INDEX OF SHEETS

SHEET No.	DESCRIPTION
1	TITLE SHEET
2	INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

MAINTENANCE PROJECT No.				SHEET No.
RMC 646063001				1
DRAFT	STATE	DISTRICT	COUNTY	
TxDOT	TEXAS	WACO	HILL, ETC	
CHECK	CONT	SECT	JOB	HIGHWAY No.
CWS	6460	63	001	SH 22, ETC

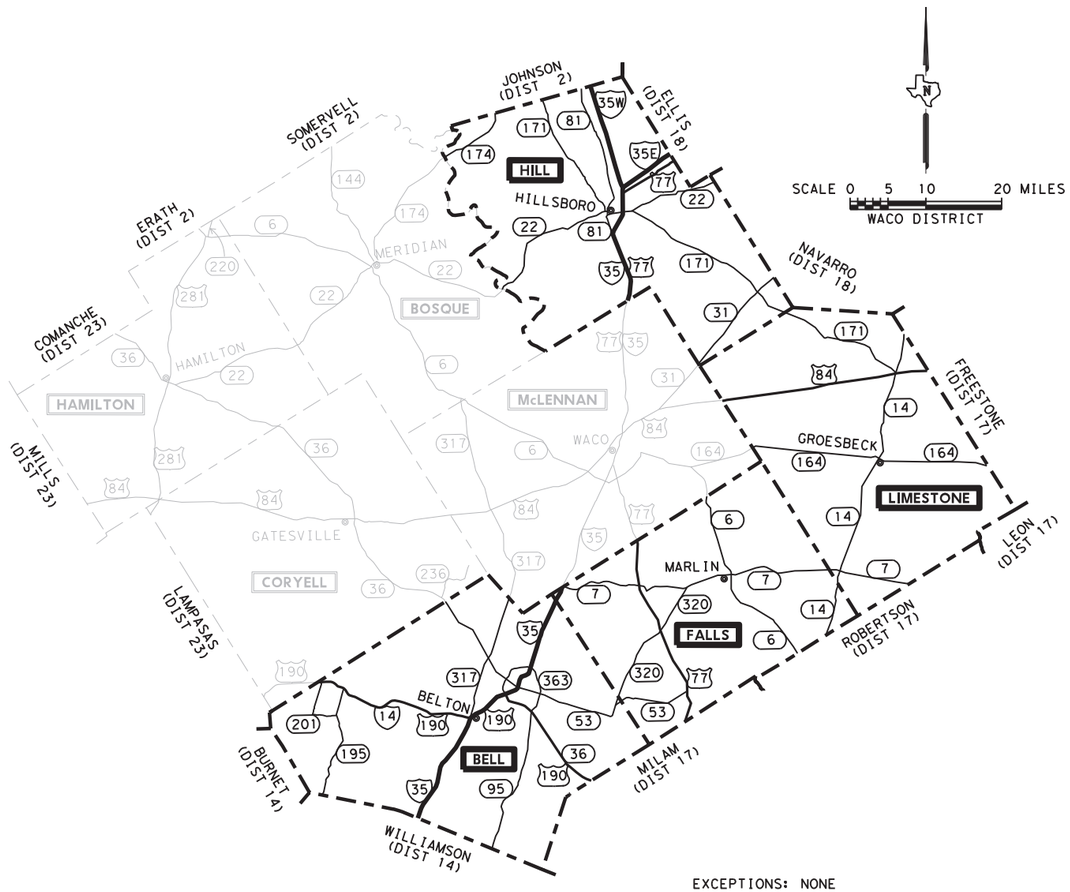
AREA OF DISTURBED SOIL = 0 ACRES

PLANS OF PROPOSED
HIGHWAY ROUTINE MAINTENANCE CONTRACT

TYPE OF WORK:

ROUTINE MAINTENANCE CONTRACT

PROJECT No.: RMC 646063001
HIGHWAY No.: SH 22, ETC
LIMITS OF WORK: BELL, FALLS, HILL, LIMESTONE COUNTIES



EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD: BNSF
DOT NO: 023 183 K
DOT NO: 024 489 T

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND PROVISIONAL ITEMS INCLUDED HEREIN, SHALL GOVERN ON THIS CONTRACT.

TEXAS DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR LETTING:

DocuSigned by:
Charles W Smith, PE
E7CF0200F8C48F...
1/24/2024
DISTRICT MAINTENANCE ENGINEER

RECOMMENDED FOR LETTING:

DocuSigned by:
Stephen Michael Kasberg, P.E.
6597DEC5B49C452...
1/24/2024
DIRECTOR OF MAINTENANCE

APPROVED FOR LETTING:

DocuSigned by:
Stanley Swiatek
B69BD796DD564C9...
1/24/2024
DISTRICT ENGINEER

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED
PROFESSIONAL ENGINEER

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

Charles W. Smith, P.E. 1/22/2024
DATE

Texas Department of Transportation

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Sheet 1 of 2

DESIGN	FED RD DIV No.	PROJECT No.		HIGHWAY No.
TxDOT	6	RMC 646063001		SH 22, ETC
CHECK	STATE	DISTRICT	COUNTY	SHEET No.
CWS	TEXAS	WACO	HILL, ETC	
GRAPHICS	CONTROL	SECTION	JOB	2
TxDOT	6460	63	001	
CHECK				
CWS				

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STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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

Charles W. Smith, P.E. 1/22/2024
DATE

Texas Department of Transportation

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Sheet 2 of 2

DESIGN	FED RD DIV No.	PROJECT No.		HIGHWAY No.
TxDOT	6	RMC 646063001		SH 22, ETC
CHECK	STATE	DISTRICT	COUNTY	SHEET No.
CWS	TEXAS	WACO	HILL, ETC	
GRAPHICS	CONTROL	SECTION	JOB	3
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CWS				

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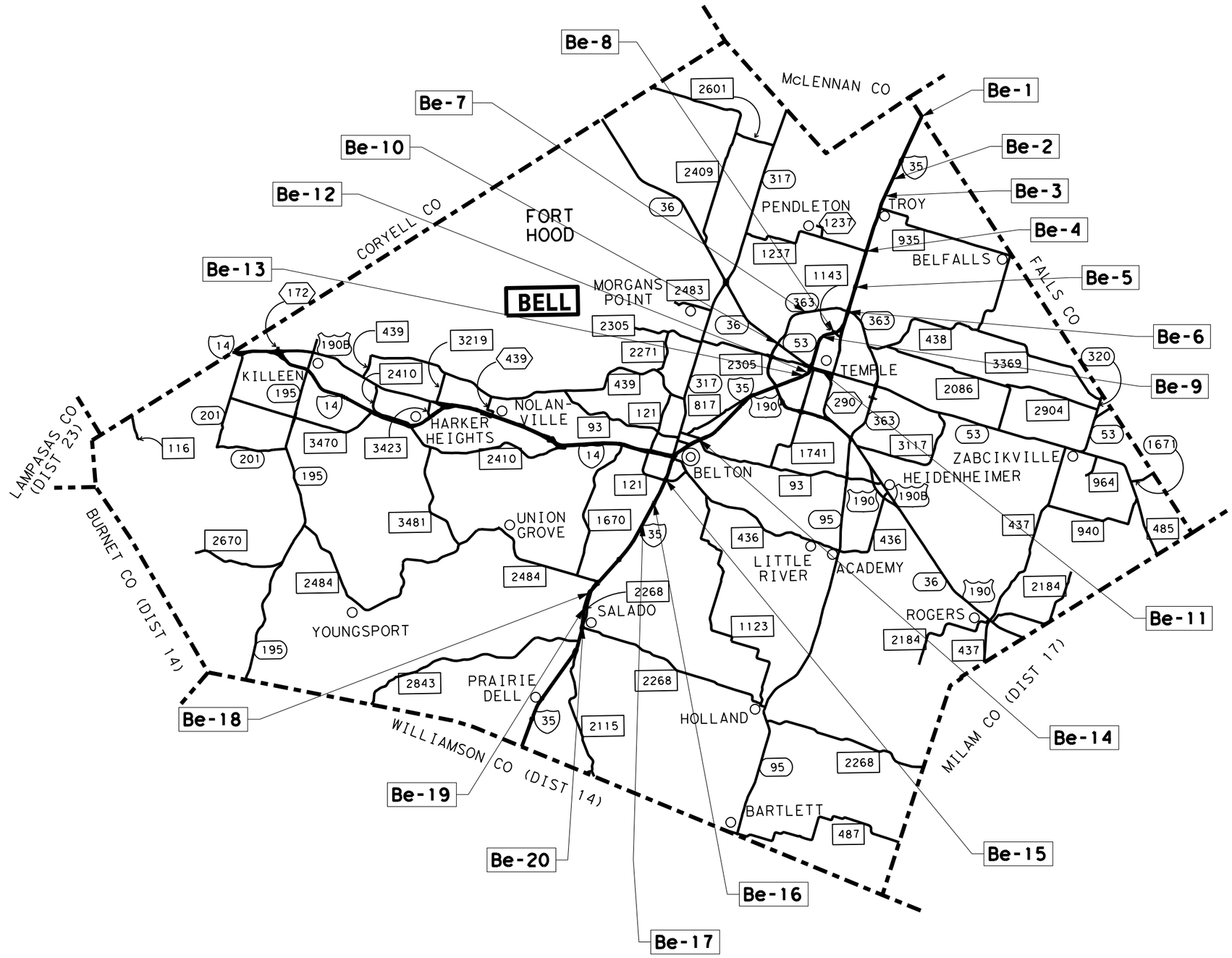

HORIZONTAL 0 1.25 2.5 5
SCALE IN MILES

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation
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PROJECT LAYOUT
BELL COUNTY

SCALE: 1"= 5 MILES Sheet 1 of 4

DESIGN	FED RD DIV No.	PROJECT No.	HIGHWAY No.
DL	6	RMC 646063001	SH 22, ETC
CHECK	STATE	DISTRICT	COUNTY	SHEET No.
CS	TEXAS	WACO	HILL, ETC	4
GRAPHICS	CONTROL	SECTION	JOB	
DL	6460	63	001	
CHECK				
CS				

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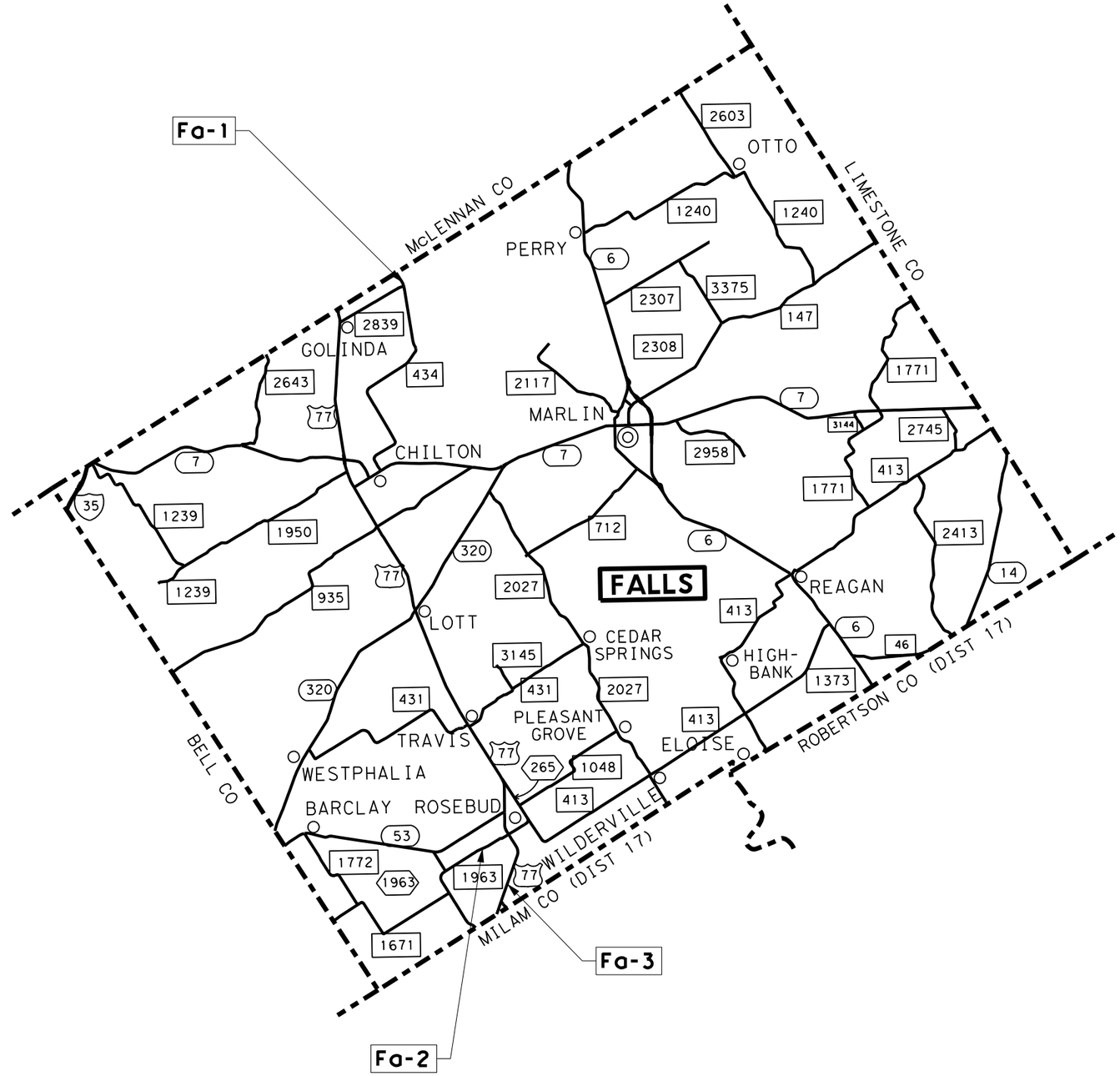

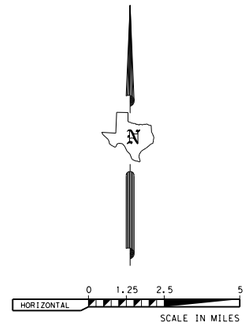

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation

PROJECT LAYOUT
FALLS COUNTY

SCALE: 1"= 5 MILES Sheet 2 of 4

DESIGN	FED RD DIV No.	PROJECT No.		HIGHWAY No.
DL	6	RMC 646063001		SH 22, ETC
CHECK	STATE	DISTRICT	COUNTY	SHEET No.
CS	TEXAS	WACO	HILL, ETC	5
GRAPHICS	CONTROL	SECTION	JOB	
DL	6460	63	001	
CHECK				
CS				

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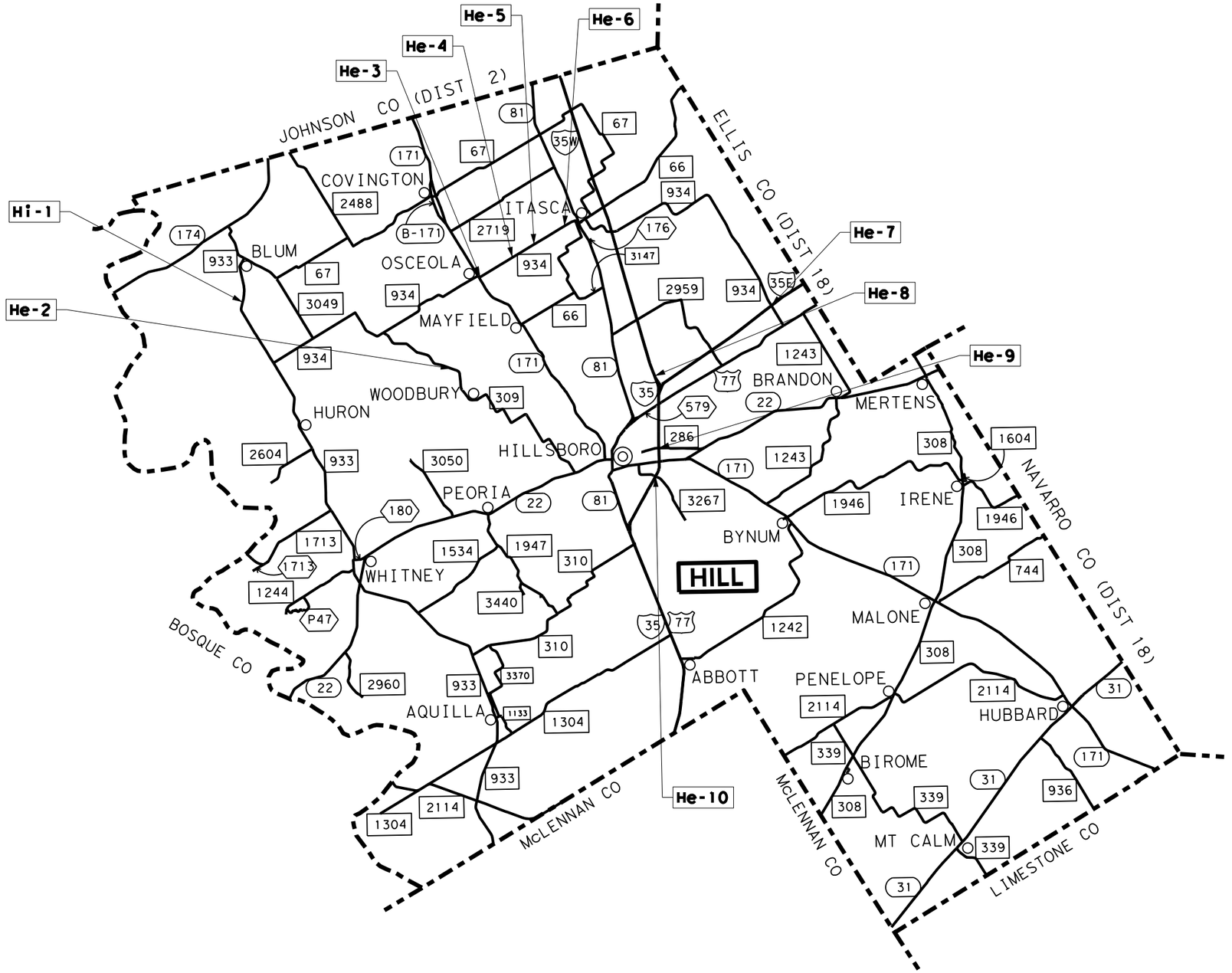

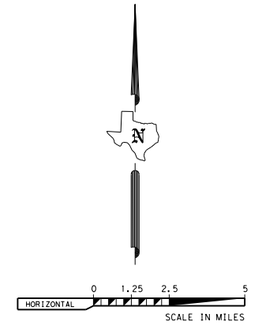

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Charles W. Smith, P.E. PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation

PROJECT LAYOUT
HILL COUNTY

SCALE: 1"= 5 MILES Sheet 3 of 4

DESIGN	FED RD DIV No.	PROJECT No.	HIGHWAY No.
DL	6	RMC 646063001	SH 22, ETC
CHECK	STATE	DISTRICT / COUNTY	SHEET No.
CS	TEXAS	WACO / HILL, ETC	
GRAPHICS	CONTROL	SECTION / JOB	6
DL	6460	63 / 001	
CHECK			
CS			

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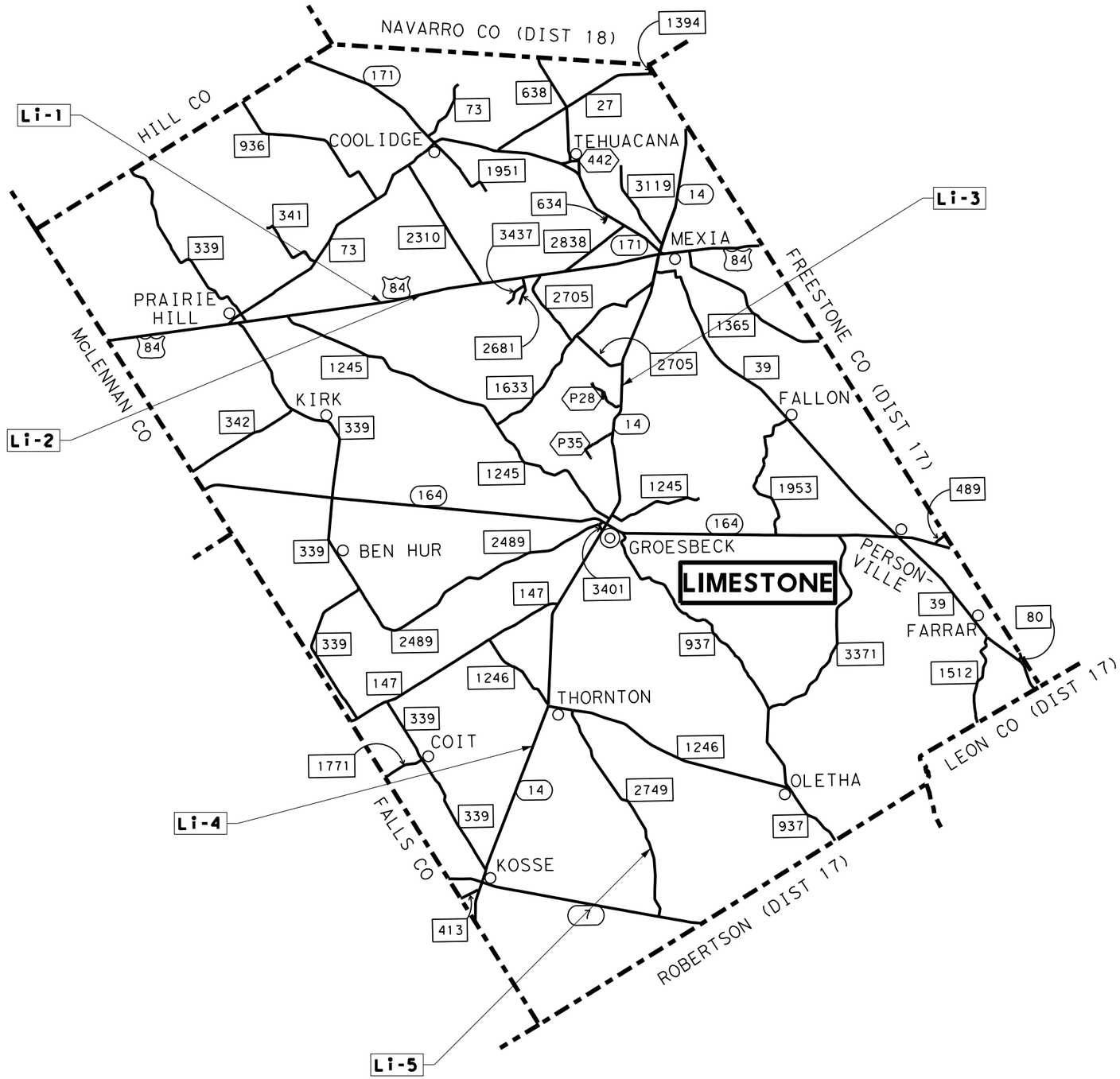

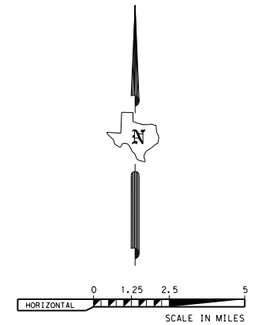

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

PROJECT LAYOUT
LIMESTONE COUNTY

SCALE: 1"= 5 MILES Sheet 4 of 4

DESIGN	FED RD DIV No.	PROJECT No.	HIGHWAY No.
DL	6	RMC 646063001	SH 22, ETC

CHECK	STATE	DISTRICT	COUNTY	SHEET No.
CS	TEXAS	WACO	HILL, ETC	7

GRAPHICS	CONTROL	SECTION	JOB
DL	6460	63	001

CHECK
CS

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Table 6: Basis of Estimate for Asphalt Pavements				
Item	**Description**	**Rate**	**Basis**	**Quantities**
3076	**DENSE-GRADED HOT MIX ASPHALT**			
	TY-C PG 64-22	**110 LB / SY / IN**	**2,832 SY**	**312 TON**

Table 7: Basis of Estimate for Interlayer Material				
Item	**Description**	**Rate**	**Basis**	**Quantities**
3085	**UNDERSEAL COURSE**	**0.20 GAL / SY**	**2,832 SY**	**567 GAL**

GENERAL NOTES

A site-specific contract for bridge maintenance consisting of embankment, pile encasements, riprap, and concrete structure repairs within the highway right of way of various roadways in Bell, Hamilton, Hill, Limestone and McLennan Counties according to the standard specifications or as modified in the general specifications listed below.

The disturbed area for this project, as shown on the plans is 0 acres. However, the Total Disturbed Area (TDA) will establish the required authorization for storm water discharges. The TDA of this project will be determined by the sum of the disturbed area in all project locations in the contract, and all disturbed area on all Project-Specific Locations (PSL) located in the project limits and/or within 1 mile of the project limits. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction site as shown on the plans, according to the TDA of the project. The contractor will obtain any required authorization from the TCEQ for the discharge of storm water from any PSL for construction support activities on or off of the project row according to the TDA of the project. When the TDA for the project exceeds 1 acre, provide a copy of the appropriate application of permit (NOI, or Construction Site Notice) to the engineer, for any PSL located in the project limits or within 1 mile of the project limits. Follow the directives and adhere to all requirements set forth in the TCEQ, Texas Pollution Discharge Elimination System, Construction General Permit (TPDES, CGP).

PRE-BID QUESTIONS

Contractor questions on this project are to be emailed to the Waco District at the following address:

Stephen Kasberg - Wacoprebid@txdot.gov, 254-867-2780, 100 S. Loop Dr., Waco, TX
Carmen Chau - Wacoprebid@txdot.gov, 254-867-2794, 100 S. Loop Dr., Waco, TX

Contractor questions will be accepted through email, phone, and in person by the above individuals. Questions may also be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

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

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

The Letting Pre-Bid Q&A web page for each project can be accessed by using the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the

controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

For this contract, the office of record is the Maintenance Office listed below. All work will be coordinated through this office and with the Maintenance Supervisor or his designated representative.

Maint. Supervisor	Telephone Number	Maint. Office Location
Eric Olivas	(254) 582-5411	1400 S. Abbott Ave. Hillsboro, TX 76645

The Contractor will perform the work required for this contract according to the Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (2014).

Prior to beginning work, a pre-construction meeting between representatives of the State and the Contractor will be arranged by the State. This meeting will outline the proper methods of construction, sequence of work, work locations, emphasize traffic control, plans, specifications, unusual conditions, and other pertinent items regarding the work.

ITEM 4: SCOPE OF WORK

All new and existing concrete adjacent to the roadway must be free of stains, dirt, tire marks, etc., at the time of final acceptance. These items include but are not limited to bridge rails curb and gutter, inlets and riprap. Blast cleaning of these items will be required to achieve acceptance of the project and will be considered subsidiary to the applicable bid items.

During final clean-up the contractor will be required to remove any foreign material that has accumulated at all bridge abutments and bent caps. The removal of foreign material will be performed in a manner approved. All work and equipment involved in the removal of this material will be subsidiary to the various bid items of the contract.

ITEM 5: CONTROL OF THE WORK

Underground utilities owned by the Texas Department of Transportation may be present within the Right-Of-Way on this project. For signal, illumination, surveillance, and communications & control maintained by TxDOT, call the TxDOT Traffic Signal Office (254)867-2808 for locates a minimum of 48 hours in advance of excavation. For irrigation systems, call TxDOT Landscape Office (254)867-2726 for locates a minimum of 48 hours in advance of excavation. If city or town owned irrigation facilities are present, call the appropriate department of the local city or town a minimum of 48 hours in advance of excavation. The Contractor is liable for all damages when utilities are damaged due to Contractor’s negligence including, but not limited to, repair or replacement at the Contractor’s expense.

ITEM 6: CONTROL OF MATERIALS

This proposed Contract will not include federal funds. Buy Texas stipulations apply in accordance with 6.1.2 “Buy Texas”.

Mixing of materials, storing of materials, storing of equipment, or repairing of equipment on top of concrete pavement or bridge decks will not be permitted unless specifically authorized. Permission will be granted to store materials on surfaces if, in the opinion of the Engineer, no damage or discoloration will result.

References to manufacturer’s trade name or catalog numbers are for the purpose of identification only and the contractor will be permitted to furnish like materials of other manufacturers provided they are of equal quality and comply with specifications for this project.

ITEM 7: LEGAL RELATIONS AND RESPONSIBILITIES

No significant traffic generator events identified.

If utilizing private property for waste disposal sites, field office sites, equipment storage sites or for any other purpose involved with this project, provide to the Engineer written proof of the property owner's approval of the use of this property. This proof may be in the form of a letter or agreement signed by the property owner or other documents acceptable to the Engineer.

Personal vehicles of the contractor’s employees will not be parked within the right of way at any time including any section closed to public traffic unless the vehicle is being utilized for construction procedures. However, the contractor’s employees may park on the right of way at the sites where the contractor has his office, equipment, and materials storage yard.

The contractor is alerted to the possible presence of swallows under the existing bridges or culverts. Because the migratory bird treaty act prohibits harm to swallows, their eggs or their nestlings, the contractor will not begin potentially disturbing activities on or near the bridge until the birds have abandoned any occupied nests (approximately September 1). Active nests may not be removed regardless of the date.

Prior to the swallows returning to the nests (approximately March 1), abandoned nests will be removed from the bridge. The contractor will prevent the establishment of new nests on any portion of the structure. Methods for preventing the establishment of new nests must be approved by the project Engineer. Examples of acceptable nest prevention methods are bird-deterrent netting and bird-repelling sprays and/or gels to be applied to the structure. This work will not be paid for directly, but will be subsidiary to the various bid items.

ITEM 8: PROSECUTION AND PROGRESS

Meet bi-weekly or at intervals as agreed upon with the engineer to notify him or her of planned work for the upcoming 3-week period.

For this project, provide a Bar Chart progress schedule.

Submit the schedule in both PDF and in a base software electronic file format acceptable to TxDOT to allow for import and analysis into TxDOT's current scheduling software.
At all times, the Contractor's personnel must be dressed in approved safety attire while outside vehicles and/or while performing work on the highway right of way. This will include but is not limited to hard hats and Type III safety vests.

The contractor must clean up and remove from all work areas loose material resulting from the contractor operations each day before work is suspended. No loose material shall remain at the work site overnight.

Working days will be charged in accordance with Article 8.3.1.5, "Calendar Day".

Working day charges will begin the day the contractor begins work but no later than 7 calendar days after the written authorization to begin work.

Working days are based on the following production rates:

WORK DESCRIPTION	WORKING DAYS
Cleaning Existing Joints	150 LF/DAY
Flexible Pavement Structural Repair	2,000 SY/DAY
Plane Asph Conc (0"-5")	1,500 SY/DAY
D-GR HMA TY-C	800 TON/DAY
Striping	16,000 LF/DAY

All work in this contract shall be completed no later than August 15, 2024.

Liquidated damages will be assessed for any working day charged beyond the authorized time. The amount of liquidated damages will be calculated based on total contract amount.

LANE CLOSURES

IH-35 main lane closures must be coordinated with other projects IH 35 including maintenance operations requiring main lane and frontage road closures in the Waco District with the Project Engineer and TxDOT's Mobility Coordinator. Provide one week notice to the Project Engineer of any planned lane closures to allow coordination. The Project Engineer must approve all closures prior to implementing. No additional compensation will be provided due to rescheduling of requested lane closures caused by the need for coordination with adjoining projects.

Placement of traffic control devices for night operations will not commence until after the start time and all devices must be removed from the roadway prior to the finish time.

The Contractor will be assessed a lane rental charge for each 15-minute increment one or more lanes are closed during any hours not included in defined non-peak hours provided. Charge will commence once five (5) minutes of a 15-minute increment have elapsed and will continue for each 15-minute increment until such time as all lanes are open to traffic. Charges will be as outlined in the following table:

Lane Rental Information

TIME	NO. OF LANES CLOSED	15 MINUTE INCREMENT RATE
Peak Hours	1 Lane Closed	$100.00 / Increment
Peak Hours	2 Lanes Closed	$200.00 / Increment
Peak Hours	3 Lanes Closed	$300.00 / Increment
Non-Peak Hours	3 Lanes or More	$300.00 / Increment

Lane closures that are necessary to perform emergency operations are excluded from lane rental charges. Emergency operations are those circumstances to restore pavement or other items as approved by the Engineer. Failure of the Contractor to prosecute emergency operations within a reasonable timeframe may result in lane rental charges being applied, based on a case-by-case review by the Engineer.

IH 35 main lane closures will only be allowed during Non-Peak Hours, and the purpose of the Peak Hour Lane Rental rate is to apply a disincentive when operations during Non-Peak Hours are not completed promptly, requiring extending lane closures into Peak Hours.

Non-Peak Hours are as follows:
Sunday 10PM – Monday 6AM
Monday 7PM – Tuesday 6AM
Tuesday 7PM – Wednesday 6AM
Wednesday 7PM – Thursday 6AM
Thursday 7PM – Friday 6AM

Lane closure restrictions will consist of:
• Lane closure length restricted to 2 miles or less
• Full freeway closures will only be allowed at nighttime

ITEM 438: CLEANING AND SEALING JOINTS

Submit information from the sealant manufacture showing recommended equipment and installation procedures before starting work. All equipment and procedures will be subject to approval. If the equipment causes damage to dowels, reinforcing steel, concrete, base, sub-base, or subgrade, repair the damage and change the procedure and equipment to prevent further damage.

Remove all debris, dirt, dust, saw-cuttings, and other foreign material from joint by an approved method. Collect and dispose of all the removed materials.

Remove existing performed bituminous fiber board material or other spacer material the full depth of the joint along with all other debris in the joint opening. Resize the joint sealant space by sawing to the width and depth shown on the plans to accommodate the type of sealant specified.

Place the sealant in accordance with the manufacturer's recommended procedures. Apply the primer, when required, at the specified rate and time interval before applying the sealant. Apply the sealant to dry joint surfaces unless otherwise recommended by the sealant manufacture. Tool any sealant material that is not self-leveling to force the sealant against the joint surfaces.

ITEM 500: MOBILIZATION

Material On Hand (MOH) will not be used in calculating partial payments for Mobilization.

ITEM 502: BARRICADES, SIGNS AND TRAFFIC HANDLING

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.

Access will be provided to all business and residences at all times. Where turning radii are limited during phased construction at intersections, provide all weather surfaces such as RAP or base in turning movements to accommodate and to protect the traffic from edge drop-offs.

PROJECT NUMBER: RMC 646063001

COUNTY: HILL, ETC

HIGHWAY: SH 22, ETC **CONTROL: 6460-63-001**

Materials, labor, maintenance and removal for these temporary accesses and radii will not be paid for directly but will be considered subsidiary to the various bid items.

Provide a person on the project at all times (24 hours/day, 7 days/week) to patrol, monitor, and maintain the traffic control devices and signs. The person must be knowledgeable of TxDOT Guidelines for traffic control devices and signs.

Place barricades and signs in locations that do not obstruct the sight distance of drivers entering the highway from driveways or side streets.

Provide rectangular shape (CW12-2P) Temporary Clearance Signs on all bridges where the existing vertical clearance has changed. Install Signs to the satisfaction of the Engineer prior to opening to traffic. Plywood sign blanks will have minimum dimensions of 84" X 12". Work performed and materials are subsidiary to this item.

Law Enforcement Personnel.

As approved by the Engineer, provide uniformed off duty police officers and squad cars during the following activities:

- Lane closures on controlled access facilities or 4 lane divided facilities with speed limits above 55mph,
- ramp closures,
- Roadway Closures,
- Support of phase construction traffic switches,
- nighttime work, or
- other situations that indicate a need for additional traffic control to protect the traveling public or the construction workforce.

Law Enforcement Personnel must have jurisdictional authority to act in the area of the project.

Law Enforcement Personnel will be paid when use is approved by the Engineer. The Contractor retains the right to have law enforcement personnel on sight at their own cost and discretion when note approved by the Engineer.

Submit charge summary and invoices using the Department form 318. Provide documentation such as payroll, log sheets with signatures and badge number, or invoices from the government entity providing the officers for reimbursement. 318 forms must be submitted daily, upon completion of shift.

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. Windows / Windshields may not be blocked.

No payment will be made for law enforcement personnel needed for moving equipment or payment for drive time to/from the event site. A minimum number of hours is not guaranteed. Payment is for work performed.

Cancel law enforcement personnel when the event is canceled. Cancellation, minimums or “show up” fees will not be paid when cancellation is made 12 hours prior to beginning of the event. Failure to cancel within 12 hours will not be cause for payment for cancellation, minimums, or "show up" time. Payment of actual “show up” time to the event site due to cancellation will be on a case by case basis at a maximum of 2 hours per officer.

The Contractor Responsible Person(s) (CRP) for Work Zone Traffic Controls will inspect and ensure any deficiencies are corrected each and every day throughout the duration of this contract. Any misaligned or damaged traffic control devices will be repaired as soon as practical after deficiency is discovered.

In addition to providing a Contractor’s Responsible Person and a phone number for emergency contact, have an employee(s) available to respond on the project for emergencies and for taking corrective measures within One (1) Hour.

ITEM 6001: PORTABLE CHANGEABLE MESSAGE SIGN

This project will require “full matrix” type portable changeable message signs.

Ensure that the Contractor’s Responsible Person for traffic control can revise messages within thirty (30) minutes of notification.

Furnish portable changeable message signs. The portable changeable message sign(s) will be used for all lane closures and freeway closures as shown on the traffic control plan standard sheets.

Supply portable changeable message sign(s) in accordance with the Traffic Control Plan standard sheets and Article 6f.55 of the Texas Manual on Uniform Traffic Control Devices for Streets and Highways Part VI.

ITEM 6185: TRUCK MOUNTED ATTENUATORS

The shadow vehicle with truck mounted attenuator (TMA) will not be optional, but will be required as shown on the appropriate traffic control plan sheets. Truck mounted attenuators must meet the requirements of the Compliant Work Zone Traffic Control Device List.

All TMAs required for this contract will be Level 3 Compliant.

The total number of truck mounted attenuators (TMA) required when utilizing the traffic control standards are shown in the tables below.

TCP 1 Series	Scenario		Required TMA	
(1-1)-18 / (1-2)-18			1	
(1-3)-18	A	B	1	2
(1-4)-18 / (1-5)-18 / (1-6)-18			1	

TCP 2 Series	Scenario		Required TMA	
(2-1)-18 / (2-2)-18 / (2-4)-18 / (2-5)-18 / (2-6)-18	All		1	
(2-3)-18	A	B	1	2

TCP 3 Series	Scenario			Required TMA
(3-1)-13	All			2
(3-2)-13	All			3
(3-3)-14	A	B	D	2
	C			3
(3-4)-13	All			1, unless working inside a twltl, then 2.
(3-5)-15	All			1

TCP 6 Series	Scenario		Required TMA	
(6-1)-12	A	B	1	2
(6-2)-12 / (6-3)-12	All		1	
(6-4)-12	A	B	1	2
(6-5)-12	A	B	1	2
(6-6)-12 / (6-7)-12	All		1 Per Lane	
(6-8)-14 / (6-9)-14	All		1	

Shadow vehicles equipped for truck mounted attenuators (TMA) for stationary operations will be paid for by the day and must be available for use at any time as determined by the Engineer.

Mobile operations will be paid for by the hour, per specifications. For mobile operations, payment will be made only while the TMA is in use.

For mobile operations requiring multiple TMA’s, judgement may be applied in lower speed, urban / in town traffic environments to reduce the numbers of TMA in use where the added TMA may pose a hazard for traffic entering and exiting driveways, side streets, etc.

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 TMA needed for the project for those times per plan requirements. Additional TMAs used that are not specified in the plans in which the contractor expects compensation will require prior approval from the Engineer.

ITEM 7329: MAINTENANCE SPEED LIMIT SIGNING

All maintenance activity work sites will require Maintenance Work Zone Speed Limit Signs to temporarily lower regulatory speed limits. Form 1204M will be completed for each work site and this form will determine the temporary reduced speed based on the type of work and relevant work zone factors. Refer to the Maintenance Work Zone Speed Limit Standard Sheets for the listing of signs required and additional information on placement and covering of signs. At the conclusion of work, all signs related to the temporary speed limit must immediately be removed and permanent speed limit signs uncovered.

PROJECT NUMBER: RMC 646063001 SHEET NO. 8E

COUNTY: HILL, ETC

HIGHWAY: SH 22, ETC CONTROL: 6460-63-001

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Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6460-63-001 **DISTRICT** Waco **COUNTY** Hill
HIGHWAY SH0022

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**6460-63-001**			
		PROJECT ID		**A00205811**			
		COUNTY		**Hill**			
		HIGHWAY		**SH0022**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	351-6012	FLEXIBLE PAVEMENT STRUCTURE REPAIR(2")	SY	25.000		25.000	
	354-6088	PLANE ASPH CONC PAV (0" TO 5")	SY	2,832.000		2,832.000	
	356-6021	PAV JT UNDERSEAL (24")	LF	258.000		258.000	
	438-6002	CLEANING AND SEALING EXIST JOINTS(CL3)	LF	1,878.000		1,878.000	
	438-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	LF	1,056.000		1,056.000	
	438-6009	CLEANING EXISTING JOINTS	LF	4,617.000		4,617.000	
	454-6008	HEADER TYPE EXPANSION JOINT	CF	37.000		37.000	
	454-6009	JOINT SEALANT	LF	220.000		220.000	
	500-6001	MOBILIZATION	LS	0.100		0.100	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	5.000		5.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	18.000		18.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	1,396.000		1,396.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	175.000		175.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	698.000		698.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	20.000		20.000	
	3076-6069	D-GR HMA TY-C SAC-B PG64-22 (EXEMPT)	TON	312.000		312.000	
	3085-6001	UNDERSEAL COURSE	GAL	567.000		567.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	248.000		248.000	
	6185-6002	TMA (STATIONARY)	DAY	248.000		248.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	24.000		24.000	
	7329-6002	MAINTENANCE SPEED LIMIT SIGNING	DAY	124.000		124.000	

BRG-JNT FY-2024

COUNTY	LOCATION CODE	LOCATION & STR ID	351 6012 FLEXIBLE PAVEMENT STRUCTURE REPAIR (2") SY	354 6088 PLANE ASPH CONC PAV (0" TO 5") SY	356 6021 PAV JT UNDERSEAL (24") LF	438 6002 CLEANING AND SEALING EXIST JOINTS(CL3) LF	438 6004 CLEANING AND SEALING EXIST JOINTS(CL7) LF	438 6009 CLEANING EXISTING JOINTS LF	454 6008 HEADER TYPE EXPANSION JOINT CF	454 6009 JOINT SEALANT LF	500 6001 MOBILIZATION LS	502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING MO
BELL	Be-1	IH 35 NB/SB @ DEER CREEK; BELL CO STR: 09-014-0-0015-04-562/563						248				
	Be-2	IH 35 NBML @ BIG ELM CREEK; BELL CO STR: 09-014-0-0015-04-555						119				
	Be-3	IH 35 SB/NB @ NORTH TROY RD; BELL CO STR: 09-014-0-0015-04-603/604						280				
	Be-4	IH 35 NB @ FM 1237; BELL CO STR: 09-014-0-0015-04-589						116				
	Be-5	IH 35 NB @ BERGER/HART RD; BELL CO STR: 09-014-0-0015-04-584						140				
	Be-6	LP 363 @ IH 35; BELL CO STR: 09-014-0-0015-04-398	19					168	28	168		
	Be-7	LP 363 NB/SB @ WENDLAND RD; BELL CO STR: 09-014-0-0320-06-403/404						216				
	Be-8	SP 290 @ IH 35; BELL CO STR: 09-014-0-0015-04-709						180				
	Be-9	IH 35 SB @ BELCO YARD; BELL CO STR: 09-014-0-0015-14-704						294				
	Be-10	SH 36 WB/EB @ LP 363; BELL CO STR: 09-014-0-0184-03-444/445						298				
	Be-11	SH 53 EB @ BNSF; BELL CO STR: 09-014-0-0184-03-046	6					52	9	52		
	Be-12	IH 35 SBFR @ BSNF RR; BELL CO STR: 09-014-0-0015-14-695						147				
	Be-13	IH 35 SBML @ BSNF RR; BELL CO STR: 09-014-0-0015-14-697						725				
	Be-14	FM 93 (6TH AVE) @ IH 35; BELL CO STR: 09-014-0-0015-14-338					310					
	Be-15	LP 121 @ IH 35; BELL CO STR: 09-014-0-0015-06-530						319				
	Be-16	SHANKLIN RD @ IH 35; BELL CO STR: 09-014-0-0015-06-531						168				
	Be-17	IH 35 ML @ LAMPASAS RIVER; BELL CO STR: 09-014-0-0015-06-532						369				
	Be-18	IH 35 NB @ SALADO PLAZA DR; BELL CO STR: 09-014-0-0015-07-552						122				
	Be-19	THOMAS ARNOLD RD @ IH 35; BELL CO STR: 09-014-0-0015-07-549						106				
	Be-20	IH 35 NBFR @ IH 35 NB OFF-RAMP; BELL CO STR: 09-014-0-0015-07-545						126				
TOTALS:			25	0	0	0	310	4193	37	220	0	0

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Texas Department of Transportation

SUMMARY SHEET

BELL COUNTY
1 OF 2

Sheet 1 of 4

DESIGN	FED RD DIV No.	PROJECT No.	HIGHWAY No.
TxDOT	6	RMC 646063001	SH 22, ETC
CHECK	STATE	DISTRICT / COUNTY	SHEET No.
CWS	TEXAS	WACO / HILL, ETC	10
GRAPHICS	CONTROL	SECTION / JOB	
TxDOT	6460	63 / 001	
CHECK			
CWS			

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BRG-JNT FY-2024

COUNTY	LOCATION CODE	LOCATION & STR ID	662 6111 WK ZN PAV MRK SHT TERM (TAB)TY Y-2 EA	666 6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL) LF	666 6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL) LF	666 6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL) LF	672 6009 REFL PAV MRKR TY II-A-A EA	3076 6069 D-GR HMA TY-C SAC-B PG64-22 (EXEMPT) TON	3085 6001 UNDERSEAL COURSE GAL	6001 6001 PORTABLE CHANGEABLE MESSAGE SIGN DAY	6185 6002 TMA (STATIONARY) DAY	6185 600 TMA (MOBILE OPERATION) HR	7329 6002 MAINTENANCE SPEED LIMIT SIGNING DAY
BELL	Be-1	IH 35 NB/SB @ DEER CREEK; BELL CO STR: 09-014-0-0015-04-562/563											
	Be-2	IH 35 NBML @ BIG ELM CREEK; BELL CO STR: 09-014-0-0015-04-555											
	Be-3	IH 35 SB/NB @ NORTH TROY RD; BELL CO STR: 09-014-0-0015-04-603/604											
	Be-4	IH 35 NB @ FM 1237; BELL CO STR: 09-014-0-0015-04-589											
	Be-5	IH 35 NB @ BERGER/HART RD; BELL CO STR: 09-014-0-0015-04-584											
	Be-6	LP 363 @ IH 35; BELL CO STR: 09-014-0-0015-04-398											
	Be-7	LP 363 NB/SB @ WENDLAND RD; BELL CO STR: 09-014-0-0320-06-403/404											
	Be-8	SP 290 @ IH 35; BELL CO STR: 09-014-0-0015-04-709											
	Be-9	IH 35 SB @ BELCO YARD; BELL CO STR: 09-014-0-0015-14-704											
	Be-10	SH 36 WB/EB @ LP 363; BELL CO STR: 09-014-0-0184-03-444/445											
	Be-11	SH 53 EB @ BNSF; BELL CO STR: 09-014-0-0184-03-046											
	Be-12	IH 35 SBFR @ BSNF RR; BELL CO STR: 09-014-0-0015-14-695											
	Be-13	IH 35 SBML @ BSNF RR; BELL CO STR: 09-014-0-0015-14-697											
	Be-14	FM 93 (6TH AVE) @ IH 35; BELL CO STR: 09-014-0-0015-14-338											
	Be-15	LP 121 @ IH 35; BELL CO STR: 09-014-0-0015-06-530											
	Be-16	SHANKLIN RD @ IH 35; BELL CO STR: 09-014-0-0015-06-531											
	Be-17	IH 35 ML @ LAMPASAS RIVER; BELL CO STR: 09-014-0-0015-06-532											
	Be-18	IH 35 NB @ SALADO PLAZA DR; BELL CO STR: 09-014-0-0015-07-552											
	Be-19	THOMAS ARNOLD RD @ IH 35; BELL CO STR: 09-014-0-0015-07-549											
	Be-20	IH 35 NBFR @ IH 35 NB OFF-RAMP; BELL CO STR: 09-014-0-0015-07-545											
TOTALS:			0	0	0	0	0	0	0	0	0	0	0

SUMMARY SHEET

BELL COUNTY
2 OF 2

DESIGN	FED RD DIV No.	PROJECT No.	HIGHWAY No.
TxDOT	6	RMC 646063001	SH 22, ETC
CHECK	STATE	DISTRICT / COUNTY	SHEET No.
CWS	TEXAS	WACO / HILL, ETC	11
GRAPHICS	CONTROL	SECTION / JOB	
TxDOT	6460	63 / 001	
CHECK			
CWS			

BRG-JNT FY-2024

COUNTY	LOCATION CODE	LOCATION & STR ID	351 6012 FLEXIBLE PAVEMENT STRUCTURE REPAIR (2") SY	354 6088 PLANE ASPH CONC PAV (0" TO 5") SY	356 6021 PAV JT UNDERSEAL (24") LF	438 6002 CLEANING AND SEALING EXIST JOINTS(CL3) LF	438 6004 CLEANING AND SEALING EXIST JOINTS(CL7) LF	438 6009 CLEANING EXISTING JOINTS LF	454 6008 HEADER TYPE EXPANSION JOINT CF	454 6009 JOINT SEALANT LF	500 6001 MOBILIZATION LS	502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING MO
FALLS	Fa-1	FM 434 @ BULLHIDE CREEK; FALLS CO STR: 09-074-0-2090-03-023						70				
	Fa-2	FM 1963 @ POND CREEK RELIEF; FALLS CO STR: 09-074-0-2090-04-485						60				
	Fa-3	US 77 @ POND CREEK; FALLS CO STR: 09-074-0-0290-03-043				572						
HILL	Hi-1	FM 933 @ ROCK CREEK; HILL CO STR: 09-110-0-1190-01-004					138					
	HI-2	FM 309 @ COTTONWOOD CREEK; HILL CO STR: 09-110-0-0888-02-008					48					
	Hi-3	FM 934 @ COTTONWOOD CREEK; HILL CO STR: 09-110-0-0888-01-014					60					
	Hi-4	FM 934 @ TRIB HACKBERRY CREEK; HILL CO STR: 09-110-0-0888-01-011		1245	66	122						
	Hi-5	FM 934 @ HACKBERRY CREEK; HILL CO STR: 09-110-0-0888-01-012					60					
	Hi-6	FM 934 @ BRANCH HACKBERRY CREEK; HILL CO STR: 09-110-0-0888-01-013					60					
	HI-7	FM 934 @ IH 35E; HILL CO STR: 09-110-0-0048-09-533						140				
	Hi-8	CR 4235 @ IH 35W; HILL CO STR: 09-110-0-0014-23-306					100					
	Hi-9	IH 35 NB/SB @ FM 286; HILL CO STR: 09-110-0-0014-24-472/479					280					
	Hi-10	FM 3267 @ IH 35; HILL CO STR: 09-110-0-0014-24-040						154				
LIMESTONE	Li-1	US 84 @ NAVASOTA RIVER; LIMESTONE CO STR: 09-110-0-0056-02-036				352						
	Li-2	US 84 @ PIN OAK CREEK; LIMESTONE CO STR: 09-110-0-0056-03-038				308						
	Li-3	SH 14 @ NAVASOTA RIVER; LIMESTONE CO STR: 09-110-0-0093-04-045				176						
	Li-4	SH 14 @ MILLS BRANCH; LIMESTONE CO STR: 09-147-0-0093-06-032		1587	192	192						
	Li-5	FM 2749 @ STEELE CREEK RELIEF; LIMESTONE CO STR: 09-147-0-2807-02-002				156						
TBD		TO - BE - DETERMINED									1	5
		TOTALS:	0	2832	258	1878	746	424	0	0	1	5

SUMMARY SHEET

FALLS, HILL & LIMESTONE
1 OF 2

DESIGN	FED RD DIV No.	PROJECT No.		HIGHWAY No.
TxDOT	6	RMC 646063001		SH 22, ETC
CHECK	STATE	DISTRICT	COUNTY	SHEET No.
CWS	TEXAS	WACO	HILL, ETC	12
GRAPHICS	CONTROL	SECTION	JOB	
TxDOT	6460	63	001	
CHECK				
CWS				

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BRG-JNT FY-2024

COUNTY	LOCATION CODE	LOCATION & STR ID	662	666	666	666	672	3076	3085	6001	6185	6185	7329
			6111	6303	6312	6315	6009	6069	6001	6001	6002	600	6002
			WK ZN PAV MRK SHT TERM (TAB)TY Y-2	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	REFL PAV MRKR TY II-A-A	D-GR HMA TY-C SAC-B PG64-22 (EXEMPT)	UNDERSEAL COURSE	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)	MAINTENANCE SPEED LIMIT SIGNING
			EA	LF	LF	LF	EA	TON	GAL	DAY	DAY	HR	DAY
FALLS	Fa-1	FM 434 @ BULLHIDE CREEK; FALLS CO STR: 09-074-0-2090-03-023											
	Fa-2	FM 1963 @ POND CREEK RELIEF; FALLS CO STR: 09-074-0-2090-04-485											
	Fa-3	US 77 @ POND CREEK; FALLS CO STR: 09-074-0-0290-03-043											
HILL	Hi-1	FM 933 @ ROCK CREEK; HILL CO STR: 09-110-0-1190-01-004											
	Hi-2	FM 309 @ COTTONWOOD CREEK; HILL CO STR: 09-110-0-0888-02-008											
	Hi-3	FM 934 @ COTTONWOOD CREEK; HILL CO STR: 09-110-0-0888-01-014											
	Hi-4	FM 934 @ TRIB HACKBERRY CREEK; HILL CO STR: 09-110-0-0888-01-011	10	800	100	400	11	137	249				
	Hi-5	FM 934 @ HACKBERRY CREEK; HILL CO STR: 09-110-0-0888-01-012											
	Hi-6	FM 934 @ BRANCH HACKBERRY CREEK; HILL CO STR: 09-110-0-0888-01-013											
	Hi-7	FM 934 @ IH 35E; HILL CO STR: 09-110-0-0048-09-533											
	Hi-8	CR 4235 @ IH 35W; HILL CO STR: 09-110-0-0014-23-306											
	Hi-9	IH 35 NB/SB @ FM 286; HILL CO STR: 09-110-0-0014-24-472/479											
	Hi-10	FM 3267 @ IH 35; HILL CO STR: 09-110-0-0014-24-040											
LIMESTONE	Li-1	US 84 @ NAVASOTA RIVER; LIMESTONE CO STR: 09-110-0-0056-02-036											
	Li-2	US 84 @ PIN OAK CREEK; LIMESTONE CO STR: 09-110-0-0056-03-038											
	Li-3	SH 14 @ NAVASOTA RIVER; LIMESTONE CO STR: 09-110-0-0093-04-045											
	Li-4	SH 14 @ MILLS BRANCH; LIMESTONE CO STR: 09-147-0-0093-06-032	8	596	75	298	9	175	318				
	Li-5	FM 2749 @ STEELE CREEK RELIEF; LIMESTONE CO STR: 09-147-0-2807-02-002											
TBD		TO - BE - DETERMINED								248	248	5	124
TOTALS:			18	1396	175	698	20	312	567	248	248	5	124

SUMMARY SHEET

FALLS, HILL & LIMESTONE
2 OF 2

Sheet 4 of 4

DESIGN	FED RD DIV No.	PROJECT No.	HIGHWAY No.
TxDOT	6	RMC 646063001	SH 22, ETC
CHECK CWS	STATE	DISTRICT / COUNTY	SHEET No.
GRAPHICS TxDOT	TEXAS	WACO / HILL, ETC	13
CHECK CWS	CONTROL	SECTION / JOB	
	6460	63 / 001	

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	6460	63	001	SH 22,ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL,ETC		14

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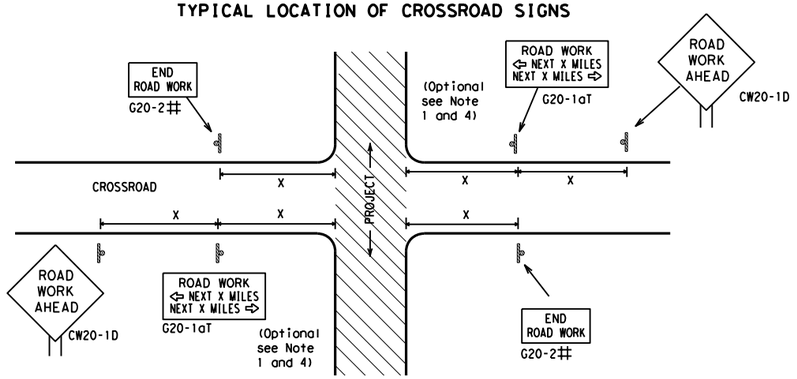
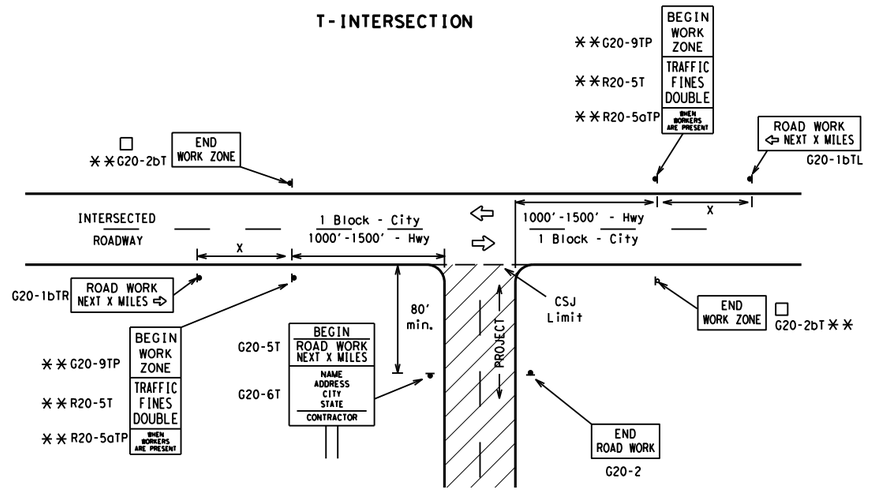
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

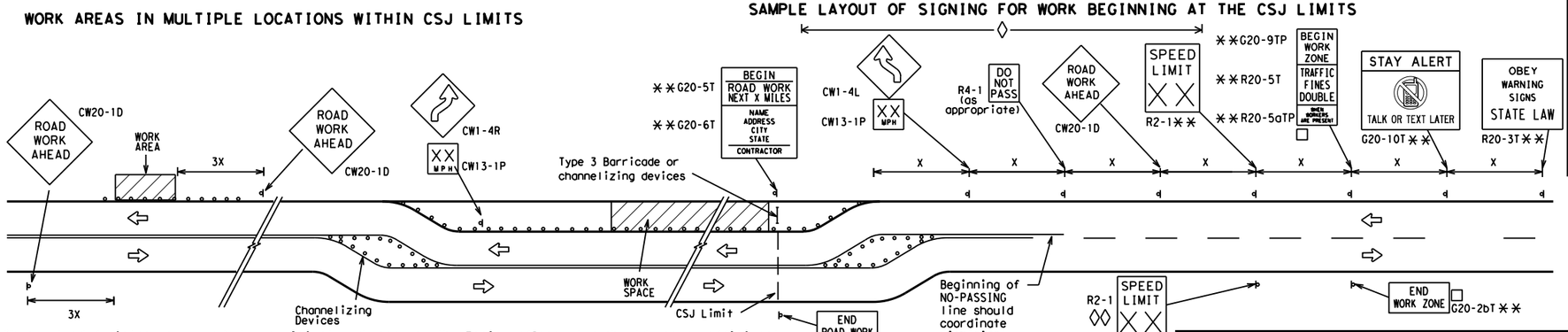
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

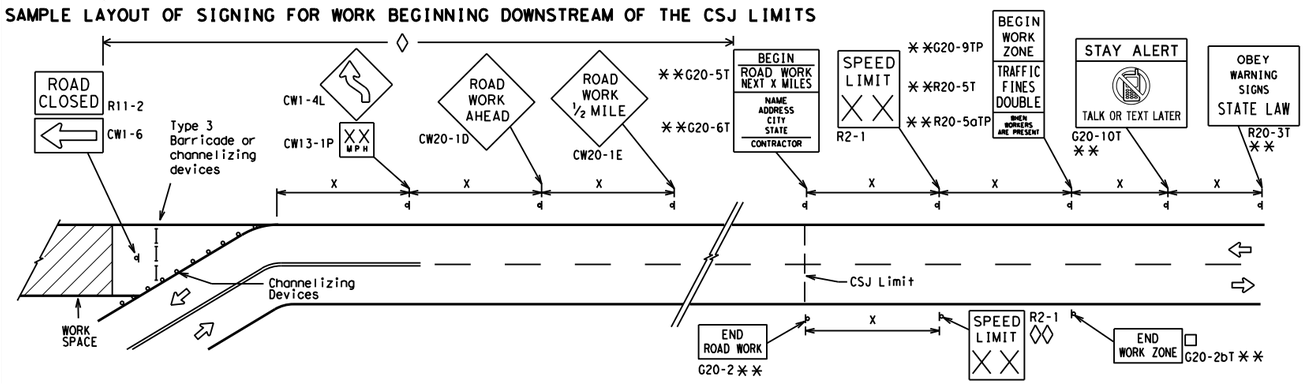
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING 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

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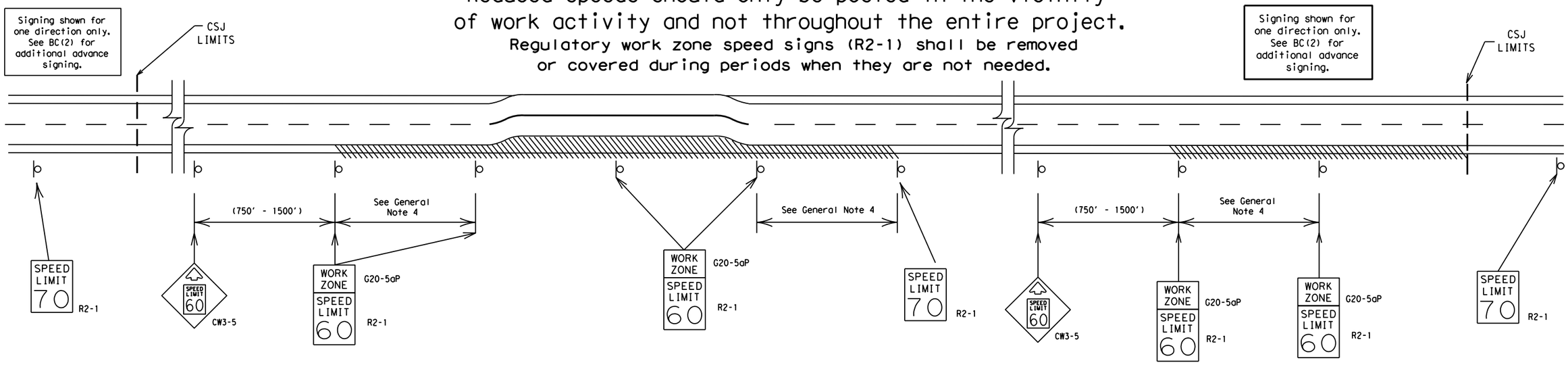
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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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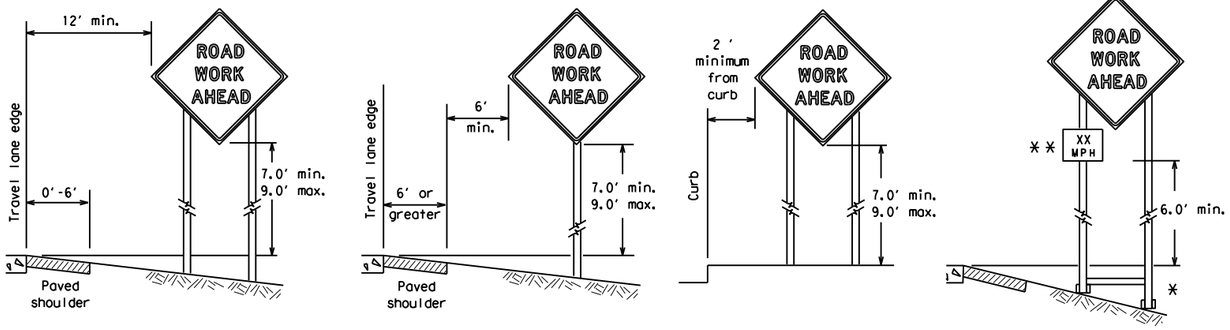
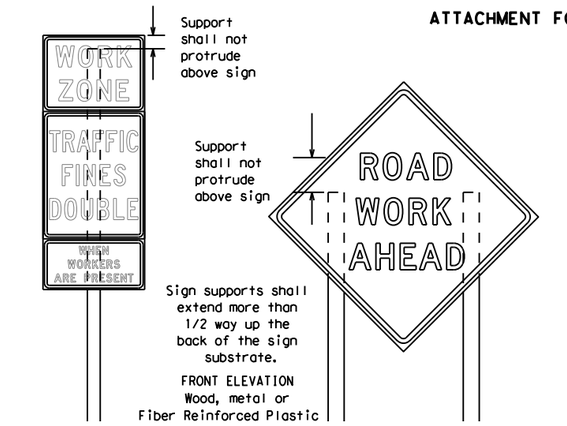
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

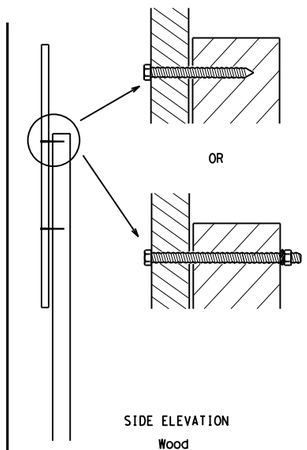


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





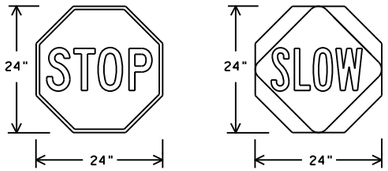
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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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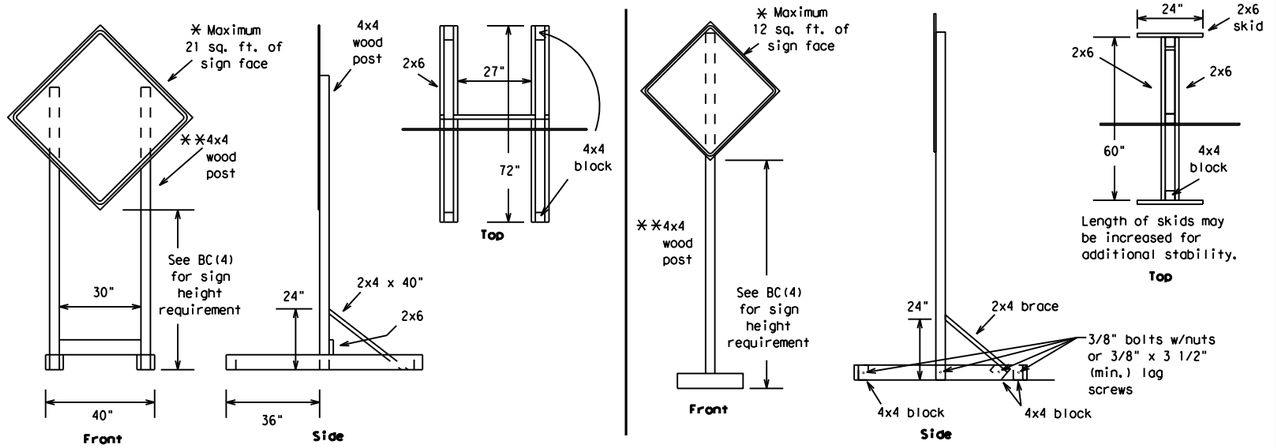
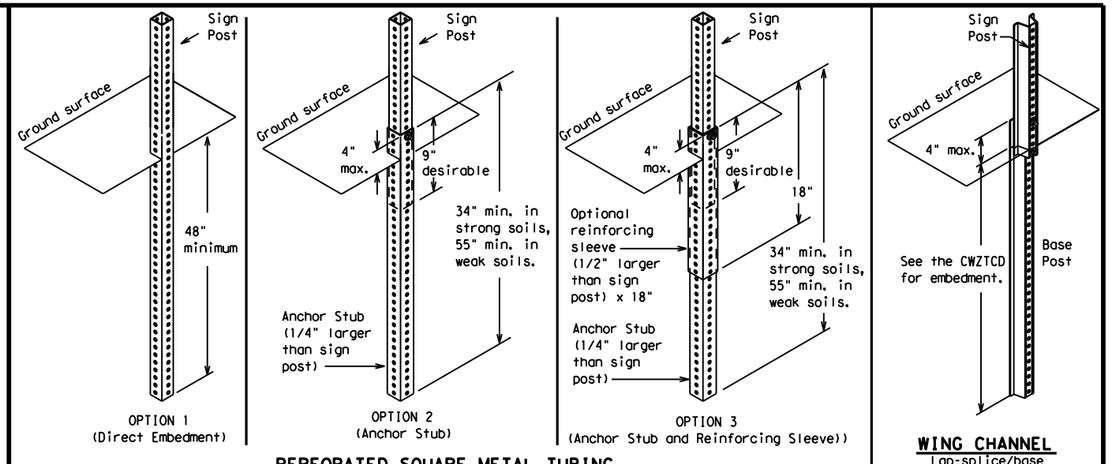


SKID MOUNTED WOOD SIGN SUPPORTS

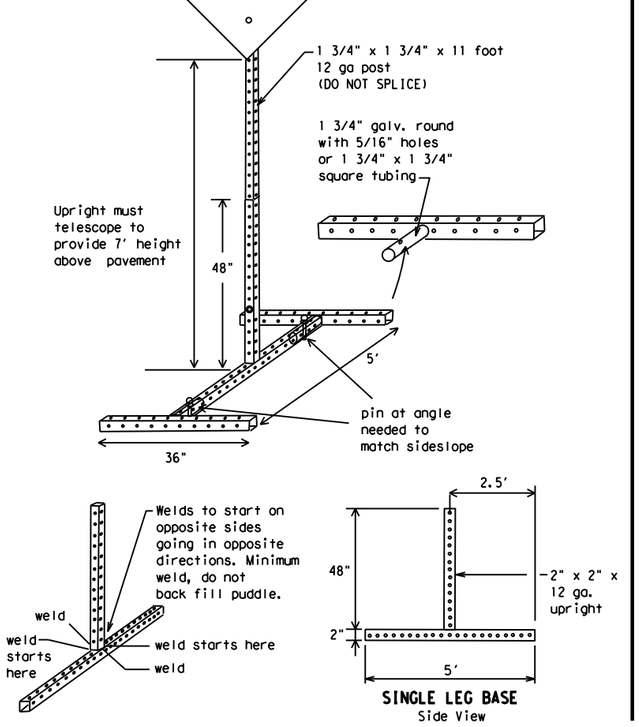
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

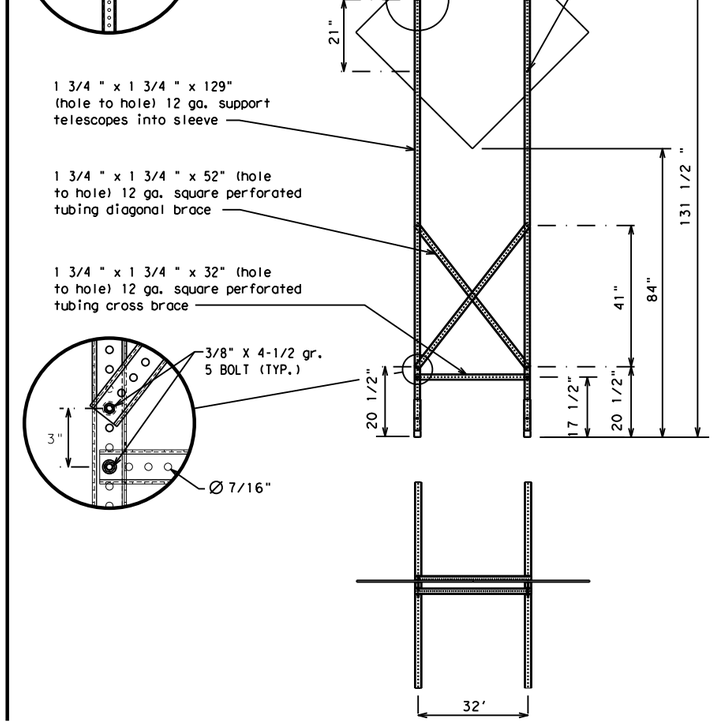


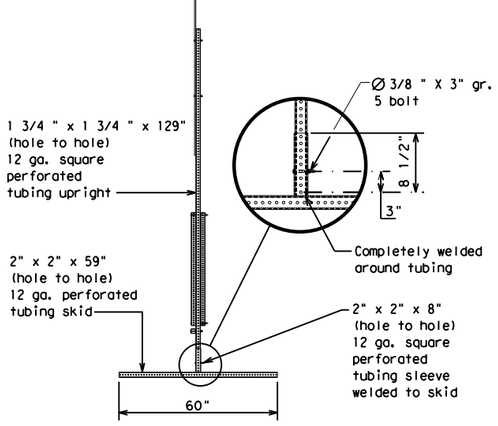
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6460	63	001	SH 22,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	WACO	HILL,ETC		19

DATE: 1/22/2024 1:18:31 PM
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DATE: 1/22/2024 1:18:31 PM
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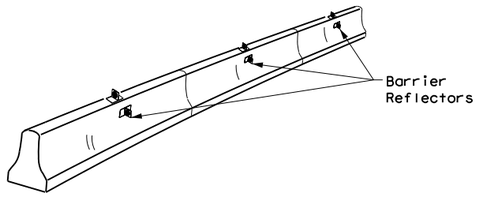
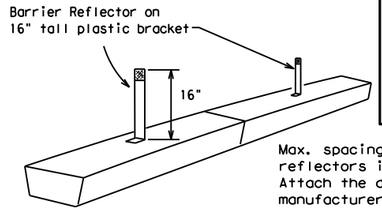
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



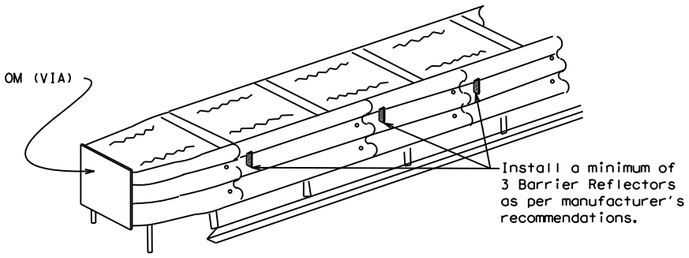
CONCRETE TRAFFIC BARRIER (CTB)

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

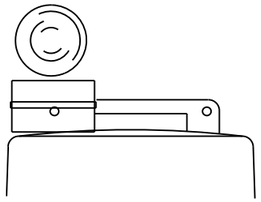
LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

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

WARNING LIGHTS

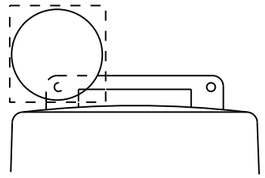


Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.

