FHWA TEXAS DIVISION	PROJECT NO.		SHEET NO.
	C 6-2-130		1
STATE	DISTRICT	COUNTY	
TEXAS	ABL	NOLAN	
CONTROL	SECTION	JOB	HIGHWAY NO.
0006	02	130	IH-20

DESIGN SPEED = N/A
NFR CURRENT A.A.D.T. (2022) = 1843
NFR PROJECTED A.A.D.T. (2042) = 3281
SFR CURRENT A.A.D.T. (2022) = 596
SFR PROJECTED A.A.D.T. (2042) = 1085
FUNCTIONAL CLASS = MAJOR COLLECTOR

INDEX OF SHEETS

SEE SHEET 2

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NO. C 6-2-130
CSJ: 0006-02-130

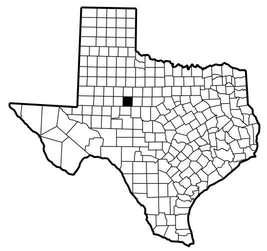
NET LENGTH OF ROADWAY (NFR) = 1200 ft = 0.227 mi
NET LENGTH OF ROADWAY (SFR) = 1147 ft = 0.217 mi
NET LENGTH OF PROJECT = 2347 ft = 0.444 mi

IH-20 FR AT HOPKINS RD
NOLAN COUNTY

LIMITS: FROM SFR EB EXIT TO HOPKINS ROAD INTERSECTION TO NFR WB EXIT

FOR THE CONSTRUCTION OF: RER - REHABILITATION OF EXISTING ROAD

CONSISTING OF: REHAB FRONTAGE ROADS AND INTERSECTION CRCP



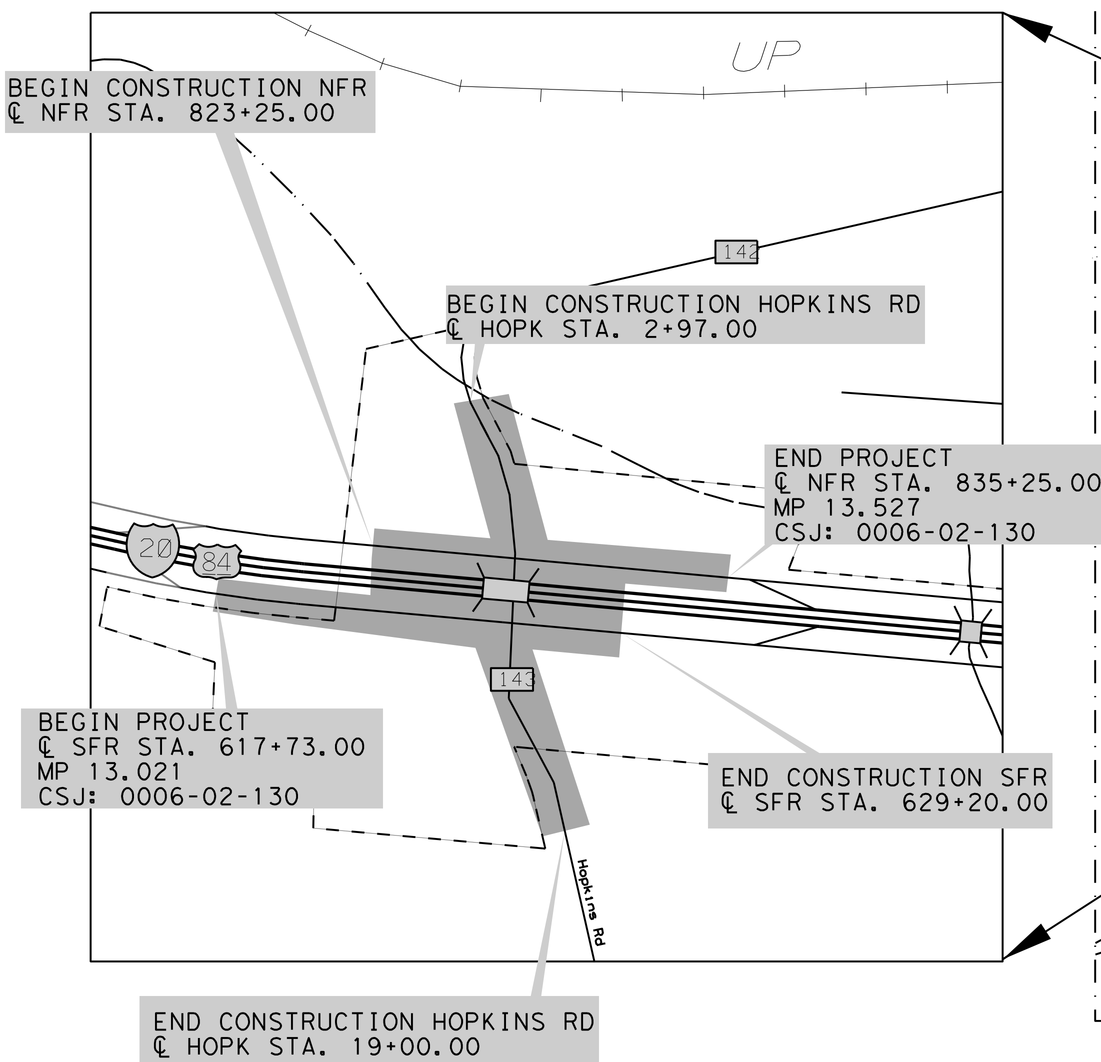
FINAL PLANS

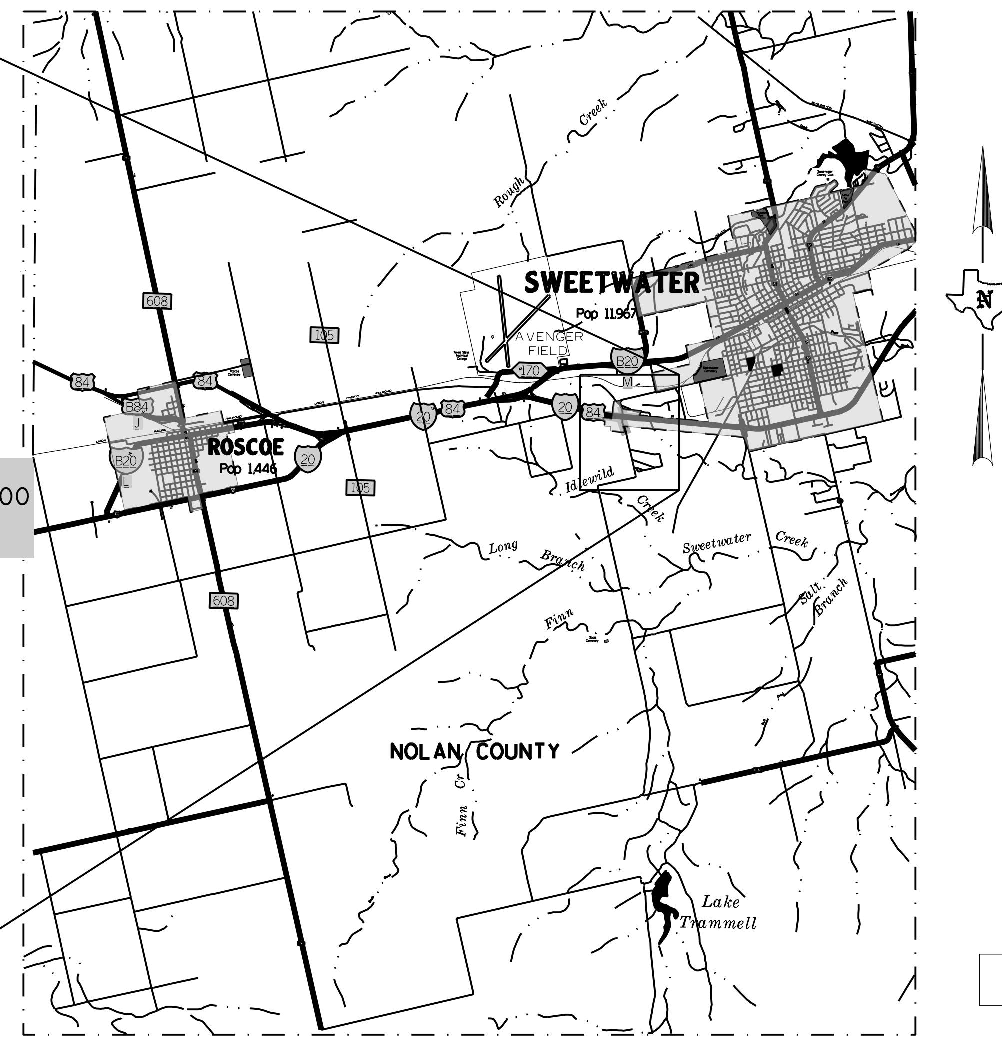
LETTING DATE: 05/02/2024
DATE CONTRACTOR BEGAN WORK:
DATE WORK WAS COMPLETED:
DATE WORK WAS ACCEPTED:
FINAL CONTRACT COST: $
CONTRACTOR :

CERTIFICATION FOR FINAL PLANS

THIS PROJECT WAS BUILT ACCORDING TO THE PLANS AND SPECIFICATIONS. THESE FINAL PLANS REFLECT THE WORK DONE AND THE QUANTITIES SHOWN THEREON AND ON THE FINAL ESTIMATE ARE FINAL QUANTITIES.

AREA ENGINEER DATE





NOT TO SCALE

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

THE DISTRICT TRAFFIC SAFETY COMMITTEE HAS REVIEWED THE TRAFFIC CONTROL PLAN FOR THIS PROJECT AND IT IS IN COMPLIENCE WITH CURRENT TRAFFIC CONTROL STANDARDS.

DocuSigned by: Michael Wittie, P.E. 2/13/2024
COMMITTEE CHAIRMAN DATE

Texas Department of Transportation®

SUBMITTED FOR LETTING: 1/30/2024
SEAN K. YOUNG, P.E.
AECOM PROJECT MANAGER

RECOMMENDED FOR LETTING: 1/31/2024
DocuSigned by: Michelle Luedke
MICHELLE LUEDKE
TxDOT PROJECT MANAGER

RECOMMENDED FOR LETTING: 2/13/2024
DocuSigned by: Ryan Roy Sayles
RYAN R. SAYLES, P.E.
AREA ENGINEER

RECOMMENDED FOR LETTING: 2/13/2024
DocuSigned by: Michael Haithcock
MICHAEL A. HAITHCOCK, P.E.
DIRECTOR OF T P & D

APPROVED FOR LETTING: 2/13/2024
DocuSigned by: Thomas G. Allbritton, P.E.
THOMAS G. ALLBRITTON, P.E.
DISTRICT ENGINEER

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS. (SP 000-008)

DATE: 1/30/2024

INDEX OF SHEETS

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A " # " HAVE BEEN ISSUED BY ME, OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

SEAN K. YOUNG, P.E. — NAME

1/30/2024 — DATE

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED PROFESSIONAL ENGINEER

1/30/2024

AECOM
13355 Noel Road, Suite 400
Dallas, Texas 72540
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

INDEX OF SHEETS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		2

CK: DW: CK: DW:

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CK:
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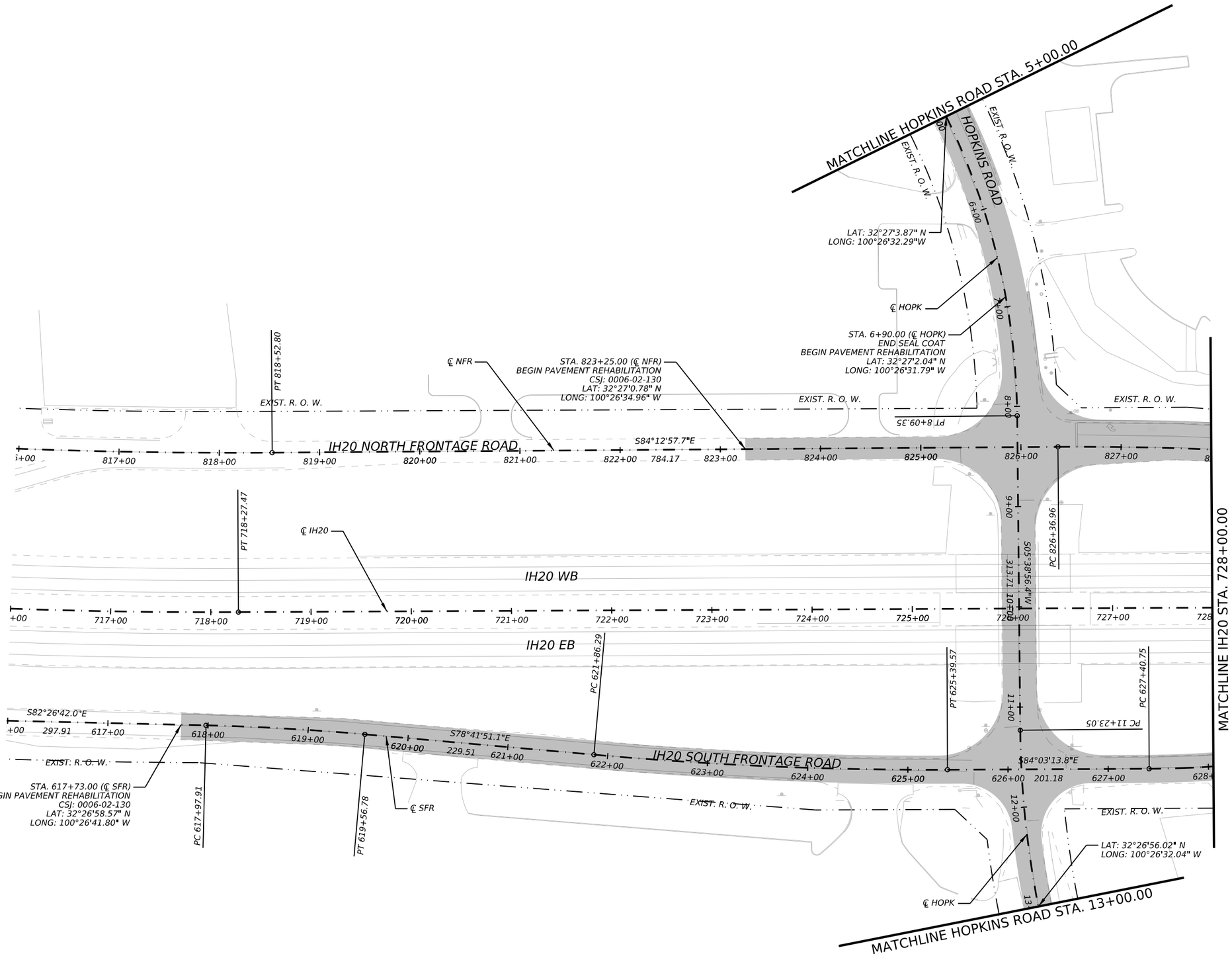

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0 50 100

SCALE IN FEET

LEGEND

PROJECT LIMITS

NOTE:

ROW AND ALIGNMENTS SHOWN ARE BASED ON BEST AVAILABLE INFORMATION. EXISTING TOPO ELEMENTS SHOWN ARE BASED ON AERIAL IMAGERY AND SURVEY PROVIDED BY TXDOT (JULY 2023). CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION. CONTRACTOR TO SET HORIZONTAL AND VERTICAL CONTROL AND VERIFY PRIOR TO CONSTRUCTION.

AECOM TBPE NO: F-3580

STATE OF TEXAS
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1/30/2024

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Texas Department of Transportation

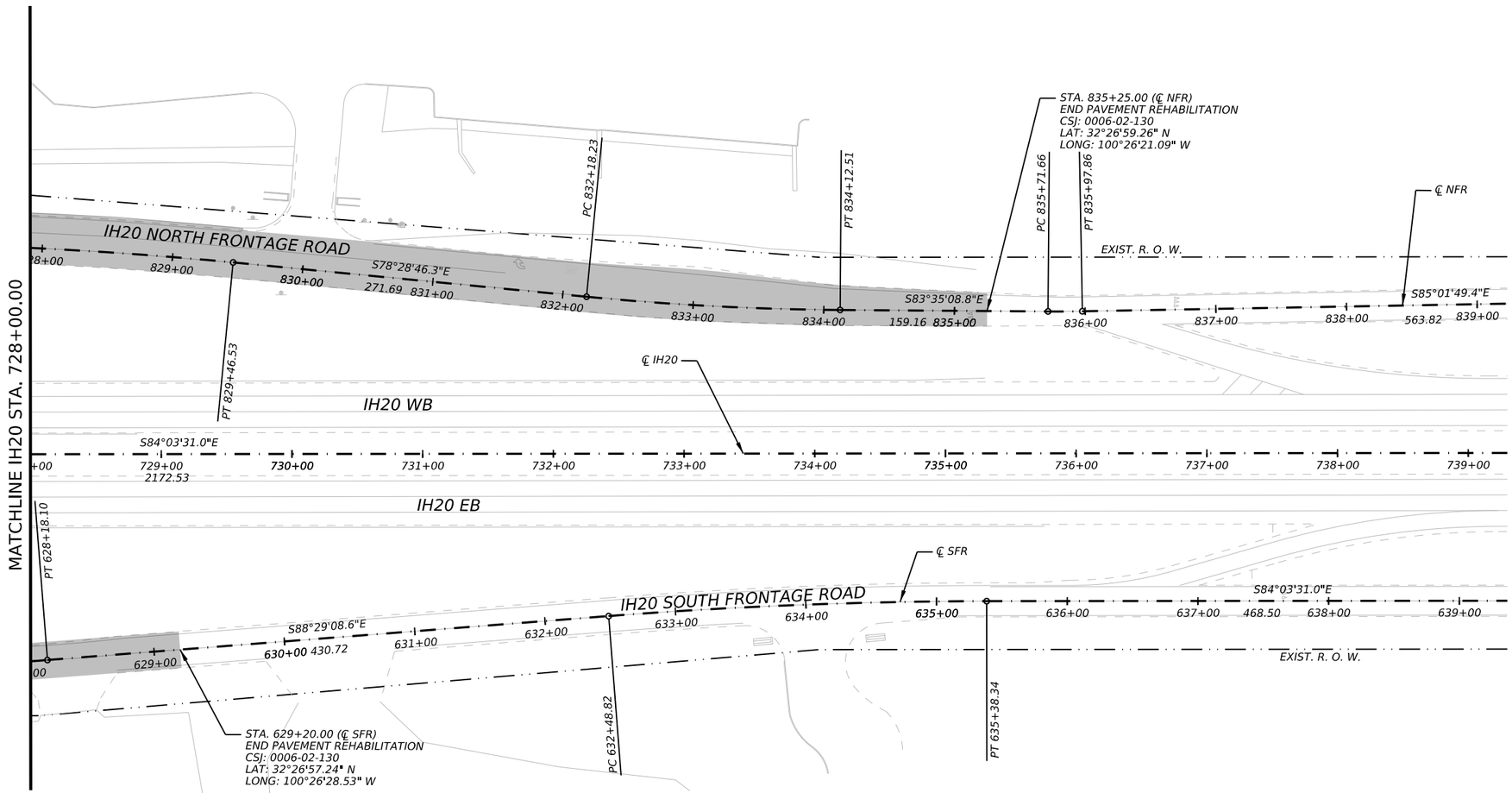
IH 20

PROJECT LAYOUT

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		3

DATE:
FILE:



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SCALE IN FEET

LEGEND

PROJECT LIMITS

NOTE:

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1/30/2024

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Texas Department of Transportation

IH 20

PROJECT LAYOUT

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		4

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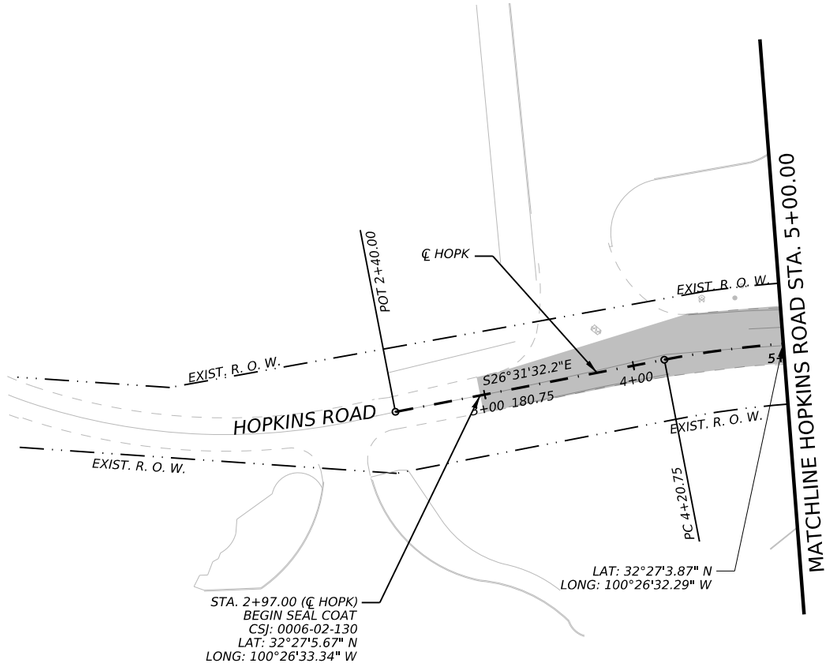

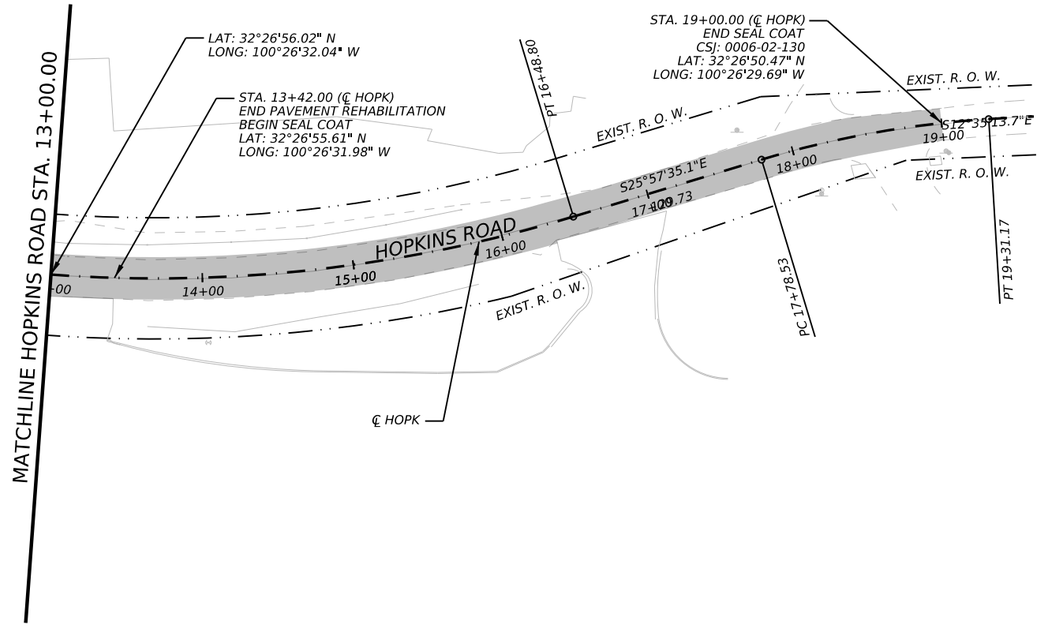

0 50 100

SCALE IN FEET

LEGEND

PROJECT LIMITS

NOTE:

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1/30/2024

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Texas Department of Transportation

IH 20

PROJECT LAYOUT

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		5

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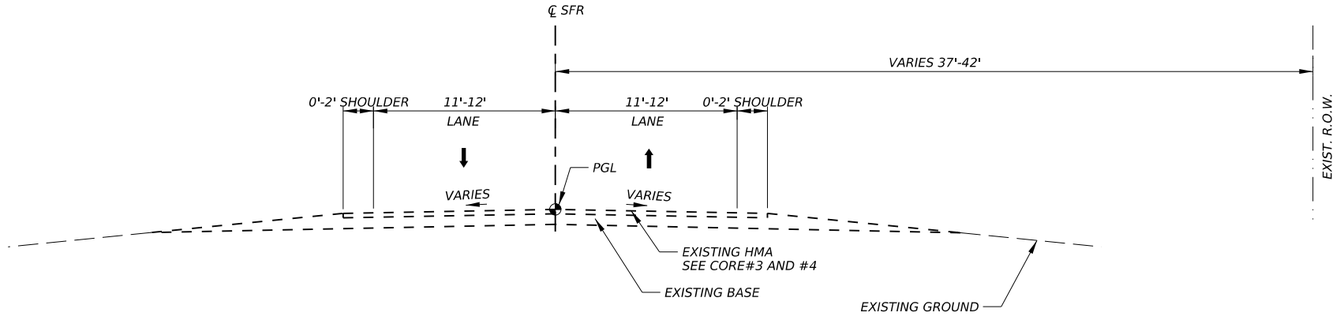
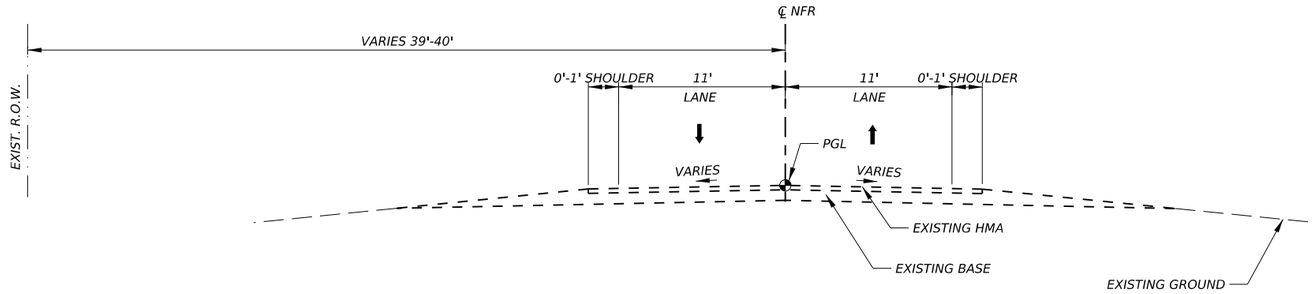


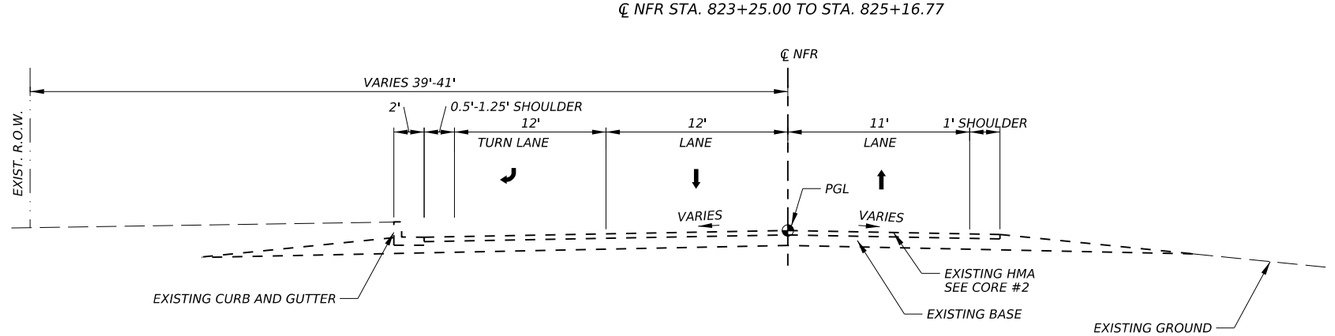
EXISTING IH 20 SOUTH FRONTAGE ROAD

℄ SFR STA. 617+73.00 TO STA. 629+20.00



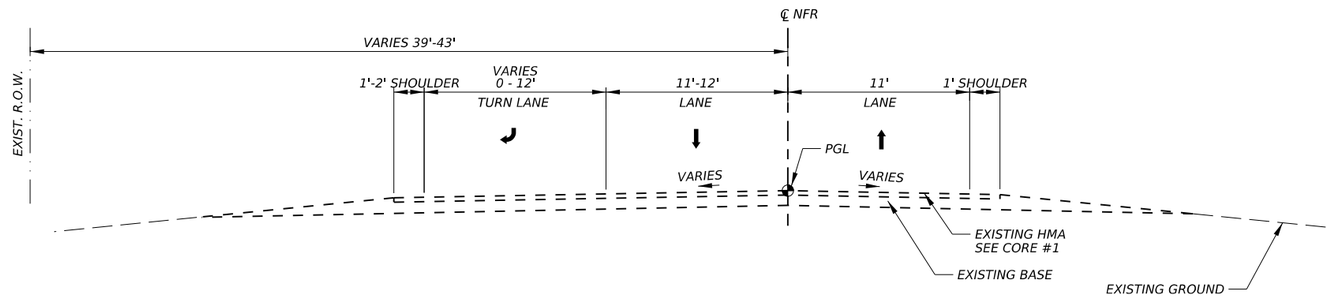
EXISTING IH 20 NORTH FRONTAGE ROAD

℄ NFR STA. 823+25.00 TO STA. 825+16.77



EXISTING IH 20 NORTH FRONTAGE ROAD

℄ NFR STA. 826+36.96 TO STA. 829+51.86



EXISTING IH 20 NORTH FRONTAGE ROAD

℄ NFR STA. 829+51.86 TO STA. 835+25.00

CORE	RDWY	HMA LAYER THICKNESS
#1	NFR	5"
#2	NFR	5"
#3	SFR	5.5"
#4	SFR	4.5"
#5	HOPK	4"
#6	HOPK	4"
#7	HOPK	6.5"

NOTES:

1. REFER TO ROADWAY PLAN SHEETS FOR LOCATION OF EXISTING PAVEMENT CORES.

2. ITEM 105-6019 CONSISTS OF REMOVAL OF BASE, ASPHALT, AND SUBGRADE TO THE 14" DEPTH.

AECOM TBPE NO.: F-3580
STATE OF TEXAS
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1/30/2024

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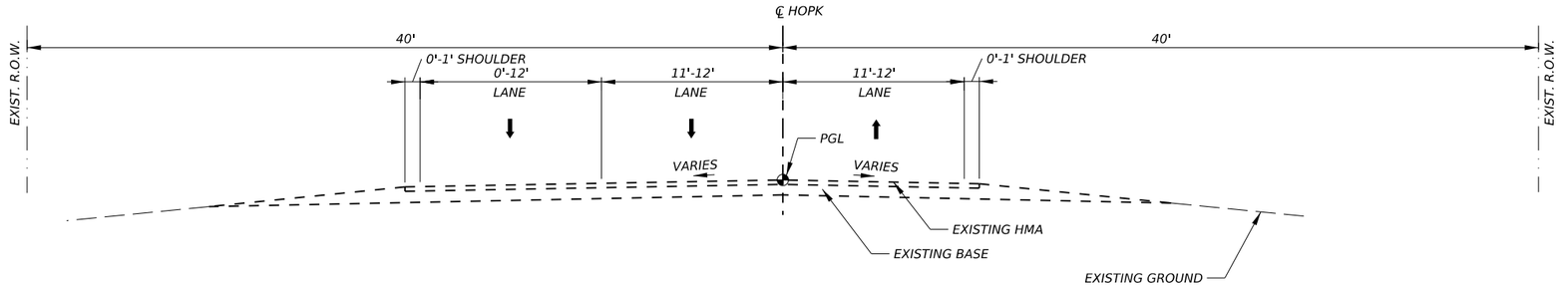
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

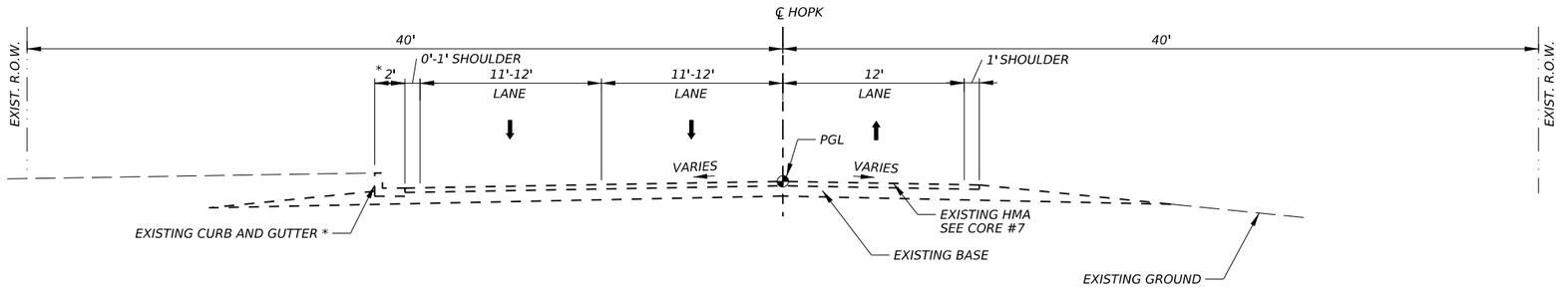
EXISTING TYPICAL SECTIONS

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		6



EXISTING HOPKINS RD

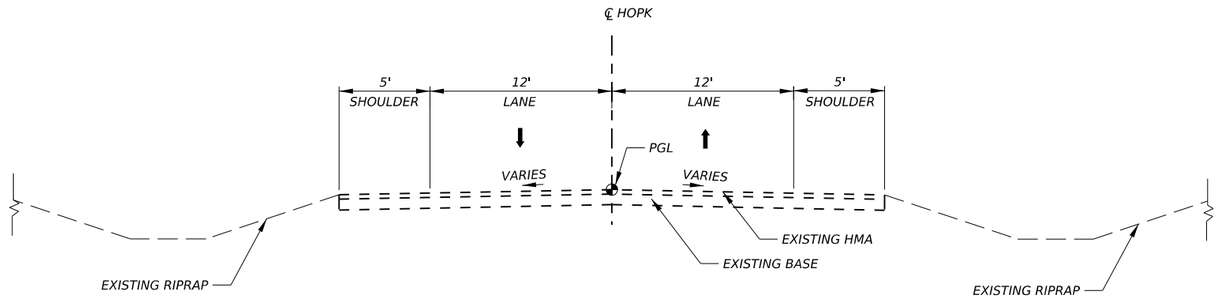
℄ HOPK STA. 2+97.00 TO STA. 4+20.75



EXISTING HOPKINS RD

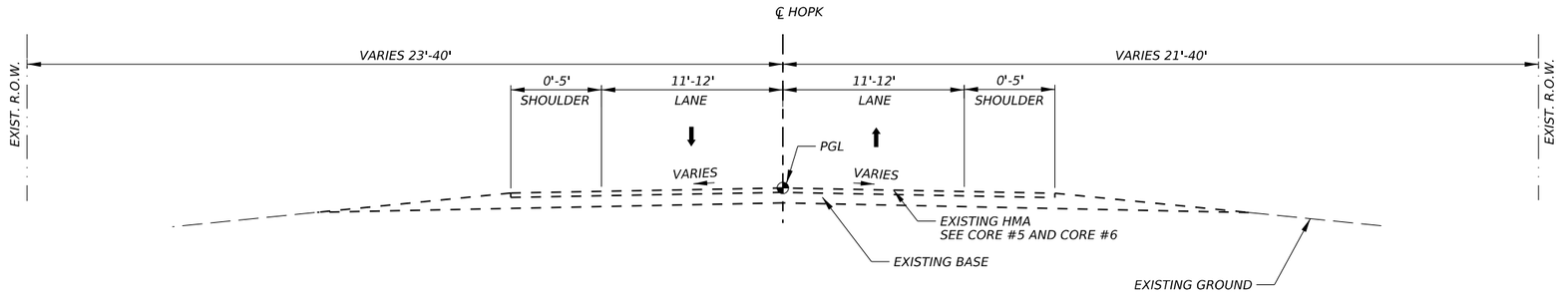
℄ HOPK STA. 4+20.75 TO STA. 8+50.19

* EXISTING CURB & GUTTER LIMITS FROM ℄ HOPK STA. 6+88.62 TO STA. 7+57.64



EXISTING HOPKINS RD

℄ HOPK STA. 9+16.49 TO STA. 10+83.54



EXISTING HOPKINS RD

℄ HOPK STA. 10+83.54 TO STA. 19+00.00

CORE	RDWY	HMA LAYER THICKNESS
#1	NFR	5"
#2	NFR	5"
#3	SFR	5.5"
#4	SFR	4.5"
#5	HOPK	4"
#6	HOPK	4"
#7	HOPK	6.5"

NOTES:

1. REFER TO ROADWAY PLAN SHEETS FOR LOCATION OF EXISTING PAVEMENT CORES.

2. ITEM 105-6019 CONSISTS OF REMOVAL OF BASE, ASPHALT, AND SUBGRADE TO THE 14" DEPTH.

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
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LICENSED
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1/30/2024

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Texas Department of Transportation

IH 20

EXISTING TYPICAL SECTIONS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		7

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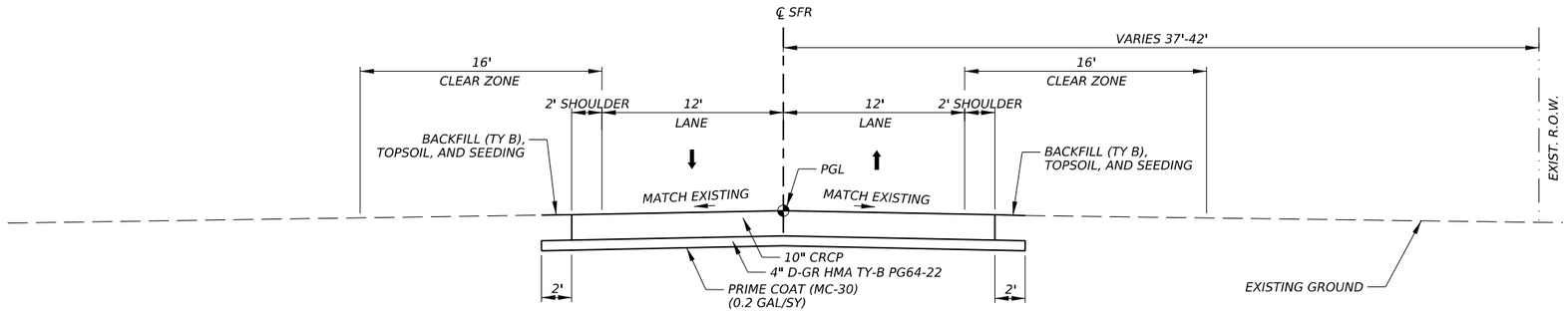
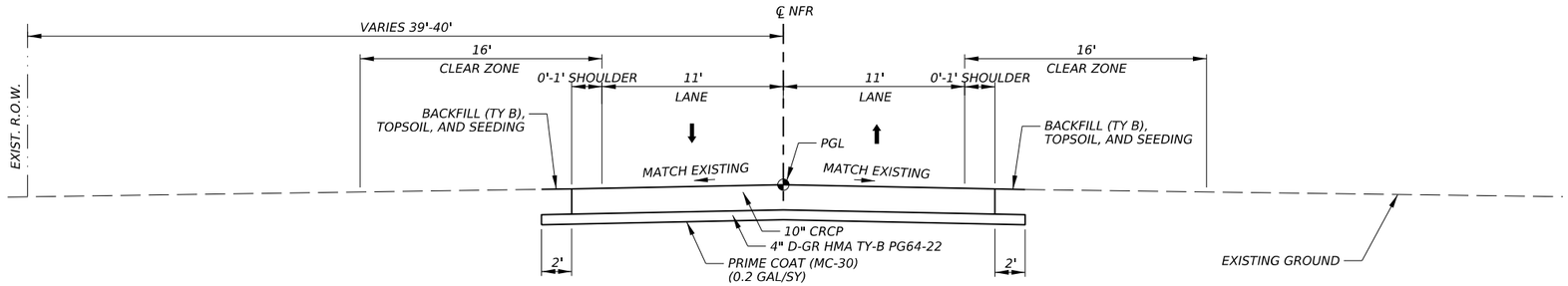


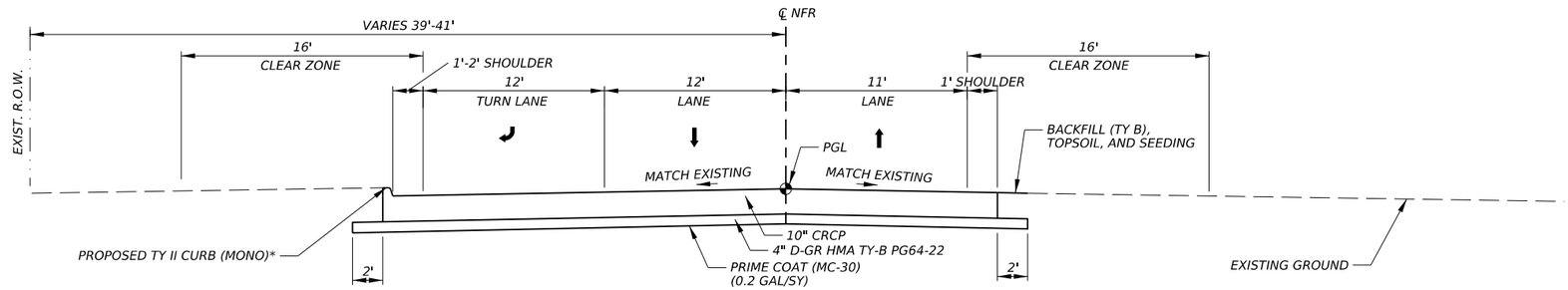
PROPOSED IH 20 SOUTH FRONTAGE ROAD (CRCP)

℄ SFR STA. 617+73.00 TO STA. 629+20.00



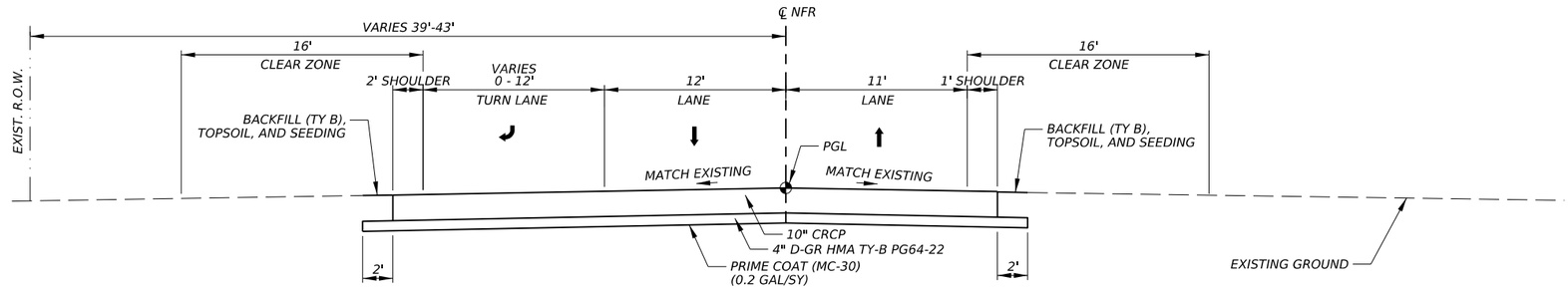
PROPOSED IH 20 NORTH FRONTAGE ROAD (CRCP)

℄ NFR STA. 823+25.00 TO STA. 826+79.96



PROPOSED IH 20 NORTH FRONTAGE ROAD (CRCP)

℄ NFR STA. 826+79.96 TO STA. 832+02.25
* PROPOSED TY II CURB (MONO) LIMITS FROM ℄ NFR STA. 826+79.96 TO STA. 829+51.86



PROPOSED IH 20 NORTH FRONTAGE ROAD (CRCP)

℄ NFR STA. 832+02.25 TO STA. 835+25.00

NOTES:

1. REFER TO ROADWAY PLAN SHEETS FOR CRCP, FAST TRK CRCP, AND SEAL COAT LIMITS.

2. PROOFROLLING SUBGRADE WILL BE SUBSIDIARY.

3. REFER TO ROADWAY PLAN SHEETS FOR PROPOSED RIPRAP LIMITS. FINAL LOCATION OF SAWCUT TO BE DETERMINED BY ENGINEER. SEE SLOTTED CURB DETAILS SHEET FOR MORE INFORMATION.

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED
PROFESSIONAL ENGINEER

1/30/2024

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13355 Noel Road, Suite 400
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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

PROPOSED TYPICAL SECTIONS

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		8

DATE: 1/30/2024 2:34:21 PM
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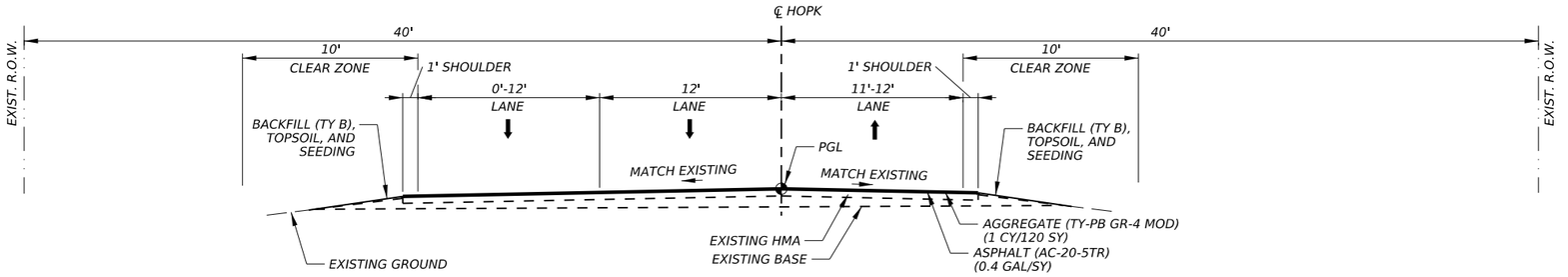
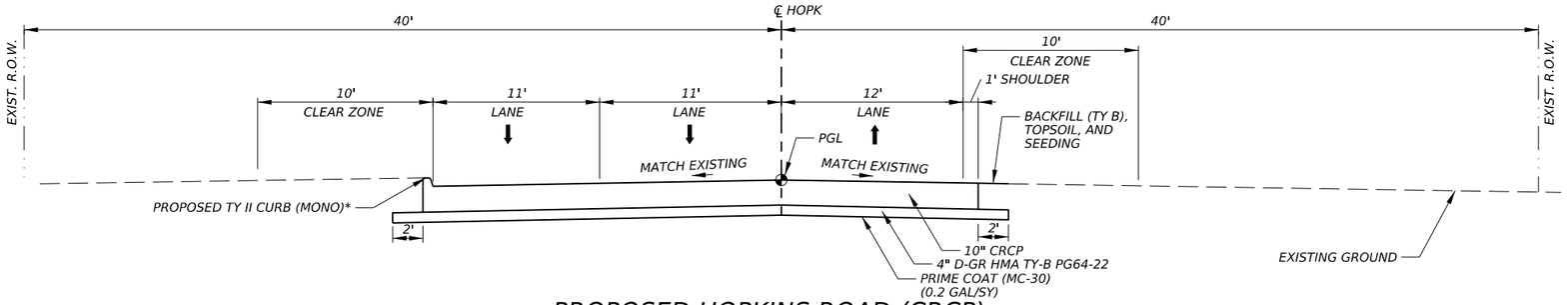


PROPOSED HOPKINS ROAD (SEAL COAT)

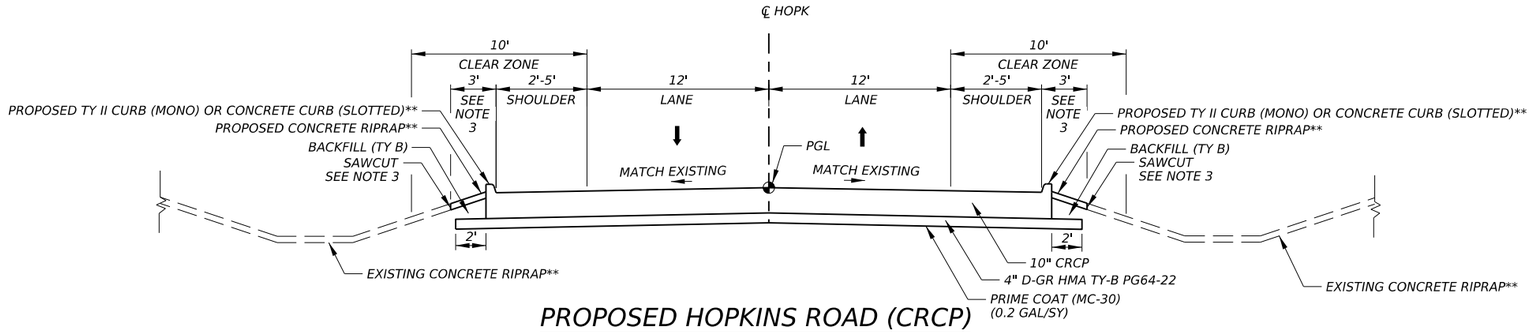
℄ HOPK STA. 2+97.00 TO STA. 6+90.00



PROPOSED HOPKINS ROAD (CRCP)

℄ HOPK STA. 6+90.00 TO STA. 9+16.49

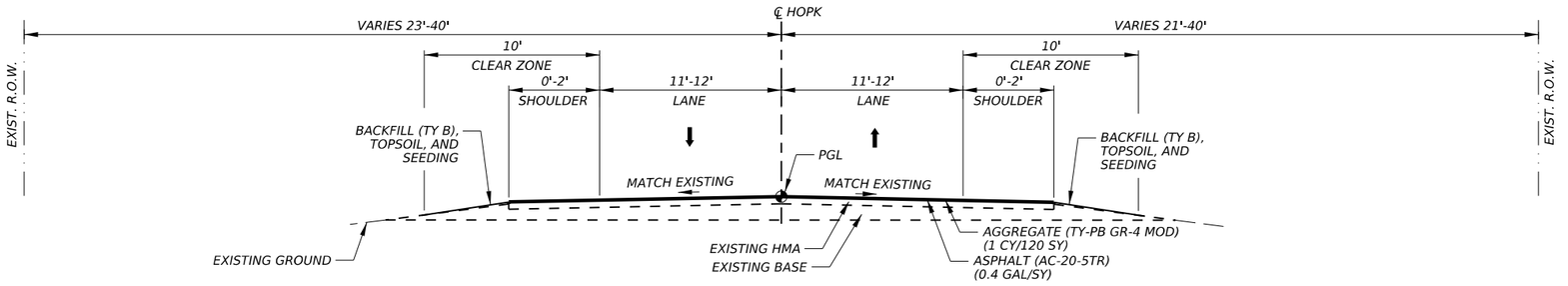
* PROPOSED TY II CURB (MONO) LIMITS FROM ℄ HOPK STA. 6+88.62 TO STA. 8+16.18



PROPOSED HOPKINS ROAD (CRCP)

℄ HOPK STA. 9+16.49 TO STA. 13+42.00

** SEE ROADWAY PLANS FOR LIMITS



PROPOSED HOPKINS ROAD (SEAL COAT)

℄ HOPK STA. 13+42.00 TO STA. 19+00.00

NOTES:

1. REFER TO ROADWAY PLAN SHEETS FOR CRCP, FAST TRK CRCP, AND SEAL COAT LIMITS.
2. PROOFROLLING SUBGRADE WILL BE SUBSIDIARY.
3. REFER TO ROADWAY PLAN SHEETS FOR PROPOSED RIPRAP LIMITS. FINAL LOCATION OF SAWCUT TO BE DETERMINED BY ENGINEER. SEE SLOTTED CURB DETAILS SHEET FOR MORE INFORMATION.

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED PROFESSIONAL ENGINEER

1/30/2024

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13355 Moel Road, Suite 400
Dallas, Texas 72540
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

PROPOSED TYPICAL SECTIONS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		9

DATE: 1/30/2024 2:34:40 PM
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DW: CK: DW: CK:

ABILENE DISTRICT GENERAL NOTES
2014 SPECIFICATIONS

General

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

Ryan R. Sayles, P.E. / Phone: 432-263-4768 / Ryan.Sayles@txdot.gov
Jeremy Arreguin, P.E. / Phone: 682-287-0804 / Jeremy.Arreguin@txdot.gov
(Nolan County only)

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

For Q&A's on Proposals navigate to
https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors
Use the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

All relevant project documentation including contract time, cross sections,etc will be posted on the districts FTP website. https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

Failure to make necessary corrections to SWP3 based on SWP3 inspections will be cause for withholding the monthly estimate until such corrections have been made.

Failure to make necessary corrections to traffic control items based on barricade inspections will be cause for withholding the monthly estimate until such corrections have been made.

Provide ingress/egress to the adjacent properties in areas under construction. Phased construction of driveways and streets shall be required to provide uninterrupted access to adjacent properties. Coordinate work with the property owners before beginning any construction in the vicinity of the drive.

Cut neat, straight lines with vertical faces along pavement edges or along joints between existing asphalt or concrete pavement and new pavement perpendicular or parallel to the direction of traffic by methods described in applicable bid items, or as directed. Provide clean edges or joints without jagged appearance or chunks broken out. This work is considered subsidiary to various bid items.

CCSJ: 0006-02-130
County: Nolan
Highway: IH 20

Environmental
Endangered and Protected Species

1. Migratory Birds
   a. **Bird nesting season is typically 15Feb through 15Sep annually.**
   b. The Contractor will avoid disturbing, destroying, removing, or relocating migratory birds and active nests found in trees, culverts, bridges, on the ground, or anywhere they are encountered.
   c. Perform all tree trimming and other vegetation clearing activities during the non-breeding season (typically 15Sep-15Feb annually). Perform any inactive nest removal and bird exclusion methods to prevent birds from establishing nests. Phasing of work during construction may be necessary to stay in compliance.
   d. When active nests are unexpectedly encountered on-site during construction, the Contractor will stop work and immediately notify the Engineer. Take measures to avoid disturbance of these birds, their occupied nest, eggs, and/or young, in accordance with the Migratory Bird Treaty Act, Texas Parks and Wildlife Code, and TxDOT policy.
   e. The Engineer will notify the Contractor when work may resume.
   f. The Contractor should be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, between 15Feb and 15Sep. The Contractor can discuss other preventative measures with the Engineer and/or District Environmental Staff.

Best Management Practices

1. Bird BMPs
   a. Not disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season.
   b. Avoiding the removal of unoccupied, inactive nests, as practicable.
   c. Preventing the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
   d. Not collecting, capturing, relocating, or transporting birds, eggs, young, or active nests without a permit.

Item 5, "Control of Work"

Use Method C for construction surveying.

All known utilities are identified in the plans, including the crossing of power lines. Use this information to identify potential issues with power poles and power lines prior to bidding.

Make necessary arrangements with utility owners regarding temporary protections such as bracing power poles, and de-energizing power lines. The Department will not reimburse the cost

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of such temporary protections to the Contractor, unless the Engineer determines that inadequate information was available at the time the project was bid. **"Call Before You Dig" "Call 811"**

Provide notification to the District Traffic Engineering Section by telephone at 325-676-6991 and by email at ABL_TrafficFix@txdot.gov when planning drilling or excavation work in areas where existing TxDOT underground utilities exist. Visual evidence of TxDOT underground utilities in the area include illumination poles, ground boxes, flashing beacons, traffic signals, etc. This notification must be provided 72 hours in advance of performing the work.

Excavation areas must be staked prior to the notification so that the underground utilities can be located in relationship to the proposed work. Preserve and document the marked utility locations to prevent unnecessary secondary notifications. Notify the Engineer of conflicts between proposed work and underground utilities.

Obtain approval from the Engineer of staked locations for illumination foundations, pull boxes, and power source prior to construction.

Item 7, "Legal Relations and Responsibilities"
The total area disturbed for this project is **0.6** acres. The disturbed area in this project, all project locations in the Contract, and the 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. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the ROW. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the ROW to the Engineer and to the government that operates a separate storm sewer system.

Provide one SWP3 Notification Board for this project. Notification Boards are to be placed at locations within the right-of-way but outside the clear zone as directed by the Engineer. Consider this work to be subsidiary to the various bid items of the contract.

No significant traffic generator events identified.

Hard hats are required at all times during construction when construction personnel are in TxDOT Right-of-Way.

Patrol vehicles must be clearly marked to correspond with the officer's agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Lights will be high intensity and visible from all angles.

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LIGHTING STANDARDS FOR HIGHWAY MAINTENANCE OR CONSTRUCTION VEHICLES AND SERVICE VEHICLES

VEHICLE LIGHTING SUMMARY

Vehicle	Color of Flashing Lights	Transportation Code
Police Vehicles	Red/Blue/White/Amber	547.305 & 547.702
Fire/EMS Vehicles	Red/Blue/White/Amber	547.305 & 547.702
Volunteer Fire/EMS	Red/Blue/White/Amber	547.305 & 547.702
School	Bus Red/White (rooftop) /Amber	547.305 & 547.701
Highway Maintenance or Construction Vehicles and Service Vehicles	Amber/Blue	547.105 & TxDOT Lighting Standards

Item 8 "Prosecution and Progress"
Each contract awarded by the Department stands on its own and as such, is separate from other contracts. A Contractor awarded multiple contracts must be capable and sufficiently staffed to concurrently process and/or execute all contracts at the same time.

Coordinate and update the work schedule with the project inspector daily. Give a minimum of 24 hours of notice to project inspector if work requiring inspection or testing is to be performed. Failure to do so may cause that work to be delayed or postponed if TxDOT personnel are not available. Work performed without suitable inspection, as determined by the Engineer, may be ordered removed and replaced at Contractor's expense.

This project includes a delayed start provision of 60 days for Contractor Mobilization.

Working days will be charged in accordance with Section 8.3.1.1., "Five-Day Workweek.

Prepare the progress schedule as a Critical Path Method (CPM).

A **Disincentive for Failure to Substantially Complete Work on Time** will apply to this contract in accordance with section 8.9.2 of special provision 008-006 using a daily road-user cost (RUC) of $13,815.00. Failure to Substantially Complete Work for Phase 1, open to traffic, as described in the Traffic Control Plans within 10 working days will result in the assessment of disincentives.

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Item 9, "Measurement and Payment"
The progress payment period shall end on the 25th of each month, unless directed by the Area Office Engineer. Material on Hand (MOH) is due two business days before estimate cut off.

Item 134, "Backfilling"
Backfill pavement edges no later than 2 weeks after the construction of the final surface.

Item 316, "Surface Treatments"
Cover or protect any sealed expansion joints or rail on bridges and any railroad tracks encountered on this project, as directed by the Engineer. Clean any of these items not properly protected. This work will not be paid for directly but will be considered subsidiary to Item 316.

AGGREGATES
AGGR (TY-PB GR-4 (MOD) SAC –B) – 1 CY/120 SY

The rate shown is for estimating purposes and the engineer can dictate higher or lower rates based on roadway conditions.

Unless authorized in writing by the Engineer, the open season for the application of asphalt is May 1 to August 31.

Furnish a minimum of six (6) light or four (4) medium pneumatic-tire rollers in accordance with item 210, "Rolling".

Furnish and use variable rate nozzles when directed by the Engineer. The asphalt placement rate outside the wheel path will be 20% to 30% greater than the rate inside the wheel path unless otherwise approved.

Movement of construction equipment and haul trucks will be prohibited from crossing the median unless specifically authorized by the Engineer. Ingress and egress to main lanes will be at entrance and exit ramps.

After each roadway is completed, all paper joints shall be removed when each roadway is completed or as directed by the Engineer.

Remove excess aggregate from the curb and gutter sections, bridge rail, intersections, and other areas as directed. After final rolling, remove any loose aggregate from the paved surface. This work is subsidiary to the various bid items.

Item 502, "Barricades, Signs and Traffic Handling"
Mobile traffic control in accordance with TPC 3 series will be required for placement of short duration, short term, intermediate term, and long-term traffic control.

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Provide the Engineer with written notification seven (7) days in advance of major traffic changes. A major traffic change is defined as the temporary (greater than one day) or permanent relocation of traffic lanes typically in an urban setting. The notice will, at a minimum, include the expected date, time and scope of the traffic change. The Department will utilize the information provided to inform the traveling public of the changes. Failure to provide advance notice, or to provide accurate information, will result in delaying the work until such time that the public has been notified.
Additional signs, barricades and traffic handling may be necessary to complete the work shown herein and will be provided by the contractor as required and will be considered subsidiary to this item.

Provide separate attenuators for each work area within a common lane closure as approved or directed by the Engineer.
In sections where traffic is restricted to one lane, two-way traffic, flaggers will be stationed at each end of that section with two-way communication devices and a pilot car will control operations.

Pilot car is subsidiary to item 502.

Relocate existing roadside signs to temporary supports as approved by the engineer.

All safety appurtenances such as signs, delineators, object markers and route markers will be in place prior to opening each phase of the construction to traffic, unless otherwise directed.

During construction on all underpass structures erect and maintain accurate clearance signs in accordance with the "Texas Manual on Uniform Traffic Control Device for Streets and Highways". The mounting method for the temporary clearance sign is subject to approval of the Engineer. Temporary clearance signs are considered subsidiary to the various bid items.
Movement of construction equipment and haul trucks will be prohibited from crossing the median unless specifically authorized by the Engineer. Ingress and egress to main lanes will be at entrance and exit ramps.

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

The Contractor's person responsible for TCP compliance must be available by local telephone and have a response time within 45 minutes.

Work will not be allowed on both sides of the roadbed at the same time.

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Equip all work vehicles within 30 feet of the traveled way with a functioning amber strobe light or rotating beacon visible from all directions.

Repair barricades within the timeline shown on the barricade inspection report. Failure to comply will cease all work until barricades are repaired to the satisfaction of the Department. Replace all damaged traffic control devices immediately. Remove any damaged traffic control devices from the project within 24 hours.

Conflicting guide signs shall be covered as approved by the Engineer. This work shall be subsidiary to Item 502.

Reduced regulatory speed limit signs should only be posted in the vicinity of ongoing work activity as shown on BC (3)-21 and not throughout the entire project. Removing, relocating or covering speed limit signs shall be considered subsidiary to item 502.

Item 504, "Field Office for Laboratory"
Field Laboratory:
Furnish a "Type D" structure for the asphalt mix control laboratory for the Engineer's exclusive use. In addition to the requirements of Item 504, furniture and equipment to be furnished by the Contractor shall include*:*

- eye wash station
- first-aid kit
- two fire extinguishers
- Provide internet connectivity for use by TxDOT lab testing personnel at all laboratory structures on this project.

Item 530, "Intersections, Driveways, and Turnouts"
Excavation and embankment necessary to construct the intersections and driveways according to the details shown elsewhere shall be considered subsidiary to this item.

Item 662, "Work Zone Pavement Markings"
Place work zone pavement markings (flexible tabs) prior to the seal coat operation.

Dispose of tabs and paper in an approved trash receptacle. (Reference Standard **SW3P**, waste material)

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Item 666, "Retro reflectorized Pavement Markings"
All longitudinal pavement markings (including profile pavement markings) must meet minimum retro reflectivity requirements.

Establish a true and correct alignment with a method approved by the Engineer. This work will be considered subsidiary.

Contractor is responsible for re-establishing location and alignment for new pavement markings matching pavement marking alignment prior to construction activities. This work will be considered subsidiary.

Item 672, "Raised Pavement Markers"
Provide a complete system of raised pavement markers at locations indicated on the plans and as directed by the engineer. The plans are intended to show typical conditions, which can be extended to similar conditions throughout this project as approved or directed.

Bituminous adhesive shall be used on this project.

Item 677, "Eliminating Existing Pavement Markings and Markers"
Remove the existing raised pavement markings (RPMs) and profile pavement markings as the work progresses, or as directed by the Engineer. Removal methods shall be approved by the Engineer. Properly dispose of materials removed. Removal of existing profile pavement markings will be paid for directly. Removal of RPMs will not be paid for directly but will be subsidiary to the pertinent bid items.

Item 3076, "Dense-Graded Hot-Mix Asphalt"
The Engineer reserves the right to test all sources even if the source is listed in the Bituminous Source Rated Quality Catalog.

Provide the testing lab samples to calibrate the ignition oven no later than five **(5)** working days prior to mix design verification.

Paving operations will not be allowed to begin until TxDOT has tested and obtained passing Hamburg results on the trial batch.

A maximum of 0.50% anti-stripping agent will be allowed for each specified mix type.

Dilution of tack coat is not allowed.

Do not exceed a laydown width of 16' per pass.

Substitute Binders will not be allowed unless RAP is used in the production of the mixture.
RAS will not be allowed in surface mixes.
A warm mix additive will be required for hotmix hauls over 50 miles.

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Unless otherwise directed by the engineer, a warm mix additive will be required when paving during November 1st through March 15th.

The use of a tapered longitudinal joint will be required for pavement thicker than 2 inches. Provide PG 64-22 tack coat at a rate of 0.10 gal/sy.

The Contractor will be required to tack 100% of the surfaces with uniform coverage prior to the subsequent lift. The type and grade of tack will be approved by the Engineer prior to use.

Tack all vertical joints unless otherwise directed.

Item 6185, "Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)"
Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA) will not be considered a major item of work on this project.

TMA,s will only be paid while workers are present or to protect a blunt object.

The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project. The Contractor must get approval from the Engineer for any changes in the number of TMA as shown in the plans.

If a TMA is used for both mobile and stationary traffic control on the same day, it will be paid for as stationary for that day.

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BASIS OF ESTIMATE FOR STATIONARY TMAs				
		TMA (Stationary)		
Phase	Standard	Required	Additional	TOTAL
PH1	-	0		0
PH2	TCP(2-3)-23	1	1	2
PH3	-	0		0
PH4	TCP(2-3)-23	1	1	2
PH5	TCP(2-3)-23	1		1
PH6	TCP(2-3)-23	1		1
PH7S1	TCP(SC-1)-22	0		0
PH7S2	TCP(SC-1)-22	0		0
Basis of Estimate for Mobile TMAs				
		TMA (Mobile)		
Phase	Standard	Required	Additional	TOTAL
PH1	-	0		0
PH2	TCP(3-1)-13	4		4
PH3	-	0		0
PH4	TCP(3-1)-13	4		4
PH5	TCP(3-1)-13	4		4
PH6	TCP(3-1)-13	4		4
PH7S1	TCP(SC-1)-22	0		0
PH7S2	TCP(SC-1)-22	0		0

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Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0006-02-130 **DISTRICT** Abilene **COUNTY** Nolan
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			CONTROL SECTION JOB		**0006-02-130**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00194636**		
			COUNTY		**Nolan**		
			HIGHWAY		**IH 20**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	104-6009	REMOVING CONC (RIPRAP)	SY	142.000		142.000	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	650.000		650.000	
	104-6022	REMOVING CONC (CURB AND GUTTER)	LF	539.000		539.000	
	105-6019	REMOVING STAB BASE & ASPH PAV(14")	SY	10,925.000		10,925.000	
	134-6002	BACKFILL (TY B)	STA	37.000		37.000	
	310-6009	PRIME COAT (MC-30)	GAL	2,434.000		2,434.000	
	316-6017	ASPH (AC-20-5TR)	GAL	1,264.000		1,264.000	
	316-6519	AGGR (TY-PB GR-4 MOD)	CY	27.000		27.000	
	360-6004	CONC PVMT (CONT REINF - CRCP) (10")	SY	7,000.000		7,000.000	
	360-6066	CONC PVMT (CONT REINF)(FAST TRK)(10")	SY	3,940.000		3,940.000	
	432-6002	RIPRAP (CONC)(5 IN)	CY	17.000		17.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000		4.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	444.000		444.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	444.000		444.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	619.000		619.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	619.000		619.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	563.000		563.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	563.000		563.000	
	508-6001	CONSTRUCTING DETOURS	SY	34.000		34.000	
	529-6002	CONC CURB (TY II)	LF	548.000		548.000	
	529-6012	CONC CURB (SLOTTED)	LF	218.000		218.000	
	530-6004	DRIVEWAYS (CONC)	SY	796.000		796.000	
	662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	12,715.000		12,715.000	
	662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	166.000		166.000	
	662-6080	WK ZN PAV MRK REMOV (W)(ARROW)	EA	6.000		6.000	
	662-6091	WK ZN PAV MRK REMOV (W)18"(YLD TRI)	EA	4.000		4.000	
	662-6098	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF	13,643.000		13,643.000	
	666-6230	PAVEMENT SEALER 24"	LF	109.000		109.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	2.000		2.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	2.000		2.000	
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	4.000		4.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	109.000		109.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	2.000		2.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	2.000		2.000	
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA	4.000		4.000	
	672-6007	REFL PAV MRKR TY I-C	EA	19.000		19.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0006-02-130 **DISTRICT** Abilene **COUNTY** Nolan
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							TOTAL EST.	TOTAL FINAL
			CONTROL SECTION JOB		**0006-02-130**			
			PROJECT ID		**A00194636**			
			COUNTY		**Nolan**			
			HIGHWAY		**IH 20**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL		
	672-6009	REFL PAV MRKR TY II-A-A		EA	105.000		105.000	
	677-6002	ELIM EXT PAV MRK & MRKS (6")		LF	2,275.000		2,275.000	
	678-6002	PAV SURF PREP FOR MRK (6")		LF	12,474.000		12,474.000	
	678-6004	PAV SURF PREP FOR MRK (8")		LF	544.000		544.000	
	678-6008	PAV SURF PREP FOR MRK (24")		LF	109.000		109.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)		EA	2.000		2.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)		EA	2.000		2.000	
	678-6023	PAV SURF PREP FOR MRK (36")(YLD TRI)		EA	4.000		4.000	
	3076-6001	D-GR HMA TY-B PG64-22		TON	2,677.000		2,677.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN		EA	6.000		6.000	
	6038-6004	MULTIPOLYMER PAV MRK (W)(6")(SLD)		LF	5,358.000		5,358.000	
	6038-6007	MULTIPOLYMER PAV MRK (W)(8")(SLD)		LF	174.000		174.000	
	6038-6009	MULTIPOLYMER PAV MRK (W)(8")(DOT)		LF	370.000		370.000	
	6038-6017	MULTIPOLYMER PAV MRK (Y)(6")(SLD)		LF	7,116.000		7,116.000	
	6185-6002	TMA (STATIONARY)		DAY	63.000		63.000	
	6185-6005	TMA (MOBILE OPERATION)		DAY	156.000		156.000	
	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	

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FILE: pw://aecom-na-pw.bentley.com:AECOM USA Texas/Documents/60706605-IH 20 at Hopkins Rd Pavement Rehab/900-CAD GIS/910 CAD/03 GENERAL/Sheets/IH20 AEC QTY SUM 001.dgn

SUMMARY OF PAVEMENT MARKING ITEMS

LOCATION	666 6230	666 6231	666 6232	666 6243	668 6076	668 6077	668 6085	668 6092	672 6007	672 6009	678 6002	678 6004	678 6008	678 6009	678 6016	678 6023	6038 6004	6038 6007	6038 6009	6038 6017
	PAVEMENT SEALER 24"	PAVEMENT SEALER (ARROW)	PAVEMENT SEALER (WORD)	PAVEMENT SEALER (YLD TRI)	PREFAB PAV MRK TY C (W) (24") (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (WORD)	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	PAV SURF PREP FOR MRK (6")	PAV SURF PREP FOR MRK (8")	PAV SURF PREP FOR MRK (24")	PAV SURF PREP FOR MRK (ARROW)	PAV SURF PREP FOR MRK (WORD)	PAV SURF PREP FOR MRK (36")(YLD TRI)	MULTIPOLYMER PAV MRK (W)(6")(SLD)	MULTIPOLYMER PAV MRK (W)(8")(SLD)	MULTIPOLYMER PAV MRK (W)(8")(DOT)	MULTIPOLYMER PAV MRK (Y)(6")(SLD)
	LF	EA	EA	EA	LF	EA	EA	EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF
SHEET 1 OF 5	65	2	2	0	65	2	2	0	17	28	2942	544	65	2	2	0	1152	174	370	1790
SHEET 2 OF 5	0	0	0	4	0	0	0	4	2	10	1299	0	0	0	0	4	649	0	0	650
SHEET 3 OF 5	32	0	0	0	32	0	0	0	0	31	3645	0	32	0	0	0	1513	0	0	2132
SHEET 4 OF 5	0	0	0	0	0	0	0	0	0	17	2117	0	0	0	0	0	951	0	0	1166
SHEET 5 OF 5	12	0	0	0	12	0	0	0	0	19	2471	0	12	0	0	0	1093	0	0	1378
PROJECT TOTALS	109	2	2	4	109	2	2	4	19	105	12474	544	109	2	2	4	5358	174	370	7116

SUMMARY OF REMOVAL ITEMS

LOCATION	104 6009	104 6017	104 6022	* 105 6019
	REMOVING CONC (RIPRAP)	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB AND GUTTER)	REMOVING STAB BASE & ASPH PAV(14")
	SY	SY	LF	SY
SHEET 1 OF 3	142	445	343	7407
SHEET 2 OF 3	0	122	196	3394
SHEET 3 OF 3	0	83	0	124
PROJECT TOTALS	142	650	539	10925

*NOTE: ITEM 105-6019 CONSISTS OF REMOVAL OF BASE, ASPHALT, AND SUBGRADE TO THE 14" DEPTH.

