INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	SUPPLEMENTAL INDEX OF SHEETS

FINAL PLANS

DATE CONTRACT LETTING: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK COMPLETED & ACCEPTED: _____

CONTRACTOR: _____

USED OF ALLOTED DAYS _____

FINAL CONTRACT 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. F2022(024)

SH 135
GREGG COUNTY

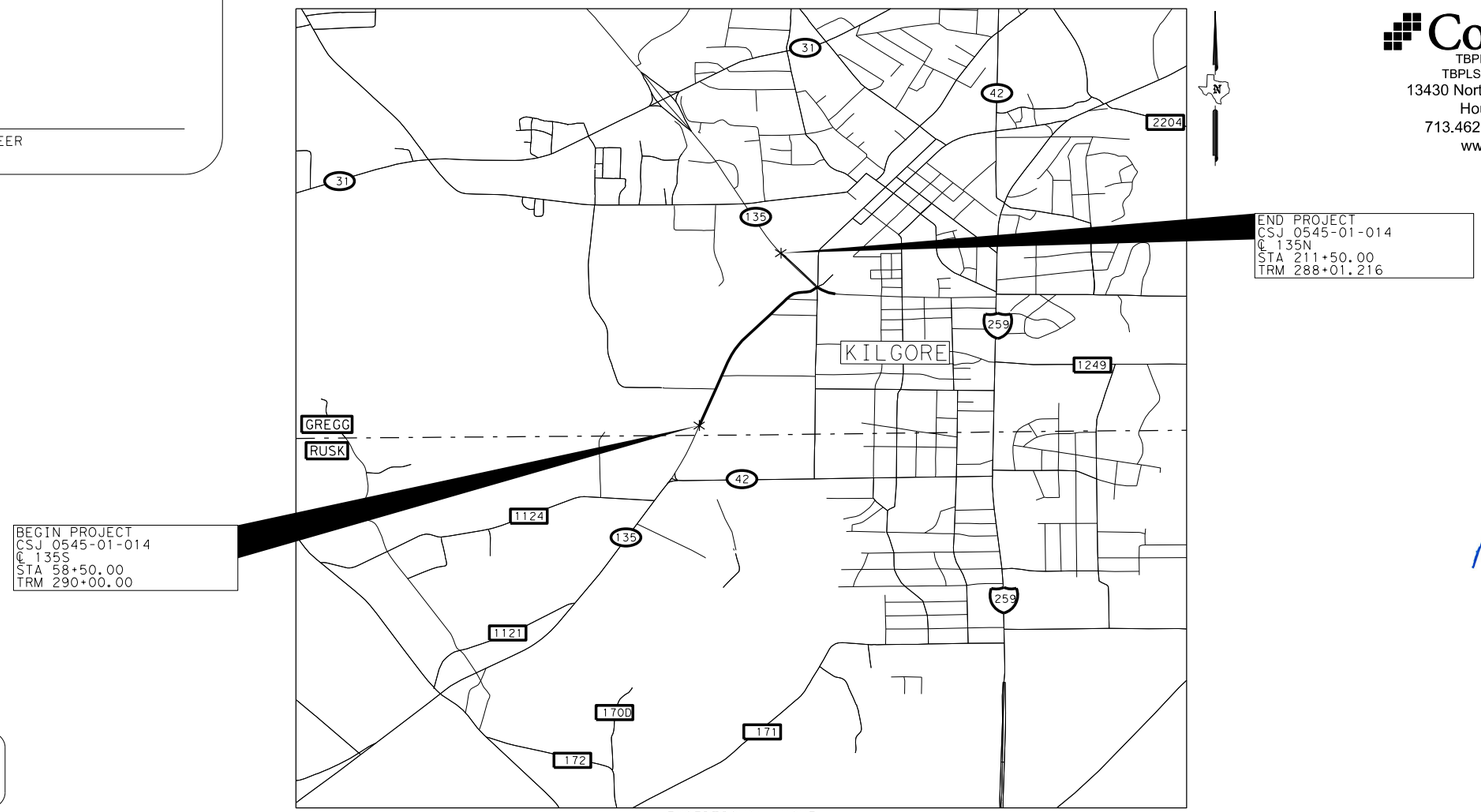
NET LENGTH OF PROJECT: 5,295 FT = 1.00 MI

LIMITS: FROM SH 135 (ROUNDABOUT) IN KILGORE, SW TO RUSK C/L
FOR THE REHABILITATION OF EXISTING ROAD CONSISTING OF
REPLACING STORM DRAIN SYSTEM AND FULL DEPTH CONC PAV

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	F2022(024)		1
STATE	STATE DIST.	COUNTY	
TEXAS	TYL	GREGG	
CONT.	SECT.	JOB	HIGHWAY NO.
0545	01	014	SH 135

FUNCTIONAL CLASSIFICATION = URBAN MINOR ARTERIAL
DESIGN SPEED = 30 MPH
CURRENT ADT (2020) = 5,200
FUTURE ADT (2040) = 7,200

100% PLANS



EXCEPTIONS: NONE
EQUATIONS: ℄ SH 135 (S) STA 104+01.18=
℄ SH 135 (N)/HOUSTON ST STA 204+05.95
RR CROSSINGS: UNDERPASS AT ℄ 135N STA 204+00

SCALE: NTS

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

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

CobbFendley
TBPE Firm Registration No. 274
TBPLS Firm Registration No. 100467
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www.cobbfendley.com

STATE OF TEXAS
MARK C. LORANCE
82015
LICENSED
PROFESSIONAL ENGINEER

02/11/2022

Mark C. Lorance, P.E.

RECOMMENDED FOR LETTING: 3/3/2022

DocuSigned by: Gilbert Arteaga
BF88CB5D0DAE4E0...
DISTRICT DESIGN ENGINEER

APPROVED FOR LETTING: 3/3/2022

DocuSigned by:
6149184A8C054E1...
DISTRICT ENGINEER

FILE: F:\Projects\2019\11004_TxDOT*5x5*PS&E\02.SH135*Kilgore\ENG\500 USTN\500.02 Sheets\01 General\135*GEN-TITLE.dgn
DATE: 2/13/2022 2:48:52 PM

COUNTY GREGG PROJ. NO. F2022(024)
HWY. NO. SH 135 LETTING DATE
DATE ACCEPTED

FED08

SHEET NO. DESCRIPTION

GENERAL

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

Michael Verhoef, P.E. 2/25/22

MICHAEL VERHOEF DATE

100% SUBMITTAL

02/25/2022

STATE OF TEXAS · MICHAEL D. VERHOEF · 128002 · LICENSED PROFESSIONAL ENGINEER

Michael Verhoef

REV. NO.	DATE	DESCRIPTION	BY

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Texas Department of Transportation

SUPPLEMENTAL INDEX OF SHEETS

SHEET 1 OF 1

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	2

GENERAL NOTES:

GENERAL.

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

Will Buskell	Will.Buskell@txdot.gov
Stacy Wylie	Stacy.Wylie@txdot.gov

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

All Contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:

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

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

For this Contract, the following standard sheets have been modified:

CCCG-21

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.

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.

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.

Project Number: **Sheet 3**

County: Gregg **Control:** 0545-01-014

Highway: SH 135

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.

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.

"When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an

alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor."

ITEM 7. LEGAL RELATIONS AND RESPONSIBILITIES

This Contract requires work that crosses or is in close proximity to a railroad. Cooperate with the railroads and comply with all of their requirements including obtaining any training they require before performing work on railroad property.

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.

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 7.08 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).

No significant traffic generator events identified.

Project Number: **Sheet 3A**

County: Gregg **Control:** 0545-01-014

Highway: SH 135

ITEM 8. PROSECUTION AND PROGRESS

Prepare the progress schedule as a bar chart.

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. Clear channel easements and any other areas to the ROW line; specifically at the southern end of the project. 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.

ITEM 104. REMOVING CONCRETE

Blasting will not be permitted on this project.

ITEM 105. REMOVING TREATED & UNTREATED BASE & ASPHALT PAVEMENT

All material removed under this Item becomes property of the Contractor.

ITEMS 110 & 132. EXCAVATION & EMBANKMENT

Before Contract letting, prospective bidders may review the earthwork cross-sections at the Area Engineer's office. The computer data is for non-construction purposes only and is the prospective bidder's responsibility to validate the data with the accompanying plans, specifications, and estimates for this Contract.

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.”

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.

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.

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

Project Number: **Sheet 3B**

County: Gregg **Control:** 0545-01-014

Highway: SH 135

(Season: September 1 to February 1)	
Bermuda (unhulled)	12
Crimson Clover	10

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.

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 204. SPRINKLING

Apply water for dust control as directed. When dust control is not being maintained, cease operations until proper resources have been utilized to adequately minimize dust during earthwork, base construction. This Item will not be paid directly but will be subsidiary to pertinent Items.

ITEM 260. LIME TREATMENT (ROAD-MIXED)

Prior to ACP layer placement under the proposed concrete pavement, provide for approval in an acceptable electronic format, the in-place profile of the subgrade on 50 ft. station intervals along the roadway and at the lane lines.

ITEM 275. CEMENT TREATMENT (ROAD-MIXED)

Prior to ACP layer placement under the proposed concrete pavement, provide for approval in an acceptable electronic format, the in-place profile of the subgrade on 50 ft. station intervals along the roadway and at the lane lines.

ITEM 360. CONCRETE PAVEMENT

Provide sawed joints for this project. Place construction sawed and contraction joints in accordance with the pavement detail sheet and as directed. The Engineer will approve locations that are not shown on the plans.

Provide a curing machine with rubber tires or another arrangement, as approved, so that the machine will bridge over or span the pavement and monolithic curb operations.

Provide pavement leave-out sections for traffic at driveways and side streets as shown on the plans or as directed. The work for leave-outs, including the construction of a suitable crossover connection at each site, will not be paid for directly but is subsidiary to Item 360.

Project Number: **Sheet 3C**

County: Gregg **Control:** 0545-01-014

Highway: SH 135

Provide access for the Engineer to take direct depth measurements immediately following concrete placement. Provide access at the 1/4, 1/2, and 3/4 location across the width of the pavement.

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 416. DRILLED SHAFT FOUNDATIONS

Hand dressing of soil around the concrete foundations for luminaries will be required as directed. Place the level of soil at a 6:1 slope or flatter, where possible, and extend it from the top of the concrete foundation to the established grades. This work will not be paid for directly but will be subsidiary to this Item.

If overhead power lines are in the vicinity of the drill shaft location, contact Electric Company prior to drilling.

Provide a low clearance drilling rig to avoid overhead transmission line if required.

ITEM 421. HYDRAULIC CEMENT CONCRETE

The Engineer will provide strength-testing equipment.

Provide the Engineer with a mixture design report using Department-provided software in accordance with Section 421.4.1., “Classification of Concrete Mix Designs,” of the standard specifications. Include in the report the producer’s plant, all materials sources, and a unique identification number for the design.

Air is not required on concrete cast-in-place elements on this project. If the Contractor proposes the use of an existing concrete design containing air, the Engineer must approve the design in writing before placement. If used, air testing will be performed in accordance with the specifications.

ITEM 432. RIPRAP

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

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

Payment for precast elements and inlet extensions are included in the payment for Inlet (Compl).

For precast inlets, use the default solid cover as indicated in TxDOT's Guide to the Standard Inlet and Manhole Program. Do not use grates on this project.

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.

Project Number: **Sheet 3D**

County: Gregg **Control:** 0545-01-014

Highway: SH 135

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.

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.

Lane closures will not be allowed before 9 A.M. or after 4 P.M. unless otherwise directed.

Unless otherwise approved, lane closures for minor or major construction operations will not be allowed on Good Friday, Easter weekend, Memorial Day, Memorial Day weekend, July 4th, Labor Day, Labor Day weekend, 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.

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.

The use of Law Enforcement Officers (LEOs) will be required for this project. Before the preconstruction meeting, coordinate with local agencies to be prepared for staffing needs.

Provide uniformed LEOs with marked vehicles during work zone activities. The officer in marked vehicle will be located as approved to monitor or direct traffic during the closure. The Engineer will approve the method used to direct traffic at signalized intersections. Additional officers and vehicles may be provided when directed.

Complete the daily tracking form provided by the Department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided. Minimums, scheduling fees, etc. will not be paid; TxDOT will consider paying cancellation fees on a case-by-case basis.

All law enforcement personnel used in work zone traffic control must be trained for performing duties in work zones and are required to take "Safe and Effective Use of Law Enforcement

Project Number: **Sheet 3E**

County: Gregg **Control:** 0545-01-014

Highway: SH 135

Personnel in Work Zones" (Course #133119) which can be found online at the following site: www.nhi.fhwa.dot.gov.

Certificates of completion should be available to all who finish the course. These should be kept by the officers to verify completion when reporting to the work site.

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. 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 7.08 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 508. CONSTRUCTING DETOURS

Salvage and stockpile flexible base used in the detour. Removed stockpiled material will become the property of the Contractor.

ITEM 512. PORTABLE CONCRETE TRAFFIC BARRIER

The Department will furnish 1160 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.

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 529. CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER

Provide steel reinforcement for all curb and curb and gutter unless otherwise directed.

ITEM 545. CRASH CUSHION ATTENUATORS

Provide crash cushion attenuators meeting TL-3 requirements.

Project Number: **Sheet 3F**

County: Gregg **Control:** 0545-01-014

Highway: SH 135

ITEM 556. PIPE UNDERDRAINS

Change location and quantities to fit field conditions as directed.

Cover the pipe with a factory installed filter screen as approved.

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. The following mailbox quantities are for Contractor's information only: 10 small mailboxes, 0 medium mailboxes, and 0 large mailboxes.

ITEM 585. RIDE QUALITY FOR PAVEMENT SURFACES

Ride quality requirements are waived.

ITEM 610. ROADWAY ILLUMINATION ASSEMBLIES

For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holder as shown on the Texas Department of Transportation (TxDOT) Material Producer List. Category is "Roadway Illumination and Electrical Supplies." Fuse holder is shown on list under Items 610 & 620. Provide 10 amp time delay fuses.

Fabricate steel roadway illumination poles in accordance with TxDOT standards RIP-2019 (Roadway Illumination Poles -2019). Poles fabricated according to RIP-2019 require no shop drawings.

Alternate designs to RIP-2019 or the use of aluminum to fabricate poles will require the submission of shop drawings electronically.

For instructions on submitting shop drawings electronically go to ftp://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/bus/bridge/e_submit_guide.pdf

ITEM 618. CONDUIT

Furnish couplings and connections that are made wrench tight. All conduit must be brought into a ground or junction box and elbowed unless otherwise shown on the plans.

Place conduit in an area not exceeding 2 ft. in any direction from a straight line between terminal points. The minimum depth of the conduit should be 2 ft. except when crossing a roadway where

the depth should not be more than 3 ft. nor less than 1 ft. below the bottom of the base material when placed by the jacking or boring method.

ITEM 620. ELECTRICAL CONDUCTORS

For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holder as shown on the Material Producer List found on the TxDOT web site. Category is "Roadway Illumination and Electrical Supplies."
Fuse holder is shown on list under Items 610 & 620. Provide 10 amp time delay fuses.

ITEM 624. GROUND BOXES

All ground boxes will be precast polymer concrete of the size and type specified on the plans.

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 Longview Maintenance Section located at 4549A W LP 281, Longview TX 75604.

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.

Project Number: **Sheet 3G**

County: Gregg **Control:** 0545-01-014

Highway: SH 135

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.

ITEM 666. RETROREFLECTORIZED PAVEMENT MARKINGS

A pre-striping meeting with the District Traffic Engineer is required.

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.

Apply hot to the pavement surface thermoplastic compound for arrows, 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.

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.

Static lane closures are required for all profile stripe operations. These operations will require a pilot car for all two-lane roadways, unless otherwise directed.

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 3076. DENSE-GRADED HOT-MIX ASPHALT

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

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

Target laboratory molded density is 97%.

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

Give the TxDOT 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."

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.

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.

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

Project Number: **Sheet 3H**

County: Gregg **Control:** 0545-01-014

Highway: SH 135

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.

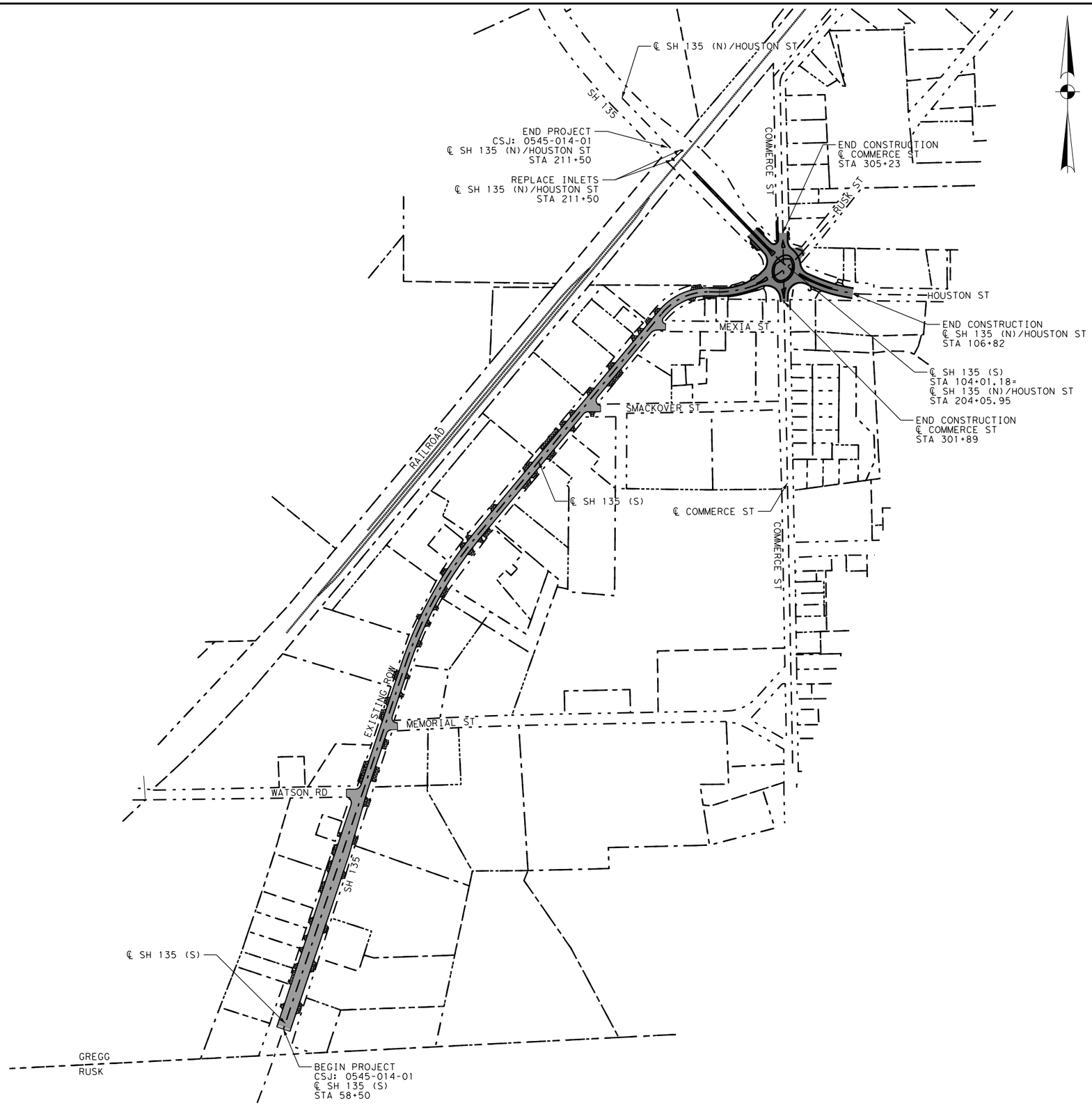
On Table 1, under 3077.2.1.3, the Sand equivalent, % Min is voided and not replaced. The minimum percent for the sand equivalent must be 45 for the combined aggregate.

ITEM 6001. PORTABLE CHANGEABLE MESSAGE SIGN

Provide 3 electronic Portable Changeable Message Sign (PCMS) units adjacent to the mainlanes in advance of each lane closure. PCMS units must be in accordance with Section 6F.60 of the TMUTCD, applicable standards and special provisions. Depending on conditions, one or all message boards may have to be relocated during operations. Messages will be in accordance with current BC standards. When not in use, remove PCMS units from the right of way. Measurement and payment for the PCMS noted above will be in accordance with Item 6001. The term "operational" is defined as displaying a message in direct support of current project operations as approved and directed by the Engineer.

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.



100% SUBMITTAL

02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoff

0 150 250 500

REV. NO.	DATE	DESCRIPTION	BY

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Land Surveying Branch No. 10046702
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Houston, Texas 77040
713.462.3242
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Texas Department of Transportation

PROJECT LAYOUT

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	4

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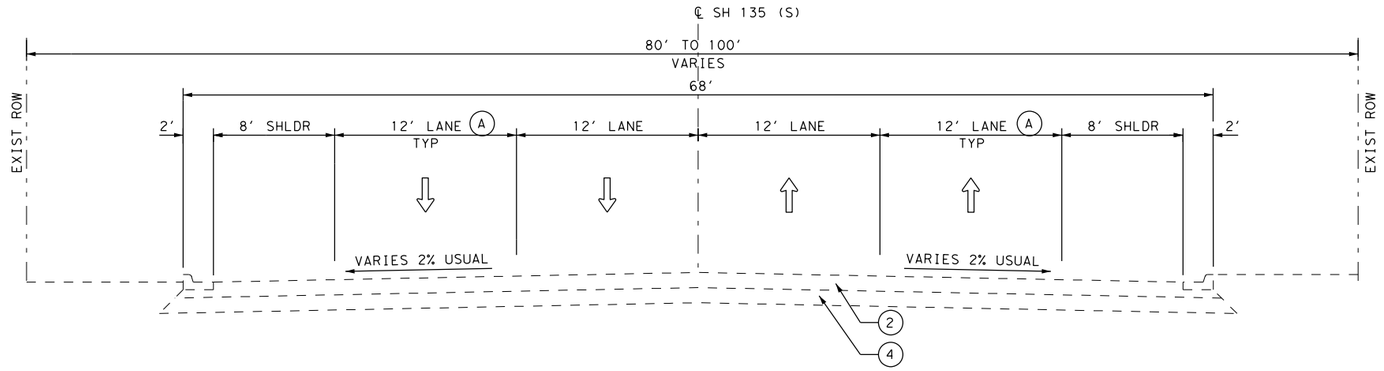
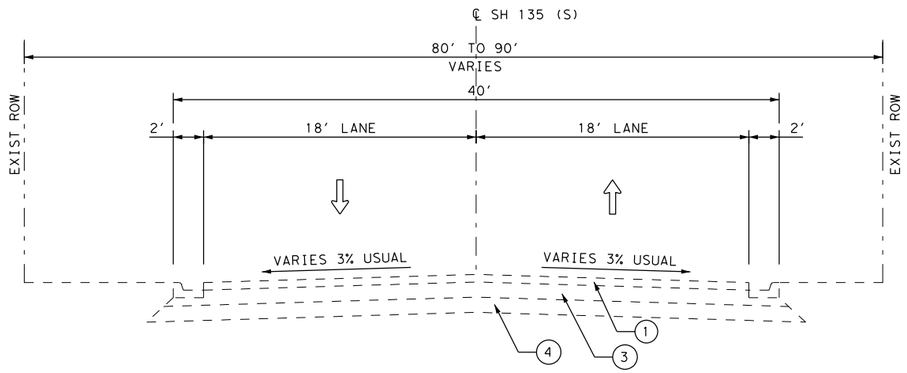
LEGEND

(1) EXISTING 3" ASPHALT
(2) EXISTING 6" ASPHALT
(3) EXISTING 6" CONCRETE
(4) EXISTING 6" LIME TREATED SUBGRADE



EXISTING TYPICAL SECTION

SH 135 (S) - STA 58+50 TO STA 70+50
(A) LANE WIDTH VARIES FROM 12' TO 0' FROM STA 67+30 TO 70+50



EXISTING TYPICAL SECTION

SH 135 (S) - STA 70+50 TO STA 100+00

100% SUBMITTAL

02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoff

0 2.5 5 10(H)
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Texas Department of Transportation

EXISTING TYPICAL SECTIONS

SH 135

SHEET **1** OF **3**

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**5**

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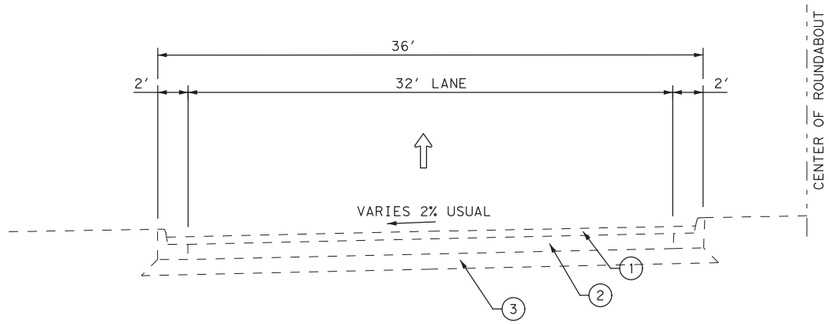
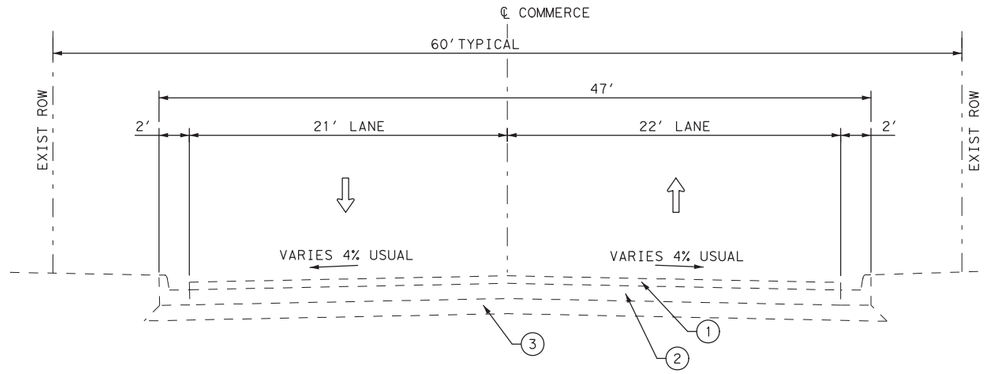


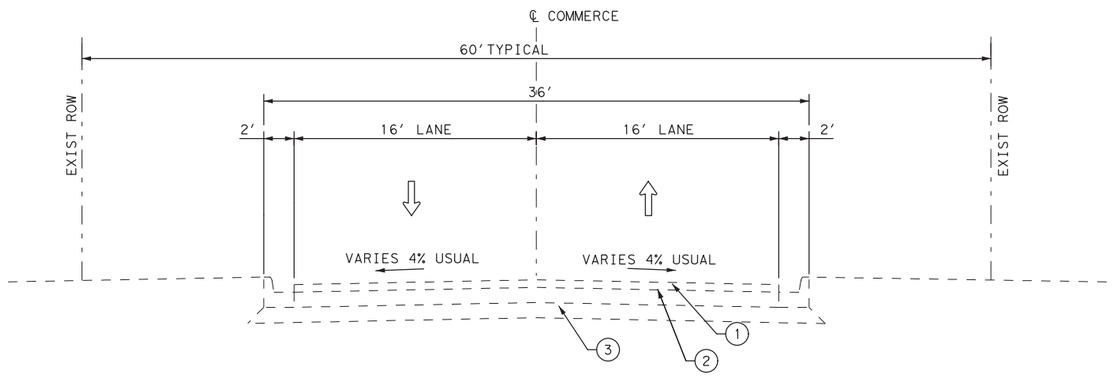
EXISTING TYPICAL SECTION

ROUNDABOUT
135(S) - STA 103+28 TO 104+70
135(N)/HOUSTON ST. - STA 203+64 TO STA 205+04
COMMERCE ST. - STA 303+05 TO STA 304+45



EXISTING TYPICAL SECTION

NORTH OF TRAFFIC CIRCLE
COMMERCE ST. - STA 304+45 TO STA 305+23



EXISTING TYPICAL SECTION

SOUTH OF TRAFFIC CIRCLE
COMMERCE ST. - STA 301+89 TO STA 302+52

LEGEND
1. EXISTING 3" ASPHALT
2. EXISTING 6" CONCRETE
3. EXISTING 6" LIME TREATED SUBGRADE

100% SUBMITTAL

STATE OF TEXAS
BORIVOJE P. DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

1" = 10'(H) 0 2.5 5 10(H)
1" = 5'(V) 0 2.5 5(V)

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EXISTING TYPICAL SECTIONS

SH 135

SHEET **2** OF **3**

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**6**

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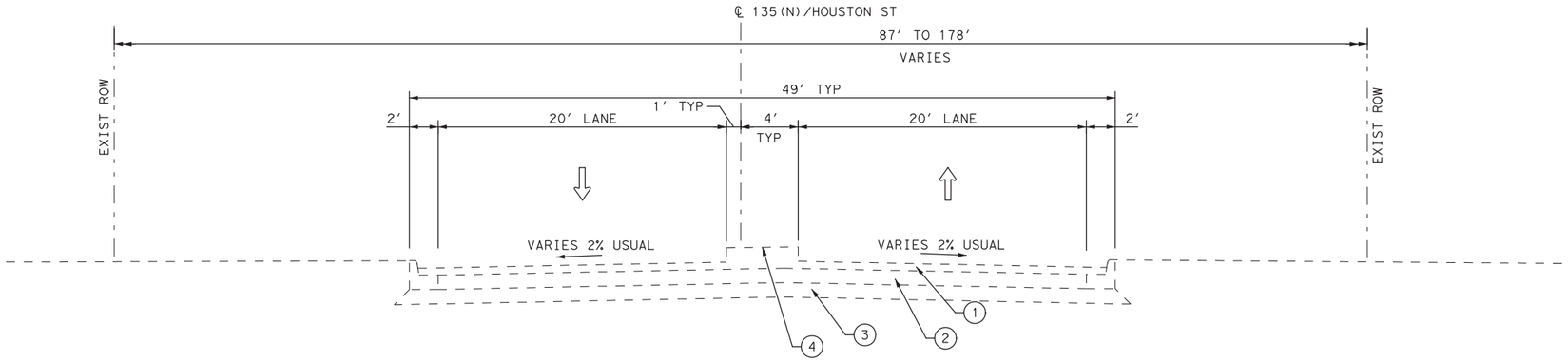
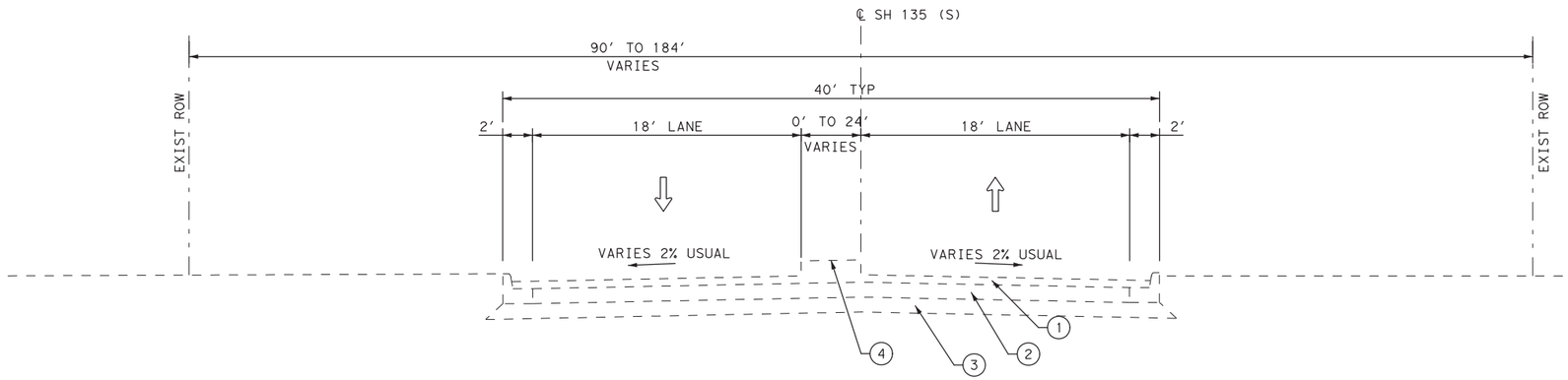
LEGEND
1. EXISTING 3" ASPHALT
2. EXISTING 6" CONCRETE
3. EXISTING 6" LIME TREATED SUBGRADE
4. EXISTING 5" TALL SPLITTER ISLAND



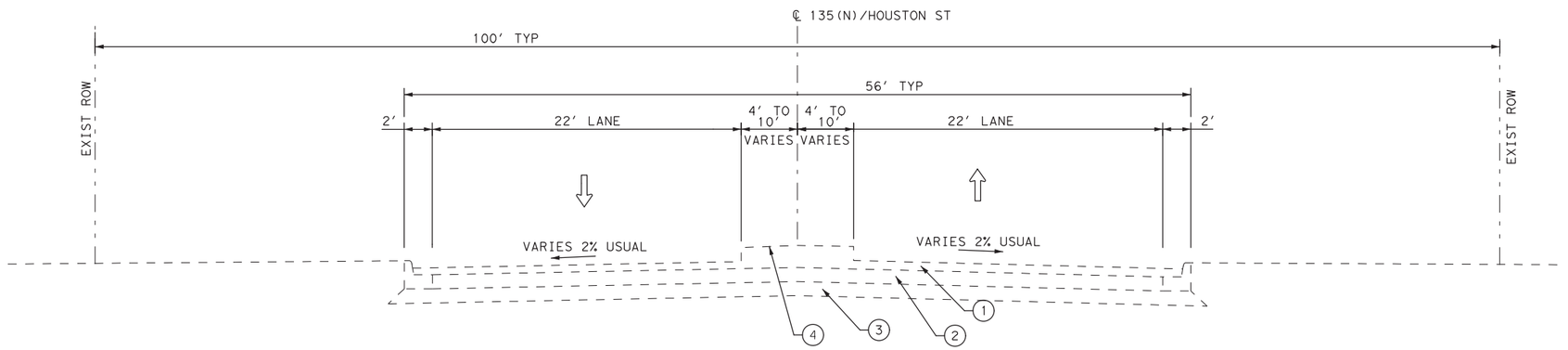
EXISTING TYPICAL SECTION

℄ 135(N)/HOUSTON ST STA 200+68 TO STA 203+63



EXISTING TYPICAL SECTION

℄ SH 135 (S) STA 100+00 TO STA 103+26



EXISTING TYPICAL SECTION

℄ 135(N)/HOUSTON ST STA 205+04 TO STA 206+41

100% SUBMITTAL

STATE OF TEXAS
BORIVOJE P. DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

1" = 10'(H) 0 2.5 5 10(H)
1" = 5'(V) 0 2.5 5(V)

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EXISTING TYPICAL SECTIONS

SH 135

SHEET **3** OF **3**

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**7**

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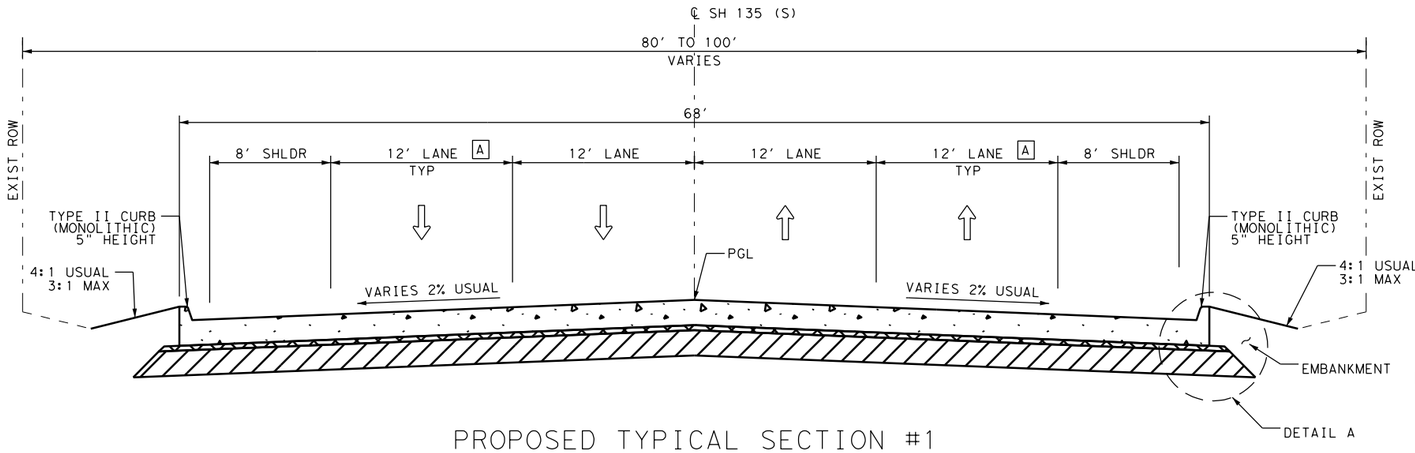
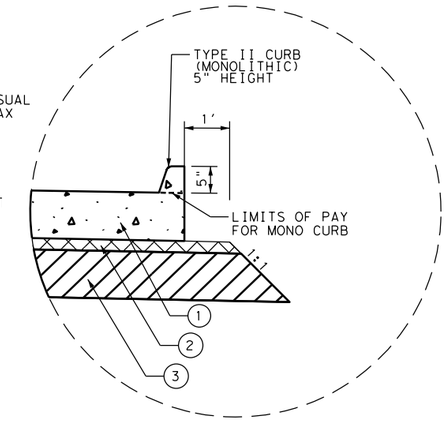


PROPOSED TYPICAL SECTION #1

SH 135 (S) - STA 58+50 TO STA 70+60

A LANE WIDTH VARIES FROM 12' TO 0' FROM STA 67+30 TO STA 70+60



DETAIL A EDGE OF PAVEMENT

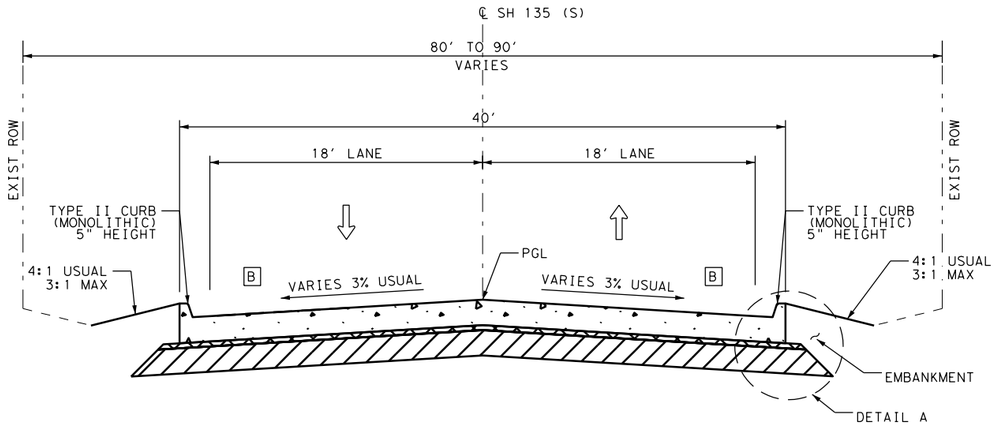
N.T.S.

LEGEND

1. 10" CONC PVMT (JOINTED-CPCD)(10")
2. 4" SP MIXES SP-C PG64-22
3. 8" QUICK LIME OR CEMENT TREAT

NOTE:

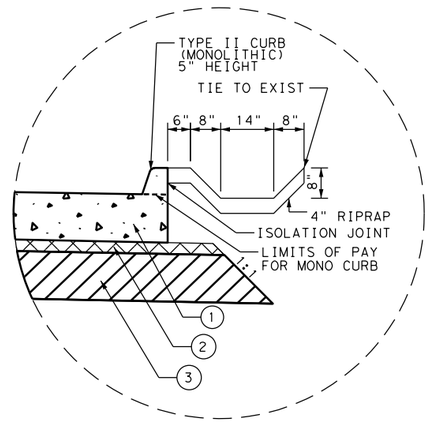
1. TxDOT WILL MAKE FIELD DECISION TO USE EITHER QUICK LIME OR CEMENT TREATMENT FOR SUBGRADE.



PROPOSED TYPICAL SECTION #2

SH 135 (S) - STA 70+60 TO STA 101+85

B SLOPE VARIES FROM 2% TO 3% FROM STA 70+10 TO STA 70+60. SLOPE VARIES FROM 3% TO 2% FROM STA 96+60 TO STA 97+00.



DRAINAGE FLUME DETAIL

N.T.S.

NOTE:

1. 6" FLAT BUFFER CAN BE OMITTED WHEN NOT ADJACENT TO A CURB AND GUTTER SECTION.
2. EST QUANTITY = 0.39 SY RIPRAP PER LF OF FLUME
3. REFER TO 135S STORM DRAIN P&P SHEET 4 AND SH 135 INTERSECTION LAYOUT SHEET 3 FOR DRAINAGE FLUME LIMITS.

100% SUBMITTAL

02/28/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED PROFESSIONAL ENGINEER

Michael Verhoef

0 2.5 5 10(H)
0 2.5 5(V)

REV. NO.	DATE	DESCRIPTION	BY

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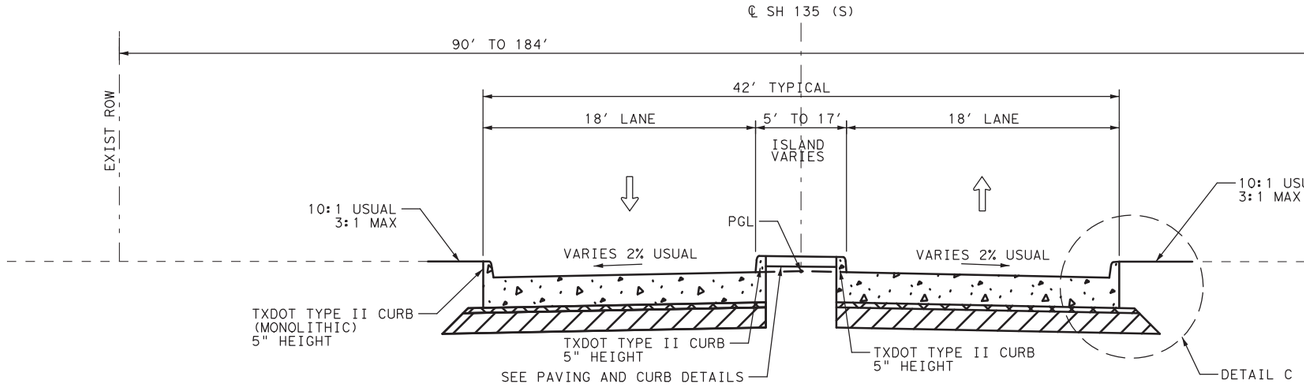
Texas Department of Transportation

PROPOSED TYPICAL SECTIONS

SH 135

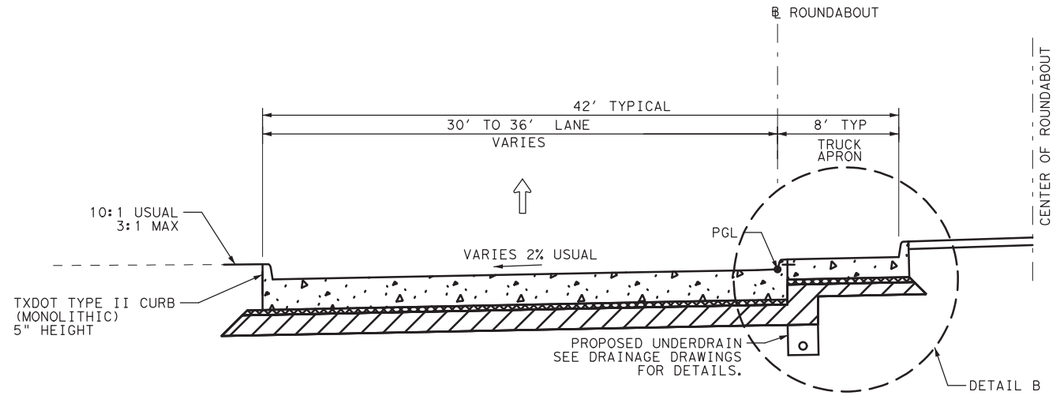
SHEET **1** OF **3**

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**8**



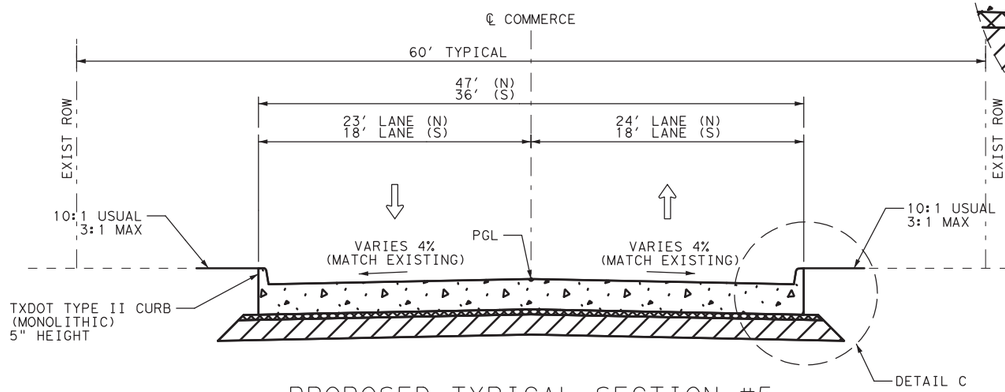
PROPOSED TYPICAL SECTION #3

SH 135 (S) - STA 101+85 TO STA 102+92



PROPOSED TYPICAL SECTION #4

ROUNDABOUT - STA 10+00 TO STA 13+67.88
SEE ROUNDABOUT DETAILS
COMMERCE ST. - STA 302+52 TO STA 304+45
135(N)/HOUSTON ST. - STA 203+63 TO STA 205+04
135(S) - STA 103+26 TO END

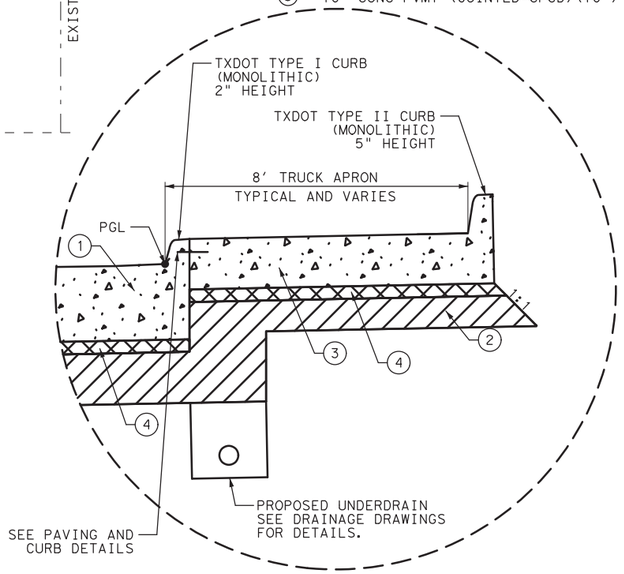


PROPOSED TYPICAL SECTION #5

COMMERCE STREET (S) - STA 301+88 TO STA 302+55
COMMERCE STREET (N) - STA 304+45 TO STA 305+22
(N) = COMMERCE STREET NORTH OF ROUNDABOUT
(S) = COMMERCE STREET SOUTH OF ROUNDABOUT

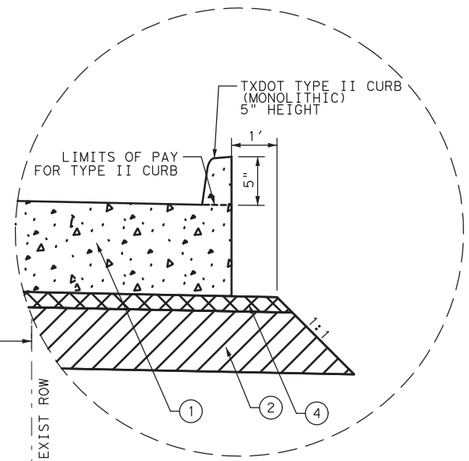
LEGEND

1. 12" CONC PVMT (JOINTED-CPCD)(12")
2. 8" QUICK LIME OR CEMENT TREAT
3. 8" CONC PVMT (JOINTED-CPCD)(8")
4. 4" SP MIXES SP-C PG64-22
5. 10" CONC PVMT (JOINTED-CPCD)(10")



DETAIL B TRUCK APRON

N.T.S.



DETAIL C EDGE OF PAVEMENT

N.T.S.

TYPE II CURB (MONOLITHIC) 5" HEIGHT

100% SUBMITTAL

STATE OF TEXAS
BORIVOJE P. DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/28/2022

1" = 10'(H) 0 2.5 5 10(H)
1" = 5'(V) 0 2.5 5(V)

REV. NO.	DATE	DESCRIPTION	BY

PARSONS
TBPELS Registration No. F-1481
1301 West President George Bush Highway, Suite 350
Richardson, Texas 75080

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

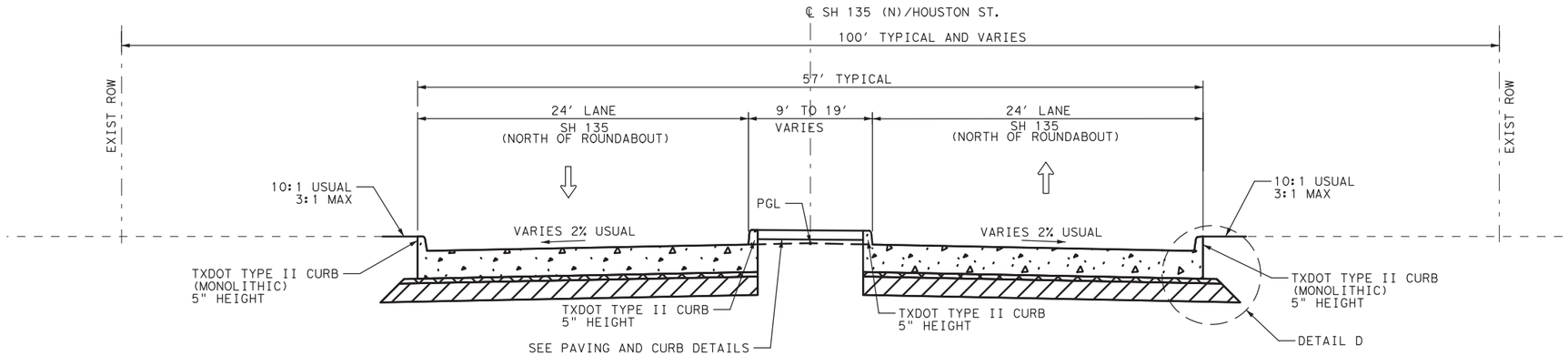
PROPOSED TYPICAL SECTIONS

SH 135

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	9

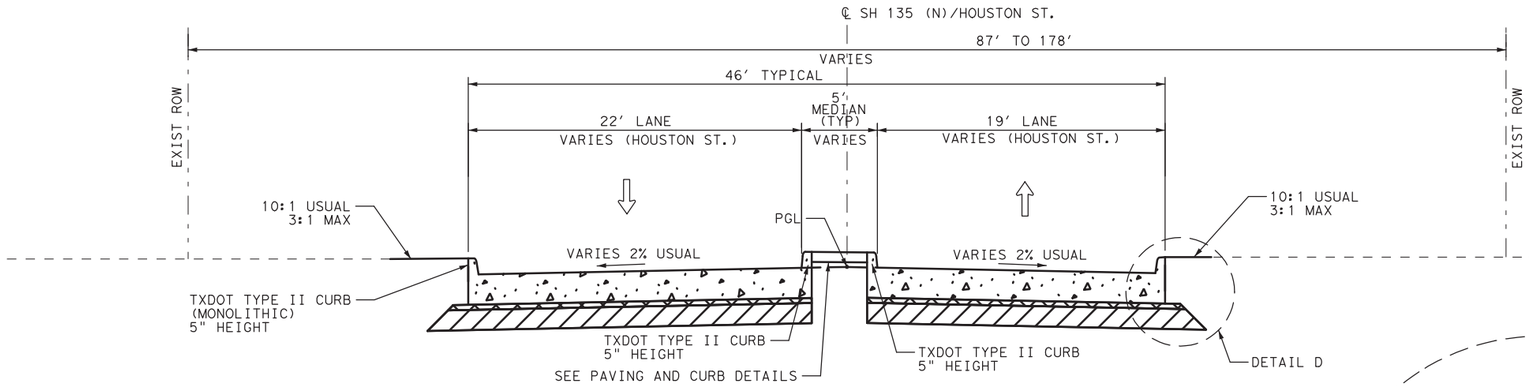
LEGEND

1. 12" CONC PVMT (JOINTED-CPCD)(12")
2. 8" QUICK LIME OR CEMENT TREAT
3. 8" CONC PVMT (JOINTED-CPCD)(8")
4. 4" SP MIXES SP-C PG64-22
5. 10" CONC PVMT (JOINTED-CPCD)(10")



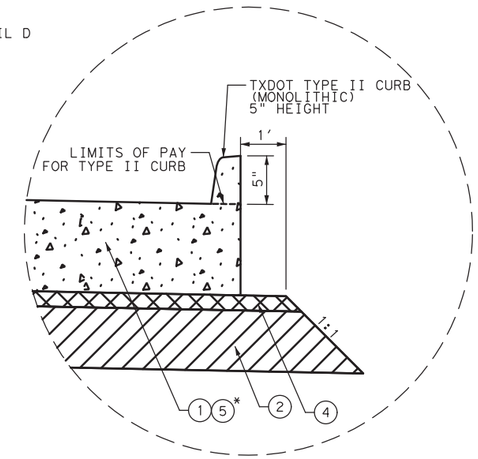
PROPOSED TYPICAL SECTION #6

℄ SH 135 (N)/HOUSTON ST.- STA 204+94.68 TO STA 206+41.47



PROPOSED TYPICAL SECTION #7

℄ SH 135 (N)/HOUSTON ST.- STA 200+68.12 TO STA 203+40.39



DETAIL D EDGE OF PAVEMENT

N.T.S.

TYPE II CURB (MONOLITHIC) 5" HEIGHT

*NOTE: USE (5) FOR STA 200+68.12 TO 202+74.22

100% SUBMITTAL

STATE OF TEXAS
BORIVOJE P DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/28/2022

1" = 10'(H) 0 2.5 5 10(H)
1" = 5'(V) 0 2.5 5(V)

REV. NO.	DATE	DESCRIPTION	BY

PARSONS
TBPELS Registration No. F-1481
1301 West President George Bush Highway, Suite 350
Richardson, Texas 75080

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

PROPOSED TYPICAL SECTIONS

SH 135

SHEET **3** OF **3**

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.
6	TEXAS	F 2022(024)		SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**10**

2/28/2022 11:22:23 AM
...\Roadway\Sheets\135_GEN-PTYP-02
...\Roadway\Sheets\135_GEN-PTYP-02

CONTROLLING PROJECT ID 0545-01-014 **DISTRICT** Tyler **COUNTY** Gregg
HIGHWAY SH 135

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0545-01-014**			
		PROJECT ID					
		COUNTY		**Gregg**			
		HIGHWAY		**SH 135**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6001	PREPARING ROW	AC	0.220		0.220	
	104-6001	REMOVING CONC (PAV)	SY	20,246.000		20,246.000	
	104-6011	REMOVING CONC (MEDIANS)	SY	434.000		434.000	
	104-6015	REMOVING CONC (SIDEWALKS)	SY	137.000		137.000	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	3,697.000		3,697.000	
	104-6022	REMOVING CONC (CURB AND GUTTER)	LF	7,579.000		7,579.000	
	104-6026	REMOVE CONC (GUTTER)	LF	5,113.000		5,113.000	
	105-6039	REMOVE STAB BASE AND ASPH PAV (6"-20")	SY	11,024.000		11,024.000	
	110-6001	EXCAVATION (ROADWAY)	CY	19,310.000		19,310.000	
	132-6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	192.000		192.000	
	158-6003	SPEC EXCAV WORK (HYD EXCAVATOR)	HR	50.000		50.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	1,222.000		1,222.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)	SY	1,822.000		1,822.000	
	164-6054	BOND FBR MTRX SEED (PERM)(RURAL)(SAND)	SY	1,822.000		1,822.000	
	260-6004	LIME (QUICKLIME (DRY))	TON	442.000		442.000	
	260-6073	LIME TRT (SUBGRADE)(8")	SY	18,428.000		18,428.000	
	275-6001	CEMENT	TON	277.000		277.000	
	275-6010	CEMENT TREAT (SUBGRADE) (8")	SY	18,428.000		18,428.000	
	360-6018	CONC PVMT (JOINTED - CPCD) (8")	SY	362.000		362.000	
	360-6020	CONC PVMT (JOINTED - CPCD) (10")	SY	23,995.000		23,995.000	
	360-6022	CONC PVMT (JOINTED - CPCD) (12")	SY	4,086.000		4,086.000	
	360-6067	CONC PVMT (JOINTED-CPCD)(HES)(10")	SY	7,252.000		7,252.000	
	360-6083	CONC PVMT (JC) (TRANSITION SLAB)	SY	120.000		120.000	
	400-6005	CEM STABIL BKFL	CY	1,200.000		1,200.000	
	400-6007	CUT & RESTORE CONC PAVING	SY	56.000		56.000	
	400-6008	CUT & RESTORE ASPH PAVING	SY	518.000		518.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	3,449.000		3,449.000	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	200.000		200.000	
	420-6071	CL C CONC (COLLAR)	EA	6.000		6.000	
	432-6022	RIPRAP (STONE COMMON)(DRY)(6 IN)	CY	1.000		1.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	2,015.000		2,015.000	
	464-6006	RC PIPE (CL III)(27 IN)	LF	35.000		35.000	
	464-6007	RC PIPE (CL III)(30 IN)	LF	131.000		131.000	
	464-6008	RC PIPE (CL III)(36 IN)	LF	479.000		479.000	
	464-6009	RC PIPE (CL III)(42 IN)	LF	1,856.000		1,856.000	
	464-6010	RC PIPE (CL III)(48 IN)	LF	303.000		303.000	
	465-6006	JCTBOX(COMPL)(PJB)(4FTX4FT)	EA	1.000		1.000	

ESTIMATE AND QUANTITY SHEET

DISTRICT	COUNTY	CCSJ	SHEET
Tyler	Gregg	0545-01-014	11

CONTROLLING PROJECT ID 0545-01-014 **DISTRICT** Tyler **COUNTY** Gregg
HIGHWAY SH 135

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0545-01-014**			
		PROJECT ID					
		COUNTY		**Gregg**			
		HIGHWAY		**SH 135**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	465-6010	JCTBOX(COMPL)(PJB)(5FTX6FT)	EA	1.000		1.000	
	465-6011	JCTBOX(COMPL)(PJB)(6FTX6FT)	EA	2.000		2.000	
	465-6021	INLET (COMPL)(PCO)(5FT)(NONE)	EA	4.000		4.000	
	465-6022	INLET (COMPL)(PCO)(5FT)(LEFT)	EA	10.000		10.000	
	465-6023	INLET (COMPL)(PCO)(5FT)(RIGHT)	EA	10.000		10.000	
	465-6024	INLET (COMPL)(PCO)(5FT)(BOTH)	EA	17.000		17.000	
	465-6149	INLET (COMPL)(PAZD)(SL)(3FTX3FT)	EA	2.000		2.000	
	465-6158	INLET(COMPL)(PAZD)(FG)(3FTX3FT-3FTX3FT)	EA	1.000		1.000	
	465-6173	MANH (COMPL)(TY A)	EA	2.000		2.000	
	465-6341	INLET (COMPL) (EXT) (TY CI)	EA	9.000		9.000	
	467-6006	SET (TY I) (24 IN) (4: 1) (C)	EA	1.000		1.000	
	496-6002	REMOV STR (INLET)	EA	32.000		32.000	
	496-6007	REMOV STR (PIPE)	LF	1,820.000		1,820.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	18.000		18.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	200.000		200.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	200.000		200.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	200.000		200.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	200.000		200.000	
	506-6029	EARTHWORK (EROSN & SEDMT CONT, IN VEH)	CY	200.000		200.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	300.000		300.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	300.000		300.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	1,000.000		1,000.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1,000.000		1,000.000	
	508-6001	CONSTRUCTING DETOURS	SY	2,210.000		2,210.000	
	512-6021	PORT CTB (DES SOURCE)(LOW PROF)(TY 1)	LF	1,320.000		1,320.000	
	512-6022	PORT CTB (DES SOURCE)(LOW PROF)(TY 2)	LF	360.000		360.000	
	512-6033	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	2,920.000		2,920.000	
	512-6034	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	380.000		380.000	
	512-6045	PORT CTB (STKPL)(LOW PROF)(TY 1)	LF	1,320.000		1,320.000	
	512-6046	PORT CTB (STKPL)(LOW PROF)(TY 2)	LF	360.000		360.000	
	529-6001	CONC CURB (TY I)	LF	368.000		368.000	
	529-6005	CONC CURB (MONO) (TY II)	LF	6,888.000		6,888.000	
	530-6017	DRIVEWAYS (CONC) (HES)	SY	6,382.000		6,382.000	
	536-6002	CONC MEDIAN	SY	1,627.000		1,627.000	
	545-6012	CRASH CUSH ATTEN (INSTL)(R)(N)(TL2)	EA	2.000		2.000	
	556-6008	PIPE UNDERDRAINS (TY 8) (6")	LF	327.000		327.000	

ESTIMATE AND QUANTITY SHEET

DISTRICT	COUNTY	CCSJ	SHEET
Tyler	Gregg	0545-01-014	11A

CONTROLLING PROJECT ID 0545-01-014 **DISTRICT** Tyler **COUNTY** Gregg
HIGHWAY SH 135

			CONTROL SECTION JOB		**0545-01-014**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00061441**		
			COUNTY		**Gregg**		
			HIGHWAY		**SH 135**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	610-6288	IN RD IL (TY SA) 50T-10 (400W EQ) LED	EA	20.000		20.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF	1,795.000		1,795.000	
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	325.000		325.000	
	620-6007	ELEC CONDR (NO.8) BARE	LF	2,270.000		2,270.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	5,520.000		5,520.000	
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	10.000		10.000	
	628-6298	ELC SRV TY T 120/240 000(NS)GS(L)SP(O)	EA	5.000		5.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	34.000		34.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	16.000		16.000	
	662-6048	WK ZN PAV MRK REMOV (REFL) TY I-C	EA	429.000		429.000	
	662-6050	WK ZN PAV MRK REMOV (REFL) TY II-A-A	EA	340.000		340.000	
	662-6056	WK ZN PAV MRK REMOV (TRAF BTN) TY W	EA	1,285.000		1,285.000	
	662-6058	WK ZN PAV MRK REMOV (TRAF BTN) TY Y	EA	1,018.000		1,018.000	
	662-6061	WK ZN PAV MRK REMOV (W)4"(DOT)	LF	261.000		261.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	5,313.000		5,313.000	
	662-6071	WK ZN PAV MRK REMOV (W)8"(SLD)	LF	1,880.000		1,880.000	
	662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	56.000		56.000	
	662-6092	WK ZN PAV MRK REMOV (W)36"(YLD TRI)	EA	59.000		59.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	5,771.000		5,771.000	
	666-6006	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	191.000		191.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	82.000		82.000	
	666-6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	38.000		38.000	
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF	330.000		330.000	
	666-6224	PAVEMENT SEALER 4"	LF	8,898.000		8,898.000	
	666-6237	PAVEMENT SEALER (LNDP ARROW)	EA	2.000		2.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	396.000		396.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	2,493.000		2,493.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	10,450.000		10,450.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA	2.000		2.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	182.000		182.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	21.000		21.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF	8,898.000		8,898.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	2.000		2.000	
	3076-6040	D-GR HMA TY-D PG70-22	TON	139.000		139.000	
	3077-6011	SP MIXESSP-CPG64-22	TON	6,299.000		6,299.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	598.000		598.000	
	6185-6002	TMA (STATIONARY)	DAY	431.000		431.000	

ESTIMATE AND QUANTITY SHEET

DISTRICT	COUNTY	CCSJ	SHEET
Tyler	Gregg	0545-01-014	11B

CONTROLLING PROJECT ID 0545-01-014 **DISTRICT** Tyler **COUNTY** Gregg
HIGHWAY SH 135

			CONTROL SECTION JOB	**0545-01-014**		TOTAL EST.	TOTAL FINAL
			PROJECT ID				
			COUNTY	**Gregg**			
			HIGHWAY	**SH 135**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	6185-6005	TMA (MOBILE OPERATION)	DAY	431.000		431.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

ESTIMATE AND QUANTITY SHEET

DISTRICT	COUNTY	CCSJ	SHEET
Tyler	Gregg	0545-01-014	11C

BASIS OF ESTIMATE						
ITEM	DESCRIPTION	RATE	CSJ 0545-01-014 AMOUNT	UNIT	PROJECT TOTAL	PAY UNIT
260*	LIME (QUICKLIME (DRY))	48LB/SY/8IN	18428	SY	442	TON
275*	CEMENT	30LB/SY/8IN	18428	SY	277	TON
360	CONC PVMT (JOINTED - CPCD) (8")	1SY/SY	362	SY	362	SY
360	CONC PVMT (JOINTED - CPCD) (10")	1SY/SY	23995	SY	23995	SY
360	CONC PVMT (JOINTED - CPCD) (12")	1SY/SY	4086	SY	4086	SY
3077	SUPERPAVE MIXTURES SP-C PG 64-22	440LB/SY/4IN	28632	SY	6299	TON
500	MOBILIZATION		1	LS	1	LS
502	BARRICADES, SIGNS AND TRAFFIC HANDLING		15	MO	15	MO

* TXDOT WILL MAKE FIELD DECISION TO USE EITHER QUICK LIME OR CEMENT TREATMENT FOR SUBGRADE. BASIS AND ESTIMATE ARE CURRENTLY SPLIT EQUALLY.

SUMMARY OF WORK ZONE PAVEMENT MARKINGS

STATION	ITEM 662 WK ZN PAV MRK REMOV (REFL) TY I-C EA	ITEM 662 WK ZN PAV MRK REMOV (REFL) TY II-A-A EA	ITEM 662 WK ZN PAV MRK REMOV (TRAF BTN) TY W EA	ITEM 662 WK ZN PAV MRK REMOV (TRAF BTN) TY Y EA	ITEM 662 WK ZN PAV MRK REMOV (W)4" (DOT) LF	ITEM 662 WK ZN PAV MRK REMOV (W)4" (SLD) LF	ITEM 662 WK ZN PAV MRK REMOV (W)8" (SLD) LF	ITEM 662 WK ZN PAV MRK REMOV (W)24" (SLD) LF	ITEM 662 WK ZN PAV MRK REMOV (W)36" (YLD TRI) EA	ITEM 662 WK ZN PAV MRK REMOV (Y)4" (SLD) LF
PHASE 1A										
STA 40+00 TO STA 67+00										
STA 67+00 TO STA 89+00										
STA 89+00 TO ROUNDABOUT										
PHASE 1B										
STA 40+00 TO STA 67+00	63	53	188	158						
STA 67+00 TO STA 89+00	10	110	29	330						
STA 89+00 TO ROUNDABOUT		71		213						
PHASE 2										
STA 40+00 TO STA 67+00	171	88	514	263						
STA 67+00 TO STA 89+00	110	18	330	54						
STA 89+00 TO ROUNDABOUT	75		224						11	
PHASE 3										
ROUNDABOUT AND APPROACHES						2178	940	28	5	1052
PHASE 4										
ROUNDABOUT AND APPROACHES						2178	940	28	5	1052
PHASE 5A										
ROUNDABOUT AND APPROACHES					129	881			27	2187
PHASE 5B & 5C										
ROUNDABOUT AND APPROACHES					132	76			11	1480
CSJ 0545-01-014 SUBTOTAL	429	340	1285	1018	261	5313	1880	56	59	5771
PROJECT TOTAL	429	340	1285	1018	261	5313	1880	56	59	5771

100% SUBMITTAL

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

SH 135
QUANTITY SUMMARY SHEETS

TRAFFIC CONTROL

SHEET 1 OF 10

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	12

SUMMARY OF TRAFFIC CONTROL ITEMS

STATION	ITEM 502 BARRICADES, SIGNS AND TRAFFIC HANDLING MO	ITEM 508 CONSTRUCTING DETOURS SY	ITEM 512 PORT CTB (DES SOURCE)(LOW PROF)(TY 1) LF	ITEM 512 PORT CTB (DES SOURCE)(LOW PROF)(TY 2) LF	ITEM 512 PORT CTB (MOVE)(LOW PROF)(TY 1) LF	ITEM 512 PORT CTB (MOVE)(LOW PROF)(TY 2) LF	ITEM 512 PORT CTB (STKPL)(LOW PROF)(TY 1) LF	ITEM 512 PORT CTB (STKPL)(LOW PROF)(TY 2) LF
PHASE 1A								
STA 40+00 TO STA 67+00								
STA 67+00 TO STA 89+00								
STA 89+00 TO ROUNDABOUT								
PHASE 1B								
STA 40+00 TO STA 67+00			400	100			160	
STA 67+00 TO STA 89+00			420	120				
STA 89+00 TO ROUNDABOUT		100	500	80				
PHASE 2								
STA 40+00 TO STA 67+00					100	60		60
STA 67+00 TO STA 89+00				20	720	120		180
STA 89+00 TO ROUNDABOUT				40	320	80		80
PHASE 3								
ROUNDABOUT AND APPROACHES		1850			460	40		
PHASE 4								
ROUNDABOUT AND APPROACHES		260			1160	40	1000	
PHASE 5A								
ROUNDABOUT AND APPROACHES					160	40	160	40
PHASE 5B & 5C								
ROUNDABOUT AND APPROACHES								
CSJ 0545-01-014 SUBTOTAL	18	2210	1320	360	2920	380	1320	360
PROJECT TOTAL	18	2210	1320	360	2920	380	1320	360

PORTABLE CHANGEABLE MESSAGE SIGN

PHASE	ITEM 6001 PORTABLE CHANGEABLE MESSAGE SIGN DAY
PHASE 1A	
PHASE 1B	86
PHASE 2	87
PHASE 3	220
PHASE 4	
PHASE 5A	205
PHASE 5B & 5C	
CSJ 0545-01-014 SUBTOTAL	598
PROJECT TOTAL	598

PHASE 1B: 1 BOARD FOR 86 DAYS
PHASE 2: 1 BOARD FOR 87 DAYS
PHASE 3: 5 BOARDS FOR 44 DAYS
PHASE 5A: 5 BOARDS FOR 41 DAYS

TRUCK MOUNTED ATTENUATOR

PHASE	ITEM 6185 TMA (STATIONARY) DAY	ITEM 6185 TMA (MOBILE OPERATION) DAY
PHASE 1A		
PHASE 1B	172	172
PHASE 2	174	174
PHASE 3	44	44
PHASE 4		
PHASE 5A	41	41
PHASE 5B & 5C		
CSJ 0545-01-014 SUBTOTAL	431	431
PROJECT TOTAL	431	431

NOTES:

1. TEMPORARY PAVEMENT SHALL BE PAID FOR USING ITEM NUMBER 508 6001 (CONSTRUCTING DETOURS).

100% SUBMITTAL

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

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SH 135
QUANTITY SUMMARY SHEETS
TRAFFIC CONTROL

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	13

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NOTES:

1. ASPHALT DRIVEWAY REMOVALS SHALL BE PAID FOR USING ITEM NUMBER 105 6039 REMOVE STAB BASE AND ASPH PAV (6"-20").

SUMMARY OF REMOVALS

STATION	ITEM 104 REMOVING CONC (PAV) SY	ITEM 104 REMOVING CONC (MEDIANS) SY	ITEM 104 REMOVING CONC (SIDEWALKS) SY	ITEM 104 REMOVING CONC (DRIVEWAYS) SY	ITEM 104 REMOVING CONC (CURB AND GUTTER) LF	ITEM 104 REMOVE CONC (GUTTER) LF	ITEM 105 REMOVE STAB BASE AND ASPH PAV (6"-20") SY	ITEM 496 REMOV STR (INLET) EA	ITEM 496 REMOV STR (PIPE) LF
STA 40+00 TO STA 67+00				273	804	896	6602	1	
STA 67+00 TO STA 89+00	7578			1676	2422	2011	3474	7	636
STA 89+00 TO STA 208+00	12668	188	137	1748	3742	2206	948	19	1184
STA 208+00 TO STA 215+00		246			611			5	
CSJ 0545-01-014 SUBTOTAL	20246	434	137	3697	7579	5113	11024	32	1820
PROJECT TOTAL	20246	434	137	3697	7579	5113	11024	32	1820

100% SUBMITTAL

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
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TEXAS REGISTERED ENGINEERING FIRM F-9073

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SH 135
QUANTITY SUMMARY SHEETS
REMOVALS

SHEET 3 OF 10

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	14

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ROADWAY SUMMARY

LOCATION	ITEM 100	ITEM 110	ITEM 132	ITEM 160	ITEM 164		ITEM 260		ITEM 275		ITEM 360		
	PREPARING ROW	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (ORD COMP) (TY C)	FURNISHING AND PLACING TOPSOIL (4")	BROADCAST SEED (TEMP) (WARM)	BOND FBR MTRX SEED (PERM) (RURAL) (SAND)	LIME (QUICKLIME) (DRY)	LIME TRT (SUBGRADE) (8")	CEMENT	CEMENT TREAT SUBGRADE (8")	CONC PVMT (JOINTED - CPCD) (8")	CONC PVMT (JOINTED - CPCD) (10")	CONC PVMT (JOINTED - CPCD) (12")
	AC	CY	CY	SY	SY	SY	TON	SY	TON	SY	SY	SY	SY
STA 58+50 TO STA 67+00		3934	22		150	150	82	3400	51	3400		6171	
STA 67+00 TO STA 78+00	0.22	3934	22		150	150	78	3248	49	3248		5872	
STA 78+00 TO STA 89+00		3934	22		150	150	63	2623	39	2623		4725	
STA 89+00 TO STA 100+00		3933	20		150	150	68	2850	43	2850		5368	
ROUNDABOUT AND APPROACHES		3575	106	1222	1222	1222	151	6307	95	6307	362	1859	4086
CSJ 0545-01-014 SUBTOTAL	0.22	19310	192	1222	1822	1822	442	18428	277	18428	362	23995	4086
PROJECT TOTAL	0.22	19310	192	1222	1822	1822	442	18428	277	18428	362	23995	4086

ROADWAY SUMMARY

LOCATION	ITEM 360		ITEM 529		ITEM 530	ITEM 536	ITEM 545	ITEM 3076	ITEM 3077
	CONC PVMT (JOINTED-CPCD) (HES) (10")	CONC PVMT (JC) (TRANSITION SLAB)	CONC CURB (TYPE I)	CONC CURB (MONO) (TY II)	DRIVEWAY (CONC) (HES)	CONC MEDIAN	CRASH CUSH ATTEN (INSTL) (R) (N) (TL 2)	D-GR HMA TY-D PG70-22 (12") (PARKING LOT REPAIR)	SP MIXES SP-C PG64-22
	SY	SY	LF	LF	SY	SY	EA	TON	TON
STA 58+50 TO STA 67+00	2259	120		1082	875				1398*
STA 67+00 TO STA 78+00	1333			1472	1369				1292
STA 78+00 TO STA 89+00	1400			1461	1251				1040
STA 89+00 TO STA 100+50	1392			1421	1467				1181
ROUNDABOUT AND APPROACHES	868		368	1452	1420	1627	2	139	1388
CSJ 0545-01-014 SUBTOTAL	7252	120	368	6888	6382	1627	2	139	6299
PROJECT TOTAL	7252	120	368	6888	6382	1627	2	139	6299

* INCLUDED 40 TONS FOR INTERFACE BETWEEN EXISTING ASPHALT AND PROPOSED CONCRETE AT BEGINNING OF PROJECT. SEE ROADWAY P&P SHEET 1 AND CONCRETE PAVEMENT TRANSITION SLAB DETAILS SHEET FOR MORE INFORMATION.

100% SUBMITTAL

REV. NO.	DATE	DESCRIPTION	BY

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Texas Department of Transportation

SUMMARY OF QUANTITIES ROADWAY

SH 135

FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**15**

DRIVEWAY SUMMARY

LOCATION STA		DRIVEWAY NO.	DESCRIPTION OF EXISTING STRUCTURE	EXIST DRVWY TYPE	EXIST WIDTH FT	PROP WIDTH FT	PROP DRVWY LENGTH	PROP DRVWY RADIUS FT	PROP DRVWY TAPER FT	ITEM 530 * DRIVEWAYS (CONC) (HES) SY
135S - 59+53	LT	1	NO PIPE	GRAVEL	15	15	16 LF	4	10	44
135S - 59+68	RT	2	NO PIPE	GRAVEL	47	45	16 LF	4	10	101
135S - 60+97	LT	3	NO PIPE	ASPHALT	22	66	10 LF	3	-	91
135S - 61+52	LT	4	NO PIPE	ASPHALT	47	18	16 LF	4	10	49
135S - 61+76	RT	5	NO PIPE	CONCRETE	45	45	16 LF	4	10	101
135S - 62+35	LT	65	NO PIPE	CONCRETE	20	15	16 LF	4	10	43
135S - 62+95	LT	6	NO PIPE	ASPHALT	12	15	16 LF	4	10	43
135S - 63+63	RT	7	NO PIPE	ASPHALT	33	31	16 LF	4	10	74
135S - 63+79	LT	8	NO PIPE	GRAVEL	28	25	16 LF	4	10	62
135S - 65+48	LT	9	NO PIPE	GRAVEL	40	45	16 LF	4	10	101
135S - 66+32	RT	10	NO PIPE	ASPHALT	42	26	16 LF	4	10	64
135S - 66+52	LT	11	NO PIPE	CONCRETE	46	45	16 LF	4	10	102
135S - 67+34	LT	12	NO PIPE	CONCRETE	46	45	16 LF	4	10	101
135S - 68+07	RT	13	NO PIPE	GRAVEL	32	33	17 LF	4	10	87
135S - 68+09	LT	14	NO PIPE	ASPHALT	27	19	16 LF	4	5	41
135S - 69+95	RT	15	NO PIPE	GRAVEL	36	37	25 LF	4	10	131
135S - 71+27	LT	16	NO PIPE	ASPHALT	102	102	20 LF	4	10	257
135S - 71+34	RT	17	NO PIPE	CONCRETE	68	71	20 LF	4	5	173
135S - 72+84	RT	18	NO PIPE	CONCRETE	52	45	20 LF	4	5	111
135S - 74+113	LT	19	NO PIPE	CONCRETE	42	45	20 LF	4	10	121
135S - 74+82	LT	20	NO PIPE	ASPHALT	28	29	20 LF	4	10	83
135S - 75+30	RT	21	NO PIPE	ASPHALT	16	15	20 LF	4	10	49
135S - 76+11	LT	22	NO PIPE	ASPHALT	34	35	20 LF	4	10	97
135S - 76+22	RT	23	NO PIPE	ASPHALT	14	15	20 LF	4	10	49
135S - 77+87	RT	24	NO PIPE	GRAVEL	18	23	20 LF	4	10	69
135S - 78+94	RT	25	NO PIPE	GRAVEL	20	23	20 LF	4	10	69
135S - 79+07	LT	26	NO PIPE	GRAVEL	14	15	18 LF	4	10	46
135S - 79+78	RT	27	NO PIPE	GRAVEL	14	15	20 LF	4	10	49
135S - 80+64	RT	28	NO PIPE	CONCRETE	44	45	20 LF	4	10	121
135S - 81+46	LT	29	NO PIPE	CONCRETE	30	29	20 LF	4	10	83
135S - 82+97	RT	30	NO PIPE	GRAVEL	31	25	20 LF	4	10	73
135S - 82+98	LT	31	NO PIPE	ASPHALT	42	23	19 LF	4	10	66
135S - 83+44	LT	32	NO PIPE	ASPHALT	19	17	19 LF	4	10	52
135S - 83+70	RT	33	NO PIPE	ASPHALT	174	15	20 LF	4	10	49
135S - 84+16	RT	34	NO PIPE	ASPHALT	174	45	20 LF	4	5	111
135S - 85+28	LT	35	NO PIPE	CONCRETE	28	29	20 LF	4	10	82
135S - 87+14	RT	36	NO PIPE	CONCRETE	216	45	20 LF	4	10	120
135S - 87+72	RT	37	NO PIPE	CONCRETE	47	31	20 LF	4	10	88
135S - 87+81	LT	38	NO PIPE	CONCRETE	46	45	20 LF	4	10	121
135S - 88+94	RT	39	NO PIPE	CONCRETE	152	45	20 LF	4	10	121
135S - 89+48	LT	40	NO PIPE	CONCRETE	128	123	19 LF	4	5	285
135S - 90+44	LT	41	NO PIPE	CONCRETE	24	25	19 LF	4	10	70
135S - 90+55	RT	42	NO PIPE	CONCRETE	0	17	19 LF	4	10	54
135S - 91+11	LT	43	NO PIPE	CONCRETE	20	21	20 LF	4	10	64
135S - 91+59	RT	44	NO PIPE	GRAVEL	24	17	22 LF	4	10	58
135S - 92+45	LT	45	NO PIPE	CONCRETE	30	31	19 LF	4	10	84
135S - 93+69	RT	46	NO PIPE	CONCRETE	97	90	20 LF	4	10	229
135S - 94+02	LT	47	NO PIPE	CONCRETE	30	31	20 LF	4	10	88
135S - 95+72	LT	48	NO PIPE	ASPHALT	20	21	20 LF	4	10	64
135S - 96+18	LT	49	NO PIPE	ASPHALT	24	21	20 LF	4	10	64
135S - 96+78	LT	50	NO PIPE	ASPHALT	31	25	19 LF	4	10	70
135S - 97+40	RT	51	NO PIPE	ASPHALT	42	25	20 LF	4	10	72
135S - 99+13	RT	52	NO PIPE	ASPHALT	21	21	15 LF	4	10	55
135S - 99+45	LT	53	NO PIPE	ASPHALT	60	45	19 LF	4	10	109
135S - 100+05	RT	54	NO PIPE	CONCRETE	62	63	12 LF	4	5	101
135S - 101+40	LT	55	NO PIPE	CONCRETE	75	55	10 LF	4	5	74
135S - 101+40	RT	56	NO PIPE	CONCRETE	118	101	38 LF	4	10	574
135S - 102+30	LT	57	NO PIPE	CONCRETE	14	21	10 LF	4	10	38
135S - 102+40	RT	58	NO PIPE	CONCRETE	20	24	75 LF	4	10	376
135N - 201+40	RT	59	NO PIPE	CONCRETE	12	24	27 LF	4	10	84
135N - 202+40	LT	60	NO PIPE	CONCRETE	100	39	12 LF	4	10	65
135N - 205+45	LT	61	NO PIPE	CONCRETE	60	50	16 LF	4	10	102
135N - 206+15	RT	62	NO PIPE	CONCRETE	32	37	8 LF	4	5	37
COMMERCE - 305+08	RT	63	NO PIPE	CONCRETE	17	17	7 LF	4	4	15
COMMERCE - 305+40	LT	64	NO PIPE	CONCRETE	65	60	9 LF	4	4	56
CSJ: 0545-01-014 SUBTOTAL										6382
PROJECT TOTAL										6382

* QUANTITY INCLUDED IN PERTINENT SUMMARY.

100% SUBMITTAL

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
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Land Surveying Branch No. 10046702
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 Texas Department of Transportation

SUMMARY OF QUANTITIES
DRIVEWAYS
SH 135

SHEET 5 OF 10

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	16

STORM SEWER SUMMARY

LOCATION	ITEM 400			ITEM 402	ITEM 420	ITEM 432	ITEM 464						ITEM 465		
	CEM STABIL BKFL	CUT & RESTORE CONC PAVING	CUT & RESTORE ASPH PAVING	TRENCH EXCAVATION PROTECTION	CL C CONC (COLLAR)	RIPRAP (STONE COMMON) (DRY) (6 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (27 IN)	RC PIPE (CL III) (30 IN)	RC PIPE (CL III) (36 IN)	RC PIPE (CL III) (42 IN)	RC PIPE (CL III) (48 IN)	JCT BOX (COMPL) (PJB) (4FTX4FT)	JCT BOX (COMPL) (PJB) (5FTX6FT)	JCT BOX (COMPL) (PJB) (6FTX6FT)
	CY	SY	SY	LF	EA	CY	LF	LF	LF	LF	LF	LF	EA	EA	EA
135N SHEET 1 OF 3	93	56			3		56			57					1
135N SHEET 2 OF 3															
135N SHEET 3 OF 3															
135S SHEET 1 OF 4	48		29	70		1	473								
135S SHEET 2 OF 4	18		11	525	1		484	35		372			1		
135S SHEET 3 OF 4	107		64	1300			482			50	880				
135S SHEET 4 OF 4	854		366	1044	2		92		19		931			1	1
ROUNDABOUT	80		48	510			428		112		45	303			
CSJ 0545-01-014 SUBTOTAL	1200	56	518	3449	6	1	2015	35	131	479	1856	303	1	1	2
PROJECT TOTAL	1200	56	518	3449	6	1	2015	35	131	479	1856	303	1	1	2

STORM SEWER SUMMARY

LOCATION	ITEM 465								ITEM 467	ITEM 556
	INLET (COMPL) (PCO) (5FT) (NONE)	INLET (COMPL) (PCO) (5FT) (LEFT)	INLET (COMPL) (PCO) (5FT) (RIGHT)	INLET (COMPL) (PCO) (5FT) (BOTH)	INLET (COMPL) (PAZD) (SL) (3FTX3FT)	INLET (COMPL) (PAZD) (FG) (3FTX3FT-3FTX3FT)	MANH (COMPL) TY A	INLET (COMPL) (EXT) (TY CI)	SET (TY I) (24 IN) (4:1) (C)	PIPE UNDERDRAINS (TY8) (6")
	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF
135N SHEET 1 OF 3	1		1	2						
135N SHEET 2 OF 3										
135N SHEET 3 OF 3										
135S SHEET 1 OF 4		3		1					1	
135S SHEET 2 OF 4		2		6	1			5		
135S SHEET 3 OF 4		2	3	4	1	1		1		
135S SHEET 4 OF 4	2	1	3	1			1			
ROUNDABOUT	1	2	3	3			1	3		327
CSJ 0545-01-014 SUBTOTAL	4	10	10	17	2	1	2	9	1	327
PROJECT TOTAL	4	10	10	17	2	1	2	9	1	327

100% SUBMITTAL

REV. NO.	DATE	DESCRIPTION	BY

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Texas Department of Transportation

SUMMARY OF QUANTITIES DRAINAGE

SH 135

SHEET 6 OF 10

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	17

SUMMARY OF PERMANENT PAVEMENT MARKINGS

STATION		ITEM 666								
		REFL PAV MRK TY I (W)4"(DOT)(100MIL)	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	REF PAV MRK TY I (W)36"(YLD TRI)(100MIL)	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	PAVEMENT SEALER 4"	PAVEMENT SEALER (LNDP ARROW)	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)
FROM	TO	LF	LF	EA	LF	LF	EA	LF	LF	LF
STA 58+50	STA 67+00	40				3846	2	386	1720	1700
STA 67+00	STA 78+00	88	42			2908		10	610	2200
STA 78+00	STA 89+00									2200
STA 89+00	STA 100+50		40							2432
ROUNDABOUT		63		38	330	2144			163	1918
CSJ 0545-01-014 SUBTOTAL		191	82	38	330	8898	2	396	2493	10450
PROJECT TOTAL		191	82	38	330	8898	2	396	2493	10450

SUMMARY OF PERMANENT PAVEMENT MARKINGS

STATION		ITEM 668	ITEM 672		ITEM 678	
		PREFAB PAV MRK TY C (W)(LNDP ARROW)	REFL PAV MRKR TY II-C-R	REFL PAV MRKR TY II-A-A	PAV SURF PREP FOR MRK (4")	PAV SURF PREP FOR MRK (ARROW)
FROM	TO	EA	EA	EA	LF	EA
STA 58+50	STA 67+00	2	20	22	3846	2
STA 67+00	STA 78+00		1	47	2908	
STA 78+00	STA 89+00			55		
STA 89+00	STA 100+50			58		
ROUNDABOUT					2144	
CSJ 0545-01-014 SUBTOTAL		2	21	182	8898	2
PROJECT TOTAL		2	21	182	8898	2

SMALL SIGN TABULATION

LOCATION	ITEM 644	
	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	REMOVE SM RD SN SUP & AM
	EA	EA
SPM Sheet 1 of 5	7	6
SPM Sheet 2 of 5	5	5
SPM Sheet 3 of 5		
SPM Sheet 4 of 5	5	5
SPM Sheet 5 of 5	17	
CSJ 0545-01-014 SUBTOTAL	34	16
PROJECT TOTAL	34	16

100% SUBMITTAL

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
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Texas Department of Transportation

SUMMARY OF QUANTITIES PAVEMENT MARKINGS

SH 135

SHEET **7** OF **10**

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**18**

ILLUMINATION SUMMARY								
LOCATION	ITEM 416	ITEM 610	ITEM 618	ITEM 618	ITEM 620	ITEM 620	ITEM 624	ITEM 628
	DRILL SHAFT (RDWY ILL POLE) (30 IN)	IN RD IL (TY SA) 50T-10 (400W EQ) LED	CONDT (PVC) (SCHD 40) (2")	CONDT (PVC) (SCHD 40) (2") (BORE)	ELEC CONDR (NO. 8) BARE	ELEC CONDR (NO. 8) INSULATED	GROUND BOX TY D (162922) W/ APRON	ELC SRV TY T 120/240 000 (NS) GS (L) SP (O)
	LF	EA	LF	LF	LF	LF	EA	EA
ROUNDABOUT AND APPROACHES	200	20	1,795	325	2,270	5,520	10	5
CSJ 0545-01-014 SUBTOTAL	200	20	1,795	325	2,270	5,520	10	5
PROJECT TOTAL	200	20	1,795	325	2,270	5,520	10	5

100% SUBMITTAL

REV. NO.	DATE	DESCRIPTION	BY

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SUMMARY OF QUANTITIES ILLUMINATION

SH 135

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**19**

EROSION CONTROL SUMMARY

LOCATION		ITEM 158	ITEM 506								
FROM	TO	SPEC EXCAV WORK (HYD EXCAVATOR)	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	EARTHWORK (EROSN & SEDMT CONT, IN VEH)
STA	STA	HR	LF	LF	LF	LF	LF	LF	SY	SY	CY
STA 56+00	STA 67+00	9	40	40	35	35	50	50			33
STA 67+00	STA 78+00	8	280	280	33	33	50	50			33
STA 78+00	STA 89+00	8	160	160	33	33	50	50			33
STA 89+00	STA 100+50	8	140	140	33	33	50	50			33
ROUNDABOUT		8	340	340	33	33	50	50			33
STA 200+00	STA 207+50	8	40	40	33	33	50	50			33
CSJ 0545-01-014 SUBTOTAL		50	1000	1000	200	200	300	300	200	200	200
PROJECT TOTALS		50	1000	1000	200	200	300	300	200	200	200

100% SUBMITTAL

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

SUMMARY OF QUANTITIES
SW3P
SH 135

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	20

SUMMARY OF EARTHWORK QUANTITIES							
STATION	END AREA		DISTANCE BETWEEN X-S	VOLUME		CUMULATIVE VOLUME	
				110	132		
				6001	6003		
	EXCAVATION	EMBANKMENT		EXCAVATION ROADWAY	EMBANKMENT (FINAL) (ORD COMP) (TY B)	EXCAVATION	EMBANKMENT
	SF	SF	FT	CY	CY	CY	CY
SH 135							
58+00	0	0	50	131	0	131	0
58+50	142	0	50	263	0	395	0
59+00	142	0	50	258	1	652	1
59+50	136	1	50	256	1	908	2
60+00	140	0	50	259	0	1167	2
60+50	139	0	50	257	0	1424	2
61+00	139	0	50	249	4	1673	6
61+50	131	4	50	248	6	1921	12
62+00	137	3	50	252	5	2173	17
62+50	135	2	50	248	4	2421	20
63+00	133	2	50	245	4	2666	24
63+50	132	2	50	244	2	2910	26
64+00	132	0	50	241	3	3151	29
64+50	128	3	50	242	3	3393	32
65+00	134	0	50	243	3	3636	35
65+50	128	3	50	236	6	3872	40
66+00	127	3	50	233	7	4105	47
66+50	124	4	50	237	4	4341	51
67+00	132	0	50	239	4	4580	55
67+50	126	4	50	231	9	4811	64
68+00	123	5	50	226	8	5037	73
68+50	120	4	50	229	4	5265	76
69+00	127	0	50	231	0	5496	76
69+50	123	0	50	211	1	5707	77
70+00	105	1	50	177	1	5884	79
70+50	86	0	50	149	1	6032	80
71+00	75	1	50	150	1	6183	81
71+50	88	0	50	169	0	6352	81
72+00	95	0	50	176	0	6527	81
72+50	95	0	50	168	1	6695	82
73+00	86	1	50	169	1	6864	83
73+50	96	0	50	179	0	7043	83
74+00	97	0	50	176	0	7220	83
74+50	93	0	50	168	0	7387	84
75+00	88	0	50	168	0	7555	84
75+50	93	0	50	174	0	7729	84
76+00	94	0	50	171	0	7900	84
76+50	90	0	50	166	0	8066	84
77+00	89	0	50	165	0	8231	84
77+50	89	0	50	162	0	8393	84
78+00	85	0	50	160	0	8553	84
78+50	87	0	50	160	0	8712	84
79+00	85	0	50	159	0	8871	84
79+50	86	0	50	159	0	9031	84
80+00	86	0	50	160	0	9191	84
80+50	87	0	50	166	0	9357	84
81+00	92	0	50	170	0	9527	84
81+50	92	0	50	169	0	9696	84
82+00	91	0	50	165	0	9861	84
82+50	88	0	50	163	0	10024	84
83+00	89	0	50	164	0	10188	84
83+50	88	0	50	162	0	10350	84
84+00	87	0	50	163	0	10513	84
84+50	88	0	50	166	0	10679	84
85+00	91	0	50	170	0	10849	84
85+50	92	0	50	172	0	11021	84
86+00	94	0	50	174	0	11195	84
86+50	94	0	50	176	0	11371	84
87+00	96	0	50	171	0	11542	84
87+50	89	0	50	167	0	11709	84
88+00	91	0	50	169	0	11877	84
88+50	91	0	50	170	0	12047	84
89+00	92	0	50	168	0	12215	84
89+50	89	0	50	168	0	12383	84
90+00	92	0	50	177	0	12560	84

SUMMARY OF EARTHWORK QUANTITIES							
STATION	END AREA		DISTANCE BETWEEN X-S	VOLUME		CUMULATIVE VOLUME	
				110	132		
				6001	6003		
	EXCAVATION	EMBANKMENT		EXCAVATION ROADWAY	EMBANKMENT (FINAL) (ORD COMP) (TY B)	EXCAVATION	EMBANKMENT
	SF	SF	FT	CY	CY	CY	CY
SH 135							
90+50	99	0	50	180	0	12740	84
91+00	96	0	50	175	0	12916	84
91+50	94	0	50	173	0	13088	84
92+00	93	0	50	173	0	13262	84
92+50	95	0	50	175	0	13437	84
93+00	94	0	50	181	0	13618	84
93+50	101	0	50	181	0	13799	84
94+00	94	0	50	173	0	13971	84
94+50	92	0	50	173	0	14144	84
95+00	95	0	50	178	0	14322	84
95+50	97	0	50	174	0	14495	84
96+00	90	0	50	166	0	14661	84
96+50	89	0	50	171	0	14832	84
97+00	96	0	50	178	0	15010	84
97+50	97	0	50	171	0	15181	84
98+00	88	0	50	160	0	15341	84
98+50	85	0	50	156	1	15497	85
99+00	84	1	50	158	1	15655	86
99+50	87	0	50	80	0	15735	86
100+00	0	0				15735	86

SHEET TOTAL	
110-6001	132-6003
EXCAVATION	EMBANKMENT
CY	CY
15735	86

100% SUBMITTAL

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
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Texas Department of Transportation

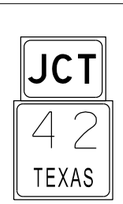
SUMMARY OF QUANTITIES EARTHWORK

SH 135

SHEET **10** OF **10**

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**21**

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"	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) TYPE N	TYPE S
1	1	W9-2		36x36	✓		10BWG	1	SA	T			
1	2	M1-6T		24x24	✓		10BWG	1	SA	P			
		D10-7aT		3x10									
1	3	R2-1		30x36	✓		10BWG	1	SA	T			
1	4	D2-1		24X18	✓		10BWG	1	SA	T			
1	5	R7-11T DBL		12X18	✓		10BWG	1	SA	P			
				21X15	✓		10BWG	1	SA	P			
				24x24									
1	6	M2-1											
		M1-6T											
1	7	W4-2		36X36	✓		10BWG	1	SA	T			
2	8	R2-1		30x36	✓		10BWG	1	SA	T			
2	9	W6-3		36X36	✓		10BWG	1	SA	T			
2	10	D3-1G		54x12	✓		10BWG	1	SA	P-BM			
		R1-1		30x30									
2	11	R2-1		30x36	✓		10BWG	1	SA	T			

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

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

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	6	GREGG		22

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

DATE:
FILE:

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) TYPE N	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE S
2	12	D3-1G	Memorial St / STOP	78x18									
		R1-1		30x30	✓		10BWG	1	SA	P-BM			
4	13	R2-1	SPEED LIMIT 40	30x36	✓		10BWG	1	SA	T			
4	14	D3-1G	Smackover Rd / STOP	90x18	✓		10BWG	1	SA	P-BM			
		R1-1		30x30									
4	15	R2-1	SPEED LIMIT 35	30x36	✓		10BWG	1	SA	T			
4	16	D3-1G	Mexia St / STOP	60x18	✓		10BWG	1	SA	P-BM			
		R1-1		30x30									
			SOUTH 135 TEXAS	24x12	✓		10BWG	1	SA	P			
4	17	M3-3		24x24									
		M1-6T											
5	18	R1-2	YIELD	48x48x48	✓		10BWG	1	SA	T			
5	19	R1-2	YIELD	48x48x48	✓		10BWG	1	SA	T			
5	20	R1-2	YIELD	48x48x48	✓		10BWG	1	SA	T			
5	21	R1-2	YIELD	48x48x48	✓		10BWG	1	SA	T			
5	22	R1-2	YIELD	48x48x48	✓		10BWG	1	SA	T			

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

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

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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

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	6	GREGG		23

18

DATE:
FILE:

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE N	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE S
5	23	M3-1		24x12	✓		10BWG	1	SA	P			
		M1-6T		24x24									
		M6-1		21x15									
5	24	D3-1G		66x12	✓		10BWG	1	SA	P-BM			
		M3-1		24x12									
		M1-6T		24x24									
		M6-1		21x15									
5	25	D3-1G		54x12	✓		10BWG	1	SA	P-BM			
		M3-1		24x12									
		M1-6T		24x24									
		M6-1		21x15									
5	26	D3-1G		66x12			10BWG	1	SA	P-BM			
		M3-1		24x12									
		M1-6T		24x24									
		M6-1		21x15									
5	27	M3-1		24x12			10BWG	1	SA	P			
		M1-6T		24x24									
		M6-1		21x15									
5	28-32	R6-4		30x24	✓		10BWG	1	SA	T			
5	33-34	W2-6		33x33	✓		10BWG	1	SA	T			
		W16-17P		24x12									

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

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

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NOTE:

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

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	6	GREGG		24

DATE:
FILE:

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
		93	SH 135N AT RAILROAD BRIDGE LOCATION	204+00		BI	TBD	TBD	CRASH CUSHION ATTENUATOR	34 ½"	34"		X						X			
		93	SH 135N AT RAILROAD BRIDGE LOCATION	204+00		BI	TBD	TBD	CRASH CUSHION ATTENUATOR	34 ½"	34"		X						X			
											TOTALS											

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/rdwylse.htm

CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:		CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		
	TYL	GREGG		
	FEDERAL AID PROJECT			SHEET NO.
				25

TCP GENERAL NOTES

1. THESE PLANS ARE PROVIDED TO INDICATE A POSSIBLE SEQUENCE FOR THE CONSTRUCTION OF THIS PROJECT AND ARE NOT INTENDED TO PROHIBIT THE CONTRACTOR FROM PROPOSING MODIFICATIONS TO THESE PLANS OR SUBMITTING ALTERNATE PLANS FOR THE APPROVAL BY THE ENGINEER. NO WORK SHALL BEGIN ASSOCIATED WITH CHANGES TO THESE PLANS OR ANY PLANS PROVIDED AS AN ALTERNATIVE WITHOUT THE APPROVAL OF THE ENGINEER IN WRITING.

2. THE CONTRACTOR SHALL PLACE ADVANCE WARNING SIGNS, BARRICADES AND PAVEMENT MARKINGS PER THE TXDOT STANDARDS AND GUIDELINES PROVIDED IN TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).

3. PLACE CHANNELIZING DEVICES AS PER THE STANDARDS LISTED ON THE INDEX SHEET OF THESE PLANS. ALL DISTANCES SHOWN ARE APPROXIMATE.

4. THE CONTRACTOR SHALL FOLLOW THE BC AND TCP STANDARDS LISTED IN THE INDEX SHEET OF THESE PLANS TO CONSTRUCT PROPOSED PAVEMENT.

5. PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) PER TMUTCD, MUST BE PLACED 7 DAYS MINIMUM IN ADVANCE OF CONSTRUCTION. THE ENGINEER SHALL APPROVE THE LOCATION OF THE PCMS PRIOR TO RELOCATING THE PCMS. THE WORDING OF THE PCMS SHALL BE APPROVED BY THE ENGINEER.

6. ALL BARRICADES, SIGNS AND FLAGGERS SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES, SIGNS AND TRAFFIC HANDLING. ALL WORK ZONE PAVEMENT MARKINGS SHALL BE PAID FOR UNDER ITEM 662 WORK ZONE PAVEMENT MARKINGS.

7. CONTRACTOR IS TO MAINTAIN POSITIVE TEMPORARY DRAINAGE AT ALL TIMES.

8. UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE, THE CONTRACTOR SHALL CLEAR AND REMOVE FROM THE WORK SITE ALL SURPLUS AND DISCARDED MATERIALS, DEBRIS OF EVERY KIND AND LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT, AND SIGHTLY CONDITION AS DETERMINED BY THE ENGINEER.

9. DO NOT PLACE FINAL SURFACE COURSE UNTIL ALL WIDENING AND FINAL STRUCTURE COMPONENTS ARE IN PLACE.

10. ANY SIGNING, PAVEMENT MARKINGS, OR MARKERS REMOVED DUE TO TEMPORARY TRAFFIC CONDITIONS SHALL BE RESTORED TO THEIR ORIGINAL TYPE AND LOCATION.

11. PAVEMENT MARKINGS IN CONFLICT WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED BY METHODS APPROVED BY THE ENGINEER. REMOVAL OF CONFLICTING PAVEMENT MARKINGS IS SUBSIDIARY TO PERMANENT PAVEMENT MARKING, NO SEPARATE PAY ITEM.

12. LOCAL TRAFFIC MUST BE PROVIDED ACCESS AT ALL TIMES.

13. SEE DETOUR PLANS FOR ADDITIONAL INFORMATION.

14. MAINTAIN A MINIMUM OF 11′ LANES FOR THROUGH TRAFFIC AT ALL TIMES.

15. CONTRACTOR SHALL VERIFY SPECIAL EVENTS DURING WHICH CONSTRUCTION OPERATIONS WILL CEASE.

16. PHASES SHALL NOT BE COMBINED OR CONSTRUCTED CONCURRENTLY WITHOUT PRIOR APPROVAL BY THE ENGINEER.

17. CONTRACTOR TO TEMPORARILY COVER CURB INLET BOXES FOR SAFETY.

PHASE 1A: SH 135 SB DRAINAGE

SH 135 SB TRAFFIC: SB TRAFFIC USES EXISTING SB LANES.

SH 135 NB TRAFFIC: NB TRAFFIC USES EXISTING NB LANES.

CONSTRUCTION: DRAINAGE STRUCTURES INSTALLED ALONG SH 135 SB AS SHOWN ON PLANS.

STEP 1: INSTALL ADVANCED WARNING SIGNS PER TXDOT TCP AND BC CONSTRUCTION STANDARDS.

STEP 2: INSTALL SW3P DEVICES.

STEP 3: INSTALL TRAFFIC CONTROL DEVICES AND SIGNS AS PER TXDOT TCP AND BC CONSTRUCTION STANDARDS. DRAINAGE STRUCTURES TO BE INSTALLED DURING NIGHTTIME OPERATIONS USING TXDOT STANDARD (2-4) - 18 TO CLOSE LANES OF SH 135 SB. LANE CLOSURES PROHIBITED BETWEEN THE HOURS OF 6:00 A.M. AND 10:00 P.M. OR AS DIRECTED BY THE ENGINEER.

STEP 4: INSTALL DRAINAGE STRUCTURES AS SHOWN ON PLANS. RESTORE PAVEMENT AS SHOWN ON CUT AND RESTORE DETAIL SHOWN ON CONSTRUCTION DETAILS.

STEP 5: CONTRACTOR TO PROVIDE LOCAL ACCESS TO DRIVEWAYS AT ALL TIMES. CONTRACTOR TO CLOSE ACCESS TO SIDE STREETS AFFECTED DURING CONSTRUCTION AND INSTALL ADDITIONAL SIGNAGE IN ACCORDANCE WITH TXDOT STANDARDS AND TMUTCD AS DIRECTED BY THE ENGINEER.

PHASE 1B: SH 135 NB

SH 135 SB TRAFFIC: SB TRAFFIC USES EXISTING SB LANE(S) AS SHOWN ON THE PLANS.

SH 135 NB TRAFFIC: ALL NB TRAFFIC USES DETOUR AS SHOWN ON THE DETOUR LAYOUT SHEETS.

CONSTRUCTION: SH 135 NB FROM BEGIN CONSTRUCTION TO ROUNDABOUT AS SHOWN ON PLANS.

STEP 1: INSTALL ADVANCED WARNING SIGNS PER THESE PLANS AND TXDOT TCP AND BC CONSTRUCTION STANDARDS.

STEP 2: INSTALL SW3P DEVICES.

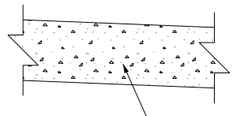
STEP 3: CONSTRUCT TEMPORARY PAVEMENT USING TXDOT STANDARDS TCP (2-1) - 18 AND TCP (2-2) - 18.

STEP 4: INSTALL TRAFFIC CONTROL DEVICES AND SIGNS AS PER PLAN SHEETS AND TXDOT STANDARDS.

STEP 5: DETOUR SH 135 NB AS SHOWN ON DETOUR PLANS. MAINTAIN ONE-WAY SB TRAFFIC USING EXISTING PAVEMENT SH 135 SB. CONTRACTOR TO PROVIDE LOCAL ACCESS TO DRIVEWAYS AT ALL TIMES. CONTRACTOR TO CLOSE ACCESS TO SIDE STREETS AFFECTED DURING CONSTRUCTION AND INSTALL ADDITIONAL SIGNAGE IN ACCORDANCE WITH TXDOT STANDARDS AND TMUTCD AS DIRECTED BY THE ENGINEER.

STEP 6: RECONSTRUCT SH 135 NB AND CORRESPONDING DRIVEWAYS FROM BEGIN CONSTRUCTION TO ROUNDABOUT AS PER LIMITS SHOWN ON PLANS. LEAVE-OUTS AND DRIVEWAYS TO BE CONSTRUCTED DURING NIGHTTIME OPERATIONS.

TEMP PAVE DETAIL
(FOR EXIST TRAFFIC ISLANDS ONLY)
N.T.S.



NOTES:

1. THE CONTRACTOR SHALL USE TXDOT TCP AND BC STANDARD DETAILS DURING CONSTRUCTION OF TEMPORARY PAVEMENT. TEMPORARY PAVEMENT SHALL BE PAID FOR USING ITEM NUMBER 508 6001 (CONSTRUCTING DETOURS).

100% SUBMITTAL

STATE OF TEXAS
JILL M. VAN HOEWYK
110940
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SH 135
TRAFFIC CONTROL PLAN
NARRATIVE

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	26

PHASE 2: SH 135 SB

SH 135 SB TRAFFIC: SB TRAFFIC USES NEWLY CONSTRUCTED SH 135 NB.

SH 135 NB TRAFFIC: ALL NB TRAFFIC USES DETOUR SHOWN ON THE DETOUR LAYOUT SHEETS.

CONSTRUCTION: SH 135 SB FROM BEGIN PROJECT TO ROUNDABOUT AS SHOWN ON PLANS.

STEP 1: RELOCATE TRAFFIC CONTROL DEVICES AND SIGNS AS PER PLAN SHEETS AND TXDOT STANDARDS.

STEP 2: INSTALL SW3P DEVICES.

STEP 3: DETOUR TO REMAIN IN PLACE FOR SH 135 NB TRAFFIC. SHIFT SH 135 SB TRAFFIC TO NEWLY CONSTRUCTED SH 135 NB PAVEMENT. MAINTAIN ONE-WAY SB TRAFFIC ON SH 135 NB. CONTRACTOR TO PROVIDE LOCAL ACCESS AT ALL TIMES. CONTRACTOR TO CLOSE ACCESS TO SIDE STREETS AFFECTED DURING CONSTRUCTION AND INSTALL ADDITIONAL SIGNAGE IN ACCORDANCE WITH TXDOT STANDARDS AND TMUTCD AS DIRECTED BY THE ENGINEER.

STEP 4: RECONSTRUCT SH 135 SB AND CORRESPONDING DRIVEWAYS FROM BEGIN CONSTRUCTION TO ROUNDABOUT AS SHOWN ON PLANS. LEAVE-OUTS AND DRIVEWAYS TO BE CONSTRUCTED DURING NIGHTTIME OPERATIONS.

STEP 5: INSTALL SH 135 FINAL PAVEMENT MARKINGS FROM BEGIN CONSTRUCTION TO SH 135 S STA 100+00.

PHASE 3: PHASED ROUNDABOUT CONSTRUCTION

SH 135 (S) TRAFFIC: NB AND SB OPEN TO TRAFFIC.

SH 135 (N) TRAFFIC: SHIFT NB AND SB TRAFFIC AS SHOW ON PLANS.

SH 135 ROUNDABOUT TRAFFIC: CLOSE ROUNDABOUT APPROACHES AS SHOWN ON PLANS. DETOUR AS SHOWN ON DETOUR LAYOUT SHEETS.

CONSTRUCTION: SH 135 ROUNDABOUT AS SHOWN ON PLANS.

STEP 1: RELOCATE ADVANCED WARNING SIGNS PER THESE PLANS AND TXDOT TCP AND BC CONSTRUCTION STANDARDS.

STEP 2: INSTALL SW3P DEVICES.

STEP 3: CONSTRUCT TEMPORARY PAVEMENT USING TXDOT STANDARDS TCP (2-1) - 18 AND TCP (2-2) - 18.

STEP 4: INSTALL TEMPORARY PAVEMENT MARKINGS AS SHOWN ON PLANS USING TXDOT TCP AND BC CONSTRUCTION STANDARDS.

STEP 5: INSTALL TRAFFIC CONTROL DEVICES AND SIGNS AS PER PLAN SHEETS AND TXDOT STANDARDS.

STEP 6: CONSTRUCT ROUNDABOUT AS SHOWN ON PLANS. SEE ROUNDABOUT DETAILS FOR TYPICAL JOINTING DETAIL FOR CONCRETE PAVEMENT. MAINTAIN ACCESS TO/FROM SH 135 N VIA SH 135 S AND HOUSTON STREET.

PHASE 4: PHASED ROUNDABOUT CONSTRUCTION

SH 135 (S) TRAFFIC: OPEN TO TRAFFIC.

SH 135 (N) TRAFFIC: SHIFT NB AND SB TRAFFIC AS SHOW ON PLANS.

SH 135 ROUNDABOUT TRAFFIC: CLOSE ROUNDABOUT APPROACHES AS SHOWN ON PLANS.

CONSTRUCTION: SH 135 ROUNDABOUT AS SHOWN ON PLANS.

STEP 1: INSTALL SW3P DEVICES.

STEP 2: CONSTRUCT TEMPORARY PAVEMENT USING TXDOT STANDARDS TCP (2-1) - 18 AND TCP (2-2) - 18.

STEP 3: INSTALL TEMPORARY PAVEMENT MARKINGS AS SHOWN ON PLANS USING TXDOT TCP AND BC CONSTRUCTION STANDARDS.

STEP 4: RELOCATE TRAFFIC CONTROL DEVICES AND SIGNS AS PER PLAN SHEETS AND TXDOT STANDARDS.

STEP 5: CONSTRUCT ROUNDABOUT AS SHOWN ON PLANS (SEE ROUNDABOUT DETAILS FOR TYPICAL JOINTING DETAIL FOR CONCRETE PAVEMENT). MAINTAIN ACCESS TO/FROM SH 135 N VIA SH 135 S AND HOUSTON STREET.

PHASE 5A: PHASED ROUNDABOUT CONSTRUCTION

SH 135 (S) TRAFFIC: OPEN TO TRAFFIC.

SH 135 (N) TRAFFIC: OPEN TO TRAFFIC.

SH 135 ROUNDABOUT TRAFFIC: CLOSE ROUNDABOUT APPROACHES AS SHOWN ON PLANS. DETOUR PROVIDED AS SHOWN ON DETOUR LAYOUT SHEETS.

CONSTRUCTION: SH 135 ROUNDABOUT AS SHOWN ON PLANS.

STEP 1: INSTALL SW3P DEVICES.

STEP 2: INSTALL TEMPORARY PAVEMENT MARKINGS AS SHOWN ON PLANS USING TXDOT TCP AND BC CONSTRUCTION STANDARDS.

STEP 3: INSTALL TRAFFIC CONTROL DEVICES, AND SIGNS AS PER PLAN SHEETS AND TXDOT STANDARDS.

STEP 4: DEMOLISH HOUSTON STREET AS SHOWN ON REMOVAL PLANS. CONSTRUCT ROUNDABOUT APPROACHES AND DRIVEWAYS AS SHOWN ON PLANS.

PHASE 5B: PHASED ROUNDABOUT CONSTRUCTION

SH 135 (S) TRAFFIC: OPEN TO TRAFFIC.

SH 135 (N) TRAFFIC: OPEN TO TRAFFIC

SH 135 ROUNDABOUT TRAFFIC: OPEN TO TRAFFIC.

CONSTRUCTION: MEDIANS AND CENTER ISLAND.

STEP 1: INSTALL SW3P DEVICES.

STEP 2: INSTALL TRAFFIC CONTROL DEVICES, AND SIGNS AS PER PLAN SHEETS AND TXDOT STANDARDS.

STEP 3: REMOVE TEMPORARY PAVEMENT AND CONSTRUCT MEDIANS AND CENTER ISLAND OF ROUNDABOUT AS SHOWN ON PLANS USING TXDOT STANDARDS TCP (2-1) - 18 AND TCP (2-2) - 18 AND TXDOT BC CONSTRUCTION STANDARDS.

STEP 4: INSTALL FINAL PAVEMENT MARKINGS FOR ROUNDABOUT AND SH 135 S STA 100+00 TO END CONSTRUCTION.

PHASE 5C: DRAINAGE STRUCTURE INSTALLATION AT RAILROAD OVERPASS

SH 135 (S) TRAFFIC: OPEN TO TRAFFIC.

SH 135 (N) TRAFFIC: OPEN TO TRAFFIC

SH 135 ROUNDABOUT TRAFFIC: OPEN TO TRAFFIC.

CONSTRUCTION: INSTALL DRAINAGE STRUCTURES AT RAILROAD OVERPASS, APPROX. SH 135 N STA 211+50.

STEP 1: RELOCATE ADVANCED WARNING SIGNS PER THESE PLANS AND TXDOT TCP AND BC CONSTRUCTION STANDARDS.

STEP 2: INSTALL SW3P DEVICES.

STEP 3: INSTALL CRASH CUSHIONS, TRAFFIC CONTROL DEVICES, AND SIGNS AS PER PLAN SHEETS AND TXDOT STANDARDS.

STEP 4: CONTRACTOR TO USE TXDOT TCP AND BC CONSTRUCTION STANDARDS FOR SHORT TERM OVERNIGHT CLOSURES DURING CONSTRUCTION.

100% SUBMITTAL

STATE OF TEXAS
JILL M. VAN HOEWYK
110940
LICENSED PROFESSIONAL ENGINEER
2/11/2022

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
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TEXAS REGISTERED ENGINEERING FIRM F-9073

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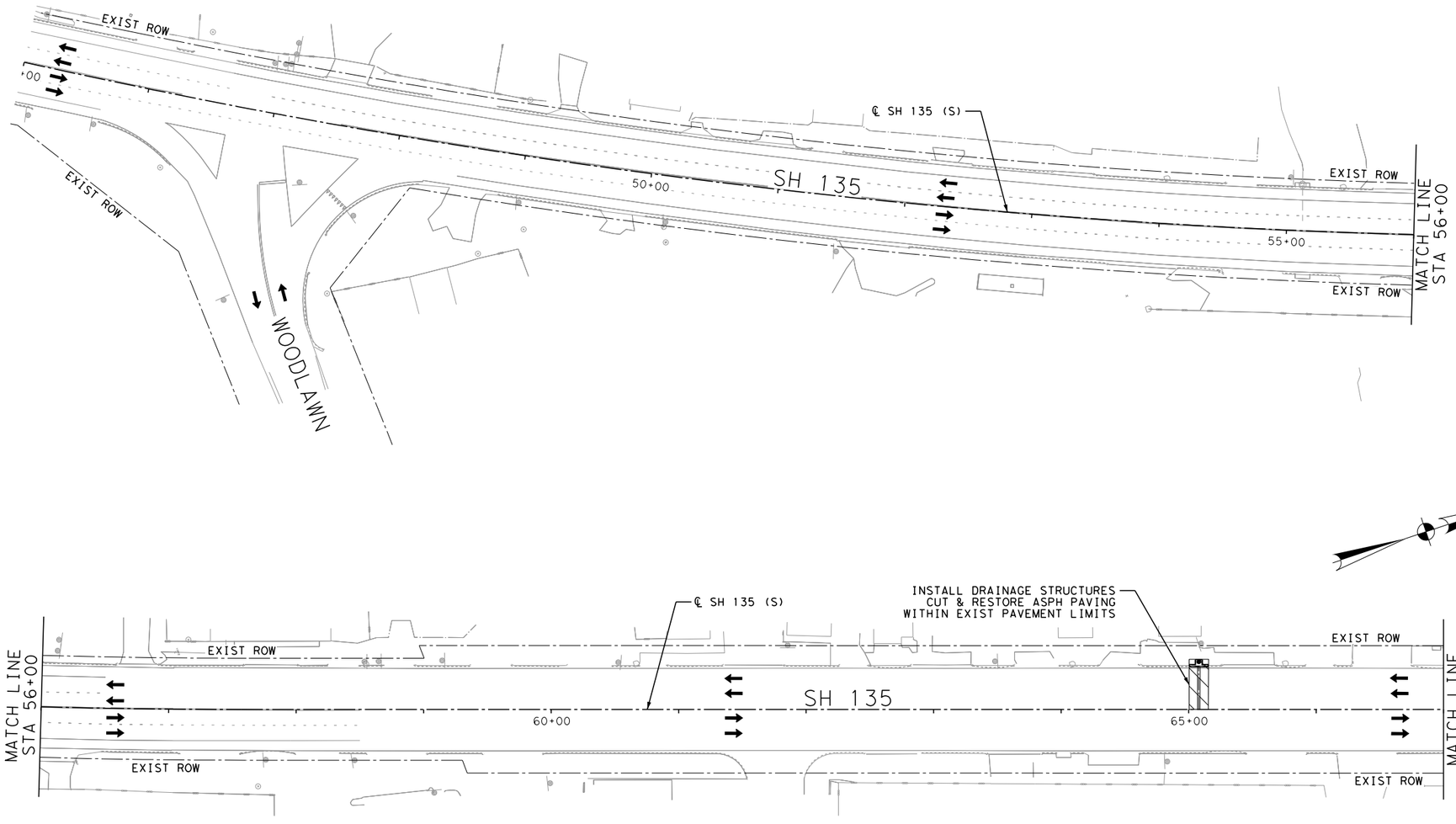
Texas Department of Transportation

SH 135
TRAFFIC CONTROL PLAN
NARRATIVE

SHEET 2 OF 2

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	27



LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- I TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
2. LANE CLOSURES PROHIBITED BETWEEN HOURS OF 6 AM AND 10 PM OR AS DIRECTED BY THE ENGINEER.

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
PROFESSIONAL ENGINEER
2/23/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
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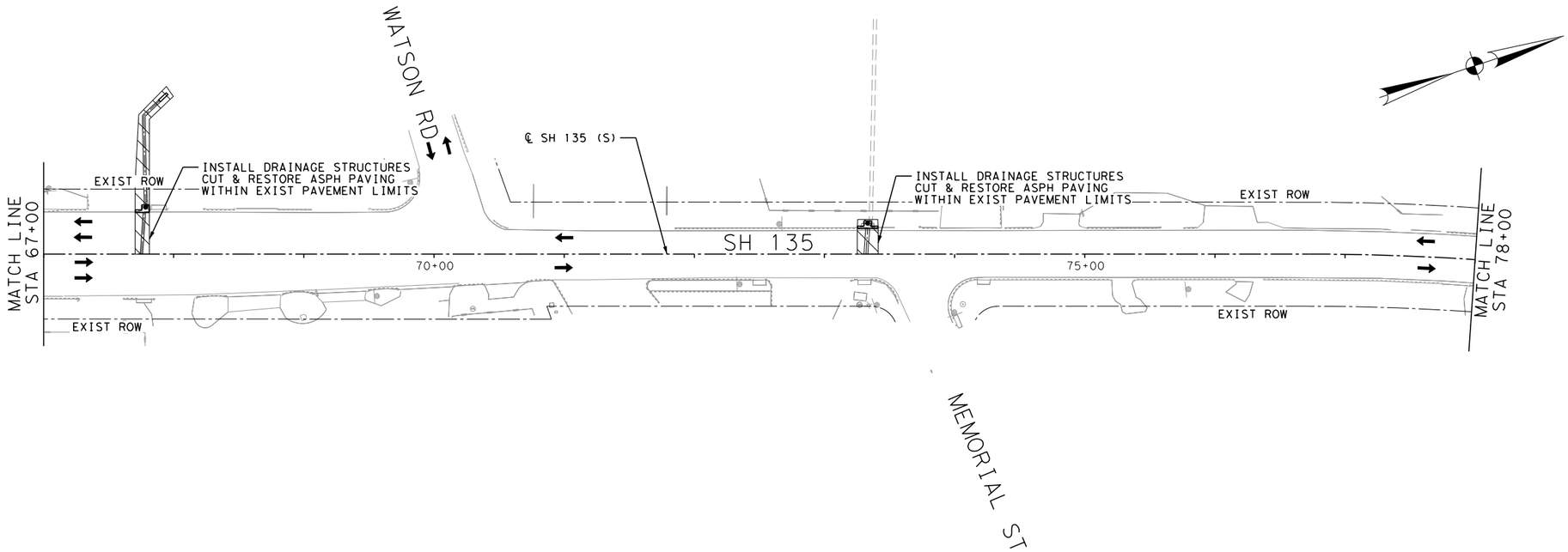
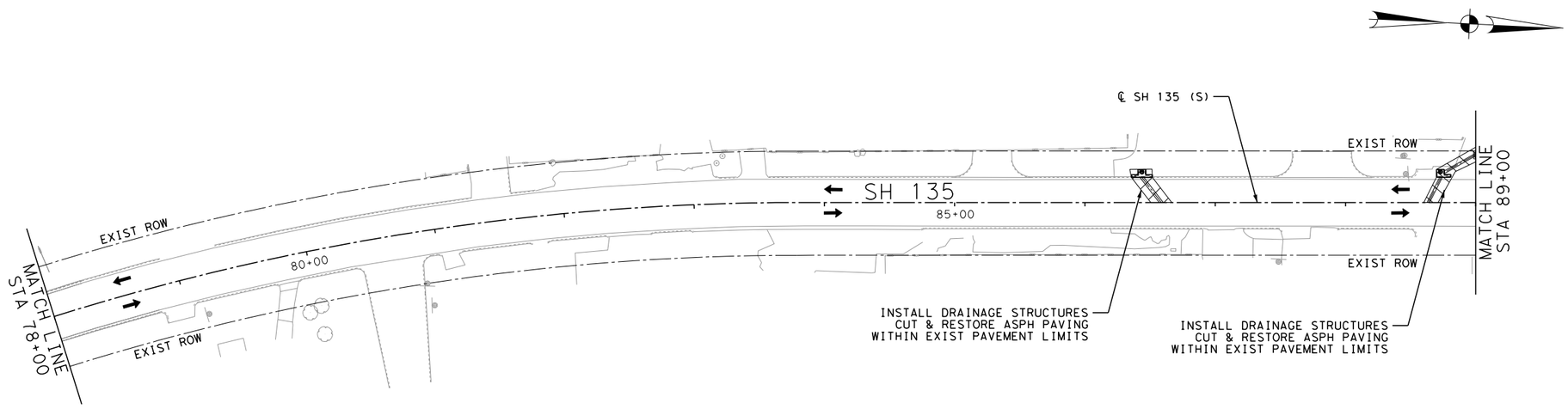
SH 135
TRAFFIC CONTROL PLAN
PHASE 1A

SHEET 1 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	28





LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
2. LANE CLOSURES PROHIBITED BETWEEN HOURS OF 6 AM AND 10 PM OR AS DIRECTED BY THE ENGINEER.

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
PROFESSIONAL ENGINEER
2/23/2022

0 25 50 100(H)

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LAMB-STAR ENGINEERING, LLC
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SH 135
TRAFFIC CONTROL PLAN
PHASE 1A

SHEET 2 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	29

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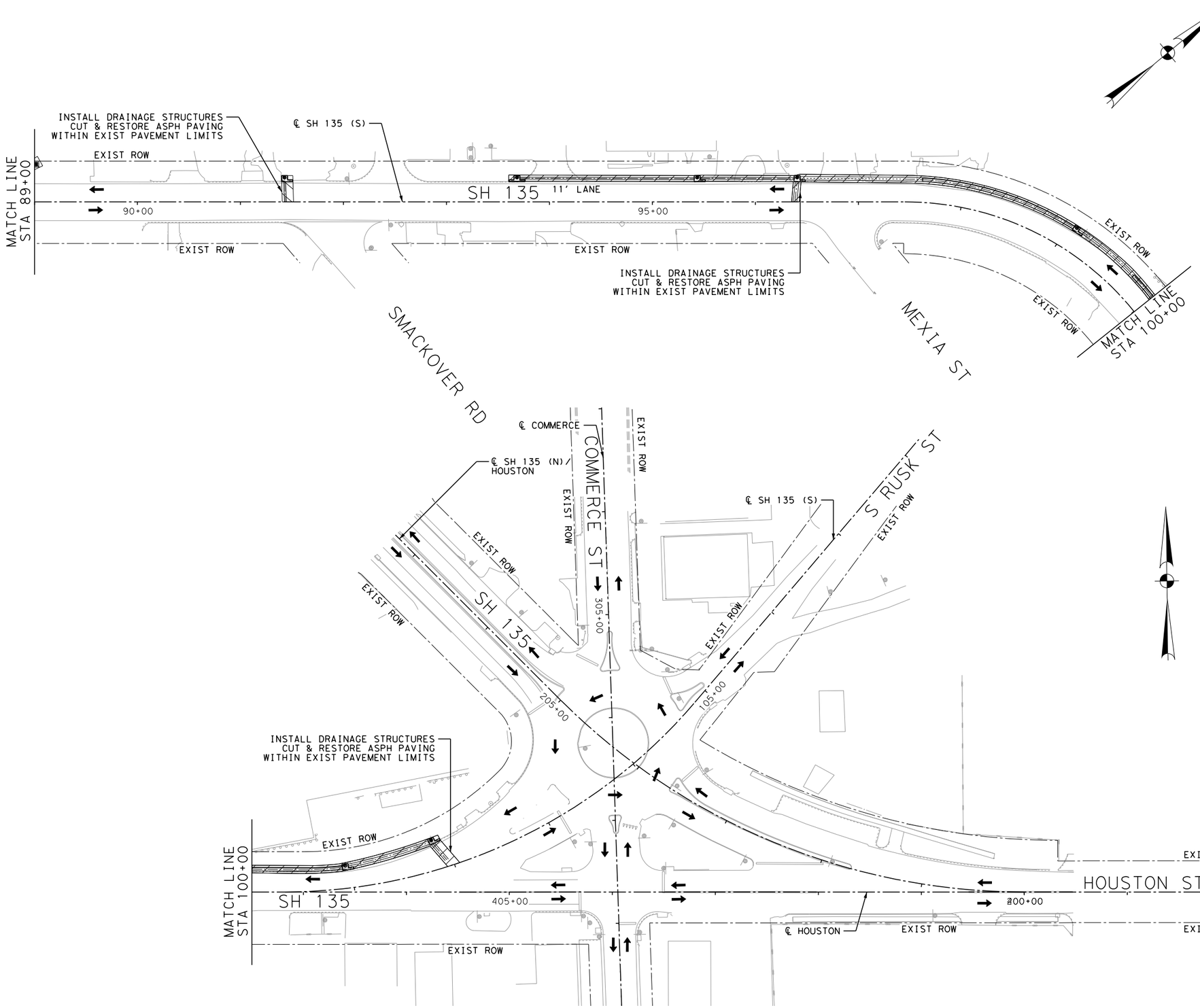

LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
2. LANE CLOSURES PROHIBITED BETWEEN HOURS OF 6 AM AND 10 PM OR AS DIRECTED BY THE ENGINEER.