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.



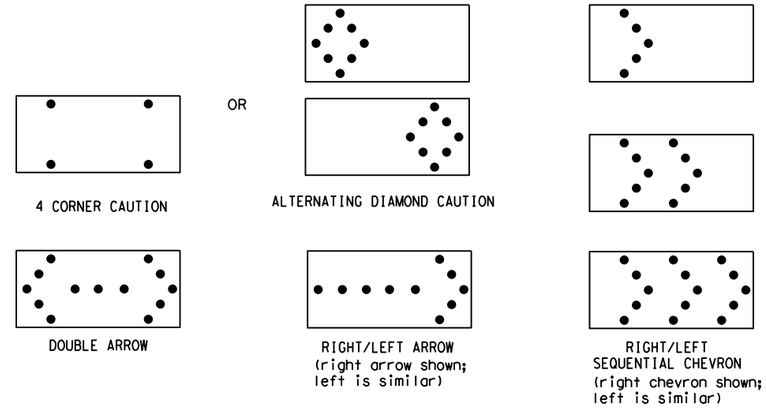
Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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

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

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

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



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

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

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

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6460	63	001	SH 22,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	WACO	HILL,ETC		20

101

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

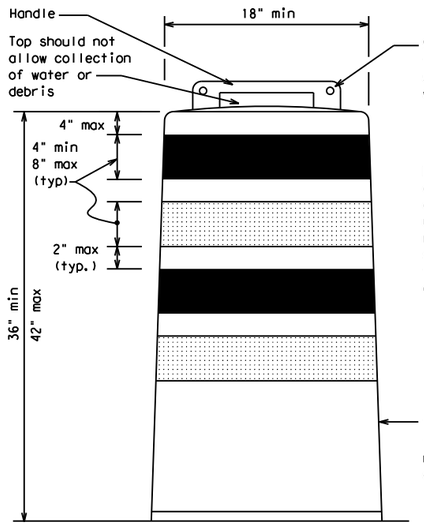
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

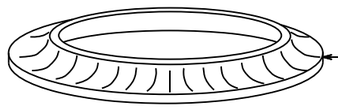
RETROREFLECTIVE SHEETING

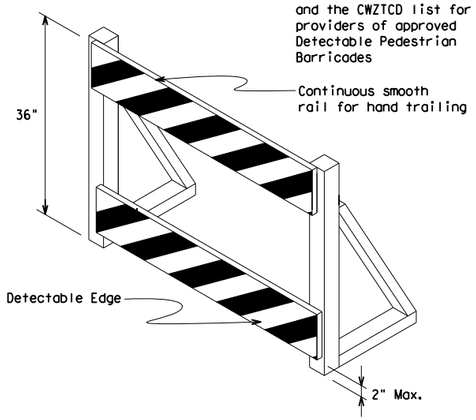
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

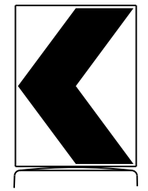




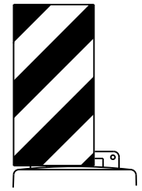


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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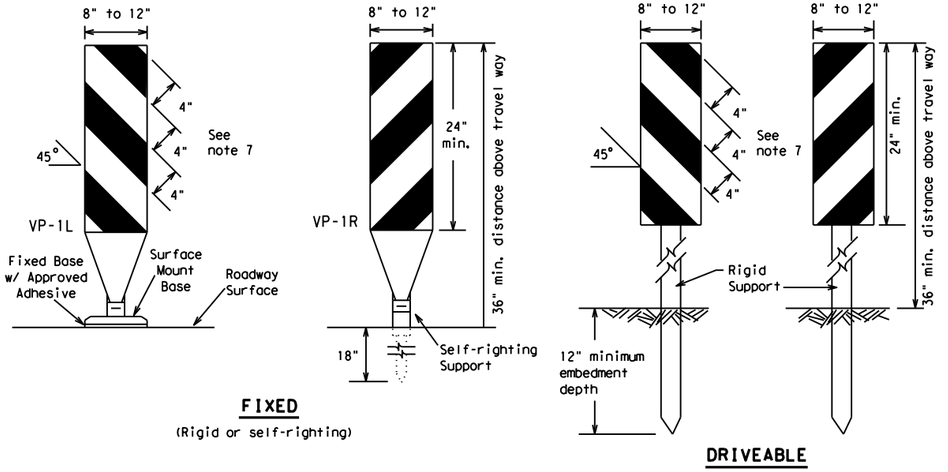
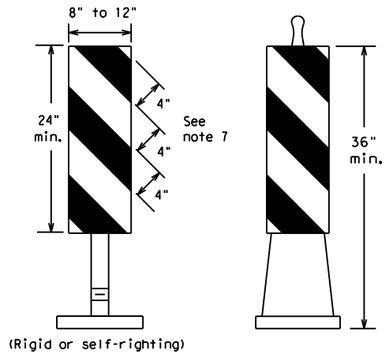


FIXED
(Rigid or self-righting)

DRIVEABLE

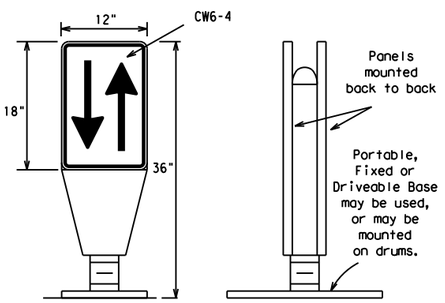


(Rigid or self-righting)

PORTABLE

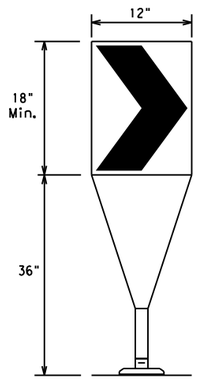
VERTICAL PANELS (VPs)

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



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



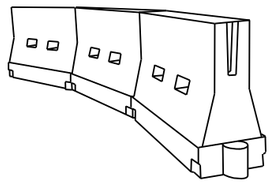
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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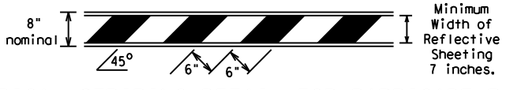
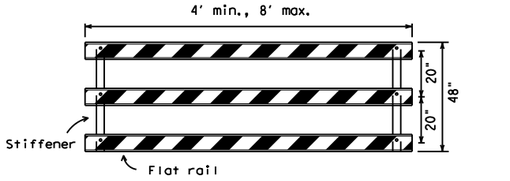
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



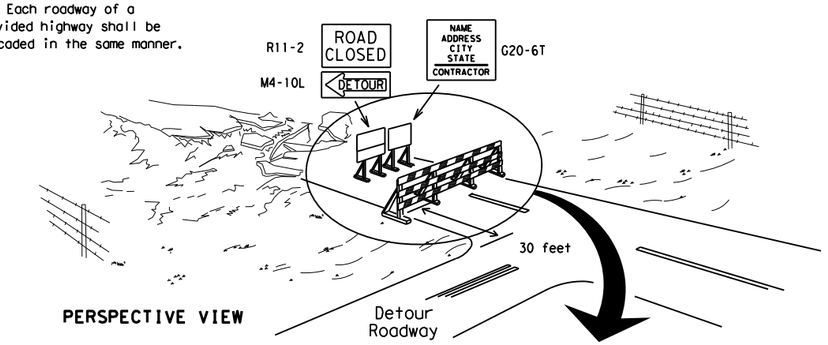
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

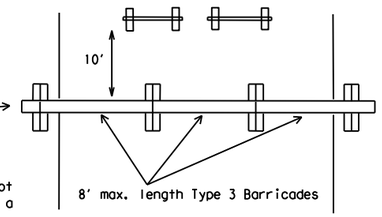
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

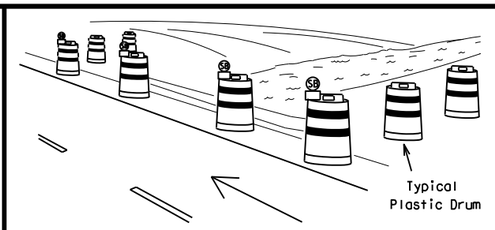
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

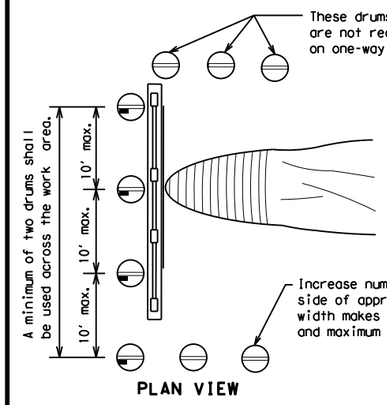
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

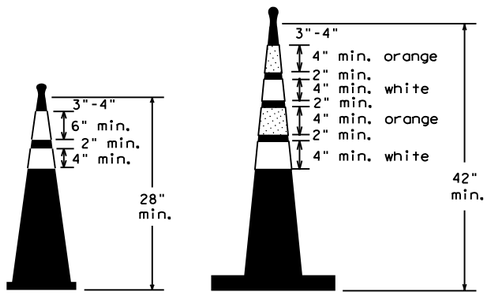
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



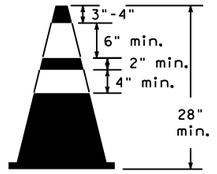
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

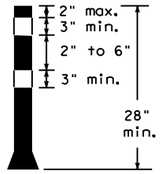
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

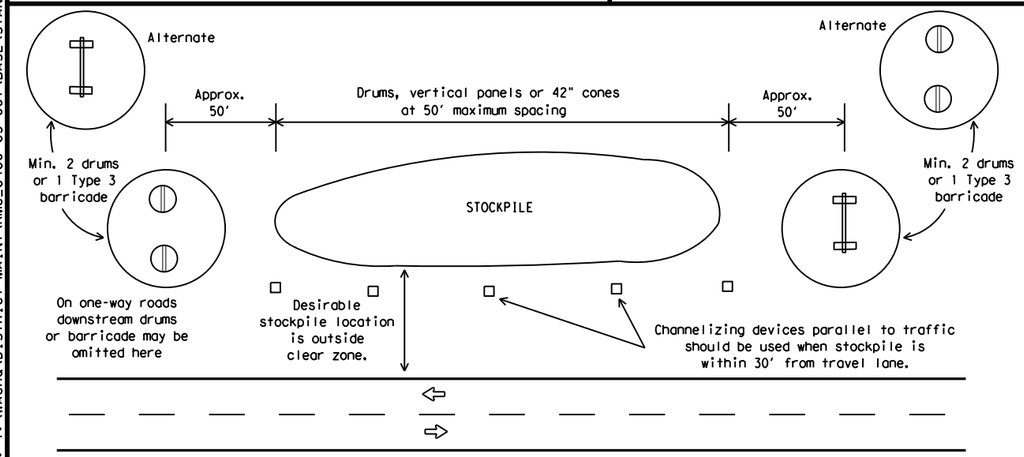


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

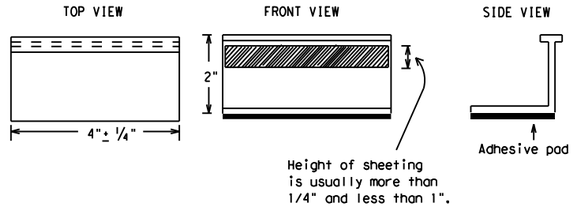
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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11-02 8-14				

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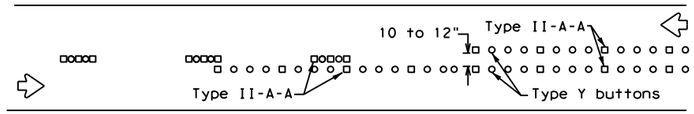
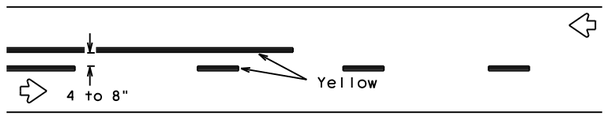
PAVEMENT MARKING PATTERNS

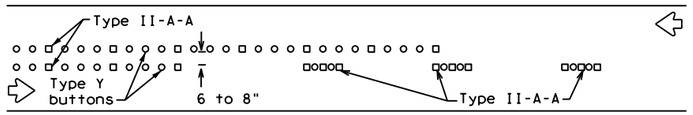
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



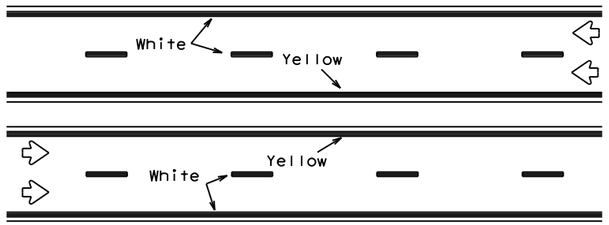
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



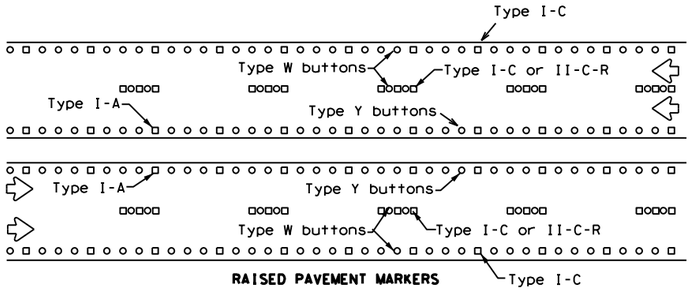
RAISED PAVEMENT MARKERS - PATTERN B

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



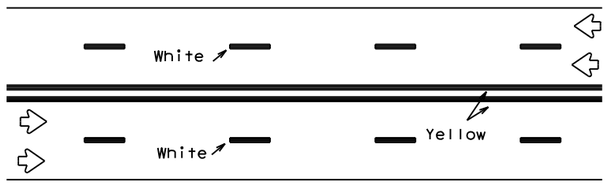
REFLECTORIZED PAVEMENT MARKINGS



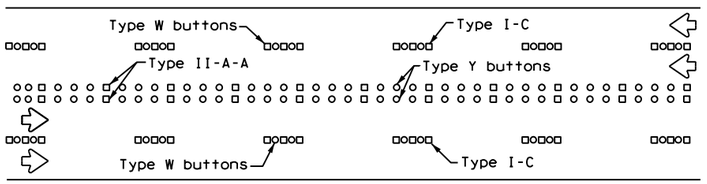
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



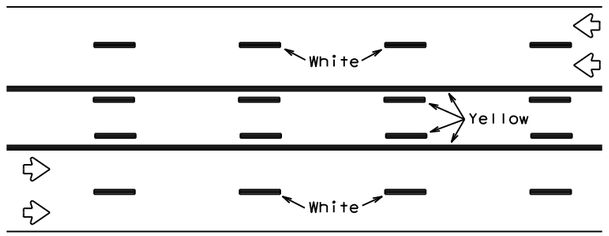
REFLECTORIZED PAVEMENT MARKINGS



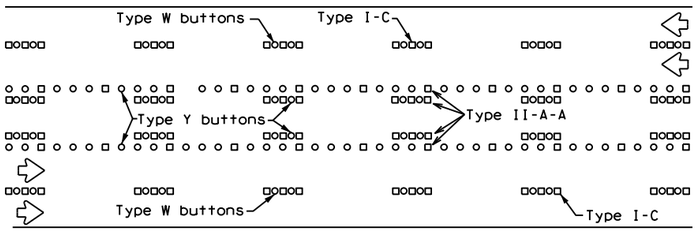
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

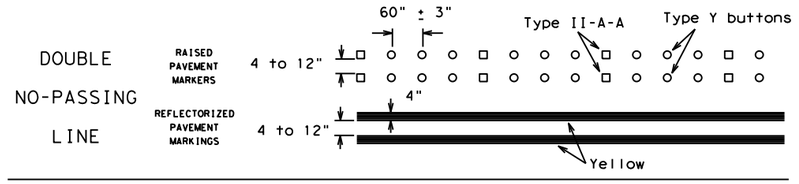
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

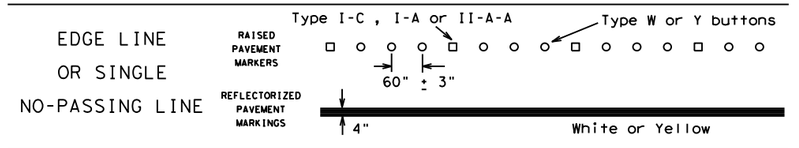
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

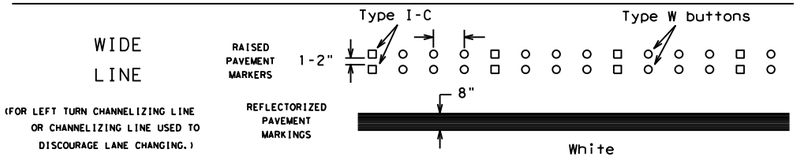


EDGE LINE OR SINGLE NO-PASSING LINE



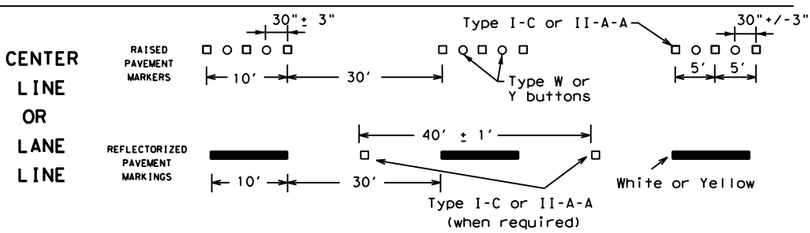
WIDE LINE

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

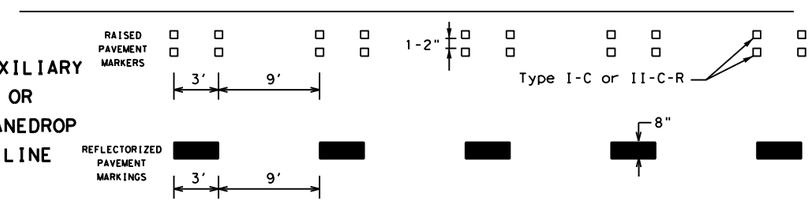


BROKEN LINES

CENTER LINE OR LANE LINE

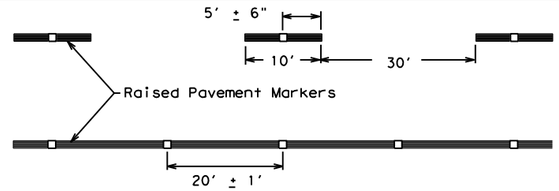


AUXILIARY OR LANEDROP LINE



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

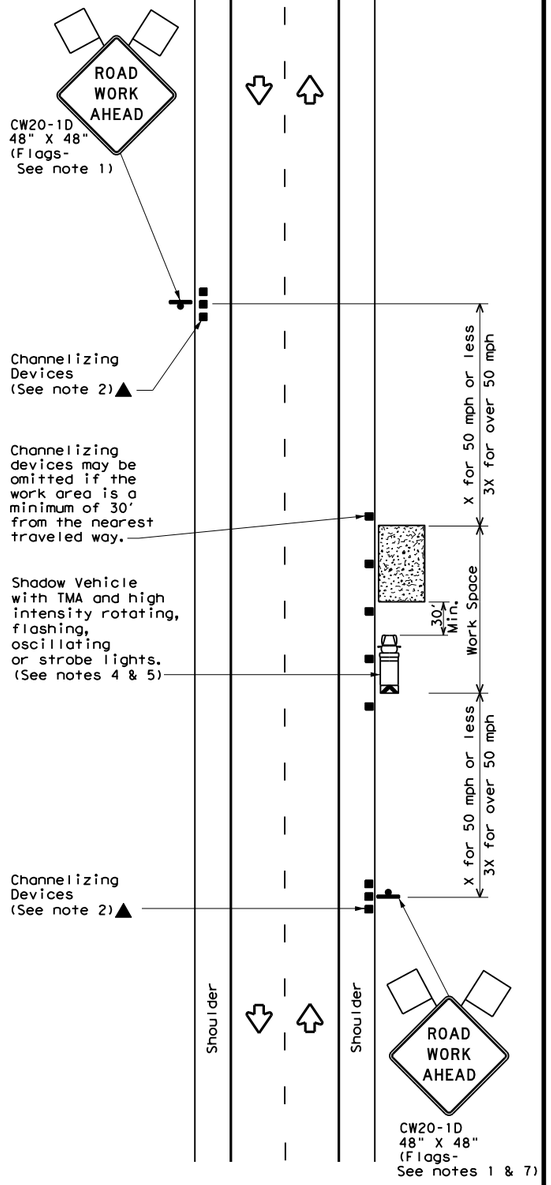
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

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	6460	63	001	SH 22,ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL,ETC		25

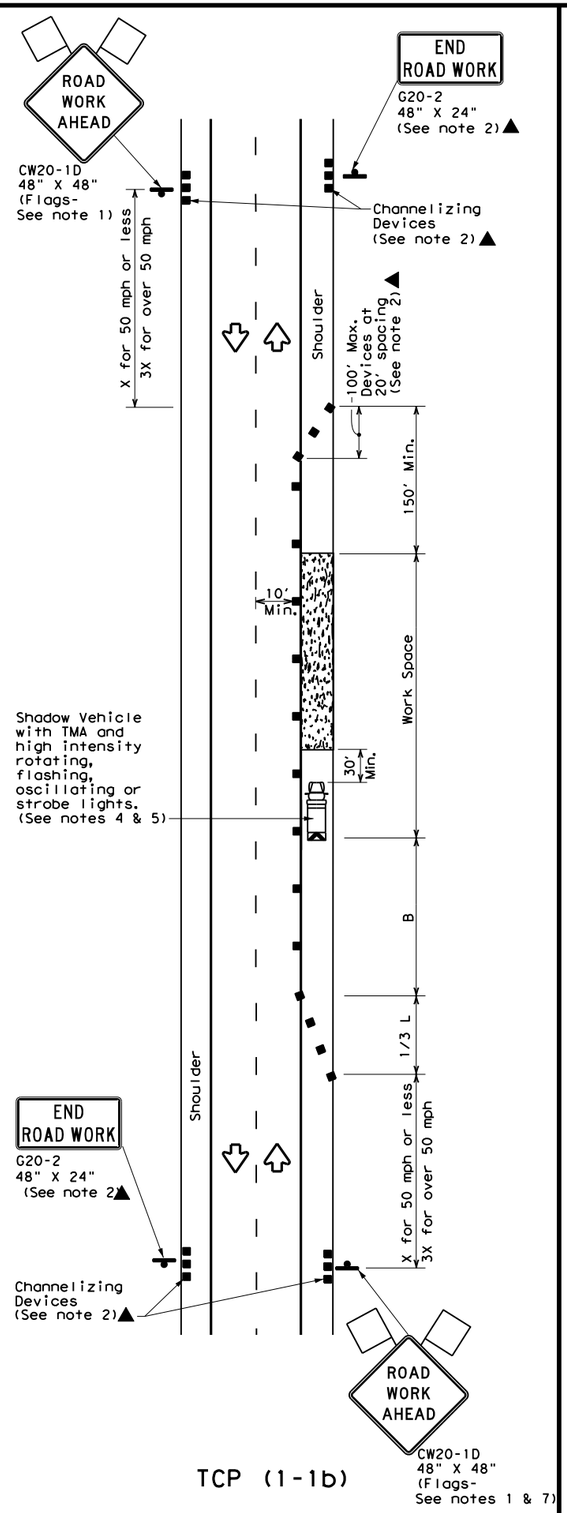
106

DATE: 1/22/2024
FILE: T:\WACO\DISTRICT MAINT\RMC_6460-63-001\BASE\STANDARDS\tcp1-1-18.dgn



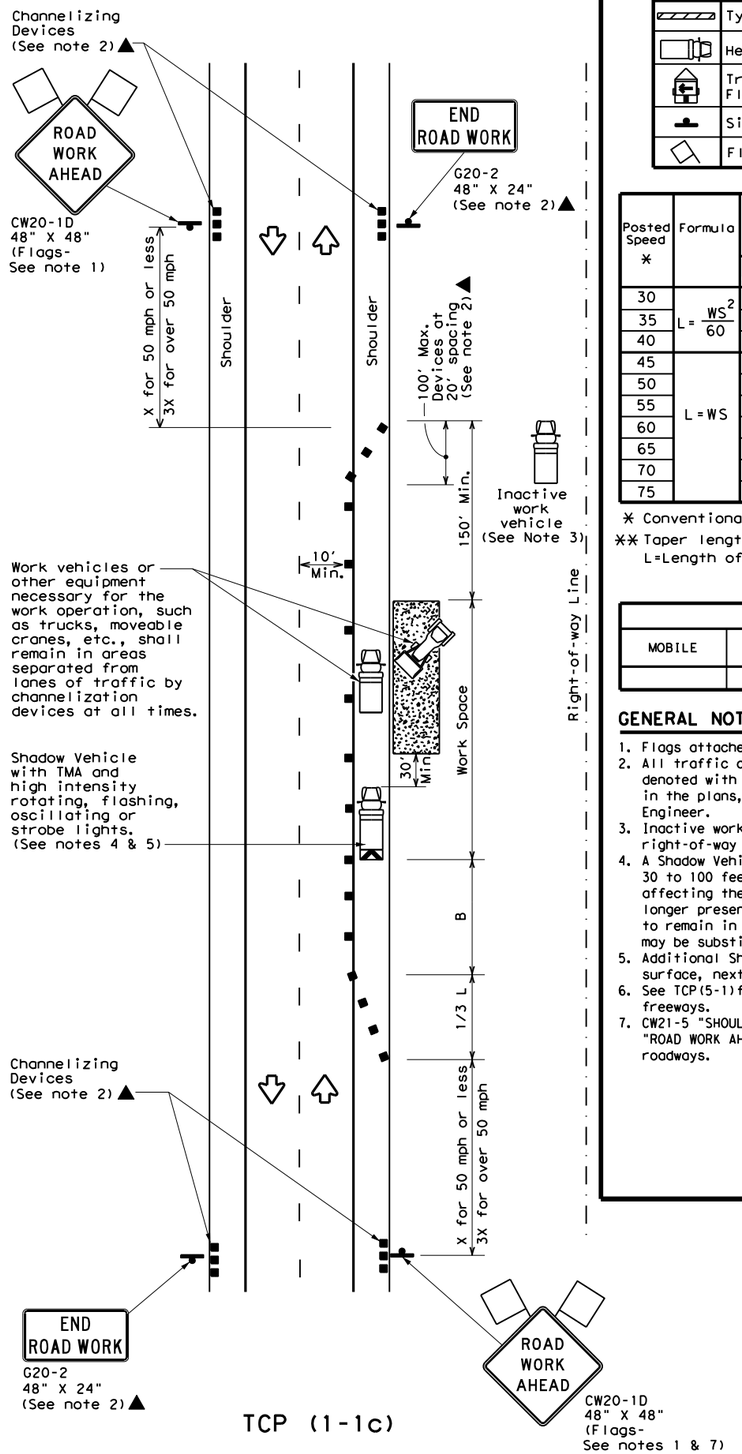
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98	6460	63	001	SH 22,ETC
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	WACO	HILL,ETC		26

DATE: 1/22/2024
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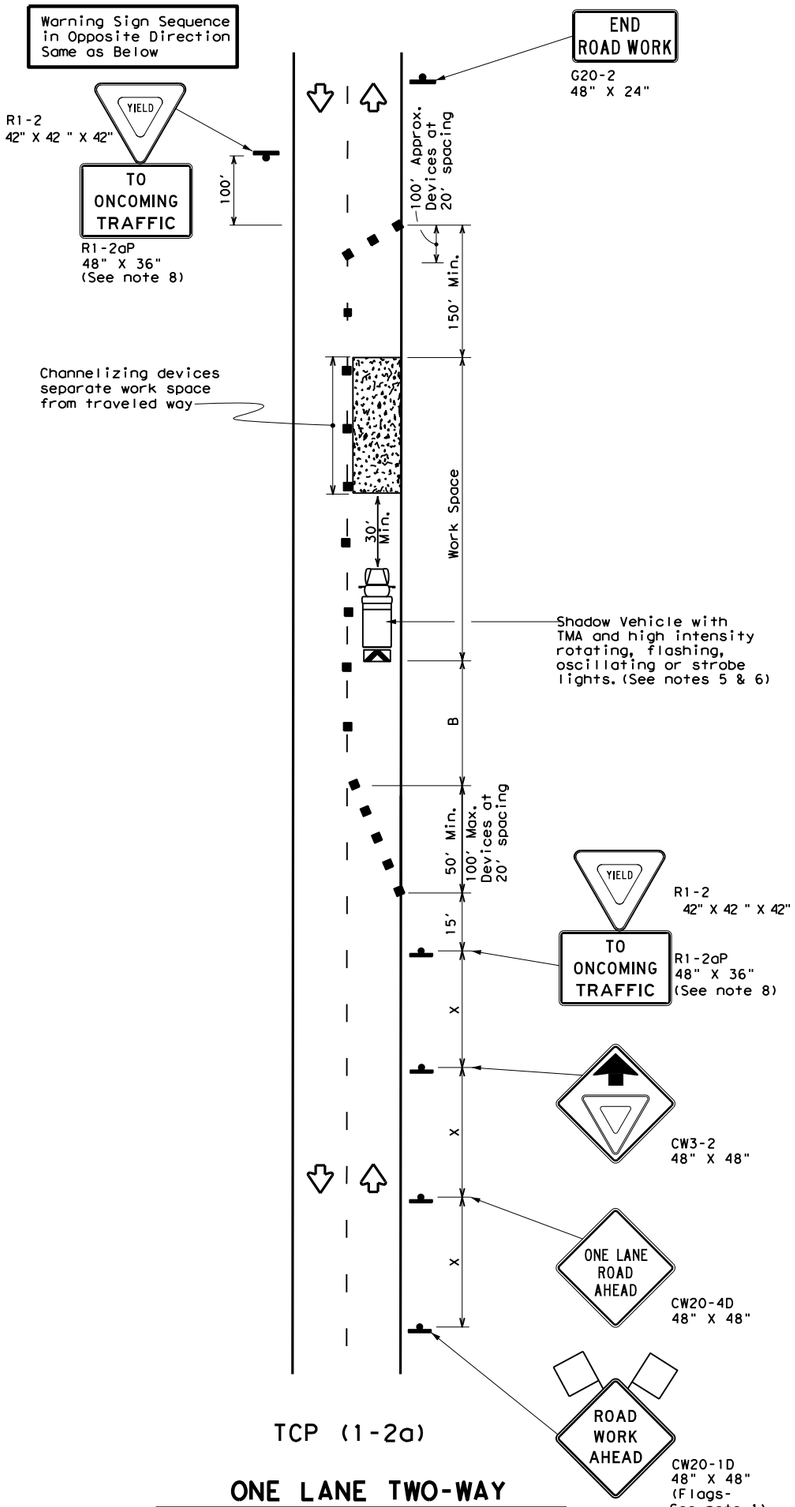
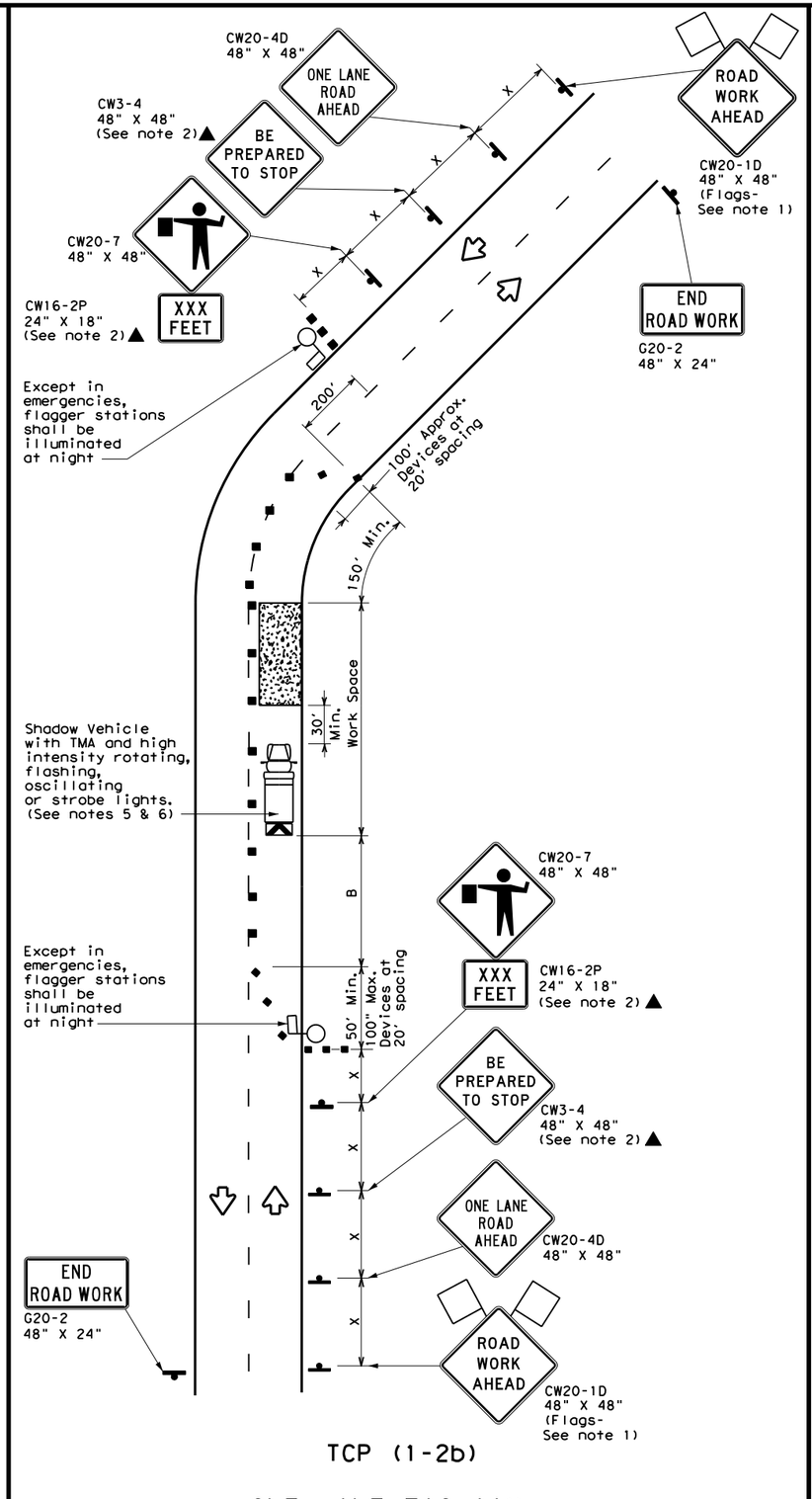


TCP (1-2a)

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



TCP (1-2b)

ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98	6460	63	001	SH 22, ETC
2-94 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	WACO	HILL, ETC		27

DATE: 1/22/2024
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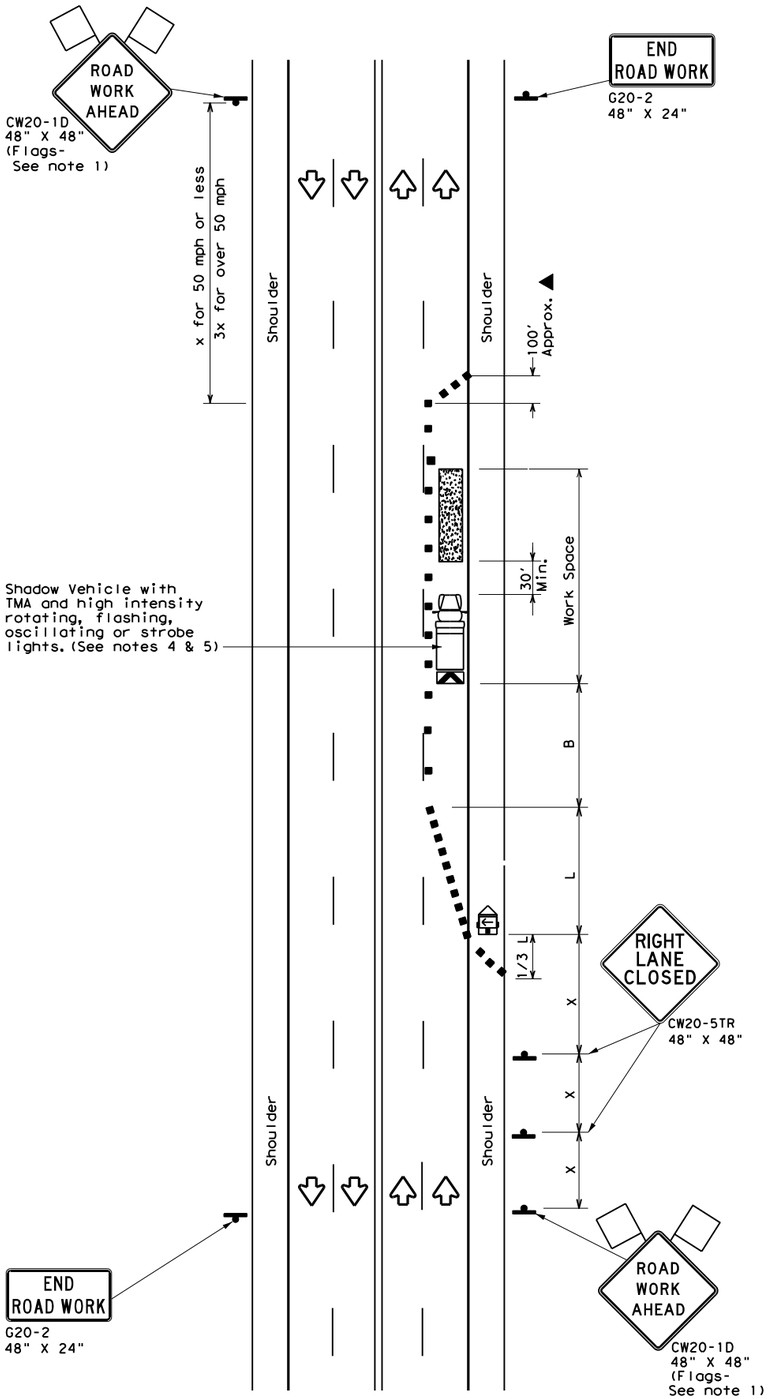
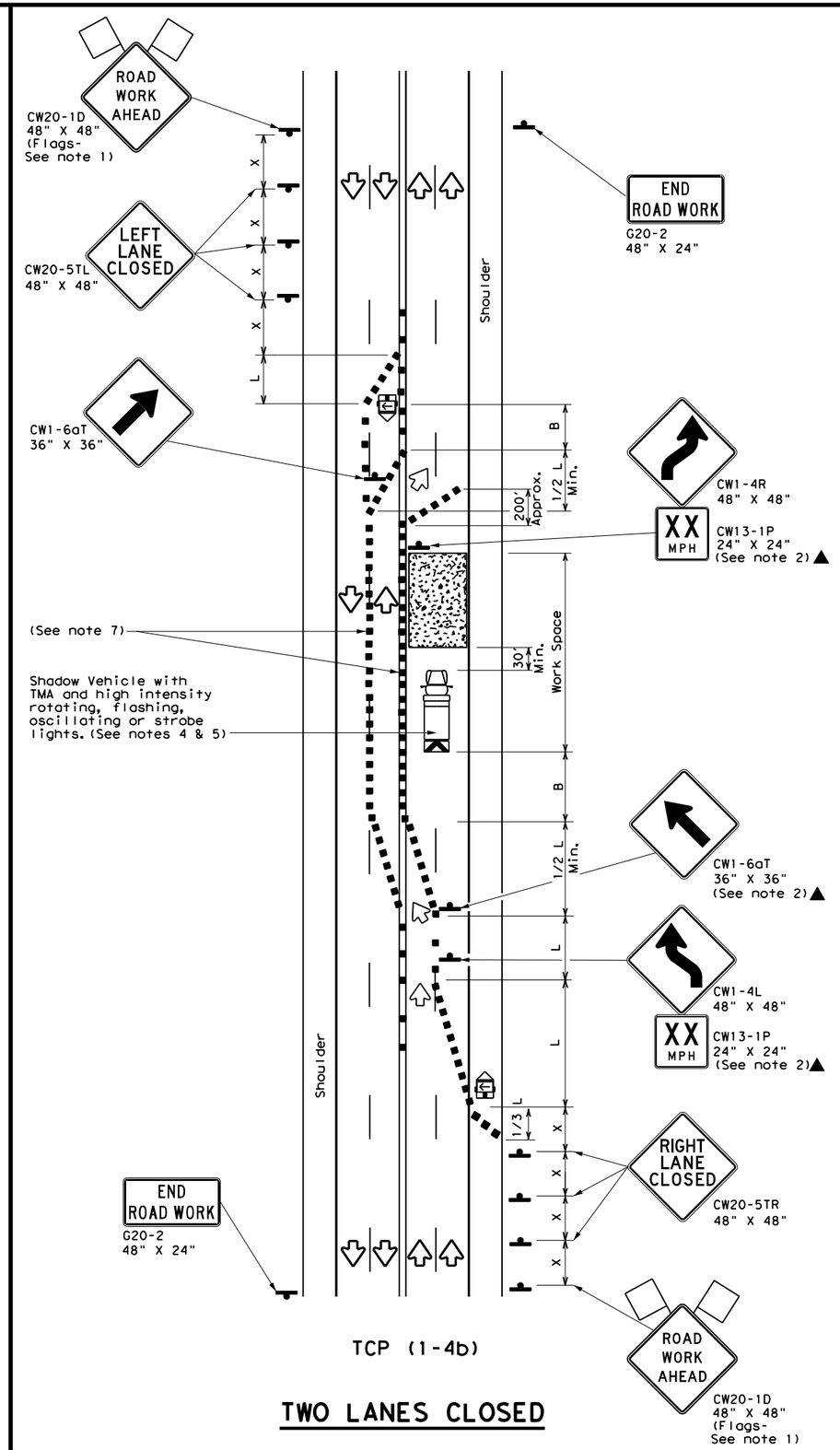


TCP (1-4a)

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

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	6460	63	001	SH 22, ETC
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	WACO	HILL, ETC		28
1-97 2-18				

DATE: 1/22/2024
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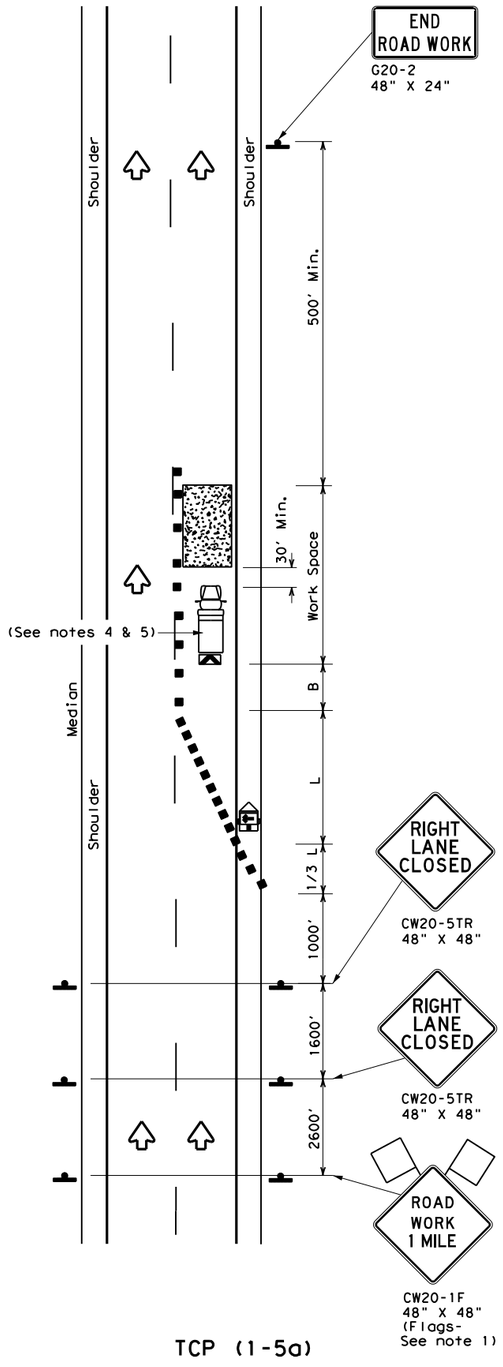
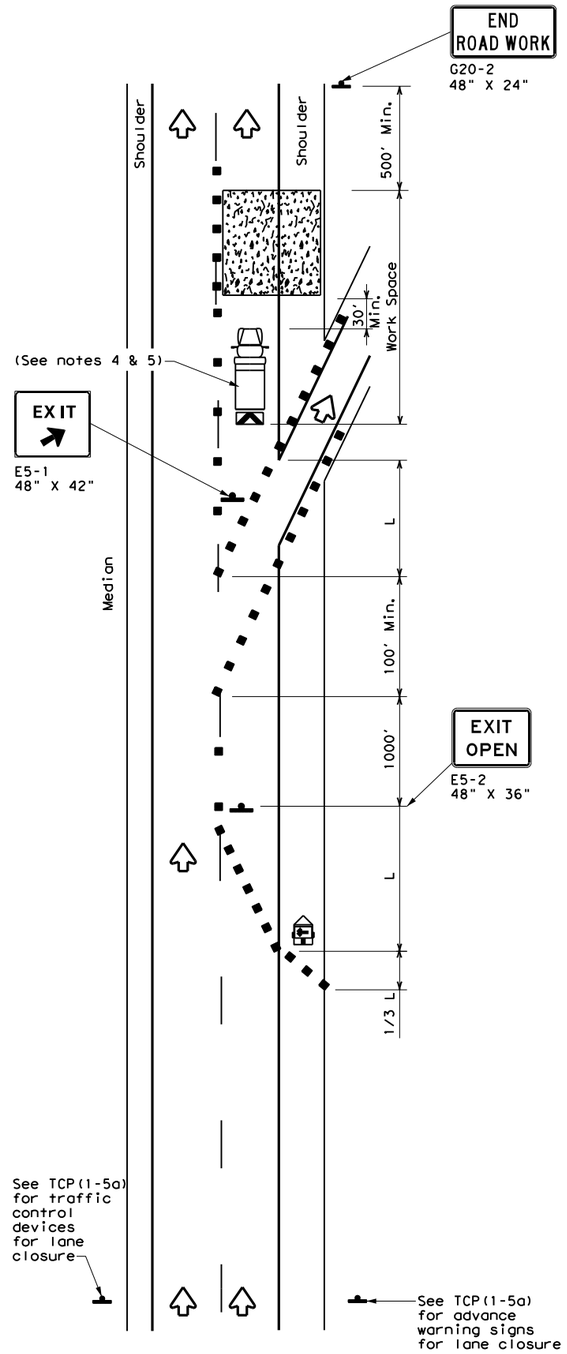


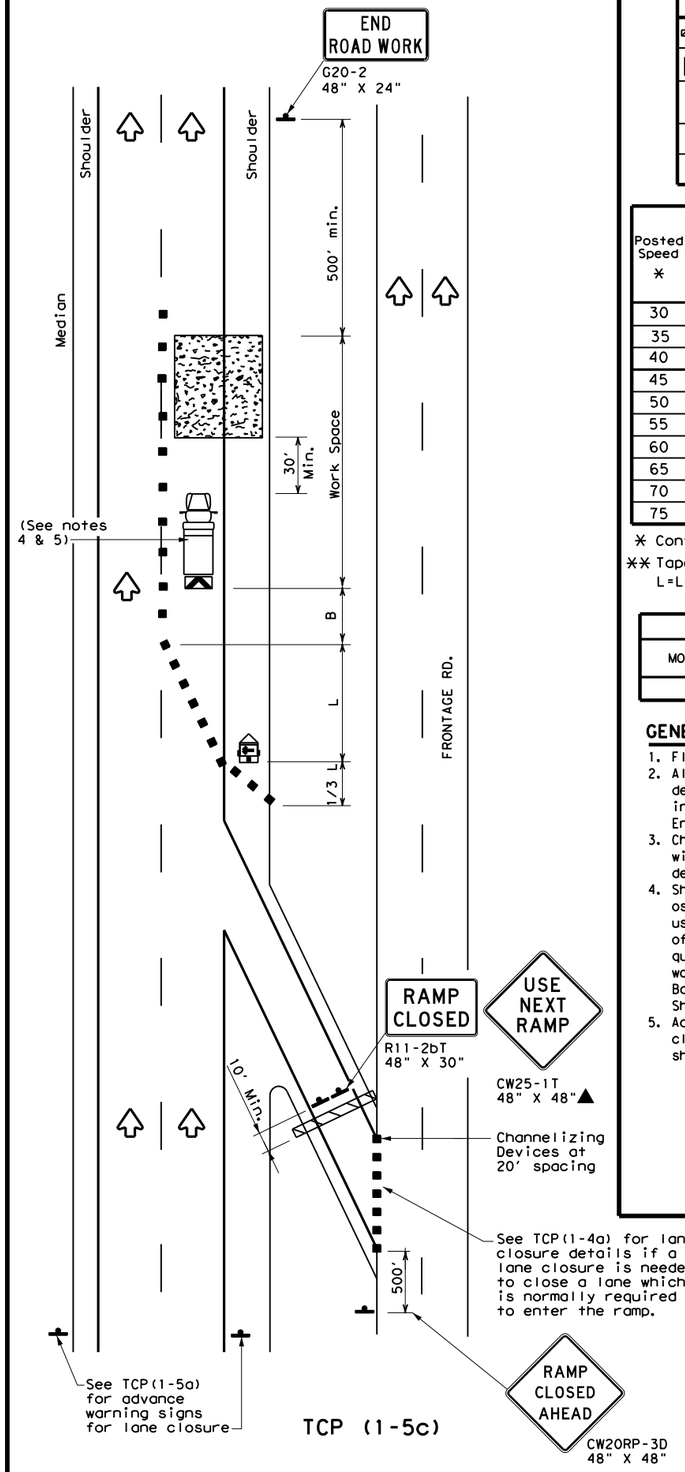
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
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 in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

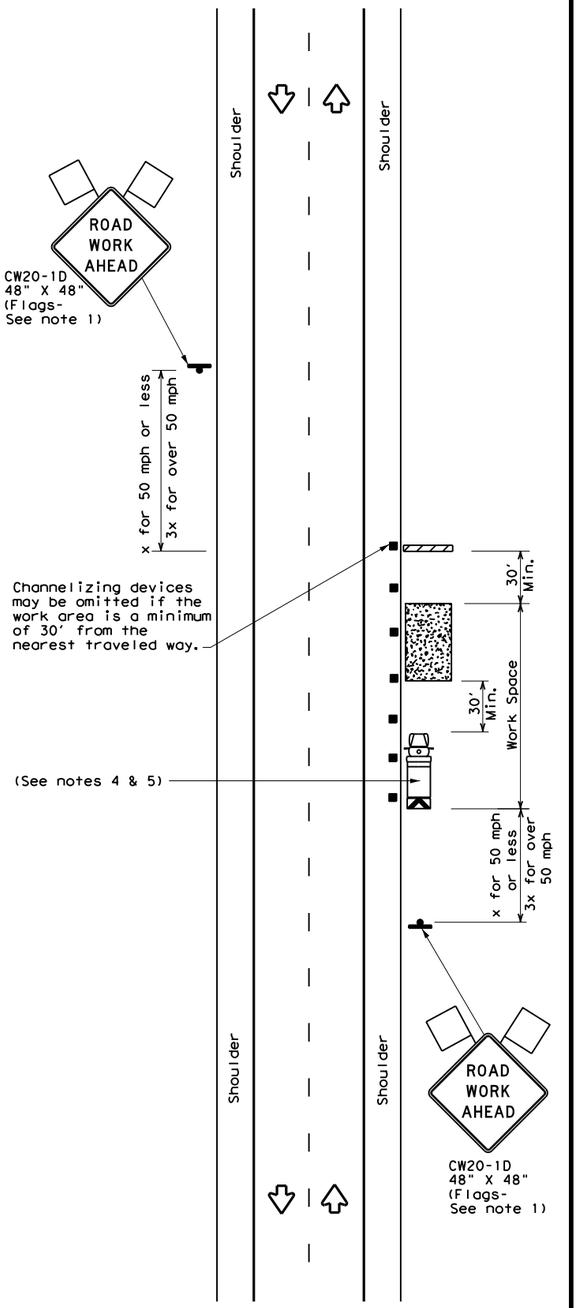
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

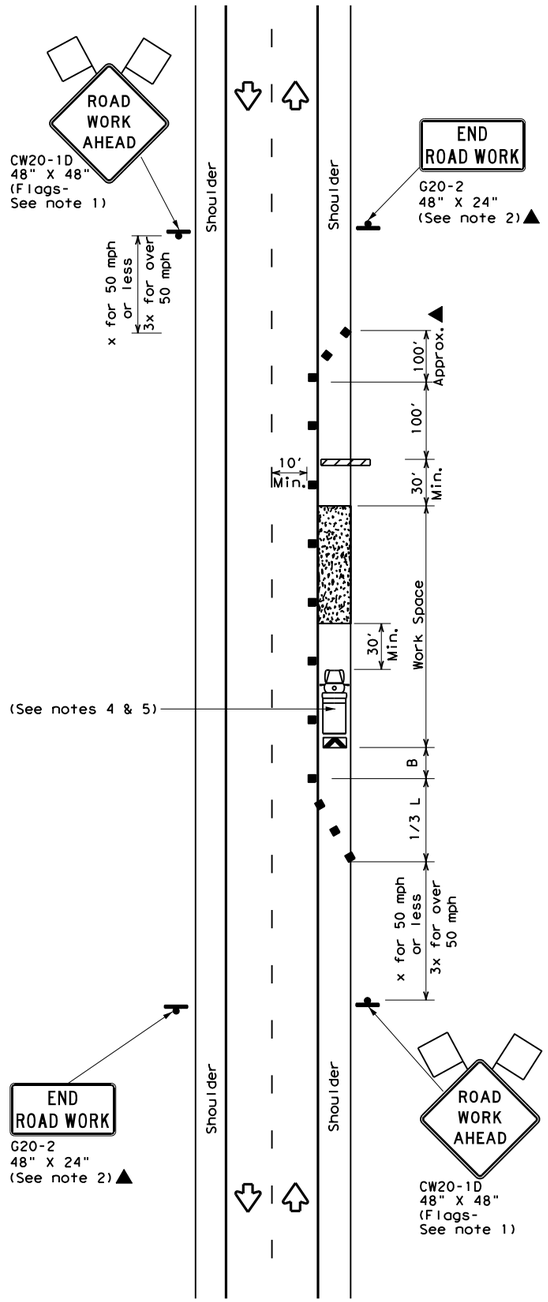
TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	6460	63	001	SH 22,ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL,ETC		29



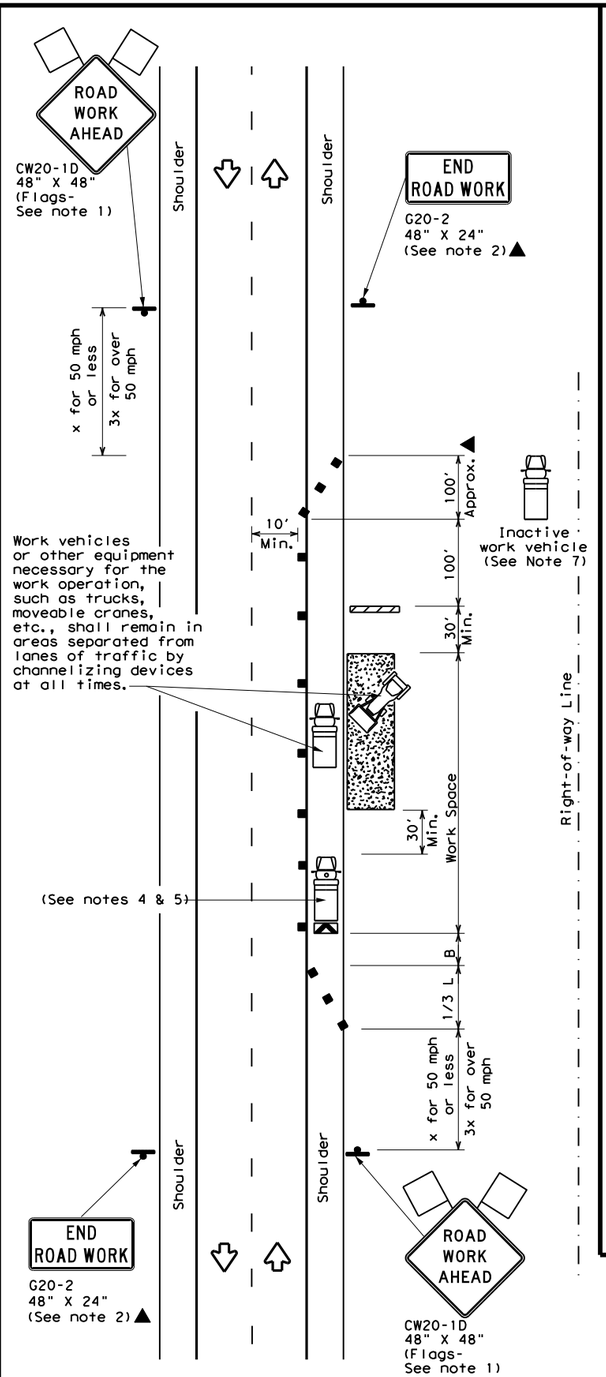
TCP (2-1a)

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 CW21-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	6460	63	001	SH 22,ETC
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	WACO	HILL,ETC		30
1-97 2-18				

DATE: 1/22/2024
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DATE: 1/22/2024
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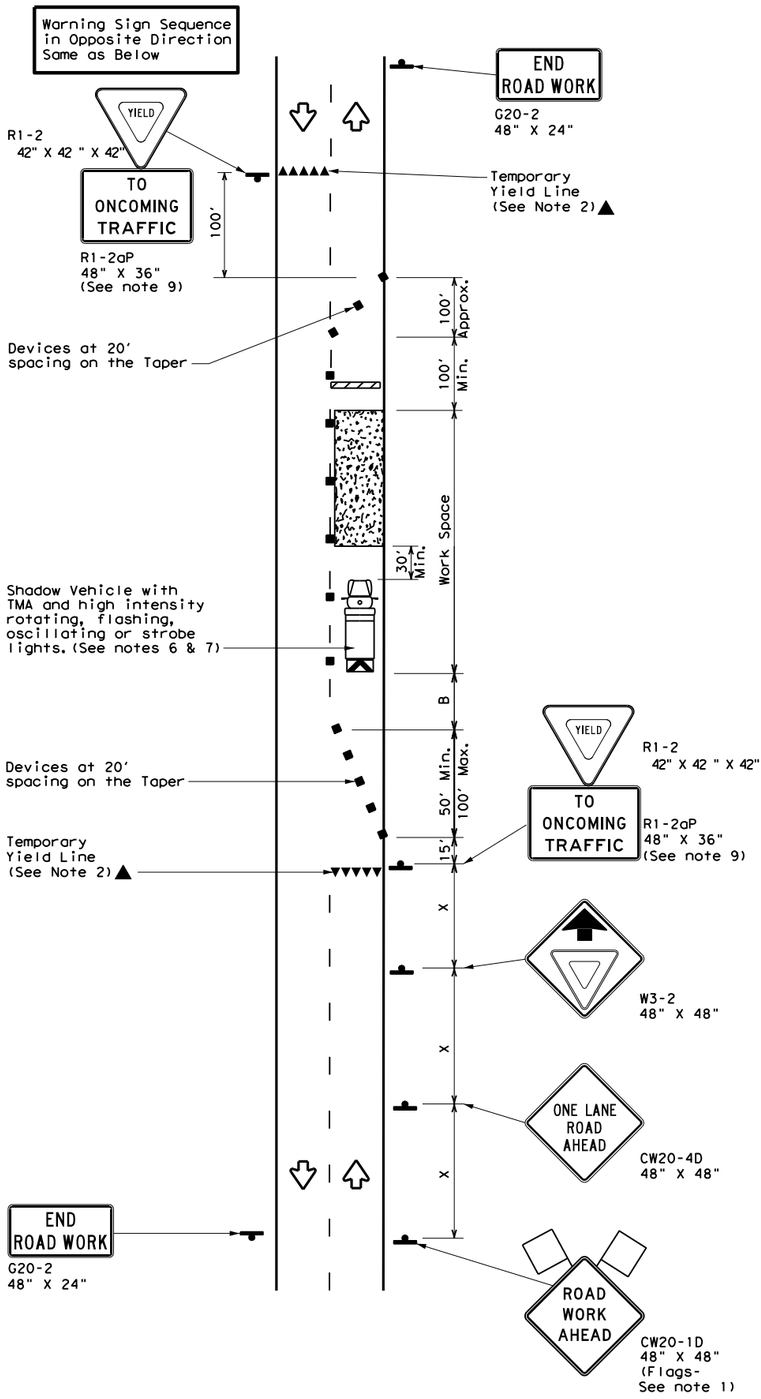
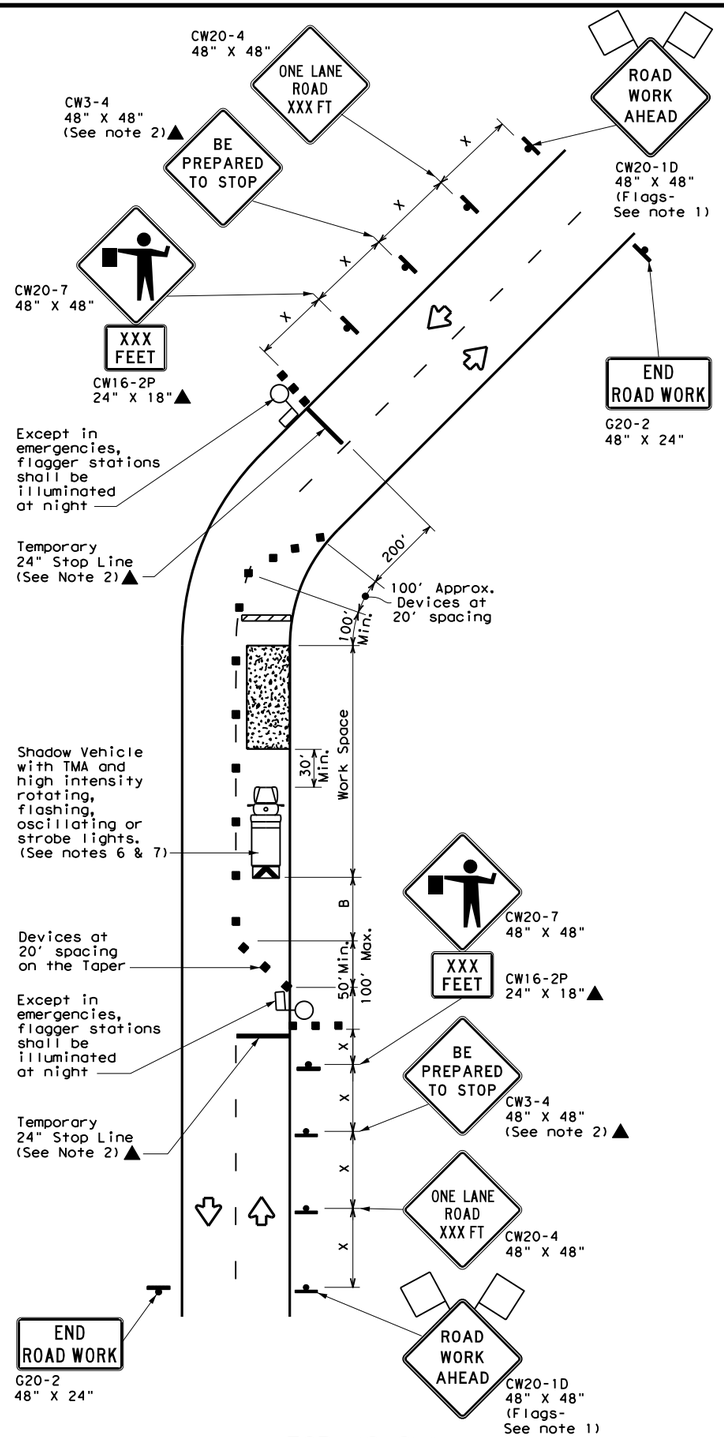


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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

