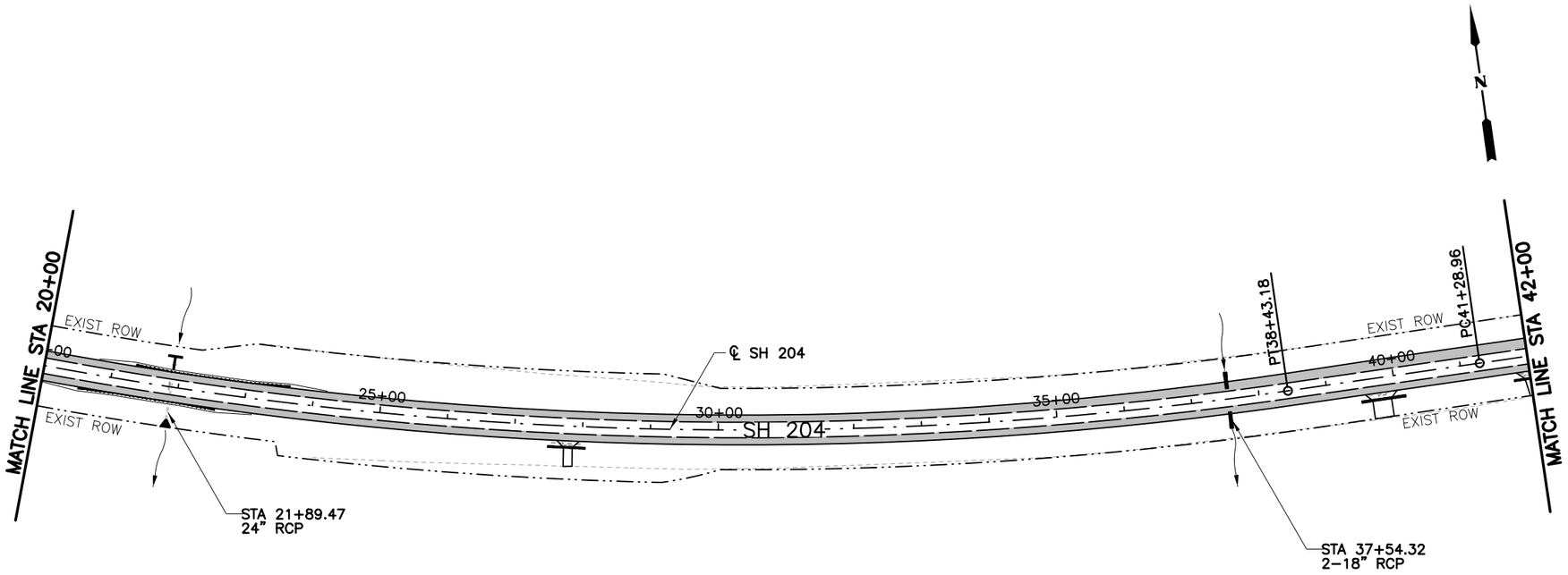
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

INDEX OF SHEETS

Designed: CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.					HIGHWAY NO.
Checked: CPY		TEXAS						SH 204
Drawn: CPY	DIST.	COUNTY		CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: CPY	TYL	CHEROKEE		0450	01	013		2





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SCALE HORIZ. FEET

LEGEND

- SOIL PROFILE
- CONTROL POINT
- MILLED AREAS

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

PROJECT LAYOUT

BEGIN PROJECT TO STA 42+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		3

SHEET 1 OF 8

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cpypsf_ANSIB.pltcfg
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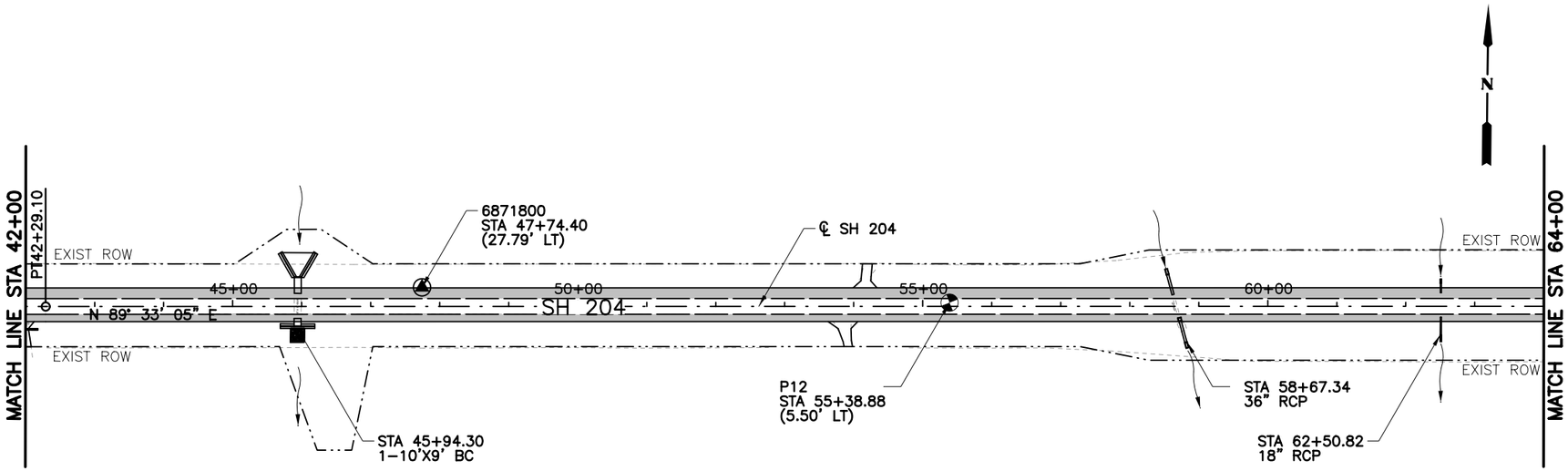
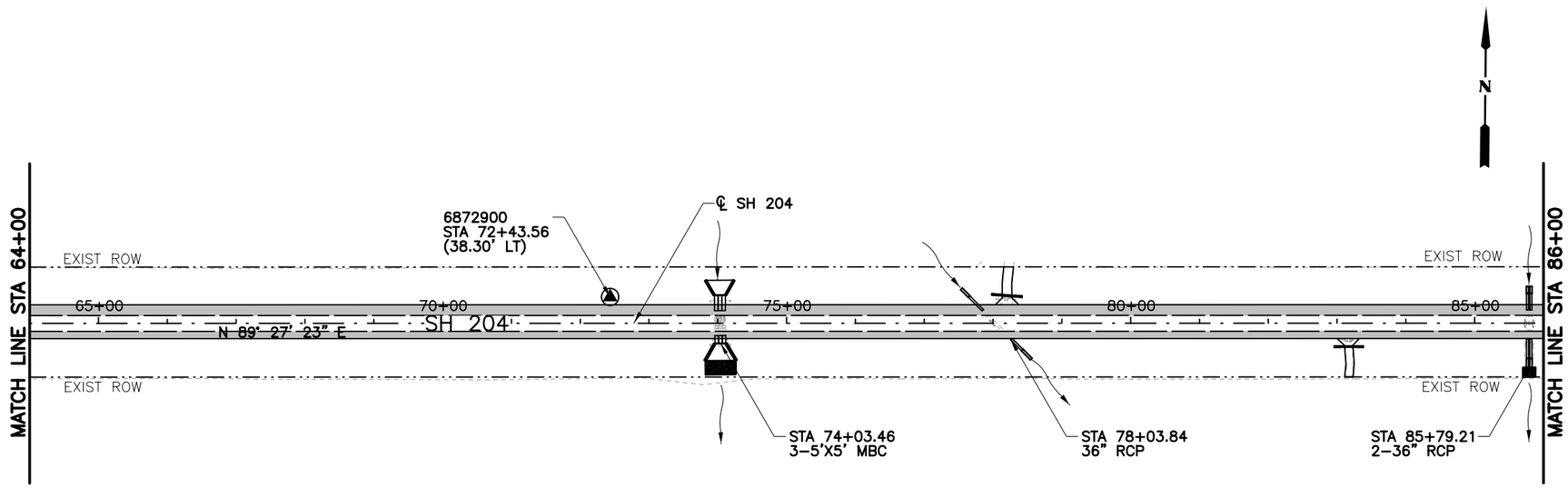




100 50 0 100 200
SCALE HORIZ. FEET

LEGEND

- SOIL PROFILE
- CONTROL POINT
- MILLED AREAS

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

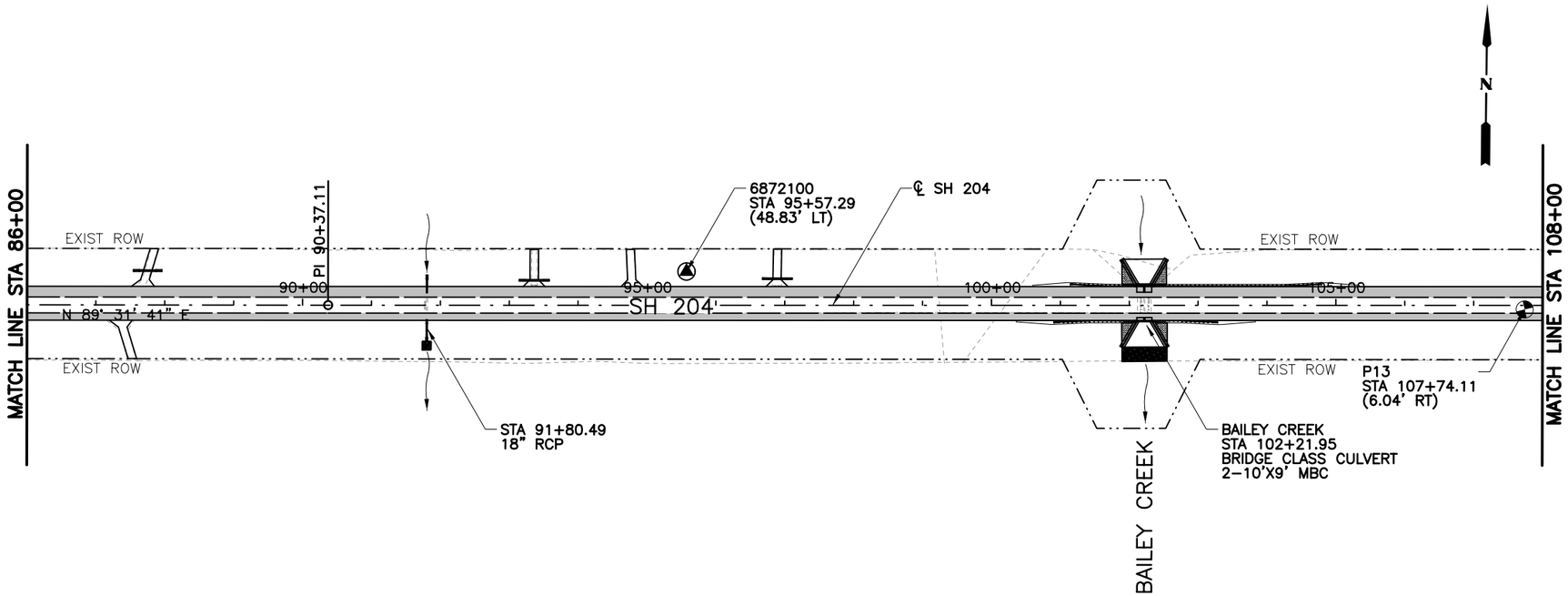
SH 204

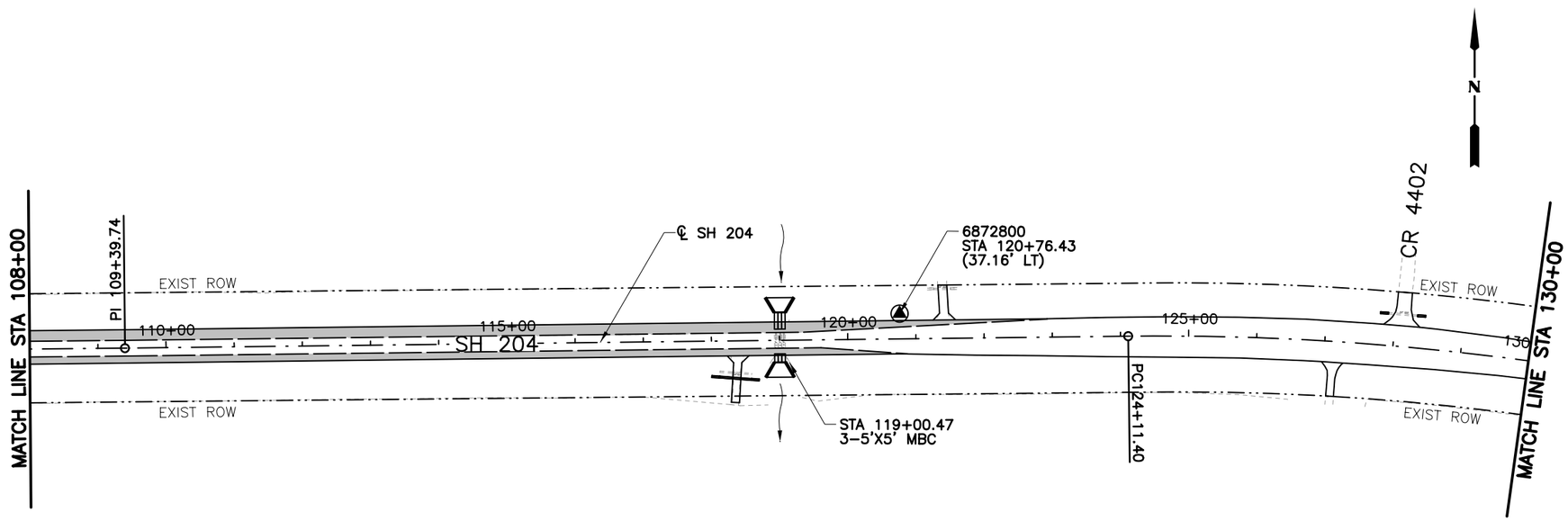
PROJECT LAYOUT

STA 42+00 TO STA 86+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		4

SHEET 2 OF 8





100 50 0 100 200
SCALE FEET
HORIZ.

LEGEND

- SOIL PROFILE
- CONTROL POINT
- MILLED AREAS

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

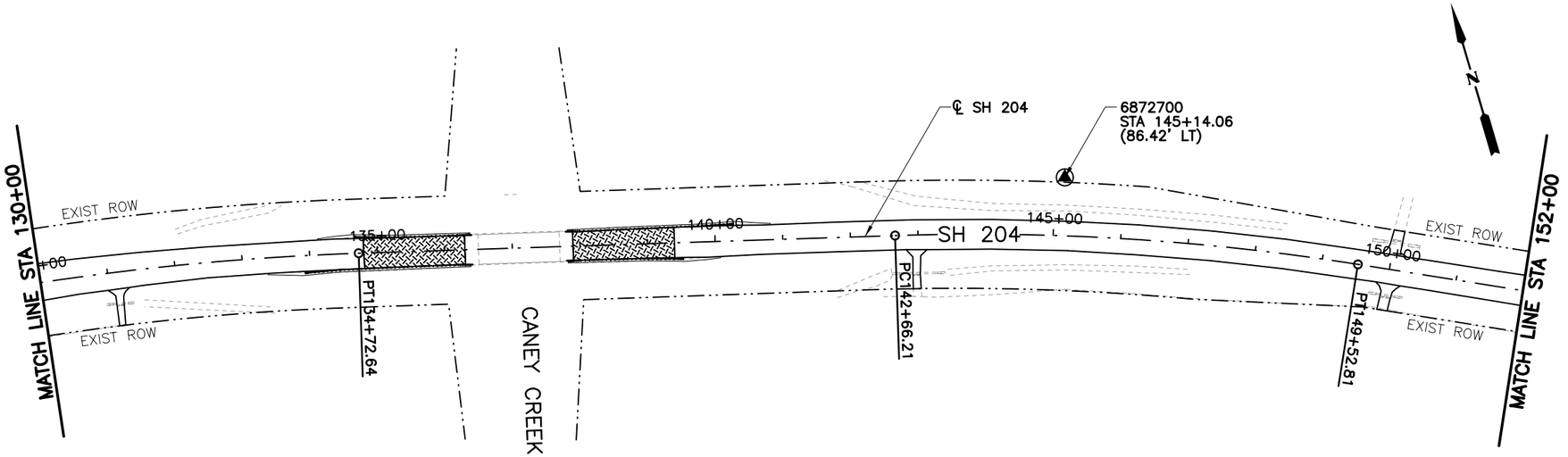
SH 204

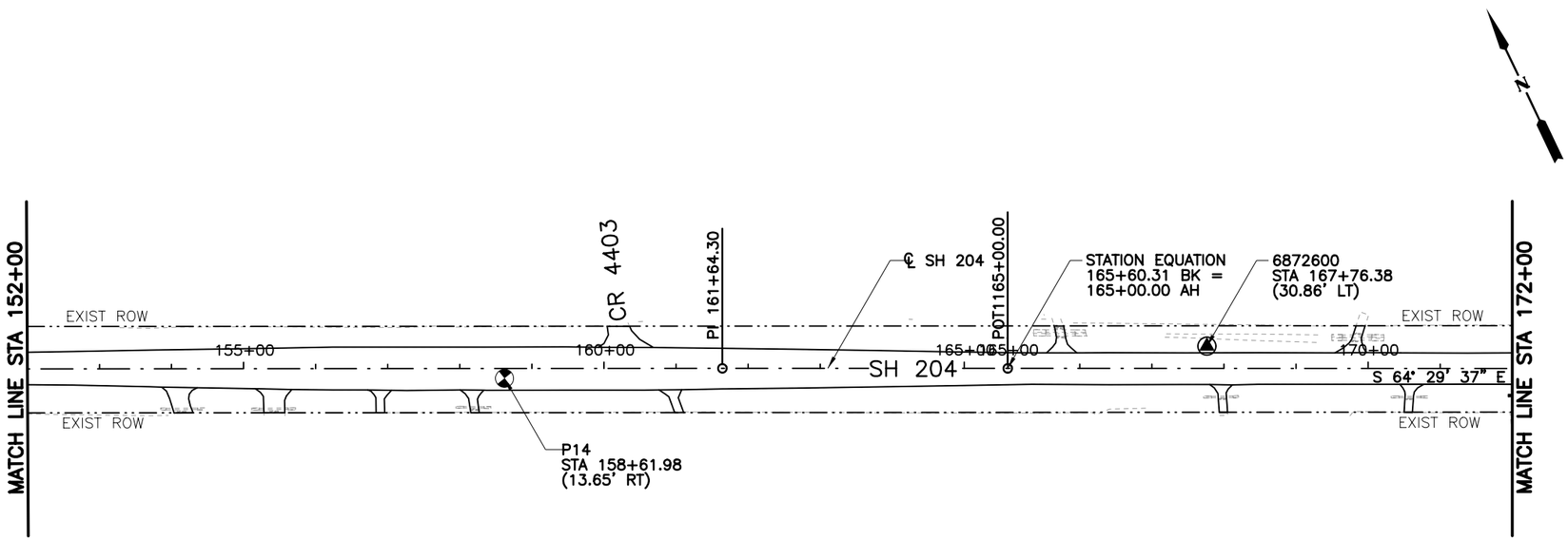
PROJECT LAYOUT

STA 86+00 TO STA 130+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		5

SHEET 3 OF 8





100 50 0 100 200
SCALE FEET
HORIZ.

LEGEND

- SOIL PROFILE
- CONTROL POINT
- MILLED AREAS

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

PROJECT LAYOUT

STA 130+00 TO STA 172+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		6

SHEET 4 OF 8

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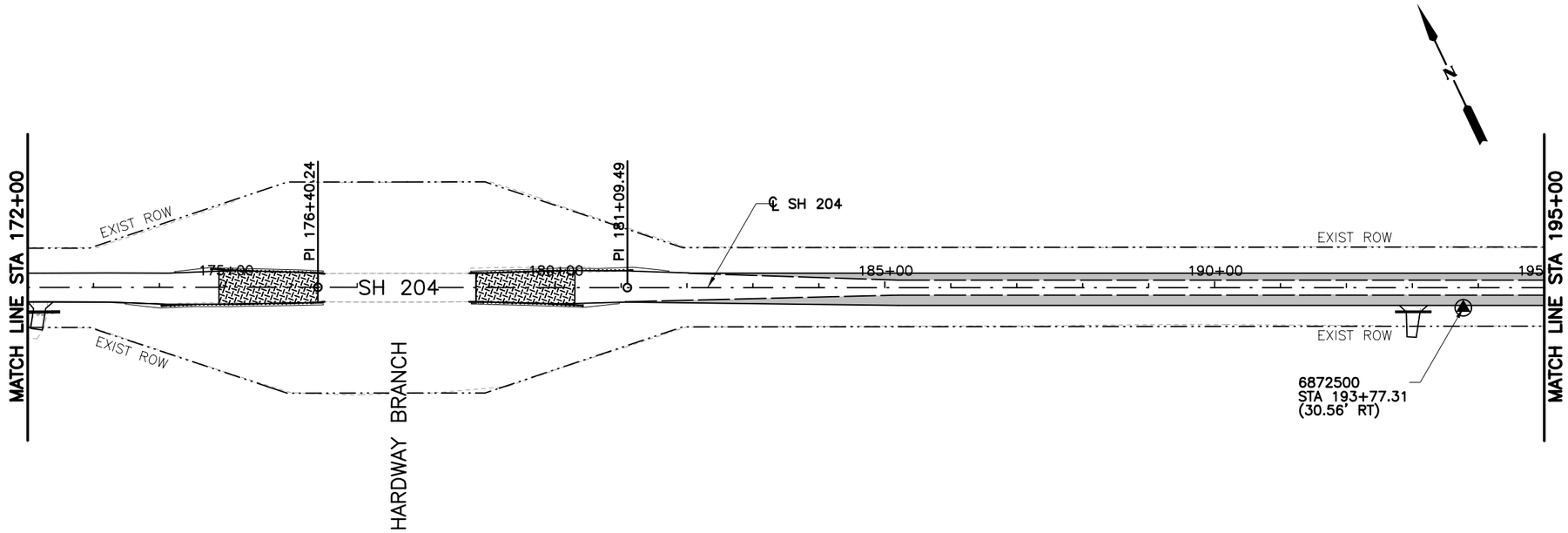
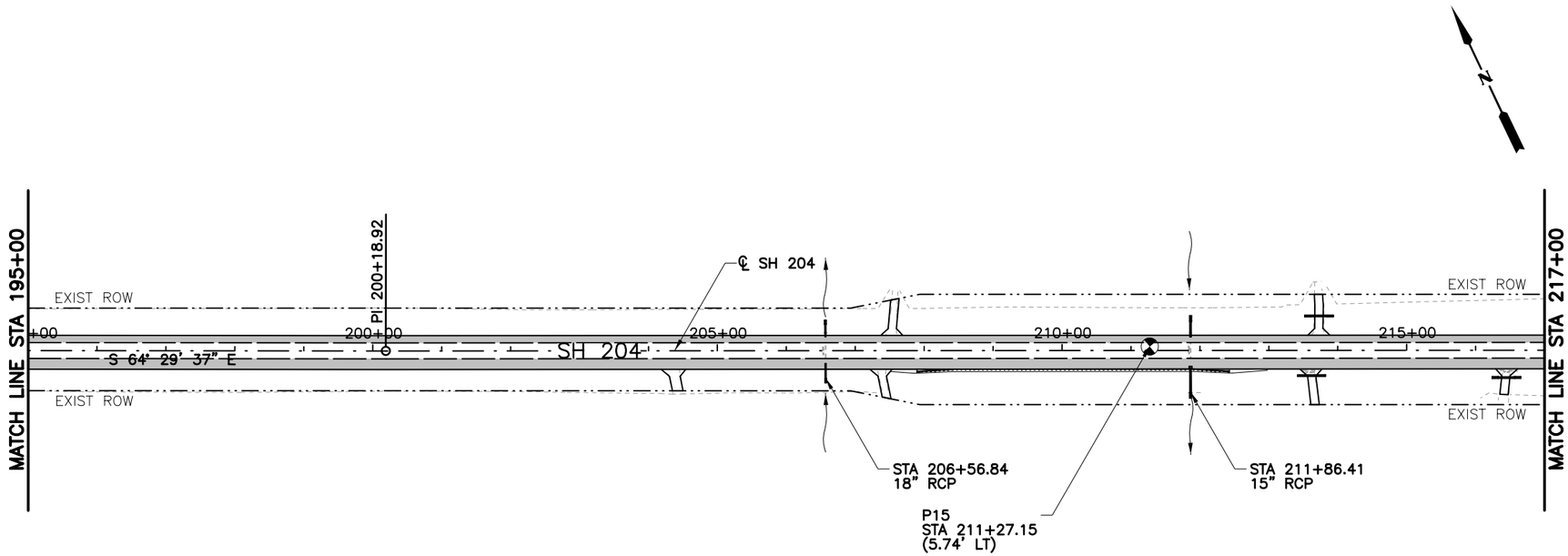




100 50 0 100 200
SCALE HORIZ. FEET

LEGEND

- SOIL PROFILE
- CONTROL POINT
- MILLED AREAS

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

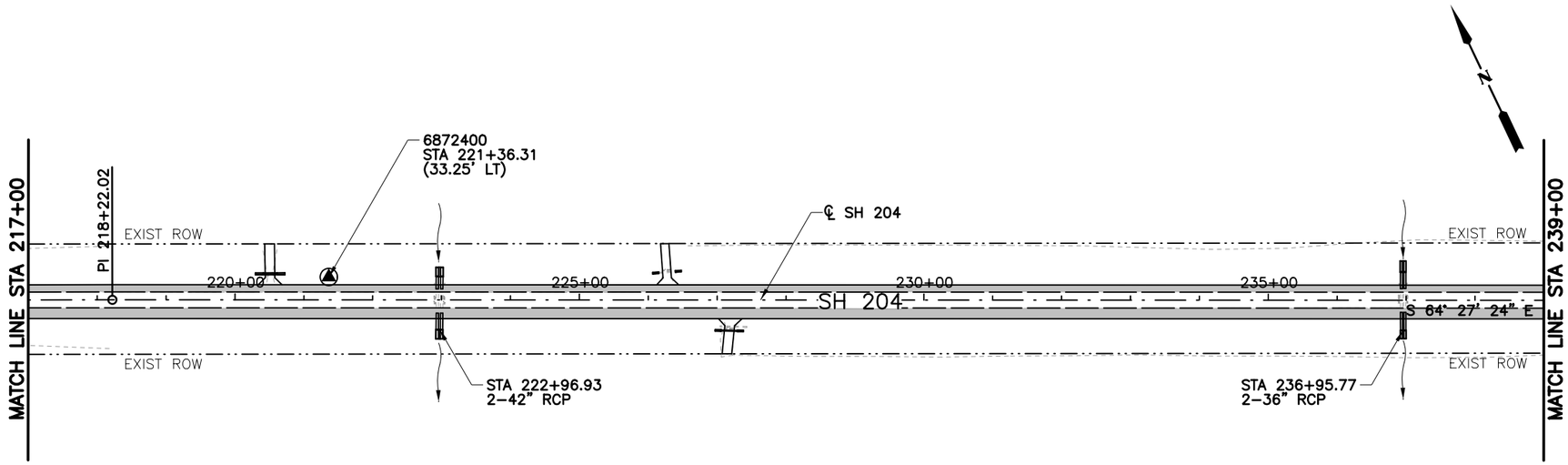
SH 204

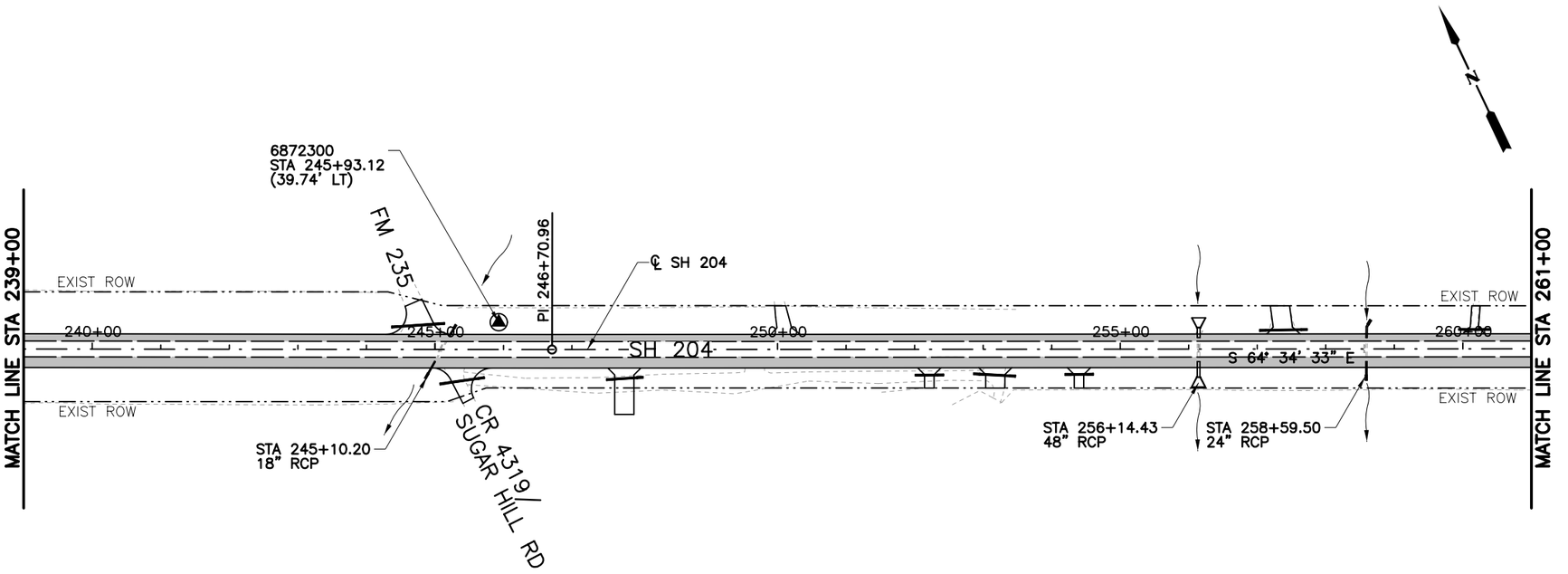
PROJECT LAYOUT

STA 172+00 TO STA 217+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	7

SHEET 5 OF 8





100 50 0 100 200
SCALE HORIZ. FEET

LEGEND

- SOIL PROFILE
- CONTROL POINT
- MILLED AREAS

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

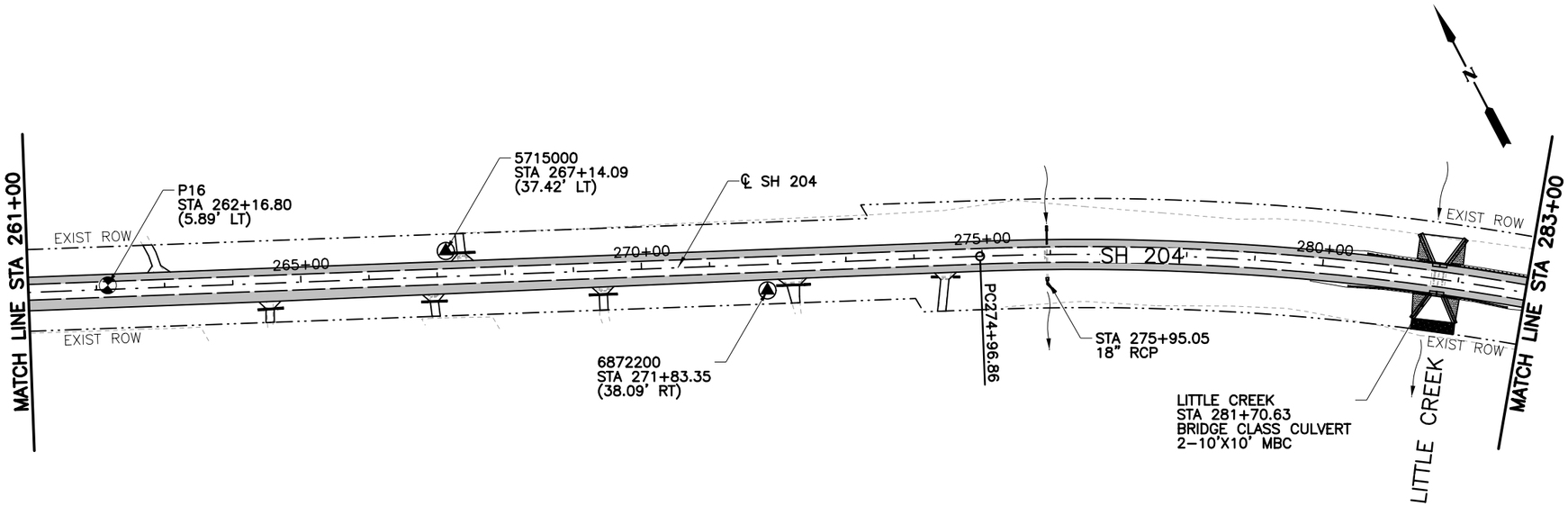
SH 204

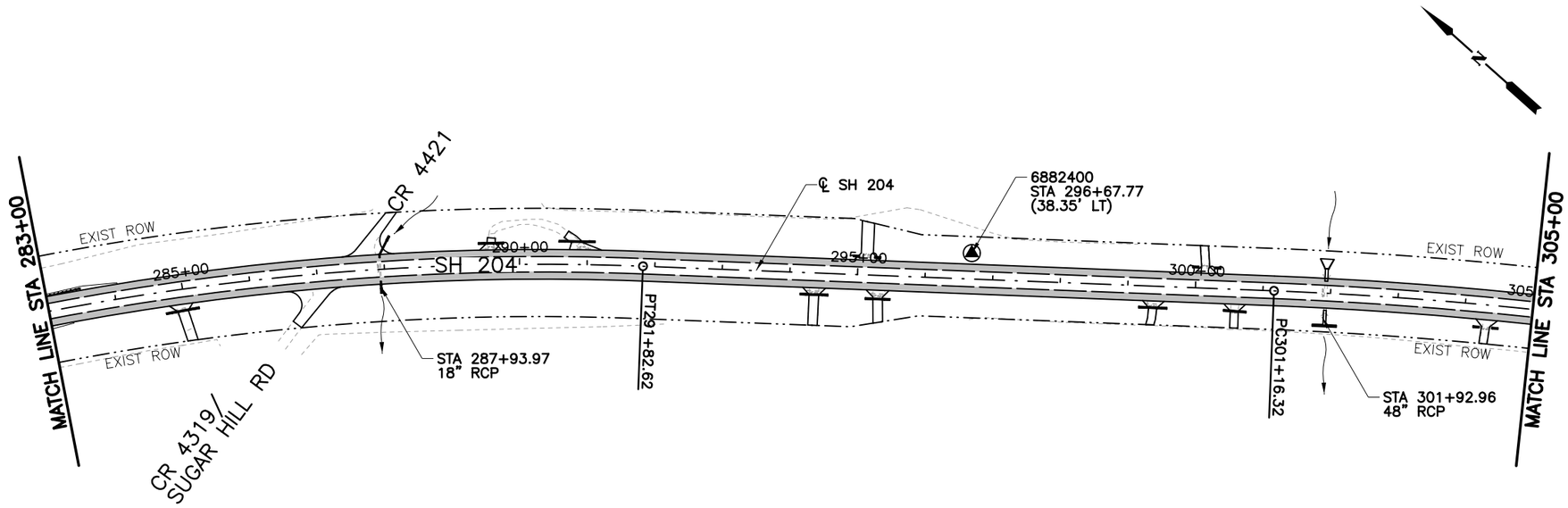
PROJECT LAYOUT

STA 217+00 TO STA 261+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	8

SHEET 6 OF 8





100 50 0 100 200
SCALE FEET
HORIZ.

LEGEND

- SOIL PROFILE
- CONTROL POINT
- MILLED AREAS

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

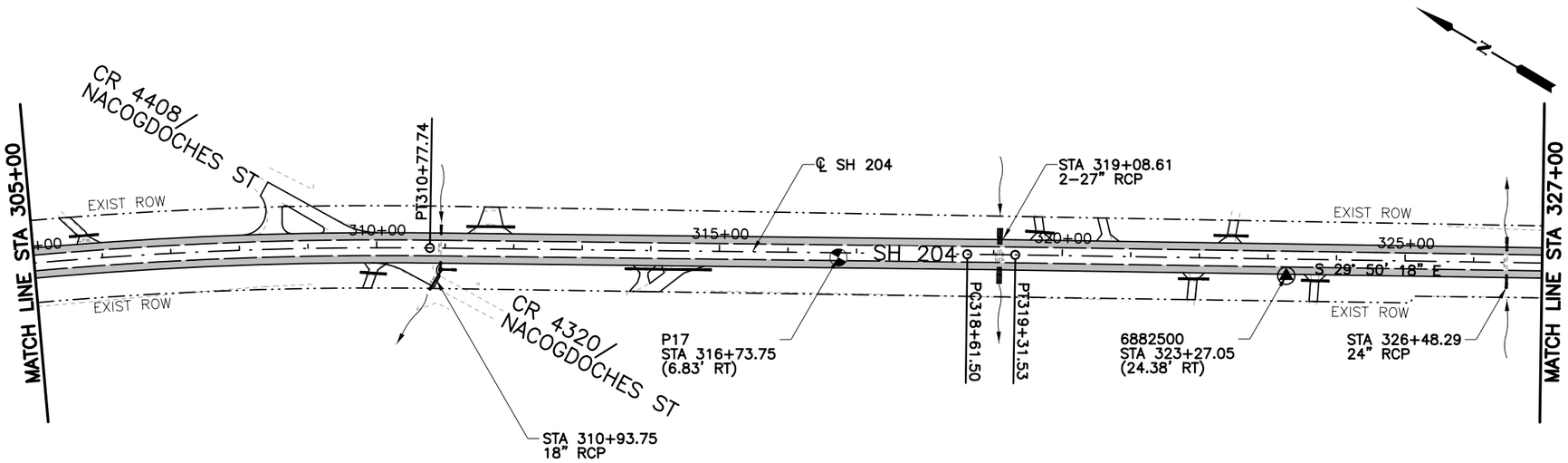
SH 204

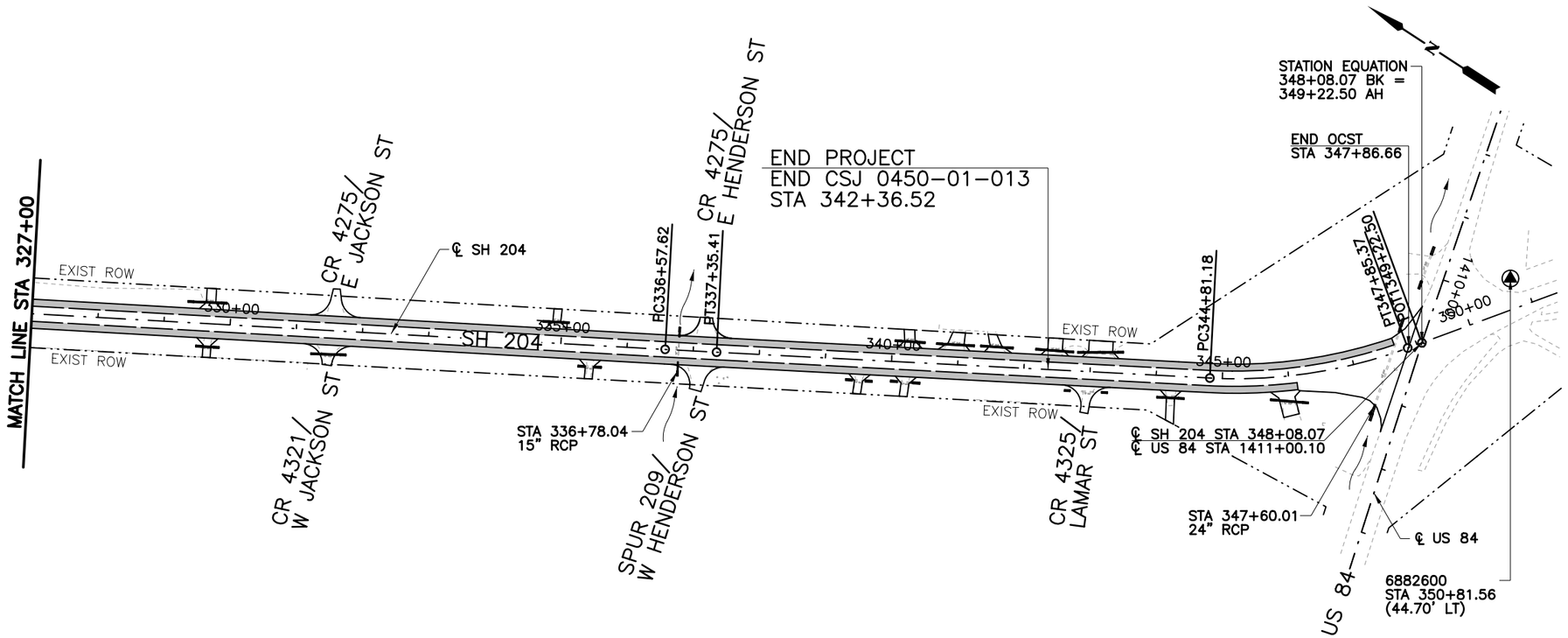
PROJECT LAYOUT

STA 261+00 TO STA 305+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	9

SHEET 7 OF 8





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SCALE HORIZ. FEET

LEGEND

- SOIL PROFILE
- CONTROL POINT
- MILLED AREAS

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F–1741

 Texas Department of Transportation

SH 204

PROJECT LAYOUT

STA 305+00 TO END PROJECT

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		10

SHEET 8 OF 8

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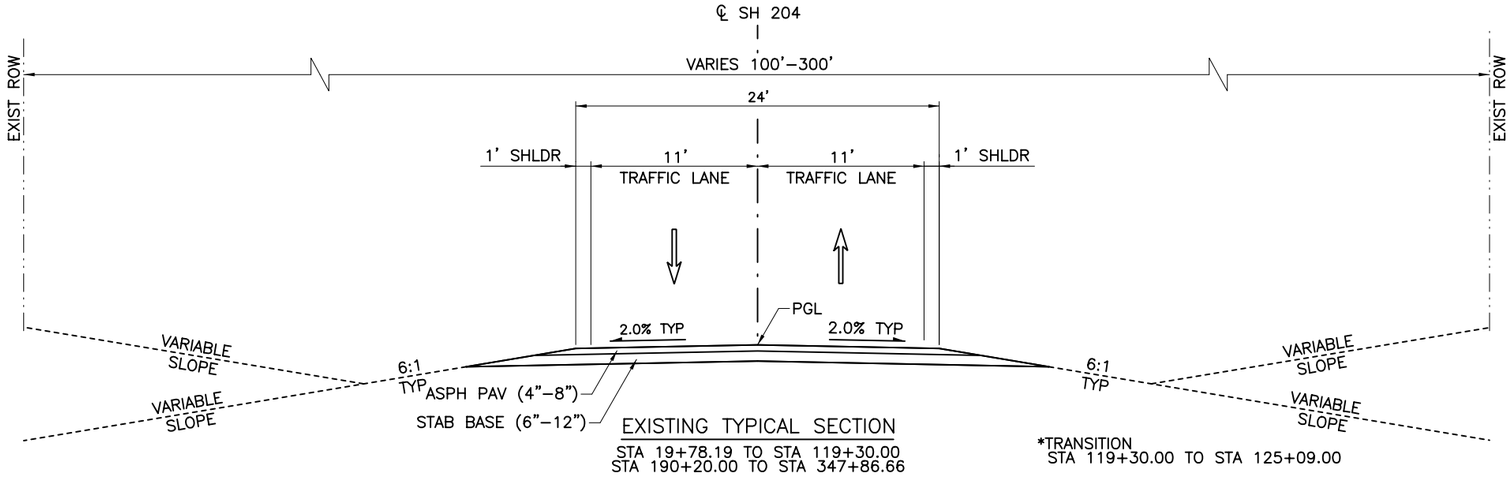
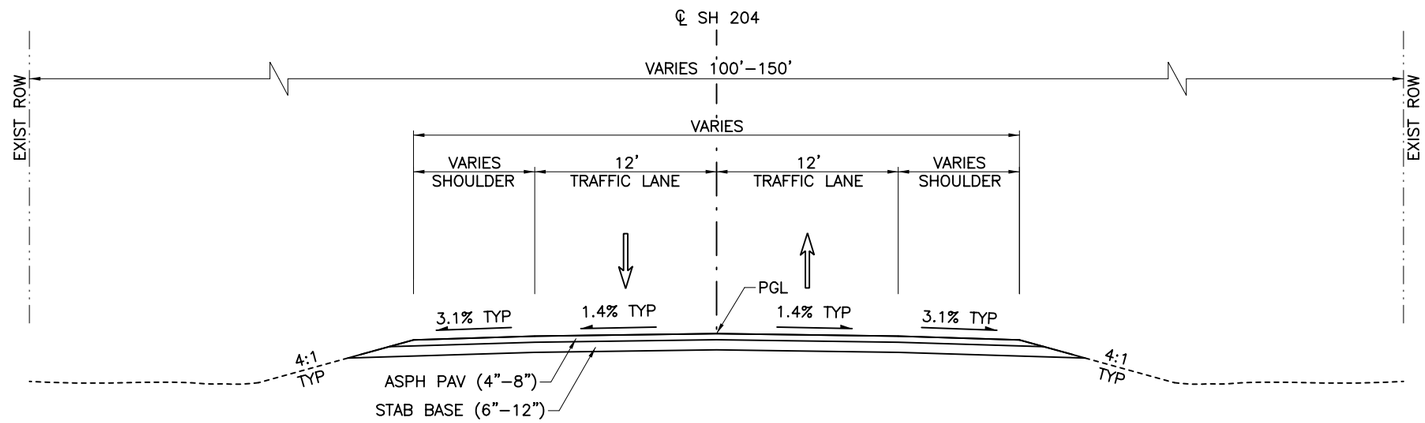


EXISTING TYPICAL SECTION

STA 19+78.19 TO STA 119+30.00
STA 190+20.00 TO STA 347+86.66

*TRANSITION
STA 119+30.00 TO STA 125+09.00

5 2.5 0 5 10
SCALE FEET



EXISTING TYPICAL SECTION

STA 15+00.00 TO STA 19+78.19
STA 133+25.00 TO STA 151+60.00
STA 165+35.00 TO STA 188+15.00

*TRANSITION
STA 151+60.00 TO STA 157+15.00
STA 188+15.00 TO STA 190+20.00

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

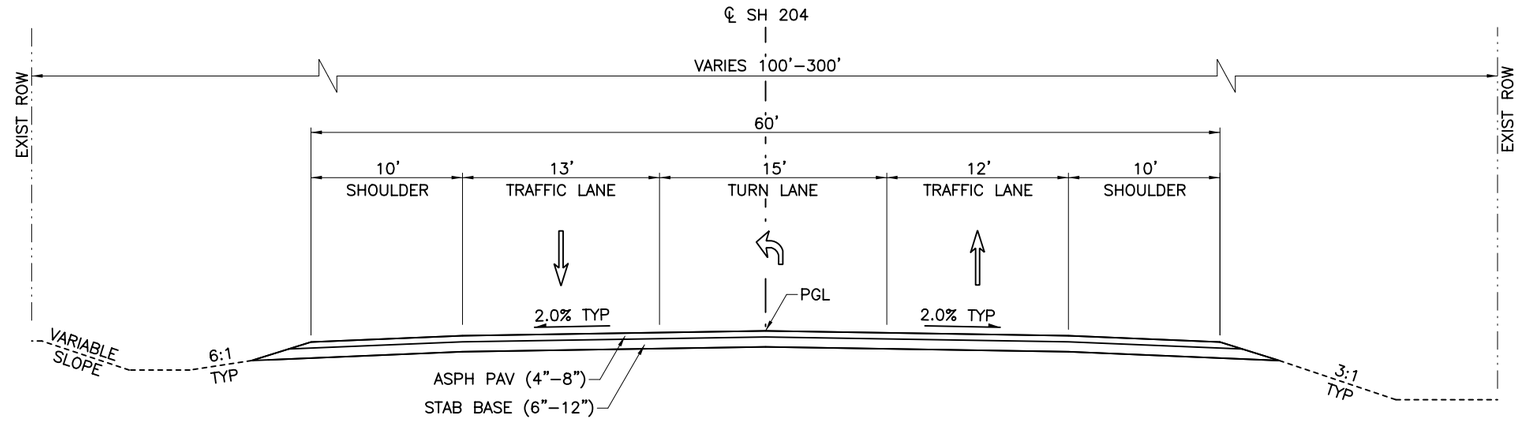
 Texas Department of Transportation

SH 204

EXISTING TYPICAL SECTIONS

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		11

SHEET 1 OF 2



EXISTING TYPICAL SECTION

STA 125+09.00 TO STA 127+84.00
STA 157+15.00 TO STA 159+87.96

*TRANSITION
STA 127+84.00 TO STA 133+25.00
STA 159+87.96 TO STA 165+35.00

5 2.5 0 5 10
SCALE FEET

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F–1741

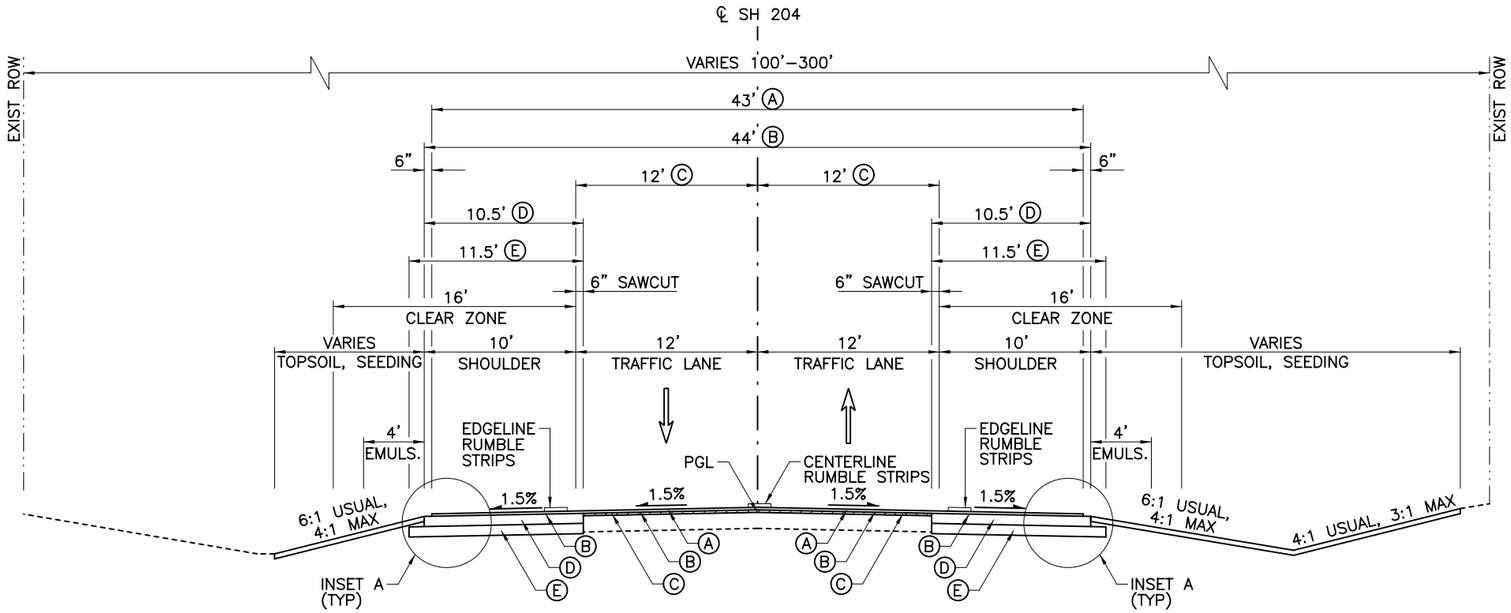
 Texas Department of Transportation

SH 204

EXISTING TYPICAL SECTIONS

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		12

SHEET 2 OF 2



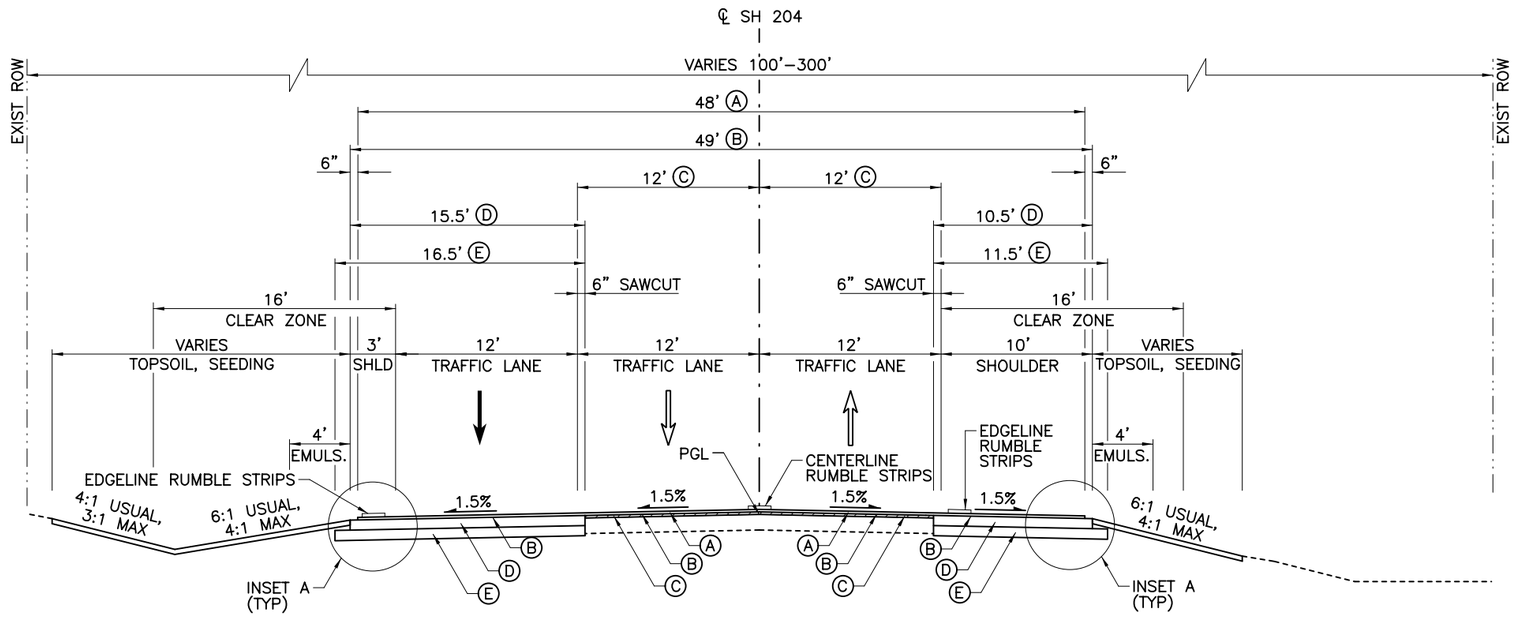
PROPOSED TYPICAL SECTION

STA 18+45.17 TO STA 31+70.00
STA 272+80.00 TO STA 346+11.73

LEGEND

(A) PFC (ASPHALT) PG76-22 (1.5")
(B) OCST
(C) SUPERPAVE MIXTURES SP-D PG 64-22 (VAR) (LEVEL-UP)
(D) SUPERPAVE MIXTURES SP-C PG 64-22 (8")
(E) TREATED SUBGRADE (8")

5 2.5 0 5 10
SCALE FEET



PROPOSED TYPICAL SECTION

STA 40+10.00 TO STA 119+30.00

*TRANSITION TO/FROM TWO-LANE SECTION
STA 31+70.00 TO STA 40+10.00
STA 119+30.00 TO STA 122+92.51

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

4/23/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

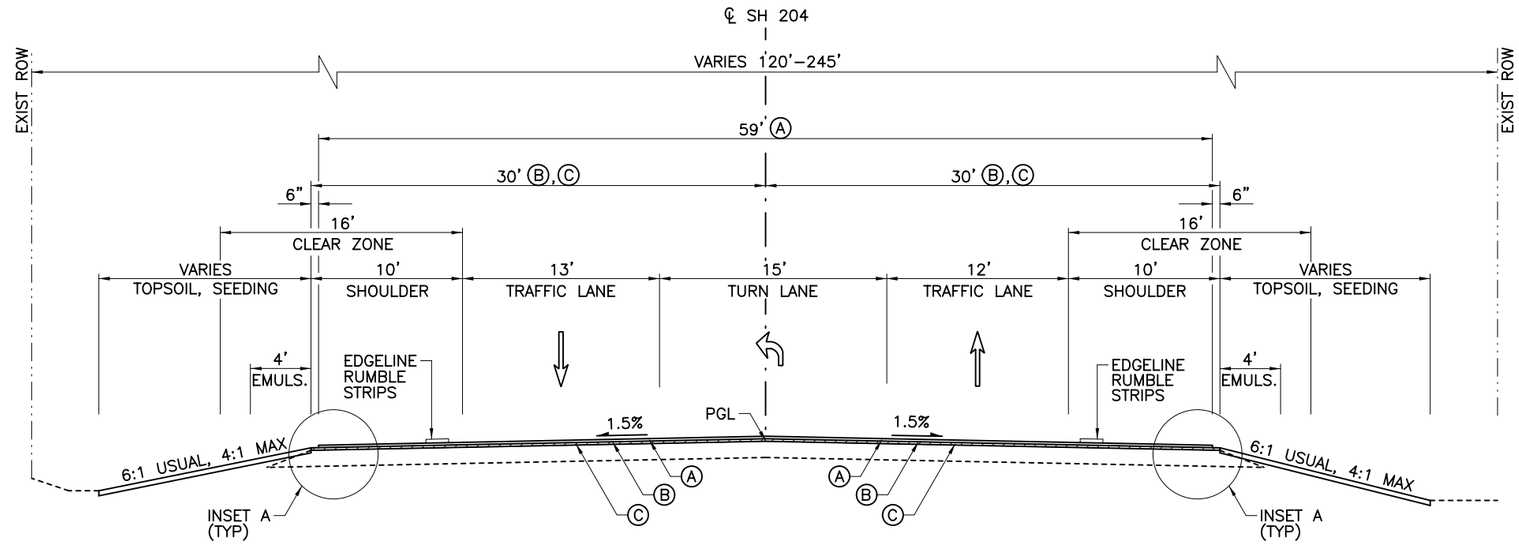
 Texas Department of Transportation

SH 204

PROPOSED TYPICAL SECTIONS

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		13

SHEET 1 OF 3



PROPOSED TYPICAL SECTION

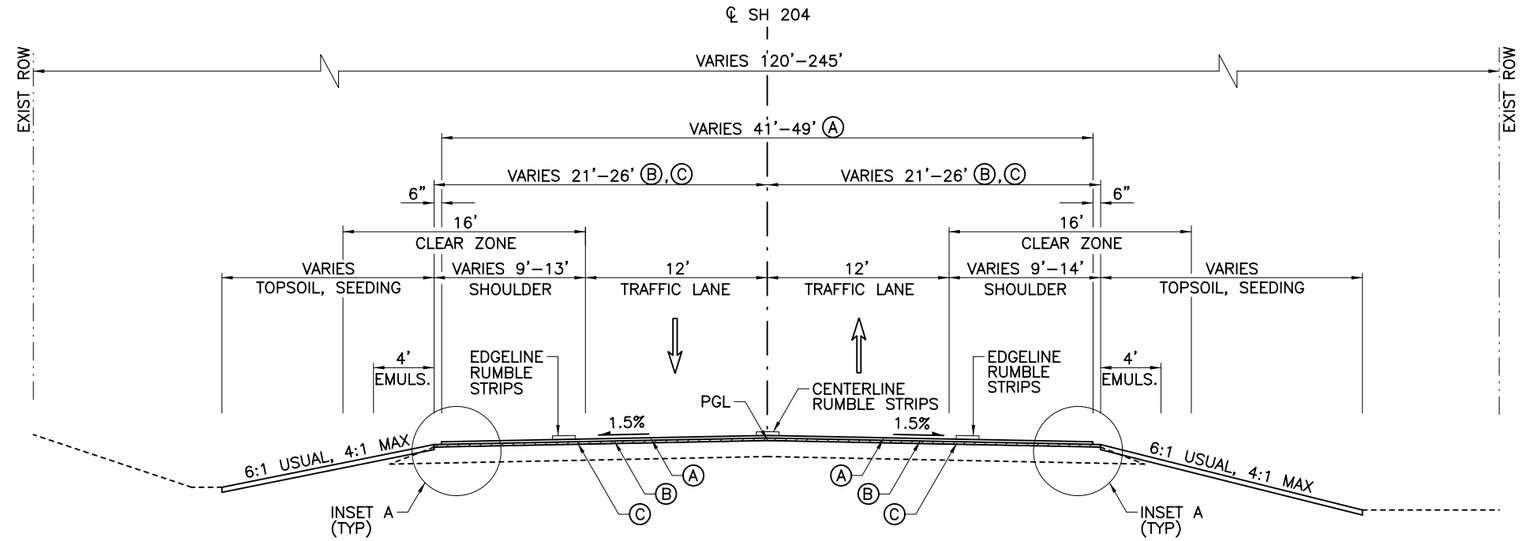
STA 125+09.00 TO STA 127+84.00
STA 157+15.00 TO STA 159+90.00

*TRANSITION
STA 122+92.51 TO STA 125+09.00
STA 127+84.00 TO STA 133+25.00
STA 151+60.00 TO STA 157+15.00
STA 159+90.00 TO STA 165+35.00

LEGEND

(A) PFC (ASPHALT) PG76–22 (1.5")
(B) OCST
(C) SUPERPAVE MIXTURES SP–D PG 64–22 (VAR) (LEVEL–UP)
(D) SUPERPAVE MIXTURES SP–C PG 64–22 (8")
(E) TREATED SUBGRADE (8")

5 2.5 0 5 10
SCALE FEET



PROPOSED TYPICAL SECTION

STA 133+25.00 TO STA 136+25.00
STA 137+90.00 TO STA 151+60.00
STA 165+35.00 TO STA 176+40.24
STA 178+79.98 TO STA 181+00.00

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER
4/23/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F–1741

 Texas Department of Transportation

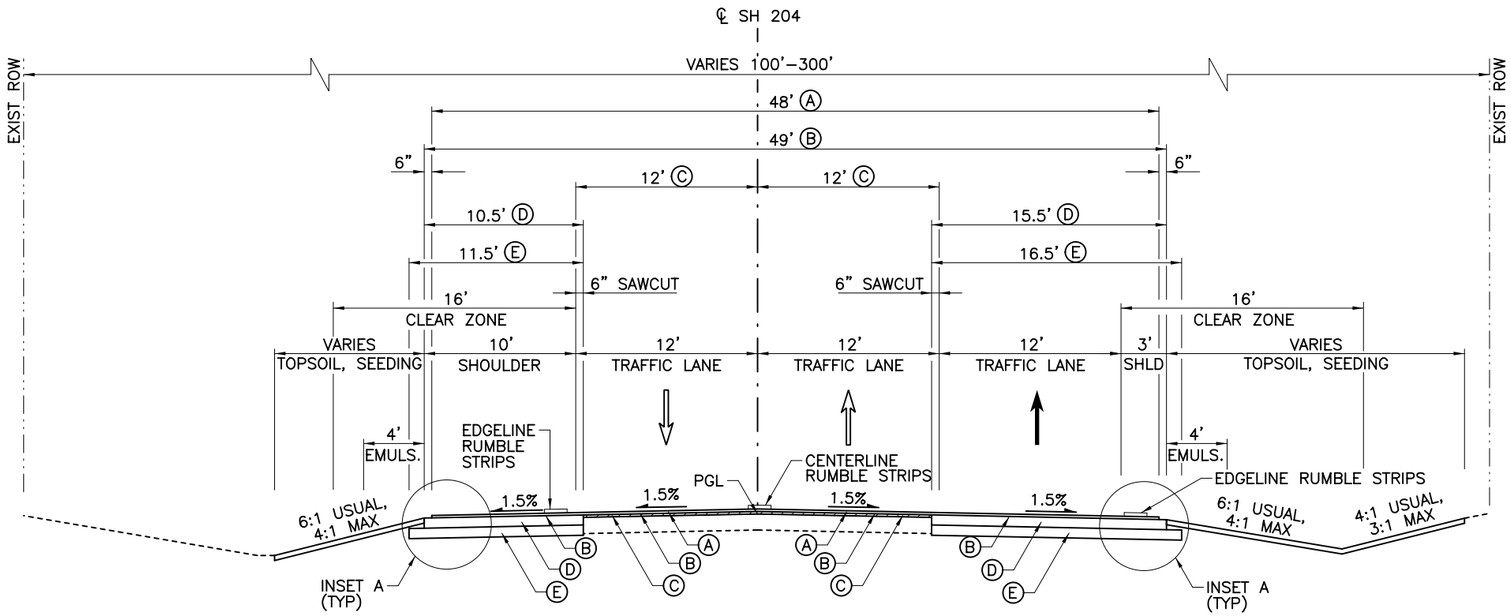
SH 204

PROPOSED TYPICAL SECTIONS

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	14

SHEET 2 OF 3

cpybw ANSIB.tbl
cpypdf_ANSIB.pltcfg
pw:Active Projects/TXDO1600493.00/TXDO1600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.01 General/4930102RDtyp04.dgn
4/23/2019 10:07:16 AM kperry



PROPOSED TYPICAL SECTION

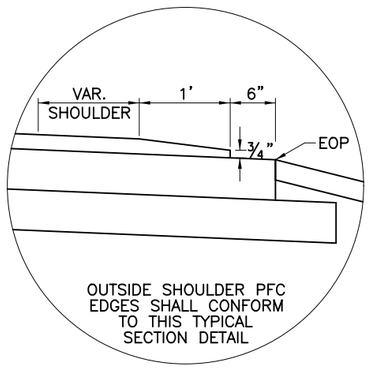
STA 185+20.00 TO STA 264+40.00

*TRANSITION TO/FROM TWO–LANE SECTION
STA 181+00.00 TO STA 185+20.00
STA 264+40.00 TO STA 272+80.00

LEGEND

(A) PFC (ASPHALT) PG76–22 (1.5")
(B) OCST
(C) SUPERPAVE MIXTURES SP–D PG 64–22 (VAR) (LEVEL–UP)
(D) SUPERPAVE MIXTURES SP–C PG 64–22 (8")
(E) TREATED SUBGRADE (8")

5 2.5 0 5 10
SCALE FEET



OUTSIDE SHOULDER PFC EDGES SHALL CONFORM TO THIS TYPICAL SECTION DETAIL

PAVEMENT DETAIL

INSET A
NTS

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

4/23/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F–1741

 Texas Department of Transportation

SH 204

PROPOSED TYPICAL SECTIONS

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		15

SHEET 3 OF 3

GENERAL NOTES:

GENERAL.

Contractor questions on this project are to be addressed to the following individuals:

Paul Schneider, P.E. Paul.Schneider@txdot.gov

Travis Singleton, P.E. Travis.Singleton@txdot.gov

For Q&A on Proposals navigate to:

https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

Use the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project and click on the link in the window that pops up to view the Q&A.

All relevant project documentation including Contract Time Determinations and cross-sections will still be posted to the districts FTP website.

https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/Tyler%20District/Construction%20Projects

All stockpiles within TxDOT right of way, must not exceed 12 ft. in height and must have 3:1 slope unless otherwise directed. Place stockpiles in a manner that will be outside the horizontal clear zone, will not obstruct traffic or sight distance, and will not interfere with roadway drainage.

Perform work as necessary off the right of way on temporary construction easements for driveway construction. All work performed in these areas will be paid for under the pertinent bid items of the Contract.

Do not haul with loaded scrapers on the surfaced areas of any highway except as approved.

Remove all vegetation from pavement edges, intersections, and driveways prior to planing operations, seal coat, or ACP operations. This work will not be paid for directly but will be subsidiary to the bid items of the Contract.

ATTN: Provide a 20-ft. length per 1-in. depth temporary taper at all transverse joints in the travel lane before opening to traffic. This work will not be paid for directly but will be subsidiary to the bid items of the Contract.

Project Number: **Sheet 16**

County: CHEROKEE **Control:** 0450-01-013

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Provide all-weather surface for temporary ingress and egress to adjacent property, as directed. Materials, labor, equipment and incidentals necessary to provide temporary ingress and egress will not be paid for directly but will be subsidiary to various bid items.

PROJECT MOWING

Mow the highway right of way in the project limits a maximum of 2 cycles per year, as directed.

Provide approved mowing equipment capable of mowing on slopes without unduly marring finished slope surfaces or damaging existing growth. The minimum cutting width should 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 should be 5 in. unless otherwise directed. Repair portions of sod or grass which are damaged during mowing operations in an acceptable manner.

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 devices to prevent injury to people or damage to property caused by flying debris propelled out from under rotary mowers. Chains should be a minimum size of 5/16 in. and links spaced side by side around the front, sides and rear of mower. When mowing at the specified cutting height, the chains should be long enough to drag the ground. If at any time it is determined that mowing or trimming equipment is defective to the point that it may affect the quality of work or create unsafe conditions, then immediately repair or replace the equipment.

LITTER PICKUP

Remove litter from the right of way in the project limits a maximum of 3 cycles per year as directed. Litter pickup will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Equipment used for litter pickup must be approved.

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

ITEM 4. SCOPE OF WORK

Upon completion of the work and before final acceptance, remove all foreign material, stains, and marks from concrete surfaces. Sandblast clean concrete surfaces as directed. Clean existing concrete structures that are marked or stained by the Contractor's operations. This work will not be paid for directly but will be subsidiary to the bid items of the Contract.

During final clean up, remove all foreign material that has accumulated at bridge abutments and bent caps as approved. All work and equipment involved in the removal of this material is subsidiary to the bid items of the Contract.

Preserve the integrity of all right of way monuments within project limits. Right of way monuments damaged or destroyed during construction must be replaced by a registered professional land surveyor (RPLS), at the Contractor's expense.

ITEM 5. CONTROL OF THE WORK

If utility lines need adjustments during construction operations, modify operations and continue the work in a manner that will allow others to make the utility adjustments. Additional working time may be allowed for delays caused by these utility adjustments.

Place and maintain construction hubs near the right of way line in accordance with Article 5.9., "Construction Surveying" on both sides of the roadway until the final item of work is complete.

Establish proposed centerlines throughout the project from control points and alignment data as shown on the plans.

Use "Method C" for construction surveying in accordance with Section 5.9.3.

Refer to the horizontal and vertical alignment data summaries for satellite-control point information.

Utility locations shown on the plans are approximate. Contact utilities in accordance with Article 5.6., "Cooperating with Utilities."

Verify survey control for accuracy before beginning construction.

Notify the Engineer if there are conflicts with survey control accuracy.

Before beginning work, profile the centerline of the existing roadway. Set horizontal and vertical control points to provide for the required thickness of materials.

Project Number: **Sheet 16A**

County: CHEROKEE **Control:** 0450-01-013

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Prior to beginning driveway and intersection work, submit a detailed construction sequence to be approved by the Engineer. Driveway and intersection completion includes existing surface removal, structure removal, removal of debris from the project site, installing the new RCP and SETs, backfilling, grading ditches to drain, and installing the permanent driveway or intersection surface (or all-weather drive surface as allowed).

ITEM 6. CONTROL OF MATERIALS

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

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

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

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

ITEM 7. LEGAL RELATIONS AND RESPONSIBILITIES

Do not initiate activities in a project specific location (PSL) associated with a U.S. Army Corps of Engineers (COE) permit area that has not been previously evaluated by the COE as part of the permit review of this project. Such activities include haul roads, equipment staging areas, borrow pits, and disposal sites. "Associated," defined here, means "materials are delivered to or from the PSL." The permit area includes all waters of the U.S. or associated wetlands affected by activities associated with this project. Special restrictions may be required for this work. The Contractor is responsible for all consultations with the COE regarding activities (including PSL) that have not been previously evaluated by the COE. Provide the Department with a copy of all consultations or approvals from the COE before initiating activities.

Proceed with activities in PSL that do not affect a COE permit area if Contractor determines that the PSL is non-jurisdictional or proper COE clearances have been obtained in jurisdictional areas or have been previously evaluated by the COE as part of the permit review of this project. The Contractor is responsible for documenting his determination that his activities do not affect a COE permit area. Maintain copies of determination for review by the Department or any regulatory agency.

Keep mailboxes in a position accessible to the carrier's vehicle along the travelway. When grading operations necessitate the moving of mailboxes, place mailboxes nearby at a location accessible to the carrier's vehicle. Return mailboxes to a position accessible to the carrier's

vehicle along the travelway when grading operations are not in progress. The Contractor may mount mailboxes on a portable stand that keeps the mailbox in a level position approximately 42 in. above the pavement.

Furnish mounts for mailboxes in accordance with the Compliant Work Zone Traffic Control Device List for temporary mailboxes. When existing mailboxes are non-standard size, supply the new standard sized mailbox when temporarily relocated on drum and label the address as directed. This process will not be paid for directly but will be subsidiary to the various bid items.

Coordinate with the local mail carrier where to place temporary mailboxes.

Concrete truck drivers and concrete pump operators are required to wash out only in designated areas specifically constructed for eliminating run-off. Dispose of materials in accordance with federal, state, and local requirements.

Placement of any fill material within the channel is not allowed. A temporary crossing must clear span from channel bank to channel bank.

Maintain positive drainage for permanent and temporary work for the duration of the project. The Contractor will be responsible for any items associated with the temporary or interim drainage and all related maintenance. This work will be subsidiary to various bid items.

The total disturbed area for this project is 37.8 acres. The disturbed area in this project and the Contractor Project Specific Locations (PSL's) within 1 mile of the project limits for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any Contractor PSL for construction support activities on or off the ROW. When the total area disturbed for all projects in the Contract and PSLs within 1 mile of the project limits exceed 5 acres, before disturbance, provide a copy of the Contractor NOI for PSLs on the ROW and within 1 mile of the project limits to the Engineer and to any local government that operates a Municipal Separate Storm Sewer System (MSSS).

In accordance with Article 7.9, provide and maintain adequate, neat, and sanitary toilet accommodations within the project limits for employees, including State employees.

No significant traffic generator events identified.

ITEM 8. PROSECUTION AND PROGRESS

Prepare the progress schedule as a bar chart.

Project Number: **Sheet 16B**

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ITEM 9. MEASUREMENT & PAYMENT

In accordance with Article 9.1., "Measurement of Quantities," furnish the tare and maximum gross weights as well as the volume capacity of all vehicles, trucks, truck-tractors, trailers, semi-trailers, or combination of such vehicles used to deliver materials for this Contract. Also, furnish calculations supporting these weights and capacities. Provide all measurements required for pay a minimum of 2 days before the trucks are used.

ITEM 100. PREPARING RIGHT OF WAY

Perform work as necessary off the right of way on temporary or drainage easements and at those locations where improvements have been taken or partially taken by right of way acquisition. Review these locations with the Area Engineer. The cost of this work will be included in the unit price bid for this Item.

Burning will not be permitted within the right of way.

Do not use a forestry type mulcher for grinding. Tub grinders will be allowed.

Dispose of trees from the right of way within 24 hours of removal.

ITEM 104. REMOVING CONCRETE

Blasting will not be permitted on this project.

The stockpile site for salvageable material is located at Jacksonville.

Before removing existing curb & gutter or laydown curb, saw cut between the gutter pan and the roadbed to eliminate the possibility of damage to the pavement structure. When the existing pavement edge must be removed to facilitate the curb & gutter transition from existing to the proposed ramp landing, remove the old and replace the new pavement structure the same day unless otherwise directed. The use of temporary material may be allowed as approved. This work will be subsidiary to Item 104.

ITEMS 110 & 132. EXCAVATION & EMBANKMENT

Excavation and embankment for driveways, intersections, mailbox turnouts and crossovers will not be paid for directly but will be subsidiary to the various bid items unless otherwise shown on the plans.

In a cut section, if the soil encountered in the subgrade is unsuitable for reasons other than excess moisture, this material will be declared "waste" and the Contractor will be required to undercut for a minimum depth of 1 ft. and a maximum depth as determined and replaced with a material

having a plasticity index of 6 to 18. This required undercutting will be paid for under Item 110, "Excavation."

When excavation is required to adjust stream flow lines at culvert ends, flatten the side slopes of channels and the backslopes of parallel ditches to the maximum extent possible within the existing right of way and channel easements.

ITEM 132. EMBANKMENT

Furnish Type C embankment consisting of suitable earth material (rock, loam, clay, or other approved materials) that will form a stable embankment. The top 2 ft. of embankment material should have a plasticity index between 6 and 18.

Test borrow sources and furnish results to the Engineer for select embankment, the Engineer will then run confirmation testing.

ITEM 164. SEEDING FOR EROSION CONTROL

The rates, types of seed, asphalt, and locations for the straw mulch and broadcast seed items will be determined if temporary erosion control is needed.

Mow tall vegetation prior to placement of erosion control measures in order to provide optimal growing conditions. This work will not be paid for directly but will be subsidiary to the bid items of the Contract.

The season and seed mixture for "Broadcast Seeding (Temporary Erosion Control) (Cool Season)" and "Broadcast Seeding (Temporary Erosion Control) (Warm Season)" is specified below:

Cool Season - September 1 thru November 30
Warm Season - May 15 thru August 31

Permanent Planting Mixture	
Species and Rates	
(lb. PLS/ac.)	
(Season: February 1 to May 15)	
Green Sprangletop	0.5
Bermudagrass	5.0
Weeping Lovegrass (Ermelo)	0.5
Sand Lovegrass	0.5
Lance-Leaf Coreopsis	1.0
(Season: September 1 to February 1)	
Bermuda (unhulled)	12
Crimson Clover	10

Project Number: **Sheet 16C**

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Temporary Seeding for Erosion Control	
Warm Season	
(Season: May 15 to August 31)	
Bermudagrass	10
Foxtail Millet	30
Cool Season	
(Season: September 1 to November 30)	
Tall Fescue	4.5
Oats	24
Wheat	34

Place topsoil before temporary seeding unless otherwise directed.

Do not use Bahiagrass.

Use additional temporary seeding if permanent seeding is placed outside the optimum growing season shown for this Item as directed.

Provide a Bonded Fiber Matrix that meets the current requirements of the Approved Products List for Item 169, "Soil Retention Blanket, Class 1, Type D, Spray Type Blanket," for both permanent and temporary seeding. Install according to manufacturer's recommendations based on a slope steeper than 3:1 with sandy soils. This Item will be paid for under Item 164.

ITEM 166. FERTILIZER

Place fertilizer at the rate of 1 lb. per 9 sq. yd. on areas prepared for seeding.

ITEM 168. VEGETATIVE WATERING

Apply water to all newly placed sod or seeded areas the same day of installation. Maintain the sod or seeded areas in a sufficiently watered condition. Do not allow sod or seeded areas to dry out so that water stress is evident.

ITEM 169. SOIL RETENTION BLANKET

Do not use synthetic mats for this project.

ITEM 316. SEAL COAT

Protect all existing bridges, curbs, and other exposed concrete surfaces from asphaltic materials by any acceptable method. Removal of excessive asphaltic materials deposited on these surfaces will be at the Contractor's expense.

During surface treatment application, if existing conditions warrant, vary the lane widths, transitions, and intersection areas as directed.

Perform rolling as directed with equipment complying with Section 210.2.4.2, "Medium Pneumatic Tire." This work will not be paid for directly but will be subsidiary to pertinent Items.

Do not apply asphalt later than 1 hour before sunset unless otherwise approved.

The Engineer will approve stockpile sites for materials. Locate stockpile site a minimum of 30 ft. from the roadway unless otherwise authorized. Place stockpiles in a manner that will not interfere with access from abutting property and will not obstruct traffic or sight distance. Avoid stockpiling at intersections. Notify the Engineer at least 5 working days prior to stockpiling

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material to secure approval of the site. The Engineer may approve stockpiling of materials closer than 30 ft. from the travelway if adequate barricades and devices are furnished and approved. Keep stockpile clear of debris and vegetative growth as approved.

Keep the material pushed into one pile at each stockpile location. Upon completion of each reference project, provide stockpile sites that are clear of debris and dressed in a manner as approved.

Clearly sign stockpile locations with Contractor's name & project name, as approved. This will not be paid for directly but will be subsidiary to Item 316.

Provide aggregate for shoulders and mainlanes from the same source unless otherwise directed.

Place surface treatments between May 1 and August 31 unless otherwise directed.

The rates shown on the plans for asphalt and aggregate are for estimating purposes only. The rates may be varied as directed.

The Contractor's project superintendent, knowledgeable of TxDOT seal coat operations, and the Department's project manager must drive all roadways for this Contract and review the pavement conditions in order to set preliminary asphalt and aggregate rates. The rates may be adjusted as necessary during construction to allow for any changes in the materials, pavement, or weather conditions at the time of construction.

ITEM 320. EQUIPMENT FOR ASPHALT CONCRETE PAVEMENT

Provide either a material transfer vehicle or material transfer paver for the surface course of this project. The material transfer vehicle must be self-propelled, wheel mounted and capable of receiving material from haul trucks separate from the paver. The 20-ton minimum capacity hopper must be equipped with a pivoting discharge conveyor and must have a means of remixing the asphaltic material before placement. The material transfer paver, if supplied, must consist of a mobile, self-propelled asphalt paver incorporating an integral mix loadout elevator (conveyor) having a minimum rated capacity of 750 ton per hour. The conveyor system must have a means of remixing the asphaltic concrete material before discharging into the paver hopper and must be equipped with either a truck dump hopper attachment or a minimum 20-ton capacity surge hopper. If a material transfer paver utilizing the truck dumper hopper attachment is used, the haul trucks must stop a minimum of 1 foot into the truck. In addition, paving will not be allowed to begin until the paver has reached its full storage capacity.

ITEM 351. FLEXIBLE PAVEMENT STRUCTURE REPAIR

Replace the unstable pavement structure with 6 in. of asphaltic concrete pavement base (Super Pave SP-C), unless otherwise directed. The Engineer will determine the exact locations and limits of pavement repair in the field prior to beginning this Item of work.

Apply a tack coat with a rate of 0.10 gal/sy of residual asphalt between each layer of ACP pavement unless otherwise directed.
Furnish planing equipment to remove existing material in accordance with Item 354, as directed. The planing equipment will be subsidiary to Item 351.

Furnish an asphalt paver on full lane width pavement repair sections in accordance with Item 320 unless otherwise directed.

ITEM 354. PLANING AND TEXTURING PAVEMENT

Use a front-end loader or other suitable equipment at the stockpile site to properly stockpile the planed material as required.

ATTN: Vary planing locations to meet field conditions as directed. Begin and end planing at a sawed or planed vertical joint to provide a smooth transition to existing pavement. Provide a 20-ft. length per 1-in. depth temporary taper at all transverse joints in the travel lane before opening to traffic.

Before opening planed areas to traffic, bevel vertical or near vertical longitudinal faces in the pavement surface.

The City of Jacksonville and their forces will adjust their manholes and water valves during the course of construction on this project.

Furnish a small planing machine as approved for planing small areas and street intersections.

Overlay all planed areas by the end of each day unless otherwise approved.

If unsuitable weather or other unexpected conditions do not allow planed areas to be overlaid, provide and maintain warning signs for overnight lane closures in accordance with the traffic control plan sheets until overlay operations are complete.

Retain all RAP generated from this project.

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ITEM 400. EXCAVATION AND BACKFILL FOR STRUCTURES

Backfill the excavation to within 10 in. of the existing finished grade when cutting existing pavement for the installation of drainage structures. Restore the remaining 10 in. of pavement with an approved asphaltic concrete pavement or other approved material; place and compact in 3 approximately equal layers. Usual testing of this material is not required, but the Engineer will approve the material at the time of placement. This work will be paid for at the unit price bid for “Cutting and Restoring Pavement.”

ITEM 403. TEMPORARY SPECIAL SHORING

Use mats during placement and removal of temporary special shoring to avoid damage to the pavement structure.

Do not allow shoring to project more than 4-in above natural ground elevation unless otherwise approved.

ITEM 432. RIPRAP

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

ITEM 462. CONCRETE BOX CULVERTS AND DRAINS

Provide Portland cement mortar joints between precast concrete box culverts and existing reinforced box culverts in accordance with Section 464.3., “Jointing.”

Removal of existing wingwalls is subsidiary to Item 462.

If existing curb and wingwalls are left in place during cast-in-place culvert extensions, drill and grout 2 ft. long #6 bars halfway into the existing curb and wingwalls at 18-in. center to center spacing. This work will be subsidiary to Item 462.

ITEM 464. REINFORCED CONCRETE PIPE

Removal of portions of the existing structure, including headwalls, safety end treatments, and pipe, is subsidiary to Item 464.

ITEM 465. JUNCTION BOXES, MANHOLES, AND INLETS

Paint all iron manhole rings and covers with galvanized paint.

ITEM 467. SAFETY END TREATMENT

Reshape embankment side slopes and provide embankment as required. Add mulch sod to achieve a smooth uniform finish around the installation of the safety end treatments and culvert extensions as directed.

Removal of portions of the existing structure, including headwalls, safety end treatments, and pipe, is subsidiary to Item 467.

ITEM 496. REMOVING STRUCTURES

All materials removed under this Item are the property of the Contractor.

ITEM 502. BARRICADES, SIGNS, AND TRAFFIC HANDLING

The traffic control plan for this Contract consists of: the installation and maintenance of warning signs and other traffic control devices shown on the plans; specification data, which may be included in the general notes; applicable provisions of the Texas Manual on Uniform Traffic Control Devices (TMUTCD); traffic control plan sheets included on the plans; standard BC sheets; Compliant Work Zone Traffic Control Device List, and Item 502 of the standard specifications.

Use ground-mounted sign mounts with two posts for all temporary work zone signs unless otherwise directed.

Inspect and correct deficiencies each day throughout the duration of the Contract. In accordance with Article 502.4., “Payment,” no payment will be made for the month if the Contractor fails to provide or properly maintain signs and devices in compliance with Contract requirements. Temporary warning signs that are visible when conditions do not apply will be considered improper maintenance of signs.

Provide at least one employee on call nights and weekends (or any other time that work is not in progress) for maintenance of signs and traffic control devices. This employee must have an address and telephone number near the project, as approved. Notify the Engineer in writing of the name, address, and telephone number of this employee. The Engineer will furnish this information to local law enforcement officials.

In addition to providing a Contractor’s Responsible Person and a phone number for emergency contact, have an employee available to respond on the project for emergencies and for taking corrective measures within 30 minutes.

Sign all roads intersecting the project in accordance with current BC standards.

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County: CHEROKEE **Control:** 0450-01-013

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Refer to the traffic control plan sheets for traffic handling through the work area. Contractor may vary the signing arrangement and spacing as necessary to fit field conditions; however, any proposed changes in the traffic control plan must be approved before implementation.

When the sequence of work is shown on the plans, the Contractor may submit an alternate proposal for approval. Submit in writing all proposed variations and revisions.

High-visibility safety apparel is required for workers in accordance with the General Notes on current BC standards.

Place and maintain signs, channelizing devices, and flaggers to direct and route traffic at any location and for any period of time as may be required or directed.

When operations require a lane closure, provide cones, vertical panels, drums, signs, flaggers, and flashing arrow panels as necessary to route traffic around the closed lane as shown on the plans and as directed. Lane closures will be limited to one specific lane as directed.

Unless otherwise approved, construction operations will not be allowed on Good Friday, Easter weekend, the Friday before Memorial Day thru Memorial Day, July 4th, the Friday before Labor Day thru Labor Day, the Wednesday before Thanksgiving Day thru Sunday, Christmas Eve, Christmas Day, New Year’s Eve, New Year’s Day, or on any other high traffic days or holidays as determined by the Engineer.

Erect R4-1 (Do Not Pass) and R4-2 (Pass With Care) signs to mark existing no-passing zones as directed. (These signs will not be required if these zones will not be eliminated during construction.)

Maintain existing roadside signs within this project’s limits during this Contract. In order to accommodate the grading or other operations, temporarily relocate these signs in accordance with the TMUTCD as directed. Use ground-mounted sign mounts with two posts for all relocated signs unless otherwise directed. This work will not be paid for directly but will be subsidiary to Item 502.

Provide truck-mounted attenuators (TMA) as shown on the appropriate traffic control plan sheets. Provide a letter certifying that all TMA used on this project meet NCHRP 350 or AASHTO Manual for Assessing Safety Hardware (MASH) requirements.

Regulate all construction activities and equipment to minimize inconvenience to the traveling public. At points where it is necessary for trucks to stop, load, or unload, provide warning signs and flaggers to protect the traveling public.

The pavement must be entirely open to traffic each night. Remove or clearly barricade all material stockpiles, equipment left overnight, or any obstruction within 30 ft. of a travelway as approved.

The Contractor Force Account "Safety Contingency" is intended to be used for work zone enhancements that could not be foreseen in the project planning and design stage for the purpose of improving the effectiveness of the Traffic Control Plan. 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.

Provide flaggers at county roads, commercial driveways, and other intersecting roadways deemed necessary by the Engineer to maintain control of the work zone during one-lane two-way operations. Provide communication radios to each flagger in the work zone and the pilot vehicle operator.

When a culvert extension, inlet construction, or safety end treatment, etc. is within 30 ft. of a travel lane, delineate these areas as shown on current BC standards. In addition, provide a 4-ft. high plastic construction fence at or around any structure or obstruction that would be a hazard to pedestrians unless otherwise approved. Erect fence using a minimum of 4-T-posts, one at each corner of the structure or obstruction.

Where there is excavation adjacent to the pavement edge, provide adequate warning signs, vertical panels, drums, and lights at the pavement edge as directed. Treat pavement drop-offs created by ACP operations in a similar manner in accordance with the details shown on the plans.

Furnish and install work zone/reduce speed ahead and work zone/speed limit signs in accordance with current BC standards at locations as established by the Engineer. Signs must be ground-mounted.

Provide work zone speed limit signs that meet sizing requirements in accordance with Table 2B-1 of the TMUTCD.

When excavation is required next to a travel lane carrying traffic and widening is not completed by the end of the day's operation, place sufficient backfill against the edge of the travel lane in order to provide a 3:1 slope, unless otherwise permitted on the plans. Provide backfill containing a durable crushed stone type of flexible base or other materials as approved. When work resumes on this excavated area, carefully remove and dispose of the backfill material. Materials and labor for this work will not be paid for directly but will be subsidiary to the various bid items of the Contract.

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Refer to the traffic control details for surfacing operations shown on the plans. Install signs as required by this standard or plan sheet. Keep signs in place until after completion of the surface course operation and until placement of the standard pavement markings. Place standard pavement markings within 7 days of surface treatment application. The placement of acceptable permanent pavement markings and the completion of the final cleanup will be considered a part of the surface course operation. These signs are in addition to the signs and barricades that may be required on standard BC sheets. Short-term stationary/short duration portable signs will be required during the removal of the temporary pavement markings.

Provide a pilot vehicle.

Do not perform base widening on both sides of the roadway simultaneously.

Prior to beginning work, the Contractor and Engineer must agree on the allowable length of lane closure.

Provide the Engineer 72-hour notice of lane or ramp closures to provide advance notice to the traveling public by way of media and for any dynamic message sign programing. Place Portable Changeable Message Signs (PCMS) at locations as directed a minimum of 3 days in advance of entrance ramp closures on the affected crossroad. These signs are to remain in place during the ramp closures.

All work required by these general notes, except as provided for by Item 502, will not be paid for directly, but will be subsidiary to Item 502 unless otherwise shown on the plans.

ITEM 504. FIELD OFFICE AND LABORATORY

Provide a facility at the asphalt concrete pavement plant for use by the Engineer as a laboratory. This is an existing requirement of Item 6, Article 5, "Plant Inspection and Testing," of the Standard Specifications. Provide a facility meeting the requirements of Item 504. At a minimum meet the requirements of 504.2.2.4, "Ty D Structure (Asphalt Mix Control Laboratory)" and 504.2.2.4.1, "Asphalt Content by Ignition Method." In addition, provide the following: At least one exterior door opening with a 48-in. minimum width. If steps are required to gain access to the facility's 48-in. door, provide a landing dock with minimum dimensions of 60 in. wide by 60 in. deep. The strong floor and landing of the facility should support the weight of all equipment and personnel providing a stable, essentially zero deflection during testing operations, acceptable to the Engineer. Provide a printer/fax/scan copier capable of printing 8.5" x 11" and 11" x 17" paper sizes and internet connectivity with a minimum of 100 mbps. This facility will be required of all projects with plant produced asphalt concrete pavement.

No direct payment will be made for Engineer field labs. All construction, maintenance, utilities, custodial services, security, and permits necessary to establish and maintain readiness of this

facility is the responsibility of the Contractor. This building/facility is required by the standard specifications and is considered a standard part of any asphalt concrete pavement plant producing materials for Department projects.

Furnish a Superpave Gyratory Compactor calibrated in accordance with Tex-241-F for molding production samples. The Superpave Gyratory Compactor will not be paid for directly but will be subsidiary to the asphalt concrete pavement Items of work.

ITEM 506. TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS

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

The total disturbed area for this project is 37.8 acres. The disturbed area in this project, all project locations in the Contract, and Contractor project specific locations (PSLs) within 1 mile of the project limits for the Contract, will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any Contractor PSLs for the construction support activities on or off right of way. When the total area disturbed for all projects in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, before disturbance, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer (to the appropriate MS4 operator when on an off-State system route).

The Engineer will provide copies of documents to meet TxDOT's posting requirements. Laminate, post, and maintain these documents at the project limits and at major roadways intersecting the project as directed. Post required Contractor documents in the same manner and location. This work will be subsidiary to Item 506.

ITEM 512. PORTABLE CONCRETE TRAFFIC BARRIER

The Department will furnish 636 ft. of portable concrete traffic barrier. The stockpile site is located at the South Tyler Area Office, 15986 SH 155 S, Tyler, TX 75703. Notify the Area Engineer a minimum of 4 days prior to barrier collection.

Remove, transport, and stockpile barrier no longer required for the Contract at the South Tyler Area Office, 15986 SH 155 S, Tyler, TX 75703. Notify the Area Engineer a minimum of 4 days prior to barrier delivery.

Project Number: **Sheet 16H**

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Supply all dowel bars and mounting hardware necessary to connect the portable concrete traffic barrier. Upon completion of this Contract, all mounting hardware will become the property of the Department. When the PCTB is no longer necessary, remove and deliver the mounting hardware to a location as specified.

ITEM 533. MILLED RUMBLE STRIPS

Provide one-lane two-way traffic control on two-lane roadways unless otherwise approved.

Provide traffic control for roadways with other lane configurations as directed.

Provide a sweeper that meets the requirements of Section 354.2.3.

ITEM 540. METAL BEAM GUARD FENCE

Length of steel posts for low fill culvert post mounting will be determined in the field to ensure proper metal beam guard fence height.

ITEMS 540 & 542. METAL BEAM GUARD FENCE & REMOVING METAL BEAM GUARD FENCE

Prior to removal of existing MBGF and associated appurtenances, submit to the Engineer for approval a work plan, including a detailed timeline, outlining removal and reinstallation of safety features. It is the intent that the Contractor has the necessary materials and labor force available to reinstall the safety features prior to beginning the removal process.

Regardless of when the Contractor installs proposed MBGF, set the rail height to account for any subsequent surfacing work in order to be in accordance with standard MBGF upon completion of the Contract.

When replacing guard rail, ensure that all segments of guard rail removed are replaced the same workday before opening to traffic.

ITEM 542. REMOVING METAL BEAM GUARD FENCE

All metal beam guard fence is non-salvageable and will become the property of the Contractor.

All metal beam guard fence not designated for re-use will become the property of the Contractor. Dispose of fence as directed.

Removal of existing ACP mow strips is incidental to removal of the existing guard rail.

ITEM 545. CRASH CUSHION ATTENUATORS

Provide crash cushion attenuators meeting TL-3 requirements.

ITEM 552. WIRE FENCE

Use treated wood posts for Type “A” fence. Usual testing requirements will be waived, but posts will be subject to visual inspection and approval by the Engineer.

Attach the permanent fence to the end of the proposed structures designated on the plans and as shown on standard sheets WF(1) / WF(2).

Any temporary fencing required during construction of the proposed structure extensions or bridge replacements will not be paid for directly but will be subsidiary to the various bid items.

Construct and maintain temporary fencing and gates at the locations and limits shown on the plans. Furnish temporary fencing and gates with material and design equal to or better than the present fencing, and adequate to properly control livestock for the duration of the project.

ITEM 560. MAILBOX ASSEMBLIES

Use round posts, set in concrete, with 12 in. reflector tape for all mailbox installations.

Provide new metal mailboxes and place the existing mailboxes at the front door of the homeowner. Ensure the new mailbox is not smaller than the existing.

Place 2-in. address location numbers on each mailbox in accordance with Placement of Emergency Location Number notes on MB-21(1). The color of the numbers must contrast the mailbox color as directed.

ITEM 585. RIDE QUALITY FOR PAVEMENT SURFACES

Use Surface Test Type B pay adjustment schedule 3 to evaluate ride quality of the travel lanes in accordance with Item 585, “Ride Quality for Pavement Surfaces.”

ITEM 636. SIGNS

Install signs in accordance with the Department of Transportation’s “Sign Crew Field Book,” latest edition, or as directed.

All signs removed from the project are deemed salvageable and become the property of the Department. Stockpile salvageable material at the Jacksonville Maintenance Section located at 522 SE SL 456 in Jacksonville.

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ITEM 644. SMALL ROADSIDE SIGN ASSEMBLIES

Sign types for which details are not shown on the plans must conform to “Standard Highway Sign Designs for Texas,” latest edition.

Before construction begins, locate all Texas Reference Marker (TRM) signs and Adopt-a-Highway signs using survey control methods for accuracy. Provide the survey data to the Engineer. If either type of sign is relocated during construction activities, survey the sign location and notify the Engineer before placement of the permanent sign.

Stake all sign locations for approval prior to placement.

ITEM 658. DELINEATOR AND OBJECT MARKER ASSEMBLIES

Accept ownership of unsalvageable delineator and object marker assemblies and remove from the right of way.

ITEM 662. WORK ZONE PAVEMENT MARKINGS

For this project, Contractor may use paint and beads for work zone pavement markings (non-removable).

Dispose of all empty paint containers and unused paint in accordance with federal, state, and local requirements.

Do not use foil backed pavement markings as removable work zone pavement markings. Removable work zone pavement markings must be pliant polymer detour grade (removable) material or other markings that can be obliterated or removed to the satisfaction of the Engineer.

Use tape for short-term removable pavement markings on hot mix & PFC surfacing applications.

Tabs may be used before surface treatment application.

Furnish and place work zone pavement markings (short term)(tab) on center lines and lane lines in accordance with WZ(STPM), and provide warning signs in accordance with TCP (7-1). Place tabs within 1 in. of the proper alignment as established by the Contractor and approved by the Engineer. Remove tabs after placement of permanent markings. Tab removal will be subsidiary to Item 662.

ITEM 666. RETROREFLECTORIZED PAVEMENT MARKINGS

Use the spray method for application of the thermoplastic compound for lane lines, barrier lines, edge lines and channelizing lines.

Extrude hot to the pavement surface thermoplastic compound for arrows, stop lines, yield triangles, transverse lines, crosswalk lines, words and symbols.

For lengths greater than 300-ft, provide guide markings that will not leave a permanent mark on the roadway. Have the guide marking material and equipment used for placement approved prior to use. Provide adequate notification for approval of the guide markings prior to placement of the permanent pavement markings.

Provide a crew experienced in the work of installing pilot guideline markings and in the necessary traffic control. Supply all the equipment, personnel, traffic control, and materials necessary for the placement of pilot guideline markings as directed. All work will be in conformance with Part 6 of the TMUTCD.

The Engineer will establish beginning and ending points of no passing zones.

Correct deficiencies in the alignment of pavement markings at Contractor's expense, as directed. Use a strip seal with aggregate and asphalt types and rates as directed to eliminate the deficient pavement markings.

ITEM 672. RAISED PAVEMENT MARKERS

Provide dispensing equipment such that the bituminous material can be directly applied from the melting pot to the pavement surface without secondary handling. Dispensing material from the melting pot into a separate container and then to the pavement surface will not be permitted. Intermittent agitation of the bituminous material will be by a method approved by the Engineer to ensure even heat distribution and must be such that the adhesive is agitated at approved and consistent intervals.

ITEM 677. ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS

Unless otherwise directed, utilize Surface Treatment Method for removal on asphaltic surfaces. The Engineer will approve materials and rates prior to use.

Furnish a high-pressure water blasting system for removing paint, thermoplastic, epoxy and preformed tape material from the following surfaces without causing any grooves or trenching of the surface: asphalt, concrete, permeable friction course, grooved asphalt and grooved concrete.

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Use a high-pressure water blasting system that consists of a vacuum recovery system that must provide for a nearly dry surface eliminating the possibility of uncontained run-off blasting water or debris, or the need for any secondary clean-up vehicles or operations.

All components required for the complete operation of the water blasting system (ultra-high-pressure pump, vacuum system, clean water supply, vacuum recovery storage, primary truck-mounted and optional secondary tractor-mounted blasting components) must be mounted and transported on a single, fully self-contained and supporting single truck chassis, thereby eliminating the need for any additional water, vacuum or other transport vehicles.

ITEM 3077. SUPERPAVE MIXTURES

When using crushed gravel as a coarse aggregate for ACP, use 1% lime as an antistripping agent.

Provide coarse aggregate for the final surface course from the same source or blended sources unless otherwise directed.

Give the State inspector at the spreading and finishing machine one weight ticket for each load of material. When directed, weigh asphaltic concrete loads on public scales to ensure the proper weight of material.

For materials paid for by the ton, provide a summary spreadsheet in accordance with Article 520.2, "Equipment."

Provide Class A coarse aggregate for the surface as listed in the Department's *Bituminous Rated Source Quality Catalog* (BRSQC).

Use an electrical impedance (non-nuclear) measurement gauge to determine mat segregation and joint density for Part V and Part VIII of test procedure Tex-207-F. Do not use nuclear density gauges or thin lift gauges for segregation or joint density determinations. Data reporting for mat segregation and joint density must be performed on Department templates.

All RAP used on this project must be fractionated. If an existing mix design is submitted for use as Warm Mix Asphalt (WMA), then a new trial batch with passing Hamburg Wheel test results is required.

Apply a tack coat with a rate of 0.10 gal/sy of residual asphalt between each layer of ACP pavement unless otherwise directed.

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

ITEM 3079. PERMEABLE FRICTION COURSE

Cease production of mixture if the asphalt content from any sublot drops below 6%. Resume production following tests showing appropriate adjustments have been made to the satisfaction of the Engineer.

Provide Class A coarse aggregate for the PFC as listed in the Department's Bituminous Rated Source Quality Catalog (BRSQC).

Warm Mix Asphalt (WMA) is not allowed.

The use of Recycled Asphalt Shingles (RAS) is not allowed.

ITEM 6001. PORTABLE CHANGEABLE MESSAGE SIGN

Provide a non-erodible, stable surface to place the Portable Changeable Message Sign (PCMS) units adjacent to the roadway as directed. Payment for this surface is incidental to Item 6001.

ITEM 6185. TRUCK MOUNTED ATTENUATOR (TMA)

Shadow vehicles with truck mounted attenuator (TMA) are required on the traffic control plan and TCP standards for this project. The Contractor will be responsible for determining if one or more of these traffic control operations will be ongoing at the same time to determine the total number of TMAs needed for the project. Additional truck mounted attenuators (TMAs) may be required as deemed necessary by the Engineer.

The TMA/TA used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0450-01-013 **DISTRICT** Tyler **COUNTY** Cherokee
HIGHWAY SH 204

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0450-01-013**			
		PROJECT ID		**A00058516**			
		COUNTY		**Cherokee**			
		HIGHWAY		**SH 204**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6002	PREPARING ROW	STA	274.280		274.280	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	73.000		73.000	
	104-6054	REMOVING CONCRETE(MOW STRIP)	LF	1,860.000		1,860.000	
	110-6001	EXCAVATION (ROADWAY)	CY	33,471.000		33,471.000	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY	45,943.000		45,943.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	182,870.000		182,870.000	
	164-6054	BOND FBR MTRX SEED (PERM)(RURAL)(SAND)	SY	182,870.000		182,870.000	
	164-6055	BONDED FBR MTRX SEED (TEMP)(WARM)	SY	91,435.000		91,435.000	
	164-6056	BONDED FBR MTRX SEED (TEMP)(COOL)	SY	91,435.000		91,435.000	
	168-6001	VEGETATIVE WATERING	MG	4,023.000		4,023.000	
	169-6004	SOIL RETENTION BLANKETS (CL 1) (TY D)	SY	2,890.000		2,890.000	
	260-6001	LIME (HYDRATED LIME (DRY))	TON	799.000		799.000	
	260-6027	LIME TRT (EXST MATL)(8")	SY	38,865.000		38,865.000	
	275-6001	CEMENT	TON	799.000		799.000	
	275-6011	CEMENT TREAT(EXIST MATL)(8")	SY	38,865.000		38,865.000	
	316-6406	ASPH (AC-20XP, AC-10-2TR, OR AC-20-5TR)	GAL	62,752.000		62,752.000	
	316-6408	AGGR(TY-PD GR-4 OR TY-PL GR-4)	CY	1,453.000		1,453.000	
	351-6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	6,600.000		6,600.000	
	354-6002	PLAN & TEXT ASPH CONC PAV(0" TO 2")	SY	3,051.000		3,051.000	
	354-6023	PLANE ASPH CONC PAV(0" TO 4")	SY	642.000		642.000	
	400-6006	CUT & RESTORING PAV	SY	20.000		20.000	
	403-6001	TEMPORARY SPL SHORING	SF	9,208.000		9,208.000	
	420-6071	CL C CONC (COLLAR)	EA	5.000		5.000	
	432-6002	RIPRAP (CONC)(5 IN)	CY	295.000		295.000	
	432-6033	RIPRAP (STONE PROTECTION)(18 IN)	CY	270.000		270.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	221.000		221.000	
	450-6006	RAIL (TY T223)	LF	92.000		92.000	
	462-6053	CONC BOX CULV (5 FT X 5 FT)(EXTEND)	LF	207.000		207.000	
	462-6077	CONC BOX CULV (10 FT X 9 FT)(EXTEND)	LF	66.000		66.000	
	462-6078	CONC BOX CULV (10 FT X 10 FT)(EXTEND)	LF	24.000		24.000	
	464-6002	RC PIPE (CL III)(15 IN)	LF	22.000		22.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF	2,086.000		2,086.000	
	464-6004	RC PIPE (CL III)(21 IN)	LF	72.000		72.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	238.000		238.000	
	464-6006	RC PIPE (CL III)(27 IN)	LF	40.000		40.000	
	464-6008	RC PIPE (CL III)(36 IN)	LF	320.000		320.000	
	464-6009	RC PIPE (CL III)(42 IN)	LF	84.000		84.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0450-01-013 **DISTRICT** Tyler **COUNTY** Cherokee
HIGHWAY SH 204

			CONTROL SECTION JOB		**0450-01-013**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00058516**		
			COUNTY		**Cherokee**		
			HIGHWAY		**SH 204**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	464-6010	RC PIPE (CL III)(48 IN)	LF	76.000		76.000	
	465-6005	JCTBOX(COMPL)(PJB)(3FTX3FT)	EA	3.000		3.000	
	465-6006	JCTBOX(COMPL)(PJB)(4FTX4FT)	EA	1.000		1.000	
	466-6011	HEADWALL (CH - FW - 0) (DIA= 48 IN)	EA	3.000		3.000	
	466-6097	HEADWALL (CH - PW - 0) (DIA= 24 IN)	EA	1.000		1.000	
	466-6103	HEADWALL (CH - PW - 0) (DIA= 48 IN)	EA	1.000		1.000	
	466-6143	WINGWALL (FW - 0) (HW=11 FT)	EA	1.000		1.000	
	466-6145	WINGWALL (FW - 0) (HW=13 FT)	EA	4.000		4.000	
	466-6153	WINGWALL (FW - 0) (HW=6 FT)	EA	3.000		3.000	
	466-6154	WINGWALL (FW - 0) (HW=7 FT)	EA	1.000		1.000	
	466-6186	WINGWALL (PW - 2) (HW=11 FT)	EA	1.000		1.000	
	467-6340	SET (TY II) (15 IN) (RCP) (6: 1) (C)	EA	2.000		2.000	
	467-6356	SET (TY II) (18 IN) (RCP) (3: 1) (C)	EA	3.000		3.000	
	467-6358	SET (TY II) (18 IN) (RCP) (4: 1) (C)	EA	10.000		10.000	
	467-6362	SET (TY II) (18 IN) (RCP) (6: 1) (C)	EA	8.000		8.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA	112.000		112.000	
	467-6374	SET (TY II) (21 IN) (RCP) (6: 1) (P)	EA	10.000		10.000	
	467-6390	SET (TY II) (24 IN) (RCP) (4: 1) (C)	EA	4.000		4.000	
	467-6394	SET (TY II) (24 IN) (RCP) (6: 1) (C)	EA	4.000		4.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA	8.000		8.000	
	467-6404	SET (TY II) (27 IN) (RCP) (6: 1) (C)	EA	4.000		4.000	
	467-6448	SET (TY II) (36 IN) (RCP) (3: 1) (C)	EA	2.000		2.000	
	467-6450	SET (TY II) (36 IN) (RCP) (4: 1) (C)	EA	6.000		6.000	
	467-6453	SET (TY II) (36 IN) (RCP) (6: 1) (C)	EA	4.000		4.000	
	467-6463	SET (TY II) (42 IN) (RCP) (4: 1) (C)	EA	4.000		4.000	
	480-6001	CLEAN EXIST CULVERTS	EA	14.000		14.000	
	496-6016	REMOV STR (PIPE)	EA	41.000		41.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	16.000		16.000	
	506-6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF	3,930.000		3,930.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	3,930.000		3,930.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	7,860.000		7,860.000	
	506-6029	EARTHWORK (EROSN & SEDMT CONT, IN VEH)	CY	1,000.000		1,000.000	
	506-6030	BACKHOE WORK (EROSION & SEDMT CONT)	HR	200.000		200.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	15,571.000		15,571.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	15,571.000		15,571.000	
	506-6046	TRACKHOE WORK (EROSION & SEDMT CONT)	HR	200.000		200.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0450-01-013 **DISTRICT** Tyler **COUNTY** Cherokee
HIGHWAY SH 204

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0450-01-013**			
		PROJECT ID		**A00058516**			
		COUNTY		**Cherokee**			
		HIGHWAY		**SH 204**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	512-6017	PORT CTB (DES SOURCE)(F-SHAPE)(TY 1)	LF	630.000		630.000	
	512-6029	PORT CTB (MOVE)(F-SHAPE)(TY 1)	LF	630.000		630.000	
	512-6041	PORT CTB (STKPL)(F-SHAPE)(TY 1)	LF	630.000		630.000	
	530-6002	INTERSECTIONS (ACP)	SY	2,351.000		2,351.000	
	530-6005	DRIVEWAYS (ACP)	SY	5,724.000		5,724.000	
	530-6008	TURNOUTS (ACP)	SY	51.000		51.000	
	530-6017	DRIVEWAYS (CONC) (HES)	SY	57.000		57.000	
	533-6001	RUMBLE STRIPS (SHOULDER)	LF	60,642.000		60,642.000	
	533-6002	RUMBLE STRIPS (CENTERLINE)	LF	27,964.000		27,964.000	
	540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	2,150.000		2,150.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	16.000		16.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	1,225.000		1,225.000	
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	8.000		8.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	22.000		22.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	8.000		8.000	
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	4.000		4.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	4.000		4.000	
	545-6007	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA	4.000		4.000	
	552-6003	WIRE FENCE (TY C)	LF	691.000		691.000	
	560-6004	MAILBOX INSTALL-S (TWG-POST) TY 2	EA	29.000		29.000	
	560-6005	MAILBOX INSTALL-D (TWG-POST) TY 2	EA	1.000		1.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	77.000		77.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3.000		3.000	
	644-6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	5.000		5.000	
	644-6037	IN SM RD SN SUP&AM TYS80(1)SA(U-WC)	EA	10.000		10.000	
	644-6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA	1.000		1.000	
	644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA	2.000		2.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	85.000		85.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	12.000		12.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	42.000		42.000	
	658-6099	INSTL OM ASSM (OM-2Z)(WFLX)GND	EA	58.000		58.000	
	662-6004	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	LF	133,388.000		133,388.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	133,388.000		133,388.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	133,388.000		133,388.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	133,388.000		133,388.000	
	662-6110	WK ZN PAV MRK SHT TERM (TAB)TY Y	EA	6,669.000		6,669.000	
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF	660.000		660.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0450-01-013 **DISTRICT** Tyler **COUNTY** Cherokee
HIGHWAY SH 204

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0450-01-013**			
		PROJECT ID		**A00058516**			
		COUNTY		**Cherokee**			
		HIGHWAY		**SH 204**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	721.000		721.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	292.000		292.000	
	666-6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	5.000		5.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	3,492.000		3,492.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	65,497.000		65,497.000	
	666-6318	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	LF	532.000		532.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	68,232.000		68,232.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	4.000		4.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA	4.000		4.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	4.000		4.000	
	672-6007	REFL PAV MRKR TY I-C	EA	214.000		214.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,133.000		1,133.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	1,598.000		1,598.000	
	730-6107	FULL - WIDTH MOWING	CYC	3.000		3.000	
	3077-6011	SP MIXESSP-CPG64-22	TON	36,290.000		36,290.000	
	3077-6041	SP MIXESSP-DPG64-22	TON	9,720.000		9,720.000	
	3077-6075	TACK COAT	GAL	14,344.000		14,344.000	
	3079-6011	PFC-C PG76-22 SAC-A	TON	12,808.000		12,808.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	42.000		42.000	
	6185-6002	TMA (STATIONARY)	DAY	110.000		110.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	20.000		20.000	
	18	SAFETY CONTINGENCY	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE	LS	1.000		1.000	

BASIS OF ESTIMATE

	ITEM	DESCRIPTION	RATE	CSJ 0450-01-013 AMOUNT	UNIT	CSJ 0450-01-013 QUANTITY	PROJECT TOTAL	PAY UNIT
[1]	166	FERTILIZER	1 LB/9 SY	365740	SY	20	20	TON
	168	VEGETATIVE WATERING	11 GAL/SY	365740	SY	4023	4023	MG
[2]	260	LIME (QUICKLIME (DRY)(5%)	41.1 LB/SY	38865	SY	799	799	TON
[2]	275	CEMENT (5%)	41.1 LB/SY	38865	SY	799	799	TON
	316	ASPH (AC-20XP, AC-10-2TR, OR AC-20-5TR)	0.36 GAL/SY	174311	SY	62752	62752	GAL
	316	AGGR (TY-PD GR-4 OR TY-PL GR-4)	1 CY/120 SY	174311	SY	1453	1453	CY
[3]	3077	SP MIXES SP-D PG 64-22 (LEVEL-UP) (DRIVEWAYS/INTERSECTIONS)	165 LB/SY	1364	SY	113	113	TON
	3079	PFC-C PG76-22 SAC-A	150 LB/SY/IN	170773	SY	12808	12808	TON
[4]	3077	SP MIXES SP-C PG 64-22 (BASE) (8")	1012 LB/SY	71720	SY	36290	36290	TON
[5]	3077	SP MIXES SP-D PG 64-22 (LEVEL-UP)	178.75 LB/SY	107491	SY	9607	9607	TON
	3077	TACK COAT	0.1 GAL/SY	143440	SY	14344	14344	GAL
	500	MOBILIZATION		1	LS	1	1	LS
	502	BARRICADES, SIGNS AND TRAFFIC HANDLING		16	MO	16	16	MO

[1] FOR INFORMATION ONLY.
[2] SUBGRADE QUANTITY IS DIVIDED EVENLY BETWEEN LIME AND CEMENT QUANTITIES. RATE IS DERIVED FROM (137 PCF)(8 IN)(1/12 FT/IN)(9 SF/SY)(5%)=41.1 LB/SY.
[3] FOR DRIVEWAYS AND INTERSECTIONS. DEPTH VARIES; AVG DEPTH IS 1.5 IN.
[4] RATE AUGMENTED TO ACCOUNT FOR TAPERED EDGE.
[5] FOR SH 204. DEPTH VARIES; AVG DEPTH IS 1.6 IN.

TRUCK MOUNTED ATTENUATORS

NUMBER OF TRUCKS	ITEM 6185 [1] TMA (STATIONARY) DAY	ITEM 6185 [2] TMA (MOBILE OPERATION) DAY
1	110	
2		20
PROJECT TOTAL	110	20

[1] FOR PAVEMENT OPERATIONS.
[2] FOR MOBILE OPERATIONS.

SUMMARY OF WORK ZONE PAVEMENT MARKINGS

PHASE	662 WK ZN PAV MRK NON-REMOVE (W) 4"(SLD) LF	662 WK ZN PAV MRK NON-REMOVE (Y) 4"(SLD) LF	662 WK ZN PAV MRK REMOV (W) 4"(SLD) LF	662 WK ZN PAV MRK REMOV (Y) 4"(SLD) LF	662 SHORT TERM TAB (Y) EA	677 ELIM EXT PAV MRK & MRKS 4" (W)(SLD) LF	677 ELIM EXT PAV MRK & MRKS 4" (Y)(SLD) LF
PHASE 1 - CULVERT EXTENSIONS & STRUC. REPAIRS							
PHASE 2 - LEVEL UP SIDE SLOPE CORRECTION	66694	66694	66694	66694	3335	799	799
PHASE 3 - WIDENING AND OCST	66694	66694	66694	66694	3335		
PHASE 4 - PERFORM PFC OVERLAY							
PROJECT TOTAL	133388	133388	133388	133388	6669	799	799

NOTE: MULTIPLE MOVE-INS WILL BE REQUIRED TO MAINTAIN ADEQUATE STRIPING.

PORTABLE CHANGEABLE MESSAGE SIGN

SIGN	LOCATION	ITEM 6001 PORTABLE CHANGEABLE MESSAGE SIGN DAY
LOC #1	TO BE LOCATED AS DIRECTED	21
LOC #2	TO BE LOCATED AS DIRECTED	21
PROJECT TOTAL		42

SUMMARY OF PORTABLE TRAFFIC BARRIER

PHASE	512 PORT CTB (DES SOURCE) (F-SHAPE) (TY 1) LF	512 PORT CTB (MOVE) (F-SHAPE) (TY 1) LF	512 PORT CTB (STKPL) (F-SHAPE) (TY 1) LF	545 CRASH CUSH ATTEN (INSTL) (L)(N)(TL3) EA	545 CRASH CUSH ATTEN (MOVE & RESET) EA	545 CRASH CUSH ATTEN (REMOVE) EA
CSJ 0450-01-013	630	630	630	4	4	4
PROJECT TOTAL	630	630	630	4	4	4

MOWING

LOCATION	ITEM 730 FULL WIDTH MOWING CYC
PROJECT LIMITS	3
PROJECT TOTAL	3

NO.	REVISION	BY	DATE

TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

Designed: CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked: CPY		TEXAS					SH 204
Drawn: CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: CPY	TYL	CHEROKEE	0450	01	013		18

pw:/Active Projects/TXDO1600493.00/TXDO1600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.02 Summaries/4930102TCPsum.dgn

ROADWAY SUMMARY

LOCATION	ITEM 100 PREPARING ROW STA	ITEM 160 FURNISHING AND PLACING TOPSOIL (4") SY	ITEM 169 SOIL RETENTION BLANKETS (CL 1) (TY D) SY	ITEM 260 LIME TRT (EXIST MATL) (8") SY	ITEM 275 CEMENT TREAT (EXIST MATL) (8") SY	ITEM 351 [1] FLEXIBLE PAVEMENT STRUCTURE REPAIR (6") SY	ITEM 354 PLAN & TEXT ASPH CONC PAV (0" TO 2") SY	ITEM 354 PLANE ASPH CONC PAV (0" TO 4") SY	ITEM 432 RIPRAP (CONC) (5 IN) CY	ITEM 533 RUMBLE STRIPS (SHOULDER) LF	ITEM 533 RUMBLE STRIPS (CENTERLINE) LF	ITEM 552 WIRE FENCE (TY C) LF
STA 15+00 TO STA 20+00	4.75	1861		354	354					570	135	
STA 20+00 TO STA 31+00	11.00	5128		1406	1406				92	2165	1065	
STA 31+00 TO STA 42+00	11.00	6177		1547	1547			100		2200	1100	
STA 42+00 TO STA 53+00	11.00	7168		1711	1711			21		2200	1100	232
STA 53+00 TO STA 64+00	11.00	7270		1711	1711			93		2200	1100	
STA 64+00 TO STA 75+00	11.00	9224		1711	1711			102		2200	1100	
STA 75+00 TO STA 86+00	11.00	10299		1711	1711			225		2200	1100	
STA 86+00 TO STA 97+00	11.00	8511	887	1711	1711			1		2200	1100	
STA 97+00 TO STA 108+00	11.00	8069		1711	1711					2200	1100	332
STA 108+00 TO STA 119+00	11.00	8401		1711	1711					2200	1100	
STA 119+00 TO STA 130+00	3.93	4171		291	291			17		2047	947	
STA 130+00 TO STA 141+00		3337					1452			1281	640	
STA 141+00 TO STA 152+00		3022								2200	1060	
STA 152+00 TO STA 163+00		3267								2024		
STA 163+00 TO STA 174+00		3449								2321	865	
STA 174+00 TO STA 185+00	3.93	4443		292	292		1599			1121	560	
STA 185+00 TO STA 196+00	11.00	4395		1710	1710					2057	957	
STA 196+00 TO STA 207+00	11.00	6580		1711	1711					2200	1100	
STA 207+00 TO STA 218+00	11.00	6255	837	1711	1711					2200	1100	
STA 218+00 TO STA 229+00	11.00	9050		1711	1711					2200	1100	
STA 229+00 TO STA 240+00	11.00	9093	965	1711	1711					2200	1100	
STA 240+00 TO STA 251+00	11.00	6824		1711	1711			4		1669	697	
STA 251+00 TO STA 262+00	11.00	5646	74	1711	1711					2200	1100	
STA 262+00 TO STA 273+00	11.00	5124		1582	1582					2200	1100	
STA 273+00 TO STA 284+00	11.00	8236	127	1405	1405					2200	1100	127
STA 284+00 TO STA 295+00	11.00	5752		1406	1406					1839	838	
STA 295+00 TO STA 306+00	11.00	5743		1406	1406			9		2200	1100	
STA 306+00 TO STA 317+00	11.00	4622		1406	1406			8		1433	484	
STA 317+00 TO STA 328+00	11.00	4847		1406	1406			19		2200	1100	
STA 328+00 TO STA 339+00	11.00	4247		1406	1406			9		1220	535	
STA 339+00 TO STA 347+87	8.67	2659		1005	1005			34		1296	479	
PROJECT TOTAL	**274.28**	**182870**	**2890**	**38865**	**38865**	**6600**	**3051**	**642**	**92**	**60642**	**27964**	**691**

[1] LOCATION AS DIRECTED.

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

Designed: CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked: CPY		TEXAS					SH 204
Drawn: CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: CPY	TYL	CHEROKEE	0450	01	013		19

TABULATION OF SURFACE AREAS

FROM	TO	LENGTH	ITEM 316 [1] OCST		ITEM 3079 [1] PFC		ITEM 3077 [2] TACK COAT		ITEM 3077 [1] SUPERPAVE MIXTURES SP-C PG 64-22 (BASE)		ITEM 3077 [1] SUPERPAVE MIXTURES SP-D PG 64-22 (LEVEL-UP)	
STA	STA	FT	AVG WIDTH (FT)	AREA (SY)	AVG WIDTH (FT)	AREA (SY)	AVG WIDTH (FT)	AREA (SY)	AVG WIDTH (FT)	AREA (SY)	AVG WIDTH (FT)	AREA (SY)
15+00.00	20+00.00	500	44	2419	43	2373	11	1260	11	630	24	1927
20+00.00	31+00.00	1100	44	5378	43	5256	21	5134	21	2567	24	2918
31+00.00	42+00.00	1100	46	5660	46	5593	23	5698	23	2849	24	2922
42+00.00	53+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2916
53+00.00	64+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2900
64+00.00	75+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2905
75+00.00	86+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2936
86+00.00	97+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2929
97+00.00	108+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2920
108+00.00	119+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2927
119+00.00	130+00.00	1100	56	6821	55	6723	4	1034	4	517	60	6476
130+00.00	141+00.00	940	46	4795	45	4690					24	4795
141+00.00	152+00.00	1100	44	5365	43	5243					24	5365
152+00.00	163+00.00	1100	56	6850	55	6727					60	6850
163+00.00	174+00.00	1100	48	5811	46	5681					24	5810
174+00.00	185+00.00	860	48	4546	47	4455	5	1014	5	507	24	4425
185+00.00	196+00.00	1100	49	5989	48	5886	26	6352	26	3176	24	3845
196+00.00	207+00.00	1100	49	5989	48	5868	26	6356	26	3178	24	2944
207+00.00	218+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2888
218+00.00	229+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2920
229+00.00	240+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2921
240+00.00	251+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2952
251+00.00	262+00.00	1100	49	5989	48	5867	26	6356	26	3178	24	2937
262+00.00	273+00.00	1100	47	5731	46	5622	24	5838	24	2919	24	2941
273+00.00	284+00.00	1100	44	5377	43	5256	21	5134	21	2567	24	2945
284+00.00	295+00.00	1100	44	5378	43	5256	21	5134	21	2567	24	2963
295+00.00	306+00.00	1100	44	5378	43	5256	21	5134	21	2567	24	2955
306+00.00	317+00.00	1100	44	5378	43	5256	21	5134	21	2567	24	2990
317+00.00	328+00.00	1100	44	5378	43	5256	21	5134	21	2567	24	2953
328+00.00	339+00.00	1100	44	5378	43	5256	21	5134	21	2567	24	2992
339+00.00	347+86.66	887	49	4822	48	4716	19	3678	19	1839	24	3424
PROJECT TOTAL				**174311**		**170773**		**143440**		**71720**		**107491**

[1] QUANTITIES INCLUDED IN BASIS OF ESTIMATE.
[2] QUANTITY BASED ON PLACING TACK BETWEEN 4" LAYERS OF SUPERPAVE BASE.

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		20

pw:/Active Projects/TXDOT1600493.00/TXDOT1600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.02 Summaries/4930102RDps02.dgn

GUARD RAIL SUMMARY

LOCATION		LENGTH	ITEM 432	ITEM 450	ITEM 540	ITEM 540	ITEM 542	ITEM 104	ITEM 542	ITEM 544	ITEM 544	ITEM 658	ITEM 658
FROM STA	TO STA	FT	RIPRAP (MOW STRIP (4") CY	RAIL (TY T223) LF	MTL W-BEAM GD FEN (STEEL POST) LF	MTL BEAM GD FEN TRANS (THRIE-BEAM) EA	REMOVE METAL BEAM GUARD FENCE LF	REMOVING CONCRETE (MOW STRIP) LF	RM MTL BM GD FENCE TRANS (THRIE-BEAM) EA	GUARDRAIL END TREATMENT (INSTALL) EA	GUARDRAIL END TREATMENT (REMOVE) EA	INSTL DEL ASSM (D-SW) SZ (BRF) CTB (BI) EA	INSTL DEL ASSM (D-SW) SZ 1 (BRF) GF2 (BI) EA
15+00.00	20+00.00	500.0											
20+00.00	31+00.00	1100.0	32		225					4			6
31+00.00	42+00.00	1100.0											
42+00.00	53+00.00	1100.0											
53+00.00	64+00.00	1100.0											
64+00.00	75+00.00	1100.0											
75+00.00	86+00.00	1100.0											
86+00.00	97+00.00	1100.0											
97+00.00	108+00.00	1100.0	34	47	275	4				4		2	6
108+00.00	119+00.00	1100.0											
119+00.00	130+00.00	1100.0											
130+00.00	141+00.00	1100.0	49		550	4	650	910	4	4	4	4	10
141+00.00	152+00.00	1100.0											
152+00.00	163+00.00	1100.0											
163+00.00	174+00.00	1100.0	3										
174+00.00	185+00.00	1100.0	46		550	4	575	950	4	4	4	4	10
185+00.00	196+00.00	1100.0											
196+00.00	207+00.00	1100.0											
207+00.00	218+00.00	1100.0	26		350					2			5
218+00.00	229+00.00	1100.0											
229+00.00	240+00.00	1100.0											
240+00.00	251+00.00	1100.0											
251+00.00	262+00.00	1100.0											
262+00.00	273+00.00	1100.0											
273+00.00	284+00.00	1100.0	30	45	200	4				4		2	5
284+00.00	295+00.00	1100.0											
295+00.00	306+00.00	1100.0											
306+00.00	317+00.00	1100.0											
317+00.00	328+00.00	1100.0											
328+00.00	339+00.00	1100.0											
339+00.00	347+86.66	886.7											
PROJECT TOTAL			221	92	2150	16	1225	1860	8	22	8	12	42

MAILBOX SUMMARY

LOCATION		ITEM 530	ITEM 560	
FROM STA	TO STA	TURNOUTS (ACP) SY	MAILBOX INSTALL-S (TWG-POST) TY 2 EA	MAILBOX INSTALL-D (TWG-POST) TY 2 EA
15+00.00	20+00.00			
20+00.00	31+00.00			
31+00.00	42+00.00		1	
42+00.00	53+00.00			
53+00.00	64+00.00	8	2	
64+00.00	75+00.00			
75+00.00	86+00.00	8	1	
86+00.00	97+00.00	8	2	
97+00.00	108+00.00			
108+00.00	119+00.00		1	
119+00.00	130+00.00			
130+00.00	141+00.00			
141+00.00	152+00.00		1	
152+00.00	163+00.00		1	
163+00.00	174+00.00		2	
174+00.00	185+00.00			
185+00.00	196+00.00			
196+00.00	207+00.00			
207+00.00	218+00.00	8	3	
218+00.00	229+00.00	8	2	
229+00.00	240+00.00			
240+00.00	251+00.00	11		1
251+00.00	262+00.00		2	
262+00.00	273+00.00		2	
273+00.00	284+00.00			
284+00.00	295+00.00		1	
295+00.00	306+00.00		3	
306+00.00	317+00.00		1	
317+00.00	328+00.00		1	
328+00.00	339+00.00			
339+00.00	347+86.66		3	
PROJECT TOTAL		51	29	1

cpybw_ANSIB.tbl
cppdf_ANSIB.pltcfg
pw:/

8/23/2023 11:19:27 AM PerryKL

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NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

Designed: CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked: CPY		TEXAS					SH 204
Drawn: CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: CPY	TYL	CHEROKEE	0450	01	013		21

SUMMARY OF EARTHWORK

STATION	0110 EXCAVATION (ROADWAY)	0132 EMBANKMENT (FINAL)(DENS CONT)(TY C)
	CY	CY
CSJ 0450-01-013		
15+00.00	0	0
16+00.00	3	14
17+00.00	8	8
18+00.00	63	30
19+00.00	73	27
20+00.00	33	9
21+00.00	29	101
22+00.00	15	352
23+00.00	11	398
24+00.00	18	165
25+00.00	39	33
26+00.00	84	21
27+00.00	97	32
28+00.00	53	36
29+00.00	30	53
30+00.00	30	62
31+00.00	22	62
32+00.00	21	74
33+00.00	15	76
34+00.00	13	67
35+00.00	21	57
36+00.00	31	63
37+00.00	22	96
38+00.00	15	125
39+00.00	19	103
40+00.00	156	51
41+00.00	404	42
42+00.00	497	42
43+00.00	421	93
44+00.00	182	343
45+00.00	3	593
46+00.00	1	518
47+00.00	6	346
48+00.00	45	238
49+00.00	117	134
50+00.00	163	124
51+00.00	120	148
52+00.00	46	173
53+00.00	19	146
54+00.00	36	60
55+00.00	97	59
56+00.00	102	123
57+00.00	53	136
58+00.00	32	167
59+00.00	29	306
60+00.00	44	256
61+00.00	231	104
62+00.00	355	119
63+00.00	265	197
64+00.00	330	273
65+00.00	415	267
66+00.00	455	198
67+00.00	584	132
68+00.00	650	157
69+00.00	564	206
70+00.00	263	262

SUMMARY OF EARTHWORK

STATION	0110 EXCAVATION (ROADWAY)	0132 EMBANKMENT (FINAL)(DENS CONT)(TY C)
	CY	CY
71+00.00	28	320
72+00.00	17	325
73+00.00	15	395
74+00.00	10	331
75+00.00	16	431
76+00.00	20	625
77+00.00	10	554
78+00.00	45	395
79+00.00	183	189
80+00.00	388	83
81+00.00	541	58
82+00.00	636	60
83+00.00	659	59
84+00.00	348	170
85+00.00	33	499
86+00.00	10	724
87+00.00	12	390
88+00.00	21	103
89+00.00	86	115
90+00.00	414	68
91+00.00	754	82
92+00.00	444	245
93+00.00	121	254
94+00.00	122	137
95+00.00	63	108
96+00.00	164	69
97+00.00	151	50
98+00.00	44	46
99+00.00	36	69
100+00.00	16	76
101+00.00	13	265
102+00.00	9	824
103+00.00	5	909
104+00.00	7	687
105+00.00	7	823
106+00.00	6	988
107+00.00	16	711
108+00.00	306	216
109+00.00	948	74
110+00.00	1038	61
111+00.00	526	46
112+00.00	165	30
113+00.00	144	38
114+00.00	245	52
115+00.00	239	54
116+00.00	158	121
117+00.00	46	429
118+00.00	7	740
119+00.00	7	495
120+00.00	10	232
121+00.00	16	165
122+00.00	17	21
123+00.00	11	0
124+00.00	9	0
125+00.00	21	0
126+00.00	20	0
127+00.00	7	0

SUMMARY OF EARTHWORK

STATION	0110 EXCAVATION (ROADWAY)	0132 EMBANKMENT (FINAL)(DENS CONT)(TY C)
	CY	CY
128+00.00	5	0
129+00.00	6	0
130+00.00	3	0
131+00.00	2	0
132+00.00	6	0
133+00.00	6	0
134+00.00	13	0
135+00.00	15	0
136+00.00	11	168
137+00.00	7	168
138+00.00	12	0
139+00.00	15	0
140+00.00	9	0
141+00.00	7	0
142+00.00	2	0
143+00.00	2	0
144+00.00	5	0
145+00.00	9	0
146+00.00	10	0
147+00.00	9	0
148+00.00	5	0
149+00.00	2	0
150+00.00	1	0
151+00.00	3	0
152+00.00	8	0
153+00.00	7	0
154+00.00	4	0
155+00.00	12	0
156+00.00	12	0
157+00.00	4	0
158+00.00	7	0
159+00.00	10	5
160+00.00	9	5
161+00.00	4	0
162+00.00	4	0
163+00.00	7	1
164+00.00	8	1
165+00.00	8	0
166+00.00	13	0
167+00.00	13	0
168+00.00	11	0
169+00.00	8	2
170+00.00	6	2
171+00.00	5	0
172+00.00	9	0
173+00.00	8	0
174+00.00	7	1
175+00.00	8	2
176+00.00	11	8
177+00.00	6	7
178+00.00	0	0
179+00.00	9	168
180+00.00	12	297
181+00.00	13	139
182+00.00	16	10
183+00.00	15	1
184+00.00	23	2

SUMMARY OF EARTHWORK

STATION	0110 EXCAVATION (ROADWAY)	0132 EMBANKMENT (FINAL)(DENS CONT)(TY C)
	CY	CY
185+00.00	31	6
186+00.00	38	10
187+00.00	41	12
188+00.00	44	8
189+00.00	40	8
190+00.00	21	37
191+00.00	9	58
192+00.00	10	81
193+00.00	9	83
194+00.00	8	87
195+00.00	7	127
196+00.00	16	132
197+00.00	23	116
198+00.00	47	97
199+00.00	70	80
200+00.00	54	129
201+00.00	43	252
202+00.00	44	290
203+00.00	55	208
204+00.00	37	183
205+00.00	6	219
206+00.00	7	304
207+00.00	9	356
208+00.00	174	203
209+00.00	516	48
210+00.00	450	90
211+00.00	108	264
212+00.00	18	371
213+00.00	92	251
214+00.00	95	93
215+00.00	42	99
216+00.00	49	180
217+00.00	35	175
218+00.00	603	121
219+00.00	1278	95
220+00.00	842	141
221+00.00	184	343
222+00.00	30	670
223+00.00	5	518
224+00.00	8	282
225+00.00	36	376
226+00.00	68	332
227+00.00	85	263
228+00.00	61	205
229+00.00	38	153
230+00.00	56	125
231+00.00	141	112
232+00.00	541	97
233+00.00	1122	73
234+00.00	1333	56
235+00.00	983	77
236+00.00	430	115
237+00.00	93	153
238+00.00	7	262
239+00.00	10	366
240+00.00	9	452
241+00.00	7	667

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		22

SUMMARY OF EARTHWORK

STATION	0110 EXCAVATION (ROADWAY)	0132 EMBANKMENT (FINAL)(DENS CONT)(TY C)
	CY	CY
242+00.00	12	945
243+00.00	13	781
244+00.00	10	277
245+00.00	22	56
246+00.00	31	108
247+00.00	29	182
248+00.00	28	180
249+00.00	35	147
250+00.00	36	91
251+00.00	29	89
252+00.00	24	127
253+00.00	13	105
254+00.00	9	83
255+00.00	10	133
256+00.00	71	337
257+00.00	70	345
258+00.00	10	132
259+00.00	57	86
260+00.00	69	72
261+00.00	59	85
262+00.00	72	116
263+00.00	46	87
264+00.00	32	61
265+00.00	36	59
266+00.00	46	70
267+00.00	80	56
268+00.00	84	58
269+00.00	45	83
270+00.00	30	81
271+00.00	35	87
272+00.00	50	72
273+00.00	54	45
274+00.00	58	43
275+00.00	43	78
276+00.00	194	220
277+00.00	550	190
278+00.00	830	44
279+00.00	676	100
280+00.00	215	412
281+00.00	8	627
282+00.00	7	333
283+00.00	7	242
284+00.00	23	265
285+00.00	44	91
286+00.00	55	56
287+00.00	42	39
288+00.00	35	28
289+00.00	54	34
290+00.00	89	35
291+00.00	66	33
292+00.00	77	32
293+00.00	117	27
294+00.00	74	20
295+00.00	48	28
296+00.00	45	68
297+00.00	40	90
298+00.00	30	86

SUMMARY OF EARTHWORK

STATION	0110 EXCAVATION (ROADWAY)	0132 EMBANKMENT (FINAL)(DENS CONT)(TY C)
	CY	CY
299+00.00	28	81
300+00.00	40	49
301+00.00	36	77
302+00.00	16	105
303+00.00	8	94
304+00.00	25	88
305+00.00	40	64
306+00.00	57	73
307+00.00	83	76
308+00.00	62	49
309+00.00	29	24
310+00.00	26	9
311+00.00	22	21
312+00.00	15	46
313+00.00	36	50
314+00.00	63	39
315+00.00	51	32
316+00.00	32	22
317+00.00	20	27
318+00.00	12	44
319+00.00	18	72
320+00.00	19	69
321+00.00	17	35
322+00.00	25	24
323+00.00	33	32
324+00.00	24	51
325+00.00	11	85
326+00.00	9	133
327+00.00	13	178
328+00.00	17	165
329+00.00	16	104
330+00.00	14	72
331+00.00	11	66
332+00.00	13	61
333+00.00	15	60
334+00.00	15	63
335+00.00	18	39
336+00.00	18	33
337+00.00	11	26
338+00.00	14	7
339+00.00	19	24
340+00.00	19	37
341+00.00	18	25
342+00.00	16	20
343+00.00	18	12
344+00.00	20	32
345+00.00	27	64
346+00.00	37	34
347+00.00	51	7
PROJECT TOTAL	**33471**	**45943**

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		23

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pw:/Active Projects/TXD01600493.00/TXD01600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.02 Summaries/4930102RDes02.dgn

DRIVEWAY & INTERSECTION SUMMARY

LOCATION STA		DRIVEWAY NO.	DESCRIPTION OF EXISTING STRUCTURE	EXIST DRVWY TYPE	EXIST WIDTH FT	PROP WIDTH FT	PROP DRVWY LENGTH FT	ITEM 104 REMOVING CONC (DRIVEWAYS) SY	ITEM 3077 [1] SP MIXES SP-D PG64-22 SY	ITEM 464 [1] RCP (CL III) (18 IN) LF	ITEM 464 [1] RCP (CL III) (21 IN) LF	ITEM 464 [1] RCP (CL III) (24 IN) LF	ITEM 467 [1] SET (TY II)(18 IN) (RCP) (6:1)(P) EA	ITEM 467 [1] SET (TY II)(21 IN) (RCP) (6:1)(P) EA	ITEM 467 [1] SET (TY II)(24 IN) (RCP) (6:1)(P) EA	ITEM 496 REMOV STR PIPE EA	ITEM 530 DRIVEWAYS (CONC) (HES) SY	ITEM 530 INTERSECTIONS (ACP) SY	ITEM 530 DRIVEWAYS (ACP) SY
CSJ 0450-01-013																			
17+56.76	RT	CR 4312		ASPHALT	16	16	36											118	
18+98.96	LT	FM 2274		ASPHALT	27	27	68											344	
27+78.35	RT	S-52	15 IN X 43 FT CMP	ASPHALT	13	13	38			40			2			1			65
39+78.88	RT	S-53	21 IN X 42 FT CMP	ASPHALT	38	38	37				44			2		1			127
41+92.50	RT	S-54	12 IN X 24 FT RCP	ASPHALT	12	12	37			24			2			1			60
53+80.63	RT	S-55		ASPHALT	12	12	37												76
54+14.02	LT	N-55		ASPHALT	14	14	35												66
78+20.63	LT	N-56	21 IN X 29 FT RCP	ASPHALT	14	14	54				24			2					97
83+14.34	RT	S-56	18 IN X 25 FT CMP	ASPHALT	10	12	56			28			2			1			86
87+29.37	RT	S-57		ASPHALT	10	12	58												90
87+59.81	LT	N-57		GRASS	12	12	58			24			2						88
93+35.98	LT	N-58	18 IN X 26 FT CMP	ASPHALT	8	12	54			28			2			1			83
94+79.54	LT	N-59		ASPHALT	10	12	54												83
96+88.15	LT	N-60	15 IN X 26 FT CMP	ASPHALT	10	12	54			28			2			1			84
118+40.40	RT	S-58	24 IN X 47 FT CMP	ASPHALT	9	12	68					48			2	1			102
121+43.45	LT	N-61	24 IN X 24 FT RCP	ASPHALT	13	13	52												85
127+14.96	RT	S-59		ASPHALT	11				79										
128+11	LT	CR 4402	24 IN X 43 FT RCP	ASPHALT	20				147						2				
131+14	RT	S-60	24 IN X 22 FT RCP	ASPHALT	9				73										
142+97	RT	S-61	24 IN X 56 FT RCP	ASPHALT	12				83										
150+00	RT	S-62	24 IN X 28 FT RCP	CONCRETE	15				81										
150+04	LT	N-62	36 IN X 36 FT RCP	CONCRETE	16				78										
154+14	RT	S-63	24 IN X 43 FT RCP	CONCRETE	26				116										
155+42	RT	S-64	24 IN X 40 FT RCP	CONCRETE	29				120										
156+88.36	RT	S-65		CONCRETE	29				52										
158+20	RT	S-66	24 IN X 28 FT RCP	CONCRETE	12				54										
160+40.67	LT	CR 4403		CONCRETE	30				149										
160+82.01	RT	S-67		CONCRETE	12				55										
165+75	LT	N-63	36 IN X 40 FT RCP	CONCRETE	13				77										
167+98	RT	S-68	24 IN X 30 FT RCP	CONCRETE	11				60										
169+85	LT	N-64	36 IN X 40 FT RCP	CONCRETE	12				78										
170+57	RT	S-69	24 IN X 30 FT RCP	ASPHALT	12				62										
172+23.00	RT	S-70	24 IN X 31 FT CMP	DIRT	18	18	42					32			2	1			95
193+03.24	RT	S-71		ASPHALT	16	16	48			36			2						109
204+30.83	RT	S-72		ASPHALT	15	15	32												64
207+31.91	RT	S-73		ASPHALT	9	12	43												68
207+51.03	LT	N-65		ASPHALT	9	12	52												81
213+57.78	RT	S-74	12 IN X 23 FT CMP	ASPHALT	9	12	52			24			2			1			81
213+72.28	LT	N-66		ASPHALT	12	12	59			24			2						90
216+47.86	RT	S-75	12 IN X 24 FT RCP	ASPHALT	12	12	38			24			2			1			61
SUBTOTALS SHT 24								0	1364	280	68	80	20	4	6	10	0	462	1841

[1] QUANTITY INCLUDED IN PERTINENT SUMMARY.

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

Designed: CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked: CPY		TEXAS					SH 204
Drawn: CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: CPY	TYL	CHEROKEE	0450	01	013		24

SHEET 7 OF 18

DRIVEWAY & INTERSECTION SUMMARY

LOCATION STA		DRIVEWAY NO.	DESCRIPTION OF EXISTING STRUCTURE	EXIST DRVWY TYPE	EXIST WIDTH FT	PROP WIDTH FT	PROP DRVWY LENGTH FT	ITEM 104 REMOVING CONC (DRIVEWAYS) SY	ITEM 3077 [1] SP MIXES SP-D PG64-22 SY	ITEM 464 [1] RCP (CL III) (18 IN) LF	ITEM 464 [1] RCP (CL III) (21 IN) LF	ITEM 464 [1] RCP (CL III) (24 IN) LF	ITEM 467 [1] SET (TY II)(18 IN) (RCP) (6:1)(P) EA	ITEM 467 [1] SET (TY II)(21 IN) (RCP) (6:1)(P) EA	ITEM 467 [1] SET (TY II)(24 IN) (RCP) (6:1)(P) EA	ITEM 496 REMOV STR PIPE EA	ITEM 530 DRIVEWAYS (CONC) (HES) SY	ITEM 530 INTERSECTIONS (ACP) SY	ITEM 530 DRIVEWAYS (ACP) SY
220+51.40	LT	N-67	24 IN X 17 FT RCP	ASPHALT	14	14	60					20			2	1			103
226+29.83	LT	N-68	18 IN X 25 FT RCP	ASPHALT	11	12	61						2						91
227+21.75	RT	S-76	18 IN X 39 FT RCP	ASPHALT	14	14	50			24			2			1			91
244+97.56	LT	FM 235		ASPHALT	27	27	50			60			2					216	
245+10.56	RT	CR 4319		ASPHALT	20	20	53			48			2					173	
247+76.41	RT	S-77		ASPHALT	28	28	68			36			2						221
250+15.57	LT	N-69		ASPHALT	16	16	42												102
252+21.41	RT	S-78		ASPHALT	14	14	30			24			2						57
253+17.60	RT	S-79		ASPHALT	28	28	30			44			2						103
254+39.75	RT	S-80		ASPHALT	14	14	30			24			2						57
257+41.50	LT	N-70		ASPHALT	28	28	41			52			2						140
260+14.29	LT	N-71	12 IN X 20 FT RCP	ASPHALT	9	12	41			28			2			1			66
262+99.34	LT	N-72		ASPHALT	11	12	44												70
264+54.19	RT	S-81		ASPHALT	8	12	31			20			2						52
266+91.24	RT	S-82	18 IN X 15 FT RCP	ASPHALT	11	12	33			20			2			1			54
267+39.55	LT	N-73	18 IN X 20 FT RCP	ASPHALT	12	12	40			24			2			1			65
269+42.40	RT	S-83	18 IN X 20 FT RCP	ASPHALT	12	12	34			24			2			1			56
272+18.38	RT	S-84	18 IN X 26 FT CMP	ASPHALT	12	12	36			32			2			1			76
274+48.26	RT	S-85	18 IN X 24 FT RCP	ASPHALT	11	12	57						2						87
284+90.60	RT	S-86	18 IN X 26 FT RCP	ASPHALT	15	15	56			32			2			1			105
287+33.41	RT	CR 4319		ASPHALT	15	15	71											184	
287+39.89	LT	CR 4421		ASPHALT	13	13	82											177	
289+55.41	LT	N-74	15 IN X 20 FT CMP	ASPHALT	9	12	18			20			2			1			35
291+21.84	LT	N-75	15 IN X 20 FT RCP	ASPHALT	9	12	37			36			2			1			64
294+36.96	RT	S-87	12 IN X 20 FT RCP	ASPHALT	14	14	56			24			2			1			97
295+13.35	LT	N-76	18 IN X 23 FT RCP	GRASS	18	18	56						2						124
295+29.50	RT	S-88	12 IN X 20 FT RCP	ASPHALT	14	14	48			20			2			1			85
299+40.39	RT	S-89	18 IN X 25 FT CMP	ASPHALT	12	12	36			28			2			1			59
300+16.99	LT	N-77	18 IN X 25 FT RCP	ASPHALT	9	12	40						2						66
300+58.82	RT	S-90	15 IN X 16 FT RCP	DIRT	12	12	36			16			2			1			58
304+34.91	RT	S-91	18 IN X 20 FT RCP	ASPHALT	10	12	36						2						59
305+92.16	LT	N-78	15 IN X 25 FT RCP	ASPHALT	8	12	51			28			2			1			80
309+93.68	LT	CR 4408		ASPHALT	22	22	136											457	
309+97.56	RT	CR 4320		ASPHALT	18	18	77											150	
310+07.10	RT	S-92	12 IN X 21 FT RCP	ASPHALT	10	12	39			24			2			1			64
311+64.40	LT	N-79	15 IN X 40 FT CMP	ASPHALT	27	27	38			52			2			1			149
313+91.25	RT	S-93		ASPHALT	14	14	39												
314+75.54	RT	S-94		ASPHALT	18	18	62			108			2						214
319+72.50	LT	N-80	15 IN X 24 FT RCP	ASPHALT	11	12	35			24			2			1			57
320+71.78	LT	N-81		ASPHALT	11	12	35												58
321+93.51	RT	S-95	18 IN X 27 FT CMP	ASPHALT	10	12	39			28			2			1			64
SUBTOTALS SHT 25								0	0	900	0	20	64	0	2	19	0	1357	2929

[1] QUANTITY INCLUDED IN PERTINENT SUMMARY.

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

Designed: CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked: CPY		TEXAS					SH 204
Drawn: CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: CPY	TYL	CHEROKEE	0450	01	013		25

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DRIVEWAY & INTERSECTION SUMMARY

LOCATION STA		DRIVEWAY NO.	DESCRIPTION OF EXISTING STRUCTURE	EXIST DRVWY TYPE	EXIST WIDTH FT	PROP WIDTH FT	PROP DRVWY LENGTH FT	ITEM 104 REMOVING CONC (DRIVEWAYS) SY	ITEM 3077 [1] SP MIXES SP-D PG64-22 SY	ITEM 464 [1] RCP (CL III) (18 IN) LF	ITEM 464 [1] RCP (CL III) (21 IN) LF	ITEM 464 [1] RCP (CL III) (24 IN) LF	ITEM 467 [1] SET (TY II)(18 IN) (RCP) (6:1)(P) EA	ITEM 467 [1] SET (TY II)(21 IN) (RCP) (6:1)(P) EA	ITEM 467 [1] SET (TY II)(24 IN) (RCP) (6:1)(P) EA	ITEM 496 REMOV STR PIPE EA	ITEM 530 DRIVEWAYS (CONC) (HES) SY	ITEM 530 INTERSECTIONS (ACP) SY	ITEM 530 DRIVEWAYS (ACP) SY
322+40.60	LT	N-82	15 IN X 32 FT CMP	CONCRETE	12	12	34	73		32			2			1	57		
323+70.49	RT	S-96	18 IN X 23 FT CMP	ASPHALT	11	12	39			24			2			1			64
329+67.30	RT	S-97	15 IN X 18 FT CMP	ASPHALT	11	12	29			20			2			1			49
329+69.27	LT	N-83	15 IN X 42 FT CMP	ASPHALT	14	14	31			44			2			1			60
331+52.94	RT	CR 4321	15 IN X 36 FT RCP	ASPHALT	14	14	30			36			2			1		92	
331+57.04	LT	CR 4321		ASPHALT	15	15	41											110	
334+90.43	LT	N-84	15 IN X 22 FT CMP	ASPHALT	12	12	30			24			2			1			51
335+46.11	RT	S-98	21 IN X 15 FT RCP	ASPHALT	7	12	29							2					50
337+18.46	LT	CR 4275		ASPHALT	20	20	29											105	
337+18.64	RT	SPUR 209		ASPHALT	18	18	37											126	
339+54.69	RT	S-99	21 IN X 20 FT RCP	ASPHALT	10	12	30							2					51
340+24.77	RT	S-100	21 IN X 20 FT RCP	ASPHALT	11	12	30				4			2					51
340+28.86	LT	N-85	12 IN X 33 FT CMP	ASPHALT	16	16	28			28			2			1			60
340+89.02	LT	N-86	15 IN X 48 FT CMP	ASPHALT	18	18	28			40			2			1			81
341+67.16	LT	N-87	15 IN X 26 FT CMP	ASPHALT	13	13	29			32			2			1			61
342+45.23	LT	N-88	15 IN X 25 FT CMP	ASPHALT	22	22	27			40			2			1			74
343+02.75	RT	CR 4325	18 IN X 19 FT RCP	ASPHALT	11	12	40			48			2					99	
343+14.48	LT	N-89	12 IN X 42 FT RCP	ASPHALT	36	36	26			52			2			1			112
344+22.86	RT	S-101	18 IN X 23 FT RCP	ASPHALT	9	12	47			24			2			1			75
345+89.69	RT	S-102	18 IN X 27 FT RCP	ASPHALT	24	24	38			40			2						115
SUBTOTALS FROM SHT 24								0	1364	280	68	80	20	4	6	10	0	462	1841
SUBTOTALS FROM SHT 25								0	0	900	0	20	64	0	2	19	0	1357	2929
SUBTOTALS FROM SHT 26								73	0	484	4	0	28	6	0	12	57	532	954
PROJECT TOTALS =								73	1364	1664	72	100	112	10	8	41	57	2351	5724

[1] QUANTITY INCLUDED IN PERTINENT SUMMARY.

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		26

CP&Y

CHECKPRINT

REVIEWER
Initial:
Date:

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Date:

PROCESSED
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Date:

VERIFIED
Initial:
Date:

SUMMARY OF CROSS-CULVERTS

LOCATION STA		EXISTING CONDITION	PROPOSED WORK	ITEM 400 CUT & RESTORING PAV SY	ITEM 403 TEMP SPL SHORING SF	ITEM 420 [1] CL C CONC (COLLAR) EA	ITEM 432 CONC RIPRAP 5" CY	ITEM 432 RIPRAP (STONE PROTECTION) (18 IN) CY	ITEM 462 CONC BOX CULV (5 FT X 5 FT) (EXTEND) LF	ITEM 462 CONC BOX CULV (10 FT X 9 FT) (EXTEND) LF	ITEM 462 CONC BOX CULV (10 FT X 10 FT) (EXTEND) LF
CSJ 0450-01-013											
17+87.66	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.								
21+89.47	LT	1-24"X80' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & CH-PW-0.		83						
	RT		PLACE 18" STONE RIPRAP.					8			
37+54.32	LT	2-18"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.								
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.								
45+94.30	LT	1-10'X9'X40' SBC WITH HEADWALL	REMOVE 2' OF SBC & HDWL. PLACE 23' OF SBC & FW-0.		856		14			23	
	RT		REMOVE 2' OF SBC & HDWL. PLACE 11' OF SBC & PW-2.		825			26		11	
58+67.34	LT	1-36"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 30' OF RCP & SET.		91						
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 32' OF RCP, & SET.		255						
62+50.82	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 16' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 26' OF RCP & SET.								
74+03.46	LT	3-5'X5'X40' MBC WITH HEADWALL	REMOVE 3-2' OF MBC & HDWL. PLACE 3-22' OF MBC & FW-0.		366		9		66		
	RT		REMOVE 3-2' OF MBC & HDWL. PLACE 3-11' OF MBC & FW-0.		422		12	58	33		
78+03.84	LT	1-36"X68' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 28' OF RCP & SET.		91						
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.								
85+79.21	LT	2-36"X51' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-26' OF RCP & SET.		115						
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-28' OF RCP & SET.					18			
91+80.49	LT	1-18"X47' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 26' OF RCP & SET.					11			
102+21.95	LT	2-10'X9'X40' MBC WITH HEADWALL	REMOVE 2-2' OF MBC & HDWL. PLACE 2-11' OF MBC & FW-0.		958		34			22	
	RT		REMOVE 2-2' OF MBC & HDWL. PLACE 2-5' OF MBC & FW-0.		883		34	86		10	
119+00.47	LT	3-5'X5'X41' MBC WITH HEADWALL	REMOVE 3-2' OF MBC & HDWL. PLACE 3-24' OF MBC & FW-0.		387		9		72		
	RT		REMOVE 3-2' OF MBC & HDWL. PLACE 3-12' OF MBC & FW-0.		382		9		36		
206+56.84	LT	1-18"X47' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.								
211+86.41	LT	1-15"X51' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 34' OF RCP, & SET.		144						
222+96.93	LT	2-42"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.		134						
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-24' OF RCP & SET.		128						
236+95.77	LT	2-36"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-24' OF RCP & SET.		122						
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-26' OF RCP & SET.		97						
245+10.20	LT	1-18"X50' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
256+14.43	LT	1-48"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & CH-FW-0.		119		3				
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & CH-FW-0.		102		3				
258+59.50	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
275+95.05	LT	1-18"X59' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 16' OF RCP, & SET.		245						
281+70.63	LT	2-10'X10'X40' MBC WITH HEADWALL	REMOVE 2-2' OF MBC & HDWL. PLACE 2-6' OF MBC & FW-0.		1143		38				12
	RT		REMOVE 2-2' OF MBC & HDWL. PLACE 2-6' OF MBC & FW-0.		1015		34	63			12
287+93.97	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 28' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.								
301+92.96	LT	1-48"X52' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & CH-FW-0.		124		3				
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & CH-PW-0.		121						
310+93.75	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP, JCT BOX, 28' OF RCP, & SET.	20							
		N/A	PLACE RT 16' OF RCP & SET.								
319+08.61	LT	2-27"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-10' OF RCP & SET.								
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-10' OF RCP & SET.								
326+48.29	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 12' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 12' OF RCP & SET.								
336+78.04	LT	1-15"X42' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.								
347+60.01	LT	1-24"X123' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.								
PROJECT TOTAL				20	9208	5	203	270	207	66	24

[1] LOCATION AS DIRECTED

NOTES:

1. PLACE COLLARS AS DIRECTED.
2. GENERAL HYDRAULIC STATEMENT: EXISTING STRUCTURES HAVE BEEN ANALYZED IN PREVIOUS PLANS AND/OR HAVE BEEN HISTORICALLY PROVEN TO BE HYDRAULICALLY ADEQUATE. THE EXTENSION OF THESE STRUCTURES SHOULD NOT ADVERSELY AFFECT THE SURROUNDING PROPERTIES (MOSTLY RURAL/AGRICULTURAL) IN REGARDS TO DAMAGE FROM BACKWATER OR HIGH VELOCITIES.

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

QUANTITY SUMMARY

Designed:	—	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	—		TEXAS					SH 204
Drawn:	—	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	—	TYL	CHEROKEE	0450	01	013		27

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Date:

SUMMARY OF CROSS-CULVERTS

LOCATION		EXISTING CONDITION	PROPOSED WORK	ITEM 464							ITEM 465	
				RC PIPE (CL III) 15 IN	RC PIPE (CL III) 18 IN	RC PIPE (CL III) 24 IN	RC PIPE (CL III) 27 IN	RC PIPE (CL III) 36 IN	RC PIPE (CL III) 42 IN	RC PIPE (CL III) 48 IN	JCTBOX (COMPL) (PJB) (3FTX3FT)	JCTBOX (COMPL) (PJB) (4FTX4FT)
STA				LF	LF	LF	LF	LF	LF	LF	EA	EA
CSJ 0450-01-013												
17+87.66	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.			10						
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.			22						
21+89.47	LT	1-24"X80' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & CH-PW-0.			18						
	RT		PLACE 18" STONE RIPRAP.									
37+54.32	LT	2-18"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.		36							
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.		36							
45+94.30	LT	1-10'X9'X40' SBC WITH HEADWALL	REMOVE 2' OF SBC & HDWL. PLACE 23' OF SBC & FW-0.									
	RT		REMOVE 2' OF SBC & HDWL. PLACE 11' OF SBC & PW-2.									
58+67.34	LT	1-36"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 30' OF RCP & SET.					30				
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 32' OF RCP, & SET.					32				1
62+50.82	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 16' OF RCP & SET.		16							
	RT		REMOVE 4' OF RCP & HDWL. PLACE 26' OF RCP & SET.		26							
74+03.46	LT	3-5'X5'X40' MBC WITH HEADWALL	REMOVE 3-2' OF MBC & HDWL. PLACE 3-22' OF MBC & FW-0.									
	RT		REMOVE 3-2' OF MBC & HDWL. PLACE 3-11' OF MBC & FW-0.									
78+03.84	LT	1-36"X68' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 28' OF RCP & SET.					28				
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.					22				
85+79.21	LT	2-36"X51' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-26' OF RCP & SET.					52				
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-28' OF RCP & SET.					56				
91+80.49	LT	1-18"X47' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.		20							
	RT		REMOVE 4' OF RCP & HDWL. PLACE 26' OF RCP & SET.		26							
102+21.95	LT	2-10'X9'X40' MBC WITH HEADWALL	REMOVE 2-2' OF MBC & HDWL. PLACE 2-11' OF MBC & FW-0.									
	RT		REMOVE 2-2' OF MBC & HDWL. PLACE 2-5' OF MBC & FW-0.									
119+00.47	LT	3-5'X5'X41' MBC WITH HEADWALL	REMOVE 3-2' OF MBC & HDWL. PLACE 3-24' OF MBC & FW-0.									
	RT		REMOVE 3-2' OF MBC & HDWL. PLACE 3-12' OF MBC & FW-0.									
206+56.84	LT	1-18"X47' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & SET.		18							
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.		22							
211+86.41	LT	1-15"X51' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.		20							
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 34' OF RCP, & SET.		34						1	
222+96.93	LT	2-42"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.						36			
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-24' OF RCP & SET.						48			
236+95.77	LT	2-36"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-24' OF RCP & SET.					48				
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-26' OF RCP & SET.					52				
245+10.20	LT	1-18"X50' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.		14							
	RT		REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.		20							
256+14.43	LT	1-48"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & CH-FW-0.							14		
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & CH-FW-0.							22		
258+59.50	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.			20						
	RT		REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.			20						
275+95.05	LT	1-18"X59' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.		20							
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 16' OF RCP, & SET.		16						1	
281+70.63	LT	2-10'X10'X40' MBC WITH HEADWALL	REMOVE 2-2' OF MBC & HDWL. PLACE 2-6' OF MBC & FW-0.									
	RT		REMOVE 2-2' OF MBC & HDWL. PLACE 2-6' OF MBC & FW-0.									
287+93.97	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 28' OF RCP & SET.		28							
	RT		REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.		10							
301+92.96	LT	1-48"X52' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & CH-FW-0.							18		
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & CH-PW-0.							22		
310+93.75	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP & SET.		8							
	RT		REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP, JCT BOX, 28' OF RCP, & SET.		36						1	
		N/A	PLACE RT 16' OF RCP & SET.		16							
319+08.61	LT	2-27"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-10' OF RCP & SET.				20					
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-10' OF RCP & SET.				20					
326+48.29	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 12' OF RCP & SET.			12						
	RT		REMOVE 4' OF RCP & HDWL. PLACE 12' OF RCP & SET.			12						
336+78.04	LT	1-15"X42' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP & SET.	8								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.	14								
347+60.01	LT	1-24"X123' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.			10						
	RT		REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.			14						
PROJECT TOTAL				22	422	138	40	320	84	76	3	1

NOTES:

1. PLACE COLLARS AS DIRECTED.
2. GENERAL HYDRAULIC STATEMENT:
   EXISTING STRUCTURES HAVE BEEN ANALYZED IN PREVIOUS PLANS AND/OR HAVE BEEN HISTORICALLY PROVEN TO BE HYDRAULICALLY ADEQUATE. THE EXTENSION OF THESE STRUCTURES SHOULD NOT ADVERSELY AFFECT THE SURROUNDING PROPERTIES (MOSTLY RURAL/AGRICULTURAL) IN REGARDS TO DAMAGE FROM BACKWATER OR HIGH VELOCITIES.

NO.	REVISION	BY	DATE

Kimley»Horn
TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

QUANTITY SUMMARY

Designed:	–	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	–		TEXAS					SH 204
Drawn:	–	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	–	TYL	CHEROKEE	0450	01	013		28

CP&Y

CHECKPRINT

REVIEWER
Initial:
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Date:

PROCESSED
Initial:
Date:

VERIFIED
Initial:
Date:

SUMMARY OF CROSS-CULVERTS

LOCATION STA		EXISTING CONDITION	PROPOSED WORK	ITEM 466 HEADWALL (CH-FW-0) (DIA=48 IN) EA	HEADWALL (CH-PW-0) (DIA=24 IN) EA	HEADWALL (CH-PW-0) (DIA=48 IN) EA	WINGWALL (FW-0) (HW=11 FT) EA	WINGWALL (FW-0) (HW=13 FT) EA	WINGWALL (FW-0) (HW=6 FT) EA	WINGWALL (FW-0) (HW=7 FT) EA	WINGWALL (PW-2) (HW=11 FT) EA
CSJ 0450-01-013											
17+87.66	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.								
21+89.47	LT	1-24"X80' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & CH-PW-0.		1						
	RT		PLACE 18" STONE RIPRAP.								
37+54.32	LT	2-18"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.								
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.								
45+94.30	LT	1-10'X9'X40' SBC WITH HEADWALL	REMOVE 2' OF SBC & HDWL. PLACE 23' OF SBC & FW-0.				1				
	RT		REMOVE 2' OF SBC & HDWL. PLACE 11' OF SBC & PW-2.								1
58+67.34	LT	1-36"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 30' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 32' OF RCP, & SET.								
62+50.82	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 16' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 26' OF RCP & SET.								
74+03.46	LT	3-5'X5'X40' MBC WITH HEADWALL	REMOVE 3-2' OF MBC & HDWL. PLACE 3-22' OF MBC & FW-0.						1		
	RT		REMOVE 3-2' OF MBC & HDWL. PLACE 3-11' OF MBC & FW-0.							1	
78+03.84	LT	1-36"X68' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 28' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.								
85+79.21	LT	2-36"X51' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-26' OF RCP & SET.								
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-28' OF RCP & SET.								
91+80.49	LT	1-18"X47' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 26' OF RCP & SET.								
102+21.95	LT	2-10'X9'X40' MBC WITH HEADWALL	REMOVE 2-2' OF MBC & HDWL. PLACE 2-11' OF MBC & FW-0.					1			
	RT		REMOVE 2-2' OF MBC & HDWL. PLACE 2-5' OF MBC & FW-0.					1			
119+00.47	LT	3-5'X5'X41' MBC WITH HEADWALL	REMOVE 3-2' OF MBC & HDWL. PLACE 3-24' OF MBC & FW-0.						1		
	RT		REMOVE 3-2' OF MBC & HDWL. PLACE 3-12' OF MBC & FW-0.						1		
206+56.84	LT	1-18"X47' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.								
211+86.41	LT	1-15"X51' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 34' OF RCP, & SET.								
222+96.93	LT	2-42"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.								
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-24' OF RCP & SET.								
236+95.77	LT	2-36"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-24' OF RCP & SET.								
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-26' OF RCP & SET.								
245+10.20	LT	1-18"X50' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
256+14.43	LT	1-48"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & CH-FW-0.	1							
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & CH-FW-0.	1							
258+59.50	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
275+95.05	LT	1-18"X59' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 16' OF RCP, & SET.								
281+70.63	LT	2-10'X10'X40' MBC WITH HEADWALL	REMOVE 2-2' OF MBC & HDWL. PLACE 2-6' OF MBC & FW-0.					1			
	RT		REMOVE 2-2' OF MBC & HDWL. PLACE 2-6' OF MBC & FW-0.					1			
287+93.97	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 28' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.								
301+92.96	LT	1-48"X52' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & CH-FW-0.	1							
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & CH-PW-0.			1					
310+93.75	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP, JCT BOX, 28' OF RCP, & SET.								
		N/A	PLACE RT 16' OF RCP & SET.								
319+08.61	LT	2-27"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-10' OF RCP & SET.								
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-10' OF RCP & SET.								
326+48.29	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 12' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 12' OF RCP & SET.								
336+78.04	LT	1-15"X42' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.								
347+60.01	LT	1-24"X123' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.								
	RT		REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.								
PROJECT TOTAL				3	1	1	1	4	3	1	1

NOTES:

1. PLACE COLLARS AS DIRECTED.
2. GENERAL HYDRAULIC STATEMENT: EXISTING STRUCTURES HAVE BEEN ANALYZED IN PREVIOUS PLANS AND/OR HAVE BEEN HISTORICALLY PROVEN TO BE HYDRAULICALLY ADEQUATE. THE EXTENSION OF THESE STRUCTURES SHOULD NOT ADVERSELY AFFECT THE SURROUNDING PROPERTIES (MOSTLY RURAL/AGRICULTURAL) IN REGARDS TO DAMAGE FROM BACKWATER OR HIGH VELOCITIES.

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

QUANTITY SUMMARY

Designed:	—	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	—		TEXAS					SH 204
Drawn:	—	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	—	TYL	CHEROKEE	0450	01	013		29

CP&Y

CHECKPRINT

REVIEWER
Initial:
Date:

VERIFIED
Initial:
Date:

PROCESSED
Initial:
Date:

VERIFIED
Initial:
Date:

SUMMARY OF CROSS-CULVERTS

LOCATION STA		EXISTING CONDITION	PROPOSED WORK	ITEM 467 SET (TY II) (15 IN) (RCP) (6:1) (C) EA	ITEM 467 SET (TY II) (18 IN) (RCP) (3:1) (C) EA	ITEM 467 SET (TY II) (18 IN) (RCP) (4:1) (C) EA	ITEM 467 SET (TY II) (18 IN) (RCP) (6:1) (C) EA	ITEM 467 SET (TY II) (24 IN) (RCP) (4:1) (C) EA	ITEM 467 SET (TY II) (24 IN) (RCP) (6:1) (C) EA	ITEM 467 SET (TY II) (27 IN) (RCP) (6:1) (C) EA
CSJ 0450-01-013										
17+87.66	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.					1		
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.						1	
21+89.47	LT	1-24"X80' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & CH-PW-0.							
	RT		PLACE 18" STONE RIPRAP.							
37+54.32	LT	2-18"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.			2				
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.			2				
45+94.30	LT	1-10'X9'X40' SBC WITH HEADWALL	REMOVE 2' OF SBC & HDWL. PLACE 23' OF SBC & FW-0.							
	RT		REMOVE 2' OF SBC & HDWL. PLACE 11' OF SBC & PW-2.							
58+67.34	LT	1-36"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 30' OF RCP & SET.							
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 32' OF RCP, & SET.							
62+50.82	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 16' OF RCP & SET.				1			
	RT		REMOVE 4' OF RCP & HDWL. PLACE 26' OF RCP & SET.				1			
74+03.46	LT	3-5'X5'X40' MBC WITH HEADWALL	REMOVE 3-2' OF MBC & HDWL. PLACE 3-22' OF MBC & FW-0.							
	RT		REMOVE 3-2' OF MBC & HDWL. PLACE 3-11' OF MBC & FW-0.							
78+03.84	LT	1-36"X68' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 28' OF RCP & SET.							
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.							
85+79.21	LT	2-36"X51' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-26' OF RCP & SET.							
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-28' OF RCP & SET.							
91+80.49	LT	1-18"X47' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.				1			
	RT		REMOVE 4' OF RCP & HDWL. PLACE 26' OF RCP & SET.			1				
102+21.95	LT	2-10'X9'X40' MBC WITH HEADWALL	REMOVE 2-2' OF MBC & HDWL. PLACE 2-11' OF MBC & FW-0.							
	RT		REMOVE 2-2' OF MBC & HDWL. PLACE 2-5' OF MBC & FW-0.							
119+00.47	LT	3-5'X5'X41' MBC WITH HEADWALL	REMOVE 3-2' OF MBC & HDWL. PLACE 3-24' OF MBC & FW-0.							
	RT		REMOVE 3-2' OF MBC & HDWL. PLACE 3-12' OF MBC & FW-0.							
206+56.84	LT	1-18"X47' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & SET.			1				
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.			1				
211+86.41	LT	1-15"X51' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.				1			
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 34' OF RCP, & SET.		1					
222+96.93	LT	2-42"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.							
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-24' OF RCP & SET.							
236+95.77	LT	2-36"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-24' OF RCP & SET.							
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-26' OF RCP & SET.							
245+10.20	LT	1-18"X50' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.			1				
	RT		REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.				1			
256+14.43	LT	1-48"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & CH-FW-0.							
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & CH-FW-0.							
258+59.50	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.					1		
	RT		REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.					1		
275+95.05	LT	1-18"X59' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.				1			
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX,16' OF RCP, & SET.		1					
281+70.63	LT	2-10'X10'X40' MBC WITH HEADWALL	REMOVE 2-2' OF MBC & HDWL. PLACE 2-6' OF MBC & FW-0.							
	RT		REMOVE 2-2' OF MBC & HDWL. PLACE 2-6' OF MBC & FW-0.							
287+93.97	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 28' OF RCP & SET.				1			
	RT		REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.				1			
301+92.96	LT	1-48"X52' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & CH-FW-0.							
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & CH-PW-0.							
310+93.75	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP & SET.			1				
	RT		REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP, JCT BOX, 28' OF RCP, & SET.		1					
		N/A	PLACE RT 16' OF RCP & SET.			1				
319+08.61	LT	2-27"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-10' OF RCP & SET.							2
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-10' OF RCP & SET.							2
326+48.29	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 12' OF RCP & SET.					1		
	RT		REMOVE 4' OF RCP & HDWL. PLACE 12' OF RCP & SET.						1	
336+78.04	LT	1-15"X42' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP & SET.	1						
	RT		REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.	1						
347+60.01	LT	1-24"X123' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.						1	
	RT		REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.						1	
PROJECT TOTAL				2	3	10	8	4	4	4

NOTES:

1. PLACE COLLARS AS DIRECTED.
2. GENERAL HYDRAULIC STATEMENT:
   EXISTING STRUCTURES HAVE BEEN ANALYZED IN PREVIOUS PLANS AND/OR HAVE BEEN HISTORICALLY PROVEN TO BE HYDRAULICALLY ADEQUATE. THE EXTENSION OF THESE STRUCTURES SHOULD NOT ADVERSELY AFFECT THE SURROUNDING PROPERTIES (MOSTLY RURAL/AGRICULTURAL) IN REGARDS TO DAMAGE FROM BACKWATER OR HIGH VELOCITIES.

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

QUANTITY SUMMARY

Designed: –	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked: –		TEXAS					SH 204
Drawn: –	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: –	TYL	CHEROKEE	0450	01	013		30

CP&Y
CHECKPRINT

REVIEWER
Initial:
Date:

VERIFIED
Initial:
Date:

PROCESSED
Initial:
Date:

VERIFIED
Initial:
Date:

SUMMARY OF CROSS-CULVERTS

LOCATION STA		EXISTING CONDITION	PROPOSED WORK	ITEM 467 SET (TY II) (36 IN) (RCP) (3:1) (C) EA	ITEM 467 SET (TY II) (36 IN) (RCP) (4:1) (C) EA	ITEM 467 SET (TY II) (36 IN) (RCP) (6:1) (C) EA	ITEM 467 SET (TY II) (42 IN) (RCP) (4:1) (C) EA	ITEM 480 CLEAN EXIST CULVERTS EA
CSJ 0450-01-013								
17+87.66	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.					
21+89.47	LT	1-24"X80' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & CH-PW-0.					
	RT		PLACE 18" STONE RIPRAP.					
37+54.32	LT	2-18"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.					
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.					
45+94.30	LT	1-10'X9'X40' SBC WITH HEADWALL	REMOVE 2' OF SBC & HDWL. PLACE 23' OF SBC & FW-0.					
	RT		REMOVE 2' OF SBC & HDWL. PLACE 11' OF SBC & PW-2.					
58+67.34	LT	1-36"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 30' OF RCP & SET.	1				
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 32' OF RCP, & SET.	1				
62+50.82	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 16' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 26' OF RCP & SET.					
74+03.46	LT	3-5'X5'X40' MBC WITH HEADWALL	REMOVE 3-2' OF MBC & HDWL. PLACE 3-22' OF MBC & FW-0.					
	RT		REMOVE 3-2' OF MBC & HDWL. PLACE 3-11' OF MBC & FW-0.					
78+03.84	LT	1-36"X68' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 28' OF RCP & SET.			1		
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.			1		
85+79.21	LT	2-36"X51' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-26' OF RCP & SET.		2			
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-28' OF RCP & SET.		2			
91+80.49	LT	1-18"X47' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 26' OF RCP & SET.					
102+21.95	LT	2-10'X9'X40' MBC WITH HEADWALL	REMOVE 2-2' OF MBC & HDWL. PLACE 2-11' OF MBC & FW-0.					
	RT		REMOVE 2-2' OF MBC & HDWL. PLACE 2-5' OF MBC & FW-0.					
119+00.47	LT	3-5'X5'X41' MBC WITH HEADWALL	REMOVE 3-2' OF MBC & HDWL. PLACE 3-24' OF MBC & FW-0.					
	RT		REMOVE 3-2' OF MBC & HDWL. PLACE 3-12' OF MBC & FW-0.					
206+56.84	LT	1-18"X47' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & SET.					
211+86.41	LT	1-15"X51' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX, 34' OF RCP, & SET.					
222+96.93	LT	2-42"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-18' OF RCP & SET.				2	
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-24' OF RCP & SET.				2	
236+95.77	LT	2-36"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-24' OF RCP & SET.			2		
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-26' OF RCP & SET.		2			
245+10.20	LT	1-18"X50' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.					
256+14.43	LT	1-48"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & CH-FW-0.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & CH-FW-0.					
258+59.50	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.					
275+95.05	LT	1-18"X59' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 20' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE JCT BOX,16' OF RCP, & SET.					
281+70.63	LT	2-10'X10'X40' MBC WITH HEADWALL	REMOVE 2-2' OF MBC & HDWL. PLACE 2-6' OF MBC & FW-0.					
	RT		REMOVE 2-2' OF MBC & HDWL. PLACE 2-6' OF MBC & FW-0.					
287+93.97	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 28' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.					
301+92.96	LT	1-48"X52' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 18' OF RCP & CH-FW-0.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 22' OF RCP & CH-PW-0.					
310+93.75	LT	1-18"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP, JCT BOX, 28' OF RCP, & SET.					
		N/A	PLACE RT 16' OF RCP & SET.					
319+08.61	LT	2-27"X43' RCP WITH HEADWALL	REMOVE 2-4' OF RCP & HDWL. PLACE 2-10' OF RCP & SET.					
	RT		REMOVE 2-4' OF RCP & HDWL. PLACE 2-10' OF RCP & SET.					
326+48.29	LT	1-24"X43' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 12' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 12' OF RCP & SET.					
336+78.04	LT	1-15"X42' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 8' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.					
347+60.01	LT	1-24"X123' RCP WITH HEADWALL	REMOVE 4' OF RCP & HDWL. PLACE 10' OF RCP & SET.					
	RT		REMOVE 4' OF RCP & HDWL. PLACE 14' OF RCP & SET.					
PROJECT TOTAL				2	6	4	4	14

NOTES:

1. PLACE COLLARS AS DIRECTED.
2. GENERAL HYDRAULIC STATEMENT:
   EXISTING STRUCTURES HAVE BEEN ANALYZED IN PREVIOUS PLANS AND/OR HAVE BEEN HISTORICALLY PROVEN TO BE HYDRAULICALLY ADEQUATE. THE EXTENSION OF THESE STRUCTURES SHOULD NOT ADVERSELY AFFECT THE SURROUNDING PROPERTIES (MOSTLY RURAL/AGRICULTURAL) IN REGARDS TO DAMAGE FROM BACKWATER OR HIGH VELOCITIES.

NO.	REVISION	BY	DATE

Kimley»Horn
TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

QUANTITY SUMMARY

		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Designed:	–		TEXAS					SH 204
Checked:	–							
Drawn:	–	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	–	TYL	CHEROKEE	0450	01	013		31

CP&Y
CHECKPRINT

REVIEWER
Initial:
Date:

VERIFIED
Initial:
Date:

PROCESSED
Initial:
Date:

VERIFIED
Initial:
Date:

STRUCTURE SUMMARY

	ITEM 464							
	RC PIPE (CL III) 15 IN	RC PIPE (CL III) 18 IN	RC PIPE (CL III) 21 IN	RC PIPE (CL III) 24 IN	RC PIPE (CL III) 27 IN	RC PIPE (CL III) 36 IN	RC PIPE (CL III) 42 IN	RC PIPE (CL III) 48 IN
	LF	LF	LF	LF	LF	LF	LF	LF
CSJ 0450-01-013								
FROM DRIVEWAY & INTERSECTION SUMMARY		1664	72	100				
FROM CROSS-CULVERT SUMMARY	22	422		138	40	320	84	76
PROJECT TOTAL	**22**	**2086**	**72**	**238**	**40**	**320**	**84**	**76**

NOTES:

1. PLACE COLLARS AS DIRECTED.
2. GENERAL HYDRAULIC STATEMENT:
   EXISTING STRUCTURES HAVE BEEN ANALYZED IN PREVIOUS PLANS AND/OR HAVE BEEN HISTORICALLY PROVEN TO BE HYDRAULICALLY ADEQUATE. THE EXTENSION OF THESE STRUCTURES SHOULD NOT ADVERSELY AFFECT THE SURROUNDING PROPERTIES (MOSTLY RURAL/AGRICULTURAL) IN REGARDS TO DAMAGE FROM BACKWATER OR HIGH VELOCITIES.