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
PROFESSIONAL ENGINEER
2/23/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
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TEXAS REGISTERED ENGINEERING FIRM F-9073

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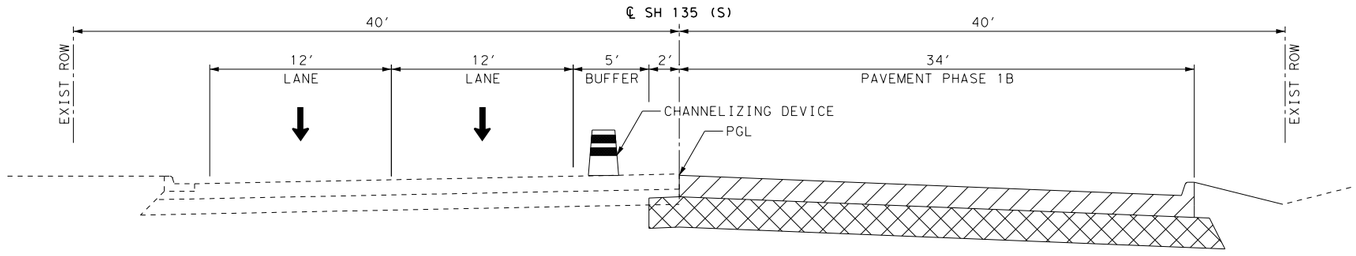
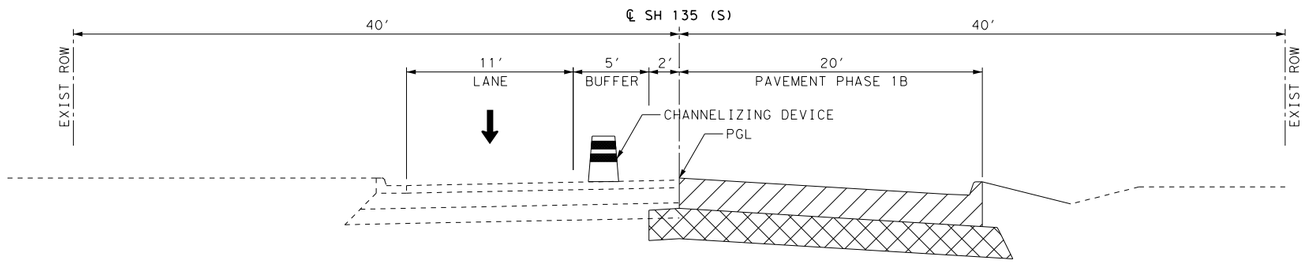
SH 135
TRAFFIC CONTROL PLAN
PHASE 1A

SHEET 3 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	30



SECTION A-A



SECTION B-B

LEGEND:

- PAVEMENT THIS PHASE
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
PROFESSIONAL ENGINEER
2/11/2022

NOT TO SCALE

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
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PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

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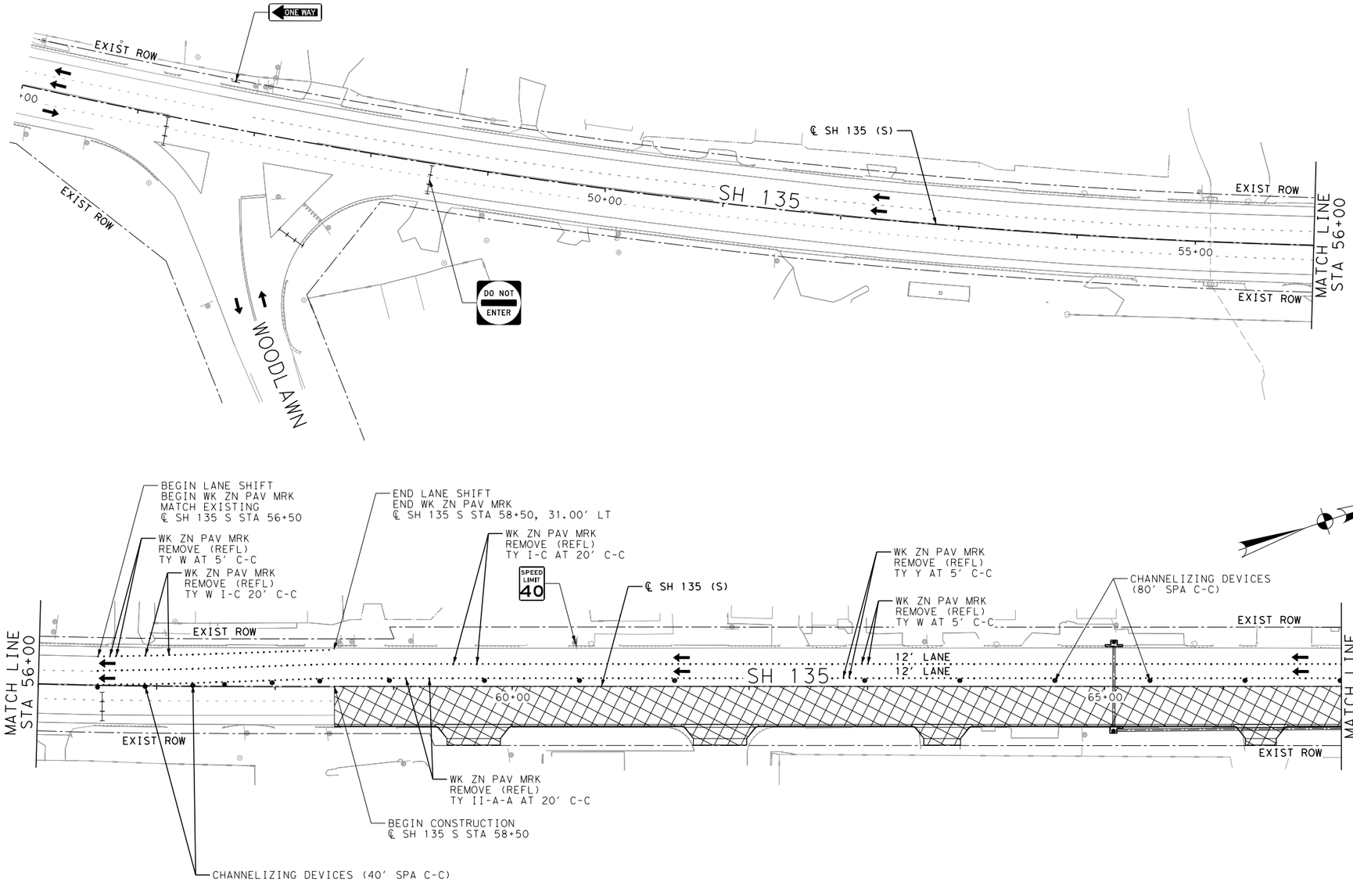
SH 135
TCP PHASE 1B
TYPICAL SECTIONS

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	31



LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. SEE DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.
2. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
3. DRAINAGE STRUCTURES INSTALLED IN PHASE 1A AS SHOWN ON SHEETS 28-30.
4. LPCB ALLOWABLE AS SHOWN ON TABLE AND AS DIRECTED BY THE ENGINEER.
5. SH 135 NB TRAFFIC TO MERGE USING APPLICABLE TXDOT TCP AND BC STANDARDS.
6. ADDITIONAL ONE-WAY SIGNS CAN BE ADDED AS DIRECTED BY THE ENGINEER.

ALLOWABLE LPCB PLACEMENT		
BEGIN STATION	END STATION	MAX BARRIER LENGTH (FT)
58+50	59+34	60
60+00	61+43	100
62+08	63+37	80
63+88	66+09	180
66+55	67+80	80

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
REGISTERED
PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

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LAMB-STAR ENGINEERING, LLC
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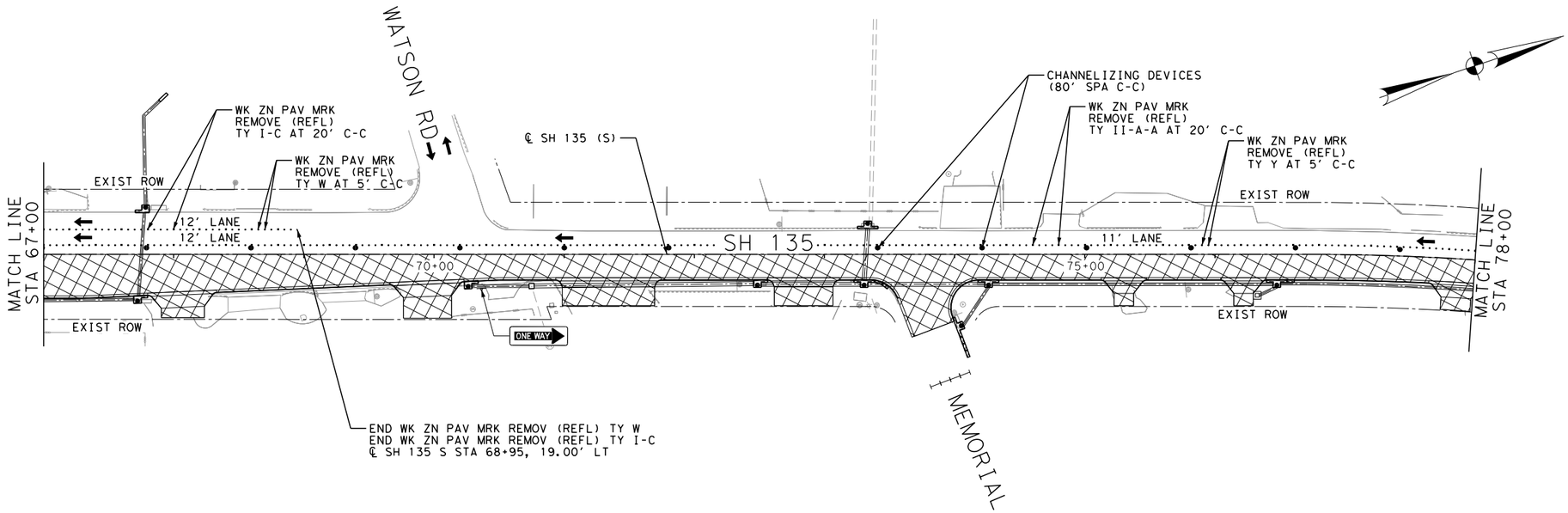
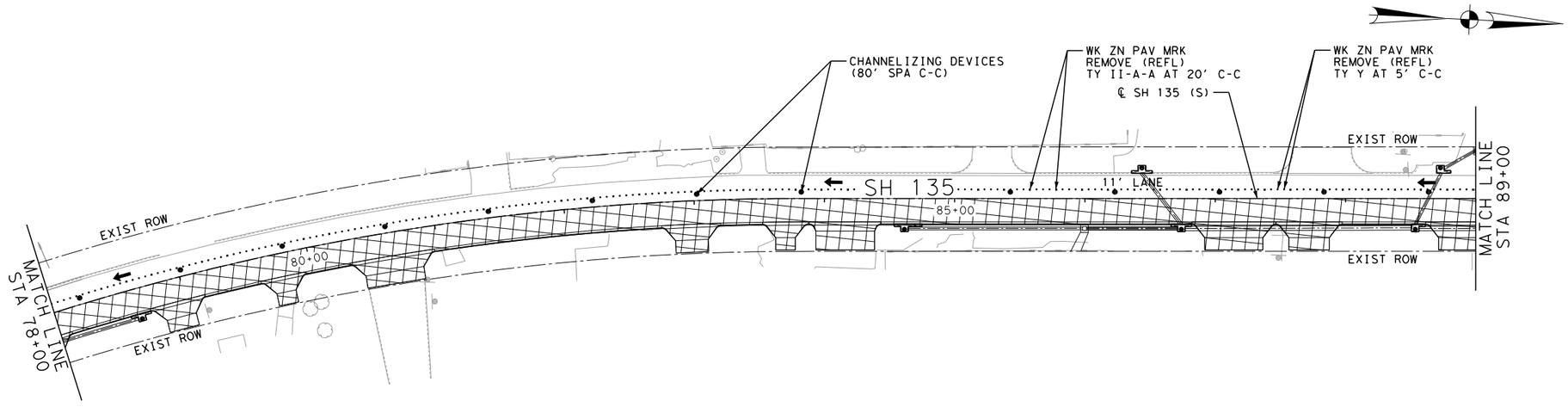
SH 135
TRAFFIC CONTROL PLAN
PHASE 1B

SHEET 1 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	32





LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. SEE DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.
2. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
3. DRAINAGE STRUCTURES INSTALLED IN PHASE 1A AS SHOWN ON SHEETS 28-30.
4. LPCB ALLOWABLE AS SHOWN ON TABLE AND AS DIRECTED BY THE ENGINEER.
5. ADDITIONAL ONE-WAY SIGNS CAN BE ADDED AS DIRECTED BY THE ENGINEER.

ALLOWABLE LPCB PLACEMENT		
BEGIN STATION	END STATION	MAX BARRIER LENGTH (FT)
68+33	69+66	80
71+74	72+56	40
74+17	75+12	40
76+39	77+65	80
80+97	82+74	120
84+44	86+82	180

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
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TEXAS REGISTERED ENGINEERING FIRM F-9073

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SH 135
TRAFFIC CONTROL PLAN
PHASE 1B

SHEET 2 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	33

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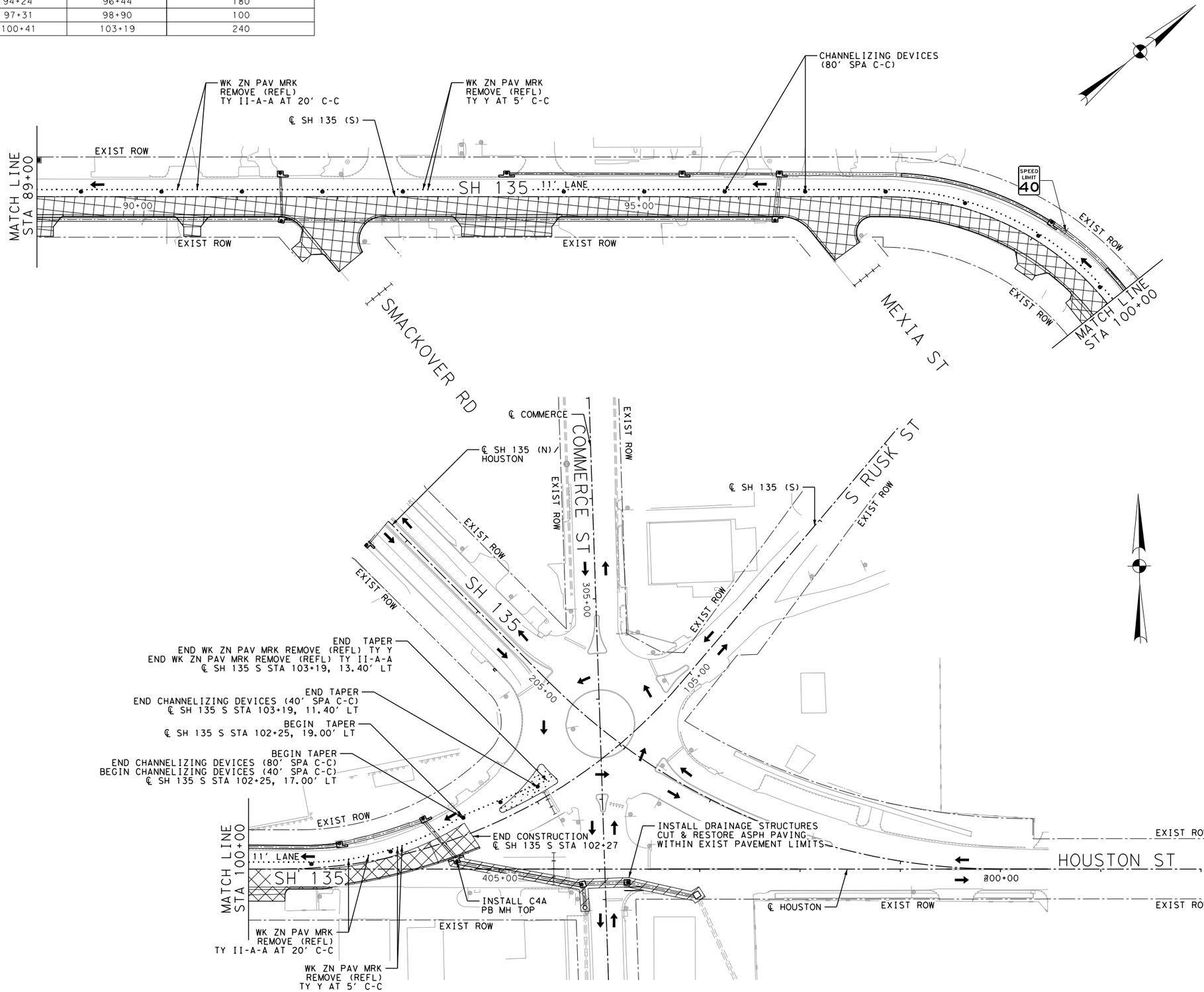
ALLOWABLE LPCB PLACEMENT		
BEGIN STATION	END STATION	MAX BARRIER LENGTH (FT)
89+26	90+36	60
94+24	96+44	180
97+31	98+90	100
100+41	103+19	240



LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. SEE DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.
2. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
3. DRAINAGE STRUCTURES INSTALLED IN PHASE 1A AS SHOWN ON SHEETS 28-30.
4. LPCB ALLOWABLE AS SHOWN ON TABLE AND AS DIRECTED BY THE ENGINEER.
5. SEE TRAFFIC CONTROL PLAN NARRATIVE FOR TEMPORARY PAVEMENT DETAILS.
6. THE CONTRACTOR SHALL USE TXDOT TCP AND BC STANDARD DETAILS DURING CONSTRUCTION OF TEMPORARY PAVEMENT. TEMPORARY PAVEMENT SHALL BE PAID FOR USING ITEM NUMBER 508 6001 (CONSTRUCTING DETOURS).
7. LANE CLOSURES PROHIBITED BETWEEN HOURS OF 6 AM AND 10 PM OR AS DIRECTED BY THE ENGINEER.

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
PROFESSIONAL ENGINEER
2/23/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
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SH 135
TRAFFIC CONTROL PLAN
PHASE 1B

SHEET 3 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	34

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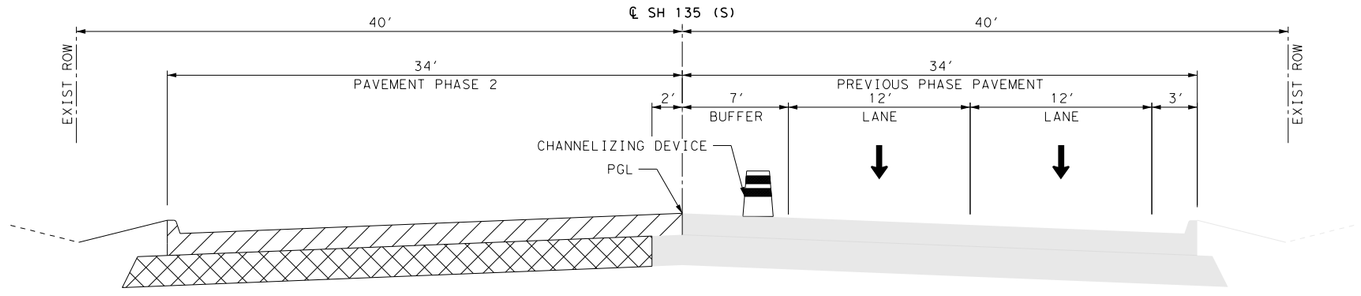
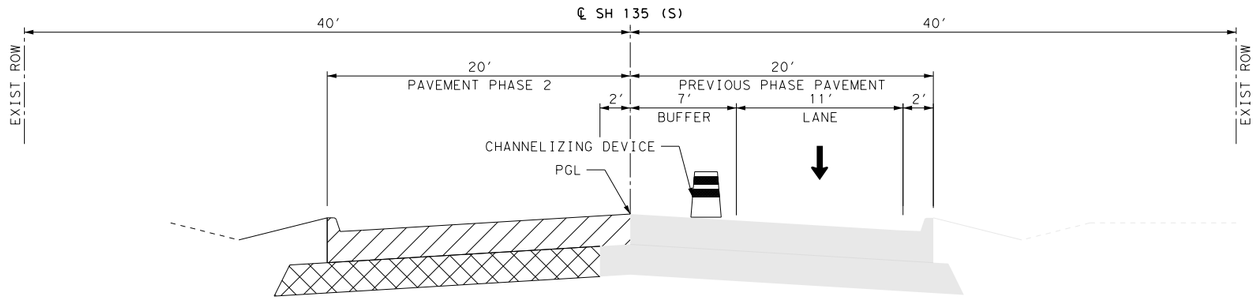


SECTION A-A



SECTION B-B

LEGEND:

- PAVEMENT THIS PHASE
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
PROFESSIONAL ENGINEER

2/11/2022

NOT TO SCALE

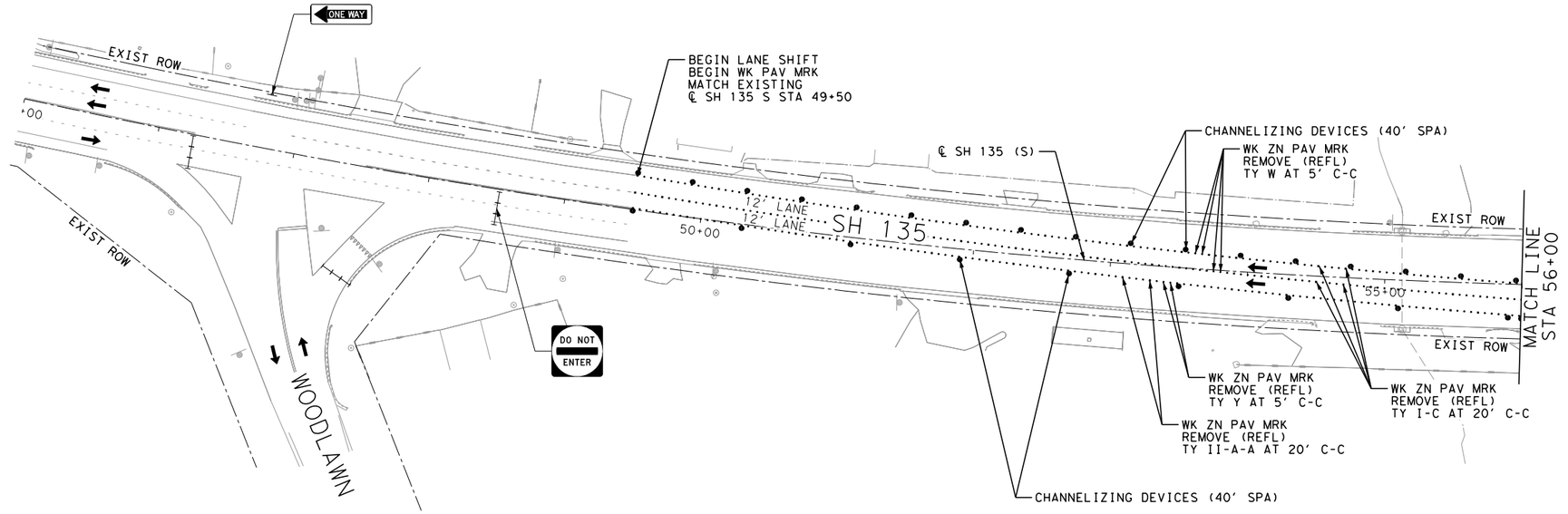
REV. NO.	DATE	DESCRIPTION	BY

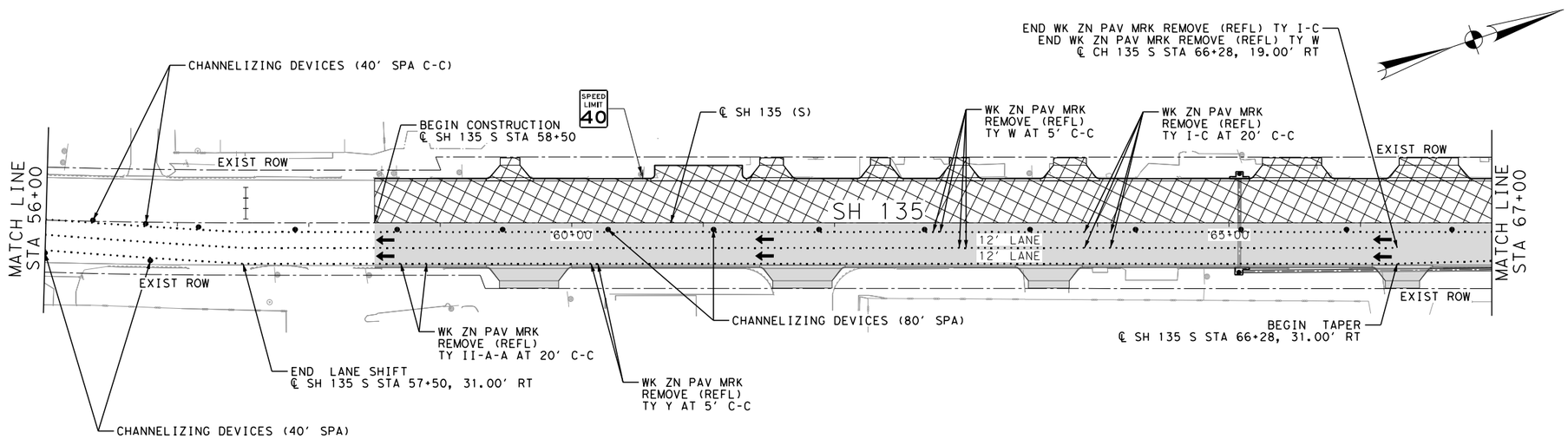
LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SH 135
TCP PHASE 2
TYPICAL SECTIONS

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	35





LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. SEE DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.
2. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
3. LPCB ALLOWABLE AS SHOWN ON TABLE AS DIRECTED BY THE ENGINEER.
4. SH 135 NB TRAFFIC TO MERGE USING APPLICABLE TXDOT TCP AND BC STANDARDS.
5. ADDITIONAL ONE-WAY SIGNS CAN BE AND ADDED AS DIRECTED BY THE ENGINEER.

ALLOWABLE LPCB PLACEMENT		
BEGIN STATION	END STATION	MAX BARRIER LENGTH (FT)
58+50	59+34	60
59+71	60+60	40
64+01	65+15	60

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STATE OF TEXAS
Ryan Lance
141449
PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

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SH 135
TRAFFIC CONTROL PLAN
PHASE 2

SHEET 1 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	36

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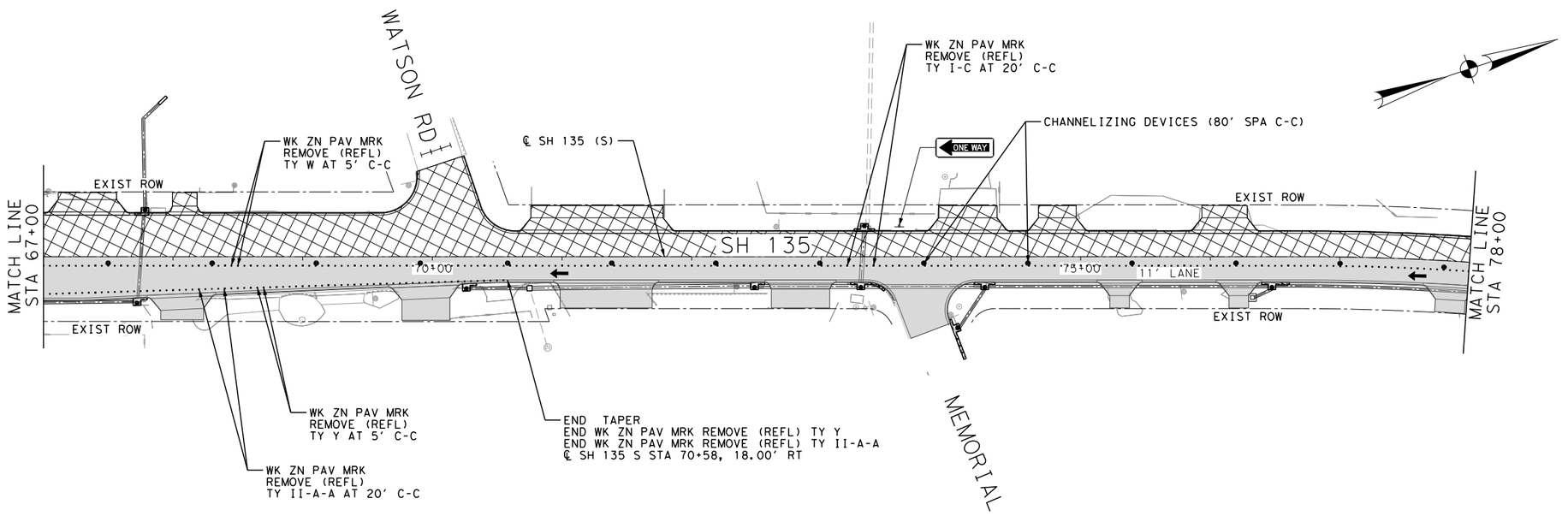

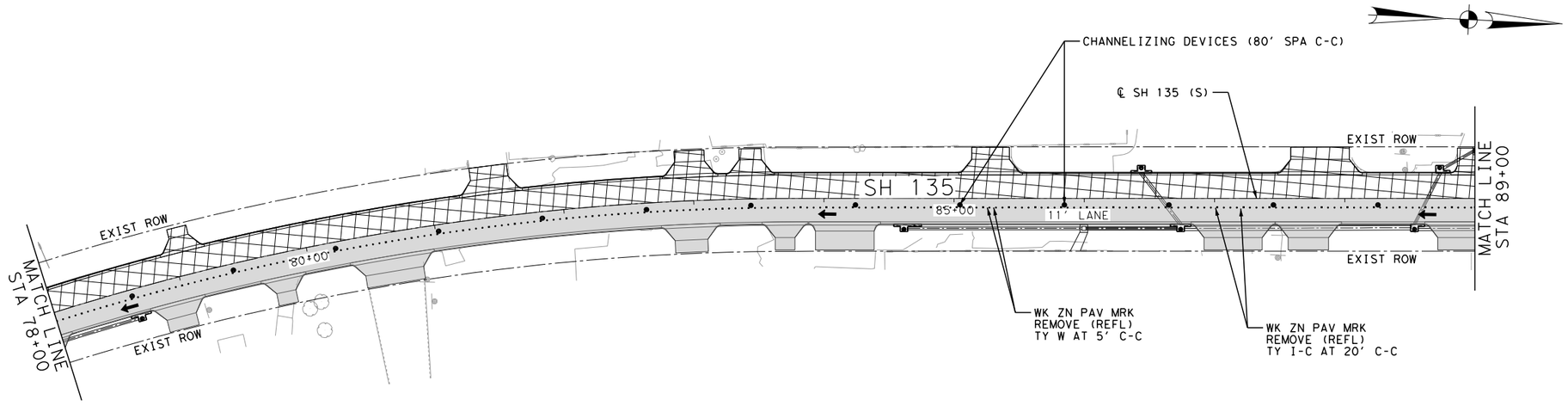

LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- I TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. SEE DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.
2. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
3. LPCB ALLOWABLE AS SHOWN ON TABLE AS DIRECTED BY THE ENGINEER.
4. ADDITIONAL ONE-WAY SIGNS CAN BE ADDED AS DIRECTED BY THE ENGINEER.

ALLOWABLE LPCB PLACEMENT		
BEGIN STATION	END STATION	MAX BARRIER LENGTH (FT)
68+24	69+60	80
71+88	73+80	140
76+38	78+90	200
79+24	81+22	140
81+70	82+77	60
83+62	85+03	100
85+52	87+49	140

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
REGISTERED
PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
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TEXAS REGISTERED ENGINEERING FIRM F-9073

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SH 135
TRAFFIC CONTROL PLAN
PHASE 2

SHEET 2 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	37

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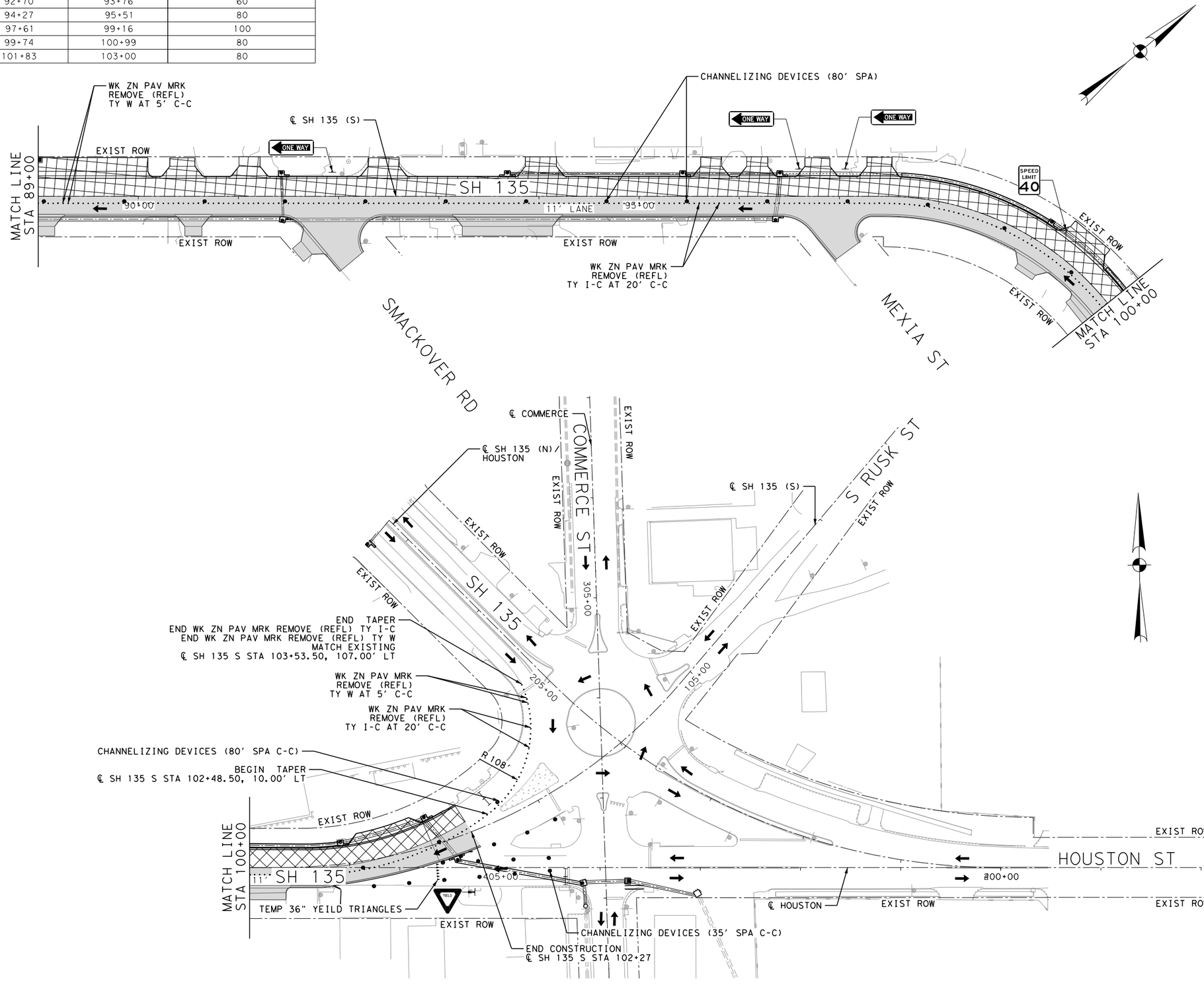
135_TCP-PH02-02.dgn Ryan.Lance

ALLOWABLE LPCB PLACEMENT		
BEGIN STATION	END STATION	MAX BARRIER LENGTH (FT)
91+32	92+19	40
92+70	93+76	60
94+27	95+51	80
97+61	99+16	100
99+74	100+99	80
101+83	103+00	80



LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. SEE DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.
2. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
3. LPCB ALLOWABLE AS SHOWN ON TABLE AS DIRECTED BY THE ENGINEER.
4. ADDITIONAL ONE-WAY SIGNS CAN BE ADDED AS DIRECTED BY THE ENGINEER.

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
PROFESSIONAL ENGINEER
LICENSED
2/11/2022

0 25 50 100(H)

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Texas Department of Transportation

SH 135
TRAFFIC CONTROL PLAN
PHASE 2

SHEET 3 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	38

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135_TCP-PH02-03.dgn Ryan.Lance

END TAPER
END WK PAV MRK (Y) 4"
℄ SH 135 N STA 213+02, 3.50' LT

END TAPER
END WK PAV MRK (W) 4"
MATCH EXISTING
℄ SH 135 N STA 213+02, 17.50' LT

BEGIN TAPER
℄ SH 135 N STA 211+27, 24.00' LT

BEGIN TAPER
℄ SH 135 N STA 211+27, 10.00' LT

EXIST ROW

END TAPER
END WK PAV MRK (Y) 4"
℄ SH 135 N STA 209+72, 3.50' RT

END TAPER
END WK PAV MRK (W) 4"
MATCH EXISTING
℄ SH 135 N STA 209+42, 17.50' RT

END LPCB
℄ SH 135 N STA 209+42, 19.50' RT

EXIST ROW

BEGIN TAPER
℄ SH 135 N STA 207+42, 0.00' LT

℄ COMMERCE

EXIST ROW

CHANNELIZING DEVICES (40' SPA C-C)

℄ SH 135 (N)
HOUSTON

WK PAV MRK (Y) 4"

12' LANE

12' LANE

EXIST ROW

EXIST ROW

BEGIN TAPER
℄ SH 135 N STA 207+42, 12.00' LT

SEE FIGURE 1

EXIST ROW

WK ZN PAV MRK (W) 4"

END CONSTRUCTION
℄ SH 135 N STA 206+42

SH 135

OTLD (80' SPA C-C)

END CHANNELIZING DEVICES (80' SPA C-C)
BEGIN CHANNELIZING DEVICES (35' SPA C-C)
℄ SH 135 N STA 204+44, 16.00' LT

BEGIN LPCB
℄ SH 135 N STA 204+45, 15.50' LT

WK PAV MRK (W) 8"

YIELD

STOP

END WK PAV MRK (W) 4"
MATCH EXISTING
℄ HOUSTON ST STA 406+88, 18.00' RT

EXIST ROW

SH 135

405+00

WK PAV MRK (W) 8"

24" TEMP STOP BAR

EXIST ROW

BEGIN WK PAV MRK (Y) 4"
℄ SH 135 N STA 206+34, 100.20' LT

END CHANNELIZING DEVICES (35' SPA C-C)
BEGIN CHANNELIZING DEVICES (70' SPA C-C)
℄ SH 135 N STA 206+87, 64.00' LT

INSTALL DRAINAGE STRUCTURES
CUT & RESTORE ASPH PAVING
WITHIN EXIST PAVEMENT LIMITS

EXIST ROW

305+00

205+00

WK PAV MRK (W) 8"

WK PAV MRK (Y) 4"

CHANNELIZING DEVICES
(35' SPA C-C)

℄ COMMERCE ST

EXIST ROW

℄ SH 135 (S)

S RUSK ST

EXIST ROW

INSTALL DRAINAGE STRUCTURES
CUT & RESTORE ASPH PAVING
WITHIN EXIST PAVEMENT LIMITS

EXIST ROW

INSTALL DRAINAGE STRUCTURES
CUT & RESTORE ASPH PAVING
WITHIN EXIST PAVEMENT LIMITS

INSTALL DRAINAGE STRUCTURES
CUT & RESTORE ASPH PAVING
WITHIN EXIST PAVEMENT LIMITS

BEGIN WK PAV MRK (W) 4"
℄ SH 135 N STA 199+60, 18.00' RT

BEGIN CONSTRUCTION
℄ SH 135 N STA 202+74

WK PAV MRK (W) 4"

EXIST ROW

HOUSTON ST

200+00

℄ HOUSTON

EXIST ROW

EXIST ROW

INSTALL DRAINAGE STRUCTURES
CUT & RESTORE ASPH PAVING
WITHIN EXIST PAVEMENT LIMITS

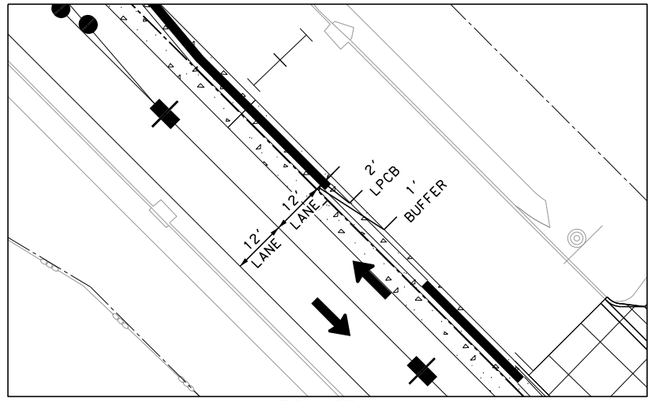

FIGURE 1
N.T.S.

LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. SEE DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.
2. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
3. SEE TRAFFIC CONTROL PLAN NARRATIVE FOR TEMPORARY PAVEMENT DETAILS.
4. THE CONTRACTOR SHALL USE TXDOT TCP AND BC STANDARD DETAILS DURING CONSTRUCTION OF TEMPORARY PAVEMENT. TEMPORARY PAVEMENT SHALL BE PAID FOR USING ITEM NUMBER 508 6001 (CONSTRUCTING DETOURS).
5. LANE CLOSURES PROHIBITED BETWEEN HOURS OF 6 AM AND 10 PM OR AS DIRECTED BY THE ENGINEER.

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
LICENSED
PROFESSIONAL ENGINEER
2/23/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

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TBPELS Engineering Firm No. 274
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13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

SH 135
TRAFFIC CONTROL PLAN
PHASE 3

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	39

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I35_TCP-PH03-03.dgn Ryan.Lance

END TAPER
END LPCB
END WK PAV MRK (W) 4"
MATCH EXISTING
℄ SH 135 N STA 211+26.50, 17.00' LT

END TAPER
END CHANNELIZING DEVICES (40' SPA C-C)
END WK PAV MRK (Y) 4"
℄ SH 135 N STA 211+26.50, 5.00' LT

END TAPER
END WK PAV MRK (Y) 4"
℄ SH 135 N STA 210+56.50, 5.50' RT

EXIST ROW

END TAPER
END WK PAV MRK (W) 4"
MATCH EXISTING
℄ SH 135 N STA 210+56.50, 17.50' RT

BEGIN TAPER
℄ SH 135 N STA 208+96.50, 23.50' RT

EXIST ROW

BEGIN TAPER
℄ SH 135 N STA 208+96.50, 0.50' LT

BEGIN TAPER
END OTLD (80' SPA C-C)
℄ SH 135 N STA 208+96.50, 11.50' RT

12' LANE
12' LANE

EXIST ROW

EXIST ROW

SEE FIGURE 1

WK PAV MRK (Y) 4"
WK PAV MRK (W) 4"

SH 135

STOP

24" TEMP STOP BAR

BEGIN LPCB
BEGIN WK PAV MRK (W) 4"
MATCH EXISTING
℄ HOUSTON ST STA 407+00, 16.00' RT

EXIST ROW

SH 135

405+00

24" TEMP STOP BAR

24" TEMP STOP BAR

EXIST ROW

WK PAV MRK (W) 8"

WK PAV MRK (Y) 4"

℄ COMMERCE

EXIST ROW

COMMERCE ST

EXIST ROW

WK PAV MRK (W) 4"

℄ SH 135 (N)/
HOUSTON

305+00

STOP

END WK PAV MRK (W) 4"
MATCH EXISTING
℄ COMMERCE ST STA 305+20, 20.00' LT

℄ SH 135 (S)

S RUSK ST

EXIST ROW

CHANNELIZING DEVICE
(20' SPA C-C)

END WK PAV MRK (W) 4"
MATCH EXISTING
℄ COMMERCE ST STA 305+20, 23.00' RT

EXIST ROW

BEGIN OTLD (80' SPA C-C)
℄ SH 135 N STA 204+10.50, 19.20' RT

105+00

WK PAV MRK (W) 8"

24" TEMP STOP BAR

WK PAV MRK (W) 4"

BEGIN WK PAV MRK (W) 4"
MATCH EXISTING
℄ SH 135 N STA 200+73, 22.00' RT

STOP

STOP

EXIST ROW

HOUSTON ST

200+00

℄ HOUSTON

EXIST ROW

EXIST ROW

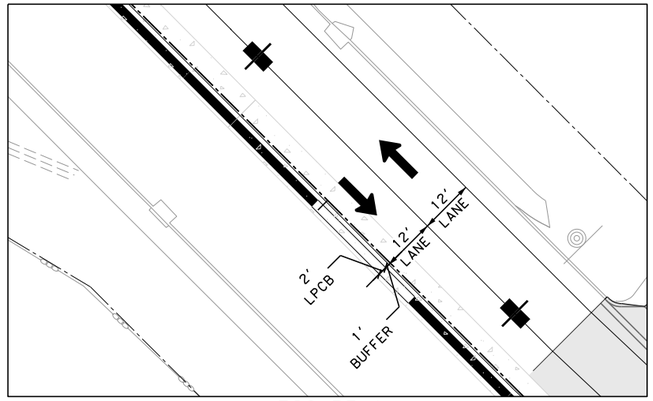

FIGURE 1
N.T.S.

LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- I TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
2. SEE TRAFFIC CONTROL PLAN NARRATIVE FOR TEMPORARY PAVEMENT DETAILS.
3. THE CONTRACTOR SHALL USE TXDOT TCP AND BC STANDARD DETAILS DURING CONSTRUCTION OF TEMPORARY PAVEMENT. TEMPORARY PAVEMENT SHALL BE PAID FOR USING ITEM NUMBER 508 6001 (CONSTRUCTING DETOURS).

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
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Texas Department of Transportation

SH 135
TRAFFIC CONTROL PLAN
PHASE 4

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	40

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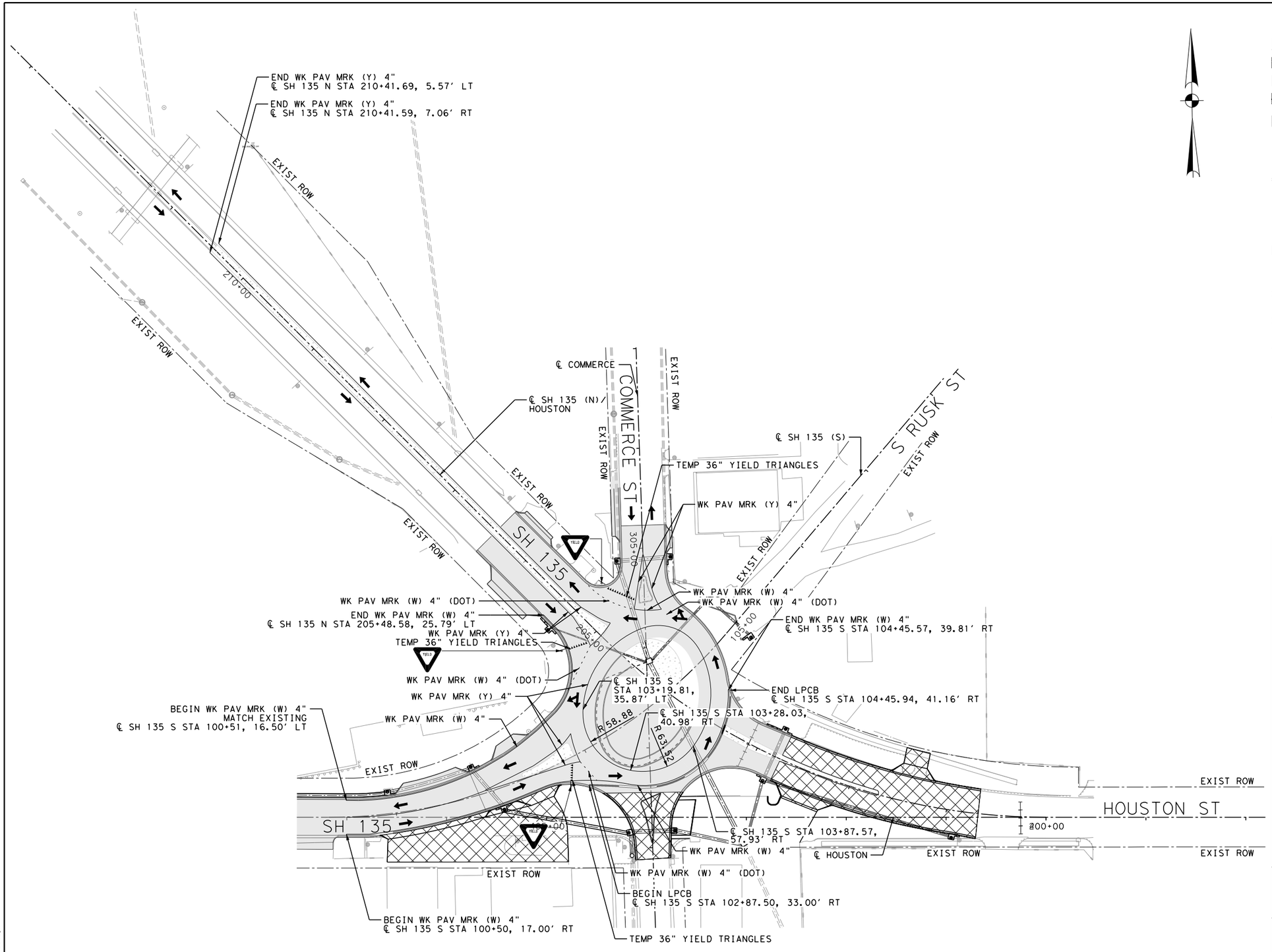
135_TCP-PH04-03.dgn Ryan.Lance



LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. SEE DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.
2. ACCESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
3. SEE TRAFFIC CONTROL PLAN NARRATIVE FOR TEMPORARY PAVEMENT DETAILS.
4. THE CONTRACTOR SHALL USE TXDOT TCP AND BC STANDARD DETAILS DURING CONSTRUCTION OF TEMPORARY PAVEMENT. TEMPORARY PAVEMENT SHALL BE PAID FOR USING ITEM NUMBER 508 6001 (CONSTRUCTING DETOURS).
5. LOCATION OF TEMPORARY STRIPING TO MATCH FINAL LANE CONFIGURATION AS SHOWN ON SIGNING & PAVEMENT MARKING LAYOUT SHEET 5 OF 5, UNLESS OTHERWISE NOTED.

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
LICENSED
PROFESSIONAL ENGINEER
2/23/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

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SH 135
TRAFFIC CONTROL PLAN
PHASE 5A

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	41

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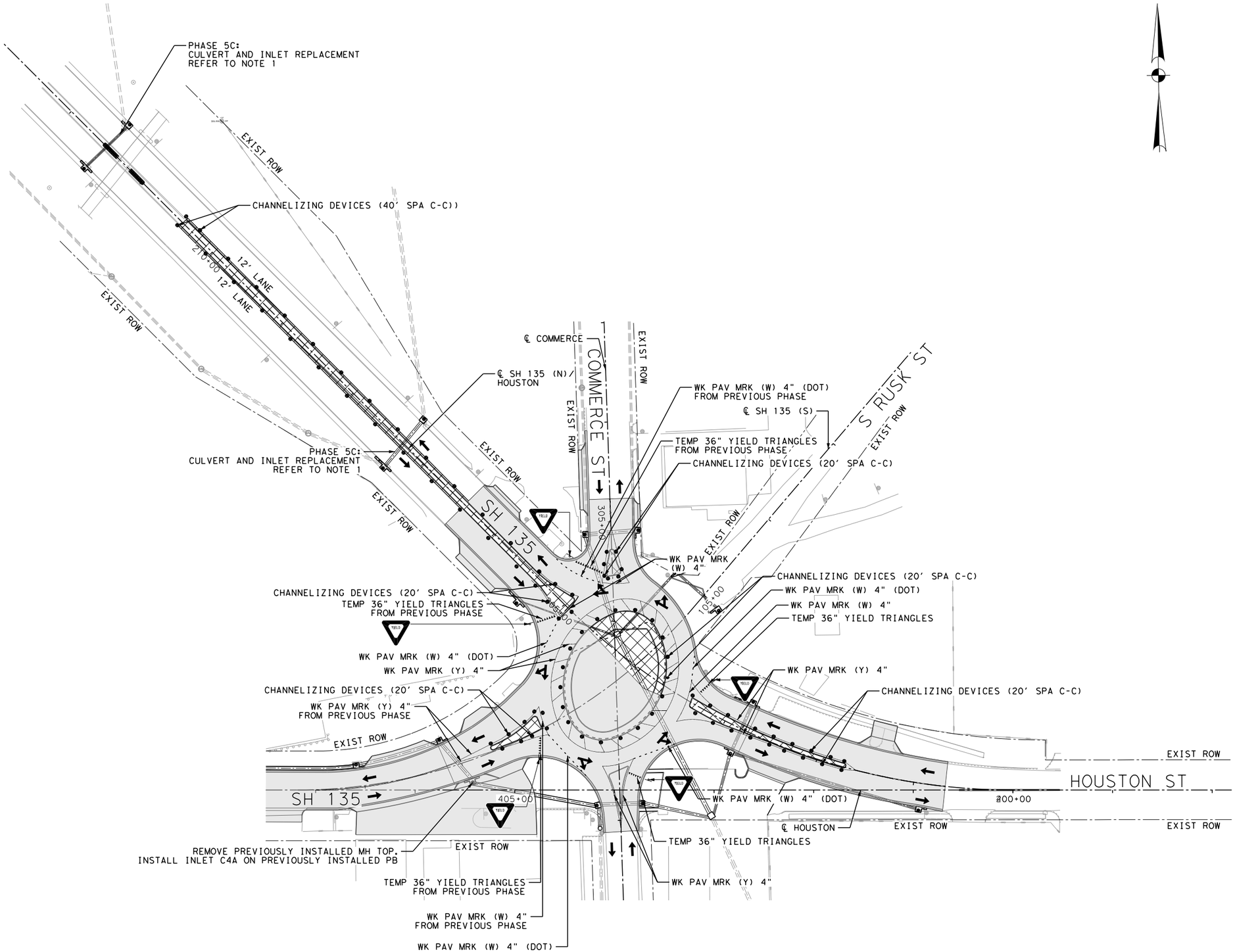

LEGEND:

- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- TEMPORARY PAVEMENT (PREVIOUSLY INSTALLED)
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- LPCB (TYPE 1 & 2)
- OPPOSING TRAFFIC LANE DIVIDERS (OTLD)
- CHANNELIZING DEVICE

NOTES:

1. REFER TO TRAFFIC CONTROL NARRATIVE FOR MORE INFORMATION ON CULVERT AND INLET REPLACEMENT.
2. LOCATION OF TEMPORARY STRIPING TO MATCH FINAL LANE CONFIGURATION AS SHOWN ON SIGNING & PAVEMENT MARKING LAYOUT SHEET 5 OF 5.

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

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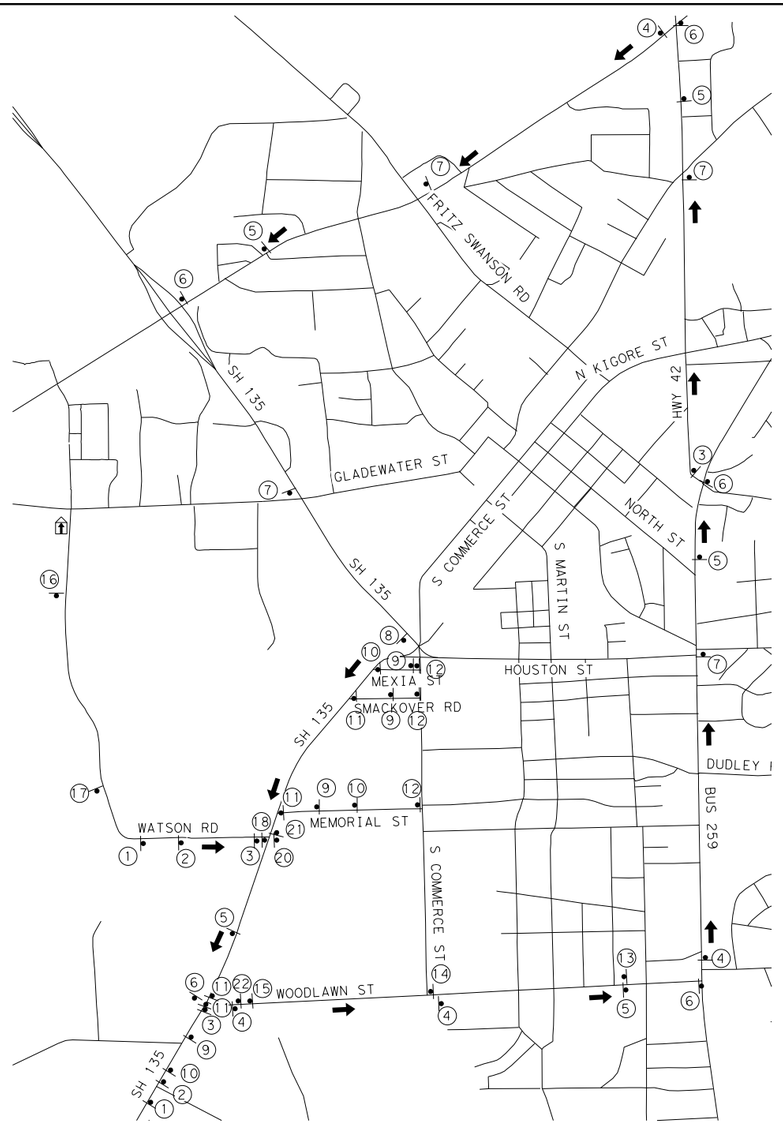
SH 135
TRAFFIC CONTROL PLAN
PHASE 5B & 5C

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	42



①	DETOUR 1500 FT	CW20-2 30" X 30"
②	DETOUR / NORTH / TEXAS 135 / M5-1	M4-8 24"X12" / M3-1 24"X12" / M1-6T 24"X24" / M5-1 21"X15"
③	DETOUR / NORTH / TEXAS 135 / M6-1	M4-8 24"X12" / M3-1 24"X12" / M1-6T 24"X24" / M6-1 21"X15"
④	DETOUR / NORTH / TEXAS 135	M4-8 24"X12" / M3-1 24"X12" / M1-6T 24"X24"
⑤	DETOUR / NORTH / TEXAS 135 / M5-1	M4-8 24"X12" / M3-1 24"X12" / M1-6T 24"X24" / M5-1 21"X15"
⑥	DETOUR / NORTH / TEXAS 135 / M6-1	M4-8 24"X12" / M3-1 24"X12" / M1-6T 24"X24" / M6-1 21"X15"
⑦	DETOUR / NORTH / TEXAS 135 / M6-3	M4-8 24"X12" / M3-1 24"X12" / M1-6T 24"X24" / M6-3 21"X15"
⑧	END DETOUR / NORTH / TEXAS 135	M4-8a 24"X18" / M3-1 24"X12" / M1-6T 24"X24"
⑨	ROAD CLOSED 500 FT	CW20-3C 36" X 36"
⑩	ROAD CLOSED 1000 FT	CW20-3C 36" X 36"
⑪	ROAD CLOSED	R11-2 48" X 30"
⑫	ROAD CLOSED TO THRU TRAFFIC	R11-4 60" X 30"
⑬	ONLY / 1 MILE	R3-5 30" X 36" / CW16-3aP 30" X 12"
⑭	ONLY / 1/2 MILE	R3-5 30" X 36" / CW16-3aP 30" X 12"
⑮	ONLY	R3-5 30" X 36"
⑯	ONLY / 1 MILE	R3-5 30" X 36" / CW16-3aP 30" X 12"
⑰	ONLY / 1/2 MILE	R3-5 30" X 36" / CW16-3aP 30" X 12"
⑱	ONLY	R3-5 30" X 36"
⑲	ONE WAY	R6-1(L) 30" X 36"
⑳	ONE WAY	R6-1(R) 30" X 36"
㉑	DO NOT ENTER	R5-1 30" X 30"
㉒		R3-1 24" X 24"

SH 135 NB
CLOSED
AT WATSON RD

USE
OTHER
ROUTES

LEGEND:

- SIGN
- DIRECTION OF TRAFFIC
- PCMS

NOTES:

1. CONTRACTOR TO REFER TO STANDARD BC(6)-14 FOR FURTHER INFORMATION.

100% SUBMITTAL

STATE OF TEXAS
JILL M. VAN HOEWYK
110940
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

0 500 1000 2000

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

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Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SH 135
DETOUR LAYOUTS
PHASE 1B

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	43

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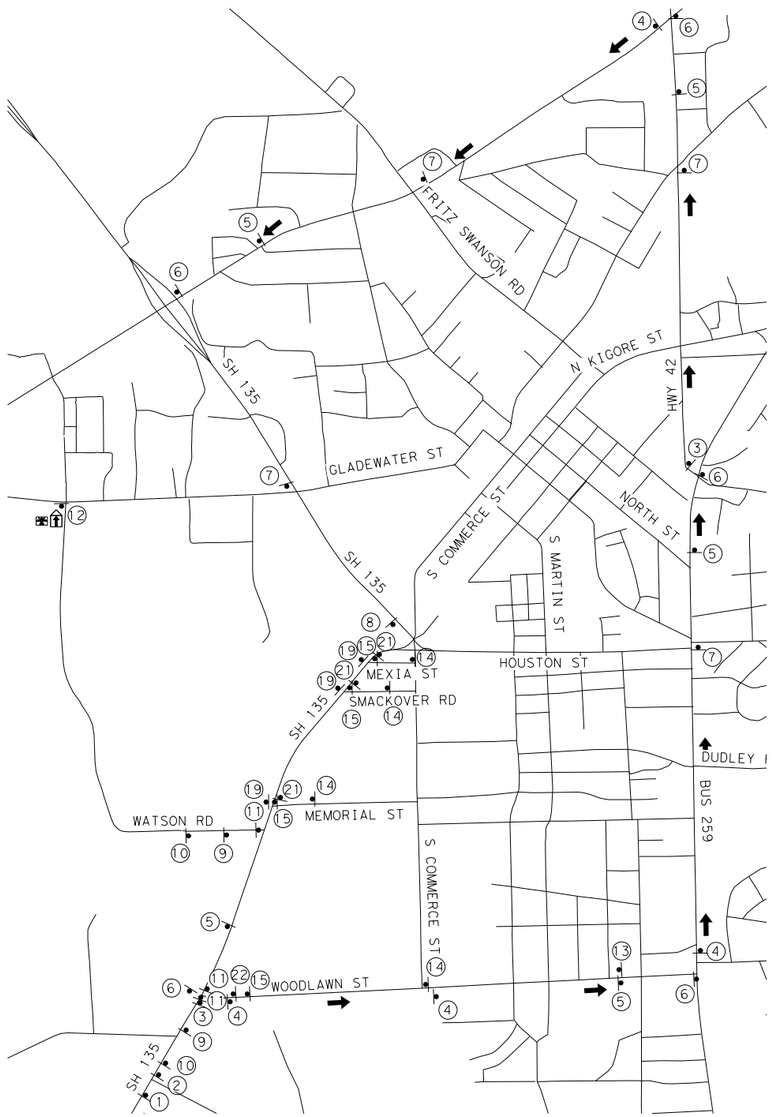

① DETOUR 1500 FT — CW20-2, 30" X 30"	② DETOUR M4-8 24"X12" / NORTH M3-1 24"X12" / TEXAS 135 M1-6T 24"X24" / M5-1 21"X15"	③ DETOUR M4-8 24"X12" / NORTH M3-1 24"X12" / TEXAS 135 M1-6T 24"X24" / M6-1 21"X15"	④ DETOUR M4-8 24"X12" / NORTH M3-1 24"X12" / TEXAS 135 M1-6T 24"X24"
⑤ DETOUR M4-8 24"X12" / NORTH M3-1 24"X12" / TEXAS 135 M1-6T 24"X24" / M5-1 21"X15"	⑥ DETOUR M4-8 24"X12" / NORTH M3-1 24"X12" / TEXAS 135 M1-6T 24"X24" / M6-1 21"X15"	⑦ DETOUR M4-8 24"X12" / NORTH M3-1 24"X12" / TEXAS 135 M1-6T 24"X24" / M6-3 21"X15"	⑧ END DETOUR M4-8a 24"X18" / NORTH M3-1 24"X12" / TEXAS 135 M1-6T 24"X24"
⑨ ROAD CLOSED 500 FT — CW20-3C, 36" X 36"	⑩ ROAD CLOSED 1000 FT — CW20-3C, 36" X 36"	⑪ ROAD CLOSED — R11-2, 48" X 30"	⑫ ROAD CLOSED TO THRU TRAFFIC — R11-4, 60" X 30"
⑬ ONLY — R3-5, 30" X 36" / 1 MILE — CW16-3aP, 24" X 12"	⑭ ONLY — R3-5, 30" X 36" / 1/2 MILE — CW16-3aP, 24" X 12"	⑮ ONLY — R3-5, 30" X 36"	
⑯ ONLY — R3-5, 30" X 36" / 1 MILE — CW16-3aP, 24" X 12"	⑰ ONLY — R3-5, 30" X 36" / 1/2 MILE — CW16-3aP, 24" X 12"	⑱ ONLY — R3-5, 30" X 36"	
WATSON RD CLOSED AT SH 135 / USE OTHER ROUTES	⑲ ONE WAY — R6-1(L), 30" X 36"	⑳ ONE WAY — R6-1(R), 30" X 36"	㉑ DO NOT ENTER — R5-1, 30" X 30"
			㉒ — R3-1, 24" X 24"

LEGEND:

- SIGN
- DIRECTION OF TRAFFIC
- PCMS

NOTES:

1. CONTRACTOR TO REFER TO STANDARD BC(6)-14 FOR FURTHER INFORMATION.

100% SUBMITTAL

STATE OF TEXAS — JILL M. VAN HOEWYK — 110940 — LICENSED PROFESSIONAL ENGINEER — 2/11/2022

0 500 1000 2000

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
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SH 135
DETOUR LAYOUTS
PHASE 2

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	44

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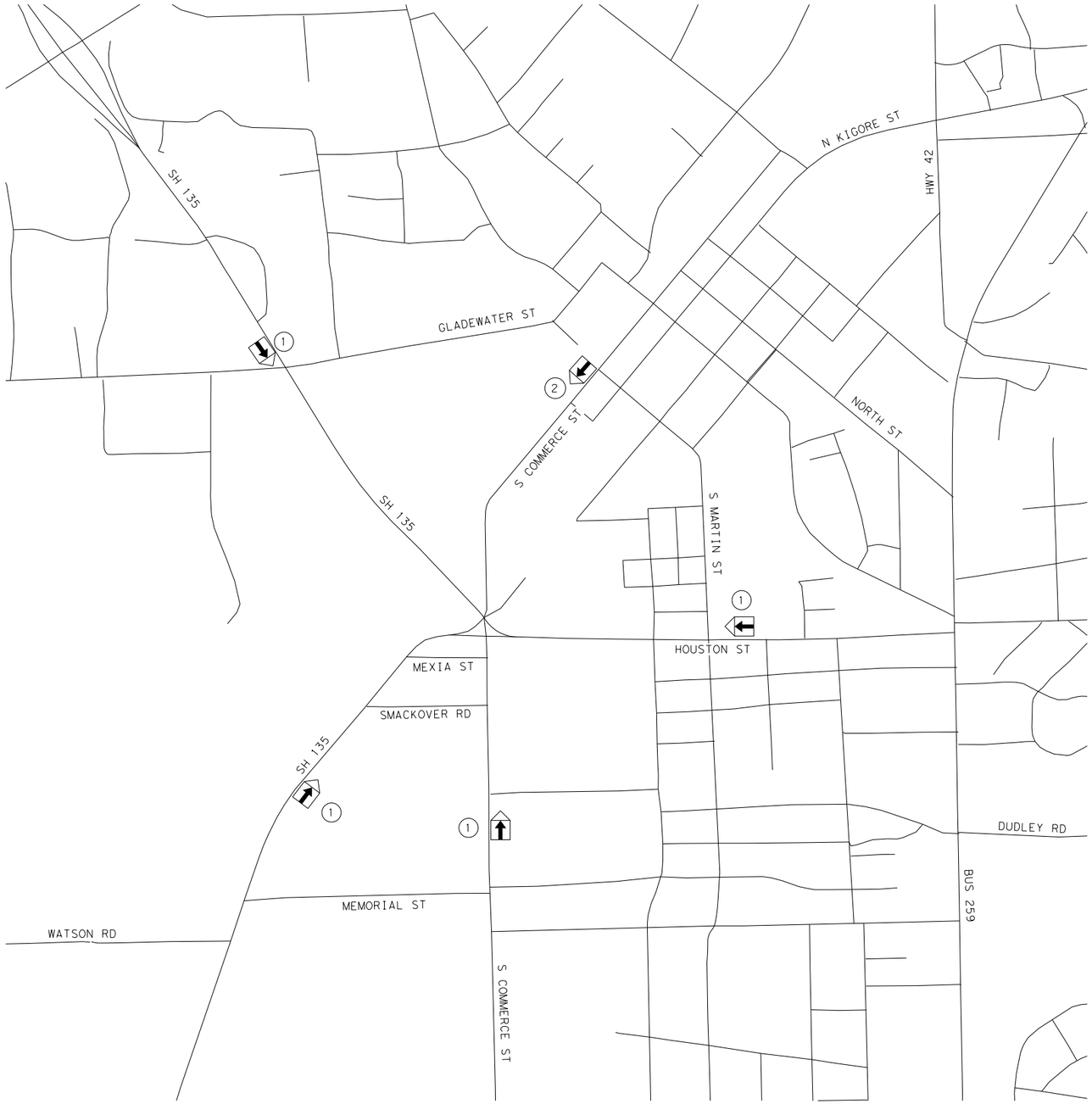

1 — S COMMERCE ST NB CLOSED — USE OTHER ROUTES

2 — S COMMERCE ST CLOSED AHEAD — USE OTHER ROUTES

LEGEND:

- SIGN
- DIRECTION OF TRAFFIC
- PCMS

NOTES:

1. CONTRACTOR TO REFER TO STANDARD BC(6)-14 FOR FURTHER INFORMATION.

100% SUBMITTAL

STATE OF TEXAS
JILL M. VAN HOEWYK
110940
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

0 250 500 1000

REV. NO.	DATE	DESCRIPTION	BY

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713.462.3242
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SH 135
DETOUR LAYOUTS
PHASE 3

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	45

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I35_DET-PH03-01.dgn Ryan.Lance

1	HOUSTON ST EB COMMERCE ST SB CLOSED AHEAD	USE OTHER ROUTES
2	S COMMERCE ST CLOSED AHEAD	USE OTHER ROUTES
3	HOUSTON ST CLOSED AHEAD	USE OTHER ROUTES

LEGEND:

- SIGN
- DIRECTION OF TRAFFIC
- PCMS

NOTES:

1. CONTRACTOR TO REFER TO STANDARD BC(6)-14 FOR FURTHER INFORMATION.

100% SUBMITTAL

STATE OF TEXAS
JILL M. VAN HOEWYK
110940
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

0 250 500 1000

REV. NO.	DATE	DESCRIPTION	BY

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SH 135
DETOUR LAYOUTS
PHASE 5A

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	46

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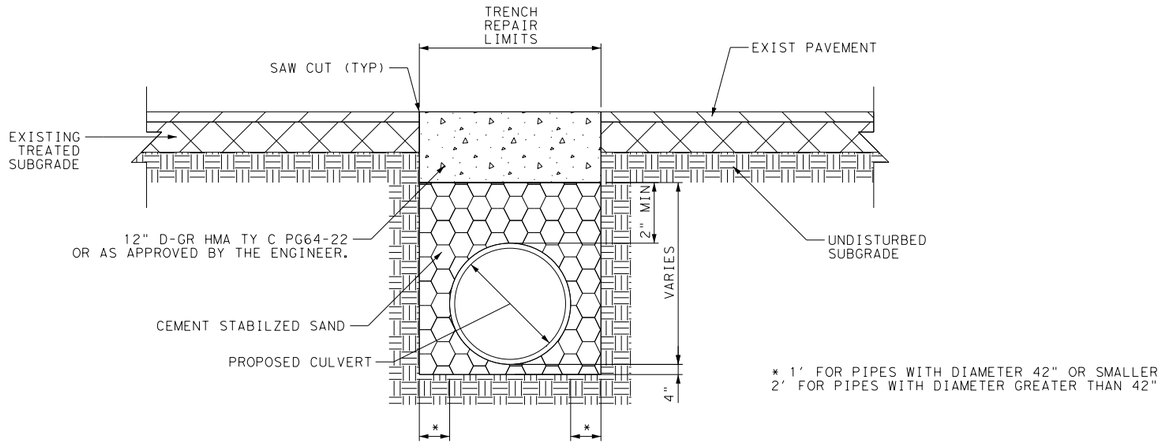
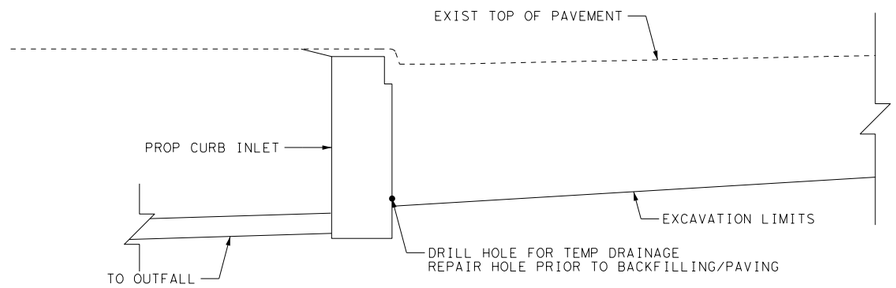


CUT & RESTORE DETAIL FOR RCP UNDER PAVEMENT

N.T.S.



TEMPORARY DRAINAGE DETAIL

N.T.S.

100% SUBMITTAL

STATE OF TEXAS
JILL M. VAN HOEWYK
110940
LICENSED
PROFESSIONAL ENGINEER

2/23/2022

REV. NO.	DATE	DESCRIPTION	BY

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713.462.3242
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SH 135
DRAINAGE CONSTRUCTION
DETAILS

SHEET 1 OF 1

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	47

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		48

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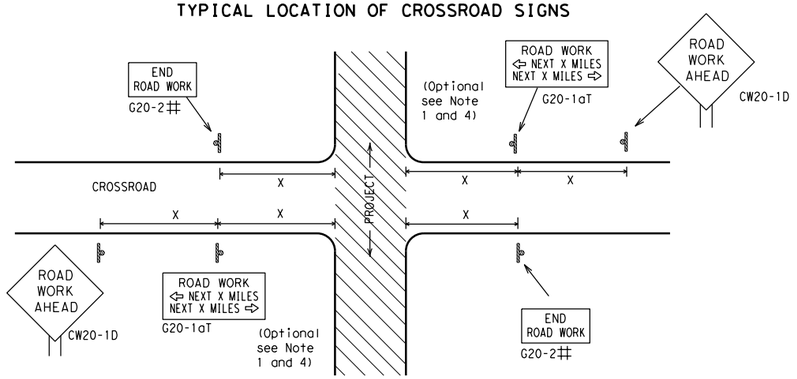
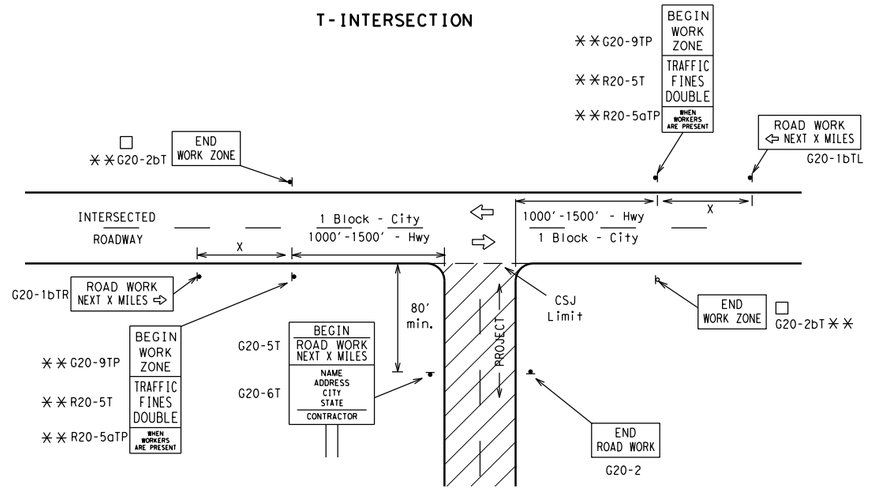
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

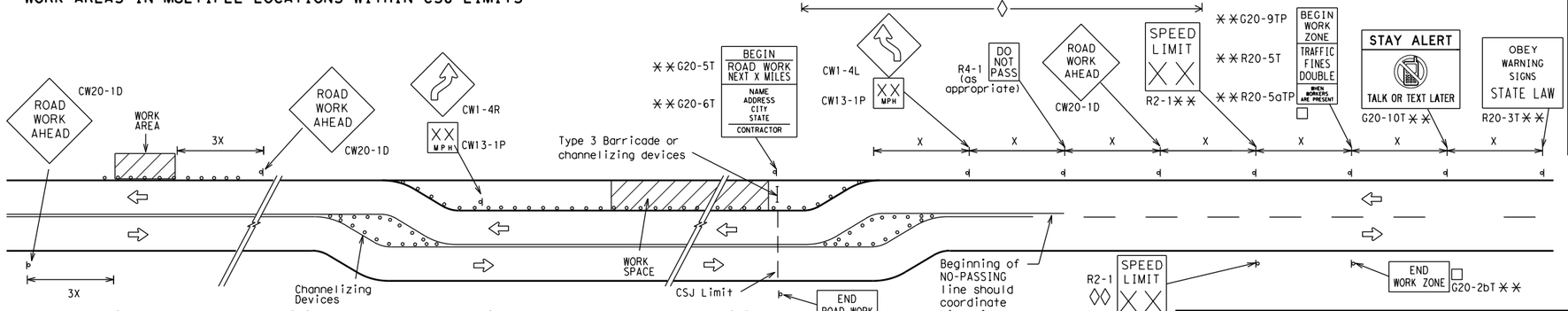
✳ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

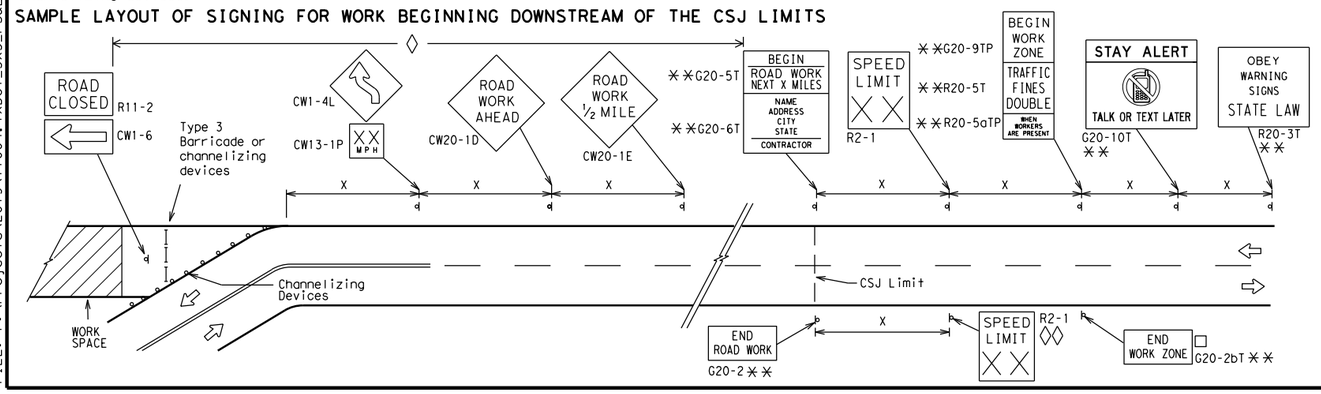
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	GREGG		49

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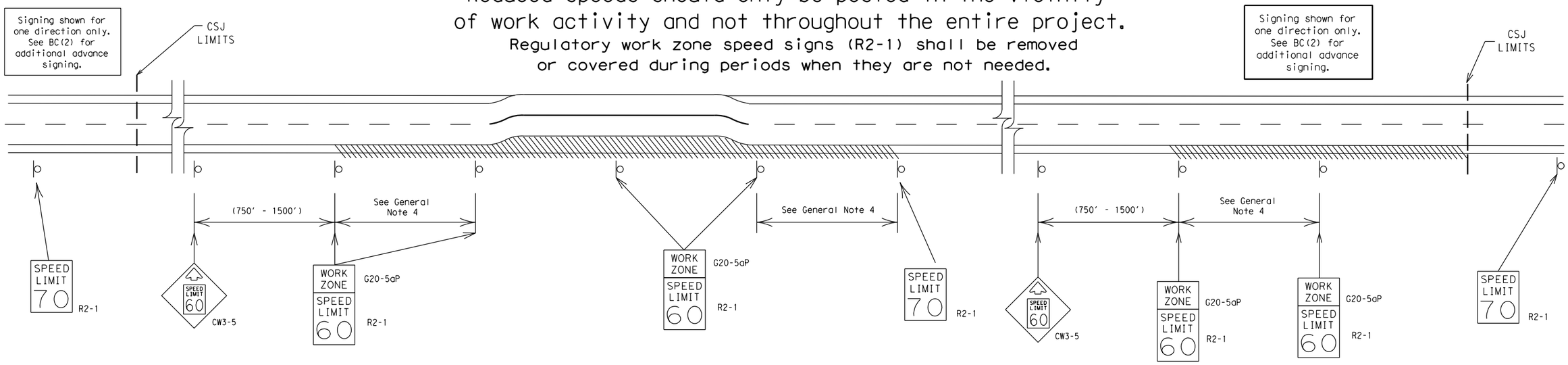
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	GREGG		50

DATE: 2/25/2022 12:48:08 PM
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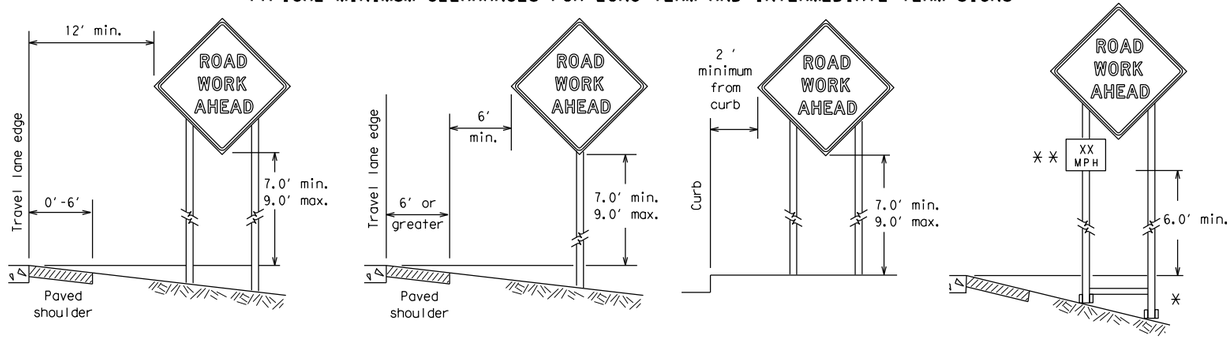
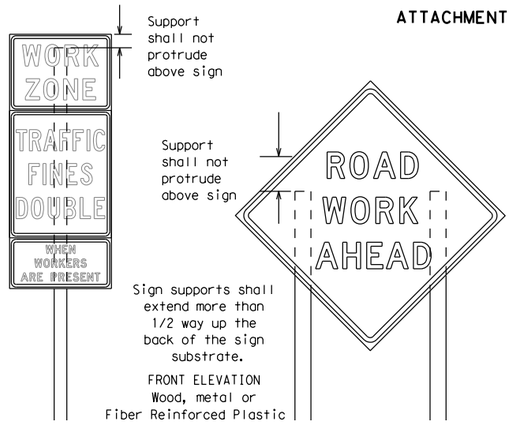
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

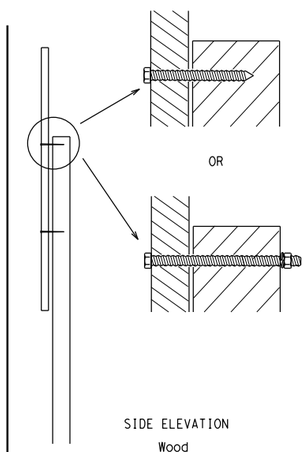


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ 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





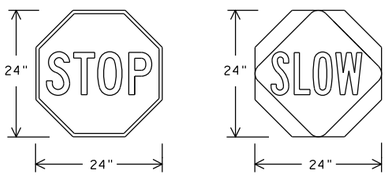
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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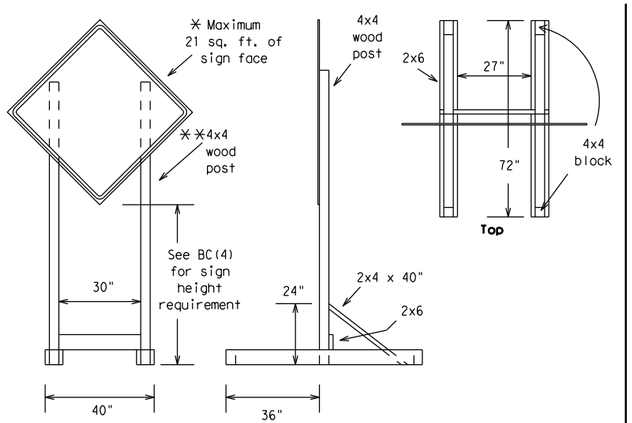
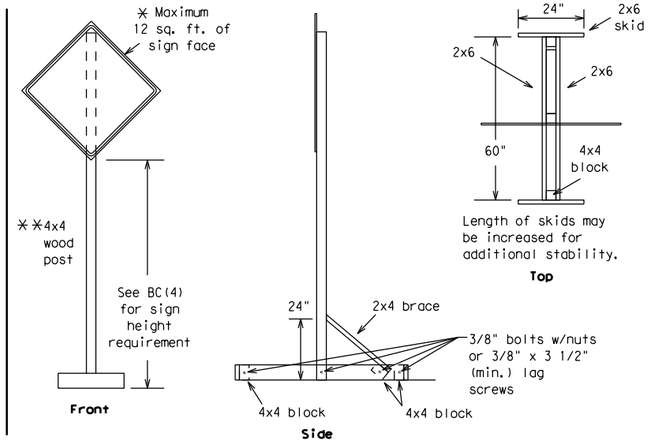
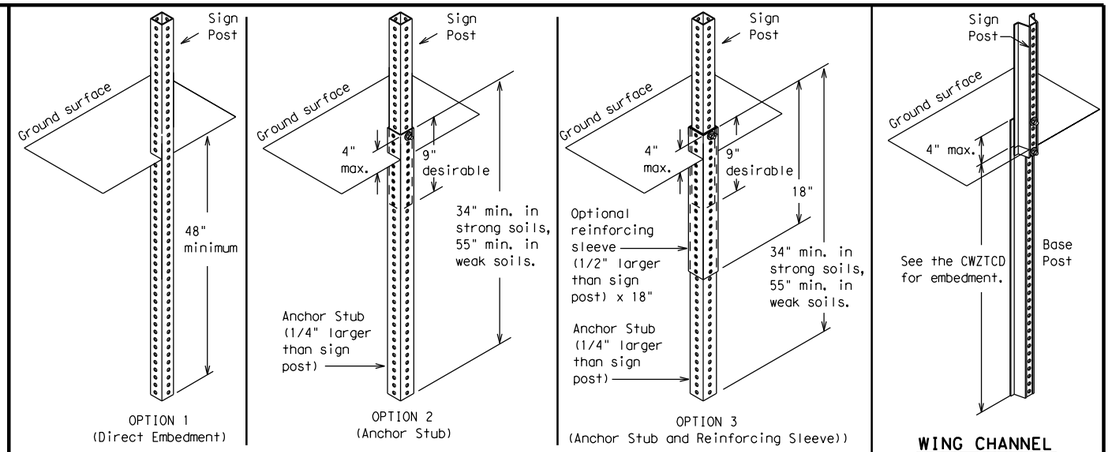




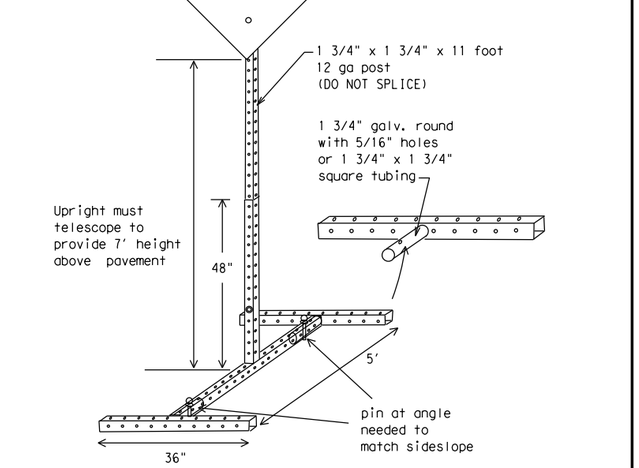
SKID MOUNTED WOOD SIGN SUPPORTS

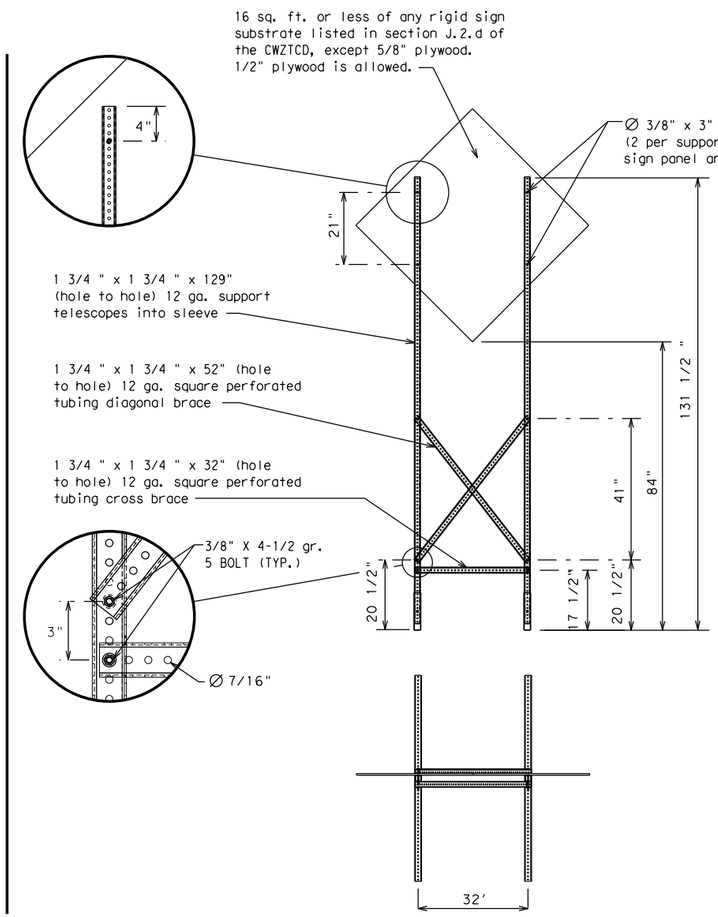
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

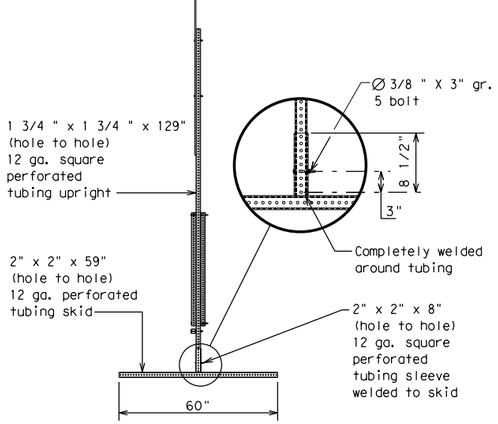


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

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

** 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	0545	01	014	SH 135
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	GREGG		53

100

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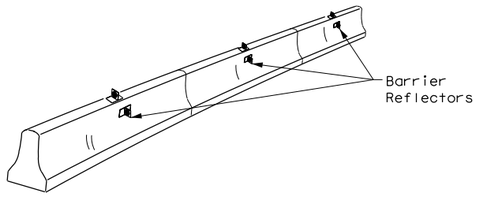
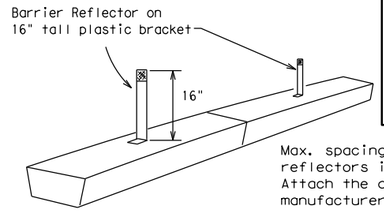
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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

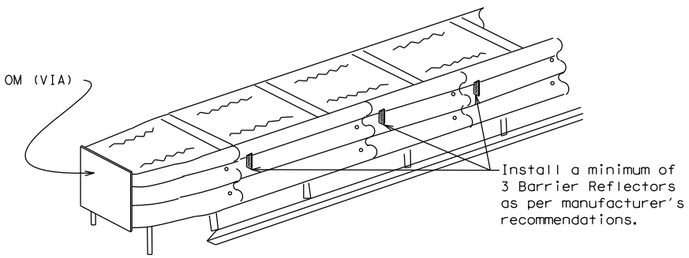


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

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.

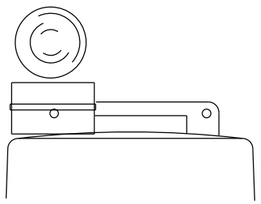


DELINEATION OF END TREATMENTS

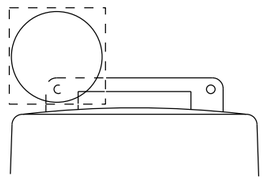
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

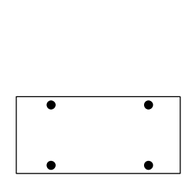
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

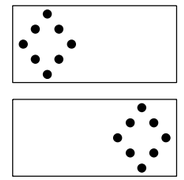
Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

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:

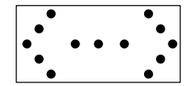


4 CORNER CAUTION

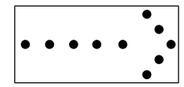
OR



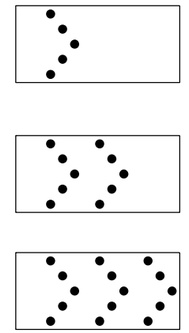
ALTERNATING DIAMOND CAUTION



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
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	GREGG		54

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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:

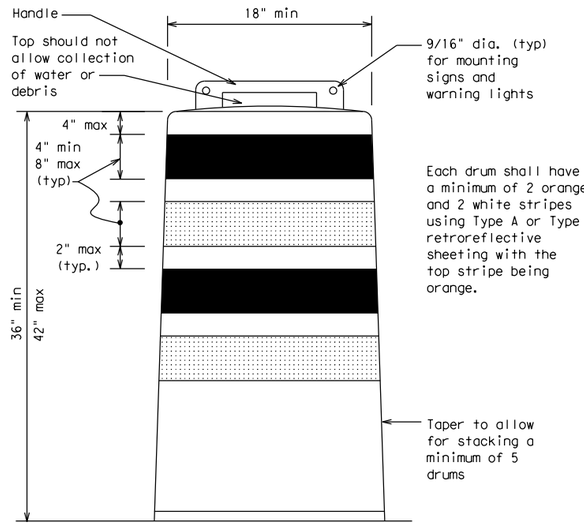
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

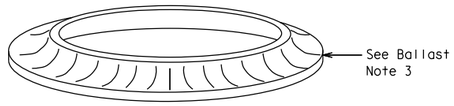
RETROREFLECTIVE SHEETING

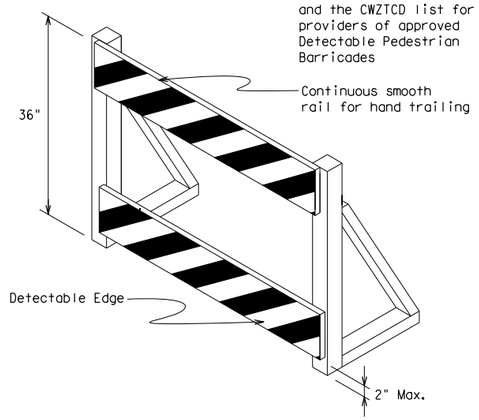
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

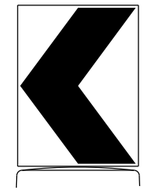




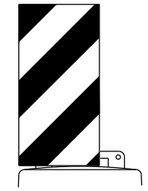


DETECTABLE PEDESTRIAN BARRICADES

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
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	TYL	GREGG		55
7-13				

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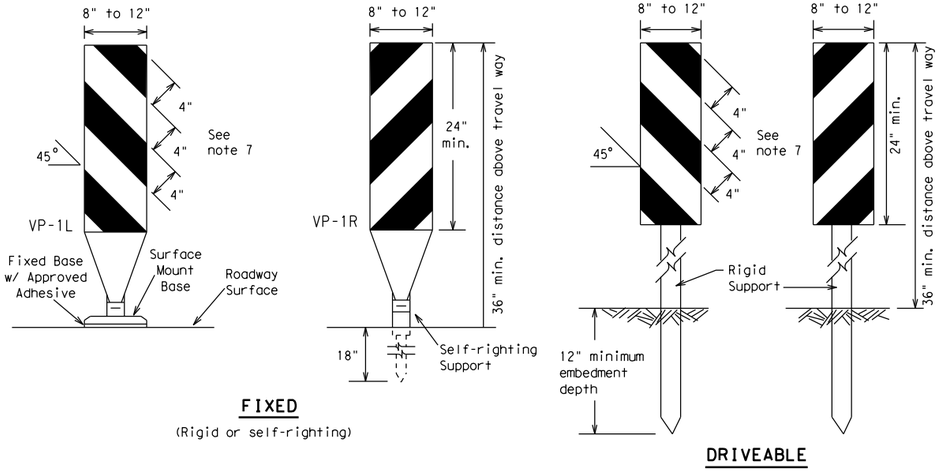
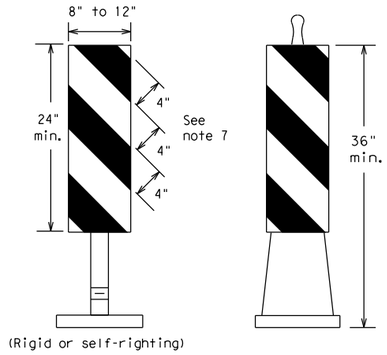


FIXED
(Rigid or self-righting)

DRIVEABLE

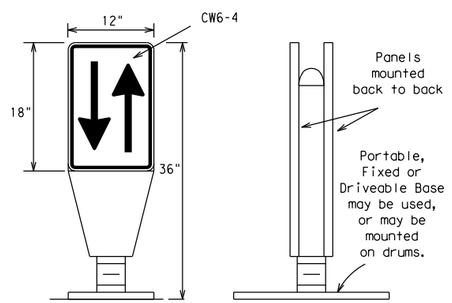


(Rigid or self-righting)

PORTABLE

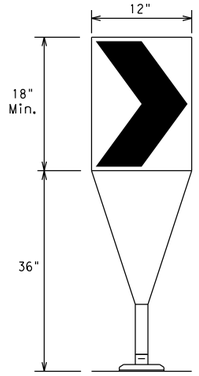
VERTICAL PANELS (VPs)

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



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



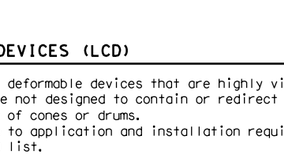
Fixed Base w/ Approved Adhesive
(Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

Posted Speed	Formula	Minimum Desirable Taper Lengths ✻✻			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

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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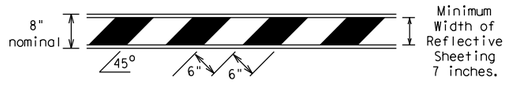
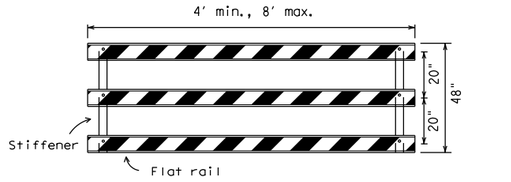
TYPE 3 BARRICADES

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.



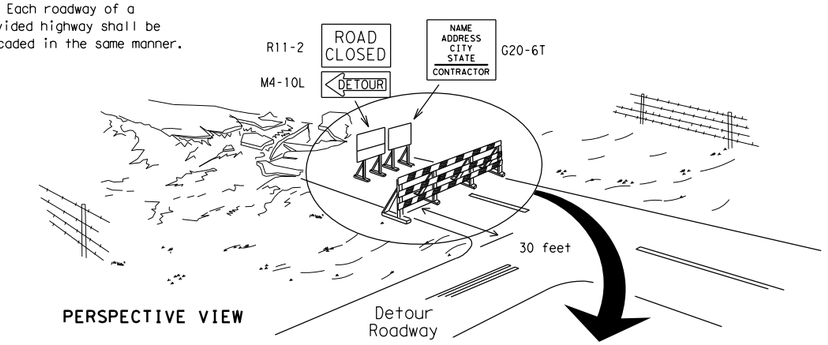
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

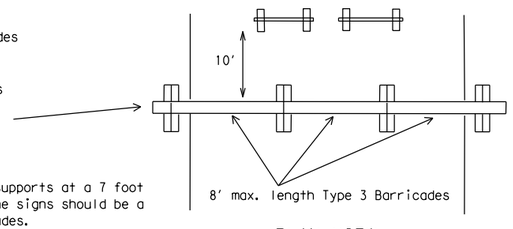
Each roadway of a divided highway shall be barricaded in the same manner.



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.

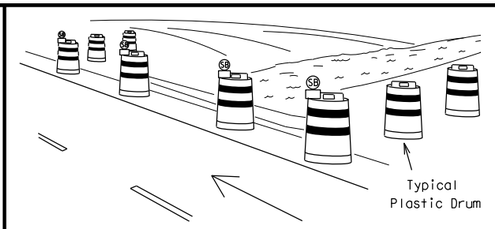
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

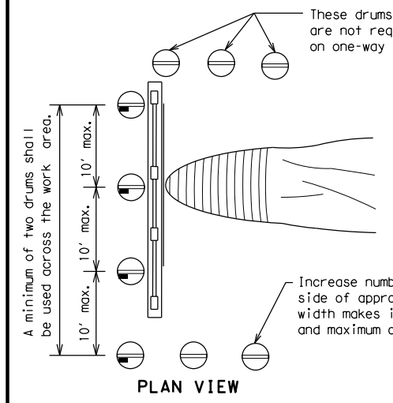
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

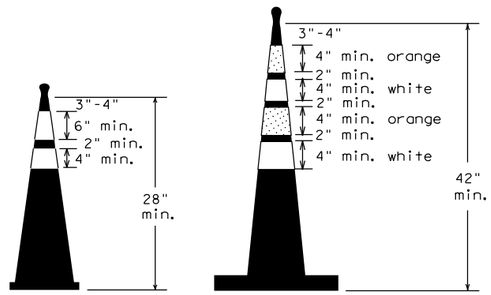
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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

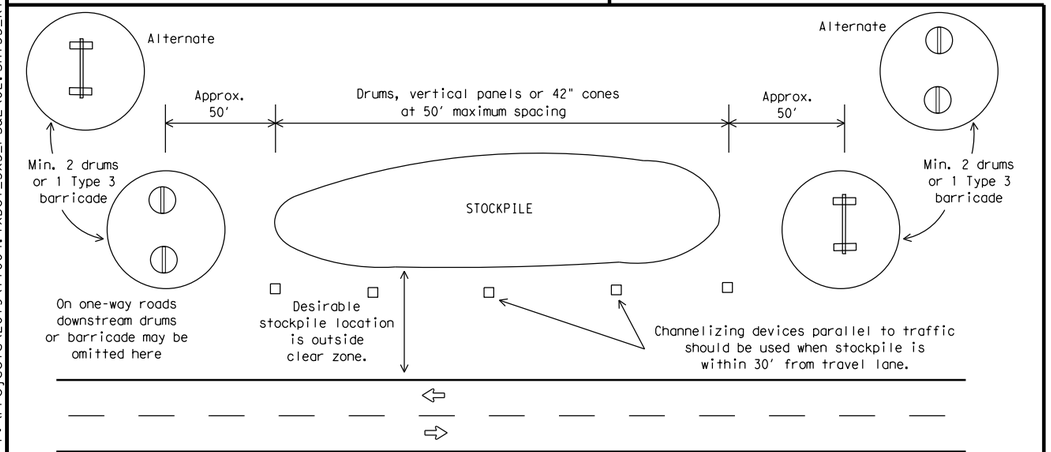


Two-Piece cones | One-Piece cones | Tubular Marker

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

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

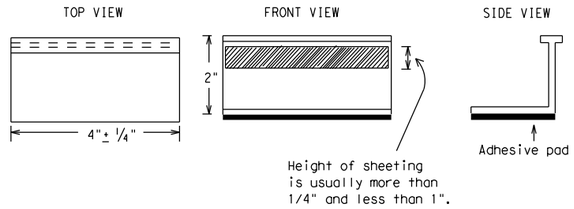
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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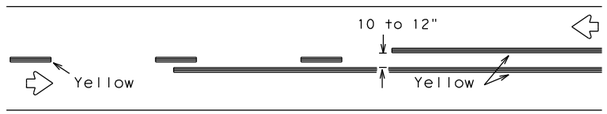
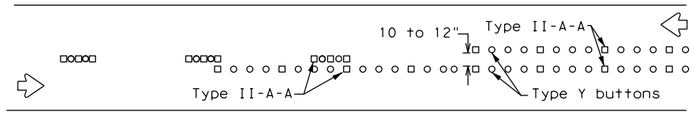
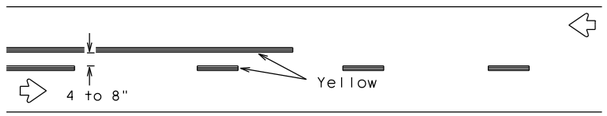
PAVEMENT MARKING PATTERNS



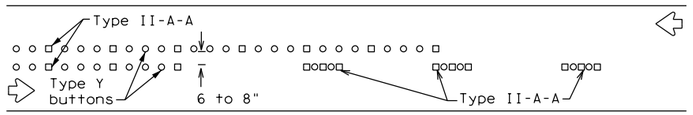
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



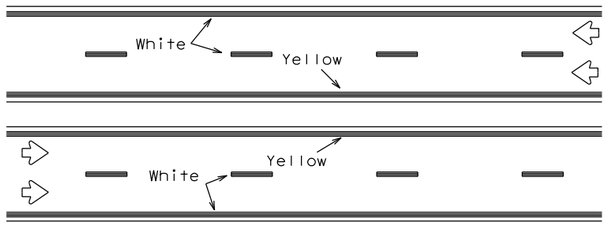
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



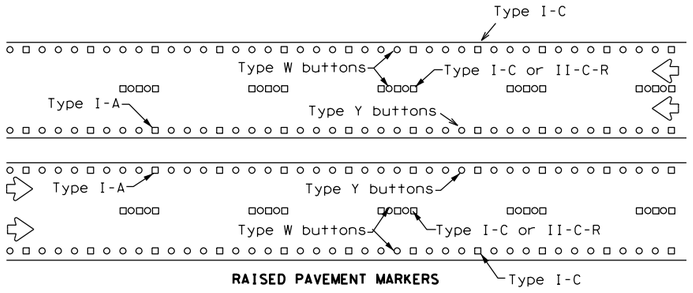
RAISED PAVEMENT MARKERS - PATTERN B

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



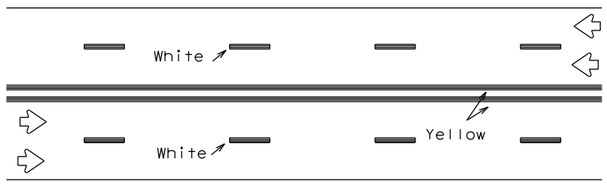
REFLECTORIZED PAVEMENT MARKINGS



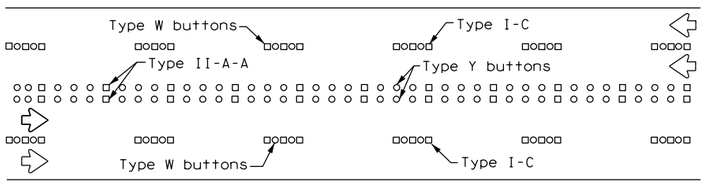
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



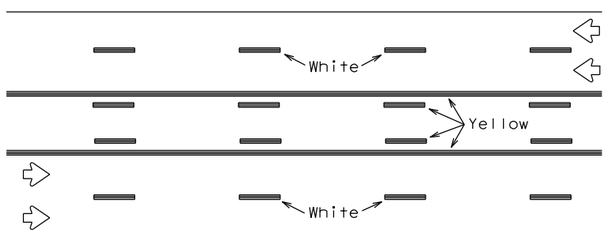
REFLECTORIZED PAVEMENT MARKINGS



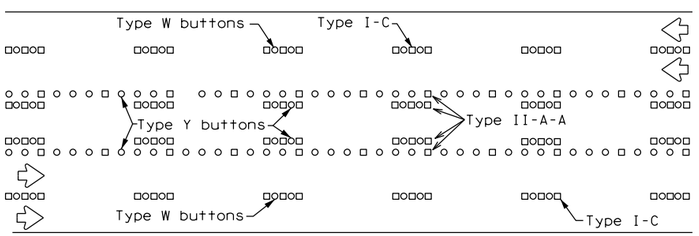
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

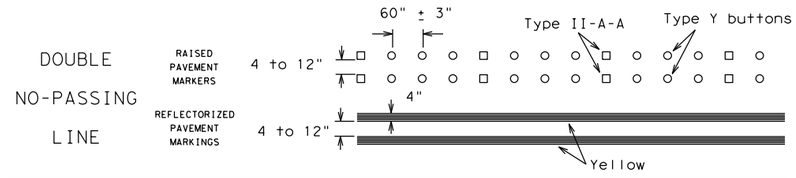
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

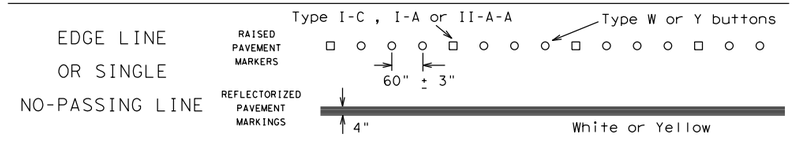
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

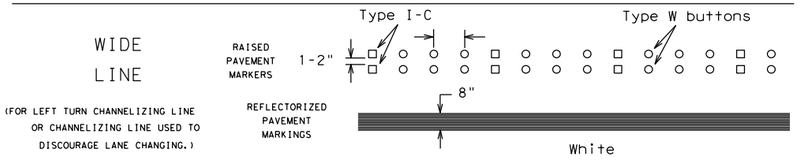


EDGE LINE OR SINGLE NO-PASSING LINE



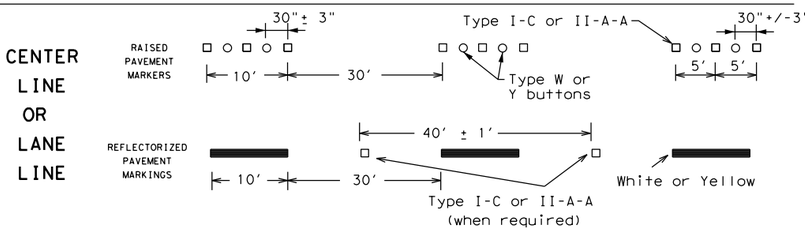
WIDE LINE

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

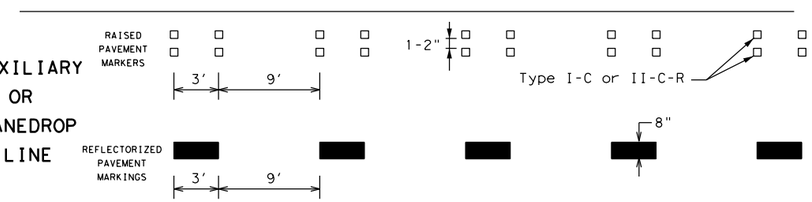


BROKEN LINES

CENTER LINE OR LANE LINE

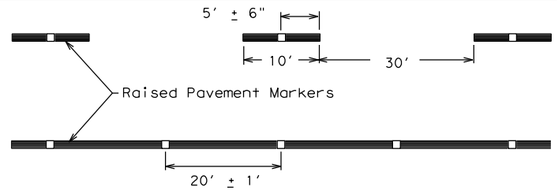


AUXILIARY OR LANEDROP LINE



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

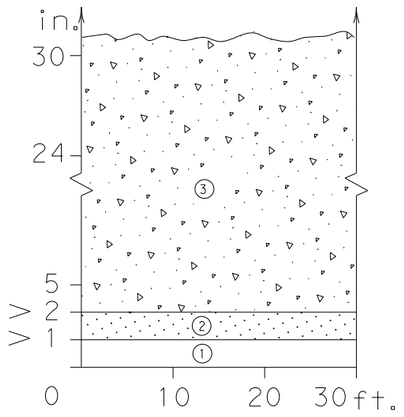
BC(12)-21

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	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		59

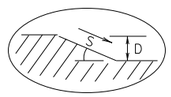
DATE:
FILE:

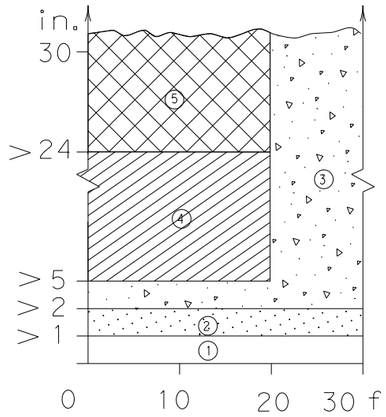
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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

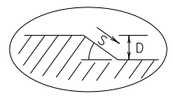


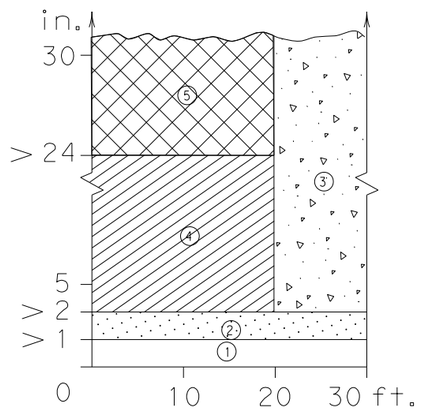
Edge Condition I
S = (3:1) (or flatter)



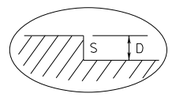


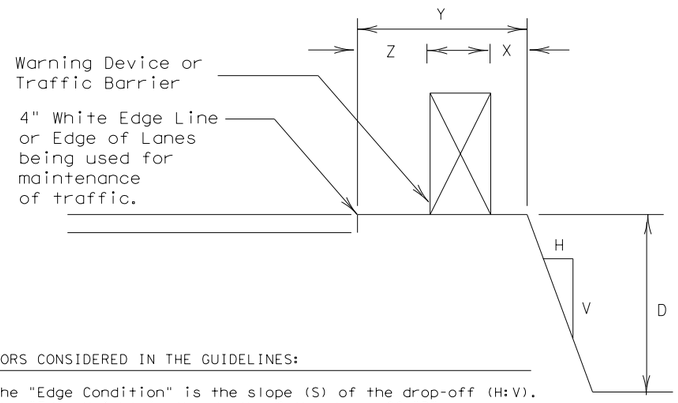
Edge Condition II
S = ((2.99):1) to (1:1)





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	CW 8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge fill may be provided to change the edge slope to that of the preferable Edge Condition I.
⑤	Check indications (Figure-1) for positive 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:

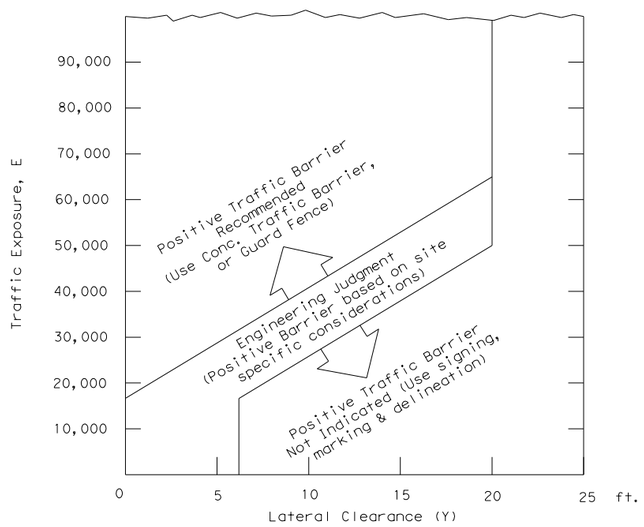
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1to 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 differen-tial 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 dura-tion 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 a lateral offset of 20 feet from the edge of the travel lane.

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

Date 2/11/2022

Texas Department of Transportation
Traffic Operations Division

TREATMENT FOR VARIOUS EDGE CONDITIONS

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

REVISIONS	CONT	SECT	JOB	HIGHWAY
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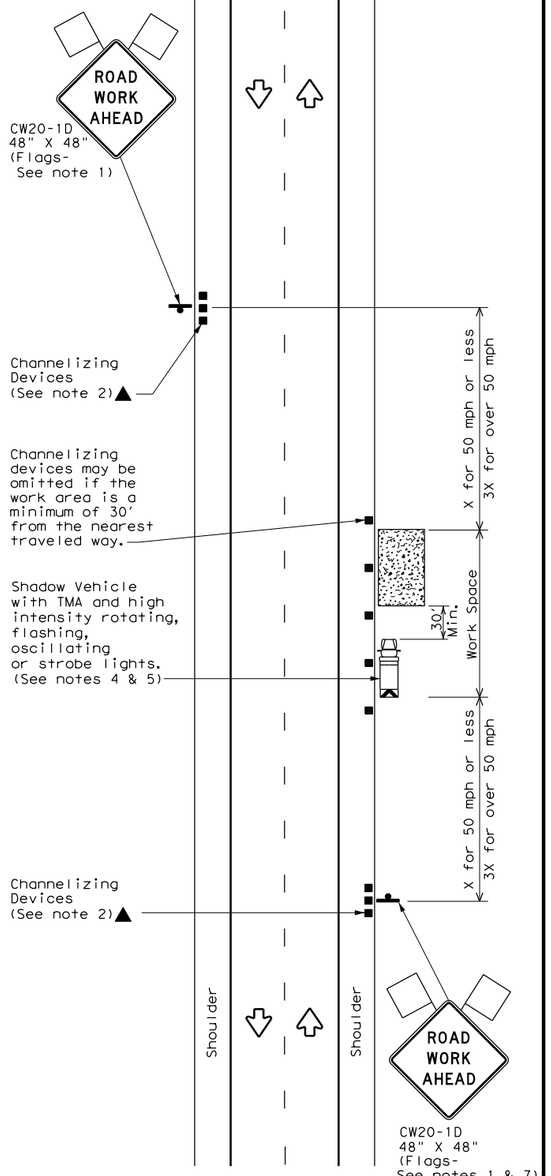
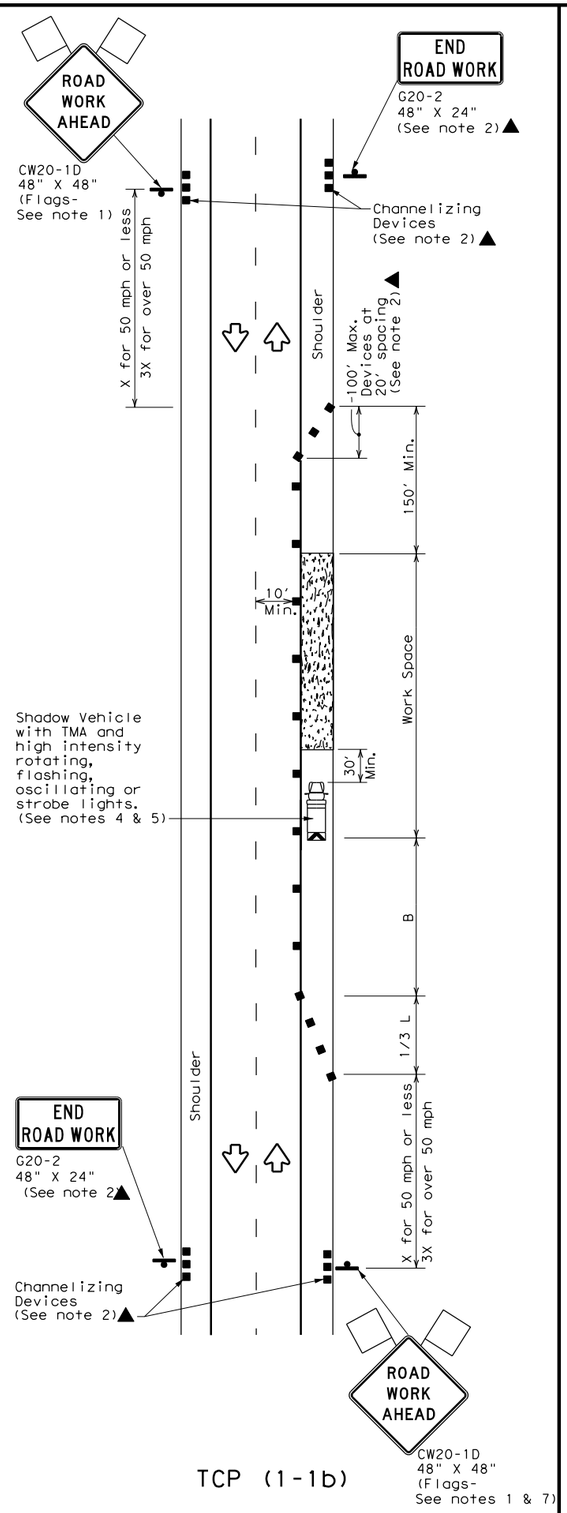


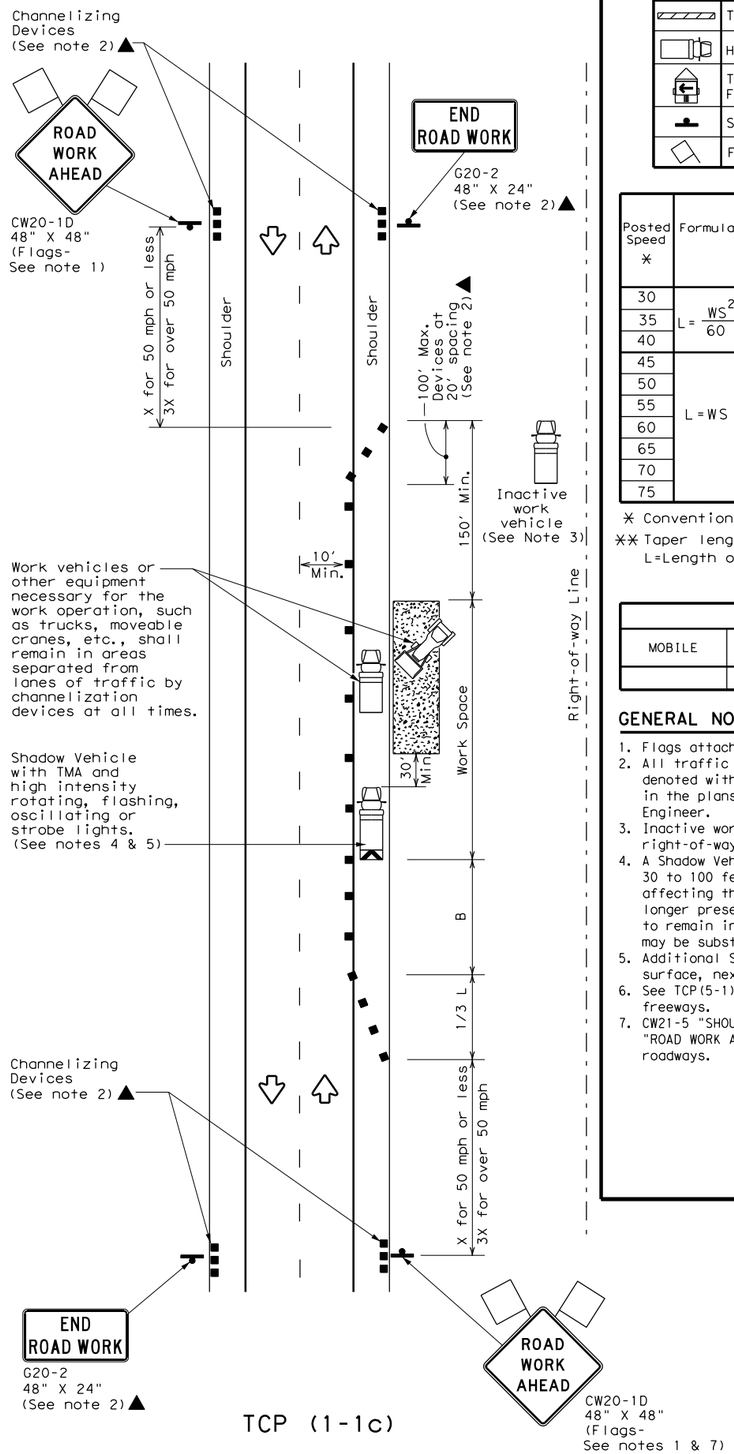
TCP (1-1a)

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

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8-95 2-12	TYL	GREGG		61
1-97 2-18				

151

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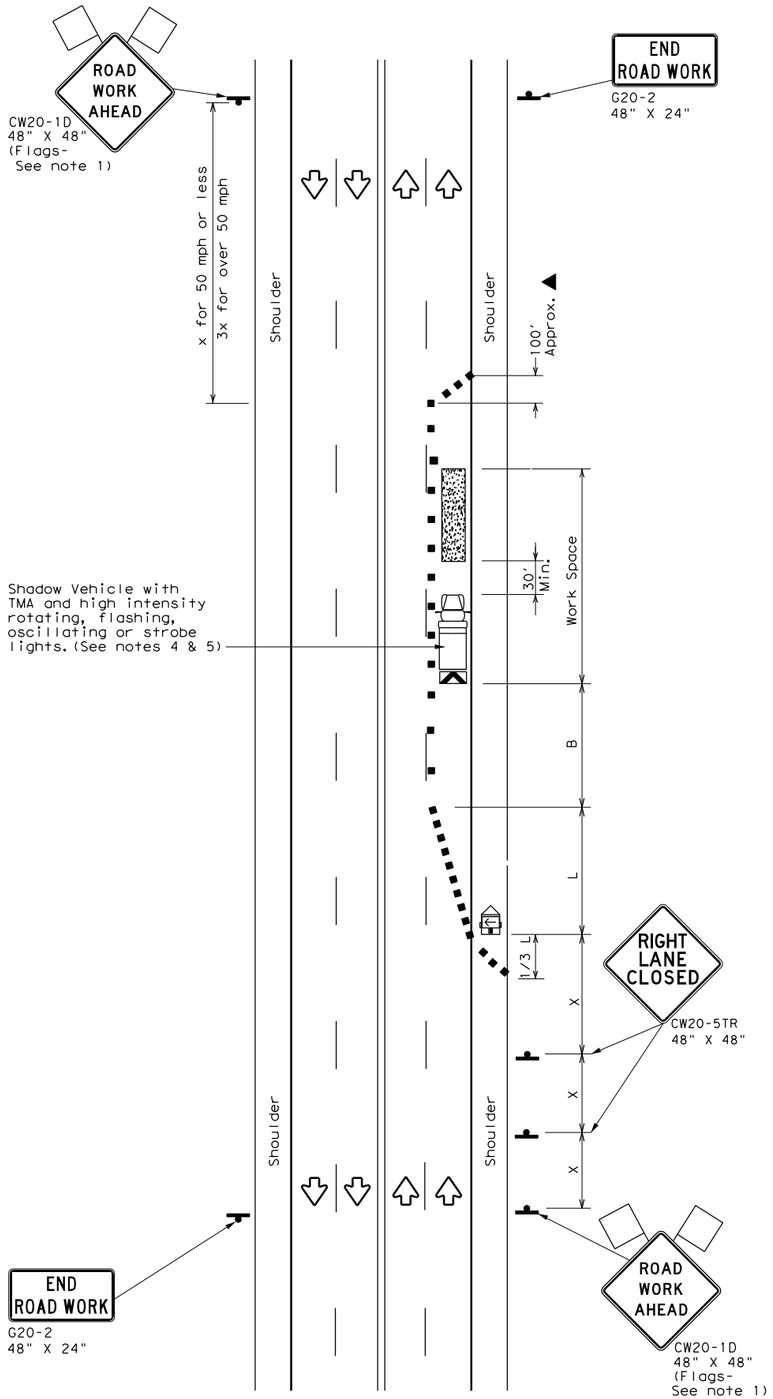
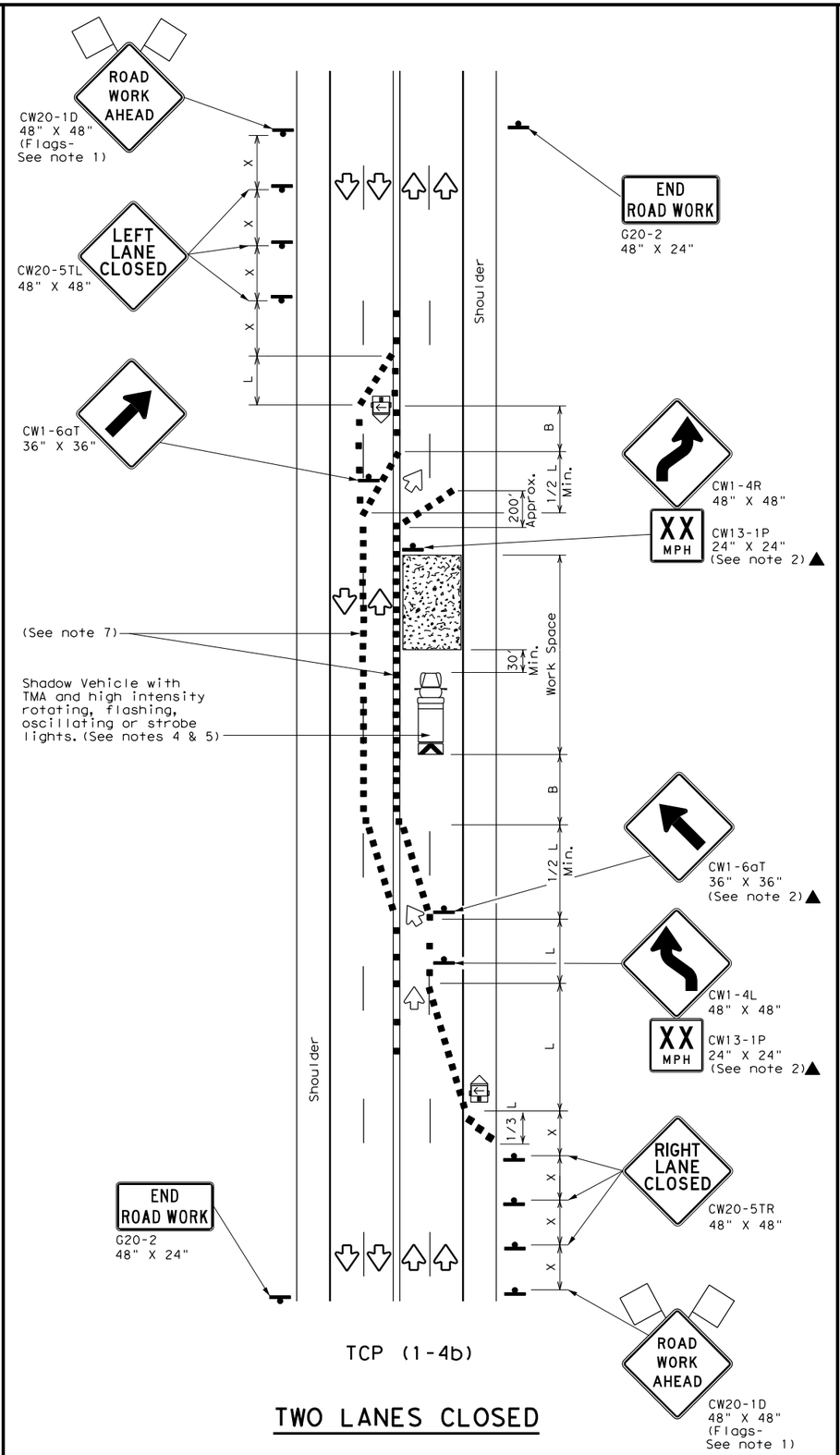


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

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

TCP (1-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

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8-95 2-12	TYL	GREGG		62
1-97 2-18				

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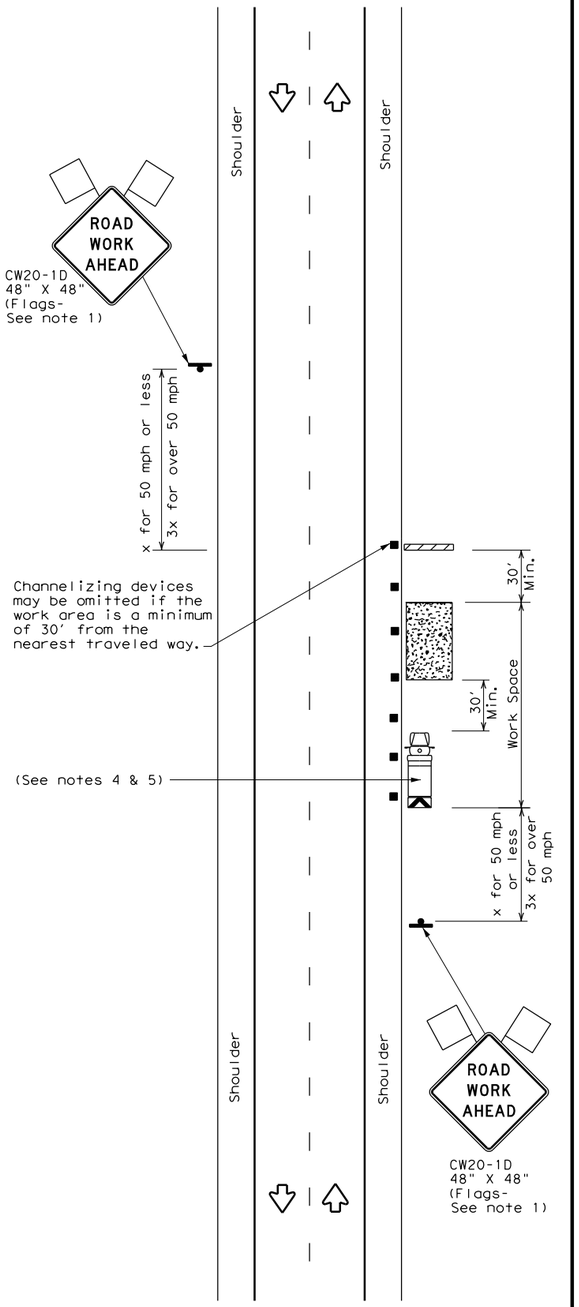
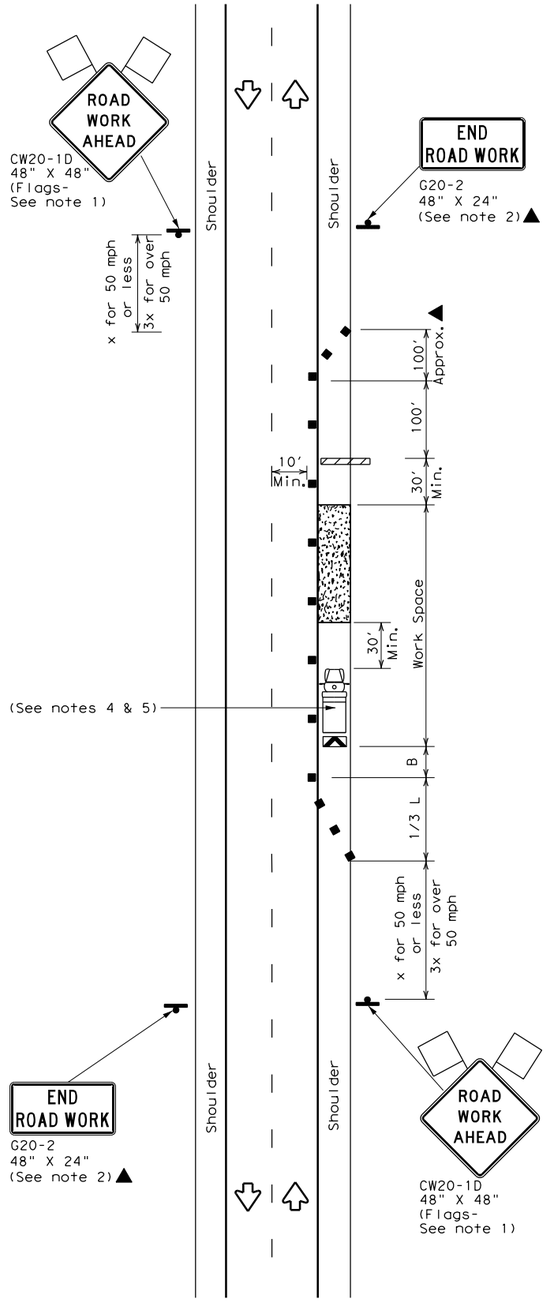