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

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

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

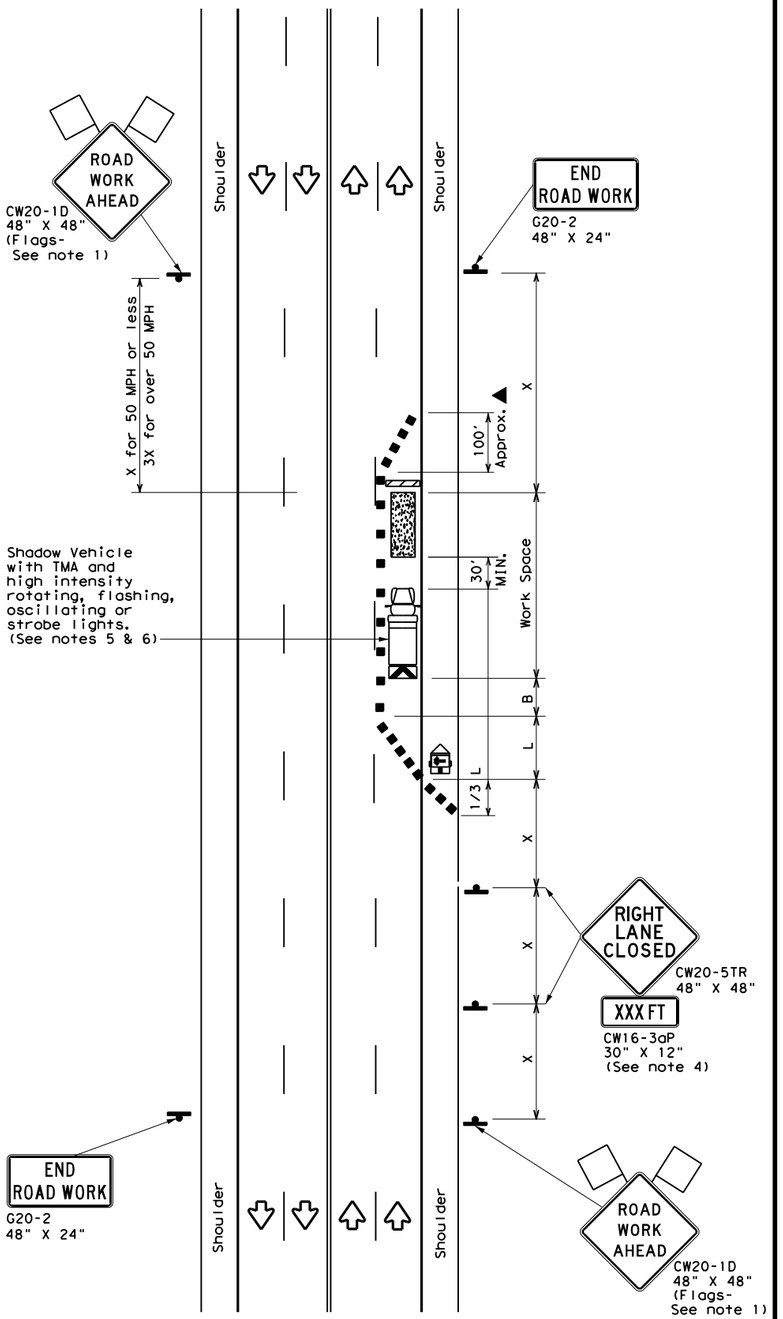
10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

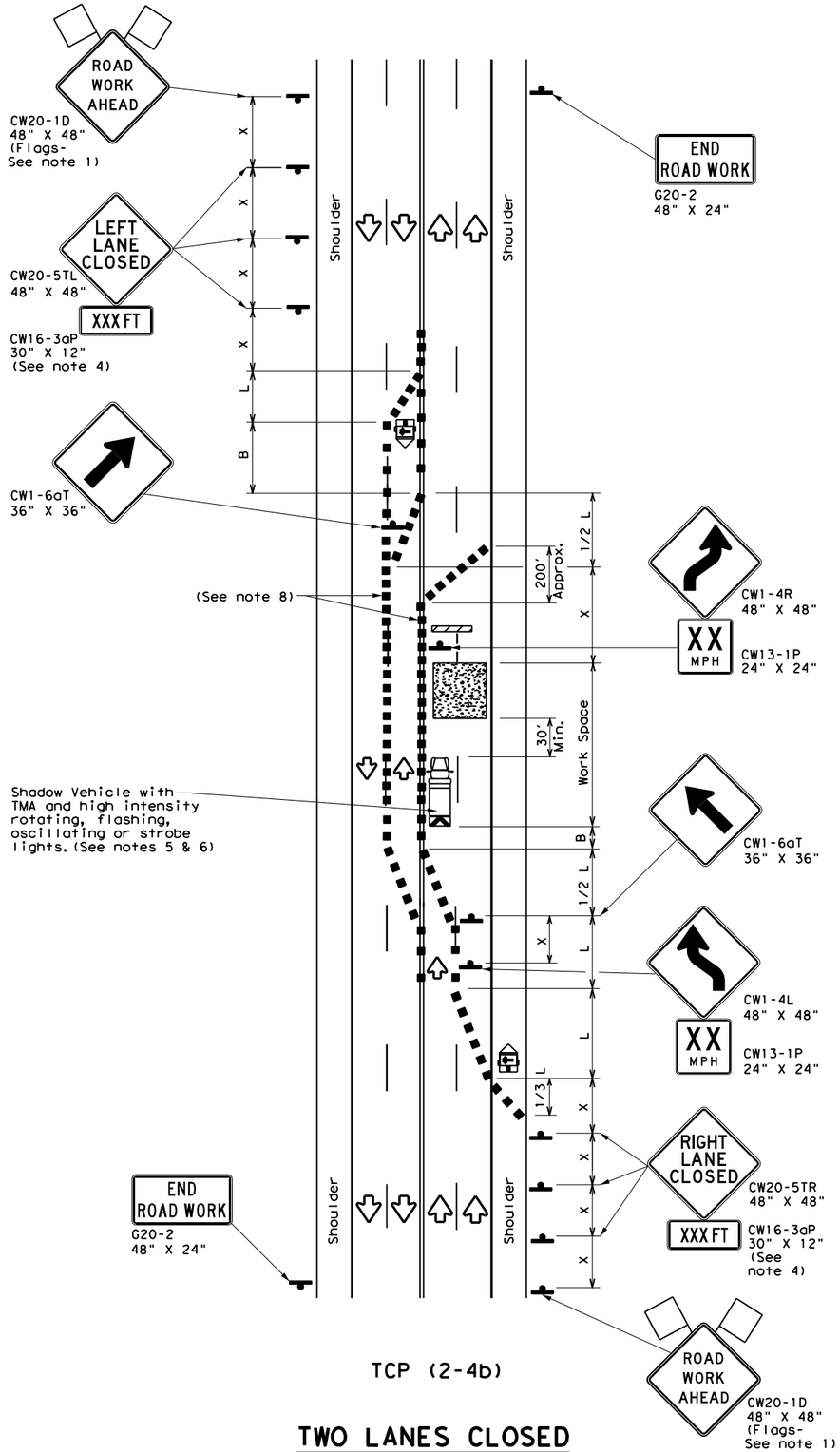
TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	6460	63	001	SH 22,ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL,ETC		31



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		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
REVISIONS 8-95 3-03	6460	63	001	SH 22,ETC
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	WACO	HILL,ETC		32

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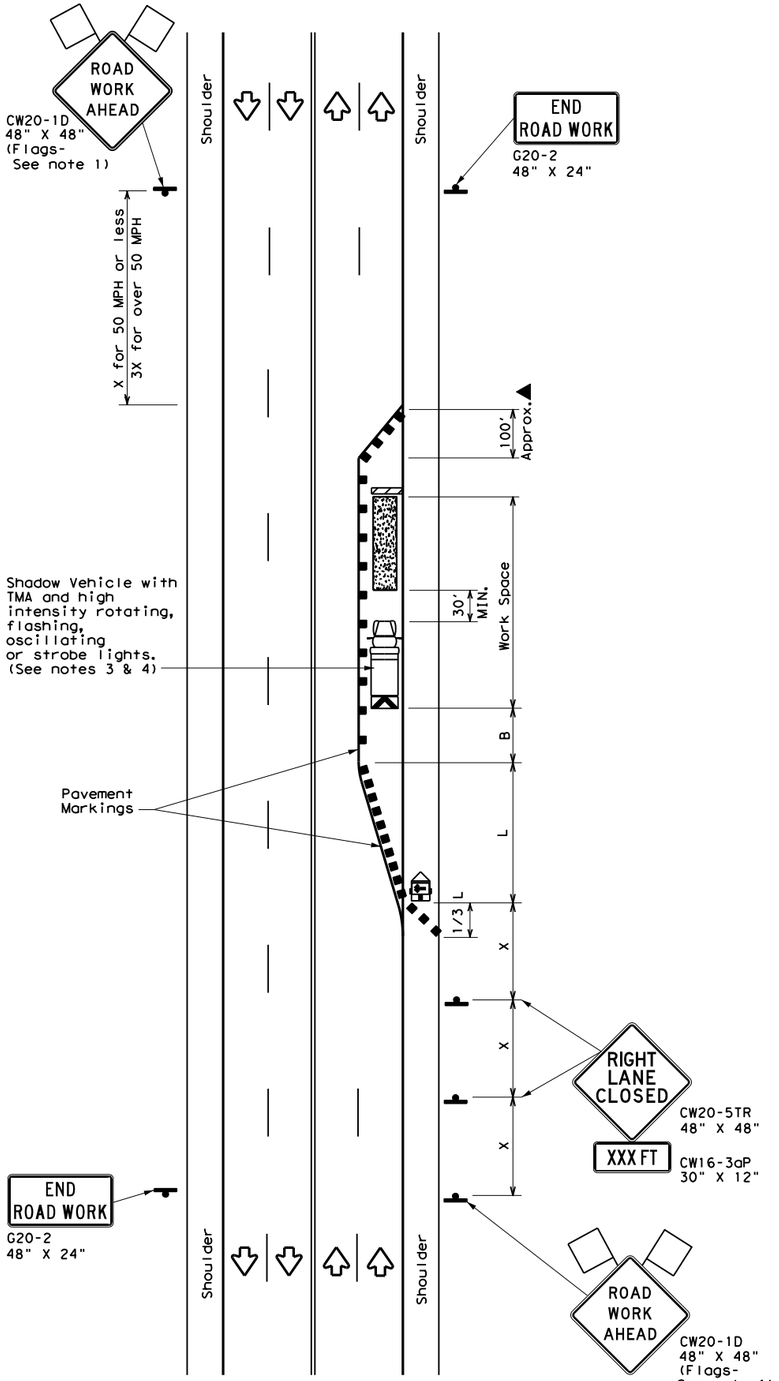
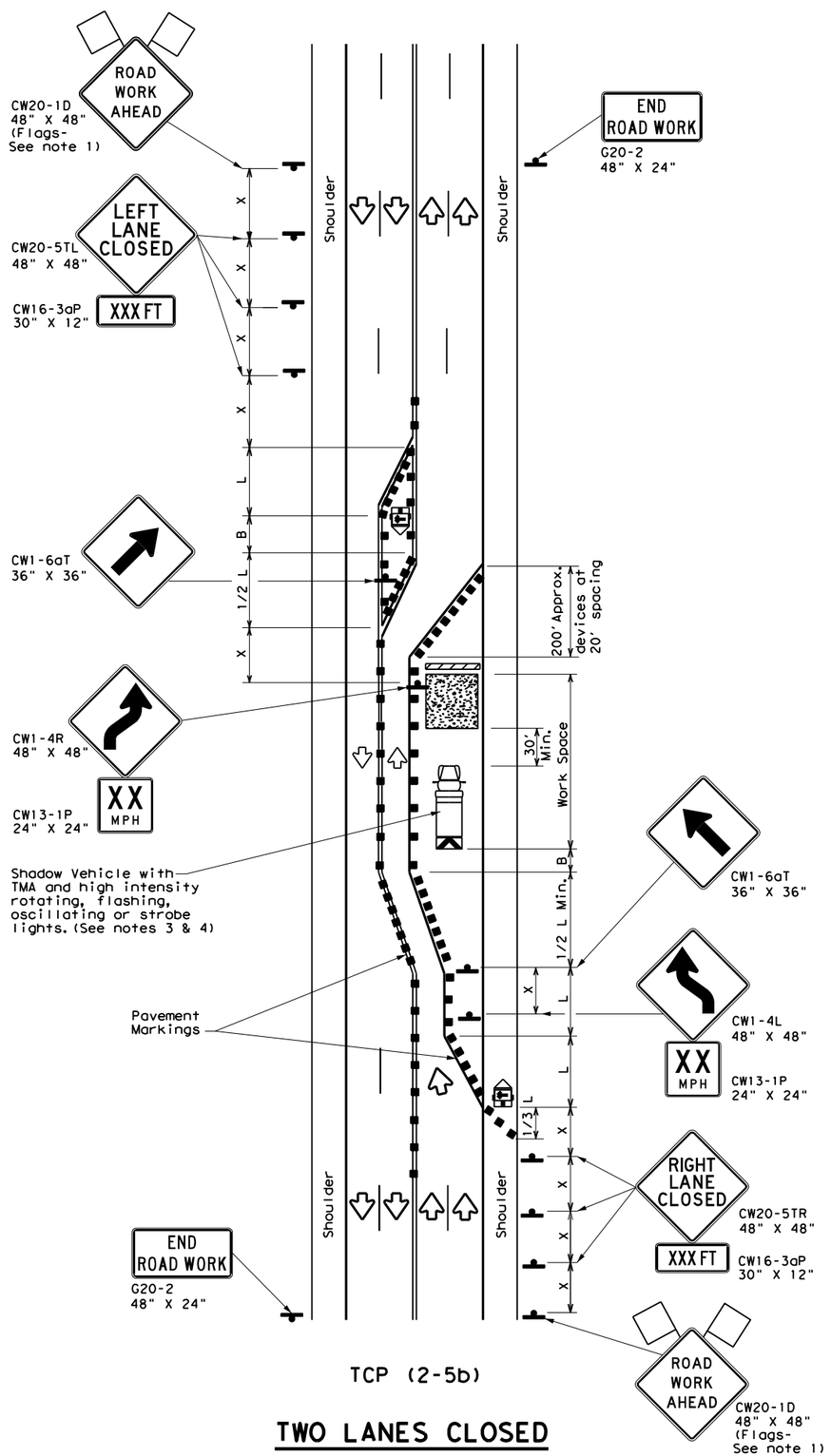


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-5a)

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

TCP (2-5b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12	6460	63	001	SH 22,ETC
1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	WACO	HILL,ETC		33

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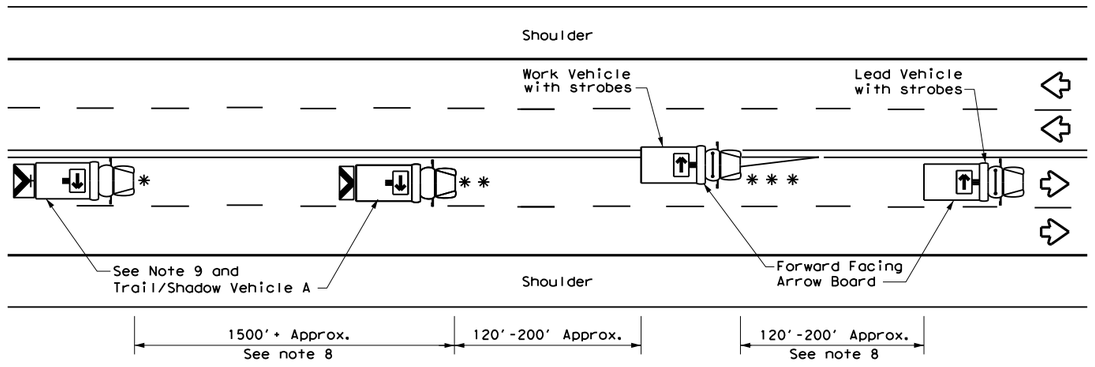
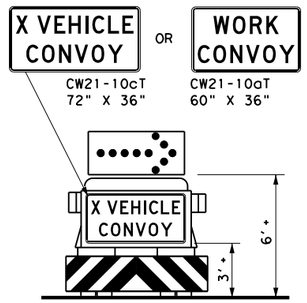


TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

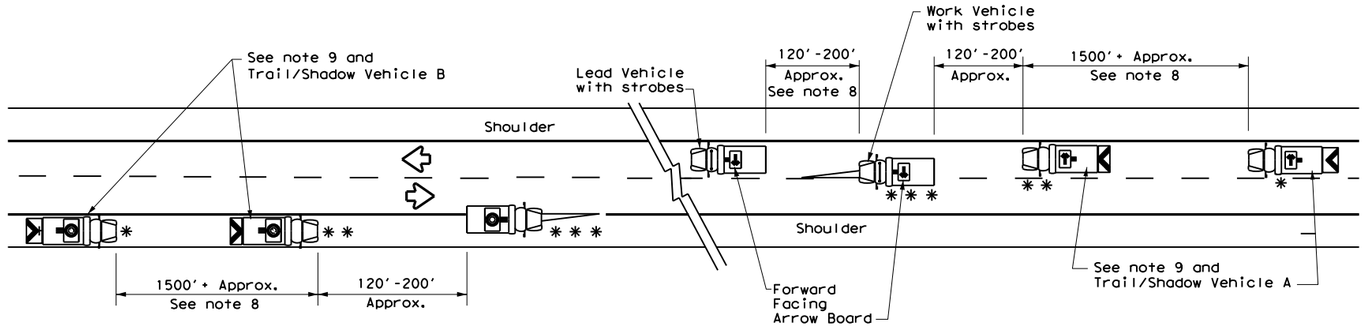
with RIGHT Directional display Flashing Arrow Board

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

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

GENERAL NOTES

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

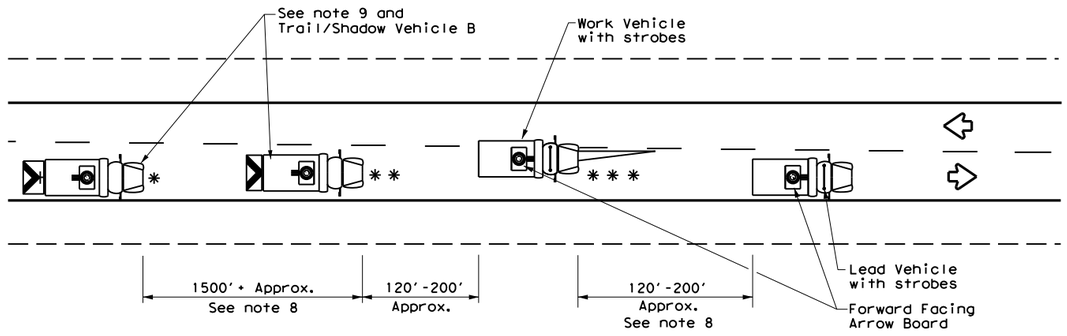


WORK ON SHOULDER

WORK ON TRAVEL LANE

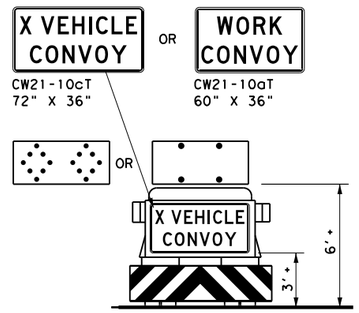
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



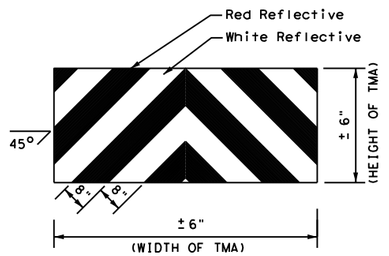
TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	6460	63	001	SH 22, ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL, ETC		34

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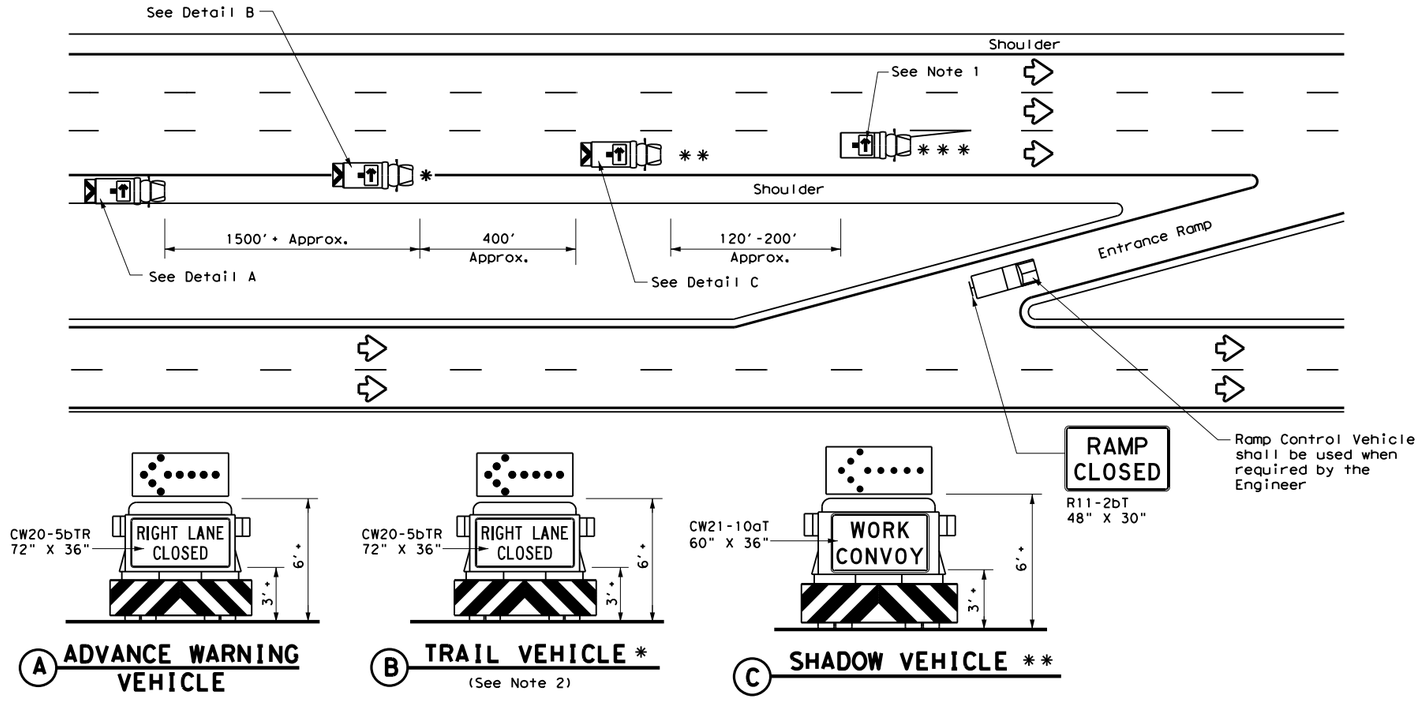
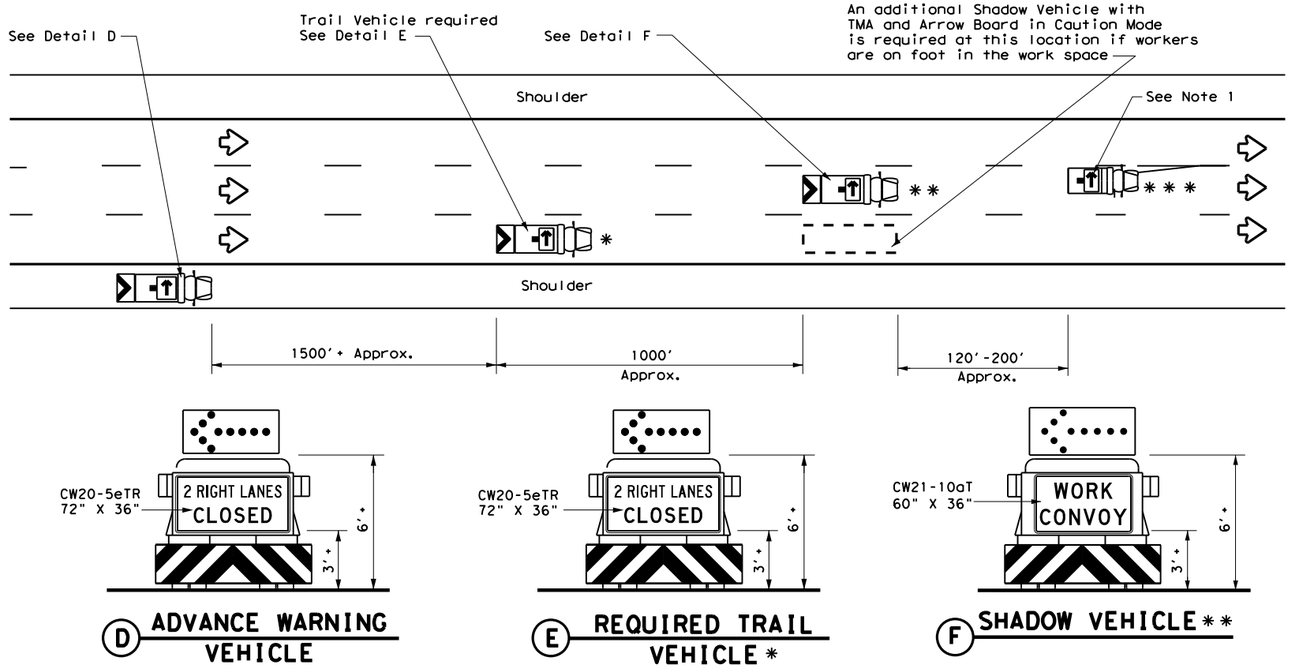


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



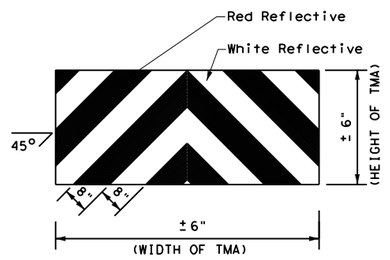
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

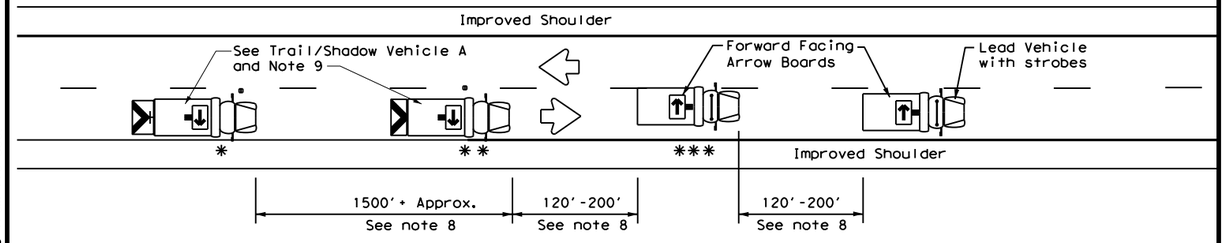
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

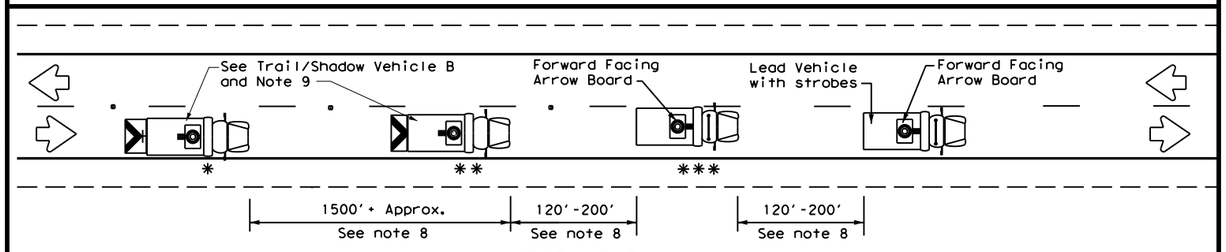
FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	6460	63	001	SH 22, ETC
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	WACO	HILL, ETC		35
1-97				

176



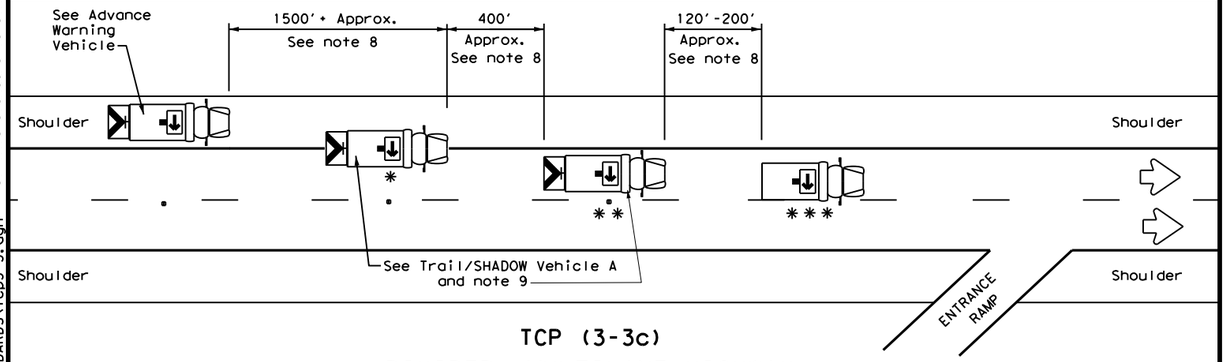
TCP (3-3a)

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



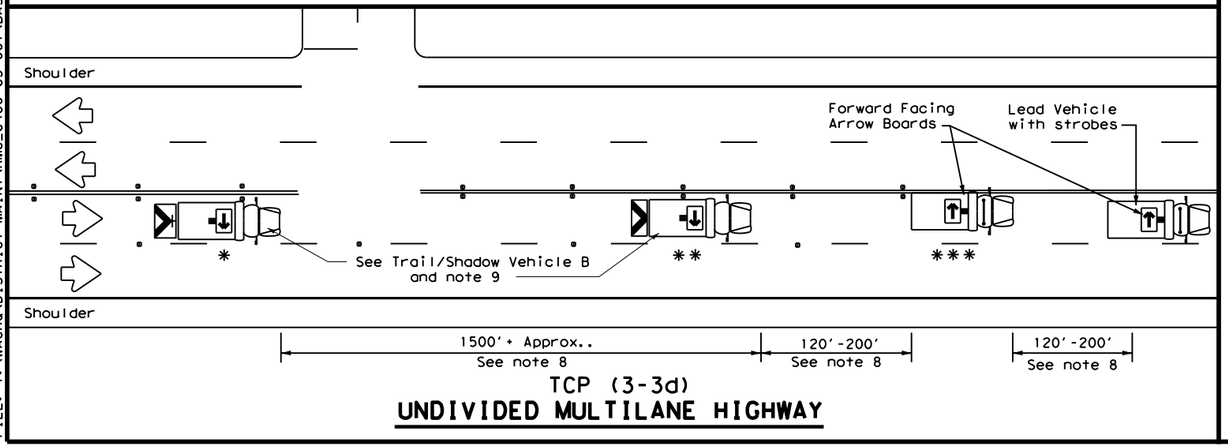
TCP (3-3b)

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



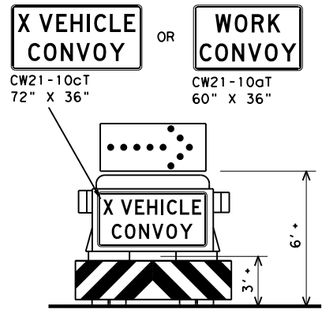
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



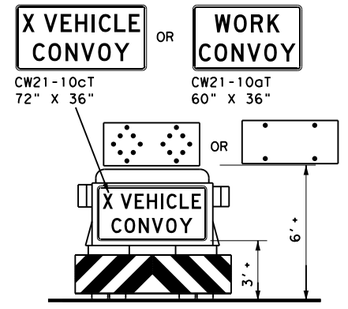
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



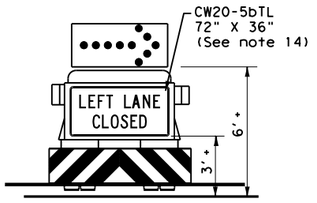
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

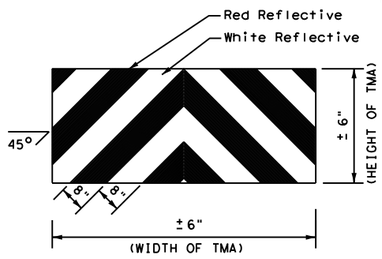


TRAIL/SHADOW VEHICLE B

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	6460	63	001	SH 22,ETC
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	WACO	HILL,ETC		36
1-97 7-14				

DATE: 1/22/2024 1:18:40 PM
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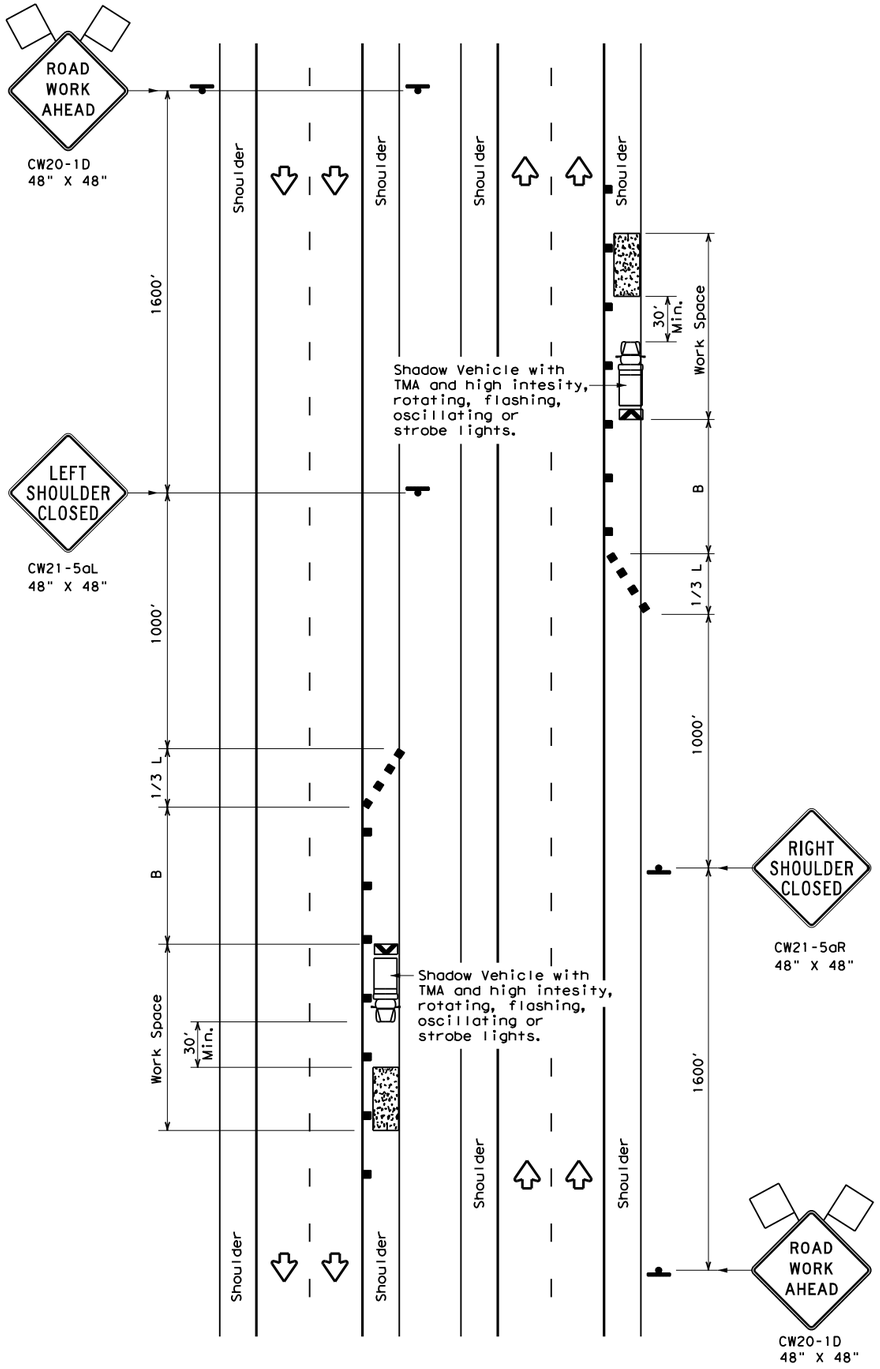
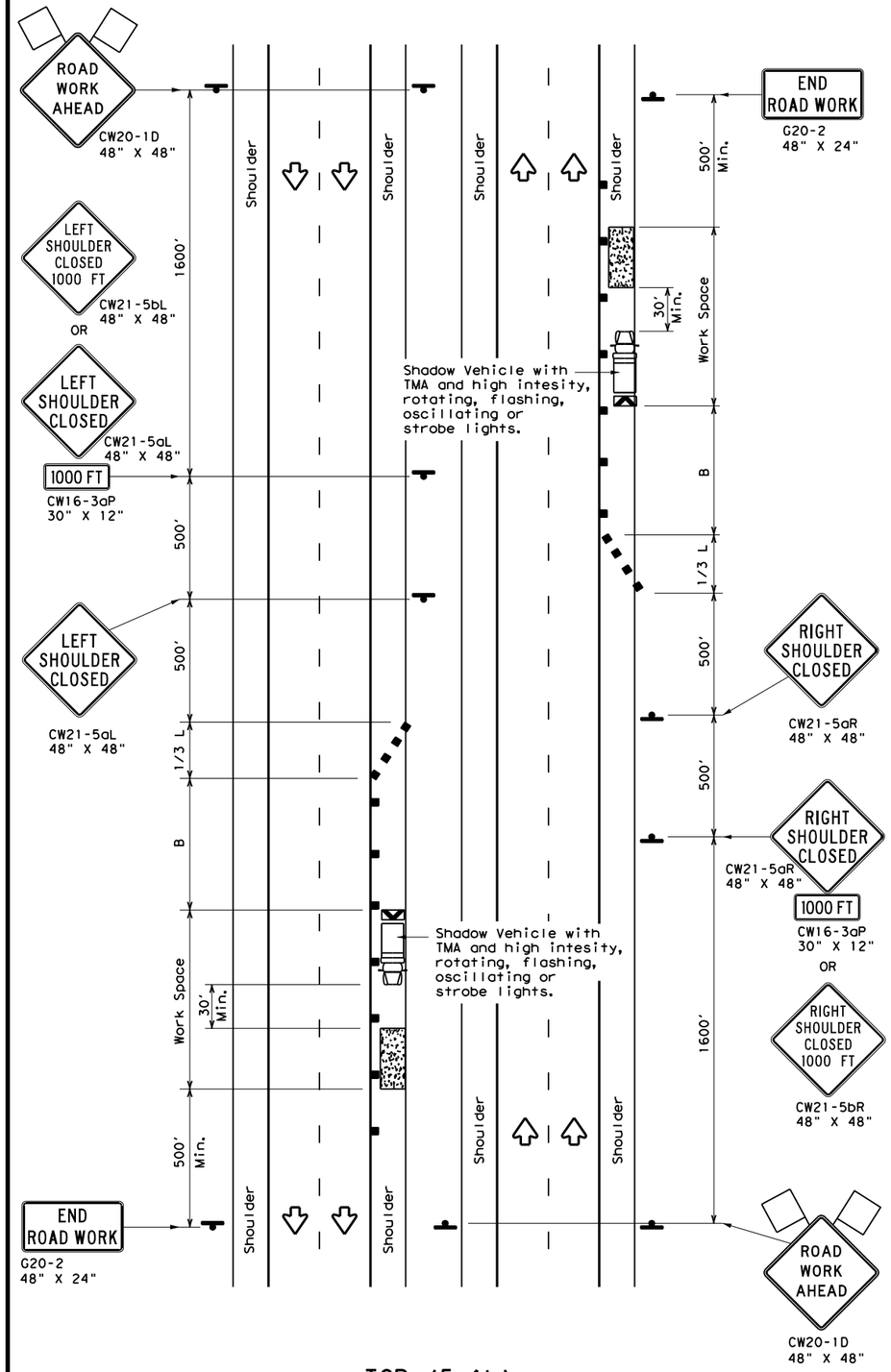


TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

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	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

* 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(5-1a)	TCP(5-1b)	TCP(5-1b)	

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.

Texas Department of Transportation

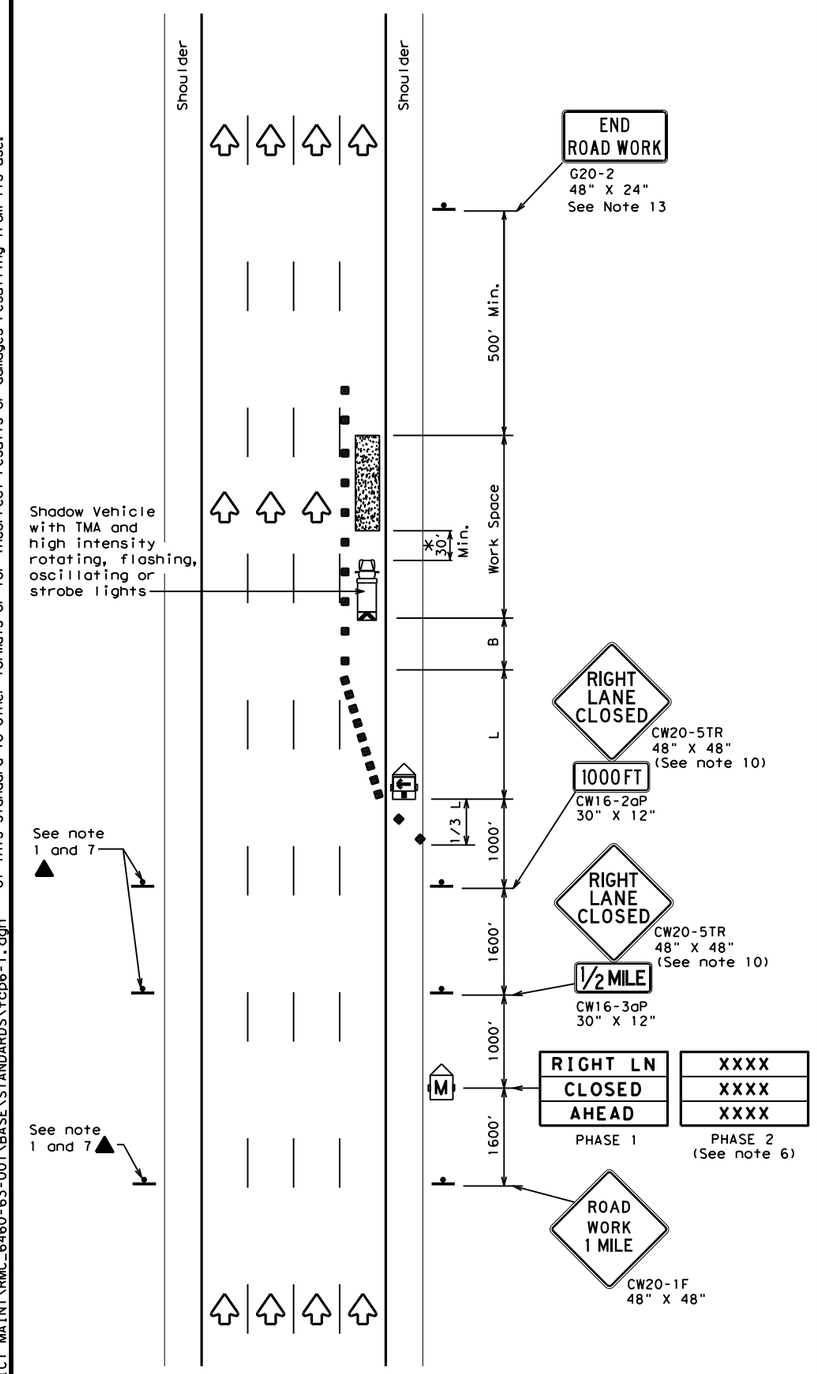
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

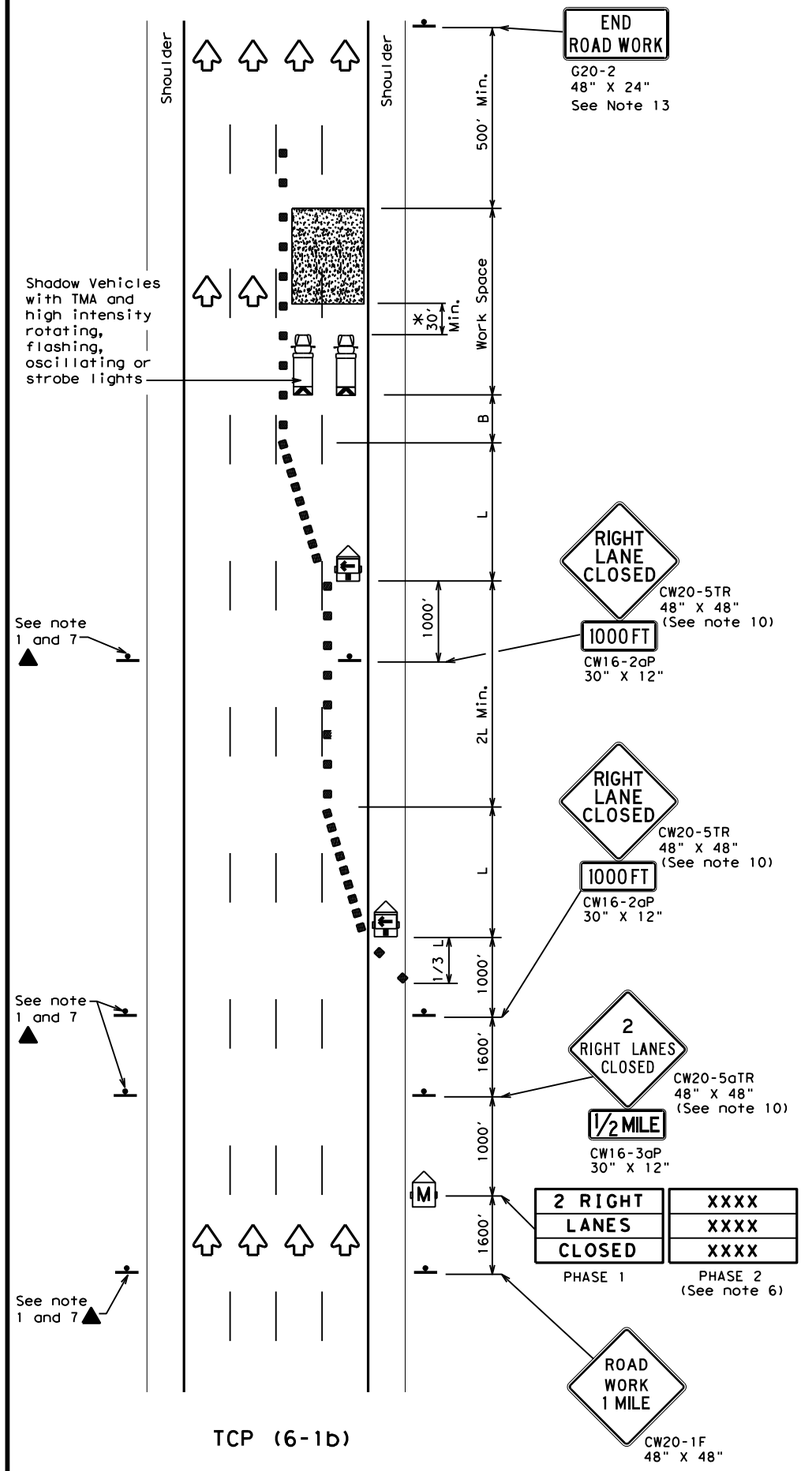
FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	6460	63	001	SH 22, ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL, ETC		37

DATE: 1/22/2024
FILE: T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\STANDARDS\tcp5-1-18.dgn



TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Drums or 42"cones are the typical channelizing devices. For Intermediate Term Stationary work, drums shall be used on tapers with drums or 42" cones used on tangent sections. Other channelizing devices may be used as directed by the Engineer.
3. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
4. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
5. Static message boards or changeable message signs stating the date and duration of ramp or freeway lane closures shall be placed a minimum of seven (7) calendar days in advance of the actual closure.
6. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE LEFT," recommended advisory speed, delay information, or other specific warnings.
7. Duplicate construction warning signs should be erected on the medians side of freeways where median width will permit and traffic volume justifies the signing.
8. The number of closed lanes may be increased provided the spacing of traffic control devices, taper lengths and tangent lengths meet the requirements of the TMUTCD.
9. Warning signs for intermediate term stationary work should be mounted at 7' to the bottom of the sign.
10. Warning signs shown shall be appropriately altered for left lane closures. When signs are mounted at 1' height for short term stationary or short duration work, sign versions shown in the SHSD for Texas with distances on the sign face rather than mounted on a plaque below the sign may be used.
11. When possible, PCMS units should be located in advance of the last available exit ramp prior to the lane closure to allow motorists an alternate route. They may also be relocated to improve advance warning in case of unanticipated queuing or congestion.
12. For Intermediate Term Stationary work at night, floodlights should be used to illuminate the work area and equipment crossings. Floodlights shall not produce a disabling glare condition for road users or workers.
13. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-12	6460	63	001	SH 22,ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL,ETC		38

DATE: 1/22/2024 1:18:41 PM
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DATE: 1/22/2024 1:18:42 PM
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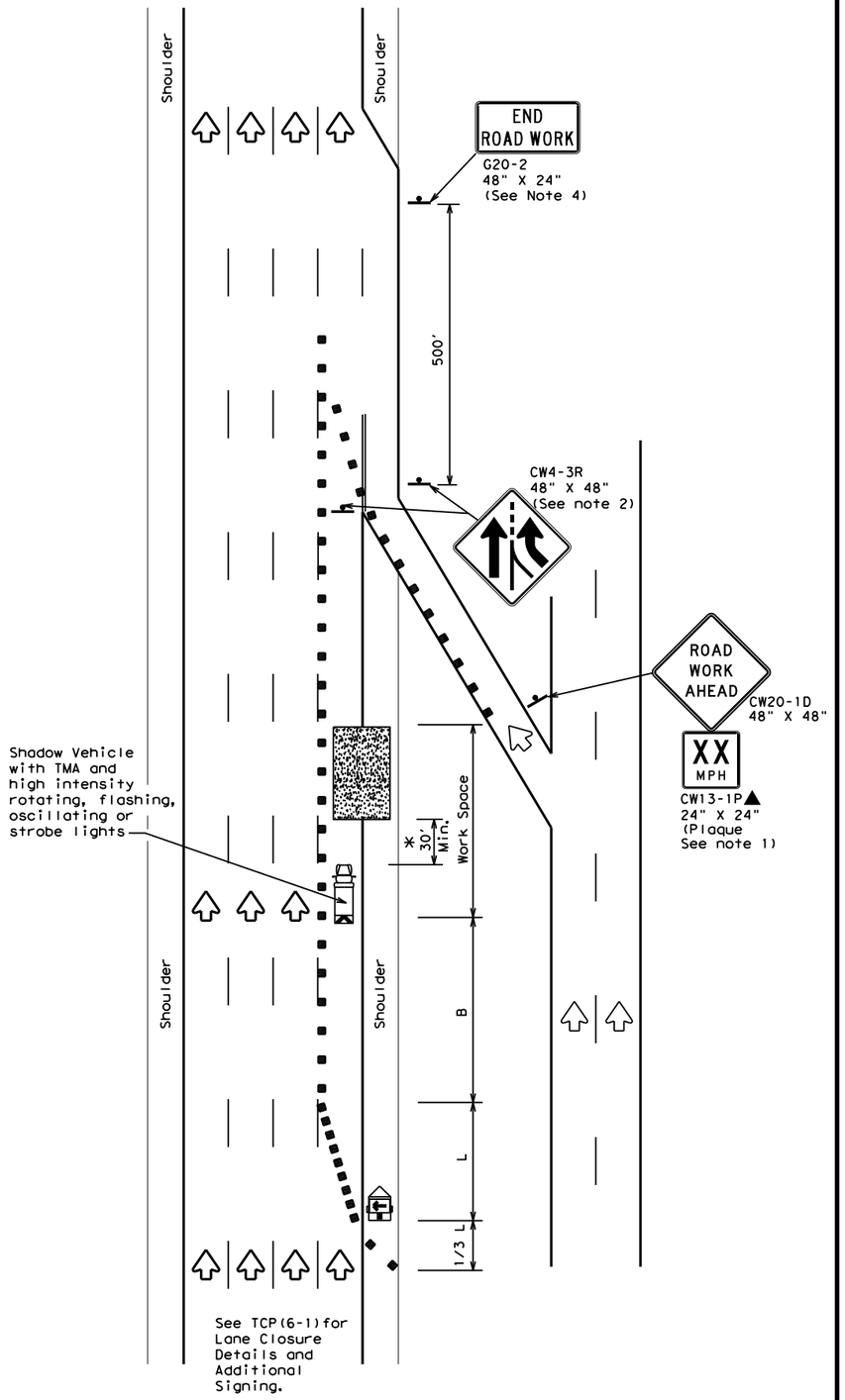
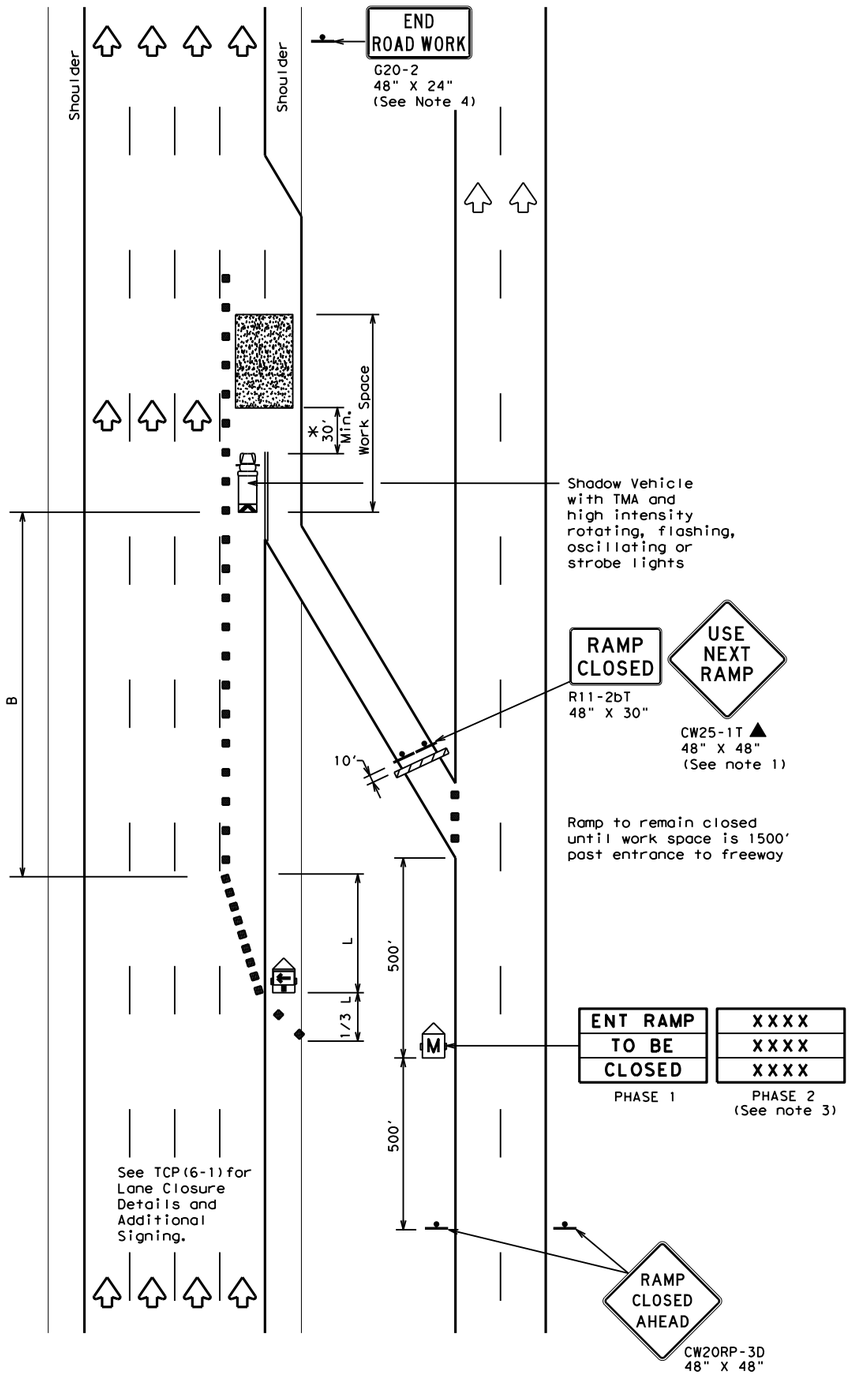


TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP 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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. ADDED LANE Symbol (CW4-3) sign may be omitted when sign between ramp and mainlane can be seen from both roadways.
3. See "Advance Notice List" on BC(6) for recommended date and time formatting options for PCMS Phase 2 message.
4. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

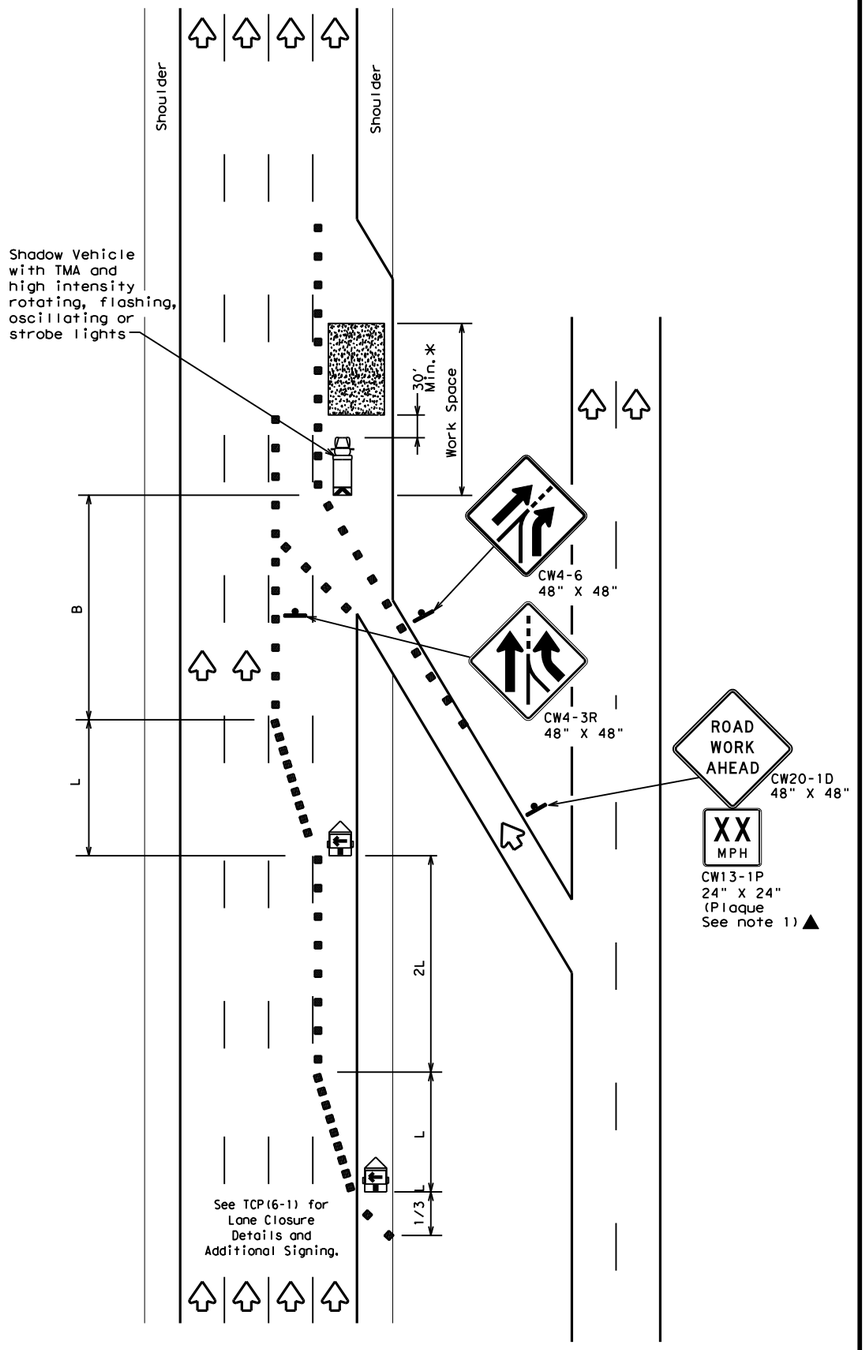
Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

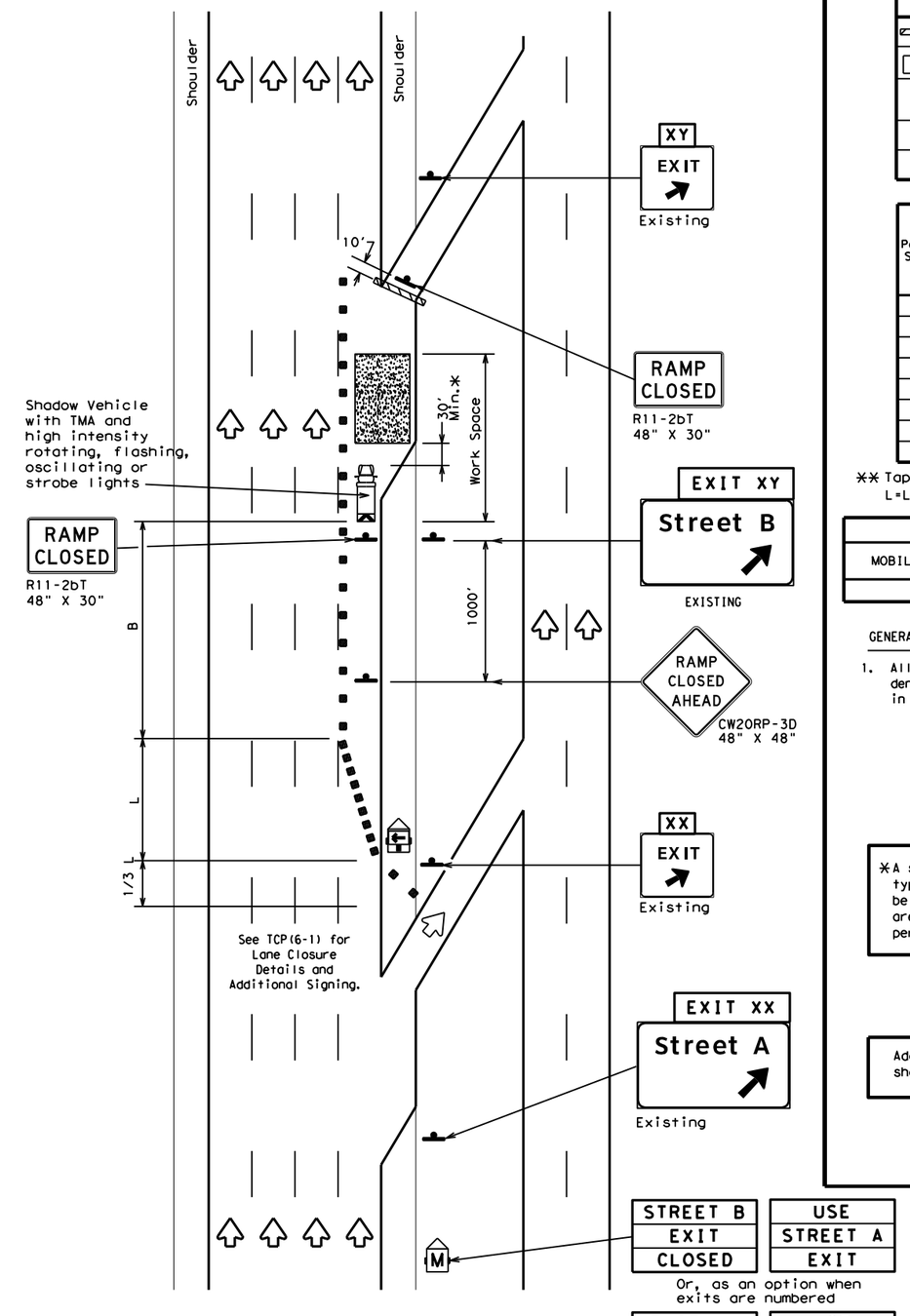
TCP(6-2)-12

FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	6460	63	001	SH 22, ETC
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	WACO	HILL, ETC		39



TCP (6-3a)

ENTRANCE RAMP OPEN



STREET B	USE
EXIT	STREET A
CLOSED	EXIT

Or, as an option when exits are numbered

EXIT XY	USE
CLOSED	EXIT XX

Place 1 mile (approx.) in advance of Street A exit.