SUMMARY OF ROADWAY ITEMS

LOCATION	134 6002	360 6004	360 6066	432 6002	529 6002	529 6012	530 6004
	BACKFILL (TY B)	CONC PVMT (CONT REINF - CRCP) (10")	CONC PVMT (CONT REINF)(FAST TRK)(10")	RIPRAP (CONC)(5 IN)	CONC CURB (TY II)	CONC CURB (SLOTTED)	DRIVEWAYS (CONC)
	STA	SY	SY	CY	LF	LF	SY
SHEET 1 OF 5	11	2680	1717	5	432	0	203
SHEET 2 OF 5	3	1227	0	0	0	0	0
SHEET 3 OF 5	12	3093	1017	0	0	0	426
SHEET 4 OF 5	4	0	747	12	116	218	0
SHEET 5 OF 5	7	0	459	0	0	0	167
PROJECT TOTALS	37	7000	3940	17	548	218	796

SUMMARY OF ASPHALT SURFACE AREAS

LOCATION	LENGTH	WIDENING	310	WIDENING	3076	1ST COURSE SURF TRT	316	316
		WIDTH	PRIME COAT (MC-30)	WIDTH	D-GR HMA TY-B PG64-22	WIDTH	AGGR (TY-PB GR-4 MOD)	ASPH (AC-20-5 TR)
	LF	LF	SY	LF	SY	LF	SY	SY
NFR								
STA 823+25 TO STA 825+14	189	26.0	546	26.0	546			
STA 825+14 TO STA 825+71	57	44.2 (AVG)	280	44.2 (AVG)	280			
STA 825+71 TO STA 826+38	67	83.6 (AVG)	622	83.6 (AVG)	622			
STA 826+38 TO STA 826+80	42	57.5 (AVG)	268	57.5 (AVG)	268			
STA 826+80 TO STA 827+50	70	44.7 (AVG)	348	44.7 (AVG)	348			
STA 827+50 TO STA 829+50	200	41.7 (AVG)	927	41.7 (AVG)	927			
STA 829+50 TO STA 832+57	307	41.9 (AVG)	1429	41.9 (AVG)	1429			
STA 832+57 TO STA 833+52	95	42.5 (AVG)	449	42.5 (AVG)	449			
STA 833+52 TO STA 834+42	90	36.3 (AVG)	363	36.3 (AVG)	363			
STA 834+42 TO STA 835+25	83	31.7 (AVG)	292	31.7 (AVG)	292			
SFR								
STA 617+73 TO STA 625+30	757	31.8 (AVG)	2675	31.8 (AVG)	2675			
STA 625+30 TO STA 625+81	51	41.1 (AVG)	233	41.1 (AVG)	233			
STA 625+81 TO STA 626+43	62	66.8 (AVG)	460	66.8 (AVG)	460			
STA 626+43 TO STA 626+95	52	43.3 (AVG)	250	43.3 (AVG)	250			
STA 626+95 TO STA 629+20	225	32.0	800	32.0	800			
HOPK								
STA 2+97 TO STA 4+40	143					30.3 (AVG)	481	481
STA 4+40 TO STA 5+83	143					38.5 (AVG)	612	612
STA 5+83 TO STA 6+90	107					34.2 (AVG)	407	407
STA 6+90 TO STA 7+57	67	39.9 (AVG)	297	39.9 (AVG)	297			
STA 7+57 TO STA 8+00	43	50.2 (AVG)	240	50.2 (AVG)	240			
STA 8+84 TO STA 9+16	32	46.6 (AVG)	166	46.6 (AVG)	166			
STA 9+16 TO STA 10+83	167	39.3	729	39.3	729			
STA 10+83 TO STA 11+23	40	47.0 (AVG)	209	47.0 (AVG)	209			
STA 11+90 TO STA 12+35	45	41.2 (AVG)	206	41.2 (AVG)	206			
STA 12+35 TO STA 13+42	107	32.0	380	32.0	380			
STA 13+42 TO STA 16+34	292					28.0	908	908
STA 16+34 TO STA 18+40	206					26.0	595	595
STA 18+40 TO STA 19+00	60					23.4 (AVG)	156	156
PROJECT TOTALS	3799		12169		12169		3159	3159

BASIS OF ESTIMATE

ITEM	DESCRIPTION	DEPTH	RATES	LOCATION	AREA (SY)	QUANTITY	UNIT
3106009	PRIME COAT (MC-30)	N/A	0.2 GAL/SY	ROADWAY PLAN	12169	2434	GAL
3166017	ASPH (AC-20-5TR)	N/A	0.4 GAL/SY	ROADWAY PLAN	3159	1264	GAL
3166519	AGGR (TY-PB GR-4 MOD)	N/A	1 CY/120 SY	ROADWAY PLAN	3159	27	CY
30766001	D-GR HMA TY-B PG64-22	4 IN	110 LBS/SY/IN	ROADWAY PLAN	12169	2677	TON

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IH 20

QUANTITY SUMMARY

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		17

CK:
DW:
CK:
DW:

DATE: 1/30/2024 3:53:46 PM
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SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION	508 6001	662 6067	662 6075	662 6080	662 6091	662 6098	677 6002	6001 6002	6185 6002	6185 6005
	CONSTRUCTING DETOURS	WK ZN PAV MRK REMOV (W)6"(SLD)	WK ZN PAV MRK REMOV (W)24"(SLD)	WK ZN PAV MRK REMOV (W)(ARROW)	WK ZN PAV MRK REMOV (W)18"(YLD TRI)	WK ZN PAV MRK REMOV (Y)6"(SLD)	ELIM EXT PAV MRK & MRKS (6")	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	SY	LF	LF	EA	EA	LF	LF	EA	DAY	DAY
PH1	34	0	0	0	0	0	0	6	0	0
PH2	0	1211	55	4	0	440	173	0	18	36
PH3	0	1681	0	0	4	2766	0	0	0	0
PH4	0	3726	52	0	0	5122	2102	0	30	60
PH5	0	4207	35	0	0	4351	0	0	9	36
PH6	0	1006	0	0	0	605	0	0	6	24
PH7S1	0	654	24	2	0	359	0	0	0	0
PH7S2	0	230	0	0	0	0	0	0	0	0
PROJECT TOTALS	34	12715	166	6	4	13643	2275	6	63	156

SUMMARY OF EROSION CONTROL ITEMS

LOCATION	506 6020	506 6024	506 6038	506 6039	506 6041	506 6043
	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
	SY	SY	LF	LF	LF	LF
SHEET 1 OF 3	222	222	0	0	465	465
SHEET 2 OF 3	0	0	0	0	73	73
SHEET 3 OF 3	222	222	619	619	25	25
PROJECT TOTALS	444	444	619	619	563	563

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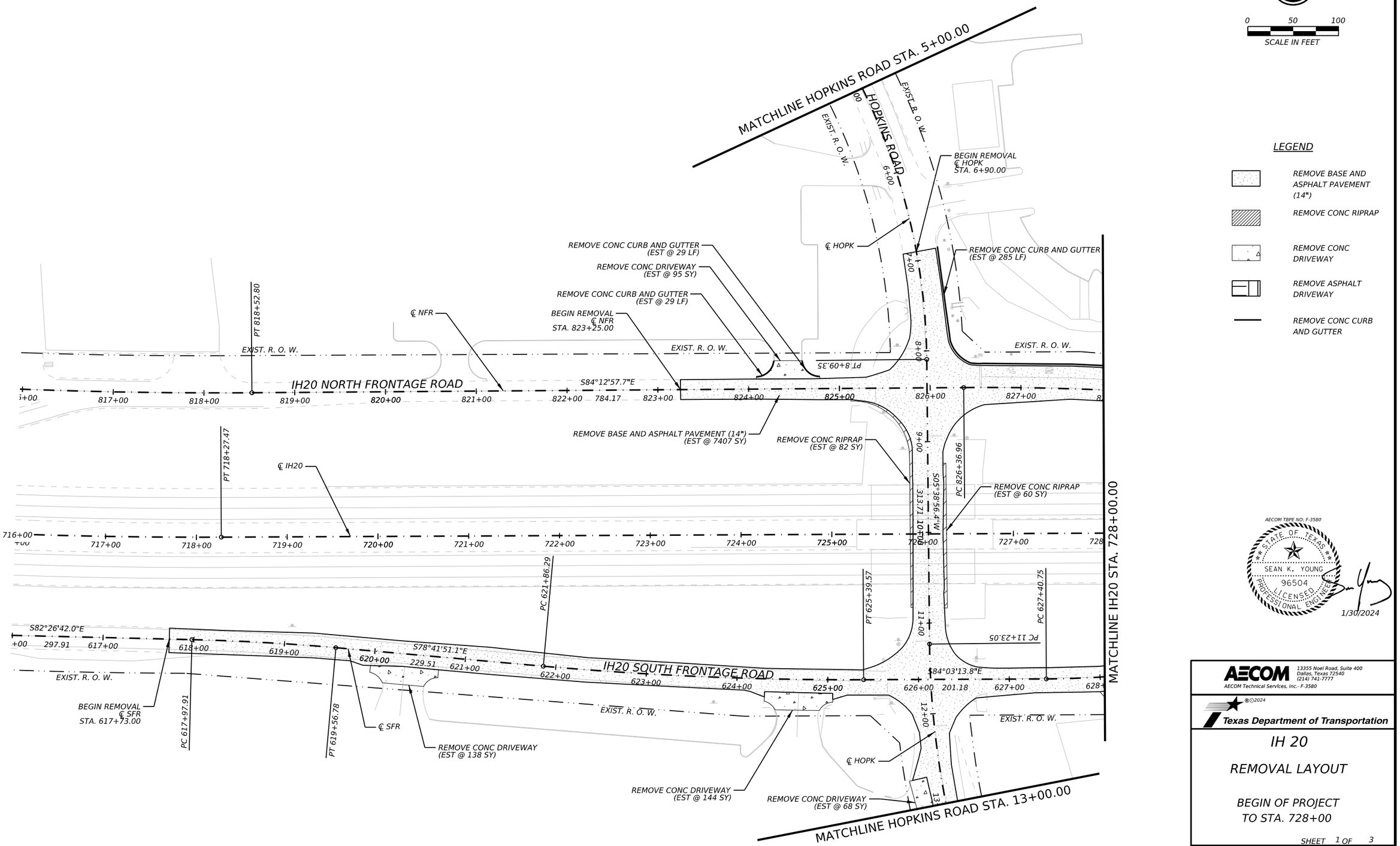
IH 20

QUANTITY SUMMARY

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		18



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IH 20

REMOVAL LAYOUT

BEGIN OF PROJECT
TO STA. 728+00

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		19

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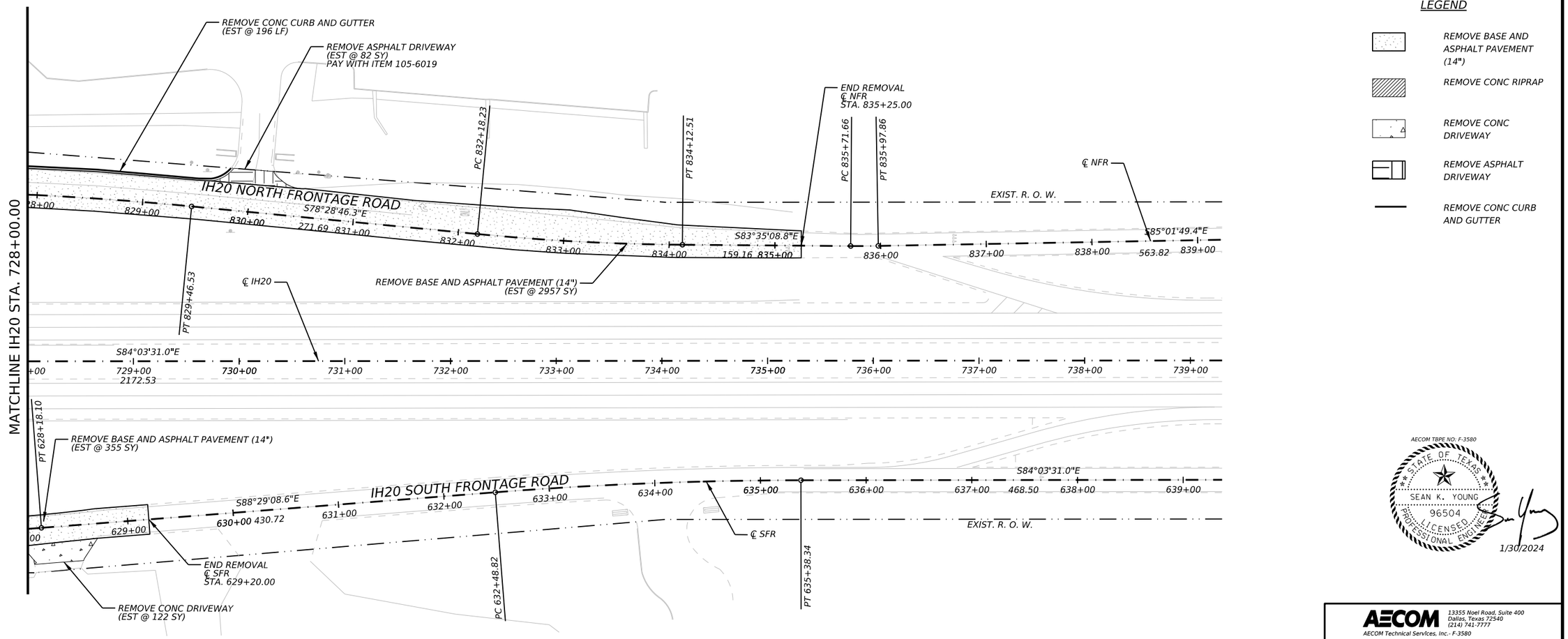

0 50 100

SCALE IN FEET

LEGEND

- REMOVE BASE AND ASPHALT PAVEMENT (14")
- REMOVE CONC RIPRAP
- REMOVE CONC DRIVEWAY
- REMOVE ASPHALT DRIVEWAY
- REMOVE CONC CURB AND GUTTER

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IH 20

REMOVAL LAYOUT

STA. 728+00 TO
END OF PROJECT

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		20

DATE: 1/30/2024 2:35:23 PM
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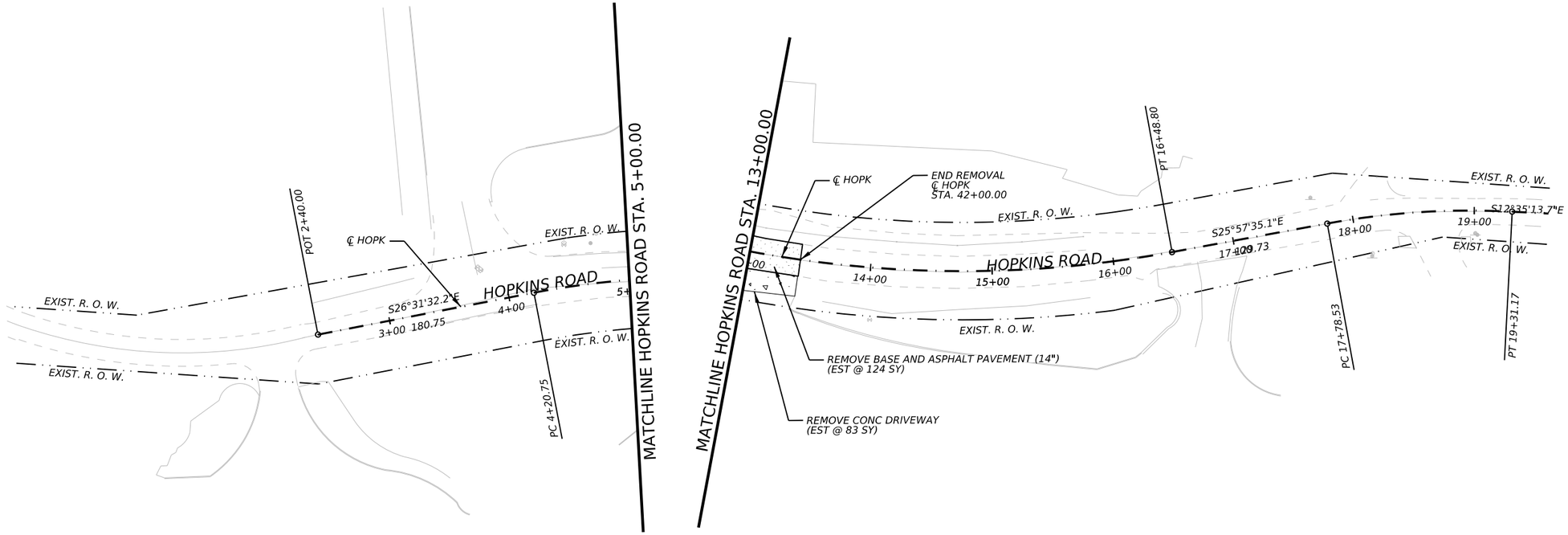

0 50 100

SCALE IN FEET

LEGEND

- REMOVE BASE AND ASPHALT PAVEMENT (14")
- REMOVE CONC RIPRAP
- REMOVE CONC DRIVEWAY
- REMOVE ASPHALT DRIVEWAY
- REMOVE CONC CURB AND GUTTER

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IH 20

REMOVAL LAYOUT

HOPKINS RD

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		21

DATE: 1/30/2024 2:35:24 PM
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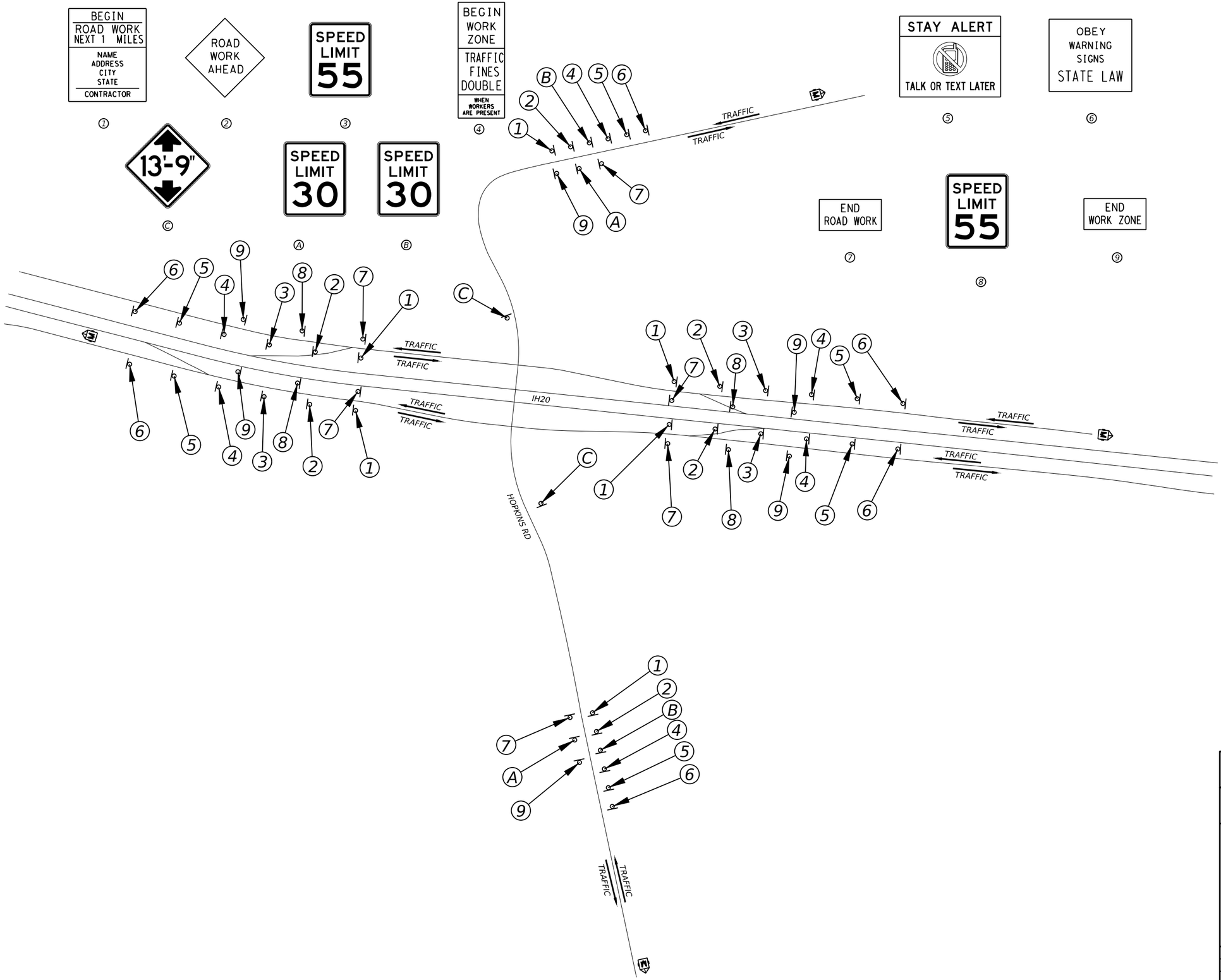

NOT TO SCALE

TRAFFIC CONTROL PLAN LEGEND

SIGN

PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

NOTE:

1. USE TYPICAL LOCATION OF ALL CROSS ROAD SIGNS. SEE BC(2) - 21.

2. PCMS LOCATIONS DEPICTED FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL LOCATIONS TO BE PROVIDED AND APPROVED BY TXDOT. MESSAGES FOR DISPLAY ON PCMS SHALL BE PROVIDED AND APPROVED BY TXDOT. CONTRACTOR SHALL CHANGE MESSAGES OR MOVE PCMS LOCATIONS DURING PROJECT DURATION IF DIRECTED BY TXDOT.

3. SEE DETAIL BC(2) - 21 FOR SIGN SPACING.

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IH 20

ADVANCE WARNING

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		22

DATE: 1/30/2024 2:35:40 PM
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DW: DW: CK: CK:

1. THIS IS A SUGGESTED TRAFFIC CONTROL PLAN (TCP). THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR RECOMMENDED MODIFICATIONS BY THE CONTRACTOR SHALL INCLUDE ANY COST, ETC. IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A LICENSED PROFESSIONAL ENGINEER WITH THE STATE OF TEXAS FOR INCLUSION AS A CHANGE ORDER. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE/SEQUENCE UNTIL WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER. IF AT ANY TIME DURING CONSTRUCTION THE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE AND COMFORTABLE MOVEMENT, THE CONTRACTOR WILL IMMEDIATELY CHANGE THEIR OPERATION TO CORRECT THE UNSATISFACTORY CONDITION.

2. DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC. DO NOT STORE EQUIPMENT OUTSIDE DESIGNATED RIGHT OF WAY WITHOUT THE PERMISSION GRANTED FIRST BY PROPERTY OWNER.

3. CONTRACTOR IS TO MAINTAIN POSITIVE DRAINAGE AT ALL TIMES.

4. ALL SEQUENCE OF WORK ON THIS PROJECT SHALL BE COORDINATED TO COINCIDE WITH ANY PROJECTS WITHIN OR ADJACENT TO THIS PROJECT.

5. ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES. AT LEAST ONE DRIVEWAY PER BUSINESS MUST REMAIN ACCESSIBLE AT ALL TIMES.

6. ALL TRAFFIC SHIFTS, DETOURS, HORIZONTAL TRAFFIC MOVEMENTS, LANE CLOSURES, ETC. ARE DIRECTLY RELATED TO THE SEQUENCE OF WORK.

7. PROVIDE THE ENGINEER WITH WRITTEN NOTIFICATION SEVEN (7) DAYS IN ADVANCE OF MAJOR TRAFFIC CHANGES.

8. IMPLEMENT ALL REQUIRED EROSION CONTROL MEASURES AS SHOWN IN THE PLANS DURING VARIOUS STAGES OF CONSTRUCTION

9. ADDITIONAL SIGNS, BARRICADES AND CHANNELIZING DEVICES MAY BE REQUIRED TO MAINTAIN TRAFFIC DURING CONSTRUCTION, AS SHOWN ON TCP STANDARDS. ADDITIONAL SIGNS, BARRICADES, ETC. (IF ANY), WILL BE SUBSIDIARY TO ITEMS 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING".

10. THE CONTRACTOR SHALL MAINTAIN EXISTING PROFILE GRADES AND CROSS SLOPES EXCEPT AS SHOWN OR AS DIRECTED.

11. CONTRACTOR TO PLACE FAST TRACK CONCRETE PAVEMENT AS INDICATED ON THE PLANS.

PHASE 0 ADVANCED WARNING SIGNS
1. PLACE ADVANCED WARNING SIGNS FOR THE PROJECT LIMITS IN ACCORDANCE WITH BC (1-12)-21 AND AS SHOWN ON THE ADVANCED WARNING SIGNS LAYOUT.

TCP PHASE I
PERFORM CONSTRUCTION OPERATIONS RELATED TO RECONSTRUCTION OF HOPKINS RD. UNDER THE I20 MAIN LANES.

NOTE: A DISINCENTIVE FOR FAILURE TO SUBSTANTIALLY COMPLETE WORK ON TIME WILL APPLY TO THIS CONTRACT IN ACCORDANCE WITH SECTION 8.9.2 OF SPECIAL PROVISION 008-006 USING A DAILY ROAD-USER COST (RUC) OF $13,815.00. FAILURE TO SUBSTANTIALLY COMPLETE WORK FOR PHASE 1, OPEN TO TRAFFIC, AS DESCRIBED IN THE TRAFFIC CONTROL PLANS WITHIN 10 WORKING DAYS WILL RESULT IN THE ASSESSMENT OF DISINCENTIVES.

1. INSTALL EROSION CONTROL DEVICES PRIOR TO ANY SOIL DISTURBANCE.
2. PLACE SIGNAGE AND CHANNELIZING DEVICES AS SHOWN ON THE TRAFFIC CONTROL PLAN.
3. CONSTRUCT FAST TRACK CONCRETE PAVEMENT SECTION WITHIN THE LIMITS AS SHOWN.
4. STABILIZE SIDE SLOPES USING MAX 3:1 SLOPES, AS NECESSARY.

TCP PHASE 2
PERFORM CONSTRUCTION OPERATIONS RELATED TO RECONSTRUCTION OF THE SOUTHEAST HALF OF THE NORTH FRONTAGE ROAD (NFR) AND THE NORTHWEST HALF OF THE SOUTH FRONTAGE ROAD (SFR).

1. INSTALL EROSION CONTROL DEVICES PRIOR TO ANY SOIL DISTURBANCE.
2. CONVERT THE NFR AND SFR TO A ONE-WAY FRONTAGE ROAD TRAVELLING WESTBOUND AND EASTBOUND ACCORDINGLY AS SHOWN ON THE TRAFFIC CONTROL PLANS.
3. FOLLOW TCP (2-3)-23 FOR SHIFTING TRAFFIC AND CONSTRUCTION OF AREA AS SHOWN ON THE TRAFFIC CONTROL PLAN.
4. CONSTRUCT CONCRETE PAVEMENT SECTION WITHIN THE LIMITS AS SHOWN.
5. STABILIZE SIDE SLOPES USING MAX 3:1 SLOPES, AS NECESSARY.

TCP PHASE 3
PERFORM CONSTRUCTION OPERATIONS RELATED TO RECONSTRUCTION OF THE SOUTHWEST HALF OF THE NFR AND NORTHEAST HALF OF THE SFR.

1. INSTALL EROSION CONTROL DEVICES PRIOR TO ANY SOIL DISTURBANCE.
2. CONVERT THE SFR TO A ONE-WAY FRONTAGE ROAD TRAVELLING EASTBOUND AS SHOWN ON THE TRAFFIC CONTROL PLANS.
3. PLACE SIGNAGE AND CHANNELIZING DEVICES AS SHOWN ON THE TRAFFIC CONTROL PLAN.
4. CONSTRUCT CONCRETE PAVEMENT SECTION WITHIN THE LIMITS AS SHOWN.
5. STABILIZE SIDE SLOPES USING MAX 3:1 SLOPES, AS NECESSARY.

TCP PHASE 4
PERFORM CONSTRUCTION OPERATIONS RELATED TO RECONSTRUCTION OF THE NORTHEAST HALF OF THE NFR, SOUTHEAST HALF OF THE SFR, AND PARTIAL WEST SIDE OF HOPKINS RD. ALONG THE SEGMENTS NORTHWEST OF THE NFR AND SOUTHWEST OF THE SFR.

1. INSTALL EROSION CONTROL DEVICES PRIOR TO ANY SOIL DISTURBANCE.
2. CONVERT THE NFR AND SFR TO A ONE-WAY FRONTAGE ROAD TRAVELLING WESTBOUND AND EASTBOUND ACCORDINGLY AS SHOWN ON THE TRAFFIC CONTROL PLANS.
3. FOLLOW TCP (2-3)-23 FOR SHIFTING TRAFFIC AND CONSTRUCTION OF NFR AND SFR AS SHOWN ON THE TRAFFIC CONTROL PLAN.
4. PLACE SIGNAGE AND CHANNELIZING DEVICES IN ACCORDANCE WITH TCP (2-3)-23 ALONG HOPKINS RD.
5. CONSTRUCT CONCRETE PAVEMENT SECTION AND FAST TRACK CONCRETE PAVEMENT SECTION WITHIN THE LIMITS AS SHOWN.
6. STABILIZE SIDE SLOPES USING MAX 3:1 SLOPES, AS NECESSARY.

TCP PHASE 5
PERFORM CONSTRUCTION OPERATIONS RELATED TO RECONSTRUCTION OF THE PARTIAL NORTHEAST QUADRANT AT NFR INTERSECTION AND SOUTHEAST QUADRANT AT SFR INTERSECTION.

1. INSTALL EROSION CONTROL DEVICES PRIOR TO ANY SOIL DISTURBANCE.
2. CONVERT THE NFR AND SFR TO A ONE-WAY FRONTAGE ROAD TRAVELLING WESTBOUND AND EASTBOUND ACCORDINGLY AS SHOWN ON THE TRAFFIC CONTROL PLANS.
3. FOLLOW TCP (2-3)-23 FOR SHIFTING TRAFFIC AND CONSTRUCTION OF AREA AS SHOWN ON THE TRAFFIC CONTROL PLAN.
4. CONSTRUCT FAST TRACK CONCRETE PAVEMENT SECTION WITHIN THE LIMITS AS SHOWN.
5. STABILIZE SIDE SLOPES USING MAX 3:1 SLOPES, AS NECESSARY.

TCP PHASE 6
PERFORM CONSTRUCTION OPERATIONS RELATED TO RECONSTRUCTION OF THE MIDDLE SECTION ALONG HOPKINS RD. FOR THE SEGMENTS NORTH OF THE NFR BASELINE AND SOUTH OF SFR BASELINE.

1. INSTALL EROSION CONTROL DEVICES PRIOR TO ANY SOIL DISTURBANCE.
2. CONVERT THE NFR AND SFR TO A ONE-WAY FRONTAGE ROAD TRAVELLING WESTBOUND AND EASTBOUND ACCORDINGLY AS SHOWN ON THE TRAFFIC CONTROL PLANS.
3. FOLLOW TCP (2-3)-23 FOR SHIFTING TRAFFIC AND CONSTRUCTION OF AREA AS SHOWN ON THE TRAFFIC CONTROL PLAN.
4. CONSTRUCT FAST TRACK CONCRETE PAVEMENT SECTION WITHIN THE LIMITS AS SHOWN.

TCP PHASE 7 STAGE 1
INTENT OF PHASE 7 STAGE 1 IS TO PERFORM CONSTRUCTION OPERATIONS RELATED TO SEAL COAT OF THE EAST HALF SECTION ALONG HOPKINS RD. NORTH AND SOUTH ENDS OF THE PROJECT.

1. INSTALL EROSION CONTROL DEVICES PRIOR TO ANY SOIL DISTURBANCE.
2. FOLLOW TCP (SC-1)-22 FOR SHIFTING TRAFFIC AND CONSTRUCTION ALONG HOPKINS RD.
3. CONSTRUCT EAST HALF SECTION OF SEAL COAT ALONG HOPKINS RD. NORTH AND SOUTH ENDS OF THE PROJECT. REFER TO ROADWAY PLAN SHEETS FOR SEAL COAT LIMITS.
4. STABILIZE SIDE SLOPES USING MAX 3:1 SLOPES, AS NECESSARY.

TCP PHASE 7 STAGE 2
INTENT OF PHASE 7 STAGE 2 IS TO PERFORM CONSTRUCTION OPERATIONS RELATED TO SEAL COAT OF THE WEST HALF SECTION ALONG HOPKINS RD. NORTH AND SOUTH ENDS OF THE PROJECT, RESTORE THE PROJECT AREA ALONG NFR, SFR AND PART OF HOPKINS RD, AND COMPLETE ALL CONSTRUCTION ACTIVITIES.

1. INSTALL EROSION CONTROL DEVICES PRIOR TO ANY SOIL DISTURBANCE.
2. PERFORM PERMANENT STRIPING OPERATIONS ALONG NFR, SFR AND HOPKINS RD. FOR THE SEGMENT UNDER THE I20 MAIN LANES UTILIZING MOBILE OPERATIONS STANDARDS.
3. RESUME NORMAL TRAFFIC OPERATION ALONG NFR, SFR AND HOPKINS RD. SEGMENT UNDER THE I20 MAIN LANES.
4. FOLLOW TCP (SC-1)-22 FOR SHIFTING TRAFFIC AND CONSTRUCTION ALONG HOPKINS RD.
5. CONSTRUCT WEST HALF SECTION OF SEAL COAT ALONG HOPKINS RD. NORTH AND SOUTH ENDS OF THE PROJECT. REFER TO ROADWAY PLAN SHEETS FOR SEAL COAT LIMITS.
6. STABILIZE SIDE SLOPES USING MAX 3:1 SLOPES, AS NECESSARY.
7. PERFORM PERMANENT STRIPING OPERATIONS FOR THE REMAINING SEGMENT OF HOPKINS RD. UTILIZING MOBILE OPERATIONS STANDARDS.
8. PERFORM CLEAN UP OPERATIONS TO COMPLETE THE PROJECT.
9. RESUME NORMAL TRAFFIC OPERATION FOR THE ENTIRE PROJECT AREA.

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IH 20

TCP NARRATIVE

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		23

DATE: 1/30/2024 2:35:56 PM
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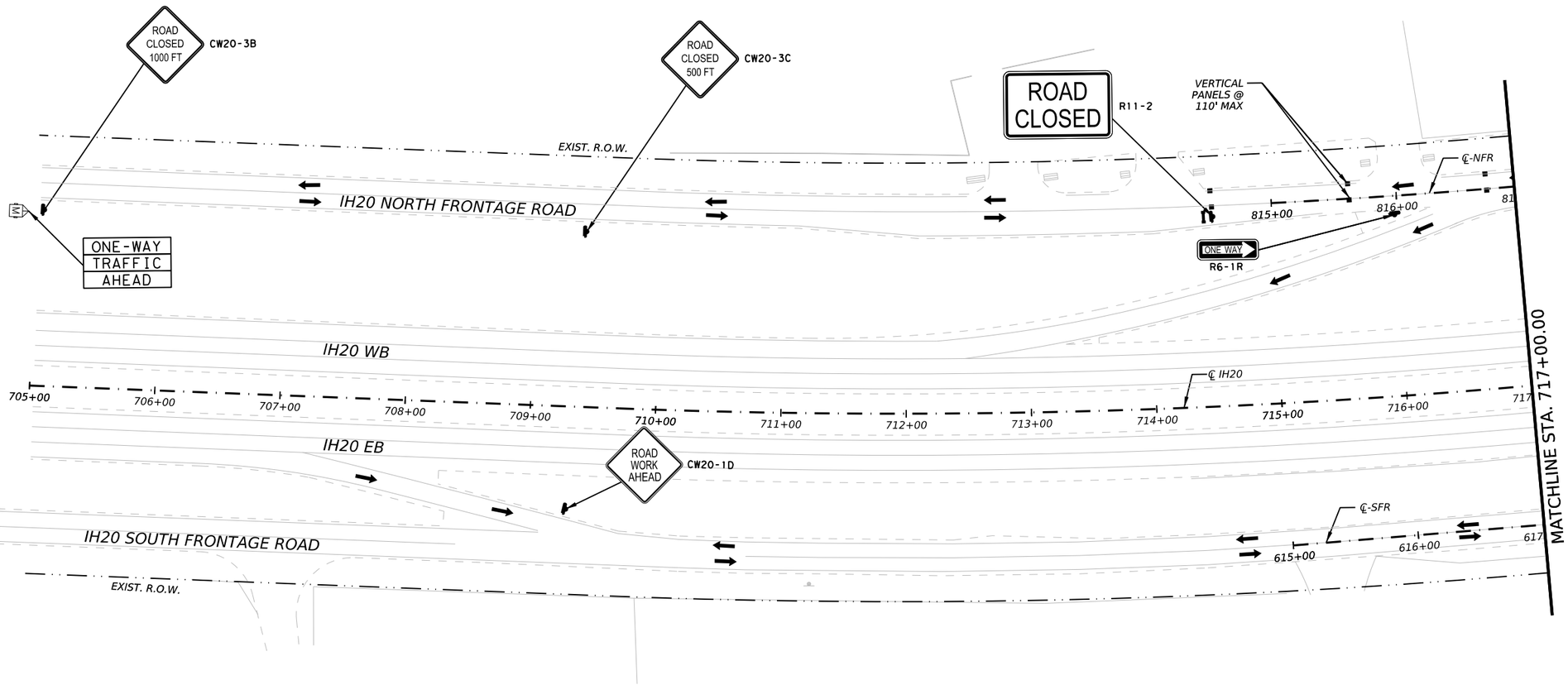

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SCALE IN FEET

LEGEND

- PERMANENT PAVEMENT CONSTRUCTION IN THIS PHASE
- PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TEMPORARY PAVEMENT CONSTRUCTION IN THIS PHASE
- TEMPORARY PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TRAFFIC FLOW
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- A — WRK ZN PAV MRK (REM)(Y)(6")(SLD)
- B — WRK ZN PAV MRK (REM)(W)(6")(SLD)
- C — WRK ZN PAV MRK (REM)(W)(24")(SLD)
- D — WRK ZN PAV MRK (REM)(Y)(6")(SLD)(DBL)
- E — WRK ZN PAV MRK (REM)(Y)(6")(DOT)
- TRUCK MOUNTED ATTENUATOR (TMA)
- M — PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

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IH 20

TCP PH1 PLAN

SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		24

DATE: 1/30/2024 2:36:14 PM
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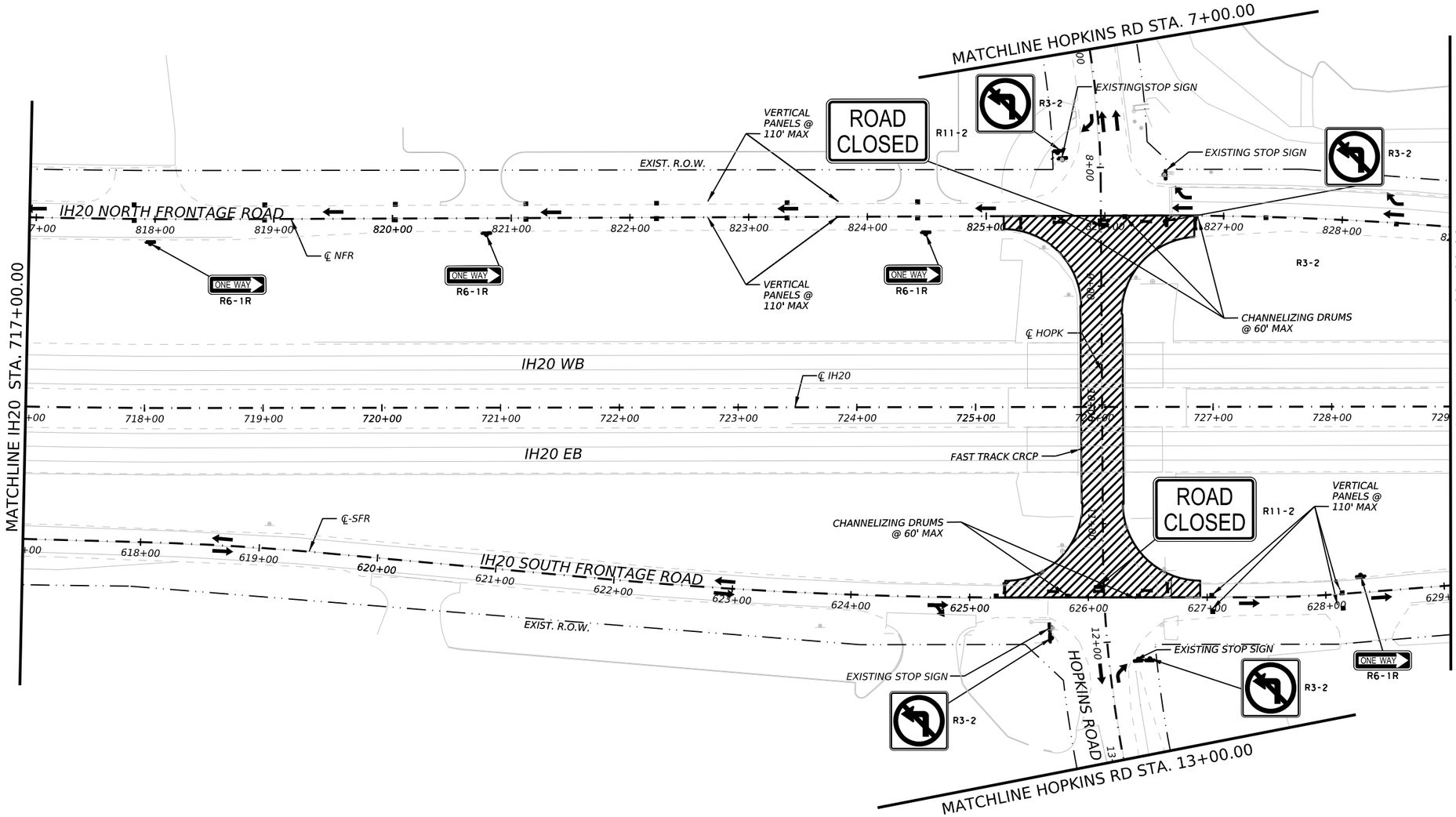

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SCALE IN FEET

LEGEND

- PERMANENT PAVEMENT CONSTRUCTION IN THIS PHASE
- PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TEMPORARY PAVEMENT CONSTRUCTION IN THIS PHASE
- TEMPORARY PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TRAFFIC FLOW
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- A — WRK ZN PAV MRK (REM)(Y)(6")(SLD)
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- C — WRK ZN PAV MRK (REM)(W)(24")(SLD)
- D — WRK ZN PAV MRK (REM)(Y)(6")(SLD)(DBL)
- E — WRK ZN PAV MRK (REM)(Y)(6")(DOT)
- TRUCK MOUNTED ATTENUATOR (TMA)
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED PROFESSIONAL ENGINEER

1/30/2024

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Dallas, Texas 72540
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

TCP PH1 PLAN

SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		25

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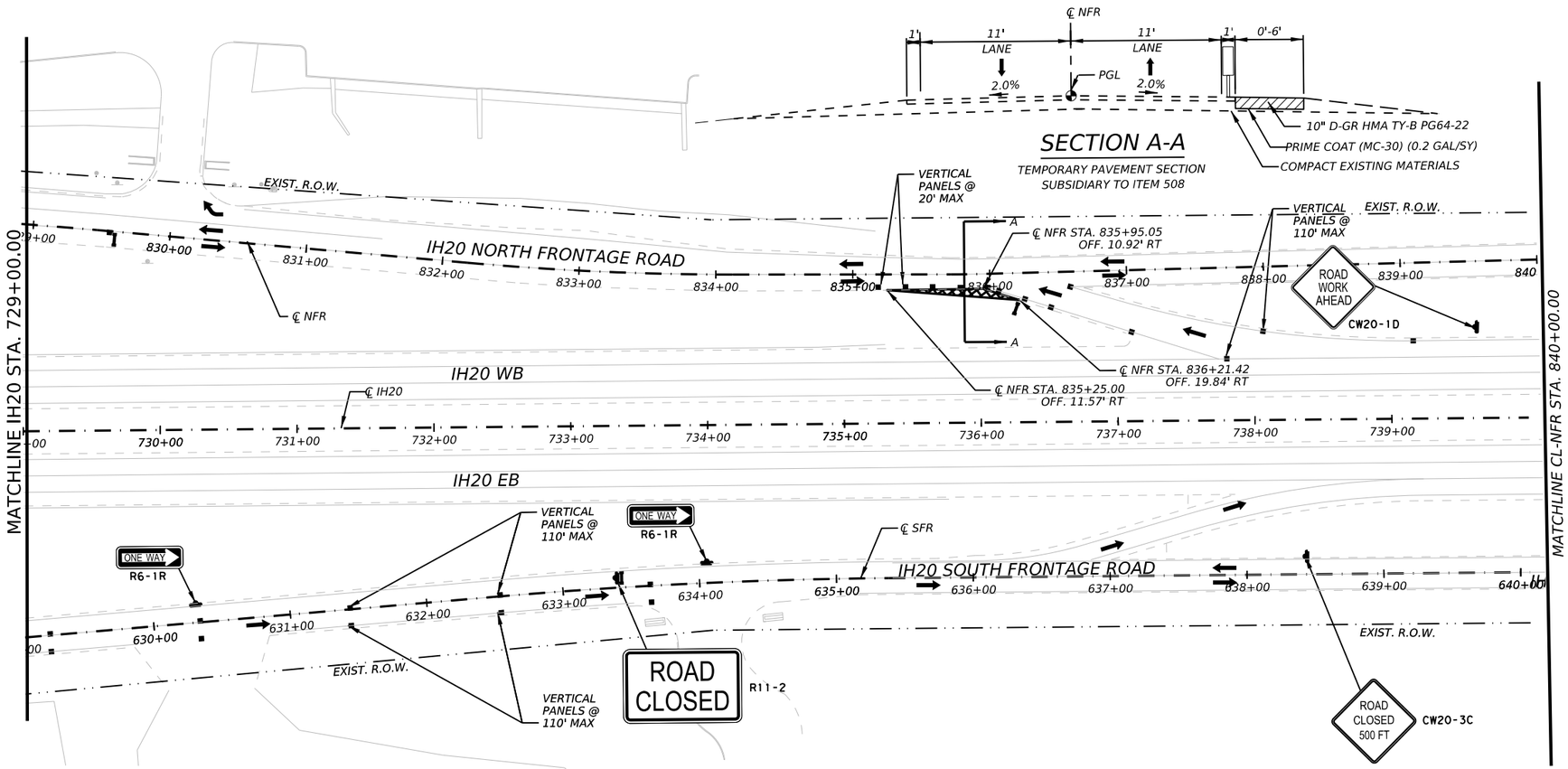

LEGEND

- PERMANENT PAVEMENT CONSTRUCTION IN THIS PHASE
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IH 20

TCP PH1 PLAN

SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		26

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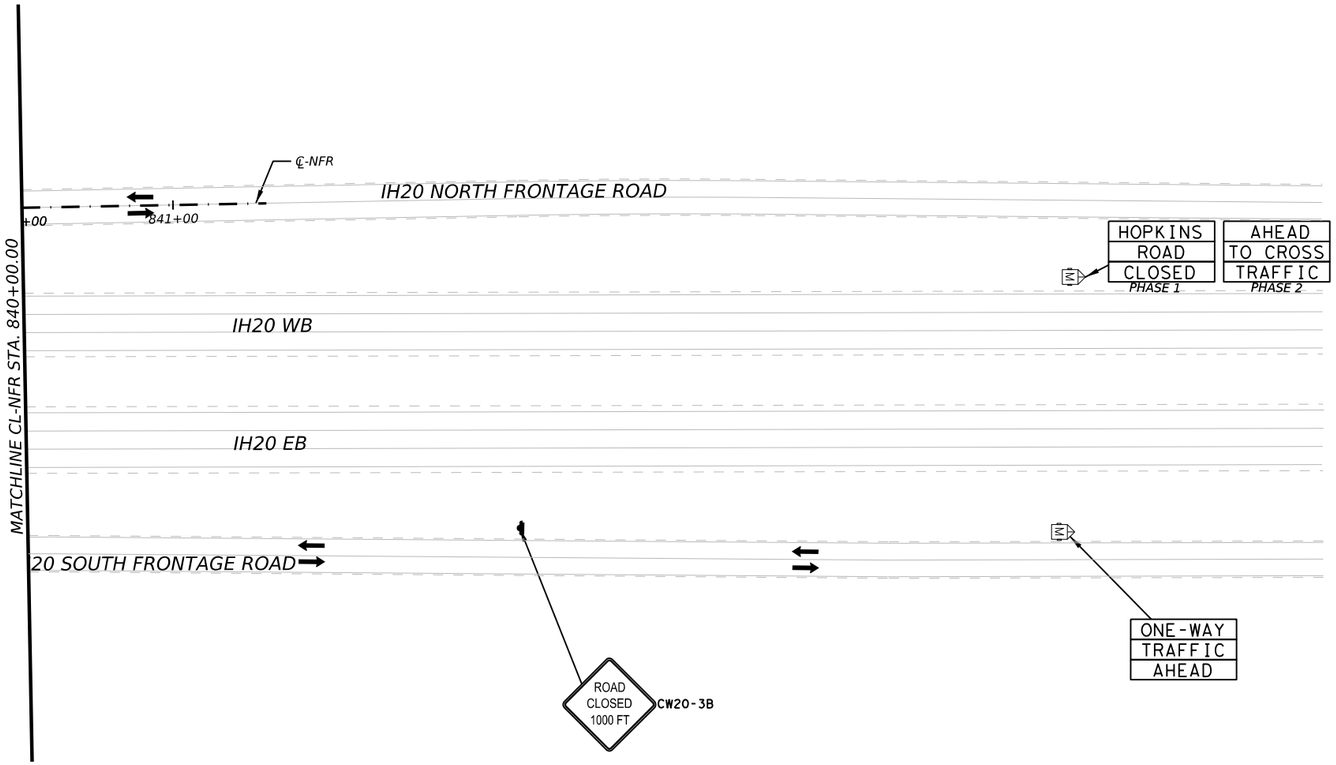

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SCALE IN FEET

LEGEND

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IH 20

TCP PH1 PLAN

SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		27

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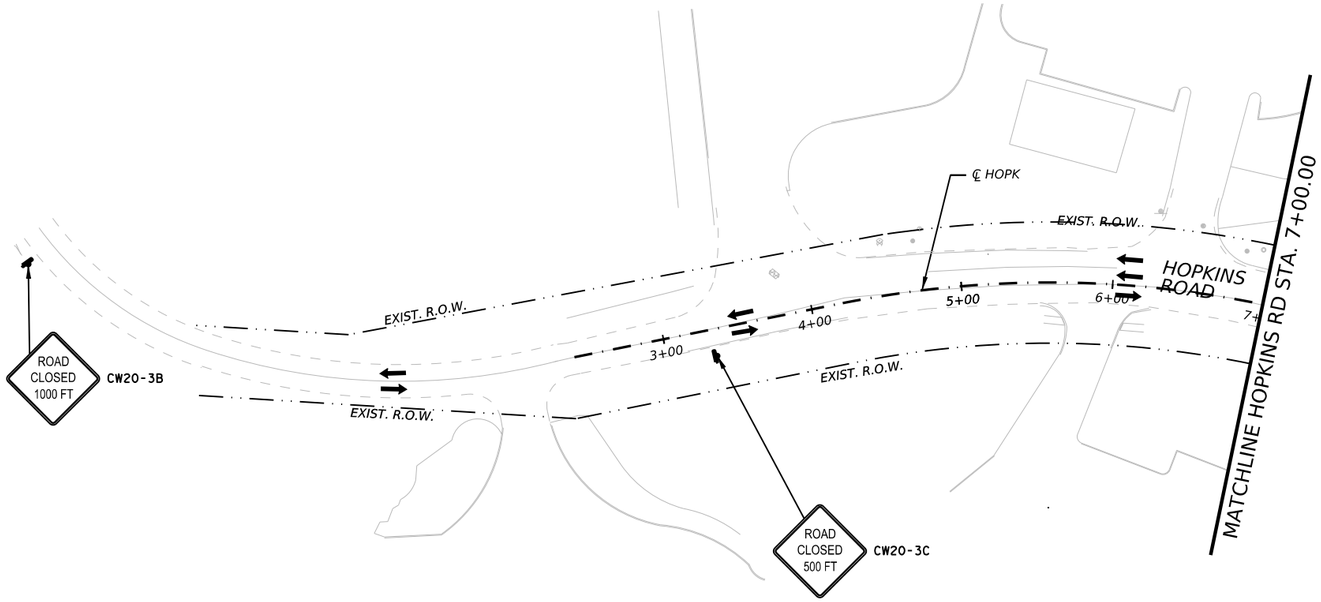

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SCALE IN FEET

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IH 20

TCP PH1 PLAN

SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		28

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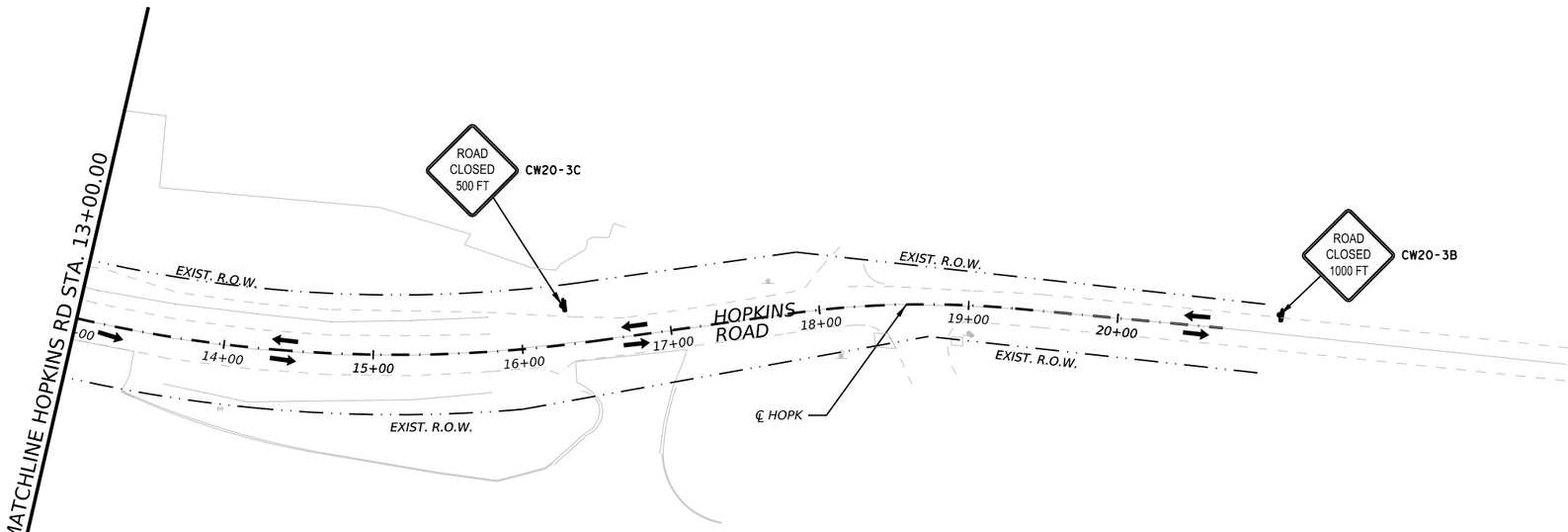

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SCALE IN FEET

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IH 20

TCP PH1 PLAN

SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		29

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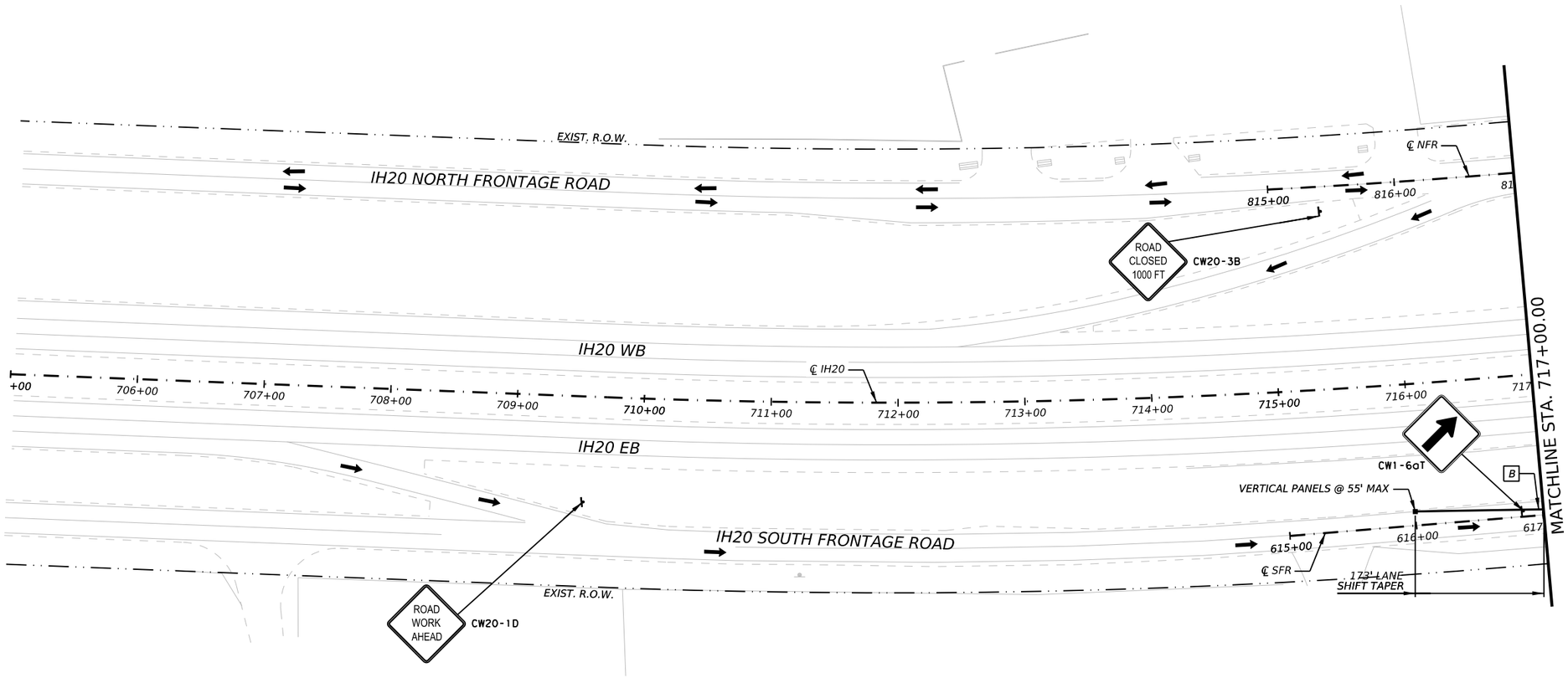

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SCALE IN FEET

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IH 20

TCP PH2 PLAN

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		30

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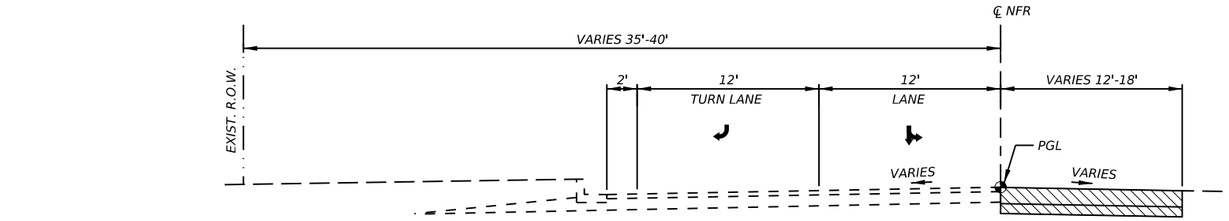

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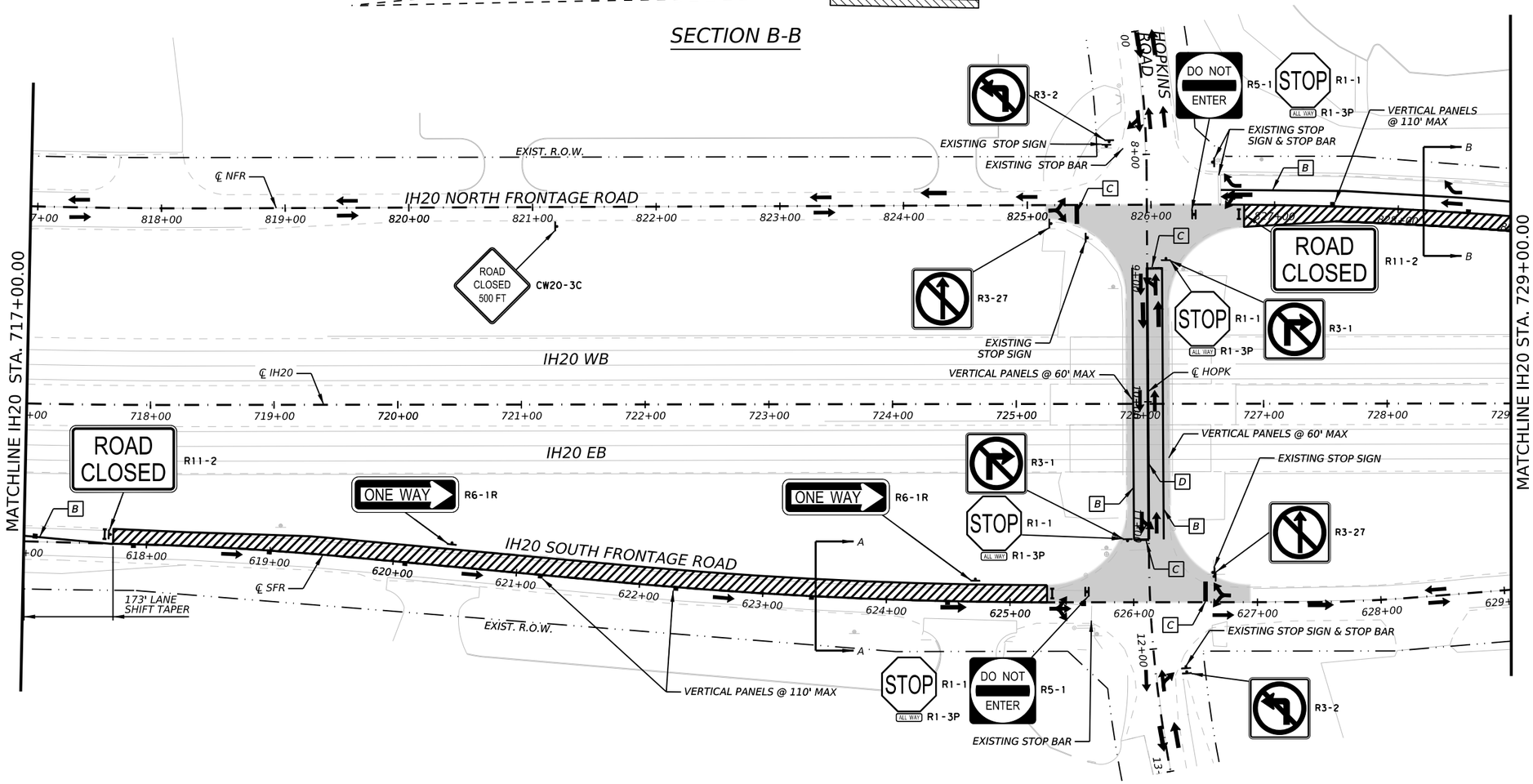

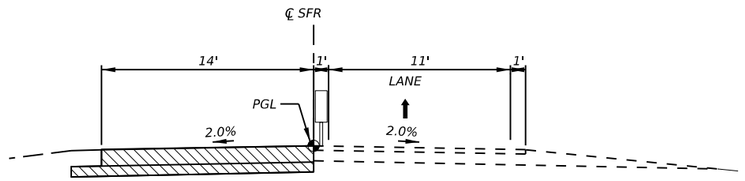

SECTION A-A

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SCALE IN FEET

LEGEND

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Texas Department of Transportation

IH 20

TCP PH2 PLAN

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		31

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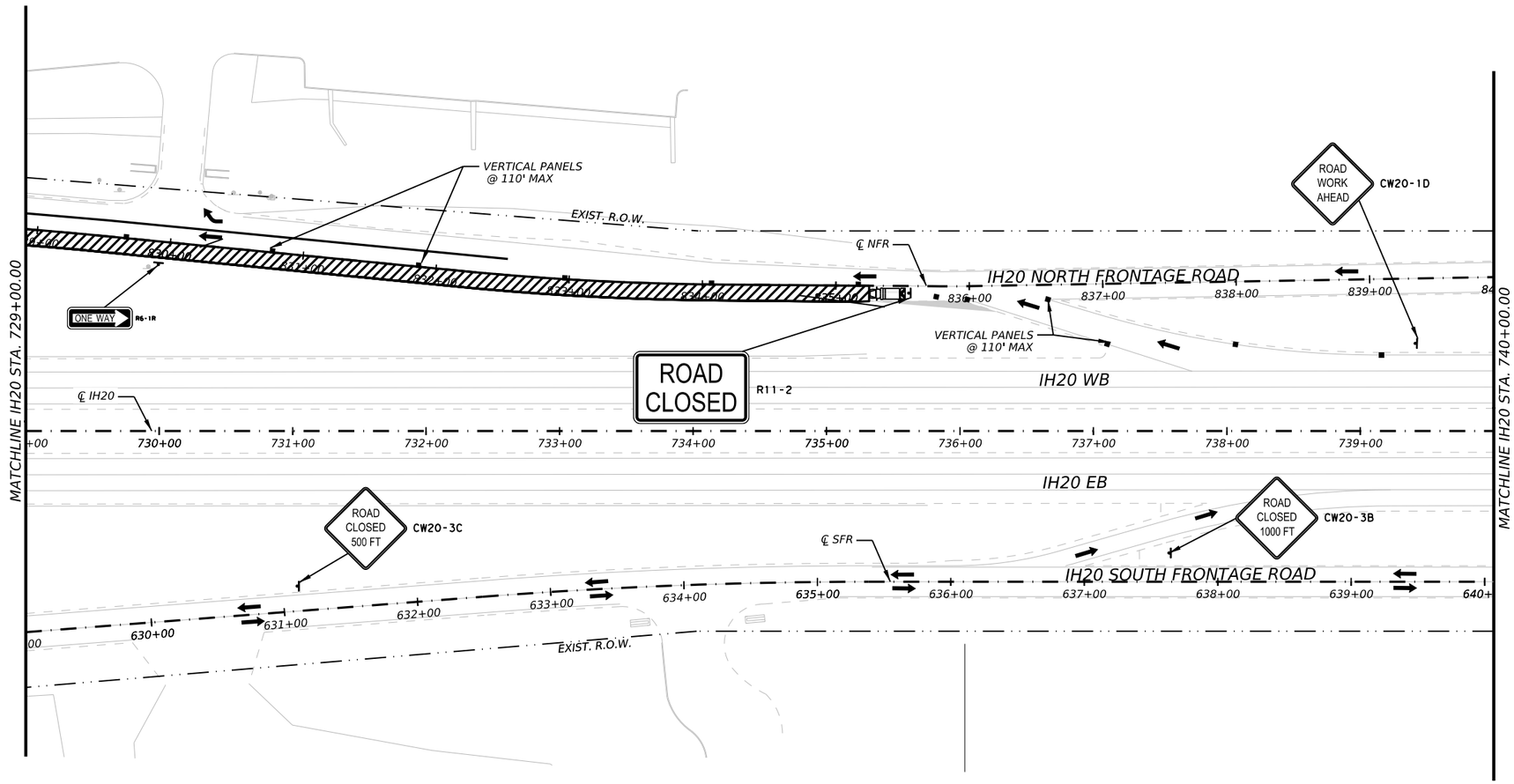

