

INDEX OF SHEETS

SHEET NO. DESCRIPTION

GENERAL

- 1 TITLE SHEET
- 2 INDEX OF SHEETS
- 3,3A-3E GENERAL NOTES
- 4 ESTIMATE & QUANTITY
- 5 QUANTITY SUMMARY

TRAFFIC CONTROL PLAN STANDARDS

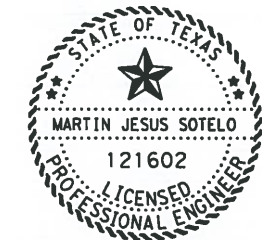
- # 6-17 BC (1)-21 THRU BC (12)-21
- # 18-22 TCP (1-1)-18 thru TCP (1-5)-18
- # 23-28 TCP (2-1)-18 thru TCP (2-6)-18
- # 29 TCP (5-1)-18
- # 30-33 TCP (6-1)-12 thru TCP (6-4)-12
- # 34 TCP (6-6)-12
- # 35 TCP (6-8)-14
- # 36 WZ (RS)-16

ROADWAY DETAILS

- 37-38 CONCRETE STRUCTURE REPAIR DETAIL
- 39 RIPRAP DETAILS

ROADWAY DETAILS STANDARDS

- # 40 CCCG-21
- # 41 CH-FW-0
- # 42-43 CSB(1)-10
- # 43A CSB(2)-13
- # 43B CSB(3)-16
- # 44-47 PED-18
- # 48-50 PRD-13
- # 51-52 REPCP-14
- # 53 RID(2)-20
- # 54 TRACC(W)-16
- # 55 CRR



M. J. Sotelo, P.E.
09/16/2021

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THIS SHEET HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

**GENERAL
INDEX OF SHEETS**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
6389	94	001	IH 10, ETC
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	2	

DATE: 9/16/2021 1:04:53 PM
 FILE: \\FS-ELPH0601.stg01.tx.us\DATA\DistrictWide\RMC - MMC Projects\052 West Area Office\RMC 6389-94-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\INDEX OF SHEETS.dgn

CONTROL: 6389-94-001**COUNTY: EL PASO****HIGHWAY: IH 10****GENERAL NOTES:**

General Project Description – This routine maintenance contract is for the repair, removal and replacement of concrete riprap, sidewalk, bridge rail, wingwalls, headwalls, concrete barrier, and curb repairs on various highways in El Paso County.

The Contract will be managed by the **West Area Office** with participating Area Engineers (AE) and Maintenance Section Supervisors (MSS) listed below:

Jonathan Concha, P.E., West AE
4201 Hondo Pass Drive
El Paso, Texas 79904
(915) 757-5901

Chad Chairez, West MSS
4201 Hondo Pass Drive
El Paso, Texas 79904
(915) 757-5921

Each Contract awarded by the Department stands on its own and as such, is separate from other contracts. A Contractor awarded multiple contracts, must be capable and sufficiently staffed to concurrently process any and all contracts at the same time.

General Requirements

Perform all work for this Contract in accordance with the Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (2014) and all applicable State Standards.

Various bid items and their associated quantities have been provided within this Contract in order to establish unit bid prices for the proposed work. The bid items and quantities provided are based on historical data and are not guaranteed. Actual quantities of work to be performed and paid will be determined in the field by the Engineer and will be paid utilizing these unit bid prices with no further compensation made regardless of the final quantities.

The Department reserves the right to reduce or increase all quantities within guidelines provided in the Standard Specifications.

Where nighttime work is approved, provide adequate lighting for the entire work site, as directed. This will be subsidiary to the various bid items.

Obtain Engineer approval for all equipment and vehicles prior to use.

Maintain the entire project area in a neat and orderly manner throughout the duration of the work. This work will be subsidiary to the various bid items.

All lane closures and traffic control items, except truck mounted attenuators (TMA) and portable changeable message signs (PCMS), required to accomplish work under this Contract will not be paid for directly but will be subsidiary to the various bid items. TMAs will be measured and paid

CONTROL: 6389-94-001**SHEET 3****COUNTY: EL PASO****HIGHWAY: IH 10**

as described in Special Specification 6185, "Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)".

Provide vehicular and pedestrian access at all times, including Saturdays, Sundays, and holidays. This access includes, but not limited to, driveways, streets, parking areas, and walkways. This will be considered subsidiary to the various bid items.

Clear and remove from all work sites, surplus and waste materials and leave the site in a neat and aesthetically pleasing condition. This work will be subsidiary to the various bid items

Schedule and perform all work to assure proper drainage during the course of construction operations. All labor, tools, equipment and supervision required, to ensure drainage, removal, and handling of water shall be considered incidental work.

Repair any existing pavement, utilities, structures, etc., damaged as a result of construction operations, at no additional cost to the Department.

ITEM 2 - INSTRUCTIONS TO BIDDERS

This Contract includes plan sheets that are not part of the bid proposal.

View plans on-line or download from the web at:

<http://www.txdot.gov/business/plansonline/plansonline.html>

Order plans from any of the plan reproduction companies shown on the web at:

<http://www.txdot.gov/business/letting-bids/repro-companies.html>

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

Monica Dubrule Monica.Dubrule@txdot.gov

Contractor questions will be accepted through email by the above individual.

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

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

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

Request a proposal electronically from the Department's website:

<http://www.txdot.gov/business-cq/pr.htm>

Or use the electronic bidding site:

<http://www.txdot.gov/business/letting-bids/ebs.html>

CONTROL: 6389-94-001

COUNTY: EL PASO

HIGHWAY: IH 10

A bid summation will be available on-line at:

<http://www.txdot.gov/business/bt.html>

ITEM 3 - AWARD AND EXECUTION

This Contract includes non-site specific work and as-needed work. The type of work identified in the Contract is for locations that have not yet been determined.

Prior to beginning operations, schedule and attend a pre-work meeting with the Engineer.

The Contract duration is for 12 months. Time charges and work will start on the day stated on the Work Authorization letter. The Contract will be in effect until the work on the last callout is completed.

ITEM 5 - CONTROL OF WORK

Inform the Engineer and the respective utility companies, when it becomes apparent that the utility lines will interfere with the work in progress.

Arrange the operations so that consecutive ramps are not closed at the same time, unless directed.

ITEM 7 - LEGAL RELATIONS AND RESPONSIBILITIES

No significant traffic generator events identified.

The Contractor will abide by Section 7.2.5. Use of Blue Warning Lights related to vehicle lighting. Vehicles equipped with unauthorized lighting will not be permitted to operate on Department highways.

Comply with all OSHA and EPA regulations as well as all local laws, ordinances, federal and state requirements.

OSHA regulations prohibit operations that bring people or equipment within 10 feet of an energized electrical line. Where workers and/or equipment may be close to an energized electrical line, notify the electrical power company and make all necessary adjustments to ensure the safety of workers near the energized line.

Do not discharge any liquid pollutant from vehicles onto the roadside. Immediately clean spills and dispose in compliance with local, state, and federal regulations to the satisfaction of the Engineer at no additional cost to the Department.

ITEM 8 - PROSECUTION AND PROGRESS

CONTROL: 6389-94-001

SHEET 3A

COUNTY: EL PASO

HIGHWAY: IH 10

This project to be completed in **365** calendar days in accordance with **Section 8.3.1.5, "Calendar Day."**

The Contractor must provide enough manpower and equipment to accomplish the required work under this contract during the hours agreed upon by the Contractor and Engineer. Failure to do so will constitute grounds for a Noncompliance Penalty.

Work must be performed within 72 hours of notification from the Engineer.

A Noncompliance Penalty will be assessed for each instance the Contractor is in noncompliance. A noncompliance instance is defined by any of the following:

1. Contractor fails to begin work at the specified time or location(s);
2. Contractor fails to complete work by the time agreed upon with the Engineer;
3. Contractor does not have all of the necessary resources (i.e. personnel, equipment, and material) to fulfill the requirement of the callout by the specified time or location(s).

The Noncompliance Penalty will be deducted from any money due or to become due for any completed Item(s) or work. The Noncompliance Penalty will be assessed as follows: \$1,000 per instance, per location.

At the discretion of the Engineer, failure to comply with contract requirements will be grounds for default as per Item 8.7.1.

Contractor work activities will be limited to the allowed lane closure times defined as daytime hours of 9 A.M. to 4 P.M. Monday through Friday or nighttime hours of 9 P.M. to 6 A.M. Sunday through Thursday, unless otherwise directed by the Engineer.

IH10 and SL375 work activities are required to be performed during nighttime hours, or as directed by the Engineer.

ITEM 9 - MEASUREMENT AND PAYMENT

If requested, the Contractor will be aware that the Department will pay for any material on hand (MOH) in accordance with established policies and procedures. If MOH is authorized for payment, the Contractor will be required to stock all material at an approved site, inventory, and submit MOH adjustments on a monthly basis.

The Contractor must submit Material on Hand (MOH) payment requests at least 3 working days before the end of the month for payment on that month's estimate.

ITEM 104 - REMOVING CONCRETE

All saw-cuts necessary for concrete removal will be subsidiary to this Item.

CONTROL: 6389-94-001

COUNTY: EL PASO

HIGHWAY: IH 10

Removal of concrete pavement, riprap, medians, foundations, sidewalks, driveways, and other appurtenances will be measured by the square yard (regardless of thickness) or by the cubic yard of calculated volume, in its original position.

Avoid damaging concrete that will remain in place. Saw-cut and remove the existing concrete to neat lines.

Replace any concrete damaged by the Contractor at no expense to the Department.

All items removed under this Item will become the property of the Contractor.

ITEM 401 - FLOWABLE BACKFILL

Mix design is to be approved prior to all applications.

ITEM 420 - CONCRETE SUBSTRUCTURES

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum-wash water at designated areas approved.

Personnel will be certified by the El Paso District Laboratory in the handling, transporting, and curing of all concrete test specimens. In addition, all equipment will be certified prior to being used. Only Department personnel will perform all concrete quality tests and molding of all test specimens. Use approved concrete mix designs and concrete aggregate sources.

The Contractor will be responsible for compatible repairs in locations directed by the Engineer to existing or current standards compensated by the provided bid items

ITEM 429 - CONCRETE STRUCTURE REPAIR

Follow the procedures outlined in the Concrete Repair Manual, unless otherwise directed by the Engineer.

Submit for approval all materials and methods of application at least 3 weeks before beginning any repair work, unless otherwise directed by the engineer.

This item includes, but is not limited to the repair of damaged inlets, flumes, concrete curbs and gutters, bridge wing walls, bridge columns, bridge cap, head walls, and coping by removing and replacing damaged concrete and steel.

Place Type A (Rapid) material at 4 inches depth (minimum).

The Contractor will be responsible for compatible repairs in locations directed by the Engineer to existing or current standards compensated by the provided bid items.

ITEM 432 - RIPRAP

CONTROL: 6389-94-001

SHEET 3B

COUNTY: EL PASO

HIGHWAY: IH 10

Wire mesh and fibers for concrete will not be allowed on this project for this Item. Reinforce all concrete riprap using bar reinforcement conforming to Item 440, "Reinforcement for Concrete," as shown on the plans, or as directed. For roadway illumination assemblies, riprap may include wire mesh per the RID standard sheet.

Provide Type II cement and Class B concrete.

Finish concrete riprap with a rough broom finish, unless otherwise directed by the Engineer.

Obtain approval for all stone riprap material sources.

ITEM 502 - BARRICADES, SIGNS AND TRAFFIC HANDLING

The Contractor and his employees will wear fluorescent orange safety vests, safety shoes/boots, eye protection and hard hats while outside vehicles within the Department's right of way and will comply with Item 7.2.4. Public Safety and Convenience, and Item 7.2.6. Barricades, Signs, and Traffic Handling.

Rumble strips will be required as shown on standard WZ (RS) – 16.

Notify and coordinate with the Department's officials when major traffic changes are to be made. Advance notification for the following week's work must be made by 5 P.M. on Wednesdays.

Contractor assumes the responsibility for any additional barricade signs and devices of any approved contractor initiated changes to the sequence of work or Traffic Control Plans.

Some signs, barricades, and channelization devices may not be shown at the precise or measured position. Place the barricades, devices, or signs, with approval, in positions to meet field conditions.

Remove signs that do not apply to current conditions at the end of each day's work (do not lay down signs within clear zone).

Clean, repair, or replace all signs that are not clean, legible, properly mounted, in good working condition, or as directed by the Engineer.

In accordance with Section 7.2.6.1 of the 2014 Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, the Contractor will designate, in writing, a Contractor Responsible Person (CRP) and a CRP alternate to take full responsibility for the set-up, maintenance, and necessary corrective measures of the traffic control plan. The CRP or CRP alternate must be present at site and implement the initial set up of every traffic control phase/stage, at each location, and/or each call out, for the entire duration of the project.

CONTROL: 6389-94-001**COUNTY: EL PASO****HIGHWAY: IH 10**

At the written request of the Engineer, immediately remove the CRP or CRP alternate from the project if, in the opinion of the Engineer, is not competent, not present at initial TCP set-ups, or does not perform in a proper, skillful, or safe manner. These individuals shall not be reinstated without written consent of the Engineer.

CRP and CRP alternate must be trained using Department approved training. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 1 for Department approved Training.

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCS	Traffic Control Supervisor	2 Days	
National Highway Institute	133112 133113	1. Design and Operation of Work Zone Traffic Control 2. Work Zone Traffic Control for Maintenance Operations	1 Day 1 Day	Both classes are required to meet minimum required training.
National Highway Institute	133112A	Design and Operation of Work Zone Traffic Control	3 Days	
Texas Engineering Extension Service	HWS410	Contractor's Responsible Person for Temporary Traffic Control	16 Hours	Please note the name has changed.
University of Texas Arlington Division for Enterprise Development	WKZ421	Traffic Control Supervisor	16 Hours	Contact UTA for training needs.

All contractor workers involved with the traffic control implementation and maintenance must participate and complete a Department approved training course. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 2 for Department approved Training.

CONTROL: 6389-94-001**SHEET 3C****COUNTY: EL PASO****HIGHWAY: IH 10**

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCT	Traffic Control Technician	1 Day	
Texas Engineering Extension Service	HWS002	Work Zone Traffic Control	16 Hours	Identical to HWS-410. Counts for 3 year CRP requirement.
National Highway Institute	133116	Maintenance of Traffic for Technicians	5 Hours	Web based
National Highway Institute	134109-I	Maintenance Training Series: Basics of Work Zone Traffic Control	1 Hour	Free, Web Based
University of Texas at Arlington, Division for Enterprise Development	WKZ 100	Work Zone Safety: Temporary Traffic Control	4 Hour	Please note the name has changed. Free Web based.
TxDOT/AGC Joint Development	N/A N/A	Safe Workers Awareness Highway Construction Work Zone Hazards	16 Minutes 18 Minutes	Videos available through the AGC of Texas Offices. English and Spanish.
AGC America	N/A	Highway Work Zone Safety Training	1 Day	
Texas Engineering Extension Service	HWS400	Temporary Traffic Control Worker	4 Hour	Contact TEEX if interested in class.
TxDOT/AGC Joint Development	N/A	Work Zone Fundamentals	10 Minutes Approx.	Videos available through the AGC of Texas Offices. English and Spanish.

Contractor may choose to train workers involved with the traffic control implementation and maintenance with a contractor developed training in lieu of Department approved training. Contractor developed training must be equivalent to the Department approved training shown in Table 2. Provide the Engineer a copy of the course curriculum for pre-approval, prior to conducting the contractor developed training. Provide the Engineer a copy of the log of attendees after training completion for project records.

Safety Contingency

The contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancement, to improve the effectiveness of the TCP 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.

ITEM 512 - PORTABLE CONCRETE TRAFFIC BARRIER (PCTB)

Portable Concrete Traffic Barrier (PCTB) will be provided from a specified Department stockpile material yard to be determined at the Preconstruction Meeting Conference. Contact Johnny Trujillo, Assistant East Area Maintenance Section Supervisor at (915) 857-5041, for coordination prior to picking up PCTB.

CONTROL: 6389-94-001

COUNTY: EL PASO

HIGHWAY: IH 10

Return PCTB and connection hardware to the respective original site.

Repair or replace any PCTB furnished by the Department damaged in the process of transporting, handling or placing, as directed, at no additional cost to the Department.

This Item will be paid per linear feet if supplied within a 20 mile radius of any PCTB locations in accordance with Item 512.5., "Payment," Sections 5.1, 5.2, and 5.4.

If this Item is used outside of the 20-mile radius of any PCTB location, payment will be made in accordance with Article 9.7, "Payment for Extra Work and Force Account Method."

Table 3 is for clarification on how and what will be paid as part of this work.

Table 3: Types of Payments

<u>Within</u> a 20 mile radius of any PCTB location	<u>Outside</u> of a 20 mile radius of any PCTB location
Payment per linear feet of PCTB	Payment by linear feet of PCTB and payment for extra hauling distance by a force account method

ITEM 529 - CONCRETE CURB, GUTTER AND COMBINED CURB AND GUTTER

Use Class A concrete for these Items, unless otherwise shown on the plans. Wire mesh and fibers for concrete will not be allowed. Reinforce all concrete using reinforcement conforming to Item 440, "Reinforcement for concrete," as shown on the plans or as directed.

Construct the curb opening with metal plate configuration detailed in the plans, or as directed, to ensure roadway drainage to the earthen ditch. No direct payment will be made for these features. Payment will be made under this Item. All required manipulations or incidentals required to complete the work will be subsidiary to these items.

Perform all requiring grading for proposed concrete curb, gutter, and combined curb and gutter construction as shown on the plans. All grading, including excavation and fill/embankment will be subsidiary to this Item.

After construction, restore the adjacent surface to a condition approved by the Engineer. This work is subsidiary to Item 529.

The Contractor will be responsible for compatible repairs in locations directed by the Engineer to existing or current standards compensated by the provided bid items

CONTROL: 6389-94-001

SHEET 3D

COUNTY: EL PASO

HIGHWAY: IH 10

ITEM 531 - SIDEWALKS

Shape and compact subgrade, foundation, or pavement surface to the line, grade, and cross section shown on the plans. Lightly sprinkle subgrade or foundation material immediately before concrete placement.

Remove and dispose of existing concrete in accordance with Item 104, "Removing Concrete." Provide a clean surface for concrete placement directly on the surface material or pavement.

Provide finished work with a well-compacted mass, a surface free from voids and honeycomb, and the required true-to-line shape and grade. Cure for at least 72 hours in accordance with Item 420, "Concrete Substructures."

For Extruded or Slip Formed Concrete, provide any additional surface finishing immediately after extrusion or slip forming as required on the plans. Construct joints at locations as shown on the plans or as directed by the Engineer.

Sidewalks will be measured by the square yard of surface area. Curb ramps will be measured by the square yard of surface area or by each. A curb ramp consists of the ramp, landing, adjacent flares or side curb, and detectable warning surface as shown on the plans.

The Contractor will be responsible for compatible repairs in locations directed by the Engineer to existing or current standards compensated by the provided bid items

ITEM 545 - CRASH CUSHION ATTENUATORS

Furnish crash cushion attenuators as directed by the Engineer. Crash Cushion attenuators shall meet the plan requirements and be on the Department's *Compliant Work Zone Traffic Control Devices* List.