NO.	REVISION	BY	DATE

Kimley»Horn
TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

QUANTITY SUMMARY

Designed: –	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked: –		TEXAS				SH 204
Drawn: –	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: –	TYL	CHEROKEE	0450	01	013	32

SMALL SIGN TABULATION

LOCATION	ITEM 644						
	INSTALL SM RD SN SUP & AM TY 10BWG (1)SA(P)	INSTALL SM RD SN SUP & AM TY 10BWG (1)SA(T)	INSTALL SM RD SN SUP & AM TY S80(1) SA(U)	INSTALL SM RD SN SUP & AM TY S80(1) SA(U-WC)	REMOVE SM RD SN SUP & AM	RELOCATE SM RD SN SUP & AM TY 10BWG	RELOCATE SM RD SN SUP & AM TY S80
	EA	EA	EA	EA	EA	EA	EA
STA 15+00 TO STA 28+00	13		1	3	16		
STA 28+00 TO STA 50+00	3		1	1	4		
STA 50+00 TO STA 72+00	2						
STA 72+00 TO STA 94+00	1		1		1		
STA 94+00 TO STA 116+00	0						
STA 116+00 TO STA 138+00	5				4		
STA 138+00 TO STA 160+00	2				2		
STA 160+00 TO STA 181+00	3				3		
STA 181+00 TO STA 203+00	3				2		
STA 203+00 TO STA 225+00	1				1		
STA 225+00 TO STA 247+00	11		2	3	14		
STA 247+00 TO STA 269+00	5			1	5	1	1
STA 269+00 TO STA 291+00	3				3		
STA 291+00 TO STA 313+00	7				7		
STA 313+00 TO STA 335+00	6	2			8		
STA 335+00 TO STA 347+87	12	1		2	15		1
PROJECT TOTAL	77	3	5	10	85	1	2

SIGNING & DEL SUMMARY

LOCATION	ITEM 658
	INSTL OM ASSM (OM-2Z) (WFLX)GND
	EA
STA 15+00 TO STA 28+00	3
STA 28+00 TO STA 50+00	5
STA 50+00 TO STA 72+00	4
STA 72+00 TO STA 94+00	10
STA 94+00 TO STA 116+00	
STA 116+00 TO STA 138+00	4
STA 138+00 TO STA 160+00	
STA 160+00 TO STA 181+00	
STA 181+00 TO STA 203+00	
STA 203+00 TO STA 225+00	6
STA 225+00 TO STA 247+00	4
STA 247+00 TO STA 269+00	4
STA 269+00 TO STA 291+00	4
STA 291+00 TO STA 313+00	6
STA 313+00 TO STA 335+00	4
STA 335+00 TO STA 347+87	4
PROJECT TOTAL	58

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

		FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Designed:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	33
Checked:	CPY						

SUMMARY OF PERMANENT PAVEMENT MARKINGS

LOCATION	ITEM 666								ITEM 668			ITEM 672	
	REF PAV MRK TY 1 (W) 36" (YLD TRI) (100 MIL) EA	REFL PAV MRK TY 1 (W) 6" (DOT) (100 MIL) LF	REFL PAV MRK TY 1 (W) 8" (SLD) (100 MIL) LF	REFL PAV MRK TY 1 (W) 24" (SLD) (100 MIL) LF	RE PM W/RET REQ TY 1 (W) 6" (SLD) (100 MIL) LF	RE PM W/RET REQ TY 1 (W) 6" (BRK) (100 MIL) LF	RE PM W/RET REQ TY 1 (Y) 6" (BRK) (100 MIL) LF	RE PM W/RET REQ TY 1 (Y) 6" (SLD) (100 MIL) LF	PREFAB PAV MARK TY C (W) (ARROW) EA	PREFAB PAV MARK TY C (W) (LNDP ARROW) EA	PREFAB PAV MARK TY C (W) (WORD) EA	REFL PAV MRKR TY I–C EA	REFL PAV MRKR TY II–A–A EA
STA 15+00 TO STA 28+00				36	2380			2445					31
STA 28+00 TO STA 50+00		234			4400	13		4400		2		1	55
STA 50+00 TO STA 72+00					4400	550		4400				28	55
STA 72+00 TO STA 94+00					4400	550		4400				28	55
STA 94+00 TO STA 116+00					4400	550		4400				28	55
STA 116+00 TO STA 138+00		86	274	16	4347	83		6663	2		2	18	212
STA 138+00 TO STA 160+00			275		4390			6042	2		2	14	200
STA 160+00 TO STA 181+00				16	4251			4752					59
STA 181+00 TO STA 203+00		105			4400	445		4400				22	55
STA 203+00 TO STA 225+00					4400	550		4400				28	55
STA 225+00 TO STA 247+00				52	4217	550		4157				28	52
STA 247+00 TO STA 269+00		235			4400	201		4400		2		10	55
STA 269+00 TO STA 291+00				20	4239			4400					55
STA 291+00 TO STA 313+00				48	4121		13	4420					56
STA 313+00 TO STA 335+00				28	4324		519	2025					51
STA 335+00 TO STA 347+87	5		172	76	2428			2528				9	32
PROJECT TOTAL	5	660	721	292	65497	3492	532	68232	4	4	4	214	1133

cpybw_ANSIB.tbl
cyppf_ANSIB.pltcfg
pw:/

8/23/2023 11:19:44 AM PerryKL

pw:/

SHEET 17 OF 18

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		34

SW3P SUMMARY

LOCATION	ITEM 164			ITEM 168		ITEM 506							
	BOND FBR MTRX SEED (PERM) (RURAL) (SAND)	BONDED FBR MTRX SEED (TEMP) (WARM)	BONDED FBR MTRX SEED (TEMP) (COOL)	VEGETATIVE WATERING (TEMP)	VEGETATIVE WATERING (PERM)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	EARTHWORK (EROSN & SEDMT CONT, IN VEH)	BACKHOE WORK (EROSION & SEDMT CONT)	TRACKHOE WORK (EROSION & SEDMT CONT)	ROCK FILTER DAMS (INSTALL) (TY 1)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)
	SY	SY	SY	SY	SY	LF	LF	CY	HR	HR	LF	LF	LF
STA 15+00 TO STA 28+00	6147	3073	3073	6147	6147	734	734				105	105	210
STA 28+00 TO STA 50+00	12116	6058	6058	12116	12116	1077	1077				255	255	510
STA 50+00 TO STA 72+00	15924	7962	7962	15924	15924	1506	1506				195	195	390
STA 72+00 TO STA 94+00	17529	8765	8765	17529	17529	1619	1619				255	255	510
STA 94+00 TO STA 116+00	15824	7912	7912	15824	15824	1969	1969				180	180	360
STA 116+00 TO STA 138+00	10310	5155	5155	10310	10310	1061	1061				270	270	540
STA 138+00 TO STA 160+00	6847	3424	3424	6847	6847	1014	1014				330	330	660
STA 160+00 TO STA 181+00	8126	4063	4063	8126	8126	393	393				255	255	510
STA 181+00 TO STA 203+00	9789	4895	4895	9789	9789	504	504				195	195	390
STA 203+00 TO STA 225+00	14895	7447	7447	14895	14895	730	730				270	270	540
STA 225+00 TO STA 247+00	16615	8307	8307	16615	16615	1131	1131				285	285	570
STA 247+00 TO STA 269+00	10654	5327	5327	10654	10654	1587	1587				240	240	480
STA 269+00 TO STA 291+00	13290	6645	6645	13290	13290	1064	1064				285	285	570
STA 291+00 TO STA 313+00	11042	5521	5521	11042	11042	400	400				285	285	570
STA 313+00 TO STA 335+00	9501	4750	4750	9501	9501	532	532				330	330	660
STA 335+00 TO STA 347+87	4261	2131	2131	4261	4261	250	250				195	195	390
PROJECT TOTALS	**182870**	**91435**	**91435**	**182870**	**182870**	**15571**	**15571**	**1000**	**200**	**200**	**3930**	**3930**	**7860**

NOTE:
MULTIPLE MOVE-INS WILL BE REQUIRED TO MAINTAIN ADEQUATE VEGETATION IN COMPLIANCE WITH THE CONSTRUCTION GENERAL PERMIT

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

QUANTITY SUMMARY

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		35

SHEET 18 OF 18

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DATE:
FILE:

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
1	1	D15-11T	NEXT PASSING LANE 5 MILES	54 X 48	X		S80	1	SA	U		
	2	W3-1	STOP AHEAD	30 X 30	X		10BWG	1	SA	P		
	3	M2-1	JUNCTION	21 X 15	X		10BWG	1	SA	P		
		M1-6T	STATE ROUTE SIGN (SH 110)	24 X 24								
	4	D20-1TR	COUNTY ROAD (CO RD 4312 ➡)	24 X 24	X		10BWG	1	SA	P		
	5	D1-2	DESTINATION (⬆ REKLAW, ⬅ PINE HILL)	78 X 30	X		S80	1	SA	U	WC	
	6	D20-2T	COUNTY ROAD (CO RD 4313⟷)	24 X 24	X		10BWG	1	SA	P		
	7	M3-4	CARDINAL DIRECTION (WEST)	24 X 12	X		10BWG	1	SA	P		
		M1-6T	STATE ROUTE SIGN (SH 204)	24 X 24								
	8	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	9	R12-1T	WEIGHT LIMIT	24 X 36	X		10BWG	1	SA	P		
	10	M1-6F	TEXAS FARM ROAD (FM 2274)	24 X 24	X		10BWG	1	SA	P		
		M6-1	DIRECTIONAL ARROW (➡)	21 X 15								
	11	D20-1TL	COUNTY ROAD (CO RD 4312 ⬅)	24 X 24	X		10BWG	1	SA	P		
	12	R2-1	SPEED LIMIT (60 MPH)	30 X 36	X		10BWG	1	SA	P		
	13	D1-2	DESTINATION (⬆ PONTA, PINE HILL ➡)	78 X 30	X		S80	1	SA	U	WC	
	14	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	15	W1-7T	CHEVRON/ TWO-DIRECTION LARGE ARROW	96 X 36	X		S80	1	SA	U	WC	
	16	M3-2	CARDINAL DIRECTION (EAST)	24 X 12	X		10BWG	1	SA	P		
		M1-6T	STATE ROUTE SIGN (SH 204)	24 X 24								
	17	R2-1	SPEED LIMIT (70 MPH)	30 X 36	X		10BWG	1	SA	P		
2	1	D15-11T	NEXT PASSING LANE 5 MILES	54 X 48	X		S80	1	SA	U		
	2	W3-1	STOP AHEAD	30 X 30	X		10BWG	1	SA	P		
	3	M2-1	JUNCTION	21 X 15	X		10BWG	1	SA	P		
		M1-6F	TEXAS FARM ROAD (FM 2274)	24 X 24								
	4	D2-2	DISTANCE (REKLAW 6, NACOGDOCHES 37)	108 X 30	X		S80	1	SA	U	WC	
	5	W3-5	REDUCE SPEED LIMIT AHEAD (60 MPH)	36 X 36	X		10BWG	1	SA	P		
3	1	W9-2TL	LANE ENDS MERGE LEFT	36 X 36	X		10BWG	1	SA	P		
	2	W9-1R	RIGHT LANE ENDS	36 X 36	X		10BWG	1	SA	P		
4	1	D15-10T	PASSING LANE 2 MILES	54 X 42	X		S80	1	SA	U		
	2	M1-6T	STATE ROUTE SIGN (SH 204)	24 X 24	X		10BWG	1	SA	P		
		D10-7aT	TEXAS REFERENCE MARKER (692)—B-B	3 X 10								
		D10-7aT	TEXAS REFERENCE MARKER (692)—	3 X 10								
6	1	R4-3	SLOWER TRAFFIC KEEP RIGHT	24 X 30	X		10BWG	1	SA	P		

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

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	0450	01	013	SH 204
4-16	DIST	COUNTY		SHEET NO.
8-16	TYL	CHEROKEE		36

T8

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DATE:
FILE:

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
6	2	D20-1TL	COUNTY ROAD (CO RD 4402 ⬅)	24 X 24	X		10BWG	1	SA	P		
	3	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	4	D20-1TR	COUNTY ROAD (CO RD 4402 ➡)	24 X 24	X		10BWG	1	SA	P		
	5	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36 X 36	X		10BWG	1	SA	P		
7	1	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36 X 36	X		10BWG	1	SA	P		
	2	D20-1TL	COUNTY ROAD (CO RD 4403 ⬅)	24 X 24	X		10BWG	1	SA	P		
8	1	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	2	D20-1TR	COUNTY ROAD (CO RD 4403 ➡)	24 X 24	X		10BWG	1	SA	P		
	3	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36 X 36	X		10BWG	1	SA	P		
9	1	M1-6T	STATE ROUTE SIGN (204 TEXAS)	24 X 24	X		10BWG	1	SA	P		
		D10-7aT	TEXAS REFERENCE MARKER (694) B-B	3 X 10								
		D10-7aT	TEXAS REFERENCE MARKER (694)	3 X 10								
	2	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36 X 36	X		10BWG	1	SA	P		
	3	R4-3	SLOWER TRAFFIC KEEP RIGHT	24 X 30	X		10BWG	1	SA	P		
10	1	W3-5	REDUCE SPEED LIMIT AHEAD (55 MPH)	36 X 36	X		10BWG	1	SA	P		
11	1	D15-10T	PASSING LANE 2 MILES	54 X 42	X		S80	1	SA	U		
	2	R2-1	SPEED LIMIT (70 MPH)	30 X 36	X		10BWG	1	SA	P		
	3	M2-1	JUNCTION	21 X 15	X		10BWG	1	SA	P		
		M1-6F	TEXAS FARM ROAD (FM 235)	24 X 24								
	4	R2-1	SPEED LIMIT (55 MPH)	30 X 36	X		10BWG	1	SA	P		
	5	D2-2	DISTANCE (PONTA 4, JACKSONVILLE 17)	102 X 30	X		S80	1	SA	U	WC	
	6	M3-4	CARDINAL DIRECTION (WEST)	24 X 12	X		10BWG	1	SA	P		
		M1-6T	STATE ROUTE SIGN (SH 204)	24 X 24								
	7	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	8	M1-6F	TEXAS FARM ROAD (FM 235)	24 X 24	X		10BWG	1	SA	P		
		M6-1	DIRECTIONAL ARROW (➡)	21 X 15								
	9	D1-2	DESTINATION (⬆ REKLAW, ⬅ NEW SUMMERFIELD)	132 X 30	X		S80	1	SA	U	WC	
	10	D20-1TR	COUNTY ROAD (CO RD 4319 ➡)	24 X 24	X		10BWG	1	SA	P		
	11	M1-6F	TEXAS FARM ROAD (FM 235)	24 X 24	X		10BWG	1	SA	P		
		M6-1	DIRECTIONAL ARROW (⬅)	21 X 15								
	12	M1-6T	STATE ROUTE SIGN (SH 204)	24 X 24	X		10BWG	1	SA	P		
		M6-4	DIRECTIONAL ARROW (⬅➡)	21 X 15								
	13	W1-7T	CHEVRON/ TWO-DIRECTION LARGE ARROW	96 X 36	X		S80	1	SA	U	WC	

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

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NOTE:

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	0450	01	013	SH 204
4-16	DIST	COUNTY		SHEET NO.
8-16	TYL	CHEROKEE		37

T8

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) 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")	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext, BM = Extruded Wind Beam, WC = 1.12 #/ft Wing Channel, EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE (TY N, TY S)
11	14	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	15	R2-1	SPEED LIMIT (55 MPH)	30 X 36	X		S80	1	SA	U		
		I-2aT	CITY LIMIT SIGN (REKLAW CITY LIMIT POP. 266)	48 X 24								
	16	W9-1R	RIGHT LANE ENDS	36 X 36	X		10BWG	1	SA	P		
12	1	D20-1TL	COUNTY ROAD (CO RD 4319 ⬅)	24 X 24	X		10BWG	1	SA	P		
	2	W2-1	INTERSECTION WARNING (SYMBOL)	30 X 30	X		10BWG	1	SA	P		
	3	D1-2	DESTINATION (⬆ PONTA, NEW SUMMERFIELD ➡)	132 X 30	X		S80	1	SA	U	WC	
	4	M3-2	CARDINAL DIRECTION (EAST)	24 X 12	X		10BWG	1	SA	P		
		M1-6T	STATE ROUTE SIGN (SH 204)	24 X 24								
	5	W9-2TL	LANE ENDS MERGE LEFT	36 X 36	X		10BWG	1	SA	P		
	6	–	WELCOME TO REKLAW						EXISTING SIGN TO BE RELOCATED			
	7	M2-1	JUNCTION	21 X 15	X		10BWG	1	SA	P		
		M1-6F	TEXAS FARM ROAD (FM 235)	24 X 24								
	8	–	MOTORCYCLE (SYMBOL)		X				EXISTING SIGN TO BE RELOCATED			
	–		SHARE THE ROAD									
13	1	D20-5T	COUNTY ROAD (CO RD 4421⬅,4319 ➡)	24 X 42	X		10BWG	1	SA	P		
	2	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	3	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
14	1	D20-5T	COUNTY ROAD (CO RD 4319⬅,4321 ➡)	24 X 42	X		10BWG	1	SA	P		
	2	R2-1	SPEED LIMIT (55 MPH)	30 X 36	X		10BWG	1	SA	P		
	3	R2-1	SPEED LIMIT (55 MPH)	30 X 36	X		10BWG	1	SA	P		
	4	M1-6T	STATE ROUTE SIGN (SH 204)	24 X 24	X		10BWG	1	SA	P		
		D10-7aT	TEXAS REFERENCE MARKER (696) B-B	3 X 10								
		D10-7aT	TEXAS REFERENCE MARKER (696)	3 X 10								
	5	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	6	D20-5T	COUNTY ROAD (CO RD 4409⬅,4320 ➡)	24 X 42	X		10BWG	1	SA	P		
	7	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
15	1	D20-5T	COUNTY ROAD (CO RD 4320⬅,4409 ➡)	24 X 42	X		10BWG	1	SA	P		
	2	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	3	D20-5T	COUNTY ROAD (CO RD 4321⬅,4275 ➡)	24 X 42	X		10BWG	1	SA	P		
	4	I-2dT	COUNTY LIMIT SIGN (CHEROKEE COUNTY LINE)	66 X 24	X		10BWG	1	SA	T		
	5	D20-5T	COUNTY ROAD (CO RD 4275⬅,4321 ➡)	24 X 42	X		10BWG	1	SA	P		
	6	M2-1	JUNCTION	21 X 15	X		10BWG	1	SA	P		
		M1-4	U.S. ROUTE SIGN (US 84)	24 X 24								

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).

DATE:
FILE:

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	0450	01	013	SH 204
4-16	DIST	COUNTY		SHEET NO.
8-16	TYL	CHEROKEE		38

T8

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) 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"	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext, BM = Extruded Wind Beam, WC = 1.12 #/ft Wing Channel, EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE: TY N, TY S
15	7	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	8	I-2dT	COUNTY LIMIT SIGN (RUSK COUNTY LINE)	48 X 24	X		10BWG	1	SA	T		
16	1	R2-1	SPEED LIMIT (55 MPH)	30 X 36	X		10BWG	1	SA	P		
	2	M1-6T	STATE ROUTE SIGN (SH 204)	24 X 24	X		10BWG	1	SA	P		
		D10-7aT	TEXAS REFERENCE MARKER (698) B-B	3 X 10								
		D10-7aT	TEXAS REFERENCE MARKER (698)	3 X 10								
	3	–	POST OFFICE (←) B-B						EXISTING SIGN TO BE RELOCATED			
		–	POST OFFICE (→)									
	4	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	5	D2-2	DISTANCE (PONTA 6, JACKSONVILLE 19)	102 X 30	X		S80	1	SA	U	WC	
	6	M3-4	CARDINAL DIRECTION (WEST)	24 X 12	X		10BWG	1	SA	P		
		M1-6T	STATE ROUTE SIGN (SH 204)	24 X 24								
	7	R2-1	SPEED LIMIT (45 MPH)	30 X 36	X		10BWG	1	SA	P		
	8	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	9	W3-1	STOP AHEAD	30 X 30	X		10BWG	1	SA	P		
		W16-2P	1000 FEET	24 X 18								
	10	D1-2	DESTINATION (← MT ENTERPRISE, RUSK →)	108 X 30	X		S80	1	SA	U	WC	
	11	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	12	W3-1	STOP AHEAD	30 X 30	X		10BWG	1	SA	P		
	13	M1-4	U.S. ROUTE SIGN (US 84)	24 X 24	X		10BWG	1	SA	P		
		M6-4	DIRECTIONAL ARROW (↔)	21 X 15								
	14	R1-2	YIELD	48 X 48 X 48	X		10BWG	1	SA	T		
	15	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
	16	R1-1	STOP	36 X 36	X		10BWG	1	SA	P		
		W4-4P	CROSS TRAFFIC DOES NOT STOP B-B	24 X 12								
		W4-4P	CROSS TRAFFIC DOES NOT STOP	24 X 12								

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
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DATE:
FILE:

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	0450	01	013	SH 204
4-16	DIST	COUNTY		SHEET NO.
8-16	TYL	CHEROKEE		39

T8

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		44	EB SH 204	99+89	TL-3	BI	PER ATTENUATOR STD		PRECAST TRAFFIC BARRIER	24"	32"	36′	X		X		X					
2		44	EB SH 204	102+89	TL-3	BI	PER ATTENUATOR STD		PRECAST TRAFFIC BARRIER	24"	32"	36′	X		X		X					
3		44	WB SH 204	101+59	TL-3	BI	PER ATTENUATOR STD		PRECAST TRAFFIC BARRIER	24"	32"	36′	X		X		X					
4		44	WB SH 204	105+19	TL-3	BI	PER ATTENUATOR STD		PRECAST TRAFFIC BARRIER	24"	32"	36′	X		X		X					
5		45	EB SH 204	279+38	TL-3	BI	PER ATTENUATOR STD		PRECAST TRAFFIC BARRIER	24"	32"	36′		X		1						
6		45	EB SH 204	282+38	TL-3	BI	PER ATTENUATOR STD		PRECAST TRAFFIC BARRIER	24"	32"	36′		X		2						
7		45	WB SH 204	281+04	TL-3	BI	PER ATTENUATOR STD		PRECAST TRAFFIC BARRIER	24"	32"	36′		X		3						
8		45	WB SH 204	284+04	TL-3	BI	PER ATTENUATOR STD		PRECAST TRAFFIC BARRIER	24"	32"	36′		X		4						
												TOTALS	8	8								

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	0450	01	013	SH 204
	DIST	COUNTY		
	TYL	CHEROKEE		
	FEDERAL AID PROJECT			SHEET NO.
				40

CONSTRUCTION SEQUENCE

1) INSTALL PROJECT SIGNS AND BARRICADES.
2) CONSTRUCT PROPOSED CROSS CULVERT AND DRIVEWAY CULVERT EXTENSIONS AND END TREATMENTS.
3) INSTALL PORTABLE TRAFFIC BARRIER AT BAILEY CREEK AND LITTLE CREEK BRIDGE CLASS CULVERTS ON EASTBOUND SIDE. REFER TO TCP BARRIER LAYOUT SHEETS FOR MORE INFORMATION.
4) PERFORM BRIDGE CLASS CULVERT EXTENSIONS FOR EASTBOUND SIDE AS SHOWN IN PLANS.
5) INSTALL PORTABLE TRAFFIC BARRIER AT BAILEY CREEK AND LITTLE CREEK BRIDGE CLASS CULVERTS ON WESTBOUND SIDE. REFER TO TCP BARRIER LAYOUT SHEETS FOR MORE INFORMATION.
6) PERFORM BRIDGE CLASS CULVERT EXTENSIONS FOR WESTBOUND SIDE AS SHOWN IN PLANS.
7) PERFORM SLOPE CORRECTION LEVEL UP.
8) PERFORM SAWCUT, PAVEMENT WIDENING, AND OCST FOR EASTBOUND SIDE.
9) PERFORM SAWCUT, PAVEMENT WIDENING, AND OCST FOR WESTBOUND SIDE.
10) CONSTRUCT ALL SIDE STREETS AND DRIVEWAYS. WORK CAN BE DONE CONCURRENTLY WITH STEPS 7–9.
11) PERFORM PFC.
12) PLACE SIGNS & PM'S.
13) CLEANUP.

NOTES:

1. INSTALL SW3P CONTROL MEASURES AS THE PROJECT PROGRESSES.
2. PLACE TEMPORARY SEEDING AS SHOWN IN THE PLANS, AND AS DIRECTED, PRIOR TO BEGINNING ANY WORK AND AFTER EACH PROPOSED CULVERT EXTENSION AND END TREATMENT.
3. A MINIMUM 4' WORK ZONE BUFFER IS DESIRABLE FOR CULVERT EXTENSION PHASE. REFER TO TxDOT STANDARD TCP(2–1) FOR CONVENTIONAL ROAD SHOULDER WORK. EXISTING LANES TO REMAIN OPEN.
4. CONTRACTOR TO PERFORM MILLING WORK IMMEDIATELY PRIOR TO OVERLAY.
5. SHIFT EASTBOUND AND WESTBOUND TRAFFIC TO ONE–LANE TWO–WAY OPERATIONS CONTROLLED BY THE USE OF FLAGMEN PER TxDOT STANDARD TCP(1–2) OR TCP(2–2) DURING CONSTRUCTION OF LEVEL UP, WIDENING, OCST, AND PFC.
6. PLACE STANDARD WORK ZONE PAVEMENT MARKINGS TO MAINTAIN TWO–LANE TWO–WAY TRAFFIC DURING NON WORKING HOURS. PROVIDE SIDE TAPER AND 3:1 SAFETY SLOPES AS NEEDED OR DIRECTED.
7. ACP WIDENING SHALL BE LIMITED TO AS MUCH WORK AS THE CONTRACTOR IS ABLE TO COMPLETE IN ONE WORKING DAY OR 1 MILE, AS DIRECTED.
8. ANY DROP GREATER THAN 2" AT SAWCUT LINE DURING CONSTRUCTION SHOULD BE PROTECTED BY 4' WORK ZONE BUFFER WITH TRAFFIC BARRELS AT END OF EACH WORKING DAY.
9. LIMIT CROSS CULVERT AND DRIVEWAY CULVERT WORK TO ONE SIDE OF THE ROAD AT A TIME.
10. LIMIT WIDENING WORK TO ONE SIDE OF THE ROADWAY AT A TIME. DRESS UP SLOPES AND PLACE PERMANENT VEGETATIVE MEASURES BEFORE PROCEEDING TO NEXT SECTION OF WORK, UNLESS OTHERWISE DIRECTED.
11. THE PORTION OF THIS PROJECT WHICH COINCIDES WITH EXISTING ROADS AND/OR PRIVATE DRIVES SHALL BE MAINTAINED AS ALL–WEATHER ROADS AND KEPT OPEN AT ALL TIMES UNLESS OTHERWISE DIRECTED.
12. CONTRACTOR TO PROVIDE ACCESS TO MAILBOXES AT ALL TIMES.
13. CW 8–17P "SHOULDER DROP OFF" SIGNS SHALL BE PLACED DURING PHASED WORK AT A MAXIMUM SPACING OF 1,800 FT.
14. THE 3:1 SLOPE BACKFILL FOR END OF DAY OPERATIONS SHALL BE DURABLE CRUSHED STONE TYPE OF FLEXIBLE BASE OR OTHER APPROVED MATERIALS. WHEN WORK IS RESUMED ON THE EXCAVATED AREA THIS BACKFILL MATERIAL SHALL BE INCORPORATED INTO THE ROAD WORK OR DISPOSED OF AS APPROVED. MATERIALS AND LABOR FOR THIS WORK WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE SUBSIDIARY TO THE VARIOUS BID ITEMS.
15. BARRELS SHOWN ARE AS DESCRIBED ON BC(8), OTHER APPROVED BASES AND SUPPORTS MAY BE USED AT THE CONTRACTOR'S OPTION AND AS APPROVED.
16. OTHER TCP OPTIONS MAY BE USED IF APPROVED. SUBMIT PROPOSED TCP IN WRITING AT LEAST TWO WEEKS PRIOR TO BEGINNING THAT PHASE OF WORK.
17. BARRICADE AND CONSTRUCTION STANDARDS BC(1–12) REQUIRED FOR ALL PHASES. REFER TO WORK ZONE AND TCP STANDARD SHEETS FOR ADDITIONAL DETAILS. STANDARDS SHOWN ARE CONSIDERED TO BE THE MINIMUM REQUIREMENTS FOR WORK ZONE SIGNING AND TRAFFIC CONTROL. ADDITIONAL OR OTHER DEVICES MAY BE REQUIRED AS DIRECTED.
18. POSTED SPEED LIMITS SHALL GOVERN FOR ALL TAPER LENGTHS AND LONGITUDINAL SPACINGS.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

TEXAS REGISTERED ENGINEERING FIRM F–1741

SH 204

TCP NARRATIVE

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		41

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cpypsf_ANSIB.pltcfg
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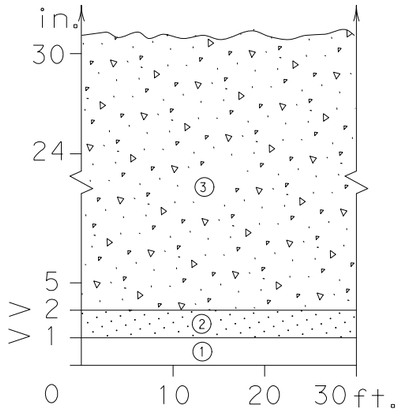
pw:/Active Projects/TXD01600493.00/TXD01600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.03 TCP/4930102TCnar01.dgn

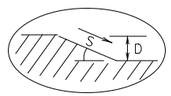
DATE:
FILE:

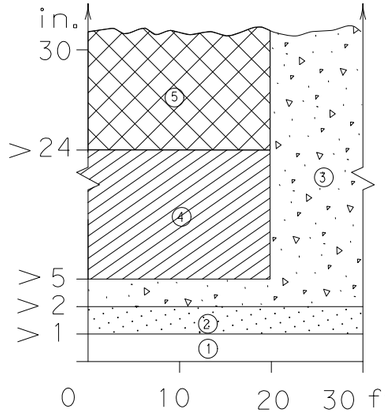
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet

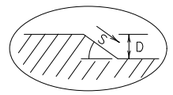


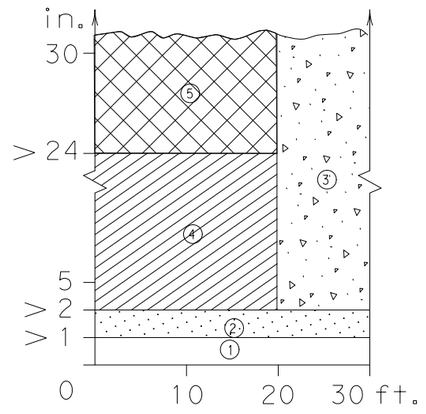
Edge Condition I
S = (3:1) (or flatter)



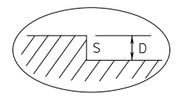


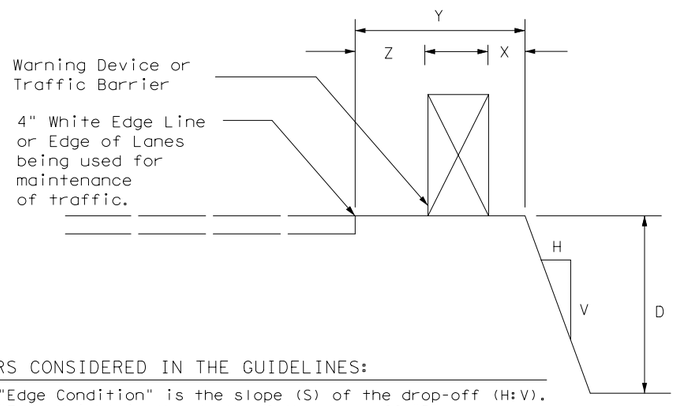
Edge Condition II
S = ((2.99):1) to (1:1)





Edge Condition III
S is steeper than (1:1)





FACTORS CONSIDERED IN THE GUIDELINES:

1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".

2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.

3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.

4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.

5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the profered Edge Condition I.
⑤	Check indications (Figure-1) for possitive barrier. Where positive barrier is not indicated, the treatment shown above for Zone-4 may be used after consideration of other applicable factors.

Edge Condition Notes:

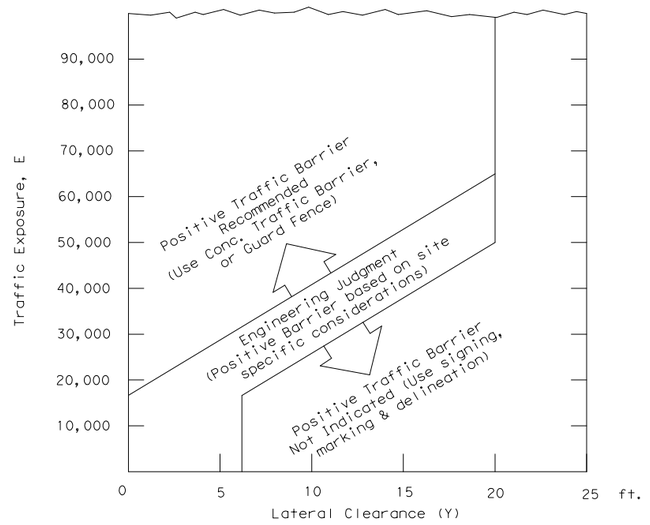
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.

3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 (▨)



1. E = ADT x T
   Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.

2. Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.

3. An approved end treatment should be provided for any positive barrier end located within the clear zone.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

Engineer's Seal

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

Jacob B. Roberts

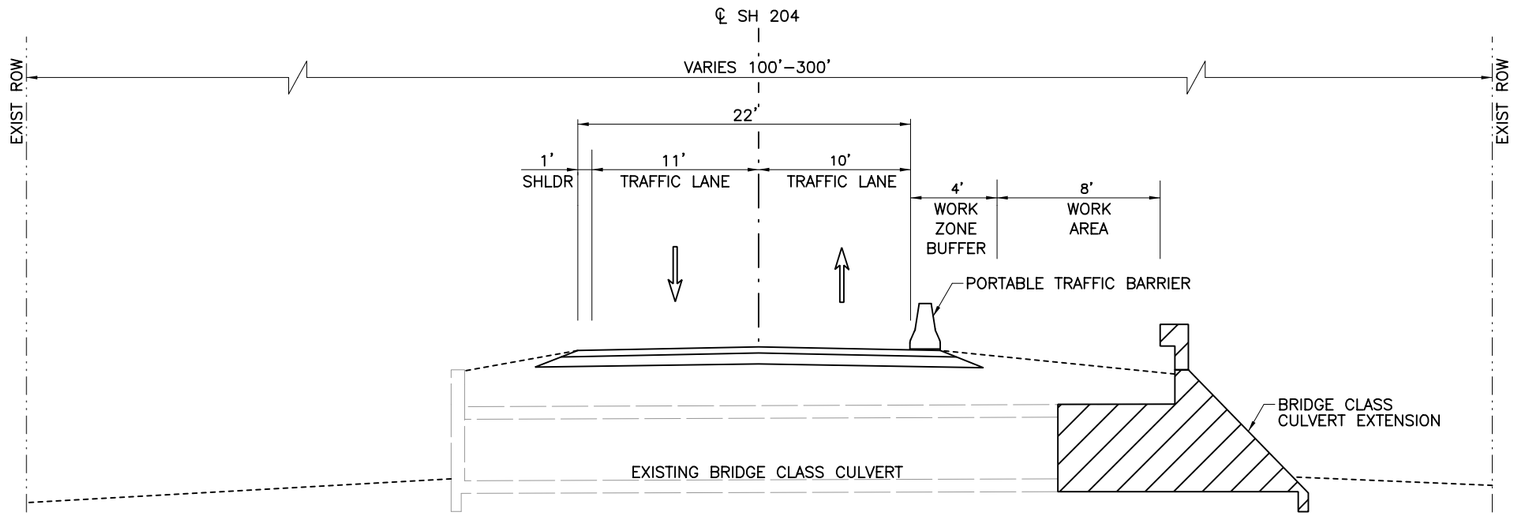
Date 08/23/2023

Texas Department of Transportation

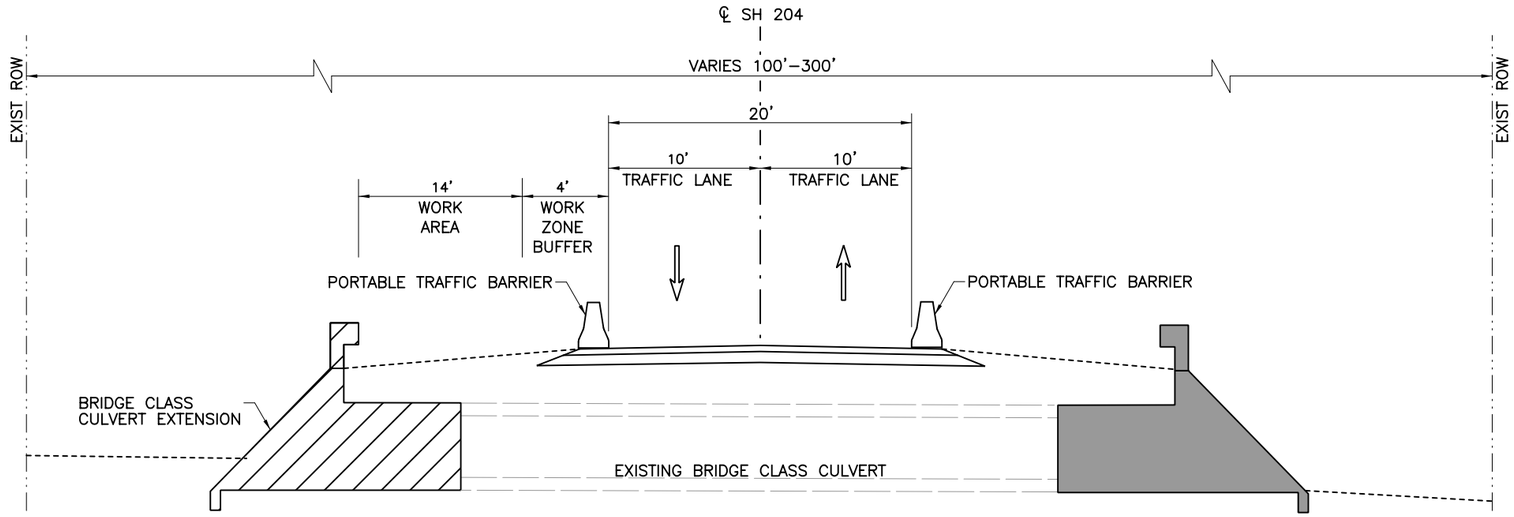
Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

FILE: edgecon.dgn	DN:	CK:	DW:	CK:
©TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
03-01 08-01 9-21	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		041A



EASTBOUND CONSTRUCTION
NOT TO SCALE



WESTBOUND CONSTRUCTION
NOT TO SCALE

LEGEND

WORK UNDER CONSTRUCTION

WORK COMPLETED

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

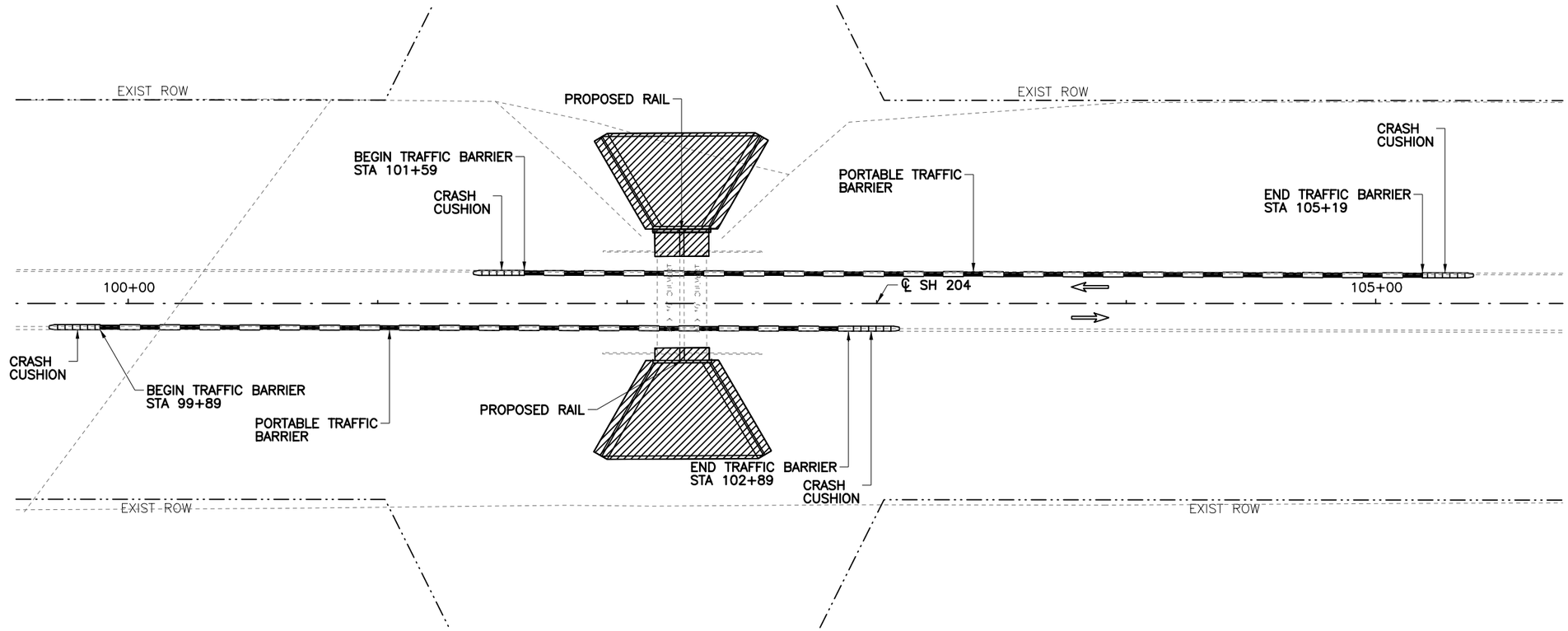
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

TCP BARRIER TYPICAL

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		42

SHEET 1 OF 2



N

25 12.5 0 25 50

SCALE FEET

LEGEND

WORK UNDER CONSTRUCTION

NOTES:

1) REFER TO TCP NARRATIVE FOR MORE INFORMATION.
2) PERFORM CONSTRUCTION ON ONE SIDE OF ROAD AT A TIME.
3) ANY TEMPORARY MOVEMENT OF PTB IS SUBSIDIARY TO ITEM 512.

PORTABLE TRAFFIC BARRIER INFORMATION				
ID	BEGIN STATION	PTB		CRASH CUSH ATTEN (INSTL)
		EB/WB	INSTALL (FT)	
BAILEY CREEK	99+89	EB	300	2
BAILEY CREEK	101+59	WB	360	2

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

TCP BARRIER LAYOUT BAILEY CREEK

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		43

SHEET 1 OF 2

cpybw_ANSIB.tbl
cpypdf_ANSIB.pltcfg
pw:/Active Projects/TXDO1600493.00/TXDO1600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.03 TCP/4930102TCPbarr01.dgn
3/5/2019 8:09:46 AM kperry
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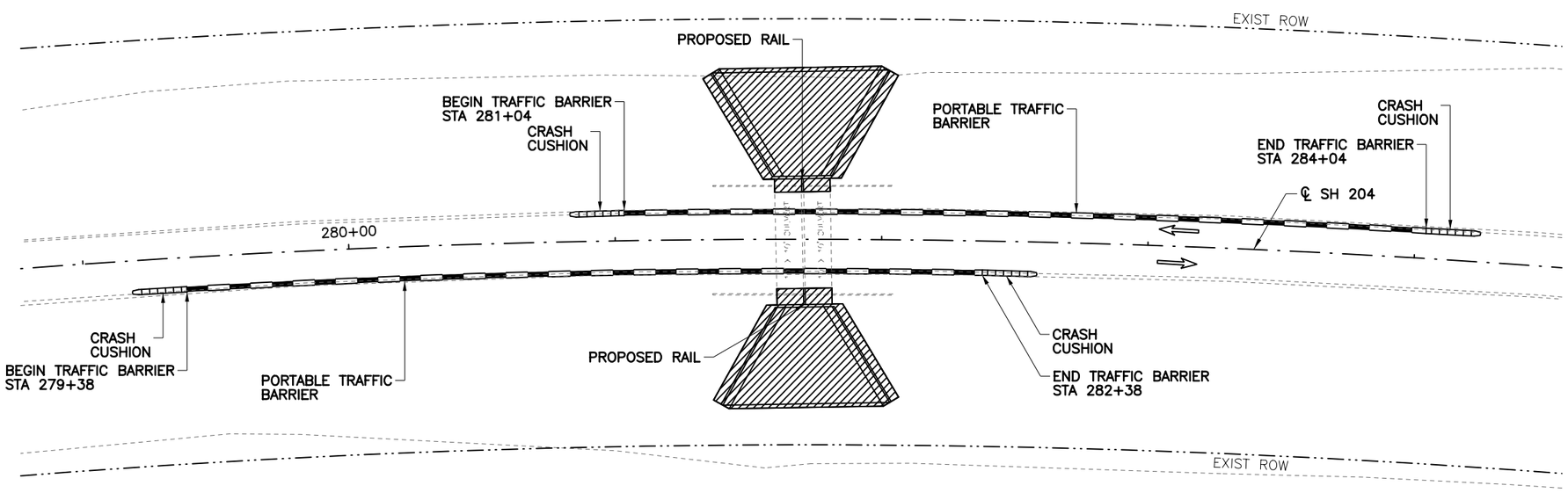
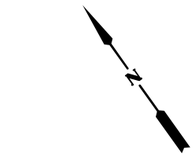




LEGEND

WORK UNDER CONSTRUCTION

NOTES:

1) REFER TO TCP NARRATIVE FOR MORE INFORMATION.
2) PERFORM CONSTRUCTION ON ONE SIDE OF ROAD AT A TIME.
3) ANY TEMPORARY MOVEMENT OF PTB IS SUBSIDIARY TO ITEM 512.

PORTABLE TRAFFIC BARRIER INFORMATION

ID	BEGIN STATION	PTB		CRASH CUSH ATTEN (INSTL)
		EB/WB	INSTALL (FT)	
LITTLE CREEK	279+38	EB	300	2
LITTLE CREEK	281+04	WB	300	2

3/5/2019

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

TCP BARRIER LAYOUT LITTLE CREEK

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	44

SHEET 2 OF 2

DATE:
FILE:

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).

2. The development and design of the Traffic Control Plan (TCP)is the responsibility of the Engineer.

3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.

4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.

5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.

6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.

7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.

8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.

10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.

11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.

12. The Engineer has the final decision on the location of all traffic control devices.

13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.

2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.

2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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

Texas Department of Transportation

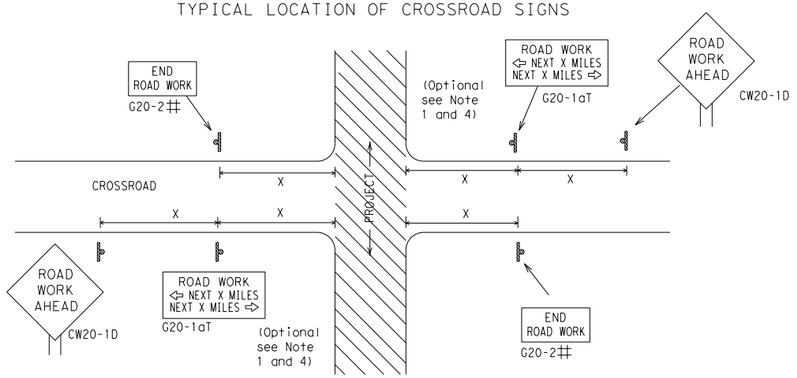
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	TYL	CHEROKEE		45
5-10 5-21				

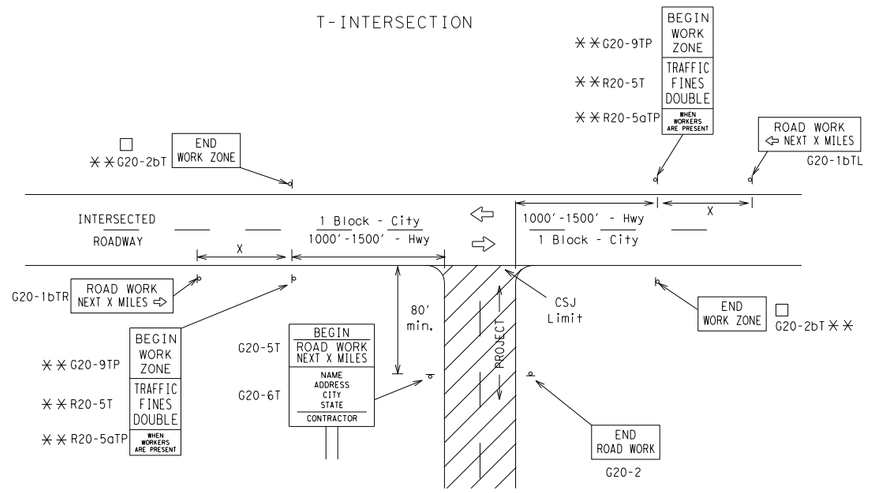
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

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

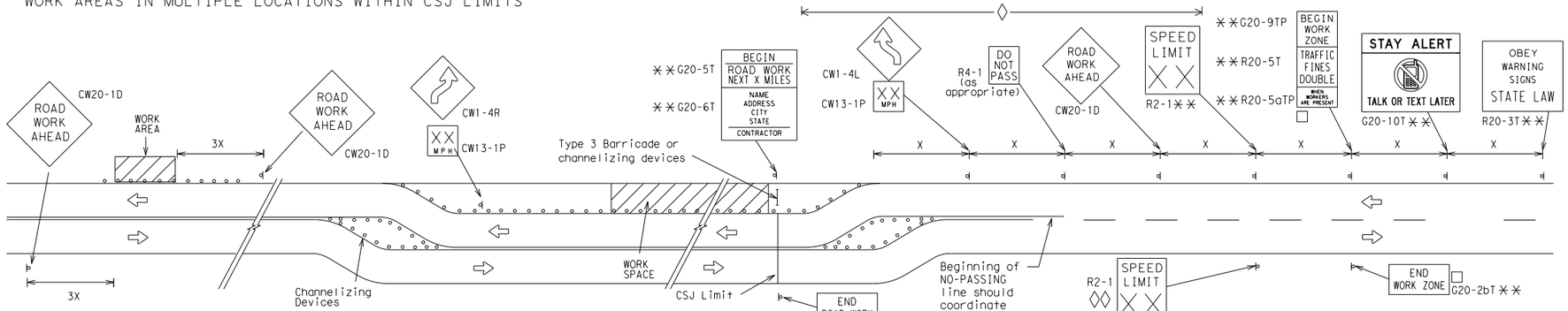
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

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

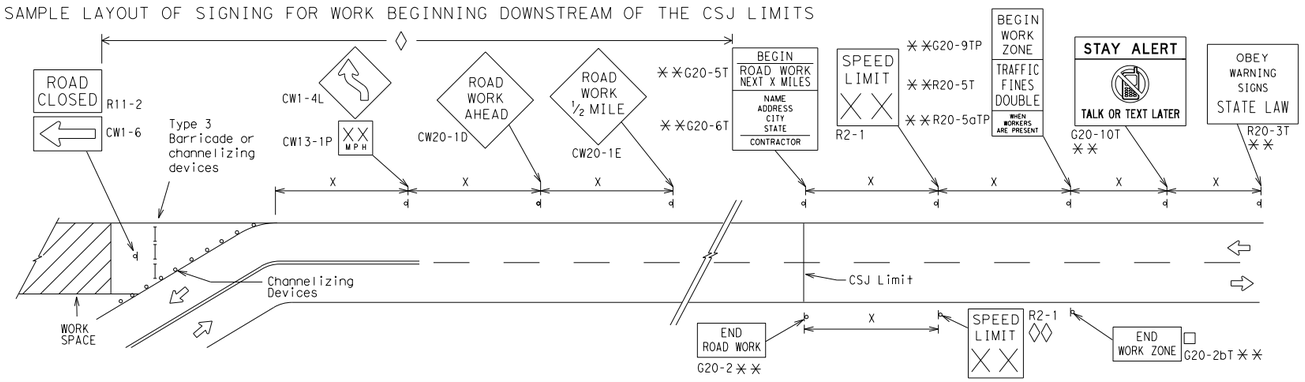
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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

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



NOTES

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

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

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

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

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

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

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	0450	01	013	SH 204
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	CHEROKEE		46

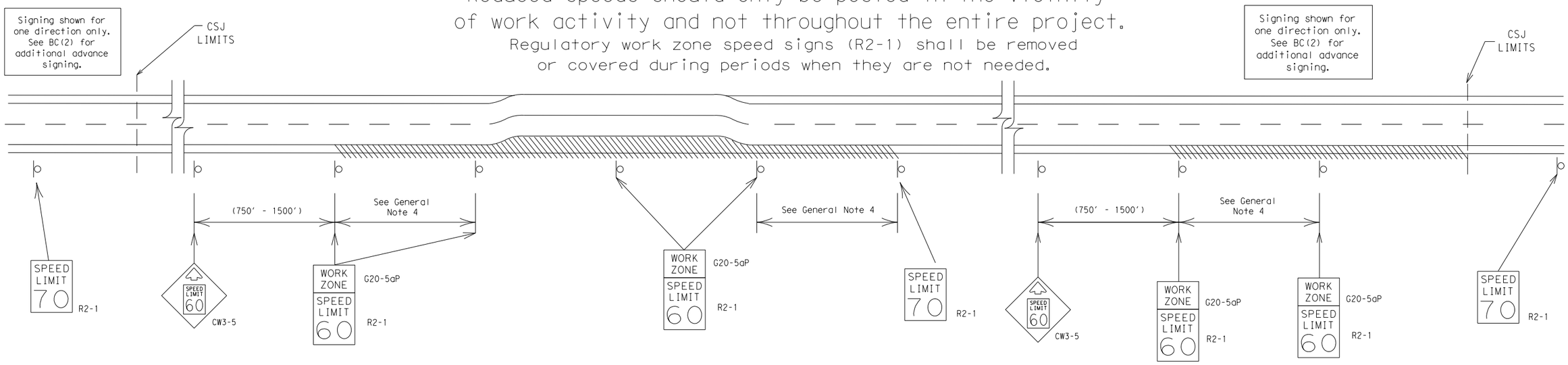
DATE:
FILE:

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	CHEROKEE		47

DATE:
FILE:

DATE:
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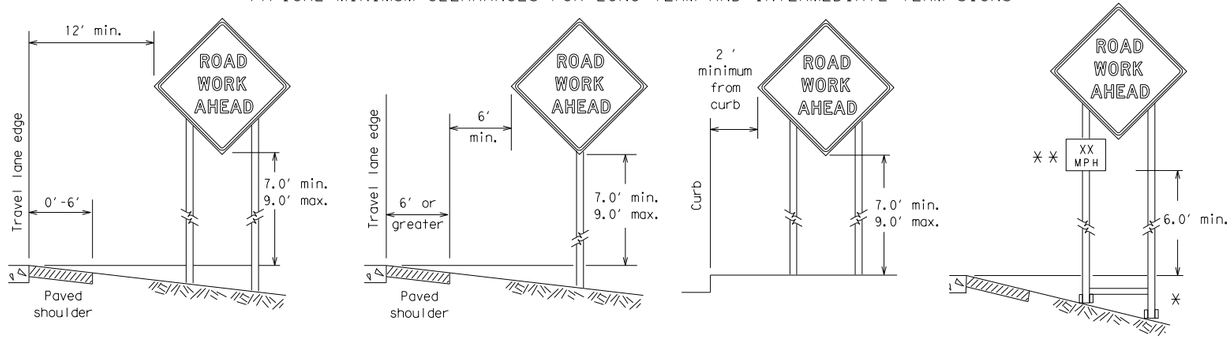
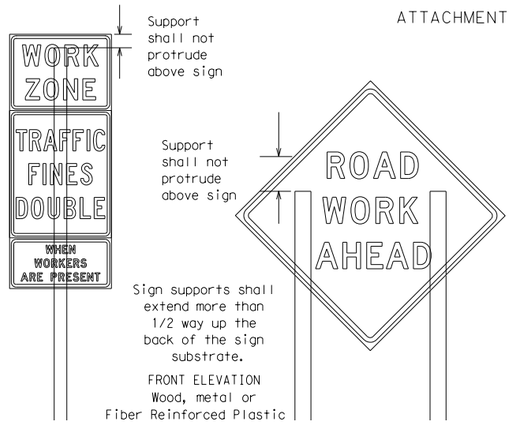
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

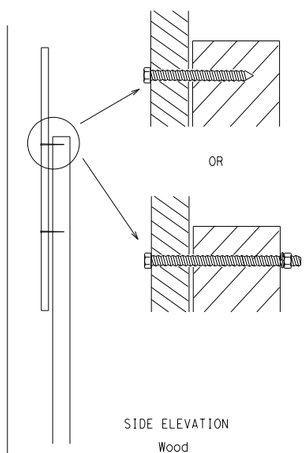


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





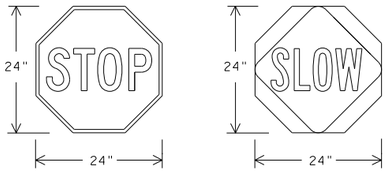
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

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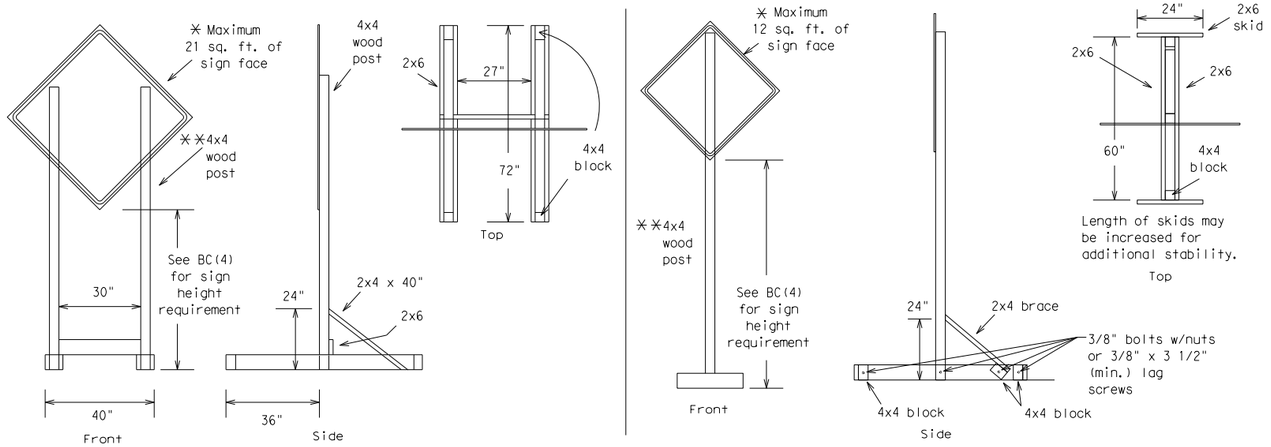
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

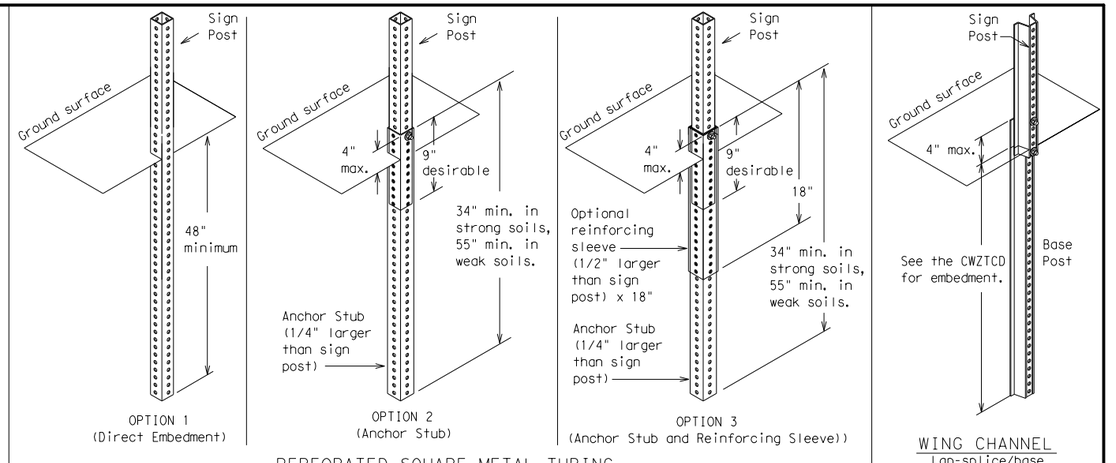
BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	CHEROKEE		48



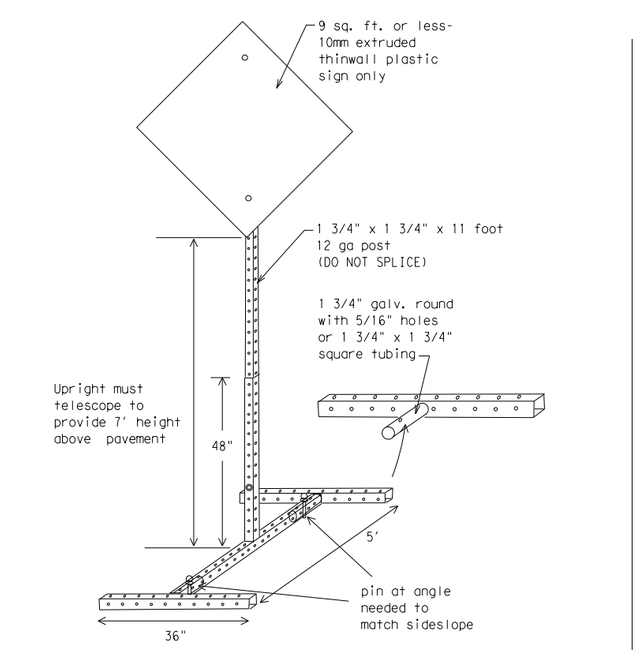
SKID MOUNTED WOOD SIGN SUPPORTS

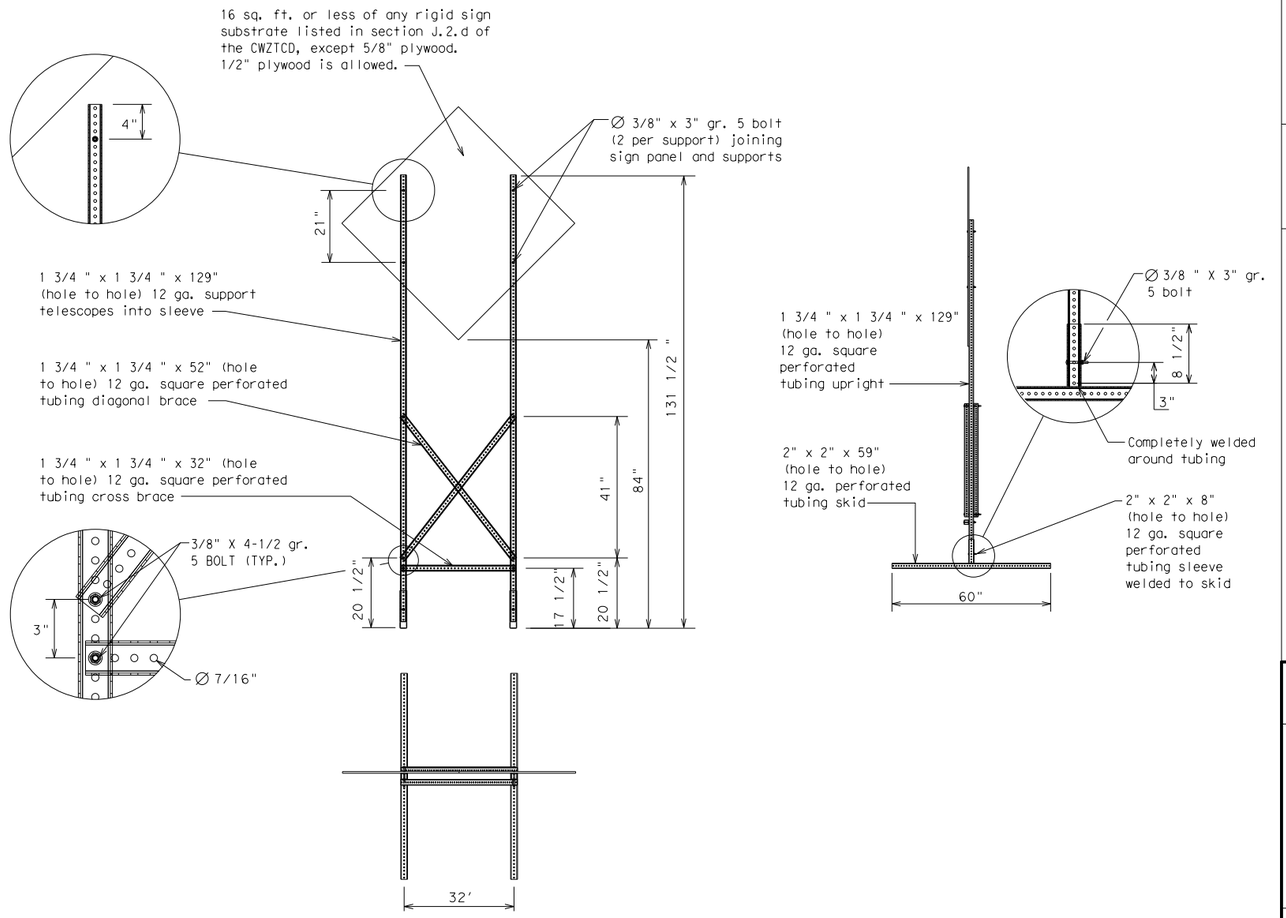
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



GROUND MOUNTED SIGN SUPPORTS

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





SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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7-13 5-21	TYL	CHEROKEE		49

DATE:
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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)

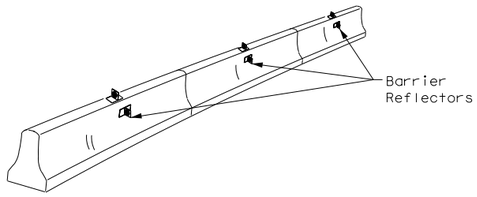
BC(6)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		0450	01	013	SH 204
9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		TYL	CHEROKEE		50

100

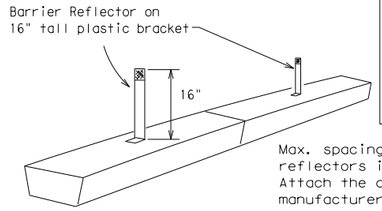
DATE:
FILE:

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.

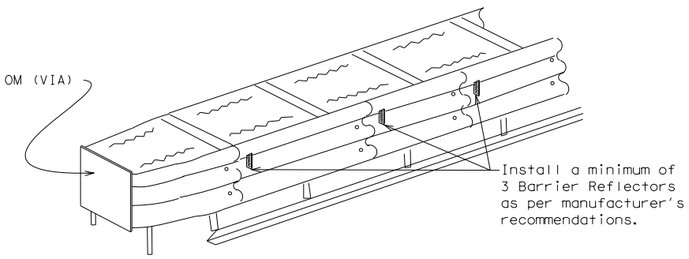


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

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.

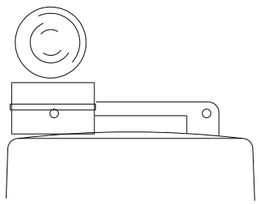


DELINEATION OF END TREATMENTS

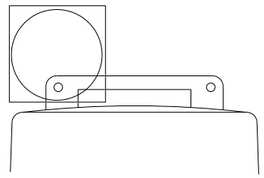
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

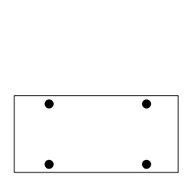
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

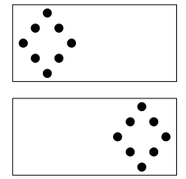
Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

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:

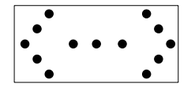


4 CORNER CAUTION

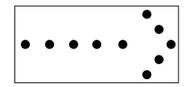
OR



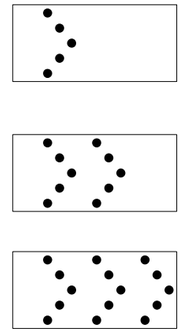
ALTERNATING DIAMOND CAUTION



DOUBLE ARROW



RIGHT/LEFT ARROW
(right arrow shown; left is similar)



RIGHT/LEFT SEQUENTIAL CHEVRON
(right chevron shown; left is similar)

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

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

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

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0450	01	013	SH 204
9-07 8-14	DIST	COUNTY		SHEET NO.
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DATE:
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

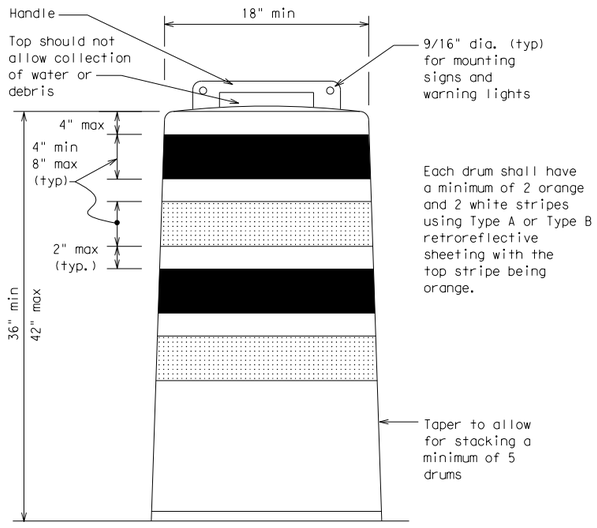
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

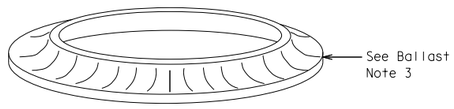
RETROREFLECTIVE SHEETING

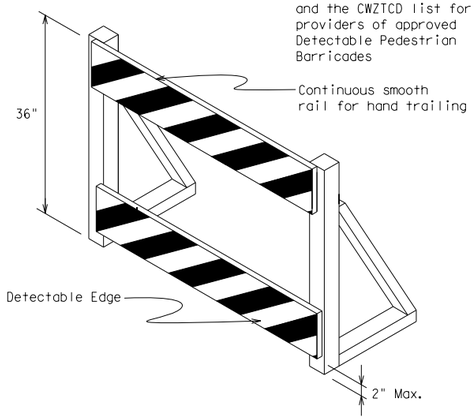
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

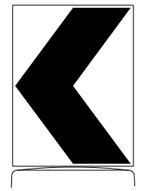




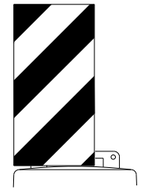


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0450	01	013	SH 204
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	TYL	CHEROKEE		52
7-13				

DATE:
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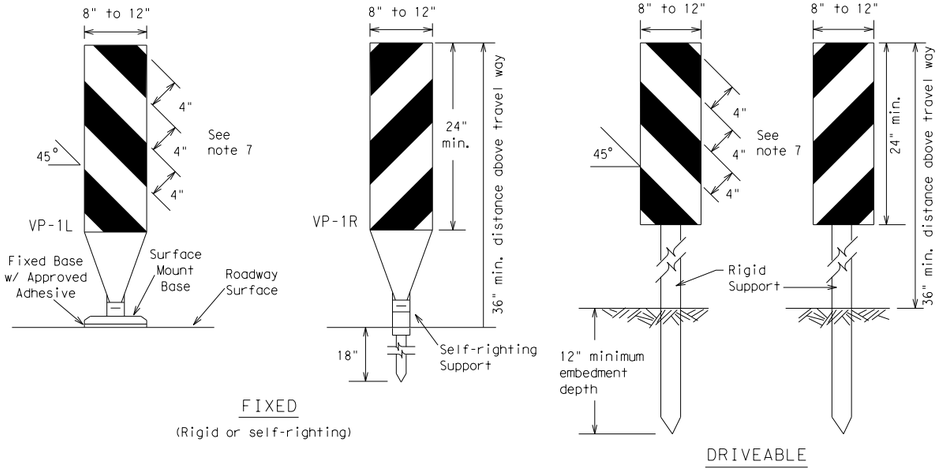
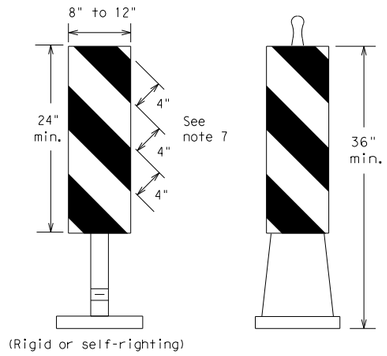


FIXED

(Rigid or self-righting)

DRIVEABLE

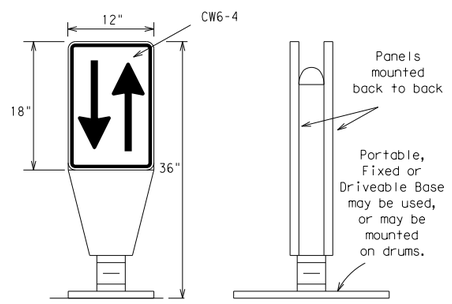


(Rigid or self-righting)

PORTABLE

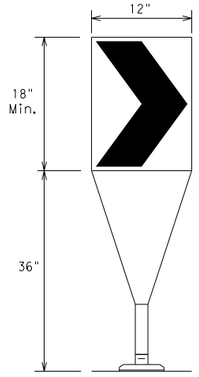
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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)



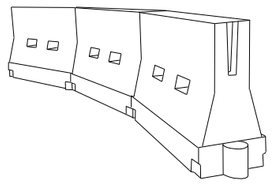
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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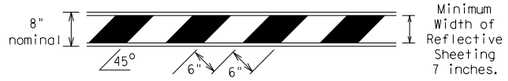
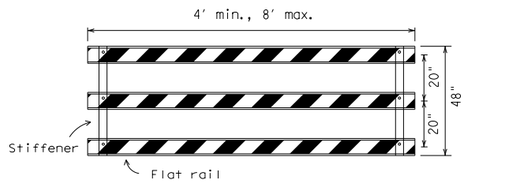
TYPE 3 BARRICADES

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.



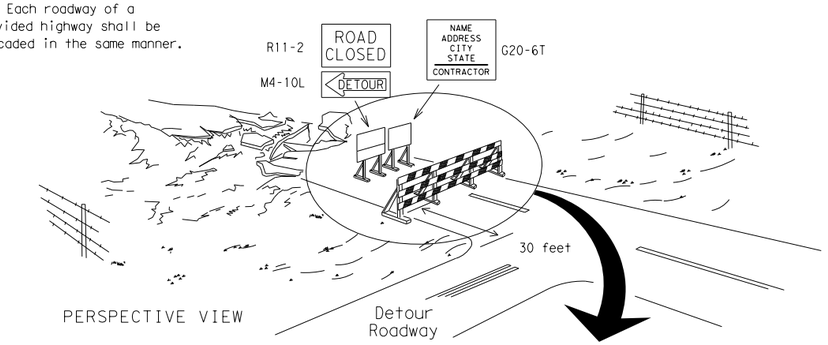
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

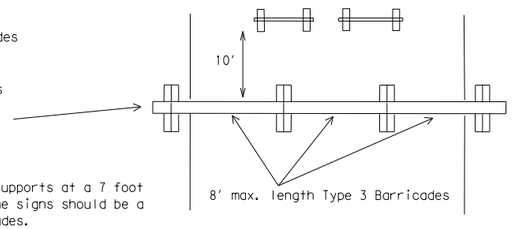
Each roadway of a divided highway shall be barricaded in the same manner.



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.

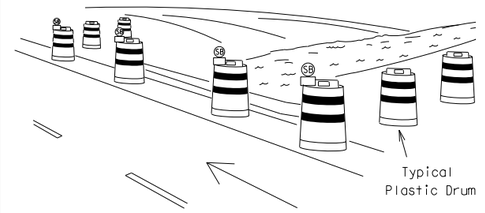
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

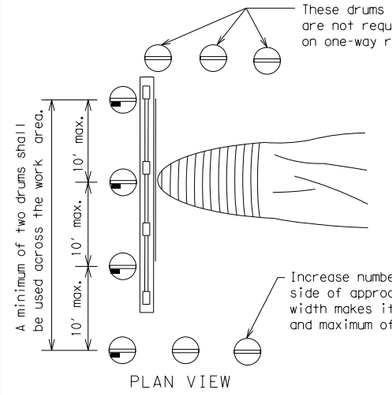
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

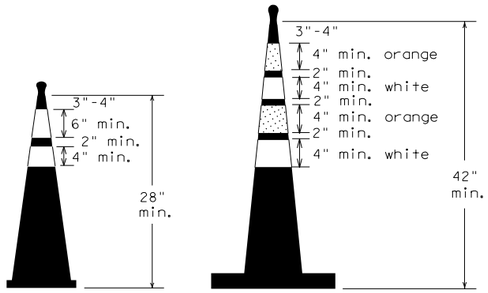
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



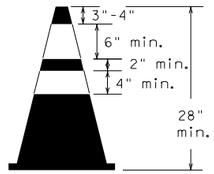
PLAN VIEW

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

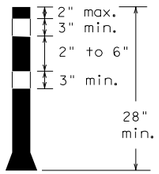
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

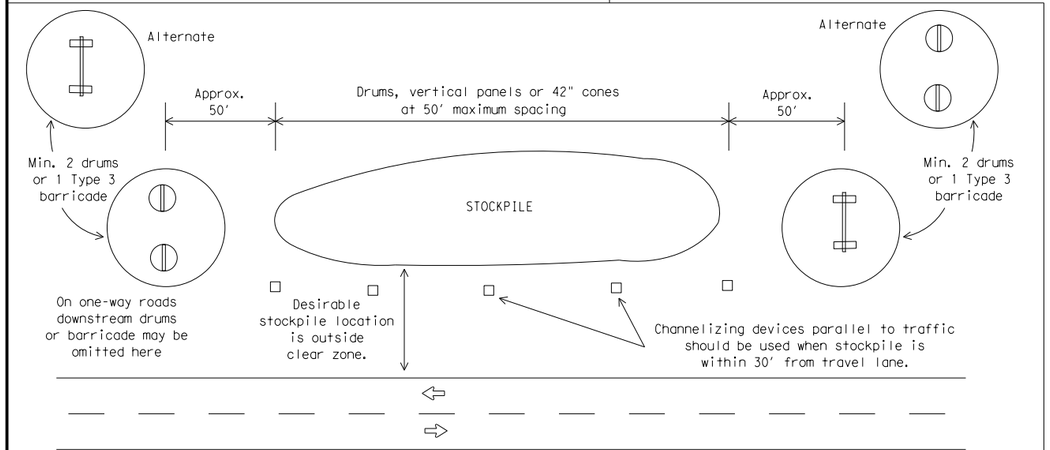


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

DATE:
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SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	CHEROKEE		54

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DATE:
FILE:

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.

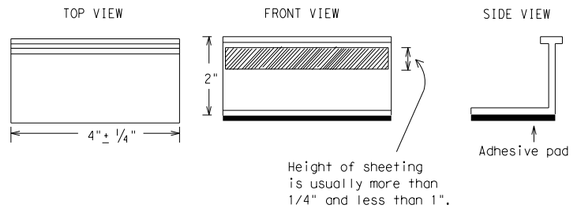
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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	0450	01	013	SH 204
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	TYL	CHEROKEE		55
11-02 8-14				

105

DATE:
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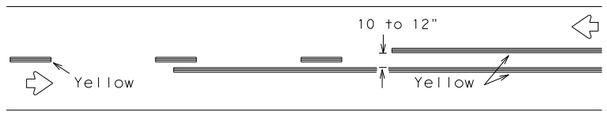
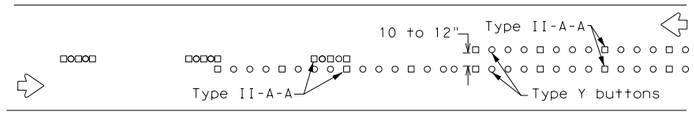
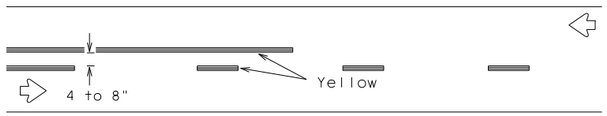
PAVEMENT MARKING PATTERNS



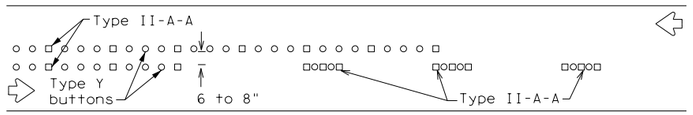
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



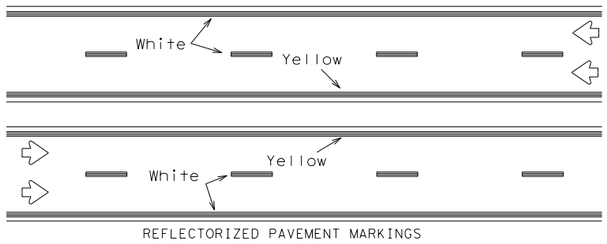
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



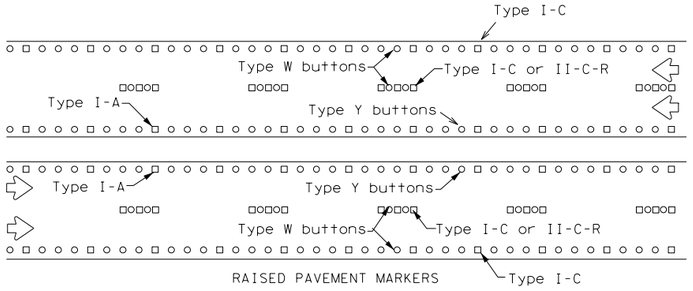
RAISED PAVEMENT MARKERS - PATTERN B

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

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



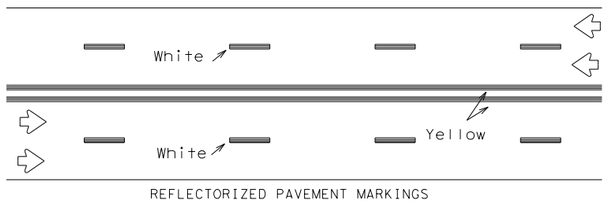
REFLECTORIZED PAVEMENT MARKINGS



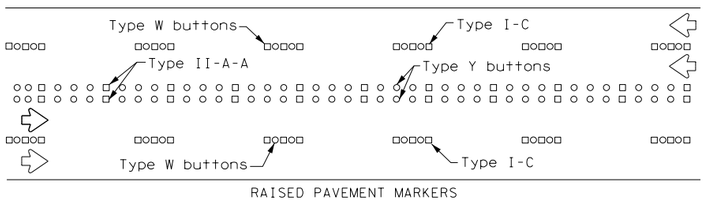
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



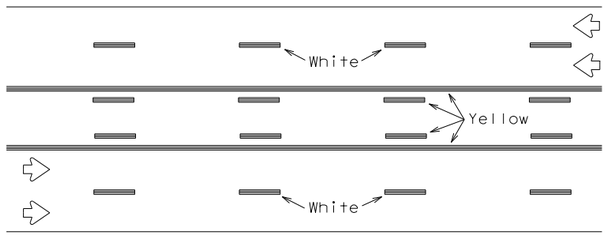
REFLECTORIZED PAVEMENT MARKINGS



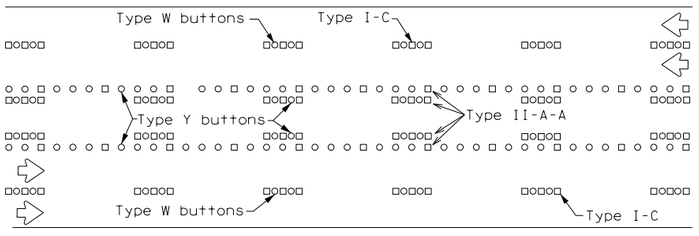
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

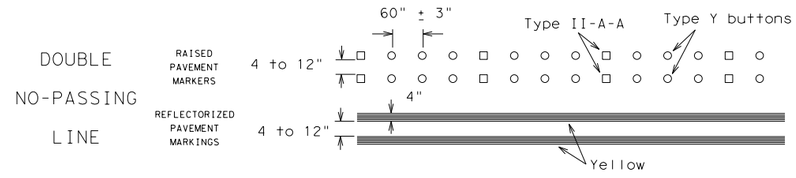
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

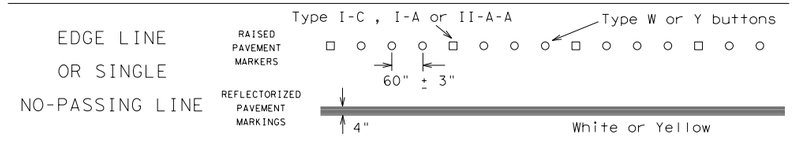
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

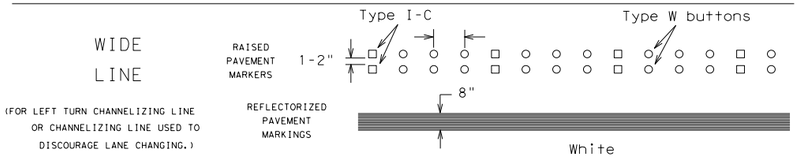


EDGE LINE OR SINGLE NO-PASSING LINE



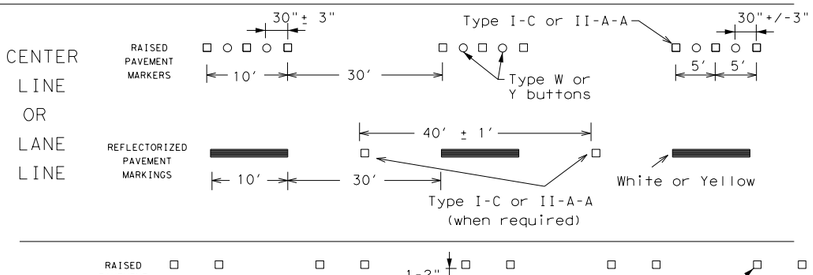
WIDE LINE

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

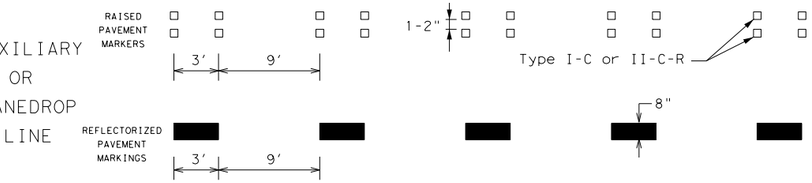


BROKEN LINES

CENTER LINE OR LANE LINE

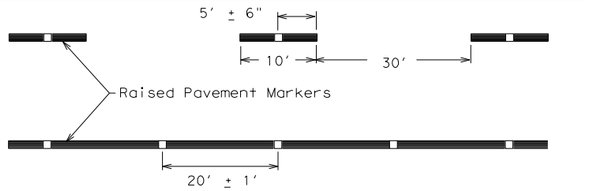


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

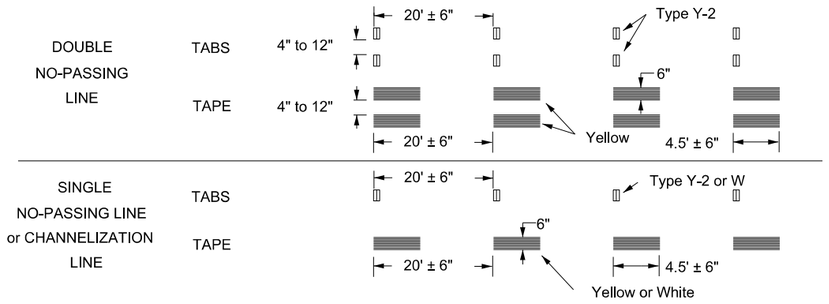
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		56

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



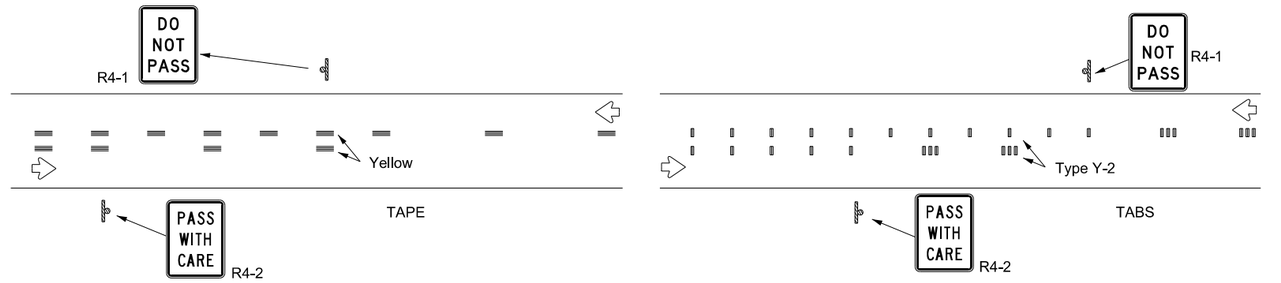
NOTES:

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

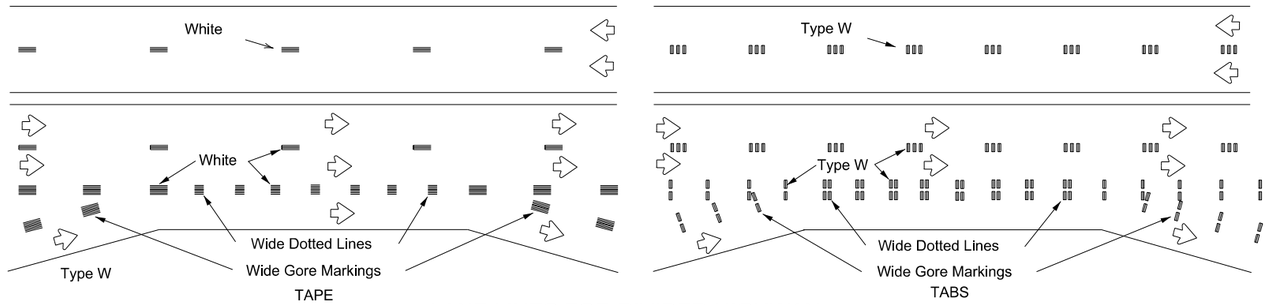
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

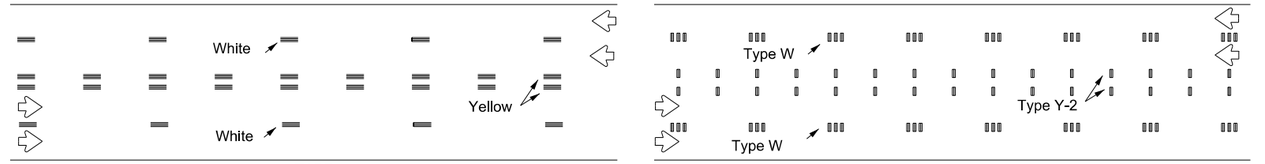
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



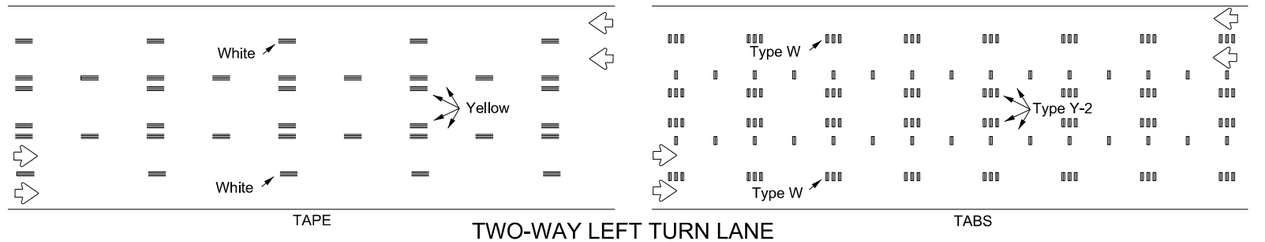
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



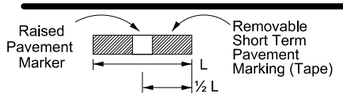
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
4-92 7-13 1-97 2-23 3-03	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		57

DATE:
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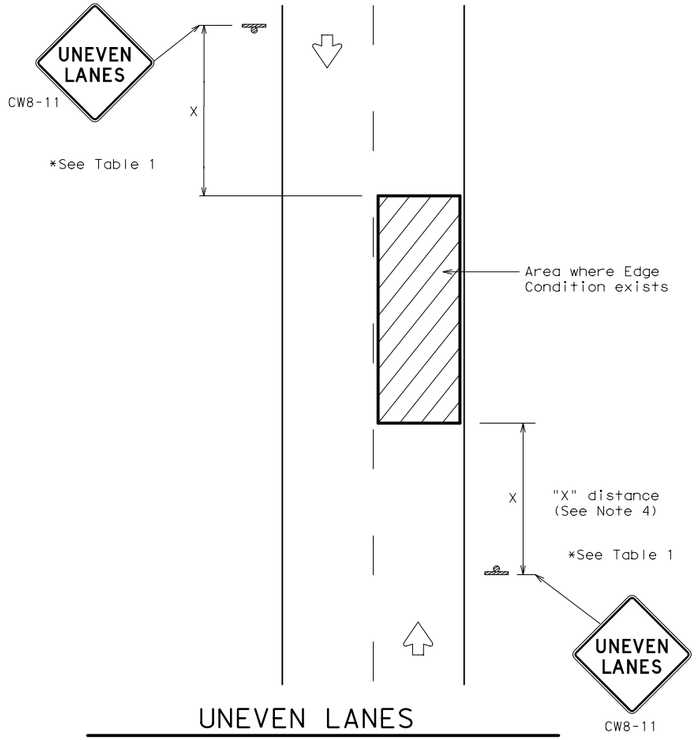
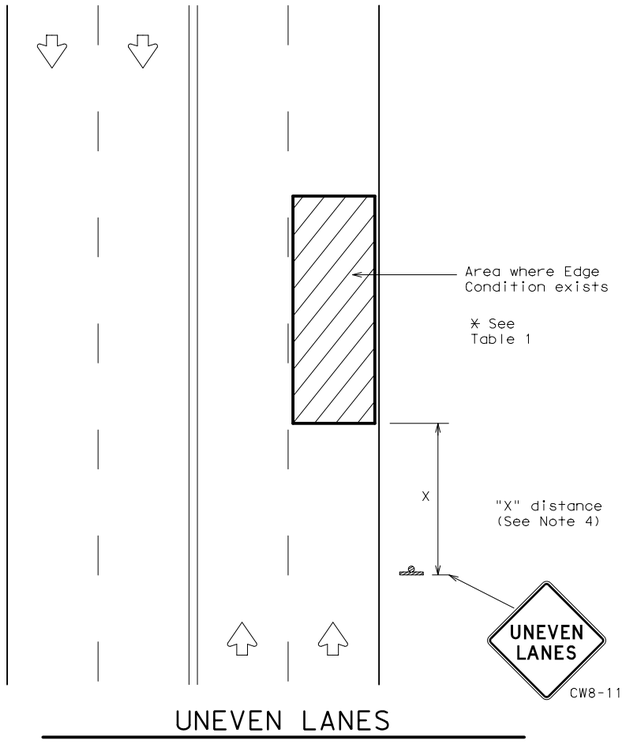
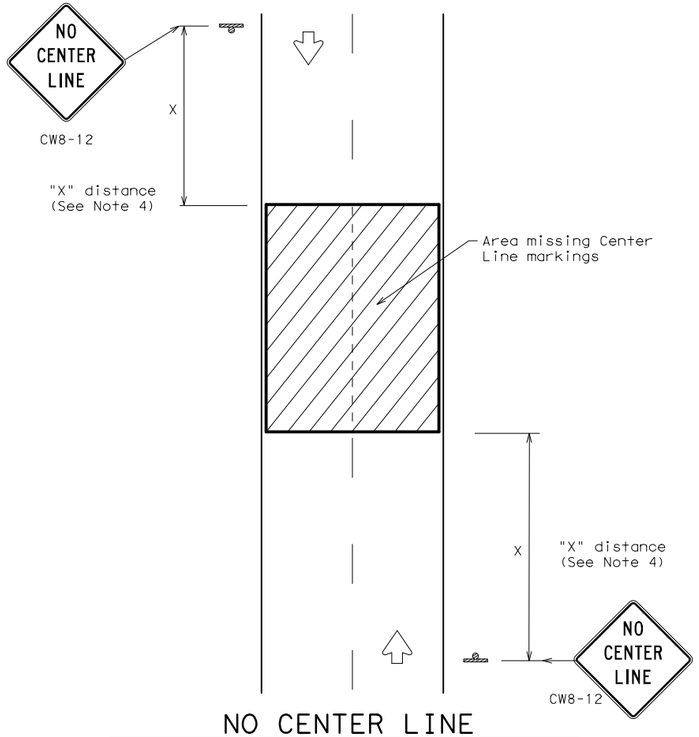


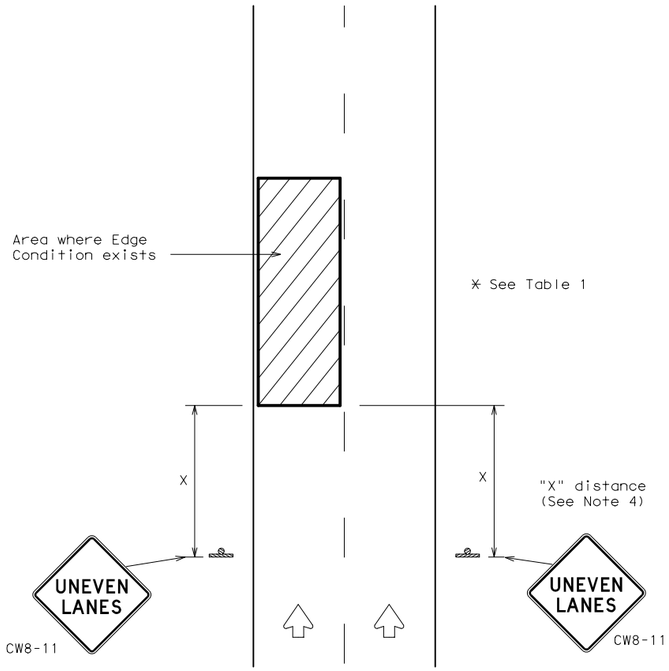
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

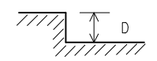
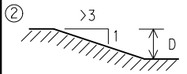
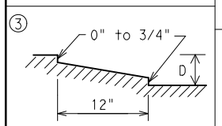
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

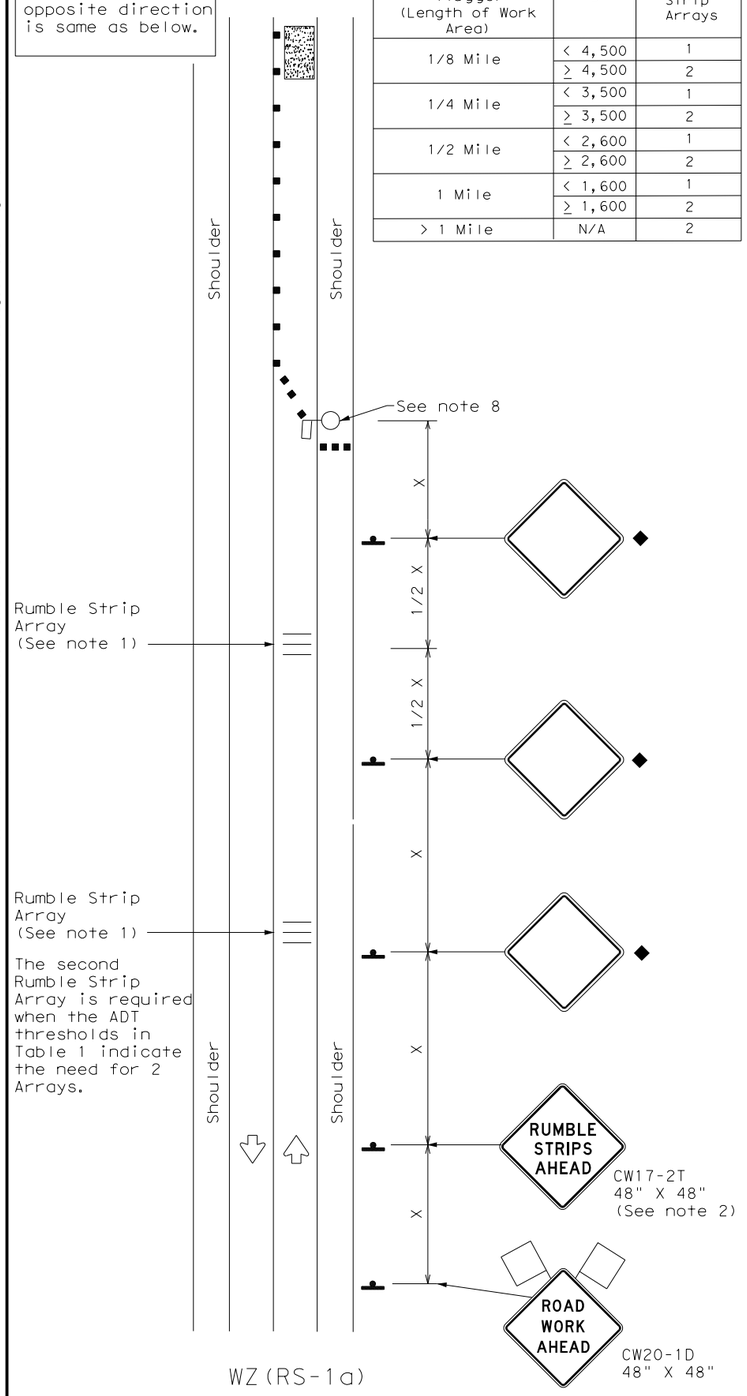
WZ(UL)-13

FILE:	wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		0450	01	013	SH 204
8-95 2-98 7-13		DIST	COUNTY		SHEET NO.
1-97 3-03		TYL	CHEROKEE		58

DATE:
FILE:

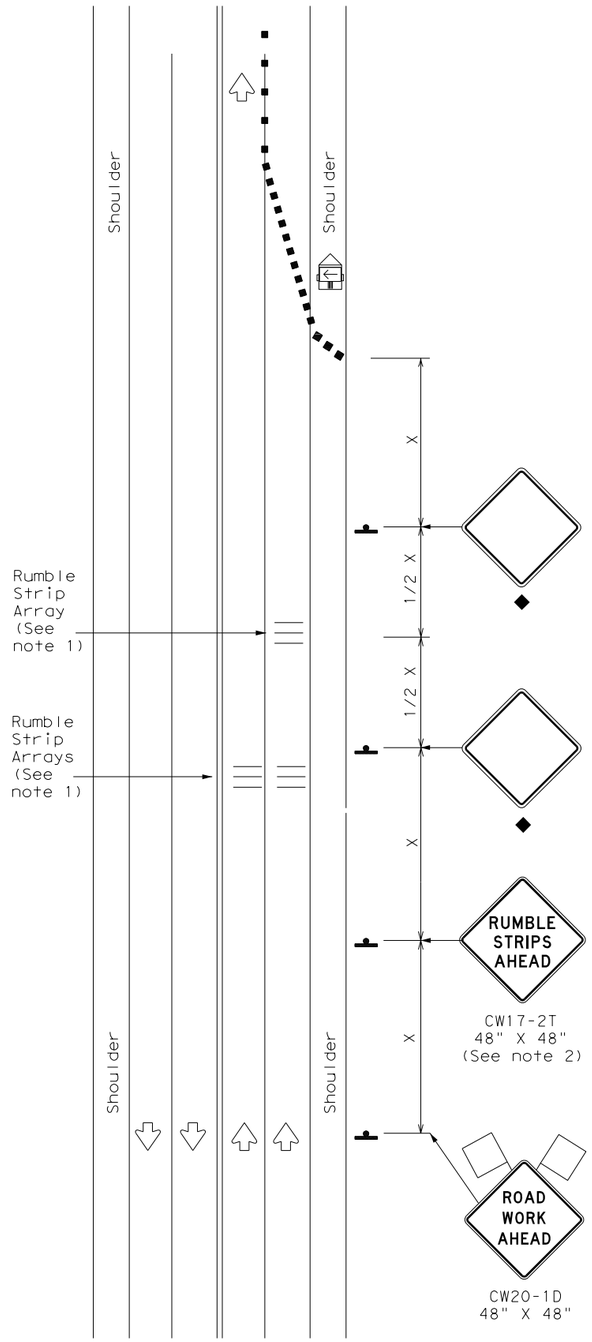
Warning sign and rumble strip sequence in opposite direction is same as below.

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
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4-16	TYL	CHEROKEE		59

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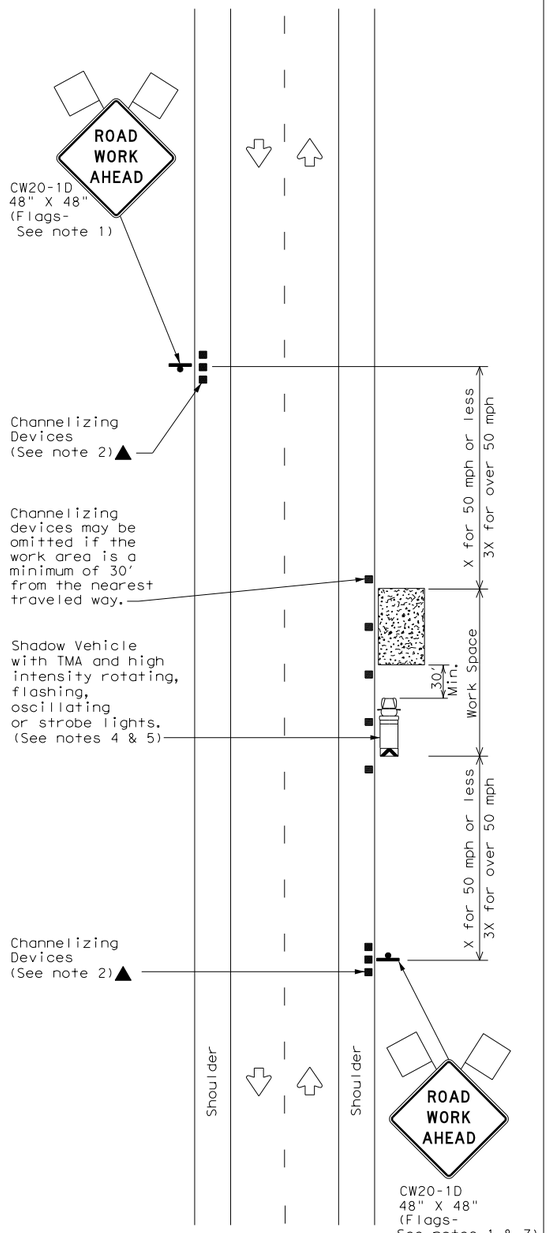
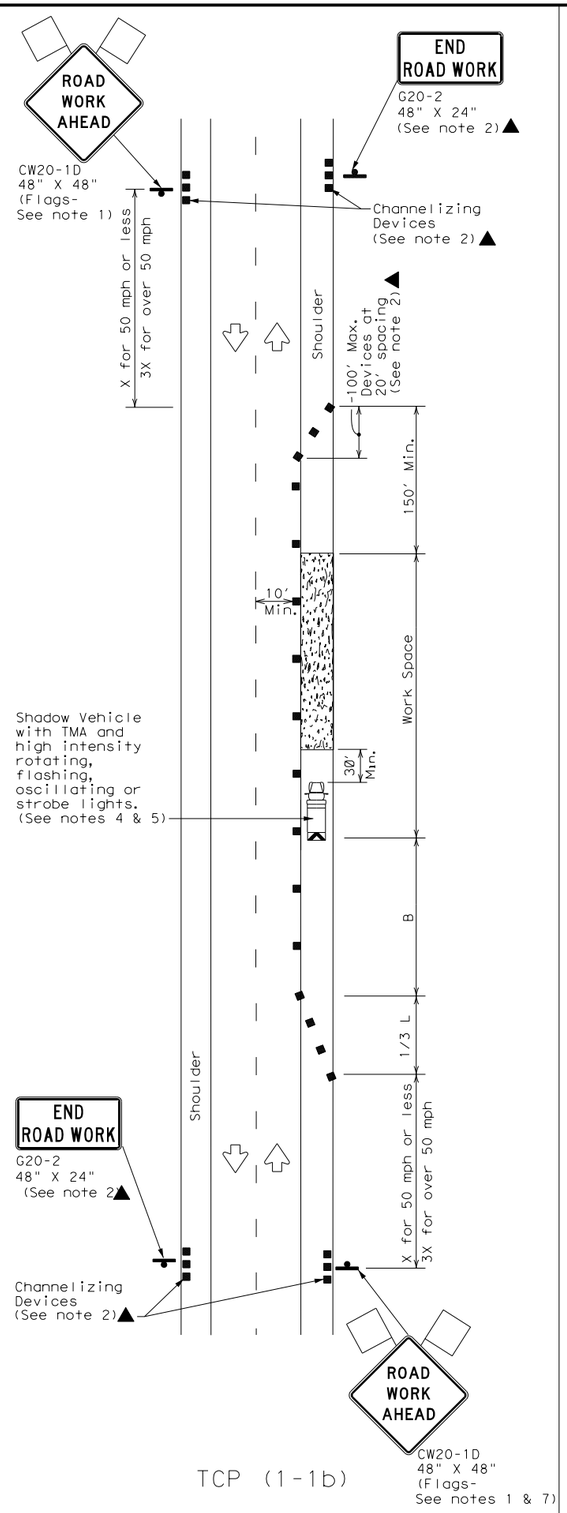


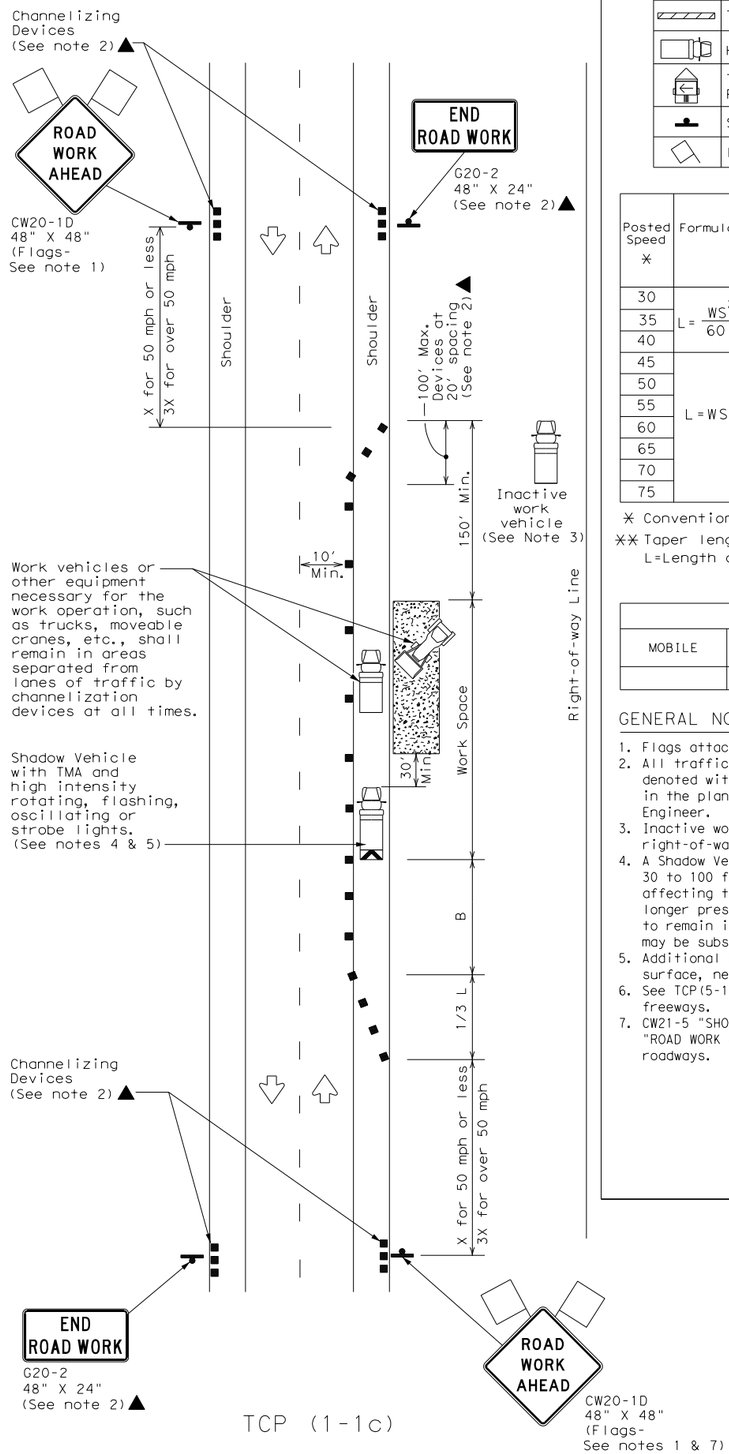
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
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REVISIONS	0450	01	013	SH 204
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	TYL	CHEROKEE		60
1-97 2-18				

151

DATE:
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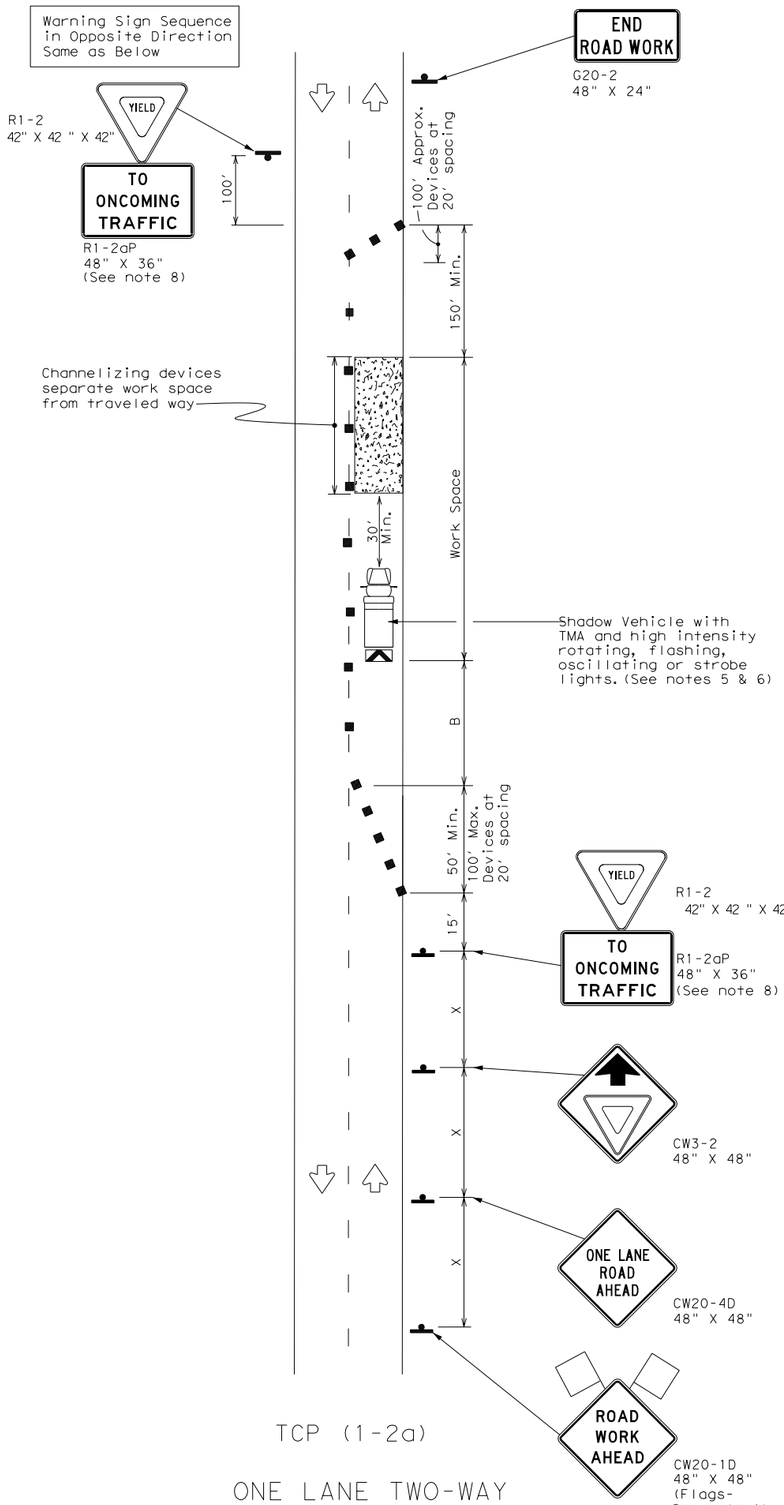
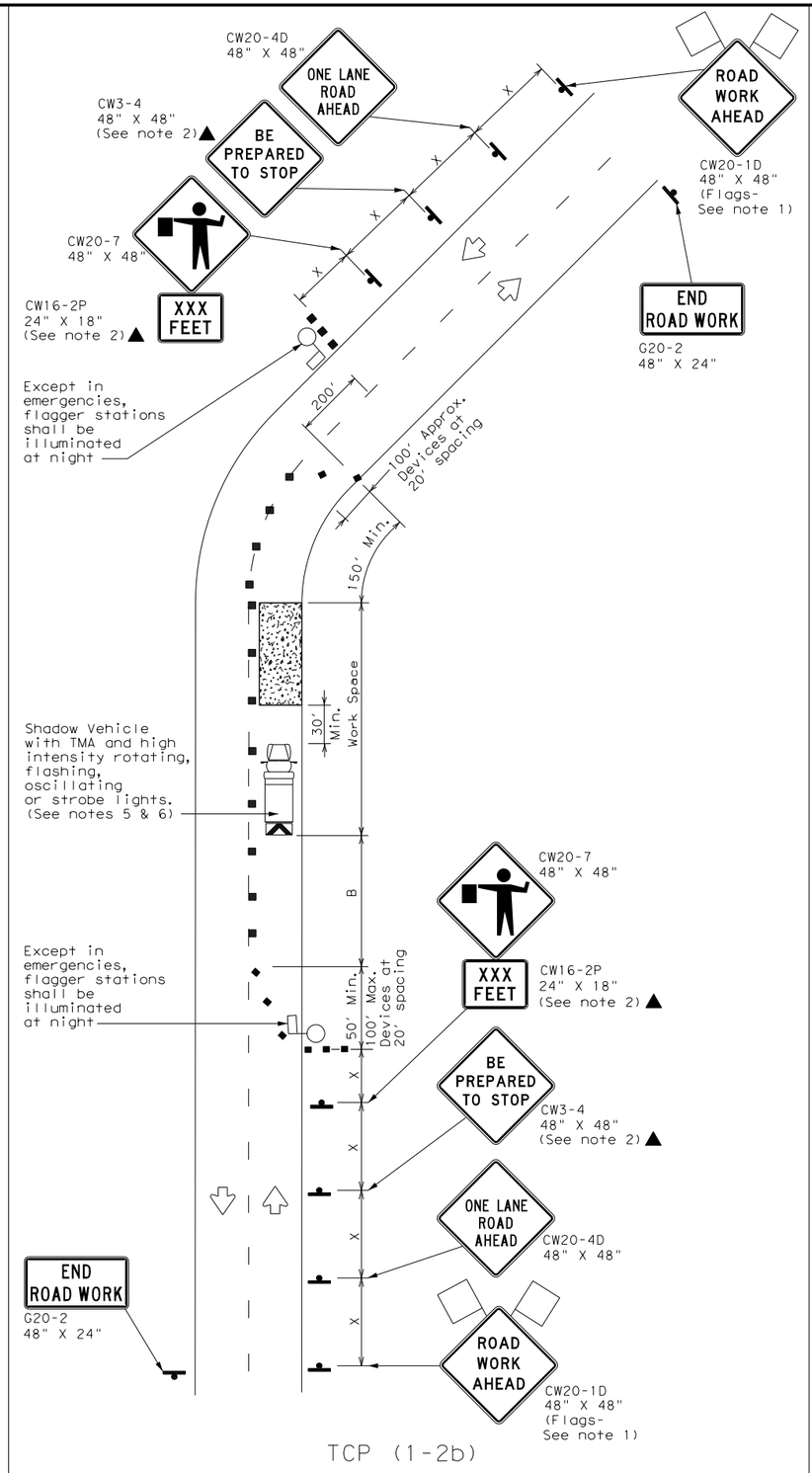


TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	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 CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP (1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98	0450	01	013	SH 204
2-94 2-12	DIST	COUNTY		SHEET NO.
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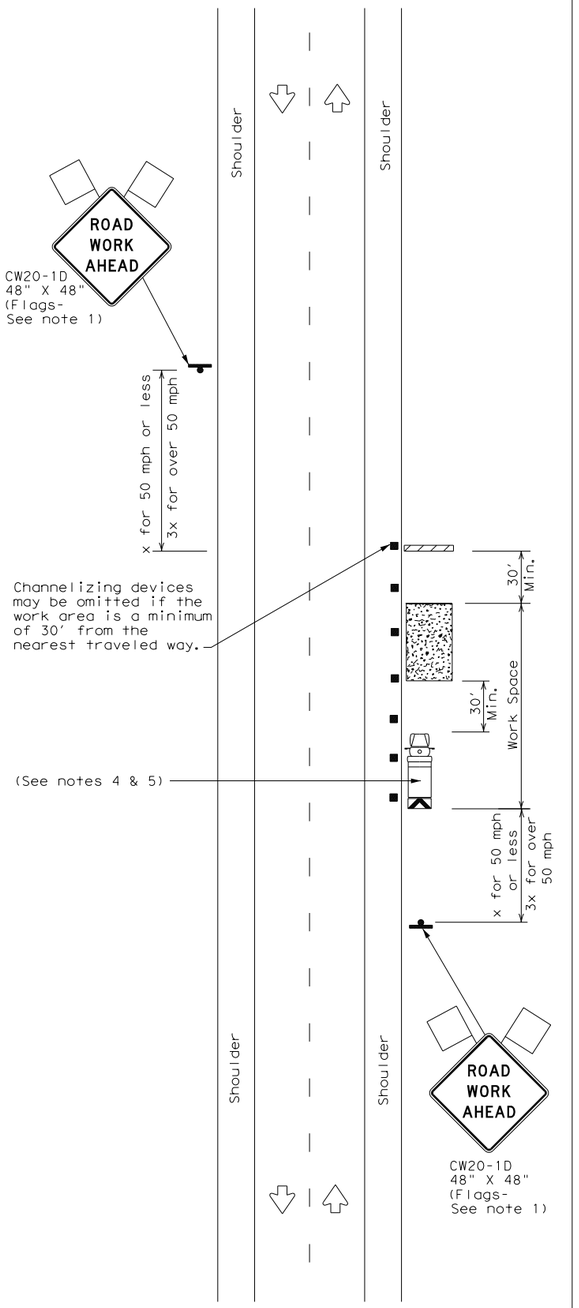
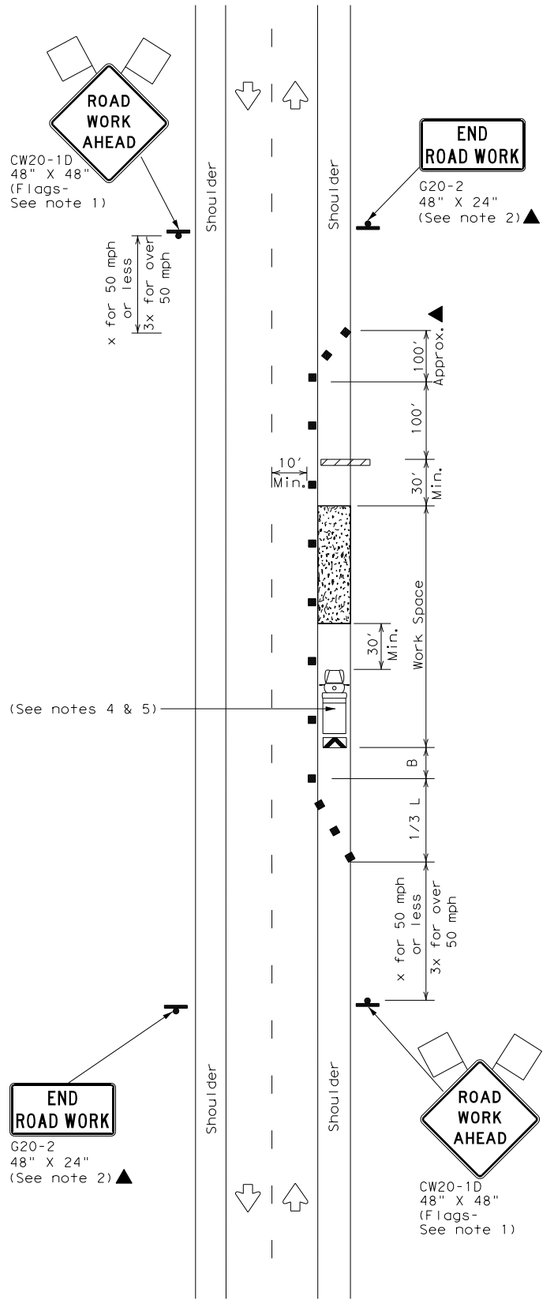


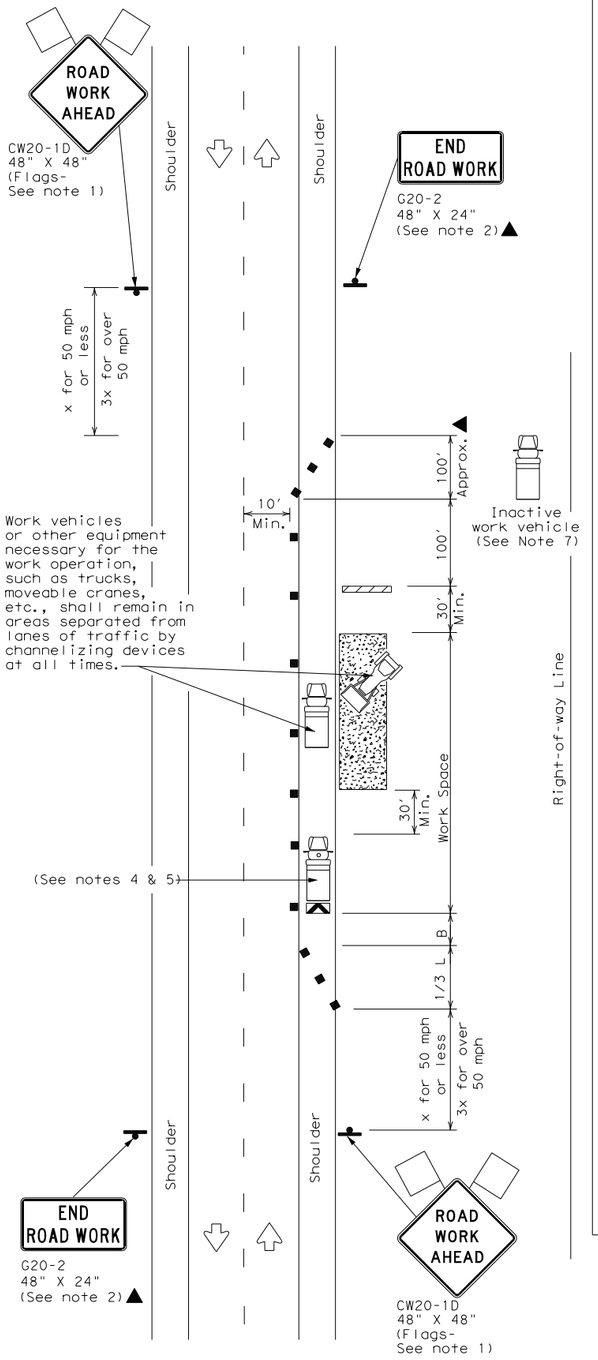
TCP (2-1a)

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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REVISIONS	0450	01	013	SH 204
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	TYL	CHEROKEE		62
1-97 2-18				

DATE:
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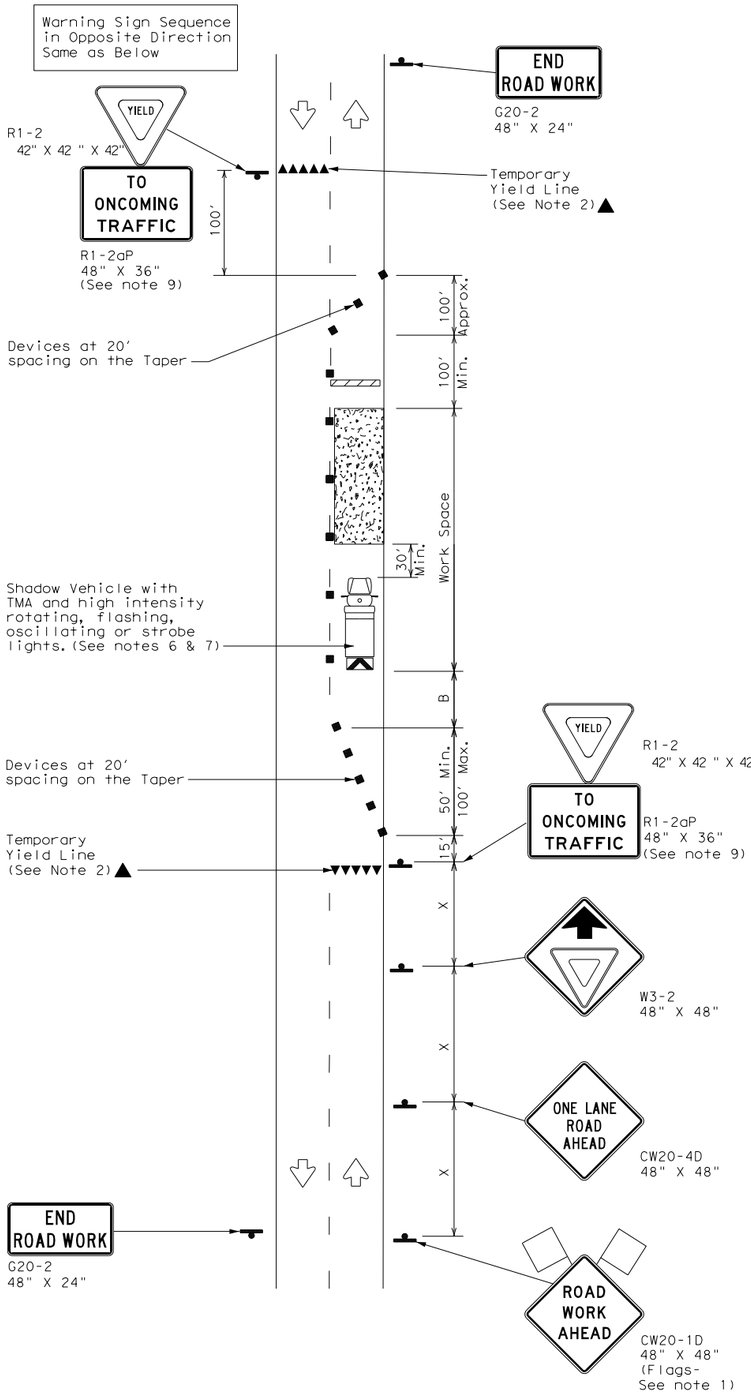
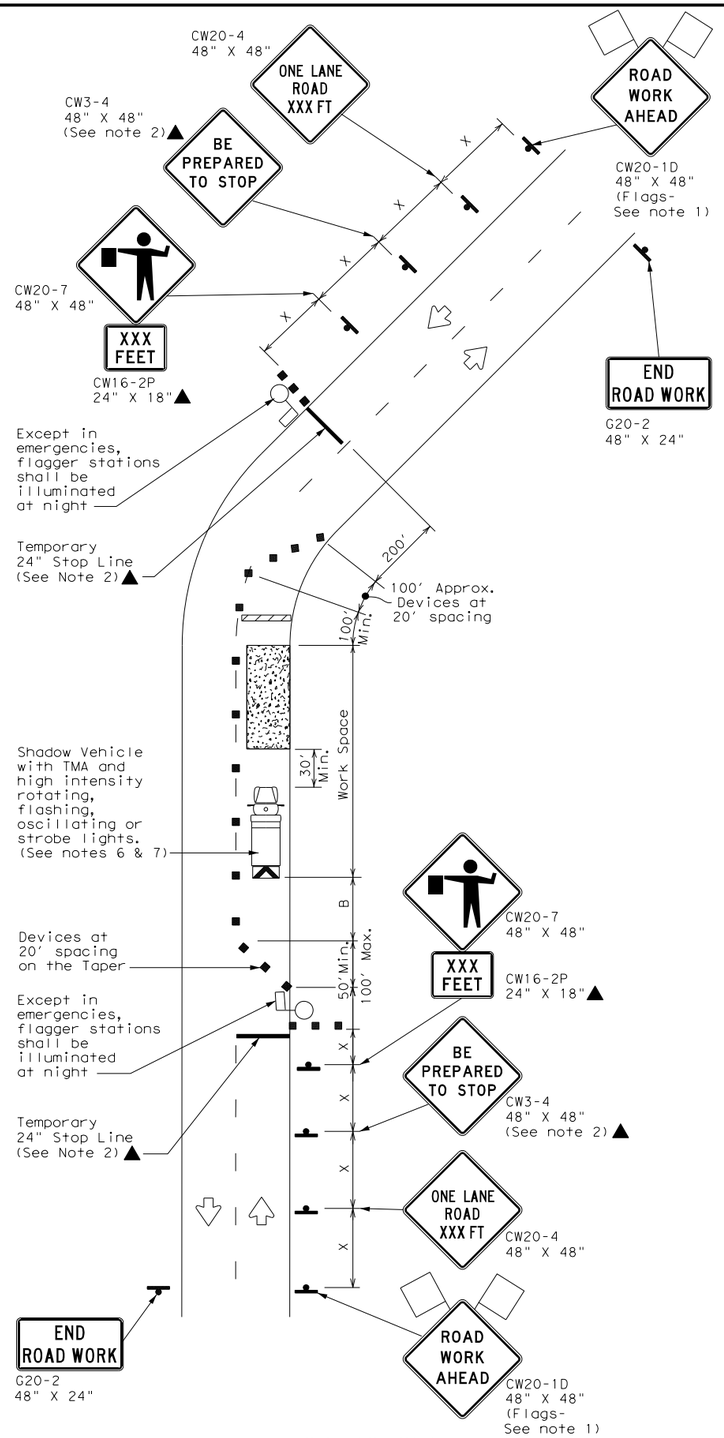


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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

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

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

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP (2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
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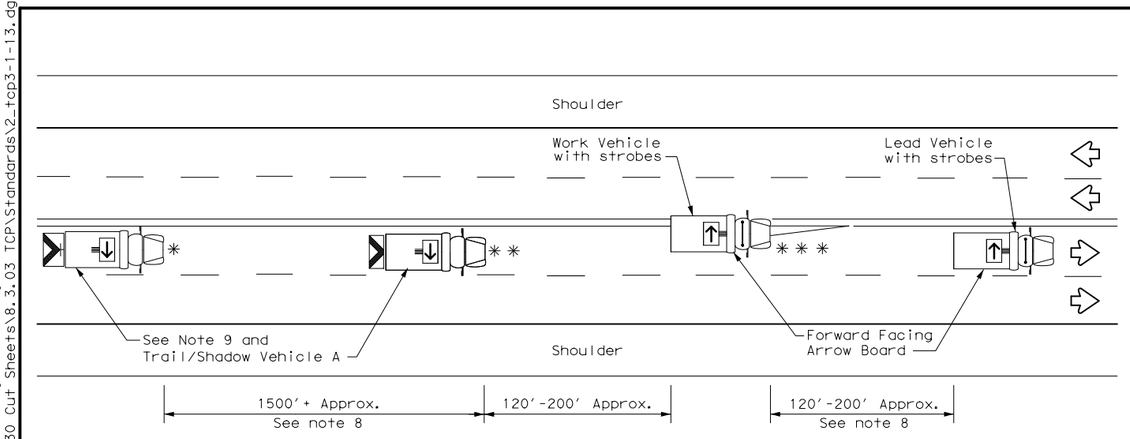
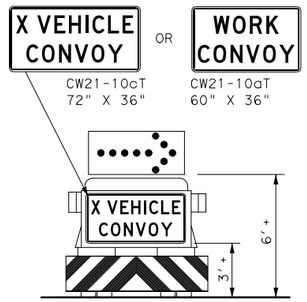


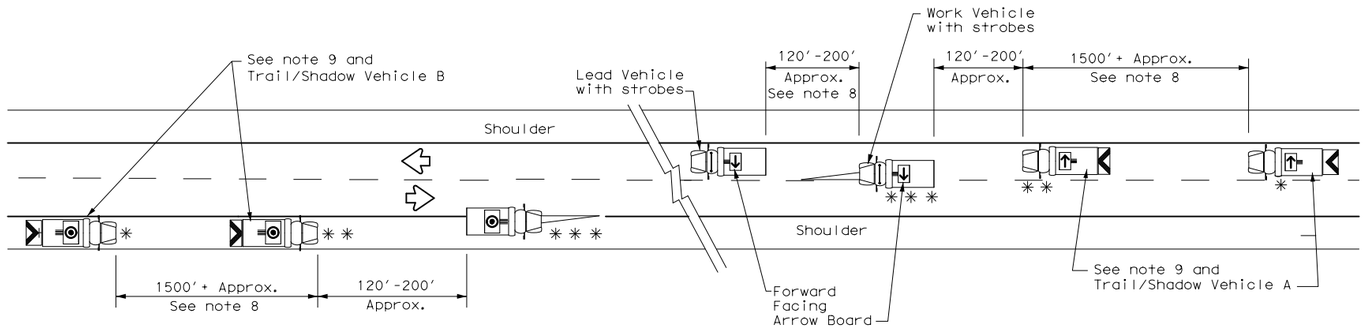
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

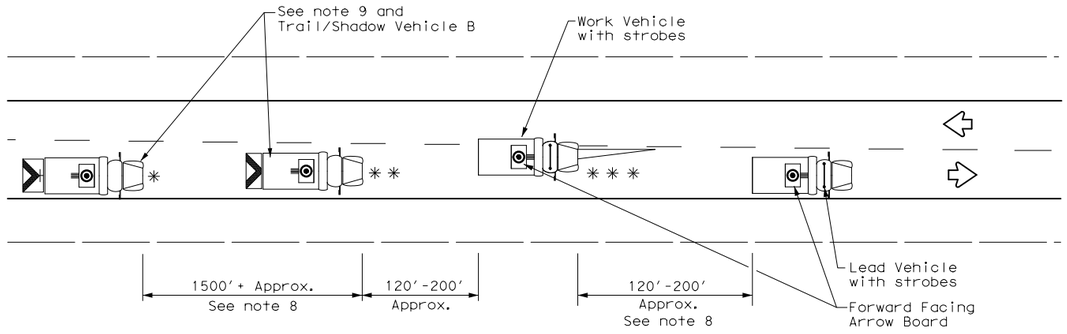


WORK ON SHOULDER

WORK ON TRAVEL LANE

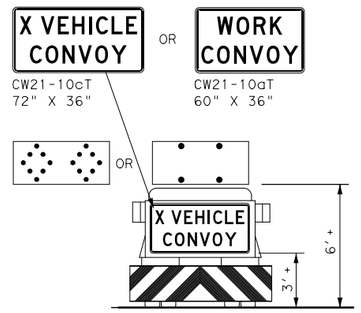
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

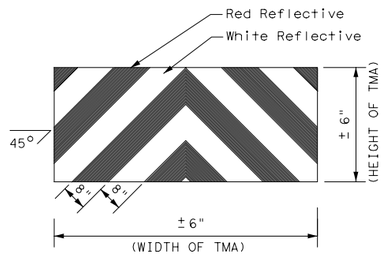
with Flashing Arrow Board in CAUTION display

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

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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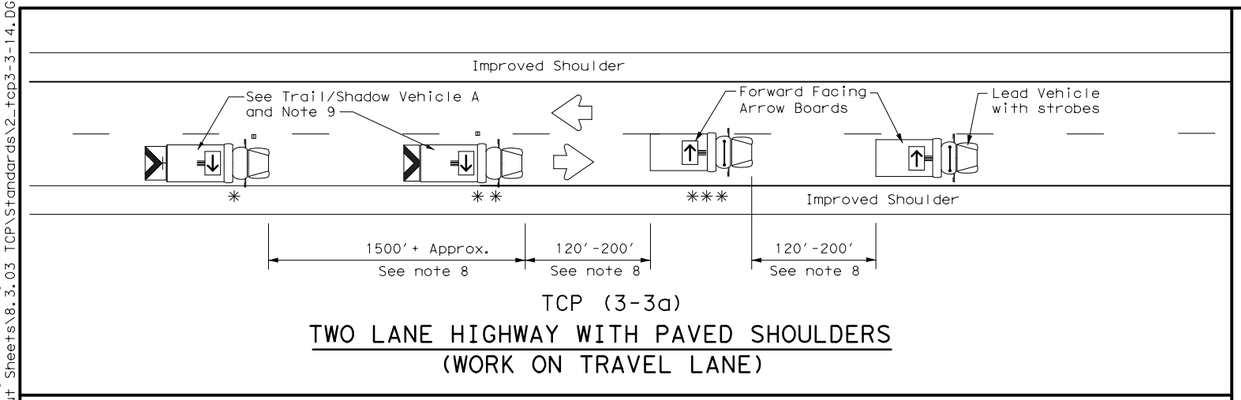
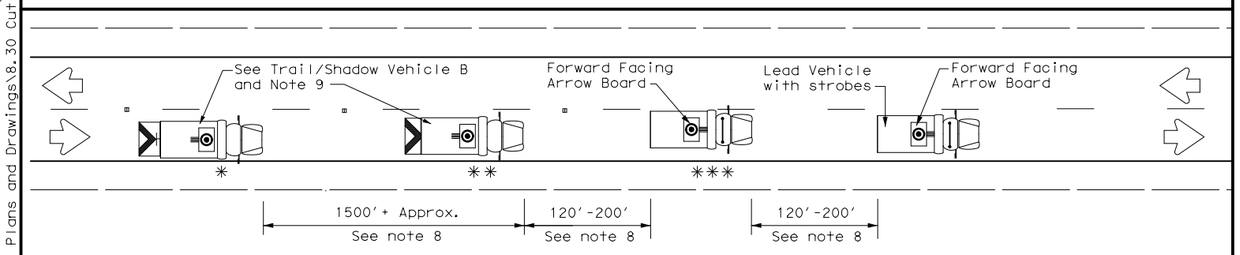


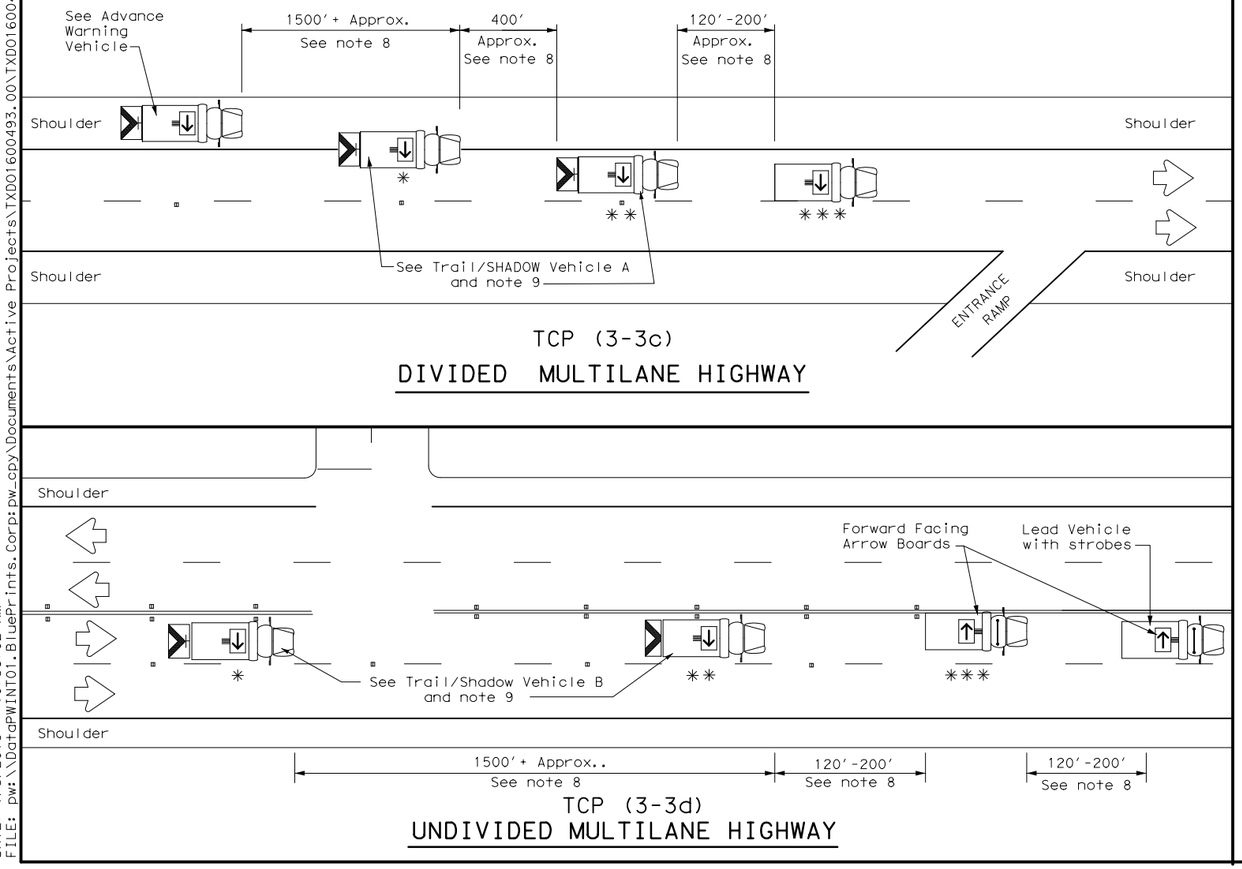
TCP (3-3a)

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



TCP (3-3b)

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

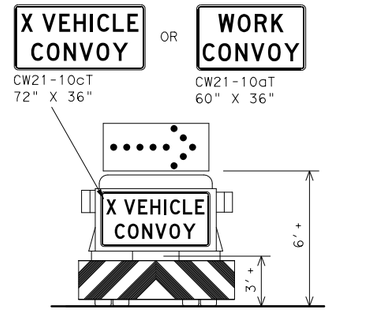


TCP (3-3c)

DIVIDED MULTILANE HIGHWAY

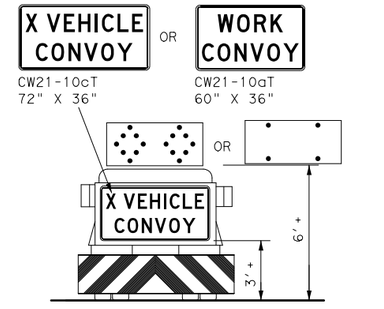
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



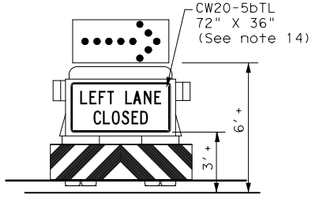
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

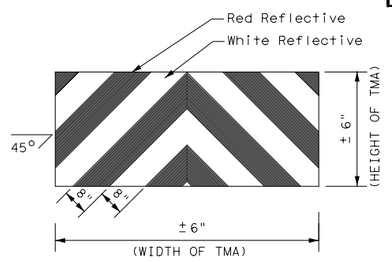


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

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©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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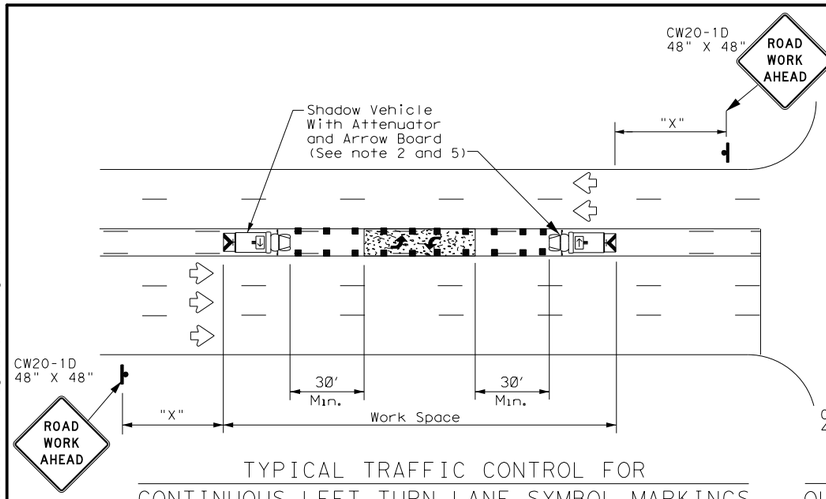
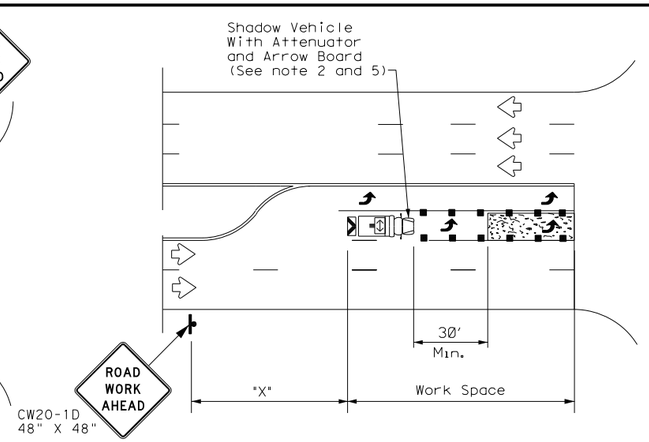
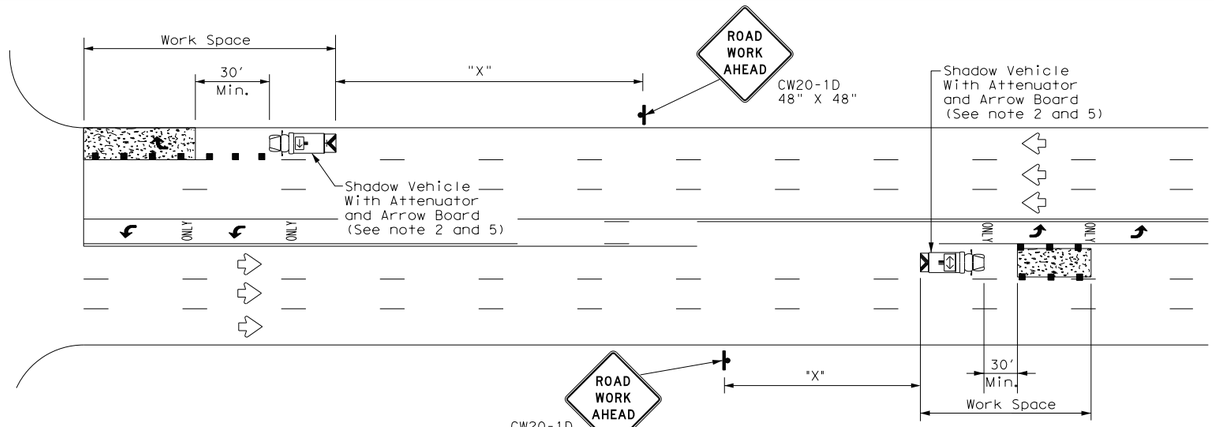
8-95 7-13	TYL	CHEROKEE		65
1-97 7-14				



TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

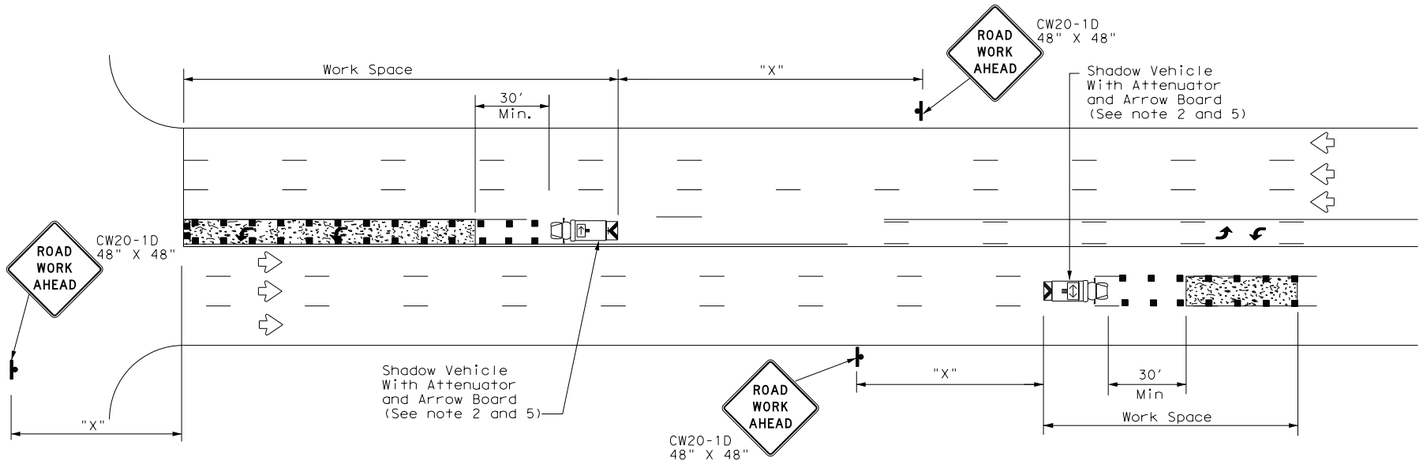


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR
OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR
LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
CENTER LANE MARKINGS

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	■ ■ ■	Channelizing Devices

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'

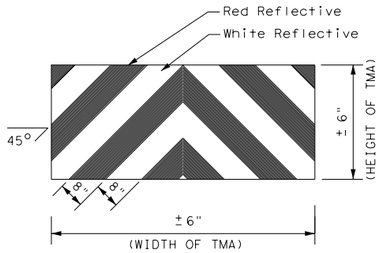
✳ Conventional Roads Only

✳✳ 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. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.
2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.
3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.
4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

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©TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		66

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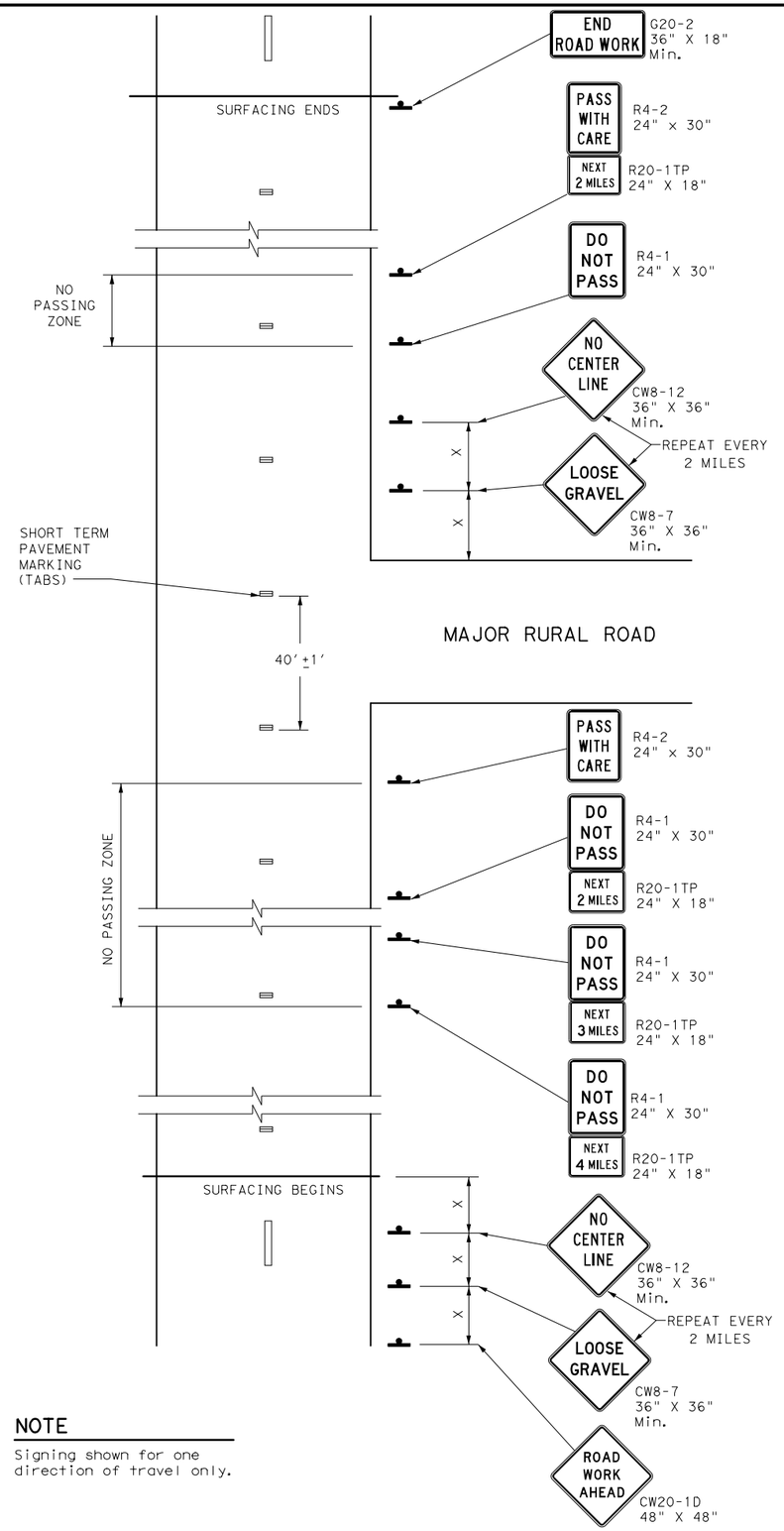
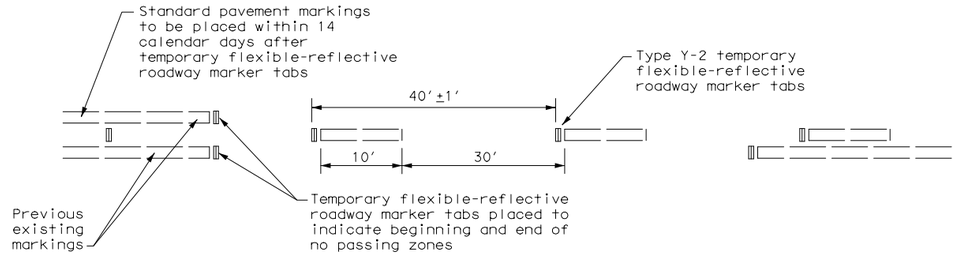


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

"DO NOT PASS" SIGN (R4-1) and NO-PASSING ZONES

A. Prior to the beginning of construction, all currently striped no-passing zones shall be signed with the DO NOT PASS (R4-1) signs and PASS WITH CARE (R4-2) signs placed at the beginning and end of each zone for each direction of travel except as otherwise provided herein. Signs marking these individual no-passing zones need not be covered prior to construction if the signs supplement the existing pavement markings.

B. At the discretion of the Engineer, in areas of numerous no-passing zones, several zones may be combined as a single zone. If passing is to be prohibited over one or more lengthy sections, a DO NOT PASS sign and a NEXT XX MILES (R20-1TP) plaque may be used at the beginning of such zones. The DO NOT PASS sign and the NEXT XX MILES plaque should be repeated every mile to the end of the no-passing zone. In areas where there is considerable distance between no-passing zones, the end of the no-passing zone may be signed with a PASS WITH CARE sign and a NEXT XX MILES plaque.

C. Depending on traffic volumes and length of sections, it may be desirable to prohibit passing throughout the project to prevent damage to windshield and lights. The DO NOT PASS sign and NEXT XX MILES plaque should be used and repeated as often as necessary for this purpose. Where several existing zones are to be combined into one individual no-passing zone, the sign at the beginning of the zone should be covered until the surfacing operation has passed this location so as not to have the DO NOT PASS sign conflict with the existing pavement markings. Also, unless one days operation completes the entire length of such combined zones, appropriate DO NOT PASS and PASS WITH CARE signs should be placed at the beginning and end of the no-passing zones where the surfacing operation has stopped for the day.

D. R4-1 and R4-2 are to remain in place until standard pavement markings are installed.

"NO CENTER LINE" SIGN (CW8-12)

A. Center line markings are yellow pavement markings that delineate the separation of travel lanes that have opposite directions of travel on a roadway. Divided highways do not typically have center line markings.

B. At the time construction activity obliterates the existing center line markings(low volume roads may not have an existing centerline), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately 2 mile intervals within the work area, beyond major intersections and other locations deemed necessary by the Engineer.

C. The NO CENTER LINE signs are to remain in place until standard pavement markings are installed.

"LOOSE GRAVEL" SIGN (CW8-7)

A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately 2 miles in rural areas and closer in urban areas.

B. The LOOSE GRAVEL signs are to remain in place until the condition no longer exists.

PAVEMENT MARKINGS

A. Temporary markings for surfacing projects shall be Temporary Flexible-reflective Roadway Marker Tabs unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement no more than two (2) days before the surfacing is applied. After the surfacing is rolled and swept, the cover over the reflective strip shall be removed.

B. Tabs shall not be used to simulate edge lines.

C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

COORDINATION OF SIGN LOCATIONS

A. The location of warning signs at the beginning and end of a work area are to be coordinated with other signing typically shown on the Barricade and Construction Standards for project limits to ensure adequate sign spacing.

B. Where possible the ROAD WORK AHEAD (CW20-1D), LOOSE GRAVEL (CW8-7), and NO CENTER LINE (CW8-12) signs should be placed in the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) and the TRAFFIC FINES DOUBLE (R20-5T) sign, and one "X" sign spacing prior to the CONTRACTOR (G20-6T)sign typically located at or near the limits of surfacing. LOOSE GRAVEL and NO CENTER LINE signs will then be repeated as described above.

Posted Speed *	Minimum Sign Spacing "X" Distance
30	120′
35	160′
40	240′
45	320′
50	400′
55	500′
60	600′
65	700′
70	800′
75	900′

* Conventional Roads Only

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

GENERAL NOTES

1. The traffic control devices detailed on this sheet will be furnished and erected as directed by the Engineer on sections of roadway where tabs must be placed prior to the surfacing operation which will cover or obliterate the existing pavement markings.
2. The devices shown on this sheet are to be used to supplement those required by the BC Standards or others required elsewhere in the plans.
3. Signs shall be erected as detailed on the BC Standards or the Compliant Work Zone Traffic Control Devices List (CWZTCD) on supports approved for Long-Term / Intermediate-Term Work Zone Sign Supports.
4. When surfacing operations take place on divided highways, freeways or expressways, the size of diamond shaped construction warning signs shall be 48" x 48".
5. Signs on divided highways, freeways and expressways will be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

FILE: tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	TYL	CHEROKEE		67

210

DATE:
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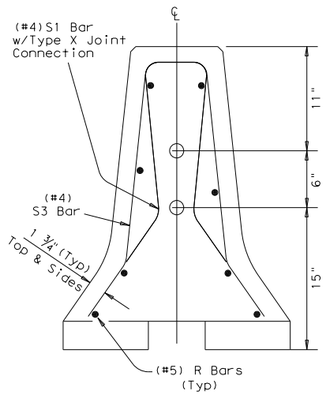
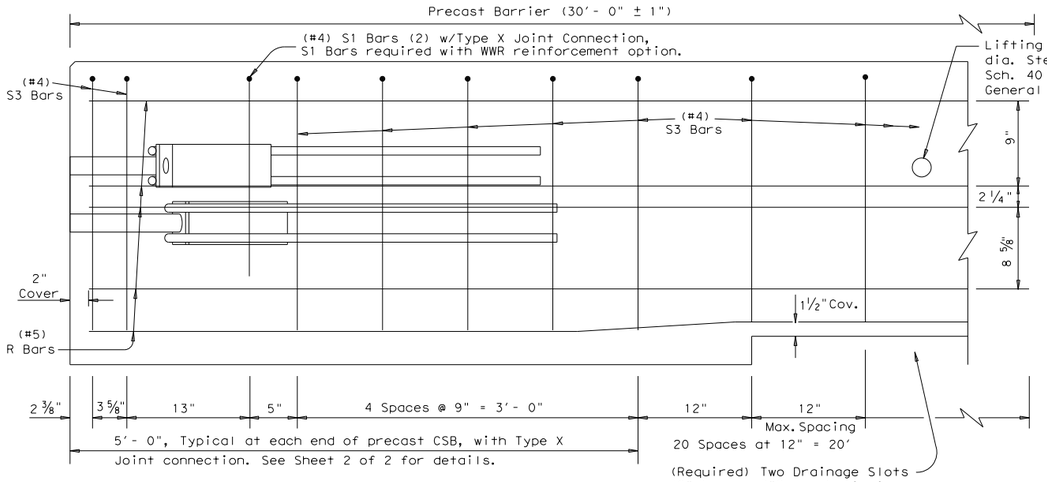


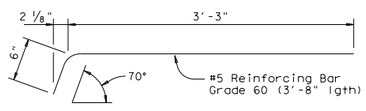
End View
Precast Barrier

See sheet 2 of 3 for Joint connection Type X



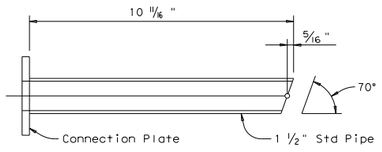
Reinforcement for Precast (CSB)
Concrete Safety Barrier (Type 1)

Showing reinforcement for Joint Type X



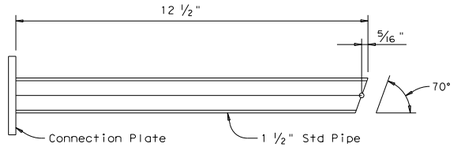
DEFORMED BAR ANCHOR DETAILS

Two (2) Bars required per assembly.
Eight (8) required per Joint.



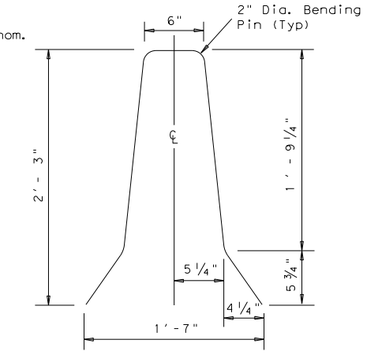
UPPER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Upper Assembly.
Two (2) required per Joint.

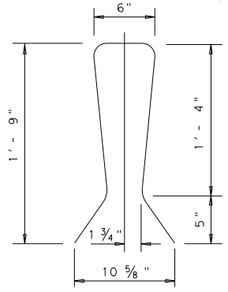


LOWER CONNECTION PIPE DETAILS

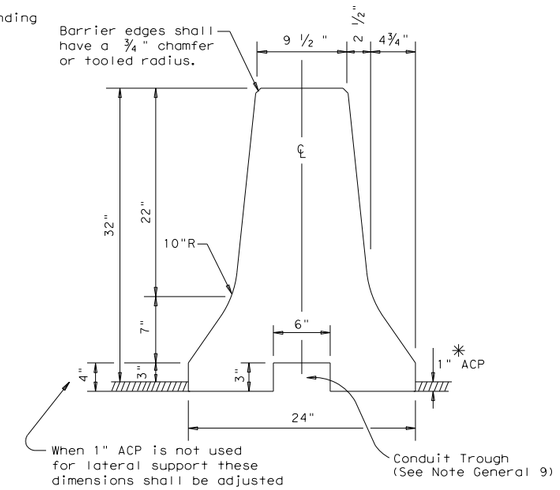
One (1) Steel Pipe required per Lower Assembly.
Two (2) required per Joint.



S3 Bar
#4 Bar



S1 Bar
#4 Bar (2)
(Joint Type X)

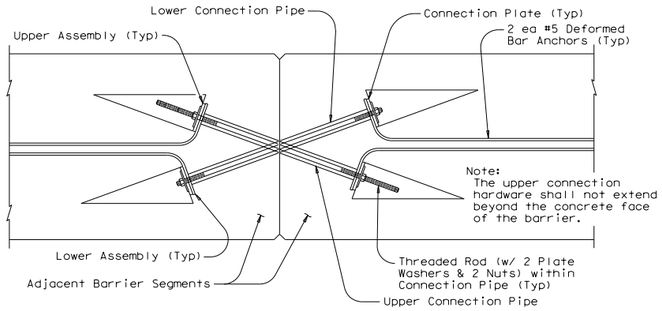


Concrete Safety Barrier

✳ When 1" ACP is "not" used as lateral support for permanent barrier placement. A permissible method of attaining the equivalent lateral support may be used, See CSB(6) sheet.

GENERAL NOTES

1. Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
4. All precast barrier edges shall have a 3/4" chamfer or tooled radius.
5. All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
6. All steel assemblies for joint shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
7. Regardless of the method of handling, barrier lifting points shall be approx. 7.5 feet from the ends of the barrier. Lifting devices and attachments to barrier sections shall be approved by the Engineer.
8. Surface finishing and grouting (where required) shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will assure a smooth surface. Surface finishing shall be considered subsidiary to the various bid items involved.
9. Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.



TYPE X JOINT INSTALLATION DETAIL

Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.

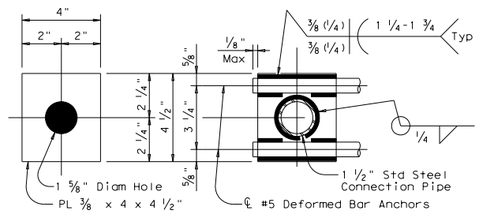
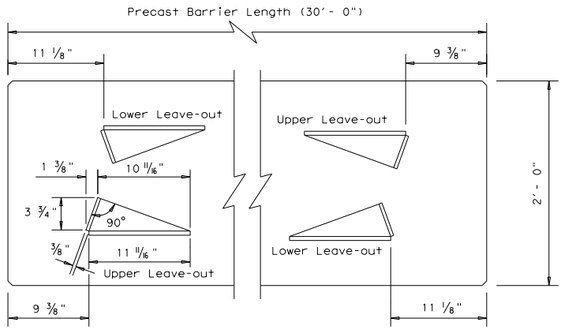


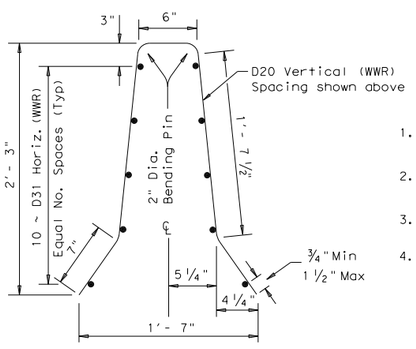
PLATE DIMENSIONS WELDING DETAILS

CONNECTION PLATE DETAILS

One (1) Plate required per assembly.
Four (4) required per Joint. All steel fittings for joint Type X shall be galvanized after fabrication in accordance with Item 445.



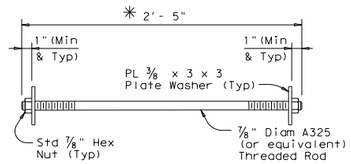
BARRIER PLAN AT END JOINTS



Welded Wire Reinforcement
(WWR) Option for Bars R and S3

(WWR) General Notes

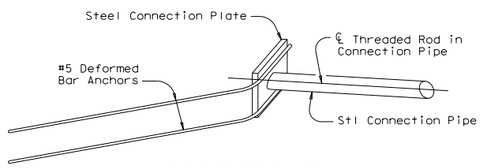
1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
3. All reinforcement shall comply with Item 440, "Reinforcing Steel."
4. Combinations of reinforcing 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".



CONNECTION BOLT OR THREADED ROD DETAIL

Two (2) Threaded Rods (Or Equivalent Hex Hd. Bolts) (w/ Two (2) PL 3/8 x 3 x 3 Plate Washers & Two (2) Std Hex Nuts) required per Joint.

✳ The connection hardware shall not extend beyond the concrete face of the barrier. Hex head bolts may be provided. The proper length of all hardware should be verified.



ISOMETRIC OF TYPICAL WELDED ASSEMBLY

Four (4) ℄2 Upper & 2 Lower℄ Assemblies required per Joint.

Weight of one Precast 30 ft. (CSB) segment = Approx. 6.5 Tons or 440 lbs per ft.

SHEET 1 OF 2

Texas Department of Transportation

Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER (TYPE 1)

CSB(1)-10

FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD	CK: VP
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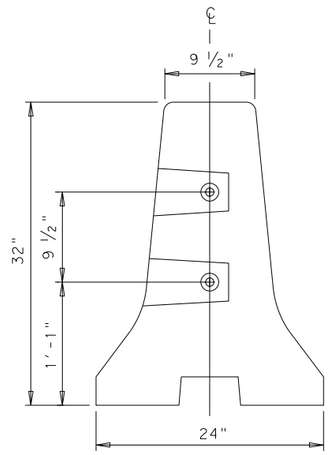
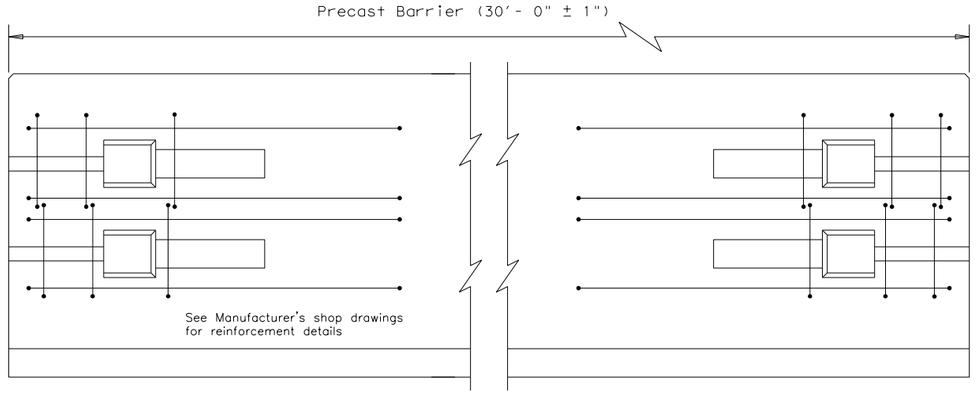


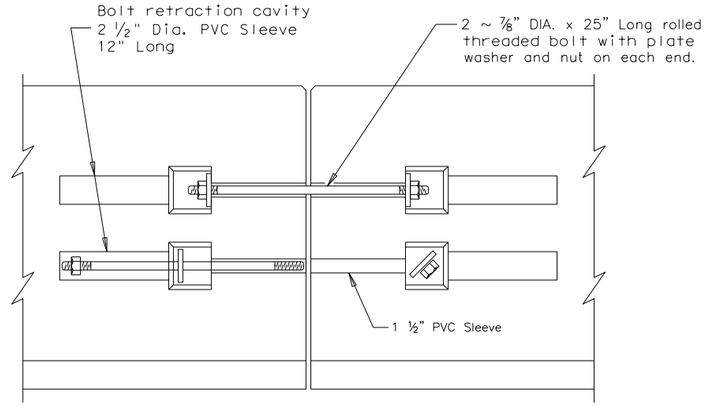
END VIEW (CSB) QUICK-BOLT

QUICK-BOLT POCKET LOCATIONS



ELEVATION (CSB) QUICK-BOLT

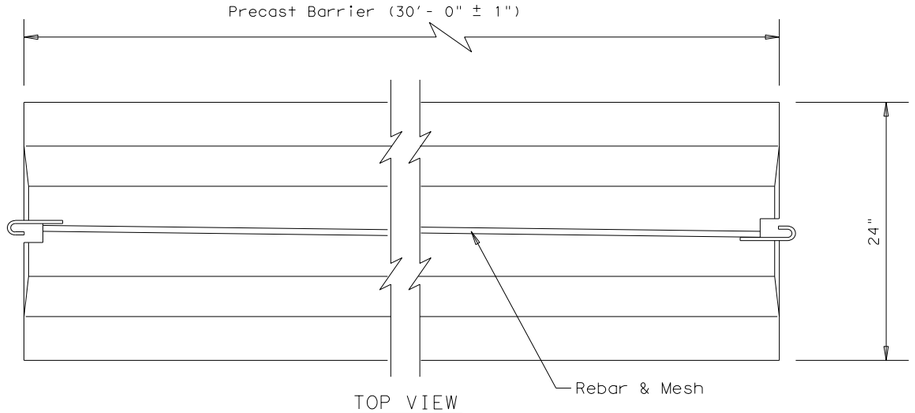
See Manufacturer's shop drawing for additional details



ELEVATION VIEW SHOWING JOINT CONNECTION

"QUICK-BOLT"

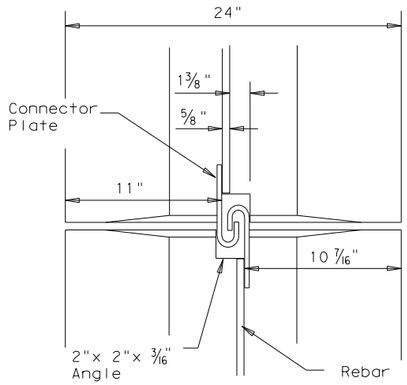
Joint Connection (Type Q)



TOP VIEW

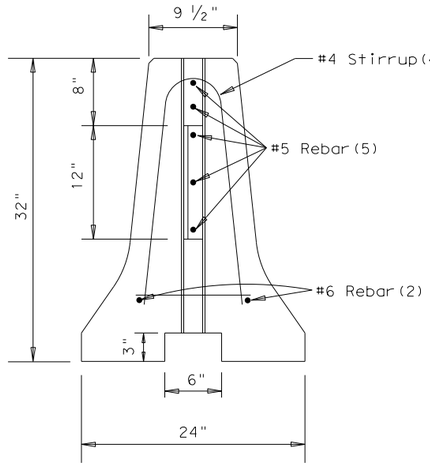
PRECAST (CSB) WITH J-J HOOKS

See Manufacturer's shop drawing for additional details



VIEW FROM ABOVE

J-J HOOK CONNECTION



END VIEW

J-J HOOK CONNECTION

Joint Connection (Type J)

Proprietary Joint Connections (CSB)

Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

J-J Hooks by Easi-Set Industries, (800)547-4045
Quick-Bolt by Bexar Concrete, (210)497-3773

If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.

SHEET 2 OF 2

Texas Department of Transportation

Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER (TYPE 1)

CSB(1)-10

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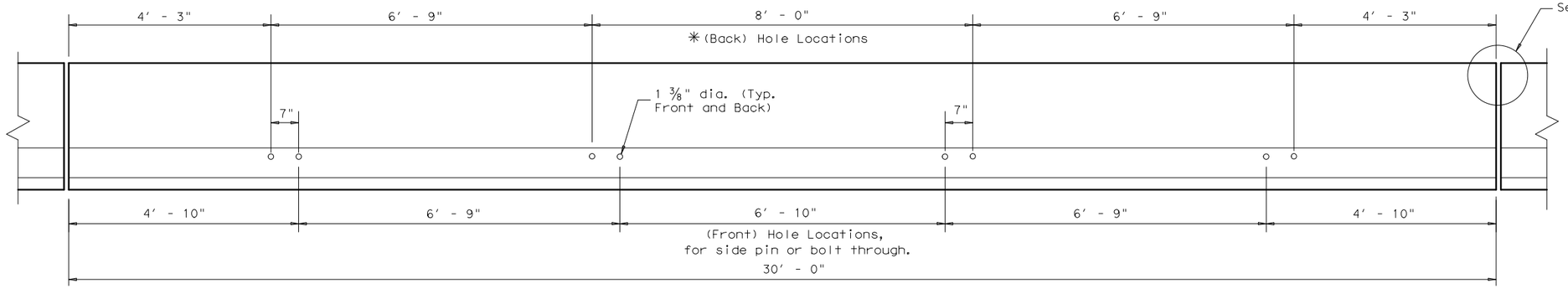
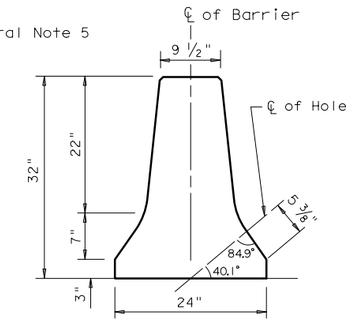
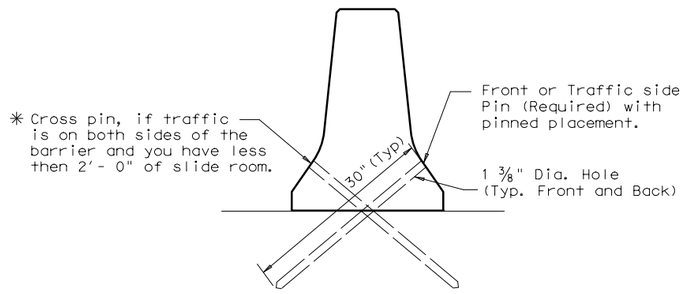


DETAIL 1

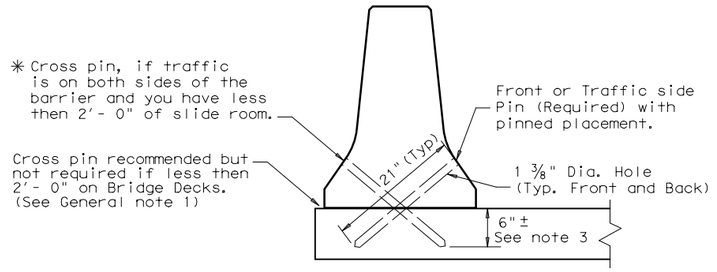


HOLE LOCATION DETAIL



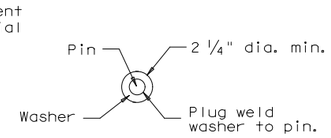
DETAIL 2

Placement on (ACP)
Asphalt Concete Pavement
or Treated Base Material
(30" Pin required)

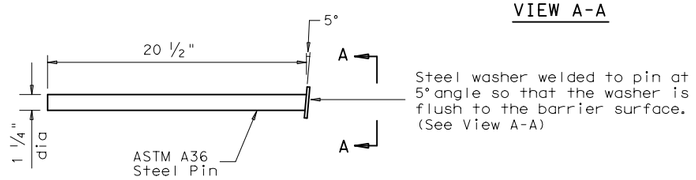


DETAIL 3

Bridge Deck or CRCP
(21" pin required)

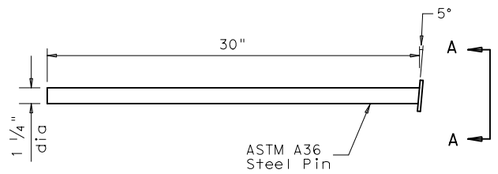


VIEW A-A



(21") PIN DETAIL

See Detail 3

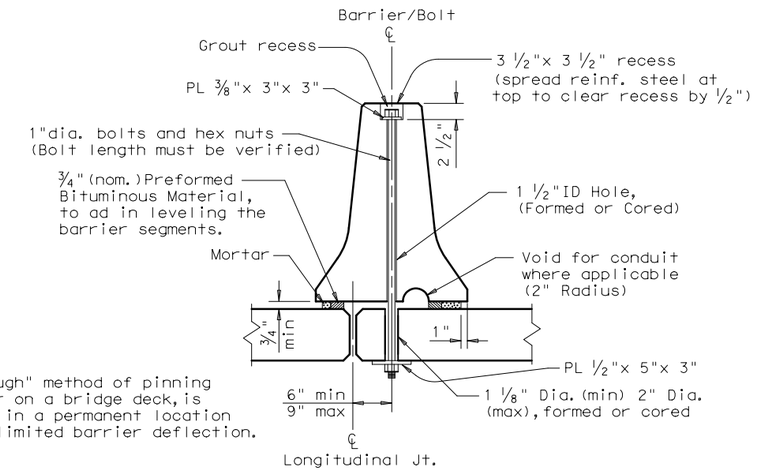


(30") PIN DETAIL

See Detail 2

CORE DRILLING EXISTING BARRIER

Core drilling existing concrete barrier is permitted. Holes shall be drilled with coring or masonry drilling type equipment. Percussion (star) drilling shall not be used. A special drill bit (to cut through existing reinforcing) will likely be required. Spalls in the concrete exceeding ½" shall be patched.



Note:
The "Bolt Through" method of pinning precast barrier on a bridge deck, is primarily used in a permanent location that requires limited barrier deflection.

PRECAST CSB (BOLT THROUGH) PLACEMENT OVER LONGITUDINAL EXPANSION JOINT

For bolt through locations, use the (Front) hole locations shown on Detail 1.

GENERAL NOTES

1. These details provide a method of laterally restraining precast concrete barrier to limit deflections under normally expected passenger vehicle impacts. These details are intended for use in work zones, primarily on bridge decks, or pavement where temporary barrier must be placed less then 2 ft. from the longitudinal edge of the deck or dropoff and parallel to the direction of travel. Other applications of these details are acceptable as directed by the Engineer.
2. Each precast concrete barrier section shall have a minimum of four or total of eight 1 ⅜" ID, holes formed or cored through the barrier. The center lines of the holes are shown in the hole location detail. If rebar is encountered, the entry point may be shifted 2" plus or minus longitudinally along the barrier. The eight holes are spaced along the length of the barrier as shown in Detail 1.
3. The drilling of the travel surface is accomplished by placing the pre-drilled barrier section on the travel surface in the desired position. Then the hole is drilled with the bit passing though the hole in the barrier. The bit is to be inserted into the hole in the barrier so that the travel surface is drilled to a point which is slightly more than the pin length.
4. Note that steel washers have been welded to the top of the steel pins to aid in the removal of the pins, when the barrier is removed.
5. See CSB(1) standard sheets for reinforcement requirements and joint connection types.
6. The forming or coring of holes in the barrier, drilling of holes in bridge deck or pavement, fabrication and materials for the 1 ¼" pins, installation of pins, and any repair to the barrier shall be considered as subsidiary to the barrier bid items.
7. The barrier and travel surface will be repaired as directed by the Engineer in accordance with Item 429, "Concrete Structure Repair."
8. Provide galvanized bolts, nuts, and plate washers. All steel pins shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
9. Weight of barrier is approx. 440 lbs per foot.