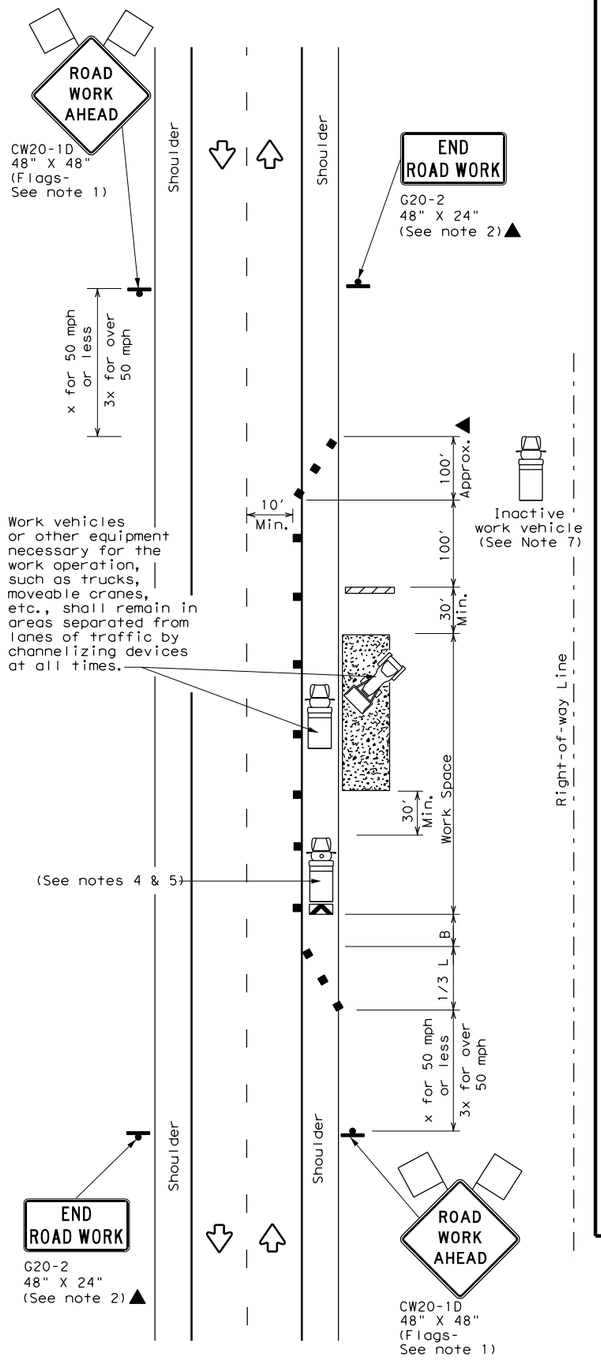
TCP (2-1a)

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

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	TYL	GREGG		63
1-97 2-18				

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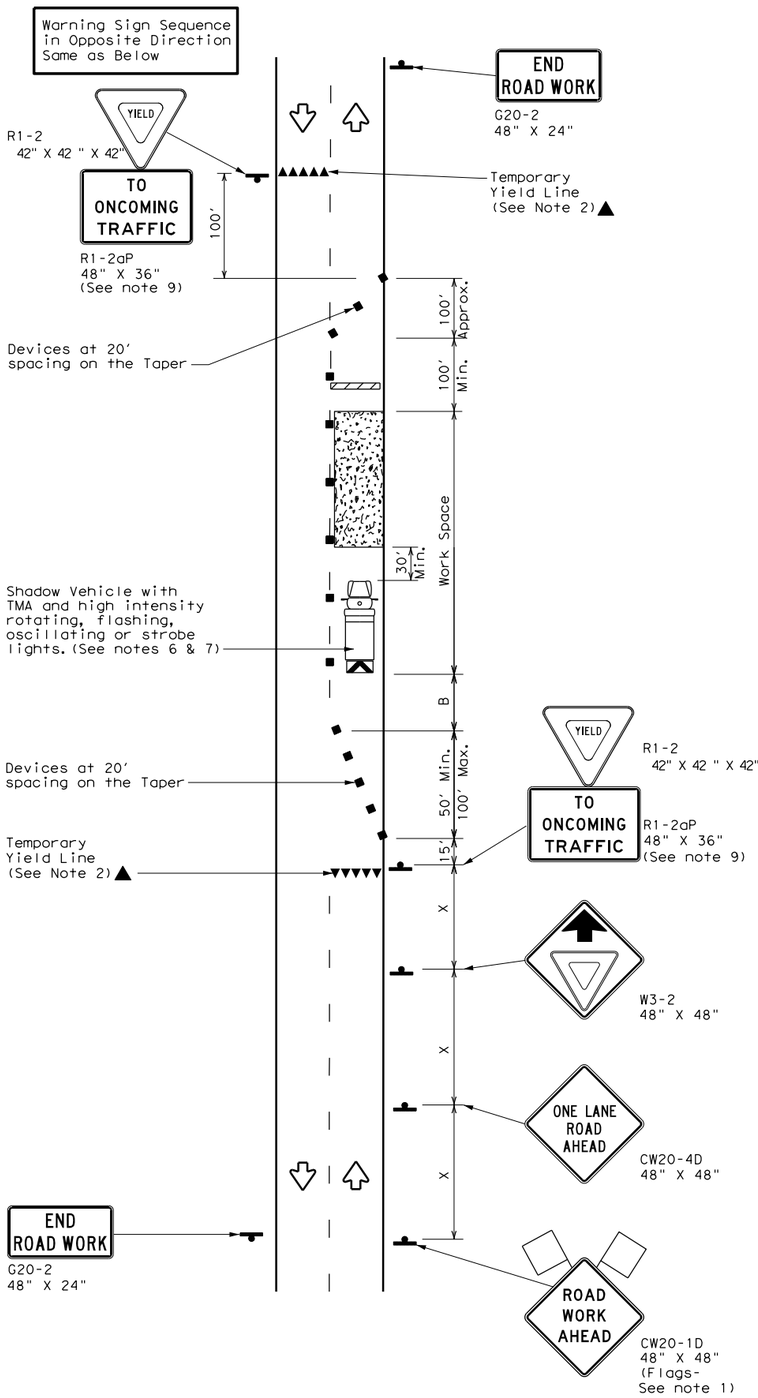
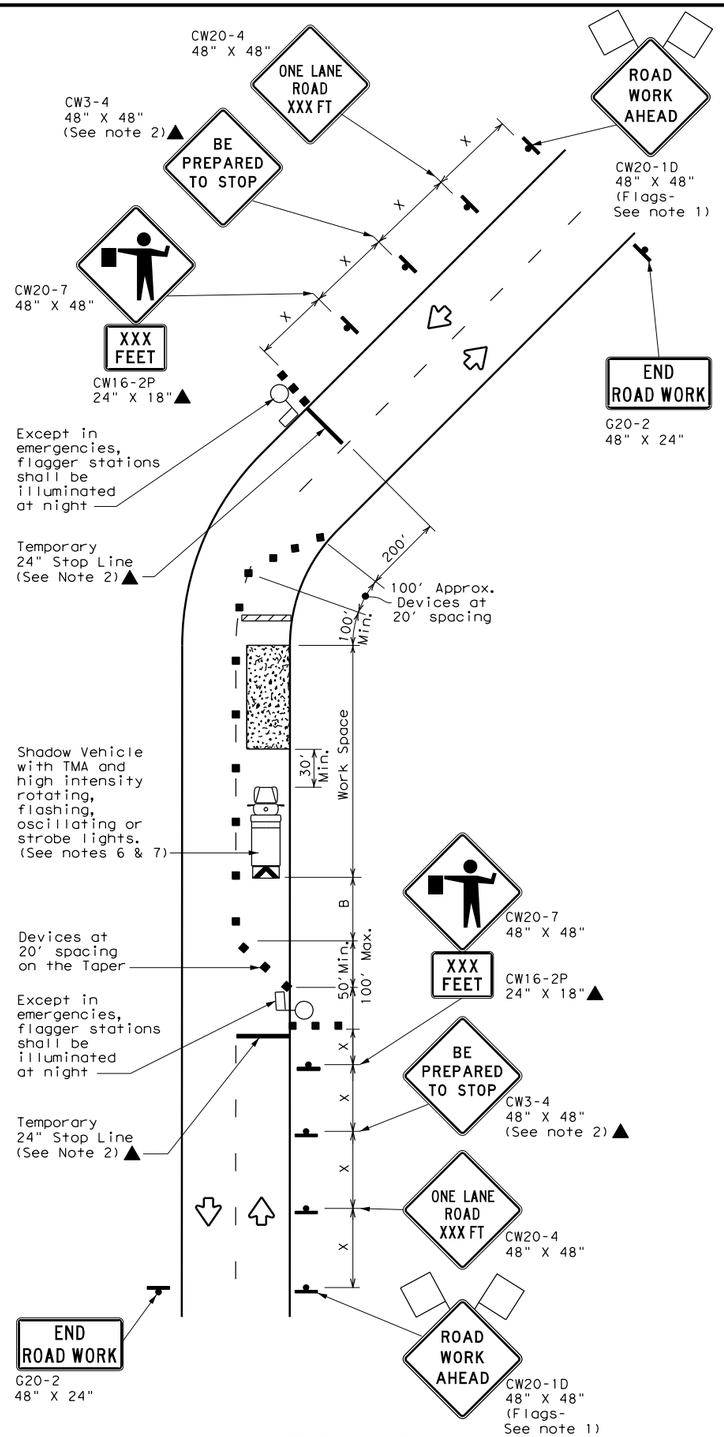


TCP (2-2a)

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	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		64

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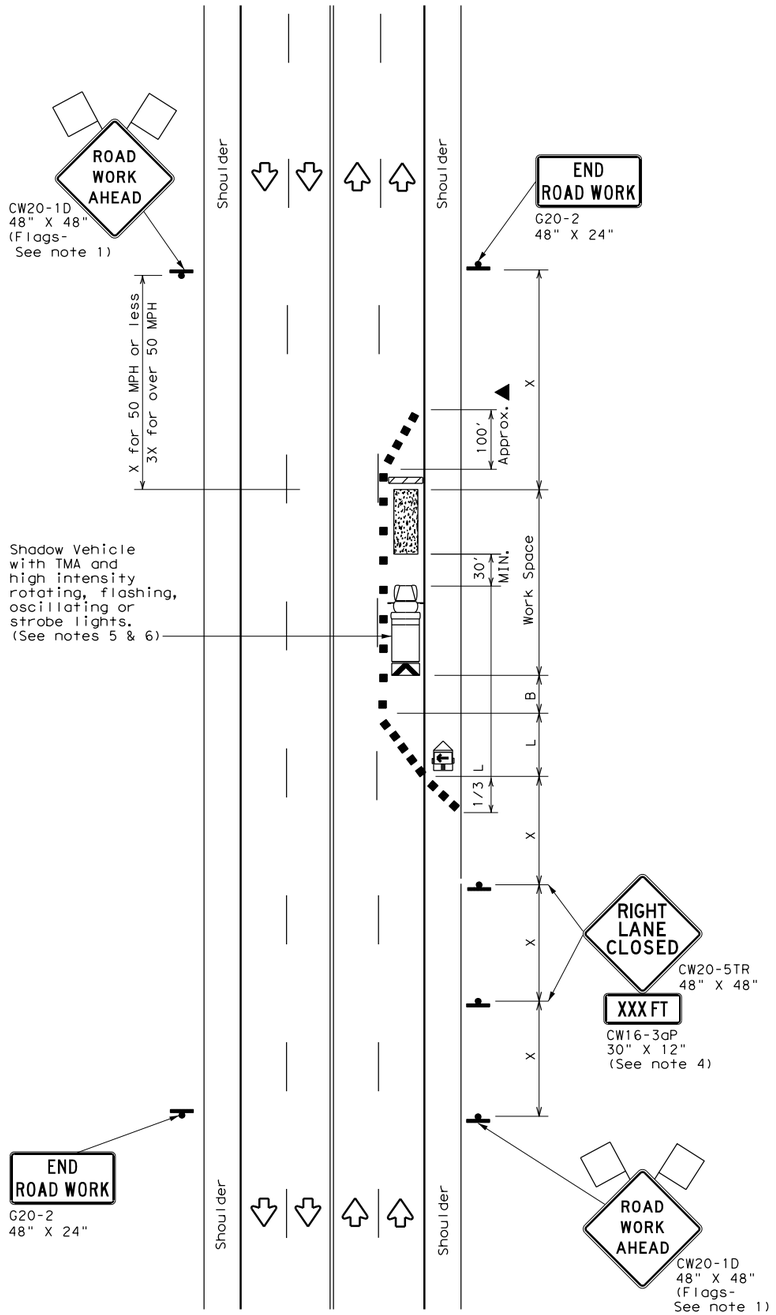
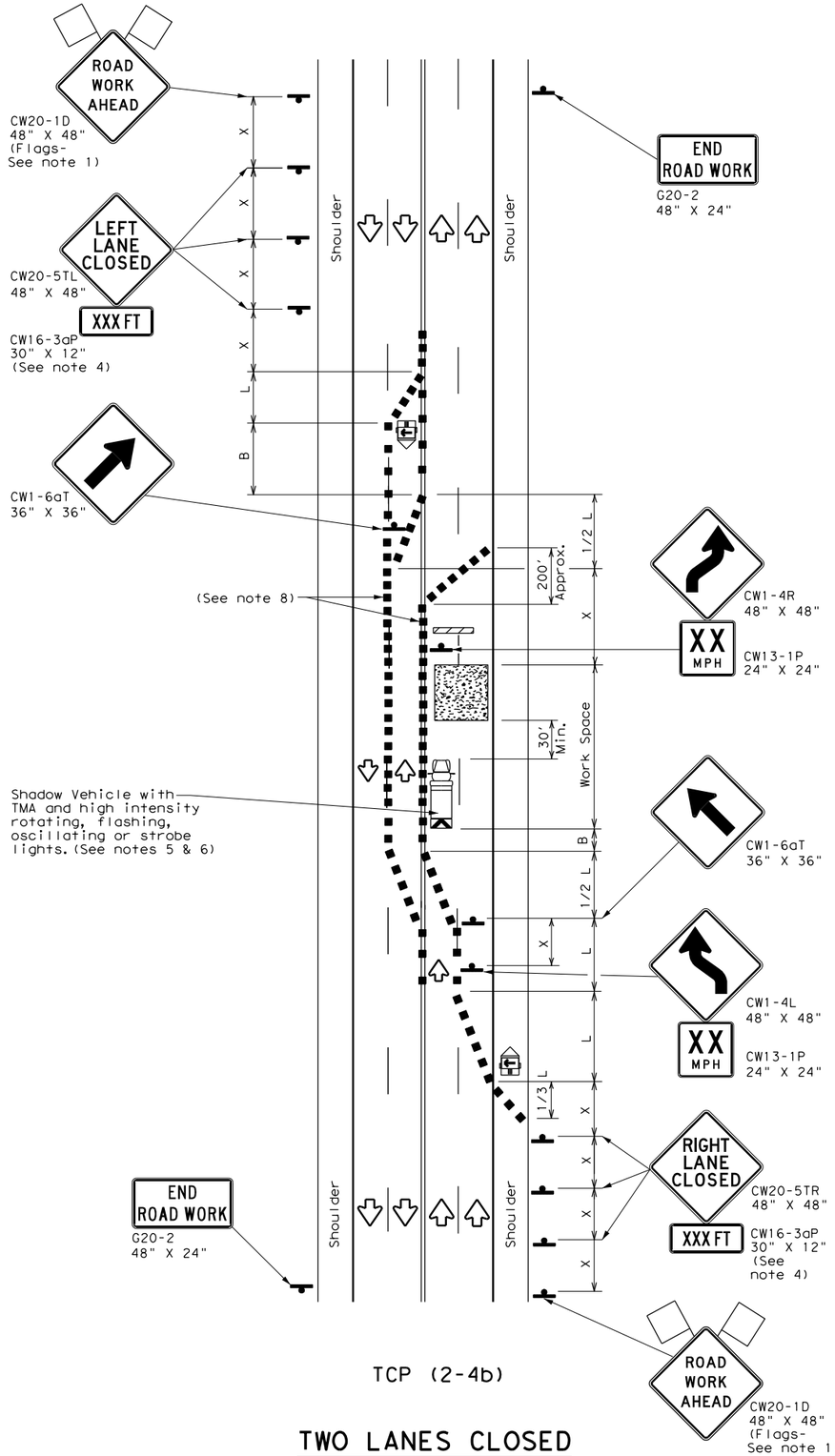


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

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4-98 2-18	TYL	GREGG		65

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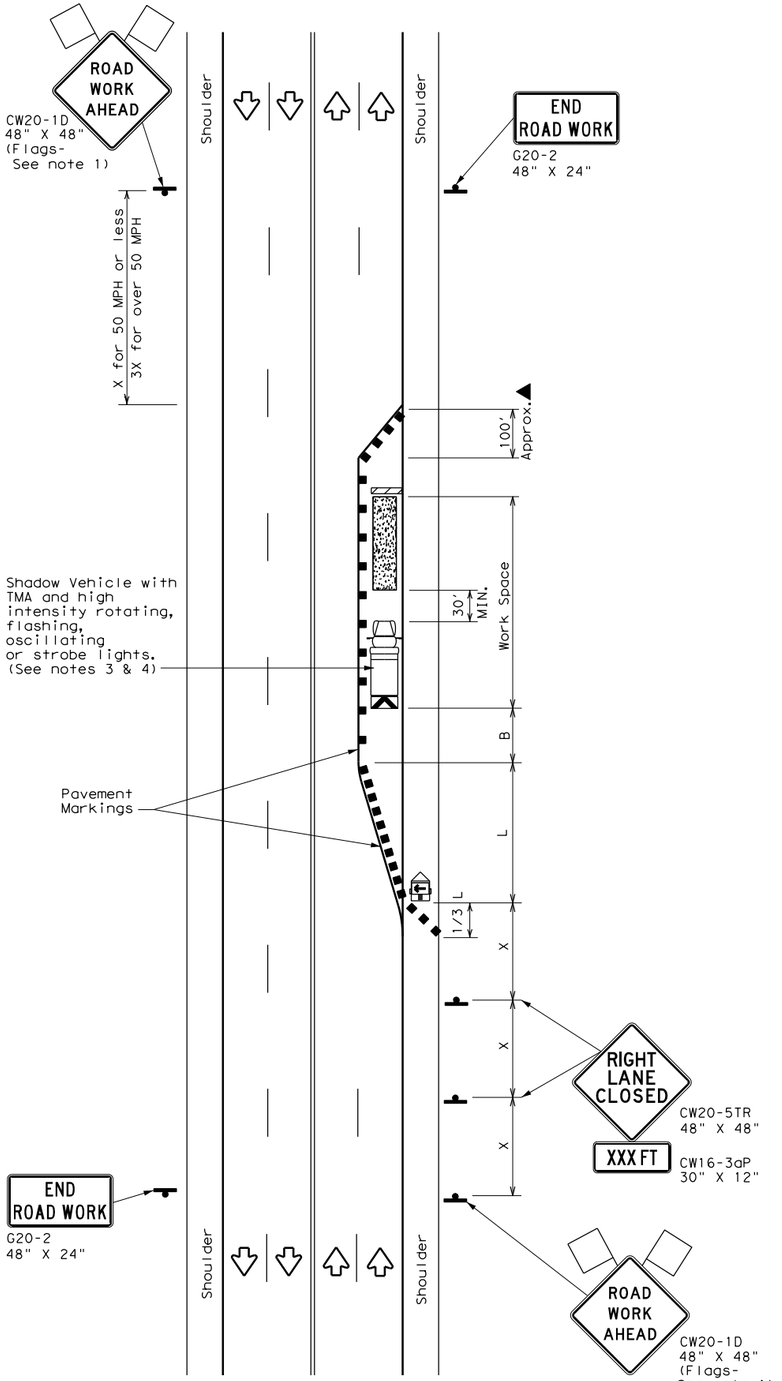
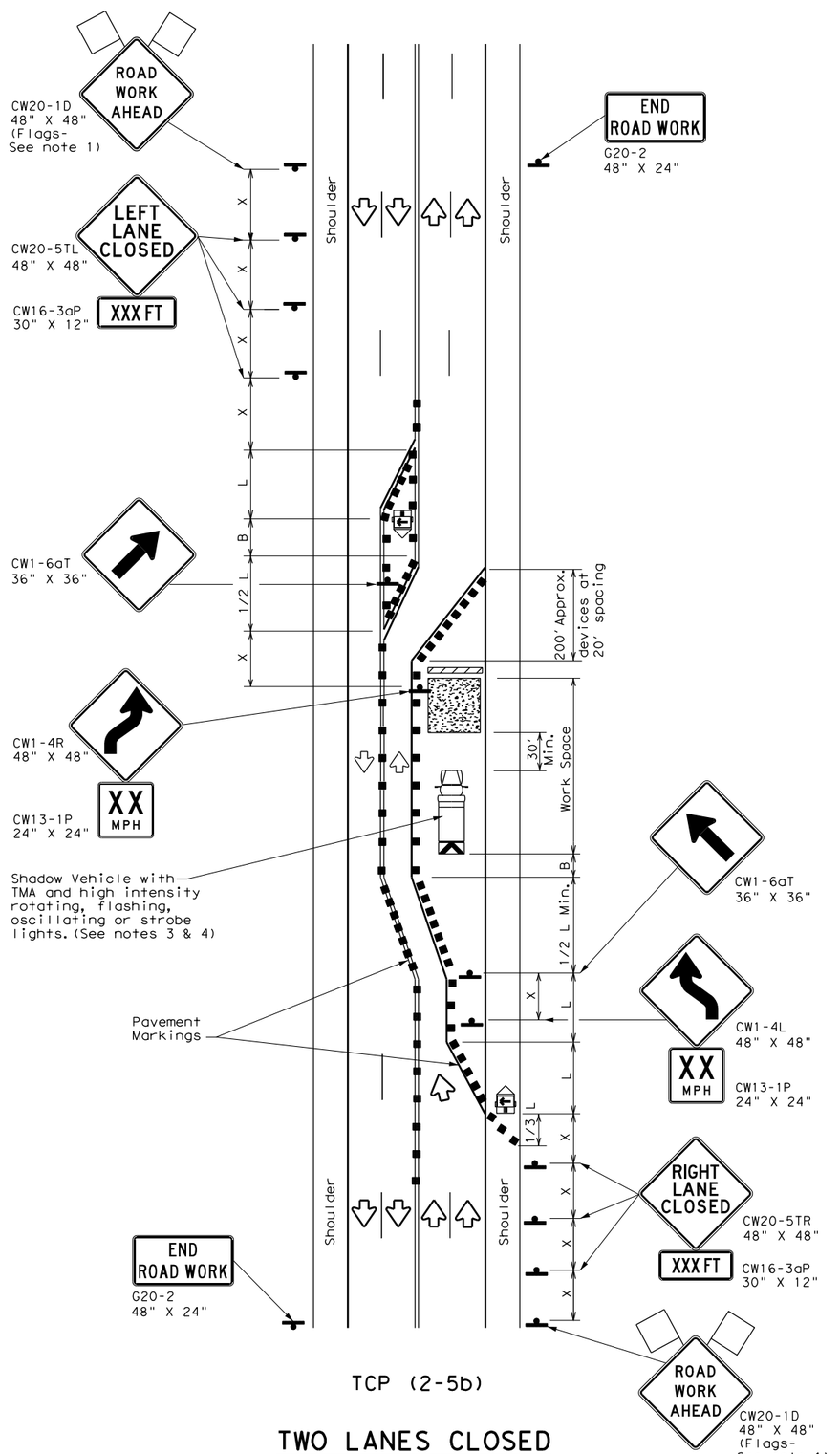


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-5a)

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

TCP (2-5b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

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4-98 2-18	TYL	GREGG		66

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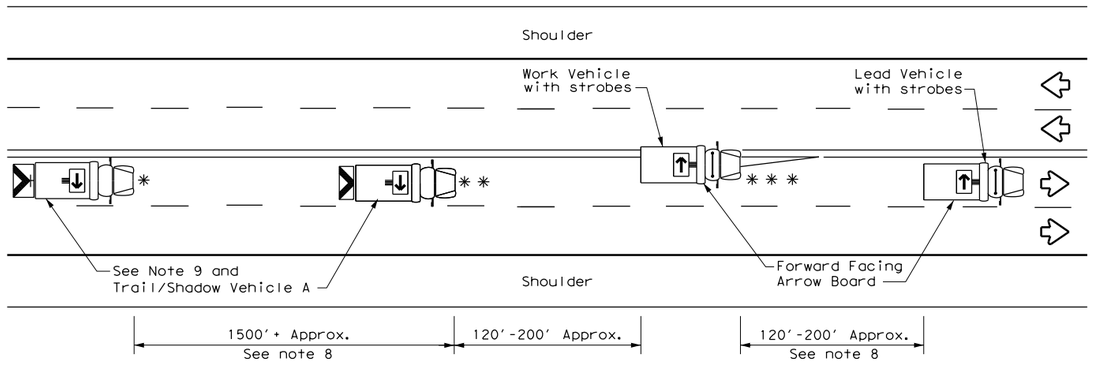
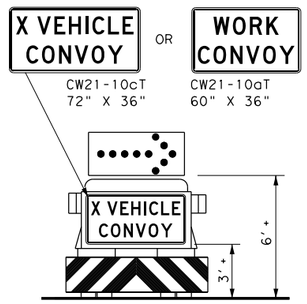


TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

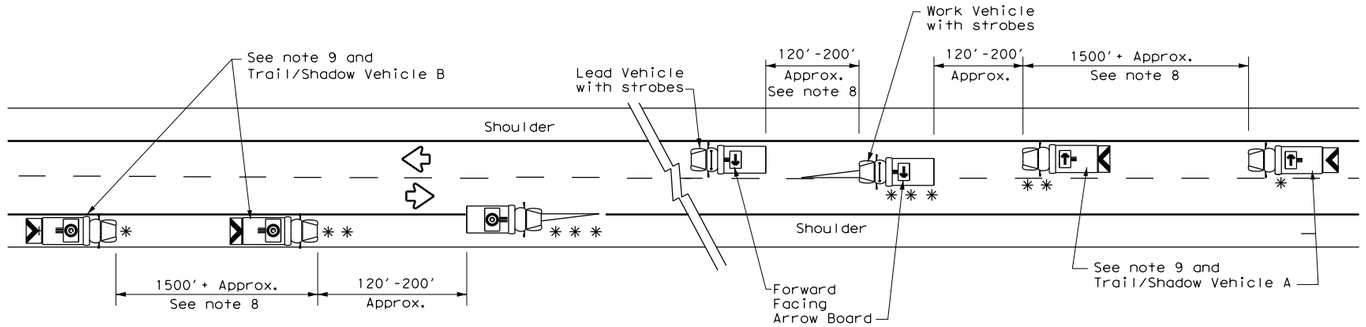
with RIGHT Directional display Flashing Arrow Board

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.

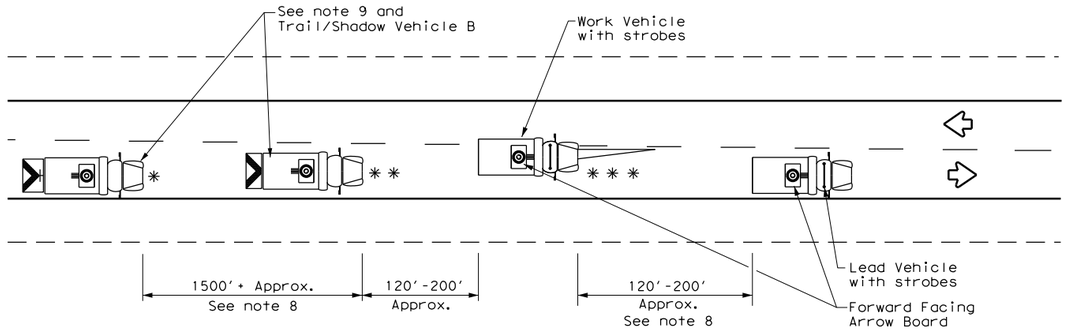


WORK ON SHOULDER

WORK ON TRAVEL LANE

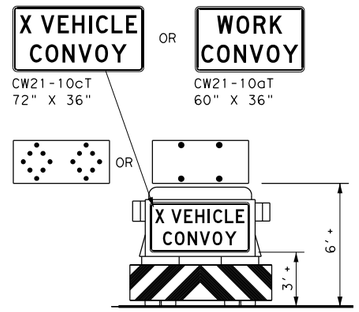
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



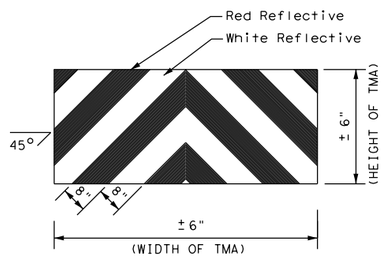
TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display



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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8-95 7-13	TYL	GREGG		67
1-97				

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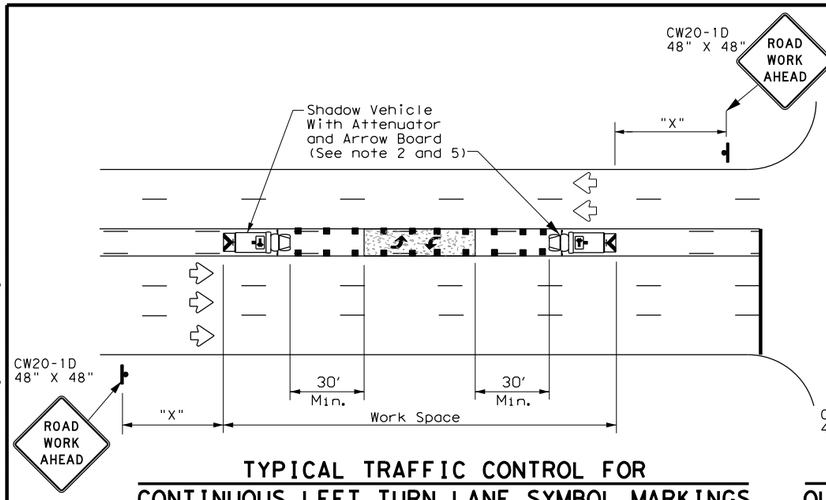
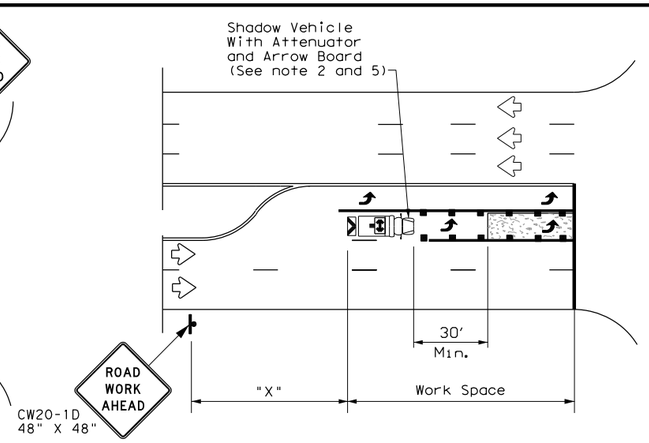
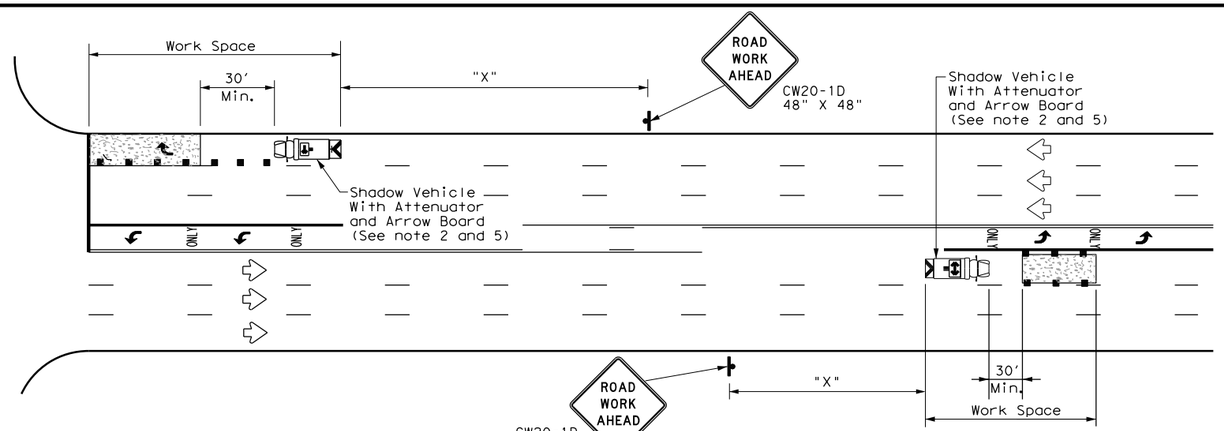


TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

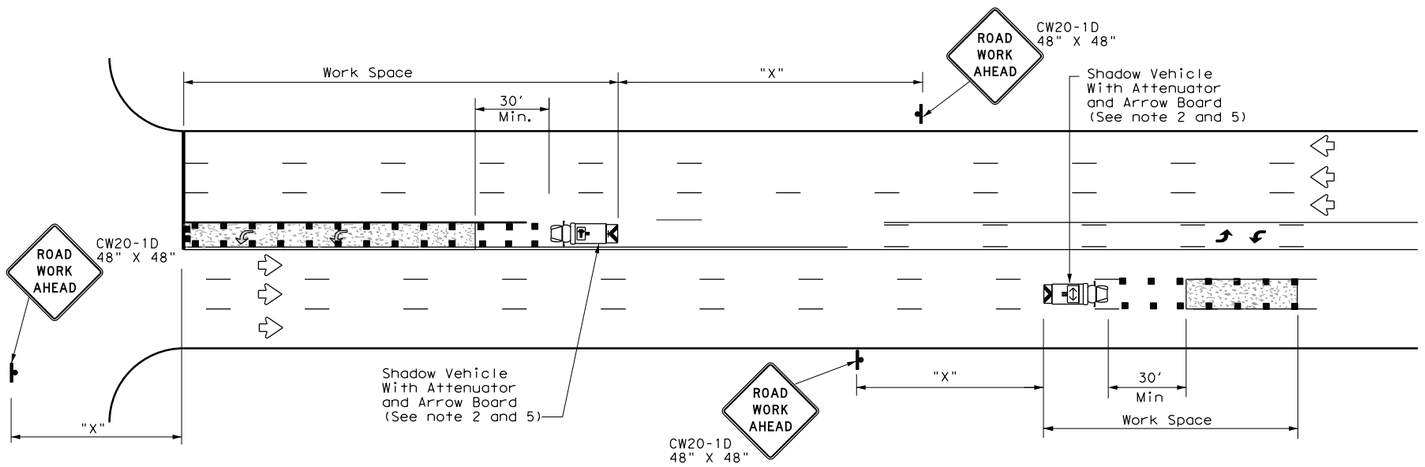


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



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

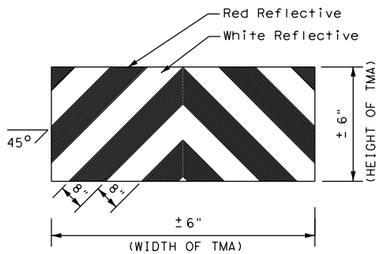
1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take 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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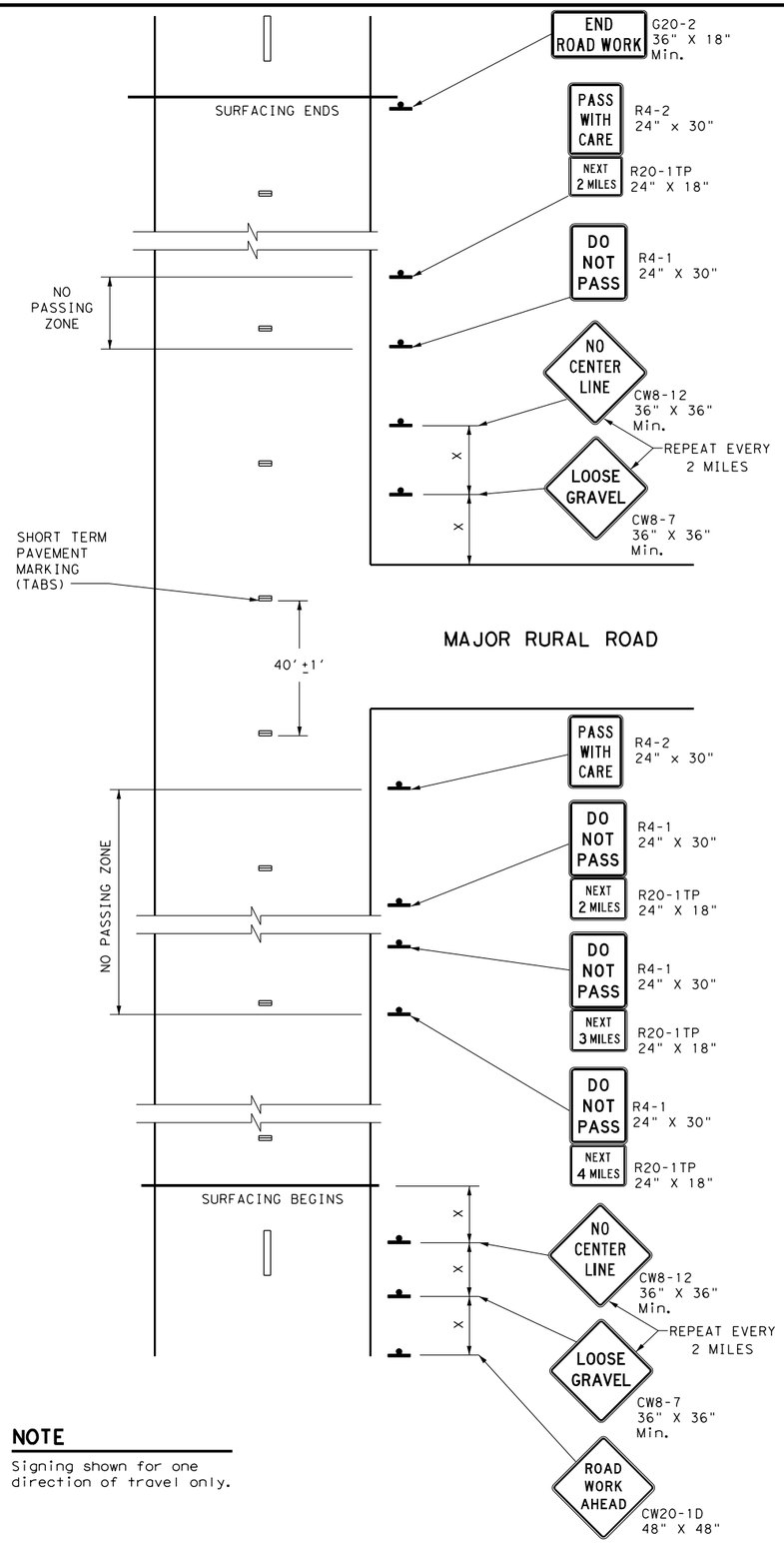
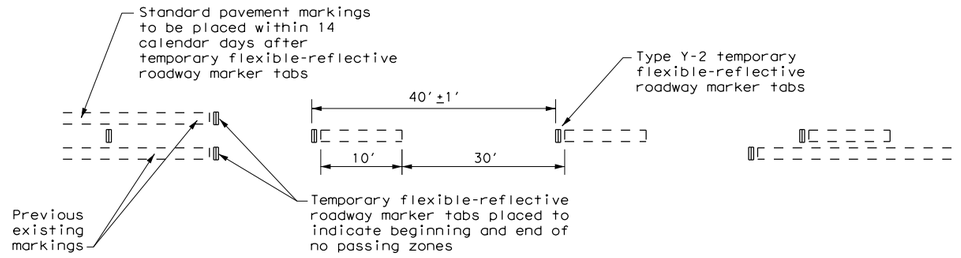


NOTE

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
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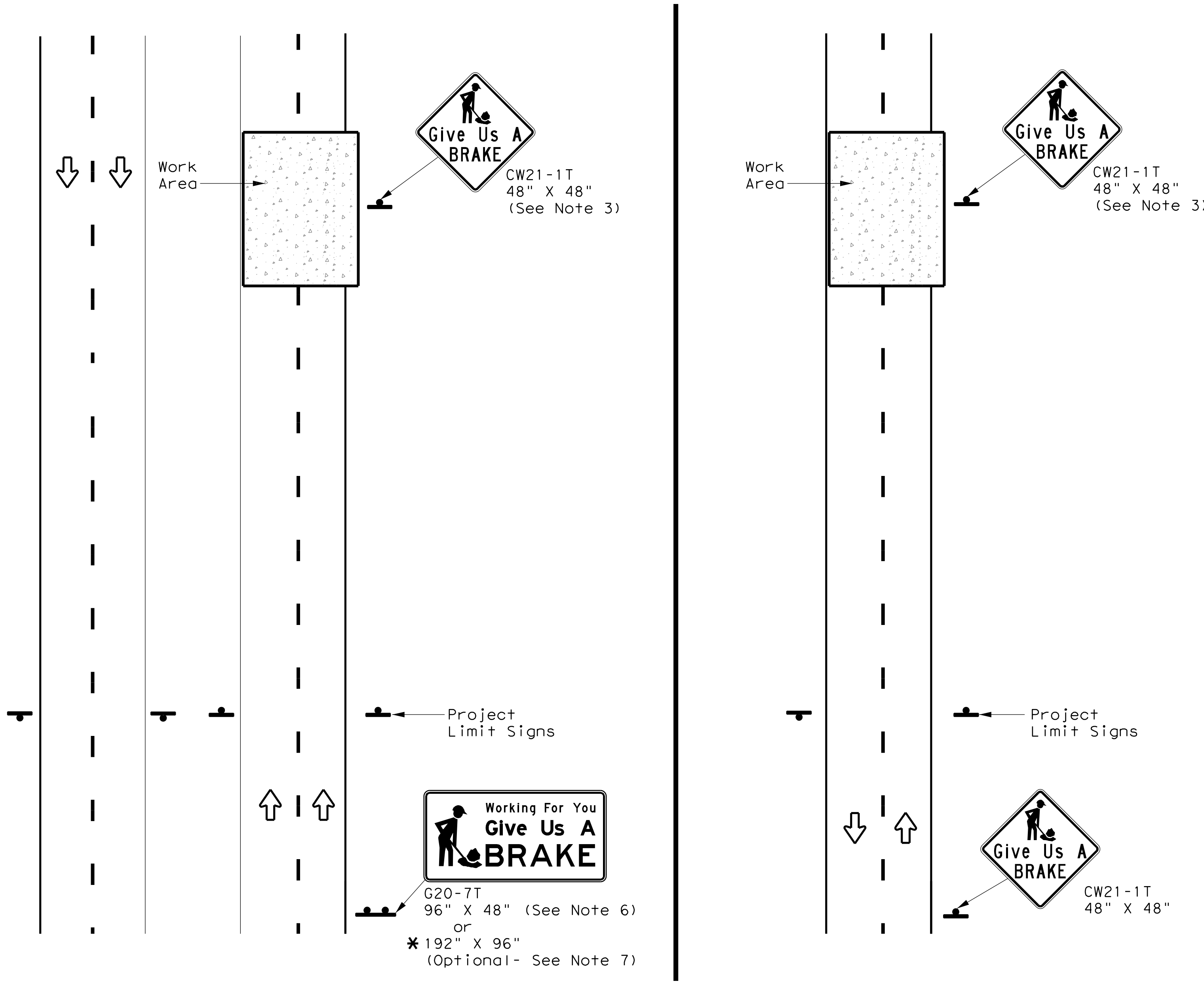

DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
(symbol)	Sign
(symbol)	Large Sign
(symbol)	Traffic Flow

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

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©TxDOT August 1995	CONT 0545	SECT 01	JOB 014	HIGHWAY SH 135
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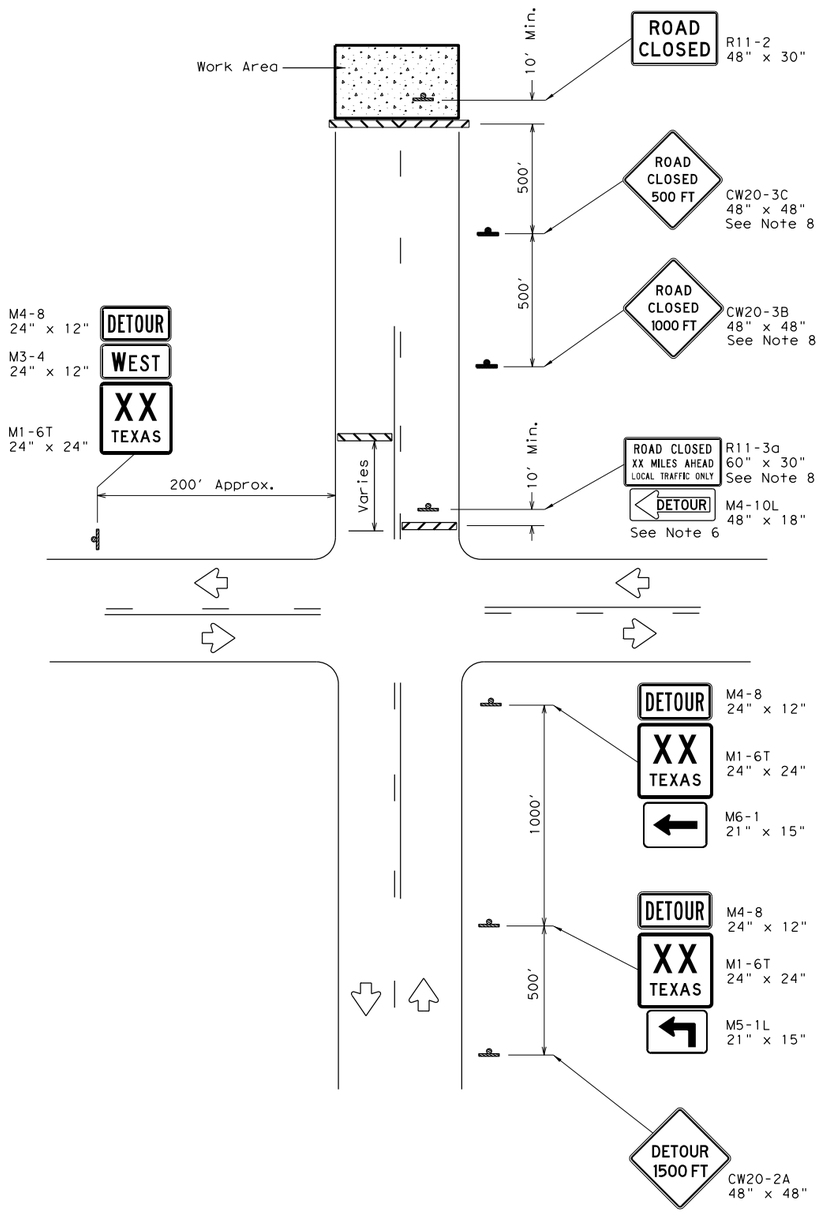
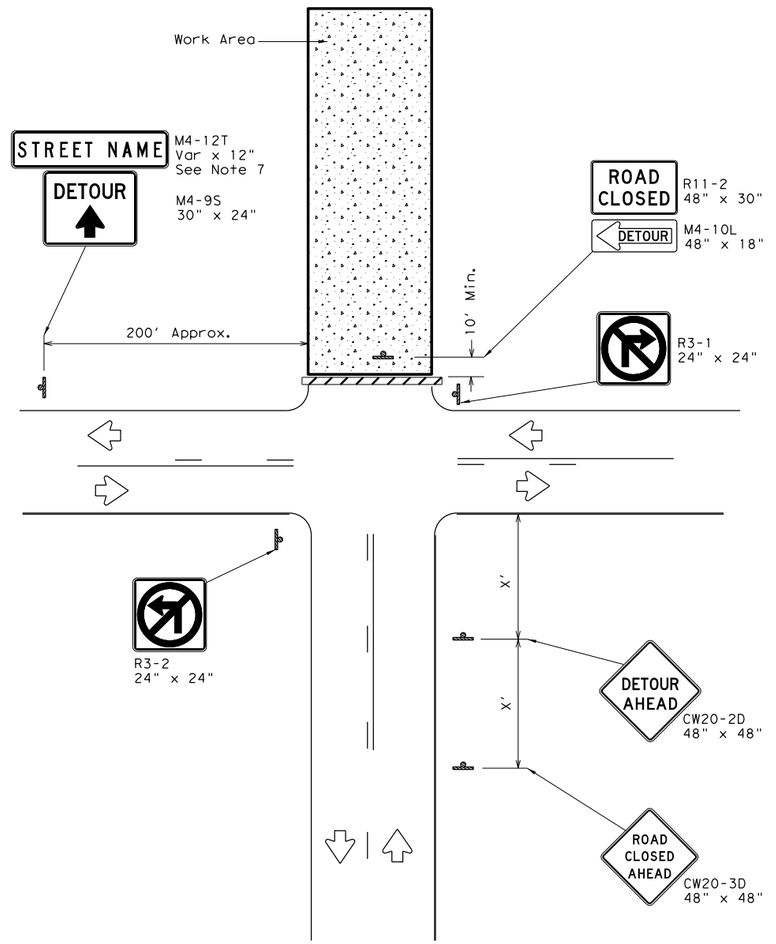


ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

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

GENERAL NOTES

1. This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the D&OM standards.
2. Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(10) and listed on the Compliant Work Zone Traffic Control Devices list (CWZTCD).
3. Stockpiled materials shall not be placed on the traffic side of barricades.
4. Barricades at the road closure should extend from pavement edge to pavement edge.
5. Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
6. If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
7. The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
8. For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
9. Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

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©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
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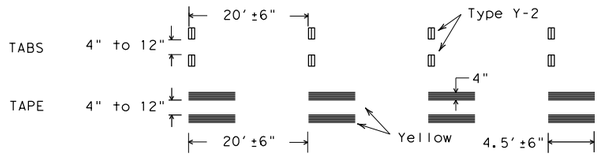
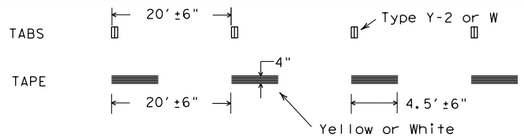
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

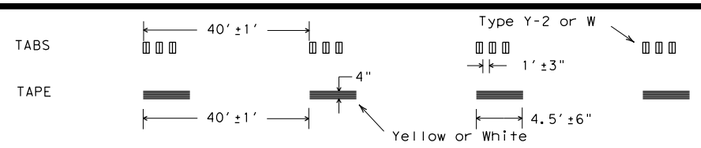


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



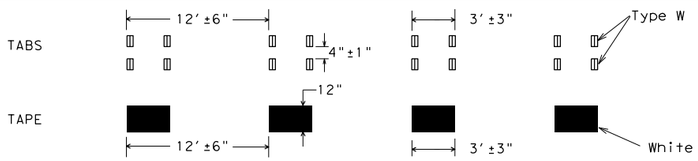
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

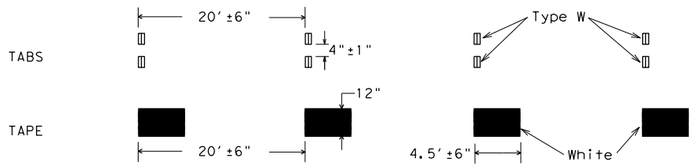


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



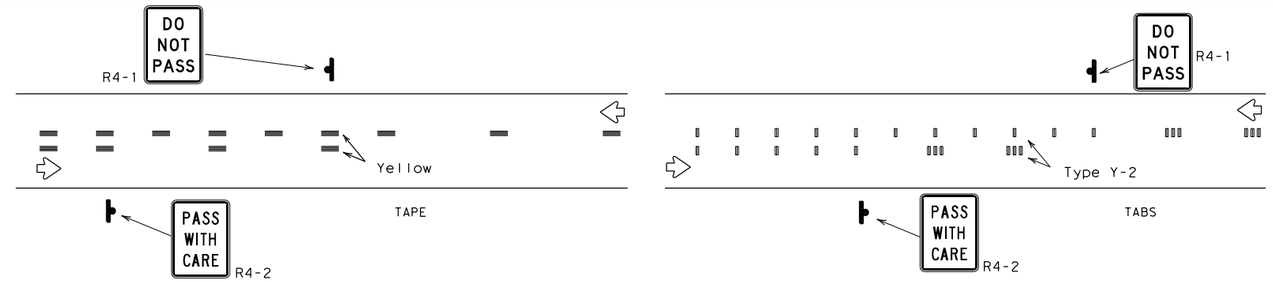
NOTES:

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.

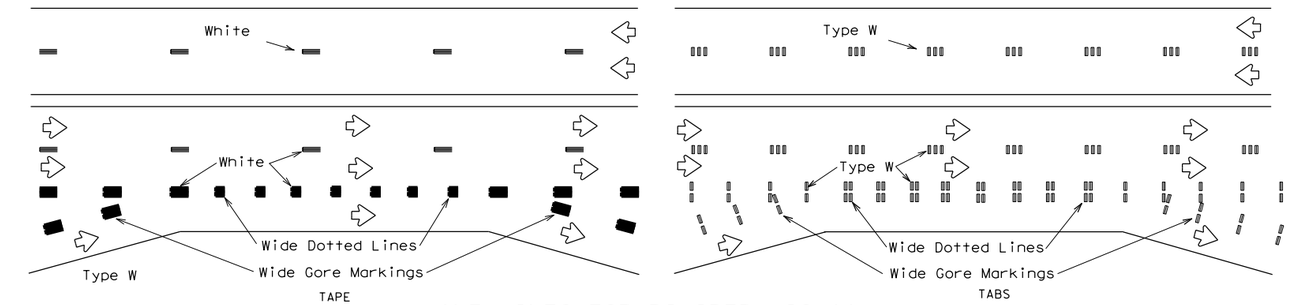
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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.

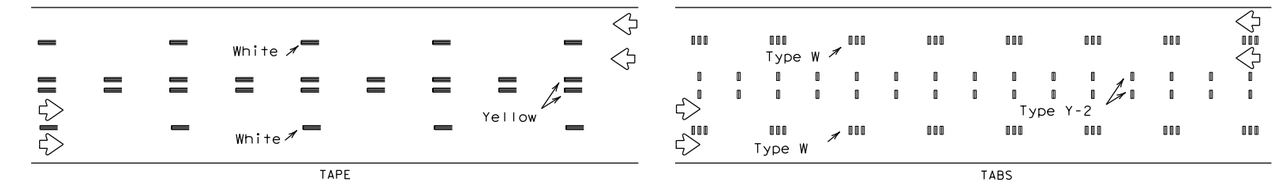
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



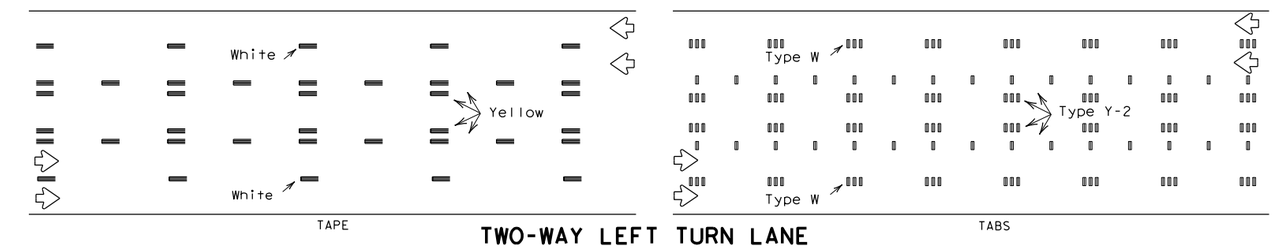
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



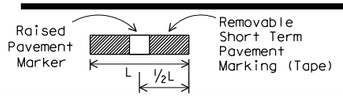
LANE LINES FOR DIVIDED HIGHWAY



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 Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

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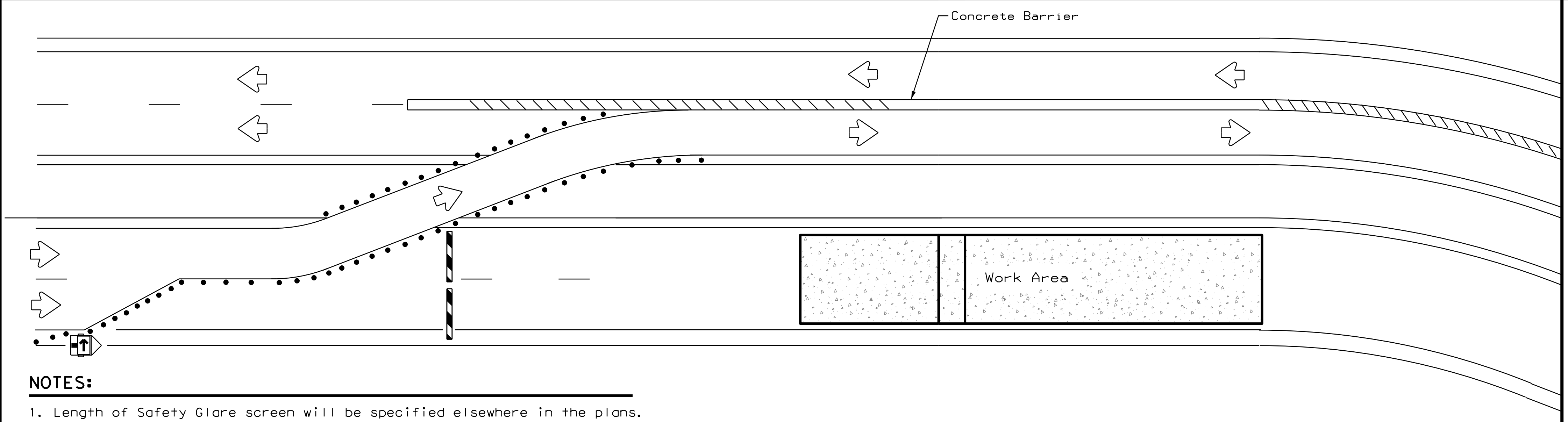


LEGEND

Symbol	Description
(hatched bar)	Type 3 Barricade
• • •	Channelizing Devices
(arrow board symbol)	Trailer Mounted Flashing Arrow Board
(sign symbol)	Sign
\ \ \ \	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS

SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

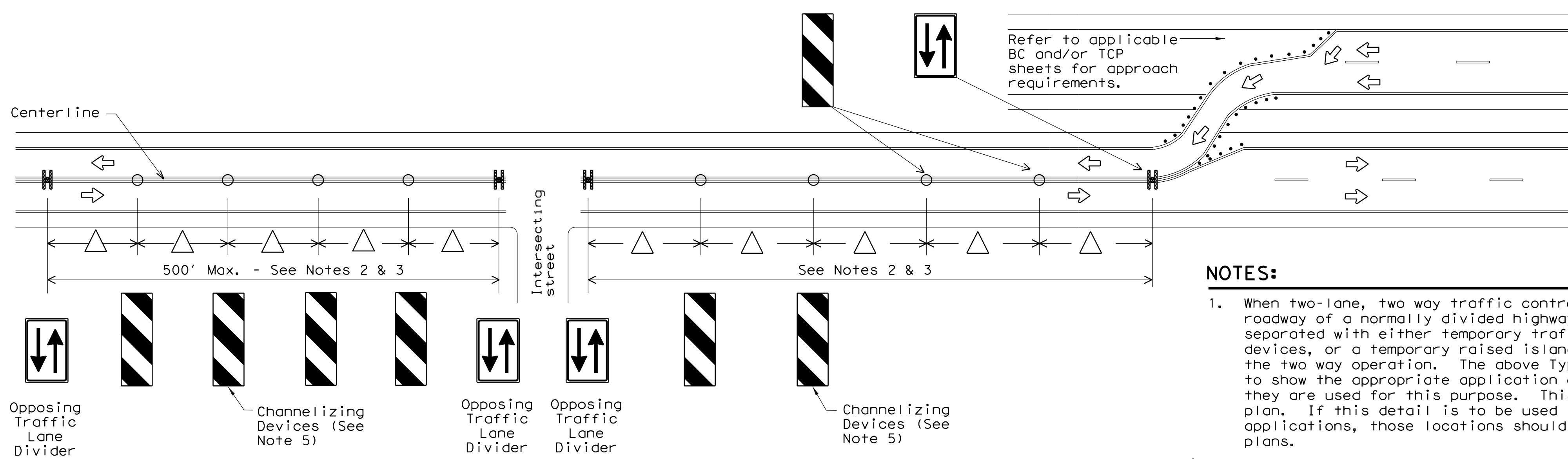
Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List" CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:

http://www.txdot.gov/business/resources/producer-list.html

NOTES:

1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

BARRIER DELINEATION WITH MODULAR GLARE SCREENS



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.
2. △ Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.
3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

Texas Department of Transportation — Traffic Operations Division Standard

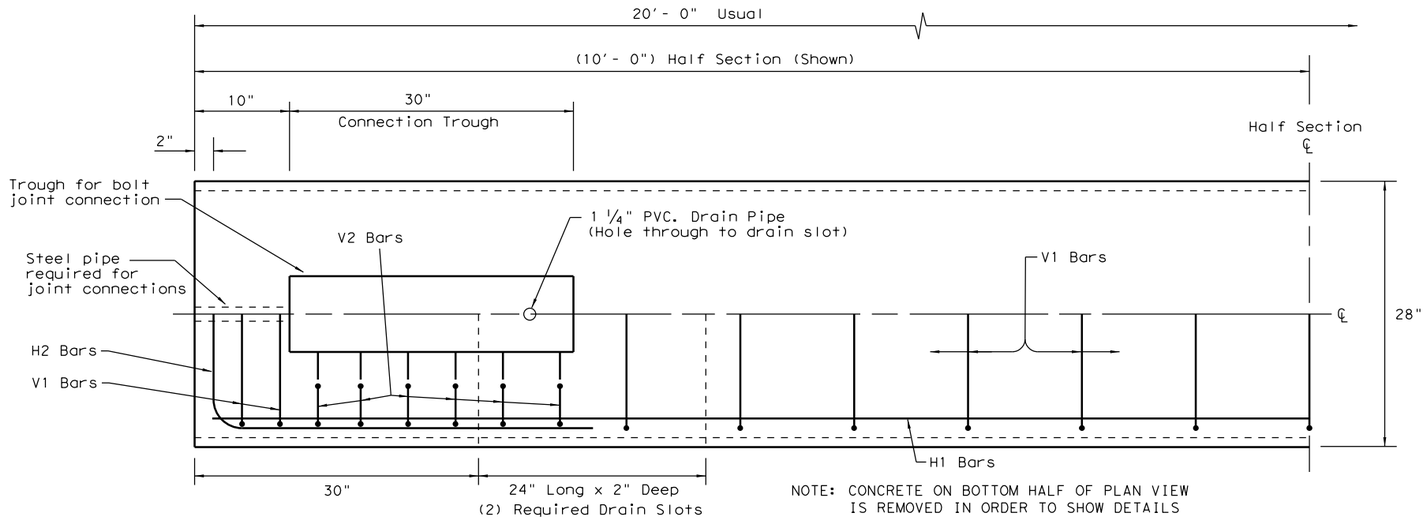
TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 2-17 3-03 7-13	0545	01	014	SH 135
	DIST		COUNTY	SHEET NO.
	TYL		GREGG	73

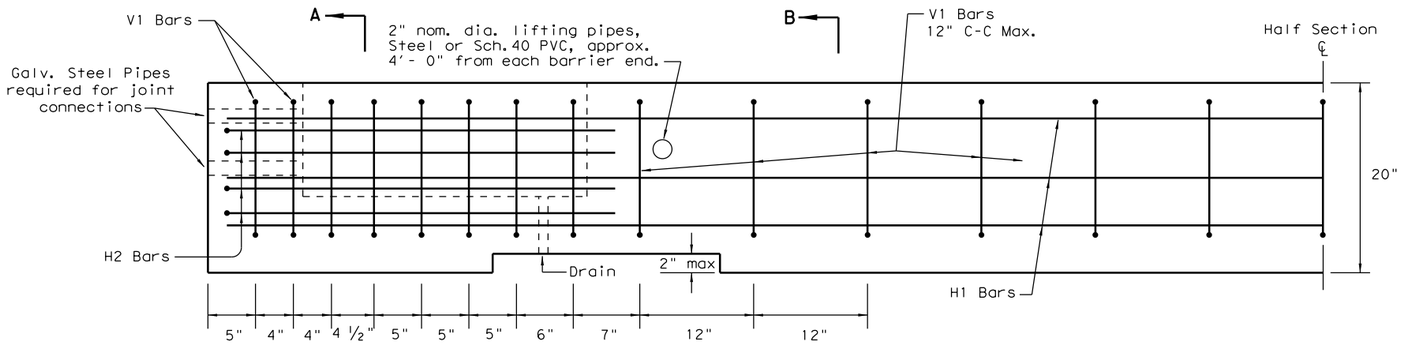
110

DATE: 2/13/2022
FILE: F:\Projects\2019\11004.TxDOT_5x5_PS&E\02.SH135_Kilgore\ENG\500 USTN\500.02 Sheets\02 TCP\Standards\lpcb13.dgn

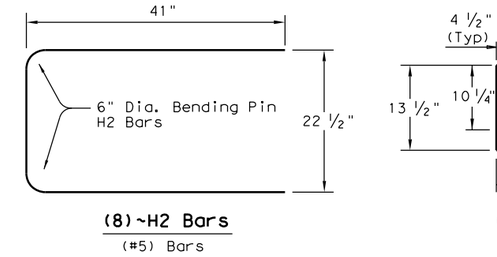


NOTE: CONCRETE ON BOTTOM HALF OF PLAN VIEW IS REMOVED IN ORDER TO SHOW DETAILS

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



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



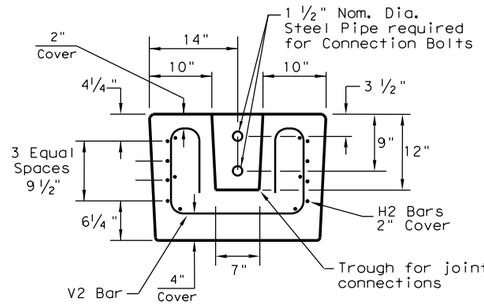
(8)~H2 Bars (#5) Bars

(12)~V2 Bars (#4) Bars

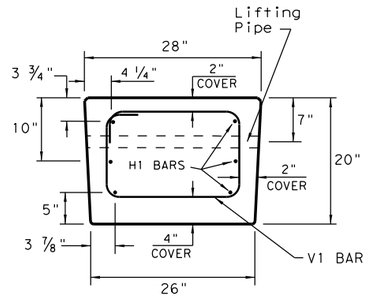
(17)~V1 Bars (#4) Bars

REINFORCING STEEL DETAILS
TYPE 1 - BARRIER SEGMENT

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



SECTION A-A



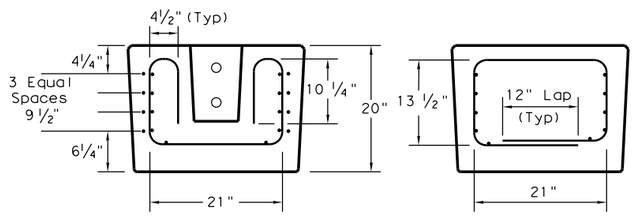
SECTION B-B

GENERAL NOTES

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

FOR CONTRACTORS INFORMATION ONLY

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



SECTION A-A SECTION B-B

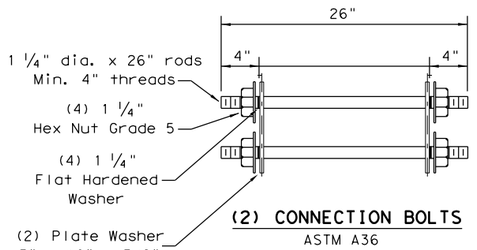
(WWR) GENERAL NOTES

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

REQUIRED (WWR) WIRE DESIGN

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

WELDED WIRE REINFORCEMENT (WWR)- OPTIONAL REINFORCING



(2) CONNECTION BOLTS
ASTM A36

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

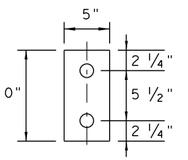


PLATE WASHER
5" x 10" x ⅜"

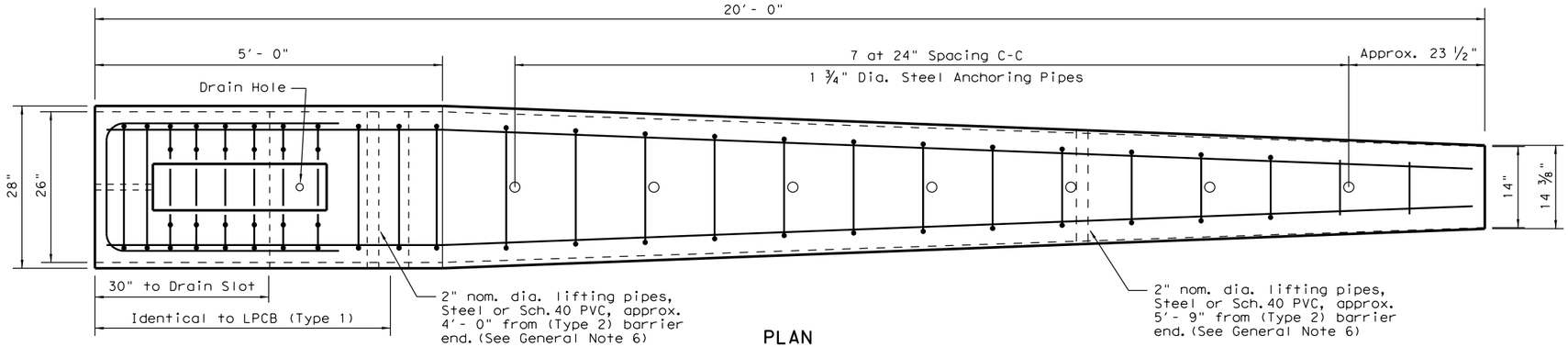
SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

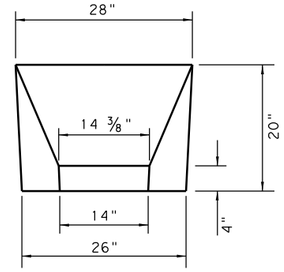
LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 1)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		74

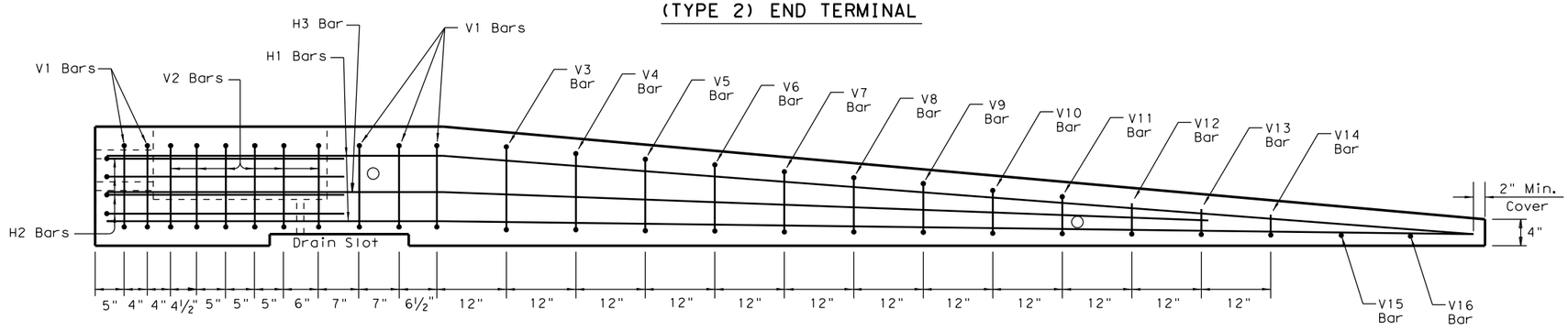
DATE: 2/13/2022
FILE: F:\Projects\2019\11004.TxDOT_5x5_PS&E\02.SH135_Kilgore\ENG\500 USTN\500.02 Sheets\02 TCP\Standards\lpcb13.dgn



PLAN
(TYPE 2) END TERMINAL



APPROACH VIEW

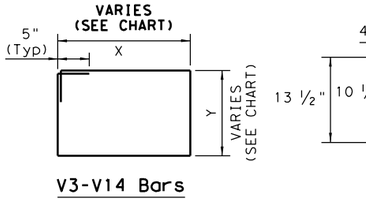


ELEVATION
(TYPE 2) END TERMINAL

Note:
Anchoring pipes not shown in Elevation View

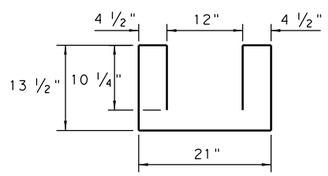
TYPE 2 - NOTES

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

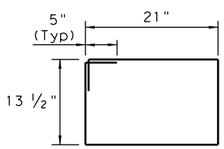


V3-V14 Bars

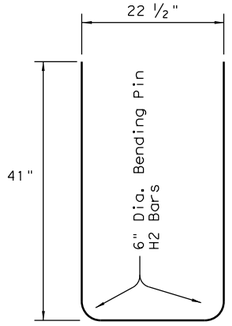
BAR(#4)	X (IN.)	Y (IN.)
V3 BAR	20 ¼	14 ½
V4 BAR	19 ½	13 ½
V5 BAR	18 ½	12 ¼
V6 BAR	17 ½	11 ¼
V7 BAR	17	10 ¼
V8 BAR	16 ¼	9
V9 BAR	15 ½	8
V10 BAR	14 ½	7
V11 BAR	13 ¾	6



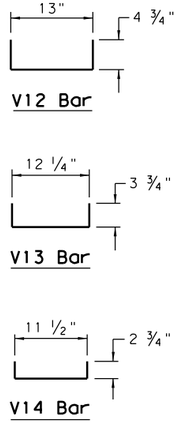
(6)~V2 Bars



(5)~V1 Bars

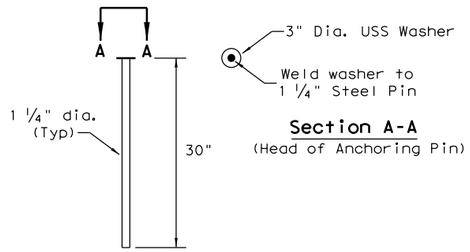


(4)~H2 Bars
(#5) Bars



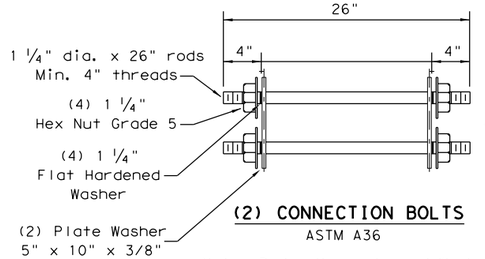
Note: All V Bars are (#4)

REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL



Section A-A
(Head of Anchoring Pin)

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

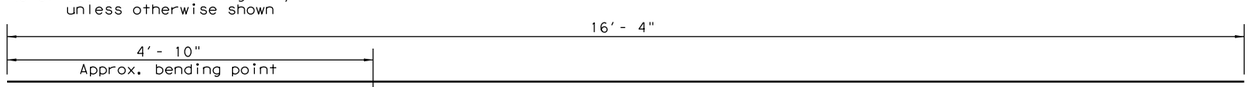


(2) CONNECTION BOLTS
ASTM A36

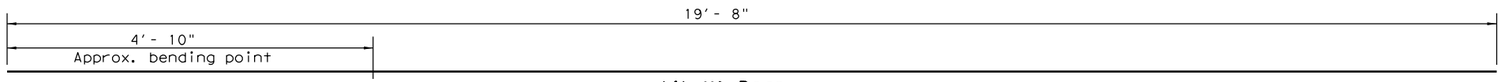
PLATE WASHER
5" x 10" x ⅜"

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

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



(2)~H3 Bars
(#5) Bar



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

(4)~H1 Bars
(#5) Bar

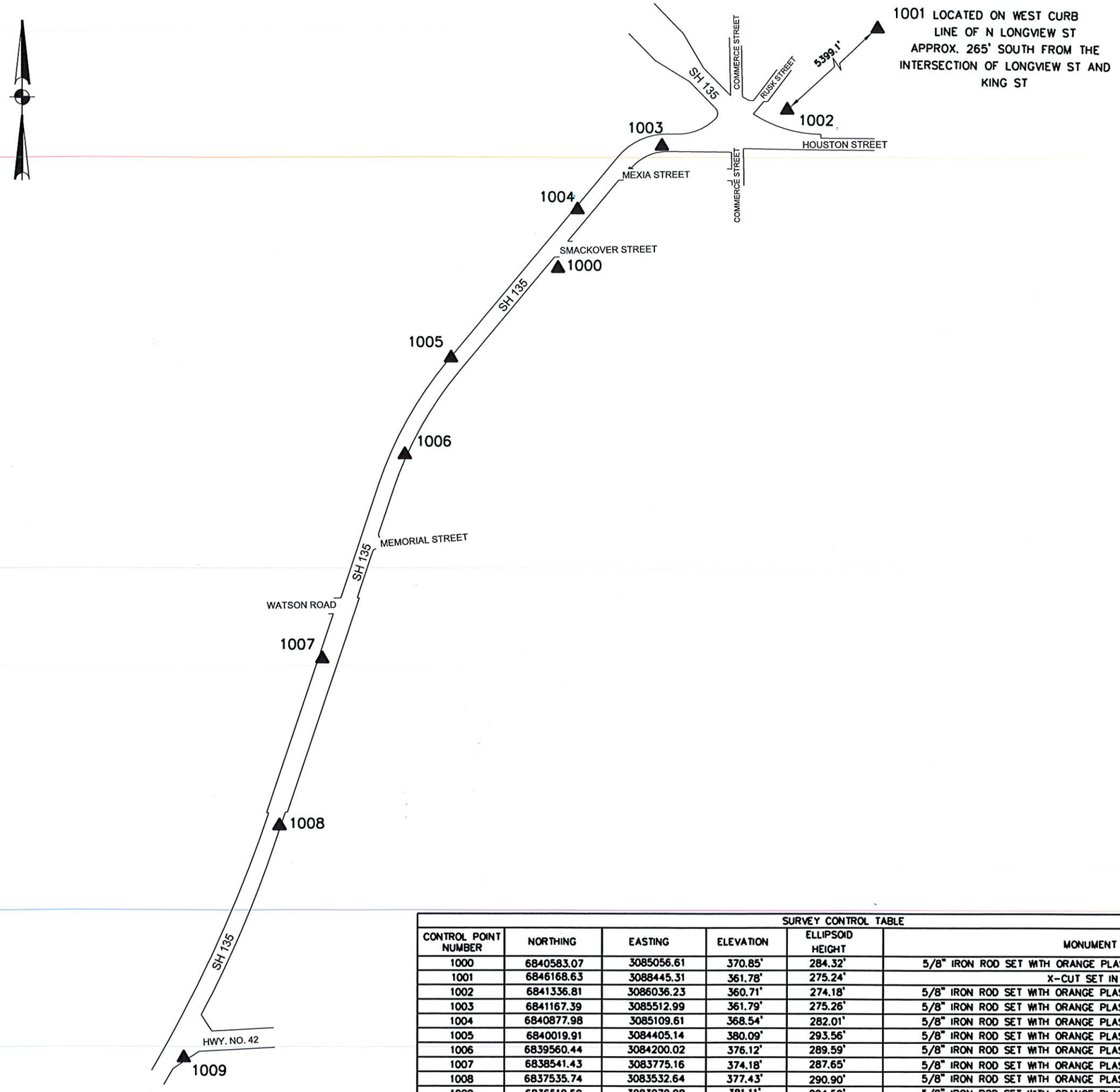
FOR CONTRACTORS INFORMATION ONLY

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

Texas Department of Transportation
Design Division Standard

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

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		75



NOTES:

1. COORDINATES SHOWN HEREON ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE, AND ARE BASED ON THE NORTH AMERICAN DATUM OF 1983, 2011 ADJUSTMENT. ALL DISTANCES AND COORDINATES SHOWN HEREON ARE SURFACE VALUES DISPLAYED IN US SURVEY FEET AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING THOSE SURFACE VALUES BY A SURFACE ADJUSTMENT FACTOR OF 1.000120.

2. ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND WERE CALCULATED BY APPLYING VERTICAL SHIFTS DERIVED FROM GEOID MODEL 2012B TO ELLIPSOID HEIGHTS CALCULATED FROM GPS/GNSS OBSERVATIONS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983, 2011 ADJUSTMENT (NAD83 2011).

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

I HEREBY CERTIFY THAT THE CONTROL INFORMATION SHOWN HEREON WAS ESTABLISHED UNDER MY DIRECT SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

2020-05-14

STATE OF TEXAS
REGISTERED
ZACHARY J. NELSON
6767
PROFESSIONAL
LAND SURVEYOR

Zach Nelson

ZACHARY J. NELSON — DATE
RPLS No. 6767

SCALE: N.T.S.

NO.	REVISION	BY	DATE

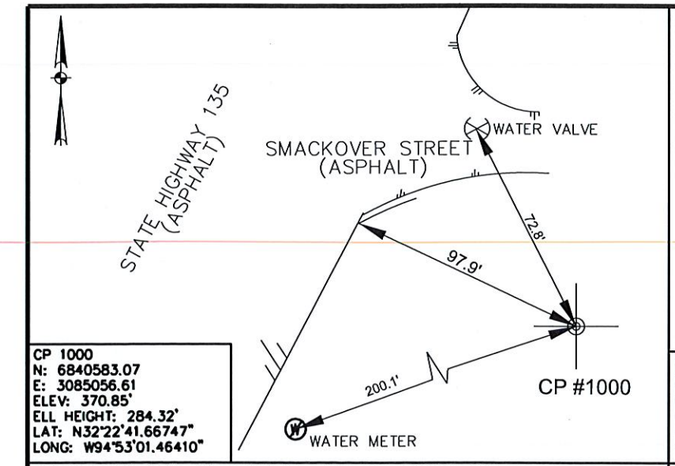
CobbFendley
TBPE Firm Registration No. 274
TBPLS Firm Registration No. 10194167
1300 South University Drive, Suite 300
Fort Worth, Texas 76107
817.445.1016| fax 817.445.1017
www.cobbfendley.com

SURVEY CONTROL INDEX

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	FY 2022(024)		SH 135
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	TYLER	GREGG	76
CONTROL	SECTION	JOB	
0545	01	014	

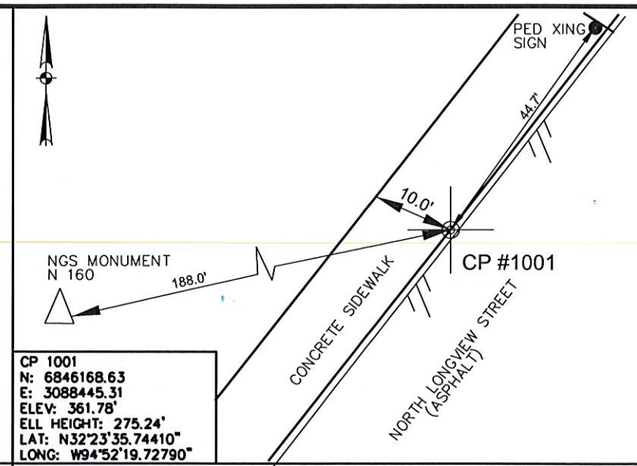
SURVEY CONTROL TABLE

CONTROL POINT NUMBER	NORTHING	EASTING	ELEVATION	ELLIPSOID HEIGHT	MONUMENT DESCRIPTION
1000	6840583.07	3085056.61	370.85'	284.32'	5/8" IRON ROD SET WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT"
1001	6846168.63	3088445.31	361.78'	275.24'	X-CUT SET IN CONCRETE
1002	6841336.81	3086036.23	360.71'	274.18'	5/8" IRON ROD SET WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT"
1003	6841167.39	3085512.99	361.79'	275.26'	5/8" IRON ROD SET WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT"
1004	6840877.98	3085109.61	368.54'	282.01'	5/8" IRON ROD SET WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT"
1005	6840019.91	3084405.14	380.09'	293.56'	5/8" IRON ROD SET WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT"
1006	6839560.44	3084200.02	376.12'	289.59'	5/8" IRON ROD SET WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT"
1007	6838541.43	3083775.16	374.18'	287.65'	5/8" IRON ROD SET WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT"
1008	6837535.74	3083532.64	377.43'	290.90'	5/8" IRON ROD SET WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT"
1009	6836510.59	3083070.08	381.11'	294.59'	5/8" IRON ROD SET WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT"



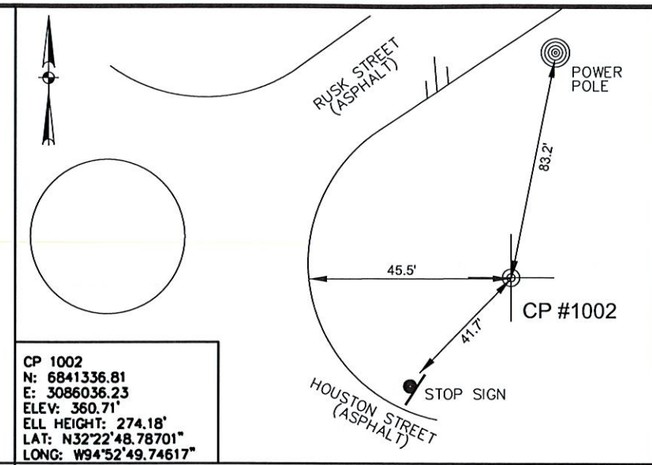
CP 1000
N: 6840583.07
E: 3085056.61
ELEV: 370.85'
ELL HEIGHT: 284.32'
LAT: N32°22'41.66747"
LONG: W94°53'01.46410"

SET 5/8" IRON ROD WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT" LOCATED ON THE EASTERN SIDE OF SH 135, APPROXIMATELY 112 FEET SOUTHEAST FROM THE INTERSECTION OF STATE HIGHWAY 135 AND SMACKOVER STREET.



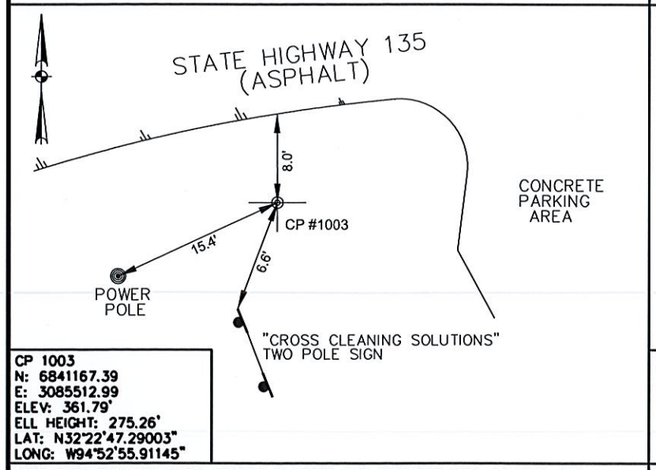
CP 1001
N: 6846168.63
E: 3088445.31
ELEV: 361.78'
ELL HEIGHT: 275.24'
LAT: N32°23'35.74410"
LONG: W94°52'19.72790"

SET CHISELED PLUS IN CONCRETE LOCATED ON THE WEST CURB LINE OF NORTH LONGVIEW STREET, APPROXIMATELY 265 FEET SOUTH FROM THE INTERSECTION OF NORTH LONGVIEW STREET AND KING STREET.



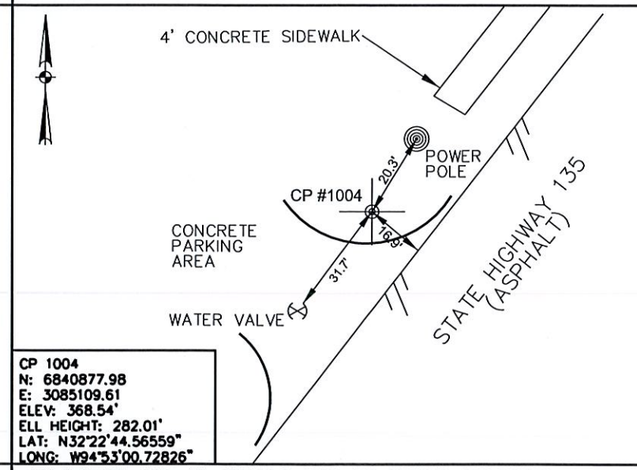
CP 1002
N: 6841336.81
E: 3086036.23
ELEV: 360.71'
ELL HEIGHT: 274.18'
LAT: N32°22'48.78701"
LONG: W94°52'49.74617"

SET 5/8" IRON ROD WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT" LOCATED ON THE EASTERN SIDE OF THE SH 135 ROUNDABOUT, BETWEEN RUSK STREET AND HOUSTON STREET.



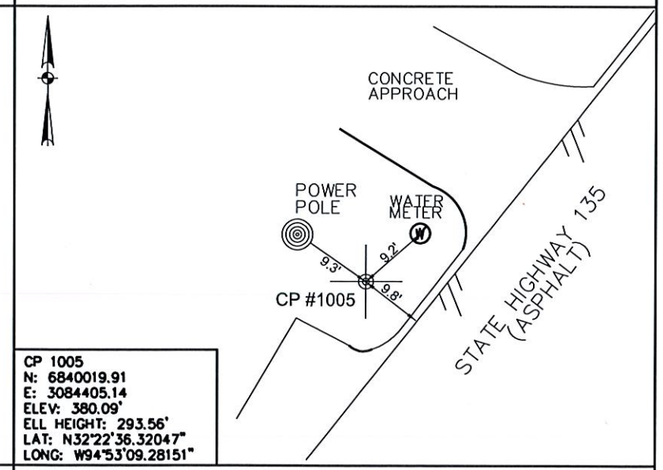
CP 1003
N: 6841167.39
E: 3085512.99
ELEV: 361.79'
ELL HEIGHT: 275.26'
LAT: N32°22'47.29003"
LONG: W94°52'55.91145"

SET 5/8" IRON ROD WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT" LOCATED ON THE SOUTHERN SIDE OF SH 135, APPROXIMATELY 404 FEET WEST FROM THE INTERSECTION OF INDUSTRIAL AVENUE AND SOUTH COMMERCE STREET.



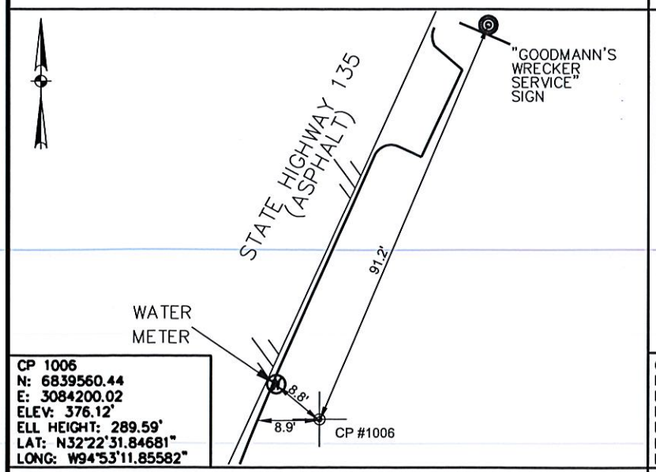
CP 1004
N: 6840877.98
E: 3085109.61
ELEV: 368.54'
ELL HEIGHT: 282.01'
LAT: N32°22'44.56559"
LONG: W94°53'00.72826"

SET 5/8" IRON ROD WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT" LOCATED ON THE WESTERN SIDE OF SH 135, APPROXIMATELY 252 FEET SOUTHWEST FROM THE INTERSECTION OF SH 135 AND MEXIA STREET.



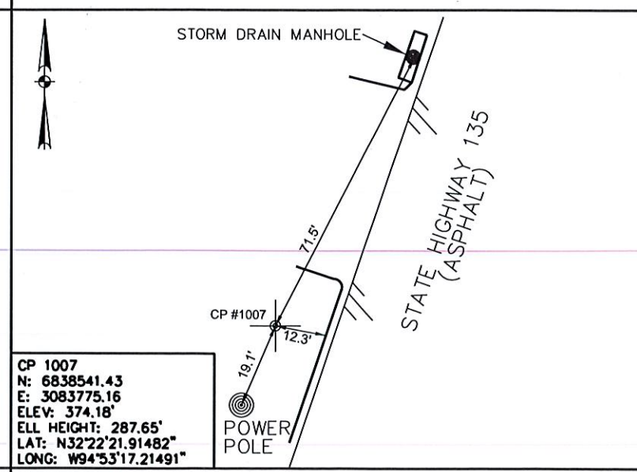
CP 1005
N: 6840019.91
E: 3084405.14
ELEV: 380.09'
ELL HEIGHT: 293.56'
LAT: N32°22'36.32047"
LONG: W94°53'09.28151"

SET 5/8" IRON ROD WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT" LOCATED ON THE WESTERN SIDE OF SH 135, APPROXIMATELY 867 FEET SOUTHWEST FROM THE INTERSECTION OF SH 135 AND SMACKOVER ROAD.



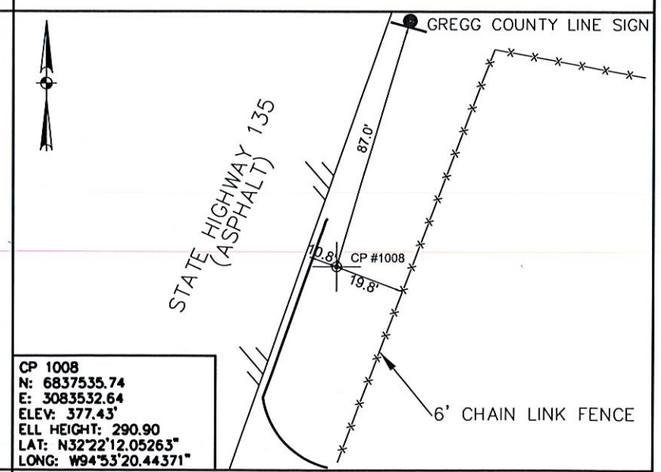
CP 1006
N: 6839560.44
E: 3084200.02
ELEV: 376.12'
ELL HEIGHT: 289.59'
LAT: N32°22'31.84681"
LONG: W94°53'11.85582"

SET 5/8" IRON ROD WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT" LOCATED ON THE EASTERN SIDE OF SH 135, APPROXIMATELY 453 FEET NORTH FROM THE INTERSECTION OF SH 135 AND MEMORIAL STREET.



CP 1007
N: 6838541.43
E: 3083775.16
ELEV: 374.18'
ELL HEIGHT: 287.65'
LAT: N32°22'21.91482"
LONG: W94°53'17.21491"

SET 5/8" IRON ROD WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT" LOCATED ON THE WESTERN SIDE OF SH 135, APPROXIMATELY 288 FEET SOUTH FROM THE INTERSECTION OF SH 135 AND WATSON ROAD.



CP 1008
N: 6837535.74
E: 3083532.64
ELEV: 377.43'
ELL HEIGHT: 290.90
LAT: N32°22'12.05263"
LONG: W94°53'20.44371"

SET 5/8" IRON ROD WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT" LOCATED ON THE EASTERN SIDE OF SH 135, APPROXIMATELY 988 FEET NORTH FROM THE INTERSECTION OF SH 135 AND TEXAS HIGHWAY 42.

NOTES:

1. COORDINATES SHOWN HEREON ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE, AND ARE BASED ON THE NORTH AMERICAN DATUM OF 1983, 2011 ADJUSTMENT. ALL DISTANCES AND COORDINATES SHOWN HEREON ARE SURFACE VALUES DISPLAYED IN US SURVEY FEET AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING THOSE SURFACE VALUES BY A SURFACE ADJUSTMENT FACTOR OF 1.000120.

2. ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND WERE CALCULATED BY APPLYING VERTICAL SHIFTS DERIVED FROM GEOID MODEL 2012B TO ELLIPSOID HEIGHTS CALCULATED FROM GPS/GNSS OBSERVATIONS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983, 2011 ADJUSTMENT (NAD83 2011).

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

I HEREBY CERTIFY THAT THE CONTROL INFORMATION SHOWN HEREON WAS ESTABLISHED UNDER MY DIRECT SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

2020-05-14

STATE OF TEXAS
REGISTERED
ZACHARY J. NELSON
6767
PROFESSIONAL
LAND SURVEYOR

Zach Nelson

ZACHARY J. NELSON DATE
RPLS No. 6767

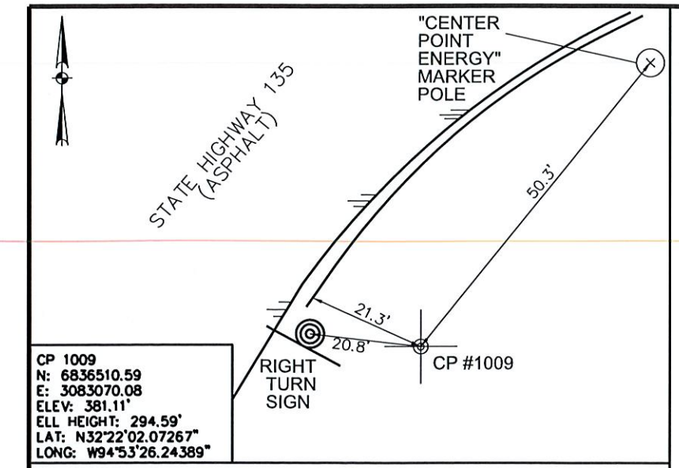
SCALE: N.T.S.

NO.	REVISION	BY	DATE

CobbFendley
TBPE Firm Registration No. 274
TBPLS Firm Registration No. 10194167
1300 South University Drive, Suite 300
Fort Worth, Texas 76107
817.445.1016| fax 817.445.1017
www.cobbfendley.com

HORIZONTAL AND VERTICAL CONTROL

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	FY 2022(024)		SH 135
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	TYLER	GREGG	77
CONTROL	SECTION	JOB	
0545	01	014	



CP 1009
N: 6836510.59
E: 3083070.08
ELEV: 381.11'
ELL HEIGHT: 294.59'
LAT: N32°22'02.07267"
LONG: W94°53'26.24389"

SET 5/8" IRON ROD WITH ORANGE PLASTIC CAP STAMPED "CFA CONTROL PT" LOCATED ON THE EASTERN SIDE OF SH 135, APPROXIMATELY 128 FEET SOUTH FROM THE INTERSECTION OF STATE HIGHWAY 135 AND TEXAS HIGHWAY 42.

NOTES:

1. COORDINATES SHOWN HEREON ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE, AND ARE BASED ON THE NORTH AMERICAN DATUM OF 1983, 2011 ADJUSTMENT. ALL DISTANCES AND COORDINATES SHOWN HEREON ARE SURFACE VALUES DISPLAYED IN US SURVEY FEET AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING THOSE SURFACE VALUES BY A SURFACE ADJUSTMENT FACTOR OF 1.000120.

2. ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND WERE CALCULATED BY APPLYING VERTICAL SHIFTS DERIVED FROM GEOID MODEL 2012B TO ELLIPSOID HEIGHTS CALCULATED FROM GPS/GNSS OBSERVATIONS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983, 2011 ADJUSTMENT (NAD83 2011).

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

I HEREBY CERTIFY THAT THE CONTROL INFORMATION SHOWN HEREON WAS ESTABLISHED UNDER MY DIRECT SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

2020-05-14

STATE OF TEXAS
REGISTERED
ZACHARY J. NELSON
6767
PROFESSIONAL
LAND SURVEYOR

Zach Nelson

ZACHARY J. NELSON
RPLS No. 6767

DATE

SCALE: N.T.S.

NO.	REVISION	BY	DATE

CobbFendley
TBPE Firm Registration No. 274
TBPLS Firm Registration No. 10194167
1300 South University Drive, Suite 300
Fort Worth, Texas 76107
817.445.1016| fax 817.445.1017
www.cobbfendley.com

Texas Department of Transportation

HORIZONTAL AND VERTICAL CONTROL

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6	FY 2022(024)	SH 135

STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	TYLER	GREGG	78
CONTROL	SECTION	JOB	
0545	01	014	

Chain 135S contains:
CUR 135S_1 CUR 135S_4 CUR 135S_7 CUR 135S_10 102

Beginning chain 135S description
Feature: Geom_Centerline

		Curve Data				
Curve 135S_1						
P.I. Station		51+31.12	X	3,083,312.00	Y	6,837,017.80
Delta	=	12° 34′ 15.15"	(LT)			
Degree	=	0° 59′ 59.73"				
Tangent	=	631.12				
Length	=	1,257.18				
Radius	=	5,730.00				
External	=	34.65				
Long Chord	=	1,254.66				
Mid. Ord.	=	34.44				
P.C. Station		45+00.00	X	3,082,986.13	Y	6,836,477.31
P.T. Station		57+57.18	X	3,083,512.41	Y	6,837,616.26
C.C.			X	3,078,078.99	Y	6,839,435.84
Back	= N 31° 05′ 09.30" E					
Ahead	= N 18° 30′ 54.15" E					
Chord Bear	= N 24° 48′ 01.72" E					

Course from PT 135S_1 to PC 135S_4 N 18° 30′ 54.15" E Dist 1,914.94

		Curve Data				
Curve 135S_4						
P.I. Station		80+30.37	X	3,084,234.27	Y	6,839,771.79
Delta	=	21° 14′ 47.10"	(RT)			
Degree	=	2° 59′ 59.20"				
Tangent	=	358.25				
Length	=	708.27				
Radius	=	1,910.00				
External	=	33.31				
Long Chord	=	704.22				
Mid. Ord.	=	32.74				
P.C. Station		76+72.12	X	3,084,120.51	Y	6,839,432.08
P.T. Station		83+80.39	X	3,084,463.40	Y	6,840,047.18
C.C.			X	3,085,931.65	Y	6,838,825.56
Back	= N 18° 30′ 54.15" E					
Ahead	= N 39° 45′ 41.25" E					
Chord Bear	= N 29° 08′ 17.70" E					

Course from PT 135S_4 to PC 135S_7 N 39° 45′ 41.25" E Dist 1,364.57

		Curve Data				
Curve 135S_7						
P.I. Station		98+81.66	X	3,085,423.61	Y	6,841,201.23
Delta	=	51° 05′ 33.25"	(RT)			
Degree	=	20° 02′ 00.56"				
Tangent	=	136.70				
Length	=	255.04				
Radius	=	286.00				
External	=	30.99				
Long Chord	=	246.67				
Mid. Ord.	=	27.96				
P.C. Station		97+44.96	X	3,085,336.18	Y	6,841,096.15
P.T. Station		100+00.00	X	3,085,560.29	Y	6,841,199.19
C.C.			X	3,085,556.03	Y	6,840,913.22
Back	= N 39° 45′ 41.25" E					
Ahead	= S 89° 08′ 45.50" E					
Chord Bear	= N 65° 18′ 27.88" E					

Course from PT 135S_7 to PC 135S_10 S 89° 08′ 45.50" E Dist 31.65

		Curve Data				
Curve 135S_10						
P.I. Station		102+73.60	X	3,085,833.86	Y	6,841,195.11
Delta	=	49° 35′ 04.95"	(LT)			
Degree	=	10° 56′ 17.55"				
Tangent	=	241.95				
Length	=	453.32				
Radius	=	523.81				
External	=	53.18				
Long Chord	=	439.30				
Mid. Ord.	=	48.28				
P.C. Station		100+31.65	X	3,085,591.93	Y	6,841,198.72
P.T. Station		104+84.96	X	3,085,993.45	Y	6,841,376.97
C.C.			X	3,085,599.74	Y	6,841,722.47
Back	= S 89° 08′ 45.50" E					
Ahead	= N 41° 16′ 09.55" E					
Chord Bear	= N 66° 03′ 42.03" E					

Course from PT 135S_10 to 102 N 41° 16′ 09.55" E Dist 335.31

Point 102 X 3,086,214.62 Y 6,841,628.99 Sta 108+20.27

Ending chain 135S description

100% SUBMITTAL

02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

HORIZONTAL ALIGNMENT DATA SHEET

SH 135

SHEET 1 OF 2

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	79

2/13/2022 1:05:38 PM
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135_ROAD-ALIGN.dgn

POINT TYPE	STATION	NORTHING	EASTING	RADIUS	LENGTH	TANGENT	DELTA/THETA	ROTATION DIRECTION
Alignment Name:		**COMMERCE ST**						
Description:								
POB	300+00.00	6840963.501	3085920.096					
PI	303+74.93	6841338.371	3085913.192					
PI	303+74.93	6841338.371	3085913.192					
POE	306+27.61	6841591.001	3085908.479					

POINT TYPE	STATION	NORTHING	EASTING	RADIUS	LENGTH	TANGENT	DELTA/THETA	ROTATION DIRECTION
Alignment Name:		**ROUNDABOUT**						
Description:								
PC	10+00.00	6841371.714	3085912.570					
PI	10+85.67	6841341.905	3085832.257	80.00	131.13	85.67	93°55'05"	Left
PCC	11+31.13	6841263.816	3085867.484					
PCC	11+31.13	6841263.816	3085867.484					
PI	11+59.30	6841238.801	3085880.427	36.70	48.05	28.17	75°01'00"	Left
PCC	11+79.18	6841244.836	3085907.939					
PCC	11+79.18	6841244.836	3085907.939					
PI	12+76.66	6841269.201	3086002.324	76.00	138.10	97.48	104°06'58"	Left
PCC	13+17.28	6841354.793	3085955.676					
PCC	13+17.28	6841354.793	3085955.676					
PI	13+48.16	6841382.261	3085941.584	35.01	50.60	30.87	82°49'09"	Left
PT	13+67.88	6841371.714	3085912.570					

POINT TYPE	STATION	NORTHING	EASTING	RADIUS	LENGTH	TANGENT	DELTA/THETA	ROTATION DIRECTION
Alignment Name:		**SH 135 (N)/HOUSTON ST**						
Description:								
POB	197+00.00	6841183.535	3086610.481					
PC	200+00.00	6841188.007	3086310.515					
PC	200+00.00	6841188.007	3086310.515					
PI	202+63.87	6841191.940	3086046.677	637.00	500.32	263.87	45°00'07"	Right
PT	205+00.32	6841381.288	3085862.904					
PT	205+00.32	6841381.288	3085862.904					
POE	215+26.82	6842117.892	3085147.986					

100% SUBMITTAL

STATE OF TEXAS
BORIVOJE P. DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

REV. NO.	DATE	DESCRIPTION	BY

PARSONS
TBPELS Registration No. F-1481
1301 West President George Bush Highway, Suite 350
Richardson, Texas 75080

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

HORIZONTAL ALIGNMENT DATA SHEET

SH 135

SHEET **2** OF **2**

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**80**

2/10/2022 5:42:30 PM
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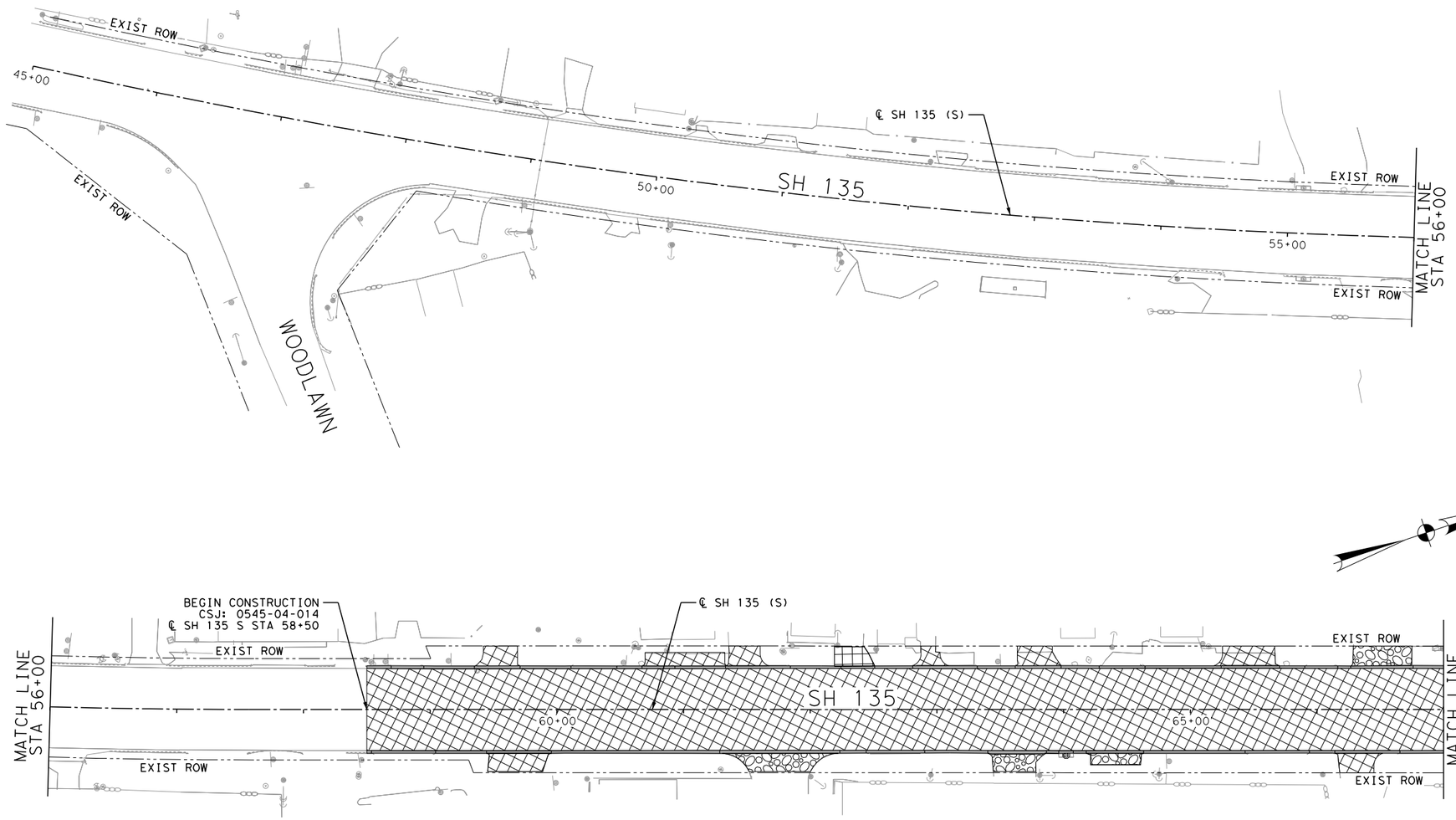
ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 105	ITEM 496	ITEM 496
REMOVING CONC (PAV)	REMOVING CONC (MEDIANS)	REMOVING CONC (SIDEWALKS)	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB AND GUTTER)	REMOVE CONC (GUTTER)	REMOVE STAB BASE AND ASPH PAV (6"-20")	REMOV STR (INLET)	REMOV STR (PIPE)
SY	SY	SY	SY	LF	LF	SY	EA	LF
			273	804	896	6602	1	



LEGEND

- REMOVING CONC (PAV)
- REMOVING CONC (DRIVEWAY)
- REMOVING CONC (MEDIAN)
- REMOVING CONC (SIDEWALK)
- REMOVING CONC (GUTTER OR CURB & GUTTER)
- REMOVING ASPH (PAV)
- REMOVING STR (INLET)
- —STM— REMOVING STR (PIPE)

NOTES:

1. SEE SIGNING AND PAVEMENT MARKING LAYOUTS FOR MODIFICATION OR REMOVAL OF EXISTING SIGNS, SUPPORTING STRUCTURES AND PAVEMENT MARKINGS.
2. ASPHALT DRIVEWAY REMOVALS SHALL BE PAID FOR USING ITEM NUMBER 105 6039 REMOVE STAB BASE AND ASPH PAV (6"-20").

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
LICENSED PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

SH 135
REMOVAL PLAN

SHEET 1 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	81

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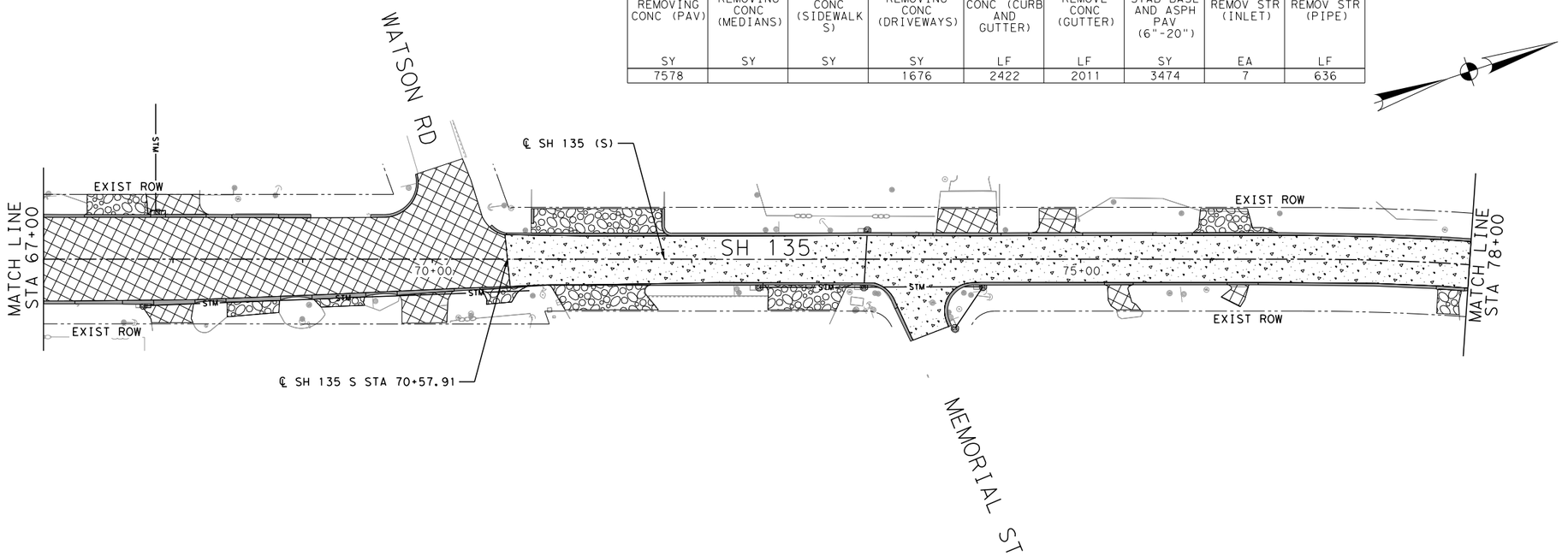
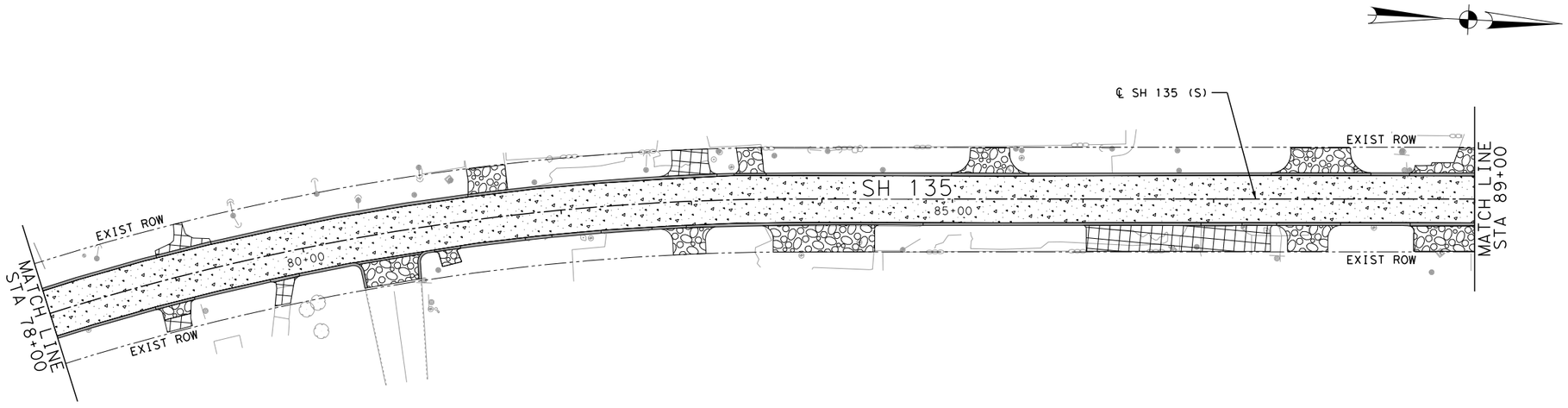
Ryan.Lance 135_REMOL.dgn

ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 105	ITEM 496	ITEM 496
REMOVING CONC (PAV)	REMOVING CONC (MEDIANS)	REMOVING CONC (SIDEWALKS)	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB AND GUTTER)	REMOVE CONC (GUTTER)	REMOVE STAB BASE AND ASPH PAV (6"-20")	REMOV STR (INLET)	REMOV STR (PIPE)
SY	SY	SY	SY	LF	LF	SY	EA	LF
7578			1676	2422	2011	3474	7	636





LEGEND

- REMOVING CONC (PAV)
- REMOVING CONC (DRIVEWAY)
- REMOVING CONC (MEDIAN)
- REMOVING CONC (SIDEWALK)
- REMOVING CONC (GUTTER OR CURB & GUTTER)
- REMOVING ASPH (PAV)
- REMOVING STR (INLET)
- STM REMOVING STR (PIPE)

NOTES:

1. SEE SIGNING AND PAVEMENT MARKING LAYOUTS FOR MODIFICATION OR REMOVAL OF EXISTING SIGNS, SUPPORTING STRUCTURES AND PAVEMENT MARKINGS.
2. ASPHALT DRIVEWAY REMOVALS SHALL BE PAID FOR USING ITEM NUMBER 105 6039 REMOVE STAB BASE AND ASPH PAV (6"-20").

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
LICENSED PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SH 135
REMOVAL PLAN

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	82

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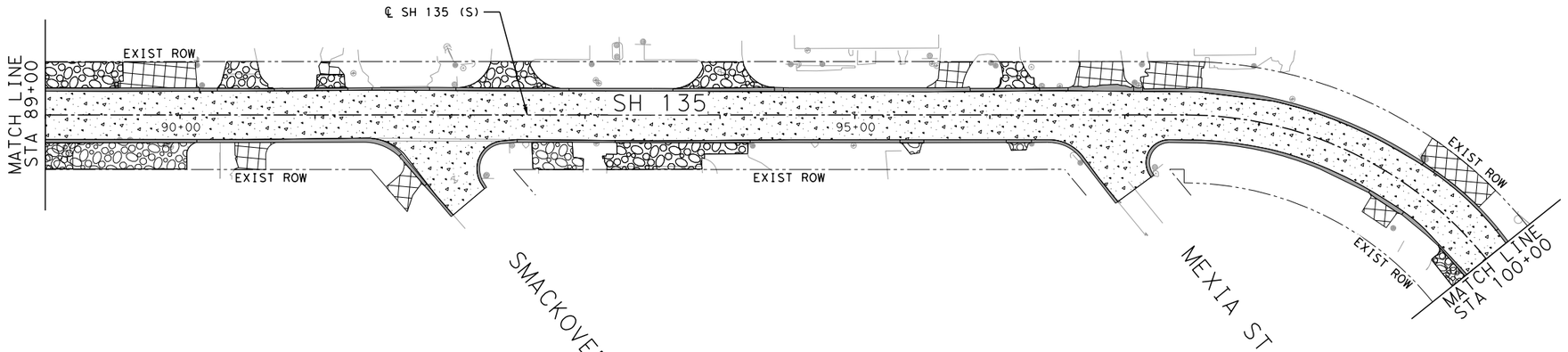
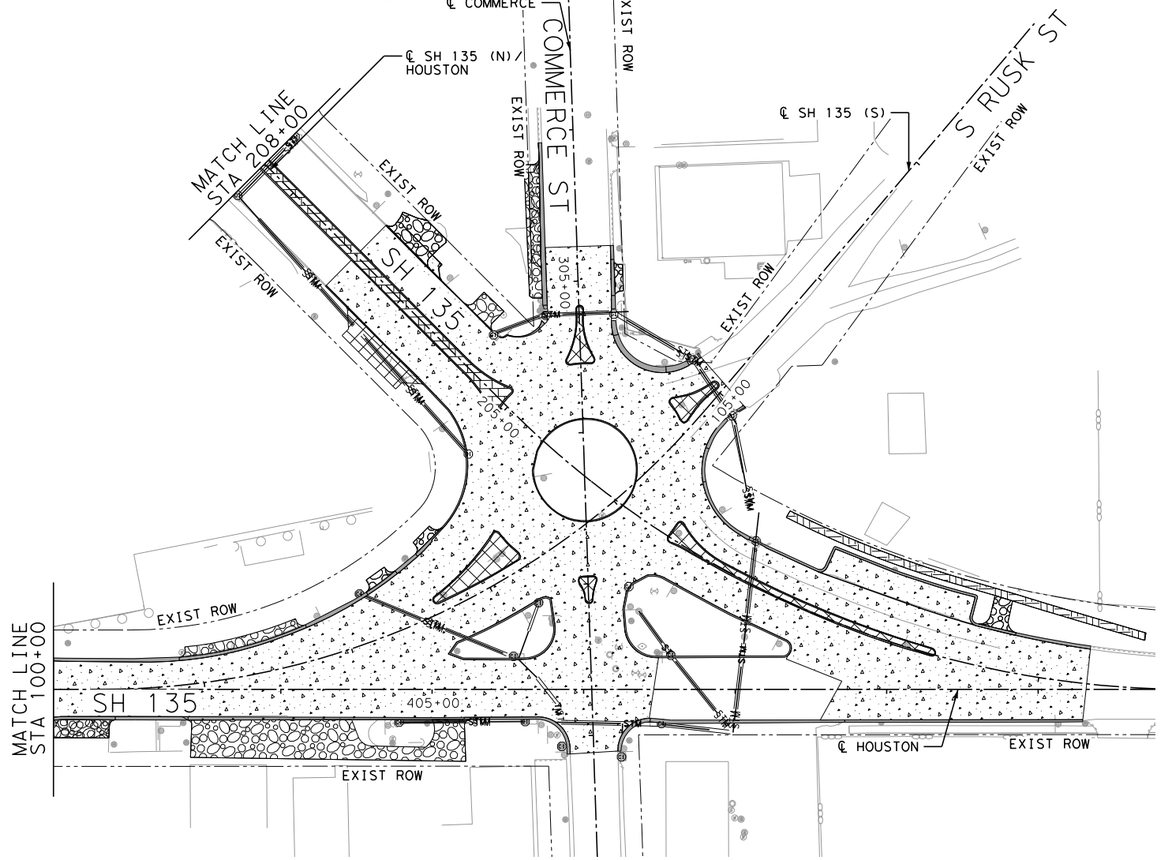
Ryan.Lance 135_REM02.dgn

ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 105	ITEM 496	ITEM 496
REMOVING CONC (PAV)	REMOVING CONC (MEDIANS)	REMOVING CONC (SIDEWALKS)	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB AND GUTTER)	REMOVE CONC (GUTTER)	REMOVE STAB BASE AND ASPH PAV (6"-20")	REMOV STR (INLET)	REMOV STR (PIPE)
SY	SY	SY	SY	LF	LF	SY	EA	LF
12668	188	137	1748	3742	2206	948	19	1184





LEGEND

- REMOVING CONC (PAV)
- REMOVING CONC (DRIVEWAY)
- REMOVING CONC (MEDIAN)
- REMOVING CONC (SIDEWALK)
- REMOVING CONC (GUTTER OR CURB & GUTTER)
- REMOVING ASPH (PAV)
- REMOVING STR (INLET)
- STM — REMOVING STR (PIPE)

NOTES:

1. SEE SIGNING AND PAVEMENT MARKING LAYOUTS FOR MODIFICATION OR REMOVAL OF EXISTING SIGNS, SUPPORTING STRUCTURES AND PAVEMENT MARKINGS.
2. ASPHALT DRIVEWAY REMOVALS SHALL BE PAID FOR USING ITEM NUMBER 105 6039 REMOVE STAB BASE AND ASPH PAV (6"-20").

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
LICENSED PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
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SH 135
REMOVAL PLAN

SHEET 3 OF 4

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	83

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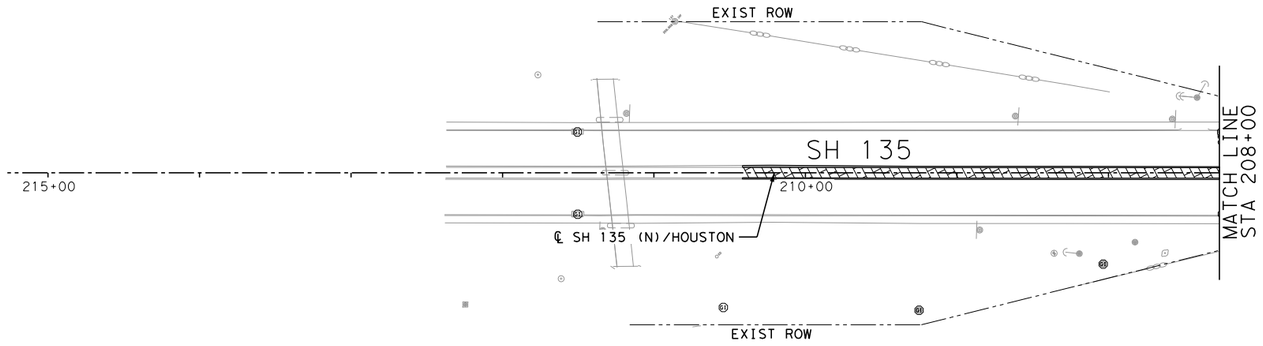
135_REM03.dgn Ryan.Lance

ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 104	ITEM 105	ITEM 496	ITEM 496
REMOVING CONC (PAV)	REMOVING CONC (MEDIANS)	REMOVING CONC (SIDEWALKS)	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB AND GUTTER)	REMOVE CONC (GUTTER)	REMOVE STAB BASE AND ASPH PAV (6"-20")	REMOV STR (INLET)	REMOV STR (PIPE)
SY	SY	SY	SY	LF	LF	SY	EA	LF
	246			611			5	



LEGEND

- REMOVING CONC (PAV)
- REMOVING CONC (DRIVEWAY)
- REMOVING CONC (MEDIAN)
- REMOVING CONC (SIDEWALK)
- REMOVING CONC (GUTTER OR CURB & GUTTER)
- REMOVING ASPH (PAV)
- (20) REMOVING STR (INLET)
- —STM— REMOVING STR (PIPE)

NOTES:

1. SEE SIGNING AND PAVEMENT MARKING LAYOUTS FOR MODIFICATION OR REMOVAL OF EXISTING SIGNS, SUPPORTING STRUCTURES AND PAVEMENT MARKINGS.
2. ASPHALT DRIVEWAY REMOVALS SHALL BE PAID FOR USING ITEM NUMBER 105 6039 REMOVE STAB BASE AND ASPH PAV (6"-20").

100% SUBMITTAL

STATE OF TEXAS
Ryan Lance
141449
PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SH 135
REMOVAL PLAN

SHEET 4 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	84

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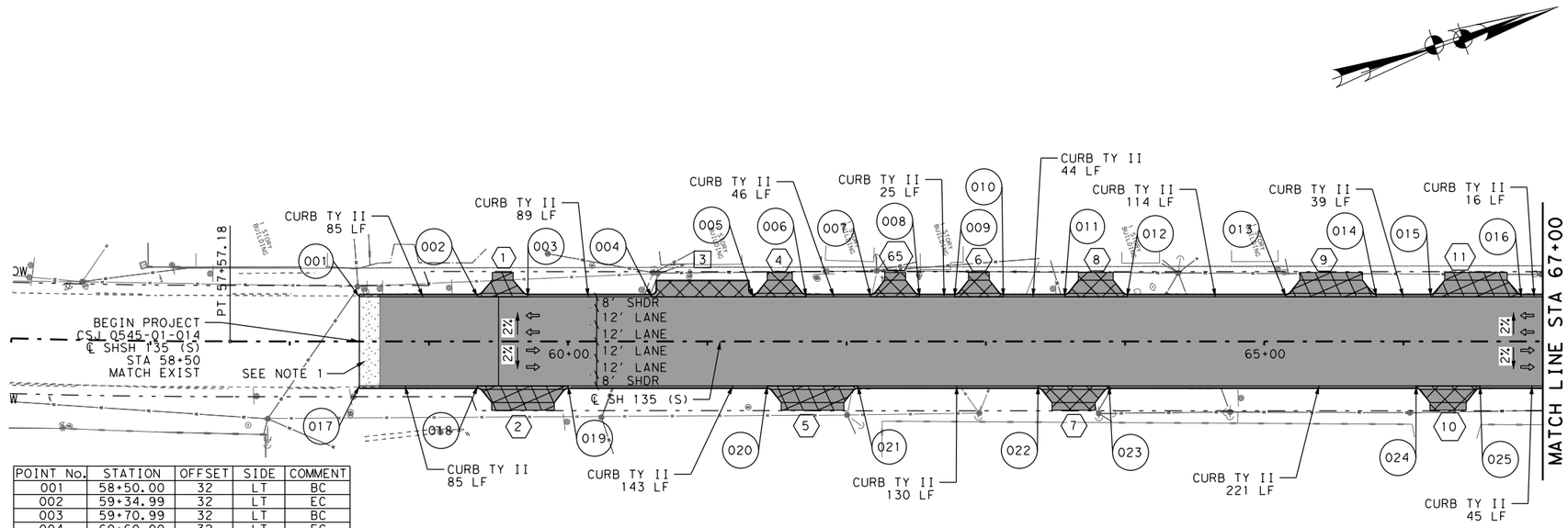
Ryan.Lance
135_REM04.dgn



POINT No.	STATION	OFFSET	SIDE	COMMENT
001	58+50.00	32	LT	BC
002	59+34.99	32	LT	EC
003	59+70.99	32	LT	BC
004	60+60.00	32	LT	EC
005	61+33.00	32	LT	
006	61+71.00	32	LT	BC
007	62+17.31	32	LT	EC
008	62+52.31	32	LT	BC
009	62+77.50	32	LT	EC
010	63+12.50	32	LT	BC
011	63+56.50	32	LT	EC
012	64+01.50	32	LT	BC
013	65+15.50	32	LT	EC
014	65+80.50	32	LT	BC
015	66+19.50	32	LT	EC
016	66+84.50	32	LT	BC
017	58+50.00	32	RT	BC
018	59+35.00	32	RT	EC
019	60+00.00	32	RT	BC
020	61+43.00	32	RT	EC
021	62+08.00	32	RT	BC
022	63+37.50	32	RT	EC
023	63+88.50	32	RT	BC
024	66+09.00	32	RT	EC
025	66+55.00	32	RT	BC

LEGEND

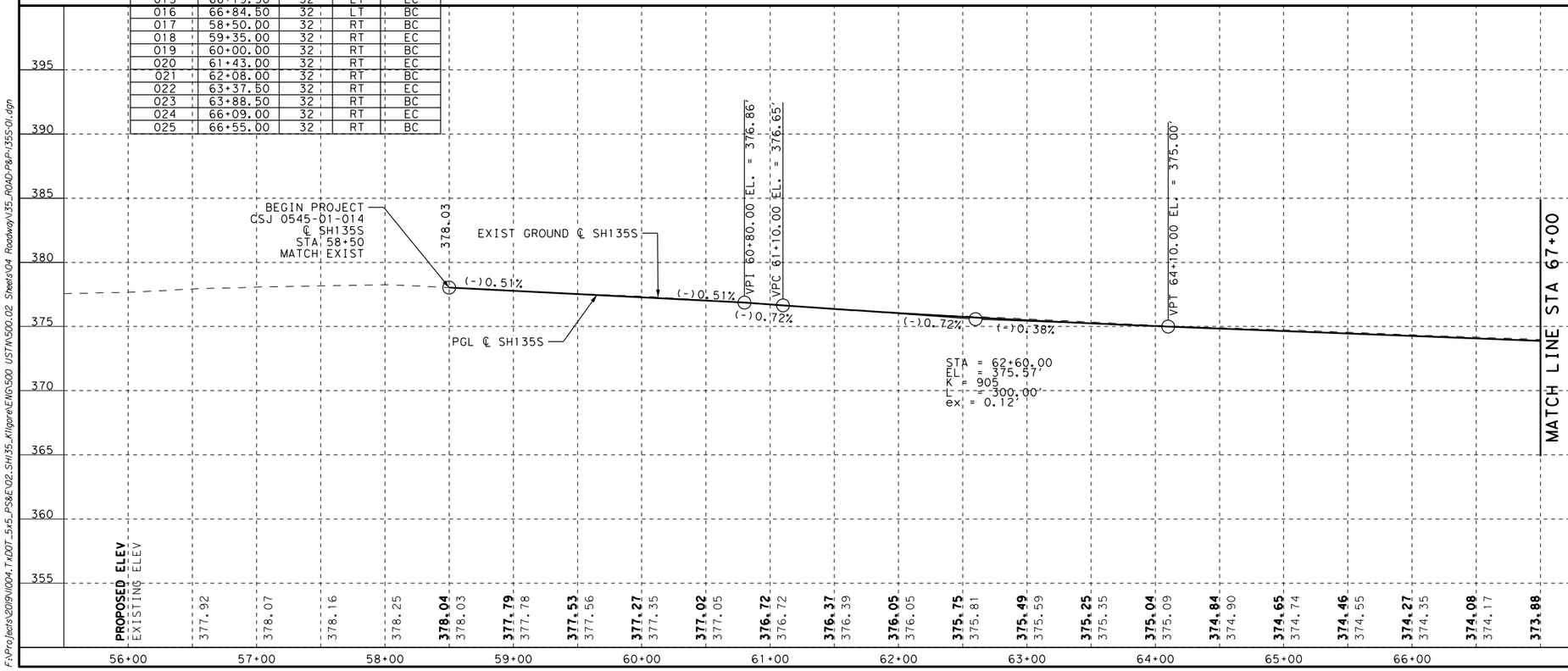
- PROPOSED CONC PAVE
- PROPOSED CONC DRIVEWAY
- (#) DRIVEWAY NUMBER
- [#] PARKING NUMBER

ABBREVIATIONS:

BC=BEGIN CURB
EC=END CURB
RC=RADUIS CURB
BT=BEGIN TRANSITION
ET=END TRANSITION

NOTE:

1. 15' PAVEMENT SLAB TRANSITION. SEE ITEM 360-6083 ON PAVEMENT SLAB TRANSITION DETAIL SHEET . 40 TONS OF SUPERPAVE INCLUDED IN QUANTITIES FOR ASPHALT PORTION OF TRANSITION.
2. REFER TO DRIVEWAY & UNDERDRAIN DETAILS SHEET FOR ADDITIONAL DRIVEWAY INFORMATION.
3. POINTS CALLED OUT ARE AT FACE OF CURB UNLESS OTHERWISE NOTED.