ITEM 6158 - TRAILER MOUNTED SOLAR POWERED RADAR SPEED CONTROL MONITOR

Provide units meeting or exceeding this special specification. Contractor is cautioned to read the specification carefully, as there may be special requirements not commonly offered by the equipment manufacturer. The following is a list of models that meet this special specification:

- Kustom Signal, SMART Model II
- McCoy's Law Line, Speedtrak SST
- MPH Speed Monitor, Speed Advisory Trailer
- Might Mover Trailers
- Or TxDOT approved equal

CONTROL: 6389-94-001

COUNTY: EL PASO

HIGHWAY: IH 10

ITEM 6185 - TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA)

The contractor will be responsible for determining if one or more operations will be ongoing at the same time to determine the total number of TMAs needed for the project. TMAs will be used and positioned per the applicable Traffic Control Plan standard or as directed by the Engineer. Additional TMAs required by the Engineer will be provided by the contractor.

All Truck Mounted Attenuator (TMA) Operators must participate in a TMA workshop to be conducted by the El Paso District Safety Office, on the proper use of TMAs, prior to working on Department Right of Way (ROW). A certificate of completion will be issued to TMA Operators that successfully complete the TMA workshop. The certificate of completion must be carried by TMA Operators at all times while working on Department ROW.

It is the responsibility of the Contractor to acquire the TCP and TMA Operator's certificates of completion prior to the authorization to begin work. No time suspension will be granted and no traffic control work will be allowed without certificates of completion.

The supporting vehicle for the TMA shall have a minimum gross (i.e., ballasted) vehicular weight of 19,000 pounds.

Truck-Mounted Attenuators (TMA) must be NCHRP 350 or MASH compliant and will require pre-approval by the Department. Attachment of TMA will be in accordance with manufacturer's recommendations.

NCHRP 350 **Level 3** compliant TMAs may be used on any Department facility.

ITEM 7148 - LANE CLOSURES

Item 7148 will not be paid for directly but will be subsidiary to various bid items.

TMAs required to accomplish work under this Contract will be measured and paid as described in Special Specification 6185, "Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)".

Install, maintain, and remove lane closures as shown on the plans, or as directed by the Engineer. This specification is intended for lane closures approximately 24 hours in duration or less.

Rumble Strips will not be paid for directly but shall be subsidiary to the various bid items, as shown on standard sheet WZ (RS)-16.

The Contractor must have enough manpower and equipment to perform any revised traffic control as directed by the Engineer.

Use flashing arrow boards on all tapers for each lane closure, as shown on TxDOT standards.

CONTROL: 6389-94-001

SHEET 3E

COUNTY: EL PASO

HIGHWAY: IH 10

The Contractor may be required to furnish and place additional TMAs, Flaggers, Pilot Cars, Truck Mounted forward facing arrow boards, and/or Work Zone Rumble Strips not shown on the TCP plan sheets, as directed by the engineer.

The Department will notify the Contractor at least in advance of any scheduled lane closures for roadway routine maintenance or repair. Lane closures identified by the Department as emergencies shall be accomplished within one hour from verbal notification.

DATE: 9/16/2021 10:35:47 AM
FILE: \\FS-ELPHO.dot.state.tx.us\DATA1\DistrictWide\RMC - MMC Projects\052 West Area Office\RMC 6389-94-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\QUANTITY_SUMMARY.dgn

SUMMARY OF ROADWAY ITEMS

LOCATION	104	104	104	104	104	104	132	401	420	420	420	429	429	429
	6009	6021	6025	6028	6031	6037	6002	6001	6003	6054	6057	6006	6008	6009
	REMOVING CONC (RIPRAP)	REMOVING CONC (CURB)	REMOVE CONC (WINGWALL)	REMOVING CONC (MISC)	REMOVING CONC (HEADWALL)	REMOVE CONC (RAIL)	EMBANKMENT (FINAL)(DENS CONT)(TY A)	FLOWABLE BACKFILL	CL A CONC (MISC)	CL C CONC (HEADWALL)	CL C CONC (WINGWALLS)	CONC STR REPR(RAP ID DECK REP(FULL DPT))	CONC STR REPR(RAP ID VERT AND OVERHEAD)	CONC STR REPAIR (STANDARD)
	SY	LF	CY	SY	CY	LF	CY	CY	SY	CY	CY	SF	SF	SF
RMC 6389-94-001	1200	2000	10	2000	10	30	40	40	1500	5	5	200	100	300
PROJECT TOTALS	1200	2000	10	2000	10	30	40	40	1500	5	5	200	100	300

SUMMARY OF ROADWAY ITEMS

LOCATION	432	450	512	512	512	514	529	529	531	531	545	545	545	545	778
	6006	6047	6017	6029	6061	6013	6005	6008	6001	6041	6002	6003	6005	6024	6012
	RIPRAP (CONC)(CL B)	RAIL (HANDRAIL)(TY A)	PORT CTB (DES SOURCE)(F-SHAPE)(TY 1)	PORT CTB (MOVE)(F-SHAPE)(TY 1)	PORT CONC TRAF BAR (STKPL, INSTL&RETR N)	PERM CTB (F-SHAPE) (TY 1)	CONC CURB (MONO) (TY II)	CONC CURB & GUTTER (TY II)	CONC SIDEWALKS (4")	CURB RAMPS (SPECIAL)	CRASH CUSH ATTN (DES SOURCE)	CRASH CUSH ATTN (MOVE & RESET)	CRASH CUSH ATTN (REMOVE)	CRASH CUSHION ATTN (INSTALL) (TRACC)	CONCRETE RAIL REPAIR (TYPE 551)
	CY	LF	LF	LF	LF	LF	LF	LF	SY	SY	EA	EA	EA	EA	LF
RMC 6389-94-001	150	40	100	100	100	200	2000	30	200	15	1	1	1	1	50
PROJECT TOTALS	150	40	100	100	100	200	2000	30	200	15	1	1	1	1	50

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION	6001	6158	6185
	6001	6001	6003
	PORTABLE CHANGEABLE MESSAGE SIGN	TMSP RADAR SPEED CONTROL MONITOR	TMA (MOBILE OPERATION)
	DAY	EA	HR
RMC 6389-94-001	20	1	800
PROJECT TOTALS	20	1	800

SUMMARY OF MOBILIZATION ITEMS

LOCATION	500
	6001
	MOBILIZATION
	LS
RMC 6389-94-001	1.00
PROJECT TOTALS	1

WEST AREA OFFICE QUANTITY SUMMARY

CONT	SECT	JOB	HIGHWAY
6389	94	001	IH 10, ETC
DIST	COUNTY		SHEET NO.
ELP	EL PASO		5

DATE: 9/16/2021 10:35:48 AM
 FILE: \\FS-ELPH0.dot.state.tx.us\DATA1\Districtwide\RMC - MMC Projects\051 East Area\01 Ce RMC 6388-90-001 Miscel Laneous Concrete\051 TCP Plan Set\Standard\TCP\bc-21.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT or any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to any other format.

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).

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

SHEET 1 OF 12



**BARRICADE AND CONSTRUCTION
 GENERAL NOTES
 AND REQUIREMENTS**

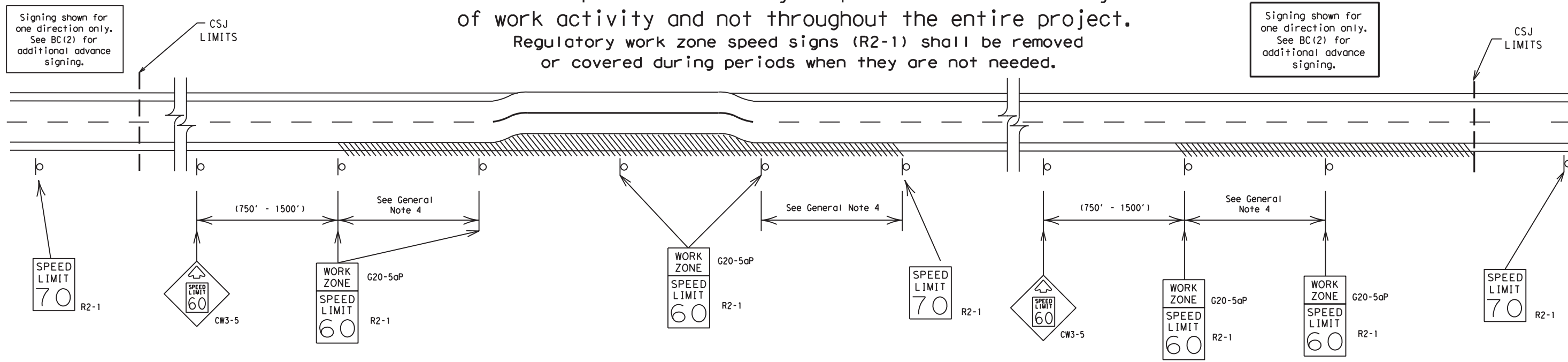
BC (1) - 21

FILE:	bc-21.dgn	DN:	TxDOT	CR:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		6389	94	001	IH 10, ETC				
4-03	7-13								
9-07	8-14								
5-10	5-21	ELP	EL PASO		SHEET NO.		6		

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:

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- 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

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- 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
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- 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.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
 - Law enforcement.
 - Flagger stationed next to sign.
 - Portable changeable message sign (PCMS).
 - Low-power (drone) radar transmitter.
 - Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- 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.

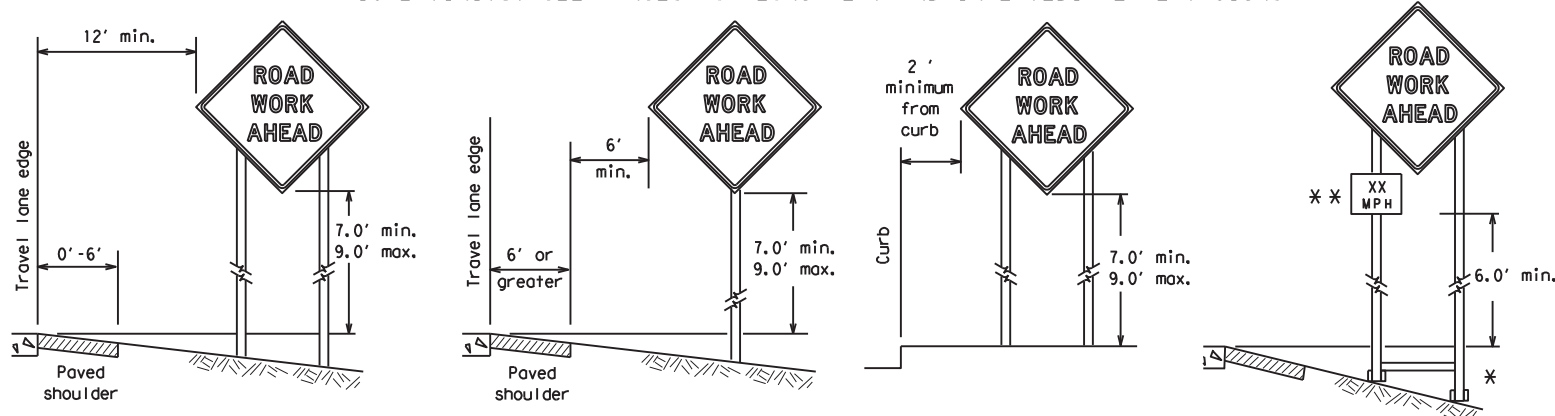
DATE: 9/16/2021 10:35:50 AM
 FILE: \\FS-ELPHO.dot.state.tx.us\DATA1\Districtwide\RMC - MMC Projects\051 Districtwide\RMC - MMC Projects\051 Districtwide\BC(3)-21.dgn
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the accuracy of any information contained herein.

SHEET 3 OF 12

		Traffic Safety Division Standard	
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT			
BC (3) - 21			
FILE:	bc-21.dgn	DW:	TxDOT
© TxDOT	November 2002	CONT	SECT
REVISIONS		6389	94
9-07	8-14	001	IH 10, ETC
7-13	5-21		
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	8	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use. FILE: \\FS-ELPH01-dot.state.tx.us\DATA\INDistrict\Wide\RM - MMC Projects\051 East Area Office\RM 6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\TCP\bc-21.dgn

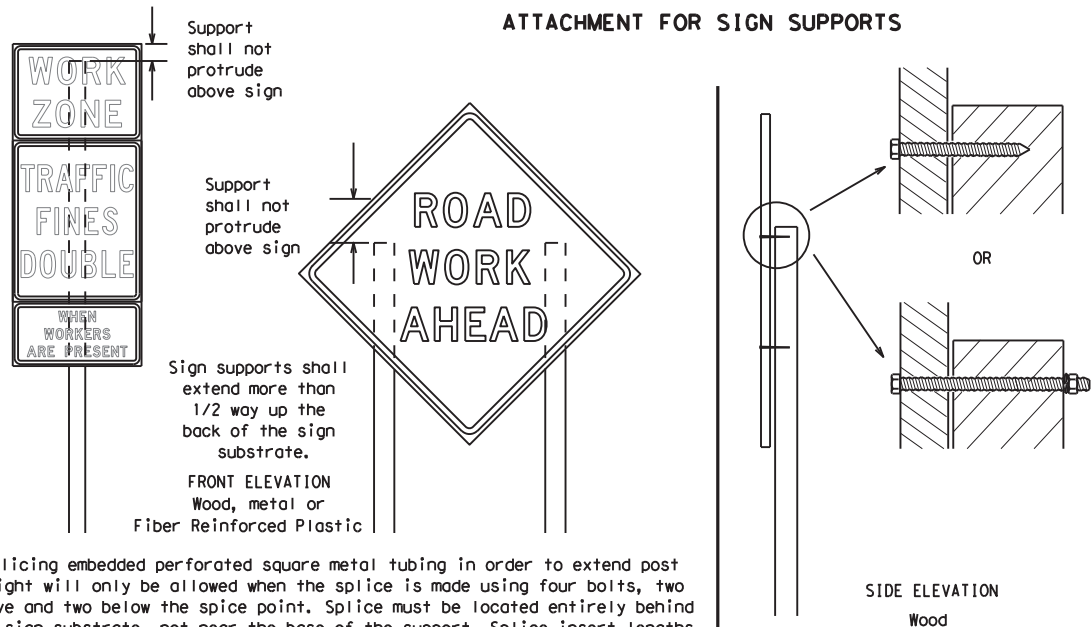
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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



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 splice 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.

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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)

- 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.
 - Long-term stationary - work that occupies a location more than 3 days.
 - 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.
 - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - Short, duration - work that occupies a location up to 1 hour.
 - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

- 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.
- 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.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- 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.
- 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

- 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

- 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.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- 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

- 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).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- 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

- 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

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

SIGN SUPPORT WEIGHTS

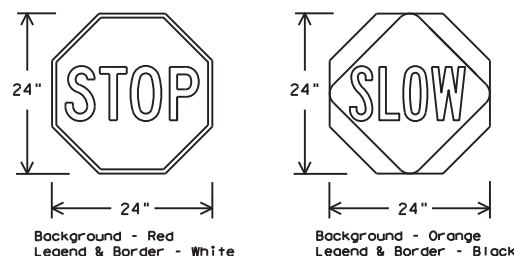
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- 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.
- 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.
- 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.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

- 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.

STOP/SLOW PADDLES

- STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
- STOP/SLOW paddles shall be retroreflectORIZED when used at night.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- 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

- 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.
- 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.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- 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.
- 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.
- 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.

SHEET 4 OF 12

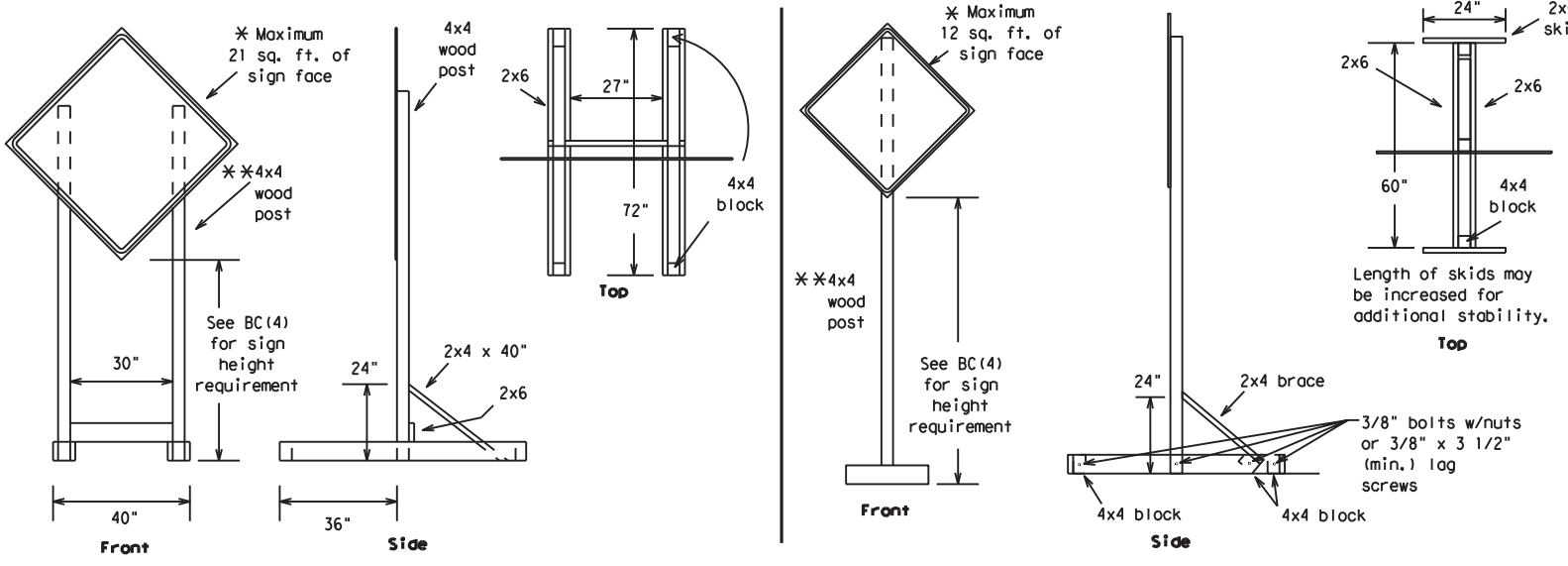
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

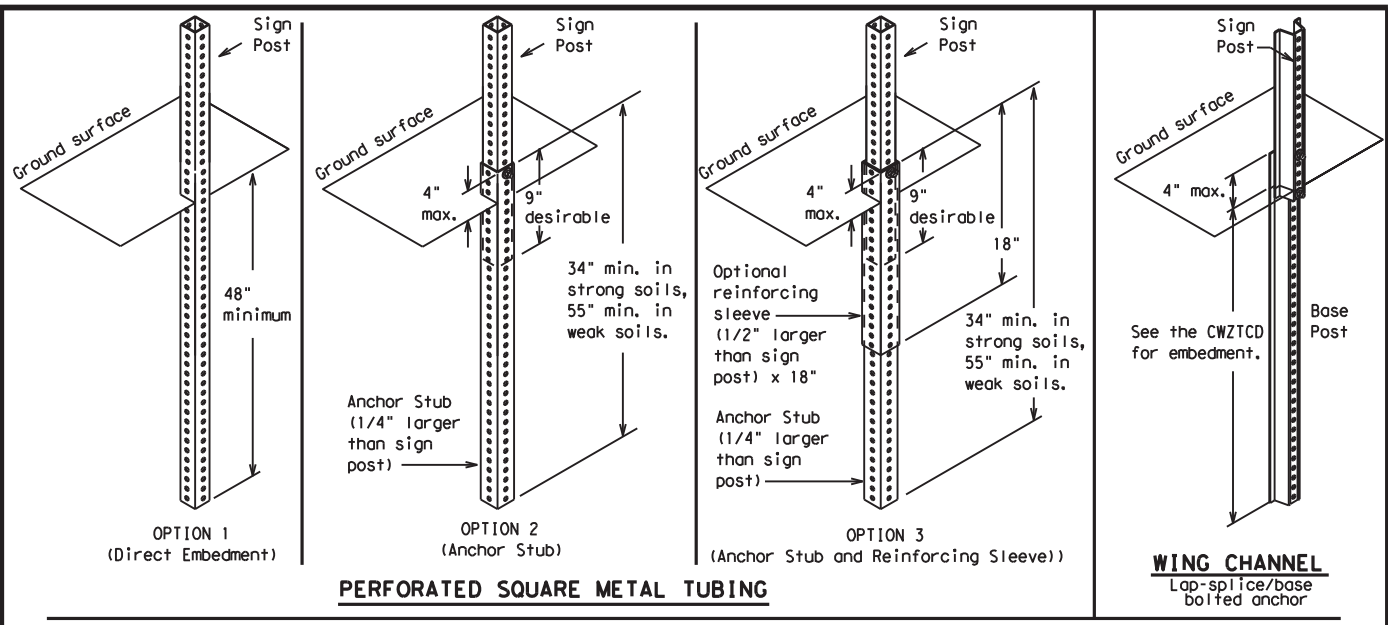
FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	OW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		6389 94	001	1H 10, ETC
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	ELP	EL PASO	9	

DATE: 9/16/2021 10:35:52 AM
 FILE: \\FS-ELPHO.dot.state.tx.us\DATA1\Districtwide\RMC - MMC Projects\051 East Area Office\RMC_6389-94\Miscellaneous Concrete\DESIGN PLAN_Set Standards\TCP\bc-21.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats for incorrect results resulting from its use.