Texas Department of Transportation

Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER
(TYPE 1)
PINNED PLACEMENT

CSB(7)-10

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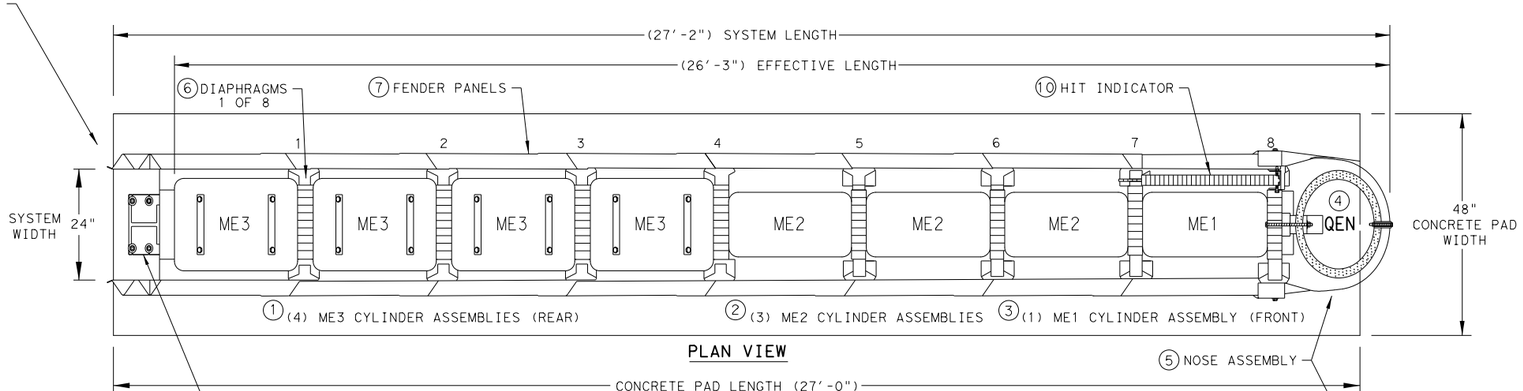
NOTE:
A TRANSITION MAY BE REQUIRED TO INSTALL THE QUADGUARD ELITE M10 TO THE OBJECT BEING SHIELDED.

QUADGUARD EITE M10 24" WIDE (8 BAY) SYSTEM



PLAN VIEW

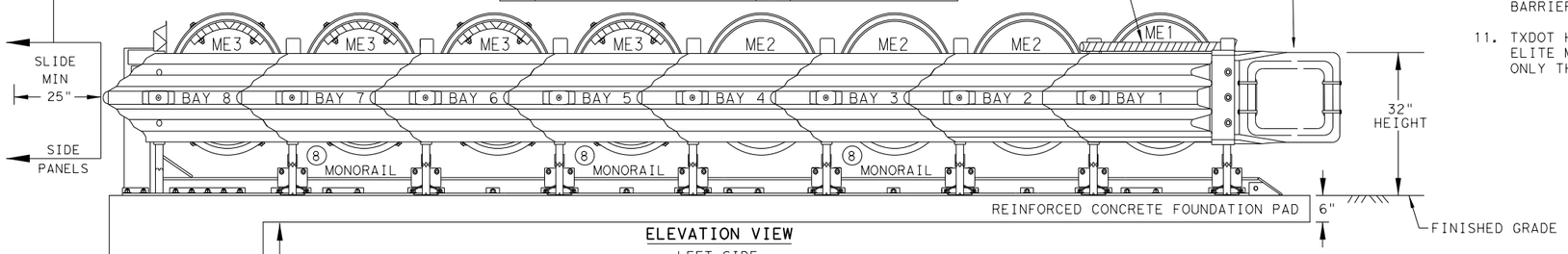
⑨ SHOWN WITH TENSION STRUT BACKUP ASSEMBLY

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

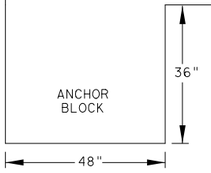
④ QEN CYLINDER INSTALLED INSIDE OF NOSE BELT ASSEMBLY ⑤

NOTE:
HIT INDICATOR WILL RAISE UPON IMPACT.

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.

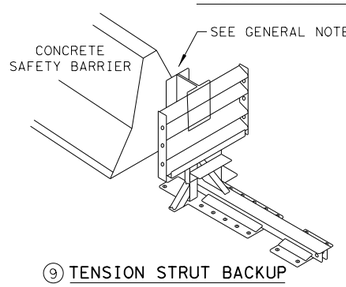
8" NON-REINFORCED CONCRETE PAD MAY NOT REQUIRE AN ANCHOR BLOCK, IF THE PAD IS INSTALLED AGAINST AN IMMOVABLE CONCRETE BACKUP.

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

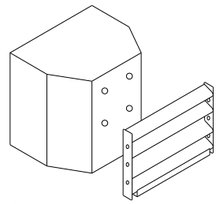


⑨ TENSION STRUT BACKUP

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

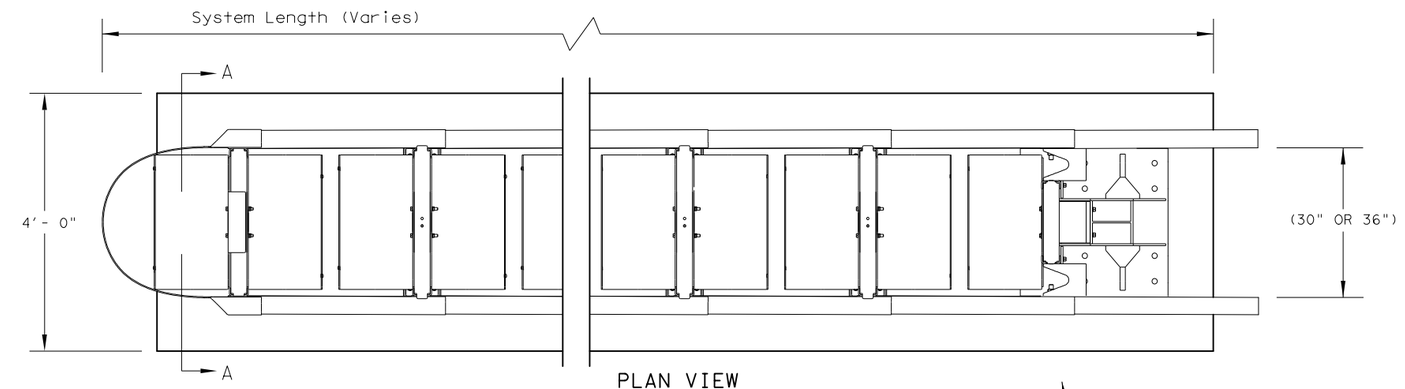
Design Division Standard

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
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		71

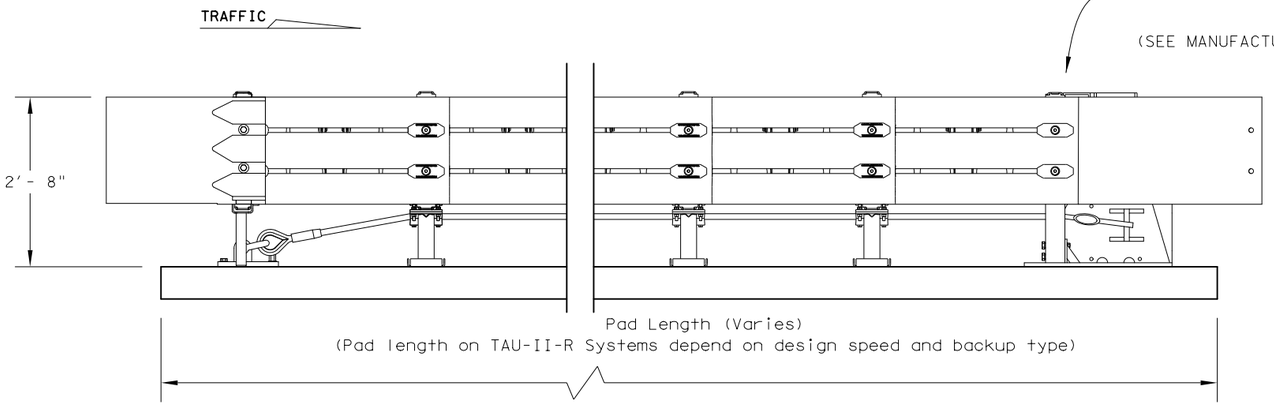
DATE:
FILE:



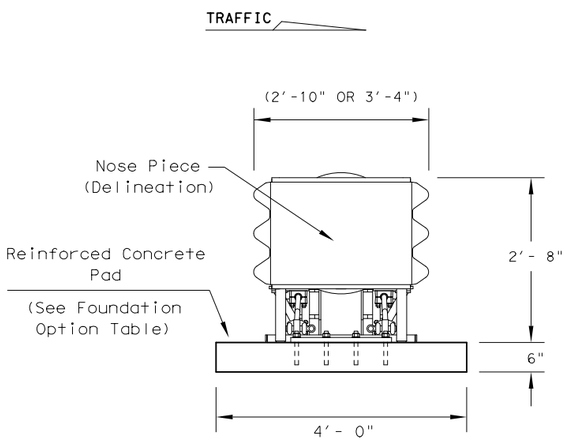
PLAN VIEW

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

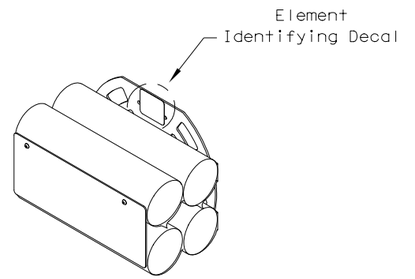
Nose Piece delineation orientation, is shown elsewhere on the plans.

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)

LOW MAINTENANCE

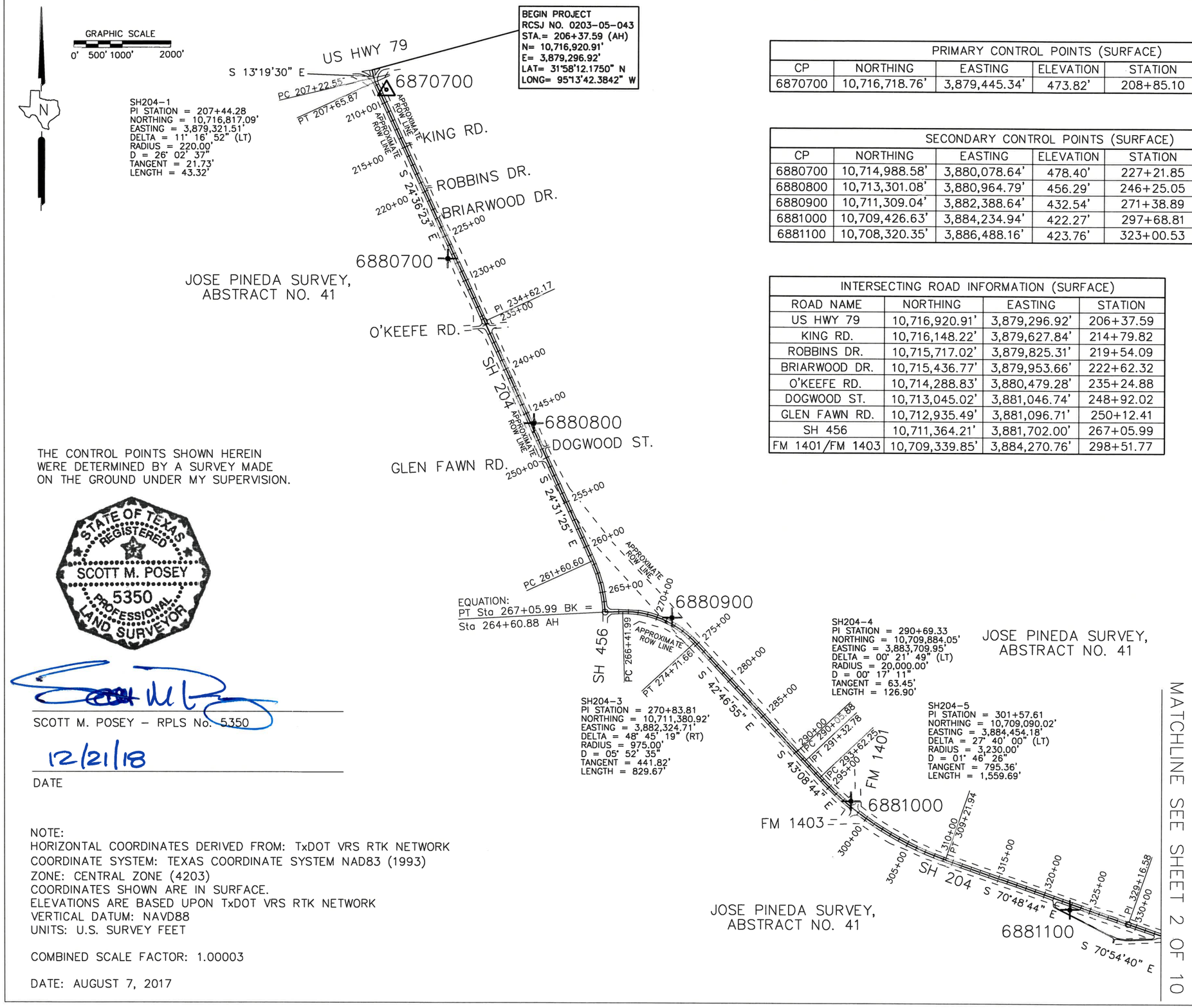
Texas Department of Transportation

Design Division Standard

LTS-BARRIER SYSTEMS CRASH CUSHION (R-NARROW)

TAU-II-R(N)-16

FILE: tauiirn16.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)	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		72



PRIMARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6870700	10,716,718.76'	3,879,445.34'	473.82'	208+85.10	71.64' LT

SECONDARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6880700	10,714,988.58'	3,880,078.64'	478.40'	227+21.85	72.99' RT
6880800	10,713,301.08'	3,880,964.79'	456.29'	246+25.05	31.72' LT
6880900	10,711,309.04'	3,882,388.64'	432.54'	271+38.89	57.66' LT
6881000	10,709,426.63'	3,884,234.94'	422.27'	297+68.81	45.03' LT
6881100	10,708,320.35'	3,886,488.16'	423.76'	323+00.53	58.41' RT

INTERSECTING ROAD INFORMATION (SURFACE)			
ROAD NAME	NORTHING	EASTING	STATION
US HWY 79	10,716,920.91'	3,879,296.92'	206+37.59
KING RD.	10,716,148.22'	3,879,627.84'	214+79.82
ROBBINS DR.	10,715,717.02'	3,879,825.31'	219+54.09
BRIARWOOD DR.	10,715,436.77'	3,879,953.66'	222+62.32
O'KEEFE RD.	10,714,288.83'	3,880,479.28'	235+24.88
DOGWOOD ST.	10,713,045.02'	3,881,046.74'	248+92.02
GLEN FAWN RD.	10,712,935.49'	3,881,096.71'	250+12.41
SH 456	10,711,364.21'	3,881,702.00'	267+05.99
FM 1401/FM 1403	10,709,339.85'	3,884,270.76'	298+51.77

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

STATE OF TEXAS
REGISTERED
SCOTT M. POSEY
5350
PROFESSIONAL
LAND SURVEYOR

SCOTT M. POSEY – RPLS No. 5350

12/21/18

DATE

NOTE:
HORIZONTAL COORDINATES DERIVED FROM: TxDOT VRS RTK NETWORK
COORDINATE SYSTEM: TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
COORDINATES SHOWN ARE IN SURFACE.
ELEVATIONS ARE BASED UPON TxDOT VRS RTK NETWORK
VERTICAL DATUM: NAVD88
UNITS: U.S. SURVEY FEET

COMBINED SCALE FACTOR: 1.00003

DATE: AUGUST 7, 2017

NO.	REVISION	BY	DATE

CONTROL POINT LEGEND

DENOTES SECONDARY CONTROL POINT
(5/8" IRON ROD SET WITH PLASTIC CAP STAMPED "LAMB-STAR")
UNLESS OTHERWISE NOTED

DENOTES PRIMARY CONTROL POINT
(5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK")
UNLESS OTHERWISE NOTED

LAMB-STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TX 75093
P 214-440-3600
F 214-440-3601
TBPLS # 10048300

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

CONTROL INDEX MAP

SHEET 1 OF 10

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	N/A	6	TEXAS				SH 204
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.	77

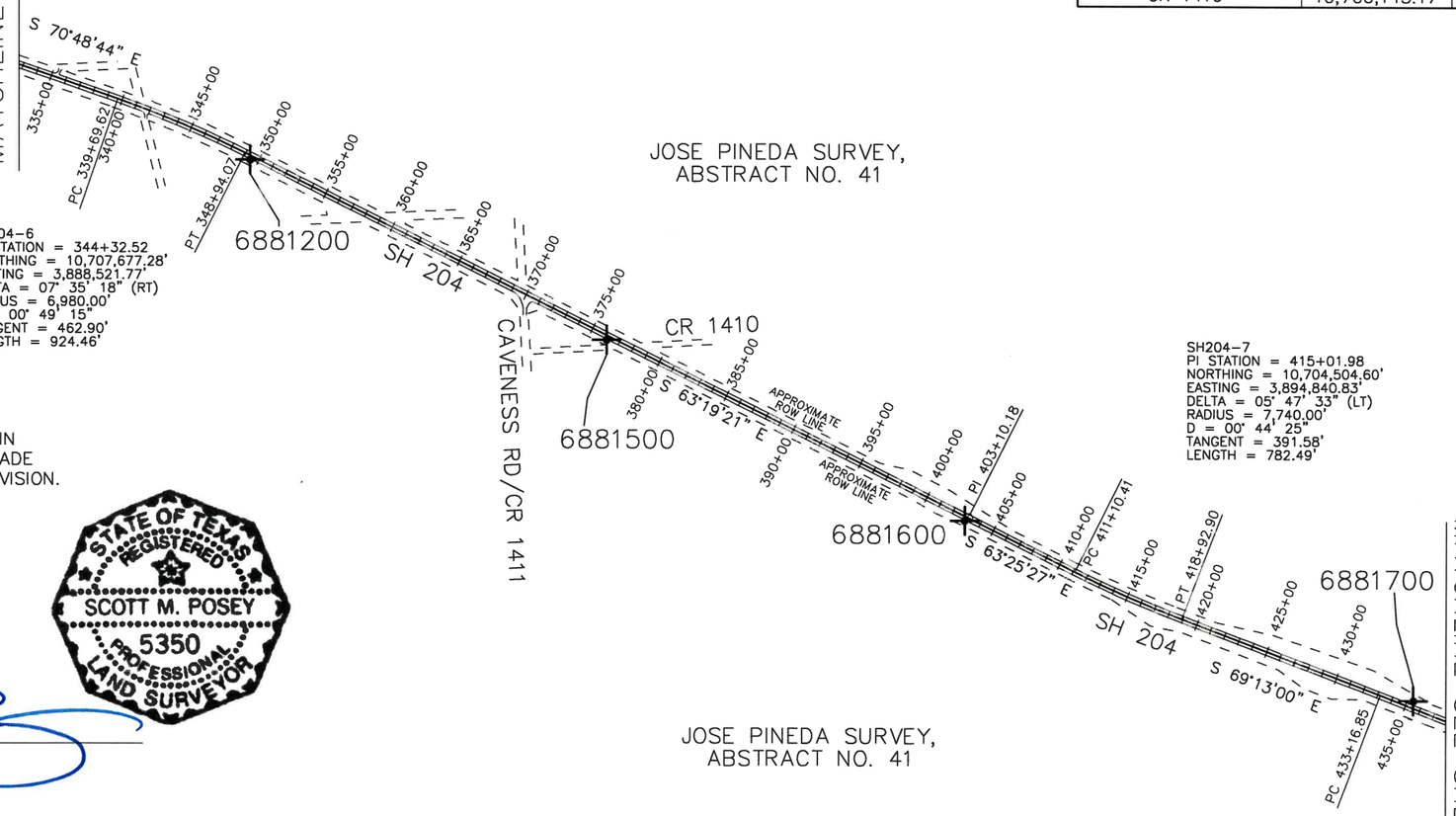
MATCHLINE SEE SHEET 1 OF 10

GRAPHIC SCALE
0' 500' 1000' 2000'

N

SECONDARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6881200	10,707,422.07'	3,888,969.85'	401.30'	329+46.13	26.86' RT
6881500	10,706,220.99'	3,891,356.34'	393.56'	376+17.82	28.63' RT
6881600	10,705,017.68'	3,893,752.95'	319.97'	402+99.56	27.85' RT
6881700	10,703,822.21'	3,896,760.56'	400.79'	435+37.98	43.90' LT

INTERSECTING ROAD INFORMATION (SURFACE)			
ROAD NAME	NORTHING	EASTING	STATION
CAVENESS RD/CR 1411	10,706,527.93'	3,890,809.23'	369+91.14
CR 1410	10,706,143.17'	3,891,575.00'	378+48.14



SH204-6
PI STATION = 344+32.52
NORTHING = 10,707,677.28'
EASTING = 3,888,521.77'
DELTA = 07° 35' 18" (RT)
RADIUS = 6,980.00'
D = 00° 49' 15"
TANGENT = 462.90'
LENGTH = 924.46'

SH204-7
PI STATION = 415+01.98
NORTHING = 10,704,504.60'
EASTING = 3,894,840.83'
DELTA = 05° 47' 33" (LT)
RADIUS = 7,740.00'
D = 00° 44' 25"
TANGENT = 391.58'
LENGTH = 782.49'

SH204-8
PI STATION = 439+07.45
NORTHING = 10,703,650.82'
EASTING = 3,897,090.40'
DELTA = 01° 56' 00" (RT)
RADIUS = 35,000.00'
D = 00° 09' 49"
TANGENT = 590.60'
LENGTH = 1,181.09'

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

STATE OF TEXAS REGISTERED SCOTT M. POSEY 5350 PROFESSIONAL LAND SURVEYOR

SCOTT M. POSEY – RPLS No. 5350

12/21/18
DATE

NOTE:
HORIZONTAL COORDINATES DERIVED FROM: TxDOT VRS RTK NETWORK
COORDINATE SYSTEM: TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
COORDINATES SHOWN ARE IN SURFACE.
ELEVATIONS ARE BASED UPON TxDOT VRS RTK NETWORK
VERTICAL DATUM: NAVD88
UNITS: U.S. SURVEY FEET

COMBINED SCALE FACTOR: 1.00003

DATE: AUGUST 7, 2017

NO.	REVISION	BY	DATE

CONTROL POINT LEGEND

DENOTES SECONDARY CONTROL POINT (5/8" IRON ROD SET WITH PLASTIC CAP STAMPED "LAMB-STAR") UNLESS OTHERWISE NOTED

DENOTES PRIMARY CONTROL POINT (5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK") UNLESS OTHERWISE NOTED

LAMB-STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TX 75093
P 214-440-3600
F 214-440-3601
TBPLS # 10048300

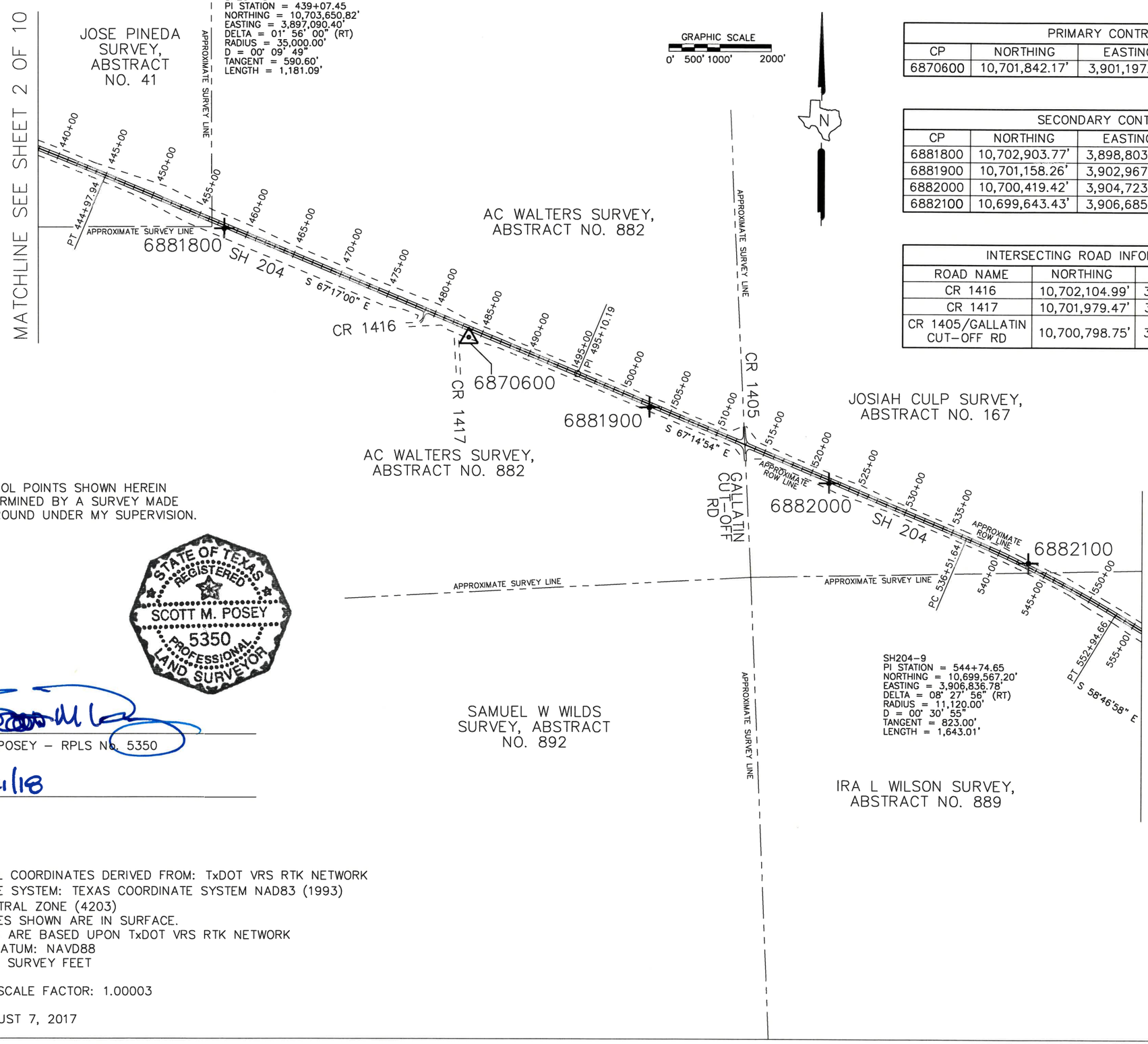
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

CONTROL INDEX MAP

SHEET 2 OF 10

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	N/A	6	TEXAS				SH 204
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.	78



PRIMARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6870600	10,701,842.17'	3,901,197.77'	349.72'	483+94.55	82.18' RT

SECONDARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6881800	10,702,903.77'	3,898,803.20'	360.73'	457+75.77	27.66' RT
6881900	10,701,158.26'	3,902,967.42'	307.09'	502+91.04	29.16' RT
6882000	10,700,419.42'	3,904,723.90'	309.30'	521+96.58	31.22' RT
6882100	10,699,643.43'	3,906,685.33'	316.83'	543+04.07	30.91' LT

INTERSECTING ROAD INFORMATION (SURFACE)			
ROAD NAME	NORTHING	EASTING	STATION
CR 1416	10,702,104.99'	3,900,782.80'	479+10.27
CR 1417	10,701,979.47'	3,901,082.62'	482+35.31
CR 1405/GALLATIN CUT-OFF RD	10,700,798.75'	3,903,900.09'	512+90.17

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

STATE OF TEXAS REGISTERED SCOTT M. POSEY 5350 PROFESSIONAL LAND SURVEYOR

SCOTT M. POSEY – RPLS NO. 5350

12/21/18

DATE

NOTE:
HORIZONTAL COORDINATES DERIVED FROM: TxDOT VRS RTK NETWORK
COORDINATE SYSTEM: TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
COORDINATES SHOWN ARE IN SURFACE.
ELEVATIONS ARE BASED UPON TxDOT VRS RTK NETWORK
VERTICAL DATUM: NAVD88
UNITS: U.S. SURVEY FEET

COMBINED SCALE FACTOR: 1.00003

DATE: AUGUST 7, 2017

NO.	REVISION	BY	DATE

CONTROL POINT LEGEND

DENOTES SECONDARY CONTROL POINT (5/8" IRON ROD SET WITH PLASTIC CAP STAMPED "LAMB-STAR") UNLESS OTHERWISE NOTED

DENOTES PRIMARY CONTROL POINT (5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK") UNLESS OTHERWISE NOTED

LAMB-STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TX 75093
P 214-440-3600
F 214-440-3601
TBPLS # 10048300

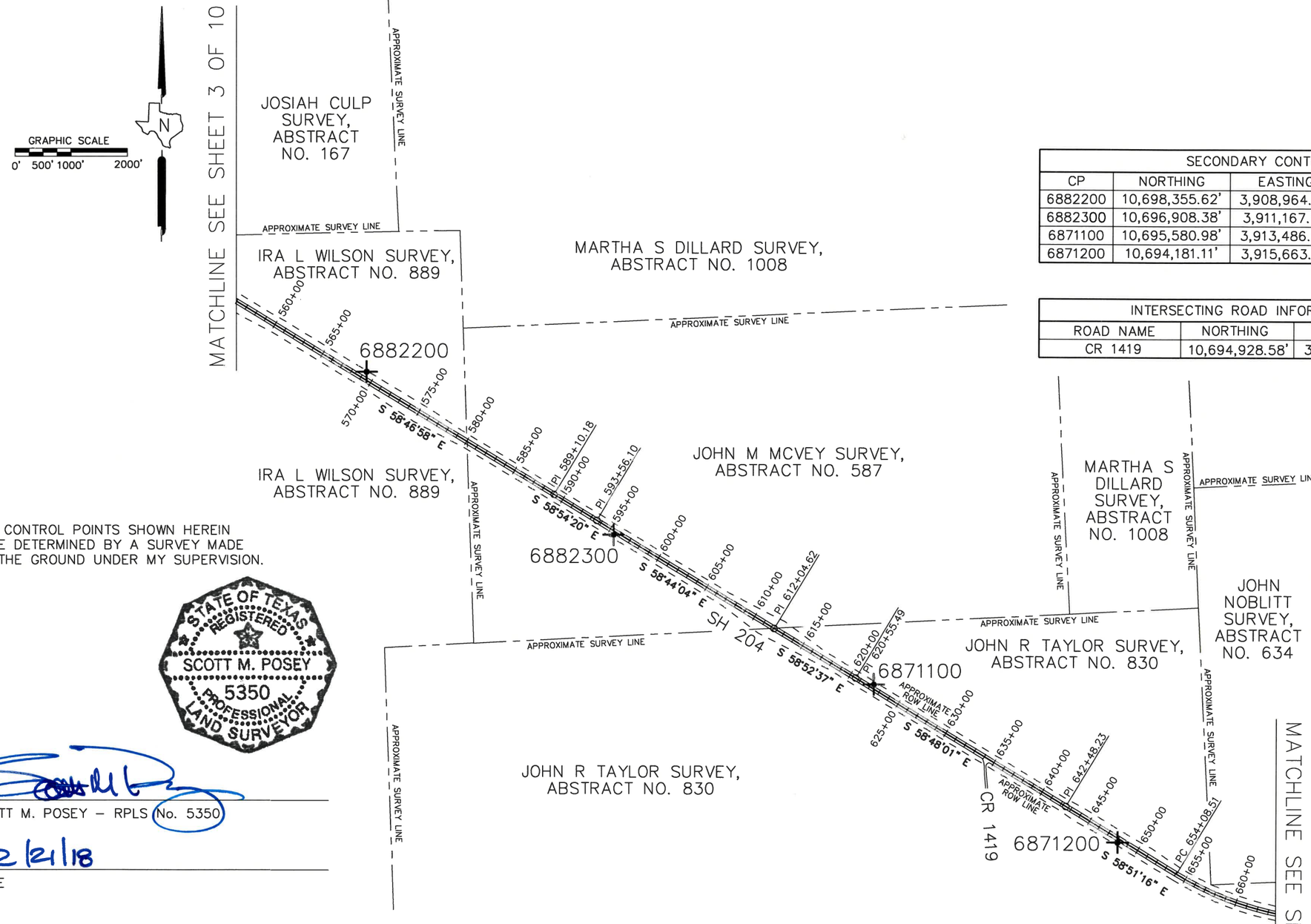
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

CONTROL INDEX MAP

SHEET 3 OF 10

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	N/A	6	TEXAS					SH 204
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.		79



SECONDARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6882200	10,698,355.62'	3,908,964.08'	317.42'	569+18.88	66.39' LT
6882300	10,696,908.38'	3,911,167.81'	275.94'	595+53.63	29.94' RT
6871100	10,695,580.98'	3,913,486.68'	307.85'	622+24.71	36.63' LT
6871200	10,694,181.11'	3,915,663.10'	310.46'	648+11.48	33.87' RT

INTERSECTING ROAD INFORMATION (SURFACE)			
ROAD NAME	NORTHING	EASTING	STATION
CR 1419	10,694,928.58'	3,914,493.22'	634+23.63

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

STATE OF TEXAS REGISTERED SCOTT M. POSEY 5350 PROFESSIONAL LAND SURVEYOR

SCOTT M. POSEY – RPLS No. 5350

12/21/18

DATE

NOTE:
HORIZONTAL COORDINATES DERIVED FROM: TxDOT VRS RTK NETWORK
COORDINATE SYSTEM: TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
COORDINATES SHOWN ARE IN SURFACE.
ELEVATIONS ARE BASED UPON TxDOT VRS RTK NETWORK
VERTICAL DATUM: NAVD88
UNITS: U.S. SURVEY FEET

COMBINED SCALE FACTOR: 1.00003

DATE: AUGUST 7, 2017

SH204-10
PI STATION = 663+22.20
NORTHING = 10,693,428.73'
EASTING = 3,916,973.58'
DELTA = 35° 12' 14" (LT)
RADIUS = 2,880.00'
D = 01° 59' 22"
TANGENT = 913.69'
LENGTH = 1,769.53'

NO.	REVISION	BY	DATE

CONTROL POINT LEGEND

DENOTES SECONDARY CONTROL POINT (5/8" IRON ROD SET WITH PLASTIC CAP STAMPED "LAMB-STAR") UNLESS OTHERWISE NOTED

DENOTES PRIMARY CONTROL POINT (5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK") UNLESS OTHERWISE NOTED

LAMB-STAR

LAMB-STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TX 75093
P 214-440-3600
F 214-440-3601
TBPLS # 10048300

CP&Y

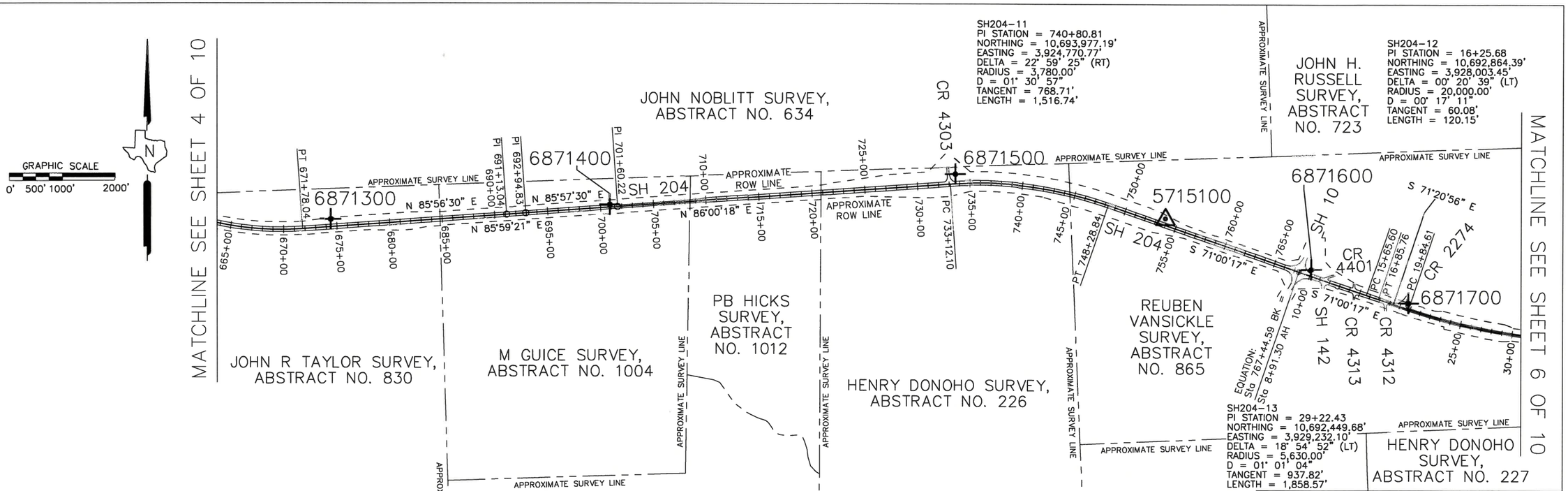
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

CONTROL INDEX MAP

SHEET 4 OF 10

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.	
Checked:	N/A	6	TEXAS					SH 204	
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.		80	



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

STATE OF TEXAS REGISTERED SCOTT M. POSEY 5350 PROFESSIONAL LAND SURVEYOR

SCOTT M. POSEY – RPLS No. 5350

12/21/18

DATE

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COORDINATE SYSTEM: TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
COORDINATES SHOWN ARE IN SURFACE.
ELEVATIONS ARE BASED UPON TxDOT VRS RTK NETWORK
VERTICAL DATUM: NAVD88
UNITS: U.S. SURVEY FEET

COMBINED SCALE FACTOR: 1.00003

DATE: AUGUST 7, 2017

PRIMARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
5715100	10,693,603.45'	3,926,039.96'	317.51'	753+81.85	59.72' LT

SECONDARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6871300	10,693,583.05'	3,918,149.15'	300.82'	674+47.90	70.73' LT
6871400	10,693,722.27'	3,920,787.60'	275.46'	700+89.57	23.26' LT
6871500	10,694,017.75'	3,924,051.45'	302.52'	733+64.79	90.95' LT
6871600	10,693,123.99'	3,927,426.12'	335.22'	9+95.29	57.55' LT
6871700	10,692,807.33'	3,928,344.22'	333.44'	19+66.81	54.92' LT

INTERSECTING ROAD INFORMATION (SURFACE)			
ROAD NAME	NORTHING	EASTING	STATION
CR 4303	10,693,923.09'	3,923,996.11'	733+04.26
SH 10	10,693,103.42'	3,927,309.06'	8+91.30
CR 4401/SH 142	10,693,019.88'	3,927,551.76'	11+47.98
CR 4313	10,692,923.09'	3,927,832.92'	14+45.33
CR 4312	10,692,823.26'	3,928,125.29'	17+54.27
CR 2274	10,692,770.71'	3,928,280.99'	19+18.60

NO.	REVISION	BY	DATE

CONTROL POINT LEGEND

DENOTES SECONDARY CONTROL POINT (5/8" IRON ROD SET WITH PLASTIC CAP STAMPED "LAMB–STAR") UNLESS OTHERWISE NOTED

DENOTES PRIMARY CONTROL POINT (5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK") UNLESS OTHERWISE NOTED

LAMB–STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TX 75093
P 214–440–3600
F 214–440–3601
TBPLS # 10048300

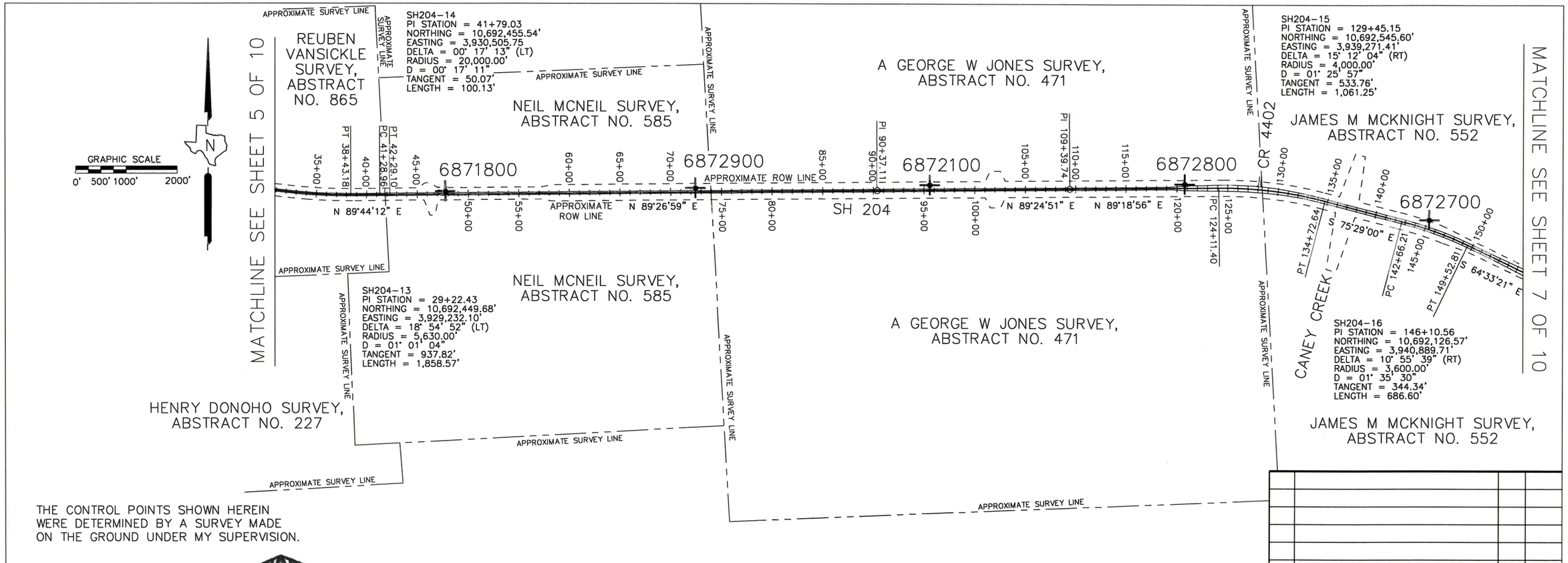
TEXAS REGISTERED ENGINEERING FIRM F–1741

SH 204

CONTROL INDEX MAP

SHEET 5 OF 10

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	N/A	6	TEXAS					SH 204
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.		81



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

STATE OF TEXAS REGISTERED SCOTT M. POSEY 5350 PROFESSIONAL LAND SURVEYOR

SCOTT M. POSEY – RPLS No. 5350

12/21/18

DATE

NOTE:
HORIZONTAL COORDINATES DERIVED FROM: TxDOT VRS RTK NETWORK
COORDINATE SYSTEM: TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
COORDINATES SHOWN ARE IN SURFACE.
ELEVATIONS ARE BASED UPON TxDOT VRS RTK NETWORK
VERTICAL DATUM: NAVD88
UNITS: U.S. SURVEY FEET

COMBINED SCALE FACTOR: 1.00003

DATE: AUGUST 7, 2017

SECONDARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6871800	10,692,489.04'	3,931,100.83'	286.17'	47+74.40	27.79' LT
6872900	10,692,523.26'	3,933,569.77'	280.36'	72+43.56	38.30' LT
6872100	10,692,556.33'	3,935,883.26'	317.64'	95+57.29	48.83' LT
6872800	10,692,572.38'	3,938,402.30'	295.62'	120+76.43	37.17' LT
6872700	10,692,224.52'	3,940,821.33'	318.94'	145+14.06	86.42' LT

INTERSECTING ROAD INFORMATION (SURFACE)			
ROAD NAME	NORTHING	EASTING	STATION
CR 4402	10,692,523.94'	3,939,137.94'	128+12.11

NO.	REVISION	BY	DATE

CONTROL POINT LEGEND

+ DENOTES SECONDARY CONTROL POINT (5/8" IRON ROD SET WITH PLASTIC CAP STAMPED "LAMB-STAR") UNLESS OTHERWISE NOTED

△ DENOTES PRIMARY CONTROL POINT (5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK") UNLESS OTHERWISE NOTED

LAMB-STAR

LAMB-STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TX 75093
P 214-440-3600
F 214-440-3601
TBPLS # 10048300

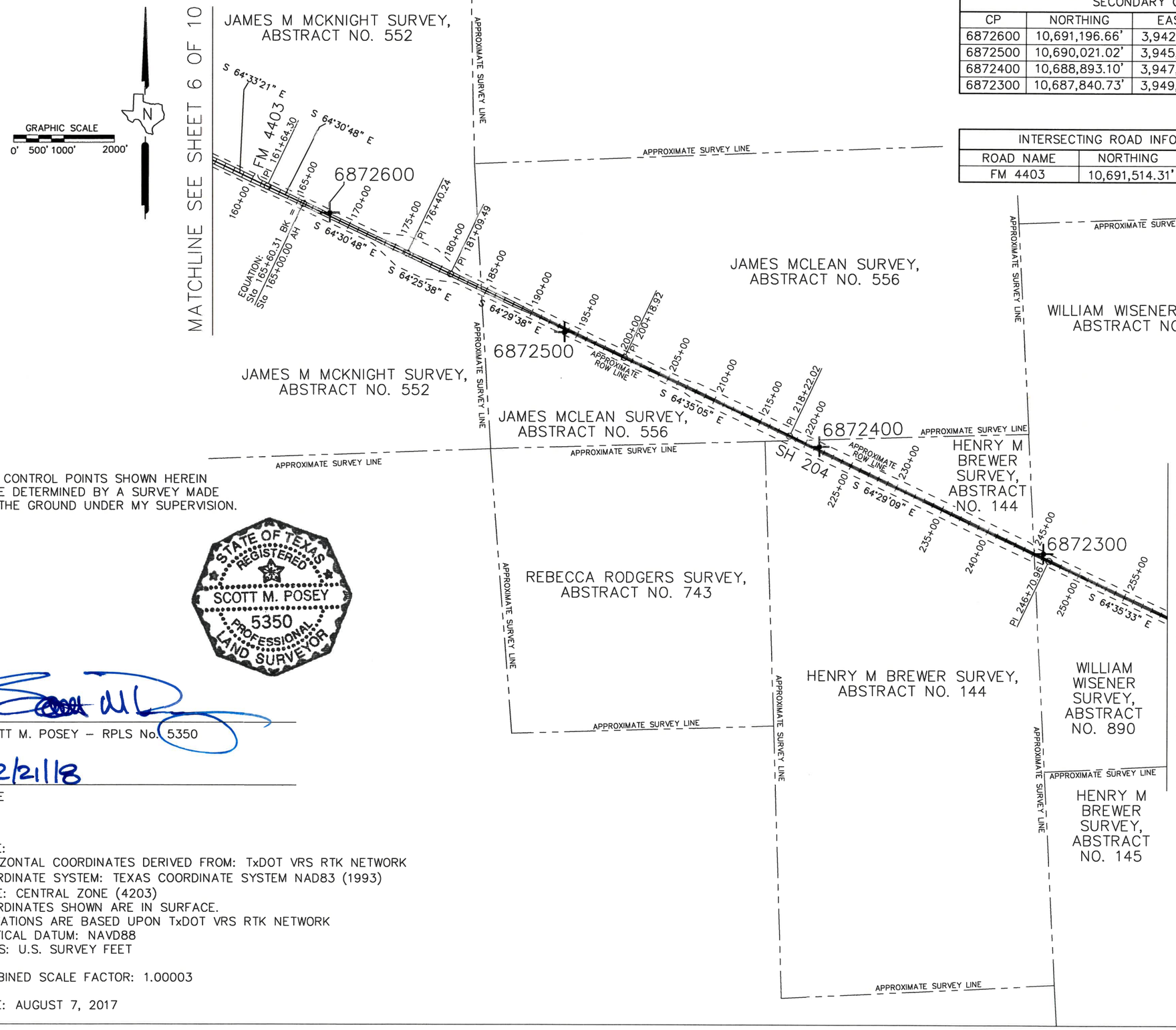
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

CONTROL INDEX MAP

SHEET 6 OF 10

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	N/A	6	TEXAS				SH 204
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.	82



SECONDARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6872600	10,691,196.66'	3,942,914.87'	320.28'	167+76.38	30.86' LT
6872500	10,690,021.02'	3,945,235.76'	341.92'	193+77.31	30.56' RT
6872400	10,688,893.10'	3,947,754.56'	291.07'	221+36.31	33.25' LT
6872300	10,687,840.73'	3,949,974.58'	339.93'	245+93.12	39.74' LT

INTERSECTING ROAD INFORMATION (SURFACE)			
ROAD NAME	NORTHING	EASTING	STATION
FM 4403	10,691,514.31'	3,942,176.56'	160+33.54

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

STATE OF TEXAS REGISTERED SCOTT M. POSEY 5350 PROFESSIONAL LAND SURVEYOR

SCOTT M. POSEY – RPLS No. 5350

12/21/18

DATE

NOTE:
HORIZONTAL COORDINATES DERIVED FROM: TxDOT VRS RTK NETWORK
COORDINATE SYSTEM: TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
COORDINATES SHOWN ARE IN SURFACE.
ELEVATIONS ARE BASED UPON TxDOT VRS RTK NETWORK
VERTICAL DATUM: NAVD88
UNITS: U.S. SURVEY FEET

COMBINED SCALE FACTOR: 1.00003

DATE: AUGUST 7, 2017

NO.	REVISION	BY	DATE

CONTROL POINT LEGEND

DENOTES SECONDARY CONTROL POINT (5/8" IRON ROD SET WITH PLASTIC CAP STAMPED "LAMB-STAR") UNLESS OTHERWISE NOTED

DENOTES PRIMARY CONTROL POINT (5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK") UNLESS OTHERWISE NOTED

LAMB-STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TX 75093
P 214-440-3600
F 214-440-3601
TBPLS # 10048300

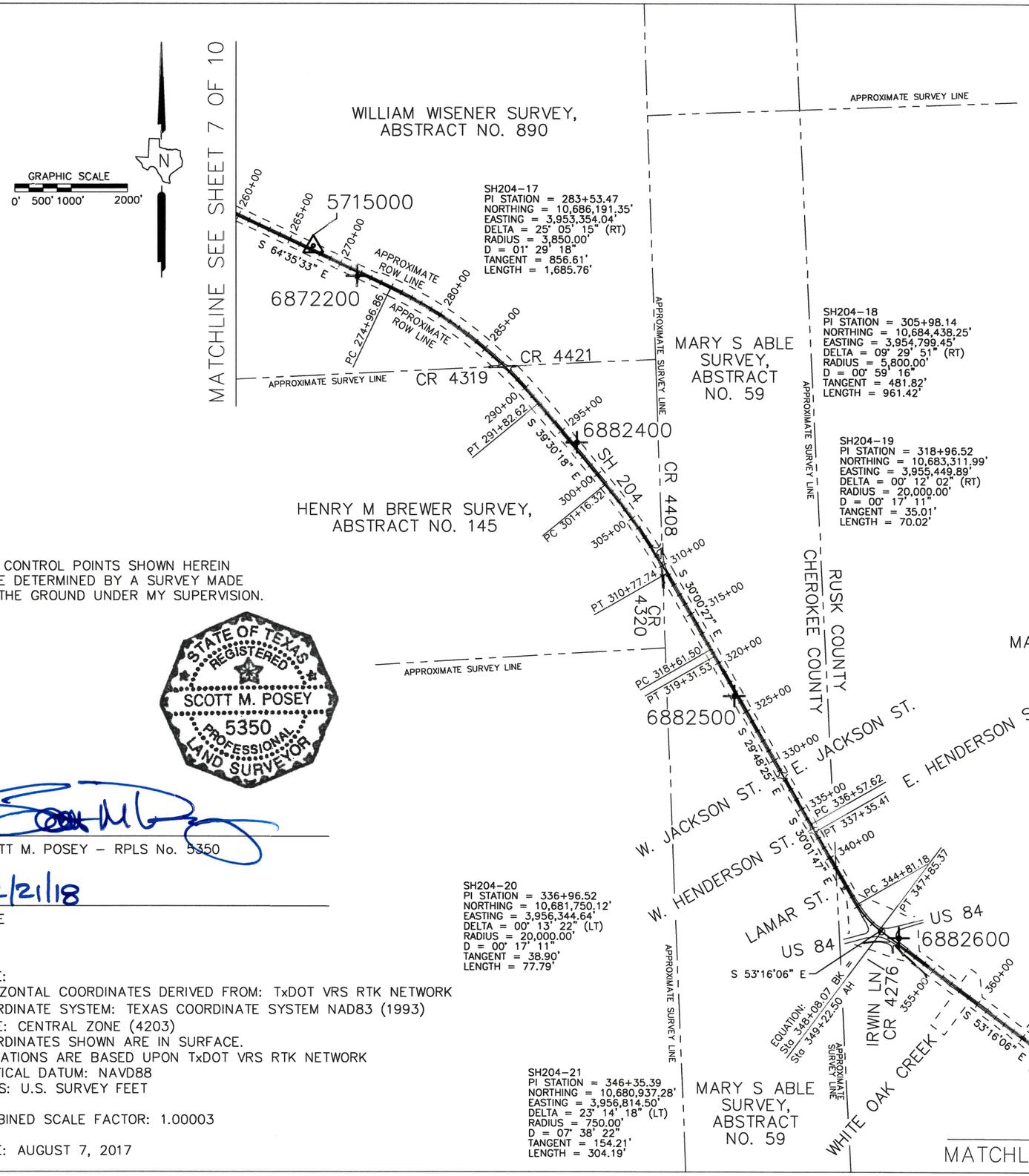
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

CONTROL INDEX MAP

SHEET 7 OF 10

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	N/A	6	TEXAS				SH 204
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.	83



PRIMARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
5715000	10,686,928.53'	3,951,889.28'	336.63'	267+14.08	37.42' LT

SECONDARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6872200	10,686,658.98'	3,952,280.76'	317.90'	271+83.35	38.09' RT
6882400	10,685,180.49'	3,954,237.19'	330.34'	296+67.76	38.35' LT
6882500	10,682,926.30'	3,955,642.75'	317.57'	323+27.05	24.37' RT
6882600	10,680,772.16'	3,957,110.50'	291.23'	350+81.56	44.70' LT
6882700	10,679,509.04'	3,958,763.03'	299.62'	371+61.41	20.71' LT

INTERSECTING ROAD INFORMATION (SURFACE)			
ROAD NAME	NORTHING	EASTING	STATION
CR 4319/CR 4421	10,685,856.71'	3,953,596.65'	287+37.55
CR 4408/CR 4320	10,684,088.08'	3,955,001.08'	310+00.00
JACKSON ST.	10,682,219.85'	3,956,075.54'	331+55.17
HENDERSON ST.	10,681,731.57'	3,956,355.37'	337+17.94
LAMAR ST.	10,681,227.65'	3,956,646.65'	343+00.00
US 84	10,680,831.47'	3,956,956.29'	348+08.07
IRWIN LN/CR 4276	10,680,756.49'	3,957,056.76'	350+47.87

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

STATE OF TEXAS REGISTERED SCOTT M. POSEY 5350 PROFESSIONAL LAND SURVEYOR

SCOTT M. POSEY – RPLS No. 5350

12/21/18

DATE

NOTE:
HORIZONTAL COORDINATES DERIVED FROM: TxDOT VRS RTK NETWORK
COORDINATE SYSTEM: TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
COORDINATES SHOWN ARE IN SURFACE.
ELEVATIONS ARE BASED UPON TxDOT VRS RTK NETWORK
VERTICAL DATUM: NAVD88
UNITS: U.S. SURVEY FEET

COMBINED SCALE FACTOR: 1.00003

DATE: AUGUST 7, 2017

NO.	REVISION	BY	DATE

CONTROL POINT LEGEND

DENOTES SECONDARY CONTROL POINT (5/8" IRON ROD SET WITH PLASTIC CAP STAMPED "LAMB-STAR") UNLESS OTHERWISE NOTED

DENOTES PRIMARY CONTROL POINT (5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK") UNLESS OTHERWISE NOTED

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5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TX 75093
P 214-440-3600
F 214-440-3601
TBPLS # 10048300

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

CONTROL INDEX MAP

SHEET 8 OF 10

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	N/A	6	TEXAS					SH 204
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.		84

SECONDARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6882800	10,677,626.78'	3,960,444.12'	310.73'	396+96.21	18.15' LT
6882900	10,675,448.46'	3,961,874.57'	311.95'	423+02.23	22.74' LT
6883000	10,673,329.88'	3,963,273.72'	305.99'	448+41.11	31.66' LT
6883100	10,671,727.00'	3,964,615.29'	305.75'	469+39.46	51.73' LT

INTERSECTING ROAD INFORMATION (SURFACE)			
ROAD NAME	NORTHING	EASTING	STATION
CR 4267 D	10,676,805.50'	3,960,959.56'	406+65.67

GRAPHIC SCALE
0' 500' 1000' 2000'

N

MATCHLINE SEE SHEET 8 OF 10

SH204-23
PI STATION = 385+15.97
NORTHING = 10,678,611.60'
EASTING = 3,959,778.33'
DELTA = 14° 37' 53" (RT)
RADIUS = 6,000.00'
D = 00° 57' 18"
TANGENT = 770.29'
LENGTH = 1,532.19'

APPROXIMATE SURVEY LINE
RUSK COUNTY
CHEROKEE COUNTY

MARY S ABLE SURVEY,
ABSTRACT NO. 51

380+00
385+00
390+00
PT 392+77.88
395+00
6882800
400+00
405+00
CR 4267 D
S 33°11'08" E
410+00
415+00
SH 204
420+00
PI 420+27.42
6882900
425+00
430+00
435+00
S 33°14'24" E
440+00
445+00
6883000
PC 449+40.05
450+00
455+00
PT 458+79.99
460+00
465+00
6883100
470+00
S 41°39'16" E
475+00

MARY S ABLE SURVEY,
ABSTRACT NO. 59

SH204-24
PI STATION = 454+10.87
NORTHING = 10,672,835.99'
EASTING = 3,963,559.55'
DELTA = 08° 24' 53" (LT)
RADIUS = 6,400.00'
D = 00° 53' 43"
TANGENT = 470.82'
LENGTH = 939.95'

MATCHLINE SEE SHEET 10 OF 10

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

STATE OF TEXAS
REGISTERED
SCOTT M. POSEY
5350
PROFESSIONAL
LAND SURVEYOR

SCOTT M. POSEY – RPLS No. 5350

12/21/18
DATE

NOTE:
HORIZONTAL COORDINATES DERIVED FROM: TxDOT VRS RTK NETWORK
COORDINATE SYSTEM: TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
COORDINATES SHOWN ARE IN SURFACE.
ELEVATIONS ARE BASED UPON TxDOT VRS RTK NETWORK
VERTICAL DATUM: NAVD88
UNITS: U.S. SURVEY FEET

COMBINED SCALE FACTOR: 1.00003

DATE: AUGUST 7, 2017

NO.	REVISION	BY	DATE

CONTROL POINT LEGEND

+ DENOTES SECONDARY CONTROL POINT (5/8" IRON ROD SET WITH PLASTIC CAP STAMPED "LAMB-STAR") UNLESS OTHERWISE NOTED

△ DENOTES PRIMARY CONTROL POINT (5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK") UNLESS OTHERWISE NOTED

LAMB-STAR
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5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TX 75093
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F 214-440-3601
TBPLS # 10048300

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

CONTROL INDEX MAP

SHEET 9 OF 10

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	N/A	6	TEXAS				SH 204
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.	85

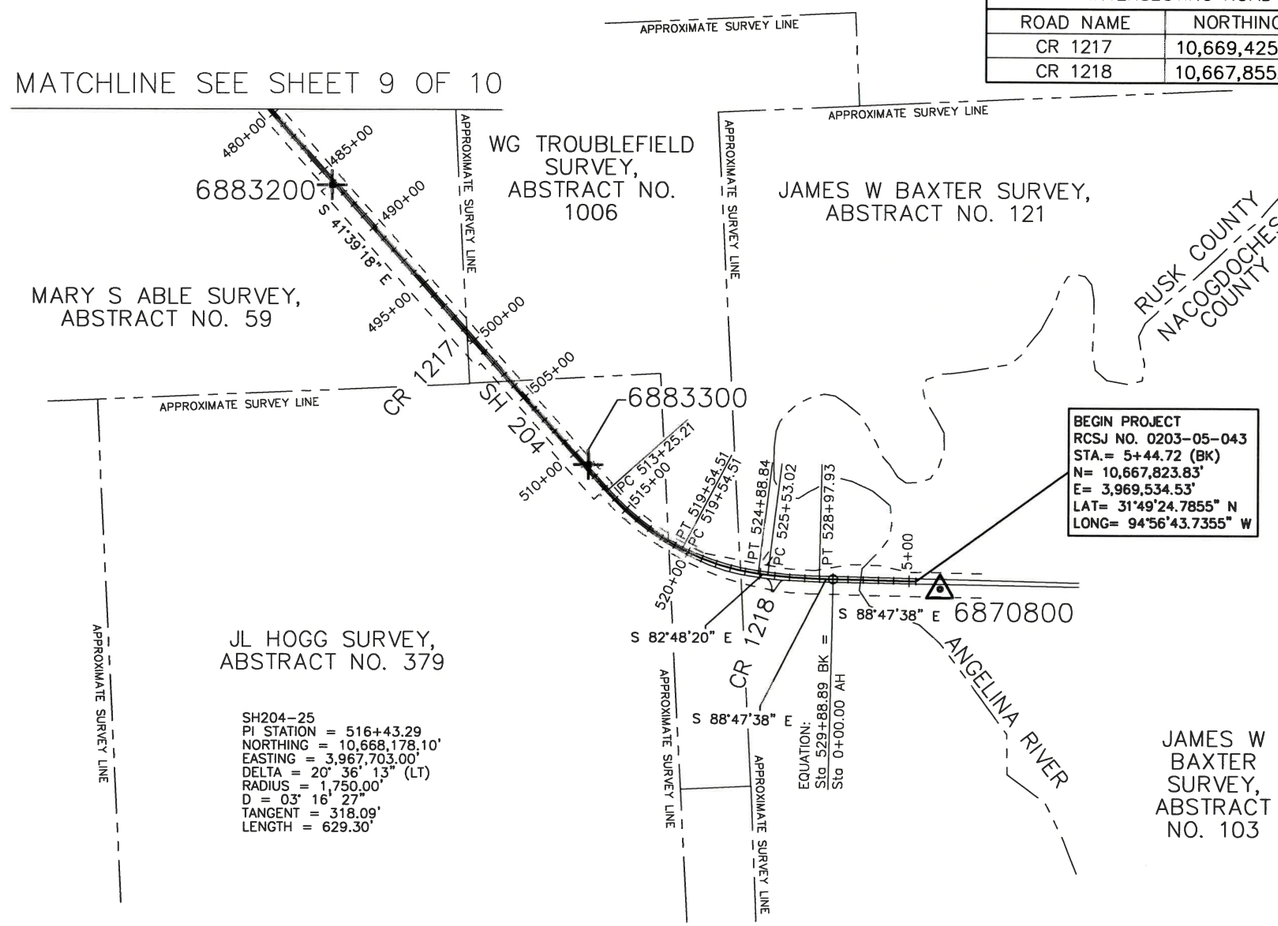
PRIMARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6870800	10,667,773.23'	3,969,692.82'	258.92'	7+04.03	47.26' RT

SECONDARY CONTROL POINTS (SURFACE)					
CP	NORTHING	EASTING	ELEVATION	STATION	OFFSET
6883200	10,670,429.56'	3,965,671.54'	299.62'	486+10.89	21.42' RT
6883300	10,668,585.56'	3,967,366.47'	271.04'	511+15.18	19.37' LT

INTERSECTING ROAD INFORMATION (SURFACE)			
ROAD NAME	NORTHING	EASTING	STATION
CR 1217	10,669,425.91'	3,966,593.00'	499+73.22
CR 1218	10,667,855.38'	3,968,615.81'	526+14.08

GRAPHIC SCALE
0' 500' 1000' 2000'

N



BEGIN PROJECT
RCSJ NO. 0203-05-043
STA.= 5+44.72 (BK)
N= 10,667,823.83'
E= 3,969,534.53'
LAT= 31°49'24.7855" N
LONG= 94°56'43.7355" W

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

STATE OF TEXAS
REGISTERED
SCOTT M. POSEY
5350
PROFESSIONAL
LAND SURVEYOR

SCOTT M. POSEY – RPLS No. 5350

12/21/18

DATE

SH204-25
PI STATION = 516+43.29
NORTHING = 10,668,178.10'
EASTING = 3,967,703.00'
DELTA = 20° 36' 13" (LT)
RADIUS = 1,750.00'
D = 03° 16' 27"
TANGENT = 318.09'
LENGTH = 629.30'

SH204-26
PI STATION = 522+24.57
NORTHING = 10,667,904.32'
EASTING = 3,968,223.55'
DELTA = 20° 32' 50" (LT)
RADIUS = 1,490.00'
D = 03° 50' 43"
TANGENT = 270.07'
LENGTH = 534.34'

SH204-27
PI STATION = 527+25.63
NORTHING = 10,667,840.85'
EASTING = 3,968,726.42'
DELTA = 05° 59' 18" (LT)
RADIUS = 3,300.00'
D = 01° 44' 10"
TANGENT = 172.61'
LENGTH = 344.91'

NOTE:
HORIZONTAL COORDINATES DERIVED FROM: TxDOT VRS RTK NETWORK
COORDINATE SYSTEM: TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
COORDINATES SHOWN ARE IN SURFACE.
ELEVATIONS ARE BASED UPON TxDOT VRS RTK NETWORK
VERTICAL DATUM: NAVD88
UNITS: U.S. SURVEY FEET

COMBINED SCALE FACTOR: 1.00003

DATE: AUGUST 7, 2017

NO.	REVISION	BY	DATE

CONTROL POINT LEGEND

+ DENOTES SECONDARY CONTROL POINT (5/8" IRON ROD SET WITH PLASTIC CAP STAMPED "LAMB-STAR") UNLESS OTHERWISE NOTED

△ DENOTES PRIMARY CONTROL POINT (5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK") UNLESS OTHERWISE NOTED

LAMB-STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TX 75093
P 214-440-3600
F 214-440-3601
TBPLS # 10048300

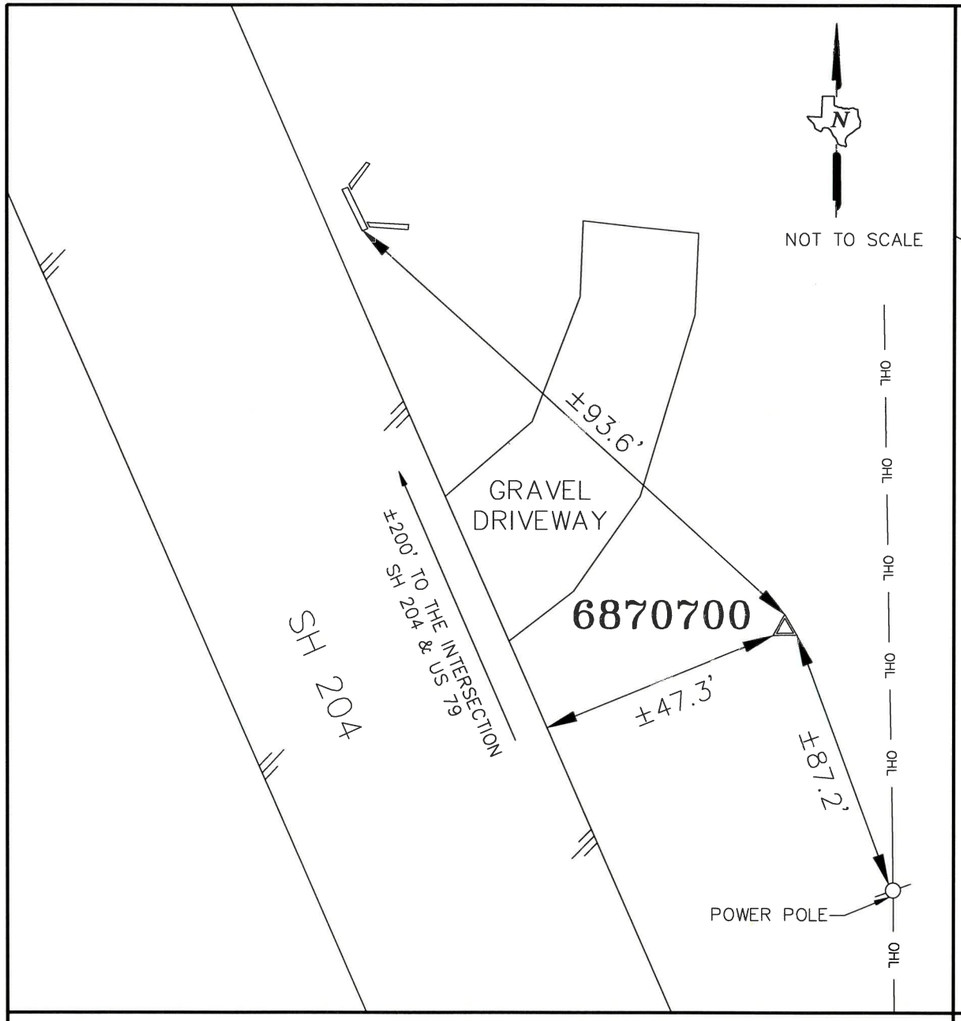
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

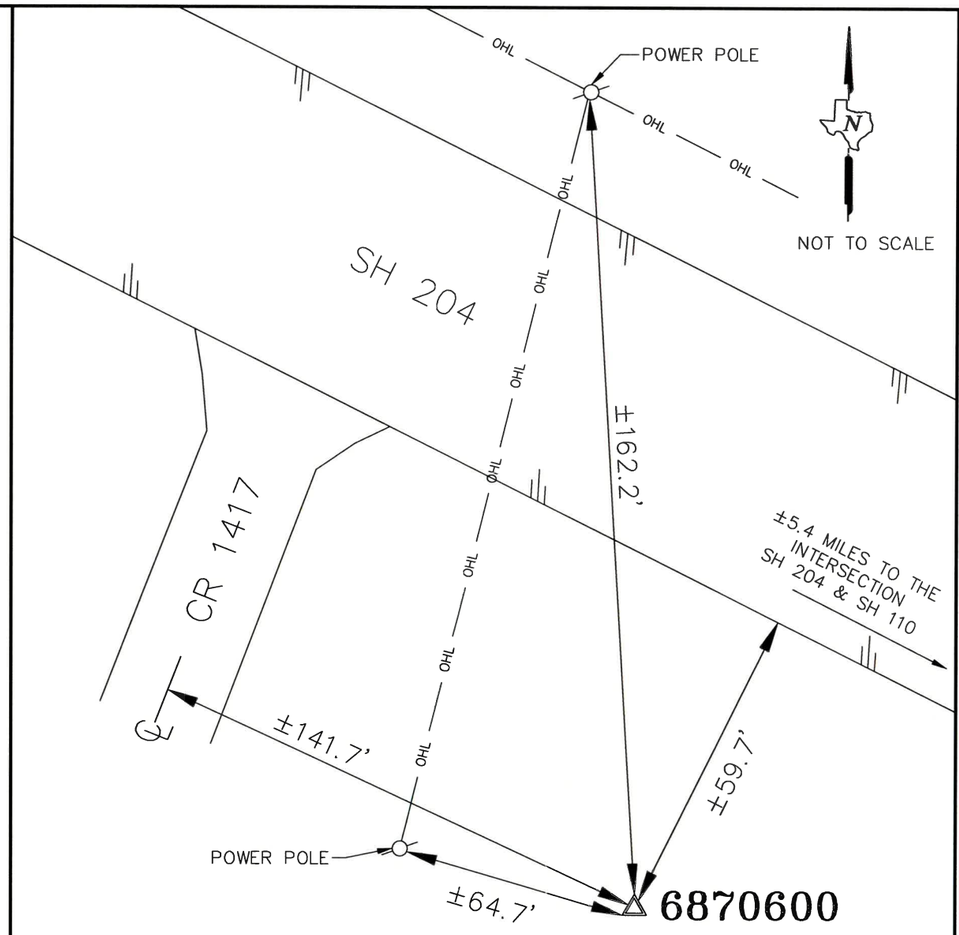
SH 204

CONTROL INDEX MAP

SHEET 10 OF 10

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	N/A	6	TEXAS				SH 204
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.	86





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

STATE OF TEXAS REGISTERED SCOTT M. POSEY 5350 PROFESSIONAL LAND SURVEYOR

R/1/18

Scott M. Posey
Registered Professional Land Surveyor
No. 5350

LAMB–STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY,
SUITE 1000
PLANO, TX. 75093
TBPLS # 10048300

CONTROL POINT No. 6870700

APPROXIMATE LOCATION:
A 5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK", ±200' SOUTHEAST OF THE INTERSECTION OF SH 204 AND US 79, ±47.3' NORTHEAST OF THE NORTHERLY EDGE OF ASPHALT OF SH 204, ±93.6' SOUTHEAST OF A HEADWALL, AND ±87.2' NORTHWEST OF A POWER POLE.

TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
BEARING BASIS: GRID NORTH
ELEVATION BASIS: NAVD88
UNITS: U.S. SURVEY FEET
SURFACE ADJUSTMENT FACTOR: 1.00003
DATE SET: AUGUST 07, 2017
MONUMENT: 3 1/4" ALUMINUM CAP STAMPED "TXDOT CONTROL MARK"
STATE PLANE SURFACE COORDINATES
NORTHING: 10,716,718.76'
EASTING: 3,879,445.34'
ELEVATION: 473.82'

CONTROL POINT No. 6870600

APPROXIMATE LOCATION:
A 5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK", ±5.4 MILES NORTHWEST OF THE INTERSECTION OF SH 204 AND SH 110, ±59.7' SOUTHWEST OF THE SOUTHERLY EDGE OF ASPHALT OF SH 204, ±141.7' SOUTHEAST OF THE CENTERLINE OF CR 1417, ±64.7' SOUTHEAST OF A POWER POLE AND ±162.2' SOUTH OF A POWER POLE.

TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
BEARING BASIS: GRID NORTH
ELEVATION BASIS: NAVD88
UNITS: U.S. SURVEY FEET
SURFACE ADJUSTMENT FACTOR: 1.00003
DATE SET: AUGUST 07, 2017
MONUMENT: 3 1/4" ALUMINUM CAP STAMPED "TXDOT CONTROL MARK"
STATE PLANE SURFACE COORDINATES
NORTHING: 10,701,842.17'
EASTING: 3,901,197.77'
ELEVATION: 349.72'

NO.	REVISION	BY	DATE

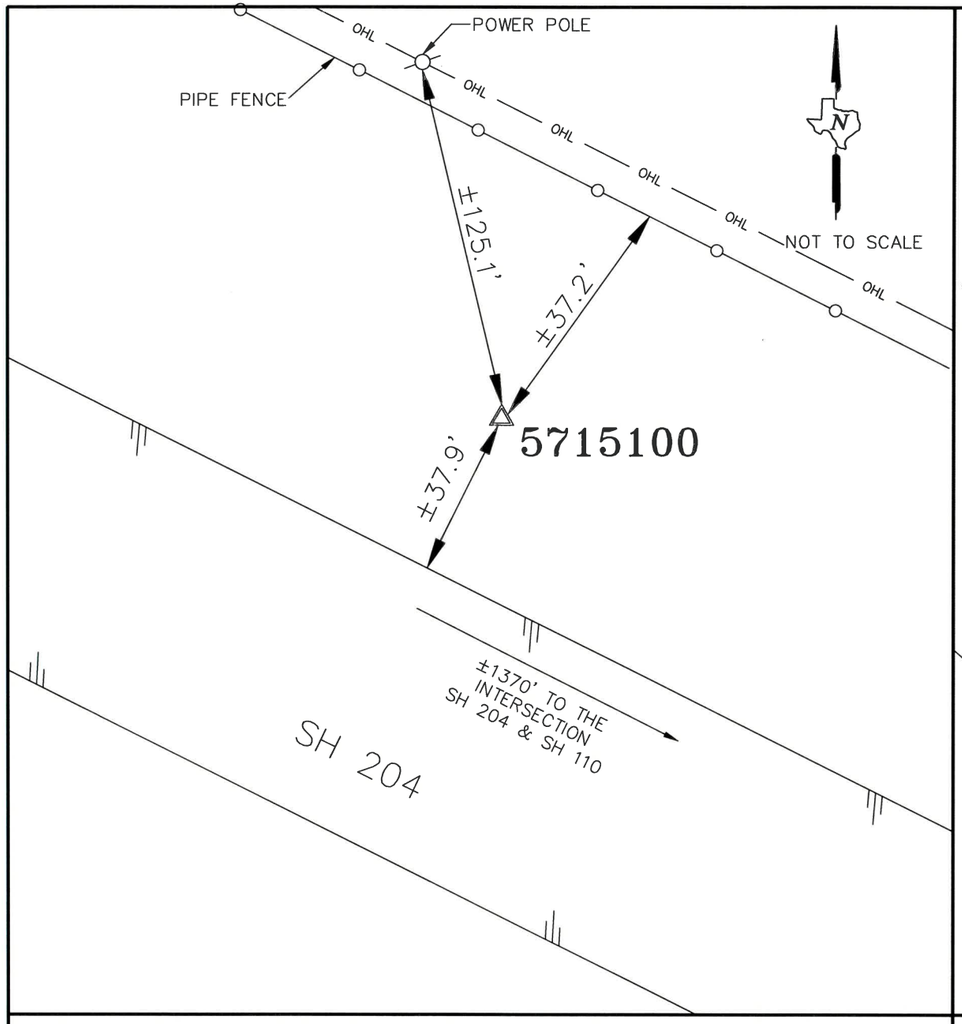
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

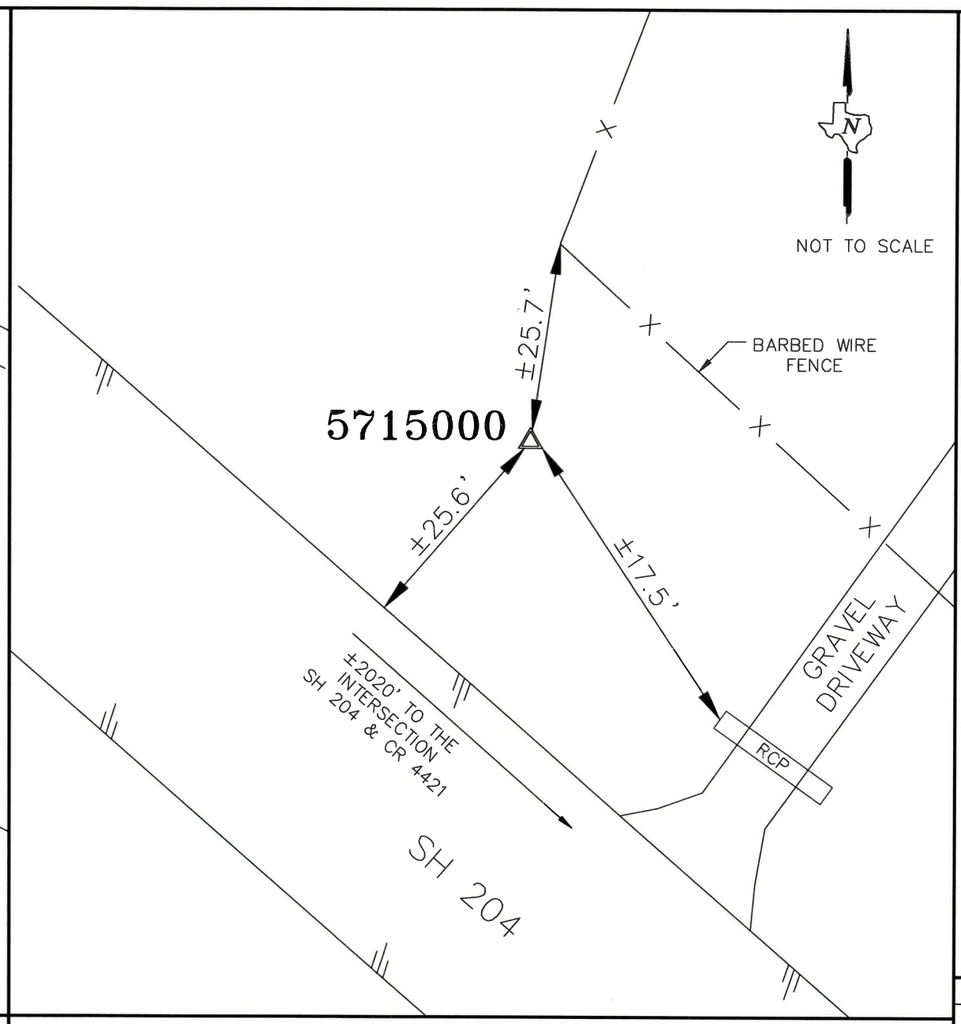
SH 204

SURVEY CONTROL DATA

1 OF 3

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	N/A	6	TEXAS					SH 204
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.		87





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

STATE OF TEXAS
REGISTERED
SCOTT M. POSEY
5350
PROFESSIONAL
LAND SURVEYOR

12/21/18

Scott M. Posey
Registered Professional Land Surveyor
No. 5350

LAMB–STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY,
SUITE 1000
PLANO, TX. 75093
TBPLS # 10048300

CONTROL POINT No. 5715100

APPROXIMATE LOCATION:
A 5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK", ±1370' NORTHWEST OF THE INTERSECTION OF SH 204 AND SH 110, ±37.9' NORTHEAST OF THE NORTHERLY EDGE OF ASPHALT OF SH 204, ±37.2' SOUTHWEST OF A PIPE FENCE, AND ±125.1' SOUTHEAST OF A POWER POLE.

TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
BEARING BASIS: GRID NORTH
ELEVATION BASIS: NAVD88
UNITS: U.S. SURVEY FEET
SURFACE ADJUSTMENT FACTOR: 1.00003
DATE SET: AUGUST 07, 2017
MONUMENT: 3 1/4" ALUMINUM CAP STAMPED "TXDOT CONTROL MARK"
STATE PLANE SURFACE COORDINATES
NORTHING: 10,693,603.45'
EASTING: 3,926,039.96'
ELEVATION: 317.51'

CONTROL POINT No. 5715000

APPROXIMATE LOCATION:
A 5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK", ±2020' NORTHWEST OF THE INTERSECTION OF SH 204 AND CR 4421, ±25.6' NORTHEAST OF THE NORTHERLY EDGE OF ASPHALT OF SH 204, ±25.7' SOUTHEAST OF A FENCE CORNER, AND ±17.5' NORTHWEST OF A RCP PIPE.

TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
BEARING BASIS: GRID NORTH
ELEVATION BASIS: NAVD88
UNITS: U.S. SURVEY FEET
SURFACE ADJUSTMENT FACTOR: 1.00003
DATE SET: AUGUST 07, 2017
MONUMENT: 3 1/4" ALUMINUM CAP STAMPED "TXDOT CONTROL MARK"
STATE PLANE SURFACE COORDINATES
NORTHING: 10,686,928.53'
EASTING: 3,951,889.28'
ELEVATION: 336.63'

NO.	REVISION	BY	DATE

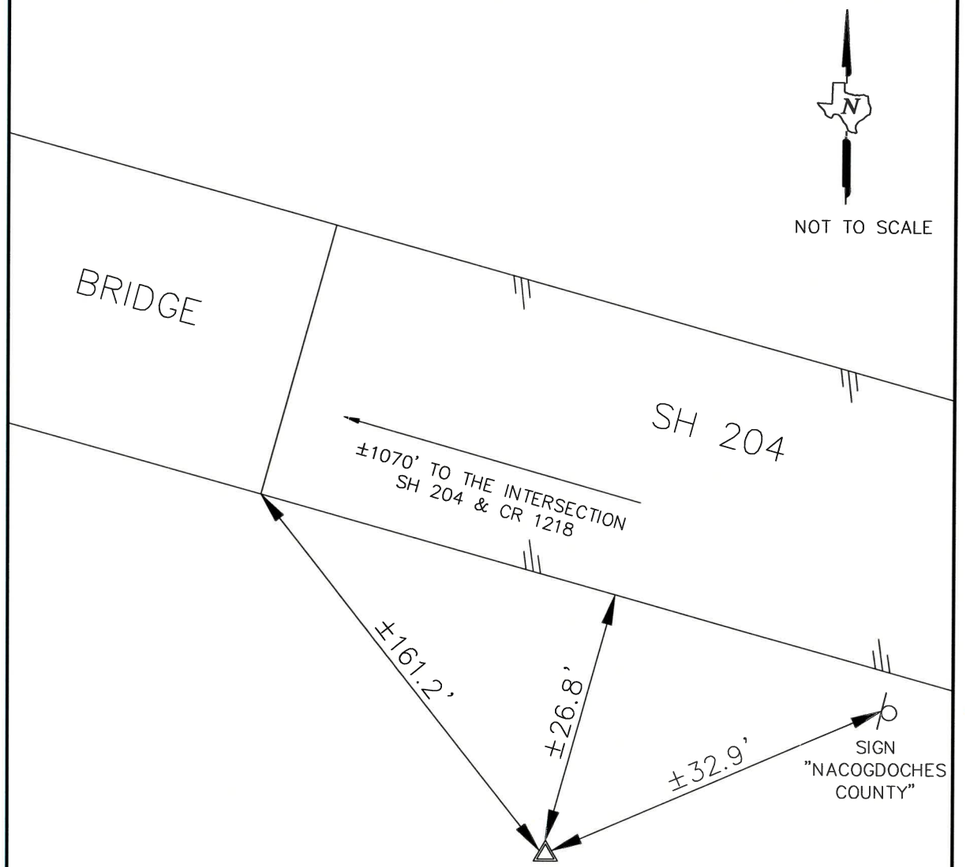
TEXAS REGISTERED ENGINEERING FIRM F–1741

SH 204

SURVEY CONTROL DATA

2 OF 3

Designed:	N/A	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	N/A	6	TEXAS					SH 204
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.		88



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

STATE OF TEXAS
REGISTERED
SCOTT M. POSEY
5350
PROFESSIONAL
LAND SURVEYOR

12/21/18

Scott M. Posey
Registered Professional Land Surveyor
No. 5350

LAMB–STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY,
SUITE 1000
PLANO, TX. 75093
TBPLS # 10048300

CONTROL POINT No. 6870800

APPROXIMATE LOCATION:
A 5/8" IRON ROD SET IN CONCRETE WITH A 3 1/2" ALUMINUM CAP STAMPED "TEXAS DEPT. OF TRANSPORTATION CONTROL MARK", ±1070' SOUTHEAST OF THE INTERSECTION OF SH 204 AND CR 1218, ±26.8' SOUTHWEST OF THE SOUTHERLY EDGE OF ASPHALT OF SH 204, ±32.9' SOUTHWEST OF A SIGN, AND ±161.2' SOUTHEAST OF THE BRIDGE ARMOR JOINT.

TEXAS COORDINATE SYSTEM NAD83 (1993)
ZONE: CENTRAL ZONE (4203)
BEARING BASIS: GRID NORTH
ELEVATION BASIS: NAVD88
UNITS: U.S. SURVEY FEET
SURFACE ADJUSTMENT FACTOR: 1.00003
DATE SET: AUGUST 07, 2017
MONUMENT: 3 1/4" ALUMINUM CAP STAMPED "TXDOT CONTROL MARK"
STATE PLANE SURFACE COORDINATES
NORTHING: 10,667,773.23'
EASTING: 3,969,692.82'
ELEVATION: 258.92'

NO.	REVISION	BY	DATE

TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SURVEY CONTROL DATA

3 OF 3

		FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Designed:	N/A	6	TEXAS				SH 204
Checked:	N/A						
Drawn:	RBH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	SMP	10	CHEROKEE	0198	07	014, ETC.	89

HORIZONTAL ALIGNMENT FOR ℄ SH 204

Beginning chain CLSH204 description

Point 2012 N 10,693,704.0509 E 3,920,859.7070 Sta 701+60.22

Course from 2012 to PC SH204-11 N 86° 00' 18.32" E Dist 3,151.8790

Curve Data			
Curve SH204-11			
P.I. Station	740+80.81 N	10,693,977.1902 E	3,924,770.7729
Delta =	22° 59' 24.72" (RT)		
Degree =	1° 30' 56.74"		
Tangent =	768.7130		
Length =	1,516.7427		
Radius =	3,780.0000		
External =	77.3721		
Long Chord =	1,506.5880		
Mid. Ord. =	75.8202		
P.C. Station	733+12.10 N	10,693,923.6356 E	3,924,003.9277
P.T. Station	748+28.84 N	10,693,726.9814 E	3,925,497.6260
C.C.	N	10,690,152.8201 E	3,924,267.2722
Back = N	86° 00' 18.32" E		
Ahead = S	71° 00' 16.96" E		
Chord Bear = S	82° 29' 59.32" E		

Course from PT SH204-11 to STAEQN2 S 71° 00' 16.96" E Dist 1,915.7543

Equation: Sta 767+44.59 (BK) = Sta 8+91.30 (AH) — End Region 2 / Begin Region 3

Point STAEQN2 N 10,693,103.4218 E 3,927,309.0585 Sta 8+91.30

Course from STAEQN2 to PC SH204-12 S 71° 00' 16.96" E Dist 674.3021

Curve Data			
Curve SH204-12			
P.I. Station	16+25.68 N	10,692,864.3883 E	3,928,003.4476
Delta =	0° 20' 39.18" (LT)		
Degree =	0° 17' 11.32"		
Tangent =	60.0774		
Length =	120.1544		
Radius =	20,000.0000		
External =	0.0902		
Long Chord =	120.1542		
Mid. Ord. =	0.0902		
P.C. Station	15+65.60 N	10,692,883.9429 E	3,927,946.6417
P.T. Station	16+85.76 N	10,692,845.1753 E	3,928,060.3699
C.C.	N	10,711,794.8497 E	3,934,456.4500
Back = S	71° 00' 16.96" E		
Ahead = S	71° 20' 56.14" E		
Chord Bear = S	71° 10' 36.55" E		

Course from PT SH204-12 to PC SH204-13 S 71° 20' 56.14" E Dist 298.8570

Curve Data			
Curve SH204-13			
P.I. Station	29+22.43 N	10,692,449.6824 E	3,929,232.0973
Delta =	18° 54' 51.83" (LT)		
Degree =	1° 01' 03.67"		
Tangent =	937.8158		
Length =	1,858.5671		
Radius =	5,630.0000		
External =	77.5738		
Long Chord =	1,850.1393		
Mid. Ord. =	76.5195		
P.C. Station	19+84.61 N	10,692,749.5996 E	3,928,343.5321
P.T. Station	38+43.18 N	10,692,453.9924 E	3,930,169.9033
C.C.	N	10,698,083.9330 E	3,930,144.0286
Back = S	71° 20' 56.14" E		
Ahead = N	89° 44' 12.03" E		
Chord Bear = S	80° 48' 22.05" E		

Course from PT SH204-13 to PC SH204-14 N 89° 44' 12.03" E Dist 285.7841

HORIZONTAL ALIGNMENT FOR ℄ SH 204 CONT.

Curve Data			
Curve SH204-14			
P.I. Station	41+79.03 N	10,692,455.5360 E	3,930,505.7510
Delta =	0° 17' 12.71" (LT)		
Degree =	0° 17' 11.32"		
Tangent =	50.0673		
Length =	100.1343		
Radius =	20,000.0000		
External =	0.0627		
Long Chord =	100.1342		
Mid. Ord. =	0.0627		
P.C. Station	41+28.96 N	10,692,455.3059 E	3,930,455.6843
P.T. Station	42+29.10 N	10,692,456.0167 E	3,930,555.8160
C.C.	N	10,712,455.0946 E	3,930,363.7673
Back = N	89° 44' 12.03" E		
Ahead = N	89° 26' 59.33" E		
Chord Bear = N	89° 35' 35.68" E		

Course from PT SH204-14 to 2013 N 89° 26' 59.33" E Dist 4,808.0081

Point 2013 N 10,692,502.1853 E 3,935,363.6025 Sta 90+37.11

Course from 2013 to 2014 N 89° 24' 51.00" E Dist 1,902.6322

Point 2014 N 10,692,521.6388 E 3,937,266.1352 Sta 109+39.74

Course from 2014 to PC SH204-15 N 89° 18' 55.95" E Dist 1,471.6582

Curve Data			
Curve SH204-15			
P.I. Station	129+45.15 N	10,692,545.5951 E	3,939,271.4078
Delta =	15° 12' 04.42" (RT)		
Degree =	1° 25' 56.62"		
Tangent =	533.7575		
Length =	1,061.2458		
Radius =	4,000.0000		
External =	35.4550		
Long Chord =	1,058.1360		
Mid. Ord. =	35.1435		
P.C. Station	124+11.40 N	10,692,539.2189 E	3,938,737.6884
P.T. Station	134+72.64 N	10,692,411.8017 E	3,939,788.1247
C.C.	N	10,688,539.5044 E	3,938,785.4714
Back = N	89° 18' 55.95" E		
Ahead = S	75° 28' 59.64" E		
Chord Bear = S	83° 05' 01.84" E		

Course from PT SH204-15 to PC SH204-16 S 75° 28' 59.64" E Dist 793.5712

HORIZONTAL ALIGNMENT FOR ℄ SH 204 CONT.

Curve Data			
Curve SH204-16			
P.I. Station	146+10.56 N	10,692,126.5685 E	3,940,889.7095
Delta =	10° 55' 39.03" (RT)		
Degree =	1° 35' 29.58"		
Tangent =	344.3422		
Length =	686.5956		
Radius =	3,600.0000		
External =	16.4308		
Long Chord =	685.5555		
Mid. Ord. =	16.3561		
P.C. Station	142+66.21 N	10,692,212.8825 E	3,940,556.3606
P.T. Station	149+52.81 N	10,691,978.6277 E	3,941,200.6517
C.C.	N	10,688,727.8149 E	3,939,653.9726
Back = S	75° 28' 59.64" E		
Ahead = S	64° 33' 20.61" E		
Chord Bear = S	70° 01' 10.12" E		

Course from PT SH204-16 to 2015 S 64° 33' 20.61" E Dist 1,211.4887

Point 2015 N 10,691,458.1321 E 3,942,294.6303 Sta 161+64.30

Course from 2015 to STAEQN3 S 64° 30' 48.46" E Dist 396.0113

Equation: Sta 165+60.31 (BK) = Sta 165+00.00 (AH) — End Region 3 / Begin Region 4

Point STAEQN3 N 10,691,287.7288 E 3,942,652.1043 Sta 165+00.00

Course from STAEQN3 to 2016 S 64° 30' 48.46" E Dist 1,140.2354

Point 2016 N 10,690,797.0867 E 3,943,681.3792 Sta 176+40.24

Course from 2016 to 2017 S 64° 25' 38.14" E Dist 469.2529

Point 2017 N 10,690,594.5306 E 3,944,104.6632 Sta 181+09.49

Course from 2017 to 2018 S 64° 29' 38.21" E Dist 1,909.4328

Point 2018 N 10,689,772.3165 E 3,945,828.0023 Sta 200+18.92

Course from 2018 to 2019 S 64° 35' 04.86" E Dist 1,803.1019

Point 2019 N 10,688,998.4673 E 3,947,456.6011 Sta 218+22.02

Course from 2019 to 2020 S 64° 29' 09.18" E Dist 2,848.9373

Point 2020 N 10,687,771.3346 E 3,950,027.7078 Sta 246+70.96

Course from 2020 to PC SH204-17 S 64° 35' 33.45" E Dist 2,825.8967

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

HORIZONTAL ALIGNMENT DATA

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		90

SHEET 1 OF 3

HORIZONTAL ALIGNMENT FOR ℄ SH 204 CONT.

Curve Data

Curve SH204-17
P.I. Station 283+53.47 N 10,686,191.3496 E 3,953,354.0434
Delta = 25° 05' 15.16" (RT)
Degree = 1° 29' 17.53"
Tangent = 856.6108
Length = 1,685.7620
Radius = 3,850.0000
External = 94.1453
Long Chord = 1,672.3277
Mid. Ord. = 91.8981
P.C. Station 274+96.86 N 10,686,558.8797 E 3,952,580.2839
P.T. Station 291+82.62 N 10,685,530.4159 E 3,953,898.9735
C.C. N 10,683,081.2514 E 3,950,928.4359
Back = S 64° 35' 33.45" E
Ahead = S 39° 30' 18.28" E
Chord Bear = S 52° 02' 55.86" E

Course from PT SH204-17 to PC SH204-18 S 39° 30' 18.28" E Dist 933.7003

Curve Data

Curve SH204-18
P.I. Station 305+98.14 N 10,684,438.2487 E 3,954,799.4492
Delta = 9° 29' 51.03" (RT)
Degree = 0° 59' 16.29"
Tangent = 481.8158
Length = 961.4242
Radius = 5,800.0000
External = 19.9782
Long Chord = 960.3238
Mid. Ord. = 19.9096
P.C. Station 301+16.32 N 10,684,810.0024 E 3,954,492.9437
P.T. Station 310+77.74 N 10,684,021.0157 E 3,955,040.4123
C.C. N 10,681,120.3521 E 3,950,017.8482
Back = S 39° 30' 18.28" E
Ahead = S 30° 00' 27.25" E
Chord Bear = S 34° 45' 22.77" E

Course from PT SH204-18 to PC SH204-19 S 30° 00' 27.25" E Dist 783.7609

Curve Data

Curve SH204-19
P.I. Station 318+96.52 N 10,683,311.9914 E 3,955,449.8926
Delta = 0° 12' 02.18" (RT)
Degree = 0° 17' 11.32"
Tangent = 35.0124
Length = 70.0247
Radius = 20,000.0000
External = 0.0306
Long Chord = 70.0246
Mid. Ord. = 0.0306
P.C. Station 318+61.50 N 10,683,342.3107 E 3,955,432.3824
P.T. Station 319+31.53 N 10,683,281.6110 E 3,955,467.2966
C.C. N 10,673,340.0221 E 3,938,113.1958
Back = S 30° 00' 27.25" E
Ahead = S 29° 48' 25.07" E
Chord Bear = S 29° 54' 26.16" E

Course from PT SH204-19 to PC SH204-20 S 29° 48' 25.07" E Dist 1,726.0910

Curve Data

Curve SH204-20
P.I. Station 336+96.52 N 10,681,750.1233 E 3,956,344.6351
Delta = 0° 13' 22.28" (LT)
Degree = 0° 17' 11.32"
Tangent = 38.8955
Length = 77.7909
Radius = 20,000.0000
External = 0.0378
Long Chord = 77.7908
Mid. Ord. = 0.0378
P.C. Station 336+57.62 N 10,681,783.8731 E 3,956,325.3009
P.T. Station 337+35.41 N 10,681,716.4489 E 3,956,364.1003
C.C. N 10,691,725.4619 E 3,973,679.4016
Back = S 29° 48' 25.07" E
Ahead = S 30° 01' 47.35" E
Chord Bear = S 29° 55' 06.21" E

Course from PT SH204-20 to PC SH204-21 S 30° 01' 47.35" E Dist 745.7663

HORIZONTAL ALIGNMENT FOR ℄ SH 204 CONT.

Curve Data

Curve SH204-21
P.I. Station 346+35.39 N 10,680,937.2768 E 3,956,814.4964
Delta = 23° 14' 18.20" (LT)
Degree = 7° 38' 21.97"
Tangent = 154.2147
Length = 304.1898
Radius = 750.0000
External = 15.6907
Long Chord = 302.1091
Mid. Ord. = 15.3691
P.C. Station 344+81.18 N 10,681,070.7905 E 3,956,737.3196
P.T. Station 347+85.37 N 10,680,845.0456 E 3,956,938.0909
C.C. N 10,681,446.1285 E 3,957,386.6434
Back = S 30° 01' 47.35" E
Ahead = S 53° 16' 05.55" E
Chord Bear = S 41° 38' 56.45" E

Course from PT SH204-21 to STAEQN4 S 53° 16' 05.55" E Dist 22.7029

Equation: Sta 348+08.07 (BK) = Sta 349+22.50 (AH) — End Region 4 / Begin Region 5

Point STAEQN4 N 10,680,831.4676 E 3,956,956.2860 Sta 349+22.50

Course from STAEQN4 to PC SH204-22 S 53° 16' 05.55" E Dist 2,484.8255

Curve Data

Curve SH204-22
P.I. Station 375+54.91 N 10,679,257.1037 E 3,959,066.0132
Delta = 5° 27' 04.55" (RT)
Degree = 1° 50' 53.70"
Tangent = 147.5822
Length = 294.9418
Radius = 3,100.0000
External = 3.5110
Long Chord = 294.8305
Mid. Ord. = 3.5070
P.C. Station 374+07.33 N 10,679,345.3682 E 3,958,947.7343
P.T. Station 377+02.27 N 10,679,158.0020 E 3,959,175.3721
C.C. N 10,676,860.8921 E 3,957,093.7174
Back = S 53° 16' 05.55" E
Ahead = S 47° 49' 01.00" E
Chord Bear = S 50° 32' 33.27" E

Course from PT SH204-22 to PC SH204-23 S 47° 49' 01.00" E Dist 43.4220

Curve Data

Curve SH204-23
P.I. Station 385+15.97 N 10,678,611.5964 E 3,959,778.3317
Delta = 14° 37' 52.79" (RT)
Degree = 0° 57' 17.75"
Tangent = 770.2851
Length = 1,532.1893
Radius = 6,000.0000
External = 49.2429
Long Chord = 1,528.0295
Mid. Ord. = 48.8420
P.C. Station 377+45.69 N 10,679,128.8440 E 3,959,207.5479
P.T. Station 392+77.88 N 10,677,966.9434 E 3,960,199.9496
C.C. N 10,674,682.8248 E 3,955,178.5390
Back = S 47° 49' 01.00" E
Ahead = S 33° 11' 08.21" E
Chord Bear = S 40° 30' 04.60" E

Course from PT SH204-23 to 2021 S 33° 11' 08.21" E Dist 2,749.5413

Point 2021 N 10,675,665.8474 E 3,961,704.9196 Sta 420+27.42

Ending chain CLSH204 description

HORIZONTAL ALIGNMENT FOR ℄ SH 110

Beginning chain CLSH110 description

Point SH11001 N 10,693,700.7677 E 3,927,536.7502 Sta 904+60.00

Course from SH11001 to PC CLSH1101 S 16° 17' 14.29" W Dist 86.2895

Curve Data

Curve CLSH1101
P.I. Station 908+23.93 N 10,693,351.4399 E 3,927,434.6836
Delta = 10° 34' 30.33" (RT)
Degree = 1° 54' 35.49"
Tangent = 277.6439
Length = 553.7105
Radius = 3,000.0000
External = 12.8203
Long Chord = 552.9249
Mid. Ord. = 12.7657
P.C. Station 905+46.29 N 10,693,617.9413 E 3,927,512.5499
P.T. Station 911+00.00 N 10,693,103.7554 E 3,927,309.2304
C.C. N 10,694,459.3033 E 3,924,632.9476
Back = S 16° 17' 14.29" W
Ahead = S 26° 51' 44.62" W
Chord Bear = S 21° 34' 29.46" W

Curve Data

Curve CLSH1102
P.I. Station 912+27.41 N 10,692,990.0938 E 3,927,251.6604
Delta = 4° 51' 49.59" (RT)
Degree = 1° 54' 35.49"
Tangent = 127.4098
Length = 254.6666
Radius = 3,000.0000
External = 2.7043
Long Chord = 254.5902
Mid. Ord. = 2.7019
P.C. Station 911+00.00 N 10,693,103.7554 E 3,927,309.2304
P.T. Station 913+54.67 N 10,692,881.7227 E 3,927,184.6606
C.C. N 10,694,459.3033 E 3,924,632.9475
Back = S 26° 51' 44.62" W
Ahead = S 31° 43' 34.21" W
Chord Bear = S 29° 17' 39.42" W

Course from PT CLSH1102 to SH11002 S 31° 43' 34.21" W Dist 385.3334

Point SH11002 N 10,692,553.9693 E 3,926,982.0291 Sta 917+40.00

Ending chain CLSH110 description

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER
3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

HORIZONTAL ALIGNMENT DATA

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	91

HORIZONTAL ALIGNMENT FOR ℄ US 84

Beginning chain CLUS84 description

==========

Point US8401 N 10,680,988.7323 E 3,957,576.7695 Sta 1404+60.00

Course from US8401 to US8402 S 75° 46' 39.70" W Dist 640.1448

Point US8402 N 10,680,831.4585 E 3,956,956.2452 Sta 1411+00.14

Course from US8402 to PC CLUS841 S 74° 41' 40.86" W Dist 398.7251

		Curve Data		
Curve CLUS841				
P.I. Station	1416+19.77	N 10,680,694.2974	E	3,956,455.0513
Delta =	9° 12' 57.71" (LT)			
Degree =	3° 49' 10.99"			
Tangent =	120.8983			
Length =	241.2751			
Radius =	1,500.0000			
External =	4.8642			
Long Chord =	241.0151			
Mid. Ord. =	4.8485			
P.C. Station	1414+98.87	N 10,680,726.2100	E	3,956,571.6618
P.T. Station	1417+40.15	N 10,680,644.1207	E	3,956,345.0572
C.C.		N 10,679,279.4106	E	3,956,967.6056
Back = S	74° 41' 40.86" W			
Ahead = S	65° 28' 43.15" W			
Chord Bear = S	70° 05' 12.00" W			

==========

Ending chain CLUS84 description

STATE OF TEXAS
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3/5/2019

NO.	REVISION	BY	DATE

CP&Y

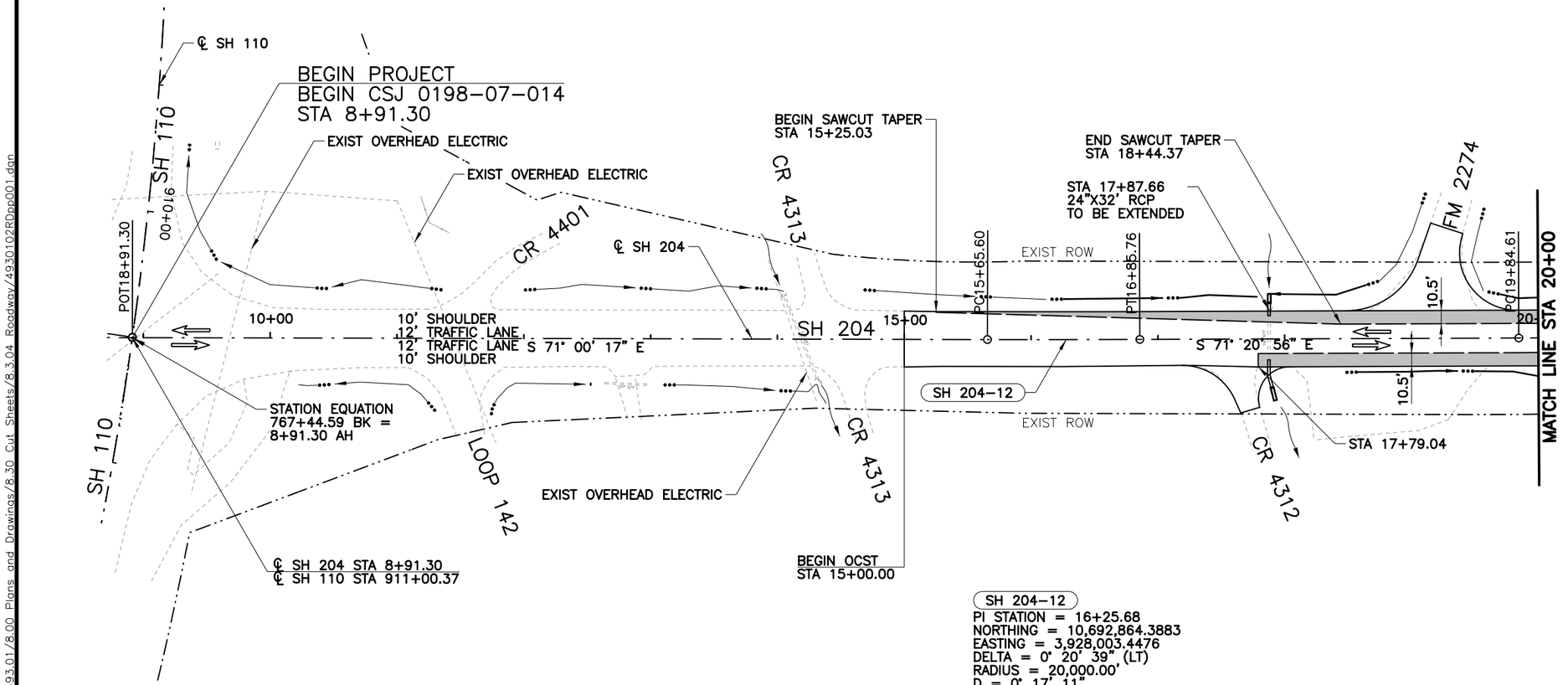
TEXAS REGISTERED ENGINEERING FIRM F-1741

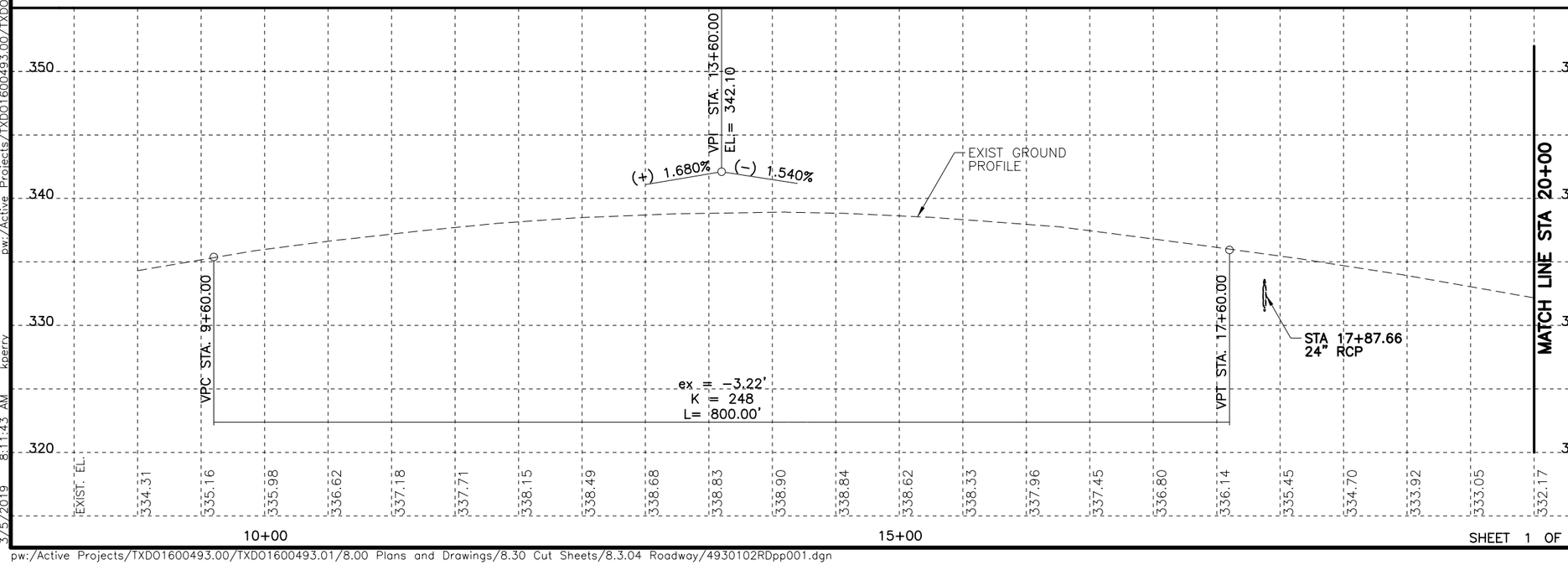
SH 204

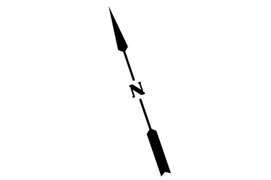
HORIZONTAL ALIGNMENT DATA

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	92

SHEET 3 OF 3







50 25 0 50 100
SCALE FEET
HORIZ.

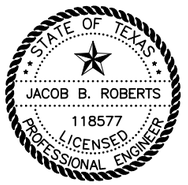
5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.



3/5/2019

NO.	REVISION	BY	DATE

TEXAS REGISTERED ENGINEERING FIRM F-1741

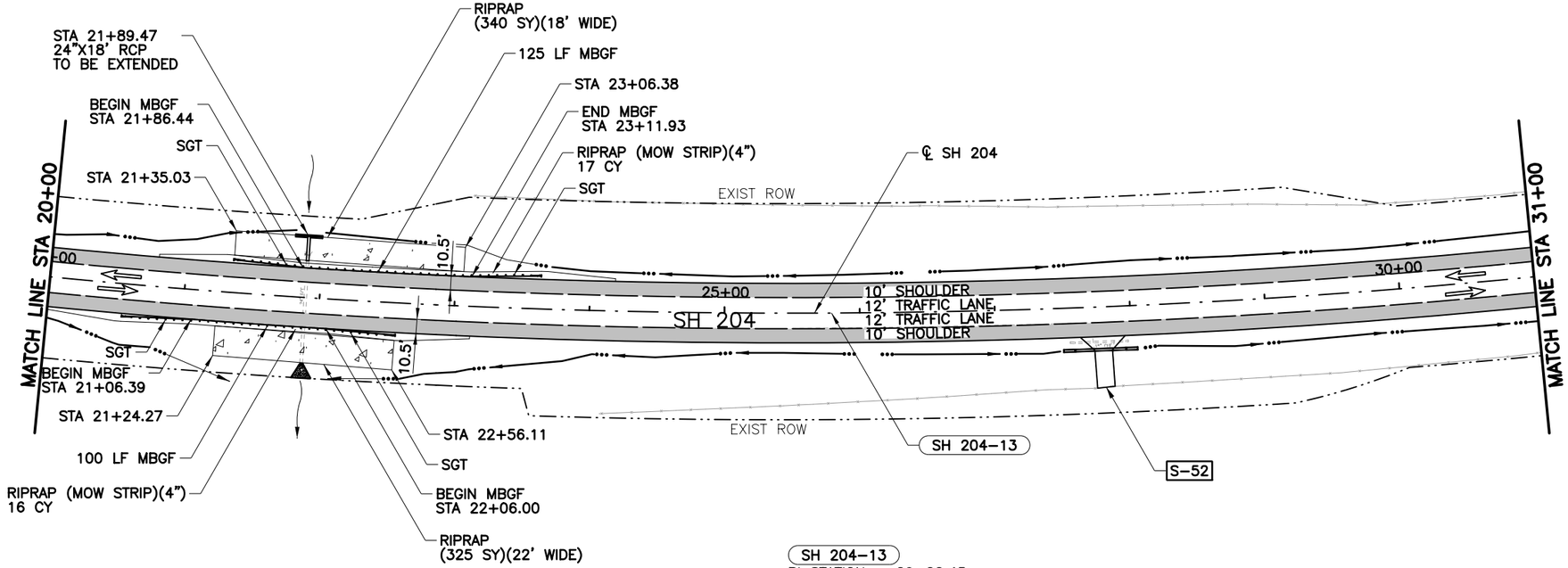
SH 204

ROADWAY PLAN & PROFILE

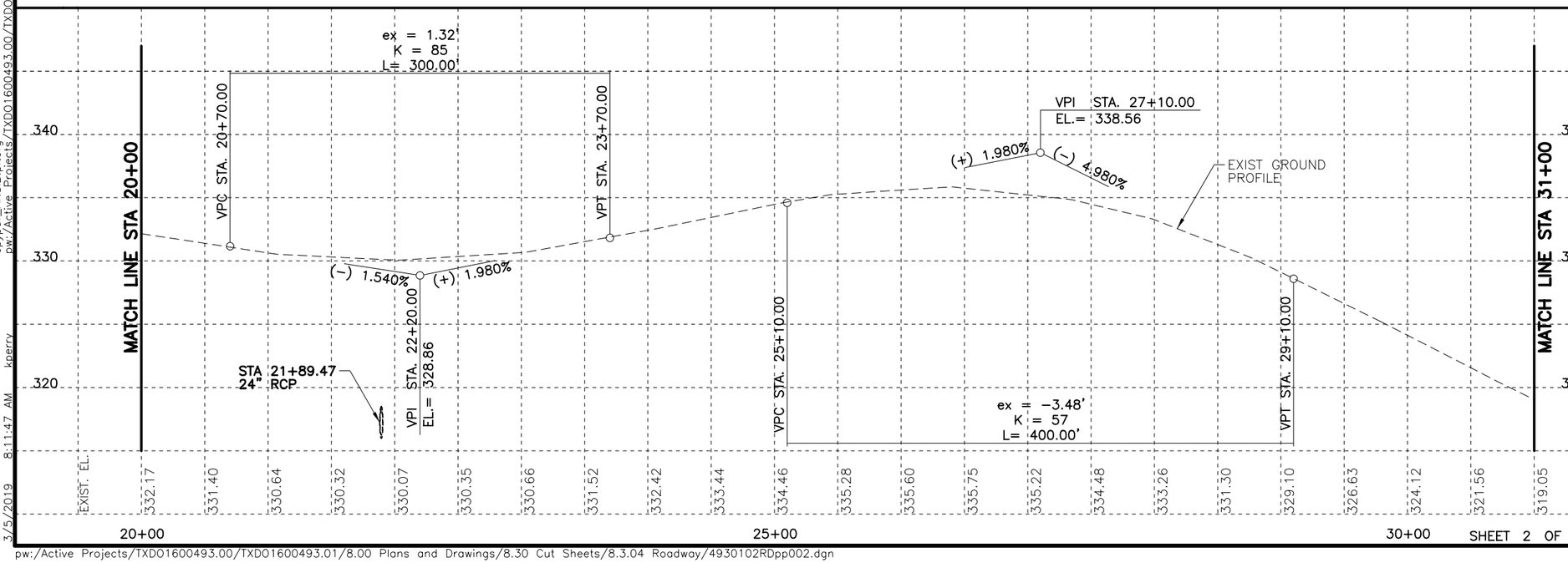
BEGIN PROJECT TO STA 20+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.	
Checked:	CPY		TEXAS				SH 204	
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
Checked:	CPY	TYL	CHEROKEE	0450	01	013	93	

SHEET 1 OF 31



SH 204-13
PI STATION = 29+22.43
NORTHING = 10,692,449.6824
EASTING = 3,929,232.0973
DELTA = 18° 54' 52" (LT)
RADIUS = 5,630.00'
D = 1° 01' 04"
TANGENT = 937.82'
LENGTH = 1,858.57'



LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER
3/5/2019

NO.	REVISION	BY	DATE

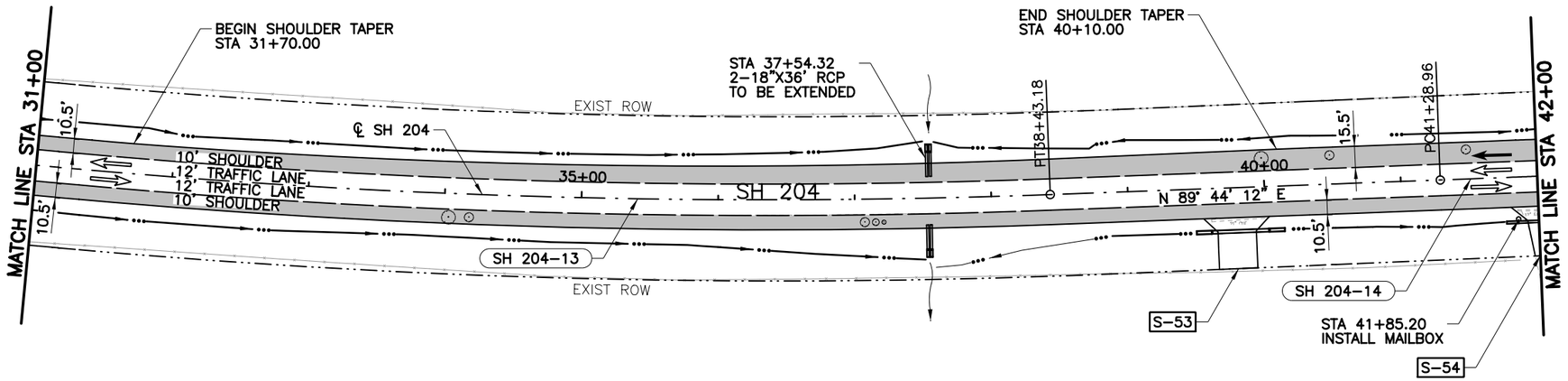
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

ROADWAY PLAN & PROFILE

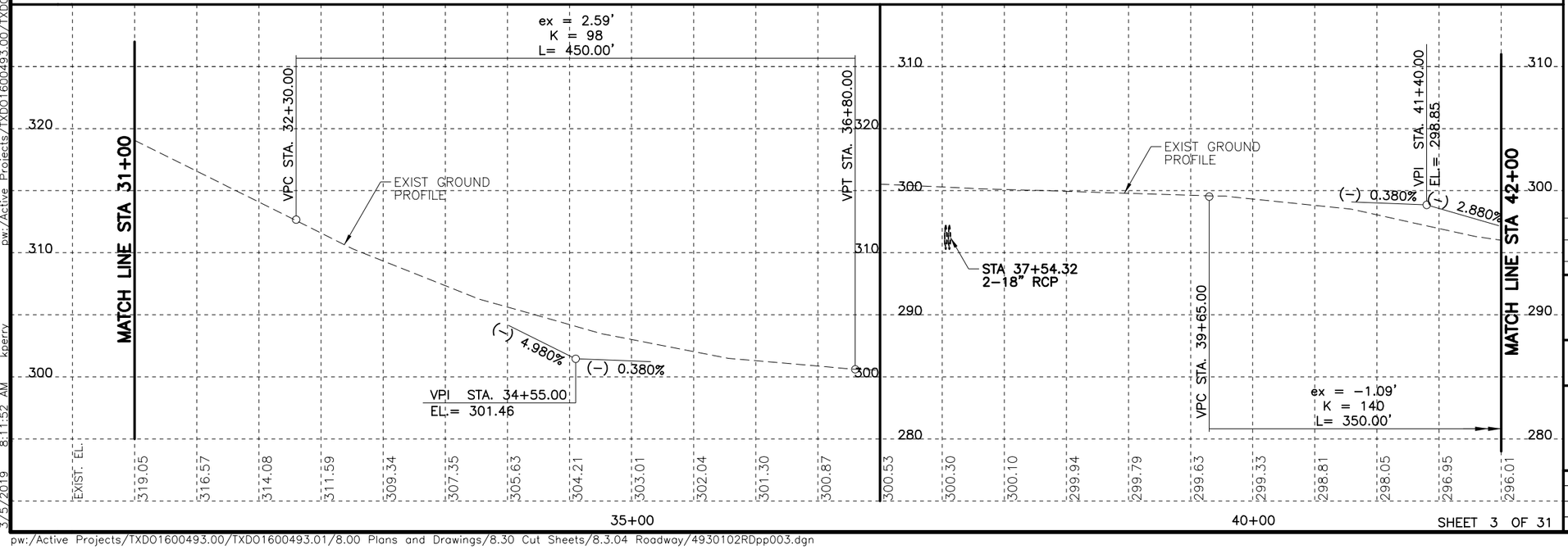
STA 20+00 TO STA 31+00

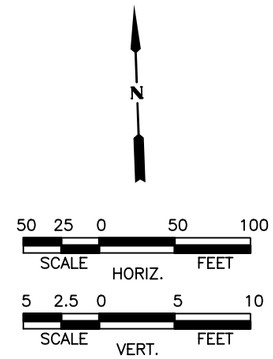
Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	94



SH 204-13
PI STATION = 29+22.43
NORTHING = 10,692,449.6824
EASTING = 3,929,232.0973
DELTA = 18° 54' 52" (LT)
RADIUS = 5,630.00'
D = 1° 01' 04"
TANGENT = 937.82'
LENGTH = 1,858.57'

SH 204-14
PI STATION = 41+79.03
NORTHING = 10,692,455.5360
EASTING = 3,930,505.7510
DELTA = 0° 17' 13" (LT)
RADIUS = 20,000.00'
D = 0° 17' 11"
TANGENT = 50.07'
LENGTH = 100.13'





LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

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STATE OF TEXAS
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3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

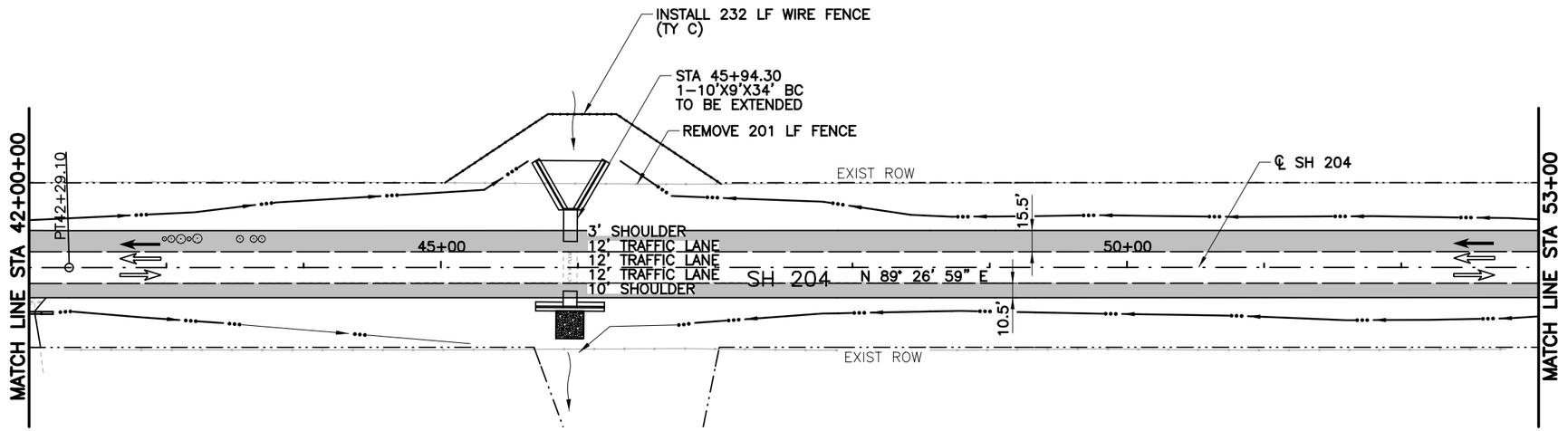
SH 204

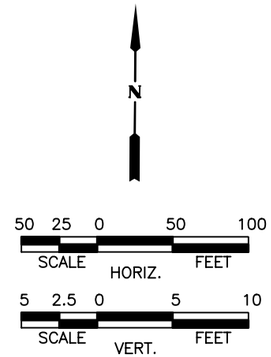
ROADWAY PLAN & PROFILE

STA 31+00 TO STA 42+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		95

SHEET 3 OF 31



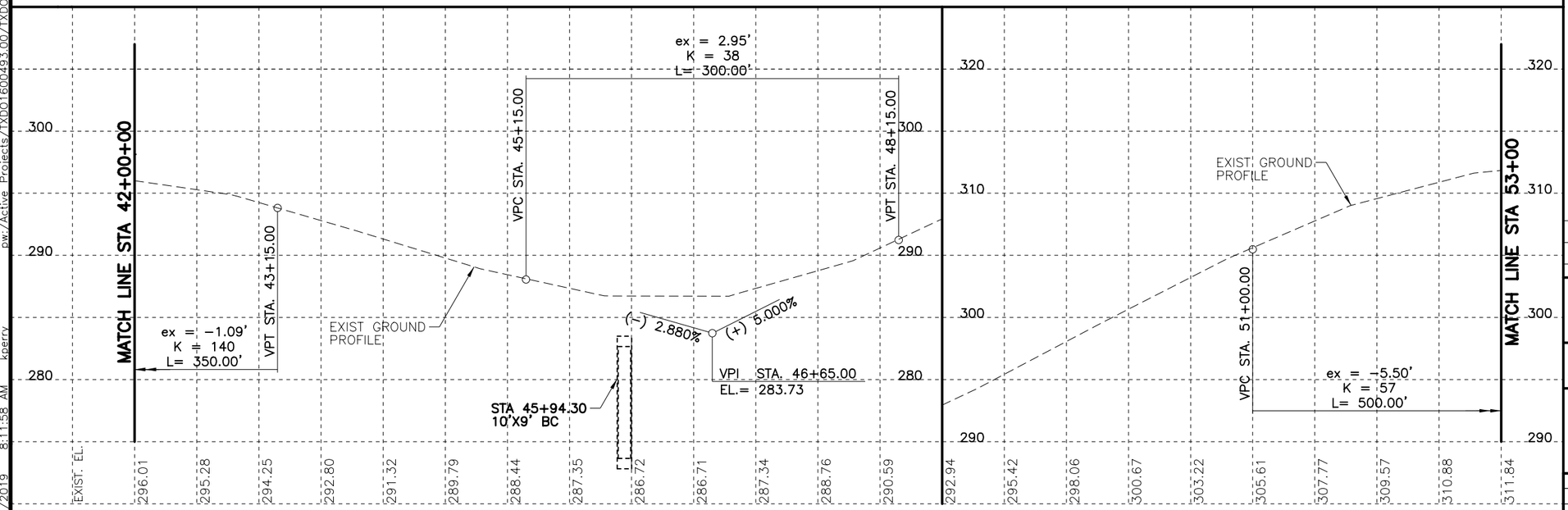


LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X–XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.



STATE OF TEXAS
JACOB B. ROBERTS
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3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F–1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 42+00 TO STA 53+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	96

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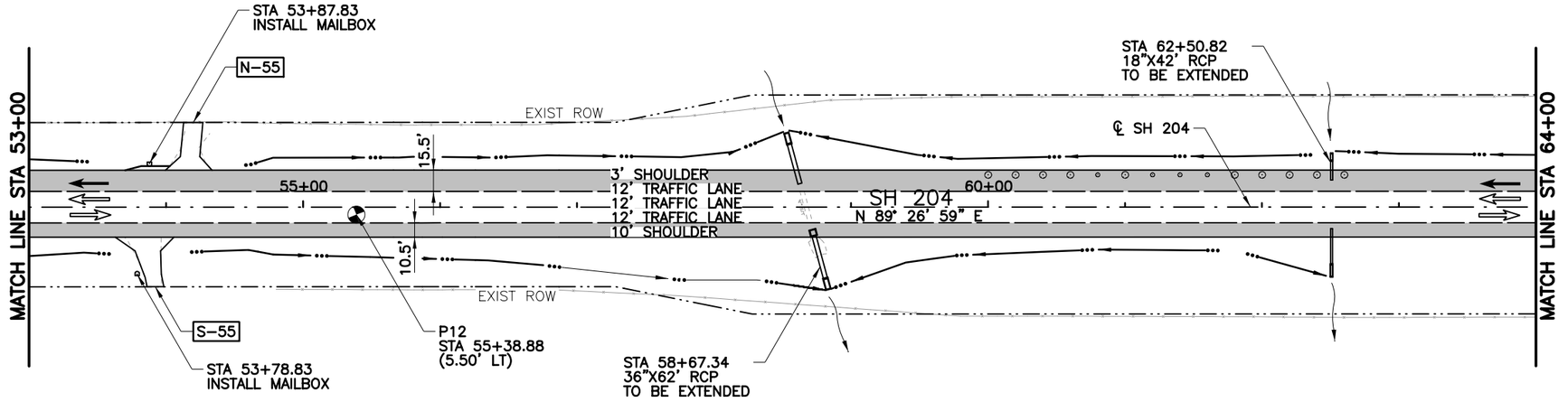

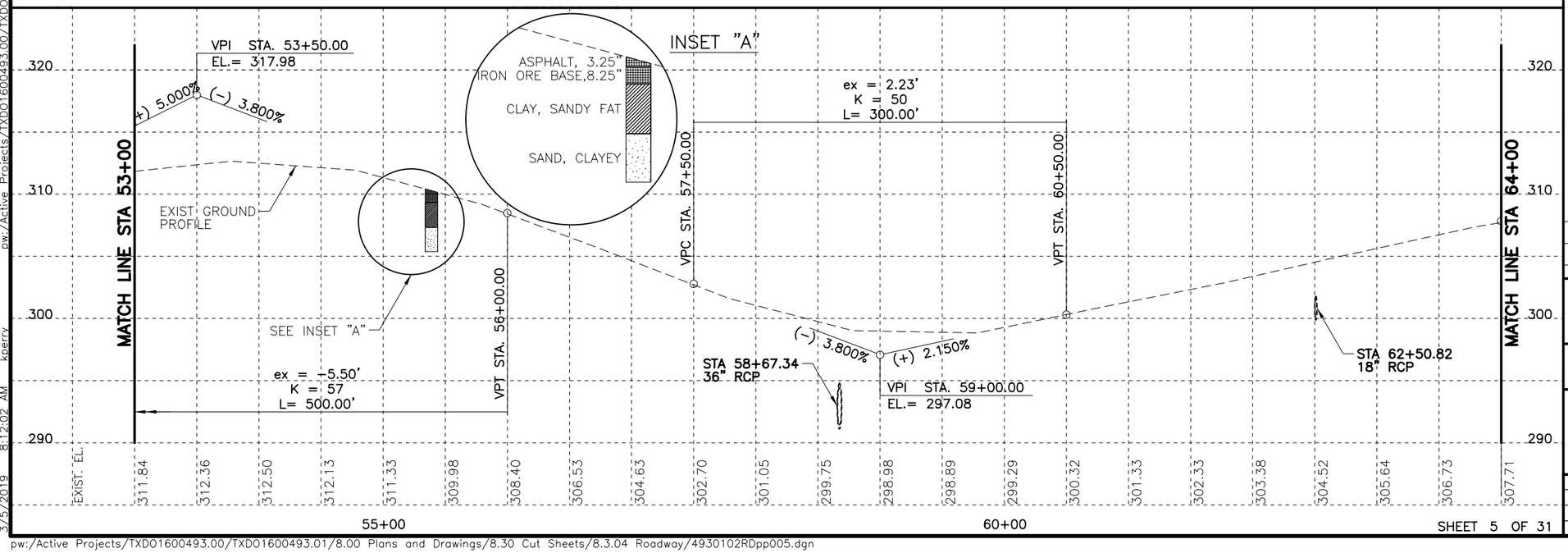

N

50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER
3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 53+00 TO STA 64+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	97

SHEET 5 OF 31

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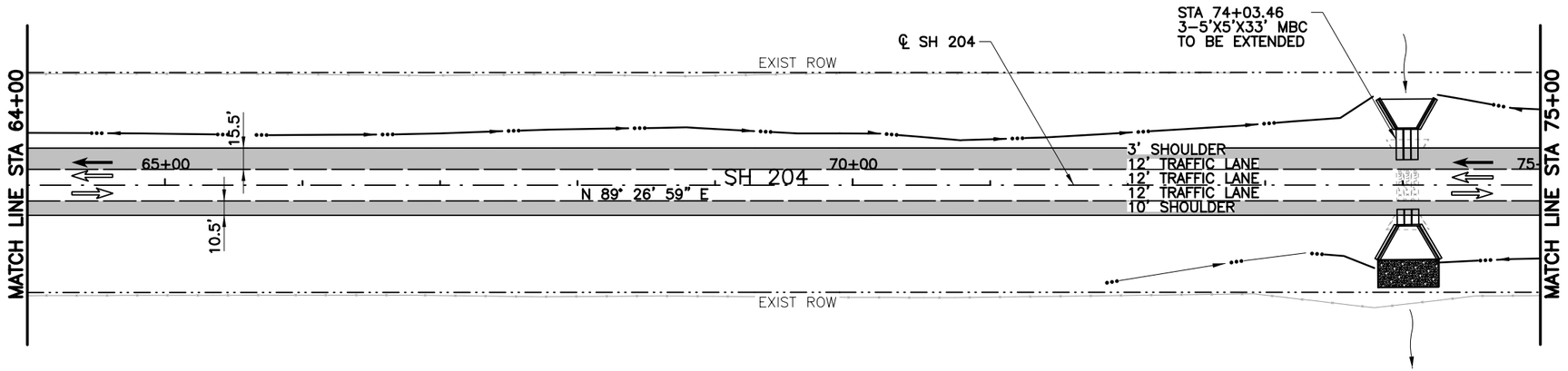
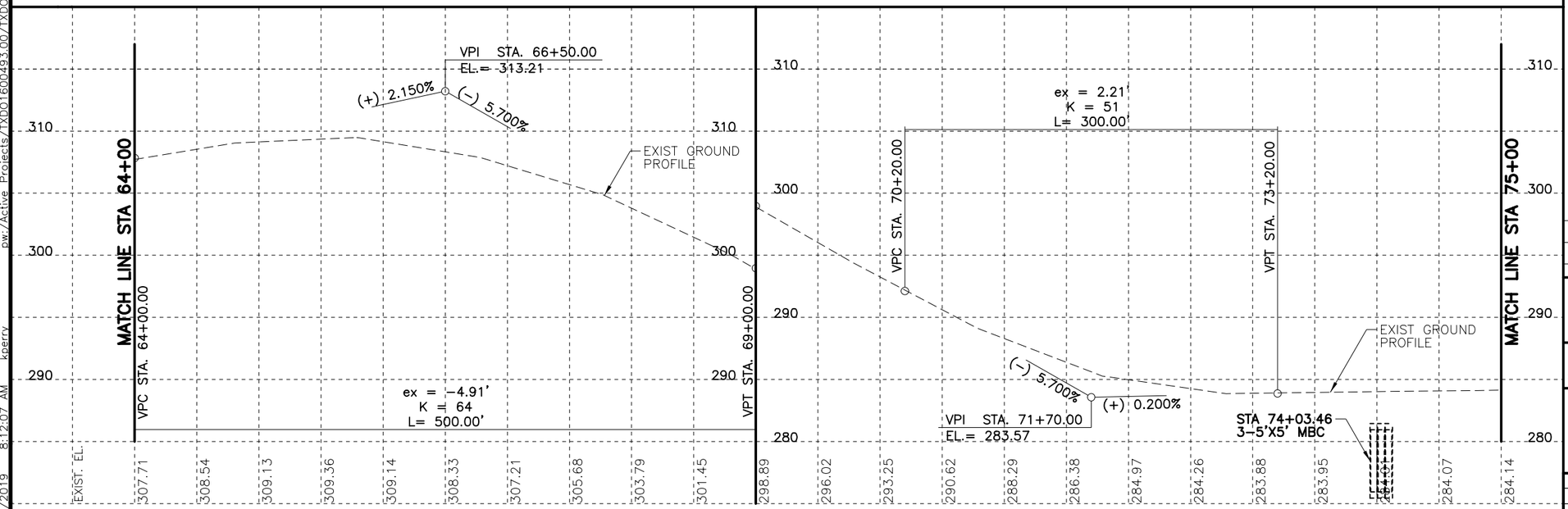




N

50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

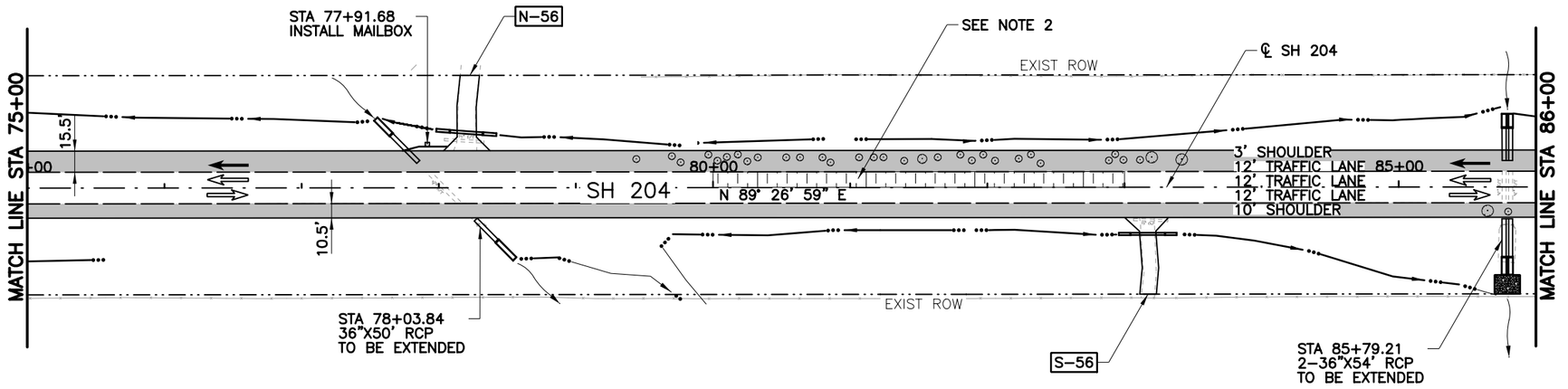
SH 204

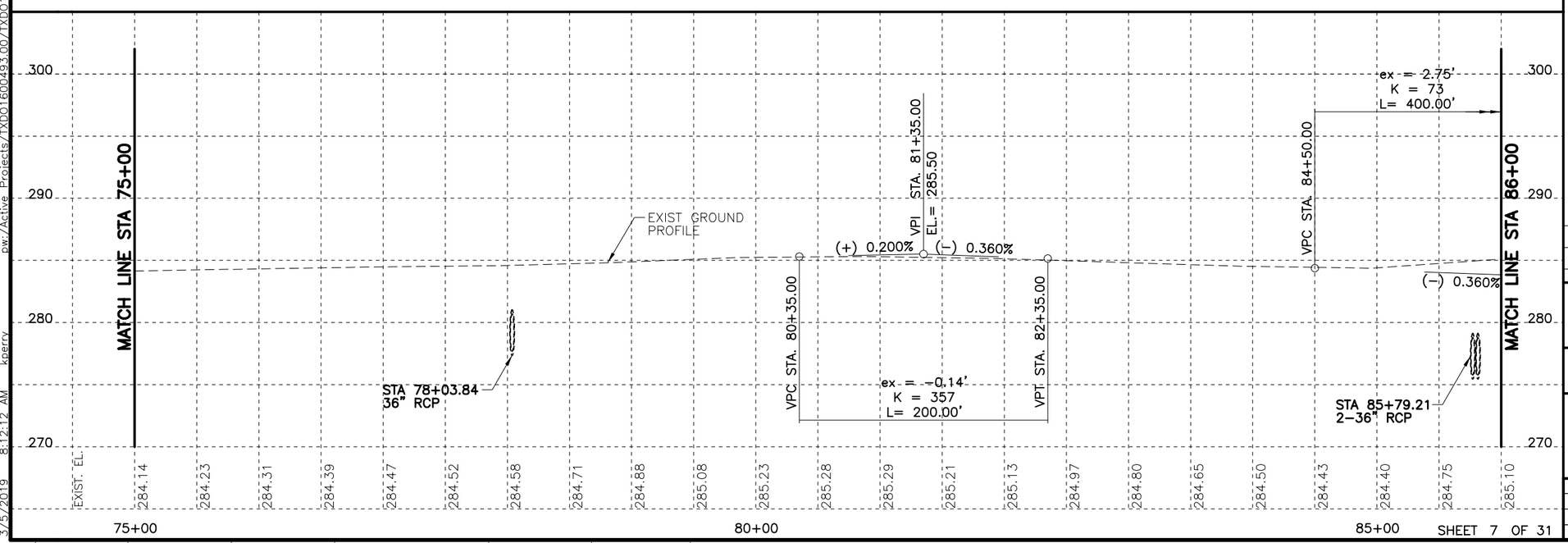
ROADWAY PLAN & PROFILE

STA 64+00 TO STA 75+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		98

SHEET 6 OF 31





50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.
2. MILLING APPROACHING 4" IN THIS AREA. CONTRACTOR TO VERIFY MILLING DOESN'T APPROACH SUBGRADE.

STATE OF TEXAS
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118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

ROADWAY PLAN & PROFILE

STA 75+00 TO STA 86+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		99

SHEET 7 OF 31

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3/5/2019 8:12:12 AM kperry

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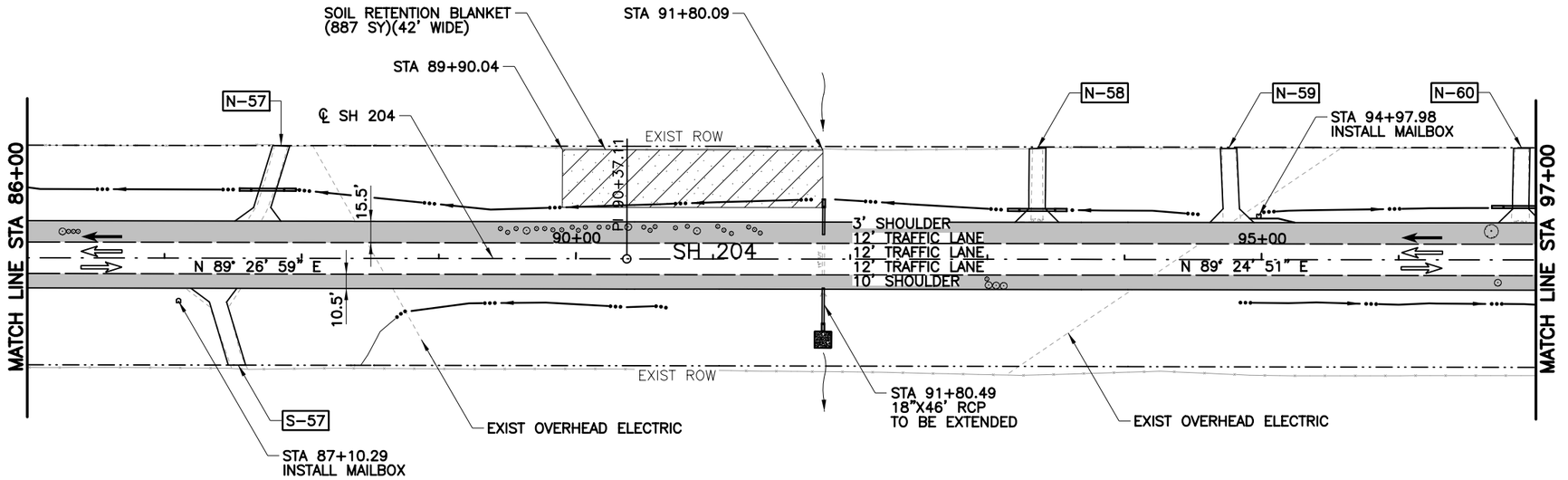

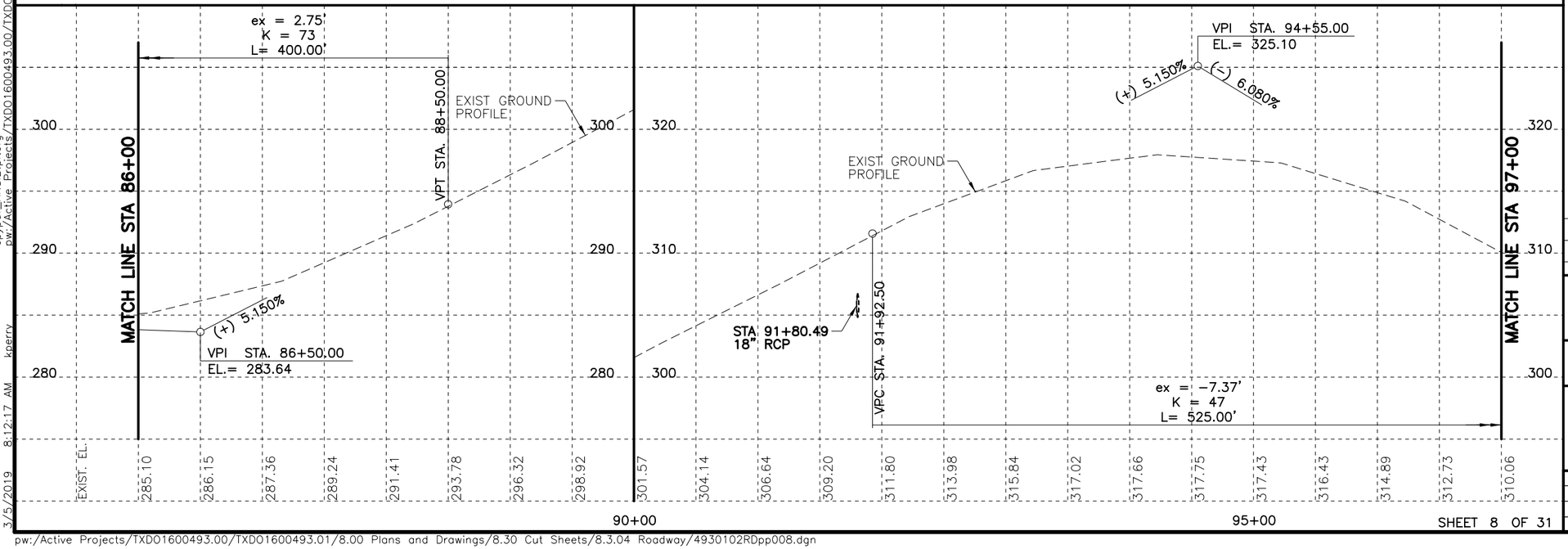

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 86+00 TO STA 97+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		100

SHEET 8 OF 31

cpybw_ANSIB.tbl
cpypsf_ANSIB.pltcfg
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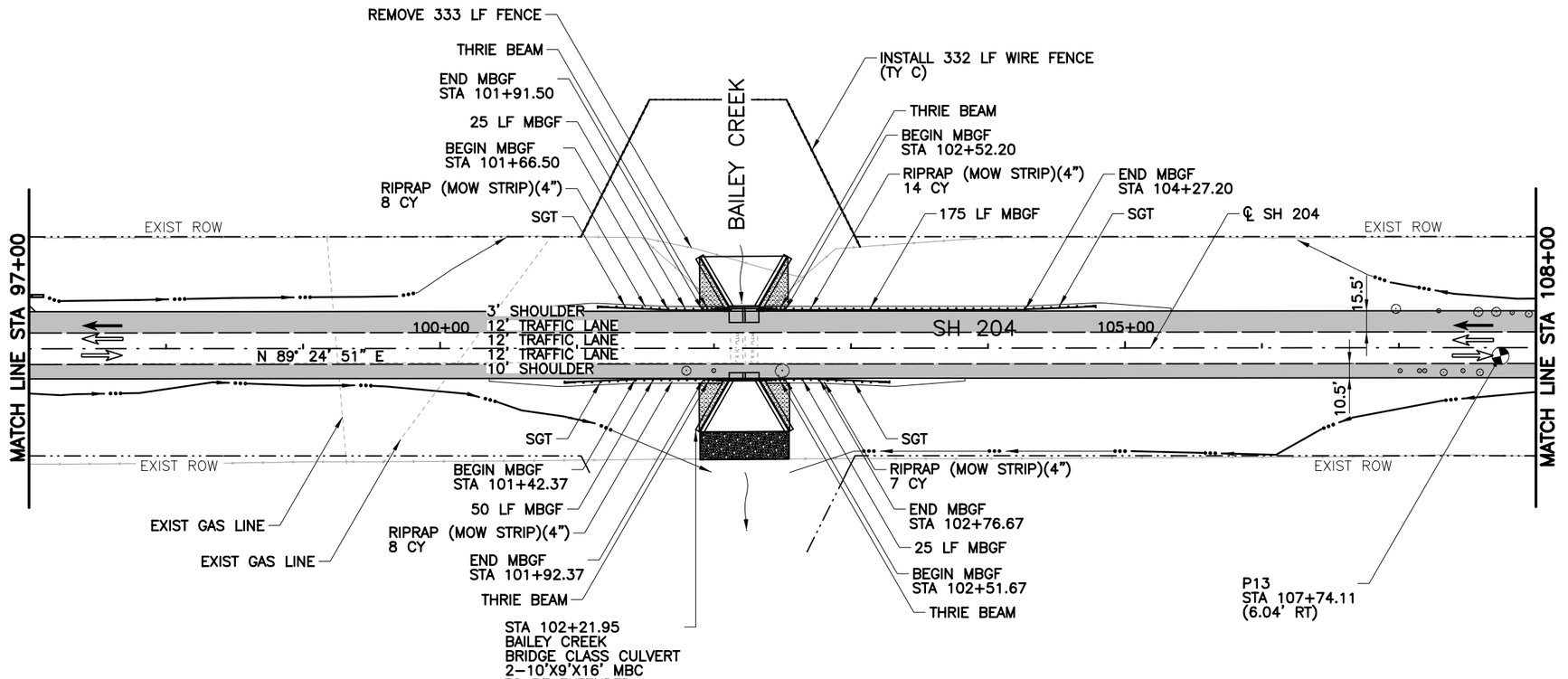
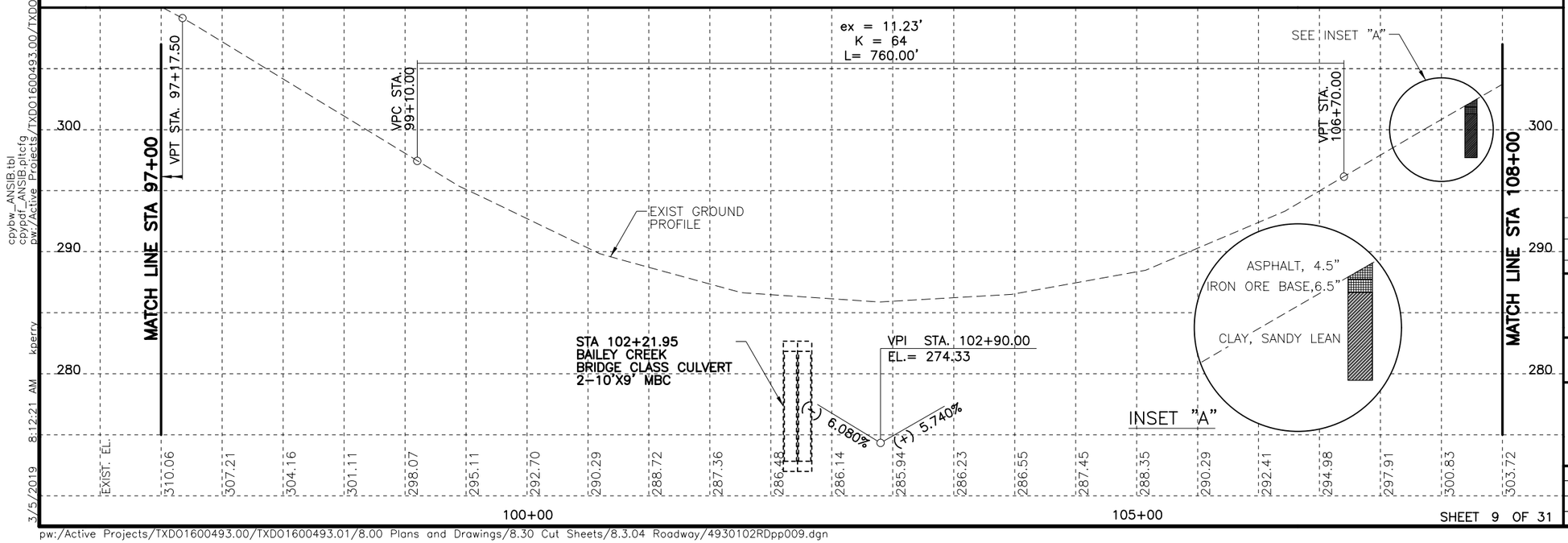
3/5/2019 8:12:17 AM kperry





N

50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 97+00 TO STA 108+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.	
Checked:	CPY		TEXAS					SH 204	
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	CPY	TYL	CHEROKEE	0450	01	013		101	

SHEET 9 OF 31

cpybw_ANSIB.tbl
cpypdf_ANSIB.pltcfg
pw:/Active Projects/TXDO1600493.00/TXDO1600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/4930102RDpp009.dgn
3/5/2019 8:12:21 AM kperry

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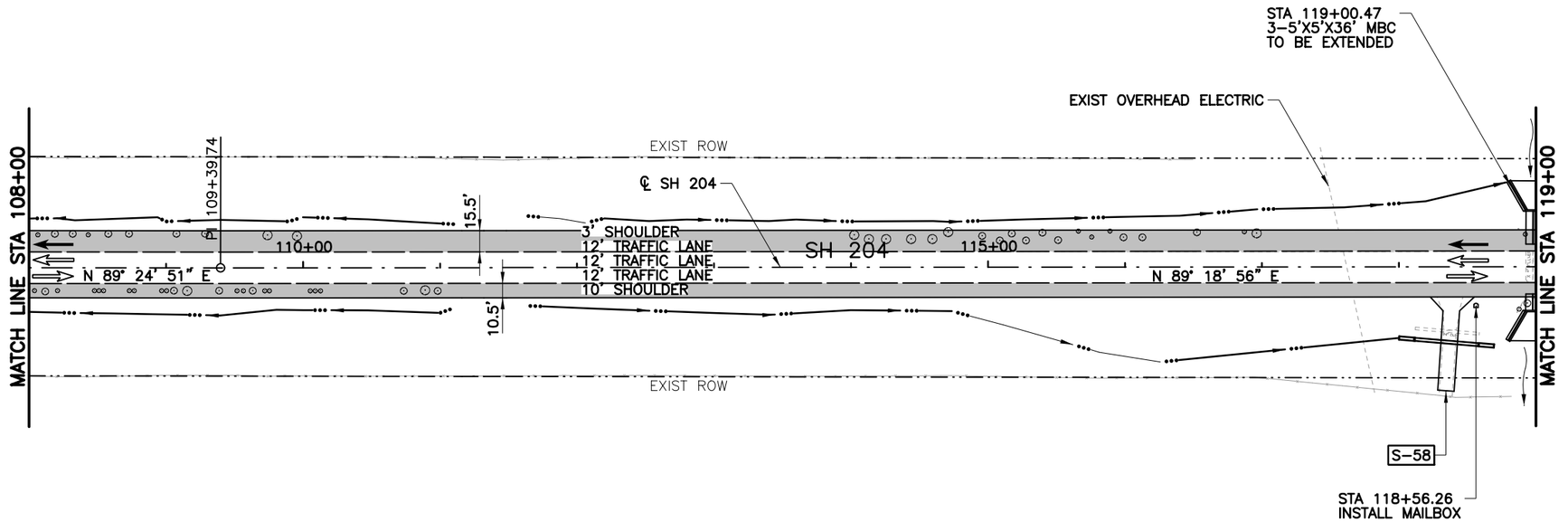
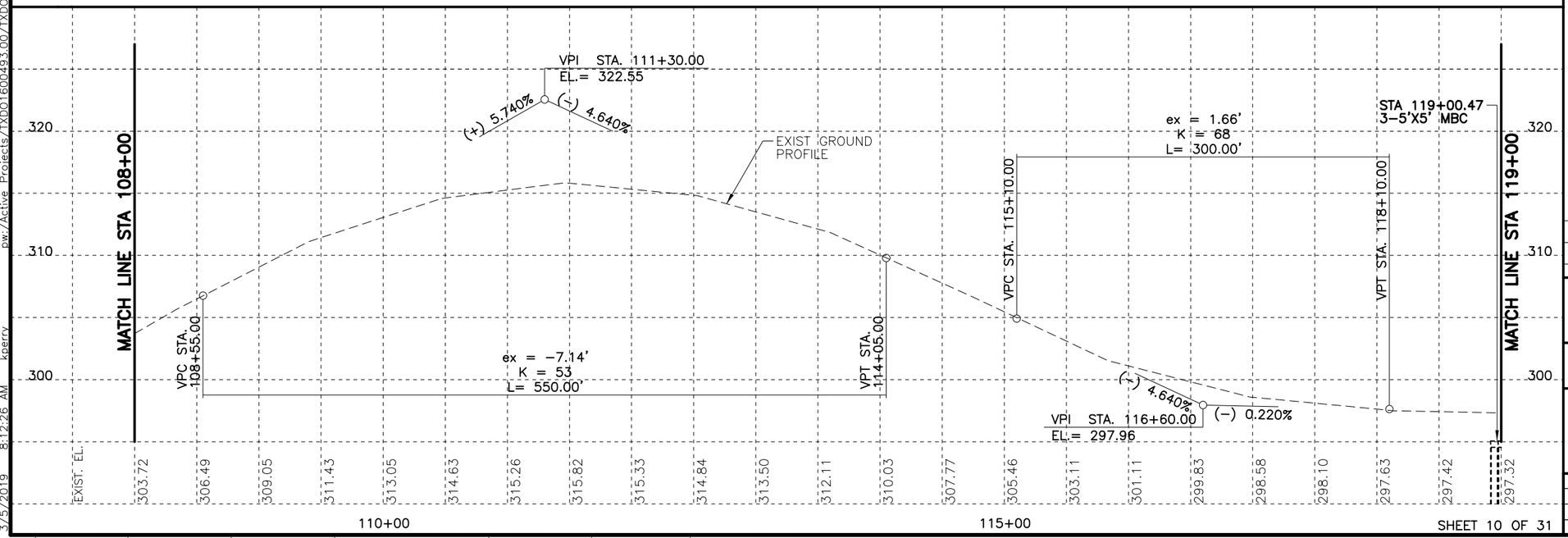




50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER
3/5/2019

NO.	REVISION	BY	DATE

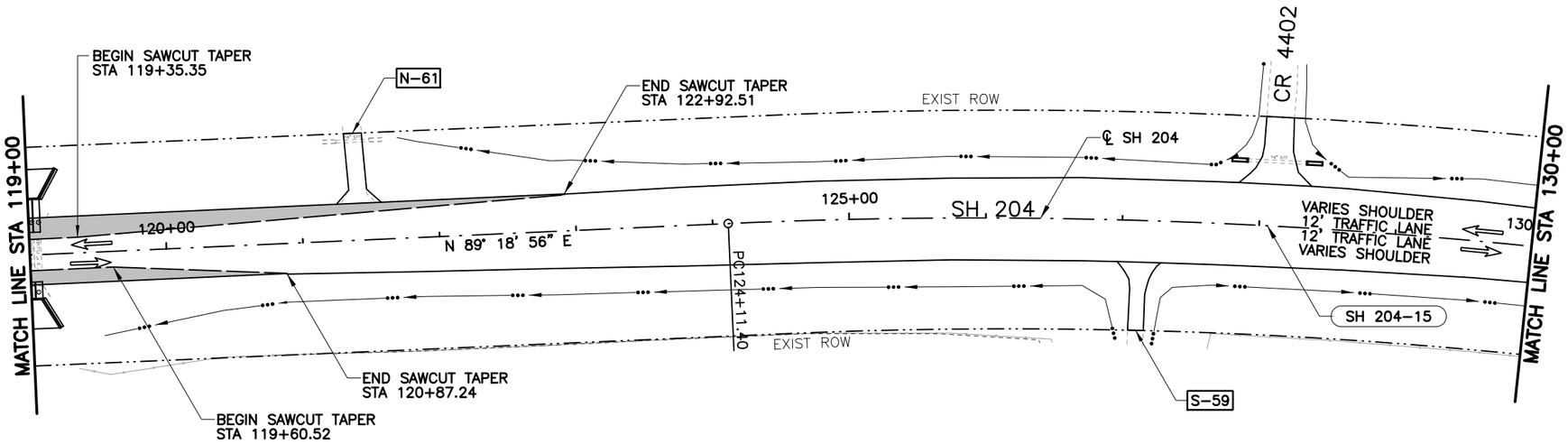
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

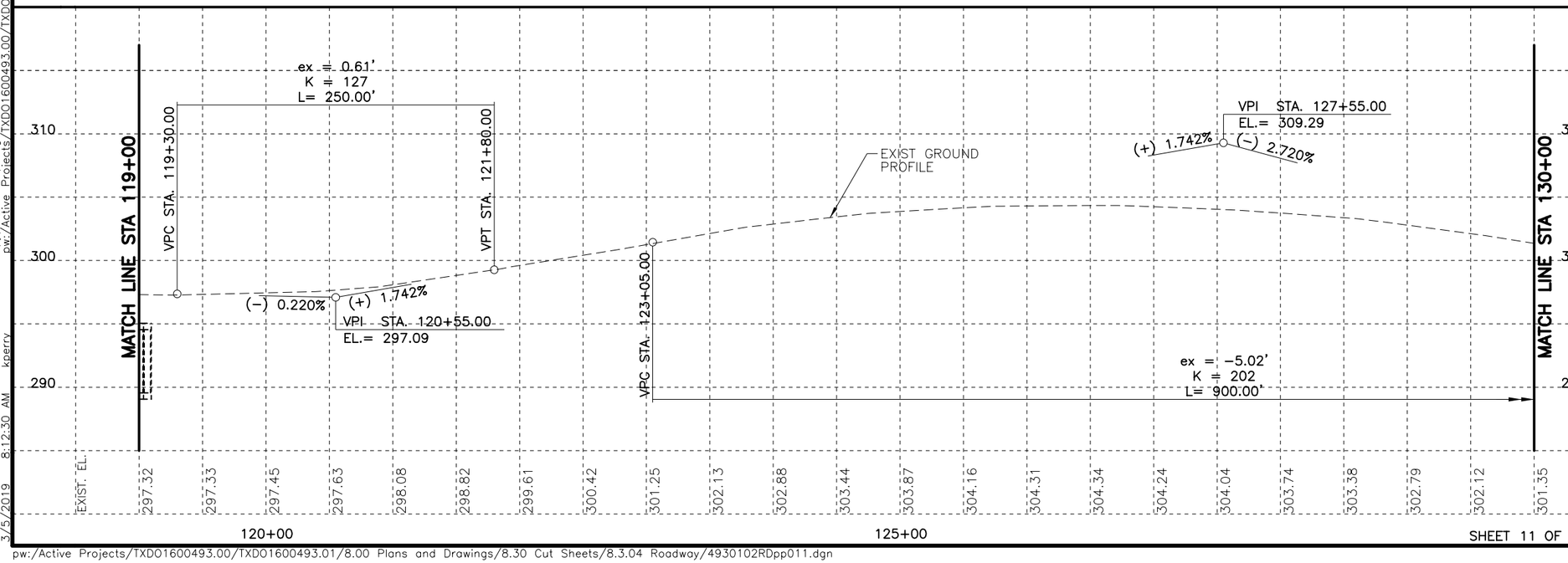
ROADWAY PLAN & PROFILE

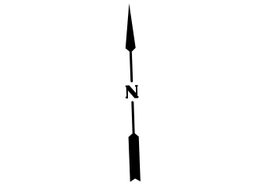
STA 108+00 TO STA 119+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		102



SH 204-15
PI STATION = 129+45.15
NORTHING = 10,692,545.5951
EASTING = 3,939,271.4078
DELTA = 15° 12' 04" (RT)
RADIUS = 4,000.00'
D = 1° 25' 57"
TANGENT = 533.76'
LENGTH = 1,061.25'





LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER
3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 119+00 TO STA 130+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		103

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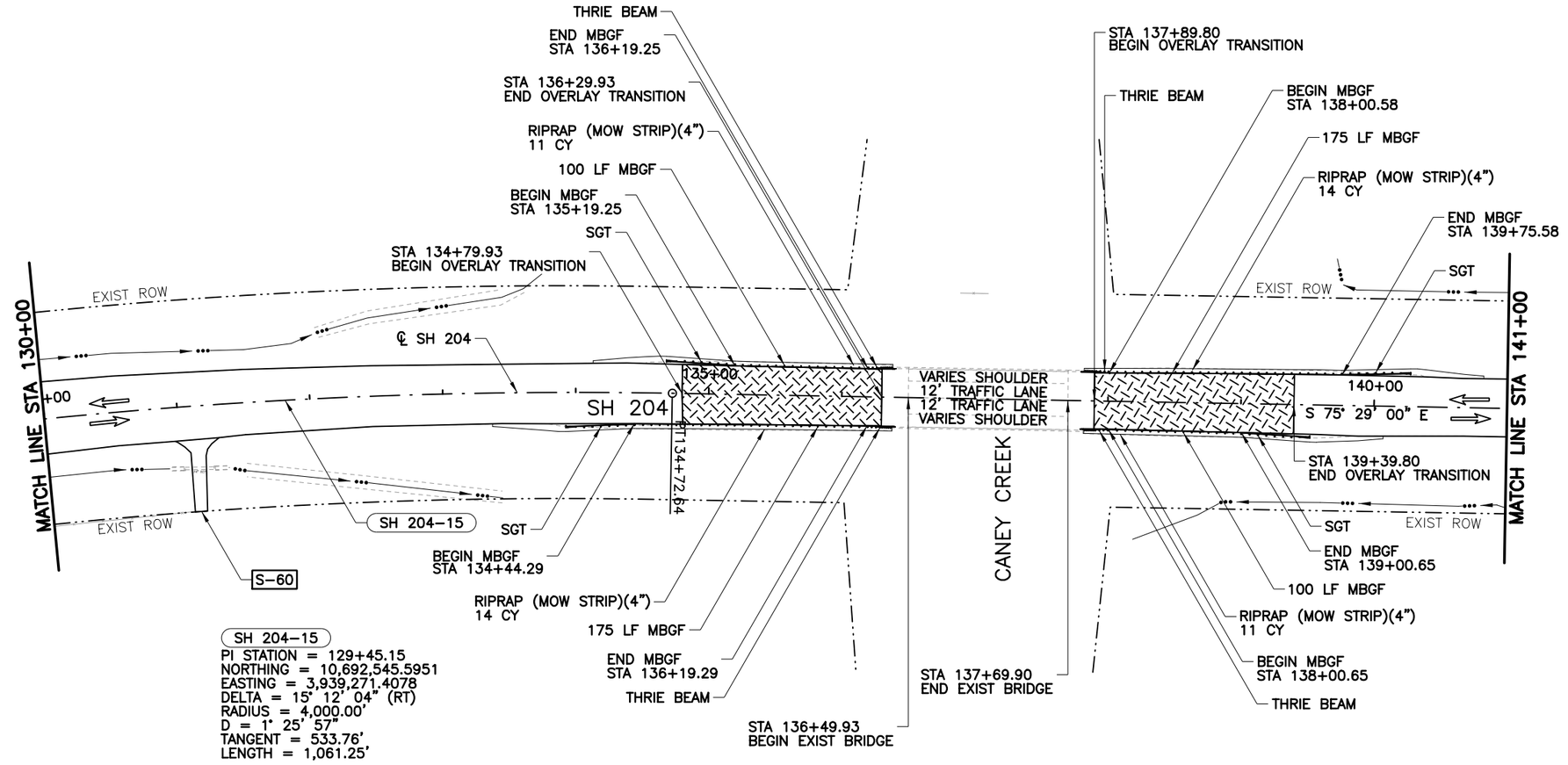
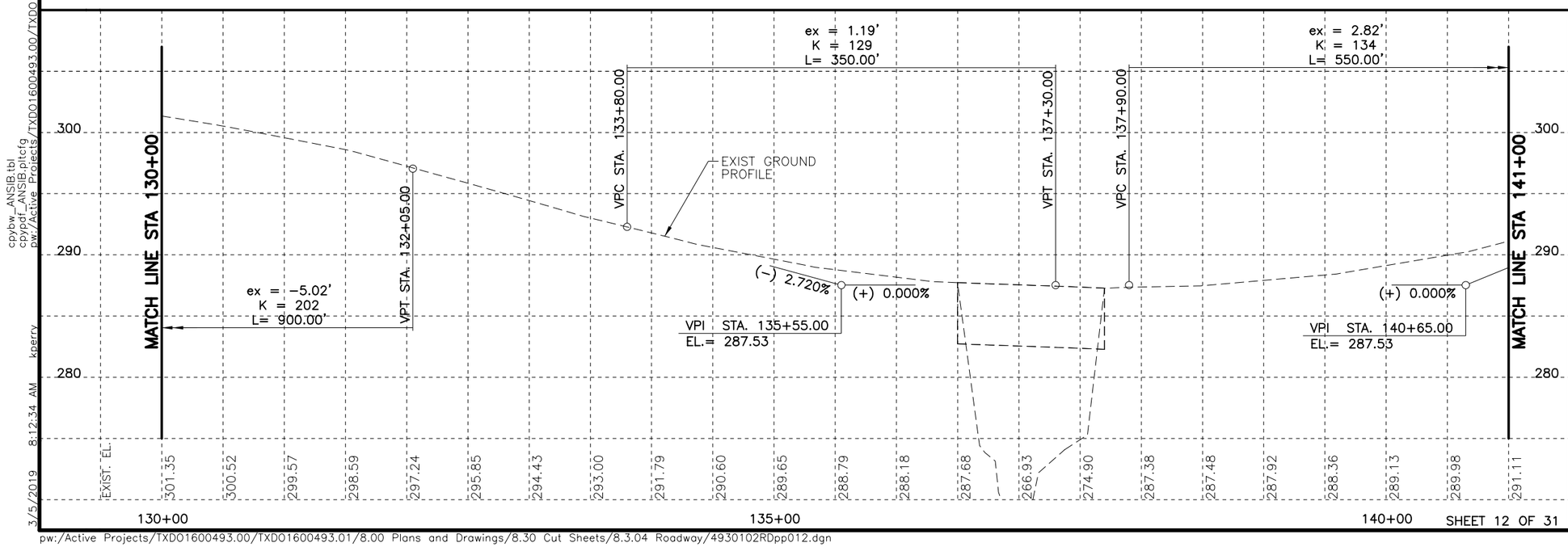




LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X–XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F–1741

 Texas Department of Transportation

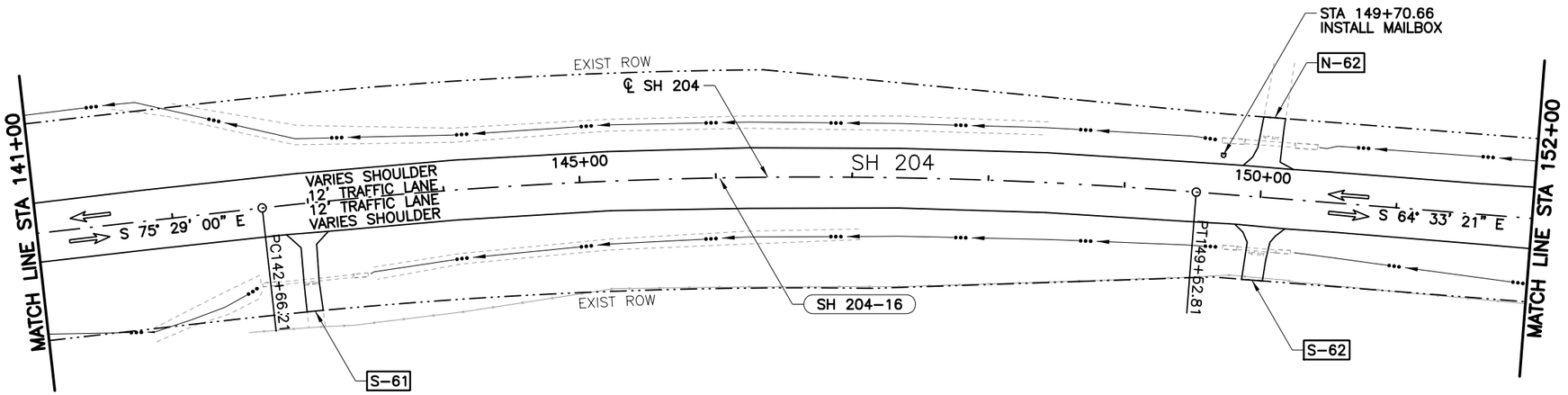
SH 204

ROADWAY PLAN & PROFILE

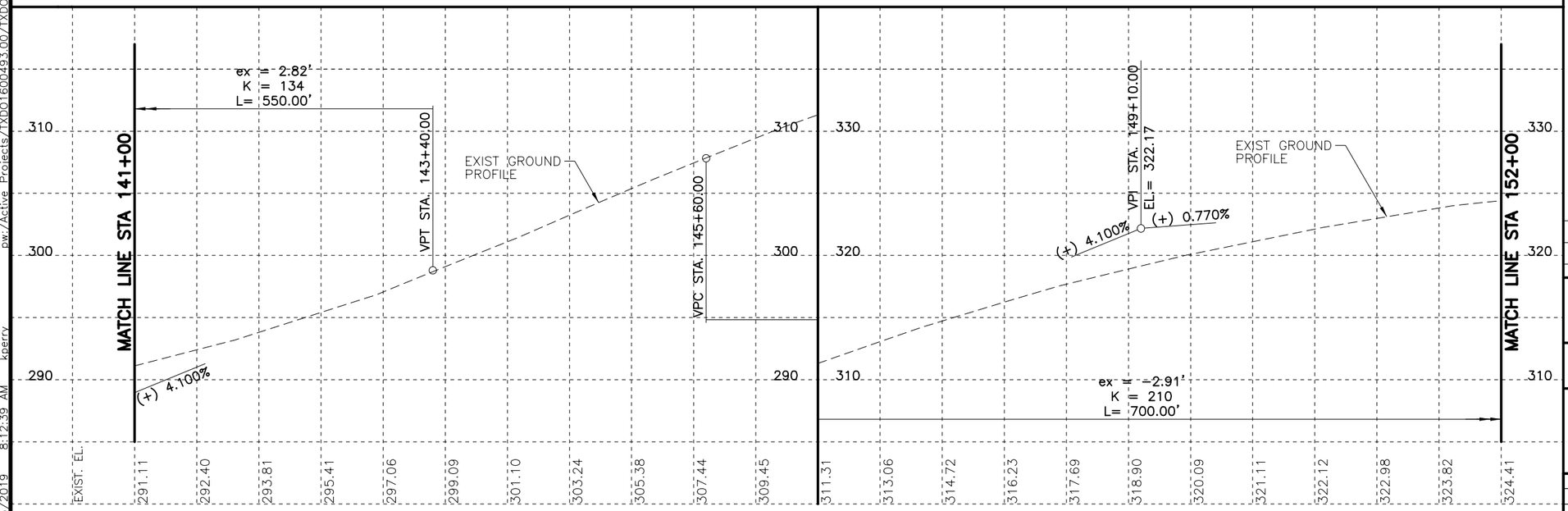
STA 130+00 TO STA 141+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		104

SHEET 12 OF 31



SH 204–16
PI STATION = 146+10.56
NORTHING = 10,692,126.5685
EASTING = 3,940,889.7095
DELTA = 10° 55' 39" (RT)
RADIUS = 3,600.00'
D = 1° 35' 30"
TANGENT = 344.34'
LENGTH = 686.60'



LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X–XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

3/5/2019

NO.	REVISION	BY	DATE

TEXAS REGISTERED ENGINEERING FIRM F–1741

SH 204

ROADWAY PLAN & PROFILE

STA 141+00 TO STA 152+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	105

SHEET 13 OF 31

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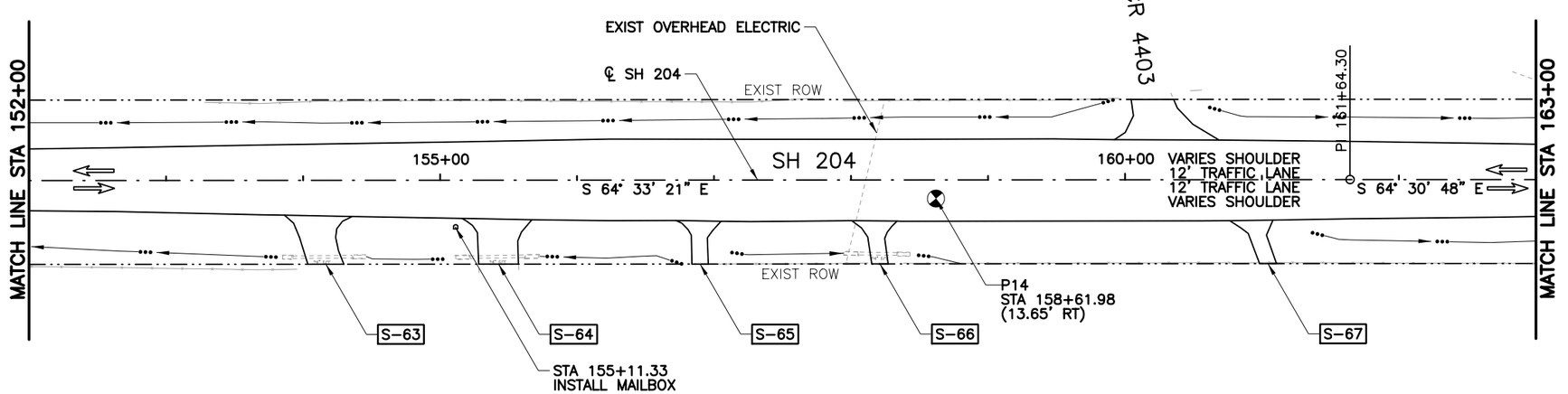

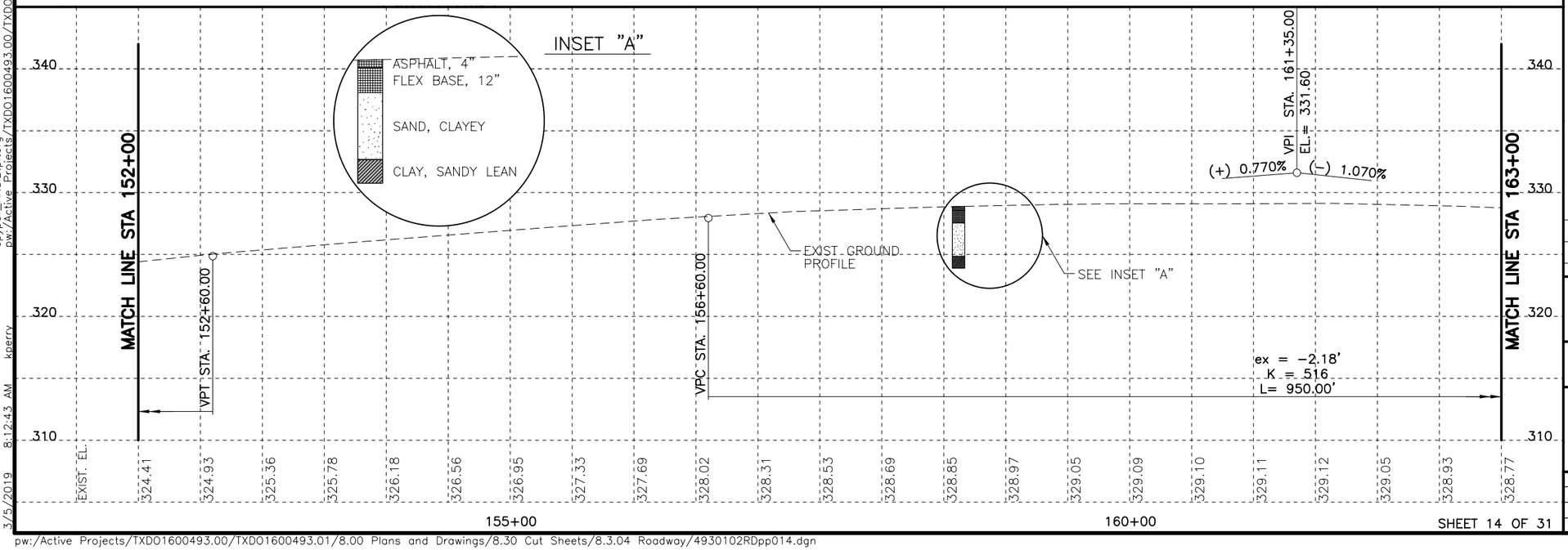

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX — DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
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118577
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3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

ROADWAY PLAN & PROFILE

STA 152+00 TO STA 163+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		106

SHEET 14 OF 31

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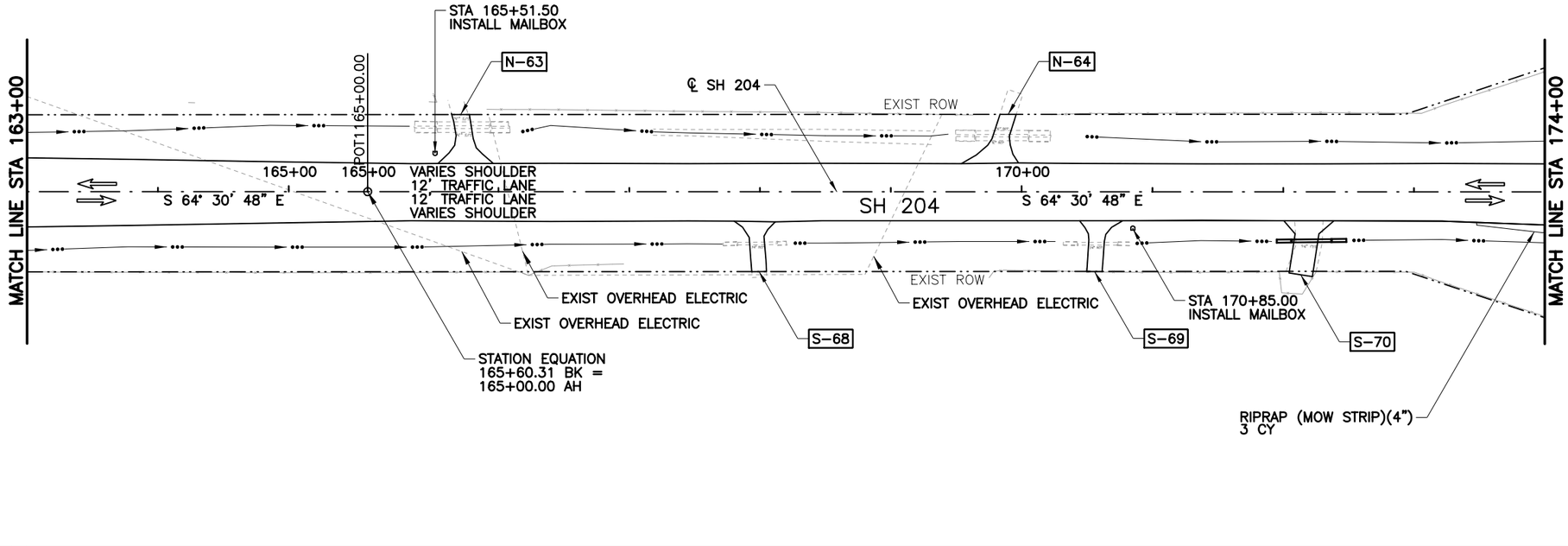

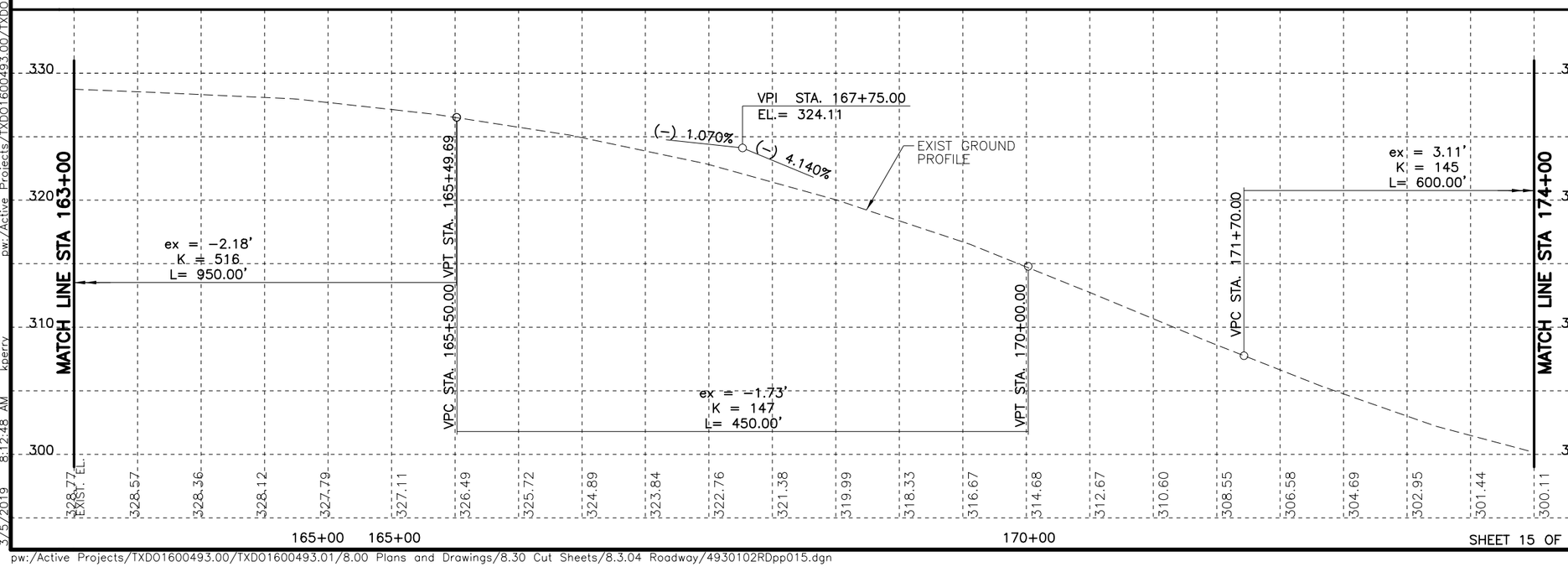

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 163+00 TO STA 174+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	107

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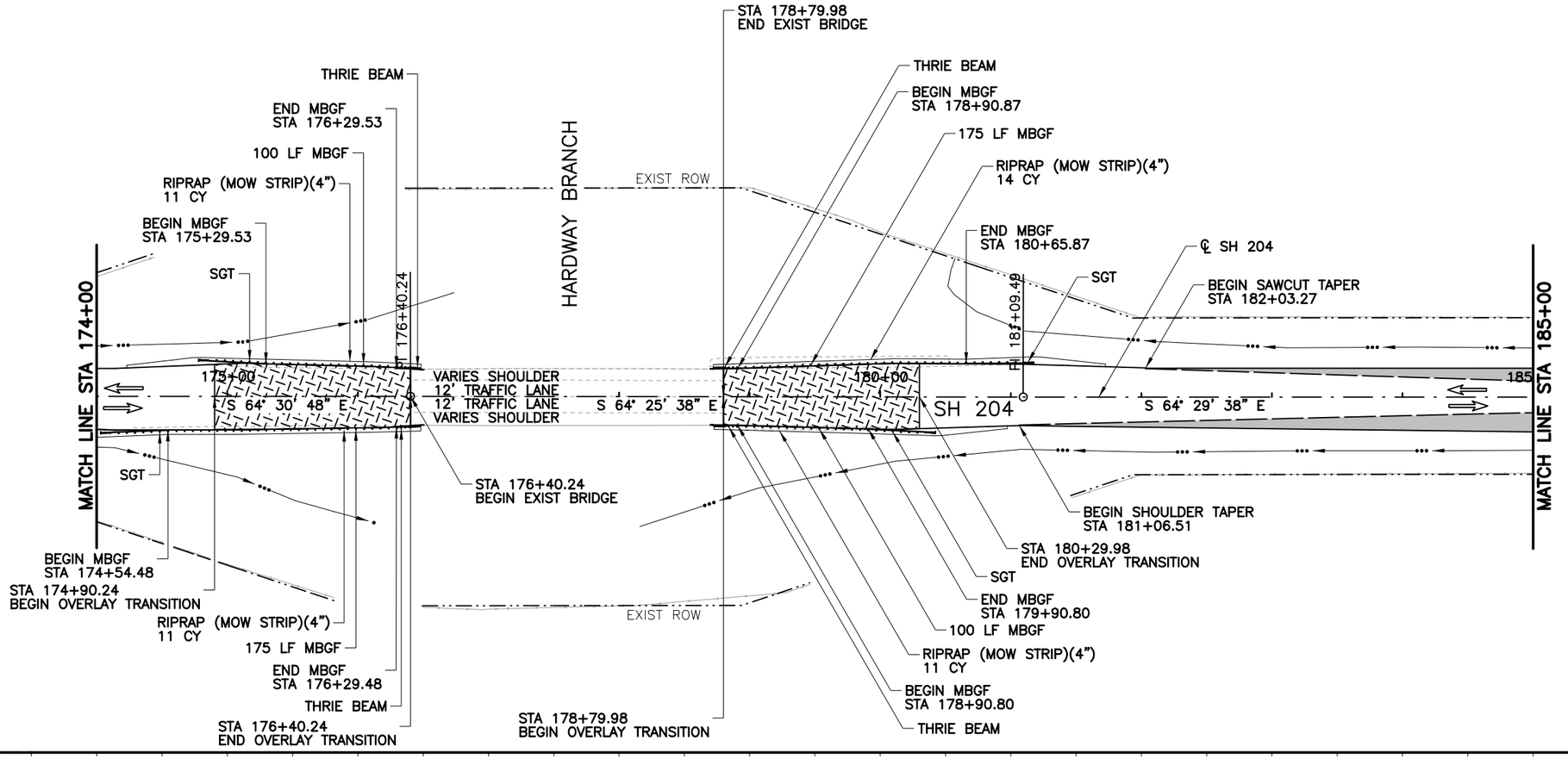

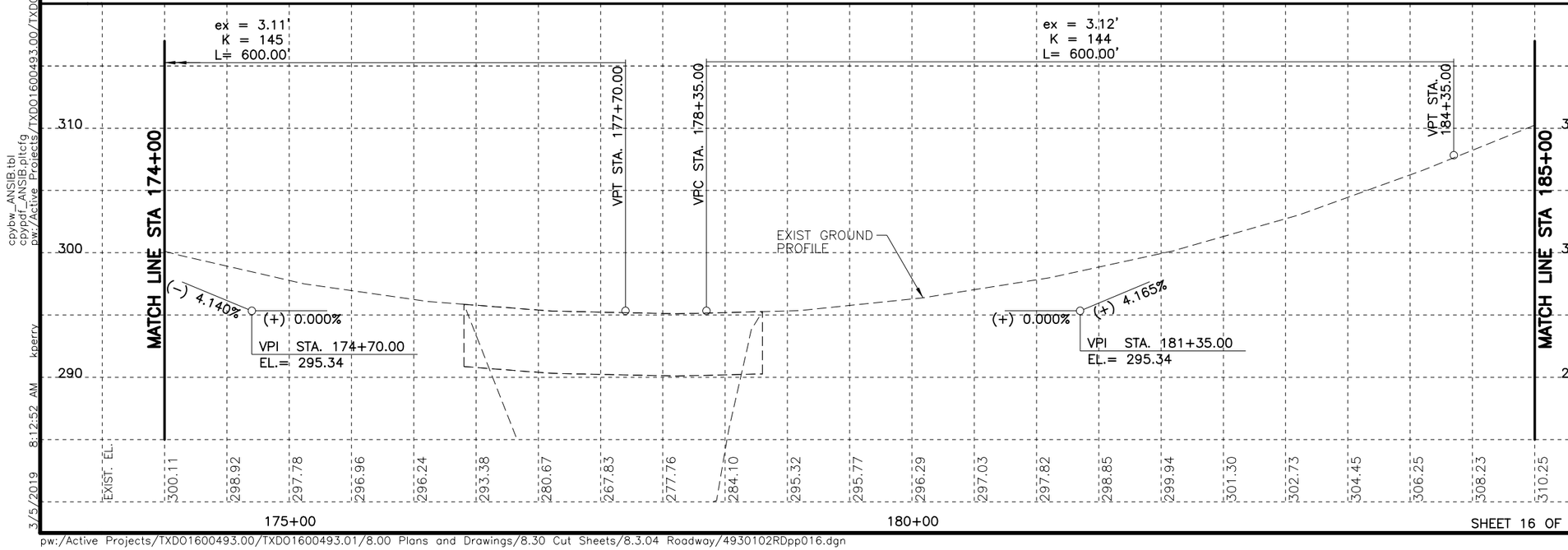

50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

ROADWAY PLAN & PROFILE

STA 174+00 TO STA 185+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		108

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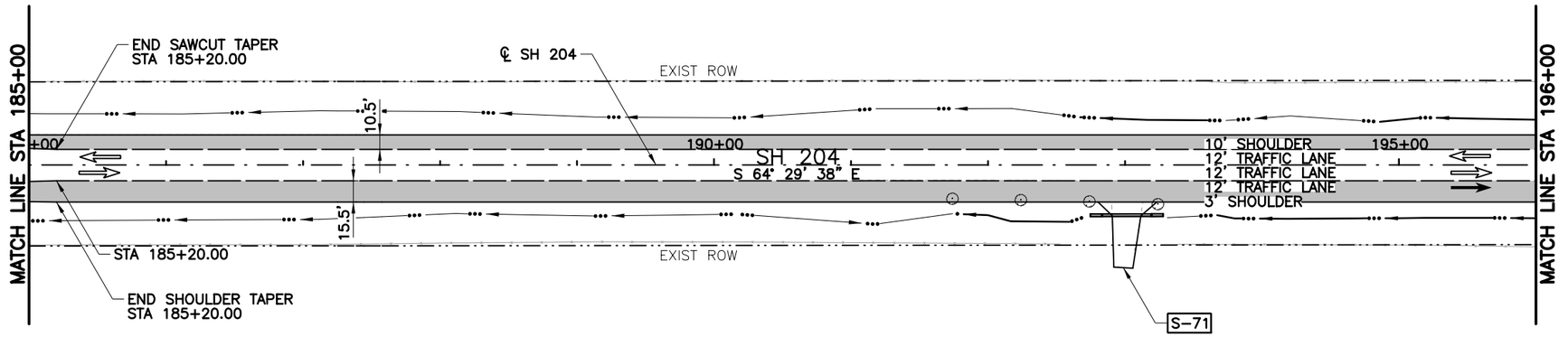
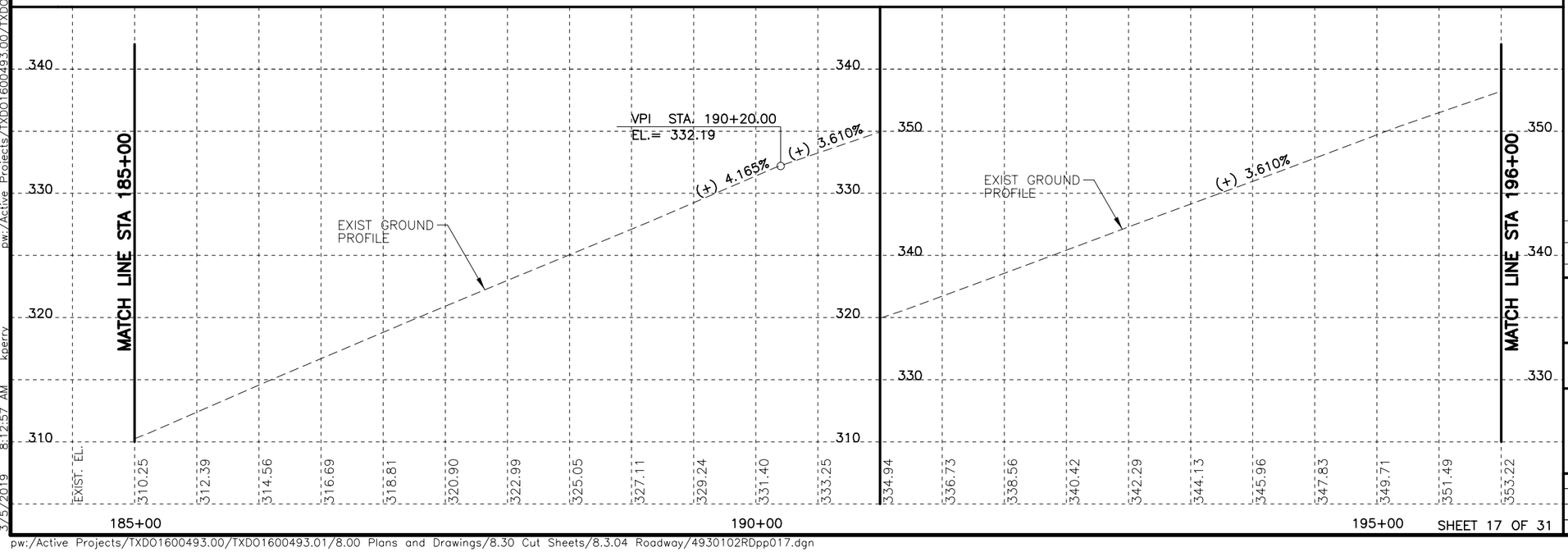




50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

TEXAS REGISTERED ENGINEERING FIRM F-1741

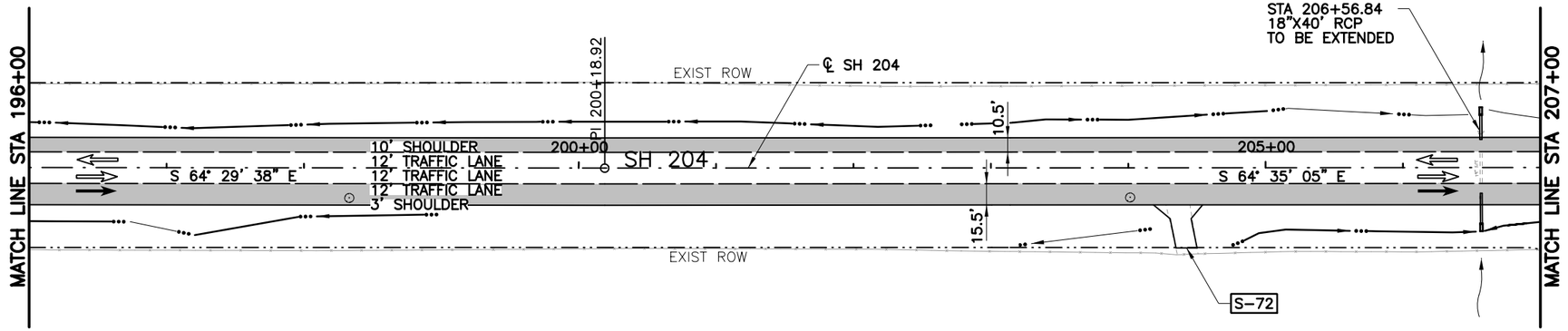
SH 204

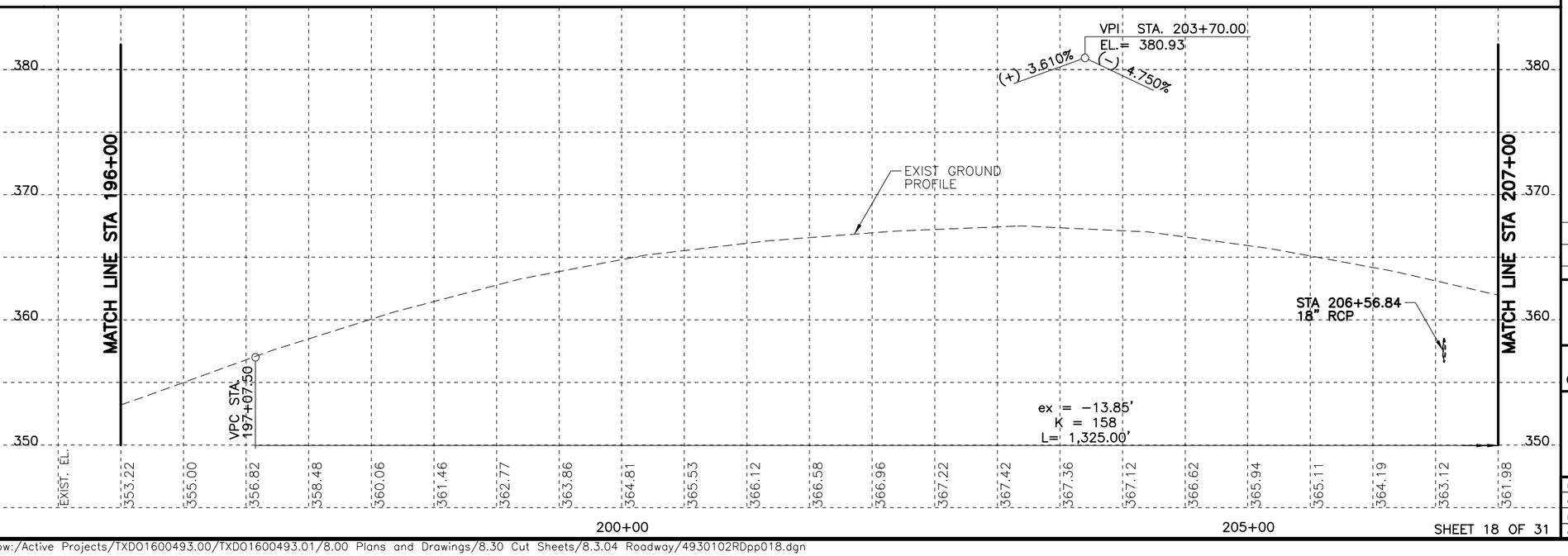
ROADWAY PLAN & PROFILE

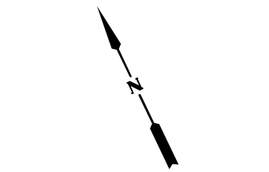
STA 185+00 TO STA 196+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		109

SHEET 17 OF 31







LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

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JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

ROADWAY PLAN & PROFILE

STA 196+00 TO STA 207+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	110

SHEET 18 OF 31

cpybw ANSIB.tbl
cpypsf_ANSIB.pltcfg
pw:/Active Projects/TXD01600493.00/TXD01600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/4930102RDpp018.dgn
3/5/2019 8:13:03 AM kperry

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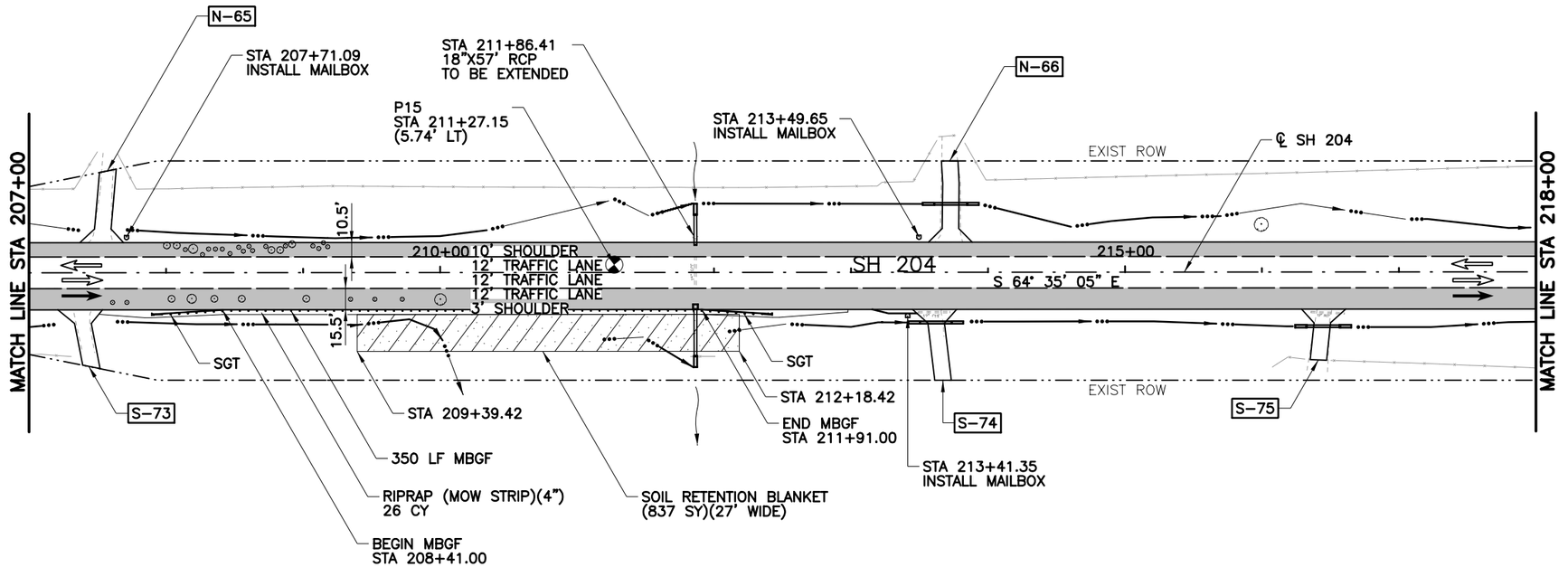
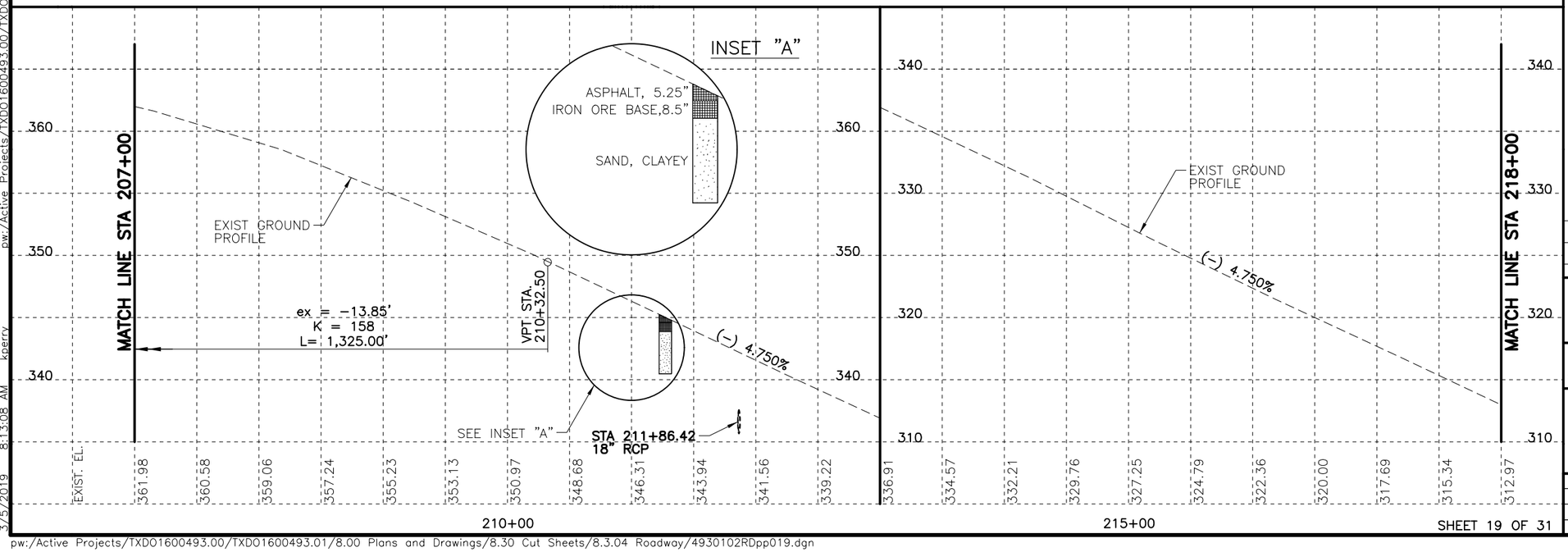
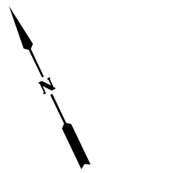






50 25 0 50 100
SCALE FEET
HORIZ.