100% SUBMITTAL

02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

0 25 50 100
1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

SH 135
ROADWAY PLAN & PROFILE
BEGIN TO STA 67+00

SHEET 1 OF 8

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	85

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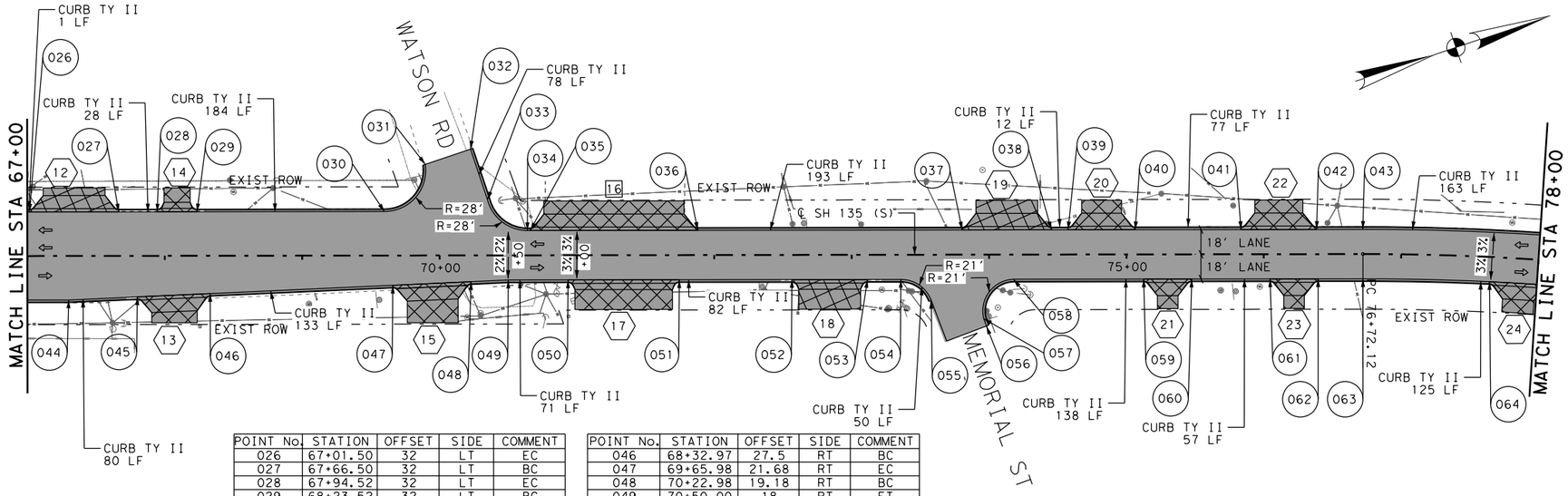


POINT No.	STATION	OFFSET	SIDE	COMMENT
026	67+01.50	32	LT	EC
027	67+66.50	32	LT	BC
028	67+94.52	32	LT	EC
029	68+23.52	32	LT	BC
030	69+60.00	32	LT	RC
031	69+89.69	66.32	LT	EC
032	70+22.61	77.35	LT	BC
033	70+35.00	40.37	LT	RC
034	70+64.01	18	LT	RC
035	70+66.00	18	LT	EC
036	71+88.00	18	LT	BC
037	73+80.50	18	LT	EC
038	74+45.50	18	LT	BC
039	74+57.50	18	LT	EC
040	75+06.50	18	LT	BC
041	75+83.50	18	LT	EC
042	76+38.50	18	LT	BC
043	76+72.12	18	LT	EC
044	67+30.00	32	RT	BT
045	67+79.97	29.81	RT	EC

POINT No.	STATION	OFFSET	SIDE	COMMENT
046	68+32.97	27.5	RT	BC
047	69+65.98	21.68	RT	EC
048	70+22.98	19.18	RT	BC
049	70+50.00	18	RT	ET
050	70+93.50	18	RT	EC
051	71+74.50	18	RT	BC
052	72+56.50	18	RT	EC
053	73+11.50	18	RT	BC
054	73+35.79	18	RT	RC
055	73+57.82	33.32	RT	EC
056	73+98.06	52.01	RT	BC
057	73+96.03	46.62	RT	RC
058	74+17.80	18	RT	RC
059	75+12.50	18	RT	EC
060	75+47.50	18	RT	BC
061	76+04.50	18	RT	EC
062	76+39.50	18	RT	BC
063	76+72.12	18	RT	RC
064	77+65.16	18	RT	EC

LEGEND

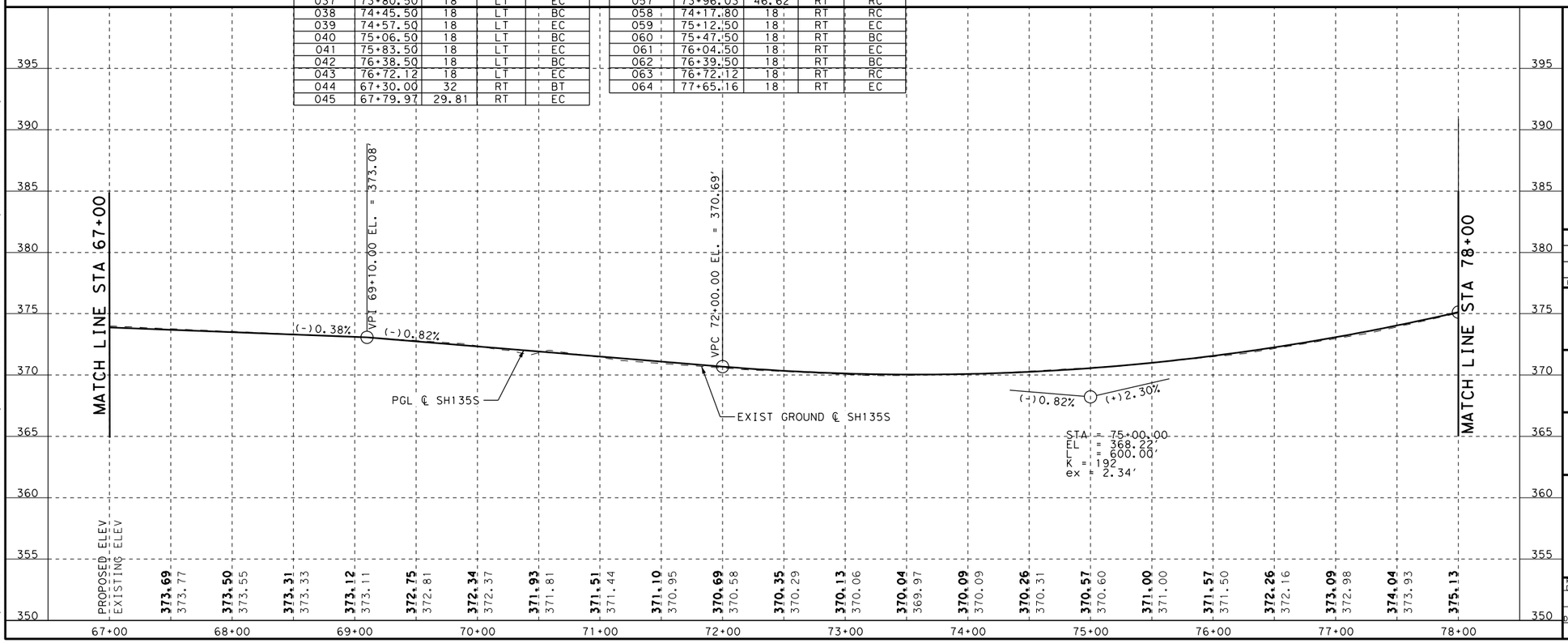
- PROPOSED CONC PAVE
- PROPOSED CONC DRIVEWAY
- (#) DRIVEWAY NUMBER
- [#] PARKING NUMBER

ABBREVIATIONS:

BC=BEGIN CURB
EC=END CURB
RC=RADUIS CURB
BT=BEGIN TRANSITION
ET=END TRANSITION

NOTE:

1. SLOPE VARIES FROM 2% TO 3% FROM STA 70+10 TO STA 70+60.
2. REFER TO DRIVEWAY & UNDERDRAIN DETAILS SHEET FOR ADDITIONAL DRIVEWAY INFORMATION.
3. POINTS CALLED OUT ARE AT FACE OF CURB UNLESS OTHERWISE NOTED.



100% SUBMITTAL

02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

0 25 50 100
1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

SH 135
ROADWAY PLAN & PROFILE
STA 67+00 TO STA 78+00

SHEET 2 OF 8

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.
6	TEXAS	F 2022(024)		SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	86

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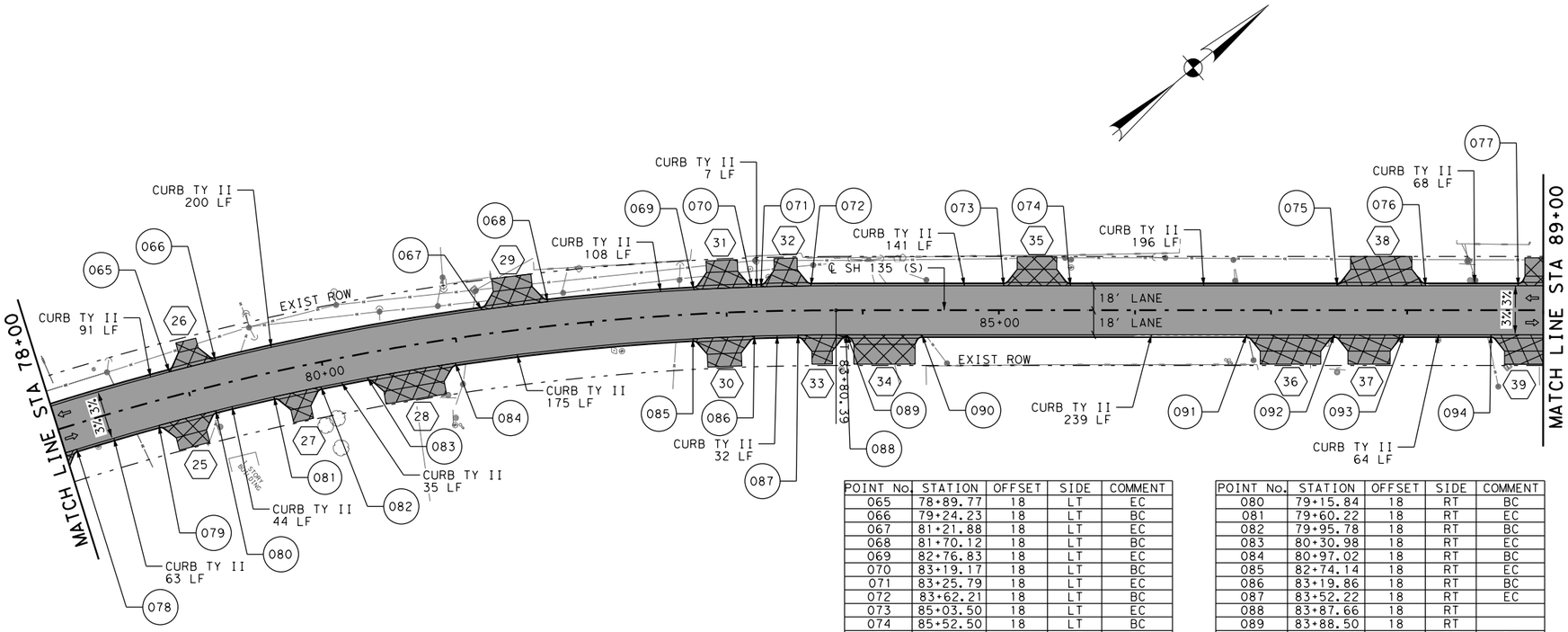


POINT No.	STATION	OFFSET	SIDE	COMMENT
065	78+89.77	18	LT	EC
066	79+24.23	18	LT	BC
067	81+21.88	18	LT	EC
068	81+70.12	18	LT	BC
069	82+76.83	18	LT	EC
070	83+19.17	18	LT	BC
071	83+25.79	18	LT	EC
072	83+62.21	18	LT	BC
073	85+03.50	18	LT	EC
074	85+52.50	18	LT	BC
075	87+48.50	18	LT	EC
076	88+13.50	18	LT	BC
077	88+81.50	18	LT	EC
078	78+08.84	18	RT	BC
079	78+72.16	18	RT	EC

POINT No.	STATION	OFFSET	SIDE	COMMENT
080	79+15.84	18	RT	BC
081	79+60.22	18	RT	EC
082	79+95.78	18	RT	BC
083	80+30.98	18	RT	EC
084	80+97.02	18	RT	BC
085	82+74.14	18	RT	EC
086	83+19.86	18	RT	BC
087	83+52.22	18	RT	EC
088	83+87.66	18	RT	
089	83+88.50	18	RT	
090	84+43.50	18	RT	BC
091	86+82.00	18	RT	EC
092	87+47.00	18	RT	
093	87+97.50	18	RT	BC
094	88+61.50	18	RT	EC

LEGEND

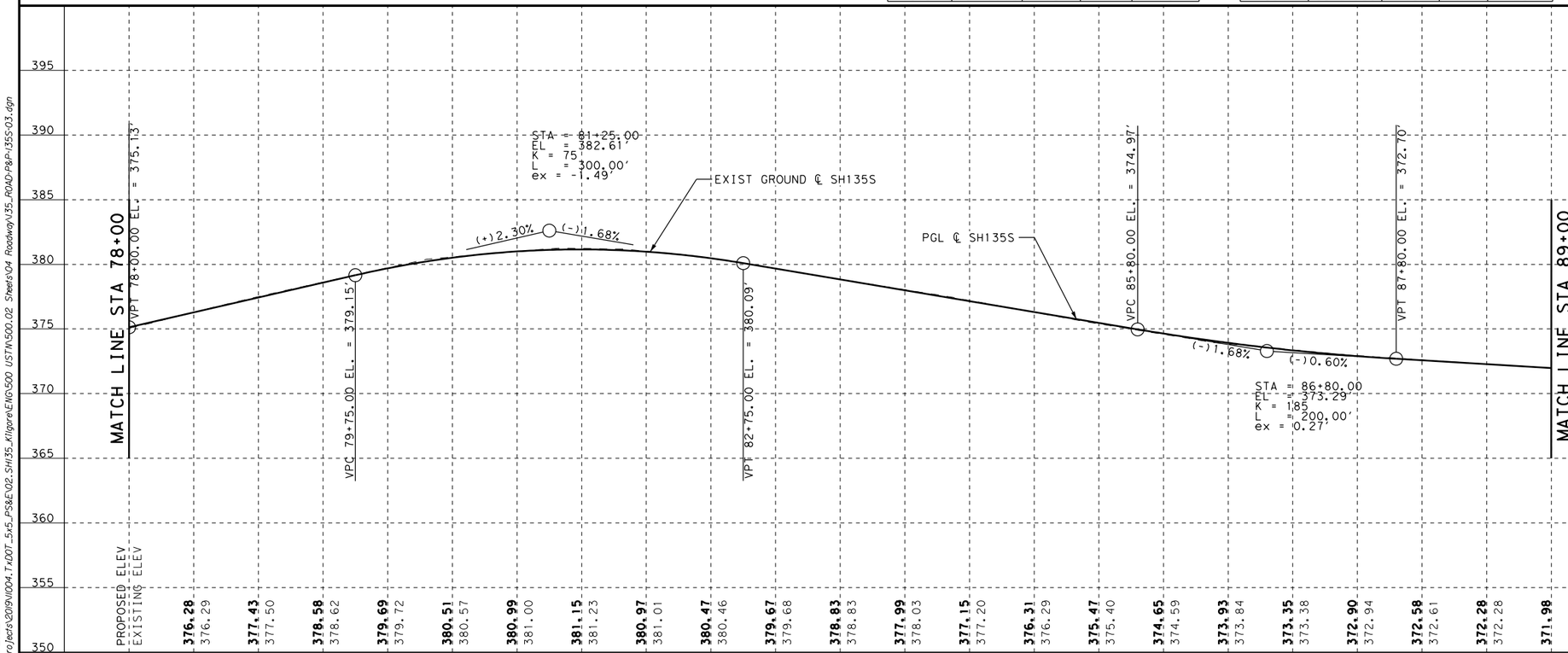
- PROPOSED CONC PAVE
- PROPOSED CONC DRIVEWAY
- (#) DRIVEWAY NUMBER
- [#] PARKING NUMBER

ABBREVIATIONS:

BC=BEGIN CURB
EC=END CURB
RC=RADUIS CURB
BT=BEGIN TRANSITION
ET=END TRANSITION

NOTE:

1. REFER TO DRIVEWAY & UNDERDRAIN DETAILS SHEET FOR ADDITIONAL DRIVEWAY INFORMATION.
2. POINTS CALLED OUT ARE AT FACE OF CURB UNLESS OTHERWISE NOTED.



100% SUBMITTAL

02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

0 25 50 100
1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SH 135
ROADWAY PLAN & PROFILE
STA 78+00 TO STA 89+00

SHEET 3 OF 8

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.
6	TEXAS	F 2022(024)		SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	87

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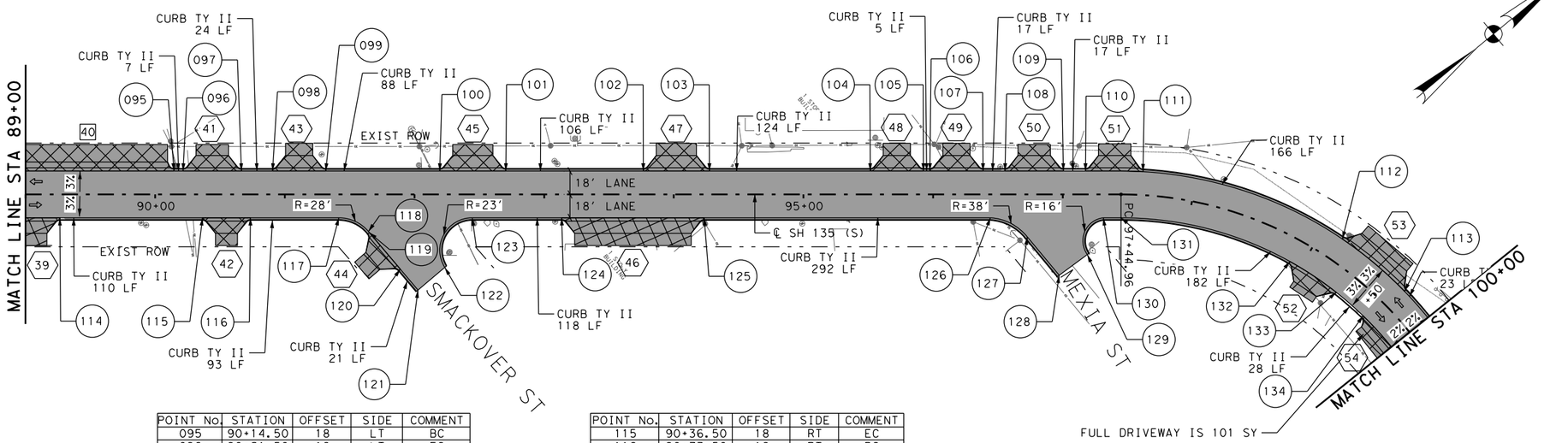


POINT No.	STATION	OFFSET	SIDE	COMMENT
095	90+14.50	18	LT	BC
096	90+21.50	18	LT	EC
097	90+66.50	18	LT	BC
098	90+90.50	18	LT	EC
099	91+31.50	18	LT	BC
100	92+19.50	18	LT	EC
101	92+70.50	18	LT	BC
102	93+76.50	18	LT	EC
103	94+27.50	18	LT	BC
104	95+51.50	18	LT	EC
105	95+92.50	18	LT	BC
106	95+97.50	18	LT	EC
107	96+38.50	18	LT	BC
108	96+55.50	18	LT	EC
109	97+00.50	18	LT	BC
110	97+17.50	18	LT	EC
111	97+60.85	18	LT	BC
112	99+15.53	18	LT	EC
113	99+74.47	18	LT	BC
114	89+26.50	18	RT	BC

POINT No.	STATION	OFFSET	SIDE	COMMENT
115	90+36.50	18	RT	EC
116	90+73.50	18	RT	BC
117	91+41.67	18	RT	RC
118	91+64.54	28.58	RT	RC
119	91+65.22	29.39	RT	EC
120	91+89.08	57.67	RT	BC
121	92+02.71	73.82	RT	EC
122	92+23.40	56.36	RT	BC
123	92+44.53	18	RT	RC
124	93+13.50	18	RT	EC
125	94+23.50	18	RT	BC
126	96+44.23	18	RT	RC
127	96+72.65	32.85	RT	RC
128	96+97.24	62.4	RT	EC
129	97+18.90	46.45	RT	BC
130	97+31.30	18	RT	RC
131	97+44.96	18	RT	RC
132	98+90.07	18	RT	EC
133	99+35.93	18	RT	BC
134	99+65.49	18	RT	EC

LEGEND

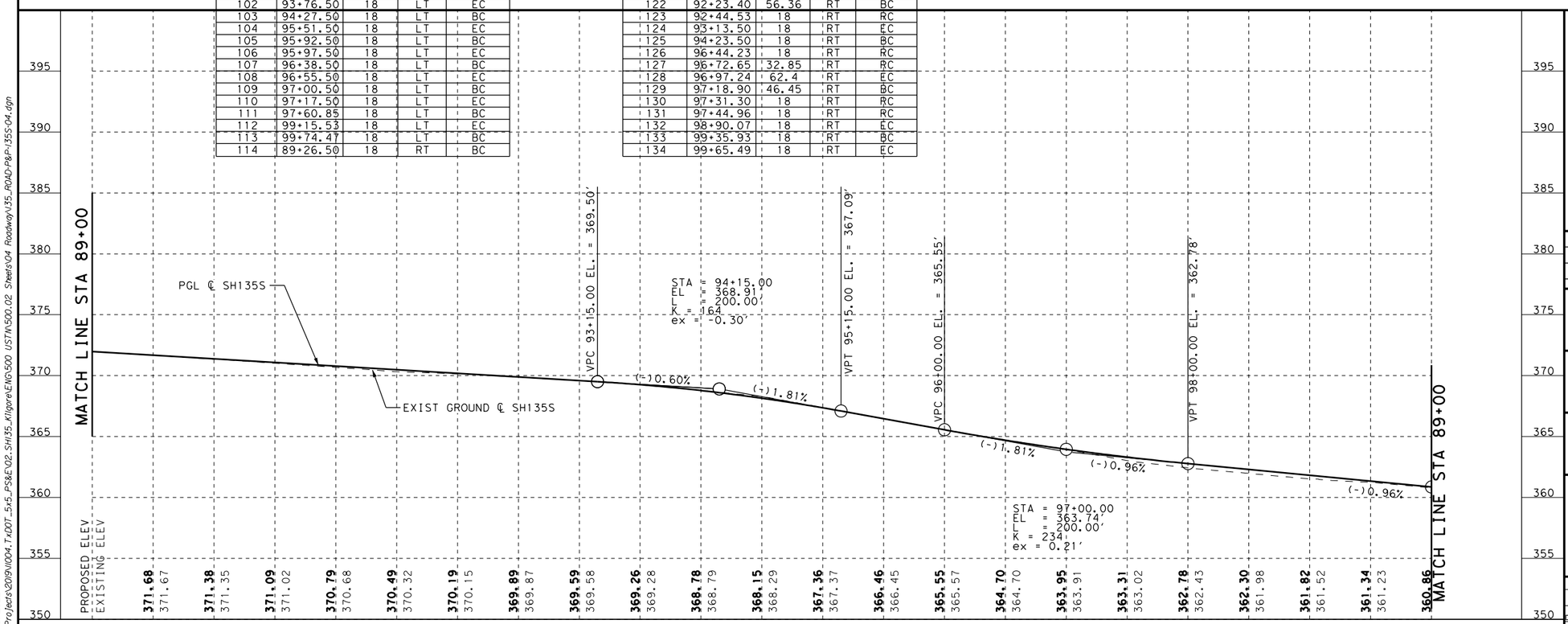
- PROPOSED CONC PAVE
- PROPOSED CONC DRIVEWAY
- (#) DRIVEWAY NUMBER
- [#] PARKING NUMBER

ABBREVIATIONS:

BC=BEGIN CURB
EC=END CURB
RC=RADUIS CURB
BT=BEGIN TRANSITION
ET=END TRANSITION

NOTE:

1. SLOPE VARIES FROM 3% TO 2% FROM STA 96+60 TO STA 97+00.
2. REFER TO DRIVEWAY & UNDERDRAIN DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. POINTS CALLED OUT ARE AT FACE OF CURB UNLESS OTHERWISE NOTED.



100% SUBMITTAL

02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoff

0 25 50 100
1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SH 135
ROADWAY PLAN & PROFILE

STA 89+00 TO STA 100+00

SHEET 4 OF 8

FED.RD. DIV.NO.	STATE	PROJECT NO.	HIGHWAY NO.
6	TEXAS	F 2022(024)	SH 135

STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	88

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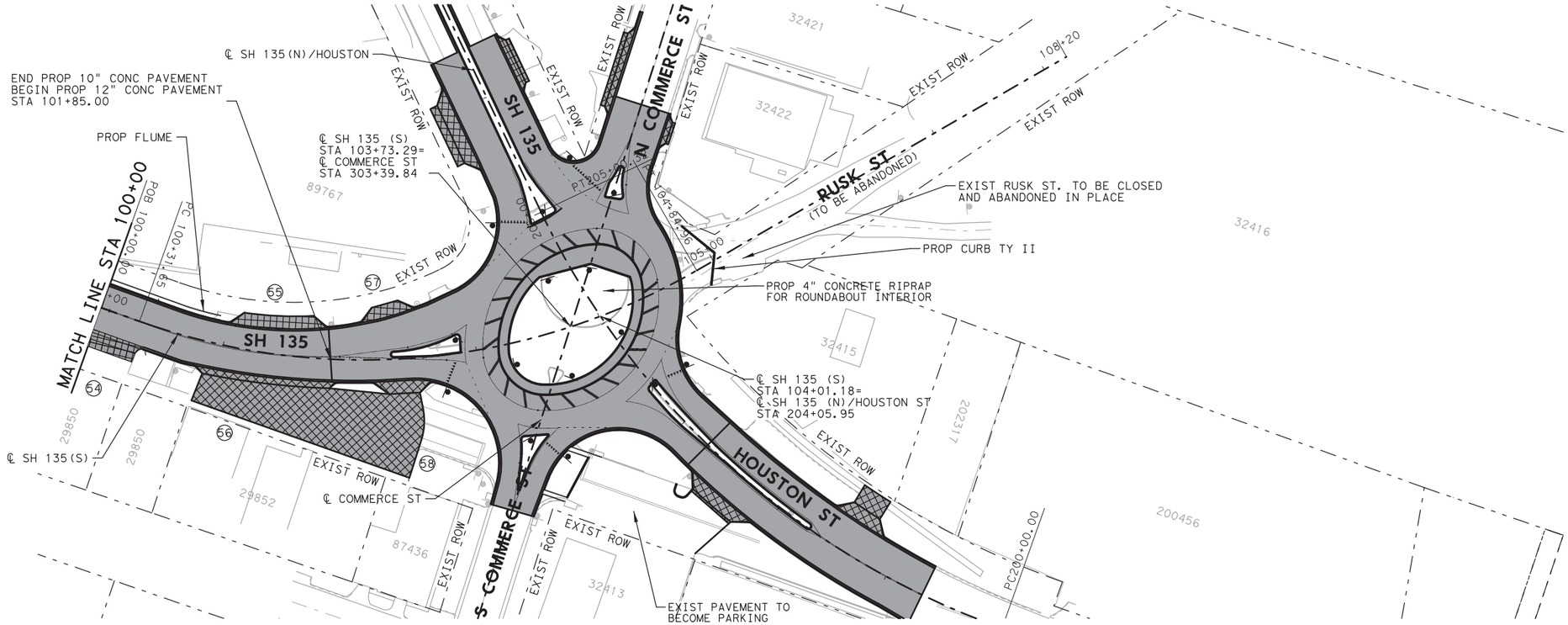
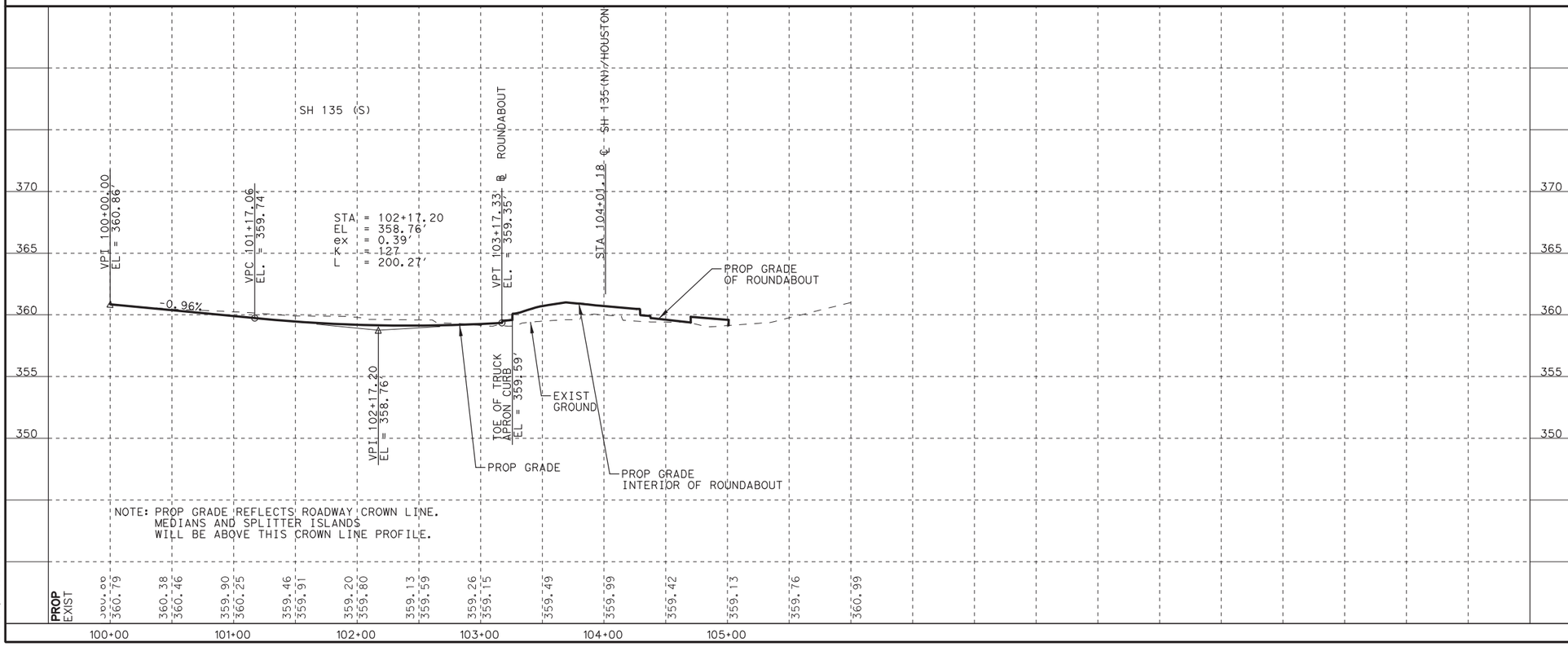


NOTE:

1. FOR INFORMATION ON CURBS, SEE SHEETS 93 THORUGH 96.

LEGEND

- PROPOSED CONC PAVE
- PROPOSED CONC DRIVEWAY



NOTE: PROP GRADE REFLECTS ROADWAY CROWN LINE. MEDIANS AND SPLITTER ISLANDS WILL BE ABOVE THIS CROWN LINE PROFILE.

100% SUBMITTAL

STATE OF TEXAS
BORIVOJE P. DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

1" = 100'(H) 0 25 50 100(H)
1" = 10'(V) 0 5 10(V)

REV. NO.	DATE	DESCRIPTION	BY

PARSONS
TBPELS Registration No. F-1481
1301 West President George Bush Highway, Suite 350
Richardson, Texas 75080

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation
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SH 135
ROADWAY PLAN & PROFILE
SH 135 (South of Roundabout)

SHEET 5 OF 8

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	89

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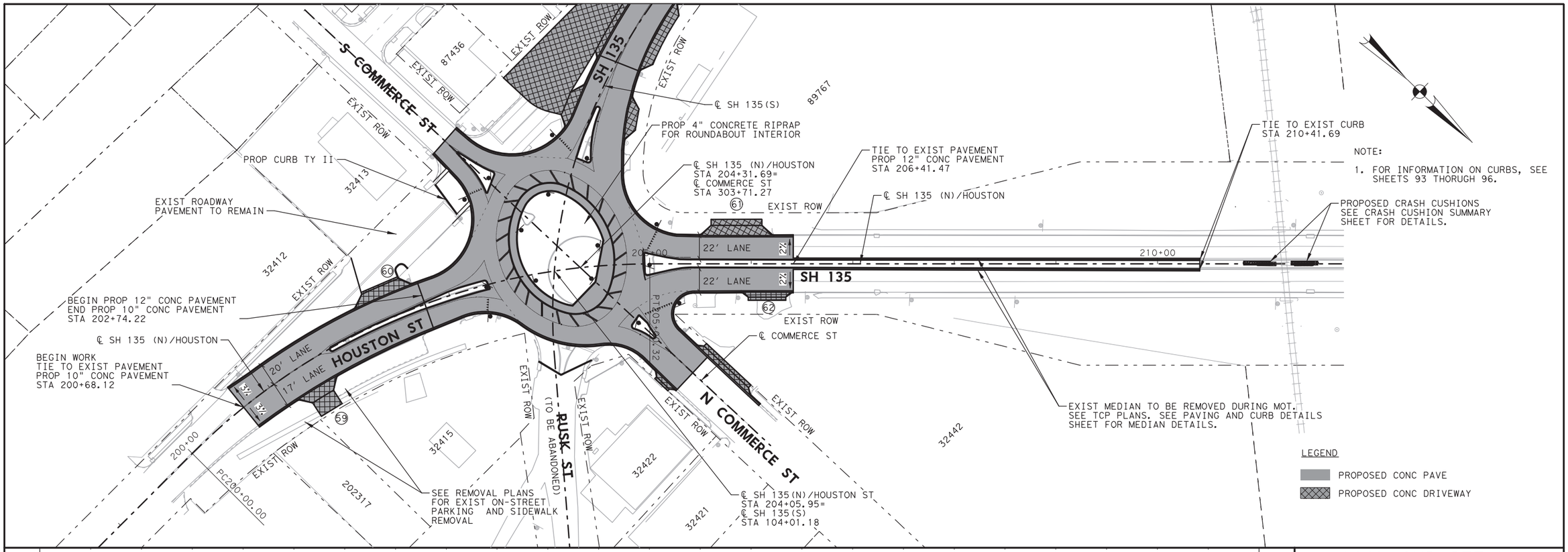

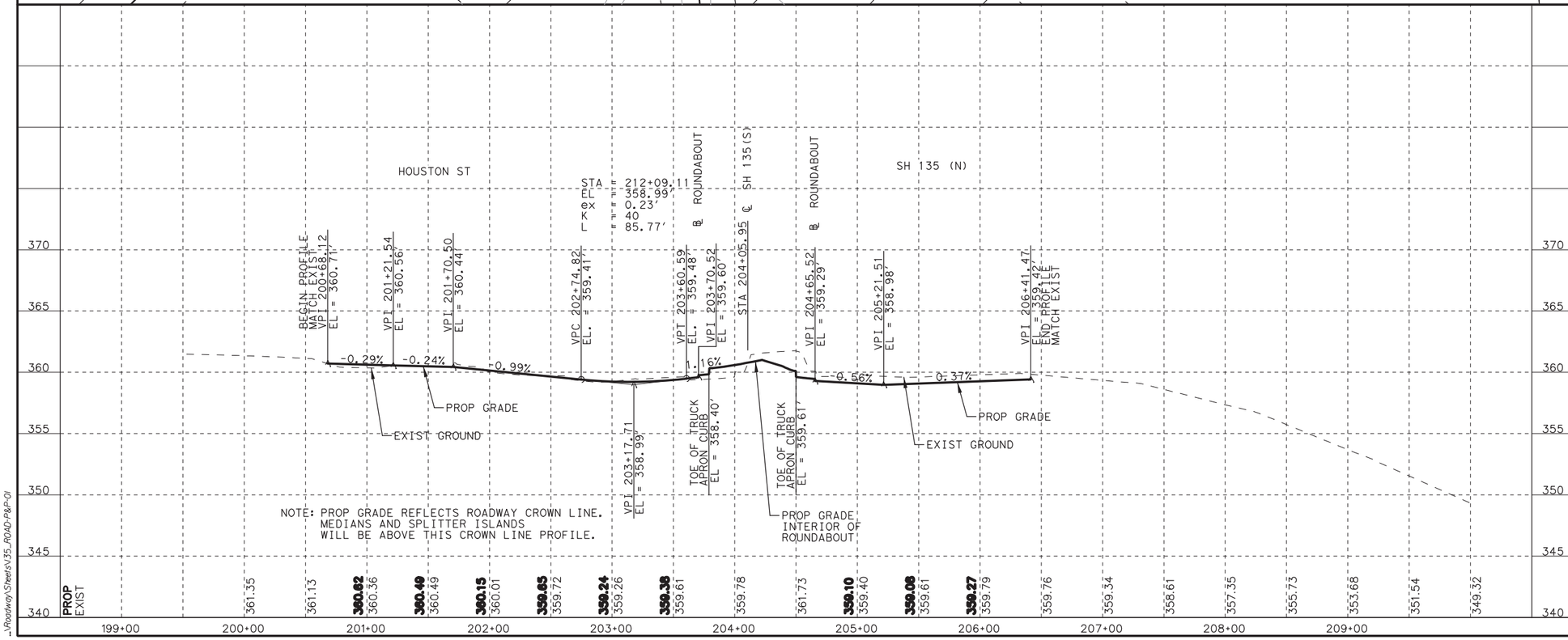

100% SUBMITTAL

STATE OF TEXAS
BORIVOJE P. DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

1" = 100'(H) 0 25 50 100(H)
1" = 10'(V) 0 5 10(V)

REV. NO.	DATE	DESCRIPTION	BY

PARSONS
TBPELS Registration No. F-1481
1301 West President George Bush Highway, Suite 350
Richardson, Texas 75080

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

SH 135
ROADWAY PLAN & PROFILE
SH 135 (N)/HOUSTON ST

SHEET 6 OF 8

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	90

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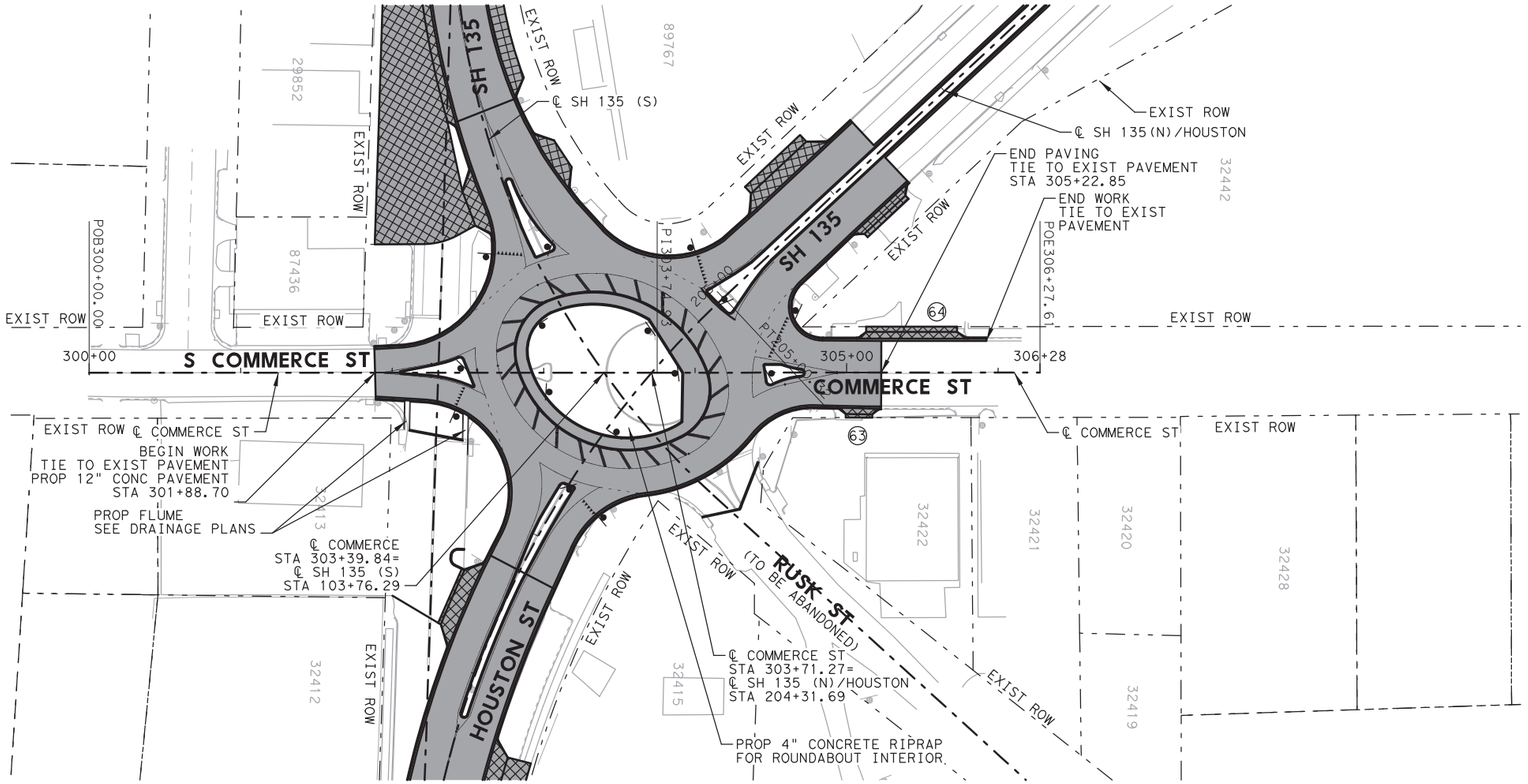
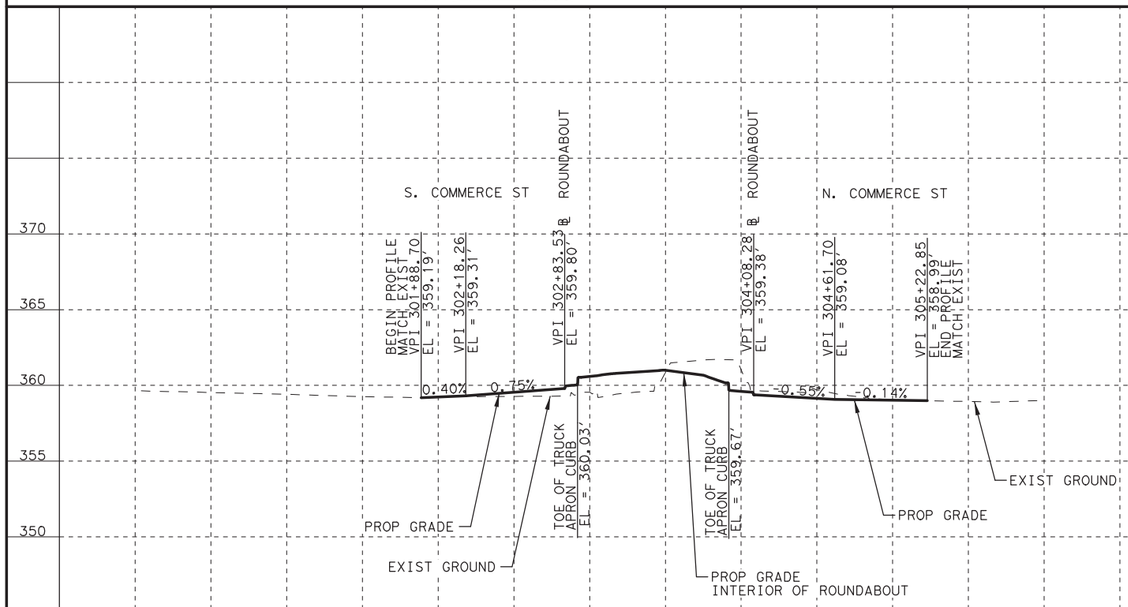


NOTE:

1. FOR INFORMATION ON CURBS, SEE SHEETS 93 THORUGH 96.

LEGEND

- PROPOSED CONC PAVE
- PROPOSED CONC DRIVEWAY



NOTE: PROP GRADE REFLECTS ROADWAY CROWN LINE. MEDIANS AND SPLITTER ISLANDS WILL BE ABOVE THIS CROWN LINE PROFILE.

100% SUBMITTAL

STATE OF TEXAS
BORIVOJE P. DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

1" = 100'(H) 0 25 50 100(H)
1" = 10'(V) 0 5 10(V)

REV. NO.	DATE	DESCRIPTION	BY

PARSONS
TBPELS Registration No. F-1481
1301 West President George Bush Highway, Suite 350
Richardson, Texas 75080

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SH 135
ROADWAY PLAN & PROFILE
COMMERCE ST

SHEET 7 OF 8

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.
6	TEXAS	F 2022(024)		SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	91

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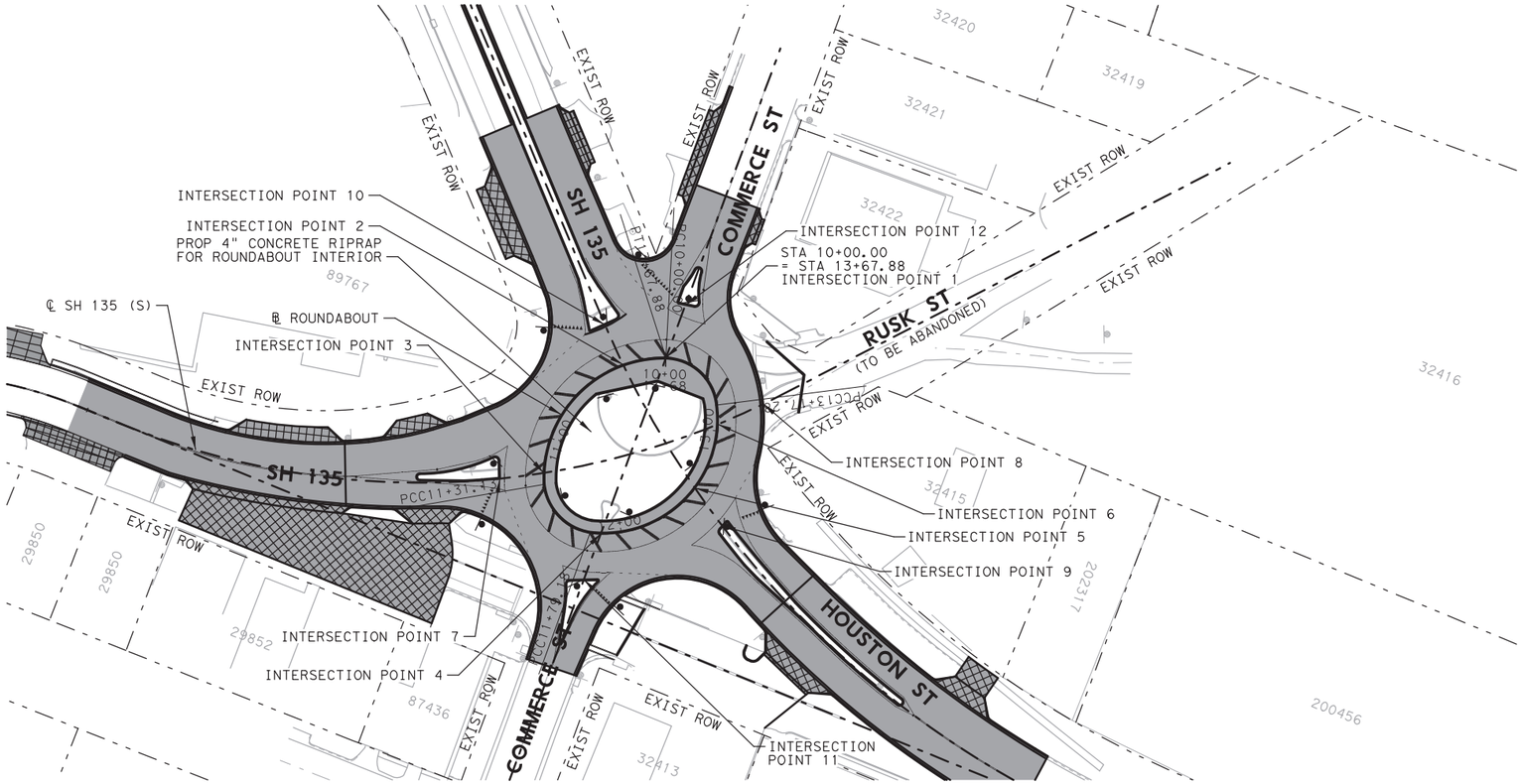
...\Roadway\Sheets\135_ROAD-P&P-03



BASELINE INTERSECTIONS

INTERSECTION POINT 1
℞ ROUNDABOUT
STA 10+00.00/STA 13+67.88
=℄ COMMERCE
STA 304+08.28

INTERSECTION POINT 2
℞ ROUNDABOUT
STA 10+28.97
=℄ SH 135 (N)/HOUSTON ST
STA 204+65.52

INTERSECTION POINT 3
℞ ROUNDABOUT
STA 11+23.78
=℄ SH 135 (S)
STA 103+17.33

INTERSECTION POINT 4
℞ ROUNDABOUT
STA 11+86.44
=℄ COMMERCE
STA 302+83.53

INTERSECTION POINT 5
℞ ROUNDABOUT
STA 12+58.65
=℄ SH 135 (N)/HOUSTON ST
STA 203+70.52

INTERSECTION POINT 6
℞ ROUNDABOUT
STA 13+04.41
=℄ SH 135 (S)
STA 104+37.89

CIRCULATORY ROADWAY
PERIMITER INTERSECTIONS

INTERSECTION POINT 7
=℄ SH 135 (S)
STA 102+88

INTERSECTION POINT 8
=℄ SH 135 (S)
STA 104+70

INTERSECTION POINT 9
=℄ SH 135 (N)/HOUSTON ST
STA 203+40

INTERSECTION POINT 10
=℄ SH 135 (N)/HOUSTON ST
STA 204+95

INTERSECTION POINT 11
=℄ COMMERCE
STA 302+51

INTERSECTION POINT 12
=℄ COMMERCE
STA 304+45

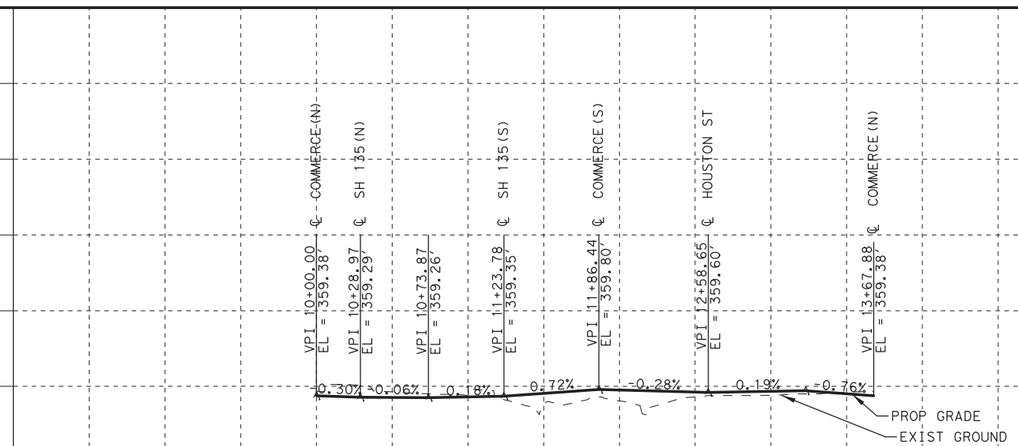
NOTE:

1. FOR INFORMATION ON CURBS, SEE SHEETS 93 THORUGH 96.

LEGEND

PROPOSED CONC PAVE

PROPOSED CONC DRIVEWAY



NOTE: PROP GRADE REFLECTS ROADWAY CROWN LINE. MEDIANS AND SPLITTER ISLANDS WILL BE ABOVE THIS CROWN LINE PROFILE.

100% SUBMITTAL

STATE OF TEXAS
BORIVOJE P. DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

1" = 100'(H) 0 25 50 100(H)
1" = 10'(V) 0 5 10(V)

REV. NO.	DATE	DESCRIPTION	BY

PARSONS
TBPELS Registration No. F-1481
1301 West President George Bush Highway, Suite 350
Richardson, Texas 75080

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

SH 135
ROADWAY PLAN & PROFILE
ROUNDABOUT

SHEET 8 OF 8

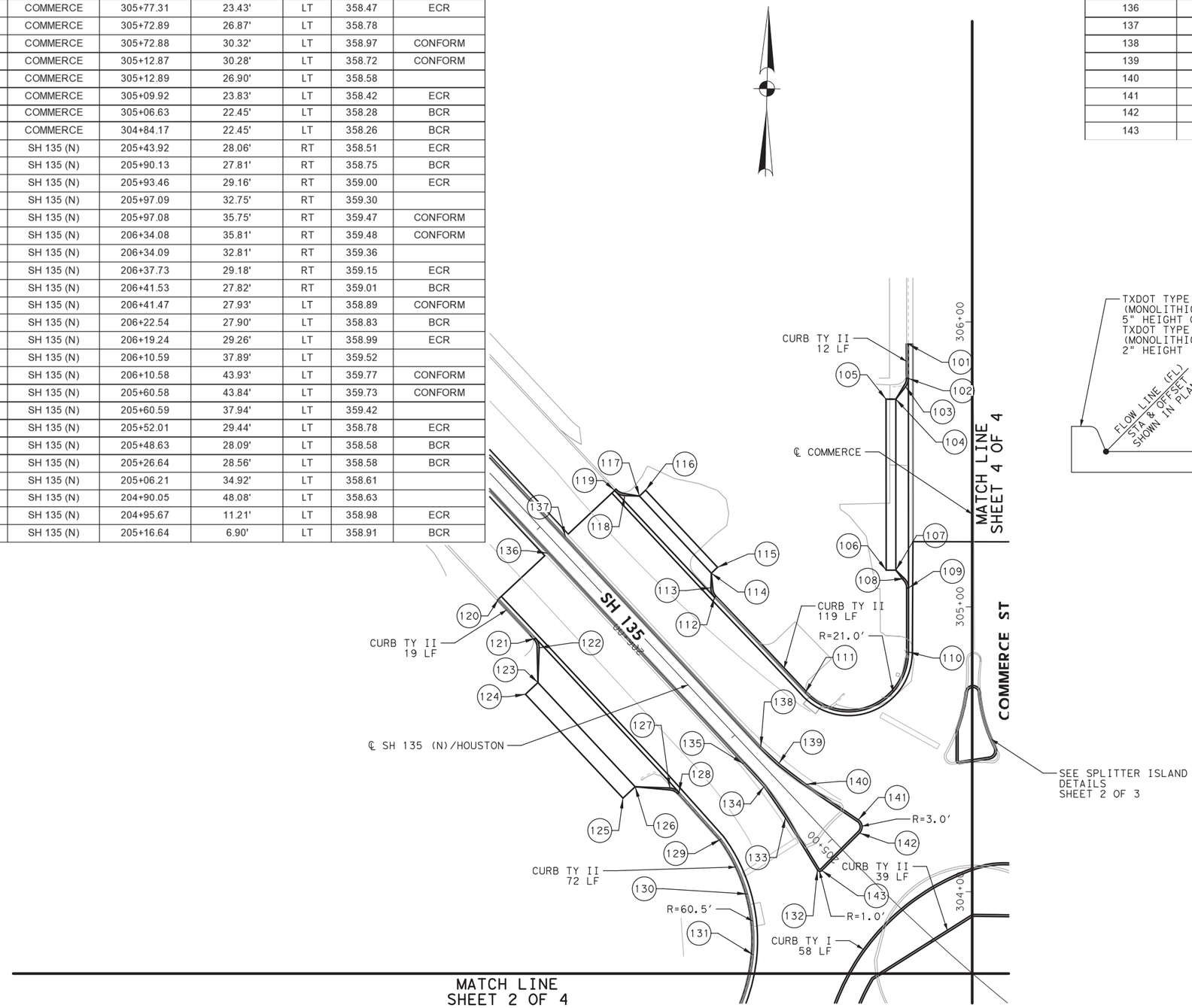
FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	92

2/10/2022 5:2:46 PM
_\Roadway\Sheets\V35_ROAD-P&P-04

_\Roadway\Sheets\V35_ROAD-P&P-04

POINT No.	ALIGNMENT	STATION	OFFSET	SIDE	EL	COMMENT
101	COMMERCE	305+92.21	22.45'	LT	358.22	CONFORM
102	COMMERCE	305+80.18	22.45'	LT	358.21	BCR
103	COMMERCE	305+77.31	23.43'	LT	358.47	ECR
104	COMMERCE	305+72.89	26.87'	LT	358.78	
105	COMMERCE	305+72.88	30.32'	LT	358.97	CONFORM
106	COMMERCE	305+12.87	30.28'	LT	358.72	CONFORM
107	COMMERCE	305+12.89	26.90'	LT	358.58	
108	COMMERCE	305+09.92	23.83'	LT	358.42	ECR
109	COMMERCE	305+06.63	22.45'	LT	358.28	BCR
110	COMMERCE	304+84.17	22.45'	LT	358.26	BCR
111	SH 135 (N)	205+43.92	28.06'	RT	358.51	ECR
112	SH 135 (N)	205+90.13	27.81'	RT	358.75	BCR
113	SH 135 (N)	205+93.46	29.16'	RT	359.00	ECR
114	SH 135 (N)	205+97.09	32.75'	RT	359.30	
115	SH 135 (N)	205+97.08	35.75'	RT	359.47	CONFORM
116	SH 135 (N)	206+34.08	35.81'	RT	359.48	CONFORM
117	SH 135 (N)	206+34.09	32.81'	RT	359.36	
118	SH 135 (N)	206+37.73	29.18'	RT	359.15	ECR
119	SH 135 (N)	206+41.53	27.82'	RT	359.01	BCR
120	SH 135 (N)	206+41.47	27.93'	LT	358.89	CONFORM
121	SH 135 (N)	206+22.54	27.90'	LT	358.83	BCR
122	SH 135 (N)	206+19.24	29.26'	LT	358.99	ECR
123	SH 135 (N)	206+10.59	37.89'	LT	359.52	
124	SH 135 (N)	206+10.58	43.93'	LT	359.77	CONFORM
125	SH 135 (N)	205+60.58	43.84'	LT	359.73	CONFORM
126	SH 135 (N)	205+60.59	37.94'	LT	359.42	
127	SH 135 (N)	205+52.01	29.44'	LT	358.78	ECR
128	SH 135 (N)	205+48.63	28.09'	LT	358.58	BCR
129	SH 135 (N)	205+26.64	28.56'	LT	358.58	BCR
130	SH 135 (N)	205+06.21	34.92'	LT	358.61	
131	SH 135 (N)	204+90.05	48.08'	LT	358.63	
132	SH 135 (N)	204+95.67	11.21'	LT	358.98	ECR
133	SH 135 (N)	205+16.64	6.90'	LT	358.91	BCR

POINT No.	ALIGNMENT	STATION	OFFSET	SIDE	EL	COMMENT
134	SH 135 (N)	205+29.73	4.87'	LT	358.93	BCR
135	SH 135 (N)	205+40.60	4.75'	LT	358.97	
136	SH 135 (N)	206+41.49	4.43'	LT	359.34	
137	SH 135 (N)	206+41.50	4.13'	RT	359.36	
138	SH 135 (N)	205+40.74	3.81'	RT	358.97	
139	SH 135 (N)	205+32.16	4.43'	RT	358.93	BCR
140	SH 135 (N)	205+20.33	6.39'	RT	358.89	BCR
141	SH 135 (N)	204+98.59	11.29'	RT	359.07	BCR
142	SH 135 (N)	204+94.89	8.44'	RT	359.11	ECR
143	SH 135 (N)	204+94.48	10.21'	LT	359.00	BCR



ABBREVIATIONS:

BCR = BEGIN OF CURVE
ECR = END OF CURVE
CONFORM = TIE TO EXISTING
EXIST = EXISTING GROUND

100% SUBMITTAL

STATE OF TEXAS
BORIVOJE P. DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

0 10 20 40
1" = 40'

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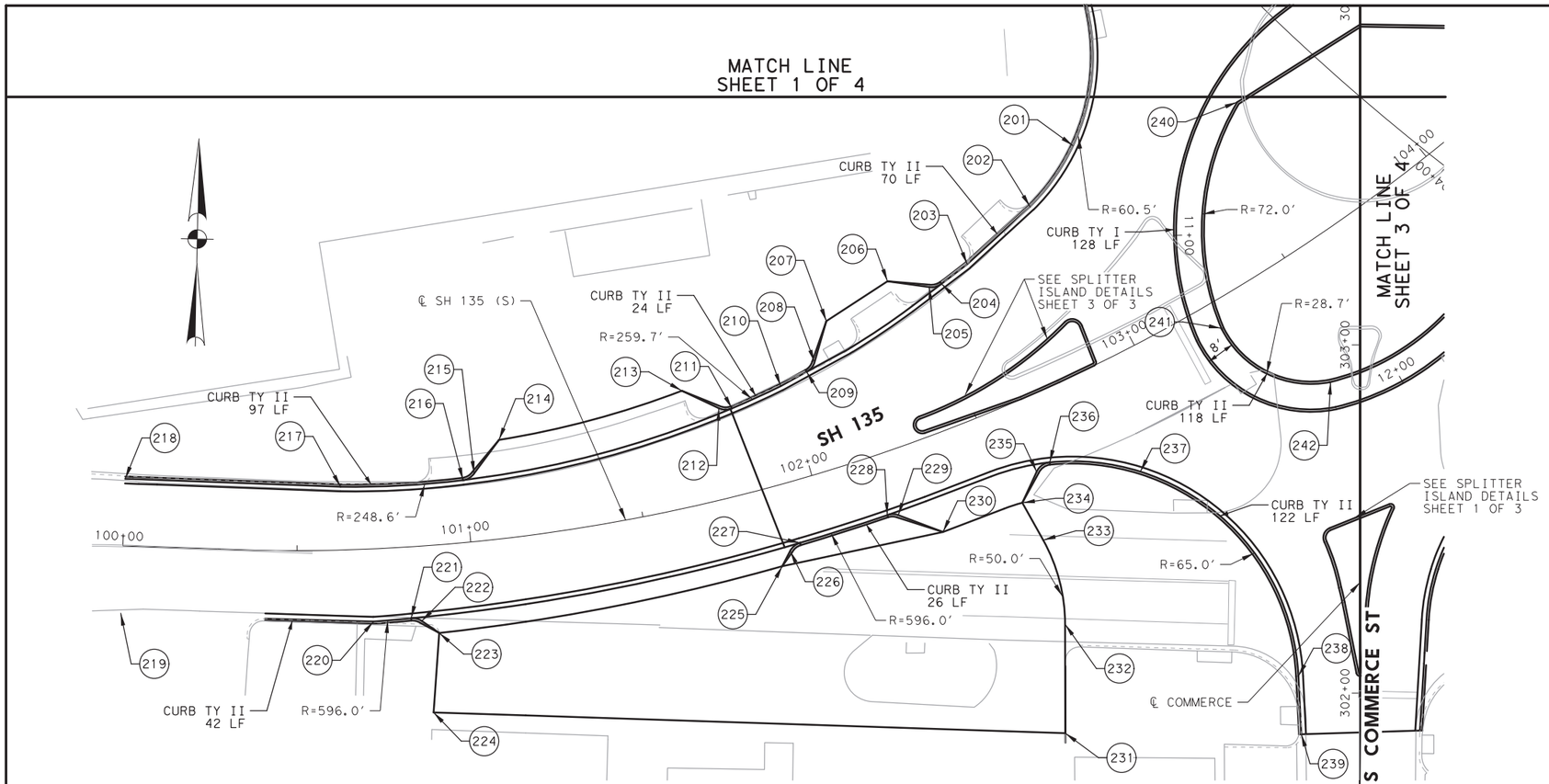
713.462.3242
www.cobbfendley.com

SH 135
INTERSECTION LAYOUT
ROUNDABOUT NORTHWEST

SHEET 1 OF 4

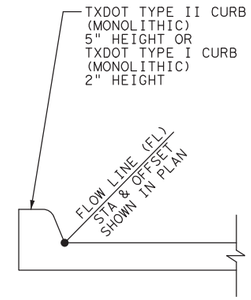
FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	93

...\135_ROAD-INT-I-COMMERCE&SH135N



POINT No.	ALIGNMENT	STATION	OFFSET	SIDE	EL	COMMENT
201	SH 135(S)	103+12.20	58.88'	LT	358.66	
202	SH 135(S)	102+90.96	49.13'	LT	358.69	ECR
203	SH 135(S)	102+65.37	41.76'	LT	358.72	
204	SH 135(S)	102+55.61	39.48'	LT	358.73	BCR
205	SH 135(S)	102+51.75	39.96'	LT	359.03	ECR
206	SH 135(S)	102+40.26	45.92'	LT	359.64	CONFORM
207	SH 135(S)	102+17.99	41.04'	LT	359.71	CONFORM
208	SH 135(S)	102+10.58	30.90'	LT	359.18	BCR
209	SH 135(S)	102+07.42	28.90'	LT	358.78	ECR
210	SH 135(S)	101+98.60	27.15'	LT	358.79	BCR
211	SH 135(S)	101+82.62	24.73'	LT	358.80	ECR/BCR
212	SH 135(S)	101+78.79	25.75'	LT	359.33	ECR
213	SH 135(S)	101+69.11	33.06'	LT	359.94	CONFORM
214	SH 135(S)	101+11.54	28.30'	LT	360.30	CONFORM
215	SH 135(S)	101+02.96	19.45'	LT	359.75	BCR
216	SH 135(S)	100+99.49	17.92'	LT	359.61	ECR/BCR
217	SH 135(S)	100+63.00	18.17'	LT	359.79	ECR
218	SH 135(S)	100+00.00	19.29'	LT	360.50	
219	SH 135(S)	100+00.00	19.33'	RT	360.47	
220	SH 135(S)	100+71.10	20.87'	RT	359.81	BCR
221	SH 135(S)	100+81.54	20.49'	RT	359.71	ECR/BCR
222	SH 135(S)	100+84.44	21.48'	RT	359.71	ECR
223	SH 135(S)	100+89.00	25.26'	RT	359.74	
224	SH 135(S)	100+85.91	47.90'	RT	359.76	CONFORM
225	SH 135(S)	101+85.09	22.79'	RT	358.79	
226	SH 135(S)	101+88.30	19.16'	RT	358.68	BCR
227	SH 135(S)	101+91.51	17.68'	RT	358.59	ECR/BCR
228	SH 135(S)	102+16.96	17.34'	RT	358.55	ECR/BCR
229	SH 135(S)	102+19.84	18.38'	RT	358.60	ECR
230	SH 135(S)	102+29.97	27.19'	RT	358.81	

POINT No.	ALIGNMENT	STATION	OFFSET	SIDE	EL	COMMENT
231	SH 135(S)	102+41.42	93.59'	RT	359.95	CONFROM
232	SH 135(S)	102+51.35	64.48'	RT	359.48	BCR
233	SH 135(S)	102+54.39	39.73'	RT	359.10	ECR
234	SH 135(S)	102+53.05	27.50'	RT	358.92	
235	SH 135(S)	102+59.94	20.88'	RT	358.82	BCR
236	SH 135(S)	102+64.30	19.90'	RT	358.77	ECR/BCR
237	SH 135(S)	102+85.74	33.20'	RT	358.88	FL CREST
238	COMMERCE ST	302+04.87	17.74'	LT	358.51	ECR
239	COMMERCE ST	301+88.20	16.90'	LT	358.55	CONFORM
240	COMMERCE ST	303+69.75	35.34'	LT	359.51	BCR
241	COMMERCE ST	303+04.78	39.90'	LT	359.64	ECR/BCR
242	COMMERCE ST	302+89.36	8.54'	LT	359.98	ECR/BCR



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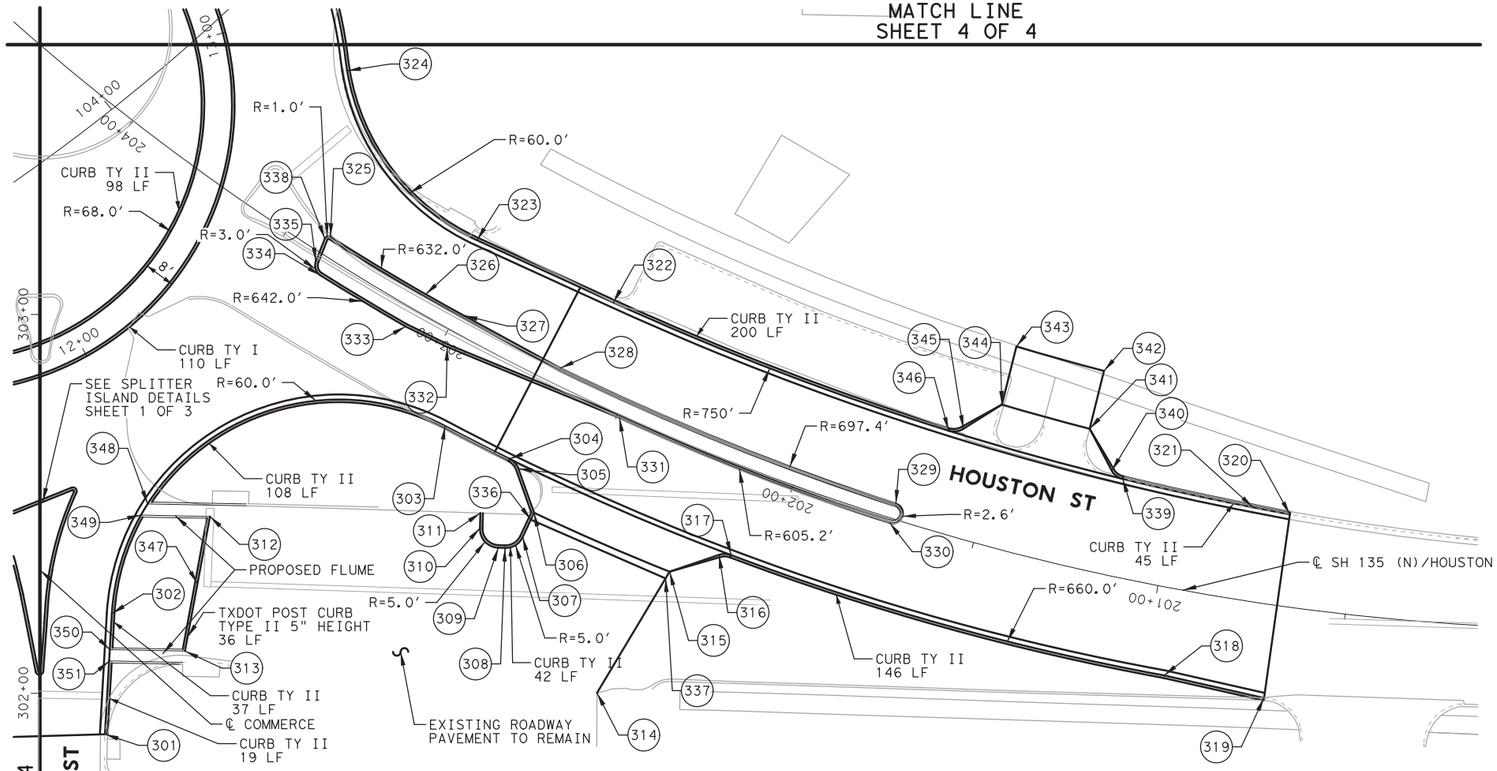
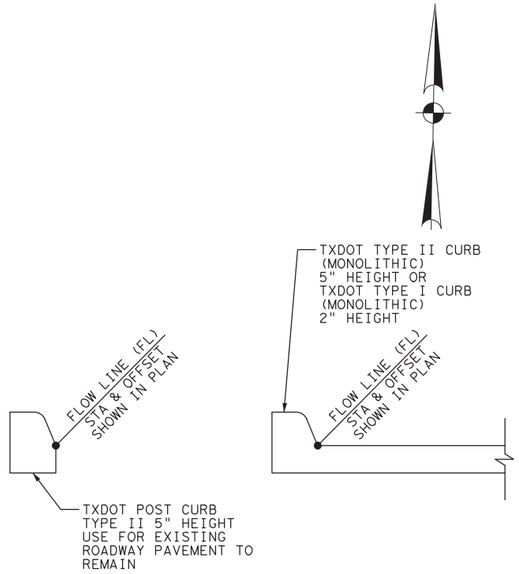
SH 135
INTERSECTION LAYOUT
ROUNDABOUT SOUTHWEST

SHEET 2 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	94





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POINT No.	ALIGNMENT	STATION	OFFSET	SIDE	EL	COMMENT
301	COMMERCE ST	301+89.22	17.14'	RT	358.27	CONFORM
302	COMMERCE ST	302+21.07	19.01'	RT	358.21	BCR
303	SH 135(N)/HOUSTON ST	202+88.85	23.00'	LT	358.93	ECR/BCR
304	SH 135(N)/HOUSTON ST	202+70.37	23.00'	LT	358.99	ECR/BCR
305	SH 135(N)/HOUSTON ST	202+67.24	24.33'	LT	359.08	ECR
306	SH 135(N)/HOUSTON ST	202+58.89	33.00'	LT	359.42	
307	SH 135(N)/HOUSTON ST	202+58.89	40.07'	LT	359.58	BCR/EXIST
308	SH 135(N)/HOUSTON ST	202+61.71	44.66'	LT	359.62	ECR/EXIST
309	SH 135(N)/HOUSTON ST	202+63.21	45.37'	LT	359.61	BCR/EXIST
310	SH 135(N)/HOUSTON ST	202+69.39	42.85'	LT	359.41	ECR/EXIST
311	SH 135(N)/HOUSTON ST	202+70.95	39.21'	LT	359.26	EXIST
312	COMMERCE ST	302+46.70	44.90'	RT	358.99	EXIST
313	COMMERCE ST	302+11.16	38.29'	RT	358.83	EXIST
314	SH 135(N)/HOUSTON ST	202+27.07	69.83'	LT	359.44	EXIST
315	SH 135(N)/HOUSTON ST	202+21.80	33.00'	LT	360.10	
316	SH 135(N)/HOUSTON ST	202+11.72	24.08'	LT	359.57	BCR
317	SH 135(N)/HOUSTON ST	202+08.86	23.00'	LT	359.44	ECR/BCR
318	SH 135(N)/HOUSTON ST	200+94.12	23.00'	LT	360.30	ECR
319	SH 135(N)/HOUSTON ST	200+68.12	24.65'	LT	360.48	CONFIRM
320	SH 135(N)/HOUSTON ST	200+68.12	24.29'	RT	360.46	CONFIRM
321	SH 135(N)/HOUSTON ST	200+78.43	24.72'	RT	360.42	BCR
322	SH 135(N)/HOUSTON ST	202+63.78	26.13'	RT	358.93	ECR
323	SH 135(N)/HOUSTON ST	203+04.95	24.09'	RT	358.85	BCR
324	SH 135(N)/HOUSTON ST	203+60.65	44.02'	RT	359.17	ECR/BCR
325	SH 135(N)/HOUSTON ST	203+39.40	5.00'	RT	359.21	ECR/BCR
326	SH 135(N)/HOUSTON ST	203+09.82	4.92'	RT	359.12	ECR/BCR
327	SH 135(N)/HOUSTON ST	202+98.16	5.00'	RT	359.14	
328	SH 135(N)/HOUSTON ST	202+68.94	4.42'	RT	359.38	BCR
329	SH 135(N)/HOUSTON ST	201+72.65	4.06'	RT	360.34	ECR/BCR
330	SH 135(N)/HOUSTON ST	201+72.69	1.26'	LT	360.38	ECR/BCR
331	SH 135(N)/HOUSTON ST	202+49.18	0.81'	LT	359.64	ECR
332	SH 135(N)/HOUSTON ST	202+98.06	4.38'	LT	359.18	BCR

POINT No.	ALIGNMENT	STATION	OFFSET	SIDE	EL	COMMENT
333	SH 135(N)/HOUSTON ST	203+10.19	5.00'	LT	359.14	BCR
334	SH 135(N)/HOUSTON ST	203+36.23	5.00'	LT	359.21	ECR/BCR
335	SH 135(N)/HOUSTON ST	203+39.17	2.56'	LT	359.26	ECR
336	SH 135(N)/HOUSTON ST	202+58.89	35.00'	LT	359.47	CONFORM
337	SH 135(N)/HOUSTON ST	202+22.10	35.00'	LT	360.17	CONFORM
338	SH 135(N)/HOUSTON ST	203+40.39	3.81'	RT	359.24	BCR
339	SH 135(N)/HOUSTON ST	201+15.09	25.76'	RT	360.26	ECR/BCR
340	SH 135(N)/HOUSTON ST	201+18.53	27.22'	RT	360.40	BCR
341	SH 135(N)/HOUSTON ST	201+27.13	36.69'	RT	360.85	
342	SH 135(N)/HOUSTON ST	201+26.92	52.48'	RT	361.42	
343	SH 135(N)/HOUSTON ST	201+53.09	52.90'	RT	361.07	
344	SH 135(N)/HOUSTON ST	201+52.61	37.11'	RT	360.51	
345	SH 135(N)/HOUSTON ST	201+61.09	28.15'	RT	360.08	BCR
346	SH 135(N)/HOUSTON ST	201+64.81	26.57'	RT	359.93	ECR/BCR
347	COMMERCE ST	302+28.94	41.60'	RT	359.46	EXIST
348	COMMERCE ST	302+50.00	28.44'	RT	358.39	
349	COMMERCE ST	302+47.03	26.65'	RT	358.37	
350	COMMERCE ST	302+11.53	18.46'	RT	358.21	
351	COMMERCE ST	302+08.51	18.28'	RT	358.22	

100% SUBMITTAL

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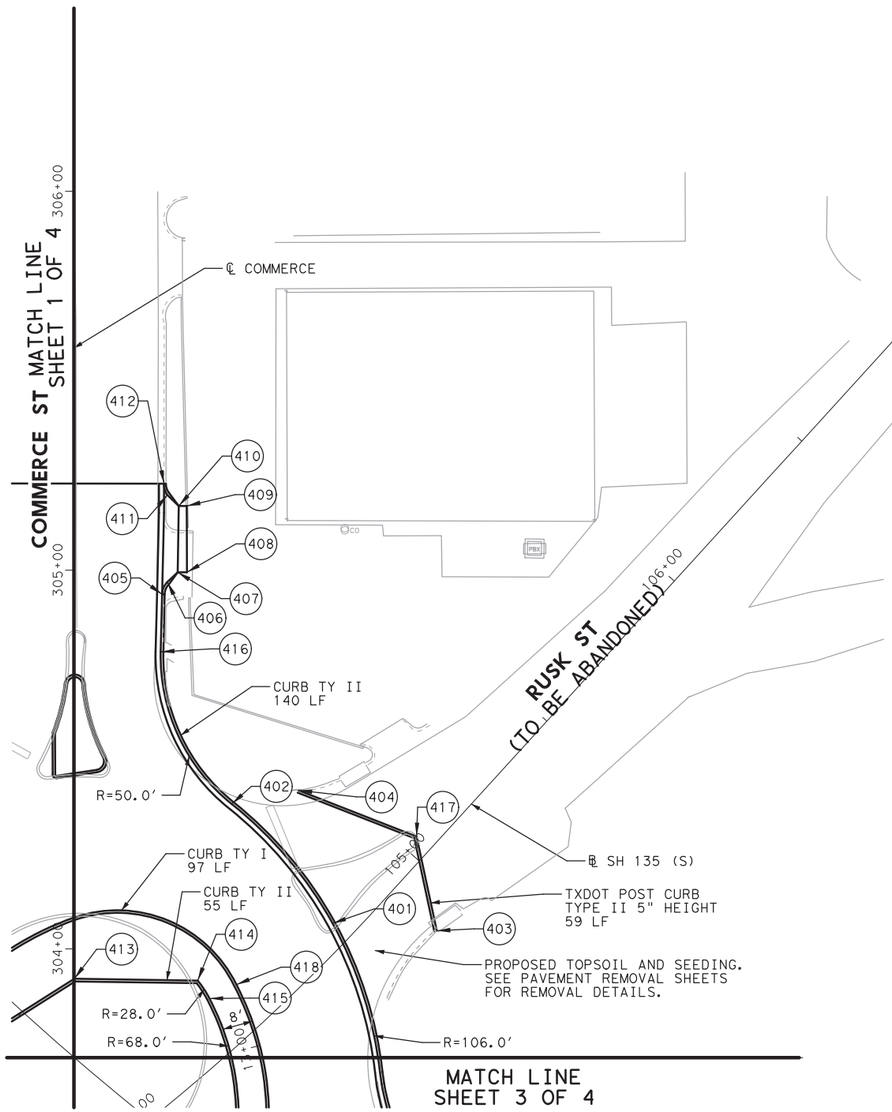
SH 135
INTERSECTION LAYOUT
ROUNDABOUT SOUTHEAST

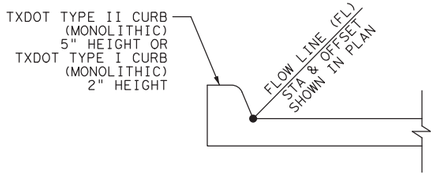
SHEET 3 OF 4

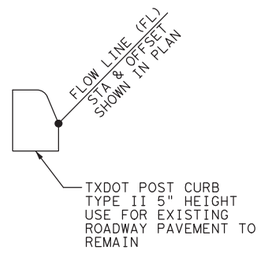
FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	95

_\35_ROAD-INT-3-COMMERCE&HOUSTON

POINT No.	ALIGNMENT	STATION	OFFSET	SIDE	EL	COMMENT
401	SH 135(S)	104+72.27	5.71'	LT	359.36	FL CREST
402	SH 135(S)	104+77.11	46.70'	LT	358.74	ECR
403	SH 135(S)	104+89.51	15.80'	RT	358.67	EXIST
404	SH 135(S)	104+92.35	36.19'	LT	358.68	EXIST
405	COMMERCE ST	304+93.57	23.18'	RT	358.00	BCR
406	COMMERCE ST	304+96.85	24.61'	RT	358.28	ECR
407	COMMERCE ST	304+99.43	27.28'	RT	358.56	
408	COMMERCE ST	304+99.44	29.72'	RT	358.75	CONFORM
409	COMMERCE ST	305+16.04	20.71'	RT	358.03	CONFORM
410	COMMERCE ST	305+16.94	27.60'	RT	358.74	
411	COMMERCE ST	305+19.81	24.60'	RT	358.37	BCR
412	COMMERCE ST	305+22.79	23.69'	RT	358.14	ECR/CONFORM
413	COMMERCE ST	303+92.09	0.00'	RT	359.66	
414	COMMERCE ST	303+91.58	32.59'	RT	359.87	BCR
415	COMMERCE ST	303+86.86	35.68'	RT	359.90	ECR/BCR
416	COMMERCE ST	304+78.44	22.83'	RT	358.07	ECR
417	SH 135(S)	105+04.35	4.94'	LT	359.14	EXIST
418	COMMERCE ST	303+90.56	42.78'	RT	359.71	ECR/BCR







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ECR = END OF CURVE
CONFORM = TIE TO EXISTING
EXIST = EXISTING GROUND

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STATE OF TEXAS
BORIVOJE P. DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

0 10 20 40
1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

PARSONS
TBPELS Registration No. F-1481
1301 West President George Bush Highway, Suite 350
Richardson, Texas 75080

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
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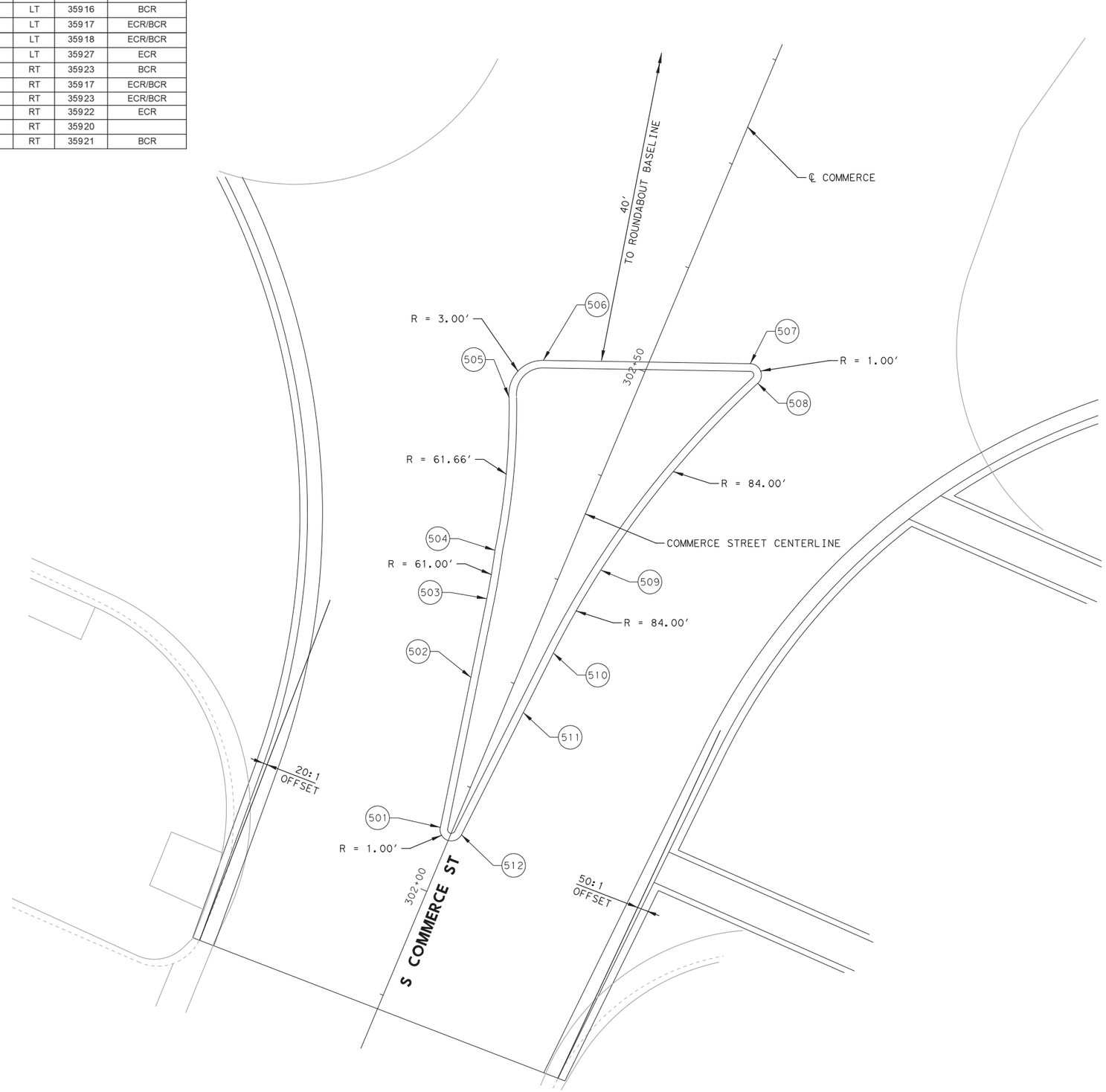
SH 135
INTERSECTION LAYOUT
ROUNDABOUT NORTHEAST

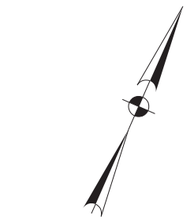
SHEET 4 OF 4

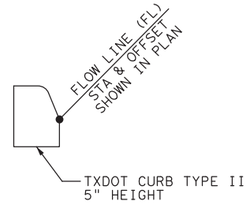
FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	96

_V35_ROAD-INT-4-HOUSTON&COMMERCE

POINT No.	ALIGNMENT	STATION	OFFSET	SIDE	EL	COMMENT
501	COMMERCE ST	302+05.69	1.09'	LT	35921	ECR
502	COMMERCE ST	302+19.02	3.75'	LT	35915	ECR
503	COMMERCE ST	302+26.01	5.13'	LT	35916	BCR
504	COMMERCE ST	302+30.25	6.14'	LT	35917	ECR/BCR
505	COMMERCE ST	302+43.25	10.24'	LT	35918	ECR/BCR
506	COMMERCE ST	302+47.44	8.71'	LT	35927	ECR
507	COMMERCE ST	302+54.28	8.35'	RT	35923	BCR
508	COMMERCE ST	302+52.93	9.63'	RT	35917	ECR/BCR
509	COMMERCE ST	302+32.26	3.20'	RT	35923	ECR/BCR
510	COMMERCE ST	302+23.84	2.17'	RT	35922	ECR
511	COMMERCE ST	302+17.95	1.75'	RT	35920	
512	COMMERCE ST	302+05.82	0.88'	RT	35921	BCR







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88712
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

0 2.5 5 10
1"=10'

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SPLITTER ISLAND DETAILS

SHEET 1 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	97

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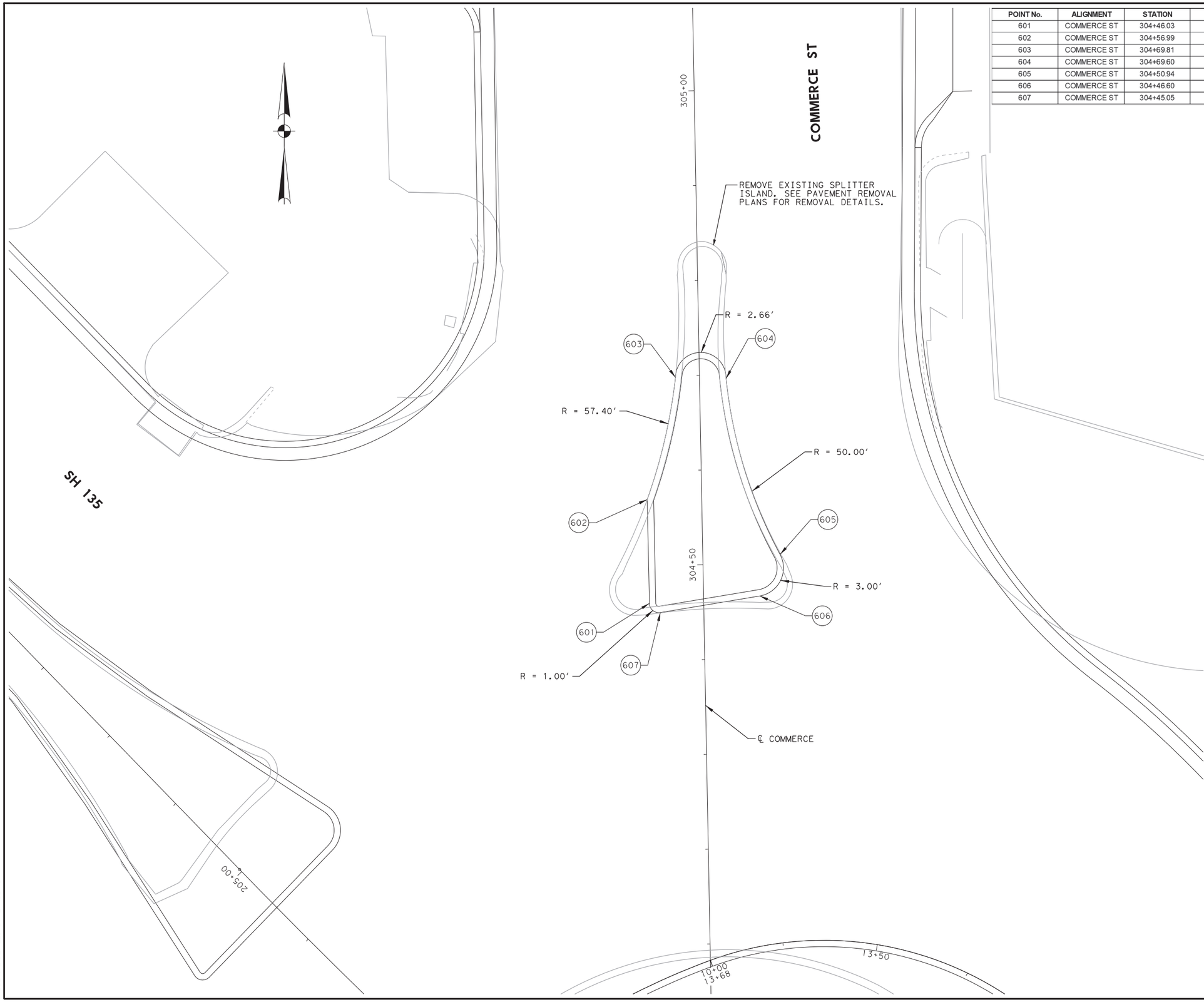
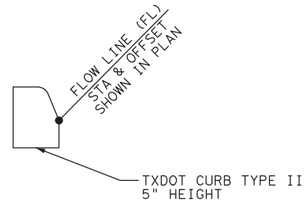
...\35_ROAD-DET-I_SPLITTER-ISLAND

...\35_ROAD-DET-I_SPLITTER-ISLAND

POINT No.	ALIGNMENT	STATION	OFFSET	SIDE	EL	COMMENT
601	COMMERCE ST	304+46.03	5.72'	LT	359.05	ECR
602	COMMERCE ST	304+56.99	5.75'	LT	358.99	BCR
603	COMMERCE ST	304+69.81	2.53'	LT	358.98	ECR/BCR
604	COMMERCE ST	304+69.60	2.79'	RT	358.95	ECR/BCR
605	COMMERCE ST	304+50.94	8.15'	RT	358.97	ECR/BCR
606	COMMERCE ST	304+46.60	5.92'	RT	359.04	ECR/BCR
607	COMMERCE ST	304+45.05	4.58'	LT	359.08	ECR/BCR





ABBREVIATIONS:

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2/11/2022

0 2.5 5 10
1"=10'

REV. NO.	DATE	DESCRIPTION	BY

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SPLITTER ISLAND DETAILS

SHEET 2 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	98

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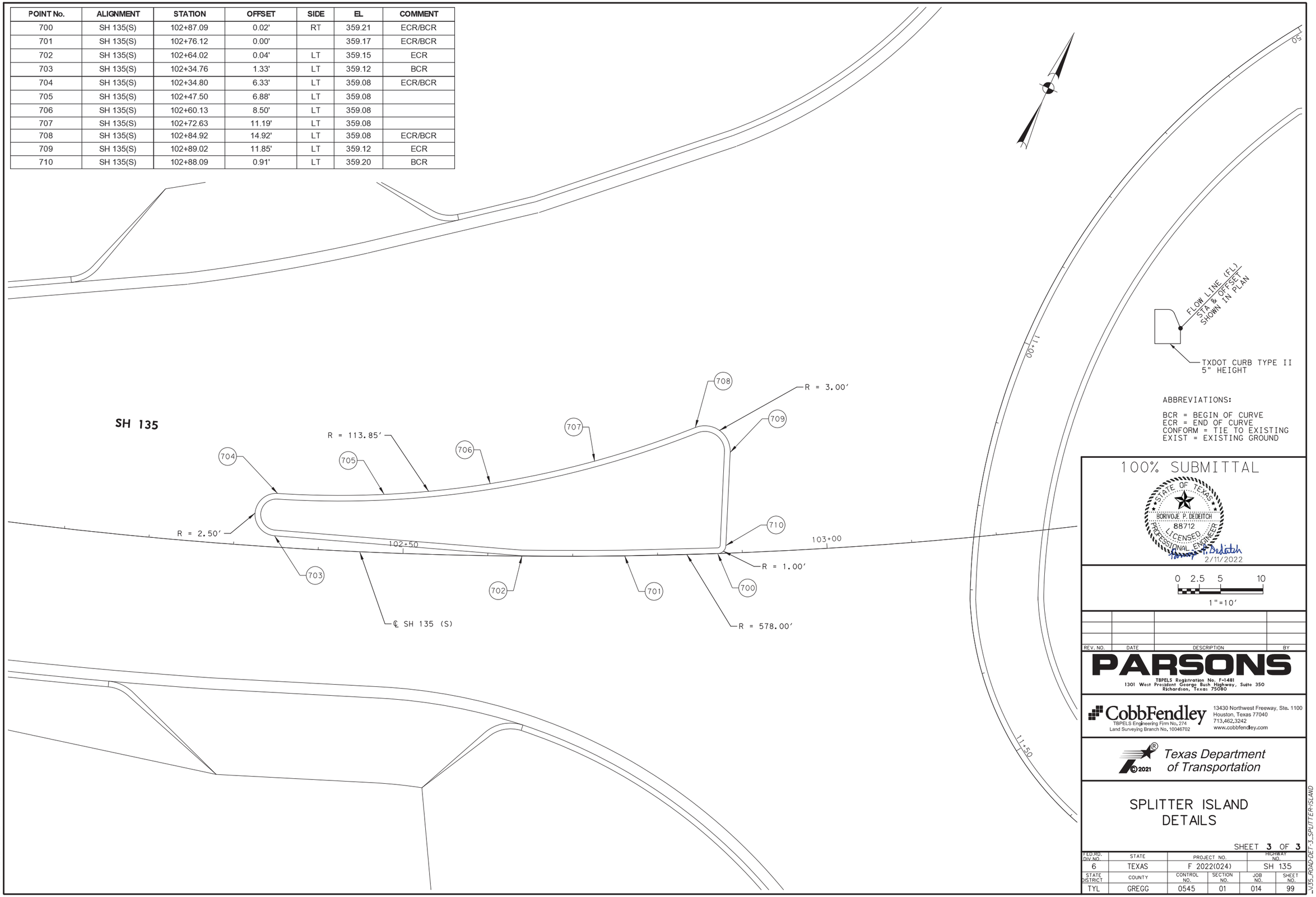
_LV35_ROAD-DET-2_SPLITTER-ISLAND
_LV35_ROAD-DET-2_SPLITTER-ISLAND

POINT No.	ALIGNMENT	STATION	OFFSET	SIDE	EL	COMMENT
700	SH 135(S)	102+87.09	0.02'	RT	359.21	ECR/BCR
701	SH 135(S)	102+76.12	0.00'		359.17	ECR/BCR
702	SH 135(S)	102+64.02	0.04'	LT	359.15	ECR
703	SH 135(S)	102+34.76	1.33'	LT	359.12	BCR
704	SH 135(S)	102+34.80	6.33'	LT	359.08	ECR/BCR
705	SH 135(S)	102+47.50	6.88'	LT	359.08	
706	SH 135(S)	102+60.13	8.50'	LT	359.08	
707	SH 135(S)	102+72.63	11.19'	LT	359.08	
708	SH 135(S)	102+84.92	14.92'	LT	359.08	ECR/BCR
709	SH 135(S)	102+89.02	11.85'	LT	359.12	ECR
710	SH 135(S)	102+88.09	0.91'	LT	359.20	BCR



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2/11/2022

0 2.5 5 10
1"=10'

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SPLITTER ISLAND DETAILS

SHEET 3 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	99

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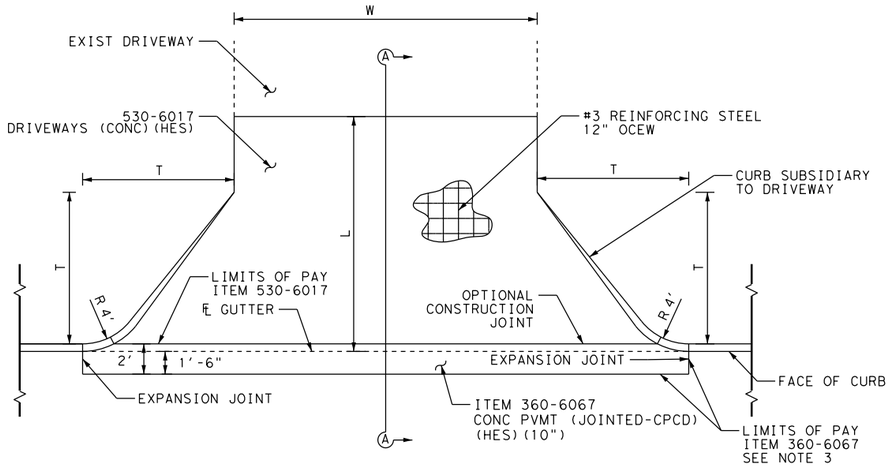
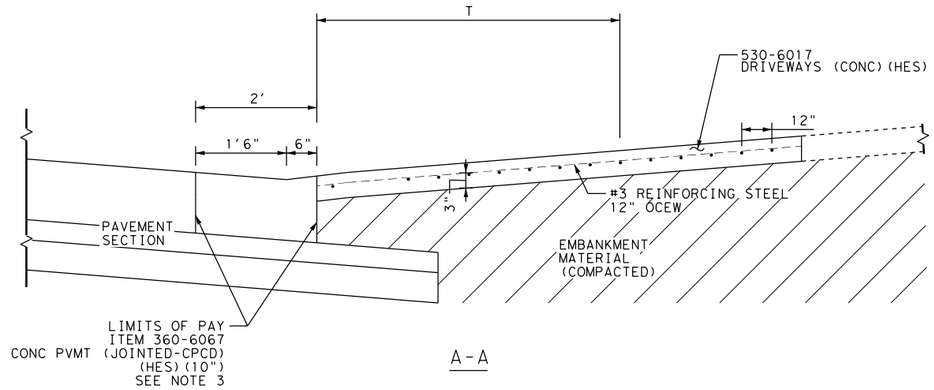
_V35_ROAD-DET-3_SPLITTER-ISLAND



TYPICAL DRIVEWAY DETAIL
IN CURB & GUTTER SECTION

N.T.S.



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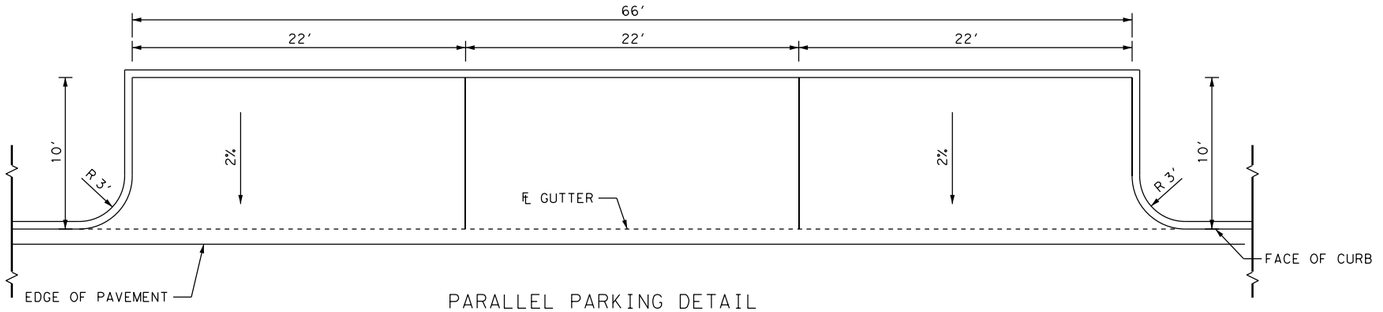
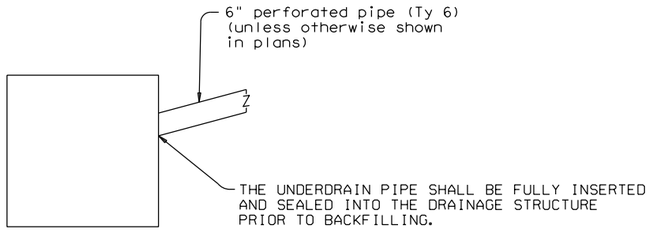


PARALLEL PARKING DETAIL
IN CURB & GUTTER SECTION

N.T.S.

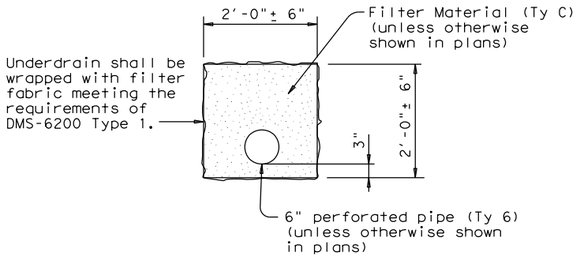
NOTE:

1. REFER TO DRIVEWAY QUANTITY SUMMARY SHEET FOR T, L, AND W DIMENSIONS.
2. UNDERDRAIN TO BE USED AT TRAFFIC CIRCLE TO DRAIN SUBGRADE
3. REFER TO JOINT LAYOUT SHEETS FOR ADDITIONAL HES CONCRETE TO MAINTAIN PHASED ACCESS TO ALL DRIVEWAYS.



UNDERDRAIN TIE IN DETAIL

N.T.S.



UNDERDRAIN DETAIL

N.T.S.

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02/22/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

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713.462.3242
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DRIVEWAY & UNDERDRAIN DETAILS

SHEET 1 OF 1

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	100

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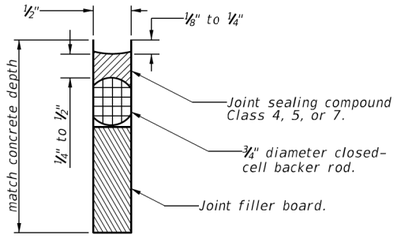
I35_ROAD-MISC.dgn

LEGEND

asphalt concrete pavement

concrete pavement

base course

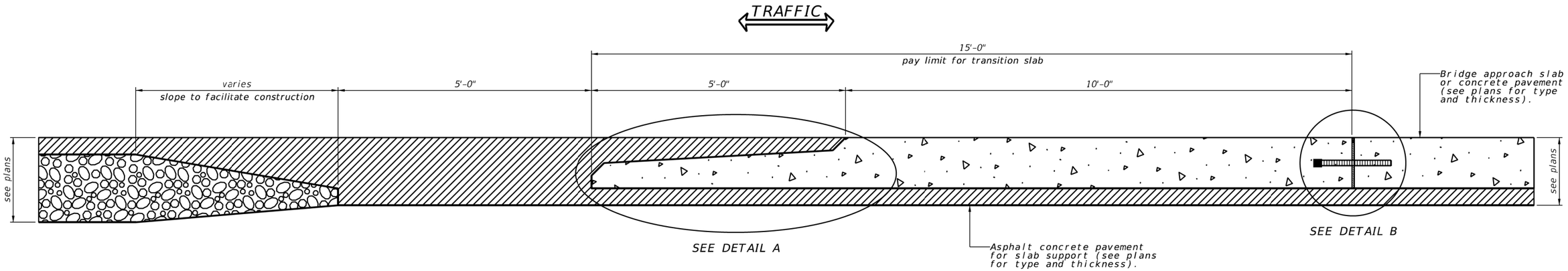


SEALED EXPANSION JOINT

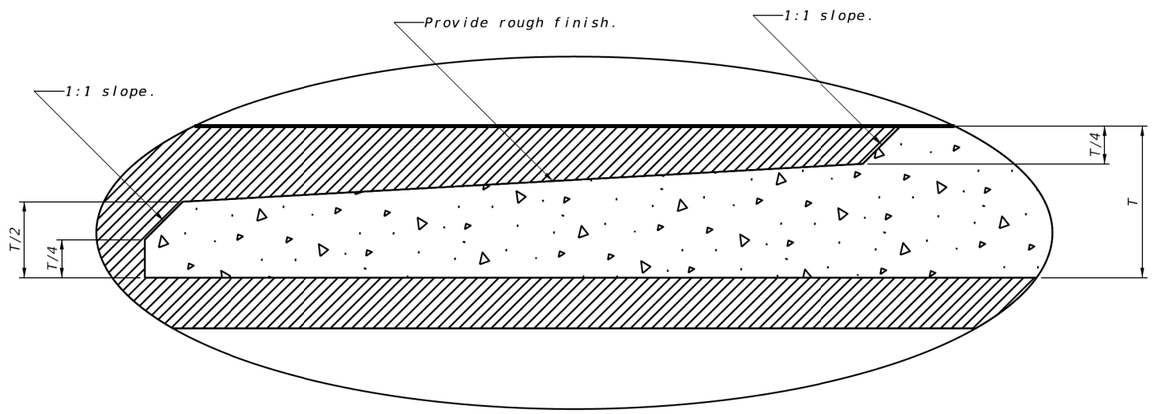
DOWEL BARS	
slab thickness	dowel bar diameter
6" to 7.5"	1"
8" to 10"	1.25"
> 10"	1.5"

GENERAL NOTES

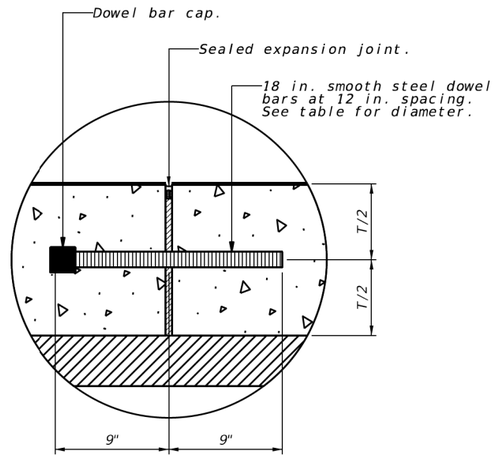
1. Transition slab shall conform to the requirements of Item 360, "Concrete Pavement."
2. Thickness "T" of transition slab adjacent to concrete pavement shall match the adjacent concrete pavement thickness. Thickness "T" of transition slab adjacent to bridge approach slabs shall be 13 in.
3. Detail B shows joint at concrete pavement terminal. At bridge approach slab, use detail "SECTION B-B" as shown on Standard Sheet BAS-C.
4. Match the longitudinal joints of the transition slab with adjoining concrete pavement. Provide equivalent tie bars at longitudinal joints.
5. Do not provide reinforcement in transition slab, except for dowel bars.
6. Acceptable joint sealing compounds are listed on the Department's "Joint Sealers" Material/Producer List.
7. Joint filler boards shall conform to the requirements of DMS-6310, "Joint Sealants and Fillers."



LONGITUDINAL SECTION THRU TRANSITION SLAB



DETAIL A



DETAIL B
(see general note 3)

PAY ITEMS

0360	6083	CONC PVMT (JC) (TRANSITION SLAB)	SY
3077	6011	SP MIXES SP-C PG64-22	TON

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
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PROFESSIONAL ENGINEER

Michael Verhoef

02/13/2022

Texas Department of Transportation

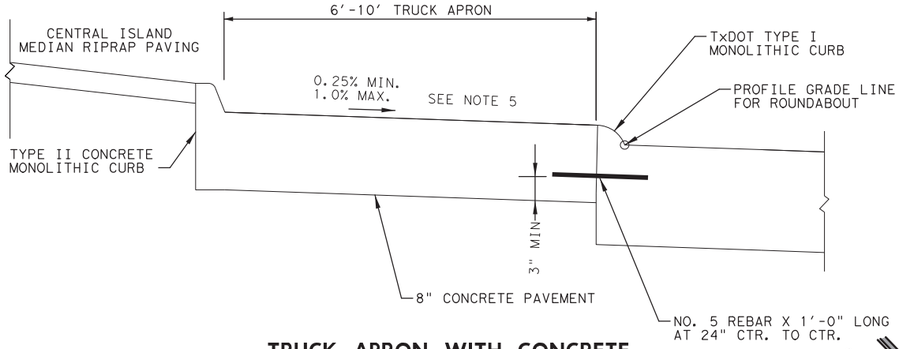
San Angelo District

CONCRETE PAVEMENT TRANSITION SLAB DETAILS

SHEET 1 OF 1 NOT TO SCALE

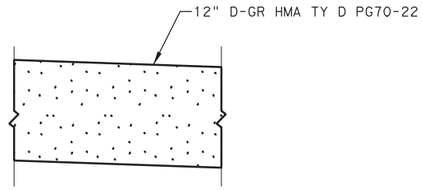
©TxDOT $YEAR$	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	0545	01	014	SH 135
10-19	DIST	COUNTY		SHEET NO.
	TYL	GREGG		101

DATE: $DATE$ $TIME$
FILE: $FILE$



TRUCK APRON WITH CONCRETE

N.T.S



PARKING LOT REPAIR DETAIL

N.T.S

PARKING LOT REPAIR AREAS TO BE MARKED IN THE FIELD FOR APPROVAL BY ENGINEER.

NOTES

1. SPLITTER ISLAND SHOULD BE A RAISED MEDIAN WITH 5" CONCRETE. SPLITTER ISLAND SHOULD EXTEND A DESIRABLE MINIMUM OF 50' FROM YIELD LINE.
2. FOR CONCRETE CURB DETAILS SEE STD DWG CCCG-21.
3. THE FINISH ON THE THE TRUCK APRON SHOULD CREATE A CONTRAST IN TEXTURE BETWEEN THE CIRCULATORY ROADWAY AND THE APRON. THIS WILL BE ACCOMPLISHED WITH THE USE OF STAMPED CONCRETE.
4. ALL COSTS FOR CONSTRUCTING A TRUCK APRON WILL BE INCLUDED IN ITEM No. 360, CLASS A CONCRETE(ROADWAY), PER SQUARE YARD
5. PAYMENT FOR CURB WILL BE AS FOLLOWS:
   ITEM No. 529, CONCRETE CURB, PER LINEAR FEET
   ITEM No. 536, CONCRETE MEDIAN, PER SQUARE YARD.

LEGEND

- PROPOSED CONC PAVE
- PROPOSED CONC DRIVEWAY
- PROPOSED PARKING LOT REPAIR

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BORIVOJE P. DEDEITCH
88712
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

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ROUNDABOUT DETAILS

SHEET 1 OF 2

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	102

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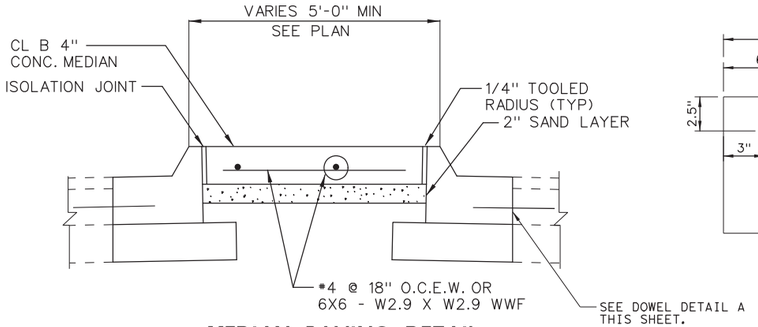
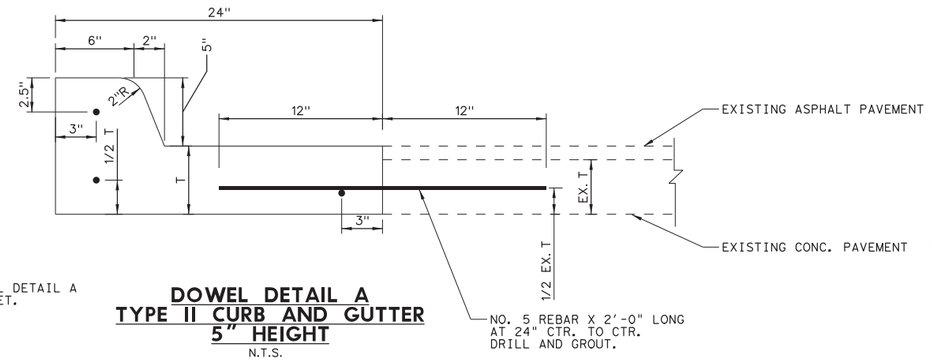


MEDIAN PAVING DETAIL

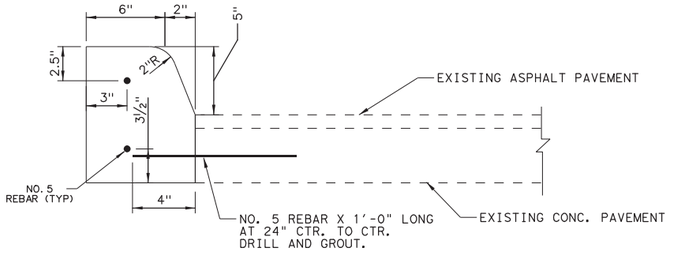
135(N)/HOUSTON ST. - STA. 206+41.47 TO STA 210+41.69

N.T.S.



DOWEL DETAIL A
TYPE II CURB AND GUTTER
5" HEIGHT

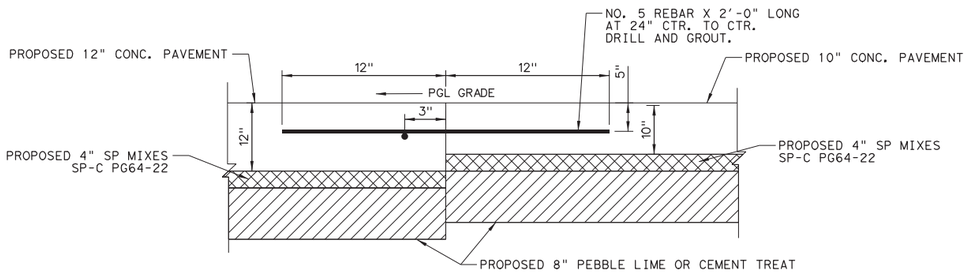
N.T.S.



POST CURB FOR ROAD CLOSURE
TYPE II CURB
5" HEIGHT

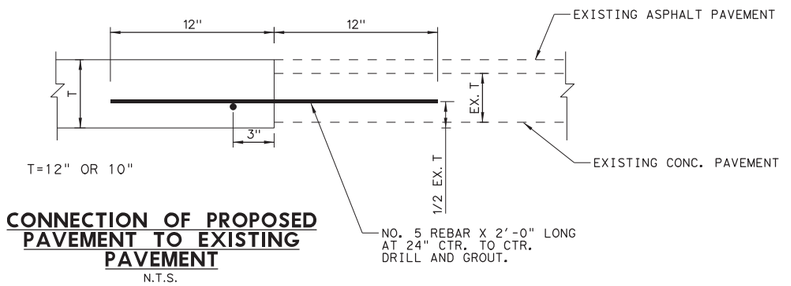
N.T.S.

FOR USE WHERE EXISTING PAVEMENT
IS TO REMAIN (RUSK STREET AND
INDUSTRIAL AVENUE)



PAVEMENT DEPTH TRANSITION

N.T.S.



CONNECTION OF PROPOSED PAVEMENT TO EXISTING PAVEMENT

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PROFESSIONAL ENGINEER
2/28/2022

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SH 135
PAVING AND CURB DETAILS

SHEET 2 OF 2

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**103**

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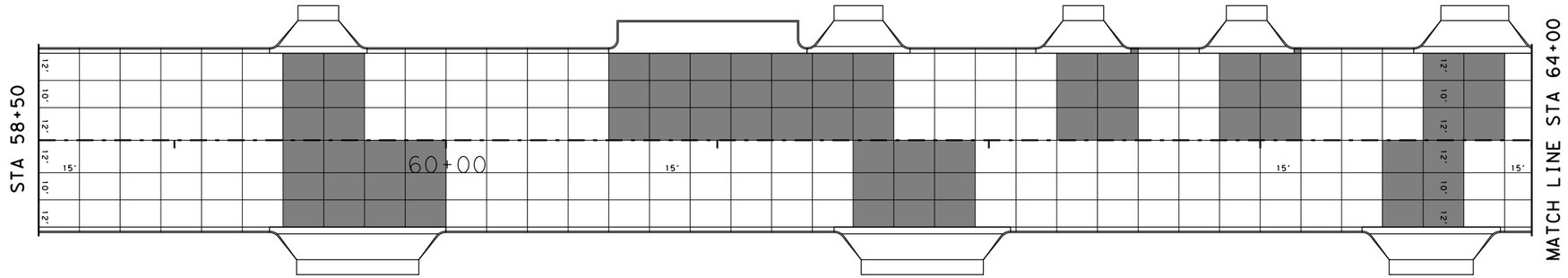
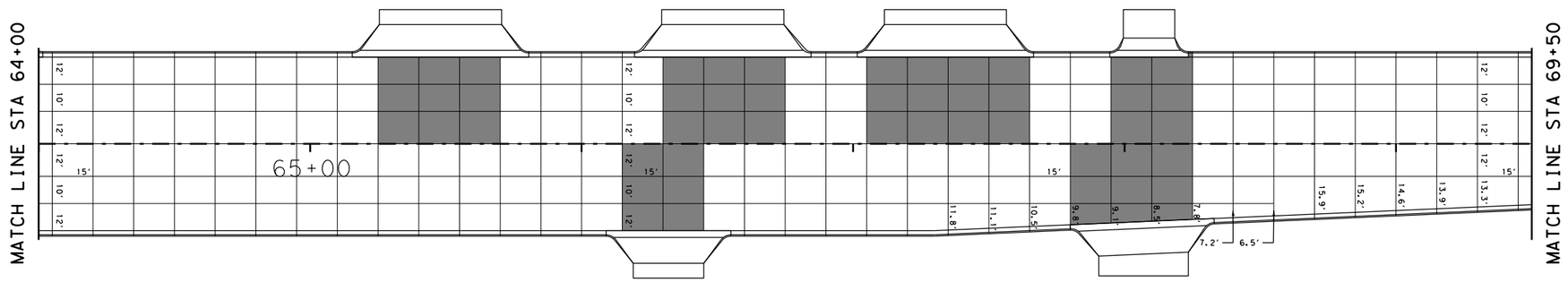
LEGEND

CONC PVMT (CONT REINF-CRCP)(HES)(10")





NOTE:

1. HES CONC IS INTENDED TO MAINTAIN DRIVEWAY OPERATION THROUGHOUT PROJECT PHASING.

100% SUBMITTAL

02/22/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

0 12.5 25 50

REV. NO.	DATE	DESCRIPTION	BY

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CONCRETE JOINT DETAIL

SHEET 1 OF 5

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	104

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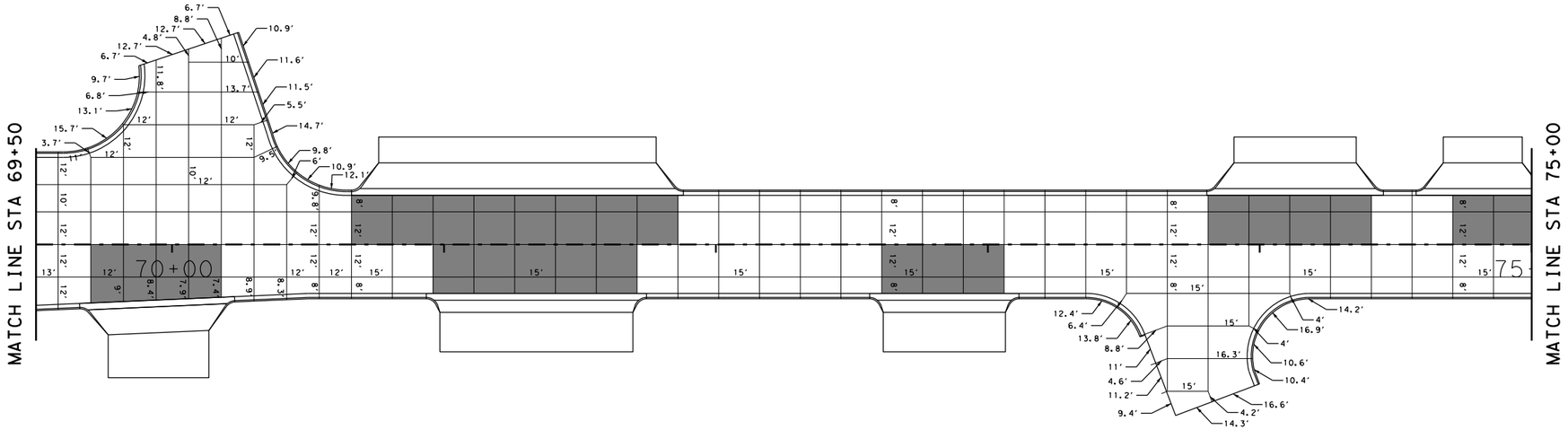
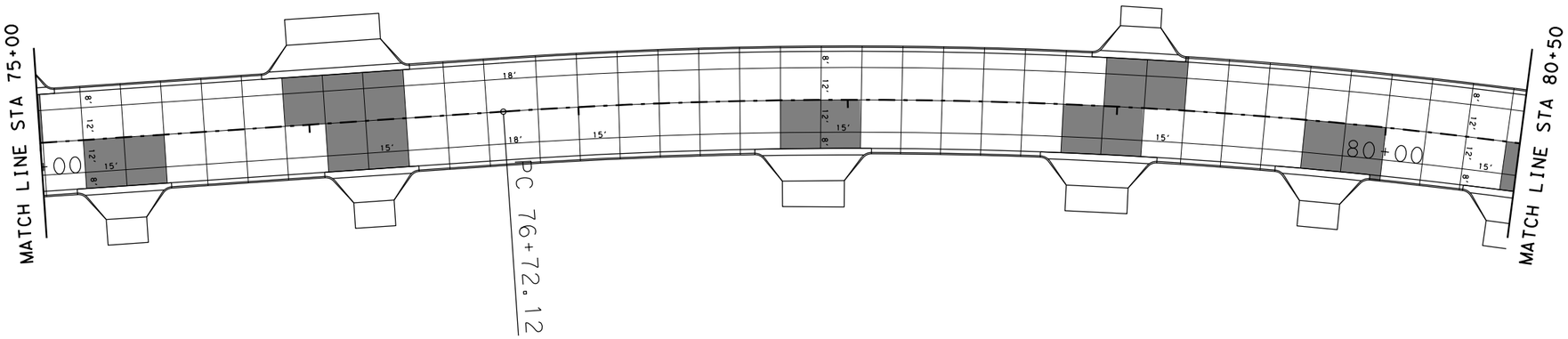
I35_ROAD-JOINT-1355-01.dgn

LEGEND

CONC PVMT (CONT REINF-CRCP)(HES)(10")





NOTE:

1. HES CONC IS INTENDED TO MAINTAIN DRIVEWAY OPERATION THROUGHOUT PROJECT PHASING.

100% SUBMITTAL

02/22/2022

STATE OF TEXAS
MICHAEL D. VERHOF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhof

0 12.5 25 50

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

CONCRETE JOINT DETAIL

SHEET 2 OF 5

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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LEGEND

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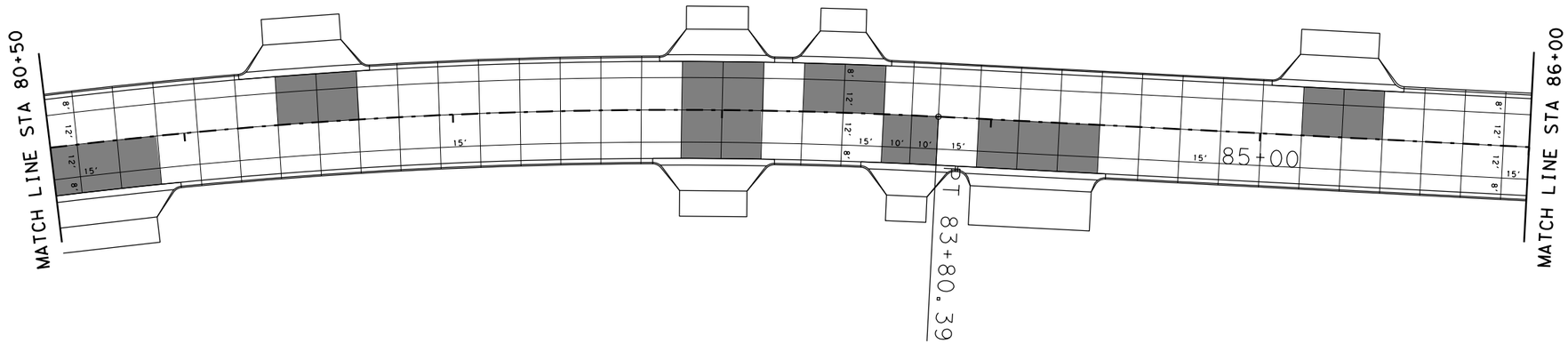

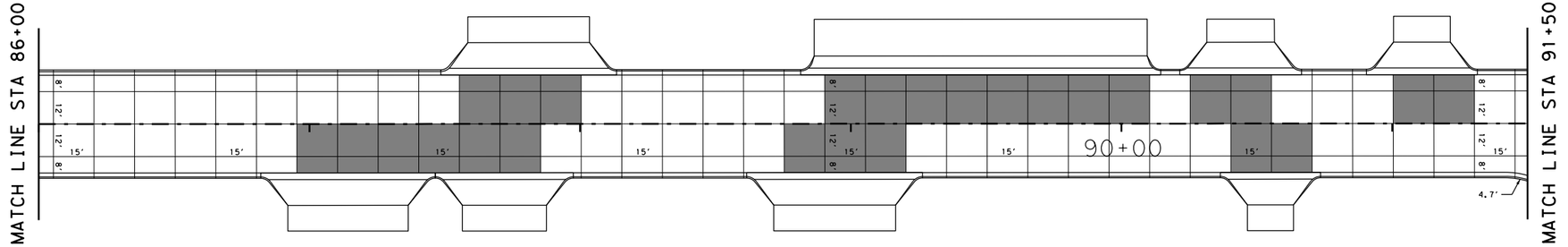

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CONCRETE JOINT DETAIL

SHEET 3 OF 5

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	106

LEGEND

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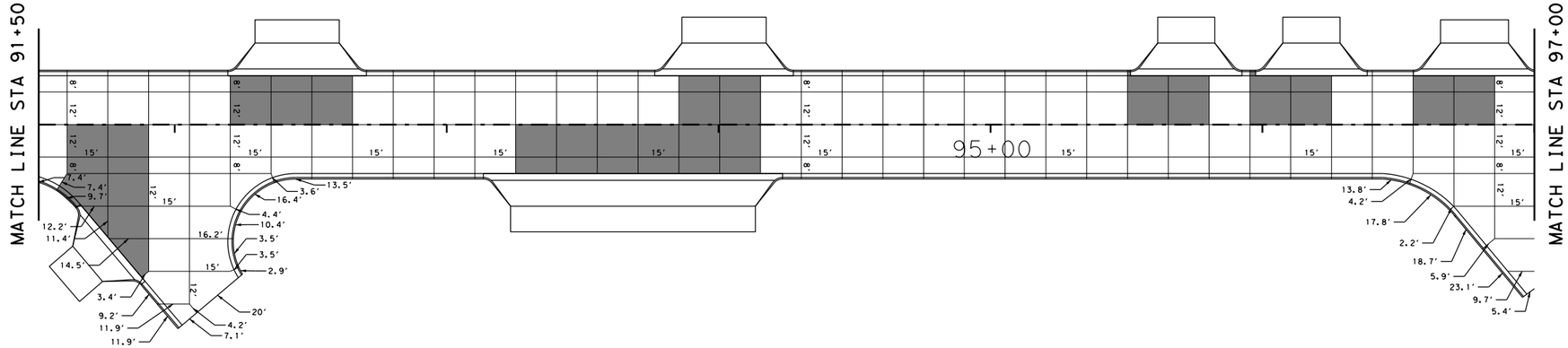

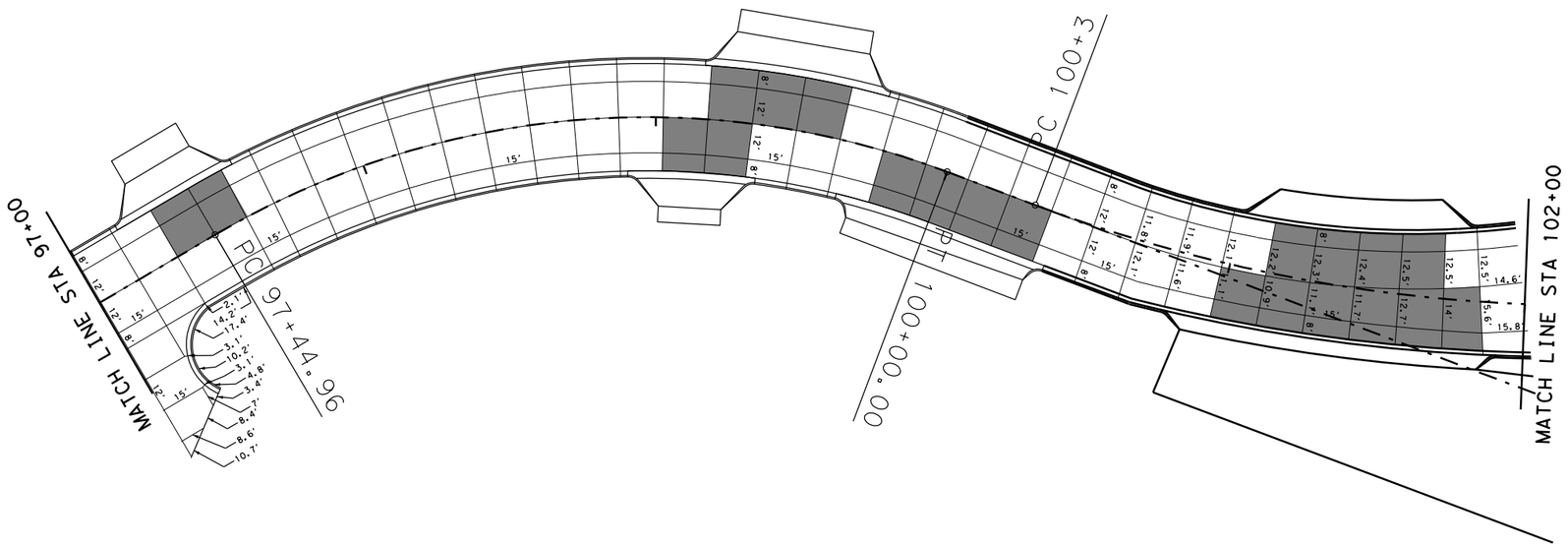

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02/22/2022

STATE OF TEXAS
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CONCRETE JOINT DETAIL

SHEET 4 OF 5

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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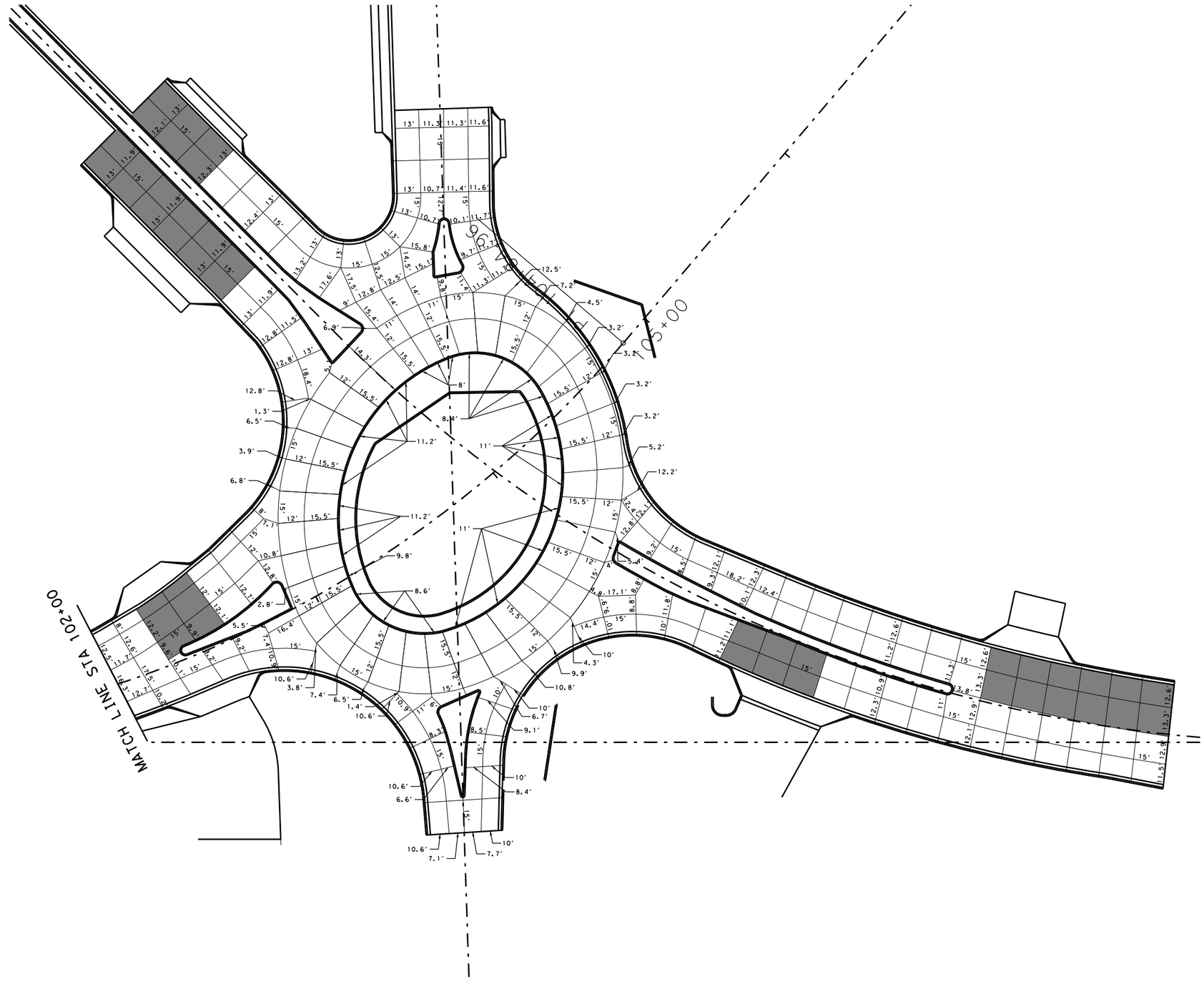

LEGEND

CONC PVMT (CONT REINF-CRCP)(HES)(10")

NOTE:

1. HES CONC IS INTENDED TO MAINTAIN DRIVEWAY OPERATION THROUGHOUT PROJECT PHASING.

100% SUBMITTAL

02/22/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

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CONCRETE JOINT DETAIL

SHEET 5 OF 5

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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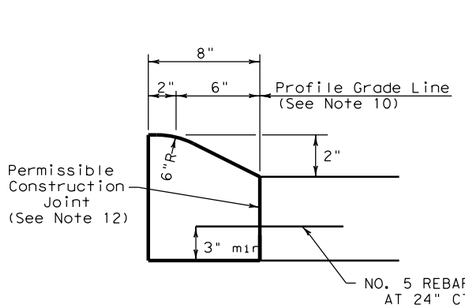
DOCUMENT IS FOR INTERIM REVIEW AND NOT INTENDED FOR CONSTRUCTION BIDDING, OR PERMIT PURPOSES
MICHAEL D. VERHOEF, PE
128002
TEXAS SERIAL NO.
2/13/2022
DATE

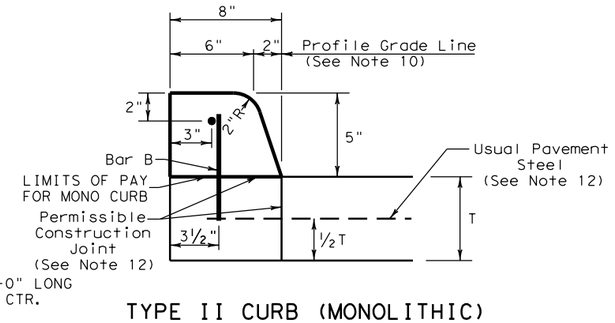
02/13/2022

MODIFICATIONS

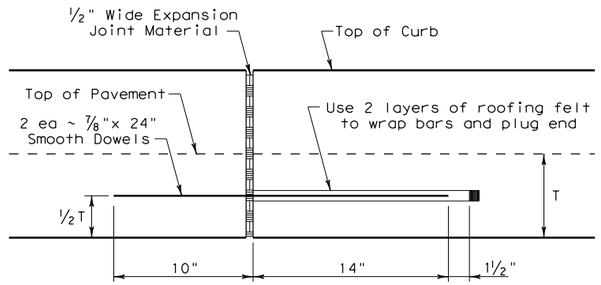
1. UNUSED CURB TYPES REMOVED
2. CURB HEIGHTS SPECIFIED



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

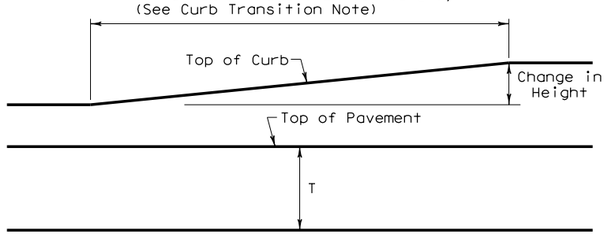


TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

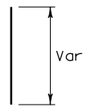
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



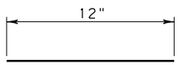
CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and the grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B used as needed to support curb reinforcing steel during concrete placement.