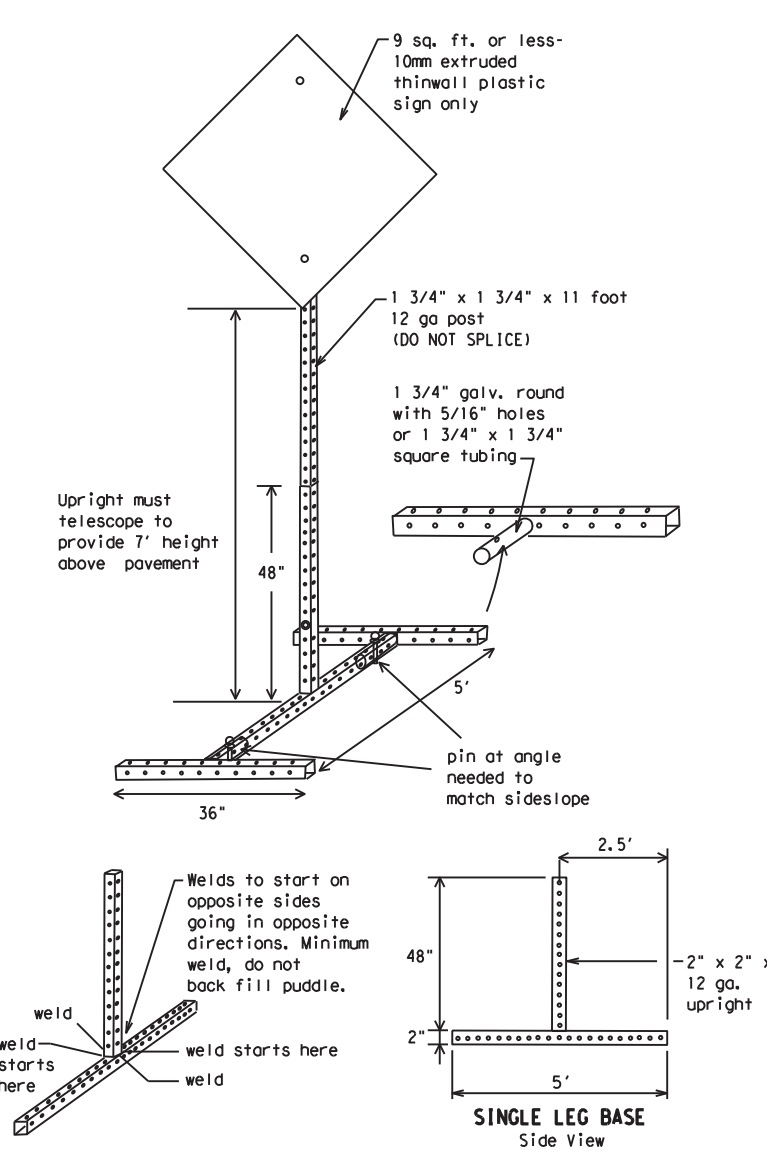
SKID MOUNTED WOOD SIGN SUPPORTS

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



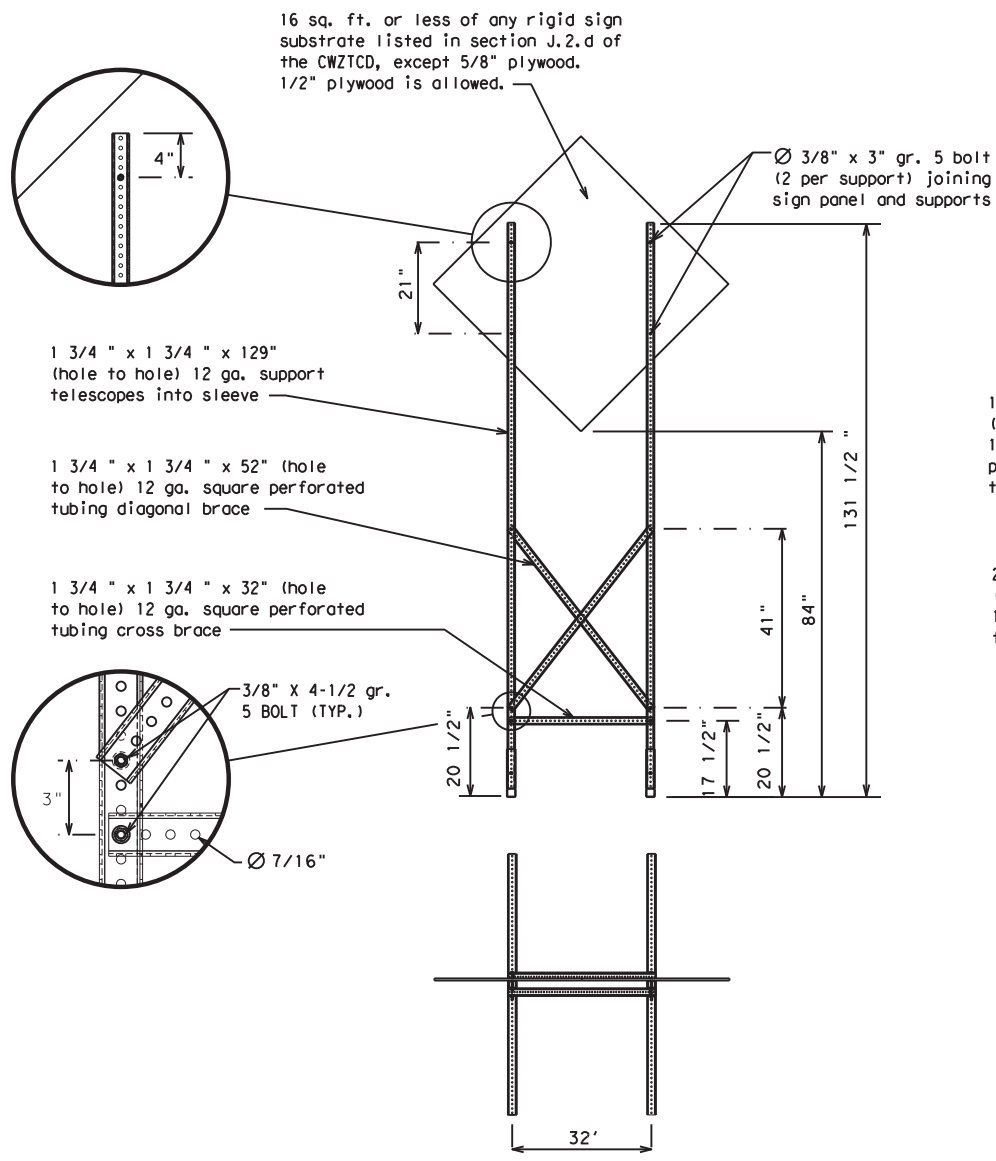
GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

- 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.
 - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
 - 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



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CR:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS	6389	94	001	1H 10,	ETC				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	ELP	EL PASO	10					

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- 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.
- 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.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- 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.
- 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.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 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.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- 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.
- 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.
- Each line of text should be centered on the message board rather than left or right justified.
- 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.

Phase 1: Condition Lists

Road/Lane/Ramp Closure List		Other Condition List	
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *
XXXXXXXX BLVD CLOSED			

* 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	Location List	Warning List	** Advance Notice List
MERGE RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM-X PM
DETOUR NEXT X EXITS	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX-XX X PM-X AM
USE EXIT XXX	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	XXXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES			TONIGHT XX PM-XX AM
STAY IN LANE *			

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- 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.
- 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

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- 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

- 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.
- 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.
- 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.
- 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.

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats for printing or reproduction. The standard is provided as a service to the public. DATE: 9/16/2021 10:35:53 AM FILE: \\FS-ELPH0.dot.state.tx.us\DATA1\Districtwide\RMC - MMC Projects\051 East Area Office\RMC_6388-90-001_Miscellaneous_Concrete\BC(6)-21.dgn

WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Canot	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLR
High-Occupancy Vehicle	HOV	Tuesday	TUES
Highway	HWY	Time Minutes	TIME MIN
Hour(s)	HR, HRS	Upper Level	UPR LEVEL
Information	INFO	Vehicles (s)	VEH, VEHS
It Is	ITS	Warning	WARN
Junction	JCT	Wednesday	WED
Left	LFT	Weight Limit	WT LIMIT
Left Lane	LFT LN	West	W
Lane Closed	LN CLOSED	Westbound	(route) W
Lower Level	LWR LEVEL	Wet Pavement	WET PVMT
Maintenance	MAINT	Will Not	WONT

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



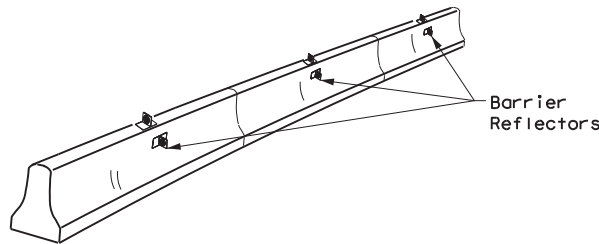
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

FILE:	bc-21.dgn	DN:	TxDOT	CR:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT:	SECT:	JOB:	REVISIONS:	6389	94	001	IH 10, ETC
9-07	8-14	DIST:	COUNTY:	SHEET NO.:					
7-13	5-21	ELP:	EL PASO	11					

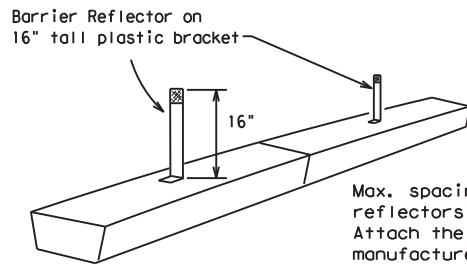
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.
 DATE: 9/16/2021 10:35:55 AM
 FILE: \\FS-ELPHO.dot.state.tx.us\DATA\INDistrict\wide\MMC Projects\051 East Area Office\RMC_6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\TCP\bc-21.dgn

- 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).
- 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)

- 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.
- 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.
- When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
- Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
- Maximum spacing of Barrier Reflectors is forty (40) feet.
- Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
- Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
- Single slope barriers shall be delineated as shown on the above detail.

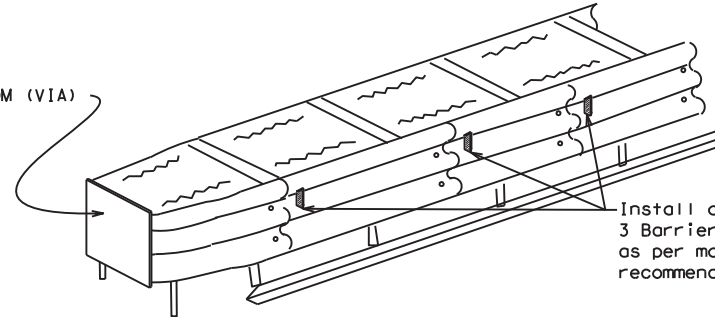


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

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

END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the appropriate 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

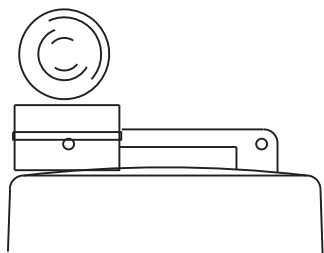
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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.
- 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".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- 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.
- 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.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

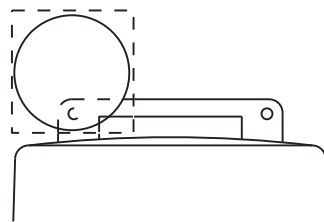
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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.
- 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.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

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

- 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.
- 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.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- 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.
- 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.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.



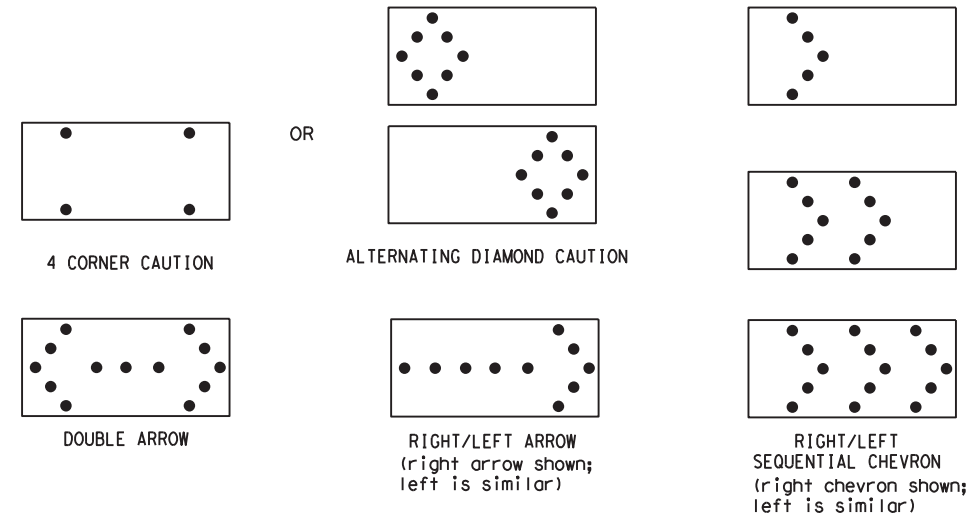
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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.

- 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.
- 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.
- 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.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- 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.
- 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.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- 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.
- Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

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

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

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- 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.
- The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.



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

BC (7) -21

FILE:	bc-21.dgn	DN:	TxDOT	CR:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		6389	94	001	IH 10,	ETC			
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	ELP	EL PASO	12					

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.
 DATE: 9/16/2021 10:35:56 AM
 FILE: \\FS-ELPH0.dot.state.tx.us\DATA\INDistrict\wide\MMC Projects\051 East Area Office\RMC 6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\TCP\bc-21.dgn

GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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).
- 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.
- 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:

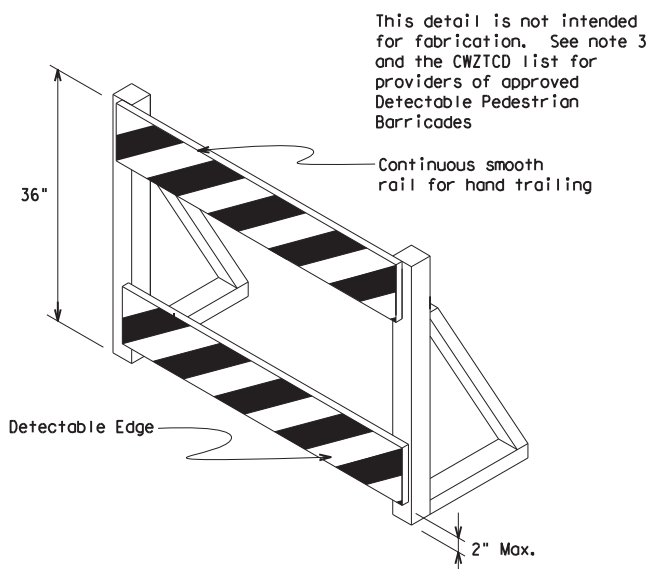
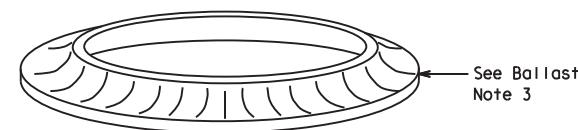
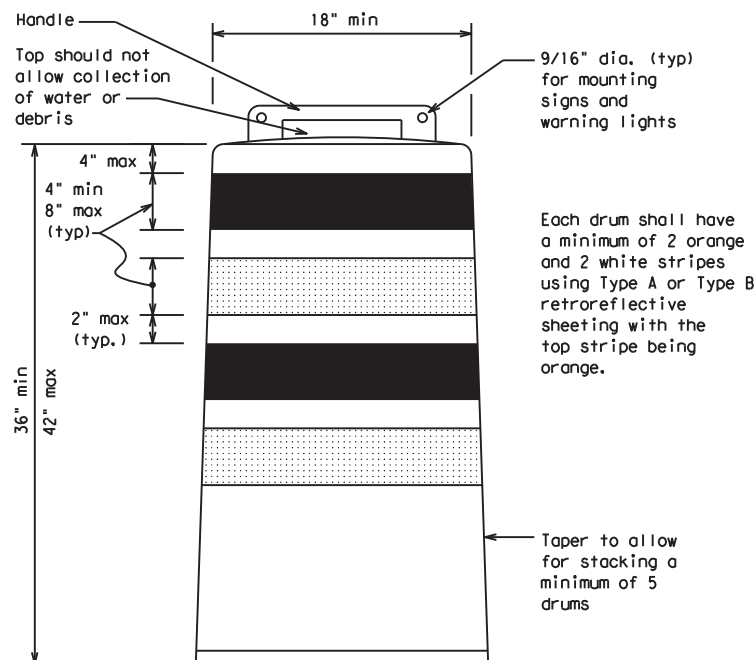
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
- 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.
- 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.
- 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.
- 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.
- 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.
- Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
- Drum body shall have a maximum unballasted weight of 11 lbs.
- Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

- 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.
- 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.