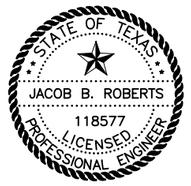
5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.



3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

ROADWAY PLAN & PROFILE

STA 207+00 TO STA 218+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.	
Checked:	CPY		TEXAS					SH 204	
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	CPY	TYL	CHEROKEE	0450	01	013		111	

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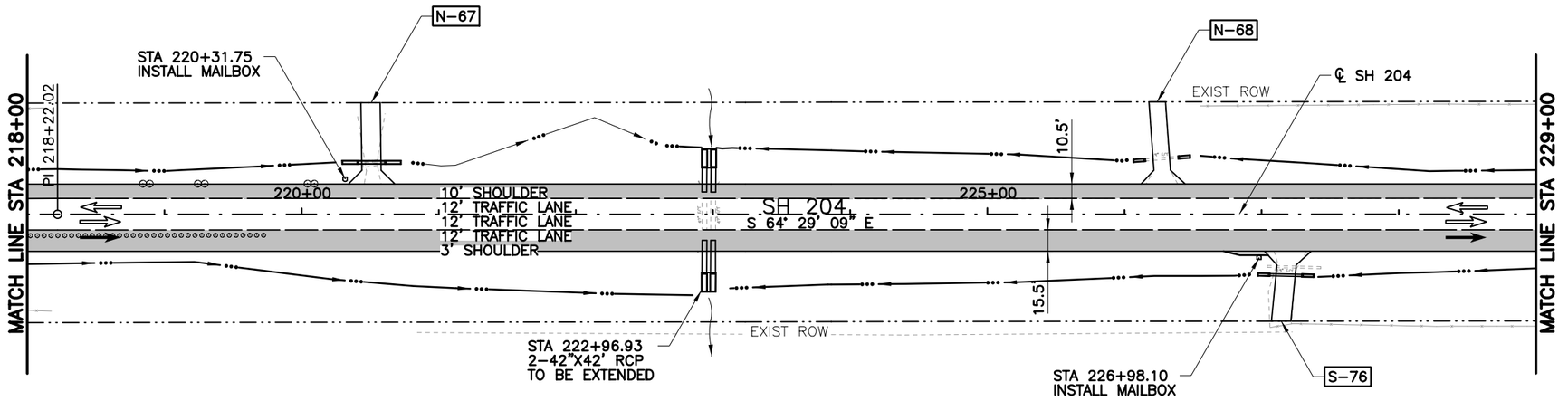
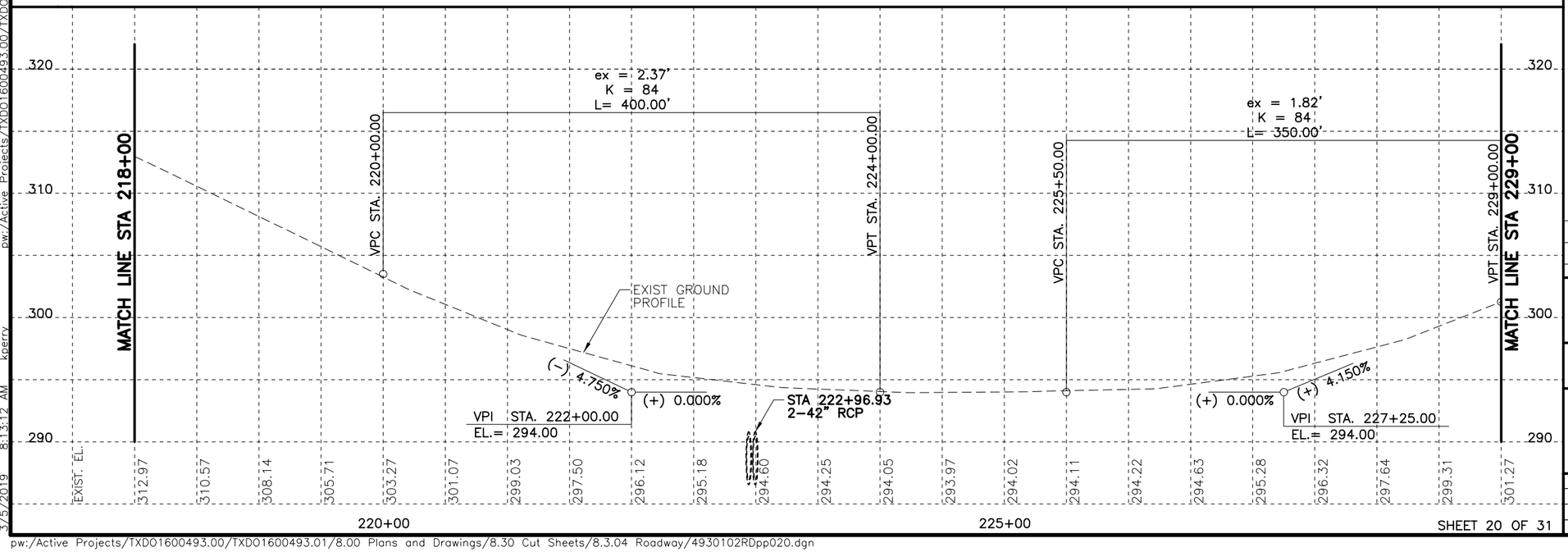




50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER
3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

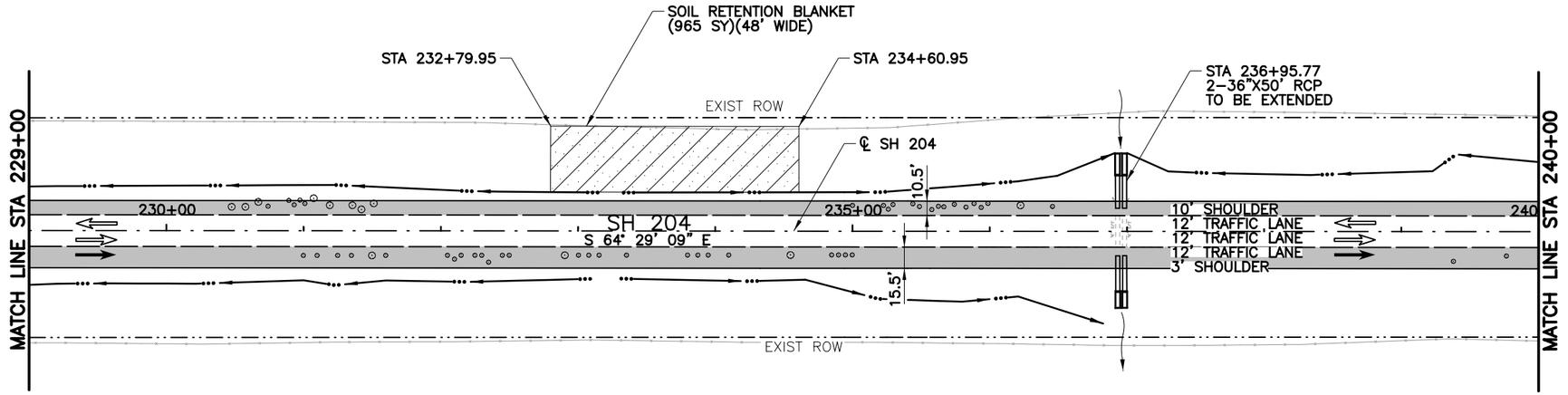
ROADWAY PLAN & PROFILE

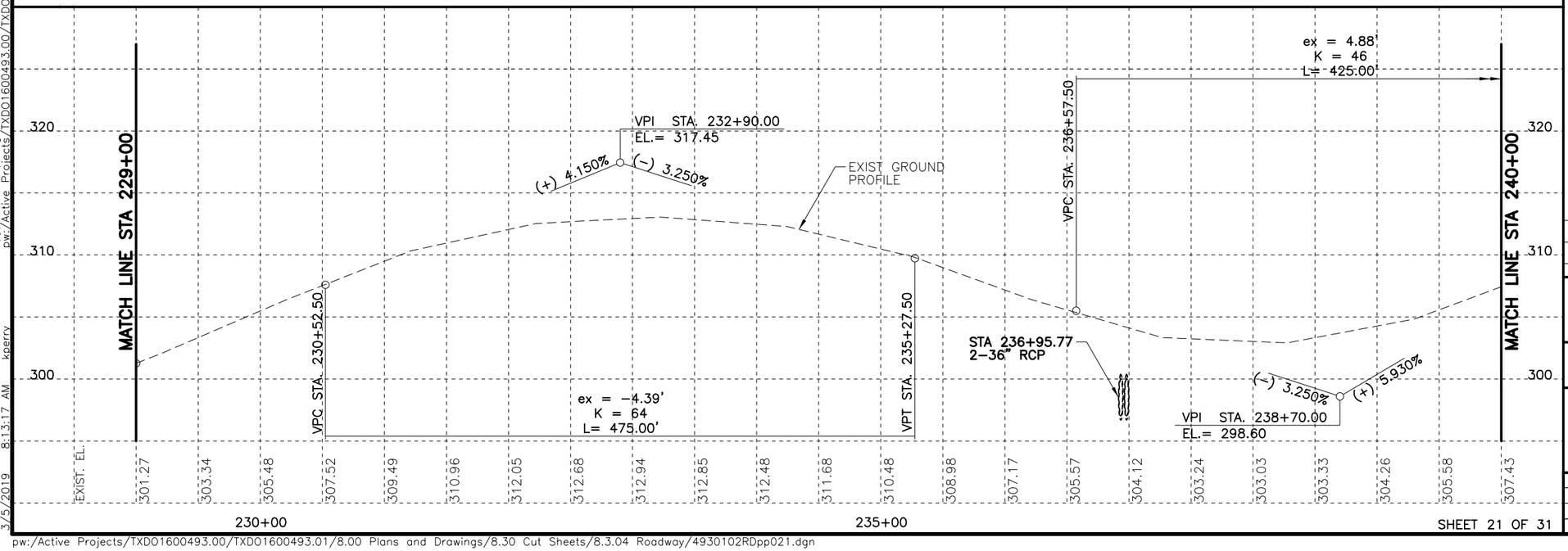
STA 218+00 TO STA 229+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	112

SHEET 20 OF 31

pw:/Active Projects/TXDOT1600493.00/TXDOT1600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/4930102RDpp020.dgn





N

50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 229+00 TO STA 240+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		113

SHEET 21 OF 31

cpybw ANSIB.tbl
cpypsf_ANSIB.pltcfg
pw:/Active Projects/TXDO1600493.00/TXDO1600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/4930102RDpp021.dgn
3/5/2019 8:13:17 AM kperry

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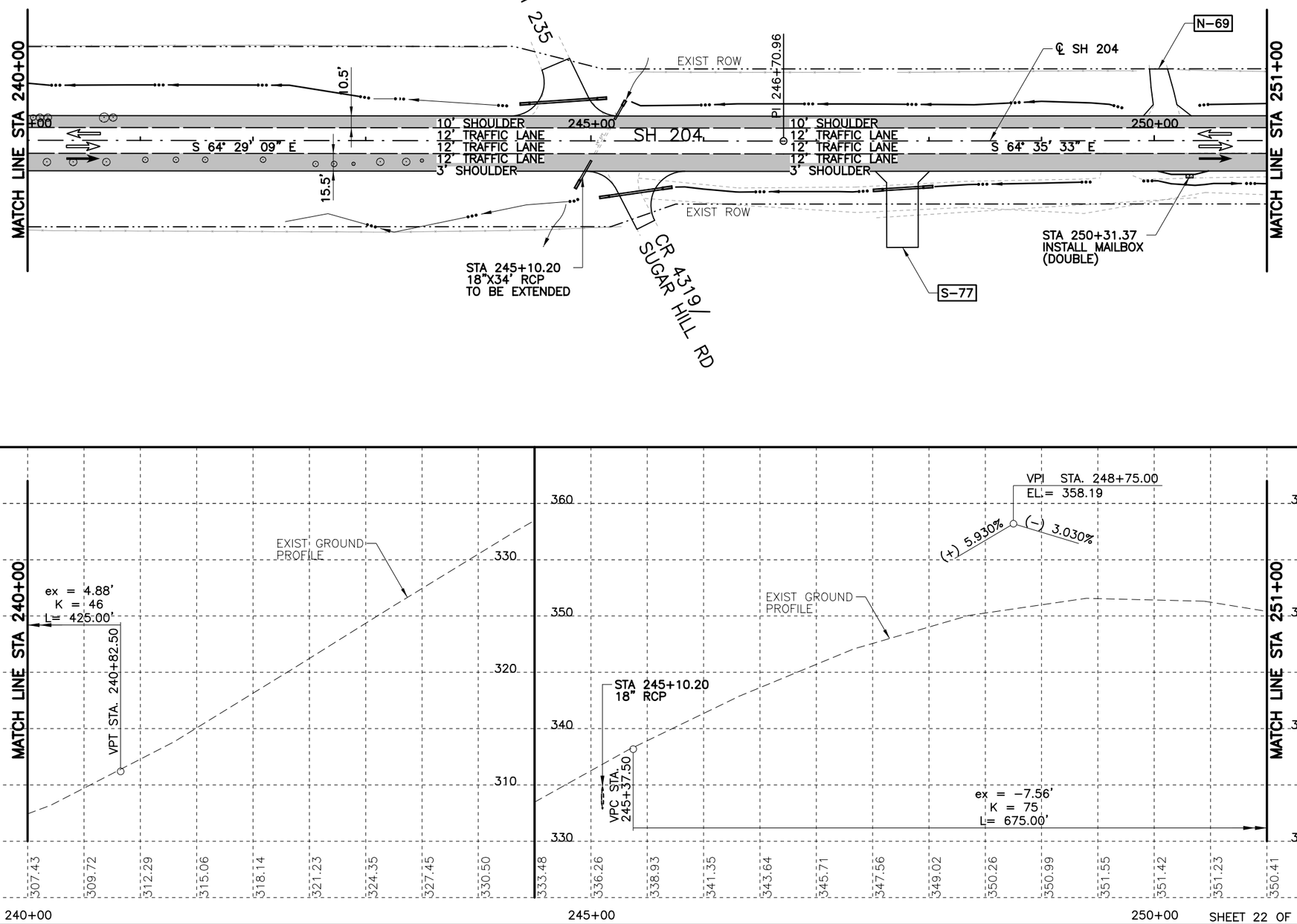


50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

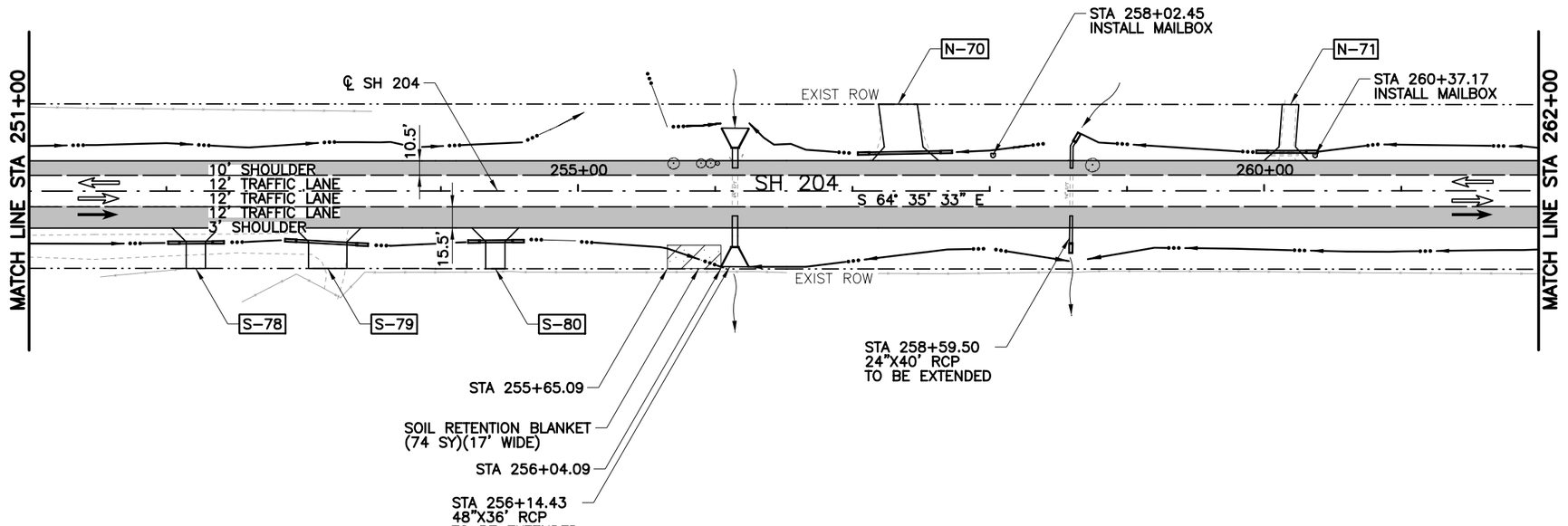
ROADWAY PLAN & PROFILE

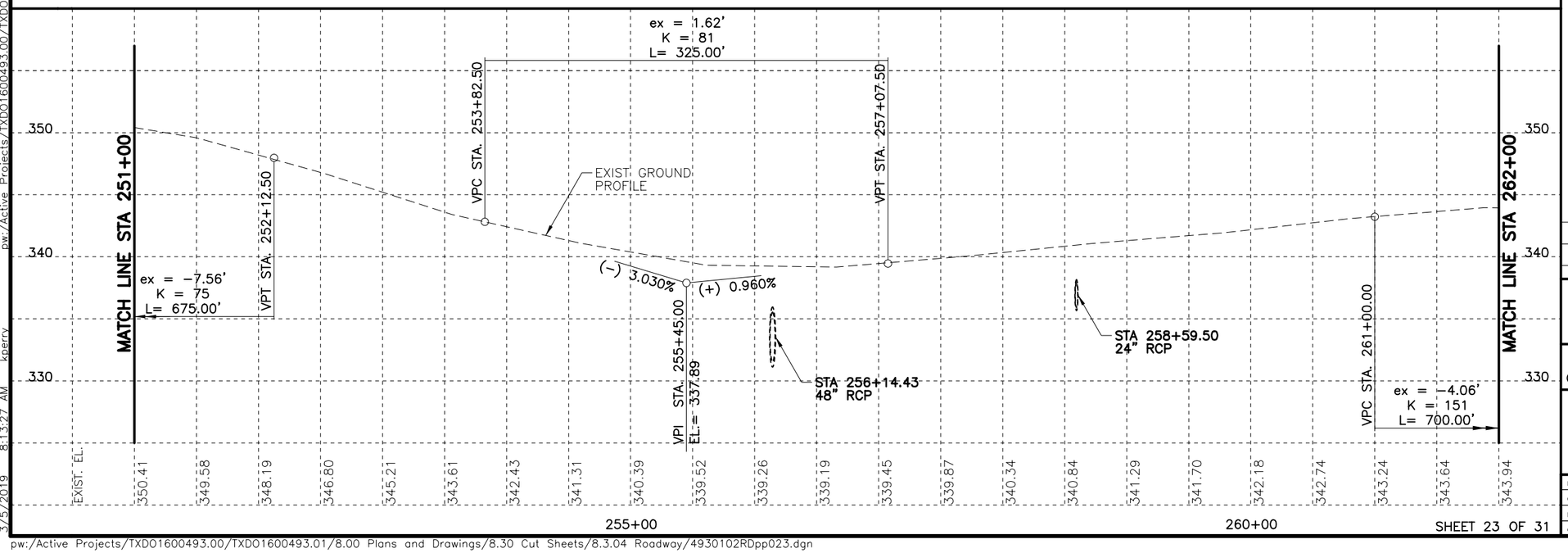
STA 240+00 TO STA 251+00

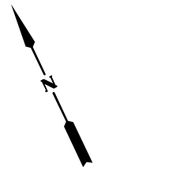
Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		114

SHEET 22 OF 31

pw:/Active Projects/TXDOT1600493.00/TXDOT1600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/4930102RDpp022.dgn





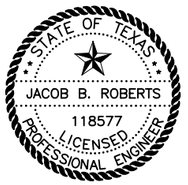


LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.



3/5/2019

NO.	REVISION	BY	DATE

CP&Y

TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

ROADWAY PLAN & PROFILE

STA 251+00 TO STA 262+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.	
Checked:	CPY		TEXAS					SH 204	
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	CPY	TYL	CHEROKEE	0450	01	013		115	

SHEET 23 OF 31

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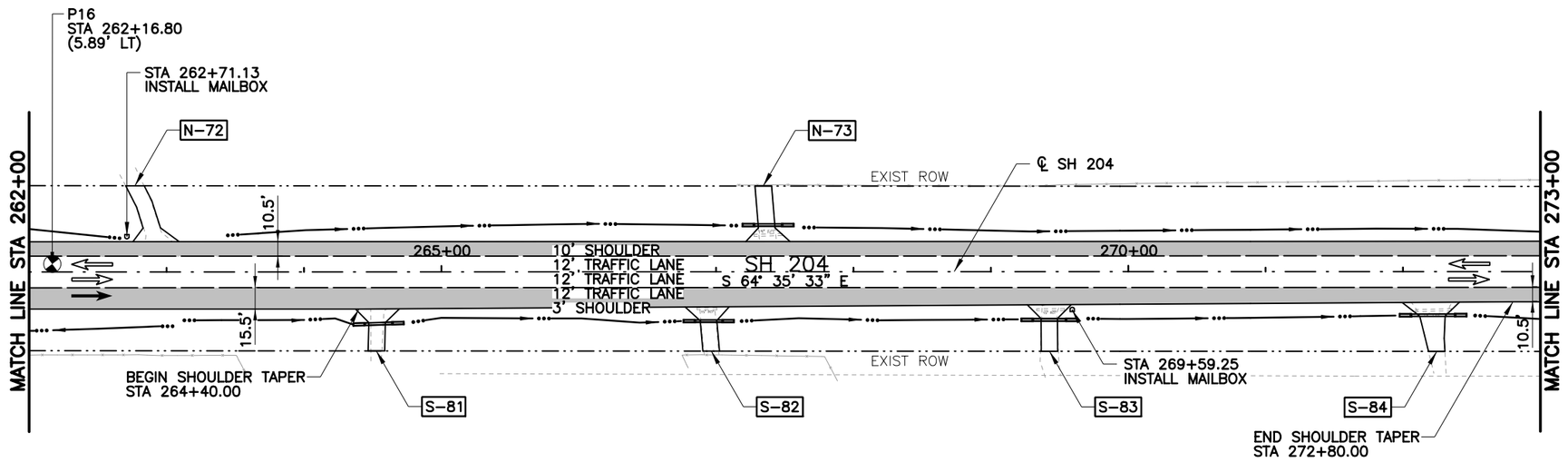

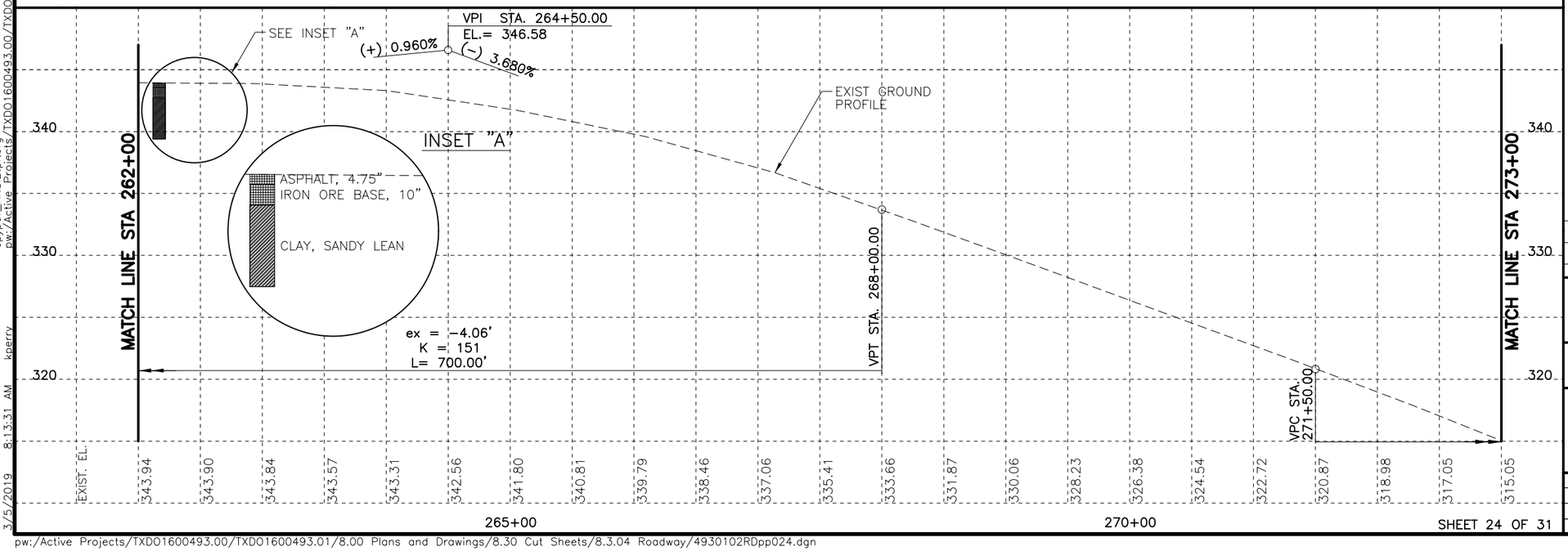

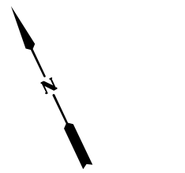

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 262+00 TO STA 273+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	116

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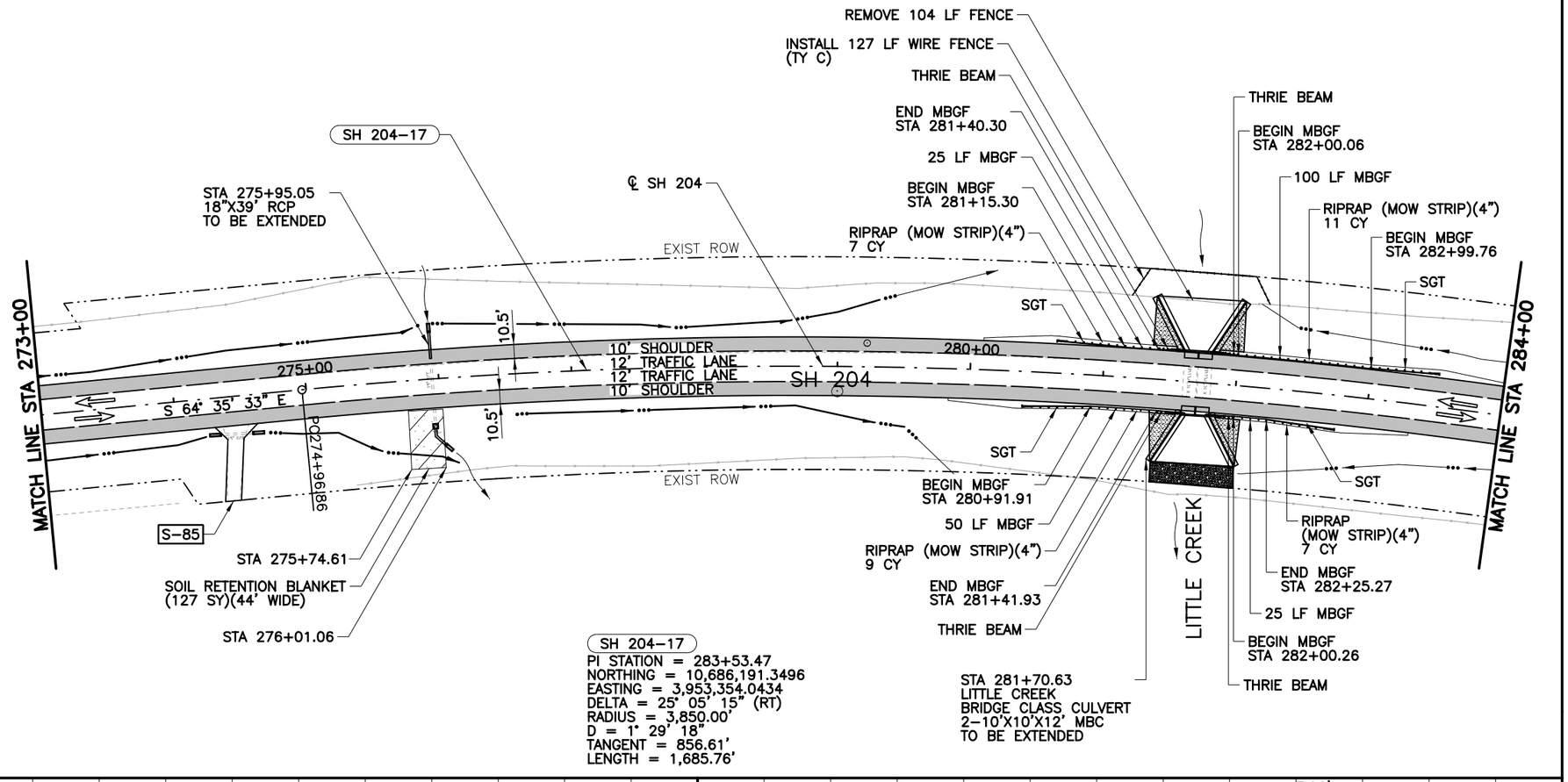
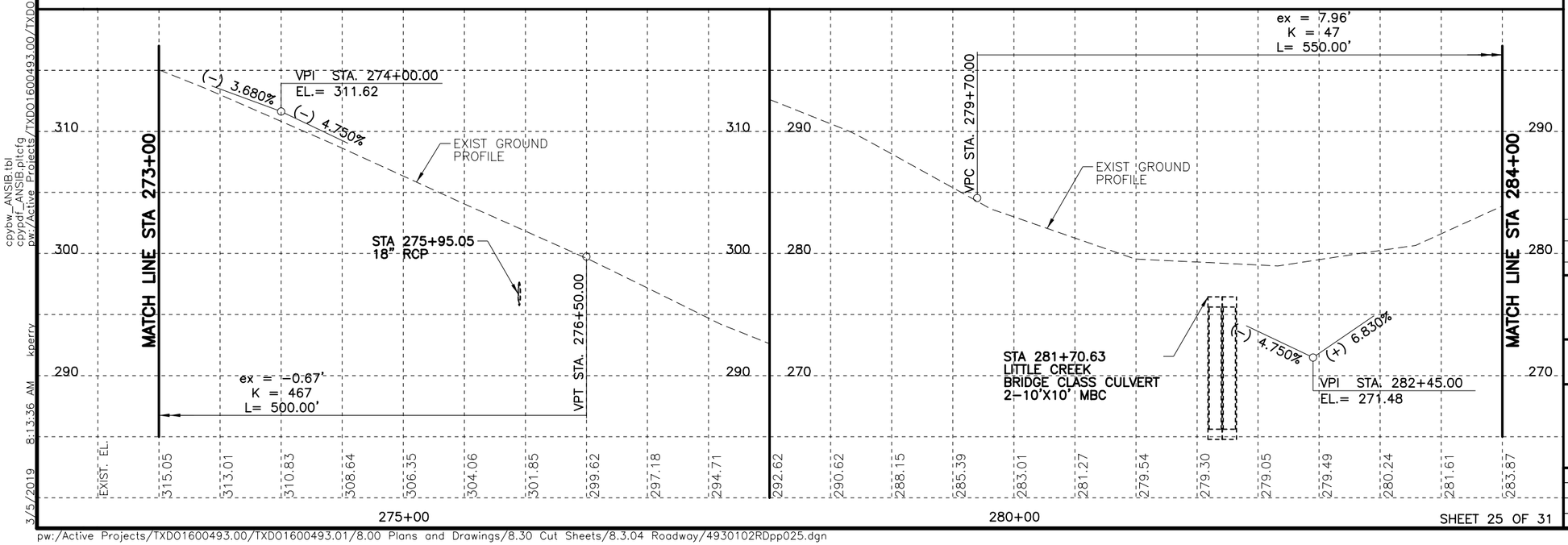


SH 204-17
PI STATION = 283+53.47
NORTHING = 10,686,191.3496
EASTING = 3,953,354.0434
DELTA = 25° 05' 15" (RT)
RADIUS = 3,850.00'
D = 1° 29' 18"
TANGENT = 856.61'
LENGTH = 1,685.76'



SHEET 25 OF 31

N

50 25 0 50 100
SCALE HORIZ. FEET

5 2.5 0 5 10
SCALE VERT. FEET

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 273+00 TO STA 284+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.	
Checked:	CPY		TEXAS					SH 204	
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	CPY	TYL	CHEROKEE	0450	01	013		117	

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cpypdf: ANSIB.pltcfg
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kperry
8:13:36 AM
3/5/2019

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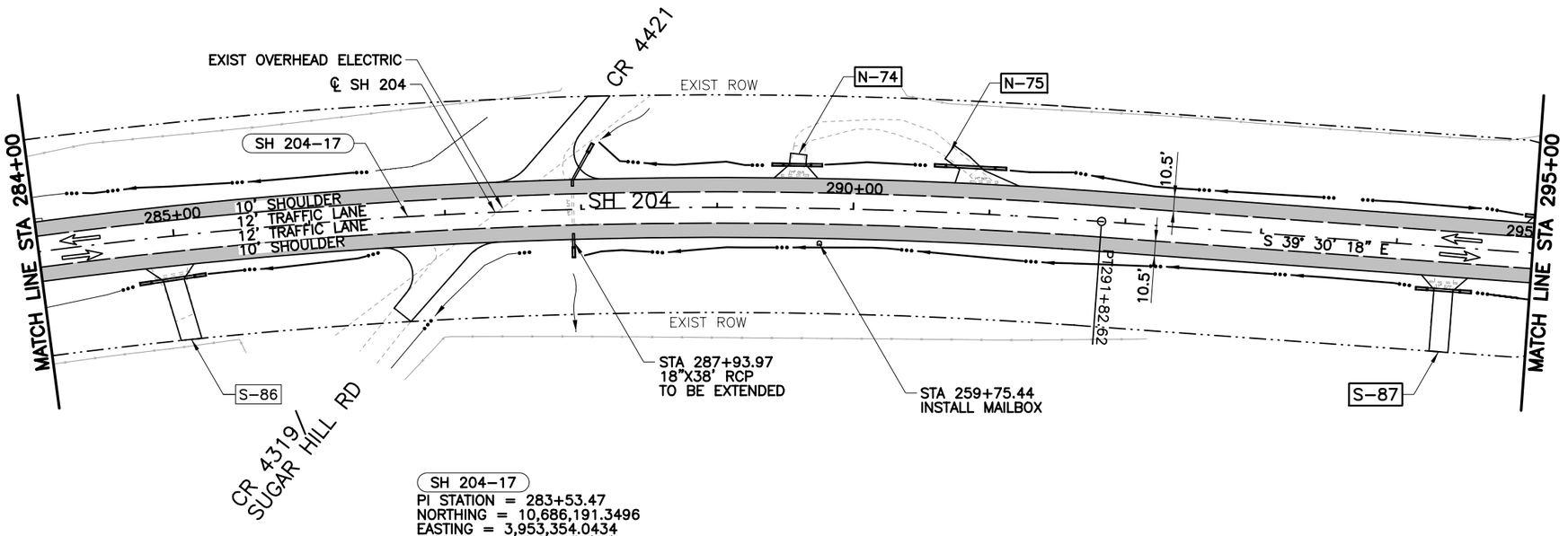
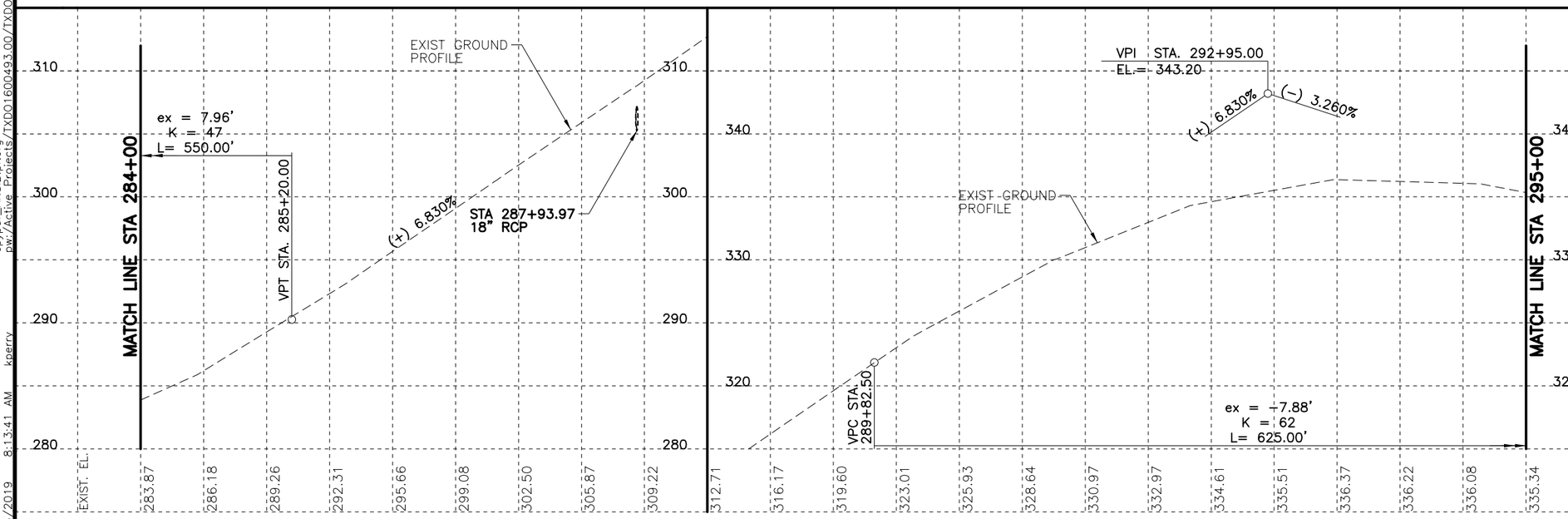


SH 204-17
PI STATION = 283+53.47
NORTHING = 10,686,191.3496
EASTING = 3,953,354.0434
DELTA = 25° 05' 15" (RT)
RADIUS = 3,850.00'
D = 1° 29' 18"
TANGENT = 856.61'
LENGTH = 1,685.76'



50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 284+00 TO STA 295+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		118

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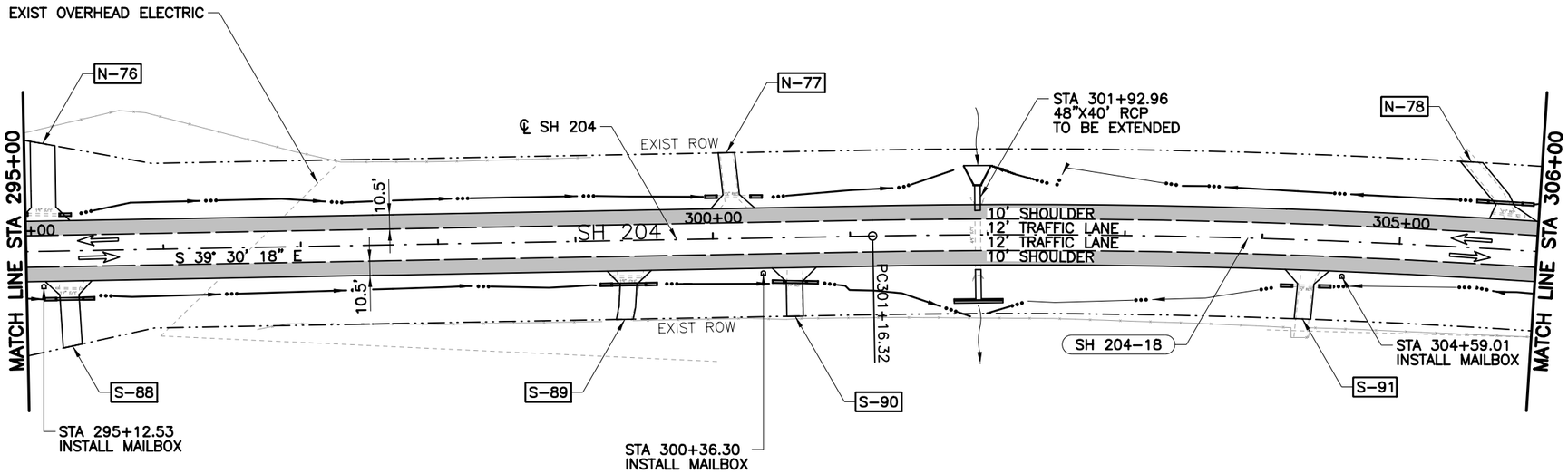
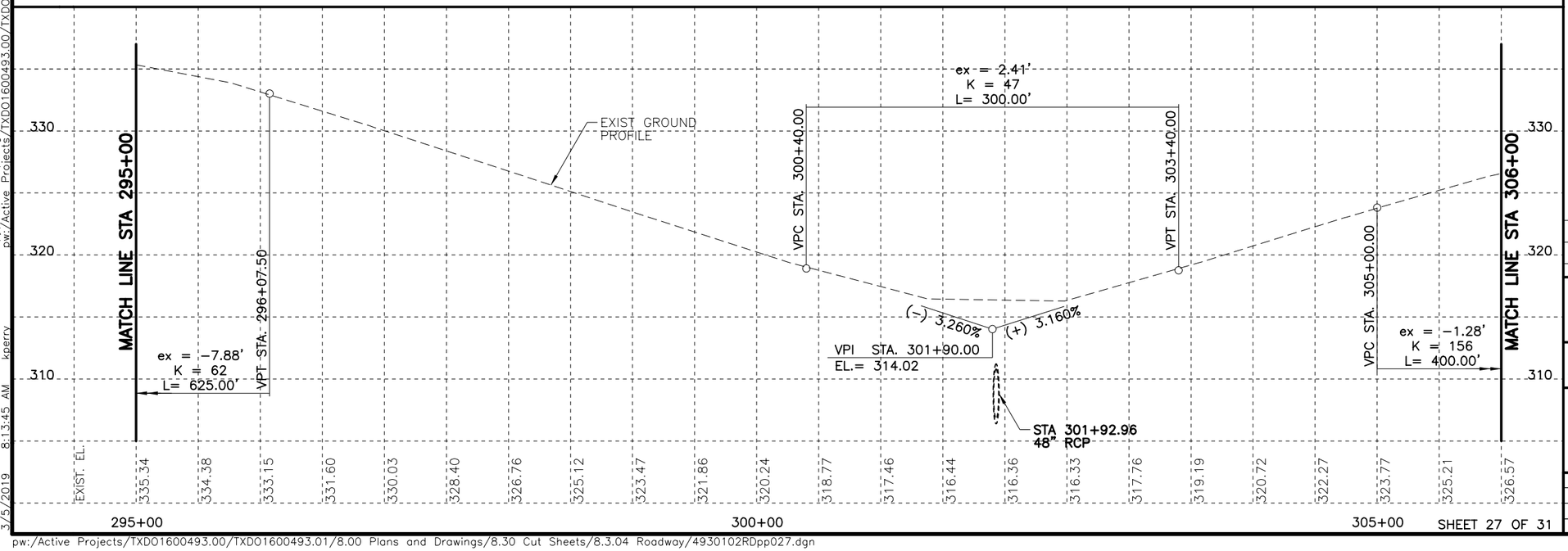
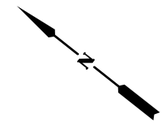


SH 204-18
PI STATION = 305+98.14
NORTHING = 10,684,438.2487
EASTING = 3,954,799.4492
DELTA = 9° 29' 51" (RT)
RADIUS = 5,800.00'
D = 0° 59' 16"
TANGENT = 481.82'
LENGTH = 961.42'



SHEET 27 OF 31



50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

ROADWAY PLAN & PROFILE

STA 295+00 TO STA 306+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	119

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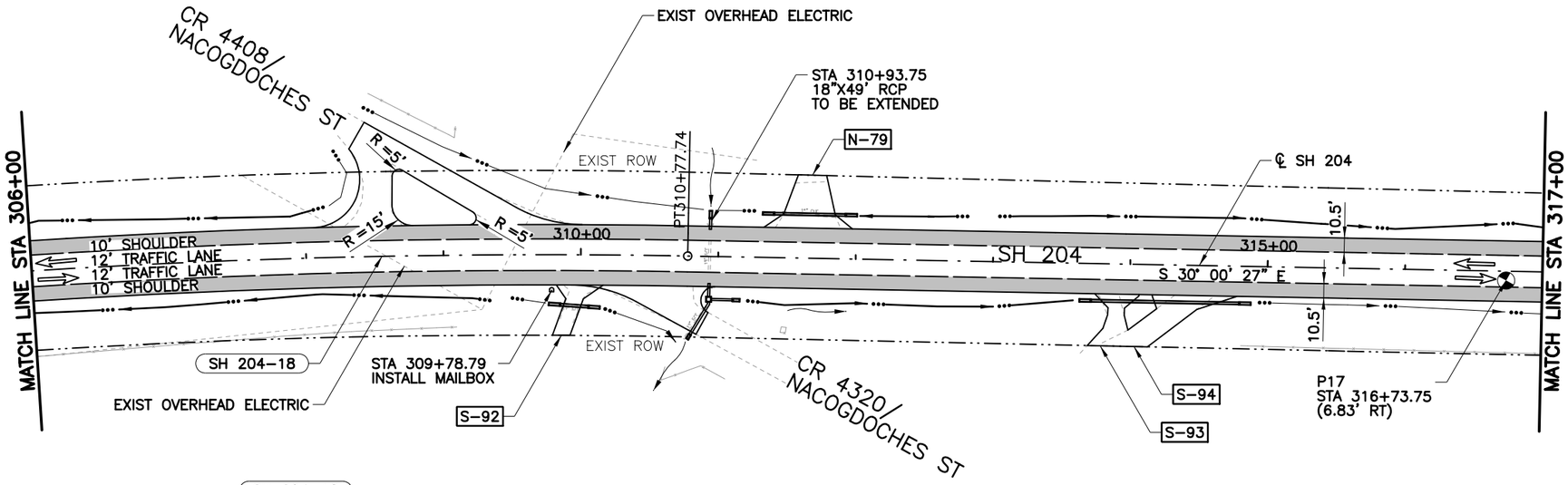
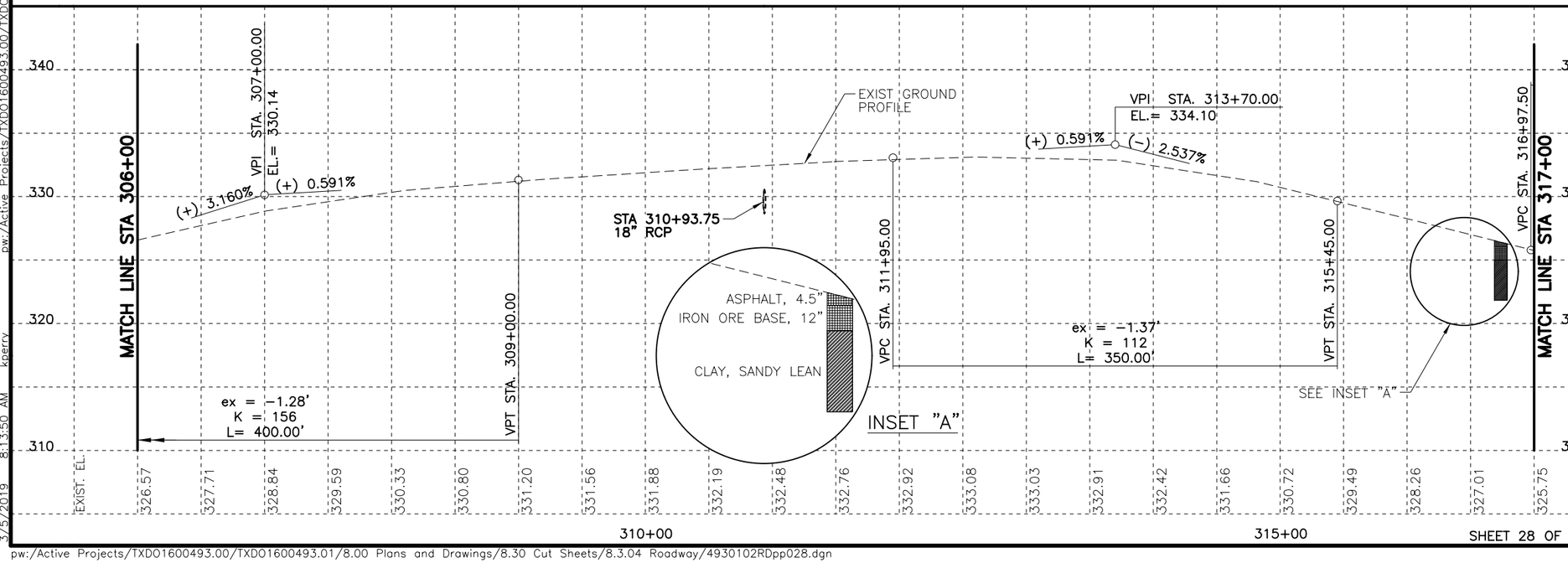
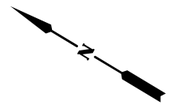


SH 204-18
SH204-18
PI STATION = 305+98.14
NORTHING = 10,684,438.2487
EASTING = 3,954,799.4492
DELTA = 9° 29' 51" (RT)
RADIUS = 5,800.00'
D = 0° 59' 16"
TANGENT = 481.82'
LENGTH = 961.42'





50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER
3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

ROADWAY PLAN & PROFILE

STA 306+00 TO STA 317+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		120

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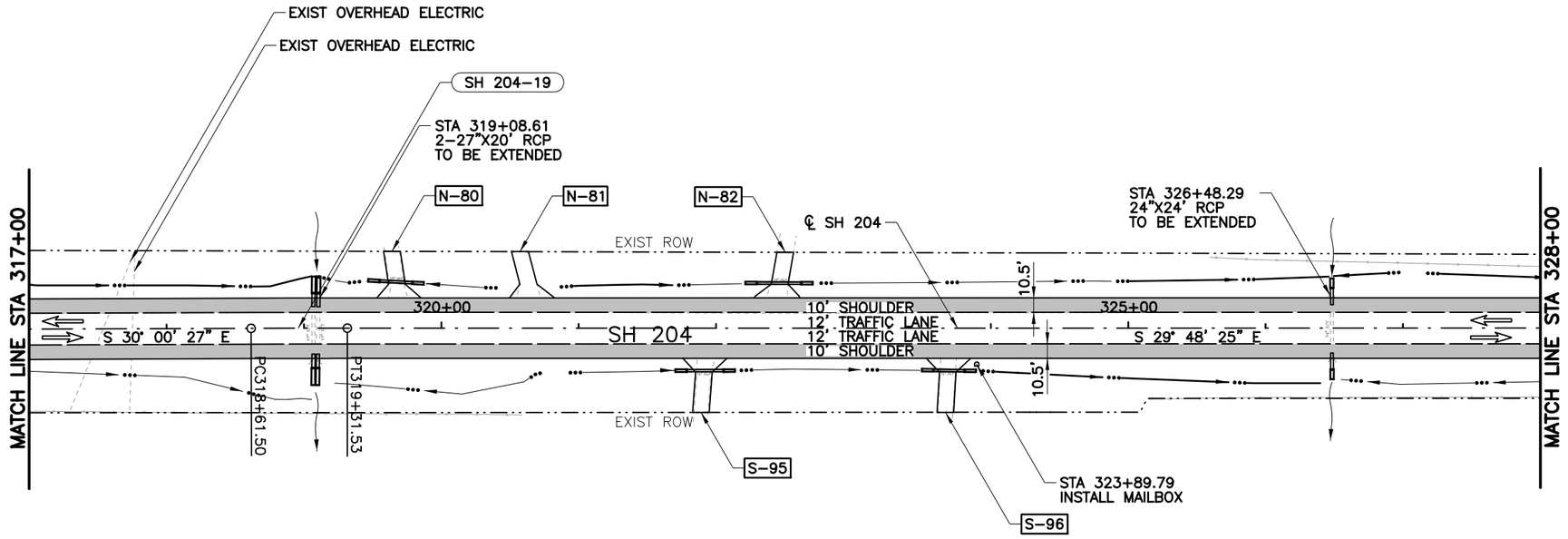
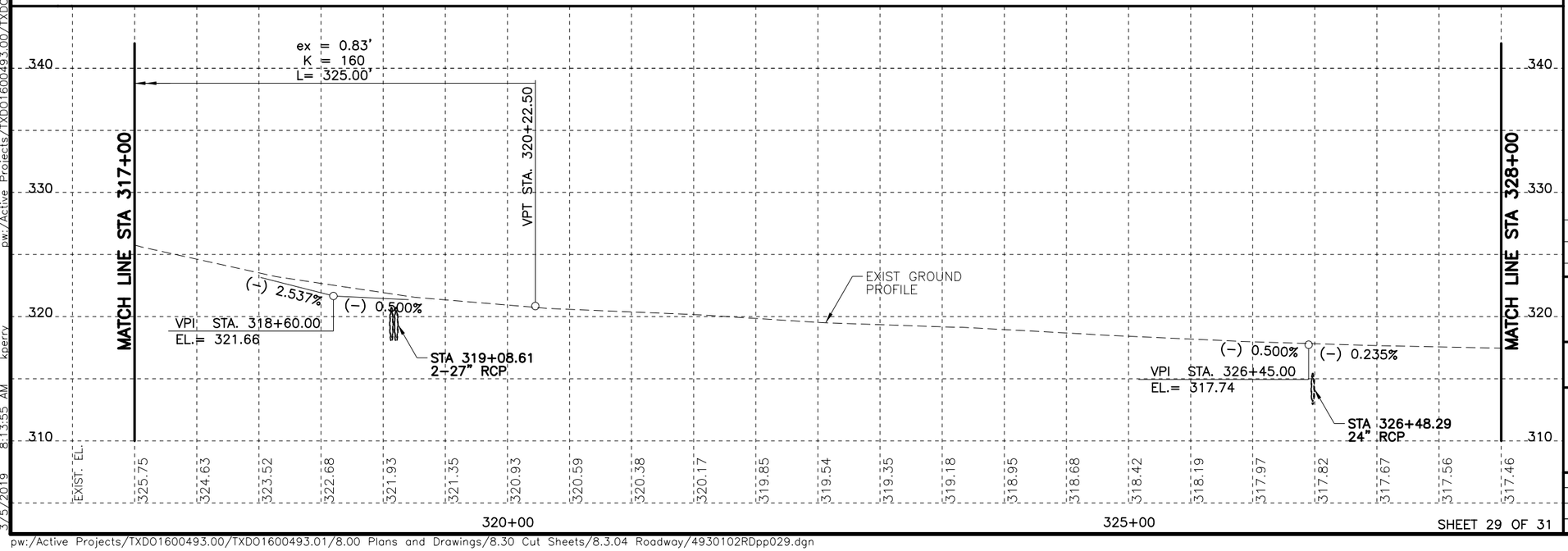
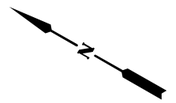


SH 204-19
PI STATION = 318+96.52
NORTHING = 10,683,311.9914
EASTING = 3,955,449.8926
DELTA = 0° 12' 02" (RT)
RADIUS = 20,000.00'
D = 0° 17' 11"
TANGENT = 35.01'
LENGTH = 70.02'





50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

ROADWAY PLAN & PROFILE

STA 317+00 TO STA 328+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	121

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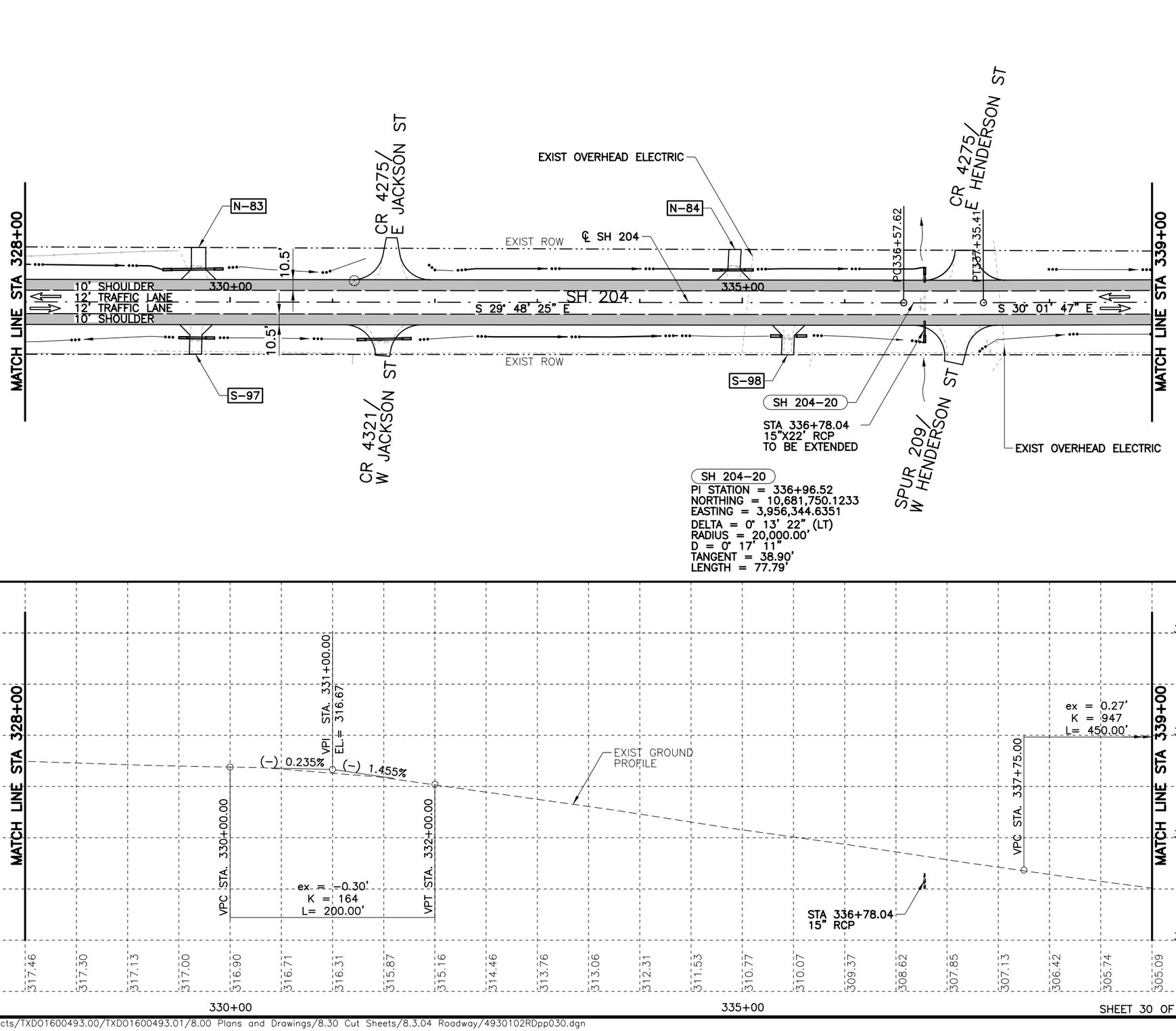

N

50 25 0 50 100
SCALE FEET
HORIZ.

5 2.5 0 5 10
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 328+00 TO STA 339+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.	
Checked:	CPY		TEXAS					SH 204	
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	CPY	TYL	CHEROKEE	0450	01	013		122	

SHEET 30 OF 31

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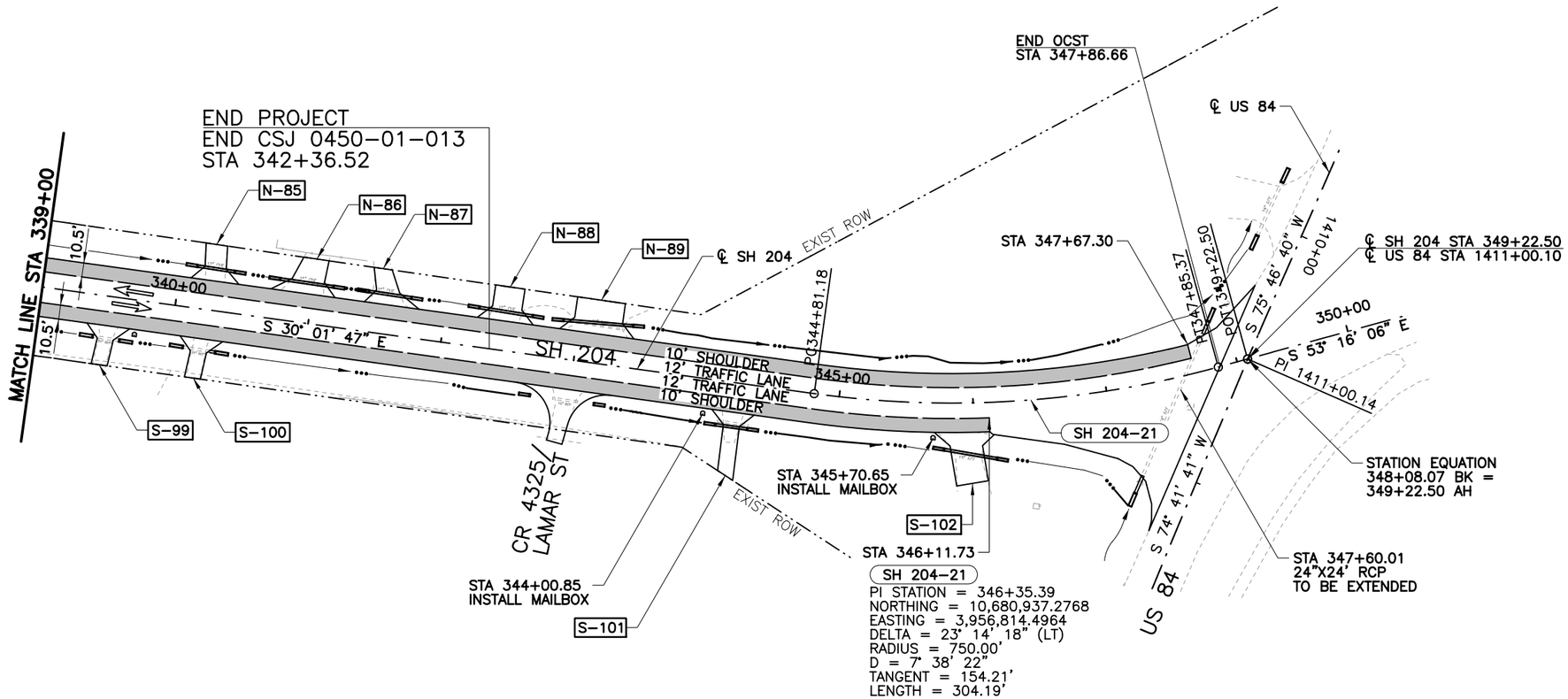

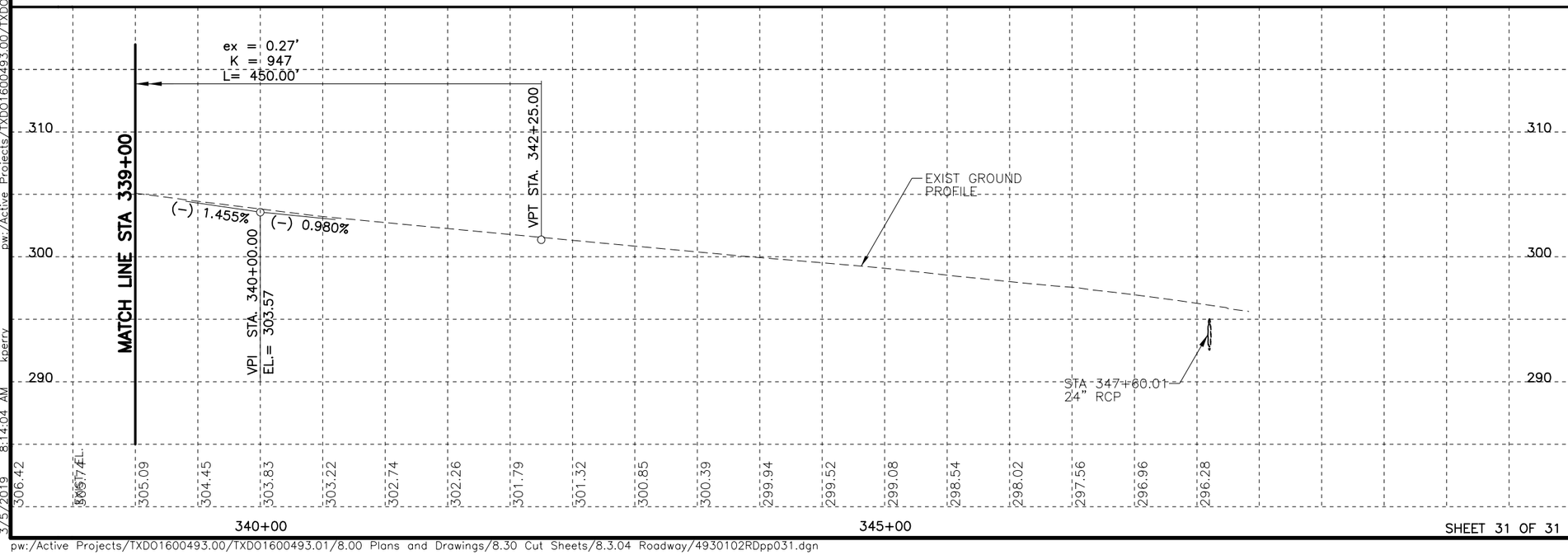

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LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- X-XXX DRIVEWAY ID
- SOIL PROFILE
- EXISTING DITCH
- PROPOSED DITCH

NOTES:

1. ALL STATIONS AND OFFSETS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER
3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

ROADWAY PLAN & PROFILE

STA 339+00 TO END PROJECT

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		123

SHEET 31 OF 31

pw:/Active Projects/TXD01600493.00/TXD01600493.01/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.04 Roadway/4930102RDpp031.dgn

DRIVEWAY TABLE

SHEET NUMBER	DRIVEWAY ID	STREET HORIZONTAL ALIGNMENT	STATION	OFFSET	TYPE	ANGLE	ELEV "A"	ELEV "B"	ELEV "C"	WIDTH (FT)	L1 (FT)	L2 (FT)	L3 (FT)	VERTICAL CURVE #1 LENGTH (FT)	VERTICAL CURVE #2 LENGTH (FT)	G1 (%)	G2 (%)	G3 (%)
SHEET 2 OF 31	S-52	SH 204	27+78.35	RT	ASPHALT	91°56'21"	334.03	MATCH	EXISTING	13	38.10					-2.58		
SHEET 3 OF 31	S-53	SH 204	39+78.88	RT	ASPHALT	90°00'00"	299.36	MATCH	EXISTING	38	36.58					-2.28		
SHEET 3 OF 31	S-54	SH 204	41+92.50	RT	ASPHALT	99°25'25"	295.86	296.41	296.51	12	3.00	16.80	17.02	6	8	-1.70	6.00	-2.00
SHEET 5 OF 31	S-55	SH 204	53+80.63	RT	ASPHALT	101°12'25"	312.40	MATCH	EXISTING	12	3.00	33.84		6		-1.61	-7.59	
SHEET 5 OF 31	N-55	SH 204	54+14.02	LT	ASPHALT	84°39'53"	312.09	314.61	314.20	14	3.50	29.57	2.00	7	4	-1.56	8.68	-3.76
SHEET 7 OF 31	N-56	SH 204	78+20.63	LT	ASPHALT	90°24'33"	284.32	286.47	287.71	14	5.00	49.22		10		-1.50	6.60	
SHEET 7 OF 31	S-56	SH 204	83+14.34	RT	ASPHALT	94°31'54"	284.55	281.61	281.93	12	20.00	36.03				-4.00	-5.67	
SHEET 8 OF 31	S-57	SH 204	87+29.37	RT	ASPHALT	106°56'09"	288.44	283.21	283.19	12	4.00	53.77		8		-0.50	-9.74	
SHEET 8 OF 31	N-57	SH 204	87+59.81	LT	ASPHALT	72°56'16"	289.75	MATCH	EXISTING	12	4.00	54.06		8		-0.50	5.84	
SHEET 8 OF 31	N-58	SH 204	93+35.98	LT	ASPHALT	89°30'11"	316.55	MATCH	EXISTING	12	5.00	49.19		10		-1.49	7.48	
SHEET 8 OF 31	N-59	SH 204	94+79.54	LT	ASPHALT	92°31'21"	317.15	MATCH	EXISTING	12	5.00	48.78		10		-1.47	6.52	
SHEET 8 OF 31	N-60	SH 204	96+88.15	LT	ASPHALT	88°52'03"	310.28	315.11	314.81	12	5.00	48.70		10		-1.59	9.52	
SHEET 10 OF 31	S-58	SH 204	118+40.40	RT	ASPHALT	86°07'32"	297.25	290.29	290.24	12	4.00	60.00	4.00	8	8	-1.48	-12.00	-5.08
SHEET 11 OF 31	N-61	SH 204	121+43.45	LT	ASPHALT	92°50'04"	298.45	293.25	293.43	13	4.00	48.25		8		-1.57	-10.21	
SHEET 15 OF 31	S-70	SH 204	172+23.00	RT	ASPHALT	81°22'32"	305.41	307.79	308.20	18	5.00	34.28	2.50	10	5	-2.20	7.91	1.12
SHEET 17 OF 31	S-71	SH 204	193+03.24	RT	ASPHALT	86°38'29"	342.08	339.14	339.04	16	3.00	45.46		6		-1.72	-8.00	
SHEET 18 OF 31	S-72	SH 204	204+30.83	RT	ASPHALT	101°13'08"	366.53	363.31	363.54	15	4.00	25.11	3.00	8	6	-1.74	-12.00	-1.06
SHEET 19 OF 31	S-73	SH 204	207+31.91	RT	ASPHALT	101°07'37"	360.70	MATCH	EXISTING	12	20.00	23.02		5		-3.50	2.93	
SHEET 19 OF 31	N-65	SH 204	207+51.03	LT	ASPHALT	85°03'32"	360.29	356.86	356.67	12	3.00	39.16	9.96	6	3	-1.76	-8.00	-3.65
SHEET 19 OF 31	S-74	SH 204	213+57.78	RT	ASPHALT	96°44'36"	333.78	MATCH	EXISTING	12	4.00	43.42	5.00	8		-2.04	-11.89	-9.56
SHEET 19 OF 31	N-66	SH 204	213+72.28	LT	ASPHALT	89°25'51"	333.31	334.13	334.04	12	58.97					1.38		
SHEET 19 OF 31	S-75	SH 204	216+47.86	RT	ASPHALT	84°11'46"	319.95	MATCH	EXISTING	12	32.51	5.00		3		-3.20	2.60	
SHEET 20 OF 31	N-67	SH 204	220+51.40	LT	ASPHALT	90°51'54"	300.83	MATCH	EXISTING	14	48.94	11.00				-3.92	-2.00	
SHEET 20 OF 31	N-68	SH 204	226+29.83	LT	ASPHALT	94°04'29"	294.16	MATCH	EXISTING	12	61.22					-0.80		
SHEET 20 OF 31	S-76	SH 204	227+21.75	RT	ASPHALT	84°25'41"	295.27	295.07	294.72	14	50.15					-0.75		
SHEET 22 OF 31	S-77	SH 204	247+76.41	RT	ASPHALT	90°00'00"	348.06	MATCH	EXISTING	28	2.00	62.65	3.00	4	6	-1.50	-8.00	-4.06
SHEET 22 OF 31	N-69	SH 204	250+15.57	LT	ASPHALT	100°32'13"	351.21	351.90	352.00	16	20.00	21.58		6		1.00	2.66	
SHEET 23 OF 31	S-78	SH 204	252+21.41	RT	ASPHALT	90°00'00"	347.33	345.33	345.67	14	2.00	24.00	4.35	4	8	-1.50	-7.80	1.76
SHEET 23 OF 31	S-79	SH 204	253+17.60	RT	ASPHALT	90°00'00"	344.38	342.23	343.18	28	2.00	24.00	4.38	4	8	-1.50	-7.80	2.22
SHEET 23 OF 31	S-80	SH 204	254+39.75	RT	ASPHALT	90°00'00"	341.27	339.66	339.96	14	2.50	21.64	6.31	5	6	-1.50	-6.00	-1.56
SHEET 23 OF 31	N-70	SH 204	257+41.50	LT	ASPHALT	97°34'19"	339.57	MATCH	EXISTING	28	15.00	26.33				-1.59	1.23	
SHEET 23 OF 31	N-71	SH 204	260+14.29	LT	ASPHALT	85°32'36"	342.16	343.75	343.90	12	4.00	15.00	21.91	8	6	-1.41	8.00	2.37
SHEET 24 OF 31	N-72	SH 204	262+99.34	LT	ASPHALT	107°33'57"	343.67	344.66	344.63	12	3.50	40.07		7		-1.37	2.39	
SHEET 24 OF 31	S-81	SH 204	264+54.19	RT	ASPHALT	88°32'01"	342.23	341.01	341.30	12	19.73	11.00				-4.10	-2.50	
SHEET 24 OF 31	S-82	SH 204	266+91.24	RT	ASPHALT	95°08'35"	336.99	335.28	335.61	12	32.52					-4.72		
SHEET 24 OF 31	N-73	SH 204	267+39.55	LT	ASPHALT	94°47'31"	335.64	336.24	335.82	12	40.41					0.97		
SHEET 24 OF 31	S-83	SH 204	269+42.40	RT	ASPHALT	90°16'01"	328.27	325.99	326.38	12	3.00	31.16		6		-1.52	-6.50	
SHEET 24 OF 31	S-84	SH 204	272+18.38	RT	ASPHALT	95°39'26"	318.00	317.29	317.31	12	36.31					-1.86		
SHEET 25 OF 31	S-85	SH 204	274+48.26	RT	ASPHALT	82°34'05"	308.45	MATCH	EXISTING	12	4.00	52.74		8		-1.74	4.93	
SHEET 26 OF 31	S-86	SH 204	284+90.60	RT	ASPHALT	100°27'46"	288.06	MATCH	EXISTING	15	5.00	51.44		10		-3.42	5.19	
SHEET 26 OF 31	N-74	SH 204	289+55.41	LT	ASPHALT	84°20'57"	320.67	321.14	321.46	12	17.83					3.83		
SHEET 26 OF 31	N-75	SH 204	291+21.84	LT	ASPHALT	138°57'59"	330.00	326.68	326.38	12	4.00	28.80	4.00	8	8	-0.27	-11.33	-5.48
SHEET 26 OF 31	S-87	SH 204	294+36.96	RT	ASPHALT	89°33'56"	335.84	MATCH	EXISTING	14	55.58					-2.21		
SHEET 27 OF 31	N-76	SH 204	295+13.35	LT	ASPHALT	90°00'00"	334.88	MATCH	EXISTING	18	56.31					1.46		
SHEET 27 OF 31	S-88	SH 204	295+29.50	RT	ASPHALT	92°35'25"	334.55	MATCH	EXISTING	14	47.51					-4.14		
SHEET 27 OF 31	S-89	SH 204	299+40.39	RT	ASPHALT	85°56'49"	322.03	321.61	321.79	12	36.49					-0.87		
SHEET 27 OF 31	N-77	SH 204	300+16.99	LT	ASPHALT	95°38'46"	319.58	MATCH	EXISTING	12	26.00	14.03				-1.00	0.55	
SHEET 27 OF 31	S-90	SH 204	300+58.82	RT	ASPHALT	90°00'00"	318.35	316.50	316.75	12	2.50	30.90	2.50	5	5	-1.50	-5.42	-0.18
SHEET 27 OF 31	S-91	SH 204	304+34.91	RT	ASPHALT	86°24'47"	321.14	319.40	319.19	12	35.65					-5.30		
SHEET 27 OF 31	N-78	SH 204	305+92.16	LT	ASPHALT	133°28'54"	326.71	324.58	325.76	12	2.50	48.92				0.63	-4.21	
SHEET 28 OF 31	S-92	SH 204	310+07.10	RT	ASPHALT	70°15'15"	330.68	MATCH	EXISTING	12	16.00	22.56		2		-4.00	-7.41	
SHEET 28 OF 31	N-79	SH 204	311+64.40	LT	ASPHALT	86°44'02"	332.60	MATCH	EXISTING	27	38.39					-3.87		

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

DRIVEWAY AND SIDE ROAD TABLES

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		124

DRIVEWAY TABLE (CON'T)

SHEET NUMBER	DRIVEWAY ID	STREET HORIZONTAL ALIGNMENT	STATION	OFFSET	TYPE	ANGLE	ELEV "A"	ELEV "B"	ELEV "C"	WIDTH (FT)	L1 (FT)	L2 (FT)	L3 (FT)	VERTICAL CURVE #1 LENGTH (FT)	VERTICAL CURVE #2 LENGTH (FT)	G1 (%)	G2 (%)	G3 (%)
SHEET 28 OF 31	S-93	SH 204	313+91.25	RT	ASPHALT	88°29'22"	332.37	MATCH	EXISTING	14	30.00	8.59				−0.50	0.80	
SHEET 28 OF 31	S-94	SH 204	314+75.54	RT	ASPHALT	38°01'12"	331.49	MATCH	EXISTING	18	62.36					0.98		
SHEET 29 OF 31	N-80	SH 204	319+72.50	LT	ASPHALT	98°42'07"	320.99	320.53	320.51	12	34.52					−1.34		
SHEET 29 OF 31	N-81	SH 204	320+71.78	LT	ASPHALT	104°46'54"	320.32	319.75	319.67	12	28.00	6.87		6		−2.50	1.24	
SHEET 29 OF 31	S-95	SH 204	321+93.51	RT	ASPHALT	85°49'43"	319.71	318.81	318.82	12	38.94					−2.30		
SHEET 29 OF 31	N-82	SH 204	322+40.60	LT	CONCRETE	80°06'24"	319.39	320.86	320.87	12	4.00	30.44		8		−1.59	5.10	
SHEET 29 OF 31	S-96	SH 204	323+70.49	RT	ASPHALT	86°38'00"	318.91	318.91	319.16	12	27.00	11.80				0.80	−0.69	
SHEET 30 OF 31	S-97	SH 204	329+67.30	RT	ASPHALT	88°52'24"	316.76	MATCH	EXISTING	12	12.00	16.80				−1.50	1.21	
SHEET 30 OF 31	N-83	SH 204	329+69.27	LT	ASPHALT	90°00'00"	316.76	MATCH	EXISTING	14	3.00	28.27		6		−1.50	−7.27	
SHEET 30 OF 31	N-84	SH 204	334+90.43	LT	ASPHALT	87°15'02"	310.69	MATCH	EXISTING	12	2.50	27.37		5		−1.50	−6.02	
SHEET 30 OF 31	S-98	SH 204	335+46.11	RT	ASPHALT	87°54'00"	309.94	MATCH	EXISTING	12	24.00	4.90		6		−3.50	0.75	
SHEET 31 OF 31	S-99	SH 204	339+54.69	RT	ASPHALT	84°36'39"	304.21	302.83	302.77	12	12.00	17.64				−3.80	−5.40	
SHEET 31 OF 31	S-100	SH 204	340+24.77	RT	ASPHALT	84°52'38"	303.36	MATCH	EXISTING	12	29.57					−4.39		
SHEET 31 OF 31	N-85	SH 204	340+28.86	LT	ASPHALT	95°01'13"	303.31	MATCH	EXISTING	16	12.00	15.76		5		−1.40	−5.03	
SHEET 31 OF 31	N-86	SH 204	340+89.02	LT	ASPHALT	77°20'26"	302.60	301.60	301.22	18	28.04					−4.23		
SHEET 31 OF 31	N-87	SH 204	341+67.16	LT	ASPHALT	109°51'12"	301.98	300.86	300.78	13	2.50	22.20	4.17	5	6	−1.09	−5.00	−0.95
SHEET 31 OF 31	N-88	SH 204	342+45.23	LT	ASPHALT	89°22'38"	301.17	MATCH	EXISTING	22	15.55	11.00				−4.41	−2.75	
SHEET 31 OF 31	N-89	SH 204	343+14.48	LT	ASPHALT	90°00'00"	300.53	MATCH	EXISTING	36	10.00	13.03	3.00	5	6	−2.50	−6.69	−1.51
SHEET 31 OF 31	S-101	SH 204	344+22.86	RT	ASPHALT	90°30'25"	299.66	MATCH	EXISTING	12	2.50	44.99				−0.96	−4.86	
SHEET 31 OF 31	S-102	SH 204	345+89.69	RT	ASPHALT	98°58'06"	298.39	298.17	298.24	24	11.00	26.57				0.50	−0.78	

SIDE ROAD TABLE

SHEET NUMBER	SIDE ROAD	STATION	OFFSET	ANGLE	ELEV "A"	ELEV "B"	ELEV "C"	RADIUS LT (FT)	RADIUS RT (FT)	WIDTH (FT)	L1 (FT)	L2 (FT)	L3 (FT)	VERTICAL CURVE #1 LENGTH (FT)	VERTICAL CURVE LENGTH 2	G1 (%)	G2 (%)	G3 (%)
SHEET 1 OF 31	CR 4312	17+56.76	RT	106°10'16"	335.67	333.36	333.25	25	45	16	1.50	34.28		3		−1.75	−6.03	
SHEET 1 OF 31	FM 2274	18+98.96	LT	71°54'18"	333.56	334.61	334.27	60	45	27	4.00	64.46		8		−2.50	2.22	
SHEET 22 OF 31	FM 235	244+97.56	LT	113°14'40"	335.40	335.99	336.98	30	30	27	5.00	42.78	2.50	10	5	−3.57	4.27	0.50
SHEET 22 OF 31	CR 4319	245+10.56	RT	117°08'32"	337.34	334.5	334.23	25	30	20	3.00	50.14		6		1.20	−5.60	
SHEET 26 OF 31	CR 4319	287+33.41	RT	47°22'11"	302.87	300.06	299.84	30	20	15	16.00	54.58		6		−6.00	−2.81	
SHEET 26 OF 31	CR 4421	287+39.89	LT	46°33'58"	306.77	307.67	308.24	30	20	13	81.58					2.87		
SHEET 28 OF 31	CR 4408	309+93.68	LT	29°44'50"	331.84	330.14	330.81	35	100	22	135.97					−0.87		
SHEET 28 OF 31	CR 4320	309+97.56	RT	28°37'53"	330.69	329.82	329.81	10	100	18	38.00	18.84				−3.00	0.81	
SHEET 30 OF 31	CR 4321	331+52.94	RT	85°32'03"	315.65	MATCH	EXISTING	30	30	14	30.25					−2.10		
SHEET 30 OF 31	CR 4321	331+57.04	LT	89°22'04"	315.56	MATCH	EXISTING	30	30	15	3.00	34.63	3.50	6	7	−1.50	−8.00	−3.55
SHEET 30 OF 31	CR 4275	337+18.46	LT	91°18'48"	307.38	MATCH	EXISTING	30	30	20	2.50	26.90		5		−1.47	−4.36	
SHEET 30 OF 31	SPUR 209	337+18.64	RT	77°55'34"	307.44	MATCH	EXISTING	30	30	18	37.30					−2.85		
SHEET 31 OF 31	CR 4325	343+02.75	RT	82°00'10"	300.67	MATCH	EXISTING	30	30	12	2.50	37.54		5		−1.36	−4.31	

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

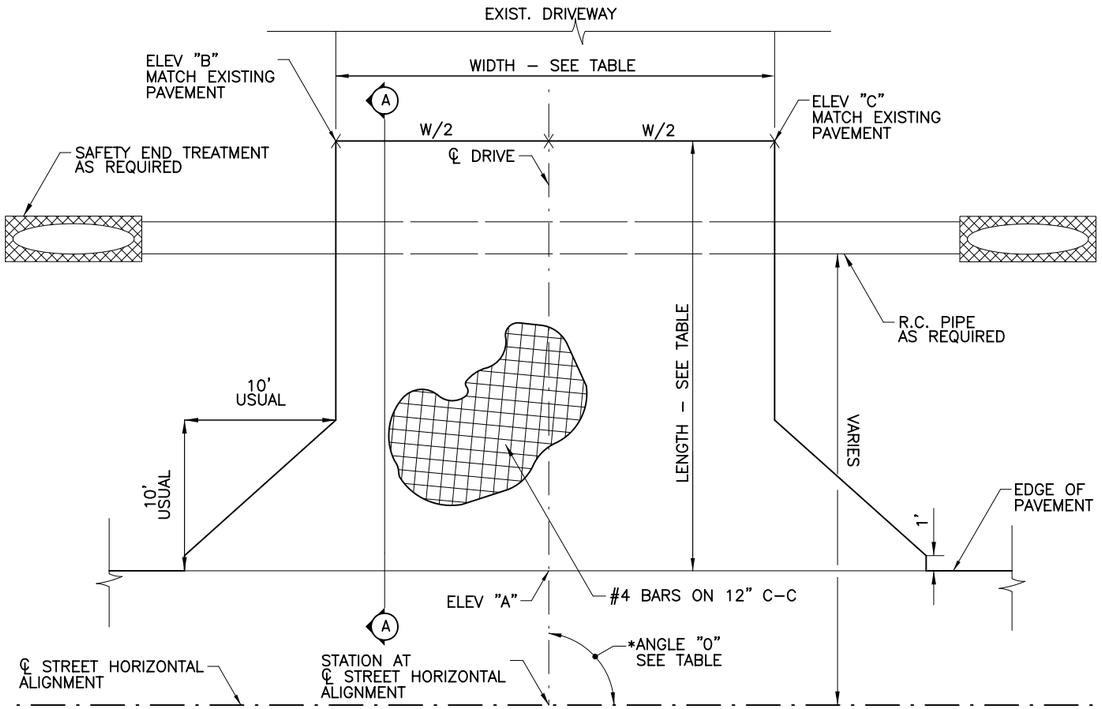
NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

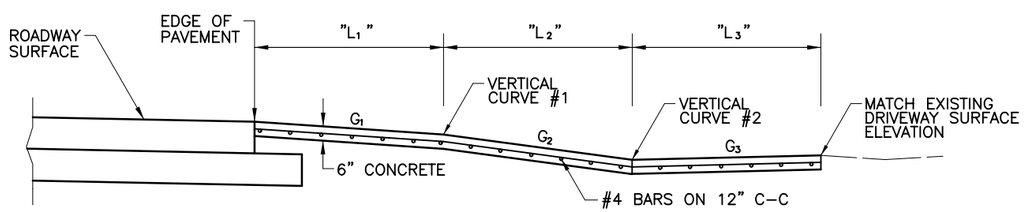
DRIVEWAY AND SIDE ROAD TABLES

Designed: CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.					HIGHWAY NO.
Checked: CPY		TEXAS						SH 204
Drawn: CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.			SHEET NO.
Checked: CPY	TYL	CHEROKEE	0450	01	013			125



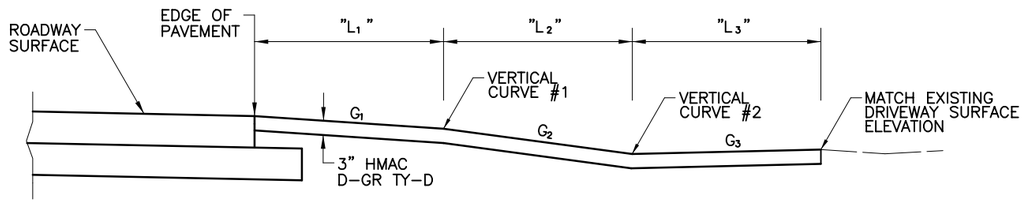
*ANGLE SHALL BE MEASURED FROM LOCAL TANGENT IF CENTERLINE IS ON CURVE.

CONCRETE DRIVEWAY PLAN
SCALE: NTS



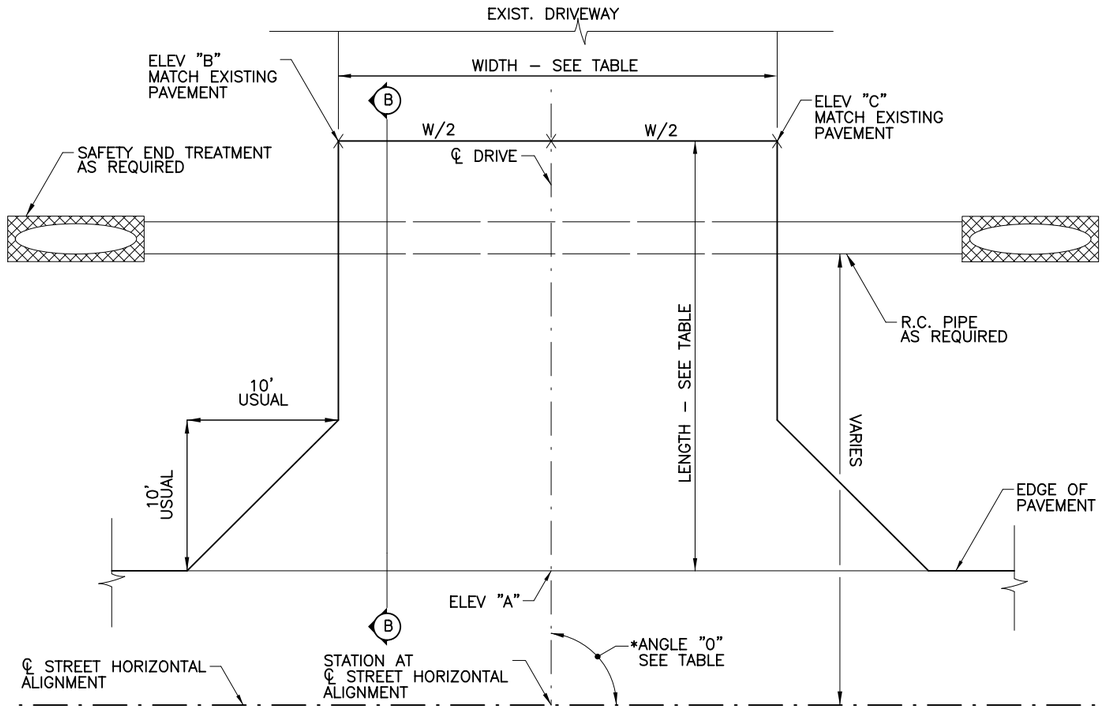
NOTE: CRITERIA WILL VARY WITH EACH DRIVEWAY

CONCRETE DRIVEWAY SECTION "A–A"
SCALE: NTS



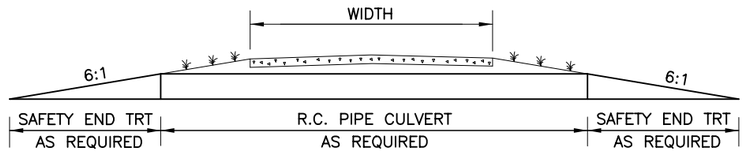
NOTES: 1. CRITERIA WILL VARY WITH EACH DRIVEWAY
2. 5" AT CR INTERSECTIONS

INTERSECTION & ACP DRIVEWAY SECTION "B–B"
SCALE: NTS



*ANGLE SHALL BE MEASURED FROM LOCAL TANGENT IF CENTERLINE IS ON CURVE.

ACP DRIVEWAY PLAN
SCALE: NTS



TYPICAL SECTION
NTS

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

STATE OF TEXAS
JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER
8/23/2023

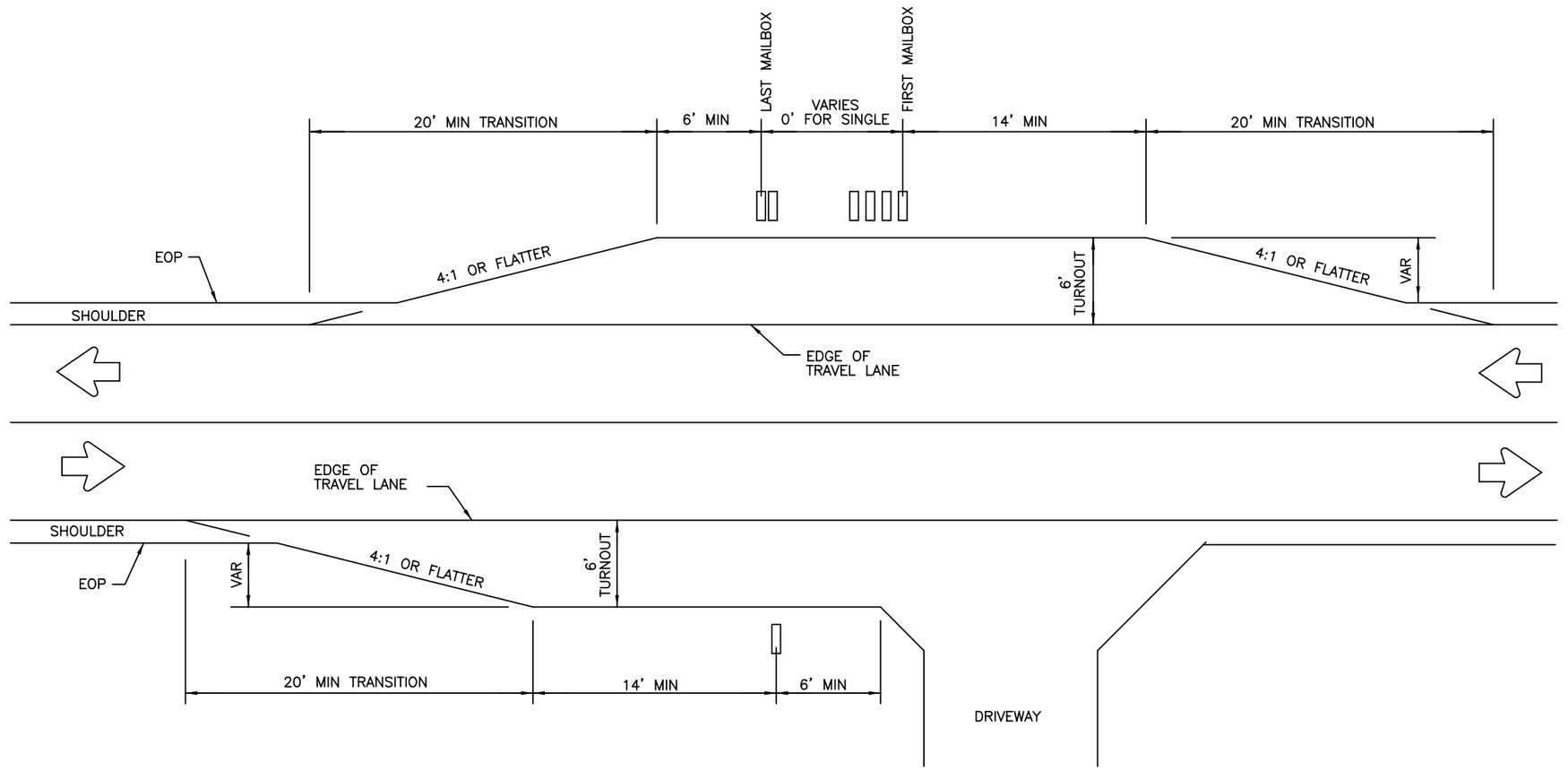
 Texas Department of Transportation

SH 204

DRIVEWAY DETAILS

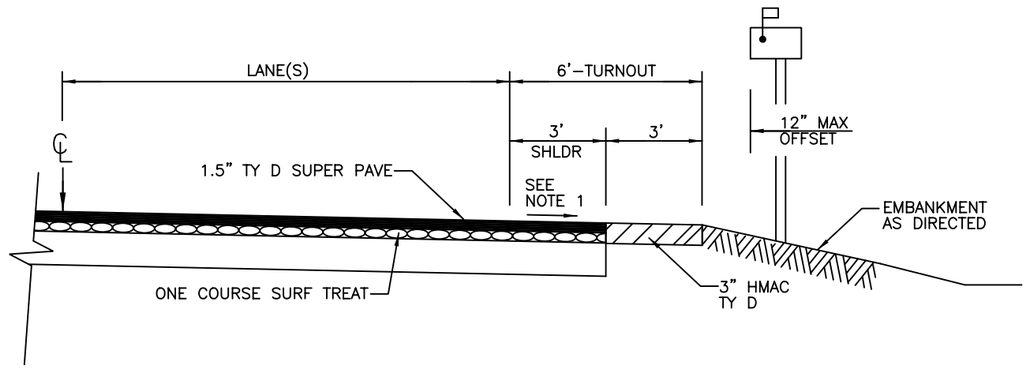
Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		126

SHEET 1 OF 1



TYPICAL MAILBOX TURNOUT

NTS.



NOTES:
1. MATCH SHLDR SLOPE

TYPICAL SECTION

NTS.

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 Texas Department of Transportation

SH 204

MISCELLANEOUS DETAILS

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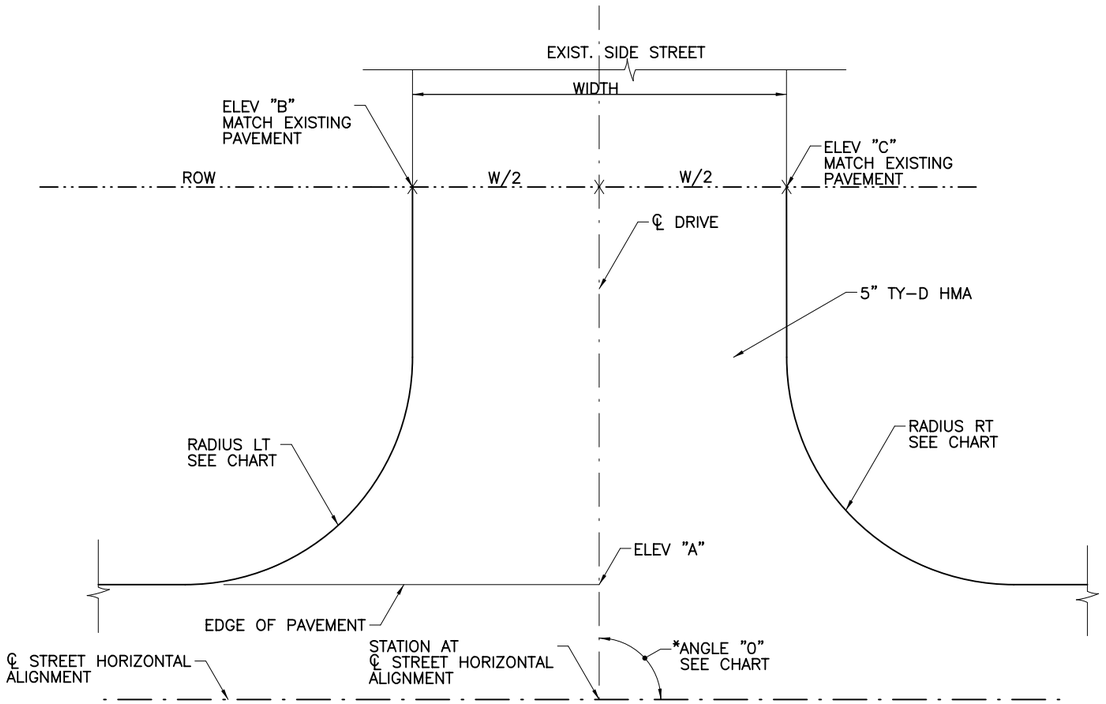
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		127

SHEET 1 OF 3



*ANGLE SHALL BE MEASURED FROM LOCAL TANGENT IF CENTERLINE IS ON CURVE.

INTERSECTION LAYOUT
NTS

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MISCELLANEOUS DETAILS

		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Designed:	CPY		TEXAS					SH 204
Checked:	CPY							
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		128

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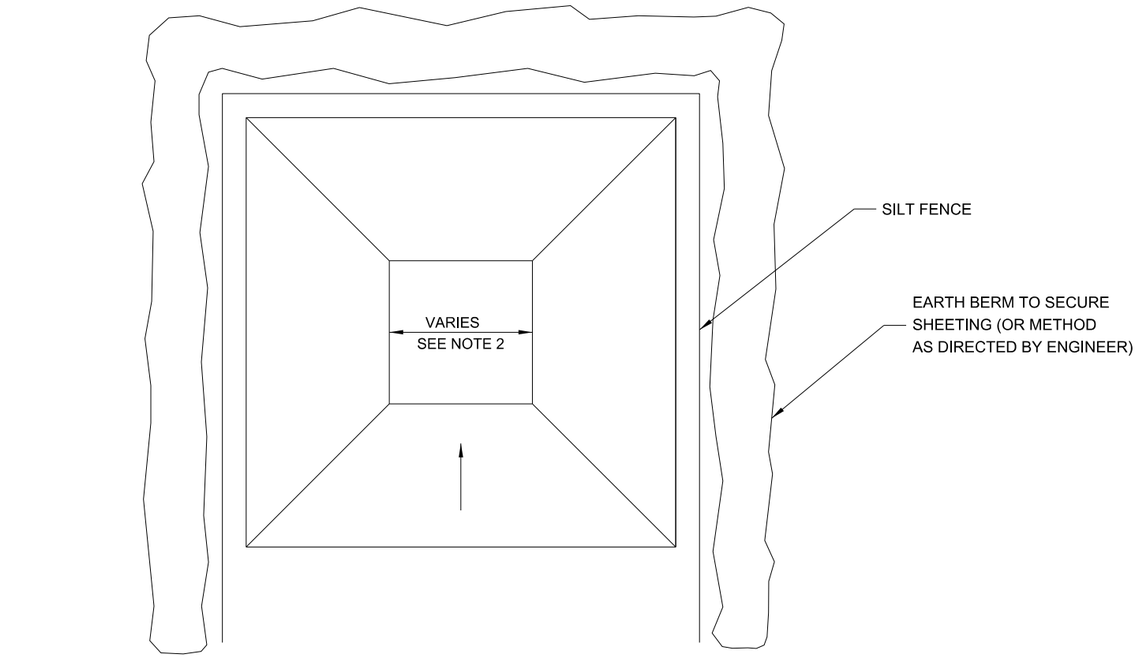

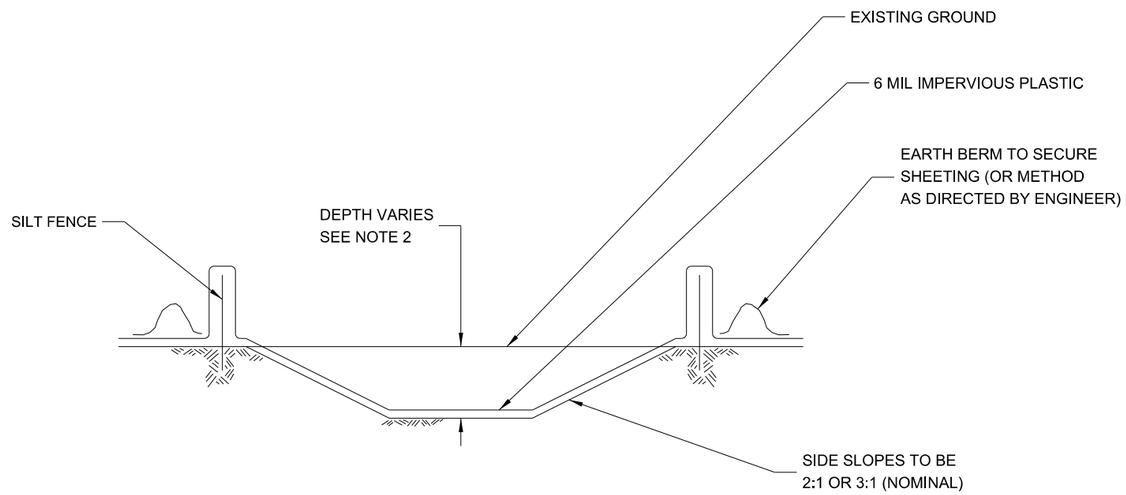

CONCRETE WASHOUT AREA

(SEE NOTE 2)

NOTES

1. CONCRETE WASHOUT AREA(S) SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE. THE CONCRETE WASHOUT AREA SHALL BE ENTIRELY SELF-CONTAINED.

2. THE CONTRACTOR SHALL SUBMIT THE DESIGN, LOCATION AND SIZING OF OF THE CONCRETE WASHOUT AREA(S) WITH THE PROJECT'S EROSION AND SEDIMENTATION CONTROL PLAN AND SHALL BE APPROVED BY THE ENGINEER.

LOCATION: WASHOUT AREA(S) ARE TO BE LOCATED AT LEAST 50 FEET FROM ANY STREAM, WETLAND, STORM DRAINS, OR OTHER SENSITIVE RESOURCE. THE FLOOD CONTINGENCY PLAN MUST ADDRESS THE CONCRETE WASHOUT IF THE WASHOUT IS TO BE LOCATED WITHIN THE FLOODPLAN.

SIZE: THE WASHOUT MUST HAVE SUFFICIENT VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS INCLUDING, BUT NOT LIMITED TO, OPERATIONS ASSOCIATED WITH GROUT AND MORTAR.

3. SURFACE DISCHARGE IS UNACCEPTABLE, THERFORE EARTH BERM OR OTHER CONTROL MEASURES, AS APPROVED BY THE ENGINEER, SHOULD BE USED AROUND THE PERIMETER OF THE CONCRETE WASHOUT AREA FOR CONTAINMENT.

4. SIGNS SHOULD BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CONCRETE AREA(S) AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS. WASHOUT AREA(S) SHOULD BE FLAGGED WITH SAFETY FENCING OR OTHER APPROVED METHOD.

5. CONCRETE WASH-OUT AREAS SHALL BE LINED WITH IMPERVIOUS PLASTIC WITH A MINIMUM THICKNESS OF 6 MILS AND BE REPLACED IF DAMAGED DURING CLEAN-OUT OF HARDENED CONCRETE FROM THE WASH-OUT AREA.

6. WASHOUT AREA(S) ARE TO BE INSPECTED AT LEAST ONCE A WEEK FOR STRUCTURAL INTEGRITY, ADEQUATE HOLDING CAPACITY AND CHECKED FOR LEAKS, TEARS, OR OVERFLOWS. (AS DIRECTED BY THE CONSTRUCTION SITE ENVIRONMENTAL INSPECTION REPORT) WASHOUT AREA(S) SHOULD BE CHECKED AFTER HEAVY RAINS.

7. HARDENED CONCRETE WASTE SHOULD BE REMOVED AND DISPOSED OF WHEN THE WASTE HAS ACCUMULATED TO HALF OF THE CONCRETE WASHOUT'S HEIGHT. THE WASTE CAN BE STORED AT AN UPLAND LOCATION, AS APPROVED BY THE ENGINEER. ALL CONCRETE WASTE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH ALL APPLICABLE LAWS, REGULATIONS, AND GUIDELINES.

8. PAYMENT FOR THIS ITEM IS TO BE INCLUDED UNDER THE GENERAL COST OF THE WORK FOR THE PROJECT, INCLUDING SITE RESTORATION.

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Texas Department of Transportation

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MISCELLANEOUS
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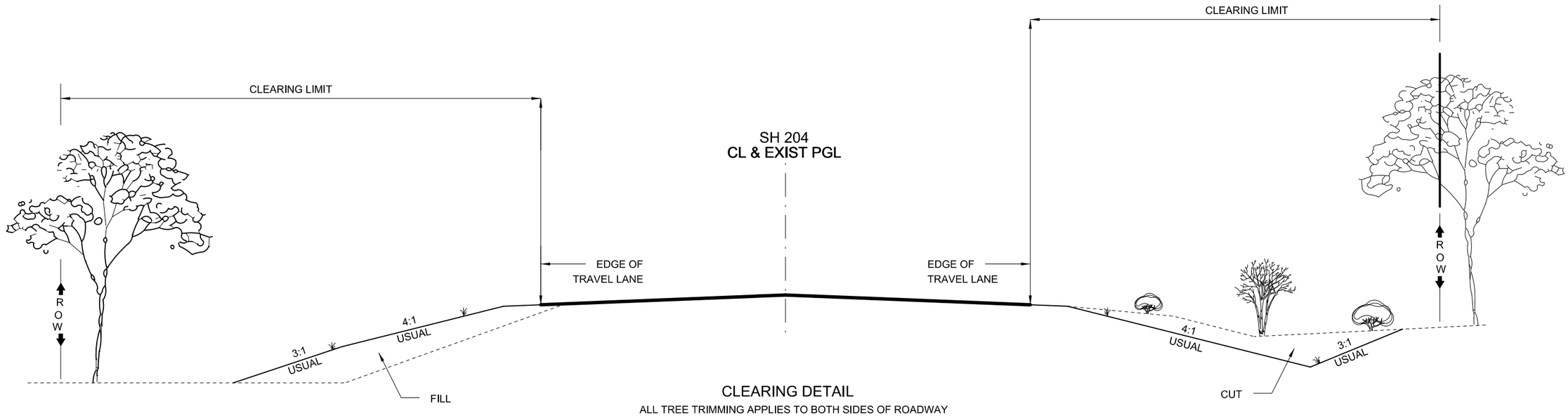
N.T.S

CONT	SECT	JOB	HIGHWAY
0450	01	013	SH 204
DIST	COUNTY		SHEET NO.
TYL	CHEROKEE		128A



CLEARING DETAIL

ALL TREE TRIMMING APPLIES TO BOTH SIDES OF ROADWAY

PREPARING ROW DETAILS

STATIONS TO BE CLEARED ONLY AS DIRECTED.

NOTES:

1) ALL TREE LIMBS EXTENDING INTO THE CLEARING LIMITS SHALL BE REMOVED, WITH NO VERTICAL LIMITS, UNLESS OTHERWISE SHOWN ON PLANS.

2) CLEARING OPERATIONS SHALL BE PERFORMED IN ACCORDANCE TO ITEM 100, "PREPARING RIGHT OF WAY", EXCEPT THOSE SHOWN BY THESE DETAILS.

3) PAYMENT WILL BE MADE AT THE UNIT PRICE BID FOR PREPARING RIGHT OF WAY BY THE STATION, LIMITS WILL BE SHOWN ELSEWHERE IN THE PLANS.

4) IF FRONT SLOPE IS STEEPER THAN 4:1 IN FILL SECTION, THEN A MINIMUM OF 7' FROM THE TOE OF SLOPE SHALL BE CLEARED TO PROVIDE A SAFETY RECOVERY ZONE.

5) WHERE STEEP SLOPES MAKE GRINDING OPERATIONS IMPRACTICAL, AND THE ENGINEER APPROVES IN WRITING, THE CONTRACTOR MAY CUT STUMPS OFF EVEN WITH THE GROUND.

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N.T.S

CONT	SECT	JOB	HIGHWAY
0450	01	013	SH 204
DIST	COUNTY		SHEET NO.
TYL	CHEROKEE		129

DATE:
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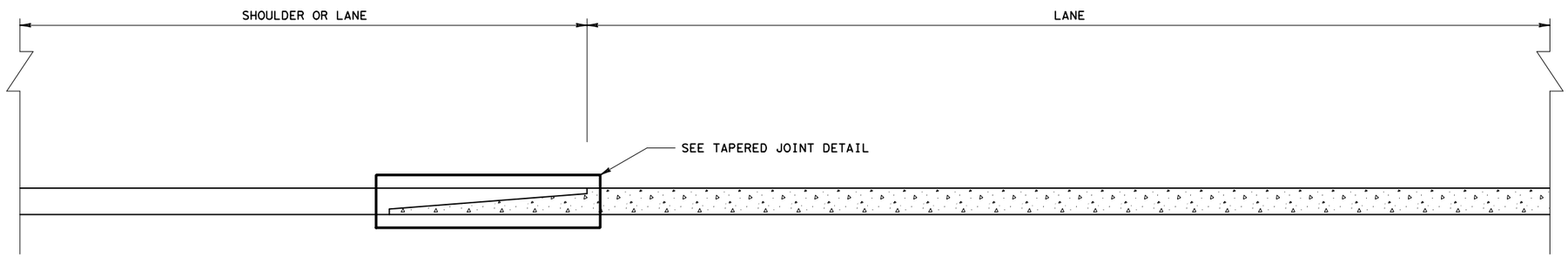
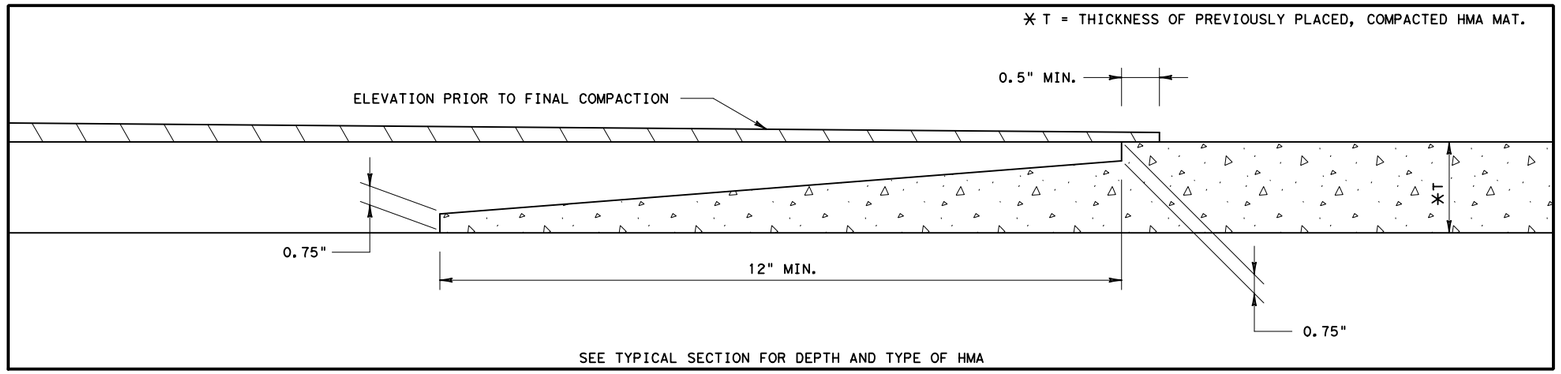


CROSS-SECTIONAL VIEW OF LONGITUDINAL JOINT



TAPERED JOINT DETAIL

NOTES:

EXTEND THE TAPERED PORTION OF THE MAT BEYOND THE NORMAL LANE WIDTH.

CONSTRUCT THE TAPERED PORTION OF THE MAT USING AN APPROVED STRIKE-OFF DEVICE THAT WILL PROVIDE A UNIFORM SLOPE AND WILL NOT RESTRICT THE MAIN SCREED.

APPLY TACK COAT TO THE IN-PLACE TAPER BEFORE THE ADJACENT MAT IS PLACED.

FINAL DENSITY REQUIREMENTS FOR THE ENTIRE PAVEMENT, INCLUDING THE TAPER AREA, WILL NOT CHANGE.

COMPACTION OF THE INITIAL TAPER SECTION WILL BE REQUIRED TO BE AS NEAR TO FINAL DENSITY AS POSSIBLE.

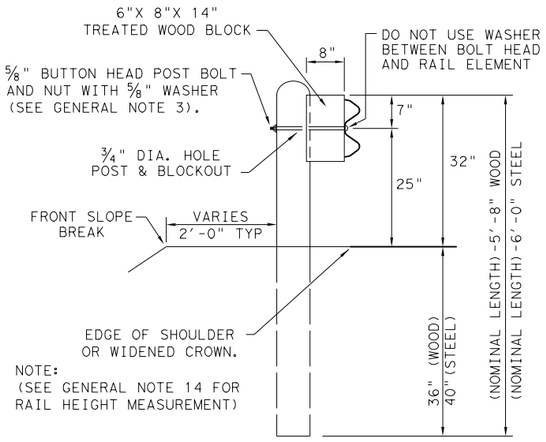
USE A SMALL STATIC ROLLER (APPROXIMATELY 400 LBS) LOCATED IMMEDIATELY BEHIND THE PAVER FOR PRE-COMPACTION OF THE NOTCHED WEDGE JOINT.

HOTMIX LONGITUDINAL JOINT DETAILS

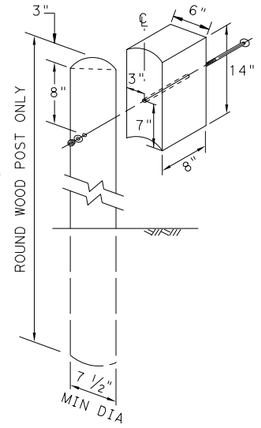
37P02.DGN /

FED.RD. DIV.NO.	STATE PROJECT NO.		SHEET NO.
6			130
STATE	STATE DISTRICT	COUNTY	
TEXAS	TYL	CHEROKEE	
CONT.	SECT.	JOB	HIGHWAY NO.
0450	01	013	SH 204

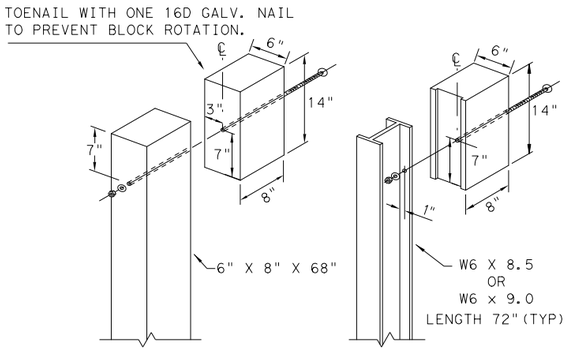
DATE:
FILE:



TYPICAL POST PLACEMENT



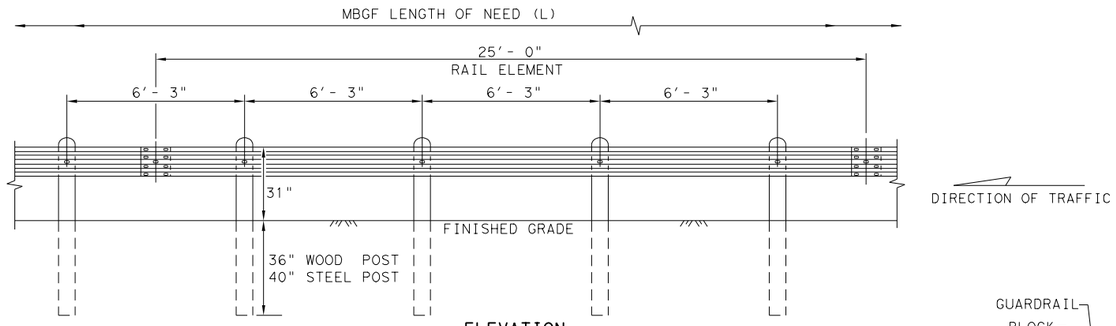
WOOD BLOCK TO
ROUND WOOD POST



WOOD BLOCK TO
RECTANGULAR WOOD POST

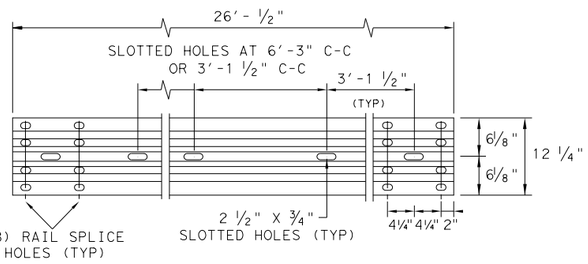
ROUTED WOOD BLOCK
TO I-BEAM STEEL POST

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



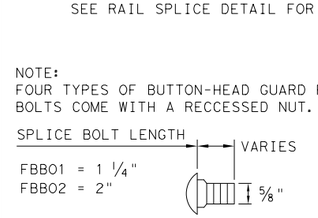
ELEVATION
MID-SPAN RAIL SPLICE

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



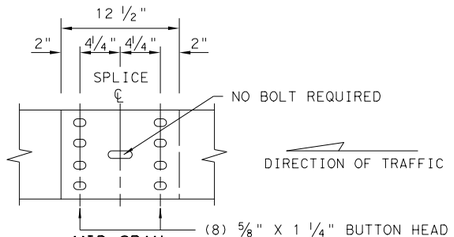
ELEVATION 25'- 0"(NOM.) W-BEAM SECTION

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



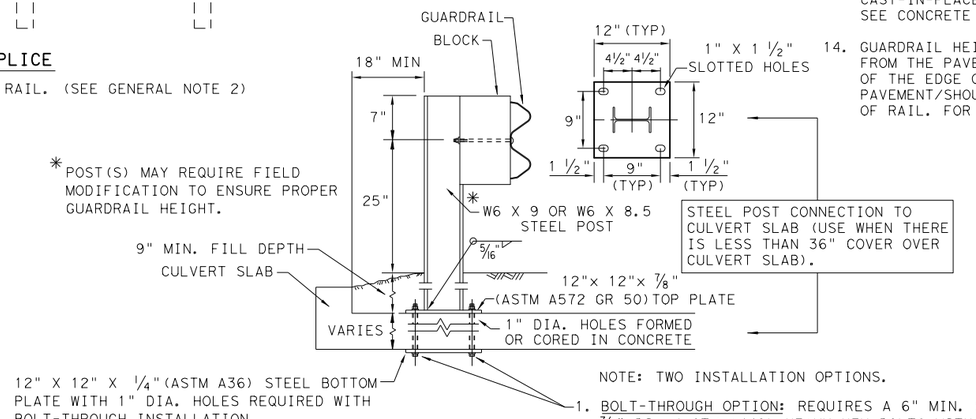
BUTTON HEAD BOLT

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. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS 1/4" MIN. BEYOND NUT.

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

GENERAL NOTES

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

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

Texas Department of Transportation

Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0450	01	013	SH 204	
	DIST	COUNTY		SHEET NO.	
	TYL	CHEROKEE		131	

DATE:
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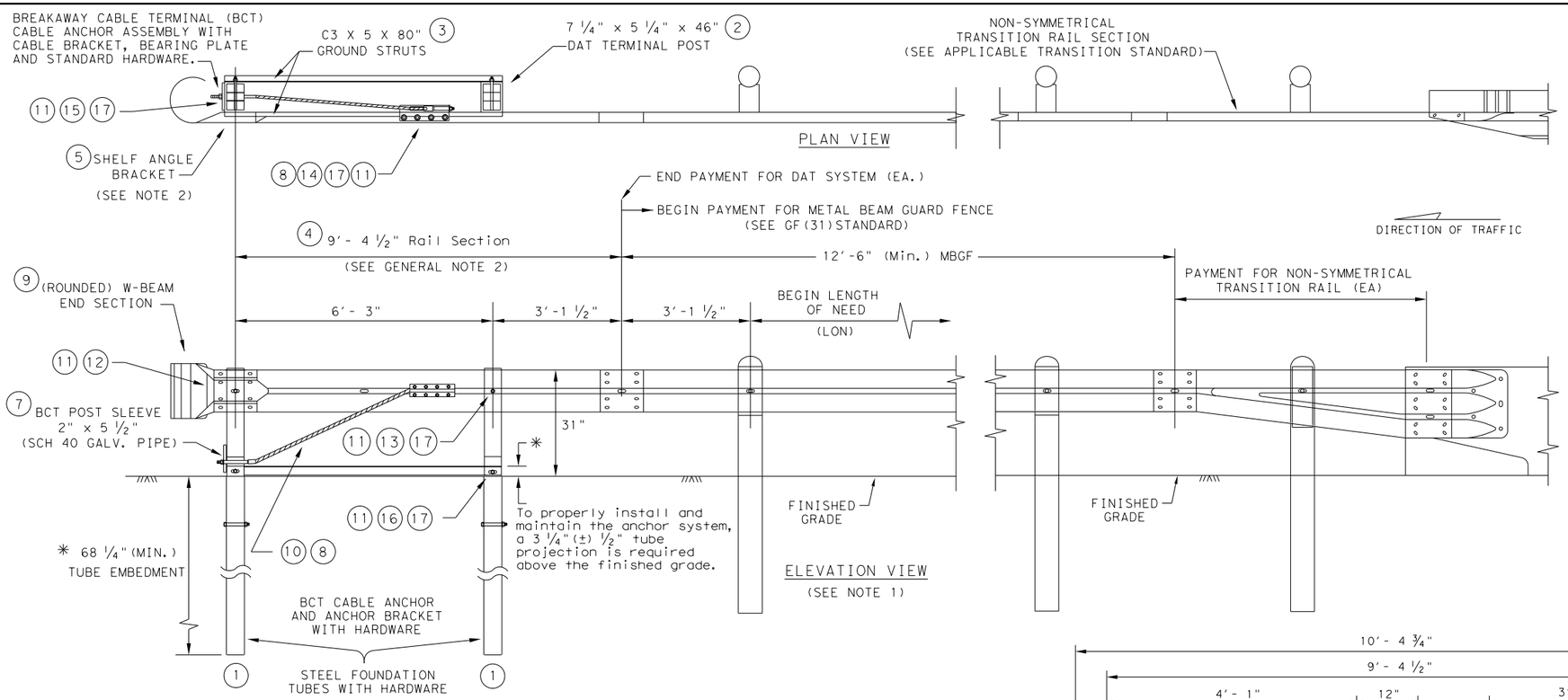


DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

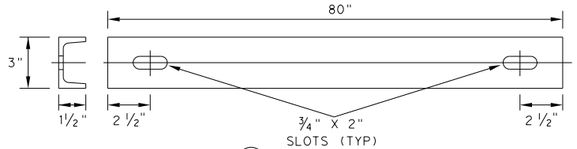
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

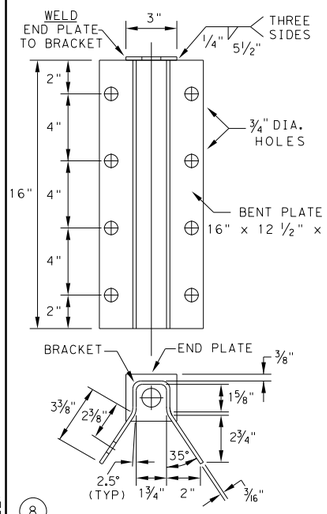
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED) W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 1/4" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	5/8" X 2" HEX HEAD BOLT	8
(15)	5/8" X 8" HEX HEAD BOLT	4
(16)	5/8" X 10" HEX HEAD BOLT	2
(17)	5/8" FLAT WASHER	18

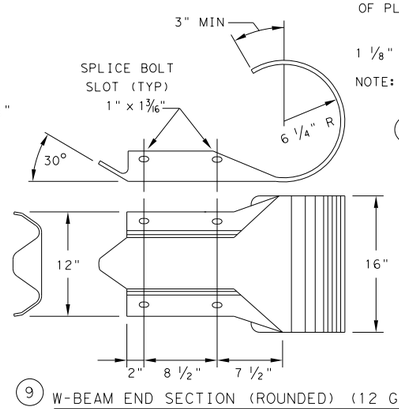
(4) TERMINAL RAIL ELEMENT FOR DAT



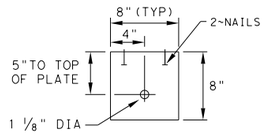
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

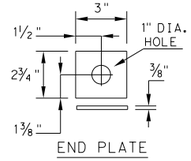


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

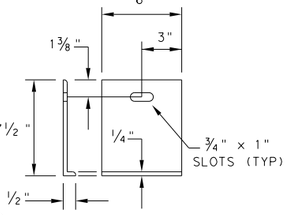


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

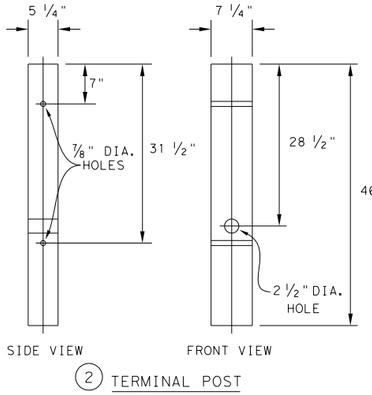
(6) BEARING PLATE
8"x 8"x 5/8" R



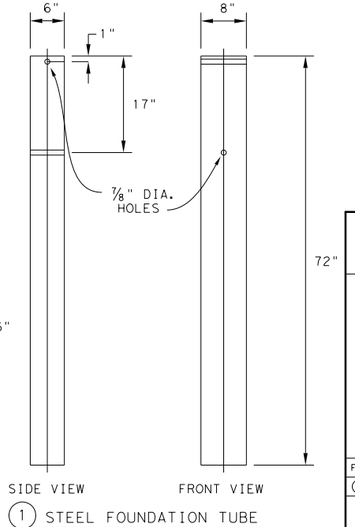
END PLATE



(5) SHELF ANGLE BRACKET



(2) TERMINAL POST
7 1/4"x 5 1/4"x 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		132

DATE:
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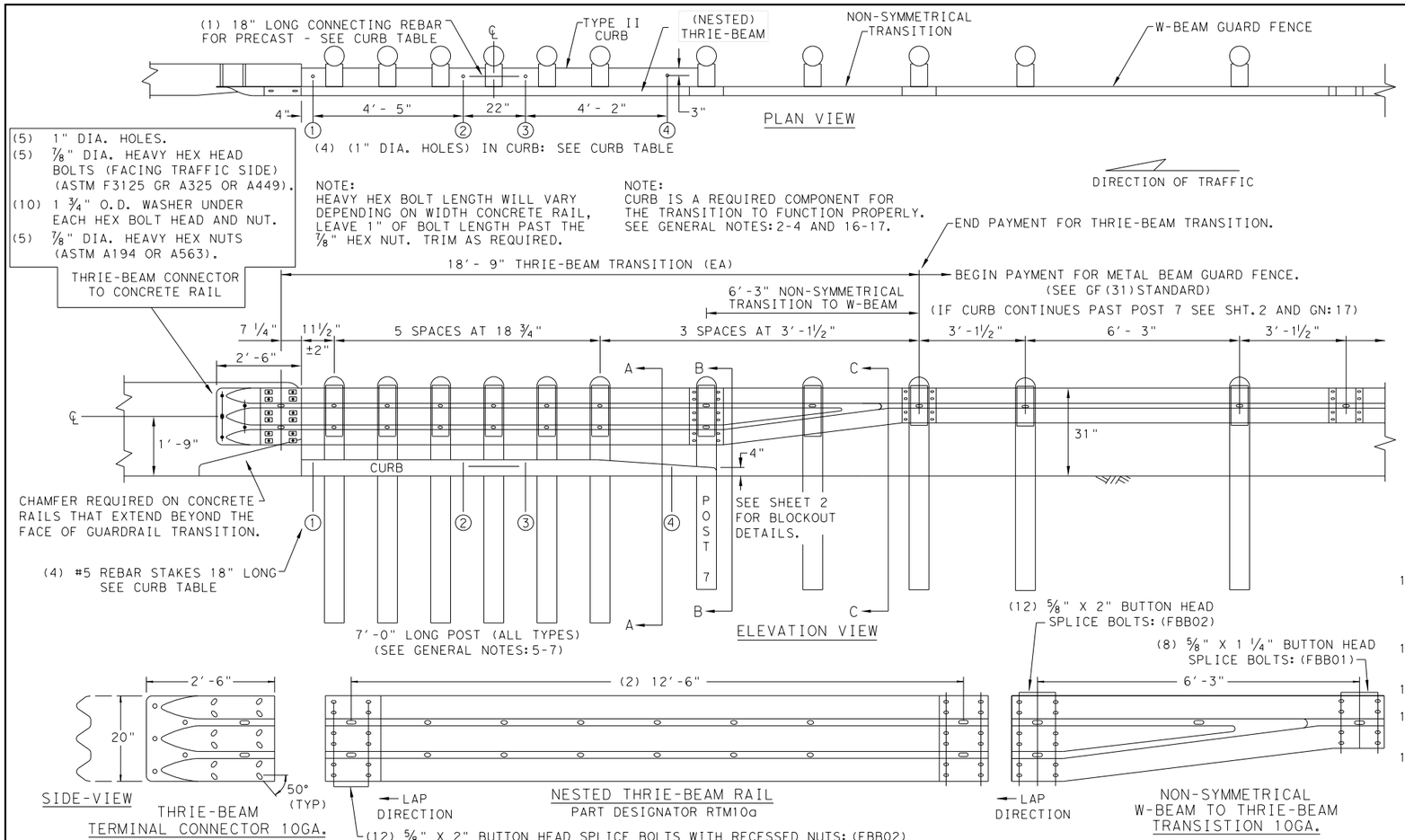
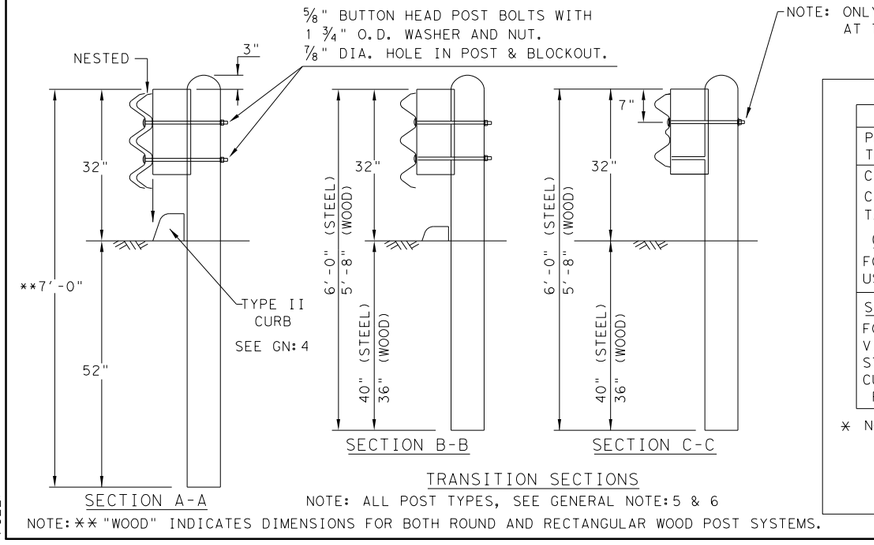
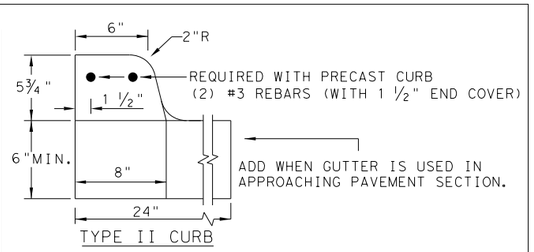




THRIE-BEAM TERMINAL - CURB TABLE
PRECAST CURB FULL LENGTH EQUALS 12'- 2" THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.
CURB (1) LENGTH 5'- 8" CURB (2) LENGTH 6'- 6" TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7
CONNECTING PRECAST CURB SECTIONS (1) & (2): FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB 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.



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

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.

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation

Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31tr1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
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	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		133

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

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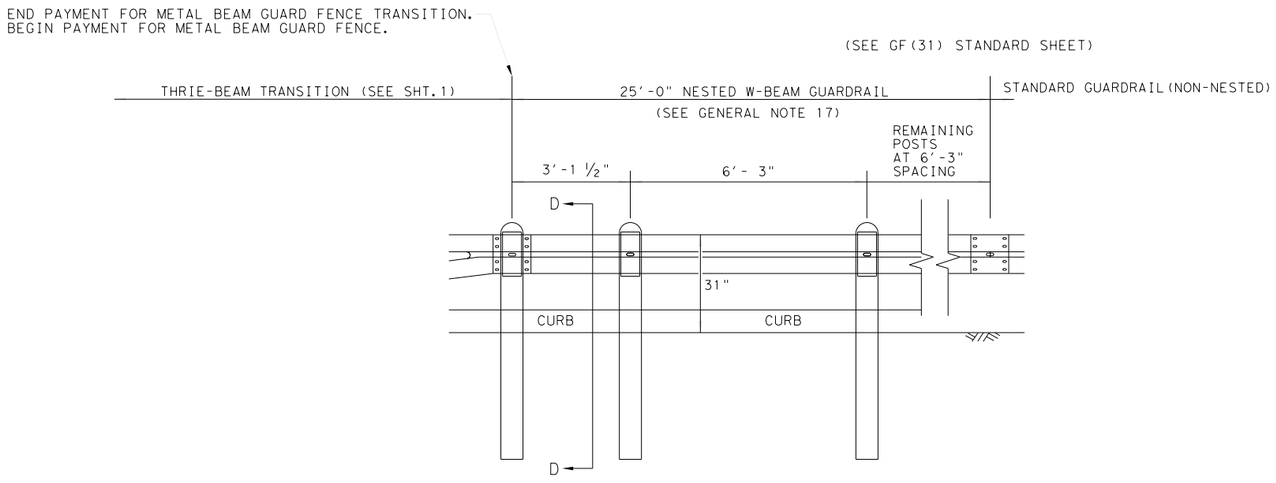
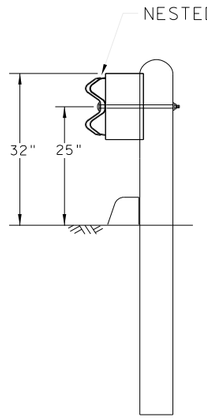
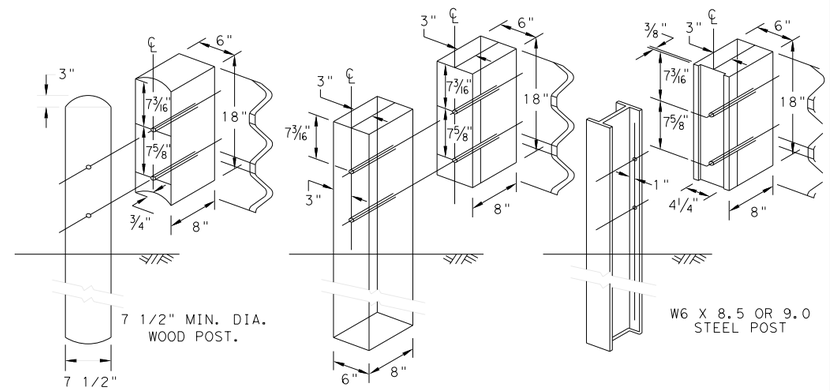
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



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: gf31tr1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0450	01	013	SH 204	
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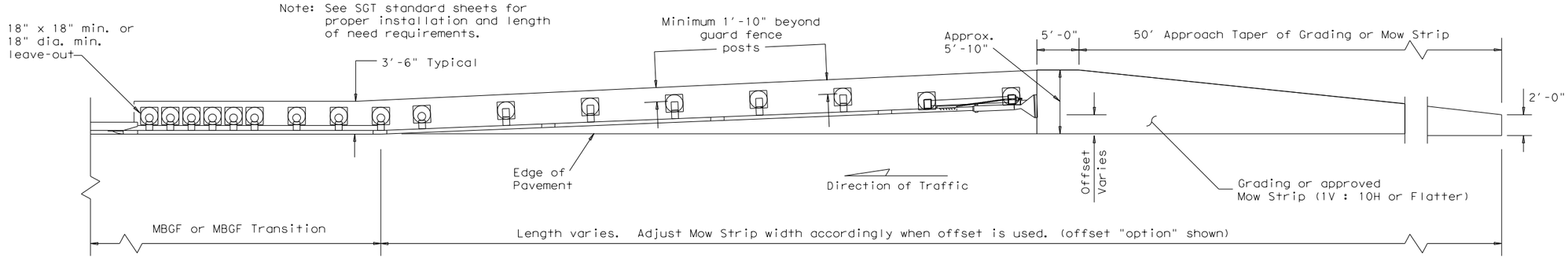
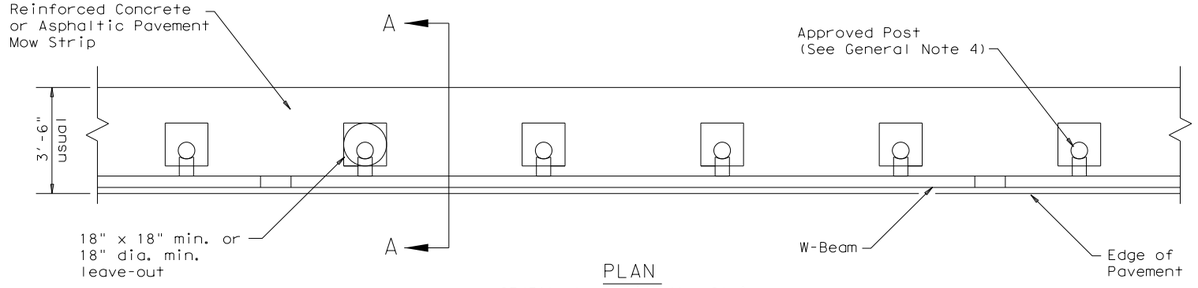
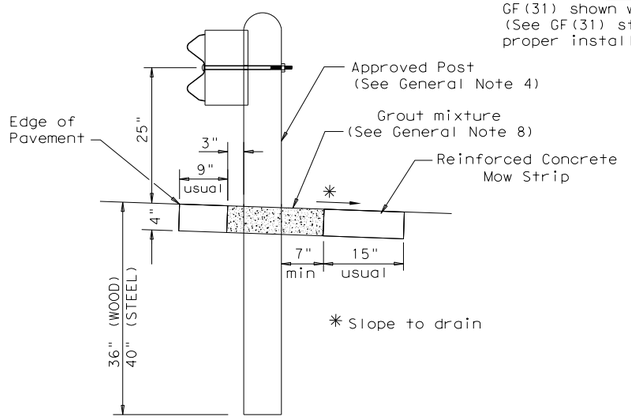


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



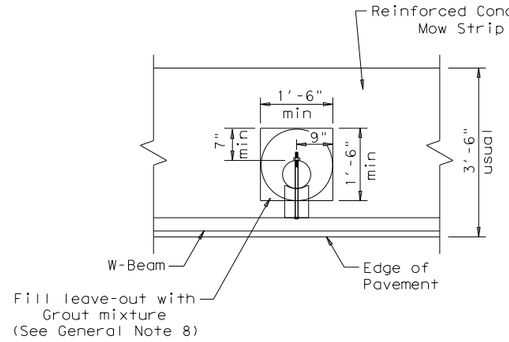
PLAN

GF(31) shown with Mow Strip
(See GF(31) standard sheet for proper installation)



SECTION A-A

Typical



MOW STRIP DETAIL

Reinforced Concrete Mow Strip
with 18" x 18" Square or
18" Dia. minimum leave-out.

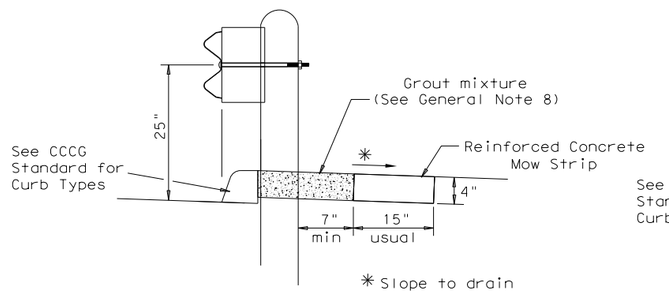
Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

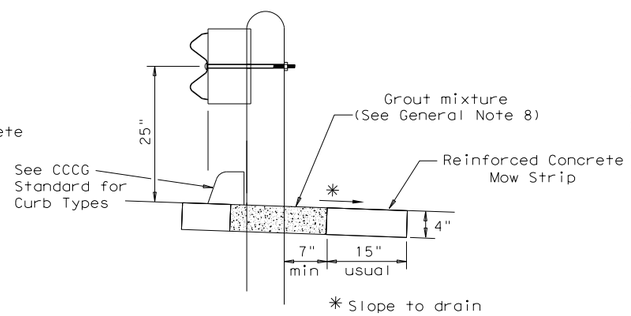
GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type 1 or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.



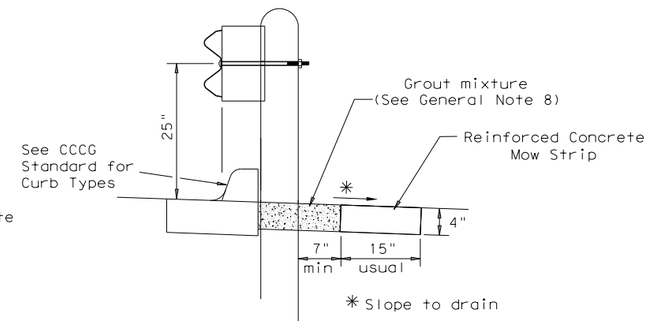
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

GF(31)MS-19

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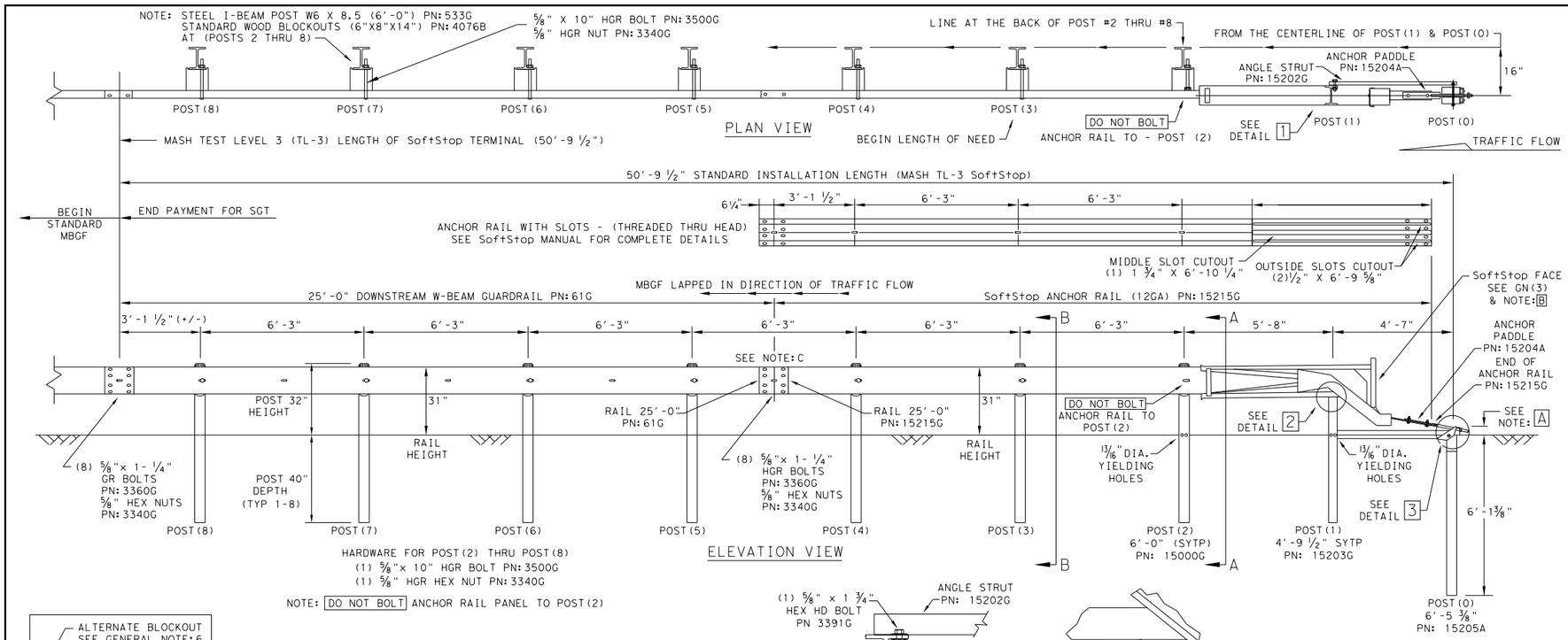
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		134



GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
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. A COMPOSITE MATERIAL BLOCKOUT 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.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop 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.

NOTE: A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-3/4" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE: B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE: C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 7/8")
15203G	1	POST #1 - (SYTP) (4'- 9 1/2")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 1/2" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (1/2" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	3/4" x 2 1/2" HEX BOLT A325
3701G	4	3/4" ROUND WASHER F436
3704G	2	3/4" HEAVY HEX NUT A563 GR.DH
3360G	16	5/8" x 1 1/4" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	5/8" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	5/8" x 10" HGR POST BOLT A307
3391G	1	5/8" x 1 3/4" HEX HD BOLT A325
4489G	1	5/8" x 9" HEX HD BOLT A325
4372G	4	5/8" WASHER F436
105285G	2	5/8" x 2 1/2" HEX HD BOLT GR-5
105286G	1	5/8" x 1 1/2" HEX HD BOLT GR-5
3240G	6	5/8" ROUND WASHER (WIDE)
3245G	3	5/8" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE: B

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

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT(10S)31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		135

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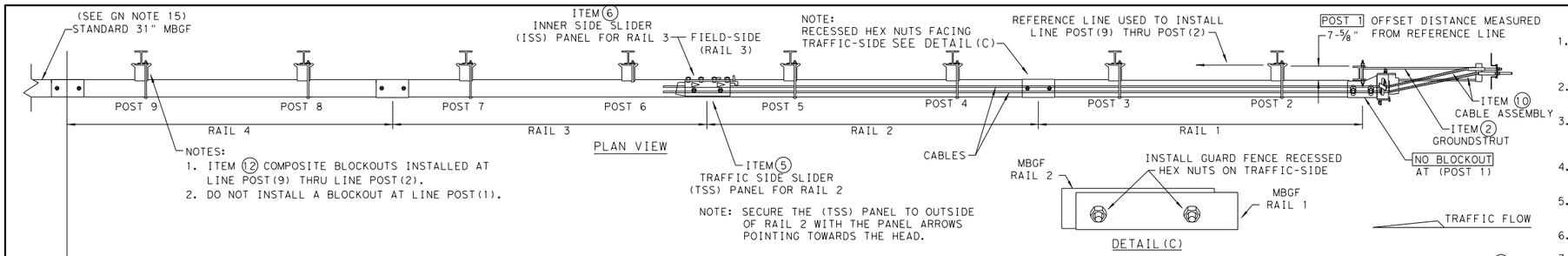

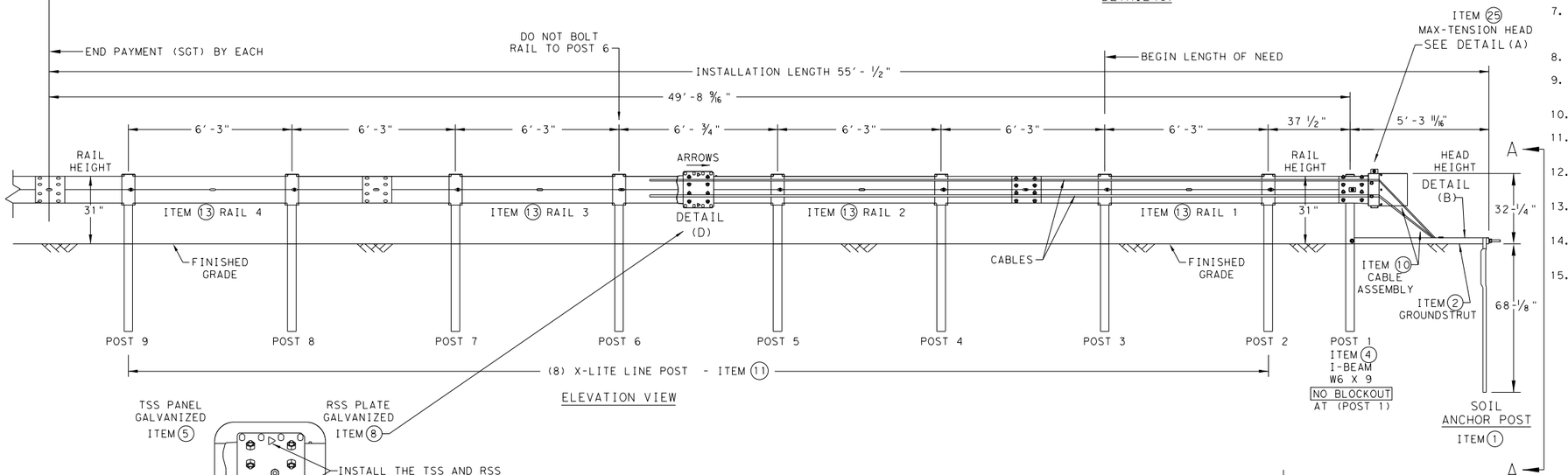

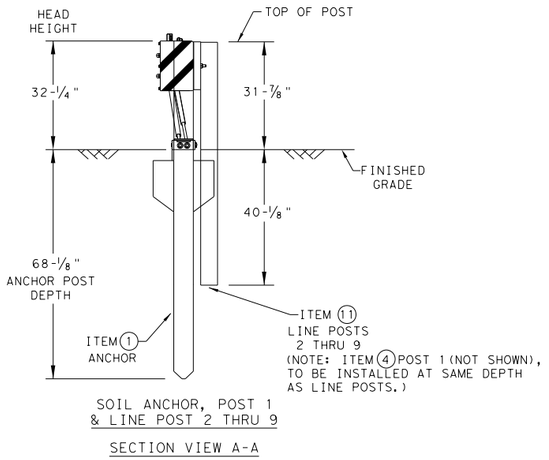

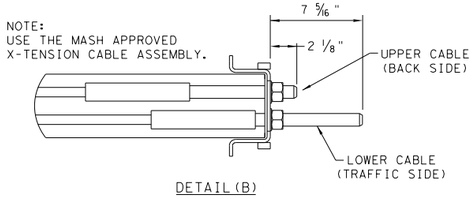

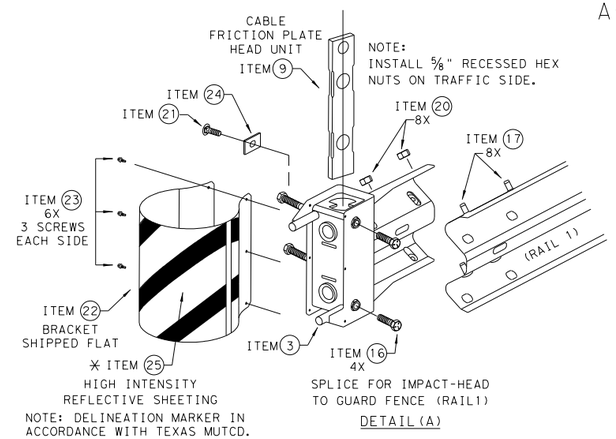

GENERAL NOTES

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	5/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	5/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" 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
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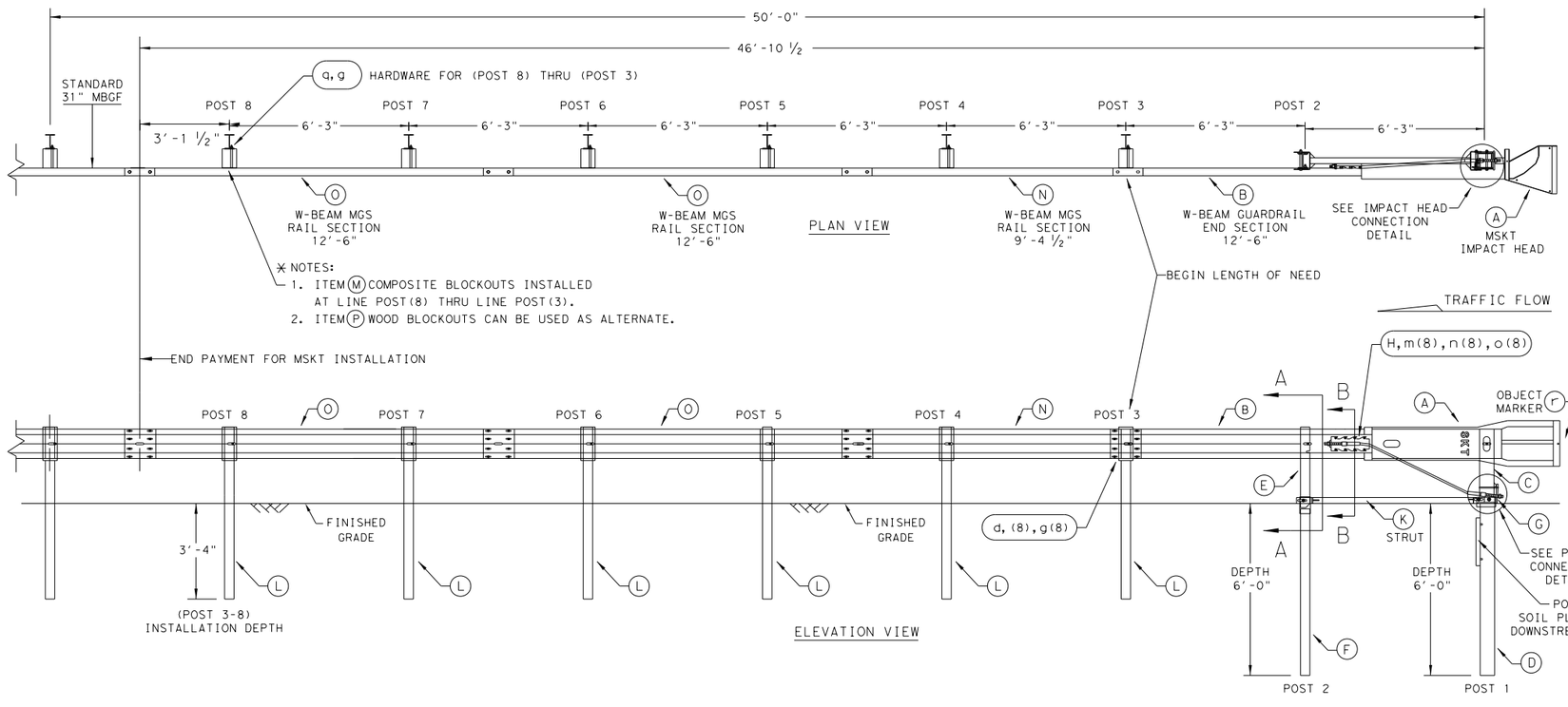
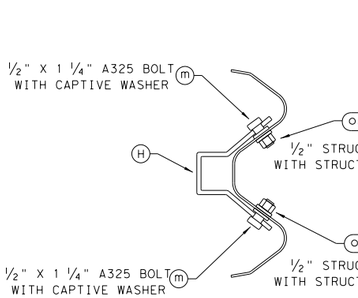
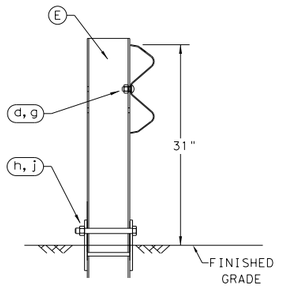
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		136



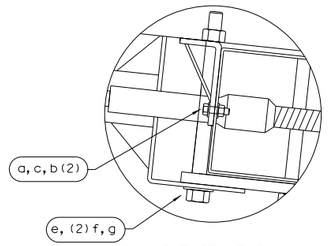
NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.