BAR B



BAR C

Texas Department of Transportation

Design Division Standard

CONCRETE CURB AND CURB AND GUTTER

CCCG-21 (MOD)

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: SS	CK: KM
©TxDOT: FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		109

DATE: 2/13/2022 1:06:21 PM
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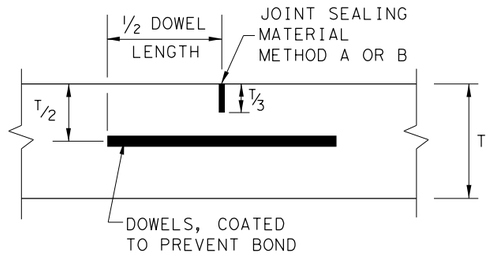
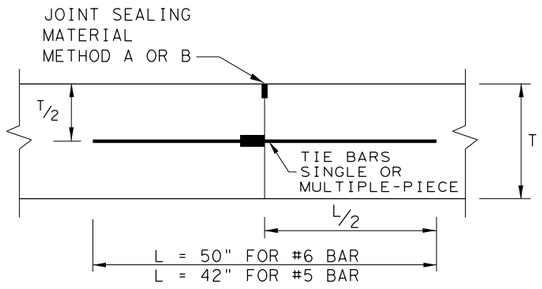
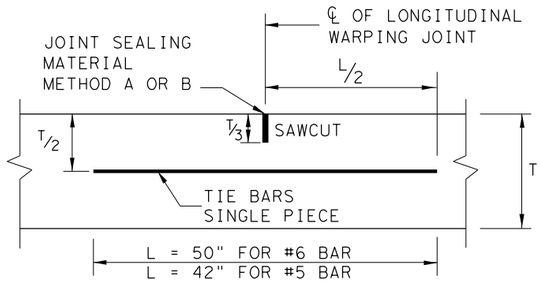


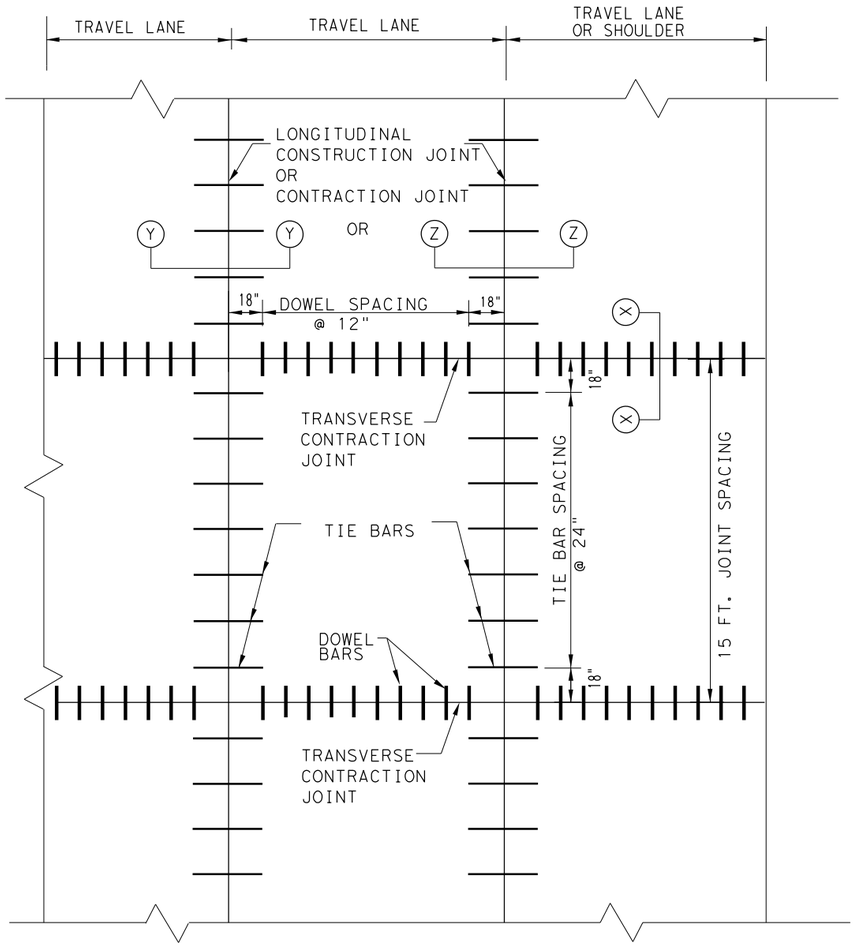
TRANSVERSE CONTRACTION JOINT
SECTION X-X



LONGITUDINAL CONSTRUCTION JOINT
SECTION Y-Y



LONGITUDINAL CONTRACTION JOINT
SECTION Z-Z



TYPICAL PAVEMENT LAYOUT
PLAN VIEW (NOT TO SCALE)

GENERAL NOTES

1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT ARE NOT COVERED BY THIS STANDARD.
2. FOR FURTHER INFORMATION REGARDING THE PLACEMENT OF CONCRETE AND LOAD TRANSFER DEVICES REFER TO THE GOVERNING SPECIFICATION FOR "CONCRETE PAVEMENT".
3. THE SPACING BETWEEN TRANSVERSE CONTRACTION JOINTS SHALL BE 15 FT. UNLESS OTHERWISE SHOWN IN THE PLANS.
4. TRANSVERSE CONSTRUCTION JOINTS MAY BE FORMED BY USE OF METAL OR WOOD FORMS EQUAL IN DEPTH TO THE DEPTH OF PAVEMENT, OR BY METHODS APPROVED BY THE ENGINEER.
5. USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL THE FORMED JOINTS.
6. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
7. THE JOINT BETWEEN OUTSIDE LANE AND SHOULDER SHALL BE A LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z) UNLESS OTHERWISE SHOWN IN THE PLANS. THE SAW CUT DEPTH FOR THE LONGITUDIANL CONTRACTION JOINT (SECTION Z-Z) SHALL BE ONE THIRD OF THE SLABTHICKNESS (T/3).
8. WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 IN. OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF TIE BAR.
9. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN. 10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
10. WHEN AN MONOLITHIIC CURB IS SPECIFIED, THE JOINT IN THE CURB SHALL COINCIDE WITH PAVEMENT JOINTS AND MAY BE FORMED BY ANY MEANS APPROVED BY THE ENGINEER.
11. DOWEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1/4 IN. HORIZONTALLY AND VERTICALLY UNLESS OTHERWISE SPECIFIED. WHERE DOWEL BAR BASKETS ARE USED, REMOVE THE SHIPPING WIRES.
12. THE DETAIL FOR JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."

TABLE NO.1 DOWELS (SMOOTH BARS)

SLAB THICKNESS T (IN.)	BAR DIA. AND LENGTH	AVERAGE SPACING (IN.)
6 to 7.5	1" X 18"	12
8 to 10	1 1/4" X 18"	12
>= 10.5	1 1/2" X 18"	12

TABLE NO.2 TIE BARS (DEFORMED BARS)

SLAB THICKNESS T (IN.)	BAR SIZE	AVERAGE SPACING (IN.)
6 to 7.5	#5	24
>= 8	#6	24

Texas Department of Transportation

Design Division Standard

CONCRETE PAVEMENT DETAILS
CONTRACTION DESIGN
T-6 to 12 INCHES

CPCD-14

FILE: cpcd14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		110

DATE: 2/13/2022 1:06:22 PM
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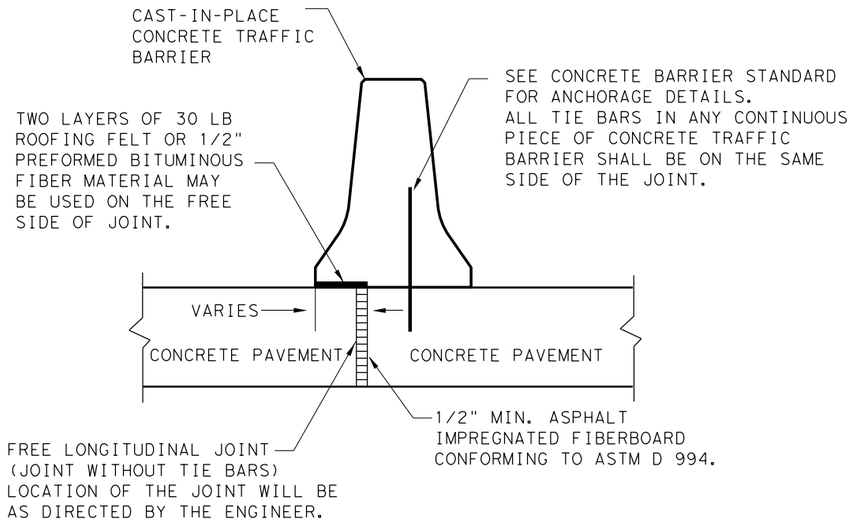
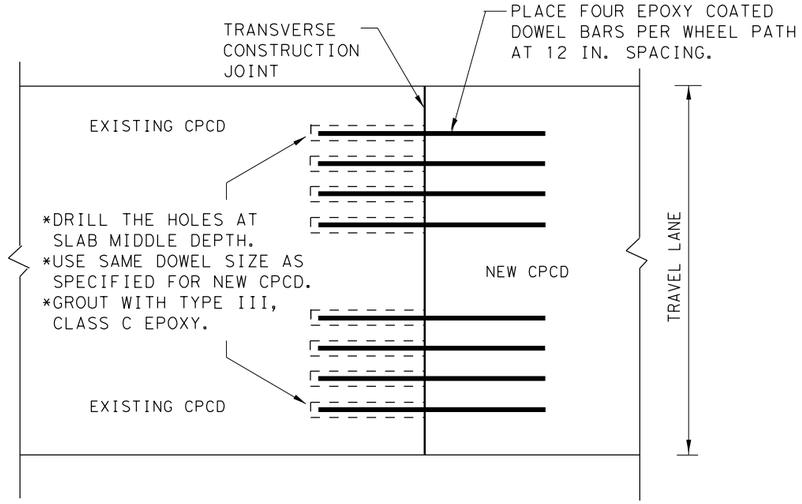
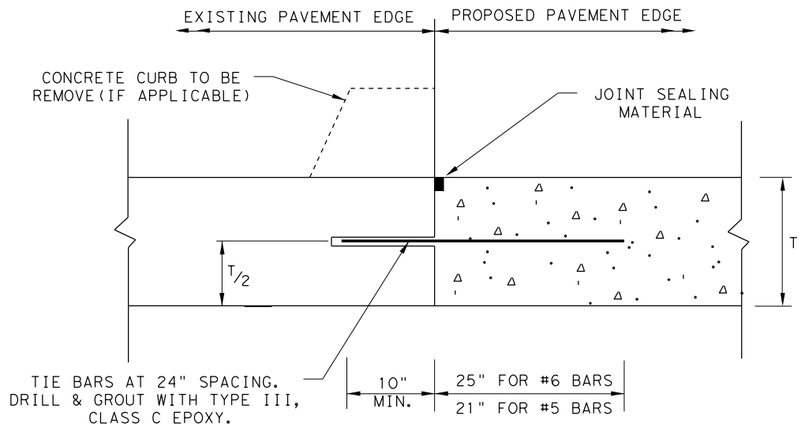


FREE LONGITUDINAL JOINT DETAIL



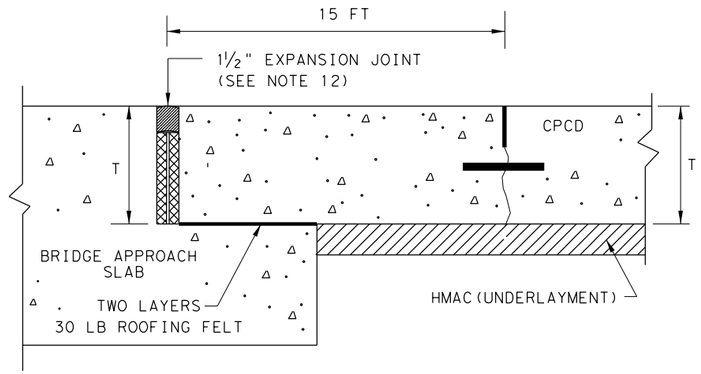
TRANSVERSE JOINT DETAIL
EXISTING CPCD TO NEW CPCD

PLAN VIEW (NOT TO SCALE)



1. BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQUIREMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
2. SPACE TIE BARS AT 24" SPACING. USE #6 BARS FOR 8" AND THICKER SLABS, USE #5 BARS FOR LESS THAN 8" THICK SLABS.
3. THE TRANSVERSE JOINTS OF PROPOSED PAVEMENT SHALL COINCIDE WITH EXISTING PAVEMENT JOINTS UNLESS OTHERWISE SHOWN ON THE PLANS.

LONGITUDINAL WIDENING JOINT DETAIL



TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

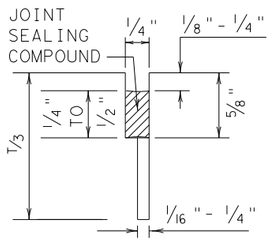
CONCRETE PAVEMENT DETAILS
CONTRACTION DESIGN
T-6 to 12 INCHES

CPCD-14

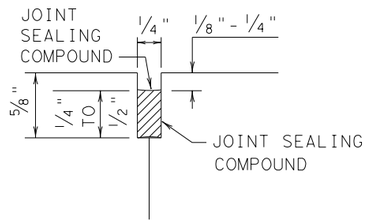
FILE: cpcd14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
© TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		111

DATE: 2/13/2022
FILE: F:\Projects\2019\11004.TxDOT_5x5_PS&E\02.SH135_Kilgore\ENG\500 USTN\500.02 Sheets\04 Roadway\Standards\js14.dgn

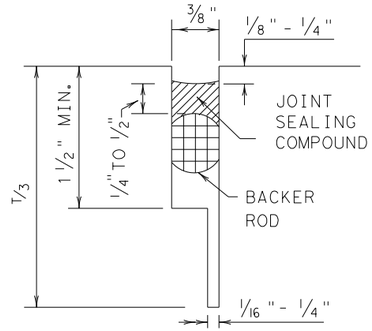
METHOD B: JOINT SEALING COMPOUND



LONGITUDINAL SAWED
CONTRACTION JOINT



LONGITUDINAL OR TRANSVERSE
CONSTRUCTION JOINT



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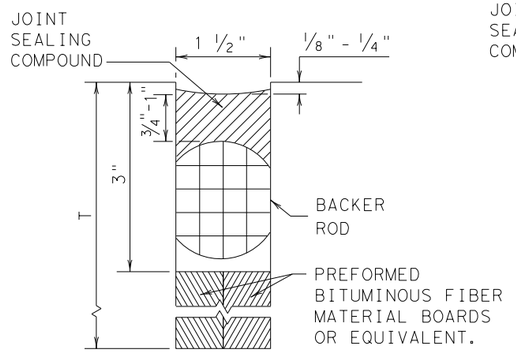

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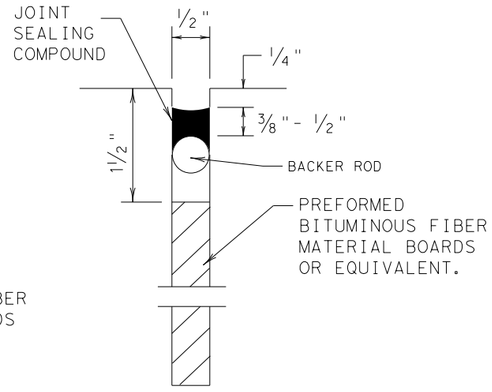
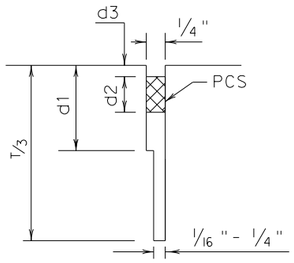
EXPANSION JOINT



FORMED
ISOLATION JOINT

METHOD A: PREFORMED COMPRESSION SEALS (PCS)(DMS-6310 CLASS 6)



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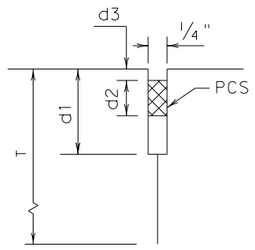
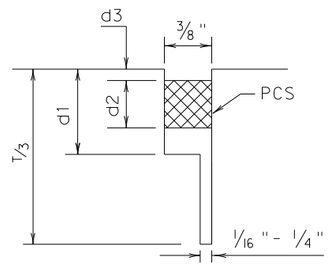
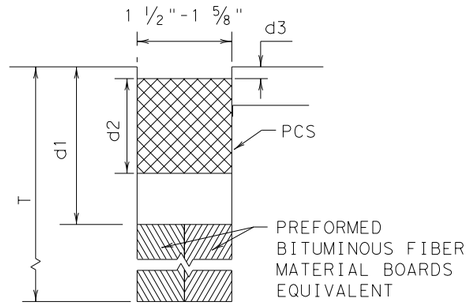


LONGITUDINAL
CONSTRUCTION JOINT



TRANSVERSE SAWED
CONTRACTION JOINT



TRANSVERSE FORMED
EXPANSION JOINT

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, EITHER METHOD "A" OR METHOD "B" MAY BE USED.
2. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. THE JOINT RESERVOIR FOR SEALANT OR PCS SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION JOINTS AND THE SAWED JOINTS.
4. DIMENSIONS d1, d2, AND d3 SHOWN IN METHOD A SHALL BE IN ACCORDANCE WITH THE PREFORMED COMPRESSION SEAL MANUFACTURER'S RECOMMENDATION.
5. REFER TO DMS-6310 "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
6. FOR SAWED LONGITUDINAL JOINT, LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT, USE JOINT SEALANT CLASS 5 OR 8 UNLESS OTHERWISE SHOWN ON THE PLAN OR APPROVED.
7. FOR TRANSVERSE SAWED CONTRACTION, TRANSVERSE FORMED EXPANSION JOINT, AND ISOLATION JOINT USE JOINT SEALANT CLASS 5 OR 8 AT NEW JOINTS. USE JOINT SEALANT CLASS 4,5,7,OR 8 FOR MAINTAINING EXISTING JOINTS.
8. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 "CLEANING AND SEALING JOINTS" OR ITEM 713 "CLEANING AND SEALING JOINTS AND CRACKS (CONCRETE PAVEMENT)".
9. ISOLATION JOINTS ACCOMMODATE HORIZONTAL AND VERTICAL MOVEMENTS THAT OCCUR BETWEEN A PAVEMENT AND A STRUCTURE. ISOLATION JOINTS MAY BE USED FOR BRIDGE ABUTMENTS, INTERSECTIONS, CURB AND GUTTER, OLD AND NEW PAVEMENTS, OR AROUND DRAINAGE INLETS, MANHOLES, FOOTINGS AND LIGHTING STRUCTURES.

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CONCRETE PAVING DETAILS

JOINT SEALS

JS-14

FILE: js14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		112

DATE: 2/13/2022
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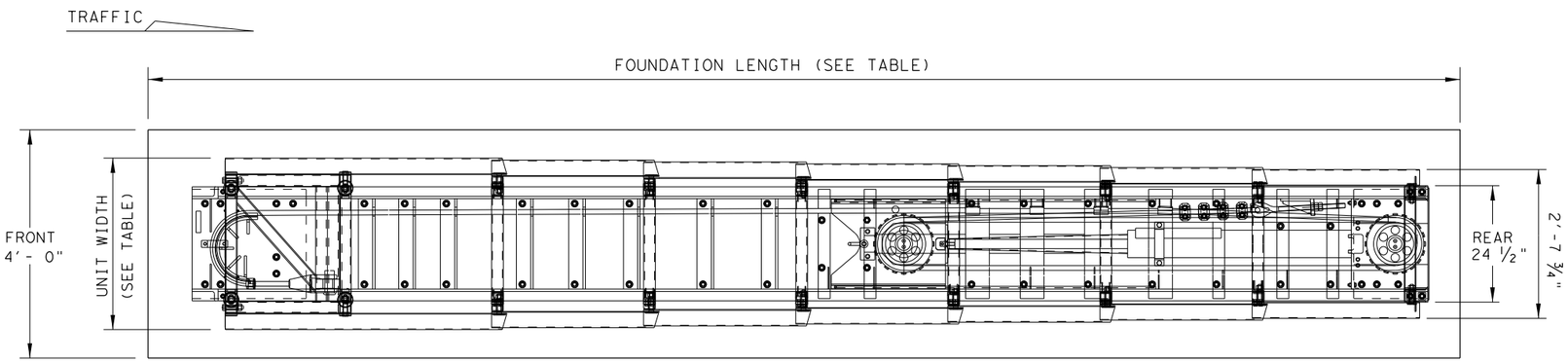
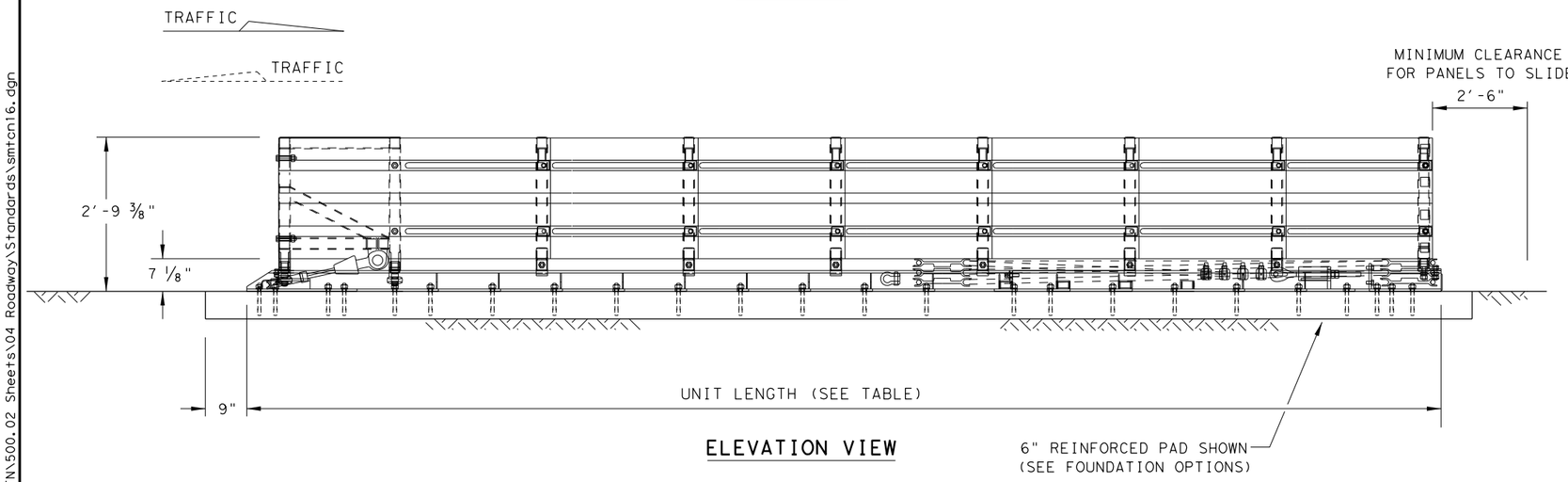


PLAN VIEW



ELEVATION VIEW

MODEL	TEST LEVEL	UNIT LENGTH (approx.)	UNIT WIDTH	FOUNDATION LENGTH	OBSTACLE WIDTH
SCI70GM	TL-2	13′-6"	2′-10 ⅝"	15′- 6 ¼"	24"to 36"
SCI100GM	TL-3	21′-6"	3′-1 ½"	23′- 0"	24"to 36"

SYSTEM AND PAD LENGTHS VARY DEPENDING ON BACKUP TYPE.

FOUNDATION OPTIONS
6" REINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
8" UNREINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
3" MIN. ASPHALT OVER 3" MIN. CONCRETE (16 ½" ANCHOR EMBED.)
6" ASPHALT OVER 6" COMPACT SUBBASE (16 ½" ANCHOR EMBED.)
8" MINIMUM ASPHALT (16 ½" ANCHOR EMBEDMENT)

FOR STEEL PLACEMENT IN CONCRETE FOUNDATIONS, SEE MANUFACTURER'S PRODUCT MANUAL.

TRANSITION OPTIONS
CONCRETE VERTICAL WALL
CONCRETE TRAFFIC BARRIERS
GUARDRAIL (W-BEAM)
GUARDRAIL (THRIE-BEAM)

TRANSITION TYPES ARE SHOWN ELSEWHERE ON THE PLANS (I.E. ATTENUATOR LOCATION DETAILS OR IN THE GENERAL NOTES).

FOR BI-DIRECTIONAL TRANSITION PANEL AND END SHOE DETAILS, SEE MANUFACTURER'S PRODUCT MANUAL.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: WORK AREA PROTECTION, CORP. AT (800) 327-4417, OR (630) 377-9100.
2. FOR BI-DIRECTIONAL TRAFFIC, APPROPRIATE TRANSITION PANELS WILL BE REQUIRED.
3. ADDITIONAL DETAILS FOR THE TRANSITION OPTION 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 SCI100GM & SCI70GM SYSTEMS SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTERLINE OF MERGING BARRIERS.

NOTE:
FOR ATTACHMENT AND TRANSITIONS TO OTHER SHAPES, BARRIERS, RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE. (SEE MANUFACTURER'S PRODUCT MANUAL)

NOTE:
SIDE PANELS CAN TRAVEL 30" BEYOND THE LAST TERMINAL BRACE AT THE REAR OF THE CUSHION. ALL OBJECTS THAT MAY INTERFERE WITH THIS MOTION CAN AFFECT PERFORMANCE OF AND MAY CAUSE UNDUE DAMAGE TO THE CRASH CUSHION.

Texas Department of Transportation — Design Division Standard

WORK AREA PROTECTION CORP (SMART-NARROW)

SMTC(N)-16

FILE: smtcn16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
© TxDOT: February 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
REVISED 06, 2013 (VP)	DIST	COUNTY		SHEET NO.
REVISED 03, 2016 (VP)	TYL	GREGG		113

LOW MAINTENANCE

DATE: 2/13/2022
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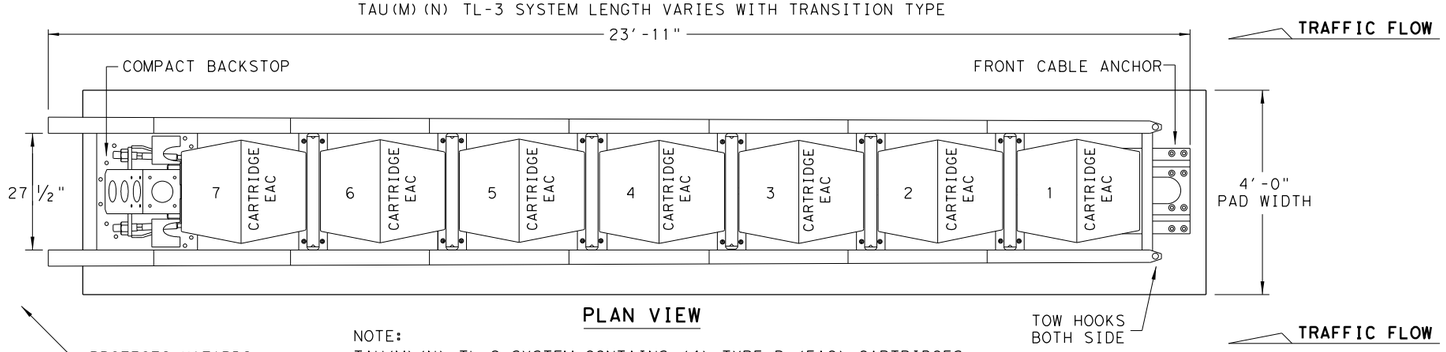
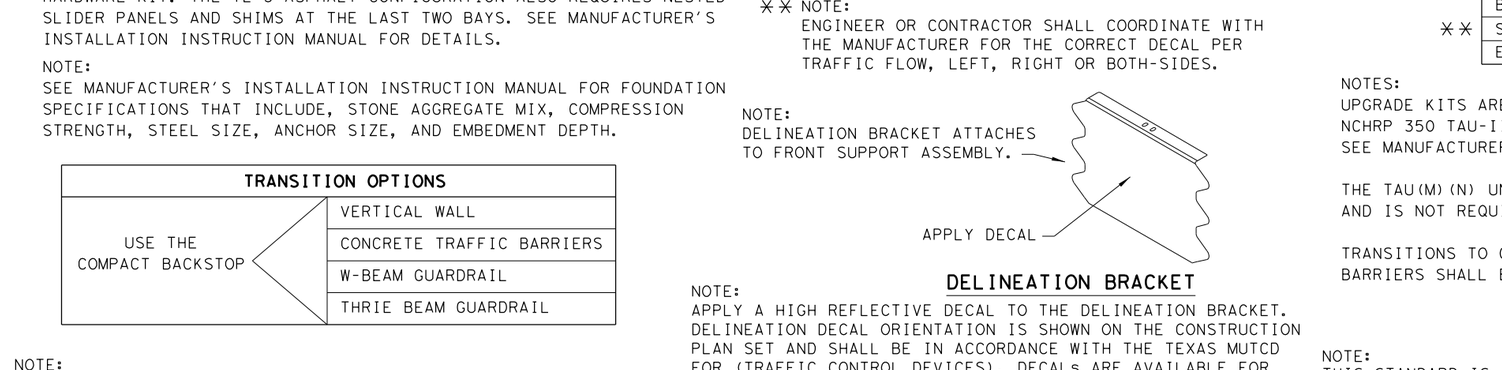
TAU(M)(N) TL-3 SYSTEM LENGTH VARIES WITH TRANSITION TYPE



PLAN VIEW

NOTE:
TAU(M)(N) TL-2 SYSTEM CONTAINS (4) TYPE B (EAC) CARTRIDGES. INSTALLED ON ROADWAYS WITH MAXIMUM SPEEDS OF 45 MPH.



ELEVATION VIEW

END VIEW

NOTE:
PAD THICKNESS VARIES - SEE FOUNDATION OPTIONS

NOTES:
TRANSITIONS AND ATTACHMENTS TO VARIOUS BARRIER SHAPES, RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE. SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS MANUAL FOR ADDITIONAL TRANSITION DETAILS.

NOTE:
CONCRETE FOUNDATION PAD LENGTH VARIES WITH TL-3 AND TL-2 SYSTEMS, SEE SYSTEM & FOUNDATION LENGTH TABLE.

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

SYSTEM & FOUNDATION LENGTH TABLE	
SYSTEM LENGTH	FOUNDATION LENGTH
TL-2 = 15'-5"	TL-2 = 15'-4"
TL-3 = 23'-11"	TL-3 = 23'-10"

⁎ NOTE:
REQUIRES AN ASPHALT ANCHORAGE PACKAGE: INCLUDES ADDITIONAL BRACES FOR THE FRONT CABLE ANCHOR AND THE COMPACT BACKSTOP, AND ASPHALT HARDWARE KIT. THE TL-3 ASPHALT CONFIGURATION ALSO REQUIRES NESTED SLIDER PANELS AND SHIMS AT THE LAST TWO BAYS. SEE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL FOR DETAILS.

NOTE:
SEE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL FOR FOUNDATION SPECIFICATIONS THAT INCLUDE, STONE AGGREGATE MIX, COMPRESSION STRENGTH, STEEL SIZE, ANCHOR SIZE, AND EMBEDMENT DEPTH.

TRANSITION OPTIONS	
USE THE COMPACT BACKSTOP	VERTICAL WALL
	CONCRETE TRAFFIC BARRIERS
	W-BEAM GUARDRAIL
	THRIE BEAM GUARDRAIL

NOTE:
FOR BI-DIRECTIONAL TRANSITION PANELS AND BRIDGE RAIL END SHOE DETAILS. SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS MANUAL.

⁎⁎ NOTE:
ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

NOTE:
DELINEATION BRACKET ATTACHES TO FRONT SUPPORT ASSEMBLY.

DELINEATION BRACKET

NOTE:
APPLY A HIGH REFLECTIVE DECAL TO THE DELINEATION BRACKET. DELINEATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALs ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
2. REFER TO THE LATEST (LTS) INSTALLATION INSTRUCTION MANUAL FOR IMPORATANT SAFETY MESSAGES, COMPLETE SYSTEM ASSEMBLY, AND ANCHOR INSTALLATION REQUIREMENTS FOR THE NINE (9) DIFFERENT SITE TRANSITIONS.
3. INSTALLATION DETAILS FOR THE COMPACT BACKSTOP, FRONT CABLE ANCHOR AND FOUNDATION OPTIONS ARE SHOWN ON THE INSTALLATION INSTRUCTION MANUAL FURNISHED TO THE ENGINEER.
4. CONCRETE SHALL BE CLASS "S" WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 P.S.I.
5. IF THE CROSS-SLOPES VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE TAU(M)(N) SYSTEM SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTER LINE OF MERGING BARRIERS.
8. THIS DRAWING REPRESENTS THE UNIVERSAL TAU(M)(N) TL-3 SYSTEM, A RE-DIRECTIVE NON-GATING CRASH CUSHION THAT CAN PROTECT HAZARDS UP TO 30-INCHES IN WIDTH. ALSO AVAILABLE IN TL-2 CONFIGURATION.

BILL OF MATERIALS FOR TAU(M)(N) TL-3 & TL-2 SYSTEMS		QUANTITIES	
PART NUMBER	PART DESCRIPTION	TL-3 SYSTEM	TL-2 SYSTEM
BSI-1708019-00	SLIDING PANEL GALVANIZED TAU(M)(N)	14	8
BSI-1708030-00	END PANEL, THRIE BEAM, GALV, TAU(M)(N)	2	2
BSI-1706001-00	CABLE ASSEMBLY, 7 BAY, TAU(M)(N)	2	-
BSI-1805036-00	CABLE ASSEMBLY, 4 BAY, TAU(M)(N)	-	2
BSI-1708018-00	FRONT CABLE ANCHOR	1	1
BSI-1707034-00	COMPACT BACKSTOP	1	1
B030703	MIDDLE SUPPORT ASSEMBLY	6	3
B030704	FRONT SUPPORT	1	1
B010722	ENERGY ABSORBING CARTRIDGE, TYPE B	7	4
K001005	TAU-II FRONT SUPPORT LEG KIT	1	1
BSI-1709083-KT	TETHER KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1809041-KT	SLIDER KIT (INCLUDES ALL HARDWARE)	7	4
BSI-1808033-KT	CABLE GUIDE KIT (INCLUDES ALL HARDWARE)	6	3
BSI-1809040-KT	TOW HOOK KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1808034-KT	DELINEATION BRACKET KIT(INCLUDES ALL HARDWARE)	1	1
BSI-1808035-KT	END PANEL MOUNT KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1808036-KT	CONCRETE ANCHORING KIT	1	1
⁎⁎ SEE NOTE	HIGH REFLECTIVE DECAL	1	1
ECN 3883	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

NOTES:
UPGRADE KITS ARE AVAILABLE TO RETROFIT EXISTING NCHRP 350 TAU-II SYSTEMS TO MASH COMPLIANT SYSTEMS. SEE MANUFACTURER'S PRODUCT INFORMATION.

THE TAU(M)(N) UNIDIRECTIONAL SYSTEM IS FREE STANDING AND IS NOT REQUIRED TO BE CONNECTED TO THE HAZARD.

TRANSITIONS TO GUARD FENCE, BRIDGE RAILS AND ROADSIDE BARRIERS SHALL BE IN ACCORDANCE WITH TxDOT'S POLICY.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE UNIVERSAL TAU(M)(N) SYSTEM, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTION MANUAL.

REUSABLE

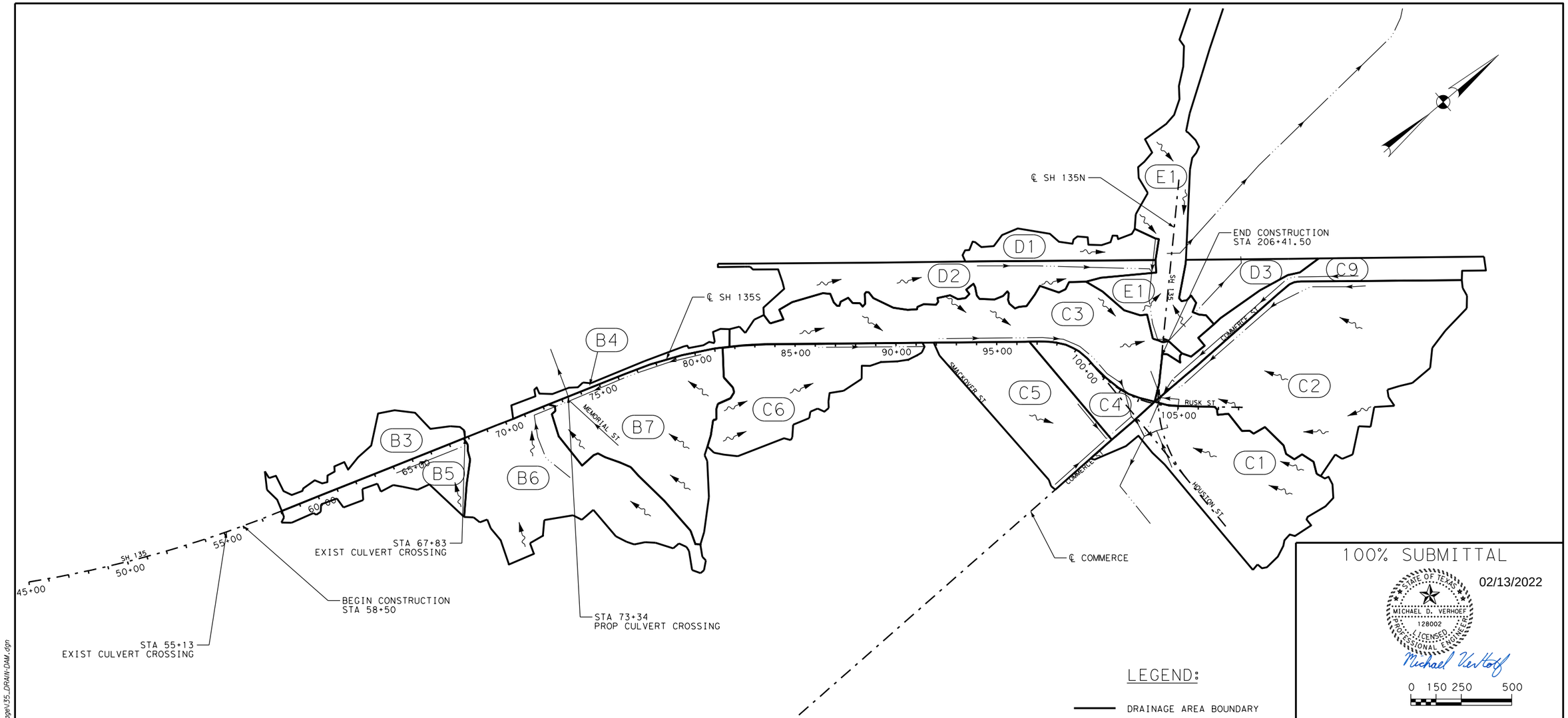
Texas Department of Transportation — Design Division Standard

LINDSAY TRANSPORTATION SOLUTIONS

UNIVERSAL CRASH CUSHION (MASH TL-3 & TL-2)

TAU(M)(N)-19

FILE: taumn19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
©TxDOT: APRIL 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		114



HYDROLOGIC DATA

DA ID	DA AREA	C				WEIGHTED "C"	CA	Tc CALC	Tc	5 YR		100 YR	
	(acres)	PVMT 0.90	COMM 0.65	RESID 0.45	GROUND 0.35	(none)	(none)	(min)	(min)	INTENSITY (in/hr)	Q (cfs)	INTENSITY (in/hr)	Q (cfs)
B2	6.70	0.40	6.25	-	0.05	0.66	4.44	23.74	24	4.6	20.60	5.3	23.43
B3	3.00	0.81	1.69	-	0.50	0.67	2.00	9.26	10	7.2	14.41	8.0	16.10
B4	1.00	0.59	0.39	-	0.02	0.79	0.79	7.90	10	7.2	5.70	8.0	6.36
B5	2.70	0.67	0.64	-	1.39	0.56	1.51	5.33	10	7.2	10.84	8.0	12.10
B6	10.90	0.24	4.50	-	6.16	0.49	5.30	35.06	35	3.7	19.57	4.2	22.48
B7	10.00	0.80	7.21	-	1.99	0.61	6.10	31.30	31	4.0	24.31	4.6	27.84
C1	10.30	1.55	1.99	-	6.76	0.49	5.05	44.11	44	3.2	16.12	3.7	18.63
C2	18.00	0.59	4.64	-	12.77	0.45	8.02	44.39	44	3.2	25.57	3.7	29.55
C3	11.80	1.44	10.34	-	0.02	0.68	8.02	21.45	21	5.0	40.14	5.7	45.53
C4	2.40	0.61	1.54	-	0.25	0.68	1.64	13.73	14	6.2	10.12	6.9	11.37
C5	6.90	0.70	0.46	1.42	4.32	0.35	2.44	21.12	21	5.0	12.21	5.7	13.85
C8	10.30	0.03	-	-	10.27	0.35	3.62	-	10	7.2	26.07	8.0	29.11
C9	3.90	0.76	0.99	-	2.15	0.53	2.08	-	10	7.2	14.97	8.0	16.72
D1	2.50	-	-	-	2.50	0.35	0.88	17.83	18	5.4	4.76	6.1	5.38
D2	7.30	-	6.59	-	0.71	0.62	4.53	29.89	30	4.1	18.42	4.6	21.07
D3	2.70	-	2.39	-	0.31	0.62	1.66	-	10	7.2	11.96	8.0	13.36

LEGEND:

- DRAINAGE AREA BOUNDARY
- A01 DRAINAGE AREA ID
- FLOW DIRECTION
- CHANNEL/CONDUIT FLOW

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02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

0 150 250 500

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

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OVERALL DRAINAGE AREA MAP

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	115

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Michael Verhoef

0 25 50 100
1" = 100'

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SITE DRAINAGE
SH 135 S
STA 56+00 TO STA 67+00

SHEET 1 OF 6

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
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TYL	GREGG	0545	01	014	116

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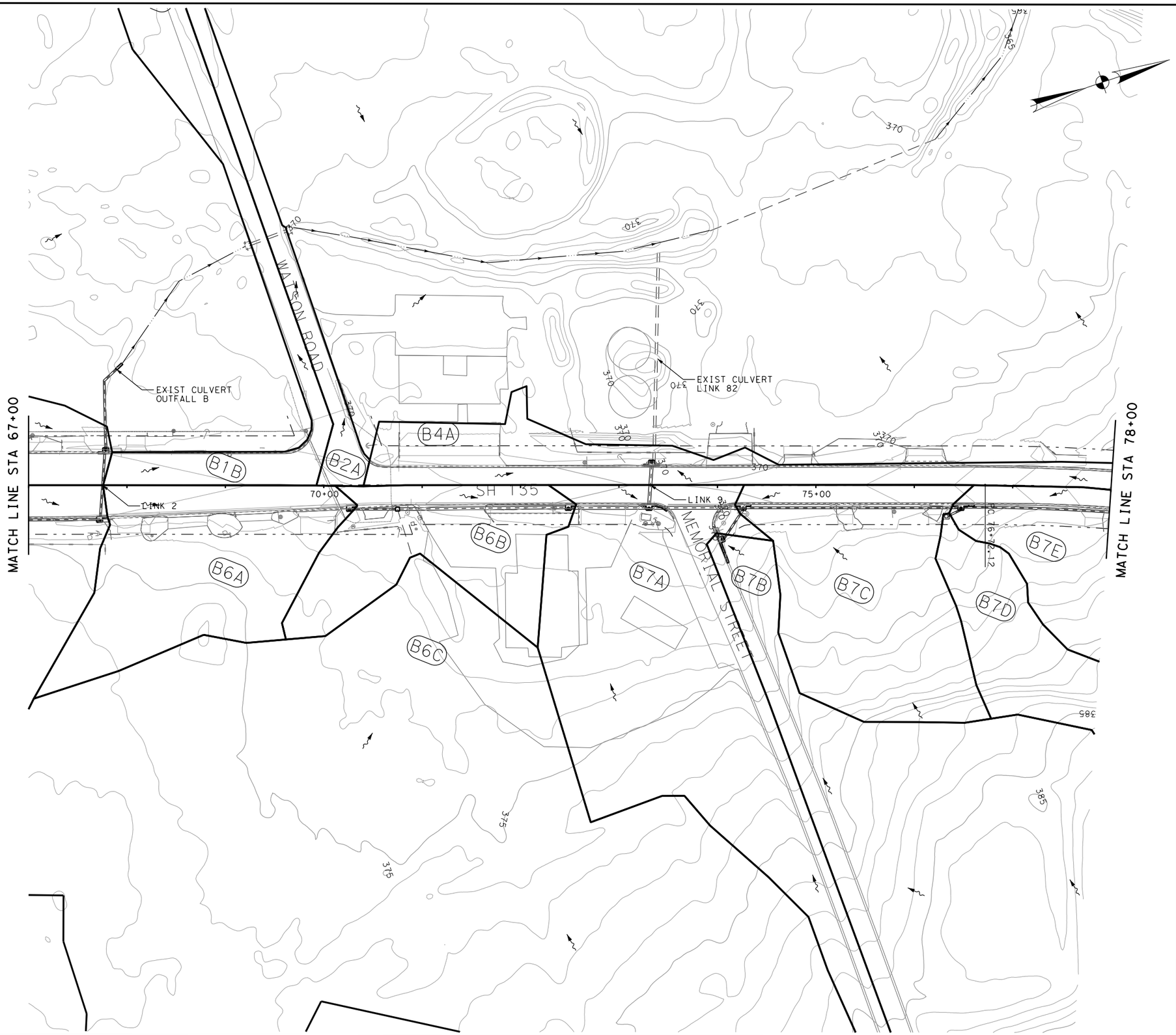

LEGEND

- DRAINAGE AREA BOUNDARY
- A1 DRAINAGE AREA ID
- FLOW DIRECTION
- CHANNEL/CONDUIT FLOW
- MAJOR CONTOUR
- MINOR CONTOUR

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1" = 100'

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SITE DRAINAGE
SH 135 S
STA 67+00 TO STA 78+00

SHEET 2 OF 6

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	117

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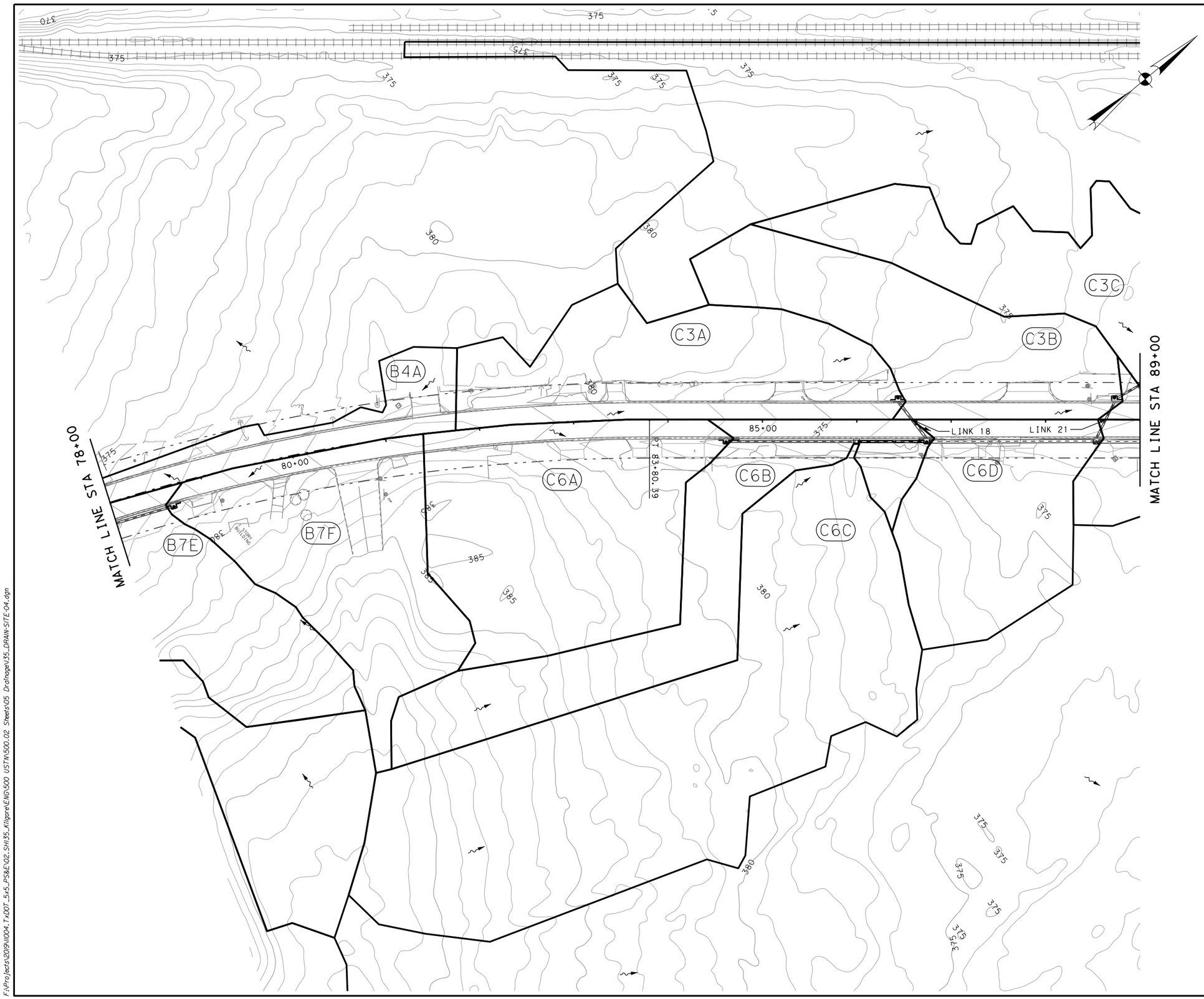

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STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED PROFESSIONAL ENGINEER

02/13/2022

Michael Verhoef

0 25 50 100

1" = 100'

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SITE DRAINAGE
SH 135 S

STA 78+00 TO STA 89+00

SHEET **3** OF **6**

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
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TYL	GREGG	0545	01	014	**118**

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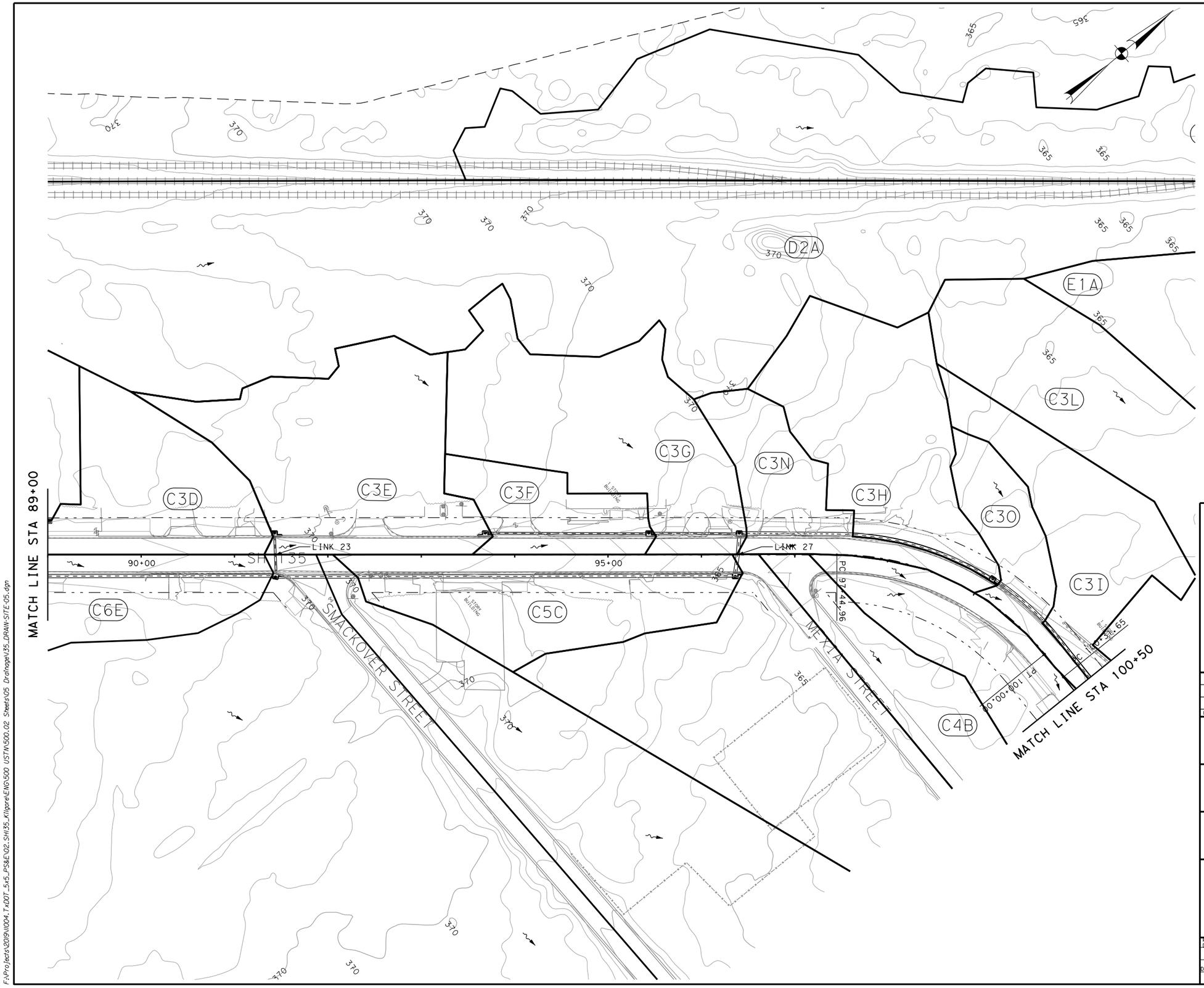

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STATE OF TEXAS
MICHAEL D. VERHOEF
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PROFESSIONAL ENGINEER

Michael Verhoef

0 25 50 100

1" = 100'

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SITE DRAINAGE
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STA 89+00 TO STA 100+50

SHEET 4 OF 6

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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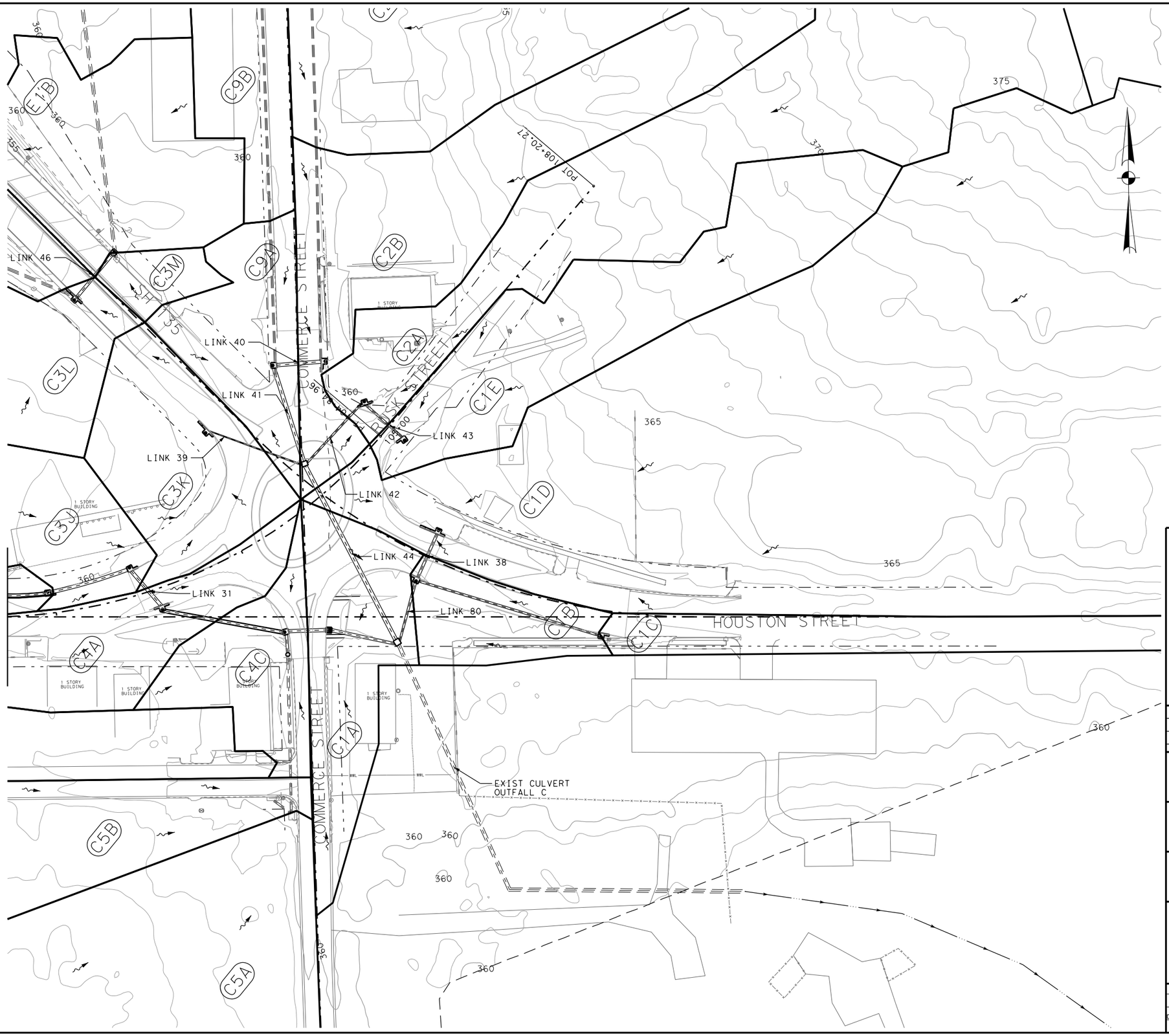

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TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

SITE DRAINAGE
SH 135 S
STA 100+50 TO END

SHEET **5** OF **6**

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**120**

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35_DRAIN_SITE-06.dgn

LEGEND

- DRAINAGE AREA BOUNDARY
- A1 DRAINAGE AREA ID
- FLOW DIRECTION
- CHANNEL/CONDUIT FLOW
- MAJOR CONTOUR
- MINOR CONTOUR

EXIST LINK 48

EXIST CULVERT OUTFALL 'D'

D3A

C2C

C9B

C9A

E1'B

C3M

E1A

D1A

LINK 47

LINK 46

LINK 40

SH 135

100% SUBMITTAL

STATE OF TEXAS
MICHAEL D. VERHOFF
128002
LICENSED PROFESSIONAL ENGINEER

02/13/2022

0 25 50 100
1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
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SITE DRAINAGE
SH 135 N
BEGIN TO END

SHEET 6 OF 6

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	121

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F:\Projects\2019\I004.TxDOT_5x5_PS&E\02.SH135_Kilgore\ENG\500 USTIN\500.02 Sheets\05 Drainage\I35_DRAIN-SITE-07.dgn
I35_DRAIN-SITE-07.dgn

Area - ID	Area - Composite C Value	Area - Composite Area (AC)	Area - Time of Concentration (min)	Area - Intensity (in/hr)	Area - Discharge (cfs)
B1B	0.75	1.36	10.00	5.76	5.88
B2A	0.90	0.27	10.00	5.76	1.39
B3A	0.73	1.70	19.00	4.34	5.40
B3B	0.59	1.30	10.00	5.76	4.39
B4A	0.75	1.04	10.00	5.76	4.51
B5A	0.74	1.37	10.00	5.76	5.82
B5B	0.69	1.37	10.00	5.76	5.39
B6A	0.69	0.90	14.00	5.02	3.11
B6B	0.69	0.65	10.00	5.76	2.59
B6C	0.48	8.95	21.00	4.13	17.81
B7A	0.58	2.09	10.00	5.76	6.94
B7B	0.51	3.43	12.00	5.36	9.43
B7C	0.64	1.01	10.00	5.76	3.74
B7D	0.63	1.21	14.00	5.02	3.79
B7E	0.67	1.13	13.00	5.18	3.91
B7F	0.67	1.18	10.00	5.76	4.58
C1A	0.79	0.67	10.00	5.76	3.05
C1B	0.77	0.35	10.00	5.76	1.55
C1C	0.59	0.55	10.00	5.76	1.88
C1D	0.44	7.22	24.00	3.85	12.18
C1E	0.44	1.22	14.00	5.02	2.66
C2A	0.41	3.84	25.00	3.76	5.87
C2B	0.59	1.63	23.00	3.94	3.76
C2C	0.50	3.27	18.00	4.46	7.31
C2D	0.62	0.67	10.00	5.76	2.39
C2E	0.67	0.31	10.00	5.76	1.20
C2F	0.67	0.76	10.00	5.76	2.90
C2G	0.47	3.19	19.00	4.34	6.54
C2H	0.43	0.46	10.00	5.76	1.14
C2I	0.56	2.32	14.00	5.02	6.54
C2J	0.69	1.84	16.00	4.72	5.95
C3A	0.70	1.12	10.00	5.76	4.55
C3B	0.68	1.04	18.00	4.46	3.15
C3C	0.65	0.90	18.00	4.46	2.60
C3D	0.70	0.71	10.00	5.76	2.87
C3E	0.67	1.14	17.00	4.59	3.54
C3F	0.71	0.37	10.00	5.76	1.51
C3G	0.66	1.09	16.00	4.72	3.41
C3H	0.65	0.94	17.00	4.59	2.80
C3I	0.65	0.69	17.00	4.59	2.07
C3J	0.68	0.48	10.00	5.76	1.87
C3K	0.76	0.73	10.00	5.76	3.21
C3L	0.66	1.65	20.00	4.23	4.59
C3M	0.73	0.14	10.00	5.76	0.59
C3N	0.72	0.45	12.00	5.36	1.75
C3O	0.71	0.35	14.00	5.02	1.24
C4A	0.75	1.09	10.00	5.76	4.68
C4B	0.72	0.84	10.00	5.76	3.50
C4C	0.75	0.47	10.00	5.76	2.02
C5A	0.45	3.86	22.00	4.03	7.02
C5B	0.46	2.18	19.00	4.34	4.34
C5C	0.57	0.81	10.00	5.76	2.65
C6A	0.67	1.48	14.00	5.02	5.00
C6B	0.67	1.11	17.00	4.59	3.42
C6C	0.64	3.04	21.00	4.13	8.00
C6D	0.67	0.91	12.00	5.36	3.26
C6E	0.67	0.66	10.00	5.76	2.52
C9A	0.78	0.53	10.00	5.76	2.41
C9B	0.74	1.12	10.00	5.76	4.75
C9C	0.51	0.72	10.00	5.76	2.11
C9D	0.59	1.52	10.00	5.76	5.17
D1A	0.35	2.48	12.00	5.36	4.66
D2A	0.62	7.26	30.00	3.40	15.37
D3A	0.62	2.67	10.00	5.76	9.50
E1A	0.48	6.07	13.00	5.18	15.22
E1B	0.73	2.23	10.00	5.76	9.31

NOTE:

1. CALCULATIONS SHOWN ARE BASED ON A FIVE YEAR DESIGN STORM.

100% SUBMITTAL

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

02/13/2022

Michael Verhoef

REV. NO.	DATE	DESCRIPTION	BY

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HYDROLOGIC DATA CALCS

FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	122

Link - ID	Link - Upstream Node	Link - Downstream Node	Link - Actual Length	Link - Hydraulic Length	Link - Slope	Link - Shape	Link - Rise	Link - Number of Barrels	Link - Mannin g's N	Link - Invert Upstream	Link - Invert Downstream	Link - Uniform Depth	Link - Actual Depth	Link - Actual Depth	Link - Uniform Velocity	Link - Actual Velocity	Link - Actual Velocity	Link - HGL Upstream	Link - HGL Downstream	Link - Capacity	Link - Discharge
1	B3B	OutB	83.93	85.43	0.10	Circular	2.00	1	0.01	368.69	368.60	2.00	1.97	1.45	5.27	5.15	6.62	370.66	370.05	8.34	16.13
2	B5B	B3B	64.03	68.03	0.26	Circular	2.00	1	0.01	369.44	369.26	1.76	1.56	1.40	4.51	5.03	5.62	370.99	370.66	13.49	13.20
6	B6A	B6BJun	44.36	48.86	0.20	Circular	2.00	1	0.01	366.70	366.60	0.73	2.00	2.00	2.98	0.99	0.99	370.56	370.54	11.79	3.11
7	B6BJun	B6B	169.08	173.58	0.10	Circular	3.00	1	0.01	365.57	365.40	2.29	3.00	3.00	3.51	2.87	2.87	370.54	369.57	24.58	20.29
8	B6B	B7A	79.33	84.33	0.57	Circular	3.00	1	0.01	365.40	364.92	1.32	3.00	3.00	7.25	3.07	3.07	369.57	369.49	58.67	21.70
9	B7A	B4A	35.55	39.56	0.10	Circular	3.00	1	0.01	364.92	364.88	3.00	3.00	3.00	6.58	6.42	6.42	369.49	367.94	24.58	45.37
10	B7C	B7A	88.25	93.27	0.10	Circular	3.00	1	0.01	365.01	364.92	2.46	3.00	3.00	3.69	3.24	3.24	370.74	369.49	24.58	22.91
11	B7B	B7C	35.28	40.28	0.10	Circular	2.25	1	0.01	365.31	365.27	1.72	2.25	2.25	2.90	2.37	2.37	370.86	370.74	11.41	9.43
12	B7E	B7C	212.03	217.02	0.20	Circular	2.00	1	0.01	366.45	366.01	1.88	2.00	2.00	3.77	3.67	3.67	371.59	370.74	11.79	11.54
13	B7D	B7E	12.75	15.75	0.25	Circular	2.00	1	0.01	367.99	367.95	0.76	2.00	2.00	3.44	1.21	1.21	371.62	371.59	13.18	3.79
14	B7F	B7E	214.09	219.11	0.20	Circular	2.00	1	0.01	368.94	368.50	0.91	2.00	2.00	3.30	1.46	1.46	371.71	371.59	11.79	4.58
15	C6A	C6C	129.51	133.51	0.10	Circular	2.00	1	0.01	364.00	363.87	1.17	1.37	1.44	2.61	2.17	2.07	365.37	365.30	8.34	5.00
17	C6C	C6B	70.31	74.32	0.30	Circular	2.00	1	0.01	363.87	363.64	1.50	1.44	1.25	4.81	5.02	5.86	365.30	364.89	14.44	12.12
18	C3A	C6B	50.00	55.00	0.51	Circular	3.00	1	0.01	368.92	368.64	0.60	0.82	0.60	4.53	2.90	4.50	369.74	369.24	55.69	4.55
19	C6B	C6D	174.48	179.47	0.10	Circular	3.50	1	0.01	359.60	359.42	1.85	2.16	2.26	3.56	2.94	2.79	361.76	361.68	37.08	18.35
20	C3C	C3B	30.64	34.09	0.10	Circular	2.00	1	0.01	368.02	367.98	0.79	1.02	1.04	2.24	1.62	1.57	369.04	369.02	8.34	2.60
21	C3B	C6D	42.97	46.97	0.10	Circular	2.00	1	0.01	367.98	367.94	1.29	1.04	0.84	2.66	3.46	4.53	369.02	368.78	8.34	5.71
22	C6D	C6E	285.63	290.63	0.10	Circular	3.50	1	0.01	359.42	359.13	2.26	2.26	2.26	3.90	3.90	3.90	361.68	361.39	37.08	25.61
23	C3D	C6E	38.44	42.44	0.37	Circular	2.00	1	0.01	366.33	366.18	0.59	0.78	0.59	3.67	2.54	3.70	367.11	366.77	16.01	2.87
24	C6E	C5C	487.12	492.12	0.10	Circular	3.50	1	0.01	359.13	358.64	2.46	2.26	1.65	3.94	4.35	6.41	361.39	360.29	37.08	28.54
25	C3E	C3F	170.07	175.05	0.10	Circular	2.00	1	0.01	360.00	359.82	0.94	0.96	0.98	2.44	2.36	2.30	360.96	360.81	8.34	3.54
26	C3F	C3G	91.91	96.91	0.10	Circular	2.00	1	0.01	359.82	359.73	1.11	0.98	0.75	2.55	2.99	4.24	360.81	360.48	8.34	4.58
27	C5C	C3G	40.19	45.19	0.89	Circular	3.50	1	0.01	357.50	357.10	1.27	1.66	1.36	9.19	6.44	8.34	359.16	358.46	110.30	28.97
28	C3G	C3N	274.87	286.17	0.10	Circular	3.50	1	0.01	356.79	356.50	3.29	2.45	1.85	3.78	4.92	6.89	359.24	358.35	37.32	35.45
29	C3O	C3J	82.05	88.09	0.52	Circular	3.50	1	0.01	354.34	353.88	1.77	3.50	3.50	8.22	4.17	4.17	357.92	357.80	84.88	40.14
30	C3N	C3O	187.42	187.42	0.57	Circular	3.50	1	0.01	355.42	354.34	1.67	2.54	3.50	8.38	5.07	3.94	357.96	357.92	88.74	37.91
31	C3J	C4A	47.43	52.43	0.10	Circular	3.50	1	0.01	353.88	353.83	3.50	3.50	3.50	4.39	4.28	4.28	357.80	357.73	37.04	41.16
33	C4A	C4C	125.92	130.92	0.40	Circular	3.50	1	0.01	353.83	353.30	2.03	3.50	3.50	7.60	4.56	4.56	357.73	357.52	74.43	43.89
34	MH3	C4C	18.84	23.34	1.02	Circular	2.50	1	0.01	354.25	354.01	0.94	2.50	2.50	7.98	2.74	2.74	357.54	357.52	48.24	13.46
35	C4C	C1A	39.22	44.22	0.65	Circular	3.50	1	0.01	353.01	352.73	2.05	3.50	3.50	9.68	5.90	5.90	357.52	357.40	94.31	56.77
37	C1C	C1B	191.86	196.86	0.79	Circular	2.00	1	0.01	356.34	354.78	0.40	0.92	2.00	4.26	1.33	0.60	357.25	357.26	23.41	1.88
38	C1D	C1B	49.50	54.50	0.10	Circular	2.50	1	0.01	354.34	354.28	1.76	2.50	2.50	3.30	2.48	2.48	357.30	357.26	15.12	12.18
39	C3K	MH5	101.98	105.49	1.28	Circular	2.00	1	0.01	355.24	353.89	0.46	2.00	2.00	5.88	1.02	1.02	357.41	357.40	29.88	3.21
40	C2B	C9A	45.04	50.04	0.10	Circular	3.50	1	0.01	352.54	352.49	2.67	3.50	3.50	4.00	3.27	3.27	357.51	357.47	37.08	31.46
41	C9A	MH5	100.49	104.99	0.10	Circular	4.00	1	0.01	351.99	351.89	2.82	4.00	4.00	4.35	3.27	3.27	357.47	357.40	52.93	41.13
42	C2A	MH5	83.64	88.12	1.20	Circular	2.00	1	0.01	354.95	353.89	0.74	2.00	2.00	7.44	2.50	2.50	357.49	357.40	28.91	7.87
43	C1E	C2A	50.78	55.78	0.10	Circular	2.00	1	0.01	355.00	354.95	0.82	2.00	2.00	2.19	0.85	0.85	357.49	357.49	8.34	2.66
44	MH5	MH4	202.56	208.06	0.33	Circular	4.00	1	0.01	351.89	351.20	2.11	4.00	4.00	7.32	3.92	3.92	357.40	357.19	96.15	49.27
46	C3L	C3M	56.98	60.98	0.10	Circular	3.00	1	0.01	355.36	355.30	2.29	1.79	1.56	3.72	4.88	5.78	357.15	356.86	24.58	21.52
47	E1A	E1B	56.42	61.42	0.12	Circular	2.00	1	0.01	341.52	341.45	2.00	2.00	1.82	4.97	4.84	5.07	343.81	343.27	8.99	15.22
48	E1B	OutE	420.00	2422.50	0.67	Circular	2.00	1	0.01	341.45	325.10	1.82	1.82	1.72	7.81	7.81	8.16	343.27	326.82	23.63	23.44
49	C3M	OutD	553.80	556.30	0.31	Circular	3.00	1	0.01	355.30	353.55	1.56	1.56	1.50	5.84	5.84	6.16	356.86	355.05	43.59	21.74
50	MH4	OutC	430.22	433.72	0.04	Circular	4.00	1	0.01	351.20	351.03	4.00	4.00	3.28	9.65	9.41	10.73	357.19	354.31	33.14	118.25
58	C5A	MH7	50.04	55.54	0.90	Circular	2.00	1	0.01	355.36	354.86	0.97	2.00	2.00	7.29	3.52	3.52	357.75	357.64	24.98	11.05
59	C5B	C5A	20.31	25.31	0.23	Circular	2.00	1	0.01	355.42	355.36	0.85	2.00	2.00	3.41	1.38	1.38	357.76	357.75	12.55	4.34
60	MH7	MH3	104.33	109.33	0.10	Circular	2.50	1	0.01	354.36	354.25	2.05	2.50	2.50	3.12	2.74	2.74	357.64	357.54	15.12	13.46
61	C2J	C2H	61.28	66.28	0.10	Circular	2.00	1	0.01	357.41	357.34	1.29	1.69	1.72	2.77	2.10	2.07	359.10	359.06	8.34	5.95
62	C2I	C2H	51.75	57.78	0.50	Circular	2.00	1	0.01	357.63	357.34	0.85	1.45	1.72	5.14	2.69	2.27	359.08	359.06	18.64	6.54
63	C2H	C2G	203.50	208.50	0.36	Circular	2.00	1	0.01	357.34	356.58	1.44	1.72	2.00	5.33	4.48	4.10	359.06	358.59	15.90	12.89
64	C2G	C2F	205.28	210.28	0.17	Circular	2.50	1	0.01	356.08	355.72	2.05	2.50	2.50	4.30	3.78	3.78	358.59	358.23	19.84	18.54
65	C2F	C2E	50.01	55.01	0.10	Circular	3.00	1	0.01	355.22	355.16	2.29	3.00	3.00	3.51	2.87	2.87	358.23	358.18	24.58	20.30
66	C2E	C2D	107.42	112.42	0.19	Circular	3.00	1	0.01	355.16	354.95	1.80	3.00	3.00	4.74	2.98	2.98	358.18	358.09	33.71	21.04
67	C2D	C2C	223.09	228.09	0.28	Circular	3.00	1	0.01	354.95	354.33	1.67	3.00	3.00	5.57	3.19	3.19	358.09	357.87	40.77	22.57
68	C2C	C2B	216.44	221.44	0.58	Circular	3.00	1	0.01	354.33	353.04	1.54	3.00	3.00	7.92	4.09	4.09	357.87	357.51	59.18	28.94
69	C9D	C9C	319.28	324.28	0.35	Circular	2.00	1	0.01	357.52	356.39	0.82	1.14	1.86	4.25	2.81	1.70	358.65	358.24	15.58	5.17
70	C9C	C9B	634.38	639.38	0.21	Circular	2.00	1	0.01	356.39	355.07	1.14	1.86	2.00	3.74	2.28	2.21	358.24	357.74	11.96	6.95
71	C9B	C9A	146.09	151.08	0.71	Circular	2.00	1	0.01	355.07	353.99	1.00	2.00	2.00	6.61	3.32	3.32	357.74	357.47	22.27	10.44
72	D1A	MH8	165.10	169.10	0.30	Circular	2.00	1	0.01	359.51	359.00	0.82	1.06	0.76	3.83	2.74	4.26	360.57	359.76	14.37	4.66
73	D2A	MH8	19.96	21.96	0.34	Circular	2.00	1	0.01	357.64	357.57	1.88	2.00	1.41	5.02	4.89	6.48	359.94	358.98	15.37	15.37
74	MH8	MH9	125.33	129.33	0.25	Circular	2.50	1	0.01	356.40	356.07	1.72	1.72	1.71	5.07	5.07	5.11	358.12	357.79	23.90	18.30
75	MH10	C3L	83.73	88.23	0.25	Circular	2.50	1	0.01	355.76	355.54	1.72	1.68	1.61	5.07	5.21	5.46	357.44	357.15	23.90	18.30
76	B6C	B6BJun	43.75	48.25	0.20	Circular	2.50	1	0.01	366.17	366.07	1.83	2.50	2.50	4.62	3.63	3.63	370.82	370.54	21.38	17.81
78	B2A	Out	9.98	12.48	0.00	Circular	2.00	1	0.01	-2.00	-2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	C1A	MH4	66.74	72.74	1.41	Circular	3.50	1	0.01	352.73	351.70	1.65	3.50	3.50	13.14	6.09	6.09	357.40	357.19	139.29	58.56
80	C1B	MH4	62.55	68.55	2.31	Circular	2.50	1	0.01	354.28	352.70	0.78	2.50	2.50	10.93	2.93	2.93	357.26	357.19	72.63	14.39
81	C4B	MH7	13.61	19.11	4.34	Circular	2.00	1	0.01	355.69	354.86	0.35	1.95	2.00	9.30	1.12	1.11	357.64	357.64	54.91	3.50
82	B4A	OutB2	226.57	229.07	0.25	Circular	3.00	1	0.01	364.88	364.30	3.00	3.00	2.27	7.02	6.85	8.45	367.94	366.57	39.11	48.39
83	B5A	B5B	259.59	264.59	0.31	Circular	2.00	1	0.01	370.25	369.44	1.23	1.24	1.56	4.66	4.60	3.60	371.49	370.99	14.60	9.46
84	B3A	B5A	65.86	69.86	0.10	Circular	2.00	1	0.01	370.32	370.25	1.23	1.24	1.24	2.65	2.63	2.62	371.56	371.49	8.34	5.39
85	MH9	MH10	121.32	125.32	0.25	Circular	2.50	1	0.01	356.07	355.76	1.72	1.71	1.68	5.07	5.11	5.21	357.79	357.44	23.90	18.30

NOTE:

1. CALCULATIONS SHOWN ARE BASED ON A FIVE YEAR DESIGN STORM.

100% SUBMITTAL

02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

REV. NO.	DATE	DESCRIPTION	BY

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HYDRAULIC DATA CALCS - LINKS

SHEET 1 OF 2

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	123

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135_DRAIN-SITE-CALC02.dgn

Inlet - ID	Inlet - Type	Inlet - Discharge	Inlet - Capacity	Inlet - Longitudinal Slope	Inlet - Max Ponded	Inlet - Computed Ponded	Inlet - Max Ponded	Inlet - Computed Ponded	Inlet - By Pass Flow	Inlet - By Pass Flow	Inlet - By Pass Node ID
B3A	Curb and Grate	5.40	5.39	0.38	33.50	13.74	0.67	0.41	0.01	0.00	B3B
B3B	Curb and Grate	4.41	4.23	0.38	23.50	12.71	0.42	0.38	0.18	0.01	OutB
B4A	Curb	4.51	14.39	n/a	10.50	10.35	0.50	0.23	0.00	0.00	
B5A	Curb	5.82	5.61	0.38	21.50	14.10	0.50	0.42	0.21	0.00	B5B
B5B	Curb	5.60	5.43	0.38	21.50	13.90	0.50	0.42	0.17	0.21	B6A
B6A	Curb	3.28	3.27	0.82	10.00	9.86	0.50	0.30	0.01	0.17	B6B
B6B	Curb	2.60	2.60	0.56	10.00	9.73	0.50	0.29	0.00	0.01	
B6C	Curb	17.81	20.00	n/a	35.00	0.00	2.00	1.76	0.00	0.00	
B7A	Curb	6.94	7.94	n/a	19.00	12.17	0.28	0.26	0.00	0.00	
B7B	Curb	9.43	10.57	2.50	12.00	11.90	0.50	0.36	0.00	0.00	
B7C	Curb	3.74	3.74	1.15	10.00	9.73	0.50	0.29	0.00	0.00	
B7E	Curb	3.94	3.94	1.50	9.50	9.44	0.50	0.28	0.00	0.03	
B7F	Curb	4.58	4.55	2.30	9.50	9.22	0.28	0.28	0.03	0.00	B7E
C1A	Curb	3.05	6.26	n/a	50.00	21.78	0.50	0.31	0.00	0.00	
C1B	Curb	1.55	1.55	0.70	13.50	12.27	0.50	0.17	0.00	0.00	
C1C	Curb	1.88	1.88	0.71	12.00	11.49	0.50	0.20	0.00	0.00	
C1D	Curb	12.18	14.40	n/a	15.00	14.00	0.39	0.38	0.00	0.00	
C1E	Curb	2.66	4.33	n/a	20.00	7.23	0.28	0.20	0.00	0.00	
C2A	Curb	5.87	6.03	n/a	20.00	10.05	0.28	0.27	0.00	0.00	
C2B	Curb	3.76	9.11	n/a	10.00	8.12	0.46	0.26	0.00	0.00	
C2C*	Curb	7.31	10.00	n/a	0.00	0.00	0.00	0.00	0.00	0.00	
C2D*	Curb	2.39	10.00	n/a	0.00	0.00	0.00	0.00	0.00	0.00	
C2E*	Curb	1.20	10.00	n/a	0.00	0.00	0.00	0.00	0.00	0.00	
C2F*	Curb	2.90	10.00	n/a	0.00	0.00	0.00	0.00	0.00	0.00	
C2G*	Curb	6.54	10.00	n/a	0.00	0.00	0.00	0.00	0.00	0.00	
C2H*	Curb	1.14	10.00	n/a	0.00	0.00	0.00	0.00	0.00	0.00	
C2I*	Curb	6.54	10.00	n/a	0.00	0.00	0.00	0.00	0.00	0.00	
C2J*	Curb	5.95	10.00	n/a	0.00	0.00	0.00	0.00	0.00	0.00	
C3A	Curb	4.55	4.55	1.33	10.50	10.19	0.50	0.31	0.00	0.00	
C3B	Curb and Grate	3.15	3.08	0.60	10.50	10.31	0.50	0.31	0.08	0.00	C3D
C3C	Grate	2.60	17.68	n/a	0.00	0.00	0.00	0.00	0.00	0.00	
C3D	Curb and Grate	2.95	2.89	0.60	10.50	10.07	0.50	0.30	0.06	0.08	C3E
C3E	Curb	3.59	3.59	0.97	10.50	9.90	0.50	0.30	0.00	0.06	
C3F	Curb	1.51	1.51	1.81	9.50	6.36	0.50	0.19	0.00	0.00	
C3G	Curb	3.41	3.22	1.65	9.50	8.79	0.50	0.26	0.19	0.00	C3N
C3J	Curb	1.87	1.87	0.79	13.00	12.44	0.50	0.19	0.00	0.00	C3K
C3K	Curb	3.21	5.24	n/a	50.00	14.45	0.22	0.16	0.00	0.00	
C3L	Curb	4.59	4.59	1.05	16.00	15.25	0.50	0.26	0.00	0.00	
C3M	Curb	0.59	0.59	1.05	14.00	4.95	0.50	0.15	0.00	0.00	
C3N	Curb	1.94	1.94	0.96	9.50	7.87	0.50	0.24	0.00	0.19	
C3O	Curb	1.24	1.24	0.96	9.50	6.66	0.50	0.20	0.00	0.00	
C4A	Curb	4.68	7.47	n/a	8.50	8.33	0.32	0.24	0.00	0.00	
C4B	Curb	3.50	10.00	n/a	0.00	0.00	0.00	0.00	0.00	0.00	
C4C	Curb	2.02	5.51	n/a	11.20	7.52	0.46	0.24	0.00	0.00	
C5A	Curb	7.02	10.00	n/a	0.00	0.00	0.00	0.00	0.00	0.00	
C5B	Curb	4.37	10.00	n/a	0.00	0.00	0.00	0.00	0.00	0.03	
C5C	Curb	2.65	2.62	1.65	9.50	7.99	0.50	0.24	0.03	0.00	C5B
C6A	Curb	5.00	5.00	1.68	10.50	10.11	0.50	0.30	0.00	0.00	
C6B	Curb	3.42	3.42	1.17	9.50	9.38	0.50	0.28	0.00	0.00	
C6D	Curb	3.26	3.26	0.60	10.50	10.44	0.50	0.31	0.00	0.00	
C6E	Curb	2.52	2.52	0.60	10.50	9.49	0.50	0.28	0.00	0.00	
C9A	Curb	2.41	4.15	n/a	10.00	7.06	0.38	0.26	0.00	0.00	
C9B	Curb	4.75	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
C9C*	Curb	2.11	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
C9D*	Curb	5.17	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
E1A*	Curb	15.22	29.68	n/a	18.00	11.53	0.81	0.52	0.00	0.00	
E1B	Curb	9.31	14.61	n/a	18.00	13.34	0.63	0.47	0.00	0.00	

* Existing inlet. Assume full capture.

NOTE:

1. CALCULATIONS SHOWN ARE BASED ON A FIVE YEAR DESIGN STORM.

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02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

REV. NO.	DATE	DESCRIPTION	BY

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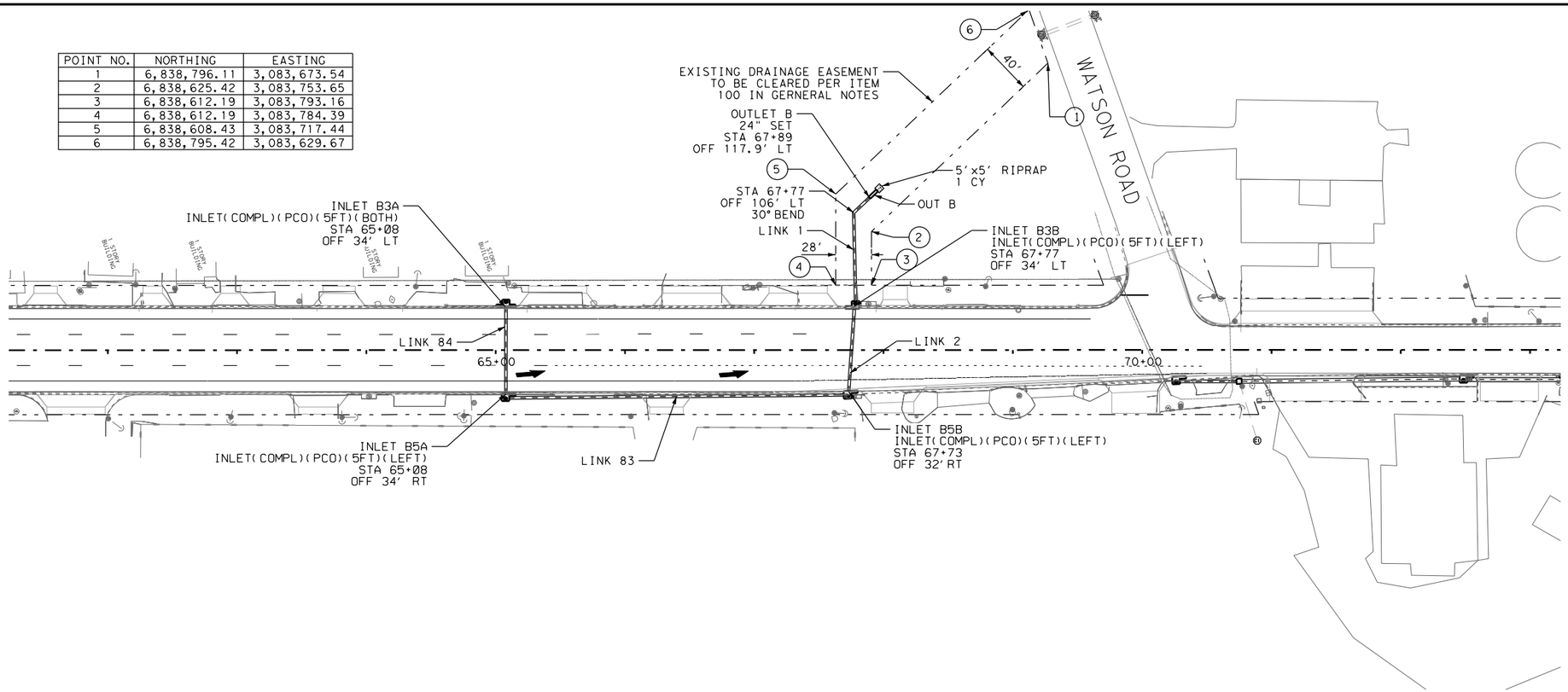
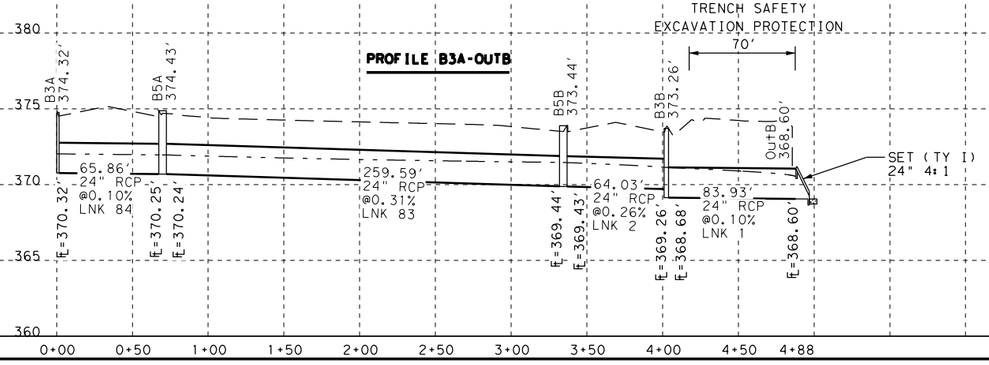
HYDRAULIC DATA CALCS - INLETS

SHEET 2 OF 2

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	124

POINT NO.	NORTHING	EASTING
1	6,838,796.11	3,083,673.54
2	6,838,625.42	3,083,753.65
3	6,838,612.19	3,083,793.16
4	6,838,612.19	3,083,784.39
5	6,838,608.43	3,083,717.44
6	6,838,795.42	3,083,629.67





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STATE OF TEXAS
MICHAEL D. VERHOEF
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LICENSED
PROFESSIONAL ENGINEER

02/13/2022

Michael Verhoef

0 25 50 100(H)
0 5 10(V)

REV. NO.	DATE	DESCRIPTION	BY

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Texas Department of Transportation

SH 135S
STORM DRAIN
PLAN & PROFILE

SHEET 1 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	125

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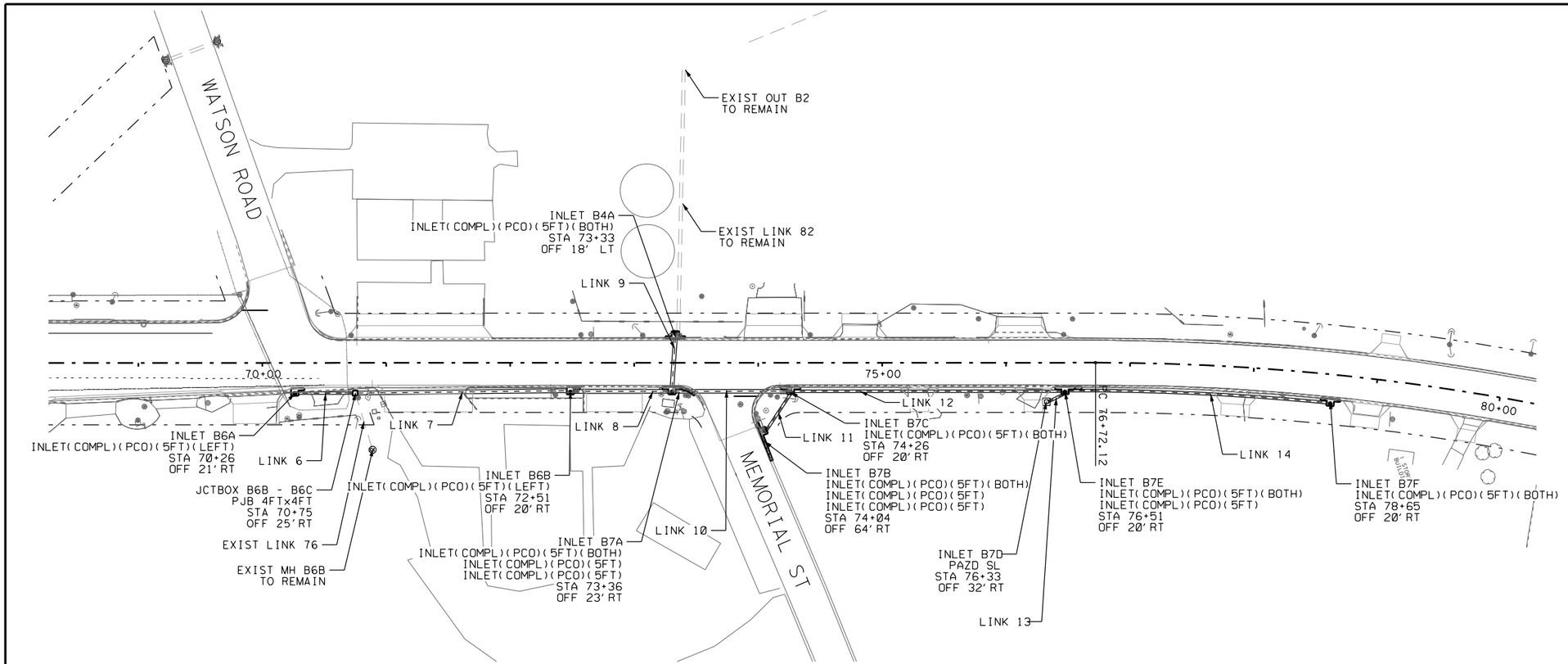
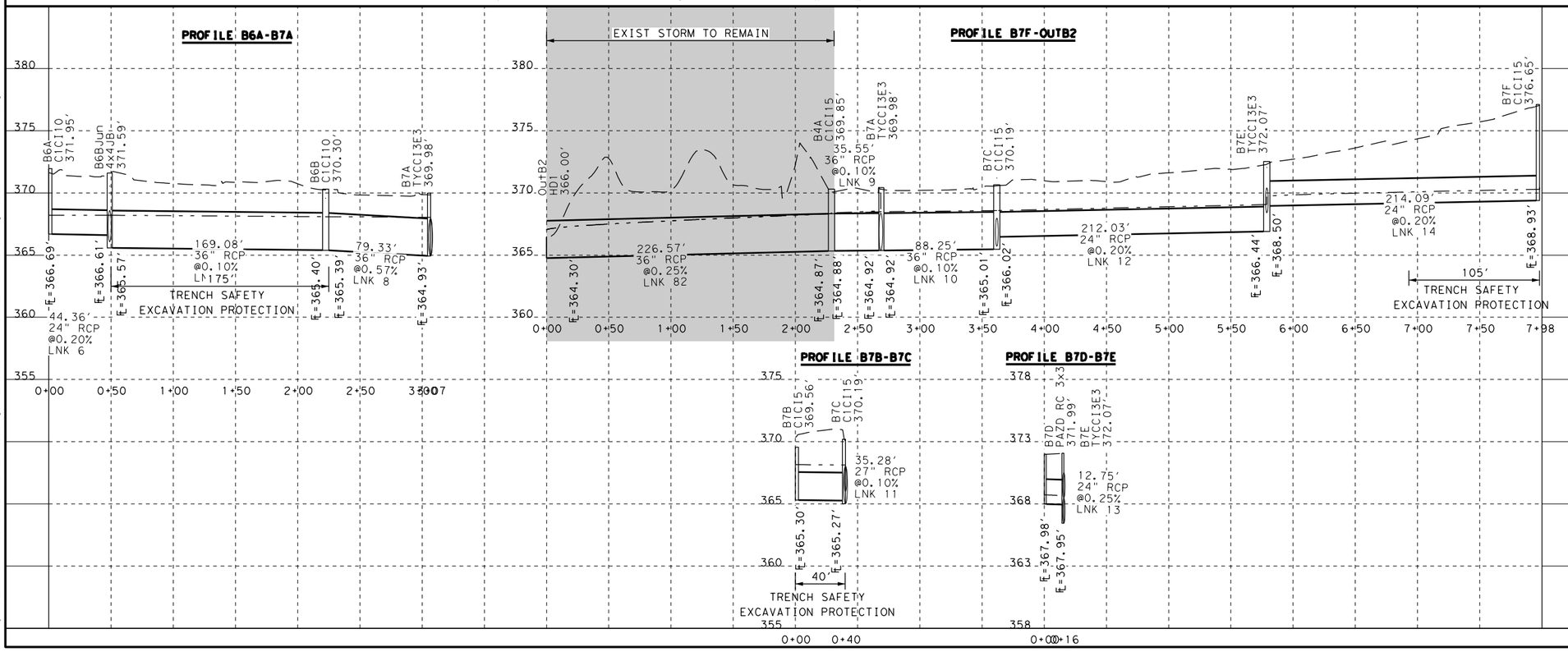


NOTE:

1. EXISTING STORM PIPES, INLETS, AND OUTFALLS SHOWN HERE ARE BASED ON FIELD OBSERVATIONS AND AS-BUILTS.
2. EXISTING STORM PROFILES ARE APPROXIMATIONS BASED ON AS-BUILT PIPE SIZES AND MEASURED OUTFALL ELEVATIONS.
3. NO WORK IS TO BE PERFORMED IN SHADED AREAS.



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02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED PROFESSIONAL ENGINEER

Michael Verhoef

0 25 50 100(H)

0 5 10(V)

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SH 135S
STORM DRAIN
PLAN & PROFILE

SHEET 2 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	126

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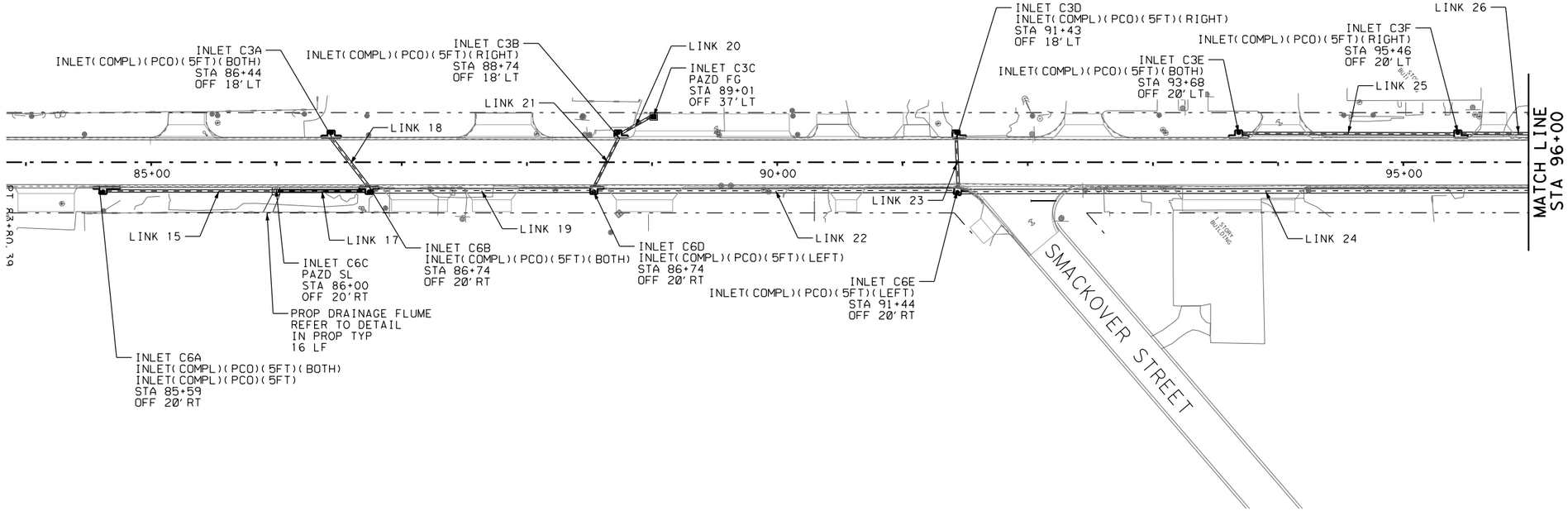
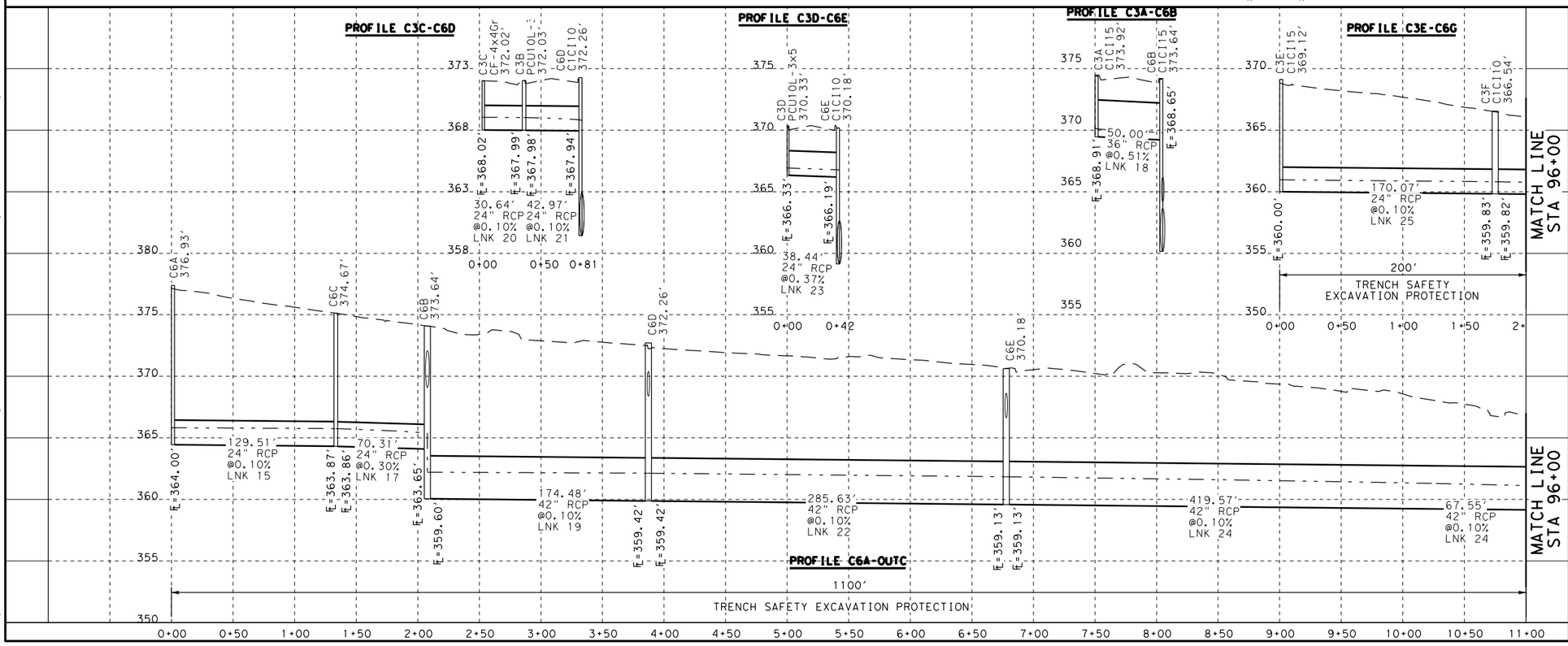
135_DRAIN-P&P-135S-02.dgn





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02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

0 25 50 100(H)
0 5 10(V)

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
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Texas Department of Transportation

SH 135S
STORM DRAIN
PLAN & PROFILE

SHEET 3 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	127

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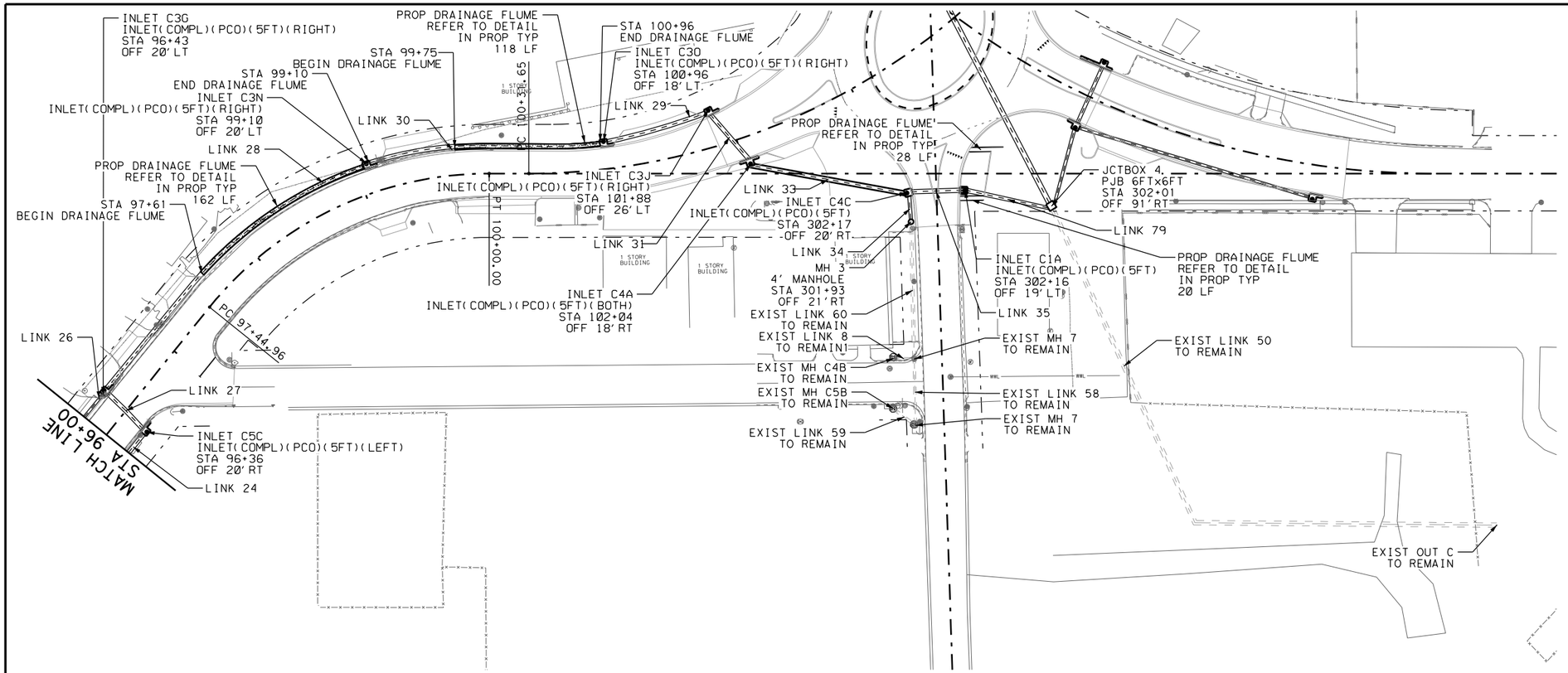

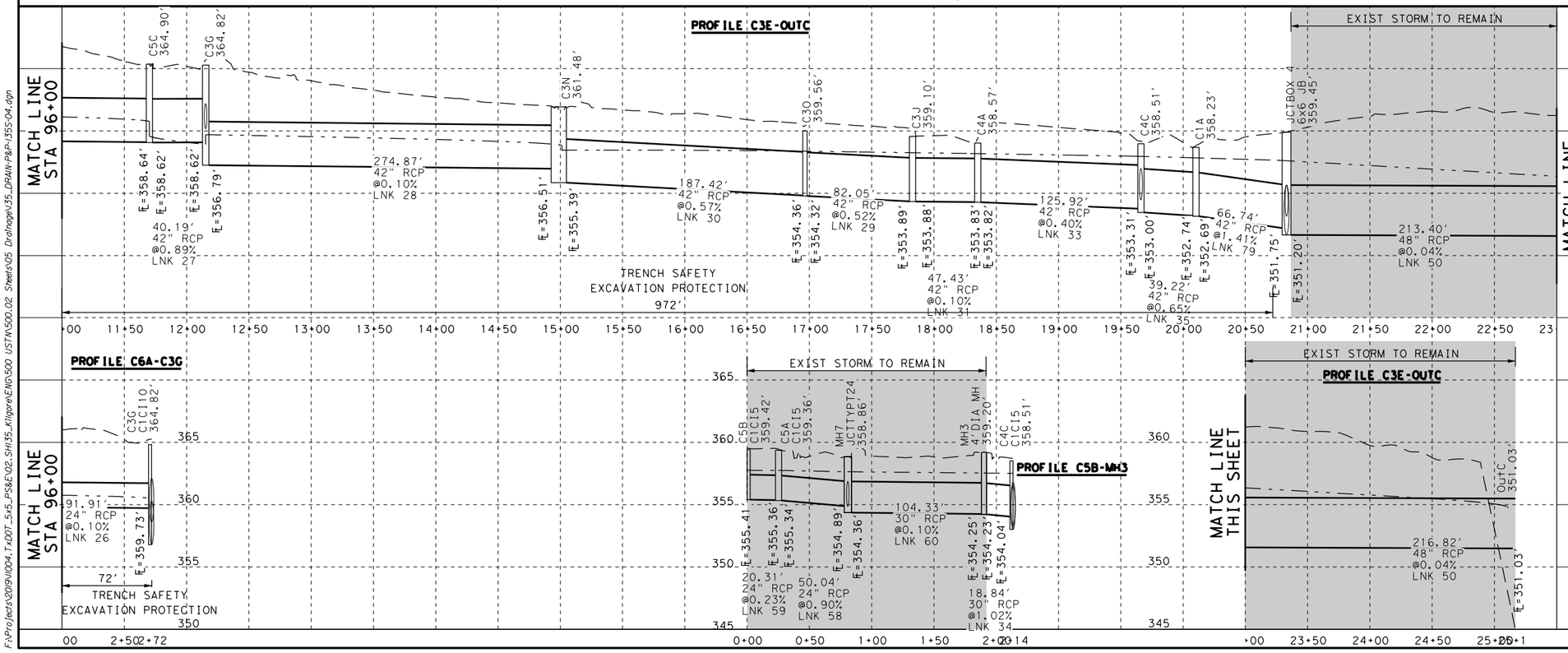

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02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

0 25 50 100(H)

0 5 10(V)

REV. NO.	DATE	DESCRIPTION	BY

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SH 135S
STORM DRAIN
PLAN & PROFILE

SHEET 4 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	128

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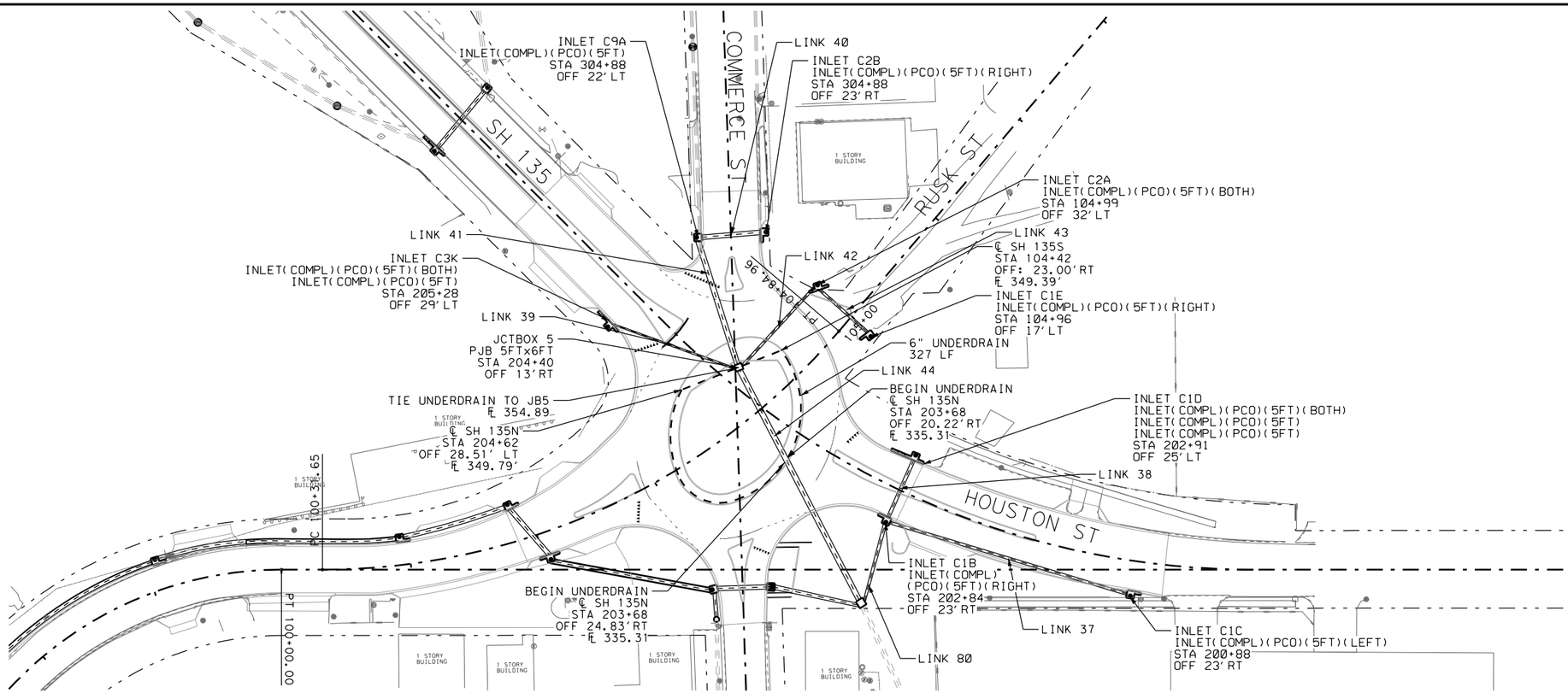
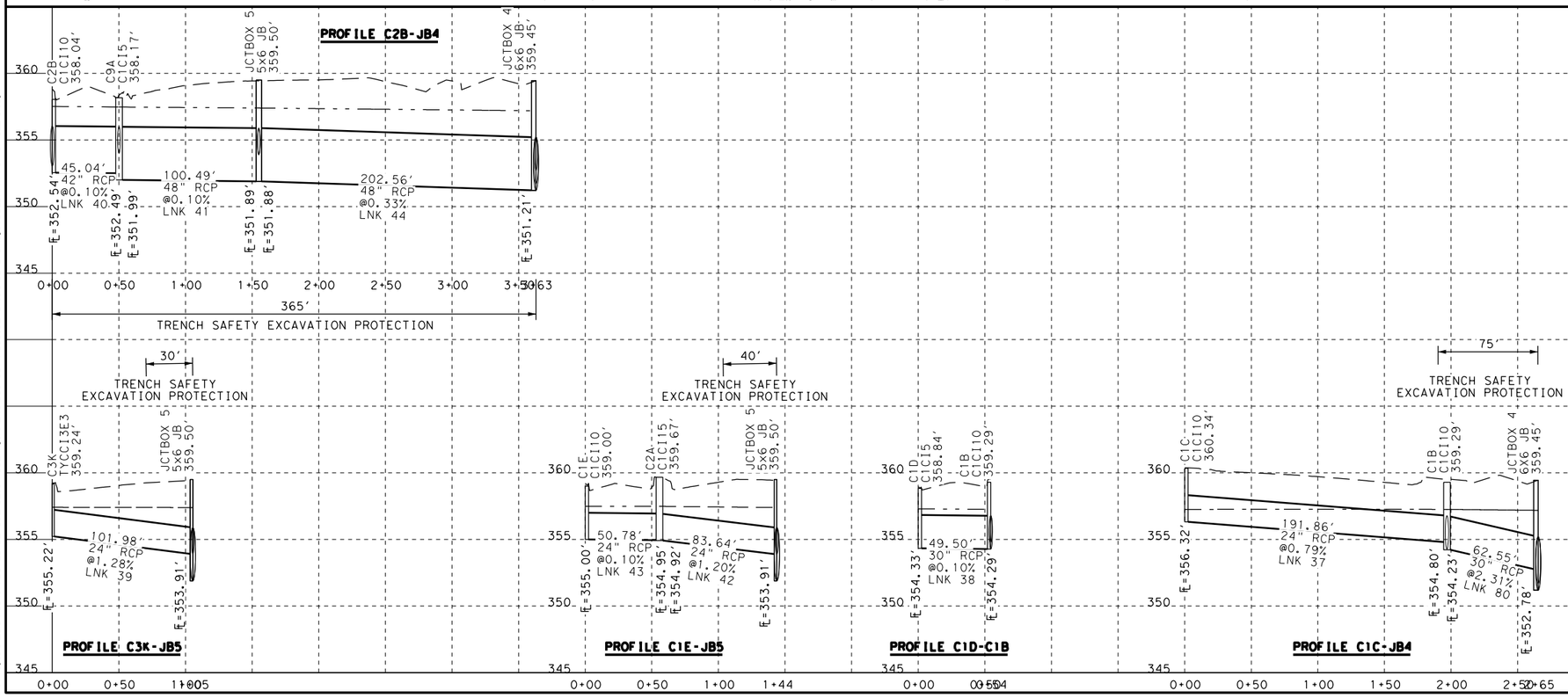


NOTE:

1. UNDERDRAIN TO BE INSTALLED 1' BEHIND BACK OF MOUNTABLE CURB



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02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

0 25 50 100(H)
0 5 10(V)

REV. NO.	DATE	DESCRIPTION	BY

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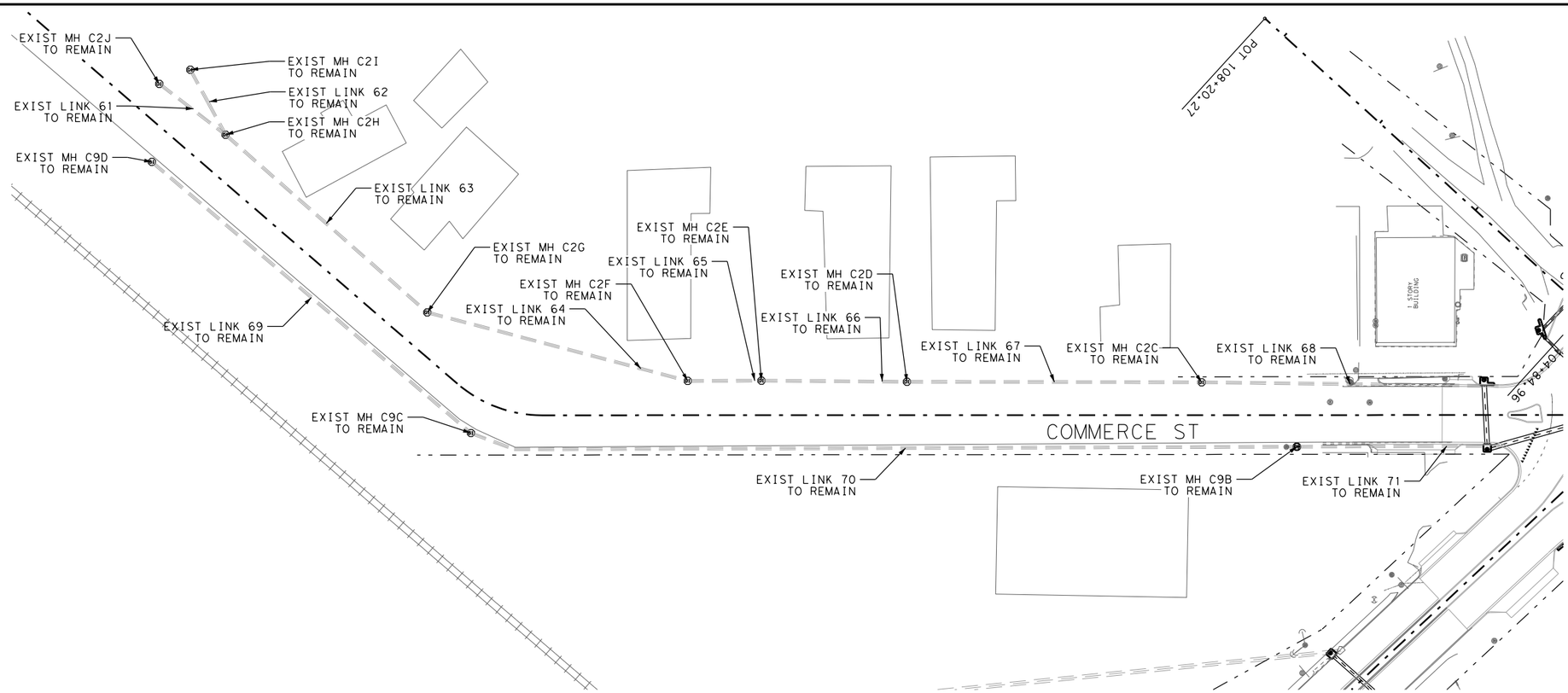
Texas Department of Transportation

CIRCLE
DRAINAGE PLAN & PROFILE

SHEET 1 OF 1

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	129



NOTE:

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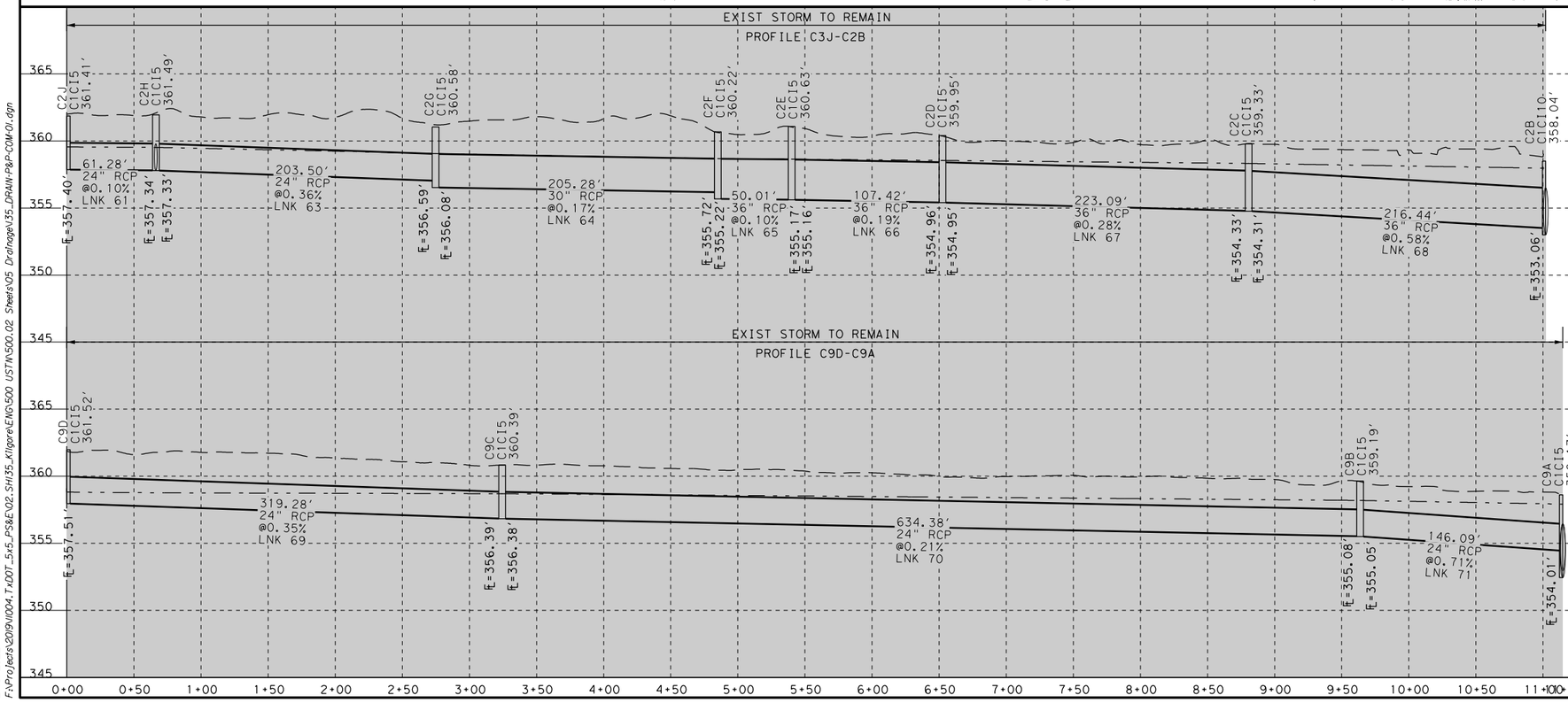

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02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
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LICENSED PROFESSIONAL ENGINEER

Michael Verhoef

0 25 50 100(H)

0 5 10(V)

REV. NO.	DATE	DESCRIPTION	BY

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Texas Department of Transportation

COMMERCE ST NORTH DRAINAGE PLAN & PROFILE

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	130

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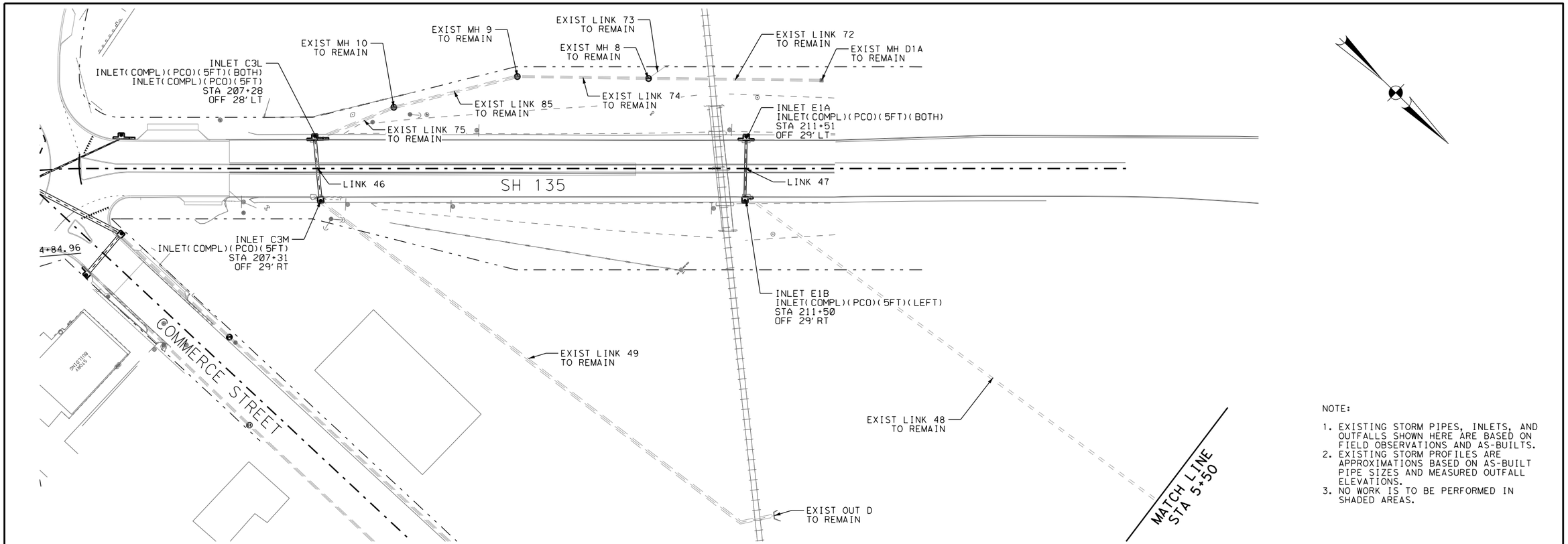
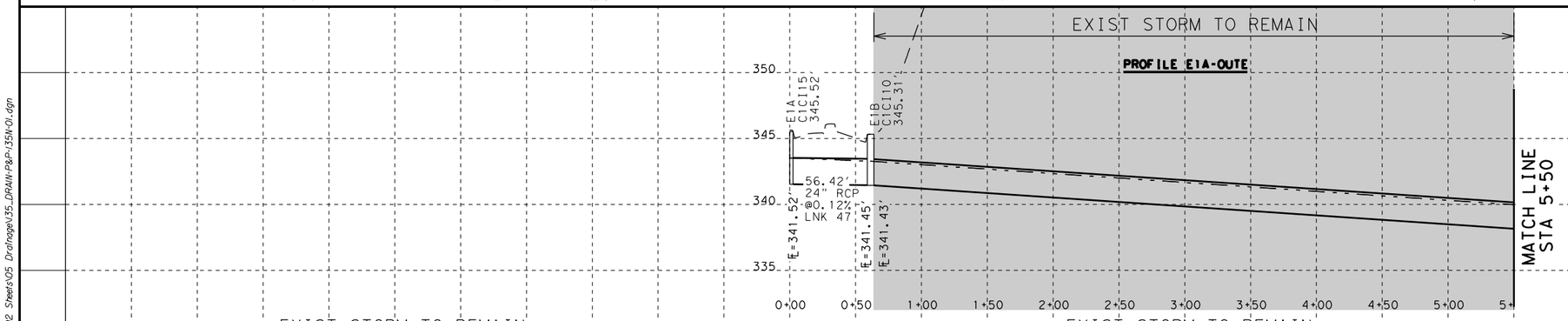
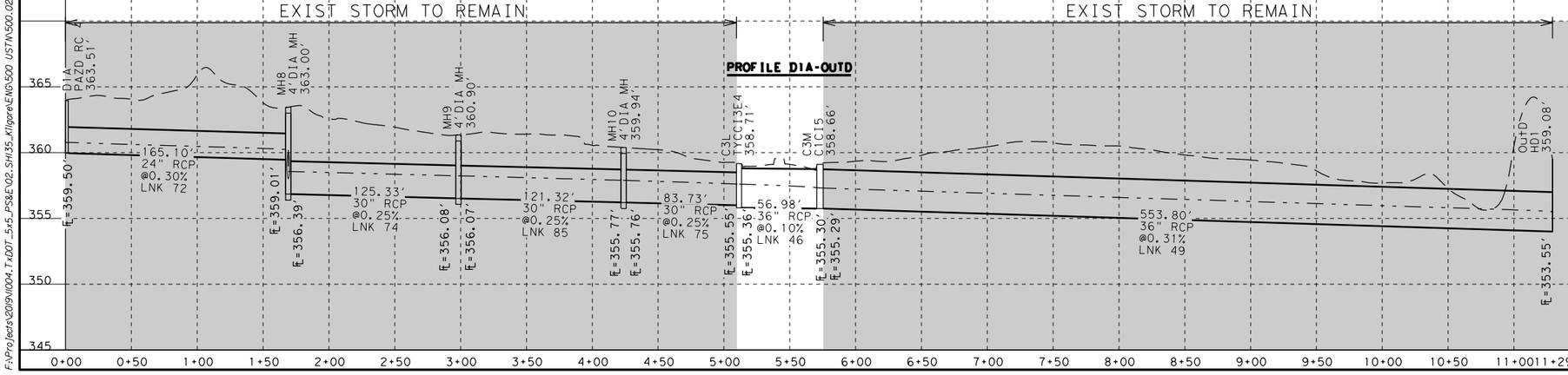


NOTE:

1. EXISTING STORM PIPES, INLETS, AND OUTFALLS SHOWN HERE ARE BASED ON FIELD OBSERVATIONS AND AS-BUILTS.
2. EXISTING STORM PROFILES ARE APPROXIMATIONS BASED ON AS-BUILT PIPE SIZES AND MEASURED OUTFALL ELEVATIONS.
3. NO WORK IS TO BE PERFORMED IN SHADED AREAS.