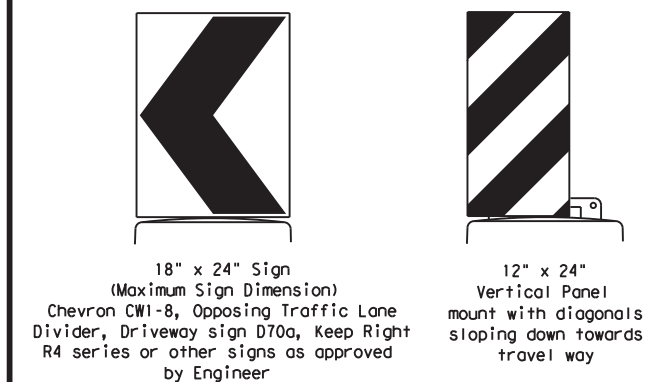
BALLAST

- 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.
- 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.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 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.
- 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.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.



DETECTABLE PEDESTRIAN BARRICADES

- 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.
- 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.
- 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.
- 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.
- Warning lights shall not be attached to detectable pedestrian barricades.
- 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.



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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- 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.
- Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on the Vertical Panels shall slope down toward the intended traveled lane.
- 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.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- 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.
- 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.

SHEET 8 OF 12



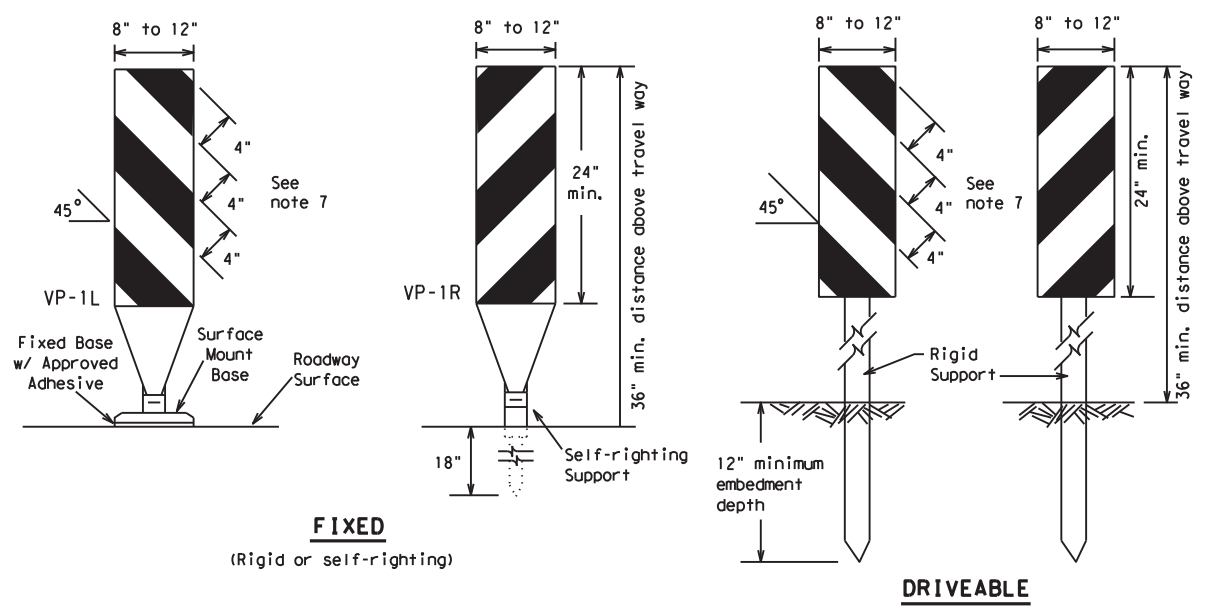
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

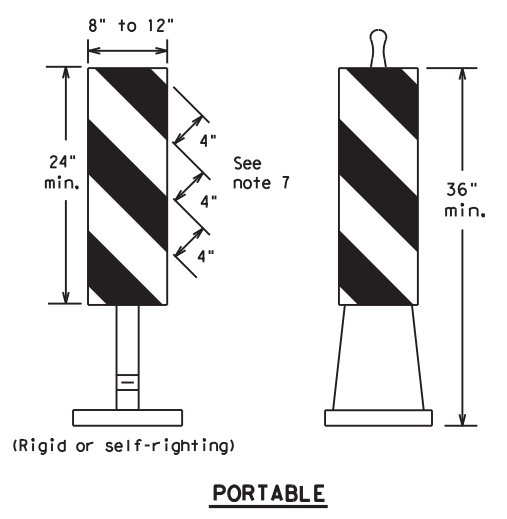
FILE:	bc-21.dgn	DN:	TxDOT	CR:	TxDOT	OW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		6389	94	001	10	ETC			
4-03	8-14	DIST		COUNTY	SHEET NO.				
9-07	5-21	ELP		EL PASO	13				
7-13									

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

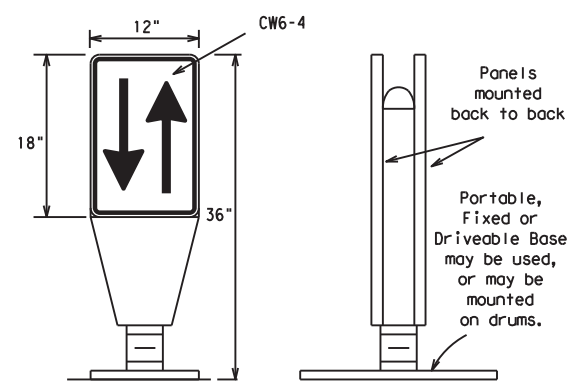
DATE: 9/16/2021 10:35:57 AM
 FILE: \\FS-ELPH0.dot.state.tx.us\DATA\1\DistrictWide\RMC - MMC Projects\051 East Area Office\RMC_6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\TCP\bc-21.dgn



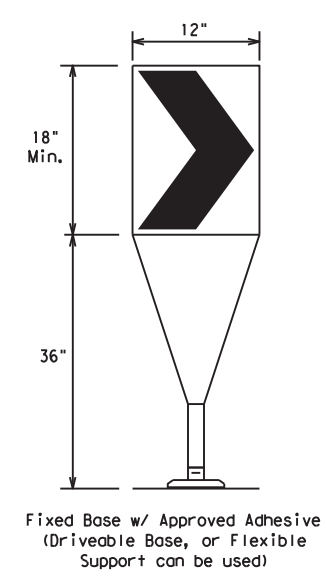
- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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



VERTICAL PANELS (VPs)

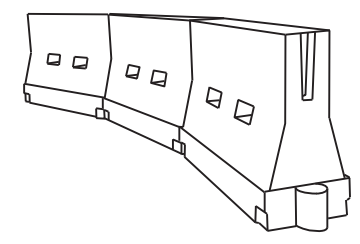


- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
- The OTLD may be used in combination with 42" cones or VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
- 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.



- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- 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.
- To be effective, the chevron should be visible for at least 500 feet.
- 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.
- 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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 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

- 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.
- 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.
- 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.
- 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.
- 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 cones 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

GENERAL NOTES

- 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).
- 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.
- 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).
- 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.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 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.
- 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.

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

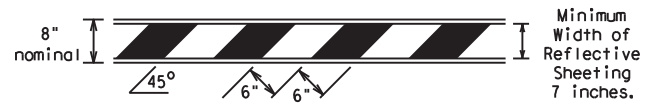
FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389	94	001	IH 10, ETC
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	ELP	EL PASO	14	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the use of this standard to other formats or for incorrect results or damages resulting from its use. FILE: \\FS-ELPHO.dot.state.tx.us\DATA\1\DistrictWide\RMC - MMC Projects\051 East Area Office\RMC_6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan_Set\Standards\TP\bc-21.dgn

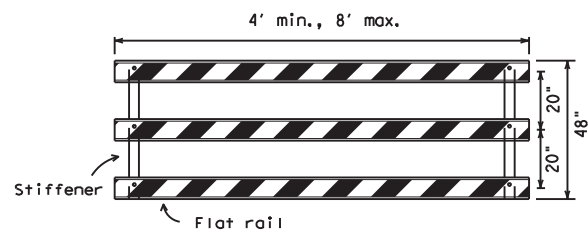
TYPE 3 BARRICADES

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.



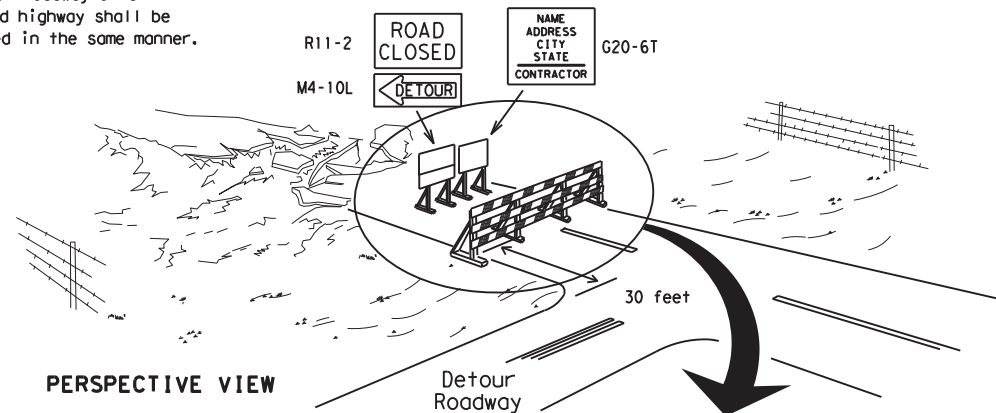
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

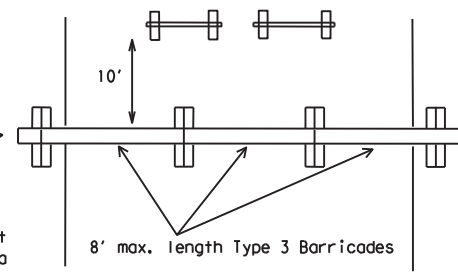
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

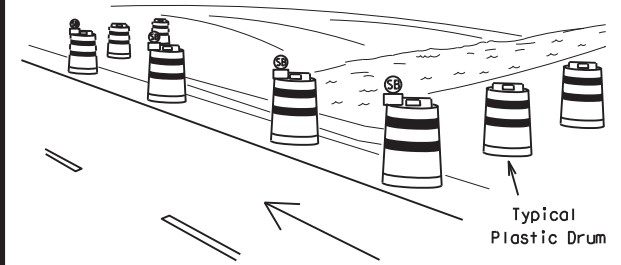
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



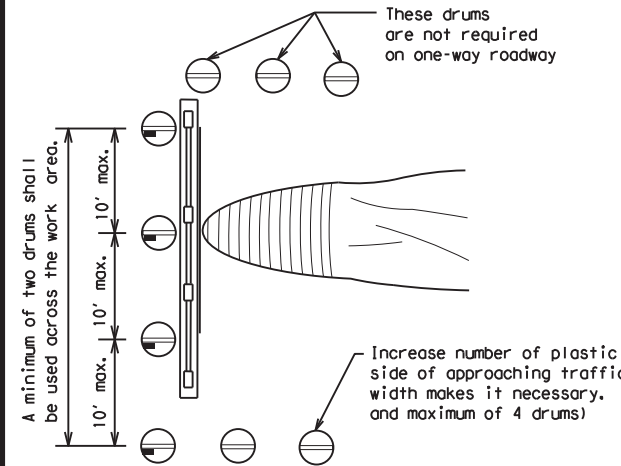
PLAN VIEW

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

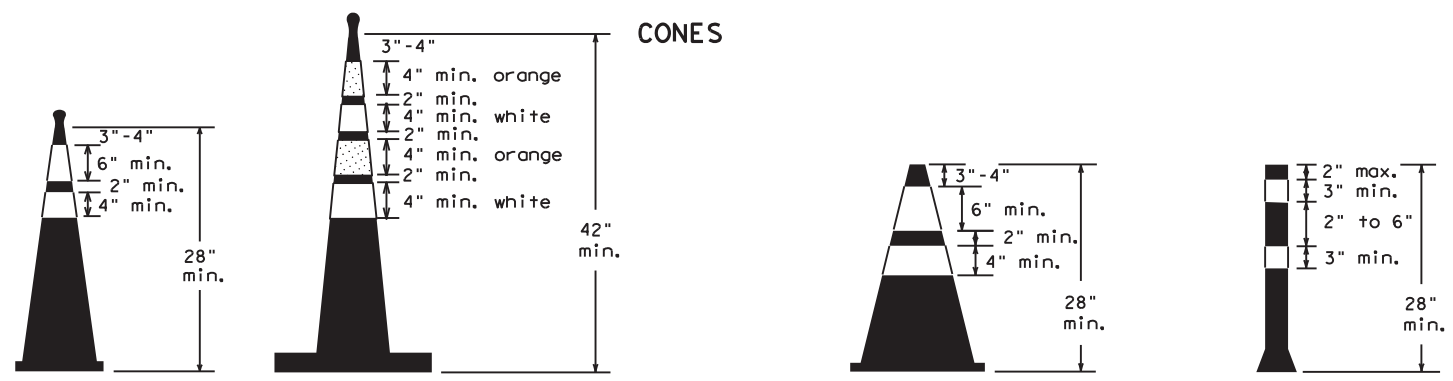


PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

1. Where positive redirection 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
	Steady burn warning light or yellow warning reflector



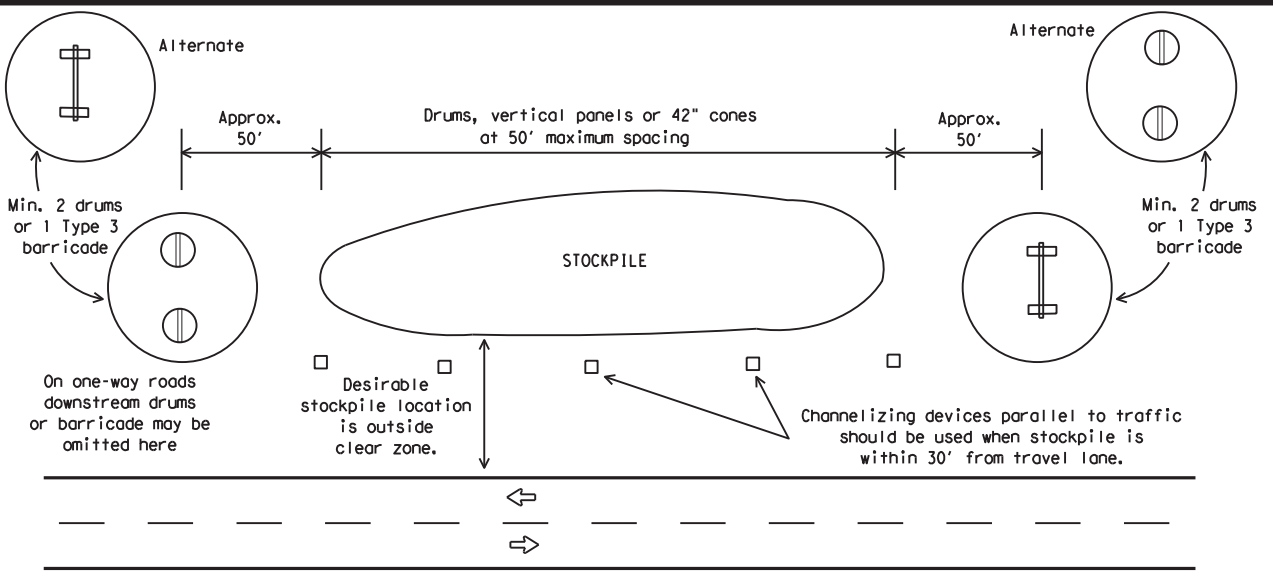
Two-Piece cones

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

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) -21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389	94	001	IH 10, ETC
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	ELP	EL PASO	15	

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

WORK ZONE PAVEMENT MARKINGS

GENERAL

- 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.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- 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).
- 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.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- 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

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

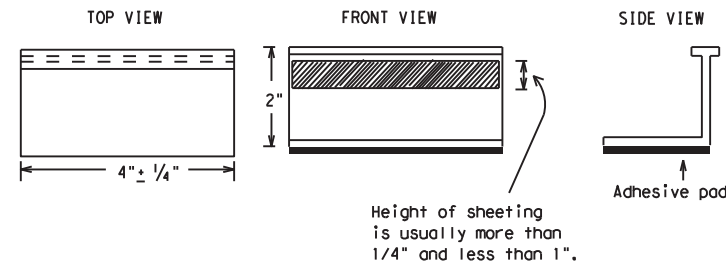
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- 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.
- 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.
- 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

- 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.
- 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.
- 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".
- The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- Over-painting of the markings SHALL NOT BE permitted.
- Removal of raised pavement markers shall be as directed by the Engineer.
- 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.
- 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

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 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.
 - 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.
 - 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.
- Small design variances may be noted between tab manufacturers.
- 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

- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- 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).

SHEET 11 OF 12

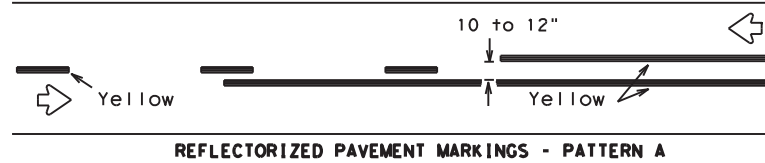


BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

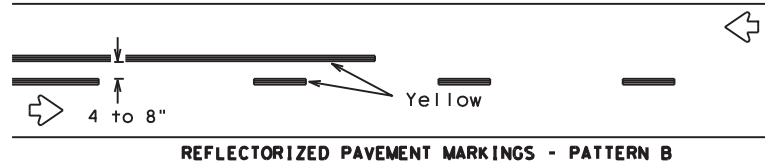
BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS		6389	94	001
2-98	9-07	5-21		
1-02	7-13			
11-02	8-14			
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		16

PAVEMENT MARKING PATTERNS

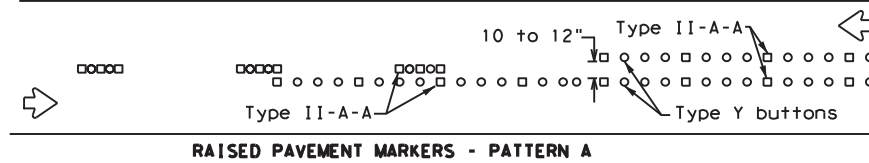


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

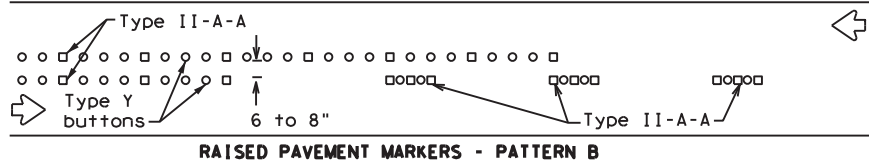


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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.