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SCALE IN FEET

LEGEND

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IH 20

TCP PH2 PLAN

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		32

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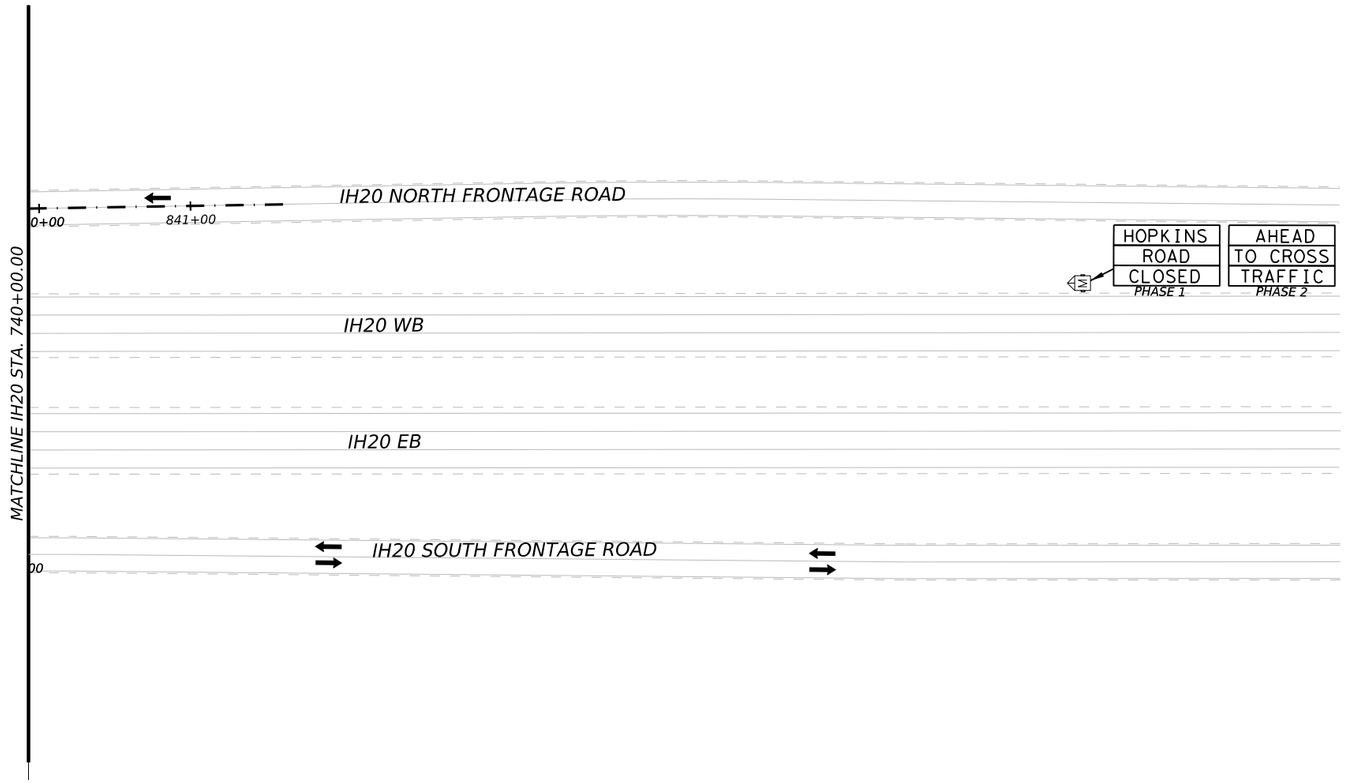

LEGEND

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IH 20

TCP PH2 PLAN

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		33

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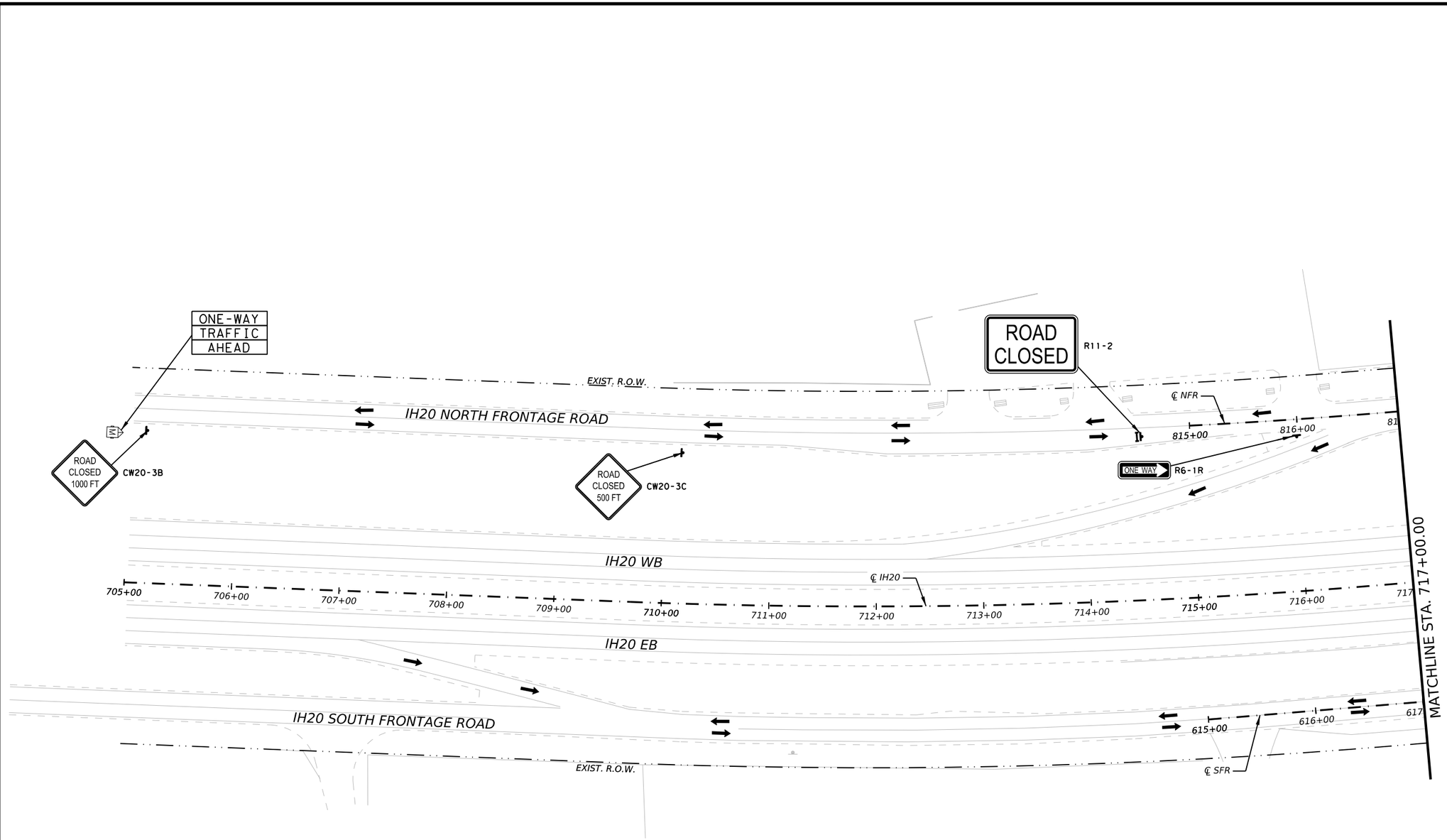

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SCALE IN FEET

LEGEND

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IH 20

TCP PH3 PLAN

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		34

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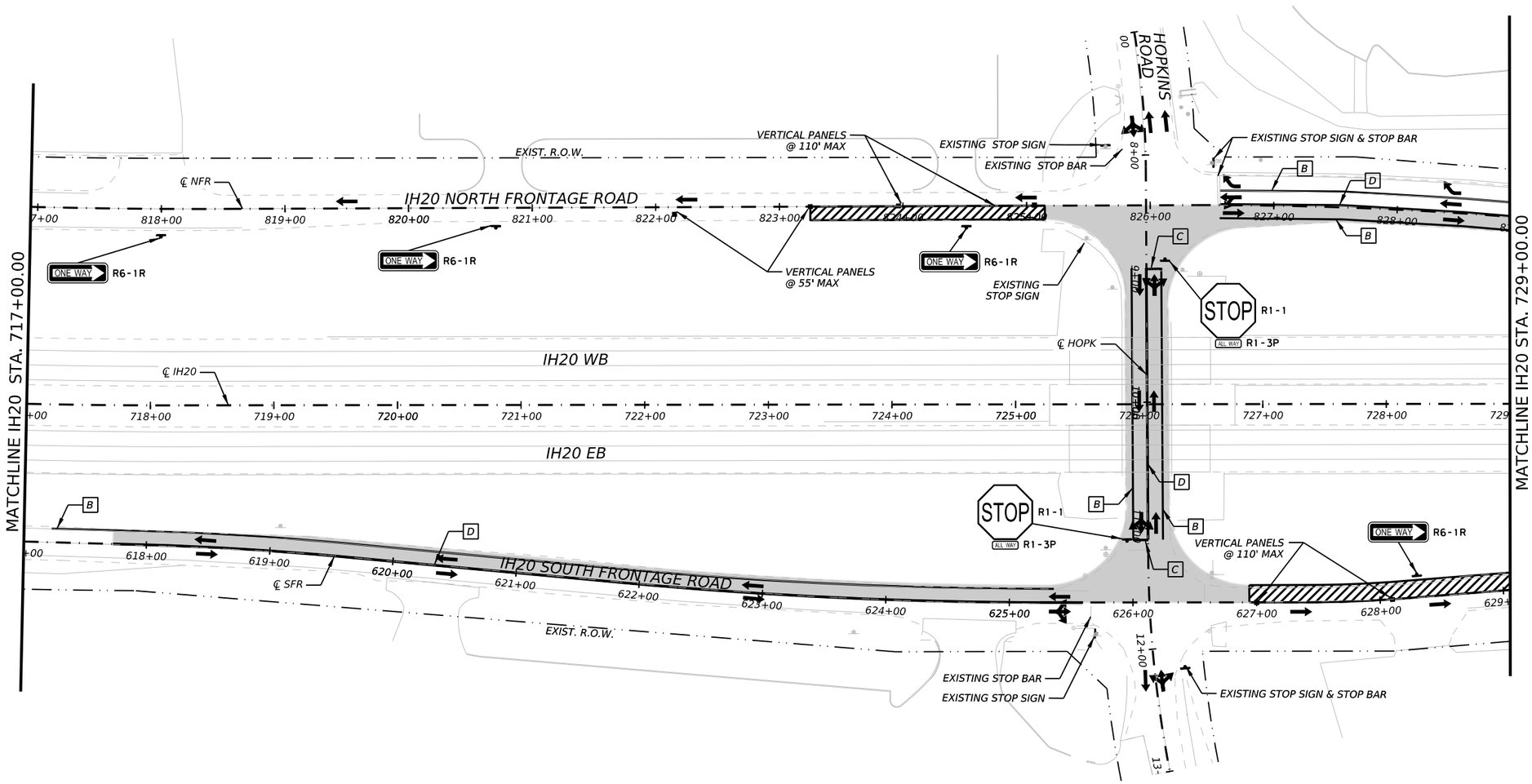

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SCALE IN FEET

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IH 20

TCP PH3 PLAN

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		35

DATE: 1/30/2024 2:36:52 PM
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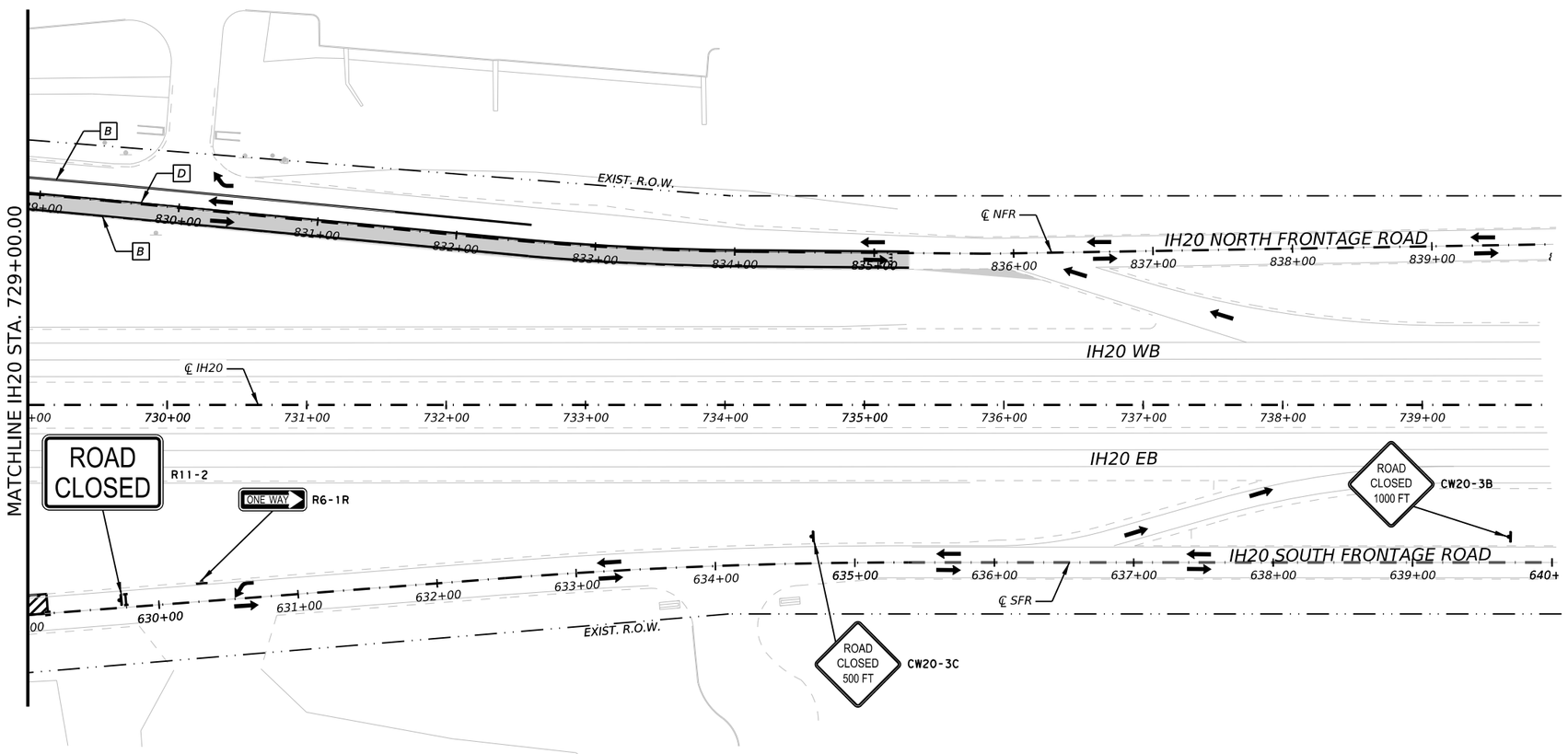

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IH 20

TCP PH3 PLAN

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		36

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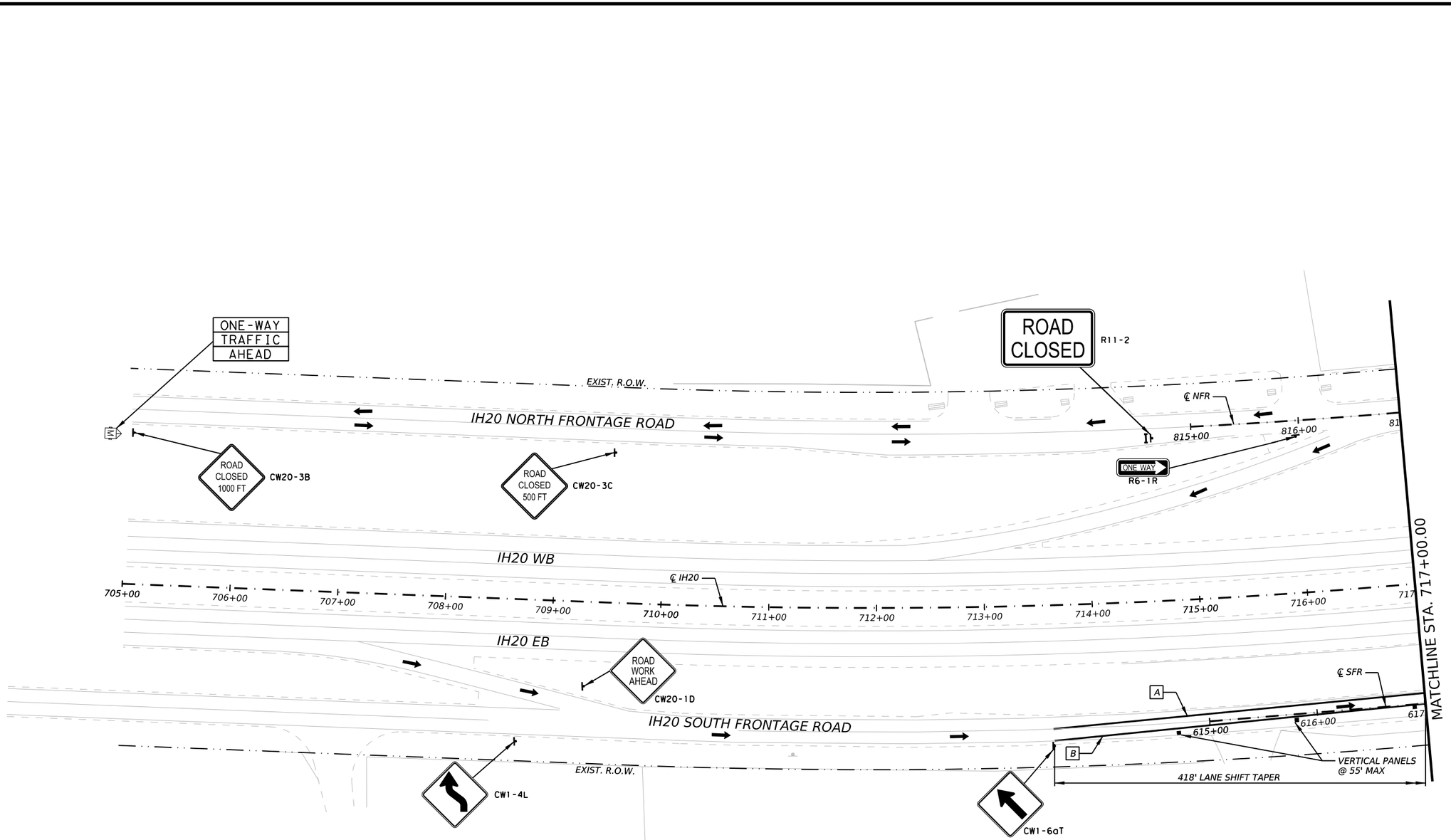

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- [A] WRK ZN PAV MRK (REM)(Y)(6")(SLD)
- [B] WRK ZN PAV MRK (REM)(W)(6")(SLD)
- [C] WRK ZN PAV MRK (REM)(W)(24")(SLD)
- [D] WRK ZN PAV MRK (REM)(Y)(6")(SLD)(DBL)
- [E] WRK ZN PAV MRK (REM)(Y)(6")(DOT)
- TRUCK MOUNTED ATTENUATOR (TMA)
- [M] PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED
PROFESSIONAL ENGINEER

1/30/2024

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13355 Noel Road, Suite 400
Dallas, Texas 75240
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

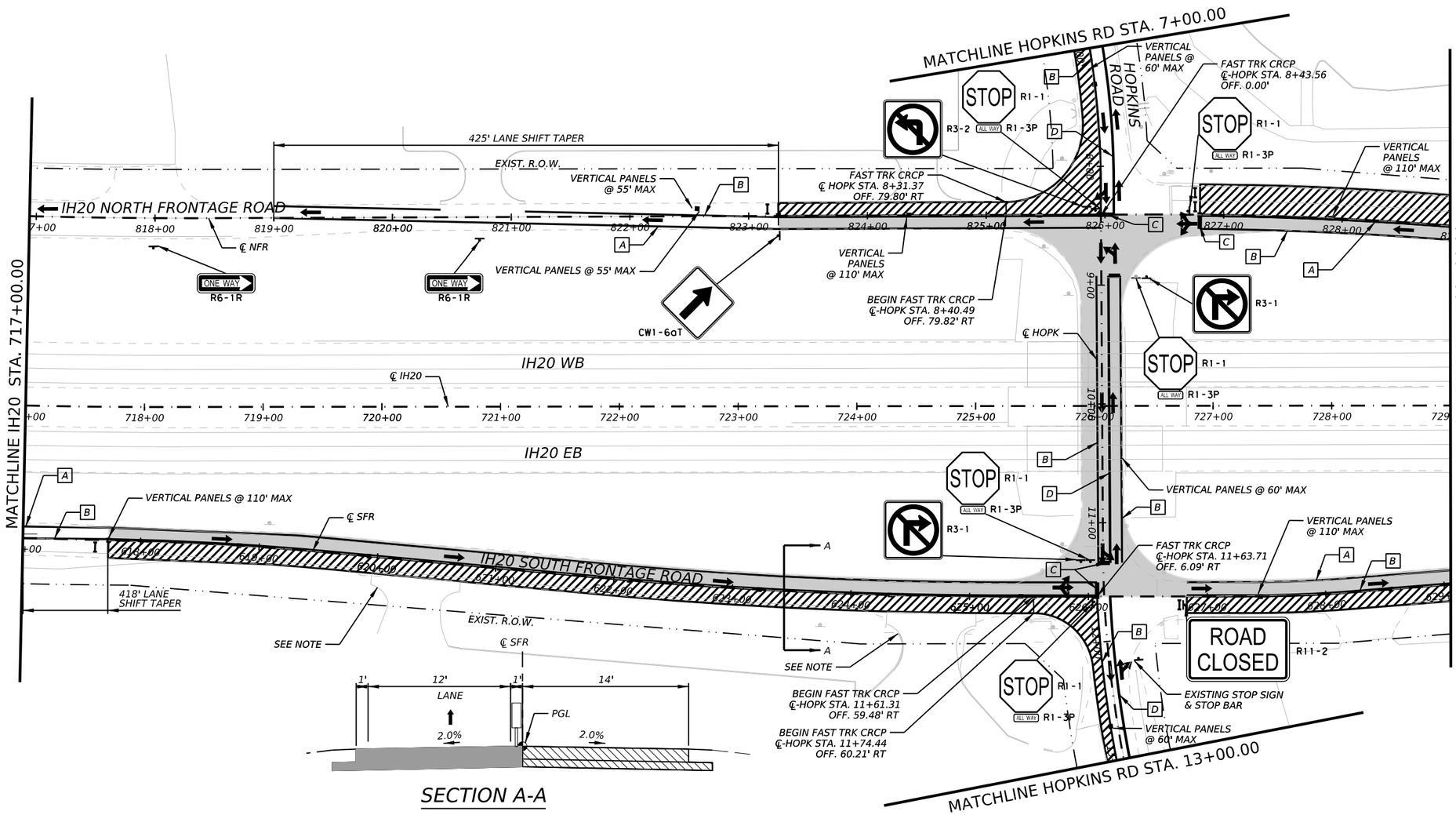
IH 20

TCP PH4 PLAN

SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		37

DATE: 1/30/2024 2:37:07 PM
FILE: pw://aecom-na-pw.bentley.com:AECOM USA Texas/Documents/60706605-IH 20 at Hopkins Rd Pavement Rehab/900-CAD GIS/910 CAD/04 TCP/Sheets/IH20 TCP PH4.dgn



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SCALE IN FEET

LEGEND

- PERMANENT PAVEMENT CONSTRUCTION IN THIS PHASE
- PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TEMPORARY PAVEMENT CONSTRUCTION IN THIS PHASE
- TEMPORARY PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TRAFFIC FLOW
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- E — WRK ZN PAV MRK (REM)(Y)(6")(DOT)
- TRUCK MOUNTED ATTENUATOR (TMA)
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NOTE: CONTRACTOR SHALL NOT CLOSE BOTH DRIVEWAYS AT THE SAME TIME. KEEP ACCESS TO THE PROPERTY AT ALL TIMES.

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IH 20

TCP PH4 PLAN

SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		38

DATE: 1/30/2024 2:37:08 PM
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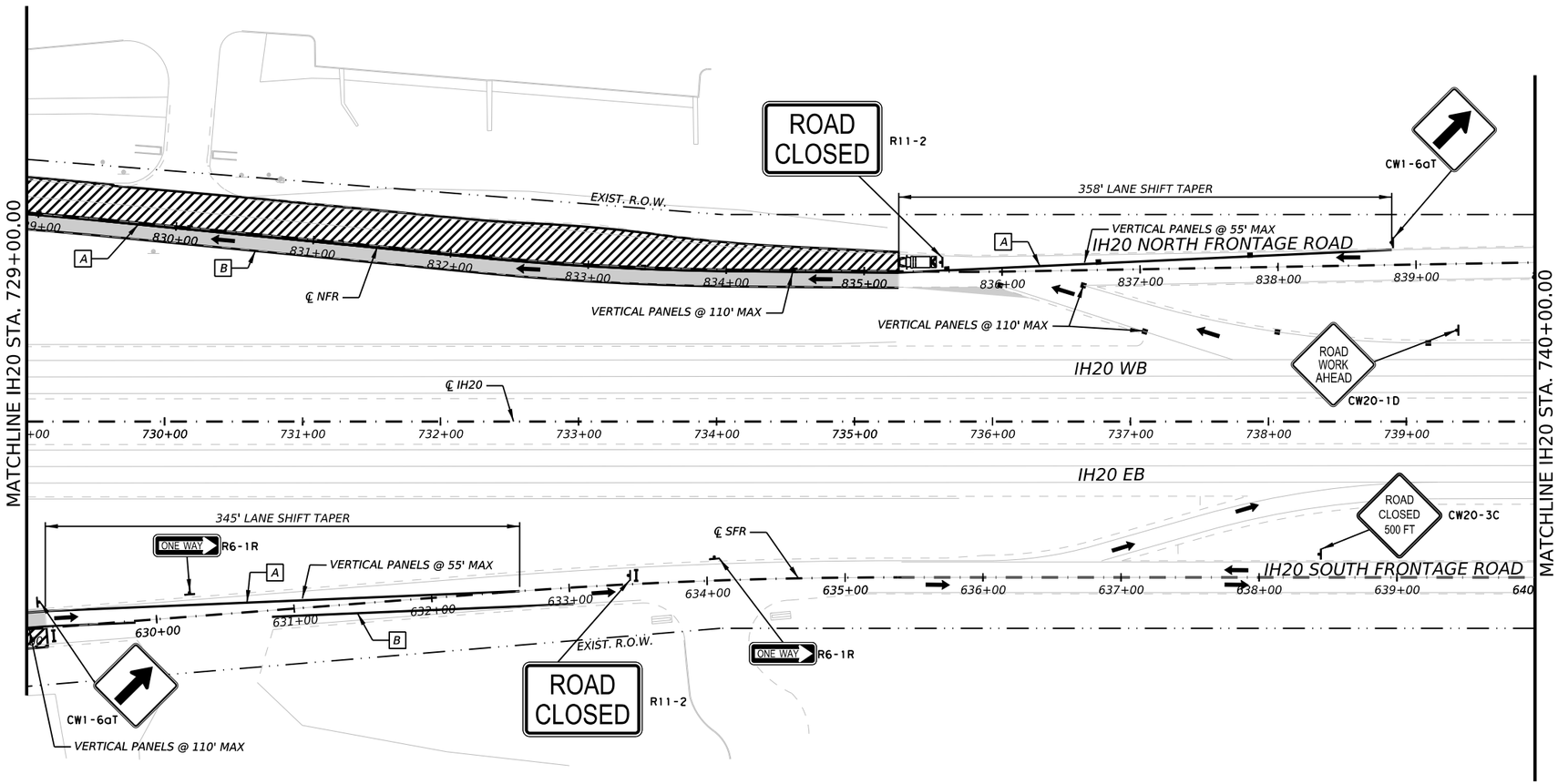

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SCALE IN FEET

LEGEND

- PERMANENT PAVEMENT CONSTRUCTION IN THIS PHASE
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IH 20

TCP PH4 PLAN

SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		39

DATE: 1/30/2024 2:37:08 PM
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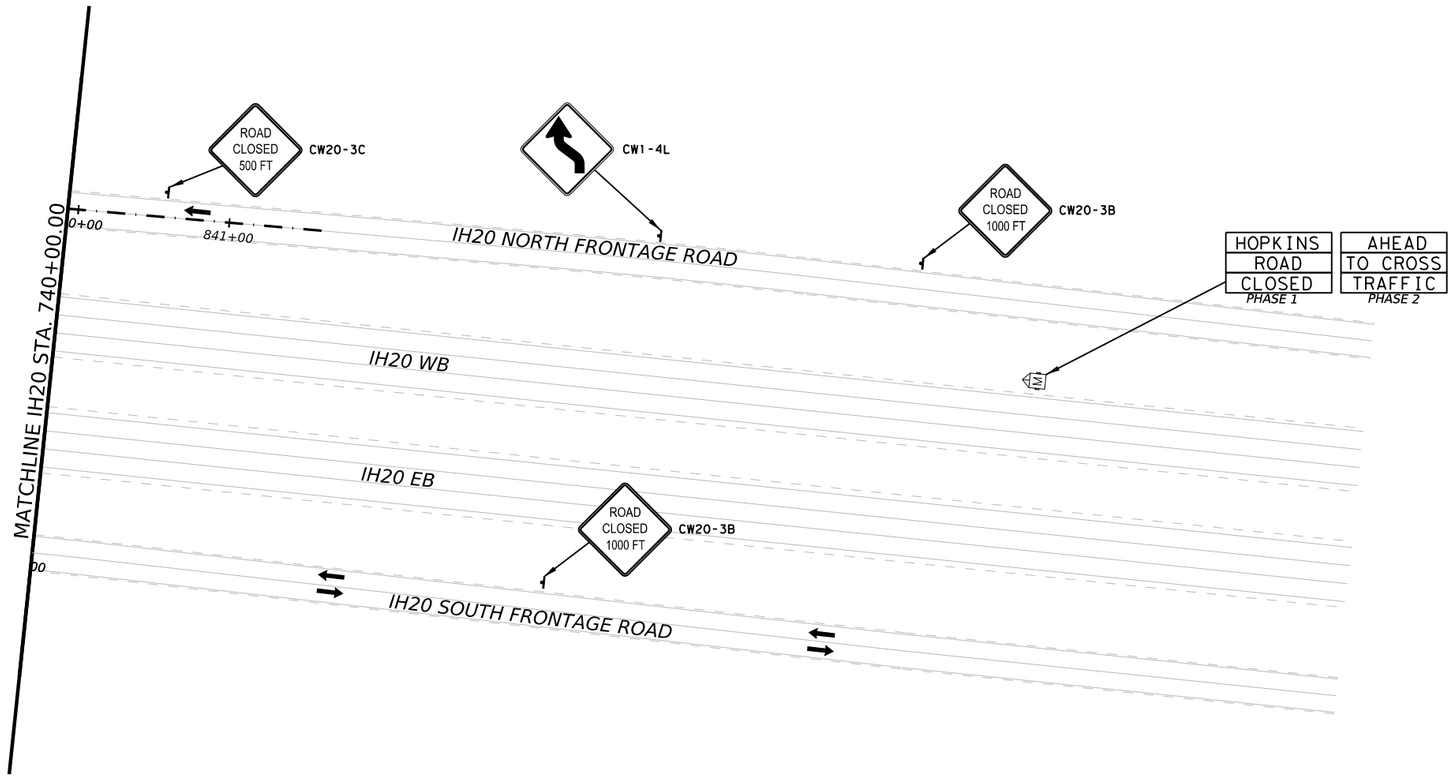

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SCALE IN FEET

LEGEND

- PERMANENT PAVEMENT CONSTRUCTION IN THIS PHASE
- PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
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IH 20

TCP PH4 PLAN

SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		40

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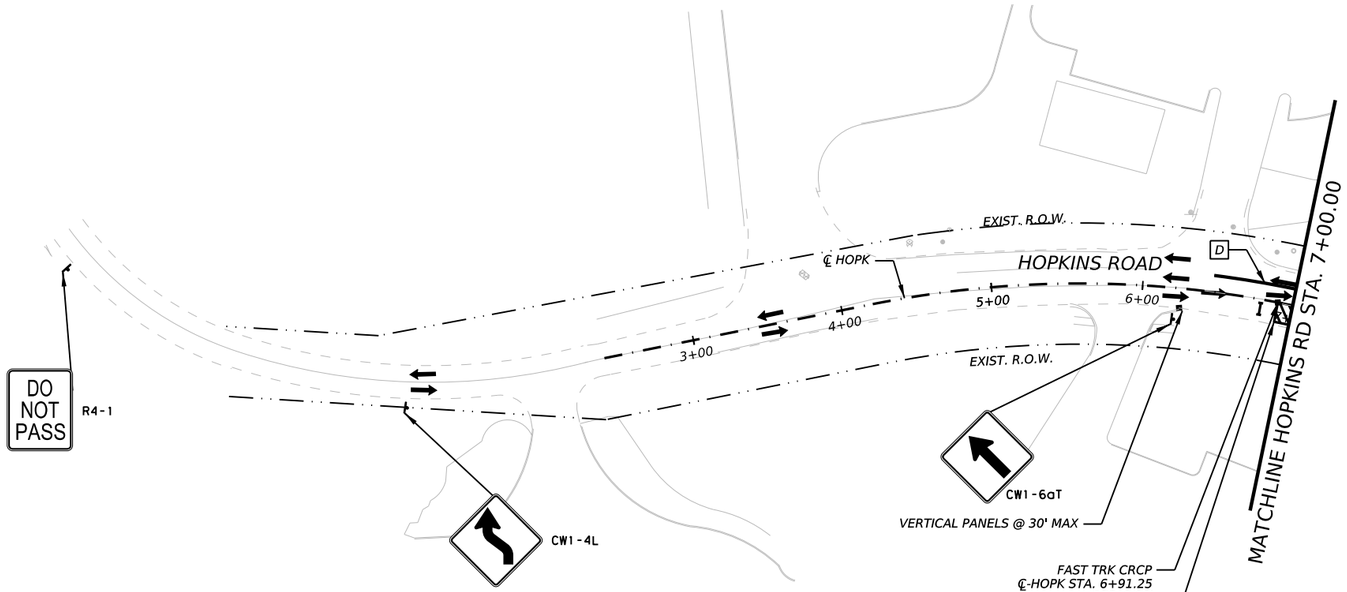

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IH 20

TCP PH4 PLAN

SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		41

DATE: 1/30/2024 2:37:09 PM
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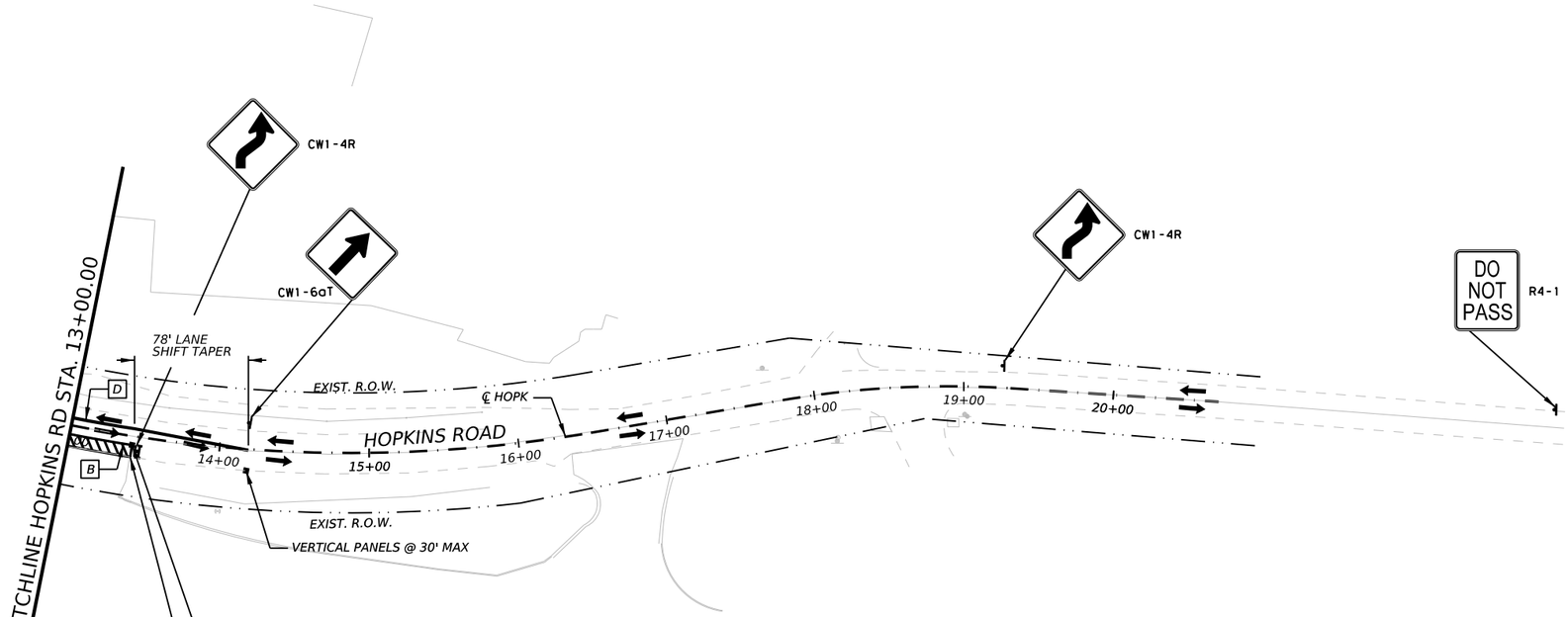

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IH 20

TCP PH4 PLAN

SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		42

DATE: 1/30/2024 2:37:10 PM
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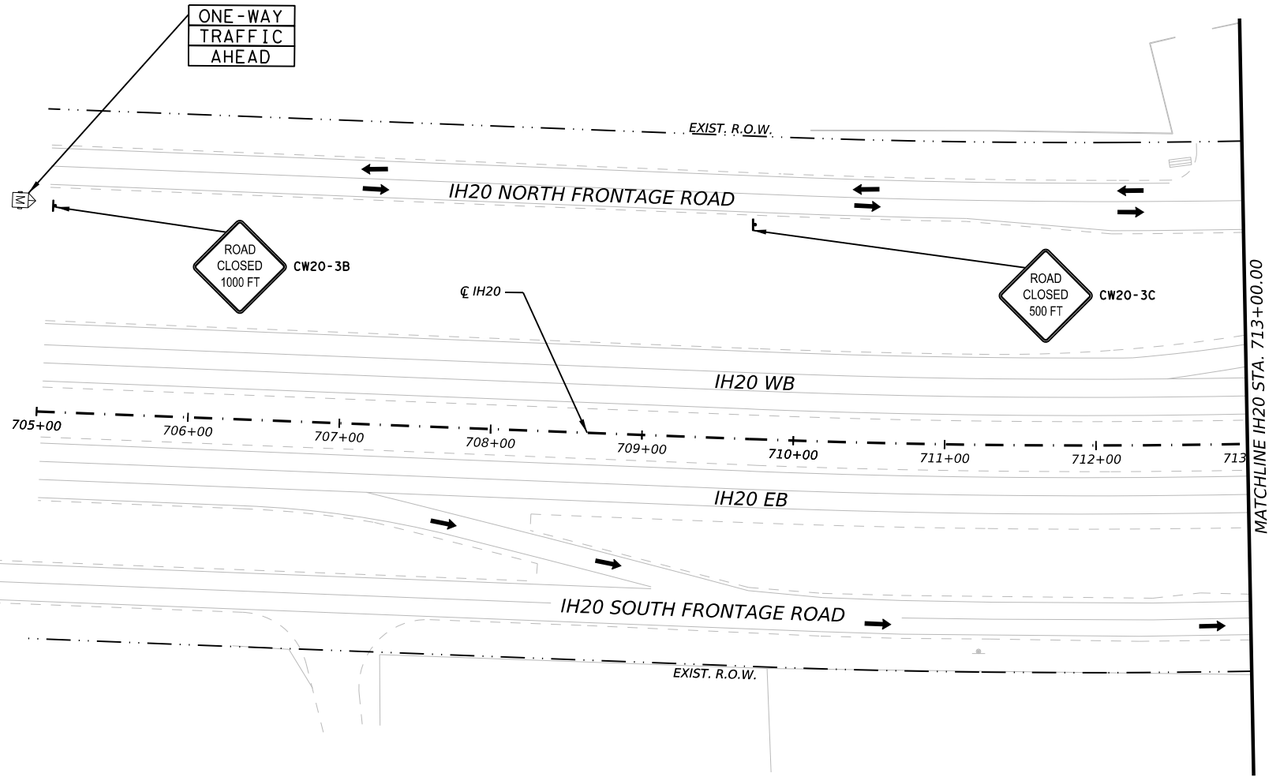

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SCALE IN FEET

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IH 20

TCP PH5 PLAN

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		43

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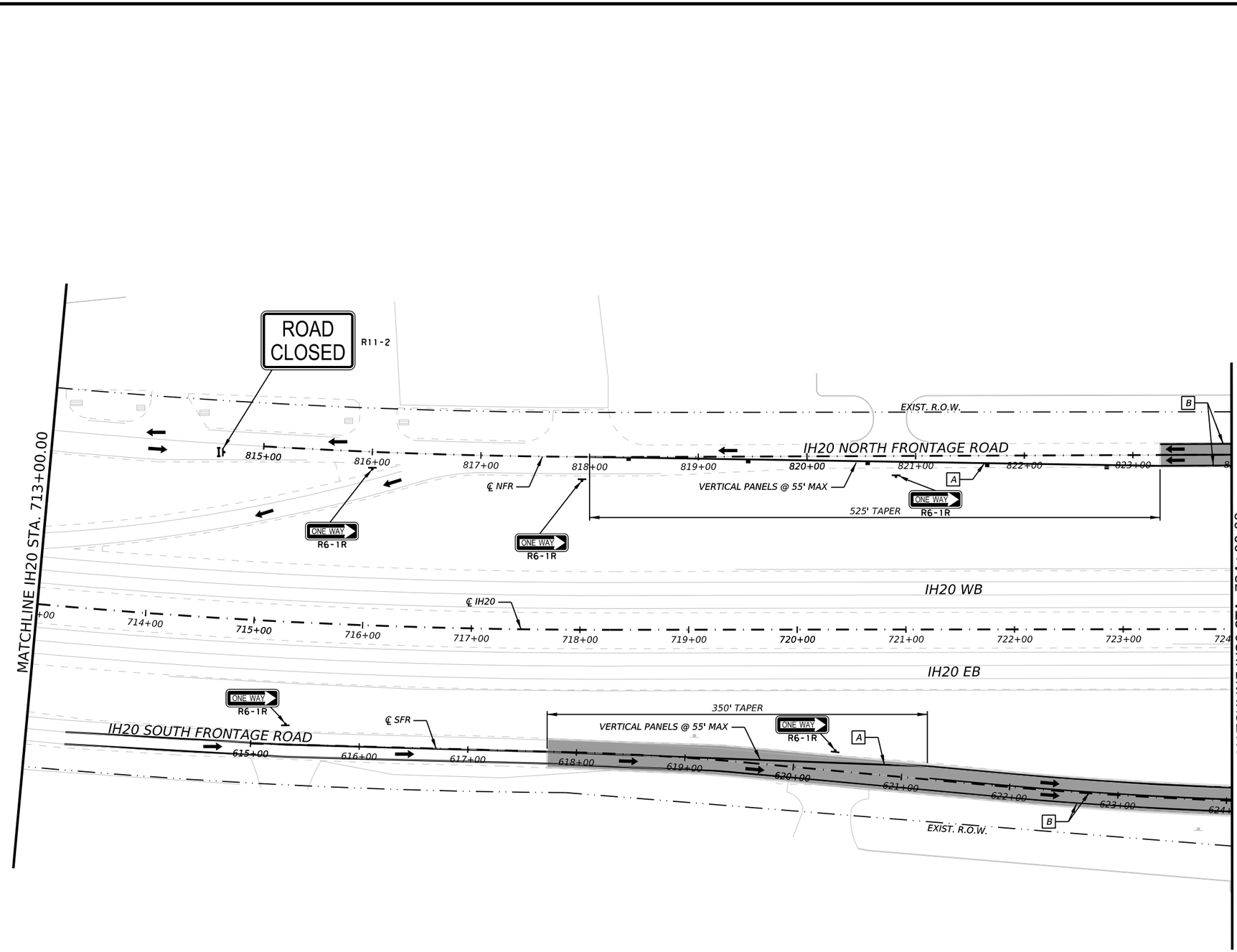

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SCALE IN FEET

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1/30/2024

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IH 20

TCP PH5 PLAN

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		44

DATE: 1/30/2024 2:37:29 PM
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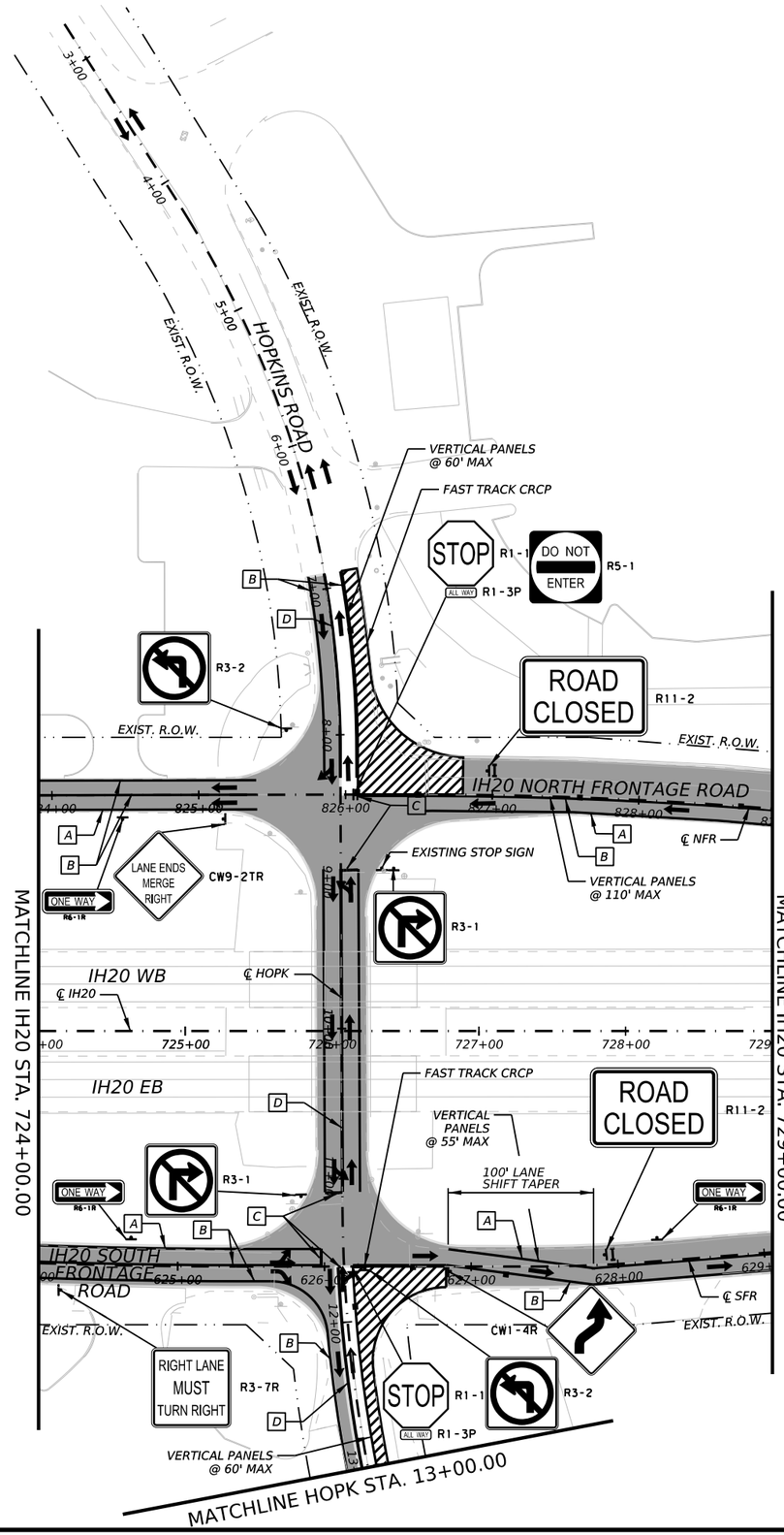

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SCALE IN FEET

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IH 20

TCP PH5 PLAN

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		45

DATE: 1/30/2024 2:37:29 PM
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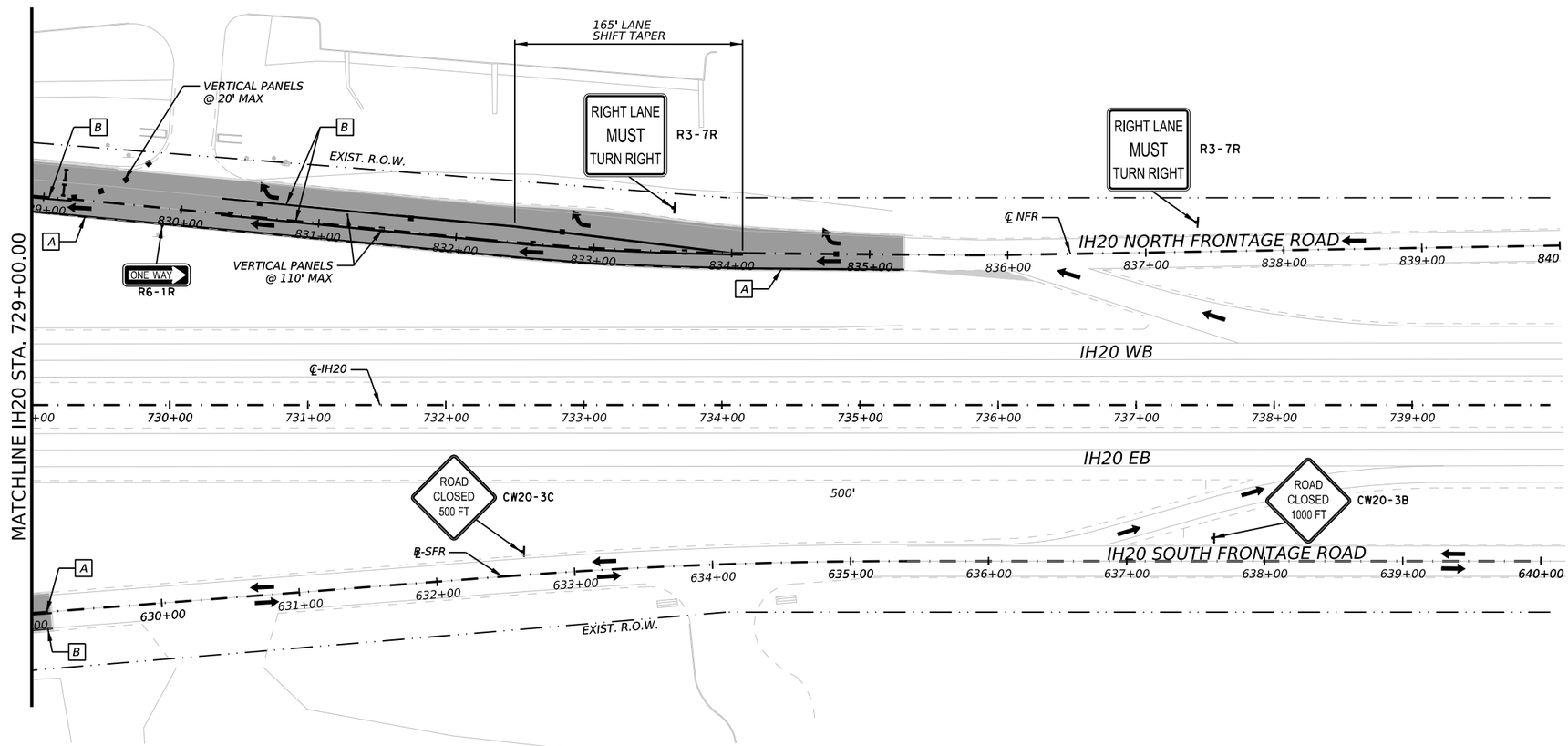

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SCALE IN FEET

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IH 20

TCP PH5 PLAN

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		46

DATE: 1/30/2024 2:37:29 PM
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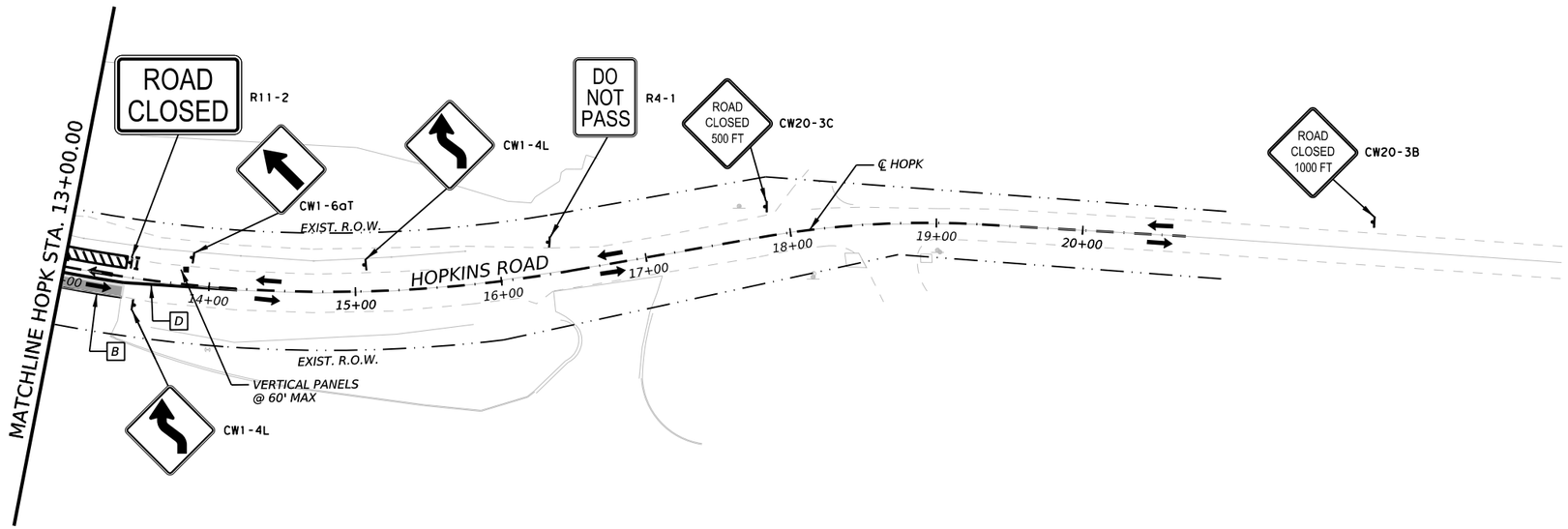

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SCALE IN FEET

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IH 20

TCP PH5 PLAN

SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		47

DATE: 1/30/2024 2:37:30 PM
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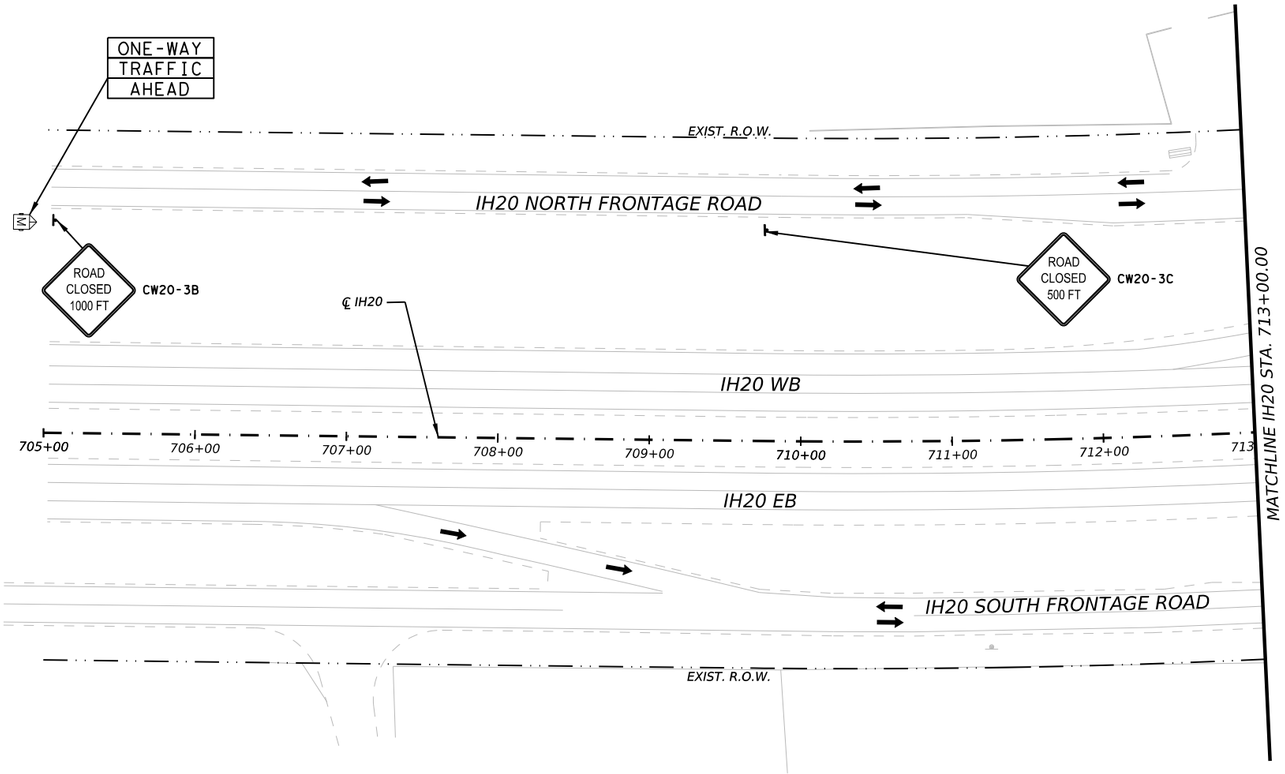

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IH 20

TCP PH6 PLAN

SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		48

DATE: 1/30/2024 2:37:47 PM
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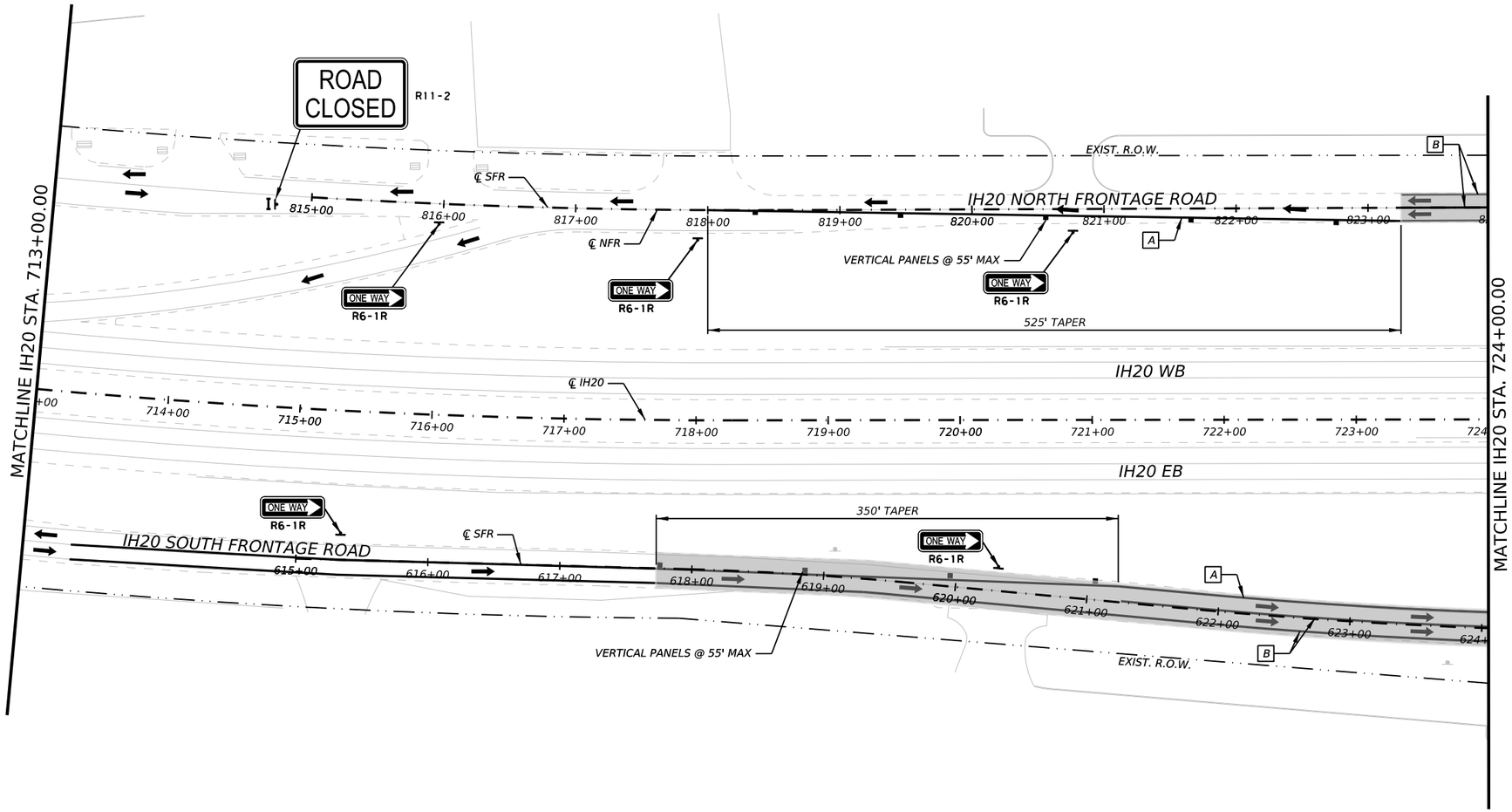

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LICENSED PROFESSIONAL ENGINEER

1/30/2024

AECOM
13355 Noel Road, Suite 400
Dallas, Texas 72540
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

TCP PH6 PLAN

SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		49

DATE: 1/30/2024 2:37:47 PM
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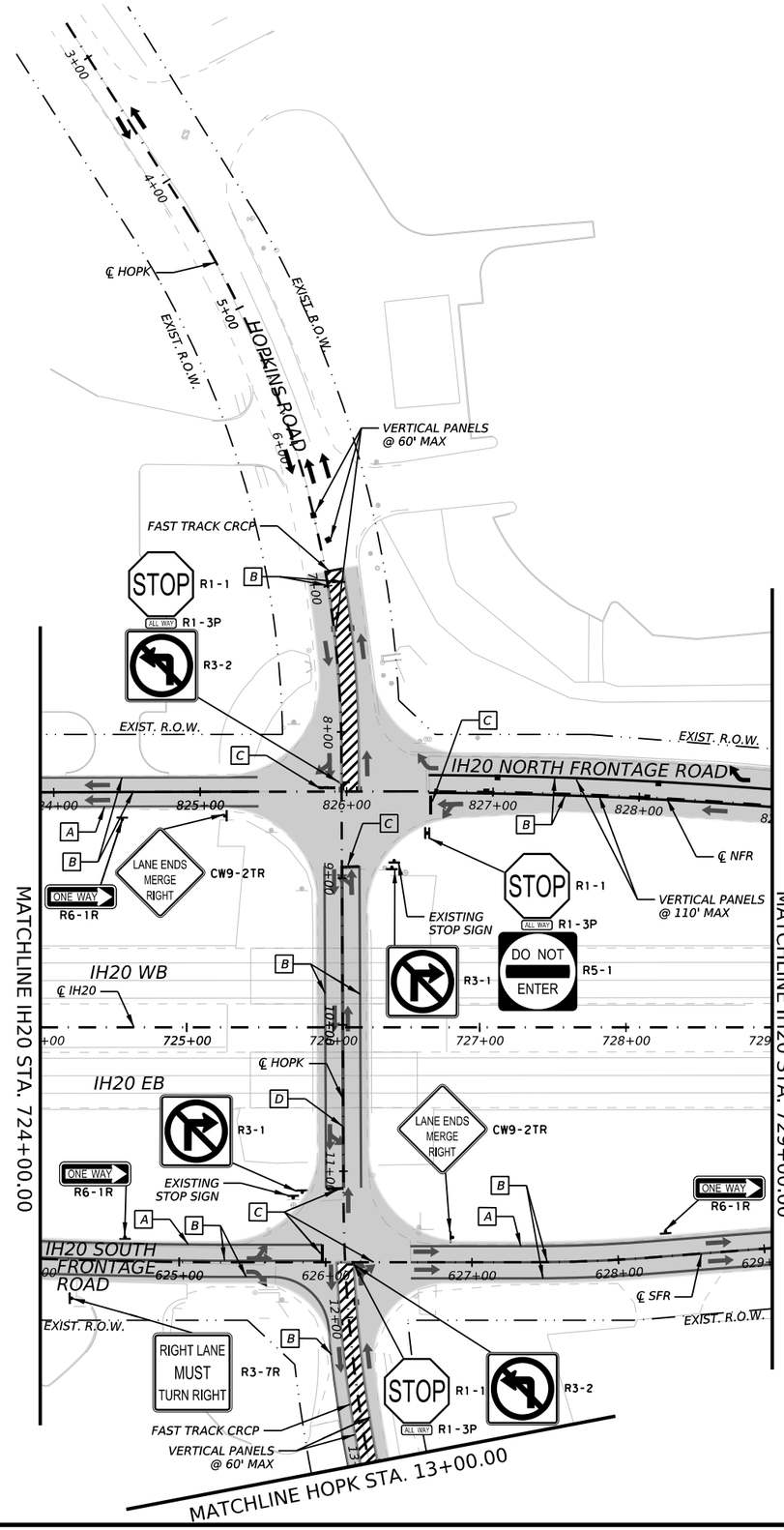

N

0 50 100

SCALE IN FEET

LEGEND

- PERMANENT PAVEMENT CONSTRUCTION IN THIS PHASE
- PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TEMPORARY PAVEMENT CONSTRUCTION IN THIS PHASE
- TEMPORARY PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TRAFFIC FLOW
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- A — WRK ZN PAV MRK (REM)(Y)(6")(SLD)
- B — WRK ZN PAV MRK (REM)(W)(6")(SLD)
- C — WRK ZN PAV MRK (REM)(W)(24")(SLD)
- D — WRK ZN PAV MRK (REM)(Y)(6")(SLD)(DBL)
- E — WRK ZN PAV MRK (REM)(Y)(6")(DOT)
- TRUCK MOUNTED ATTENUATOR (TMA)
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED
PROFESSIONAL ENGINEER

1/30/2024

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Texas Department of Transportation

IH 20

TCP PH6 PLAN

SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		50

DATE: 1/30/2024 2:37:48 PM
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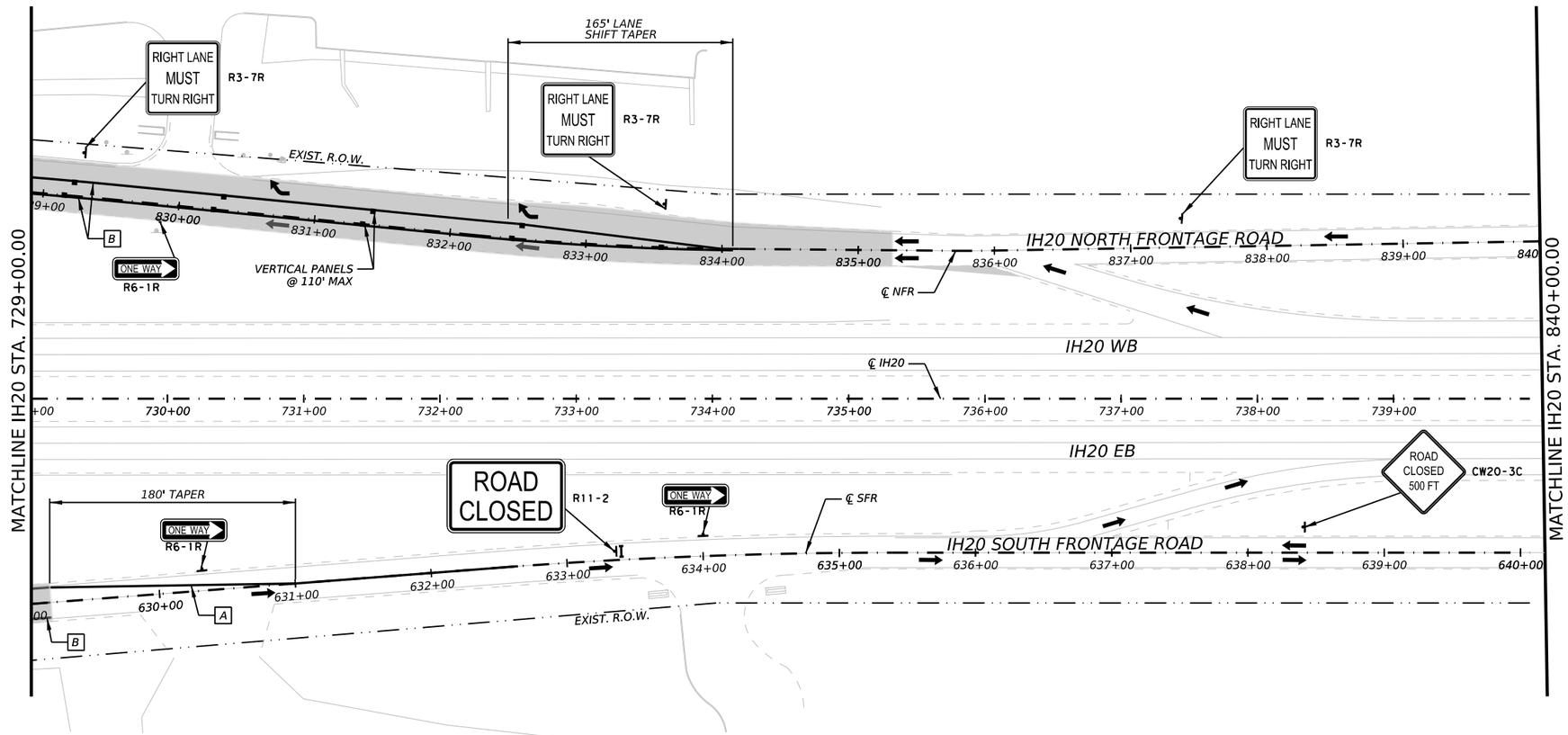