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02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

0 25 50 100(H)

0 5 10(V)

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

135N
DRAINAGE PLAN & PROFILE

SHEET 1 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	131

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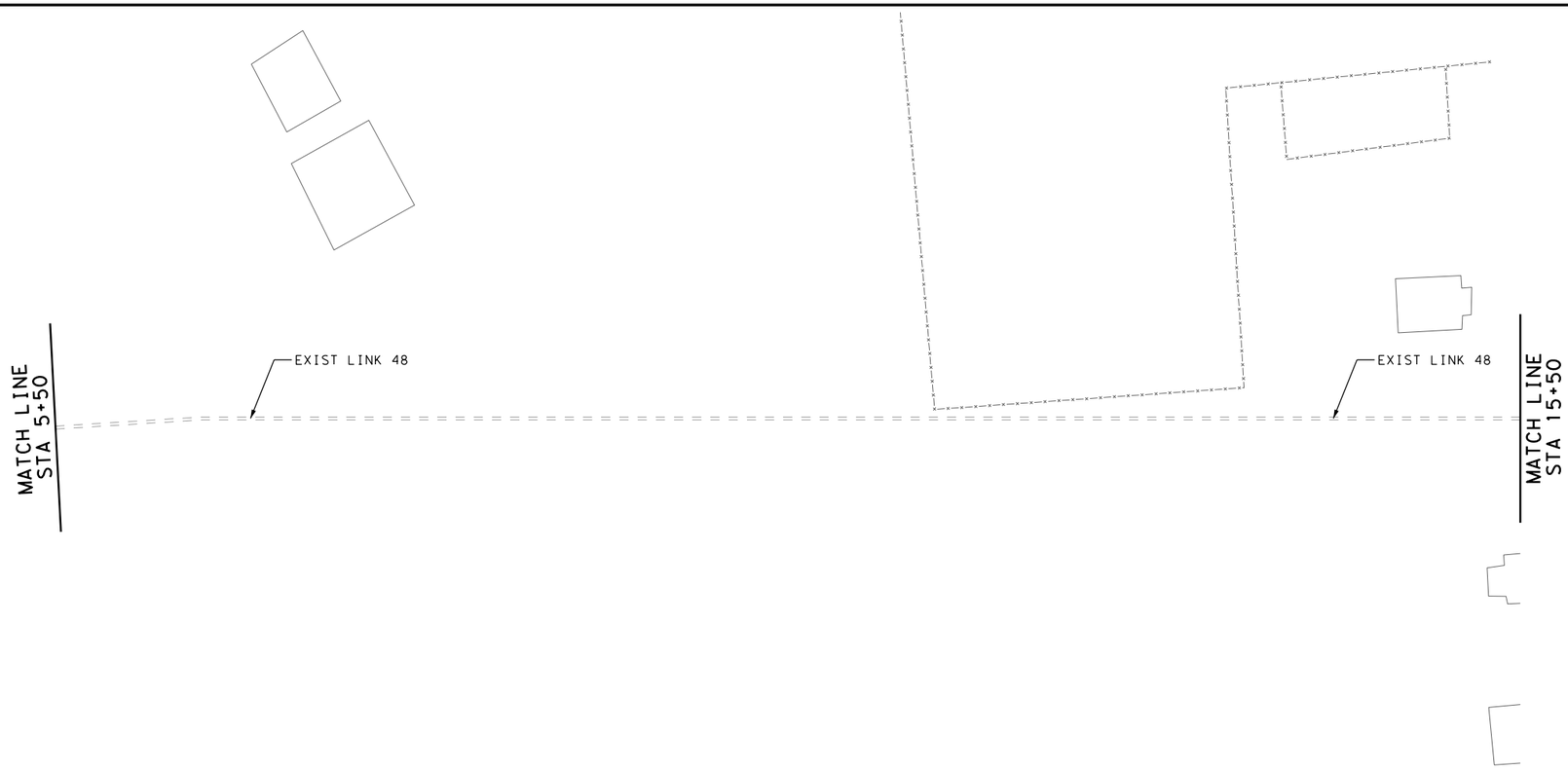

NOTE:

1. EXISTING STORM PIPES, INLETS, AND OUTFALLS SHOWN HERE ARE BASED ON FIELD OBSERVATIONS AND AS-BUILTS.
2. EXISTING STORM PROFILES ARE APPROXIMATIONS BASED ON AS-BUILT PIPE SIZES AND MEASURED OUTFALL ELEVATIONS.
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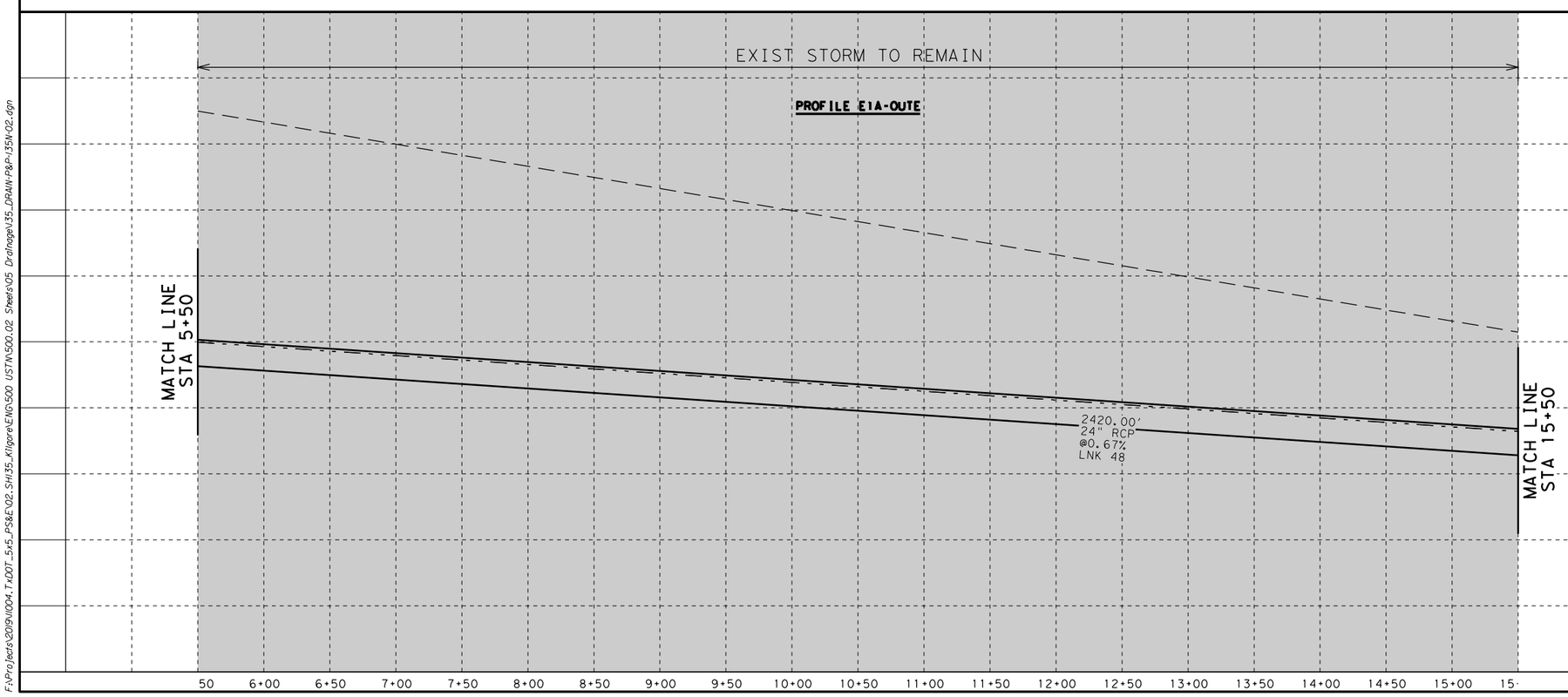

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STATE OF TEXAS
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13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
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135N
DRAINAGE PLAN & PROFILE

SHEET 2 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
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STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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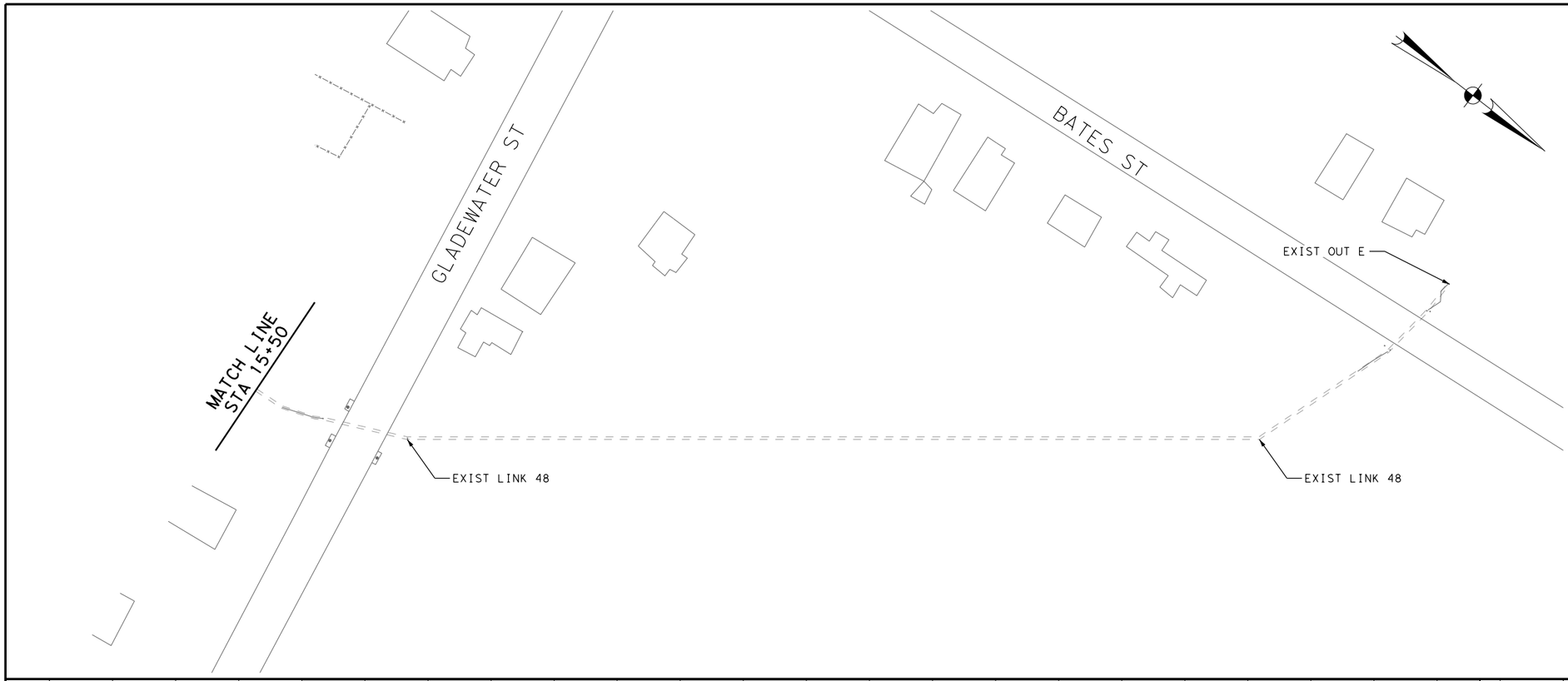

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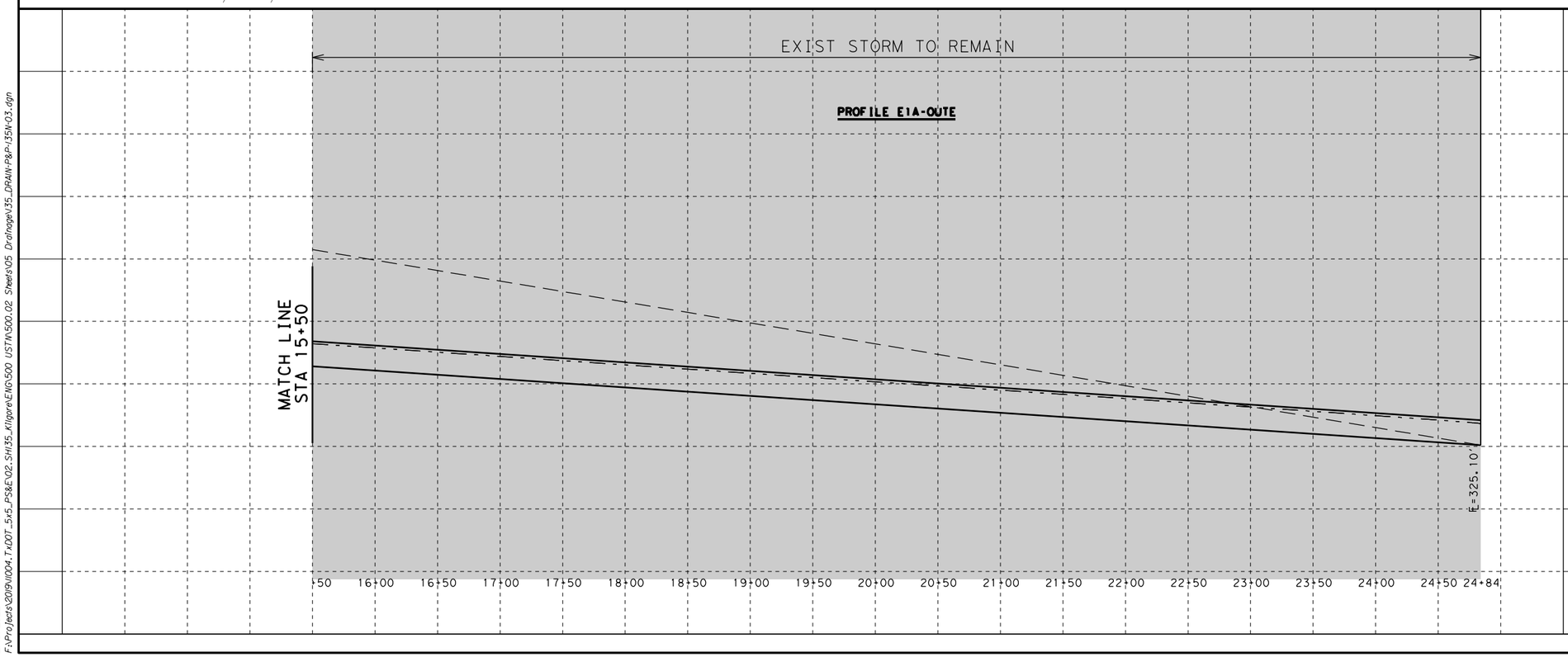
2. EXISTING STORM PROFILES ARE APPROXIMATIONS BASED ON AS-BUILT PIPE SIZES AND MEASURED OUTFALL ELEVATIONS.
3. NO WORK IS TO BE PERFORMED IN SHADED AREAS.



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STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

02/13/2022

Michael Verhoff

0 25 50 100(H)

0 5 10(V)

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
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13430 Northwest Freeway, Ste. 1100
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135N
DRAINAGE PLAN & PROFILE

SHEET 3 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
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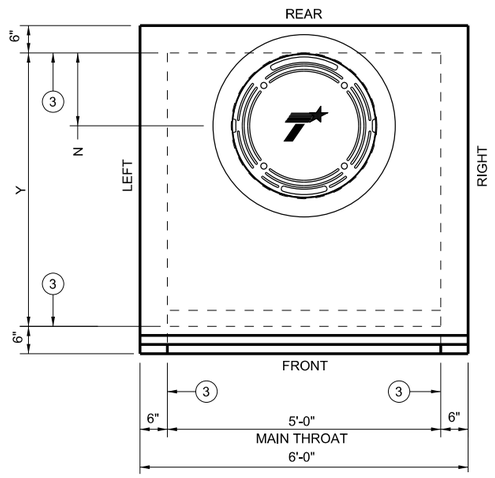
Size (Y)	N	MH Dia (2)
3'	9"	18"
4'	16"	32"
5'	16"	32"
6'	16"	32"

BAR TABLE	
BAR	SIZE
A1	#3
A2	#3
A3 (1)	#3
A4 (1)	#3
B1	#4
B2	#4
B3 (1)	#4
C (1)	#4
G	#4
L (1)	#5
Ra	#5
U1 (1)	#5
U2 (1)	#5

(1) Reinforcing bar used only with extension(s).

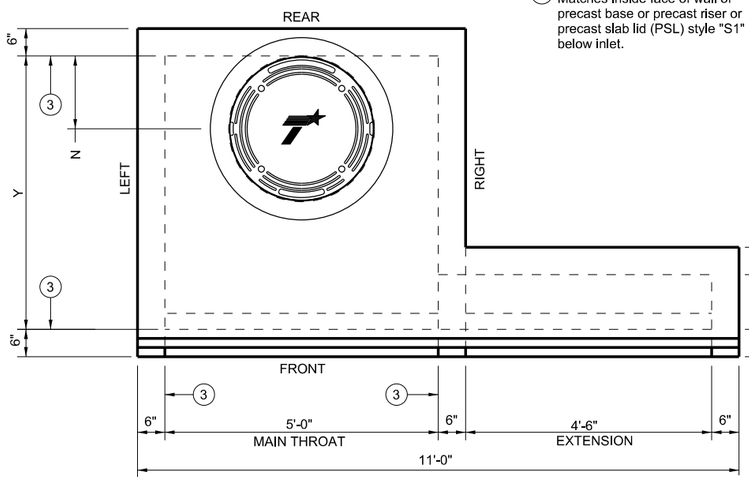
(2) Nominal ring and cover size.

(3) Matches inside face of wall of precast base or precast riser or precast slab lid (PSL) style "S1" below inlet.



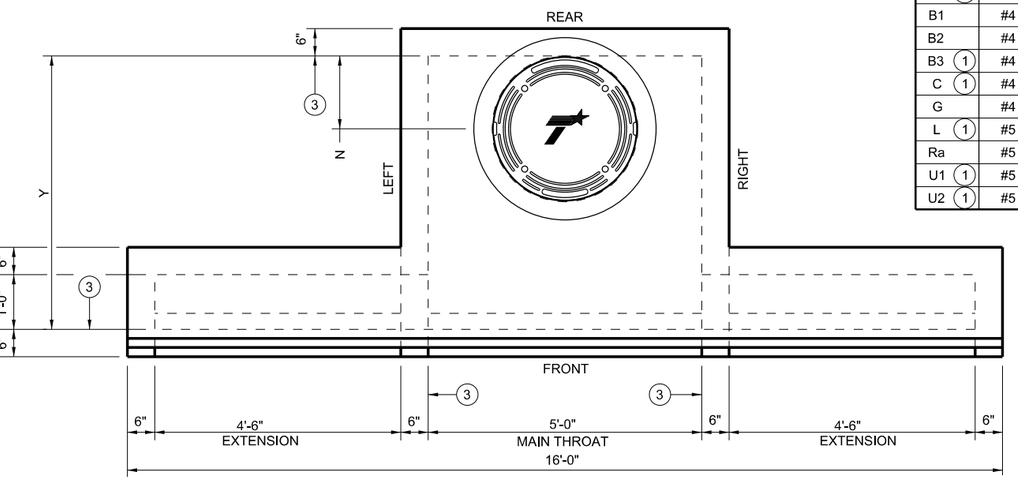
PLAN VIEW

(Shown without extensions.)
See SHEET 2 OF 4 for details.



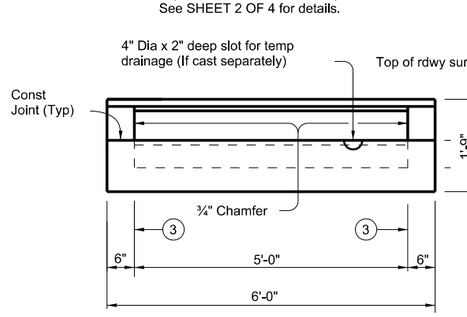
PLAN VIEW

(Showing one extension.)
See SHEET 3 OF 4 for details.



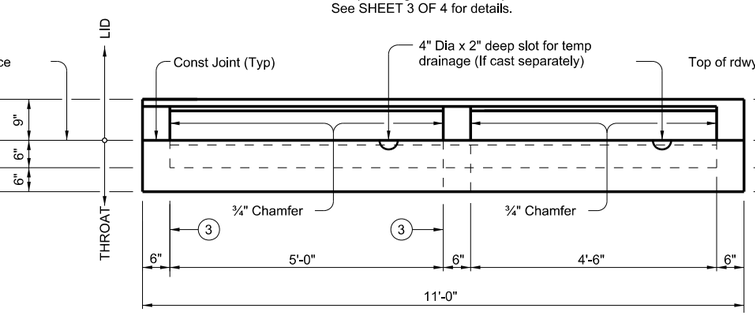
PLAN VIEW

(Showing extension on each side)
See SHEET 4 OF 4 for details.



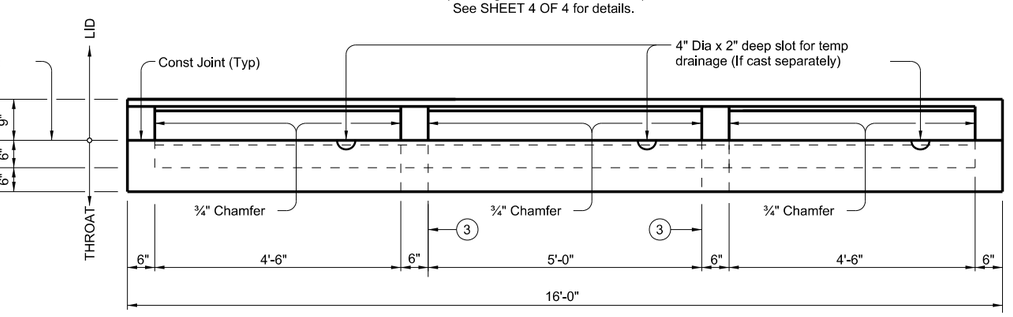
FRONT VIEW

(Shown without extensions.)
See SHEET 2 OF 4 for details.



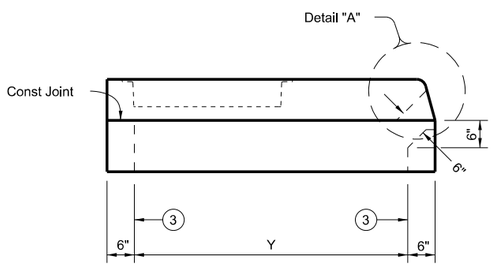
FRONT VIEW

(Showing one extension.)
See SHEET 3 OF 4 for details.



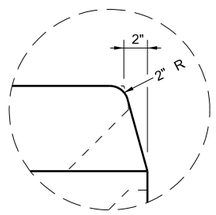
FRONT VIEW

(Showing extension on each side.)
See SHEET 4 OF 4 for details.



LEFT SIDE VIEW

(Extensions not shown for clarity.)



DETAIL "A"

CONSTRUCTION NOTES:

Chamfer all vertical edges of inlet lid ¾" as shown in Front View, Sheet 1 of 4.
Maintain 1 ½" clear cover to ends of all vertical reinforcing bars, unless otherwise noted.

MATERIAL NOTES:

Provide Class "S" concrete (f'c = 4,000 psi).
Provide Grade 60 reinforcing steel or equivalent area of WWR.
Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
The intent of this standard is to provide a cast-in-place lid to be used with precast base, precast riser or precast slab lid style "S1".
Inlet throat and lid are not intended for direct traffic. Do not place in roadway.
Lid and throat may be cast monolithically or separately.
See Precast Base (PB) standard for details and notes not shown.
See Precast Slab Lid (PSL) standard for details and notes not shown.
See Curb & Gutter Transitions Details (CGT-PCO) standard for transition examples.
Extensions may be right, left, both, or none. Provide extensions as specified elsewhere in the plans.
Shop drawings for approval are not required.
Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, size, and extension placement. Extensions are subsidiary to inlet.
Open area of main throat = 360 sq in.
Open area of one extension throat = 324 sq in.

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

HL93 LOADING SHEET 1 OF 4

Texas Department of Transportation

Bridge Division Standard

CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY

CCO

FILE: ccostds1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	TYL	GREGG		134

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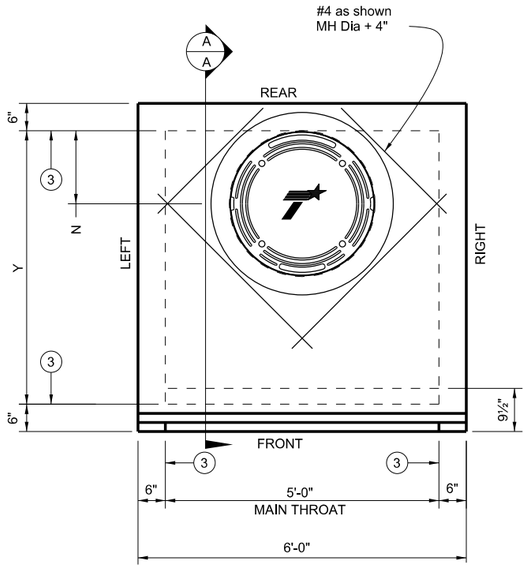
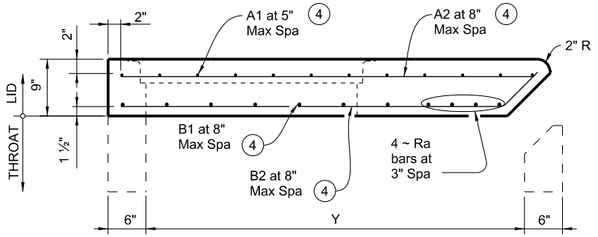
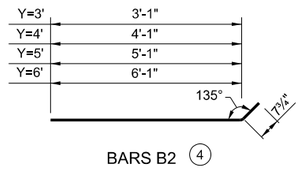


LID PLAN VIEW

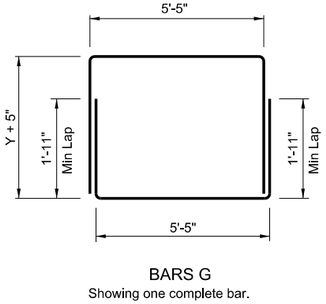
(Shown without extensions)



LID SECTION A-A



BARS B2 (4)



BARS G
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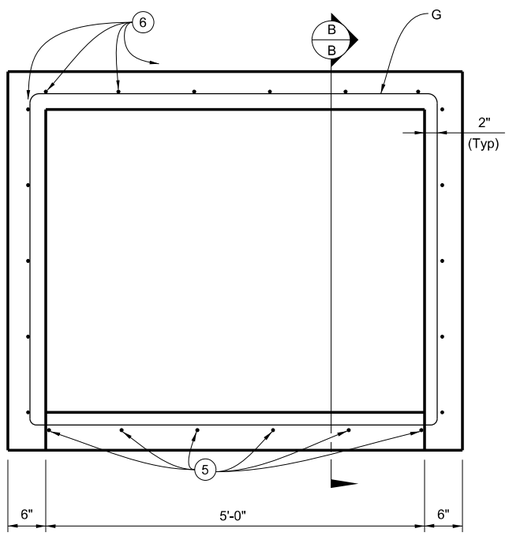
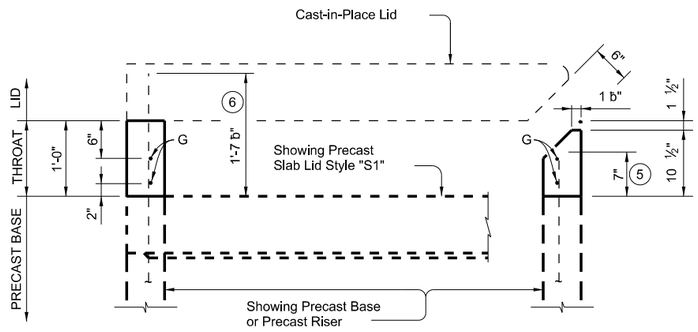


THROAT PLAN VIEW

(Shown without extensions)



THROAT SECTION B-B

(Showing reinforcing bar extended from pecast base or precast riser or precast slab lid style "S1".)

(3) Matches inside face of wall of precast base or precast riser or precast slab lid style "S1" below inlet.

(4) Cut reinforcing bars as needed to provide 1 ½" clear to manhole.

(5) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 7".

(6) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 1'-7 b".

HL93 LOADING SHEET 2 OF 4

Texas Department of Transportation

Bridge Division Standard

CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY

CCO

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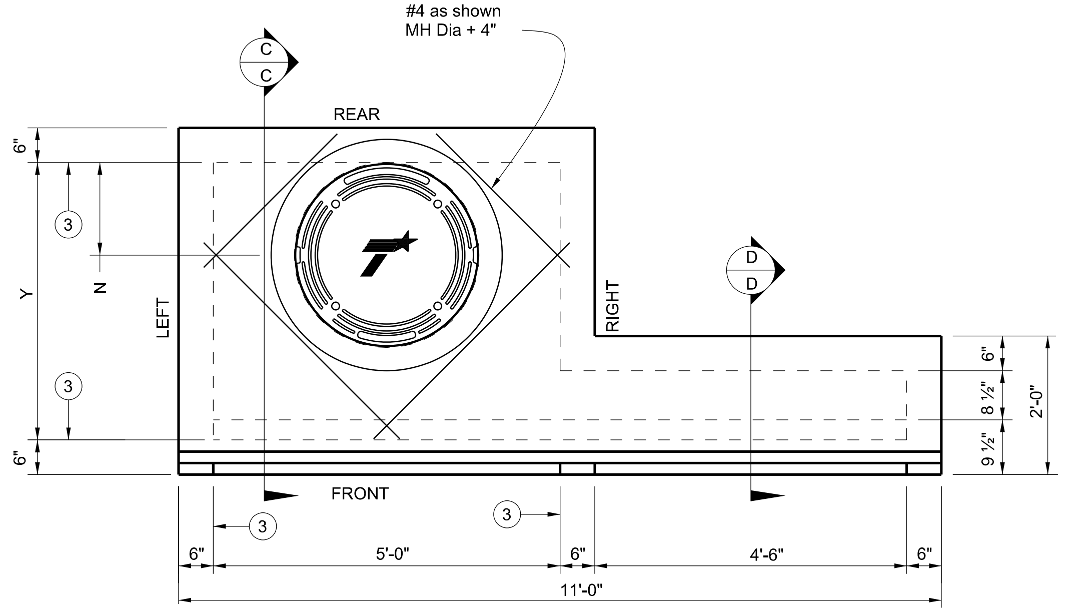

LID PLAN VIEW

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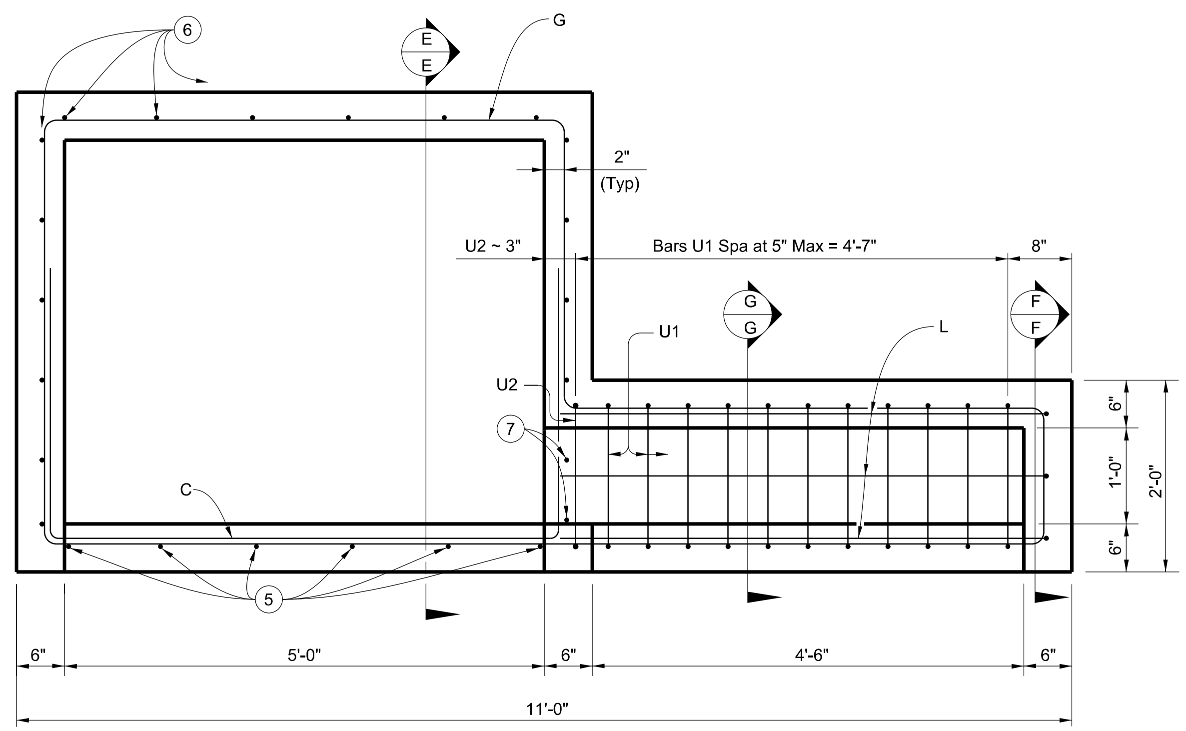

THROAT PLAN VIEW

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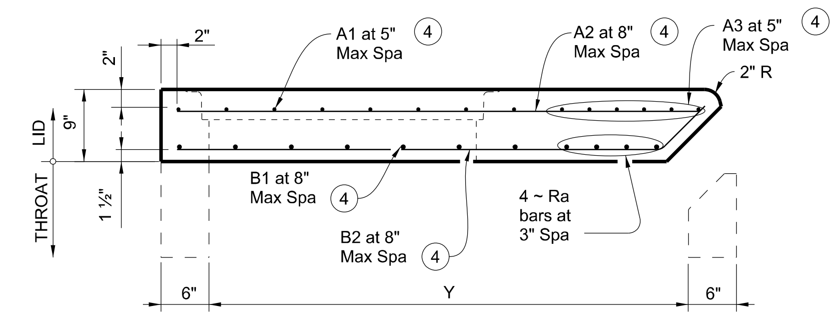

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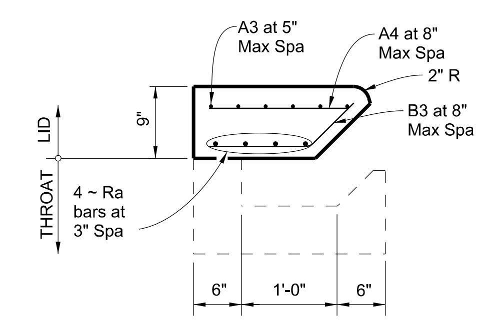

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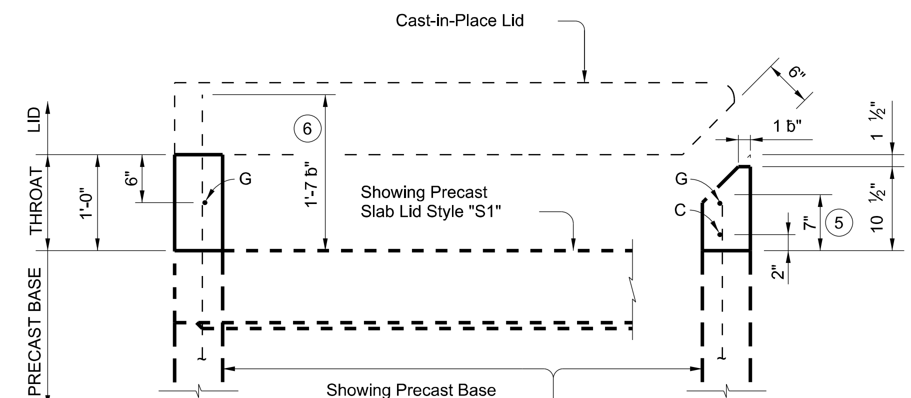
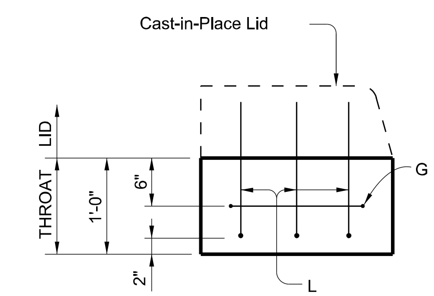
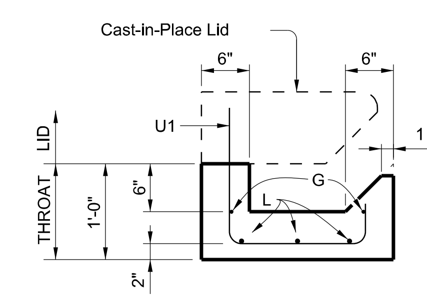


THROAT SECTION E-E

(Showing reinforcing bar extended from pecast base or precast riser or precast slab lid style "S1".)



THROAT SECTION F-F



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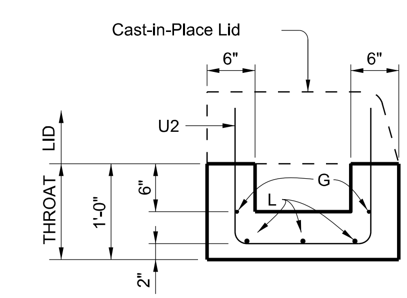
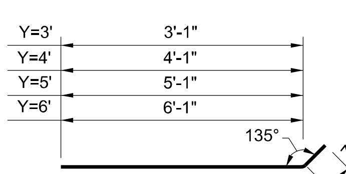


BARS U2 LOCATION

THROAT SECTION G-G



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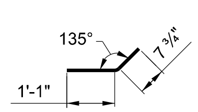
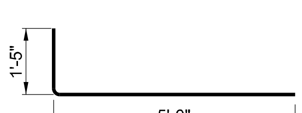


BARS B3

BARS C



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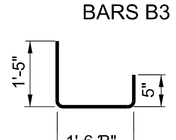
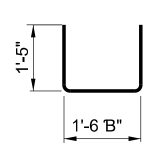


BARS U1



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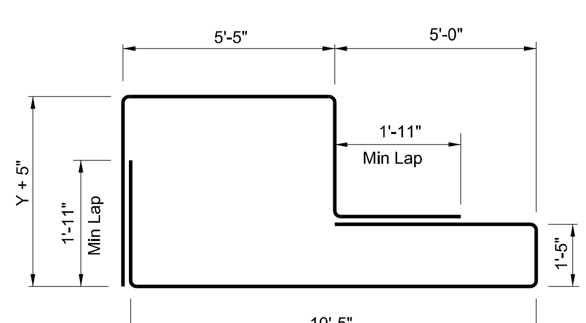

BARS G

Showing one complete bar.

(3) Matches inside face of wall of precast base or precast riser or precast slab lid style "S1" below inlet.

(4) Cut reinforcing bars as needed to provide 1 ½" clear to manhole.

(5) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 7".

(6) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 1'-7 ½".

(7) Do not extend reinforcing bars from precast base.

HL93 LOADING SHEET 3 OF 4

Texas Department of Transportation

Bridge Division Standard

CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY

CCO

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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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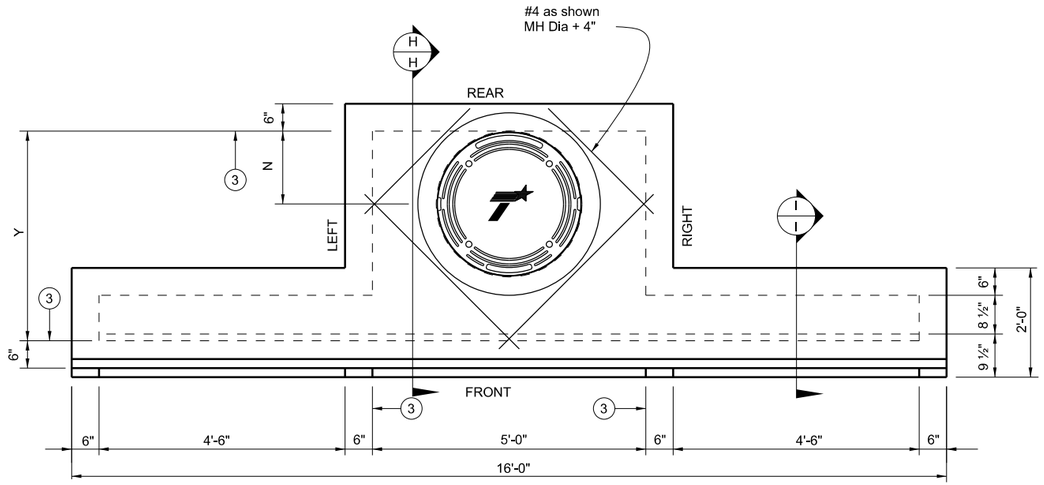
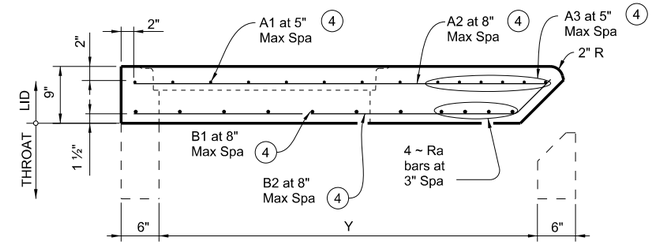


LID PLAN VIEW

(Showing extension on each side.)



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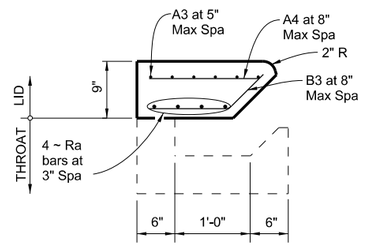
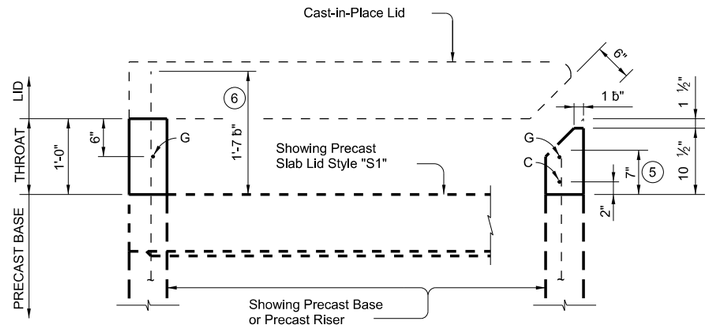
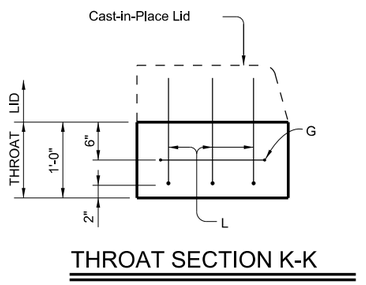


LID SECTION I-I

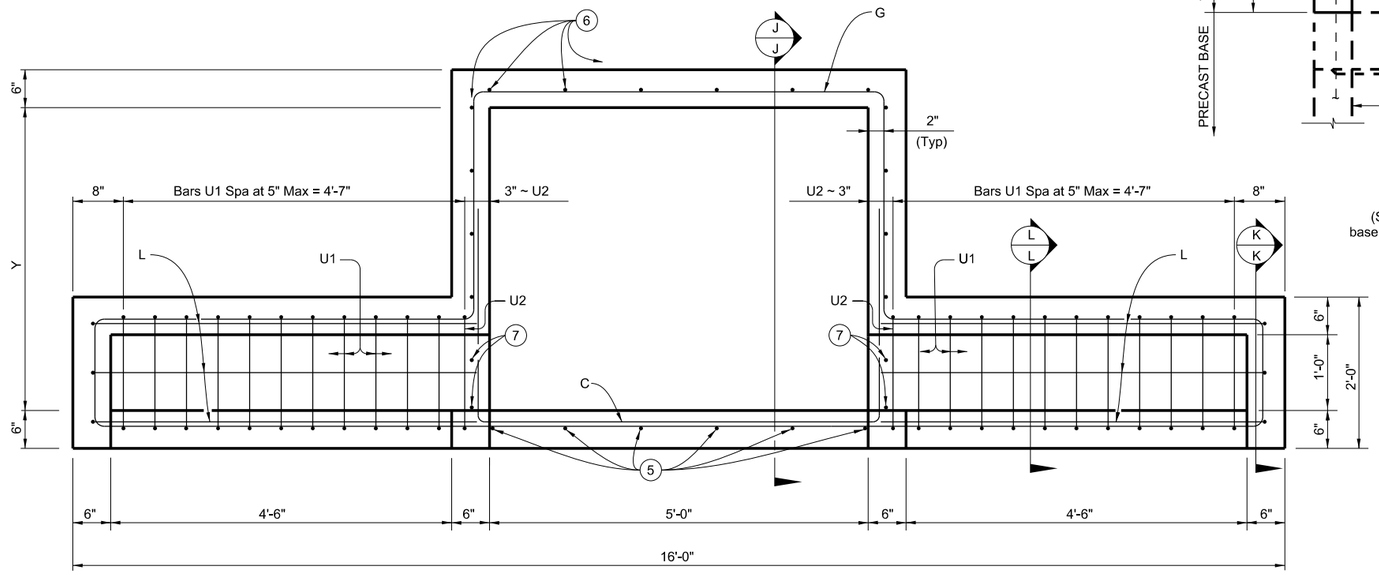


THROAT SECTION J-J

(Showing reinforcing bar extended from pecast base or precast riser or precast slab lid style "S1".)

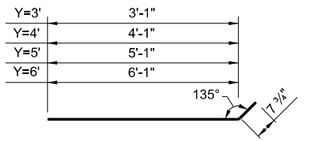


THROAT SECTION K-K

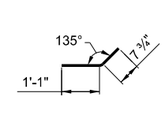


THROAT PLAN VIEW

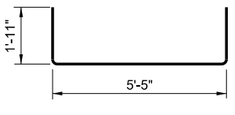
(Showing extension on each side.)



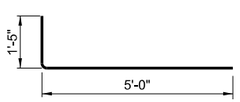
BARS B2 (4)



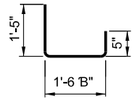
BARS B3



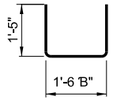
BARS C



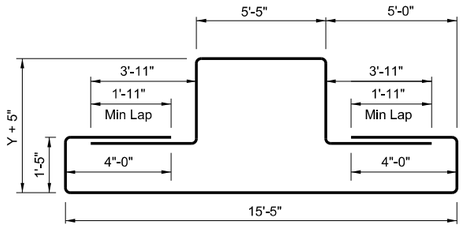
BARS L



BARS U1

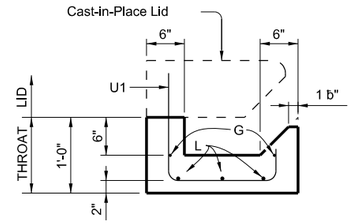


BARS U2

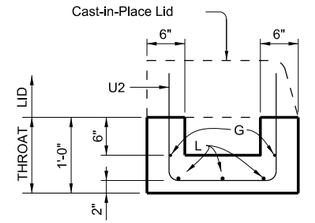


BARS G

Showing one complete bar.



BARS U1 LOCATION



BARS U2 LOCATION

THROAT SECTION L-L

(3) Matches inside face of wall of precast base or precast riser or precast slab lid style "S1" below inlet.

(4) Cut reinforcing bars as needed to provide 1 ½" clear to manhole.

(5) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 7".

(6) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 1'-7 b".

(7) Do not extend reinforcing bars from precast base.

HL93 LOADING SHEET 4 OF 4

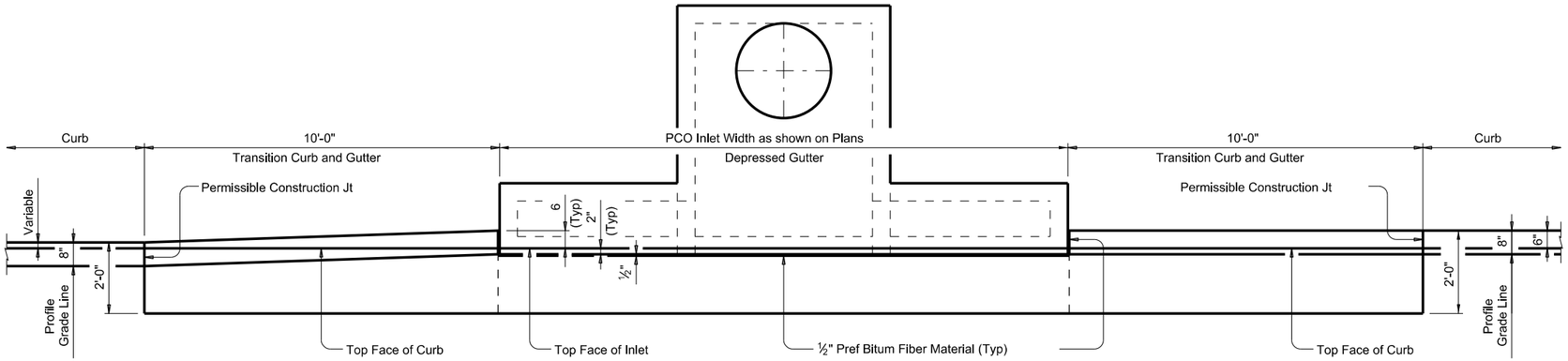
Texas Department of Transportation

Bridge Division Standard

CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY

CCO

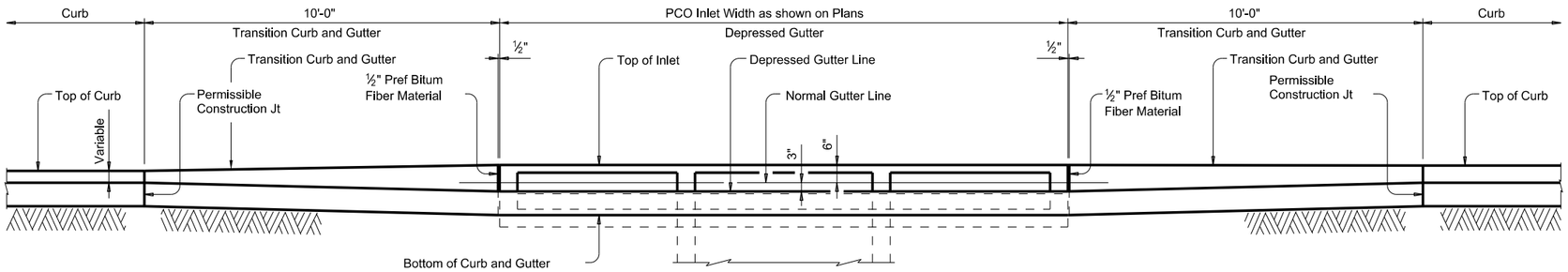
FILE: ccostds1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		137



SHOWING TYPE I, IIa & III Curb and Gutter

SHOWING TYPE II & IV Curb and Gutter

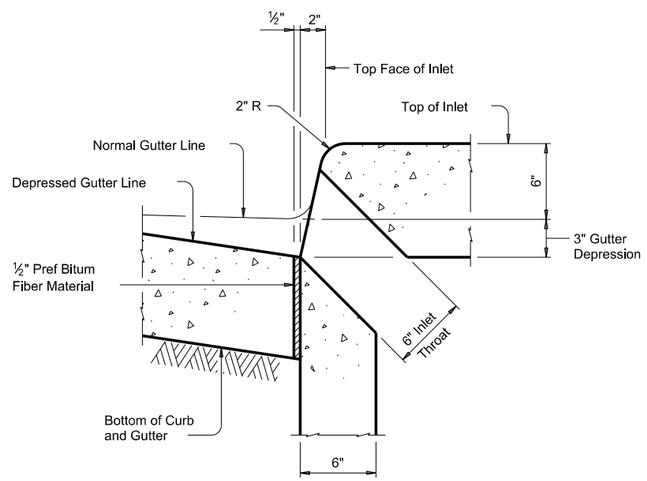
PLAN



SHOWING TYPE I, IIa & III Curb and Gutter

SHOWING TYPE II & IV Curb and Gutter

ELEVATION



SECTION AT GUTTER AND INLET

Reinforcing steel not shown for clarity.

CONSTRUCTION NOTES:
Align top face of curb with PCO Inlet as shown.

MATERIAL NOTES:
Provide ½" Preformed Bituminous Fiber Material.

GENERAL NOTES:
See Precast Curb Inlet Outside Roadway (PCO) standard for details and notes not shown.
See Concrete Curb and Curb and Gutter (CCCG-12) standard for details and notes not shown.
Curb and Gutter Transitions is paid for and in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
Preformed Bituminous Fiber Material is subsidiary to PCO Inlet.

Texas Department of Transportation

Bridge Division Standard

CURB AND GUTTER TRANSITION DETAILS FOR PCO INLET

CGT-PCO

FILE: prestd13-20.dgn	DN: TxDOT	CK: AES	DW: JTR	CK: AES			
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY			
REVISIONS	0545	01	014	SH 135			
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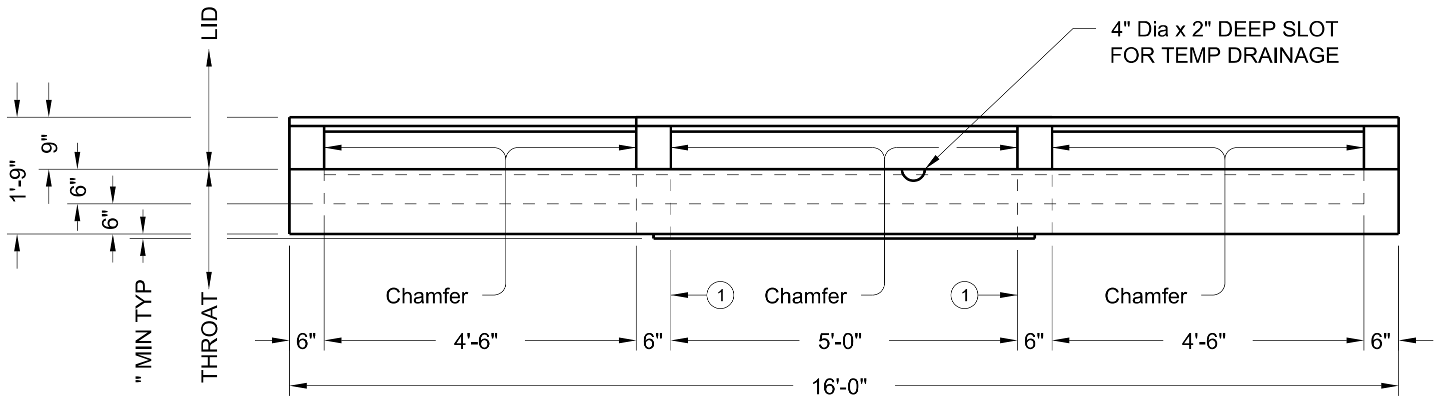
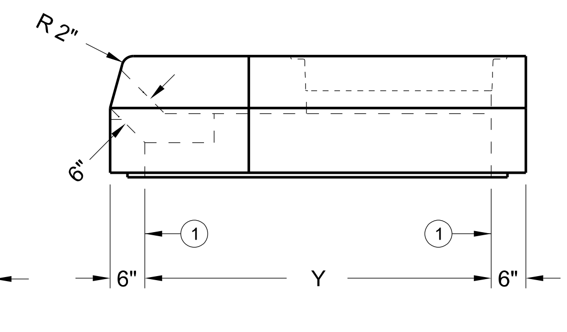
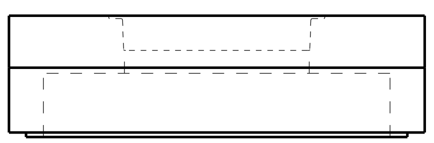


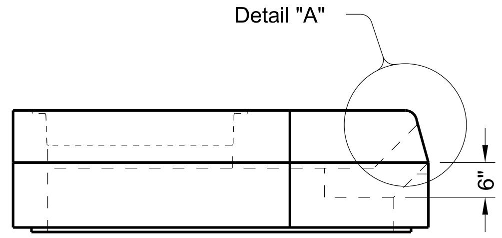
FRONT VIEW
(SHOWING LEFT AND RIGHT EXTENSIONS)



RIGHT VIEW

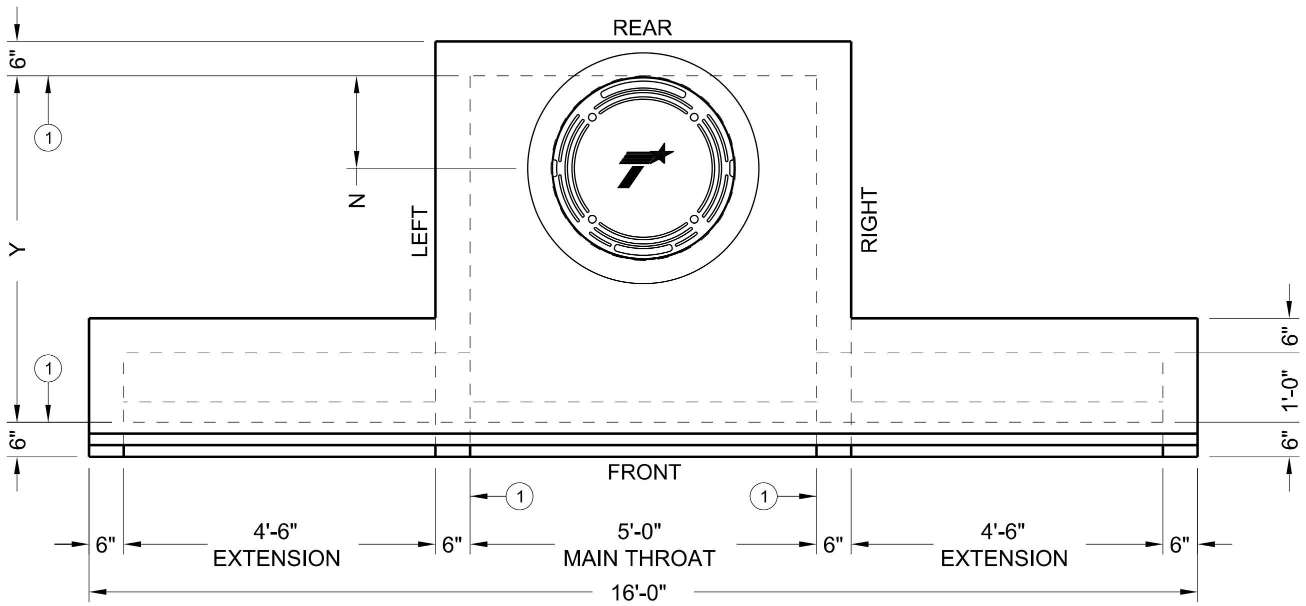


REAR VIEW
(EXTENSIONS NOT SHOWN)

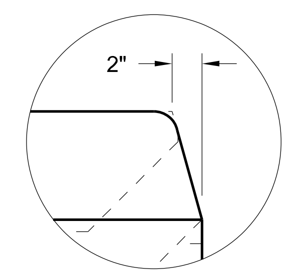


LEFT VIEW

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



PLAN VIEW
(SHOWING LEFT AND RIGHT EXTENSIONS)



DETAIL "A"

HS20 LOADING SHEET 1 OF 2

Texas Department of Transportation — Bridge Division Standard

PRECAST CURB INLET OUTSIDE ROADWAY

PCO

FILE: prestd03-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST		COUNTY	SHEET NO.
	TYL		GREGG	139

DATE: 2/13/2022 1:07:30 PM
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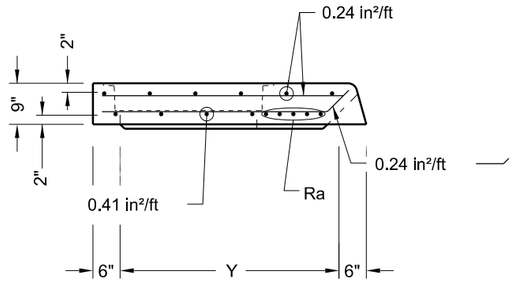
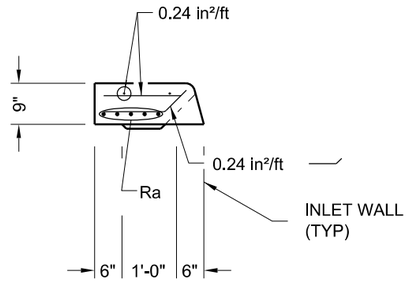
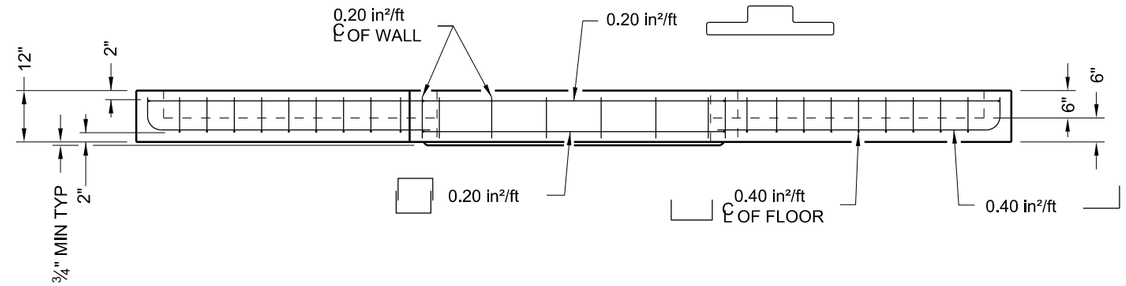


LID SECTION A-A

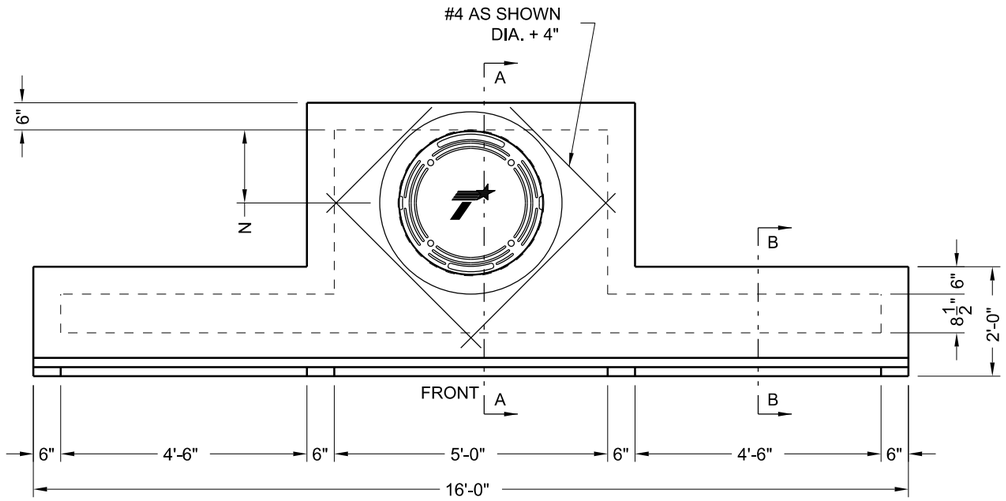


LID SECTION B-B



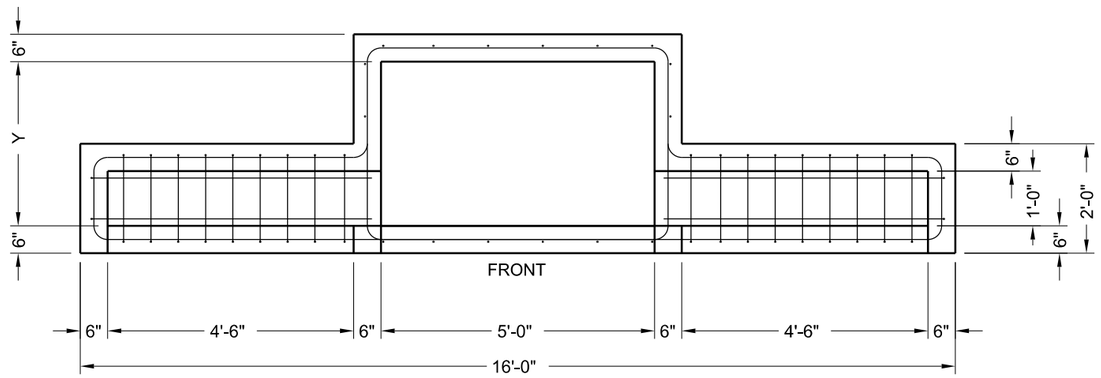
THROAT ELEVATION VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



LID PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



THROAT PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)

SIZE (Y)	N	MH DIA ✳	Ra
3'	9"	18"	(4) #5 Additional
4'	16"	32"	(4) #5 Additional
5'	16"	32"	(4) #5 Additional
6'	16"	32"	(4) #5 Additional

✳ Nominal ring and cover size.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Extensions may be right, left, both or none. Provide extensions as specified elsewhere in the plans.
4. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾". Lid may employ a butt joint with dowels at the Contractor's option.
5. Provide lifting devices in conformance with Manufacturer's recommendations.
6. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.
7. Chamfer vertical edges of inlet lid ¾" as shown in Front View, sheet 1.

INSTALLATION NOTES:

1. Inlet throat and lid are not intended for direct traffic. Do not place in roadway.
2. Seal tongue and groove joints and butt joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Open area of main throat = 360 sq in. Open area of one extension throat = 324 sq in.
3. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, size, and extension placement. Extensions are subsidiary to inlet.

Cover dimensions are clear dimensions, unless noted otherwise.

HS20 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

PRECAST CURB INLET OUTSIDE ROADWAY

PCO

FILE: prestd03-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		140

DATE: 2/13/2022 1:07:30 PM
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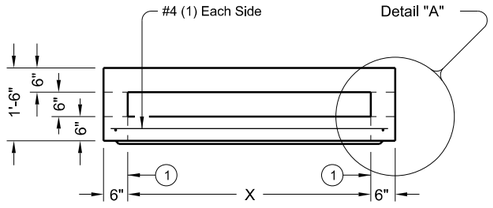
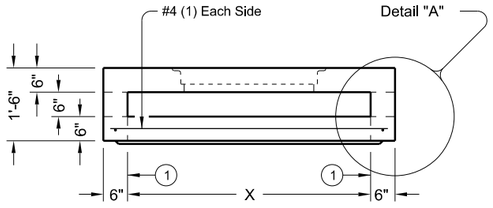
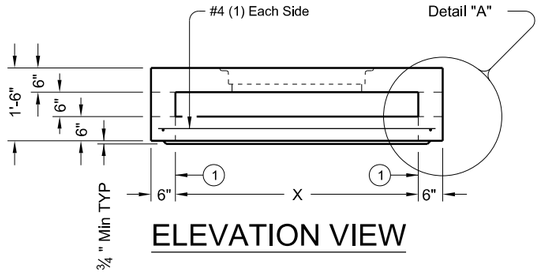


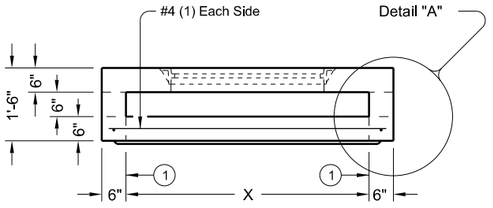
ELEVATION VIEW



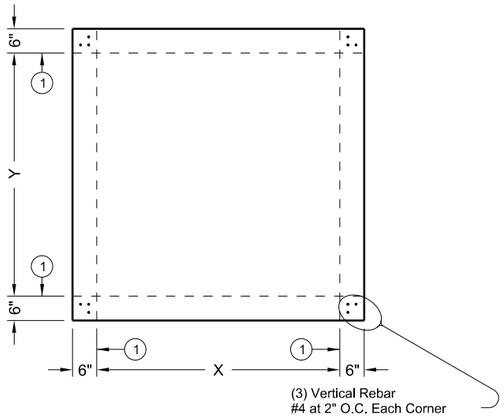
ELEVATION VIEW



ELEVATION VIEW



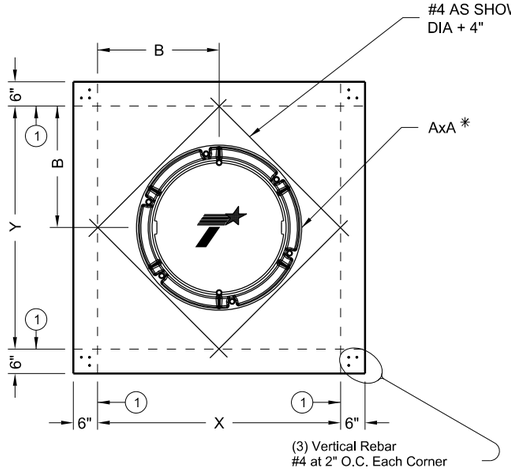
ELEVATION VIEW



PLAN VIEW

NO OPENINGS

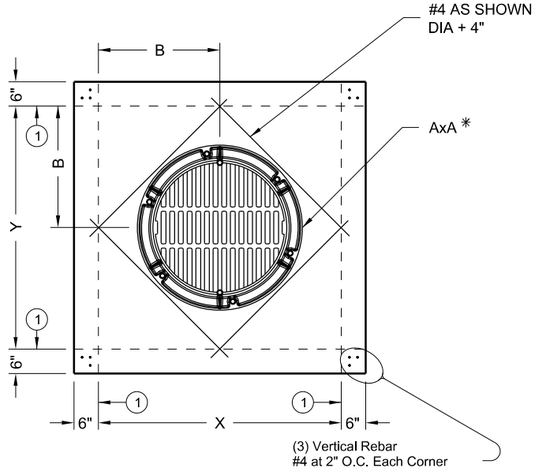
STYLE 'SL'



PLAN VIEW

32" DIA CAST-IN RING & COVER

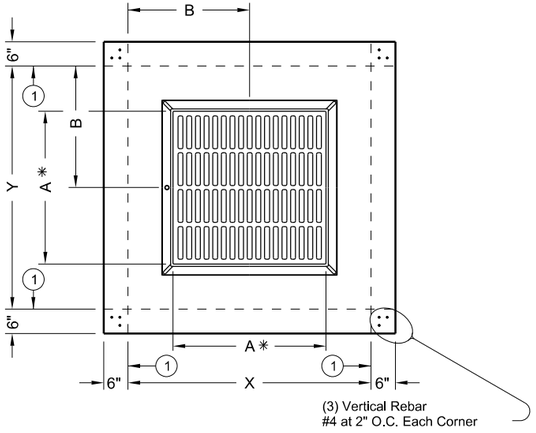
STYLE 'RC'



PLAN VIEW

32" DIA CAST-IN RING & GRATE

STYLE 'RG'



PLAN VIEW

CAST-IN FRAME & GRATE

STYLE 'FG'

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

* Nominal frame/grate or ring/cover size.

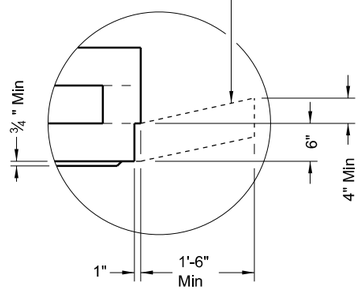
(1) Matches inside face of wall of precast base or riser below inlet.

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

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

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

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



DETAIL "A"

(Reinforcing not shown for clarity)

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

Texas Department of Transportation

Bridge Division Standard

PRECAST AREA ZONE DRAIN

PAZD

FILE: presto08-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
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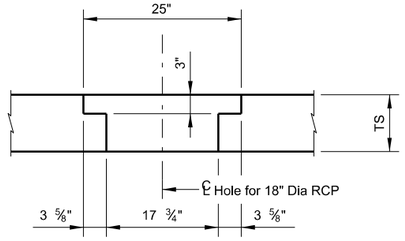
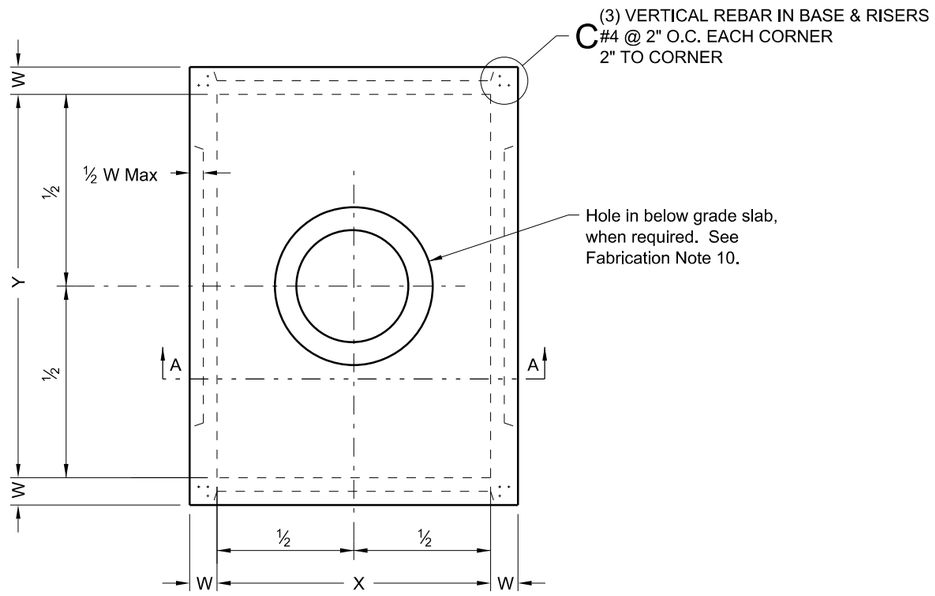
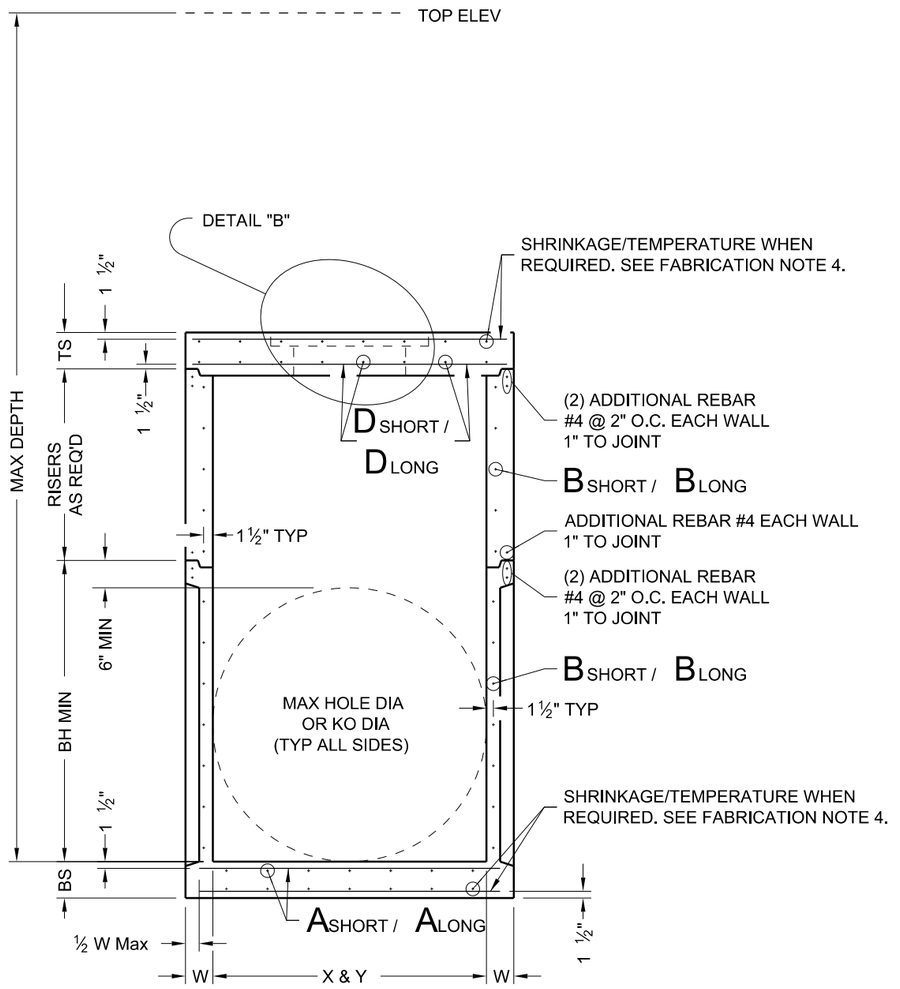


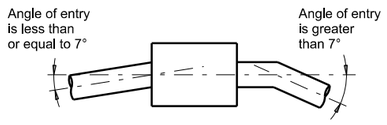
DETAIL "B"



PLAN VIEW



SECTION A-A



PIPE CONNECTION DETAIL

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

FABRICATION NOTES:

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

INSTALLATION NOTES:

1. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to junction box.
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 Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for junction box is per Item 465 "Junction Boxes, Manholes, and Inlets" by type and size.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

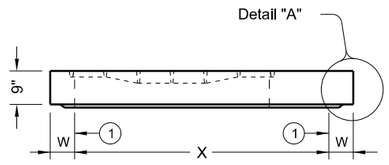
Bridge Division Standard

PRECAST JUNCTION BOX

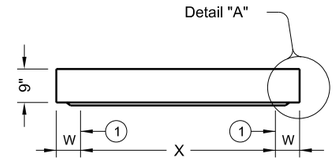
PJB

FILE: prestd09-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		142

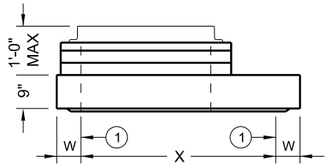
DATE:
FILE:



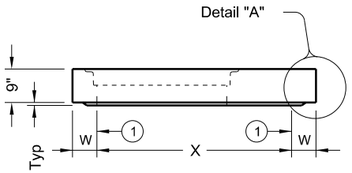
STYLE 'FG'



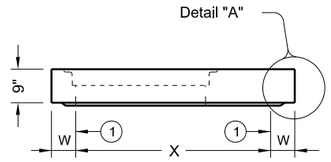
ELEVATION VIEW



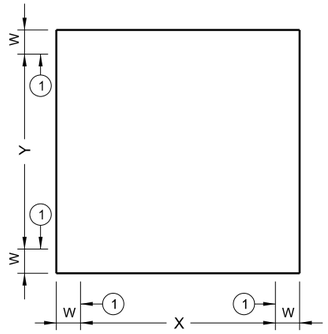
ELEVATION VIEW



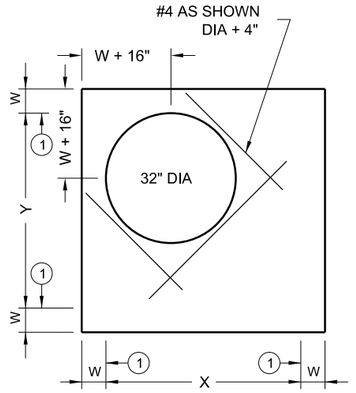
ELEVATION VIEW



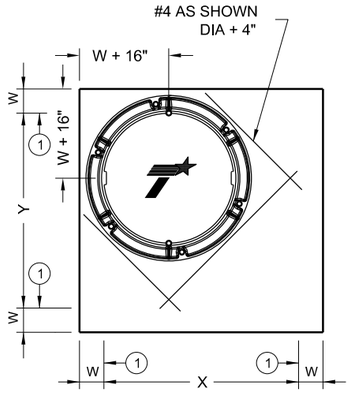
ELEVATION VIEW



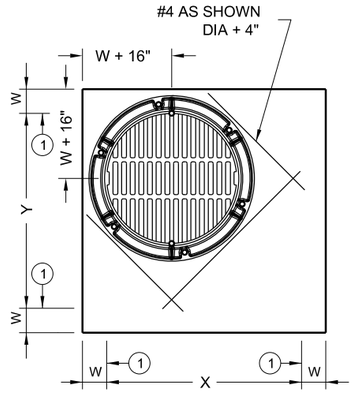
PLAN VIEW
NO OPENINGS
STYLE 'SL'



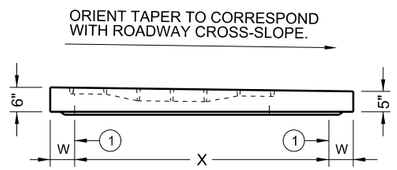
PLAN VIEW
SHIP LOOSE RING & COVER
STYLE 'RH'



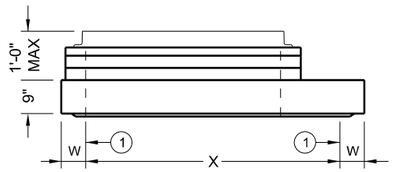
PLAN VIEW
32" DIA CAST-IN RING & COVER
STYLE 'RC'



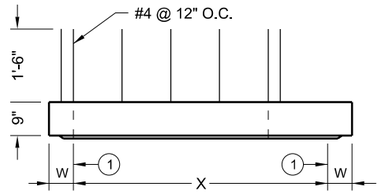
PLAN VIEW
32" DIA CAST-IN RING & GRATE
STYLE 'RG'



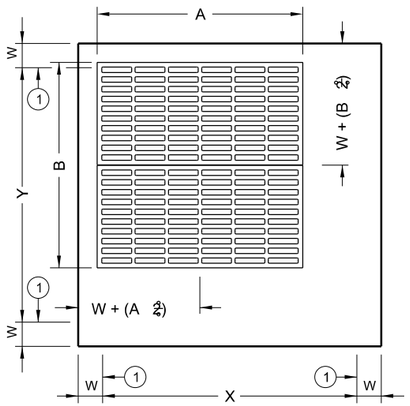
STYLE 'SFG'
ELEVATION VIEW



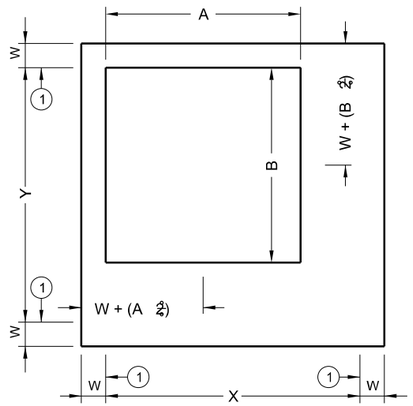
ELEVATION VIEW



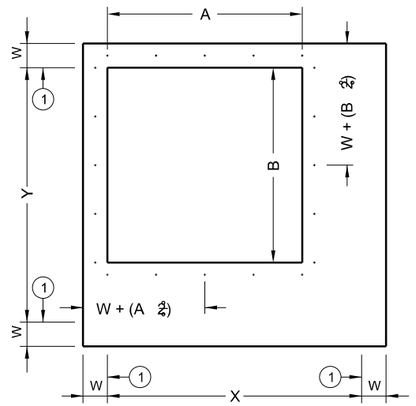
ELEVATION VIEW



PLAN VIEW
CAST-IN FRAME & GRATE
STYLES 'FG' & 'SFG'



PLAN VIEW
SHIP LOOSE FRAME & GRATE
STYLE 'SH'



PLAN VIEW
EXPOSED REBAR
STYLE 'S1'

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

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

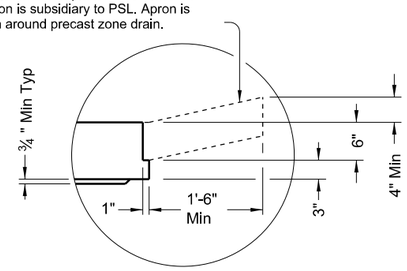
FILE: presto05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		143

DATE:
FILE:

Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in□/ft	0.37 in□/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in□/ft	0.37 in□/ft
SFG	3'x3'	6"	3'x3'	0.32 in□/ft	0.32 in□/ft
SL	4'x4'	6"	n/a	0.34 in□/ft	0.34 in□/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in□/ft	0.41 in□/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in□/ft	0.41 in□/ft
SFG	4'x4'	6"	4'x4'	0.32 in□/ft	0.32 in□/ft
SL	3'x5'	6"	n/a	0.39 in□/ft	0.39 in□/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in□/ft	0.48 in□/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in□/ft	0.48 in□/ft
SFG	3'x5'	6"	3'x5'	0.32 in□/ft	0.32 in□/ft
SL	4'x5'	6"	n/a	0.42 in□/ft	0.42 in□/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in□/ft	0.42 in□/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in□/ft	0.63 in□/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in□/ft	0.66 in□/ft
SL	5'x5'	6"	n/a	0.36 in□/ft	0.36 in□/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in□/ft	0.43 in□/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in□/ft	0.63 in□/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in□/ft	0.63 in□/ft
SL	5'x6'	6"/8"	n/a	0.48 in□/ft	0.48 in□/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in□/ft	0.48 in□/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in□/ft	0.60 in□/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in□/ft	0.60 in□/ft
SL	6'x6'	6"/8"	n/a	0.43 in□/ft	0.43 in□/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in□/ft	0.56 in□/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in□/ft	0.56 in□/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in□/ft	0.59 in□/ft
SL	8'x8'	8"/10"	n/a	0.45 in□/ft	0.45 in□/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in□/ft	0.45 in□/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in□/ft	0.45 in□/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in□/ft	0.45 in□/ft

(2) See sheet PDD for corresponding wall thickness (W) of base unit or riser.

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



DETAIL "A"

(Reinforcing not shown for clarity)

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

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of ¾" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in²/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
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.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans

GENERAL NOTES:

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

Cover dimensions are clear dimensions, unless noted otherwise.

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

FILE: presta05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		144

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

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DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

FILE: prestd10-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT 0545	SECT 01	JOB 014	HIGHWAY SH 135
REVISIONS	DIST TYL	COUNTY GREGG		SHEET NO. 145

DATE: 2/13/2022 1:07:39 PM
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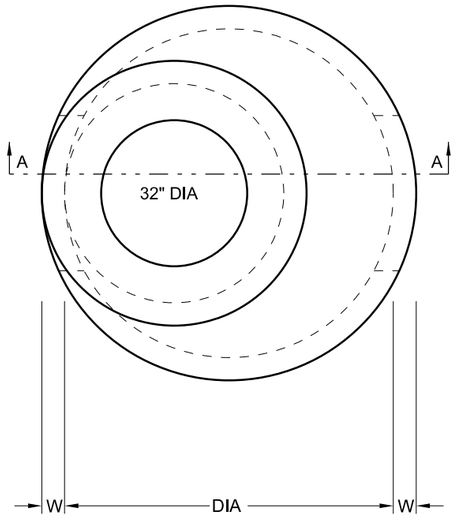
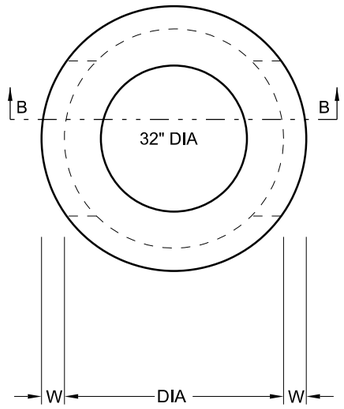
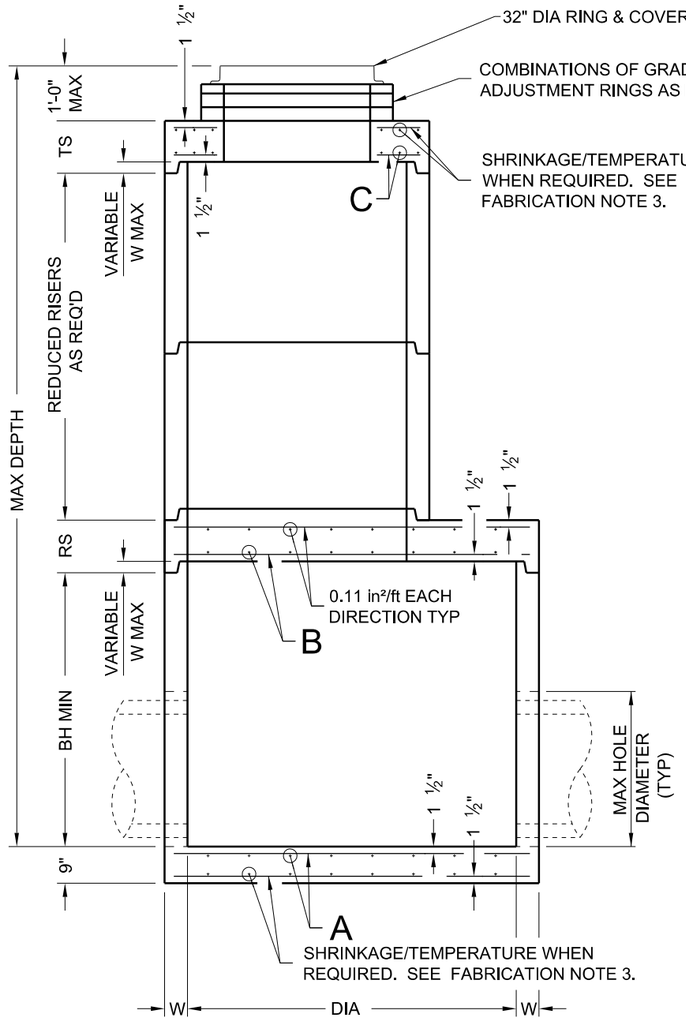


PLAN VIEW "A"

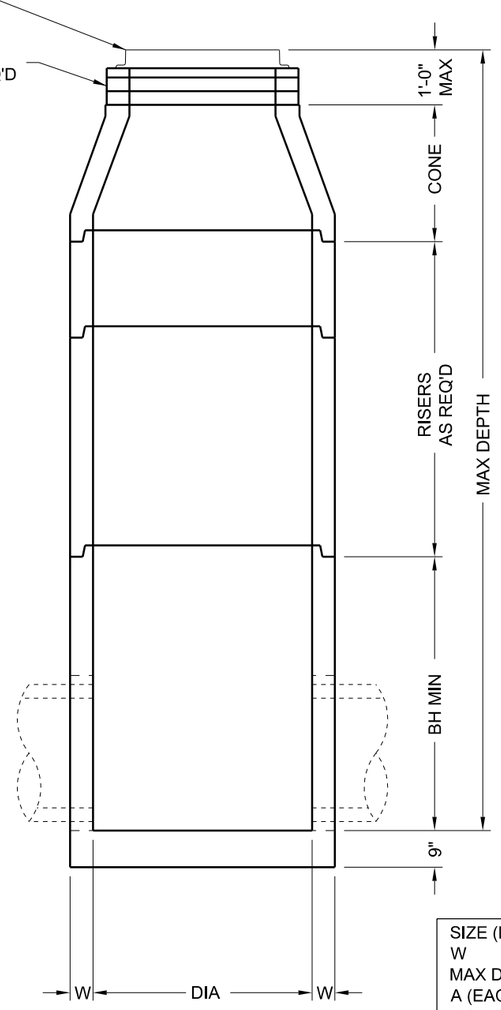


PLAN VIEW "B"



SECTION A-A

ROUND REDUCED RISER OPTION
SHOWING FLAT SLAB TOP



SECTION B-B

ROUND RISER OPTION
SHOWING CONE

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. Provide circumferential reinforcing steel in vertical walls of base, riser and cone in accordance with ASTM C478.
3. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
4. Manufacture base and risers to nearest 3" increment.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
6. Provide lifting devices in conformance with Manufacturer's recommendations.
7. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.

INSTALLATION NOTES:

1. Cones may be concentric or eccentric. Reduction cones are acceptable. See Manufacturer for cone dimensions.
2. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to this item.
3. 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.
4. Do not grout rubber gasket joints without Manufacturer's recommendation.
5. Initial installation of grade adjustment rings is limited to 1'-0" Max as shown.
6. Grade adjustment rings may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments may be made up to the Max depth shown. Structure must be evaluated if Max depth will be exceeded.

GENERAL NOTES:

1. Designed according to ASTM C478.
2. Payment for manhole is per Item 465, "Junction Boxes, Manholes, and Inlets" by type and size.
3. Pipe OD + placement tolerance must be equal or less than Max hole diameter. For rigid pipe, placement tolerance is 4" Max, 2" Min. For flexible pipe, consult boot/seal manufacturer's specification for placement tolerance.

Cover dimensions are clear dimensions, unless noted otherwise.

SIZE (DIA)	48 in	60 in	72 in
W	5 in	6 in	7 in
MAX DEPTH	25 ft	25 ft	25 ft
A (EACH WAY)	0.22 in²/ft	0.30 in²/ft	0.45 in²/ft
B (EACH WAY)	N/A	0.37 in²/ft	0.62 in²/ft
C (EACH WAY)	0.24 in²/ft	0.46 in²/ft	0.46 in²/ft
BH MIN	12 in	36 in	36 in
TS	9 in	9 in	9 in
RS	N/A	9 in	12 in
REDUCED RISER DIA	N/A	48 in	48/60 in
MAX HOLE DIA	32 in	40 in	54 in

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Bridge Division Standard

PRECAST ROUND MANHOLE

PRM

FILE: prestd02-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		146

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.

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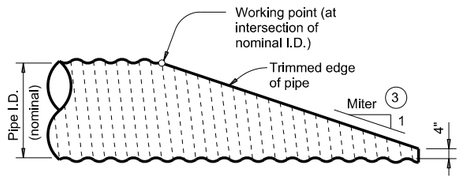
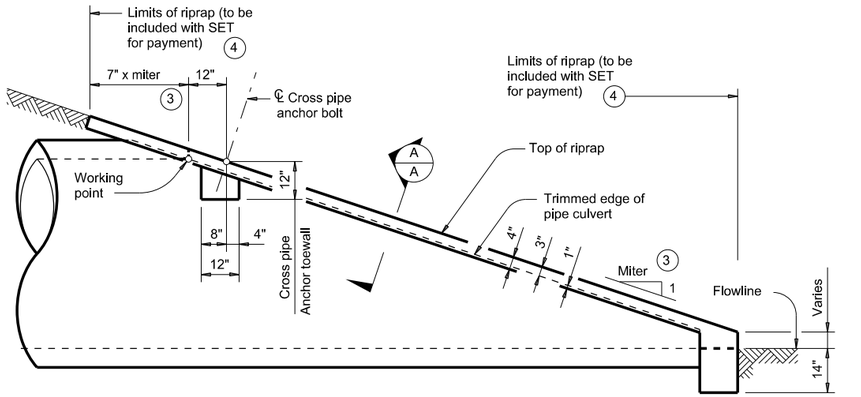


NOTE: All pipe runners, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

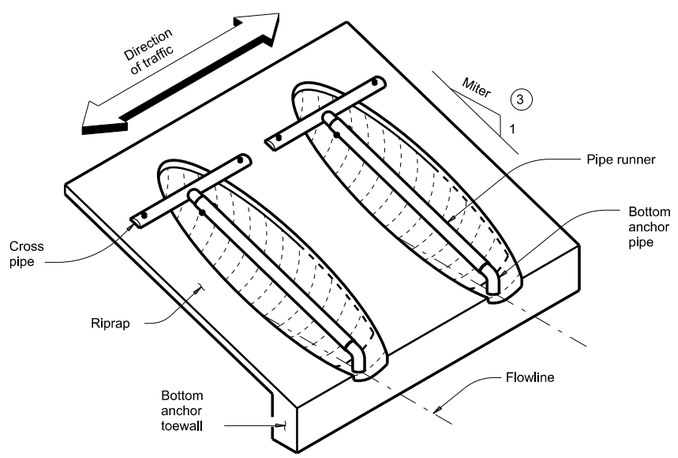
SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details of reinforced concrete pipe (RCP) culvert are similar.)



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details of corrugated metal pipe (CMP) culvert are similar. Pipe runners not shown for clarity)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing installation with no skew.)

CROSS PIPE LENGTHS AND PIPE RUNNER LENGTHS (1) (2)

Nominal Culvert I.D.	Pipe Culvert Spa ~ G	Cross Pipe Length	Pipe Runner Length											
			3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
			0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
24"	1' - 7"	3' - 5"	N/A	N/A	N/A	5' - 10"	N/A	N/A	N/A	8' - 1"	N/A	N/A	N/A	12' - 9"
27"	1' - 8"	3' - 8"	N/A	N/A	5' - 5"	6' - 11"	N/A	N/A	7' - 7"	9' - 7"	N/A	N/A	11' - 11"	14' - 11"
30"	1' - 10"	3' - 11"	N/A	N/A	6' - 4"	8' - 0"	N/A	N/A	8' - 9"	11' - 0"	N/A	N/A	13' - 8"	17' - 0"
33"	1' - 11"	4' - 2"	6' - 2"	6' - 5"	7' - 3"	9' - 1"	8' - 6"	8' - 10"	10' - 0"	12' - 5"	13' - 3"	13' - 9"	15' - 5"	19' - 2"
36"	2' - 1"	4' - 5"	6' - 11"	7' - 3"	8' - 2"	10' - 2"	9' - 6"	9' - 11"	11' - 2"	13' - 10"	14' - 9"	15' - 3"	17' - 2"	21' - 3"
42"	2' - 4"	4' - 11"	8' - 6"	8' - 10"	9' - 11"	12' - 4"	11' - 7"	12' - 0"	13' - 6"	16' - 8"	17' - 9"	18' - 5"	20' - 8"	25' - 7"
48"	2' - 7"	5' - 5"	10' - 1"	10' - 5"	11' - 9"	N/A	13' - 7"	14' - 2"	15' - 10"	N/A	20' - 9"	21' - 6"	24' - 2"	N/A
54"	3' - 0"	5' - 11"	11' - 8"	12' - 1"	N/A	N/A	15' - 8"	16' - 3"	N/A	N/A	23' - 10"	24' - 8"	N/A	N/A
60"	3' - 3"	6' - 5"	13' - 3"	N/A	N/A	N/A	17' - 9"	N/A	N/A	N/A	26' - 10"	N/A	N/A	N/A

TYPICAL PIPE CULVERT MITERS (3)

Side Slope	0° Skew	15° Skew	30° Skew	45° Skew
3:1	3:1	3.106:1	3.464:1	4.243:1
4:1	4:1	4.141:1	4.619:1	5.657:1
6:1	6:1	6.212:1	6.928:1	8.485:1

CONDITIONS WHERE PIPE RUNNERS ARE NOT REQUIRED (2)

Nominal Culvert I.D.	Single Pipe Culvert	Multiple Pipe Culverts
12" thru 21"	Skews thru 45°	Skews thru 45°
24"	Skews thru 45°	Skews thru 30°
27"	Skews thru 30°	Skews thru 15°
30"	Skews thru 15°	Skews thru 15°
33"	Skews thru 15°	Always required
36"	Normal (no skew)	Always required
42" thru 60"	Always required	Always required

STANDARD PIPE SIZES AND MAX PIPE RUNNER LENGTHS (1)

Pipe Size	Pipe O.D.	Pipe I.D.	Max Pipe Runner Length
2" STD	2.375"	2.067"	N/A
3" STD	3.500"	3.068"	10' - 0"
4" STD	4.500"	4.026"	19' - 8"
5" STD	5.563"	5.047"	34' - 2"

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) (5)

Nominal Culvert I.D.	3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
12"	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.8
15"	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9
18"	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0
21"	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.2
24"	0.6	0.7	0.7	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.1	1.3
27"	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.1	1.1	1.1	1.2	1.4
30"	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.3	1.6
33"	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.3	1.3	1.4	1.5	1.7
36"	0.9	0.9	0.9	1.1	1.1	1.1	1.2	1.4	1.4	1.5	1.6	1.8
42"	1.0	1.0	1.1	1.3	1.2	1.3	1.3	1.6	1.6	1.7	1.8	2.1
48"	1.1	1.1	1.2	N/A	1.4	1.4	1.5	N/A	1.9	1.9	2.1	N/A
54"	1.3	1.3	N/A	N/A	1.6	1.6	N/A	N/A	2.1	2.1	N/A	N/A
60"	1.4	N/A	N/A	N/A	1.7	N/A	N/A	N/A	2.3	N/A	N/A	N/A

(1) Provide pipe runner of the size shown in the tables. Provide cross pipe of the same size as the pipe runner. Provide cross pipe stub out and bottom anchor pipe of the next smaller size pipe as shown in the Standard Pipe Sizes and Max Pipe Runner Lengths table.

(2) This standard allows for the placement of only one pipe runner across each culvert pipe opening. In order to limit the clear opening to be traversed by an errant vehicle, the following conditions must be met:

For 60" culvert pipes, the skew must not exceed 0°.
For 54" culvert pipes, the skew must not exceed 15°.
For 48" culvert pipes, the skew must not exceed 30°.
For all culvert pipe sizes 42" and less, the skew must not exceed 45°.

If the above conditions cannot be met, the designer should consider using a safety end treatment with flared wings. For further information, refer to the TxDOT Roadway Design Manual.

(3) Miter = slope of mitered end of pipe culvert.

(4) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(5) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

DATE:
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SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 60" DIA
PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

SETP-CD

FILE: setpcdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
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REVISIONS	0545	01	014	
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		147

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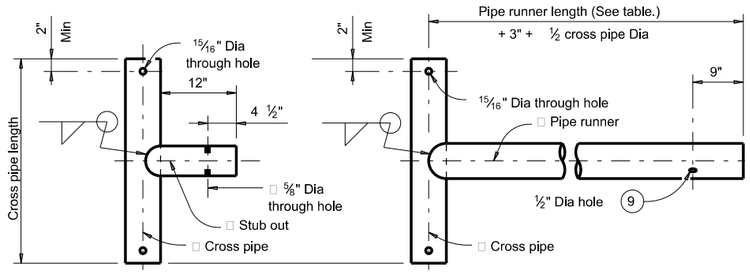
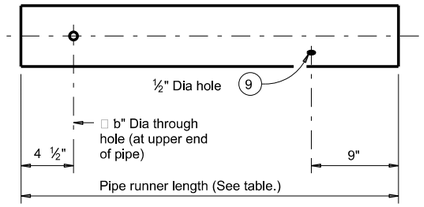


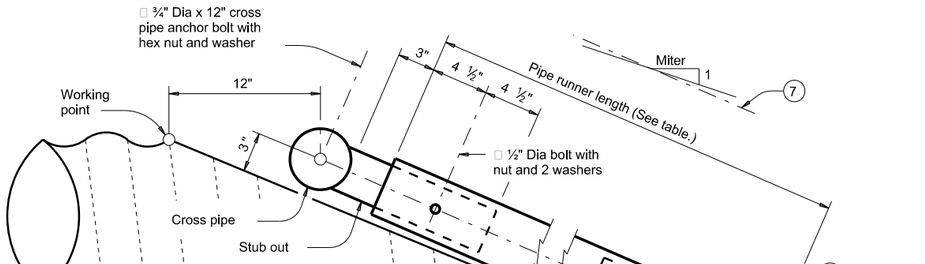
OPTION A1 OPTION A2

CROSS PIPE AND CONNECTIONS DETAILS



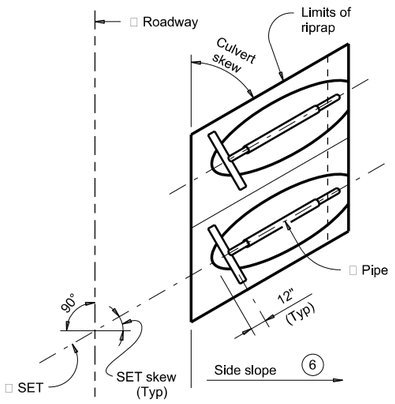
NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS

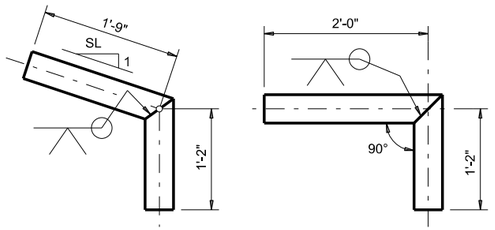


SIDE ELEVATION OF SAFETY END TREATMENT INSTALLATION

(Showing pipe runner with Cross Pipe Connection Option A1 and Anchor Pipe Option B2 on corrugated metal pipe (CMP) culvert. Reinforced concrete pipe culvert (RCP) details are similar. Riprap not shown for clarity)

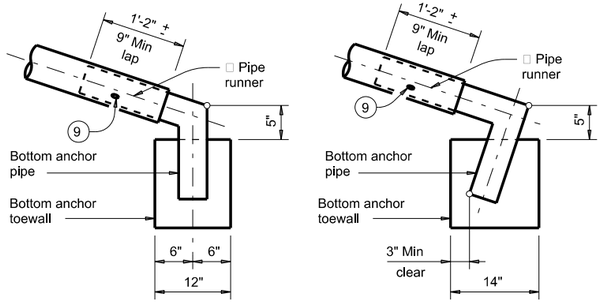


PLAN OF SKEWED INSTALLATION



OPTION B1 OPTION B2

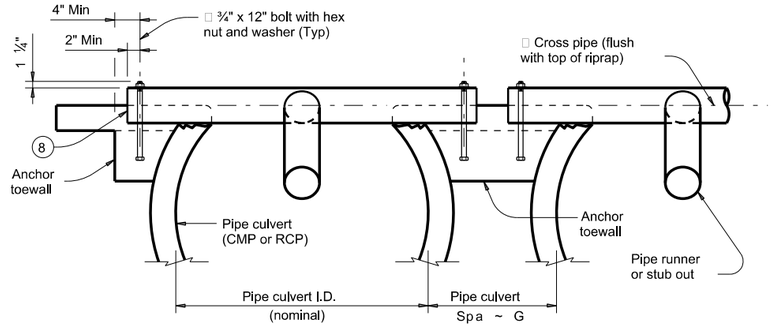
BOTTOM ANCHOR PIPE DETAILS (10)



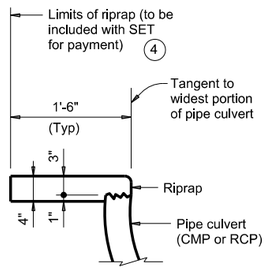
OPTION B1 OPTION B2

BOTTOM ANCHOR TOEWALL DETAILS

(Culvert and riprap not shown for clarity.)



SHOWING CROSS PIPE AND ANCHOR TOEWALL



SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SECTION A-A

(4) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Recommended values of side slope are 3:1, 4:1, and 6:1. All quantities, calculations, and dimensions shown herein are based on these recommended values. Slope of 3:1 or flatter is required for vehicle safety.

(7) Note that actual slope of pipe runner may vary slightly from side slope of riprap and trimmed culvert pipe edge.

(8) Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.

(9) After installation, inspect the ½" hole to ensure that the lap of the pipe runner with the bottom anchor pipe is adequate.

(10) At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the runner) may be substituted for the mitered and welded joint in the bottom anchor pipe.

MATERIAL NOTES:

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.

Provide pipe runners, cross pipes, and anchor pipes conforming to the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication.

Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

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

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.

Payment for riprap and toewall is included in the price bid for each safety end treatment.

Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 60" DIA
PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

SETP-CD

FILE: setpcdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
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REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		148

UTILITY QUALITY LEVELS

(OBTAINED FROM ASCE PUBLICATION CI/ASCE STANDARD 38-02)

1. UTILITY QUALITY LEVEL D (QL D): INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

2. UTILITY QUALITY LEVEL C (QL C): INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

3. UTILITY QUALITY LEVEL B (QL B): INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

4. UTILITY QUALITY LEVEL A (QL A): PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 15-MM VERTICAL AND TO APPLICABLE HORIZONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER.

GENERAL NOTES

1. THE UTILITIES DEPICTED WERE INVESTIGATED BY LAMB-STAR ENGINEERING, ALL OTHER PLAN INFORMATION, NOTABLY THE BACKGROUND INFORMATION, WERE PROVIDED BY OTHERS AND LAMB-STAR ENGINEERING DISCLAIMS RESPONSIBILITY FOR ITS ACCURACY.

2. EXISTING SUBSURFACE UTILITY INVESTIGATIONS WERE COMPLETED ON 02/21/2020. LIMITS OF LAMB-STAR SUE INVESTIGATION ARE FROM STA 45+00 TO STA 110+00 ALONG CENTERLINE SH 135 SOUTH, FROM STA 200+00 TO STA 215+27 ALONG CENTERLINE SH 135 NORTH AND FROM STA 300+00 TO STA 306+28 ALONG CENTERLINE COMMERCE. LAMB-STAR ENGINEERING EXPRESSLY DISCLAIMS ANY AND ALL RESPONSIBILITY FOR SUE DATA PROVIDED BY OTHERS AND NEW UTILITY INSTALLATIONS OR MODIFICATIONS, AND ADJUSTMENTS TO EXISTING UTILITIES AFTER THE COMPLETION DATE.

3. UTILITY LOCATIONS ON THESE DRAWINGS ARE INTENDED FOR DESIGN PURPOSES AND NOT CONSTRUCTION. THEY REFLECT SUBSURFACE UTILITIES AT THE TIME SURVEYED. CALL TEXAS 811 FOR UTILITY LOCATIONS 48-HOURS PRIOR TO ANY WORK.

4. UTILITIES ON THESE DRAWINGS HAVE BEEN IDENTIFIED TO ASCE STANDARD 38-02. QUALITY LEVEL D INFORMATION IS SHOWN AS NOTED IN THE LEGEND.

5. UTILITIES ON THESE DRAWINGS HAVE BEEN IDENTIFIED TO ASCE STANDARD 38-02. QUALITY LEVEL C INFORMATION IS SHOWN AS NOTED IN THE LEGEND.

6. UTILITY LINES WERE DESIGNATED WHERE POSSIBLE. HOWEVER, SOME SERVICE LINES ARE CONSTRUCTED OF NON-CONDUCTIVE MATERIAL AND UTILITY COMPANY DRAWINGS DO NOT SHOW SERVICE LINE LOCATIONS. THEREFORE, NOT ALL SERVICE LINES MAY BE SHOWN.

STORM SEWER MANHOLES

MANHOLE NUMBER	RIM ELEVATION	FL IN (DIRECTION)	FL OUT (DIRECTION)
100039	376.32	FULL OF WATER/MUD	
100510	376.49	FULL OF WATER/MUD	
100479	374.3	FULL OF DIRT	
100441	370.14	UNABLE TO ACCESS INVERT (S)	365.41 (N)
100434	369.91	365.53 (N) UNABLE TO ACCESS INVERT (S)	364.75 (W)
100131	370.01	364.89 (E)	364.83 (W)
100412	370.17	UNABLE TO ACCESS INVERT	
100406	370.29	CURB INLET	366.86 (NW)
100990	356.04	GRATE FULL OF DEBRIS	
100980	358.79	355.24 (NW)	355.02 (SE)
101014	355.81	COULD NOT OPEN	
101011	356.03	351.82 (SE)	351.85 (NW)
101008	356.73	351.25 (N)	351.21 (S)
101009	356.13	351.92 (SE)	351.81 (NW)
100936	359.06	GRATE INLET	356.60 (NE)
101326	358.5	354.83 (NW)	354.83 (S)
100970	357.99	355.35 (W)	355.27 (SE)
100932	358.41	GRATE INLET: COULD NOT OPEN	
100945	358.2	GRATE INLET: COULD NOT OPEN	
100901	359.67	355.21 (NW)	355.20 (SE)
100902	360.7	355.84 (NW)	355.81 (SE)
100926	344.9	FULL OF DEBRIS	
100921	345.2	FULL OF DERBIS	
100308	359.53	357.21 (NW)	356.05 (SE)
100336	359.96	CURB INLET	356.32 (E)
100329	358.87	CURB INLET	355.91 (S)
100328	359.48	355.57 (W) UNABLE TO ACCESS INVERT (N)	UNABLE TO ACCESS INVERT (SE)
100327	359.56	CURB INLET	UNABLE TO ACCESS INVERT (E)
101023	356.05	CURB INLET	352.68 (E)
101024	356.31	CURB INLET	352.87 (N)
102014	372.23	CURB INLET (E) 369.47 (S)	366.69 (W)

LEGEND OF UTILITY TYPES

GENERAL
- UTILITY CONTINUES
- UTILITY TERMINATES
- QL-B SIGNAL LOST

COMMUNICATIONS
- FIBER - CONTERRA (QL-B) — FO1
- FIBER - CONTERRA (QL-D) — FO1(D)
- OH FIBER - CONTERRA (QL-C) — OFO1
- FIBER - CONTERRA (QL-D) — FO1(D)
- OH FIBER - FRONTIER (QL-C) — OFO2
- FIBER - FRONTIER (QL-D) — FO2(D)
- TELEPHONE - FRONTIER (QL-B) — T2
- OH TELEPHONE - FRONTIER (QL-C) — OT2
- FIBER - MCI/VERIZON (QL-B) — FO3
- OH FIBER - MCI/VERIZON (QL-C) — OFO3
- FIBER - MCI/VERIZON (QL-D) — FO3(D)
- OH CATV - LONGVIEW-KILGORE (QL-C) — OTV4
- OH TELEPHONE - LONGVIEW-KILGORE (QL-C) — OT4
- OH FIBER - UNKNOWN (QL-C) — OFO5

ELECTRIC
- ELECTRIC - SWEPCO (QL-B) — E1
- ELECTRIC OH - SWEPCO (QL-C) — OE1
- ELECTRIC - SWEPCO (QL-D) — E1(D)

GAS
- GAS - CENTERPOINT (QL-B) — G2
- GAS - CENTERPOINT (QL-D) — G2(D)
- GAS - ENERFIN (QL-D) — G3(D)
- GAS - BASA RESOURCES (QL-D) — G4(D)
- GAS - AMERICAN MIDSTREAM (QL-B) — G5
- GAS - AMERICAN MIDSTREAM (QL-D) — G5(D)
- GAS - SHELL (QL-D) — G6(D)
- GAS - UNKNOWN (QL-B) — G9
- GAS - XTO ENERGY (QL-D) (ABAN) — G1(D)
- GAS - CENTERPOINT (QL-B) (ABAN) — G2
- GAS - CENTERPOINT (QL-D) (ABAN) — G2(D)
- GAS - ENERFIN (QL-D) (ABAN) — G3(D)
- GAS - BASA RESOURCES (QL-D) (ABAN) — G4(D)
- GAS - AMERICAN MIDSTREAM (QL-D) (ABAN) — G5(D)
- PIPELINE - SHELL (QL-B) (ABAN) — PL6
- PIPELINE - SHELL (QL-D) (ABAN) — PL6(D)
- PIPELINE - MOBIL (QL-D) (ABAN) — PL7(D)
- PIPELINE - ETSWD (QL-D) (ABAN) — PL8(D)
- PIPELINE - SUNOCO/ET (QL-D) (ABAN) — PL10(D)

WATER
- WATER - CITY OF KILGORE (QL-D) — W1
- WATER - CITY OF KILGORE (QL-D) — W1(D)

WASTEWATER/DRAINAGE
- WASTEWATER - CITY OF KILGORE (QL-B) — WW1
- WASTEWATER - CITY OF KILGORE (QL-D) — WW1(D)
- STORM SEWER - CITY OF KILGORE (QL-B) — STM1
- STORM SEWER - CITY OF KILGORE (QL-D) — STM1(D)

MISCELLANEOUS
- ANCHOR LINE (QL-C)
- UNKNOWN (QL-D) — UNK — UNK

LEGEND OF UTILITY SYMBOLS

GENERAL
- GUY WIRE

COMMUNICATIONS
- COMMUNICATIONS ANTENNA
- TELEPHONE SERVICE POLE (T)
- TELEPHONE PEDESTAL (T)
- FIBER MANHOLE (F)
- UNDERGROUND FIBER MARKER (F)

ELECTRIC
- SERVICE POLE (SP)
- UTILITY POLE (UP)
- PEDESTAL (E)

GAS
- METER (GM)
- TEST VALVE (GTV)
- VENT
- UNDERGROUND MARKER (G)

WATER
- METER (WM)
- MANHOLE (W)
- FIRE HYDRANT
- VALVE (WV)

WASTEWATER/DRAINAGE
- WASTEWATER MANHOLE (WW)
- WASTEWATER LIFT STATION (WV)
- WASTEWATER CLEANOUT (CO)
- STORM SEWER MANHOLE (STM)
- STORM SEWER GRATE INLET (GI)
- STORM SEWER CURB INLET (CI)

TEST HOLE BY OTHERS

WASTEWATER MANHOLES

MANHOLE NUMBER	RIM ELEVATION	FL IN (DIRECTION)	FL OUT (DIRECTION)
100374	371.03	OVERLAID WITH ASPHALT	
100375	371.09	OVERLAID WITH ASPHALT	
100405	371.94	367.64 (W) 367.47 (S)	367.43 (N)
101435	362.99	FULL OF WATER	
102044	376.97	371.09 (N)	371.05 (S)
102041	360.03	352.67 (NW)	352.45 (SE)
102040	359.49	350.21 (N) 354.21 (W) 350.34 (S)	350.15 (E)
102036	359.98	354.14 (N) 354.24 (E)	354.12 (W)
102037	359.43	351.41 (N) 351.31 (W)	350.89 (S)
102045	365.05	361.72 (W) 361.53 (S)	361.49 (E)
102046	373.26	368.70 (E) 365.11 (N) 365.52 (W)	365.02 (S)
102047	372.50	367.26 (N) 367.22 (S)	367.08 (E)
102048	371.53	367.37 (W)	367.29 (S)
102049	372.16	368.64 (W)	368.58 (E)

100% SUBMITTAL

STATE OF TEXAS — JILL M. VAN HOEWYK — 110940 — LICENSED PROFESSIONAL ENGINEER

2/11/2022

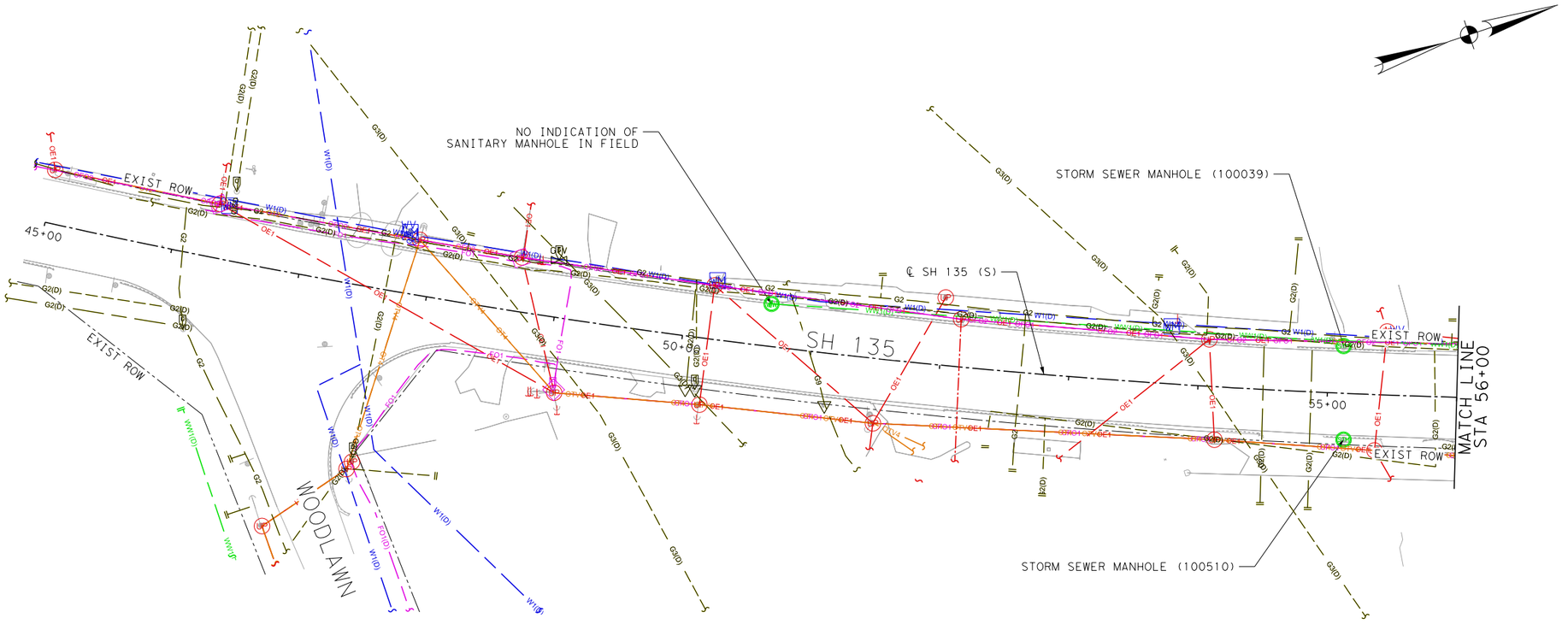
REV. NO.	DATE	DESCRIPTION	BY

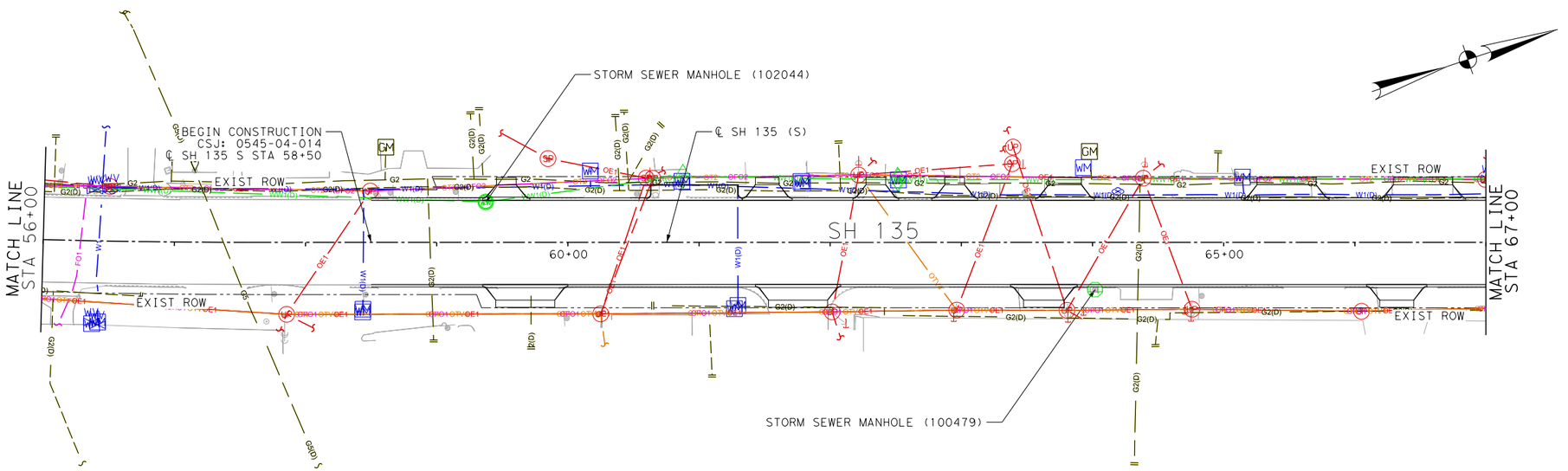
LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SH 135
UTILITY NOTES

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	149





NOTES:

1. SEE UTILITY NOTES FOR ADDITIONAL INFORMATION.
2. QUALITY LEVEL A TEST HOLE INFORMATION SHOWN WAS PROVIDED BY OTHERS. LAMB-STAR ENGINEERING DISCLAIMS RESPONSIBILITY FOR ITS ACCURACY AND DEPICTION.