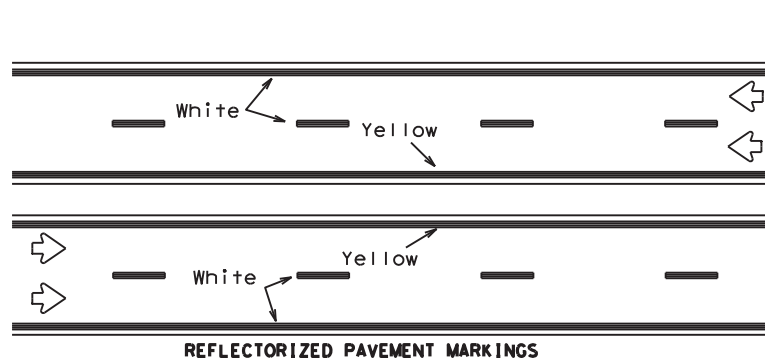


RAISED PAVEMENT MARKERS - PATTERN A



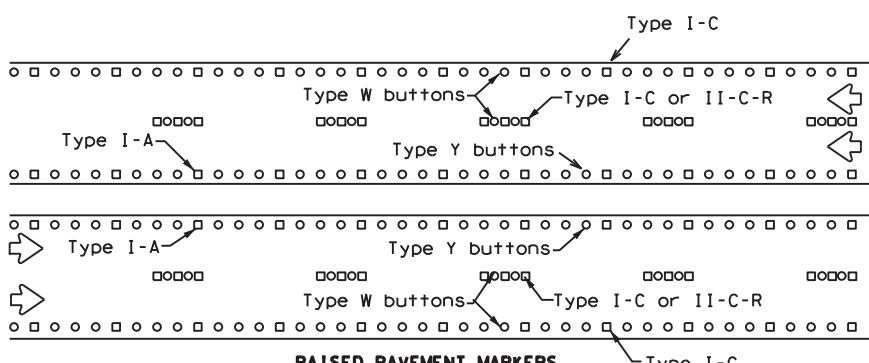
RAISED PAVEMENT MARKERS - PATTERN B

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



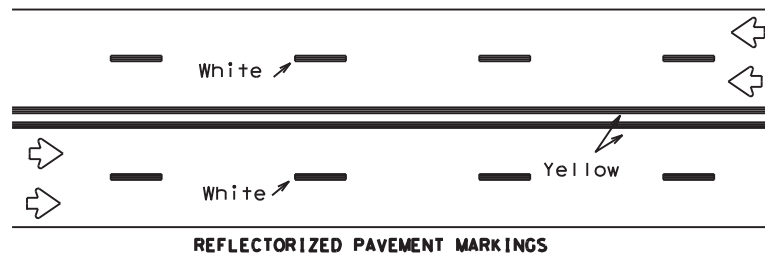
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



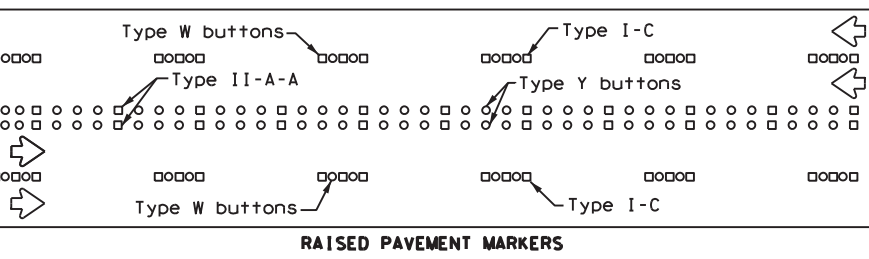
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



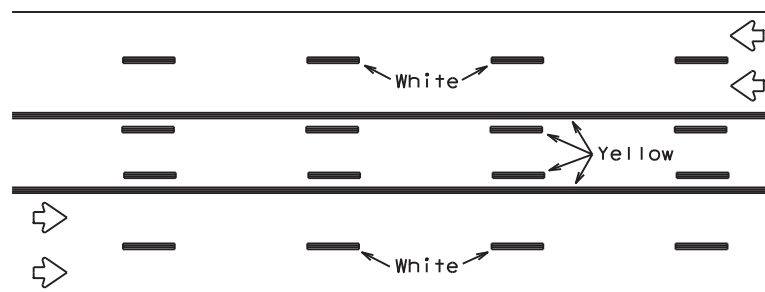
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



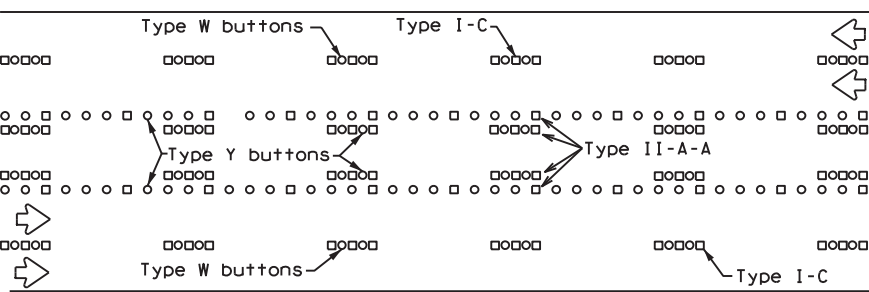
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

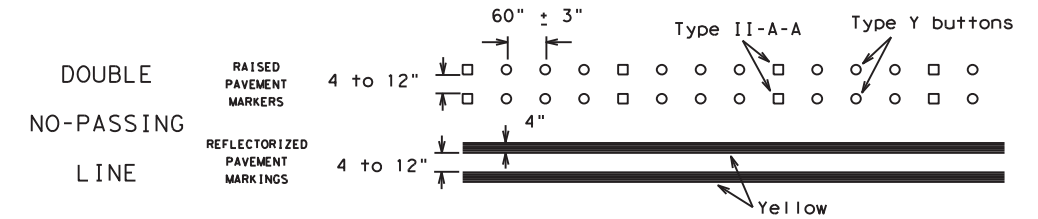
Prefabricated markings may be substituted for reflectorized pavement markings.



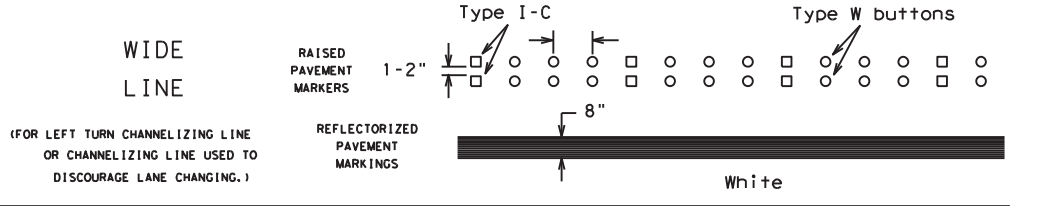
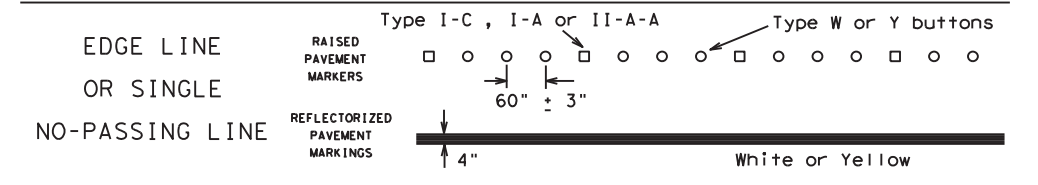
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

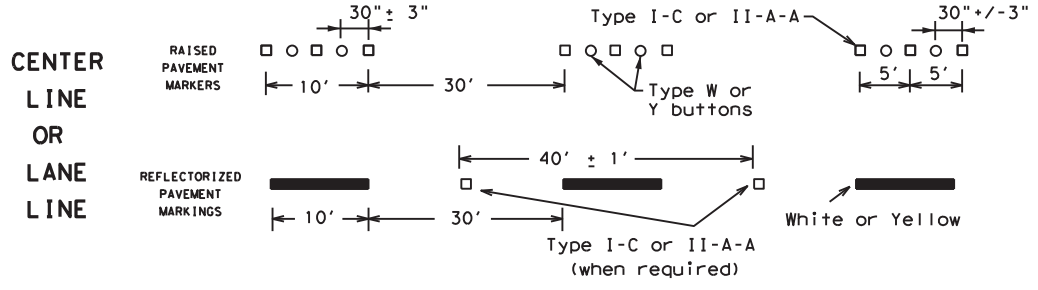
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



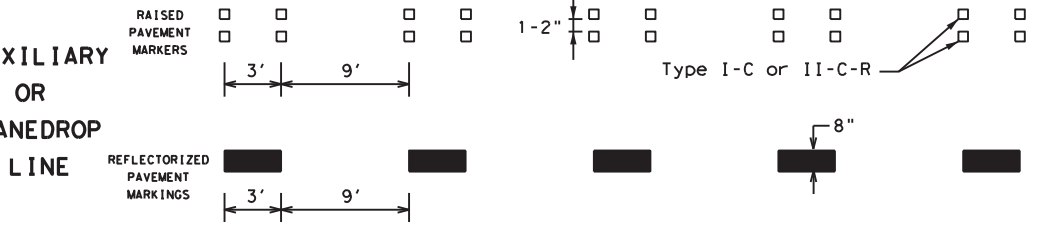
SOLID LINES



BROKEN LINES

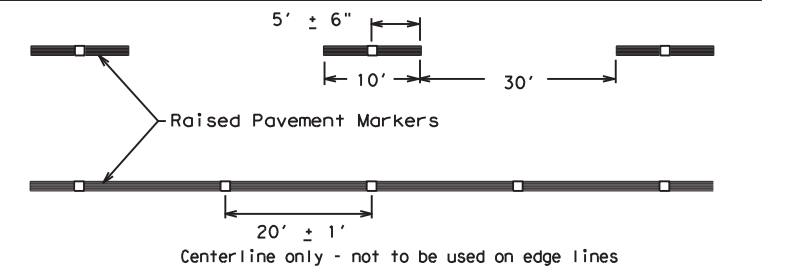


AUXILIARY OR LANEDROP LINE



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.



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 21

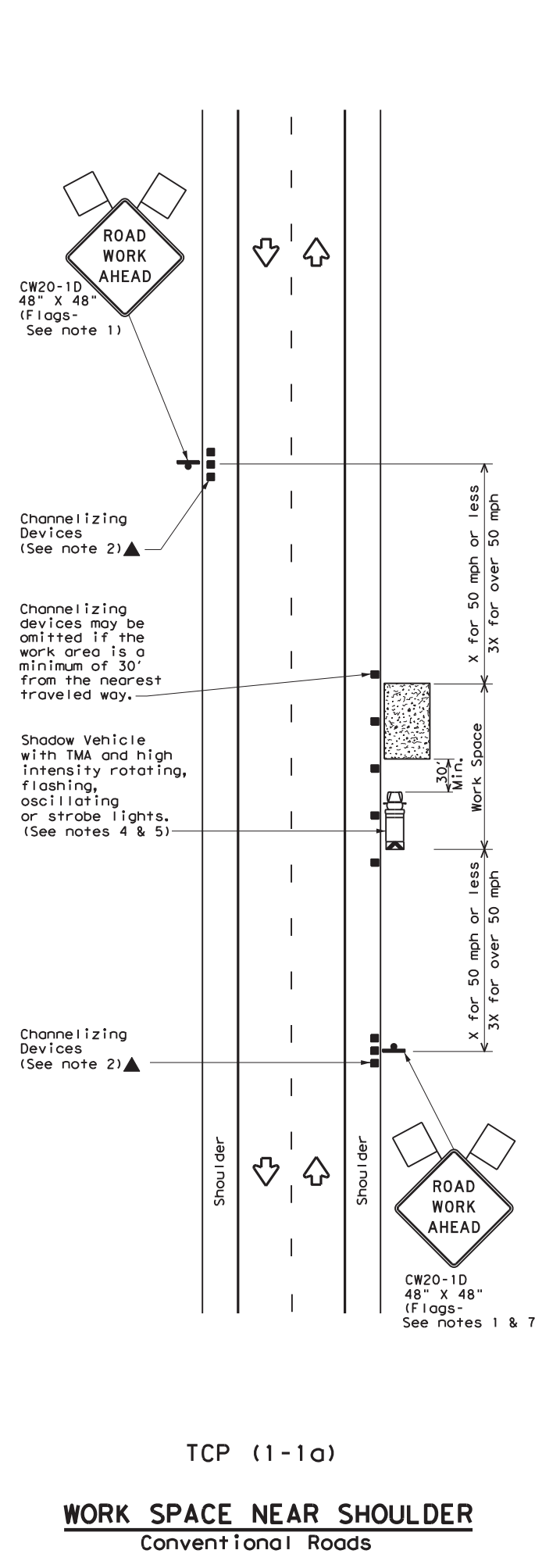
Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CR: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389	94	001	IH 10, ETC
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	ELP	EL PASO	17	
11-02 8-14				

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

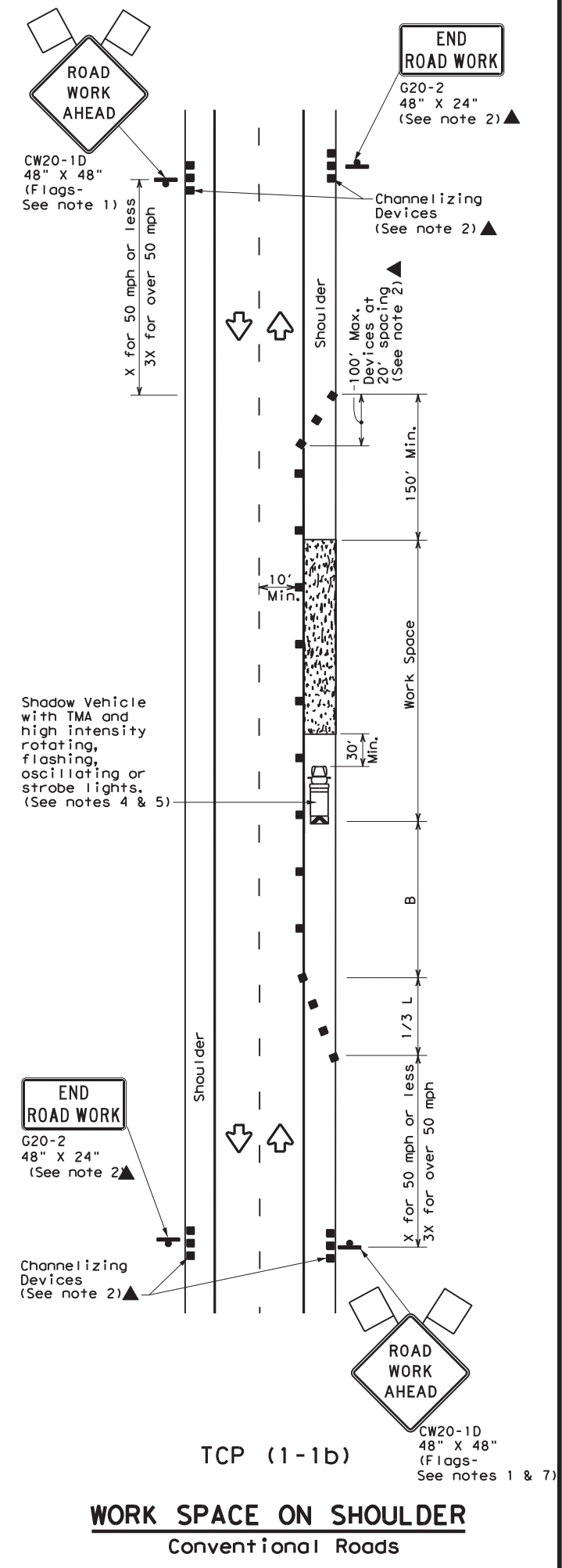
DATE: 9/16/2021 10:36:00 AM
 FILE: \\FS-ELPH01.dot.state.tx.us\DATA1\Districtwide\MMC Projects\051 East Area Office\RMC_6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\TCP\bc-21.dgn

DATE: 9/16/2021 10:36:01 AM
 FILE: \\FS-ELPHO.dot.state.tx.us\DATA\1\Districtwide\MMC Projects\051\051-1-18\051-1-18-18.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of electronic files to paper.



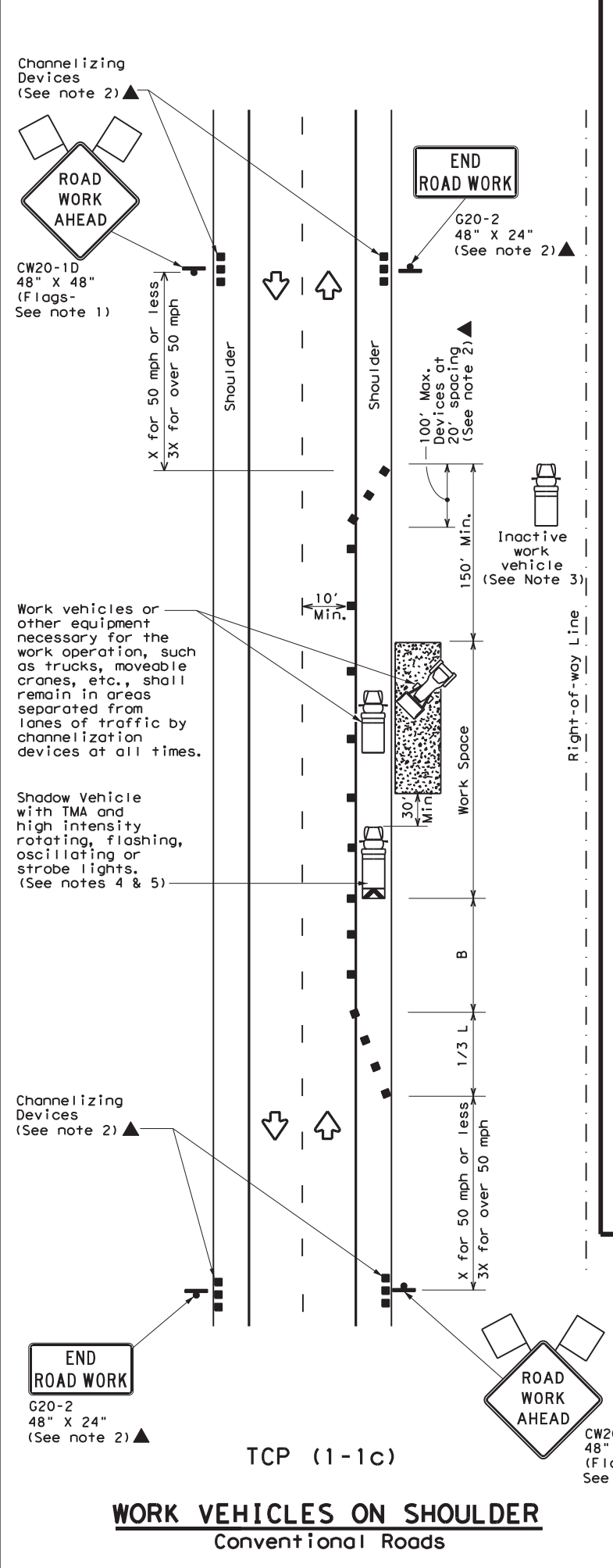
TCP (1-1a)

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		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown are REQUIRED.
 - 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.
 - Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
 - 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.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
 - See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
 - CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