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SCALE IN FEET

LEGEND

- PERMANENT PAVEMENT CONSTRUCTION IN THIS PHASE
- PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TEMPORARY PAVEMENT CONSTRUCTION IN THIS PHASE
- TEMPORARY PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TRAFFIC FLOW
- CHANNELIZING DEVICES
- TYPE III BARRICADE
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- B — WRK ZN PAV MRK (REM)(W)(6")(SLD)
- C — WRK ZN PAV MRK (REM)(W)(24")(SLD)
- D — WRK ZN PAV MRK (REM)(Y)(6")(SLD)(DBL)
- E — WRK ZN PAV MRK (REM)(Y)(6")(DOT)
- TRUCK MOUNTED ATTENUATOR (TMA)
- M — PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

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Texas Department of Transportation

IH 20

TCP PH6 PLAN

SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		51

DATE: 1/30/2024 2:37:48 PM
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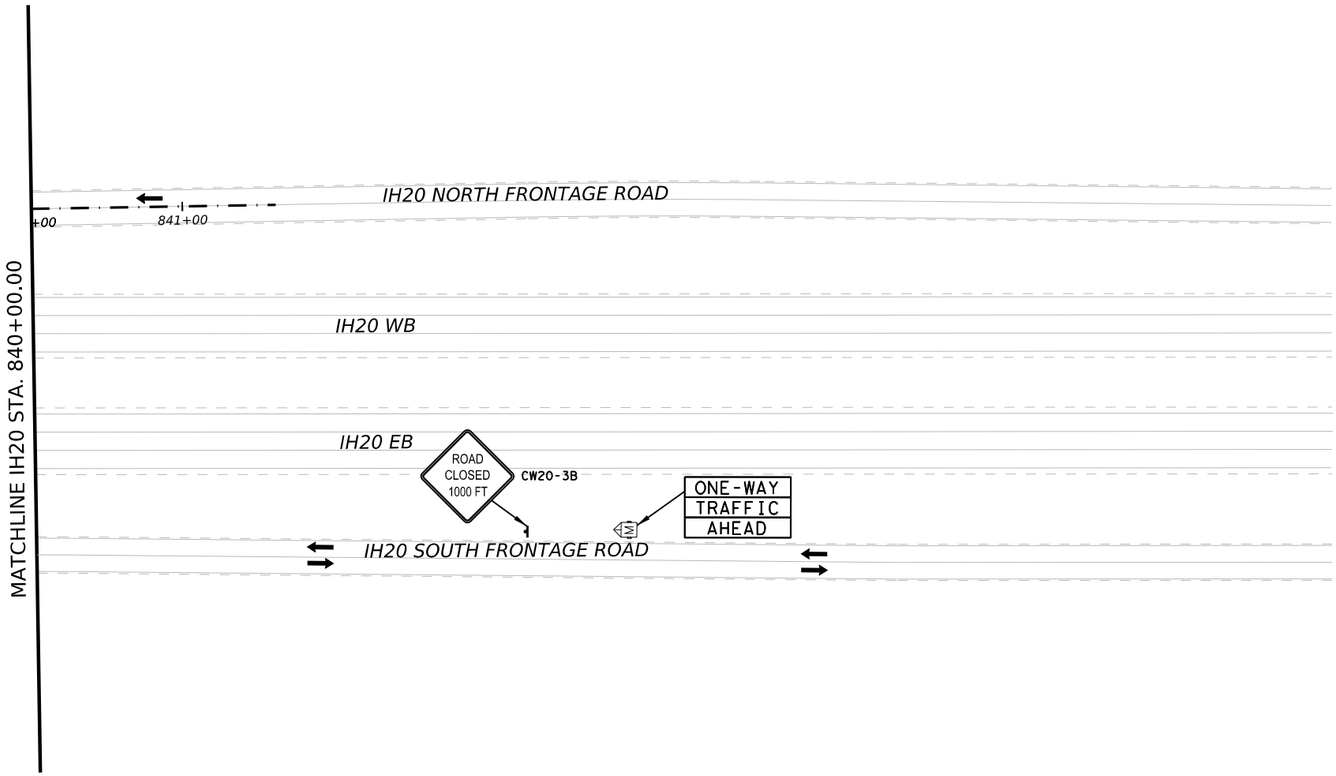

LEGEND

- PERMANENT PAVEMENT CONSTRUCTION IN THIS PHASE
- PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TEMPORARY PAVEMENT CONSTRUCTION IN THIS PHASE
- TEMPORARY PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TRAFFIC FLOW
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- A — WRK ZN PAV MRK (REM)(Y)(6")(SLD)
- B — WRK ZN PAV MRK (REM)(W)(6")(SLD)
- C — WRK ZN PAV MRK (REM)(W)(24")(SLD)
- D — WRK ZN PAV MRK (REM)(Y)(6")(SLD)(DBL)
- E — WRK ZN PAV MRK (REM)(Y)(6")(DOT)
- TRUCK MOUNTED ATTENUATOR (TMA)
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

AECOM TBPE NO: F-3580

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IH 20

TCP PH6 PLAN

SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		52

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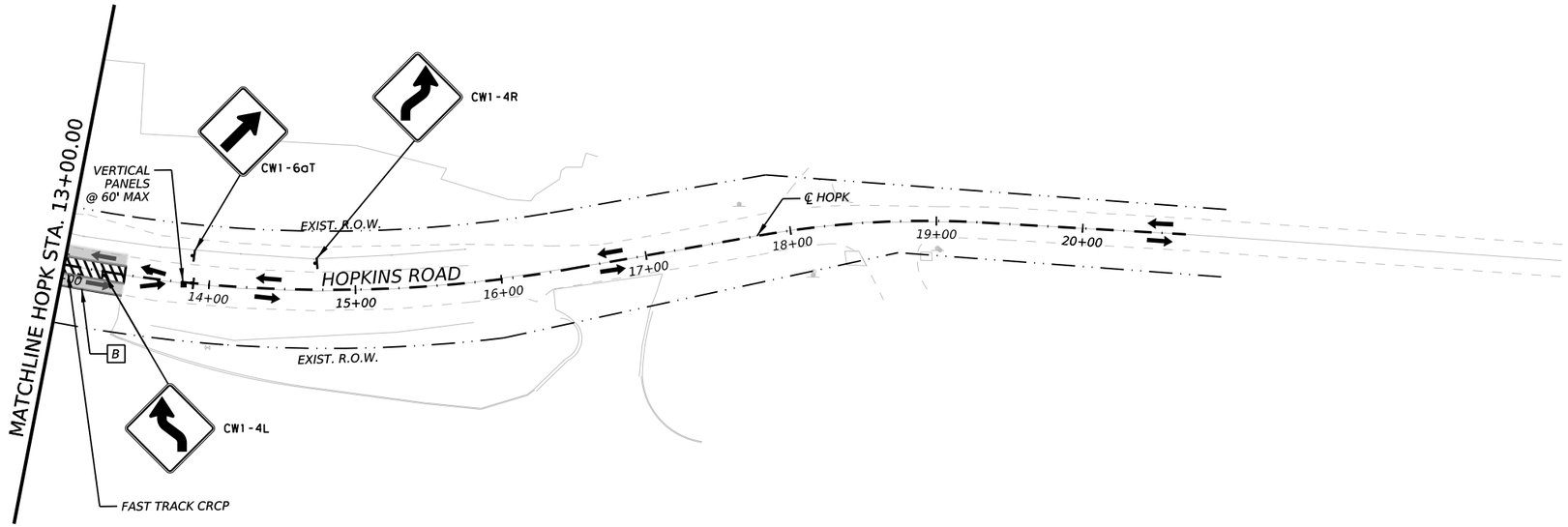

0 50 100

SCALE IN FEET

LEGEND

- PERMANENT PAVEMENT CONSTRUCTION IN THIS PHASE
- PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TEMPORARY PAVEMENT CONSTRUCTION IN THIS PHASE
- TEMPORARY PAVEMENT CONSTRUCTED IN PREVIOUS PHASE(S)
- TRAFFIC FLOW
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- A — WRK ZN PAV MRK (REM)(Y)(6")(SLD)
- B — WRK ZN PAV MRK (REM)(W)(6")(SLD)
- C — WRK ZN PAV MRK (REM)(W)(24")(SLD)
- D — WRK ZN PAV MRK (REM)(Y)(6")(SLD)(DBL)
- E — WRK ZN PAV MRK (REM)(Y)(6")(DOT)
- TRUCK MOUNTED ATTENUATOR (TMA)
- M — PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

AECOM TBPE NO: F-3580

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1/30/2024

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Texas Department of Transportation

IH 20

TCP PH6 PLAN

SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		53

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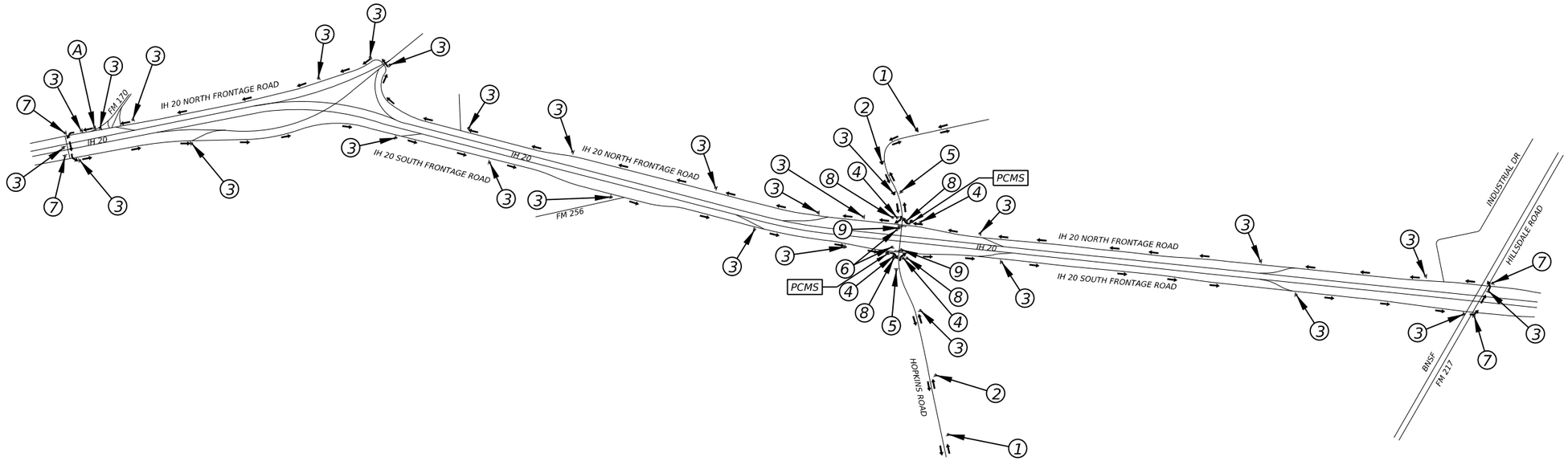
CK | DW | CK | DW



NOT TO SCALE

LEGEND

- SIGN
- TRAFFIC FLOW
- TYPE 3 BARRICADE
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

DETOUR LAYOUT

NTS

① ROAD CLOSED AHEAD — CW20-3	④ HOPKINS RD M4-12T / DETOUR M4-9R	⑦ HOPKINS RD M4-12T / DETOUR M4-9L
② DETOUR AHEAD — CW20-2	⑤ END DETOUR M4-8a / HOPKINS RD M4-12T	⑧ R3-2
③ HOPKINS RD M4-12T / DETOUR M4-9S	⑥ ROAD CLOSED TO THRU TRAFFIC — R11-4	⑨ ROAD CLOSED — R11-2
	Ⓐ 13'-4" — CW12-2	

AECOM TBPE NO: F-3580

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1/30/2024

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Texas Department of Transportation

IH 20

DETOUR LAYOUT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		54

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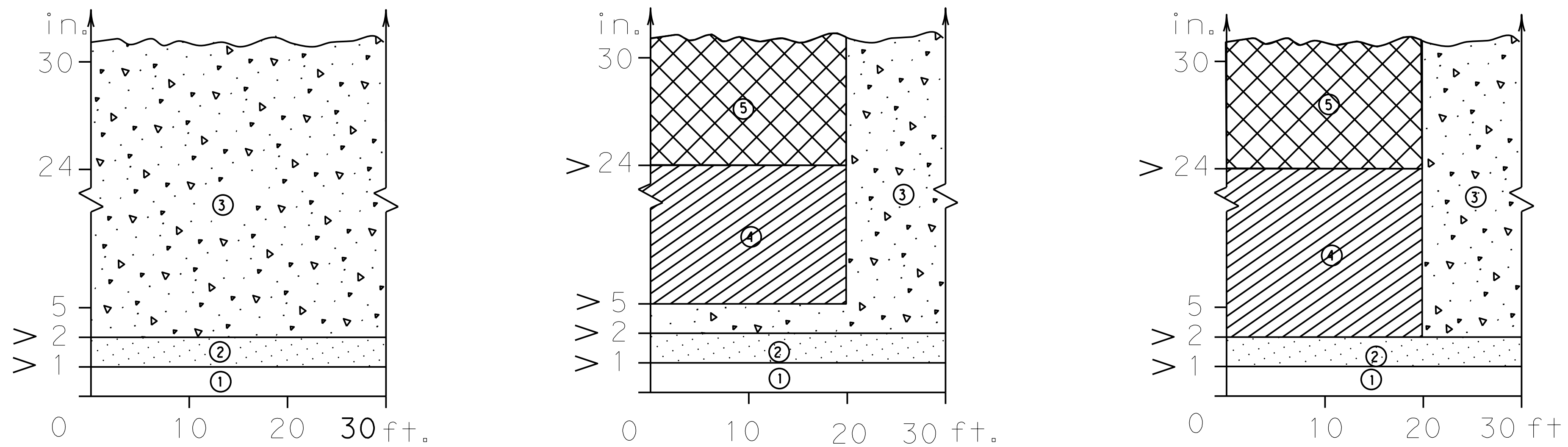
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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)

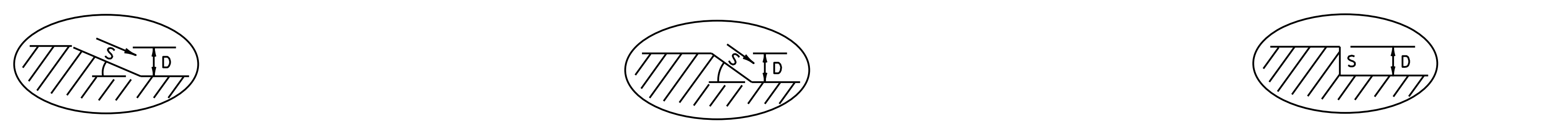
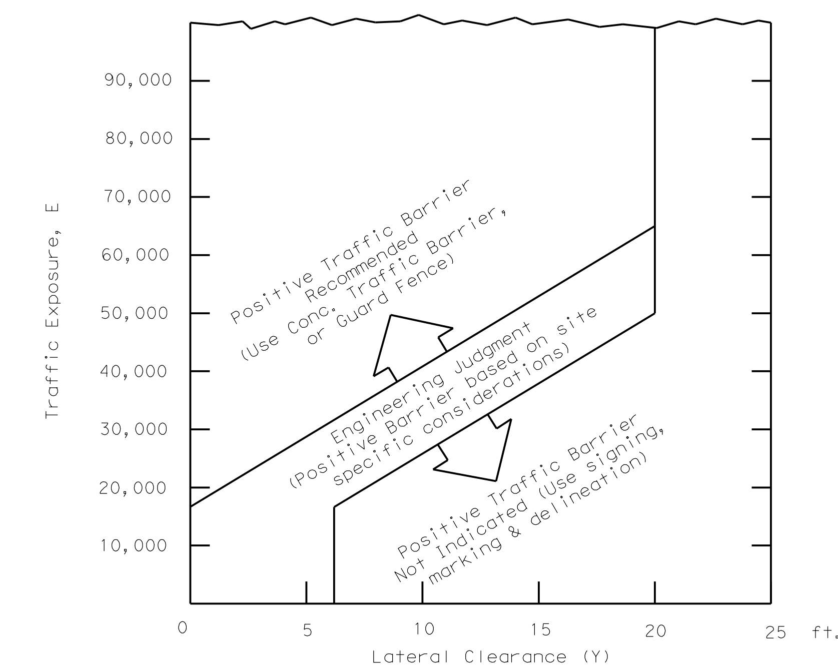
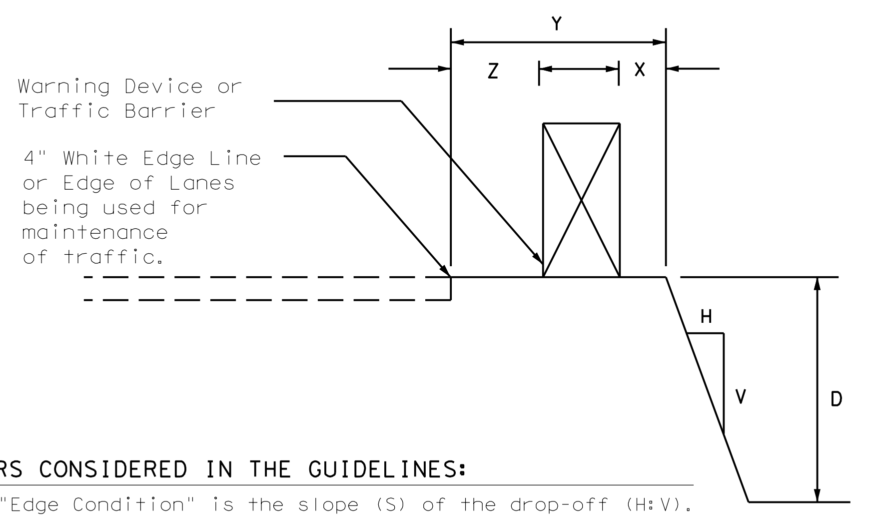


FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5



1. E = ADT x T
   Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.
2. Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.
3. An approved end treatment should be provided for any positive barrier end located within the clear zone.



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

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.

FACTORS CONSIDERED IN THE GUIDELINES:

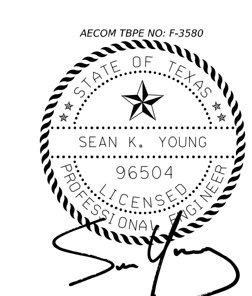
1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".
2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of 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.

Edge Condition Notes:

1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.
2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.
3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.
4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

Engineer's Seal

AECOM TBPE NO: F-3580



Date 1/30/2024

Texas Department of Transportation

Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

FILE: edgecon.dgn	DN:	CK:	DW:	CK:
© TxDOT August 2000	CONT 0006	SECT 02	JOB 130	HIGHWAY IH 20
REVISIONS 03-01 08-01 9-21	DIST ABL	COUNTY NOLAN		SHEET NO. 55

DATE: 1/30/2024 2:38:30 PM
FILE: pw://aecom-na-pw.bentley.com:AECOM_USA_Texas/Documents/60706605-IH 20

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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

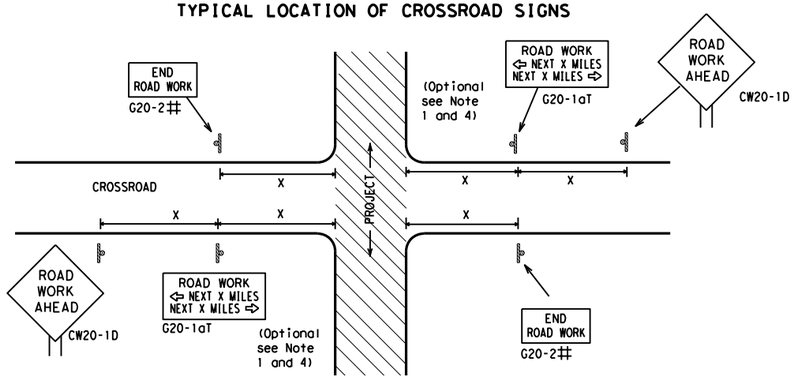
Traffic Safety Division Standard

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	0006	02	130	IH 20
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	ABL	NOLAN		56
5-10 5-21				

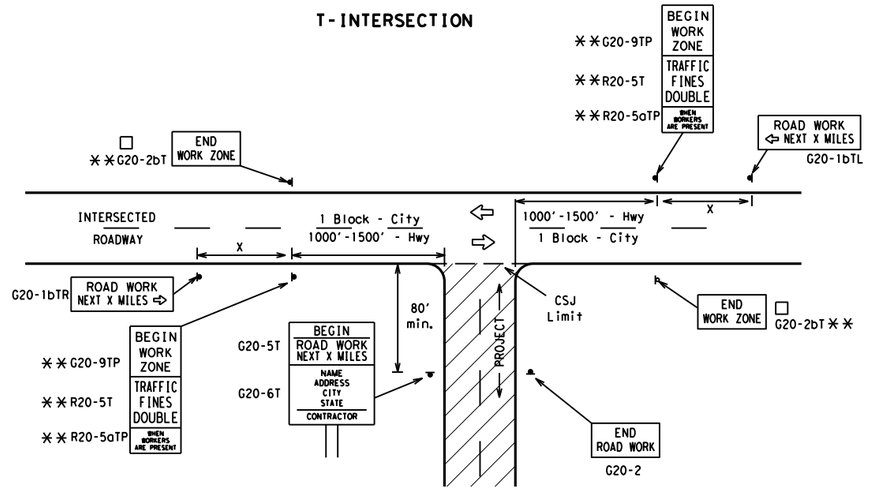
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

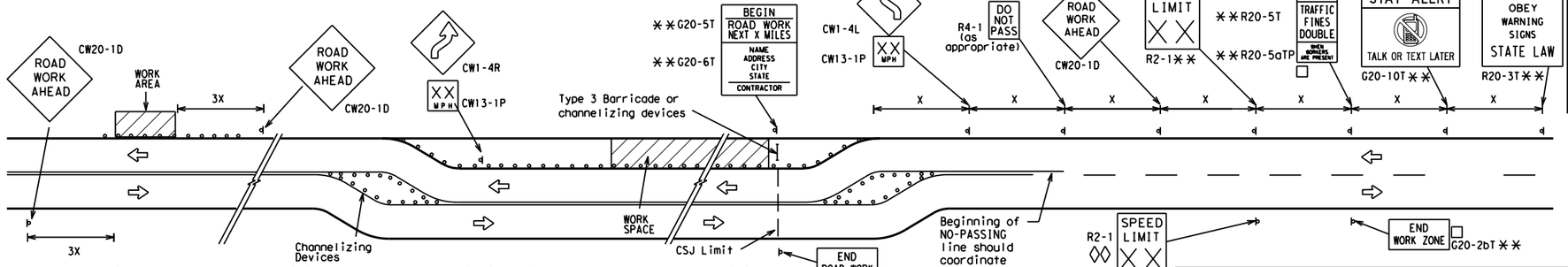
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

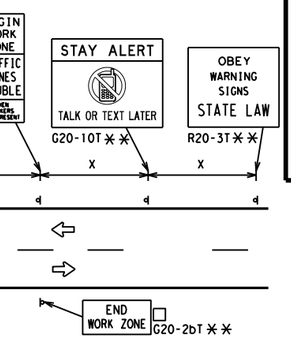
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

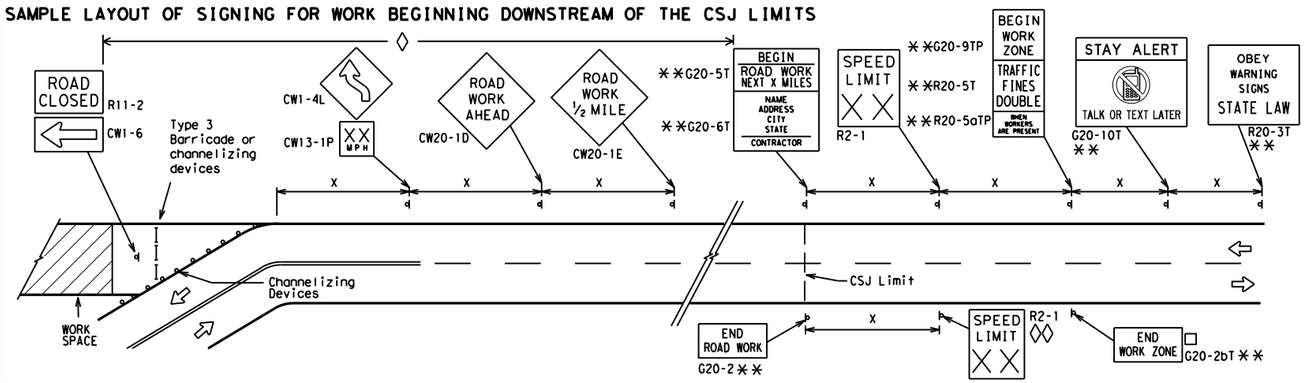


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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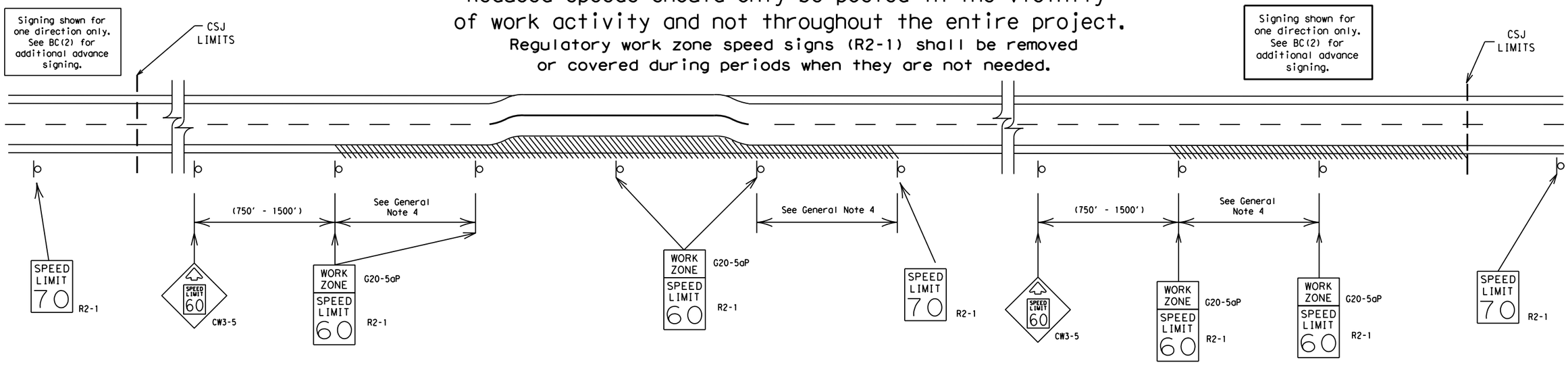
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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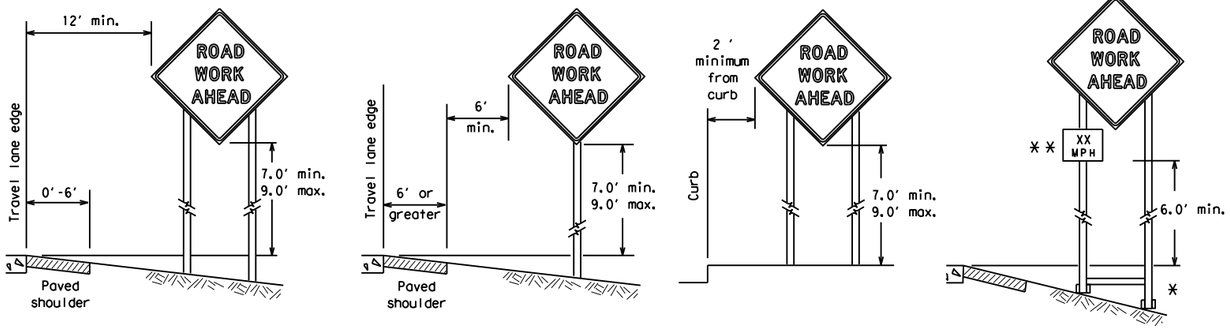
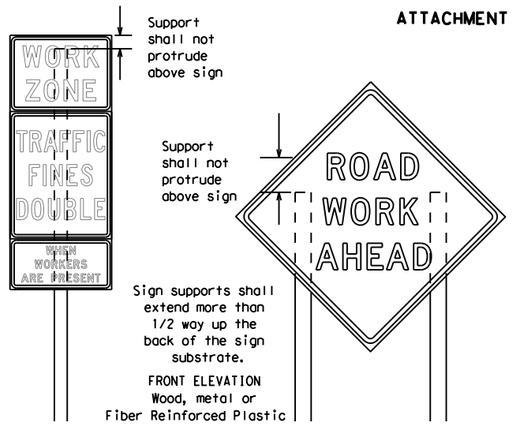
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

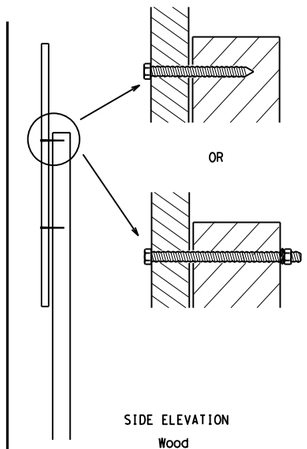


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





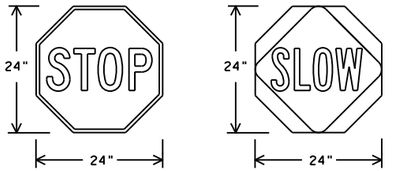
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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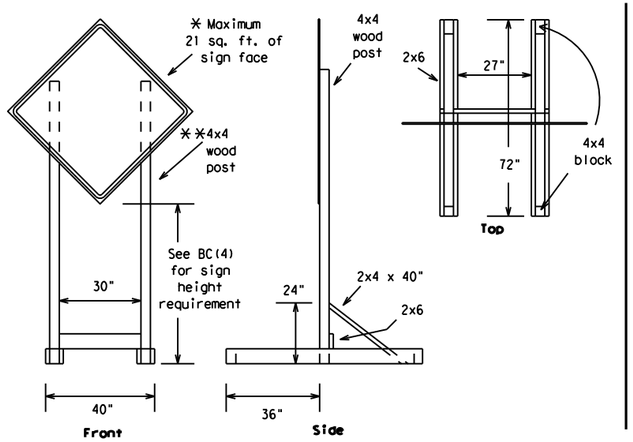
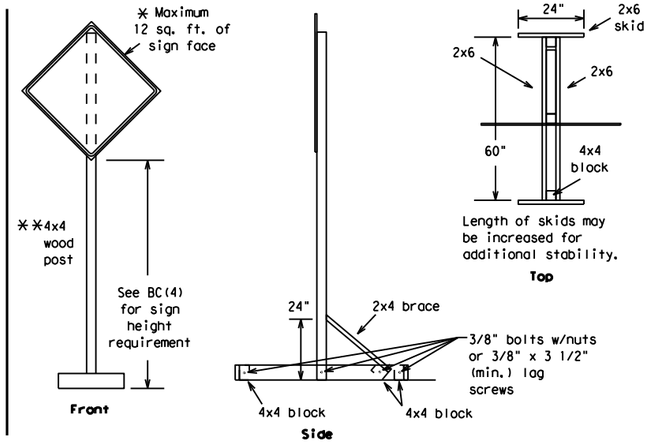
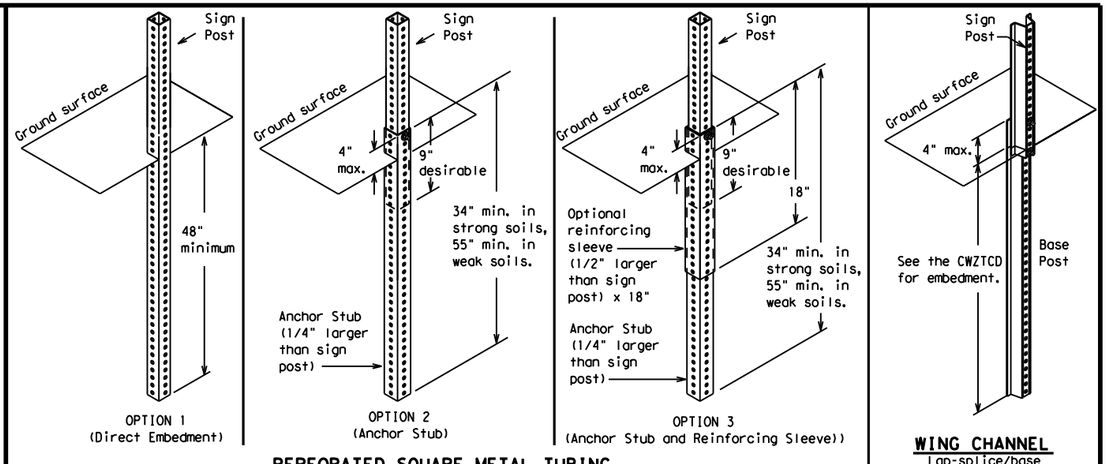




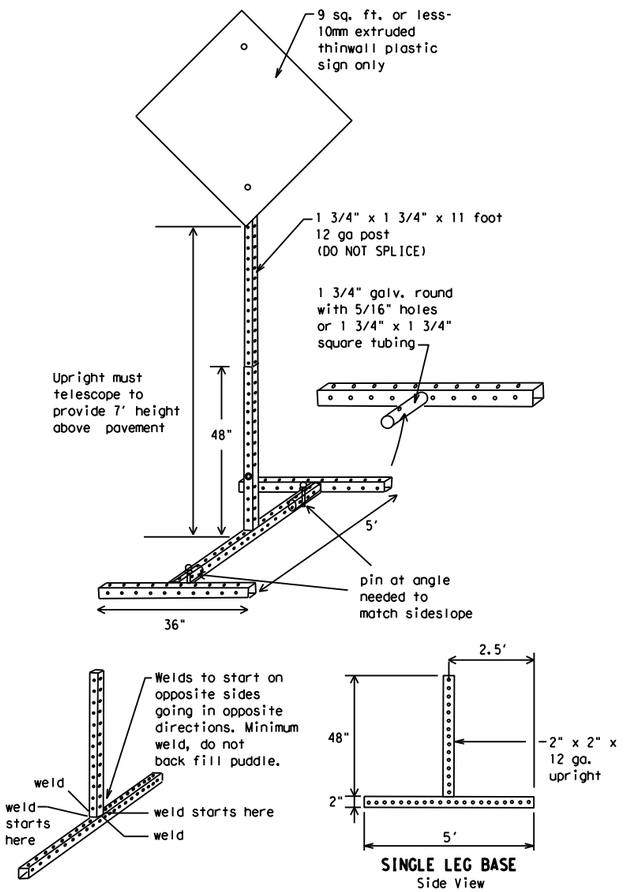
SKID MOUNTED WOOD SIGN SUPPORTS

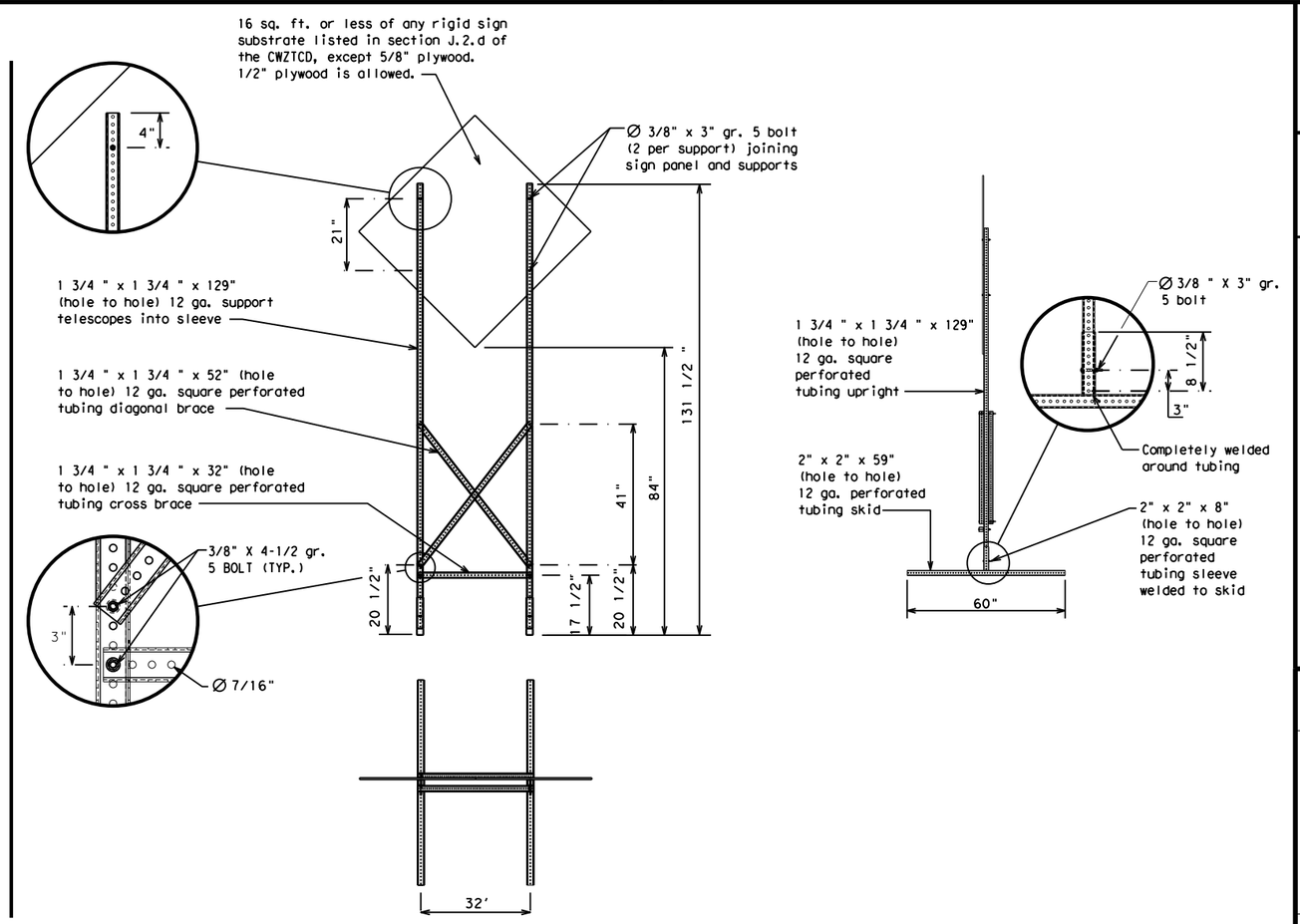
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



GROUND MOUNTED SIGN SUPPORTS

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





SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

SHEET 5 OF 12

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
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	0006	02	130	IH 20
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	NOLAN		61

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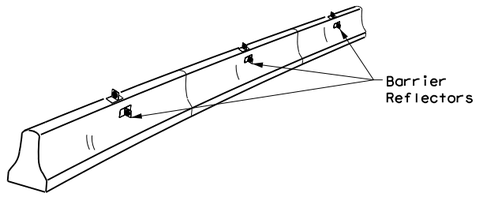
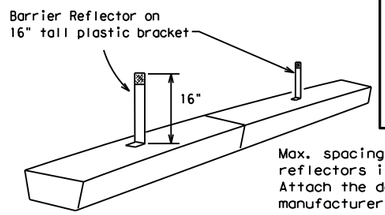
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



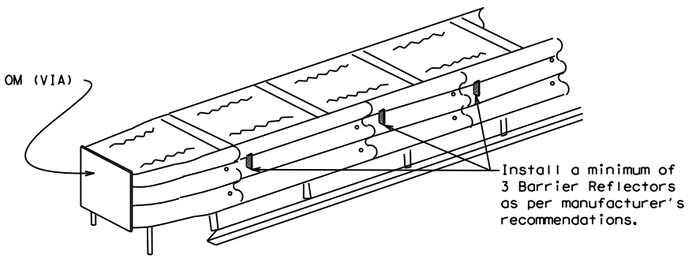
CONCRETE TRAFFIC BARRIER (CTB)

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)



DELINEATION OF END TREATMENTS

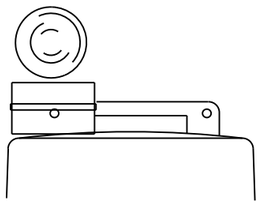
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

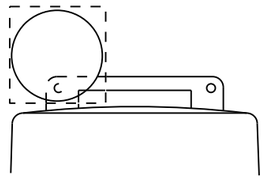
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

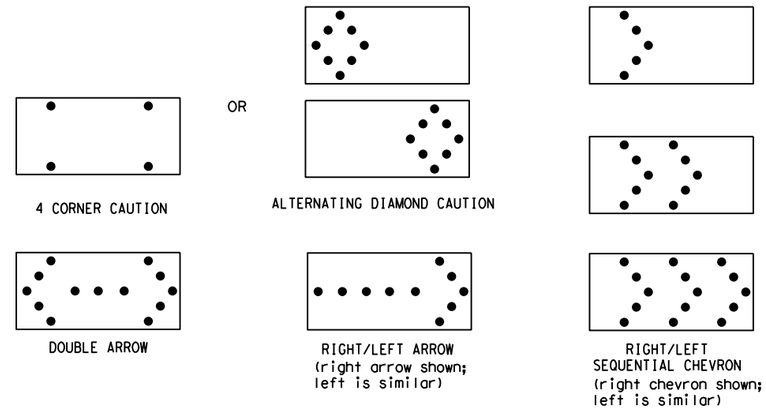
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

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	0006	02	130	IH 20
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	NOLAN		62

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DATE:
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

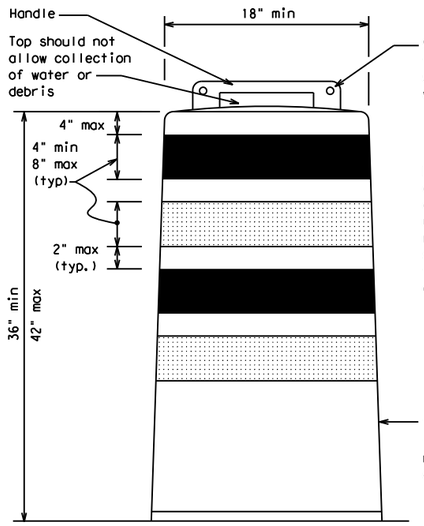
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

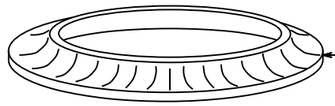
RETROREFLECTIVE SHEETING

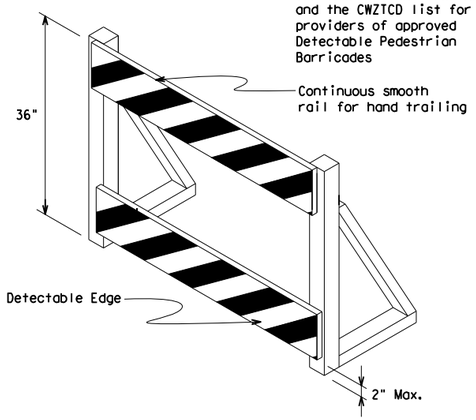
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

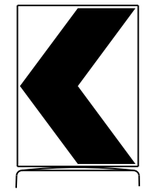




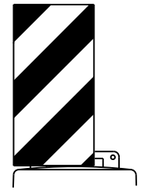


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	ABL	NOLAN		63
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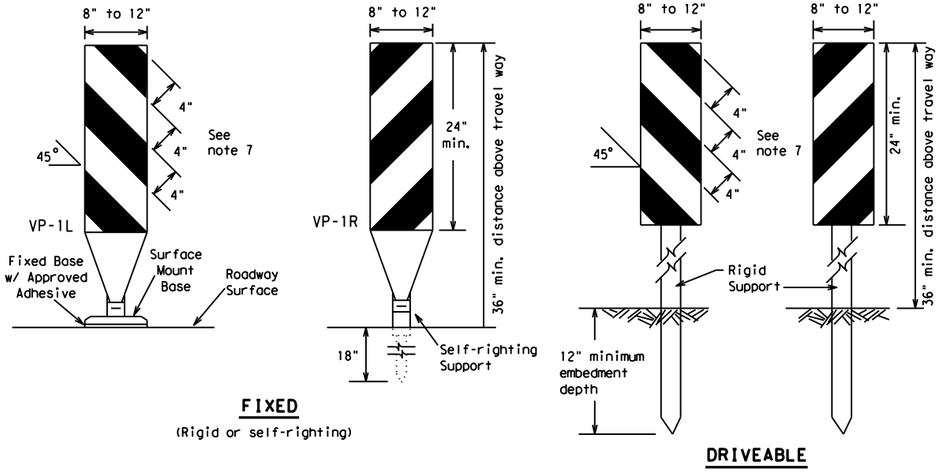
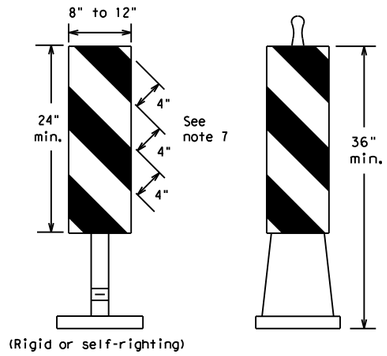


FIXED
(Rigid or self-righting)

DRIVEABLE

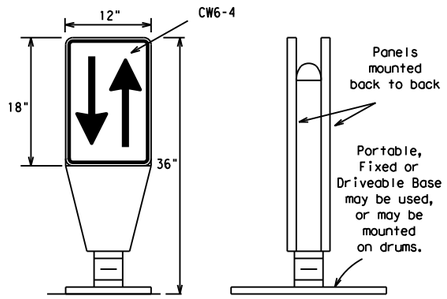


(Rigid or self-righting)

PORTABLE

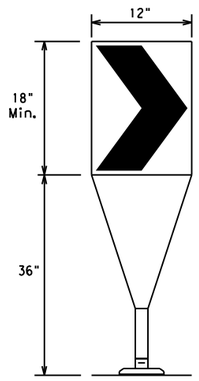
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



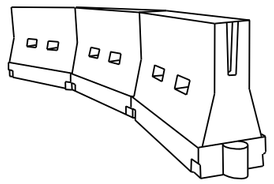
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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REVISIONS	0006	02	130	IH 20
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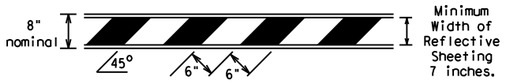
7-13 5-21	ABL	NOLAN		64

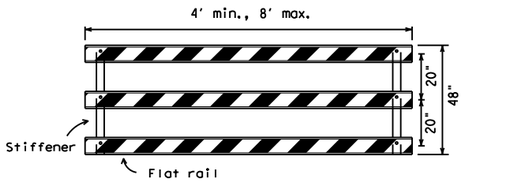
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



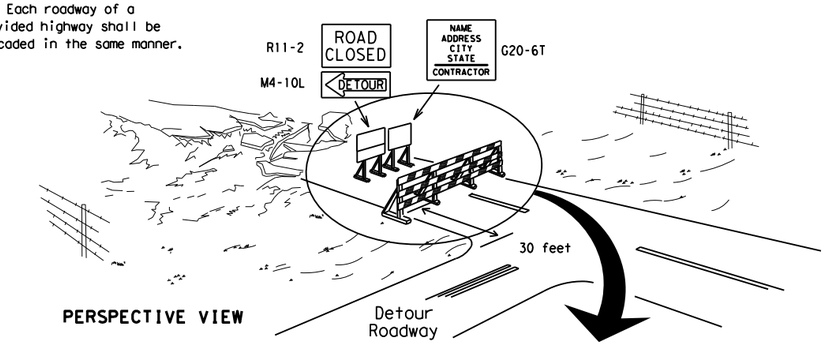
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

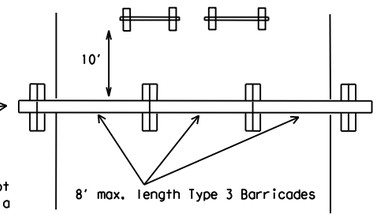
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

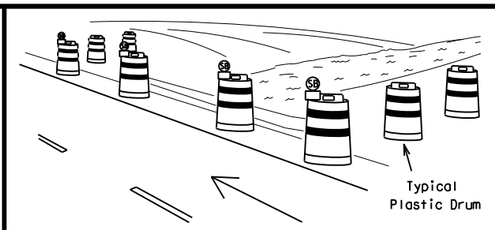
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

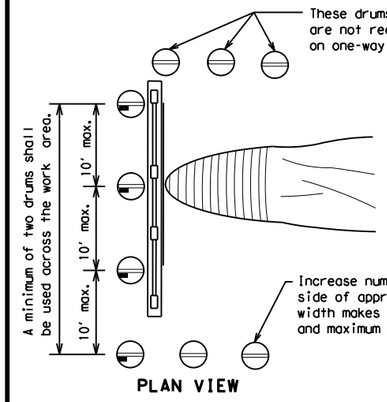
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

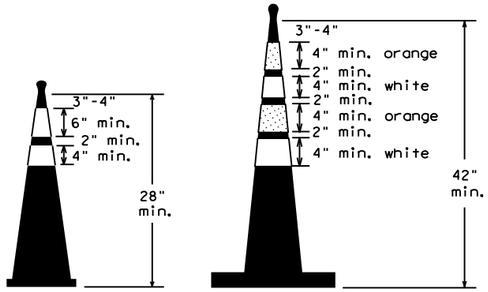
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

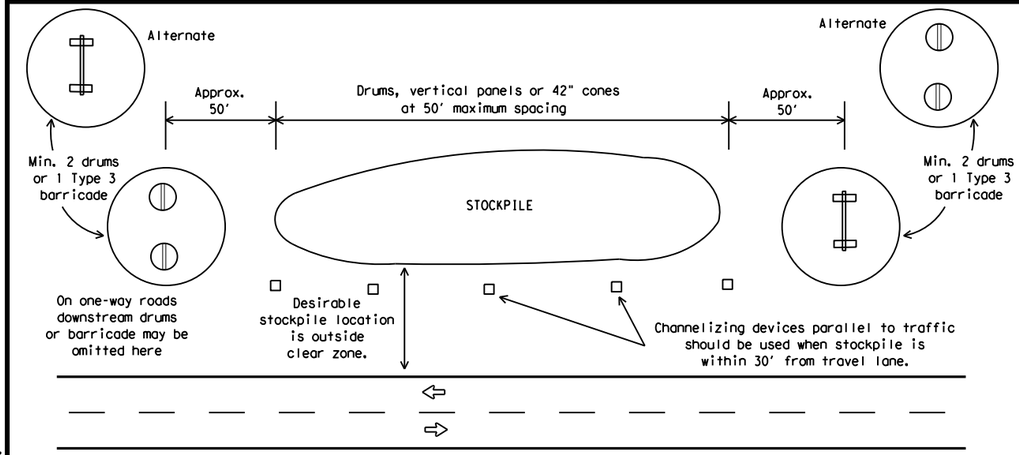
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



28" Cones shall have a minimum weight of 9 1/2 lbs.
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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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.

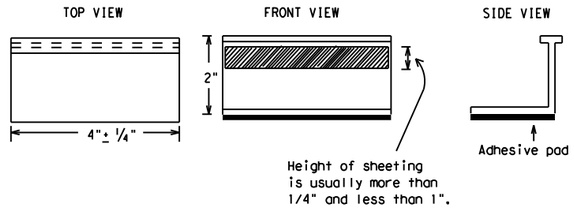
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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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1-02 7-13	ABL	NOLAN		66
11-02 8-14				

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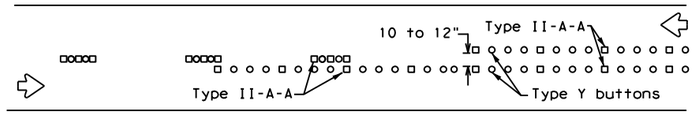
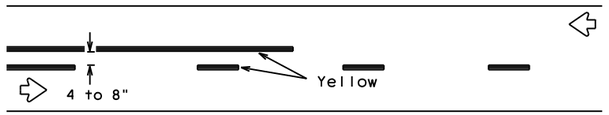
PAVEMENT MARKING PATTERNS

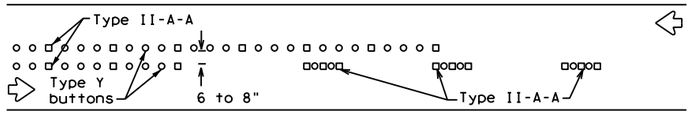
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



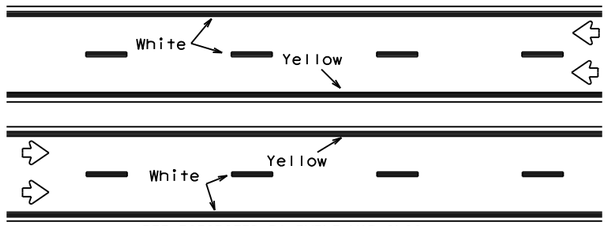
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



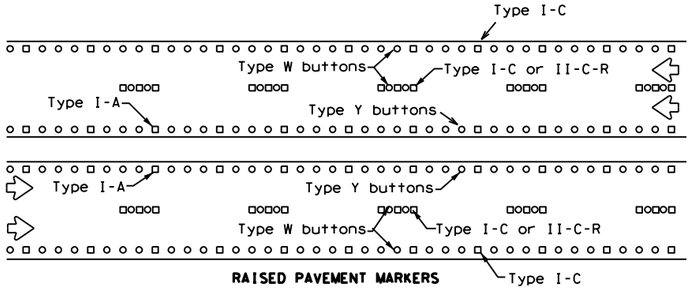
RAISED PAVEMENT MARKERS - PATTERN B

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

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



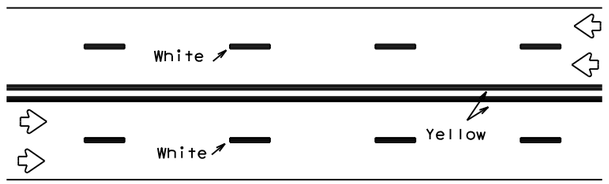
REFLECTORIZED PAVEMENT MARKINGS



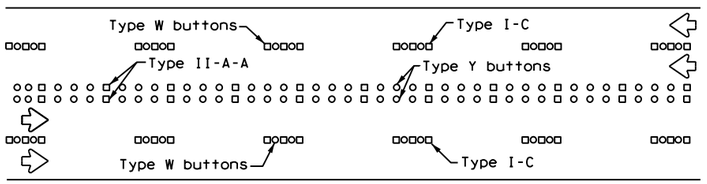
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



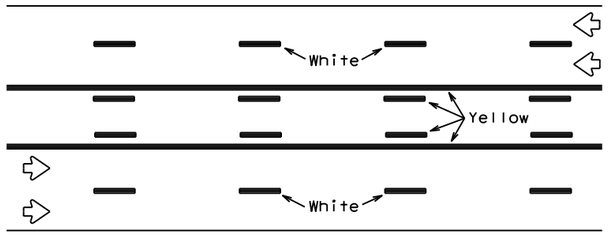
REFLECTORIZED PAVEMENT MARKINGS



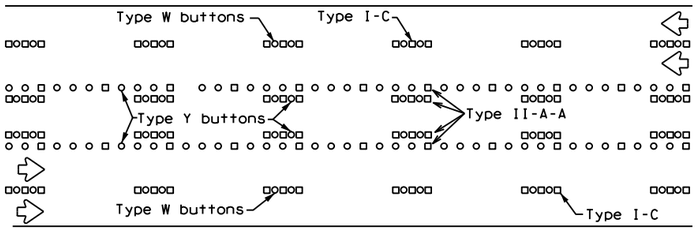
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

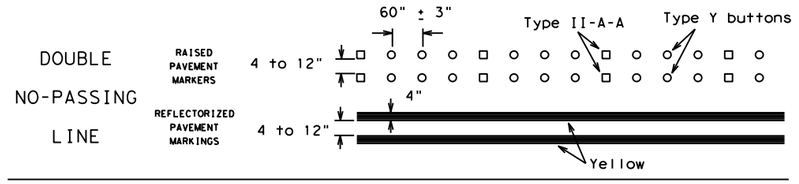
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

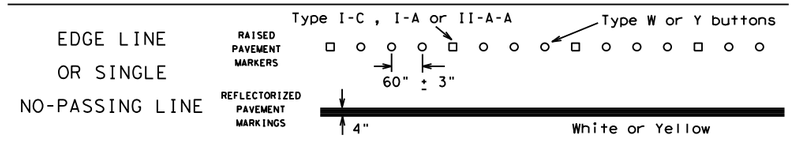
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

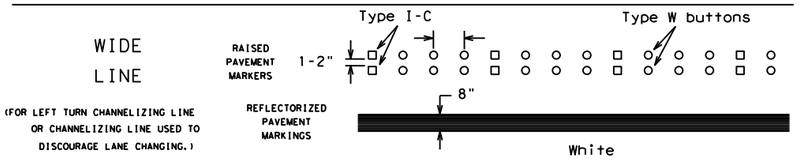


EDGE LINE OR SINGLE NO-PASSING LINE



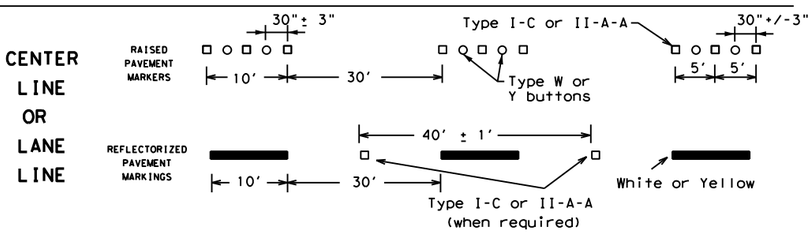
WIDE LINE

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

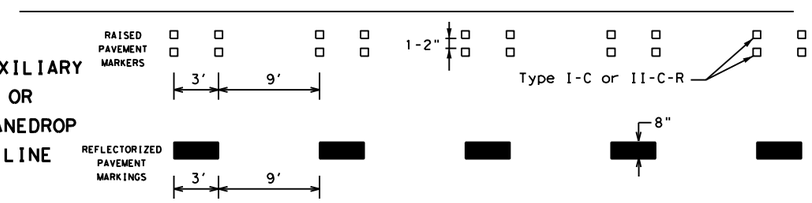


BROKEN LINES

CENTER LINE OR LANE LINE

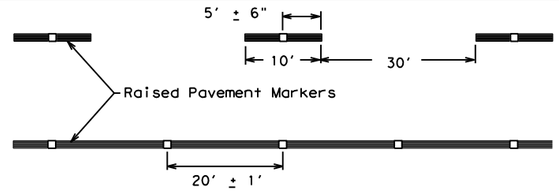


AUXILIARY OR LANEDROP LINE



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

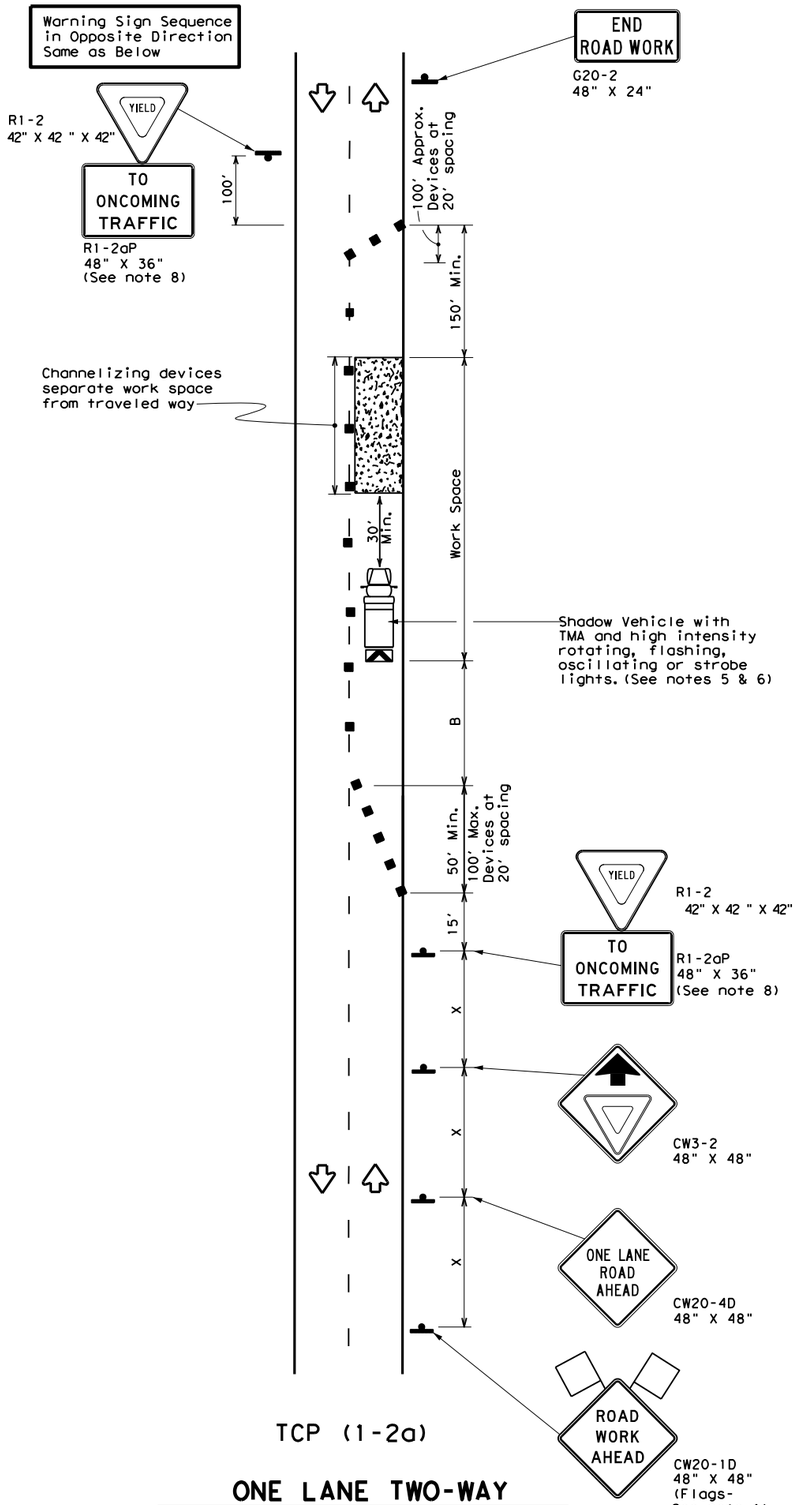
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

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	0006	02	130	IH 20
	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		67

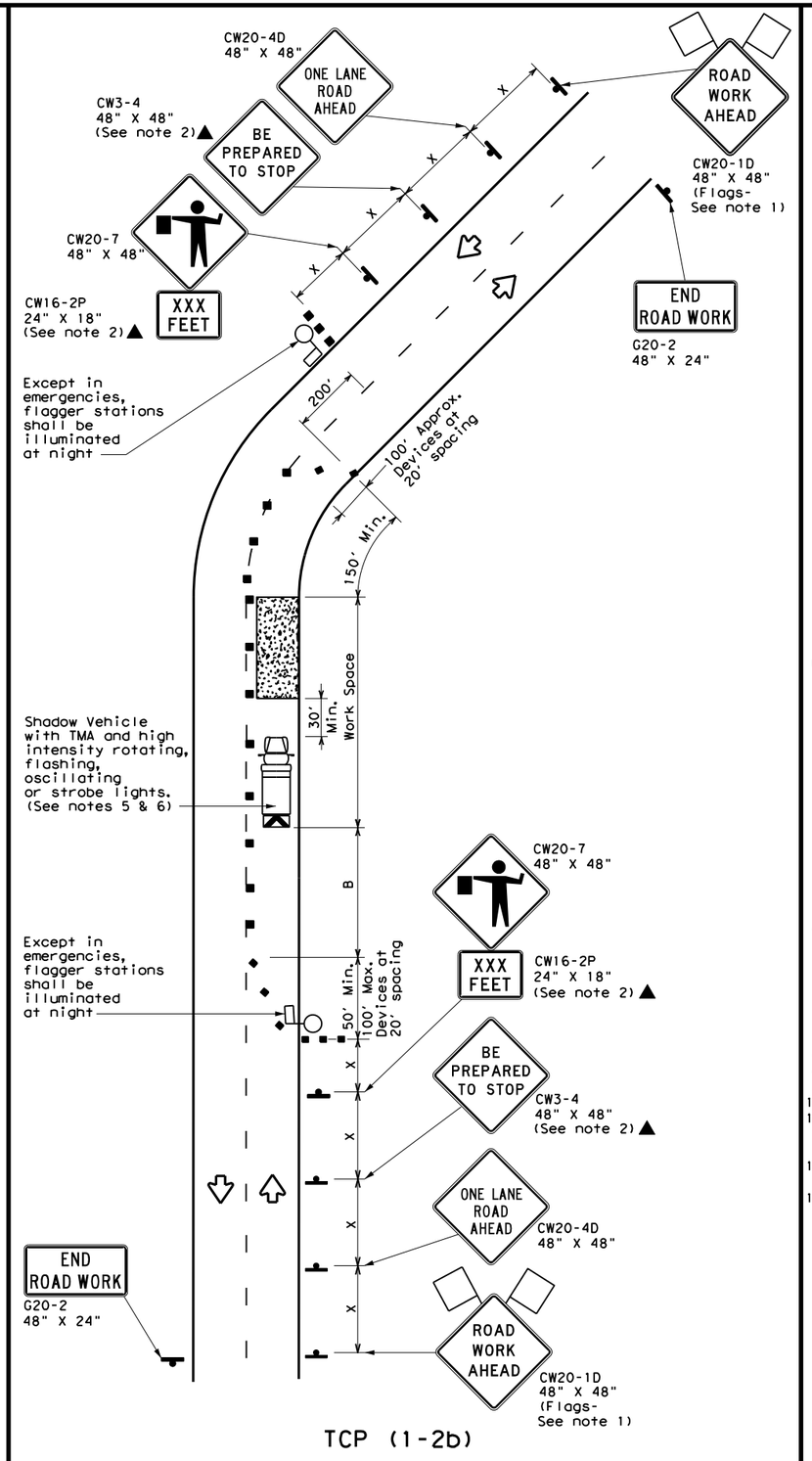
106

DATE:
FILE:



TCP (1-2a)

ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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

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

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
4-90 4-98	DIST	COUNTY		SHEET NO.
2-94 2-12	ABL	NOLAN		68
1-97 2-18				

DATE:
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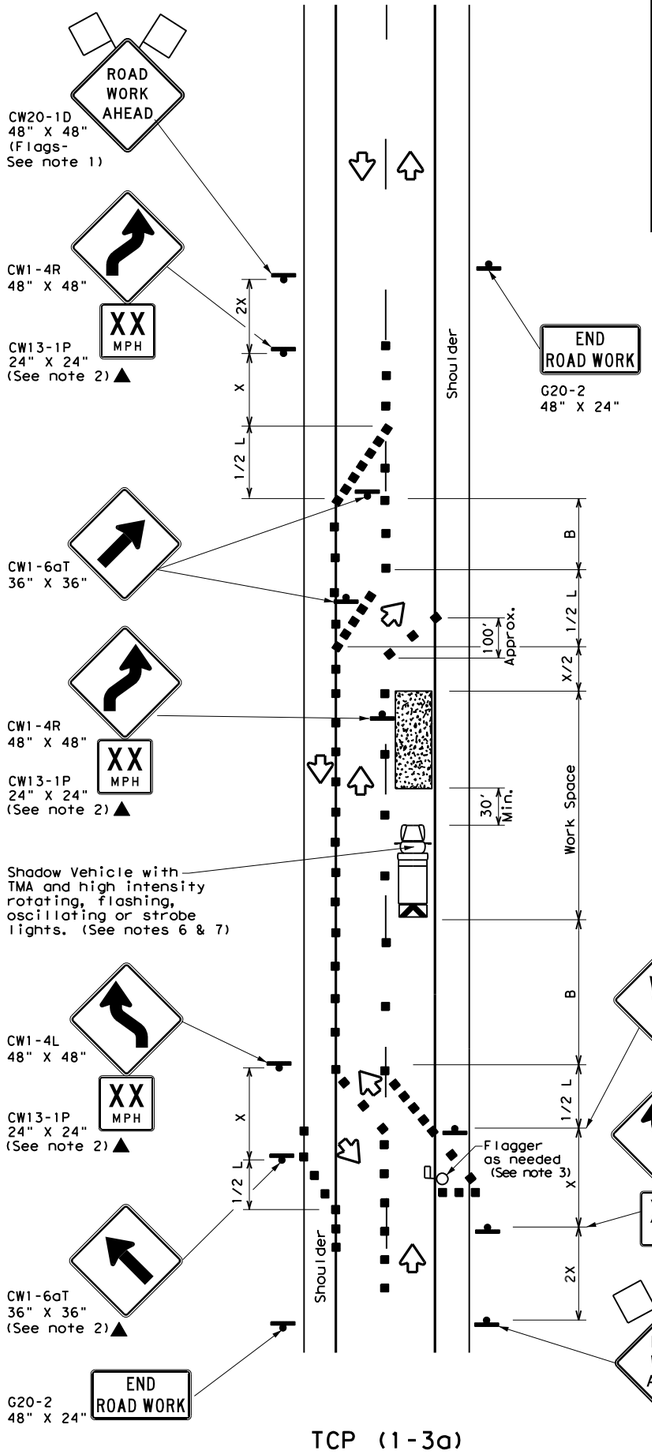


TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

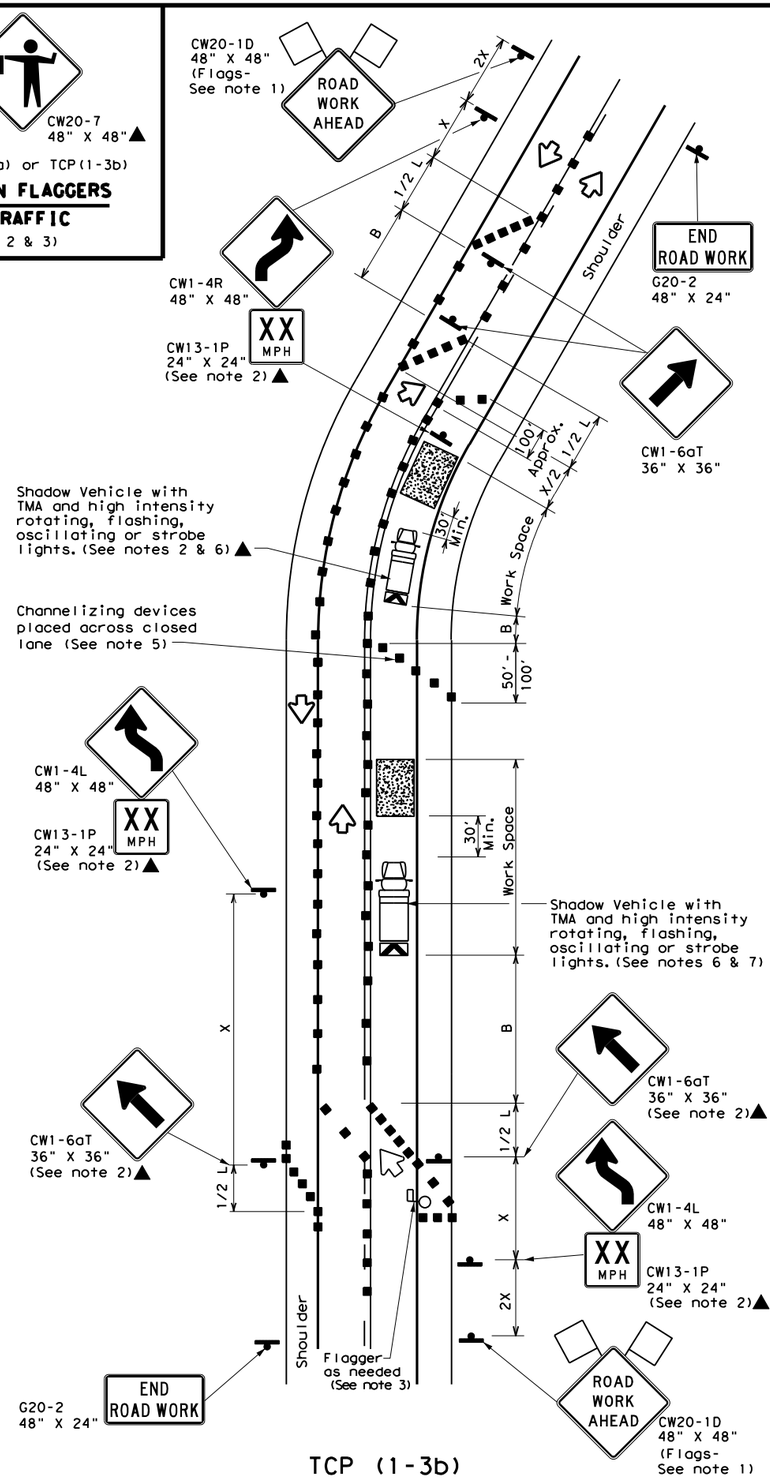
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW

BE PREPARED TO STOP
CW3-4 48" X 48"
CW20-7 48" X 48"

For either TCP(1-3a) or TCP(1-3b)

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC

(See Notes 2 & 3)



TCP (1-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
4. DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
5. When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
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 wider work spaces.
8. 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 speed 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 area of conflicting markings not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ABL	NOLAN		69
1-97 2-18				

153

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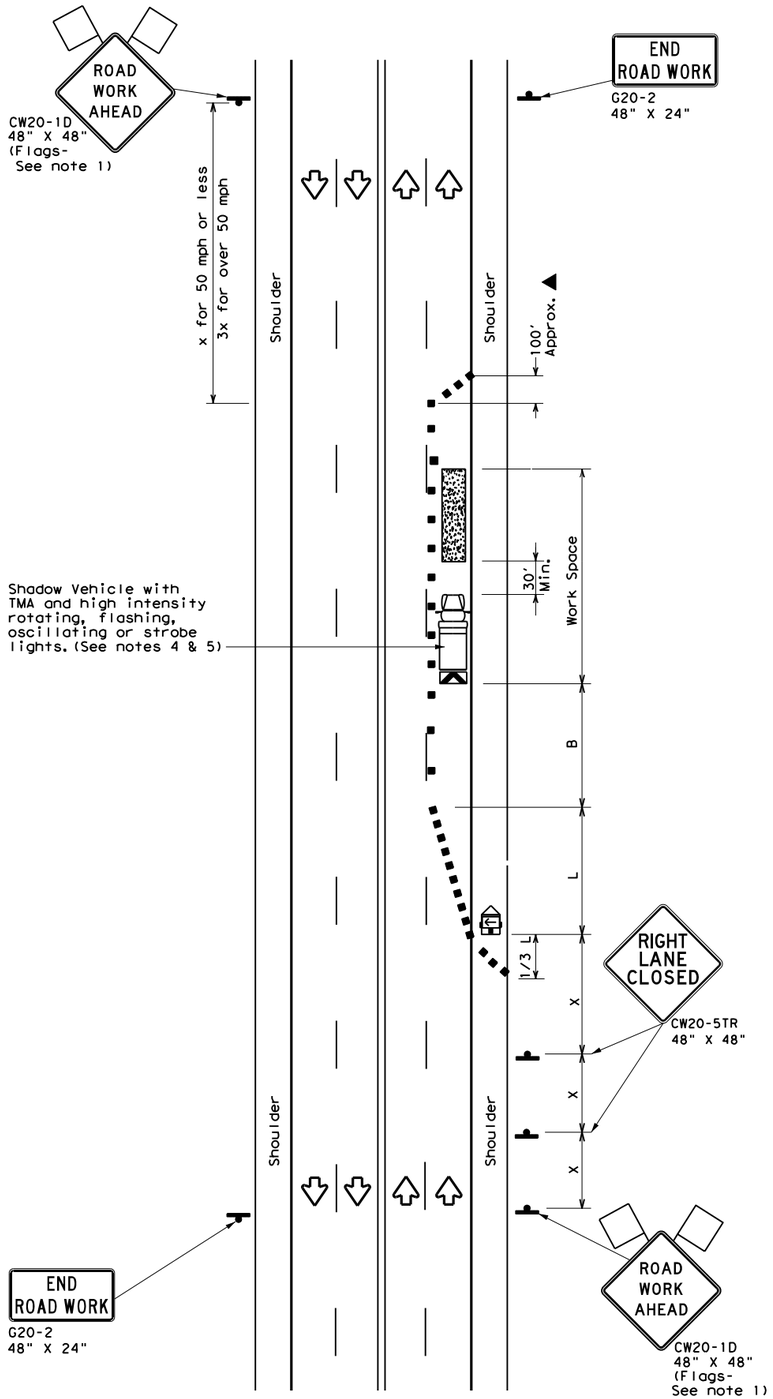
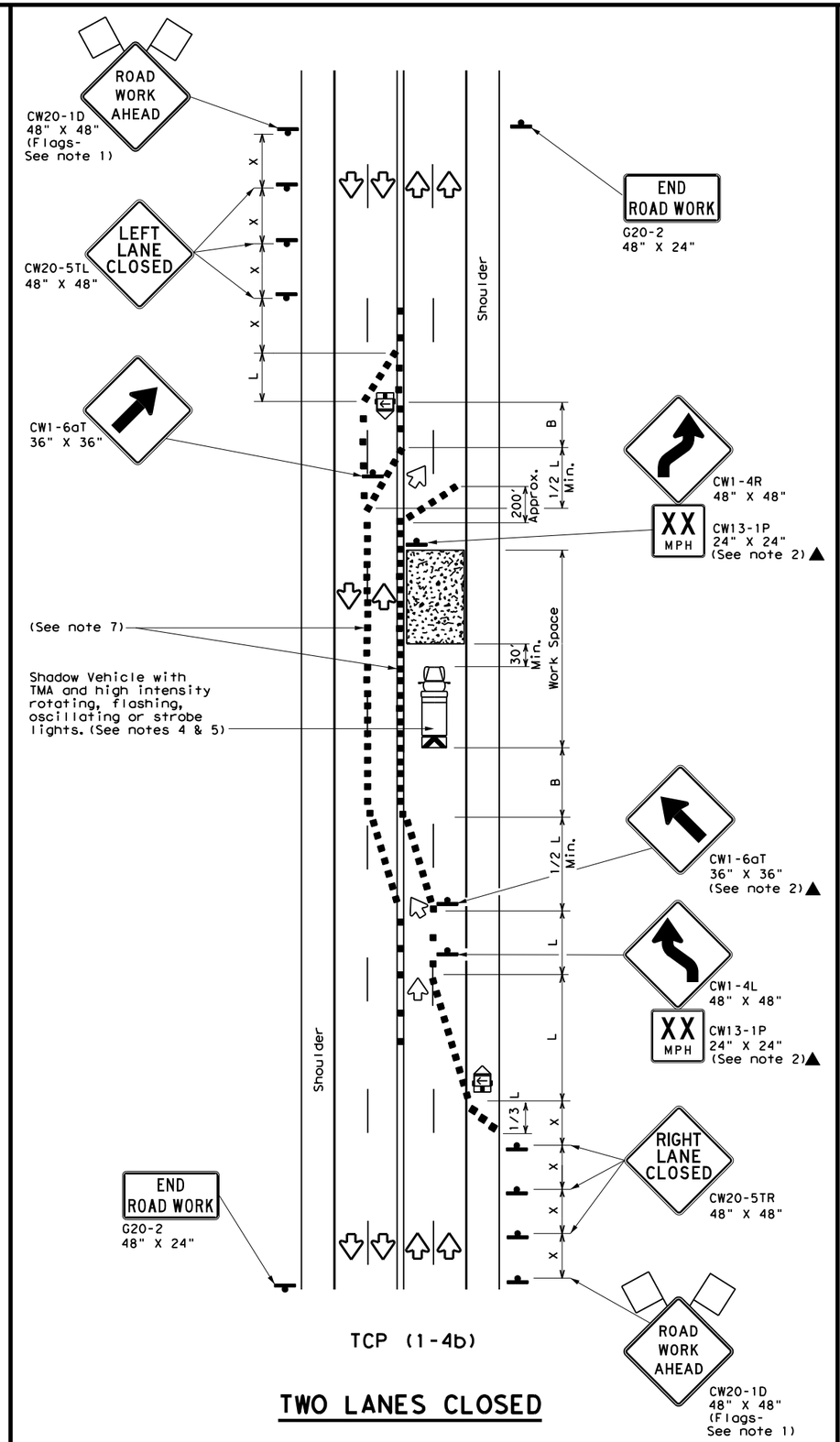


TCP (1-4a)

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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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ABL	NOLAN		70
1-97 2-18				

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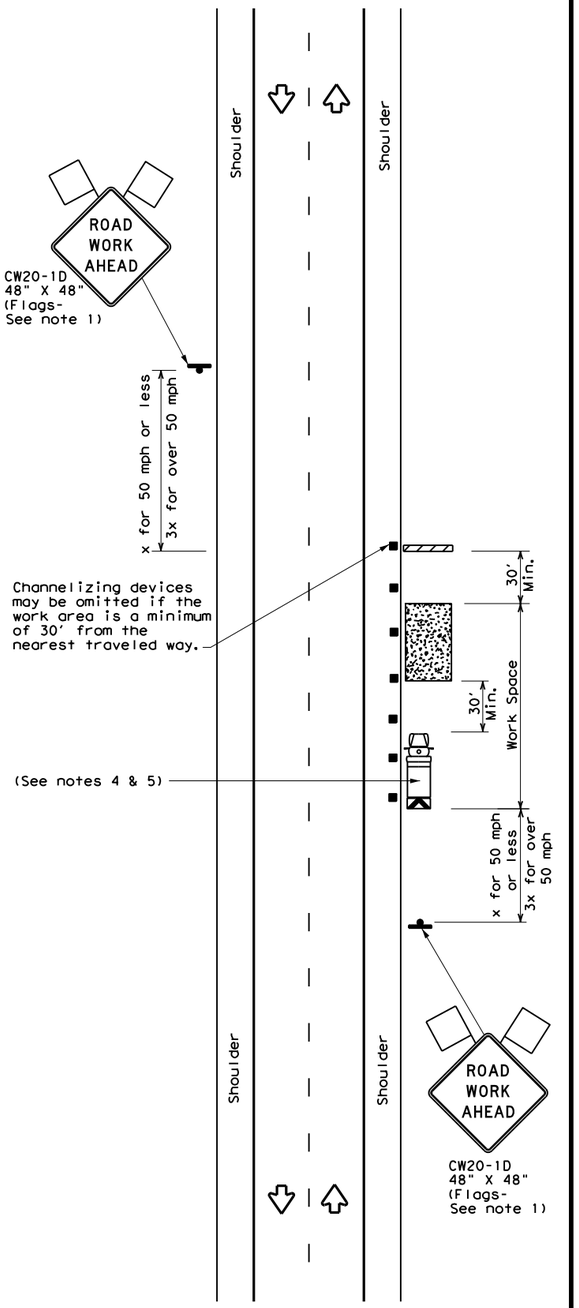
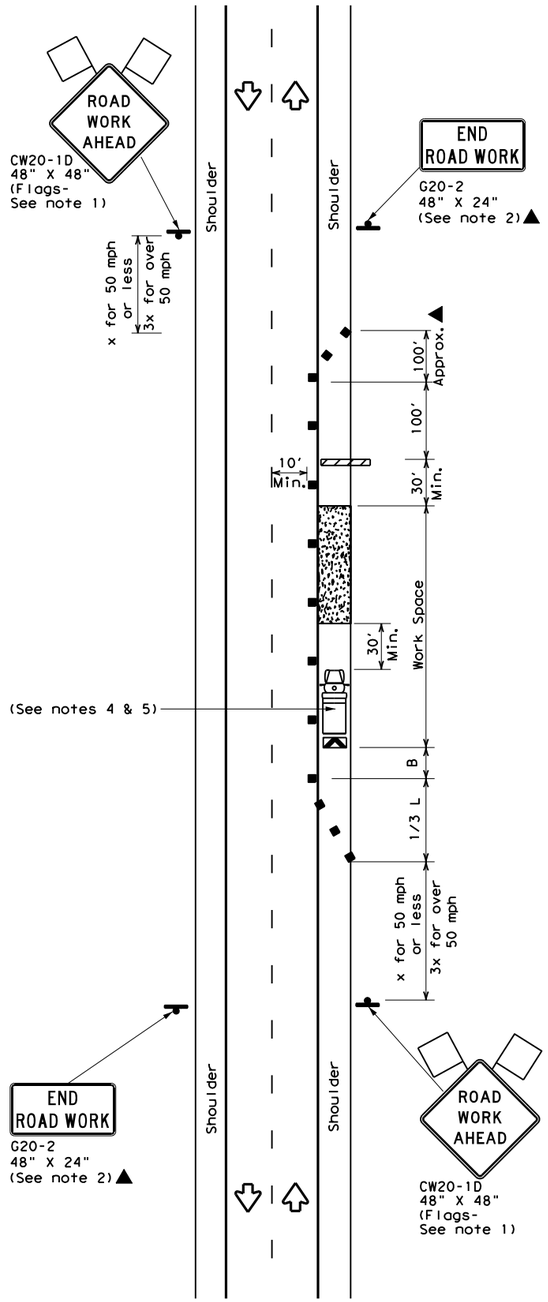


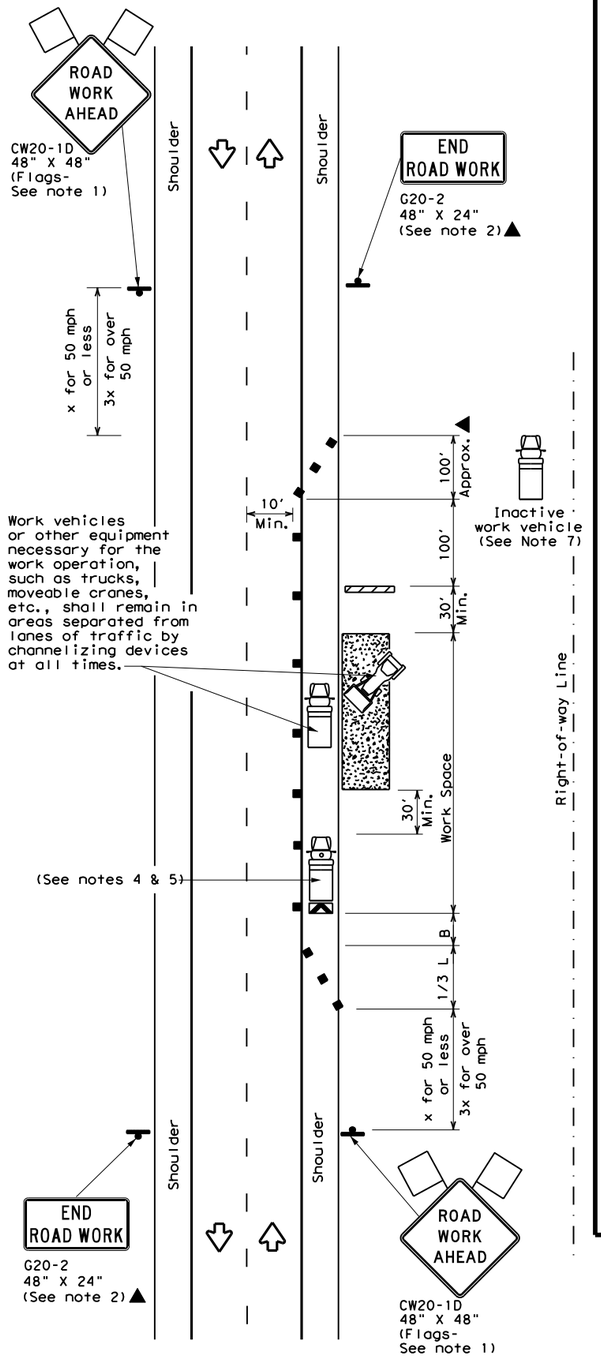
TCP (2-1a)

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

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ABL	NOLAN		71
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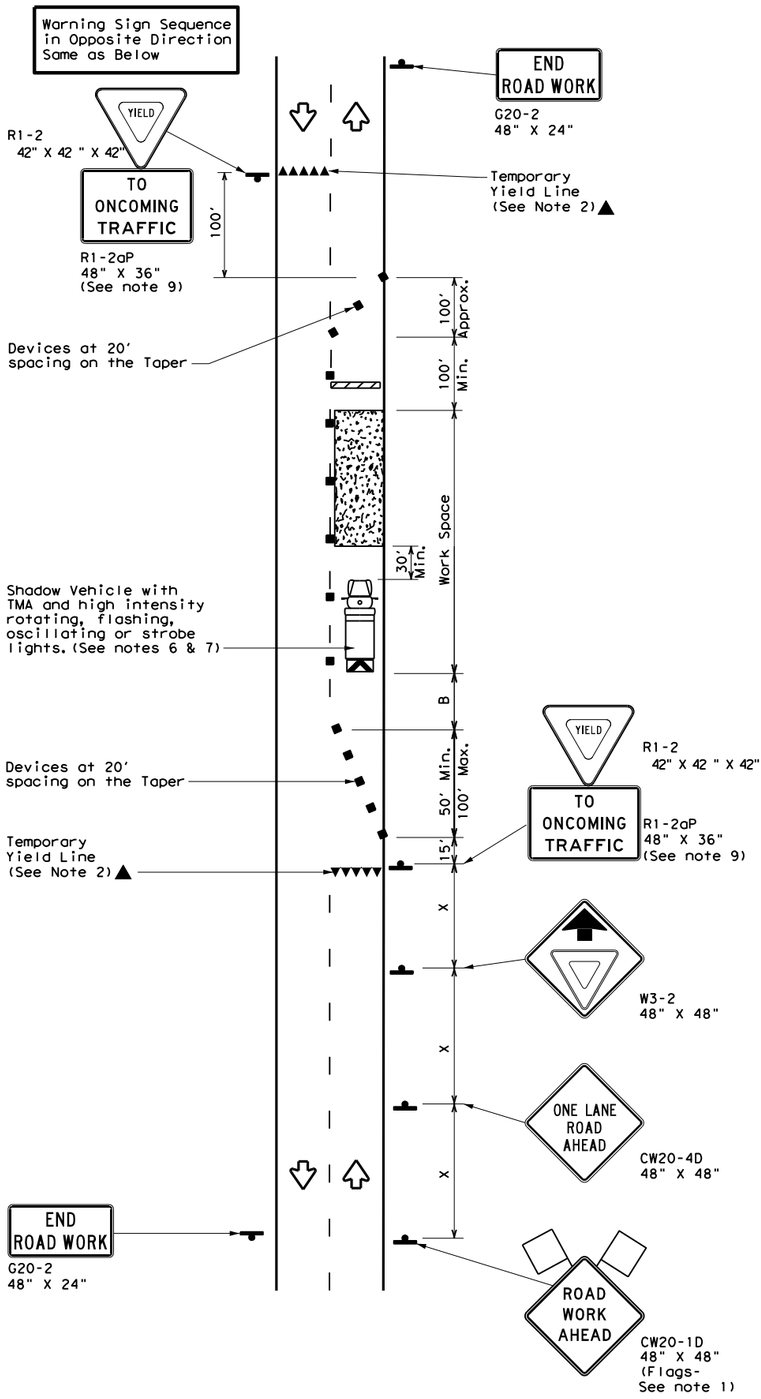
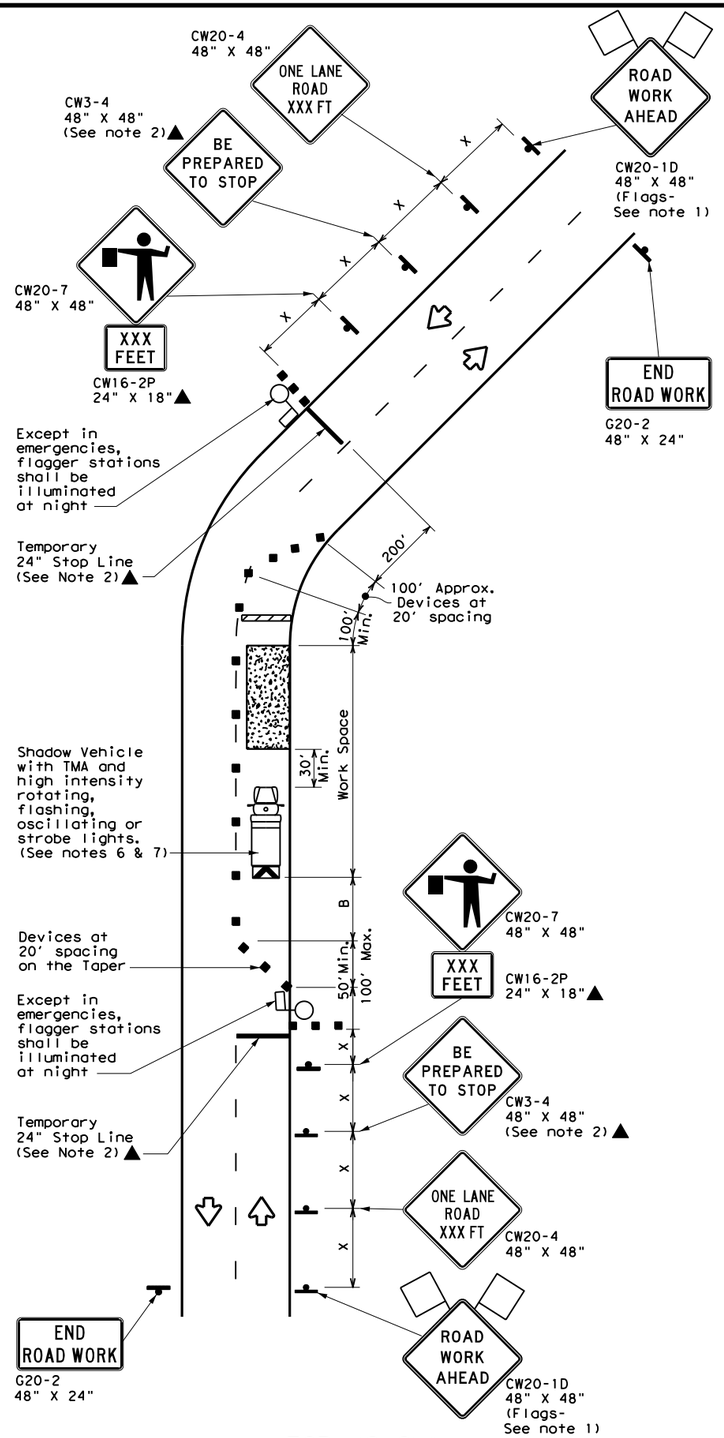


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS

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	0006	02	130	IH 20
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	ABL	NOLAN		72

DATE:
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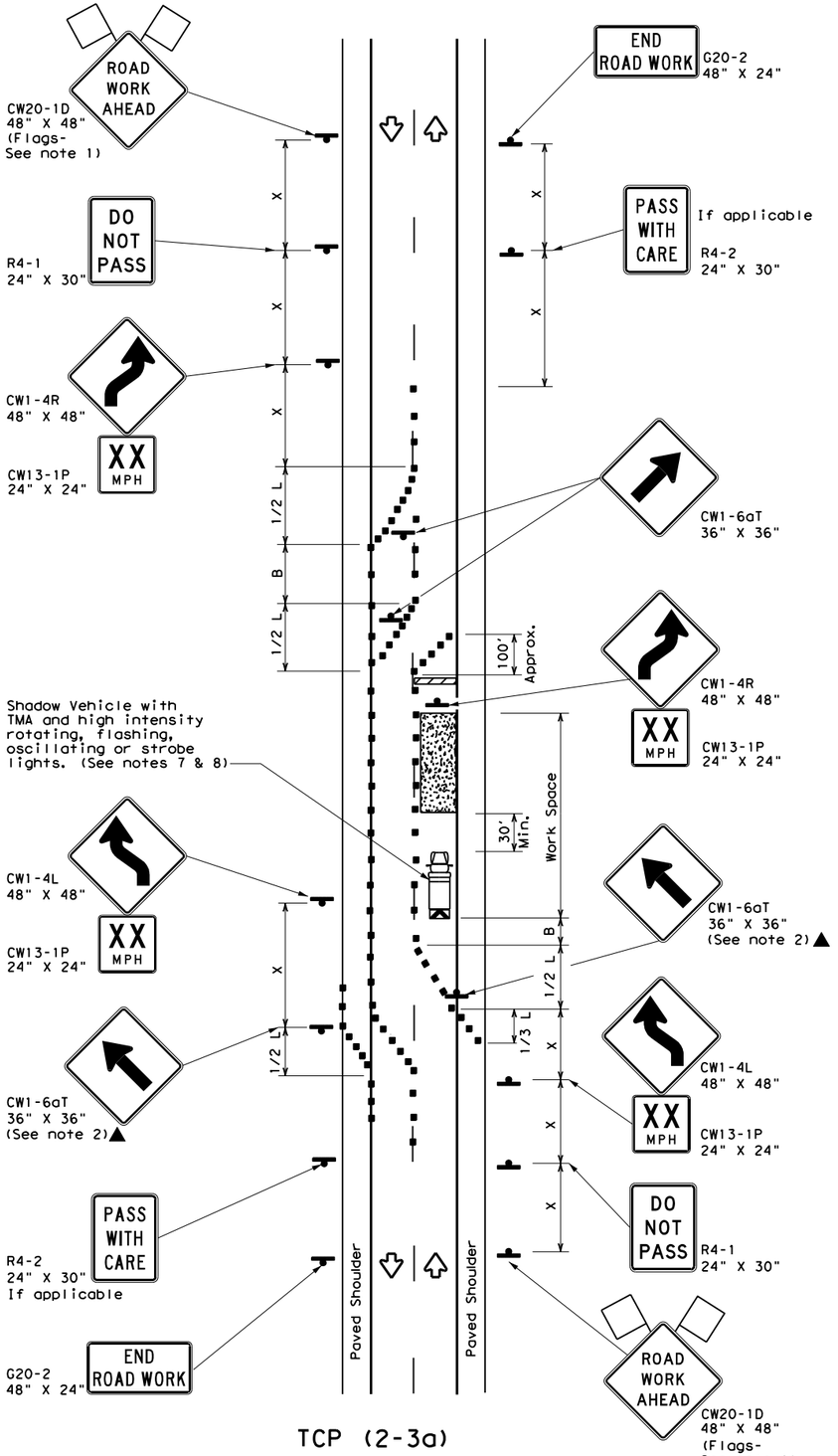
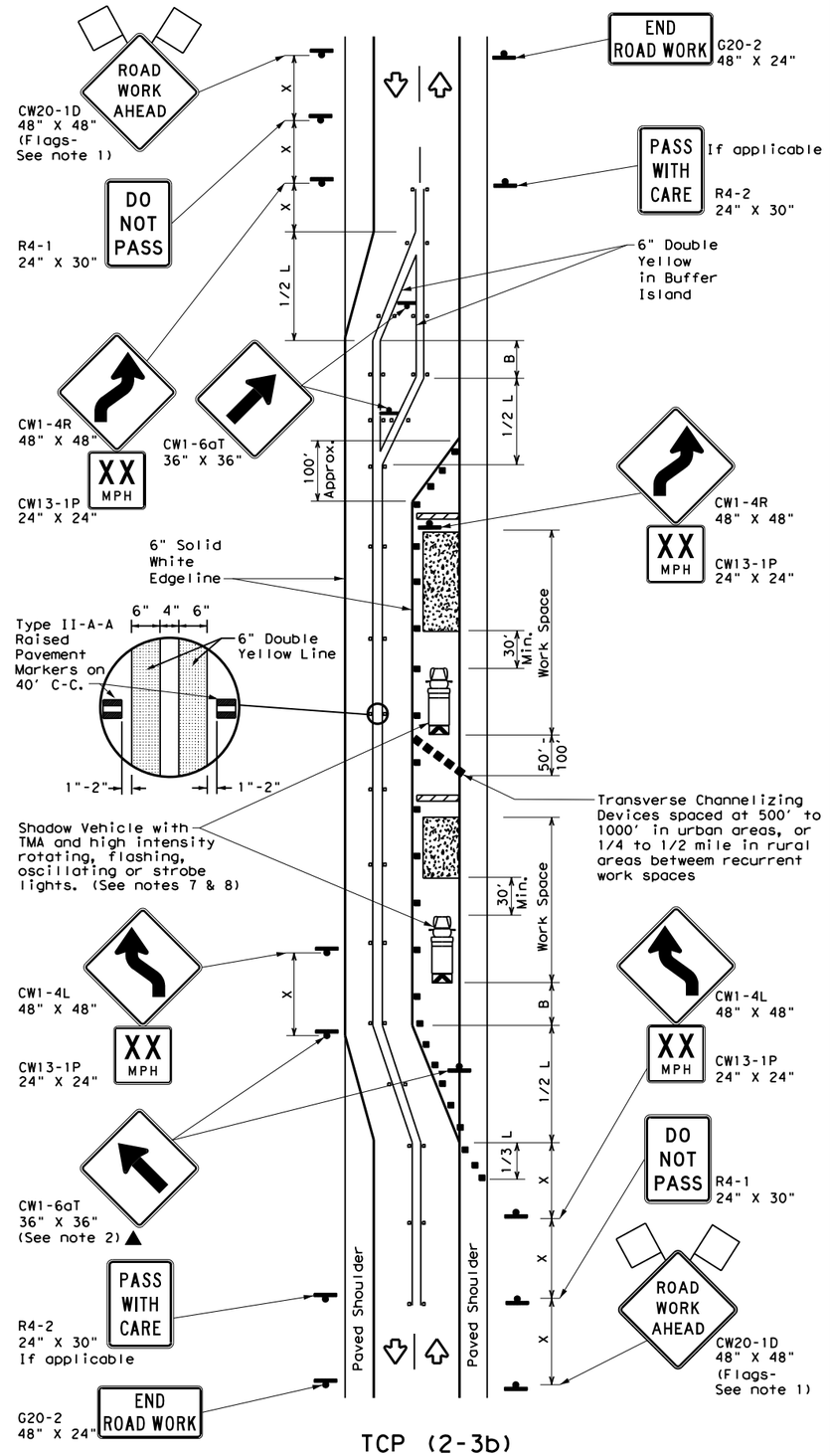


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 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
				TCP(2-3b)ONLY
			✓	✓

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. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. 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.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

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

Texas Department of Transportation

Traffic Operations Division Standard

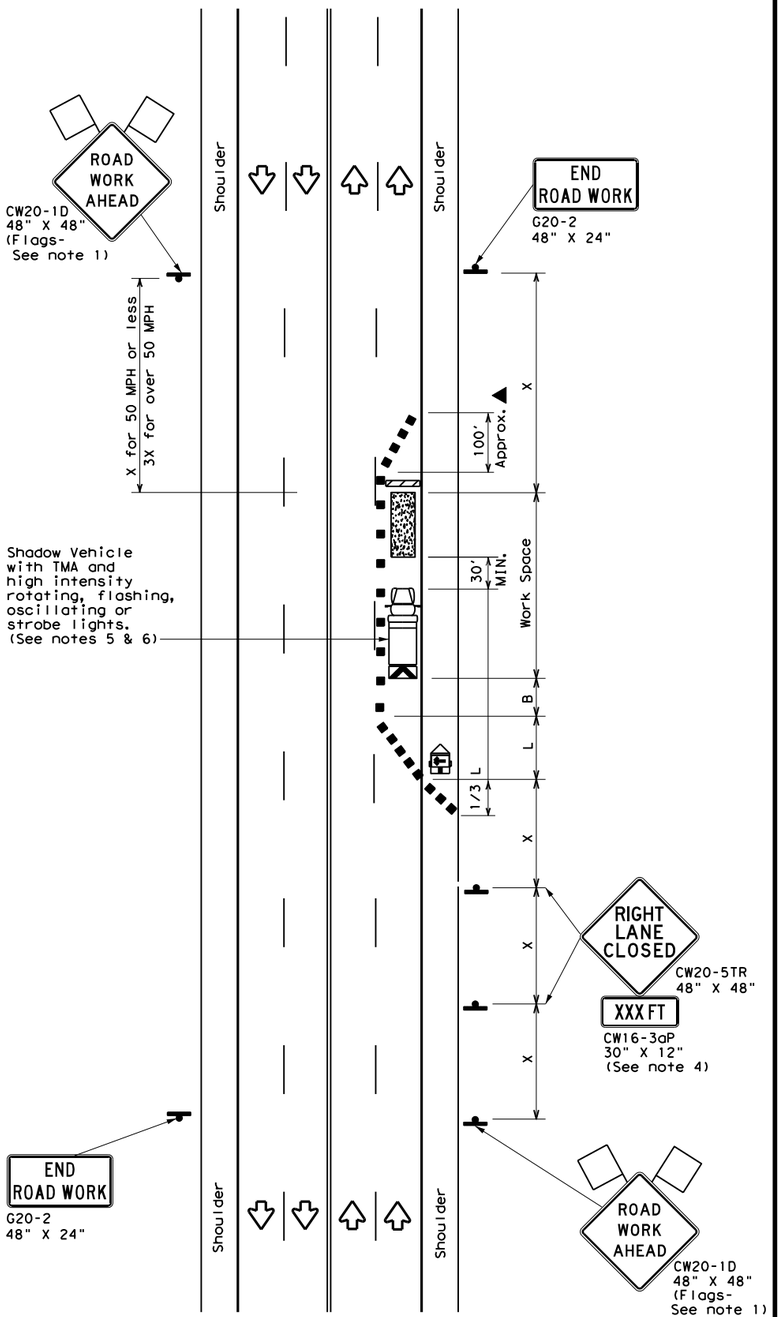
TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-23

FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18	0006	02	130	IH 20
8-95 3-03 4-23	DIST	COUNTY		SHEET NO.
1-97 2-12	ABL	NOLAN		73

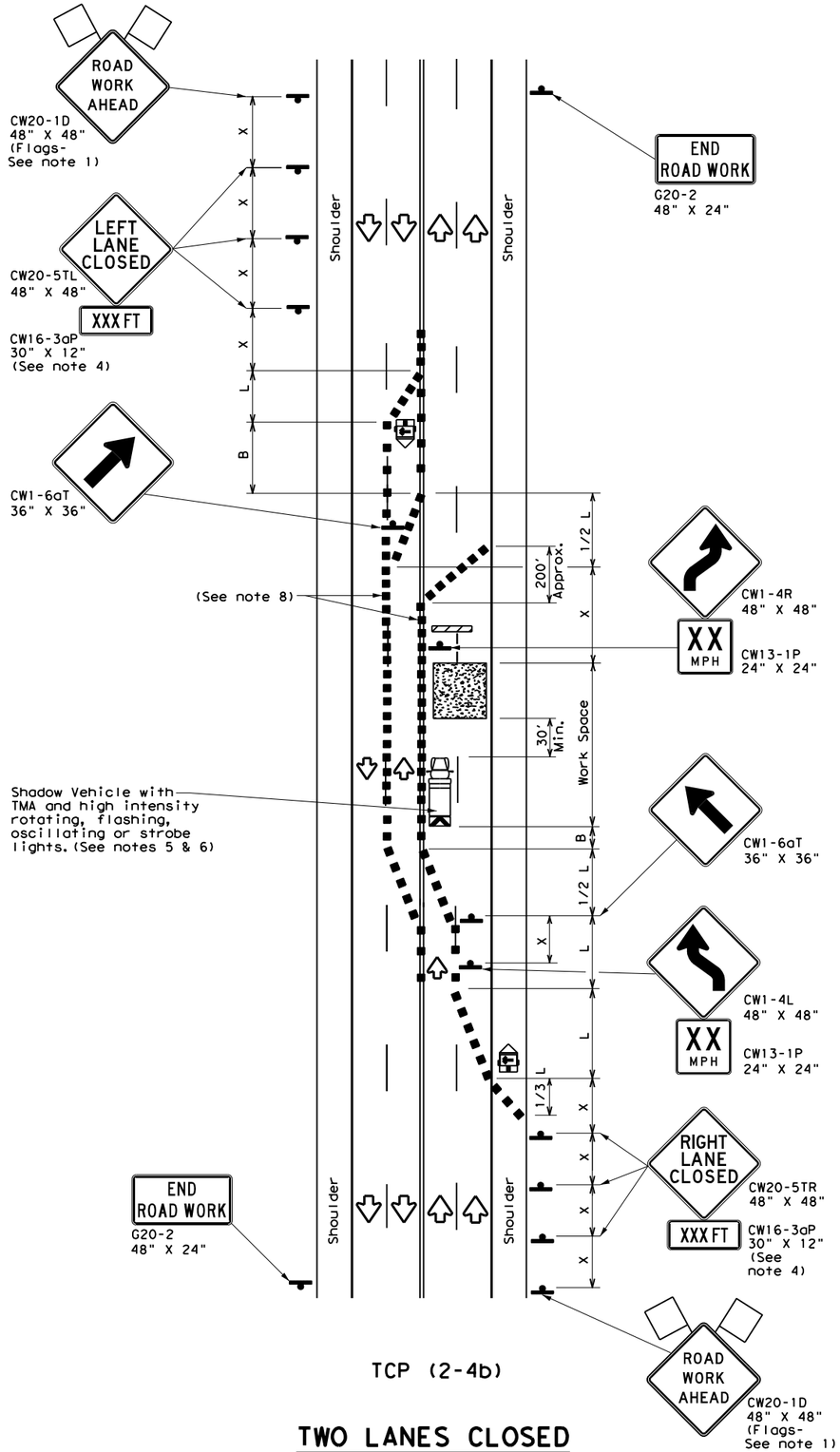
163

DATE:
FILE:



TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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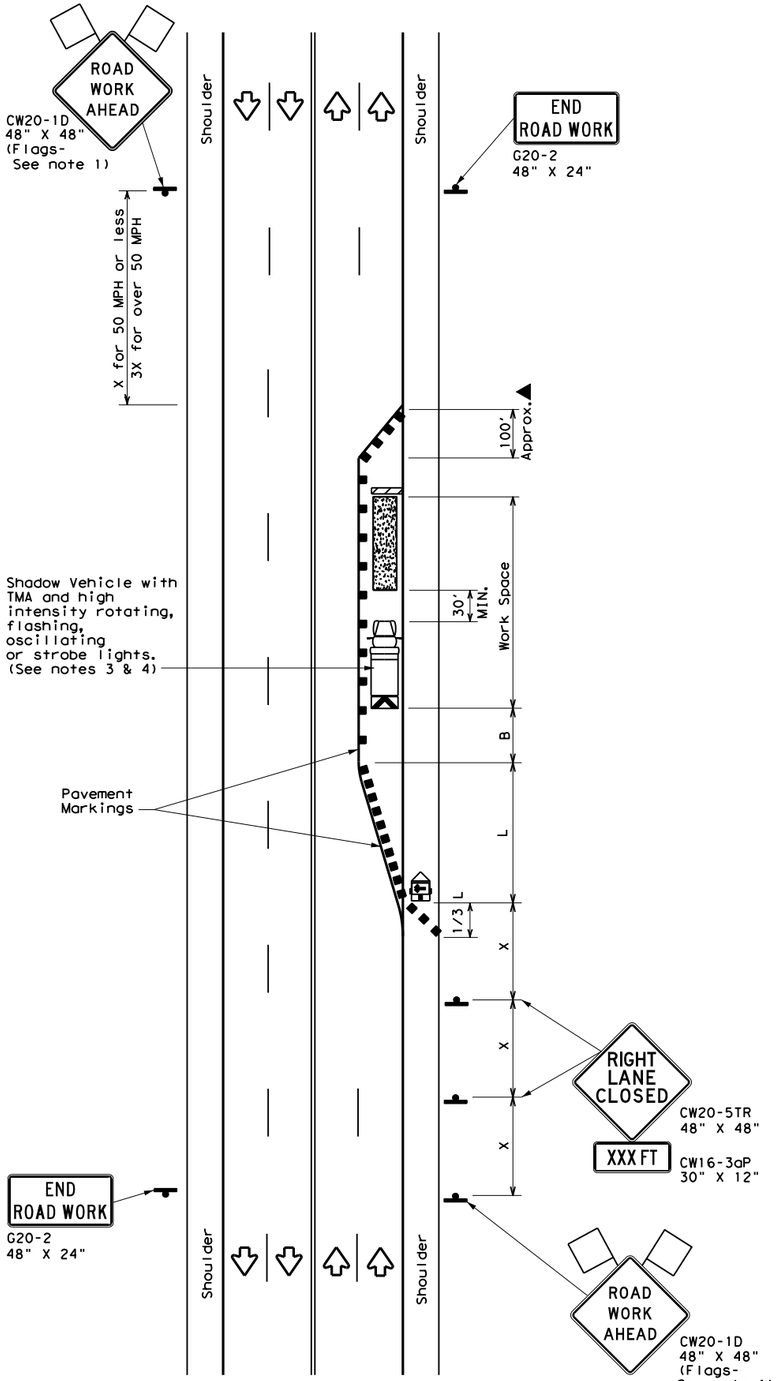
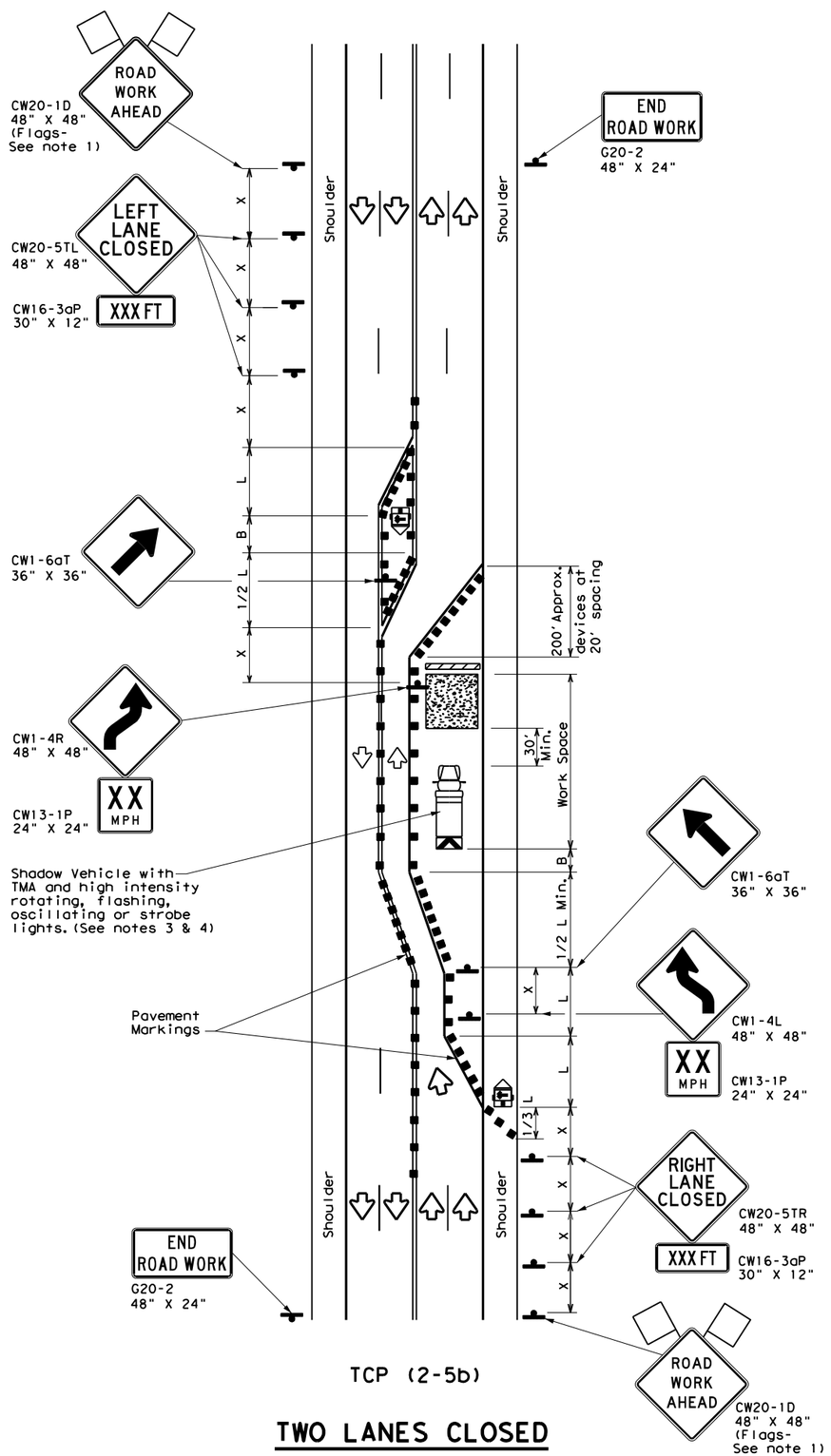
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	ABL	NOLAN		74



TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

DATE:
FILE:

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

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

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 3-03	ABL	NOLAN		75
4-98 2-18				

DATE:
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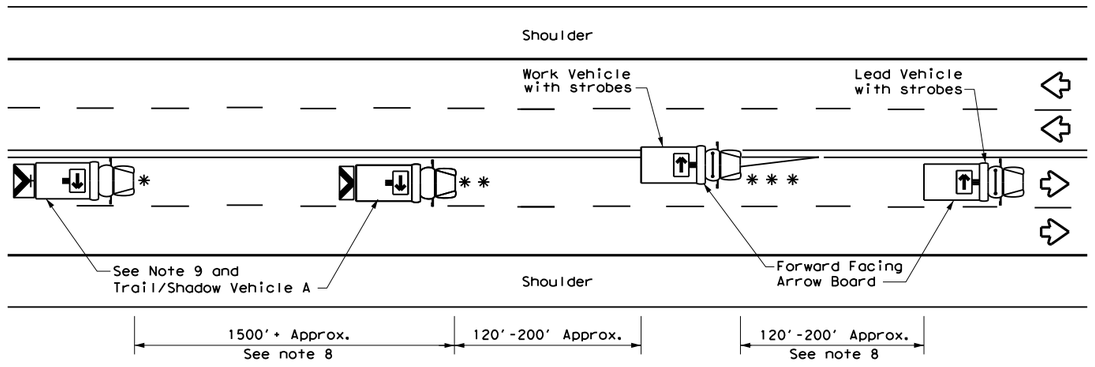
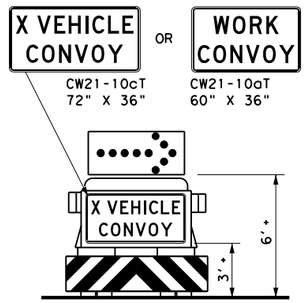


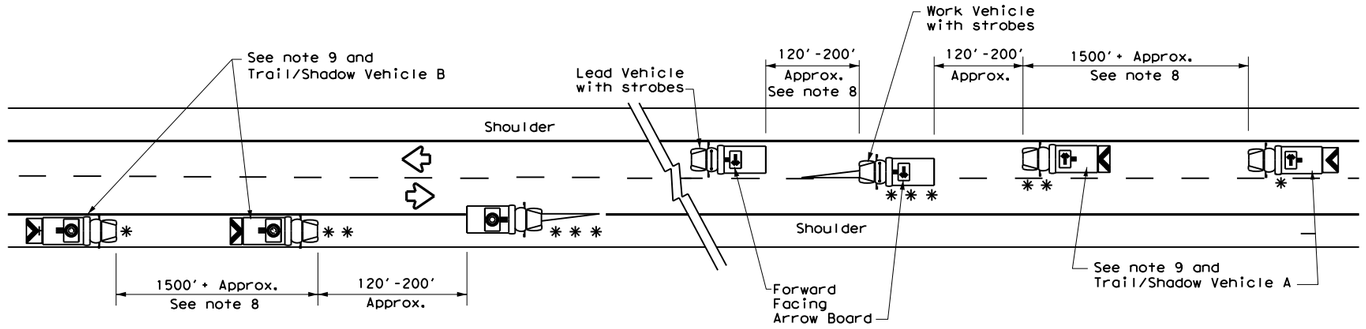
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

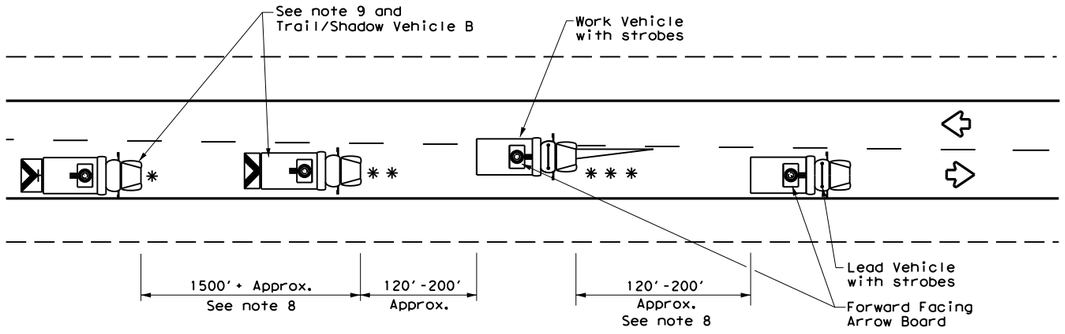


WORK ON SHOULDER

WORK ON TRAVEL LANE

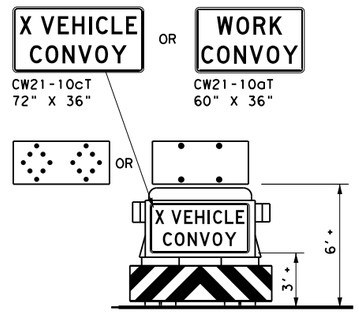
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

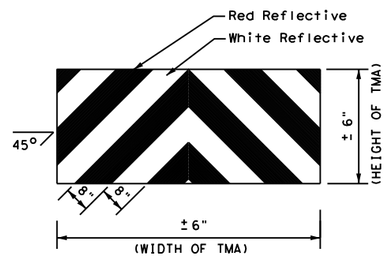
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0006	02	130	IH 20
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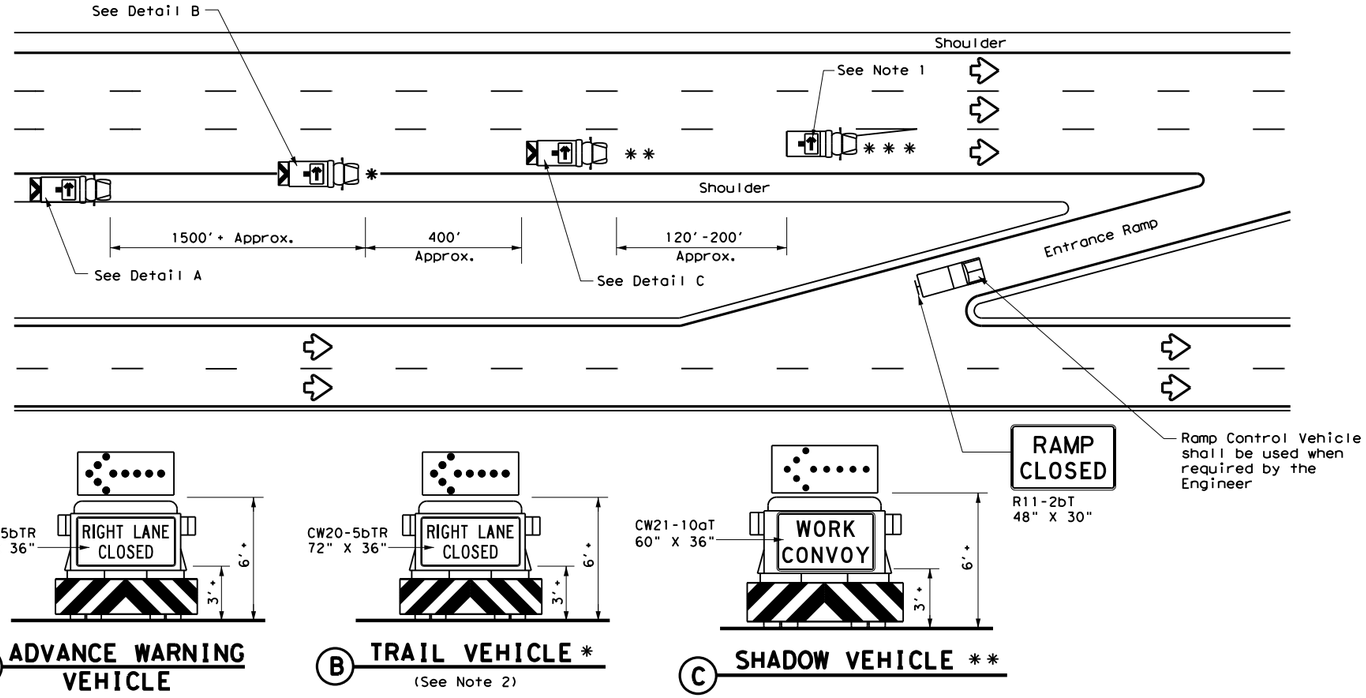
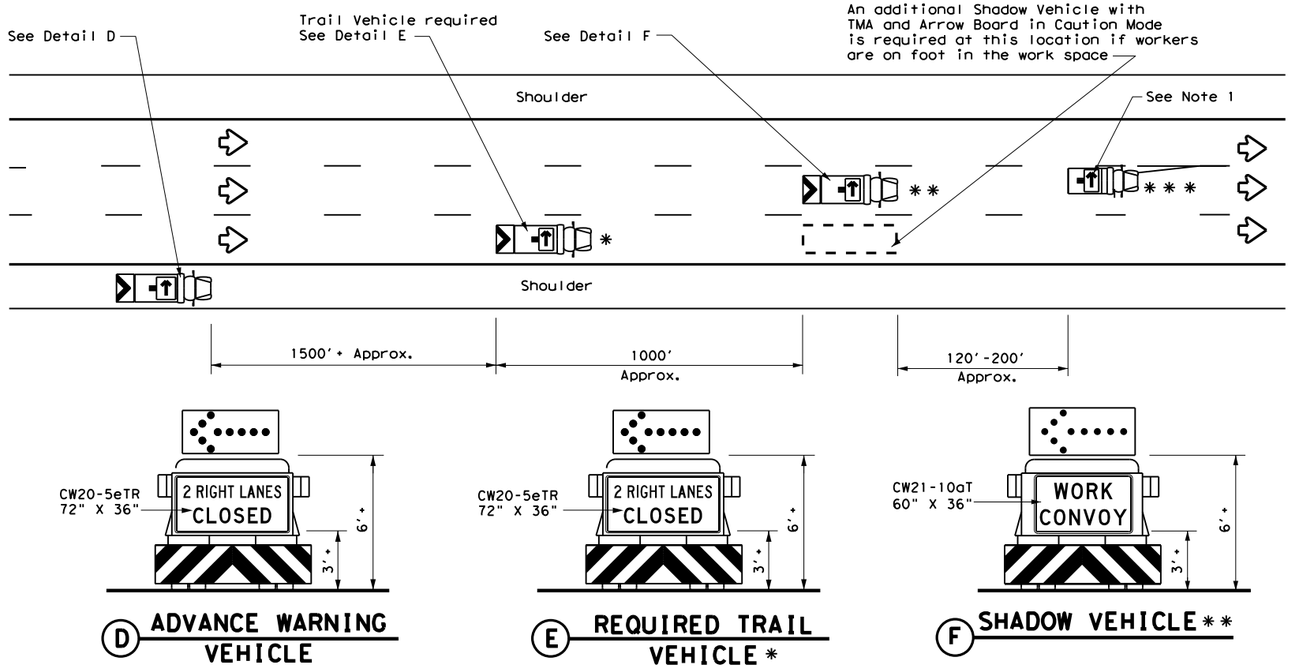
	ABL	NOLAN		76



RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



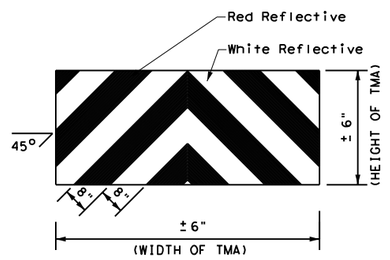
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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. ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
2. For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
3. 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.
4. The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
5. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
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 may vary according to terrain, work activity and other factors.
9. Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
10. The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board, must be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
12. The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
13. Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
14. The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

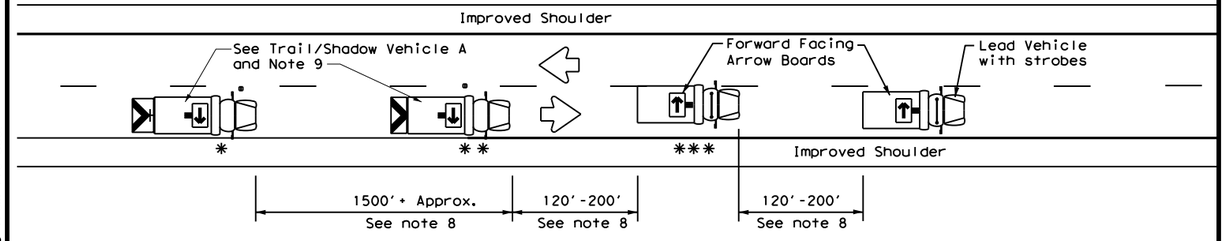
TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0006	02	130	IH 20
	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		77

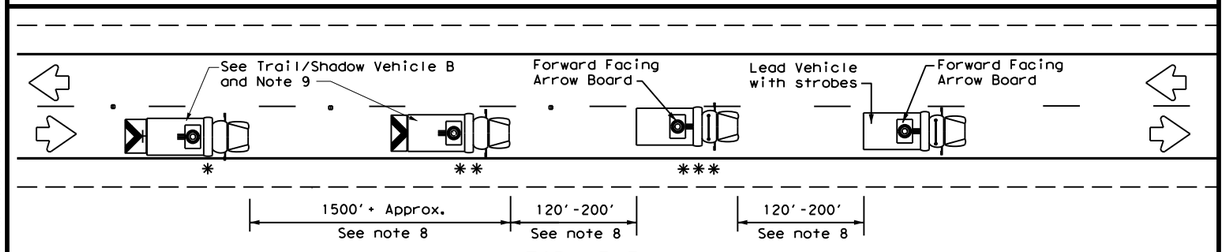
DATE:
FILE:

176



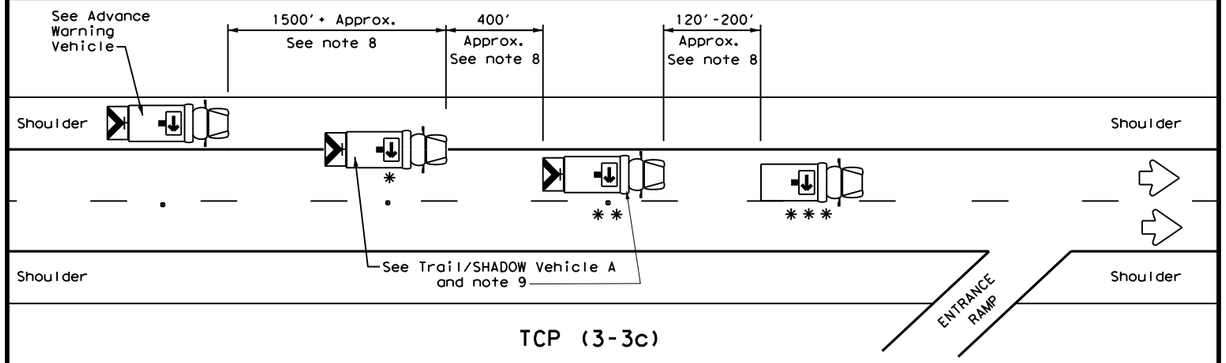
TCP (3-3a)

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



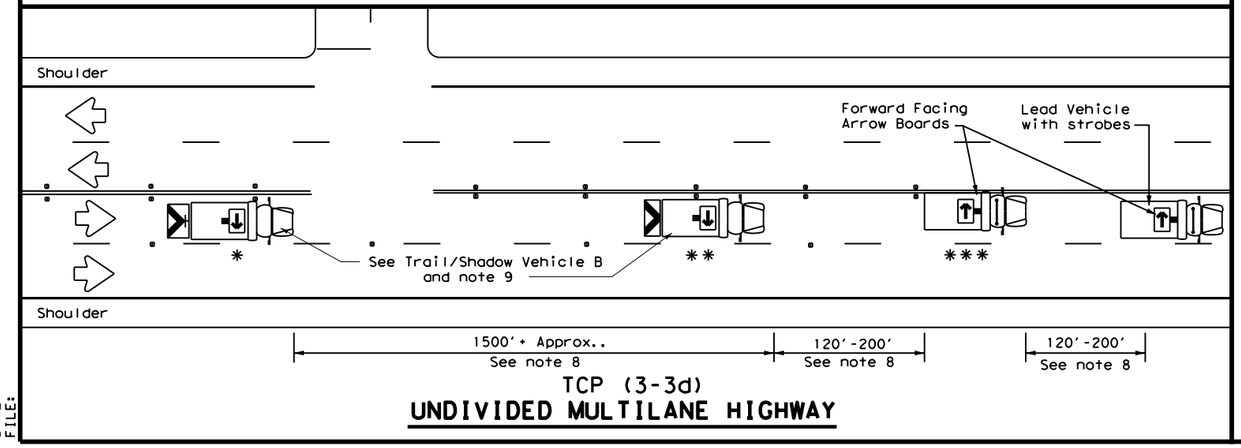
TCP (3-3b)

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



TCP (3-3c)

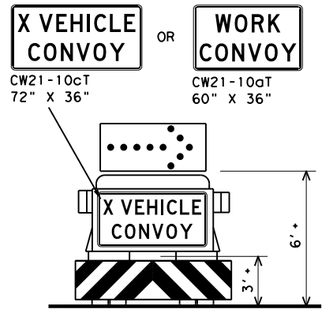
DIVIDED MULTILANE HIGHWAY



TCP (3-3d)

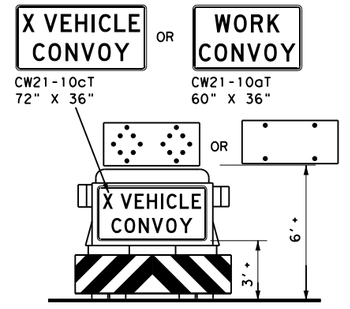
UNDIVIDED MULTILANE HIGHWAY

DATE:
FILE:



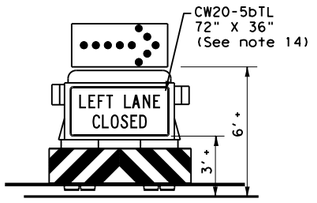
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

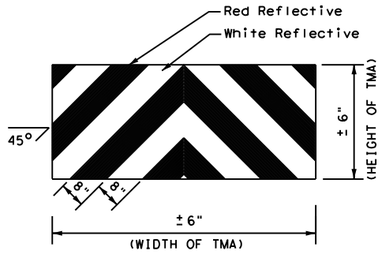


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

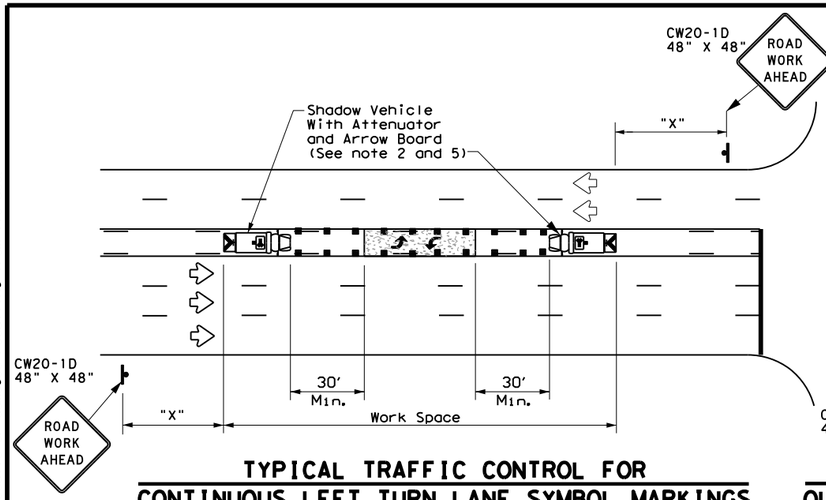
Texas Department of Transportation

Traffic Operations Division Standard

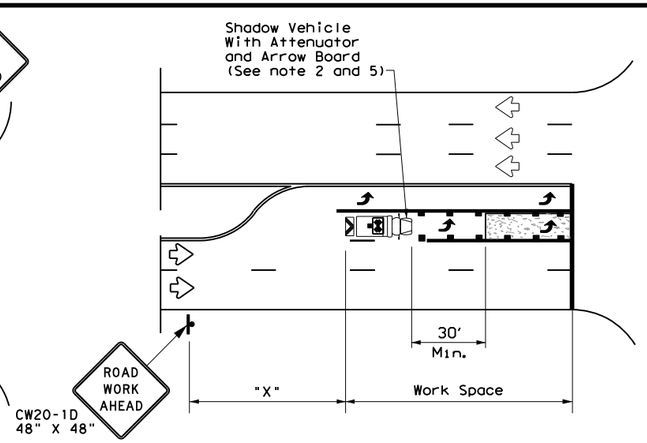
TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL
TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	ABL	NOLAN		78
1-97 7-14				

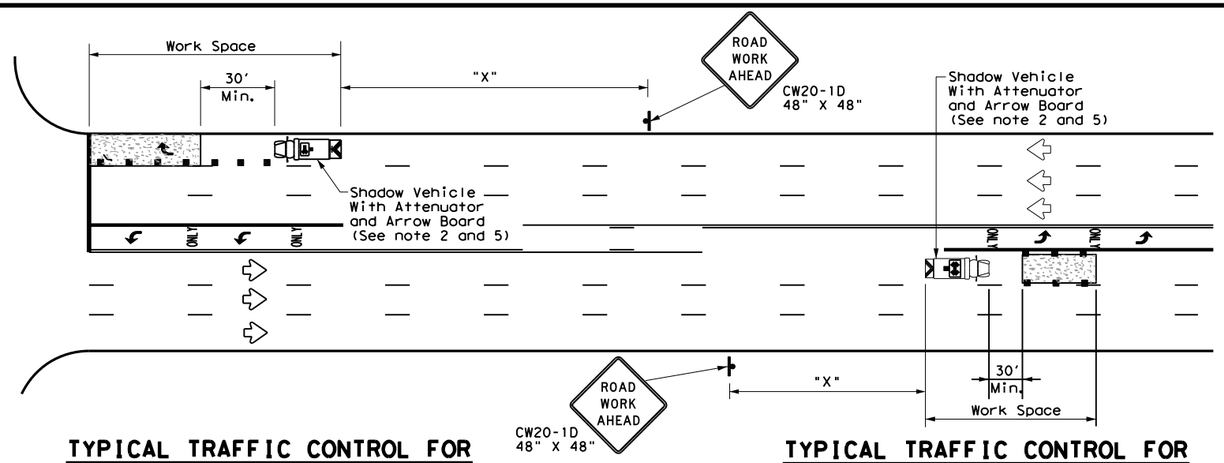
DATE:
FILE:



TYPICAL TRAFFIC CONTROL FOR CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

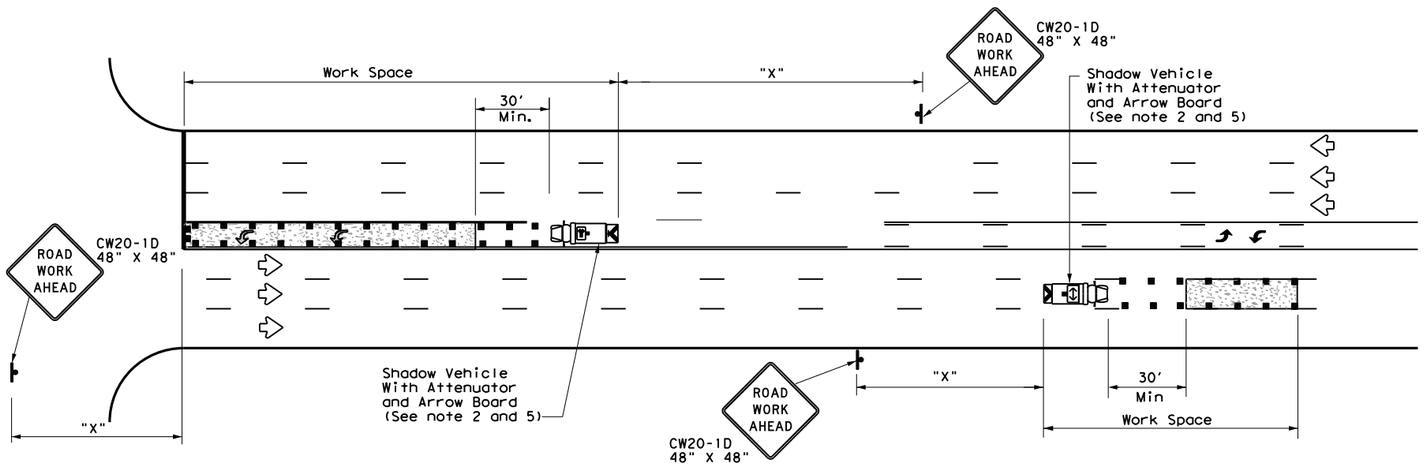


TYPICAL TRAFFIC CONTROL FOR OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



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'

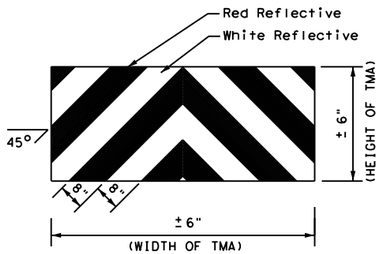
* Conventional Roads Only

** 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

FILE: tcp3-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
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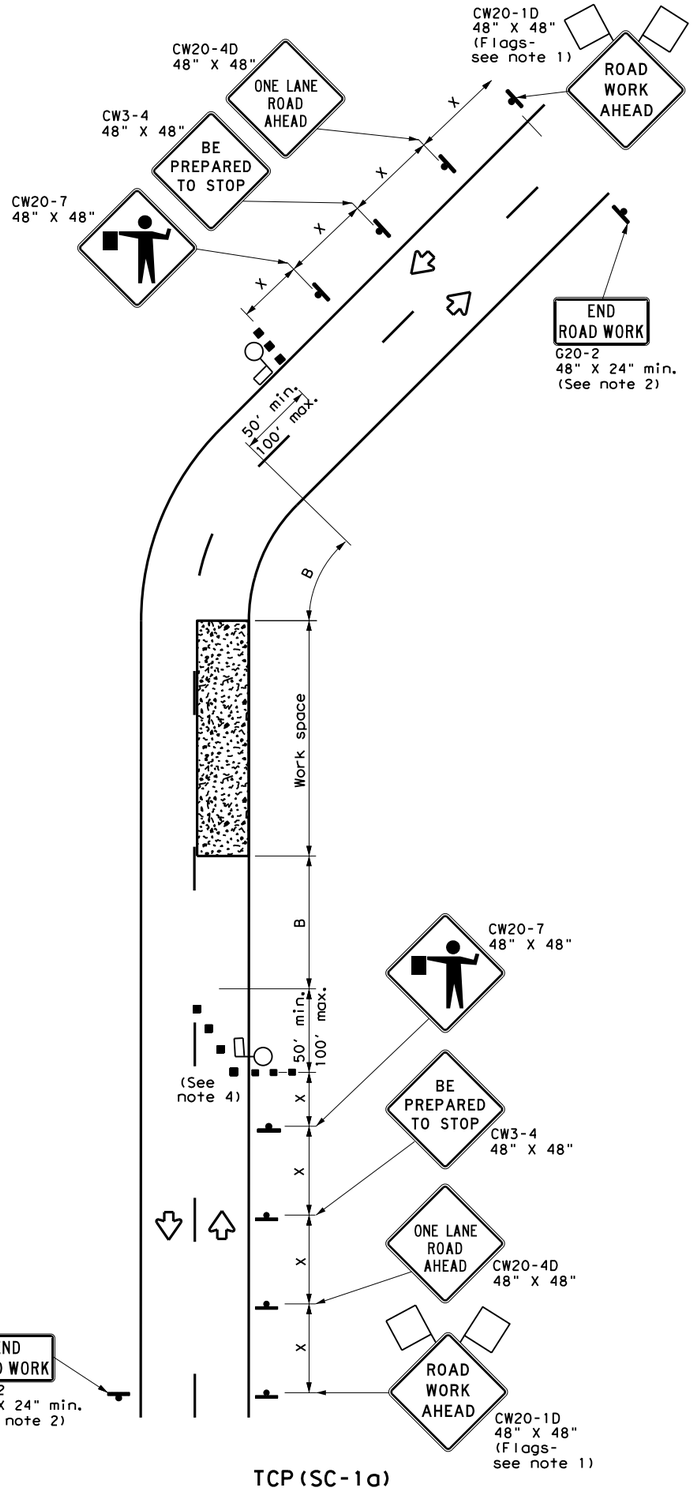
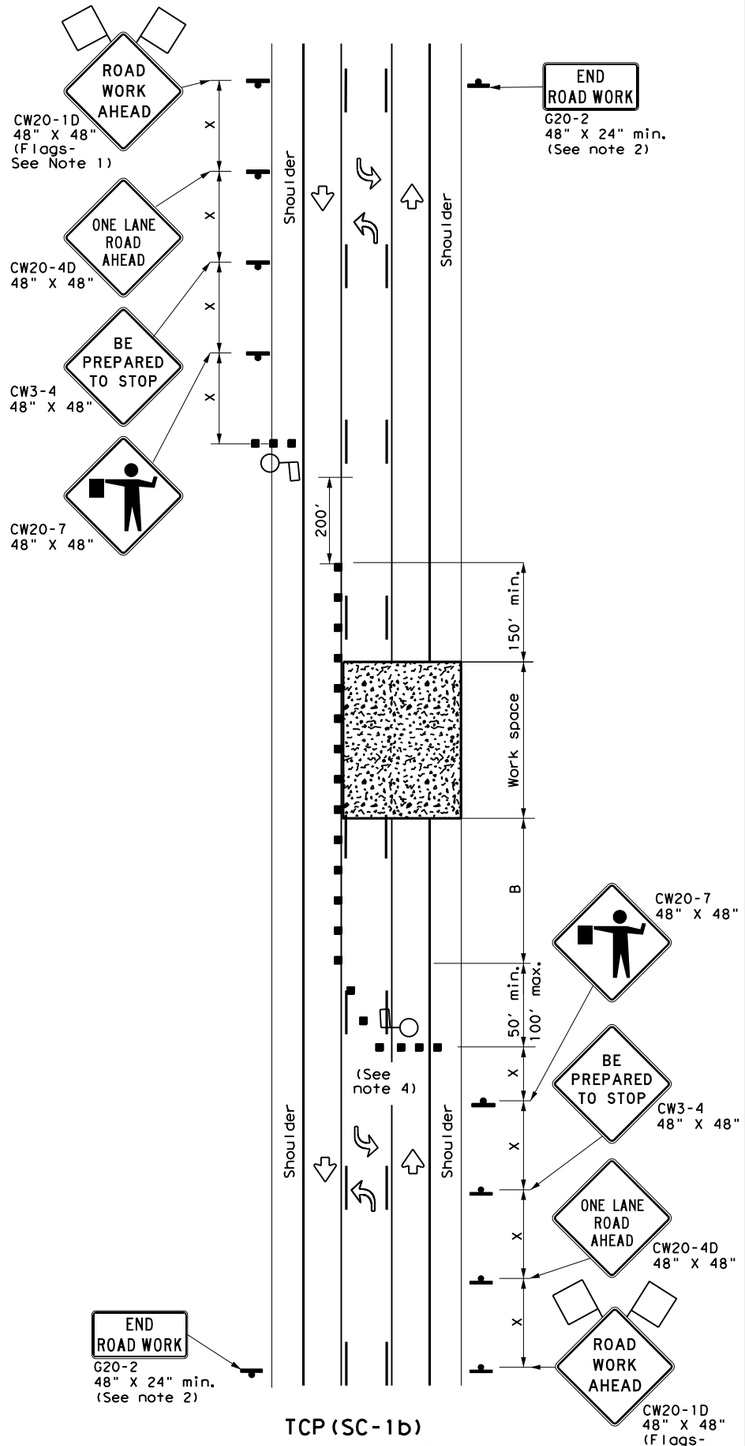
	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		79

DATE:
FILE:



TCP(SC-1a)

ONE LANE TWO-WAY (TWO LANES) CONTROL WITH PILOT VEHICLE



TCP(SC-1b)

ONE LANE TWO-WAY (THREE LANES) CONTROL WITH PILOT VEHICLE AND CHANNELIZING DEVICES

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 Distance "X"	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: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
3. Sign spacing may be increased or an additional ROAD WORK AHEAD (CW20-1D) sign may be used if advance warning ahead of the flagger sign is less than 1500 feet.
4. Flaggers should use two-way radios or other methods of communication at all times for traffic control coordination.
5. Flaggers should use 24" STOP (CW20-8) / SLOW (CW20-8aT) paddles to control traffic. Flags should be limited to emergency situations.
6. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
7. If the seal coat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning additional traffic control personnel (flaggers) at the intersection.
8. Temporary rumble strips are not required on seal coat operations.
9. The pilot car is used to guide vehicles through traffic control zone. The pilot car shall have an identification name displayed and PILOT CAR, FOLLOW ME (G20-4) sign or message board mounted in a conspicuous position on rear.

TCP (SC-1a)

1. Channelizing devices on the centerline are not required when a pilot car is leading traffic, unless directed by the Engineer.

Texas Department of Transportation — Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS ONE-LANE TWO-WAY

TCP(SC-1)-22

FILE: tcpsc-1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
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	ABL	NOLAN		80

DATE:
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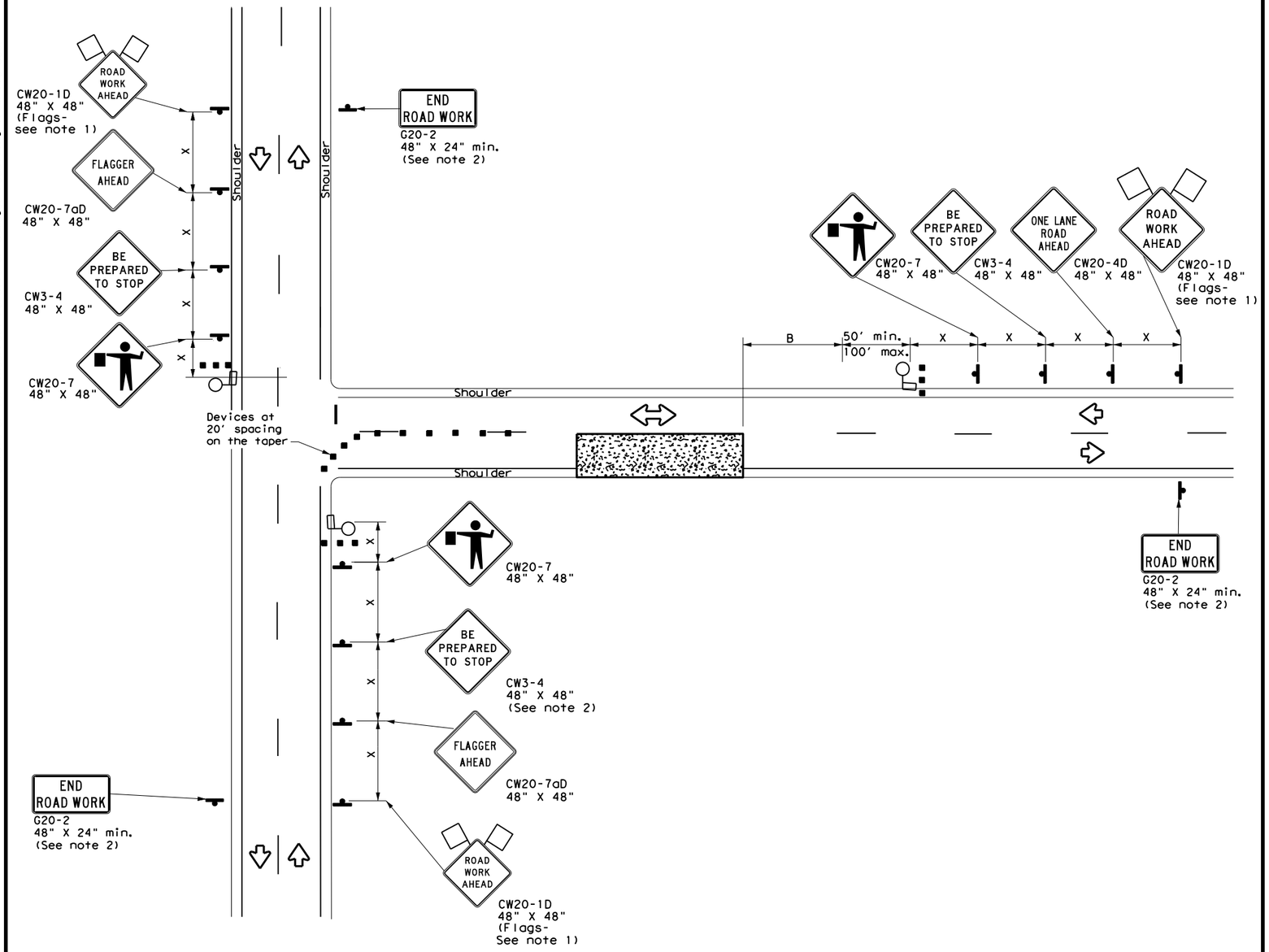


ONE LANE TWO-WAY (T-INTERSECTION) CONTROL WITH PILOT VEHICLE

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 Distance "X"	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: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
3. Flaggers should use two-way radios or other methods of communication at all times for traffic control coordination.
4. Flaggers should use 24" STOP (CW20-8) / SLOW (CW20-8aT) paddles to control traffic. Flags should be limited to emergency situations.
5. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
6. Temporary rumble strips are not required on seal coat operations.
7. The pilot car is used to guide vehicles through traffic control zone. The pilot car shall have an identification name displayed and PILOT CAR, FOLLOW ME (G20-4) sign or message board mounted in a conspicuous position on rear.

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS NEAR INTERSECTION

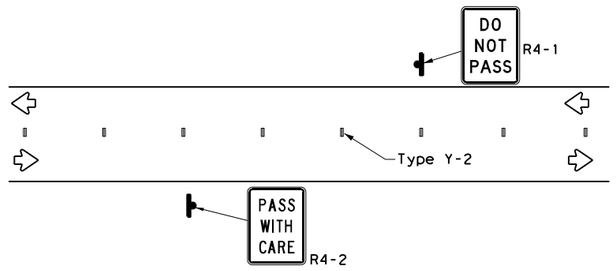
TCP(SC-4)-22

FILE: tcpsc-4-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-21 10-22	0006	02	130	IH 20
	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		81

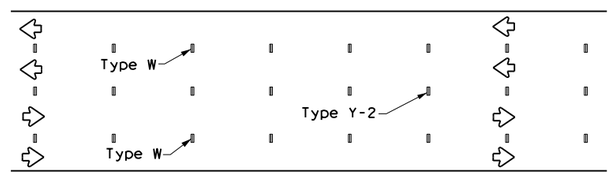
220

DATE:
FILE:

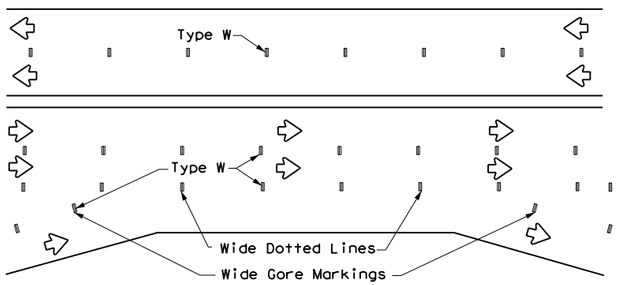
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS (TABS)



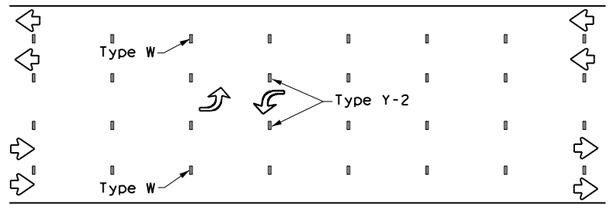
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS

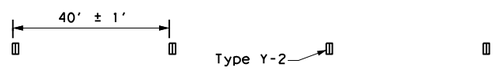
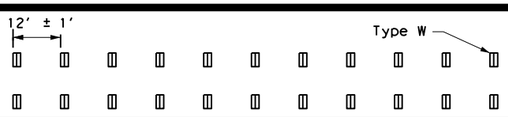


LANE LINES FOR DIVIDED HIGHWAY

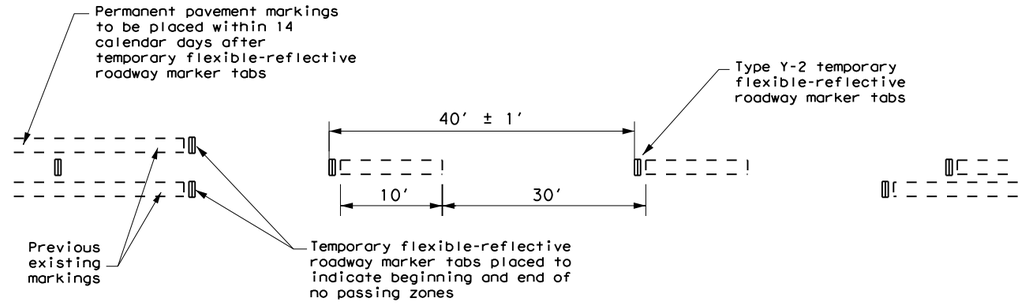


TWO-WAY LEFT TURN LANE

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS (TABS)

SOLID LINES	DOUBLE NO-PASSING LINE	
	SINGLE NO-PASSING LINE or CHANNELIZATION LINE	
	8" WIDE SOLID LINE	
BROKEN LINES (FOR CENTER LINE OR LANE LINE)		
WIDE DOTTED LINES (FOR LANE DROP LINES)		
WIDE GORE MARKINGS		

TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS



TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS

1. Temporary markings for surfacing projects shall be Temporary Flexible-Reflective Roadway Marker Tabs with protective cover 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 days before the surfacing is applied. After the surfacing is rolled and swept, the protective cover over the reflective strip shall be removed.
2. Temporary Flexible-Reflective Roadway Marker Tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with a 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).
3. Temporary Flexible-Reflective Roadway Marker Tabs will require normal maintenance replacement when used on roadways with an Average Daily Traffic (ADT) per lane of up to 7500 vehicles with no more than 10% truck mix. When roadway volumes exceed these values, additional maintenance replacement of these devices should be planned for.
4. 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.
5. 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 4.
6. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
7. Tabs shall NOT be used to simulate edge lines.

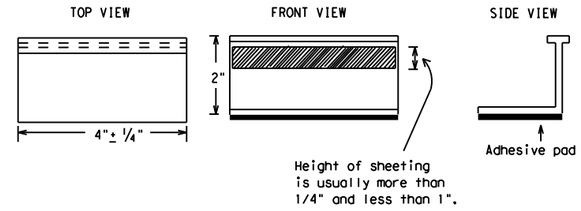
NOTES:

1. 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.
2. 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 acceptable.
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.

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

1. DMSs referenced above may be found along with embedded links to their respective MPLs at the following website: http://www.txdot.gov

TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS



Texas Department of Transportation

Traffic Safety Division Standard

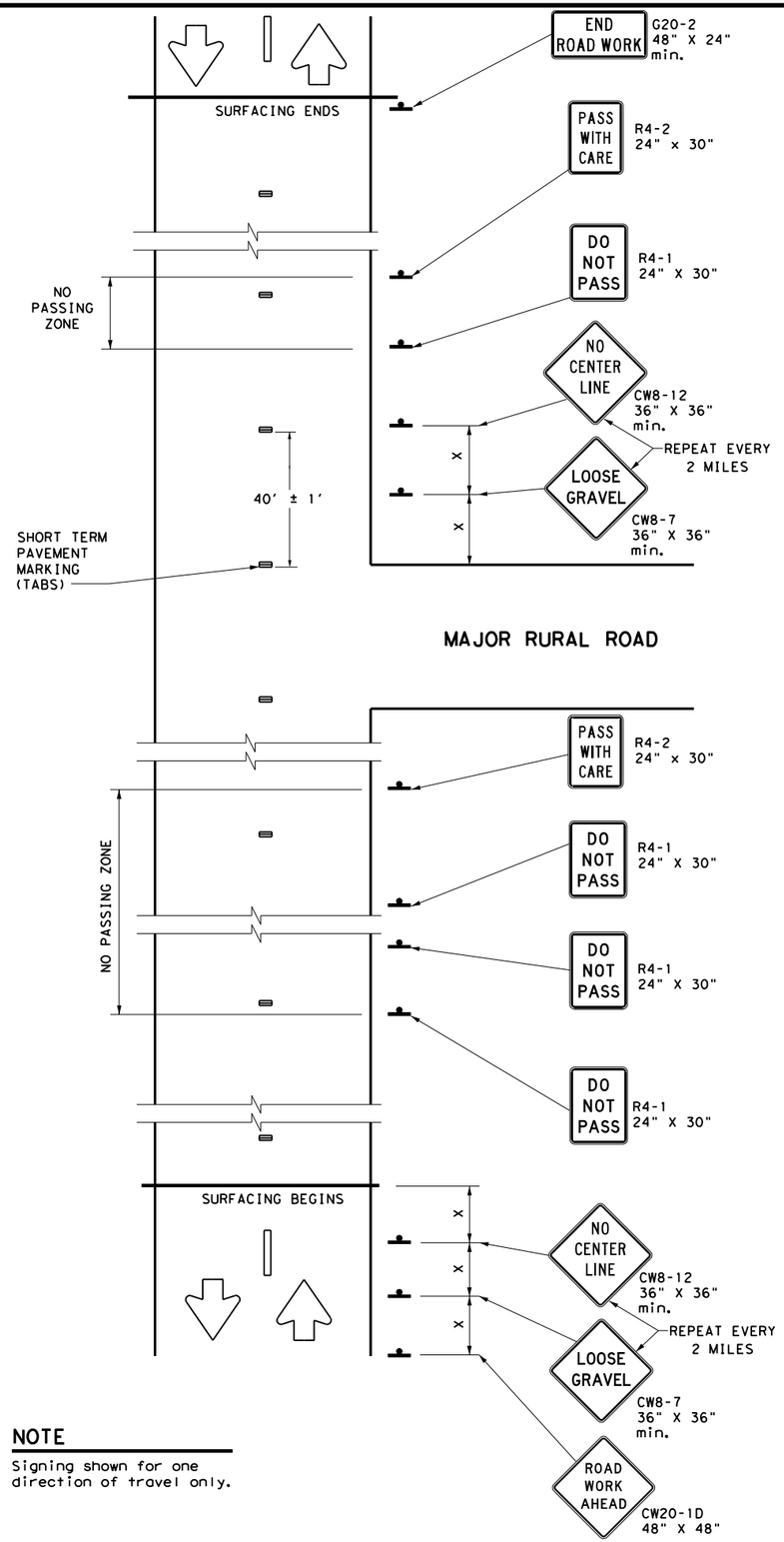
TEMPORARY PAVEMENT MARKINGS FOR SEAL COAT OPERATIONS

TCP(SC-7)-22

FILE: tcpsc-7-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-21 10-22	0006	02	130	IH 20
	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		82

223

DATE:
FILE:



NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS

DO NOT PASS (R4-1) SIGN 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 prohibitd 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 a 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 windshields 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 day of 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. DO NOT PASS and PASS WITH CARE signs are to remain in place until permanent pavement markings are installed.

NO CENTER LINE (CW8-12) SIGN

A. Center line markings are yellow pavement markings that delineate the separation between 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 center line), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately two 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 permanent pavement markings are installed.

LOOSE GRAVEL (CW8-7) SIGN

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 two 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.

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:
   a.) In the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) sign and the TRAFFIC FINES DOUBLE (R20-5T) sign; and
   b.) 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 sign placements will then be repeated as described above.

Posted Speed *	Minimum Sign Spacing Distance "X"
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. Surfacing operations that cover or obliterate existing pavement markings must first have the passing zones clearly marked with tabs as well as having any of the traffic control devices detailed on this sheet furnished and erected as directed by the Engineer.
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 Short Duration / Short Term Stationary 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 should be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.

Texas Department of Transportation

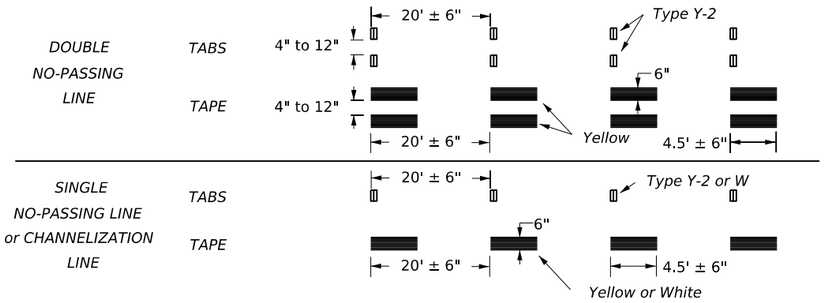
Traffic Safety Division Standard

TRAFFIC CONTROL DETAILS FOR SEAL COAT OPERATIONS

TCP(SC-8)-22

FILE: tcpsc-8-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
4-21	DIST	COUNTY		SHEET NO.
10-22	ABL	NOLAN		83

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



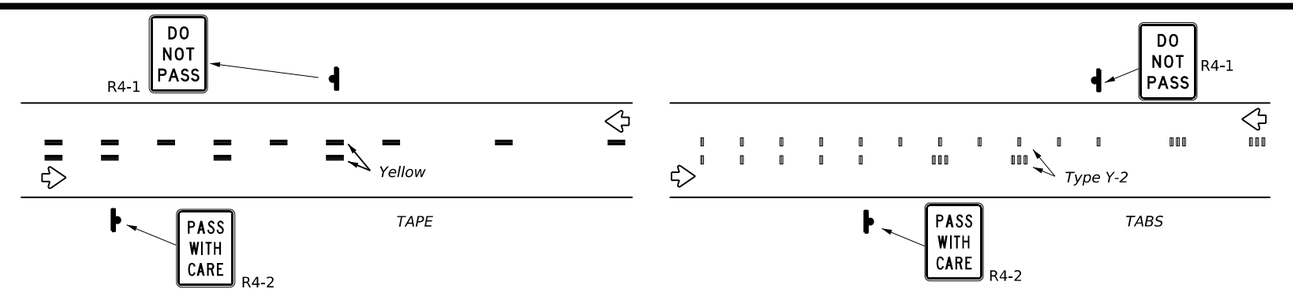
NOTES:

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

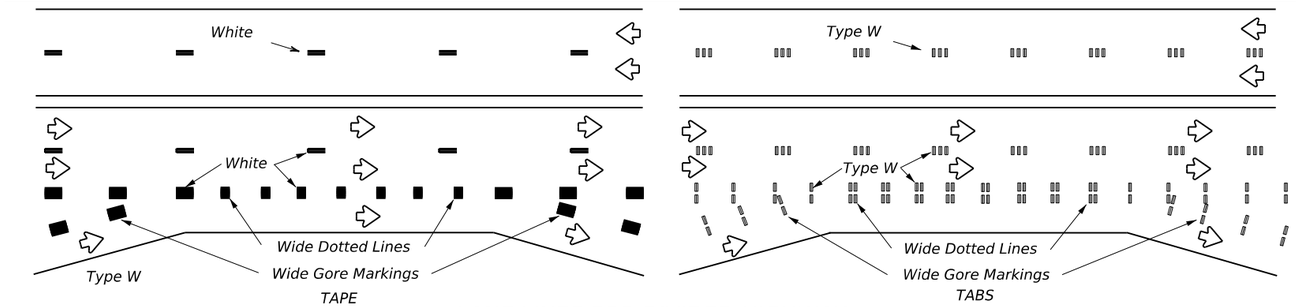
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

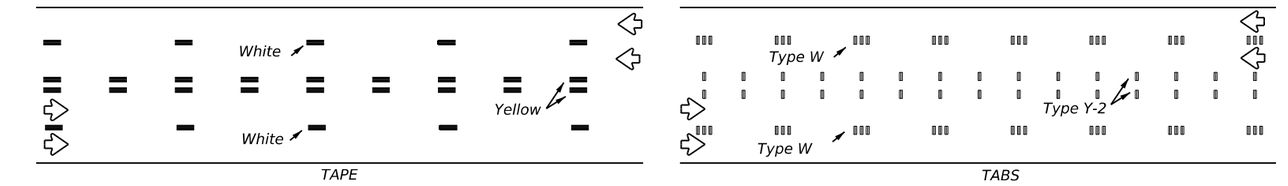
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



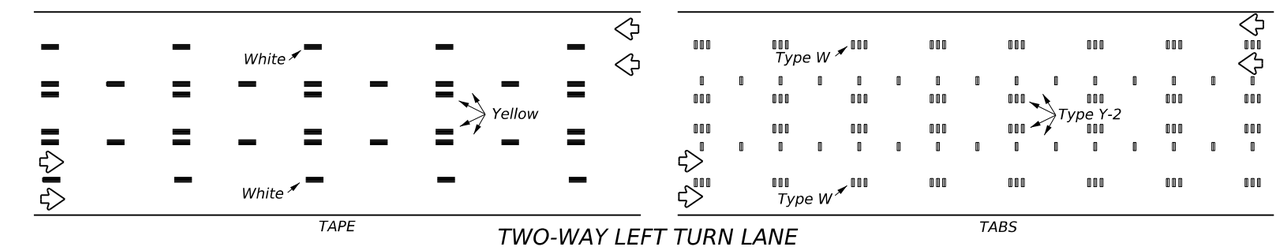
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



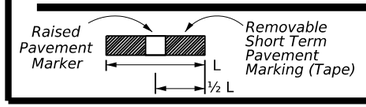
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
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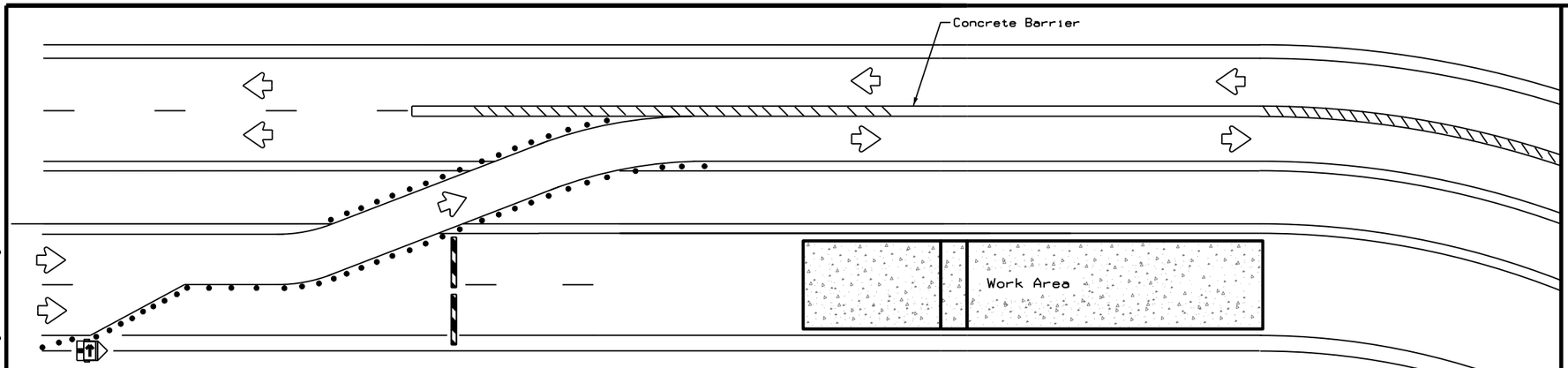
1-97 2-23	ABL	NOLAN		84
3-03				

DATE:
FILE:



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.

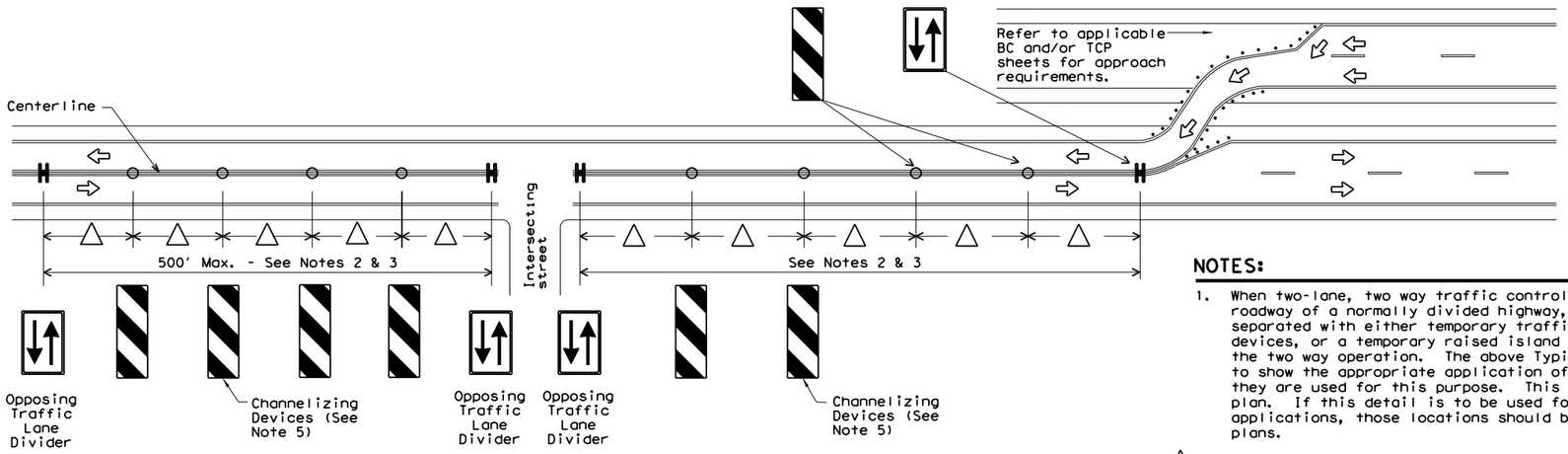
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
• • •	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	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



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	0006	02	130	IH 20
	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		85

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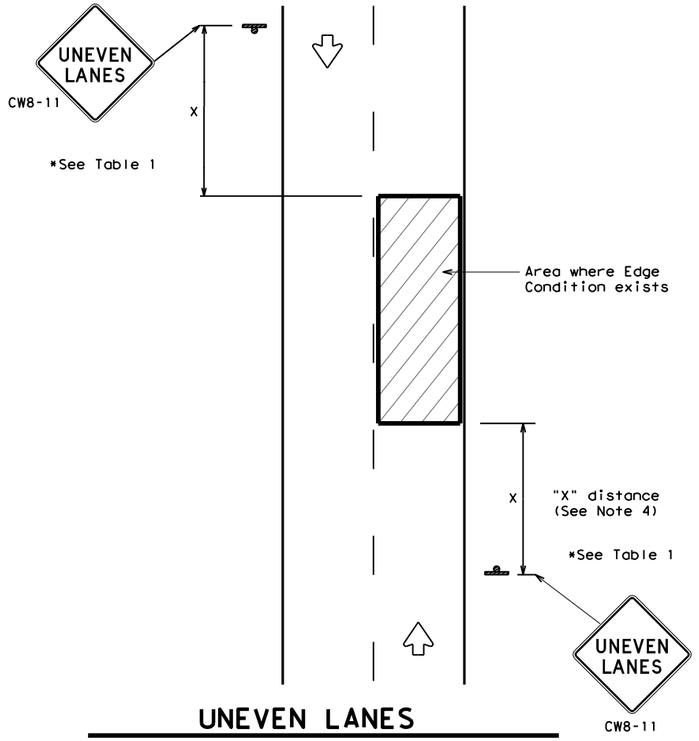
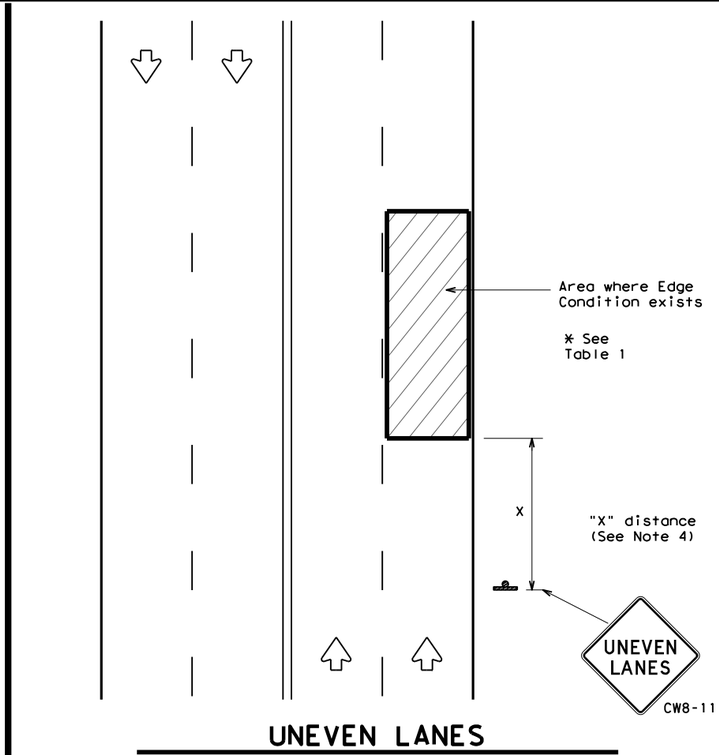
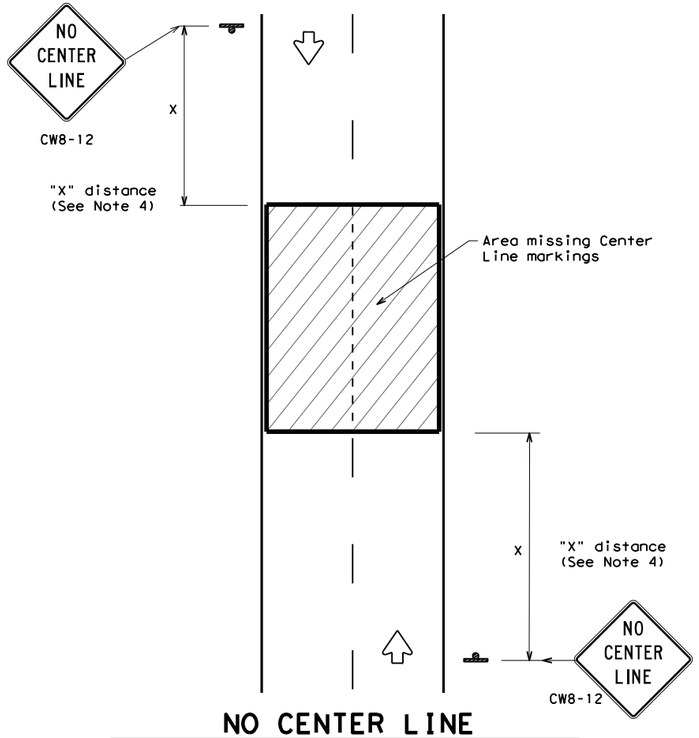


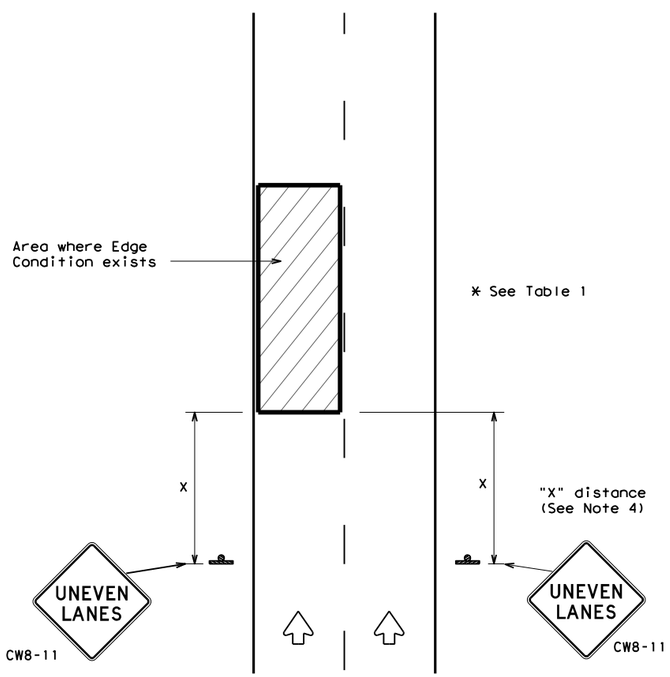
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

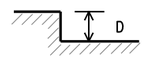
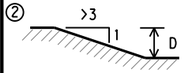
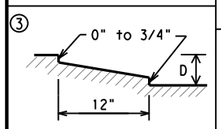
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	ABL	NOLAN		86

LEGEND

CONTROL POINT ▲

CONTROL POINT	SURFACE COORDINATES		GRID COORDINATES		LATITUDE	LONGITUDE	ELEVATION	DESCRIPTION
	NORTHING	EASTING	NORTHING	EASTING				
1770040	6,852,796.18	1,369,530.36	6,851,973.94	1,369,366.04	32°26'57.8208"	100°26'32.5419"	2,241.48	5/8" REBAR WITH 3" ALUMINUM CAP IN CONCRETE
1770041	6,853,013.66	1,369,640.18	6,852,191.40	1,369,475.84	32°26'59.9924"	100°26'31.3077"	2,239.48	5/8" REBAR WITH 3" ALUMINUM CAP IN CONCRETE
130-1	6,852,961.44	1,370,498.61	6,852,139.19	1,370,334.17	32°26'59.6327"	100°26'21.2810"	2,229.48	1/2" REBAR WITH CAP "TXDOT TPT"
130-2	6,853,576.19	1,369,520.70	6,852,753.86	1,369,356.37	32°27'05.5354"	100°26'32.8231"	2,232.68	1/2" REBAR WITH CAP "TXDOT TPT"
130-3	6,852,965.23	1,369,082.17	6,852,142.97	1,367,918.02	32°26'59.2279"	100°26'49.4746"	2,280.12	1/2" REBAR WITH CAP "TXDOT TPT"
130-4	6,852,200.14	1,369,737.82	6,851,377.98	1,369,572.97	32°26'51.9623"	100°26'29.9989"	2,239.57	1/2" REBAR WITH CAP "TXDOT TPT"

NOTES:

ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS COORDINATE SYSTEM, NORTH CENTRAL ZONE (4202)NORTH AMERICAN DATUM OF 1983 (NAD 83) 2011 ADJUSTMENT,ALL DISTANCES AND COORDINATES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.00012.

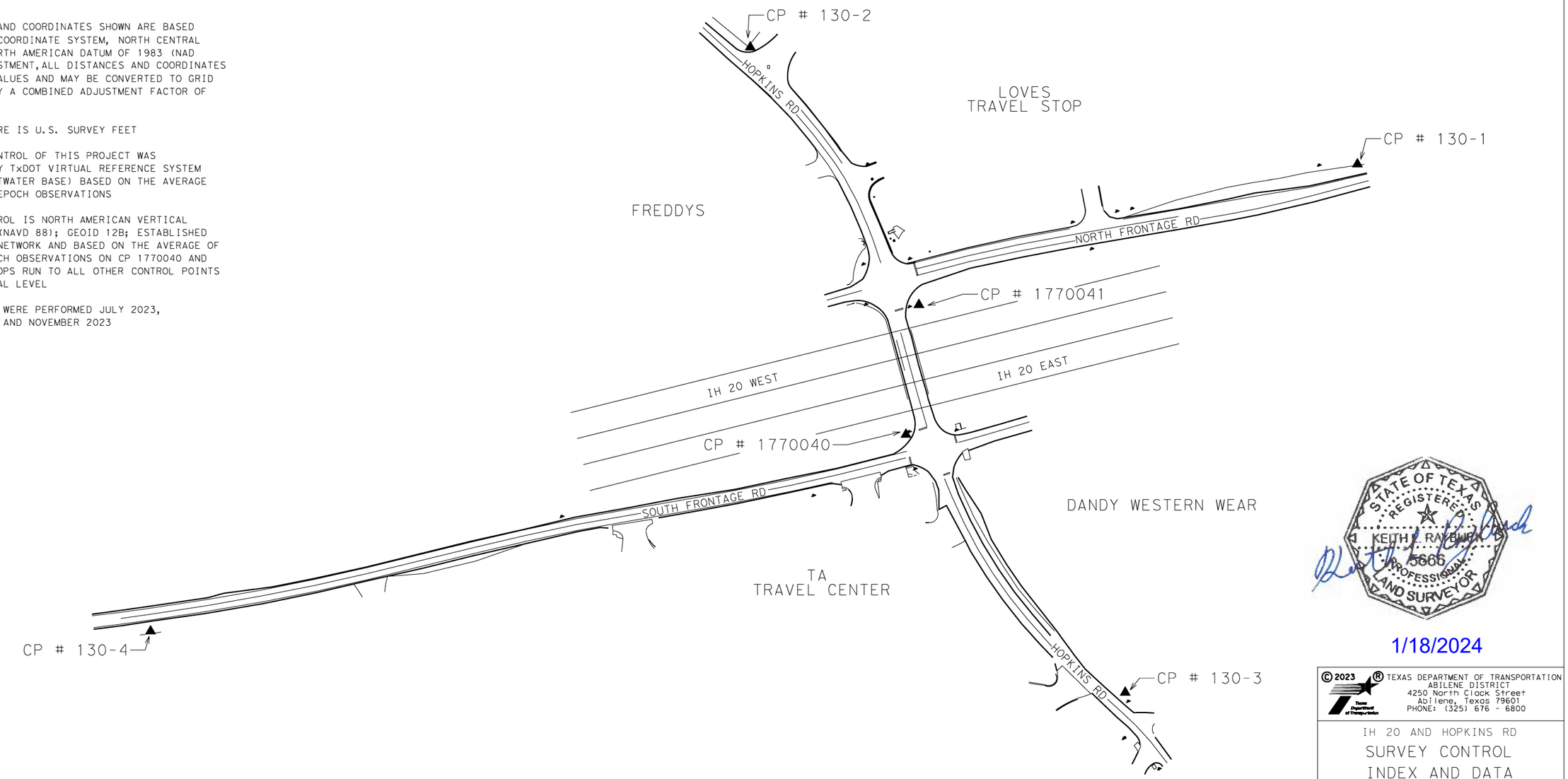
UNIT OF MEASURE IS U.S. SURVEY FEET

HORIZONTAL CONTROL OF THIS PROJECT WAS ESTABLISHED BY TxDOT VIRTUAL REFERENCE SYSTEM NETWORK (SWEETWATER BASE) BASED ON THE AVERAGE OF THREE 180 EPOCH OBSERVATIONS

VERTICAL CONTROL IS NORTH AMERICAN VERTICAL DATUM OF 1988(NAVD 88); GEOID 12B; ESTABLISHED BY TXDOT VRS NETWORK AND BASED ON THE AVERAGE OF THREE 180 EPOCH OBSERVATIONS ON CP 1770040 AND THEN LEVEL LOOPS RUN TO ALL OTHER CONTROL POINTS USING A DIGITAL LEVEL

FIELD SURVEYS WERE PERFORMED JULY 2023, OCTOBER 2023, AND NOVEMBER 2023

0 100 200
SCALE IN FEET



STATE OF TEXAS
REGISTERED
KEITH L. RAYBURN
5666
PROFESSIONAL
LAND SURVEYOR

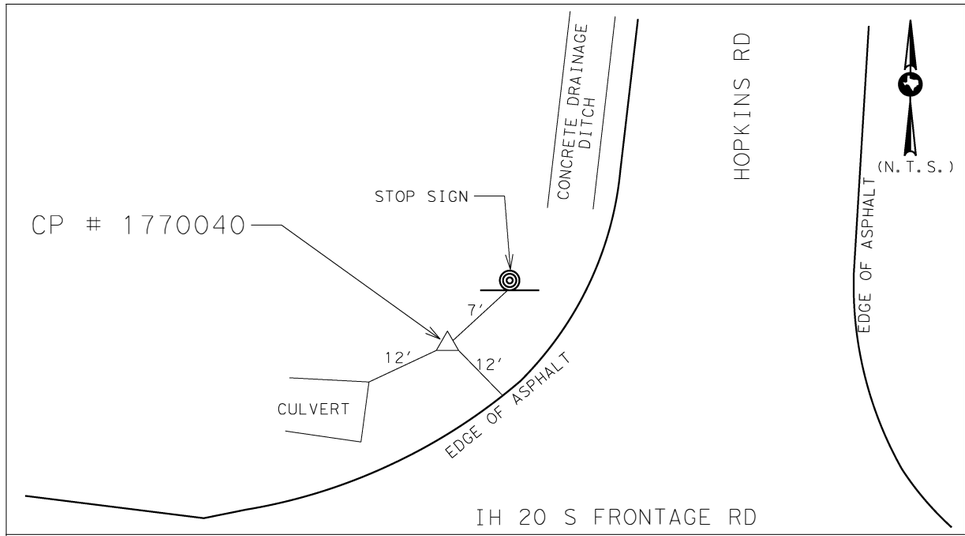
1/18/2024

TEXAS DEPARTMENT OF TRANSPORTATION
ABILENE DISTRICT
4250 North Clack Street
Abilene, Texas 79601
PHONE: (325) 676 - 6800

IH 20 AND HOPKINS RD

SURVEY CONTROL INDEX AND DATA

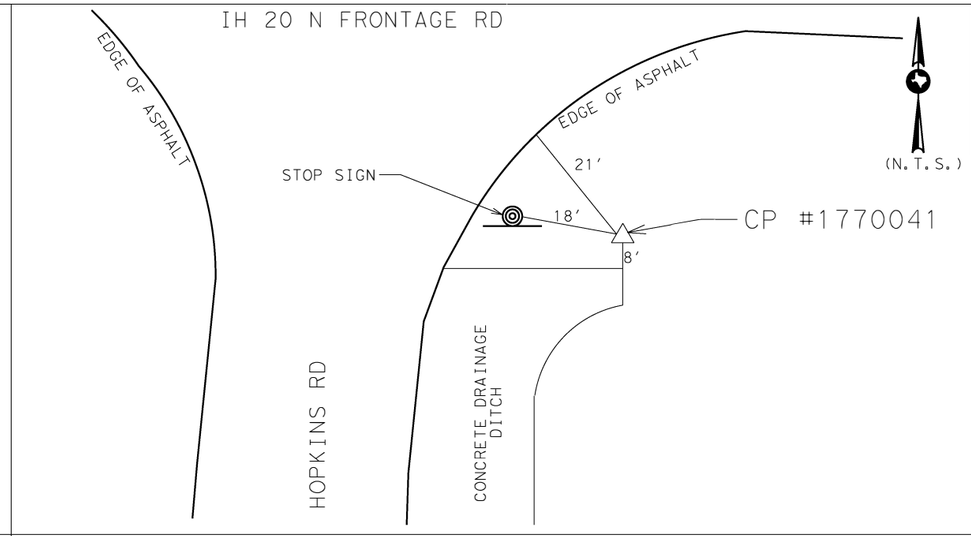
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET				IH 20
STATE DISTRICT NO.	COUNTY	CONTROL NO.	SECTION NO.		JOB NO.	SHEET NO.
8	NOLAN	0006	02		130	87



CONTROL POINT: 1770040

CP# 1770040 IS A 5/8" REBAR WITH 3" ALUMINUM CAP SET IN CONCRETE. LOCATED AT THE NORTHWEST CORNER OF SOUTH IH 20 FRONTAGE RD AND HOPKINS RD INTERSECTION.

GRID COORDINATES		SURFACE COORDINATES		LATITUDE	LONGITUDE
NORTHING	6,851,973.94	NORTHING	6,852,796.18	32° 26′ 57.8208"	100° 26′ 32.5419"
EASTING	1,369,366.04	EASTING	1,369,530.36		
ELEVATION	2,241.48				



CONTROL POINT: 1770041

CP# 1770041 IS A 5/8" REBAR WITH 3" ALUMINUM CAP SET IN CONCRETE. LOCATED AT THE SOUTHEAST CORNER OF NORTH IH 20 FRONTAGE RD AND HOPKINS RD INTERSECTION.

GRID COORDINATES		SURFACE COORDINATES		LATITUDE	LONGITUDE
NORTHING	6,852,191.40	NORTHING	6,853,013.66	32° 26′ 59.9924"	100° 26′ 31.3077"
EASTING	1,369,475.84	EASTING	1,370,498.61		
ELEVATION	2,239.48				

NOTES:

ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS COORDINATE SYSTEM, NORTH CENTRAL ZONE (4202) NORTH AMERICAN DATUM OF 1983 (NAD 1983) 2011 ADJUSTMENT

UNIT OF MEASURE IS U.S. SURVEY FEET

HORIZONTAL CONTROL OF THIS PROJECT WAS ESTABLISHED BY TXDOT VIRTUAL REFERENCE SYSTEM NETWORK (SWEETWATER BASE) BASED ON THE AVERAGE OF THREE 180 EPOCH OBSERVATIONS.

VERTICAL CONTROL IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88); GEOID 12B; TXDOT VRS NETWORK AND BASED ON THE AVERAGE OF THREE 180 EPOCH OBSERVATIONS ON CP 1770040 AND THEN LEVEL LOOPS RUN TO ALL OTHER CONTROL POINTS USING A DIGITAL LEVEL.

LEGEND

CONTROL POINT △

SIGN

1/18/2024

TEXAS DEPARTMENT OF TRANSPORTATION
ABILENE DISTRICT
4250 North Clack Street
Abilene, Texas 79601
PHONE: (325) 676 - 6800

IH 20 AND HOPKINS RD

SURVEY CONTROL DATA

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			IH 20
STATE DISTRICT NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
8	NOLAN	0006	02	130	**88**

CK:
DW:
CK:
DW:

NORTH FRONTAGE ROAD
HORIZONTAL ALIGNMENT DATA

HORIZONTAL ALIGNMENT REPORT

Alignment name: CL-NFR
Alignment description:
Report Created: Tuesday, October 31, 2023
Time: 1:50:12 PM

	STATION	X	Y
PC	815+00.000 R1	1368509.049	6853193.150
PI	816+76.457 R1	1368683.130	6853164.291
CC		1369420.022	6858688.151
PT	818+52.795 R1	1368858.688	6853146.508
Radius:	5570.000		
Delta:	03°37'44.497" Left		
Degree of Curvature(Arc):	01°01'43.138"		
Length:	352.795		
Tangent:	176.457		
Chord:	352.736		
Middle Ordinate:	2.793		
External:	2.794		
Tangent Back Direction:	S80°35'13.164"E		
Radial Direction:	S09°24'46.836"W		
Chord Direction:	S82°24'05.412"E		
Radial Direction:	S05°47'02.339"W		
Tangent Ahead Direction:	S84°12'57.661"E		
PT	818+52.795 R1	1368858.688	6853146.508
PC	826+36.962 R1	1369638.862	6853067.481
Tangential Direction:	S84°12'57.661"E		
Tangential Length:	784.166		
PC	826+36.962 R1	1369638.862	6853067.481
PI	827+91.877 R1	1369792.989	6853051.869
CC		1369327.256	6849991.223
PT	829+46.535 R1	1369944.784	6853020.929
Radius:	3092.000		
Delta:	05°44'11.365" Right		
Degree of Curvature(Arc):	01°51'10.919"		
Length:	309.573		
Tangent:	154.916		
Chord:	309.444		
Middle Ordinate:	3.874		
External:	3.878		
Tangent Back Direction:	S84°12'57.661"E		
Radial Direction:	S05°47'02.339"W		
Chord Direction:	S81°20'51.978"E		
Radial Direction:	S11°31'13.704"W		
Tangent Ahead Direction:	S78°28'46.296"E		
PT	829+46.535 R1	1369944.784	6853020.929
PC	832+18.225 R1	1370211.001	6852966.668
Tangential Direction:	S78°28'46.296"E		
Tangential Length:	271.691		
PC	832+18.225 R1	1370211.001	6852966.668
PI	833+15.431 R1	1370306.249	6852947.254
CC		1370646.387	6855102.748
PT	834+12.509 R1	1370402.846	6852936.395
Radius:	2180.000		
Delta:	05°06'22.480" Left		
Degree of Curvature(Arc):	02°37'41.688"		
Length:	194.283		
Tangent:	97.206		
Chord:	194.219		
Middle Ordinate:	2.164		
External:	2.166		
Tangent Back Direction:	S78°28'46.296"E		
Radial Direction:	S11°31'13.704"W		
Chord Direction:	S81°01'57.536"E		
Radial Direction:	S06°24'51.224"W		
Tangent Ahead Direction:	S83°35'08.776"E		
PT	834+12.509 R1	1370402.846	6852936.395
PC	835+71.664 R1	1370561.005	6852918.614
Tangential Direction:	S83°35'08.776"E		
Tangential Length:	159.155		
PC	835+71.664 R1	1370561.005	6852918.614
PI	835+84.763 R1	1370574.022	6852917.151
CC		1370677.078	6853951.111
PT	835+97.861 R1	1370587.072	6852916.016
Radius:	1039.000		
Delta:	01°26'40.672" Left		
Degree of Curvature(Arc):	05°30'52.243"		
Length:	26.197		
Tangent:	13.099		
Chord:	26.196		
Middle Ordinate:	0.083		
External:	0.083		
Tangent Back Direction:	S83°35'08.776"E		
Radial Direction:	S06°24'51.224"W		
Chord Direction:	S84°18'29.111"E		
Radial Direction:	S04°58'10.553"W		
Tangent Ahead Direction:	S85°01'49.447"E		
PT	835+97.861 R1	1370587.072	6852916.016
POT	841+61.686 R1	1371148.778	6852867.174
Tangential Direction:	S85°01'49.447"E		
Tangential Length:	563.825		

IH20 CL
HORIZONTAL ALIGNMENT DATA

HORIZONTAL ALIGNMENT REPORT

Alignment name: CL-IH20
Alignment description:
Report Created: Tuesday, October 31, 2023
Time: 2:06:01 PM

	STATION	X	Y
POT	705+00.000 R1	1367509.908	6853261.816
PC	709+70.800 R1	1367965.695	6853143.873
Tangential Direction:	S75°29'31.270"E		
Tangential Length:	470.800		
PC	709+70.800 R1	1367965.695	6853143.873
PI	713+99.935 R1	1368381.146	6853036.369
CC		1369401.057	6858690.821
PT	718+27.470 R1	1368807.975	6852991.949
Radius:	5729.650		
Delta:	08°33'59.732" Left		
Degree of Curvature(Arc):	00°59'59.955"		
Length:	856.670		
Tangent:	429.135		
Chord:	855.872		
Middle Ordinate:	16.003		
External:	16.048		
Tangent Back Direction:	S75°29'31.270"E		
Radial Direction:	S14°30'28.730"W		
Chord Direction:	S79°46'31.136"E		
Radial Direction:	S05°56'28.998"W		
Tangent Ahead Direction:	S84°03'31.002"E		
PT	718+27.470 R1	1368807.975	6852991.949
POT	740+00.000 R1	1370968.835	6852767.068
Tangential Direction:	S84°03'31.002"E		
Tangential Length:	2172.530		

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED PROFESSIONAL ENGINEER

1/30/2024

AECOM
13355 Noel Road, Suite 400
Dallas, Texas 72540
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

HORIZONTAL ALIGNMENT DATA

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		89

DATE:
FILE:

CK:
DW:
CK:
DW:

SOUTH FRONTAGE ROAD
HORIZONTAL ALIGNMENT DATA

HORIZONTAL ALIGNMENT REPORT

Alignment name: CL-SFR
Alignment description:
Report Created: Tuesday, October 31, 2023
Time: 2:11:25 PM

	STATION	X	Y
POT	615+00.000 R1	1368468.242	6852922.372
PC	617+97.906 R1	1368763.562	6852883.204
Tangential Direction:	S82°26'41.956"E		
Tangential Length:	297.906		
PC	617+97.906 R1	1368763.562	6852883.204
PI	618+77.369 R1	1368842.336	6852872.756
CC		1368444.202	6850475.290
PT	619+56.776 R1	1368920.258	6852857.182
Radius:	2429.000		
Delta:	03°44'50.906" Right		
Degree of Curvature(Arc):	02°21'31.758"		
Length:	158.871		
Tangent:	79.464		
Chord:	158.842		
Middle Ordinate:	1.299		
External:	1.299		
Tangent Back Direction:	S82°26'41.956"E		
Radial Direction:	S07°33'18.044"W		
Chord Direction:	S80°34'16.504"E		
Radial Direction:	S11°18'08.949"W		
Tangent Ahead Direction:	S78°41'51.051"E		
PT	619+56.776 R1	1368920.258	6852857.182
PC	621+86.287 R1	1369145.318	6852812.201
Tangential Direction:	S78°41'51.051"E		
Tangential Length:	229.511		
PC	621+86.287 R1	1369145.318	6852812.201
PI	623+63.057 R1	1369318.659	6852777.556
CC		1369885.959	6856517.911
PT	625+39.569 R1	1369494.478	6852759.243
Radius:	3779.000		
Delta:	05°21'22.791" Left		
Degree of Curvature(Arc):	01°30'58.185"		
Length:	353.282		
Tangent:	176.770		
Chord:	353.153		
Middle Ordinate:	4.128		
External:	4.132		
Tangent Back Direction:	S78°41'51.051"E		
Radial Direction:	S11°18'08.949"W		
Chord Direction:	S81°22'32.446"E		
Radial Direction:	S05°56'46.158"W		
Tangent Ahead Direction:	S84°03'13.842"E		
PT	625+39.569 R1	1369494.478	6852759.243
PC	627+40.747 R1	1369694.574	6852738.403
Tangential Direction:	S84°03'13.842"E		
Tangential Length:	201.178		
PC	627+40.747 R1	1369694.574	6852738.403
PI	627+79.442 R1	1369733.061	6852734.394
CC		1369798.168	6853733.022
PT	628+18.098 R1	1369771.742	6852733.372
Radius:	1000.000		
Delta:	04°25'54.721" Left		
Degree of Curvature(Arc):	05°43'46.481"		
Length:	77.351		
Tangent:	38.695		
Chord:	77.331		
Middle Ordinate:	0.748		
External:	0.748		
Tangent Back Direction:	S84°03'13.842"E		
Radial Direction:	S05°56'46.158"W		
Chord Direction:	S86°16'11.202"E		
Radial Direction:	S01°30'51.438"W		
Tangent Ahead Direction:	S88°29'08.562"E		
PT	628+18.098 R1	1369771.742	6852733.372
PC	632+48.823 R1	1370202.316	6852721.989
Tangential Direction:	S88°29'08.562"E		
Tangential Length:	430.725		
PC	632+48.823 R1	1370202.316	6852721.989
PI	633+93.656 R1	1370347.098	6852718.162
CC		1370103.297	6848976.298
PT	635+38.344 R1	1370491.153	6852703.170
Radius:	3747.000		
Delta:	04°25'37.560" Right		
Degree of Curvature(Arc):	01°31'44.799"		
Length:	289.521		
Tangent:	144.833		
Chord:	289.449		
Middle Ordinate:	2.796		
External:	2.798		
Tangent Back Direction:	S88°29'08.562"E		
Radial Direction:	S01°30'51.438"W		
Chord Direction:	S86°16'19.782"E		
Radial Direction:	S05°56'28.998"W		
Tangent Ahead Direction:	S84°03'31.002"E		
PT	635+38.344 R1	1370491.153	6852703.170
POT	640+06.846 R1	1370957.138	6852654.675
Tangential Direction:	S84°03'31.002"E		
Tangential Length:	468.502		

HOPKINS ROAD
HORIZONTAL ALIGNMENT DATA

HORIZONTAL ALIGNMENT REPORT

Alignment name: CL-HOPK
Alignment description:
Report Created: Tuesday, October 31, 2023
Time: 2:17:33 PM

	STATION	X	Y
POT	2+40.000 R1	1369451.575	6853641.622
PC	4+20.753 R1	1369532.299	6853479.896
Tangential Direction:	S26°31'32.159"E		
Tangential Length:	180.753		
PC	4+20.753 R1	1369532.299	6853479.896
PI	6+20.323 R1	1369621.426	6853301.334
CC		1368913.142	6853170.850
PT	8+09.348 R1	1369601.782	6853102.734
Radius:	692.000		
Delta:	32°10'28.519" Right		
Degree of Curvature(Arc):	08°16'47.053"		
Length:	388.594		
Tangent:	199.569		
Chord:	383.509		
Middle Ordinate:	27.098		
External:	28.203		
Tangent Back Direction:	S26°31'32.159"E		
Radial Direction:	S63°28'27.841"W		
Chord Direction:	S10°26'17.899"E		
Radial Direction:	N84°21'03.640"W		
Tangent Ahead Direction:	S05°38'56.360"W		
PT	8+09.348 R1	1369601.782	6853102.734
PC	11+23.053 R1	1369570.903	6852790.552
Tangential Direction:	S05°38'56.360"W		
Tangential Length:	313.706		
PC	11+23.053 R1	1369570.903	6852790.552
PI	13+92.804 R1	1369544.350	6852522.112
CC		1370519.274	6852696.744
PT	16+48.801 R1	1369662.430	6852279.579
Radius:	953.000		
Delta:	31°36'31.425" Left		
Degree of Curvature(Arc):	06°00'43.736"		
Length:	525.748		
Tangent:	269.750		
Chord:	519.106		
Middle Ordinate:	36.026		
External:	37.441		
Tangent Back Direction:	S05°38'56.360"W		
Radial Direction:	N84°21'03.640"W		
Chord Direction:	S10°09'19.352"E		
Radial Direction:	S64°02'24.935"W		
Tangent Ahead Direction:	S25°57'35.065"E		
PT	16+48.801 R1	1369662.430	6852279.579
PC	17+78.530 R1	1369719.218	6852162.939
Tangential Direction:	S25°57'35.065"E		
Tangential Length:	129.729		
PC	17+78.530 R1	1369719.218	6852162.939
PI	18+55.199 R1	1369752.779	6852094.005
CC		1369131.205	6851876.657
PT	19+31.171 R1	1369769.487	6852019.179
Radius:	654.000		
Delta:	13°22'21.405" Right		
Degree of Curvature(Arc):	08°45'38.961"		
Length:	152.641		
Tangent:	76.669		
Chord:	152.295		
Middle Ordinate:	4.448		
External:	4.479		
Tangent Back Direction:	S25°57'35.065"E		
Radial Direction:	S64°02'24.935"W		
Chord Direction:	S19°16'24.363"E		
Radial Direction:	S77°24'46.339"W		
Tangent Ahead Direction:	S12°35'13.661"E		
PT	19+31.171 R1	1369769.487	6852019.179
POT	20+70.490 R1	1369799.848	6851883.209
Tangential Direction:	S12°35'13.661"E		
Tangential Length:	139.319		

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED
PROFESSIONAL ENGINEER

1/30/2024

AECOM
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Dallas, Texas 72540
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

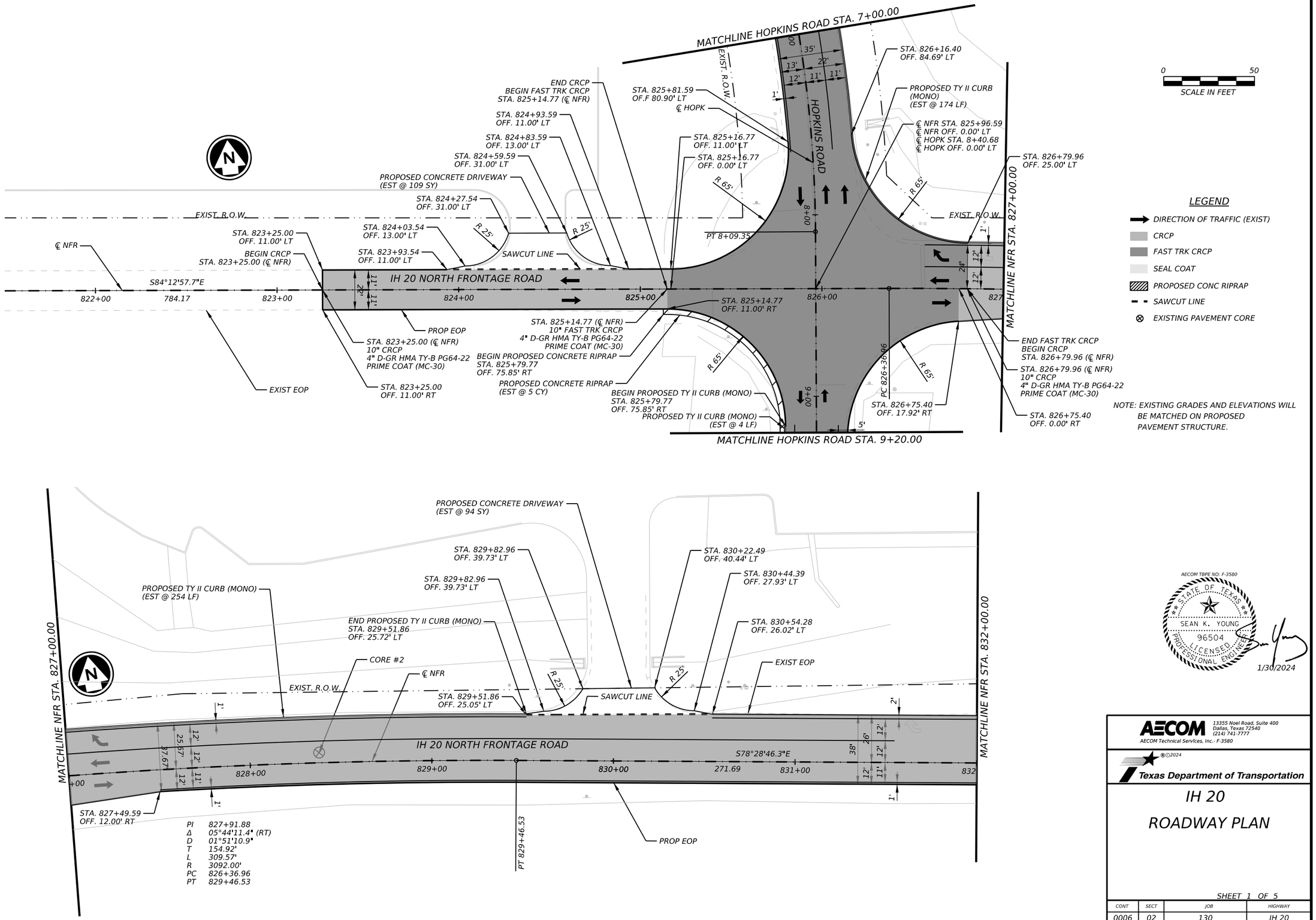
IH 20

HORIZONTAL ALIGNMENT DATA

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		90

DATE:
FILE:



AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED PROFESSIONAL ENGINEER

1/30/2024

AECOM
13355 Noel Road, Suite 400
Dallas, Texas 72540
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

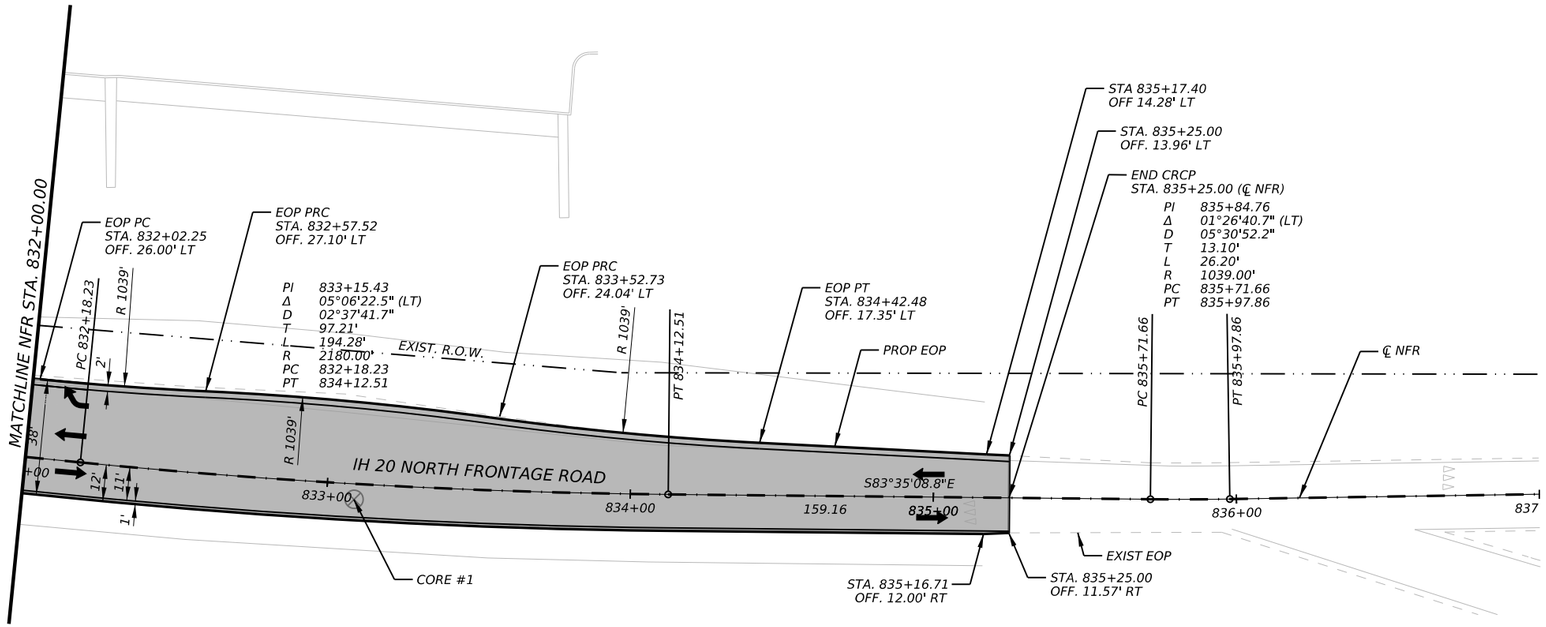
IH 20

ROADWAY PLAN

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		91

DATE: 1/30/2024 2:44:25 PM
FILE: pw://aecom-na-pw.bentley.com:AECOM USA Texas/Documents/60706605-IH 20 at Hopkins Rd Pavement Rehab/900-CAD GIS/910 CAD/05 ROADWAY/Sheets/IH20 AEC RD PN 001.dgn



0 50

SCALE IN FEET

LEGEND

- DIRECTION OF TRAFFIC (EXIST)
- CRCP
- FAST TRK CRCP
- SEAL COAT
- PROPOSED CONC RIPRAP
- SAWCUT LINE
- EXISTING PAVEMENT CORE

NOTE: EXISTING GRADES AND ELEVATIONS WILL BE MATCHED ON PROPOSED PAVEMENT STRUCTURE.