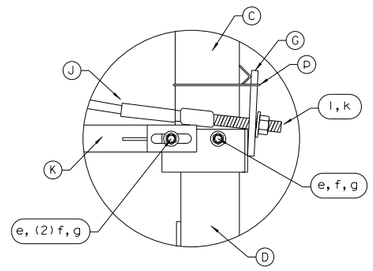
SECTION B-B
ANCHOR BRACKET



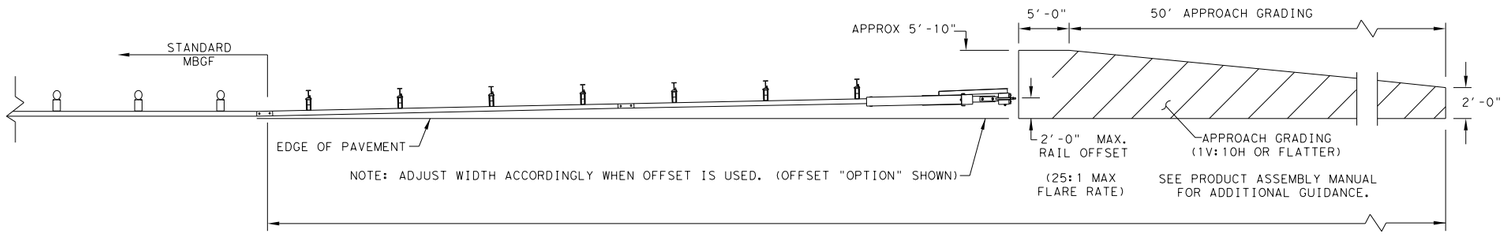
POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL



APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

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.

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.

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 1/8" 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 1/2")	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	5/8" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/8" WASHER	W0516
c	2	5/8" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" 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	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151

SEE NOTES: * —

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

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	
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	TYL	CHEROKEE		137	

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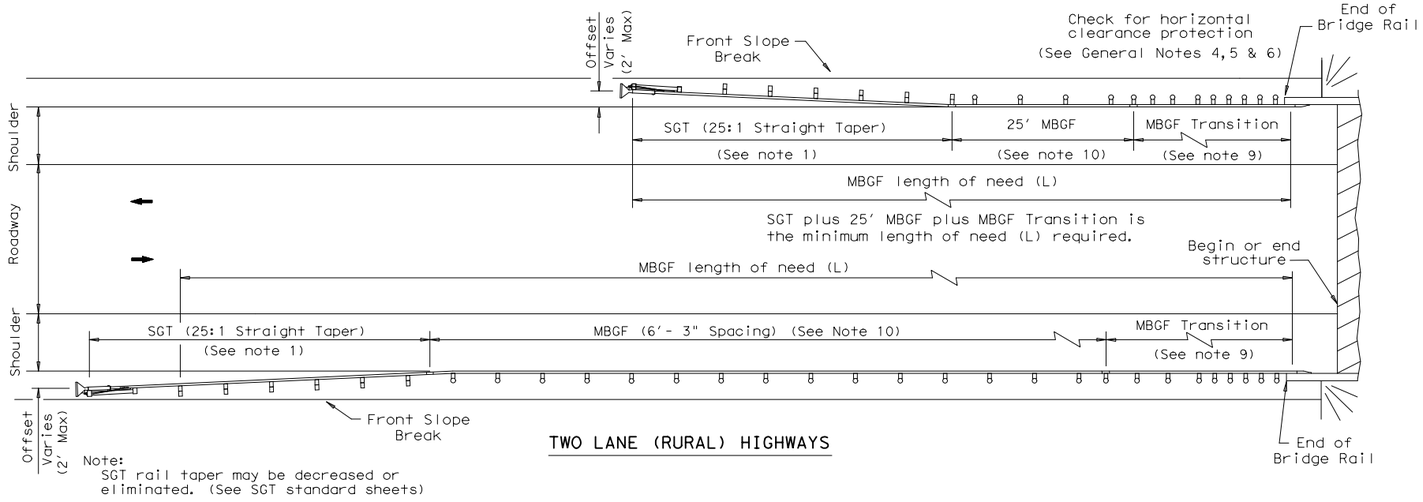
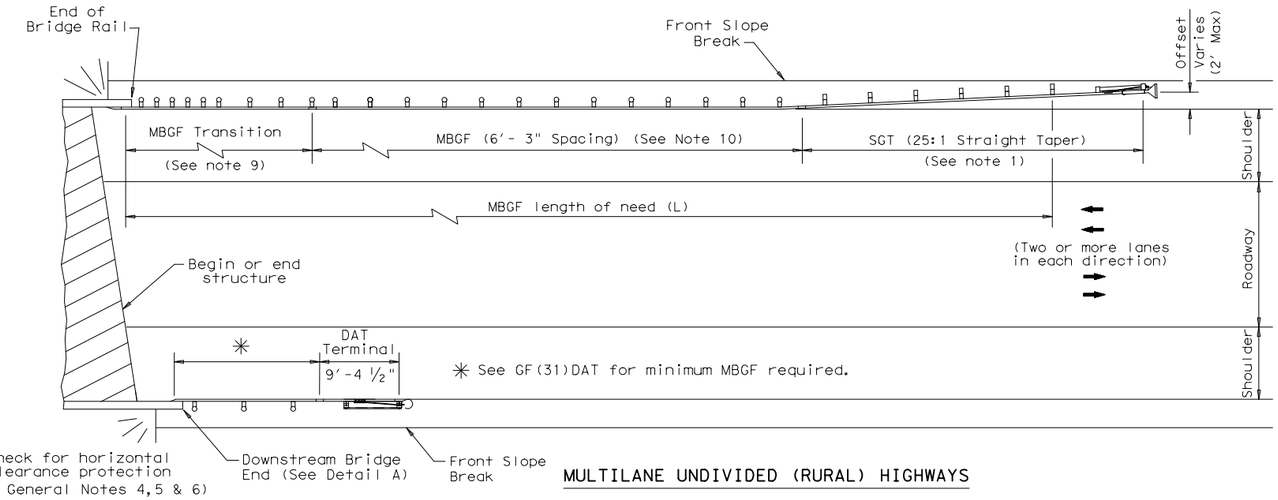
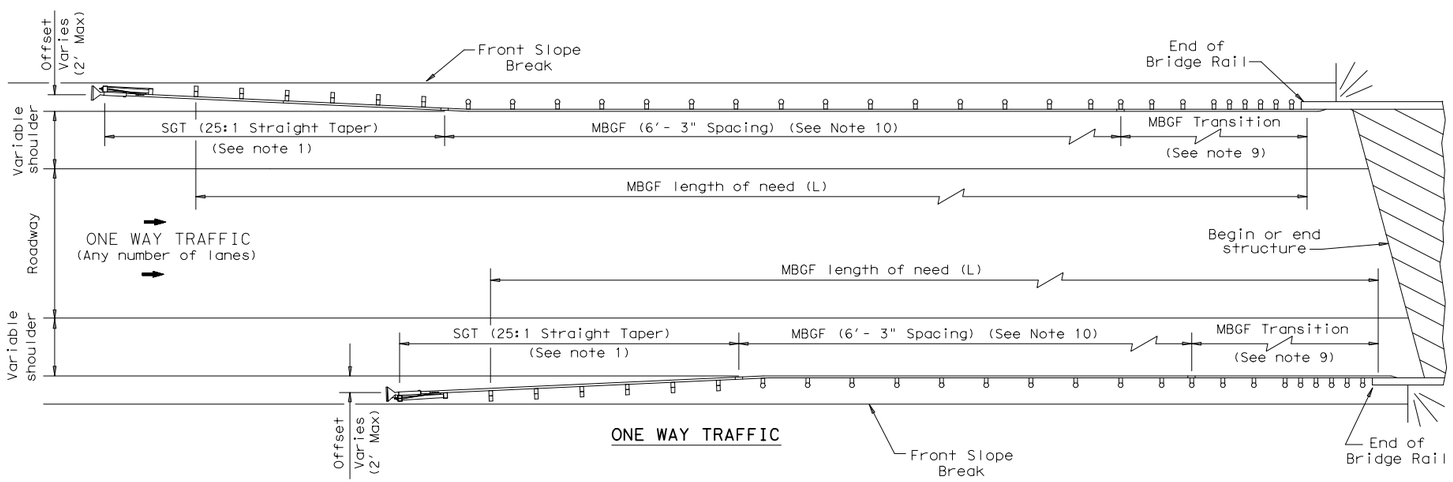


TWO LANE (RURAL) HIGHWAYS

Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)



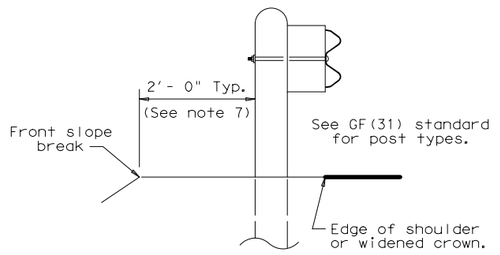
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



ONE WAY TRAFFIC

GENERAL NOTES

1. For more detail: See GF(31), SGT( )31, GF(31)TR, and GF(31)TL2 standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
3. Use average daily traffic (ADT) for the current year to determine MBGF length of need in accordance with the Roadway Design Manual unless otherwise specified. Where significant traffic volume growth is anticipated on low volume (0-750 ADT) highways, use length determinations for the higher volume category.
4. MBGF may not be required to shield departure end of bridge unless other obstacles within the horizontal clearance limits or opposing traffic indicate a MBGF consideration.
5. Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. Direct connection of MBGF to concrete rails are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (This requires a minimum of three standard line posts plus the DAT terminal, See Detail A)
7. The crown shall be widened to accommodate MBGF. Typically the "front slope" break should be 2'- 0" from the back of the MBGF post. This applies to new construction on new alignment or where existing roadway cross section is to be widened to increase roadway width. This does not apply to rehabilitation work where existing roadway crown width is to be retained (See Typical Cross Section at MBGF).
8. For restrictive bridge widths: The MBGF should be properly transitioned from the existing bridge rail to the adjoining MBGF (See MBGF Transition Standards). Metal beam guard fence at these bridge location(s) shall be flared at the rate of 25:1 or flatter, and be of the length necessary to locate the terminal end at the 2 ft. "maximum" offset from the shoulder edge in the approach direction.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.
10. A minimum 25' length of MBGF will be required.



TYPICAL CROSS SECTION AT MBGF

Note:
All rail elements shall be lapped in the direction of adjacent traffic.

DETAIL A

Showing Downstream Rail Attachment

Texas Department of Transportation

Design Division Standard

BRIDGE END DETAILS

(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
©TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
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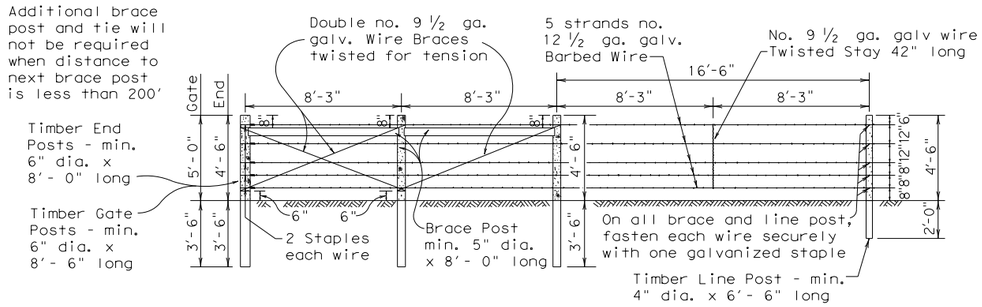
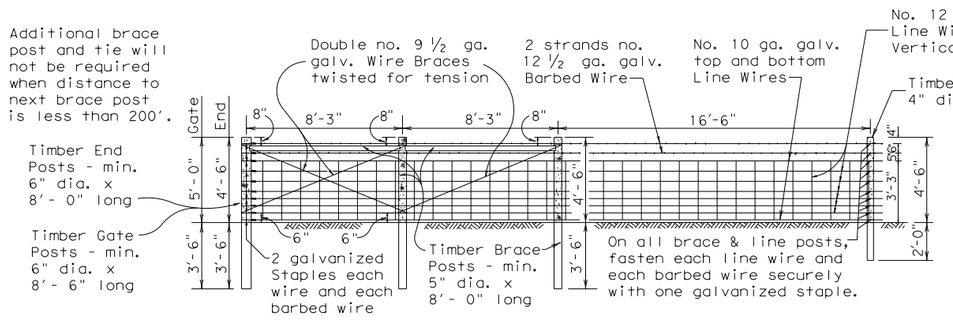


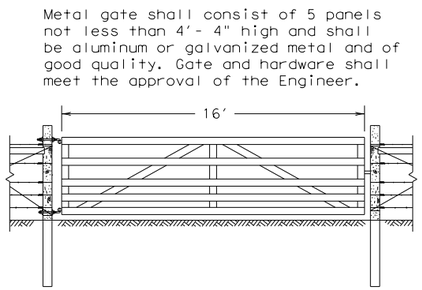
SECTION GALVANIZED BARBED WIRE FENCE WITH WOOD POSTS
Bracing Detail Used at Ends and Gates
TYPE "A" FENCE
(See General Note 6)



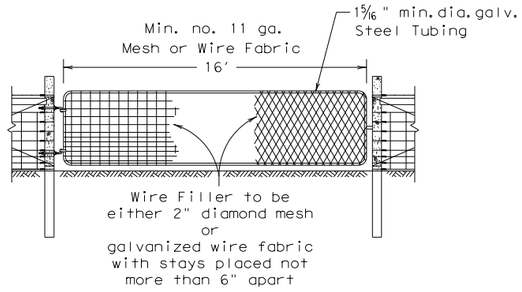
SECTION GALVANIZED WOVEN WIRE FENCE WITH WOOD POSTS
Bracing Detail Used at Ends and Gates
TYPE "B" FENCE
(See General Note 6)

TABLE OF EQUIVALENT SIZES FOR OPTIONAL SHAPE

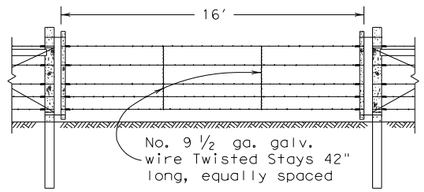
Minimum Diameter of Round Post (Inches)	Minimum Equivalent Dimension for Each Side of Square Post (Inches)
4	3 ½
5	4 ½
6	5 ¼



DETAIL TYPE 1 GATE



DETAIL TYPE 2 GATE

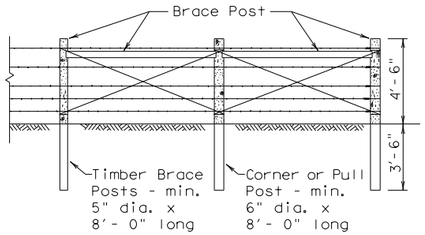


DETAIL TYPE 3 GATE

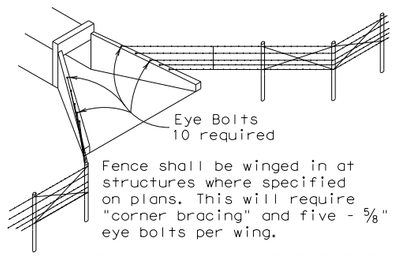
GENERAL NOTES

1. Any high point which interferes with the placing of wire mesh shall be excavated to provide 2" clearance.
2. Latches for Type 1 and Type 2 gates shall be good commercial quality and design latches of the spring, fork or chain type. All latches shall be suitable for the gate and shall be approved by the Engineer.
3. Hinges for Type 2 gates shall be commercial design approved by the Engineer suitable for post and gate.
4. Concrete shall be of the design and consistency approved by the Engineer and shall contain not less than 4 sacks of cement per cubic yard. Concrete footings are to be crowned at the top to shed water.
5. If rock is encountered at a depth less than the embedded depth required, a 15" or larger diameter hole shall be drilled for the post and the post shall be set in concrete. If rock is encountered at a depth of 1'- 6" or more below the ground surface, the hole shall be drilled to the required depth. If rock is encountered at a depth less than 1'- 6" below the ground surface, the holes shall be drilled a minimum of 2'- 0" into the rock or to the depth whichever is the lesser depth.
6. Barbed Wire shall be in accordance with ASTM A 121 (Class 1) Design designation 12-2-4-1 4R or 12-2-5-1 4R, or as approved by the Engineer.

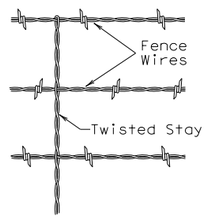
   Woven Wire Fence (Type B) shall be in accordance with ASTM A 116 (Class 1) No. 12-1/2 Grade 60 (See Table 1 ASTM A 116) to the height and design shown on the plans, or as approved by the Engineer.
7. The location of gates and corner posts will be as indicated elsewhere on these plans.
8. Square wood posts may be used in lieu of round posts provided minimum equivalent size requirements, as shown are met. All wood posts shall be in accordance with Item 552, "Wire Fence."



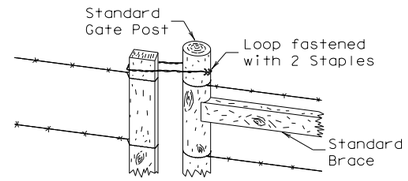
CORNER OR PULL POST ASSEMBLY



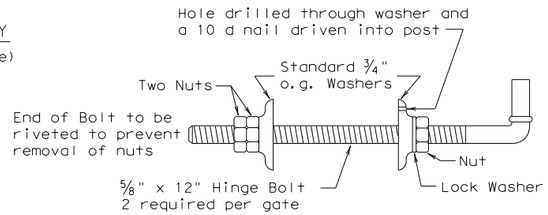
DETAIL OF FENCE TREATMENT AT STRUCTURES



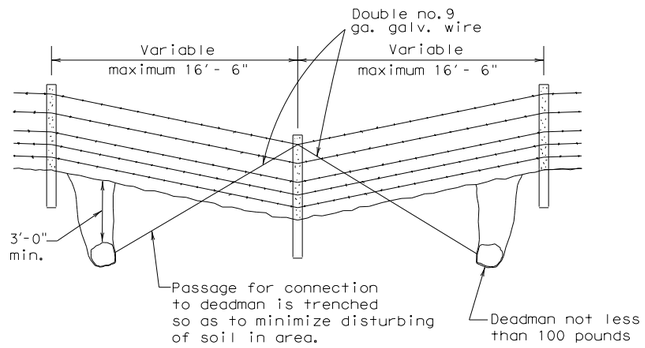
DETAIL OF STAY
(Barbed wire fence)



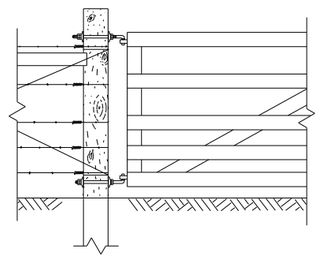
DETAIL FASTENER TYPE 3 GATE



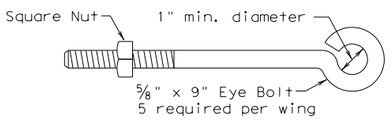
DETAIL OF GATE HINGE BOLT ASSEMBLY



DETAIL OF FENCE SAG
(Single Line Connection)



DETAIL SHOWING INSTALLATION OF HINGES OF TYPE 1 & 2 GATE



DETAIL OF EYE BOLT

Texas Department of Transportation
Design Division Standard

BARBED WIRE AND WOVEN WIRE FENCE
(WOOD POSTS)
WF(1)-10

FILE: wf110.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0198	07	014	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		139

DATE:
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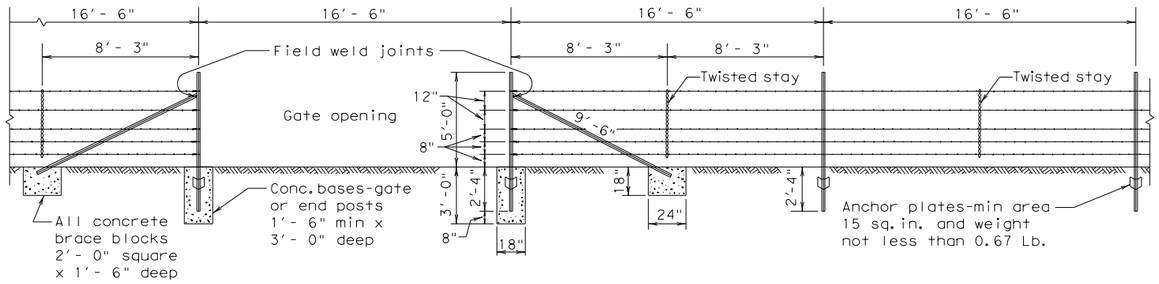
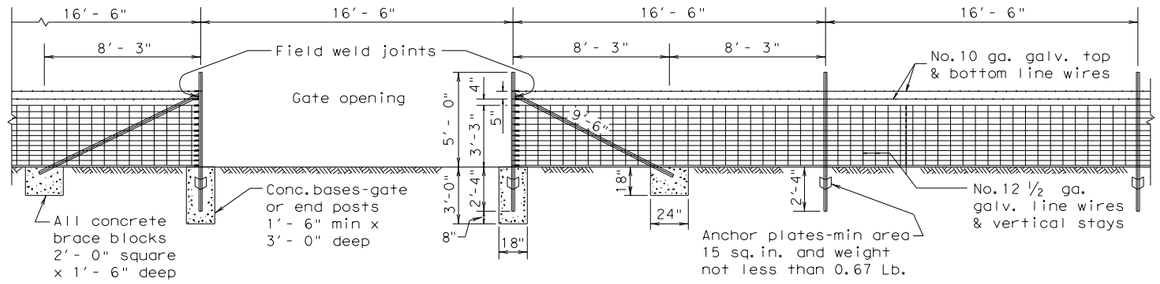


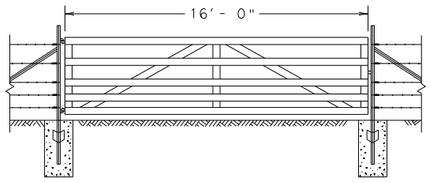
SECTION GALVANIZED BARBED WIRE FENCE WITH METAL POSTS
BRACING DETAIL USED AT ENDS AND GATES
TYPE "C" FENCE
(See General Note 8)

Note:
For Steel pipe and T-Post requirements. (See General Notes 6 & 7)

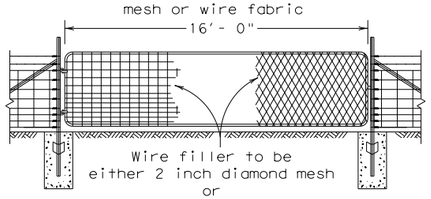


SECTION GALVANIZED WOVEN WIRE FENCE WITH METAL POSTS
BRACING DETAIL USED AT ENDS AND GATES
TYPE "D" FENCE
(See General Note 8)

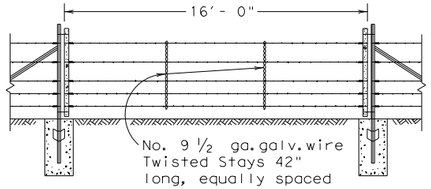
Metal gate shall consist of 5 panels not less than 4'- 4" high and shall be aluminum or galvanized metal and of good quality. Gate and hardware shall meet the approval of the engineer.



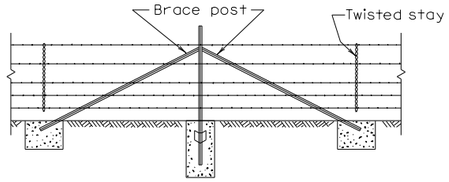
DETAIL TYPE 1 GATE



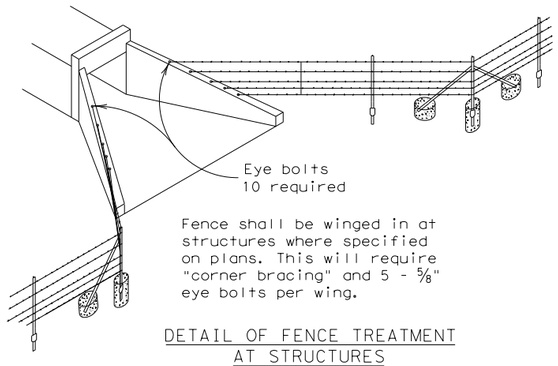
DETAIL TYPE 2 GATE



DETAIL TYPE 3 GATE

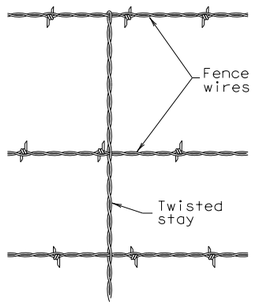


CORNER OR PULL POST ASSEMBLY

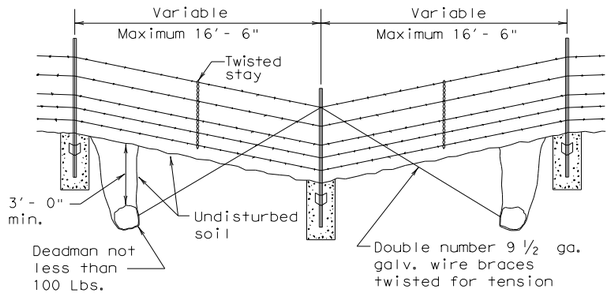


Fence shall be winged in at structures where specified on plans. This will require "corner bracing" and 5 - ⅝" eye bolts per wing.

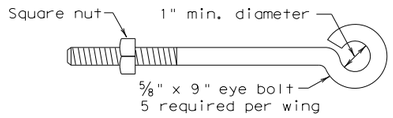
DETAIL OF FENCE TREATMENT AT STRUCTURES



DETAIL OF STAY
(Barbed Wire Fence)



DETAIL OF FENCE SAG



DETAIL OF EYE BOLT

GENERAL NOTES

1. Any high point which interferes with the placing of wire mesh shall be excavated to provide a 2 inch clearance.
2. Latches for Type 1 and Type 2 gates shall be good commercial quality and design latch of the spring, fork or chain type. All latches shall be suitable to the gate and shall be approved by the Engineer.
3. Hinges for Type 2 gates shall be a commercial design approved by the Engineer suitable for post and gate.
4. Concrete shall be of the design and consistency approved by the Engineer and shall contain not less than 4 sacks of cement per cubic yard. Concrete footings are to be crowned at the top to shed water.
5. Steel anchor plates shall be of a design and thickness sufficient to prevent turning of the post in firm soil.
6. Steel pipe end posts, corner and pull posts shall be a minimum of 2" Std. pipe (2.375" O.D., 0.154" wall thickness) with a 1¼" Std. pipe brace (1.660" O.D., 0.140" wall thickness), with a 2"x2"x1/4" angle, or other as approved by the Engineer. Fasteners for securing barbed wire or woven wire fence to metal posts shall be a minimum of 11 gauge galvanized steel wire. Tubular posts shall be fitted with water malleable iron caps.
7. If Steel pipe is used for posts and braces, use standard pipe in accordance with ASTM A 53, Class B or A 501. For T-Posts use steel that meets ASTM A 702. Metal line posts shall be not less than 6'-6" in length and shall weigh not less than (1.33 lbs./lin.ft.). These Items shall be in accordance with Item 552, "Wire Fence."
8. Barbed Wire shall be in accordance with ASTM A 121, Class 1 Design designation 12-2-4-1 4R or 12-2-5-1 4R, or as approved by the Engineer.

   Woven Wire Fence (Type D) shall be in accordance with ASTM A 116, Class 1 No. 12-1/2 Grade 60 (See Table 1 ASTM A 116) to the height and design shown on the plans, or as approved by the Engineer.
9. The location of gates and corner posts will be as indicated elsewhere in these plans.

Texas Department of Transportation

Design Division Standard

BARBED WIRE AND WOVEN WIRE FENCE (STEEL POSTS)

WF(2)-10

FILE: wf210.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
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REVISIONS	0198	07	014	SH 204
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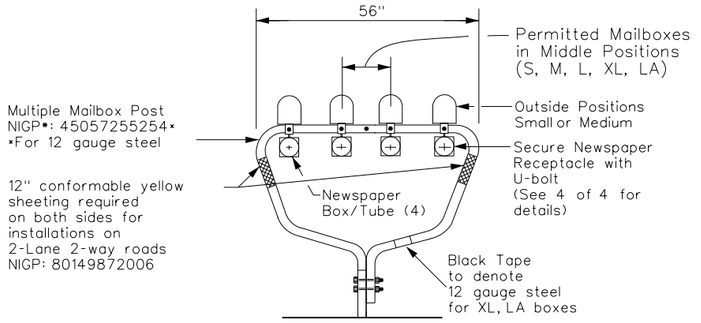
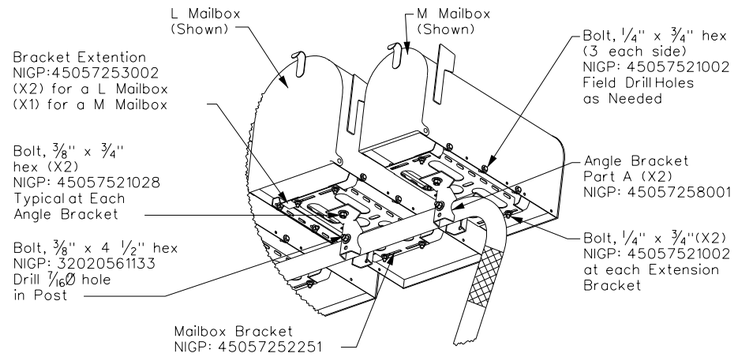
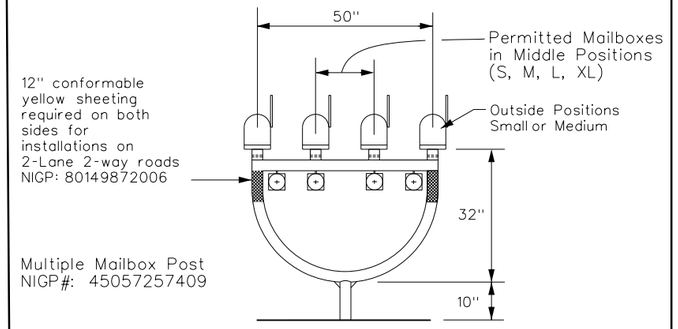
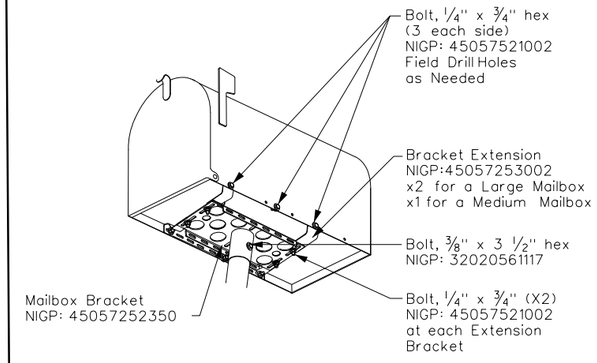
TYPE 1 - MULTIPLE





TYPE 4 - MULTIPLE





MAILBOX SIZES

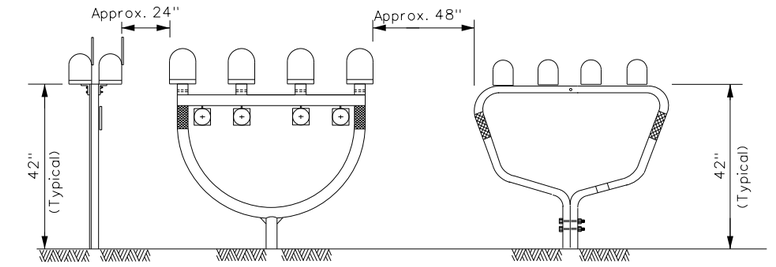
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX ** WEIGHT
	LENGTH	WIDTH	HEIGHT	
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

* 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.

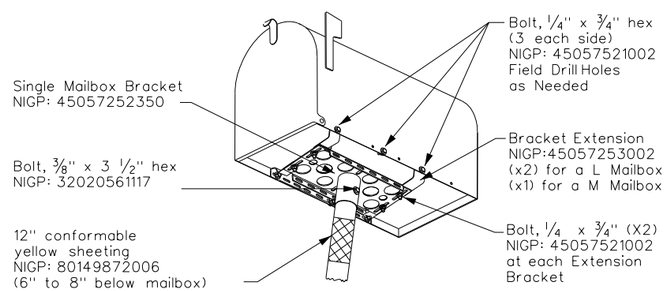
TYPICAL INSTALLATION MEASUREMENTS

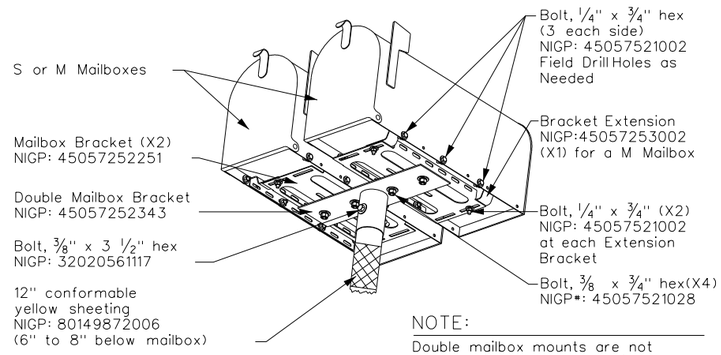


NOTE:

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

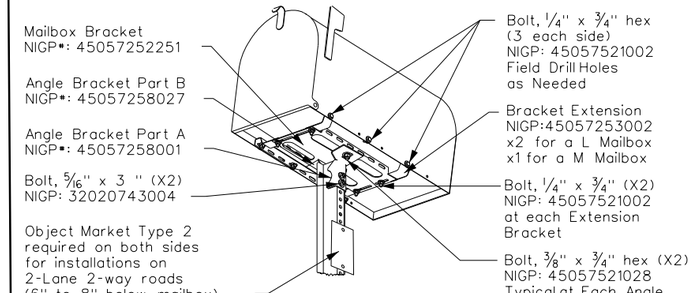


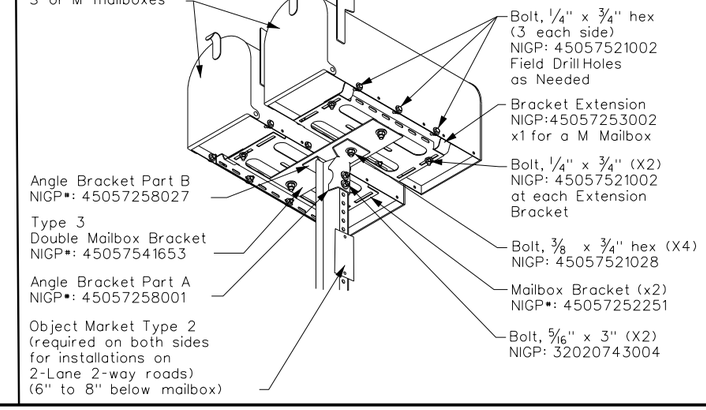


NOTE:

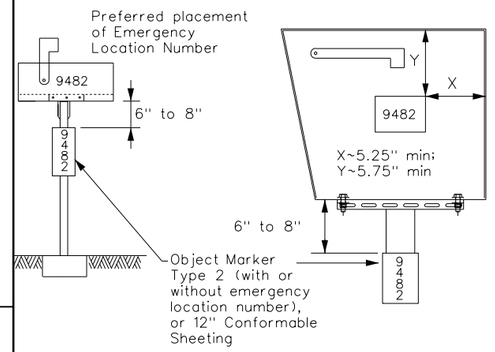
Double mailbox mounts are not allowed with a type 4 multiple mailbox installation

TYPE 3 - SINGLE/DOUBLE





PLACEMENT OF EMERGENCY LOCATION NUMBER

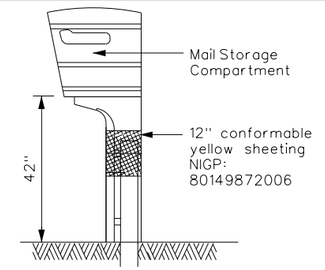


NOTES:

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
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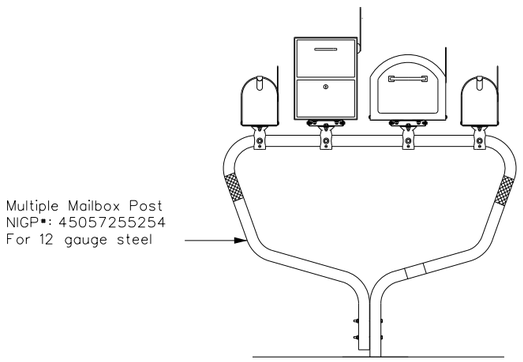
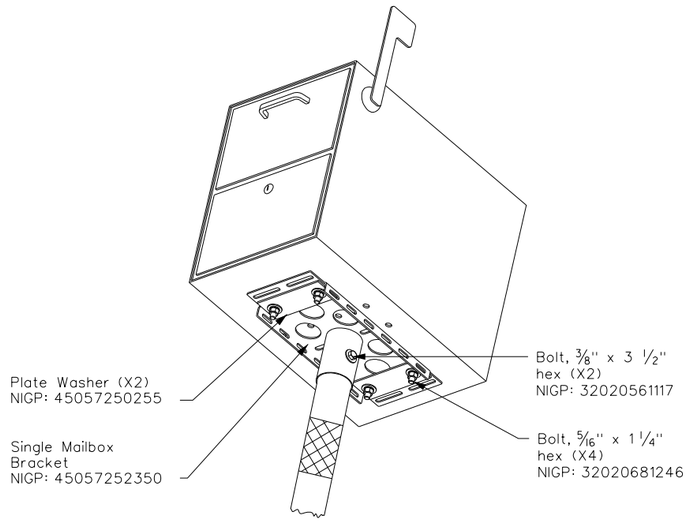
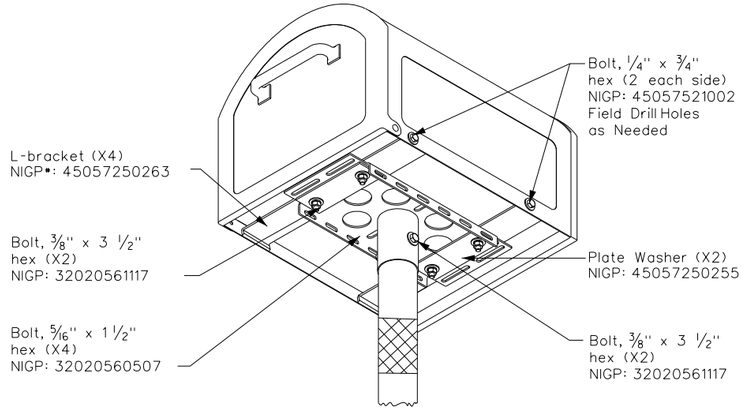
TYPE 1 - MULTI LOCKABLE AND XL MAILBOX



TYPE 2/4 - SINGLE LOCKABLE MAILBOX

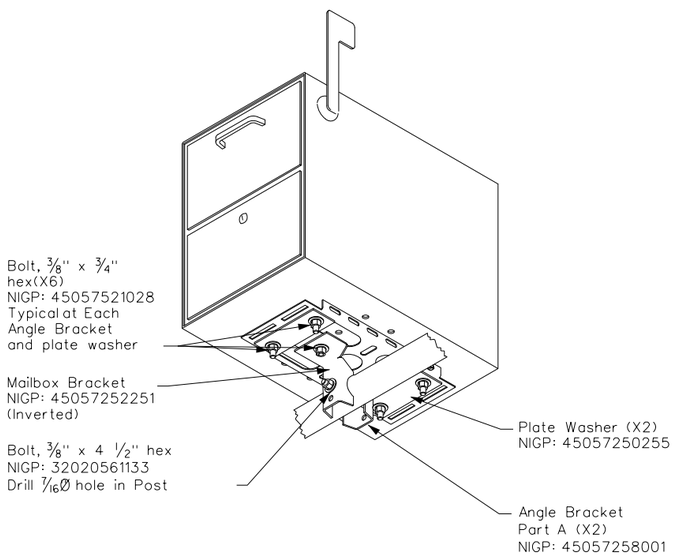


TYPE 2/4 - SINGLE XL MAILBOX

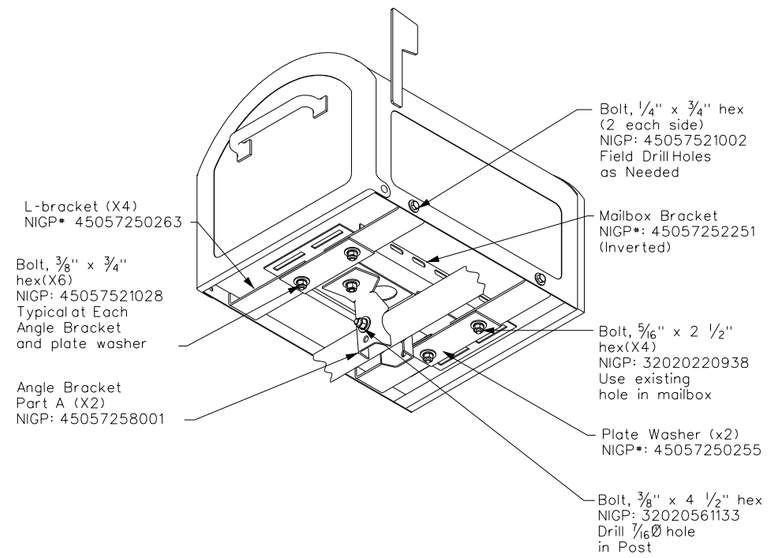


NOTE:
Follow same configuration when mounting an XL mailbox on a Type 4 multipost.

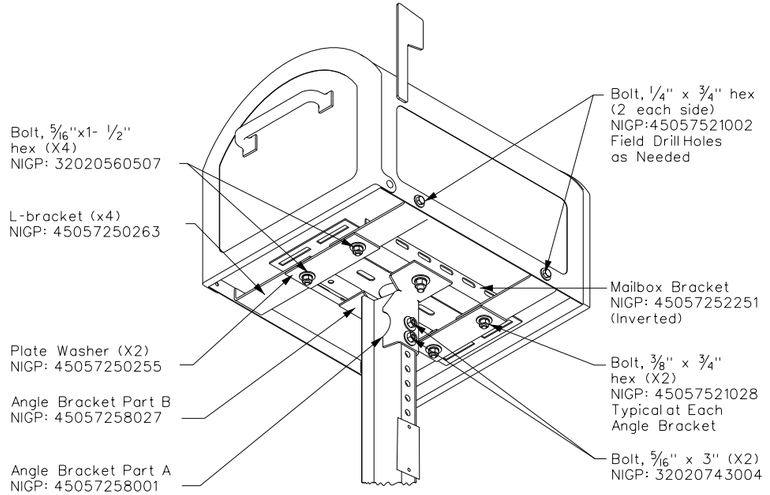
TYPE 1 MULTI – LOCKABLE ARCHITECTURAL (LA)



TYPE 1 MULTI – XL MAILBOX



TYPE 3 - XL MAILBOX MOUNTING



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XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY

MB(2)-21

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	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		14-2

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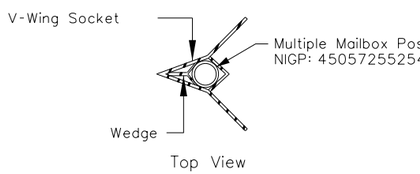
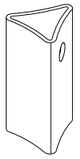
TYPE 1 - SUPPORT/FOUNDATION

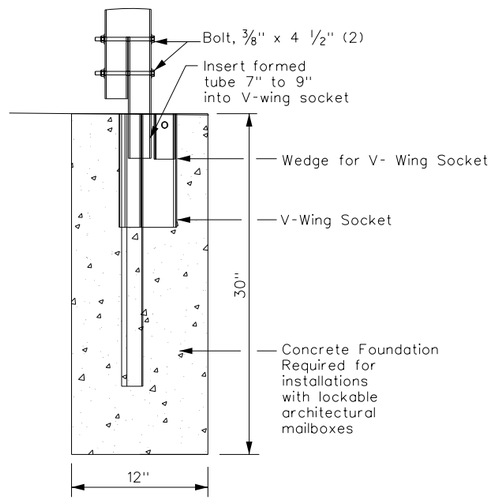
Thin Wall Tube w/ V-LOC Anchorage

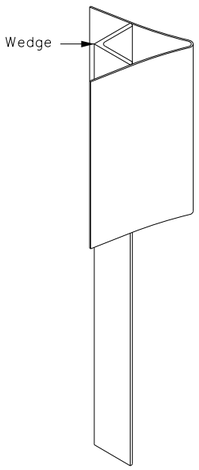


Top View



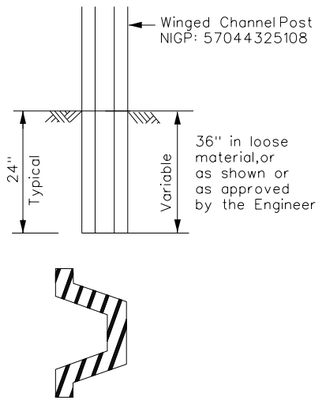
Wedge
NIGP: 45057259009





V-Wing Socket
NIGP: 45057256500

TYPE 3 - SUPPORT/FOUNDATION

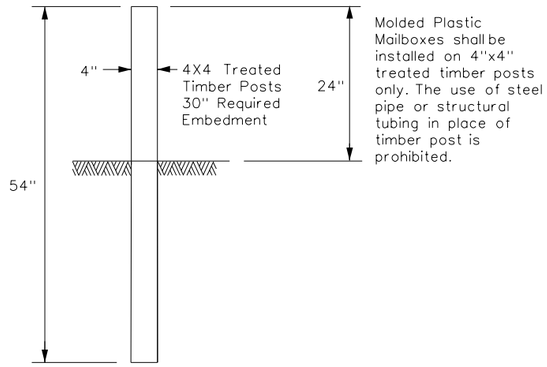


Top View

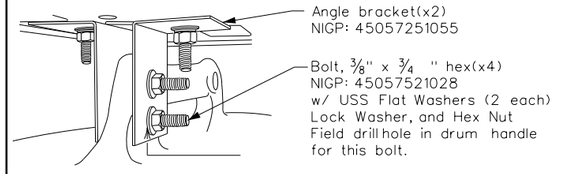
NOTES:

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:

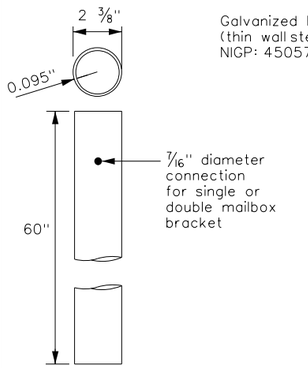
1. Place on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
2. Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

GENERAL NOTES:

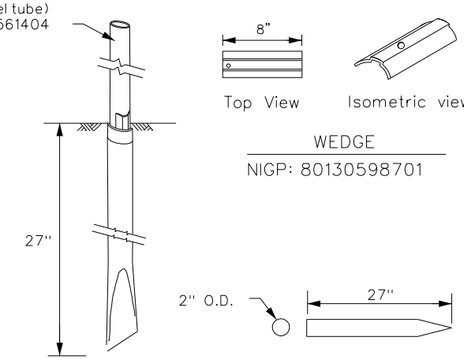
1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition, only on Type 1, Type 2, and Type 4

TYPE 2 - SUPPORT/FOUNDATION

Thin Wall Steel Tube w/Wedge Anchor System



MAILBOX POST

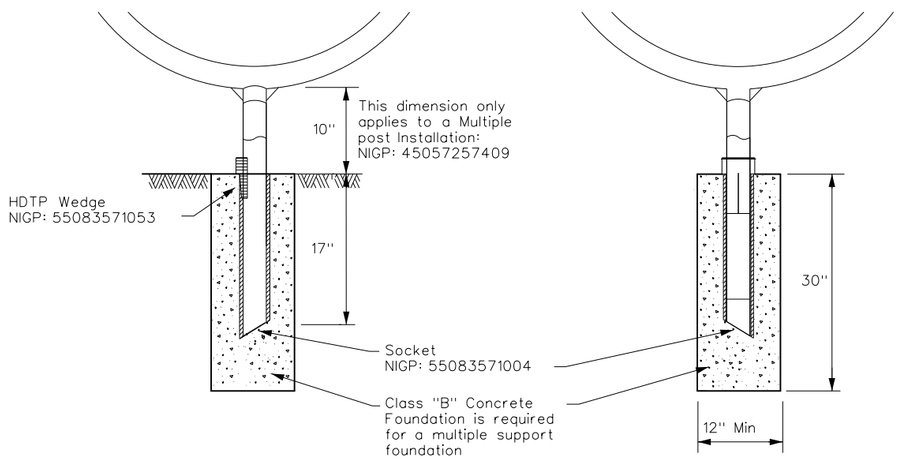


WEDGE
NIGP: 80130598701

WEDGE ANCHOR
NIGP: 80130238407

TYPE 4 - SUPPORT/FOUNDATION

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



SHEET 3 OF 4

Texas Department of Transportation

Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB(3)-21

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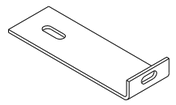
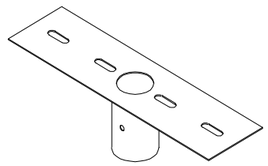
	TYL	CHEROKEE		14.3

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



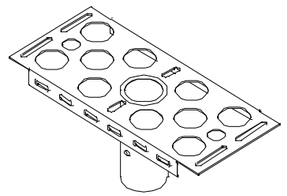
NIGP: 45057250263

L-Bracket x4 for
XL sized mailboxes



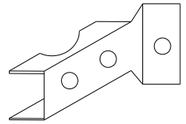
NIGP: 45057252343

Double Mailbox Bracket
For Type 2 and Type 4
double mount



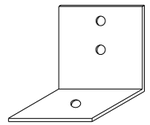
NIGP: 45057252350

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



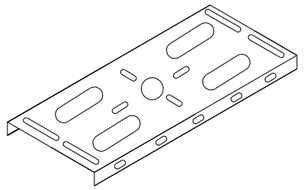
NIGP: 45057258001

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



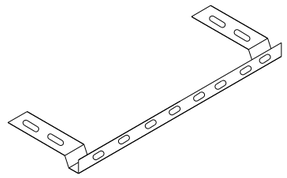
NIGP: 45057251055

Type 6 Angle Bracket
(2 per mailbox)



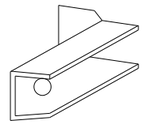
NIGP: 45057252251

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



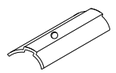
NIGP: 45057253002

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

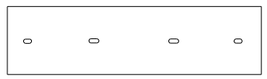


NIGP: 80130598701

Wedge for Type 2

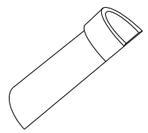
NIGP: 45057250255

Plate Washer for Architecural
and XL Mailboxes



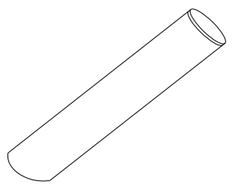
NIGP: 45057541653

Type 3 double mailbox bracket



NIGP: 55083571053

Type 4 Mailbox Wedge

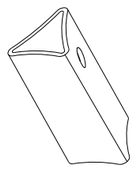


NIGP: 55083571004

Type 4 Mailbox Socket

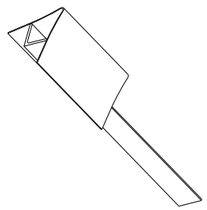
NIGP: 80130238407

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

DATE:
FILE:

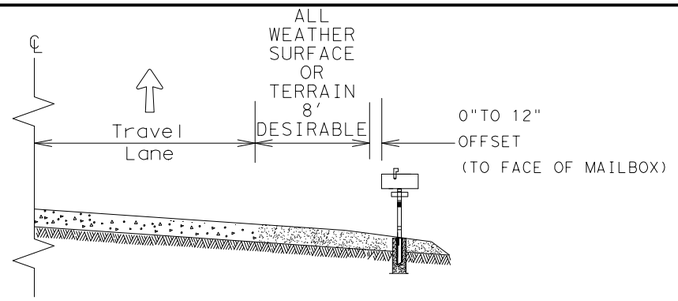
SHEET 4 OF 4

Texas Department of Transportation — Maintenance Division Standard

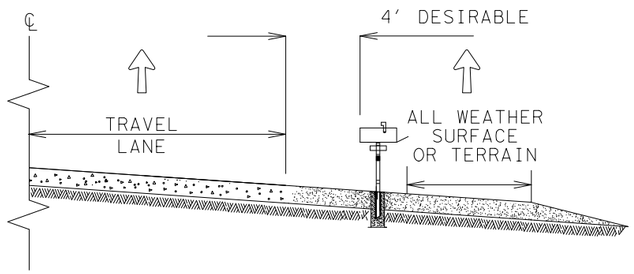
NIGP PARTS LIST AND COMPATIBILITY

MB(4)-21

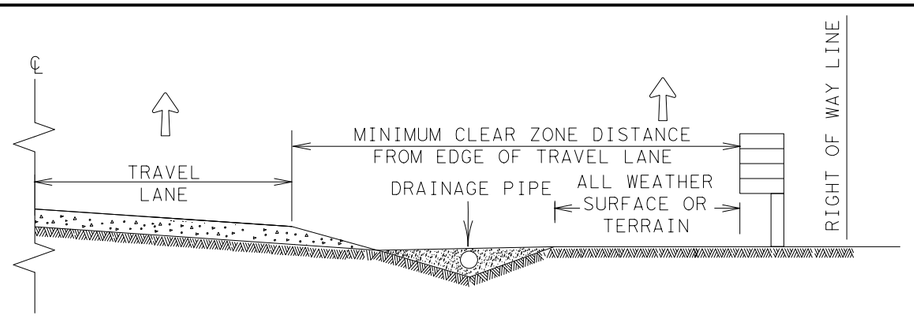
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		144



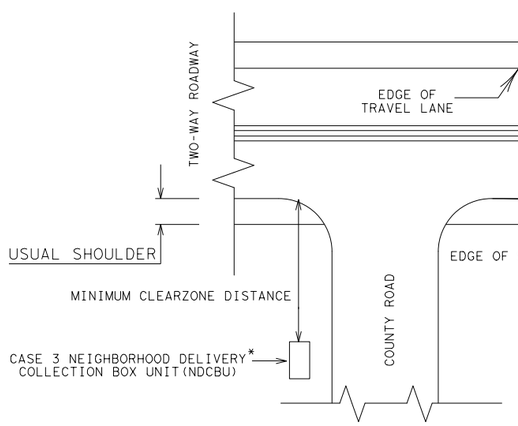
CASE 1. OFF TRAVEL WAY DELIVERY

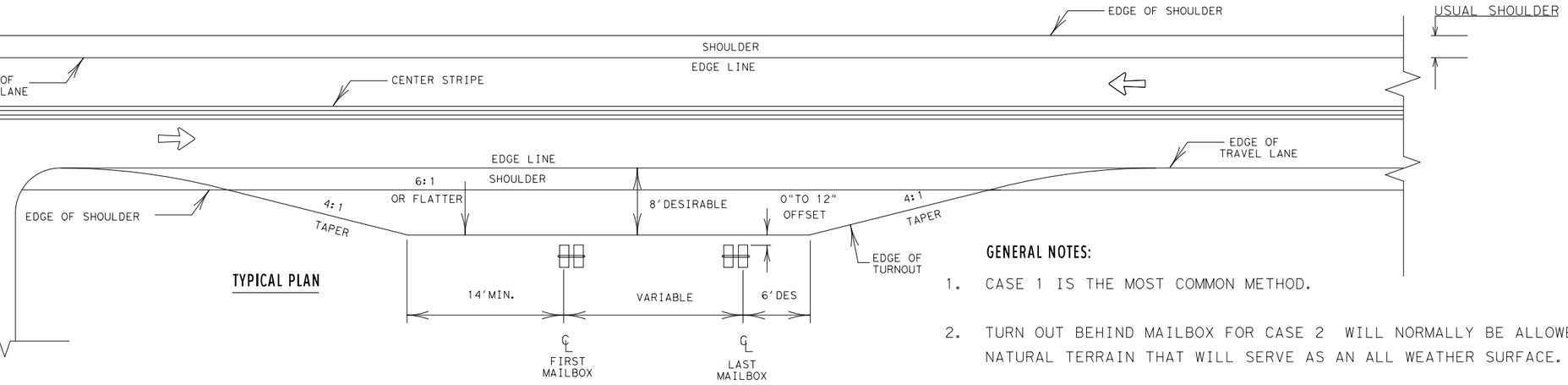


CASE 2. BACK SIDE DELIVERY

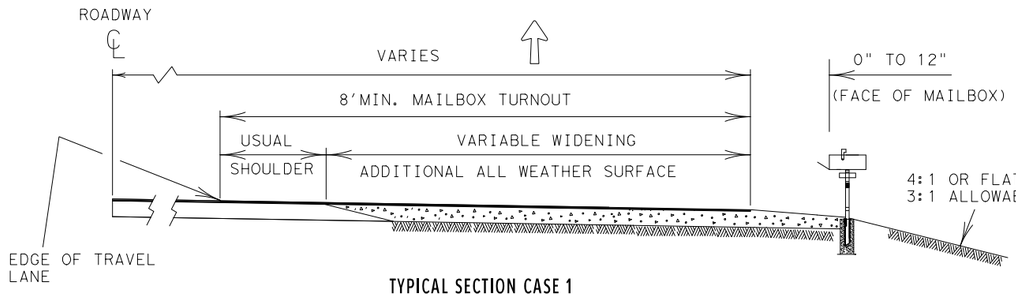


CASE 3. DELIVERY NEAR RIGHT OF WAY LINE





TYPICAL PLAN



TYPICAL SECTION CASE 1

GENERAL NOTES:

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

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

MAIL DELIVERY VEHICLE TRAVEL DIRECTION

Texas Department of Transportation

Maintenance Division Standard

Guideline

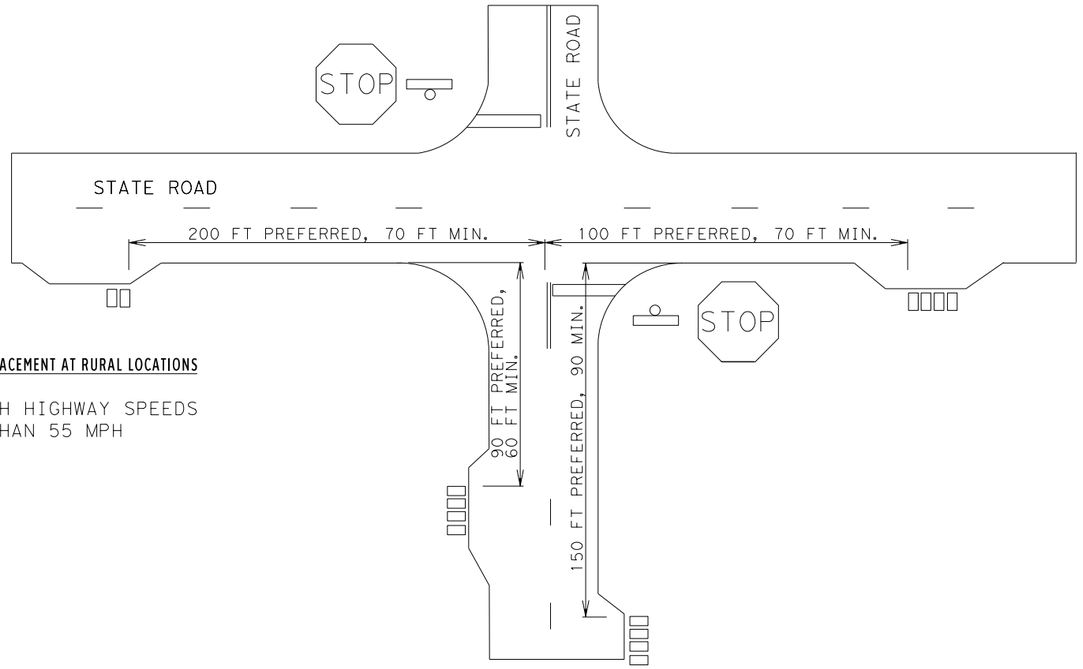
MAILBOX SIDE ROAD PLACEMENT AND TURNOUTS

MBP(1)-22

FILE: MBP-22.DGN	DN: VS		CK:	DW: VS		CK:	
© TxDOT OCTOBER 2022	CONT	SECT	JOB		HIGHWAY		
REVISIONS 12/2012 5/2014	0450	01	013		SH 204		
	DIST	COUNTY				SHEET NO.	
	TYL	CHEROKEE				144A	

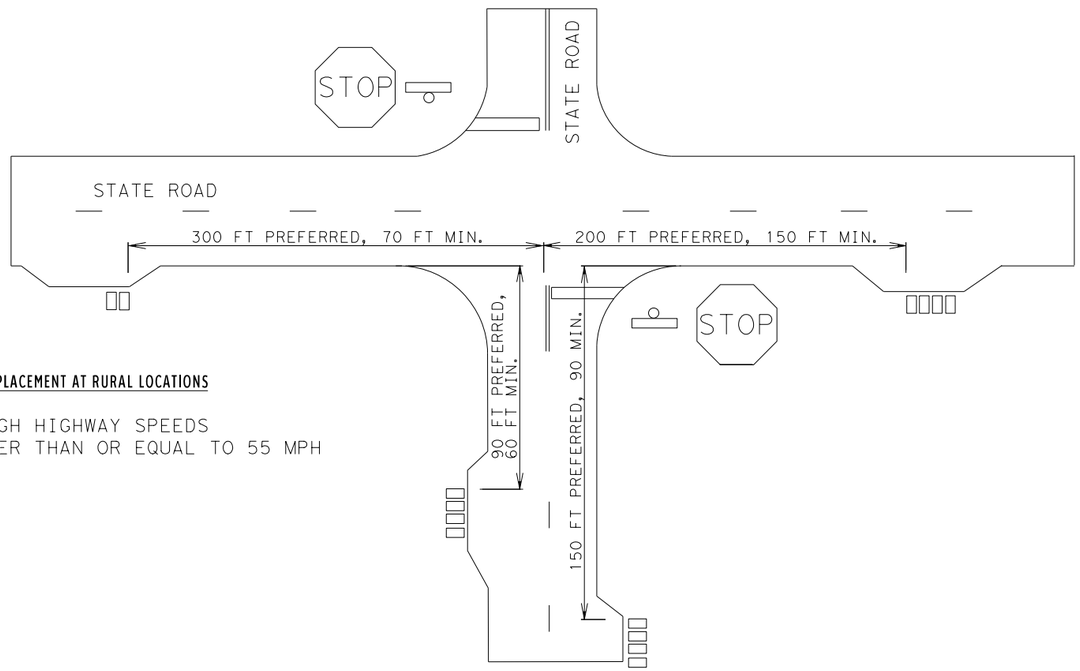
DATE:
FILE:

DATE:
FILE:



MAILBOX PLACEMENT AT RURAL LOCATIONS

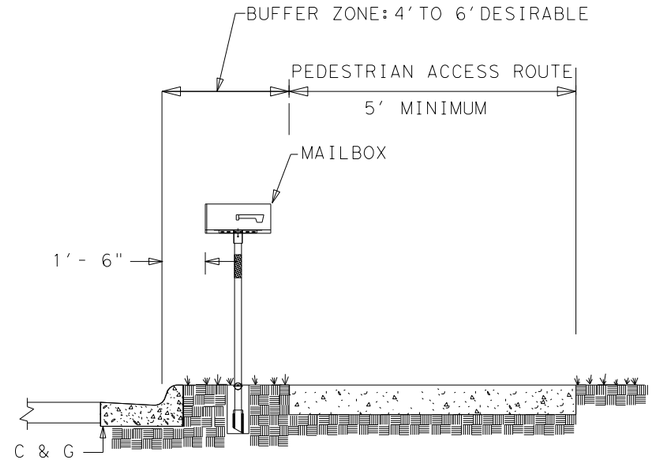
THROUGH HIGHWAY SPEEDS
LESS THAN 55 MPH



MAILBOX PLACEMENT AT RURAL LOCATIONS

THROUGH HIGHWAY SPEEDS
GREATER THAN OR EQUAL TO 55 MPH

CURB AND GUTTER MAILBOX INSTALLATION



NOTES:

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

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

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

Texas Department of Transportation

Maintenance Division Standard

MAILBOX PLACEMENT CURBS & INTERSECTIONS

MBP(2)-22

FILE: MBP-22.DGN	DN: VS		CK:	DW: VS		CK:
	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0450	01	013		SH 204	
12/2012 5/2014	DIST	COUNTY			SHEET NO.	
	TYL	CHEROKEE			144B	

CP&Y

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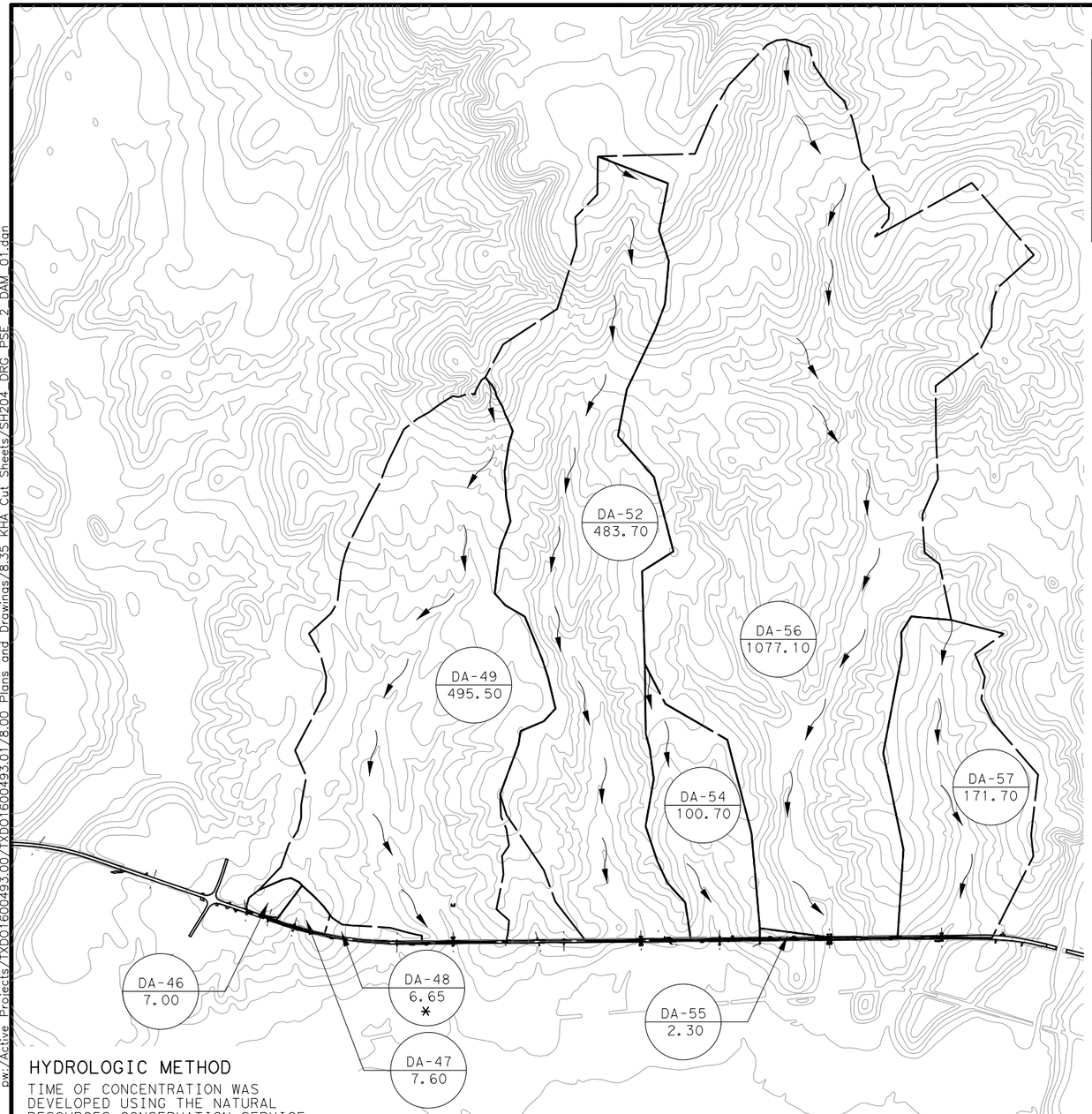

DRAINAGE AREA	STORM EVENT	Cr	Ci	Cv	Cs	C	Tc	I (in/hr)	A(acre's)	Q(cfs)
46	10 YR	0.1	0.1	0.06	0.08	**0.34**	35	**3.97**	7.00	**9.4**
	100 YR	0.1	0.1	0.06	0.08	**0.34**	35	**6.46**		**15.4**
47	10 YR	0.1	0.1	0.06	0.08	**0.34**	32	**4.18**	7.60	**10.8**
	100 YR	0.1	0.1	0.06	0.08	**0.34**	32	**6.79**		**17.5**
54	10 YR	0.1	0.08	0.06	0.08	**0.32**	52	**3.10**	100.70	**99.9**
	100 YR	0.1	0.08	0.06	0.08	**0.32**	52	**5.08**		**163.7**
55	10 YR	0.12	0.08	0.06	0.08	**0.34**	37	**3.84**	2.30	**3.0**
	100 YR	0.12	0.08	0.06	0.08	0.34	37	**6.25**		**4.9**
57	10 YR	0.1	0.08	0.06	0.08	**0.32**	64	**2.70**	171.70	**148.3**
	100 YR	0.1	0.08	0.06	0.08	**0.32**	64	**4.45**		**244.5**

HYDROGRAPH FLOWS, Q (CFS)			
FREQUENCY (YR)	DA-49	DA-52	DA-56
2	250	153.8	331.7
5	523.9	367.5	787.9
10	703.2	510.8	1092.7
25	964.8	728.3	1544.6
50	1195	922.8	1947.3
100	1604.8	1274.2	2672.3

DRAINAGE AREA	Coefficient	10% (10-year)	1% (100-year)
46	e	0.80	0.80
	b (in)	84.46	146.17
	d (min)	11.60	13.91
	Intensity (in/hr)	**3.97**	**6.46**
47	e	0.80	0.80
	b (in)	84.46	146.17
	d (min)	11.60	13.91
	Intensity (in/hr)	**4.18**	**6.79**
54	e	0.80	0.80
	b (in)	84.46	146.17
	d (min)	11.60	13.91
	Intensity (in/hr)	**3.84**	**6.25**
55	e	0.80	0.80
	b (in)	84.46	146.17
	d (min)	11.60	13.91
	Intensity (in/hr)	**2.70**	**4.45**
57	e	0.80	0.80
	b (in)	84.46	146.17
	d (min)	11.60	13.91
	Intensity (in/hr)	**2.70**	**4.45**

1000 500 0 1000 2000
SCALE HORIZ. FEET

LEGEND:

DA-XX / XX.XX DRAINAGE AREA ID / DRAINAGE AREA SIZE (ACRES)

FLOW DIRECTION ARROW

DRAINAGE AREA BOUNDARY

HYDROLOGIC METHOD

TIME OF CONCENTRATION WAS DEVELOPED USING THE NATURAL RESOURCES CONSERVATION SERVICE TR-55 METHOD FROM TXDOT HYDRAULIC MANUAL (JULY 2016).

WEB SOIL SURVEY WAS USED TO OBTAIN HYDROLOGIC SOIL TYPE INFORMATION OF THE DRAINAGE AREA.

PEAK FLOWS WERE DETERMINED USING THE RATIONAL METHOD PROVIDED IN CHAPTER 4 OF THE TXDOT HYDRAULIC DESIGN MANUAL (JULY 2016) FOR DRAINAGE AREAS 54,55 & 57.

PEAK FLOWS FOR DRAINAGE AREAS 49, 52 AND 56 WERE DETERMINED BY UTILIZING THE KERBY KERPICH METHOD AND HEC HMS VERSION 4.1

*DRAINAGE AREA NOT STUDIED

NOTES:
1. DRAINAGE AREA DELINEATED BASED ON TOPOGRAPHIC SURVEY AND TEXAS NATURAL RESOURCES INFORMATION 10' CONTOURS.
2. FEMA PANEL #48073C0350D
3. BASED ON HISTORIC PERFORMANCE OF THE EXISTING CROSS DRAINAGE STRUCTURES AND THE MINOR NATURE OF THE PROPOSED IMPROVEMENTS, ONLY CULVERTS WITH THE POTENTIAL TO IMPACT EXISTING STRUCTURES OR WITHIN A STUDIED FLOODZONE WERE ANALYZED. (49,52,54,55,56,57)
4. DRAINAGE AREAS NOT SHOWN FOR CULVERTS NOT BEING ANALYZED.

STATE OF TEXAS · PEDRO CARRASCO JR. · 93580 · LICENSED · PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

 Texas Department of Transportation

SH 204

DRAINAGE AREA MAP

SHEET 1 OF 2

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	PRC		TEXAS				SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013	145

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cpypdf_ANSIB.pltcfg
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3/6/2019 10:15:02 AM ashley.davison

pw:/Active Projects/TXD01600493.00/TXD01600493.01/8.00 Plans and Drawings/8.35 KHA Cut Sheets/SH204_DRG_PSE_2_DAM_01.dgn

CP&Y

CHECKPRINT

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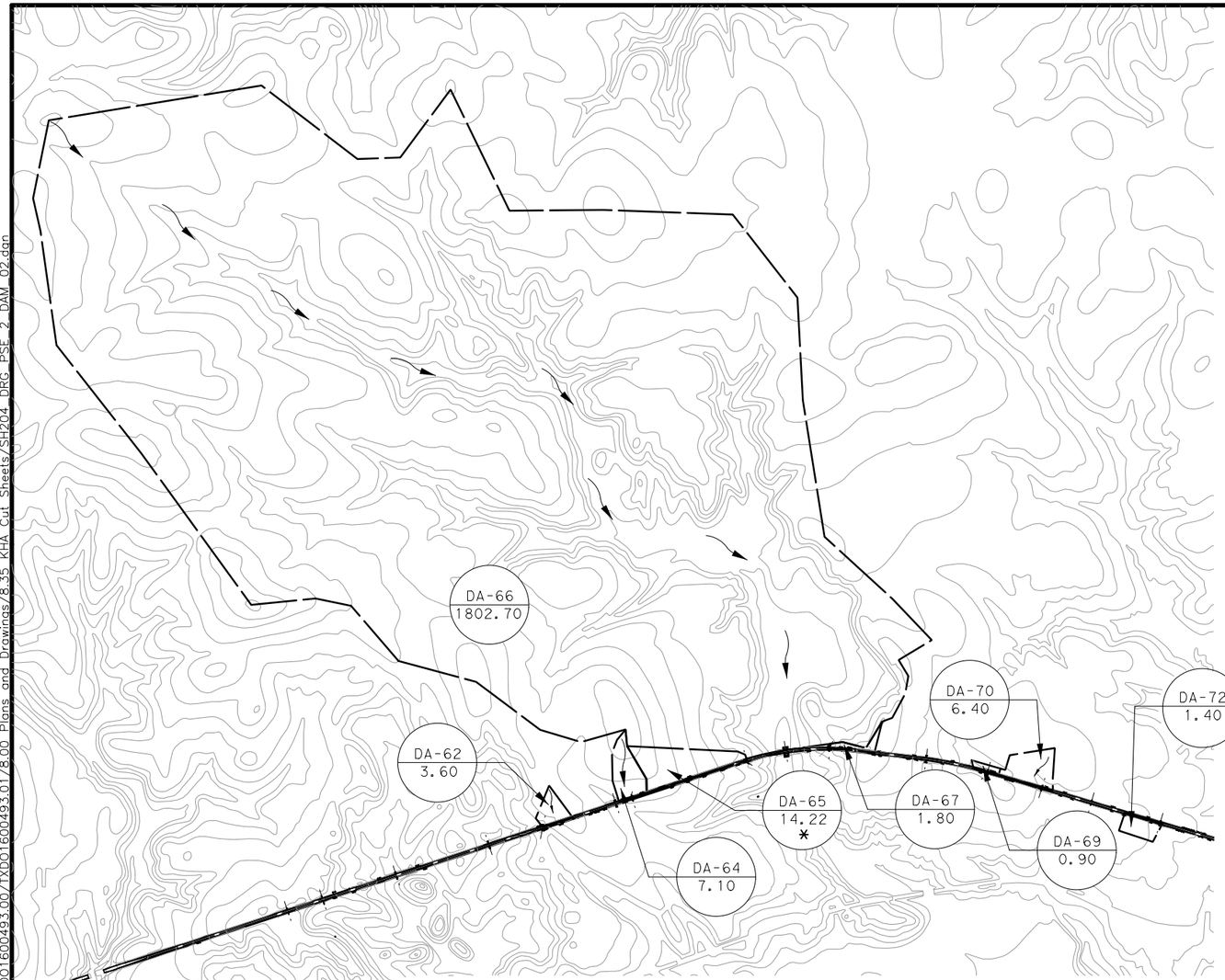

DRAINAGE AREA	STORM EVENT	Cr	Ci	Cv	Cs	C	Tc	I (in/hr)	A(acre's)	Q(cfs)
62	10 YR	0.14	0.08	0.06	0.08	**0.36**	34	**4.04**	**3.60**	**5.2**
	100 YR	0.14	0.08	0.06	0.08	**0.36**	34	**6.57**		**8.5**
64	10 YR	0.1	0.08	0.05	0.08	**0.31**	32	**4.18**	**7.10**	**9.2**
	100 YR	0.1	0.08	0.05	0.08	**0.31**	32	**6.79**		**14.9**
67	10 YR	0.1	0.08	0.06	0.08	**0.32**	24	**4.92**	**1.80**	**2.8**
	100 YR	0.1	0.08	0.06	0.08	**0.32**	24	**7.92**		**4.6**
69	10 YR	0.08	0.08	0.07	0.08	**0.31**	22	**5.15**	**0.90**	**1.4**
	100 YR	0.08	0.08	0.07	0.08	**0.31**	22	**8.27**		**2.3**
70	10 YR	0.1	0.08	0.05	0.08	**0.31**	27	**4.61**	**7.40**	**10.6**
	100 YR	0.1	0.08	0.05	0.08	**0.31**	27	**7.45**		**17.1**
72	10 YR	0.08	0.08	0.06	0.08	**0.3**	31	**7.32**	**3.50**	**7.7**
	100 YR	0.08	0.08	0.06	0.08	**0.3**	31	**11.47**		**12.0**

HYDROGRAPH FLOWS, Q (CFS)	
FREQUENCY (YR)	DA-66
2	533.4
5	1202.9
10	1643.3
25	2291.6
50	2866.1
100	3895.3

1000 500 0 1000 2000
SCALE HORIZ. FEET

DA-XX
XX.XX
DRAINAGE AREA ID
DRAINAGE AREA SIZE (ACRES)
FLOW DIRECTION ARROW
DRAINAGE AREA BOUNDARY

HYDROLOGIC METHOD

TIME OF CONCENTRATION WAS DEVELOPED USING THE NATURAL RESOURCES CONSERVATION SERVICE TR-55 METHOD FROM TXDOT HYDRAULIC MANUAL (JULY 2016).

WEB SOIL SURVEY WAS USED TO OBTAIN HYDROLOGIC SOIL TYPE INFORMATION OF THE DRAINAGE AREA.

PEAK FLOWS WERE DETERMINED USING THE RATIONAL METHOD PROVIDED IN CHAPTER 4 OF THE TXDOT HYDRAULIC DESIGN MANUAL (JULY 2016) FOR DRAINAGE AREAS 62, 64, 67, 69, 70 & 72.

PEAK FLOWS FOR DRAINAGE AREA 66 WAS DETERMINED BY UTILIZING THE KERBY KERPICH METHOD AND HEC HMS VERSION 4.1

DRAINAGE AREA	Coefficient	10% (10-year)	1% (100-year)
62	e	0.80	0.80
	b (in)	84.46	146.17
	d (min)	11.60	13.91
	Intensity (in/hr)	**4.04**	**6.57**
64	e	0.80	0.80
	b (in)	84.46	146.17
	d (min)	11.60	13.91
	Intensity (in/hr)	**4.18**	**6.79**
67	e	0.80	0.80
	b (in)	84.46	146.17
	d (min)	11.60	13.91
	Intensity (in/hr)	**4.92**	**7.92**
69	e	0.80	0.80
	b (in)	84.46	146.17
	d (min)	11.60	13.91
	Intensity (in/hr)	**5.15**	**8.27**
70	e	0.80	0.80
	b (in)	84.46	146.17
	d (min)	11.60	13.91
	Intensity (in/hr)	**4.61**	**7.45**
72	e	0.80	0.80
	b (in)	84.46	146.17
	d (min)	11.60	13.91
	Intensity (in/hr)	**7.32**	**11.47**

*DRAINAGE AREA NOT STUDIED

NOTES:
1. DRAINAGE AREA DELINEATED BASED ON TOPOGRAPHIC SURVEY AND TEXAS NATURAL RESOURCES INFORMATION 10' CONTOURS.
2. FEMA PANEL #48073C0350D
3. BASED ON HISTORIC PERFORMANCE OF THE EXISTING CROSS DRAINAGE STRUCTURES AND THE MINOR NATURE OF THE PROPOSED IMPROVEMENTS, ONLY CULVERTS WITH THE POTENTIAL TO IMPACT EXISTING STRUCTURES OR WITHIN A STUDIED FLOODZONE WERE ANALYZED. (62, 64, 66, 67, 69, 70 & 72)
4. DRAINAGE AREAS NOT SHOWN FOR CULVERTS NOT BEING ANALYZED.

STATE OF TEXAS
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98380
LICENSED
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SH 204

DRAINAGE AREA MAP

SHEET 2 OF 2

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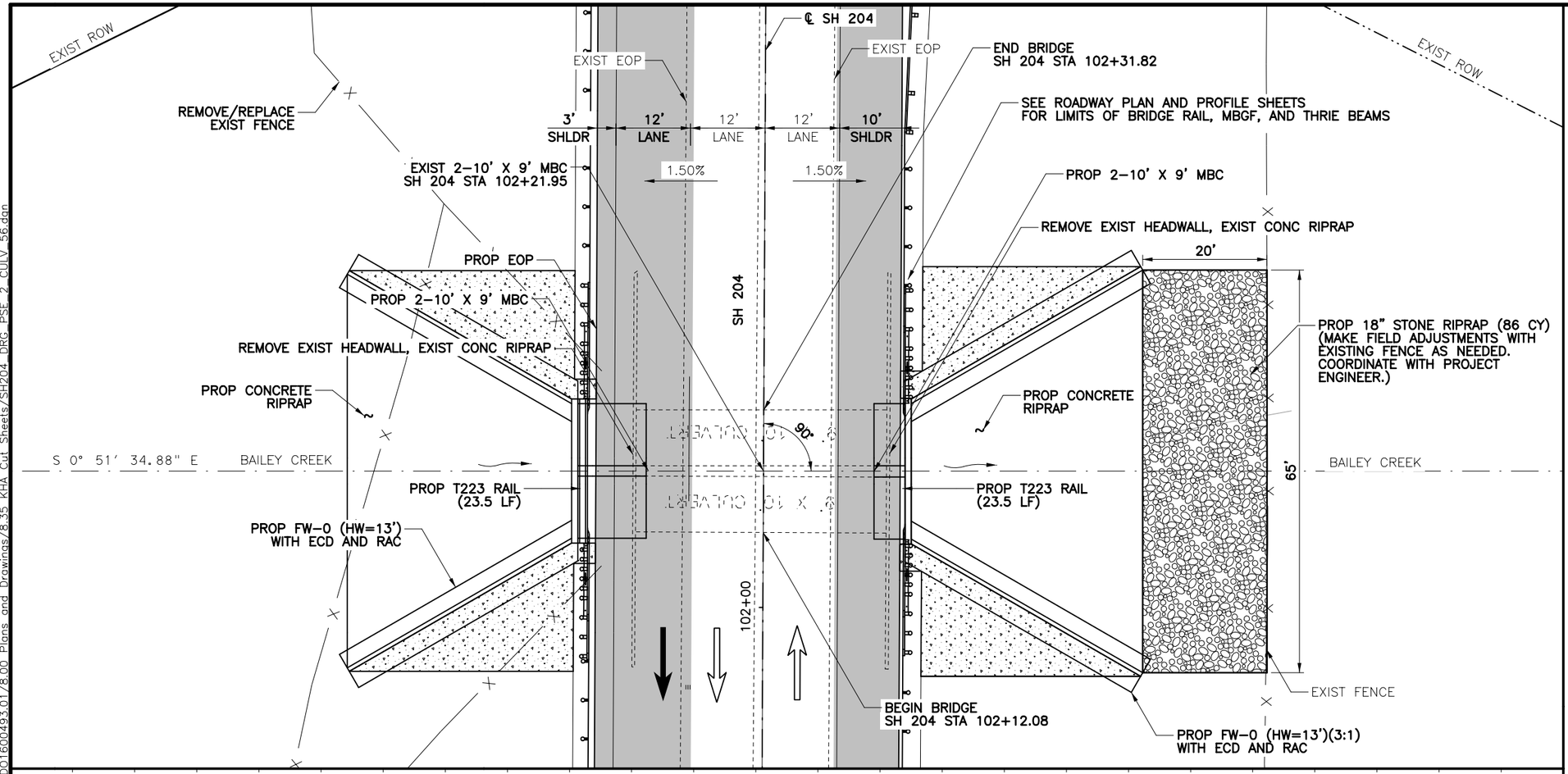

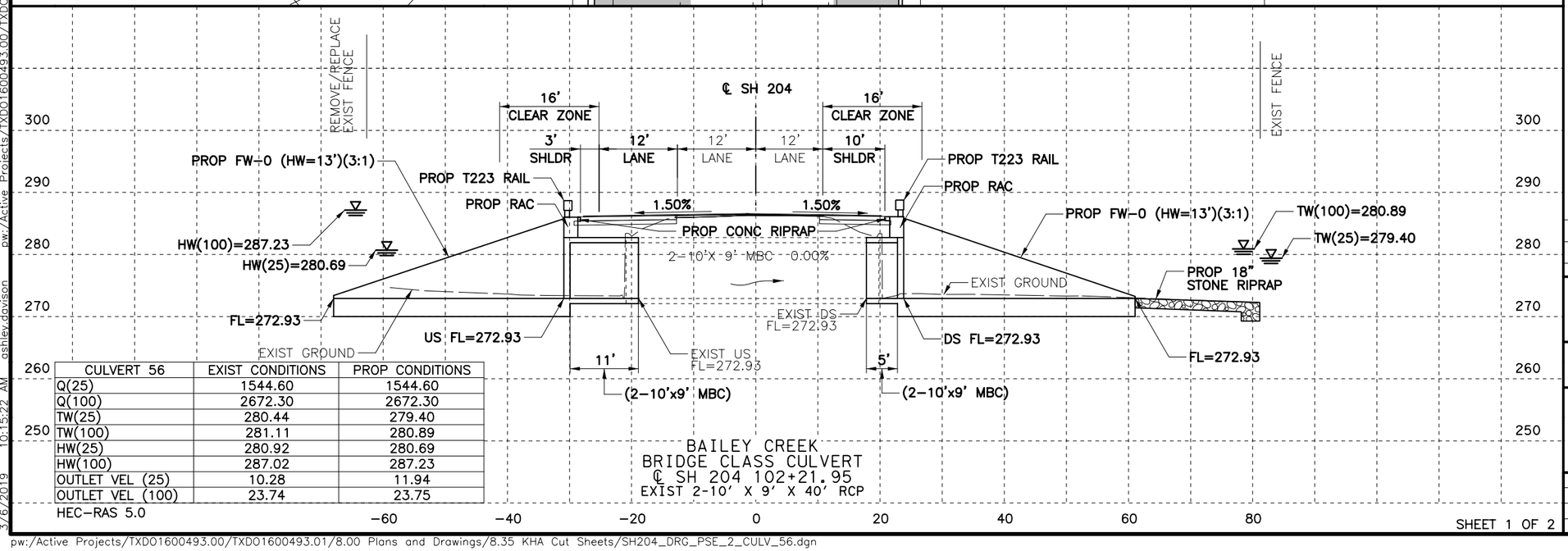

CULVERT 56	EXIST CONDITIONS	PROP CONDITIONS
Q(25)	1544.60	1544.60
Q(100)	2672.30	2672.30
TW(25)	280.44	279.40
TW(100)	281.11	280.89
HW(25)	280.92	280.69
HW(100)	287.02	287.23
OUTLET VEL (25)	10.28	11.94
OUTLET VEL (100)	23.74	23.75
HEC-RAS 5.0		

BAILEY CREEK
BRIDGE CLASS CULVERT
℄ SH 204 102+21.95
EXIST 2-10' X 9' X 40' RCP

N

SCALE HORIZ. 10 5 0 10 20 FEET

SCALE VERT. 10 5 0 10 20 FEET

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIPRAP
- FLOW ARROW
- EXISTING DITCH FLOW LINE
- PROPOSED DITCH FLOW LINE
- EOP=EDGE OF PAVEMENT

NOTES:

1. REFER TO TCP SHEETS FOR PTB PLACEMENT PRIOR TO CULVERT CONSTRUCTION.
2. CONTRACTOR TO FIELD VERIFY ALL PIPE LENGTHS AND ELEVATIONS.
3. REFER TO CONCRETE COLLAR DETAILS FOR MORE INFORMATION.
4. ALL DIMENSIONS IN PROFILE ARE NORMAL TO THE ROADWAY.

BRIDGE DATA

NBI # 10-037-0-0450-01-021
DESIGN SPEED = 40MPH
ADT (2018) = 2,534
ADT (2038) = 4,610
FUNCTIONAL CLASS = RURAL MINOR ARTERIAL

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SH 204

BRIDGE LAYOUT

STA 102+21.95
BRIDGE CLASS CULVERT

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Checked:	PRC		TEXAS				SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013	147

SHEET 1 OF 2

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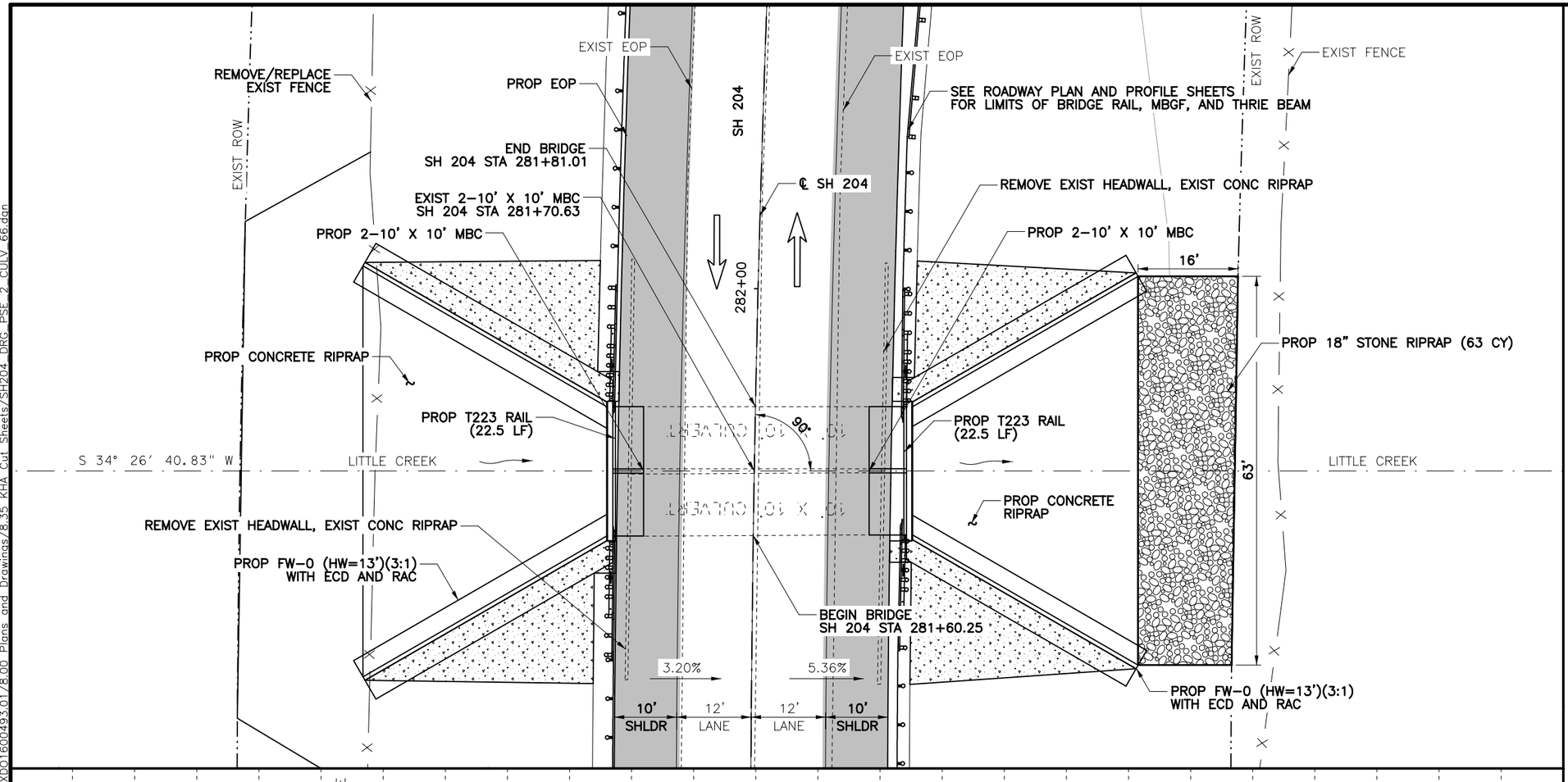
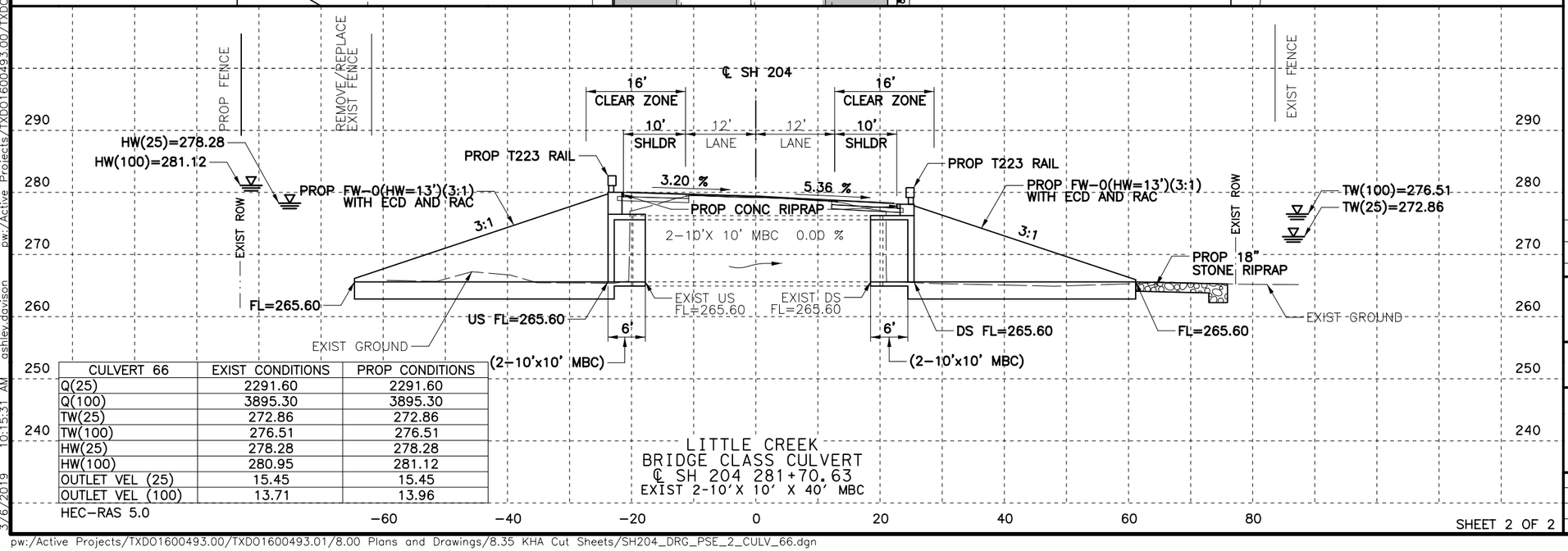
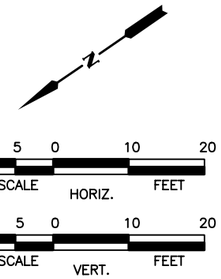




CULVERT 66	EXIST CONDITIONS	PROP CONDITIONS
Q(25)	2291.60	2291.60
Q(100)	3895.30	3895.30
TW(25)	272.86	272.86
TW(100)	276.51	276.51
HW(25)	278.28	278.28
HW(100)	280.95	281.12
OUTLET VEL (25)	15.45	15.45
OUTLET VEL (100)	13.71	13.96
HEC-RAS 5.0		

LITTLE CREEK
BRIDGE CLASS CULVERT
℄ SH 204 281+70.63
EXIST 2-10'X 10' X 40' MBC



LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIPRAP
- FLOW ARROW
- EXISTING DITCH FLOW LINE
- PROPOSED DITCH FLOW LINE
- EOP=EDGE OF PAVEMENT

NOTES:

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2. CONTRACTOR TO FIELD VERIFY ALL PIPE LENGTHS AND ELEVATIONS.
3. REFER TO CONCRETE COLLAR DETAILS FOR MORE INFORMATION.
4. ALL DIMENSIONS IN PROFILE ARE NORMAL TO THE ROADWAY.

BRIDGE DATA

NBI # 10-037-0-0450-01-024
DESIGN SPEED = 40MPH
ADT (2018) = 2,534
ADT (2038) = 4,610
FUNCTIONAL CLASS = RURAL MINOR ARTERIAL

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BRIDGE LAYOUT
STA 281+70.63
BRIDGE CLASS CULVERT

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SHEET 2 OF 2

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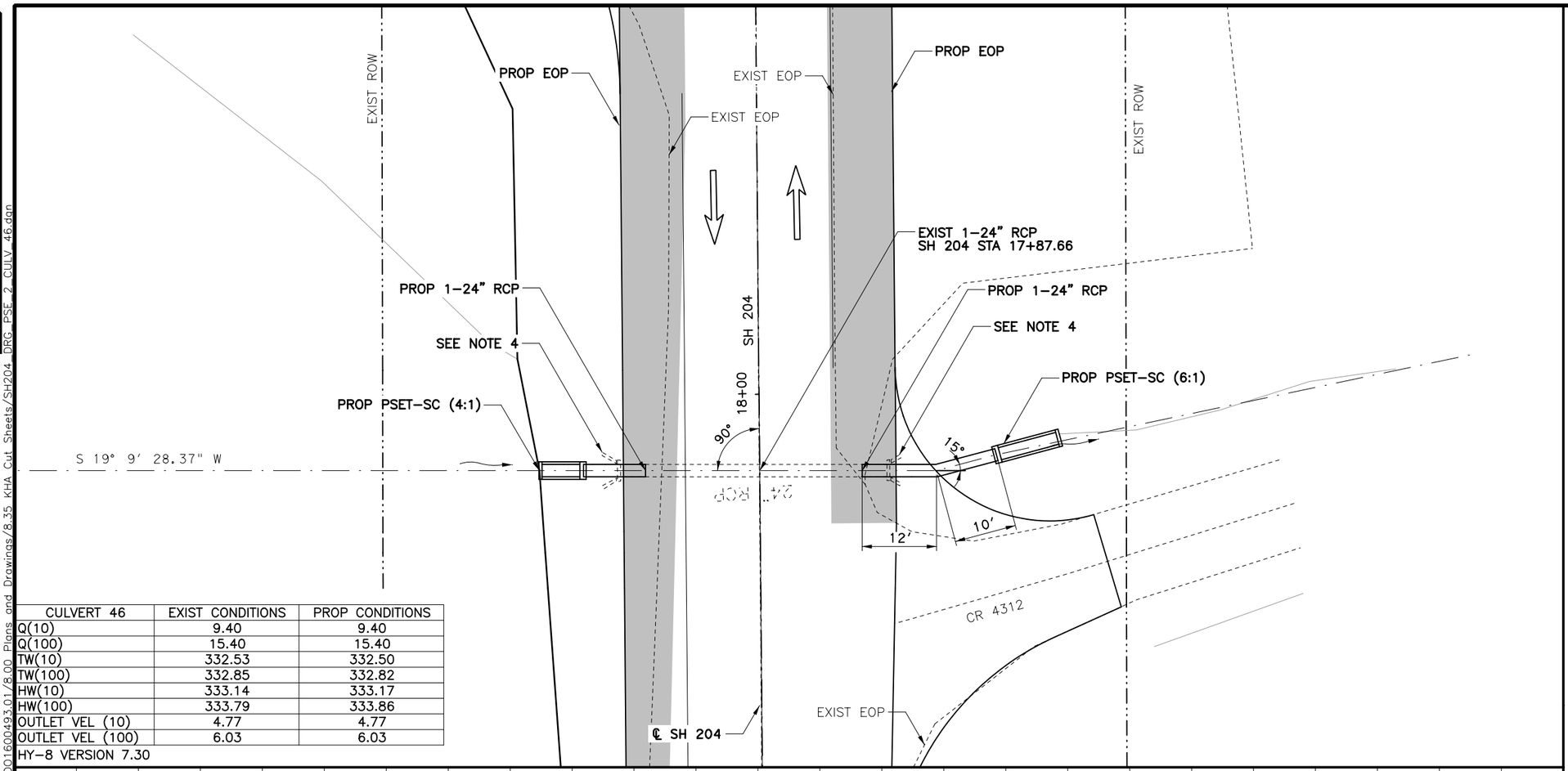
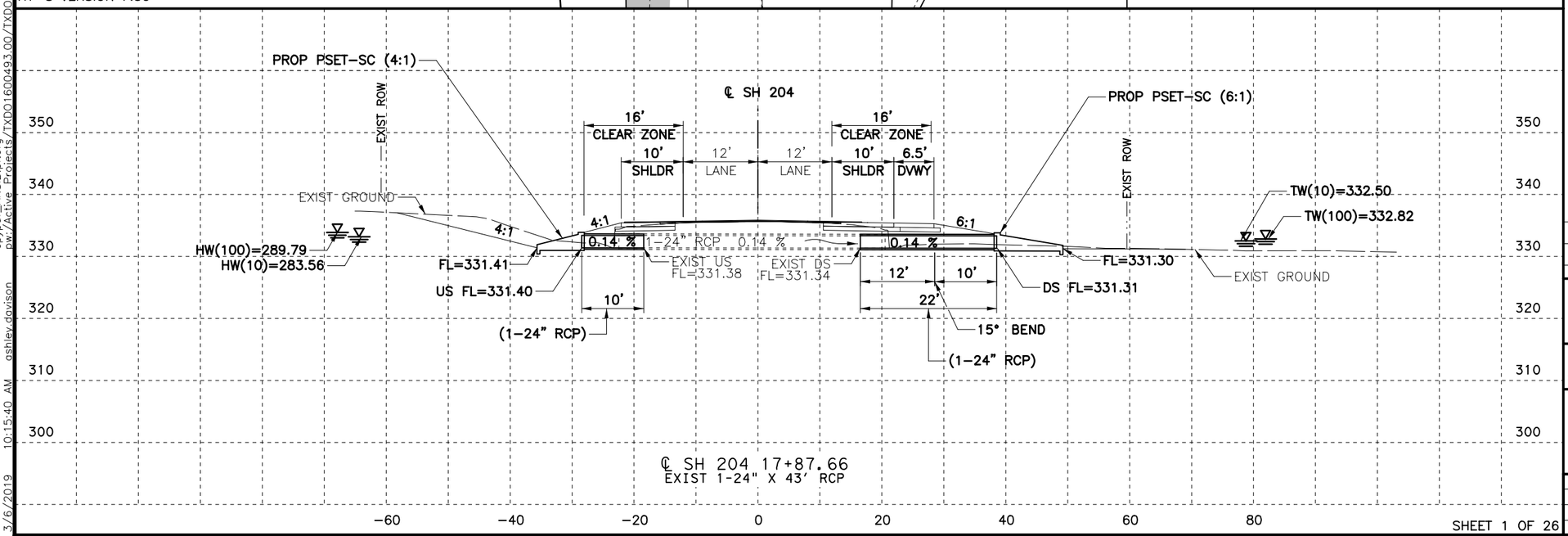


CULVERT 46	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	9.40	9.40
Q(100)	15.40	15.40
TW(10)	332.53	332.50
TW(100)	332.85	332.82
HW(10)	333.14	333.17
HW(100)	333.79	333.86
OUTLET VEL (10)	4.77	4.77
OUTLET VEL (100)	6.03	6.03

HY–8 VERSION 7.30



10 5 0 10 20
SCALE FEET
HORIZ.

10 5 0 10 20
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIPRAP
- FLOW ARROW
- EXISTING DITCH FLOW LINE
- PROPOSED DITCH FLOW LINE
- EOP=EDGE OF PAVEMENT

NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL PIPE LENGTHS AND ELEVATIONS.
2. REFER TO CONCRETE COLLAR DETAILS FOR MORE INFORMATION.
3. SEE PLAN AND PROFILE SHEETS FOR PROPOSED DITCH INFORMATION
4. REMOVE EXISTING HEADWALL, ANY ASSOCIATED CONCRETE RIPRAP, AND 4 LF OF PIPE OR UP TO FIRST JOINT. BEGIN EXTENSION AT FINISHED PIPE END.

STATE OF TEXAS
PEDRO R. CARRASCO JR.
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Pedro Carrasco Jr.

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 Texas Department of Transportation

SH 204

CULVERT LAYOUT

STA 17+87.66

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Checked:	PRC	TYL	CHEROKEE	0450	01	013		149

SHEET 1 OF 26

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PROP EOP

EXIST EOP

SEE ROADWAY PLAN AND PROFILE SHEETS FOR LIMITS OF MBGF AND MOW STRIP

EXIST ROW

PROP CONCRETE RIPRAP (SEE ROADWAY PLAN AND PROFILE SHEETS FOR MORE INFORMATION)

PROP 1–24" RCP

SEE NOTE 4

PROP CH–PW–0 (DIA=24 IN)

EXIST 1–24" RCP SH 204 STA 21+89.47

SH 204

PROP CONCRETE RIPRAP (SEE ROADWAY PLAN AND PROFILE SHEETS FOR MORE INFORMATION)

EXIST HEADWALL/WINGWALL TO REMAIN

PROP 18" STONE RIPRAP (8 CY)

S 16° 30′ 52.61" W

90° 22+00

14.62′

10.68′

EXIST ROW

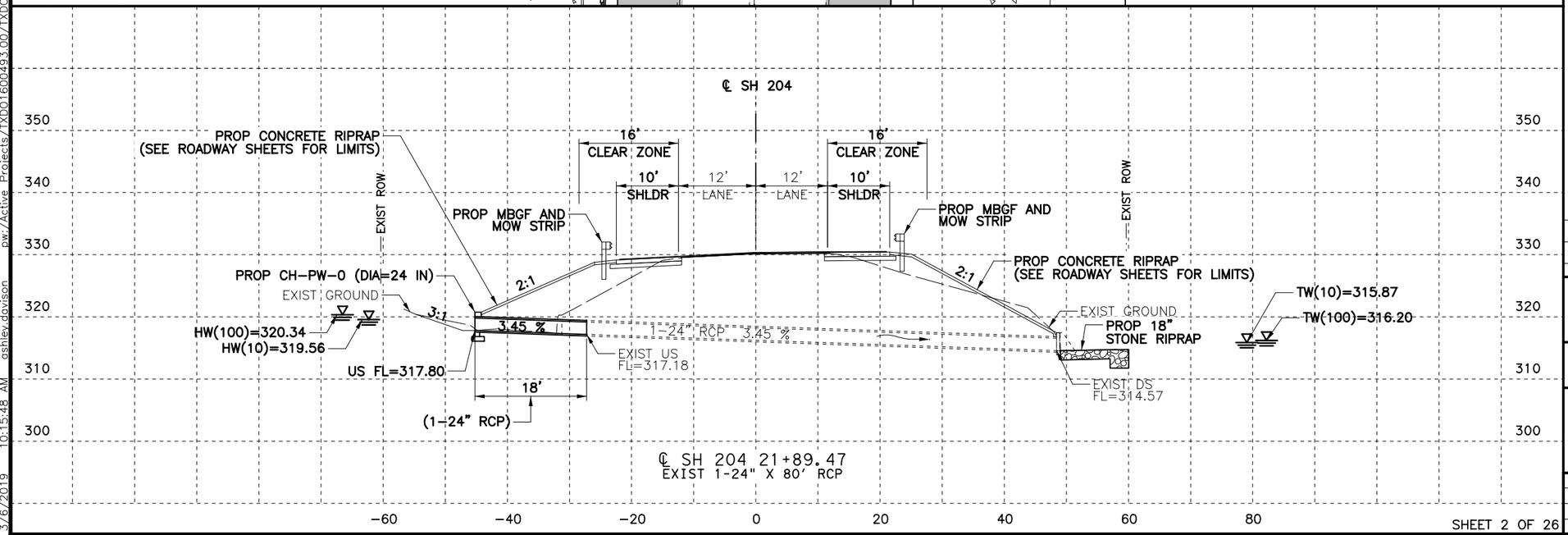
EXIST EOP

PROP EOP

℄ SH 204

CULVERT 47	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	10.80	10.80
Q(100)	17.50	17.50
TW(10)	315.87	315.87
TW(100)	316.20	316.20
HW(10)	319.08	319.56
HW(100)	319.86	320.34
OUTLET VEL (10)	11.19	11.48
OUTLET VEL (100)	12.56	12.72

HY–8 VERSION 7.30



SHEET 2 OF 26

N

10 5 0 10 20
SCALE FEET
HORIZ.

10 5 0 10 20
SCALE FEET
VERT.

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
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- FLOW ARROW
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NOTES:

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2. REFER TO CONCRETE COLLAR DETAILS FOR MORE INFORMATION.
3. SEE PLAN AND PROFILE SHEETS FOR PROPOSED DITCH INFORMATION
4. REMOVE EXISTING HEADWALL, ANY ASSOCIATED CONCRETE RIPRAP, AND 4 LF OF PIPE OR UP TO FIRST JOINT. BEGIN EXTENSION AT FINISHED PIPE END.

STATE OF TEXAS 98380 LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

03/06/2019

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TEXAS REGISTERED ENGINEERING FIRM F-928

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SH 204

CULVERT LAYOUT

STA 21+89.47

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Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
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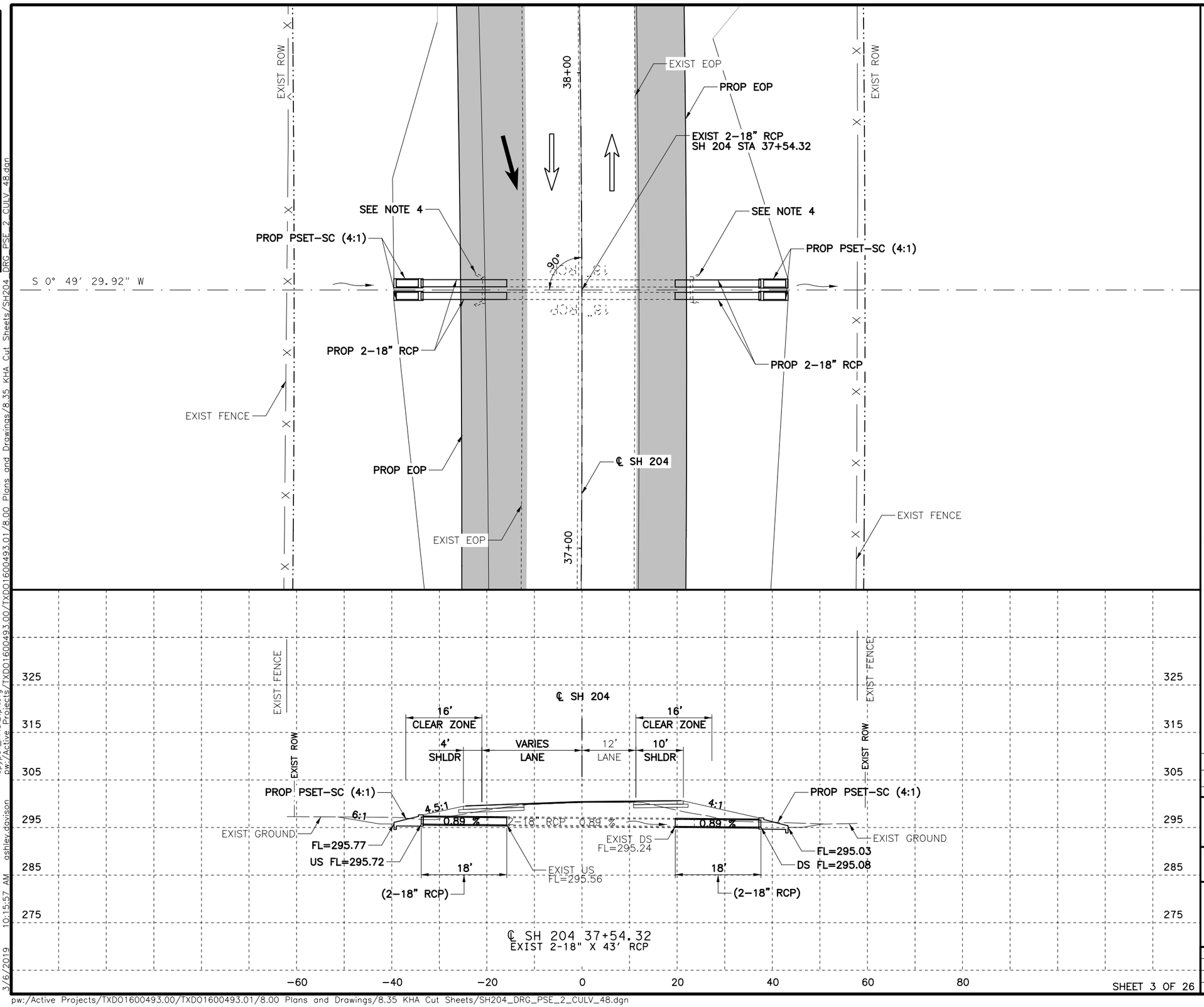

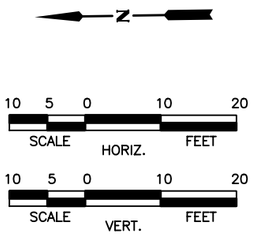

LEGEND

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CULVERT LAYOUT

STA 37+54.32

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Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
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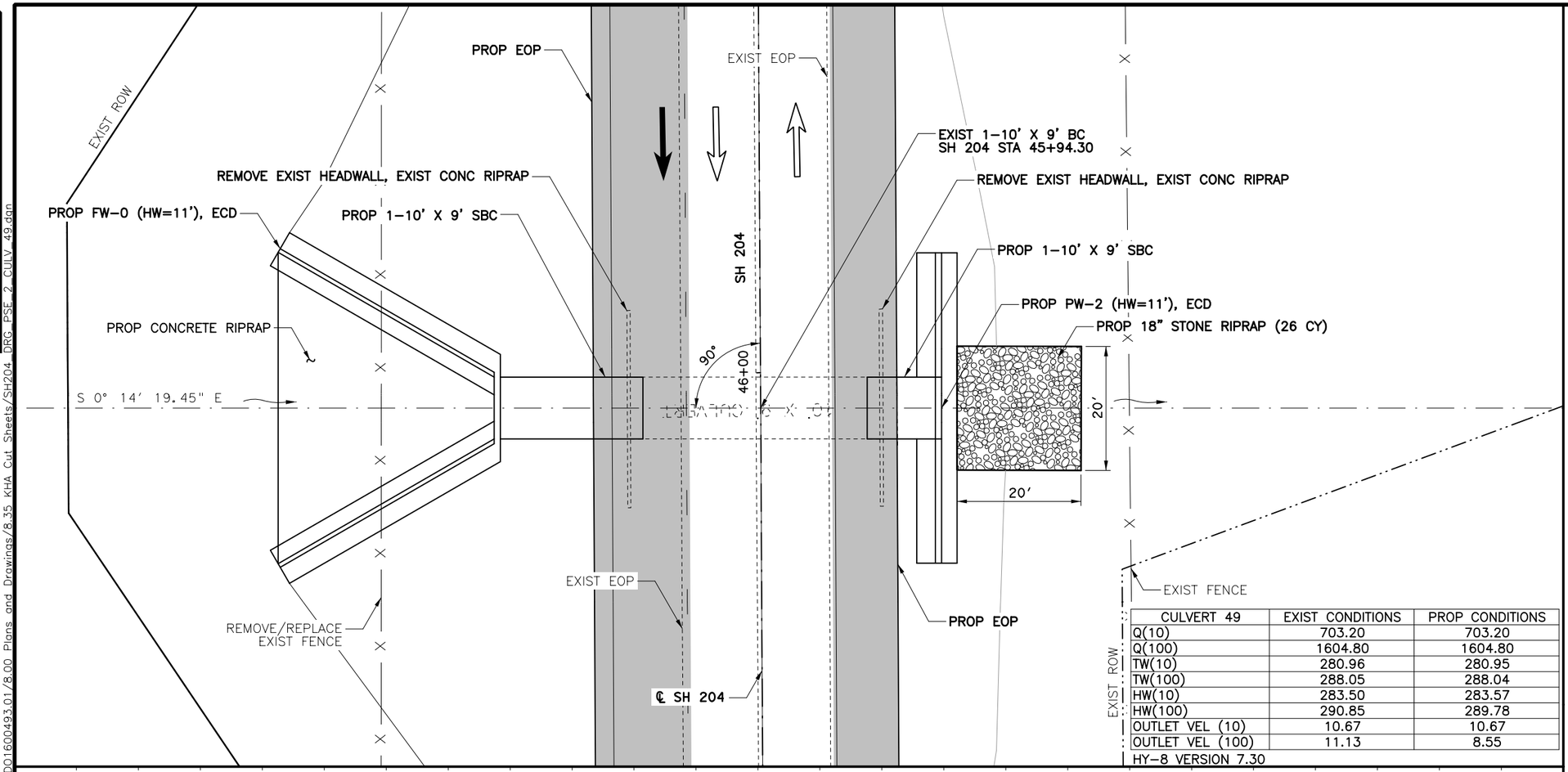
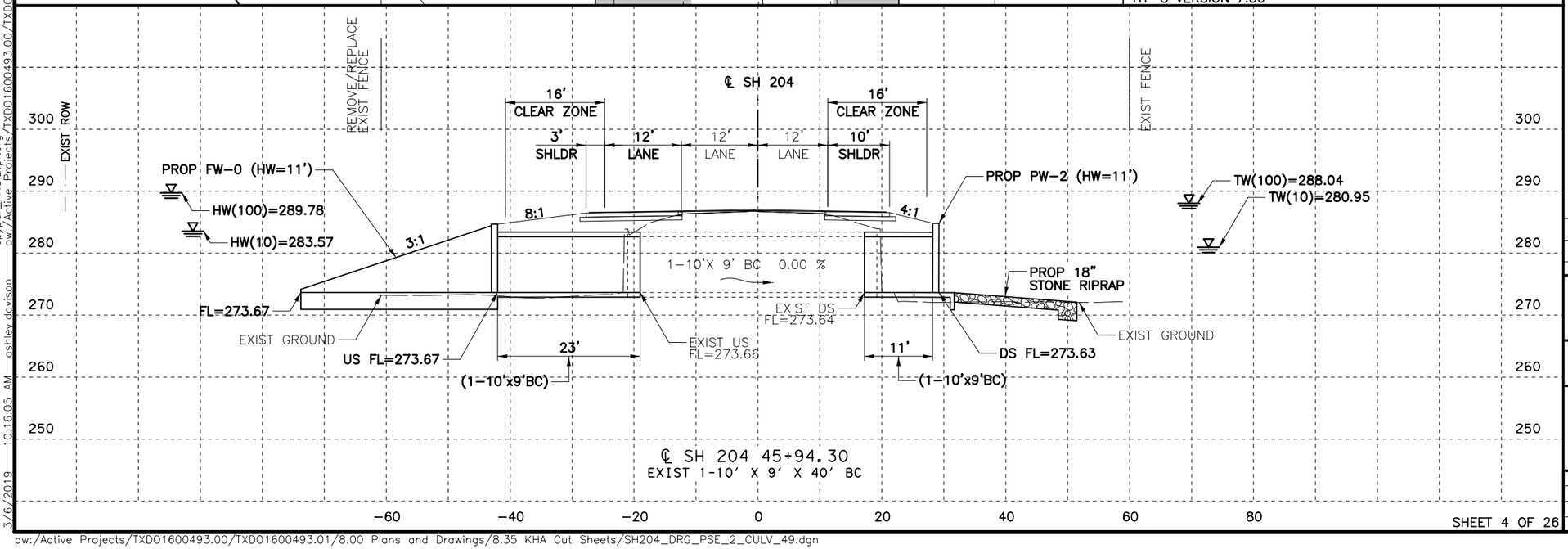


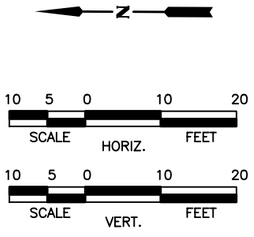
CULVERT 49	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	703.20	703.20
Q(100)	1604.80	1604.80
TW(10)	280.96	280.95
TW(100)	288.05	288.04
HW(10)	283.50	283.57
HW(100)	290.85	289.78
OUTLET VEL (10)	10.67	10.67
OUTLET VEL (100)	11.13	8.55

HY-8 VERSION 7.30



℄ SH 204 45+94.30
EXIST 1-10' X 9' X 40' BC

SHEET 4 OF 26



LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIPRAP
- FLOW ARROW
- EXISTING DITCH FLOW LINE
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NOTES:

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2. REFER TO CONCRETE COLLAR DETAILS FOR MORE INFORMATION.
3. SEE PLAN AND PROFILE SHEETS FOR PROPOSED DITCH INFORMATION

Pedro Carrasco Jr.

03/06/2019

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TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

CULVERT LAYOUT

STA 45+94.30

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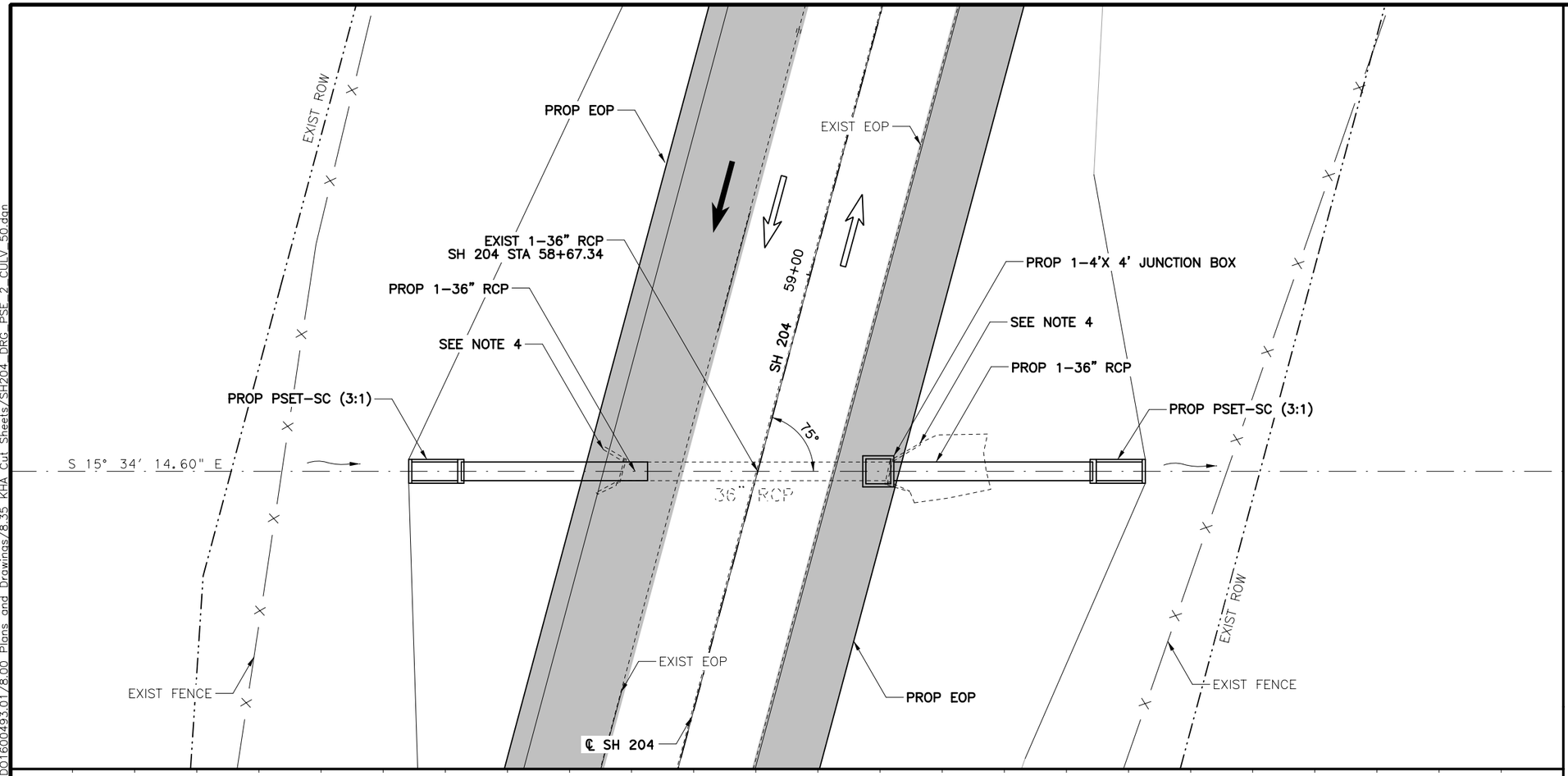

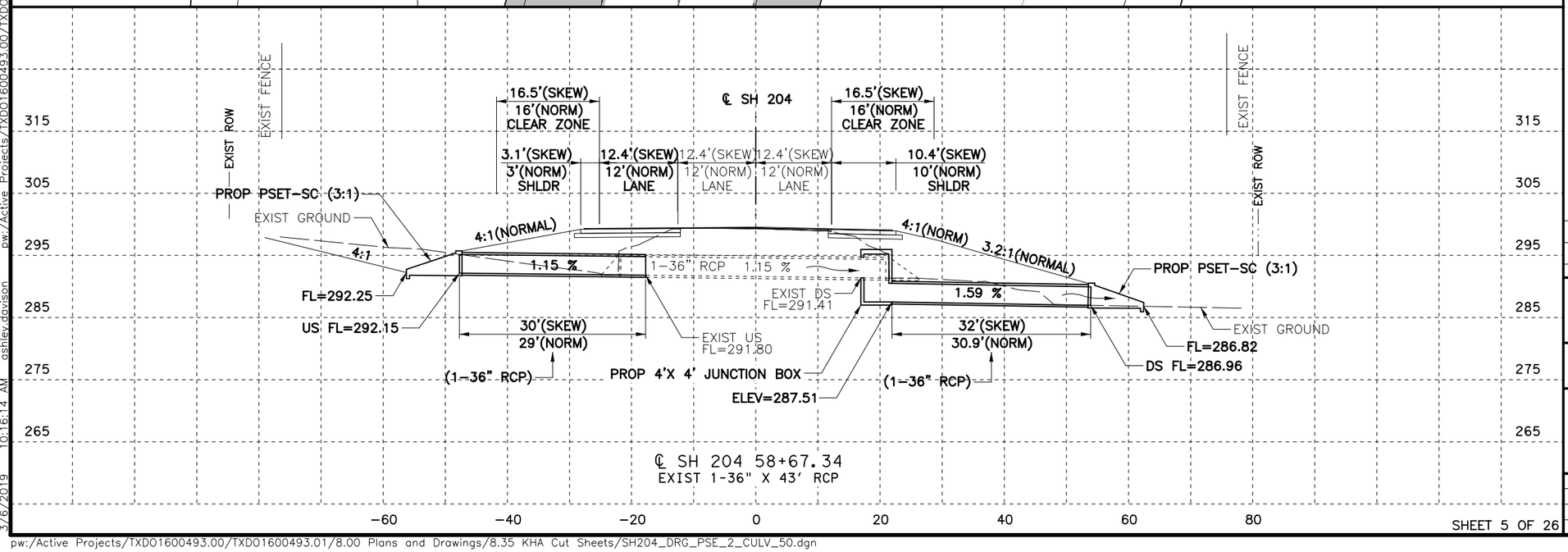

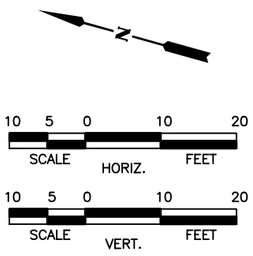

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
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2. REFER TO CONCRETE COLLAR DETAILS FOR MORE INFORMATION.
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4. REMOVE EXISTING HEADWALL, ANY ASSOCIATED CONCRETE RIPRAP, AND 4 LF OF PIPE OR UP TO FIRST JOINT. BEGIN EXTENSION AT FINISHED PIPE END.

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03/06/2019

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TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

CULVERT LAYOUT

STA 58+67.34

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
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Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		153

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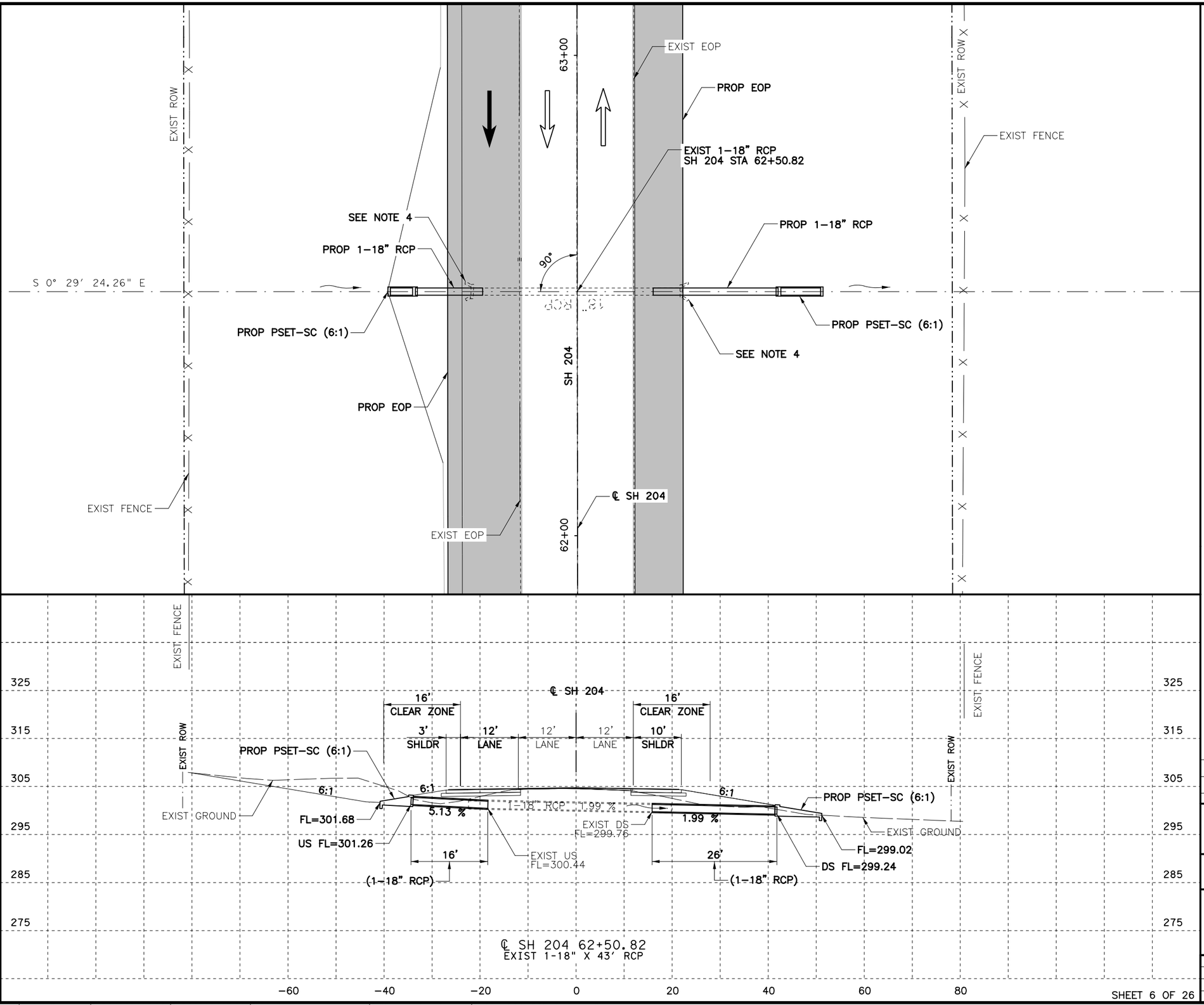

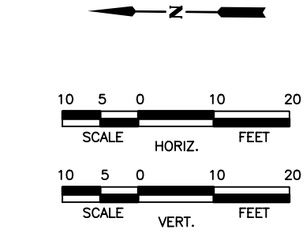

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIPRAP
- FLOW ARROW
- EXISTING DITCH FLOW LINE
- PROPOSED DITCH FLOW LINE
- EOP=EDGE OF PAVEMENT

NOTES:

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2. REFER TO CONCRETE COLLAR DETAILS FOR MORE INFORMATION.
3. SEE PLAN AND PROFILE SHEETS FOR PROPOSED DITCH INFORMATION
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Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

CULVERT LAYOUT

STA 62+50.82

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		154

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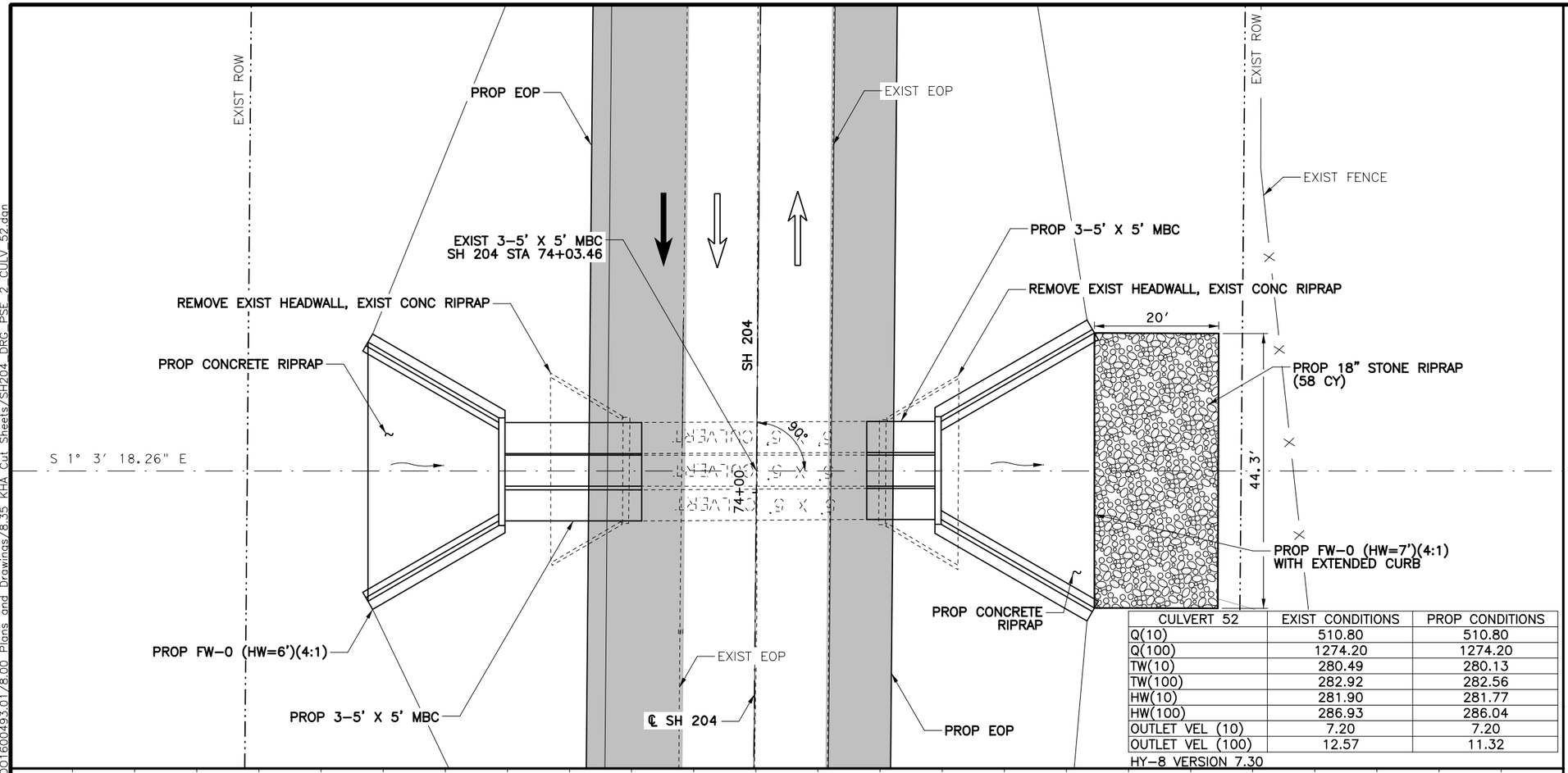
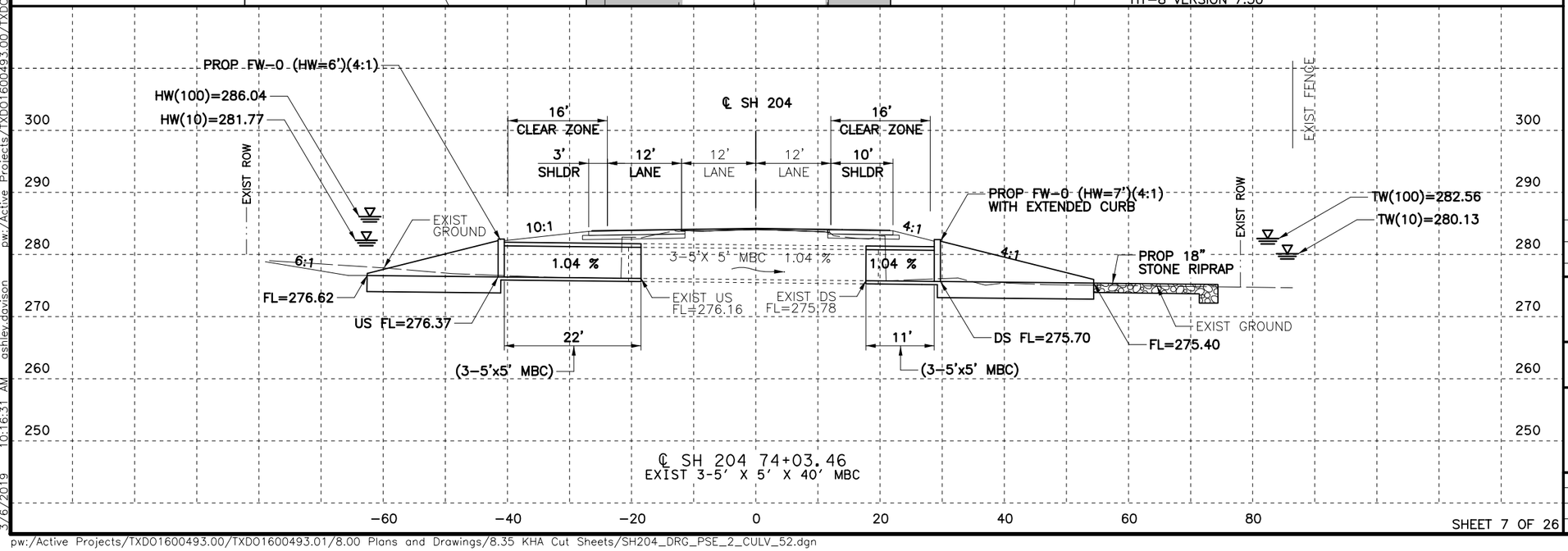


CULVERT 52	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	510.80	510.80
Q(100)	1274.20	1274.20
TW(10)	280.49	280.13
TW(100)	282.92	282.56
HW(10)	281.90	281.77
HW(100)	286.93	286.04
OUTLET VEL (10)	7.20	7.20
OUTLET VEL (100)	12.57	11.32

HY-8 VERSION 7.30



℄ SH 204 74+03.46
EXIST 3-5' X 5' X 40' MBC

SHEET 7 OF 26

10 5 0 10 20
SCALE FEET
HORIZ.

10 5 0 10 20
SCALE FEET
VERT.

LEGEND

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STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn
TEXAS REGISTERED ENGINEERING FIRM F-928

 Texas Department of Transportation

SH 204

CULVERT LAYOUT

STA 74+03.46

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		155

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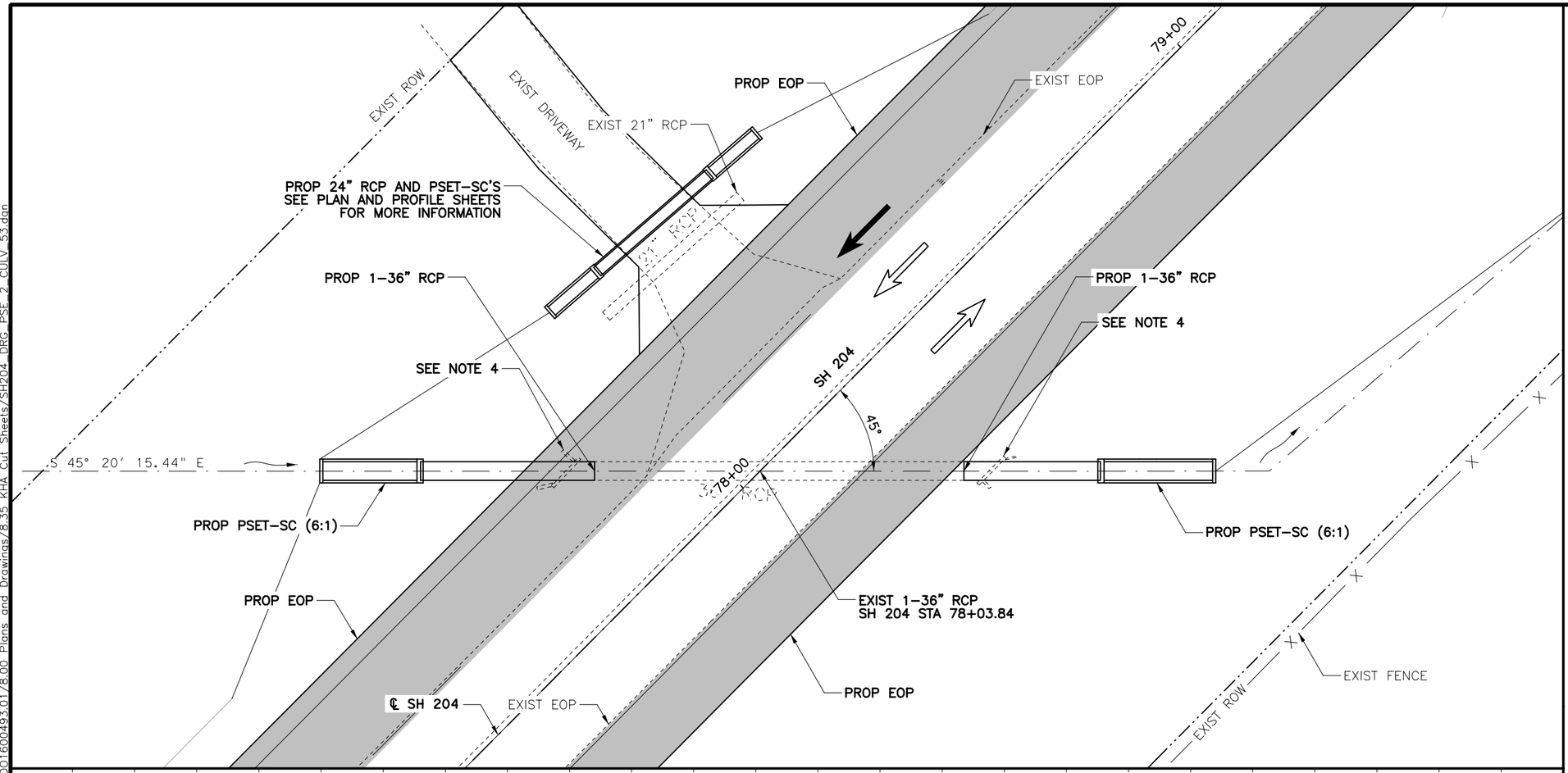

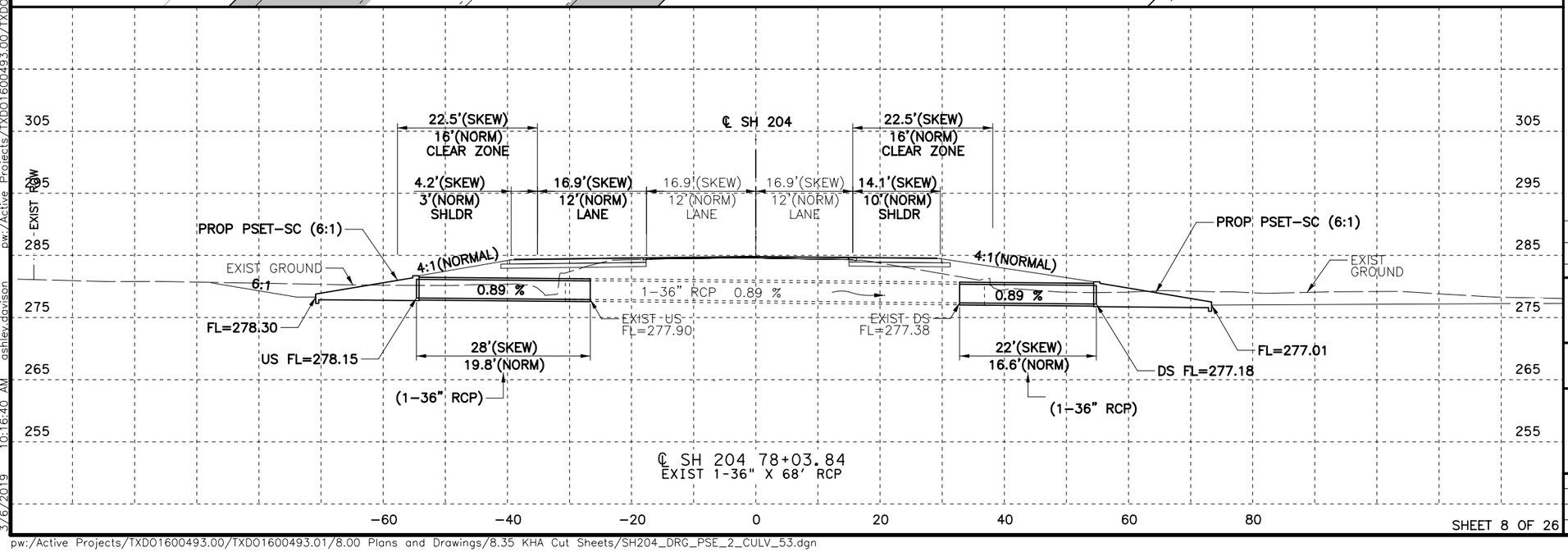

10 5 0 10 20
SCALE HORIZ. FEET

10 5 0 10 20
SCALE VERT. FEET

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 Texas Department of Transportation

SH 204

CULVERT LAYOUT

STA 78+03.84

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Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		156

pw:/Active Projects/TXDO1600493.00/TXDO1600493.01/8.00 Plans and Drawings/8.35 KHA Cut Sheets/SH204_DRG_PSE_2_CULV_53.dgn

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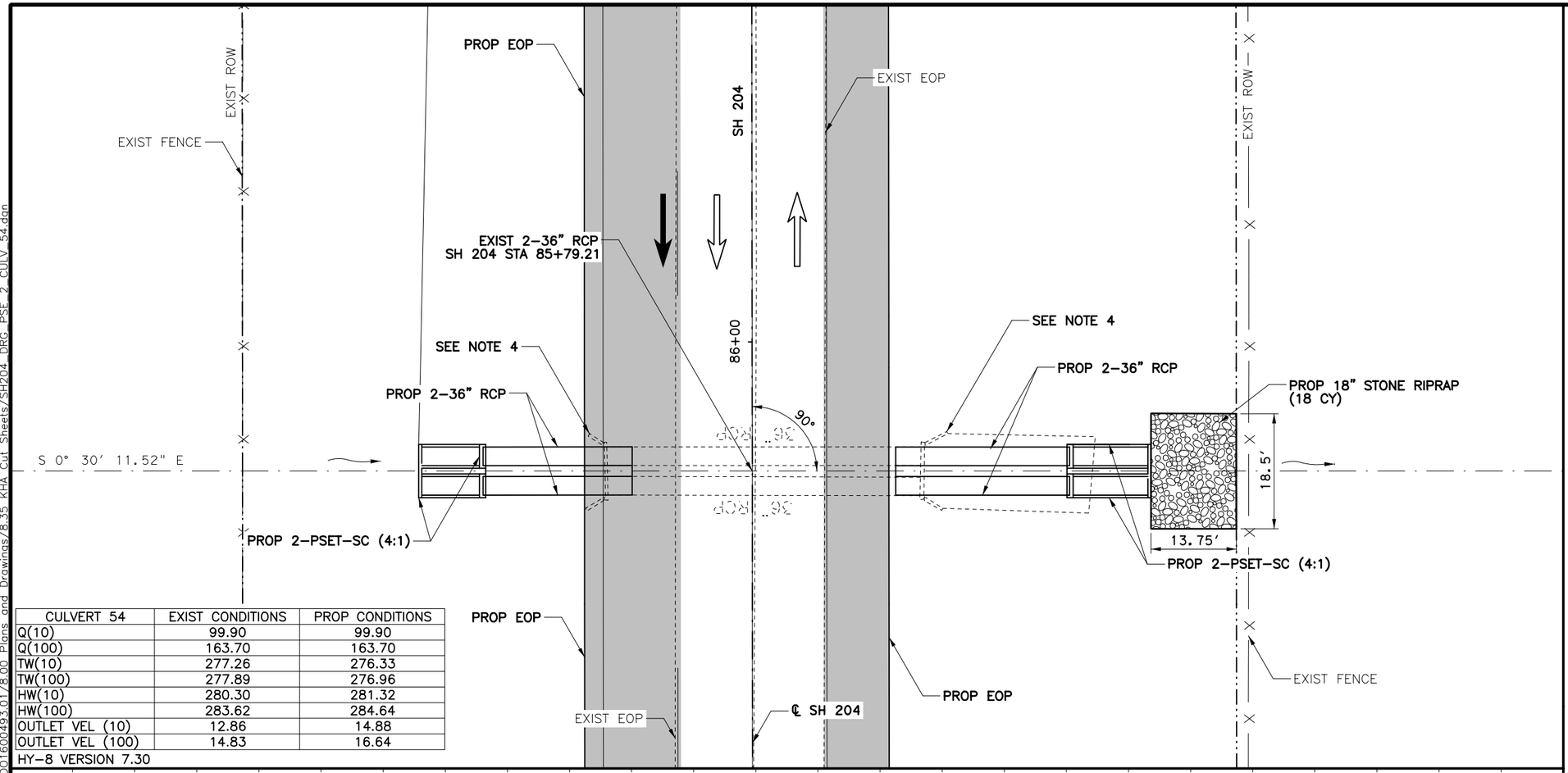
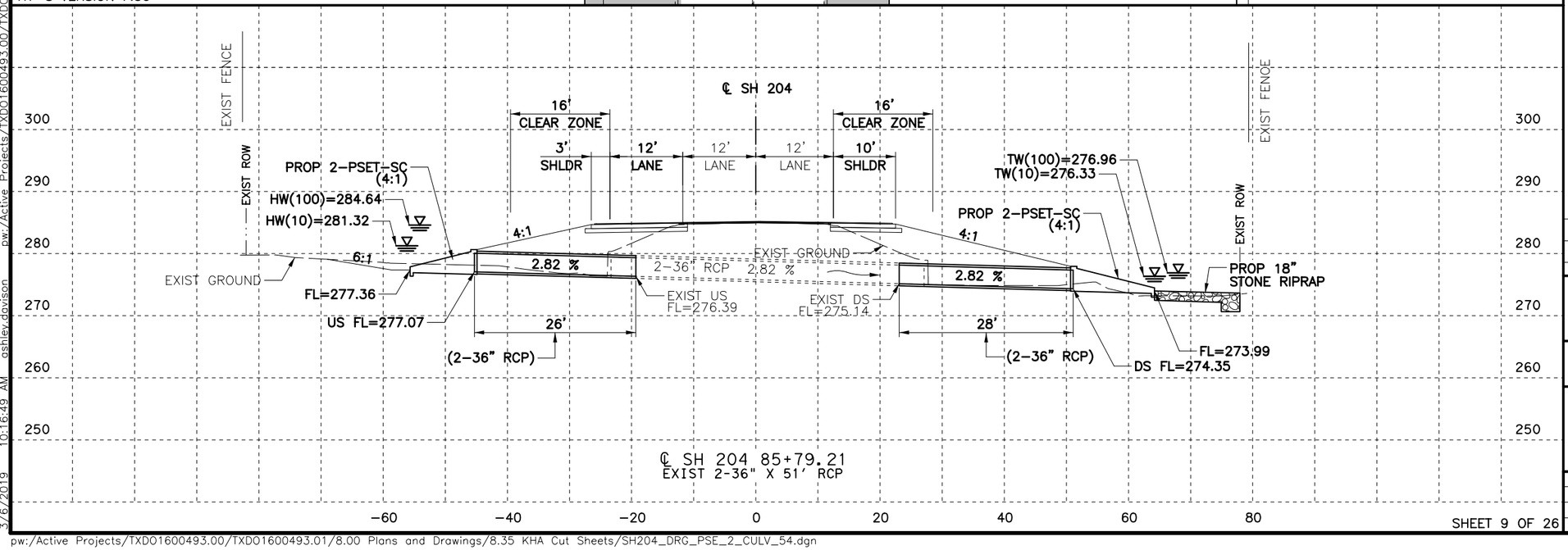
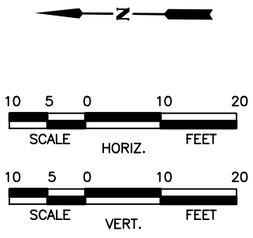


CULVERT 54	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	99.90	99.90
Q(100)	163.70	163.70
TW(10)	277.26	276.33
TW(100)	277.89	276.96
HW(10)	280.30	281.32
HW(100)	283.62	284.64
OUTLET VEL (10)	12.86	14.88
OUTLET VEL (100)	14.83	16.64

HY–8 VERSION 7.30



SHEET 9 OF 26



LEGEND

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- PROPOSED LANE
- PROPOSED PAVEMENT
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Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

CULVERT LAYOUT

STA 85+79.21

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.	
Checked:	PRC		TEXAS					SH 204	
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
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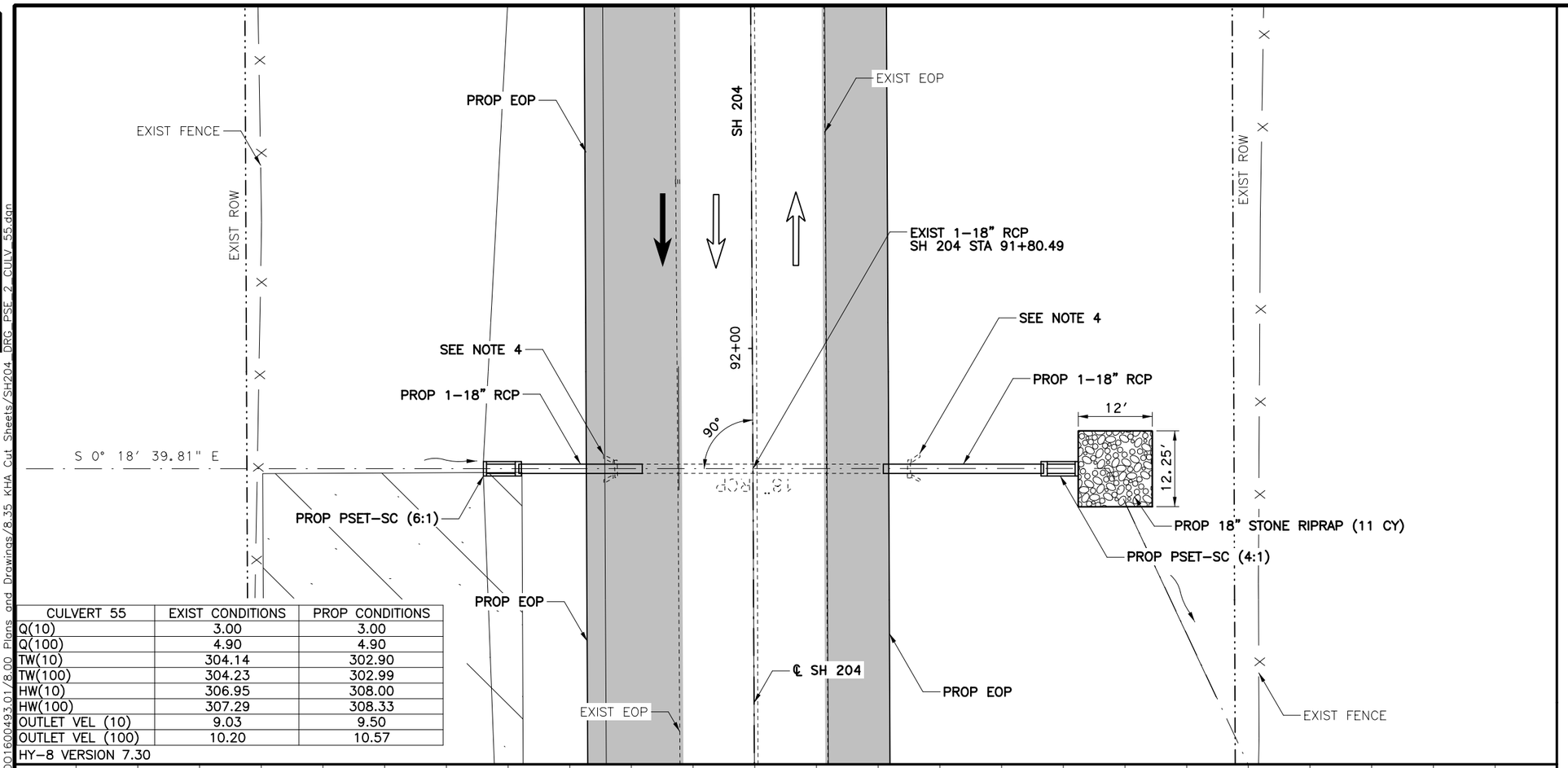
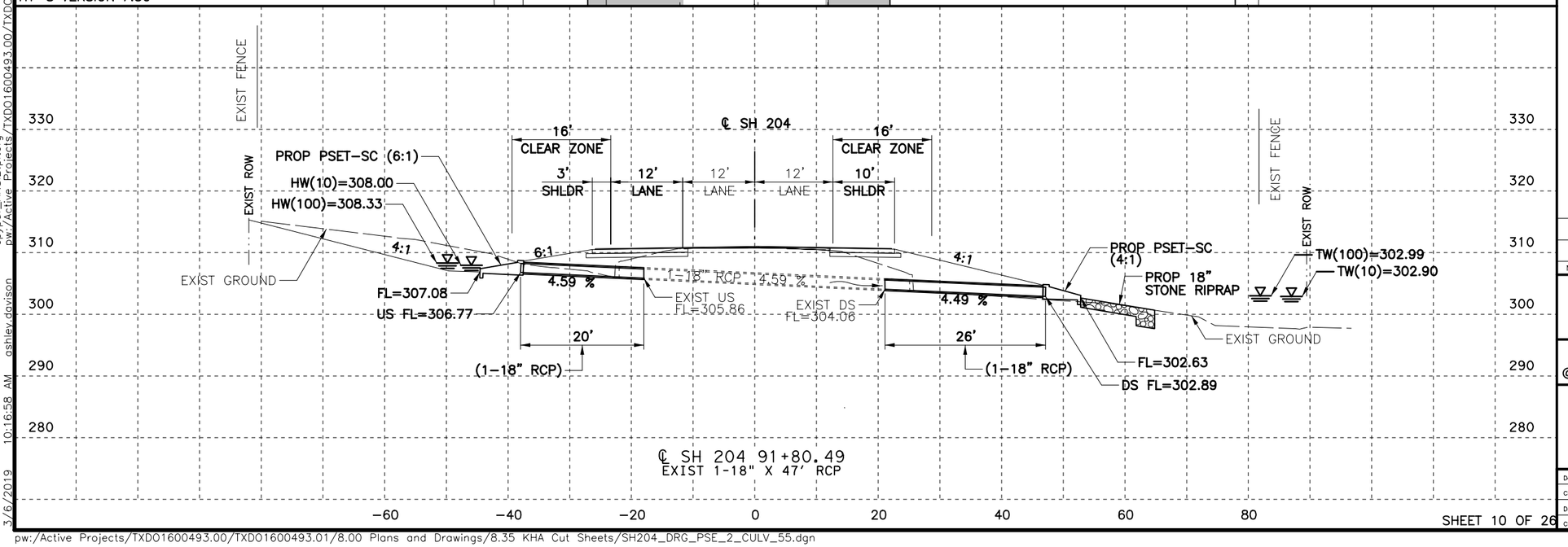
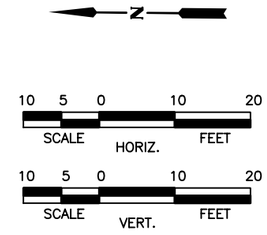


CULVERT 55	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	3.00	3.00
Q(100)	4.90	4.90
TW(10)	304.14	302.90
TW(100)	304.23	302.99
HW(10)	306.95	308.00
HW(100)	307.29	308.33
OUTLET VEL (10)	9.03	9.50
OUTLET VEL (100)	10.20	10.57

HY–8 VERSION 7.30





LEGEND

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03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

CULVERT LAYOUT

STA 91+80.49

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
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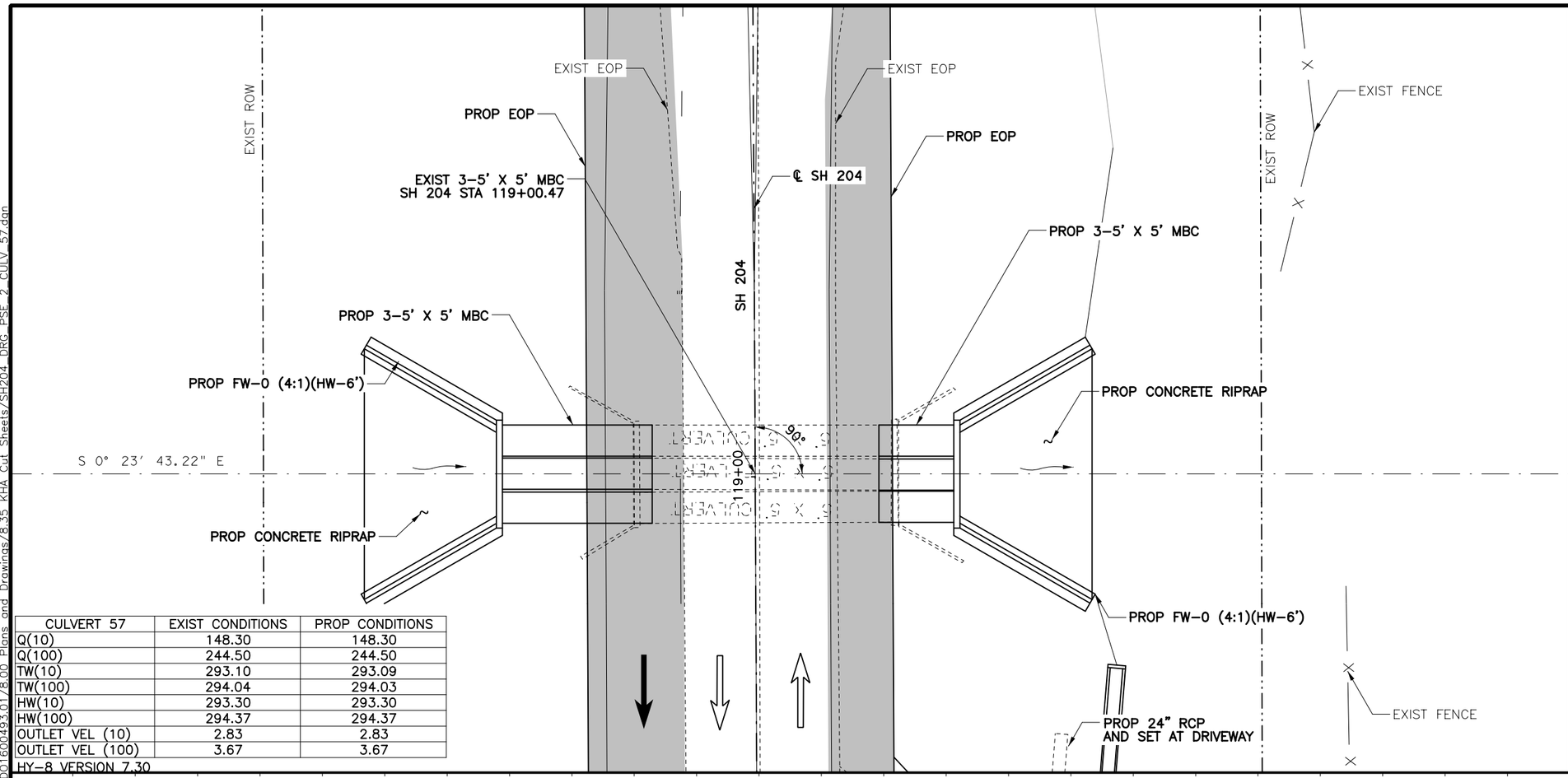
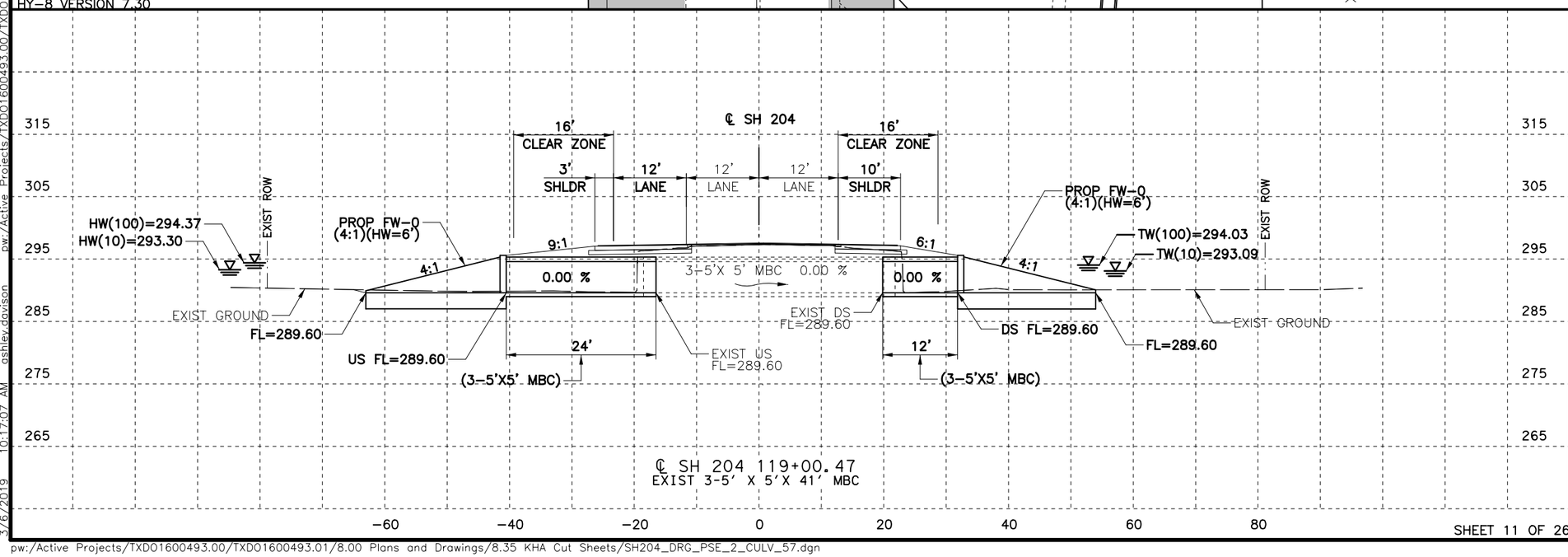


CULVERT 57	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	148.30	148.30
Q(100)	244.50	244.50
TW(10)	293.10	293.09
TW(100)	294.04	294.03
HW(10)	293.30	293.30
HW(100)	294.37	294.37
OUTLET VEL (10)	2.83	2.83
OUTLET VEL (100)	3.67	3.67

HY–8 VERSION 7.30



10 5 0 10 20
SCALE HORIZ. FEET

10 5 0 10 20
SCALE VERT. FEET

LEGEND

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STATE OF TEXAS · PEDRO CARRASCO JR. · 98380 · LICENSED PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

 Texas Department of Transportation

SH 204

CULVERT LAYOUT

STA 119+00.47

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	PRC		TEXAS				SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013	159

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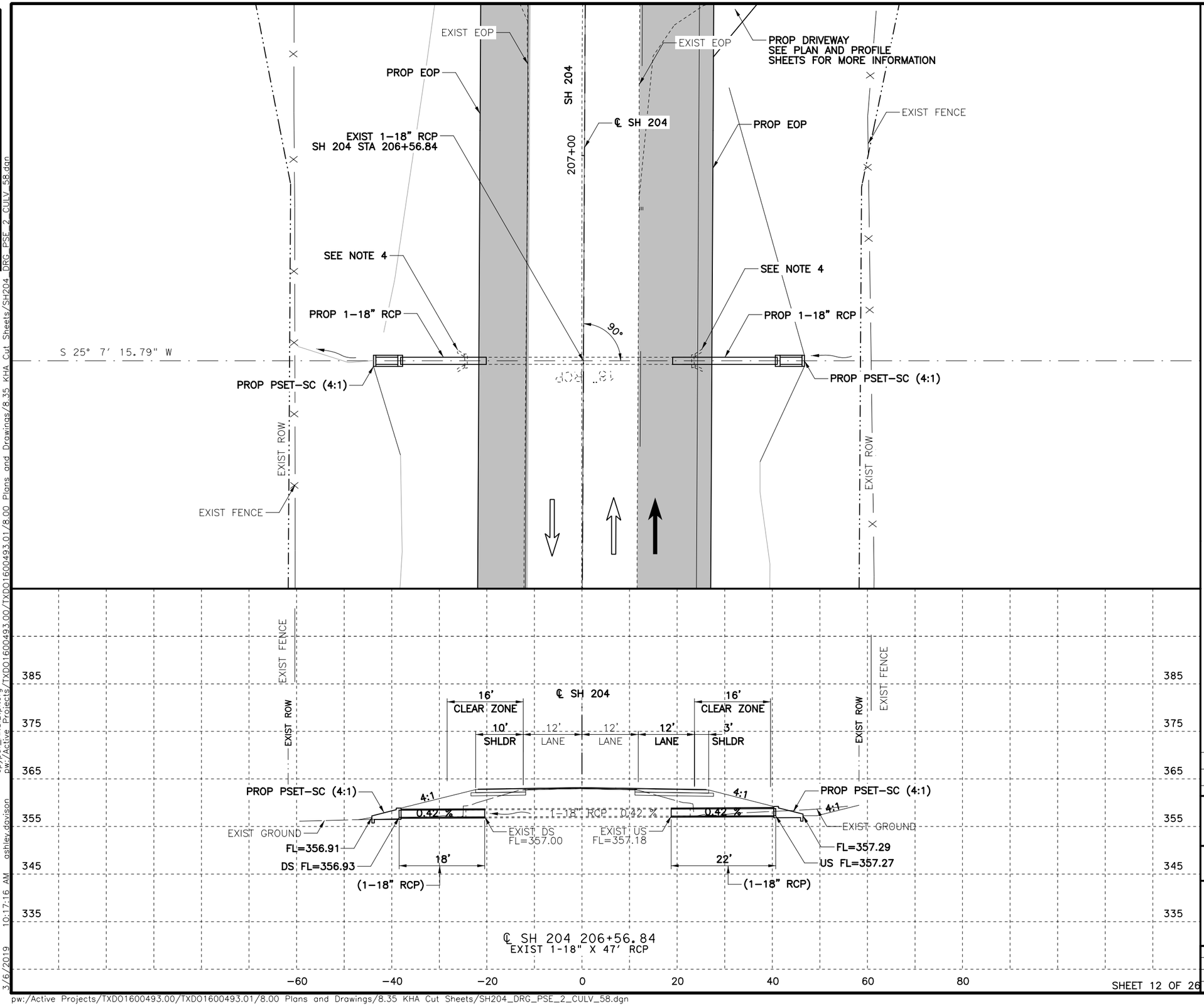

LEGEND

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TEXAS REGISTERED ENGINEERING FIRM F-928

 Texas Department of Transportation

SH 204

CULVERT LAYOUT

STA 206+56.84

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
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Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		160

SHEET 12 OF 26

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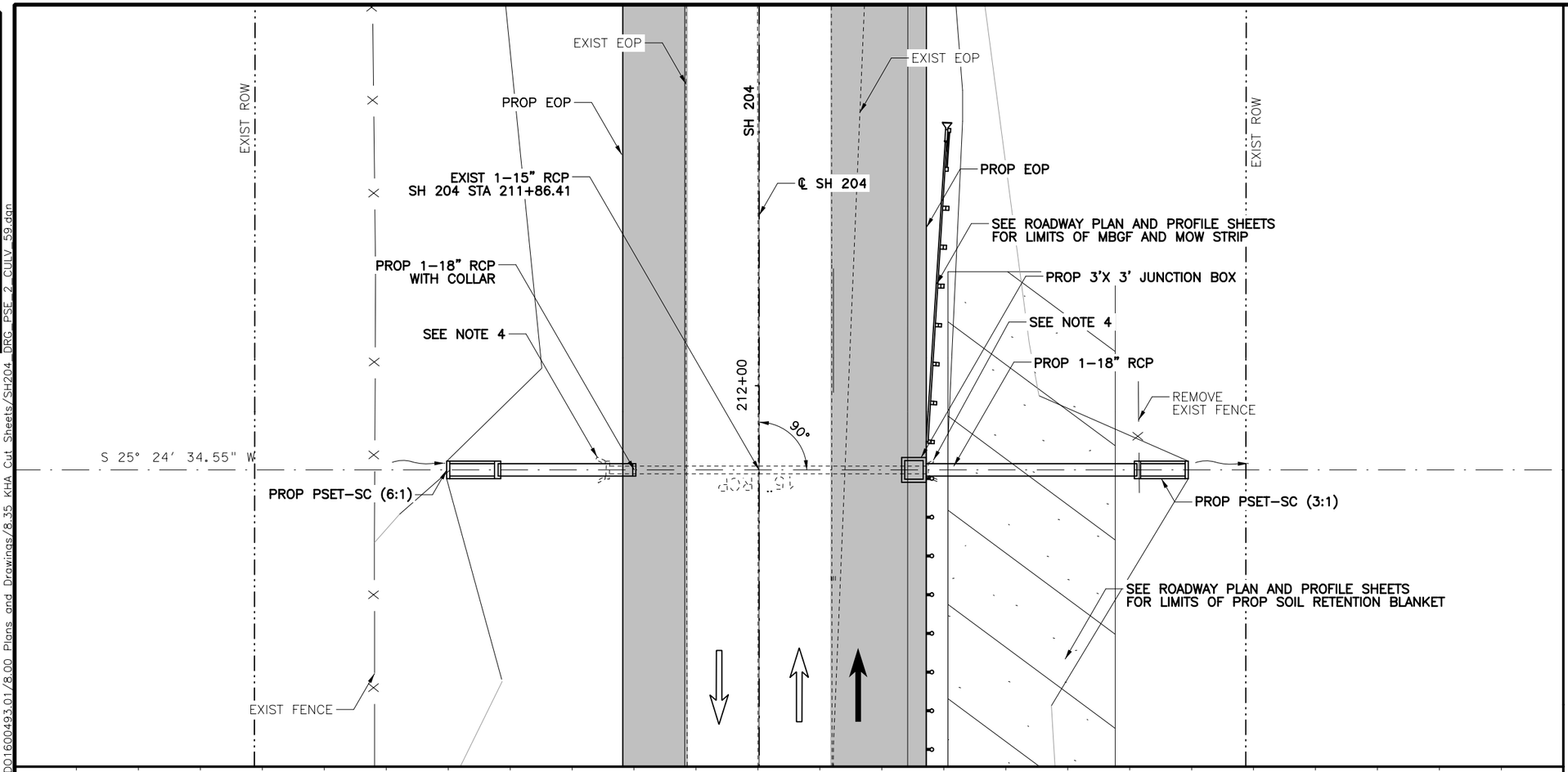

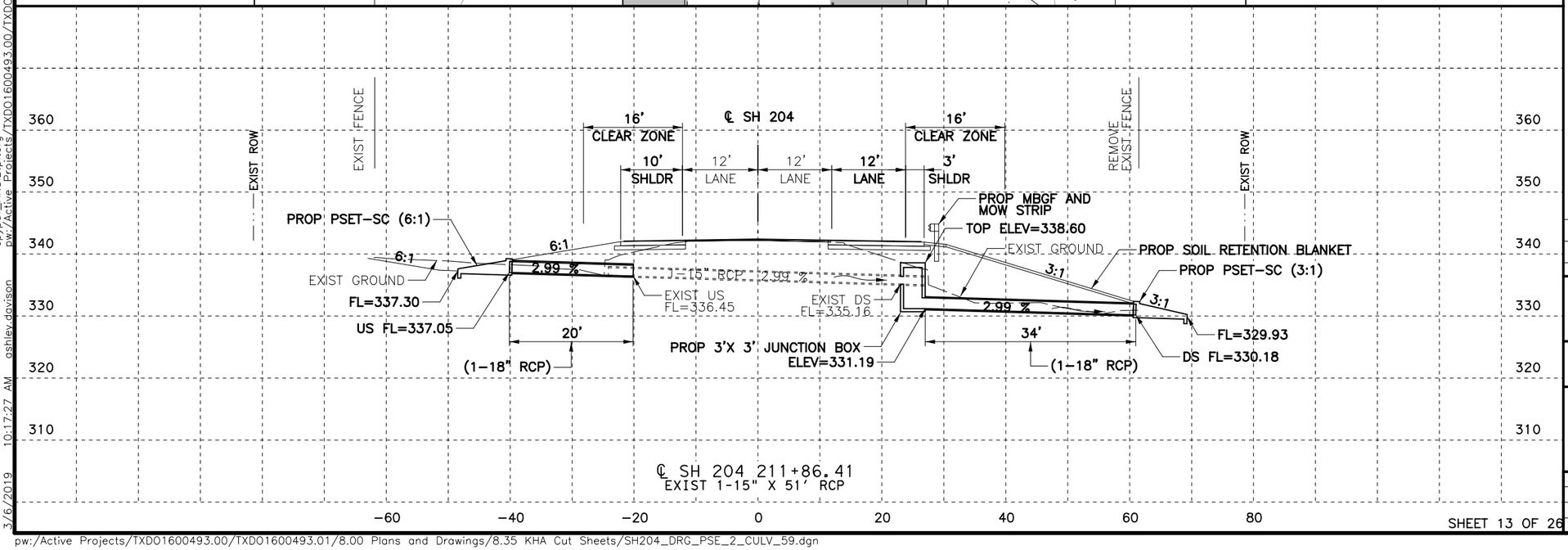

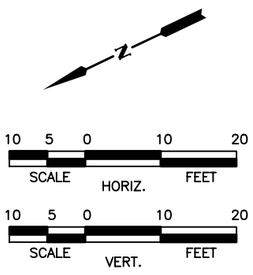

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STATE OF TEXAS
98380
LICENSED
PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

 Texas Department of Transportation

SH 204

CULVERT LAYOUT

STA 211+86.41

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
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SHEET 13 OF 26

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3/6/2019 10:17:27 AM ashley.davison

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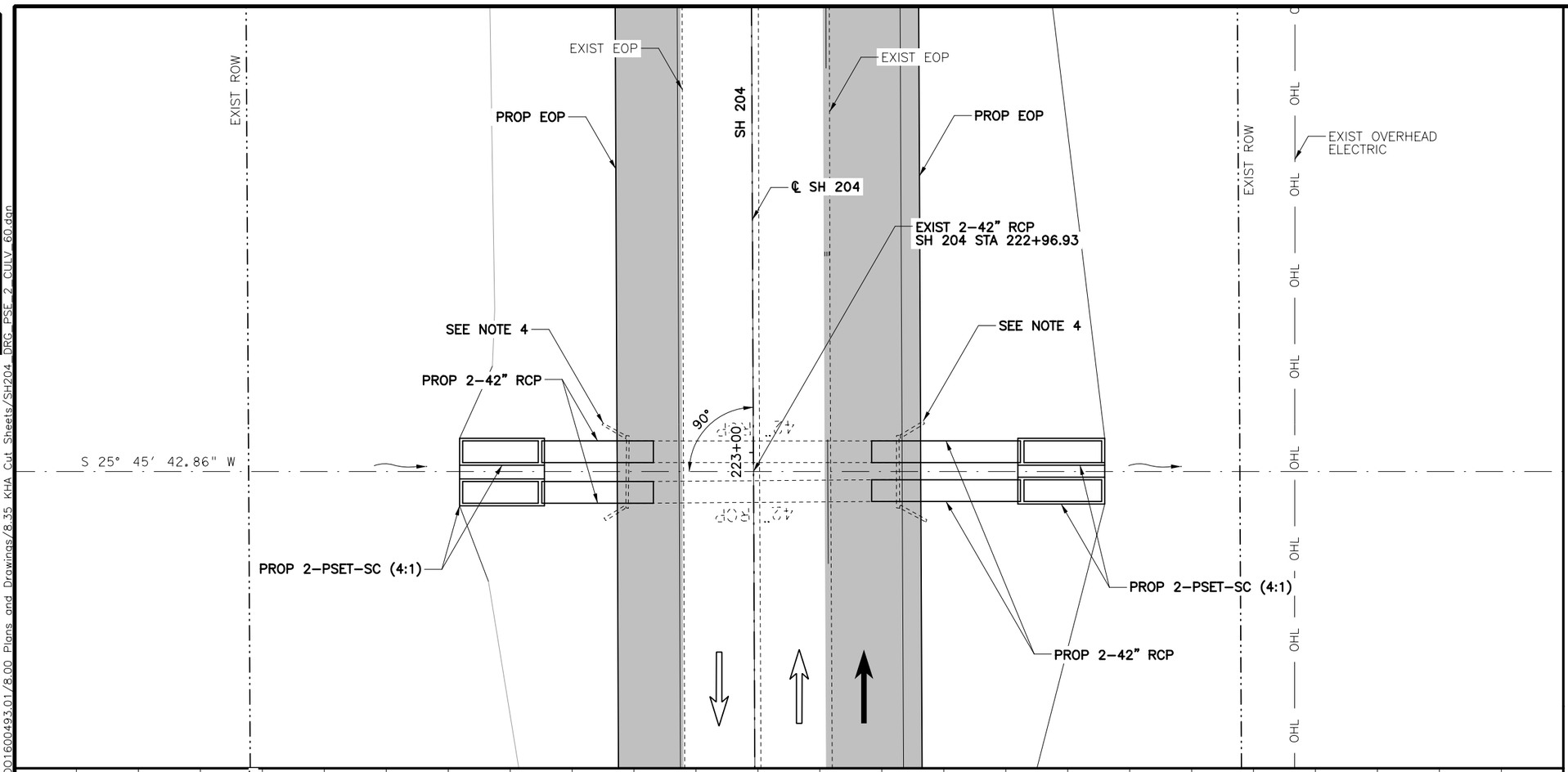