100% SUBMITTAL

STATE OF TEXAS
JILL M. VAN HOEWYK
110940
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
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713.462.3242
www.cobbfendley.com

SH 135
UTILITY LAYOUTS

SHEET 1 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	150

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Ryan.Lance
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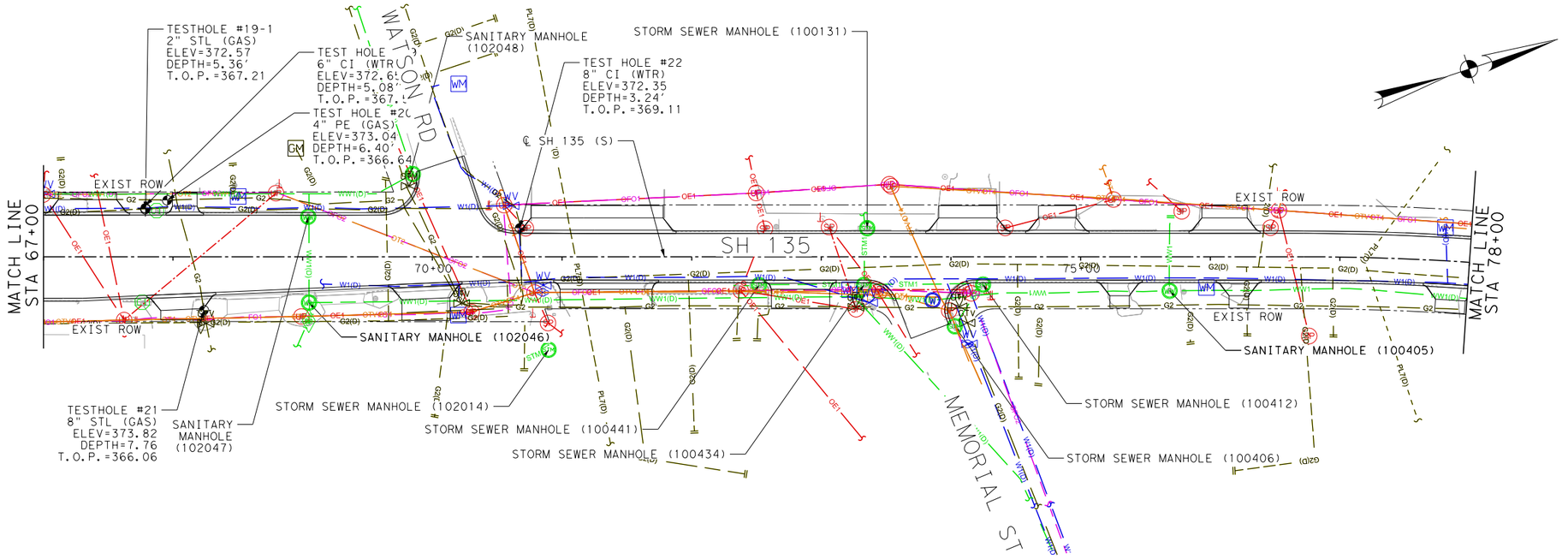

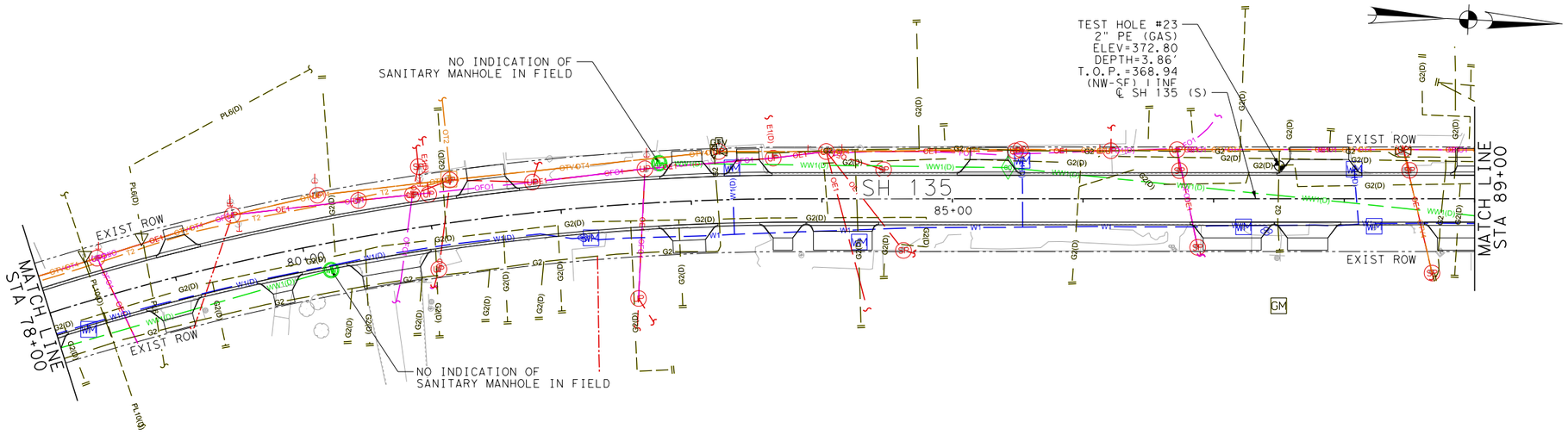

NOTES:

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3. SANITARY MANHOLE 102049
℄ 135 S STA 68+57, 410' LT
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100% SUBMITTAL

STATE OF TEXAS
JILL M. VAN HOEWYK
110940
LICENSED
PROFESSIONAL ENGINEER

2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

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SH 135
UTILITY LAYOUTS

SHEET 2 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	151

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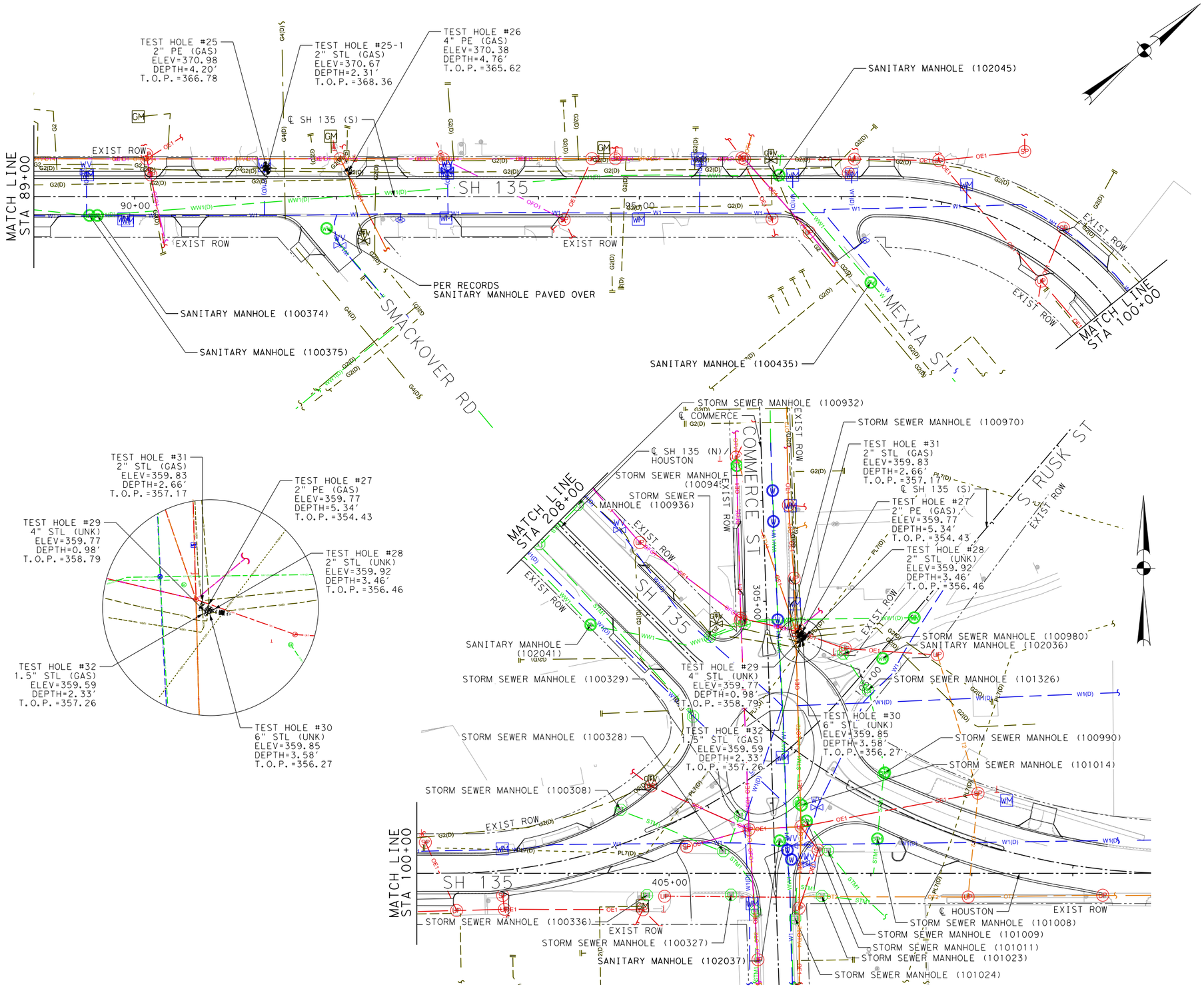

NOTES:

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3. SANITARY MANHOLE 102040 ℄ COMMERCE STA 300+68, 6' RT OFF PAGE

100% SUBMITTAL

STATE OF TEXAS
JILL M. VAN HOEWYK
110940
LICENSED
PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

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Texas Department of Transportation

SH 135
UTILITY LAYOUTS

SHEET 3 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	152

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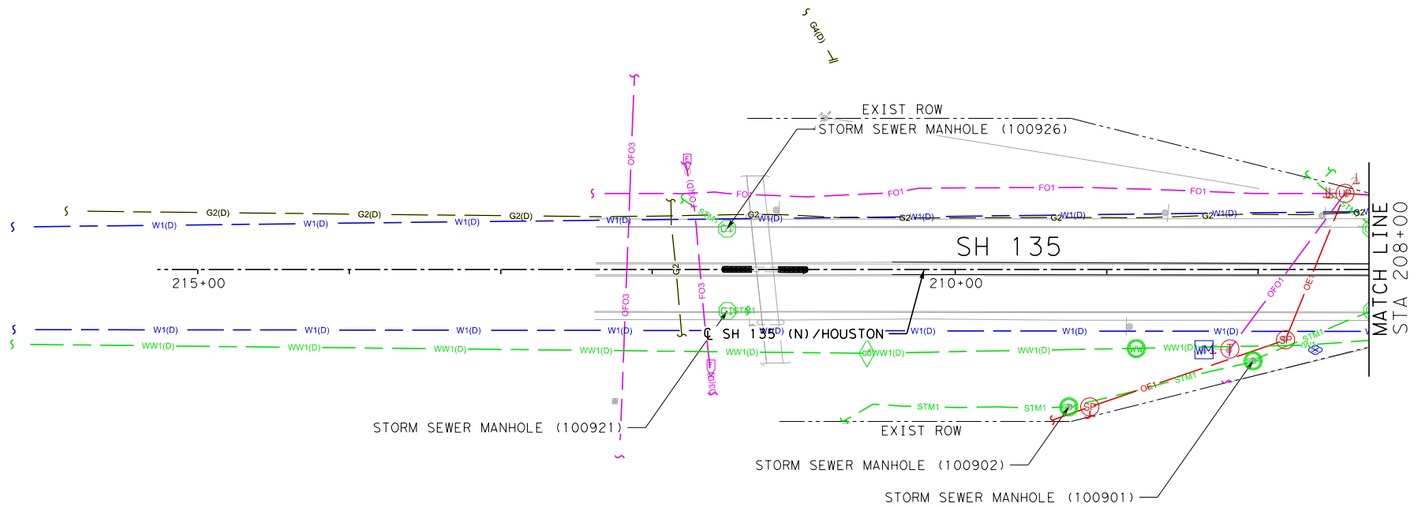

NOTES:

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100% SUBMITTAL

STATE OF TEXAS
JILL M. VAN HOEWYK
110940
REGISTERED
PROFESSIONAL ENGINEER
2/11/2022

0 25 50 100(H)

REV. NO.	DATE	DESCRIPTION	BY

LAMB-STAR ENGINEERING, LLC
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SH 135
UTILITY LAYOUTS

SHEET 4 OF 4

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	153

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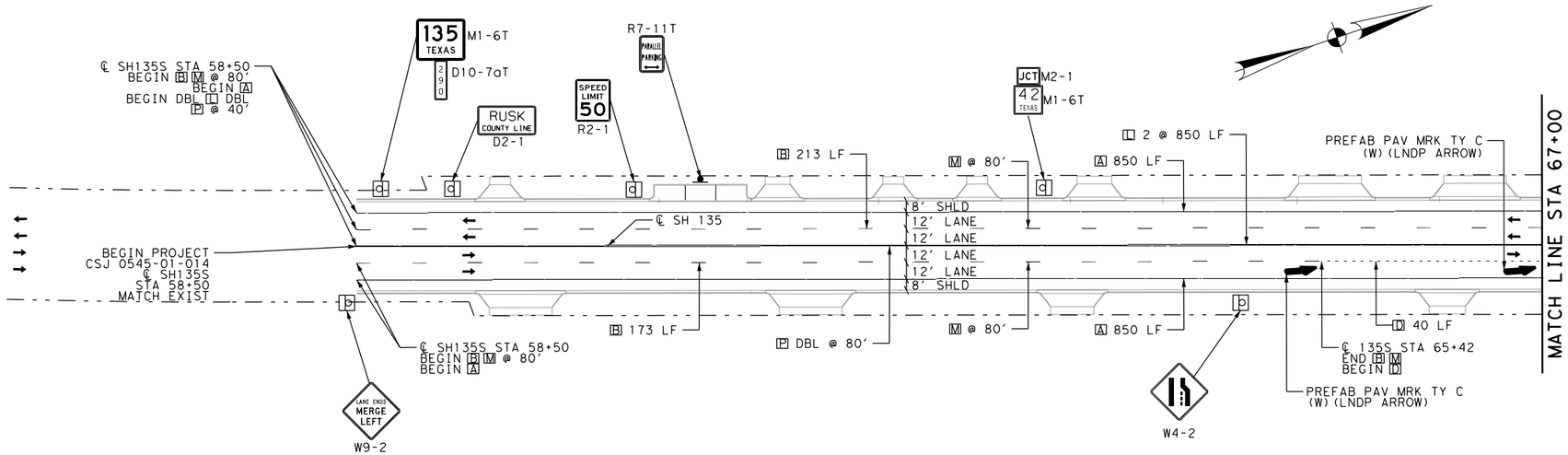

LEGEND

- A PAV MRK TY I (W)4"(SLD)(100MIL)
- B PAV MRK TY I (W)4"(BRK)(100MIL)
- C PAV MRK TY I (W)8"(DOT)(100MIL)
- D PAV MRK TY I (W)4"(DOT)(100MIL)
- F PAV MRK TY I (W)12"(SLD)(100MIL)
- L PAV MRK TY I (Y)4"(SLD)(100MIL)
- M PAV MRKR TY II-C-R
- N PAV MRKR TY I-C
- P PAV MRKR TY II-A-A
- S PAV MRKR TY I (Y) (MED NOSE)(100MIL)
- T PAV MRK TY I (W)36"(YLD TRI)(100MIL)
- b EXISTING SIGN TO REMOVE AND REPLACE
- b EXISTING SIGN TO REMOVE
- PROPOSED SMALL SIGN
- PREFAB PAV MRK TY C (W)(ARROW)
- (#) POINT NUMBER

100% SUBMITTAL

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED PROFESSIONAL ENGINEER

02/13/2022

Michael Verhoff

0 25 50 100
1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SIGNING & PAVEMENT MARKING LAYOUT

BEGIN TO STA 67+00

SHEET **1** OF **5**

FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**154**

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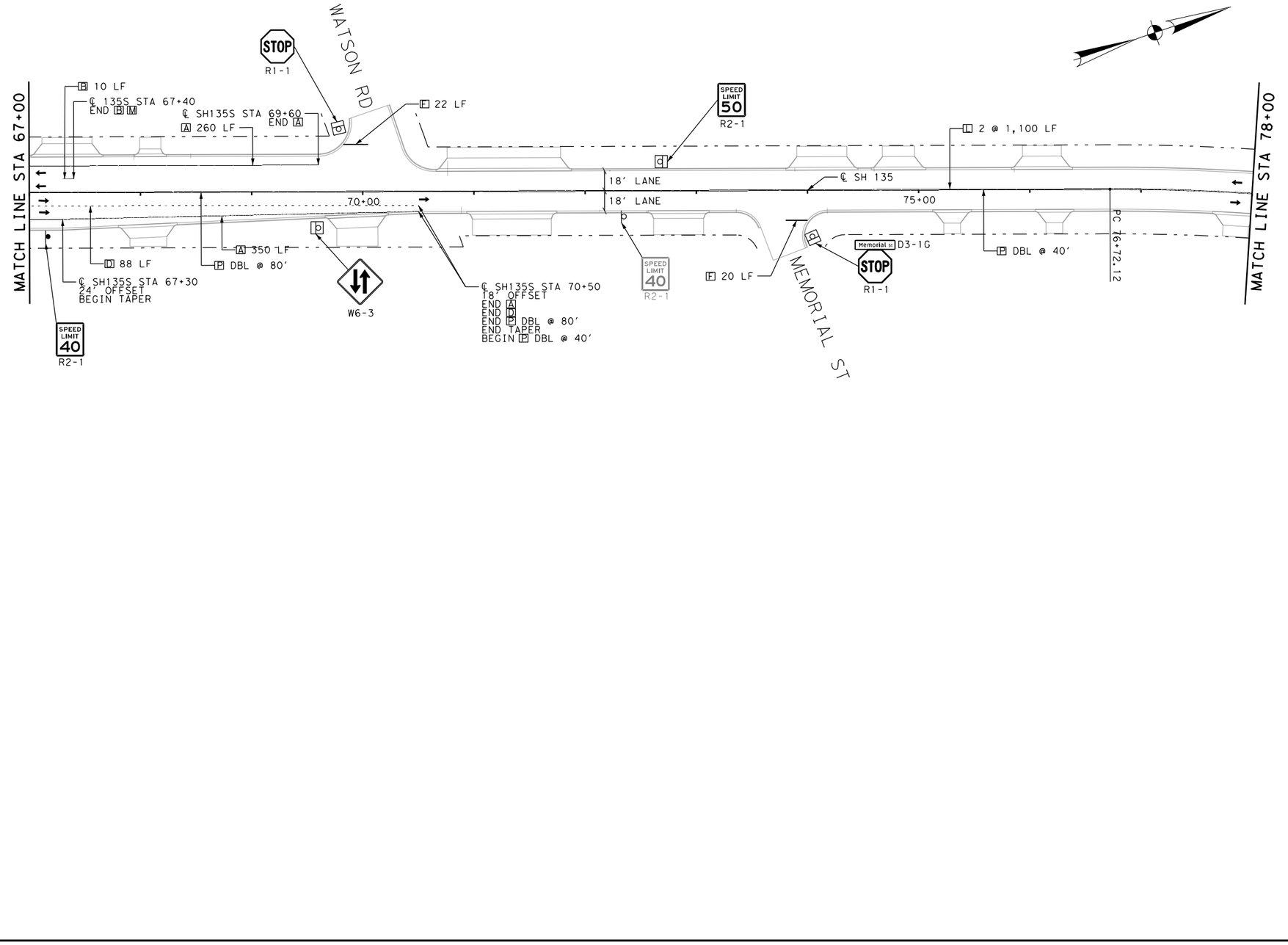

LEGEND

- A PAV MRK TY I (W)4"(SLD)(100MIL)
- B PAV MRK TY I (W)4"(BRK)(100MIL)
- C PAV MRK TY I (W)8"(DOT)(100MIL)
- D PAV MRK TY I (W)4"(DOT)(100MIL)
- F PAV MRK TY I (W)12"(SLD)(100MIL)
- L PAV MRK TY I (Y)4"(SLD)(100MIL)
- M PAV MRKR TY II-C-R
- N PAV MRKR TY I-C
- P PAV MRKR TY II-A-A
- S PAV MRKR TY I (Y) (MED NOSE)(100MIL)
- T PAV MRK TY I (W)36"(YLD TRI)(100MIL)
- ⊳ EXISTING SIGN TO REMOVE AND REPLACE
- ⊳ EXISTING SIGN TO REMOVE
- ▸ PROPOSED SMALL SIGN
- → PREFAB PAV MRK TY C (W)(ARROW)
- (n) POINT NUMBER

100% SUBMITTAL

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED PROFESSIONAL ENGINEER

02/13/2022

Michael Verhoef

0 25 50 100
1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

SIGNING & PAVEMENT MARKING LAYOUT

STA 67+00 TO STA 78+00

SHEET **2** OF **5**

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**155**

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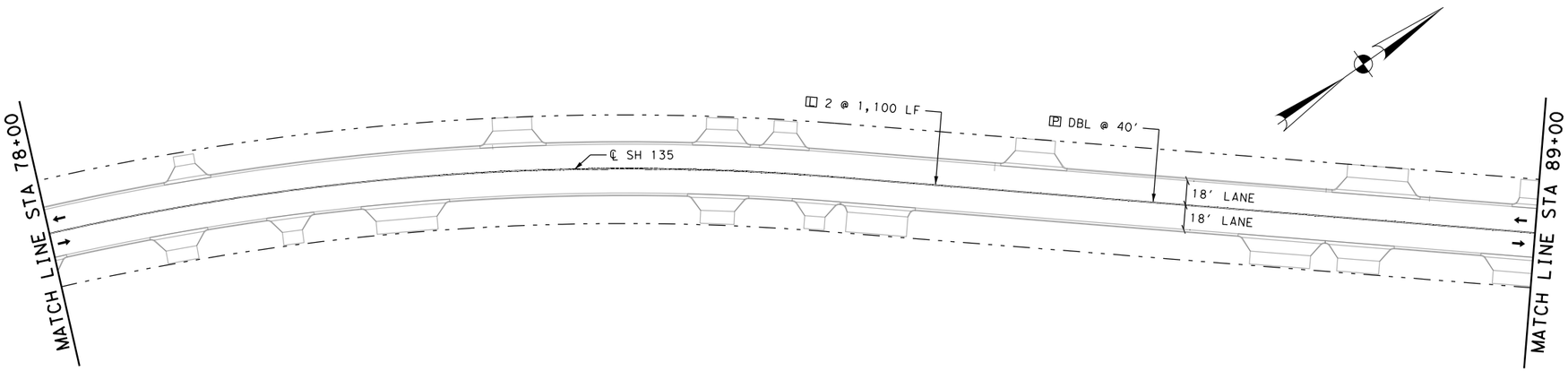


LEGEND

- A PAV MRK TY I (W)4"(SLD)(100MIL)
- B PAV MRK TY I (W)4"(BRK)(100MIL)
- C PAV MRK TY I (W)8"(DOT)(100MIL)
- D PAV MRK TY I (W)4"(DOT)(100MIL)
- F PAV MRK TY I (W)12"(SLD)(100MIL)
- L PAV MRK TY I (Y)4"(SLD)(100MIL)
- M PAV MRKR TY II-C-R
- N PAV MRKR TY I-C
- P PAV MRKR TY II-A-A
- S PAV MRKR TY I (Y) (MED NOSE)(100MIL)
- T PAV MRK TY I (W)36"(YLD TRI)(100MIL)
- EXISTING SIGN TO REMOVE AND REPLACE
- EXISTING SIGN TO REMOVE
- PROPOSED SMALL SIGN
- PREFAB PAV MRK TY C (W)(ARROW)
- (n) POINT NUMBER

100% SUBMITTAL

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

02/13/2022

Michael Verhoff

0 25 50 100
1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

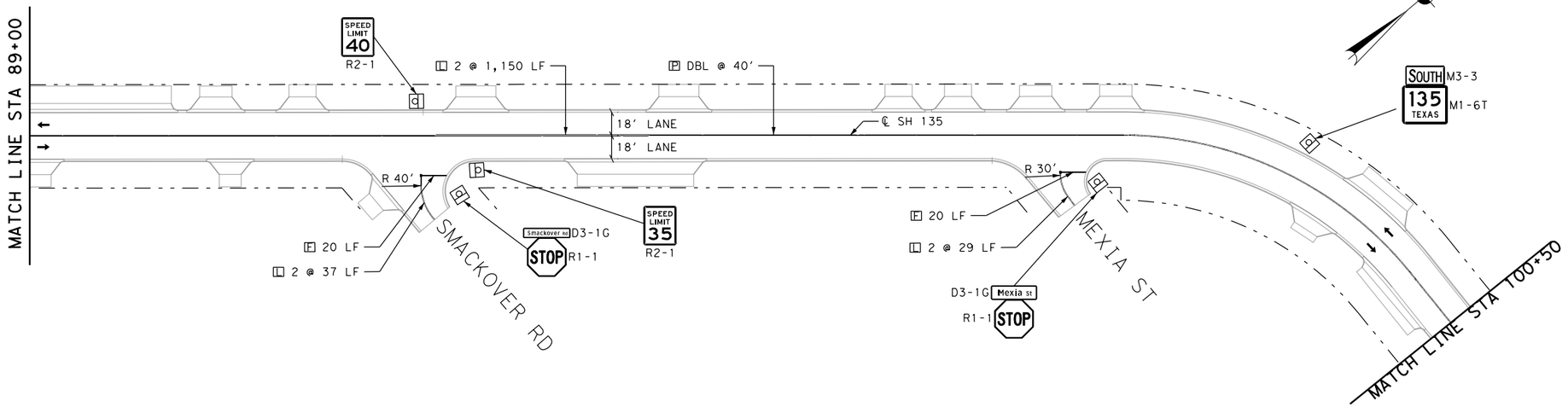
Texas Department of Transportation

SIGNING & PAVEMENT MARKING LAYOUT

STA 78+00 TO STA 89+00

SHEET **3** OF **5**

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**156**



LEGEND

- A PAV MRK TY I (W)4"(SLD)(100MIL)
- B PAV MRK TY I (W)4"(BRK)(100MIL)
- C PAV MRK TY I (W)8"(DOT)(100MIL)
- D PAV MRK TY I (W)4"(DOT)(100MIL)
- F PAV MRK TY I (W)12"(SLD)(100MIL)
- L PAV MRK TY I (Y)4"(SLD)(100MIL)
- M PAV MRKR TY II-C-R
- N PAV MRKR TY I-C
- P PAV MRKR TY II-A-A
- S PAV MRKR TY I (Y) (MED NOSE)(100MIL)
- T PAV MRK TY I (W)36"(YLD TRI)(100MIL)
- EXISTING SIGN TO REMOVE AND REPLACE
- EXISTING SIGN TO REMOVE
- PROPOSED SMALL SIGN
- PREFAB PAV MRK TY C (W)(ARROW)
- (#) POINT NUMBER

100% SUBMITTAL

STATE OF TEXAS · MICHAEL D. VERHOFF · 128002 · LICENSED PROFESSIONAL ENGINEER

02/13/2022

Michael Verhoff

0 25 50 100

1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SIGNING & PAVEMENT MARKING LAYOUT

STA 89+00 TO STA 100+50

SHEET **4** OF **5**

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**157**

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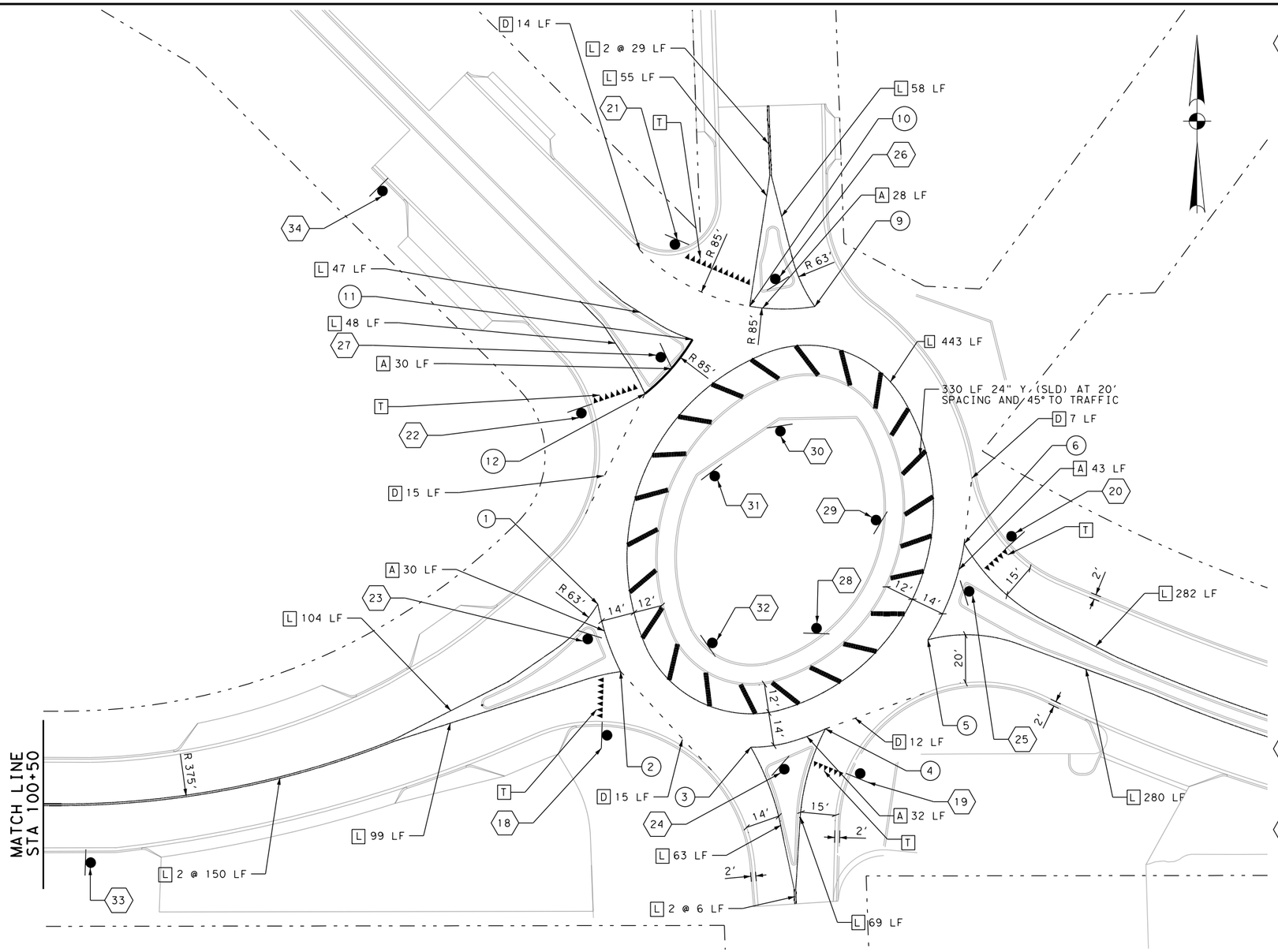

Point No.	Northing	Easting
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2	6,841,250.48	3,085,845.02
3	6,841,217.99	3,085,898.96
4	6,841,225.18	3,085,930.28
5	6,841,261.79	3,085,973.77
6	6,841,301.76	3,085,989.57
9	6,841,401.96	3,085,928.66
10	6,841,402.49	3,085,901.38
11	6,841,388.99	3,085,877.29
12	6,841,366.55	3,085,856.98

18 – 22 YIELD R1-2

23 SOUTH M3-3, 135 TEXAS M1-6T, M6-1

24 Commerce st D3-1G, NORTH M3-1, 135 TEXAS M1-6T, M6-1

25 Houston st D3-1G, NORTH M3-1, 135 TEXAS M1-6T, M6-1

26 Commerce st D3-1G, NORTH M3-1, 135 TEXAS M1-6T, M6-1

27 NORTH M3-1, 135 TEXAS M1-6T, M6-1

28 – 32 R6-4

33 – 34 W2-6, ROUNDABOUT, W16-17P

LEGEND

- A PAV MRK TY I (W)4"(SLD)(100MIL)
- B PAV MRK TY I (W)4"(BRK)(100MIL)
- C PAV MRK TY I (W)8"(DOT)(100MIL)
- D PAV MRK TY I (W)4"(DOT)(100MIL)
- F PAV MRK TY I (W)12"(SLD)(100MIL)
- L PAV MRK TY I (Y)4"(SLD)(100MIL)
- M PAV MRKR TY II-C-R
- N PAV MRKR TY I-C
- P PAV MRKR TY II-A-A
- S PAV MRKR TY I (Y) (MED NOSE)(100MIL)
- T PAV MRK TY I (W)36"(YLD TRI)(100MIL)
- EXISTING SIGN TO REMOVE AND REPLACE
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- PROPOSED SMALL SIGN
- PREFAB PAV MRK TY C (W)(ARROW)
- (#) POINT NUMBER

100% SUBMITTAL

02/13/2022

STATE OF TEXAS · MICHAEL D. VERHOEF · 128002 · LICENSED PROFESSIONAL ENGINEER

Michael Verhoef

0 12.5 25 50

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
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Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

SIGNING & PAVEMENT MARKING LAYOUT

ROUNDABOUT

SHEET 5 OF 5

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	158

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135_TRAF-SPM05.dgn

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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)

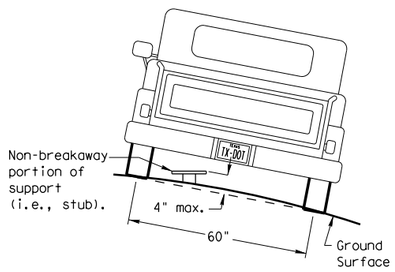
Anchor Type

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))

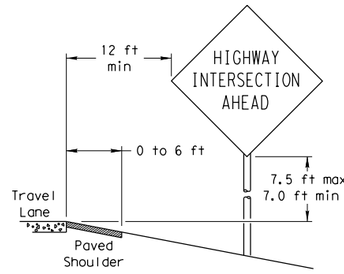
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

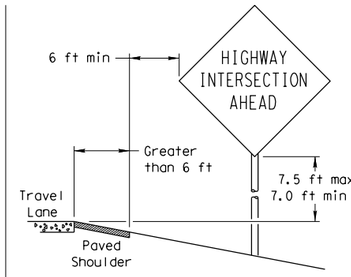
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

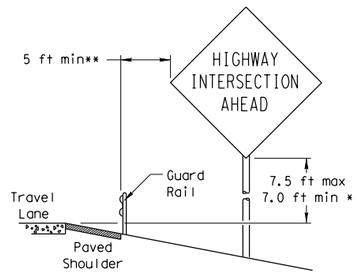
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



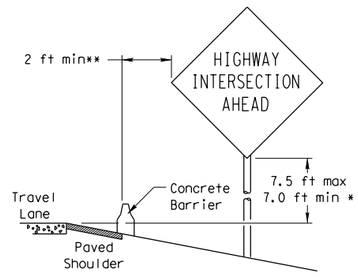
GREATER THAN 6 FT. WIDE

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



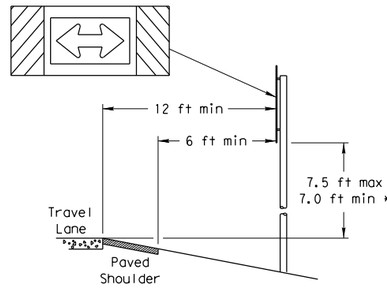
BEHIND GUARDRAIL



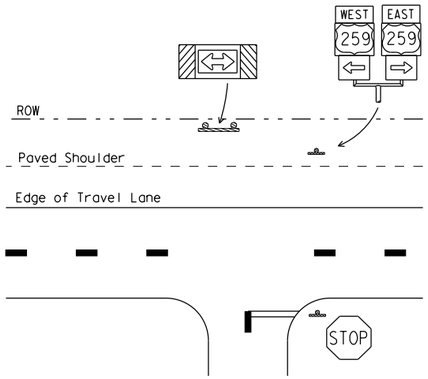
BEHIND CONCRETE BARRIER

**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:

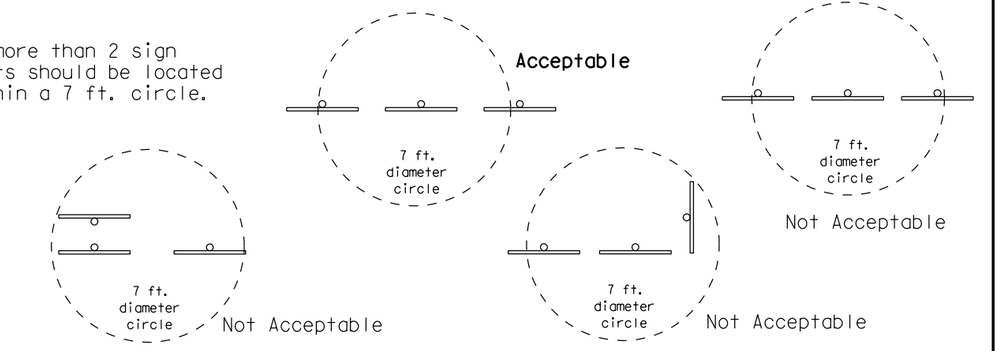
(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(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.

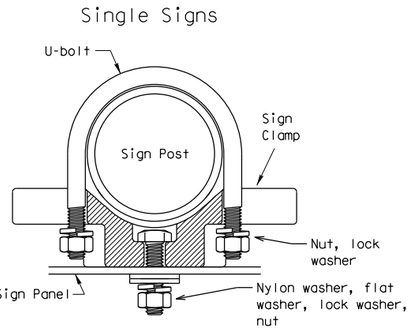
The maximum values may be increased when directed by the Engineer.

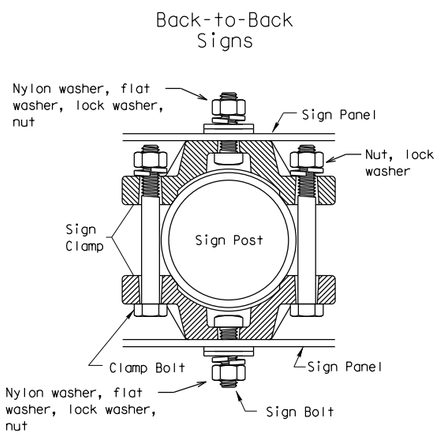
See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm



TYPICAL SIGN ATTACHMENT DETAIL





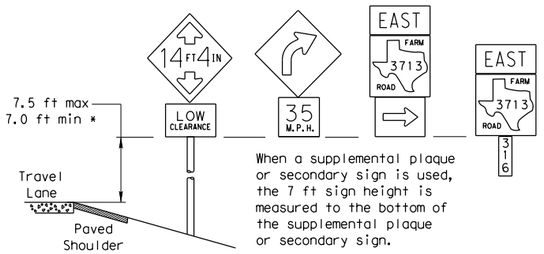
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

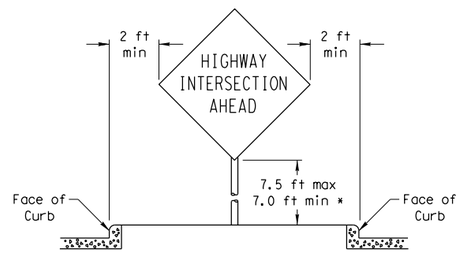
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



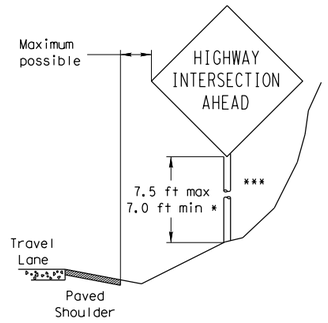
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		159

DATE: 2/13/2022 1:08:02 PM
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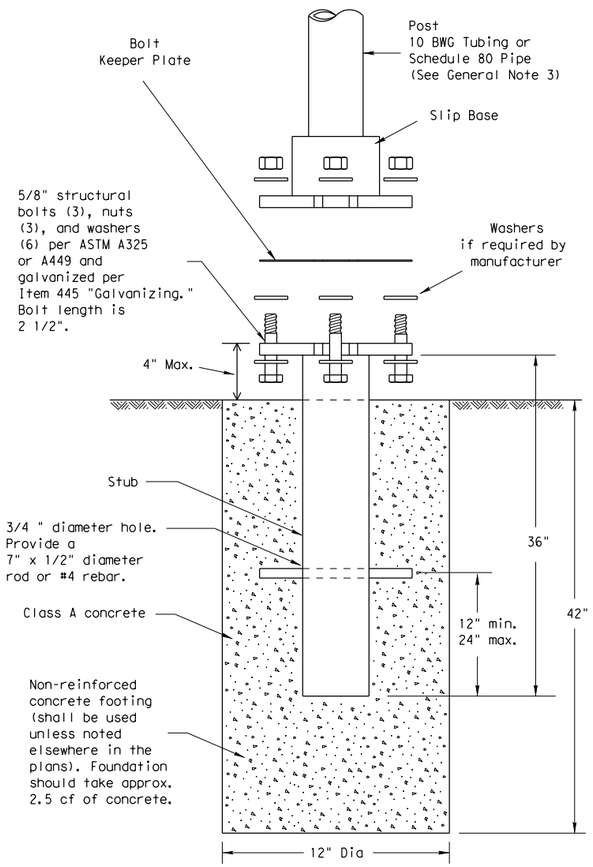
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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:

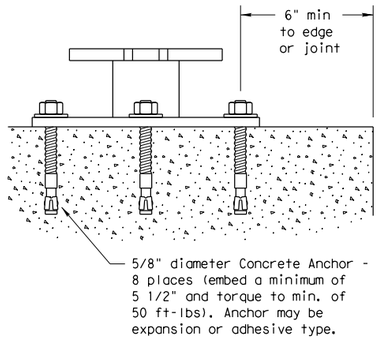
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   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

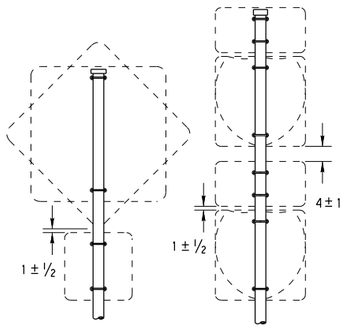
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

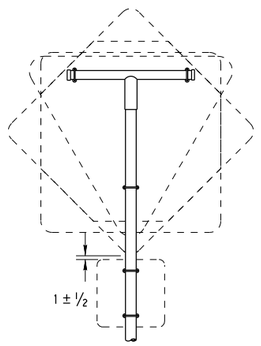
CONT	SECT	JOB	HIGHWAY
0545	01	014	SH 135

DIST	COUNTY	SHEET NO.
TYL	GREGG	160

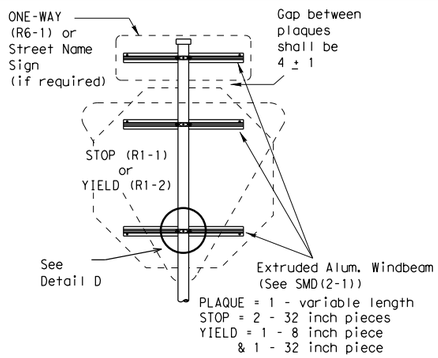
DATE: 2/13/2022 1:08:03 PM
FILE: F:\Projects\2019\11004.TxDOT#5x5#PS&E\02.SH135#Kilgore\ENG\500 USTN\500.02 Sheets\08 Traffic\Standards\smds2.dgn



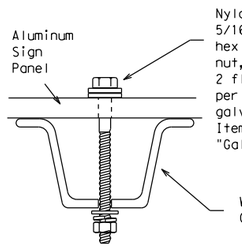
SM RD SGN ASSM TY XXXXX(1)XX(P)



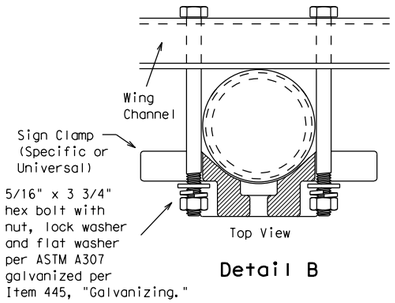
SM RD SGN ASSM TY XXXXX(1)XX(T)



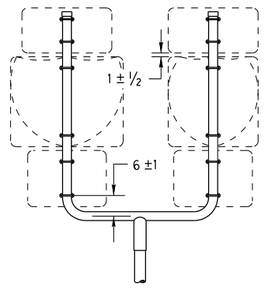
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



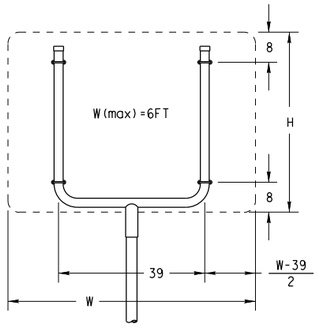
Detail A



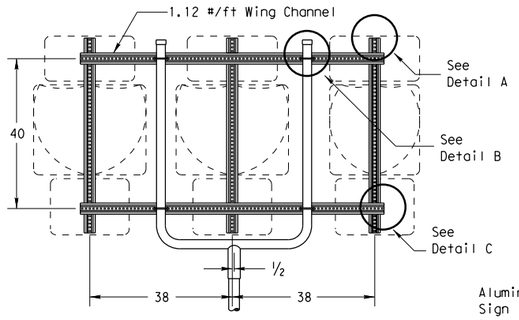
Detail B



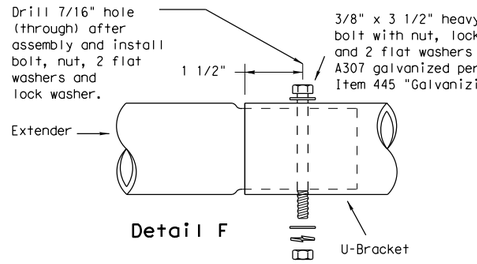
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)

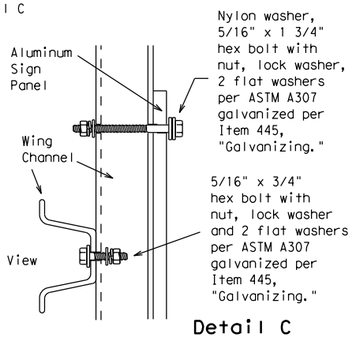


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

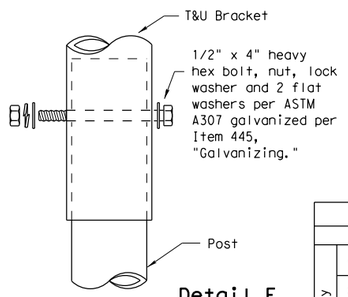


Detail F

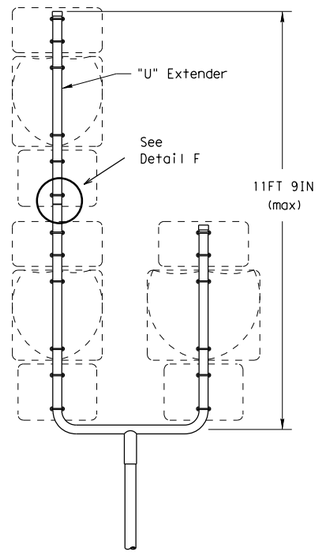
Splices shall only be allowed behind the sign substrate.



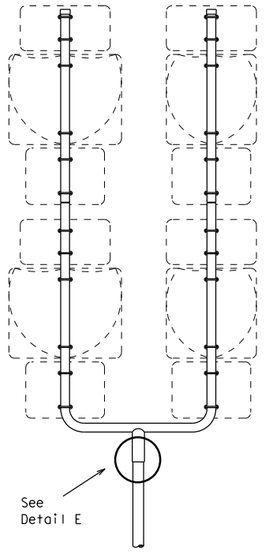
Detail C



Detail E



SM RD SGN ASSM TY S80(1)XX(U-1EXT)



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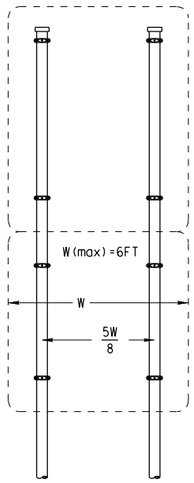
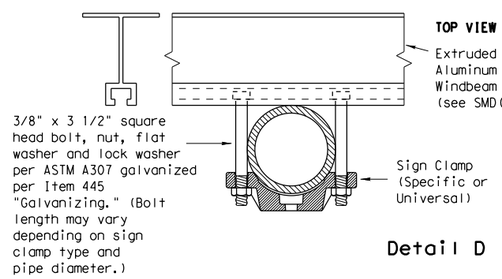
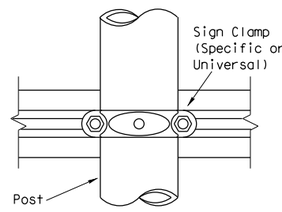


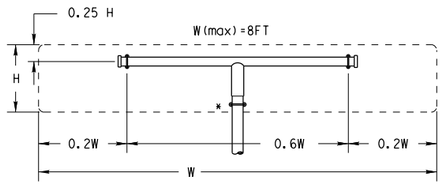
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D

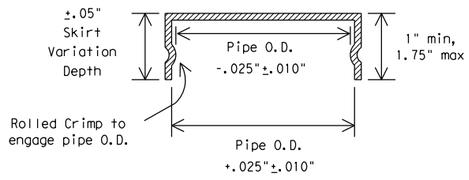




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

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

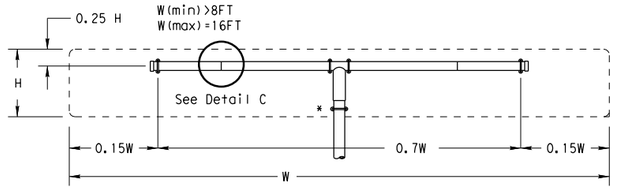
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

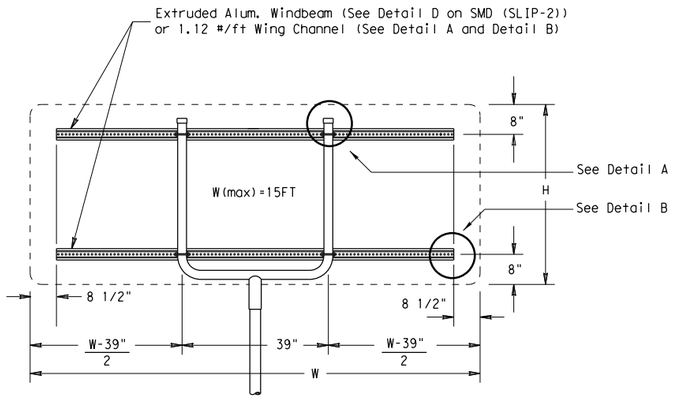
REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		161

26C

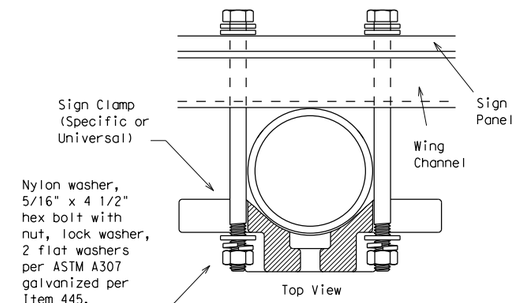
DATE: 2/13/2022 1:08:04 PM
FILE: F:\Projects\2019\1004_TxDOT*5x5*PS&E\02.SH135*Kilgore\ENG\500 USTN\500.02 Sheets\08 Traffic\Standards\smds3.dgn



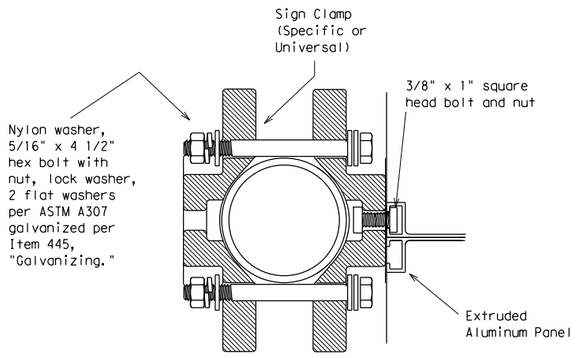
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



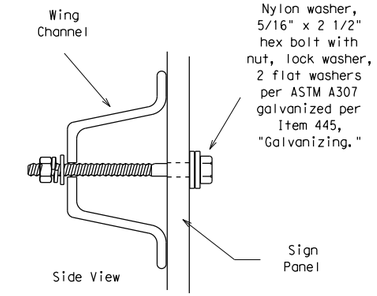
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



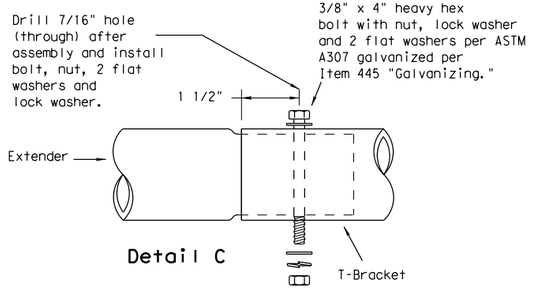
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

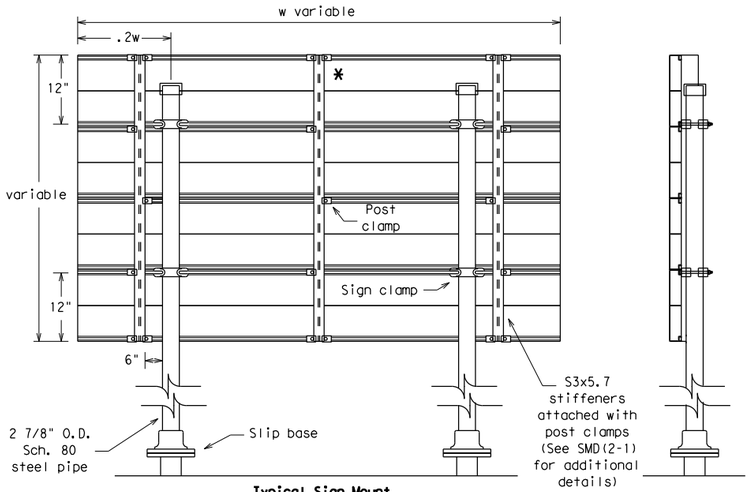


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

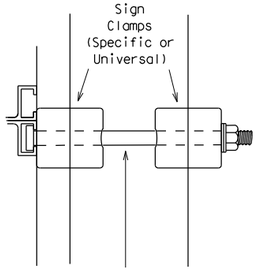


Typical Sign Mount

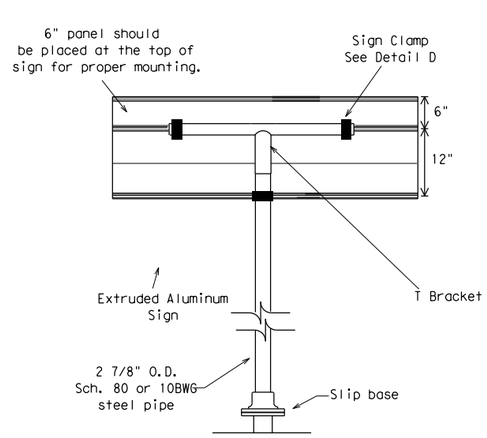
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

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

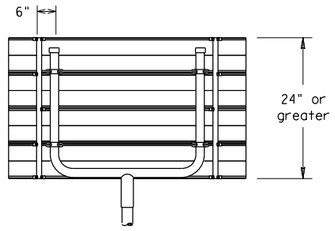
See Detail E
for clamp installation



Detail E



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

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. 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.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. 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.
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6. 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.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. 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."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. 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.
11. Post open ends shall be fitted with Friction Caps.

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

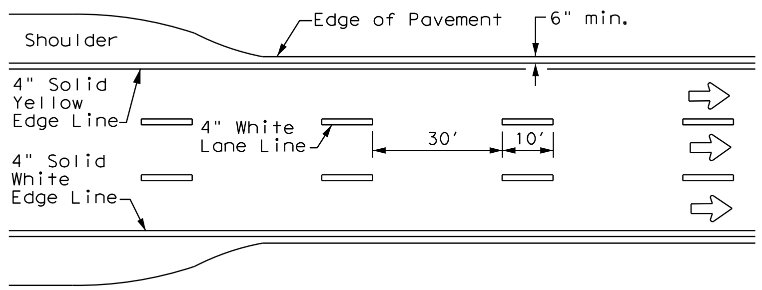
SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

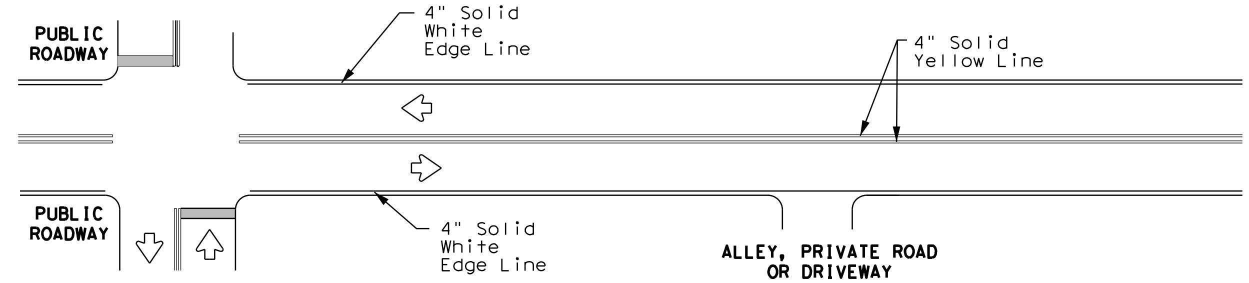
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

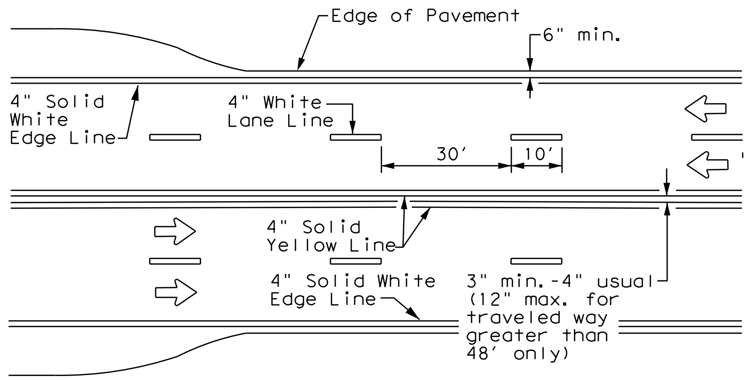
CONT	SECT	JOB	HIGHWAY
0545	01	014	SH 135
DIST	COUNTY		SHEET NO.
TYL	GREGG		162



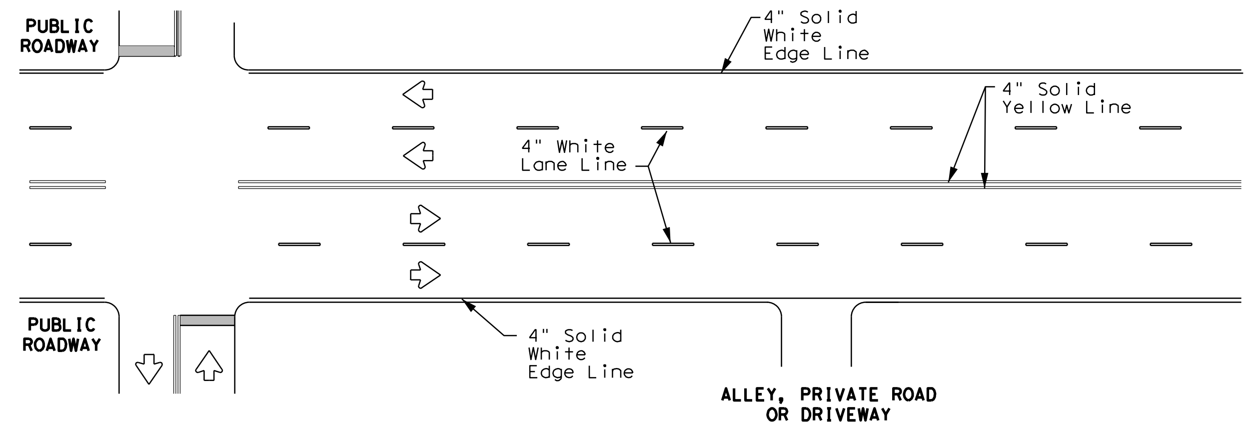
EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



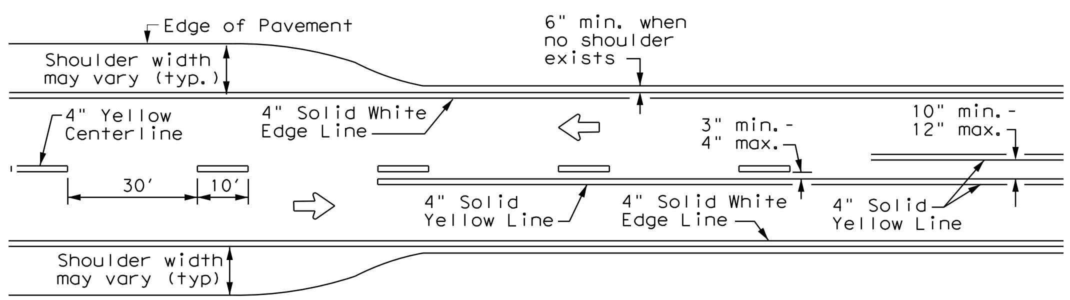
TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



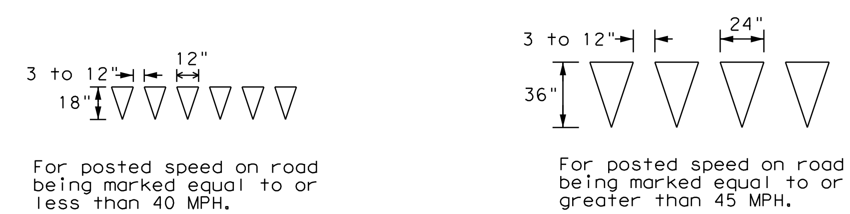
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



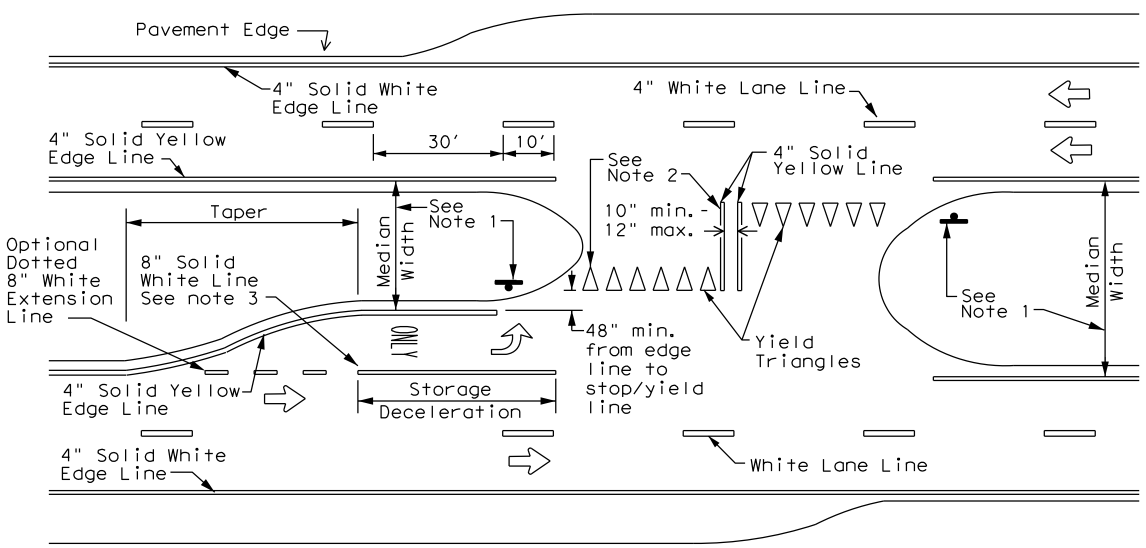
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

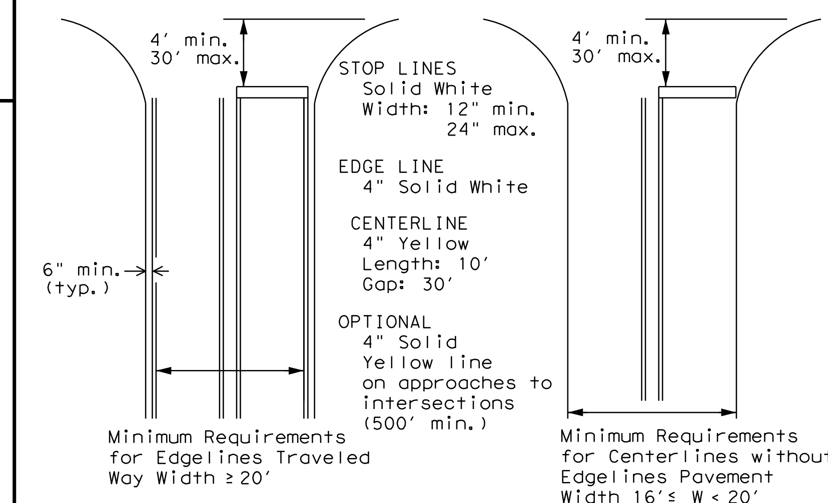
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE
Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation
Traffic Safety Division Standard

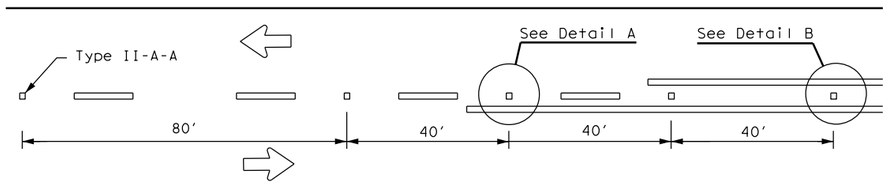
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

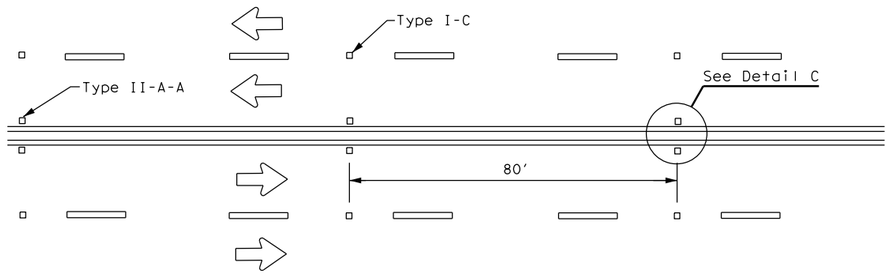
FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
©TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0545	01	014	SH 135
5-00 2-12	DIST		COUNTY	SHEET NO.
8-00 6-20	TYL		GREGG	163

22A

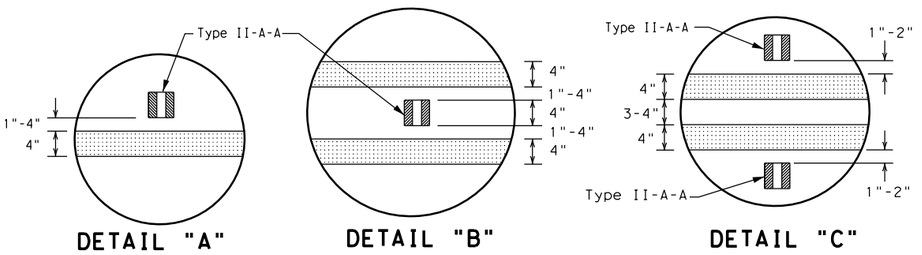
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



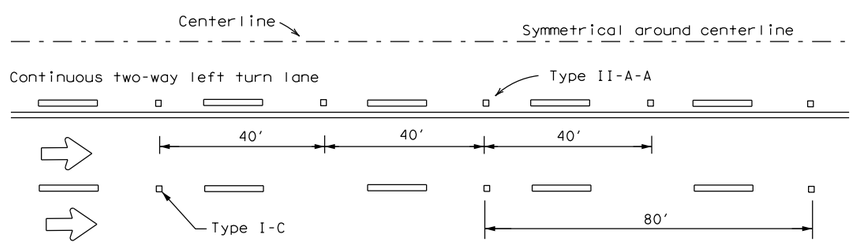
CENTERLINE FOR ALL TWO LANE ROADWAYS



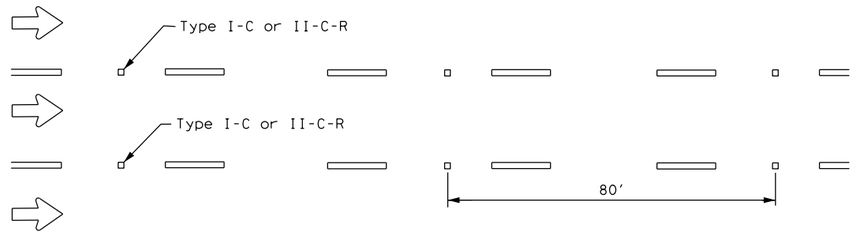
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

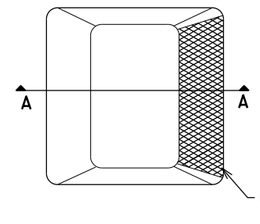


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

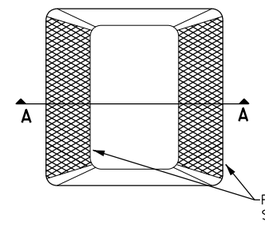
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

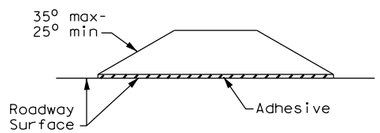
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

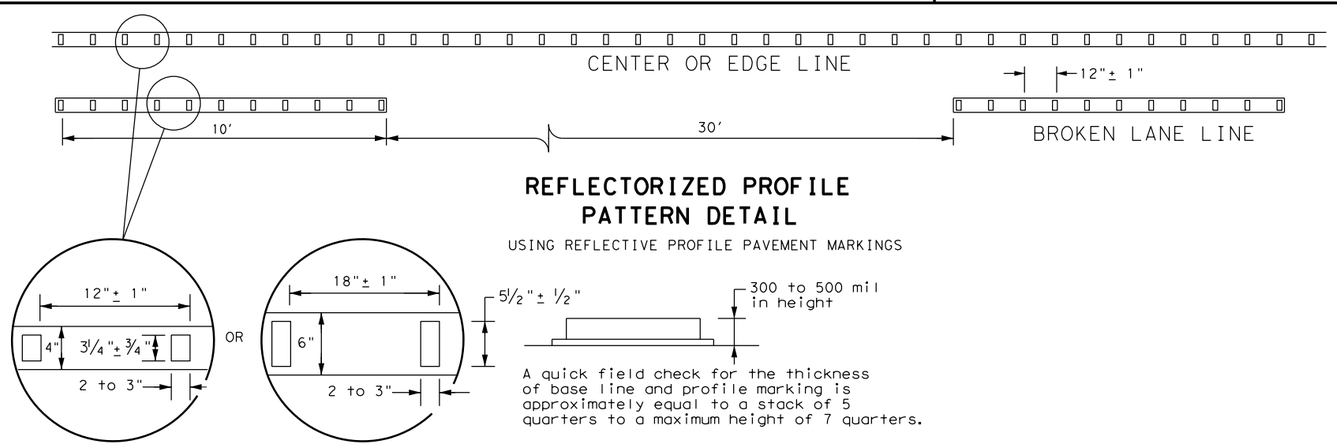


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



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.

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

NOTE

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

GENERAL NOTES

1. All raised pavement markers placed in 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.

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		164

22B

DATE: 2/13/2022 1:08:05 PM
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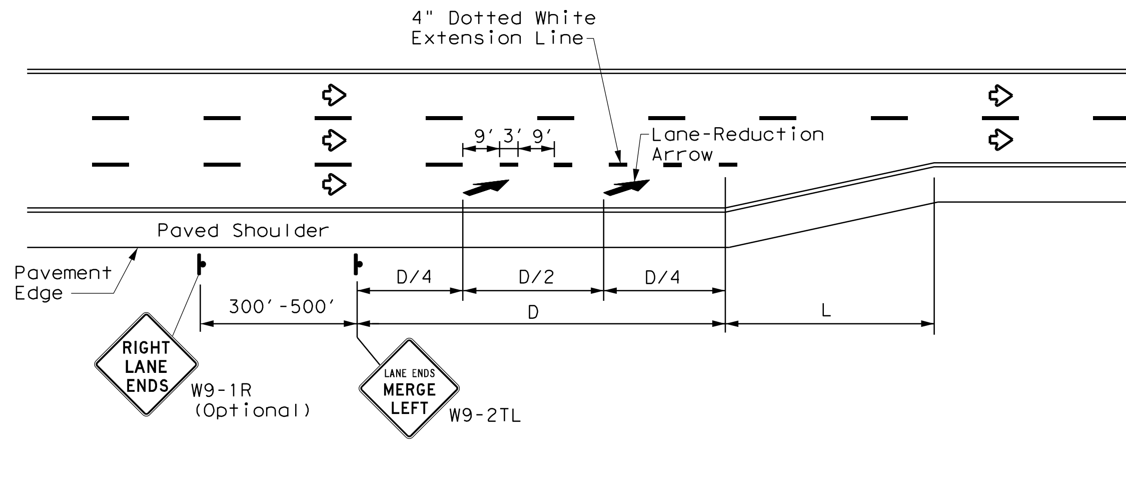


LANE REDUCTION

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	

NOTES

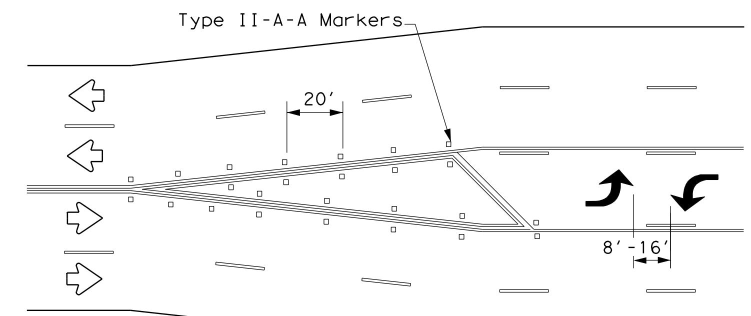
1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
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.

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.

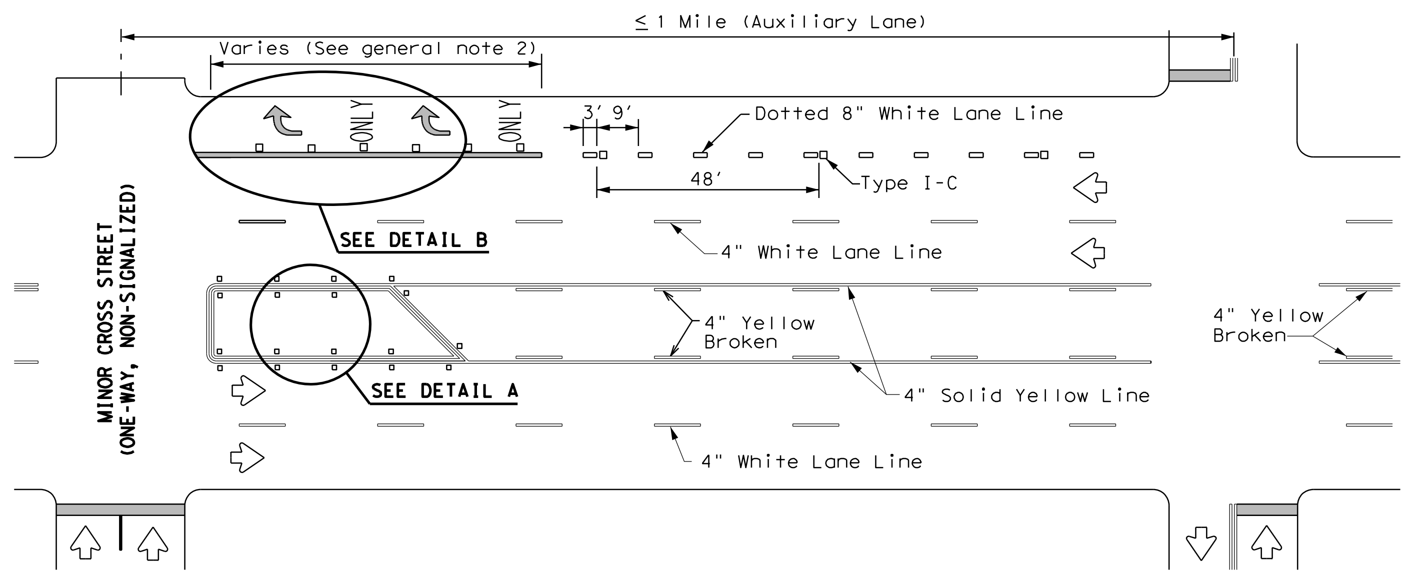
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

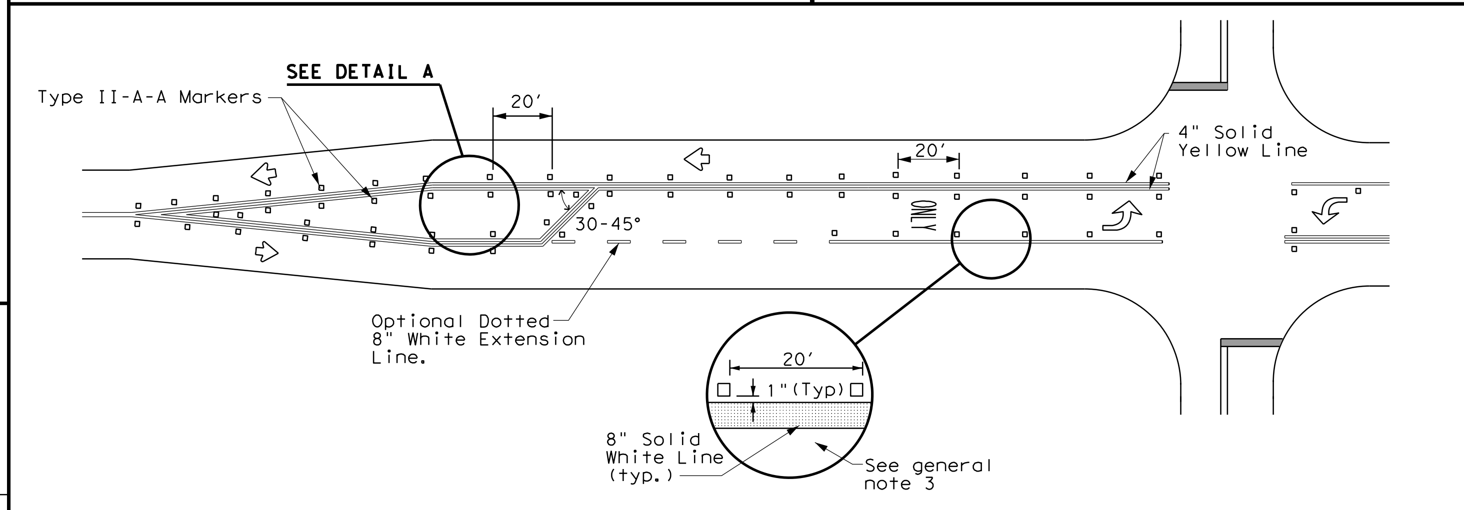


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

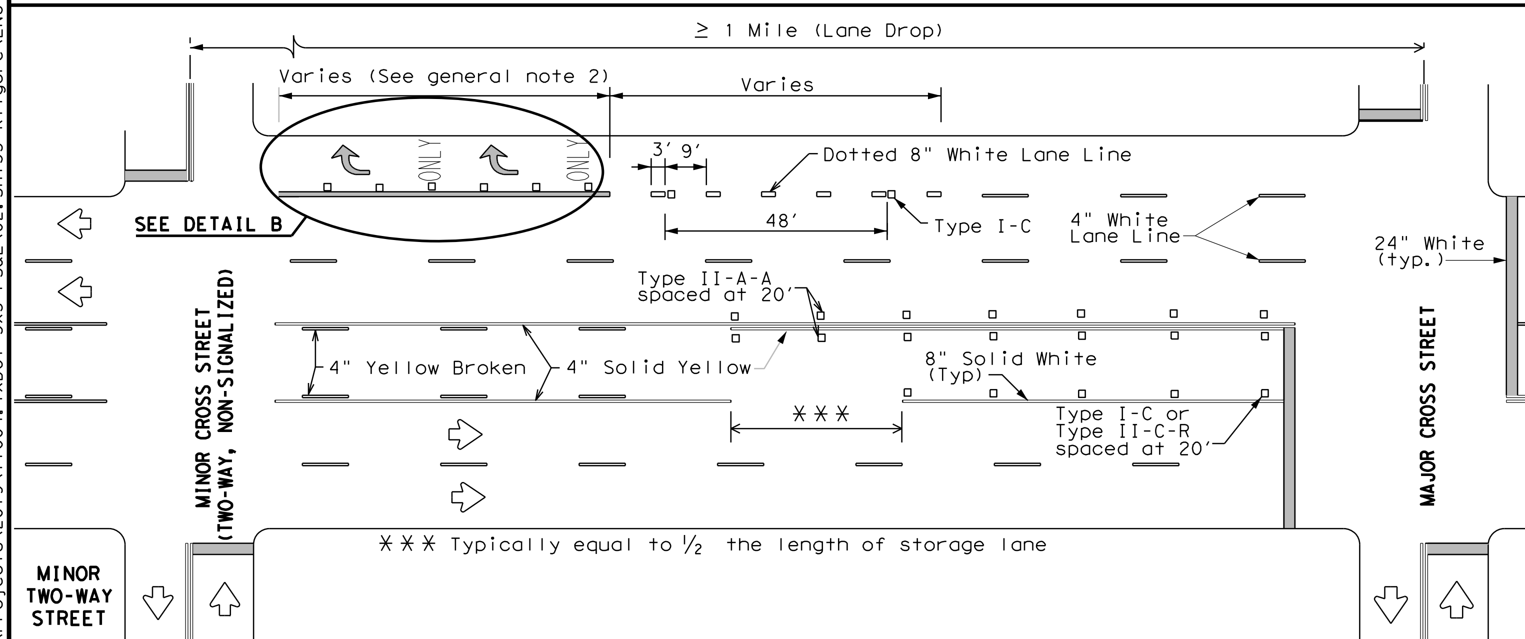
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



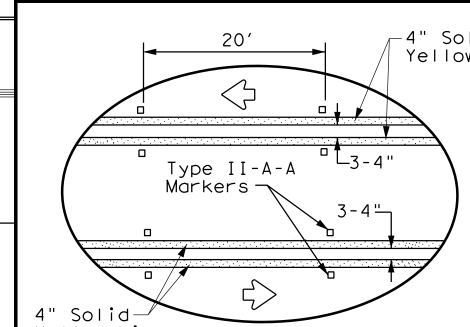
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



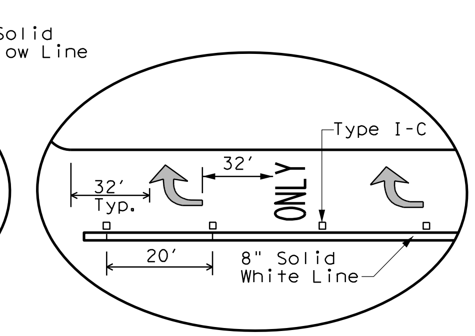
TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



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



DETAIL A



DETAIL B

Texas Department of Transportation — Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-20

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©TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 5-00 2-10, 8-00 2-12, 3-03 6-20	0545	01	014	SH 135
	DIST		COUNTY	SHEET NO.
	TYL		GREGG	165

22C

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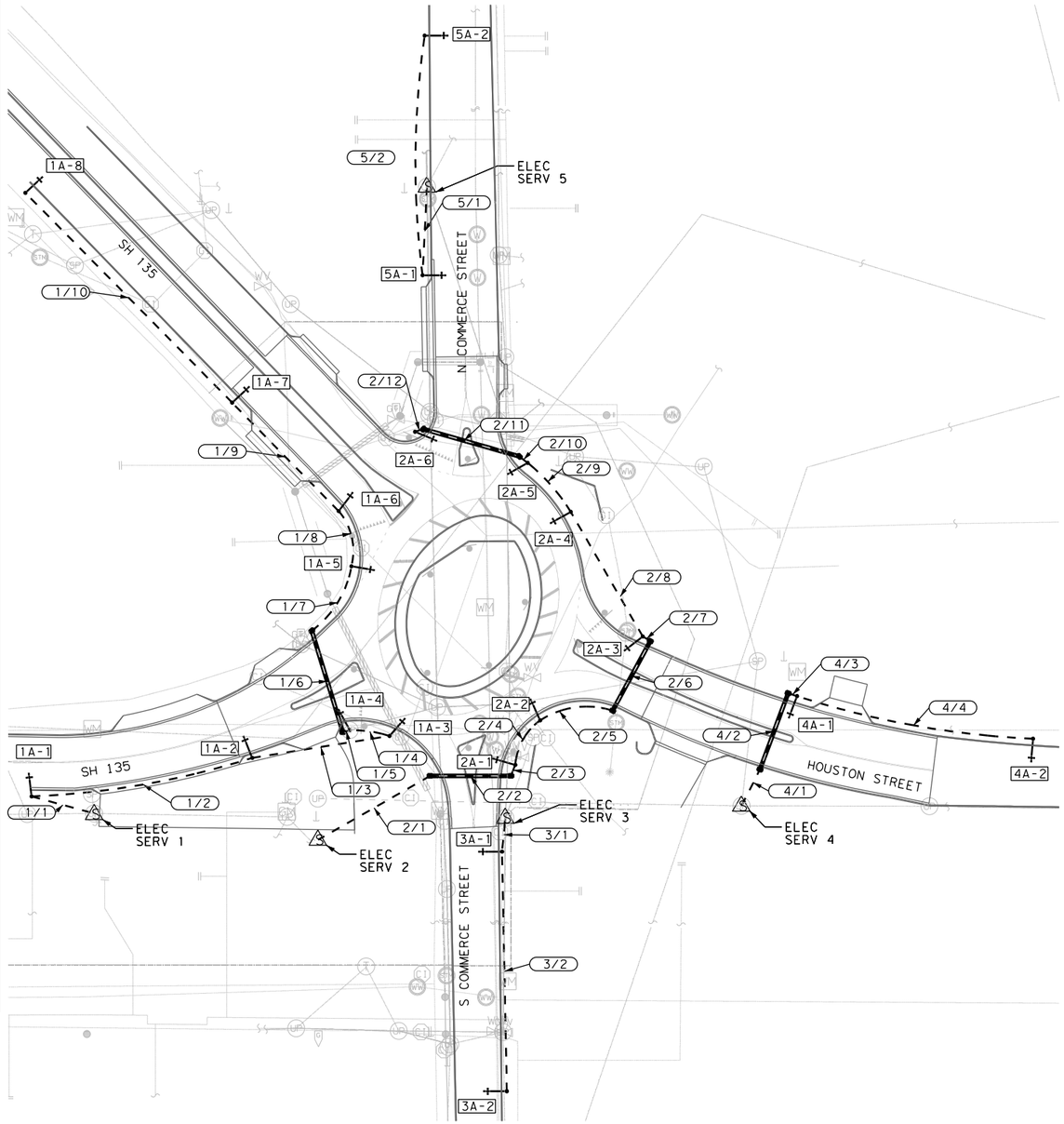
ELECTRICAL SERVICE DATA

ELEC. SERVICE NO.	ELECTRICAL SERVICE DESCRIPTION (SEE ED (5) - 14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CKT. BKR. POLE/AMP	TWO-POLE CONTACTOR AMPS	CIRCUIT NO.	BRANCH CKT. BKR. POLE/AMPS	KVA LOAD
1	ELC SRV TY T 120/240 000 (NS) GS (L) SP (O)	2 IN	3/#6	N/A	N/A	60	A	2P/20	<7:1
2	ELC SRV TY T 120/240 000 (NS) GS (L) SP (O)	2 IN	3/#6	N/A	N/A	60	A	2P/20	<7:1
3	ELC SRV TY T 120/240 000 (NS) GS (L) SP (O)	2 IN	3/#6	N/A	N/A	60	A	2P/20	<7:1
4	ELC SRV TY T 120/240 000 (NS) GS (L) SP (O)	2 IN	3/#6	N/A	N/A	60	A	2P/20	<7:1
5	ELC SRV TY T 120/240 000 (NS) GS (L) SP (O)	2 IN	3/#6	N/A	N/A	60	A	2P/20	<7:1

CONDUIT AND CONDUCTOR SCHEDULE

RUN NUMBER	CIRCUIT ID	RUN LENGTH (FT)	618 6023		618 6024		620 6007			620 6008		
			CONDT (PVC) (SCH 40) (2")		CONDT (PVC) (SCH 40) (2") (BORE)		ELEC CONDR (NO. 8) BARE			ELEC CONDR (NO. 8) INSULATED		
			PROPOSED CONDUITS	CONDUIT LENGTH (FT)	PROPOSED CONDUITS	CONDUIT LENGTH (FT)	PROPOSED CONDUCTOR	CONDUCTOR LENGTH (FT)	SLACK LENGTH (FT)	PROPOSED CONDUCTOR	CONDUCTOR LENGTH (FT)	SLACK LENGTH (FT)
1/1	A	50	1	50			1	50	5	4	50	10
1/2	A	160	1	160			1	160	5	4	160	10
1/3	A	100	1	100			1	100	5	4	100	10
1/4	A	30	1	30			1	30	5	2	30	10
1/5	A	10	1	10			1	10	5	2	10	10
1/6	A	75			1	75	1	75	5	2	75	10
1/7	A	55	1	55			1	55	5	2	55	10
1/8	A	45	1	45			1	45	5	2	45	10
1/9	A	110	1	110			1	110	5	2	110	10
1/10	A	210	1	210			1	210	5	2	210	10
2/1	A	95	1	95			1	95	5	2	95	10
2/2	A	60			1	60	1	60	5	2	60	10
2/3	A	10	1	10			1	10	5	2	10	10
2/4	A	40	1	40			1	40	5	2	40	10
2/5	A	55	1	55			1	55	5	2	55	10
2/6	A	60			1	60	1	60	5	2	60	10
2/7	A	10	1	10			1	10	5	2	10	10
2/8	A	105	1	105			1	105	5	2	105	10
2/9	A	50	1	50			1	50	5	2	50	10
2/10	A	10	1	10			1	10	5	2	10	10
2/11	A	70			1	70	1	70	5	2	70	10
2/12	A	10	1	10			1	10	5	2	10	10
3/1	A	25	1	25			1	25	5	2	25	10
3/2	A	170	1	170			1	170	5	2	170	10
4/1	A	30	1	30			1	30	5	2	30	10
4/2	A	60			1	60	1	60	5	2	60	10
4/3	A	10	1	10			1	10	5	2	10	10
4/4	A	170	1	170			1	170	5	2	170	10
5/1	A	65	1	65			1	65	5	2	65	10
5/2	A	170	1	170			1	170	5	2	170	10
TOTAL (FT)				1795		325		2270			5520	



LEGEND

- PROP ROADWAY ILLUM ASSEMBLY
- PROP ELECTRICAL SERVICE TYPE "T"
- PROP CONDUIT
- PROP BORED CONDUIT
- PROP GROUND BOX (TY D) W/ APRON
- 1/1 CONDUIT RUN NO. IDENTIFICATION
- 1A-1 POLE OR LUMINAIRE NO.
- CIRCUIT NO.
- SERVICE NO.

NOTE:

1. ALL ILLUMINATION POLES SHALL HAVE A NOMINAL MOUNTING HEIGHT OF 50'. (TYPE SA) 50T-10 (400W EQ) LED

100% SUBMITTAL

STATE OF TEXAS
KARL ROTHERMEL
116355
LICENSED
PROFESSIONAL ENGINEER
2/11/2021

0 25 50 100
1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

ILLUMINATION LAYOUT

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	166

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35_TRAF-ILLUM-1.dgn

CALCULATION SUMMARY						
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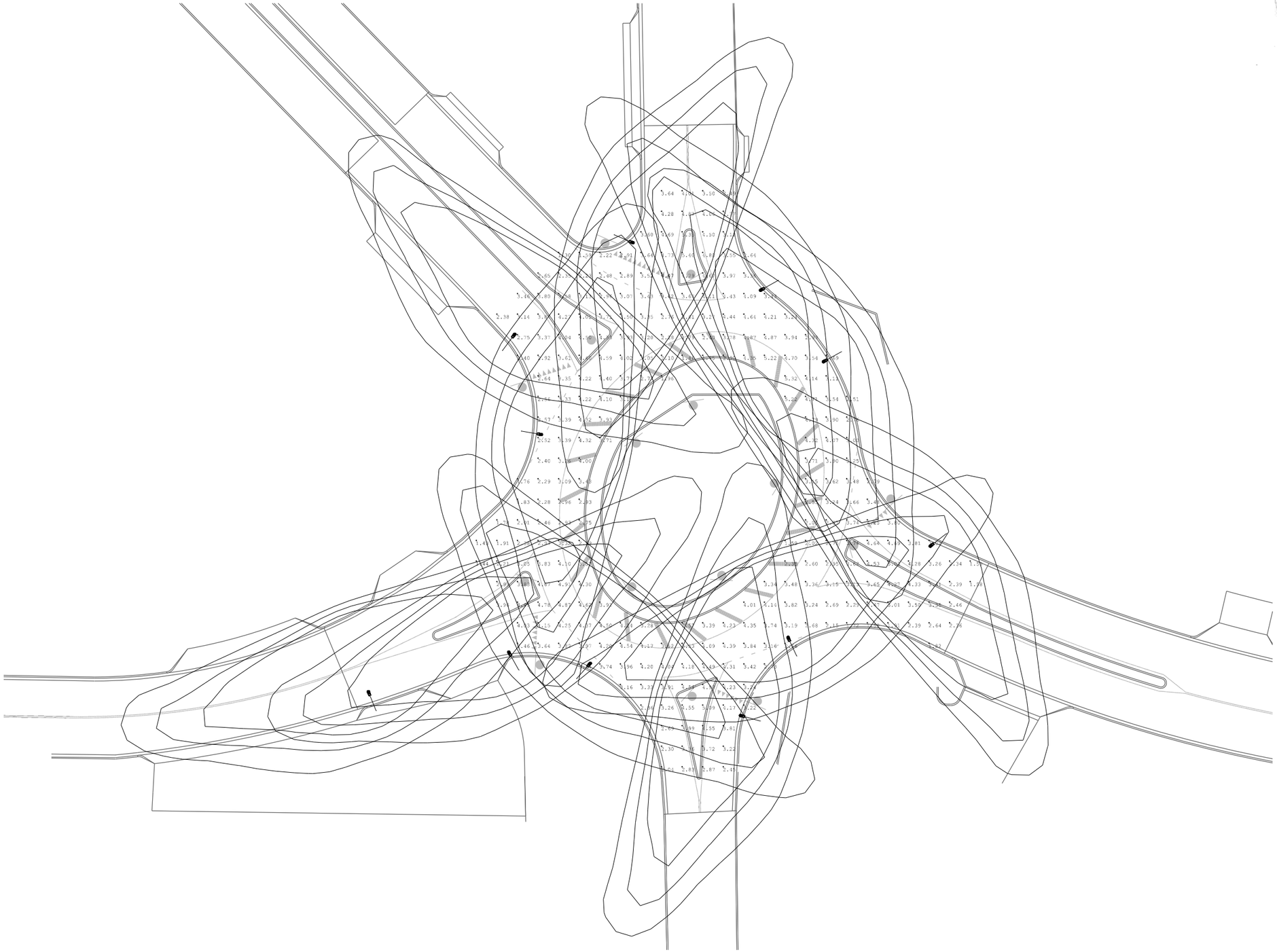
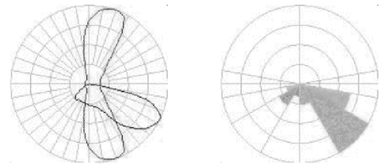
ILLUMINANCE	Fc	3.43	5.4	1.3	2.64	4.15





NOTE:

1. PHOTOMETRIC ANALYSIS AND CALCULATION SUMMARY DOES NOT INCLUDE APPROACH LUMINAIRES, ONLY COVERAGE WITHIN THE ROUNDABOUT.

100% SUBMITTAL

STATE OF TEXAS
KARL ROTHERMEL
116355
LICENSED PROFESSIONAL ENGINEER

2/11/2021

0 12.5 25 50

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702

13430 Northwest Freeway, Ste. 1100
Houston, Texas 77040
713.462.3242
www.cobbfendley.com

Texas Department of Transportation

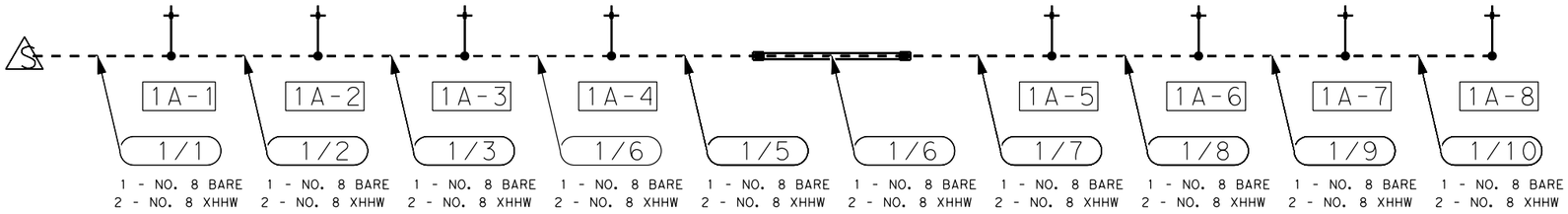
ILLUMINATION PHOTOMETRIC ANALYSIS

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**167**

LEGEND

- PROP ROADWAY ILLUM ASSEMBLY
- PROP ELECTRICAL SERVICE TYPE "T"
- PROP CONDUIT
- PROP BORED CONDUIT
- PROP GROUND BOX (TY D) W/ APRON
- 1/1 — CONDUIT RUN NO. IDENTIFICATION
- 1A-1 — POLE OR LUMINAIRE NO.
  - CIRCUIT NO.
  - SERVICE NO.

ELECTRICAL SERVICE 1



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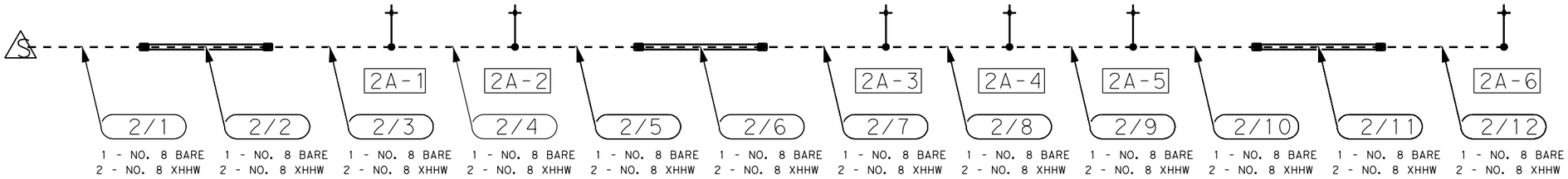

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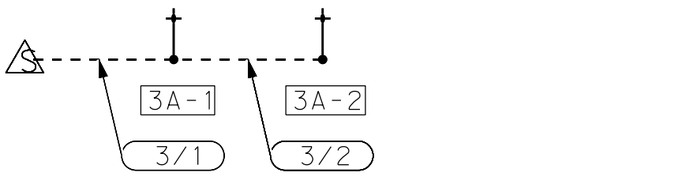
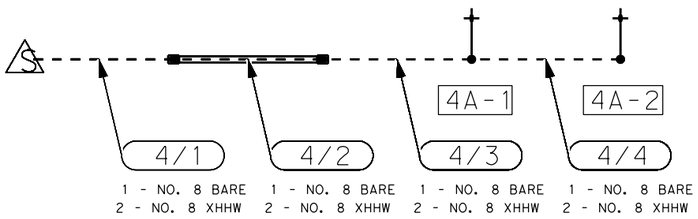
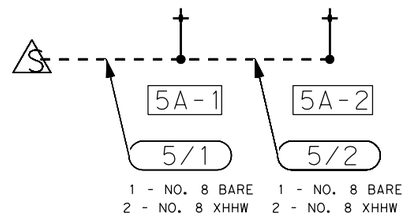


ELECTRICAL SERVICE 4



ELECTRICAL SERVICE 5



100% SUBMITTAL

STATE OF TEXAS
KARL ROTHERMEL
116355
LICENSED
PROFESSIONAL ENGINEER
2/11/2021

SCALE: NTS

REV. NO.	DATE	DESCRIPTION	BY

CobbFendley
TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702
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713.462.3242
www.cobbfendley.com

Texas Department of Transportation

ILLUMINATION CIRCUIT DIAGRAM

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**168**

DATE: 2/13/2022 1:08:21 PM
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GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is $\frac{1}{2}$ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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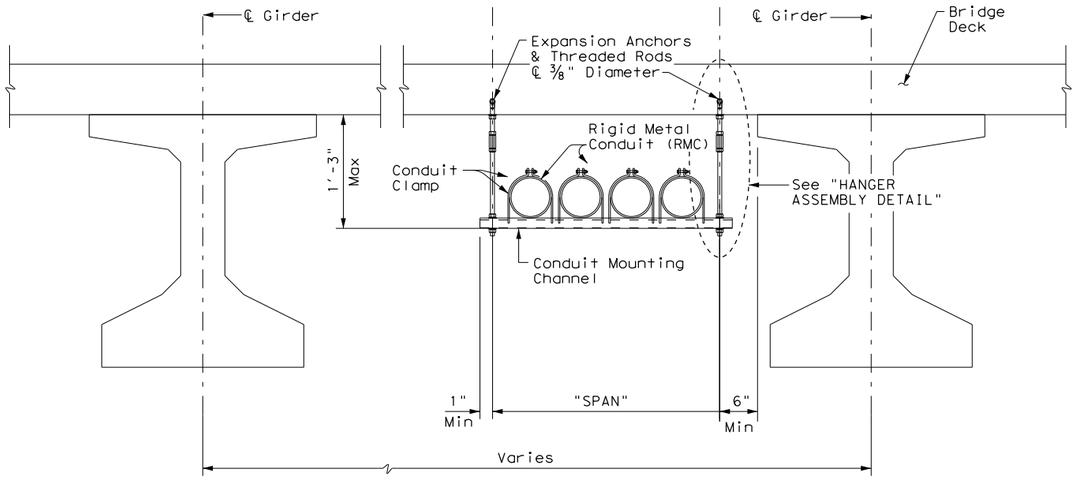
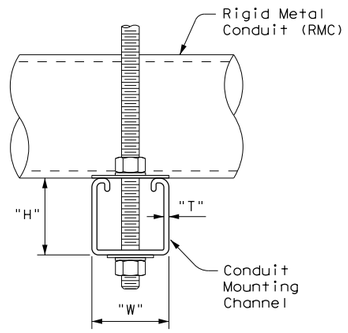
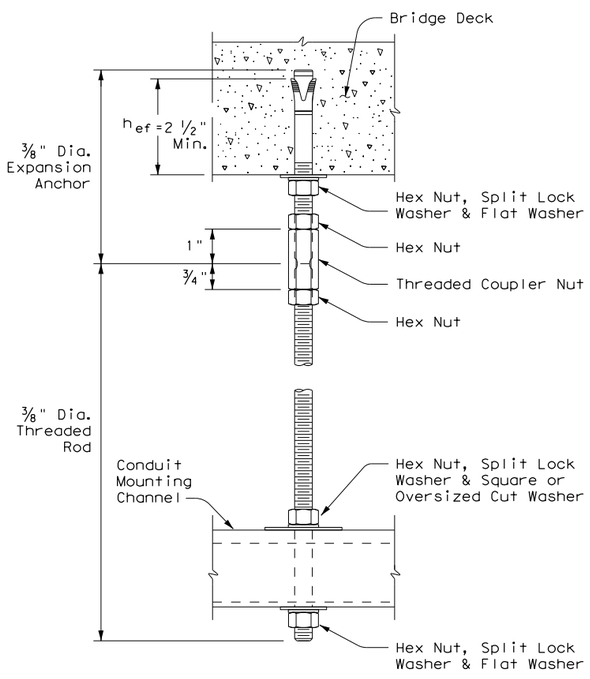


CONDUIT HANGING DETAIL

CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

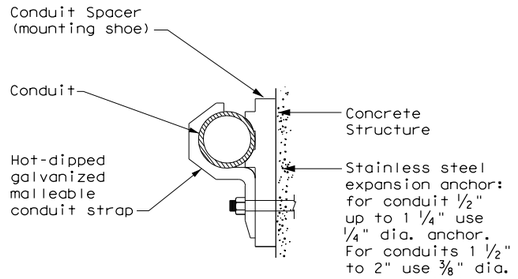
Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.

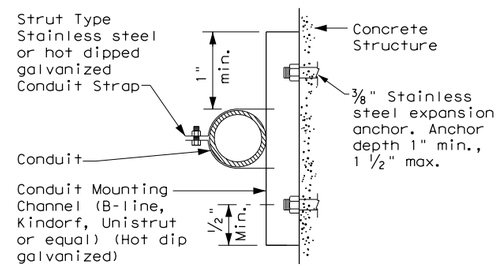




HANGER ASSEMBLY DETAIL

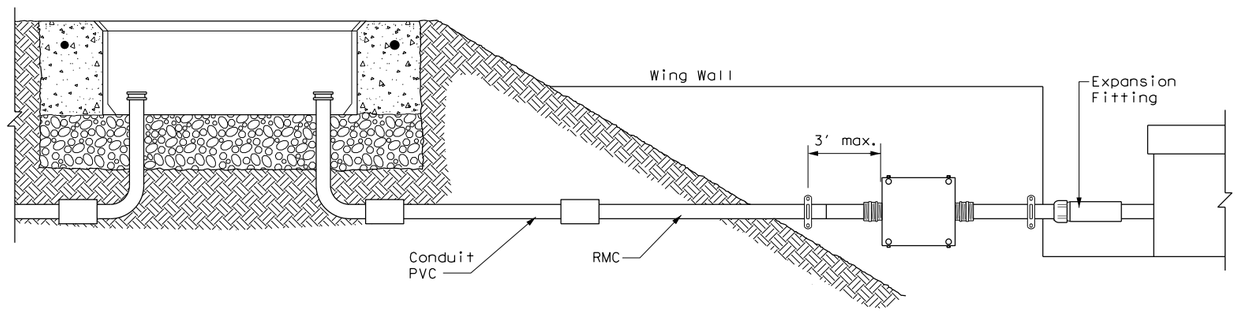
ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT





CONDUIT MOUNTING OPTIONS

Attachment to concrete surfaces
See ED(1)B.2



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.

2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.

3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.

4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.

5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef}) as needed to ensure sufficient thread length for proper torqueing and tightening of anchors.

6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
CONDUIT SUPPORTS

ED(2)-14

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

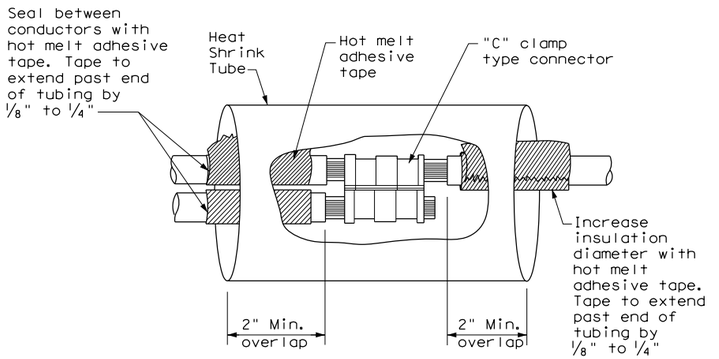
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

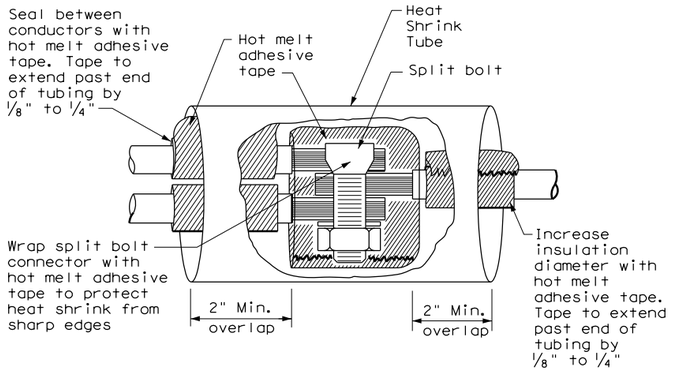
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

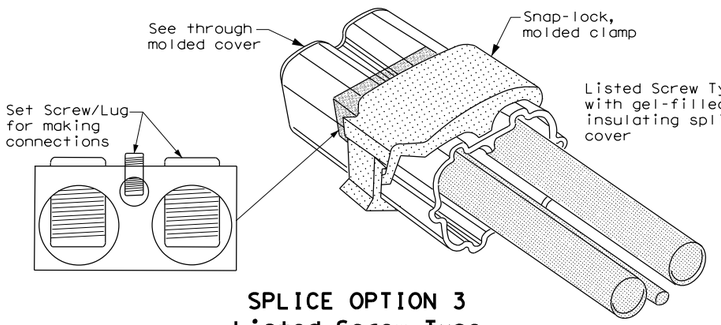
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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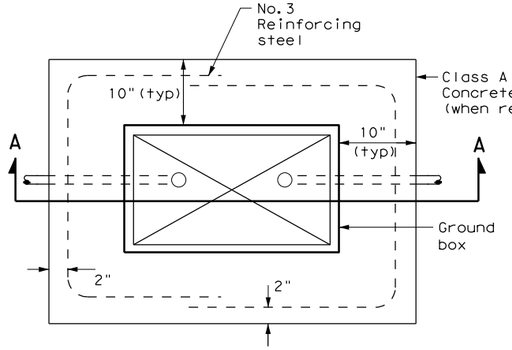
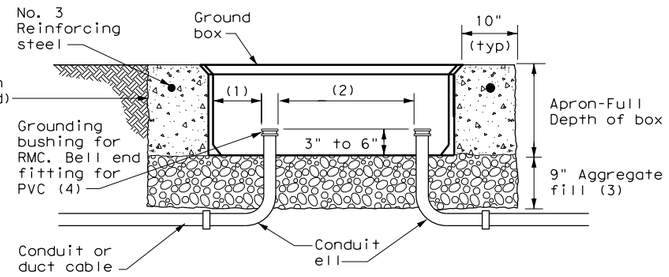


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

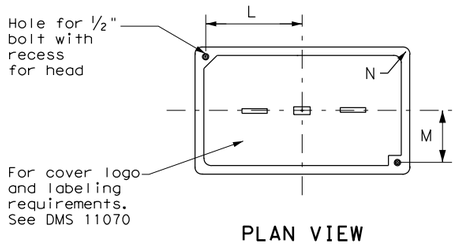
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



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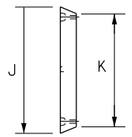

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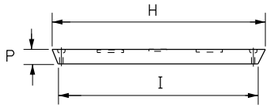

SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS GROUND BOXES

ED(4)-14

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

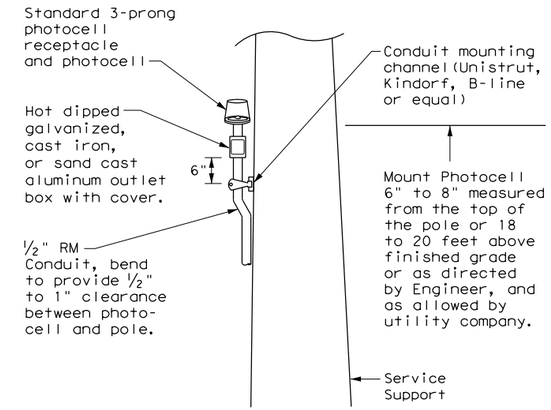
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

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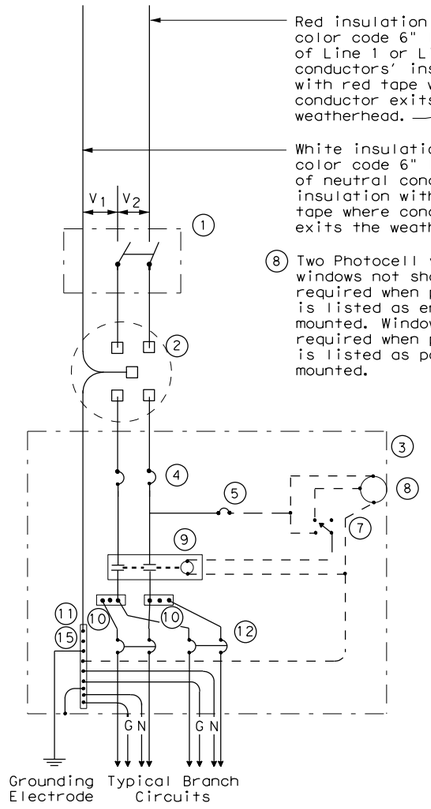
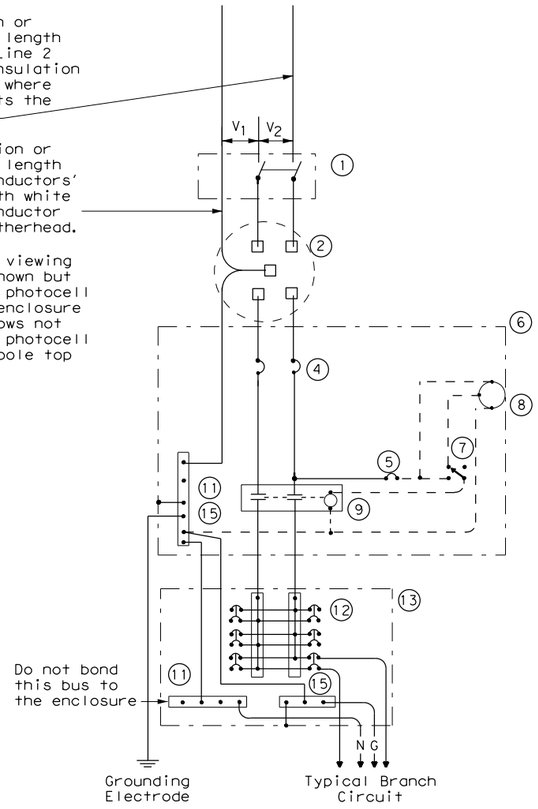
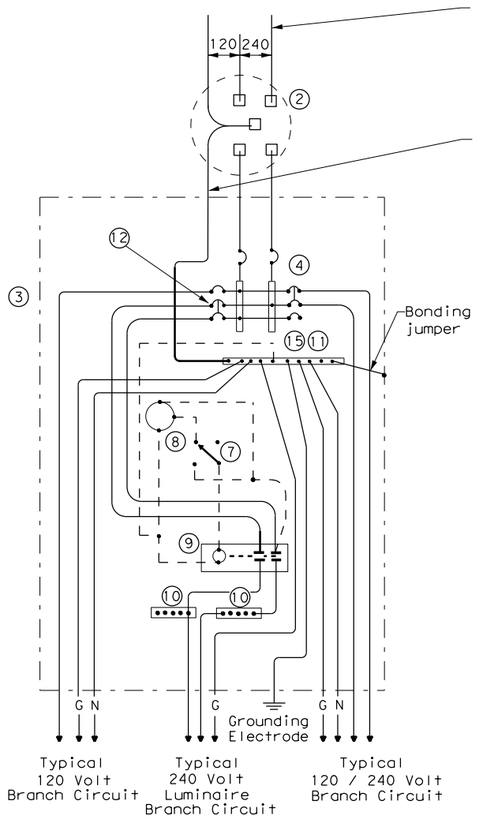


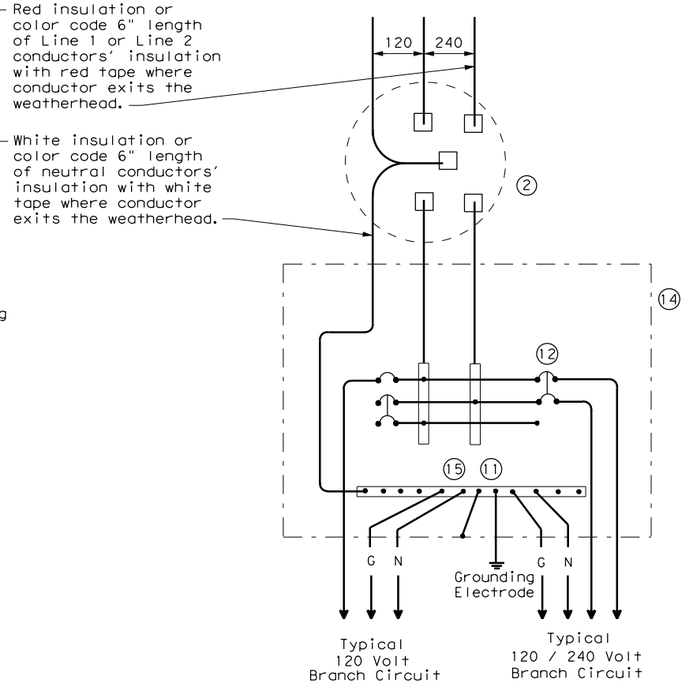
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
- - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

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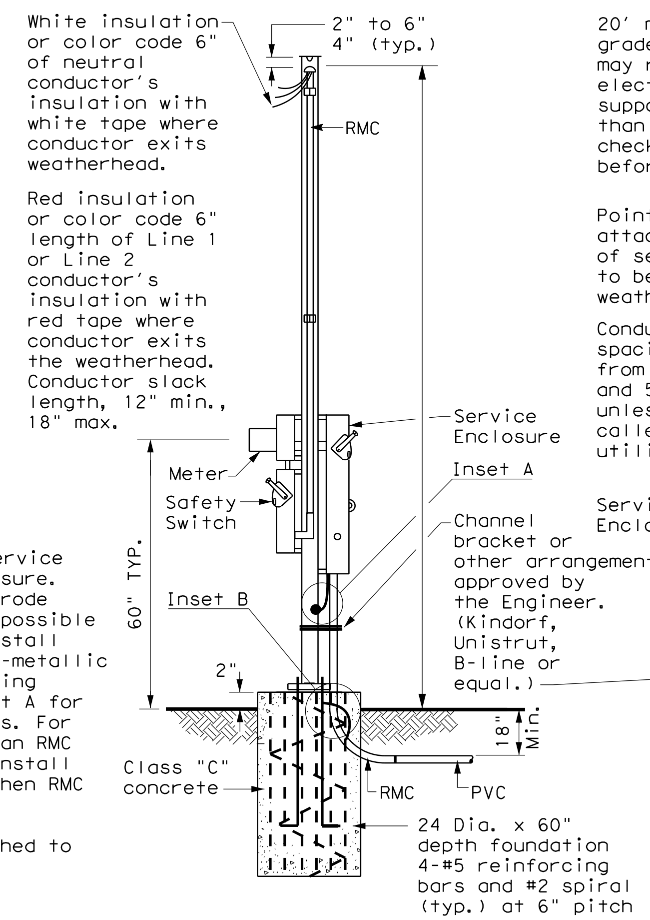
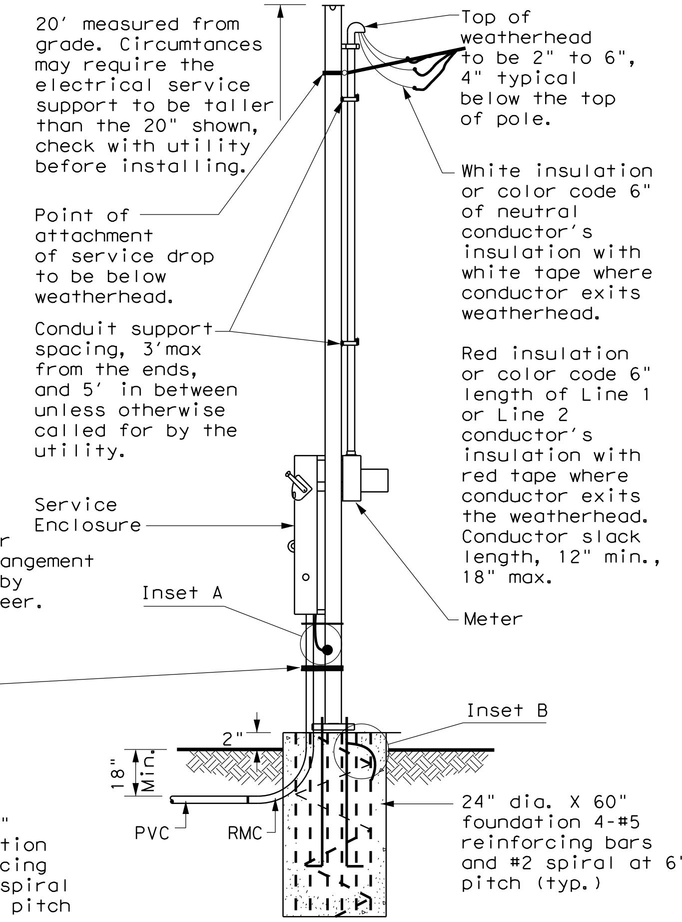
SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.
2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.
3. Provide and install galvanized ¾ in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized ¾ in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 ¼ in. to 3 ½ in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.
4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.
5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.
6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.
8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.
9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.
10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.
11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

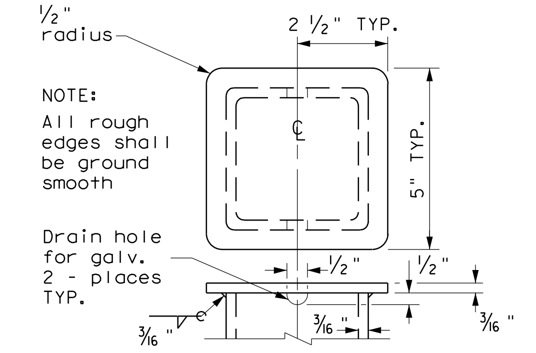


WITH SAFETY SWITCH

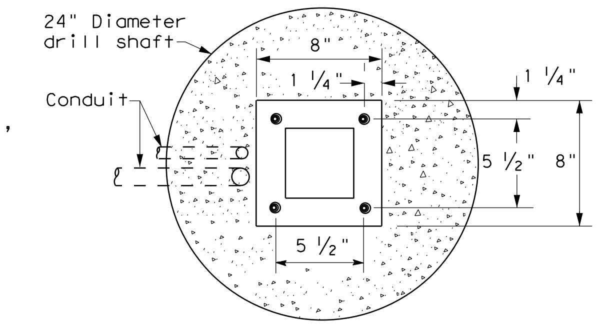


WITHOUT SAFETY SWITCH

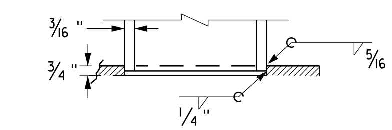
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE



POLE TOP PLATE

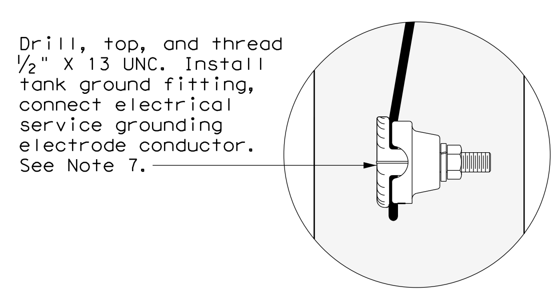


BASE PLATE DETAIL

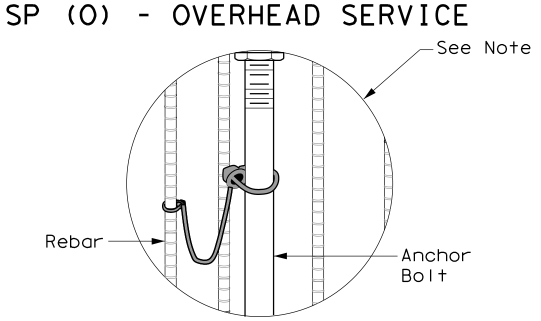


BOTTOM OF POLE

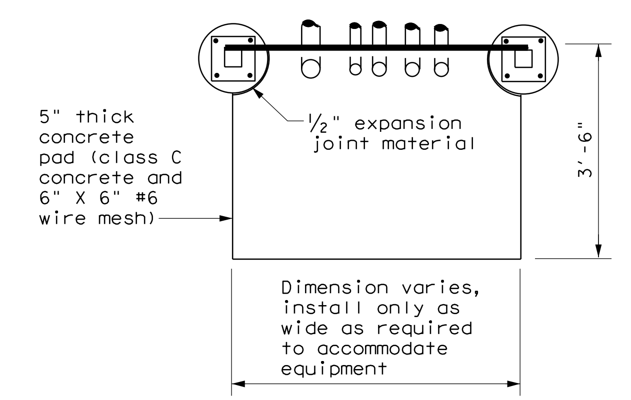
SERVICE SUPPORT TYPE SF & SP



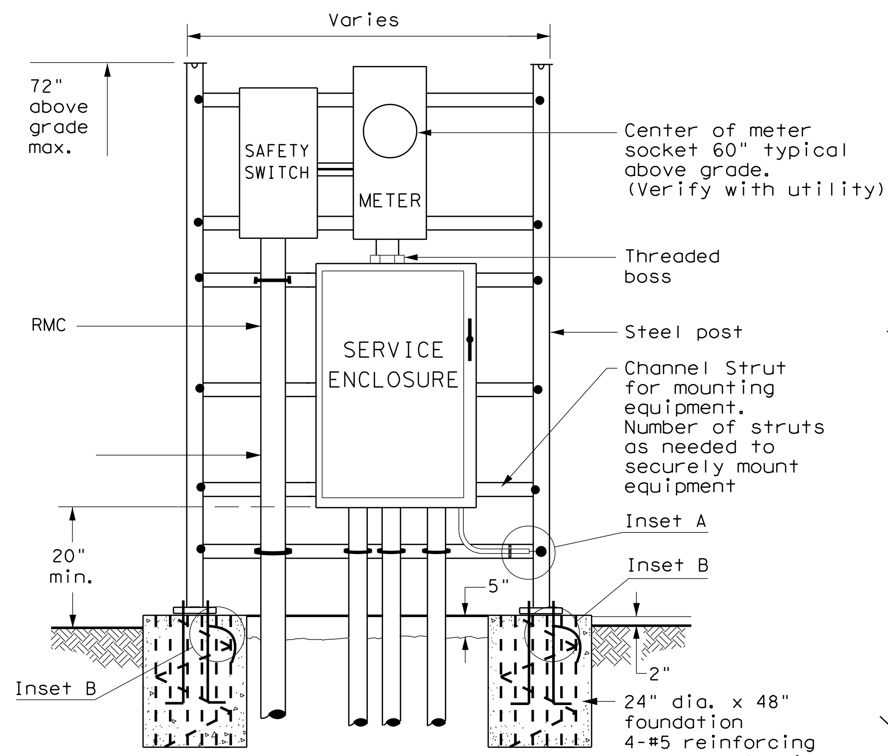
FRONT VIEW
INSET A



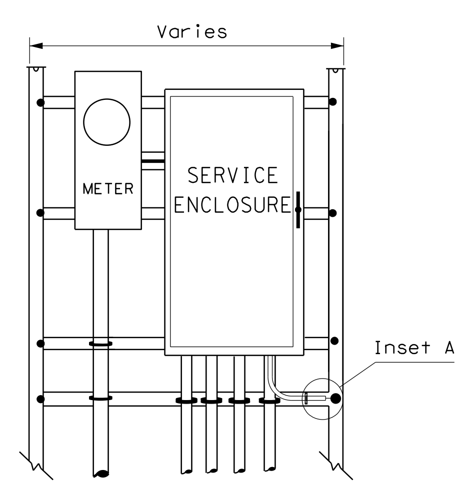
INSET B



TOP VIEW
SERVICE SUPPORT TY SF (O) & SF (U)



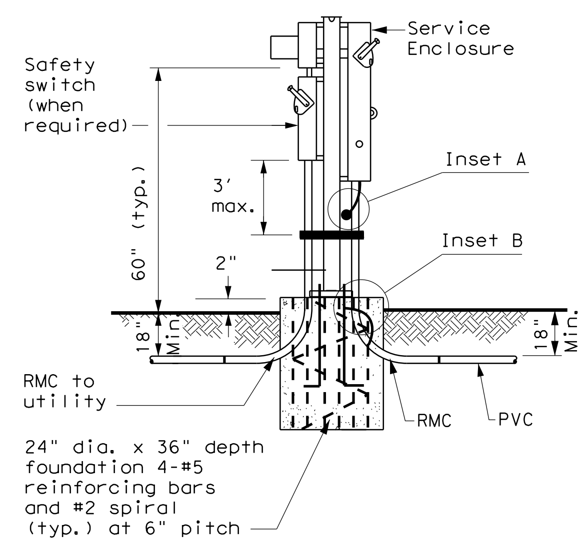
WITH SAFETY SWITCH



WITHOUT SAFETY SWITCH

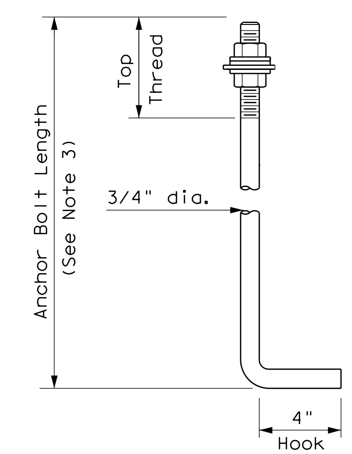
FRONT VIEW

SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE



WITH SAFETY SWITCH

SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE



HOOKED ANCHOR DETAIL

Texas Department of Transportation
Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP

ED(7)-14

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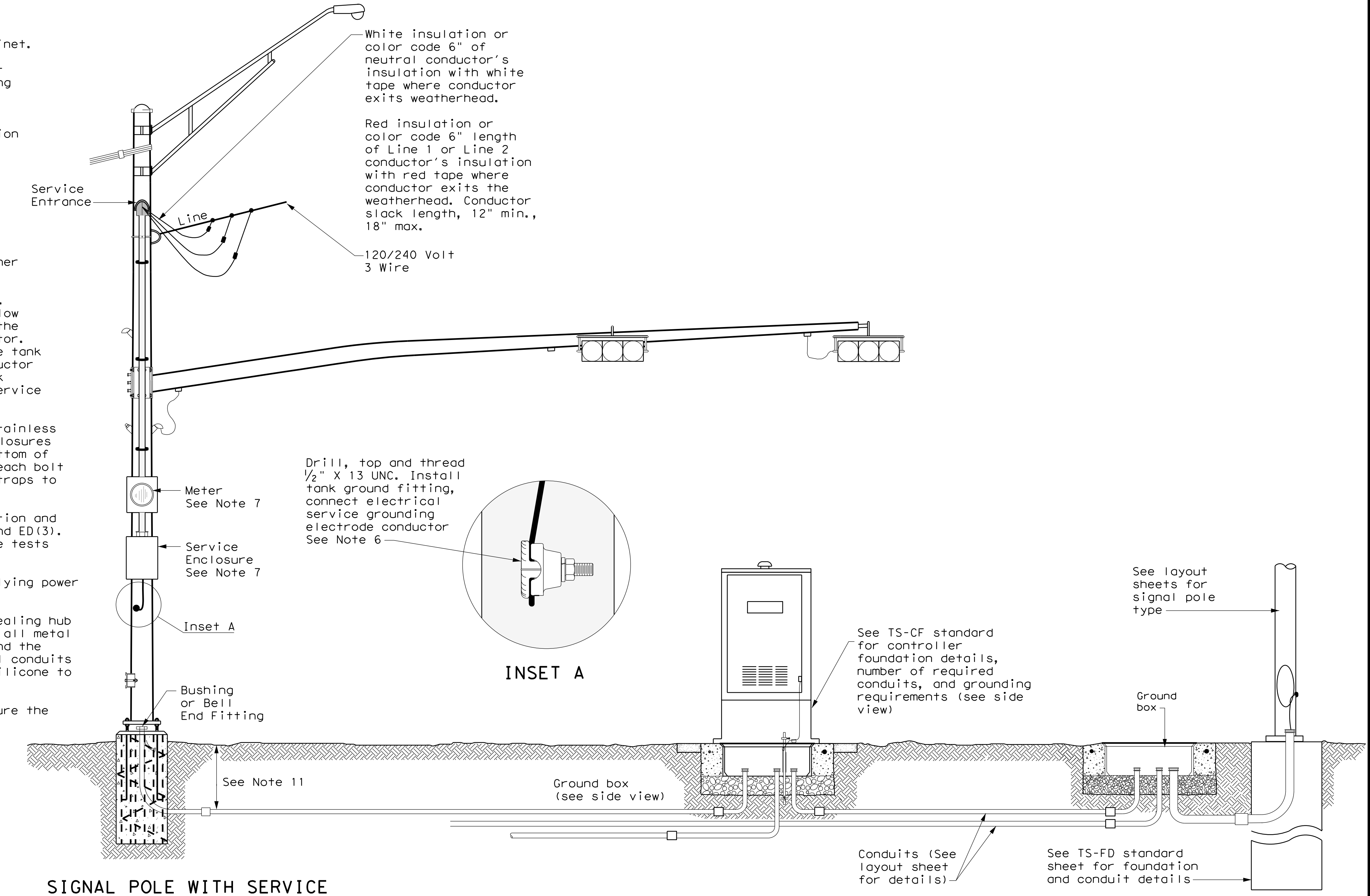
TRAFFIC SIGNAL NOTES

1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".

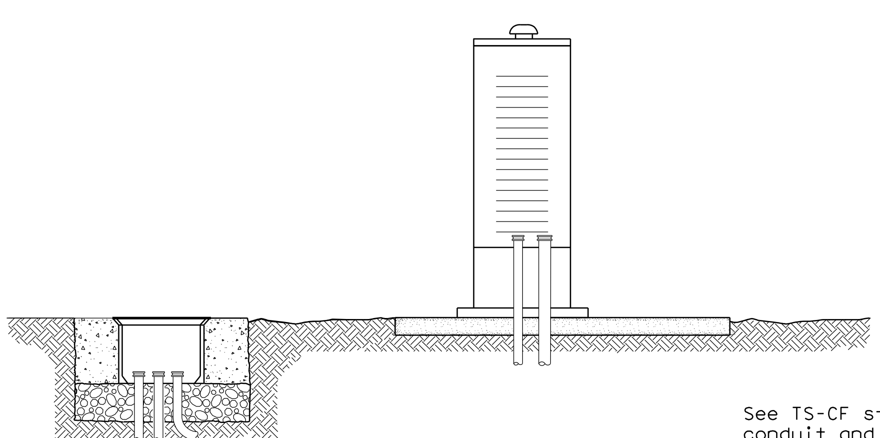


SIGNAL POLE WITH SERVICE

Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

Texas Department of Transportation | Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

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PEDESTAL SERVICE NOTES

1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS)11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services. "Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.

2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.

3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.

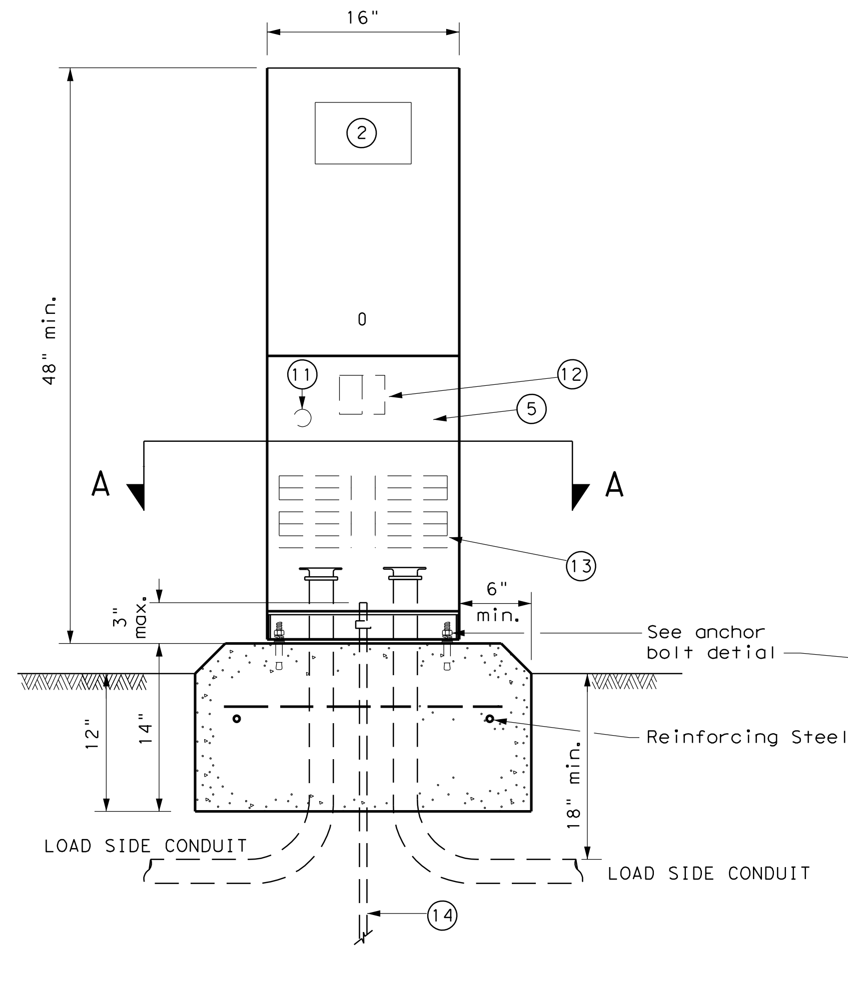
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install 1/2 in. X 2 1/16 in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a 1/2 in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.

6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than 1/8 in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of 1/8 in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within 1/4 in. Repair rocking or movement of the service enclosure at no additional cost to the department.