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED
PROFESSIONAL ENGINEER

1/30/2024

AECOM
13355 Noel Road, Suite 400
Dallas, Texas 72540
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

ROADWAY PLAN

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		92

DATE: 1/30/2024 2:44:25 PM
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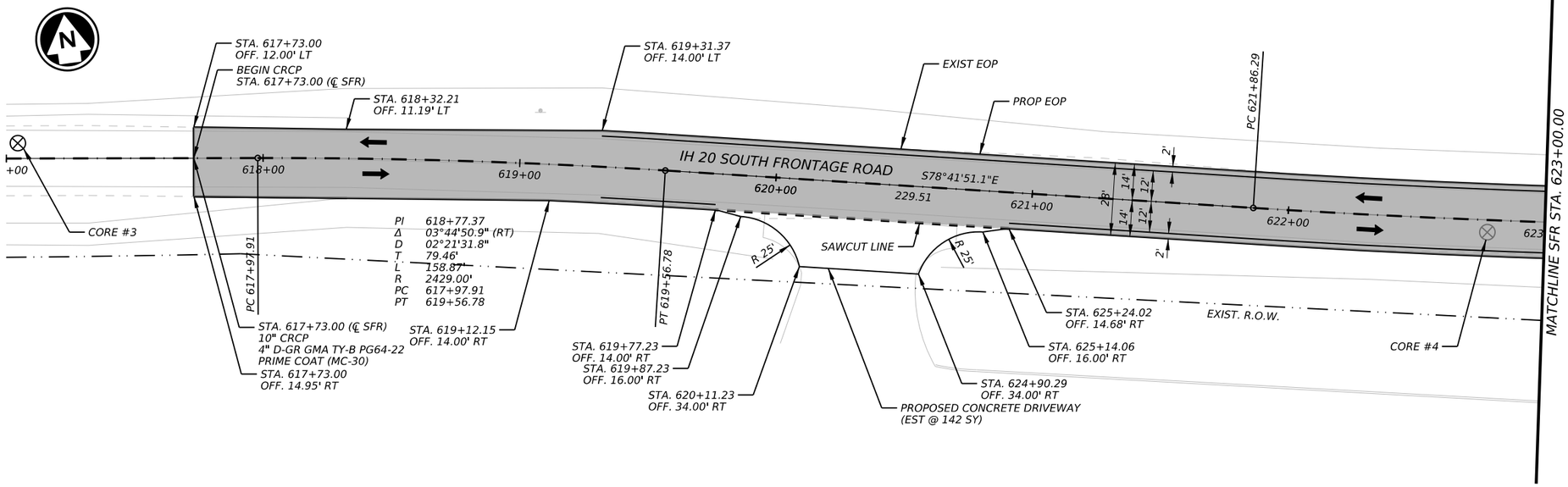

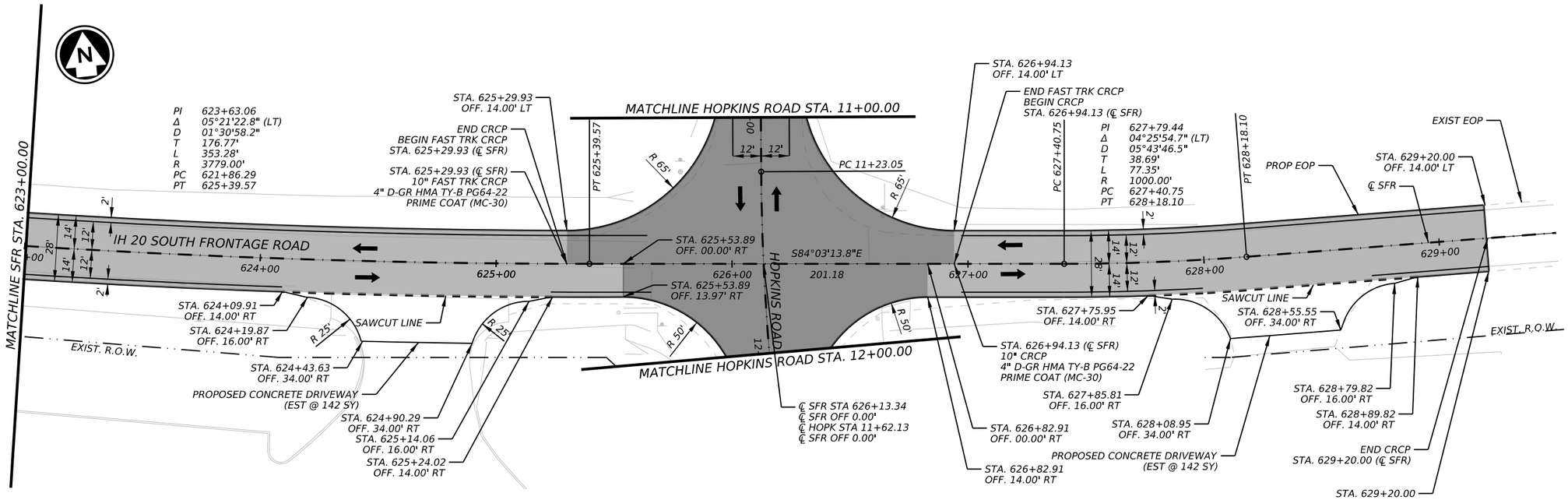

0 50

SCALE IN FEET

LEGEND

- DIRECTION OF TRAFFIC (EXIST)
- CRCP
- FAST TRK CRCP
- SEAL COAT
- PROPOSED CONC RIPRAP
- SAWCUT LINE
- EXISTING PAVEMENT CORE

NOTE: EXISTING GRADES AND ELEVATIONS WILL BE MATCHED ON PROPOSED PAVEMENT STRUCTURE.

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED
PROFESSIONAL ENGINEER

1/30/2024

AECOM
13355 Noel Road, Suite 400
Dallas, Texas 72540
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

ROADWAY PLAN

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		93

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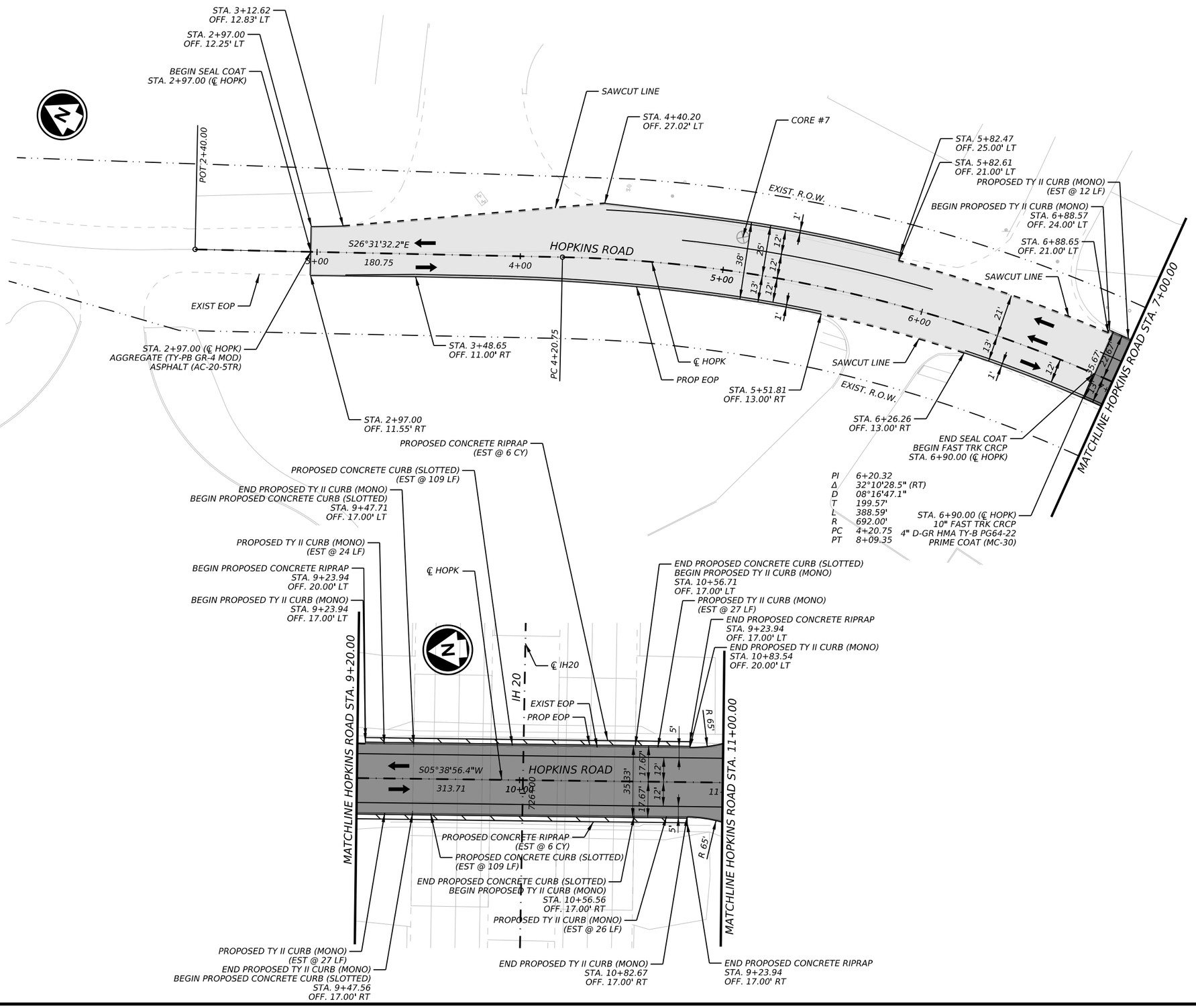

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
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LICENSED PROFESSIONAL ENGINEER

1/30/2024

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Texas Department of Transportation

IH 20

ROADWAY PLAN

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		94

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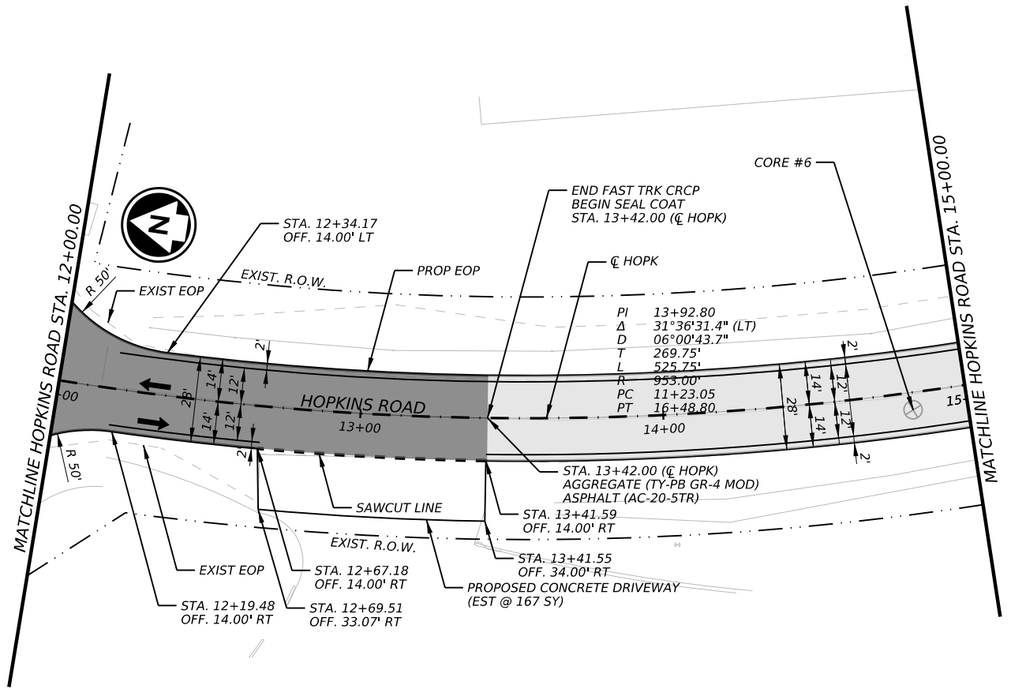

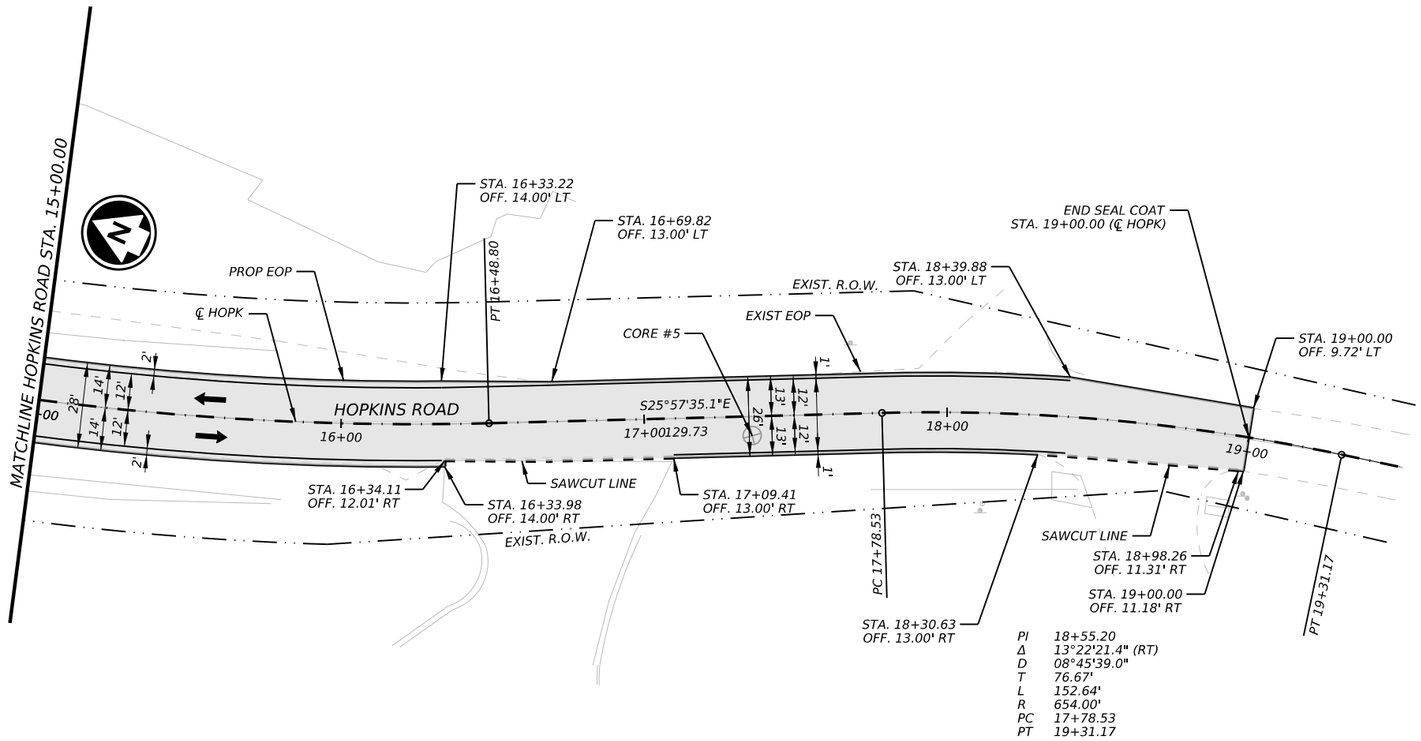

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SCALE IN FEET

LEGEND

- DIRECTION OF TRAFFIC (EXIST)
- CRCP
- FAST TRK CRCP
- SEAL COAT
- PROPOSED CONC RIPRAP
- SAWCUT LINE
- EXISTING PAVEMENT CORE

NOTE: EXISTING GRADES AND ELEVATIONS WILL BE MATCHED ON PROPOSED PAVEMENT STRUCTURE.

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
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Texas Department of Transportation

IH 20

ROADWAY PLAN

SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		95

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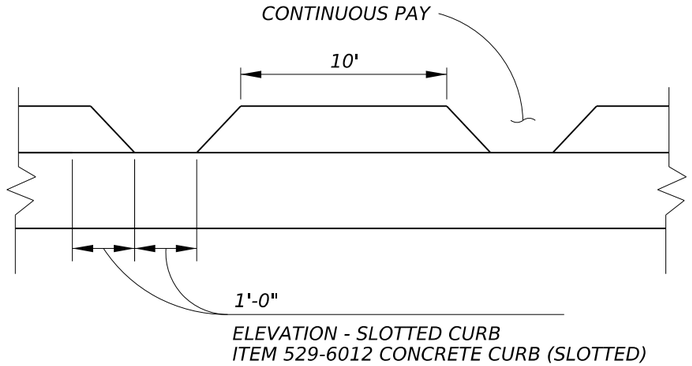
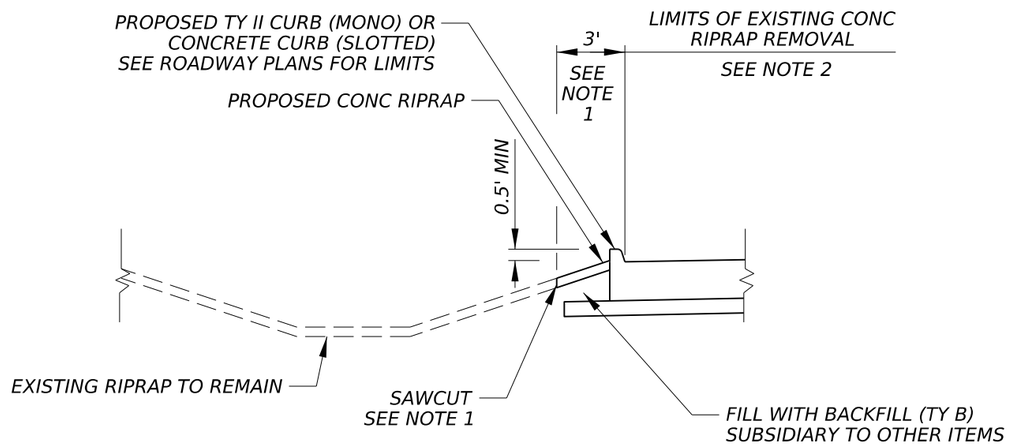


ELEVATION - SLOTTED CURB
ITEM 529-6012 CONCRETE CURB (SLOTTED)

SLOTTED CURB

NTS



CONCRETE RIPRAP REPLACEMENT UNDER BRIDGE

NTS

NOTES:

1. 3 FT RECOMMENDED. LOCATION OF SAWCUT TO BE DETERMINED BY ENGINEER.

2. REFER TO REMOVAL SHEETS FOR LIMITS OF EXISTING CONC RIPRAP REMOVAL.

AECOM TBPE NO: F-3580

STATE OF TEXAS
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IH 20

SLOTTED CURB DETAILS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		96

DATE: 1/31/2024 10:02:23 AM
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DW: CK: DW: CK:

DATE:
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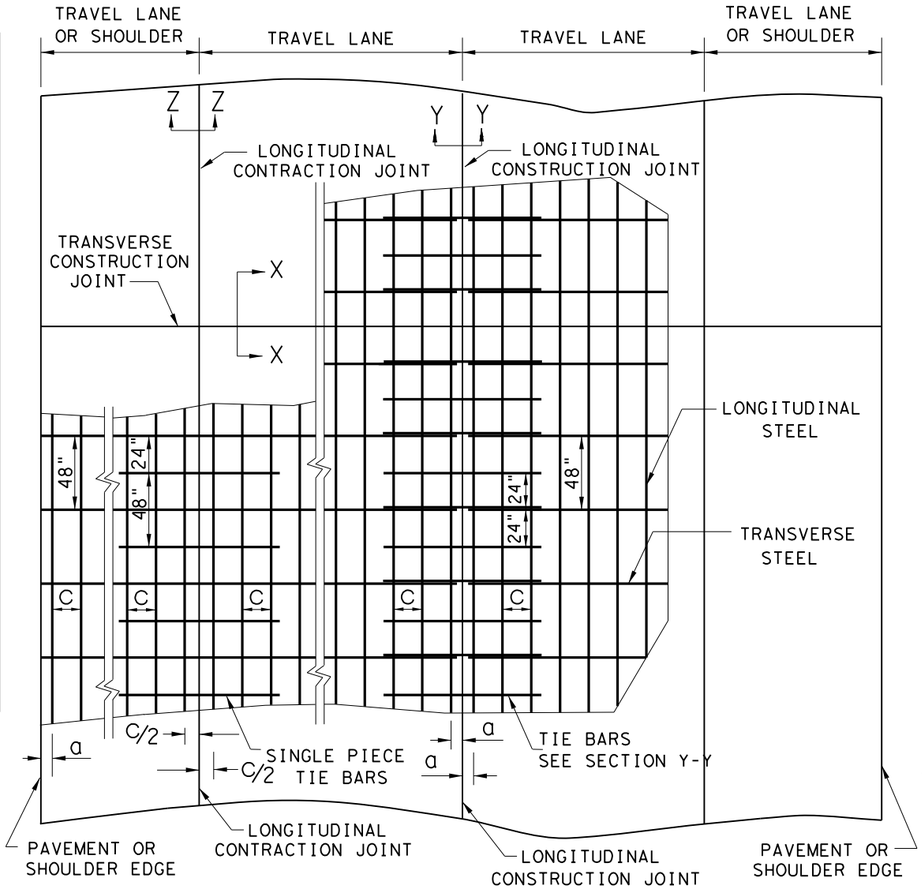
TABLE NO. 1 LONGITUDINAL STEEL				
SLAB THICKNESS AND BAR SIZE		LONGITUDINAL STEEL BARS	FIRST SPACING AT EDGE OR JOINT	LONG. STEEL VERTICAL POSITION FROM BOTTOM OF PAVEMENT
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING a (IN.)	T1 (IN.)
7.0	#5	6.5	3 TO 4	3.5
7.5	#5	6.0	3 TO 4	3.75
8.0	#6	9.0	3 TO 4	4.0
8.5	#6	8.5	3 TO 4	4.25
9.0	#6	8.0	3 TO 4	4.5
9.5	#6	7.5	3 TO 4	4.75
10.0	#6	7.0	3 TO 4	5.0
10.5	#6	6.75	3 TO 4	5.5
11.0	#6	6.5	3 TO 4	6.0
11.5	#6	6.25	3 TO 4	6.5
12.0	#6	6.0	3 TO 4	7.0
12.5	#6	5.75	3 TO 4	7.5
13.0	#6	5.5	3 TO 4	8.0

TABLE NO. 2 TRANSVERSE STEEL AND TIE BARS						
SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONSTRUCTION JOINT (SECTION Y-Y)	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
7.0 - 7.5	#5*	48	#5*	48	#5*	24
8.0 - 13.0	#5*	48	#6	48	#6	24

*CONTRACTOR MAY USE #6 REINFORCING STEEL INSTEAD OF #5 REINFORCING STEEL OR COMBINATION OF EACH SIZE

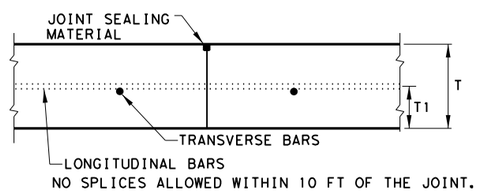


TYPICAL PAVEMENT LAYOUT

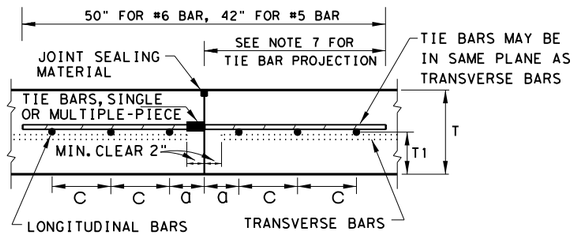
PLAN VIEW (NOT TO SCALE)

GENERAL NOTES

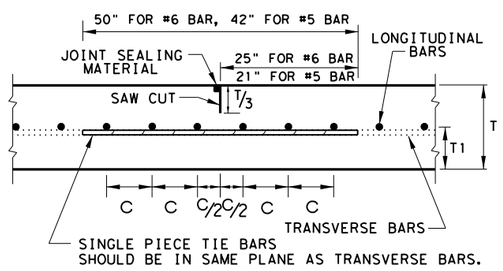
1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. FOR PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT, ADDITIONAL DETAIL MAY BE SHOWN ELSEWHERE IN THE PLANS.
2. USE COARSE AGGREGATES WITH A RATED COEFFICIENT OF THERMAL EXPANSION (CoTE) OF NOT MORE THAN 5.5 X 10^{-6} IN/IN/ °F AS LISTED IN THE CONCRETE RATED SOURCE QUALITY CATALOG (CRSQC).
3. ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60) OR ABOVE. STEEL BAR SIZES AND SPACINGS SHALL CONFORM TO TABLE NO.1 AND TABLE NO.2.
4. STEEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1 IN. HORIZONTALLY AND +/- 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS) SHALL CONFORM TO TABLE NO.1.
5. ADJUST REINFORCING STEEL VERTICALLY USING SHIMS OR OTHER METHODS, AS APPROVED, TO MEET VERTICAL TOLERANCES PRIOR TO CONCRETE PLACEMENT.
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 MINIMUM PROJECTION OF TIE BARS INTO THE ADJACENT PLACEMENT IS 22.5 IN. for #6 BARS AND 18.5 IN. FOR #5 BARS.
8. SEE STANDARD SHEET "CONCRETE CURB AND CURB AND GUTTER," FOR DETAILS WHEN TYING CONCRETE CURB OR CURB GUTTER AT A LONGITUDINAL JOINT.
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. OMIT TIE BARS LOCATED WITHIN 18-IN. OF THE TRANSVERSE CONSTRUCTION JOINTS (SECTION X-X). USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
11. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



TRANSVERSE CONSTRUCTION JOINT
SECTION X - X



LONGITUDINAL CONSTRUCTION JOINT
SECTION Y - Y



LONGITUDINAL CONTRACTION JOINT
SECTION Z - Z

SHEET 1 OF 2

Texas Department of Transportation

Design Division Standard

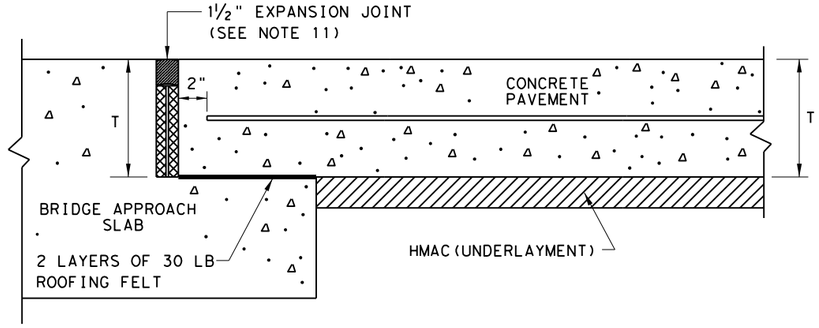
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT T - 7 to 13 INCHES

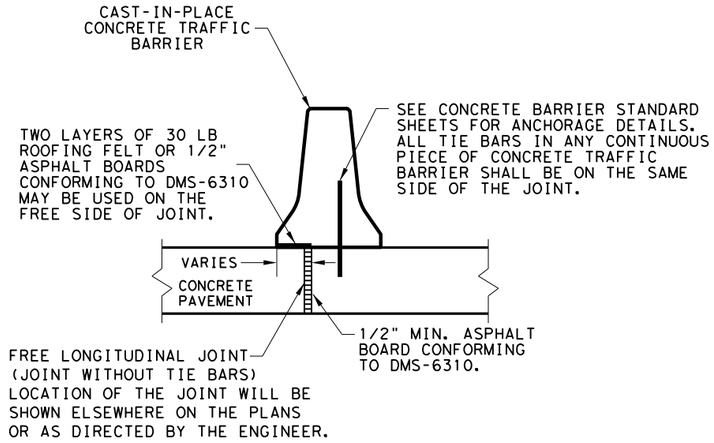
CRCP(1)-23

FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES	CK:
© TxDOT: APRIL 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
APRIL 2023: REVISED LONG. STEEL VERTICAL LOCATION. REMOVED ADDITIONAL TIEBAR AT TRANSVERSE CONSTRUCTION JOINTS	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		97

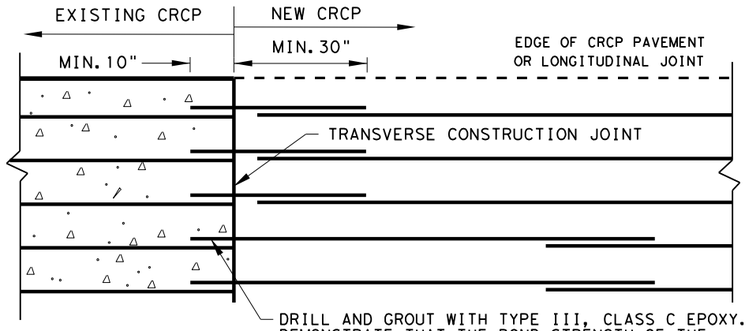
DATE:
FILE:



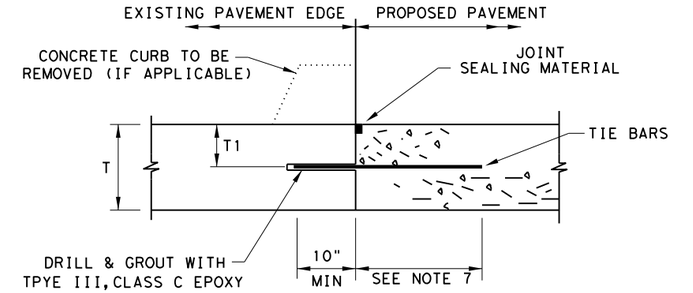
TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH



CENTERLINE FREE LONGITUDINAL JOINT DETAIL

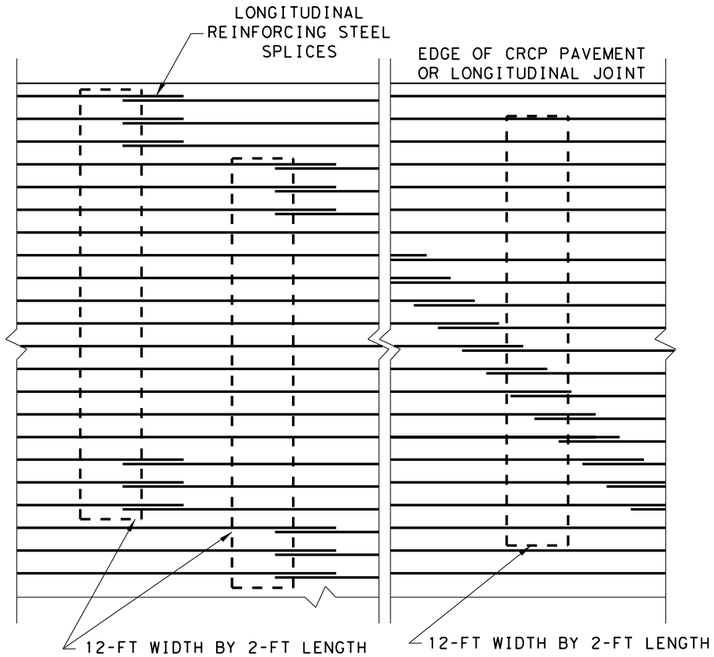


OPTION A: DRILL AND EPOXY
PLAN VIEW (NOT TO SCALE)



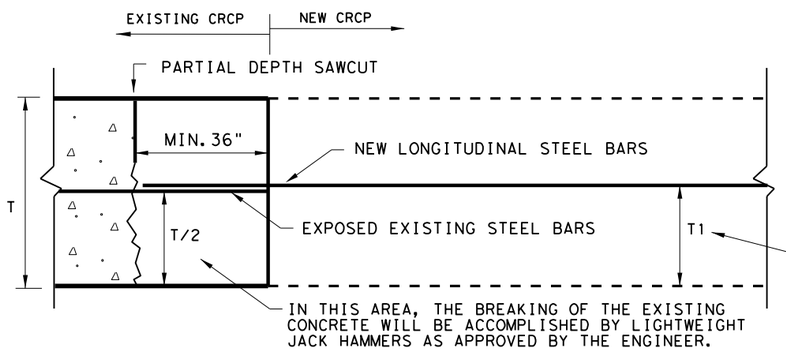
1. BEFORE CONCRETE PLACEMENT, PERFORM PULL-OUT TESTS ON EPOXY-GROUTED TIE BARS IN ACCORDANCE WITH ITEM 360.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER PAVEMENTS, USE #5 TIE BARS FOR LESS THAN 8" THICK PAVEMENTS.

LONGITUDINAL WIDENING JOINT DETAIL



STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT. ANY OTHER LAP CONFIGURATION MEETING THIS REQUIREMENT WILL BE ALLOWED.

EXAMPLES OF LAP CONFIGURATION
PLAN VIEW (NOT TO SCALE)



OPTION B: BREAKBACK AND LAP

TRANSVERSE TIE JOINT DETAIL
NEW CRCP TO EXISTING CRCP

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

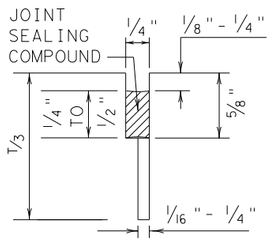
ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

CRCP(1)-23

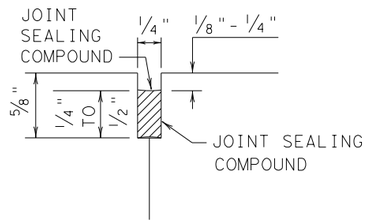
FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES	CK:	
©TxDOT: APRIL 2023	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0006	02	130	IH 20	
APRIL 2023: MODIFIED EXPANSION JOINT DETAIL AT BRIDGE APPROACH SLAB	DIST	COUNTY		SHEET NO.	
	ABL	NOLAN		98	

DATE:
FILE:

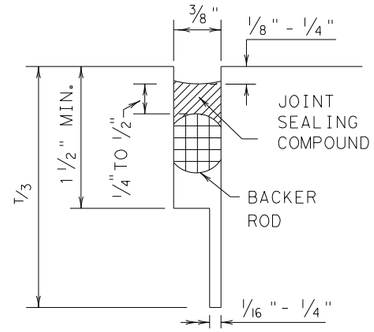
METHOD B: JOINT SEALING COMPOUND



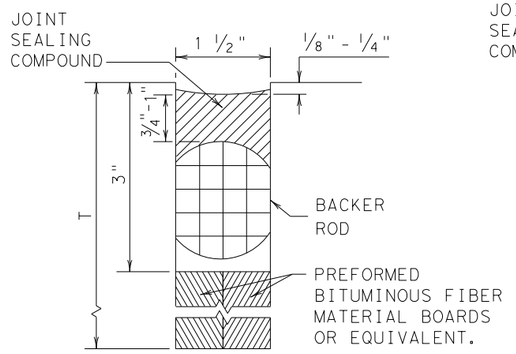
LONGITUDINAL SAWED CONTRACTION JOINT



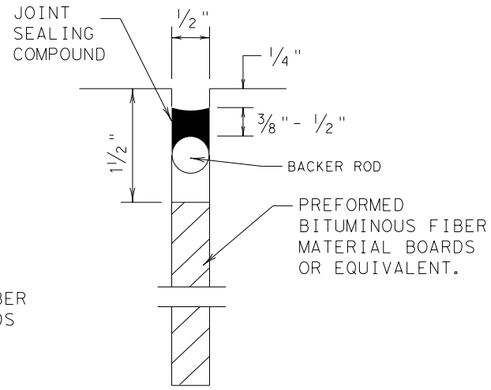
LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT

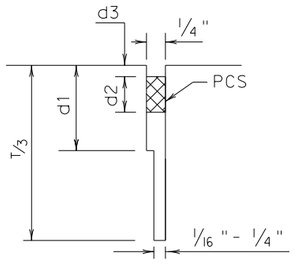


TRANSVERSE FORMED EXPANSION JOINT



FORMED ISOLATION JOINT

METHOD A: PREFORMED COMPRESSION SEALS (PCS)(DMS-6310 CLASS 6)



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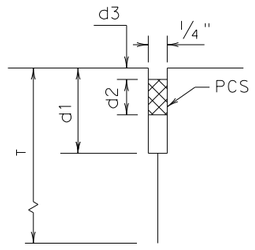
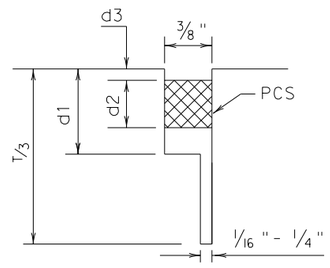


LONGITUDINAL CONSTRUCTION JOINT



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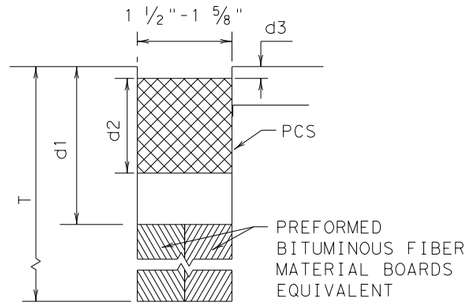


TRANSVERSE FORMED EXPANSION JOINT

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.

Texas Department of Transportation

Design Division Standard

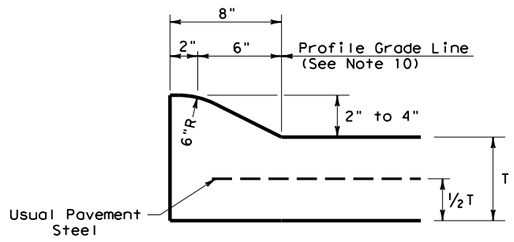
CONCRETE PAVING DETAILS

JOINT SEALS

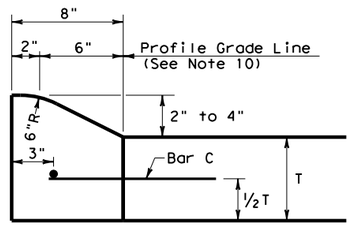
JS-14

FILE: js14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		99

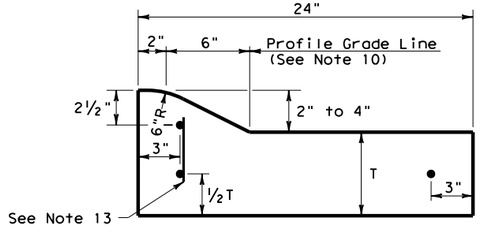
DATE:
FILE:



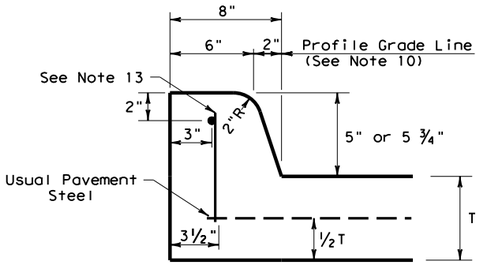
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



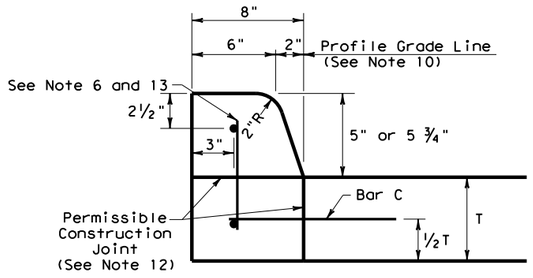
TYPE I CURB
2" - 4" HEIGHT



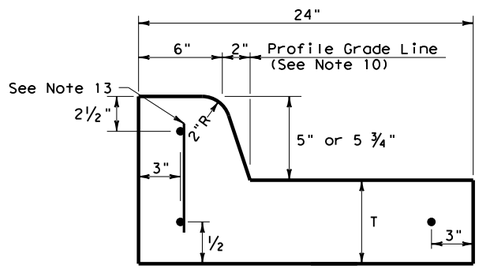
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



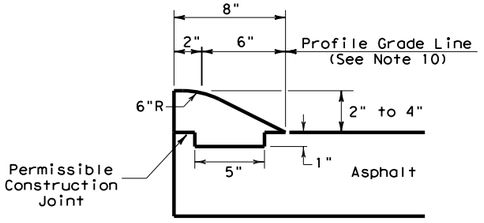
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



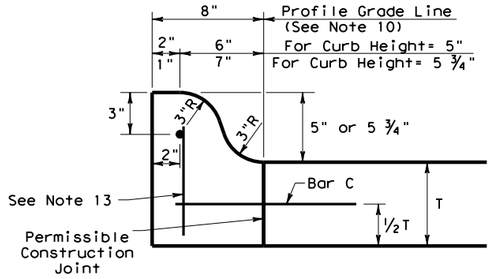
TYPE II CURB
5" - 5 ¾" HEIGHT



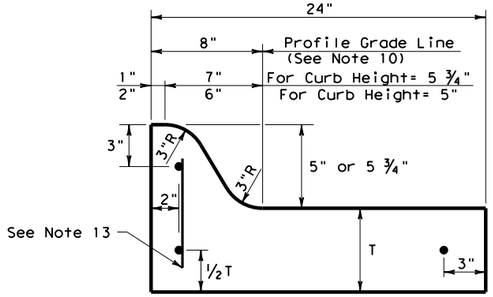
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



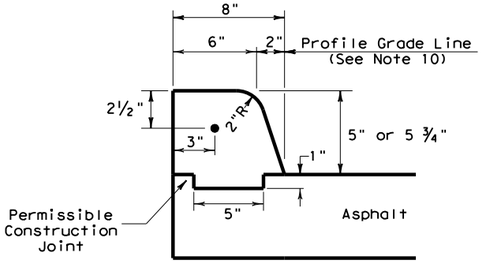
TYPE III CURB (KEYED)
2" - 4" HEIGHT



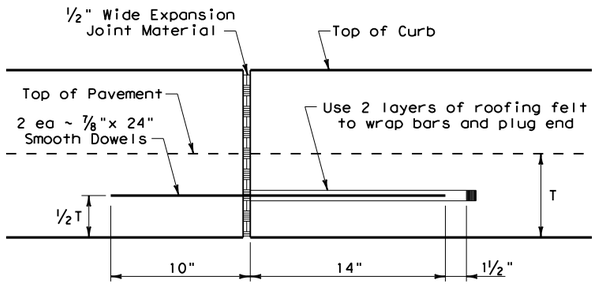
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

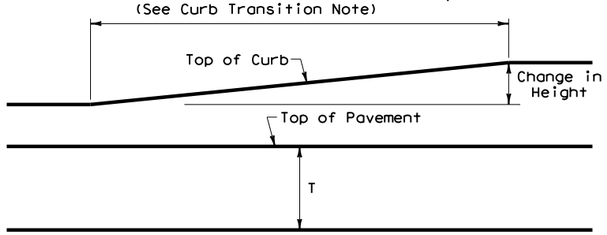


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



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.

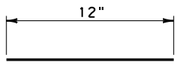


CURB TRANSITION
Note: To be paid for as Highest Curb

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 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 placement as needed (typically at four ft. C-C) 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-22

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: CS	CK: KM
© TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
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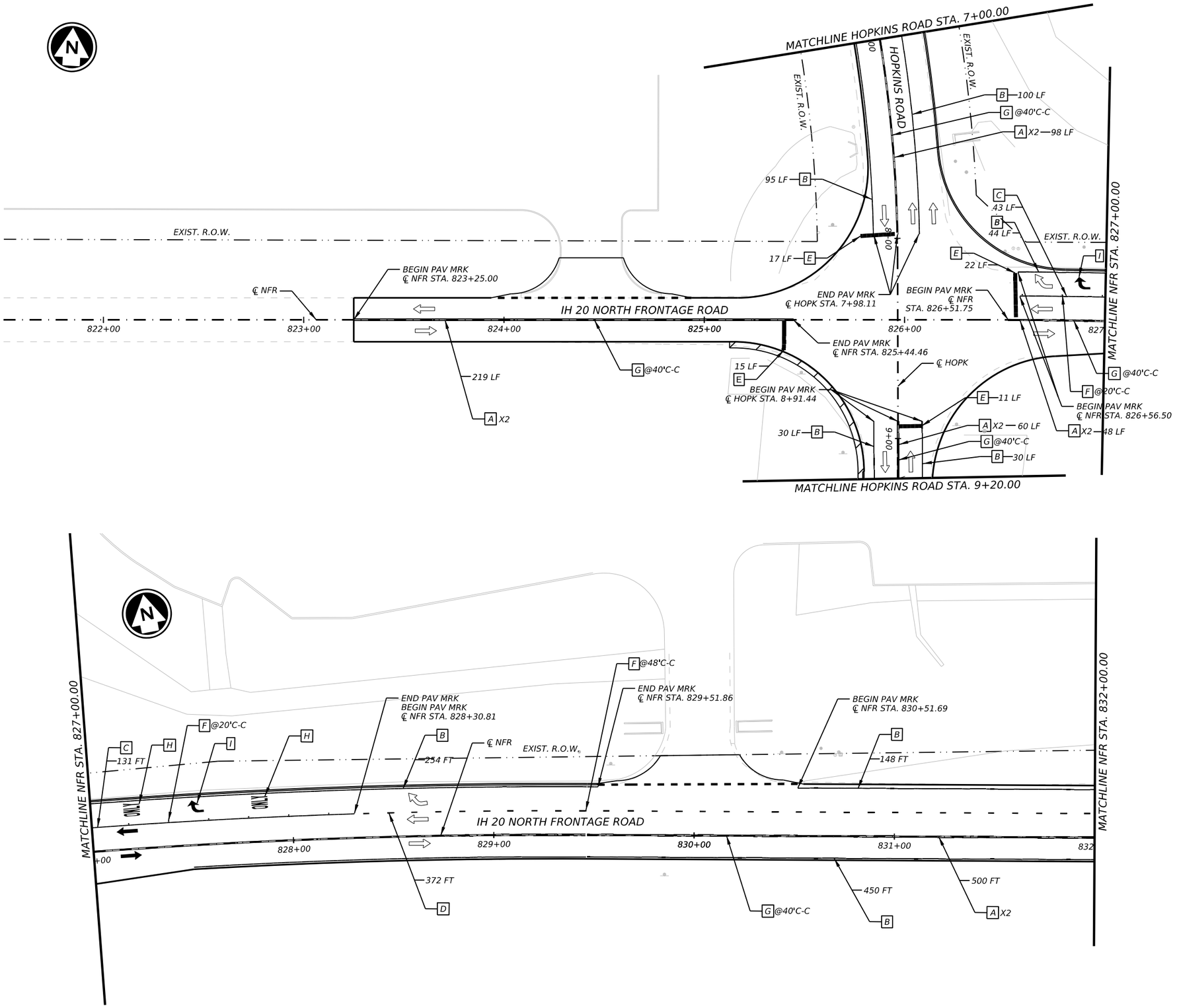
	ABL	NOLAN		100



AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED PROFESSIONAL ENGINEER

1/30/2024

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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

PAVEMENT MARKING PLAN

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		101

DATE: 1/30/2024 2:45:47 PM
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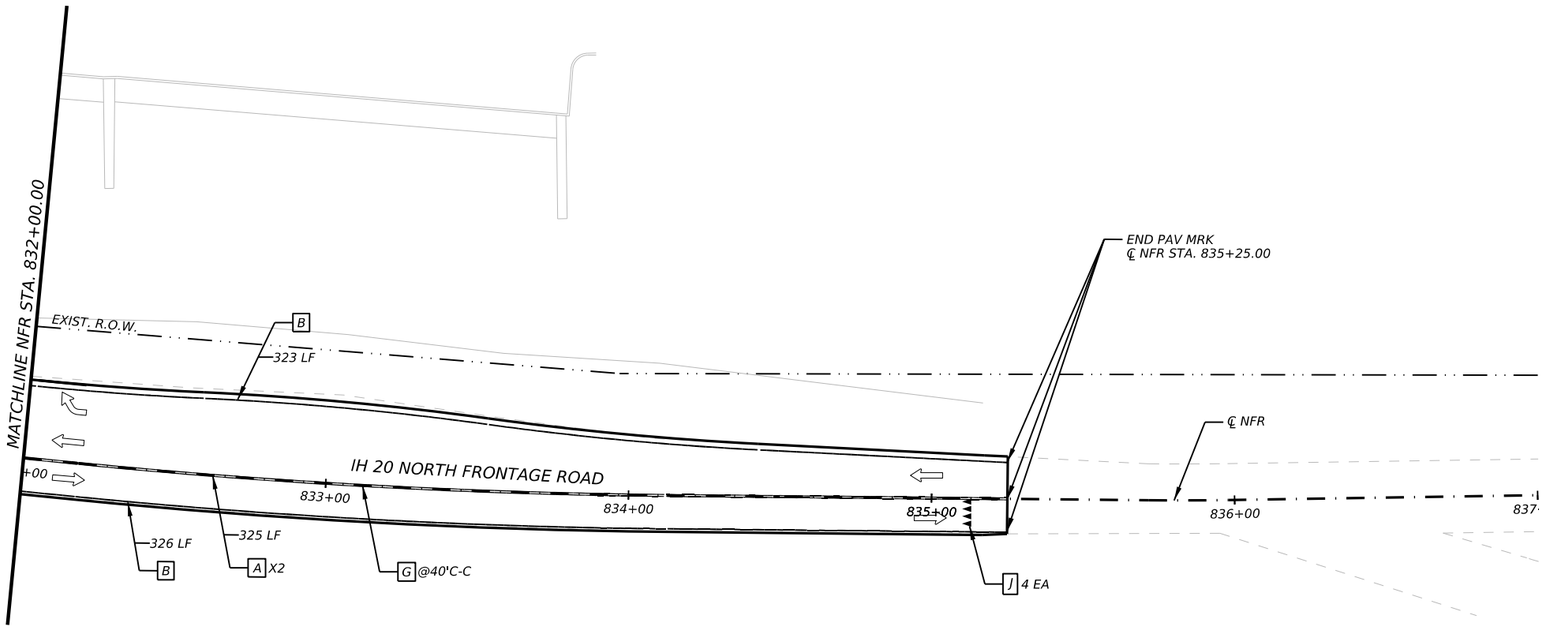

0 50

SCALE IN FEET

LEGEND

- A MULTIPOLYMER PAV MRK (Y) 6" (SLD) (100MIL)
- B MULTIPOLYMER PAV MRK (W) 6" (SLD) (100MIL)
- C MULTIPOLYMER PAV MRK (W) 8" (SLD) (100MIL)
- D MULTIPOLYMER PAV MRK (W) 8" (DOT) (100MIL)
- E PREFAB PAV MRK TY C (W) 24" (SLD) (100MIL)
- F REFL PAV MRKR TY I-C
- G REFL PAV MRKR TY II-A-A
- H PREFAB PAV MRK TY C (W) (WORD)
- I PREFAB PAV MRK TY C (W) (ARROW)
- J PREFAB PAV MRK TY C (W) (36") (YLD TRI)

⇨ DIRECTION OF TRAFFIC (EXIST)

AECOM TBPE NO: F-3580

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Texas Department of Transportation

IH 20

PAVEMENT MARKING PLAN

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		102

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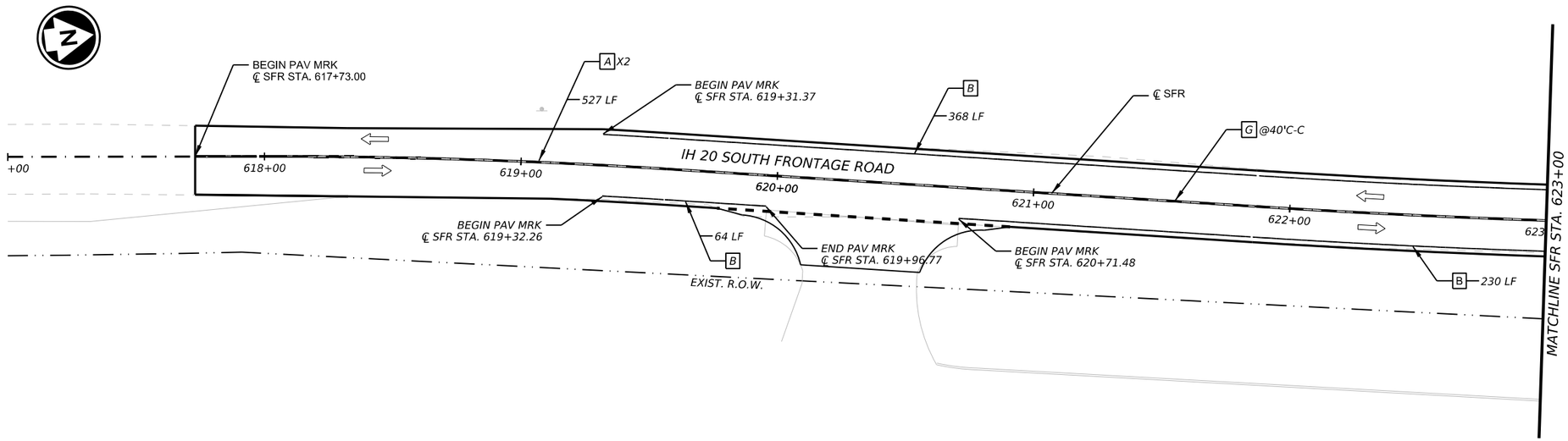
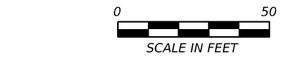
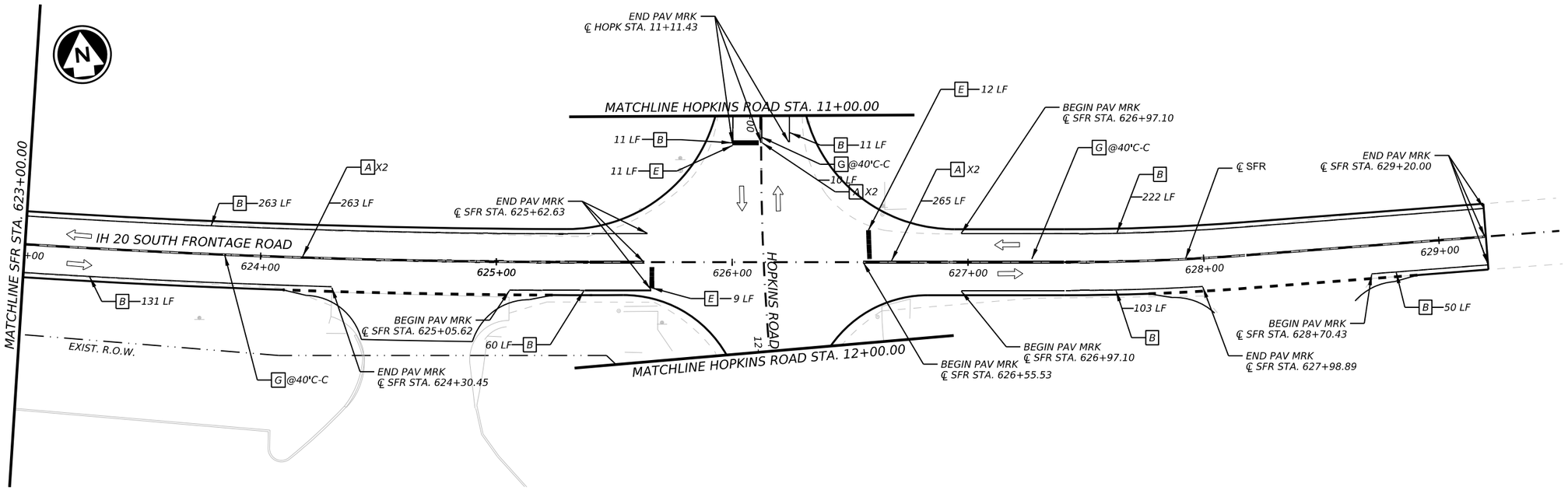




LEGEND

- A MULTIPOLYMER PAV MRK (Y) 6" (SLD) (100MIL)
- B MULTIPOLYMER PAV MRK (W) 6" (SLD) (100MIL)
- C MULTIPOLYMER PAV MRK (W) 8" (SLD) (100MIL)
- D MULTIPOLYMER PAV MRK (W) 8" (DOT) (100MIL)
- E PREFAB PAV MRK TY C (W) 24" (SLD) (100MIL)
- F REFL PAV MRKR TY I-C
- G REFL PAV MRKR TY II-A-A
- H PREFAB PAV MRK TY C (W) (WORD)
- I PREFAB PAV MRK TY C (W) (ARROW)
- J PREFAB PAV MRK TY C (W) (36") (YLD TRI)
- DIRECTION OF TRAFFIC (EXIST)



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Texas Department of Transportation

IH 20

PAVEMENT MARKING PLAN

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		103

DATE: 1/30/2024 2:45:48 PM
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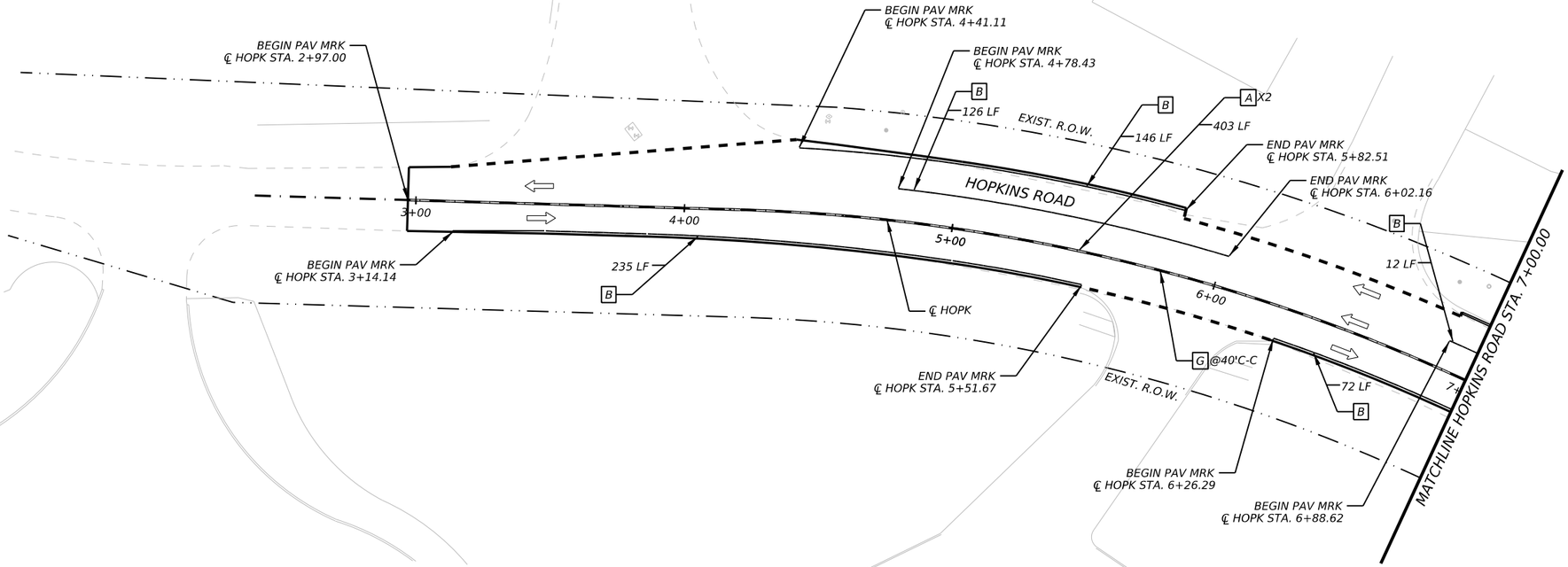

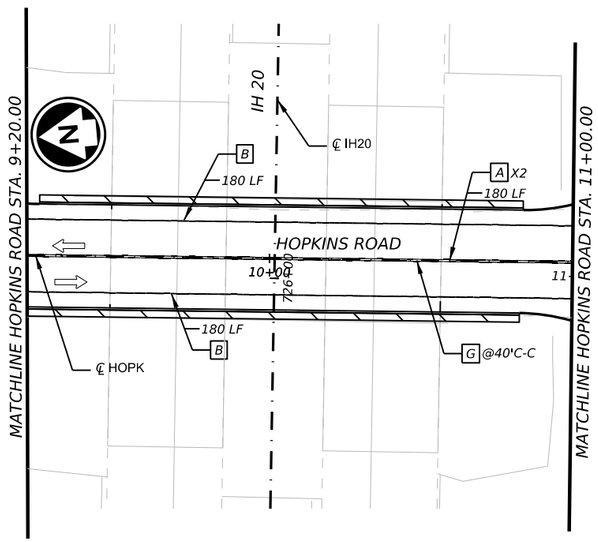

LEGEND

- A MULTIPOLYMER PAV MRK (Y) 6" (SLD) (100MIL)
- B MULTIPOLYMER PAV MRK (W) 6" (SLD) (100MIL)
- C MULTIPOLYMER PAV MRK (W) 8" (SLD) (100MIL)
- D MULTIPOLYMER PAV MRK (W) 8" (DOT) (100MIL)
- E PREFAB PAV MRK TY C (W) 24" (SLD) (100MIL)
- F REFL PAV MRKR TY I-C
- G REFL PAV MRKR TY II-A-A
- H PREFAB PAV MRK TY C (W) (WORD)
- I PREFAB PAV MRK TY C (W) (ARROW)
- J PREFAB PAV MRK TY C (W) (36") (YLD TRI)
- DIRECTION OF TRAFFIC (EXIST)

AECOM TBPE NO: F-3580

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Texas Department of Transportation

IH 20

PAVEMENT MARKING PLAN

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
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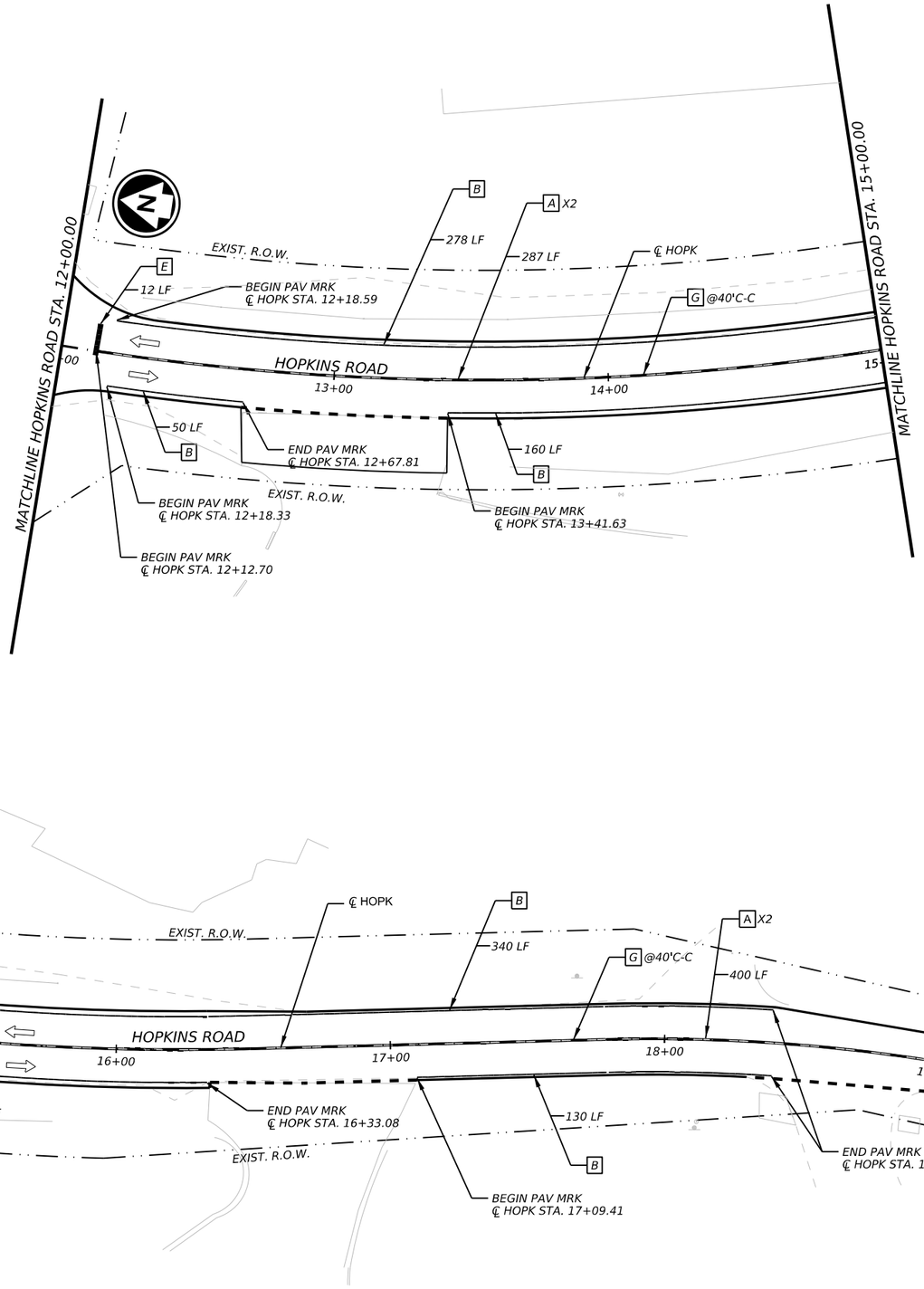

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SCALE IN FEET

LEGEND

- A MULTIPOLYMER PAV MRK (Y) 6" (SLD) (100MIL)
- B MULTIPOLYMER PAV MRK (W) 6" (SLD) (100MIL)
- C MULTIPOLYMER PAV MRK (W) 8" (SLD) (100MIL)
- D MULTIPOLYMER PAV MRK (W) 8" (DOT) (100MIL)
- E PREFAB PAV MRK TY C (W) 24" (SLD) (100MIL)
- F REFL PAV MRKR TY I-C
- G REFL PAV MRKR TY II-A-A
- H PREFAB PAV MRK TY C (W) (WORD)
- I PREFAB PAV MRK TY C (W) (ARROW)
- J PREFAB PAV MRK TY C (W) (36") (YLD TRI)
- ⇨ DIRECTION OF TRAFFIC (EXIST)

AECOM TBPE NO: F-3580

STATE OF TEXAS
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Texas Department of Transportation

IH 20

PAVEMENT MARKING PLAN

SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		105

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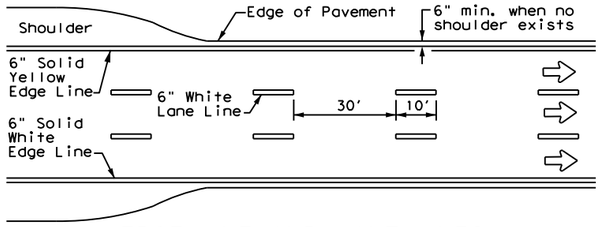
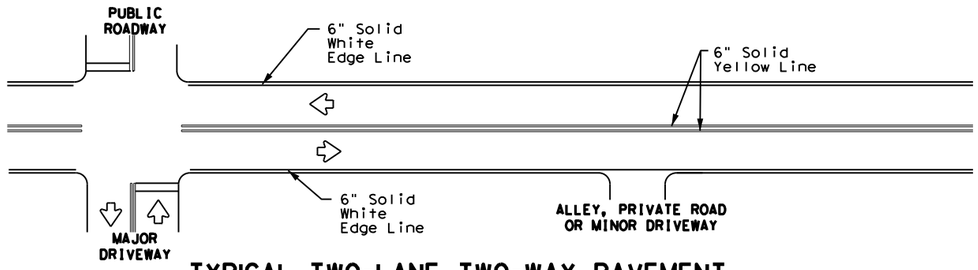
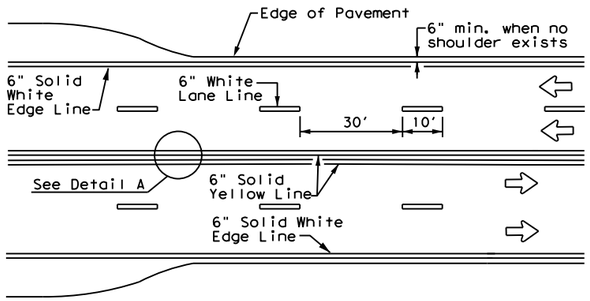
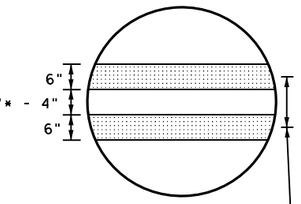


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

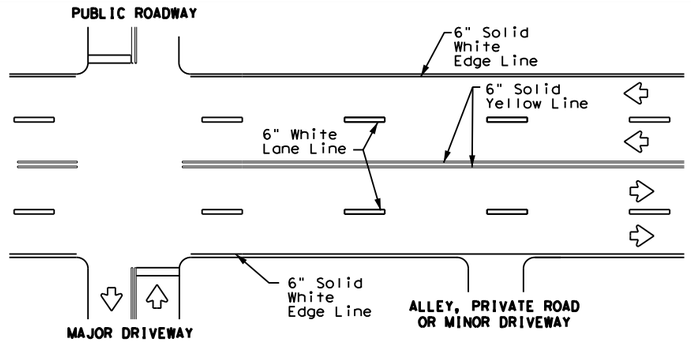




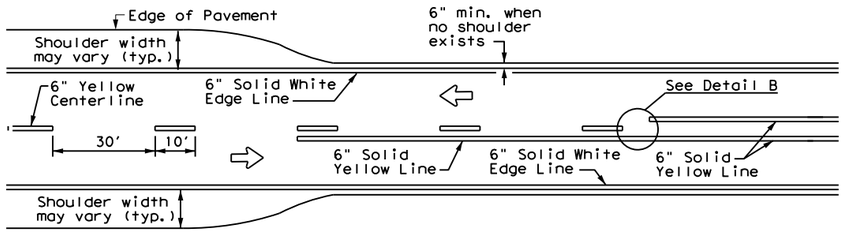
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

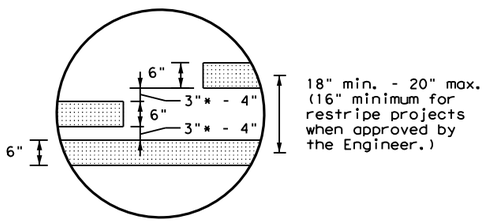
** 8" minimum for restripe projects when approved by the Engineer.