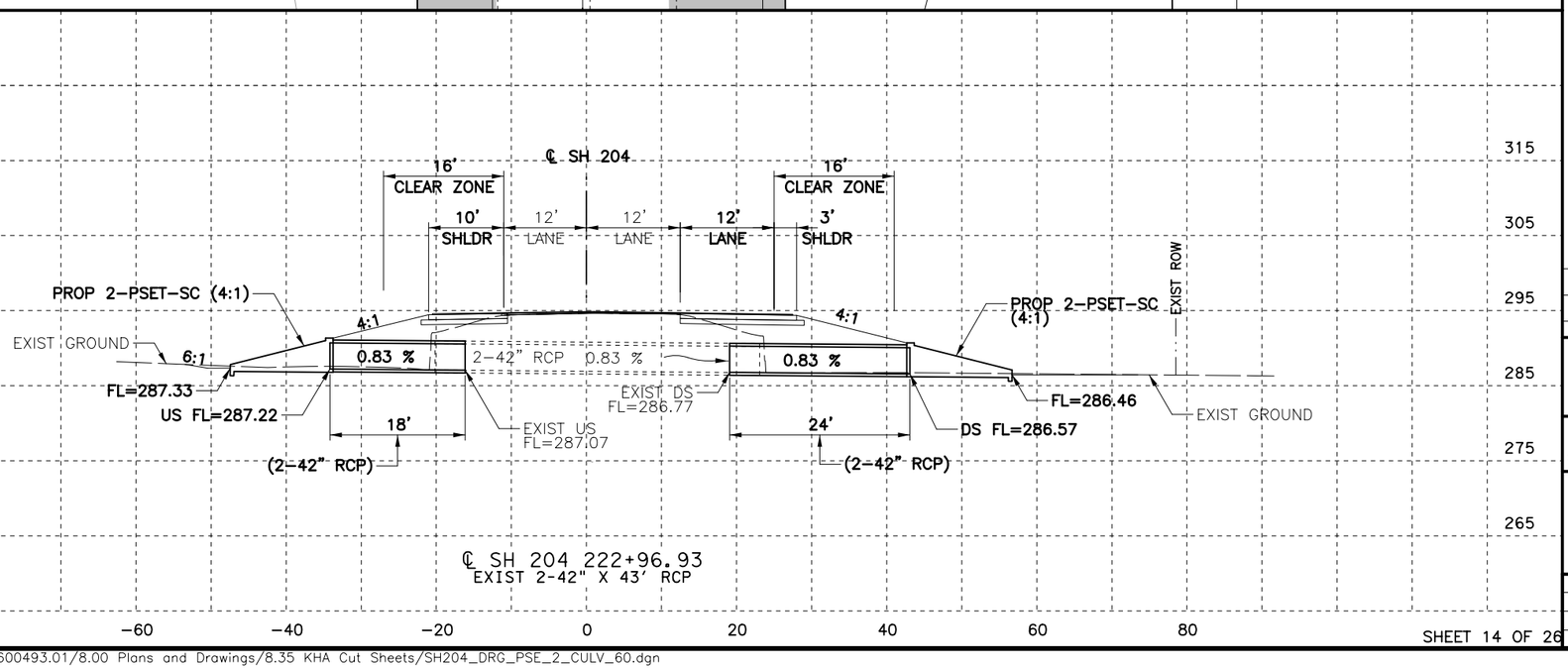

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STATE OF TEXAS 98380 LICENSED PROFESSIONAL ENGINEER

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SH 204

CULVERT LAYOUT

STA 222+96.93

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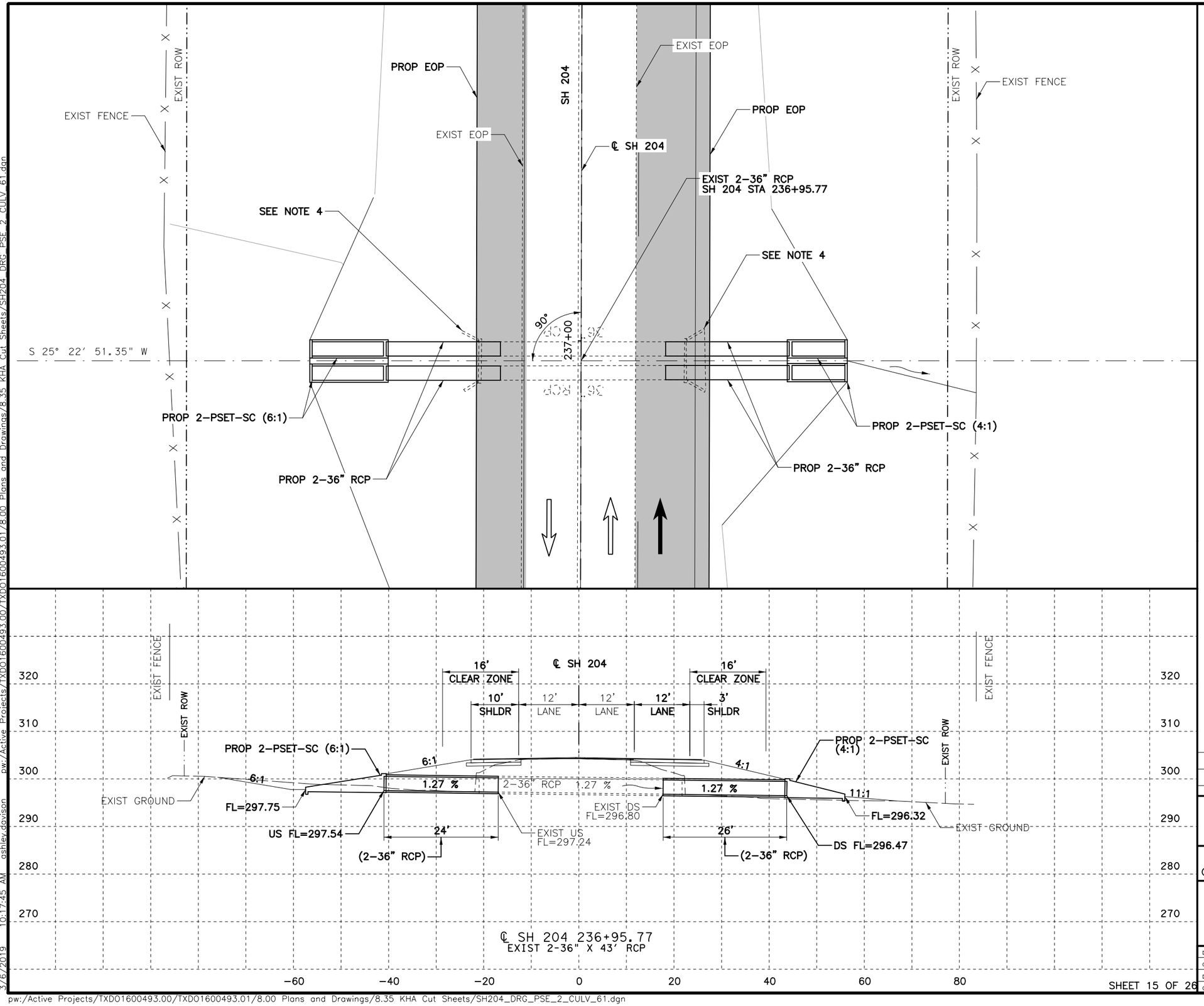

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4. REMOVE EXISTING HEADWALL, ANY ASSOCIATED CONCRETE RIPRAP, AND 4 LF OF PIPE OR UP TO FIRST JOINT. BEGIN EXTENSION AT FINISHED PIPE END.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

CULVERT LAYOUT

STA 236+95.77

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		163

SHEET 15 OF 26

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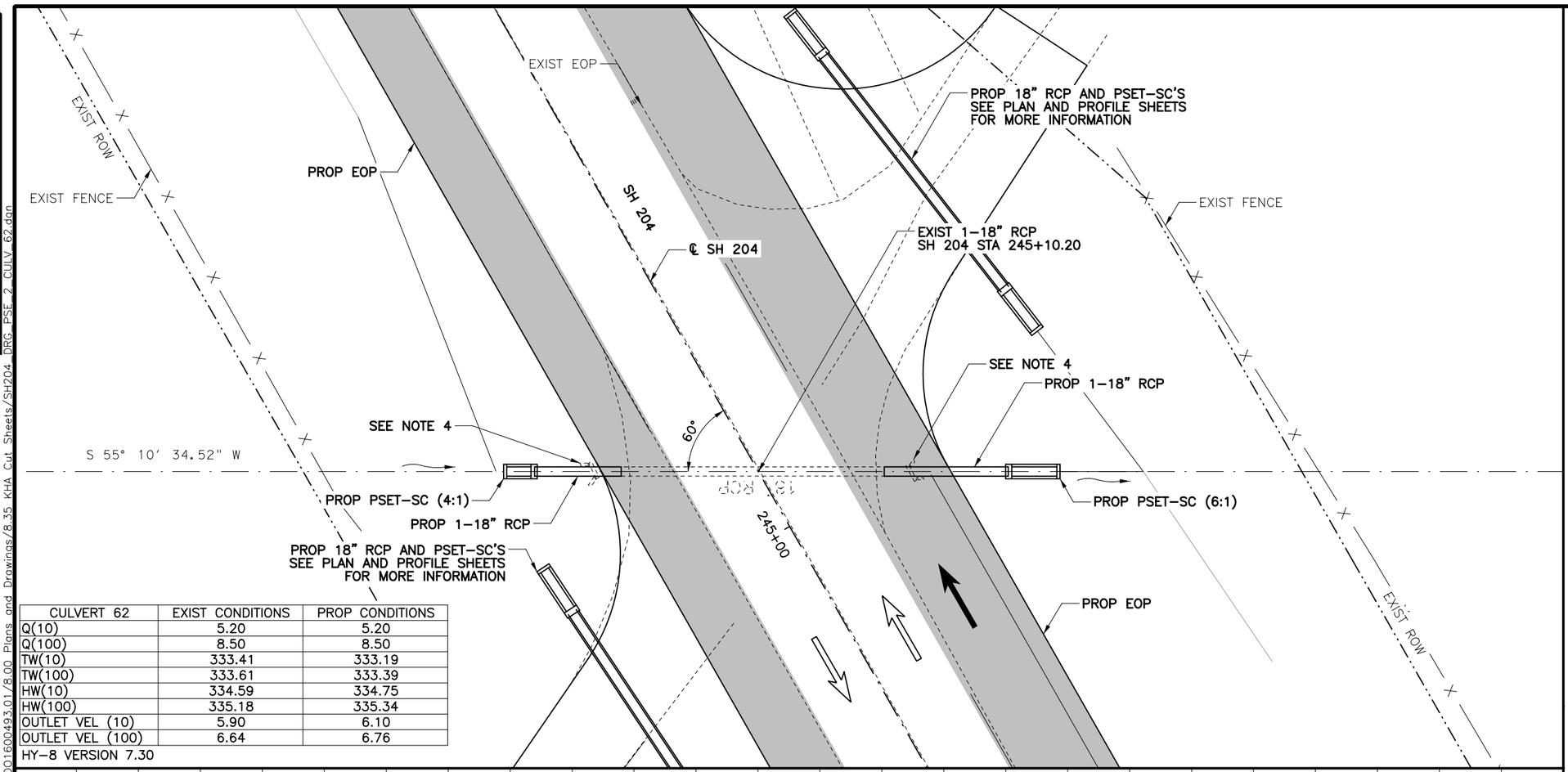
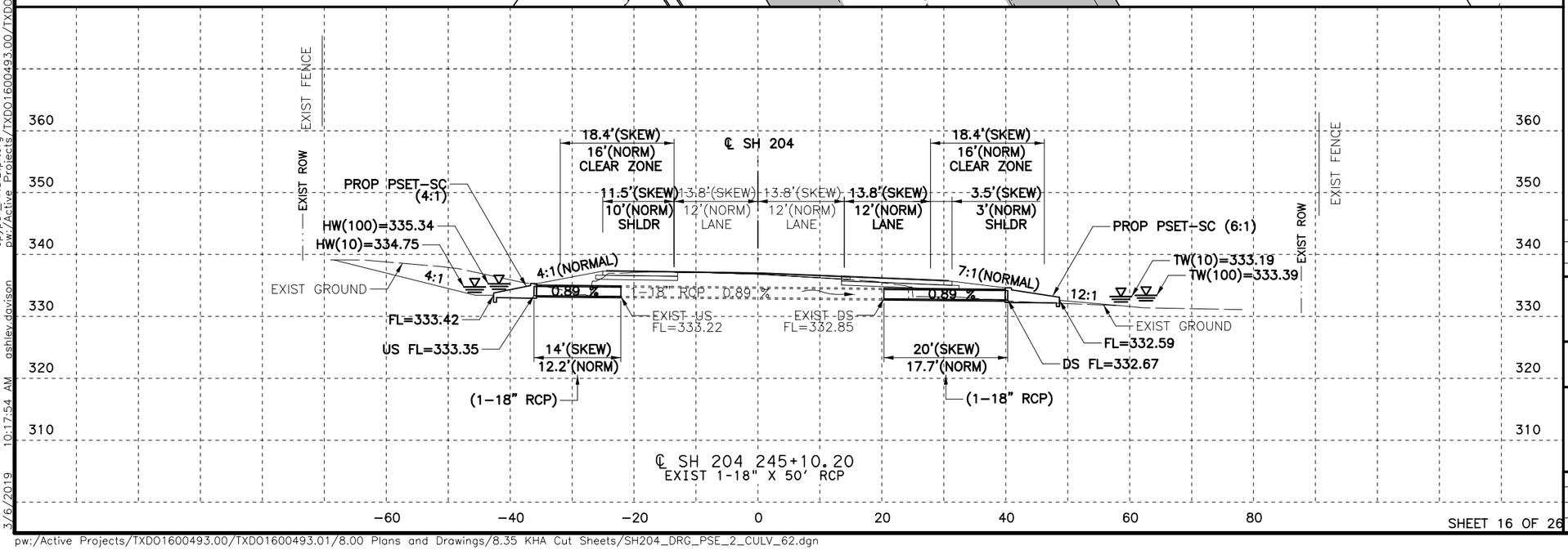
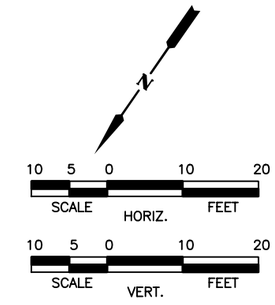


CULVERT 62	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	5.20	5.20
Q(100)	8.50	8.50
TW(10)	333.41	333.19
TW(100)	333.61	333.39
HW(10)	334.59	334.75
HW(100)	335.18	335.34
OUTLET VEL (10)	5.90	6.10
OUTLET VEL (100)	6.64	6.76

HY-8 VERSION 7.30



SHEET 16 OF 26



LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIPRAP
- FLOW ARROW
- EXISTING DITCH FLOW LINE
- PROPOSED DITCH FLOW LINE
- EOP=EDGE OF PAVEMENT

NOTES:

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Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

 Texas Department of Transportation

SH 204

CULVERT LAYOUT

STA 245+10.20

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		164

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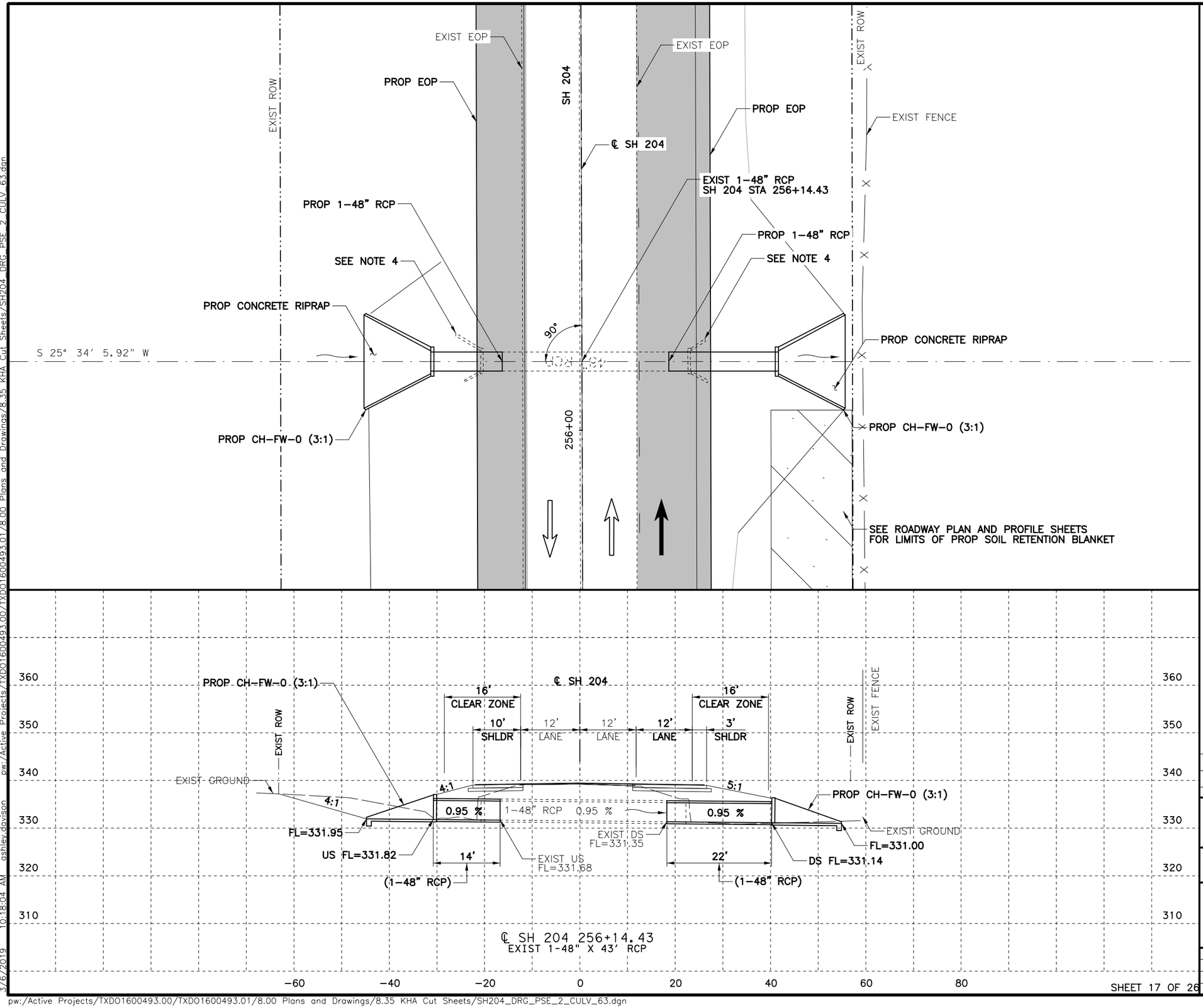

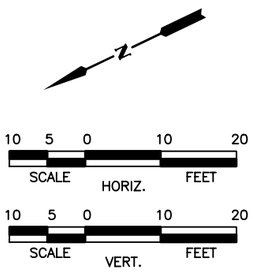

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIPRAP
- FLOW ARROW
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03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

CULVERT LAYOUT

STA 256+14.43

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		165

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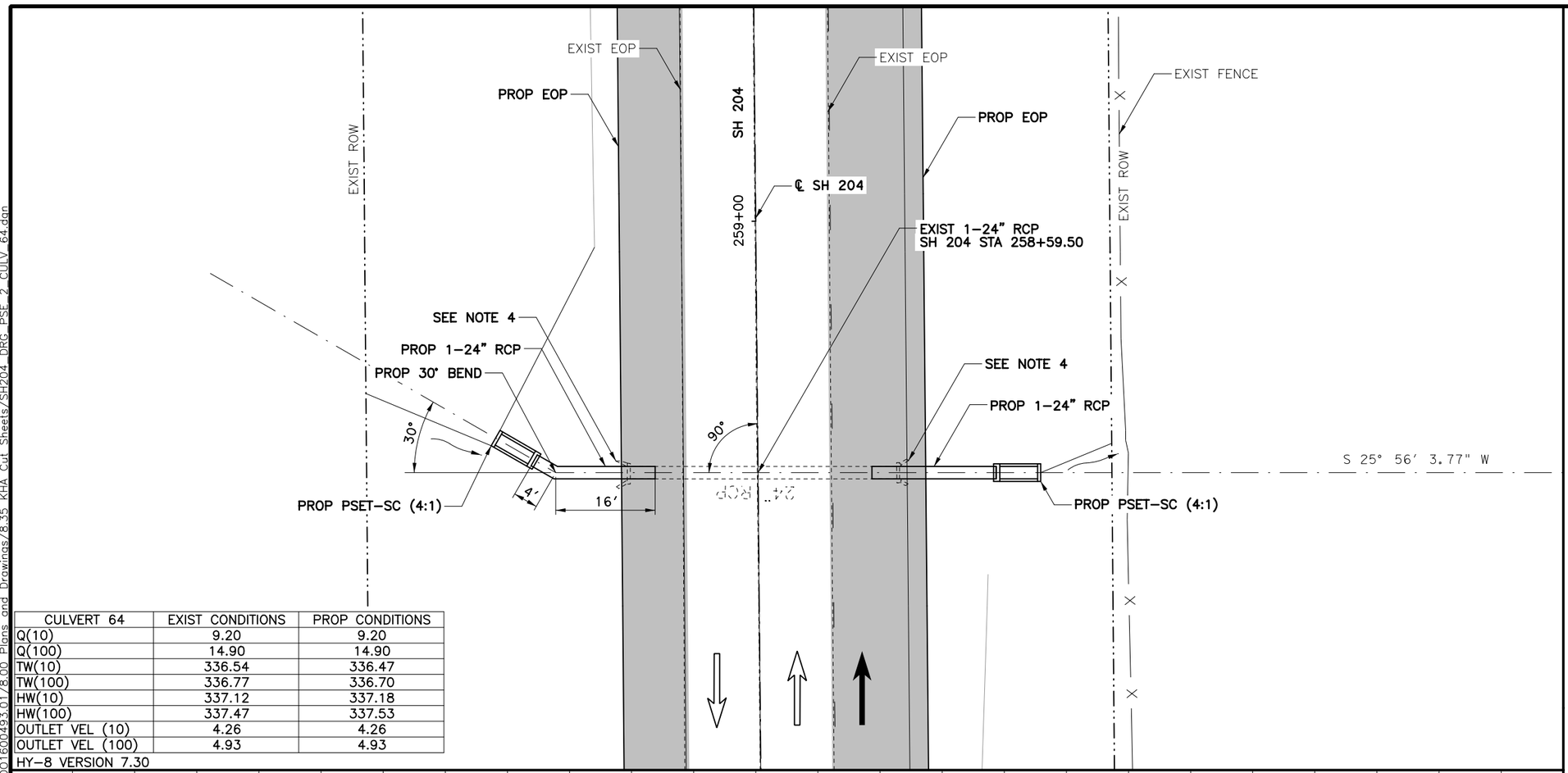
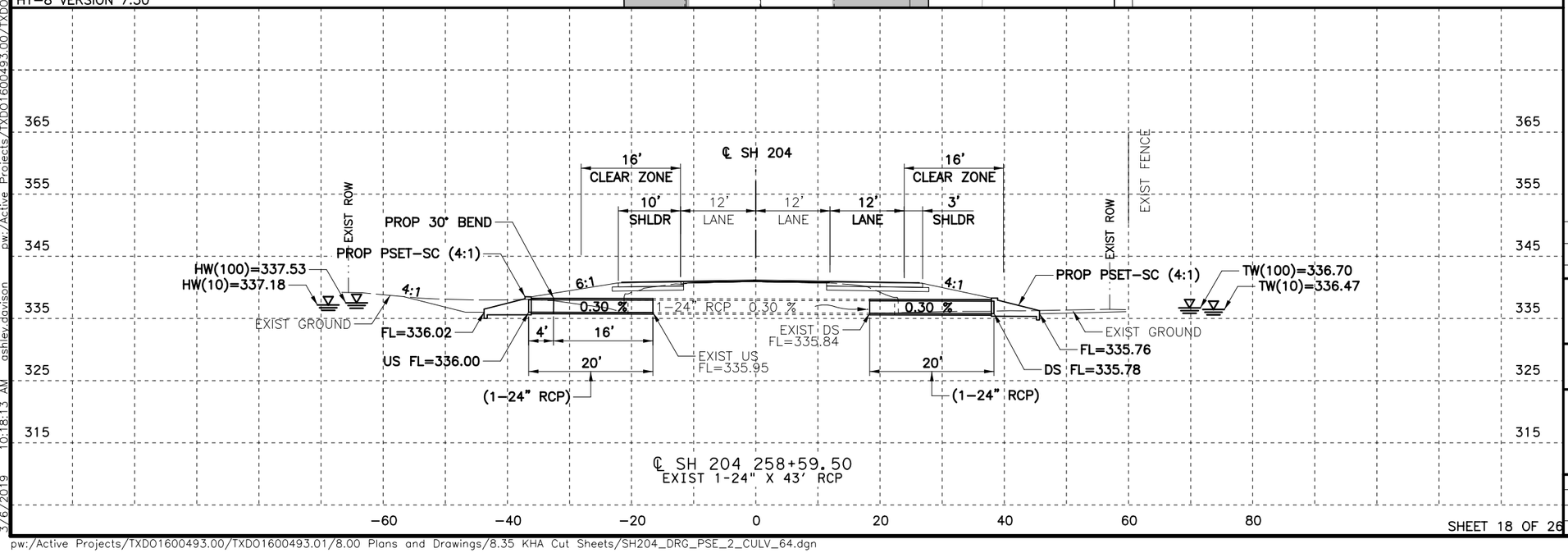
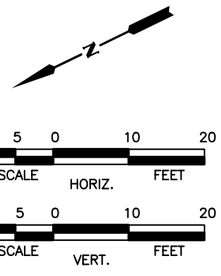


CULVERT 64	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	9.20	9.20
Q(100)	14.90	14.90
TW(10)	336.54	336.47
TW(100)	336.77	336.70
HW(10)	337.12	337.18
HW(100)	337.47	337.53
OUTLET VEL (10)	4.26	4.26
OUTLET VEL (100)	4.93	4.93

HY–8 VERSION 7.30





LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIPRAP
- FLOW ARROW
- EXISTING DITCH FLOW LINE
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Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

CULVERT LAYOUT

STA 258+59.50

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	PRC		TEXAS				SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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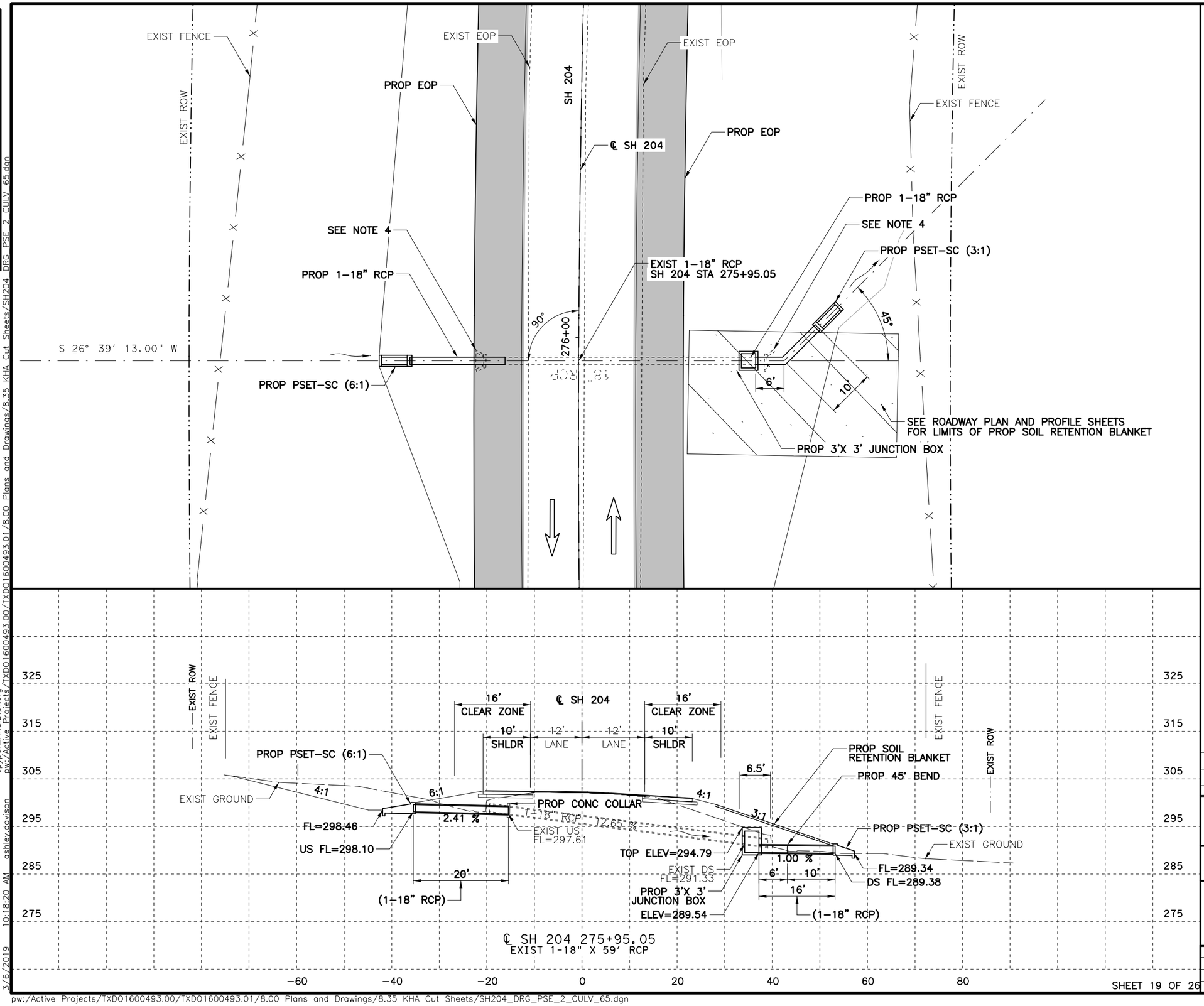

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LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
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STATE OF TEXAS
98380
LICENSED
PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

CULVERT LAYOUT

STA 275+95.05

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		167

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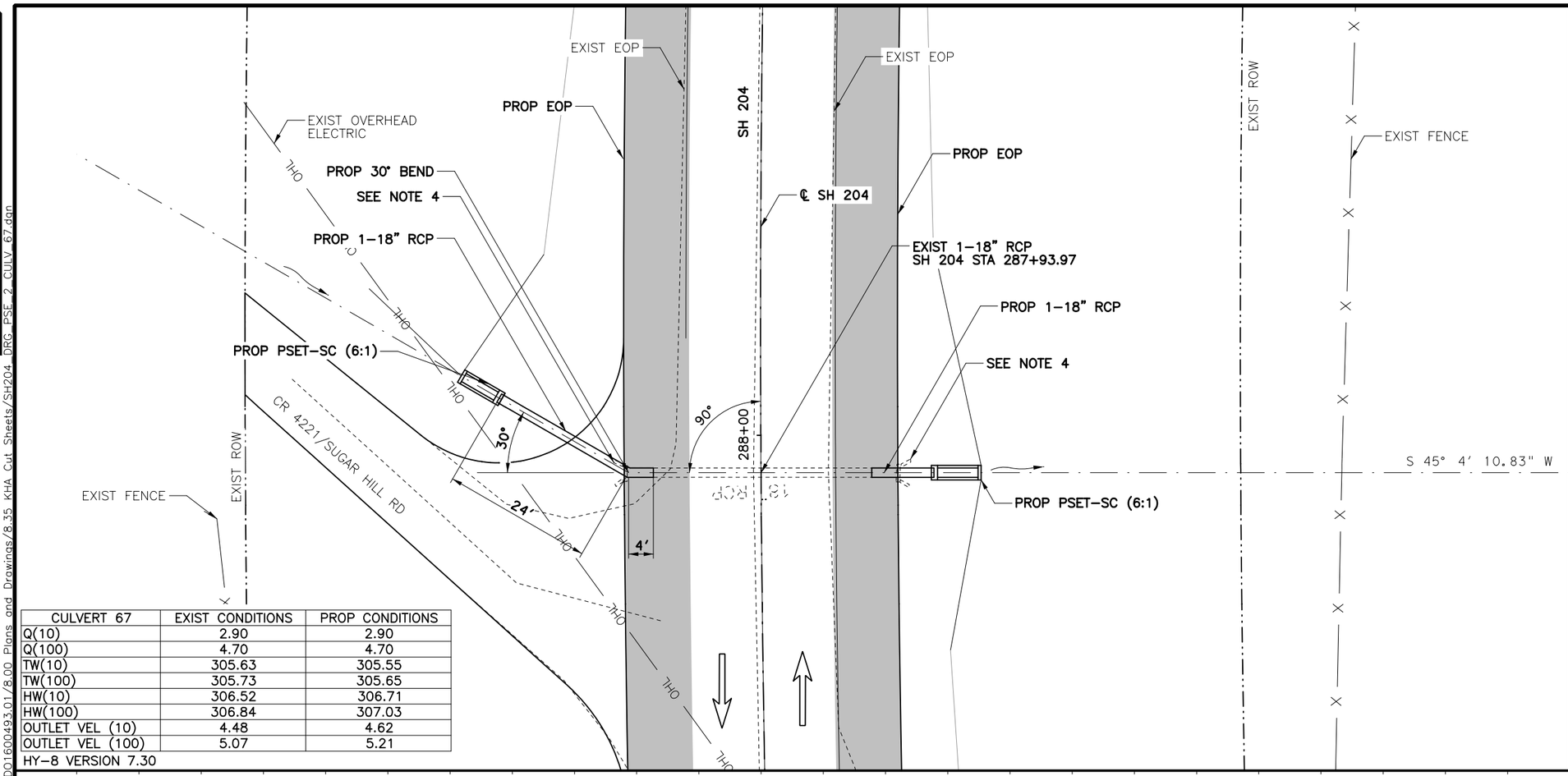
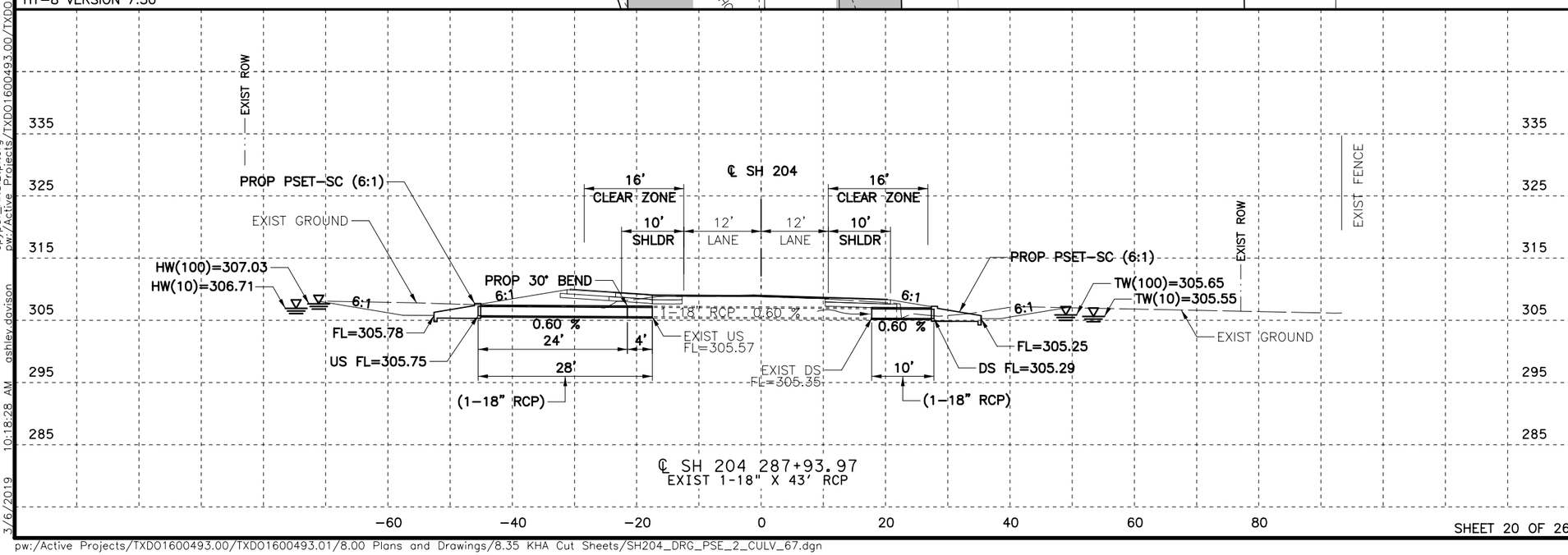
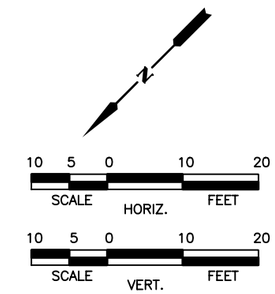


CULVERT 67	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	2.90	2.90
Q(100)	4.70	4.70
TW(10)	305.63	305.55
TW(100)	305.73	305.65
HW(10)	306.52	306.71
HW(100)	306.84	307.03
OUTLET VEL (10)	4.48	4.62
OUTLET VEL (100)	5.07	5.21

HY–8 VERSION 7.30





LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIPRAP
- FLOW ARROW
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Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

 Texas Department of Transportation

SH 204

CULVERT LAYOUT

STA 287+93.97

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
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SHEET 20 OF 26

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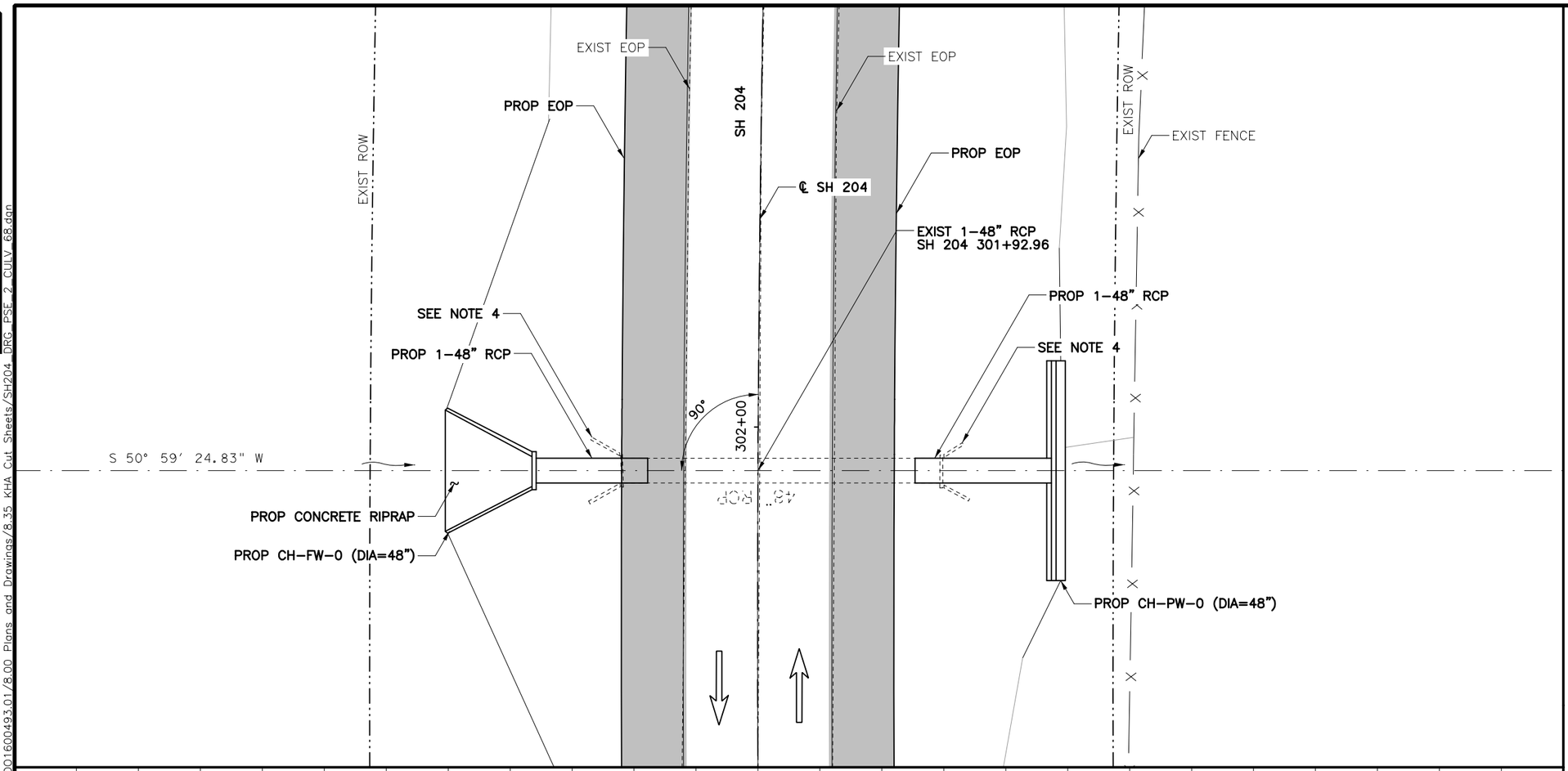

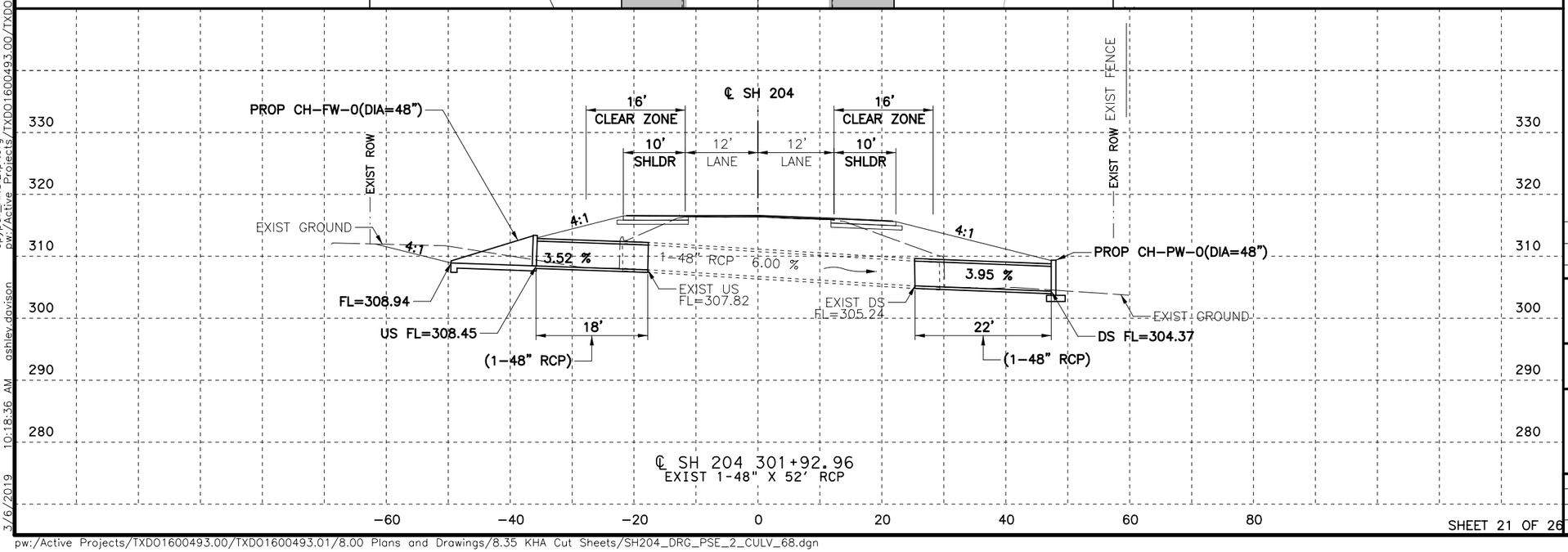

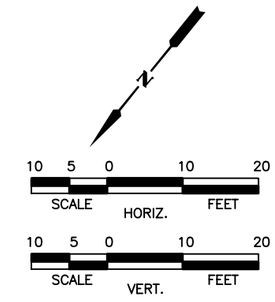

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
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- FLOW ARROW
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STATE OF TEXAS
98380
LICENSED
PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

 Texas Department of Transportation

SH 204

CULVERT LAYOUT

STA 301+92.96

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		169

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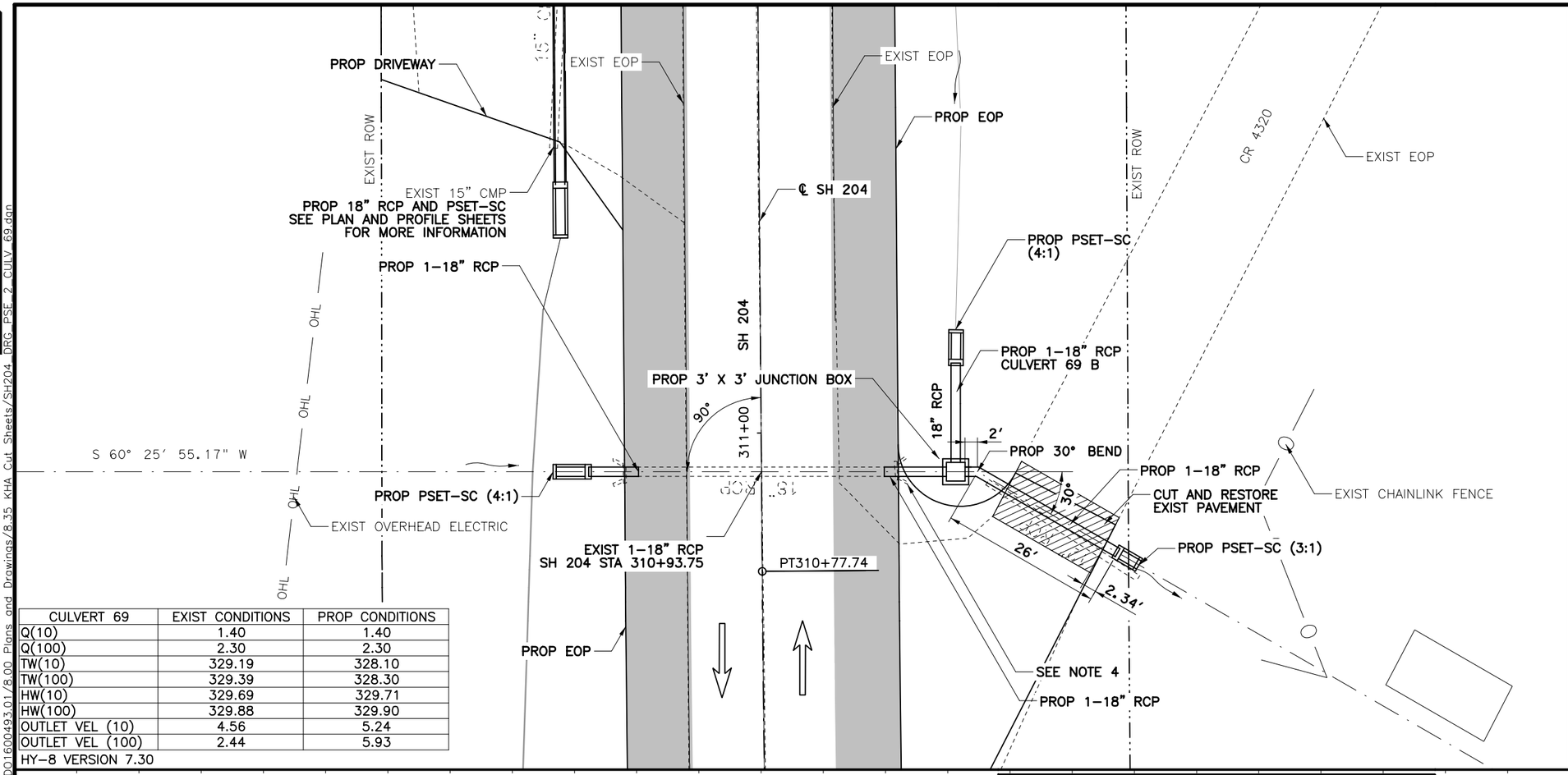
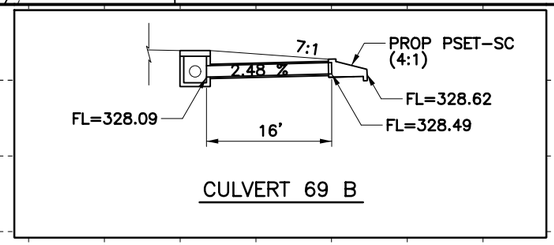
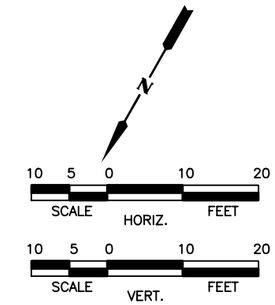


CULVERT 69	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	1.40	1.40
Q(100)	2.30	2.30
TW(10)	329.19	328.10
TW(100)	329.39	328.30
HW(10)	329.69	329.71
HW(100)	329.88	329.90
OUTLET VEL (10)	4.56	5.24
OUTLET VEL (100)	2.44	5.93

HY-8 VERSION 7.30



CULVERT 69 B



LEGEND

- EXISTING LANE
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- PROPOSED PAVEMENT
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03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

CULVERT LAYOUT

STA 310+93.75

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
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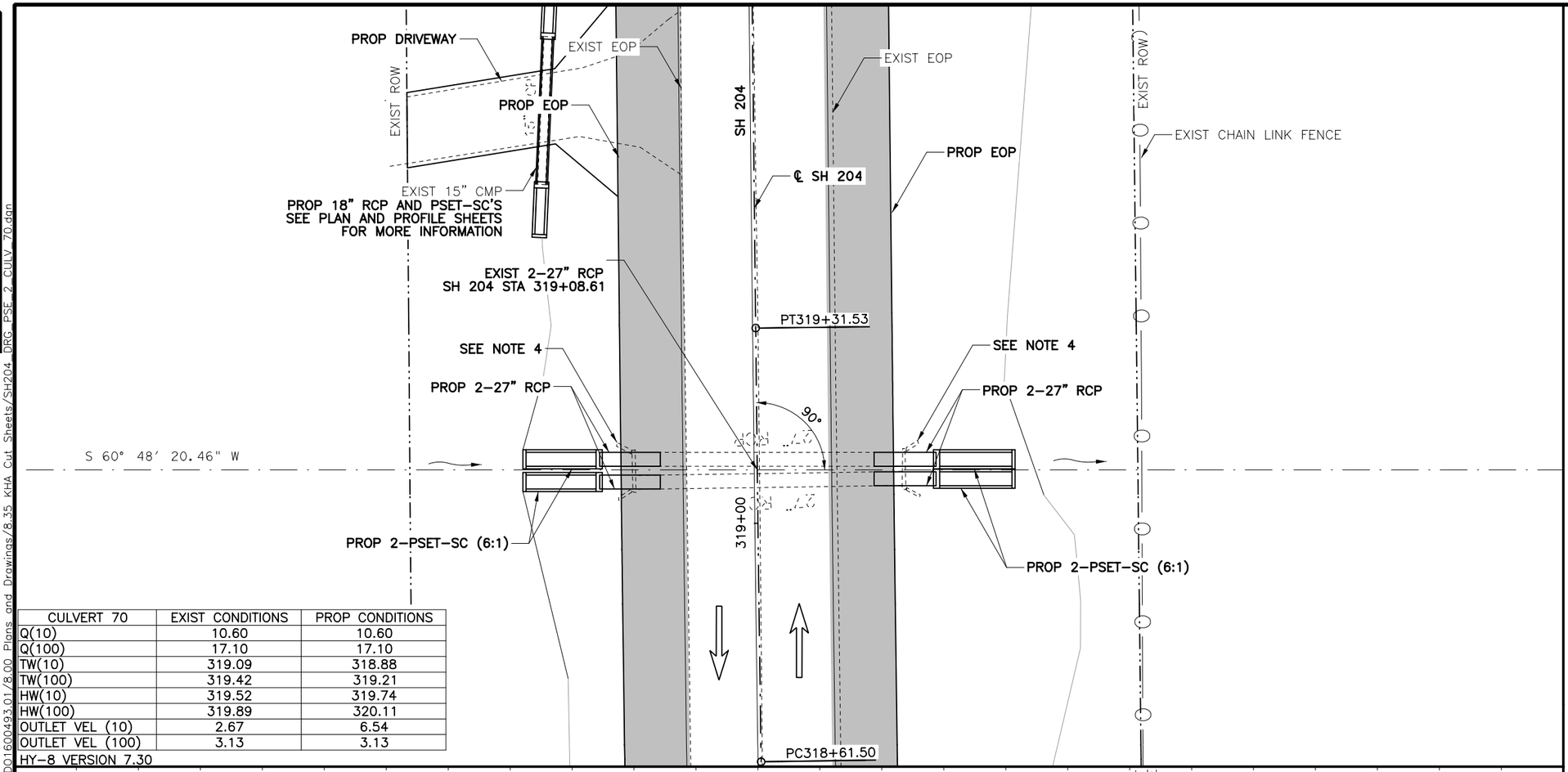
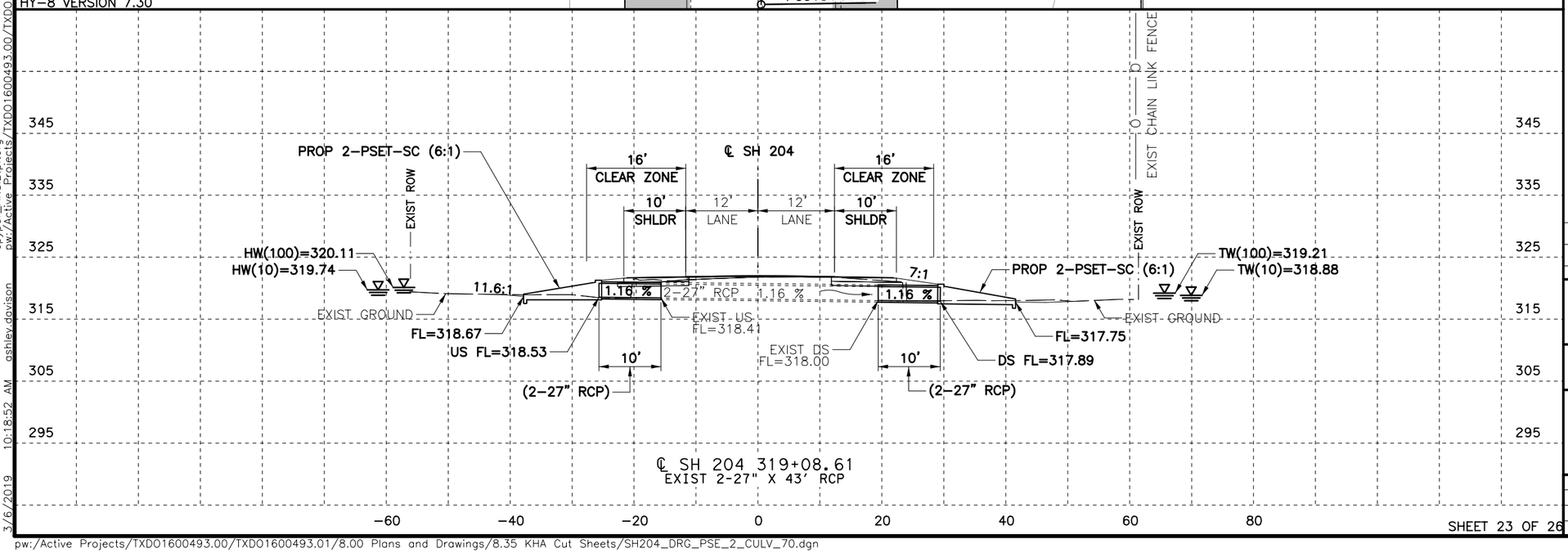
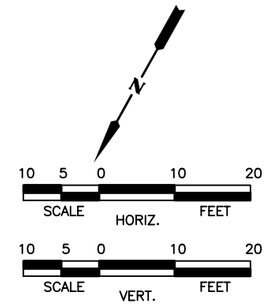


CULVERT 70	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	10.60	10.60
Q(100)	17.10	17.10
TW(10)	319.09	318.88
TW(100)	319.42	319.21
HW(10)	319.52	319.74
HW(100)	319.89	320.11
OUTLET VEL (10)	2.67	6.54
OUTLET VEL (100)	3.13	3.13

HY-8 VERSION 7.30





LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIPRAP
- FLOW ARROW
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Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

 Texas Department of Transportation

SH 204

CULVERT LAYOUT

STA 319+08.61

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
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SHEET 23 OF 26

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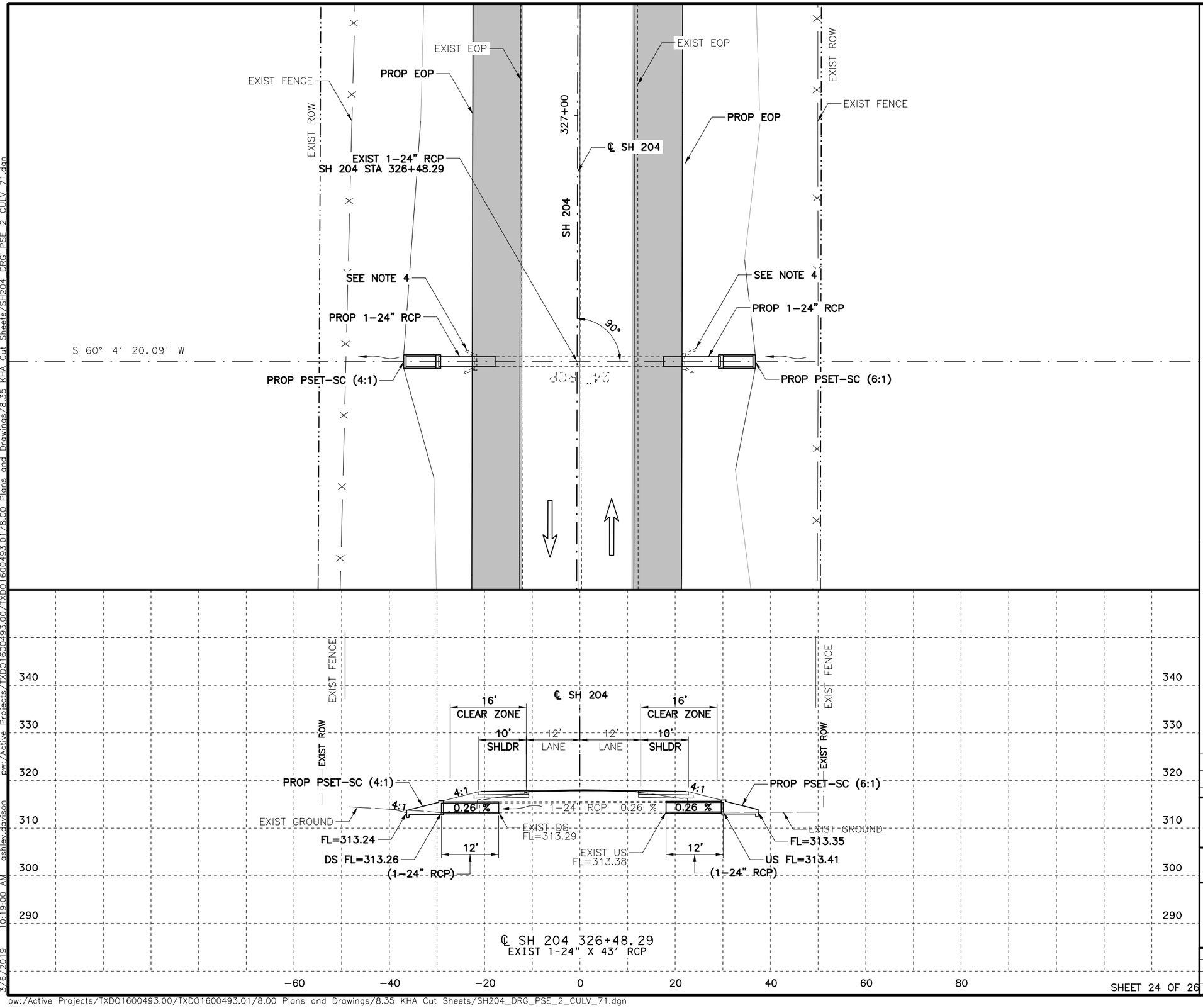

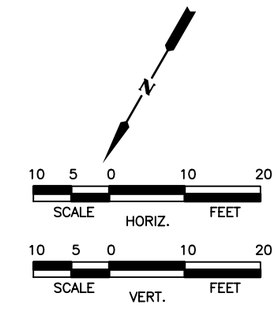

LEGEND

- EXISTING LANE
- PROPOSED LANE
- PROPOSED PAVEMENT
- PROPOSED CONCRETE RIPRAP
- FLOW ARROW
- EXISTING DITCH FLOW LINE
- PROPOSED DITCH FLOW LINE
- EOP=EDGE OF PAVEMENT

NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL PIPE LENGTHS AND ELEVATIONS.
2. REFER TO CONCRETE COLLAR DETAILS FOR MORE INFORMATION.
3. SEE PLAN AND PROFILE SHEETS FOR PROPOSED DITCH INFORMATION
4. REMOVE EXISTING HEADWALL, ANY ASSOCIATED CONCRETE RIPRAP, AND 4 LF OF PIPE OR UP TO FIRST JOINT. BEGIN EXTENSION AT FINISHED PIPE END.

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

 Texas Department of Transportation

SH 204

CULVERT LAYOUT

STA 326+48.29

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		172

SHEET 24 OF 26

CP&Y

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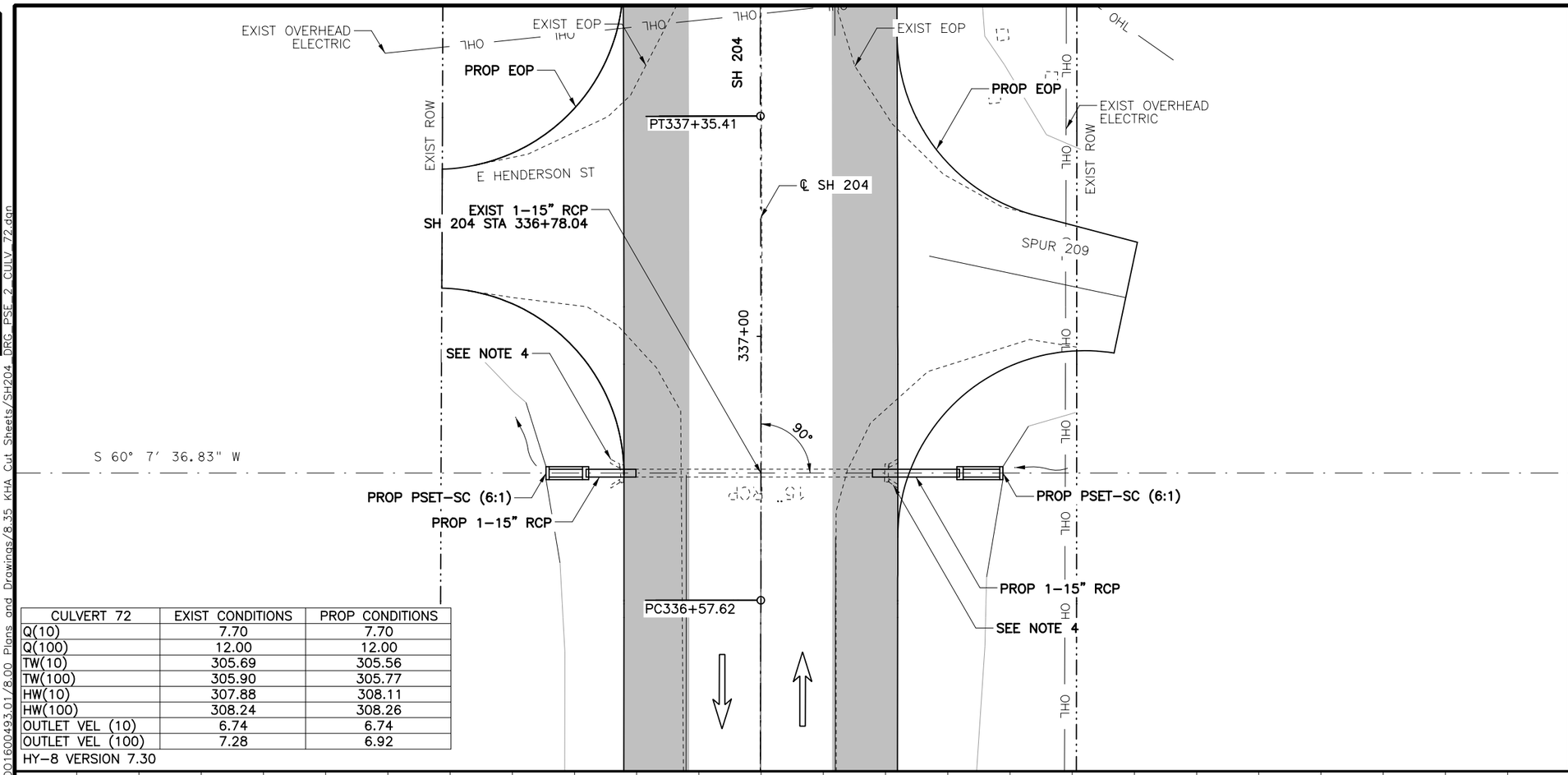
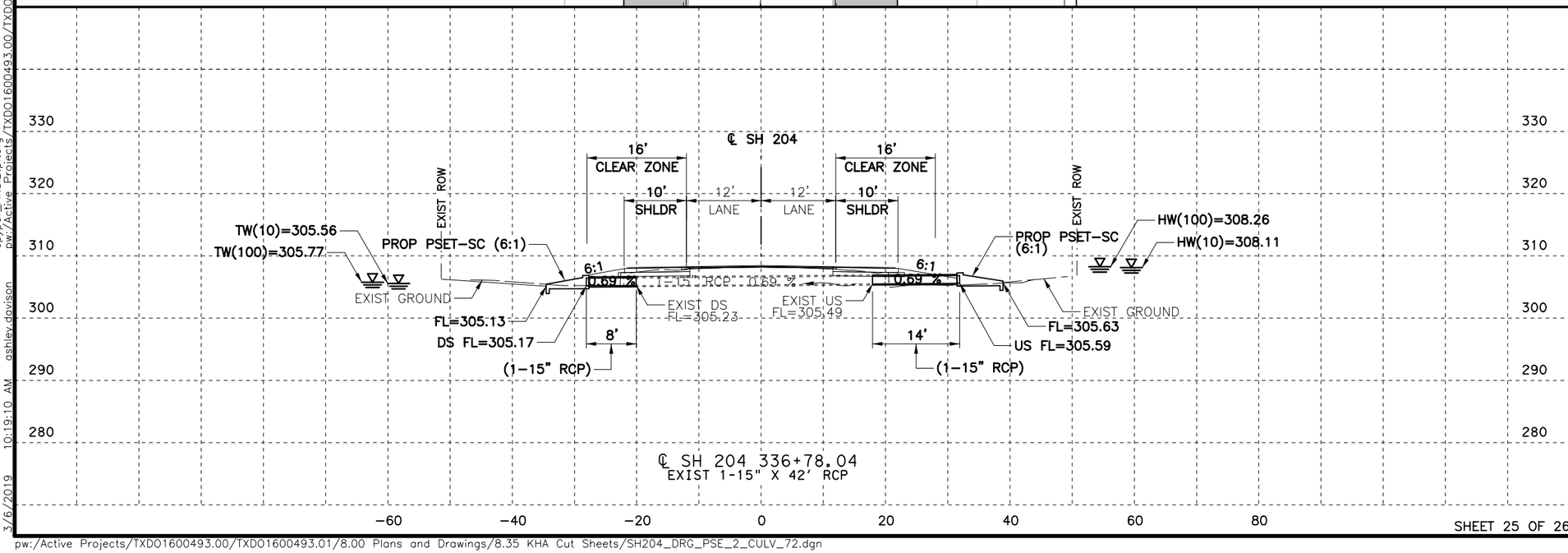
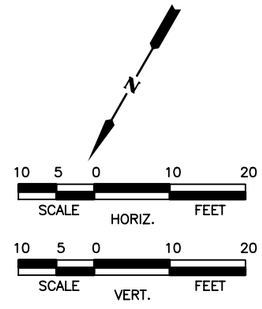


CULVERT 72	EXIST CONDITIONS	PROP CONDITIONS
Q(10)	7.70	7.70
Q(100)	12.00	12.00
TW(10)	305.69	305.56
TW(100)	305.90	305.77
HW(10)	307.88	308.11
HW(100)	308.24	308.26
OUTLET VEL (10)	6.74	6.74
OUTLET VEL (100)	7.28	6.92

HY–8 VERSION 7.30



℄ SH 204 336+78.04
EXIST 1-15" X 42' RCP



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03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

SH 204

CULVERT LAYOUT

STA 336+78.04

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		173

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3/6/2019 10:19:10 AM ashley.dovison

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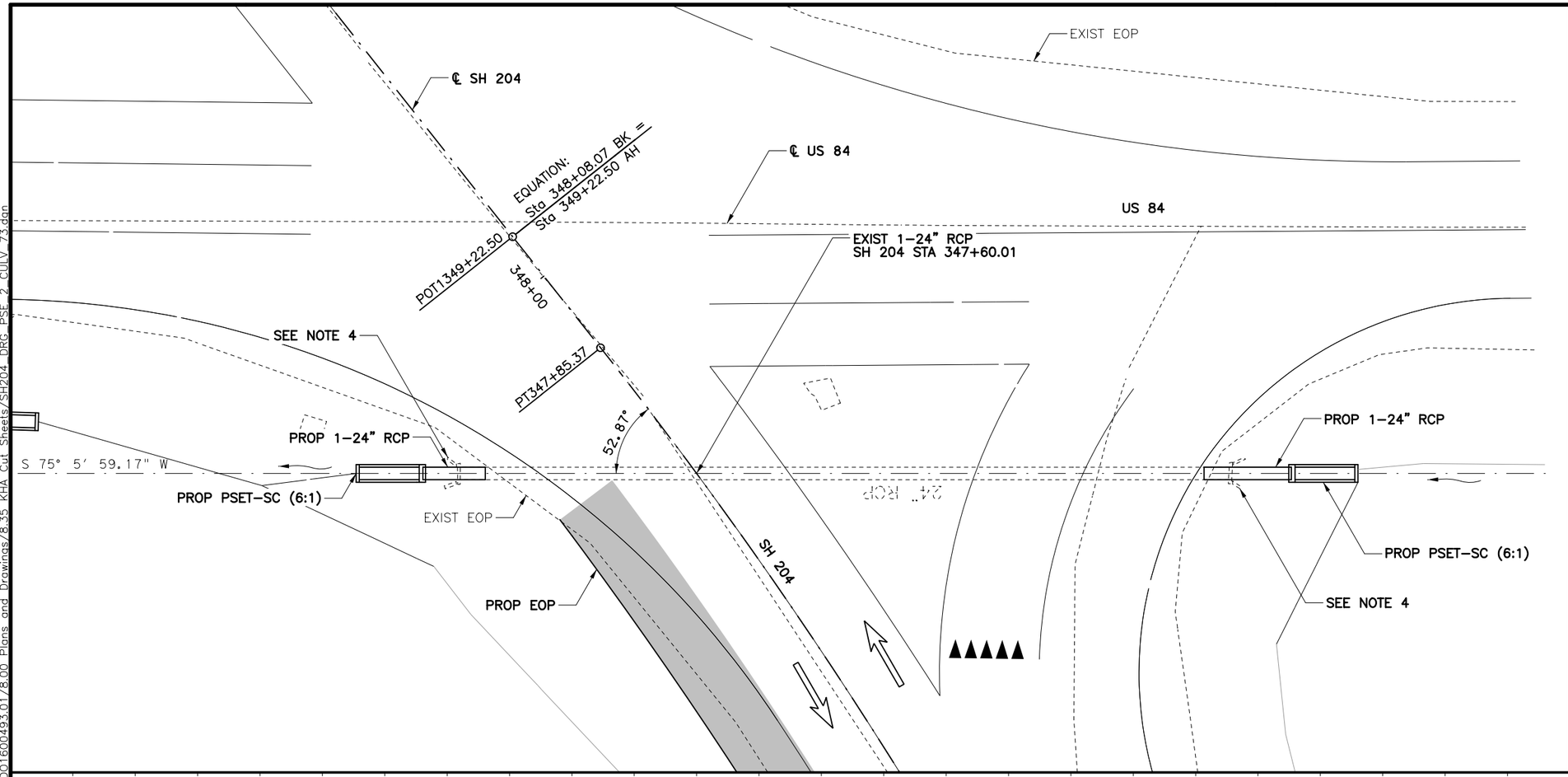

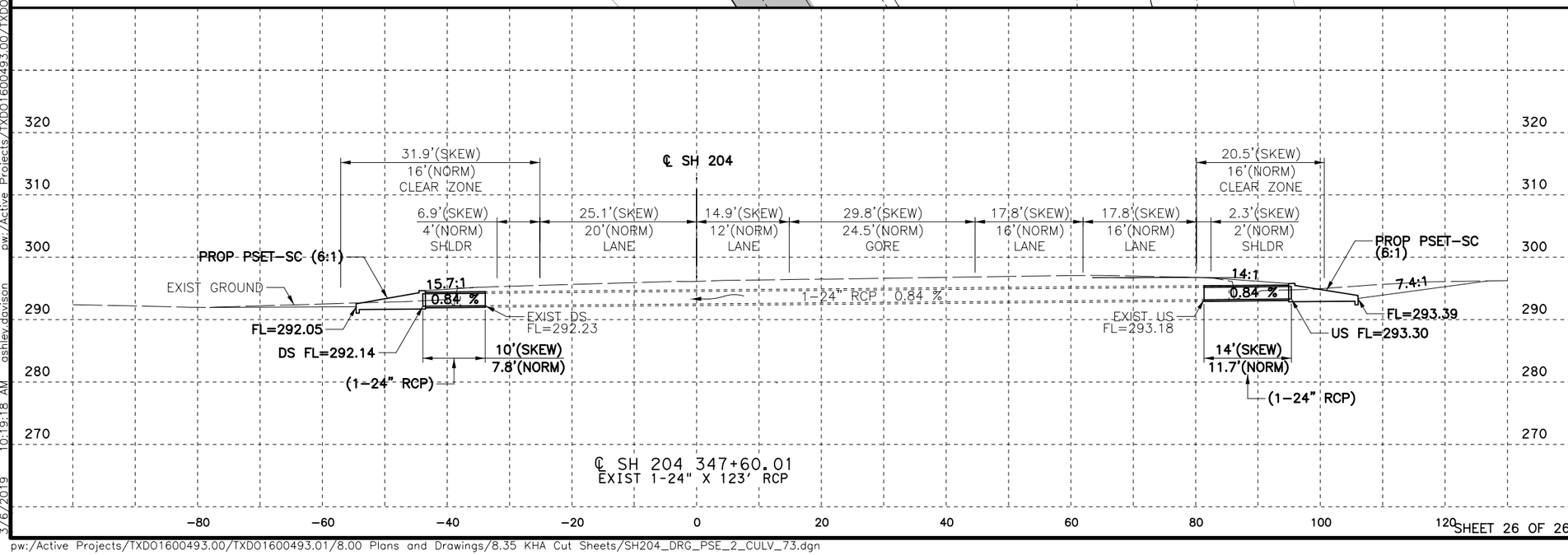

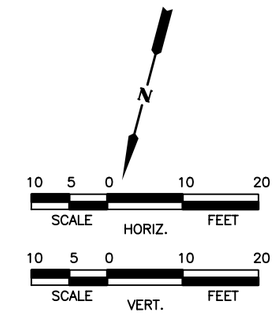

LEGEND

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STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn

TEXAS REGISTERED ENGINEERING FIRM F-928

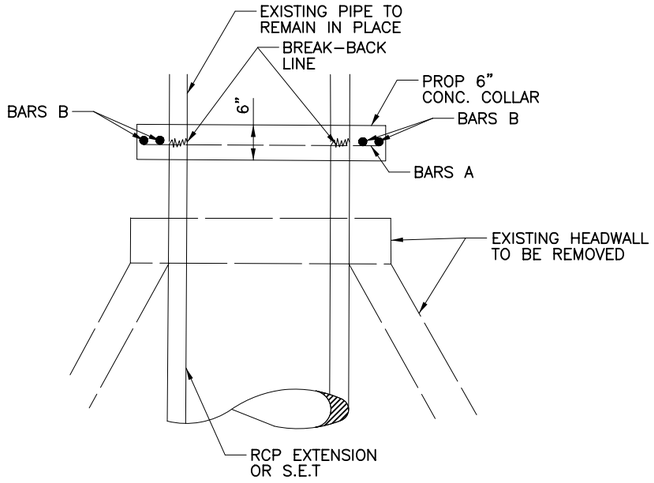
 Texas Department of Transportation

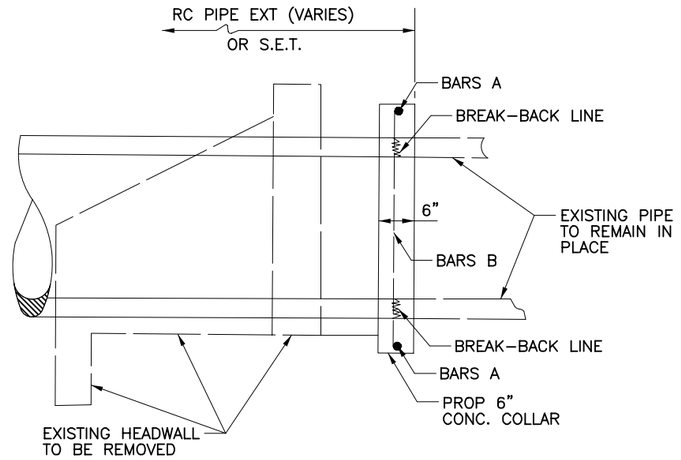
SH 204

CULVERT LAYOUT

STA 347+60.01

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	PRC	TYL	CHEROKEE	0450	01	013		174

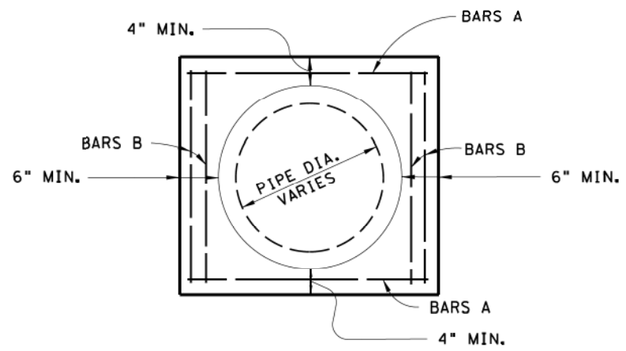




LONGITUDINAL ELEVATION

CONCRETE COLLAR DETAIL

NTS



END VIEW

NOTES:

A CL C CONCRETE COLLAR SHALL BE USED AT LOCATIONS WHERE ONLY THE EXISTING HEADWALL OR LESS THAN A FULL JOINT OF PIPE IS TO BE REMOVED PRIOR TO THE INSTALLATION OF THE CULVERT EXTENSION.

A CONCRETE COLLAR SHALL BE USED AT LOCATIONS WHERE AN EXISTING METAL PIPE CULVERT IS BEING EXTENDED WITH R.C. PIPE FOR A SAFETY END TREATMENT.

A CONCRETE COLLAR SHALL BE USED AT ALL 15, 30, & 45 DEGREE PIPE BEND JOINT CONNECTIONS.

REINFORCING STEEL (BARS A & B) SHALL BE #4 BARS CUT IN THE FIELD TO FIT.

CONCRETE COLLAR SHALL CONFORM TO OUTSIDE DIAMETER OF PIPE CULVERTS.

NOT TO SCALE

03/06/2019

NO.	REVISION	BY	DATE

Kimley»Horn
TEXAS REGISTERED ENGINEERING FIRM F-928

 Texas Department of Transportation

SH 204

MISCELLANEOUS DETAILS

SHEET 1 OF 1

Designed:	ASD	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	PRC		TEXAS					SH 204
Drawn:	ASD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
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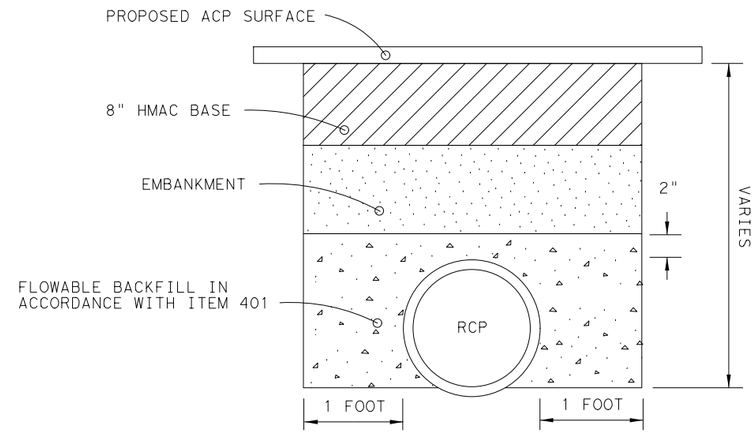

NOT TO SCALE

FLOWABLE BACKFILL DETAIL FOR RCP

JACOB B. ROBERTS
118577
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

FLOWABLE FILL DETAIL

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
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pw:/Active Projects/TXDO1600493.00/TXDO1600493.01/6.00 Bidding Phase/6.10 Letting Documents/Addendum No 1/DGN's/4930102DRmd01.dgn

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 (1) Height of Wingwall (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 (C.Y.)	Class "C" Conc (Curb) (2) (C.Y.)	Class "C" Conc (Wingwall) (3) (C.Y.)	Total Wingwall Area (S.F.)
STA 45+94.30 (Lt)	1 ~10′x 9′	3.35′	SCC-10	FW-0	0°	3:1	7"	7"	2.640′	11.979′	34.938′	20.171′	40.342′	N/A	N/A	14.0	1.1	29.1	497
STA 45+94.30 (Rt)	1 ~10′x 9′	3.25′	SCC-10	PW-2	0°	2:1	7"	7"	1.430′	11.021′	N/A	N/A	20.042′	11.167′	N/A	0.0	0.6	30.2	436
STA 74+03.46 (Lt)	3 ~ 5′x 5′	2.11′	MC-5-20	FW-0	0°	4:1	7"	7"	0.500′	5.833′	22.000′	12.702′	25.403′	N/A	N/A	9.8	0.3	9.3	157
STA 74+03.46 (Rt)	3 ~ 5′x 5′	2.68′	MC-5-20	FW-0	0°	4:1	7"	7"	1.160′	6.500′	24.667′	14.241′	28.483′	N/A	N/A	11.3	0.7	11.8	195
STA 102+21.95 (Lt)	2 ~10′x 9′	3.74′	MC-10-7	FW-0	0°	3:1	8"	7"	3.280′	12.688′	37.063′	21.398′	42.796′	N/A	N/A	21.5	2.6	36.6	557
STA 102+21.95 (Rt)	2 ~10′x 9′	3.43′	MC-10-7	FW-0	0°	3:1	8"	7"	3.340′	12.750′	37.250′	21.506′	43.013′	N/A	N/A	21.7	2.7	36.8	563
STA 119+00.47 (Lt)	3 ~ 5′x 5′	2.02′	MC-5-20	FW-0	0°	4:1	7"	7"	0.290′	5.625′	21.167′	12.221′	24.441′	N/A	N/A	9.3	0.2	9.0	146
STA 119+00.47 (Rt)	3 ~ 5′x 5′	1.83′	MC-5-20	FW-0	0°	4:1	7"	7"	0.290′	5.625′	21.167′	12.221′	24.441′	N/A	N/A	9.3	0.2	9.0	146
STA 281+70.63 (Lt)	2 ~10′x10′	3.73′	MC-10-7	FW-0	0°	3:1	8"	7"	3.530′	13.938′	40.813′	23.563′	47.126′	N/A	N/A	24.7	2.8	45.2	673
STA 281+70.63 (Rt)	2 ~10′x10′	2.06′	MC-10-7	FW-0	0°	3:1	8"	7"	1.820′	12.229′	35.688′	20.604′	41.208′	N/A	N/A	20.3	1.5	35.3	518

NOTES:

Skew Angle = 0° for SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standards.
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 shall 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.

U = Box Culvert Wall Thickness. Dimension can be found on the applicable Box Culvert Standard.

C = Curb Height.

See applicable wing or end treatment standards 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 S.F. for two wingwalls (one structure end) if Lt or Rt. Area for four wingwalls (two structure ends) if Both.

(1) The wall heights shown will be rounded to the nearest Foot for bidding purposes.

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

(3) Concrete volume shown is total of wing, footing, culvert toewall (if any), anchor toewall (if any) and wingwall toewall. Riprap apron, culvert and curb quantities are not included.

(4) Regardless of the type of culvert shown on this sheet, the Contractor shall have 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 shall be 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 97 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 shall be signed, sealed, and dated by a licensed Professional Engineer.

STATE OF TEXAS
PEDRO CARRASCO JR.
98380
LICENSED
PROFESSIONAL ENGINEER

Pedro Carrasco Jr.

03/06/2019

Texas Department of Transportation

Bridge Division Standard

BOX CULVERT SUPPLEMENT

WINGS AND END TREATMENTS

BCS

FILE: bcsstde1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2010	CONT 0450	SECT 01	JOB 013	HIGHWAY SH 204
REVISIONS	DIST TYL	COUNTY CHEROKEE		SHEET NO. 176

DATE:
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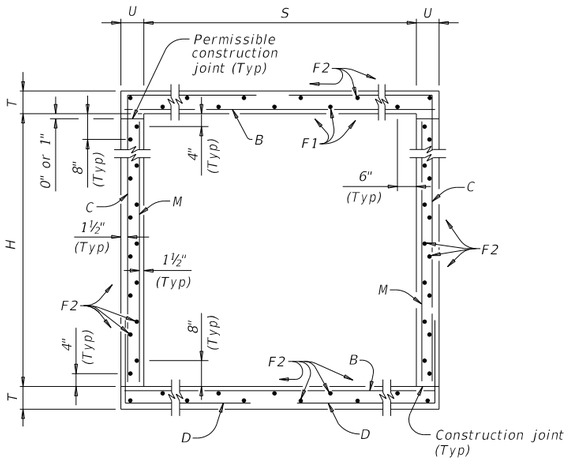
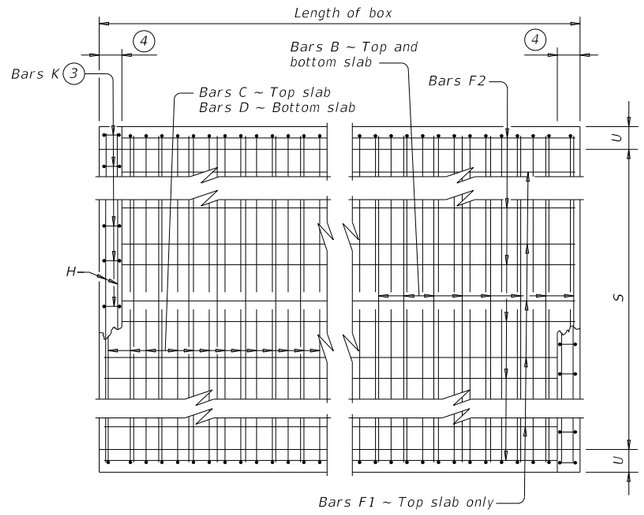
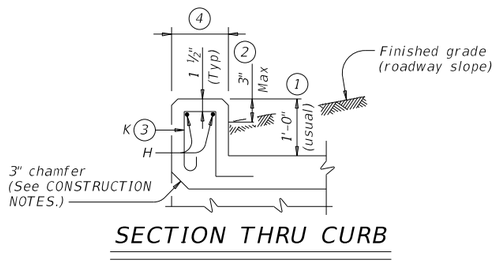


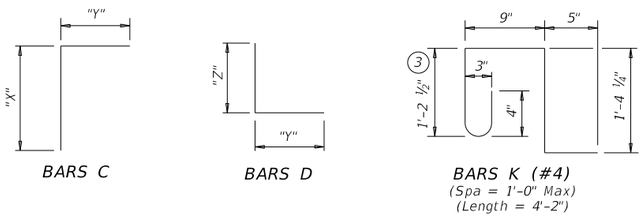
TYPICAL SECTION



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
- 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.

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:	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		177

DATE:
FILE:

SECTION DIMENSIONS				FILL HEIGHT (5)	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																														QUANTITIES					
					Bars B					Bars C							Bars D							Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total	
S	H	T	U		No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	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:	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		178

DATE:
FILE:

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.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

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

SCC-10

FILE:	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		178A

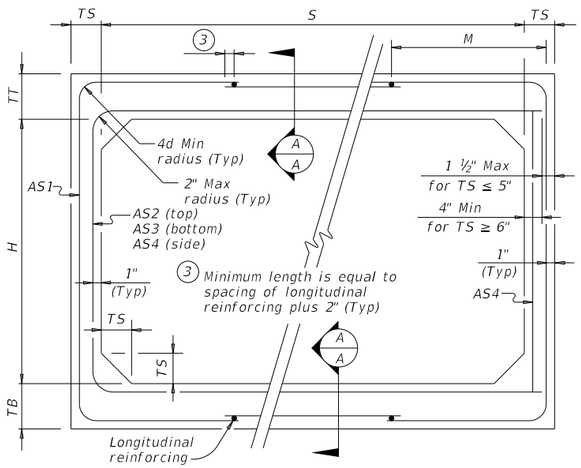
DATE:
FILE:

BOX DATA

SECTION DIMENSIONS					Fill Height	M (Min)	REINFORCING (sq. in. / ft.) (2)							(1) Lift Weight
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	(ft.)	(in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	(tons)
10	4	10	10	10	< 2	–	0.33	0.34	0.27	0.24	0.24	0.24	0.24	16.5
10	4	10	10	10	2 < 3	58	0.38	0.35	0.30	0.24	–	–	–	16.5
10	4	10	10	10	3 – 5	53	0.31	0.28	0.27	0.24	–	–	–	16.5
10	4	10	10	10	10	52	0.36	0.32	0.33	0.24	–	–	–	16.5
10	4	10	10	10	15	52	0.47	0.42	0.43	0.24	–	–	–	16.5
10	4	10	10	10	20	52	0.61	0.54	0.55	0.24	–	–	–	16.5
10	4	10	10	10	25	52	0.75	0.67	0.68	0.24	–	–	–	16.5
10	5	10	10	10	< 2	–	0.30	0.36	0.30	0.24	0.24	0.24	0.24	17.5
10	5	10	10	10	2 < 3	58	0.35	0.39	0.34	0.24	–	–	–	17.5
10	5	10	10	10	3 – 5	52	0.28	0.31	0.30	0.24	–	–	–	17.5
10	5	10	10	10	10	52	0.33	0.35	0.36	0.24	–	–	–	17.5
10	5	10	10	10	15	47	0.42	0.46	0.47	0.24	–	–	–	17.5
10	5	10	10	10	20	47	0.55	0.59	0.61	0.24	–	–	–	17.5
10	5	10	10	10	25	47	0.68	0.73	0.75	0.24	–	–	–	17.5
10	6	10	10	10	< 2	–	0.28	0.38	0.33	0.24	0.24	0.24	0.24	18.5
10	6	10	10	10	2 < 3	58	0.32	0.42	0.37	0.24	–	–	–	18.5
10	6	10	10	10	3 – 5	53	0.26	0.34	0.33	0.24	–	–	–	18.5
10	6	10	10	10	10	52	0.30	0.38	0.39	0.24	–	–	–	18.5
10	6	10	10	10	15	47	0.39	0.49	0.51	0.24	–	–	–	18.5
10	6	10	10	10	20	47	0.50	0.63	0.65	0.24	–	–	–	18.5
10	6	10	10	10	25	47	0.61	0.78	0.80	0.24	–	–	–	18.5
10	7	10	10	10	< 2	–	0.25	0.40	0.36	0.24	0.24	0.24	0.24	19.5
10	7	10	10	10	2 < 3	58	0.30	0.45	0.40	0.24	–	–	–	19.5
10	7	10	10	10	3 – 5	58	0.24	0.36	0.35	0.24	–	–	–	19.5
10	7	10	10	10	10	52	0.28	0.40	0.42	0.24	–	–	–	19.5
10	7	10	10	10	15	47	0.36	0.52	0.54	0.24	–	–	–	19.5
10	7	10	10	10	20	47	0.46	0.67	0.69	0.24	–	–	–	19.5
10	7	10	10	10	25	47	0.56	0.82	0.85	0.24	–	–	–	19.5
10	8	10	10	10	< 2	–	0.24	0.41	0.38	0.24	0.24	0.24	0.24	20.5
10	8	10	10	10	2 < 3	64	0.27	0.47	0.43	0.24	–	–	–	20.5
10	8	10	10	10	3 – 5	58	0.24	0.38	0.38	0.24	–	–	–	20.5
10	8	10	10	10	10	52	0.26	0.42	0.44	0.24	–	–	–	20.5
10	8	10	10	10	15	47	0.34	0.54	0.57	0.24	–	–	–	20.5
10	8	10	10	10	20	47	0.43	0.69	0.72	0.24	–	–	–	20.5
10	9	10	10	10	< 2	–	0.24	0.42	0.41	0.24	0.24	0.24	0.24	21.5
10	9	10	10	10	2 < 3	70	0.26	0.50	0.46	0.24	–	–	–	21.5
10	9	10	10	10	3 – 5	64	0.24	0.40	0.40	0.24	–	–	–	21.5
10	9	10	10	10	10	58	0.25	0.43	0.46	0.24	–	–	–	21.5
10	9	10	10	10	15	52	0.32	0.56	0.59	0.24	–	–	–	21.5
10	9	10	10	10	20	47	0.40	0.71	0.75	0.24	–	–	–	21.5
10	10	10	10	10	< 2	–	0.24	0.44	0.44	0.24	0.24	0.24	0.24	22.5
10	10	10	10	10	2 < 3	79	0.25	0.52	0.48	0.24	–	–	–	22.5
10	10	10	10	10	3 – 5	70	0.24	0.42	0.43	0.24	–	–	–	22.5
10	10	10	10	10	10	64	0.24	0.44	0.48	0.24	–	–	–	22.5
10	10	10	10	10	15	52	0.30	0.57	0.61	0.24	–	–	–	22.5
10	10	10	10	10	20	52	0.38	0.73	0.77	0.24	–	–	–	22.5

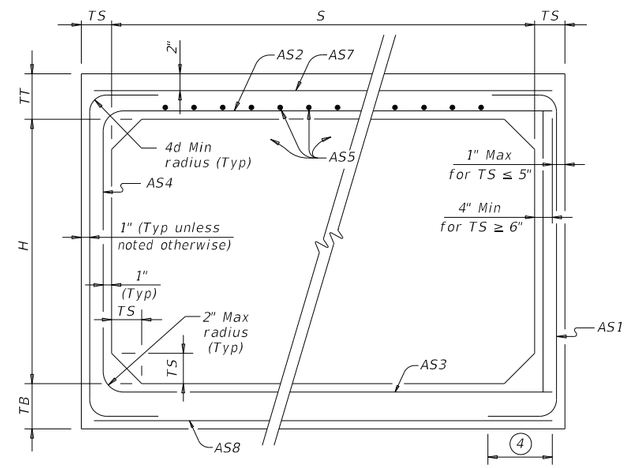
(1) For box length = 8'-0"

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



CORNER OPTION "A" CORNER OPTION "B"

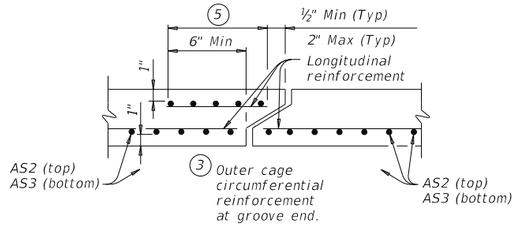
FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

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



SECTION A-A

(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:

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

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

GENERAL NOTES:

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

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

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

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

SINGLE BOX CULVERTS PRECAST

10'-0" SPAN

SCP-10

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		179

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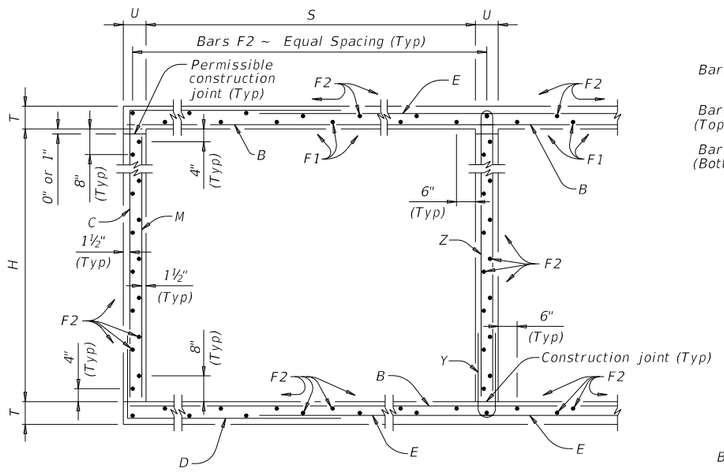
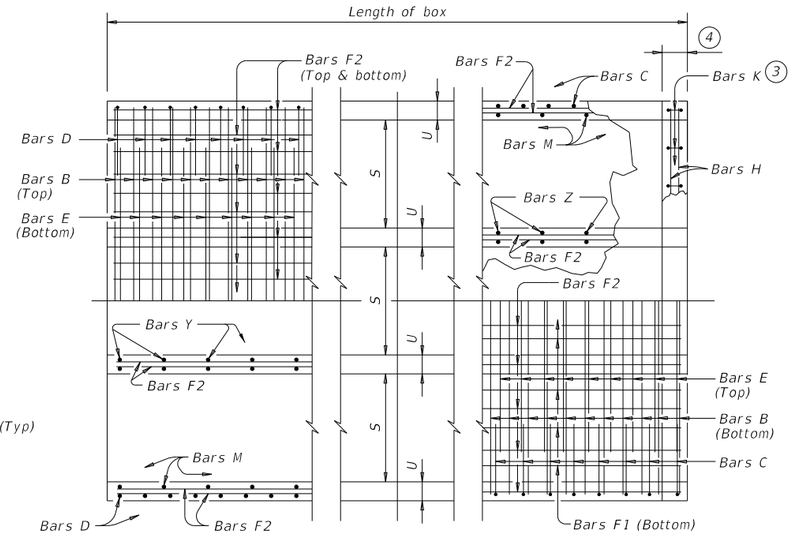


TYPICAL SECTION



BOTTOM SLAB TOP SLAB

PART PLANS

(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, and Bars Y and Z may be reversed.

MATERIAL NOTES:

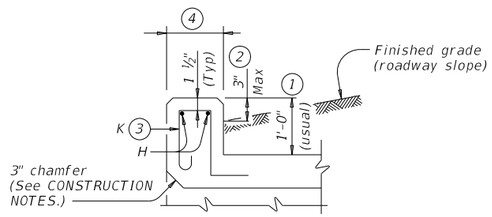
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
- culverts with overlay,
- culverts 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 Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

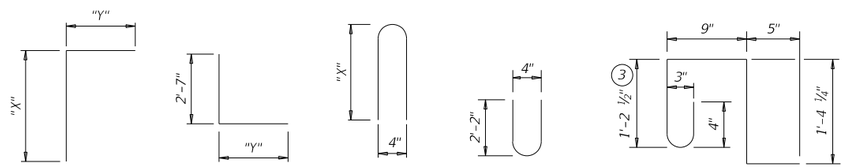
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



SECTION THRU CURB

TABLE OF BAR DIMENSIONS

H	"X"	"Y"
2'-0"	2'-6 ½"	3'-8 ½"
3'-0"	3'-6 ½"	3'-8 ½"
4'-0"	4'-6 ½"	3'-8 ½"
5'-0"	5'-6 ½"	3'-8 ½"



HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE
5'-0" SPAN
0' TO 20' FILL
MC-5-20

FILE:	DN: TBE	CK: BMP	DN: TxDOT	CK: TxDOT
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BILLS OF REINFORCING STEEL (For Box Length = 40 feet)

NUMBER OF SPANS	SECTION DIMENSIONS				Bars B					Bars C & D								Bars E					Bars F1 ~ #4				Bars F2 ~ #4				Bars M ~ #4				Bars Y & Z ~ #4								Bars H 4 ~ #4		Bars K		QUANTITIES					
													Bars C		Bars D																						Bars Y		Bars Z								Per Foot of Barrel		Curb		Total	
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	Length	Wt	No.	Size	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	Length	Wt	Length	Wt	No.	Spa	Length	Wt	No.	Wt	Conc (CY)	Renf (Lb)	Conc (CY)	Renf (Lb)	Conc (CY)	Renf (Lb)
2	5' – 0"	2' – 0"	8"	7"	108	#5	9"	11' – 6"	1,295	108	#5	9"	6' – 3"	704	6' – 4"	713	108	#5	9"	8' – 8"	976	8	18"	39' – 9"	212	38	18"	39' – 9"	1,009	108	9"	2' – 0"	144	54	9"	4' – 7"	165	5' – 3"	189	11' – 6"	31	26	72	0.710	135.2	0.9	103	29.3	5,510
3	5' – 0"	2' – 0"	8"	7"	108	#5	9"	17' – 1"	1,924	108	#5	9"	6' – 3"	704	6' – 4"	713	108	#5	9"	14' – 3"	1,605	12	18"	39' – 9"	319	54	18"	39' – 9"	1,434	108	9"	2' – 0"	144	108	9"	4' – 7"	331	5' – 3"	379	17' – 1"	46	38	106	1.029	188.8	1.3	152	42.4	7,705
4	5' – 0"	2' – 0"	8"	7"	108	#5	9"	22' – 8"	2,553	108	#5	9"	6' – 3"	704	6' – 4"	713	108	#5	9"	19' – 10"	2,234	16	18"	39' – 9"	425	70	18"	39' – 9"	1,859	108	9"	2' – 0"	144	162	9"	4' – 7"	496	5' – 3"	568	22' – 8"	61	48	134	1.348	242.4	1.7	195	55.6	9,891
5	5' – 0"	2' – 0"	8"	7"	108	#5	9"	28' – 3"	3,182	108	#5	9"	6' – 3"	704	6' – 4"	713	108	#5	9"	25' – 5"	2,863	20	18"	39' – 9"	531	86	18"	39' – 9"	2,284	108	9"	2' – 0"	144	216	9"	4' – 7"	661	5' – 3"	758	28' – 3"	75	60	167	1.667	296.0	2.1	242	68.8	12,082
6	5' – 0"	2' – 0"	8"	7"	108	#5	9"	33' – 10"	3,811	108	#5	9"	6' – 3"	704	6' – 4"	713	108	#5	9"	31' – 0"	3,492	24	18"	39' – 9"	637	102	18"	39' – 9"	2,708	108	9"	2' – 0"	144	270	9"	4' – 7"	827	5' – 3"	947	33' – 10"	90	70	195	1.986	349.6	2.5	285	82.0	14,268
2	5' – 0"	3' – 0"	8"	7"	108	#6	9"	11' – 6"	1,865	108	#5	9"	7' – 3"	817	6' – 4"	713	108	#5	9"	8' – 8"	976	8	18"	39' – 9"	212	44	18"	39' – 9"	1,168	108	9"	3' – 0"	216	54	9"	4' – 7"	165	7' – 3"	262	11' – 6"	31	26	72	0.775	159.9	0.9	103	31.9	6,497
3	5' – 0"	3' – 0"	8"	7"	108	#6	9"	17' – 1"	2,771	108	#5	9"	7' – 3"	817	6' – 4"	713	108	#5	9"	14' – 3"	1,605	12	18"	39' – 9"	319	62	18"	39' – 9"	1,646	108	9"	3' – 0"	216	108	9"	4' – 7"	331	7' – 3"	523	17' – 1"	46	38	106	1.115	223.5	1.3	152	45.9	9,093
4	5' – 0"	3' – 0"	8"	7"	108	#6	9"	22' – 8"	3,677	108	#5	9"	7' – 3"	817	6' – 4"	713	108	#5	9"	19' – 10"	2,234	16	18"	39' – 9"	425	80	18"	39' – 9"	2,124	108	9"	3' – 0"	216	162	9"	4' – 7"	496	7' – 3"	785	22' – 8"	61	48	134	1.456	287.2	1.7	195	59.9	11,682
5	5' – 0"	3' – 0"	8"	7"	108	#6	9"	28' – 3"	4,583	108	#5	9"	7' – 3"	817	6' – 4"	713	108	#5	9"	25' – 5"	2,863	20	18"	39' – 9"	531	98	18"	39' – 9"	2,602	108	9"	3' – 0"	216	216	9"	4' – 7"	661	7' – 3"	1,046	28' – 3"	75	60	167	1.796	350.8	2.1	242	73.9	14,274
6	5' – 0"	3' – 0"	8"	7"	108	#6	9"	33' – 10"	5,488	108	#5	9"	7' – 3"	817	6' – 4"	713	108	#5	9"	31' – 0"	3,492	24	18"	39' – 9"	637	116	18"	39' – 9"	3,080	108	9"	3' – 0"	216	270	9"	4' – 7"	827	7' – 3"	1,308	33' – 10"	90	70	195	2.137	414.5	2.5	285	88.0	16,863
2	5' – 0"	4' – 0"	8"	7"	108	#6	9"	11' – 6"	1,865	108	#5	9"	8' – 3"	929	6' – 4"	713	108	#5	9"	8' – 8"	976	8	18"	39' – 9"	212	44	18"	39' – 9"	1,168	108	9"	4' – 0"	289	54	9"	4' – 7"	165	9' – 3"	334	11' – 6"	31	26	72	0.840	166.3	0.9	103	34.5	6,754
3	5' – 0"	4' – 0"	8"	7"	108	#6	9"	17' – 1"	2,771	108	#5	9"	8' – 3"	929	6' – 4"	713	108	#5	9"	14' – 3"	1,605	12	18"	39' – 9"	319	62	18"	39' – 9"	1,646	108	9"	4' – 0"	289	108	9"	4' – 7"	331	9' – 3"	667	17' – 1"	46	38	106	1.202	231.8	1.3	152	49.4	9,422
4	5' – 0"	4' – 0"	8"	7"	108	#6	9"	22' – 8"	3,677	108	#5	9"	8' – 3"	929	6' – 4"	713	108	#5	9"	19' – 10"	2,234	16	18"	39' – 9"	425	80	18"	39' – 9"	2,124	108	9"	4' – 0"	289	162	9"	4' – 7"	496	9' – 3"	1,001	22' – 8"	61	48	134	1.564	297.2	1.7	195	64.3	12,083
5	5' – 0"	4' – 0"	8"	7"	108	#6	9"	28' – 3"	4,583	108	#5	9"	8' – 3"	929	6' – 4"	713	108	#5	9"	25' – 5"	2,863	20	18"	39' – 9"	531	98	18"	39' – 9"	2,602	108	9"	4' – 0"	289	216	9"	4' – 7"	661	9' – 3"	1,335	28' – 3"	75	60	167	1.926	362.7	2.1	242	79.1	14,748
6	5' – 0"	4' – 0"	8"	7"	108	#6	9"	33' – 10"	5,488	108	#5	9"	8' – 3"	929	6' – 4"	713	108	#5	9"	31' – 0"	3,492	24	18"	39' – 9"	637	116	18"	39' – 9"	3,080	108	9"	4' – 0"	289	270	9"	4' – 7"	827	9' – 3"	1,668	33' – 10"	90	70	195	2.288	428.1	2.5	285	94.0	17,408
2	5' – 0"	5' – 0"	8"	7"	108	#6	9"	11' – 6"	1,865	108	#5	9"	9' – 3"	1,042	6' – 4"	713	108	#5	9"	8' – 8"	976	8	18"	39' – 9"	212	50	18"	39' – 9"	1,328	108	9"	5' – 0"	361	54	9"	4' – 7"	165	11' – 3"	406	11' – 6"	31	26	72	0.904	176.7	0.9	103	37.0	7,171
3	5' – 0"	5' – 0"	8"	7"	108	#6	9"	17' – 1"	2,771	108	#5	9"	9' – 3"	1,042	6' – 4"	713	108	#5	9"	14' – 3"	1,605	12	18"	39' – 9"	319	70	18"	39' – 9"	1,859	108	9"	5' – 0"	361	108	9"	4' – 7"	331	11' – 3"	812	17' – 1"	46	38	106	1.288	245.3	1.3	152	52.8	9,965
4	5' – 0"	5' – 0"	8"	7"	108	#6	9"	22' – 8"	3,677	108	#5	9"	9' – 3"	1,042	6' – 4"	713	108	#5	9"	19' – 10"	2,234	16	18"	39' – 9"	425	90	18"	39' – 9"	2,390	108	9"	5' – 0"	361	162	9"	4' – 7"	496	11' – 3"	1,217	22' – 8"	61	48	134	1.672	313.9	1.7	195	68.6	12,750
5	5' – 0"	5' – 0"	8"	7"	108	#6	9"	28' – 3"	4,583	108	#5	9"	9' – 3"	1,042	6' – 4"	713	108	#5	9"	25' – 5"	2,863	20	18"	39' – 9"	531	110	18"	39' – 9"	2,921	108	9"	5' – 0"	361	216	9"	4' – 7"	661	11' – 3"	1,623	28' – 3"	75	60	167	2.056	382.5	2.1	242	84.3	15,540
6	5' – 0"	5' – 0"	8"	7"	108	#6	9"	33' – 10"	5,488	108	#5	9"	9' – 3"	1,042	6' – 4"	713	108	#5	9"	31' – 0"	3,492	24	18"	39' – 9"	637	130	18"	39' – 9"	3,452	108	9"	5' – 0"	361	270	9"	4' – 7"	827	11' – 3"	2,029	33' – 10"	90	70	195	2.439	451.0	2.5	285	100.1	18,326

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE

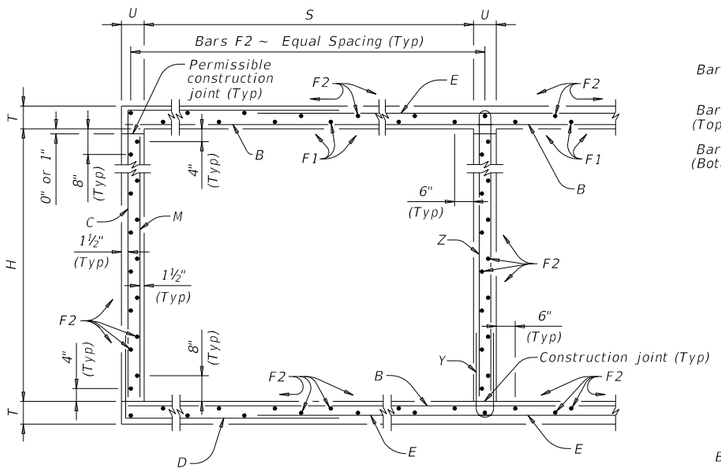
5'-0" SPAN

0' TO 20' FILL

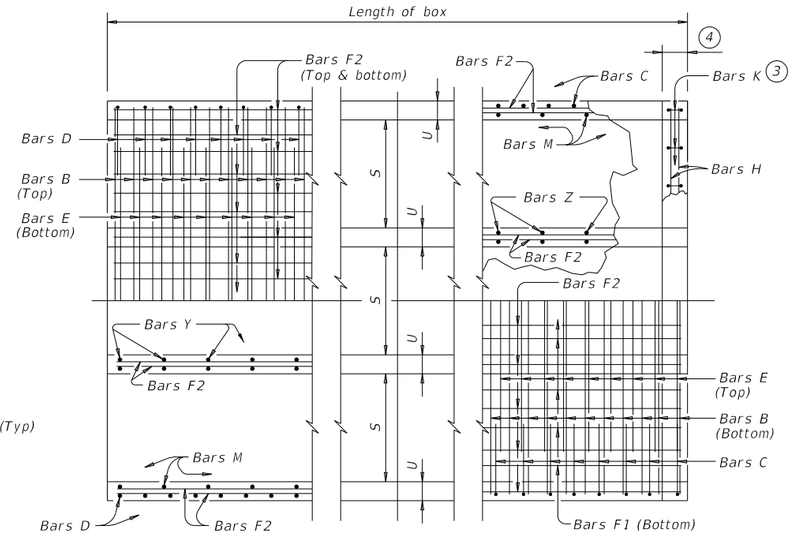
MC-5-20

FILE:	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		181

DATE:
FILE:

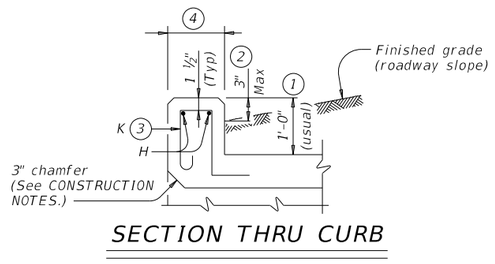


TYPICAL SECTION



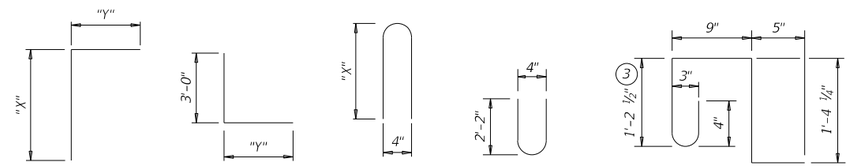
BOTTOM SLAB TOP SLAB

PART PLANS



SECTION THRU CURB

TABLE OF BAR DIMENSIONS		
H	"X"	"Y"
4'-0"	4'-6 ½"	5'-9"
5'-0"	5'-6 ½"	5'-9"
6'-0"	6'-6 ½"	5'-9"
7'-0"	7'-6 ½"	5'-9"
8'-0"	8'-6 ½"	5'-9"
9'-0"	9'-6 ½"	5'-9"
10'-0"	10'-6 ½"	5'-9"



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, and Bars Y and Z 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 Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-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.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE

10'-0" SPAN
0' TO 7' FILL

MC-10-7

FILE:	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		182

DATE:
FILE:

NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																																QUANTITIES					
					Bars B (5)					Bars C & D							Bars E					Bars F1 ~ #4				Bars F2 ~ #4				Bars M ~ #4				Bars Y & Z ~ #4						Bars H 4 ~ #4 (5)		Bars K		Per Foot of Barrel		Curb		Total	
												Bars C		Bars D																		Bars Y		Bars Z											
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	Length	Wt	No.	Size	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	Length	Wt	No.	Wt	Conc (CY)	Renf (Lb)	Conc (CY)	Renf (Lb)	Conc (CY)	Renf (Lb)
2	10′ – 0″	4′ – 0″	8″	7″	162	#6	6″	21′ – 6″	5,231	108	#6	9″	10′ – 4″	1,676	8′ – 10″	1,433	162	#6	6″	15′ – 4″	3,731	14	18″	39′ – 9″	372	66	18″	39′ – 9″	1,752	108	9″	4′ – 0″	289	54	9″	4′ – 7″	165	9′ – 3″	334	21′ – 6″	57	46	128	1.333	374.6	1.6	185	54.9	15,168
3	10′ – 0″	4′ – 0″	8″	7″	162	#6	6″	32′ – 1″	7,807	108	#6	9″	10′ – 4″	1,676	8′ – 10″	1,433	162	#6	6″	25′ – 11″	6,306	21	18″	39′ – 9″	558	95	18″	39′ – 9″	2,523	108	9″	4′ – 0″	289	108	9″	4′ – 7″	331	9′ – 3″	667	32′ – 1″	86	68	189	1.942	539.8	2.4	275	80.1	21,865
4	10′ – 0″	4′ – 0″	8″	7″	162	#6	6″	42′ – 8″	10,382	108	#6	9″	10′ – 4″	1,676	8′ – 10″	1,433	162	#6	6″	36′ – 6″	8,881	28	18″	39′ – 9″	743	124	18″	39′ – 9″	3,293	108	9″	4′ – 0″	289	162	9″	4′ – 7″	496	9′ – 3″	1,001	42′ – 8″	114	88	245	2.551	704.9	3.2	359	105.2	28,553
5	10′ – 0″	4′ – 0″	8″	7″	162	#6	6″	53′ – 3″	12,957	108	#6	9″	10′ – 4″	1,676	8′ – 10″	1,433	162	#6	6″	47′ – 1″	11,457	35	18″	39′ – 9″	929	153	18″	39′ – 9″	4,063	108	9″	4′ – 0″	289	216	9″	4′ – 7″	661	9′ – 3″	1,335	53′ – 3″	142	110	306	3.160	870.0	3.9	448	130.3	35,248
6	10′ – 0″	4′ – 0″	8″	7″	162	#6	6″	66′ – 4″	16,140	108	#6	9″	10′ – 4″	1,676	8′ – 10″	1,433	162	#6	6″	57′ – 8″	14,032	42	18″	39′ – 9″	1,115	182	18″	39′ – 9″	4,833	108	9″	4′ – 0″	289	270	9″	4′ – 7″	827	9′ – 3″	1,668	65′ – 6″	175	130	362	3.770	1,050.3	4.7	537	155.5	42,550
2	10′ – 0″	5′ – 0″	8″	7″	162	#6	6″	21′ – 6″	5,231	108	#6	9″	11′ – 4″	1,838	8′ – 10″	1,433	162	#6	6″	15′ – 4″	3,731	14	18″	39′ – 9″	372	72	18″	39′ – 9″	1,912	108	9″	5′ – 0″	361	54	9″	4′ – 7″	165	11′ – 3″	406	21′ – 6″	57	46	128	1.398	386.2	1.6	185	57.5	15,634
3	10′ – 0″	5′ – 0″	8″	7″	162	#6	6″	32′ – 1″	7,807	108	#6	9″	11′ – 4″	1,838	8′ – 10″	1,433	162	#6	6″	25′ – 11″	6,306	21	18″	39′ – 9″	558	103	18″	39′ – 9″	2,735	108	9″	5′ – 0″	361	108	9″	4′ – 7″	331	11′ – 3″	812	32′ – 1″	86	68	189	2.029	554.5	2.4	275	83.5	22,456
4	10′ – 0″	5′ – 0″	8″	7″	162	#6	6″	42′ – 8″	10,382	108	#6	9″	11′ – 4″	1,838	8′ – 10″	1,433	162	#6	6″	36′ – 6″	8,881	28	18″	39′ – 9″	743	134	18″	39′ – 9″	3,558	108	9″	5′ – 0″	361	162	9″	4′ – 7″	496	11′ – 3″	1,217	42′ – 8″	114	88	245	2.659	722.7	3.2	359	109.5	29,268
5	10′ – 0″	5′ – 0″	8″	7″	162	#6	6″	53′ – 3″	12,957	108	#6	9″	11′ – 4″	1,838	8′ – 10″	1,433	162	#6	6″	47′ – 1″	11,457	35	18″	39′ – 9″	929	165	18″	39′ – 9″	4,381	108	9″	5′ – 0″	361	216	9″	4′ – 7″	661	11′ – 3″	1,623	53′ – 3″	142	110	306	3.290	891.0	3.9	448	135.5	36,088
6	10′ – 0″	5′ – 0″	8″	7″	162	#6	6″	66′ – 4″	16,140	108	#6	9″	11′ – 4″	1,838	8′ – 10″	1,433	162	#6	6″	57′ – 8″	14,032	42	18″	39′ – 9″	1,115	196	18″	39′ – 9″	5,204	108	9″	5′ – 0″	361	270	9″	4′ – 7″	827	11′ – 3″	2,029	65′ – 6″	175	130	362	3.921	1,074.5	4.7	537	161.6	43,516
2	10′ – 0″	6′ – 0″	8″	7″	162	#6	6″	21′ – 6″	5,231	108	#6	9″	12′ – 4″	2,001	8′ – 10″	1,433	162	#6	6″	15′ – 4″	3,731	14	18″	39′ – 9″	372	78	18″	39′ – 9″	2,071	108	9″	6′ – 0″	433	54	9″	4′ – 7″	165	13′ – 3″	478	21′ – 6″	57	46	128	1.463	397.9	1.6	185	60.1	16,100
3	10′ – 0″	6′ – 0″	8″	7″	162	#6	6″	32′ – 1″	7,807	108	#6	9″	12′ – 4″	2,001	8′ – 10″	1,433	162	#6	6″	25′ – 11″	6,306	21	18″	39′ – 9″	558	111	18″	39′ – 9″	2,947	108	9″	6′ – 0″	433	108	9″	4′ – 7″	331	13′ – 3″	956	32′ – 1″	86	68	189	2.115	569.3	2.4	275	87.0	23,047
4	10′ – 0″	6′ – 0″	8″	7″	162	#6	6″	42′ – 8″	10,382	108	#6	9″	12′ – 4″	2,001	8′ – 10″	1,433	162	#6	6″	36′ – 6″	8,881	28	18″	39′ – 9″	743	144	18″	39′ – 9″	3,824	108	9″	6′ – 0″	433	162	9″	4′ – 7″	496	13′ – 3″	1,434	42′ – 8″	114	88	245	2.767	740.7	3.2	359	113.8	29,986
5	10′ – 0″	6′ – 0″	8″	7″	162	#6	6″	53′ – 3″	12,957	108	#6	9″	12′ – 4″	2,001	8′ – 10″	1,433	162	#6	6″	47′ – 1″	11,457	35	18″	39′ – 9″	929	177	18″	39′ – 9″	4,700	108	9″	6′ – 0″	433	216	9″	4′ – 7″	661	13′ – 3″	1,912	53′ – 3″	142	110	306	3.420	912.1	3.9	448	140.7	36,931
6	10′ – 0″	6′ – 0″	8″	7″	162	#6	6″	66′ – 4″	16,140	108	#6	9″	12′ – 4″	2,001	8′ – 10″	1,433	162	#6	6″	57′ – 8″	14,032	42	18″	39′ – 9″	1,115	210	18″	39′ – 9″	5,576	108	9″	6′ – 0″	433	270	9″	4′ – 7″	827	13′ – 3″	2,390	65′ – 6″	175	130	362	4.072	1,098.7	4.7	537	167.6	44,484
2	10′ – 0″	7′ – 0″	8″	7″	162	#6	6″	21′ – 6″	5,231	108	#6	9″	13′ – 4″	2,163	8′ – 10″	1,433	162	#6	6″	15′ – 4″	3,731	14	18″	39′ – 9″	372	78	18″	39′ – 9″	2,071	108	9″	7′ – 0″	505	54	9″	4′ – 7″	165	15′ – 3″	550	21′ – 6″	57	46	128	1.528	405.5	1.6	185	62.7	16,406
3	10′ – 0″	7′ – 0″	8″	7″	162	#6	6″	32′ – 1″	7,807	108	#6	9″	13′ – 4″	2,163	8′ – 10″	1,433	162	#6	6″	25′ – 11″	6,306	21	18″	39′ – 9″	558	111	18″	39′ – 9″	2,947	108	9″	7′ – 0″	505	108	9″	4′ – 7″	331	15′ – 3″	1,100	32′ – 1″	86	68	189	2.202	578.8	2.4	275	90.5	23,425
4	10′ – 0″	7′ – 0″	8″	7″	162	#6	6″	42′ – 8″	10,382	108	#6	9″	13′ – 4″	2,163	8′ – 10″	1,433	162	#6	6″	36′ – 6″	8,881	28	18″	39′ – 9″	743	144	18″	39′ – 9″	3,824	108	9″	7′ – 0″	505	162	9″	4′ – 7″	496	15′ – 3″	1,650	42′ – 8″	114	88	245	2.876	751.9	3.2	359	118.2	30,436
5	10′ – 0″	7′ – 0″	8″	7″	162	#6	6″	53′ – 3″	12,957	108	#6	9″	13′ – 4″	2,163	8′ – 10″	1,433	162	#6	6″	47′ – 1″	11,457	35	18″	39′ – 9″	929	177	18″	39′ – 9″	4,700	108	9″	7′ – 0″	505	216	9″	4′ – 7″	661	15′ – 3″	2,200	53′ – 3″	142	110	306	3.549	925.1	3.9	448	145.9	37,453
6	10′ – 0″	7′ – 0″	8″	7″	162	#6	6″	66′ – 4″	16,140	108	#6	9″	13′ – 4″	2,163	8′ – 10″	1,433	162	#6	6″	57′ – 8″	14,032	42	18″	39′ – 9″	1,115	210	18″	39′ – 9″	5,576	108	9″	7′ – 0″	505	270	9″	4′ – 7″	827	15′ – 3″	2,750	65′ – 6″	175	130	362	4.223	1,113.5	4.7	537	173.7	45,078
2	10′ – 0″	8′ – 0″	8″	7″	162	#6	6″	21′ – 6″	5,231	108	#6	9″	14′ – 4″	2,325	8′ – 10″	1,433	162	#6	6″	15′ – 4″	3,731	14	18″	39′ – 9″	372	84	18″	39′ – 9″	2,230	108	9″	8′ – 0″	577	54	9″	4′ – 7″	165	17′ – 3″	622	21′ – 6″	57	46	128	1.593	417.2	1.6	185	65.3	16,871
3	10′ – 0″	8′ – 0″	8″	7″	162	#6	6″	32′ – 1″	7,807	108	#6	9″	14′ – 4″	2,325	8′ – 10″	1,433	162	#6	6″	25′ – 11″	6,306	21	18″	39′ – 9″	558	119	18″	39′ – 9″	3,160	108	9″	8′ – 0″	577	108	9″	4′ – 7″	331	17′ – 3″	1,244	32′ – 1″	86	68	189	2.288	593.5	2.4	275	93.9	24,016
4	10′ – 0″	8′ – 0″	8″	7″	162	#6	6″	42′ – 8″	10,382	108	#6	9″	14′ – 4″	2,325	8′ – 10″	1,433	162	#6	6″	36′ – 6″	8,881	28	18″	39′ – 9″	743	154	18″	39′ – 9″	4,089	108	9″	8′ – 0″	577	162	9″	4′ – 7″	496	17′ – 3″	1,867	42′ – 8″	114	88	245	2.984	769.8	3.2	359	122.5	31,152
5	10′ – 0″	8′ – 0″	8″	7″	162	#6	6″	53′ – 3″	12,957	108	#6	9″	14′ – 4″	2,325	8′ – 10″	1,433	162	#6	6″	47′ – 1″	11,457	35	18″	39′ – 9″	929	189	18″	39′ – 9″	5,019	108	9″	8′ – 0″	577	216	9″	4′ – 7″	661	17′ – 3″	2,489	53′ – 3″	142	110	306	3.679	946.2	3.9	448	151.1	38,295
6	10′ – 0″	8′ – 0″	8″	7″	162	#6	6″	66′ – 4″	16,140	108	#6	9″	14′ – 4″	2,325	8′ – 10″	1,433	162	#6	6″	57′ – 8″	14,032	42	18″	39′ – 9″	1,115	224	18″	39′ – 9″	5,948	108	9″	8′ – 0″	577	270	9″	4′ – 7″	827	17′ – 3″	3,111	65′ – 6″	175	130	362	4.374	1,137.7	4.7	537	179.7	46,045
2	10′ – 0″	9′ – 0″	8″	7″	162	#6	6″	21′ – 6″	5,231	162	#6	6″	15′ – 4″	3,731	8′ – 10″	2,149	162	#6	6″	15′ – 4″	3,731	14	18″	39′ – 9″	372	90	18″	39′ – 9″	2,390	108	9″	9′ – 0″	649	54	9″	4′ – 7″	165	19′ – 3″	694	21′ – 6″	57	46	128	1.657	477.8	1.6	185	67.9	19,297
3	10′ – 0″	9′ – 0″	8″	7″	162	#6	6″	32′ – 1″	7,807	162	#6	6″	15′ – 4″	3,731	8′ – 10″	2,149	162	#6	6″	25′ – 11″	6,306	21	18″	39′ – 9″	558	127	18″	39′ – 9″	3,372	108	9″	9′ – 0″	649	108	9″	4′ – 7″	331	19′ – 3″	1,389	32′ – 1″	86	68	189	2.374	657.3	2.4	275	97.3	26,567
4	10′ – 0″	9′ – 0″	8″	7″	162	#6	6″	42′ – 8″	10,382	162	#6	6″	15′ – 4″	3,731	8′ – 10″	2,149	162	#6	6″	36′ – 6″	8,881	28	18″	39′ – 9″	743	164	18″	39′ – 9″	4,355	108	9″	9′ – 0″	649	162	9″	4′ – 7″	496	19′ – 3″	2,083	42′ – 8″	114	88	245	3.092	836.7	3.2	359	126.8	33,828
5	10′ – 0″	9′ – 0″	8″	7″	162	#6	6″	53′ – 3″	12,957	162	#6	6″	15′ – 4″	3,731	8′ – 10″	2,149	162	#6	6″	47′ – 1″	11,457	35	18″	39′ – 9″	929	201	18″	39′ – 9″	5,337	108	9″	9′ – 0″	649	216	9″	4′ – 7″	661	19′ – 3″	2,778	53′ – 3″	142	110	306	3.809	1,016.2	3.9	448	156.3	41,096
6	10′ – 0″	9′ – 0″	8″	7″	162	#6	6″	66′ – 4″	16,140	162	#6	6″	15′ – 4″	3,731	8′ – 10″	2,149	162	#6	6″	57′ – 8″	14,032	42	18″	39′ – 9″	1,115	238	18″	39′ – 9″	6,320	108	9″	9′ – 0″	649	270	9″	4′ – 7″	827	19′ – 3″	3,472	65′ – 6″	175	130	362	4.526	1,210.9	4.7	537	185.8	48,972
2	10′ – 0″	10′ – 0″	8″	7″	162	#6	6″	21′ – 6″	5,231	162	#6	6″	16′ – 4″	3,974	8′ – 10″	2,149	162	#6	6″	15′ – 4″	3,731	14	18″	39′ – 9″	372	90	18″	39′ – 9″	2,390	108	9″	10′ – 0″	721	54	9″	4′ – 7″	165	21′ – 3″	767	21′ – 6″	57	46	128	1.722	487.5	1.6	185	70.5	19,685
3	10′ – 0″	10′ – 0″	8″	7″	162	#6	6″	32′ – 1″	7,807	162	#6	6″	16′ – 4″	3,974	8′ – 10″	2,149	162	#6	6″	25′ – 11″	6,306	21	18″	39′ – 9″	558	127	18″	39′ – 9″	3,372	108	9″	10′ – 0″	721	108	9″	4′ – 7″	331	21′ – 3″	1,533	32′ – 1″	86	68	189	2.461	668.8	2.4	275	100.8	27,026
4	10′ – 0″	10′ – 0″	8″	7″	162	#6	6″	42′ – 8″	10,382	162	#6	6″	16′ – 4″	3,974	8′ – 10″	2,149	162	#6	6″	36′ – 6″	8,881	28	18″	39′ – 9″	743	164	18″	39′ – 9″	4,355	108	9″	10′ – 0″	721	162	9″	4′ – 7″	496	21′ – 3″	2,300	42′ – 8″	114	88	245	3.200	850.0	3.2	359	131.2	34,360
5	10′ – 0″	10′ – 0″	8″	7″	162	#6	6″	53′ – 3″	12,957	162	#6	6″	16′ – 4″	3,974	8′ – 10″	2,149	162	#6	6″	47′ – 1″	11,457	35	18″	39′ – 9″	929	201	18″	39′ – 9″	5,337	108	9″	10′ – 0″	721	216	9″	4′ – 7″	661	21′ – 3″	3,066	53′ – 3″	142	110	306	3.938	1,031.3	3.9	448	161.5	41,699
6	10′ – 0″	10′ – 0″	8″	7″	162	#6	6″	66′ – 4″	16,140	162	#6	6″	16′ – 4″	3,974	8′ – 10″	2,149	162	#6	6″	57′ – 8″	14,032	42	18″	39′ – 9″	1,115	238	18″	39′ – 9″	6,320	108	9″	10′ – 0″	721	270	9″	4′ – 7″	827	21′ – 3″	3,833	65′ – 6″	175	130	362	4.677	1,227.8	4.7	537	191.8	49,648

(5) Bar lengths over 60′ include one bar lap; refer to MATERIAL NOTES for minimum lap lengths.

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

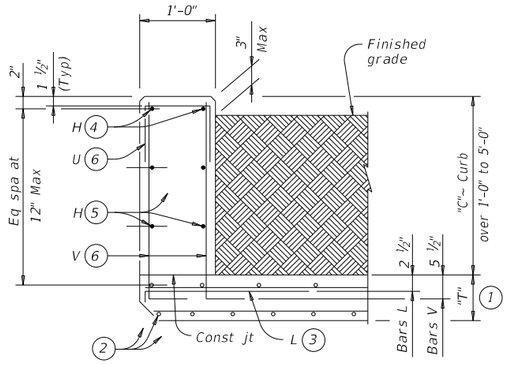
MULTIPLE BOX CULVERTS CAST-IN-PLACE

10′-0″ SPAN
0′ TO 7′ FILL

MC-10-7

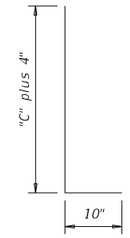
FILE:	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		183

DATE:
FILE:

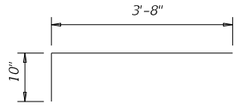


TYPICAL SECTION

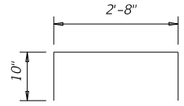
Used for curbs over 1'-0" to 5'-0"



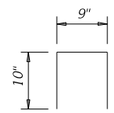
BARS V (#5) (6)
Spaced at 12" Max



BARS L (#5) (3)
Spaced at 12" Max



OPTIONAL BARS L (#5) (3) (7)
Spaced at 12" Max



BARS U (#4) (6)
Spaced at 12" Max

(1) "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 8" thick, see SCP-MD standard for additional details.

(2) Adjust normal culvert slab bars as necessary to clear obstructions.

(3) Place bars L as shown. Tilt hook as necessary to maintain cover.

(4) Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.

(5) Additional bars H(#4) as required to maintain 12" Max spacing.

(6) Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.

(7) Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.

(8) Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES (8)

Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)
1'-0"	0.037	10.4
1'-6"	0.056	14.5
2'-0"	0.074	15.6
2'-6"	0.093	18.0
3'-0"	0.111	19.0
3'-6"	0.130	21.3
4'-0"	0.148	22.4
4'-6"	0.167	24.8
5'-0"	0.185	25.9

CONSTRUCTION NOTES:

Adjust reinforcing steel as necessary to provide 1 ¼" cover.
For vehicle safety, top of the curb must not project more than 3" above the finished grade.

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) minimum for curbs.
Provide bar laps, where required, as follows:
- Uncoated or galvanized ~ #4 = 1'-8" Min

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with PR11, PR22 and PR3 type rails. These details are not suitable for the mounting of other rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.
This Curb is considered as part of the Box Culvert for payment.

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

EXTENDED CURB DETAILS
FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL

ECD

FILE:	DN: GAF	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		184

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

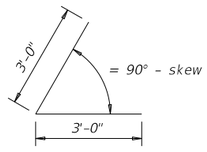
Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing (2~wings) (4)		Estimated Quantities per ft of Toewall (1~toewall)	
Maximum Wingwall Height Hw	W	X	Y	Z	Bars J1		Bars J2					
					Size	Spa	Size	Spa	Reinf Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#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)

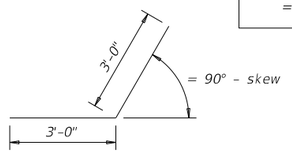
Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

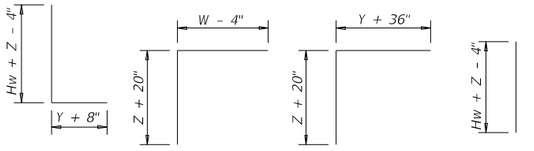
Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



BARS D1



BARS D2



BARS J1 BARS J2 BARS J3 BARS V

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

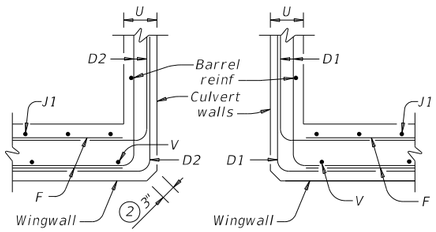
Hw = H + T + C
Lw = (Hw) (SL) ÷ cosine (θ) for Type PW-1
= (Hw - 1') (SL) ÷ cosine (θ) for Type PW-2 and Hw ≥ 4'
= (Hw - 0.5') (SL) ÷ cosine (θ) for Type PW-2 and Hw < 4'

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

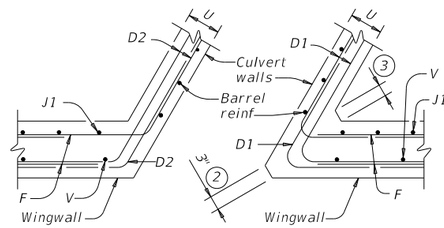
For precast culverts:
Ltw = [(N) (2 U + S) + (N - 1) (0.5')] ÷ cosine (θ)
Total Wingwall Area (two wings ~ SF)
= (2)(Hw)(Lw) for Type PW-1
= (2)(Hw)(Lw) - 6 SF for Type PW-2 and Hw ≥ 4'
= (2)(Hw)(Lw) - 1.5 SF for Type PW-2 and Hw < 4'

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

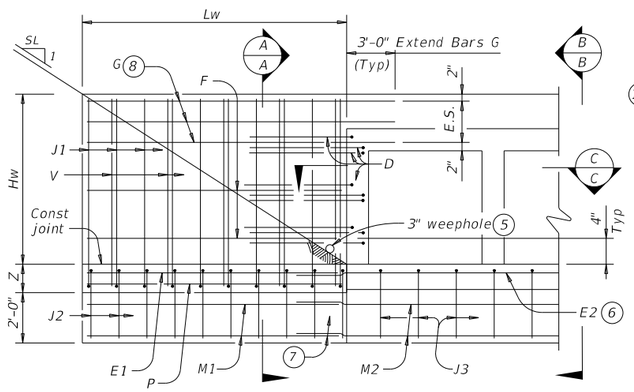
See applicable box culvert standard sheet for S, H, T, and U values.



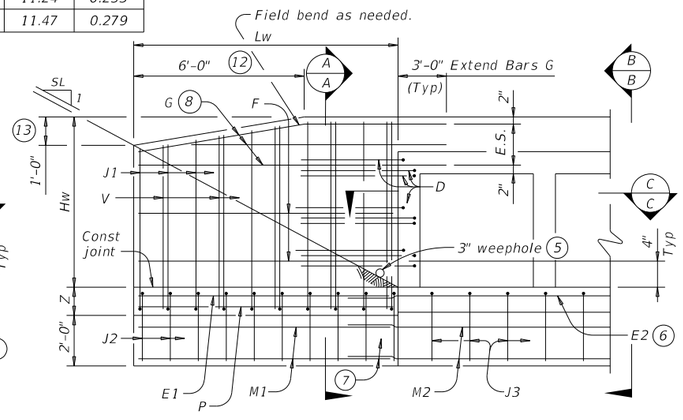
SECTION C-C - PW-1



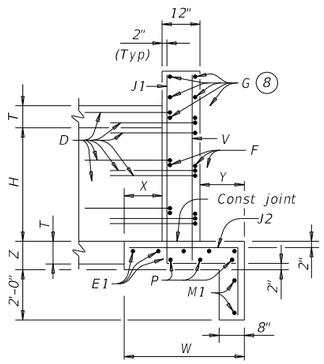
SECTION C-C - PW-2



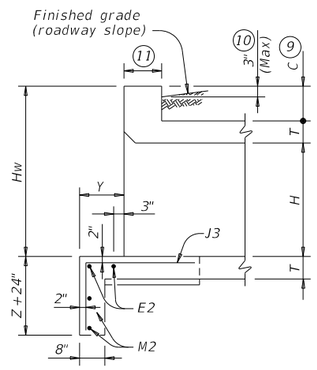
PARTIAL ELEVATION - PW-1



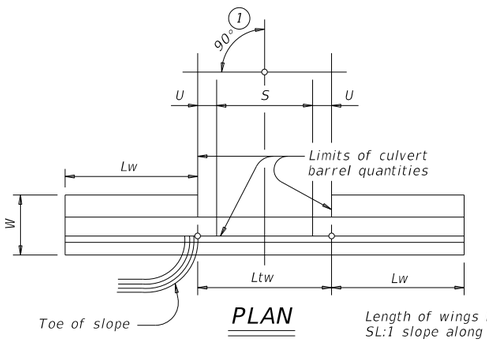
PARTIAL ELEVATION - PW-2



SECTION A-A
(Showing wing reinforcement.)

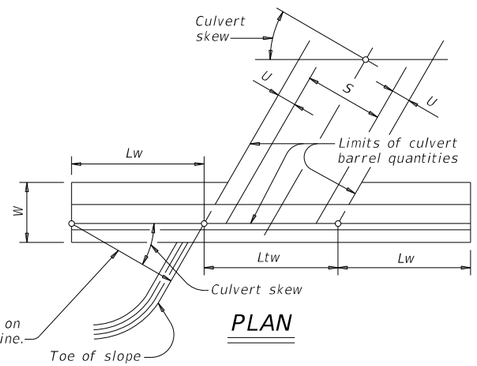


SECTION B-B
(Showing wing reinforcement.)



PLAN

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 elsewhere 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 reinforcing 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

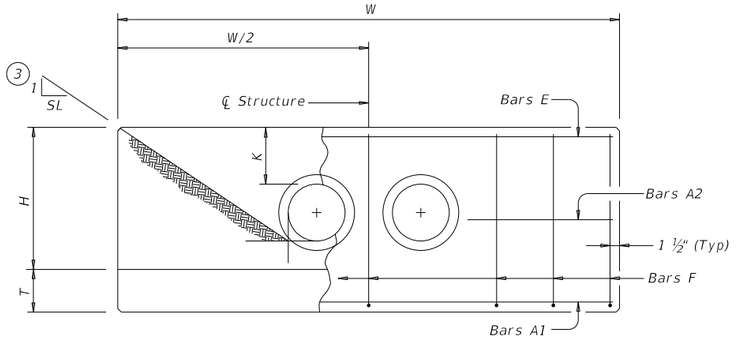
FILE:	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		185

DATE:
FILE:

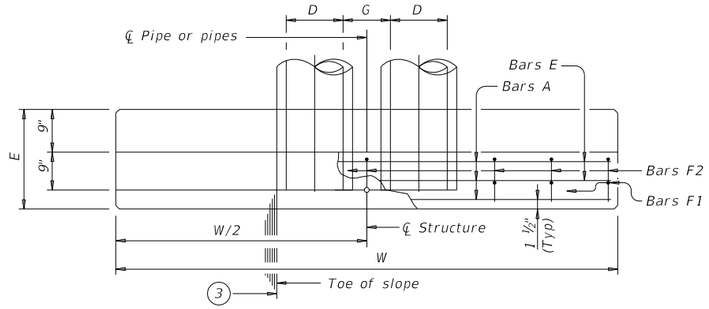
DATE:
FILE:

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

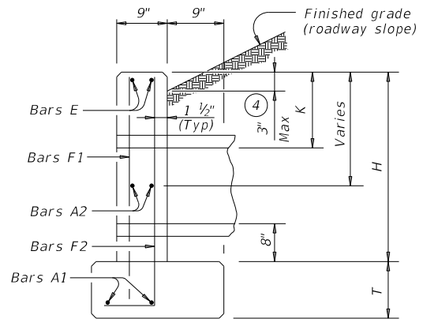
Slope	Dia of Pipe (D)	Values for One Pipe			Values To Be Added for Each Addt'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' – 0"	122	1.1	1' – 9"	15	0.2
	15"	10' – 3"	136	1.3	2' – 2"	16	0.2
	18"	11' – 6"	163	1.5	2' – 8"	19	0.3
	21"	12' – 9"	200	1.8	3' – 1"	31	0.4
	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



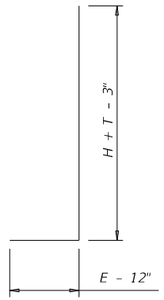
ELEVATION



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

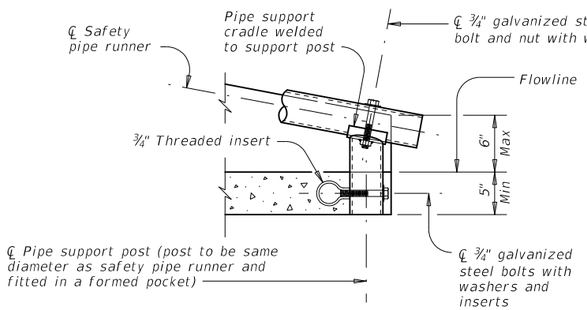
CH-PW-0

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		186

DATE:
FILE:

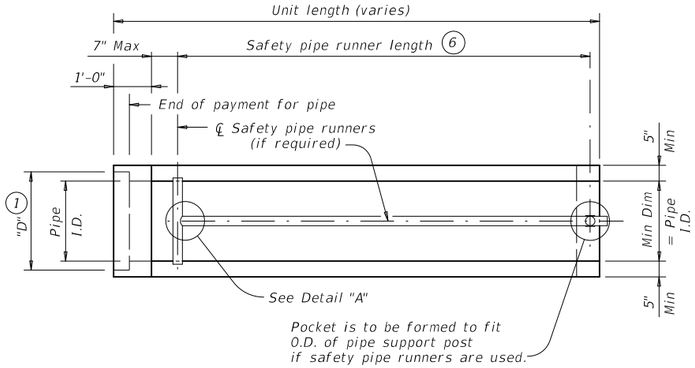
REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

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"				



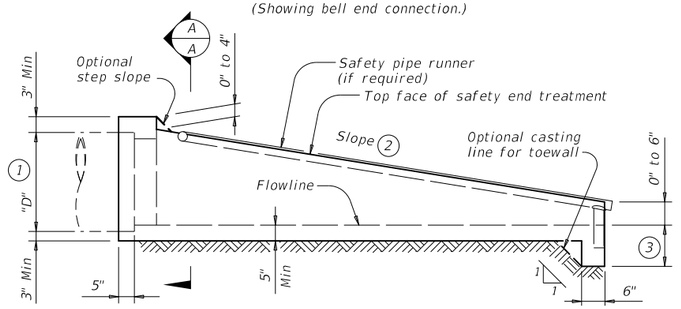
END DETAIL FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)



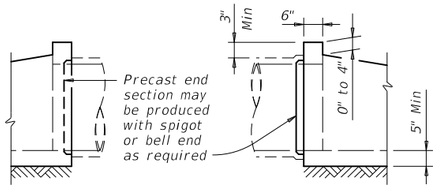
PLAN

(Showing bell end connection.)



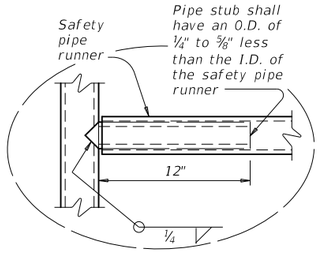
LONGITUDINAL ELEVATION

(Showing bell end connection.)



OPTIONAL JOINT FOR RCP

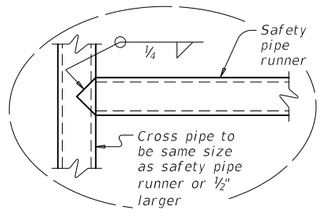
(Showing joint between RCP and precast safety end treatment)



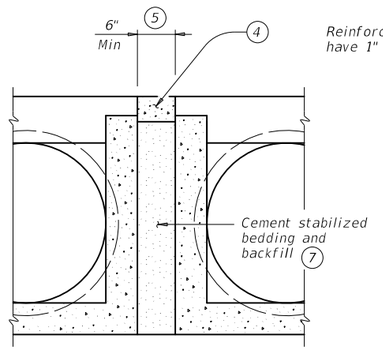
OPTION A

DETAIL A

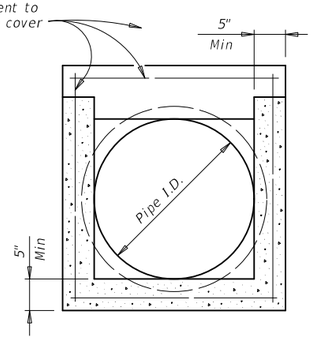
(If required)



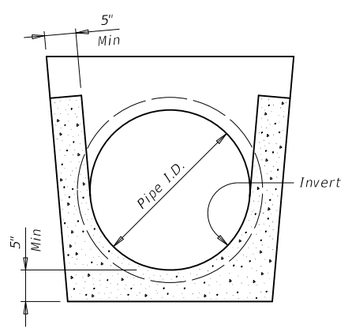
OPTION B



MULTIPLE PIPE INSTALLATION

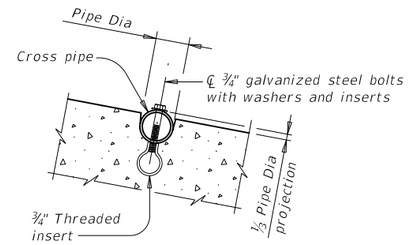


OPTION WITH SQUARE BOTTOM



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:	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		187

DATE:
FILE:

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

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

TABLE OF WINGWALL REINFORCING
(2~wings)

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

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

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

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

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

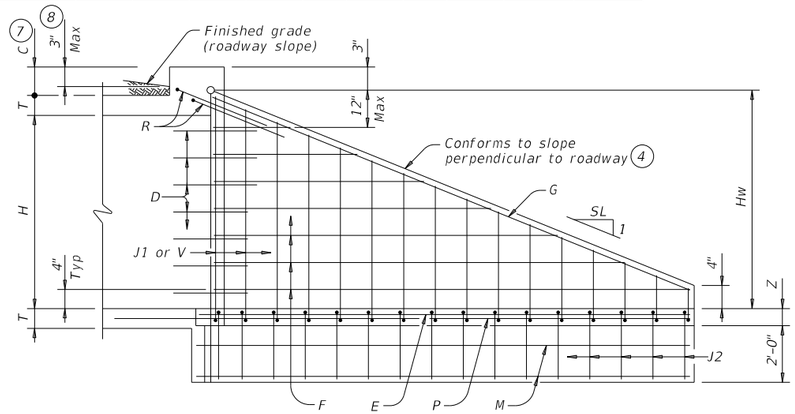
For cast-in-place culverts:
Ltw = (N) (S) + (N + 1) (U)

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

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

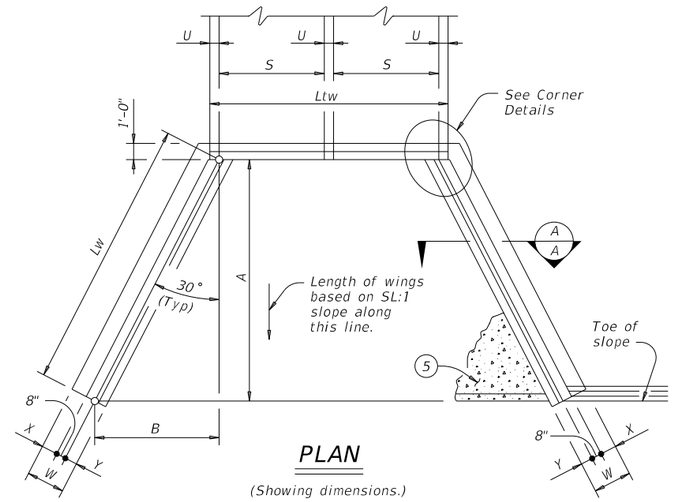
Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans

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



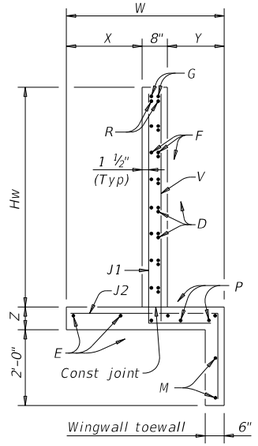
INSIDE ELEVATION

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

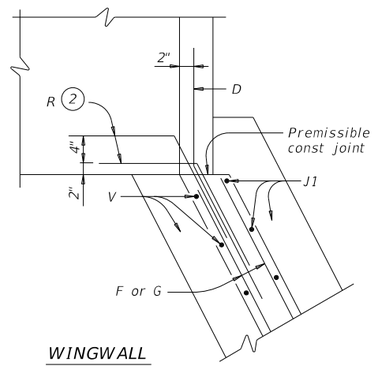


PLAN

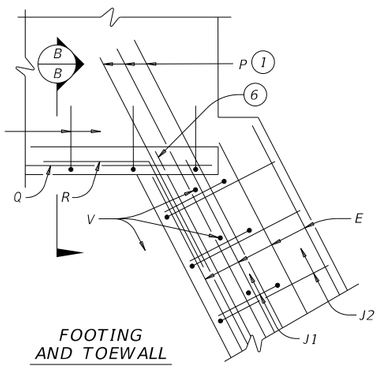
(Showing dimensions.)



SECTION A-A



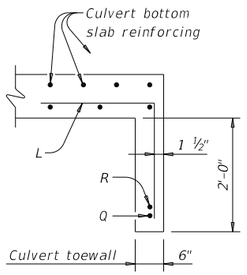
WINGWALL



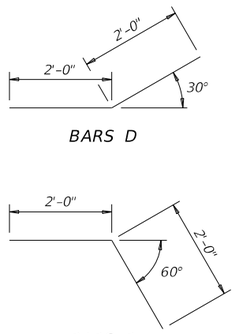
FOOTING AND TOEWALL

CORNER DETAILS

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

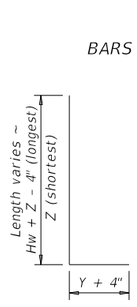


SECTION B-B (5)

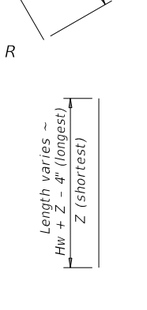


BARS D

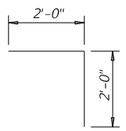
BARS R



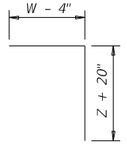
BARS J1



BARS V



BARS L



BARS J2

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

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

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

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

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

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

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

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

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

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

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

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

Texas Department of Transportation

Bridge Division Standard

CONCRETE WINGWALLS
WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS

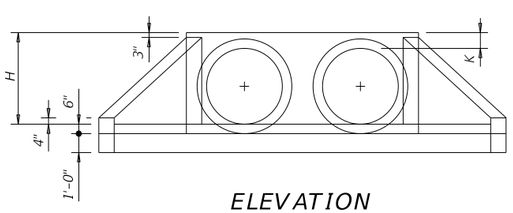
FW-0

FILE:	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		188

DATE:
FILE:

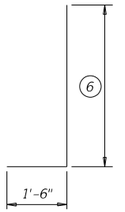
TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

Slope	Dia of Pipe (D)	Values for One Pipe						Values to be Added for Each Addt'l Pipe		
		W	X	Y	L	Reinf (Lbs)	Conc (CY) (1)	X and W	Reinf (Lbs)	Conc (CY) (1)
2:1	12"	4' – 7 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

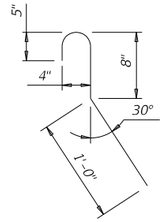


ELEVATION

(Showing dimensions.)

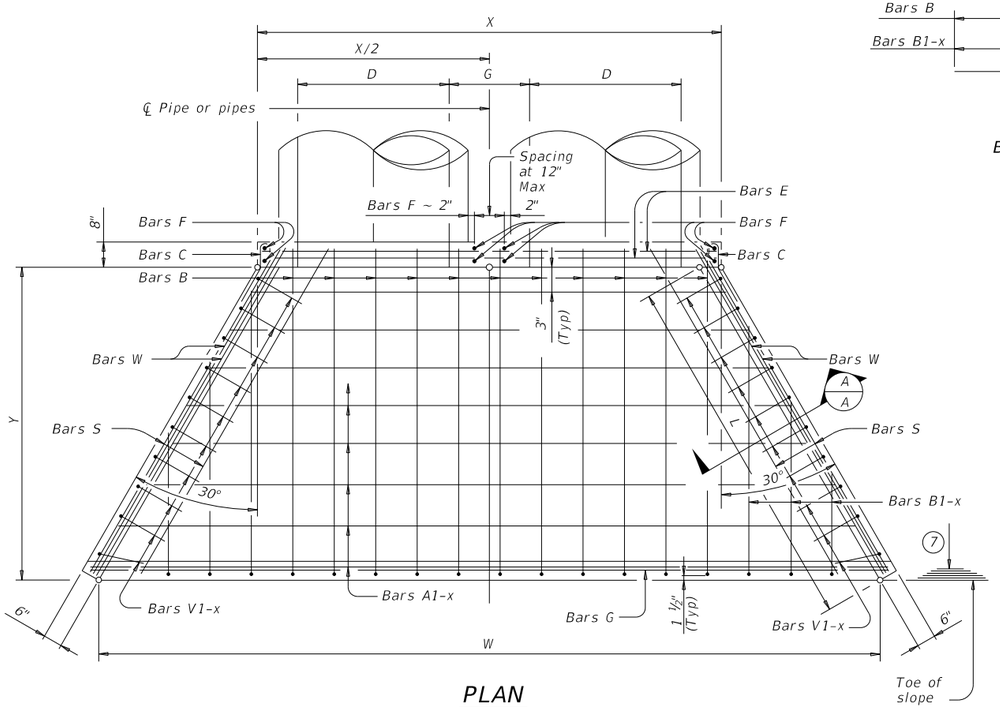


BARS V

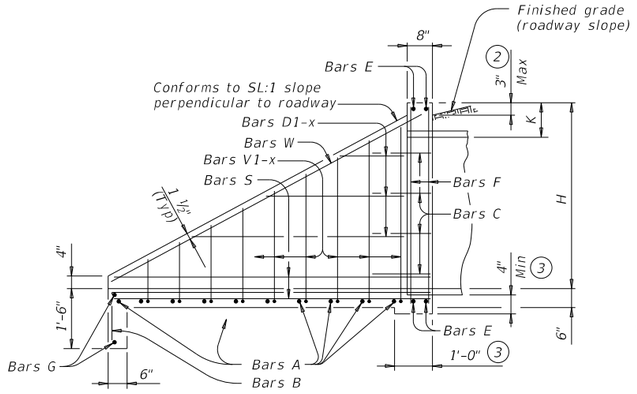


BARS CL

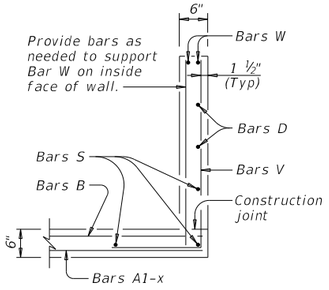
(Length = 2'-5")



PLAN



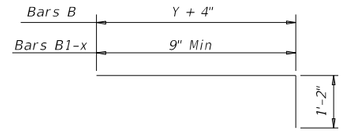
TYPICAL WING ELEVATION



SECTION A-A

TABLE OF (5) REINFORCING STEEL

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



BARS B and B1-x

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"

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

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

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

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

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

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

Texas Department of Transportation

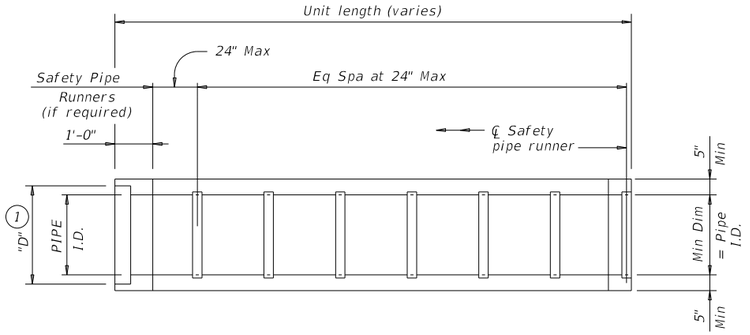
Bridge Division Standard

CONCRETE HEADWALLS
WITH FLARED WINGS FOR 0° SKEW PIPE CULVERTS

CH-FW-0

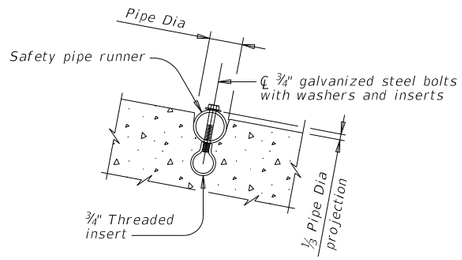
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		189

DATE:
FILE:



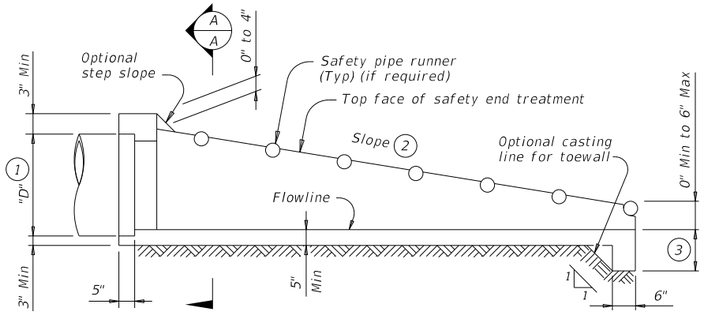
PLAN

(Showing bell end connection.)



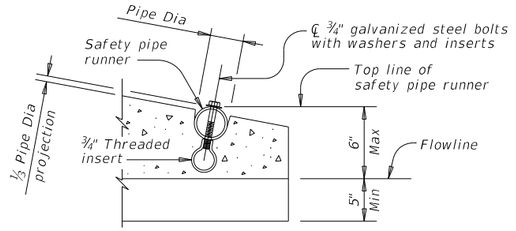
INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

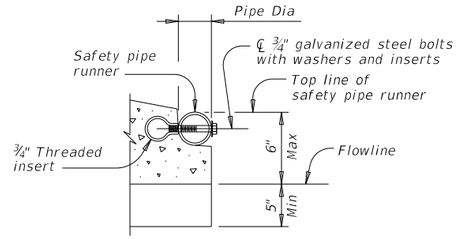


LONGITUDINAL ELEVATION

(Showing bell end connection.)



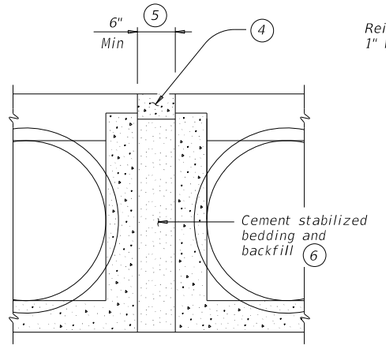
OPTION A



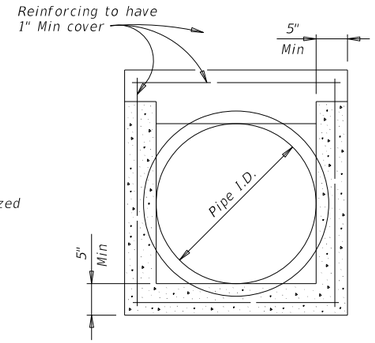
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

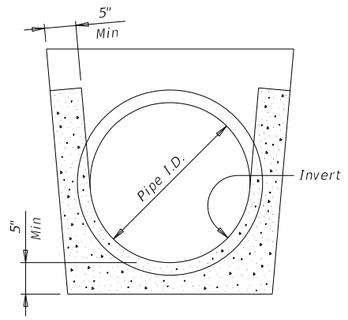
(If required)



MULTIPLE PIPE INSTALLATION

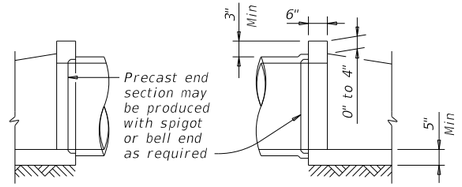


OPTION WITH SQUARE BOTTOM



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

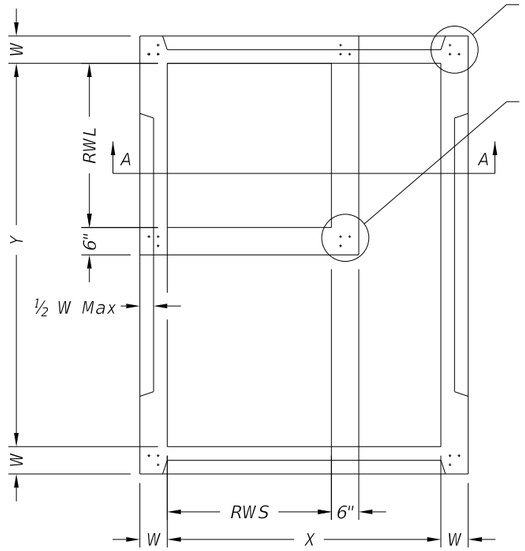
Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

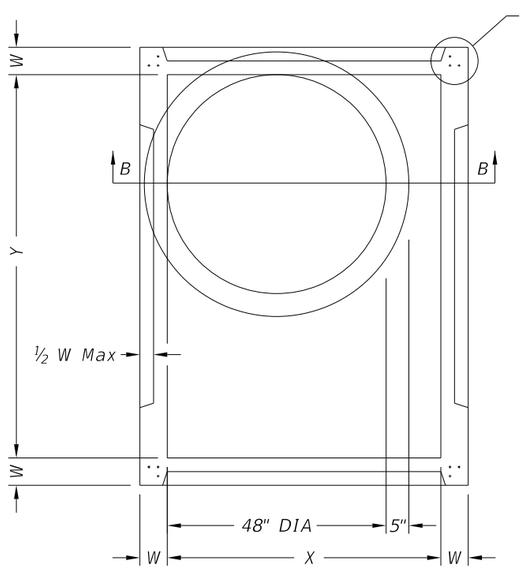
PSET-SP

FILE:	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		190



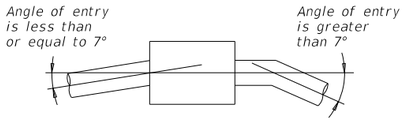
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



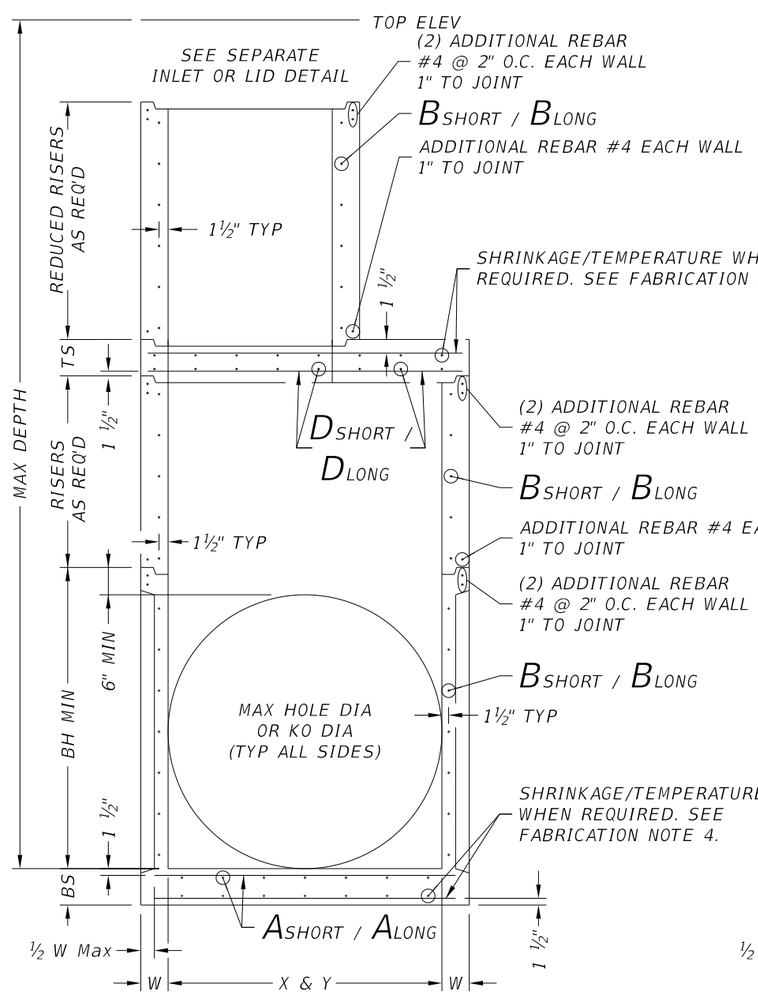
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



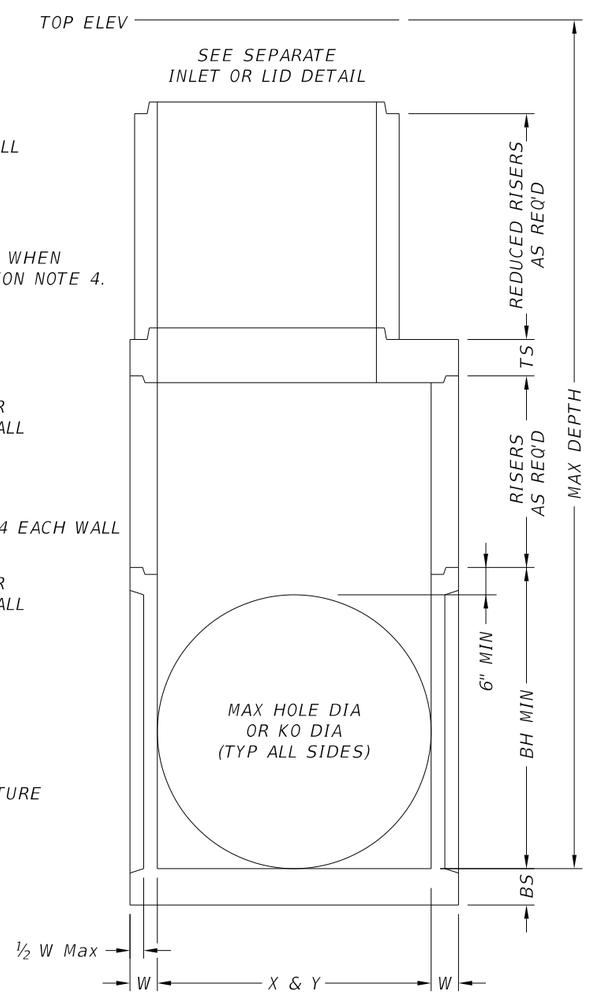
PIPE CONNECTION DETAIL

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



SECTION A-A

SQUARE REDUCED RISER OPTION



SECTION B-B

ROUND REDUCED RISER OPTION

FABRICATION NOTES:

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

INSTALLATION NOTES:

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

GENERAL NOTES:

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

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST BASE

PB

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		191

DATE:
FILE:

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

** Unless otherwise indicated.

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

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

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		192

DATE:
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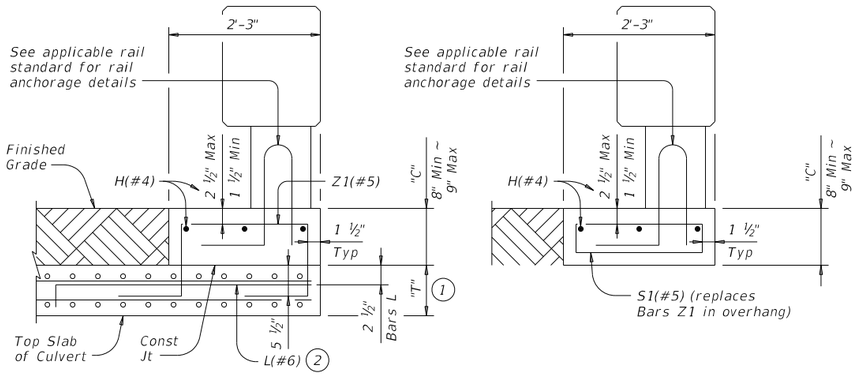
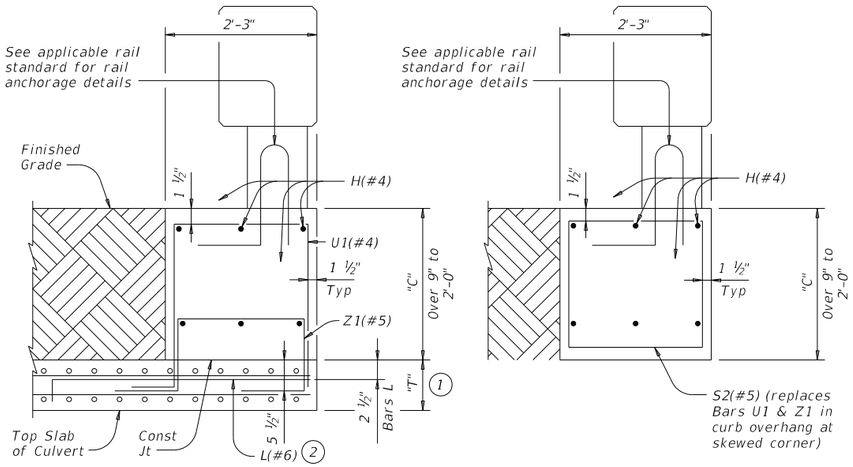


SECTION A-A SECTION B-B

TYPE 1 CURB

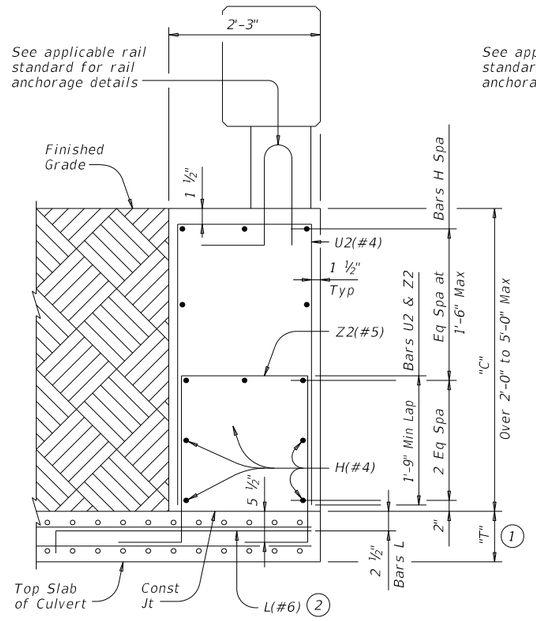
Used for curbs from 8" to 9" (Showing "C" = 9"). Showing T223 Rail, other rails similar. (Bars L(#5) on T223 and C223 Rails are not used for this structure). Bars RH(#5) required on standards T80HT, T80SS and T224 are not required when used with the RAC standard.



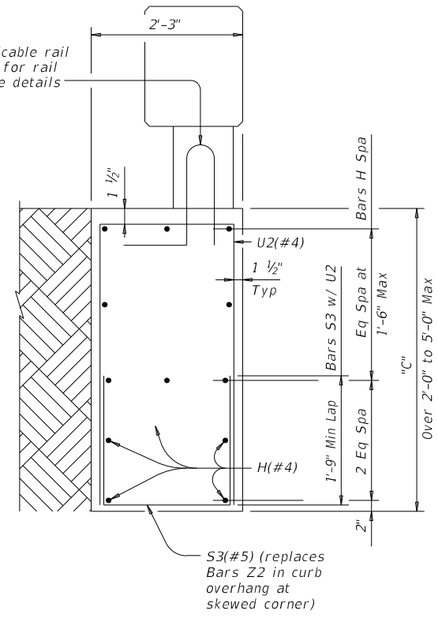
SECTION A-A SECTION B-B

TYPE 2 CURB

Used for curbs over 9" to 2'-0" (Showing "C" = 2'-0"). Showing T223 Rail, other rails similar. (Bars L(#5) on T223 and C223 Rails are not used for this structure). Bars RH(#5) required on standards T80HT, T80SS and T224 are not required when used with the RAC standard.



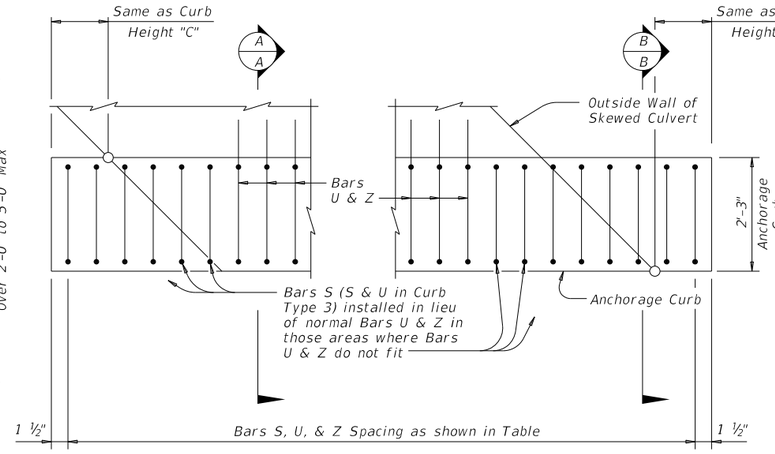
SECTION A-A



SECTION B-B

TYPE 3 CURB

Used for curbs over 2'-0" to 5'-0" (Showing "C" = 4'-0"). Showing T223 Rail, other rails similar. (Bars L(#5) on T223 and C223 Rails are not used for this structure). Bars RH(#5) required on standards T80HT, T80SS and T224 are not required when used with the RAC standard.



TYPICAL CURB PLAN

Showing typical installation on skewed culvert. (Bars L(#5) on T223 and C223 Rails are not used for this structure). Bars RH(#5) required on standards T80HT, T80SS and T224 are not required when used with the RAC standard.

BARS U1 (#4) BARS U2 (#4) BARS Z (#5) BARS L (#6) (2) Spaced at 6" Max OPTIONAL BARS L (#6) (3) (2) Spaced at 6" Max BARS S1 (#5) BARS S2 (#5) BARS S3 (#5)

TABLE OF REINFORCING SPACING

Curb Height "C"	Section Type	Bars S, U, & Z Spa
8" to 9"	1	12"
Over 9" to 2'-0"	2	9"
Over 2'-0" to 3'-0"	3	7"
Over 3'-0" to 5'-0"	3	5"

TABLE OF ESTIMATED QUANTITIES (4)

Curb Height "C"	Section Type	Reinf Steel (Lb/LF)	Class "C" Concrete (CY/LF)
8"	1	21.5	0.056
9"	1	21.5	0.063
1'-0"	2	29.7	0.083
1'-6"	2	30.6	0.125
2'-0"	2	31.5	0.167
3'-0"	3	44.6	0.250
4'-0"	3	56.8	0.333
5'-0"	3	60.0	0.417

(1) *"T" is equal to the culvert top slab thickness. For Precast Boxes with slabs less than 8" thick, see SCP-MD Standard for additional details.*

(2) *Tilt Bars L hook as necessary to maintain cover.*

(3) *Optional Bars L are to be used only for Precast Box Culverts with 3'-0" closure pours.*

(4) *Quantities shown are for Contractor's information only. Quantities are per Linear Foot of curb length. The values for each section type in table can be interpolated for intermediate values of Curb Height, "C".*

CONSTRUCTION NOTES:

When using this anchorage curb, omit normal culvert curb reinforcing bars K and H shown on the culvert standard sheets.

For vehicle safety, the top of the curb must be flush with the finished grade.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.

Galvanize all reinforcing steel if required elsewhere.

Provide bar laps, where required, as follows:
Uncoated or galvanized ~ #4 = 1'-11"

Provide Class "C" concrete (f'c=3,600 psi). Provide Class "C" (HPC) concrete if shown elsewhere in the plans.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

The rail anchorage curb details have sufficient strength for use with all standard rail types.

See appropriate rail standard for approved design speed restrictions, notes and details not shown.

This anchorage curb is considered part of the Box Culvert for payment.

These details are for use with curbs that are 8" to 5'-0" tall only. Curb heights that are less than or greater than those shown will require special design.

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

RAIL ANCHORAGE CURB
BOX CULVERT
RAIL MOUNTING DETAILS
(CURBS 8" TO 5'-0" TALL ONLY)
RAC

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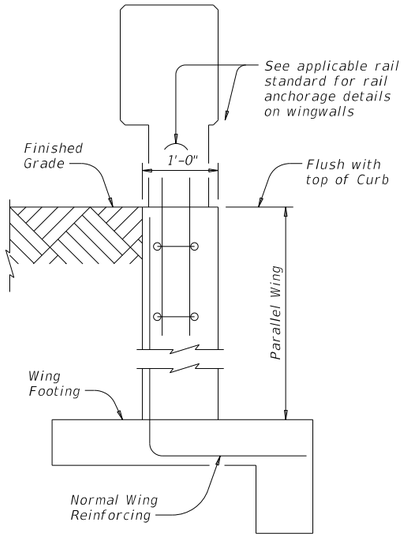
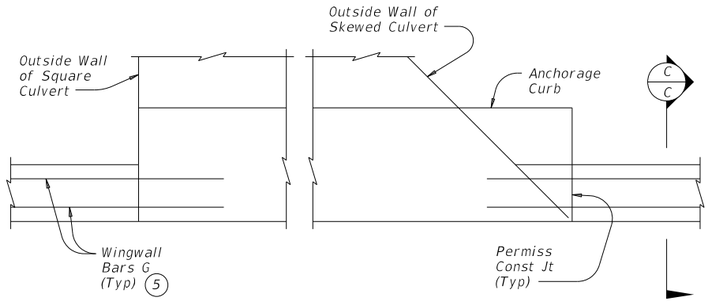
	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		193

DATE:
FILE:



SECTION C-C



TYPICAL CURB PLAN

Curb reinforcing and footings not shown for clarity

INSTALLATION AT PARALLEL CULVERT WINGWALLS

See culvert wingwall standard for bars and details not shown.

(5) Bars G (#5), as identified on the PARALLEL WINGS PW standard sheet, must extend 1'-6" into the Anchorage Curb similar to that shown for a normal culvert curb.