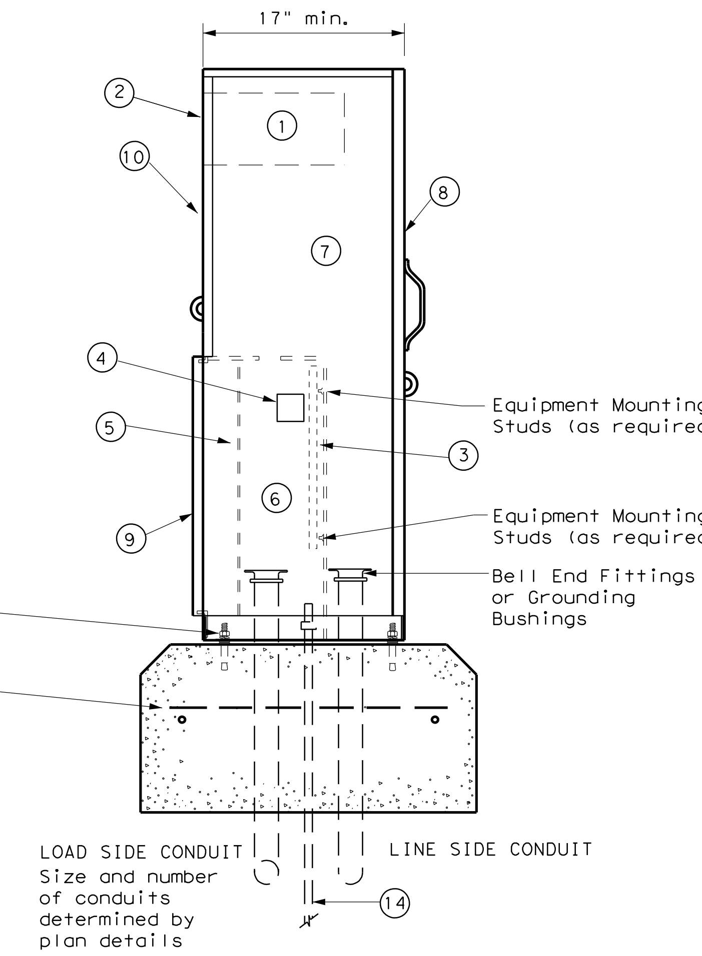
7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.

8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.

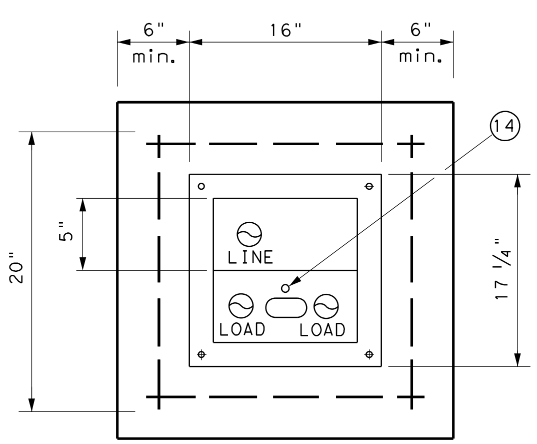


FRONT VIEW

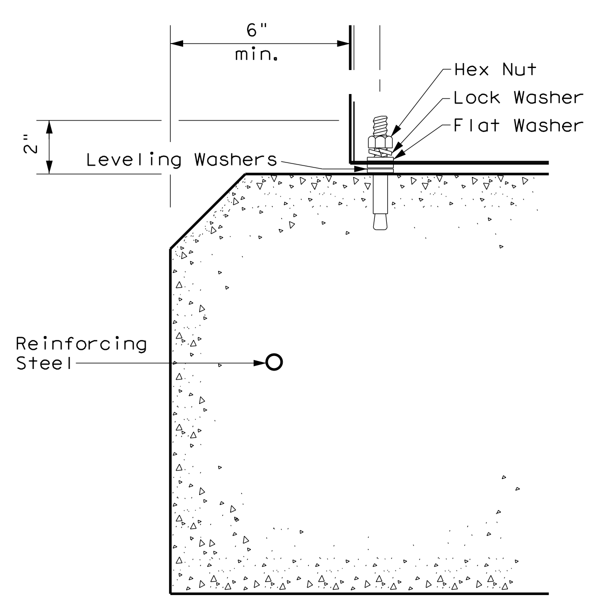
TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SIDE VIEW



SECTION A-A



ANCHOR BOLT DETAIL

LEGEND	
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

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Traffic Operations Division Standard

ELECTRICAL DETAILS ELECTRICAL SERVICE SUPPORT PEDESTAL SERVICE TYPE PS

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TIMBER POLE (TP) SERVICE SUPPORT NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627 "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Conduit and electrical conductors attached to the electrical service pole and underground within 12 in. of service pole are not paid for directly but are subsidiary to the electrial service.
3. Install pole-top mounted photocell (T) on north side of pole, or in service enclosure (E) as required. See Electrical Service Data chart in plan set.
4. Gain pole as required to provide flat surface for each channel. Gain timber pole to 5/8 in. max. depth and 1 7/8 in. max. height. Gain pole in a neat and workmanlike manner.
5. Mount meter and service equipment on stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Provide channel sized 1 in. to 3 3/4 in. maximum depth, and 1½ in. to 1⅝ in. maximum width. File smooth the cut ends of galvanized channel and paint with zinc rich paint before installing on pole. Secure each channel section to timber pole with two galvanized or SS lag bolts, ¼ in. minimum diameter by 1½ in. minimum length. Use a galvanized or SS flat washer on each lag bolt. Do not stack channel.
6. When excess length must be trimmed from poles, trim from the top end only.

(1) Class 5 pole, height as required

(2) Service drop from utility company (attached below weatherhead)

(3) Service conduit (RMC) and service entrance conductors - One Red, One Black, One White (See Electrical Service Data)

(4) Safety switch (when required)

(5) Meter (when required)

(6) Service enclosure

(7) 6 AWG bare grounding electrode conductor in ½ in. PVC to ground rod - extend ½ in. PVC 6 in. underground.

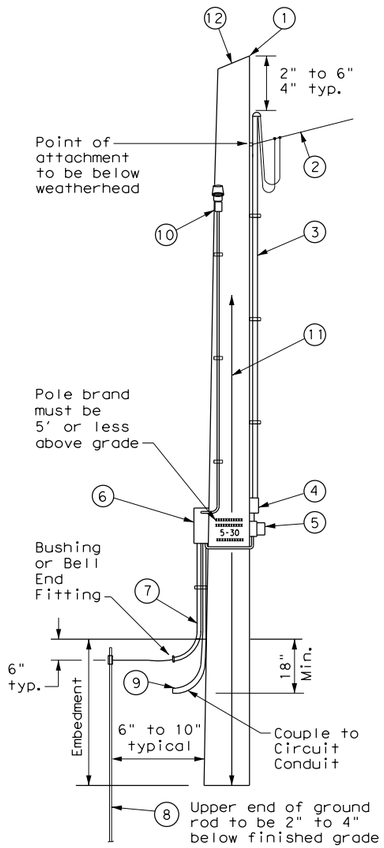
(8) ⅝ in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.

(9) RMC same size as branch circuit conduit.

(10) See pole-top mounted photocell detail on ED(5).

(11) When required by the serving utility provide bare 6 AWG copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor with non-conductive material to a height of 8 ft. above finished grade.

(12) When required by utility, cut top of pole at an angle to enhance rain run off.

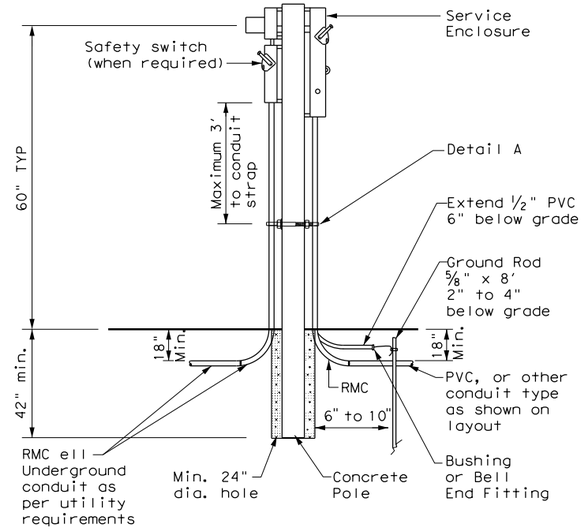


SERVICE SUPPORT TYPE TP (O)

GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

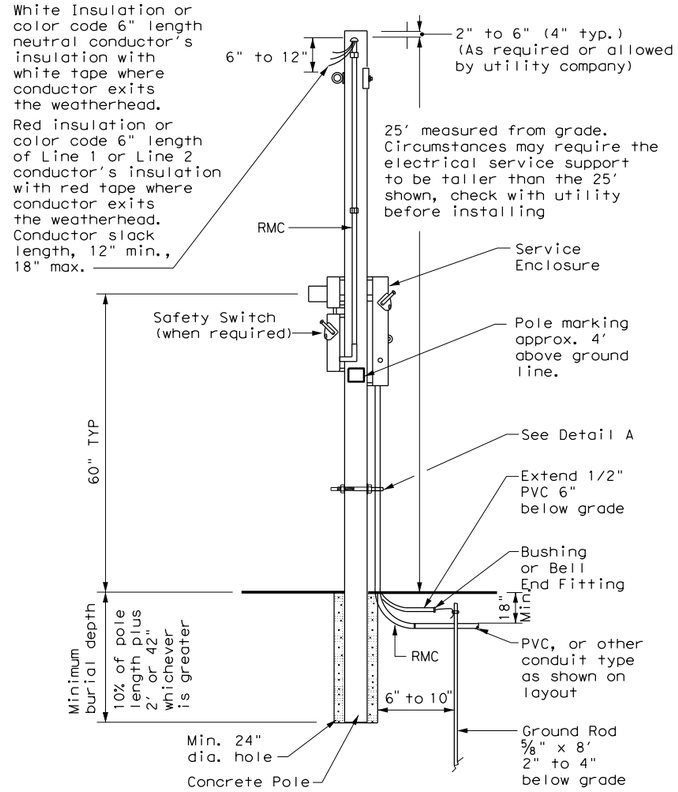
Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' above final grade. Use the two-point pickup locations when handling pole in horizontal position, and one-point pickup location for use in raising the pole to a vertical position. These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., whichever is greater.
5. Ensure all installation details of services are in accordance with utility company specifications.
6. Install a one point rack or eye bolt bracket 6 inches to 12 inches below the weatherhead as an overhead service drop anchoring point for the electric utility.
7. Furnish and install galvanized or stainless steel channel strut 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep (Unistrut, Kindorf, B-line or equal). Attach channel strut with stainless steel concrete anchors (max. 1" depth), square U-bolts or back to back channel strut with long bolts, or other secure mounting as approved by the Engineer. Ensure bolts are galvanized in accordance with ASTM A153. Do not stack channel struts.
8. Backfill the holes thoroughly by tamping in 6 in. lifts. After tamping to grade, place additional backfill material in a 6 inch high cone around the pole to allow for settling. Use material equal in composition and density to the surrounding area. Backfilling will not be paid for directly but is subsidiary to various bid items.



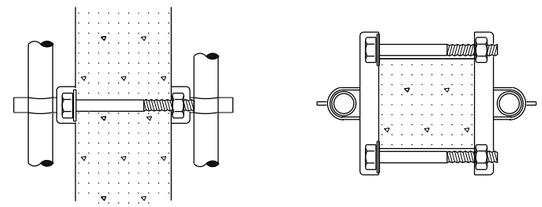
CONCRETE SERVICE SUPPORT

Underground (U)



CONCRETE SERVICE SUPPORT

Overhead (O)



DETAIL A

See Note 7. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP

ED(10)-14

FILE: ed10-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	TYL	GREGG		178

71K

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ROADWAY ILLUMINATION ASSEMBLY NOTES

1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.

2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC),TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA),and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.

4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.

5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.

   a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.

   b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25′ above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 6th Edition (2013) of the AASHTO Design Specifications. For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25′ above the surrounding terrain, provide poles meeting the following requirements:

      i. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).

      ii. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to resist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.

6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.

7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.

8. Install T-Base with following procedure:

   a. Anchor Bolt Tightening.

      i. Coat the threads of the anchor bolts with electrically conductive lubricant.

      ii. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.

      iii. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.

      iv. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.

      v. Check top of T-base for level. If not level then foundation must be leveled.

   b. Top Bolt Procedure

      i. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.

      ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."

      iii. Tighten each nut to 150 ft-lb. using a torque wrench.

   c. Level and Plumb

      i. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.

9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).

10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150W HPS or 150W EQ LED.

11. Mount luminaires on arms level as shown by the luminaire level indicator.

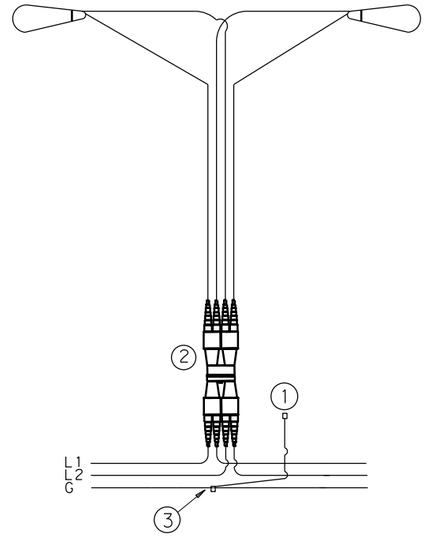
12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

Wiring Diagram Notes:

(1) Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.

(2) Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.

(3) Split Bolt or other connector.



L1,L2 = Hot Conductors
G = Grounding Conductor

TYPICAL WIRING DIAGRAM

LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.

Decorative LED Lighting Notes:

1. LED Drivers in Remote Outdoor enclosures (for drivers that do not include an enclosure as part of a factory assembly):

   a. Provide NEMA 3R outdoor enclosure or as approved.

   b. Install enclosure at least 12" above ground or other horizontal surface. Mount vertically or on ceiling, and avoid direct sun where possible.

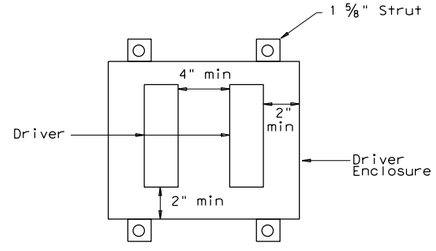
   c. Install drivers with at least 2 inches of space from enclosure walls.

   d. For multiple drivers in an enclosure, provide at least 4 inches side to side and 1 inch end to end from other drivers or electronic equipment

   e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.

   f. Provide remote drivers with a maximum of 100 watts

   g. Provide drivers with documentation of 100,000 hr lifetime at Tcase of 65C or higher.



Driver Spacing In Remote Enclosure

Texas Department of Transportation | Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS

RID(1)-20

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© TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
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12-20	TYL	GREGG		179

72A

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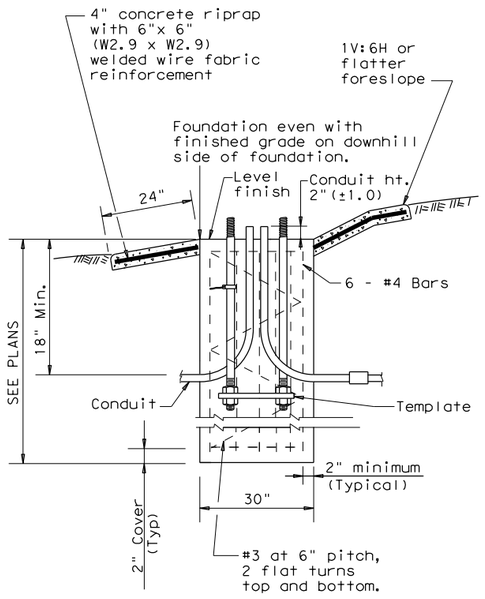
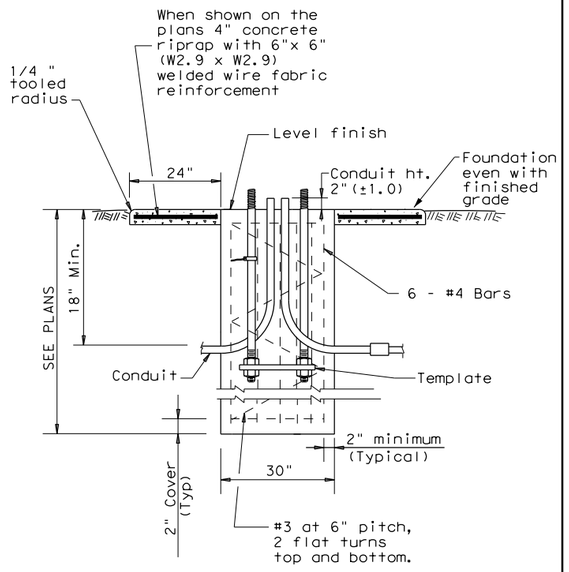


SECTION A-A
SHOWING SLOPED GRADE



SECTION A-A
SHOWING CONSTANT GRADE

TABLE 1
ANCHOR BOLTS

POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1in. x 30in.
40-50 ft.	15 in.	17 ¼in.	1 ¼in. x 30in.

TABLE 2
RECOMMENDED FOUNDATION LENGTHS (See note 1)

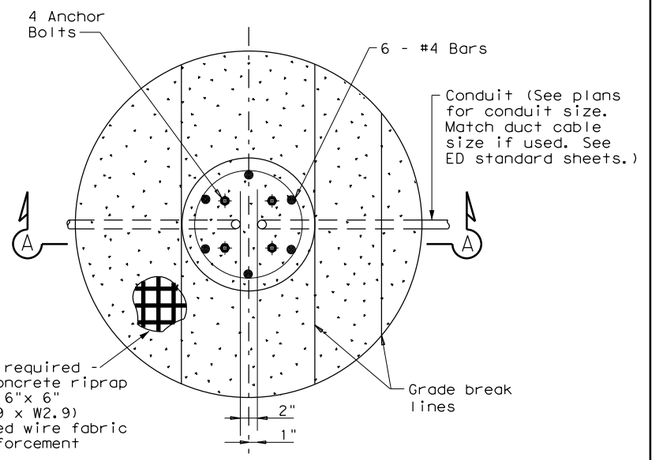
MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
≤20 ft.	6′	6′	6′
>20 ft. to 30 ft.	8′	6′	6′
>30 ft. to 40 ft.	8′	8′	6′
>40 ft. to 50 ft.	10′	8′	6′

TABLE 3
PAY QUANTITY OF RIPRAP PER FOUNDATION (Install only when shown on the plans)

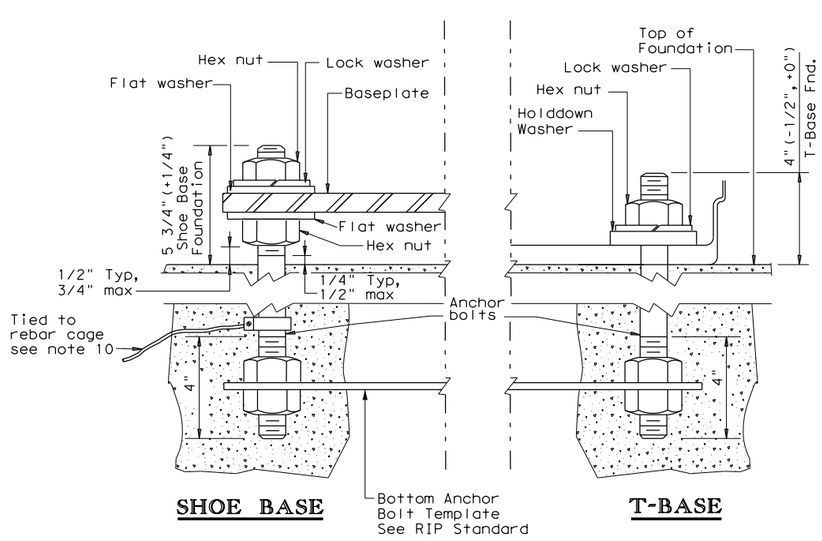
Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

GENERAL NOTES:

1. "Recommended Foundation Lengths" table is for information purposes only. Foundation lengths shall be as shown on the plans, or as directed by the Engineer. Foundations will be paid for under Item 416, "Drilled Shaft Foundations," unless otherwise shown on the plans.
2. Erect roadway illumination assembly poles plumb and true. Form and level the top 6" of the foundation so the pole will be plumb. Use leveling nuts to plumb shoe base poles. Do not use shims or leveling nuts under transformer bases. Do not grout between baseplate and the foundation.
3. Ensure Class 2A and 2B fit for anchor bolts and nuts. Tap and chase nuts after galvanizing. Anchor bolt body with rolled threads need not be full size.
4. Use appropriate class of concrete as specified in Items 416 and 432. Concrete for riprap may be upgraded to Class C at no extra cost to the Department.
5. Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
6. Locate breakaway roadway illumination assemblies as shown in the placement table, unless otherwise dimensioned on the plans. Protect non-breakaway illumination assemblies from vehicular impact (i.e. 2.5 ft. behind guard rail or mounted on traffic barrier), or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less. See Roadway Design Manual for further information.
7. Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
8. Install a minimum of 2 conduits in each foundation. See lighting layout sheets for locations of foundations with more than 2 conduits. Cap unused conduits in foundations on both ends.
9. Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
10. Bond anchor bolt to rebar cage with #6 bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. The bonded steel in the foundation creates a concrete encased grounding electrode which replaces the ground rod.
11. Grade earthwork around T-base foundations even with the finished grade as shown in Section A-A to ensure proper function of the breakaway device. Use riprap on T-base foundations that are located on sloped grades, and as shown on the plans for level grades.



FOUNDATION DETAIL



ANCHOR BOLT DETAIL

TABLE 4
BREAKAWAY POLE PLACEMENT (See note 6)

ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

* or as close to ROW line as is practical

** provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS
(RDWY ILLUM FOUNDATIONS)
RID(2)-20

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© TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
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12-20				

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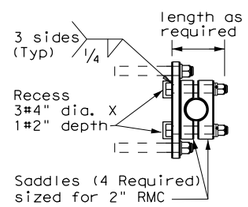
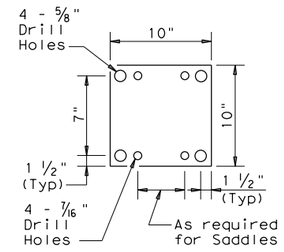
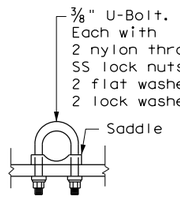


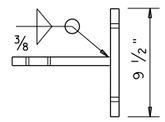
SECTION A-A



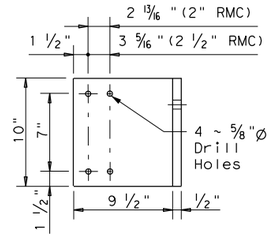
MOUNTING PLATE
(ASTM A-36 or better)



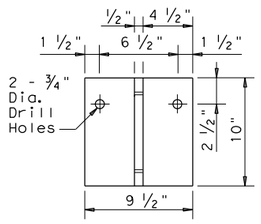
CLAMP DETAIL
(2 Req'd)



PLAN VIEW

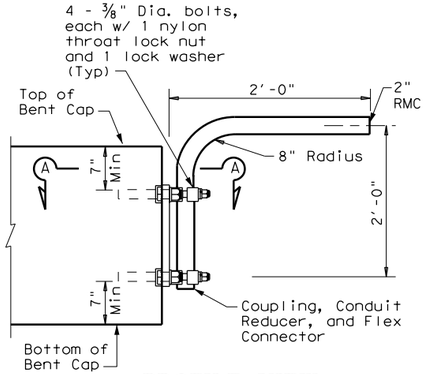


FRONT

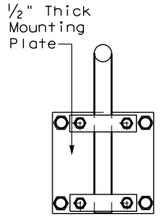


SIDE

BRACKET DETAIL
Make from 1/2" plate (ASTM A-36 or better)

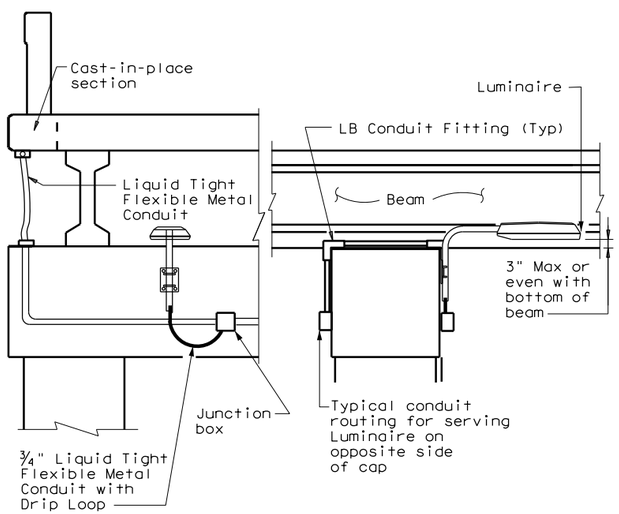


PROFILE VIEW
Or as Required
(See Note A.3)



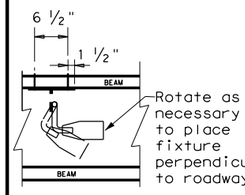
END VIEW

UNDERPASS LIGHTING ARM



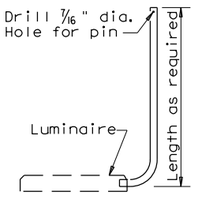
IN RD IL AM (U/P)(TY 1)
If bridge has pre-cast panels under deck, run circuit under deck edge.

UNDERPASS LIGHTING TYPE 1



PLAN VIEW

FIXTURE ORIENTATION



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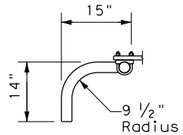
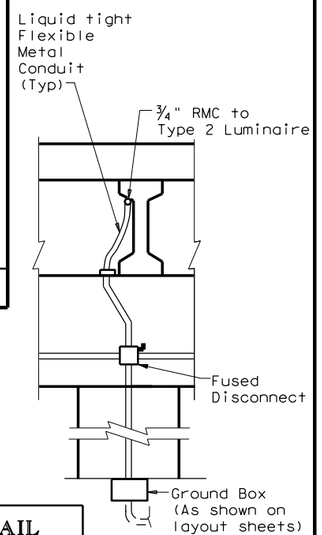


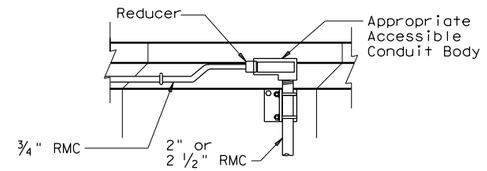
PLAN VIEW

ARM DETAIL



3 - No. 12 XHHW in 3/4" RMC for Branch Circuit runs from fused disconnect to underpass Luminaires

CONDUIT DETAIL



CONDUIT CONNECTION PROFILE

FRONT
(Beam height greater than 54")

FRONT
(Beam height equal to or less than 54")

IN RD IL AM (U/P)(TY 2)

LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET

TABLE 5	
LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET TABLE	
SPAN LENGTH	MINIMUM DISTANCE
≤ 50'	10'-0"
50' - 70'	15'-0"
70' - 90'	20'-0"
> 90'	25'-0"

UNDERPASS LIGHTING TYPE 2

GENERAL NOTES:

A. ALL 150 watt HPS and 150 watt equivalent LED Luminaires

1. Luminaire locations, conduit and conductor sizes and routing are typical and diagrammatic only. See project layout sheets for specific details.
2. Conduit will be paid for under Item 618, "Conduit" and conductors will be paid for under Item 620, "Electrical Conductors," unless otherwise shown on the plans.
3. Adjust conduit in saddles to place fixture height and orientation as required. See fixture orientation detail and plans. Where practicable, place luminaires so the bottom of luminaire is above the bottom of the beam, maximum of 3 in. (See detail UNDERPASS LIGHTING ARM TYPE 2)
4. Except as noted, galvanize all structural steel and exposed bolts, nuts, and washers in accordance with Item 445 "Galvanizing".
5. Fabrication of brackets and support arms will not be paid for directly but is subsidiary to Item 610, "Roadway Illumination Assemblies."
6. Install a heavy duty NEMA 3R fused disconnect or breaker enclosure rated at 30 amps and 480 volts to switch underpass luminaires as shown on plans, with at least one per bridge circuit. Install 20 amp time-delay fuses or inverse-time circuit breakers. Mount disconnect or breaker enclosure 10 ft.(min) above grade on columns or bent caps as approved by the Department. Modify disconnect to allow padlocking in the "ON" and "OFF" positions. Padlocks and disconnect switches or circuit breakers for underpass fixtures will not be paid for directly but are subsidiary to the various bid items of the contract.
7. Conduit on columns, caps, and slab is shown surface mounted. For new columns and caps, embed PVC conduit in concrete. Bond and ground metal junction boxes and conduit.

B. TYPE 1

1. Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) for Type 1 arm shaft.
2. Use 3/8 in. stainless steel bolt or stud non-epoxy type expansion anchors for concrete for Type 1 mounting. Except as noted, provide an allowable 2650 lbs minimum pull-out force (after consideration of adjustment factors for edge distance and bolt spacing) for each anchor. Install each anchor to the embedment depth recommended by the manufacturer.
3. Attach conduit to plate with 4 saddles, four - 3/8 in. diameter bolts, nylon throat lock nuts, and lock washers.

C. TYPE 2

1. Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) or provide a combination of 2 1/2 in. (2.875" O.D., 0.193" wall) and 2 in. (2.375" O.D., 0.146" wall) rigid metal conduits with a reducing bushing as beam height stipulated for Type 2 arm shaft. Field cutting and threading will be permitted. Paint cut and threaded areas with zinc rich paint after conduit is connected to adjacent fitting.
2. Connecting conduit may be strapped to tapered section only of precast beams as shown. Anchor as approved by the Engineer. Maximum anchor depth is 1 in.
3. Indiscriminate drilling into precast concrete beams may result in reduced beam strength. Use drilling location and method as directed by the Engineer. See Location of Underpass Lighting Mounting Bracket detail. The locations shown in the table are such that reinforcing strands will not be damaged.

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS
(UNDERPASS LIGHT FIXTURES)

RID(3)-20

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2-14	DIST	COUNTY		SHEET NO.
7-17	TYL	GREGG		181
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SHIPPING PARTS LIST - POLES AND LUMINAIRE ARMS

Nominal Mounting Ht. (ft)	Shoe Base Designation				Quantity	T-Base Designation				Quantity	CSB/SSCB Mounted Designation				Quantity
	Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire	
20	(Type SA 20 S - 4)			(150W EQ) LED		(Type SA 20 T - 4)			(150W EQ) LED						
	(Type SA 20 S - 4 - 4)			(150W EQ) LED		(Type SA 20 T - 4 - 4)			(150W EQ) LED						
30	(Type SA 30 S - 4)			(250W EQ) LED		(Type SA 30 T - 4)			(250W EQ) LED		(Type SP 28 S - 4)			(250W EQ) LED	
	(Type SA 30 S - 4 - 4)			(250W EQ) LED		(Type SA 30 T - 4 - 4)			(250W EQ) LED		(Type SP 28 S - 4 - 4)			(250W EQ) LED	
	(Type SA 30 S - 8)			(250W EQ) LED		(Type SA 30 T - 8)			(250W EQ) LED		(Type SP 28 S - 8)			(250W EQ) LED	
	(Type SA 30 S - 8 - 8)			(250W EQ) LED		(Type SA 30 T - 8 - 8)			(250W EQ) LED		(Type SP 28 S - 8 - 8)			(250W EQ) LED	
40	(Type SA 40 S - 4)			(250W EQ) LED		(Type SA 40 T - 4)			(250W EQ) LED		(Type SP 38 S - 4)			(250W EQ) LED	
	(Type SA 40 S - 4 - 4)			(250W EQ) LED		(Type SA 40 T - 4 - 4)			(250W EQ) LED		(Type SP 38 S - 4 - 4)			(250W EQ) LED	
	(Type SA 40 S - 8)			(250W EQ) LED		(Type SA 40 T - 8)			(250W EQ) LED		(Type SP 38 S - 8)			(250W EQ) LED	
	(Type SA 40 S - 8 - 8)			(250W EQ) LED		(Type SA 40 T - 8 - 8)			(250W EQ) LED		(Type SP 38 S - 8 - 8)			(250W EQ) LED	
	(Type SA 40 S - 10)			(250W EQ) LED		(Type SA 40 T - 10)			(250W EQ) LED		(Type SP 38 S - 10)			(250W EQ) LED	
	(Type SA 40 S - 10 - 10)			(250W EQ) LED		(Type SA 40 T - 10 - 10)			(250W EQ) LED		(Type SP 38 S - 10 - 10)			(250W EQ) LED	
	(Type SA 40 S - 12)			(250W EQ) LED		(Type SA 40 T - 12)			(250W EQ) LED		(Type SP 38 S - 12)			(250W EQ) LED	
	(Type SA 40 S - 12 - 12)			(250W EQ) LED		(Type SA 40 T - 12 - 12)			(250W EQ) LED		(Type SP 38 S - 12 - 12)			(250W EQ) LED	
50	(Type SA 50 S - 4)			(400W EQ) LED		(Type SA 50 T - 4)			(400W EQ) LED		(Type SP 48 S - 4)			(400W EQ) LED	
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	(Type SA 50 S - 8)			(400W EQ) LED		(Type SA 50 T - 8)			(400W EQ) LED		(Type SP 48 S - 8)			(400W EQ) LED	
	(Type SA 50 S - 8 - 8)			(400W EQ) LED		(Type SA 50 T - 8 - 8)			(400W EQ) LED		(Type SP 48 S - 8 - 8)			(400W EQ) LED	
	(Type SA 50 S - 10)			(400W EQ) LED		(Type SA 50 T - 10)			(400W EQ) LED		(Type SP 48 S - 10)			(400W EQ) LED	
	(Type SA 50 S - 10 - 10)			(400W EQ) LED		(Type SA 50 T - 10 - 10)			(400W EQ) LED		(Type SP 48 S - 10 - 10)			(400W EQ) LED	
	(Type SA 50 S - 12)			(400W EQ) LED		(Type SA 50 T - 12)			(400W EQ) LED		(Type SP 48 S - 12)			(400W EQ) LED	
	(Type SA 50 S - 12 - 12)			(400W EQ) LED		(Type SA 50 T - 12 - 12)			(400W EQ) LED		(Type SP 48 S - 12 - 12)			(400W EQ) LED	

OTHER Designation				Quantity
Pole	A1	A2	Luminaire	

GENERAL NOTES:

1. All work, materials and services not shown on the plans which may be necessary for complete and proper construction shall be performed, furnished and installed by the Contractor. Faulty fabrication or poor workmanship in any material, equipment or installation will be considered justification for rejection. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the Department such warranties or guarantees.

2. The location of poles and fixtures are diagrammatic only and may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. Standard Steel Pole Designs. Steel poles fabricated in accordance with the details and dimensions shown herein, shall be considered standard designs. Submission of shop drawings and design calculations for standard designs is not required.

4. Optional Steel Pole Designs. Multi-sided steel poles may be allowed as optional designs, if steel poles are permitted or required, pending approval by the Department as outlined below.

   a. Shop Drawings. Optional designs require submission of shop drawings and design calculations bearing the seal of an engineer licensed in the State of Texas, in accordance with Item 441, "Steel Structures." The Department may elect to pre-approve some shop drawings for optionally designed poles. Submission of shop drawings and design calculations is not required for structures fabricated in accordance with the details of shop drawings on the pre-approved list maintained by the TxDOT Traffic Operations Division. Any deviation from the pre-approved shop drawings will require submission of shop drawings of the complete assembly and design calculations as described above.
   b. Structural Support Design for Luminaires. Lighting support structures shall be designed for a 25 year design life in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto. All poles shall be designed for 110 mph 3-second gust wind speeds. The Gust Factor, G, and Wind Importance Factor, Ir, shall be applied as per the AASHTO Specifications assuming a 25-year design life. The design wind pressure for hurricane wind velocities greater than 100 mph shall not be less than the design wind pressure using 100 mph with the non-hurricane Wind Importance Factor, Ir, value. For transformer base poles, fabricator shall include transformer base and connecting hardware in design calculations and shop drawing submittals. All transformer bases shall have been structurally tested to resist the theoretical plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with the shop drawings. Shop drawings shall show breakaway base model number, and manufacturer's name and logo. Manufacturer's shop drawings shall include the ASTM designations for all materials to be used.
   c. Mast Arm Attachments. All poles and attachments shall be structurally designed to support two 12-foot mast arms and luminaires. Poles shall be supplied with mast arm combinations as shown in the plans. All mast arms shall be designed for a 60-pound luminaire having an effective projected area of 1.6 square feet.
   d. Anchor Bolt Assembly. Anchor bolt assemblies for optionally designed poles shall be the same as those shown herein.

5. Aluminum Pole Designs. Aluminum pole designs may be allowed, if aluminum poles are permitted or required, pending approval by the Department as outlined below.

   a. Meet all of the requirements stated above for optional steel pole designs and the following:
      1. Aluminum poles shall be fabricated in accordance with "Structural Welding Code-Aluminum" AWS D1.2.
      2. Aluminum pole designs shall use the same anchor bolt assembly and be subject to the same geometric restraints and other requirements for steel poles specified herein.
      3. Aluminum poles shall be equipped with vibration mitigation devices, as approved by the engineer.
      4. Pole components shall be constructed using the following material:
         Shaft: ASTM B221 or B241 Alloy 6063-T6, ASTM B209 Alloy 5086-H34, ASTM B221 Alloy 6005-T5.
         Base Flange: ASTM B26 Alloy 356.0-T6 or ASTM B108 Alloy 356.0-T6 (Yield strength test required).
         Mast Arm Fitting: ASTM B209 Alloy 6061-T6 or ASTM B221 Alloy 6005-T5.
         Mast Arms: ASTM B241 Alloy 6061-T6 or Alloy 6063-T6.
         Pole Cap: ASTM B209 Alloy 5086-H32 or ASTM B108 or B26 Alloy 356.0-T6.
         Bolts: Stainless Steel AISI 300 series. Bolts threading into aluminum threads shall be treated with anti-seize compound, Never-Seez Compound, Permatex 133K or equal.

6. Special Designs. Poles with architectural treatments shall meet the requirements shown elsewhere in the plans.

7. Luminaire Mounting Height. Actual luminaire mounting height shall be the nominal mounting height given on RIP(2) for all pole-arm combinations except for poles with 4 ft. luminaire arms, which shall be 3'-0" lower than the nominal height, unless otherwise shown or directed.

EXPLANATION OF ROADWAY ILLUMINATION ASSEMBLY DESIGNATIONS

(TYPE SA 50 T - X - X) (400W EQ) LED

- SA: Pole and mast arm may be steel or aluminum.
- ST: Pole and mast arm must be steel.
- AL: Pole and mast arm must be aluminum.
- SP: Special (ovalized) steel or aluminum pole for installing on CSB or SSCB. See standard sheet CSB (4), or SSCB (4).

Two numerical digits denote nominal mounting height in feet.

Next letter denotes type of base, (S-Shoe Base, T-Transformer Base, or B-Bridge/Ret.Wall Mount)

First number denotes length of mast arm in feet.

Use of second mast arm is indicated by second dashed number which denotes length in feet.

Luminaire rating in watts (i.e. 400W). Equivalent wattage LED fixtures will include EQ (i.e. 400W EQ)

Last letters indicate light source (S - High Pressure Sodium; LED - LED luminaire)

SHEET 1 OF 4

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ROADWAY ILLUMINATION POLES

RIP(1)-19

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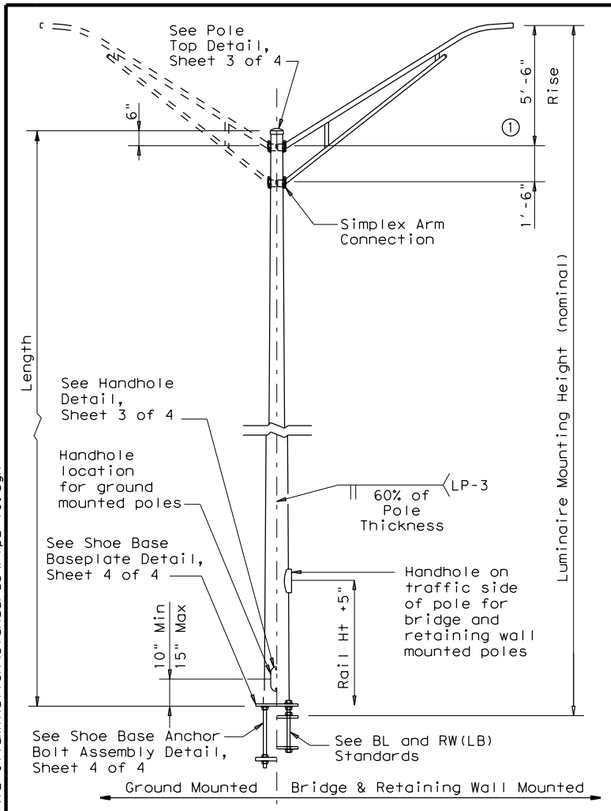
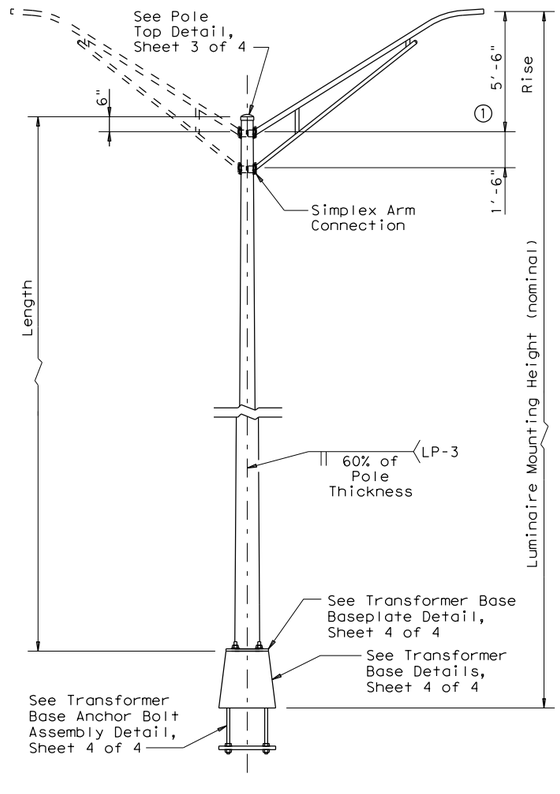


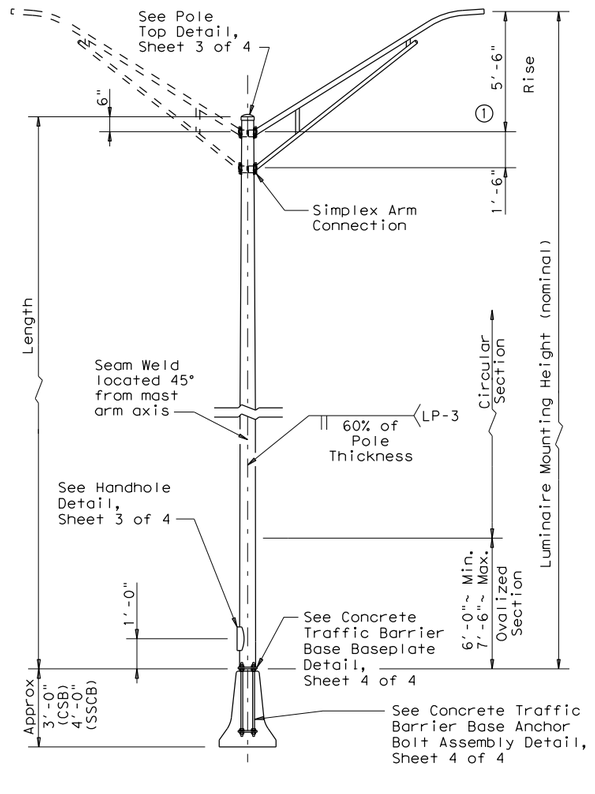
SHOE BASE POLE

SHOE BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	4.90	15.00	0.1196	7.1
30.00	7.50	4.00	25.00	0.1196	13.2
31.00-39.00	8.00	4.36-3.24	26.00-34.00	0.1196	20.7
40.00	8.50	3.60	35.00	0.1196	20.7
50.00	10.50	4.20	45.00	0.1196	30.3



TRANSFORMER BASE POLE

TRANSFORMER BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	5.11	13.50	0.1196	7.1
30.00	7.50	4.21	23.50	0.1196	13.2
31.00-39.00	8.00	4.57-3.45	24.50-32.50	0.1196	20.7
40.00	8.50	3.81	33.50	0.1196	20.7
50.00	10.00	3.91	43.50	0.1196	30.3



CONCRETE TRAFFIC BARRIER BASE POLE

CONCRETE TRAFFIC BARRIER BASE POLE (CSB/SSCB)						
Luminaire Mounting Height (Nominal) (ft)	Base ② Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)	
					About ℄ of Rail	Perp. to Rail
28.00	9.00	5.78	23.00	0.1196	10.3	13.2
38.00	9.00	4.38	33.00	0.1196	16.6	20.8
48.00	10.50	4.48	43.00	0.1345	25.1	30.5

MATERIAL DATA		
COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)
Pole Shaft (0.14"/ft. Taper)	A572 Gr 50, A595 Gr A, A1011 HSLAS Gr 50 Cl 2 ③, or A1008 HSLAS Gr 50 Cl 2	50
Base Plate and Handhole Frame	A572 Gr.50, or A36	36
T-Base Connecting Bolts	F3125 Gr A325	92
Anchor Bolts	F1554 Gr 55, A193-B7 or A321	55 105
Anchor Bolt Templates	A36	36
Heavy Hex (H.H.) Nuts	A194 Gr 2H, or A563 Gr DH	
Flat Washers	F436	

NOTES:

① 2'-6" rise for 4 ft. luminaire arms.

② Before ovalized as shown on Concrete Traffic Barrier Base Baseplate details, Sheet 4 of 4.

③ A1011 SS Gr 50 may be used instead of HSLAS, provided the material meets the elongation requirements for HSLAS.

POLE ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Shaft length	+1"
I.D. of outside piece of slip fitting pieces	+1/8", -1/16"
O.D. of inside piece of slip fitting pieces	+1/32", -1/8"
Shaft diameter: other	+3/16"
Out of "round"	1/4"
Straightness of shaft	±1/4" in 10 ft
Twist in multi-sided shaft	4° in 50 ft
Perpendicular to baseplate	1/8" in 24"
Pole centered on baseplate	±1/4"
Location of Attachments	±1/4"
Bolt hole spacing	±1/16"

GENERAL NOTES:

1. Designs conform to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals , 6th Edition (2013) and Interim Revisions thereto. Design 3-Second Gust Wind Speed equals 110 mph with a 1.14 gust factor. A wind importance factor of 0.80 is applied to adjust the wind speed to a 25 year recurrence interval. Design moments listed in tables assume base of pole is 25' above natural ground level.
2. Structures are designed to support two 12' luminaire mast arms and luminaires. Mast arms are designed to support a 60-pound luminaire having an effective projected area of 1.6 square feet.
3. Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Do not submit shop drawings for roadway illumination pole assemblies fabricated in accordance with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of these sheets and the Specifications. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
4. For mounting heights between values shown in the tables, use base diameter and thickness values for the larger height.
5. Unless otherwise noted, all steel parts shall be galvanized in accordance with Item 445, "Galvanizing."
6. Steel poles shall be fabricated in accordance with Item 441, "Steel Structures." Longitudinal seam welds for pole sections shall have 60% minimum penetration. All welding shall be in accordance with AWS D1.1, Structural Welding Code-Steel.
7. Two-section poles joined by circumferential welds will not be permitted, unless otherwise shown on the plans. Poles may be fabricated in two sections and field-assembled by the lap-joint method. The two sections shall telescope together with a lap length of not less than 1-1/2 times the shaft diameter at the lap joint.
8. Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
9. Lubricate and tighten anchor bolts, when erecting shoe base poles and concrete traffic barrier base poles, in accordance with Item 449, "Anchor Bolts."
10. All poles, except Transformer Base Poles, shall have hand holes with reinforcing frames and covers. For ground mounted shoe base poles, hand holes shall be placed 90 degrees to mast arm unless otherwise noted on the plans. For poles mounted on a concrete traffic barrier with one luminaire arm, hand holes shall be located 180 degrees from luminaire arm. For poles mounted on a concrete traffic barrier with two luminaire arms, all hand holes shall be on the same side of the barrier. For poles mounted on a bridge lighting bracket or a retaining wall lighting bracket, hand hole shall be on traffic side of the pole, at a height that will clear the barrier.
11. The finished pole shall have a smooth, uniform finish free of pits, blisters, or other defects. Scratched, chipped, and other damaged galvanized areas on poles and mast arms shall be repaired in accordance with Item 445, "Galvanizing."
12. Pole length is based on a 5'-6" luminaire arm rise. 4 ft. luminaire arms have a 2'-6" rise. A pole with 4 ft. luminaire arms will have an actual mounting height 3'-0" less than the nominal mounting height. Increasing the pole length to meet the nominal mounting height is allowed, but unnecessary unless otherwise directed by the engineer.
13. Erect transformer base poles in accordance with sheet RID(1).

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ROADWAY ILLUMINATION POLES

RIP(2)-19

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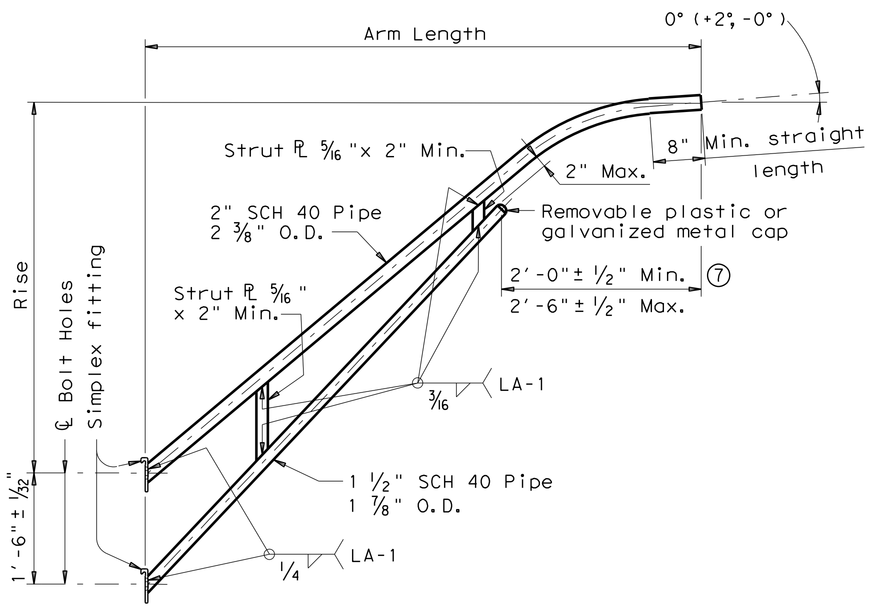
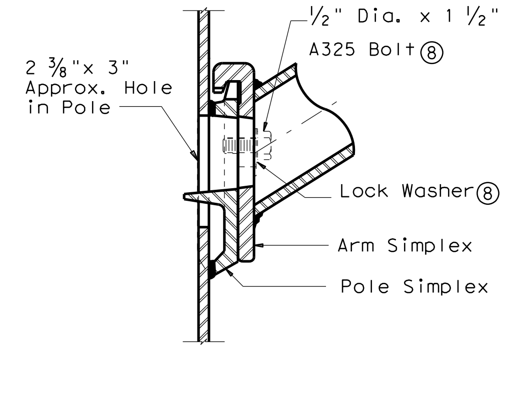
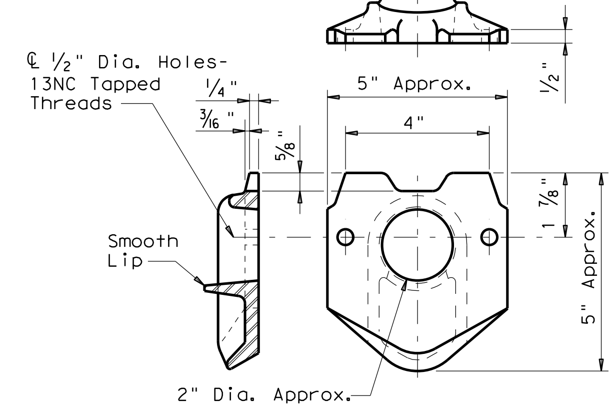


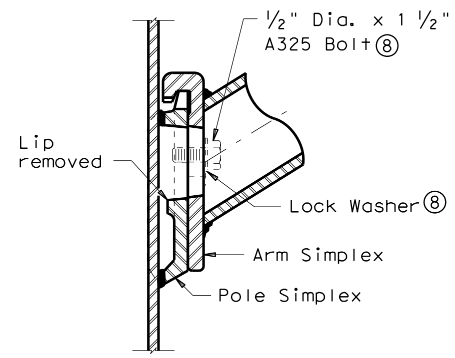
LUMINAIRE ARM



UPPER SIMPLEX FITTING
(Gusset not shown for clarity)

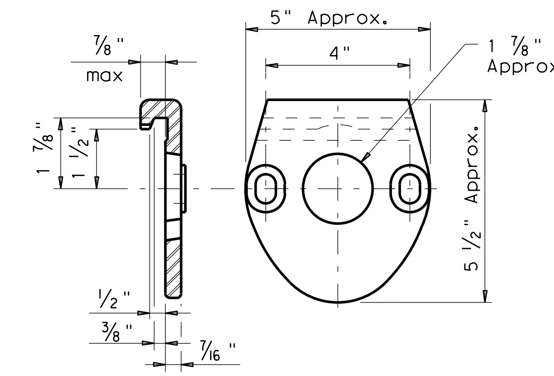


POLE SIMPLEX DETAIL 9

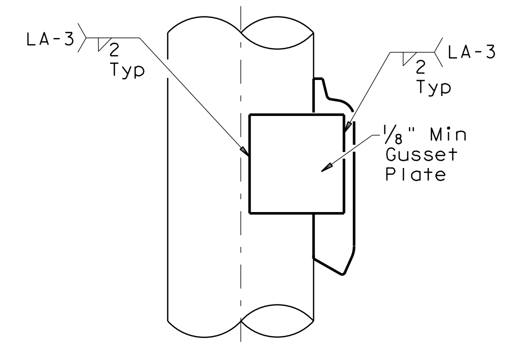


LOWER SIMPLEX FITTING
(Gusset not shown for clarity)

SECTION B-B



ARM SIMPLEX DETAIL 9



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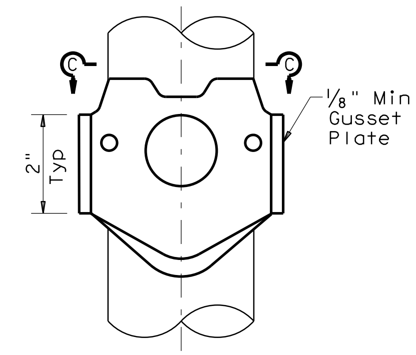
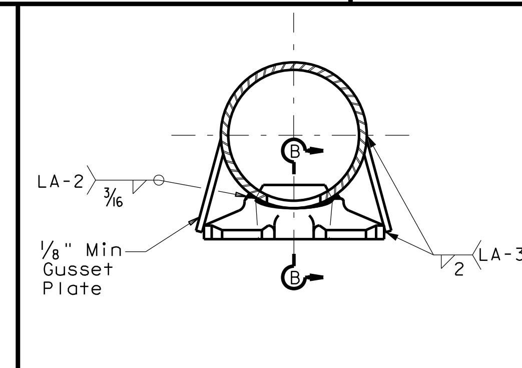
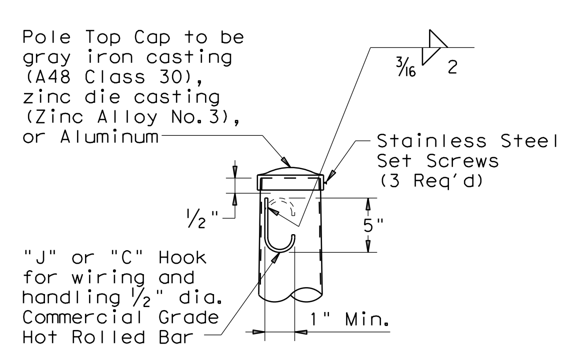


ELEVATION

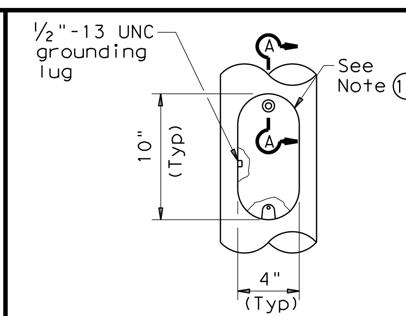


SECTION C-C

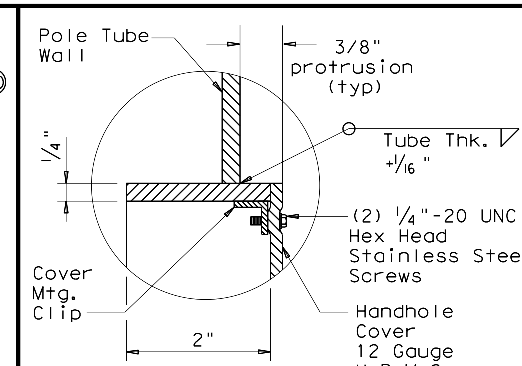
SIMPLEX ATTACHMENT DETAIL



POLE TOP



ELEVATION



SECTION A-A

HANDHOLE

LUMINAIRE ARM DIMENSIONS

Nominal Arm Length	Arm Length	Rise
4'-0"	3'-6"	2'-6"
6'-0"	5'-6"	5'-6"
8'-0"	7'-6"	5'-6"
10'-0"	9'-6"	5'-6"
12'-0"	11'-6"	5'-6"

ARM ASSEMBLY FABRICATION TOLERANCES TABLE

DIMENSION	TOLERANCE
Arm Length	±1"
Arm Rise	±1"
Deviation from flat	1/8" in 12"
Spacing between holes	±1/32"

NOTES:

4 Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

5 A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

6 A572, A1008 HSLAS-F, and A1011 HSLAS-F materials may have higher yield strengths but shall not have less elongation than the grade indicated.

7 Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

8 Each pole simplex fitting shall be supplied with 2 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans.

9 Proposed deviations in arm simplex dimensions or materials must be submitted to the Department for approval.

10 A welded handhole frame is permissible. Maximum of two (2) CJP weld splices is allowed.

MATERIALS

Pole or Arm Simplex	ASTM A27 Gr 65-35 or Gr 70-36, A148 Gr 80-50, A576 Gr 1021 5, or A36 (Arm only)
Arm Pipes	ASTM A53 Gr A or B, A500 Gr B, A501, A 1008 HSLAS-F Gr 50 6, or A1011 HSLAS-F Gr 50 6
Arm Struts and Gusset Plates 4	ASTM A36, A572 Gr 50 6, or A588
Misc.	ASTM designations as noted

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(3)-19

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REVISIONS	0545	01	014	SH 135
7-17	DIST		COUNTY	SHEET NO.
12-19	TYL		GREGG	184

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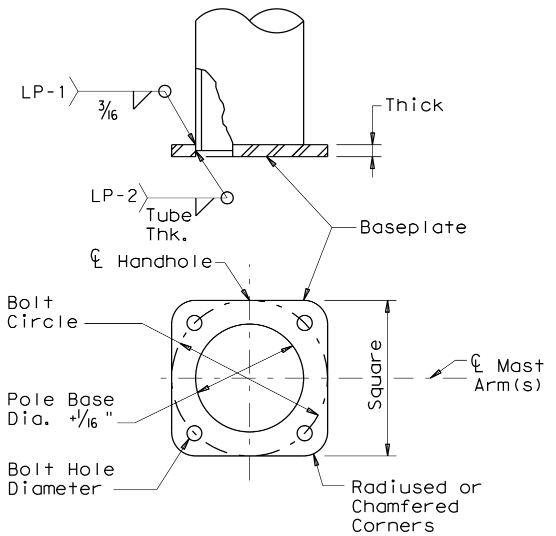
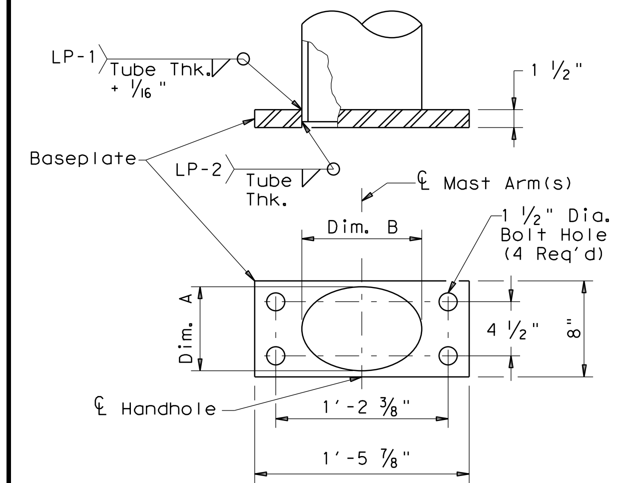


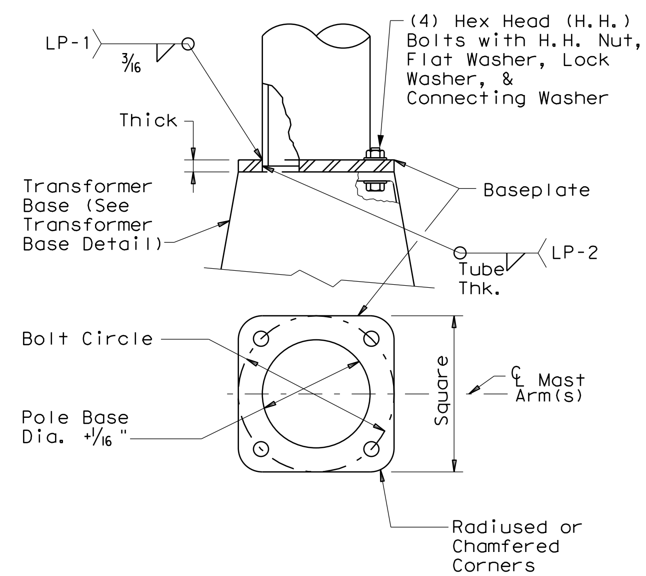
SHOE BASE BASEPLATE

SHOE BASE BASEPLATE TABLE				
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	BOLT HOLE DIAMETER
20′- 39′	13"	13"	1 1/4"	1 1/4"
40′	15"	15"	1 1/4"	1 1/2"
50′	15"	15"	1 1/2"	1 1/2"



CONCRETE TRAFFIC BARRIER BASE BASEPLATE

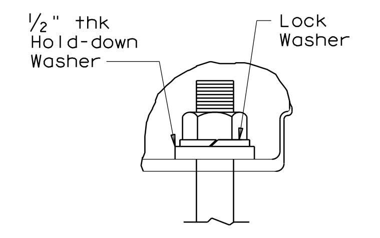
CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA. (12)	DIM. A	DIM. B
28′- 38′	9"	7"± 1/4"	10"± 1/4"
48′	10 1/2"	7"± 1/4"	13"± 1/4"



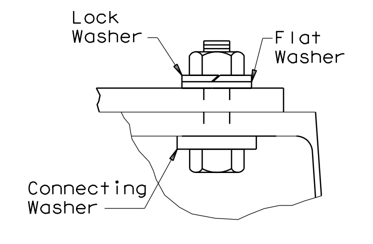
TRANSFORMER BASE BASEPLATE

TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFORMER BASE TYPE
20′- 39′	13"	13"	1 1/4"	1"	1 1/4"	A
40′	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50′	15"	15"	1 1/2"	1 1/4"	1 1/2"	B

TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



DETAIL A



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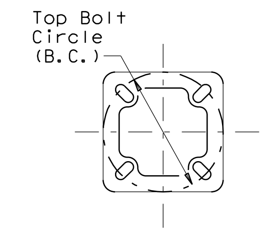
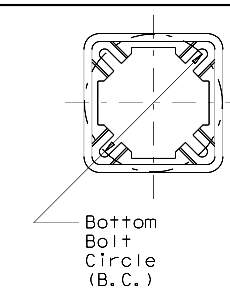


TOP PLAN



BOTTOM PLAN

GENERAL NOTES:

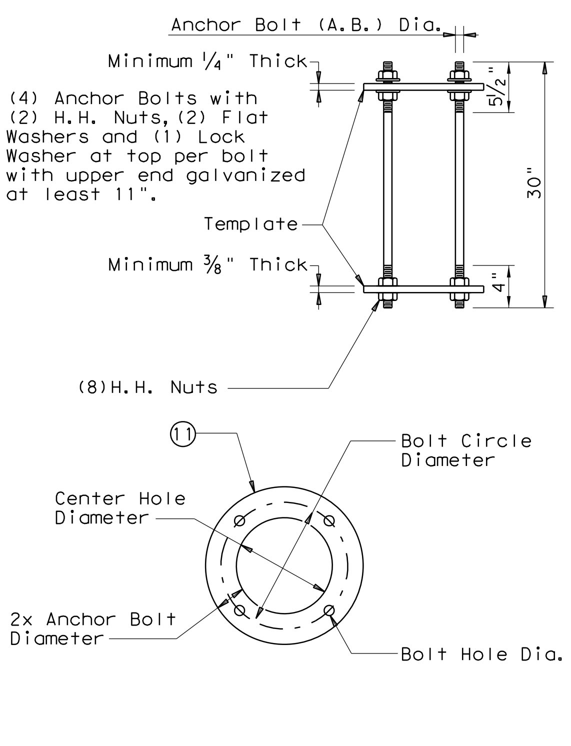
1. For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
2. All breakaway bases shall meet the breakaway requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to resist 150% of the design moment.
3. Transformer bases shall be cast from aluminum, ASTM B108 or B26 Alloy 356.0-T6, or other material approved by the Engineer. Four Hex Head (H.H.) bolts with four H.H. nuts, four lock washers, four flat washers, and connecting and hold-down washers as recommended by the manufacturer, galvanized to ASTM A153 Class C or D, or B695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A563 grade DH galvanized.
4. Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
5. Doors for transformer bases shall be made of plastic, fiberglass or other non-metallic material approved by the Engineer and shall be attached with stainless steel screws or bolts. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.

NOTES:

(11) Anchor Bolt Templates do not need to be galvanized.

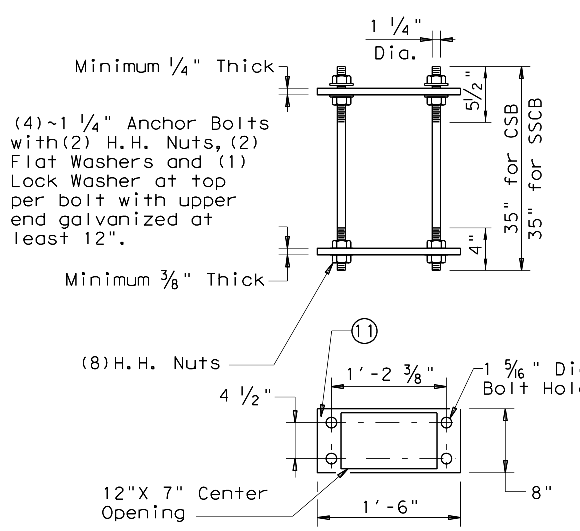
(12) Pole diameter before ovalized.

ANCHOR BOLT FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"



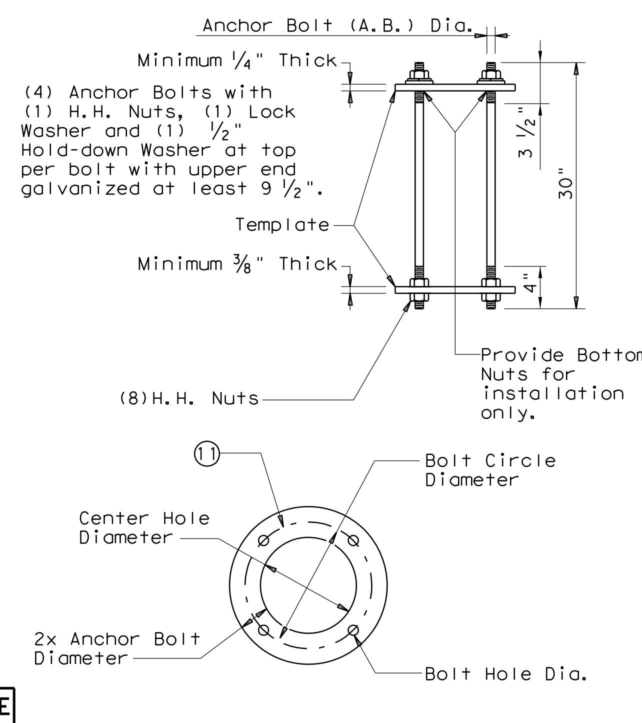
SHOE BASE ANCHOR BOLT ASSEMBLY

SHOE BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20′-39′	1"	13"	11"	1 1/16"
40′-50′	1 1/4"	15"	12 1/2"	1 5/16"

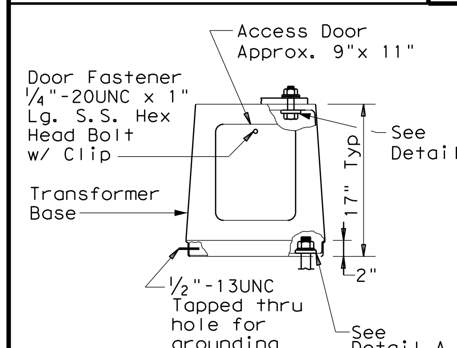


CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

TRANSFORMER BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20′- 39′	1"	14"	12"	1 1/16"
40′- 50′	1 1/4"	17 1/4"	14 3/4"	1 5/16"



TRANSFORMER BASE ANCHOR BOLT ASSEMBLY



ELEVATION

TRANSFORMER BASE DETAILS

SHEET 4 OF 4

Texas Department of Transportation — Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(4)-19

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PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

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REVISIONS March 2020	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		186

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of $\frac{1}{4}$ inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

Texas Department of Transportation — Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

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REVISIONS March 2020	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		187

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 426549L
Crossing Type: **Highway underpass
RR Company Owning Track at Crossing: UNION PACIFIC RAILROAD (UPRR)
Operating RR Company at Track: UPRR
RR MP: 12.52
RR Subdivision: Palestine
City: Kilgore
County: Gregg
CSJ at this Crossing: 0545-01-014
Highway/Roadway name crossing the railroad: SH 135
# of regularly scheduled trains per day at this crossing: 15
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: 0

Scope of Work at this Crossing to Be Performed by State Contractor:

Regrading asphalt and replacing drainage
inlets/pipes on underpass

Scope of Work at this Crossing to Be Performed by Railroad Company:

None

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

None

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 0
On this project, night or weekend flagging is:

☐ Expected
☒ Not Expected

Flagging services will be provided by:

☐ Railroad Company: TxDOT will pay flagging invoices
☐ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☐ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
☐ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

☐ Required
☒ Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit
Railroad Protective Liability	
☐ Not Required	
☒ Non - Bridge Projects	$2,000,000 / $6,000,000
☐ Bridge Projects	$5,000,000 / $10,000,000
☐ Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

☐ Not Required
☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
☒ Required: UPRR Maintenance Consent Letter. TxDOT CST to assist.
☐ Required: Contractor to obtain (see Item 5, Article 8.4)

With the following railroad companies:

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

http://www.txdot.gov/inside-txdot/division/rail/samples.html

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☒ Not Required
☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency Call
UNION PACIFIC RAILROAD (UPRR)
Railroad Emergency Line at 888-877-7267
Location: 426549L
RR Milepost 0012.52
Subdivision Palestine

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK

PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS 3/2020	0545	01	014	SH 135
	DIST		COUNTY	SHEET NO.
	TYL		GREGG	188

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A. GENERAL SITE DATA

1. PROJECT LIMITS: *SH 135 FROM KILGORE TRAFFIC CIRCLE TO RUSK COUNTY LINE*

2. PROJECT SITE MAPS:

- *Project Latitude 32.380247 Project Longitude 94.880874*
- *Project Location Map: Shown on Title Sheet*
- *Drainage Patterns: Shown on Drainage Area Maps (SHEET 118)*
- *Approx. Slopes Anticipated After Major Gradings and Areas of Soil Disturbance: Shown on Typical Sections (SHEETS 8 - 11)*
- *Major Controls and Locations of Stabilization Practices: Shown on SW3P Sheets (SHEETS 163 - 168)*
- *Project Specific Locations: Off-site waste, borrow, or storage areas are not part of this SW3P.*
- *Surface Waters and Discharge Locations: Shown on Drainage and Culvert Layout Sheets*

3. PROJECT DESCRIPTION: *WORK CONSISTS OF SURFACING/ROADWAY RESTORATION*

- *Joint-bid utilities are covered by this SW3P N/A*
  Non-Joint Bid Utilities are not part of this SW3P.

4. FOR MAJOR SOIL DISTURBING ACTIVITIES SEQUENCE OF EVENTS:

1. *Install controls down-slope of work area and initiate inspection and maintenance activities.*
2. *Begin phased construction with interim stabilization practices. Adjust erosion and sedimentation controls during construction to meet requirements and changing conditions and as directed/approved by the Engineer.*
3. *Major soil disturbing activities may include but are not limited to: right-of-way preparation, cut and/or fill to improve roadway profile, final grading and placement of topsoil and the following (if marked):*

   _X_ *Placement of road base*
   _X_ *Exstensive ditch grading*
   _X_ *Upgrading or replacing culverts or bridges*
   ____ *Temporary detour road(s)*
   ____ *Other:* _____

5. EXISTING AND PROPOSED CONDITIONS:

Description of existing vegetative cover: The project location is in a urban setting.
Percentage of existing vegetative cover: 20%
Existing vegetative cover:(mark one)
____ *Thick or uniformly established*
_X_ *Thin and Patchy*
____ *None or minimal cover*
Description of soils: The exsiting vegetative cover consists primarily of grasses.
Site Acreage: 9.80 *Acreage disturbed: 9.00*
Site runoff coefficient (pre-construction): 0.52 *Site runoff coefficient (post-construction): 0.60*

6. RECEIVING WATERS:

_X_ *A classified stream does not pass through project.*
____ *A classified stream passes through project. Name* _____ *Segment Number* _____
Name of receiving waters that will receive discharges from disturbed areas of the project: _____

Site is in a Municipal Separate Storm Sewer System (MS4).
MS4 Operator (name): _____

B. BEST MANAGEMENT PRACTICES

General timing or sequence for implementation of BMPs shall be as required and/or as directed/approved by the Engineer to provide adequate controls. BMPs shown on plan sheets are to be considered "proposed" unless/until install date is shown. BMPs are to reduce sediments from road construction activities.

1. SOIL STABILIZATION PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

_P_	SEEDING	____	PRESERVATION OF NATURAL RESOURCES
____	MULCHING (Hay or Straw)	____	FLEXIBLE CHANNEL LINER
____	BUFFER ZONES	____	RIGID CHANNEL LINER
____	PLANTING	____	SOIL RETENTION BLANKET
____	COMPOST/MULCH FILTER BERM	____	COMPOST MANUFACTURED TOPSOIL
____	SODDING	____	OTHER:

2. STRUCTURAL PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

_T_	SILT FENCES
____	HAY BALES
____	ROCK FILTER DAMS
____	DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
____	DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
____	DIVERSION DIKE AND SWALE COMBINATIONS
____	PIPE SLOPE DRAINS
____	PAVED FLUMES
____	ROCK BEDDING AT CONSTRUCTION EXIT
____	TIMBER MATTING AT CONSTRUCTION EXIT
____	CHANNEL LINERS
____	SEDIMENT TRAPS
____	SEDIMENT BASINS
____	STORM INLET SEDIMENT TRAP
____	STONE OUTLET STRUCTURES
_P_	CURBS AND GUTTERS
_P_	STORM SEWERS
____	VELOCITY CONTROL DEVICES
____	OTHER:

3. STORM WATER MANAGEMENT:

The proposed facility was designed in consideration of hydraulic design standards to convey stormwater in a manner that is protective of public safety and property. The control of erosion from the facility is inherent to the design. Additional factors affecting post-construction stormwater at the project location include:(mark all that apply)

_X_ *Existing or new vegetation provides natural filtration.*
____ *The design includes provisions for permanent erosion controls provided by strategically placed pervious and impervious surfaces.*
____ *Project includes permanent sedimentation controls (other than grass).*
____ *Velocities do not require dissipation devices.*
____ *Velocity-dissipation devices included in the design.*
____ *Other :* _____
_____

4. NON-STORM WATER DISCHARGES:

Off-site discharges are prohibited except as follows:

1. *Discharges from fire fighting activities and/or fire hydrant flushings.*
2. *Vehicle, external building, and pavement wash water where detergents and soaps are not used and where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed).*
3. *Plain water used to control dust.*
4. *Plain water originating from potable water sources.*
5. *Uncontaminated groundwater, spring water or accumulated stormwater.*
6. *Foundation or footing drains where flows are not contaminated with process materials such as solvents.*
7. *Other:* _____

Concrete truck wash water discharges on the site should be prohibited or minimized. If allowed by the Engineer, they must be managed in a manner so as not to contaminate surface water. They must not be located in areas of concentrated flow. Concrete truck wash-out locations must be shown on the SW3P Layout and included in the inspections.

Hazardous material spill/leak shall be prevented or minimized. At a minimum, this includes asphalt products, fuels, oils, lubricants, solvents, paints, acids, concrete curing compounds and chemical additives for soil stabilization. BMPs shall be implemented to the storage areas of these products. All spills must be cleaned and disposed properly and reported to the Engineer. Report any release at or above the reportable quantity during a 24 hour period to the National Response Center at 1-800-424-8802.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:

All erosion and sediment controls shall be maintained in good working order. If a repair is necessary, it shall be performed before the next anticipated storm event but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from equipment. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable. Disturbed areas on which construction activities have ceased, temporarily or permanently, shall be stabilized within 14 calendar days unless they are scheduled to and do resume within 21 calendar days. The areas adjacent to creeks and drainageways shall have priority followed by protecting storm sewer inlets.

2. INSPECTION:

For areas of the construction site that have not been finally stabilized, areas used for storage of materials, structural control measures, and locations where vehicles enter or exit the site, personnel provided by the permittee and familiar with the SW3P must inspect disturbed areas at least once every seven (7) calendar days. An Inspection and Maintenance Report shall be prepared for each inspection and the controls shall be revised on the SW3P within seven (7) calendar days following the inspection.

3. WASTE MATERIALS:

All non-hazardous municipal waste materials such as litter, rubbish, trash and garbage located on or originating from the project shall be collected and stored in a securely lidded metal dumpster, provided by the Contractor. The dumpster shall be emptied as necessary or as required by local regulation and the trash shall be hauled to a permitted disposal facility. The burying of non-hazardous municipal waste on the project shall not be permitted. Construction material waste sites, stockpiles and haul roads shall be constructed to minimize and control the amount of sediment that may enter receiving waters. Construction material waste sites shall not be located in any wetland, water body or stream bed. Construction staging areas and vehicle maintenance areas shall be constructed in a manner to minimize the runoff of pollutants.

4. OFFSITE VEHICLE TRACKING:

Off-site vehicle tracking of sediments and the generation of dust must be minimized. Excess sediments on road shall be removed on a regular basis as directed/approved by the Engineer.

5. OTHER:

See the EPIC sheet for additional environmenta

STATE OF TEXAS
MICHAEL D. VERHOFF
128002
LICENSED
PROFESSIONAL ENGINEER

02/13/2022

Michael Verhoff

DOCUMENT IS FOR INTERIM REVIEW AND NOT INTENDED FOR CONSTRUCTION BIDDING, OR PERMIT PURPOSES
MICHAEL D. VERHOEF, PE
128002
TEXAS SERIAL NO.
2/13/2022
DATE

CobbFendley
TBPE Firm Registration No. 274
TBPLS Firm Registration No. 100467
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262
www.cobbfendley.com

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			SH 135
STATE	DISTRICT	COUNTY	
TEXAS	TYL	GREGG	
CONTROL	SECTION	JOB	SHEET NO.
0545	01	014	189

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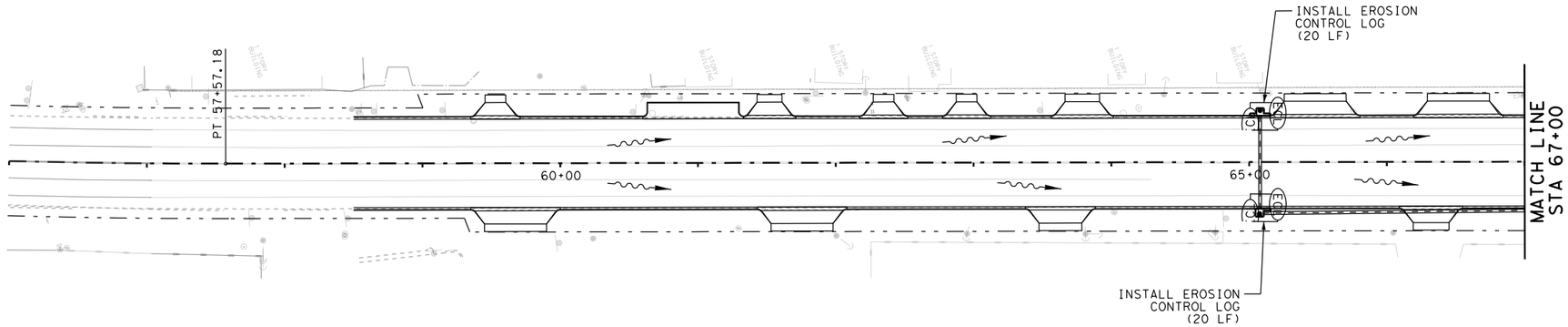

LEGEND

- SCF — SEDIMENT CONTROL FENCE
- RFD — ROCK FILTER DAM
- ECL — EROSION CONTROL LOG
- BLOCK SODDING & COMPOST
- FLOW

100% SUBMITTAL

02/13/2022

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

Michael Verhoef

0 25 50 100

1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

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TBPELS Engineering Firm No. 274
Land Surveying Branch No. 10046702

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Houston, Texas 77040
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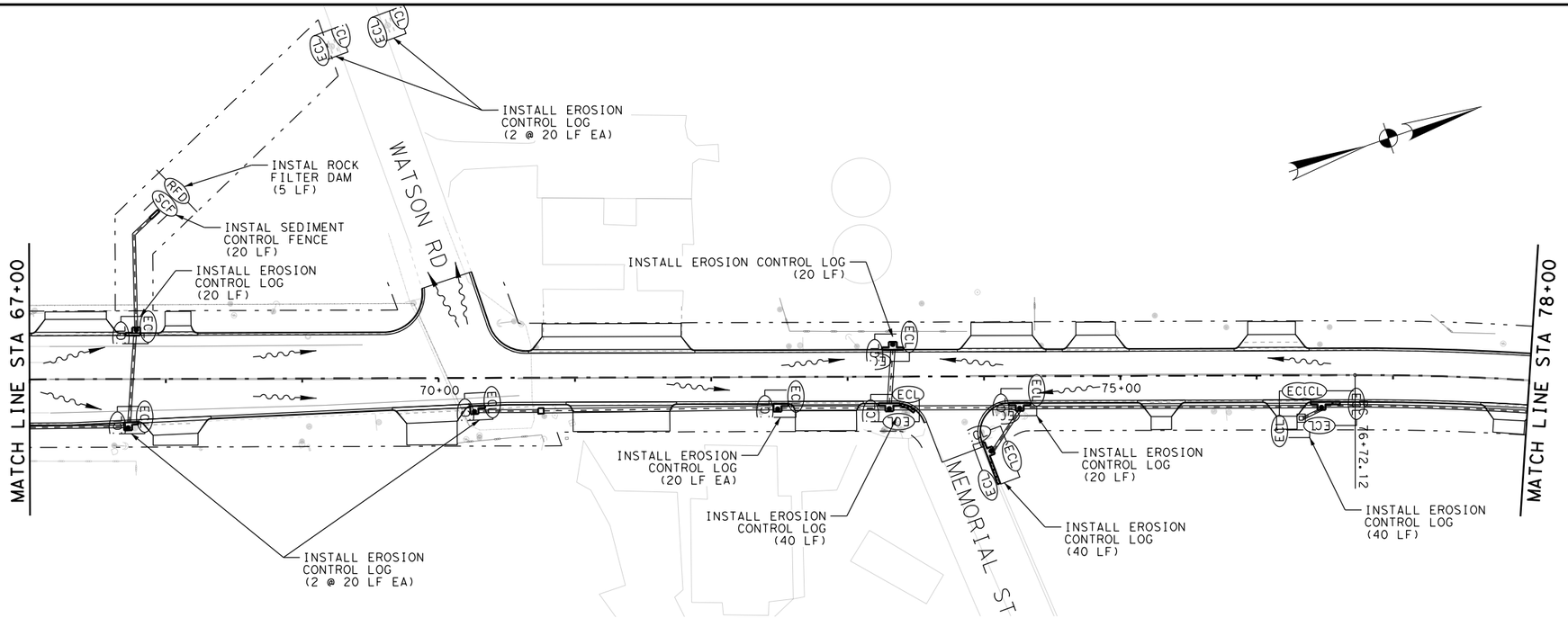
www.cobbfendley.com

Texas Department of Transportation

SH 135
SW3P LAYOUT
BEGIN TO STA 67+00

SHEET 1 OF 6

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	190



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SH 135
SW3P LAYOUT
STA 67+00 TO STA 78+00

SHEET **2** OF **6**

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	**191**

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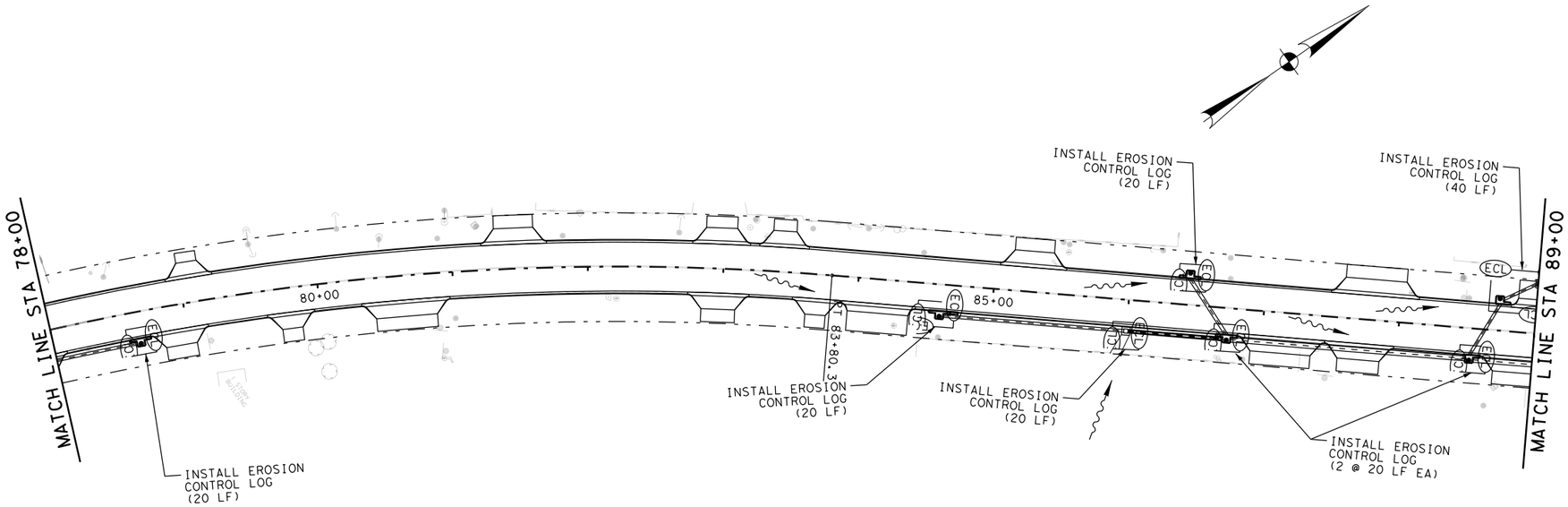

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SH 135
SW3P LAYOUT
STA 78+00 TO STA 89+00

SHEET 3 OF 6

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	192

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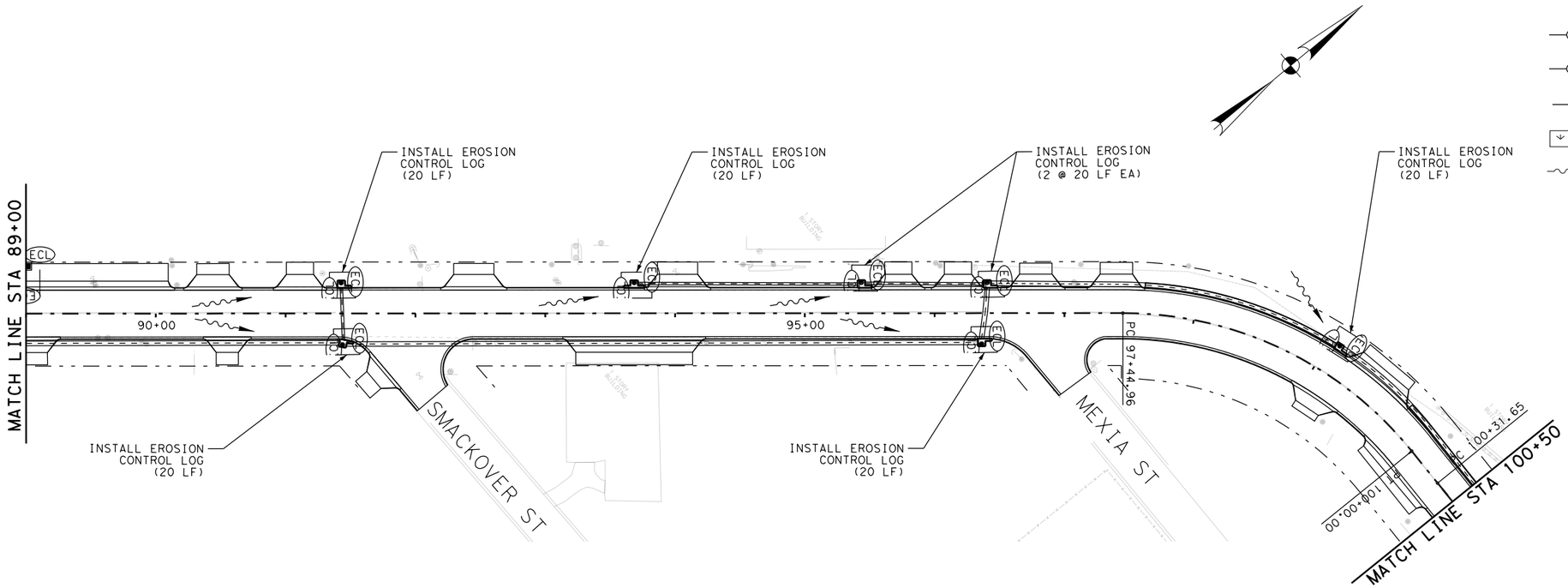

LEGEND

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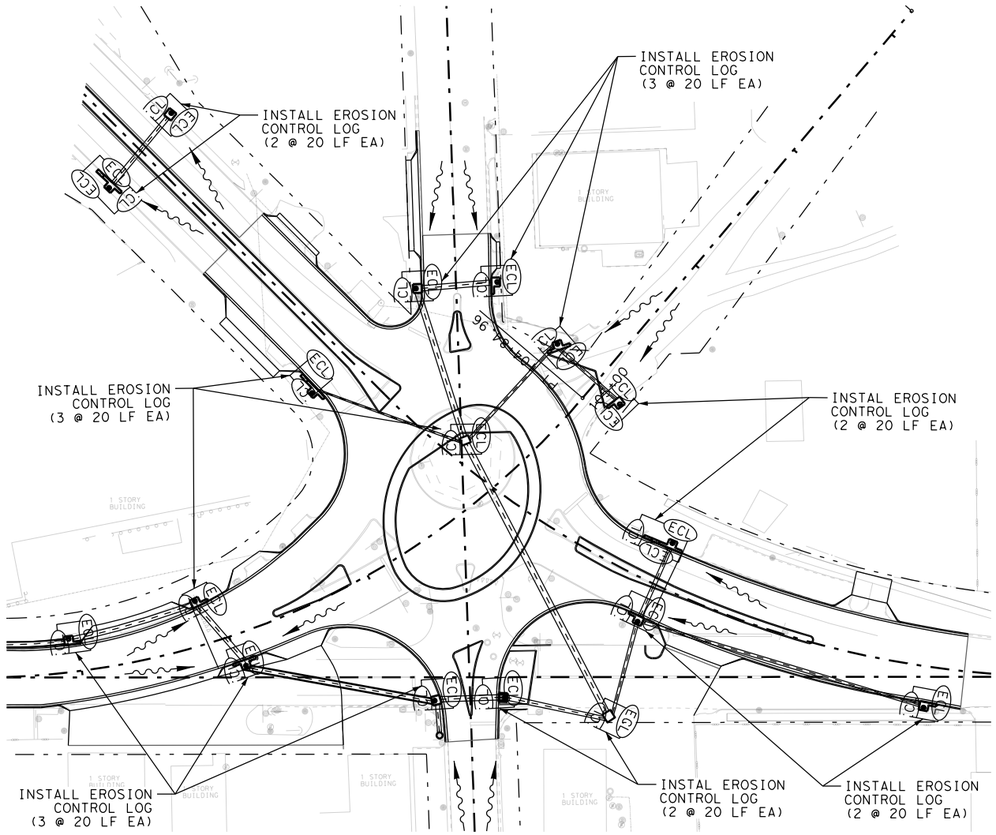
SH 135
SW3P LAYOUT
STA 89+00 TO STA 100+50

SHEET 4 OF 6

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	193



LEGEND

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SH 135
SW3P LAYOUT
CIRCLE

SHEET 5 OF 6

FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	194

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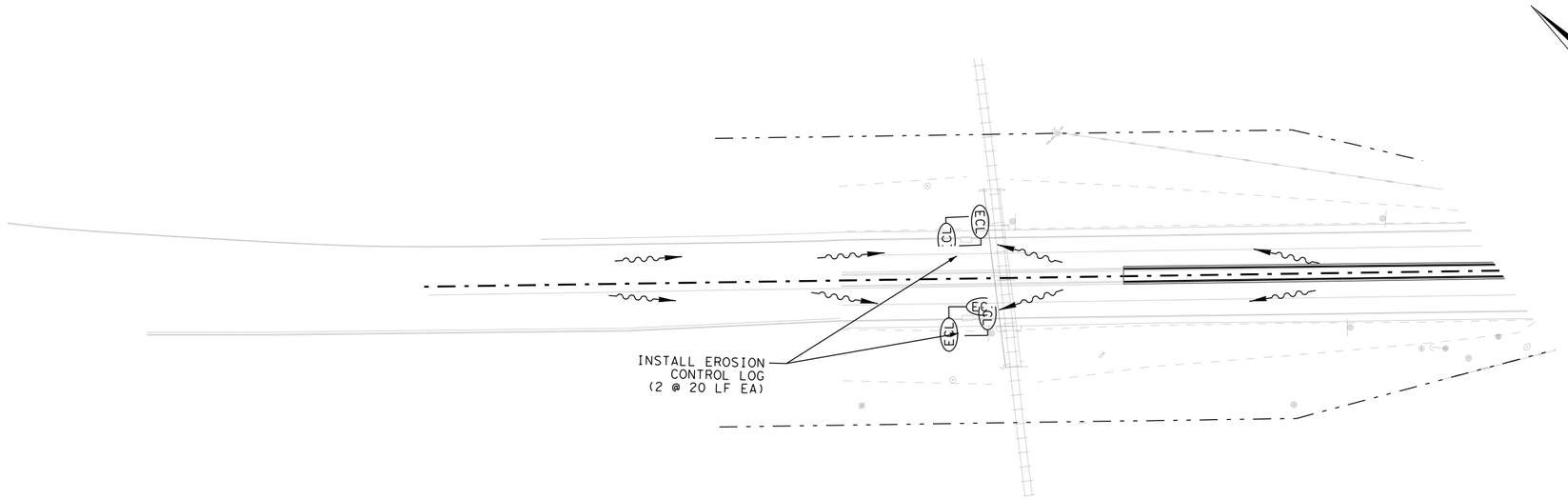

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SH 135
SW3P LAYOUT

135N

SHEET 6 OF 6

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	F 2022(024)			SH 135
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	195

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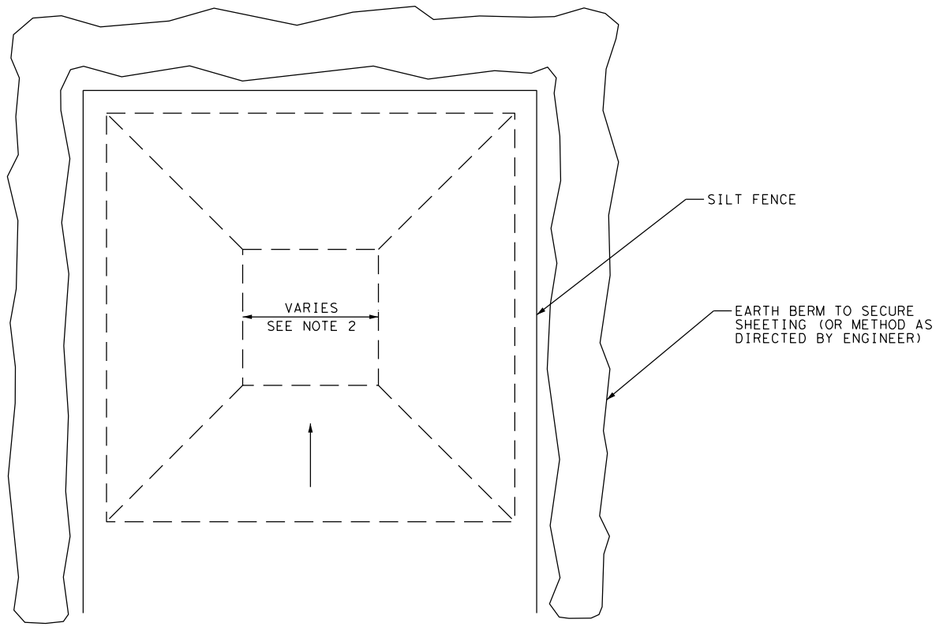

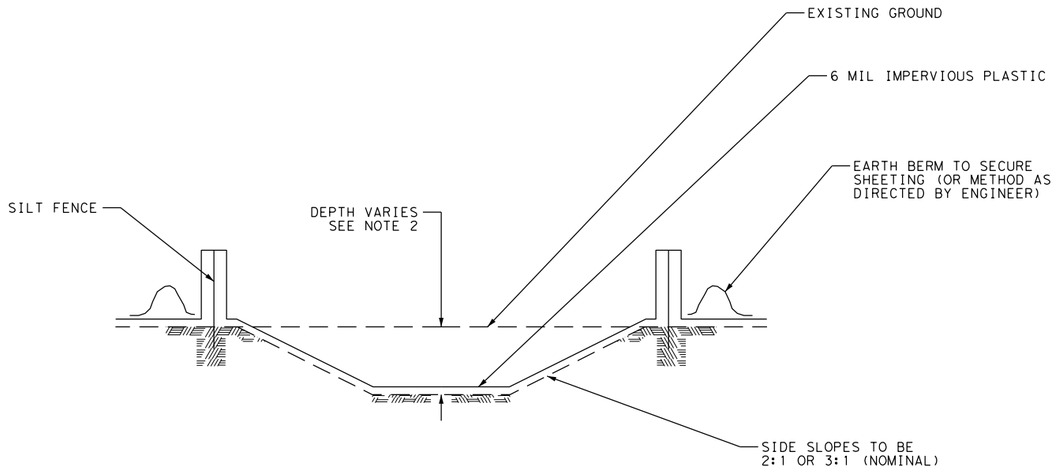

CONCRETE WASHOUT AREA
N.T.S.
(SEE NOTE 2)

NOTE:

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 THE CONCRETE WASHOUT AREA (S) WITH THE PROJECT'S EROSION AND SEDIMENTATION CONTROL PLAN AND SHALL BE APPROVED BY THE ENGINEER.
3. LOCATION: WASHOUT AREA(S) ARE TO BE LOCATED AT LEAST 50 FEET FROM ANY STREAM, WETLAND, STORM DRAIN, OR OTHER SENSITIVE RESOURCE. THE FLOOD CONTINGENCY PLAN MUST ADDRESS THE CONCRETE WASHOUT IF THE WASHOUT IS TO BE LOCATED WITHIN THE FLOODPLAIN.
4. 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.
5. SURFACE DISCHARGE IS UNACCEPTABLE, THEREFORE EARTH BERM OR OTHER CONTROL MEASURES, AS APPROVED BY THE ENGINEER, SHOULD BE USED AROUND THE PERIMETER OF THE CONCRETE WASHOUT AREA FOR CONTAINMENT.
6. 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 POUMP RIGS. WASHOUT AREA(S) SHOULD BE FLAGGED WITH SAFETY FENCING OR OTHER APPROVED METHOD.
7. CONCRETE WASHOUT 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 WASHOUT AREA.
8. WASHOUT AREA(S) ARE TO BE INSPECTED AT LEAST ONCE PER WEEK FOR STRUCTURAL INTEGRITY, ADEQUATE HOLDING CAPACITY, LEAKS, TEARS, OR OVERFLOWS. (AS DIRECTED BY THE CONSTRUCTION SITE ENVIRONMENTAL INSPECTION REPORT) WASHOUT AREA(S) SHOULD BE CHECKED AFTER HEAVY RAINS.
9. 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.
10. PAYMENT FOR THIS ITEM IS TO BE INCLUDED UNDER THE GENERAL COST OF THE WORK FOR THE PROJECT, INCLUDING SITE RESTORATION.

100% SUBMITTAL

STATE OF TEXAS
MICHAEL D. VERHOEF
128002
LICENSED
PROFESSIONAL ENGINEER

02/13/2022

Michael Verhoef

0 25 50 100
1" = 100'

REV. NO.	DATE	DESCRIPTION	BY

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CONCRETE WASHOUT DETAIL

FED.RD. DIV.NO.	STATE	PROJECT NO.		HIGHWAY NO.	
6	TEXAS	F 2022(024)		SH 135	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TYL	GREGG	0545	01	014	196

DATE: 2/13/2022
FILE: F:\Projects\2019\11004.TxDOT_5x5_PS&E\02.SH135_Kilgore\ENG\500 USTN\500.02 Sheets\10 Environmental\135_ENV-EPIC.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. Kilgore, TX

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# _____

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.
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.

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 specifications as listed above.
2.
3.

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 direction concerning migratory birds listed below.
2.
3.

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.
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	
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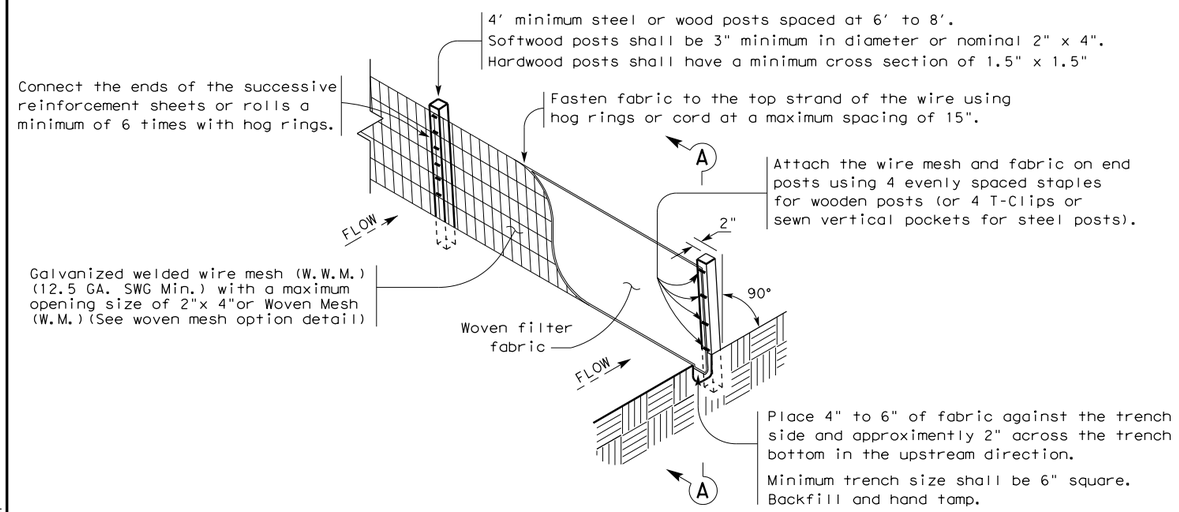
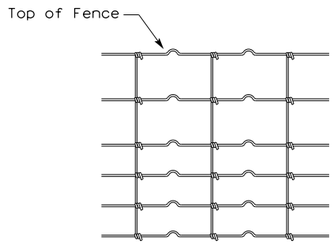
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.	
05-07-14 ADDED NOTE SECTION IV.	TYL	GREGG		197	
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.					

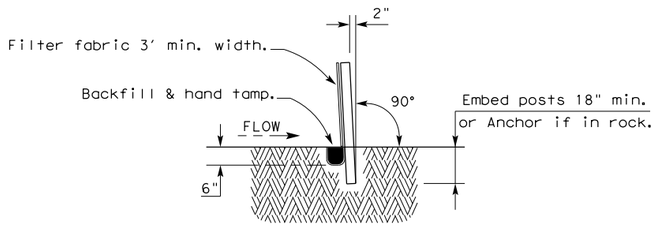
FILE: F:\EEProjects\2019\11004.TxDOT_5x5_PS8E\02.SH135_Kilgore\ENG\500 USTIN\500.02 Sheets\10 Environmental\Standards\ec116.dgn
DATE: 20AUG2022



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.

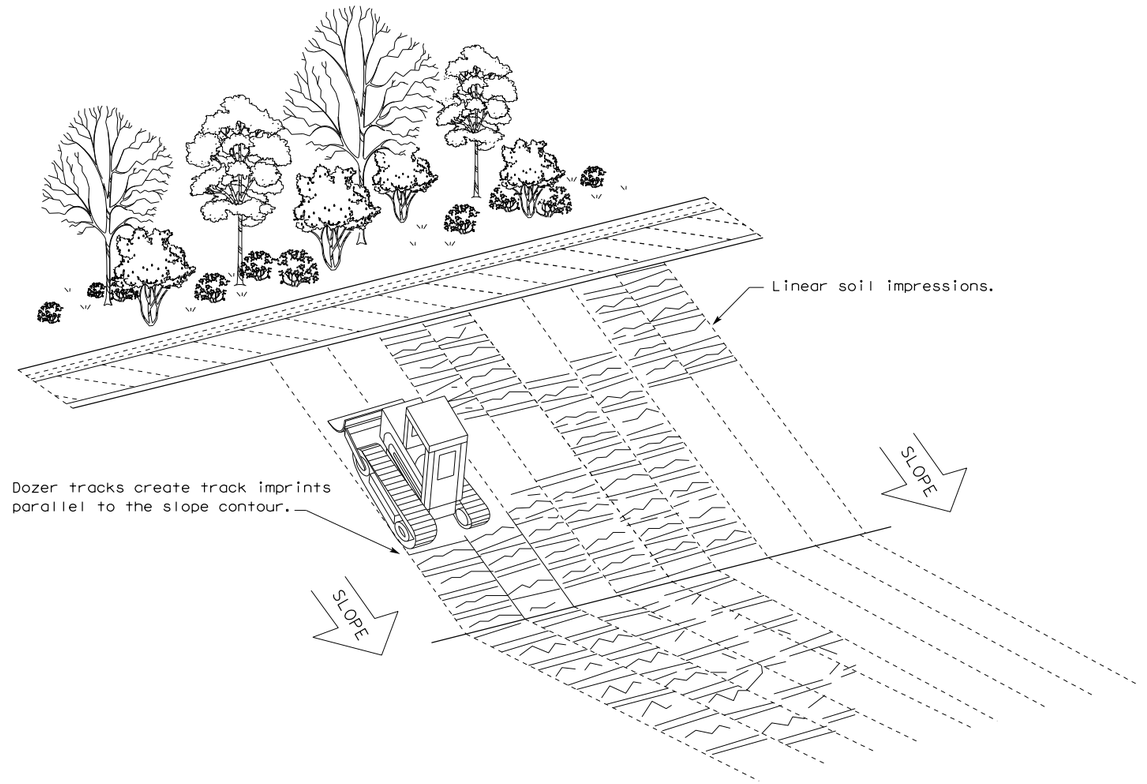
LEGEND

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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	TYL	GREGG		198

DATE: 2/13/2022
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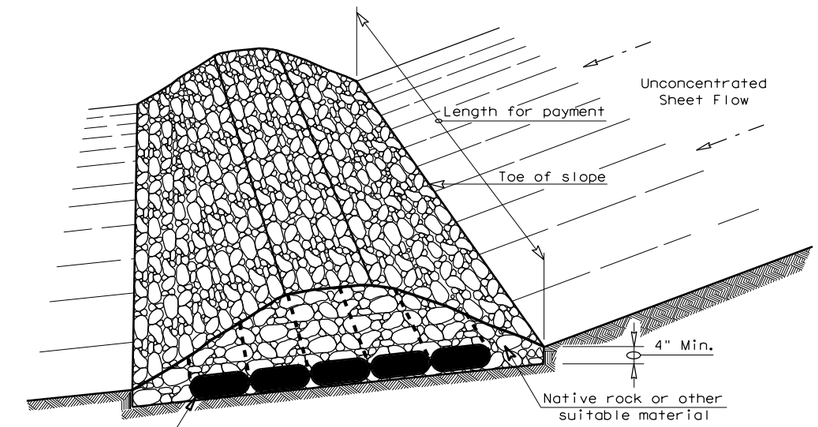
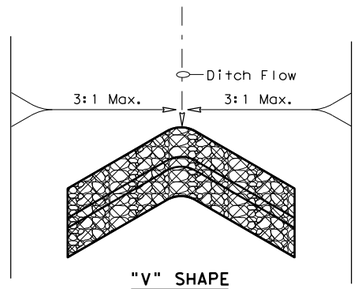
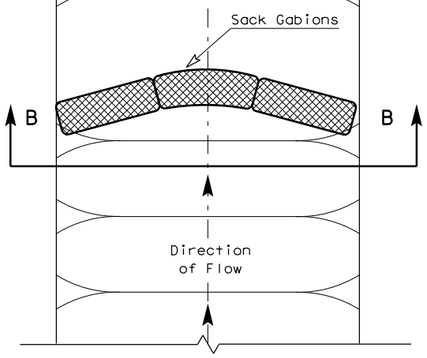


FILTER DAM AT TOE OF SLOPE

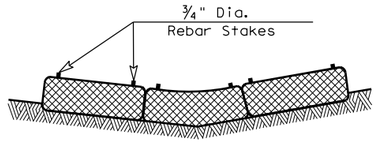
RFD1



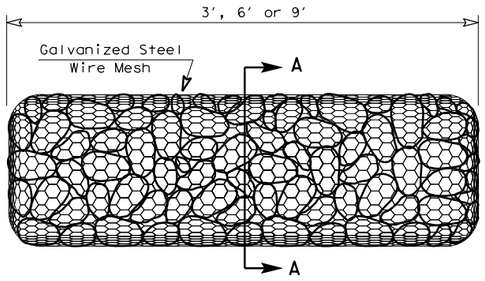
"V" SHAPE PLAN VIEW



PLAN VIEW

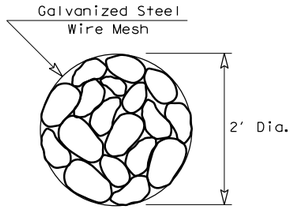


SECTION B-B

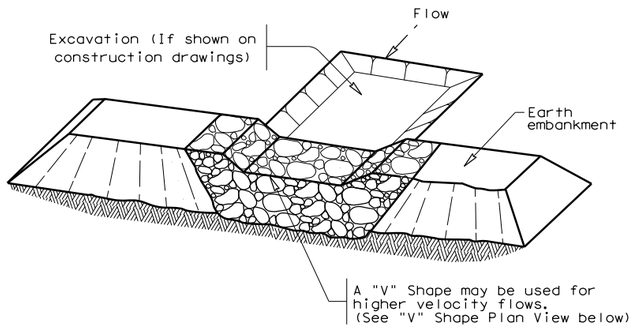


TYPE 4 (SACK GABIONS)

RFD4

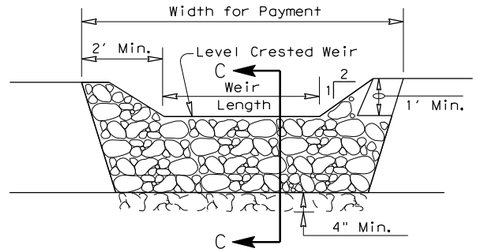


SECTION A-A

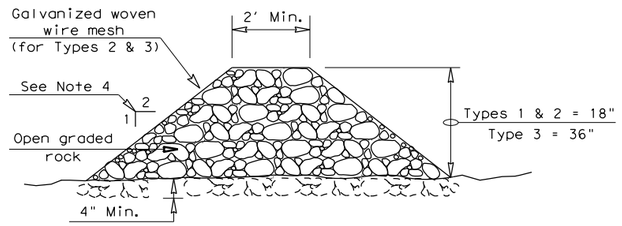


FILTER DAM AT SEDIMENT TRAP

RFD1 OR RFD2



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

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

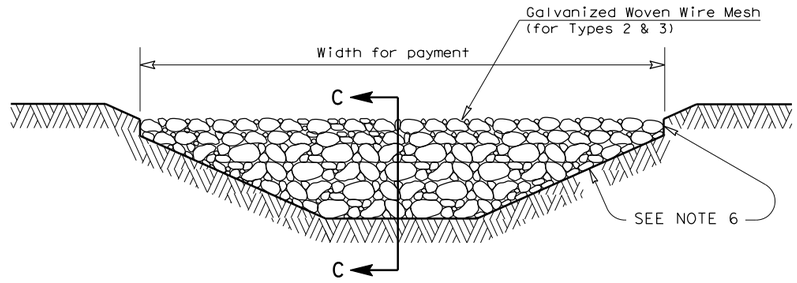
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity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

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

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

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

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



FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

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

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0545	01	014	SH 135
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	TYL	GREGG		199

DATE: 2/13/2022
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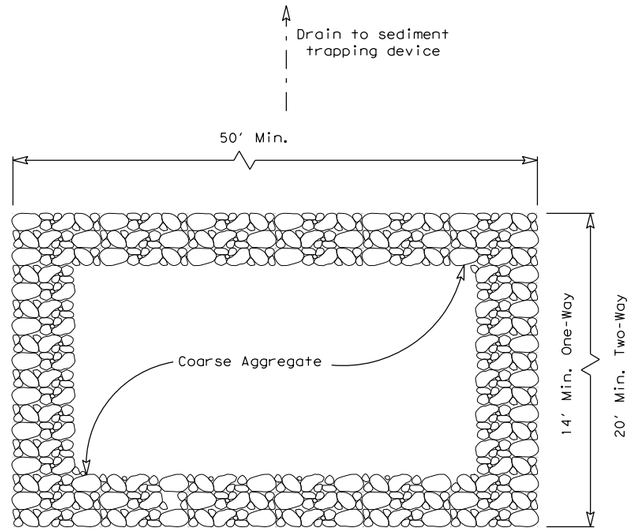
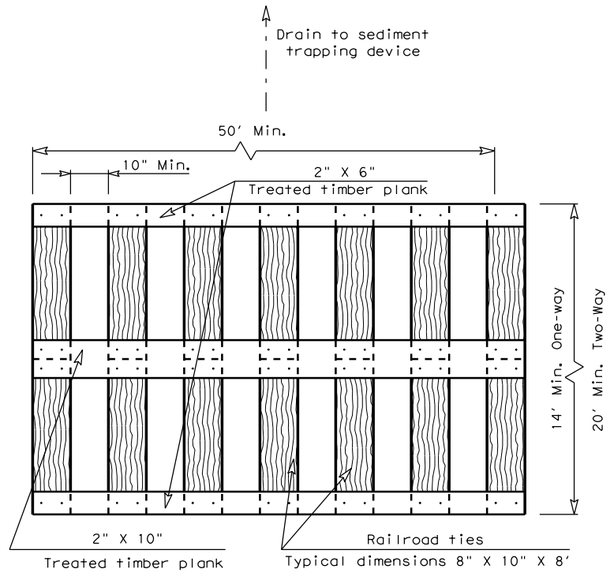


PLAN VIEW



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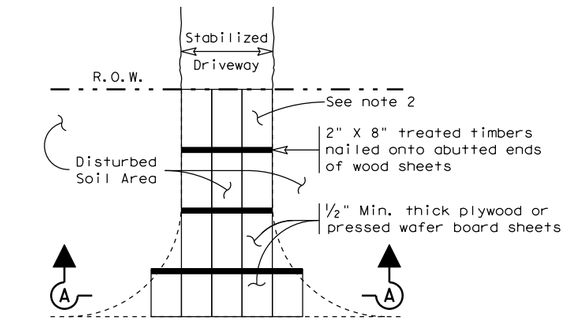

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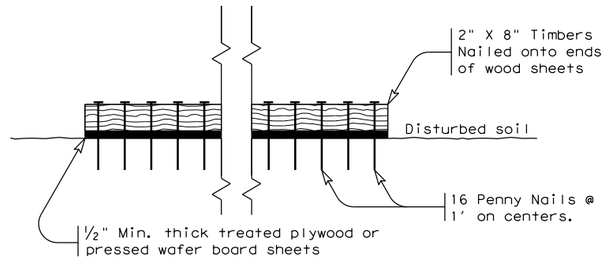
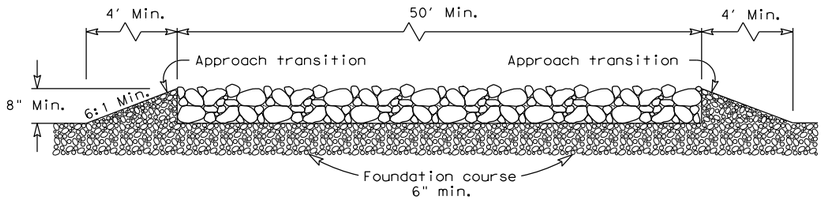


SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

SHORT TERM



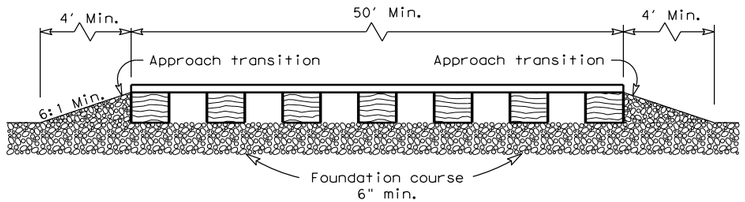
ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

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



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50′.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

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

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
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	TYL	GREGG		200

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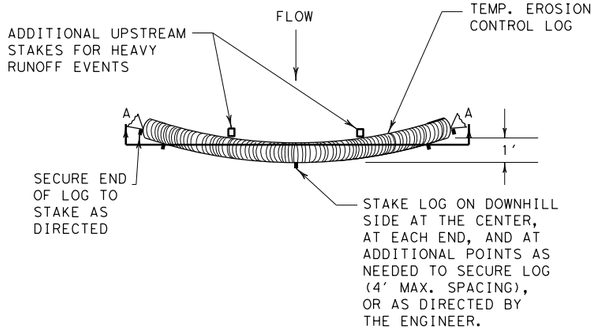

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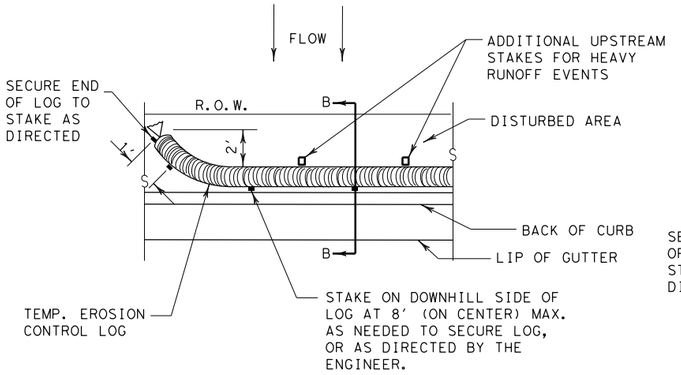

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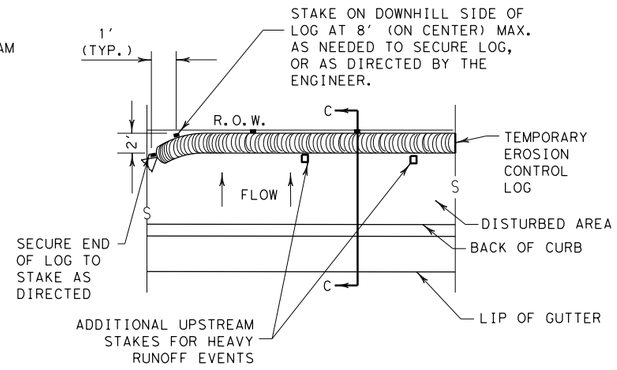

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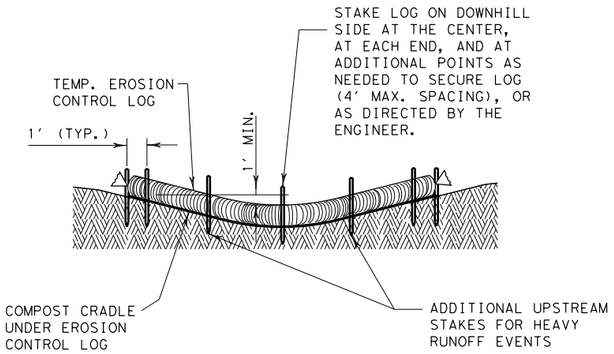
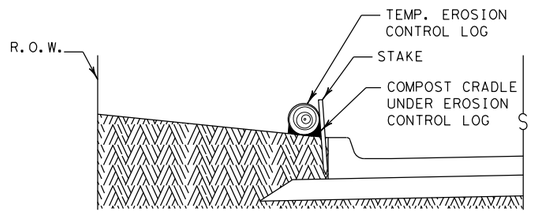


SECTION A-A

EROSION CONTROL LOG DAM

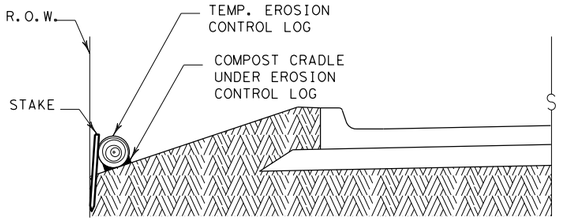
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

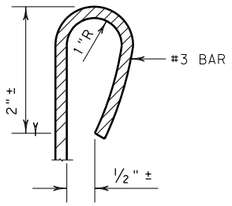
CL-BOC



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.

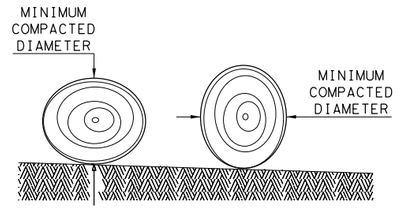
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

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

SHEET 1 OF 3

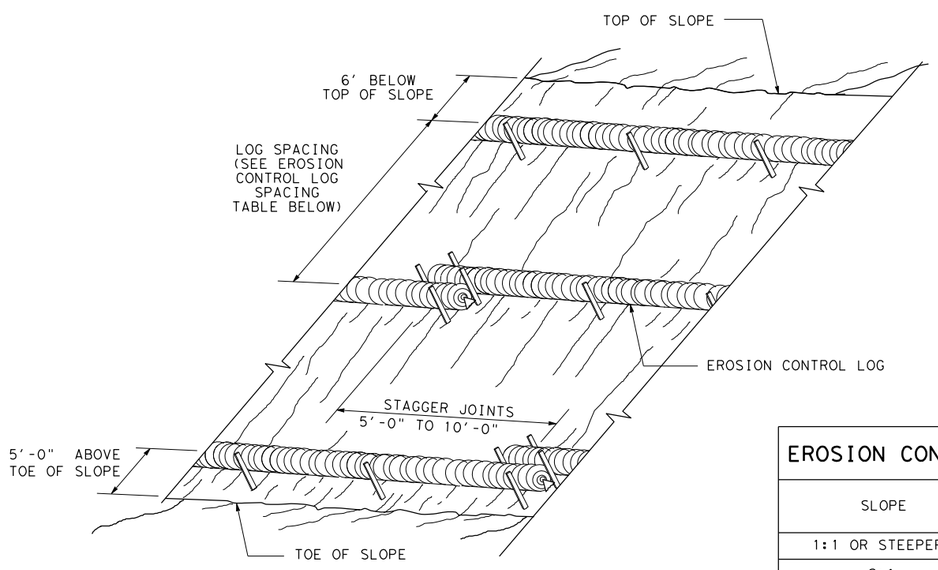
Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

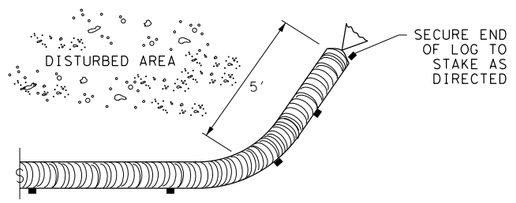
EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0545	01	014		SH 135	
	DIST		COUNTY			SHEET NO.
	TYL		GREGG			201



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

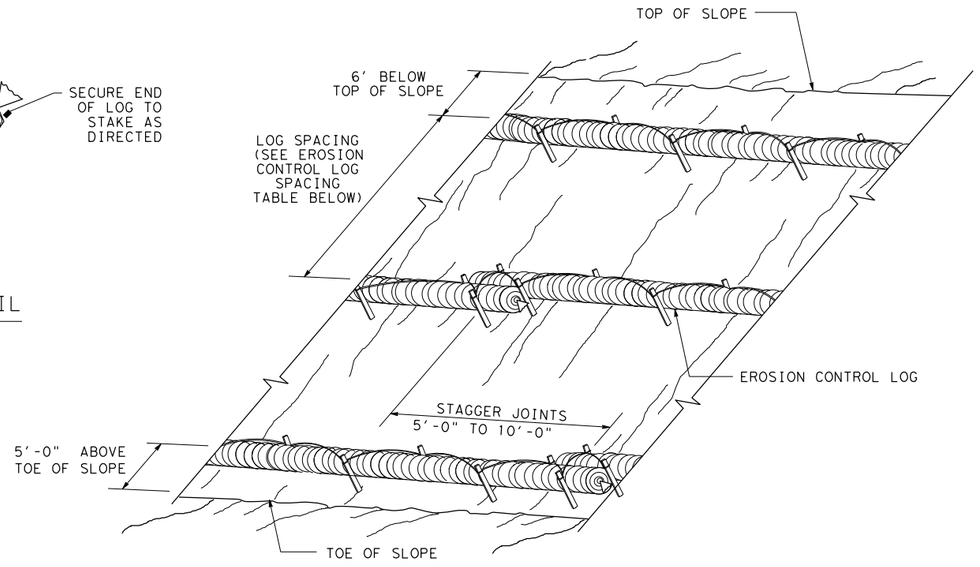
CL-SST



END SECTION RAP DETAIL

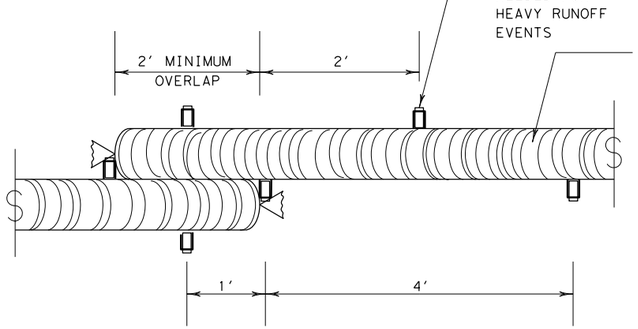
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

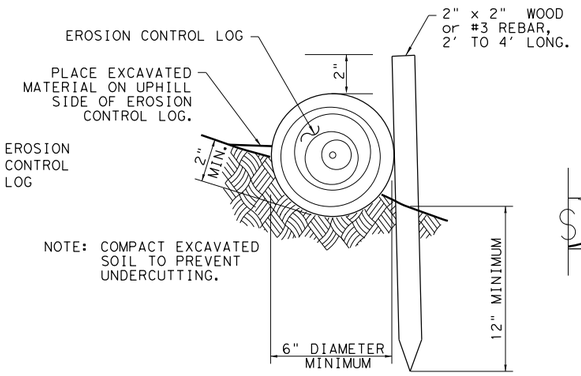
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

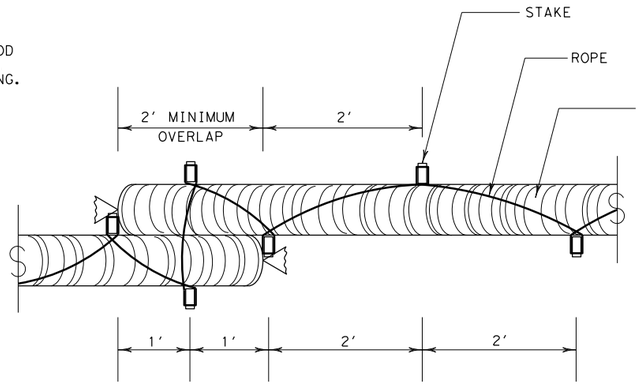


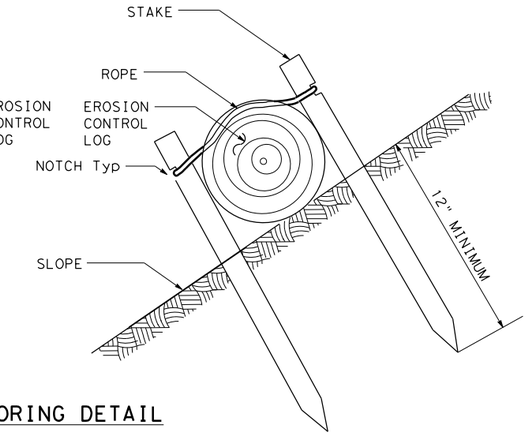


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

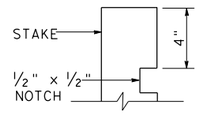
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





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

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
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REVISIONS	0545	01	014	SH 135
	DIST	COUNTY		SHEET NO.
	TYL	GREGG		202

DATE: 2/13/2022
FILE: F:\Projects\2019\11004.TxDOT_5x5_PS&E\02.SH135_Kilgore\ENG\500 USTN\500.02 Sheets\10 Environmental\Standards\ec916-2.dgn

DATE: 2/13/2022
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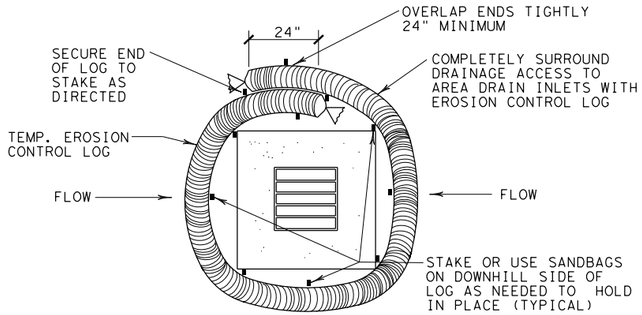
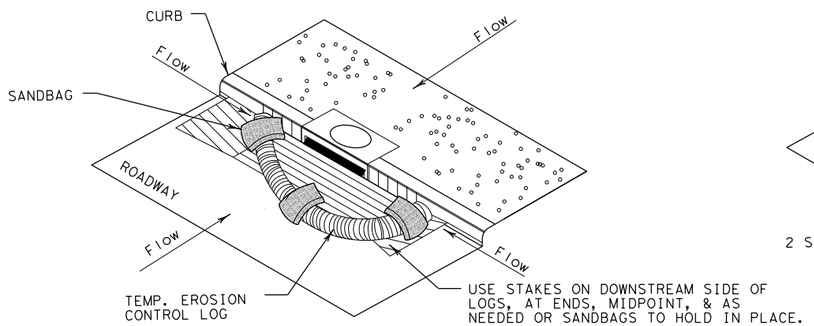


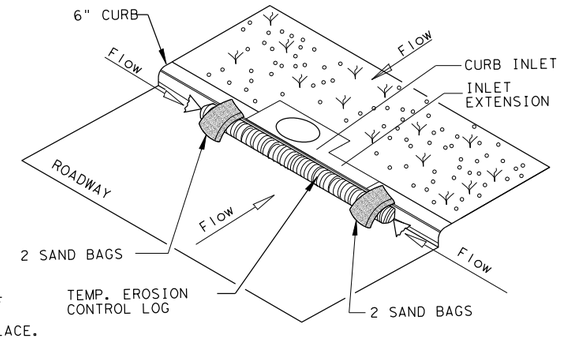
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

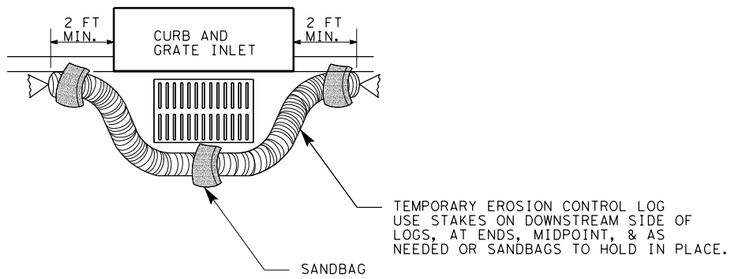
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

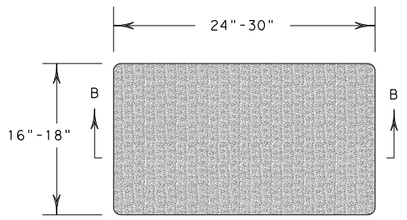
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

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	TYL	GREGG		203			