TCP (6-3b)

EXIT RAMP CLOSED

TRAFFIC EXITS PRIOR TO CLOSED RAMP

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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

TCP(6-3)-12

FILE: tcp6-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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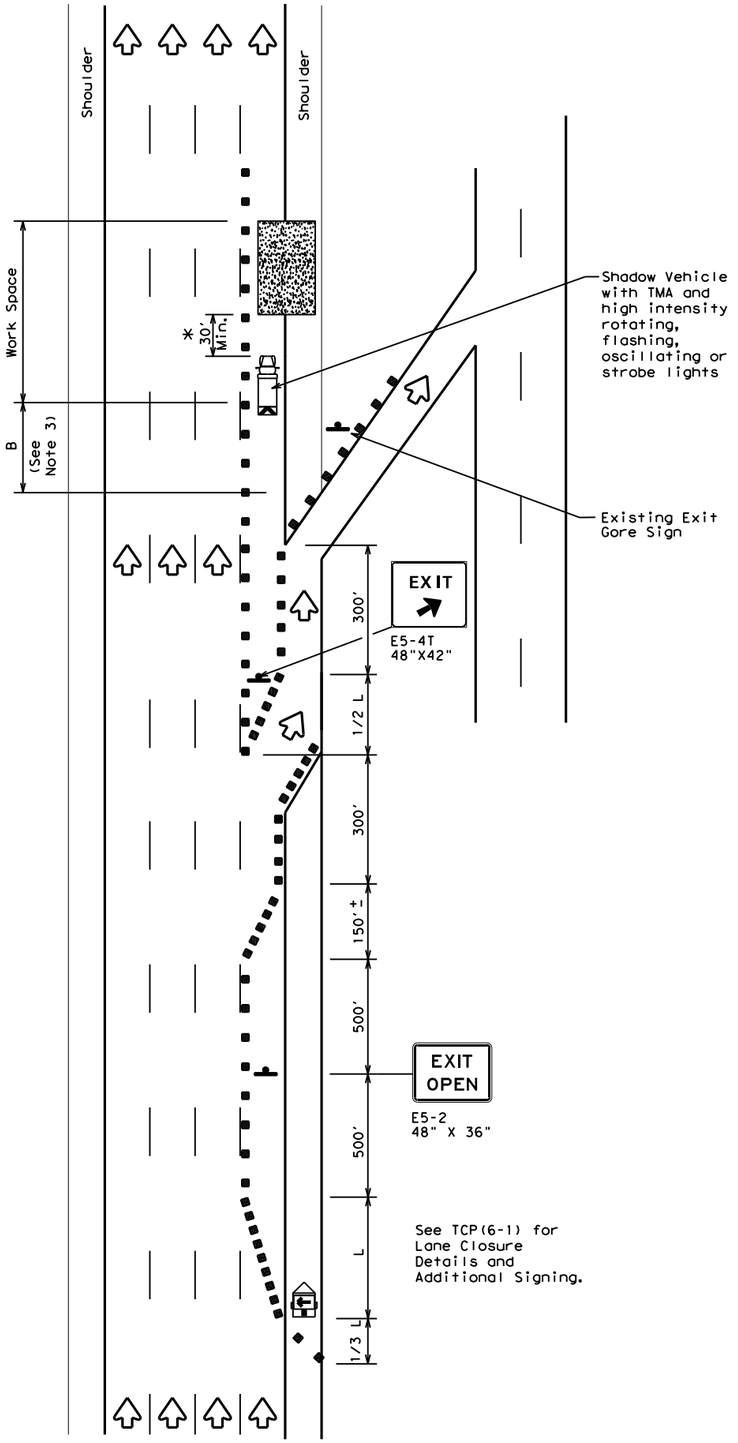
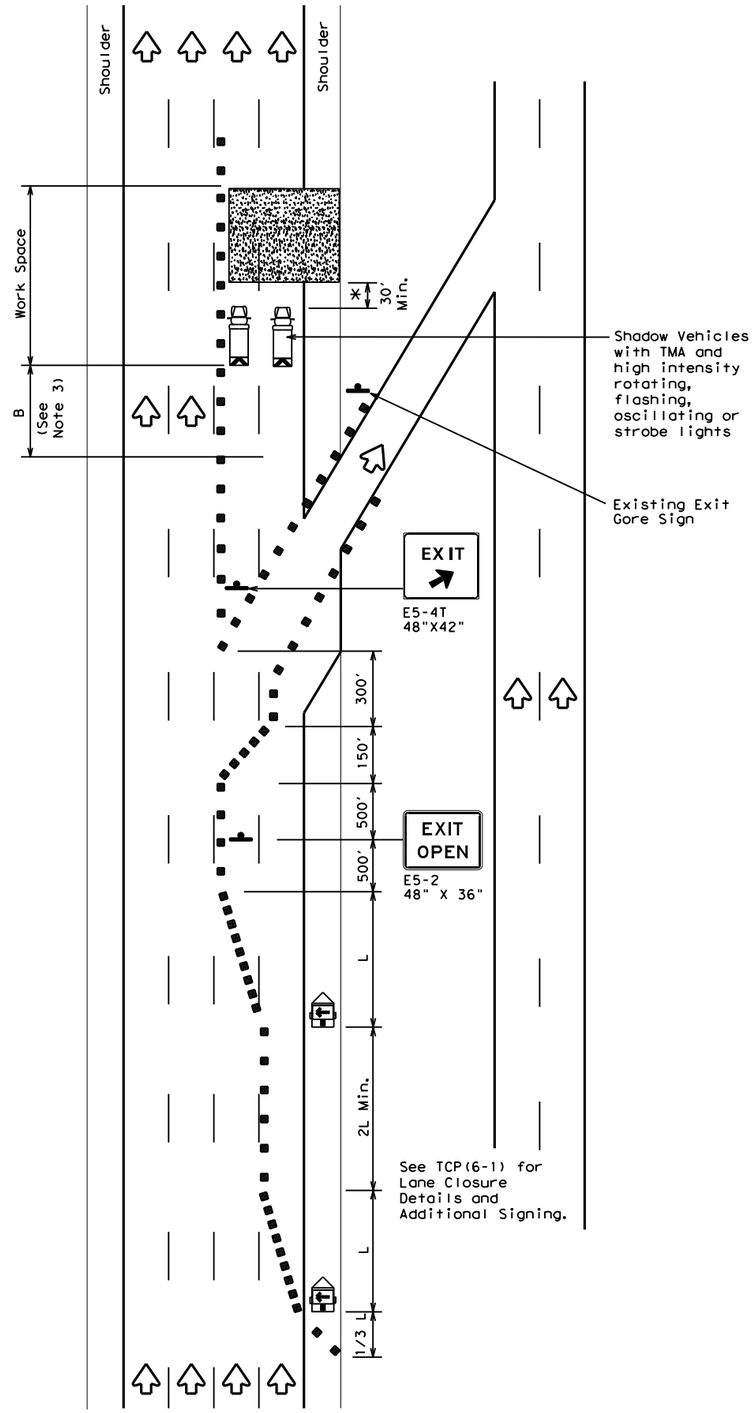


TCP (6-5a)

EXIT RAMP OPEN



TCP (6-5b)

EXIT RAMP OPEN
TWO LANE CLOSURE WITHIN 1500' PAST EXIT RAMP

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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC standards for sign details.
3. If adequate longitudinal buffer length "B" does not exist between the work space and the exit ramp, consideration should be given to closing the ramp.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND EXIT RAMP

TCP(6-5)-12

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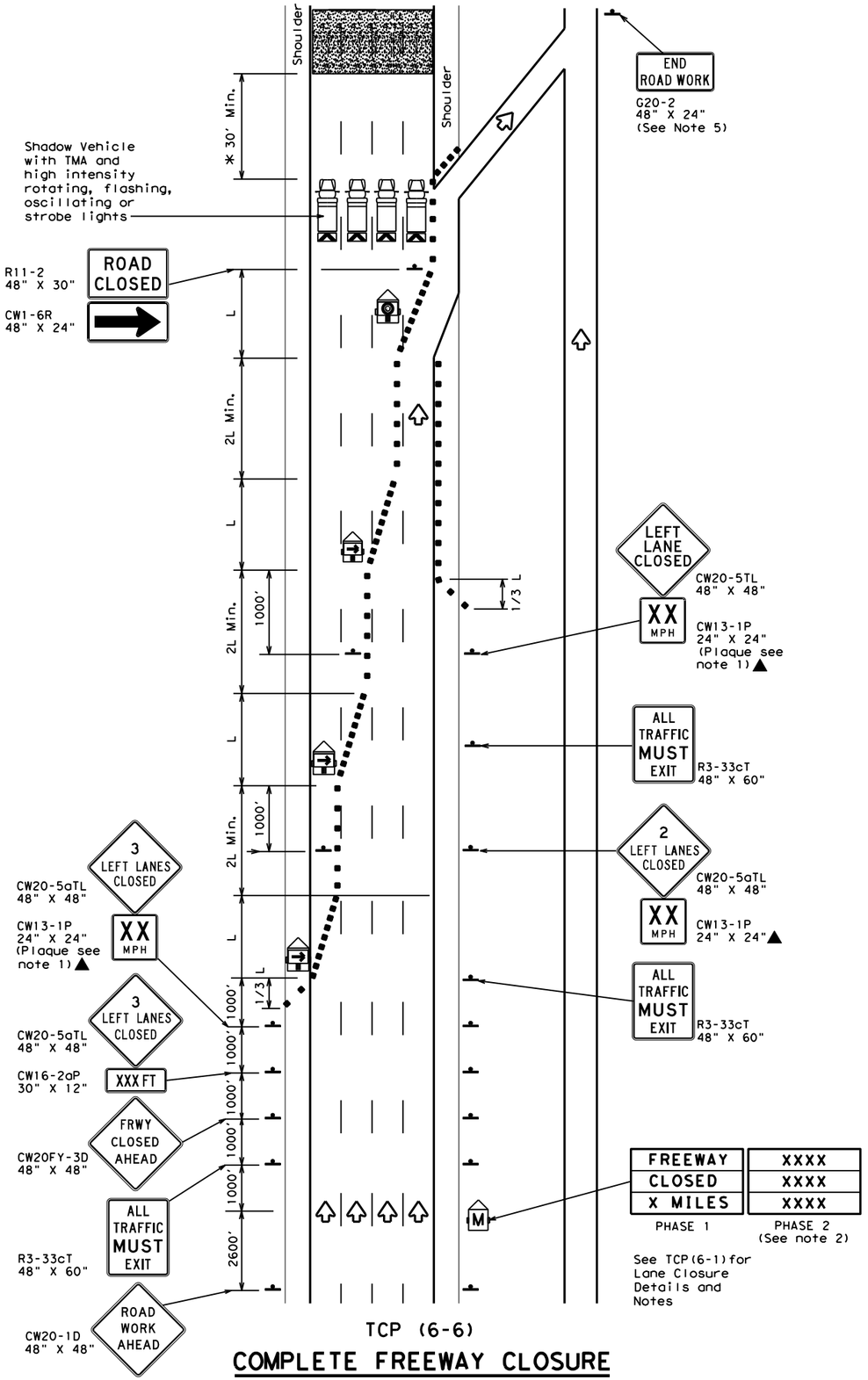

TCP (6-6)

COMPLETE FREEWAY CLOSURE

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE RIGHT," recommended speed, delay, exit information, or other specific warnings.
3. Where queuing is anticipated beyond signing shown, additional PCMS signs, other warning signs, devices or Law Enforcement Officers should be available to warn approaching high speed traffic of the end of the queue, as directed by the Engineer.
4. Entrance ramps located from the advance warning area to the exit ramp should be closed whenever possible.
5. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY CLOSURE

TCP(6-6)-12

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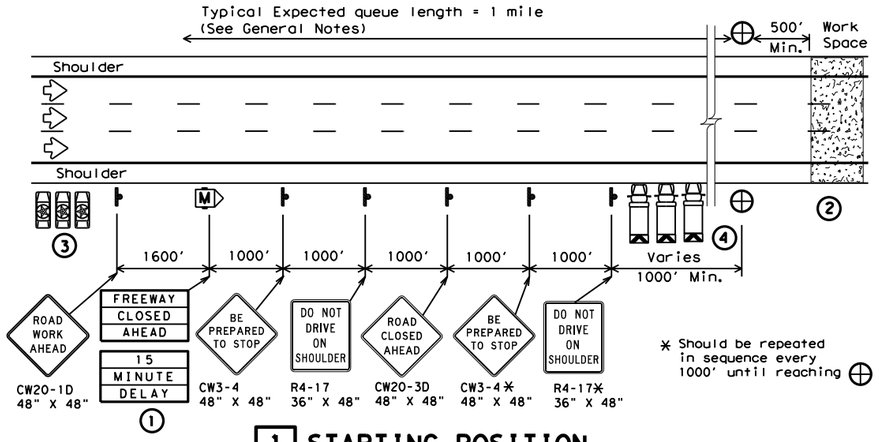


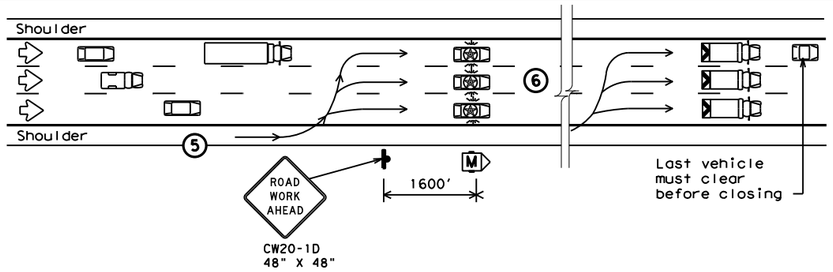
1 STARTING POSITION

(1) Traffic control devices should be installed or located near their intended position prior to beginning temporary roadway closure sequence. Duplicate signs should be erected on the median side of the roadway when median width permits. Warning signs should not be placed on the paved shoulders that will be used by the WARNING LEOV, or where movement of the LEOVs or barrier vehicles will be impeded.

(2) Prior to beginning the roadway closure sequence, all equipment, materials, personnel, and other items necessary to complete the work should be gathered near the work area. Entrance ramps located in the area where a queue is expected to build should be closed.

(3) There should be one LEOV for every lane to be controlled, plus a minimum of one to warn traffic approaching a queue. An additional lead law enforcement officer is desirable to remain with the Engineer's or Contractor's point of contact (POC) during the operation in order to improve communication with all LEOVs involved.

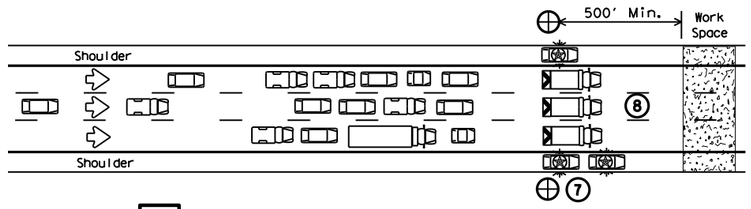
(4) One barrier vehicle with a Truck Mounted Attenuator and amber or blue and amber high intensity flashing/oscillating/strobe lighting shall be used for each lane to be closed.



2 REDUCING SPEED OPERATION

(5) Starting position of the LEOVs should be in advance of the most distant warning signs.

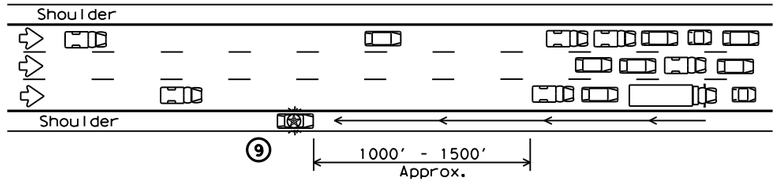
(6) Once the LEOVs have achieved an abreast blocking formation while traveling toward the CP, emergency lights and headlights should be turned "ON". The LEOVs should maintain formation, not allow traffic to pass, and begin to decelerate. The LEOVs should continue to decelerate, giving the barrier vehicles opportunity to be staged upstream of the work space after traffic has cleared. The LEOVs should then continue to decelerate slowly until bringing traffic to a stop near the barrier vehicles.



3 ALL TRAFFIC STOPPED AT CP

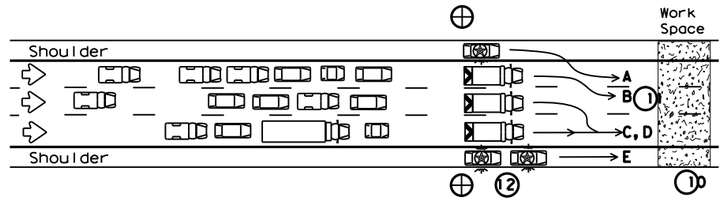
(7) Once traffic is stopped the LEOVs should park on the shoulders with emergency lighting "ON" in order to provide law enforcement presence at the closure and keep shoulders blocked ahead of the work space. They should stay in radio contact with the WARNING LEOV.

(8) The barrier vehicles should be parked, one in each lane, the parking brake set, with the high visibility flashing/oscillating/strobe lighting "ON," and the transmission in gear.



4 WARNING THE TRAFFIC QUEUE

(9) The WARNING LEOV should proceed to the right shoulder of the roadway, with emergency lights on approximately 1000' in advance of the traffic queue (stopped traffic) as the queue develops. When determined that limited sight distance situations (crest of hills, sharp roadway curvature, etc.) may occur to motorists approaching the queue, the WARNING LEOV may proceed 1/4 mile or more in advance of the queue.



5 RELEASING STOPPED TRAFFIC

(10) All equipment, materials, personnel, and other items should be removed from the roadway and maintain an adequate clear zone.

(11) When the roadway is clear for traffic, the LEOV should proceed forward from the left shoulder followed by the barrier vehicles, from left to right, as shown alphabetically in the plan view.

(12) The LEOV or LEOVs on the right shoulder may remain on the shoulder until satisfied that traffic is moving satisfactorily before merging or proceeding.

(13) LEOVs and barrier vehicles should re-group at their respective starting positions if necessary.

LEGEND			
■ ■	Channelizing Devices	⊕	Control Position (CP)
(M)	Portable Changeable Message Sign (PCMS)		Barrier Vehicle with Truck Mounted Attenuator
	Law Enforcement Officer's Vehicle(LEOV)		Traffic Flow

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

GENERAL NOTES

1. All traffic control devices shall conform with the latest edition of the Texas Manual on Uniform Traffic Control Devices (TMUTCD). Additional guidelines for traffic control devices may be found in the TMUTCD. Signs conflicting with the roadway closure sequence should be completely removed or covered. Additional traffic control devices may be required for closure of access roads, cross streets, exit and entrance ramps as directed by the Engineer.

2. Law enforcement officers and all workers involved should review and understand all procedures before the roadway closure sequence begins. Pre-work meetings may be held for this purpose. Local emergency services and media should have advance notification of roadway closure, expected dates and approximate times of closures.

3. Law enforcement officers shall be in uniform and have jurisdiction in the locale of the work area. An additional WARNING Law Enforcement Officer's Vehicle (LEOV) may be used on the median side of the roadway where median shoulder width permits (See sequence #9).

4. The roadway closure should be during off-peak hours, as shown in the plans, or as directed by the Engineer.

5. Work should be limited to approximately 15 minutes maximum duration unless otherwise directed by the Engineer based on existing roadway conditions. If the work is not complete within 15 minutes, or if the end of the traffic queue extends past the most distant advance warning signs, the work area should be cleared of all equipment, materials, personnel, and other items, and the roadway reopened. When the queue has dissipated and the traffic flow appears normal the roadway closure sequence may be repeated.

6. For traffic volumes greater than 1000 Passenger Cars Per Hour Per Lane (PCPHPL), or for roadway closures that exceed 15 minutes, see details elsewhere in the plan.

7. If traffic queues beyond the advance warning signs during one road closure sequence, the advance warning should be extended prior to repeating the road closure sequence. When possible, PCMS signs should be located in advance of the last available exit prior to the closure to allow motorists the choice of an alternate route.

THIS PLAN IS INTENDED TO BE USED AT LOCATIONS/TIMES WHEN TRAFFIC VOLUMES ARE LESS THAN 1000 PASSENGER CARS PER HOUR PER LANE.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHORT DURATION FREEWAY CLOSURE SEQUENCE

TCP(6-7)-12

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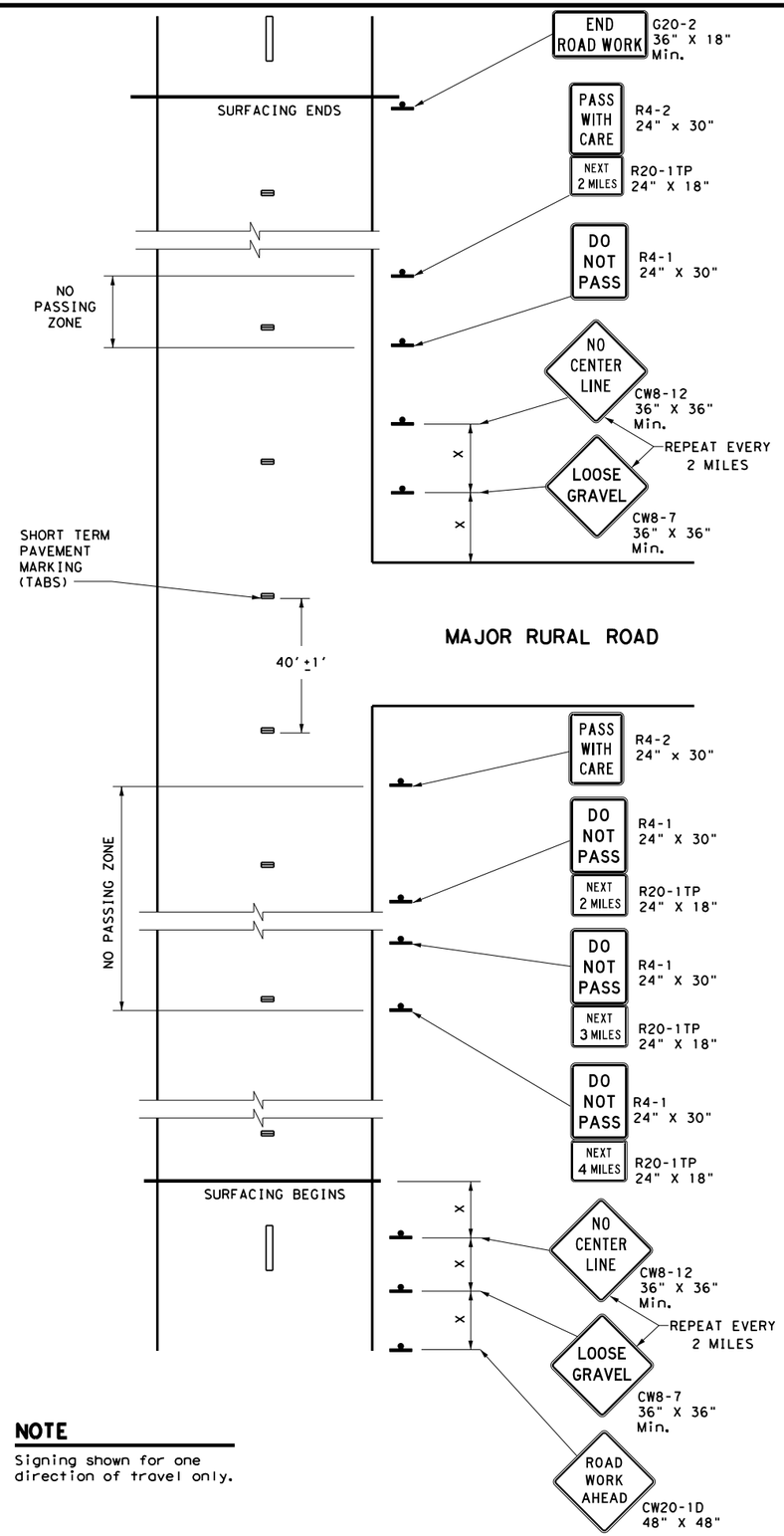
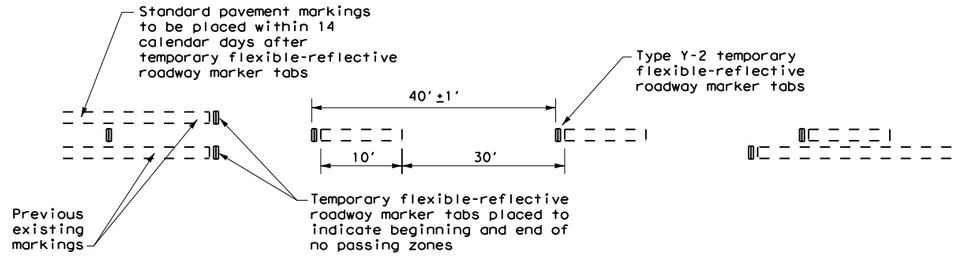


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS

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

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

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

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

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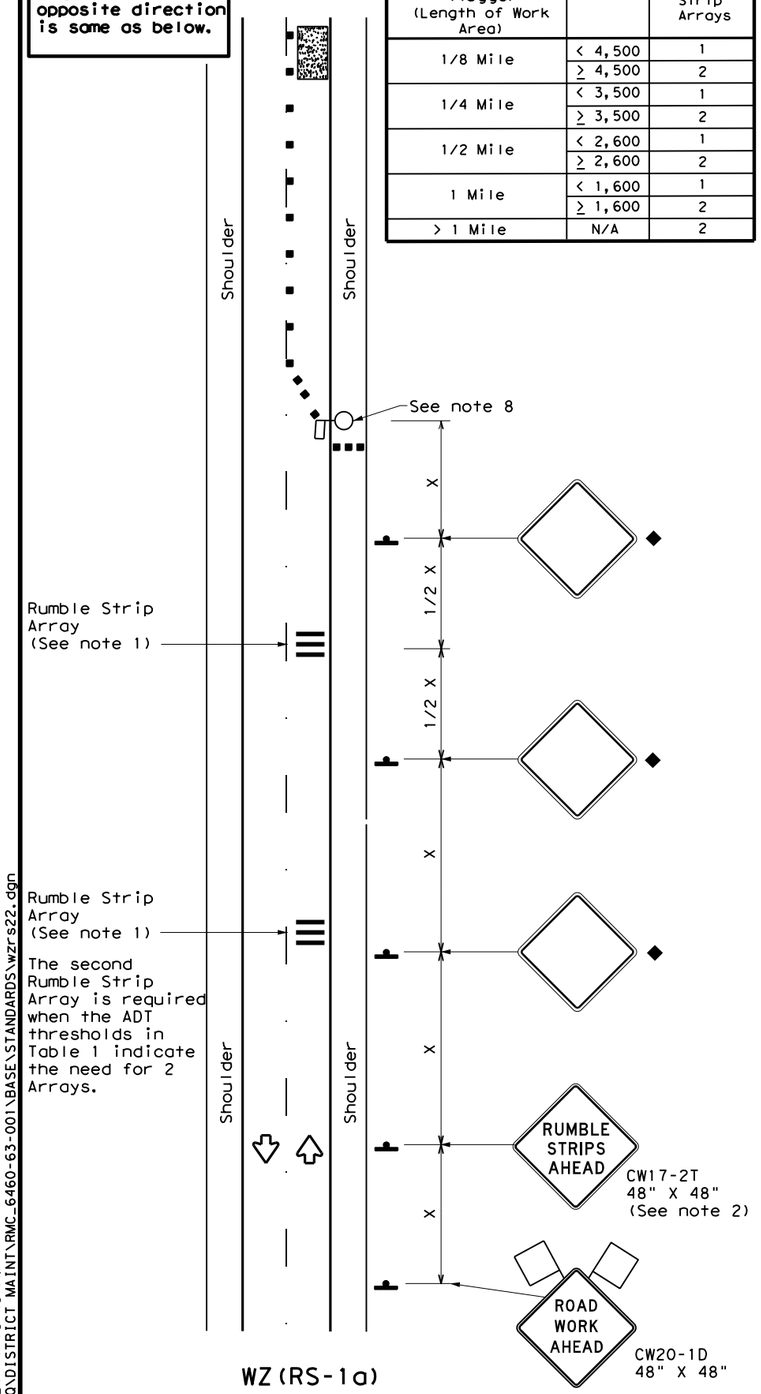
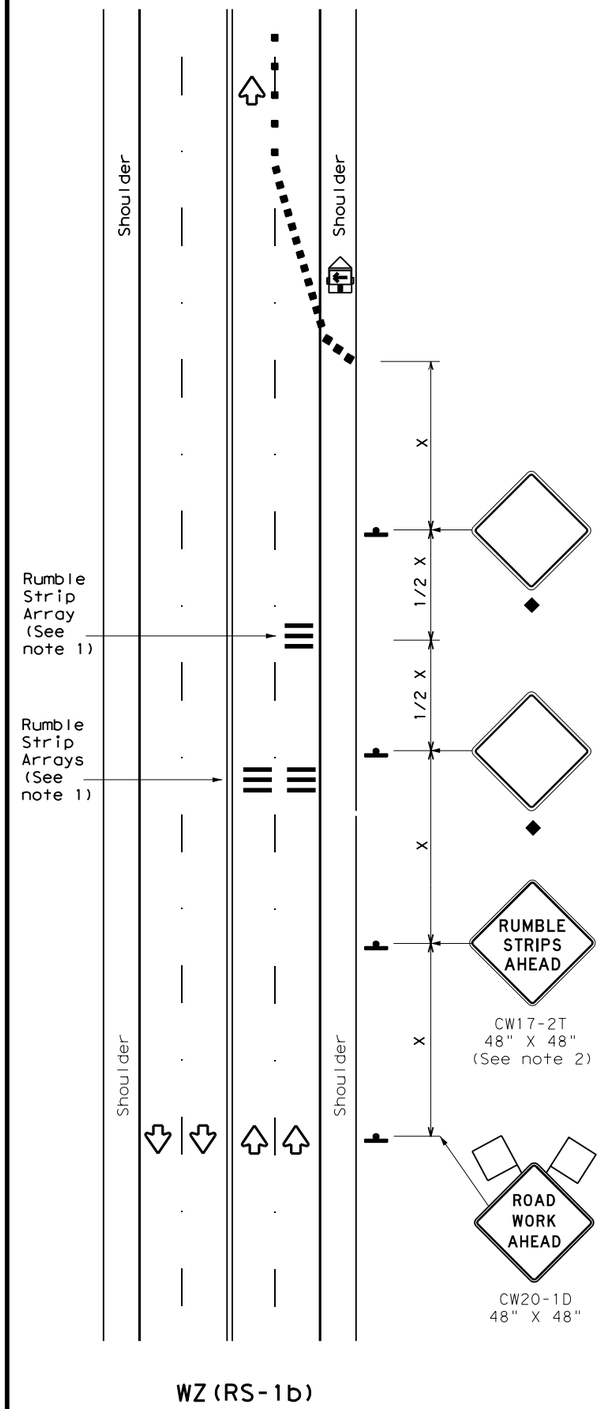
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	6460	63	001	SH 22,ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL,ETC		45

117

DATE: 1/22/2024 1:18:46 PM
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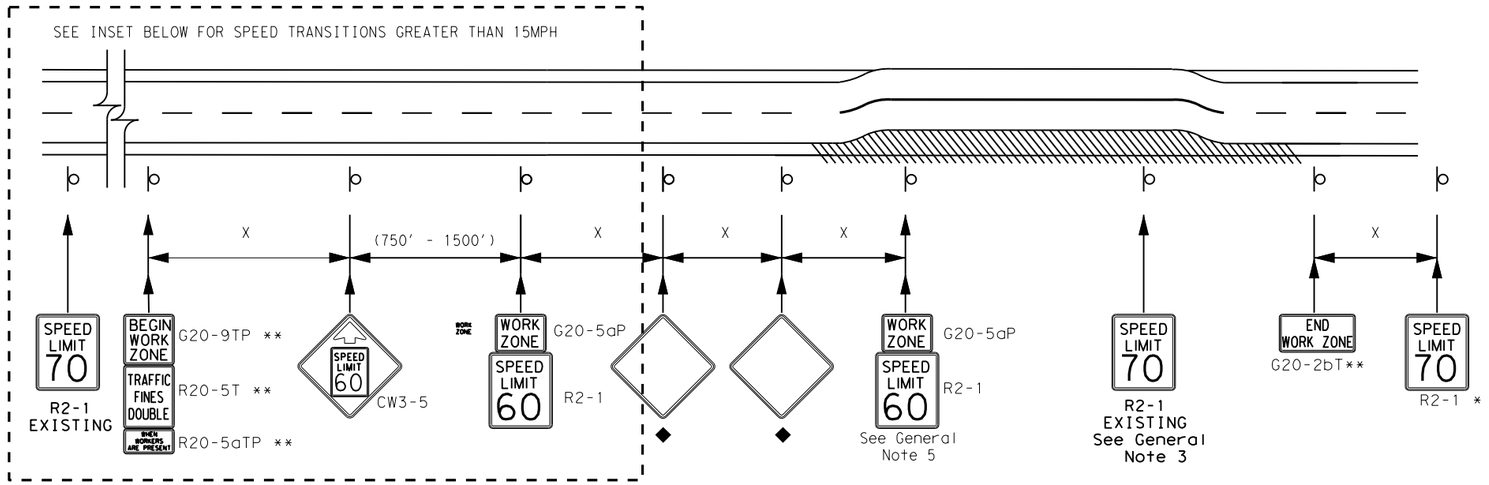
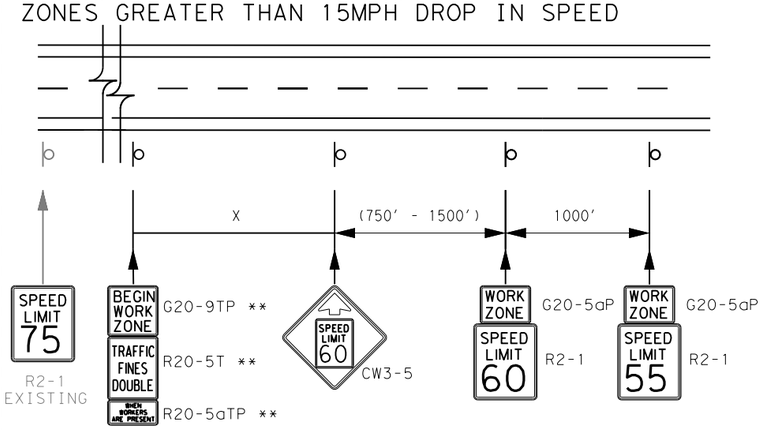
TYPICAL APPLICATION OF MAINTENANCE WORK ZONE SPEED LIMIT SIGNS

Signing shown for one direction only.

Remove all temporary speed limit signs and concealments of permanent speed limit signs when the maintenance activity has been completed and equipment has been removed from the activity site.



ALTERNATE SIGNING FOR TRANSITION OF SPEED ZONES GREATER THAN 15MPH DROP IN SPEED



* At the end of the maintenance work zone place a sign indicating the speed limit after the temporary zone ends.

** Signs should not be installed for mobile operations.

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

GENERAL NOTES

1. Signs may be skid mounted for long term or intermediate term work durations. Roll up signs may be used for short term, short duration or mobile operations.
2. Reduced speeds shall only be posted in the vicinity of work activity and not throughout the entire maintenance work area.
3. Cover all permanent speed limit signs within the work area that conflict with the temporary reduced speed limit. Advisory speed plaques on warning signs within the work area are not required by law to be covered.
4. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
5. Frequency of maintenance work zone speed limit signs should be:
   a. 40 mph and greater 0.2 to 2 miles
   b. 35 mph and less 0.2 to 1 mile
6. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
7. Turning signs from view or laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Speeds shown on details above are for illustration only. Maintenance work zone speed limits shall only be posted as approved for each highway maintenance activity work zone.
9. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory maintenance speed zone reduction see TxDOT form #1204M available from TRF.

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)

DURATION OF WORK

1. As defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6.
2. 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 lastingmore 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-term 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.

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 mtal tubing may be turned away from traffic 90 degrees when the sign message in 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 headlight 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.

SIGN DETAILS

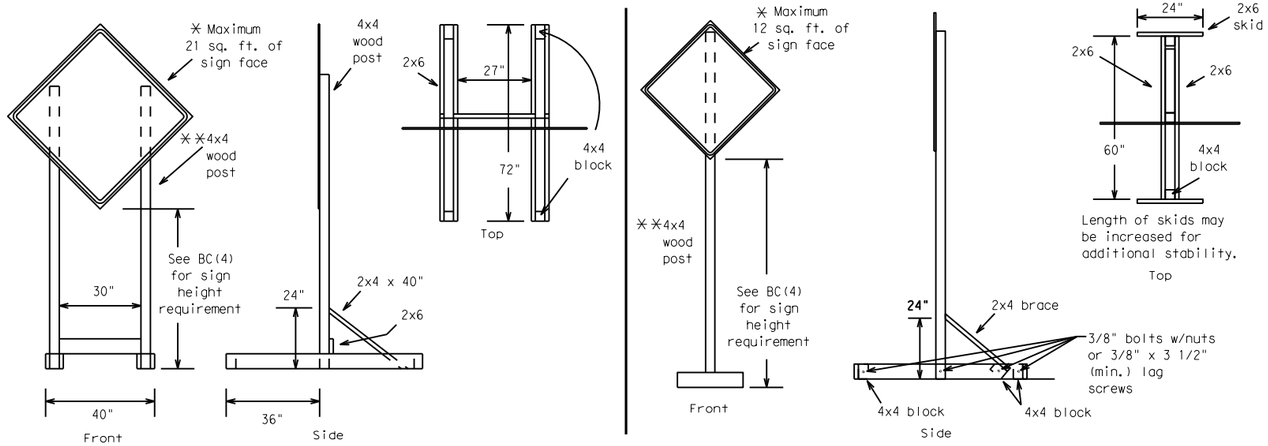
Sign Number	Conventional Road	Expressway/ Freeway
G20-2bT	36"x18"	48"x24"
G20-5aP	24"x18"	36"x24"
G20-9TP	24"x24"	36"x30"
R20-5T	24"x30"	36"x36"
R20-5aTP	24"x12"	36"x18"
CW3-5	36"x36"	48"x48"
R2-1	24"x30"	36"x48"

Texas Department of Transportation

Traffic Safety Division Standard

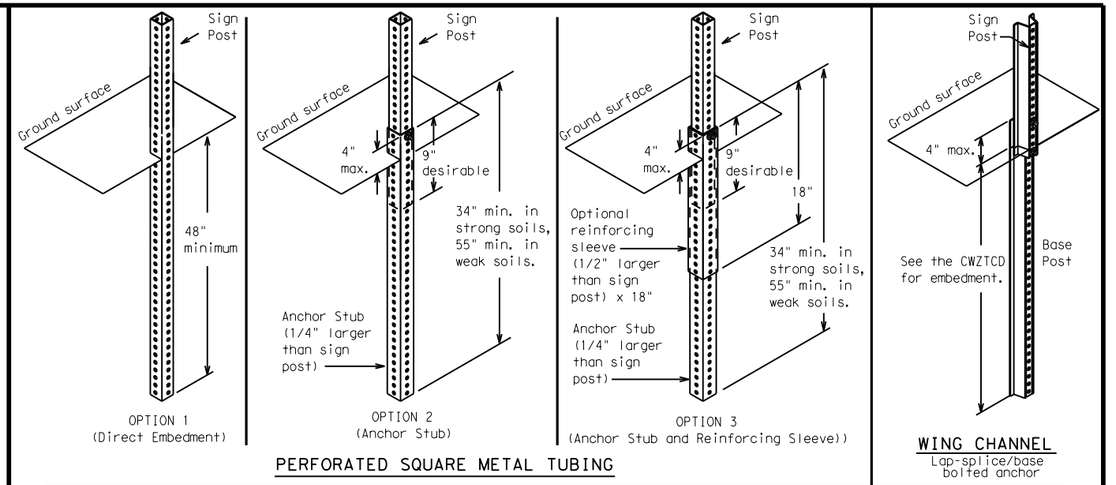
MAINTENANCE WORK ZONE SPEED LIMIT SIGNS

FILE: mntwzsl.dgn	DN:	CK:	DW:	CK:
©TxDOT November 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	6460	63	001	SH 22,ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL,ETC		46



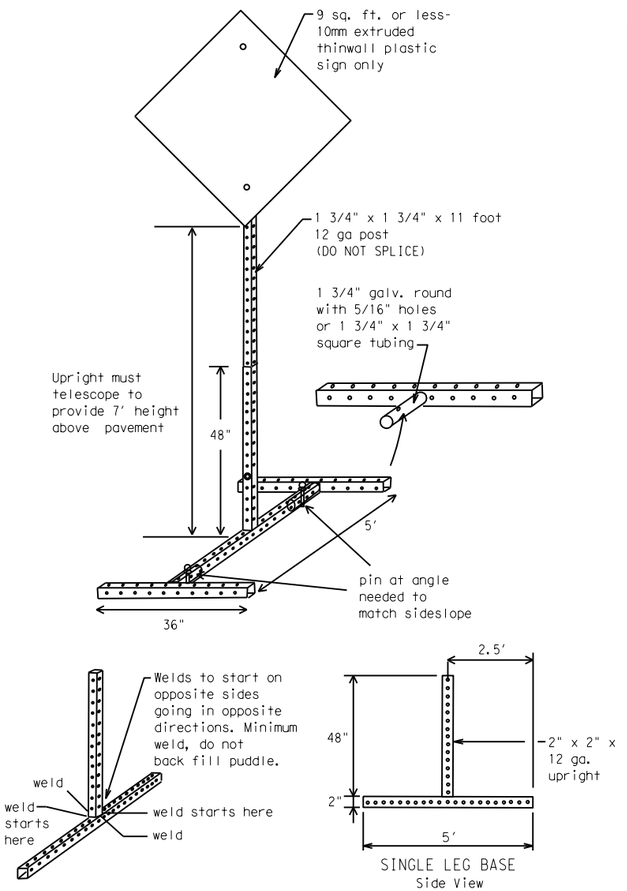
SKID MOUNTED WOOD SIGN SUPPORTS

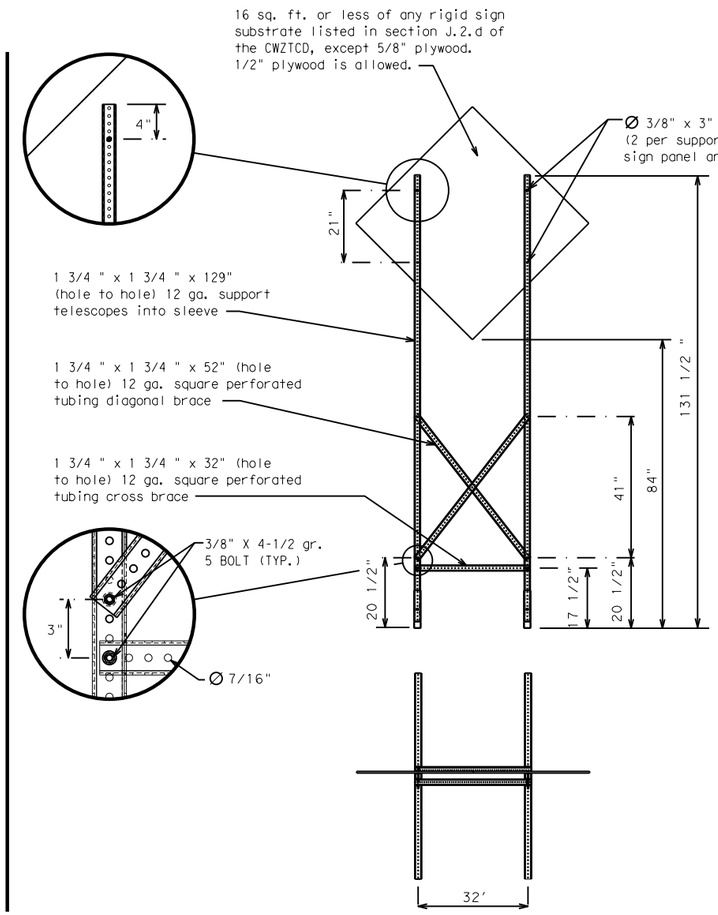
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

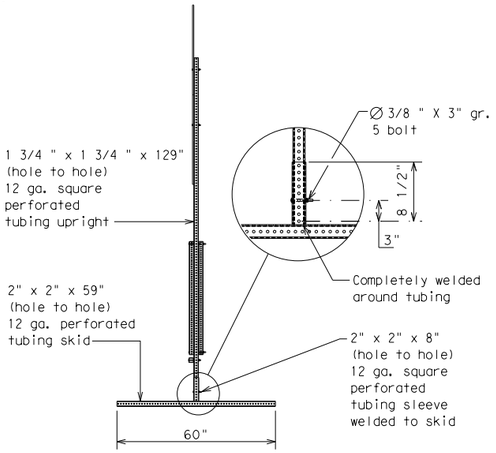


GROUND MOUNTED SIGN SUPPORTS

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.







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 sheet 1 for definition of "Work Duration."

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

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

Texas Department of Transportation | Traffic Safety Division Standard

MAINTENANCE WORK ZONE SPEED LIMIT SIGNS

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

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FILE: mntwzsl.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT
© TxDOT November 2021 | REVISIONS
CONT 6460 | SECT 63 | JOB 001 | HIGHWAY SH 22,ETC
DIST WACO | COUNTY HILL,ETC | SHEET NO. 47

DATE: 1/22/2024 1:18:47 PM
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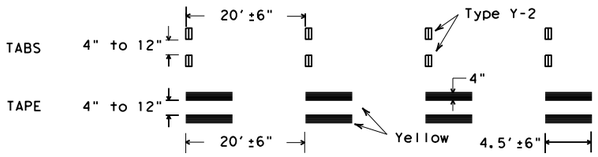
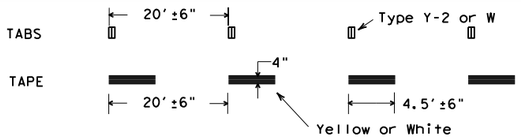
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

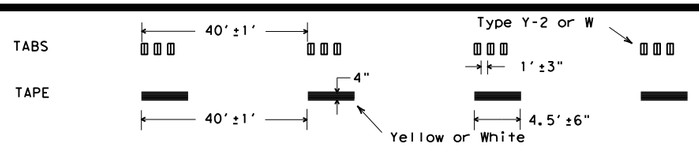


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



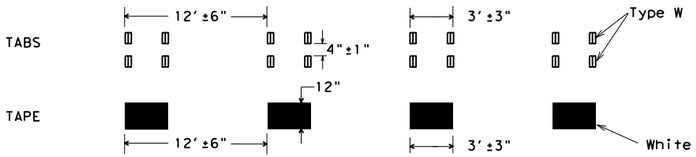
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

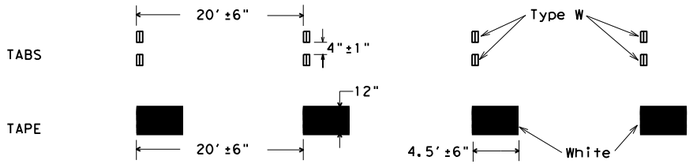


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



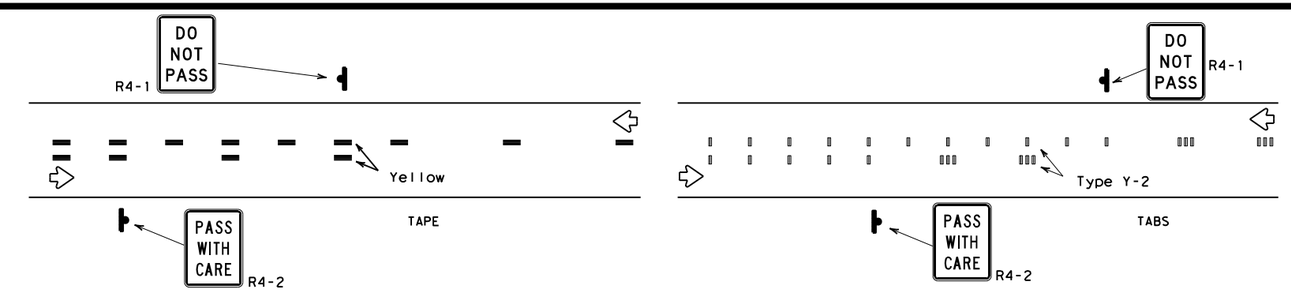
NOTES:

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

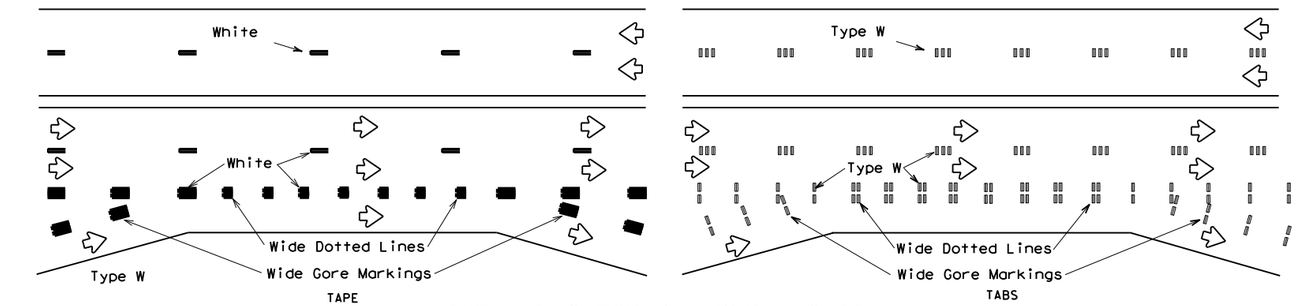
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

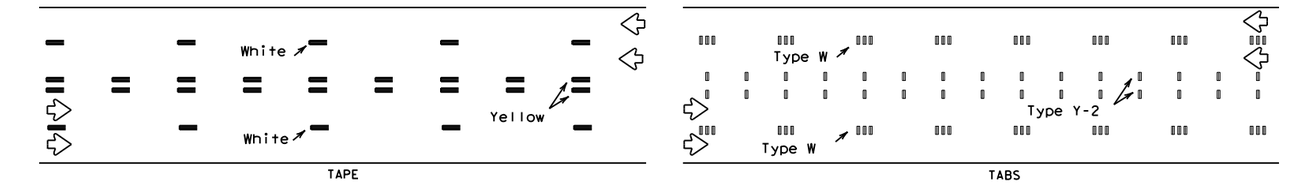
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



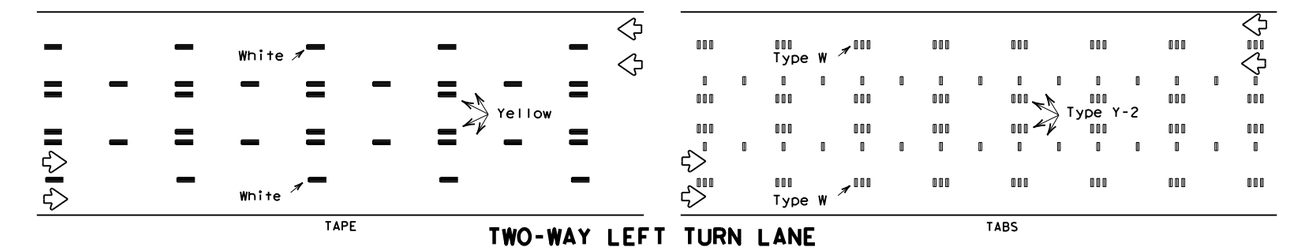
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



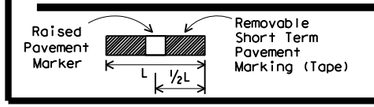
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:
   http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

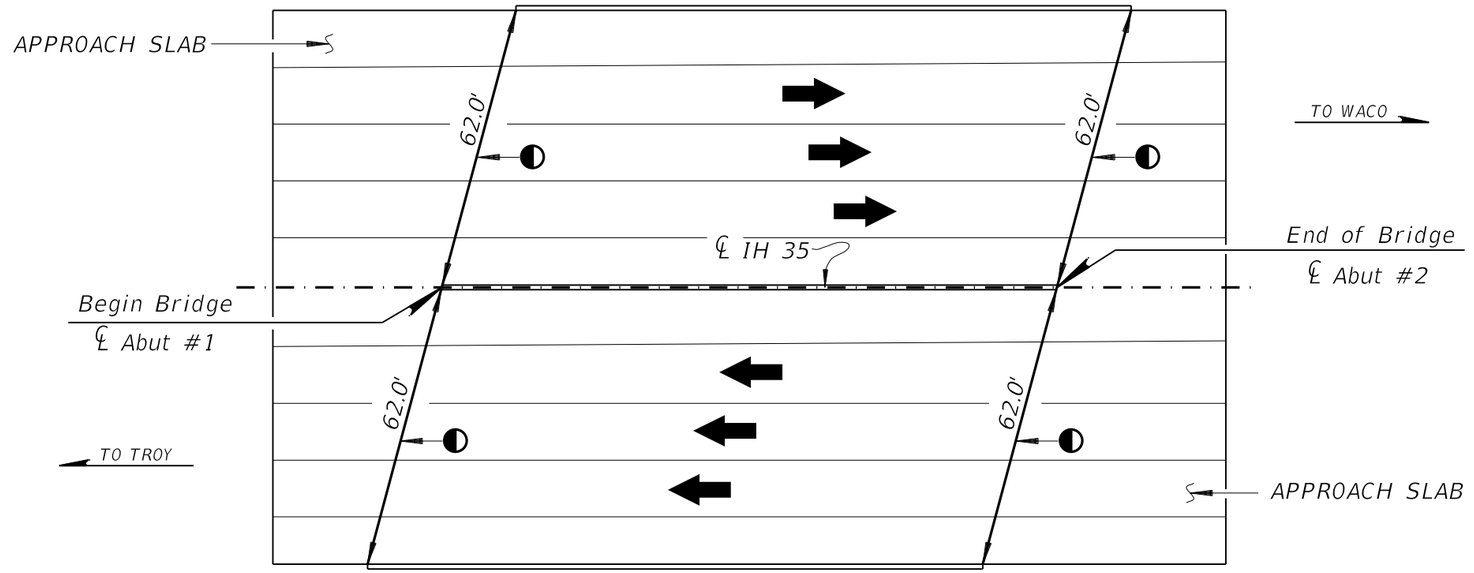
Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		6460	63	001	SH 22,ETC
1-97		DIST	COUNTY		SHEET NO.
3-03		WACO	HILL,ETC		48
7-13					



◐ Denotes location for Cleaning Existing SEJ-P

LAYOUT PLAN

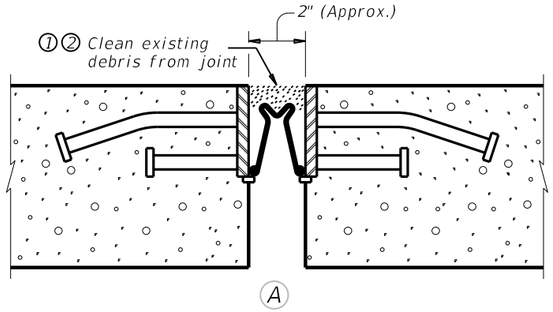
IH 35 NBML OVER DEER CREEK
(N.B.I.#09-014-0-0015-04-562)
&
IH 35 SBML OVER DEER CREEK
(N.B.I.#09-014-0-0015-04-563)
GPS LAT/LON: 31.266814/-97.269164

IH 35 NB & SB OVER DEER CREEK
130'-0" OVERALL LENGTH
PRESTRESSED CONCRETE GIRDER SPAN 15° RFS
58'-0" RDWY.
60'-0" OVERALL
T1F RAIL

GENERAL NOTES:

1. REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

2. CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-P JOINT

ESTIMATED QUANTITIES

(A)

ITEM	438-6009
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #562/563 IH 35 NB & SB OVER DEER CREEK	248.0
TOTAL	248.0

BELL COUNTY
PROJECT LAYOUT REF BE-1

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED
PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by CHARLES W. SMITH P.E. 110312, on

Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

IH 35 NB & SB OVER DEER CREEK

(STR# 562/563)

FILE: IH35DEERCREEKJT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT •	SHEET
REVISIONS	WACO	6	RMC 646063001	49
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
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LEVELS DISPLAYED ACC:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
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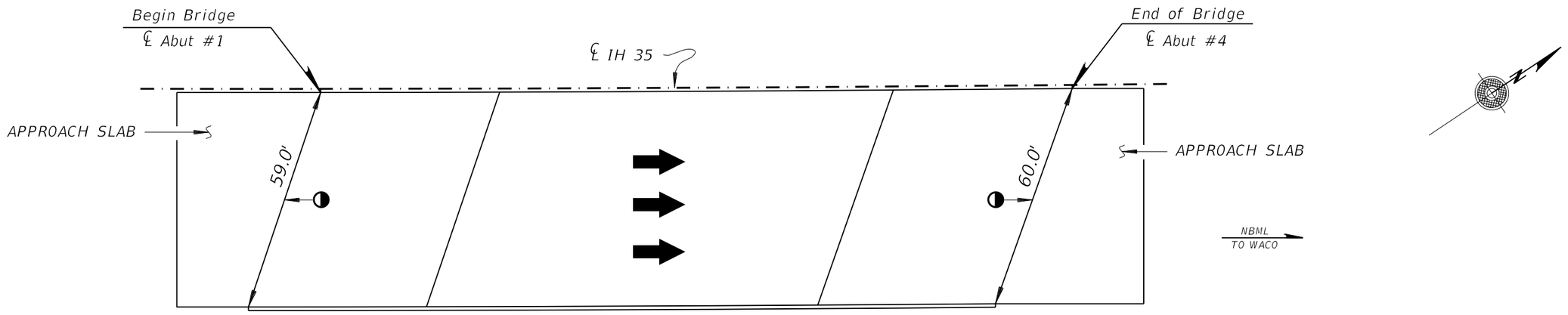
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63



LAYOUT PLAN

IH 35 NBML OVER BIG ELM CREEK
(N.B.I.#09-014-0-0015-04-555
GPS LAT/LON: 31.225746/-97.292351

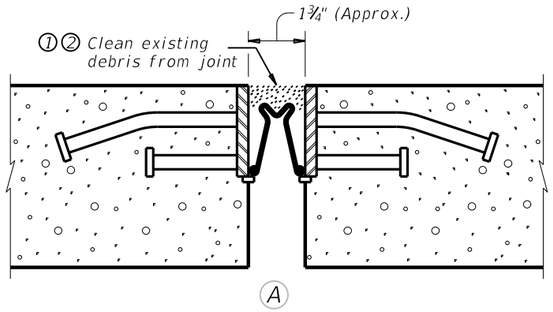
IH 35 NBML OVER BIG ELM CREEK
210'-0" OVERALL LENGTH
PRESTRESSED CONCRETE GIRDER UNIT
@ (50', 110', 50') SPANS
VARIOUS RFS
58'-0" RDWY.
60'-0" OVERALL
T1F RAIL (RT)
SSTR(MOD) (LT)

◑ Denotes location for Cleaning Existing SEJ-P

GENERAL NOTES:

(1) REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

(2) CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-P JOINT

BELL COUNTY
PROJECT LAYOUT REF BE-2

ESTIMATED QUANTITIES

ITEM	438-6009
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #555 IH 35 NBML OVER BIG ELM CREEK	119.0
TOTAL	119.0

(A)

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED
PROFESSIONAL ENGINEER

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

IH 35 NBML OVER BIG ELM CREEK

(STR# 555)

FILE: IH35BIGELMCRKJT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT ●	SHEET
REVISIONS	WACO	6	RMC 646063001	50
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\555 BE-2.dgn

LEVELS DISPLAYED
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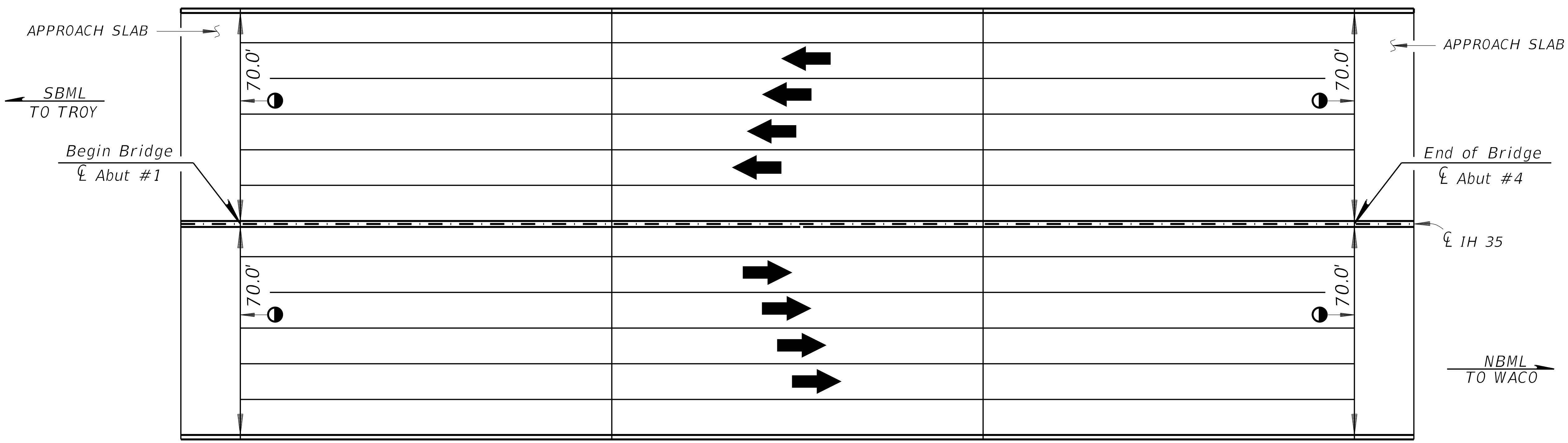
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
ACC:



LAYOUT PLAN

IH 35 SBML OVER NORTH TROY RD
(N.B.I.#09-014-0-0015-04-603)
&
IH 35 NBML OVER NORTH TROY RD
(N.B.I.#09-014-0-0015-04-604)
GPS LAT/LON: 31.217917/-97.297712

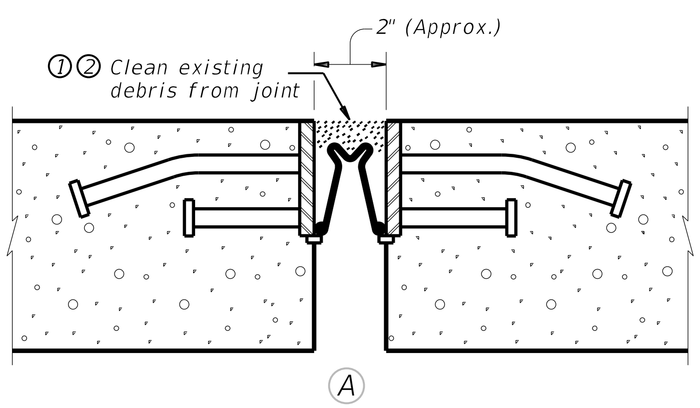
◐ Denotes location for Cleaning Existing SEJ-P

IH 35 SB & NB OVER NORTH TROY RD 375'-0" OVERALL LENGTH PRESTRESSED CONCRETE U-BEAM UNIT @ (125', 125', 125') SPANS 70'-0" RDWY. 72'-6" OVERALL SSTR RAIL (LT) C412 RAIL (RT)

GENERAL NOTES:

① REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

② CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.

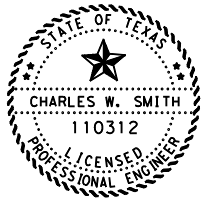


SECTION THRU SEJ-P JOINT

BELL COUNTY PROJECT LAYOUT REF BE-3

ESTIMATED QUANTITIES

ITEM	438-6009
LOCATION	CLEANING EXISTING JOINTS (A)
	L.F.
STR. #603/604 IH 35 SB & NB OVER NORTH TROY RD	280.0
TOTAL	280.0



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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation
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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

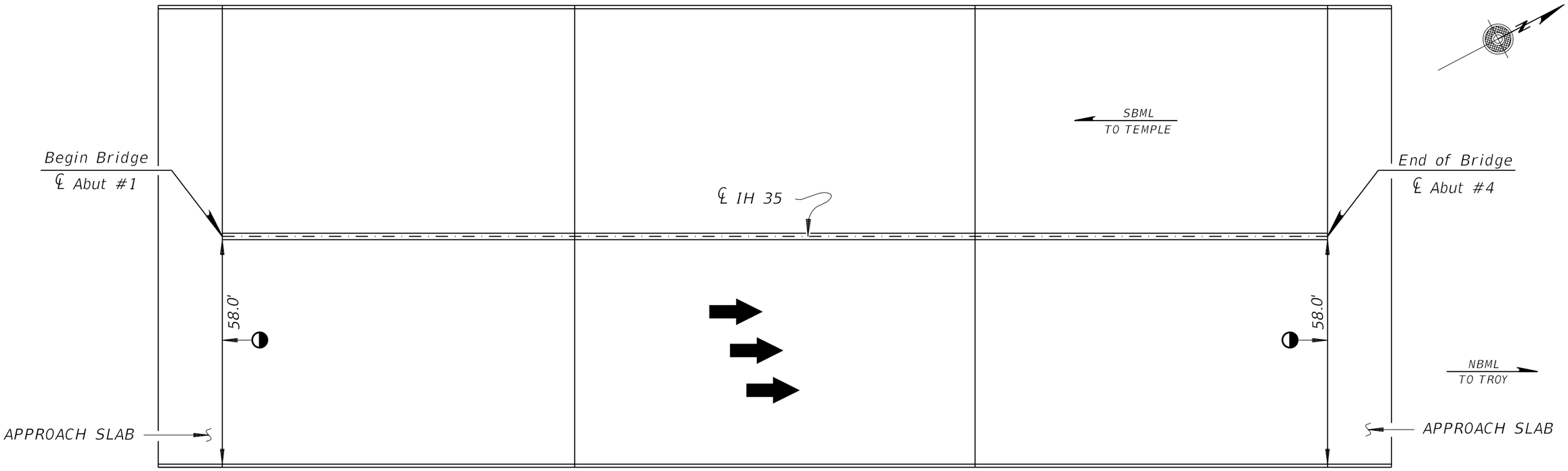
IH 35 SB & NB OVER NORTH TROY RD

(STR# 603/604)

FILE: IH35TROYRDJT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT ⊕	SHEET
REVISIONS	WACO	6	RMC 646063001	51
	COUNTY	CONTROL / SECT / JOB		HIGHWAY
	HILL,ETC	6460 / 63 / 001		SH 22,ETC

1/22/2024
T:\WACHO\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\603-604 BE-3.dgn

LEVELS DISPLAYED
ACC:



(NOT TO SCALE)

LAYOUT PLAN

IH 35 NBML OVER FM 1237
(N.B.I.#09-014-0-0015-04-589)
GPS LAT/LON: 31.178287/-97.314831

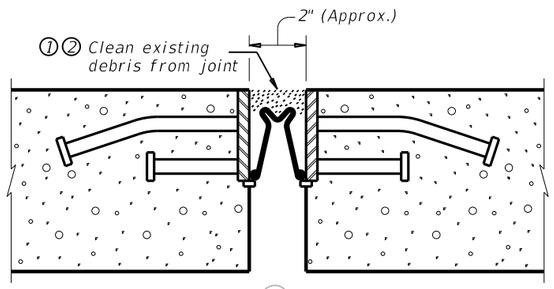
◑ Denotes location for Cleaning Existing SEJ-P

IH 35 NBML OVER FM 1237
345'-0" OVERALL LENGTH
PRESTRESSED CONCRETE U-BEAM UNIT
@ (110', 125', 110') SPANS
58'-0" RDWY.
60'-0" OVERALL
SSTR RAIL (LT)
T1F(MOD) (RT)

GENERAL NOTES:

① REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

② CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



Ⓐ

SECTION THRU SEJ-P JOINT

BELL COUNTY
PROJECT LAYOUT REF BE-4

ESTIMATED QUANTITIES

ITEM	Ⓐ 438-6009
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #589 IH 35 NBML OVER FM 1237	116.0
TOTAL	116.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

IH 35 NBML OVER FM 1237

(STR# 589)

FILE: IH35(NB)FM1237JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT ●	SHEET
REVISIONS	WACO	6	RMC 646063001	52
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\589 BE-4.dgn

LEVELS DISPLAYED
ACC:
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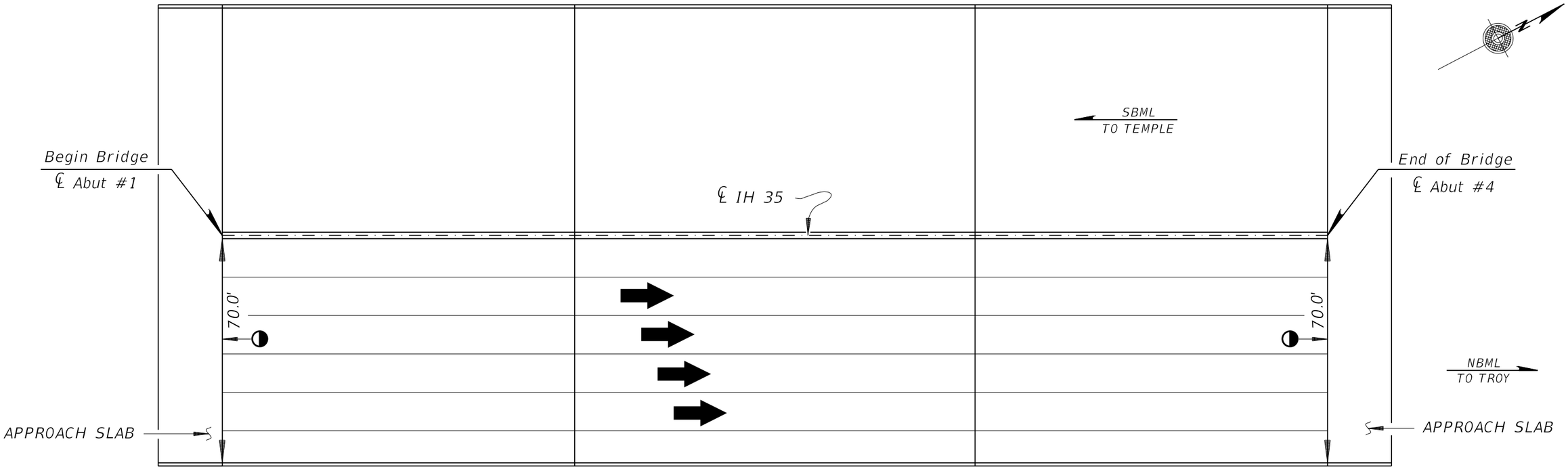


LAYOUT PLAN

IH 35 NBML OVER BERGER/HART RD
(N.B.I.#09-014-0-0015-04-584)
GPS LAT/LON: 31.154570/-97.324077

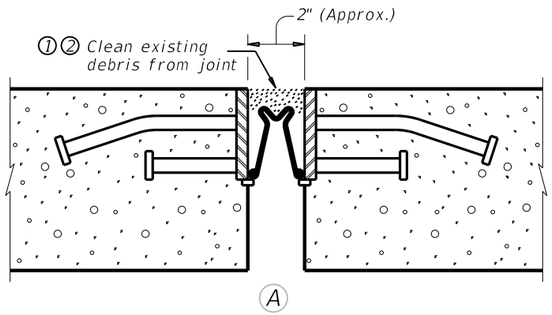
◑ Denotes location for Cleaning Existing SEJ-P

IH 35 NBML OVER BERGER/HART RD
345'-0" OVERALL LENGTH PRESTR CONC U-BEAM UNIT
(@ 110', 125', 110') SPANS
70'-0" RDWY.
72'-0" OVERALL
SSTR RAIL (LT)
T1F(MOD) RAIL (RT)

GENERAL NOTES:

① REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

② CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



Ⓐ

SECTION THRU SEJ-P JOINT

BELL COUNTY
PROJECT LAYOUT REF BE-5

ESTIMATED QUANTITIES

ITEM	Ⓐ 438-6009
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #584 IH 35 NBML OVER BERGER/HART RD	140.0
TOTAL	140.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED
PROFESSIONAL ENGINEER

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

IH 35 NBML OVER BERGER/HART RD

(STR# 584)

FILE: IH35(NB)BERGERJT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	53
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\584 BE-5.dgn

LEVELS DISPLAYED ACC:
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17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
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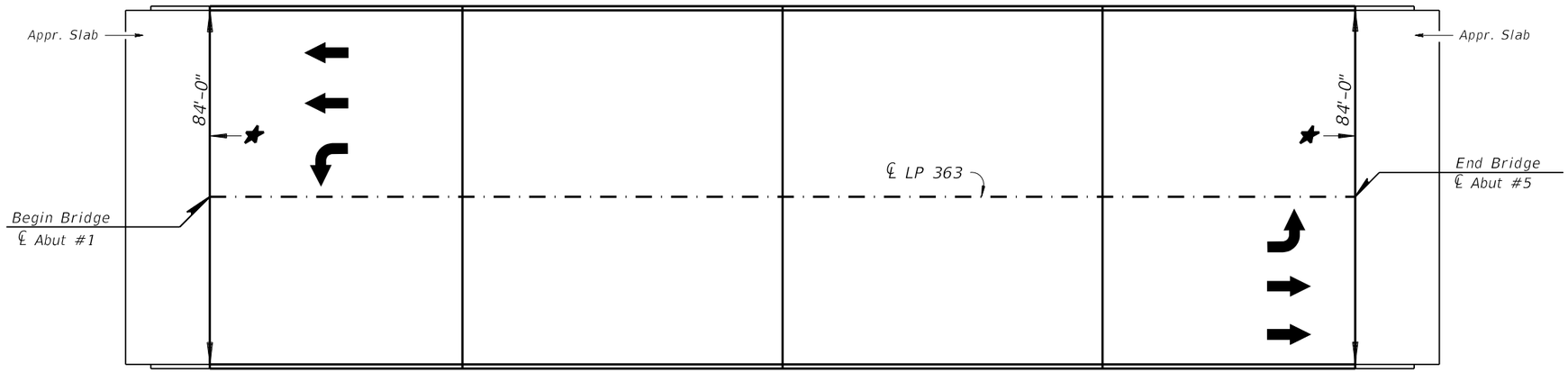
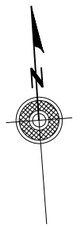
BELL COUNTY
PROJECT LAYOUT REF BE-6





GENERAL NOTE:
"Concrete Chipping" for Joint preparation is subsidiary to Item 454. The additional elastomeric concrete required to fill the spalled area is paid for by Item 454, HEADER TYPE EXPANSION JOINT.

Flexible Pavement Structure Repair will be a 2" D-GR HMA TY C PG64-22 with and underseal. All materials is subsidiary to Item 351

NOTES:

(1) Saw cut overlay to top of deck and remove material to expose existing joint.

(2) Determine condition of concrete on either side of joint opening. The entire length of existing joint must be checked and any portion that is determined unsound by the Engineer must be removed as directed by the Engineer. Chip and remove loose and deteriorated concrete. Do not place elastomeric concrete on surface that is sloped greater than 45° from horizontal. Chip concrete down to obtain surface sloped less than 45° as directed. Do not use chipping hammers heavier than the normal 15-lbs class for concrete removal work. Take care not to increase the maximum depth of the spall.

(3) Surfaces where nosing/header material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.

(4) Match the thickness of the header with the thickness of the overlay. The thickness of the overlay is approximately 2" but may vary. If the thickness of the overlay exceeds 3.25", set the width of the header at one and a half times the thickness of the overlay but should not be greater than 8" unless approved by the Engineer.