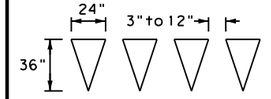
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

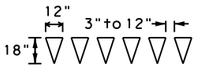


* 2" minimum for restripe projects when approved by the Engineer.

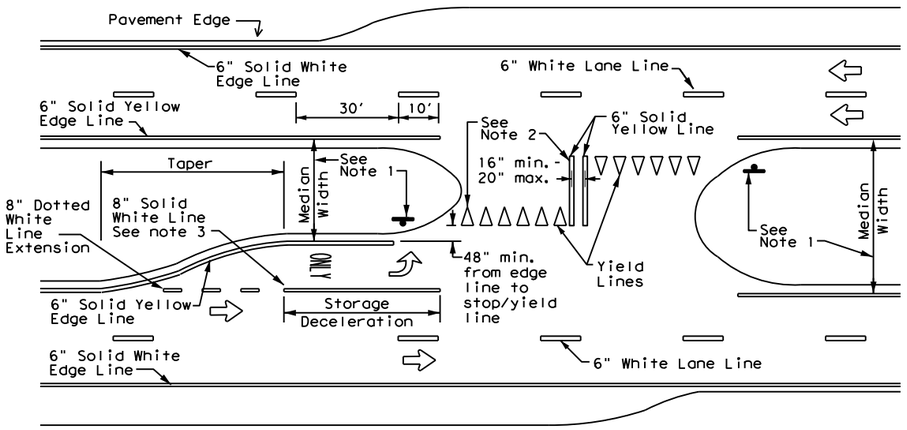


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

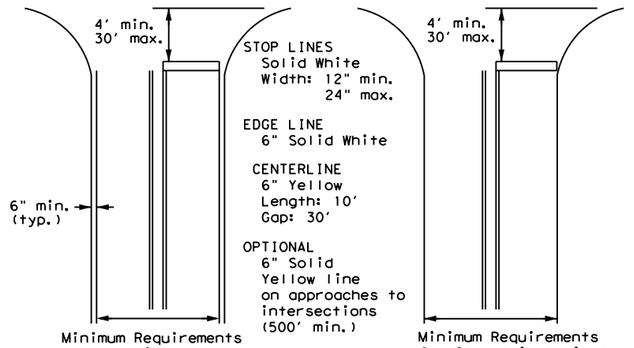
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



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

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

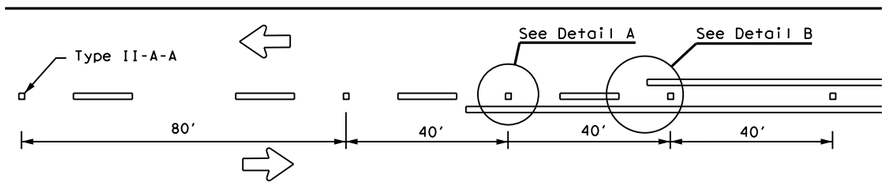
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
11-78 8-00 6-20	DIST	COUNTY		SHEET NO.
8-95 3-03 12-22	ABL	NOLAN		106
5-00 2-12				

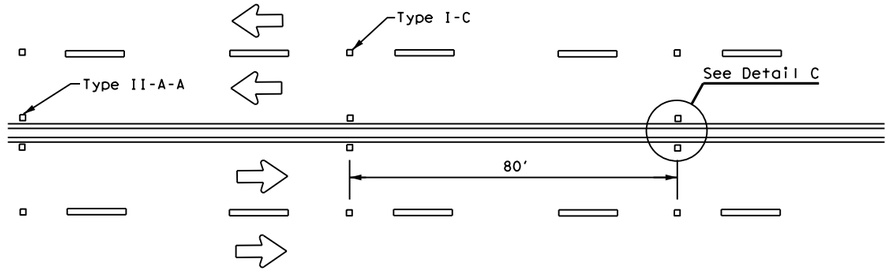
22A

DATE:
FILE:

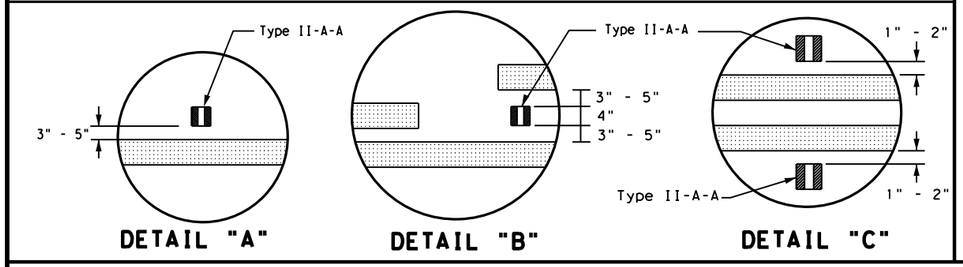
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

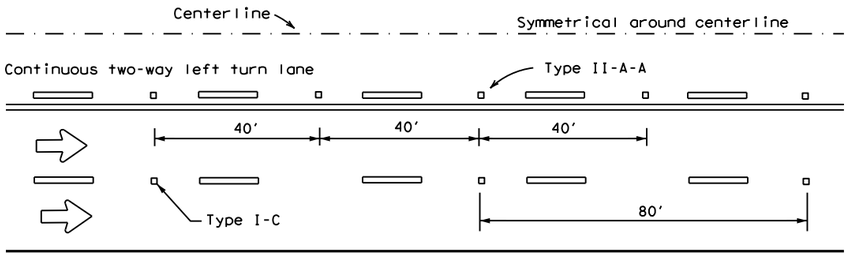


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

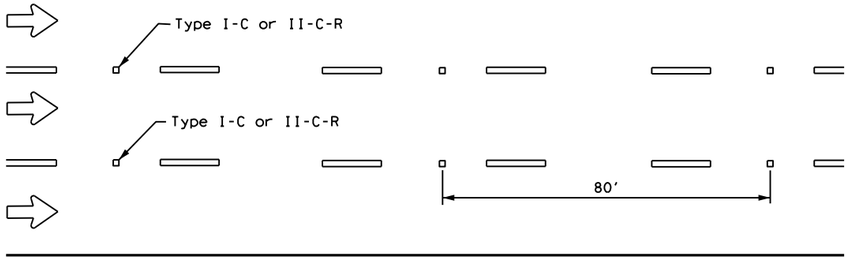


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



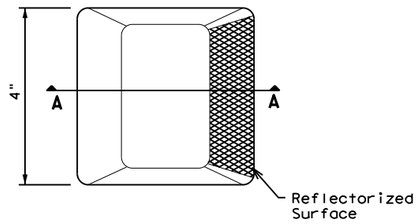
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

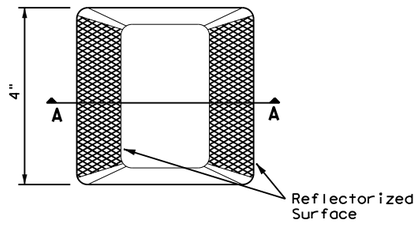
See Note 3.

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

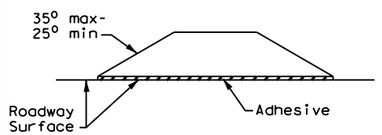
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

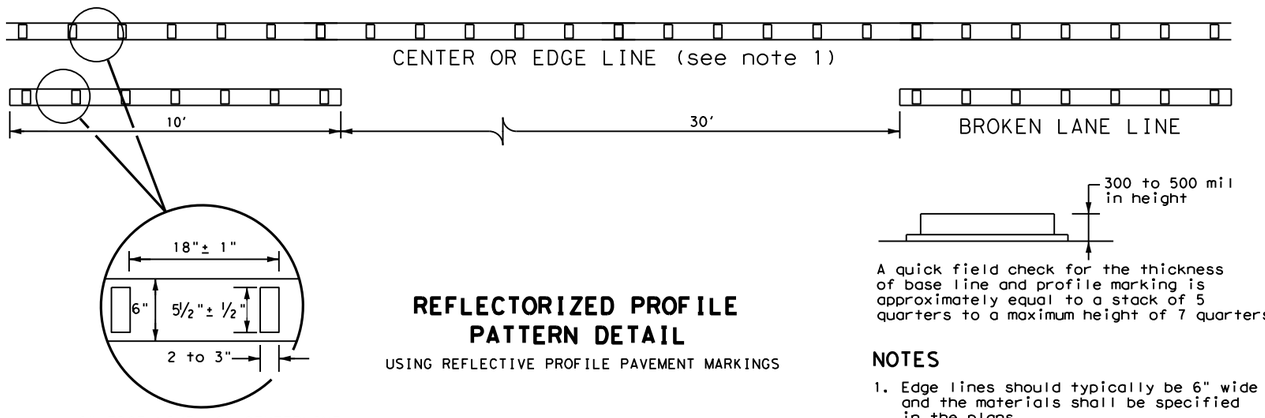


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



6" EDGE LINE, 6" CENTERLINE OR 6" LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

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

GENERAL NOTES

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

Texas Department of Transportation

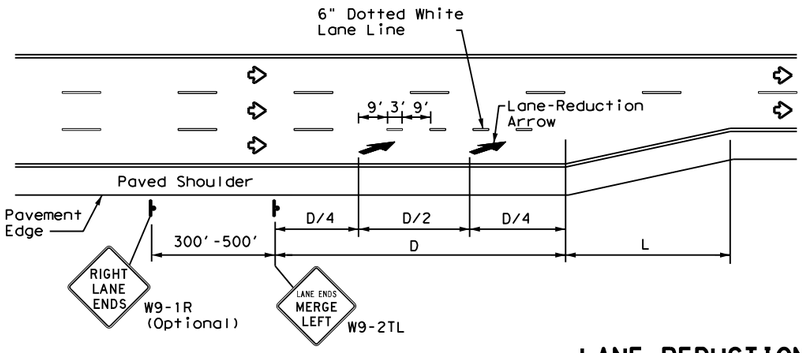
Traffic Safety Division Standard

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

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0006	02	130	IH 20
	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		107

22B

DATE:
FILE:

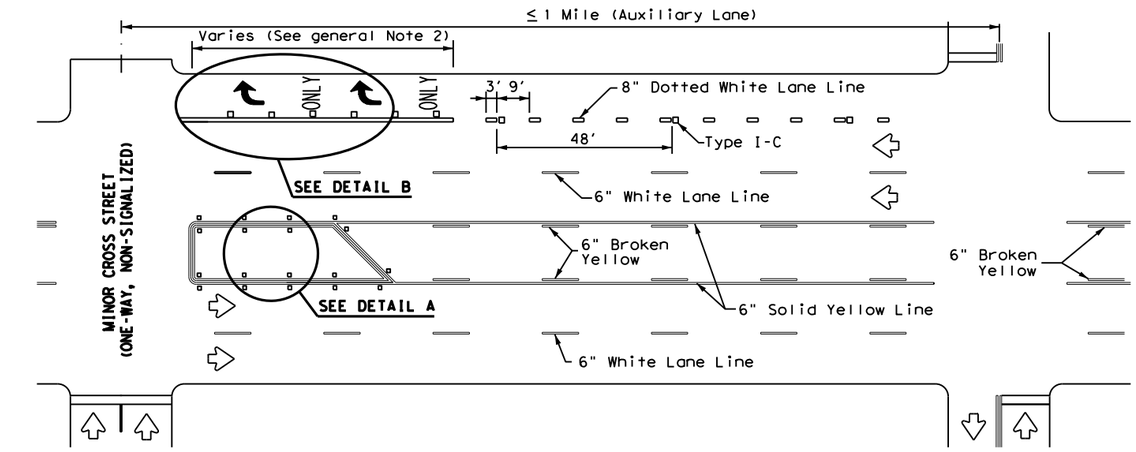


LANE REDUCTION

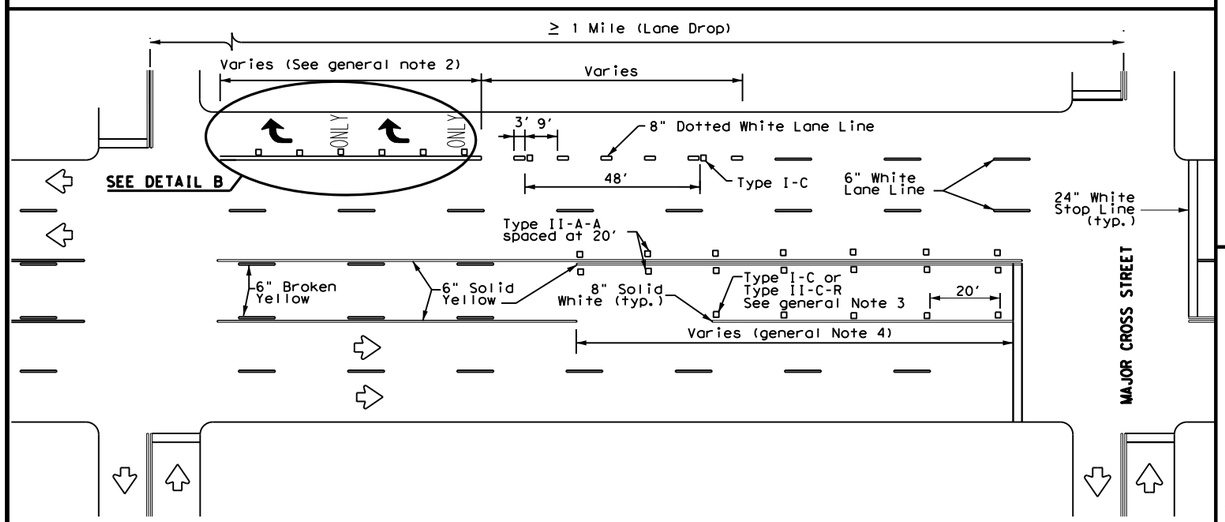
NOTES

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

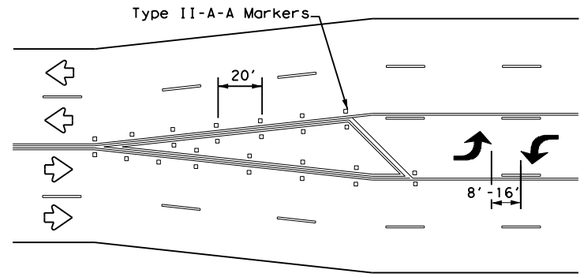
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	



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

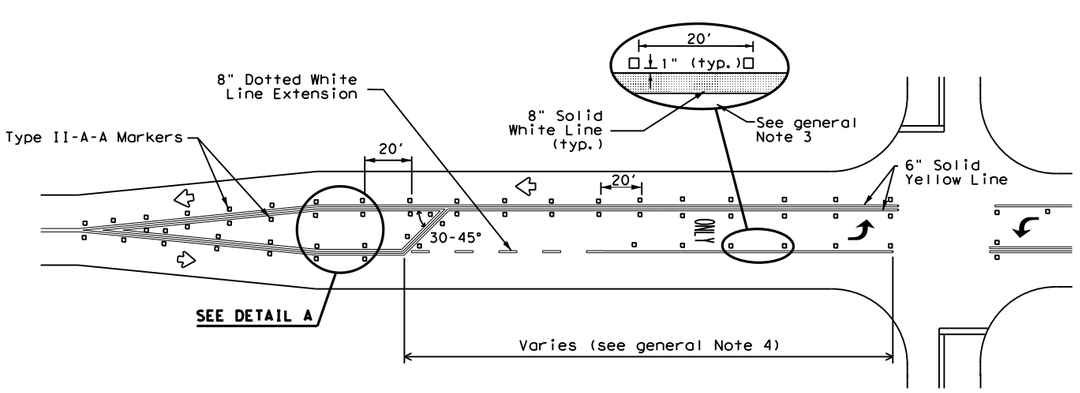


TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP

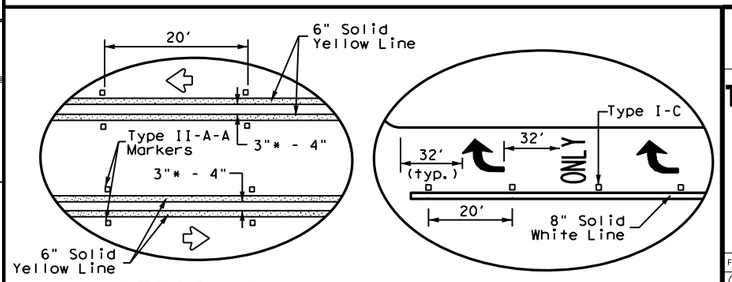


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



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

GENERAL NOTES

1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

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.

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0006	02	130	IH 20
	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		108

22C

DATE:
FILE:

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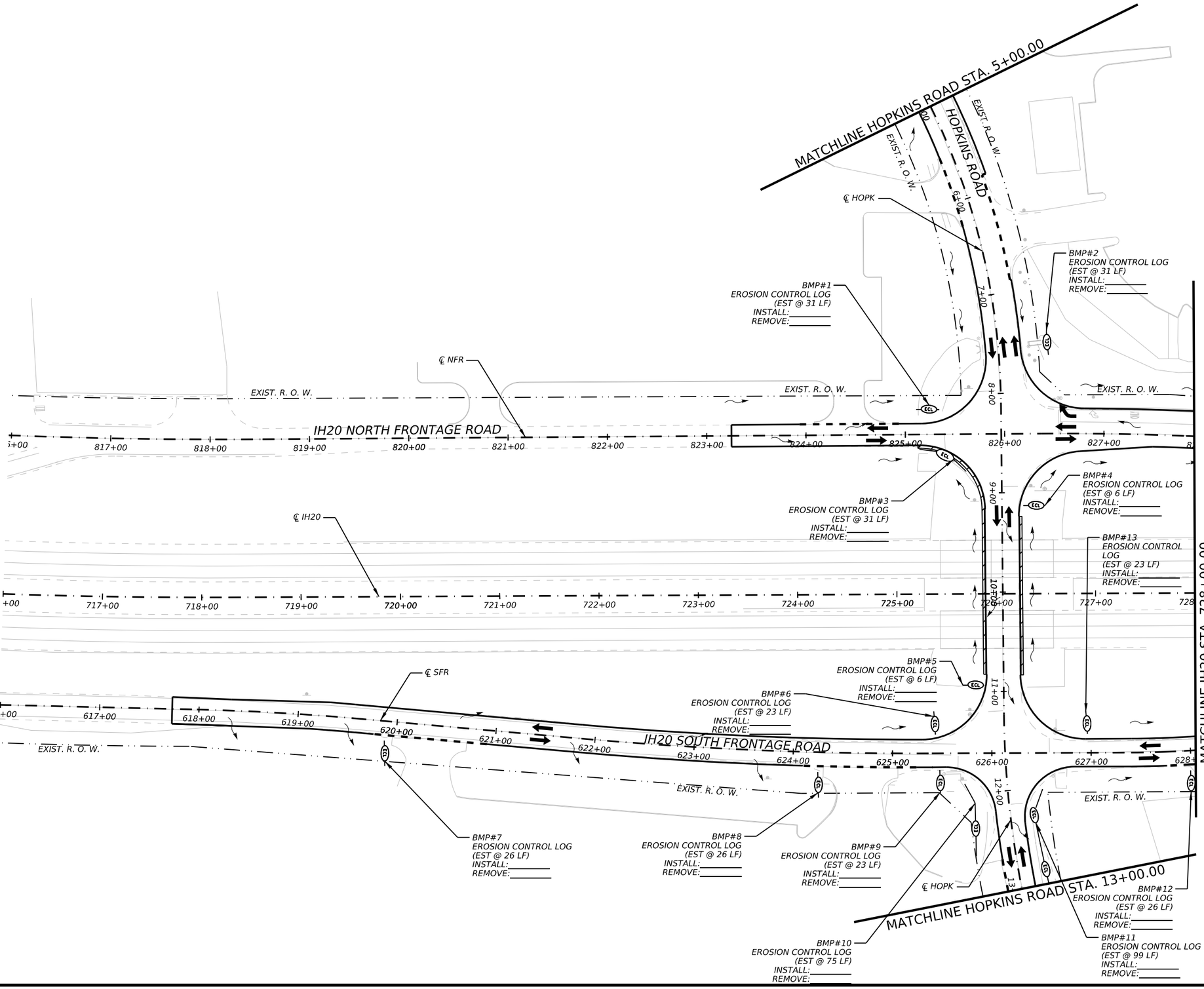
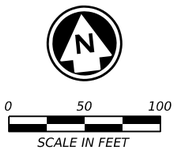




LEGEND

- ROW
- DIRECTION OF TRAFFIC (EXIST)
- SCF — SILT FENCE
- ECL — EROSION CONTROL LOG
- FLOW DIRECTION

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED
PROFESSIONAL ENGINEER

1/30/2024

AECOM
13355 Noel Road, Suite 400
Dallas, Texas 72540
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

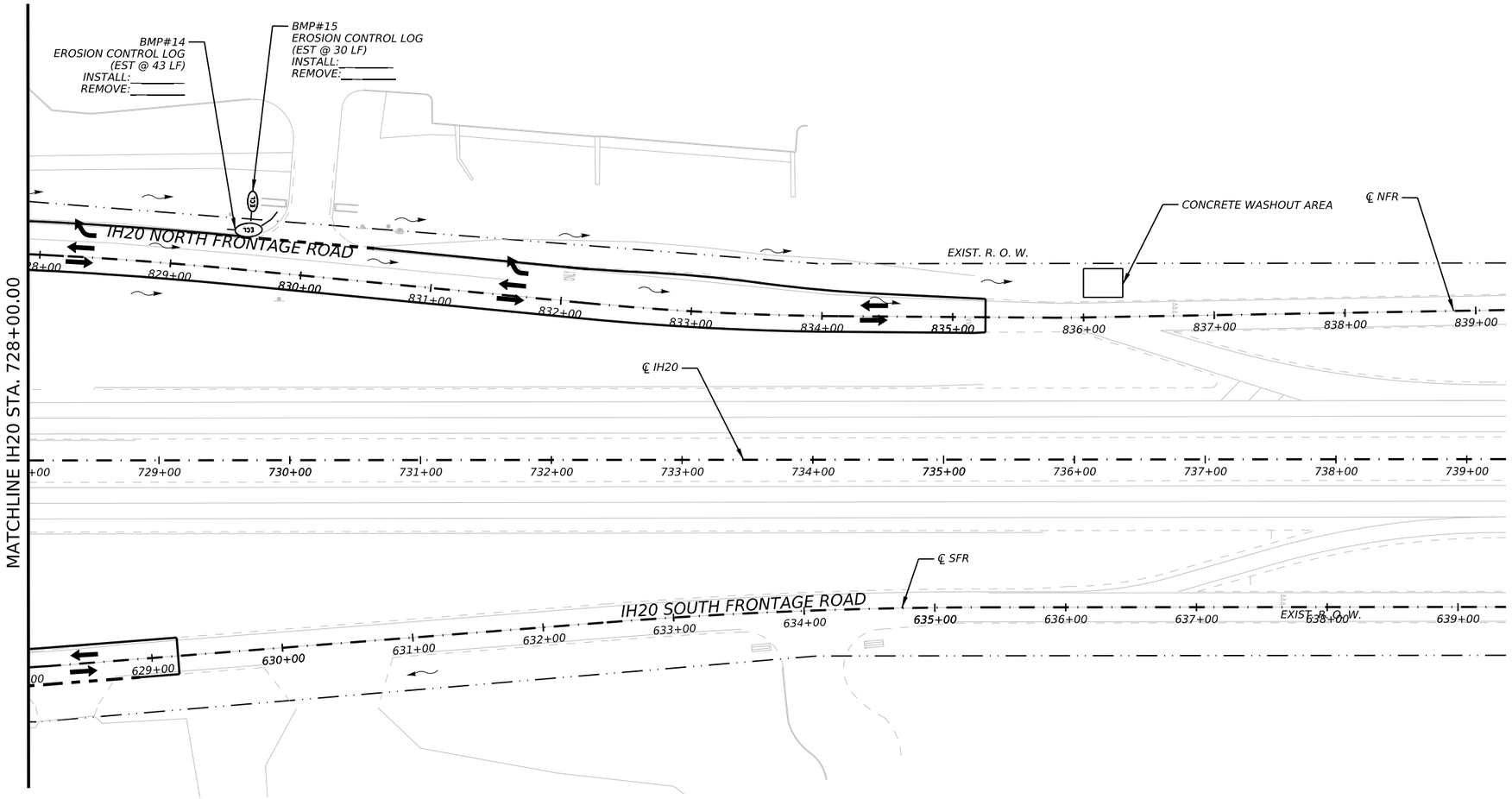
IH 20

ENVIRONMENTAL LAYOUT

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		109

DATE:
FILE:



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SCALE IN FEET

LEGEND

- ROW
- DIRECTION OF TRAFFIC (EXIST)
- SCF — SILT FENCE
- ECL — EROSION CONTROL LOG
- FLOW DIRECTION

AECOM TBPE NO: F-3580

STATE OF TEXAS
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13355 Noel Road, Suite 400
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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

ENVIRONMENTAL LAYOUT

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20
DIST	COUNTY		SHEET NO.
ABL	NOLAN		110

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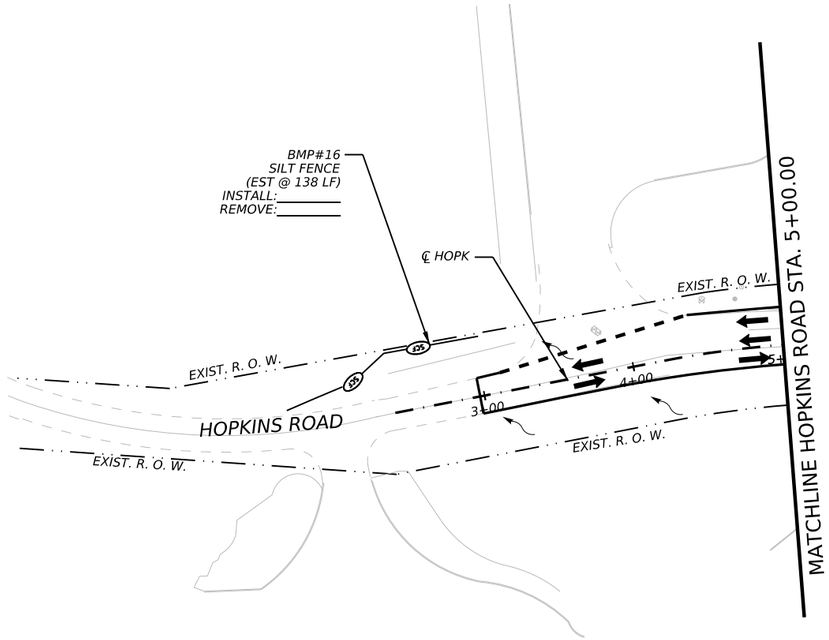

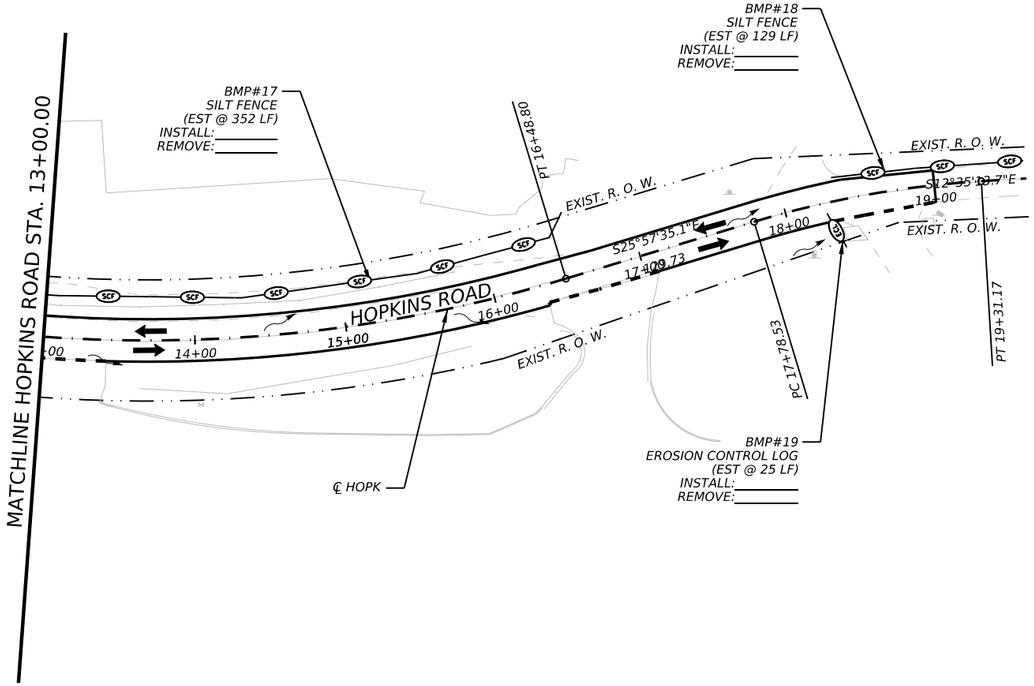

LEGEND

- ROW
- DIRECTION OF TRAFFIC (EXIST)
- SCF — SILT FENCE
- ECL — EROSION CONTROL LOG
- FLOW DIRECTION

AECOM TBPE NO: F-3580

STATE OF TEXAS
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1/30/2024

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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

IH 20

ENVIRONMENTAL LAYOUT

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0006	02	130	IH 20

DIST	COUNTY	SHEET NO.
ABL	NOLAN	111

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DW: CK: DW: CK:

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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.

2.

3.

4.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.
05-07-14 ADDED NOTE SECTION IV.	ABL	NOLAN		112
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.				

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For projects with less than one acre of soil disturbing activity and that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0006-02-130

1.2 PROJECT LIMITS:
From: SFR EB EXIT TO HOPKINS RD INTERSECTION

To: NFR WB EXIT

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 32.4503136 ,(Long) -100.4476429

END: (Lat) 32.4494872 ,(Long) -100.4390500

1.4 TOTAL PROJECT AREA (Acres): 3.2 ac

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.6 ac

1.6 NATURE OF CONSTRUCTION ACTIVITY:
REHABILITATE EXISTING ROADWAY
WORK CONSISTING OF REMOVALS, GRADING, PAVEMENT, AND PAVEMENT MARKINGS

1.7 MAJOR SOIL TYPES:

Soil Type	Description
COLORADO LOAM	0 TO 1% SLOPES, FREQUENTLY FLOODED
PADUCAH LOAM	1 TO 3% SLOPES
PITZER GRAVELLY LOAM	1 TO 8% SLOPES
TEXROY LOAM	0 TO 1% SLOPES
WOODWARD LOAM	3 TO 5% SLOPES, WARM

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):
PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☐ PSLs determined during preconstruction meeting
☐ PSLs determined during construction
☒ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

☐ Mobilization
☒ Install sediment and erosion controls
☐ Blade existing topsoil into windrows, prep ROW, clear and grub
☒ Remove existing pavement
☒ Grading operations, excavation, and embankment
☐ Excavate and prepare subgrade for proposed pavement widening
☐ Remove existing culverts, safety end treatments (SETs)
☐ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☐ Install culverts, culvert extensions, SETs
☐ Install mow strip, MBGF, bridge rail
☐ Place flex base
☐ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☐ Revegetation of unpaved areas
☒ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

☐ Sediment laden stormwater from stormwater conveyance over disturbed area
☐ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☐ Solvents, paints, adhesives, etc. from various construction activities
☐ Transported soils from offsite vehicle tracking
☐ Construction debris and waste from various construction activities
☐ Contaminated water from excavation or dewatering pump-out water
☐ Sanitary waste from onsite restroom facilities
☐ Trash from various construction activities/receptacles
☐ Long-term stockpiles of material and waste
☐ Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.11 RECEIVING WATERS:
Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
No flow paths to TCEQ classified waterbodies	

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☐ Other: _____
☐ Other: _____
☐ Other: _____

AECOM TBPE NO: F-3580

STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED PROFESSIONAL ENGINEER
2/1/2024

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
	SEE TITLE SHEET		113
STATE	STATE DIST.	COUNTY	
TEXAS	ABL	NOLAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0006	02	130	IH 20

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- ☐ ☐ Protection of Existing Vegetation
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☐ ☐ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☒ ☐ Temporary Seeding
- ☐ ☒ Permanent Planting, Sodding or Seeding
- ☒ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Vertical Tracking
- ☐ ☐ Interceptor Swale
- ☐ ☐ Riprap
- ☐ ☐ Diversion Dike
- ☐ ☐ Temporary Pipe Slope Drain
- ☐ ☐ Embankment for Erosion Control
- ☐ ☐ Paved Flumes
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- ☒ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☒ ☐ Sediment Control Fence
- ☐ ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Vegetated Filter Strips
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- ☐ Excess dirt/mud on road removed daily
- ☐ Haul roads dampened for dust control
- ☐ Loaded haul trucks to be covered with tarpaulin
- ☐ Stabilized construction exit
- ☐ Daily street sweeping
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- ☐ Chemical Management
- ☐ Concrete and Materials Waste Management
- ☐ Debris and Trash Management
- ☐ Dust Control
- ☐ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- ☒ Fire hydrant flushings
- ☒ Irrigation drainage
- ☒ Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- ☒ Potable water sources
- ☒ Springs
- ☒ Uncontaminated groundwater
- ☒ Water used to wash vehicles or control dust
- ☒ Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

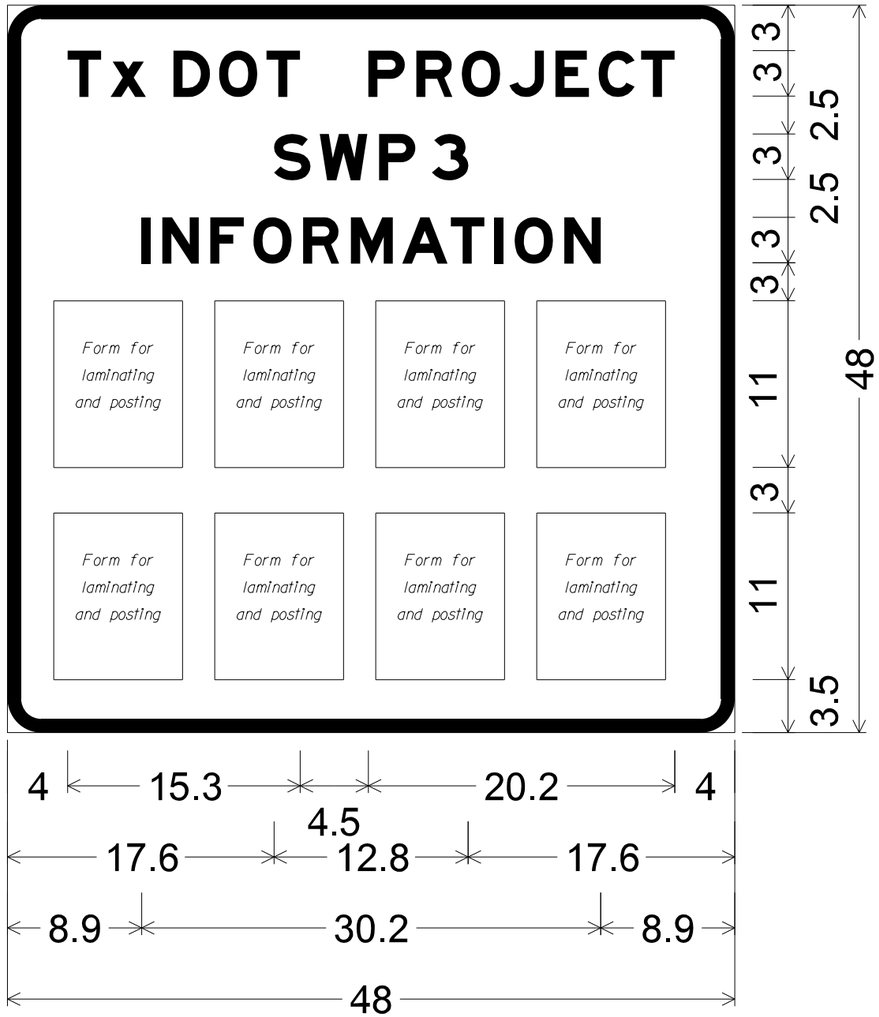
AECOM TBPE NO: F-3580
STATE OF TEXAS
SEAN K. YOUNG
96504
LICENSED PROFESSIONAL ENGINEER
2/1/2024

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

July 2023 Sheet 2 of 2

Texas Department of Transportation

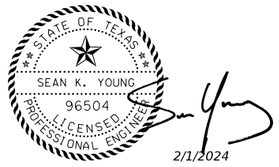
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
	SEE TITLE SHEET		114
STATE	STATE DIST.	COUNTY	
TEXAS	ABL	NOLAN	
CONT.	SECT.	JOB	HIGHWAY NO.
0006	02	130	IH 20



2.3" Radius, 0.9" Border, White on Blue;
[TxDOT PROJECT] E Mod;
[SWP3] E Mod;
[INFORMATION] E Mod;

NOTE:

The Forms needed for laminating and posting to the SWP3 Notification Board will be provided by the Engineer. The total number of forms may vary. Notification Boards are to be constructed from Plywood, ½ or ⅝-inch thick, in accordance with TxDOT Departmental Material Specification (DMS)-7100. 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 sign will be placed at a location within the right-of-way but outside the clear zone as directed by the Engineer. This work will not be paid for directly, but will be considered subsidiary to other items.



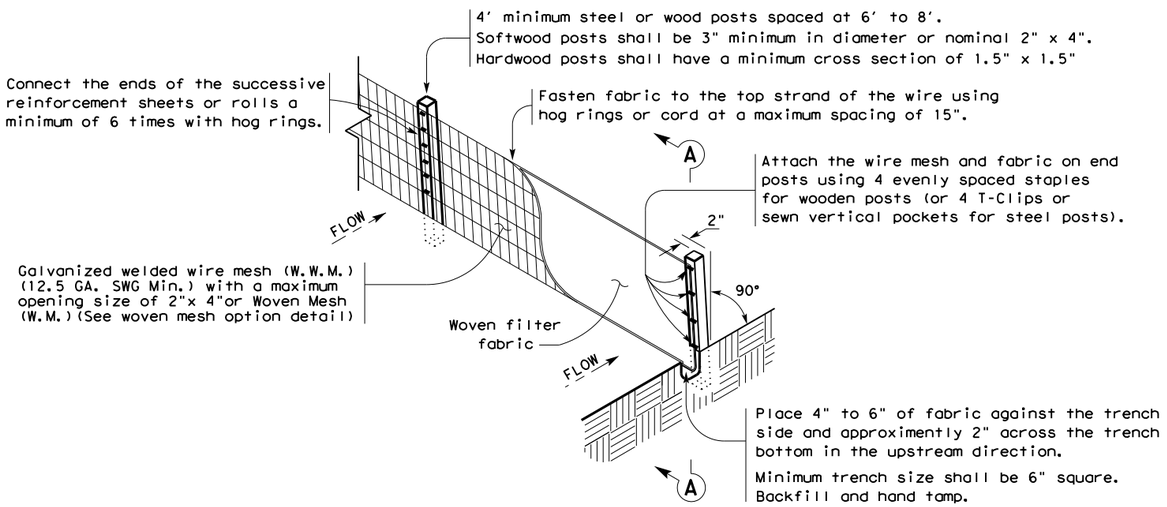
SWP3 NOTIFICATION BOARD DETAIL

Texas Department of Transportation

NO SCALE SHEET 1 OF 1

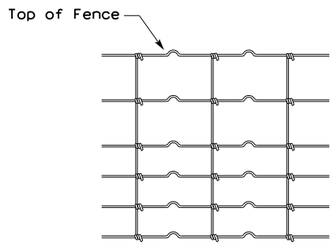
FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		IH 20
STATE	COUNTY		SHEET NO.
TEXAS	NOLAN		115
DISTRICT	CONTROL	SECTION	JOB
ABL	0006	02	130

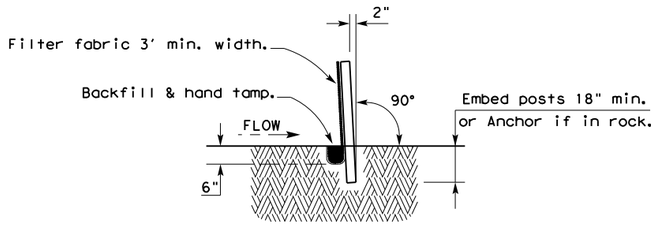
FILE: pw://aecom-na-pw.bentley.com:AECOM*USA*Texas/Documents/60706605-IH 20 at Hopkins Rd Pavement Rehab/900-CAD GIS/910*CAD/30*STANDARDS/Environmental/SWP3 Notification Board Detail.dgn
DATE: 2/1/2024 8:44:42 AM



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

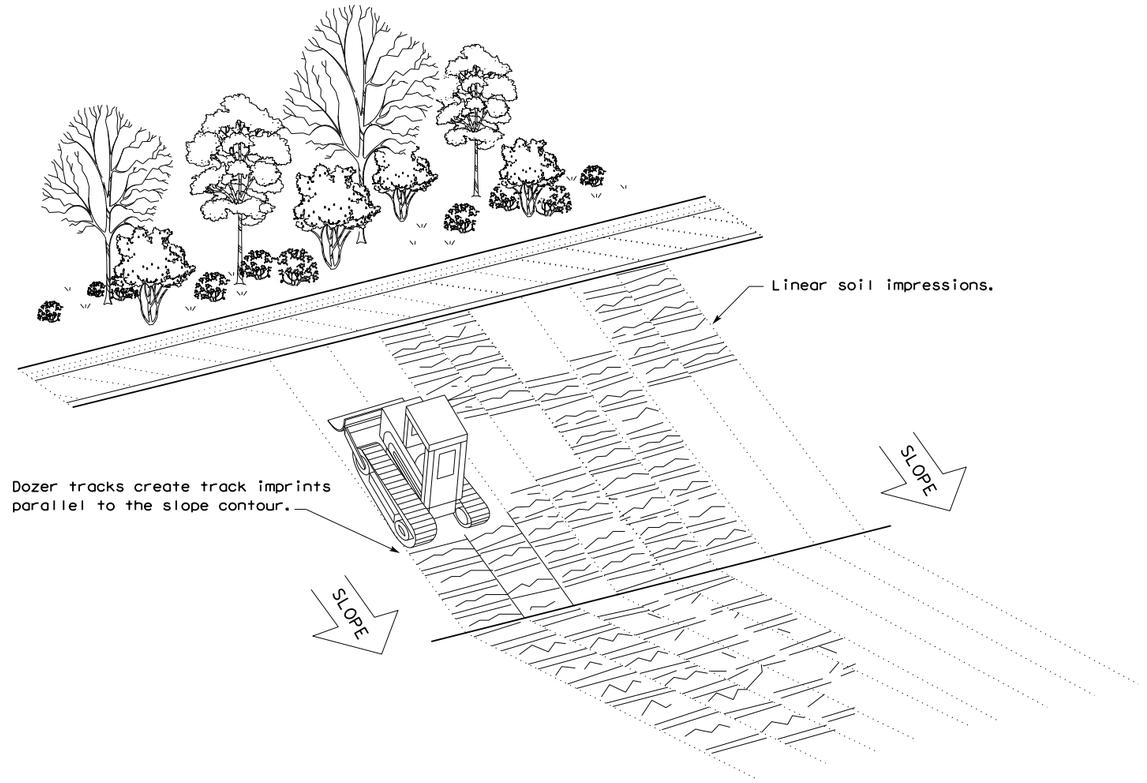
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

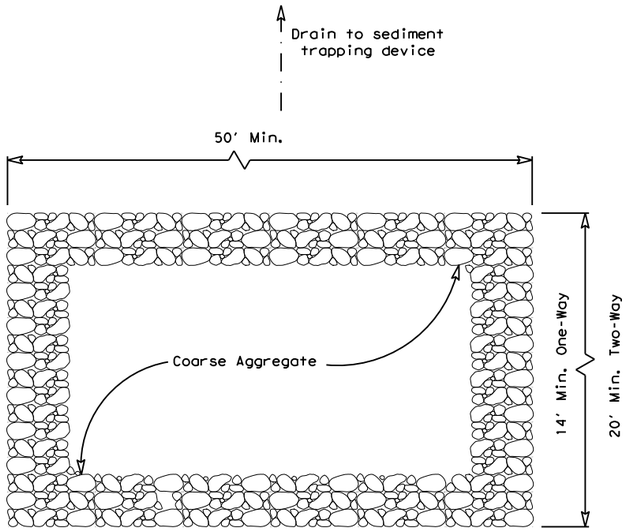
FENCE & VERTICAL TRACKING

EC(1)-16

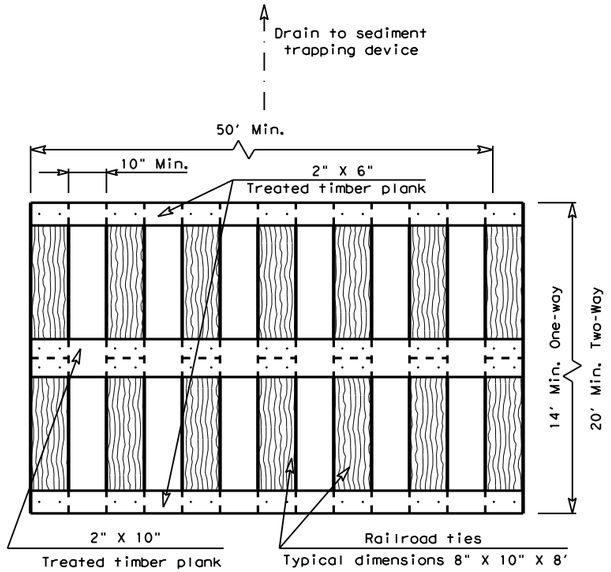
FILE: ec116	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0006	02	130		IH 20	
	DIST	COUNTY			SHEET NO.	
	ABL	NOLAN			116	

DATE
FILE

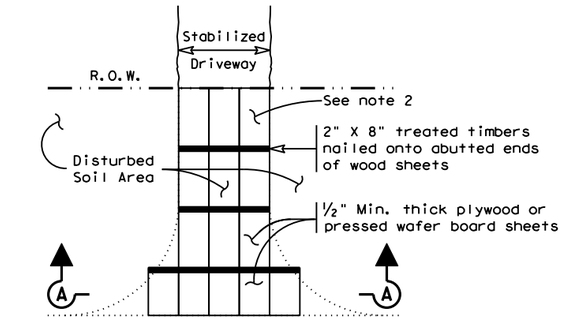
DATE: 1/30/2024
FILE: pw://aecom-no-pw.bentley.com:AECOM_USA_Texas/Documents/60706605-IH 20 at Hopkins Rd Pavement Rehab/900-CAD GIS/910_CAD/30_STANDARDS/Environmental/ec316.dgn



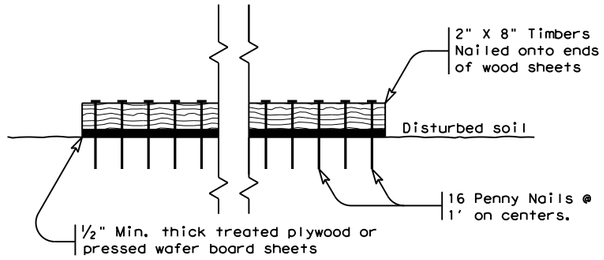
PLAN VIEW



PLAN VIEW



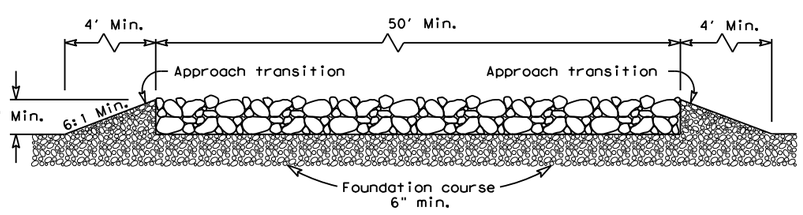
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

SHORT TERM



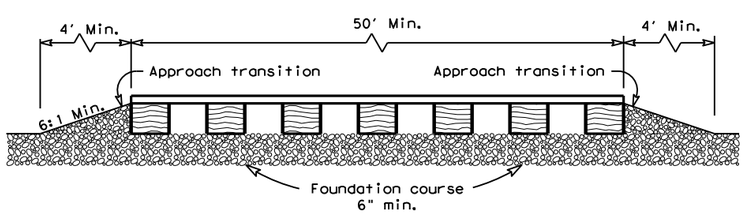
ELEVATION VIEW

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

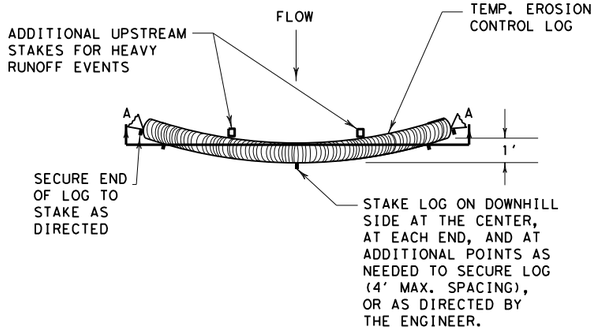
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

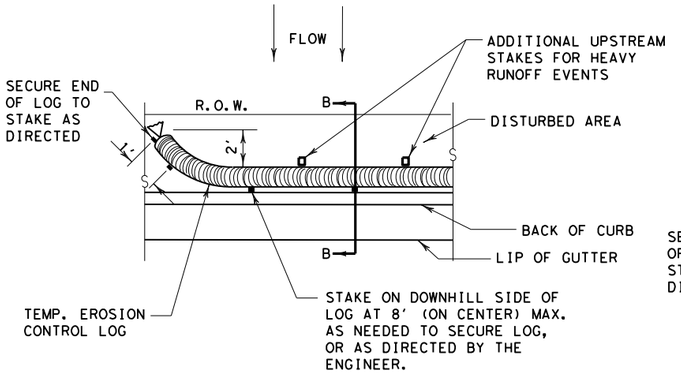
EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		117

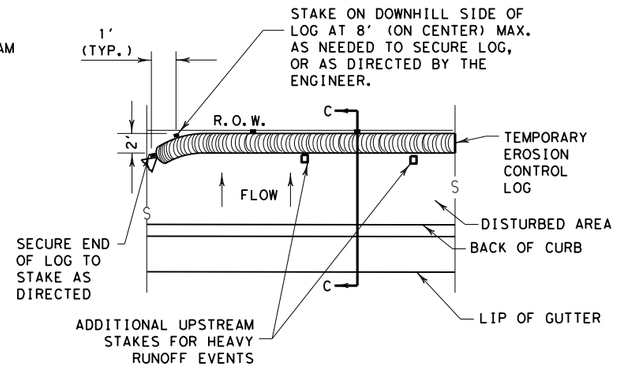
DATE:
FILE:



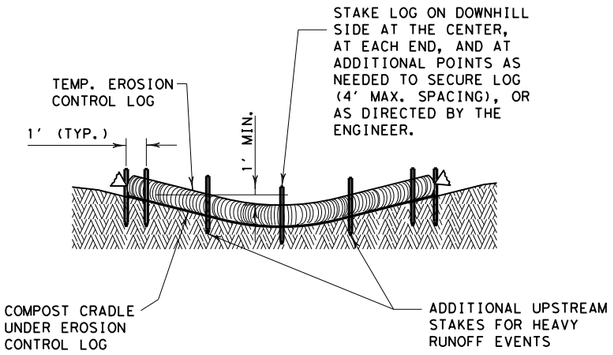
PLAN VIEW



PLAN VIEW



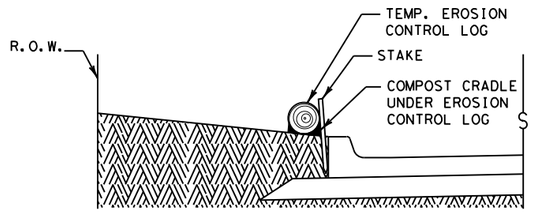
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

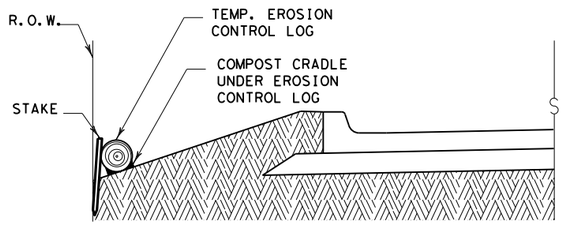
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

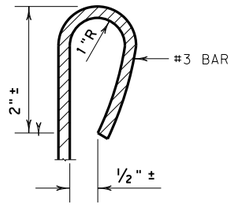
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



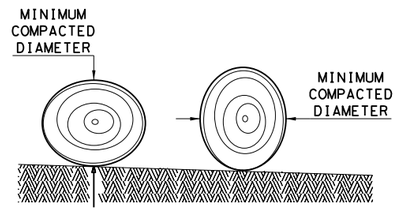
REBAR STAKE DETAIL

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.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

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.

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	0006	02	130		IH 20		
	DIST	COUNTY				SHEET NO.	
	ABL	NOLAN				118	

DATE:
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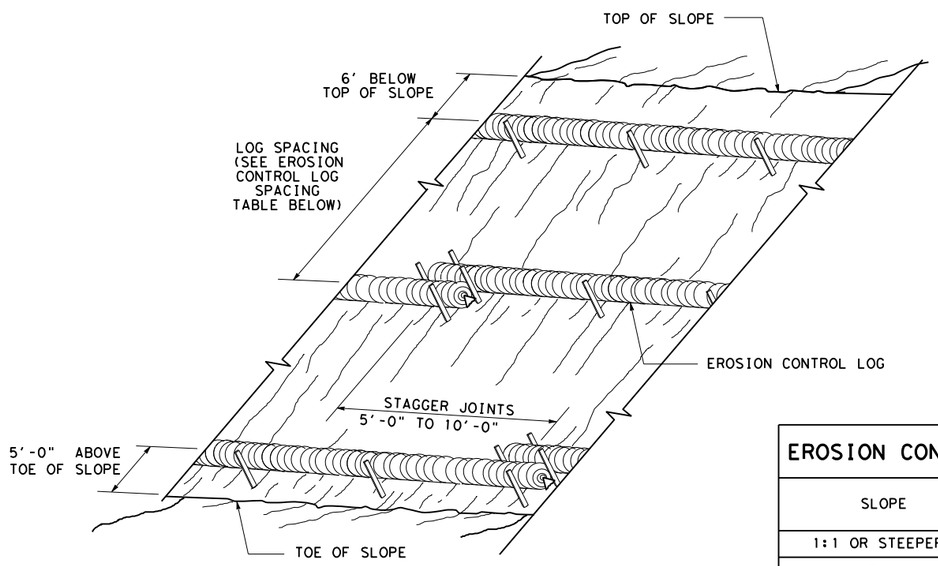
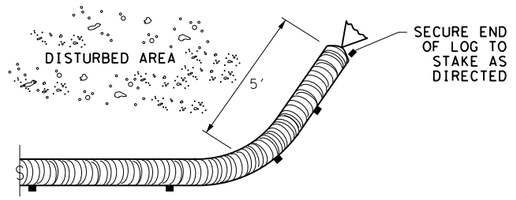


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

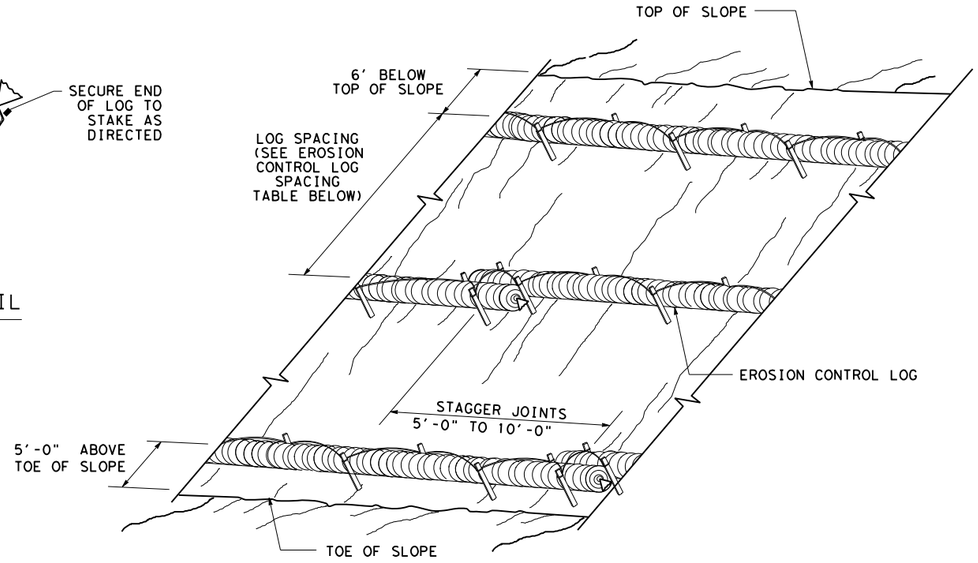
CL-SST



END SECTION RAP DETAIL

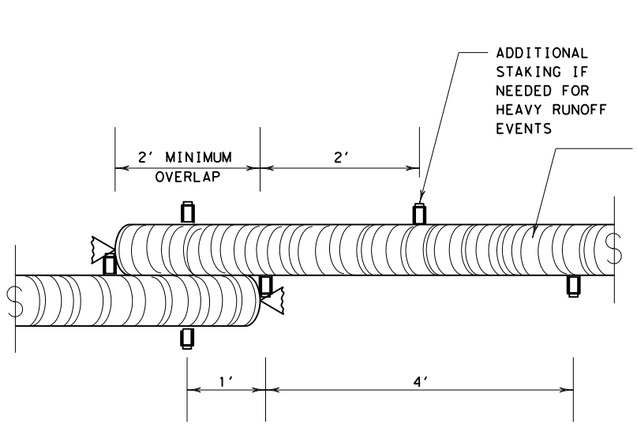
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

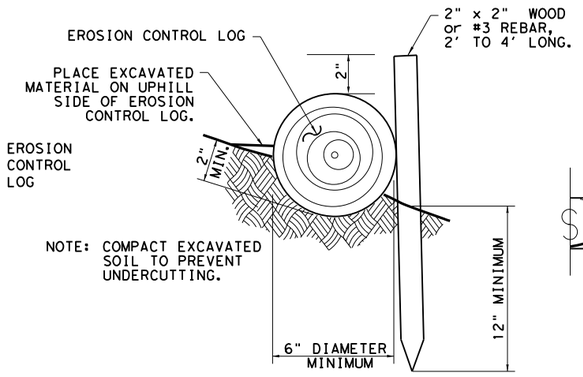
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

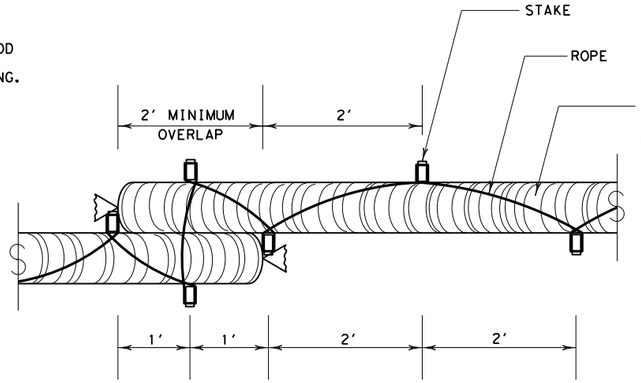


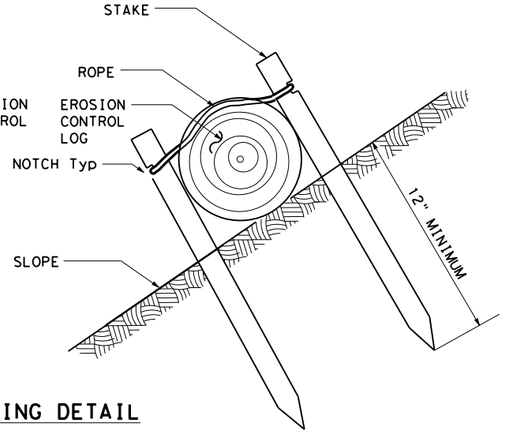


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

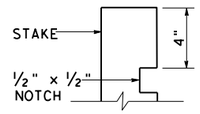
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

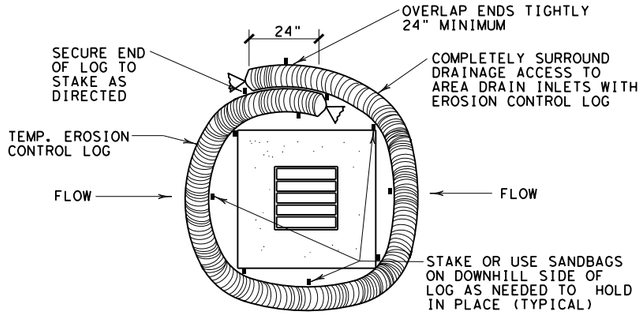
Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

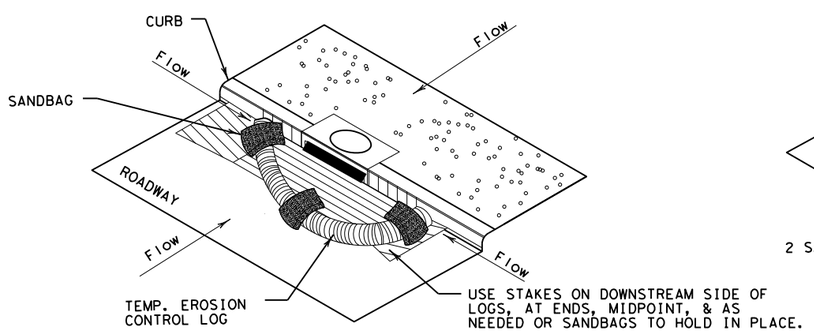
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0006	02	130	IH 20
	DIST	COUNTY		SHEET NO.
	ABL	NOLAN		119

DATE:
FILE:



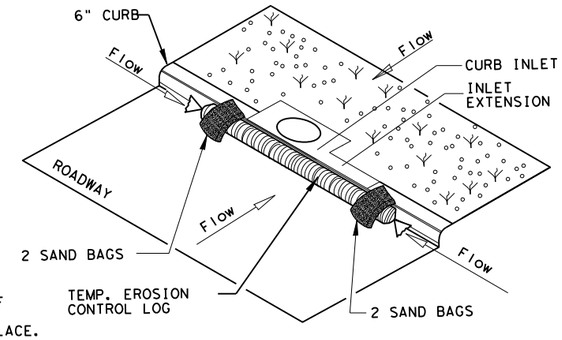
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

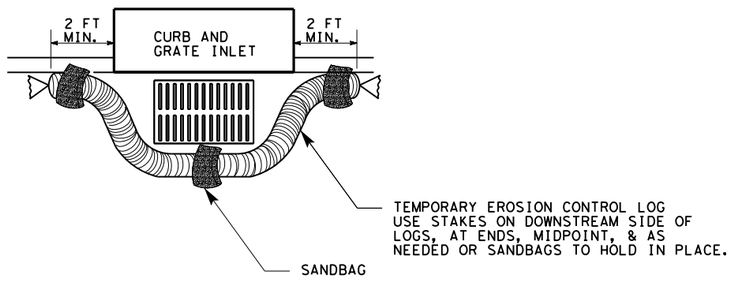
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

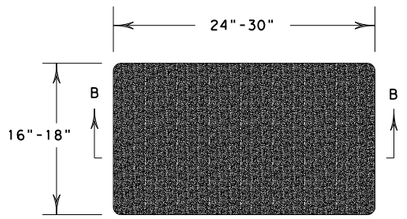
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

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

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0006	02	130		IH 20		
	DIST	COUNTY					SHEET NO.
	ABL	NOLAN					120