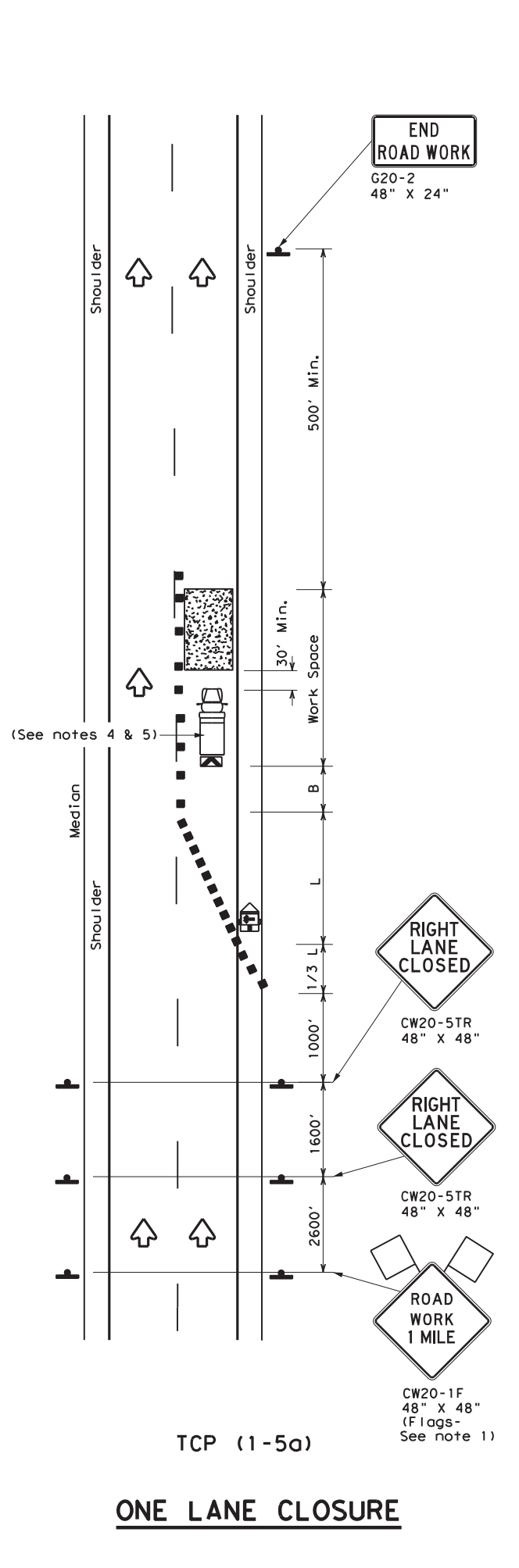


TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK

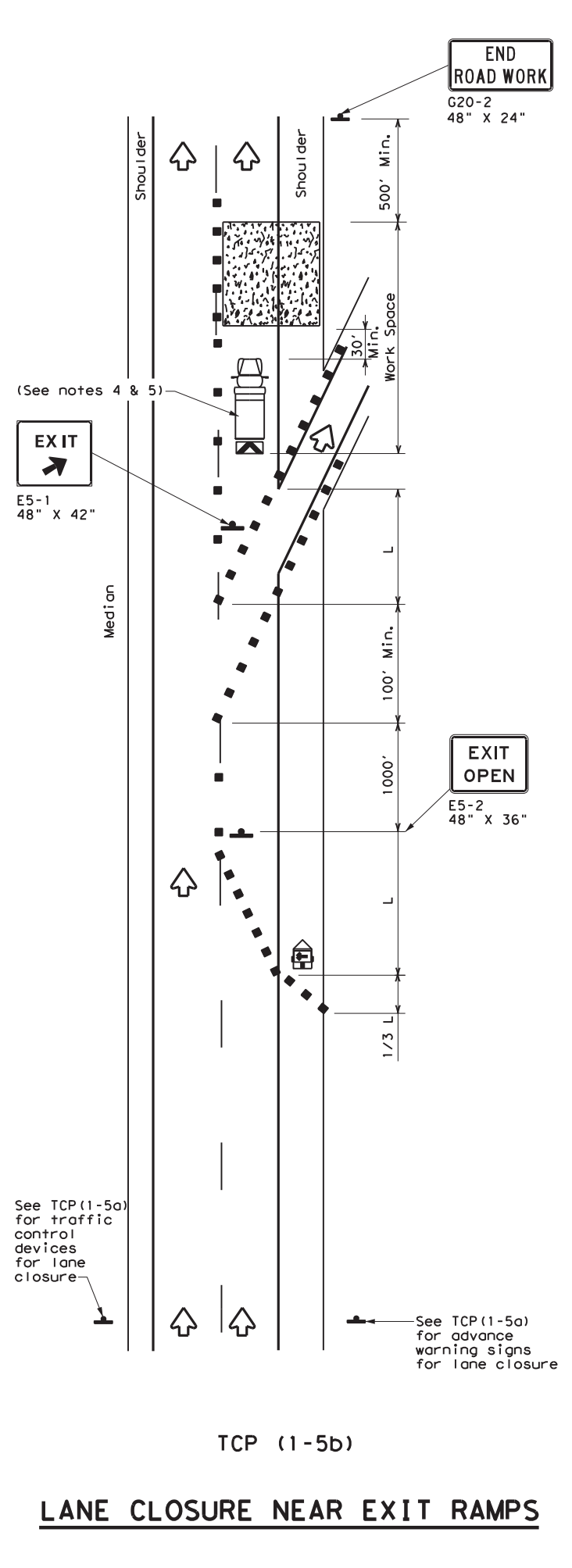
TCP (1-1) - 18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389	94	001	IH 10, ETC
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	ELP	EL PASO	18	
1-97 2-18				

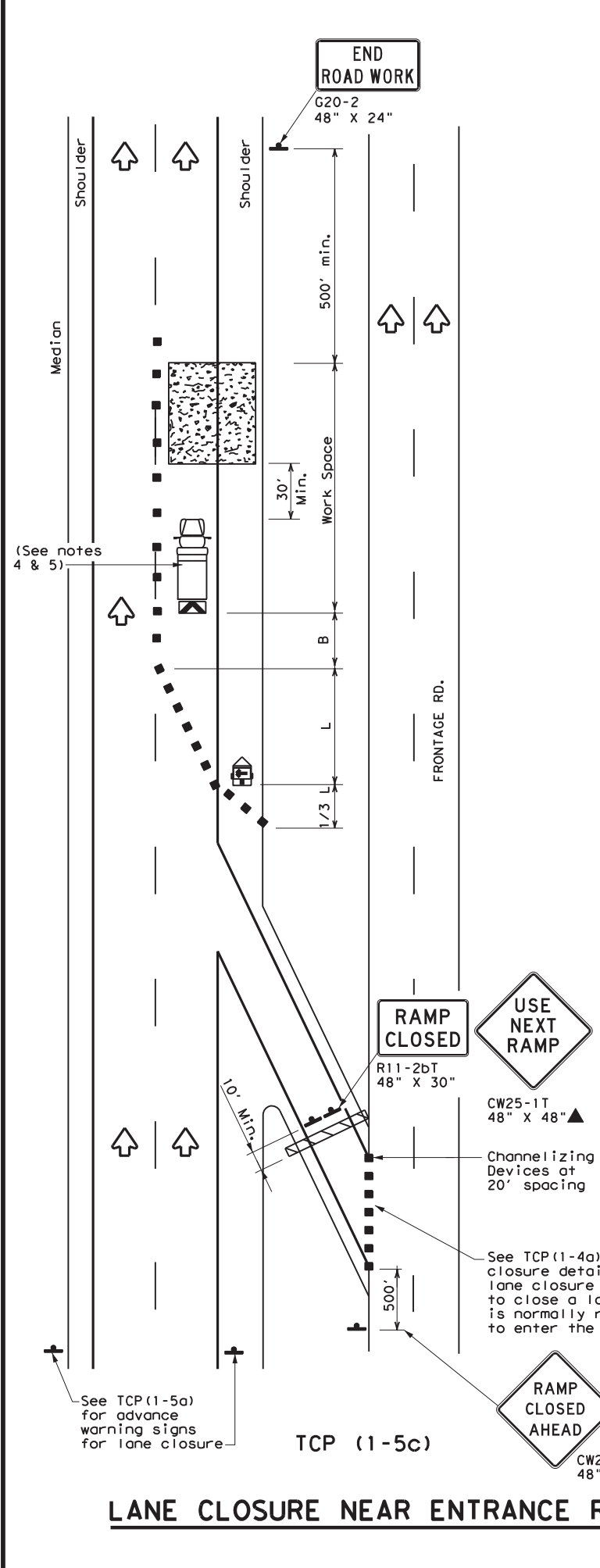
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any information into digital form or for the accuracy of any information derived therefrom. TxDOT is not responsible for any damage to any person or property resulting from the use of this standard. DATE: 9/16/2021 10:36:06 AM FILE: \\FS-ELPHO.dot.state.tx.us\DATA\1\Districtwide\RMC - MMC Projects\051\051-18\051-18-TCP(1-5)-18.dgn



ONE LANE CLOSURE



LANE CLOSURE NEAR EXIT RAMPS



LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - 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.
 - 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.
 - 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.
 - 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.

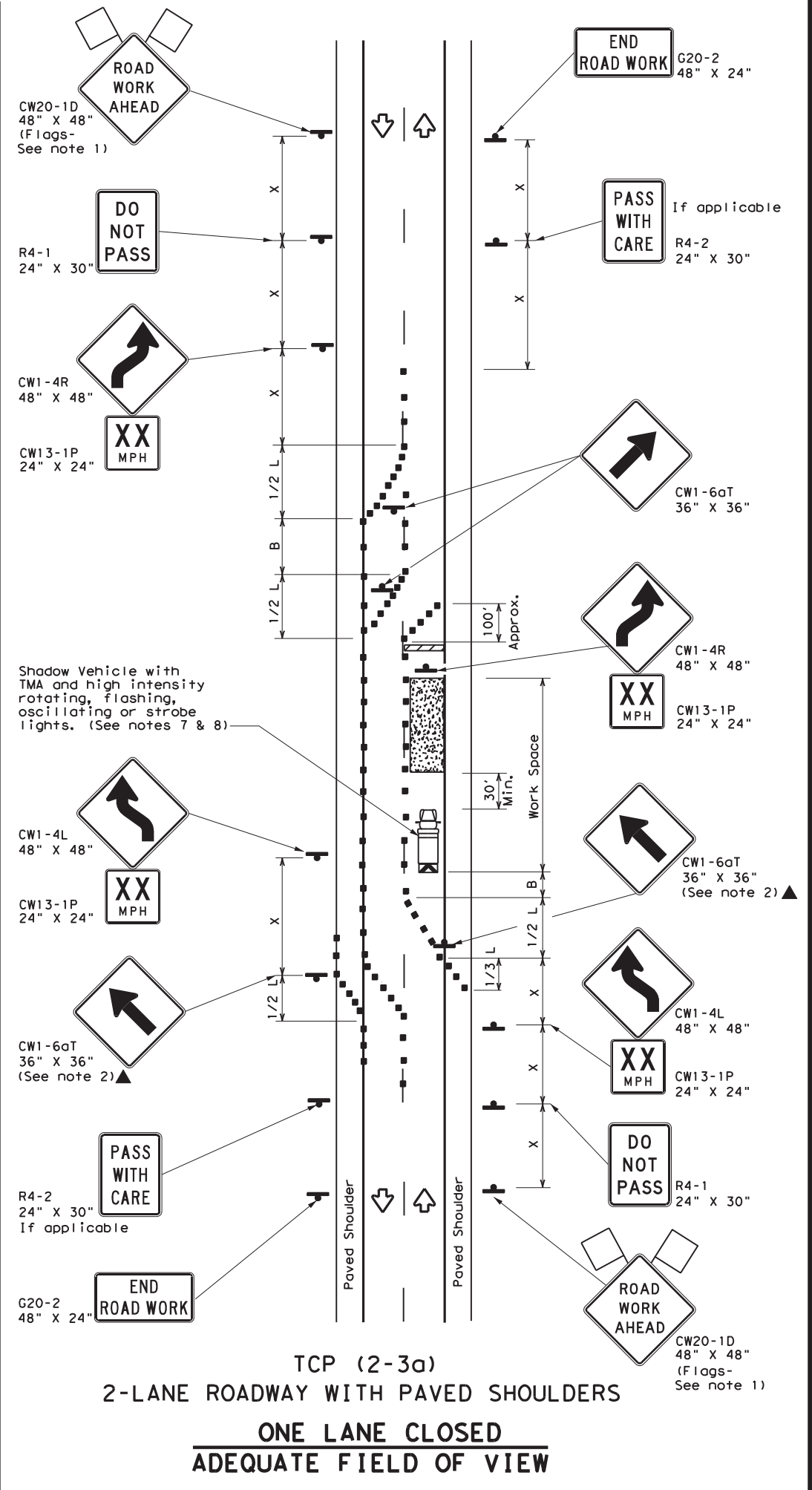
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LANE CLOSURES FOR
DIVIDED HIGHWAYS

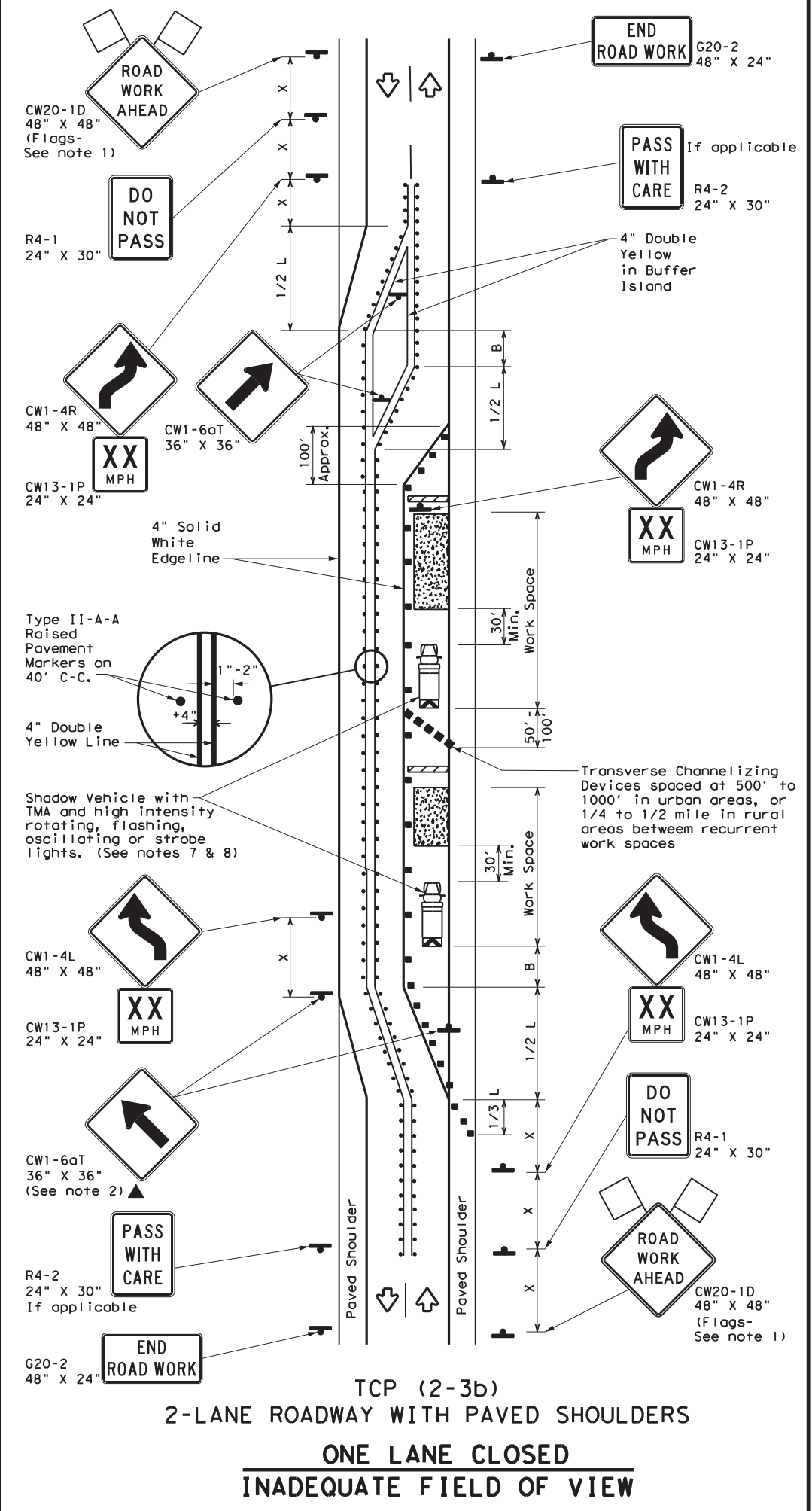
TCP (1-5) - 18

FILE: tcp1-5-18.dgn	DW: _____	CK: _____	DW: _____	CK: _____
© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
2-18	6389	94	001	IH 10, ETC
REVISIONS	DIST	COUNTY	SHEET NO.	
	ELP	EL PASO	22	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to metric units. This standard is not intended to be used for any purpose other than that for which it was developed. TxDOT reserves the right to modify this standard without notice. TxDOT reserves the right to modify this standard without notice. TxDOT reserves the right to modify this standard without notice.



TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS
ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND

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

Posted Speed * X	Formula L = WS ² / 60	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = 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	L = WS	600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75	L = WS	750'	825'	900'	75'	150'	900'	540'
75		750'	825'	900'	75'	150'	900'	540'

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

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
			✓	✓
				TCP (2-3b) ONLY

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - 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.
 - When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
 - Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
 - The R4-1 "DO NOT PASS," R4-2 "PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
 - Conflicting pavement marking shall be removed for long term projects.
 - 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.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- TCP (2-3a)**
- Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter device spacing is intended for the area of the conflicting markings, not the entire work zone.