(5) Match existing joint opening or set at the minimum shown below or as directed by the Engineer. Do not cantilever header over joint opening.

1" at 70° F when distance between joints is 150 feet or less.
2" at 70° F when distance between joints is greater than 150 feet.

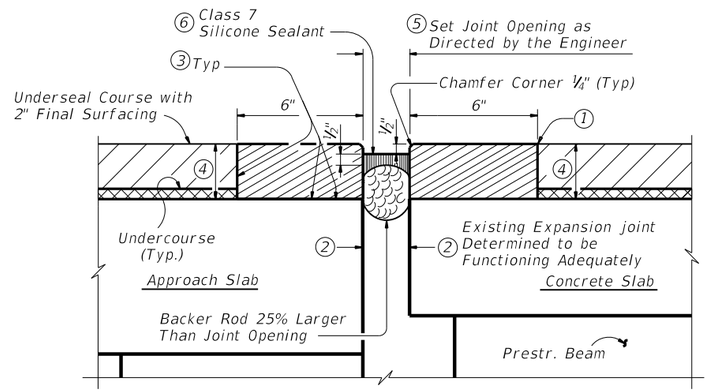
(6) Seal with Class 7 Sealant in accordance with DMS-6310 "Joint Sealants and Fillers". Prepare surfaces where sealant is to be placed in accordance with manufacturer's specifications.

LAYOUT PLAN

LP 363 OVER IH 35
(N.B.I.#09-014-0-0015-04-398)
GPS LAT/LON: 31.138874/-97.329549

✱ Denotes Location for Cleaning and Sealing Header Type Expansion Joints.

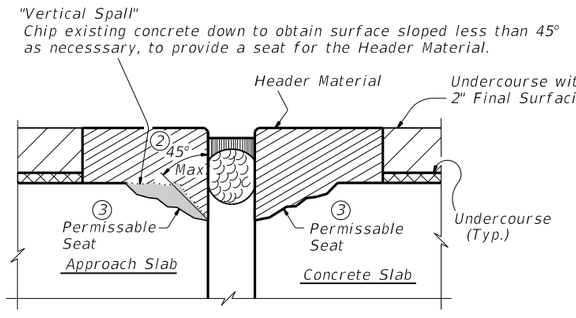
LP 363 OVER IH 35
272'-0" ~ OVERALL LENGTH =
@ (60', 76', 76', 60') PRESTR. CONC. BEAM UNIT
84' ROADWAY
86' OVERALL
TY T4 RAIL



NOT TO SCALE

SECTION THRU NOSING/HEADER AT SEALED EXPANSION JOINT

Ⓐ



NOT TO SCALE

SECTION THRU NOSING/HEADER AT SEALED EXPANSION JOINT

(SHOWING SPALLED SLAB EDGES - TYPICAL)

Ⓐ ESTIMATED QUANTITIES

ITEM	351-6012	438-6009	454-6008	454-6009
LOCATION	FLEXIBLE PAVEMENT STRUCTURE REPAIR (2")	CLEANING EXISTING JOINTS	HEADER TYPE EXPANSION JOINT	JOINT SEALANT
	S.Y.	L.F.	C.F.	L.F.
STR. #046 SH 53 EB OVER BNSF RR	19.0	168.0	28.0	168.0
TOTAL	19.0	168.0	28.0	168.0
	Refer to Item "351"	Refer to Item "438"	Refer to item "454".	

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

LP 363 OVER IH 35

(STR# 398)

FILE: LP363JT.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEPT. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	54
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\398 BE-6.dgn

LEVELS DISPLAYED
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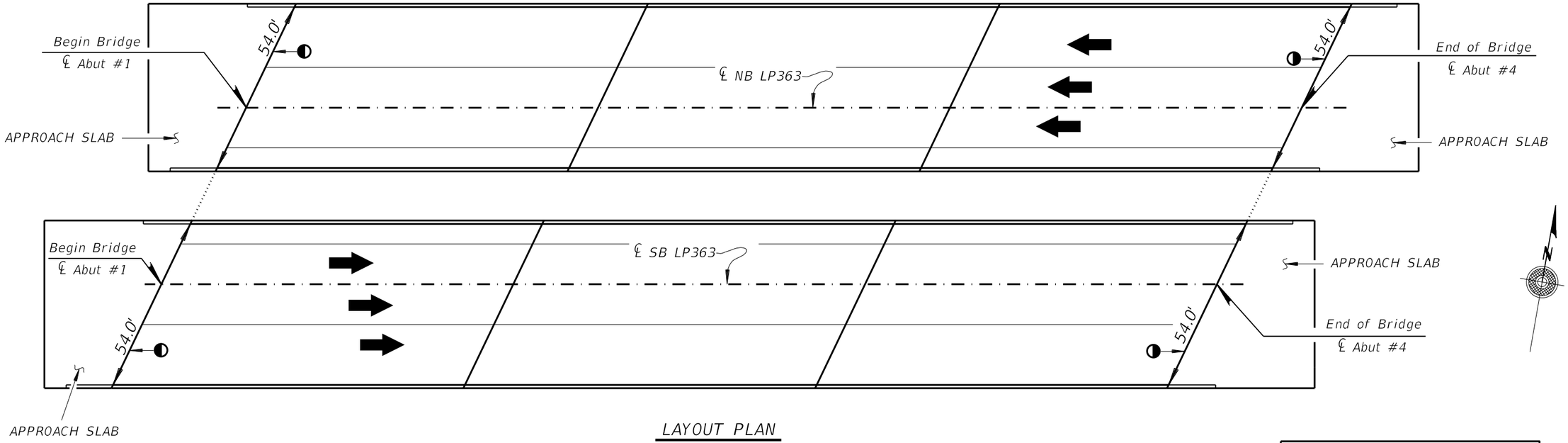
ACC:



◑ Denotes location for Cleaning Existing SEJ-A

LAYOUT PLAN

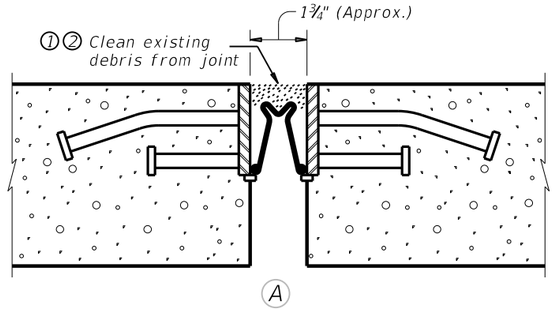
LP 363 NB OVER WENDLAND RD
(N.B.I.#09-014-0-0320-06-403)
&
LP 363 SB OVER WENDLAND RD
(N.B.I.#09-014-0-0320-06-404)
GPS LAT/LON: 31.138947/-97.361395

LP 363 NB & SB OVER WENDLAND RD
315'-0" OVERALL LENGTH
PRESTRESSED CONCRETE GIRDER UNIT
@ (105', 105', 105') SPANS
48'-0" RDWY.
50'-0" OVERALL
T401 RAIL

GENERAL NOTES:

1. REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

2. CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-A JOINT

ESTIMATED QUANTITIES

ITEM	438-6009
	A
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #403 & 404 LP 363 NB & SB WENDLAND RD	216.0
TOTAL	216.0

BELL COUNTY
PROJECT LAYOUT REF BE-7

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

LP 363 NB & SB OVER WENDLAND RD

(STR# 403 & 404)

FILE: LP363WENDRDJT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	55
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\403-404 BE-7.dgn

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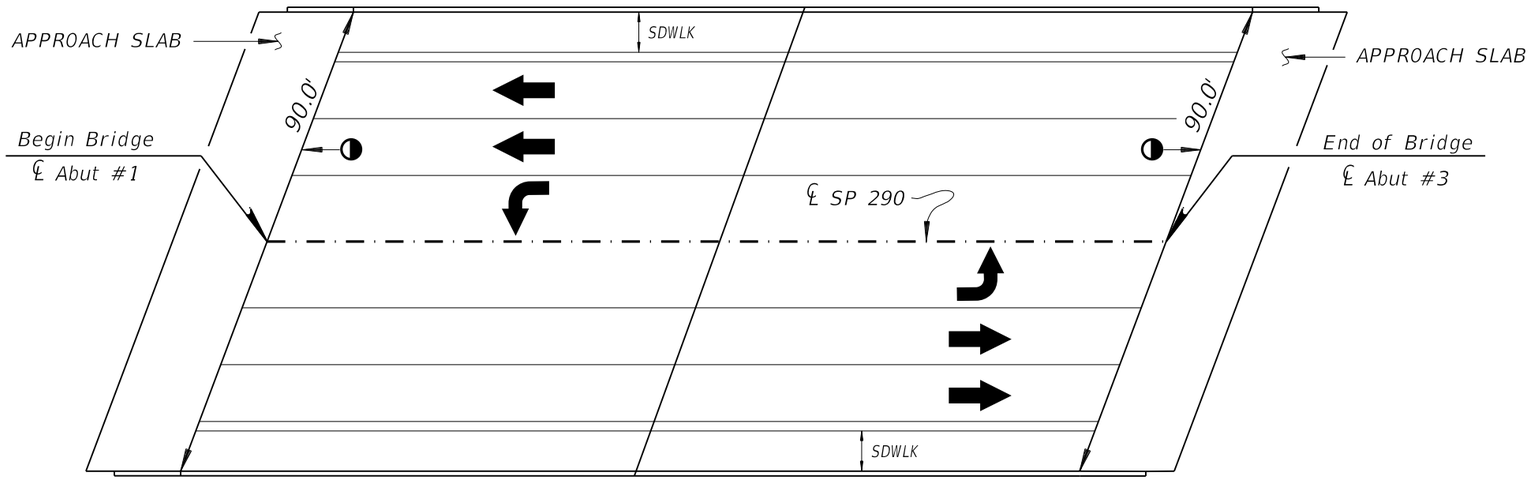
ACC:



LAYOUT PLAN

SP 290 OVER IH 35
(N.B.I.#09-014-0-0015-04-709
GPS LAT/LON: 31.125980/-97.337313

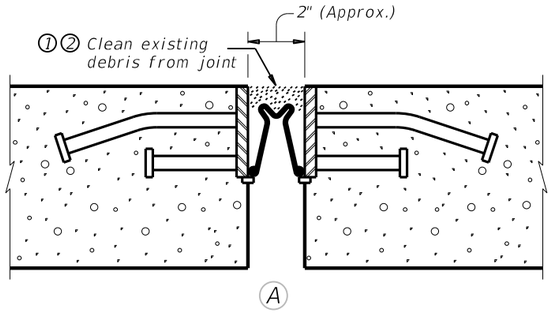
◑ Denotes location for Cleaning Existing SEJ-A

GENERAL NOTES:

(1) REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

(2) CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.

SP 290 OVER IH 35
190'-0" OVERALL LENGTH
PRESTRESSED CONCRETE BEAM UNIT
@ (95', 95') SPANS
76'-0" RDWY.
99'-0" OVERALL
TY C411 RAIL



SECTION THRU SEJ-A JOINT

BELL COUNTY
PROJECT LAYOUT REF BE-8

ESTIMATED QUANTITIES

ITEM	438-6009
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #709 SP 290 OVER IH 35	180.0
TOTAL	180.0

(A)

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED
PROFESSIONAL ENGINEER

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Charles W. Smith, PE, PE 1/22/2024
Signature of Registrant & Date

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

SP 290 OVER IH 35

(STR# 709)

FILE: SP290JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	56
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\709 BE-8.dgn

LEVELS DISPLAYED
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17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
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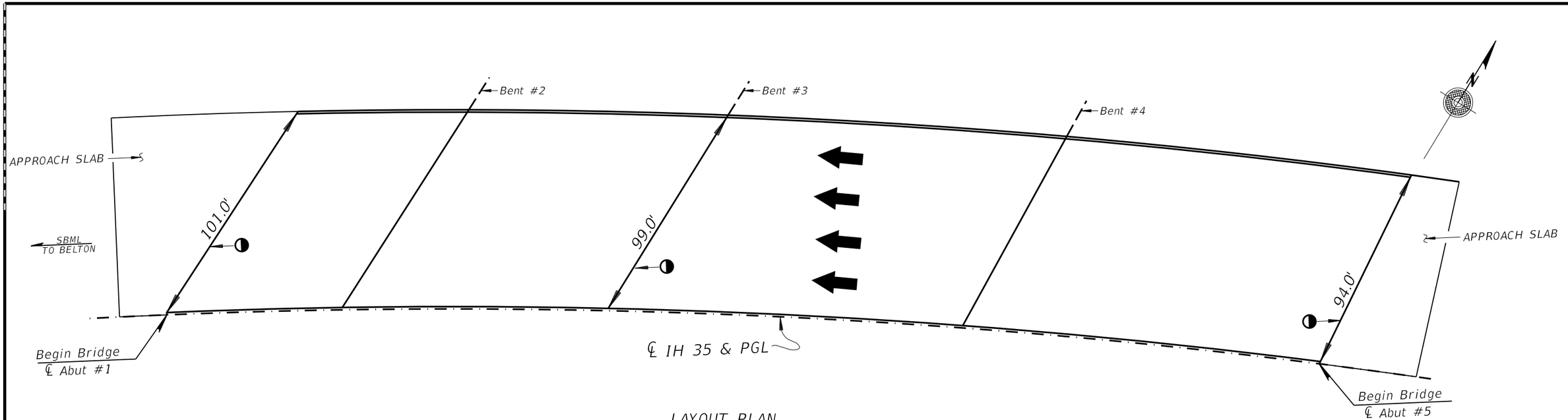
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

ACC:



LAYOUT PLAN

IH 35 SBML OVER BELCO YARD
(N.B.I.#09-014-0-0015-14-704
GPS LAT/LON: 31.123251/-97.349680

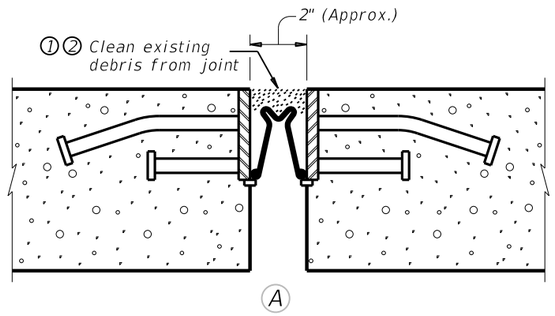
IH 35 SBML OVER BELCO YARD
485-0" OVERALL LENGTH
PRESTRESSED CONCRETE BEAM UNIT
@ (74', 112', 149', 150') SPANS
82'-0" RDWY.
84'-0" OVERALL
T401 RAIL (LEFT)
SSTR RAIL (RIGHT)

◑ Denotes location for Cleaning Existing SEJ-A

GENERAL NOTES:

1. REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

2. CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-A JOINT

BELL COUNTY
PROJECT LAYOUT REF BE-9

ESTIMATED QUANTITIES

ITEM	438-6009 (A)
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #704 IH 35 SBML OVER BELCO YARD	294.0
TOTAL	294.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation
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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

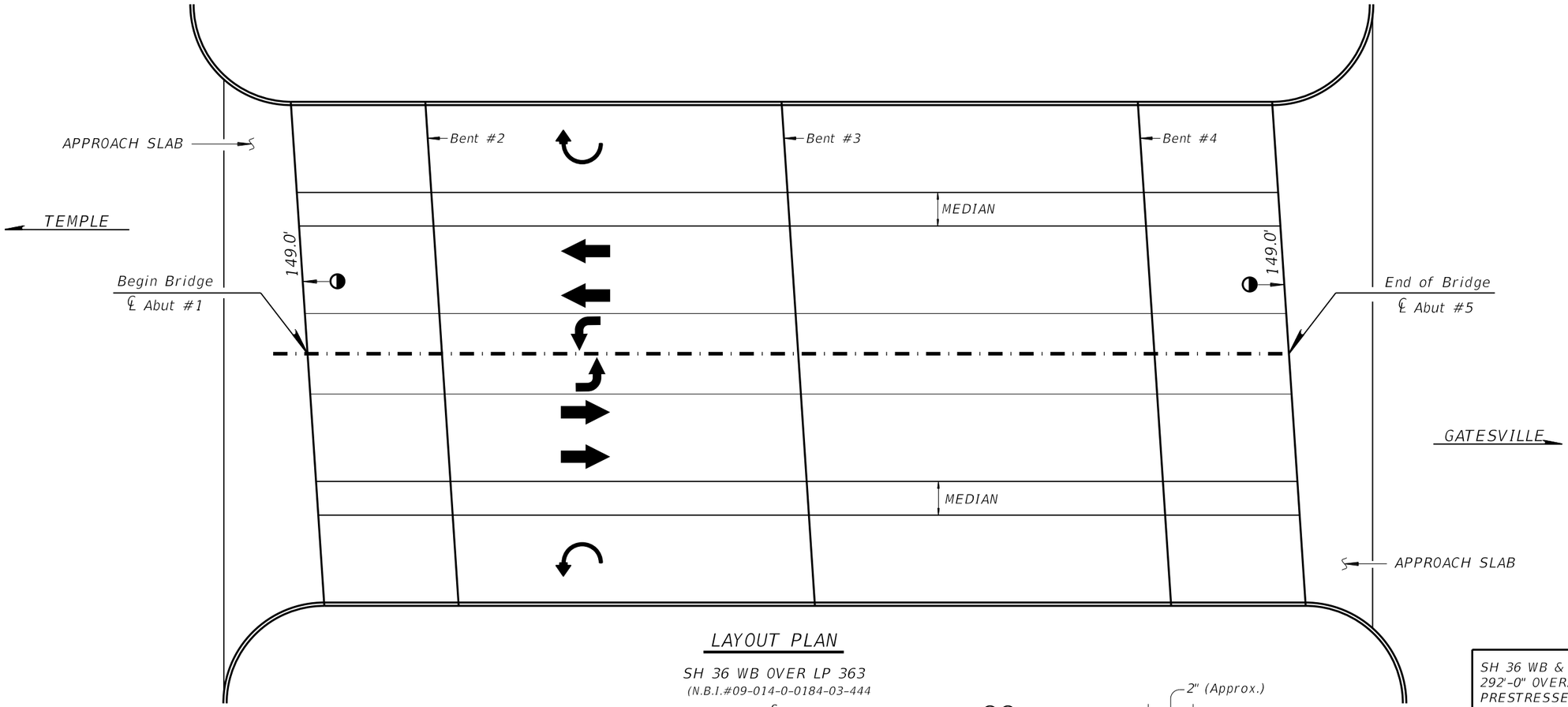
IH 35 SBML OVER BELCO YARD

(STR# 704)

FILE: IH35SBBELCOJT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	57
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\704 BE-9.dgn

LEVELS DISPLAYED ACC:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63



LAYOUT PLAN

SH 36 WB OVER LP 363
(N.B.I.#09-014-0-0184-03-444
&
SH 36 EB OVER LP 363
(N.B.I.#09-014-0-0184-03-445
GPS LAT/LON: 31.118908/-97.384363

◑ Denotes location for Cleaning Existing SEJ-A

GENERAL NOTES:

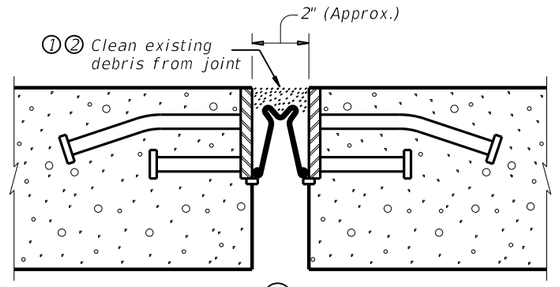
(1) REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

(2) CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.

ESTIMATED QUANTITIES

ITEM	438-6009
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #444 & 445 SH 36 WB & EB OVER LP 363	298.0
TOTAL	298.0

(A)



(A)

SECTION THRU SEJ-A JOINT

SH 36 WB & EB OVER LP 363
292'-0" OVERALL LENGTH
PRESTRESSED CONCRETE GIRDER UNIT
@ (40', 106', 106', 40') SPANS
116'-0" RDWY.
150'-0" OVERALL
TY T411 RAIL

BELL COUNTY
PROJECT LAYOUT REF BE-10

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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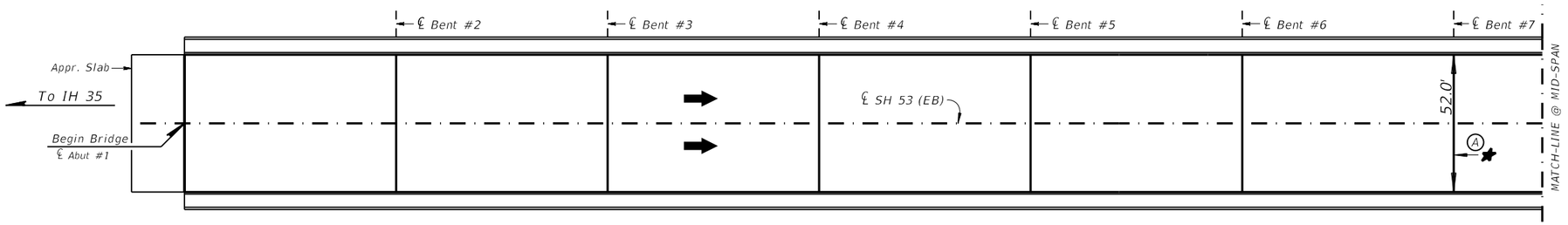
LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

SH 36 WB & EB OVER LP 363

(STR# 444 & 445)

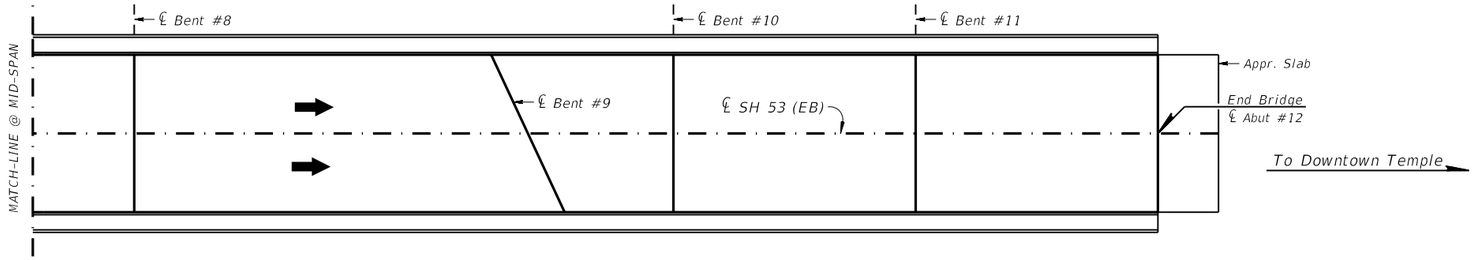
FILE: SH36(LP363)JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT ●	SHEET
REVISIONS	WACO	6	RMC 646063001	58
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 ACC:



BELL COUNTY
PROJECT LAYOUT REF BE-11

SH 53 OVER BSNF RR
885'-0" ~ OVERALL LENGTH =
480' (6 @ 80') PRESTR. CONC. I-BEAM UNIT
245' (67', 130', 48') PRESTR. CONC. I-BEAM UNIT
160' (2 @ 80') PRESTR. CONC. I-BEAM UNIT
52'-0" ROADWAY 2 - 5'-0" SIDEWALKS
Normal and 25 RFS RAIL TYPE T501



LAYOUT PLAN

SH 53 OVER BNSF RR
(N.B.I.#09-014-0-0184-03-046)
GPS LAT/LON: 31.398930/-97.349395

✱ Denotes Location for Cleaning and Sealing Header Type Expansion Joints.

GENERAL NOTE:
"Concrete Chipping" for Joint preparation is subsidiary to Item 454. The additional elastomeric concrete required to fill the spalled area is paid for by Item 454, HEADER TYPE EXPANSION JOINT.

Flexible Pavement Structure Repair will be a 2" D-GR HMA TY C PG64-22 with underseal. All materials is subsidiary to Item 351

NOTES:

(1) Saw cut overlay to top of deck and remove material to expose existing joint.

(2) Determine condition of concrete on either side of joint opening. The entire length of existing joint must be checked and any portion that is determined unsound by the Engineer must be removed as directed by the Engineer. Chip and remove loose and deteriorated concrete. Do not place elastomeric concrete on surface that is sloped greater than 45° from horizontal. Chip concrete down to obtain surface sloped less than 45° as directed. Do not use chipping hammers heavier than the normal 15-lbs class for concrete removal work. Take care not to increase the maximum depth of the spall.

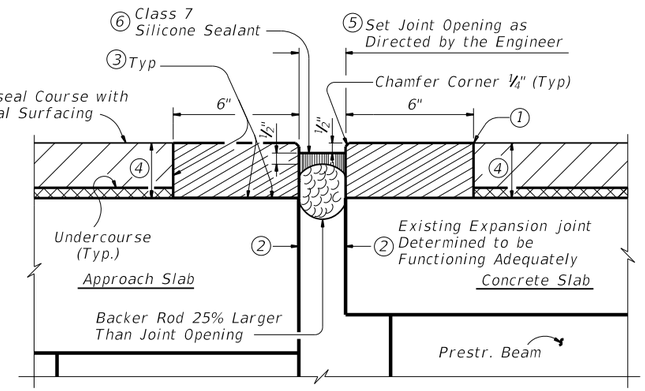
(3) Surfaces where nosing/header material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.

(4) Match the thickness of the header with the thickness of the overlay. The thickness of the overlay is approximately 2" but may vary. If the thickness of the overlay exceeds 3.25", set the width of the header at one and a half times the thickness of the overlay but should not be greater than 8" unless approved by the Engineer.

(5) Match existing joint opening or set at the minimum shown below or as directed by the Engineer. Do not cantilever header over joint opening.

1" at 70° F when distance between joints is 150 feet or less.
2" at 70° F when distance between joints is greater than 150 feet.

(6) Seal with Class 7 Sealant in accordance with DMS-6310 "Joint Sealants and Fillers". Prepare surfaces where sealant is to be placed in accordance with manufacturer's specifications.

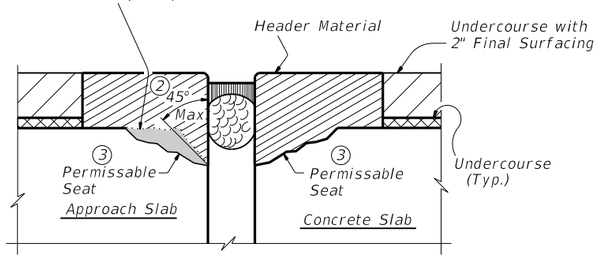


NOT TO SCALE

SECTION THRU NOSING/HEADER AT SEALED EXPANSION JOINT

Ⓐ

"Vertical Spall"
Chip existing concrete down to obtain surface sloped less than 45° as necesssary, to provide a seat for the Header Material.



Showing Pre-Finished Condition — Showing Finished Condition

NOT TO SCALE

SECTION THRU NOSING/HEADER AT SEALED EXPANSION JOINT

(SHOWING SPALLED SLAB EDGES - TYPICAL)

Ⓐ ESTIMATED QUANTITIES

ITEM	351-6012	438-6009	454-6008	454-6009
LOCATION	FLEXIBLE PAVEMENT STRUCTURE REPAIR (2")	CLEANING EXISTING JOINTS	HEADER TYPE EXPANSION JOINT	JOINT SEALANT
	S.Y.	L.F.	C.F.	L.F.
STR. #046 SH 53 EB OVER BNSF RR	6.0	52.0	9.0	52.0
TOTAL	6.0	52.0	9.0	52.0
	Refer to Item "351"	Refer to Item "438"	Refer to item "454".	

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Signature of Registrant & Date

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

(SH 53 EB OVER BNSF RR)

(STR# 046)

FILE: 046SH53JTREP.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEPT. 2023	DIST	FED REG	MAINTENANCE PROJECT ●	SHEET
REVISIONS	WACO	6	RMC 646063001	59
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\046 BE-11.dgn

LEVELS DISPLAYED
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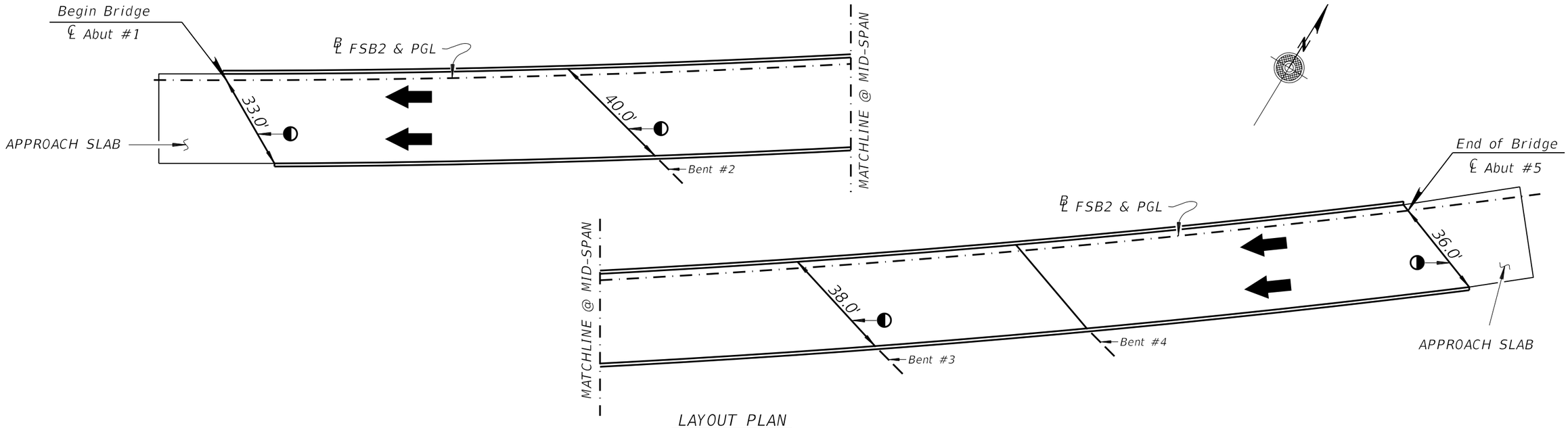
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
ACC:



LAYOUT PLAN

IH 35 SBFR OVER BNSF RAILROAD
(N.B.I.#09-014-0-0015-14-695
GPS LAT/LON: 31.098090/-97.364634

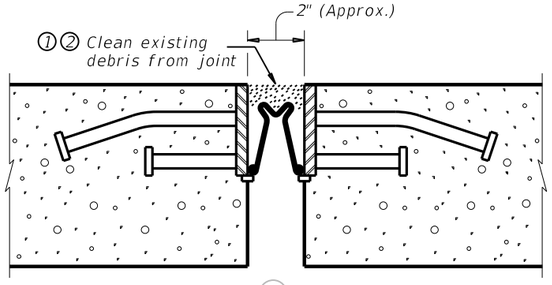
IH 35 SBFR OVER BNSF RAILROAD
447-0" OVERALL LENGTH
PRESTRESSED CONCRETE BEAM UNIT
@ (107.8', 150', 68.2', 121') SPANS
28'-0" RDWY.
30'-0" OVERALL
T401 RAIL

◑ Denotes location for Cleaning Existing SEJ-A

GENERAL NOTES:

1. REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

2. CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-A JOINT

BELL COUNTY
PROJECT LAYOUT REF BE-12

ESTIMATED QUANTITIES

ITEM	438-6009
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #695 IH 35 SBFR OVER BNSF RAILROAD	147.0
TOTAL	147.0

(A)

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

IH 35 SBFR OVER BNSF RAILROAD

(STR# 695)

FILE: IH35SBFR(BNSF)JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	60
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\695 BE-12.dgn

LEVELS DISPLAYED
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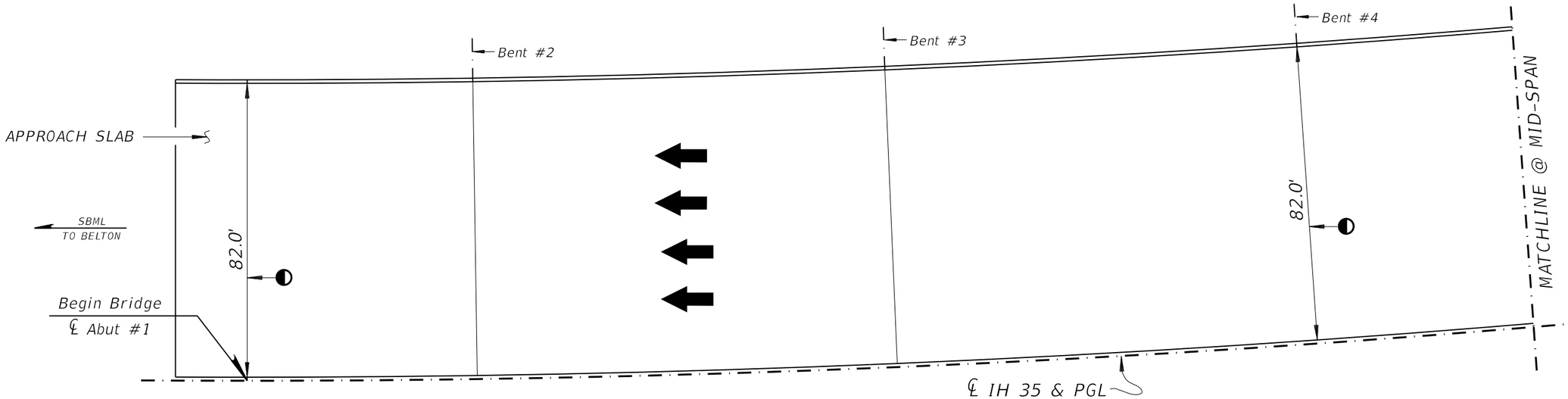
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
ACC:



LAYOUT PLAN

IH 35 SBML OVER BNSF RAILROAD
(N.B.I.#09-014-0-0015-14-697
GPS LAT/LON: 31.099186/-97.326684

◐ Denotes location for Cleaning Existing SEJ-P

IH 35 SBML OVER BNSF RAILROAD
1739-0" OVERALL LENGTH
PRESTRESSED CONCRETE BEAM UNIT
@ (63', 4 @ 115', 5 @ 116', 95', 118', 93.5', 141', 91.5', 97') SPANS
RDWY VARIES FROM 84' TO 89'-1½"
OVERALL VARIES FROM 82' TO 87'-1½"
T401 RAIL (LEFT)
SSTR RAIL (RIGHT)

BELL COUNTY
PROJECT LAYOUT REF BE-13

SHEET 1 OF 4

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

IH 35 SBML OVER BNSF RAILROAD

(STR# 697)

FILE: IH35SBFR(BNSF)JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	61
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\697 BE-13.dgn

LEVELS DISPLAYED
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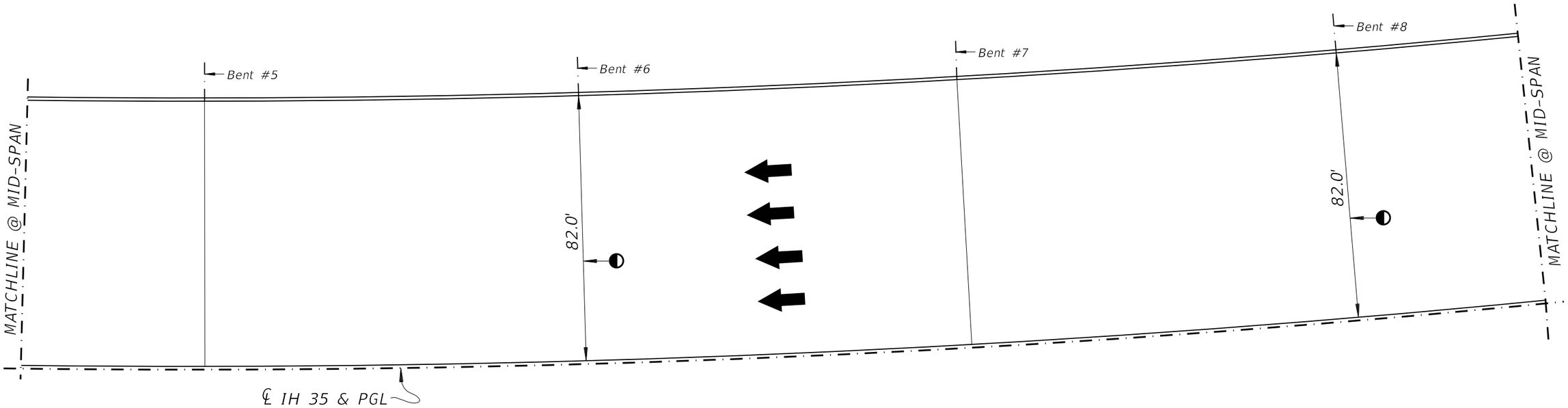

LAYOUT PLAN

IH 35 SBML OVER BNSF RAILROAD
(N.B.I.#09-014-0-0015-14-697

GPS LAT/LON: 31.099186/-97.326684

◐ Denotes location for Cleaning Existing SEJ-P

IH 35 SBML OVER BNSF RAILROAD
1739-0" OVERALL LENGTH
PRESTRESSED CONCRETE BEAM UNIT
@ (63', 4 @ 115', 5 @ 116', 95', 118', 93.5', 141', 91.5', 97') SPANS
RDWY VARIES FROM 84' TO 89'-1½"
OVERALL VARIES FROM 82' TO 87'-1½"
T401 RAIL (LEFT)
SSTR RAIL (RIGHT)

STATE OF TEXAS
CHARLES W. SMITH
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BELL COUNTY
PROJECT LAYOUT REF BE-13

SHEET 2 OF 4

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LAYOUT & DETAILS
FOR CLEANING AND SEALING
EXPANSION JOINTS
IH 35 SBML OVER BNSF RAILROAD

(STR# 697)

FILE: IH35SBFR(BNSF)JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	62
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\697 BE-13A.dgn

LEVELS DISPLAYED
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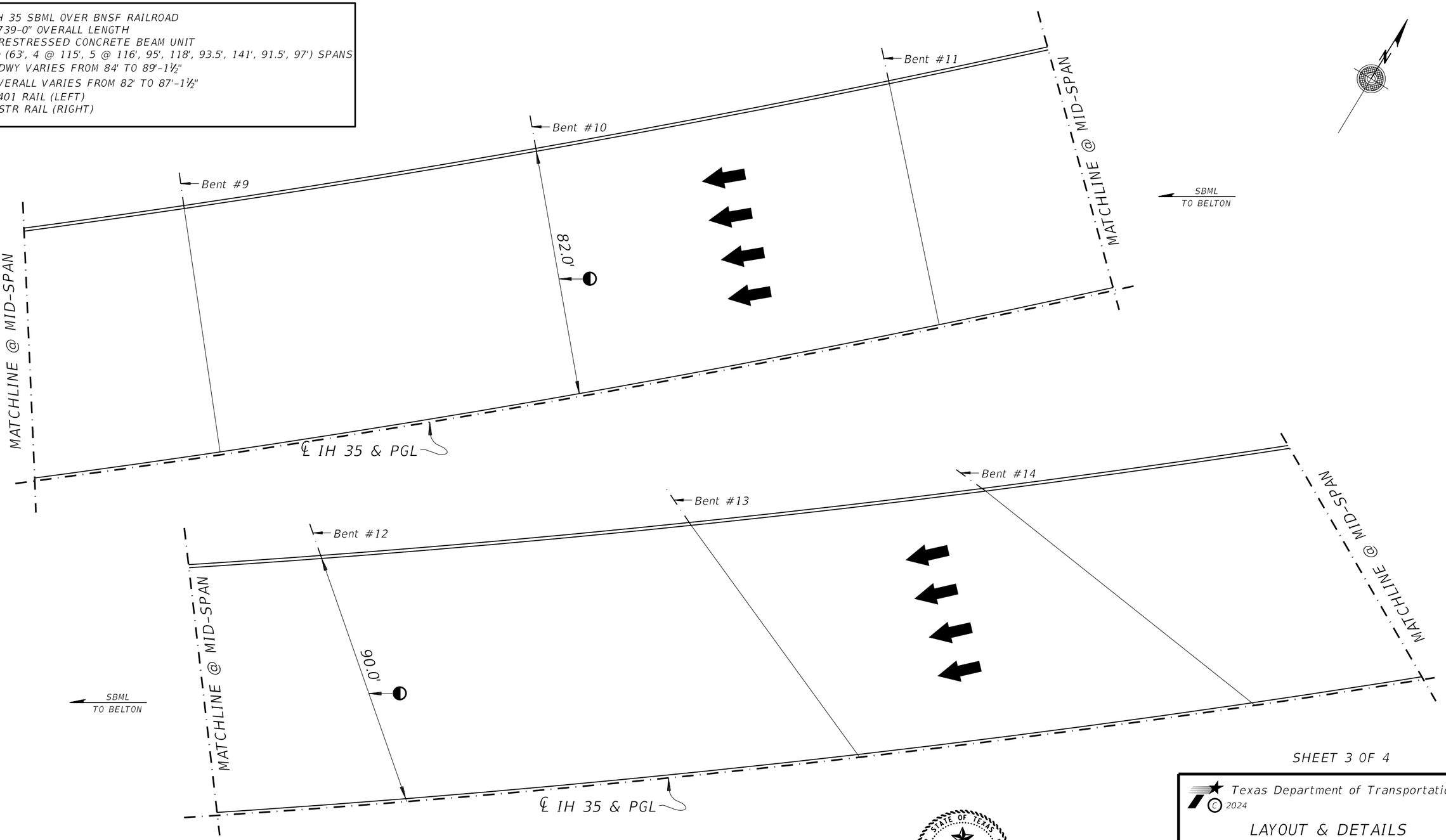
ACC:

IH 35 SBML OVER BNSF RAILROAD
1739-0" OVERALL LENGTH
PRESTRESSED CONCRETE BEAM UNIT
@ (63', 4 @ 115', 5 @ 116', 95', 118', 93.5', 141', 91.5', 97') SPANS
RDWY VARIES FROM 84' TO 89'-1½"
OVERALL VARIES FROM 82' TO 87'-1½"
T401 RAIL (LEFT)
SSTR RAIL (RIGHT)



◐ Denotes location for Cleaning Existing SEJ-P

BELL COUNTY
PROJECT LAYOUT REF BE-13

LAYOUT PLAN

IH 35 SBML OVER BNSF RAILROAD
(N.B.I.#09-014-0-0015-14-697
GPS LAT/LON: 31.099186/-97.326684

STATE OF TEXAS
CHARLES W. SMITH
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SHEET 3 OF 4

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

IH 35 SBML OVER BNSF RAILROAD

(STR# 697)

FILE: IH35SBFR(BNSF)JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	63
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\697 BE-13B.dgn

LEVELS DISPLAYED
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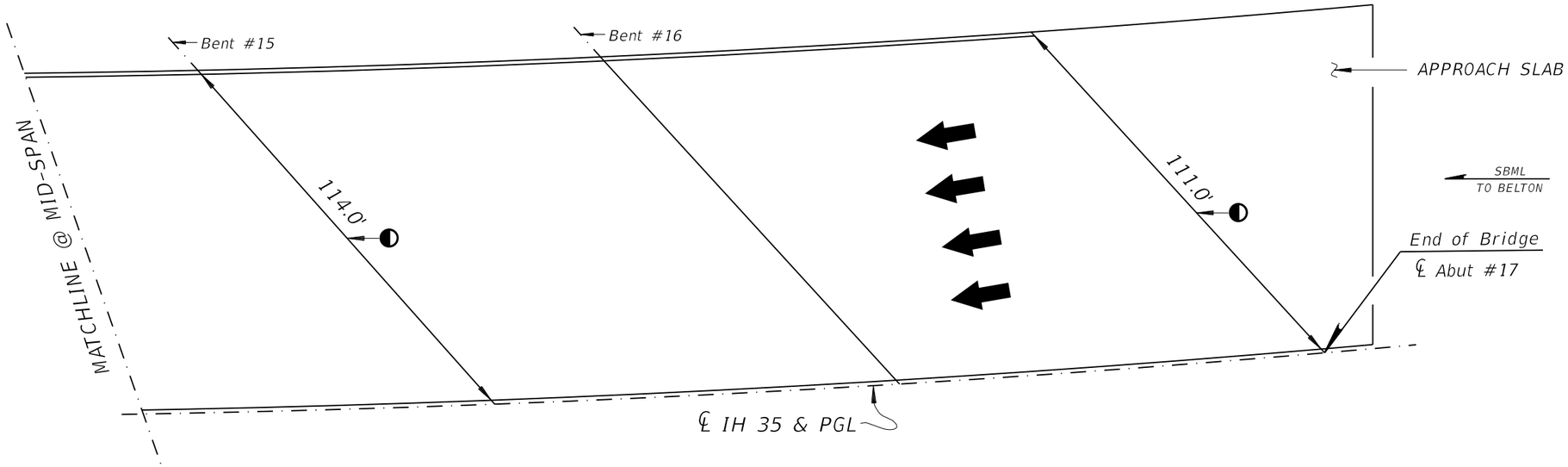
ACC:



LAYOUT PLAN

IH 35 SBML OVER BNSF RAILROAD
(N.B.I.#09-014-0-0015-14-697
GPS LAT/LON: 31.099186/-97.326684

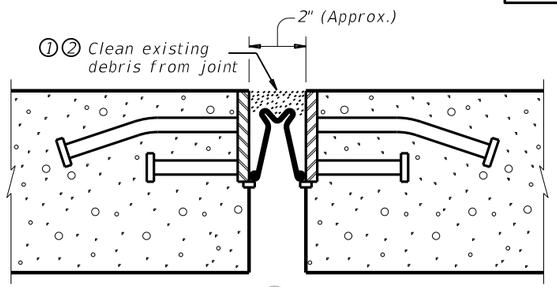
◐ Denotes location for Cleaning Existing SEJ-P

IH 35 SBML OVER BNSF RAILROAD
1739-0" OVERALL LENGTH
PRESTRESSED CONCRETE BEAM UNIT
@ (63', 4 @ 115', 5 @ 116', 95', 118', 93.5', 141', 91.5', 97') SPANS
RDWY VARIES FROM 84' TO 89'-1½"
OVERALL VARIES FROM 82' TO 87'-1½"
T401 RAIL (LEFT)
SSTR RAIL (RIGHT)

GENERAL NOTES:

(1) REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

(2) CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



Ⓐ

SECTION THRU SEJ-P JOINT

ESTIMATED QUANTITIES

Ⓐ

ITEM	438-6009
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #695 IH 35 SBFR OVER BNSF RAILROAD	725.0
TOTAL	725.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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BELL COUNTY
PROJECT LAYOUT REF BE-13

SHEET 4 OF 4

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LAYOUT & DETAILS
FOR CLEANING AND SEALING
EXPANSION JOINTS
IH 35 SBML OVER BNSF RAILROAD

(STR# 697)

FILE: IH35SBFR(BNSF)JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	64
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\697 BE-13c.dgn

LEVELS DISPLAYED
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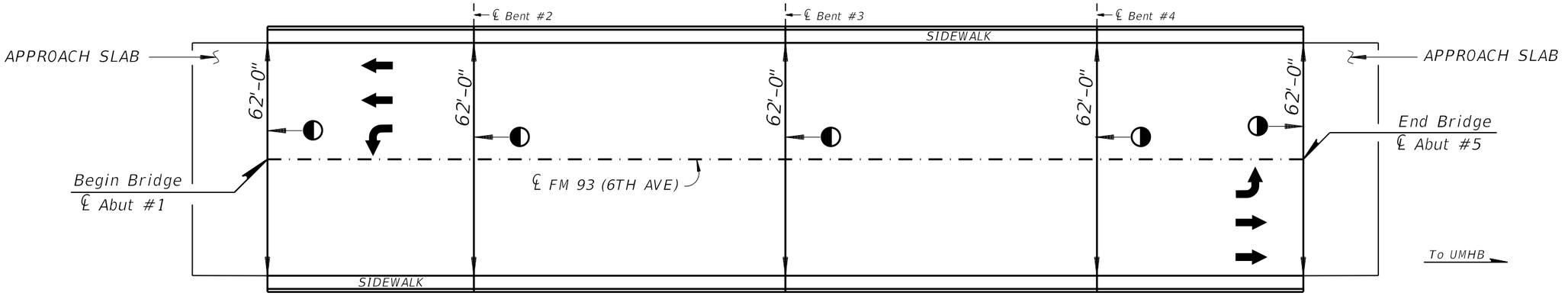
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
ACC:



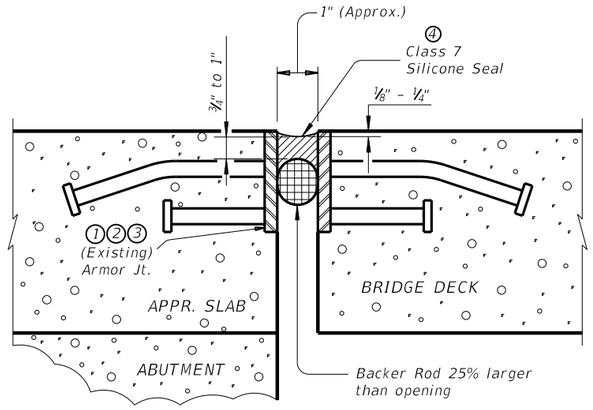
LAYOUT PLAN

FM 93 (6TH AVE) OVER IH 35

(N.B.I.#09-014-0-0015-14-338)

GPS LAT/LON: 31.056497/-97.446426

◑ Denotes location for Cleaning Existing Armor Joints



SECTION THRU EXPANSION JOINT

Ⓐ

FM 93 (6TH AVE) OVER IH 35
276'-0" ~ OVERALL LENGTH =
@ (55', 83, 83, 55) PRESTR. CONC. BEAM UNIT
70'-6" OVERALL
62' ROADWAY
TY C4(MOD) RAIL

BELL COUNTY
PROJECT LAYOUT REF BE-14

NOTES:

① The joints shall be cleaned in accordance with Item 438 and prior to beginning operations, the Contractor shall submit a statement from the Sealant Manufacturer showing the recommended equipment and Installation procedures to be used.

② Condition of existing expansion joint or rail shall be determined prior to placing sealant material. The entire length of existing joint shall be checked and any portion that is determined unsound, shall be removed as directed. Any existing seal shall be removed and disposed of.

Repair any significant spalled or cracked areas, as determined and directed, around the joint opening with an approved proprietary concrete repair material as approved and directed. This work will not be paid for directly, but shall be considered subsidiary to Item 438.

③ Surfaces where sealant material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.

④ Seal when required and as directed. Extend sealant up into rail or curb 6 inches on low side or sides of deck. Prepare surfaces where sealant is to be placed in accordance with manufacturers specifications.

If the self-leveling sealant cannot be extended up into the rail, use a Class 4 Sealant in the curb or rail portion only.

ESTIMATED QUANTITIES

ITEM	438-6004
LOCATION	CLEANING AND SEALING EXISTING JOINTS (CL 7)
	L.F.
STR. #338 FM 93 (6TH AVE) OVER IH 35	310.0
TOTAL	310.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Signature of Registrant & Date

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

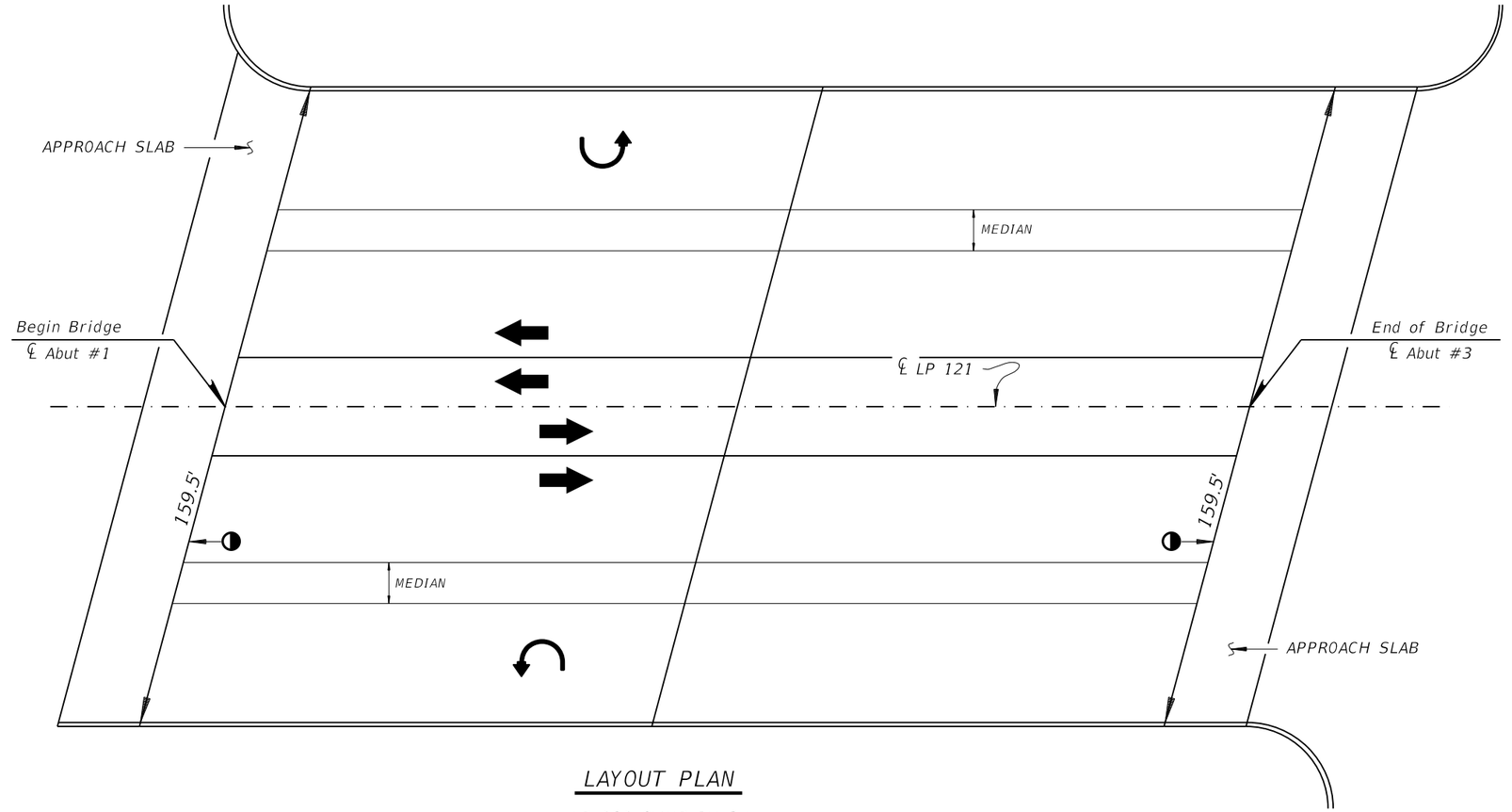
FM 93 (6TH AVE) OVER IH 35

(STR.#338)

FILE: FM93(6THAVE)JTS.DGN	DN: DOT	CK: DOT	DW:	CK: DOT
ORIG DATE: SEPT 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	65
	COUNTY	CONTROL	SECT JOB	HIGHWAY
	HILL,ETC	6460	63 001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\338 BE-14.dgn

LEVELS DISPLAYED
ACC:



LAYOUT PLAN

LP 121 OVER IH 35
(N.B.I.#09-014-0-0015-06-530
GPS LAT/LON: 31.030600/-97.473499

◑ Denotes location for Cleaning Existing SEJ-A

GENERAL NOTES:

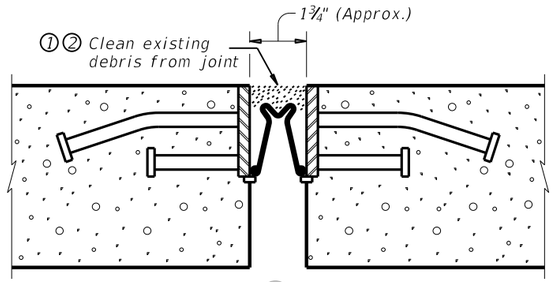
① REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

② CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.

ESTIMATED QUANTITIES

Ⓐ

ITEM	438-6009
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #530 LP 121 OVER IH 35	319.0
TOTAL	319.0



Ⓐ

SECTION THRU SEJ-A JOINT

BELL COUNTY
PROJECT LAYOUT REF BE-15

LP 121 OVER IH 35
250'-0" OVERALL LENGTH
PRESTRESSED CONCRETE GIRDER UNIT
@ (125', 125') SPANS
122'-0" RDWY.
156'-0" OVERALL
TY T401 RAIL

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

LP 121 OVER IH 35

(STR# 530)

FILE: LP121JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	66
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\530 BE-15.dgn

LEVELS DISPLAYED
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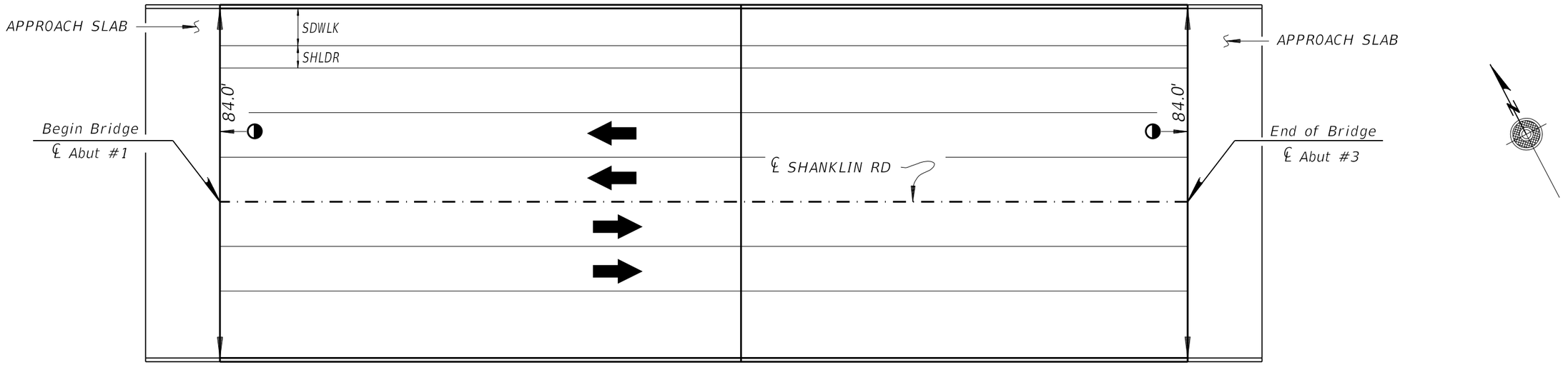
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

ACC:



LAYOUT PLAN

SHANKLIN RD OVER IH 35
(N.B.I.#09-014-0-0015-06-531
GPS LAT/LON: 31.015171/-97.482443

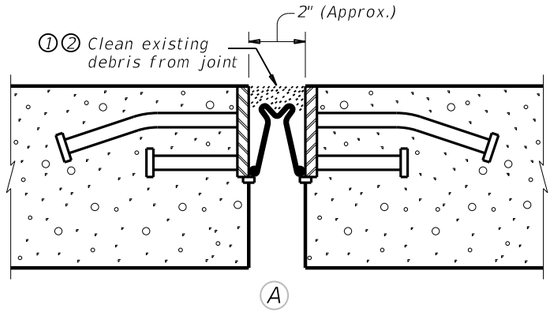
SHANKLIN RD OVER IH 35
260'-0" OVERALL LENGTH
PRESTRESSED CONCRETE GIRDER UNIT
@ (140', 120') SPANS
84'-0" RDWY.
96'-0" OVERALL
TY C402 RAIL (LT)
TY C401 RAIL (RT)

◑ Denotes location for Cleaning Existing SEJ-A

GENERAL NOTES:

① REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

② CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-A JOINT

BELL COUNTY
PROJECT LAYOUT REF BE-16

ESTIMATED QUANTITIES

ITEM	438-6009 (A)
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #531 SHANKLIN RD OVER IH 35	168.0
TOTAL	168.0

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

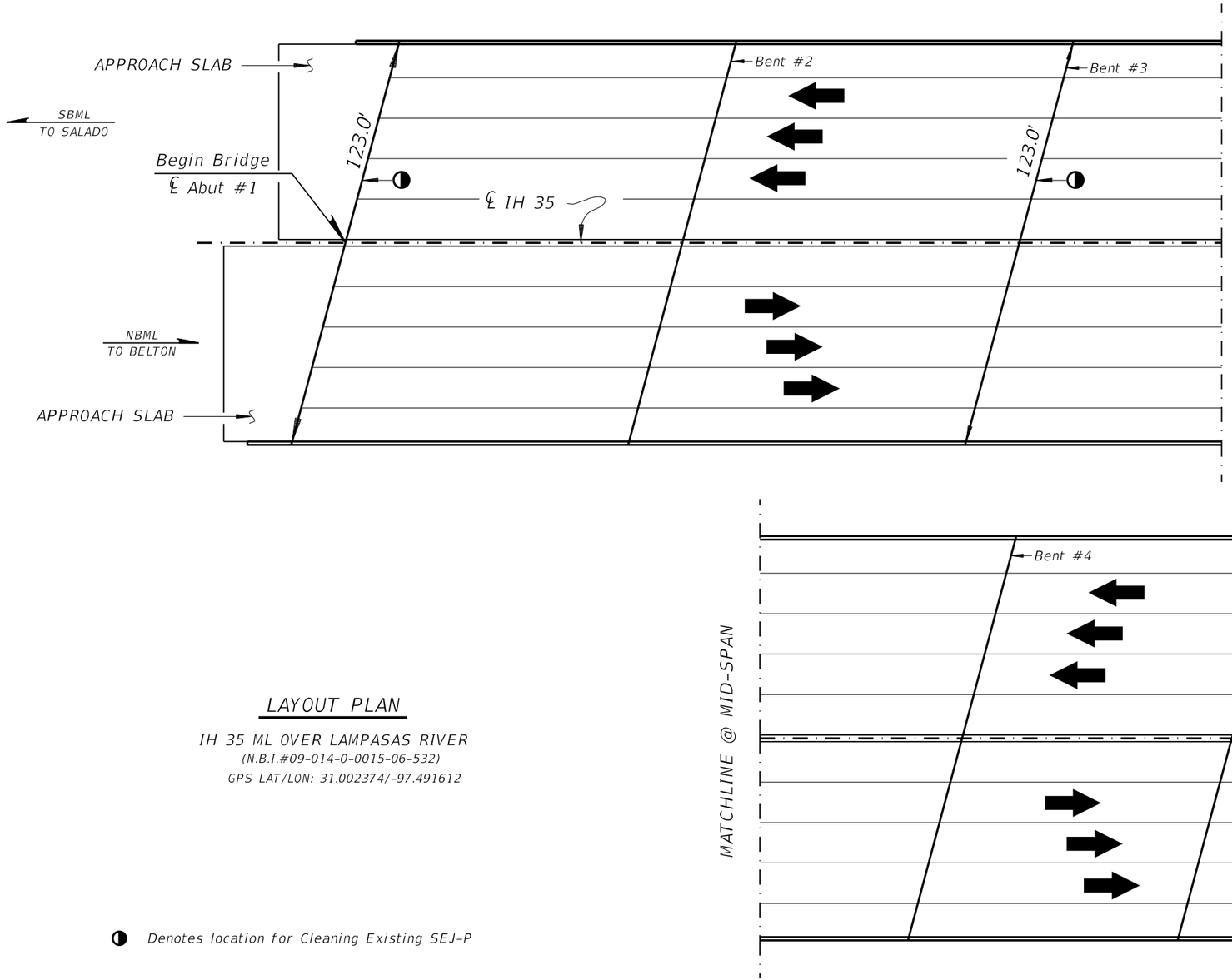
SHANKLIN RD OVER IH 35

(STR# 531)

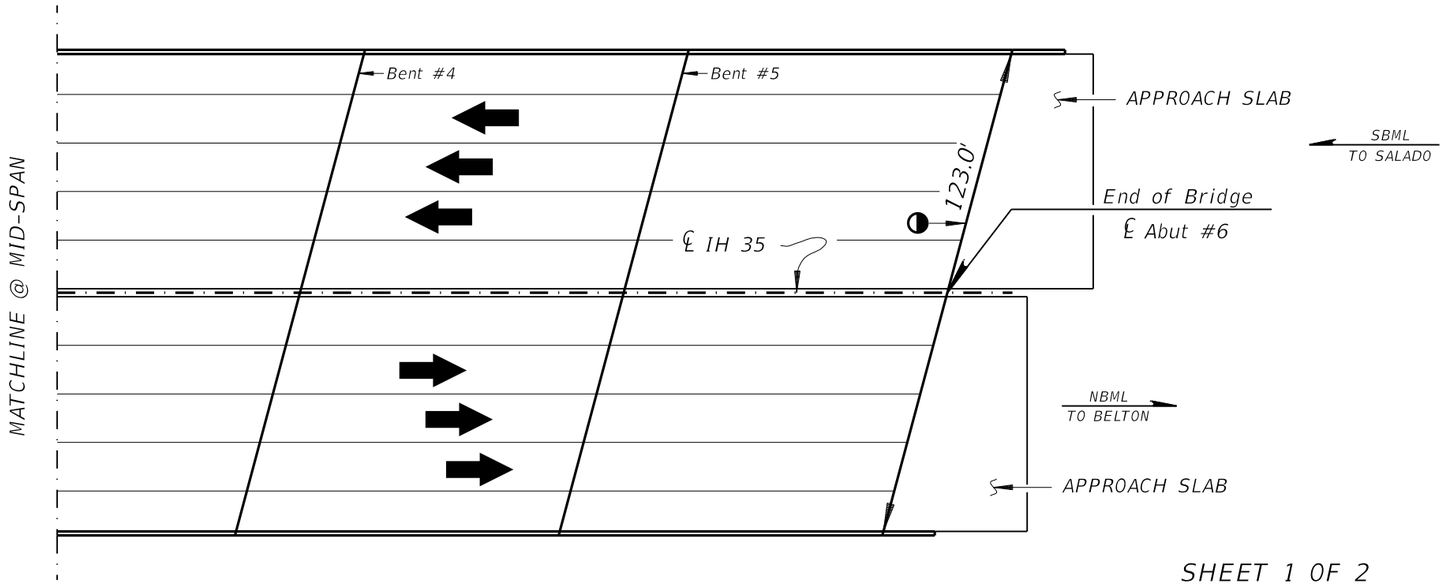
FILE: SHANKLINRDJT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	67
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\531 BE-16.dgn

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
ACC:



IH 35 NBML OVER LAMPASAS RIVER
480'-0" OVERALL LENGTH
PRESTRESSED CONCRETE GIRDER UNIT
@ (100', 100', 120', 80', 80') SPANS
118'-0" RDWY.
120'-0" OVERALL
TY SSCB (CL IH35)
TY T223 (MOD0 RAIL (LT & RT)



LAYOUT PLAN

IH 35 ML OVER LAMPASAS RIVER
(N.B.I.#09-014-0-0015-06-532)
GPS LAT/LON: 31.002374/-97.491612

◑ Denotes location for Cleaning Existing SEJ-P

BELL COUNTY
PROJECT LAYOUT REF BE-17

SHEET 1 OF 2

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

IH 35 ML OVER LAMPASAS RIVER

(STR# 532)

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FILE: IH35(LAMPASAS)JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT ●	SHEET
REVISIONS	WACO	6	RMC 646063001	68
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\532 BE-17.dgn

LEVELS DISPLAYED
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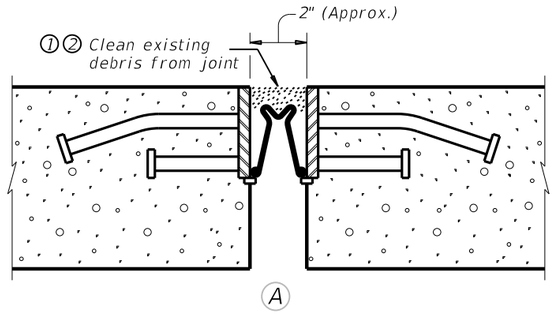
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
ACC:

◑ *Denotes location for Cleaning Existing SEJ-P*

GENERAL NOTES:

1. *REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.*

2. *CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.*



A

SECTION THRU SEJ-P JOINT

ESTIMATED QUANTITIES

Ⓐ

ITEM	*438-6009*
LOCATION	*CLEANING EXISTING JOINTS*
	L.F.
STR. #532 IH 35 ML OVER LAMPASAS RIVER	*369.0*
TOTAL	*369.0*

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

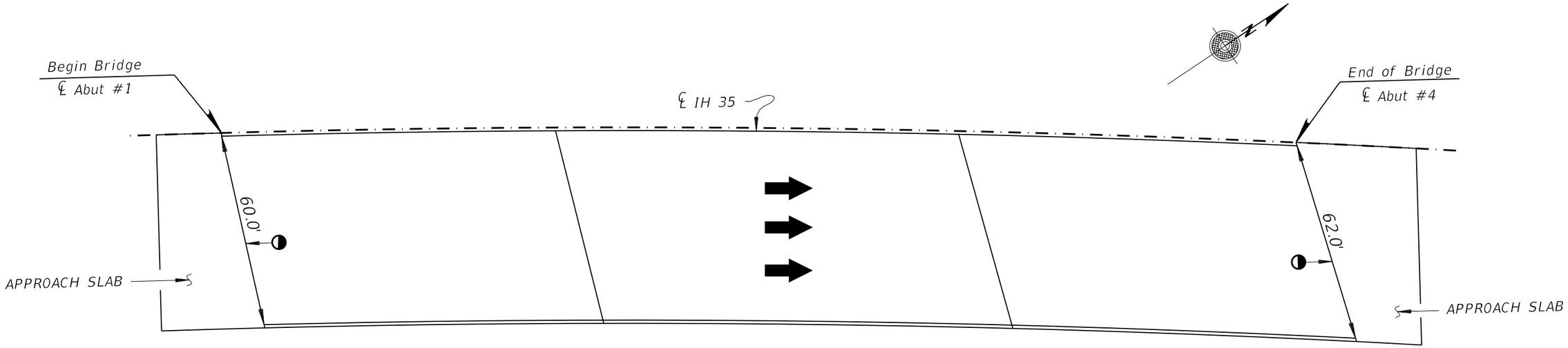
IH 35 ML OVER LAMPASAS RIVER

(STR# 532)