Texas Department of Transportation

Bridge Division Standard

RAIL ANCHORAGE CURB
BOX CULVERT
RAIL MOUNTING DETAILS
(CURBS 8" TO 5'-0" TALL ONLY)

RAC

FILE:	DN: GAF	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		194

DATE:
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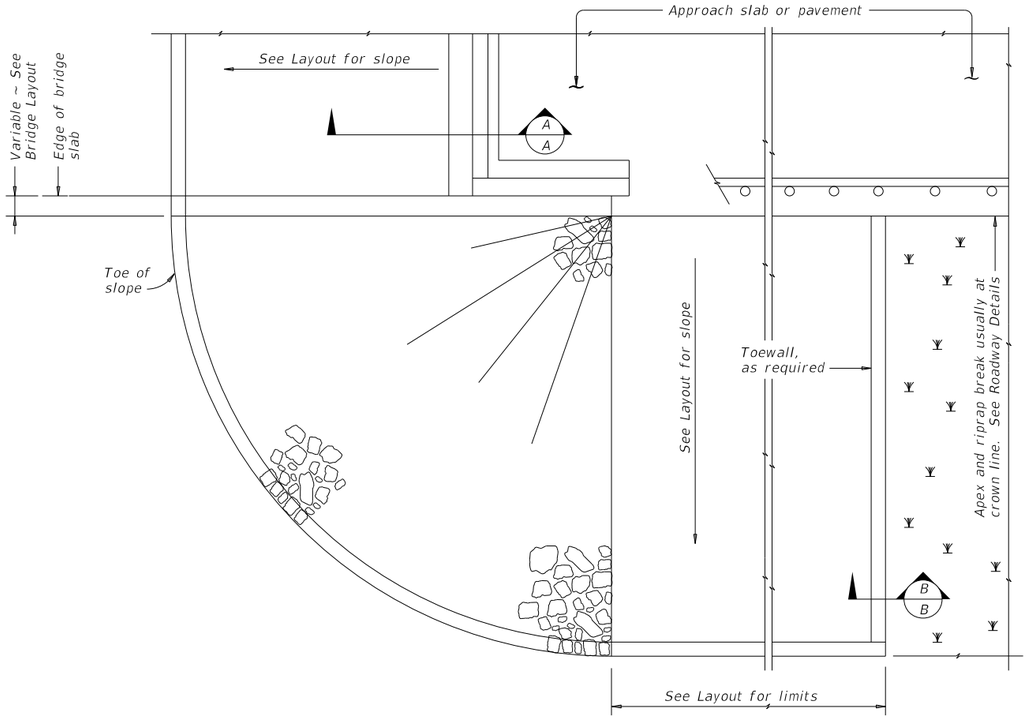
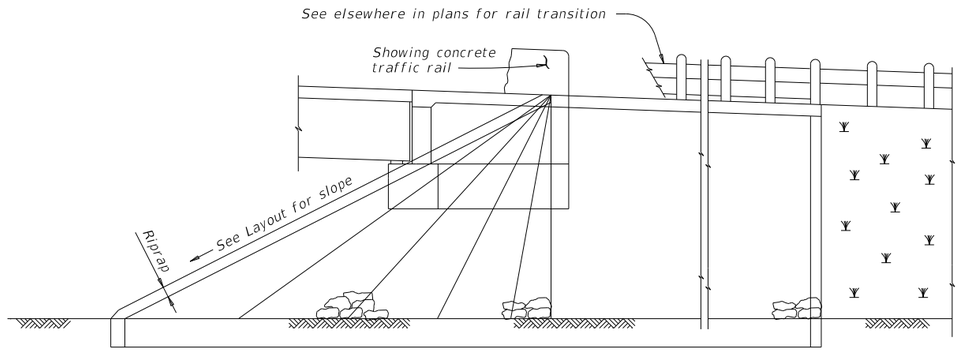
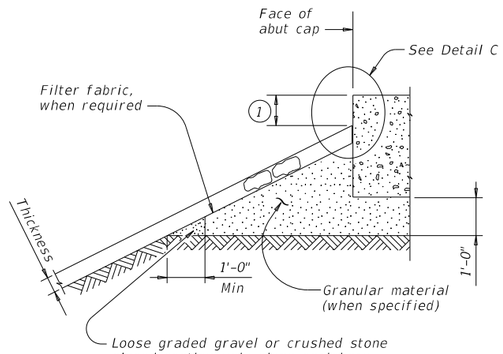


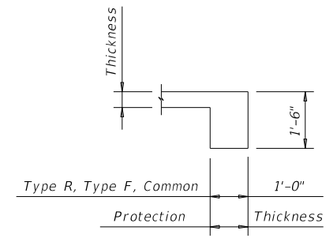
PLAN



ELEVATION

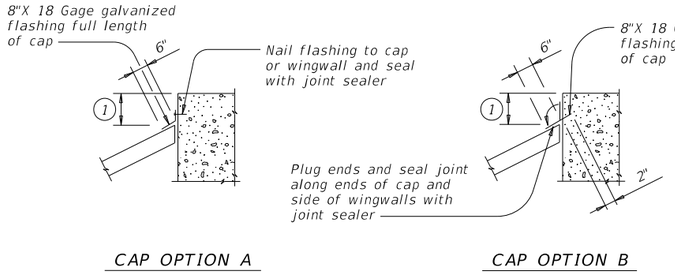


SECTION A-A AT CAP



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

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REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
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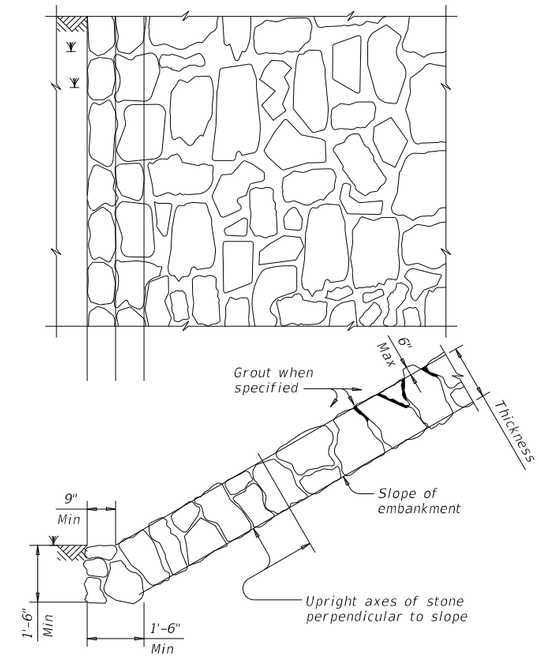


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

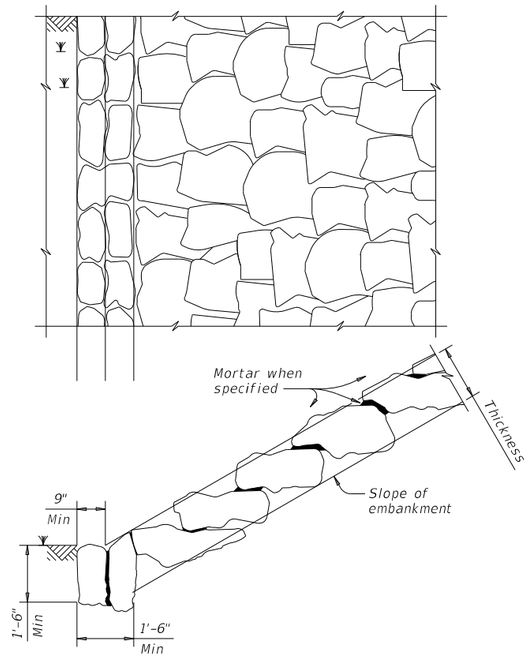


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

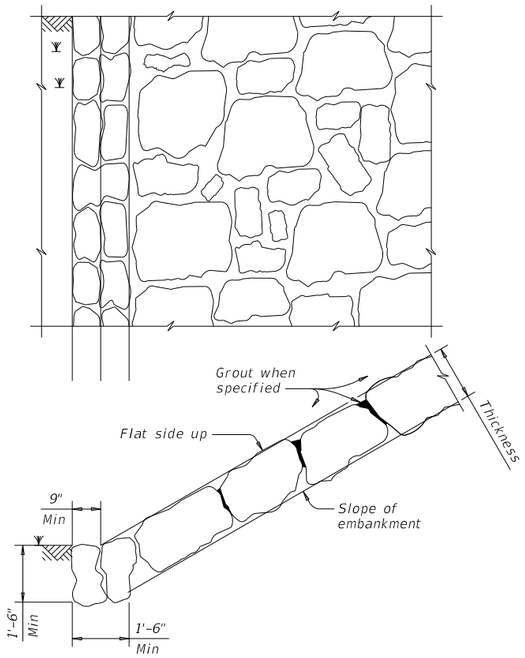
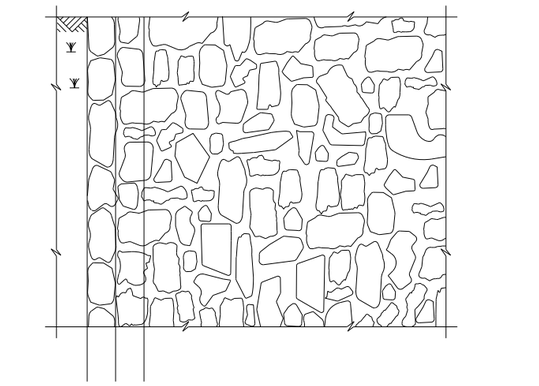
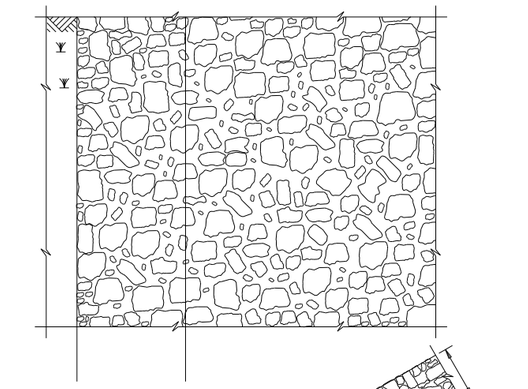


FIGURE 3 ~ TYPE F STONE RIPRAP

grouted





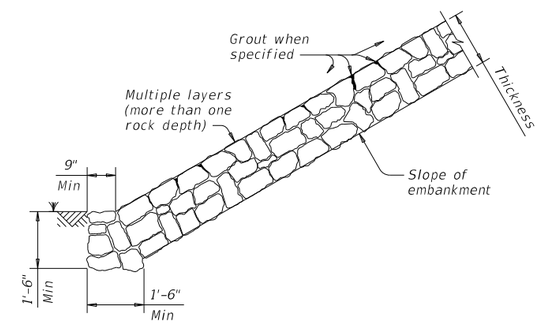


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

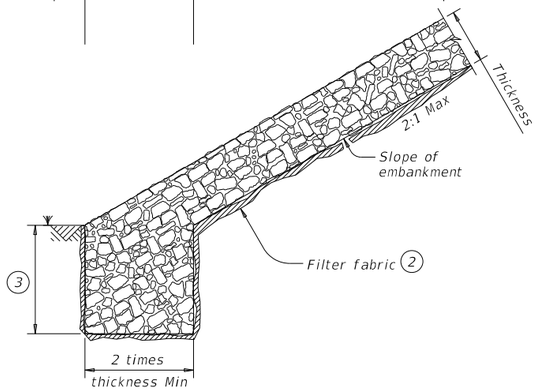


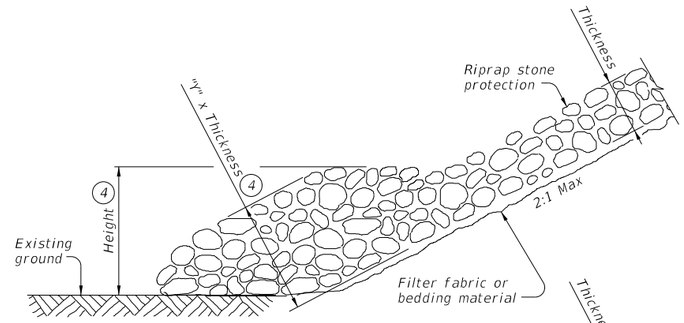
FIGURE 5 ~ PROTECTION STONE RIPRAP (5)

(2) Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.

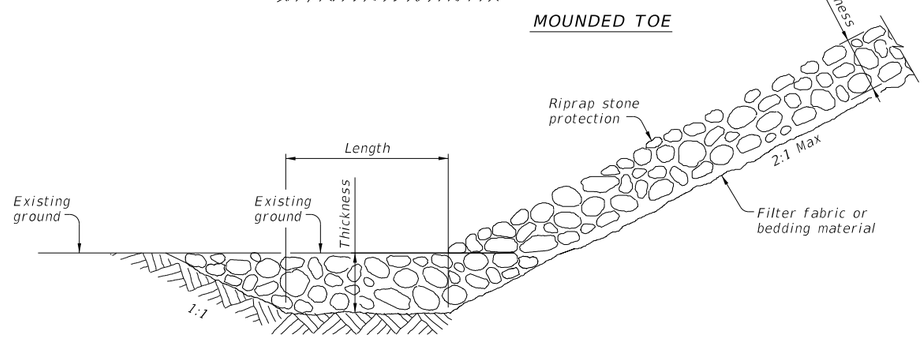
(3) Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

(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)

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

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	0450	01	013	SH 204
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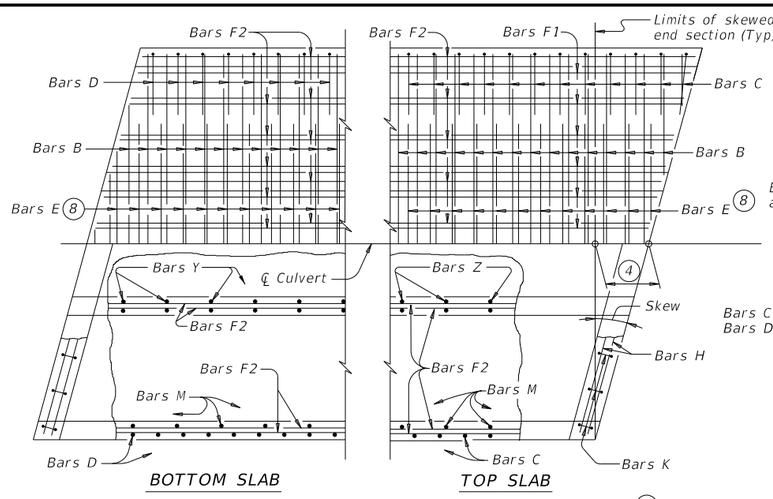
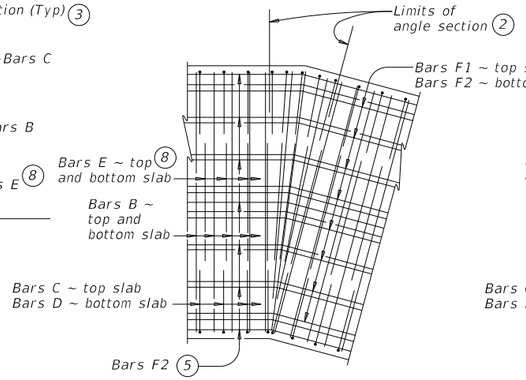
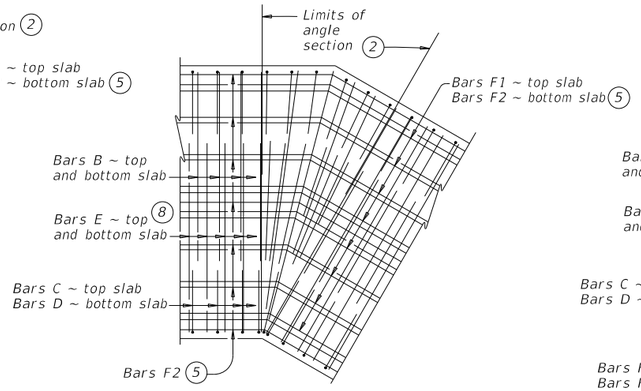


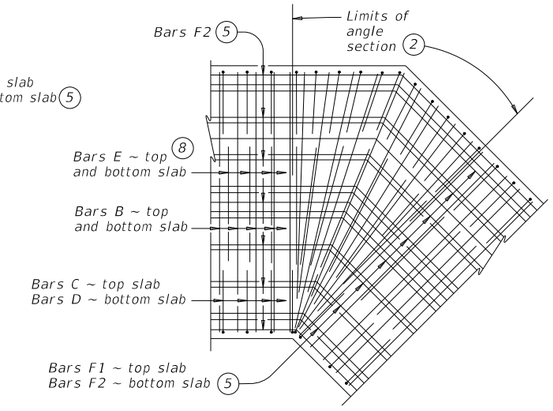
PLAN OF SKEWED ENDS ~ FROM 0° TO 15° 7



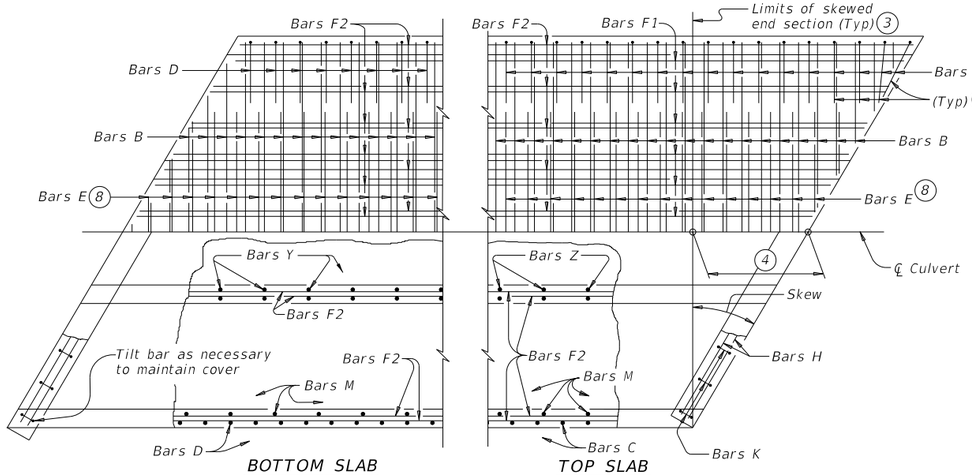
PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



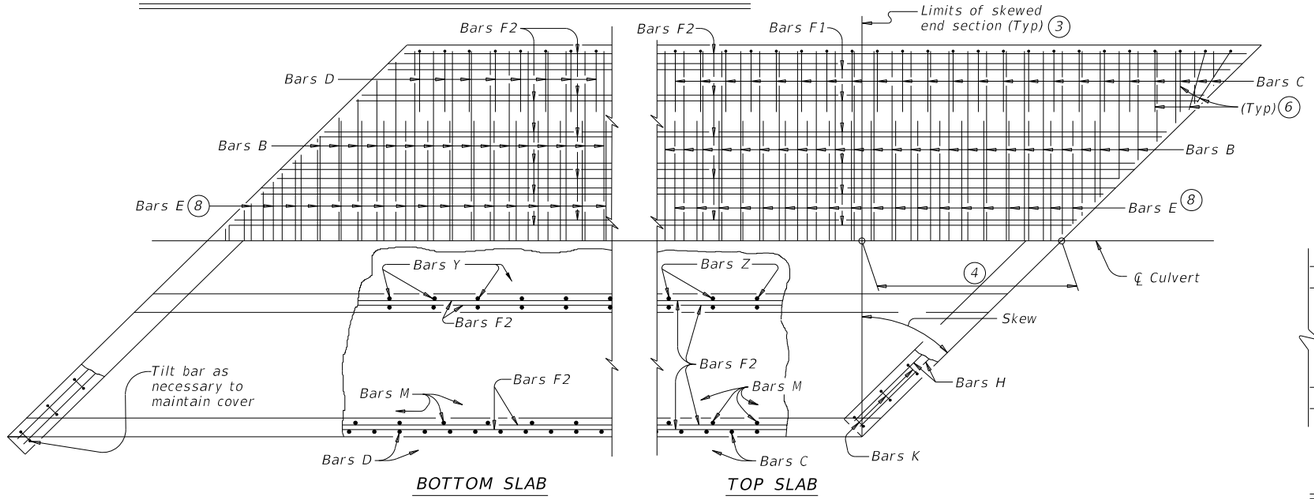
PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



PLAN OF ANGLE SECTION ~ OVER 30° TO 45°



PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



PLAN OF SKEWED ENDS ~ OVER 30° TO 45°

1 For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.

For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, Class C, D, E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.

Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.

2 When the spacing between Bars B or Bars E becomes less than half of the normal spacing, cut bars to avoid conflict.

3 The length of Bars B and Bars E will vary in the skewed end sections.

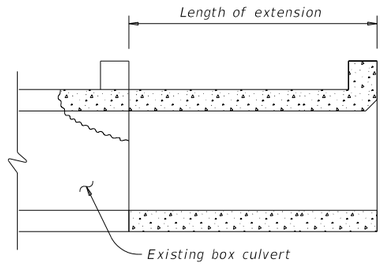
4 [One half of overall width] x [tangent of the skew angle]

5 Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.

6 When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.

7 At the Contractor's option, for skews of 15° or less, place Bars B, C, D, and E parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B and Bars E shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets to accommodate the skew.

8 Extend Bars E as shown on the MC standard sheet for direct traffic culverts.



LENGTHENING DETAIL 1

CONSTRUCTION NOTES:

Do not use permanent forms.
When required, lap Bars H 1'-8" for uncoated or galvanized bars.
Provide a minimum of 1 ½" clear cover.

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) with these exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for details of straight sections of culvert.
For skewed sections and angle sections, refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.
For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets by the cosine of the skew angle.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

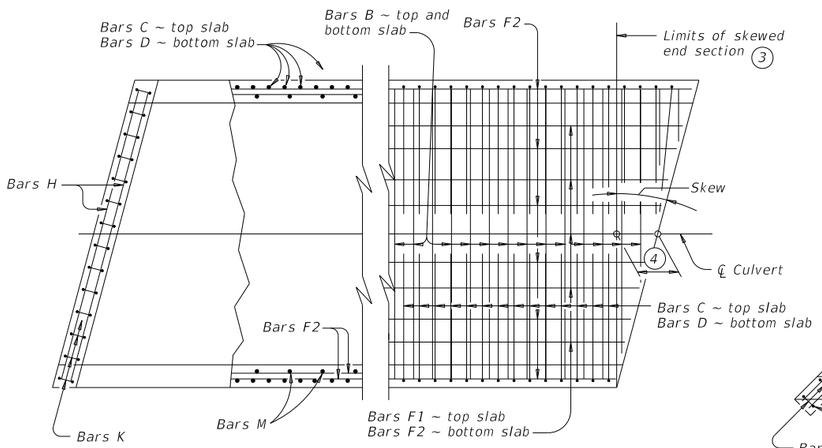
MULTIPLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS

MC-MD

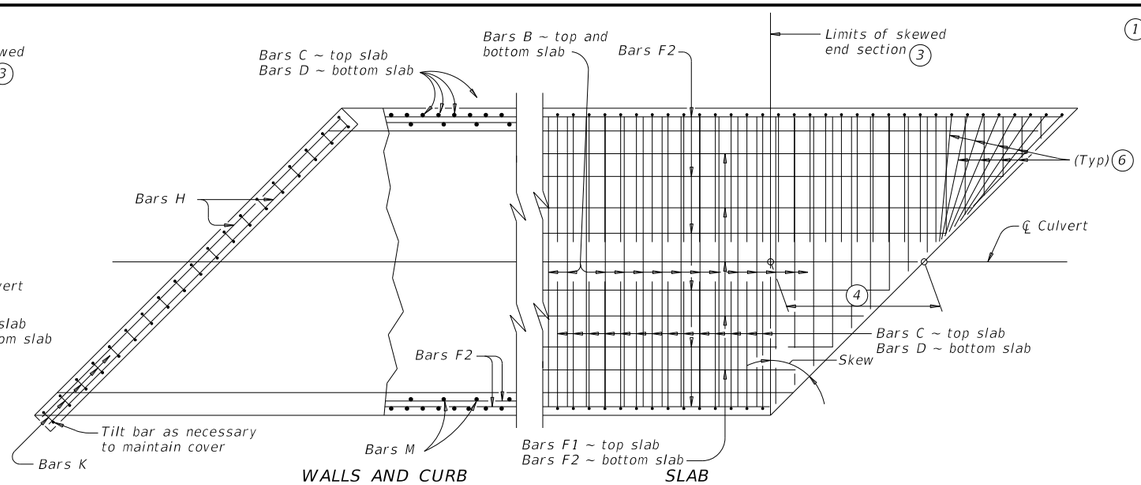
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		197

DATE:
FILE:

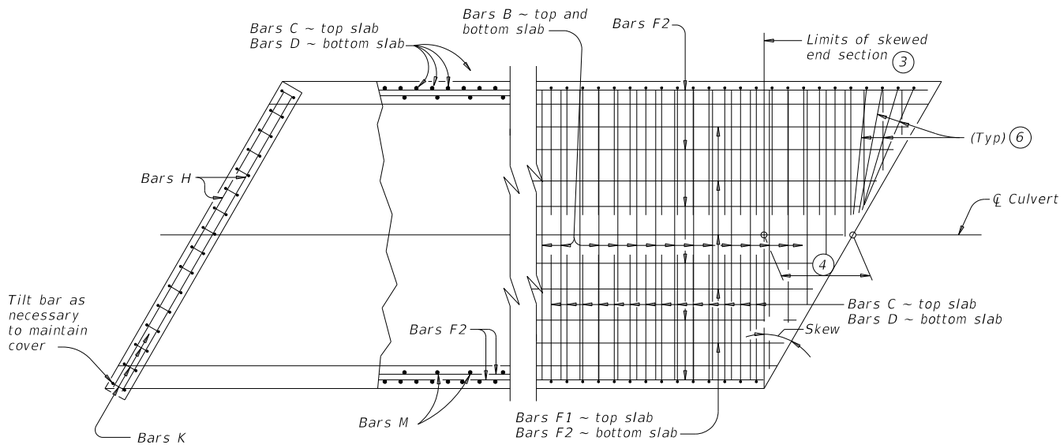
DATE:
FILE:



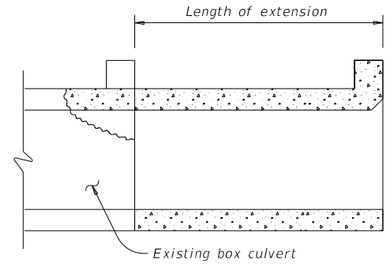
PLAN OF SKEWED ENDS ~ FROM 0° TO 15° (7)



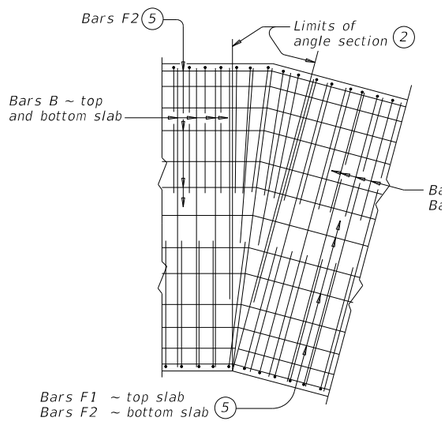
PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



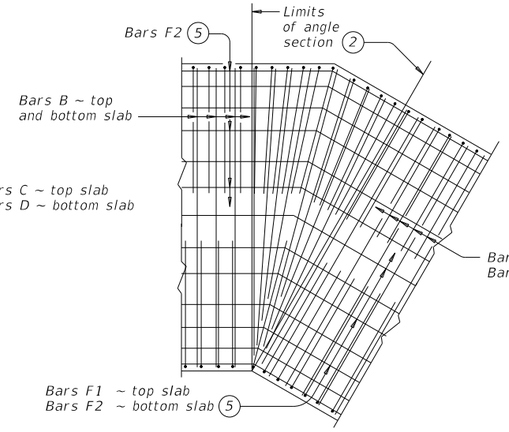
PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



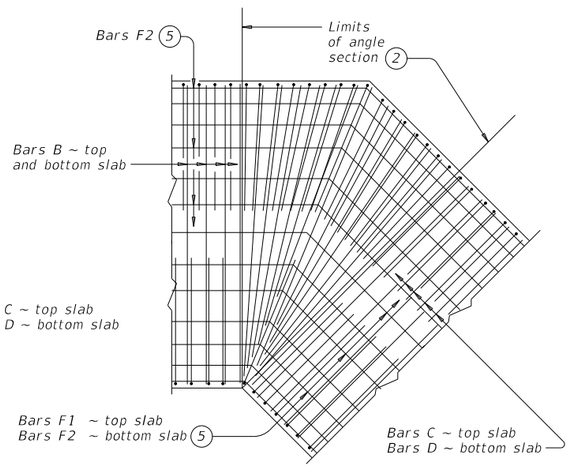
LENGTHENING DETAIL (1)



PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



PLAN OF ANGLE SECTION ~ OVER 30° TO 45°

(1) For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars in the extension.

For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, C, D , E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.

Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.

(2) When the spacing between Bars B becomes less than half of the normal spacing, cut bars to avoid conflict.

(3) The length of Bars B vary in the skewed end sections.

(4) [One half of overall width] x [tangent of the skew angle]

(5) Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.

(6) When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.

(7) At the Contractor's option, for skews of 15° or less, place Bars B, C, and D parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B shown on the Single Box Culverts Cast-In-Place (SCC) standards sheets to accommodate the skew.

CONSTRUCTION NOTES:

Do not use permanent forms.
When required, lap Bars H 1'-8" for uncoated or galvanized bars.
Provide a minimum of 1 ½" clear cover.

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) with these exceptions:
provide Class S concrete (f'c = 4,000 psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for details of straight sections of culvert.
For skewed sections and angle sections, refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for slab and wall dimensions, bar spacing, and any other details not shown.
For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the culvert Single Box Culverts Cast-In-Place (SCC) standard sheets by the cosine of the skew angle.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

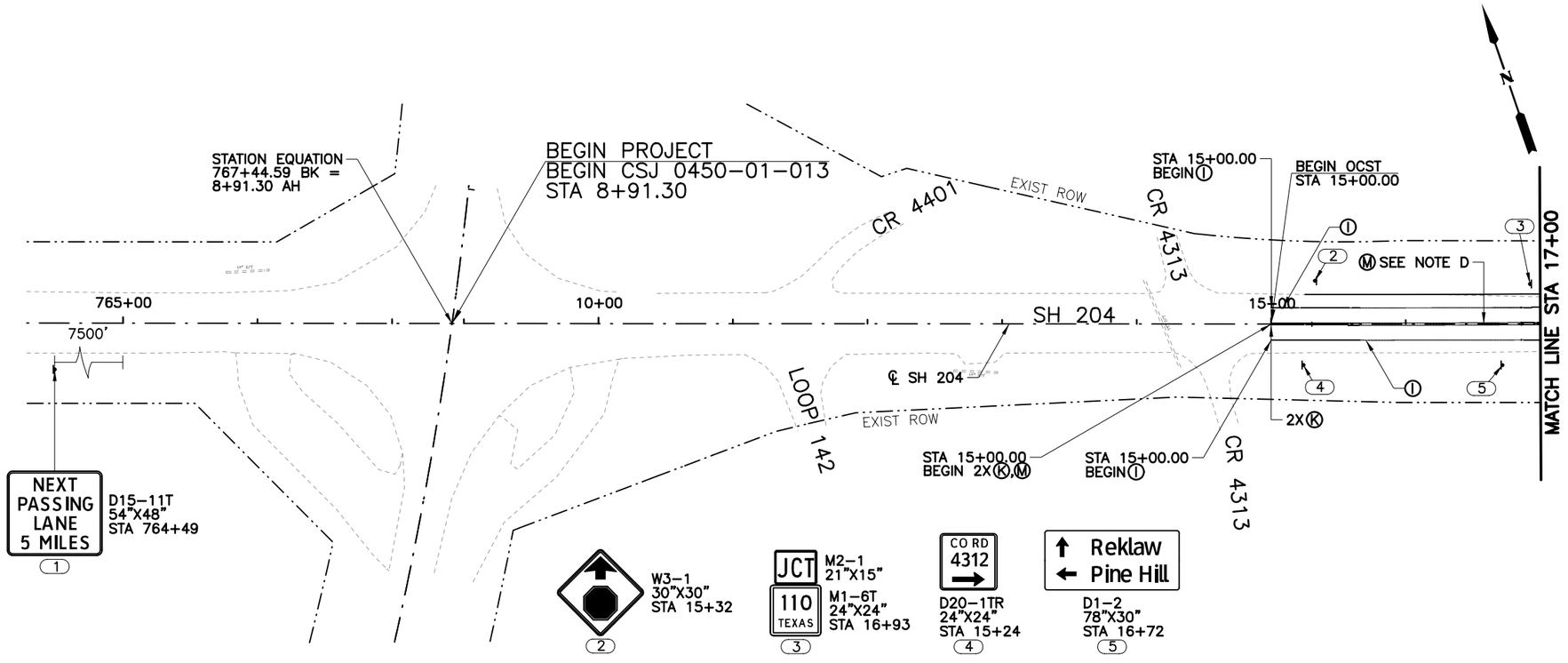
Texas Department of Transportation

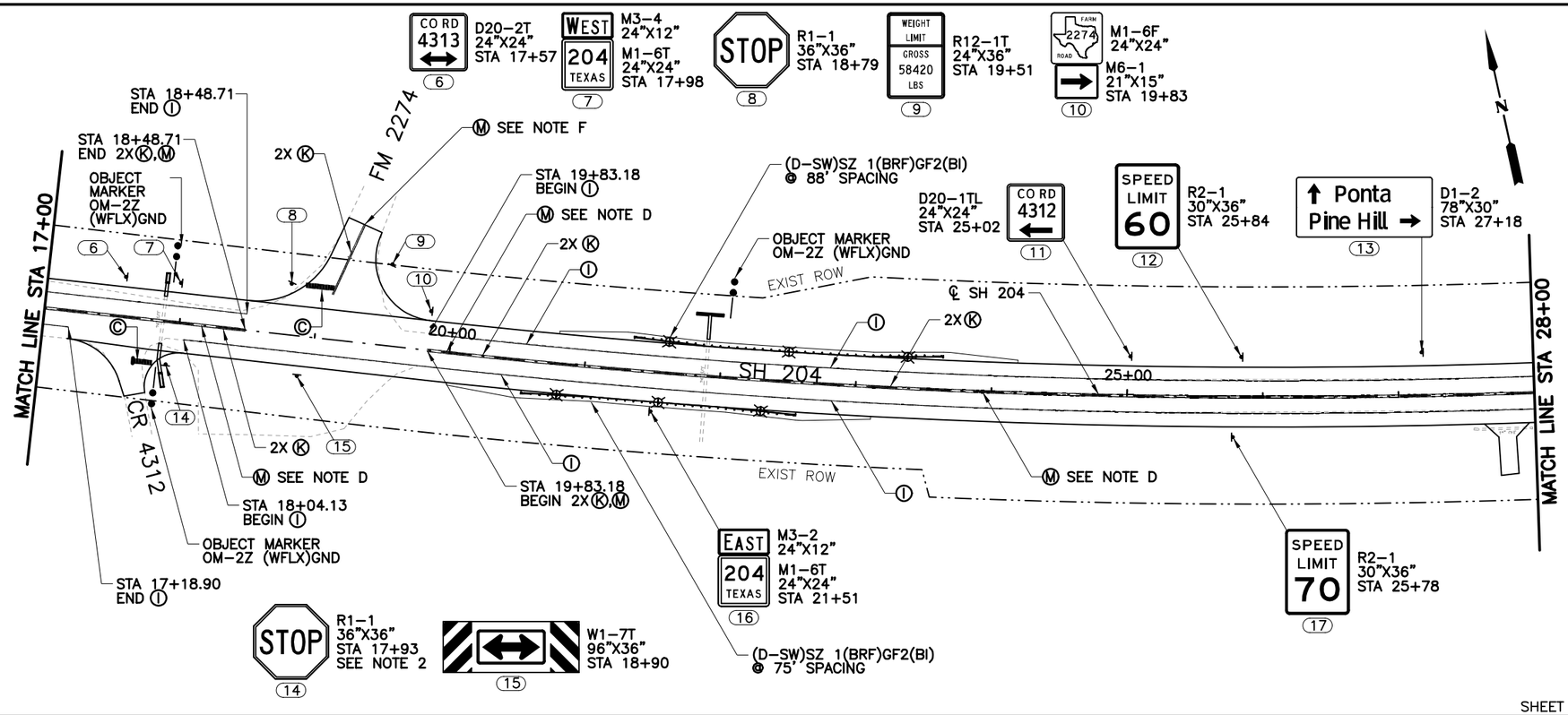
Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS

SCC-MD

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		198





50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇#◇ EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.
2. TXDOT TO COORDINATE WITH CHEROKEE COUNTY TO REPLACE STREET SIGNS.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED
PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SIGNING AND MARKING PLAN

BEGIN PROJECT TO STA 28+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.	
Checked:	CPY		TEXAS					SH 204	
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	CPY	TYL	CHEROKEE	0450	01	013		199	

SHEET 1 OF 16

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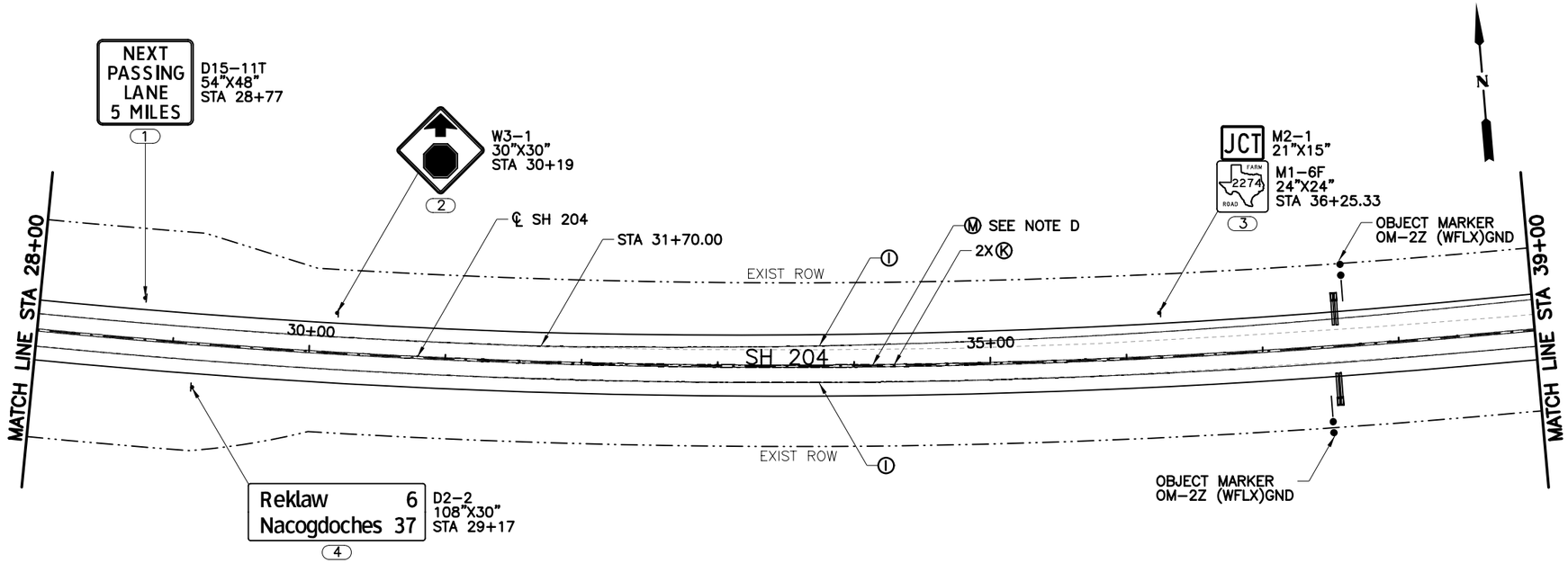
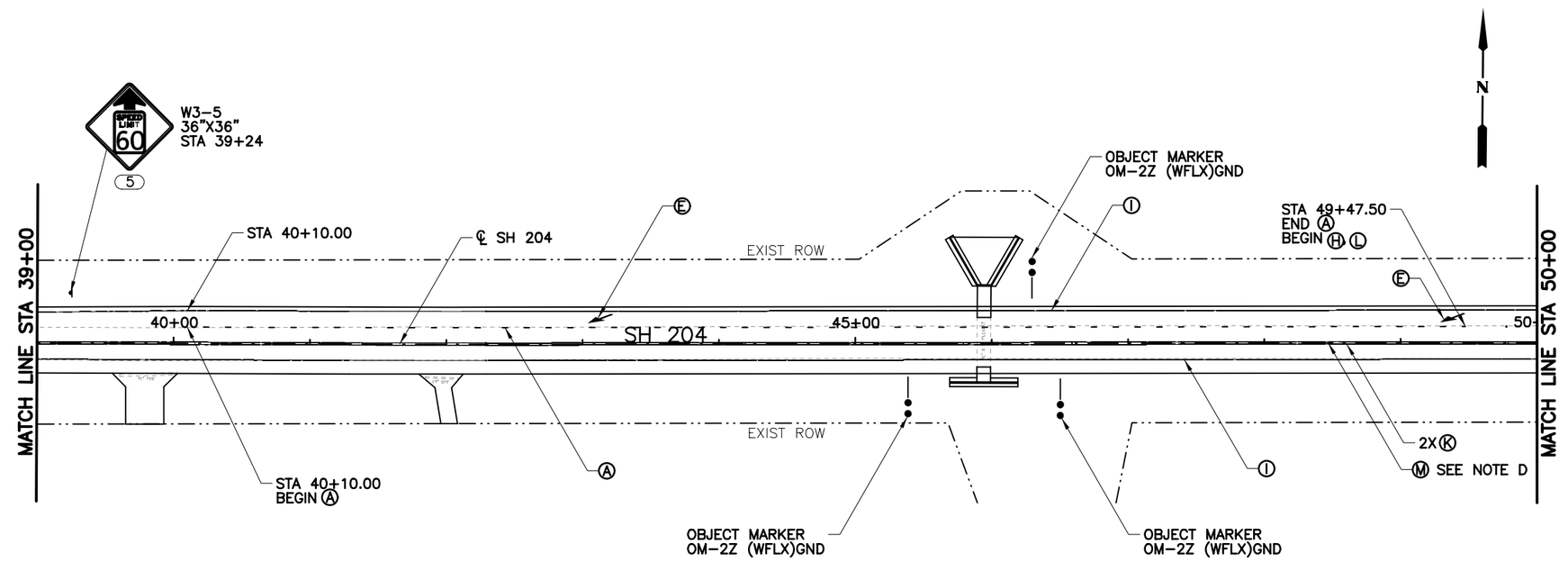




50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇# EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

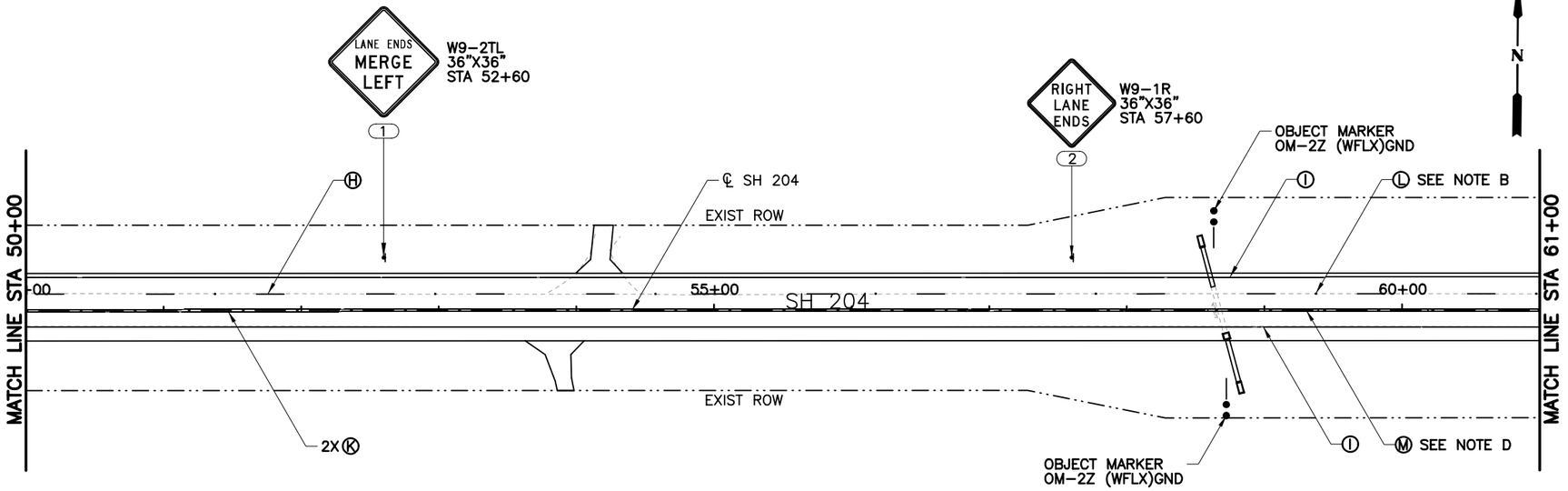
 Texas Department of Transportation

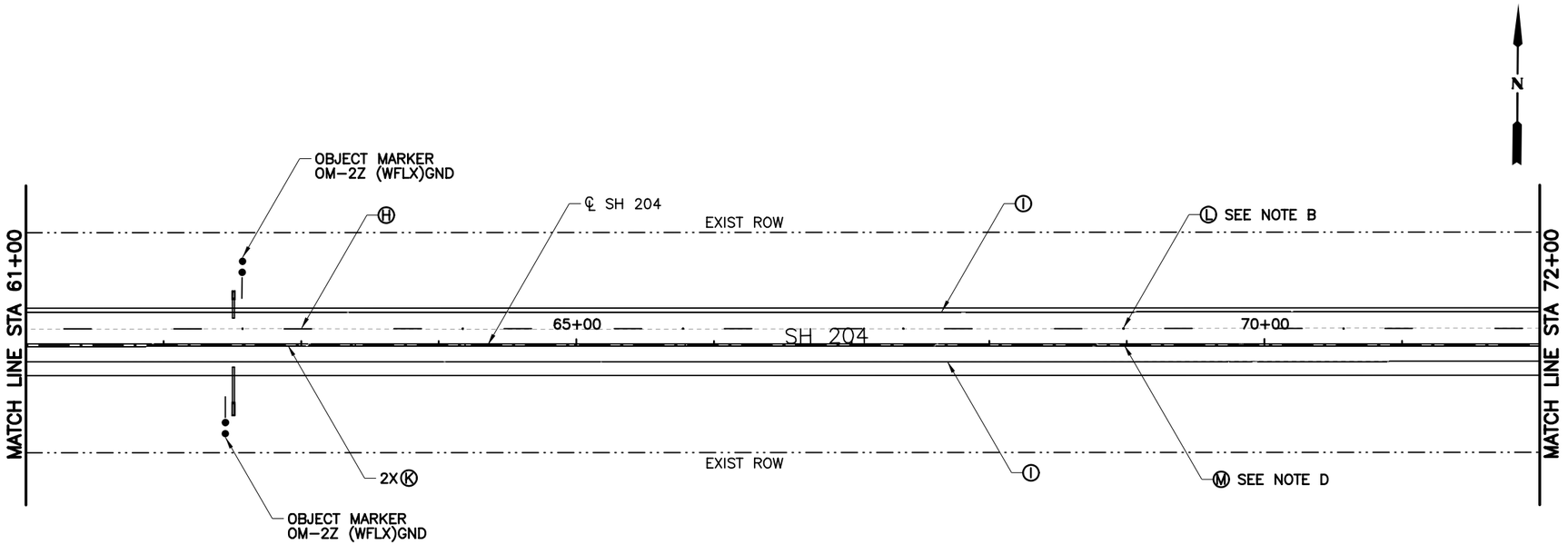
SH 204

SIGNING AND MARKING PLAN

STA 28+00 TO STA 50+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		200





50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇#◇ EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

SIGNING AND MARKING PLAN

STA 50+00 TO STA 72+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		201

SHEET 3 OF 16

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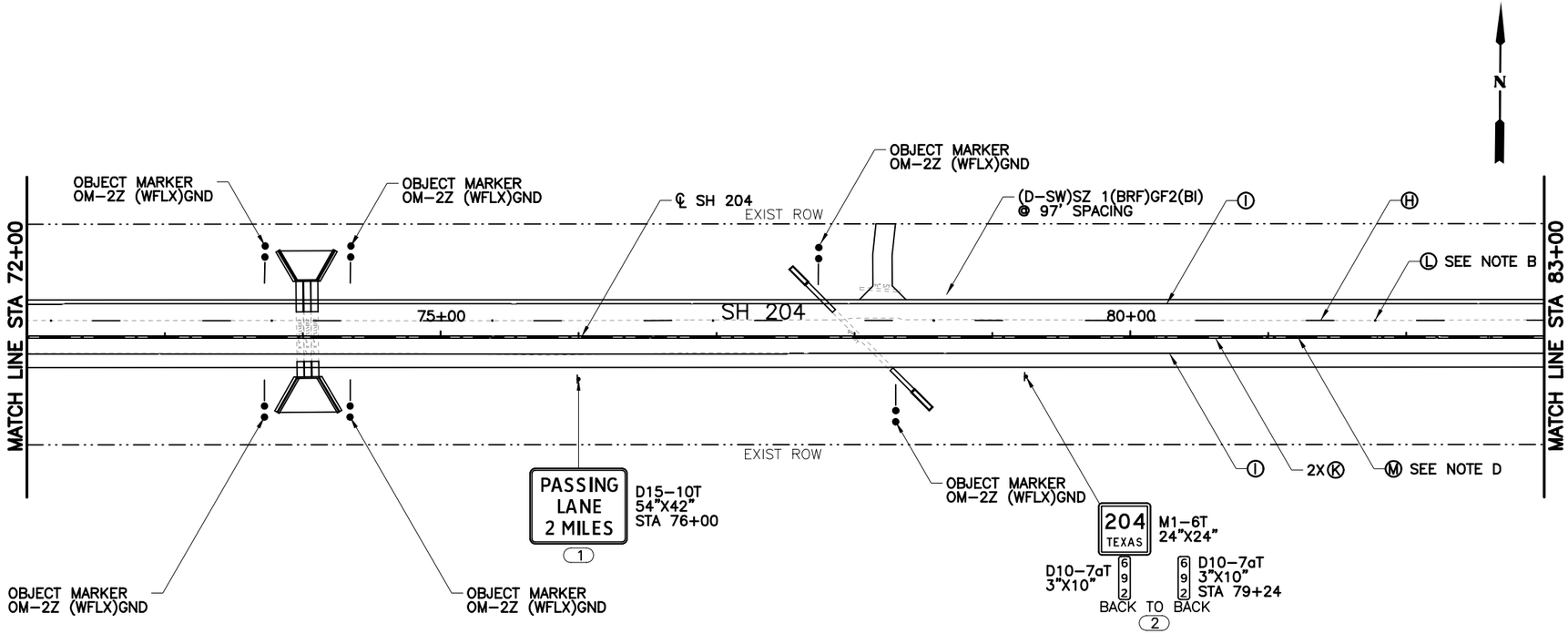
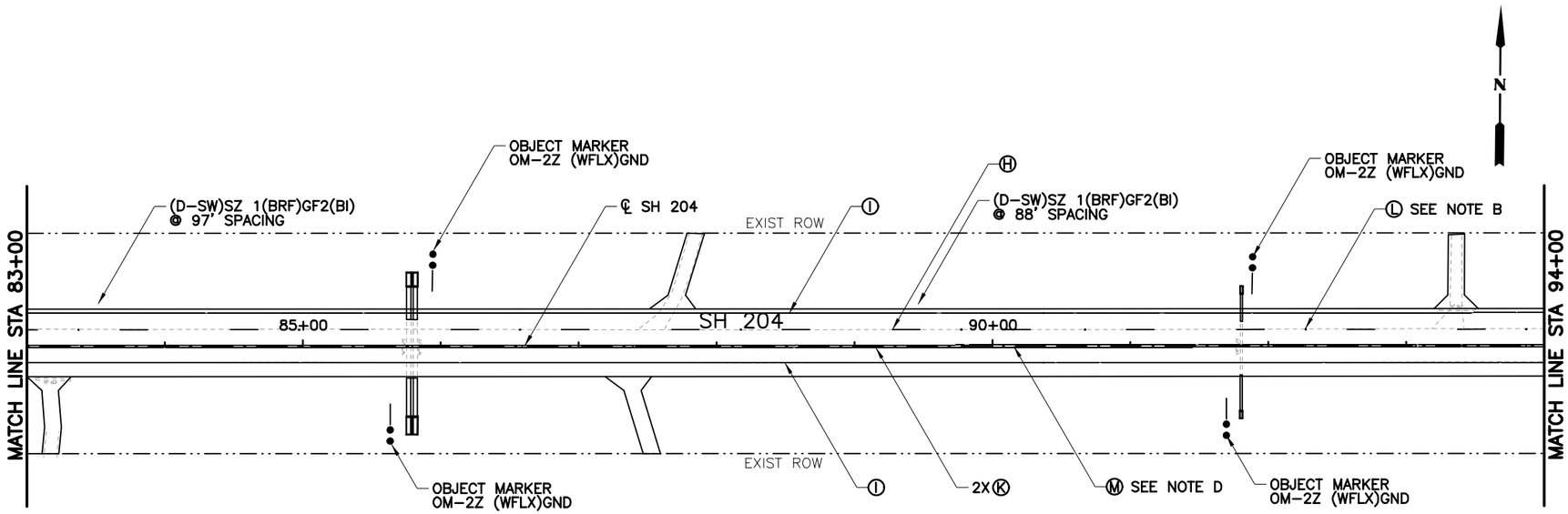




50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇#◇ EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

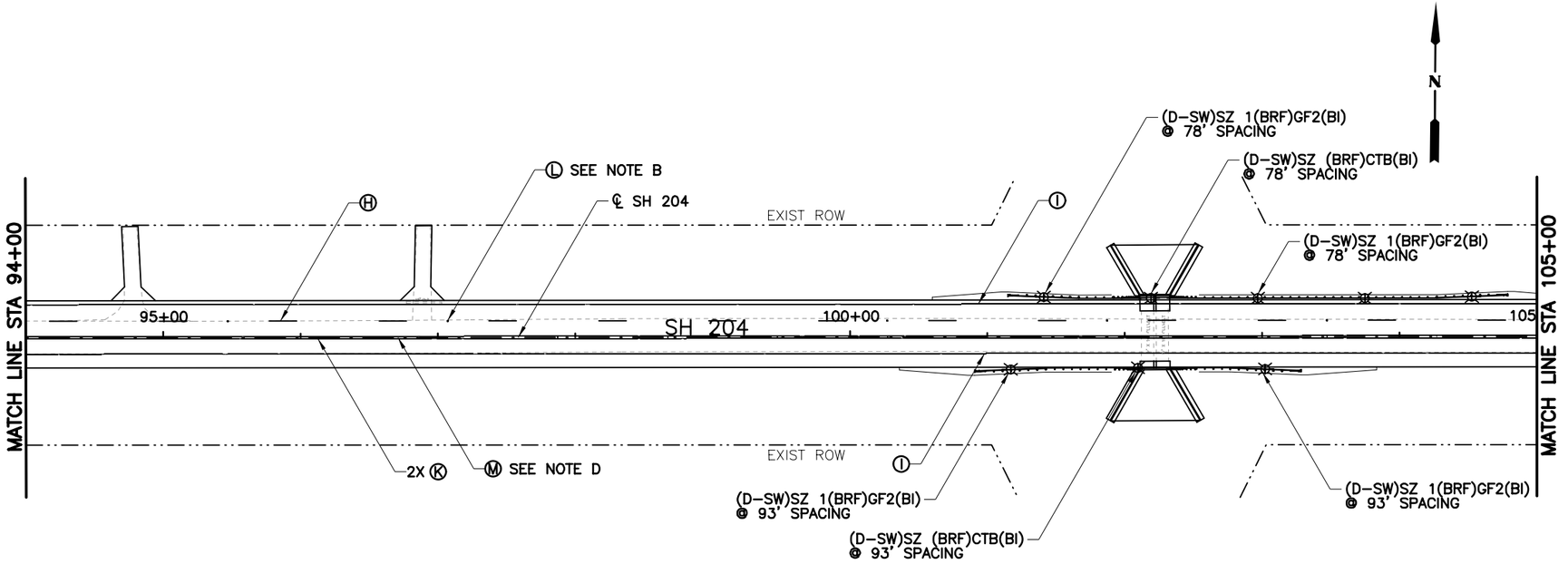
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

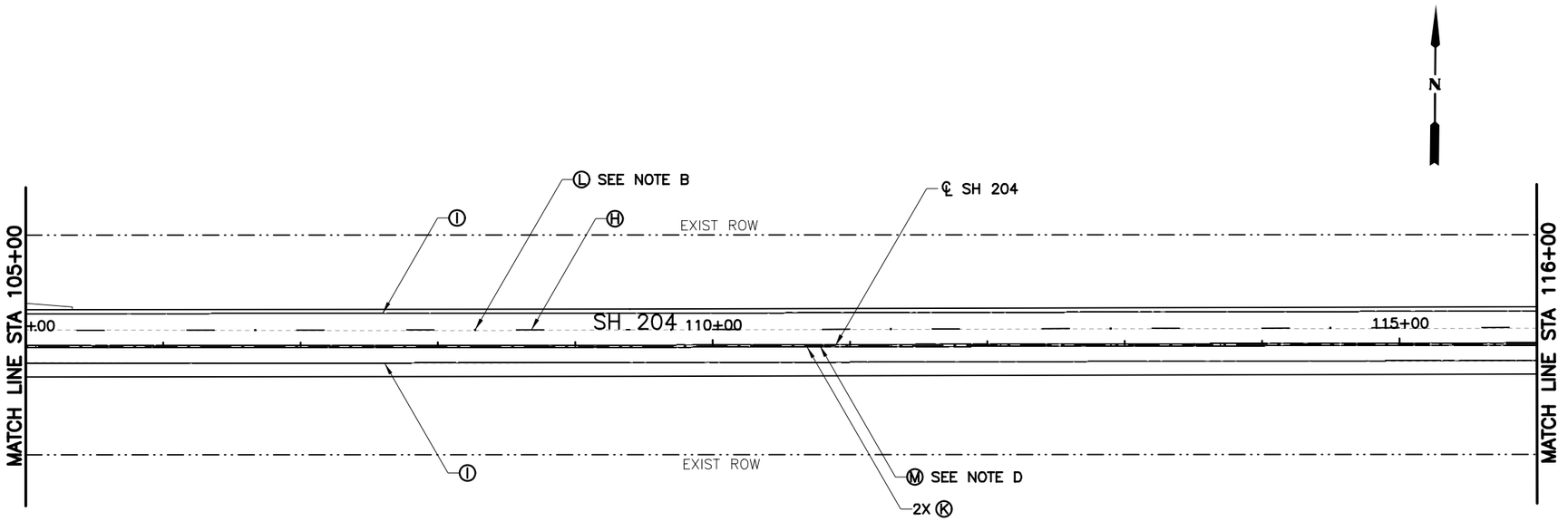
SH 204

SIGNING AND MARKING PLAN

STA 72+00 TO STA 94+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		202





50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇#◇ EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SIGNING AND MARKING PLAN

STA 94+00 TO STA 116+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		203

SHEET 5 OF 16

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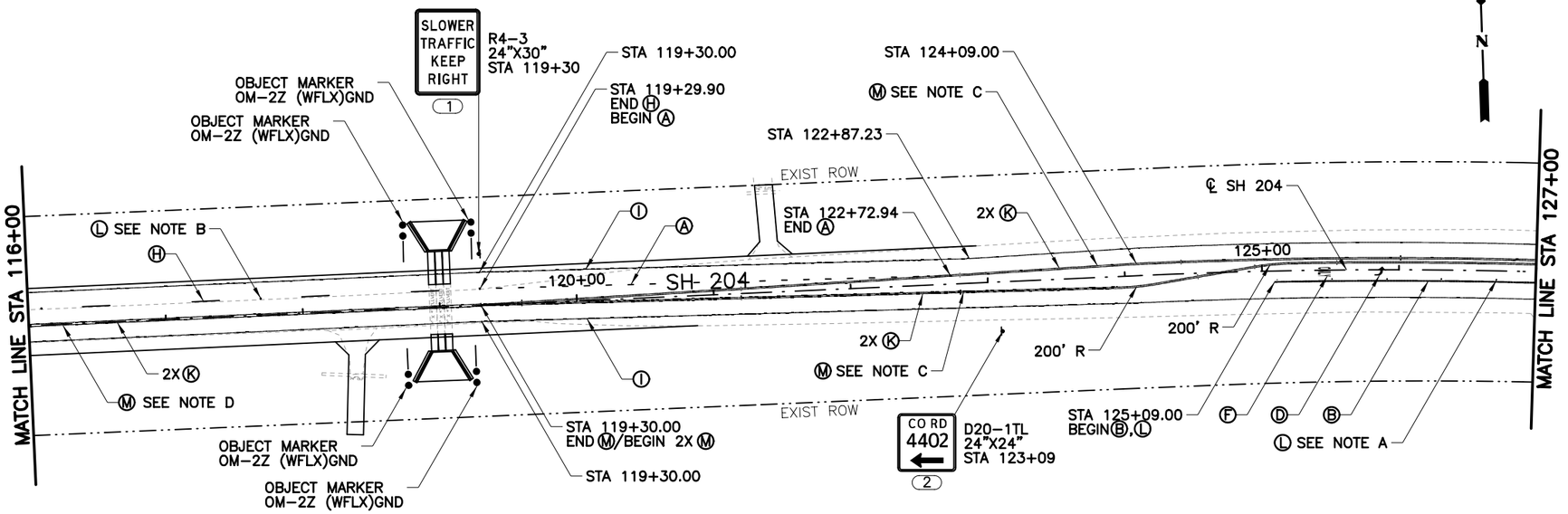

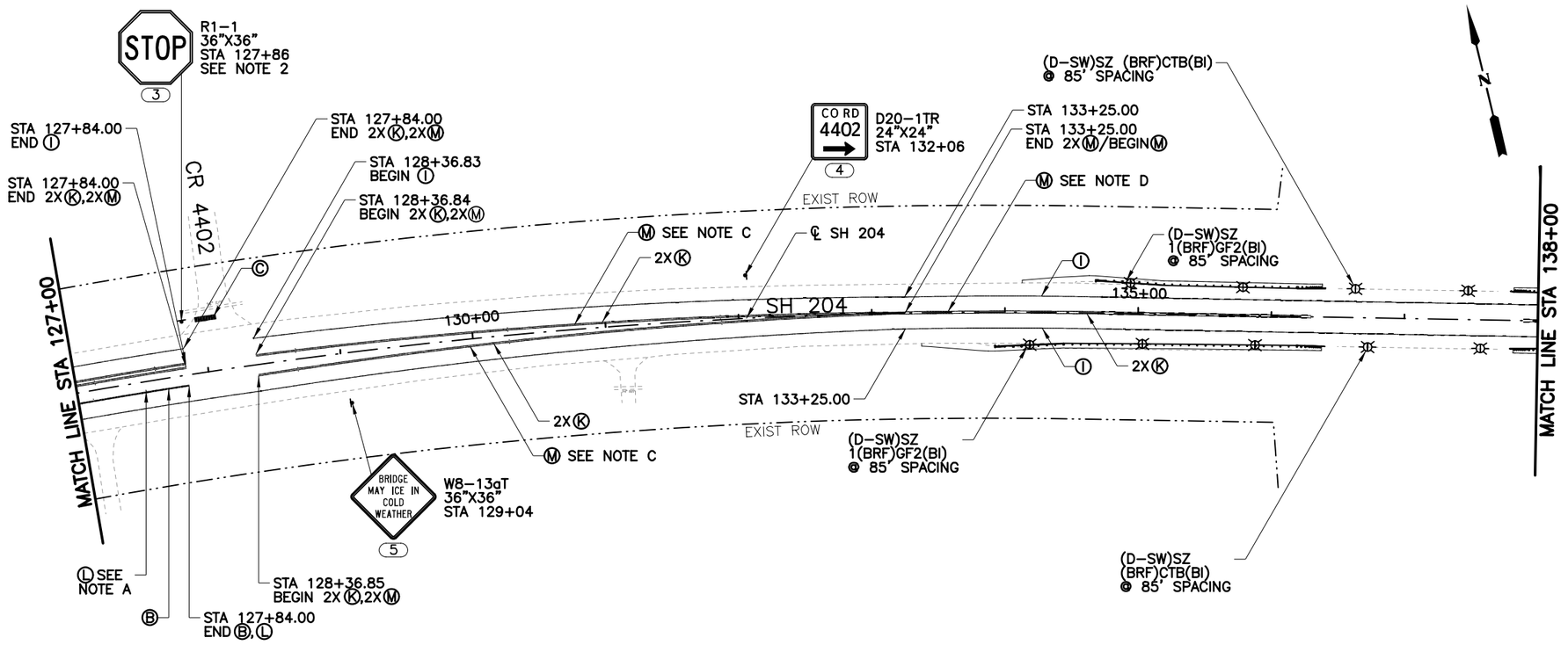

50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇(#) EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.
2. TXDOT TO COORDINATE WITH CHEROKEE COUNTY TO REPLACE STREET SIGNS.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SIGNING AND MARKING PLAN

STA 116+00 TO STA 138+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		204

SHEET 6 OF 16

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cpypdf_ANSIB.pltcfg
pw:/
8/23/2023 11:34:35 AM PerryKL
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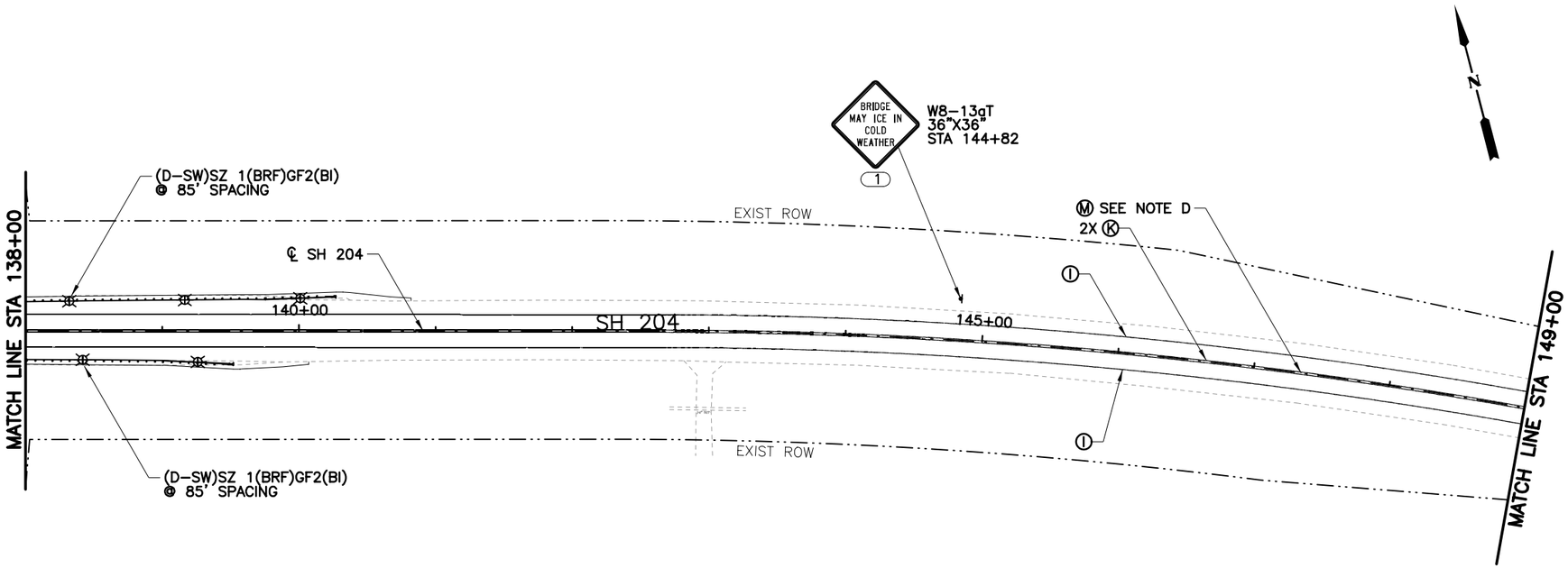

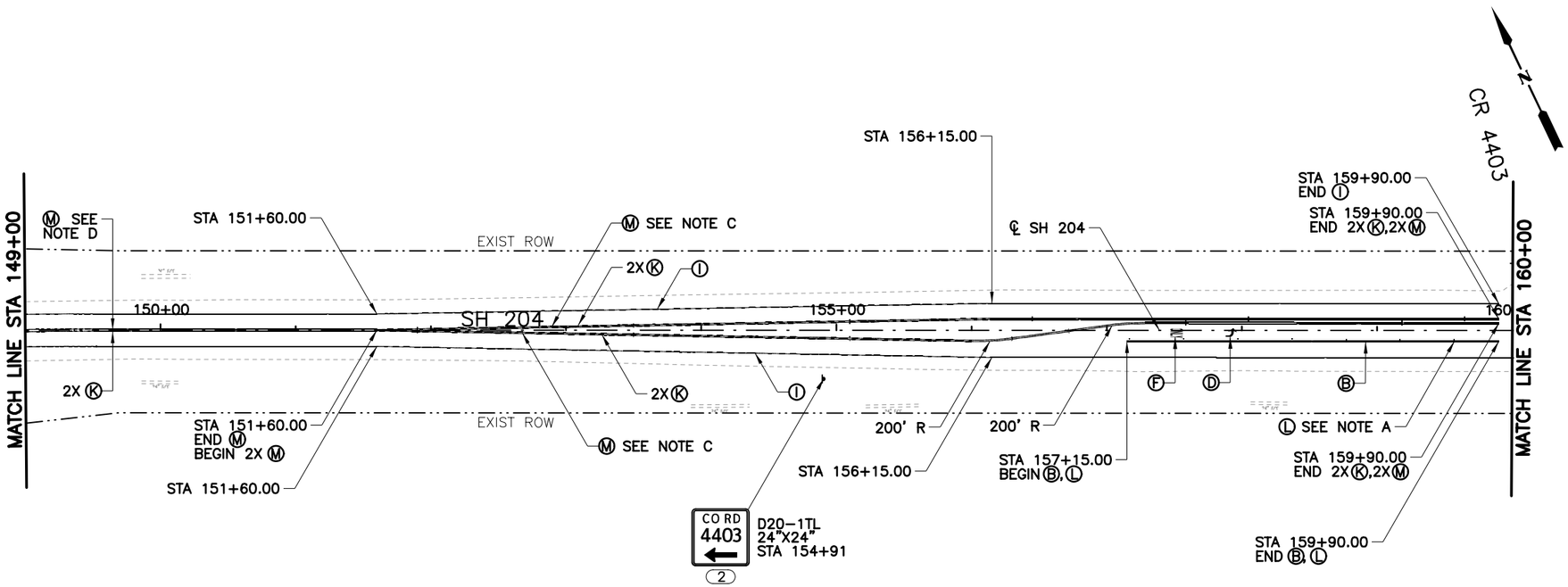

50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇#◇ EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SIGNING AND MARKING PLAN

STA 138+00 TO STA 160+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		205

SHEET 7 OF 16

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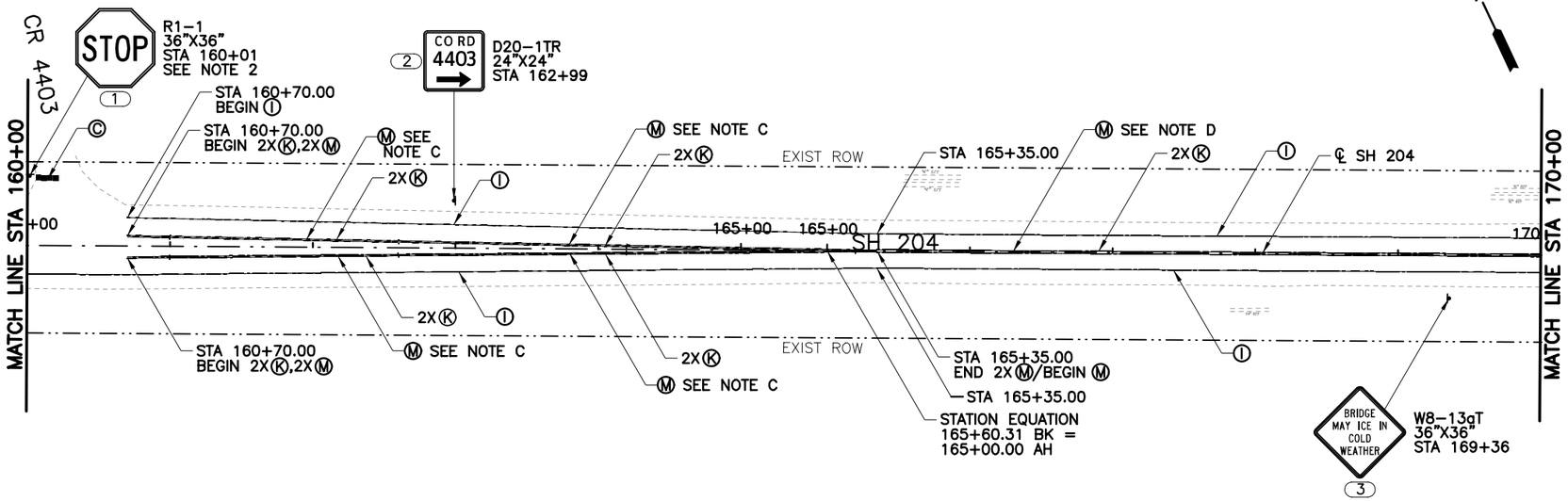

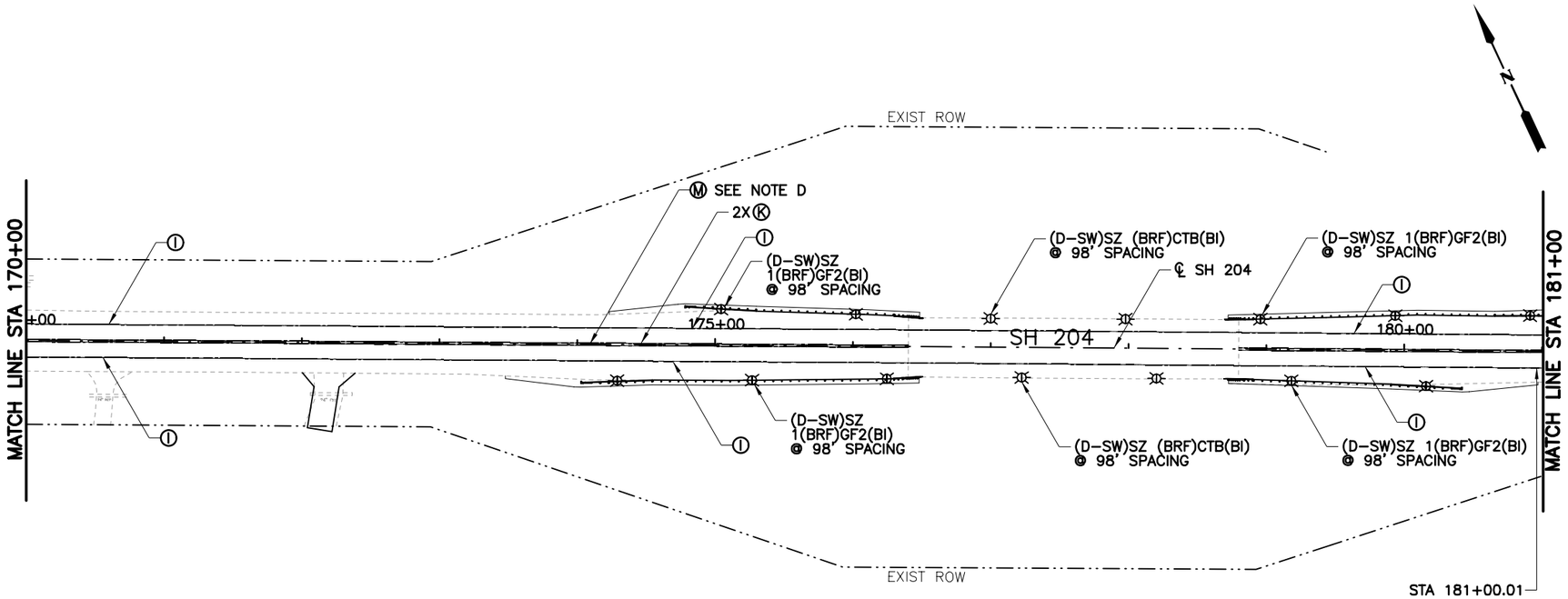

50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇# EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.
2. TXDOT TO COORDINATE WITH CHEROKEE COUNTY TO REPLACE STREET SIGNS.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X ⓂAT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED
PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

SIGNING AND MARKING PLAN

STA 160+00 TO STA 181+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		206

SHEET 8 OF 16

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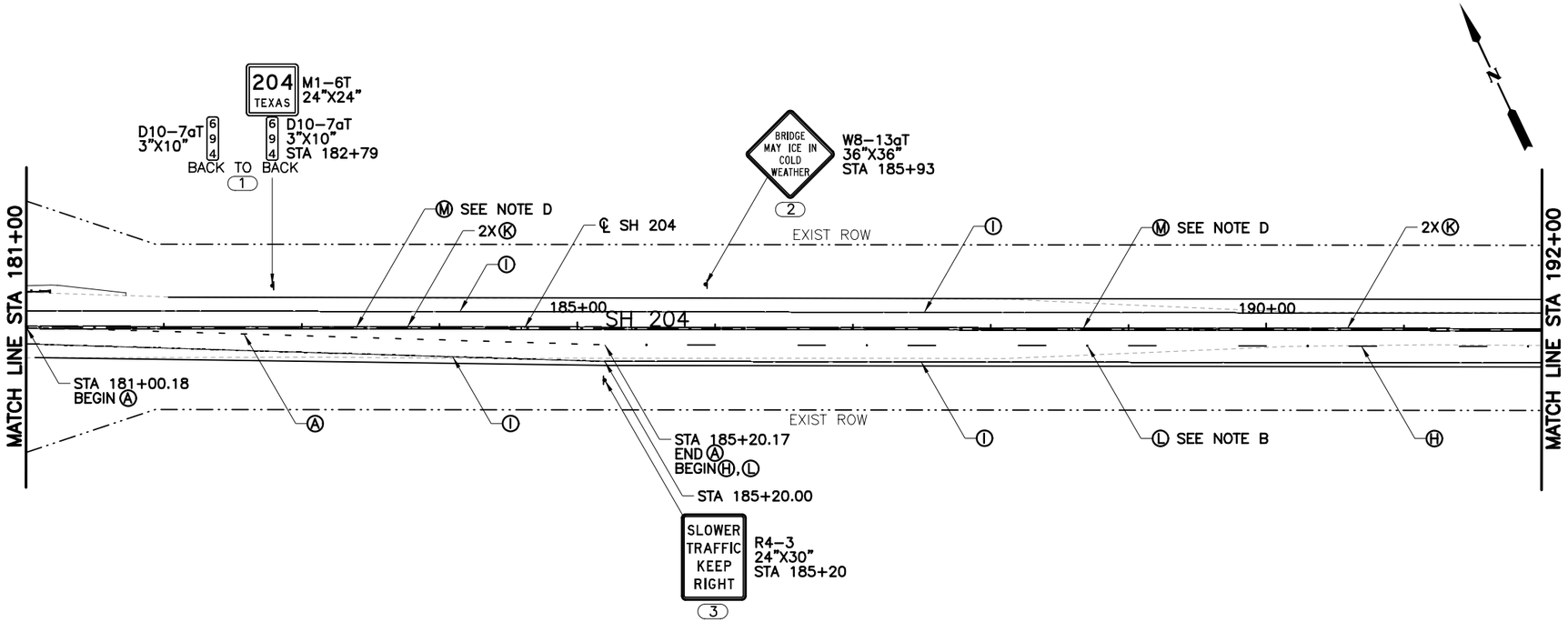
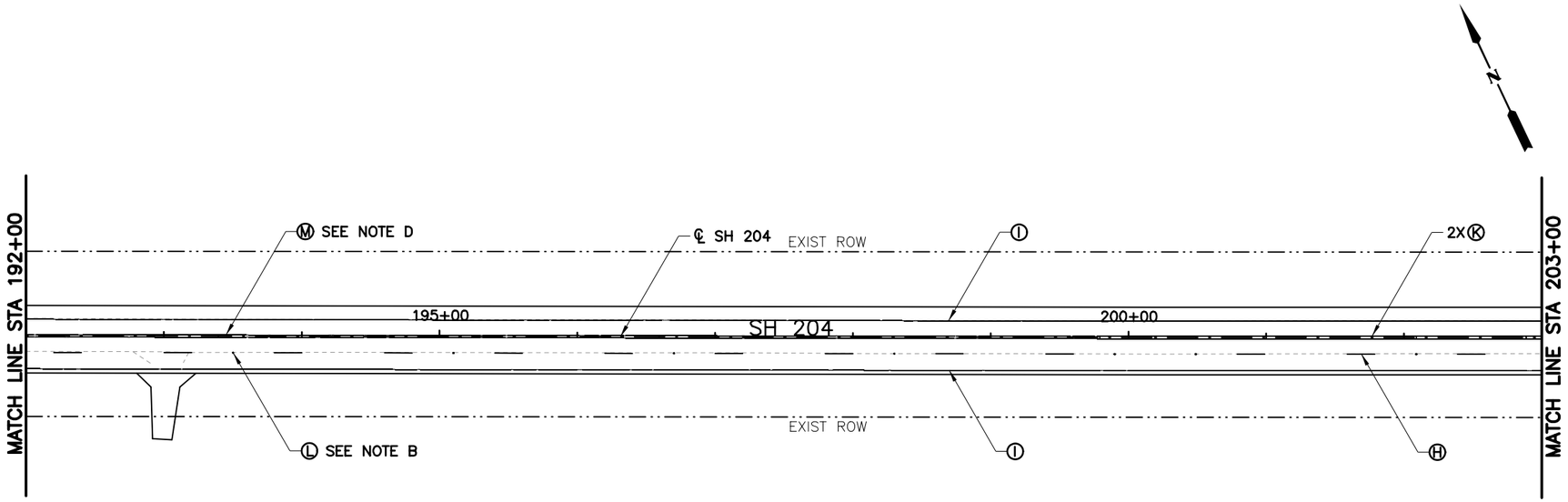




50 25 0 50 100
SCALE FEET

LEGEND

- A REFL PAV MRK TY I (W) (6") (DOT)
- B REFL PAV MRK TY I (W) (8") (SLD)
- C REFL PAV MRK TY I (W) (24")(SLD)
- D PREFAB PAV MRK TY C (W) (ARROW)
- E PREFAB PAV MRK TY C (W) (LNDP ARW)
- F PREFAB PAV MRK TY C (W) (WORD)
- G REF PAV MRK TY I (W) 36" (YLD TRI)
- H RE PM W/RET REQ TY I (W) (6") (BRK)
- I RE PM W/RET REQ TY I (W) (6") (SLD)
- J REF PROF PAV MRK TY I (Y) (6") (BRK)
- K REF PROF PAV MRK TY I (Y) (6") (SLD)
- L REFL PAV MRKR TY I-C
- M REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇# EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

NOTES:
A. L AT 20' SPACING
B. L AT 80' SPACING
C. 2X M AT 20' SPACING
D. M AT 40' SPACING
E. M AT 80' SPACING
F. 2X M AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

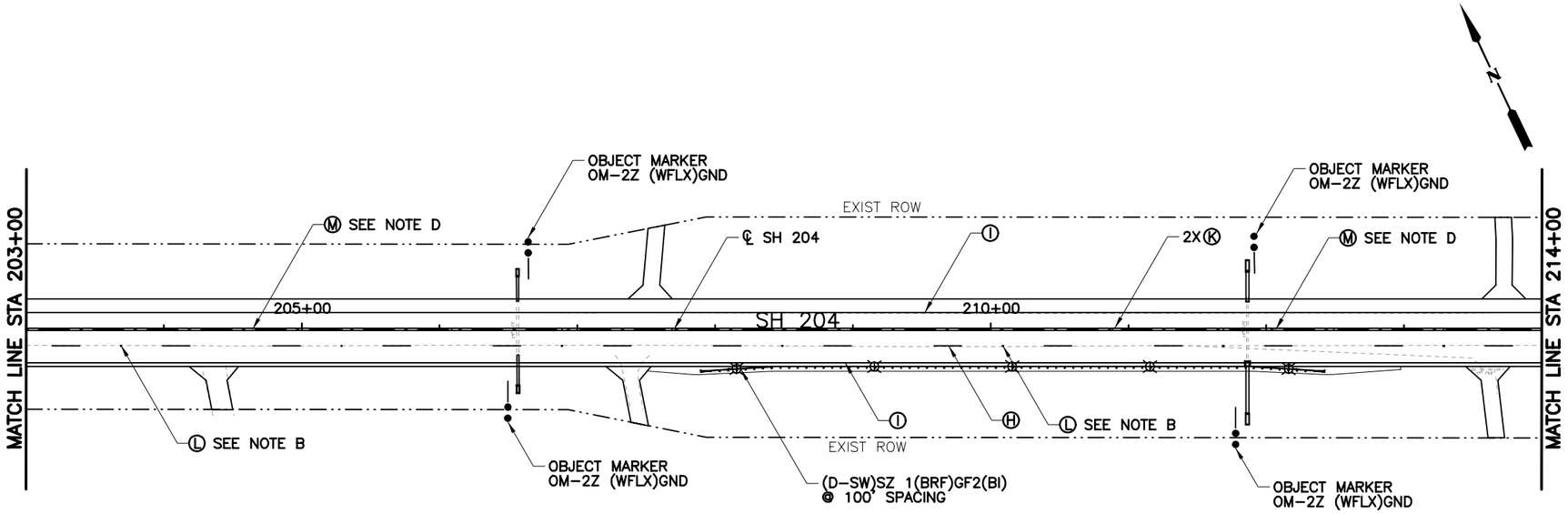
SH 204

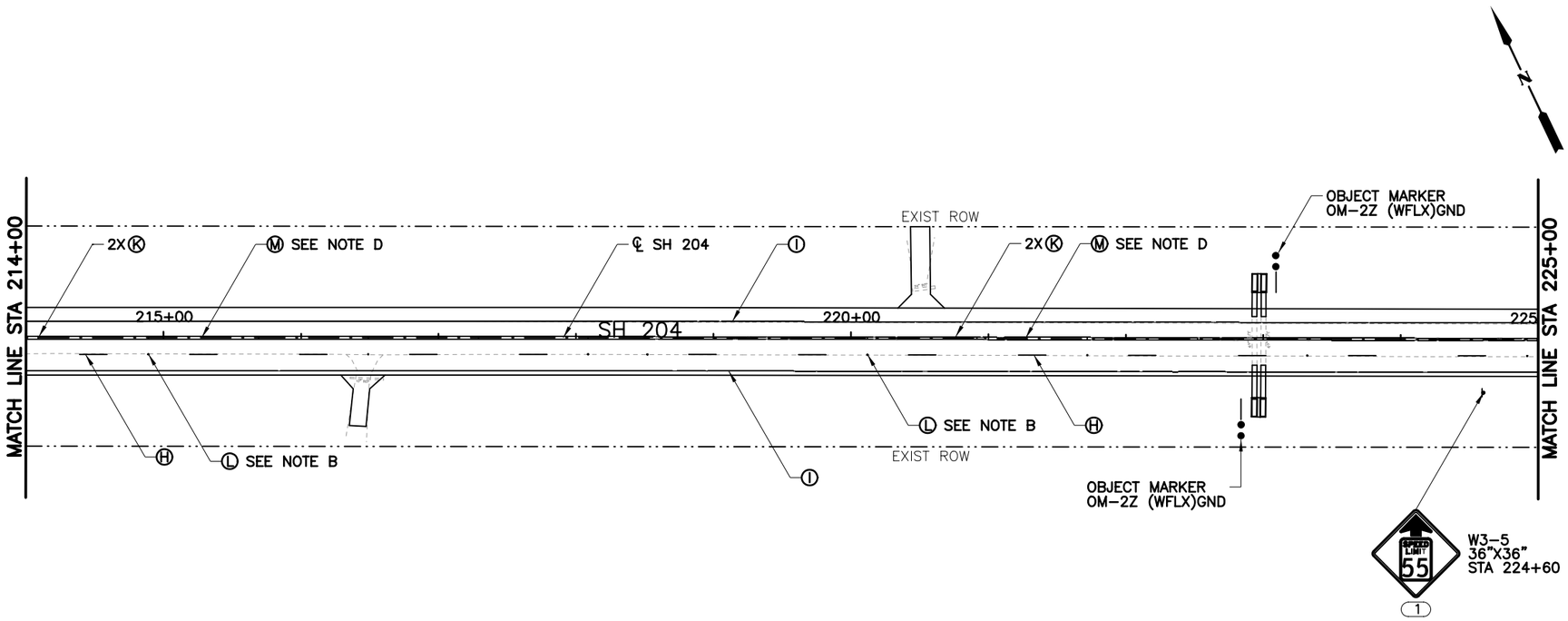
SIGNING AND MARKING PLAN

STA 181+00 TO STA 203+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		207

SHEET 9 OF 16





50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇# EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

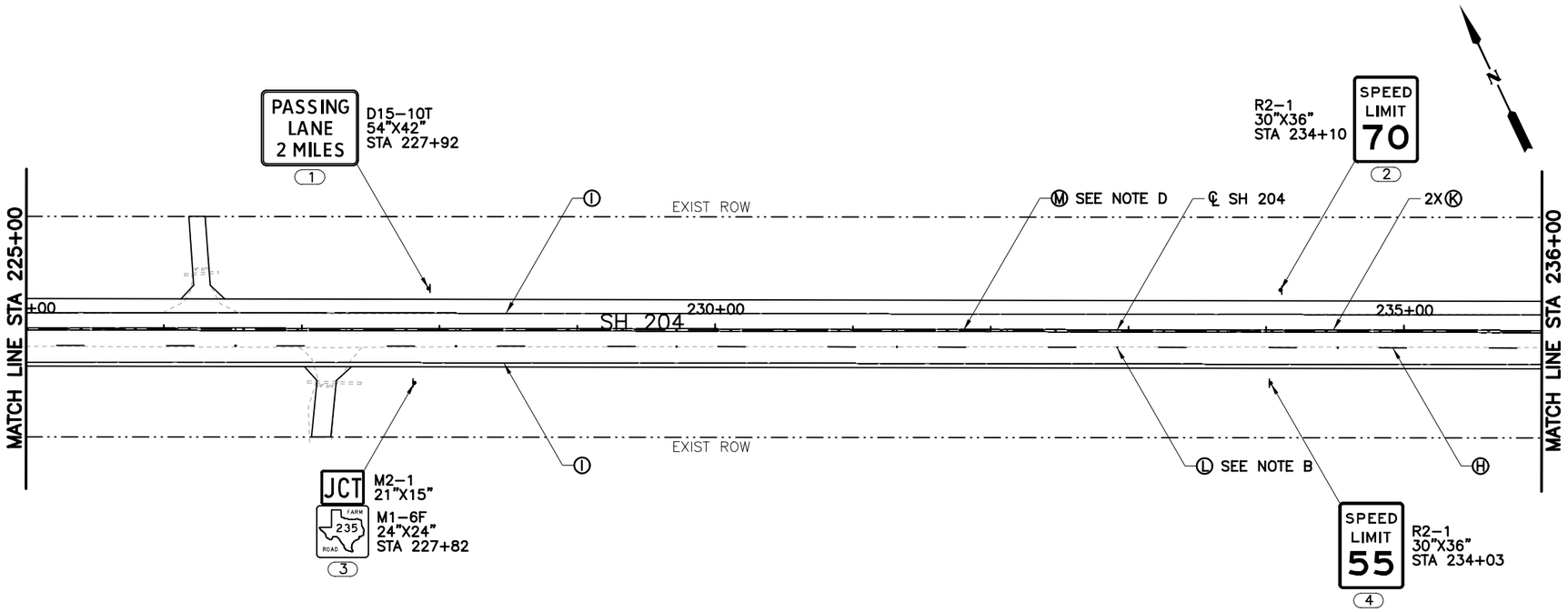
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

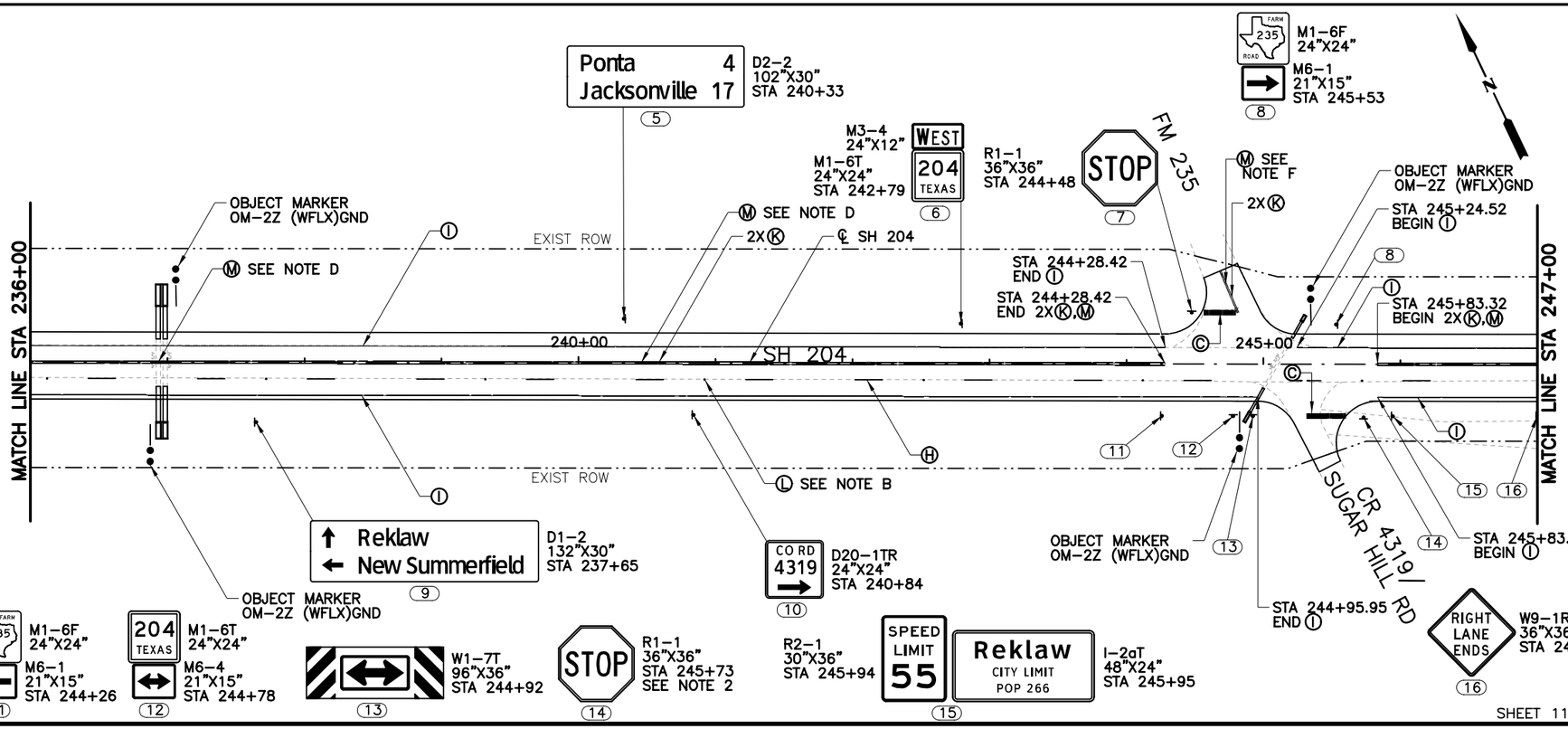
SH 204

SIGNING AND MARKING PLAN

STA 203+00 TO STA 225+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		208





50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇# EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.
2. TXDOT TO COORDINATE WITH CHEROKEE COUNTY TO REPLACE STREET SIGNS.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

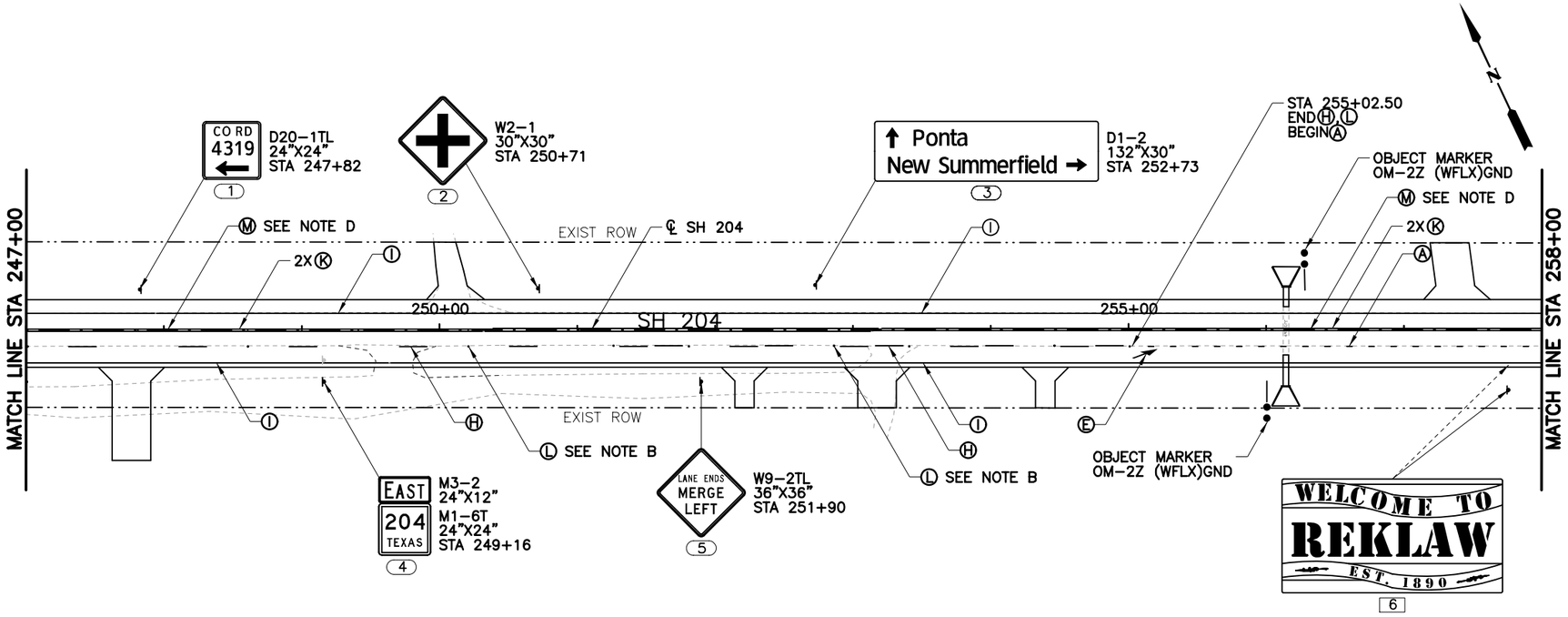
SH 204

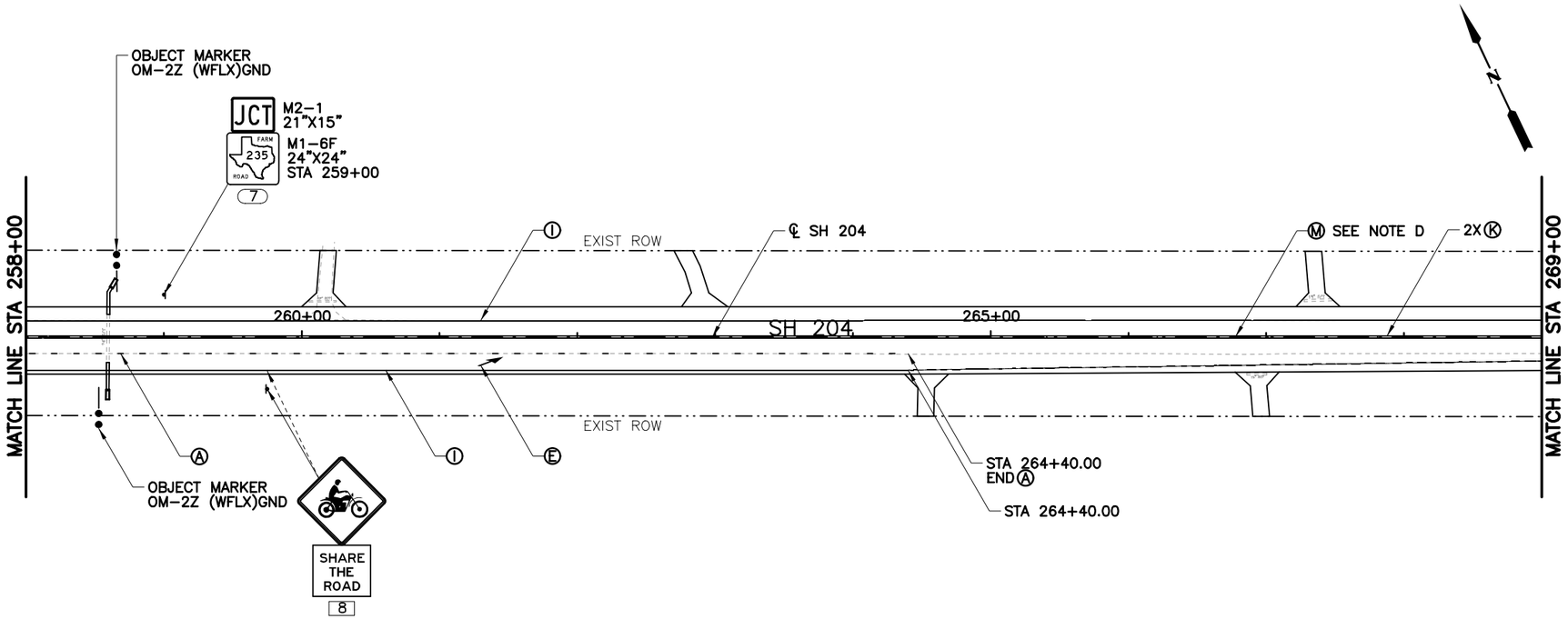
SIGNING AND MARKING PLAN

STA 225+00 TO STA 247+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.	
Checked:	CPY		TEXAS					SH 204	
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	CPY	TYL	CHEROKEE	0450	01	013		209	

SHEET 11 OF 16





50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇#◇ EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SIGNING AND MARKING PLAN

STA 247+00 TO STA 269+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		210

SHEET 12 OF 16

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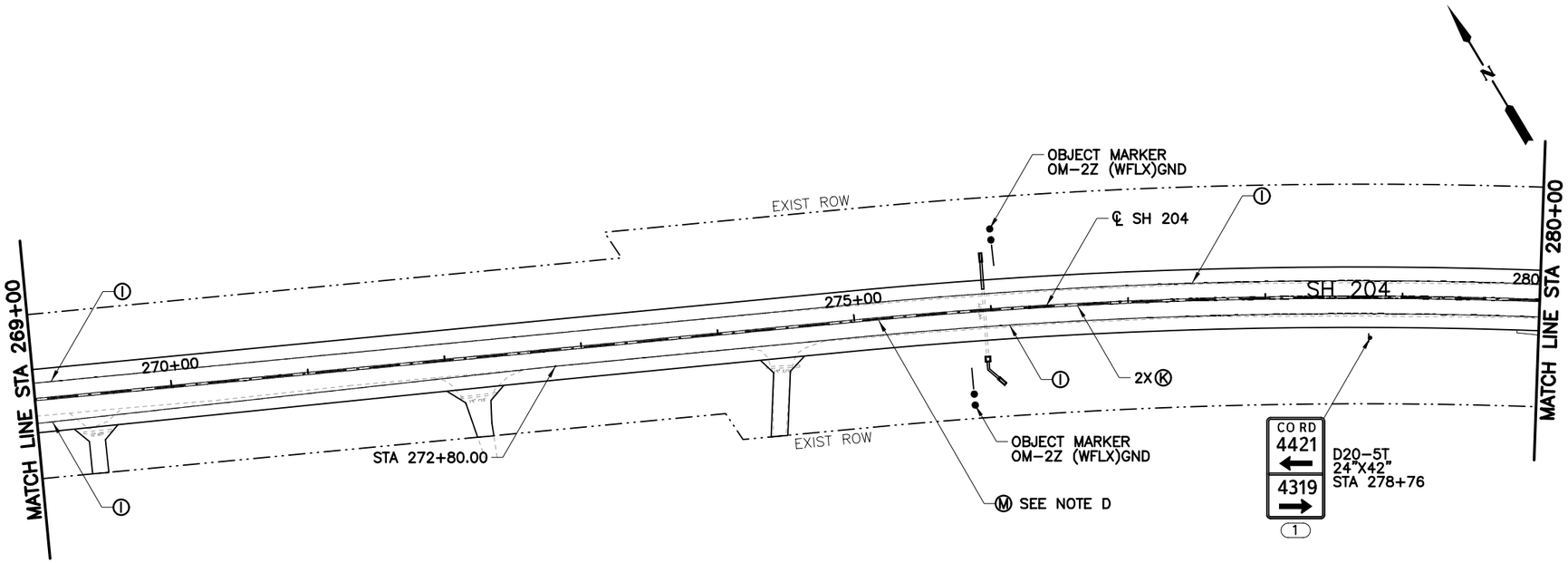

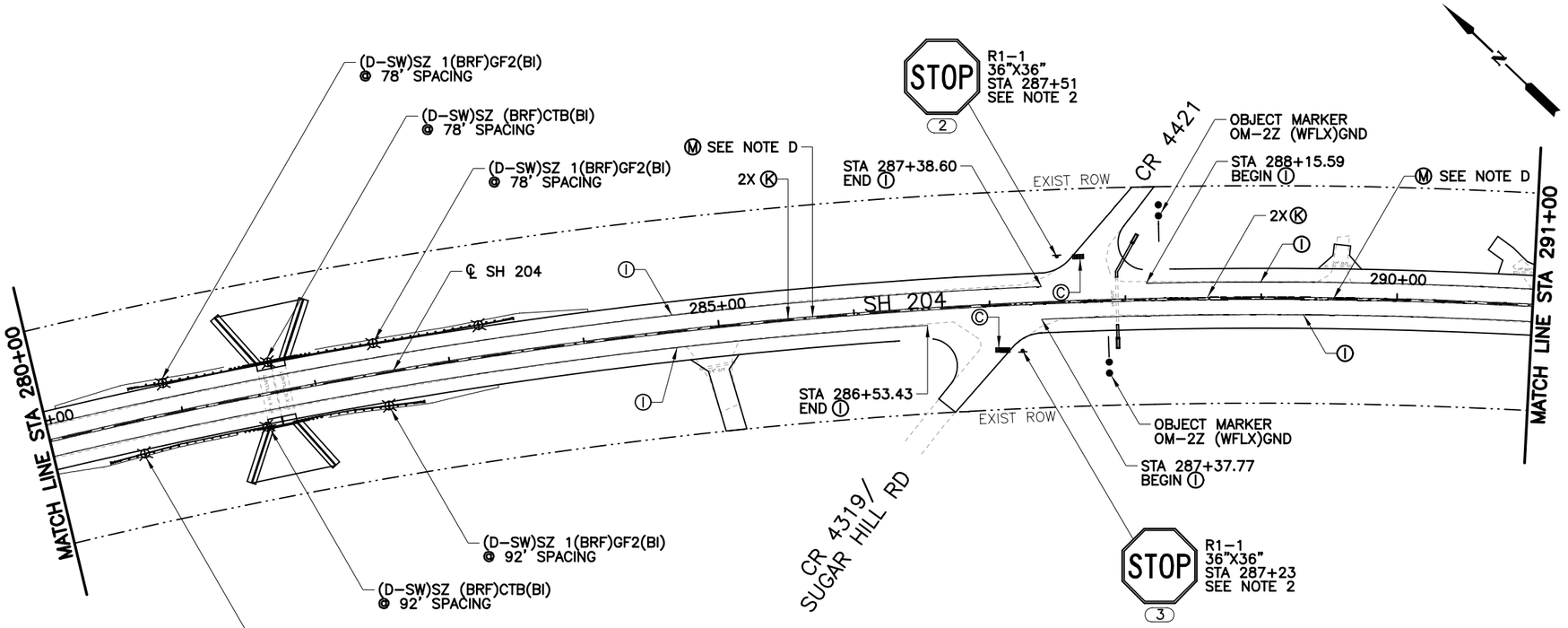

50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇#◇ EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.
2. TXDOT TO COORDINATE WITH CHEROKEE COUNTY TO REPLACE STREET SIGNS.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SIGNING AND MARKING PLAN

STA 269+00 TO STA 291+00

		FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Designed:	CPY		TEXAS				SH 204
Checked:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	CPY	TYL	CHEROKEE	0450	01	013	211
Checked:	CPY						

SHEET 13 OF 16

cpybw_ANSIB.tbl
cpypdf_ANSIB.pltcfg
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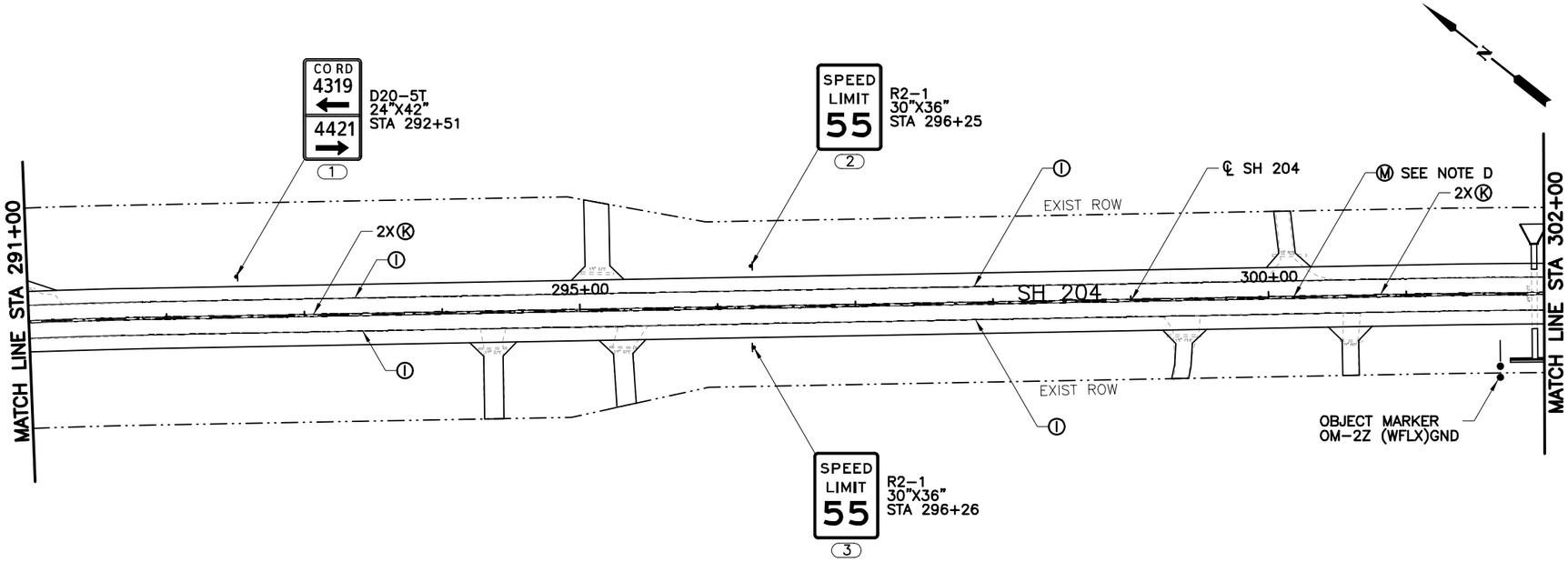
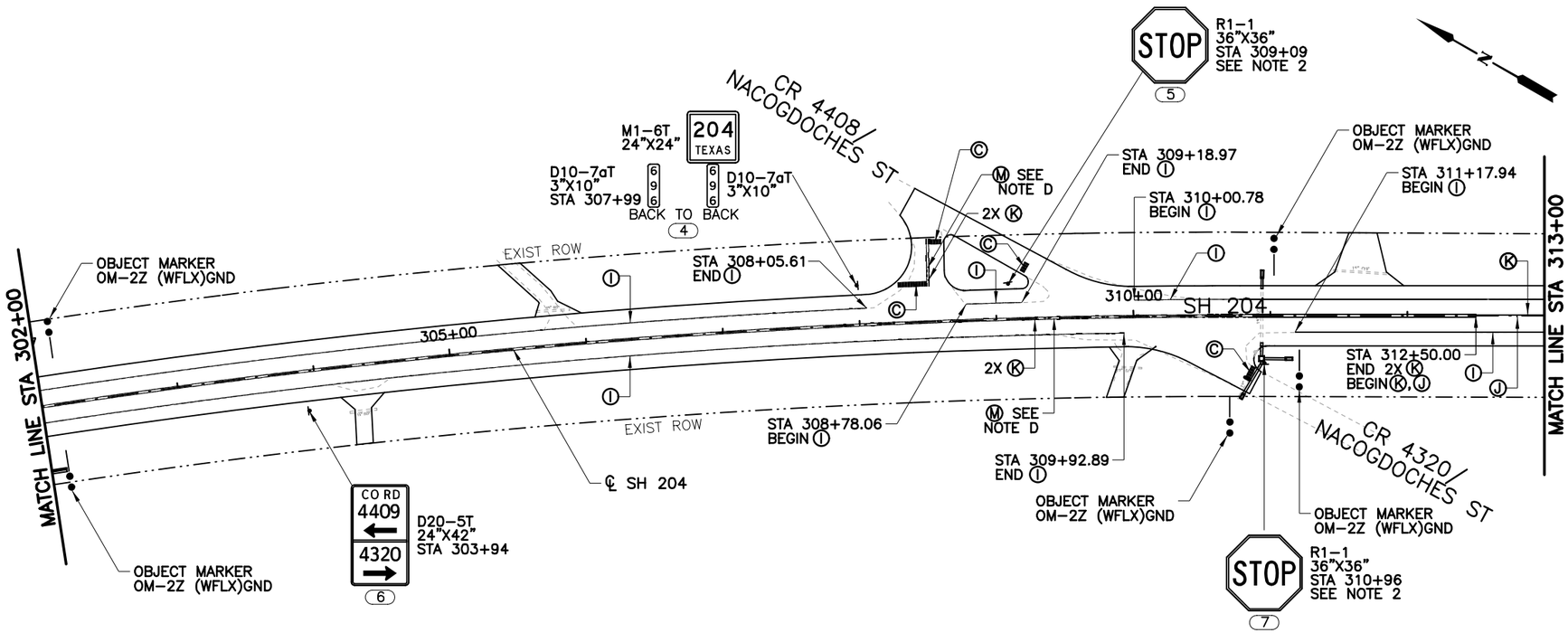
8/23/2023 11:35:08 AM PerryKL
pw:/





50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇#◇ EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- •• OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.
2. TXDOT TO COORDINATE WITH CHEROKEE COUNTY TO REPLACE STREET SIGNS.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

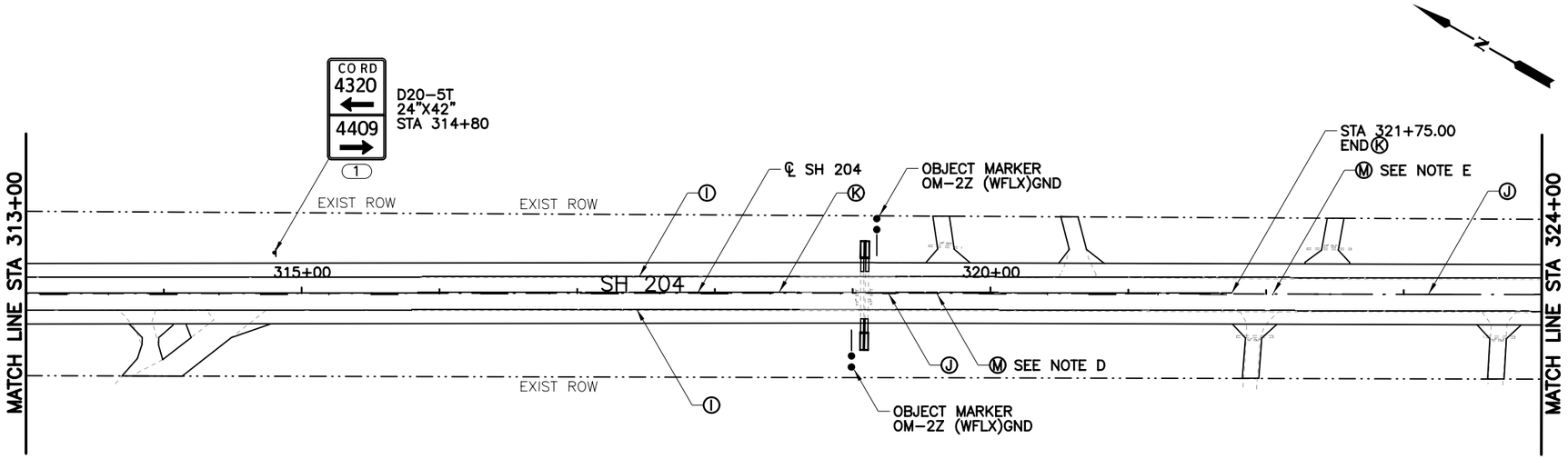
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

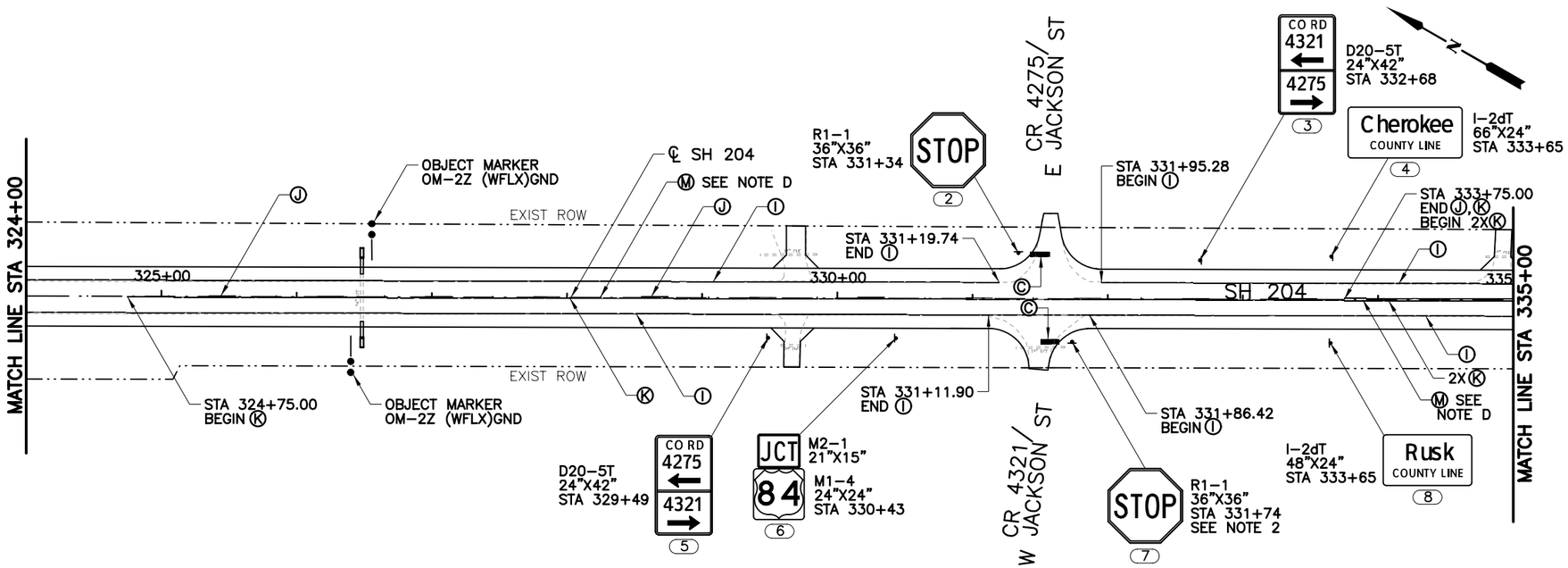
SH 204

SIGNING AND MARKING PLAN

STA 291+00 TO STA 313+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		212





50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇#◇ EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.
2. TXDOT TO COORDINATE WITH CHEROKEE COUNTY TO REPLACE STREET SIGNS.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

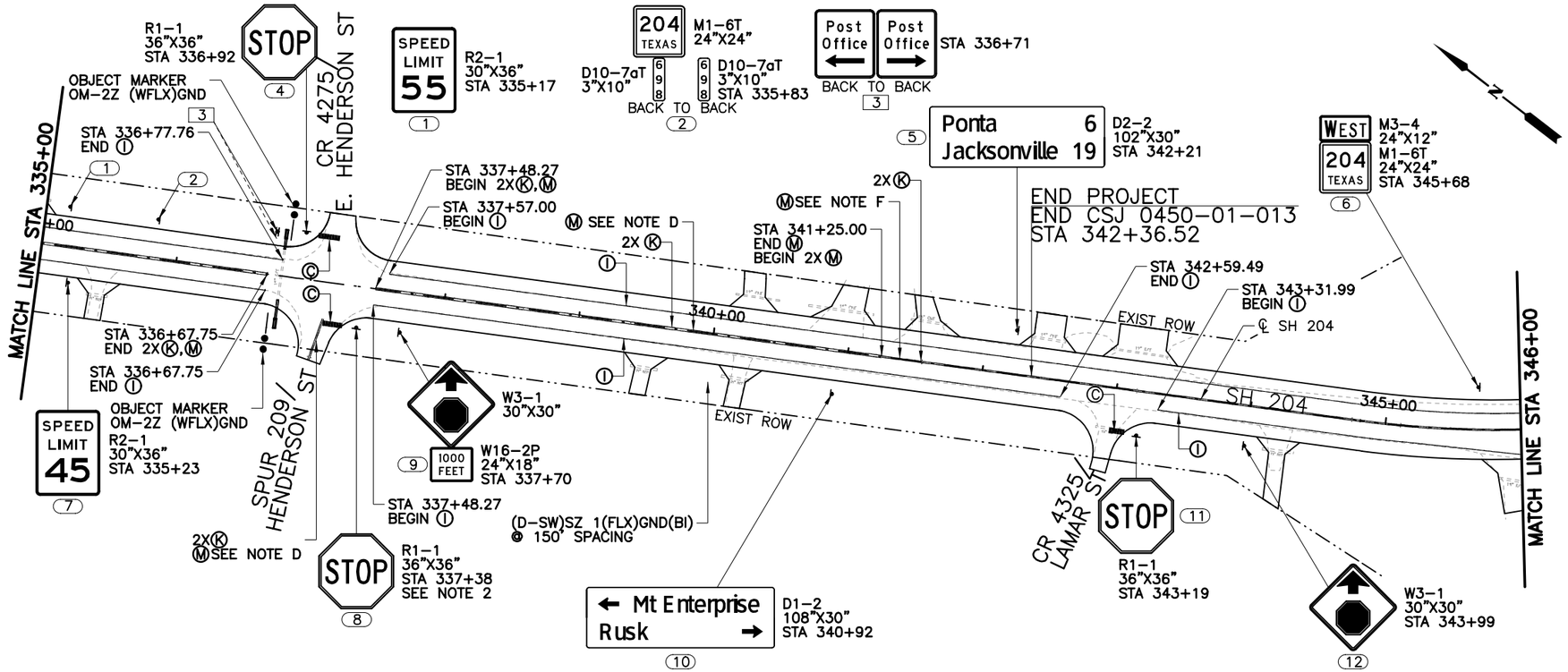
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

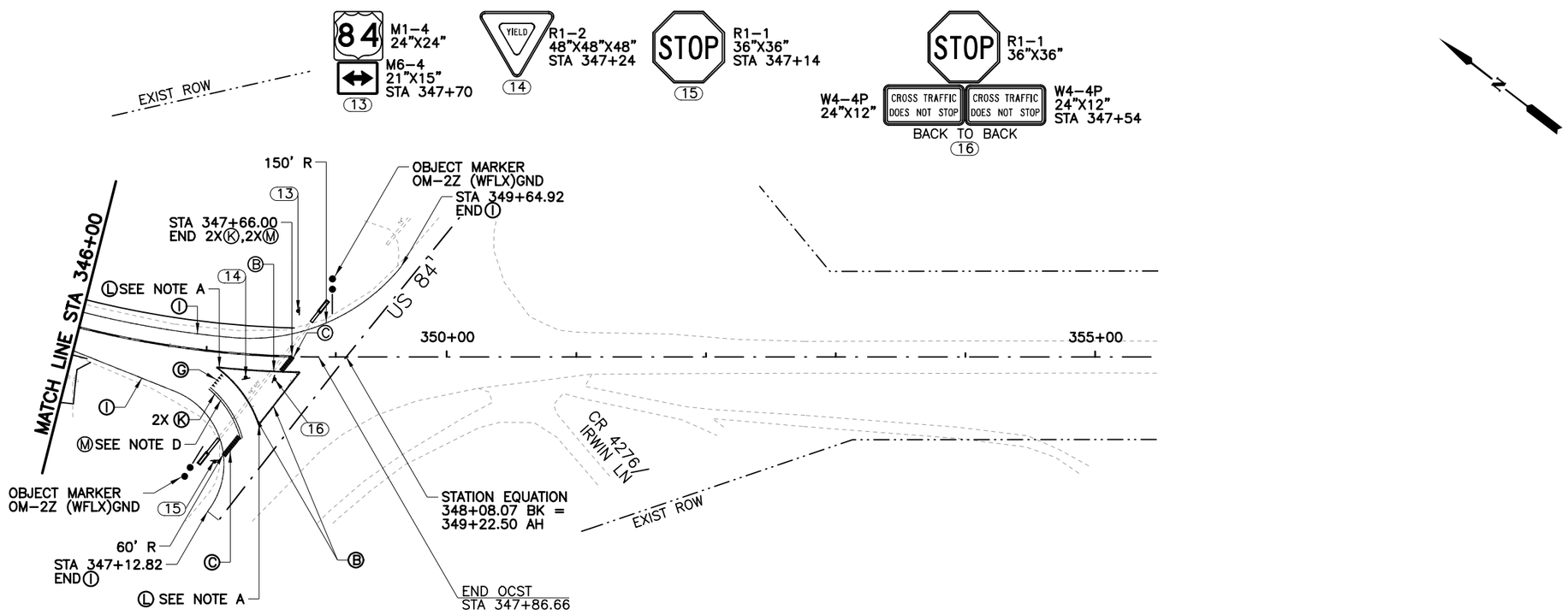
SH 204

SIGNING AND MARKING PLAN

STA 313+00 TO STA 335+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		213





50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I (W) (6") (DOT)
- Ⓑ REFL PAV MRK TY I (W) (8") (SLD)
- Ⓒ REFL PAV MRK TY I (W) (24")(SLD)
- Ⓓ PREFAB PAV MRK TY C (W) (ARROW)
- Ⓔ PREFAB PAV MRK TY C (W) (LNDP ARW)
- Ⓕ PREFAB PAV MRK TY C (W) (WORD)
- Ⓖ REF PAV MRK TY I (W) 36" (YLD TRI)
- Ⓗ RE PM W/RET REQ TY I (W) (6") (BRK)
- Ⓘ RE PM W/RET REQ TY I (W) (6") (SLD)
- Ⓙ REF PROF PAV MRK TY I (Y) (6") (BRK)
- Ⓚ REF PROF PAV MRK TY I (Y) (6") (SLD)
- Ⓛ REFL PAV MRKR TY I-C
- Ⓜ REFL PAV MRKR TY II-A-A
- (#) PROPOSED SMALL SIGN
- [#] RELOCATED SMALL SIGN
- ◇#◇ EXISTING SIGN TO REMAIN
- (D-SW)SZ (BRF)CTB(BI)
- (D-SW)SZ 1(BRF)GF2(BI)
- (D-SW)SZ 1(WFLX)GND
- (D-SW)SZ 1(WFLX)GND(BI)
- OM-2Z (WFLX)GND

NOTES:
1. ALL STATIONS ARE FROM ℄ SH 204 UNLESS NOTED OTHERWISE.
2. TXDOT TO COORDINATE WITH RUSK COUNTY TO REPLACE STREET SIGNS.

NOTES:
A. Ⓛ AT 20' SPACING
B. Ⓛ AT 80' SPACING
C. 2X Ⓜ AT 20' SPACING
D. Ⓜ AT 40' SPACING
E. Ⓜ AT 80' SPACING
F. 2X Ⓜ AT 80' SPACING

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
8/23/2023

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SIGNING AND MARKING PLAN

STA 335+00 TO END PROJECT

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		214

SHEET 16 OF 16

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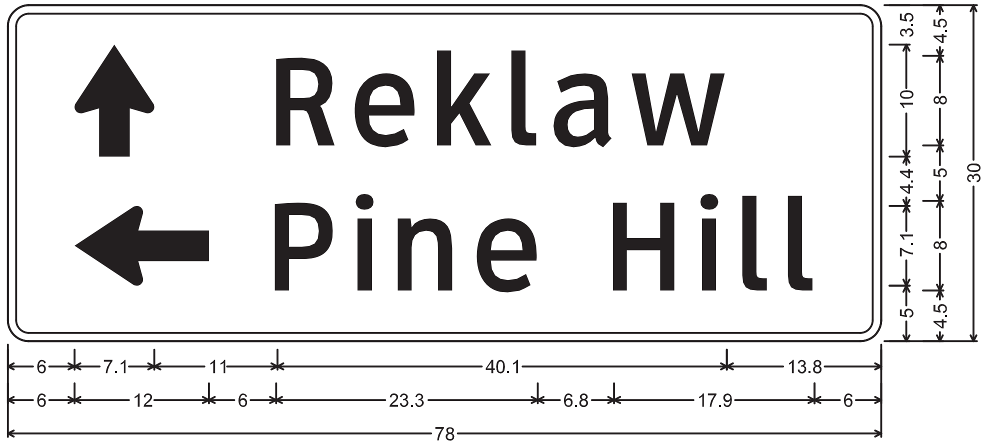
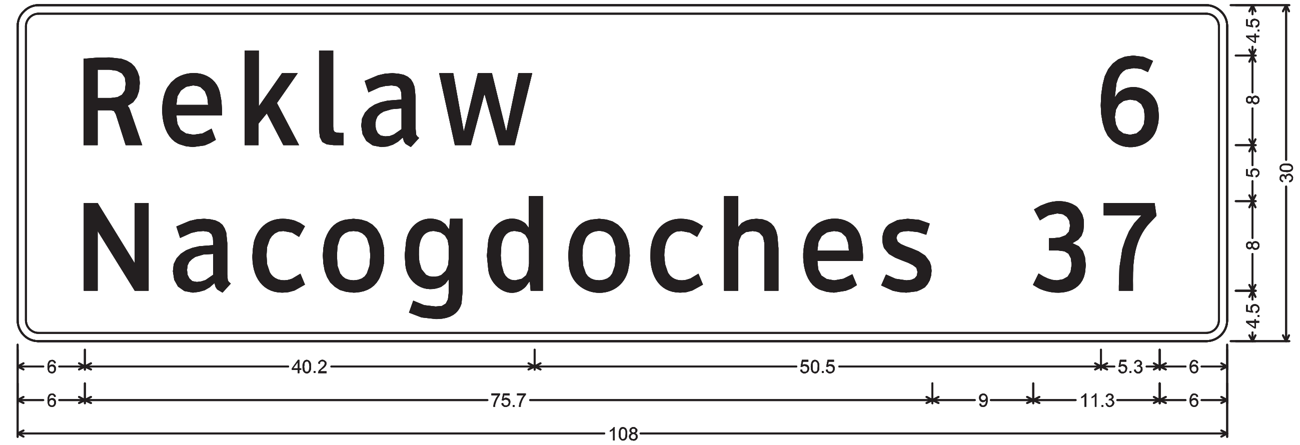
cpypdf_ANSIB.pltcfg
pw:/
8/23/2023 11:35:28 AM PerryKL
pw:/



1.9" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 10.0" X 7.1" 90°; [Reklaw] ClearviewHwy-3-W;
Standard Arrow Custom 12.0" X 7.1" 180°; [Pine Hill] ClearviewHwy-3-W;
Table of widths and spaces.

6.0	⇧ 7.1	11.0	R 5.4	1.6	e 5.3	2.1	k 5.0	1.6	l 2.3	1.4	a 5.4	1.5	w 8.5	13.8

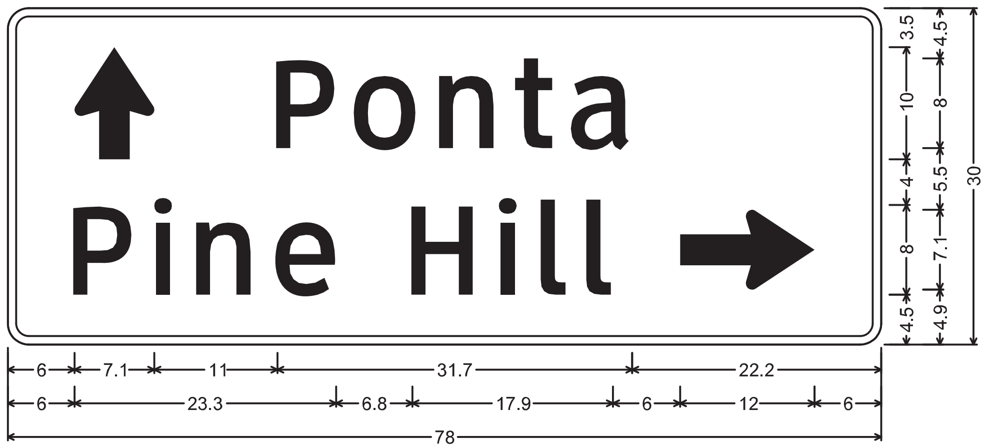
6.0	⇦ 12.0	6.0	P 5.2	1.9	i 1.7	2.1	n 5.1	2.0	e 5.3	6.8	H 5.5	2.2	i 1.7	2.2	l 2.3	1.8	l 2.2	6.0



1.9" Radius, 0.8" Border, White on Green;
[Reklaw] ClearviewHwy-3-W; [6] ClearviewHwy-3-W; [Nacogdoches] ClearviewHwy-3-W; [37] ClearviewHwy-3-W;
Table of widths and spaces.

6.0	R 5.4	1.6	e 5.4	2.0	k 5.1	1.5	l 2.3	1.5	a 5.4	1.5	w 8.5	50.5	6 5.3	6.0

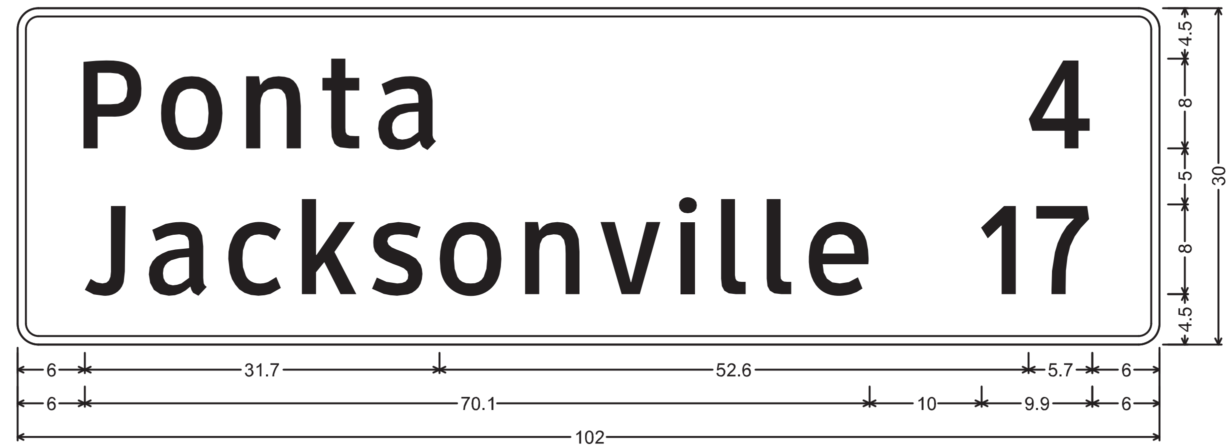
6.0	N 5.9	2.1	a 5.4	1.7	c 4.9	1.4	o 5.6	1.7	g 5.3	2.0	d 5.2	2.1	o 5.6	1.7	c 4.9	1.7	h 5.1	1.9	e 5.4	1.5	s 4.6	9.0	3 4.9	1.4	7 5.0	6.0



1.9" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 10.0" X 7.1" 90°; [Ponta] ClearviewHwy-3-W;
[Pine Hill] ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0°;
Table of widths and spaces.

6.0	⇧ 7.1	11.0	P 5.2	1.7	o 5.6	2.0	n 5.1	1.6	t 3.5	1.6	a 5.4	22.2

6.0	P 5.2	1.9	i 1.7	2.1	n 5.1	2.0	e 5.3	6.8	H 5.5	2.2	i 1.7	2.2	l 2.3	1.8	l 2.2	6.0	⇨ 12.0	6.0



1.9" Radius, 0.8" Border, White on Green;
[Ponta] ClearviewHwy-3-W; [4] ClearviewHwy-3-W; [Jacksonville] ClearviewHwy-3-W; [17] ClearviewHwy-3-W;
Table of widths and spaces.

6.0	P 5.2	1.7	o 5.6	2.1	n 5.0	1.6	t 3.5	1.6	a 5.4	52.6	4 5.7	6.0

6.0	J 3.8	2.0	a 5.4	1.7	c 4.9	1.7	k 5.1	1.0	s 4.6	1.6	o 5.6	2.1	n 5.0	1.6	v 5.5	1.5	i 1.7	2.1	l 2.3	1.8	l 2.3	1.5	e 5.3	10.0	1 3.2	1.7	7 5.0	6.0

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

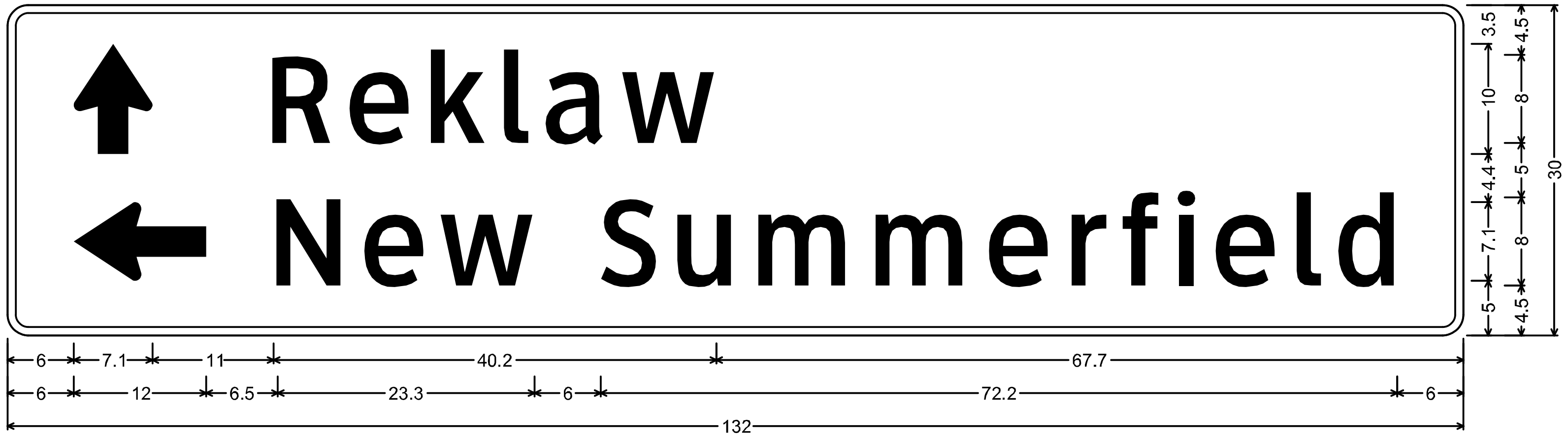
 Texas Department of Transportation

SH 204

SMALL SIGN DETAILS

Designed: CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked: CPY		TEXAS				SH 204
Drawn: CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: CPY	TYL	CHEROKEE	0450	01	013	215

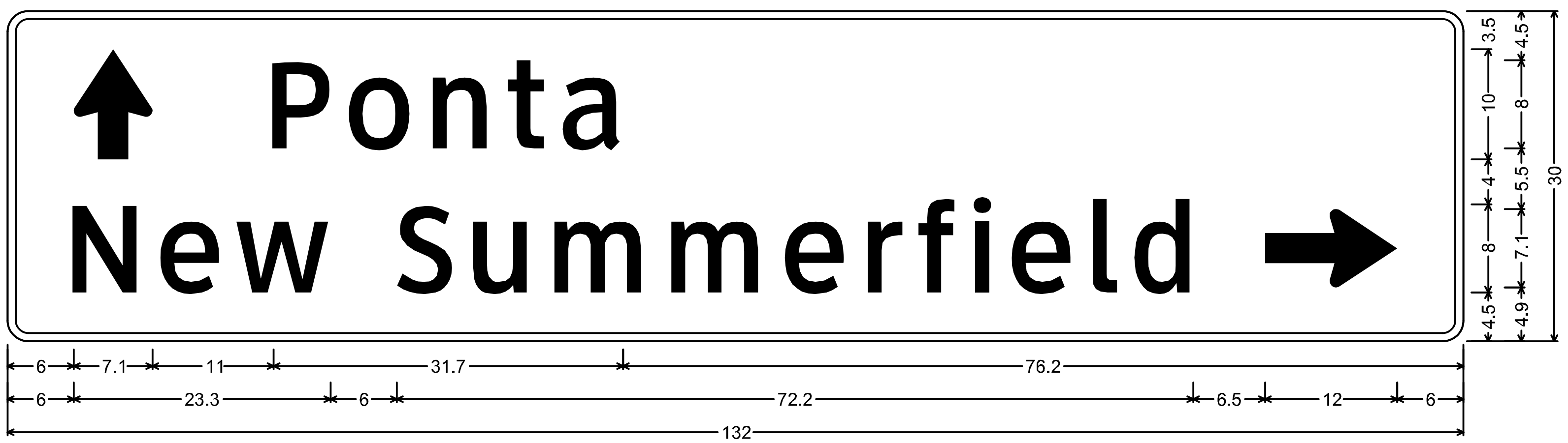
SHEET 1 OF 3



1.9" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 10.0" X 7.1" 90°; [Reklaw] ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 180°; [New Summerfield] ClearviewHwy-3-W;
Table of widths and spaces.

	⇧		R		e		k		l		a		w	
6.0	7.1	11.0	5.4	1.6	5.4	2.0	5.1	1.5	2.3	1.5	5.4	1.5	8.5	67.7

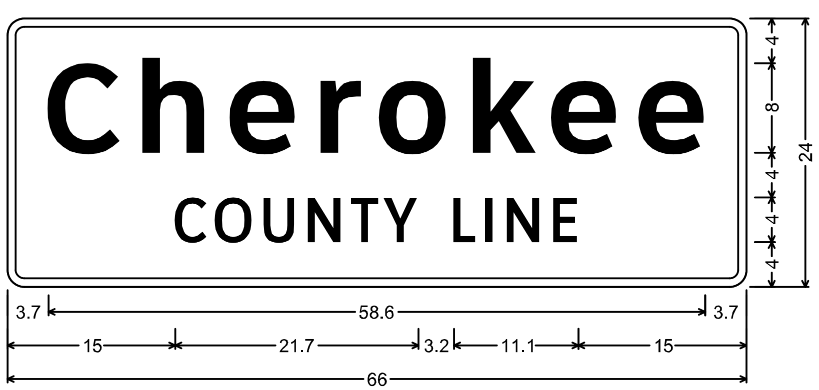
	⇦		N		e		w		S		u		m		m		e		r		f		i		e		l		d	
6.0	12.0	6.5	5.9	2.0	5.4	1.5	8.5	6.0	5.1	1.9	5.0	2.4	8.4	2.2	8.4	1.9	5.3	2.0	3.3	1.4	3.3	1.7	1.7	1.8	5.4	2.0	2.3	1.5	5.2	6.0



1.9" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 10.0" X 7.1" 90°; [Ponta] ClearviewHwy-3-W; [New Summerfield] ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0°;
Table of widths and spaces.

	⇧		P		o		n		t		a	
6.0	7.1	11.0	5.2	1.7	5.6	2.1	5.0	1.7	3.4	1.6	5.4	76.2

	N		e		w		S		u		m		m		e		r		f		i		e		l		d		⇨	
6.0	5.9	2.0	5.4	1.5	8.5	6.0	5.1	1.9	5.0	2.4	8.4	2.2	8.4	1.9	5.3	2.0	3.3	1.4	3.3	1.7	1.7	1.8	5.4	2.0	2.3	1.5	5.2	6.5	12.0	6.0

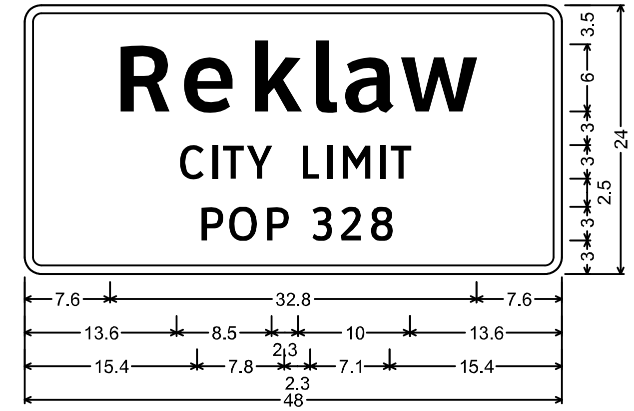


1.5" Radius, 0.8" Border, White on Green;
[Cherokee] ClearviewHwy-5-W-R; [COUNTY LINE] ClearviewHwy-3-W;
Table of widths and spaces.

	C		h		e		r		o		k		e		e	
3.7	6.5	1.9	5.5	2.3	5.9	2.2	3.7	1.5	6.2	2.2	5.7	1.3	5.9	1.9	5.9	3.7

	C		O		U		N		T		Y
15.0	2.9	0.7	3.3	1.0	2.8	1.2	2.9	0.9	2.5	0.4	3.1

	L		I		N		E	
3.2	2.0	0.9	0.7	1.1	3.0	1.2	2.2	15.0



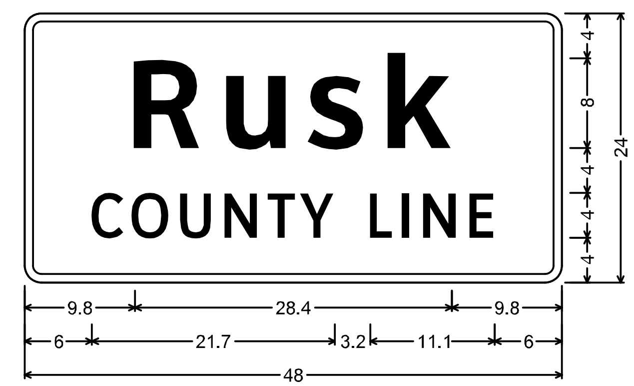
1.5" Radius, 0.8" Border, White on Green;
[Reklaw] ClearviewHwy-5-W-R;
[CITY LIMIT] ClearviewHwy-3-W;
[POP 266] ClearviewHwy-3-W;
Table of widths and spaces.

	R		e		k		l		a		w	
7.6	4.5	1.4	4.5	1.6	4.3	1.2	1.9	1.0	4.5	0.9	7.0	7.6

	C		I		T		Y
13.6	2.2	0.6	0.5	0.6	1.9	0.4	2.3

	L		I		M		I		T	
2.3	1.6	0.6	0.5	0.9	2.5	0.9	0.5	0.6	1.9	13.6

	P		O		P		3		2		8	
15.4	1.9	0.7	2.5	0.7	2.0	2.3	1.9	0.6	2.0	0.7	1.9	15.4



1.5" Radius, 0.8" Border, White on Green;
[Rusk] ClearviewHwy-5-W-R;
[COUNTY LINE] ClearviewHwy-3-W;
Table of widths and spaces.

	R		u		s		k	
9.8	6.0	2.2	5.5	1.8	5.2	2.0	5.7	9.8

	C		O		U		N		T		Y
6.0	2.9	0.7	3.3	1.0	2.8	1.2	3.0	0.8	2.5	0.5	3.0

	L		I		N		E	
3.2	2.0	0.9	0.7	1.2	2.9	1.2	2.2	6.0

8/23/2023

NO.	REVISION	BY	DATE

TEXAS REGISTERED ENGINEERING FIRM F-1741

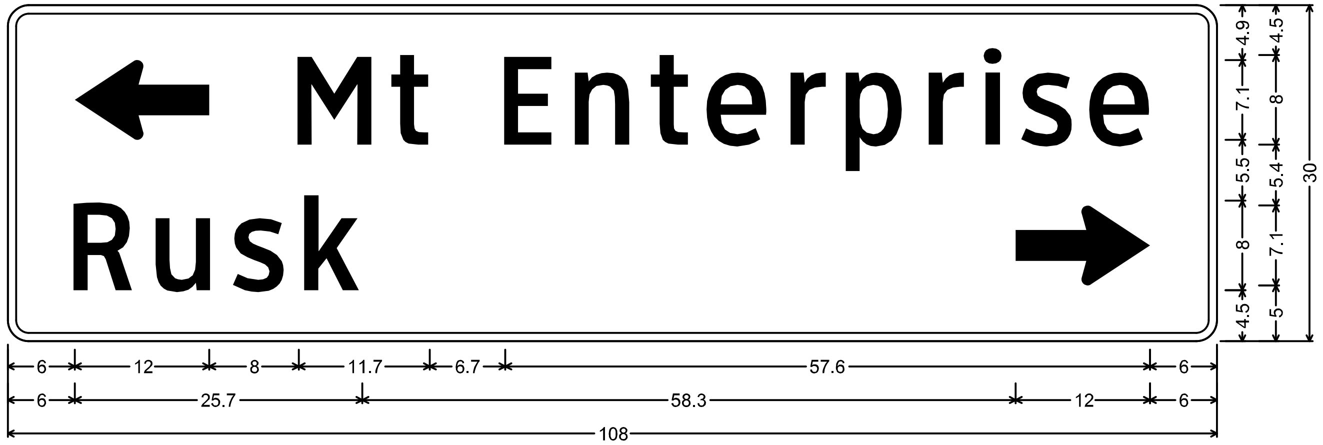
 Texas Department of Transportation

SH 204

SMALL SIGN DETAILS

SHEET 2 OF 3

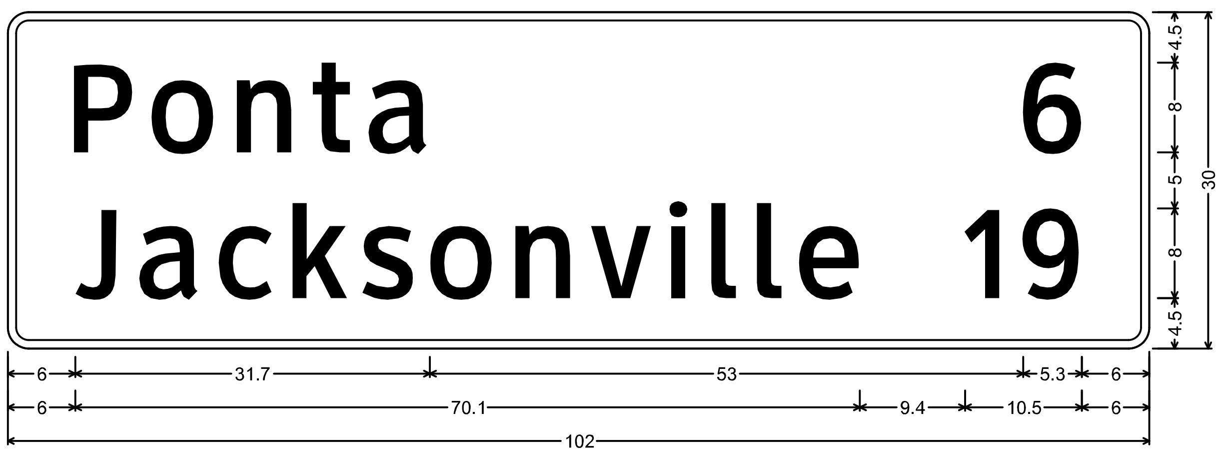
Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	216



1.9" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 12.0" X 7.1" 180°; [Mt Enterprise] ClearviewHwy-3-W; [Rusk] ClearviewHwy-3-W;
Standard Arrow Custom 12.0" X 7.1" 0°;
Table of widths and spaces.

	⇦		M		t		E		n		t		e		r		p		r		i		s		e	
6.0	12.0	8.0	6.6	1.7	3.4	6.7	4.5	1.9	5.0	1.6	3.5	1.6	5.3	2.1	3.3	1.7	5.3	2.0	3.3	1.6	1.8	1.6	4.6	1.6	5.3	6.0

	R		u		s		k		⇨	
6.0	5.4	1.9	5.0	1.8	4.6	1.9	5.1	58.3	12.0	6.0



1.9" Radius, 0.8" Border, White on Green;
[Ponta] ClearviewHwy-3-W; [6] ClearviewHwy-3-W; [Jacksonville] ClearviewHwy-3-W; [19] ClearviewHwy-3-W;
Table of widths and spaces.

	P		o		n		t		a		6	
6.0	5.2	1.7	5.6	2.1	5.0	1.7	3.4	1.6	5.4	53.0	5.3	6.0

	J		a		c		k		s		o		n		v		i		l		l		e		1		9	
6.0	3.8	2.1	5.3	1.8	4.8	1.8	5.0	1.1	4.6	1.5	5.7	2.0	5.0	1.6	5.5	1.5	1.7	2.2	2.2	1.8	2.3	1.5	5.3	9.4	3.2	2.0	5.3	6.0

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED
PROFESSIONAL ENGINEER

3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

SMALL SIGN DETAILS

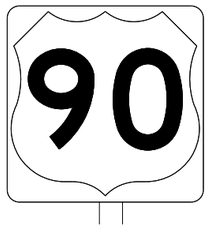
Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	217

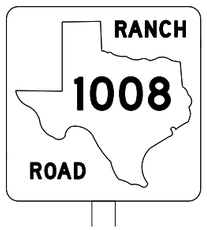
SHEET 3 OF 3

DATE: 1/3/2019 11:02:05 AM
FILE: pw:\\DataPWINT01.BluePrints.Corp:pw_cpy\Documents\Active Projects\TXD01600493.00\TXD01600493.01\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.xx Signing and Striping\Standards\

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

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

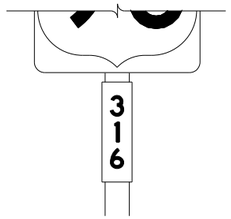




TYPICAL EXAMPLES

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

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



TYPICAL EXAMPLES

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	TYL	CHEROKEE		218

3

DATE: 1/3/2019 11:02:08 AM
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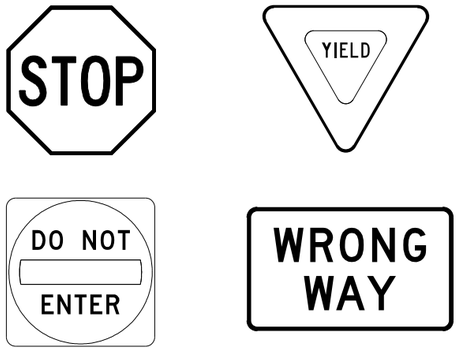
REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

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



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

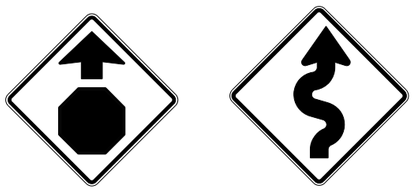
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

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

TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

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

GENERAL NOTES

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

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

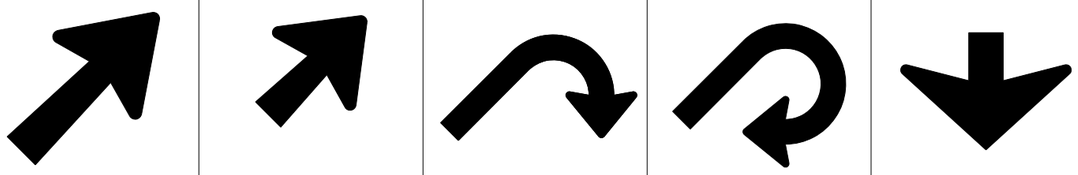
FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	TYL	CHEROKEE		219

4

DATE: 1/3/2019 11:02:11 AM
FILE: pw:\\DataPWINT01.Blueprints.Corp:pw_cpy\Documents\Active Projects\TXDOT600493.00\TXDOT600493.01\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.xx Signing and Striping\Standards\

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



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

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

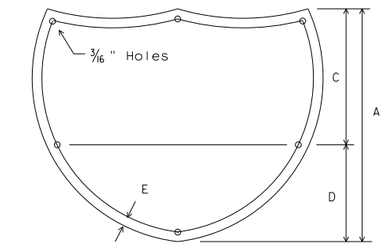
NOTE

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

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

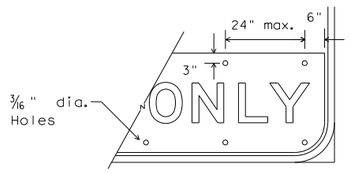
http://www.txdot.gov/

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

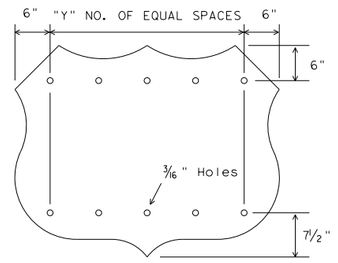


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1½
48	28	20	1¾

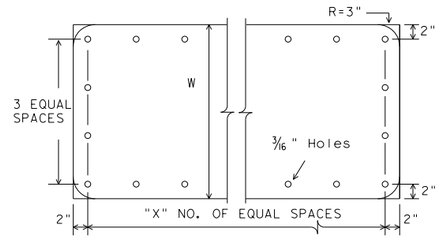


EXIT ONLY PANEL



U.S. ROUTE MARKERS

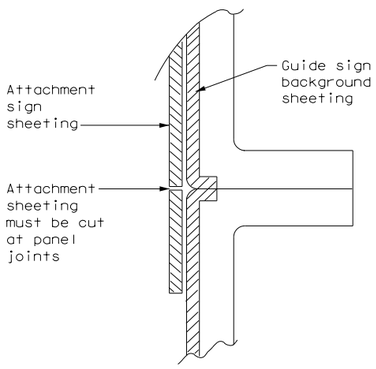
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



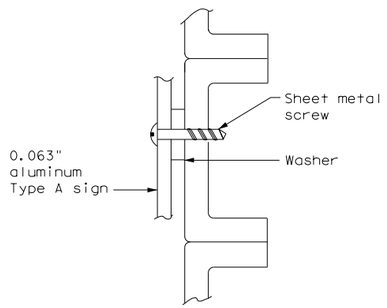
STATE ROUTE MARKERS

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

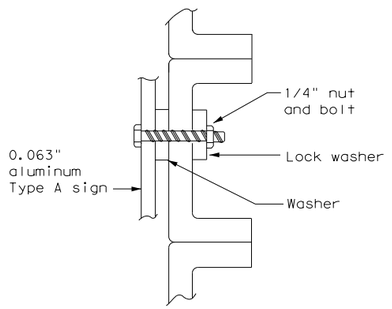
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



DIRECT APPLIED ATTACHMENT



SCREW ATTACHMENT



NUT/BOLT ATTACHMENT

NOTE:

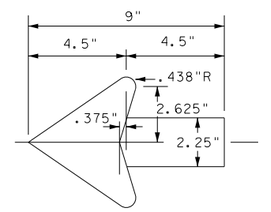
1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".

NOTE:

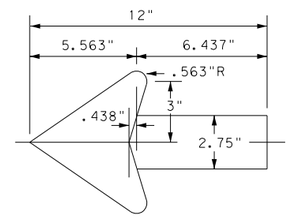
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

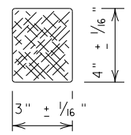
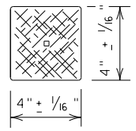
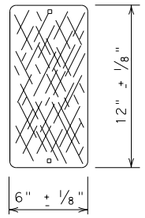
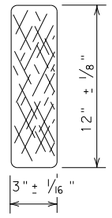
Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

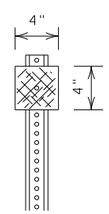
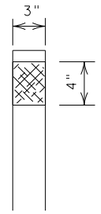
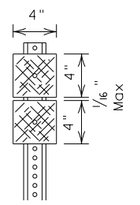
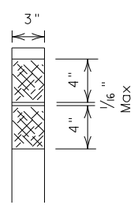
TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	TYL	CHEROKEE		220

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

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

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
- S = Single
- D = Double

COLOR OF REFLECTORS
- W = White
- Y = Yellow
- R = Red

REFLECTOR UNIT SIZE
- 1 or 2

TYPE OF POST OR DELINEATOR
- WC = Wing Channel Post
- YFLX = Yellow Flexible Post
- WFLX = White Flexible Post
- BRF = Barrier Reflector

TYPE OF MOUNT
- GND = Embedded (drivable or set in concrete)
- CTB = Concrete Barrier Mount
- GF1 or GF2 = Guard Fence Attachment
- SRF = Surface Mount

DIRECTION
If Required
- BI = Bi-Directional
- BR = Bi-Directional with red on back

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

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

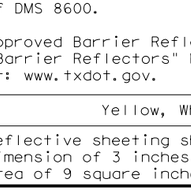
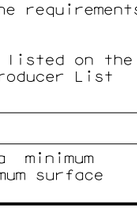
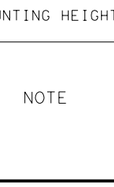
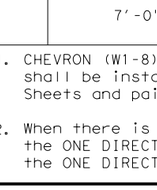
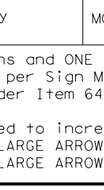
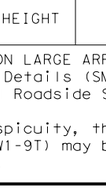
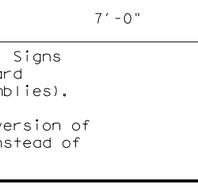
NUMBER OF REFLECTORS OR DIRECTION
- X = 3-Size 2 reflector units (Type 2 only)
- Y = 1-Size 3 reflector unit (Type 2 only)
- Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
- L = Left Side (Type 3 Object Marker only)
- R = Right Side (Type 3 Object Marker only)
- C = Center (Type 3 Object Marker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

TYPE OF POST
- WC = Wing Channel Post
- WFLX = White Flexible Post
- TWT = Thin Walled Tubing

TYPE OF MOUNT
- GND = Embedded (drivable)
- SRF = Surface Mount
- WAS = Wedge Anchor Steel
- WAP = Wedge Anchor Plastic

DIRECTION
If Required
- BI = Bi-Directional

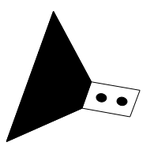
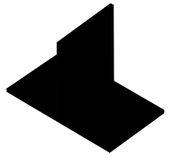
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

DEPARTMENTAL MATERIAL SPECIFICATIONS

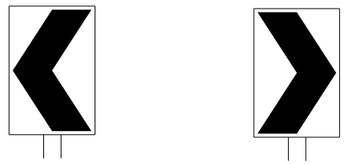
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE



W1-8

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

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE

W1-6

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

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

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DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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4-10 7-20	TYL	CHEROKEE		221

DATE:
FILE:

20A

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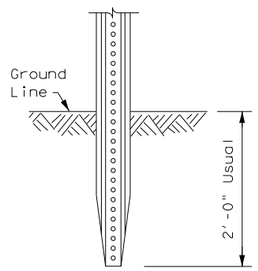
POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

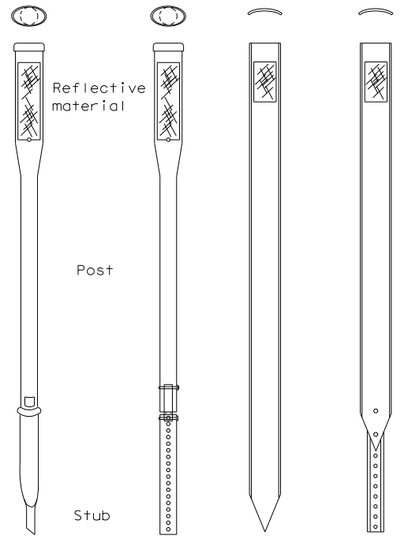


NOTES

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.

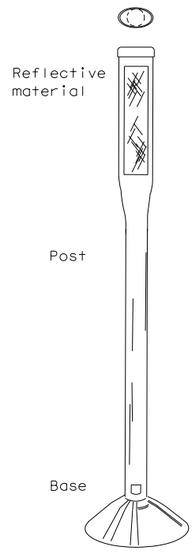
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



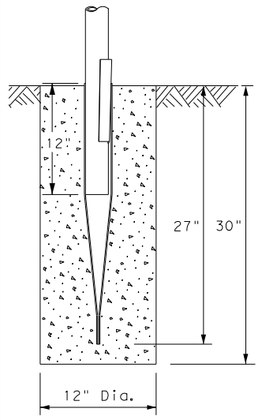
SURFACE MOUNT

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.

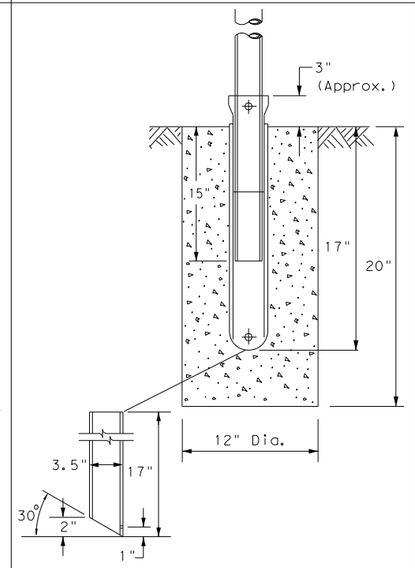
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

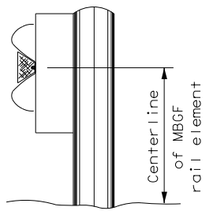
NOTE

1. Install per manufacturer's recommendations.

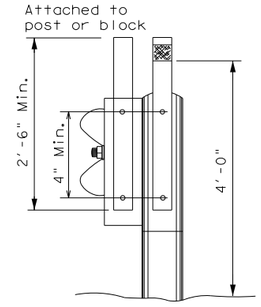
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

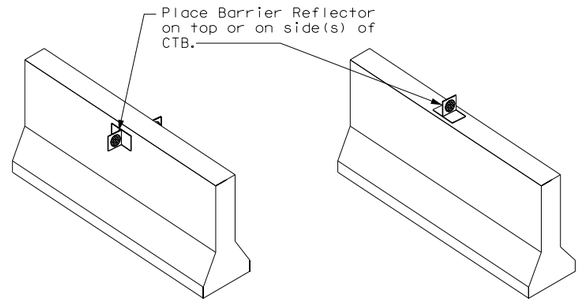
GF1



GF2



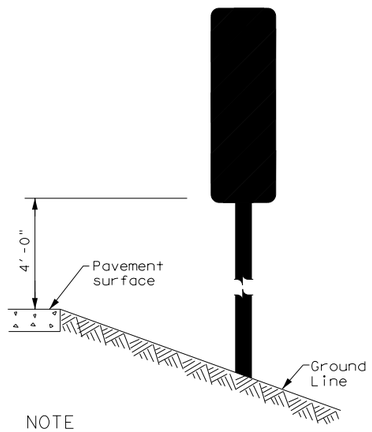
CONCRETE TRAFFIC BARRIER (CTB)



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.

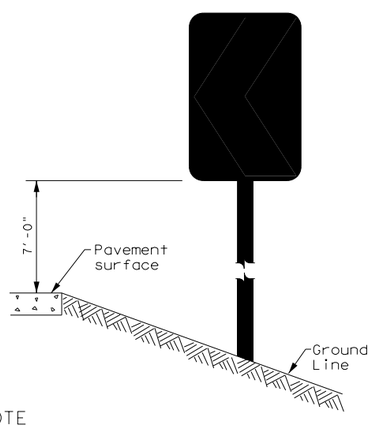
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



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)

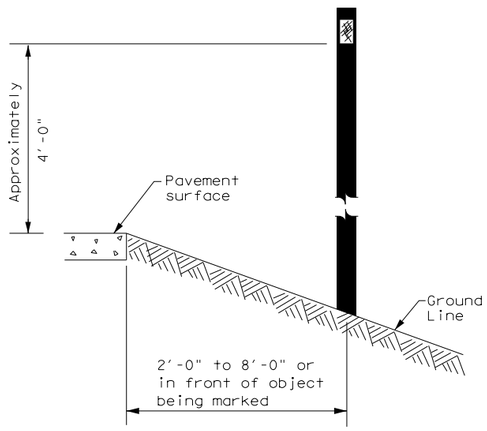
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



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

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DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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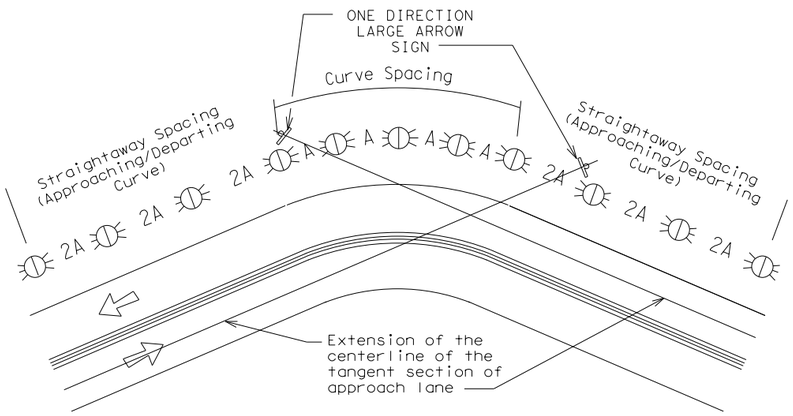
20B

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

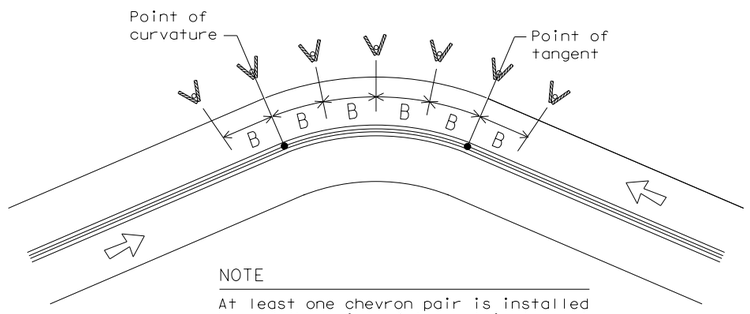
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

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

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

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

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

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

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

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

NOTES

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

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

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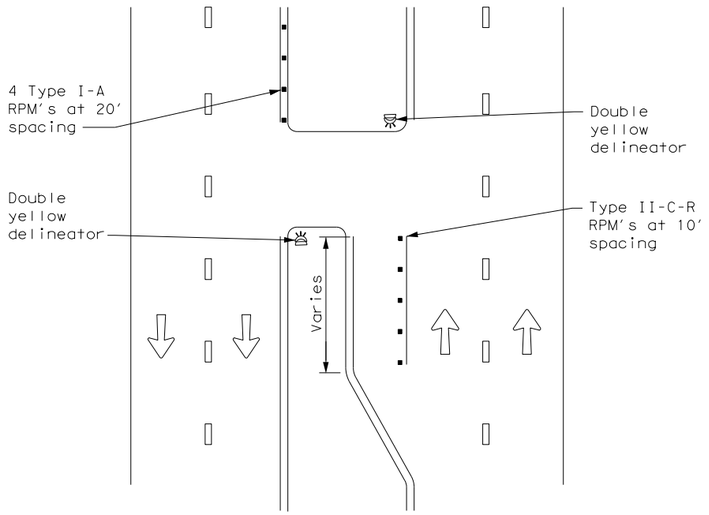
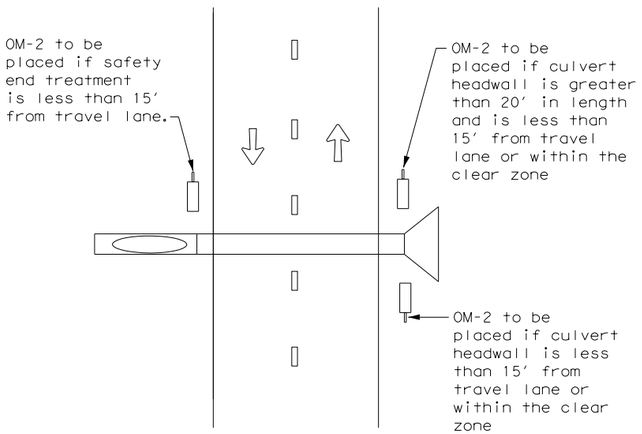
CROSSOVERS



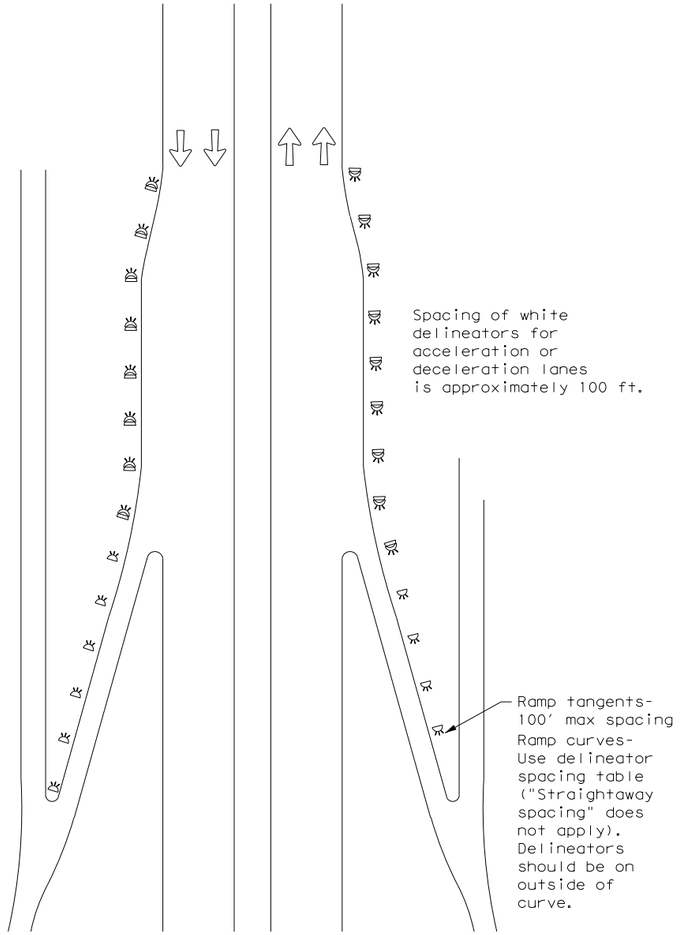
DETAIL 1

FOR CULVERTS WITH MBGF



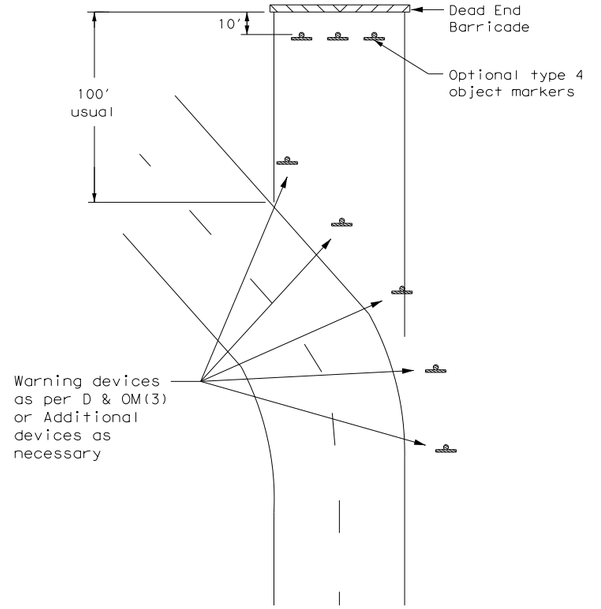
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



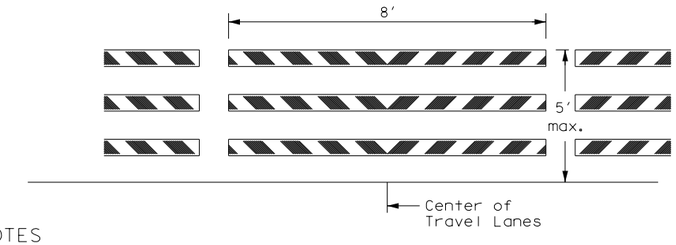
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

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

DETAIL 5

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

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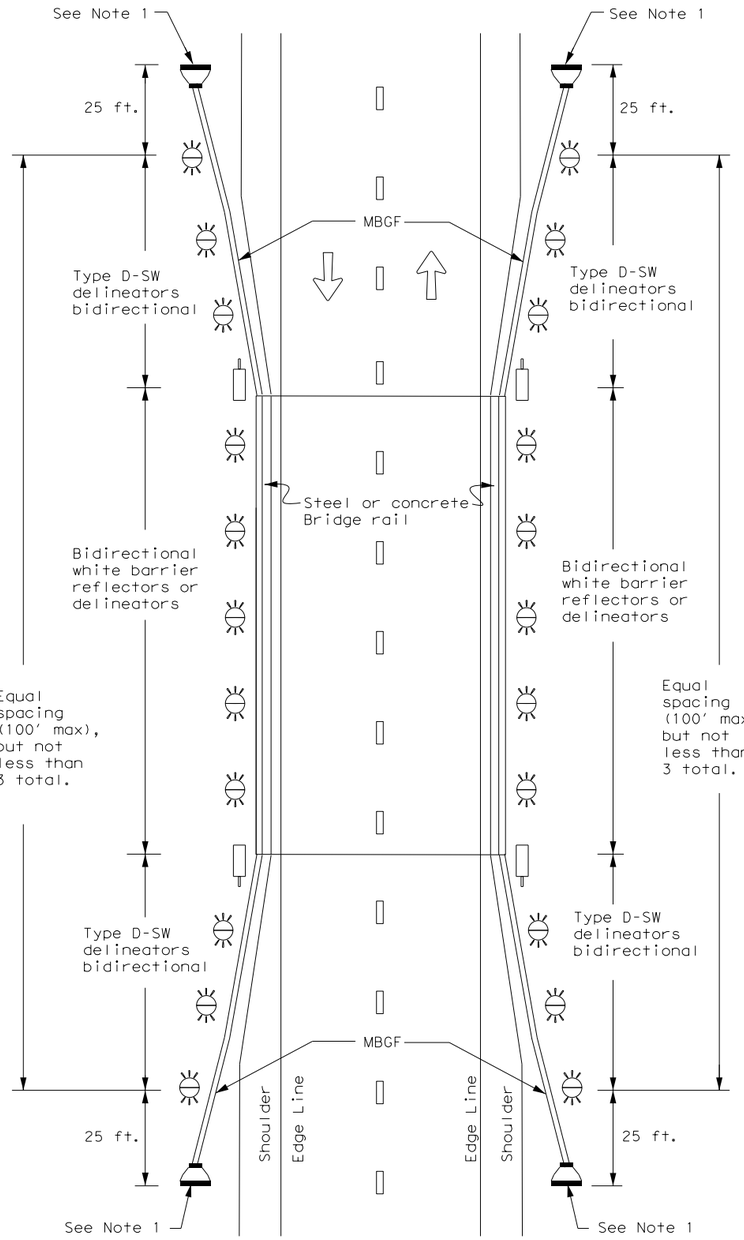
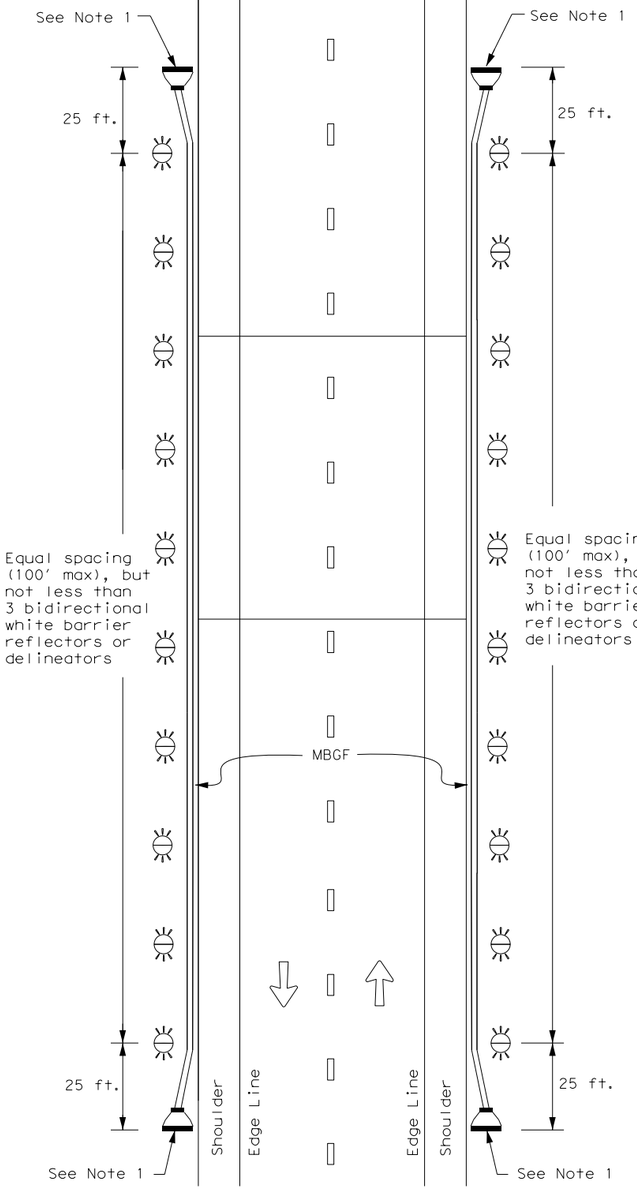
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

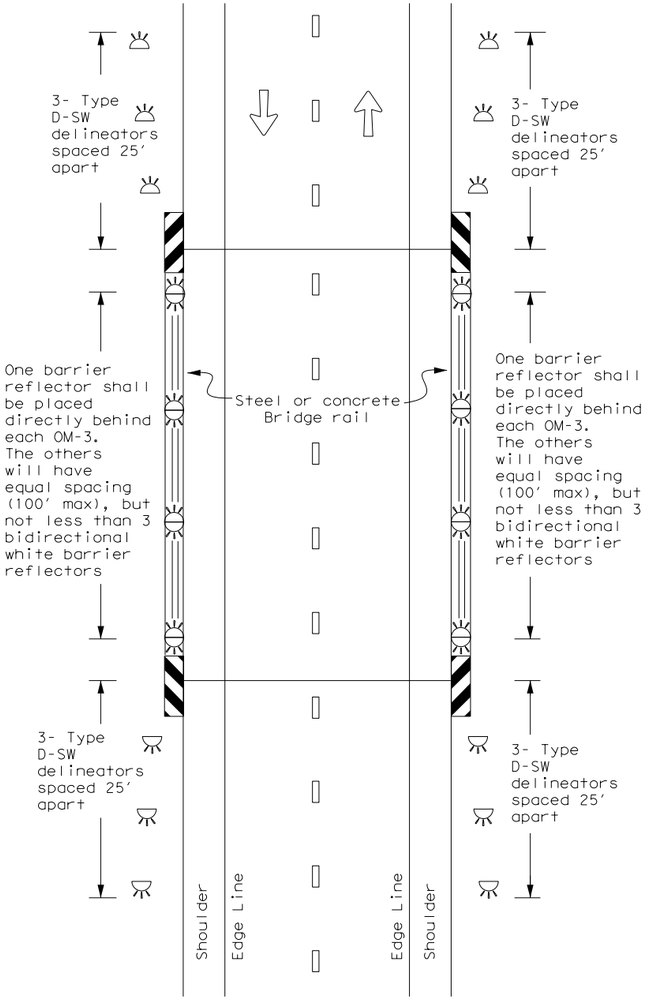
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

TWO-WAY, TWO LANE ROADWAY BRIDGE WITH NO APPROACH RAIL



LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

FILE: dom5-20.dgn		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT		
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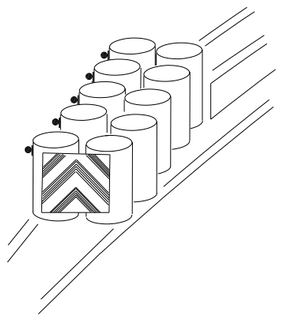
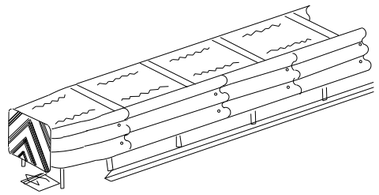
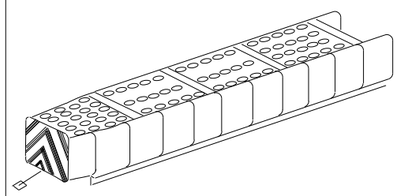
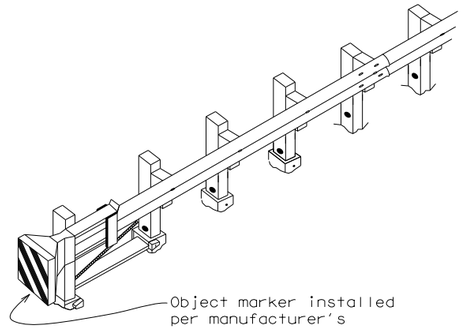
		TYL	CHEROKEE			225	

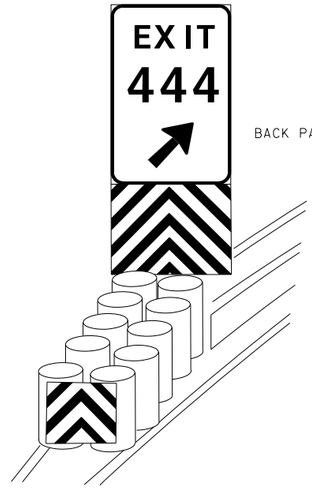
20E

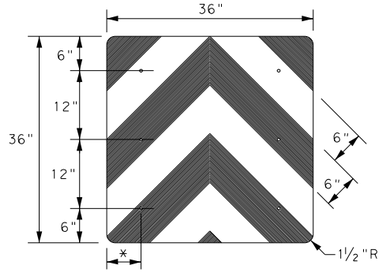


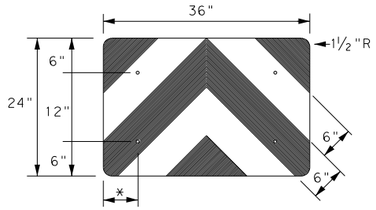




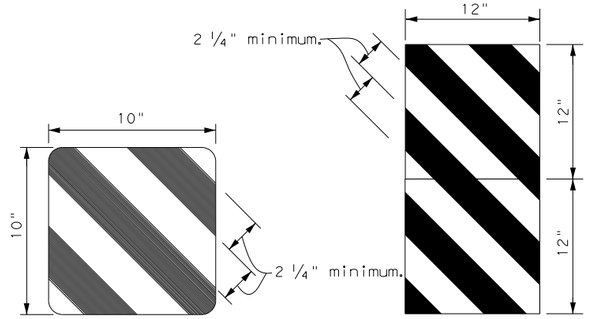




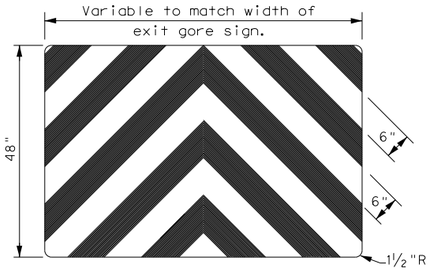


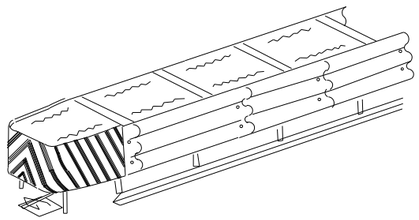


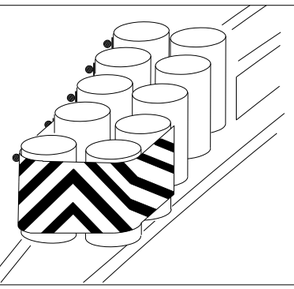
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

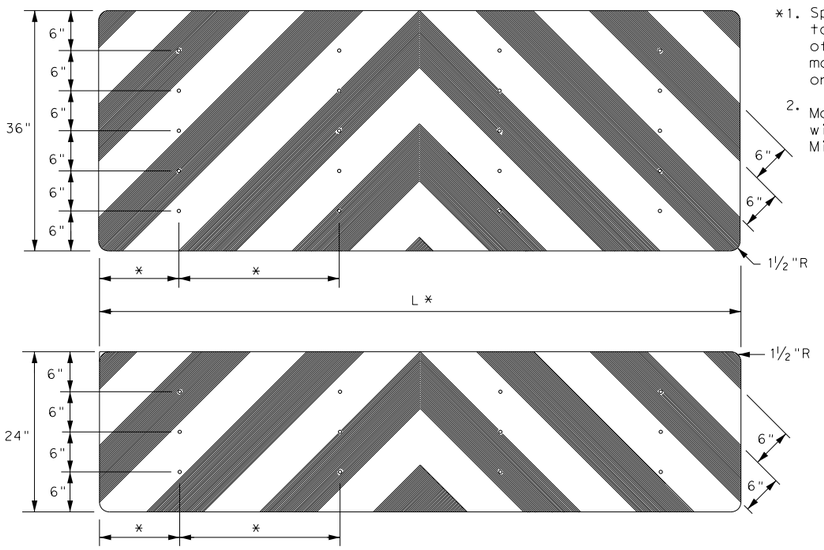


OBJECT MARKERS SMALLER THAN 3 FT^2









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	0450	01	013	SH 204
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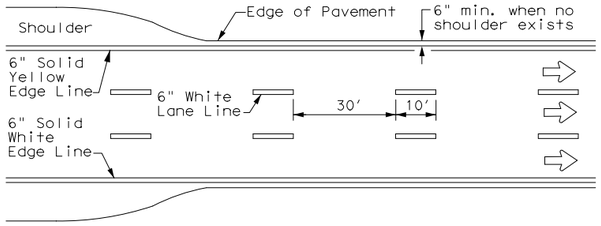
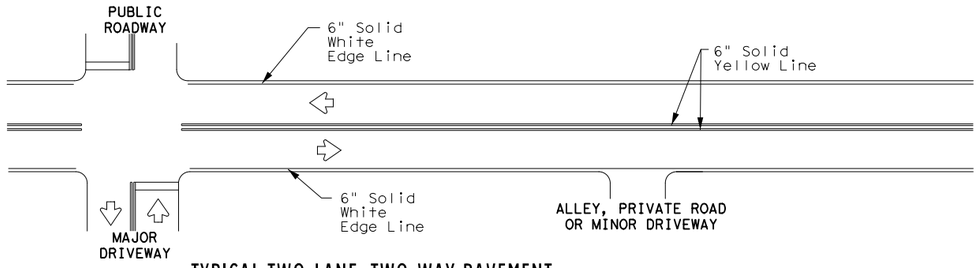
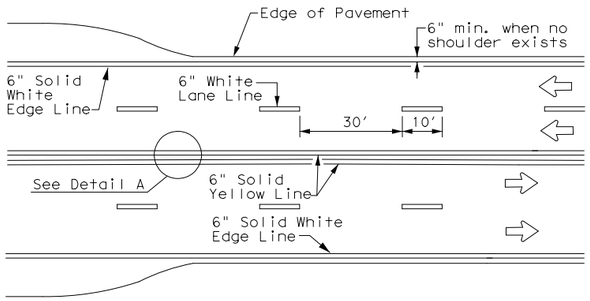
DATE:
FILE:

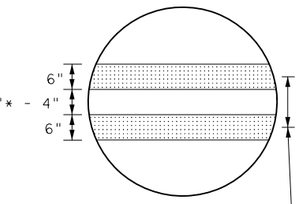


EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



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





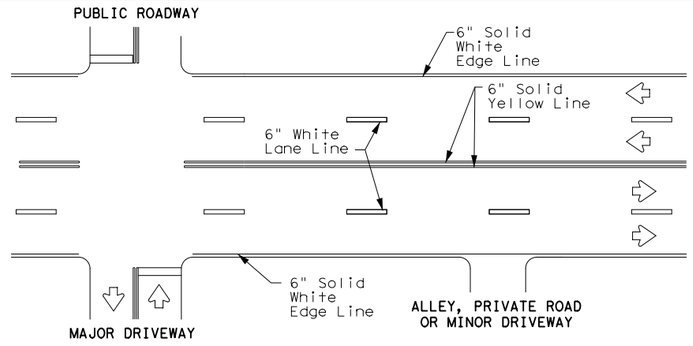
DETAIL "A"

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

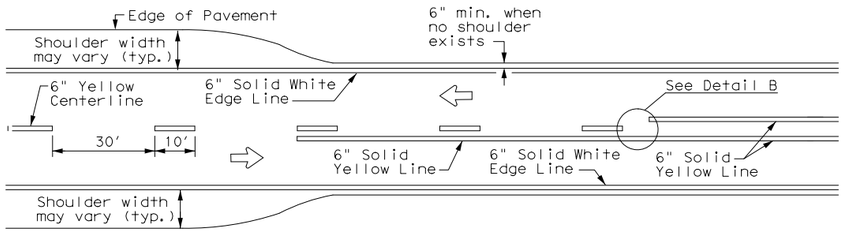
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

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

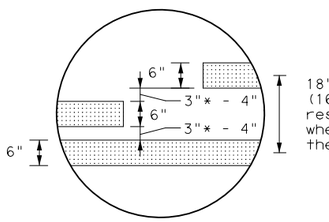
** 8" minimum for restripe projects when approved by the Engineer.