Traffic Operations Division Standard

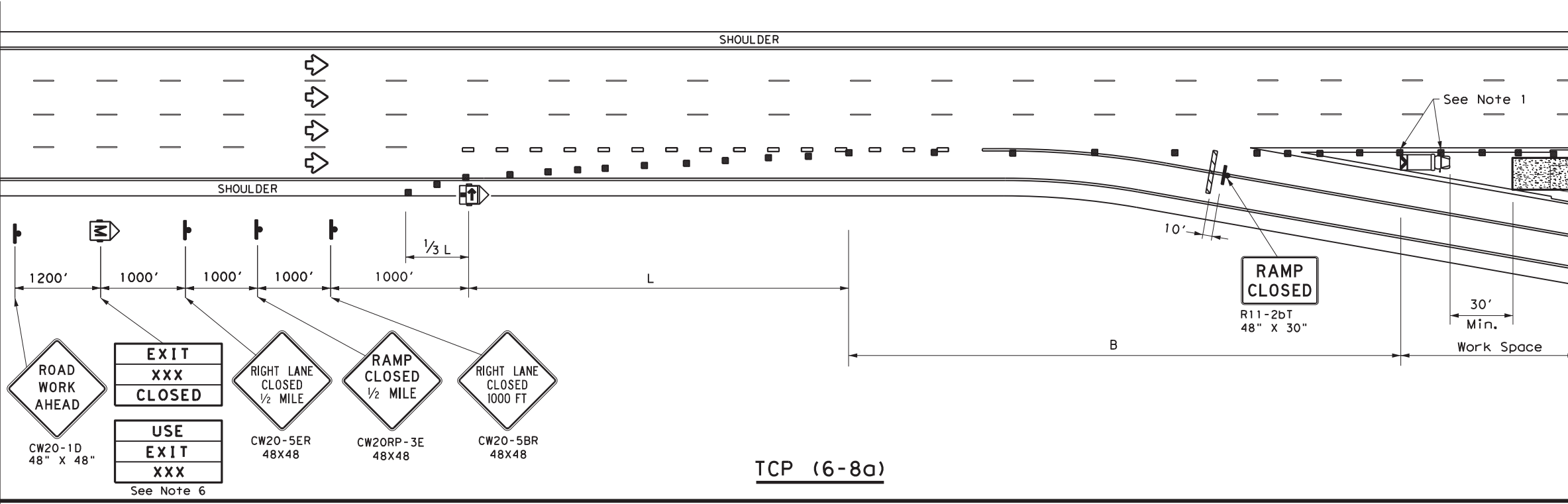
TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON
TWO-LANE ROADS

TCP (2-3) - 18

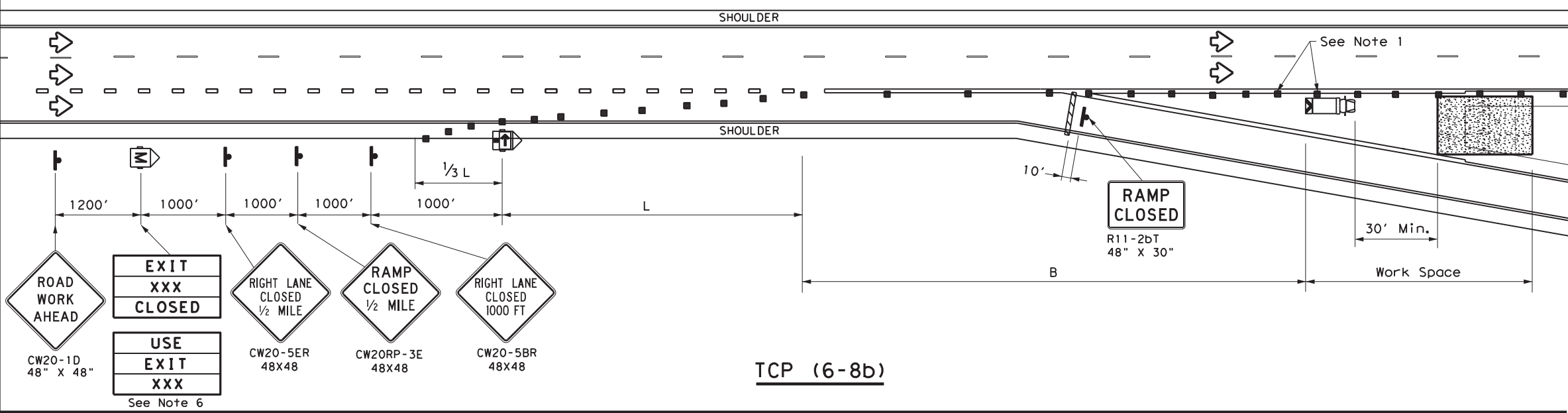
FILE: tcp(2-3)-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389	94	001	IH 10, ETC
8-95 3-03	DIST	COUNTY	SHEET NO.	
1-97 2-12	ELP	EL PASO	25	
4-98 2-18				

163

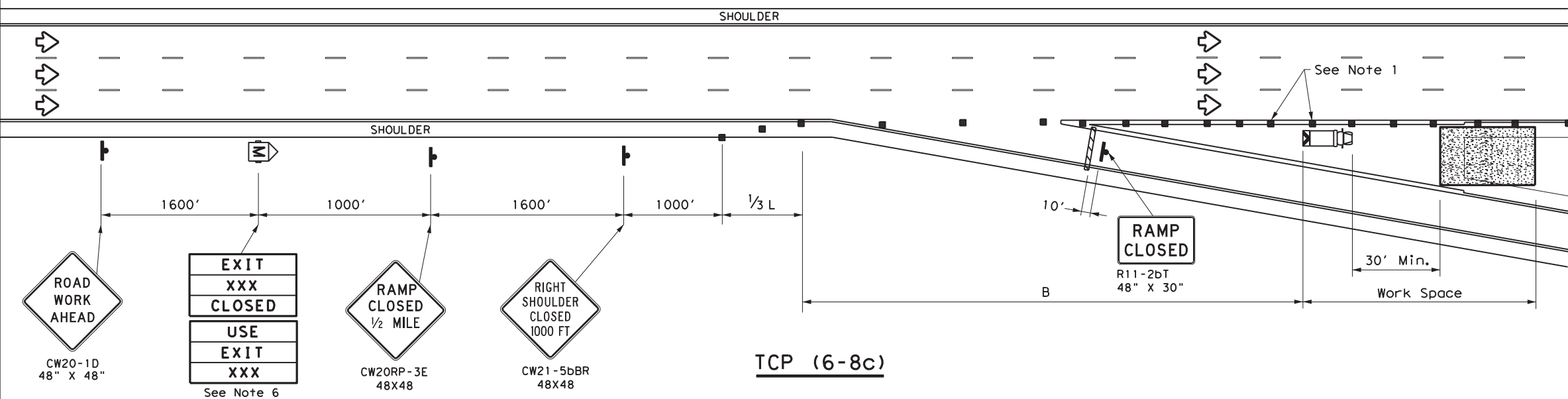
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any information from a digital file to a printed format. TxDOT is not responsible for any errors or omissions in this standard.



TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

LEGEND			
	Type 3 Barricade		Channelizing Devices (CDs)
	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 "L" **			Suggested Maximum Spacing of Channelizing Devices		Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	
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**
- Place channelizing devices in the gore at 20' spacing.
 - See the Standard Highway Sign Design for Texas (SHSD) for sign details.
 - The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
 - When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) for traffic control details.
 - Truck mounted attenuator is required.
 - The PCMS may be omitted if replaced with a "RAMP CLOSED" AHEAD (CW20RP-3D) Sign.
 - Roadway ADT should be greater than 10,000.

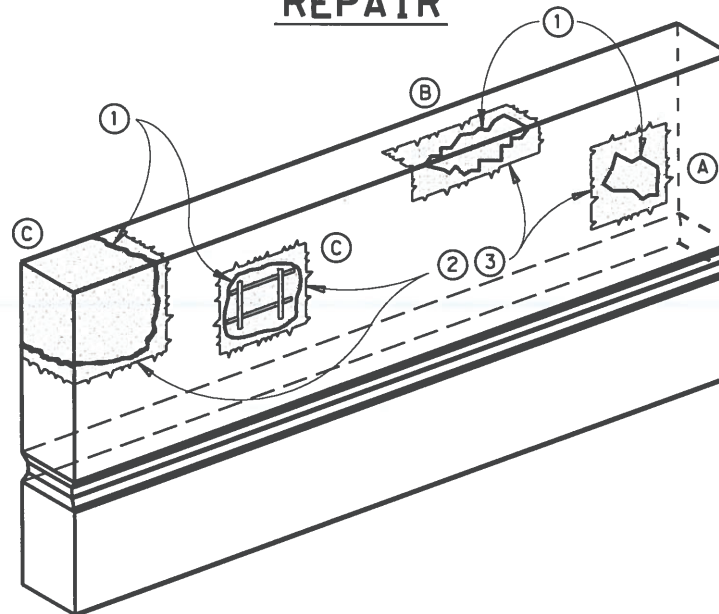


WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP (6-8) - 14

FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389	94	001	IH 10, ETC
DIST	COUNTY	SHEET NO.		
ELP	EL PASO	35		

CONCRETE STRUCTURE REPAIR



GENERAL REPAIR NOTES:

- ① - FRACTURE LINE, SHADED PORTION TO BE REMOVED
- ② - LAY OUT A SYMMETRIC SAW CUT LINE OUTSIDE OF EXTREME EDGE OF FRACTURED CONCRETE.
- ③ - SAW CUT 1/2" DEEP ALONG THE LAYOUT LINE INTO SOUND CONCRETE. CARE SHALL BE TAKEN TO NOT CUT OR DAMAGE REINFORCING STEEL, SEE GENERAL NOTES.

CONCRETE STRUCTURE REPAIR NOTES:

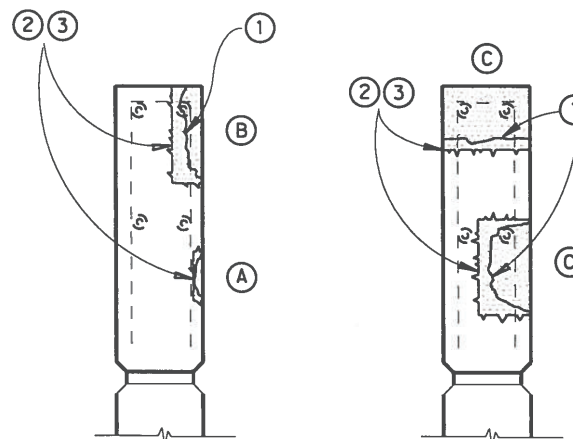
- (A) LESS THAN 1" - SHALLOW REPAIRS NOT EXTENDING TO THE REINFORCING STEEL.
- (B) 1" TO 6" - MID-DEPTH REPAIR EXTENDING TO OR SLIGHTLY BELOW THE REINFORCING STEEL.
- (C) OVER 6" - DEEP REPAIR EXTENDING WELL BEYOND THE REINFORCING STEEL, UP TO FULL DEPTH.

FOR ALL REPAIRS OVER TRAFFIC, WITH OR WITHOUT ADDITIONAL REINFORCEMENT, ANCHORS ARE REQUIRED.

WORK TO BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING:

- ITEM 420 "CONCRETE SUBSTRUCTURES"
- ITEM 421 "HYDRAULIC CEMENT CONCRETE"
- ITEM 429 "CONCRETE STRUCTURE REPAIR"
- ITEM 431 "PNEUMATICALLY PLACED CONCRETE"
- ITEM 439 "BRIDGE DECK OVERLAYS" USING CONCRETE OVERLAY
- ITEM 440 "REINFORCEMENT FOR CONCRETE"
- ITEM 448 "STRUCTURAL FIELD WELDING"
- ITEM 780 "CONCRETE CRACK REPAIR" USING EPOXY INJECTION
- DMS 4655 "CONCRETE REPAIR MATERIALS" USING RAPID REPAIR MATERIALS

PAYMENT WILL BE AS PER ITEM 429 UNLESS SPECIFIED OTHERWISE IN THE PLANS.



NOTES:

ALL CONCRETE REPAIR MATERIALS WILL MEET REQUIREMENTS SPECIFIED IN THE PLANS AS FOLLOWS:
 RAPID -RETURN TO SERVICE WITHIN 2 HOURS OF PLACEMENT (f'c = 2000 psi min.)
 PROMPT -RETURN TO SERVICE WITHIN 24 HOURS OF PLACEMENT (f'c = 3600 psi min.)
 NORMAL - RETURN TO SERVICE WHEN REQUIRED CURE TIME AND MIN. 7 DAY COMPRESSIVE STRENGTH HAS BEEN ATTAINED AS SPECIFIED IN ITEMS 429 OR 439. IF NOT SPECIFIED IN THE PLANS, A MATERIAL MEETING A NORMAL "RETURN TO SERVICE" WILL BE USED. AIR ENTRAINMENT IS NOT REQUIRED.

PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR WILL VERIFY ALL EXISTING DIMENSIONS AND LIMITS OF REPAIR BY SOUNDING OR OTHER ACCEPTABLE METHOD AS APPROVED BY THE ENGINEER.

REMOVAL OF CONCRETE WILL BE PERFORMED AS SPECIFIED IN ITEMS 429 AND 439. MINIMUM CLEARANCE BETWEEN EXPOSED STEEL AND SURROUNDING CONCRETE IS 1/2" OR 2 TIMES THE MAXIMUM AGGREGATE SIZE. ANY DAMAGE TO THE CONCRETE SUBSTRATE, REINFORCING STEEL OR BOND BETWEEN THE TWO WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. DAMAGED REINFORCING STEEL WILL BE REPLACED, LAP SPLICES FOR ALL MAIN REINFORCEMENT WILL BE AS REQUIRED BY ITEM 440, MECHANICAL COUPLERS OR WELDED SPLICES ARE PERMITTED. IF A WELDED SPLICE IS USED, THE EXISTING AND REPLACEMENT STEEL MUST MEET ALL MATERIAL REQUIREMENTS OF ITEM 448. ALL REINFORCING STEEL WILL BE GRADE 60.

EPOXY INJECTION MAY BE USED TO REPAIR MINOR NON-STRUCTURAL CRACKS 1/16" OR LESS IN WIDTH IF APPROVED BY THE ENGINEER.

WHEN WORKING OVER A STREAM OR ANY OTHER BODY OF WATER, THE CONTRACTOR IS RESPONSIBLE FOR CONTAINMENT AND REMOVAL OF ALL DEBRIS ASSOCIATED WITH THE REPAIR, TO INCLUDE ALL AREAS UNDER THE BRIDGE AND THE TOP OF BENT CAPS. IF CONTAINMENT IS REQUIRED, DEBRIS MAY BE CAPTURED ON TARPS OR BY OTHER METHODS APPROVED BY THE ENGINEER. MATERIAL WILL BE DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE STATE AND FEDERAL REGULATIONS.



M. J. Sotelo, P.E.
 9/16/21

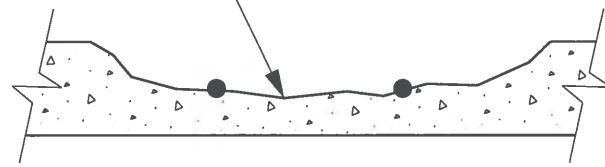
ROADWAY

CONCRETE STRUCTURE REPAIR DETAIL

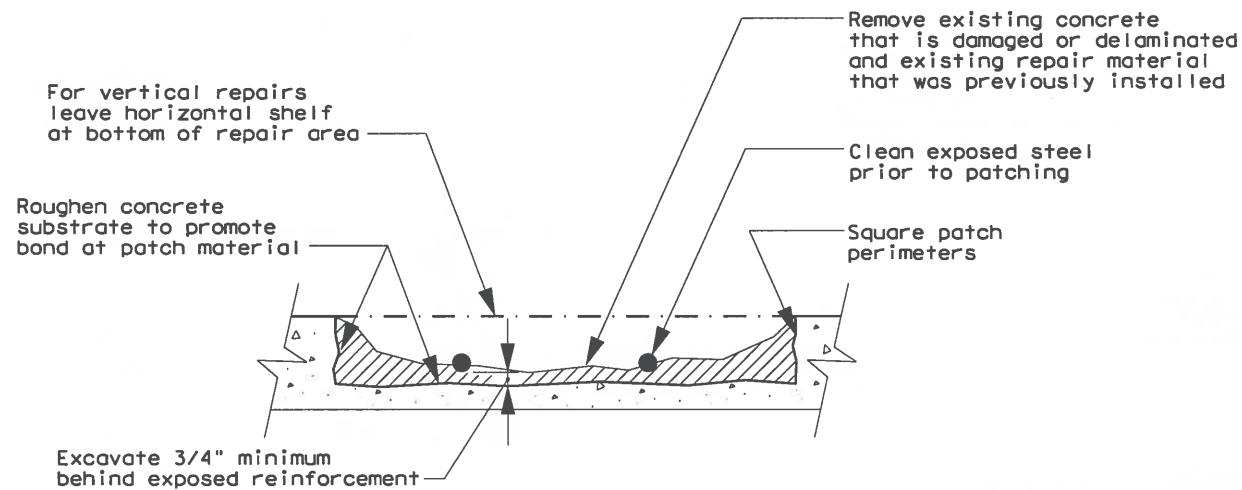
SHEET 1 OF 2

Texas Department of Transportation			
CONT	SECT	JOB	HIGHWAY
6389	94	001	IH 10, ETC
DIST		COUNTY	SHEET NO.
ELP		EL PASO	37

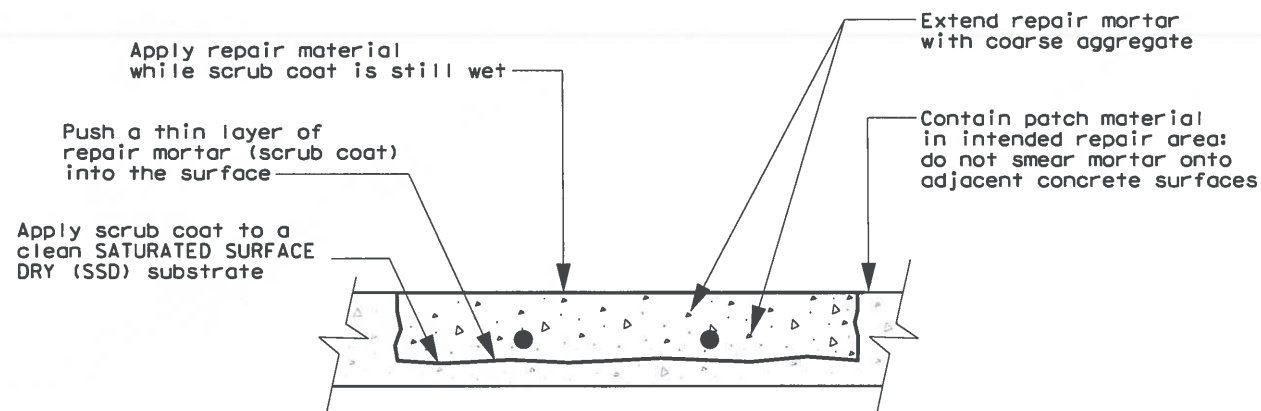
Remove existing concrete that is damaged or delaminated and existing repair material that was previously installed



Damaged Condition



**Step 1
Excavation and Preparation**



**Step 2
Patch Damaged Area**

CONCRETE REPAIR NOTES:

1. PERFORM WORK IN ACCORDANCE WITH ITEM 429, "CONCRETE STRUCTURE REPAIR". USE A TYPE A-4 REPAIR MATERIAL PER DMS 4655, "CONCRETE REPAIR MATERIALS." REFER TO THE "CONCRETE REPAIR MATERIALS" MATERIAL PRODUCER LIST FOR A LIST OF PRE-APPROVED TYPE A-4 MATERIALS AND "CONCRETE REPAIR MANUAL" FOR APPROVED CONCRETE REPAIR PROCEDURES.
2. SURFACE PREPARATION: REMOVE ANY DAMAGED OR LOOSE CONCRETE OR PREVIOUSLY APPLIED REPAIR MATERIAL, UNLESS OTHERWISE APPROVED BY THE ENGINEER. USE ONLY HAND TOOLS OR POWER DRIVEN CHIPPING HAMMERS (15 LB. CLASS MAXIMUM) TO REMOVE CONCRETE. SQUARE THE PATCH PERIMETERS USING HANDHELD GRINDERS OR SAWS; DO NOT OVER-CUT PATCH PERIMETERS AT THE CORNERS OF THE REPAIR AREAS. ROUGHEN THE SUBSTRATE TO ENSURE THERE WILL BE A MECHANICAL BOND BETWEEN THE PATCH MATERIAL AND PARENT CONCRETE. REMOVE RUST, OIL, AND OTHER CONTAMINANTS FROM EXPOSED STEEL REINFORCEMENT. JUST PRIOR TO PATCHING, BLAST THE REPAIR AREA USING A HIGH-PRESSURE AIR COMPRESSOR EQUIPPED WITH FILTERS TO REMOVE OIL FROM THE COMPRESSED AIR.
3. MIXING: USE MEASURING CUPS OR BUCKETS TO DETERMINE THE PROPER QUANTITY OF EACH COMPONENT PER THE MANUFACTURER'S REQUIREMENTS, THEN DISPENSE INTO A CLEAN CONTAINER. ENSURE THAT THE PROPER AMOUNTS ARE ADDED WHEN USING DIFFERENT COMPONENTS. MIX THE COMPONENTS THOROUGHLY UNTIL THEY ARE WELL-BLENDED (MIX A MINIMUM OF 3 MINUTES) USING A LOW-SPEED ELECTRIC DRILL AND A CLEAN "JIFFY" TYPE MIXING PADDLE. MIXING BY HAND SHALL NOT BE PERMITTED. EXTEND THE REPAIR MORTAR WITH COARSE AGGREGATE IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. DO NOT ATTEMPT TO MAKE THE MATERIAL WORKABLE BY OVER-MIXING OR ADDING ADDITIONAL LIQUID AFTER IT HAS BEGUN TO SET.
4. APPLICATION: OBTAIN A SATURATED SURFACE-DRY (SSD) SUBSTRATE JUST PRIOR TO PATCHING, USING A HIGH-PRESSURE WATER BLAST FOR A BRIEF PERIOD (1 MINUTE MINIMUM) OR OTHER METHOD APPROVED BY THE ENGINEER. SURFACE MAY BE DAMP, BUT MUST BE FREE OF STANDING WATER. APPLY A BONDING COAT CONSISTING OF A THIN LAYER OF NON-EXTENDED REPAIR MORTAR SCRUBBED INTO THE SUBSTRATE. APPLY REPAIR CONCRETE WHILE THE SCRUB COAT IS STILL WET. DO NOT EXCEED THE MAXIMUM LIFT DEPTH PERMITTED BY THE MANUFACTURER. IN MULTIPLE LIFT APPLICATIONS ROUGHEN THE SURFACE OF THE PRECEDING LIFT BEFORE IT REACHES INITIAL SET. WET THE SURFACE JUST PRIOR TO APPLYING THE NEXT LIFT.
5. CURING : MOIST CURE PATCH MATERIAL FOR A MINIMUM OF 72 HOURS USING SET MATS, WATER SPRAY, PONDING, OR OTHER METHOD APPROVED BY THE ENGINEER.