FILE: IH35(LAMPASAS)JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	69
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\532 BE-17A.dgn

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
ACC:



LAYOUT PLAN

IH 35 NB SALADO PLAZA DR
(N.B.I.#09-014-0-0015-07-552
GPS LAT/LON: 31.956126/-97.535413

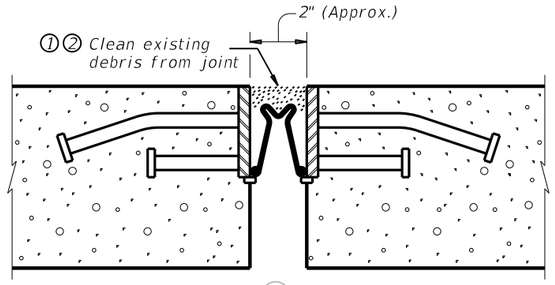
IH 35 NBML OVER SALADO PLAZA DR
328.81' OVERALL LENGTH
PRESTRESSED CONCRETE GIRDER UNIT
@ (102.16', 123.28', 103.37') SPANS
57'-11½" RDWY.
60'-0" OVERALL
T223(MOD) RAIL (RT)
SSTR(MOD) (LT)

◑ Denotes location for Cleaning Existing SEJ-P

GENERAL NOTES:

① REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

② CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-P JOINT

BELL COUNTY
PROJECT LAYOUT REF BE-18

ESTIMATED QUANTITIES

ITEM	438-6009 (A)
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #552 IH 35 NB OVER SALADO PLAZA DR	122.0
TOTAL	122.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

IH 35 NB OVER SALADO PLAZA DR

(STR# 552)

FILE: IH35NBSALADOPLAZA.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT ●	SHEET
REVISIONS	WACO	6	RMC 646063001	70
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\552 BE-18.dgn

LEVELS DISPLAYED ACC:
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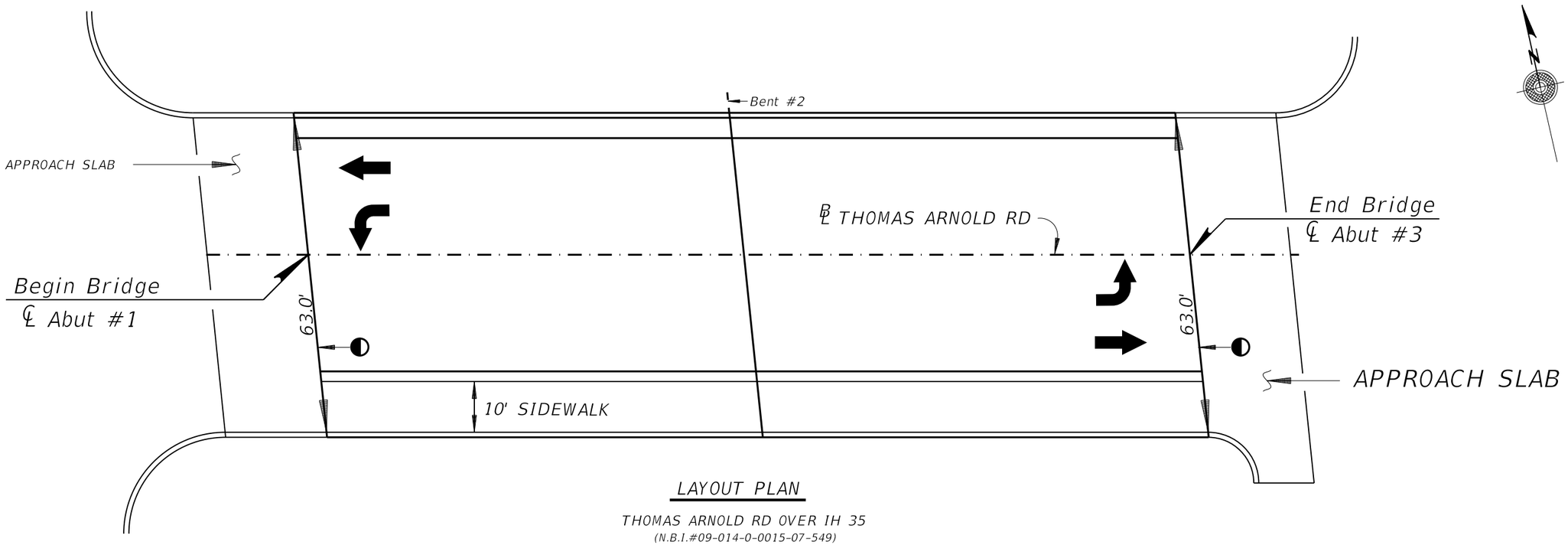
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63



LAYOUT PLAN

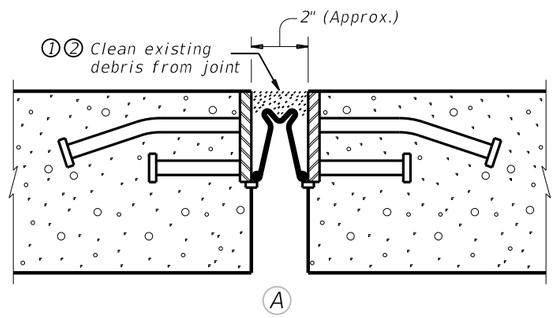
THOMAS ARNOLD RD OVER IH 35
(N.B.I.#09-014-0-0015-07-549)
GPS LAT/LON: 30.947138/-97.538733

◐ Denotes location for Cleaning Existing SEJ-A

GENERAL NOTES:

(1) REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

(2) CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-A JOINT

ESTIMATED QUANTITIES

ITEM	438-6009 (A)
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #549 THOMAS ARNOLD DR OVER IH 35	126.0
TOTAL	126.0

THOMAS ARNOLD RD OVER IH 35
174'-0" OVERALL LENGTH
(86', 88') PRESTR. CONCRETE BOX BEAM SPANS 6° LFS
52'-0" RDWY.
64'-0" OVERALL
T223 (MOD) RAIL LT
C233 (MOD) RAIL RT

BELL COUNTY
PROJECT LAYOUT REF BE-19

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

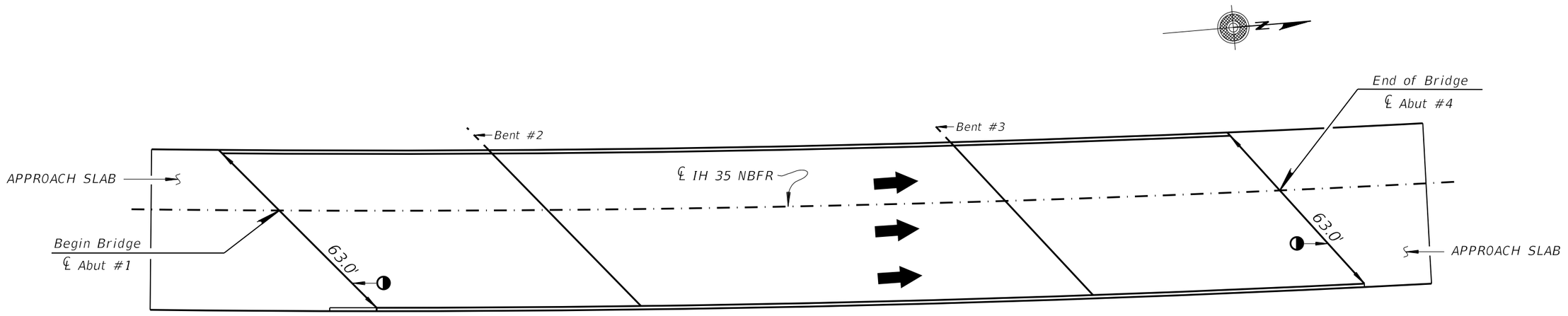
THOMAS ARNOLD DR OVER IH 35

(STR# 549)

FILE: THOMASARNOLDJTS.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	71
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\549 BE-19.dgn

LEVELS DISPLAYED
ACC:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63



LAYOUT PLAN

IH 35 NBFR OVER IH 35 NB OFF-RAMP
(N.B.I.#09-014-0-0015-07-545)
GPS LAT/LON: 30.935126/-97.540153

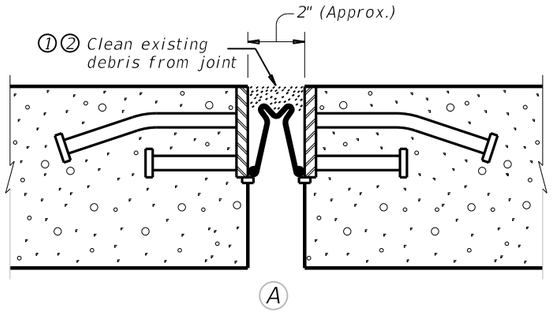
IH 35 NBFR OVER IH 35 NB OFF-RAMP
295'-0" OVERALL LENGTH
PRESTRESSED CONCRETE GIRDER UNIT
@ (79', 135', 81') SPANS
44'-0" RDWY.
46-6" OVERALL
T223 (MOD) RAIL

◑ Denotes location for Cleaning Existing SEJ-P

GENERAL NOTES:

(1) REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

(2) CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-P JOINT

BELL COUNTY
PROJECT LAYOUT REF BE-20

ESTIMATED QUANTITIES

ITEM	438-6009 (A)
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #545 IH 35 NBFR OVER IH 35 NB OFF-RAMP	126.0
TOTAL	126.0

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

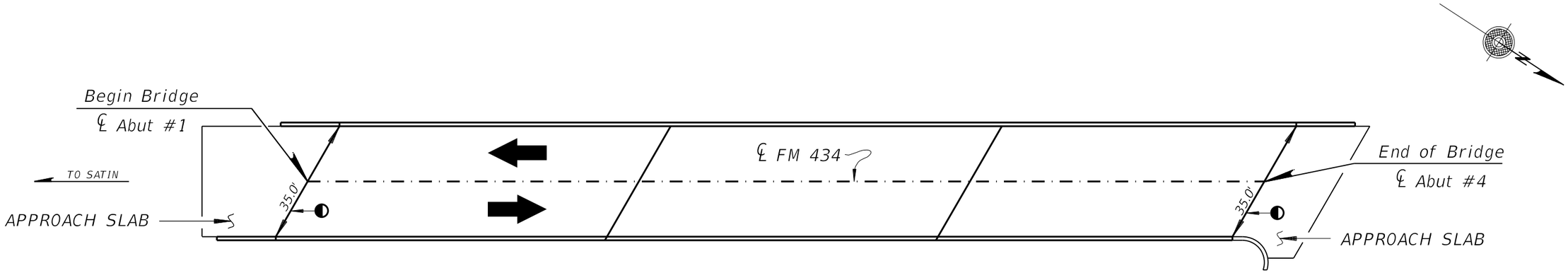
IH 35 NBFR OVER IH 35 NB OFF-RAMP

(STR# 545)

FILE: IH35(NB)OFFRAMPJT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	72
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\BELL\DGN's to Print\545 BE-20.dgn

LEVELS DISPLAYED ACC:
1 2 3 4 5 6 7 8 9 10 11 12 13 41 51 61
17 18 19 20 21 22 32 42 52 62 72 82 93 03 13
33 43 53 63 73 83 94 04 14 24 34 44 54 64 74 84
49 50 51 59 35 45 55 65 75 85 96 06 16 26 31



LAYOUT PLAN

FM 434 OVER BULLHIDE CREEK
(N.B.I.#09-074-0-1077-01-023)
GPS LAT/LON: 31.392457/-97.038877

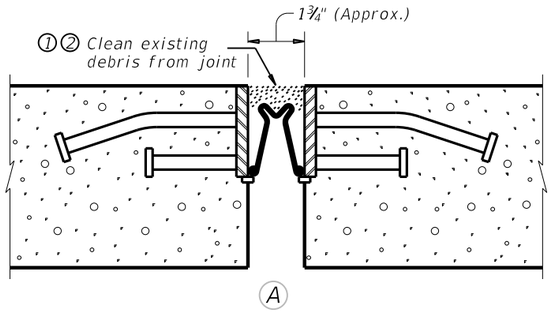
◐ Denotes location for Cleaning Existing SEJ-A

FM 434 OVER BULLHIDE CREEK
260'-0" OVERALL LENGTH
PRESTRESSED CONCRETE I-GIRDER UNIT
@ (90', 90', 80') SPANS
30'-0" RDWY.
32'-0"OVERALL
T401 RAIL (LT & RT)

GENERAL NOTES:

(1) REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

(2) CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-A JOINT

ESTIMATED QUANTITIES

ITEM	438-6009 (A)
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #023 FM 434 OVER BULLHIDE CREEK	70.0
TOTAL	70.0

STATE OF TEXAS
CHARLES W. SMITH
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Signature of Registrant & Date

FALLS COUNTY
PROJECT LAYOUT REF FA-1

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

FM 434 OVER BULLHIDE CREEK

(STR# 023)

FILE: FM434BULLHIDEJT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT •	SHEET
REVISIONS	WACO	6	RMC 646063001	73
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHO\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\FALLS\DGN's to Print\023 FA-1.dgn

LEVELS DISPLAYED
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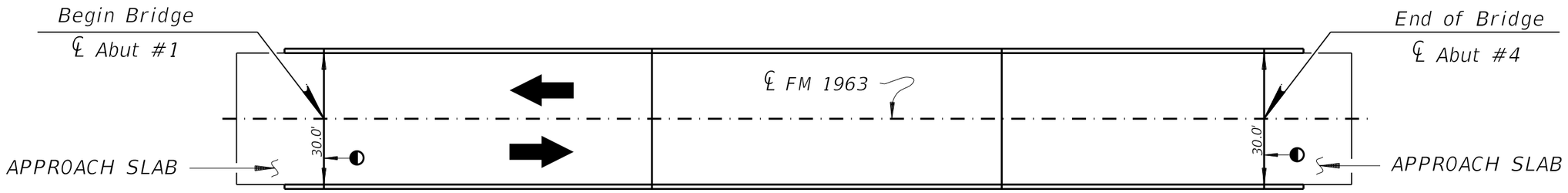


LAYOUT PLAN

FM 1963 OVER POND CREEK RELIEF
(N.B.I.#09-074-0-0209-04-485)
GPS LAT/LON: 31.063782/-96.999986

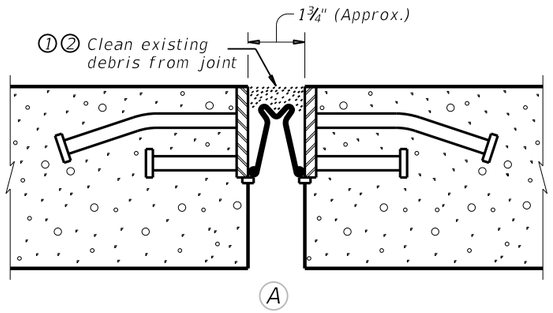
◐ Denotes location for Cleaning Existing SEJ-A

FM 1963 OVER POND CREEK RELIEF
215'-0" OVERALL LENGTH
PRESTRESSED CONCRETE I-GIRDER UNIT
@ (75', 80', 60') SPANS
30'-0" RDWY.
32'-0" OVERALL
T401 RAIL (LT & RT)

GENERAL NOTES:

1. REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

2. CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-A JOINT

ESTIMATED QUANTITIES

(A)

ITEM	438-6009
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #485 FM 1963 OVER POND CREEK RELIEF	60.0
TOTAL	60.0

FALLS COUNTY
PROJECT LAYOUT REF FA-2

STATE OF TEXAS · CHARLES W. SMITH · 110312 · LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, P.E. PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

FM 1963 OVER POND CREEK RELIEF

(STR# 485)

FILE: FM1963PONDCRKJT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	74
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
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LEVELS DISPLAYED ACC:
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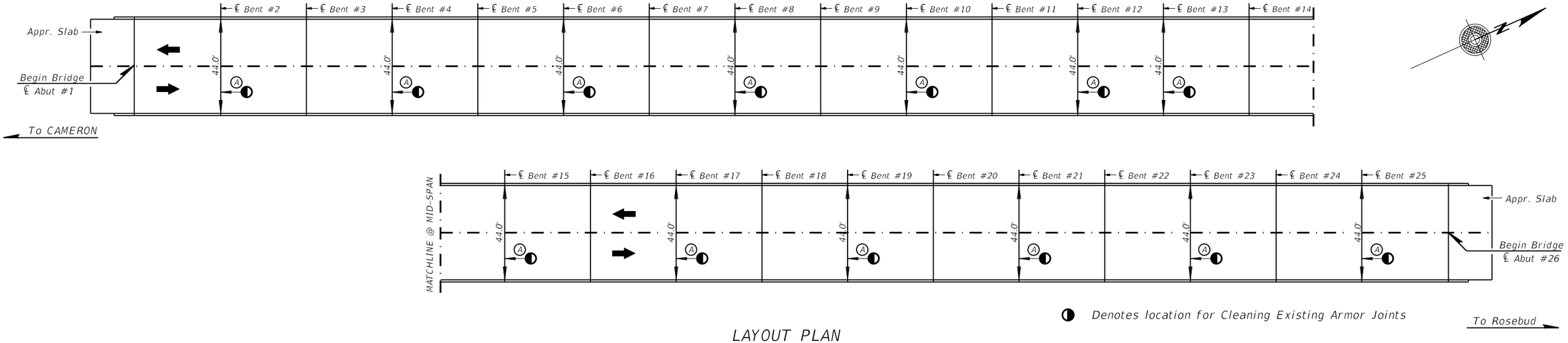
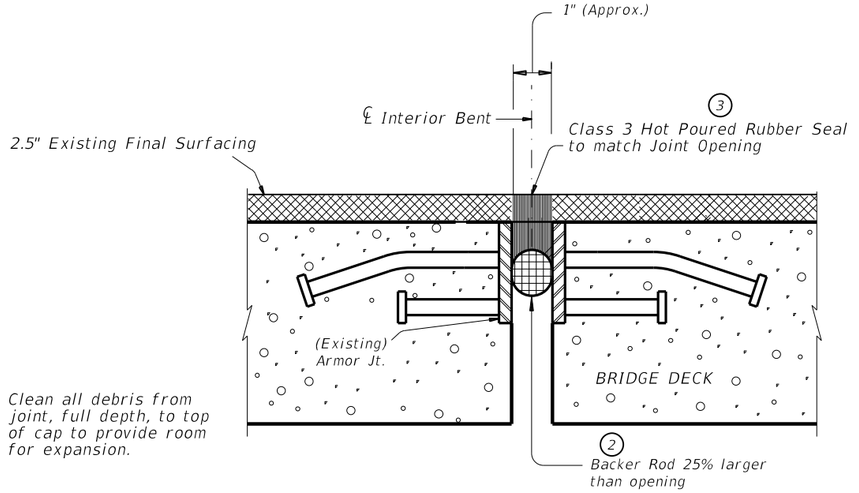
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63



LAYOUT PLAN

US 77 OVER POND CREEK
(N.B.I.#09-074-0-0209-03-043)
GPS LAT/LON: 31.046475/-97.979624



SECTION THRU EXPANSION JOINT

Ⓐ

GENERAL NOTES:

CLEANING EXISTING JOINT OPENING OF ALL DEBRIS, PROVIDING AND PLACING BACKER ROD, SAW-CUTTING JOINT OPENING, AND SEALING JOINT IS PAID FOR BY ITEM 438, "CLEANING AND SEALING JOINTS" AND MEASURED BY THE L.F. OF "CLEANING AND SEALING OF EXISTING JOINTS (CL 3)."

OBTAIN APPROVAL FOR ALL TOOLS, EQUIPMENT, MATERIALS AND TECHNIQUES PROPOSED FOR USE TO PREPARE THE JOINT.

PREPARE JOINT AND SEAL IN ACCORDANCE WITH ITEM 438 "CLEANING AND SEALING JOINTS."

PROVIDE THE CLASS 3 JOINT SEALANT IN ACCORDANCE WITH DMS-6310, "JOINT SEALANTS AND FILLERS."

PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE JOINT WITH HOT POURED RUBBER SEAL:

1. Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
2. Place backer rod into joint opening 1" below the top of concrete. Backer rod must be of the type that can handle the heat and be compatible with the hot poured rubber seal. The backer rod must be 25% larger than the joint opening.
3. Seal the joint opening with a Class 3, "Hot Poured Rubber." Seal flush to the top of the asphaltic concrete pavement.

US 77 OVER POND CREEK
1021'-6" ~ OVERALL LENGTH =
@ (24 ~ 40' & 1 ~ 60') STEEL I-BEAM SPAN
(WIDENED WITH PREST. CONC. GIRDERS EACH SIDE)
44' ROADWAY
46' OVERALL
TY T501 RAIL

FALLS COUNTY
PROJECT LAYOUT REF FA-3

Ⓐ ESTIMATED QUANTITIES

ITEM	438-6002
LOCATION	CLEANING AND SEALING EXISTING JOINTS (CL 3)
	L.F.
STR. #043 US 77 OVER POND CREEK	572.0
TOTAL	572.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Signature of Registrant & Date

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

US 77 POND CREEK

(STR.#043)

FILE: US77PONDCRKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	75
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
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LEVELS DISPLAYED ACC:
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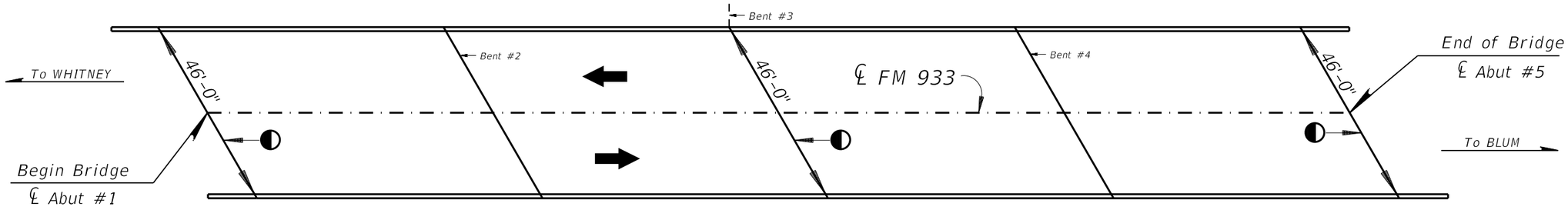
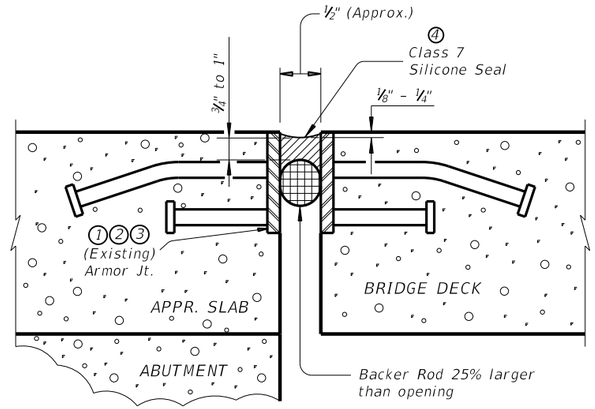


LAYOUT PLAN

FM 933 OVER ROCK CREEK
(N.B.I.#09-110-0-1190-01-004)
GPS LAT/LON: 32.115113/-97.399148

◐ Denotes location for Cleaning Existing Armor Joints

FM 933 OVER ROCK CREEK
280'-0" OVERALL LENGTH=
@ (4 @ 70') PRESTRESS CONC BEAM UNIT
42' OVERALL
40' ROADWAY
T501(MOD) RAIL



SECTION THRU EXPANSION JOINT

Ⓐ

HILL COUNTY
PROJECT LAYOUT REF HI-1

NOTES:

① The joints shall be cleaned in accordance with Item 438 and prior to beginning operations, the Contractor shall submit a statement from the Sealant Manufacturer showing the recommended equipment and Installation procedures to be used.

② Condition of existing expansion joint or rail shall be determined prior to placing sealant material. The entire length of existing joint shall be checked and any portion that is determined unsound, shall be removed as directed. Any existing seal shall be removed and disposed of.

Repair any significant spalled or cracked areas, as determined and directed, around the joint opening with an approved proprietary concrete repair material as approved and directed. This work will not be paid for directly, but shall be considered subsidiary to Item 438.

③ Surfaces where sealant material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.

④ Seal when required and as directed. Extend sealant up into rail or curb 6 inches on low side or sides of deck. Prepare surfaces where sealant is to be placed in accordance with manufacturers specifications.

If the self-leveling sealant cannot be extended up into the rail, use a Class 4 Sealant in the curb or rail portion only.

ESTIMATED QUANTITIES

ITEM	438-6004
LOCATION	CLEANING AND SEALING EXISTING JOINTS (CL 7)
	L.F.
STR. #004 FM 933 OVER ROCK CREEK	138.0
TOTAL	138.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith PE PE 1/22/2024
Signature of Registrant & Date

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

FM 933 OVER ROCK CREEK

(STR.#004)

FILE: FM933ROCKCRKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEPT 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	76
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
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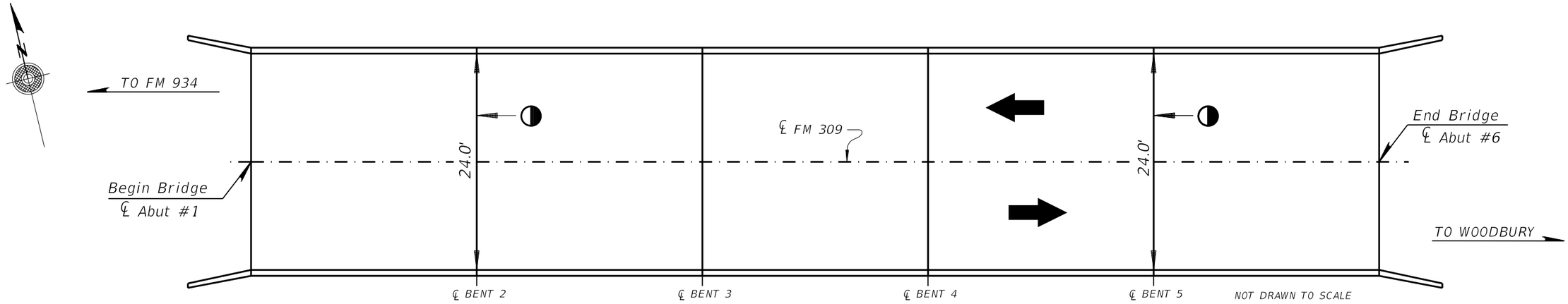


LAYOUT PLAN

FM 309 OVER COTTONWOOD CREEK
(N.B.I.#09-110-0-0888-02-008)
GPS LAT/LON: 32.070340/-97.246926

◑ Denotes Location for Cleaning and Sealing Expansion Joints.

FM 309 OVER COTTONWOOD CREEK
125' OVERALL LENGTH=
@ (5 @ 25') CONC. FLAT SLAB BRIDGE ON CONC. PILE BENTS
25'-4" OVERALL WIDTH
24'-0" ROADWAY

NOTES:

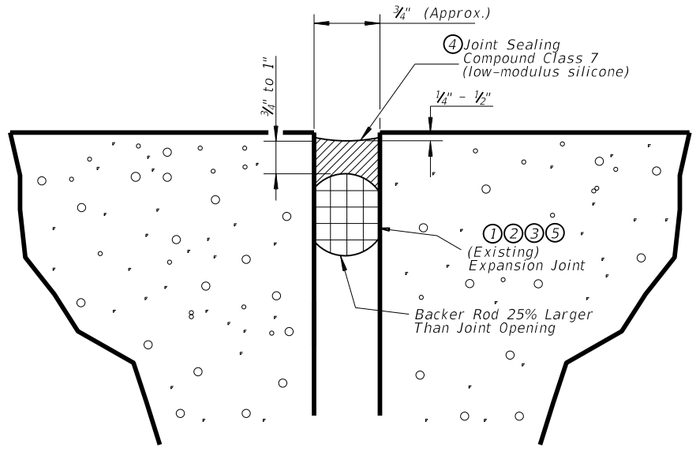
① The joints shall be cleaned in accordance with Item 438 and prior to beginning operations, the Contractor shall submit a statement from the Sealant Manufacturer showing the recommended equipment and Installation procedures to be used.

② Condition of existing expansion joint or rail shall be determined prior to placing sealant material. The entire length of existing joint shall be checked and any portion that is determined unsound by the Engineer shall be removed as directed by the Engineer. Any existing seal shall be removed and disposed of.
Repair any significant spalled or cracked areas, as determined by the Engineer, around the joint opening with an approved proprietary concrete repair material as Approved by the Engineer. This work will be paid for under Item 429 "Concrete Structure Repair".

③ Surfaces where sealant material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.

④ Seal when required as Directed by the Engineer. Extend sealant up into rail or curb 6 inches on low side or sides of deck. Prepare surfaces where sealant is to be placed in accordance with manufacturers specifications.
If the self-leveling sealant cannot be extended up into the rail, use a Class 4 Sealant in the curb or rail portion only.

⑤ Clean joint opening of all old expansion materials/devices, dirt, and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint. Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
Seal the joint opening with a Class 7 Silicone.



SECTION THRU SEALED EXPANSION JOINT

NOT TO SCALE

GENERAL NOTES:

All work, including cleaning exist joint opening of all debris, and sealing joint, is paid for by Item 438, "Cleaning and Sealing Existing Joints."

Obtain approval for all tools, equipment, materials and techniques proposed for use to prepare the joint.

Provide the joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers."

ESTIMATED QUANTITIES

ITEM	438-6004
LOCATION	CLEANING AND SEALING EXIST JOINTS (CL 7)
	L.F.
STR. #008 FM 309 OVER COTTONWOOD CREEK	48.0
TOTAL	48.0

HILL COUNTY
PROJECT LAYOUT REF HI-2

STATE OF TEXAS · CHARLES W. SMITH · 110312 · LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation
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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

FM 309 OVER COTTONWOOD CREEK

(STR# 008)

FILE: FM309COTTCRKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	77
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
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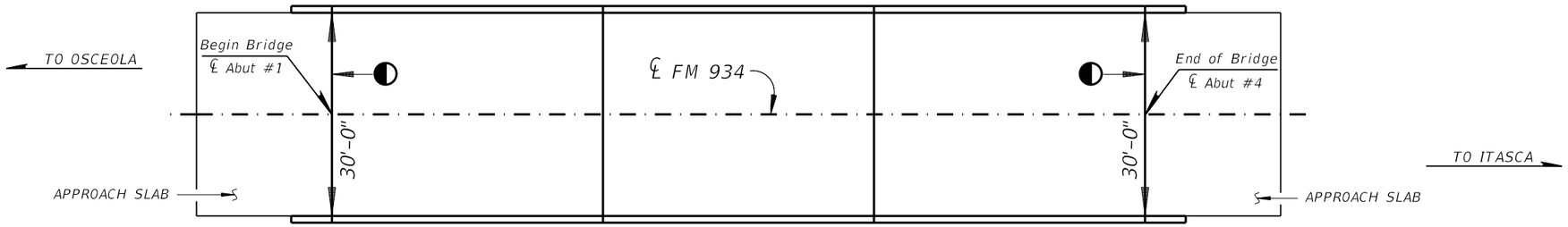


LAYOUT PLAN

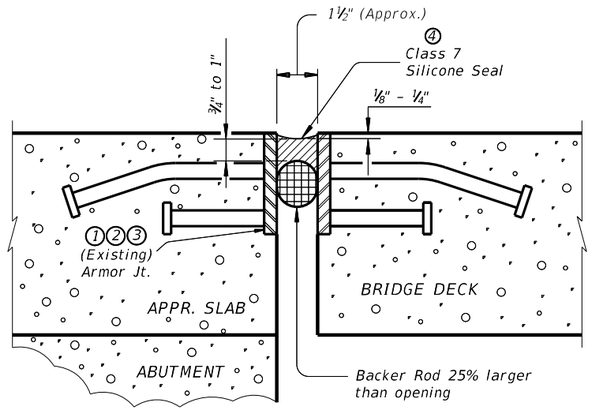
FM 934 OVER COTTONWOOD CREEK

(N.B.I.#09-110-0-0888-01-014)

GPS LAT/LON: 32.127225/-97.224063

◐ Denotes location for Cleaning Existing Armor Joints

FM 934 OVER COTTONWOOD CREEK
120'-0" OVERALL LENGTH=
@ (40', 40', 40') PRESTR. CONC. SLAB BEAM UNIT
32'-1½" OVERALL
30' ROADWAY
TY T401 RAIL



SECTION THRU EXPANSION JOINT

Ⓐ

HILL COUNTY
PROJECT LAYOUT REF HI-3

NOTES:

① The joints shall be cleaned in accordance with Item 438 and prior to beginning operations, the Contractor shall submit a statement from the Sealant Manufacturer showing the recommended equipment and Installation procedures to be used.

② Condition of existing expansion joint or rail shall be determined prior to placing sealant material. The entire length of existing joint shall be checked and any portion that is determined unsound, shall be removed as directed. Any existing seal shall be removed and disposed of.

Repair any significant spalled or cracked areas, as determined and directed, around the joint opening with an approved proprietary concrete repair material as approved and directed. This work will not be paid for directly, but shall be considered subsidiary to Item 438.

③ Surfaces where sealant material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.

④ Seal when required and as directed. Extend sealant up into rail or curb 6 inches on low side or sides of deck. Prepare surfaces where sealant is to be placed in accordance with manufacturers specifications.

If the self-leveling sealant cannot be extended up into the rail, use a Class 4 Sealant in the curb or rail portion only.

ESTIMATED QUANTITIES

ITEM	438-6004
LOCATION	CLEANING AND SEALING EXISTING JOINTS (CL 7)
	L.F.
STR. #014 FM 934 OVER COTTONWOOD CREEK	60.0
TOTAL	60.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE
Signature of Registrant

PE 1/22/2024
& Date

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

FM 934 OVER COTTONWOOD CREEK

(STR.#014)

FILE: FM934COTTCRKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	78
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
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LEVELS DISPLAYED
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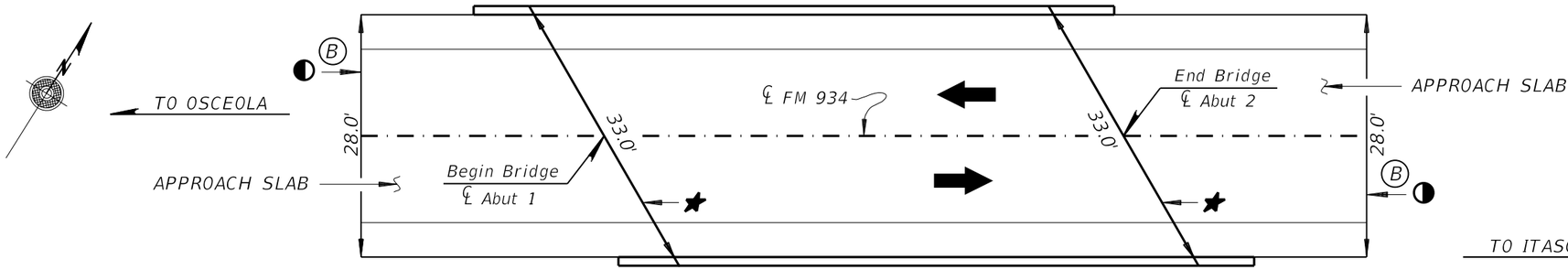
ACC:



FM 934 OVER TRIB. HACKBERRY CREEK
60'-0" OVERALL LENGTH
(1 @ 60'-0") PREST. CONC. DECKED SLAB BEAM SPAN
28'-0" ROADWAY
30'-0" OVERALL WIDTH
TYPE T401 RAIL

HILL COUNTY
PROJECT LAYOUT REF HI-4

LAYOUT PLAN

FM 934 OVER TRIB. HACKBERRY CREEK

(NBI # 09-110-0-0888-01-011)

GPS LAT/LON: 32.139046/-97.199862

NOTE: APPROX. 5.5" OF EXISTING OVERLAY IS TO BE REMOVED DOWN TO THE BRIDGE DECK PROIR TO JOINT REPAIR.
(SEE MILLING & OVERLAY FOR FURTHER DETAILS)

◑ Denotes Location for Cleaning and Sealing Joints. (See Relief Joint Detail)

★ Denotes Location for Cleaning and Sealing Expansion Joints.

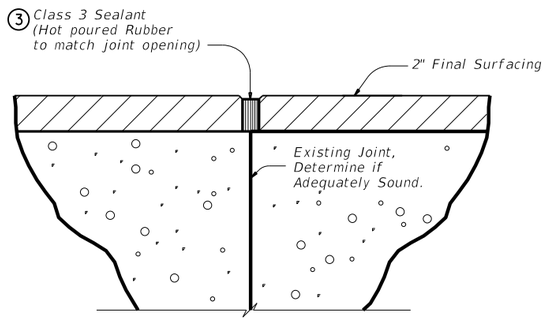
GENERAL NOTES:

CLEANING EXISTING JOINT OPENING OF ALL DEBRIS, PROVIDING AND PLACING BACKED ROD, SAW-CUTTING JOINT OPENING, AND SEALING JOINT IS PAID FOR BY ITEM 438, "CLEANING AND SEALING JOINTS" AND MEASURED BY THE L.F. OF "CLEANING AND SEALING OF EXISTING JOINTS (CL 3)". PROVIDING AND APPLYING TACK COAT AND PROVIDING AND PLACING FABRIC JOINT UNDERSEAL OS PAID FOR BY ITEM 356. "FABRIC UNDERSEAL" AND MEASURED BY THE L,F, OF "PAV JT UNDERSEAL".

OBTAIN APPROVAL FOR ALL TOOLS, EQUIPMENT, MATERIALS AND TECHNIQUES PROPOSED FOR USE TO PREPARE THE JOINT.

PROVIDE THE REINFORCED FABRIC JOINT UNDERSEAL IN ACCORDANCE WITH DMS-6260 "REINFORCED FABRIC JOINT UNDERSEAL" OR DMS-6220, "FABRIC FOR UNDERSEALS".

PROVIDE THE CLASS 3 JOINT SEALANT IN ACCORDANCE WITH DMS-6310, "JOINT SEALANTS AND FILLERS".



Ⓑ

SECTION THRU RELIEF JOINT

PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE JOINT WITH HOT POURED RUBBER SEAL:

③ Seal the joint opening with a Class 3, "Hot Poured Rubber." Seal flush to the top of the asphaltic concrete pavement.
Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."

ESTIMATED QUANTITIES

ITEM	356-6021	438-6002
LOCATION	PAV JT UNDERSEAL (24")	CLEANING AND SEALING EXIST JOINTS (CL 3)
	L.F.	L.F.
STR. #011 FM 934 TRIB. OVER HACKBERRY CREEK	66.0	122.0
TOTAL	66.0	122.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, P.E. PE 1/22/2024
Signature of Registrant & Date

SHEET 1 OF 2 SHEETS

Texas Department of Transportation

LAYOUT & DETAILS
FOR CLEANING AND SEALING EXPANSION JOINTS
FM 934 OVER TRIB. HACKBERRY CREEK
(STR.#011)

FILE: FM934TRIBHACKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	79
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
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LEVELS DISPLAYED ACC:
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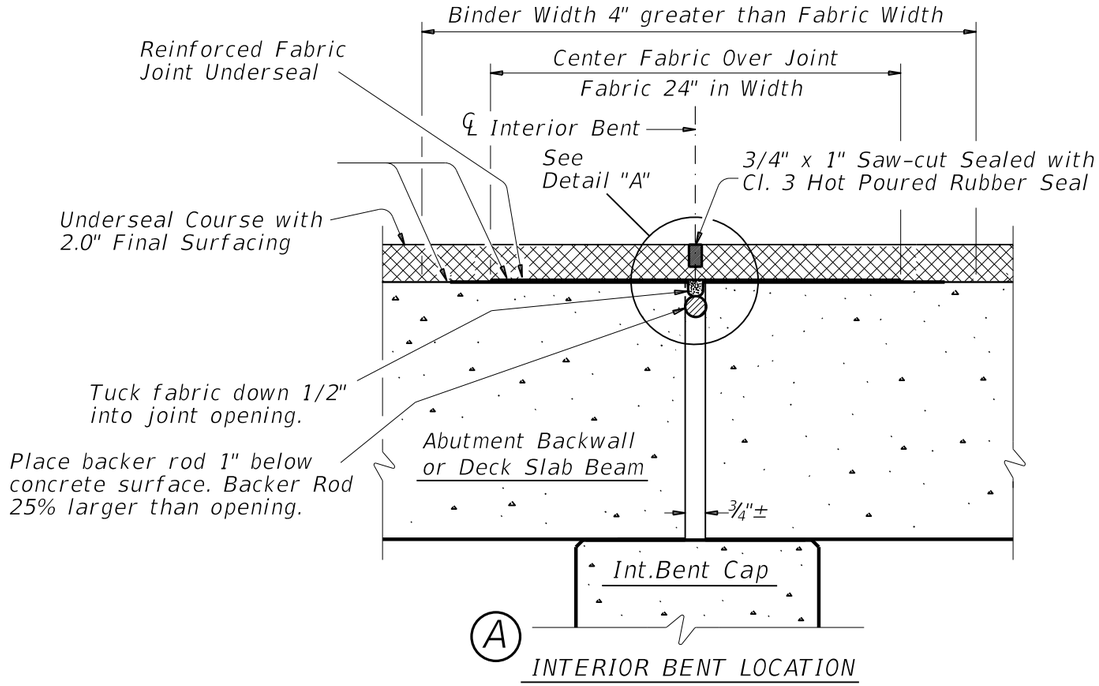
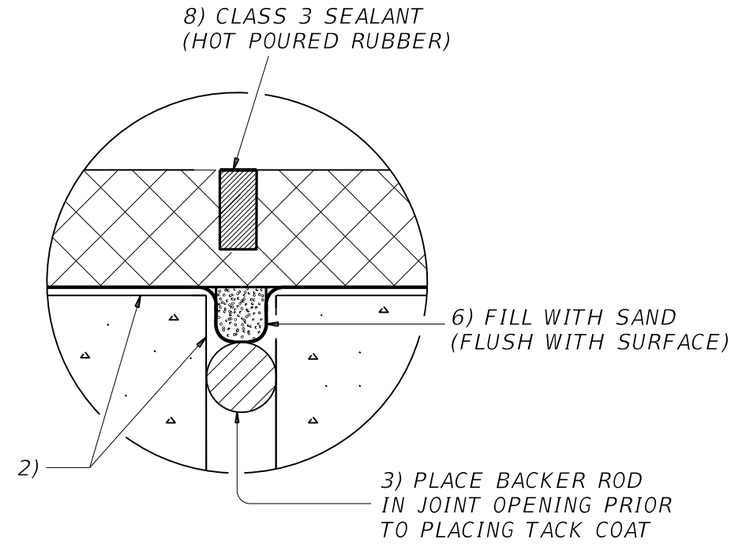
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

3) A tack coat must be applied if the surface has been milled.



INTERIOR BENT LOCATION

FABRIC JOINT SEAL WITH HOT POURED RUBBER



DETAIL "A"

PROCEDURES:

1) PRIOR TO THE PLACEMENT OF THE FABRIC JOINT UNDERSEAL. CLEAN JOINT OPENING OF ALL OLD EXPANSIONS MATERIAL/DEVICES, BITUMINOUS MATERIALS, DIRT, GREASE, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438, "CLEANING AND SEALING JOINTS".

2) REPAIR ANY SIGNIFICANT SPALLED OR CRACKED AREAS, AS DETERMINED BY THE ENGINEER, AROUND THE JOINT OPENING WITH TYPE II POLYMER CONCRETE IN ACCORDANCE WITH DMS-6140, "POLYMER CONCRETE FOR JOINT SYSTEMS". THIS WORK WILL BE PAID FOR BY ITEM 429 "CNC STR REP (STANDARD)".

3) PLACE TACK COAT OR BINDER AS REQUIRED BY THE FABRIC JOINT UNDERSEAL MANUFACTURER'S INSTALLATION INSTRUCTIONS. PLACE BACKER ROD IN JOINT OPENING PRIOR TO PLACING TACK COAT.

4) PLACE REINFORCED FABRIC JOINT UNDERSEAL CENTERED OVER JOINT OPENING. TUCK FABRIC DOWN APPROXIMATELY 1/2" INTO THE JOINT OPENING. INSTALL UNDERSEAL IN ACCORDANCE WITH MANUFACTURED RECOMMENDATIONS.

5) WHEN USING THE SELF-ADHESIVE TYPE FABRIC UNDERSEAL, PRESSURE ROLL FABRIC JOINT UNDERSEAL TO IMPROVE ADHESION.

6) JUST PRIOR TO PAVING, FILL TUCKED IN PORTION OF UNDERSEAL WITH SAND FLUSH WITH SURFACE. APPLY A TACK COAT TO FABRIC JOINT UNDERSEAL AS REQUIRED BY THE MANUFACTURER'S INSTRUCTIONS. MARK LOCATION OF CENTERLINE OF JOINT ON CURB OR BARRIER AS APPROVED.

7) AFTER THE ASPHALTIC CONCRETE PAVEMENT OPERATIONS ARE COMPLETE, SAW CUT 1" INTO THE ASPHALT AT CENTERLINE OF JOINT. MAKE MULTIPLE SAW CUTS TO CREATE A 3/4" JOINT OPENING OR MATCH THE EXISTING JOINT OPENING. WHICHEVER IS GREATER. DO NOT DAMAGE THE UNDERSEAL.

8) SEAL THE JOINT OPENING WITH A CLASS 3, "HOT POURED RUBBER". SEAL FLUSH WITH THE TOP OF THE ASPHALTIC CONCRETE PAVEMENT.

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE, PE 1/22/2024
Signature of Registrant & Date

SHEET 2 OF 2 SHEETS

Texas Department of Transportation
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LAYOUT & DETAILS
FOR CLEANING AND SEALING EXPANSION JOINTS

FM 934 OVER TRIB. HACKBERRY CREEK

(STR.#011)

FILE: FM934TRIBHACKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	80
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHO\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\HILL\DGN's to Print\011 HI-4A.dgn

LEVELS DISPLAYED
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33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
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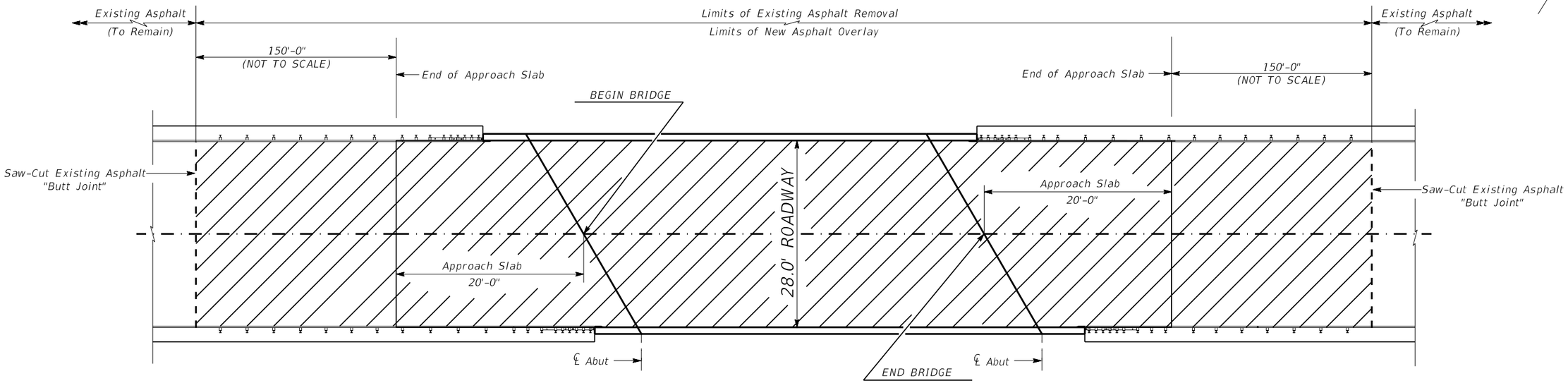
ACC:



NOTE: REMOVE APPROX. 2"-5" OF EXISTING OVERLAY DOWN TO BRIDGE DECK

INCLUDE 2" TAPER TRANSITION FROM BEGINNING OF MILLING TO BRIDGE DECK ON EACH APPROACH

ROADWAY PLAN

FM 934 OVER TRIB. HACKBERRY CREEK

(NBI # 09-110-0-0888-01-011)
(SHOWING LIMITS OF MILLING/OVERLAY)

HILL COUNTY
PROJECT LAYOUT REF HI-4

GENERAL NOTES:

1. Mill Existing Asphalt completely off the Bridge Deck.
2. Repair any damaged exposed Deck Surface or Bridge Joints in accordance with Items 429 and 438.
3. Prepare Expansion Joints in accordance with Joint Repair Details.
4. Construct Underseal Course and D-GR HMA TY-C-SAC-B Final Surfacing.
5. Clean and Seal Bridge Joints in accordance with Joint Repair Details.

FM 934 OVER TRIB. HACKBERRY CREEK
60'-0" OVERALL LENGTH
(1 @ 60'-0") PREST. CONC. DECKED SLAB BEAM SPAN
28'-0" ROADWAY
30'-0" OVERALL WIDTH
TYPE T401 RAIL

ESTIMATED QUANTITIES

ITEM	354-6088	3076-6069	3085-6001
LOCATION	PLANE ASPH CONC. PAV (0' to 5")	D-GR HMA TY-C-SAC-B PG64-22 (EXEMPT)	UNDERSEAL COURSE
	S.Y.	TON	GAL.
STR. #011 FM 934 OVER TRIB. HACKBERRY CREEK	1245.0	137.0	249.0
TOTAL	1245.0	137.0	249.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation

MILLING AND OVERLAY DETAILS

FM 934 OVER TRIB. HACKBERRY CREEK

(STR.#011)

FILE: FM934TRIBHACKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	81
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
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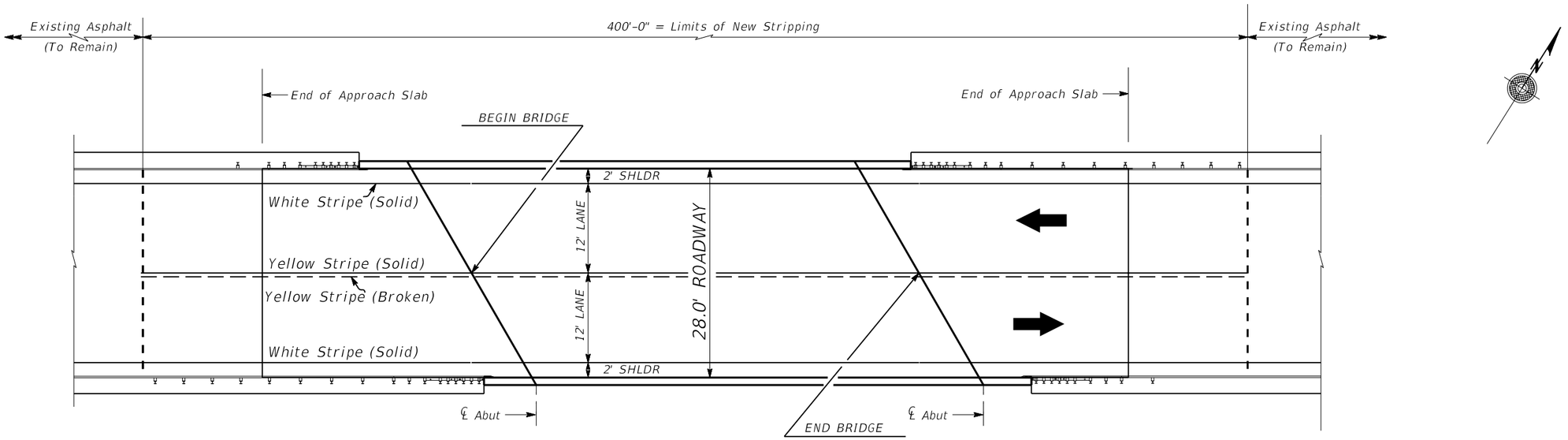

HILL COUNTY
PROJECT LAYOUT REF HI-4

ROADWAY PLAN

FM 934 OVER TRIB. HACKBERRY CREEK

(NBI # 09-110-0-0888-01-011)

FM 934 OVER TRIB. HACKBERRY CREEK
60'-0" OVERALL LENGTH
(1 @ 60'-0") PREST. CONC. DECKED SLAB BEAM SPAN
28'-0" ROADWAY
30'-0" OVERALL WIDTH
TYPE T401 RAIL

ESTIMATED QUANTITIES

ITEM	662-6111	666-6303	666-6312	666-6318	672-6009
LOCATION	WK ZN PAV MRK SHT TERM (TAB) TY Y-2	RE PM W/RET REQ TY 1 (W) 4" (SLD) (100MIL)	RE PM W/RET REQ TY 1 (Y) 4" (BRK) (100MIL)	RE PM W/RET REQ TY 1 (Y) 4" (SLD) (100MIL)	REFL PAV MRKR TY II-A-A
	EA	LF	LF	LF	EA
STR. #011 FM 934 OVER TRIB. HACKBERRY CREEK	10.0	800.0	100.0	400.0	11.0
TOTAL	10.0	800.0	100.0	400.0	11.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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STRIPING DETAILS

FM 934 OVER TRIB. HACKBERRY CREEK

(STR.#011)

FILE: FM934TRIBHACKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	82
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
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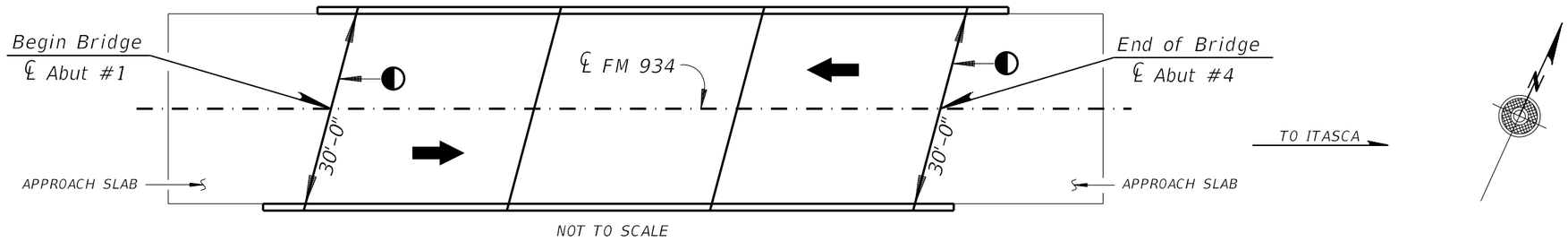


LAYOUT PLAN

FM 934 OVER HACKBERRY CREEK
(N.B.I.#09-110-0-0888-01-012)
GPS LAT/LON: 32.147082/-97.183411

◐ Denotes location for Cleaning Existing Armor Joints

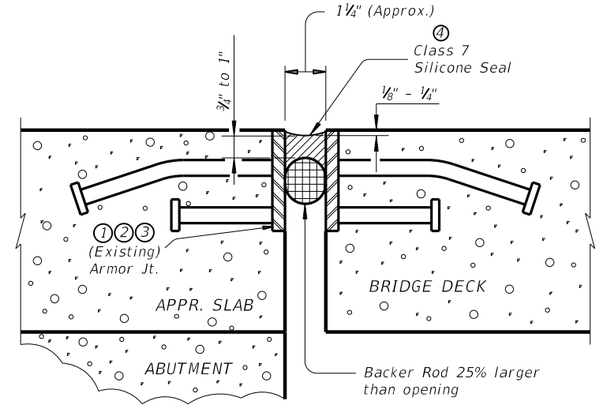
FM 934 OVER HACKBERRY CREEK
90'-0" OVERALL LENGTH=
@ (30', 30', 30') PRESTR. CONC. SLAB BEAM UNIT
30'-1" OVERALL
28' ROADWAY
TY T401 RAIL

NOTES:

1. The joints shall be cleaned in accordance with Item 438 and prior to beginning operations, the Contractor shall submit a statement from the Sealant Manufacturer showing the recommended equipment and Installation procedures to be used.
2. Condition of existing expansion joint or rail shall be determined prior to placing sealant material. The entire length of existing joint shall be checked and any portion that is determined unsound, shall be removed as directed. Any existing seal shall be removed and disposed of.

   Repair any significant spalled or cracked areas, as determined and directed, around the joint opening with an approved proprietary concrete repair material as approved and directed. This work will not be paid for directly, but shall be considered subsidiary to Item 438.
3. Surfaces where sealant material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.
4. Seal when required and as directed. Extend sealant up into rail or curb 6 inches on low side or sides of deck. Prepare surfaces where sealant is to be placed in accordance with manufacturers specifications.

   If the self-leveling sealant cannot be extended up into the rail, use a Class 4 Sealant in the curb or rail portion only.



SECTION THRU EXPANSION JOINT

Ⓐ

ESTIMATED QUANTITIES

ITEM	438-6004
LOCATION	CLEANING AND SEALING EXISTING JOINTS (CL 7)
	L.F.
STR. #012 FM 934 OVER HACKBERRY CREEK	60.0
TOTAL	60.0

HILL COUNTY
PROJECT LAYOUT REF HI-5

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

FM 934 OVER HACKBERRY CREEK

(STR.#012)

FILE: FM934HACKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	83
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\HILL\DGN's to Print\012 HI-5.dgn

LEVELS DISPLAYED ACC:
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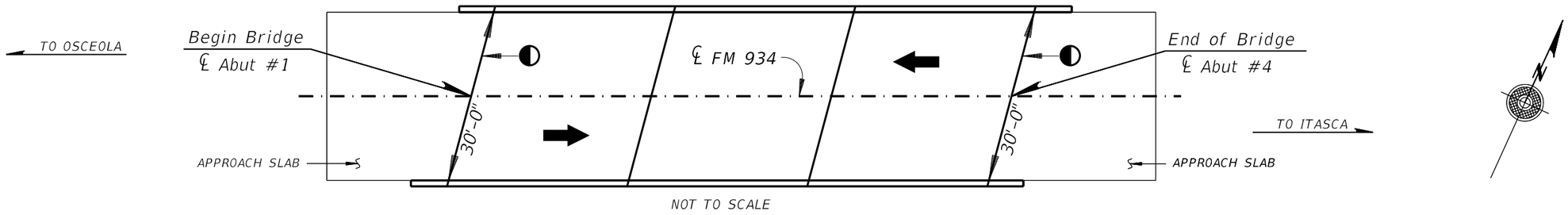


LAYOUT PLAN

FM 934 OVER BRANCH OF HACKBERRY CREEK

(N.B.I.#09-110-0-0888-01-013)

GPS LAT/LON: 31.158121/-97.160566

◐ Denotes location for Cleaning Existing Armor Joints

FM 934 OVER BRANCH OF HACKBERRY CREEK
90'-0" OVERALL LENGTH=
@ (30', 30', 30') PRESTR. CONC. SLAB BEAM UNIT
30'-1" OVERALL
28' ROADWAY
TY T401 RAIL

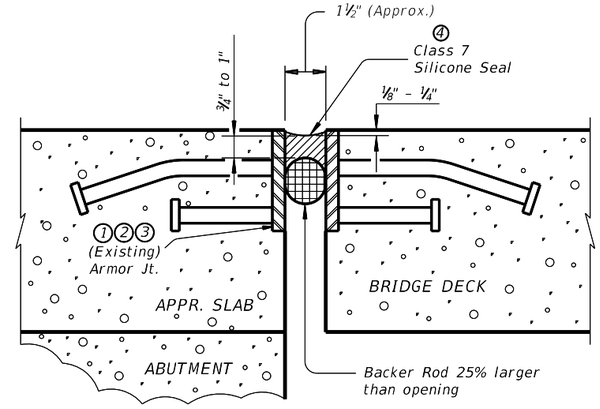
HILL COUNTY
PROJECT LAYOUT REF HI-6

NOTES:

1. The joints shall be cleaned in accordance with Item 438 and prior to beginning operations, the Contractor shall submit a statement from the Sealant Manufacturer showing the recommended equipment and Installation procedures to be used.
2. Condition of existing expansion joint or rail shall be determined prior to placing sealant material. The entire length of existing joint shall be checked and any portion that is determined unsound, shall be removed as directed. Any existing seal shall be removed and disposed of.

   Repair any significant spalled or cracked areas, as determined and directed, around the joint opening with an approved proprietary concrete repair material as approved and directed. This work will not be paid for directly, but shall be considered subsidiary to Item 438.
3. Surfaces where sealant material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.
4. Seal when required and as directed. Extend sealant up into rail or curb 6 inches on low side or sides of deck. Prepare surfaces where sealant is to be placed in accordance with manufacturers specifications.

   If the self-leveling sealant cannot be extended up into the rail, use a Class 4 Sealant in the curb or rail portion only.



SECTION THRU EXPANSION JOINT

Ⓐ

ESTIMATED QUANTITIES

ITEM	438-6004
LOCATION	CLEANING AND SEALING EXISTING JOINTS (CL 7)
	L.F.
STR. #013 FM 934 OVER BRANCH OF HACKBERRY CREEK	60.0
TOTAL	60.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, P.E. PE 1/22/2024
Signature of Registrant & Date

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

FM 934 OVER BRANCH OF HACKBERRY CREEK

(STR.#013)

FILE: FM934BRHACKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	84
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
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LEVELS DISPLAYED ACC:
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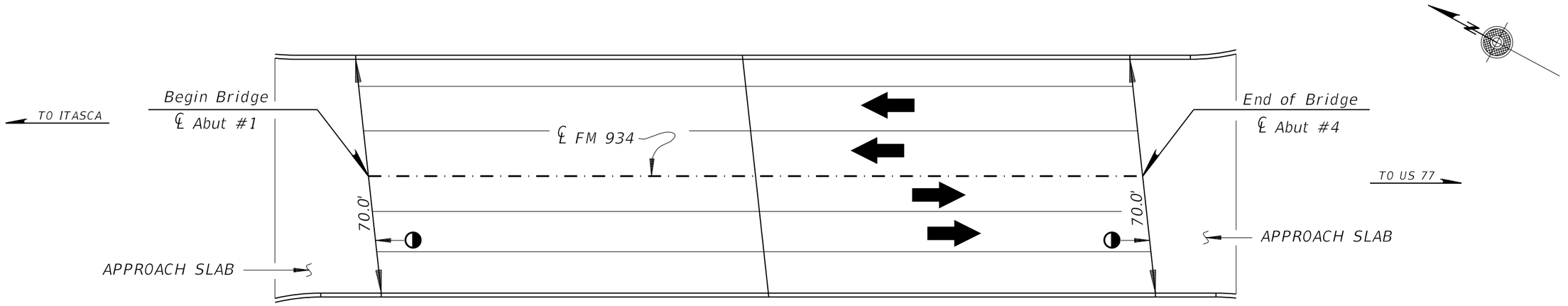


LAYOUT PLAN

FM 934 OVER IH 35E
(N.B.I.#09-110-0-0048-09-533)
GPS LAT/LON: 32.104409/-97.009866

◑ Denotes location for Cleaning Existing SEJ-A

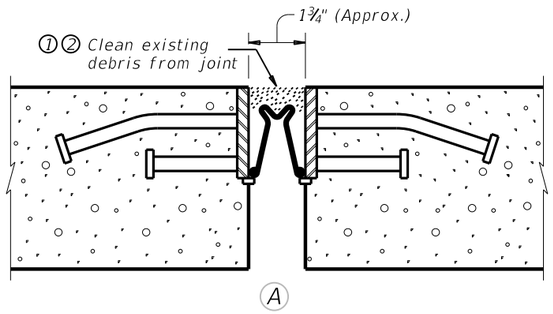
FM 934 OVER IH 35E
192-0" OVERALL LENGTH
PRESTRESSED CONCRETE I-GIRDER UNIT
@ (96', 96',) SPANS
58'-0" RDWY.
60" OVERALL
T1F(MOD) RAIL (LT & RT)

HILL COUNTY
PROJECT LAYOUT REF HI-7

GENERAL NOTES:

(1) REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

(2) CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-A JOINT

ESTIMATED QUANTITIES

ITEM	438-6009 (A)
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #533 FM 934 OVER IH 35E	140.0
TOTAL	140.0

STATE OF TEXAS · CHARLES W. SMITH · 110312 · LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE, PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation
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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

FM 934 OVER IH 35E

(STR# 533)

FILE: IH35(NB)TROYRDJT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	85
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
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LEVELS DISPLAYED ACC:
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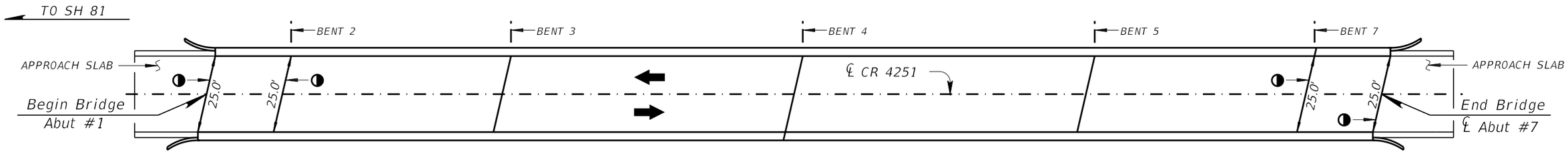


LAYOUT PLAN

CR 4251 OVER IH 35W

(N.B.I.#09-110-0-0014-23-300)

GPS LAT/LON: 32.02195/-97.097717

◑ Denotes Location for Cleaning and Sealing Expansion Joints.

CR 4251 OVER IH 35W
310' OVERALL LENGTH=
@ (58', 77', 77', 58') CONT. CONC. GIRDER SPANS
& 2- 20'-0" SPAN
28'-4" OVERALL WIDTH
24'-0" ROADWAY 13° LFS
18" CURBS
TYPE II (MOD) RAIL

NOTES:

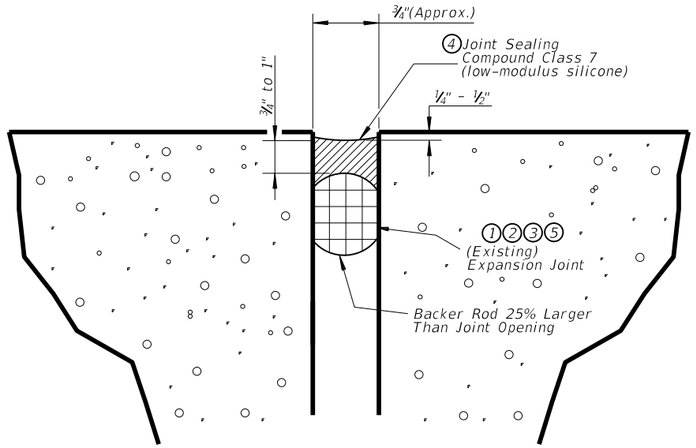
① The joints shall be cleaned in accordance with Item 438 and prior to beginning operations, the Contractor shall submit a statement from the Sealant Manufacturer showing the recommended equipment and Installation procedures to be used.

② Condition of existing expansion joint or rail shall be determined prior to placing sealant material. The entire length of existing joint shall be checked and any portion that is determined unsound by the Engineer shall be removed as directed by the Engineer. Any existing seal shall be removed and disposed of. Repair any significant spalled or cracked areas, as determined by the Engineer, around the joint opening with an approved proprietary concrete repair material as Approved by the Engineer. This work will be paid for under Item 429 "Concrete Structure Repair".

③ Surfaces where sealant material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.

④ Seal when required as Directed by the Engineer. Extend sealant up into rail or curb 6 inches on low side or sides of deck. Prepare surfaces where sealant is to be placed in accordance with manufacturers specifications. If the self-leveling sealant cannot be extended up into the rail, use a Class 4 Sealant in the curb or rail portion only.

⑤ Clean joint opening of all old expansion materials/devices, dirt, and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint. Obtain approval of cleaned joint prior to proceeding with joint sealing operation. Seal the joint opening with a Class 7 Silicone.



SECTION THRU SEALED EXPANSION JOINT

NOT TO SCALE

ESTIMATED QUANTITIES

ITEM	438-6004
LOCATION	CLEANING AND SEALING EXIST JOINTS (CL 7)
	L.F.
STR. #300 CR 4251 OVER IH 35W	100.0
TOTAL	100.0

GENERAL NOTES:

All work, including cleaning exist joint opening of all debris, and sealing joint, is paid for by Item 438, "Cleaning and Sealing Existing Joints."

Obtain approval for all tools, equipment, materials and techniques proposed for use to prepare the joint.

Provide the joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers."