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



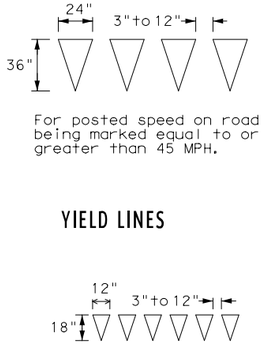
TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

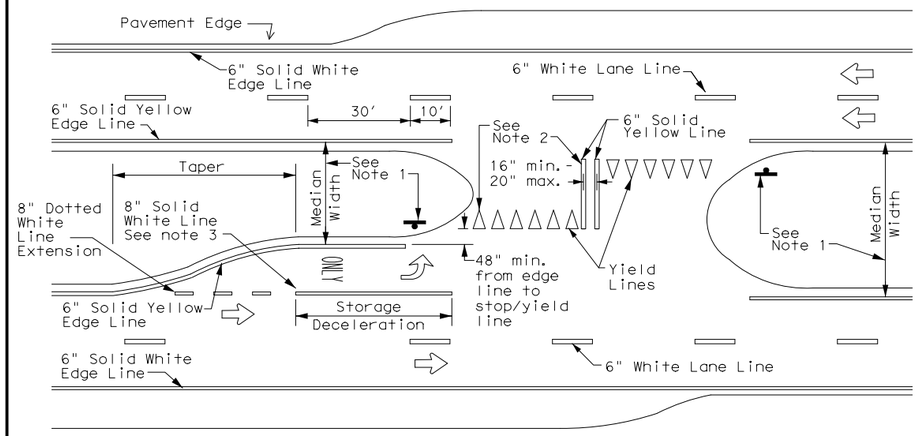


18" min. - 20" max.
(16" minimum for restripe projects when approved by the Engineer.)

DETAIL "B"

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





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

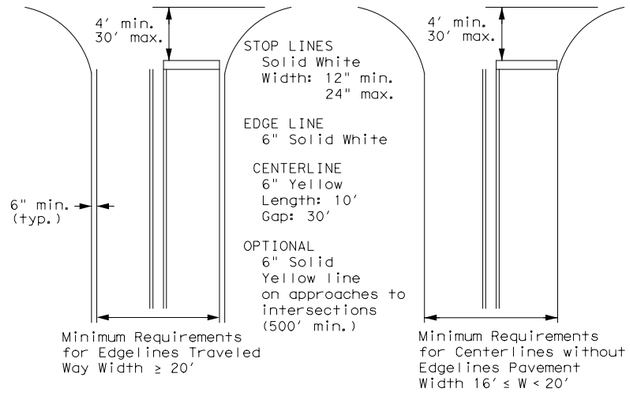
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections.
   Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



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

GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
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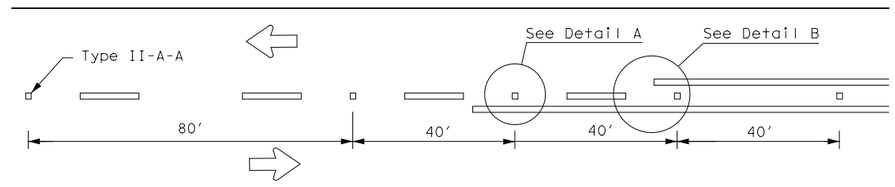
11-78 8-00 6-20	DIST	COUNTY		SHEET NO.
8-95 3-03 12-22	TYL	CHEROKEE		227
5-00 2-12				

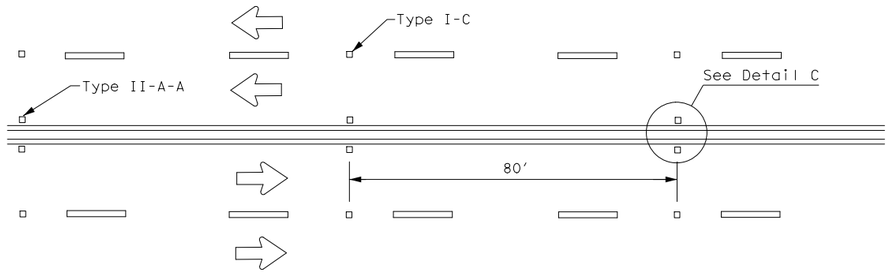
22A

DATE:
FILE:

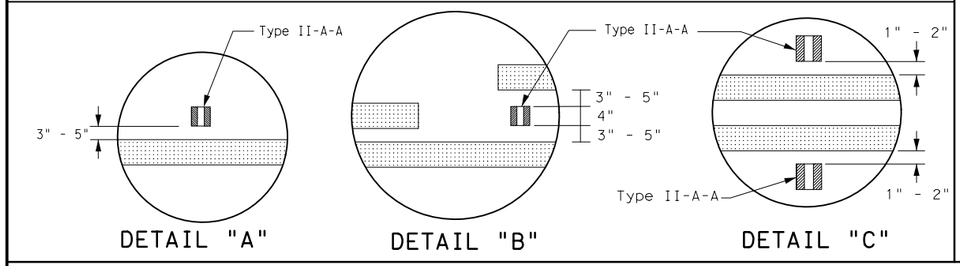
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



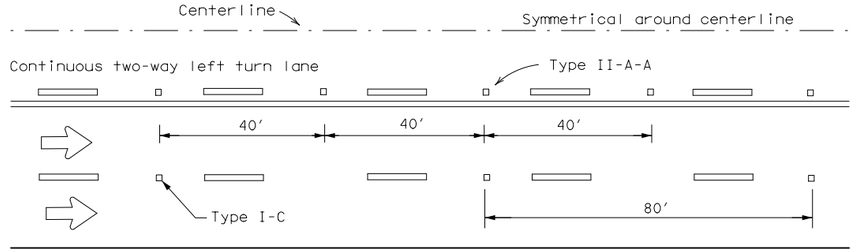
CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS



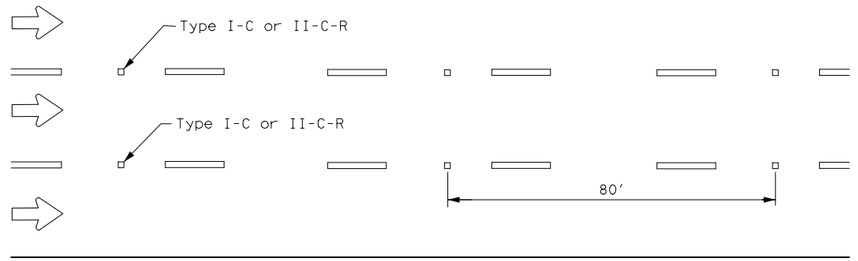
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS



DETAIL "A" DETAIL "B" DETAIL "C"



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



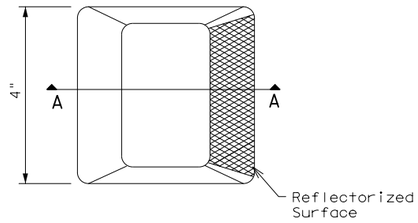
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

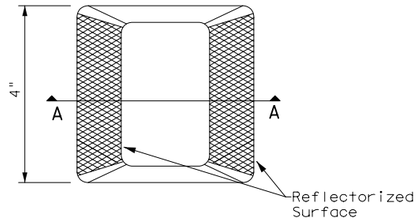
See Note 3.

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

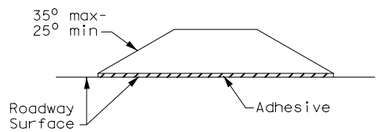
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

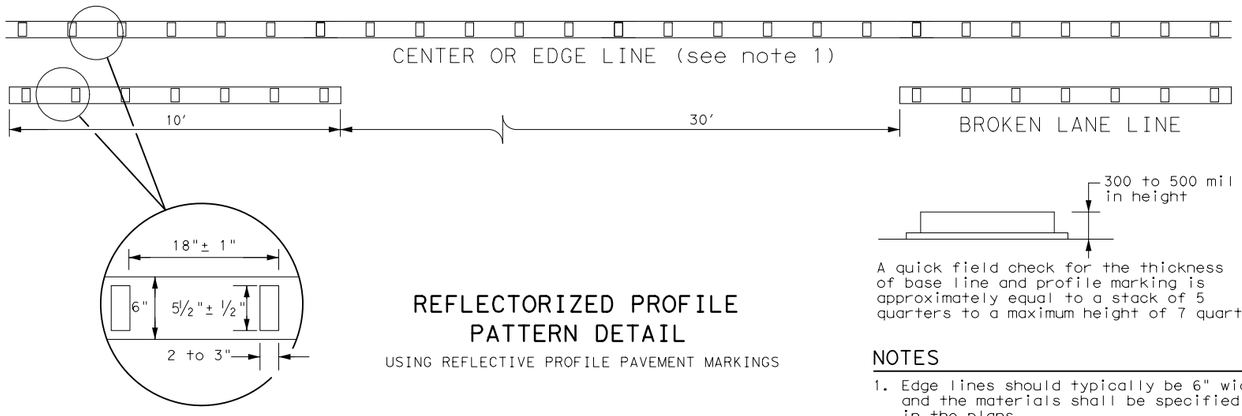


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



6" EDGE LINE, 6" CENTERLINE OR 6" LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
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4-77 8-00 6-20	DIST	COUNTY		SHEET NO.
4-92 2-10 12-22	TYL	CHEROKEE		228
5-00 2-12				

22B

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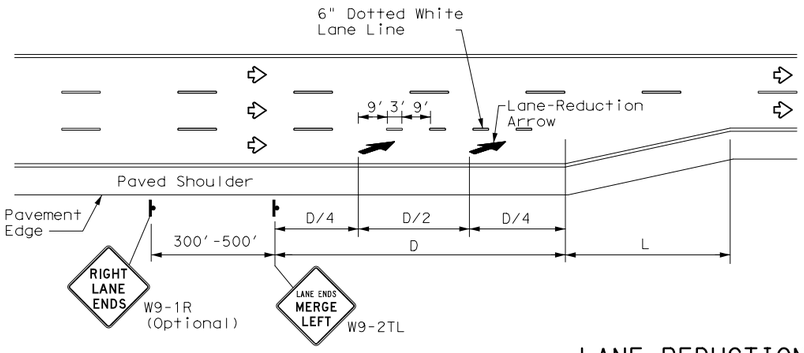


LANE REDUCTION

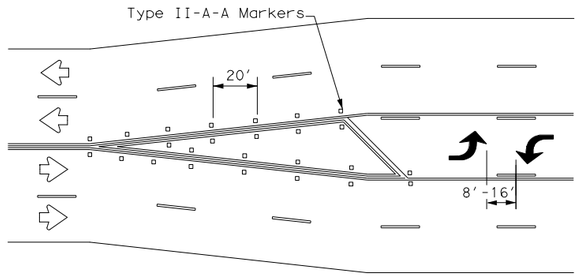
NOTES

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

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

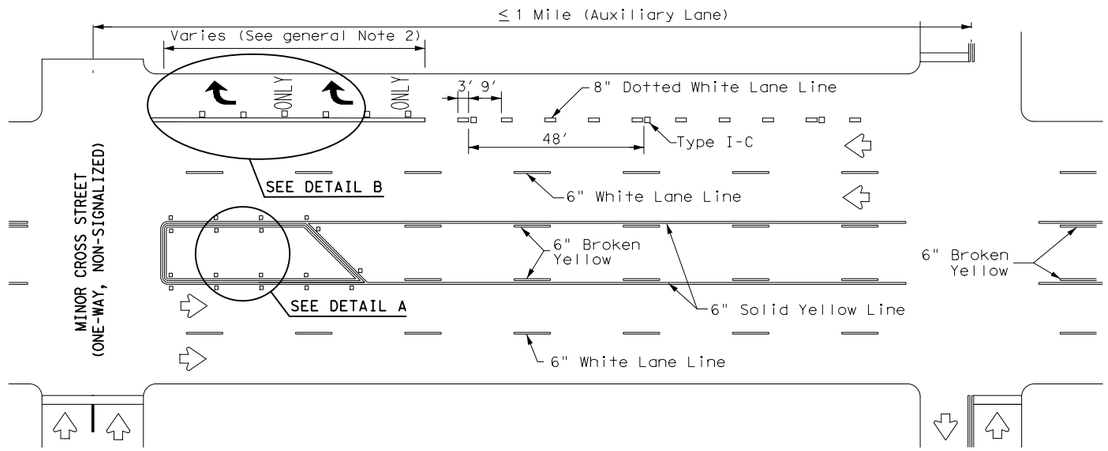


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

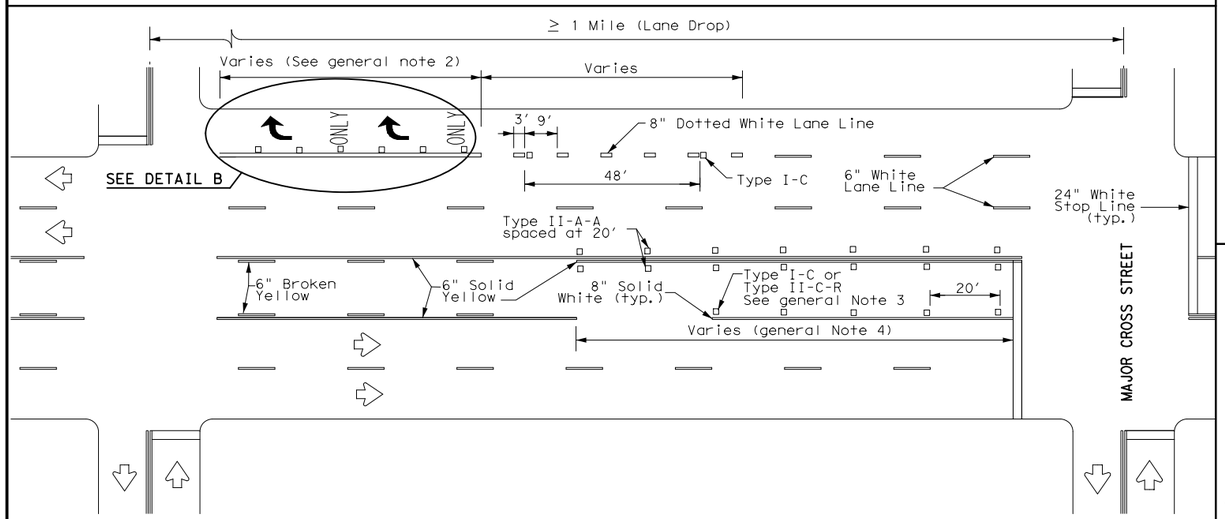
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

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

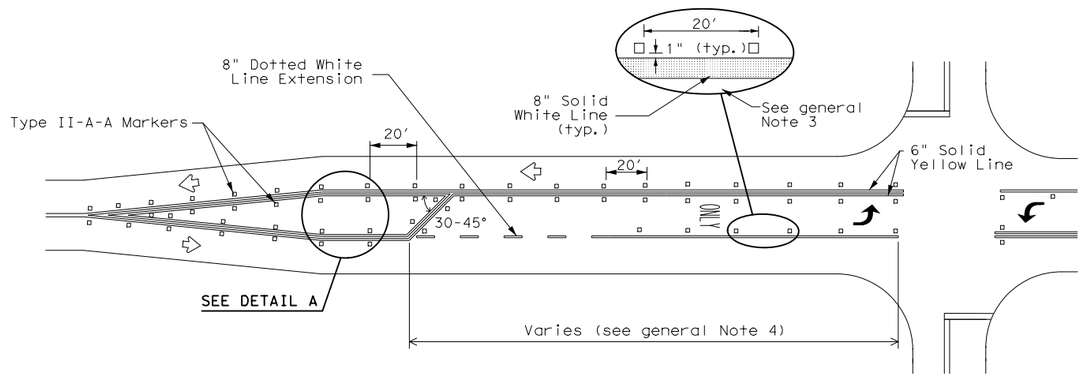
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



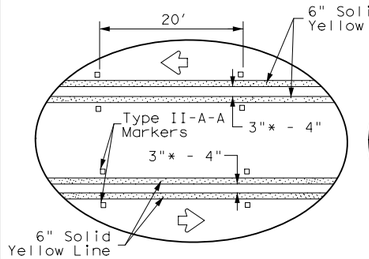
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



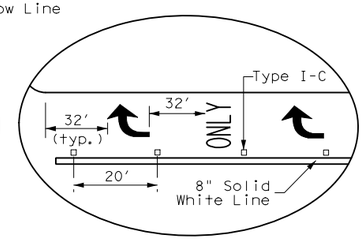
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

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

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

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©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
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	TYL	CHEROKEE		229

22C

DATE:
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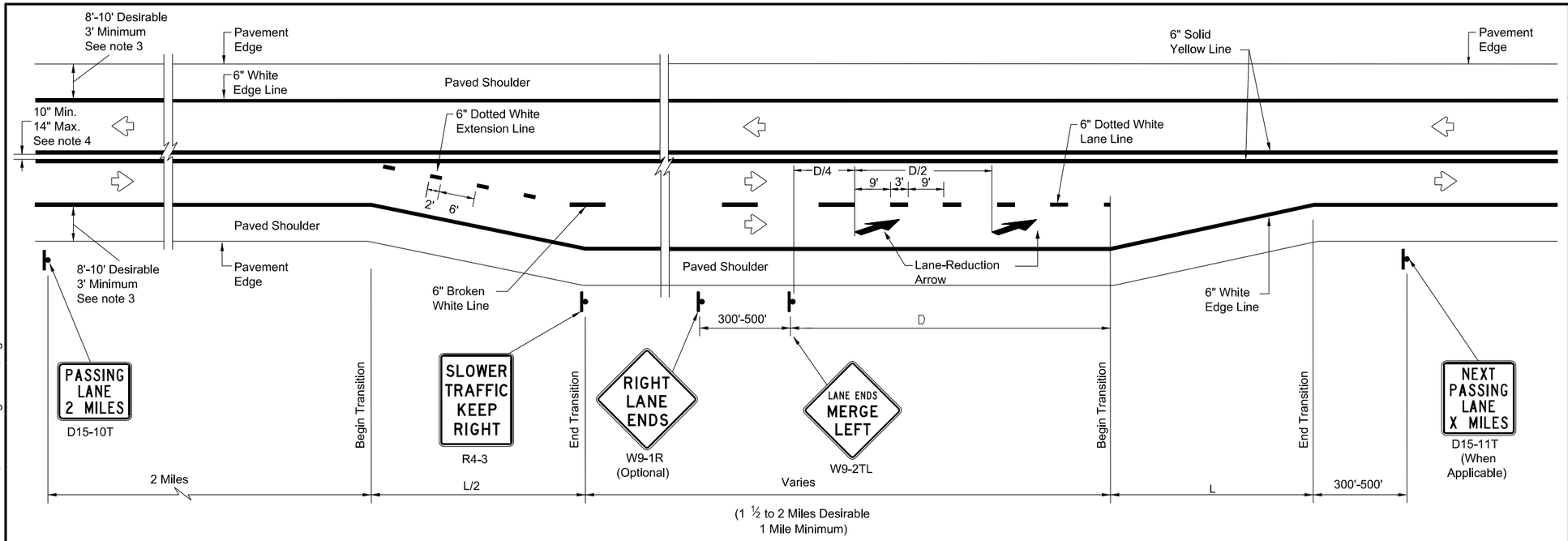
FILE:



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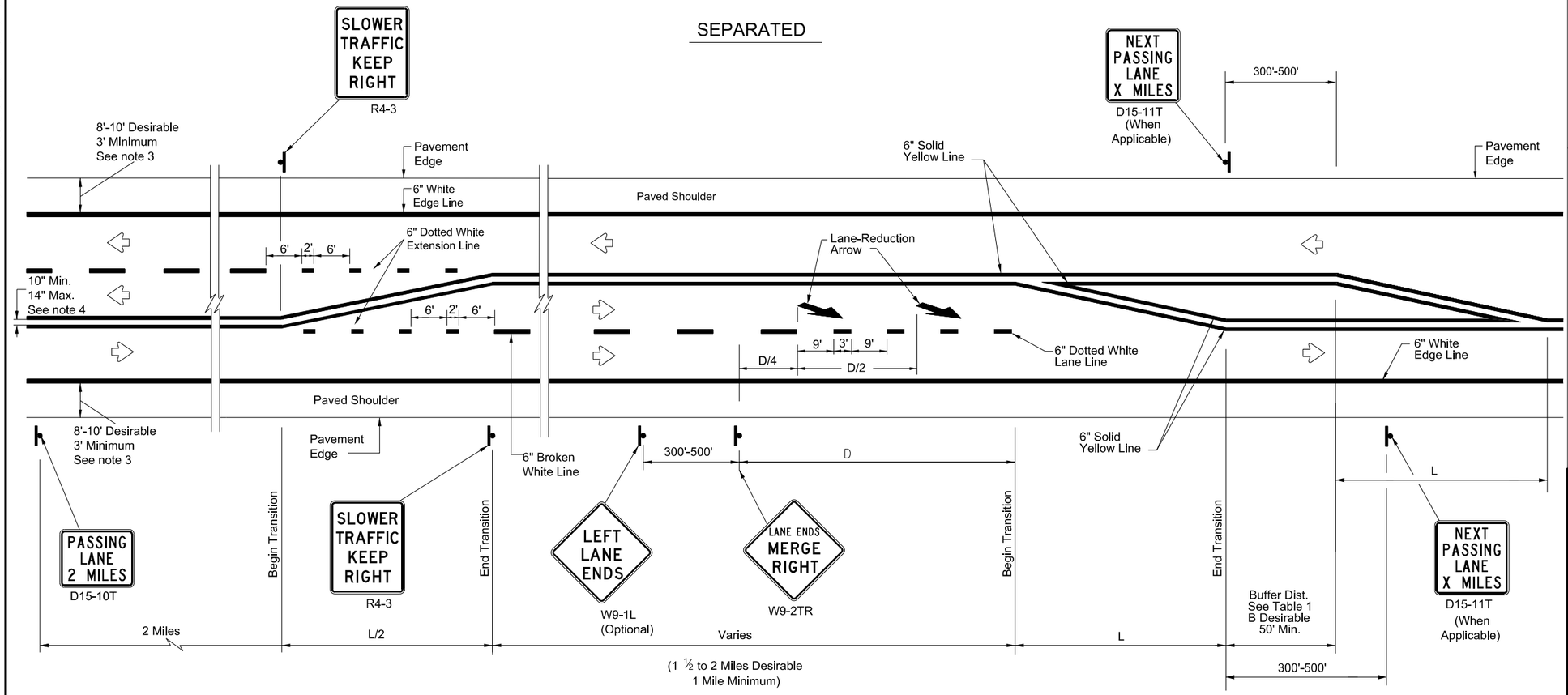


ALTERNATING

LEGEND	
	Sign
	Traffic Flow

TYPICAL TAPER LENGTH (L)

Formula ⁎	L = WS

⁎ Transition length should be rounded up to nearest 5 foot increment.

L=Length of Transition (FT)
W=Width of Offset (FT)
S=Posted Speed (MPH)

EXAMPLE

A 12 foot lane is added on a 70 mph roadway.
The length of the transition should be:

L=12x70=840 ft

TABLE 1
ADVANCE WARNING SIGN DISTANCE (D) AND BUFFER DISTANCE (B)

Posted Speed	D (FT)	B (FT)
40	670	305
45	775	360
50	885	425
55	990	495
60	1100	570
65	1200	645
70	1250	730
75	1350	820

GENERAL NOTES

1. For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.
2. For Raised Pavement Markers (RPM) details, see Pavement Markings Standard sheet, PM(2) - Centerline for All Two Lane Two-Way Roadways. Note that RPMs are not recommended on the 6" dotted white extension lines.
3. For rumble strip options available for the designed shoulder width, see Rumble Strip Standard sheet RS(2).
4. For pavement marking details, see Pavement Marking Standard sheet PM(1).

Texas Department of Transportation

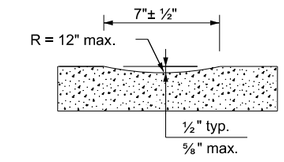
Traffic Safety Division Standard

TEXAS SUPER 2 PASSING LANES

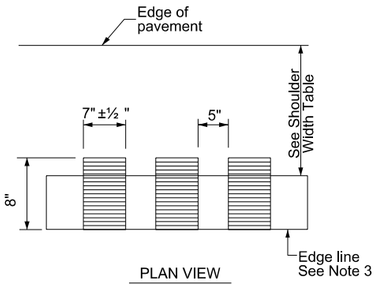
TS2(PL-1)-23

FILE: ts2-1-23.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
5-10 3-18	DIST	COUNTY		SHEET NO.
2-12 2-23	TYL	CHEROKEE		230
3-12				

DATE:
FILE:

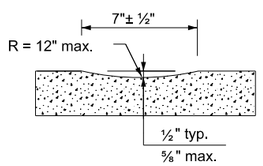


PROFILE VIEW
OPTION 1

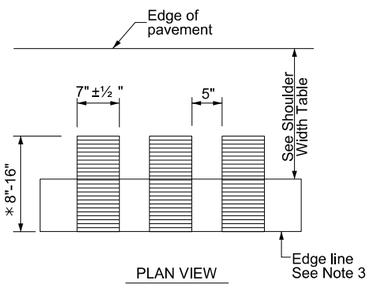


PLAN VIEW

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



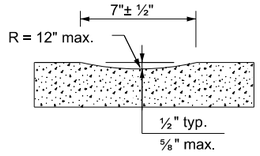
PROFILE VIEW
OPTION 2



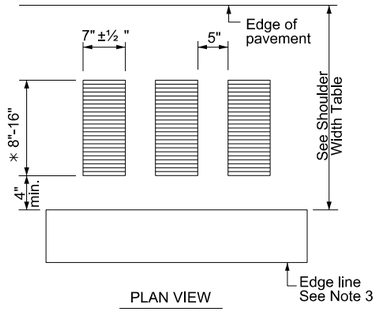
PLAN VIEW

∗ This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



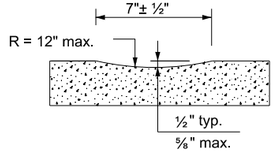
PROFILE VIEW
OPTION 3



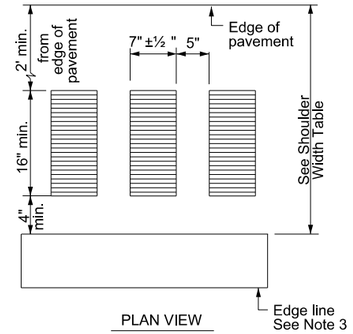
PLAN VIEW

∗ This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

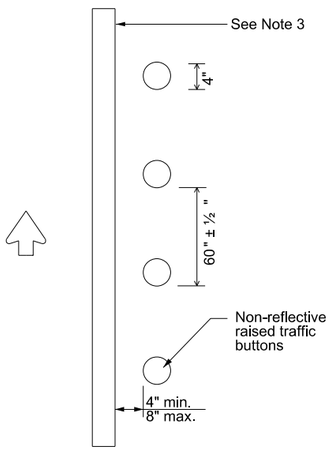


PROFILE VIEW
OPTION 4



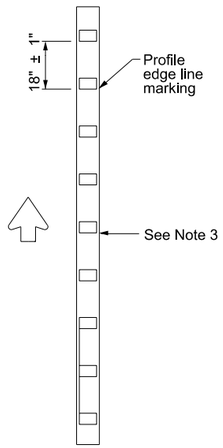
PLAN VIEW

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



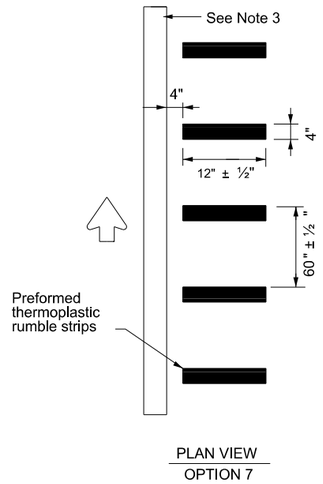
PLAN VIEW
OPTION 5

RAISED EDGE LINE
(Rumble Strips)



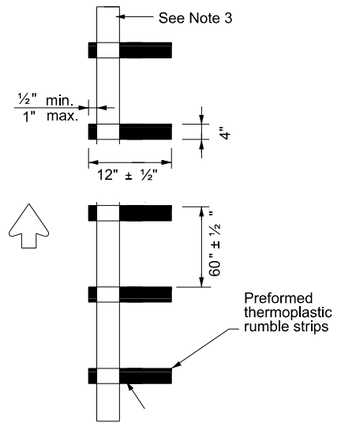
PLAN VIEW
OPTION 6

PROFILE EDGE LINE MARKINGS
(Rumble Strips)



PLAN VIEW
OPTION 7

PREFORMED THERMOPLASTIC EDGE LINE
(Rumble Strips)



PLAN VIEW
OPTION 8

PREFORMED THERMOPLASTIC EDGE LINE
(Rumble Strips)

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

GENERAL NOTES

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

WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

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

WHEN INSTALLING RAISED OR PROFILE EDGE LINE RUMBLE STRIPS:

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

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: rs(2)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
10-13	DIST	COUNTY		SHEET NO.
1-23	TYL	CHEROKEE		230A

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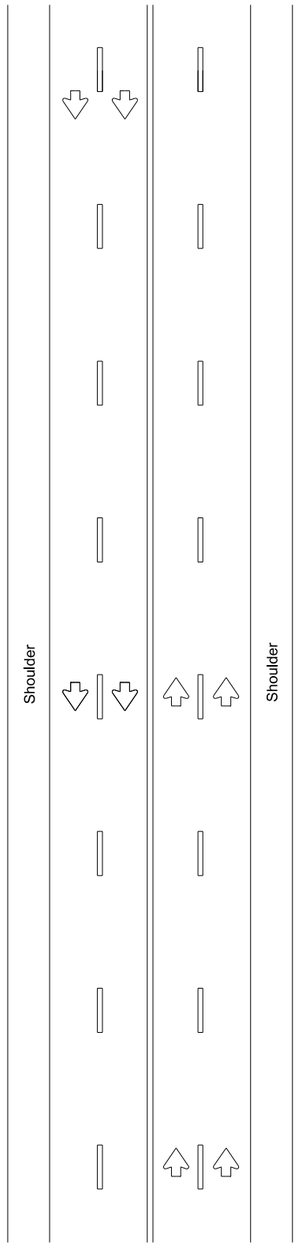
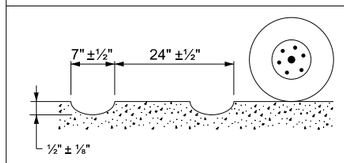
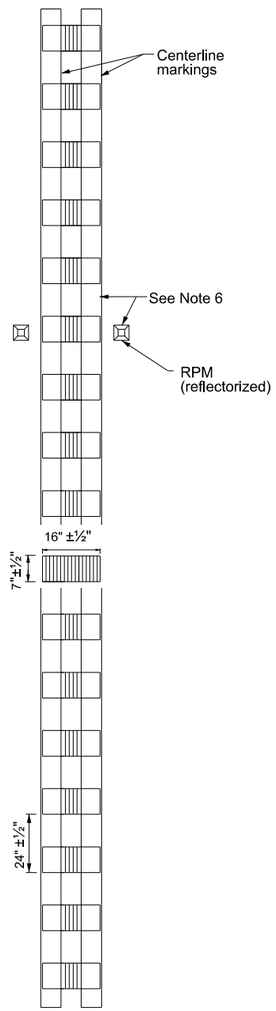
CENTERLINE RUMBLE STRIPS



MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

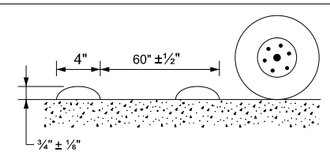


PROFILE VIEW

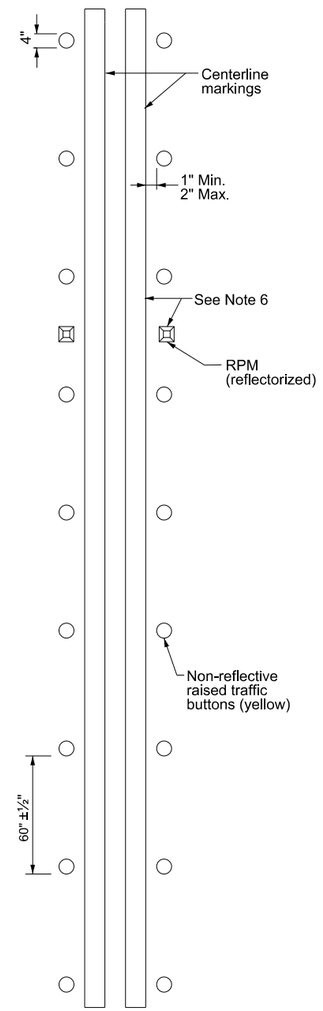


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

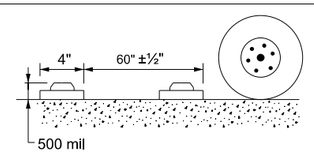


PROFILE VIEW

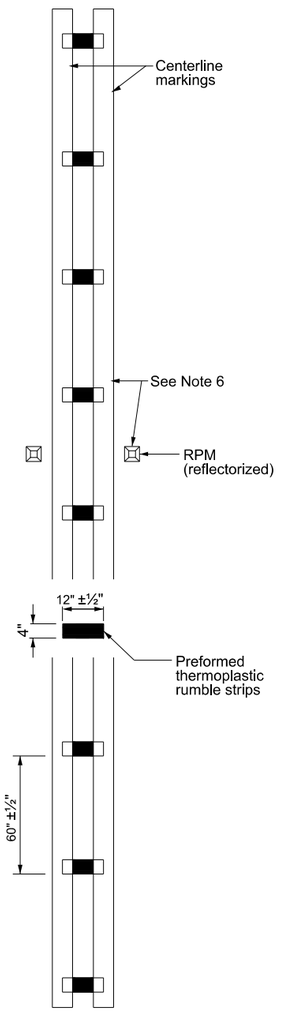


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

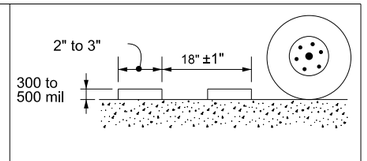


PROFILE VIEW

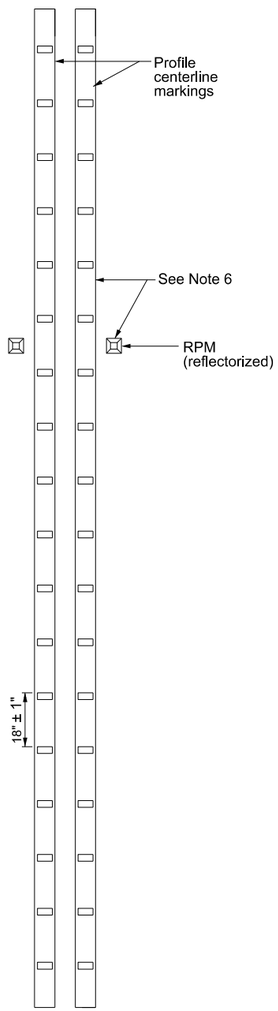


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.
2. Centerline and edge line rumble strips or profile markings shall not be placedon roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may beused if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and nomore than 150 feet in advance of bridges, railroad crossing, intersections ordriveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips for normal centerline spacing. For wider medians, specify in the plans the exact placement of the rumble strips. Place the rumble strips under each centerline marking or centered in the middle of the median.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

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

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

12. See standard sheet RS(2).

Texas Department of Transportation

Traffic Safety Division Standard

CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS RS(3)-23

FILE: rs(3)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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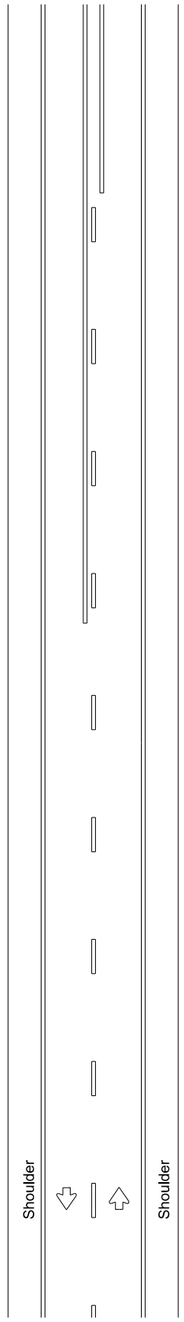
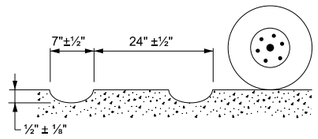
10-13 1-23	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		230B

DATE:
FILE:

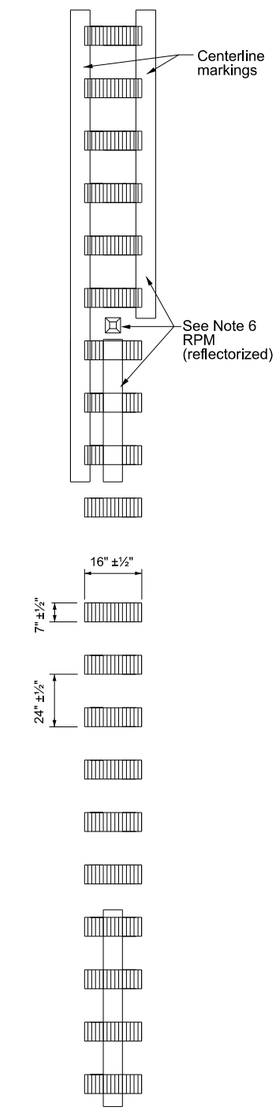
CENTERLINE RUMBLE STRIPS



TWO LANE TWO-WAY HIGHWAYS

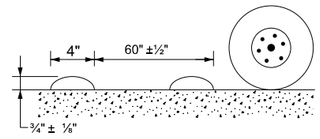


PROFILE VIEW

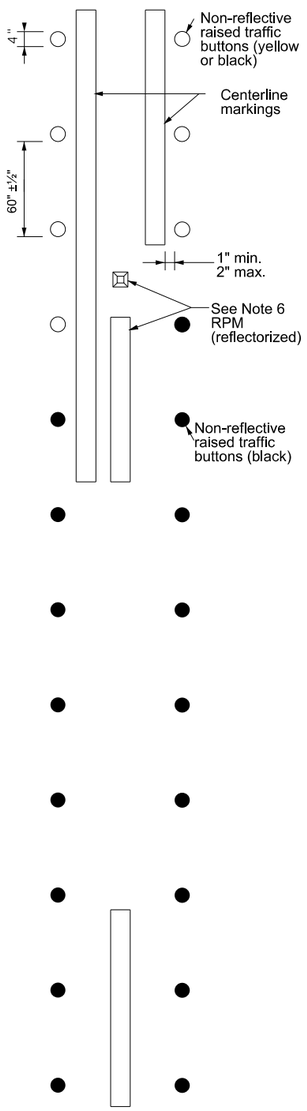


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

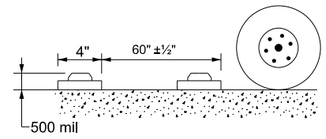


PROFILE VIEW

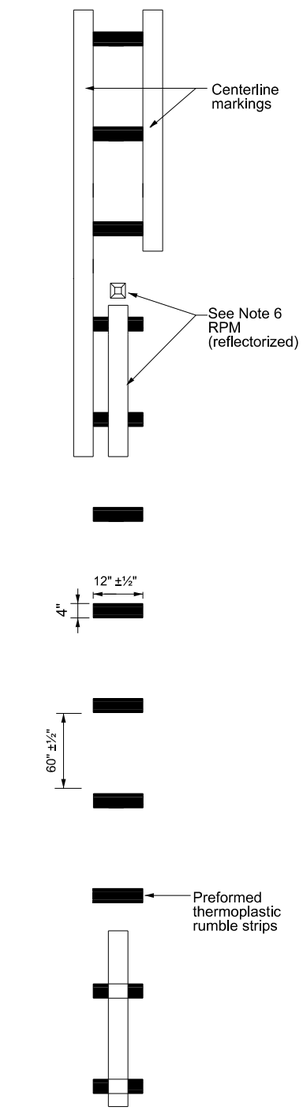


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

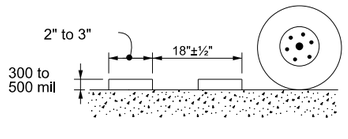


PROFILE VIEW

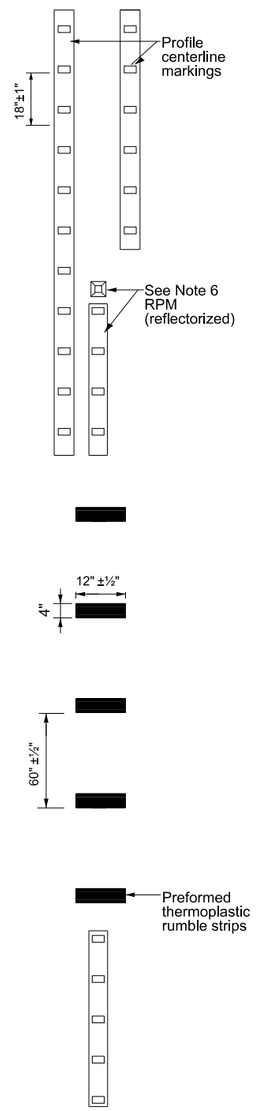


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS

GENERAL NOTES

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

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

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

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

13. See standard sheet RS(2).

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: rs(4)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0450	01	013	SH 204
10-13	DIST	COUNTY		SHEET NO.
1-23	TYL	CHEROKEE		230C

DATE: 1/3/2019 11:02:45 AM
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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

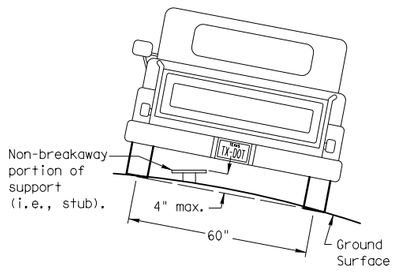
Anchor Type

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

Sign Mounting Designation

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

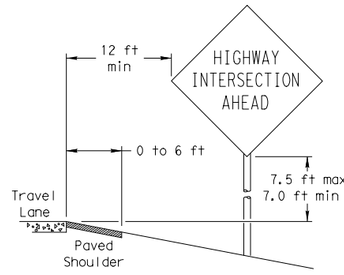
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

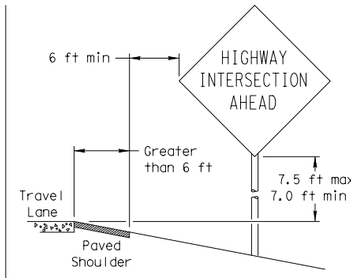
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

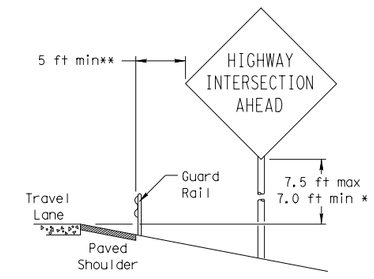
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



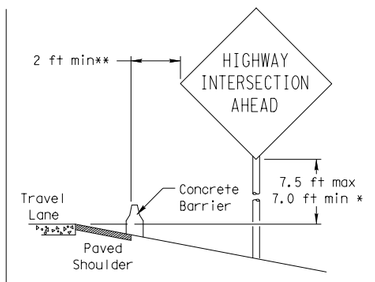
GREATER THAN 6 FT. WIDE

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

BEHIND BARRIER



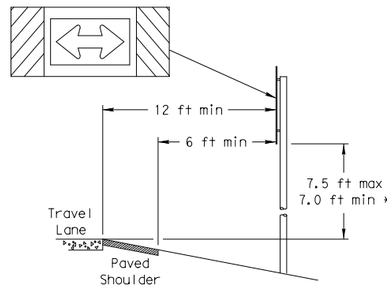
BEHIND GUARDRAIL



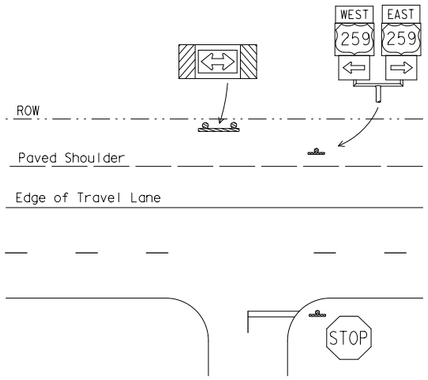
BEHIND CONCRETE BARRIER

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

T-INTERSECTION



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



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

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

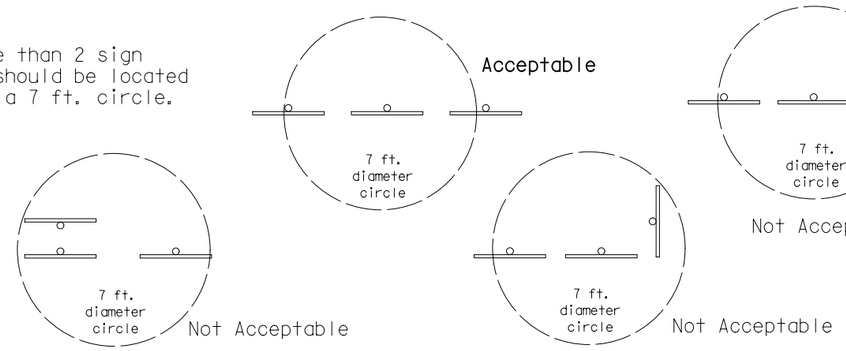
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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

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

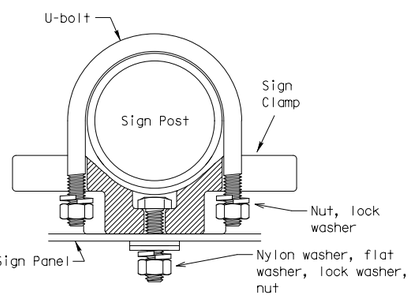
The website address is:
http://www.txdot.gov/publications/traffic.htm

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

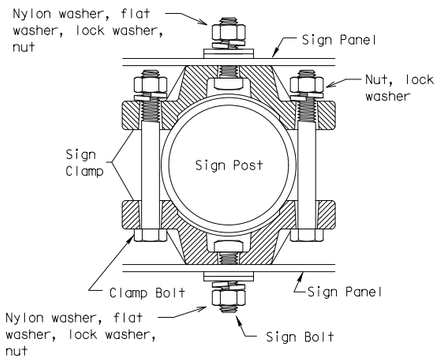


TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



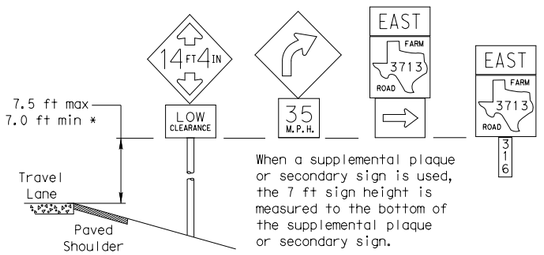
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

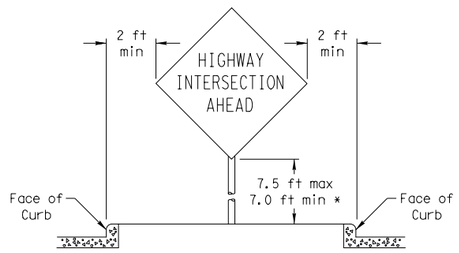
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



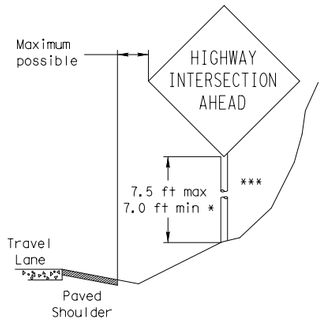
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		231

DATE: 1/3/2019 11:02:48 AM
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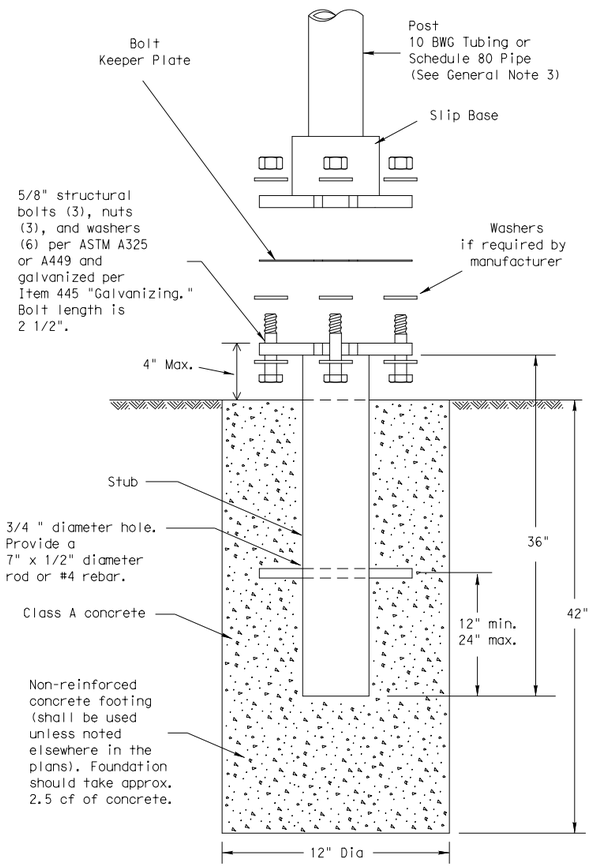
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

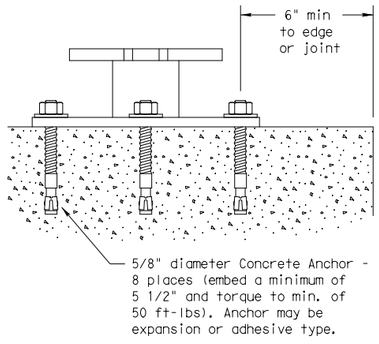
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   20% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
   46,000 PSI minimum yield strength
   62,000 PSI minimum tensile strength
   21% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



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

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0450	01	013	SH 204

DIST	COUNTY	SHEET NO.
TYL	CHEROKEE	232

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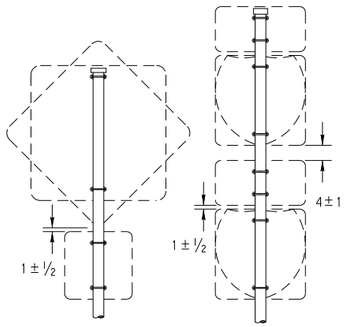
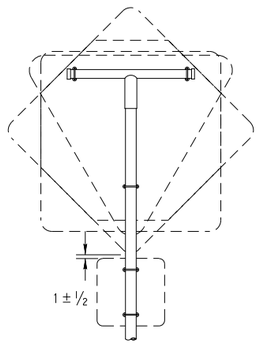


SM RD SGN ASSM TY XXXXX(1)XX(P)



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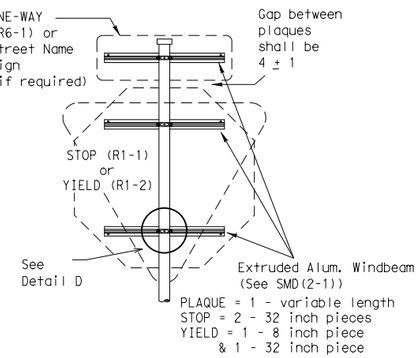

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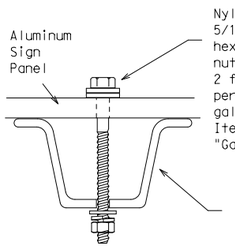
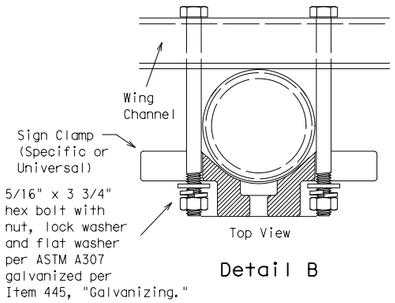
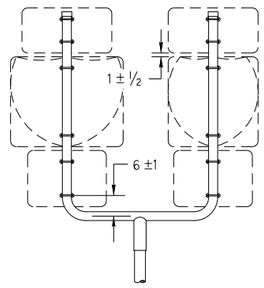


Detail A



Detail B



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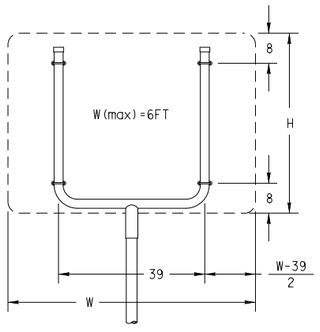

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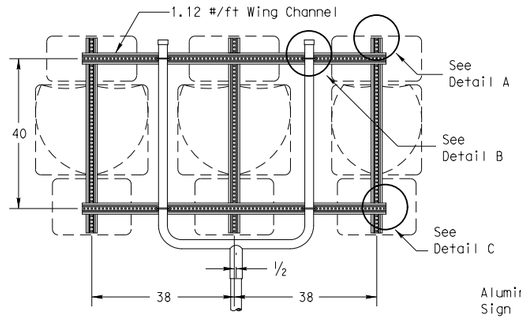
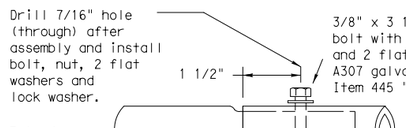
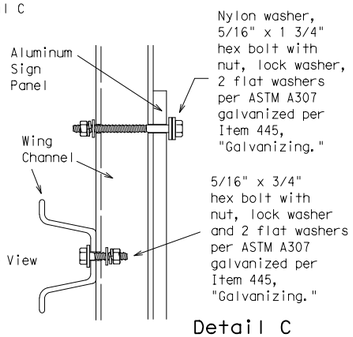


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

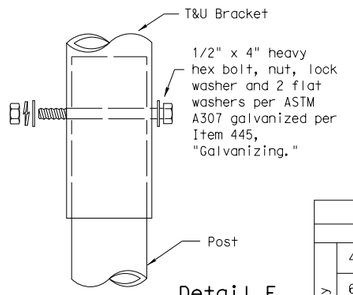


Detail F

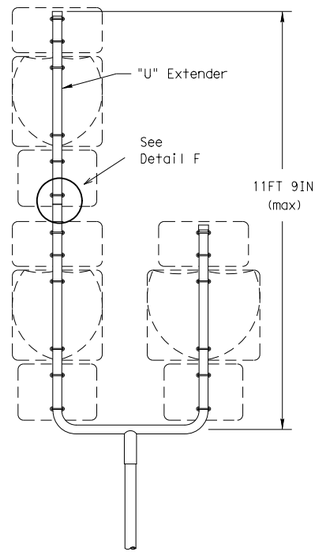
Splices shall only be allowed behind the sign substrate.



Detail C



Detail E



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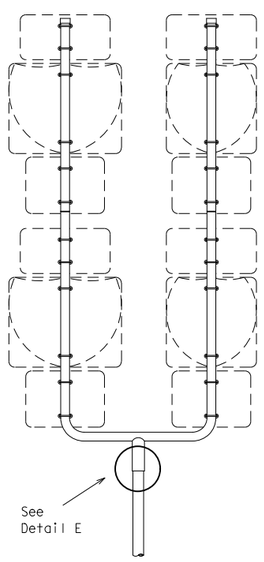

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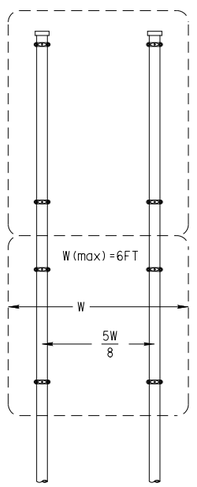
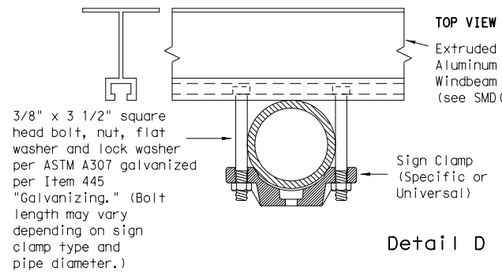
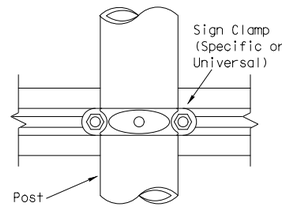


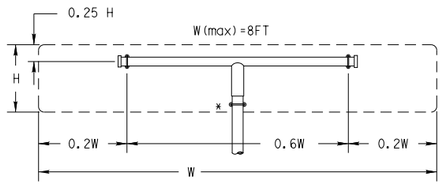
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D

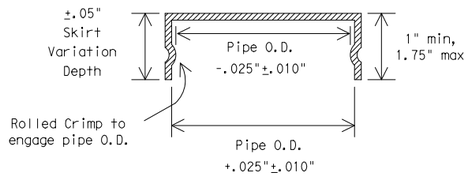




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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

REVISIONS	CONT	SECT	JOB	HIGHWAY
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	TYL	CHEROKEE		233

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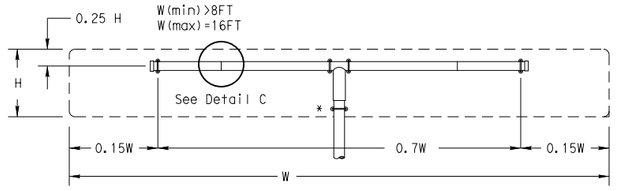
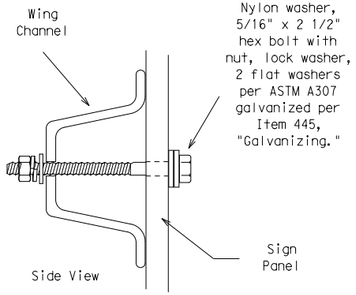
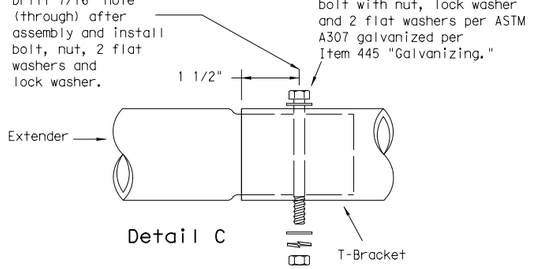


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



Detail B



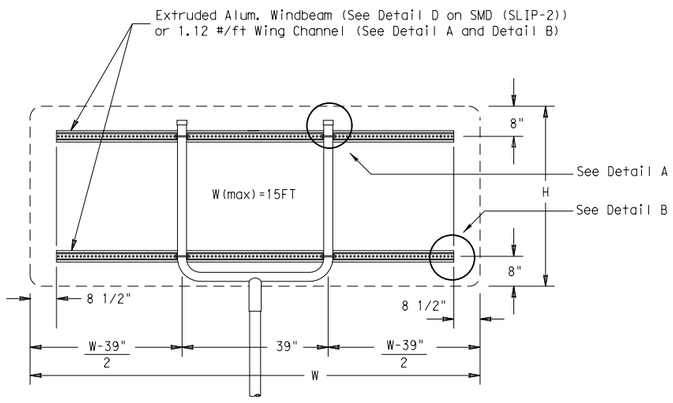
Detail C

Splices shall only be allowed behind the sign substrate.

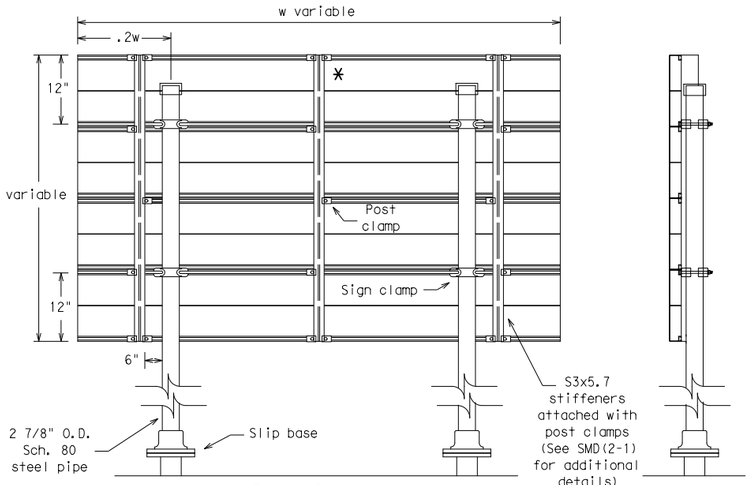
GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. See table above.
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.



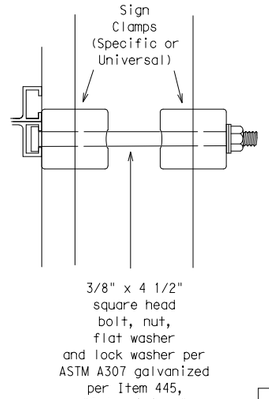
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



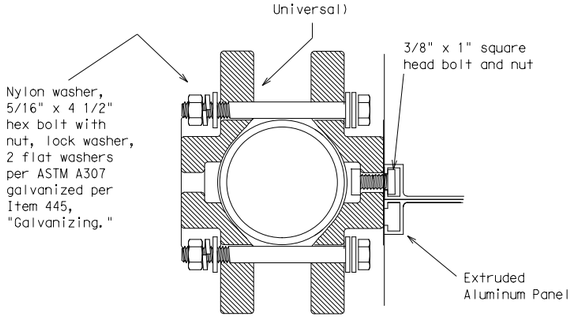
Typical Sign Mount

SM RD SGN ASSM TY S80(2)XX(P-EXAL)

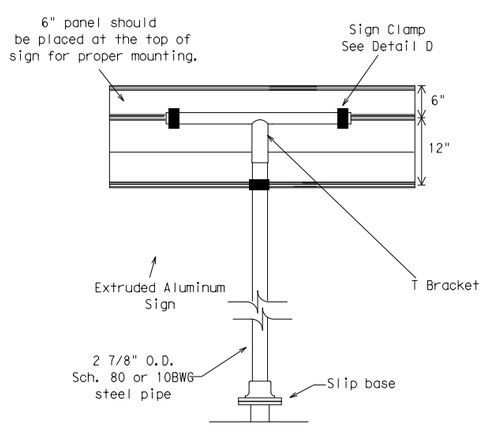
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



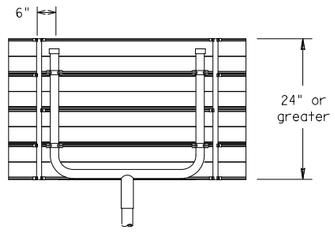
Detail E



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



Extruded Aluminum Sign
With T Bracket



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

See Detail E
for clamp installation

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0450	01	013	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		234

DATE:
FILE:

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.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☐ No Permit Required
☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
☐ Individual 404 Permit Required
☒ Other Nationwide Permit Required: NWP# 3 (a)

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. CONTRACTOR TO ADHERE TO TERMS AND CONDITIONS OF PERMIT

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☒ Temporary Vegetation	☒ Silt Fence	☒ Vegetative Filter Strips
☐ Blankets/Matting	☒ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1. No Action necessary above those required by the 2004 Texas Standard for Specifications Construction and Maintenance of Highways. Streets & Bridges.
2.
3.
4.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☐ No Action Required ☒ Required Action

Action No.

1. ADHERE TO THE SPECS AS LISTED ABOVE
2.
3.
4.

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

☐ No Action Required ☒ Required Action

Action No.

1. ADHERE TO MIGRATORY BIRD GUIDANCE LISTED BELOW
2.
3.
4.

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. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1. No Action necessary above those required by the 2014 Texas Standard for Specifications Construction and Maintenance of Highways. Streets & Bridges.
2.
3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.
2.
3.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

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.	0450	01	CHEROKEE	SH 204
	DIST	COUNTY		SHEET NO.
	TYL	CHEROKEE		235

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

For all projects with soil disturbing activity and for projects that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0450-01-013

1.2 PROJECT LIMITS:

From: SH 110

To: US 84

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 31.8980189,(Long) -95.0759734

END: (Lat) 31.8635165,(Long) -94.9857217

1.4 TOTAL PROJECT AREA (Acres): 51.2

1.5 TOTAL AREA TO BE DISTURBED (Acres): 37.8

1.6 NATURE OF CONSTRUCTION ACTIVITY:
GRADING, BASE WIDENING, ASPHALT PAVEMENT, CULVERT EXTENSION, SIGNING, PAVEMENT MARKINGS

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Bowie fine sandy loam, 3 to 8 percent slopes	Well drained, permeability is moderately slow, high runoff.
Elrose fine sandy loam, 3 to 8 percent slopes	Well drained, low to medium runoff; moderate permeability.
Elrose fine sandy loam, 8 to 15 percent slopes	Well drained, low to medium runoff; moderate permeability.
Cuthbert fine sandy loam, 8 to 15 percent slopes	Well drained, permeability is moderately slow, medium runoff.

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☐ PSLs determined during preconstruction meeting
☐ PSLs determined during construction
☒ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

☒ Mobilization
☒ Install sediment and erosion controls
☒ Blade existing topsoil into windrows, prep ROW, clear and grub
☐ Remove existing pavement
☒ Grading operations, excavation, and embankment
☐ Excavate and prepare subgrade for proposed pavement widening
☒ Remove existing culverts, safety end treatments (SETs)
☒ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☒ Install culverts, culvert extensions, SETs
☒ Install mow strip, MBGF, bridge rail
☐ Place flex base
☒ Rework slopes, grade ditches
☒ Blade windrowed material back across slopes
☒ Revegetation of unpaved areas
☒ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

☒ Sediment laden stormwater from stormwater conveyance over disturbed area
☒ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☒ Solvents, paints, adhesives, etc. from various construction activities
☒ Transported soils from offsite vehicle tracking
☒ Construction debris and waste from various construction activities
☐ Contaminated water from excavation or dewatering pump-out water
☒ Sanitary waste from onsite restroom facilities
☒ Trash from various construction activities/receptacles
☐ Long-term stockpiles of material and waste
☒ Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities.
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
MUD CREEK	Angelina River above Sam Rayburn Reservoir (SEGMENT 0611)

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☒ Submit NOI/CSN to local MS4
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☒ Submit NOI/CSN to local MS4
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

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

MS4 Entity

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			236
STATE	STATE DIST.	COUNTY	
TEXAS	TYL	CHEROKEE	
CONT.	SECT.	JOB	HIGHWAY NO.
0450	01	013	SH 204

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- ☐ ☒ Protection of Existing Vegetation
- ☐ ☐ Vegetated Buffer Zones
- ☒ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☐ ☐ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☒ ☐ Temporary Seeding
- ☐ ☒ Permanent Planting, Sodding or Seeding
- ☐ ☐ Biodegradable Erosion Control Logs
- ☒ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Vertical Tracking
- ☐ ☐ Interceptor Swale
- ☐ ☒ Riprap
- ☐ ☐ Diversion Dike
- ☐ ☐ Temporary Pipe Slope Drain
- ☐ ☐ Embankment for Erosion Control
- ☐ ☐ Paved Flumes
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- ☐ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- ☒ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☒ ☐ Sediment Control Fence
- ☒ ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☐ Vegetated Buffer Zones
- ☒ ☐ Vegetated Filter Strips
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

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

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- ☐ ☐ Sediment Trap
  - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - ☐ 3,600 cubic feet of storage per acre drained
- ☐ ☐ Sedimentation Basin
  - ☐ Not required (<10 acres disturbed)
  - ☐ Required (>10 acres) and implemented.
    - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - ☐ 3,600 cubic feet of storage per acre drained
  - ☐ Required (>10 acres), but not feasible due to:
    - ☐ Available area/Site geometry
    - ☐ Site slope/Drainage patterns
    - ☐ Site soils/Geotechnical factors
    - ☐ Public safety
    - ☐ Other: _____

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

When dewatering activities are present, a daily inspection will be conducted once per day during those activities and documented in accordance with CGP and TxDOT requirements.

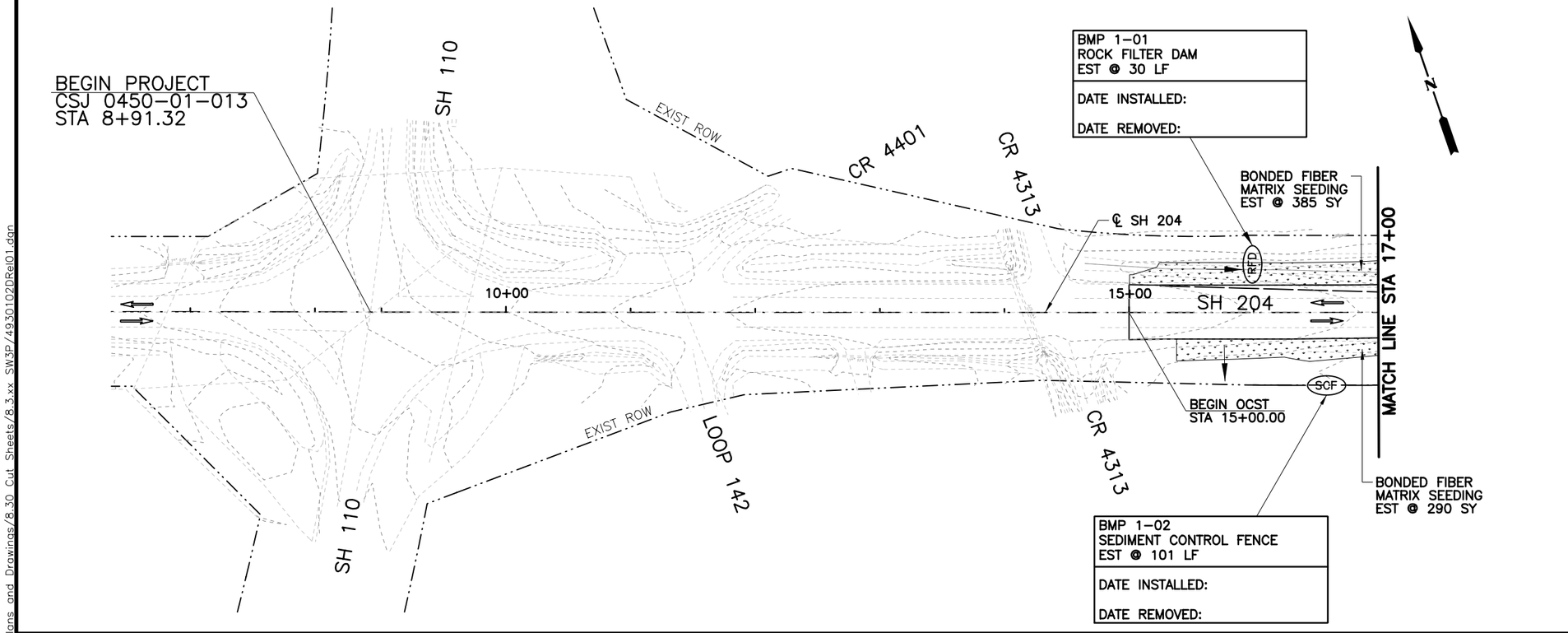
2.10 MAINTENANCE:

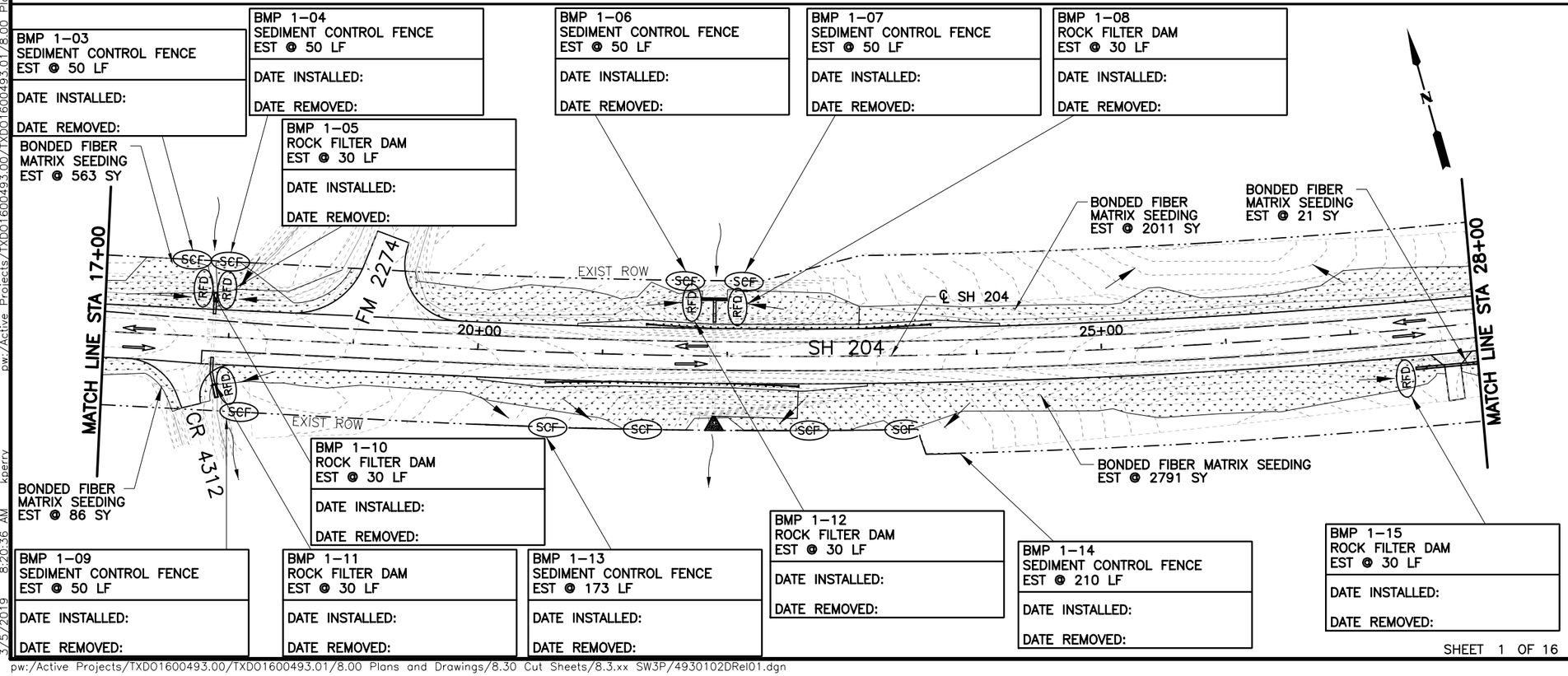
Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			237
STATE	STATE DIST.	COUNTY	
TEXAS	TYL	CHEROKEE	
CONT.	SECT.	JOB	HIGHWAY NO.
0450	01	013	SH 204





50 25 0 50 100
SCALE FEET

LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

1. THE LOCATION OF DEVICES ARE FOR GRAPHIC REPRESENTATION ONLY. OBTAIN ENGINEERS APPROVAL BEFORE INSTALLATION.
2. SEE ROADWAY LAYOUT SHEETS FOR RIPRAP DETAILS.
3. SEE ROADWAY LAYOUT SHEETS FOR SOIL RETENTION BLANKET DETAILS.

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED
PROFESSIONAL ENGINEER
3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SW3P LAYOUT

BEGIN PROJECT TO STA 28+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		238

SHEET 1 OF 16

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cpydf_ANSIB.pltcfg
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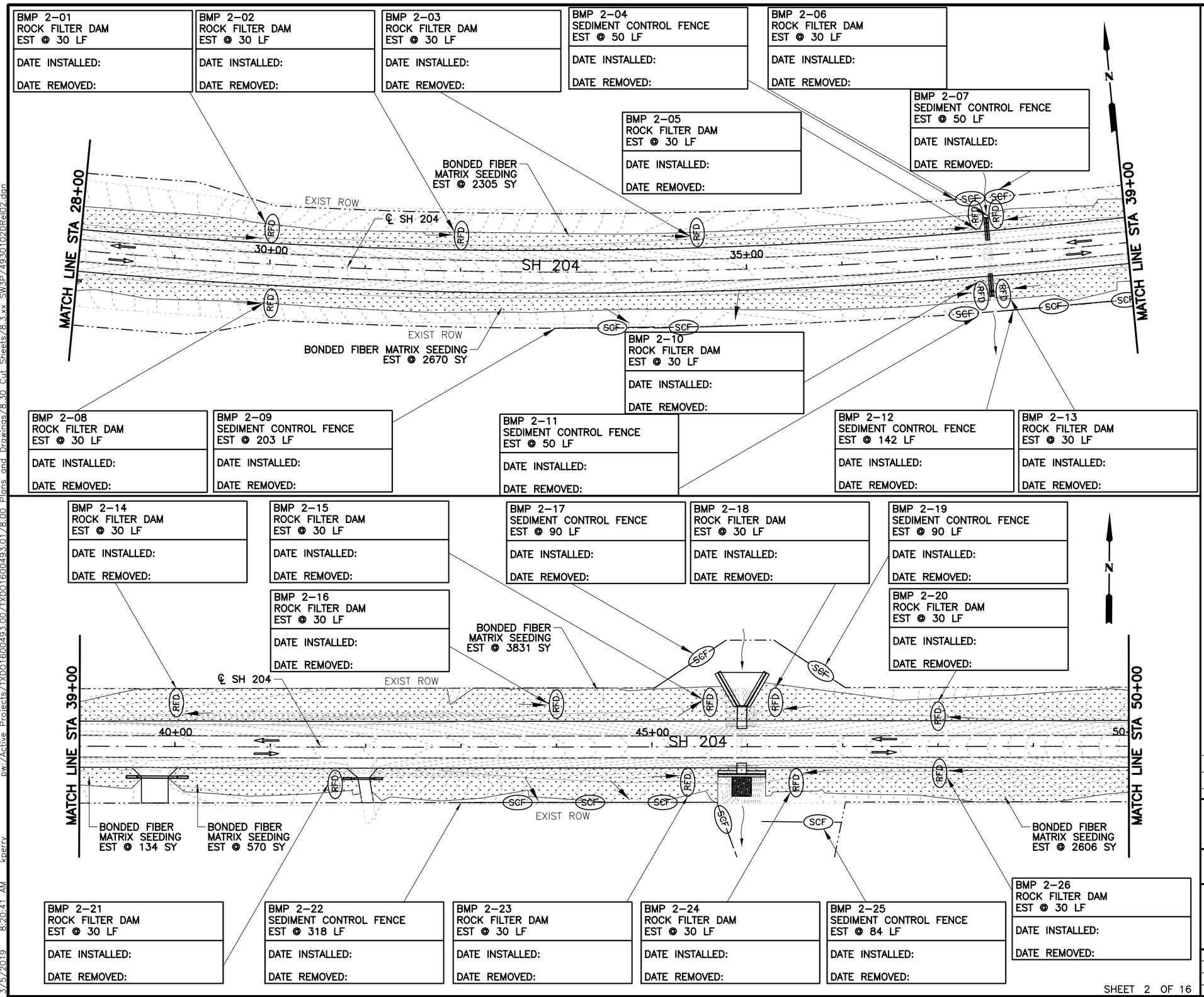

50 25 0 50 100
SCALE FEET

LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

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STATE OF TEXAS
KRISTEN L. PERRY
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3/5/2019

NO.	REVISION	BY	DATE

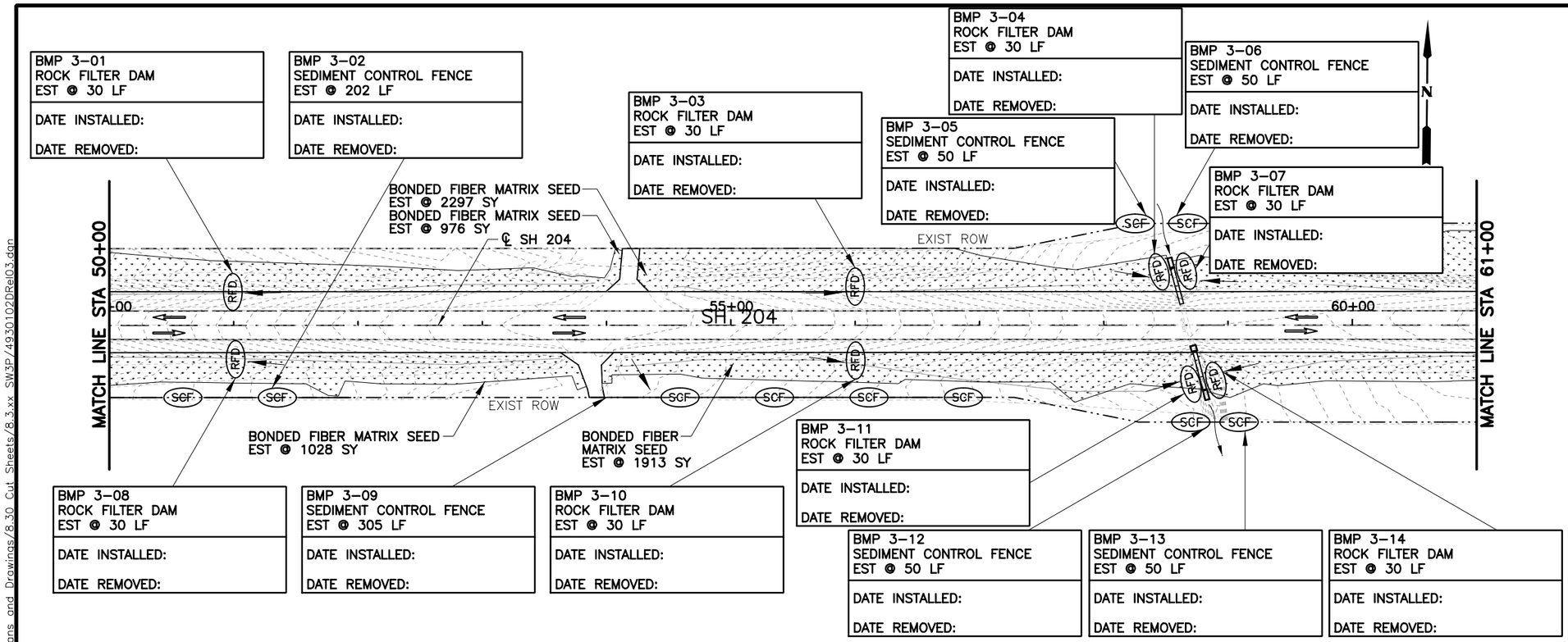
CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

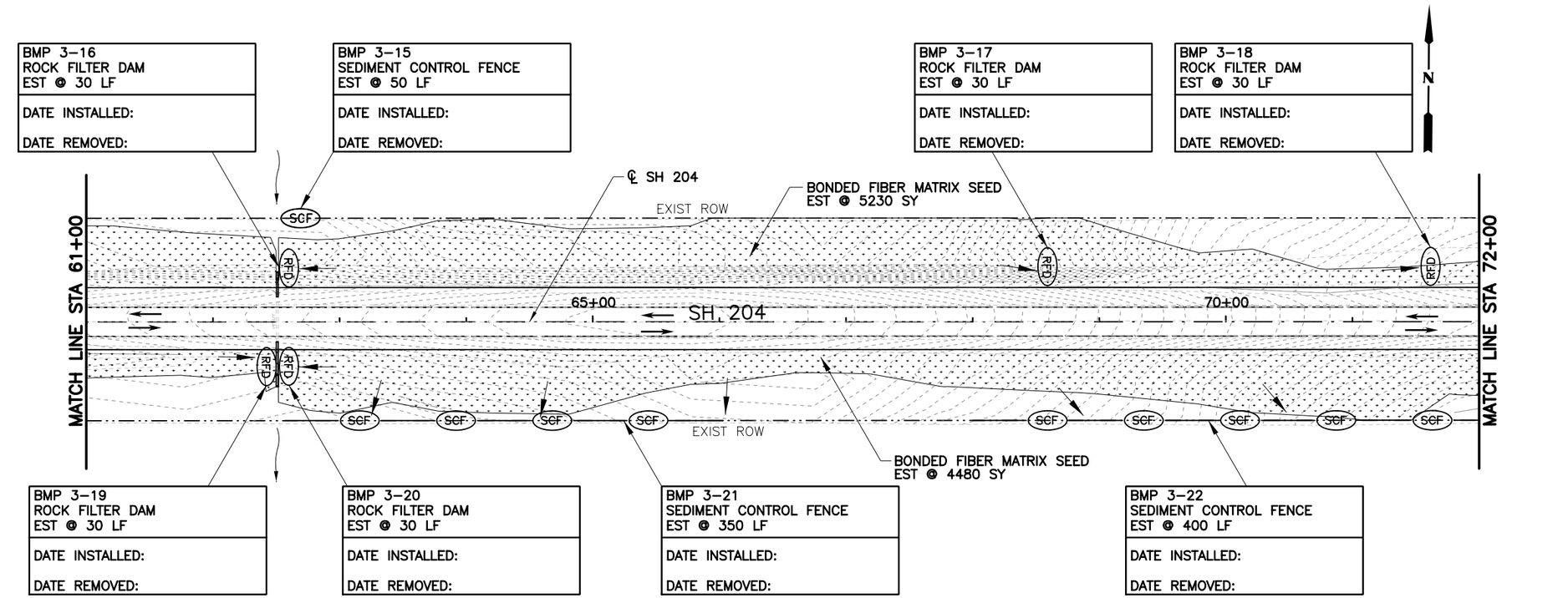
SH 204

SW3P LAYOUT

STA 28+00 TO STA 50+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		239





50 25 0 50 100
SCALE FEET

LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

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STATE OF TEXAS
KRISTEN L. PERRY
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3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

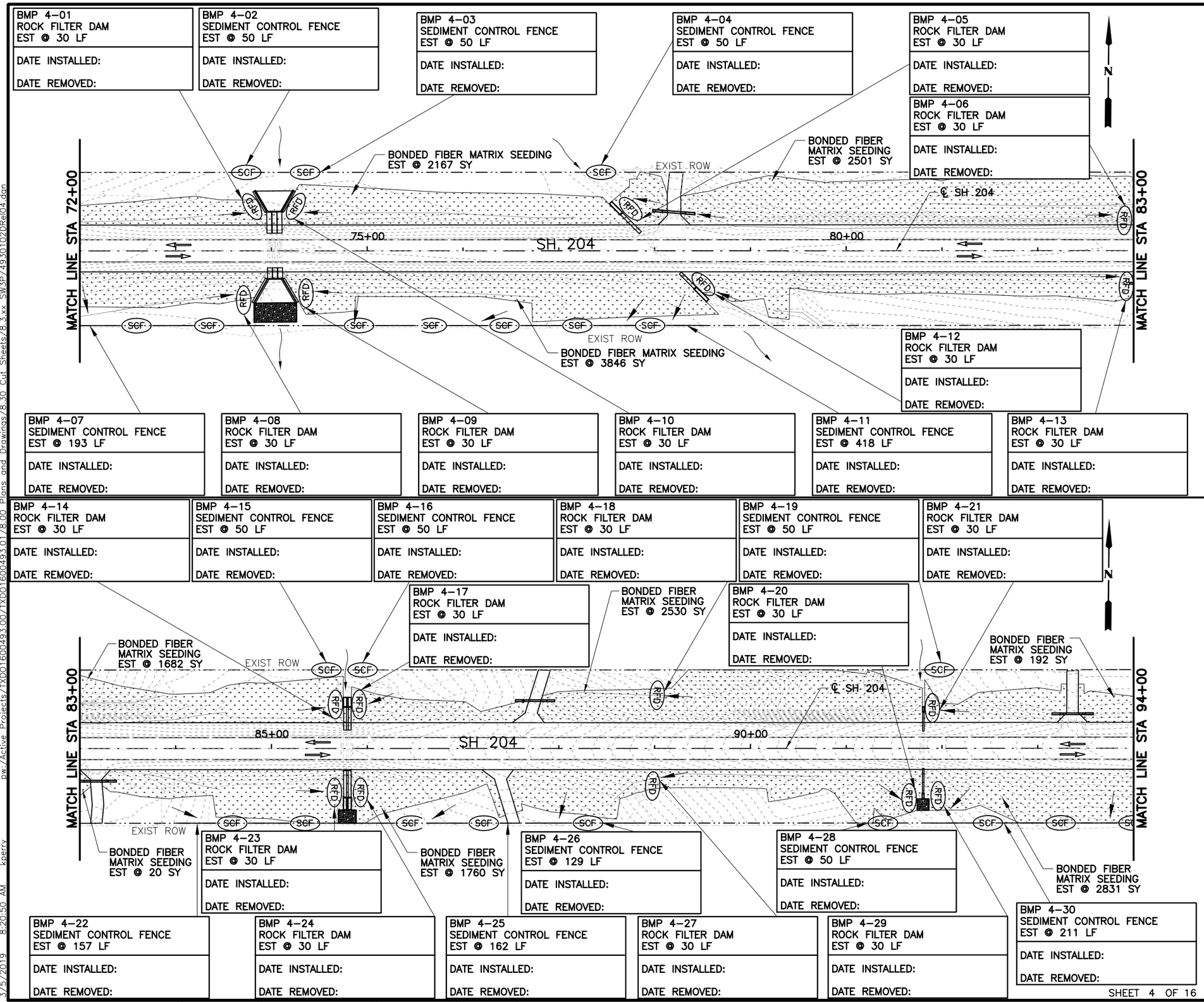
SH 204

SW3P LAYOUT

STA 50+00 TO STA 72+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		240

SHEET 3 OF 16



LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

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3. SEE ROADWAY LAYOUT SHEETS FOR SOIL RETENTION BLANKET DETAILS.

STATE OF TEXAS
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CP&Y
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SH 204

SW3P LAYOUT

STA 72+00 TO STA 94+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		241

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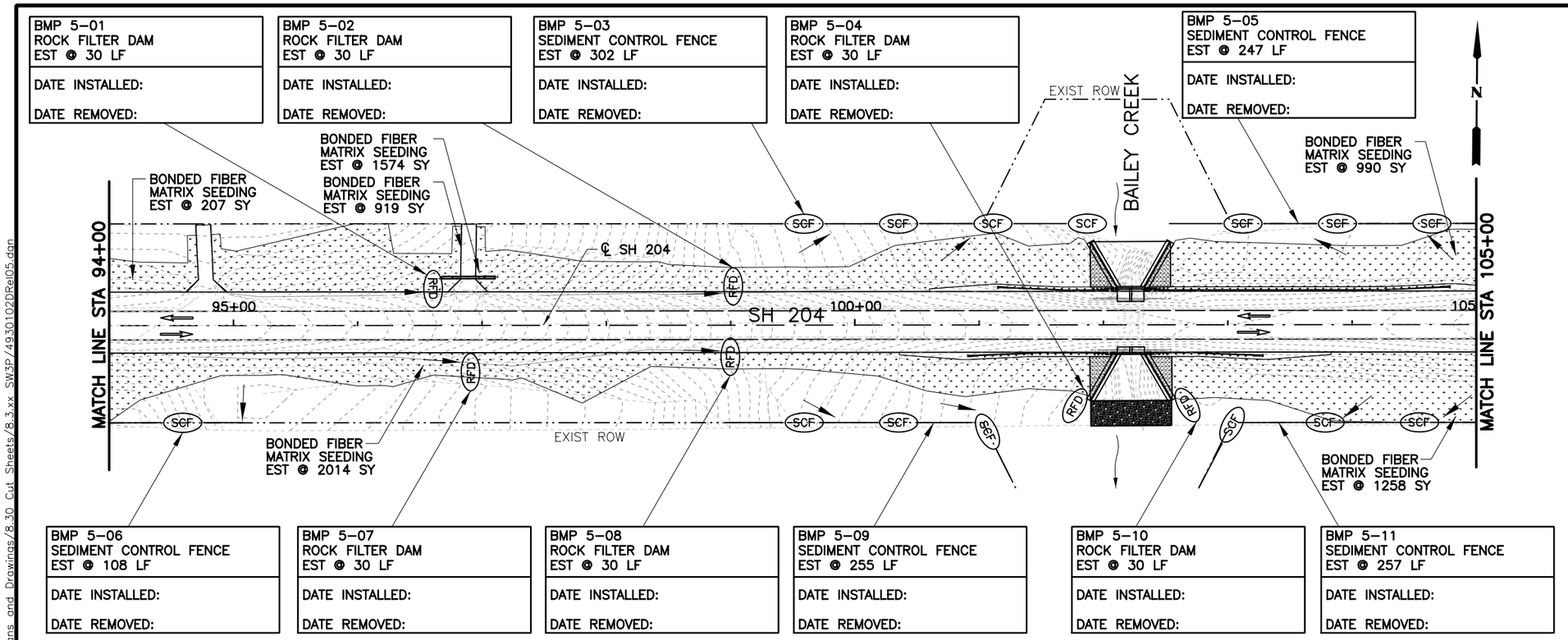

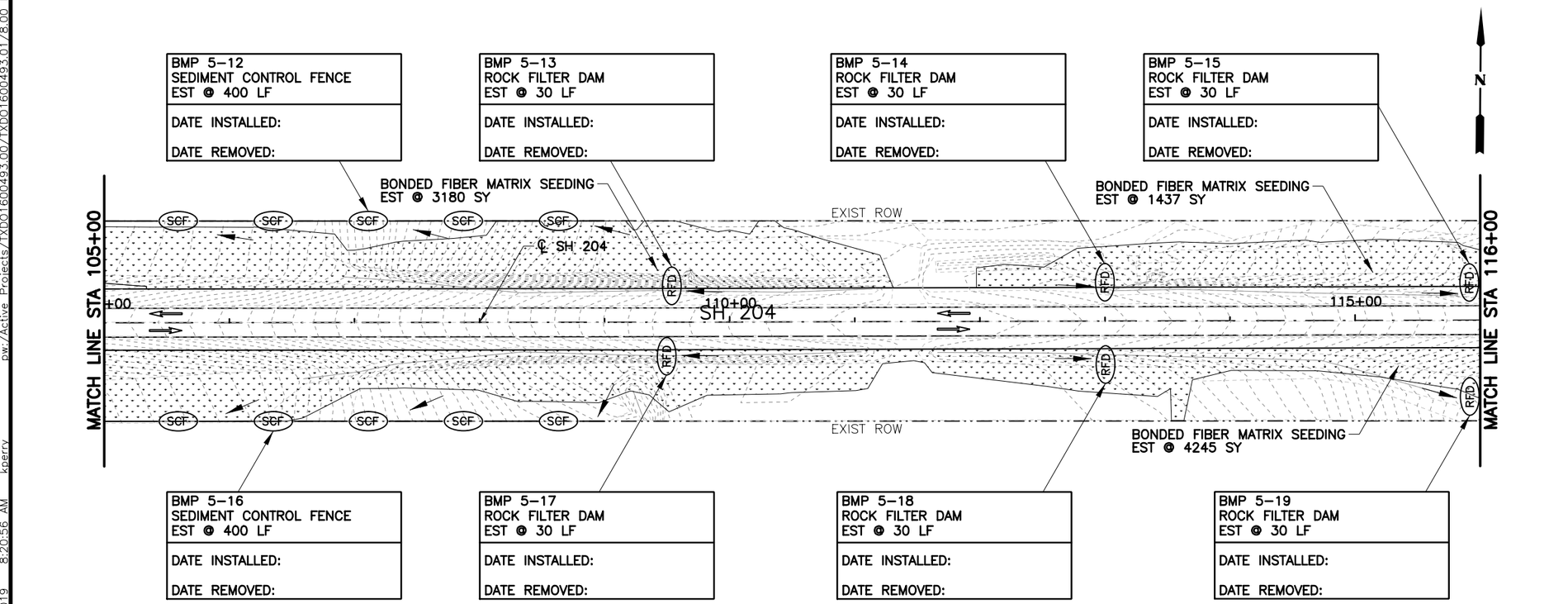

50 25 0 50 100
SCALE FEET

LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

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STATE OF TEXAS
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CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

SW3P LAYOUT

STA 94+00 TO STA 116+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		242

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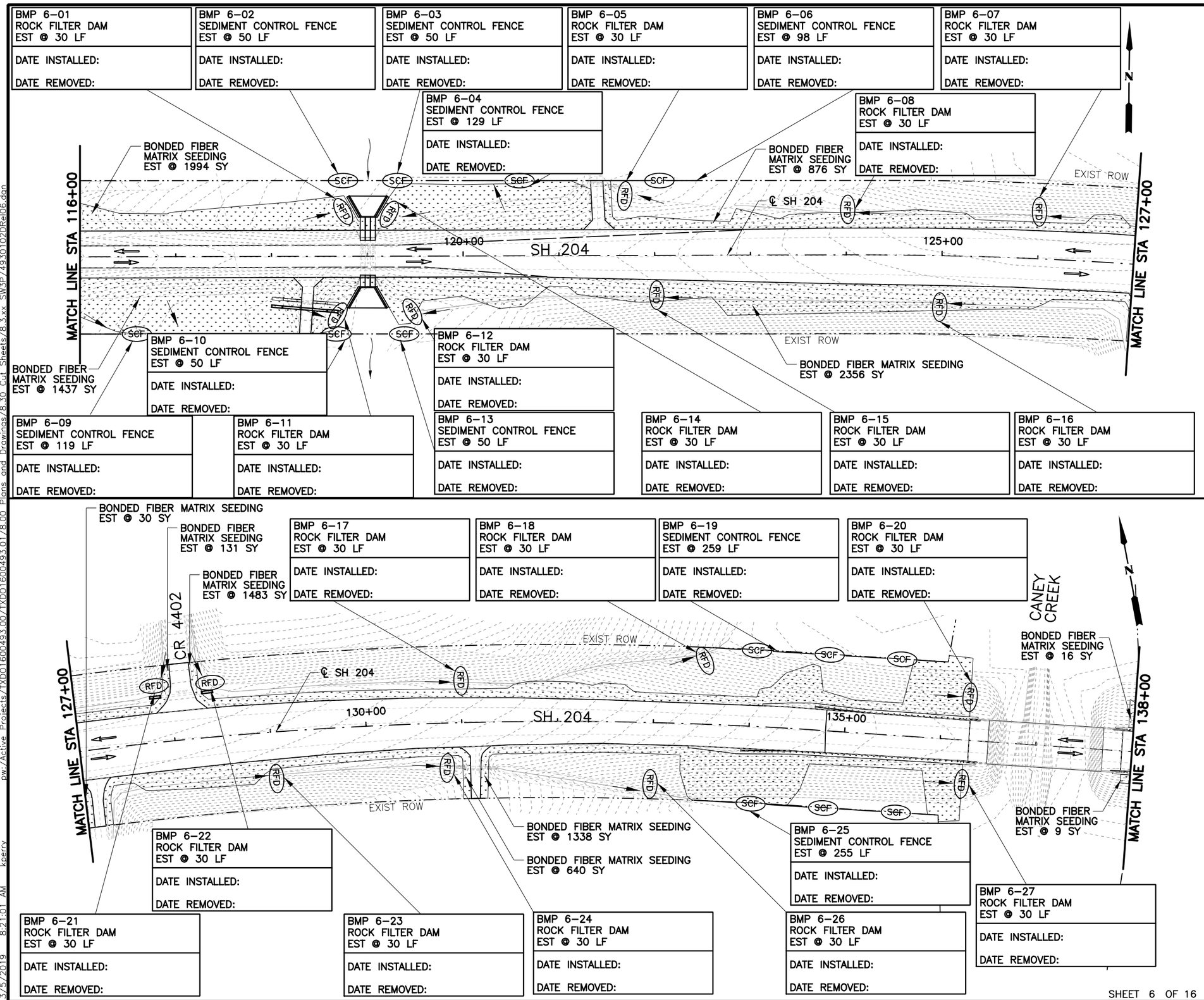

50 25 0 50 100
SCALE FEET

LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

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STATE OF TEXAS
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NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

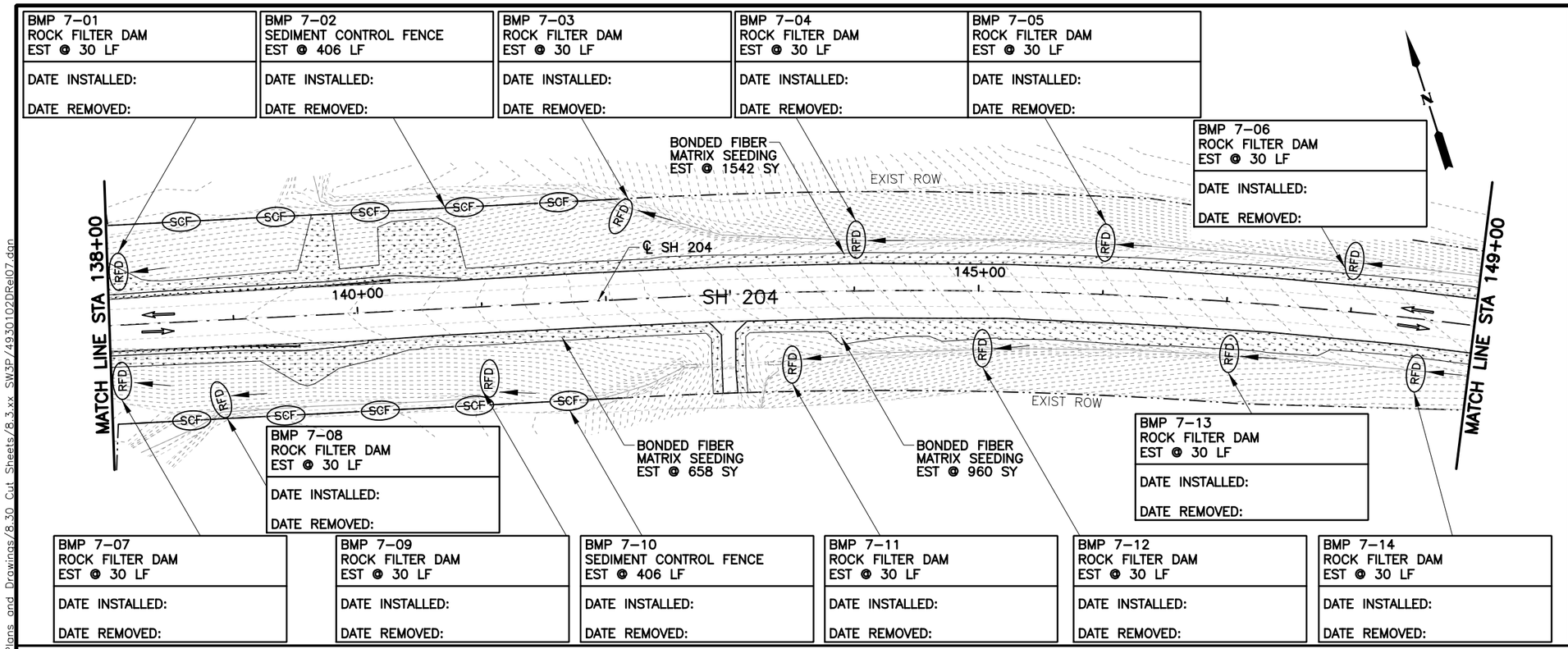
SH 204

SW3P LAYOUT

STA 116+00 TO STA 138+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		243

SHEET 6 OF 16



50 25 0 50 100
SCALE FEET

LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

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3. SEE ROADWAY LAYOUT SHEETS FOR SOIL RETENTION BLANKET DETAILS.

STATE OF TEXAS
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 Texas Department of Transportation

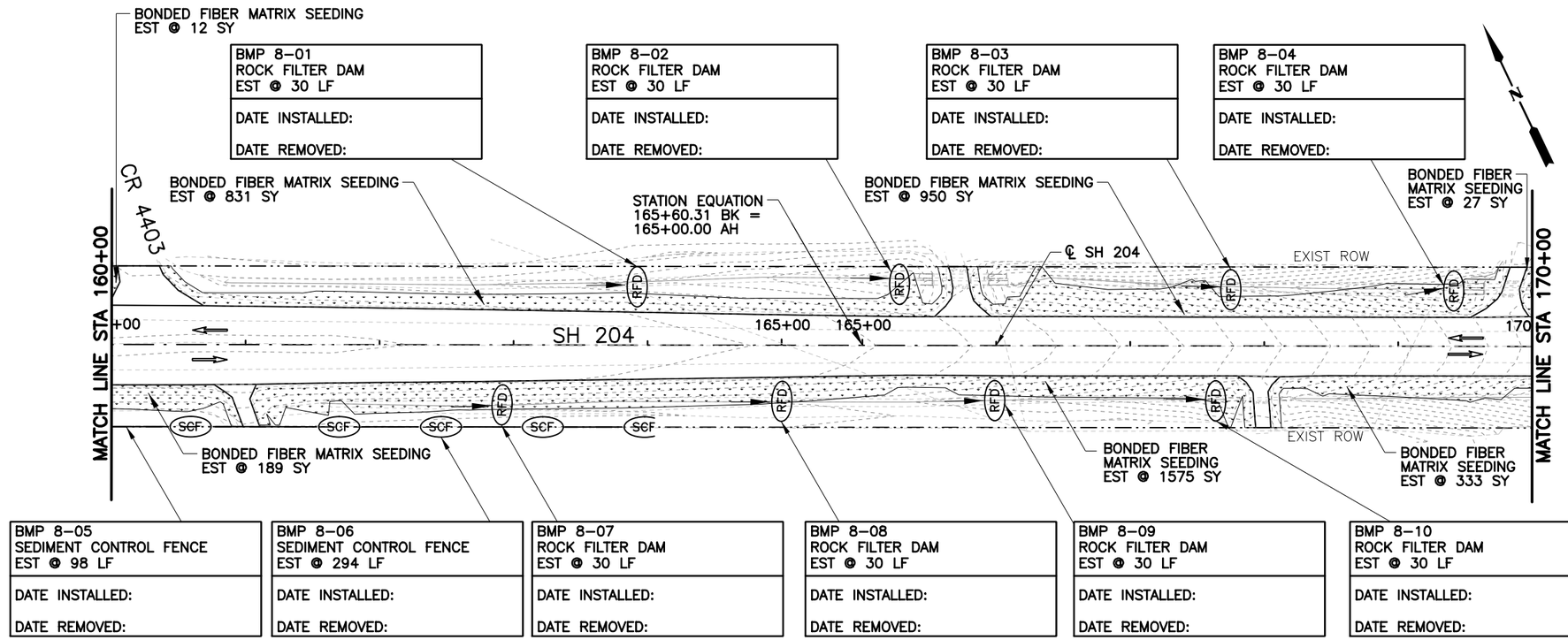
SH 204

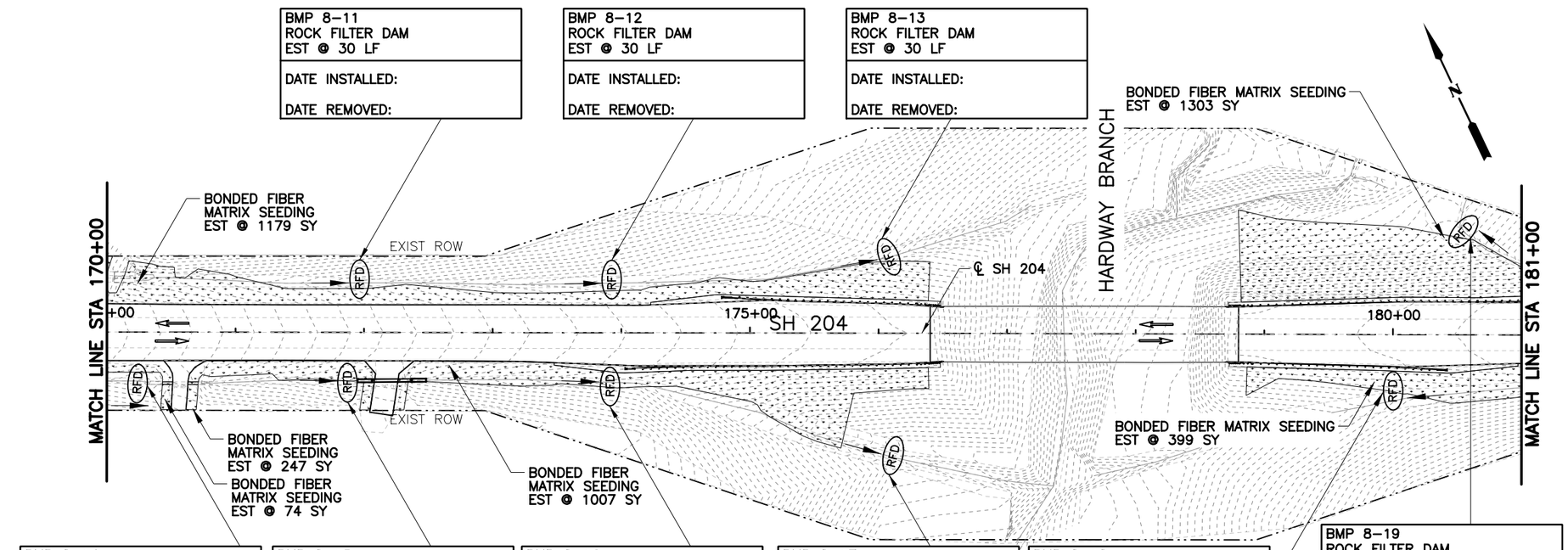
SW3P LAYOUT

STA 138+00 TO STA 160+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	244

SHEET 7 OF 16





50 25 0 50 100
SCALE FEET

LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

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3. SEE ROADWAY LAYOUT SHEETS FOR SOIL RETENTION BLANKET DETAILS.

STATE OF TEXAS
KRISTEN L. PERRY
129482
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PROFESSIONAL ENGINEER
3/5/2019

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CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

SH 204

SW3P LAYOUT

STA 160+00 TO STA 181+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.	
Checked:	CPY		TEXAS				SH 204	
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
Checked:	CPY	TYL	CHEROKEE	0450	01	013	245	

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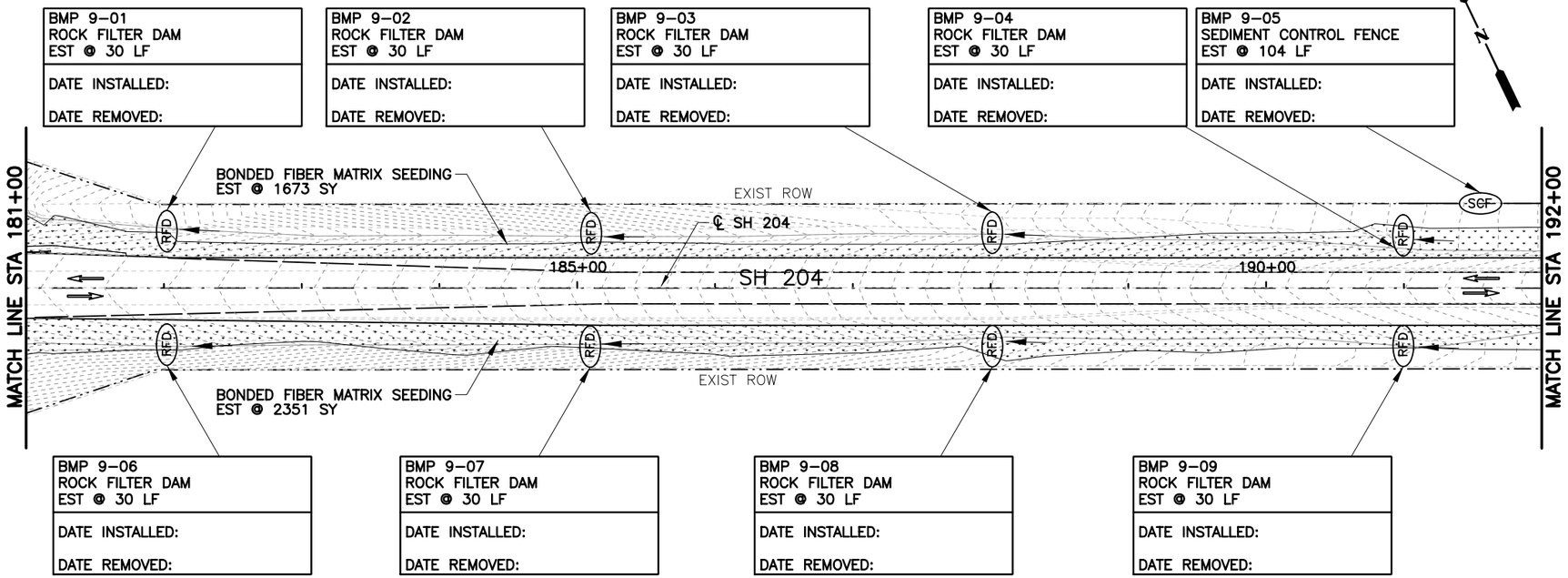

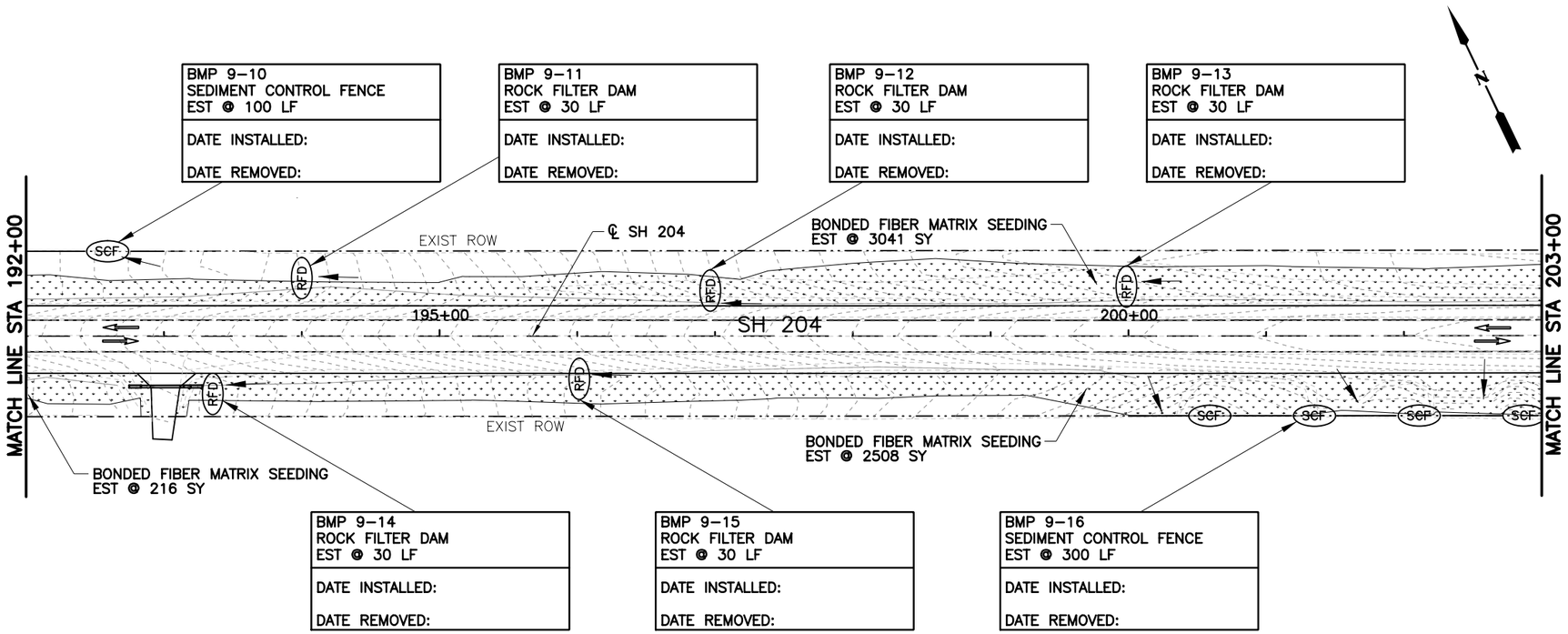

50 25 0 50 100
SCALE FEET

LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

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3. SEE ROADWAY LAYOUT SHEETS FOR SOIL RETENTION BLANKET DETAILS.

STATE OF TEXAS
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3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

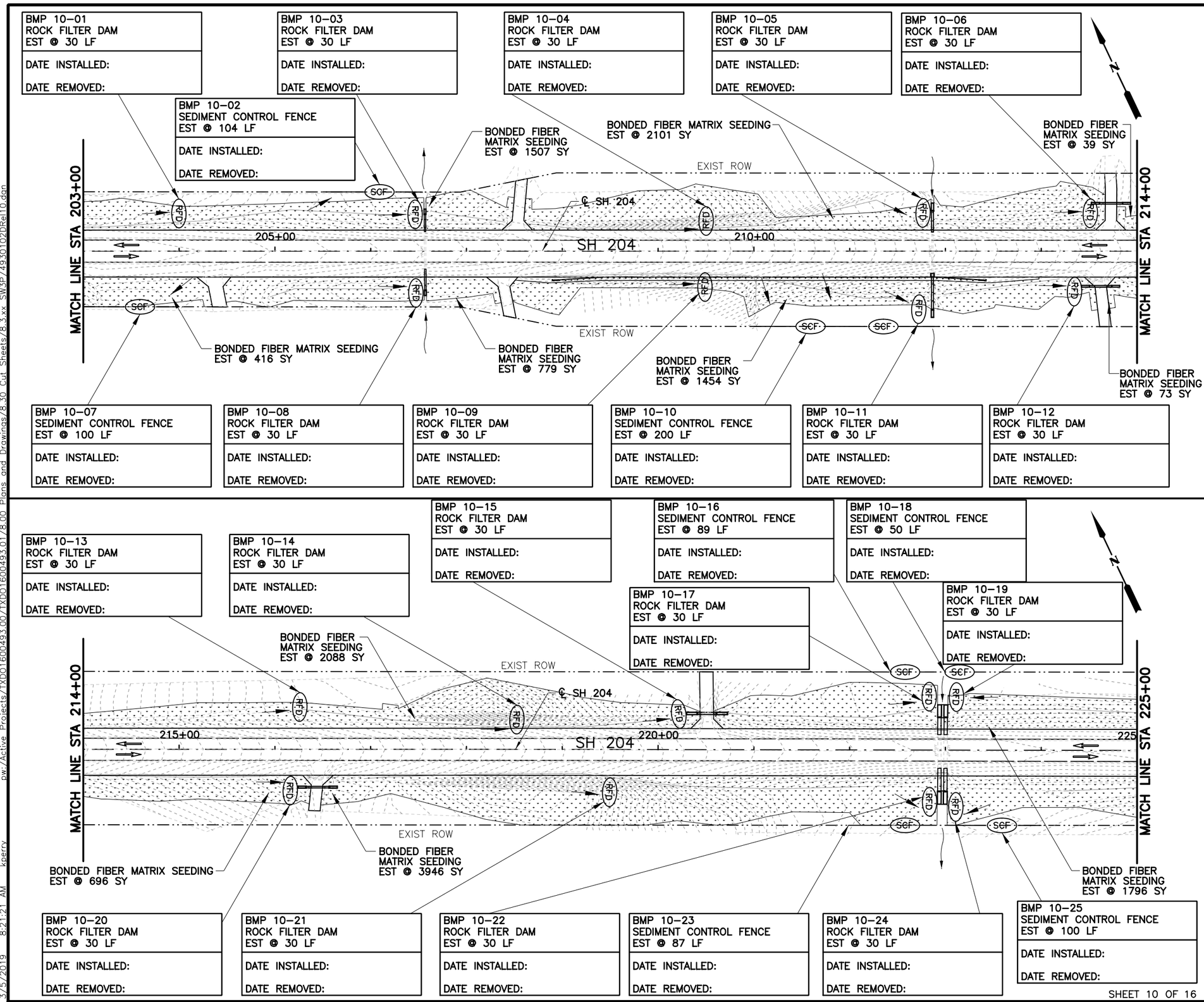
SH 204

SW3P LAYOUT

STA 181+00 TO STA 203+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	246

SHEET 9 OF 16



STATE OF TEXAS
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3/5/2019

NO.	REVISION	BY	DATE

TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SW3P LAYOUT

STA 203+00 TO STA 225+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		247

SHEET 10 OF 16

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cpypdf: ANSIB.pltcfg
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3/5/2019 8:21:21 AM kperry

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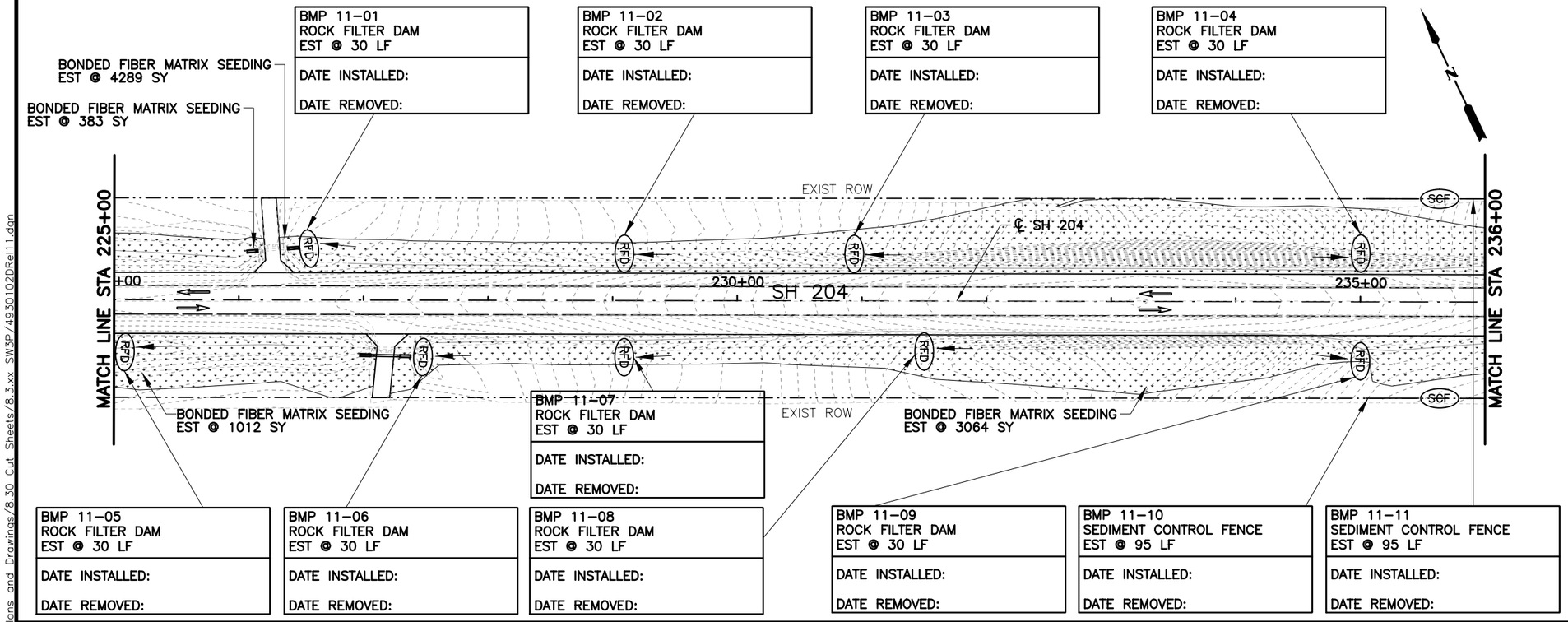

STATE OF TEXAS
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3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

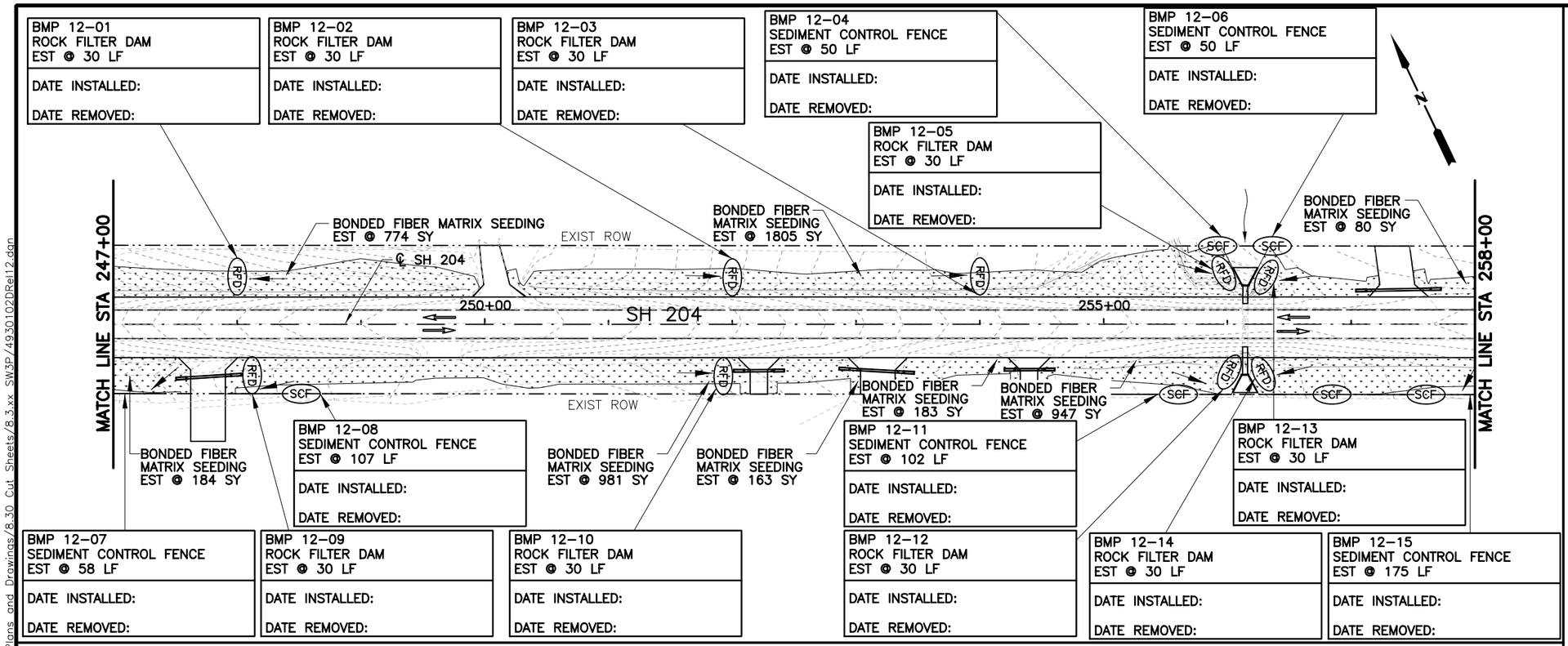
SH 204

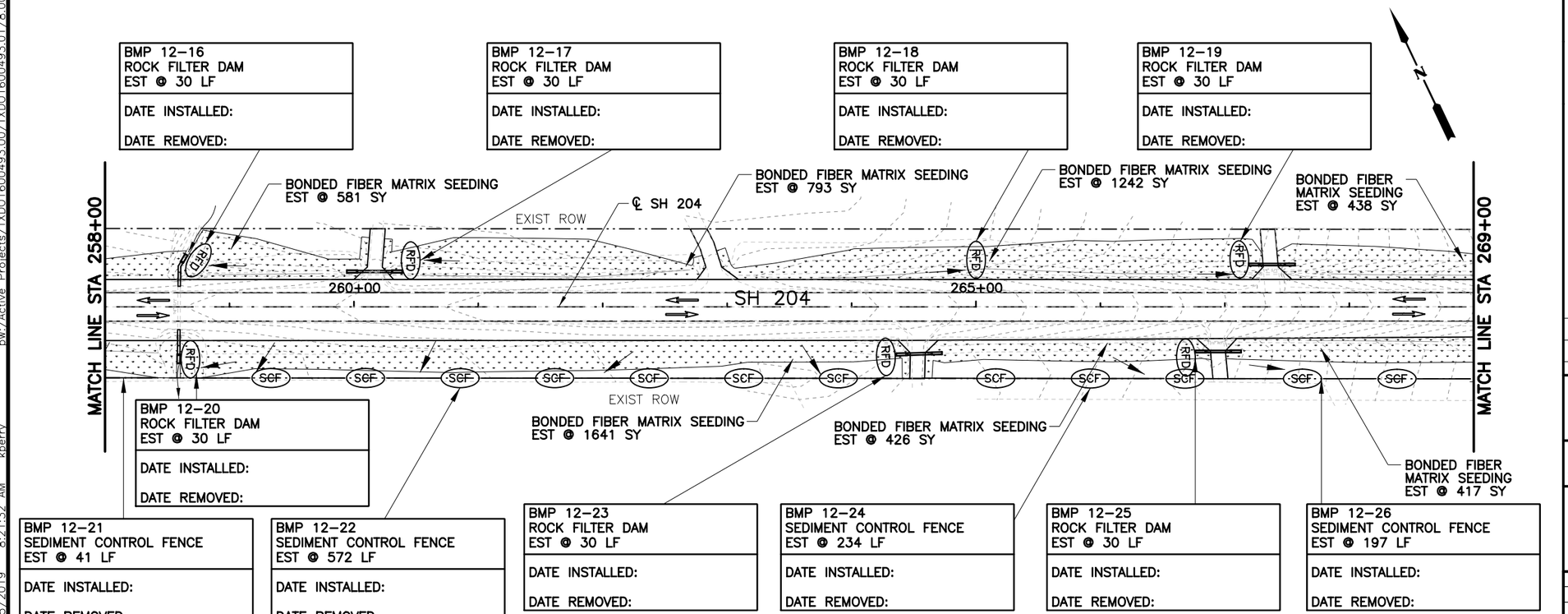
SW3P LAYOUT

STA 225+00 TO STA 247+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		248

SHEET 11 OF 16





50 25 0 50 100
SCALE FEET

LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

1. THE LOCATION OF DEVICES ARE FOR GRAPHIC REPRESENTATION ONLY. OBTAIN ENGINEERS APPROVAL BEFORE INSTALLATION.
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3. SEE ROADWAY LAYOUT SHEETS FOR SOIL RETENTION BLANKET DETAILS.

STATE OF TEXAS
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NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

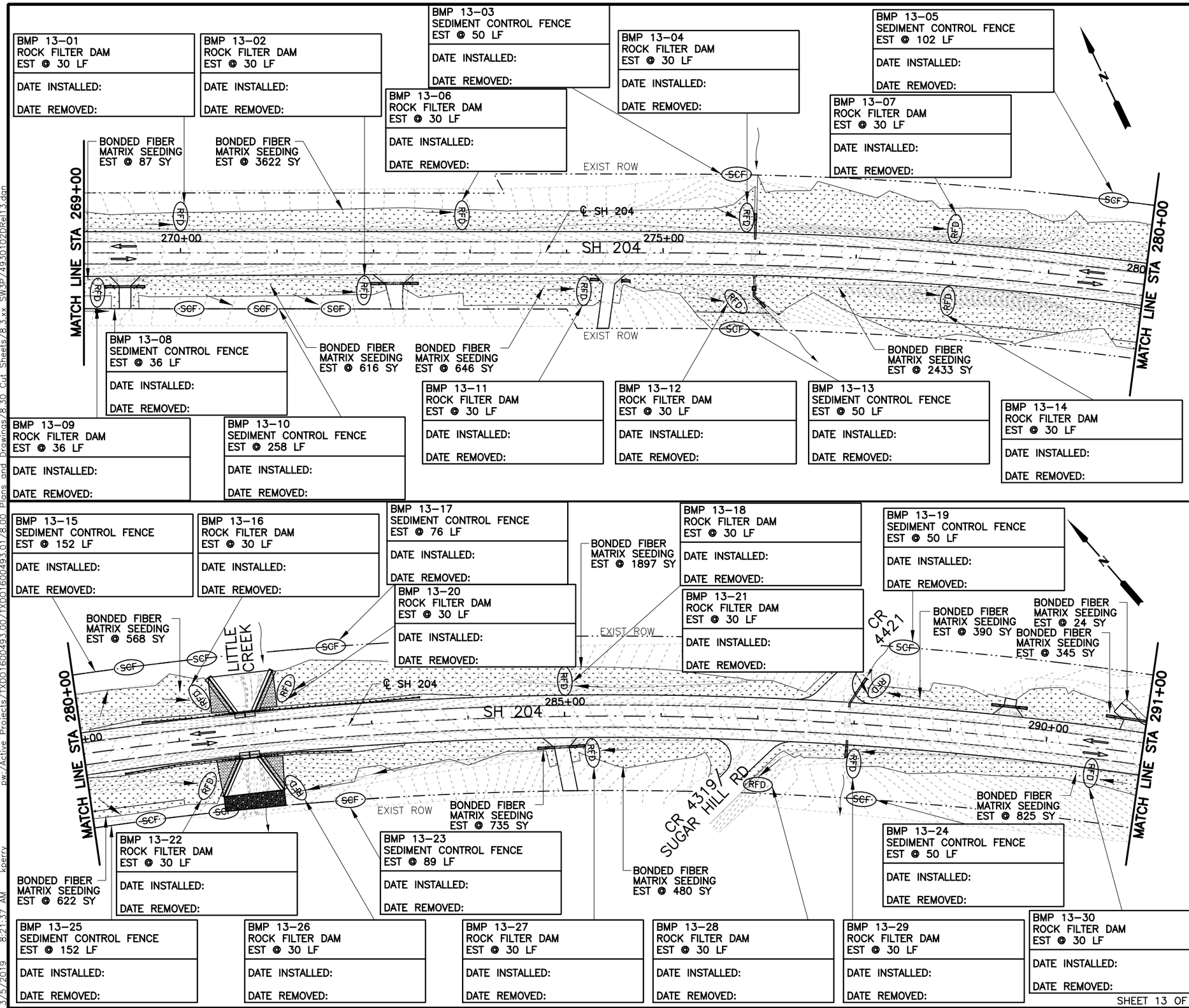
SH 204

SW3P LAYOUT

STA 247+00 TO STA 269+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
Checked:	CPY		TEXAS				SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013	249

SHEET 12 OF 16



50 25 0 50 100
SCALE FEET

LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

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STATE OF TEXAS
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NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

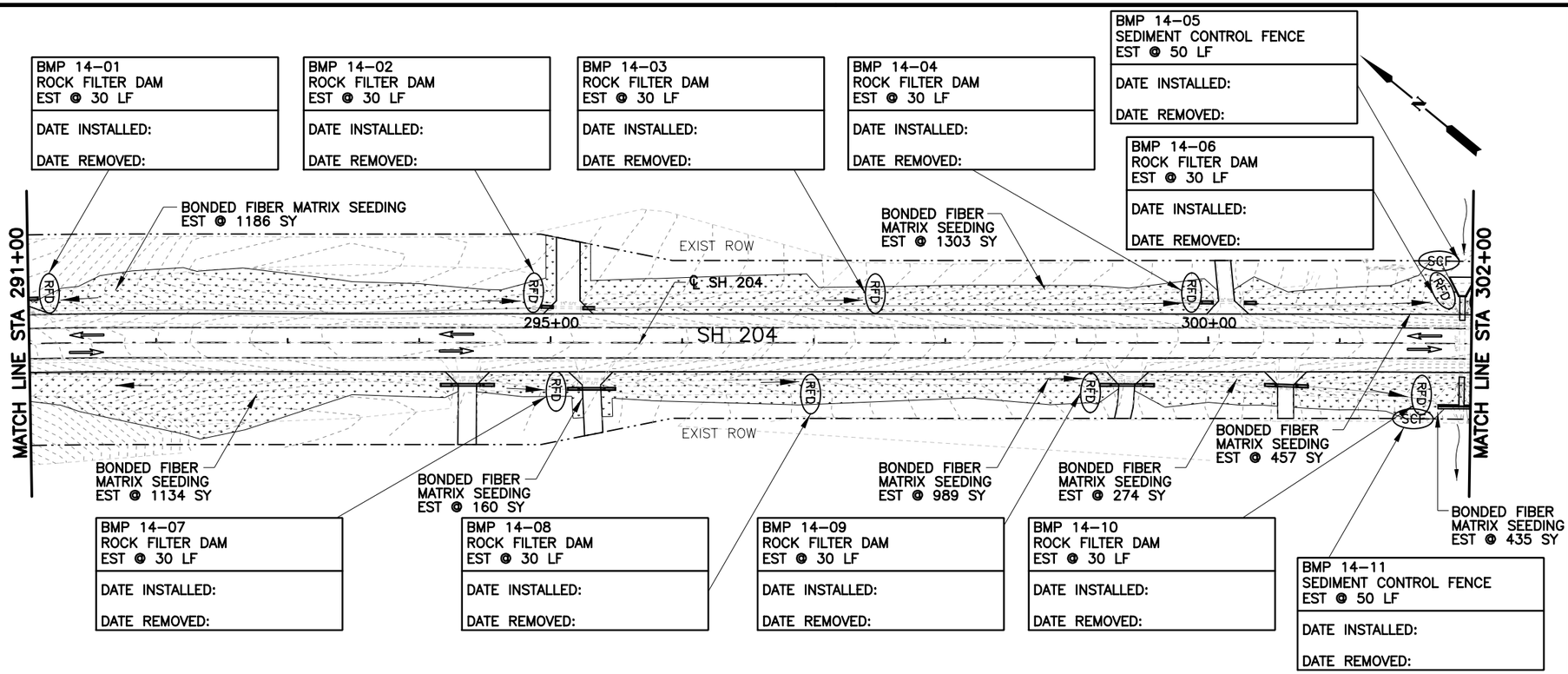
SH 204

SW3P LAYOUT

STA 269+00 TO STA 291+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
Checked:	CPY		TEXAS					SH 204
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	CPY	TYL	CHEROKEE	0450	01	013		250

SHEET 13 OF 16



STATE OF TEXAS
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NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

 Texas Department of Transportation

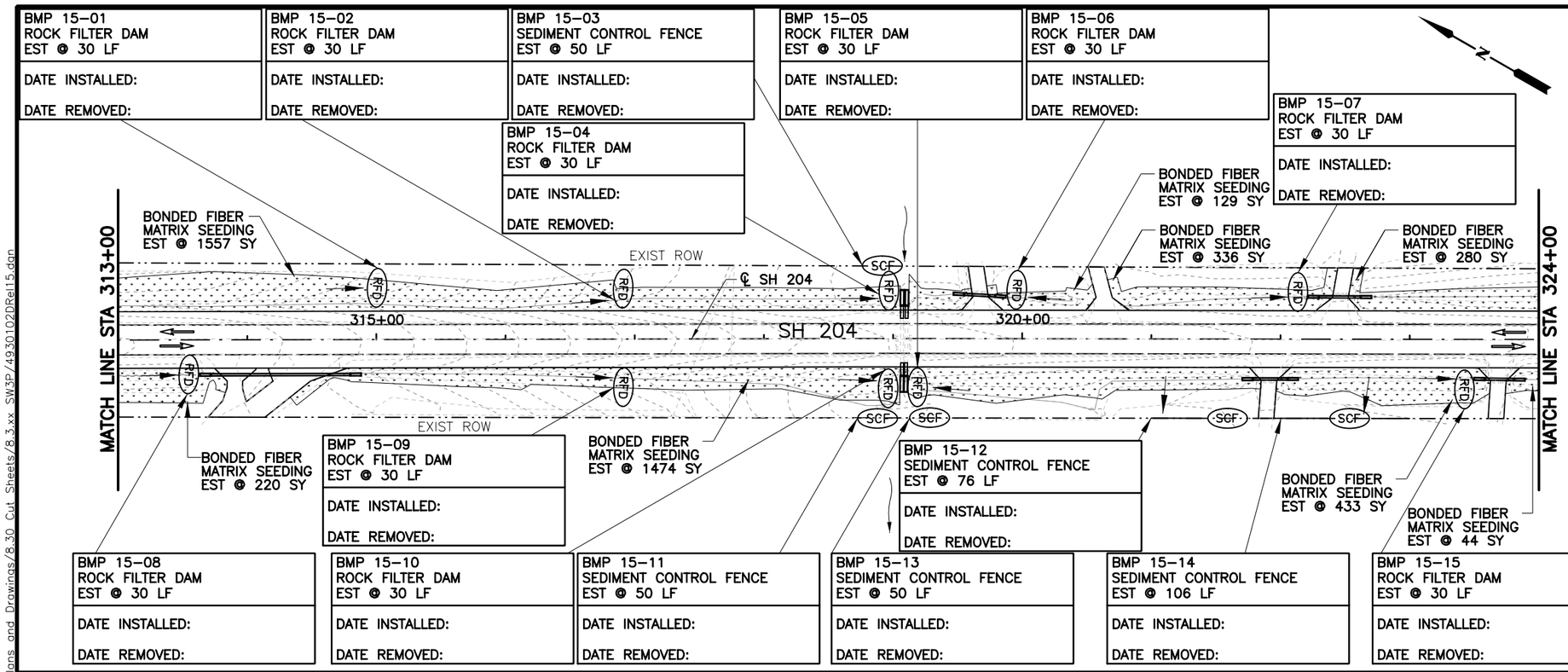
SH 204

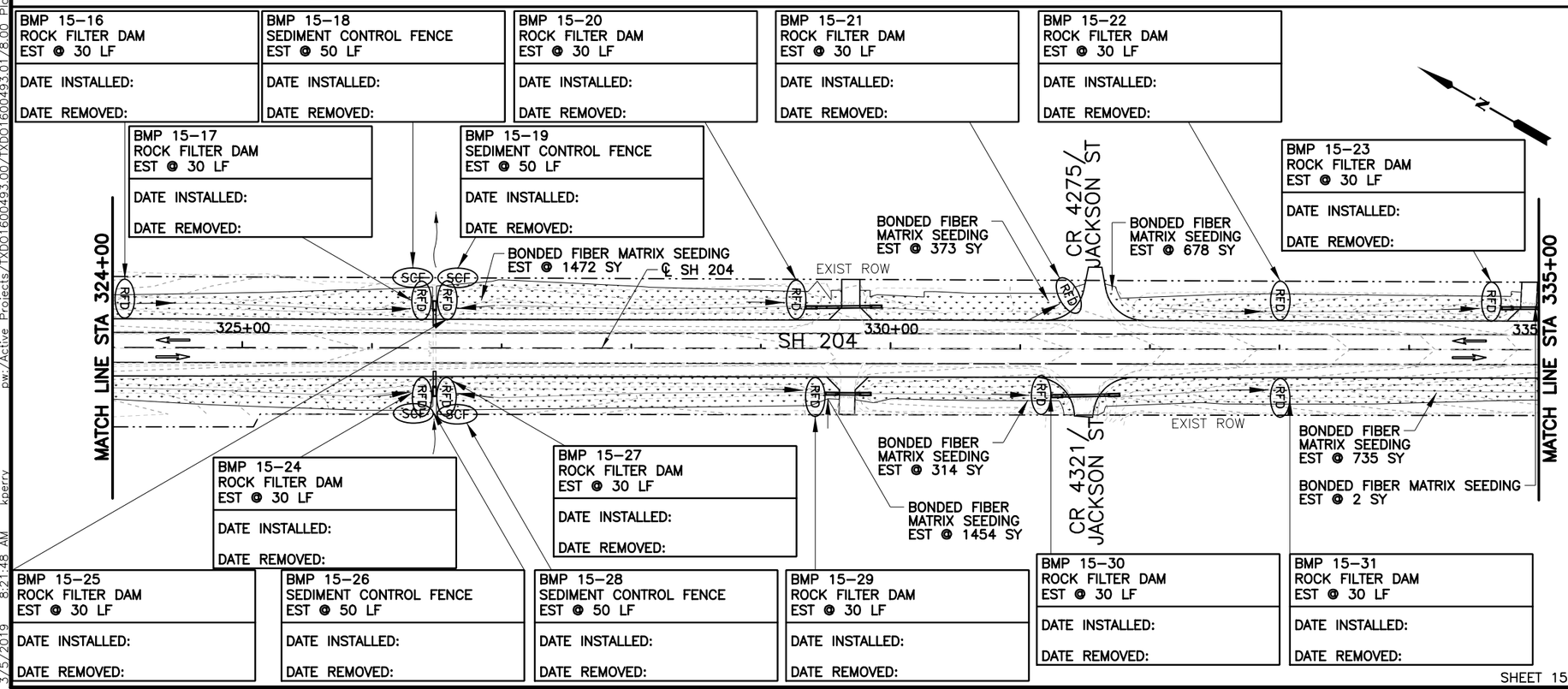
SW3P LAYOUT

STA 291+00 TO STA 313+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.	
Checked:	CPY		TEXAS					SH 204	
Drawn:	CPY	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	CPY	TYL	CHEROKEE	0450	01	013		251	

SHEET 14 OF 16





STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
3/5/2019

NO.	REVISION	BY	DATE

CP&Y
TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SW3P LAYOUT

STA 313+00 TO STA 335+00

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.	
Checked:	CPY		TEXAS					SH 204	
Drawn:	CPY	DIST.	COUNTY		CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
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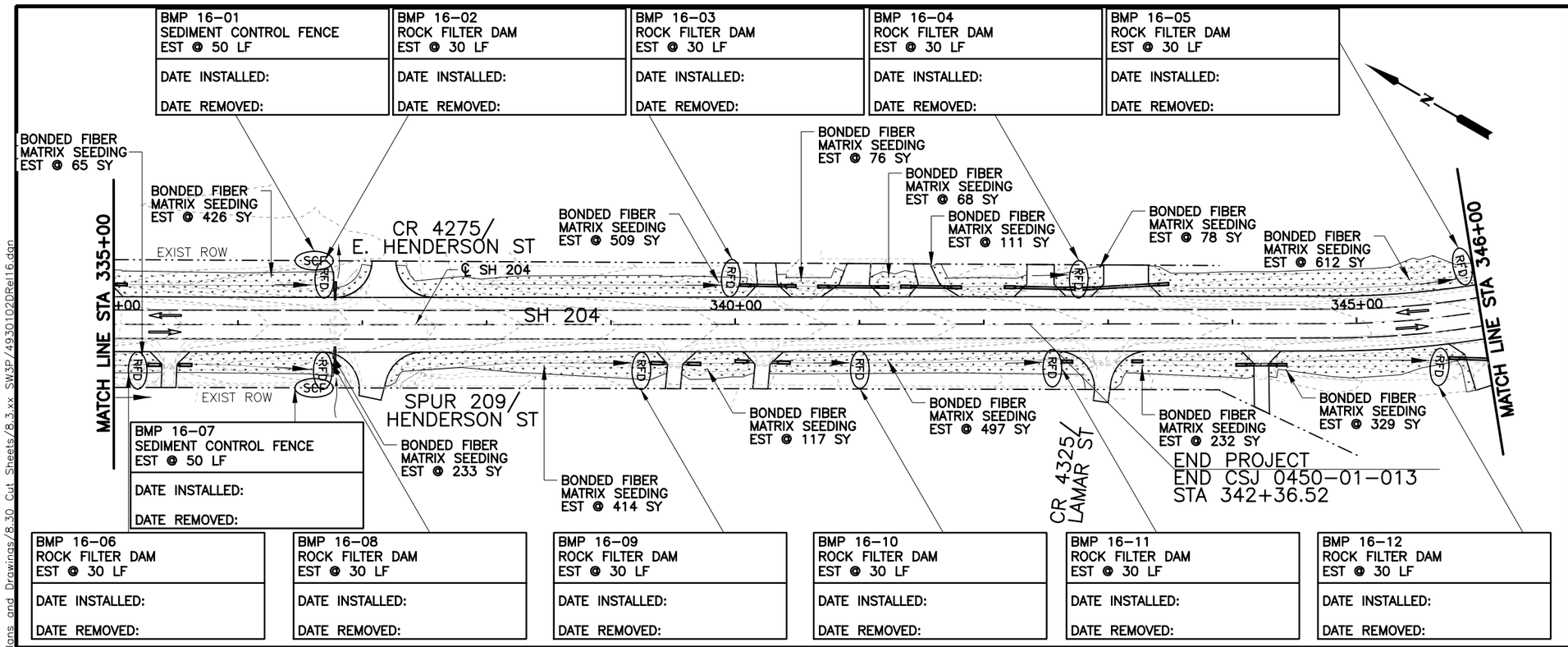
SHEET 15 OF 16



50 25 0 50 100
SCALE FEET

LEGEND

SYMBOL	DESCRIPTION
SCF	SEDIMENT CONTROL FENCE
	PERMANENT BONDED FIBER MATRIX SEEDING/VEGETATION
RFD	ROCK FILTER DAM
	EXISTING LANE
	FLOW DIRECTION

NOTES:

1. THE LOCATION OF DEVICES ARE FOR GRAPHIC REPRESENTATION ONLY. OBTAIN ENGINEERS APPROVAL BEFORE INSTALLATION.
2. SEE ROADWAY LAYOUT SHEETS FOR RIPRAP DETAILS.
3. SEE ROADWAY LAYOUT SHEETS FOR SOIL RETENTION BLANKET DETAILS.

STATE OF TEXAS
KRISTEN L. PERRY
129482
LICENSED PROFESSIONAL ENGINEER
3/5/2019

NO.	REVISION	BY	DATE

TEXAS REGISTERED ENGINEERING FIRM F-1741

SH 204

SW3P LAYOUT

STA 335+00 TO END PROJECT

Designed:	CPY	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.	
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SHEET 16 OF 16

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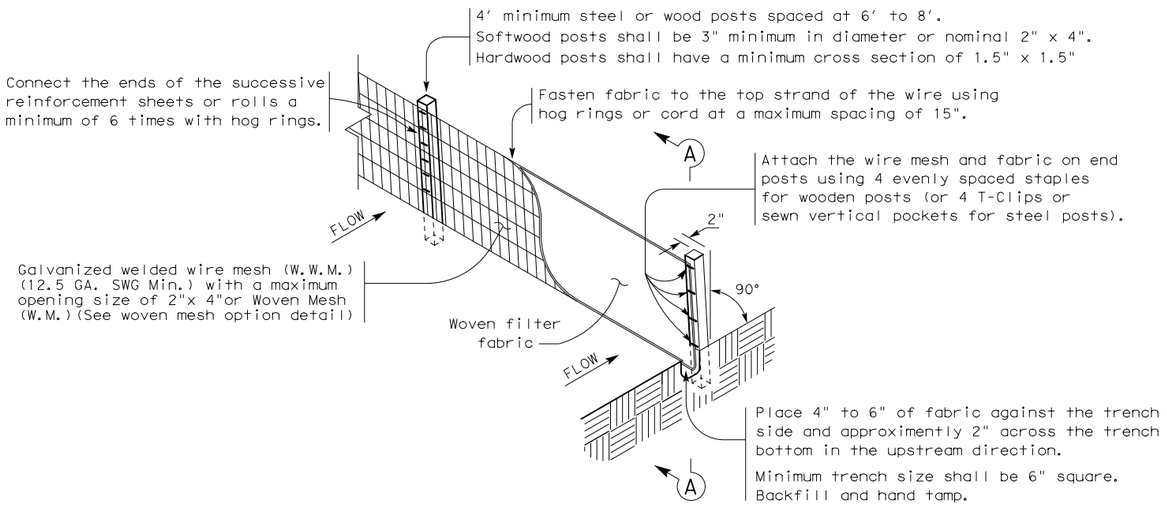
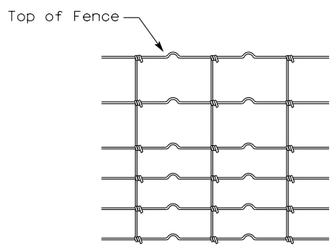
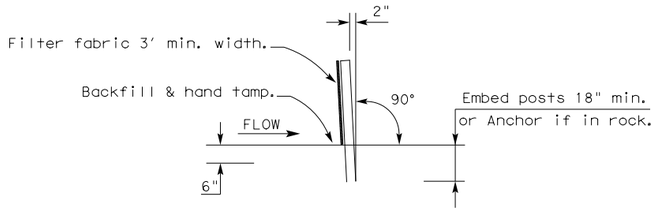


TEMPORARY SEDIMENT CONTROL FENCE

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.

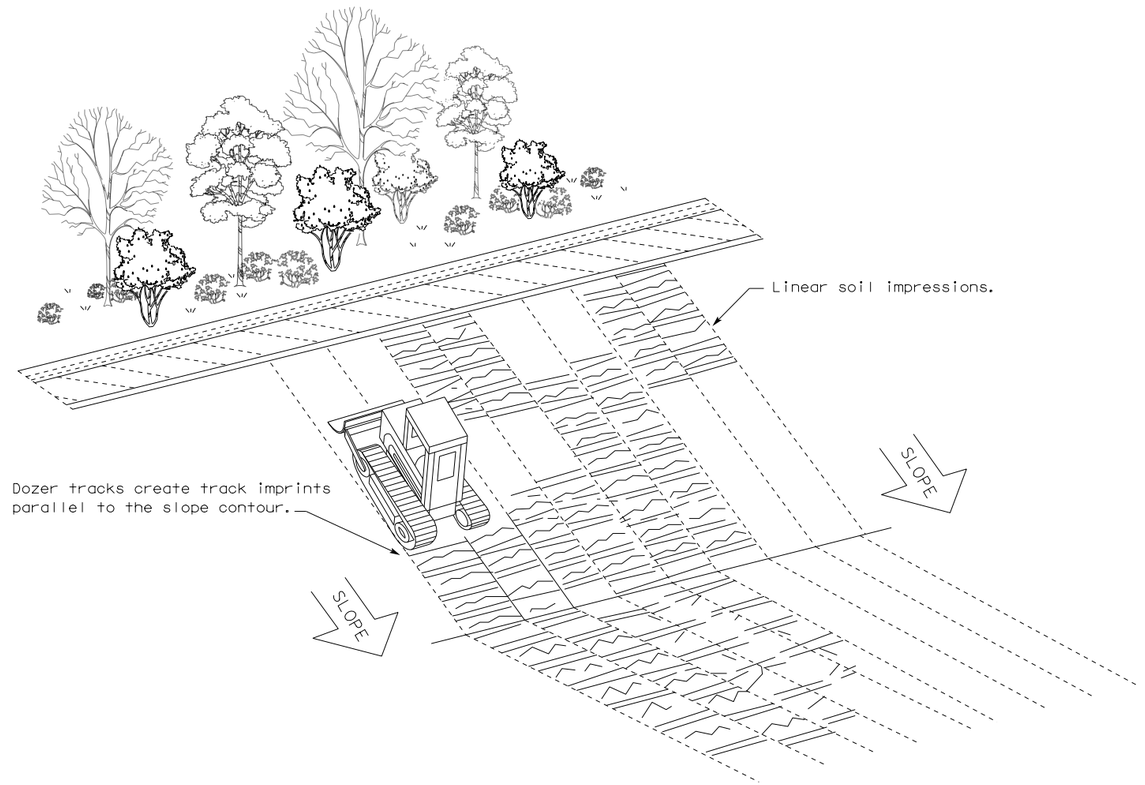
LEGEND

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
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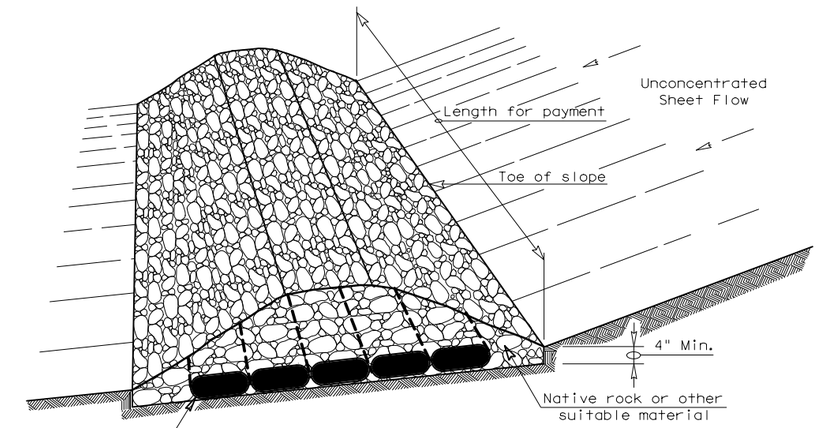
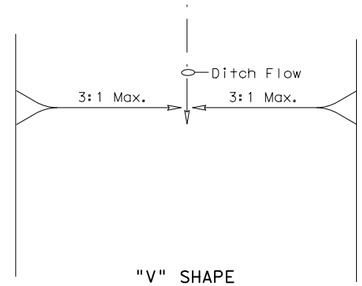
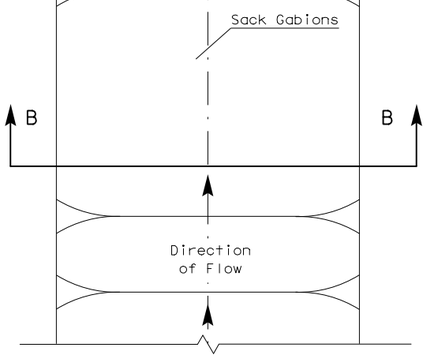


FILTER DAM AT TOE OF SLOPE

RFD1



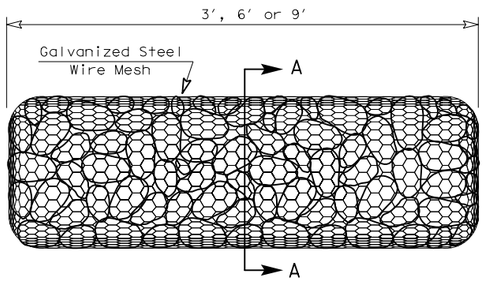
"V" SHAPE
PLAN VIEW



PLAN VIEW

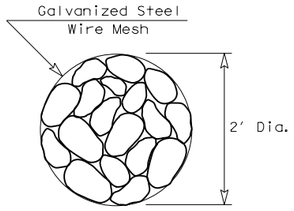
¾" Dia.
Rebar Stakes

SECTION B-B

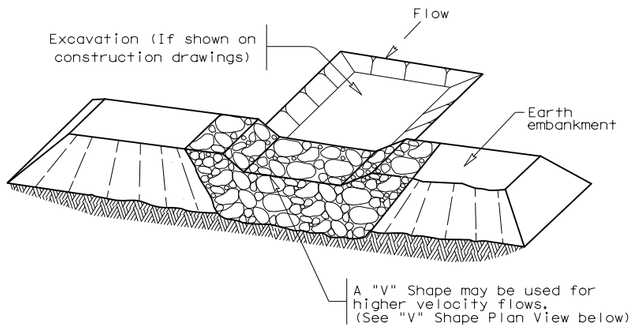


TYPE 4 (SACK GABIONS)

RFD4

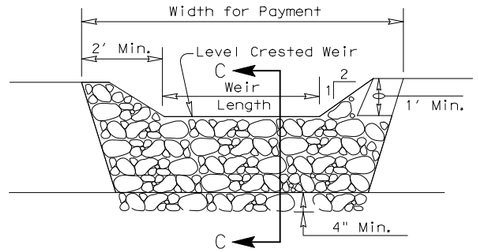


SECTION A-A

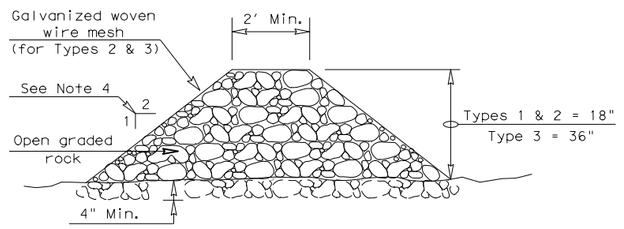


FILTER DAM AT SEDIMENT TRAP

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.

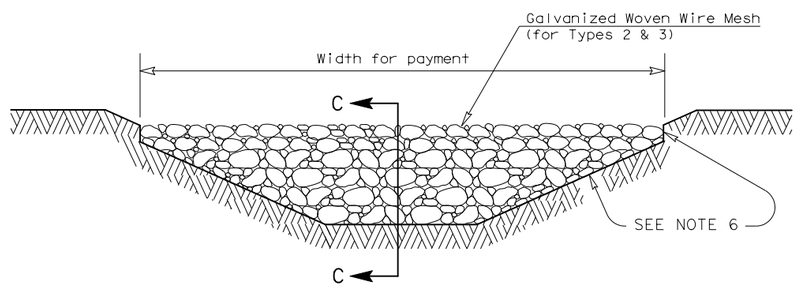
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity 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
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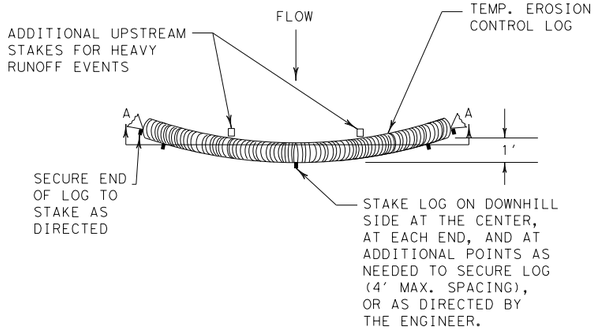
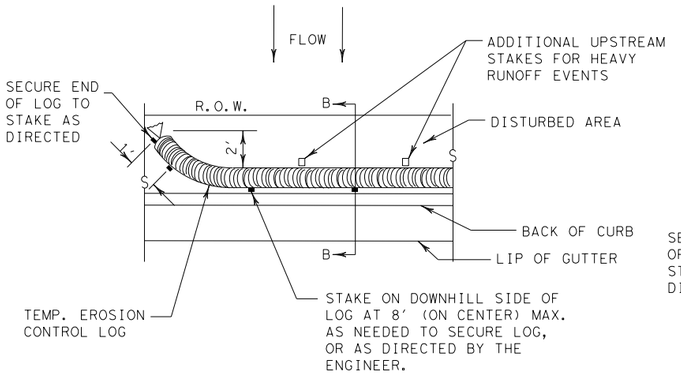


PLAN VIEW



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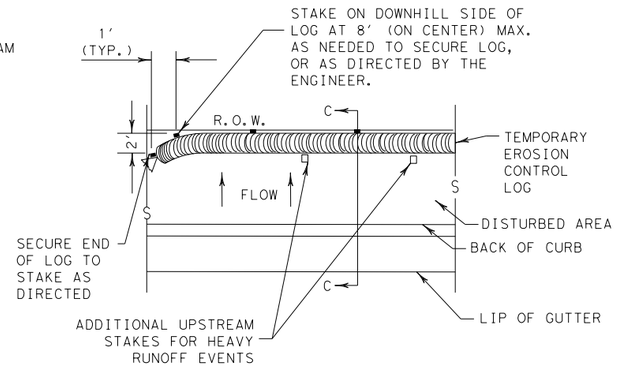

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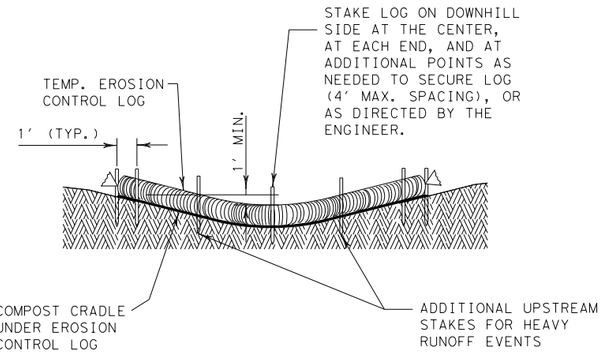
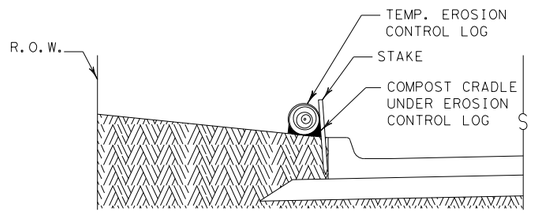


SECTION A-A

EROSION CONTROL LOG DAM

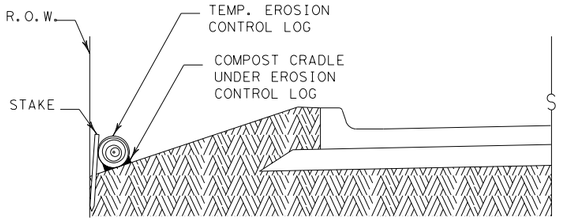
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

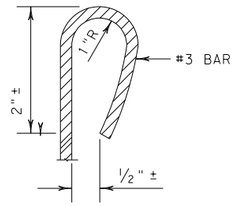
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

LEGEND

CL-D	EROSION CONTROL LOG DAM
CL-BOC	EROSION CONTROL LOG AT BACK OF CURB
CL-ROW	EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
CL-SST	EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
CL-SSL	EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
CL-DI	EROSION CONTROL LOG AT DROP INLET
CL-CI	EROSION CONTROL LOG AT CURB INLET
CL-GI	EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

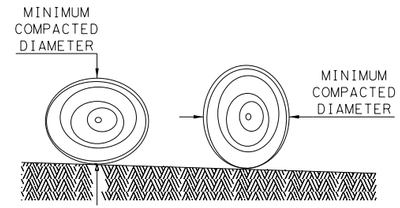
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916		DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016		CONT	SECT	JOB		HIGHWAY	
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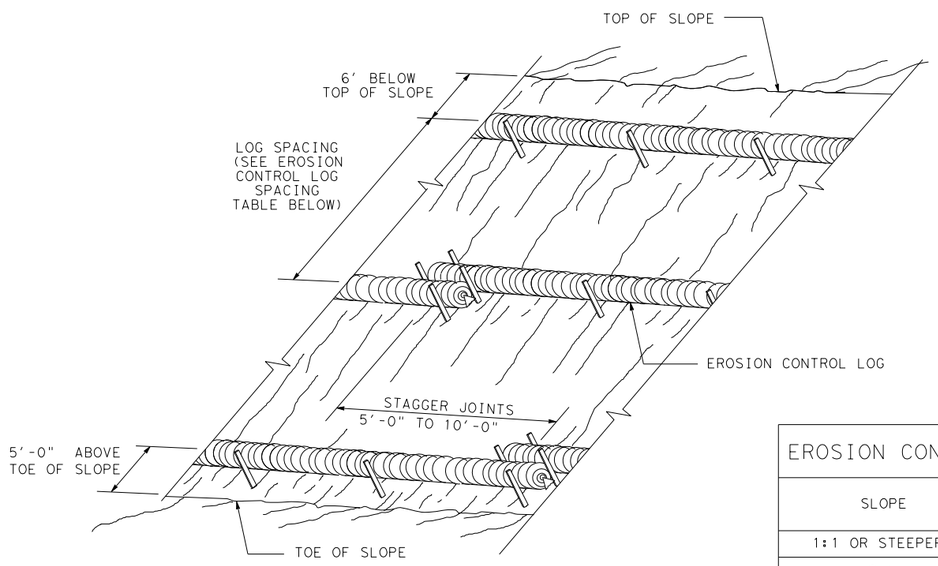
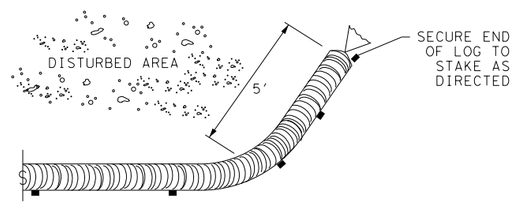


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

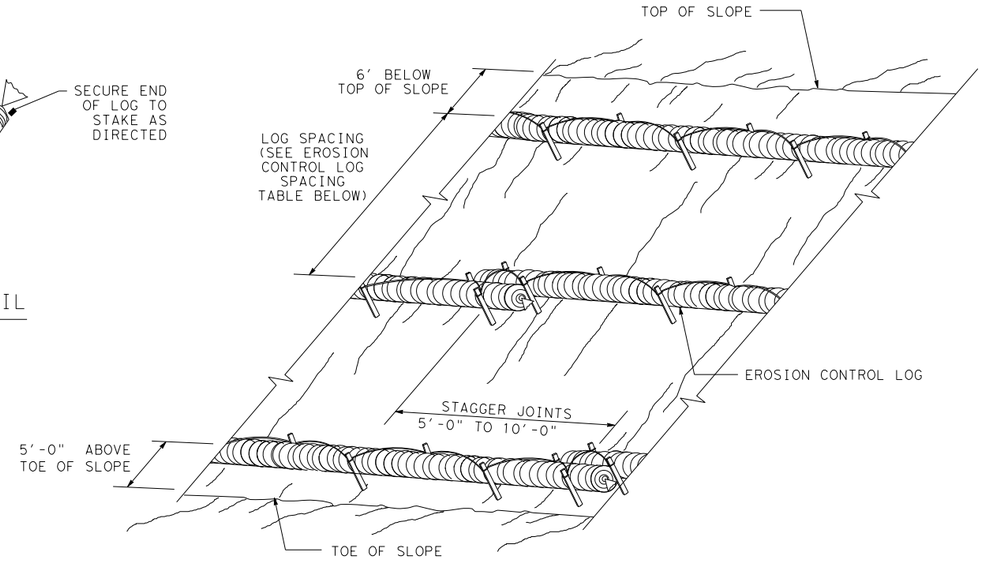
CL-SST



END SECTION RAP DETAIL

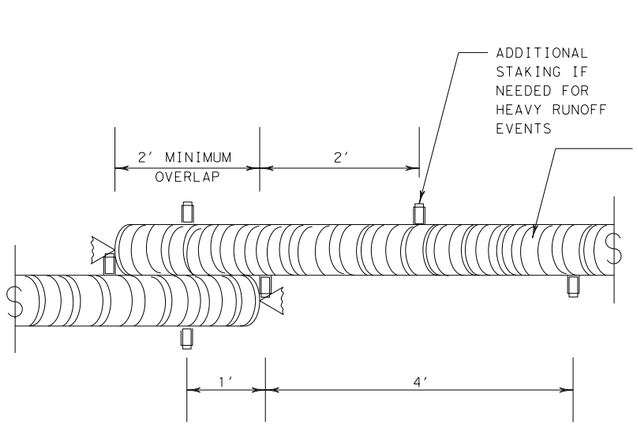
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

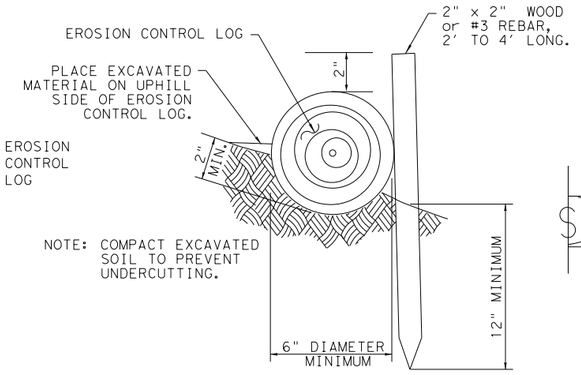
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

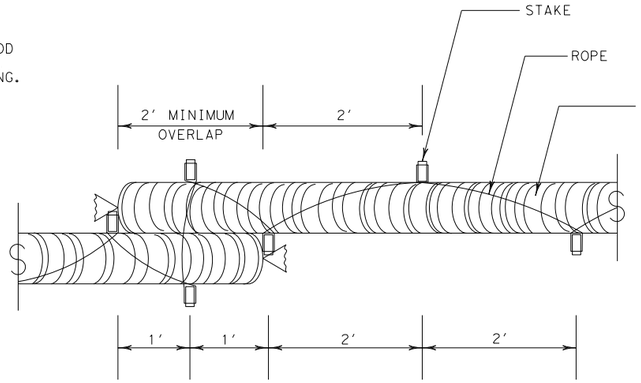




STAKE AND TRENCHING ANCHORING DETAIL

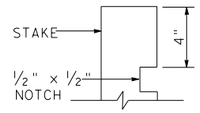
CL-SST

TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

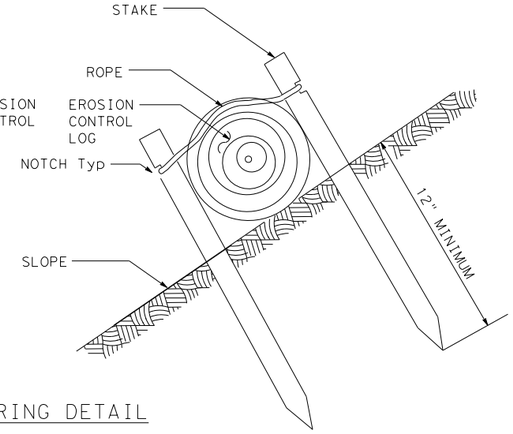


STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL



SHEET 2 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

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© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
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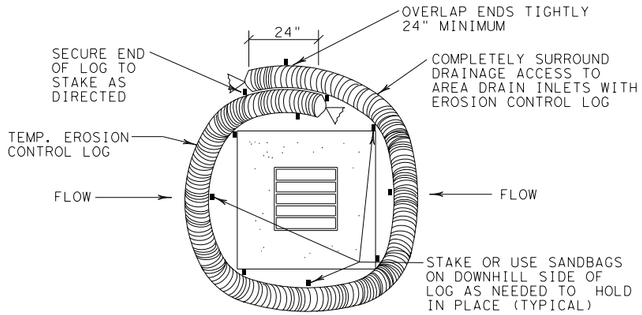
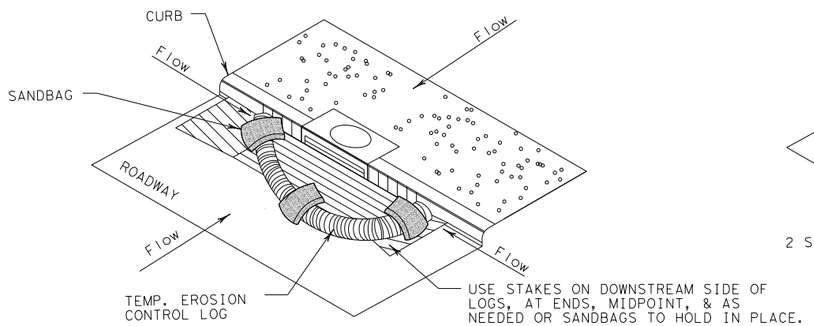
DATE:
FILE:



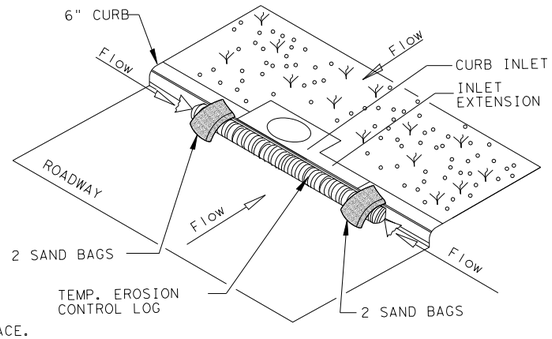
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

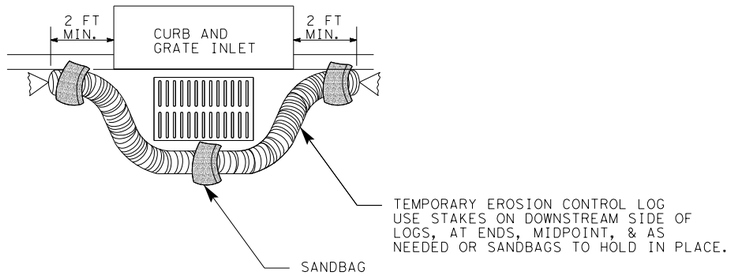
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

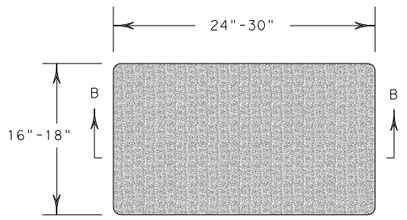
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0450	01	013		US 204		
	DIST	COUNTY			SHEET NO.		
	TYL	CHEROKEE			258		