HILL COUNTY
PROJECT LAYOUT REF HI-8

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE, PE 1/22/2024
Signature of Registrant & Date

Texas Department of Transportation

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

CR 4251 OVER IH 35W

(STR# 300)

FILE: CR4251IH35WJTREP.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	86
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
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LEVELS DISPLAYED ACC:
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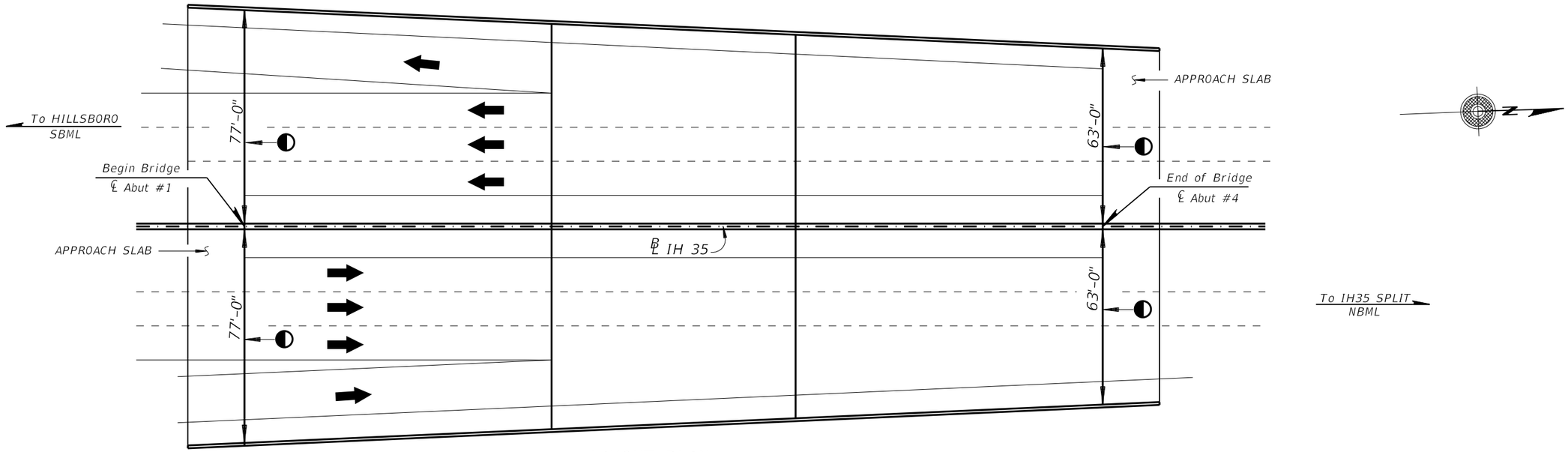


LAYOUT PLAN

IH 35 NB OVER FM 286
(N.B.I.#09-110-0-0014-24-472)
&
IH 35 SB OVER FM 286
(N.B.I.#09-110-0-0014-24-479)
GPS LAT/LON: 32.016580/-97.095616

◐ Denotes location for Cleaning Existing Armor Joints

IH 35 NB & SB OVER FM 286
305'-6" ~ OVERALL LENGTH =
@ (108.3', 86', 108.3') PRESTR. CONC. BEAM UNIT
VARIES (60'-0" TO 72'-0") OVERALL
ROADWAY VARIES
SSTR RAIL (LEFT & RIGHT)
SSCB RAIL @ CENTER

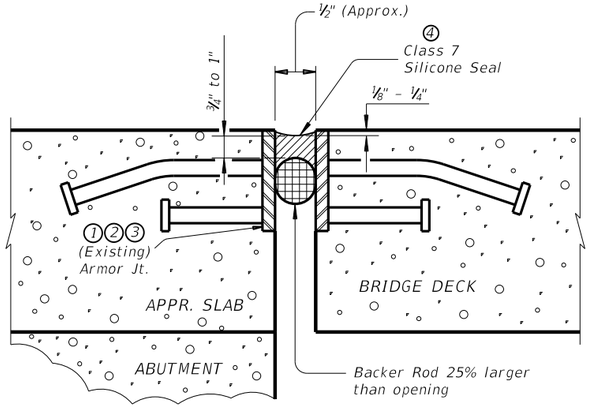
HILL COUNTY
PROJECT LAYOUT REF HI-9

NOTES:

1. The joints shall be cleaned in accordance with Item 438 and prior to beginning operations, the Contractor shall submit a statement from the Sealant Manufacturer showing the recommended equipment and Installation procedures to be used.
2. Condition of existing expansion joint or rail shall be determined prior to placing sealant material. The entire length of existing joint shall be checked and any portion that is determined unsound, shall be removed as directed. Any existing seal shall be removed and disposed of.

   Repair any significant spalled or cracked areas, as determined and directed, around the joint opening with an approved proprietary concrete repair material as approved and directed. This work will not be paid for directly, but shall be considered subsidiary to Item 438.
3. Surfaces where sealant material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.
4. Seal when required and as directed. Extend sealant up into rail or curb 6 inches on low side or sides of deck. Prepare surfaces where sealant is to be placed in accordance with manufacturers specifications.

   If the self-leveling sealant cannot be extended up into the rail, use a Class 4 Sealant in the curb or rail portion only.



SECTION THRU EXPANSION JOINT

Ⓐ

ESTIMATED QUANTITIES

ITEM	438-6004
LOCATION	CLEANING AND SEALING EXISTING JOINTS (CL 7)
	L.F.
STR. #472 & 479 IH 35 NB & SB OVER FM 286	280.0
TOTAL	280.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

IH 35 NB & SB OVER FM 286
(STR.#472 & 479)

FILE: IH35FM286JTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEPT 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	87
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
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LEVELS DISPLAYED
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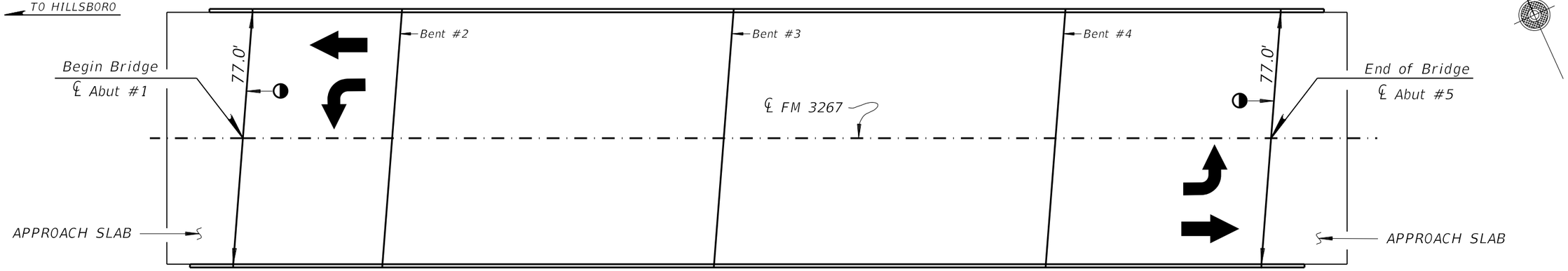


LAYOUT PLAN

FM 3267 OVER IH 35
(N.B.I.#09-110-0-0014-24-040
GPS LAT/LON: 31.999638/-97.098972

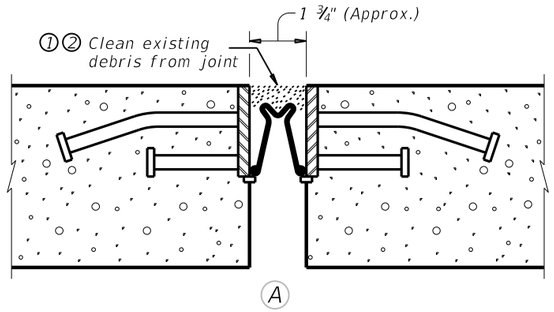
FM 3267 OVER IH 35
310'-0" OVERALL LENGTH
STEEL TUB GIRDER UNIT
@ (45', 100', 100', 65') SPANS
76'-0" RDWY.
78'-0" OVERALL
C221 RAIL

◑ Denotes location for Cleaning Existing SEJ-A

GENERAL NOTES:

(1) REMOVE ALL DEBRIS, DIRT, AND OTHER FOREIGN MATERIAL FROM JOINT BY AN APPROVED METHOD. COLLECT AND DISPOSE OF ALL REMOVED MATERIAL.

(2) CONTRACTOR TO TAKE CARE WHILE REMOVING THE DEBRIS FROM THE EXPANSION JOINTS, AS TO NOT DAMAGE OR DISPLACE THE EXISTING SEAL. ANY SEAL REPAIR OR REPLACEMENT WILL BE AT THE CONTRACTOR'S EXPENSE.



SECTION THRU SEJ-A JOINT

HILL COUNTY
PROJECT LAYOUT REF HI-10

ESTIMATED QUANTITIES

ITEM	438-6009
	A
LOCATION	CLEANING EXISTING JOINTS
	L.F.
STR. #040 FM 3267 OVER IH 35	154.0
TOTAL	154.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE
Signature of Registrant

PE 1/22/2024
& Date

Texas Department of Transportation
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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

FM 3267 OVER IH 35

(STR# 040)

FILE: FM3267IH35JT.dgn	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: SEP 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	88
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\HILL\DGN's to Print\040 HI-10.dgn

LEVELS DISPLAYED
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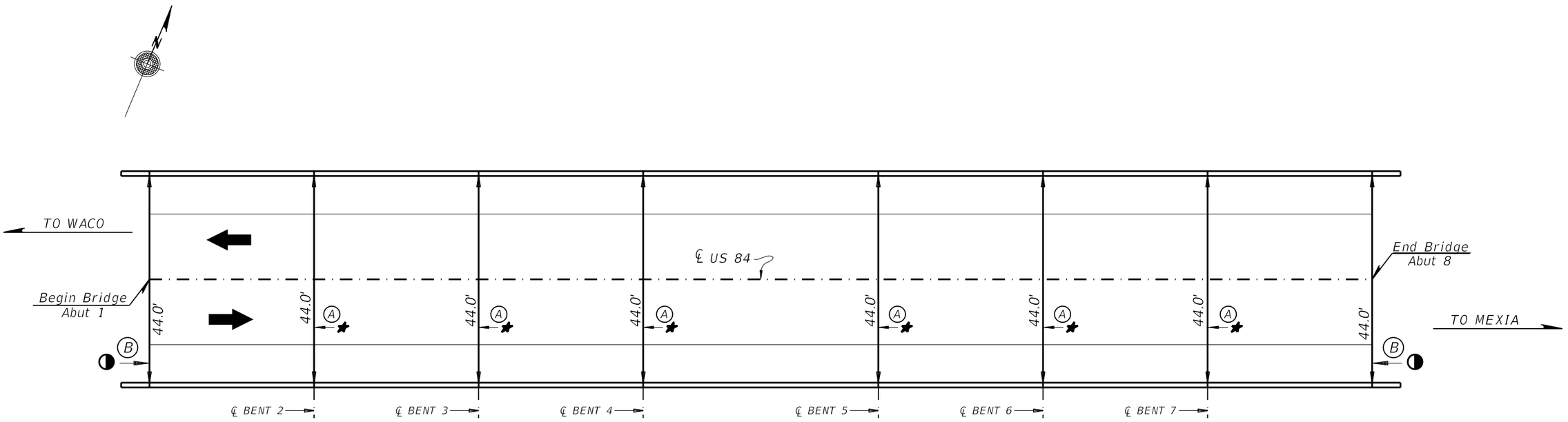

★ *Denotes Location for Cleaning and Sealing Expansion Joints.*

◑ *Denotes Location for Cleaning and Sealing Joints. (See Relief Joint Detail)*

US 84 OVER NAVASOTA RIVER
260'-0" OVERALL LENGTH
(6 @ 35') CONC. T-BEAM SPAN & 1- 50' STEEL I-BEAM SPAN
44'-0" ROADWAY
TYPE T501 RAIL

LAYOUT PLAN

US 84 OVER NAVASOTA RIVER

(NBI # 09-147-0-0056-02-036)

GPS LAT/LON: 31.663711/-97.661544

LIMESTONE COUNTY
PROJECT LAYOUT REF LI-1

GENERAL NOTES:

OBTAIN APPROVAL FOR ALL TOOLS, EQUIPMENT, MATERIALS AND TECHNIQUES PROPOSED FOR USE TO PREPARE THE JOINT.

PROVIDE THE CLASS 3 JOINT SEALANT IN ACCORDANCE WITH DMS-6310, "JOINT SEALANTS AND FILLERS".

ESTIMATED QUANTITIES

ITEM	*438-6002*
LOCATION	*CLEANING AND SEALING EXIST JOINTS (CL 3)*
	L.F.
STR. #036 US 84 OVER NAVASOTA RIVER	*352.0*
TOTAL	*352.0*

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE, PE 1/22/2024
Signature of Registrant & Date

SHEET 1 OF 2 SHEETS

Texas Department of Transportation
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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

US 84 OVER NAVASOTA RIVER

(STR.#036)

FILE: US84NAVASOTAJT.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	89
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\LIMESTONE\DGN's to Print\036 LI-1.dgn

LEVELS DISPLAYED ACC:
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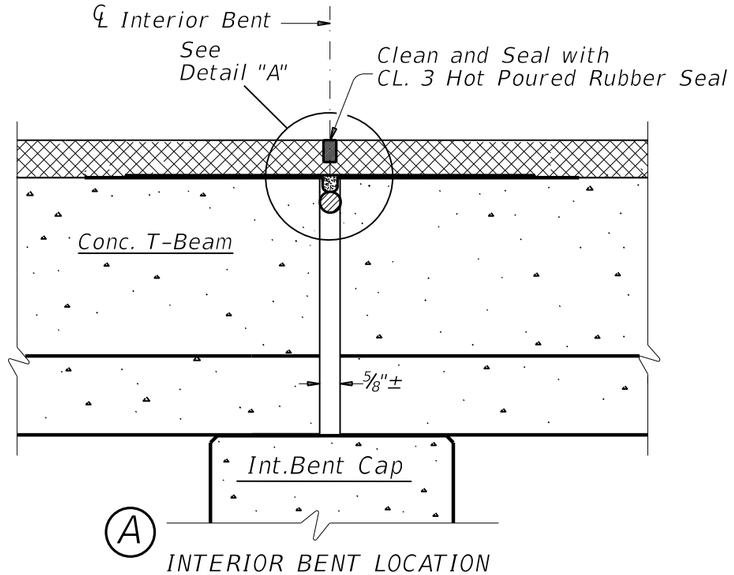
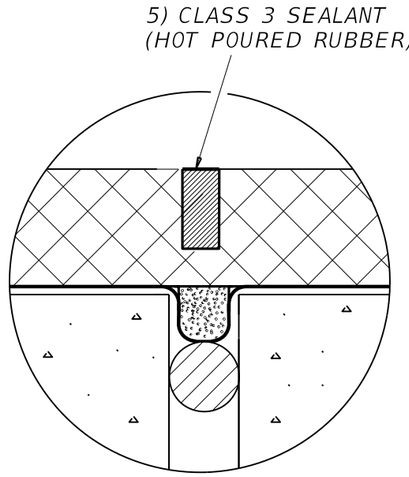


INTERIOR BENT LOCATION

FABRIC JOINT SEAL WITH HOT POURED RUBBER



DETAIL "A"

US 84 OVER NAVASOTA RIVER
260'-0" OVERALL LENGTH
(6 @ 35') CONC. T-BEAM SPAN & 1- 50' STEEL I-BEAM SPAN
44'-0" ROADWAY
TYPE T501 RAIL

GENERAL NOTES:

All work, including cleaning exist joint opening of all debris, and sealing joint, is paid for by Item 438, "Cleaning and Sealing Existing Joints."

Obtain approval for all tools, equipment, materials and techniques proposed for use to prepare the joint.

Provide the joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers."

NOTES:

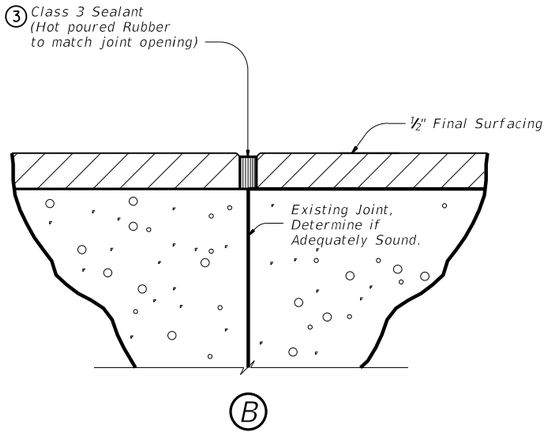
① The joints shall be cleaned in accordance with Item 438 and prior to beginning operations, the Contractor shall submit a statement from the Sealant Manufacturer showing the recommended equipment and Installation procedures to be used.

② Condition of existing expansion joint or rail shall be determined prior to placing sealant material. The entire length of existing joint shall be checked and any portion that is determined unsound by the Engineer shall be removed as directed by the Engineer. Any existing seal shall be removed and disposed of.
Repair any significant spalled or cracked areas, as determined by the Engineer, around the joint opening with an approved proprietary concrete repair material as Approved by the Engineer. This work will be paid for under Item 429 "Concrete Structure Repair".

③ Surfaces where sealant material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.

④ Seal when required as Directed by the Engineer. Extend sealant up into rail or curb 6 inches on low side or sides of deck. Prepare surfaces where sealant is to be placed in accordance with manufacturers specifications.
If the self-leveling sealant cannot be extended up into the rail, use a Class 4 Sealant in the curb or rail portion only.

⑤ Clean joint opening of all old expansion materials/devices, dirt, and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint. Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
Seal the joint opening with a Class 3 Silicone.



SECTION THRU RELIEF JOINT

PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE JOINT WITH HOT POURED RUBBER SEAL:

③ Seal the joint opening with a Class 3, "Hot Poured Rubber." Seal flush to the top of the asphaltic concrete pavement.
Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by CHARLES W. SMITH P.E. 110312, on

Charles W. Smith, PE, PE 1/22/2024
Signature of Registrant & Date

SHEET 2 OF 2 SHEETS

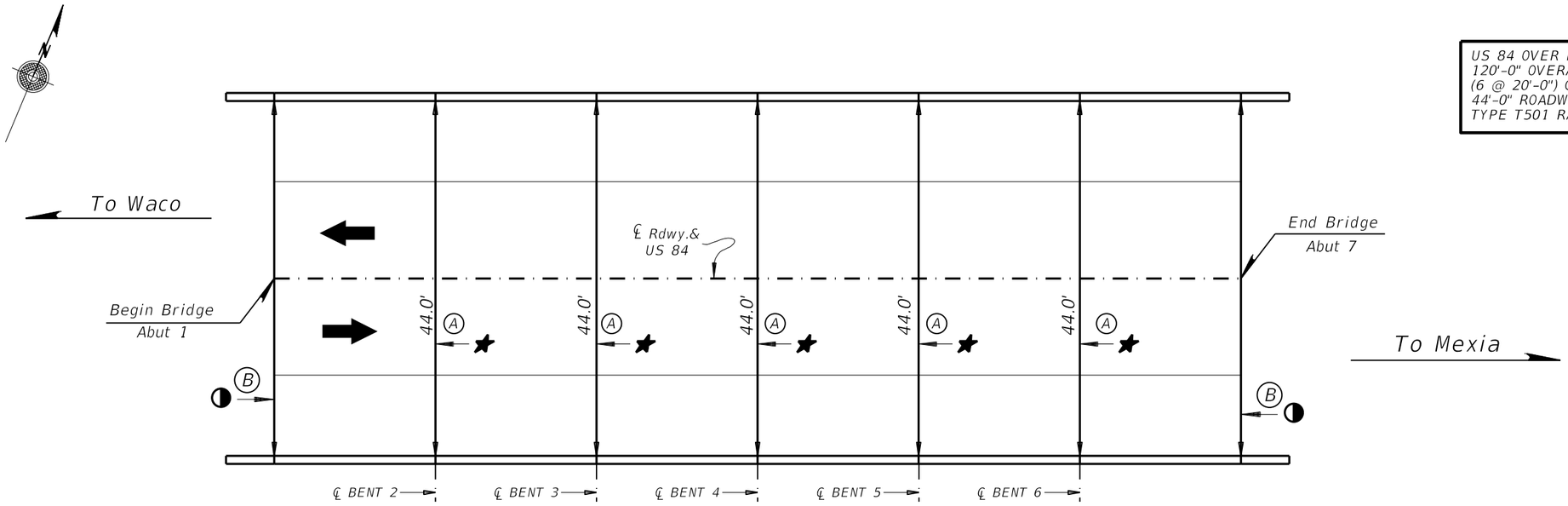
Texas Department of Transportation

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

US 84 OVER NAVASOTA RIVER

(STR.#036)

FILE: US84NAVASOTAJT.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	90
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC



US 84 OVER PIN OAK CREEK
120'-0" OVERALL LENGTH
(6 @ 20'-0") CONC. SLAB BRIDGE SPANS
44'-0" ROADWAY
TYPE T501 RAIL

★ Denotes Location for Cleaning and Sealing Expansion Joints.

◑ Denotes Location for Cleaning and Sealing Joints. (See Relief Joint Detail)

LAYOUT PLAN
US 84 OVER PIN OAK CREEK

(NBI # 09-147-0-0056-03-038)
GPS LAT/LON: 31.666112/-97.647095

LIMESTONE COUNTY
PROJECT LAYOUT REF LI-2

Ⓐ Ⓑ ESTIMATED QUANTITIES

ITEM	438-6002
LOCATION	CLEANING AND SEALING EXIST JOINTS (CL 3)
	L.F.
STR. #038 US 84 OVER PIN OAK CREEK	308.0
TOTAL	308.0

GENERAL NOTES:

OBTAIN APPROVAL FOR ALL TOOLS, EQUIPMENT, MATERIALS AND TECHNIQUES PROPOSED FOR USE TO PREPARE THE JOINT.

PROVIDE THE CLASS 3 JOINT SEALANT IN ACCORDANCE WITH DMS-6310, "JOINT SEALANTS AND FILLERS".

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE, PE 1/22/2024
Signature of Registrant & Date

SHEET 1 OF 2 SHEETS

Texas Department of Transportation
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LAYOUT & DETAILS
FOR CLEANING AND SEALING EXPANSION JOINTS
US 84 OVER PIN OAK CREEK
(STR.#038)

FILE: US84PINOAKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	91
	COUNTY	CONTROL	SECT JOB	HIGHWAY
	HILL,ETC	6460	63 001	SH 22,ETC

1/22/2024
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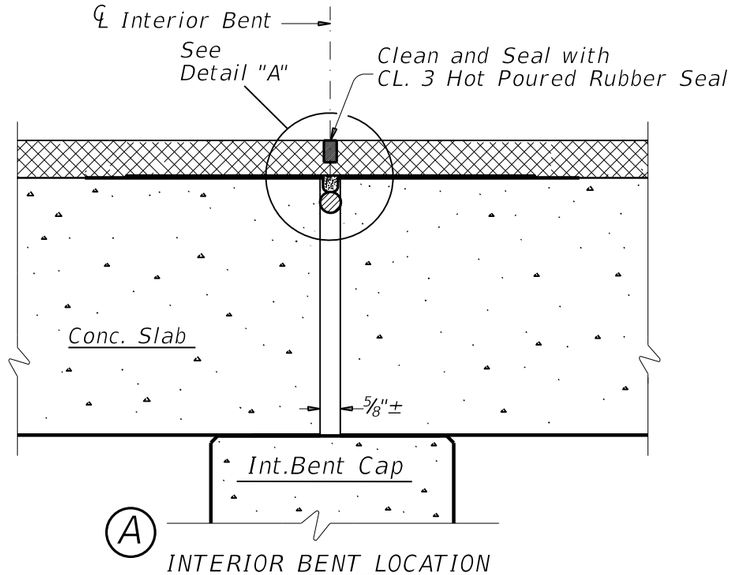
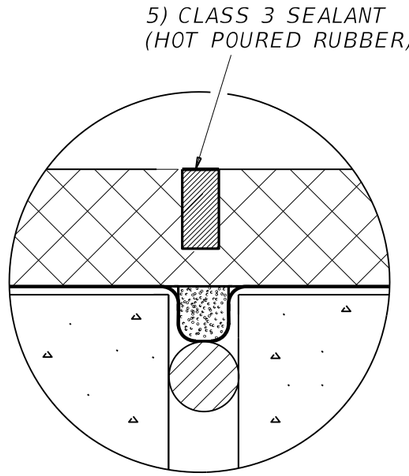
ACC:



INTERIOR BENT LOCATION

FABRIC JOINT SEAL WITH HOT POURED RUBBER



DETAIL "A"

US 84 OVER PIN OAK CREEK
120'-0" OVERALL LENGTH
(6 @ 20'-0") CONC. SLAB BRIDGE SPANS
44'-0" ROADWAY
TYPE T501 RAIL

GENERAL NOTES:

All work, including cleaning exist joint opening of all debris, and sealing joint, is paid for by Item 438, "Cleaning and Sealing Existing Joints."

Obtain approval for all tools, equipment, materials and techniques proposed for use to prepare the joint.

Provide the joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers."

NOTES:

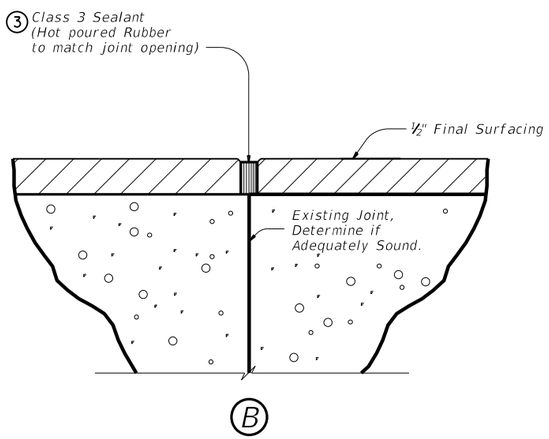
(1) The joints shall be cleaned in accordance with Item 438 and prior to beginning operations, the Contractor shall submit a statement from the Sealant Manufacturer showing the recommended equipment and Installation procedures to be used.

(2) Condition of existing expansion joint or rail shall be determined prior to placing sealant material. The entire length of existing joint shall be checked and any portion that is determined unsound by the Engineer shall be removed as directed by the Engineer. Any existing seal shall be removed and disposed of.
Repair any significant spalled or cracked areas, as determined by the Engineer, around the joint opening with an approved proprietary concrete repair material as Approved by the Engineer. This work will be paid for under Item 429 "Concrete Structure Repair".

(3) Surfaces where sealant material is to be placed shall be clean and dry in accordance with the manufacturer's specifications.

(4) Seal when required as Directed by the Engineer. Extend sealant up into rail or curb 6 inches on low side or sides of deck. Prepare surfaces where sealant is to be placed in accordance with manufacturers specifications.
If the self-leveling sealant cannot be extended up into the rail, use a Class 4 Sealant in the curb or rail portion only.

(5) Clean joint opening of all old expansion materials/devices, dirt, and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint. Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
Seal the joint opening with a Class 3 Silicone.



SECTION THRU RELIEF JOINT

PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE JOINT WITH HOT POURED RUBBER SEAL:

(3) Seal the joint opening with a Class 3, "Hot Poured Rubber." Seal flush to the top of the asphaltic concrete pavement.
Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED
PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by CHARLES W. SMITH P.E. 110312, on

Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

SHEET 2 OF 2 SHEETS

Texas Department of Transportation

LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

US 84 OVER PIN OAK CREEK

(STR.#038)

FILE: US84PINOAKJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	92
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
T:\WACHO\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\LIMESTONE\DGN's to Print\038 LI-2A.dgn

LEVELS DISPLAYED
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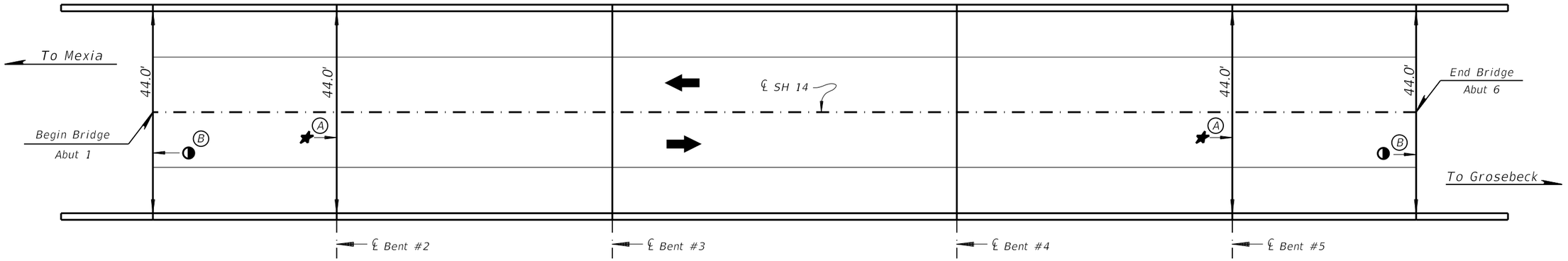
49 55 57 58 59 60 61 62 63 64 65 66 67 68 69 70
ACC:



LAYOUT PLAN

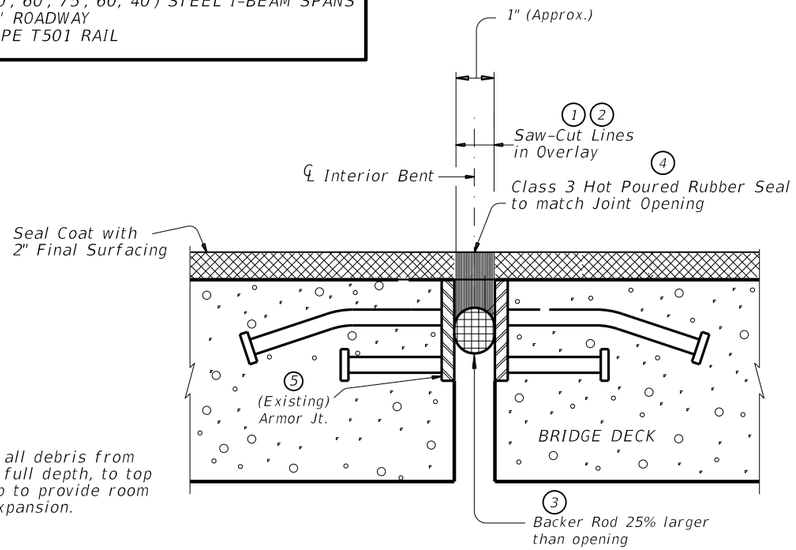
SH 14 OVER NAVASOTA RIVER

(NBI # 09-147-0-0093-04-045)
GPS LAT/LON: 31.587167/-96.525624

◑ Denotes Location for Cleaning and Sealing Joints. (See Relief Joint Detail)

★ Denotes Location for Cleaning and Sealing Expansion Joints.

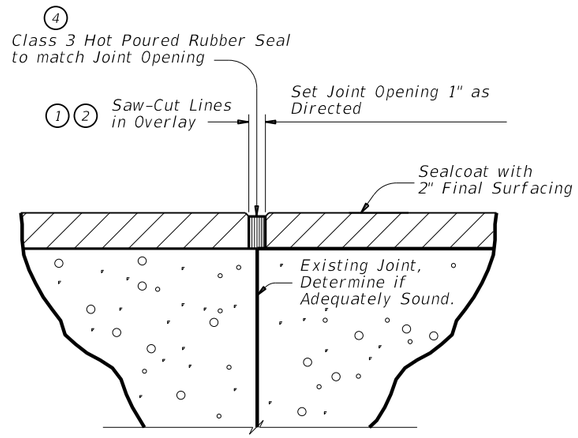
SH 14 OVER NAVASOTA RIVER
275'-0" OVERALL LENGTH
(40', 60', 75', 60, 40') STEEL I-BEAM SPANS
44' ROADWAY
TYPE T501 RAIL



Clean all debris from joint, full depth, to top of cap to provide room for expansion.

SECTION THRU EXPANSION JOINT

Ⓐ



Ⓑ

ABUTMENT BENT LOCATION

SECTION THRU RELIEF JOINT

GENERAL NOTES:

CLEANING EXISTING JOINT OPENING OF ALL DEBRIS, PROVIDING AND PLACING BACKER ROD, SAW-CUTTING JOINT OPENING, AND SEALING JOINT IS PAID FOR BY ITEM 438, "CLEANING AND SEALING JOINTS" AND MEASURED BY THE L.F. OF "CLEANING AND SEALING OF EXISTING JOINTS (CL 3)."

OBTAIN APPROVAL FOR ALL TOOLS, EQUIPMENT, MATERIALS AND TECHNIQUES PROPOSED FOR USE TO PREPARE THE JOINT.

PREPARE JOINT AND SEAL IN ACCORDANCE WITH ITEM 438 "CLEANING AND SEALING JOINTS."

PROVIDE THE CLASS 3 JOINT SEALANT IN ACCORDANCE WITH DMS-6310, "JOINT SEALANTS AND FILLERS."

LIMESTONE COUNTY
PROJECT LAYOUT REF LI-3

Ⓐ Ⓑ ESTIMATED QUANTITIES

ITEM	438-6002
LOCATION	CLEANING AND SEALING EXISTING JOINTS (CL 3)
	L.F.
STR. #045 SH 14 OVER NAVASOTA RIVER	176.0
TOTAL	176.0

PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE JOINT WITH HOT POURED RUBBER SEAL:

1. Saw cut through the asphalt at the centerline of joint. Make multiple saw cuts to create a ½" minimum joint opening or match the existing joint opening. Clean joint opening of all old expansion materials/devices, bituminous materials, dirt, grease and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints."
2. Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
3. Place backer rod into joint opening 1" below the top of concrete. Backer rod must be of the type that can handle the heat and be compatible with the hot poured rubber seal. The backer rod must be 25% larger than the joint opening.
4. Seal the joint opening with a Class 3, "Hot Poured Rubber." Seal flush to the top of the asphaltic concrete pavement.
5. Condition of existing expansion joint or rail shall be determined prior to placing sealant material. The entire length of existing joint shall be checked and any portion that is determined unsound, shall be removed as directed. Any existing seal shall be removed and disposed of.

   Repair any significant spalled or cracked areas, as determined and directed, around the joint opening with an approved proprietary concrete repair material as approved and directed. This work will not be paid for directly, but shall be considered subsidiary to Item 438.

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, P.E. PE 1/22/2024
Signature of Registrant & Date

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

SH 14 OVER NAVASOTA RIVER

(STR.#045)

FILE: SH14NAVASOTAJTS.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	93
	COUNTY	CONTROL	SECT JOB	HIGHWAY
	HILL,ETC	6460	63 001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\LIMESTONE\DGN's to Print\045 LI-3.dgn

LEVELS DISPLAYED
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33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
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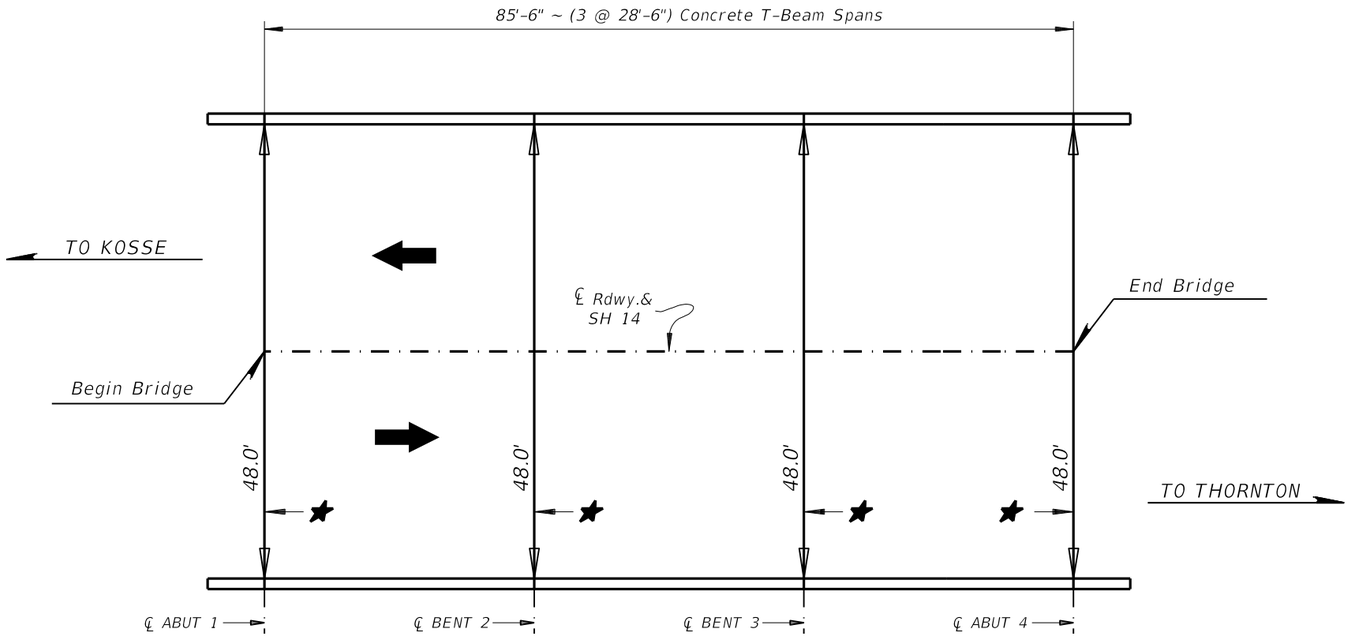
ACC:



SH 14 OVER MILLS CREEK
85'-6" OVERALL LENGTH
(3 @ 28'-6") CONCRETE T-BEAM SPANS
48'-0" ROADWAY
TYPE T501 RAIL

★ Denotes Location for Cleaning and Sealing Expansion Joints.

LIMESTONE COUNTY
PROJECT LAYOUT REF LI-4

NOTE: APPROX. 2"-5" OF EXISTING OVERLAY IS TO BE REMOVED DOWN TO THE BRIDGE DECK PROIR TO JOINT REPAIR.
(SEE MILLING & OVERLAY FOR FURTHER DETAILS)

LAYOUT PLAN

SH 14 OVER MILLS CREEK

(NBI # 09-147-0-0093-06-032)
GPS LAT/LON: 31.382219/-96.596599

GENERAL NOTES:

CLEANING EXISTING JOINT OPENING OF ALL DEBRIS, PROVIDING AND PLACING BACKED ROD, SAW-CUTTING JOINT OPENING, AND SEALING JOINT IS PAID FOR BY ITEM 438, "CLEANING AND SEALING JOINTS" AND MEASURED BY THE L.F. OF "CLEANING AND SEALING OF EXISTING JOINTS (CL 3)". PROVIDING AND APPLYING TACK COAT AND PROVIDING AND PLACING FABRIC JOINT UNDERSEAL OS PAID FOR BY ITEM 356. "FABRIC UNDERSEAL" AND MEASURED BY THE L,F, OF "PAV JT UNDERSEAL".

OBTAIN APPROVAL FOR ALL TOOLS, EQUIPMENT, MATERIALS AND TECHNIQUES PROPOSED FOR USE TO PREPARE THE JOINT.

PROVIDE THE REINFORCED FABRIC JOINT UNDERSEAL IN ACCORDANCE WITH DMS-6260 "REINFORCED FABRIC JOINT UNDERSEAL" OR DMS-6220, "FABRIC FOR UNDERSEALS".

PROVIDE THE CLASS 3 JOINT SEALANT IN ACCORDANCE WITH DMS-6310, "JOINT SEALANTS AND FILLERS".

ESTIMATED QUANTITIES

ITEM	356-6021	438-6002
LOCATION	PAV JT UNDERSEAL (24")	CLEANING AND SEALING EXIST JOINTS (CL 3)
	L.F.	L.F.
STR. #032 SH 14 OVER MILLS CREEK	192.0	192.0
TOTAL	192.0	192.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

SHEET 1 OF 2 SHEETS

Texas Department of Transportation
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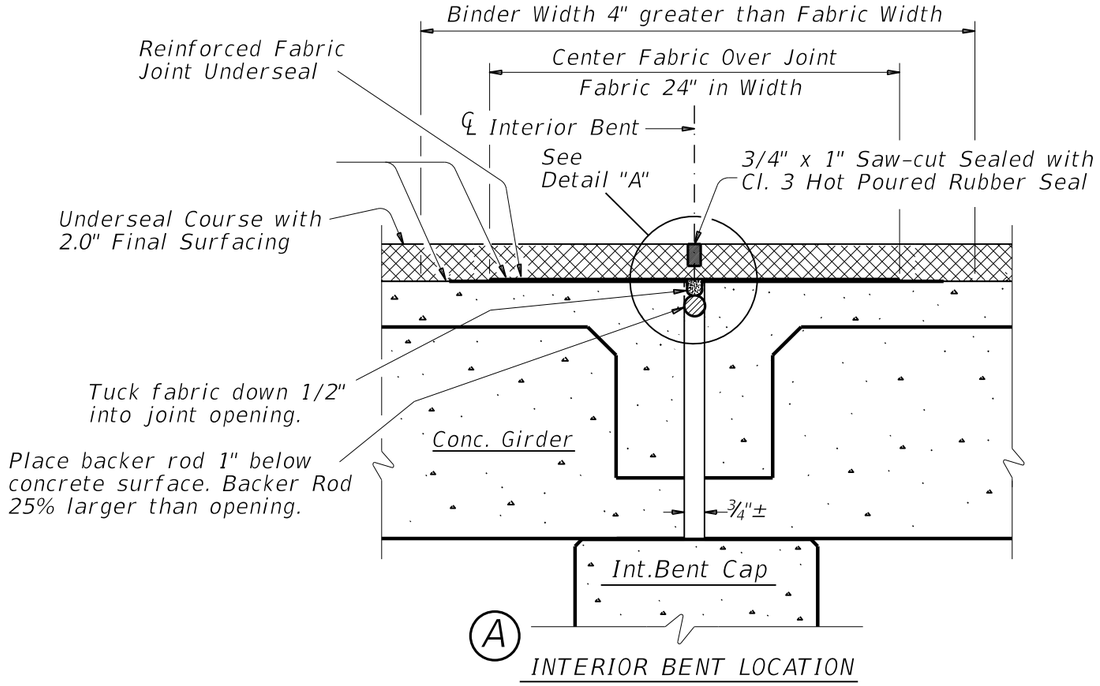
LAYOUT & DETAILS
FOR CLEANING AND SEALING EXPANSION JOINTS
SH 14 OVER MILLS CREEK
(STR.#032)

FILE: SH14MILLSCRK.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	94
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\LIMESTONE\DGN's to Print\032 LI-4.dgn

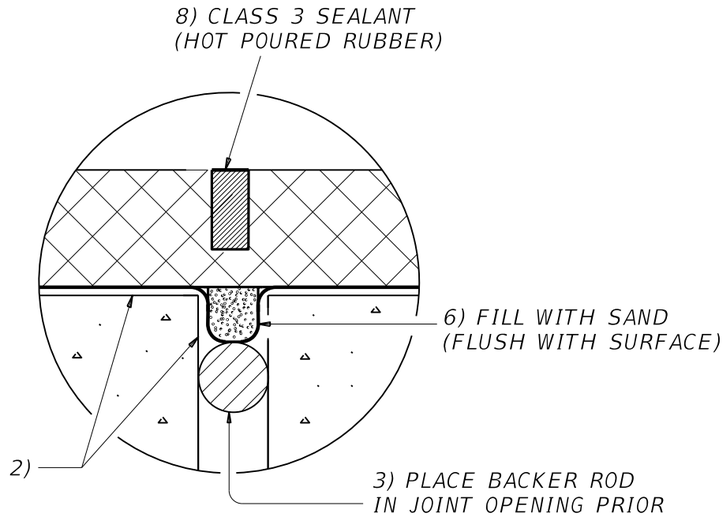
LEVELS DISPLAYED
ACC:

3) A tack coat must be applied if the surface has been milled.



INTERIOR BENT LOCATION

FABRIC JOINT SEAL WITH HOT POURED RUBBER



DETAIL "A"

PROCEDURES:

1) PRIOR TO THE PLACEMENT OF THE FABRIC JOINT UNDERSEAL. CLEAN JOINT OPENING OF ALL OLD EXPANSIONS MATERIAL/DEVICES, BITUMINOUS MATERIALS, DIRT, GREASE, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438, "CLEANING AND SEALING JOINTS".

2) REPAIR ANY SIGNIFICANT SPALLED OR CRACKED AREAS, AS DETERMINED BY THE ENGINEER, AROUND THE JOINT OPENING WITH TYPE II POLYMER CONCRETE IN ACCORDANCE WITH DMS-6140, "POLYMER CONCRETE FOR JOINT SYSTEMS". THIS WORK WILL BE PAID FOR BY ITEM 429 "CNC STR REP (STANDARD)".

3) PLACE TACK COAT OR BINDER AS REQUIRED BY THE FABRIC JOINT UNDERSEAL MANUFACTURER'S INSTALLATION INSTRUCTIONS. PLACE BACKER ROD IN JOINT OPENING PRIOR TO PLACING TACK COAT.

4) PLACE REINFORCED FABRIC JOINT UNDERSEAL CENTERED OVER JOINT OPENING. TUCK FABRIC DOWN APPROXIMATELY 1/2" INTO THE JOINT OPENING. INSTALL UNDERSEAL IN ACCORDANCE WITH MANUFACTURED RECOMMENDATIONS.

5) WHEN USING THE SELF-ADHESIVE TYPE FABRIC UNDERSEAL, PRESSURE ROLL FABRIC JOINT UNDERSEAL TO IMPROVE ADHESION.

6) JUST PRIOR TO PAVING, FILL TUCKED IN PORTION OF UNDERSEAL WITH SAND FLUSH WITH SURFACE. APPLY A TACK COAT TO FABRIC JOINT UNDERSEAL AS REQUIRED BY THE MANUFACTURER'S INSTRUCTIONS. MARK LOCATION OF CENTERLINE OF JOINT ON CURB OR BARRIER AS APPROVED.

7) AFTER THE ASPHALTIC CONCRETE PAVEMENT OPERATIONS ARE COMPLETE, SAW CUT 1" INTO THE ASPHALT AT CENTERLINE OF JOINT. MAKE MULTIPLE SAW CUTS TO CREATE A 3/4" JOINT OPENING OR MATCH THE EXISTING JOINT OPENING. WHICHEVER IS GREATER. DO NOT DAMAGE THE UNDERSEAL.

8) SEAL THE JOINT OPENING WITH A CLASS 3, "HOT POURED RUBBER". SEAL FLUSH WITH THE TOP OF THE ASPHALTIC CONCRETE PAVEMENT.

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Charles W. Smith, PE PE 1/22/2024
Signature of Registrant & Date

LAYOUT & DETAILS
FOR CLEANING AND SEALING EXPANSION JOINTS

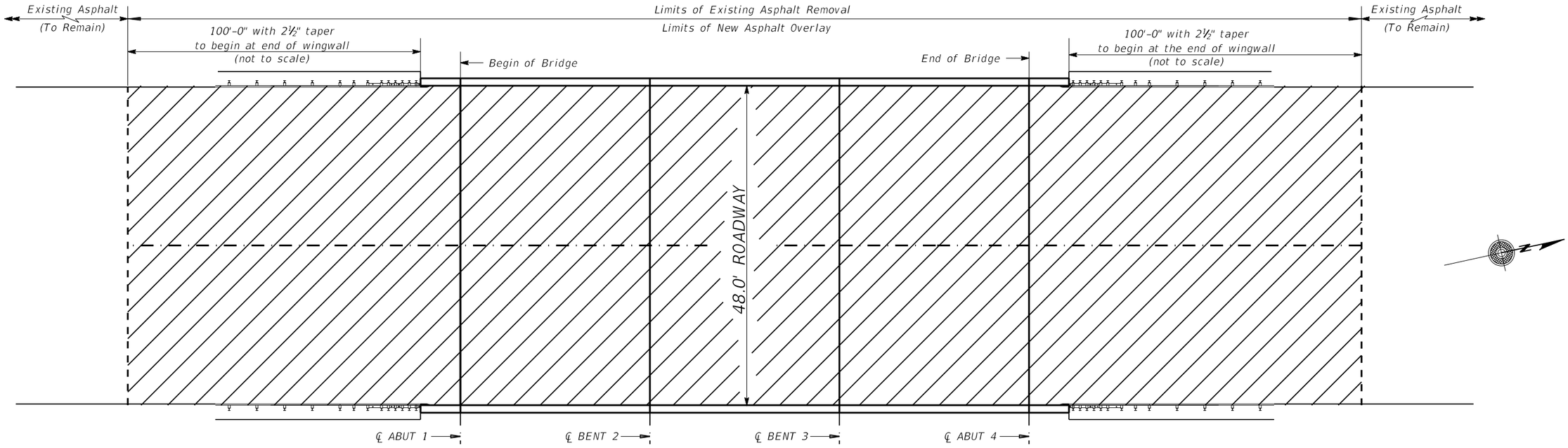
SH 14 OVER MILLS CREEK

(STR.#032)

FILE: SH14MILLSCRK.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	95
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL,ETC	6460	63	001	SH 22,ETC

1/22/2024
T:\WACHQ\DISTRICT MAINT\RMC_6460-63-001\BASE\SHEETS\LIMESTONE\DGN's to Print\032 LI-4A.dgn

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 ACC:



NOTE: REMOVE APPROX. 2"-5" OF EXISTING OVERLAY DOWN TO BRIDGE DECK

ROADWAY PLAN
SH 14 OVER MILLS CREEK

(NBI # 09-147-0-0093-06-032)
(SHOWING LIMITS OF MILLING/OVERLAY)

SH 14 OVER MILLS CREEK
85'-6" OVERALL LENGTH
(3 @ 28'-6") CONCRETE T-BEAM SPANS
48'-0" ROADWAY
TYPE T501 RAIL

GENERAL NOTES:

1. Mill Existing Asphalt completely off the Bridge Deck.
2. Repair any damaged exposed Deck Surface or Bridge Joints in accordance with Items 429 and 438.
3. Prepare Expansion Joints in accordance with Joint Repair Details.
4. Construct Underseal Course and D-GR HMA TY-C-SAC_B Final Surfacing.
5. Clean and Seal Bridge Joints in accordance with Joint Repair Details.

ESTIMATED QUANTITIES

ITEM	354-6088	3076-6069	3085-6001
LOCATION	PLANE ASPH CONC. PAV (0' to 5")	D-GR HMA TY-C-SAC-B PG64-22 (EXEMPT)	UNDERSEAL COURSE
	S.Y.	TON	GAL.
STR. #032 SH 14 OVER MILLS CREEK	1587.0	175.0	318.0
TOTAL	1587.0	175.0	318.0

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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Texas Department of Transportation

MILLING AND OVERLAY DETAILS

SH 14 OVER MILLS CREEK

(STR.#032)

FILE: SH14MILLSCRK.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT			
ORIG DATE: OCT. 2023	DIST	FED REG	MAINTENANCE PROJECT #				SHEET
REVISIONS	WACO	6	RMC 646063001				96
	COUNTY		CONTROL	SECT	JOB	HIGHWAY	
	HILL,ETC		6460	63	001	SH 22,ETC	

1/22/2024
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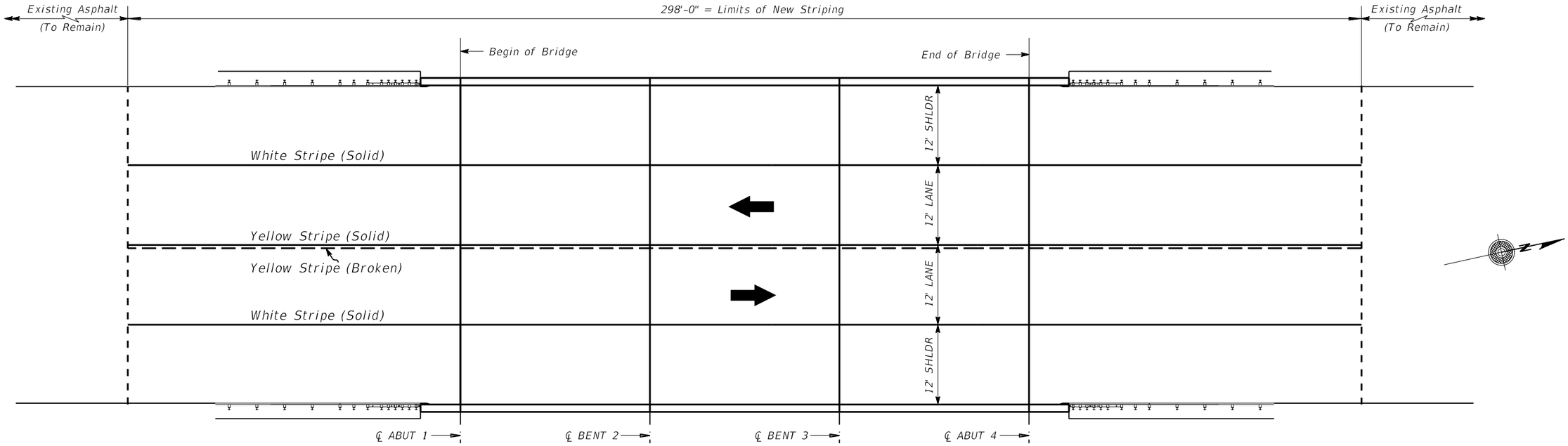

SH 14 OVER MILLS CREEK
85'-6" OVERALL LENGTH
(3 @ 28'-6") CONCRETE T-BEAM SPANS
48'-0" ROADWAY
TYPE T501 RAIL

LAYOUT PLAN
SH 14 OVER MILLS CREEK

(NBI # 09-147-0-0093-06-032)

ESTIMATED QUANTITIES

ITEM	662-6111	666-6303	666-6312	666-6318	672-6009
LOCATION	WK ZN PAV MRK SHT TERM (TAB) TY Y-2	RE PM W/RET REQ TY 1 (W) 4" (SLD) (100MIL)	RE PM W/RET REQ TY 1 (Y) 4" (BRK) (100MIL)	RE PM W/RET REQ TY 1 (Y) 4" (SLD) (100MIL)	REFL PAV MRKR TY II-A-A
	EA	LF	LF	LF	EA
STR. #011 FM 934 OVER TRIB. HACKBERRY CREEK	8.0	596.0	75.0	298.0	9.0
TOTAL	8.0	596.0	75.0	298.0	9.0

SHEET 1 OF 1 SHEETS

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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STRIPING DETAILS

SH 14 OVER MILLS CREEK

(STR.#032)

FILE: SH14MILLSCRK.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: OCT 2023	DIST	FED REG	MAINTENANCE PROJECT #	SHEET
REVISIONS	WACO	6	RMC 646063001	97
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
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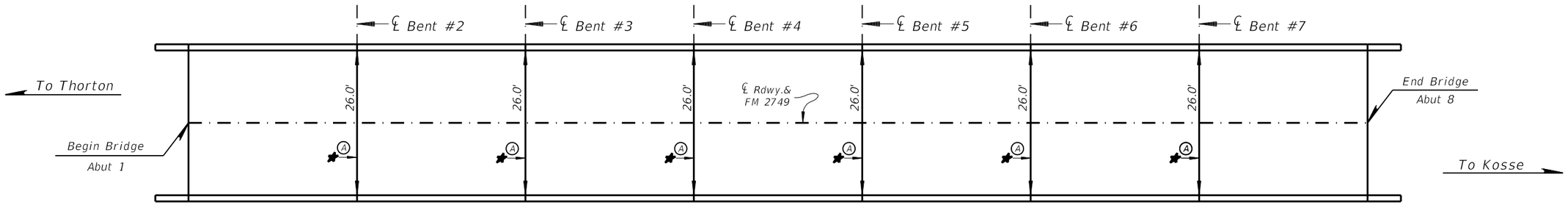


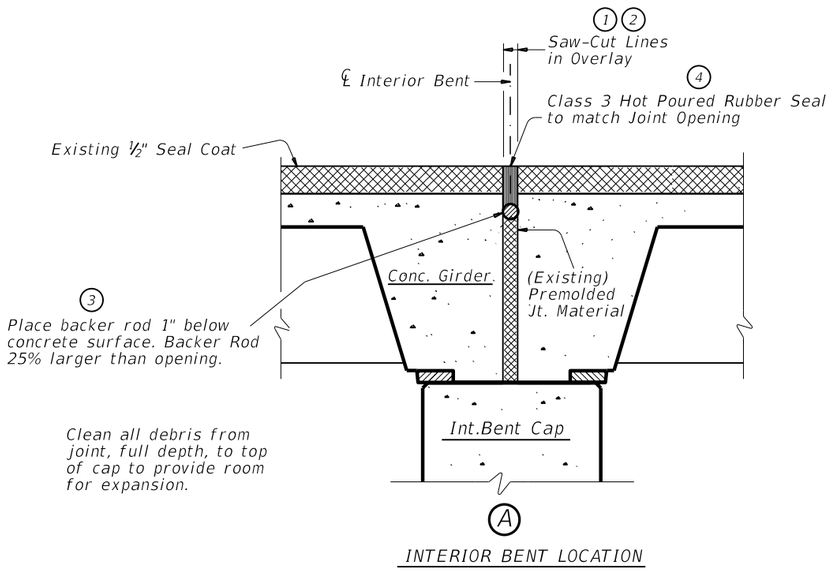
★ Denotes Location for Cleaning and Sealing Expansion Joints.

FM 2749 OVER STEELE CREEK RELIEF
212'-4" OVERALL LENGTH
(7 @ 30'-4") CONCRETE PAN GIRDER SPANS
26'-0" ROADWAY
TYPE T1 RAIL

LAYOUT PLAN

FM 2749 OVER STEELE CREEK RELIEF

(NBI # 09-147-0-2807-02-002)
GPS LAT/LON: 31.335370/-96.515909



INTERIOR BENT LOCATION

EXPANSION JOINT WITH HOT POURED RUBBER

(A) ESTIMATED QUANTITIES

ITEM	438-6002
LOCATION	CLEANING AND SEALING EXISTING JOINTS (CL 3)
	L.F.
STR. #002 FM 2749 OVER STEELE CREEK RELIEF	156.0
TOTAL	156.0

LIMESTONE COUNTY
PROJECT LAYOUT REF LI-5

PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE JOINT WITH HOT POURED RUBBER SEAL:

(1) Saw cut through the asphalt at the centerline of joint. Make multiple saw cuts to create a ½" minimum joint opening or match the existing joint opening. Clean joint opening of all old expansion materials/devices, bituminous materials, dirt, grease and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints."

(2) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.

(3) Place backer rod into joint opening 1" below the top of concrete. Backer rod must be of the type that can handle the heat and be compatible with the hot poured rubber seal. The backer rod must be 25% larger than the joint opening.

(4) Seal the joint opening with a Class 3, "Hot Poured Rubber." Seal flush to the top of the asphaltic concrete pavement.
Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."

GENERAL NOTES:

CLEANING EXISTING JOINT OPENING OF ALL DEBRIS, PROVIDING AND PLACING BACKER ROD, SAW-CUTTING JOINT OPENING, AND SEALING JOINT IS PAID FOR BY ITEM 438, "CLEANING AND SEALING JOINTS" AND MEASURED BY THE L.F. OF "CLEANING AND SEALING OF EXISTING JOINTS (CL 3)."

OBTAIN APPROVAL FOR ALL TOOLS, EQUIPMENT, MATERIALS AND TECHNIQUES PROPOSED FOR USE TO PREPARE THE JOINT.

PROVIDE THE CLASS 3 JOINT SEALANT IN ACCORDANCE WITH DMS-6310, "JOINT SEALANTS AND FILLERS."

STATE OF TEXAS
CHARLES W. SMITH
110312
LICENSED PROFESSIONAL ENGINEER

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LAYOUT & DETAILS FOR CLEANING AND SEALING EXPANSION JOINTS

FM 2749 OVER STEELE CREEK RELIEF

(STR.#002)

FILE: FM2749STEELECRK.DGN	DN: DOT	CK: DOT	DW: ZB	CK: DOT
ORIG DATE: NOV. 2023	DIST	FED REG	MAINTENANCE PROJECT	SHEET
REVISIONS	WACO	6	RMC 646063001	98
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HILL, ETC	6460	63	001	SH 22, ETC

1/22/2024
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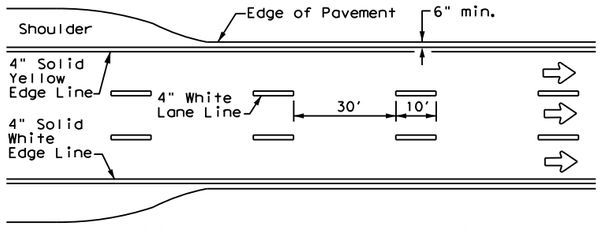
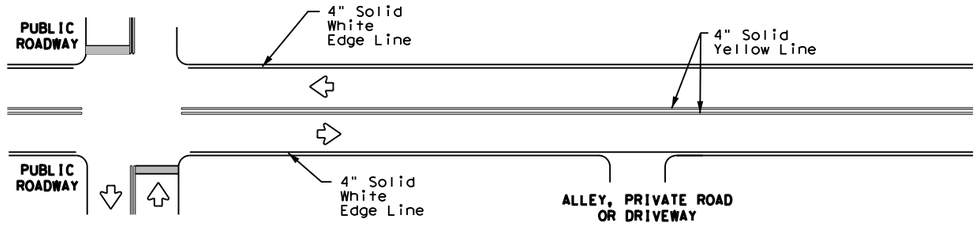
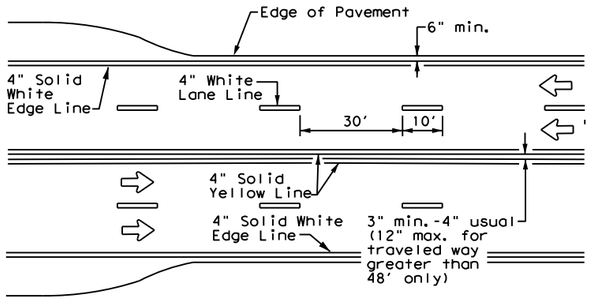
ACC:



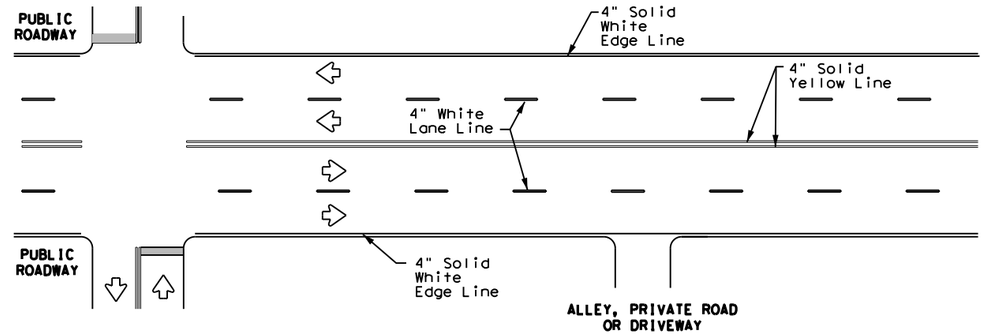
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



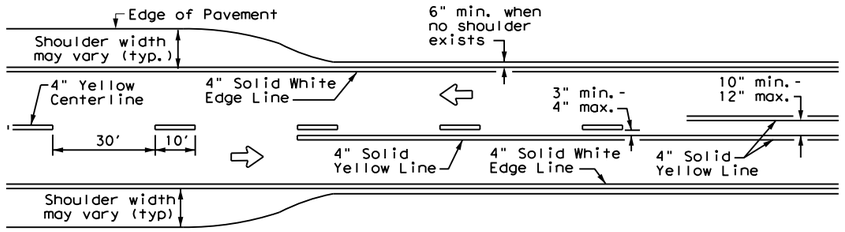
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



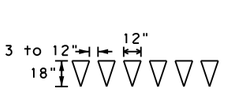
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



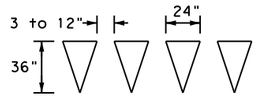
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

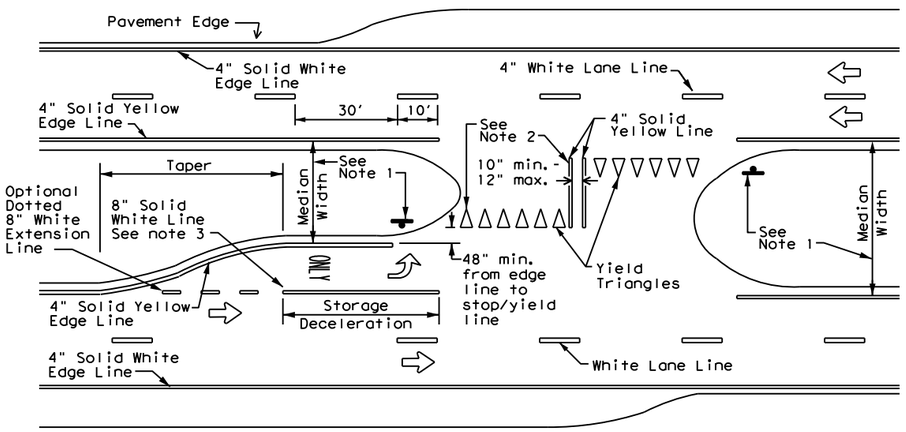


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

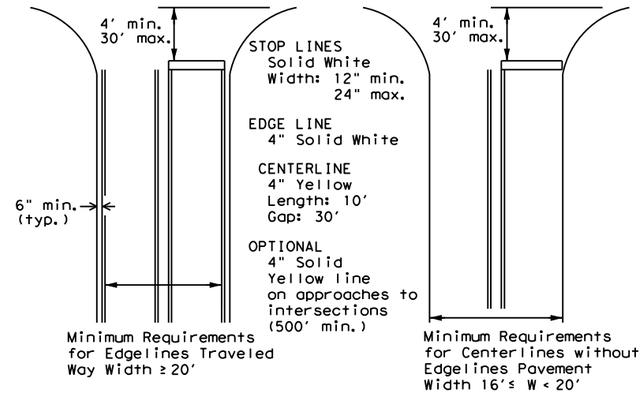
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

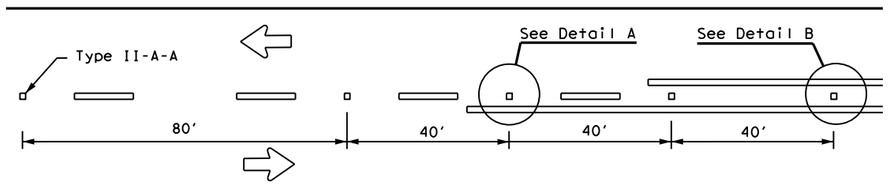
PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	6460	63	001	SH 22, ETC
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	WACO	HILL, ETC		99

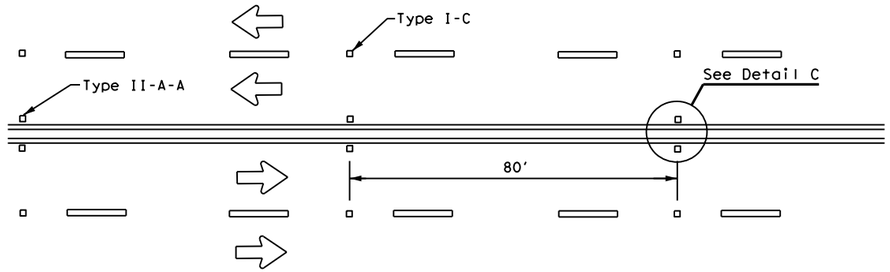
22A

DATE: 1/22/2024 1:19:28 PM
FILE: T:\WACHO\DISTRICT MAINT\RMC_6460-63-001\BASE\STANDARDS\pm1-20.dgn

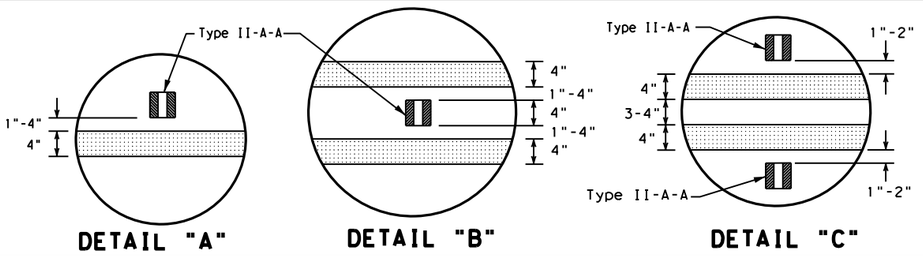
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



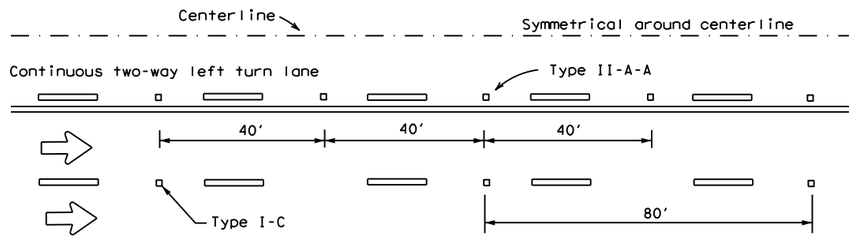
CENTERLINE FOR ALL TWO LANE ROADWAYS



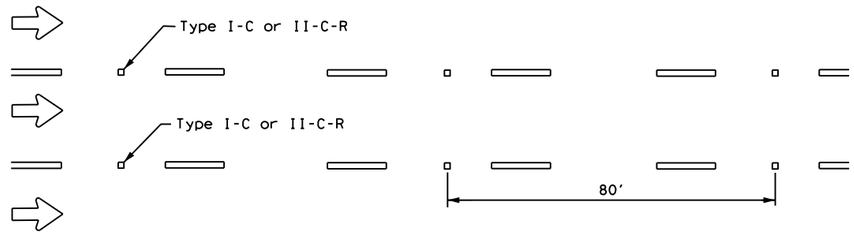
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**

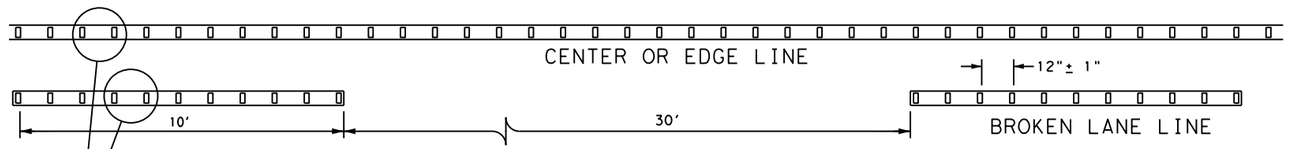


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



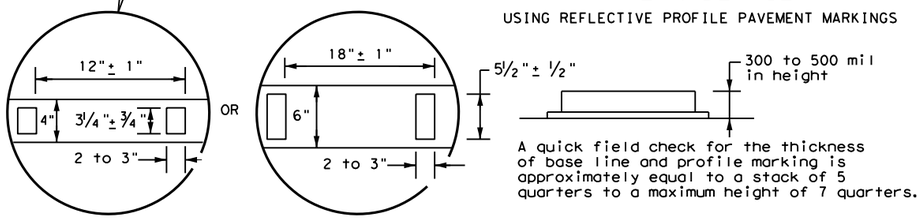
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

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.

NOTE

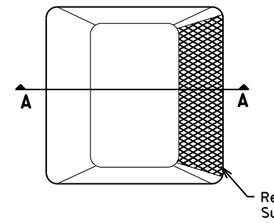
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

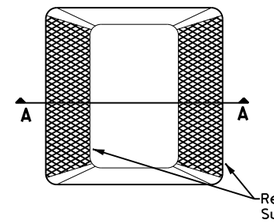
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

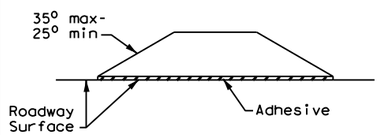
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	6460	63	001	SH 22, ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL, ETC		100

22B

DATE: 1/22/2024 1:19:28 PM
FILE: T:\WACHO\DISTRICT MAINT\RMC_6460-63-001\BASE\STANDARDS\pm2-20.dgn

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 023 183 K
Crossing Type: RR UNDER
RR Company Operating Track at Crossing: BNSF RAILWAY
RR Company Owning Track at Crossing: BNSF RAILWAY
RR MP: 218.520
RR Subdivision: FORT WORTH
City: TEMPLE
County: BELL
CSJ at this Crossing: RMC 6460-63-001
Latitude: 31.0988398
Longitude: -97.3490462

Scope of Work, including any TCP, to be performed by State Contractor:

BRIDGE JOINT CLEANING AND SEALING

Scope of Work to be performed by Railroad Company:

NONE

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 5 days

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☐ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☑ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☐ Not Required
☑ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☐ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☑ Required: Contractor to obtain
- ☑ BNSF: BNSF Temporary Occupancy Permit
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: BNSF RAILWAY
Railroad Emergency Line at: 800-832-5452
Location: DOT 023 183 K
RR Milepost: 218.520
Subdivision: FORT WORTH

RRD Review Only
Initials: _____
Date: 01/10/2024

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS	6460	63	001		SH 22, ETC		
6/2023		DIST	COUNTY			SHEET NO.	
		09	HILL, ETC			101	

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 024 489 T
Crossing Type: RR UNDER
RR Company Operating Track at Crossing: BNSF RAILWAY
RR Company Owning Track at Crossing: BNSF RAILWAY
RR MP: 219.530
RR Subdivision: LAMPASAS
City: TEMPLE
County: BELL
CSJ at this Crossing: RMC 6460-63-001
Latitude: 31.0975501
Longitude: -97.3649021

Scope of Work, including any TCP, to be performed by State Contractor:

BRIDGE JOINT CLEANING AND SEALING

Scope of Work to be performed by Railroad Company:

NONE

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 5

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

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☐ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☑ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

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Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
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☐ Other: _____	

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☐ Not Required
☐ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☑ Required: Contractor to obtain
- ☑ BNSF: BNSF Temporary Occupancy Permit
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

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Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

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IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: BNSF RAILWAY
Railroad Emergency Line at: 800-832-5452
Location: DOT 024 489 T
RR Milepost: 219.530
Subdivision: LAMPASAS

RRD Review Only
Initials: _____
Date: 01/10/2024

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS		6460	63	001		SH 22, ETC	
6/2023		DIST	COUNTY			SHEET NO.	
		09	HILL, ETC			102	

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation — Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	6460	63	001	SH 22, ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL, ETC		103

DATE:
FILE:

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of ¼ inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

DATE:
FILE:

Texas Department of Transportation

Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	6460	63	001	SH 22, ETC
	DIST	COUNTY		SHEET NO.
	WACO	HILL, ETC		104

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.

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):
RMC 6460 - 63 - 001

1.2 PROJECT LIMITS:
VARIOUS LOCATION IN THE WACO DISTRICT; SEE PROJECT LAYOUTS FOR MAPS AND LOCATIONS

1.3 PROJECT COORDINATES:
SEE PROJECT LAYOUTS FOR COORDINATE DATA

1.4 TOTAL PROJECT AREA (Acres): VARIOUS

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0

1.6 NATURE OF CONSTRUCTION ACTIVITY:
CLEANING AND SEALING BRIDGE JOINTS

1.7 MAJOR SOIL TYPES:

Soil Type	Description

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
☐
☐ 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

* 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: _____

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.
6	RMC 646063001		105
STATE	STATE DIST.	COUNTY	
TEXAS	WACO	HILL, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
6460	63	001	SH 22, ETC

DATE: 1/22/2024
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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.

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.
6	RMC 646063001		106
STATE	STATE DIST.	COUNTY	
TEXAS	WACO	HILL, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
6460	63	001	SH 22, ETC

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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.

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# NWP 3a

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. All work locations on this contract are waters of the US and work would be conducted under NWP3a
2.
3.
4.
5.
6.
7.
8.

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. SEE STATEMENT ABOVE
2.

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. SEE STATEMENT ABOVE
2. See Item 8 of General Notes in regards to tree trimming and removal
3.
4.

V. BIOLOGICAL RESOURCES

☐ No Action Required ☒ Required Action

Action No.

1. Comply with Migratory Bird Treaty Act (MBTA)
2. At SH 95 at Little River, Bell County; no work in the Little River, stay out of the river. If work has to take place in the River, contact District Environmental (254) 867-2737
3. SEE STATEMENT BELOW
4.
5.

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. Lead Based Paint: The removal, containment, and disposal process of hazardous materails would comply with applicable federal,state and local laws.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.
2.
3.

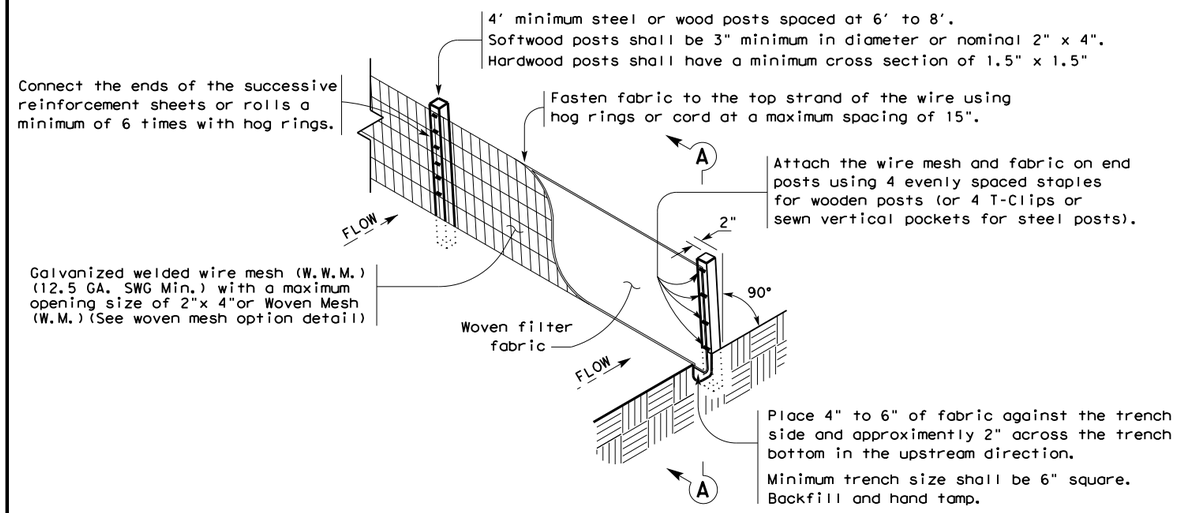
Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

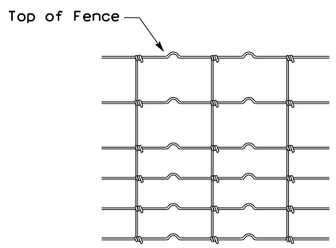
EPIC

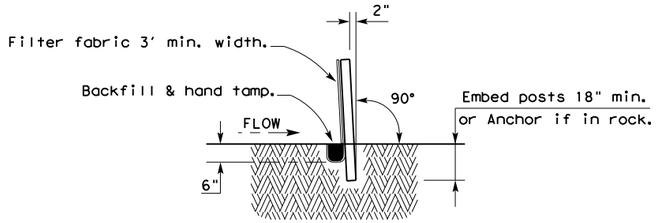
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	6460	63	001	SH 22,ETC
	DIST	COUNTY		SHEET No.
	WACO	HILL,ETC		107



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.

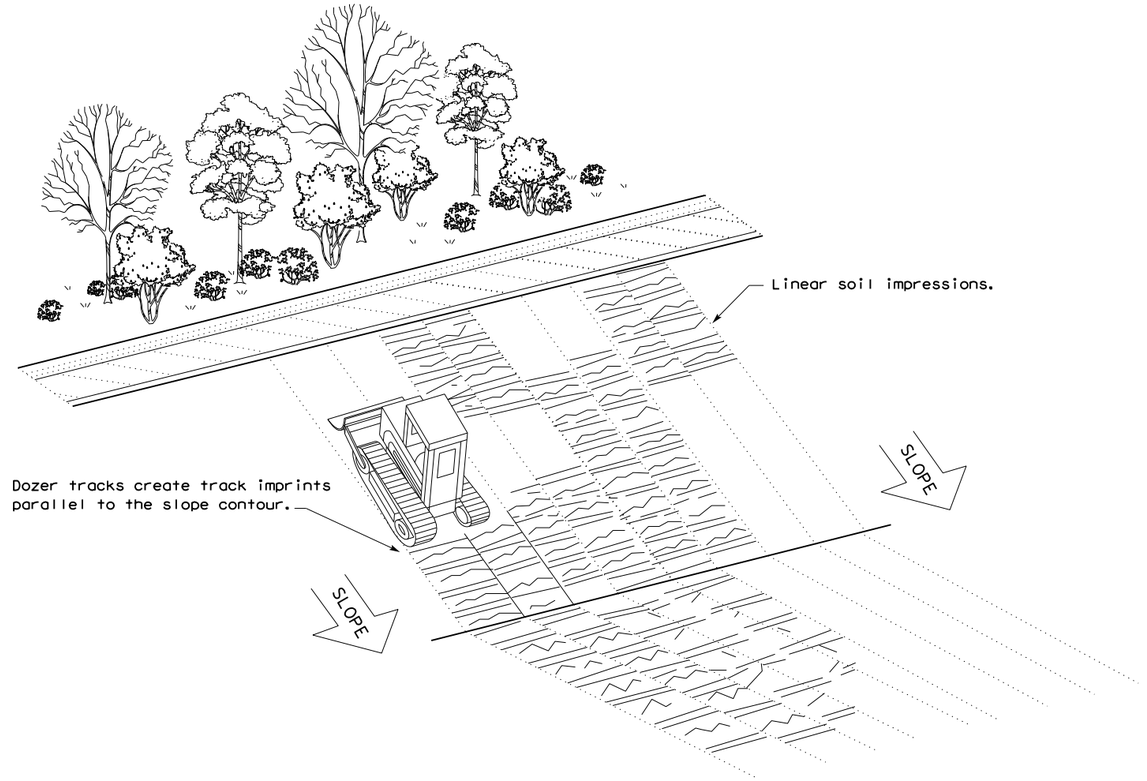
LEGEND

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

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© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
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	DIST	COUNTY			SHEET NO.	
	WACO	HILL, ETC			108	

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BEST MANAGEMENT PRACTICE (BMP) GENERAL NOTES

1. Prior to TxDOT allowing the Contractor to start construction, the Contractor will provide the required storm water and 404 permit documentation and support activities, including but not limited to the following:

   - Provide a list of all chemicals, construction and waste products that will be generated, stored or brought upon TxDOT ROW. The list includes expected construction debris, sanitary wastes, construction chemicals and petroleum products used or generated by the Contractor and sub-contractors. Along with the list, the Contractor will supply a spill prevention plan and clean up procedures that will include each of these chemical products or generated waste.

   - Provide in the construction schedule the necessary line items that will comply with the schedule and planning requirements of the storm water permit.

   - Post the TxDOT storm water permit and any Contractor permits, per permit requirements.

   - Provide copies of storm water permits for Contractor PSL(s). As new PSL(s) may be obtained for the project, provide copies of new or amended permits to TxDOT. The Contractor will not disturb soil without the proper permits.

   - Provide scale drawings of off ROW PSL's within one mile of the project, for field offices, borrow sources, plant sites or other uses.

   - Provide permit information on any Contractor batch plants or concrete crushing plants to be located at a Contractor PSL(s) within one mile of the project limits or boundaries. Copies of the air and water permits are to be provided to TxDOT before materials will be used on the project. No asphalt or concrete batch plants or concrete crushing plants will be located on TxDOT ROW.

   - Provide a letter indicating a Contractor Responsible Person for environmental compliance (CRP) for the project, and maintain a CRP throughout the project duration.

   - Provide all environmental documentation including certification of compliance and EMS training documents/certificates prior to starting work. The Contractor is to provide daily BMP inspection reports that document all field BMPs needing repair or replacement. The Contractor is to clearly document specific BMPs needing repair and location each work day. The Contractor is encouraged to be proactive in fixing BMPs without TxDOT direction.

   - Provide documentation required for Waters of the US, Note #3 and submittals for Item 496 bridge removal. Bridge removal methods submitted will follow all Waters of the US note requirements. The Contractor is not to start construction within the Ordinary High Water Marks of any stream until receiving approval for stream channel construction methods from TxDOT.

   - Provide a written procedure for managing all chemicals and construction items placed in vertical containment structures. Also, provide methods to be used for the treatment, disposal, collection or release of storm water.

   - Provide an estimated date by letter, for the submittal of marked up bridge drawings, indicating cut locations for any structural steel requiring cutting or torching of steel, coated with lead containing paints.

2. Place and maintain trash cans and portable sanitary facilities at locations where there is active construction. Worker generated trash and construction debris will be kept from being transported by storm water and will be collected daily from the ground and routinely hauled from the work area.

3. Contractor will provide TxDOT copies of all correspondence with MS4s, TCEQ, EPA, DSHS and Corps of Engineers regarding activities on this project.

4. Contractor to conduct storm water inspections and develop SWPPP documents to support Contractor permits obtained for the project including PSL(s).

5. Contractor will maintain written documentation of locations of all portable sanitary facilities. The Contractor is required to document the location and disposition of all spills and cleanups from portable sanitary facilities.

6. Contractor will not store chemicals on TxDOT ROW, unless chemicals are stored following all environmental and safety regulations. Fuels for construction equipment will not be stored on TxDOT ROW.

7. The Contractor will store fuels and bulk chemicals on Contractor PSL(s) using a secondary containment method, such as double lined tanks and/or free standing containment reservoirs made of plastic or steel designed to hold bulk chemicals or drums.

8. The Contractor will not remove sediment controls without the prior approval of TxDOT, except for a sediment control that may back up water and cause safety or traffic problems.

SCALE = NTS SHEET 1 OF 10

Texas Department of Transportation
Waco District Standard

TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES

TA-BMP

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© TxDOT 2009	CONT	SECT	JOB	HIGHWAY
REVISIONS	6460	63	001	SH 22, ETC
DEC 2013	DIST	COUNTY		SHEET NO.
FEB 2015	WACO	HILL, ETC		109

DATE: 1/22/2024
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BEST MANAGEMENT PRACTICE (BMP) GENERAL NOTES

9. Any sediment controls removed by the Contractor must be re-installed before the next rainfall event or by the end of day, as approved in advance.

10. Vegetative buffer strips may be used in place of temporary sediment controls such as silt fences and rock filter dams. The amount of disturbed soil area will be limited to 1/3 of an acre or less for a minimum of 50 feet of grassed ditch and 2/3 of an acre of disturbed soil for a minimum of 100 feet of grassed ditch.

11. Construction equipment found to be leaking oil, fuel or coolant will be immediately stopped, the leaking fluid collected and the equipment fixed. Equipment continuing to leak will be removed from the project at no cost to TxDOT. Leaking fluids from equipment will be collected and removed from the project or PSL.

12. Earth berms or mounds typically used to stockpile topsoil and used in place of boundary silt fence will be seeded upon being constructed. Long term use of earth berms or mounds will not be continued without establishing grass on the control.

13. The Contractor will inform TxDOT of new areas where soil will be disturbed to facilitate planning for new sediment controls. Areas of vegetated soil will not be disturbed by the Contractor, unless adequate sediment controls can be installed before the next rainfall event. The Contractor will assist TxDOT in keeping an accurate set of working SWPPP drawings that show the locations of all temporary sediment and erosion controls.

14. The Contractor will maintain an adequate amount of temporary sediment controls on hand at the field office or project staging area for critical SWPPP maintenance, including silt fence (minimum of 200 feet) and rock / fabric for rock filter dams (minimum for 100 feet of Type III dams).

    The requirement for BMP rock quantities on hand is waived for small projects for on and off system bridge installations. The Contractor having a BMP Subcontractor does not eliminate the requirement for the Contractor to have the required silt fence and rock on hand, typically stored at the Contractor PSL.

15. Failure of a sub-contractor to complete storm water work on time will require the Contractor to start storm water sediment control work immediately and complete the work with high priority, or be subject to stop work on the entire project.

16. Earth materials on roads as a result of soil tracking will not be allowed to be transported off ROW in storm water. Soil or rock material found on roadways deposited from Contractor equipment will be removed daily.

17. Unless approved, completed concrete curb inlets will not be blocked by sediment controls. The contractor will frequently sweep the completed or partially completed roadway to keep sediment out of drainage pipes.

18. The Contractor will be responsible for proper dust control and will route construction traffic in a manner that minimizes dust generation.

19. Water for dust control will contain no pollutants, but may be non-potable from upland stock ponds. No quantity of water to be used for construction purposes may be taken from a 404 stream, prior to the proper authorizations or permits being obtained by the Contractor.

20. Contractor is to direct workers and sub-contractors to use portable sanitary facilities provided by the Contractor and not to trespass off ROW.

21. Contractor will provide written verification to TxDOT that earth borrow pits and disposal sources meet environmental and regulatory requirements, prior to use. Excavations will meet all OSHA requirements and the current safety guidelines established for TxDOT Quarries and Pits.

22. Boundary silt fences that are terminated down slope, with one end being at the lowest elevation, will be installed with an L - hook to contain sediment. Boundary silt fences that are installed on flat ground will have L-hooks on both ends.

23. Rock filter dams across ditches will be constructed where the rock filter dam ends are embedded within the ditch side slopes and ditch bottom. The top center elevation of the rock filter dam will be at least 6 inches lower than the elevations on the rock filter dam ends.

24. Silt fence will be constructed in a U or V pattern across ditch lines and up the ditch side slope to keep storm water from flowing around the ends of the silt fence. Small silt fences that do not adequately span the ditch and allows storm water around the end(s) will not be used. Where there is adequate space, large U pattern silt fences are preferred to facilitate sediment collection and sediment removal with equipment.

25. Sediment controls (RFDs or silt fences) will be located along road ditches as marked on the SWPPP drawings. Modifications to the sediment control spacing will be adjusted during the project based on sediment control effectiveness. The installation and maintenance of sediment controls at or near outfalls, where storm water leaves TxDOT ROW, takes persistent over ditch line sediment controls.

Texas Department of Transportation
Waco District Standard

TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES

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BEST MANAGEMENT PRACTICE (BMP) GENERAL NOTES

26. Storm water draining sheet flow over disturbed soil sloped towards the ROW property line, will be intercepted by a boundary silt fence typically installed with L-shaped ends.

27. For ditch grading and shoulder up work, the Contractor is limited during good weather to remove up to one mile (limited to five acres of disturbed soil) of ditch line sediment controls; on one side of the roadway. Outfall controls cannot be removed during this activity. Ditch line controls must be replaced upon completion of work and before the next rain event.

28. Sediment controls damaged by the Contractor, as defined by permit, must be fixed or replaced immediately upon discovery.

29. Notches in silt fences are not typically allowed. Specific silt fences that back up water onto lanes of traffic may be notched if approved.

30. For silt fence maintenance, the Contractor will leave approximately 4 inches of deposited sediment up stream of silt fences and not over excavate around silt fences or rock filter dams.

31. The Contractor will inform TxDOT of new construction areas and where soil is planned to be disturbed. Sediment controls will be installed at outfalls prior to the Contractor beginning soil disturbing activities up slope from the outfall.

32. Water from concrete saw cutting, concrete grinding and concrete coring activities; or fine materials from concrete chipping and salvage will not be allowed to enter storm drains or enter streams.

33. Storm water containing suspended sediment and turbidity needing to be removed from excavations or low areas will be pumped or gravity drained through vegetated buffer strips (50 foot minimum) or placed in ditches with temporary sediment controls, prior to the water being discharged into a stream.

34. Uncontaminated water from natural groundwater seepage, springs, foundations and drains that does not contain suspended sediment or any pollutants may be discharged without storm water controls.

35. Lime or cement if spilled in ditches or outside the defined limits of application is considered a pollutant and will be excavated and removed the same day, to avoid contaminating streams.

36. If located along the project ROW, RAP stockpiles will be located where there is a minimum 100 feet of vegetative buffer strip before storm water will reach a stream. RAP will not be used as a construction material within the Ordinary High Water Marks of a stream channel of a 404 designated stream.

37. If allowed on the project, concrete truck wash out areas will have adequate volume to allow 12 inch freeboard for rain and will be lined with 6 mils of plastic. No concrete will be stored higher than the 12 inch freeboard. Cleaning of truck chutes and equipment does not constitute concrete truck wash out and this activity may be completed at the concrete placement location. Wash out areas will not be located closer than 50 ft from down slope inlets or stream channels.

38. For outfalls near stock ponds closer than 50 foot from disturbed soil at the ROW line, redundant sediment controls will be provided, typically a combination of rock filter dam and a silt fence constructed in line of the flow.

39. Earth stockpiles will utilize silt fence sediment controls, positioned on the low end of the stockpile drainage area with L-hooks or silt fence installed around the entire stockpile.

40. Sediment controls including rock filter dams and silt fences will not be installed across any 404 streams. Sediment controls at 404 streams will be positioned to limit sediment entering the stream from the banks and around structures/culverts, and will allow free flow of storm water to pass through the ROW without being dammed by any sediment controls. Remove loose materials from stream channels prior to each rain event.

41. Sediment controls for non-404 streams may be constructed across the drainage channel in unlimited locations. It is appropriate to use sediment control details typically used for 404 streams for non-404 streams when flow velocities are high. Remove loose material from stream channels prior to each rain event.

42. Incomplete drainage pipe installation across the roadway does not remove the requirement for having sediment controls around the ends of the pipe. To stay within permit requirements, sediment controls should be installed over and around the terminated end and along each side of the banks as soon as construction on the pipe has been completed. Remove loose material from stream channels prior to each rain event.

43. Safety end / headwall construction temporarily will require the removal of part of the sediment control placed over and around the pipe end. Retain in place as much functioning sediment control as possible. Replace the silt fence over and around the top of the pipe, immediately upon concrete placement and form removal. Do not remove culvert sediment controls that cannot be replaced before the next rain event. Sediment control at the ends of culverts must be in place and available for any rain event until the disturbed soil areas are re-vegetated.

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TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES

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BEST MANAGEMENT PRACTICE (BMP) GENERAL NOTES

44. Between the Ordinary High Water Marks of a 404 stream channel, the Contractor will disturb only the minimum amount of stream channel that is necessary to complete the work.

45. Rock riprap for erosion control does not replace the requirements to maintain sediment control until vegetation is re-established. Replace sediment controls immediately after installing erosion rock.

46. At the direction of TxDOT, sediment deposited into existing and new culverts will be removed subsidiary to Item 506. Sediment to be removed is either pre-existing material before construction starts or sediment generated as a part of this project.

47. Provide treated 2X4 cross bracing for rectangular inlet silt fence, subsidiary to Item 506.

48. Loose or granular earth materials will not be used to repair silt fence undercuts. Silt fence undercut repairs will be conducted with well compacted soils or the silt fence will be reset in a nearby location.

49. Silt fence steel T posts of approximately 1.25 pounds per foot are allowed at a spacing of 8 feet or less. Silt fence steel T posts between approximately 1.25 pounds per foot and 0.85 pounds per foot are allowed for T post spacing of 5 feet or less.

50. Silt fence to be used to slow the flow of storm water down slopes will be positioned approximately horizontal (on the contour) with L hooks on the ends and limited to approximately 200 feet in length. Multiple sections and levels of silt fence may be required in addition to temporary / permanent erosion control flumes.

51. Soil retention blankets will be installed rolled down the slope with the small dimension side embedded at the top of slope, unless recommended otherwise by the manufacturer. Excess grass, rocks, trash, debris or clods will be removed before seeding and installing soil retention blankets. All installations will be by the manufacturer recommendations. Contractor equipment, including tractor mowers will be kept off areas with soil retention blankets until the grass is established.

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TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES

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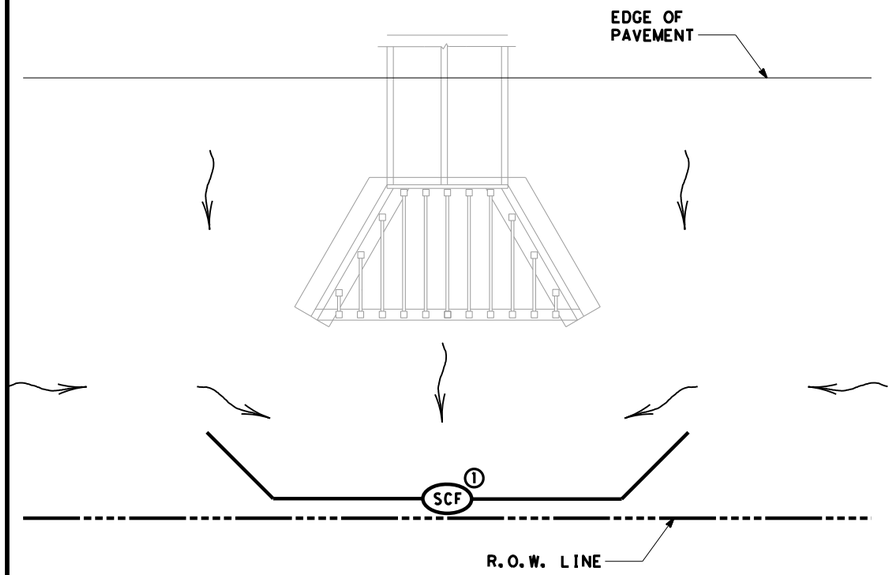
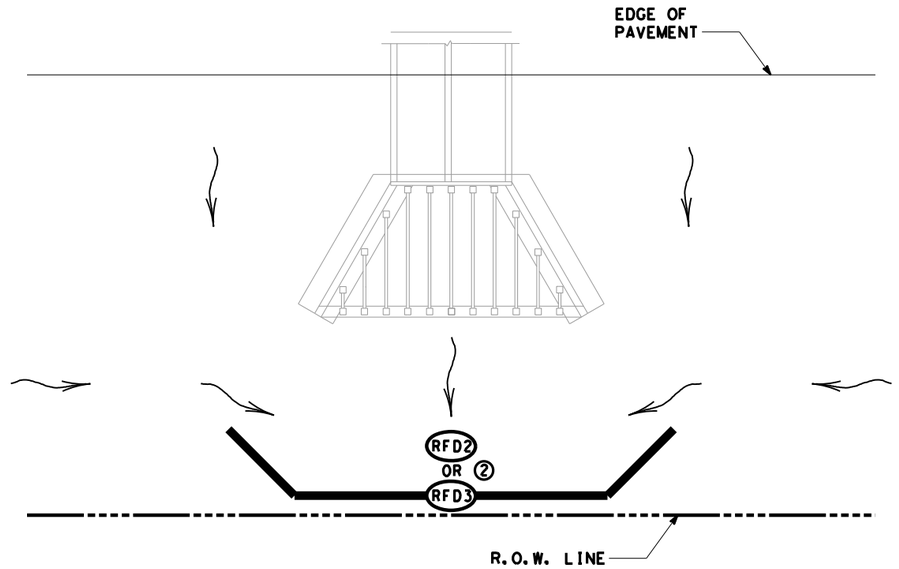


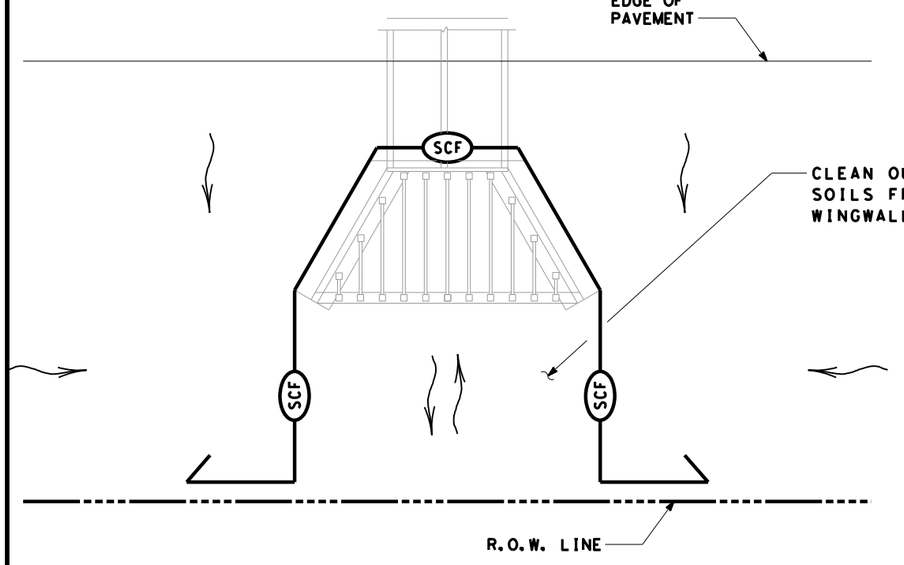
BEST MANAGEMENT PRACTICE (BMP) #1

FOR NON-404 STREAMS ONLY ~ SEDIMENT CONTROL AT EXIT OF CULVERT



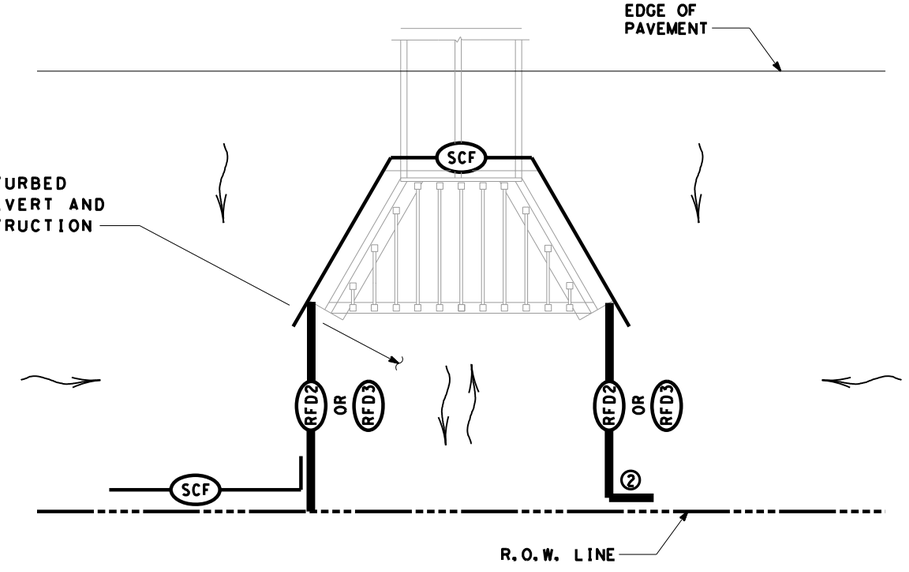
BEST MANAGEMENT PRACTICE (BMP) #2

FOR NON-404 STREAMS ONLY ~ SEDIMENT CONTROL AT EXIT OF CULVERT



BEST MANAGEMENT PRACTICE (BMP) #3

FOR 404 OR NON-404 STREAMS ~ SEDIMENT CONTROL AT EXIT OR ENTRANCE OF CULVERT



BEST MANAGEMENT PRACTICE (BMP) #4

FOR 404 OR NON-404 STREAMS ~ SEDIMENT CONTROL AT EXIT OR ENTRANCE OF CULVERT

SCF	SEDIMENT CONTROL FENCE
RFD2	ROCK FILTER DAM (TY 2)
RFD3	ROCK FILTER DAM (TY 3)
	DIRECTION OF FLOW

NOTES:

1. EXTEND SILT FENCE SO STORM WATER DOES NOT GO AROUND THE ENDS. USE L-HOOKS ON ENDS AS REQUIRED.
2. EXTEND ROCK FILTER DAM SO STORM WATER DOES NOT GO AROUND THE ENDS.

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TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES

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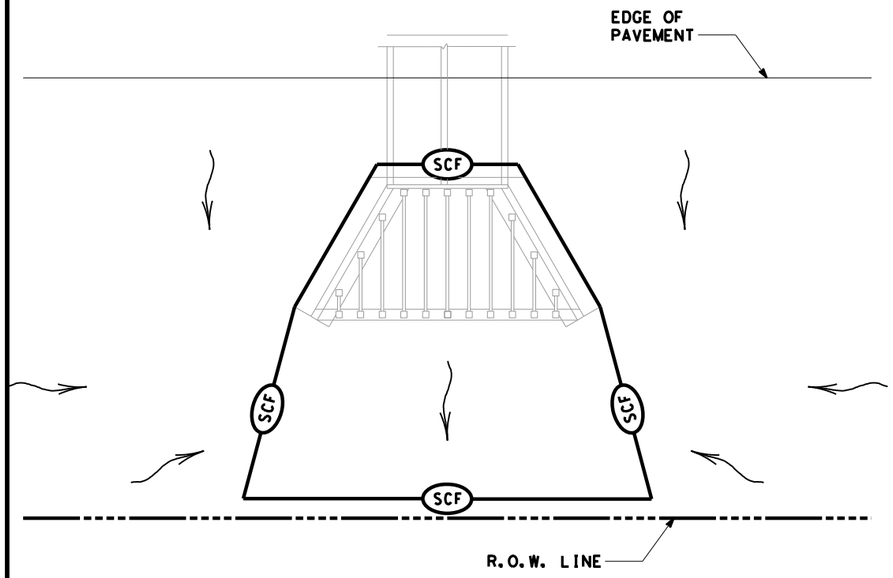
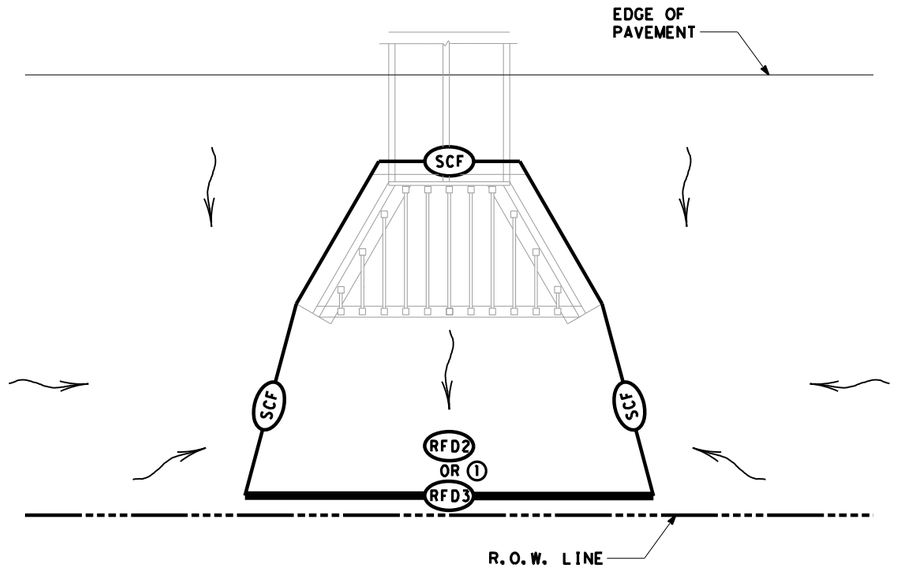


BEST MANAGEMENT PRACTICE (BMP) #5

FOR NON-404 STREAMS ONLY ~ SEDIMENT CONTROL AT EXIT OF CULVERT



BEST MANAGEMENT PRACTICE (BMP) #6

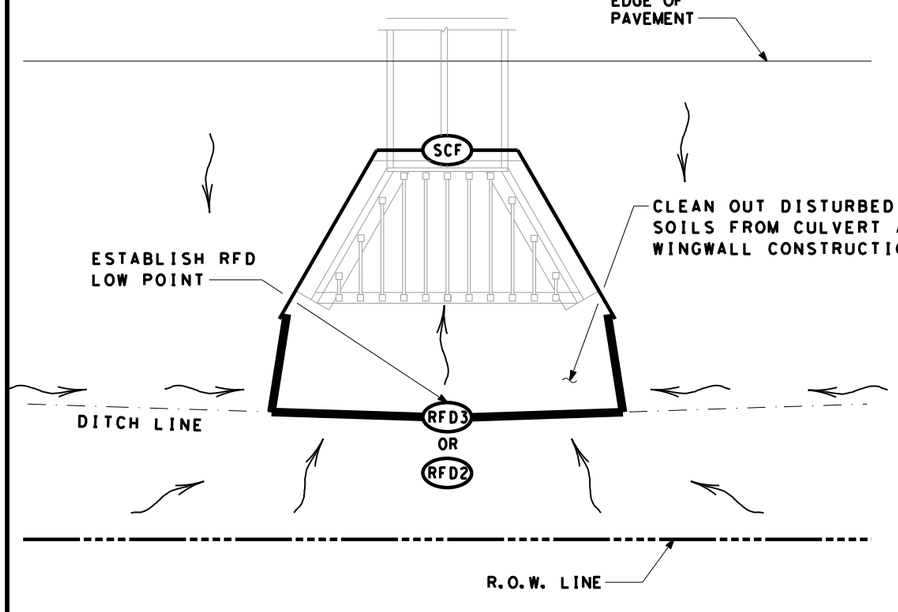
FOR NON-404 STREAMS ONLY ~ SEDIMENT CONTROL AT EXIT OF CULVERT

SCF	SEDIMENT CONTROL FENCE
RFD2	ROCK FILTER DAM (TY 2)
RFD3	ROCK FILTER DAM (TY 3)
	DIRECTION OF FLOW

NOTES:

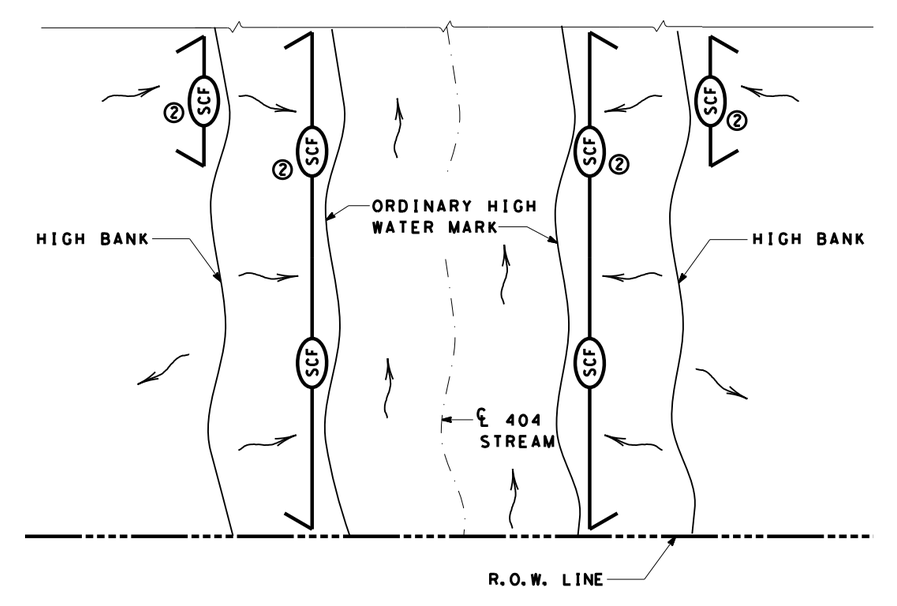
① PROVIDE OVERLAP OF SILT FENCE WITH ROCK FILTER DAM.

② USE SILT FENCE L-HOOKS ON ENDS TO BLOCK STORM WATER SEDIMENT



BEST MANAGEMENT PRACTICE (BMP) #7

FOR NON-404 STREAMS ONLY ~ SEDIMENT CONTROL AT ENTRANCE OF CULVERT



BEST MANAGEMENT PRACTICE (BMP) #8

FOR 404 STREAMS ~ SEDIMENT CONTROL DURING PROJECT CLEARING AND GRUBBING

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Texas Department of Transportation
Waco District Standard

TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES

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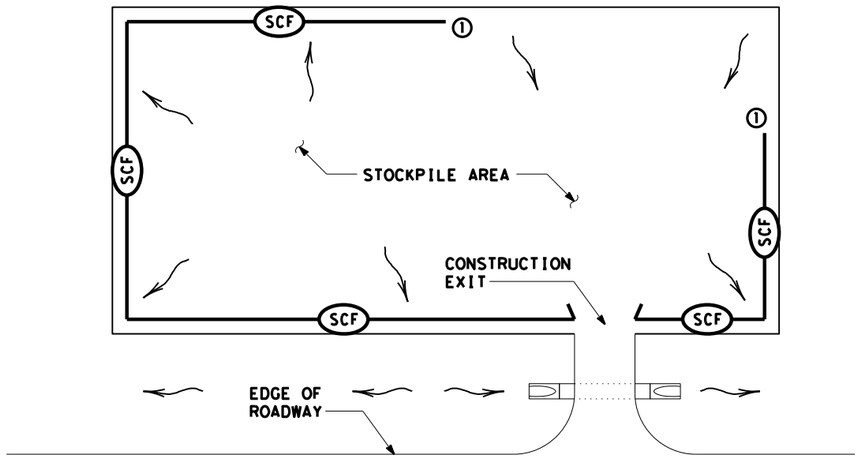
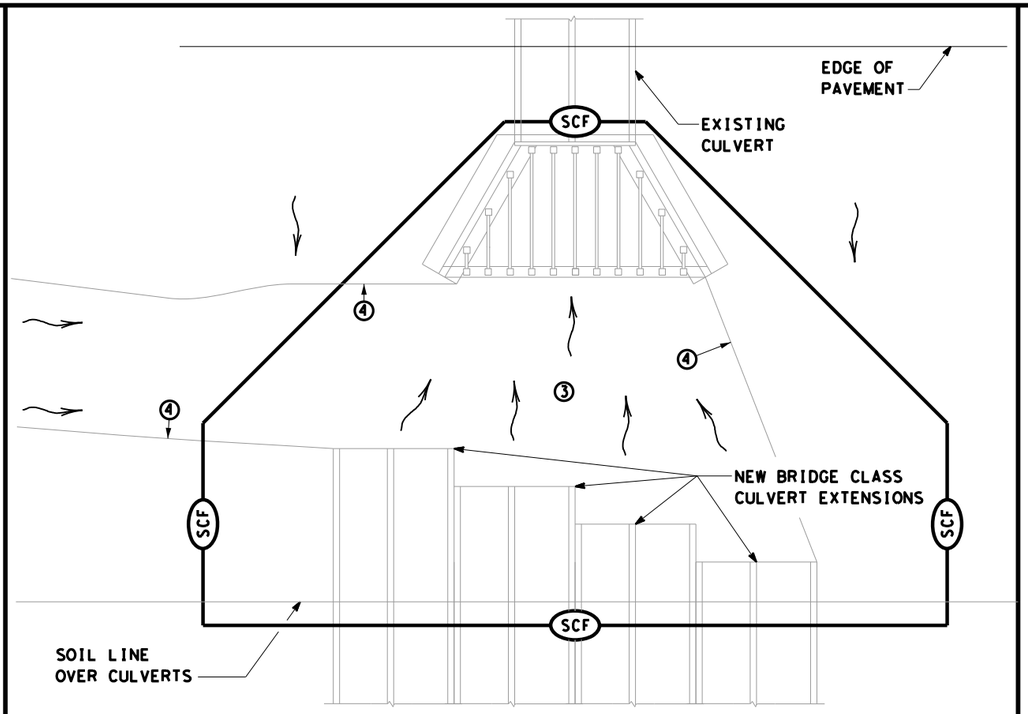


BEST MANAGEMENT PRACTICE (BMP) #9

STOCKPILE SEDIMENT CONTROL



BEST MANAGEMENT PRACTICE (BMP) #10

FOR 404 OR NON-404 STREAMS ONLY ~
SEDIMENT CONTROL AT PHASED CONSTRUCTION OF BRIDGE CLASS CULVERTS

SCF	SEDIMENT CONTROL FENCE
RFD2	ROCK FILTER DAM (TY 2)
RFD3	ROCK FILTER DAM (TY 3)
	DIRECTION OF FLOW

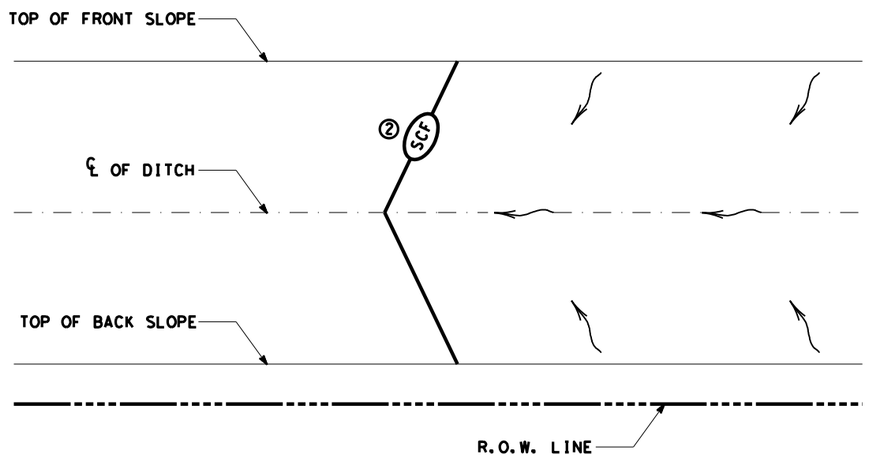
NOTES:

① START SEDIMENT CONTROL AT LOCATION SO ALL STORM WATER WITH SEDIMENT IS COLLECTED

② ROCK FILTER DAMS OR EARTH/GRASSED EMBANKMENTS CAN BE SUBSTITUTED AS DIRECTED.

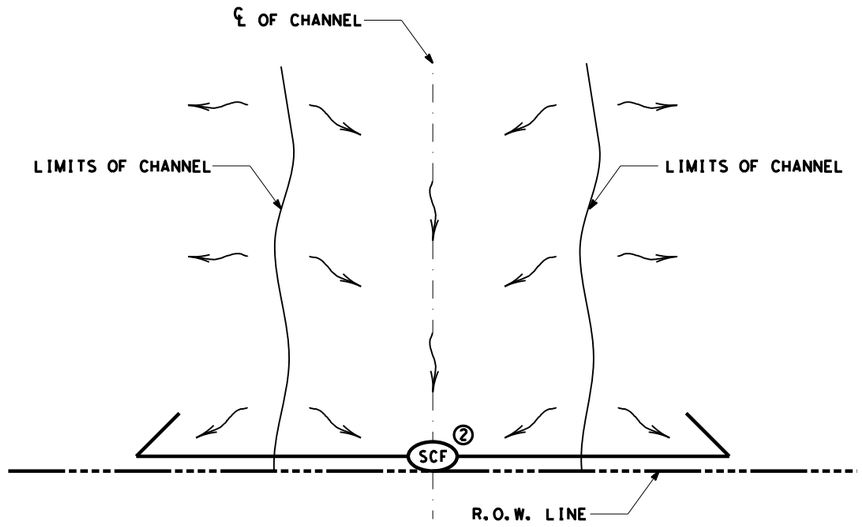
③ PROVIDE A SMOOTH TRANSITION FROM THE INVERT ELEVATIONS BETWEEN CULVERTS. REMOVE LOOSE SOIL FROM EXCAVATED AREA BETWEEN CULVERTS.

④ PROVIDE AND INSTALL PNEUMATICALLY PLACED CONCRETE ON THE DITCH BOTTOM AND SIDE SLOPES BETWEEN TEMPORARY TERMINATIONS BETWEEN OLD AND NEW CULVERTS. PNEUMATICALLY PLACED CONCRETE WILL BE PLACED TO THE HEIGHT OF THE LARGEST CULVERT ON THE DITCH SIDE SLOPES; AND TO A LIMIT 10 FEET OUTSIDE THE LOCATION OF BMPS ALONG THE DITCH BOTTOM. CEMENT STABILIZED SAND MAY BE SUBSTITUTED FOR PNEUMATICALLY PLACED CONCRETE, IN AREAS WHERE INSTALLATION WORKS AND AT THE OPTION OF TXDOT.



BEST MANAGEMENT PRACTICE (BMP) #11

BOUNDRY SEDIMENT CONTROL ~ BOTH ENDS OF CONTROL TERMINATED UP SLOPE



BEST MANAGEMENT PRACTICE (BMP) #12

BOUNDRY SEDIMENT CONTROL ~ BOTH ENDS OF CONTROL TERMINATED DOWN SLOPE

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Texas Department of Transportation
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TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES

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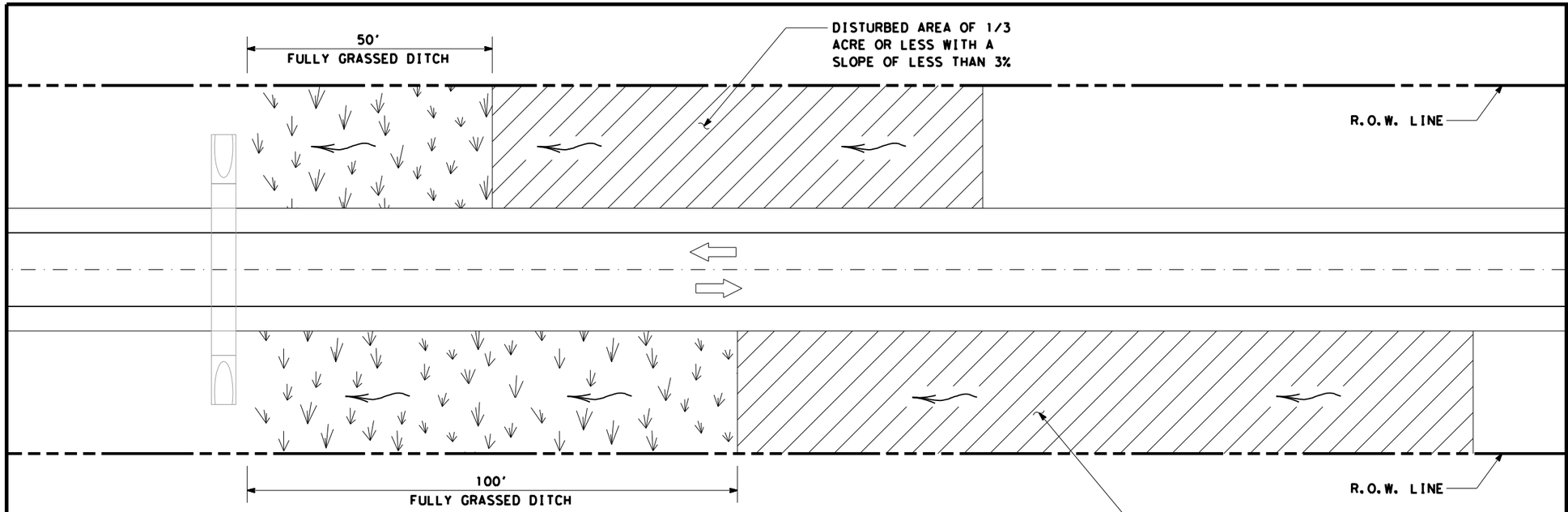


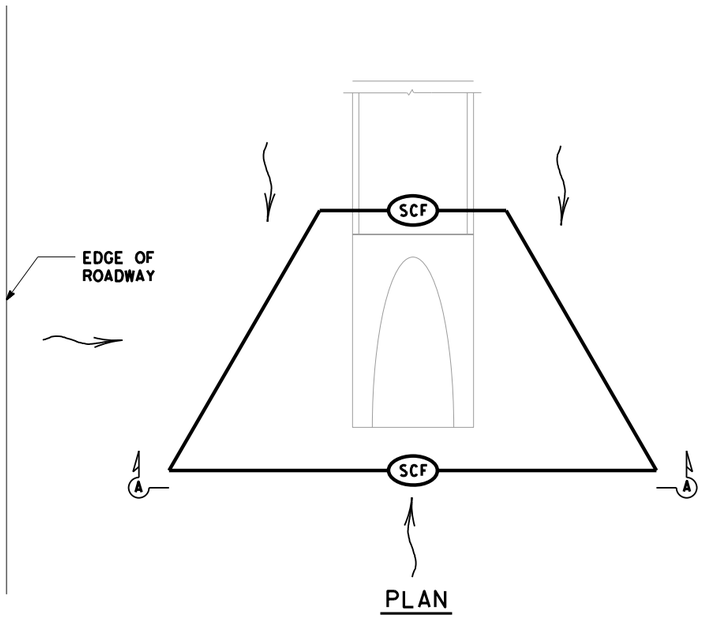
BEST MANAGEMENT PRACTICE (BMP) #13

USE OF VEGETATIVE BUFFERS IN PLACE OF TEMPORARY SEDIMENT CONTROLS SUCH AS SILT FENCE AND ROCK FILTER DAMS

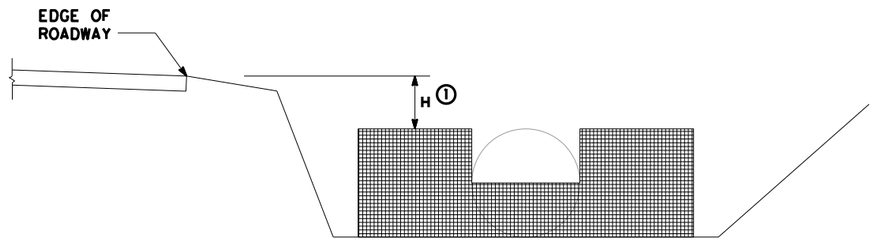
	FULLY GRASSED DITCH
	DISTURBED AREA
	DIRECTION OF FLOW
SCF	SEDIMENT CONTROL FENCE

① FOR H DIMENSIONS LESS THAN 1.5' SILT FENCE MAY NEED TO BE NOTCHED AS SHOWN IN VIEW A-A. ADD EXTRA POSTS AT NOTCH.

② BMP #14 MAY BE USED AT CROSS DRAINAGE STRUCTURES AS DIRECTED.



PLAN



VIEW A-A

BEST MANAGEMENT PRACTICE (BMP) #14

NON-404 STREAMS AND DITCHES ONLY - SEDIMENT CONTROL AT PARALLEL DRAINAGE STRUCTURE ENTRANCE ②

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TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES

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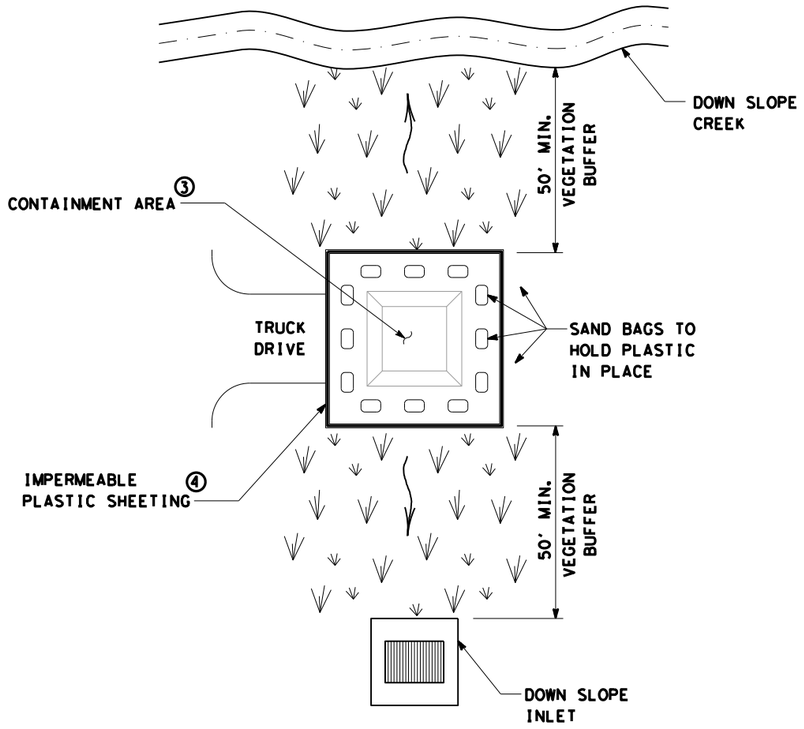
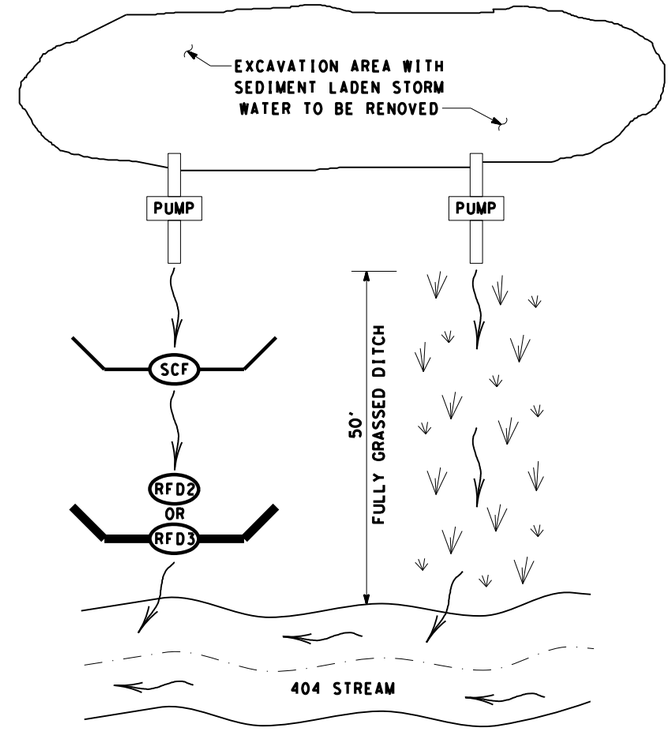


BEST MANAGEMENT PRACTICE (BMP) #15

CONCRETE TRUCK WASHOUT AREA



BEST MANAGEMENT PRACTICE (BMP) #16

PUMPED STORM WATER SEDIMENT CONTROLS ①

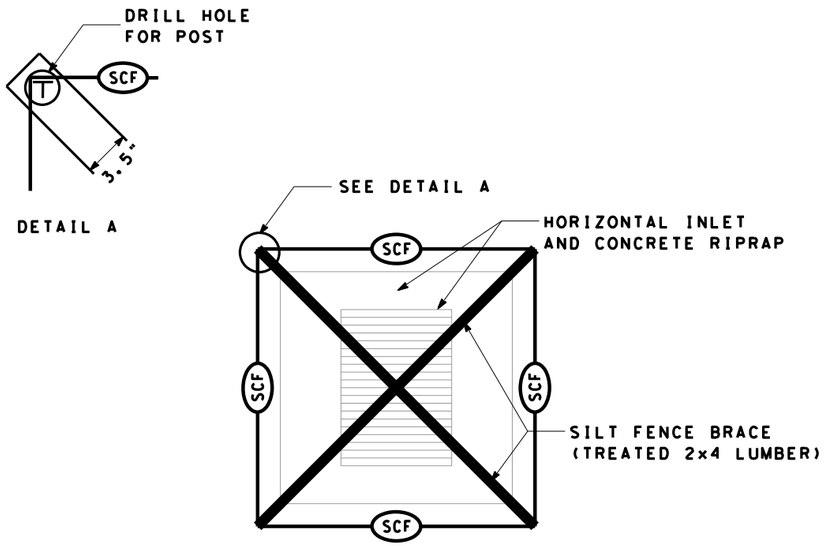
	FULLY GRASSED DITCH
	DIRECTION OF FLOW
SCF	SEDIMENT CONTROL FENCE
RFD2	ROCK FILTER DAM (TY 2)
RFD3	ROCK FILTER DAM (TY 3)

① PUMPED STROM WATER FROM AN EXCAVATION AREA SHOULD BE DISCHARGED IN A 50' VEGETATIVE BARRIER OR THROUGH TWO TEMPORARY SEDIMENT CONTROLS BEFORE ENTERING A 404 STREAM.

② FOR LANDOWNER STOCKPONDS WITHIN 50' OF THE RIGHT OF WAY LINE, PROVIDE REDUNDANT SEDIMENT CONTROLS AT THE CONVEYANCE OF THE POND. MINIMUM OF TWO SEDIMENT CONTROLS.

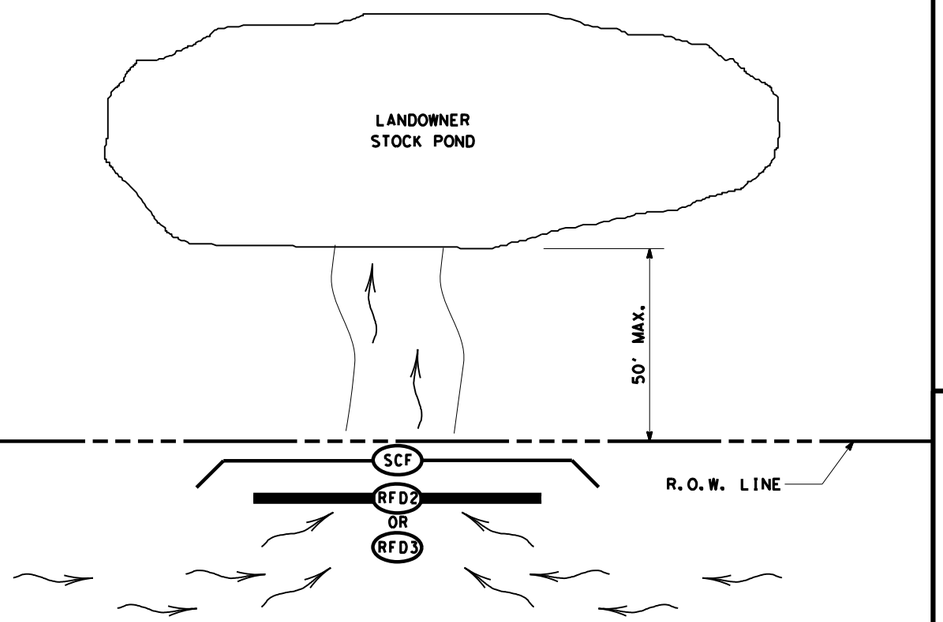
③ WHEN CONTAINMENT AREA REACHES 1' FREEBOARD, DISCONTINUE WASHOUT PLACEMENT AND REMOVE MATERIAL UPON SOLIDIFICATION.

④ EACH TIME SOLIDIFIED MATERIAL IS REMOVED REPLACE PLASTIC SHEETING.



BEST MANAGEMENT PRACTICE (BMP) #17

HORIZONTAL INLET SEDIMENT CONTROL



BEST MANAGEMENT PRACTICE (BMP) #18

LANDOWNER STOCKPOND SEDIMENT CONTROL ②

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TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES

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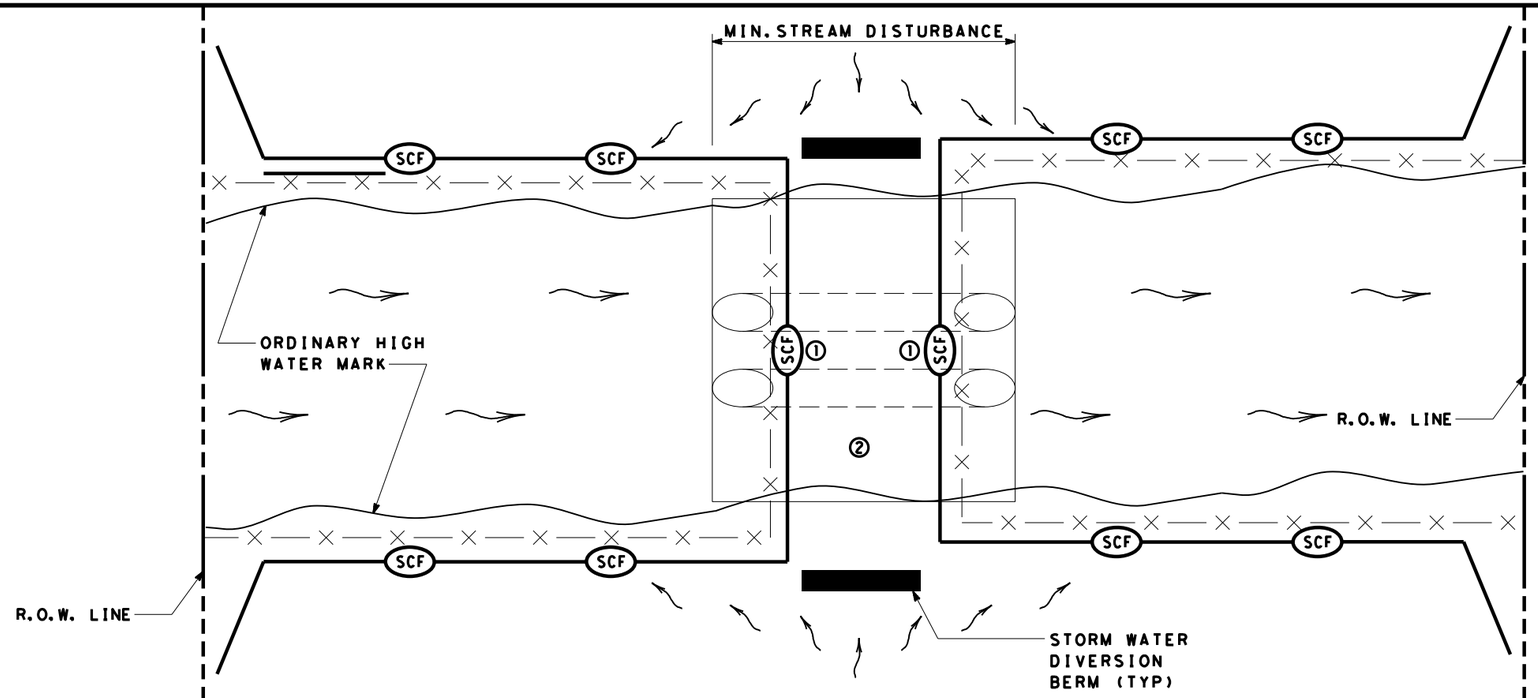


BEST MANAGEMENT PRACTICE (BMP) #19

TYPICAL 404 STREAM CROSSING (SEDIMENT CONTROL AT CROSSING)

	DIRECTION OF FLOW
SCF	SEDIMENT CONTROL FENCE
RFD	ROCK FILTER DAM
	SECURITY FENCING

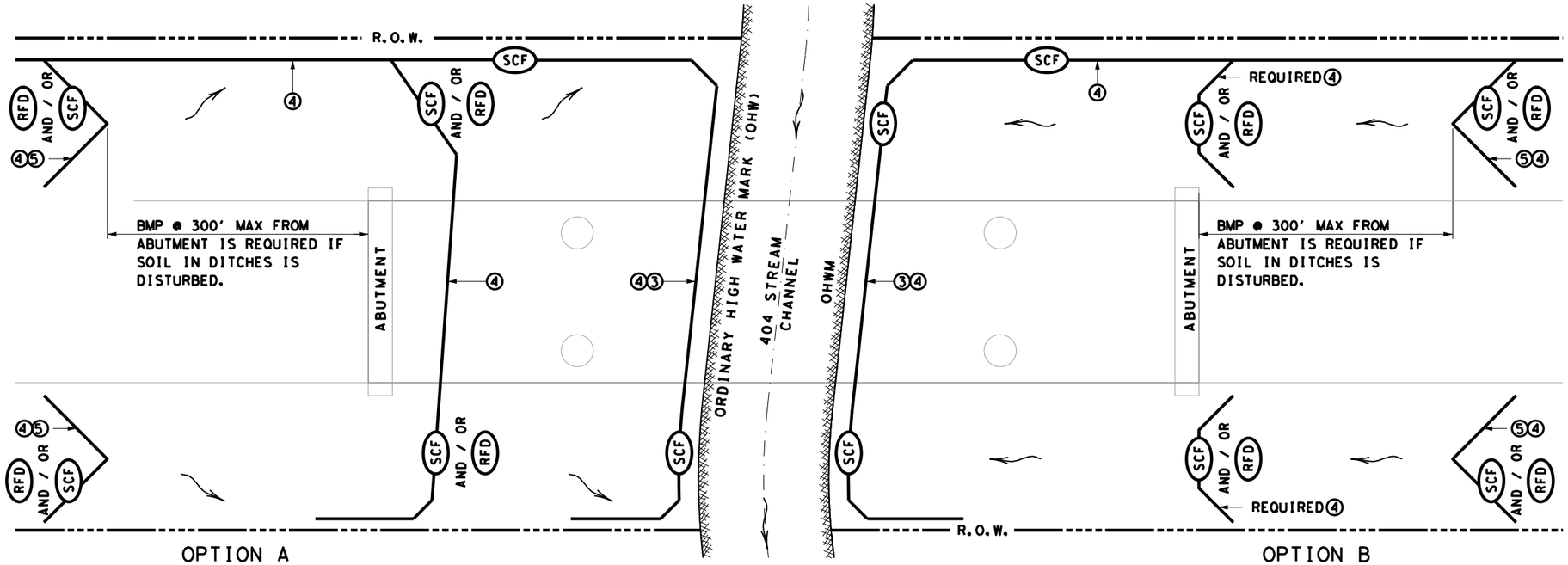
① HAY BALES MAY BE SUBSTITUTED FOR SILT FENCE OVER THE STREAM CROSSING.

② CROSSING WILL BE AS PER REQUIREMENTS OF THE WATERS OF THE US GENERAL NOTES.

③ INSTALL SILT FENCE SLIGHTLY UP FROM OHW MARK FROM R.O.W. TO R.O.W.

④ USE SILT FENCE L-HOOKS ON LEVEL OR DOWN SLOPING ENDS TO BLOCK STORM WATER SEDIMENT

⑤ INSTALL LARGE V OR U SHAPED BMP'S FROM ABUTMENT AS SHOWN. IF THERE IS STEEP DITCH CONDITIONS DECREASE SPACING AND CONSIDER RFD'S. ADD ADDITIONAL BMP'S IF GRADE IS STEEP OR IF FLOW IS HIGH.



BEST MANAGEMENT PRACTICE (BMP) #20

FOR 404 STREAMS ~ BMP'S AT BRIDGES

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TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES

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