MJS, P.E.
9/16/21

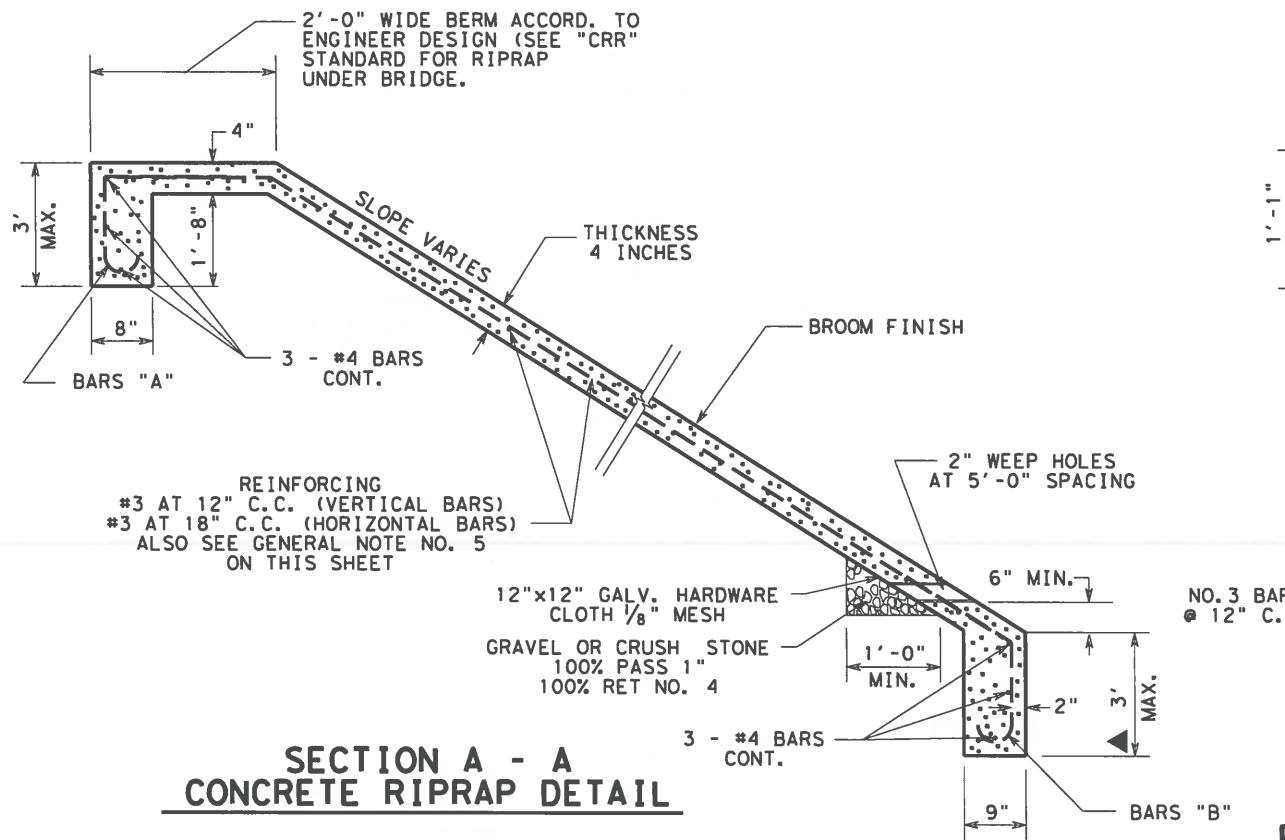
ROADWAY

**CONCRETE STRUCTURE
REPAIR DETAIL**

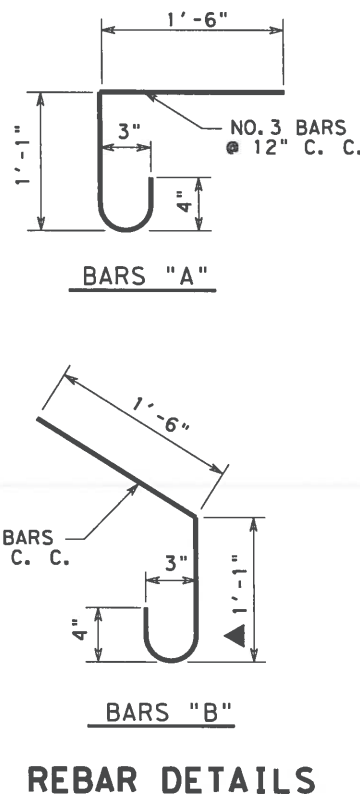
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
6389	94	001	IH 10, ETC
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	38	

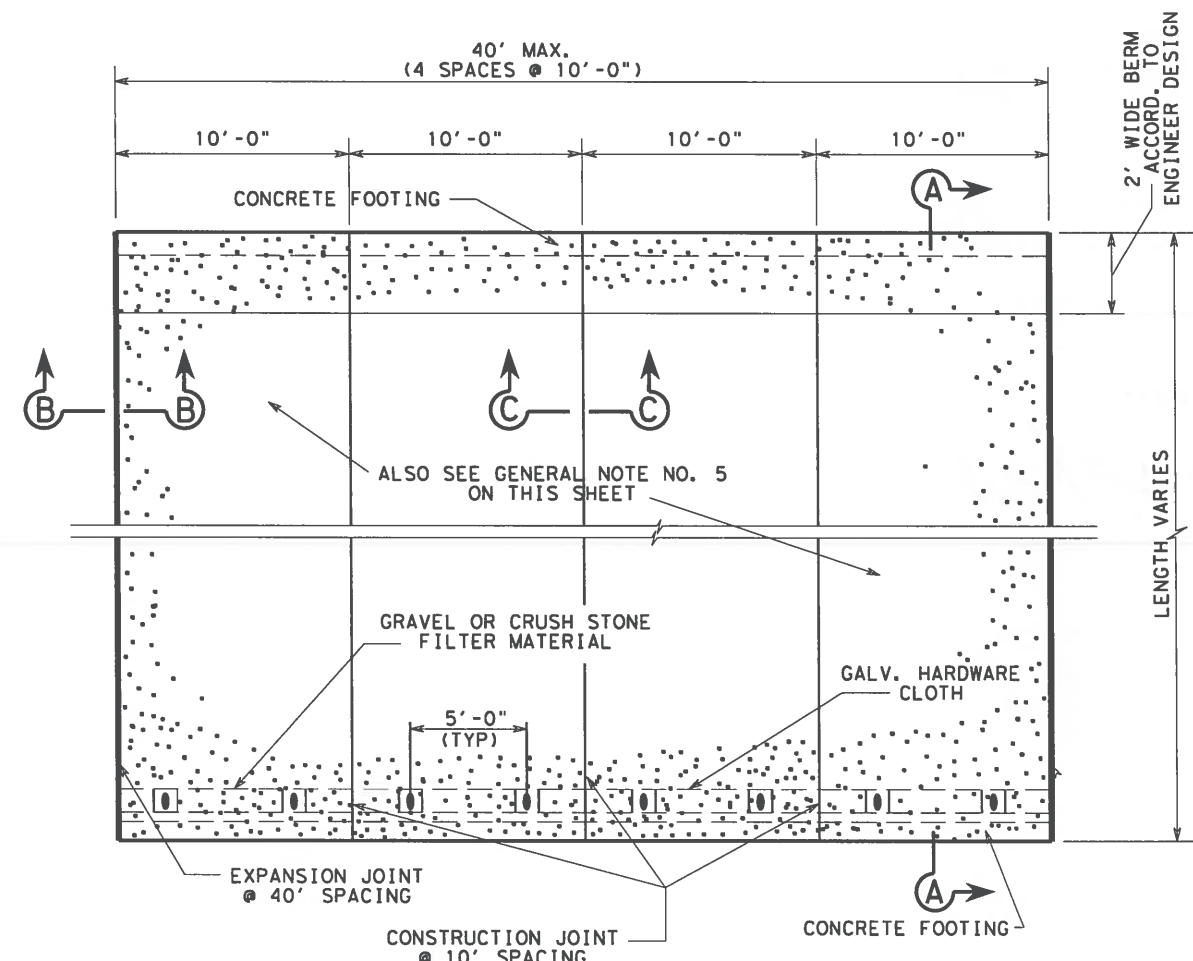
08/02/2011 08:54 AM
TxDOT_Sheets_XM.cel



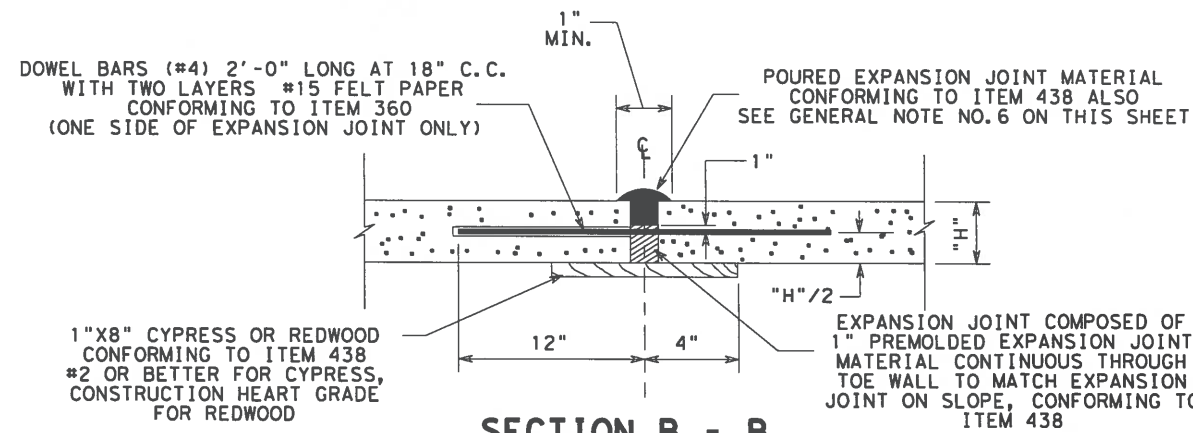
**SECTION A - A
CONCRETE RIPRAP DETAIL**



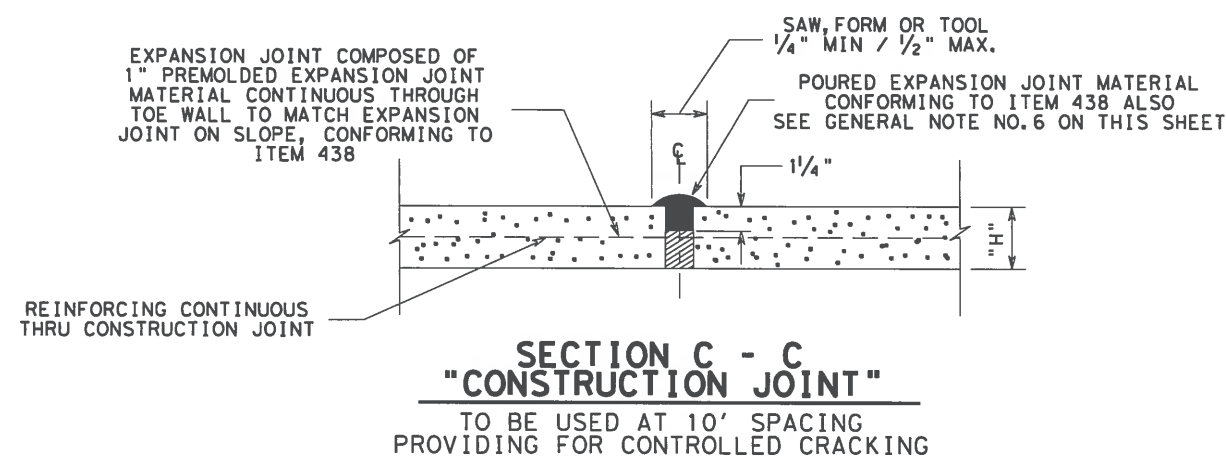
REBAR DETAILS



**PLAN VIEW
CONCRETE RIPRAP DETAIL**



**SECTION B - B
"EXPANSION JOINT"
TO BE USED AT 40' SPACING**



**SECTION C - C
"CONSTRUCTION JOINT"
TO BE USED AT 10' SPACING
PROVIDING FOR CONTROLLED CRACKING**

▲ RIPRAP TOE SHALL NOT PUNCTURE GEOGRID REINFORCEMENT. DIMENSION WILL VARY TO BE FIELD VERIFIED.

NOTES

1. GRAVEL OR CRUSHED STONE USED FOR WEEP HOLES SHALL BE PLACED CONTINUOUSLY ALONG BACK OF RIPRAP AND SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO THE ITEM 432-"RIPRAP (CONC.) (CL "B")".
2. CONCRETE SHALL BE CLASS "B" UNLESS OTHERWISE NOTED ON PLANS.
3. CONSTRUCTION AND EXPANSION JOINTS SHALL BE AS SHOWN AND/OR AS DIRECTED BY THE ENGINEER.
4. FOR PURPOSE OF PROVIDING EASIER PLACEMENT AND BETTER FINISHING, CONCRETE SHALL BE PLACED IN ALTERNATE SECTIONS, NOT TO BE GREATER THAN TEN FEET (10') IN WIDTH.
5. AT THE OPTION OF THE CONTRACTOR #4 BARS AT 18" MAY BE USED. SEE STANDARD SPECIFICATION FOR GENERAL NOTES.
6. EXPANSION & CONSTRUCTION SEALANT, SHALL BE "DOW CORNING 888 SILICONE JOINT SEALANT OR EQUIVALENT.



M. J. Sotelo, P.E.
9/16/21

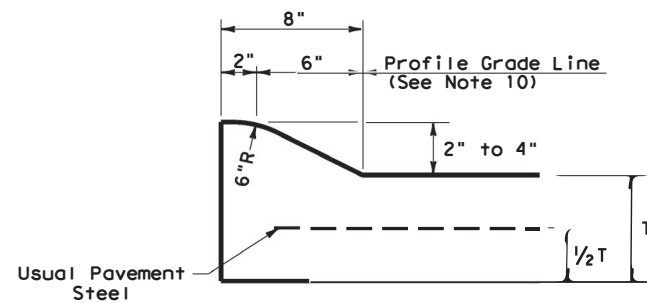
RIP RAP DETAILS

07/27/2011 07:57 AM
TxDOT_Sheets_XM.cel

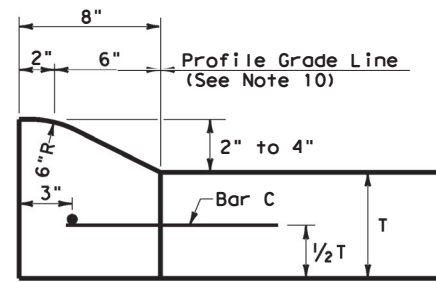
SHEET 1 OF 1			
Texas Department of Transportation			
CONT	SECT	JOB	HIGHWAY
6389	94	001	IH 10, ETC
DIST	COUNTY		SHEET NO.
ELP	EL PASO		39

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

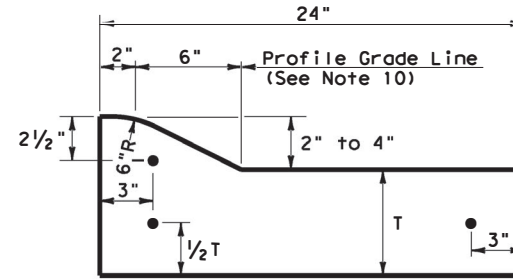
DATE: FILE:



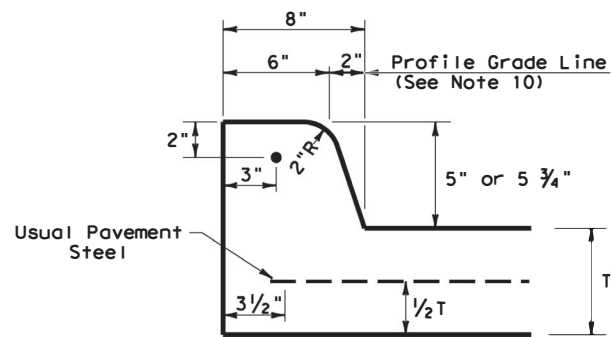
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



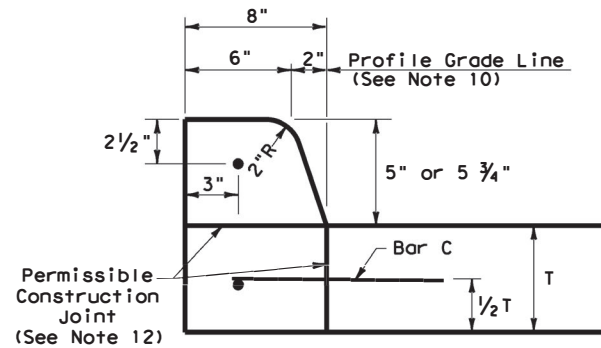
TYPE I CURB
2" - 4" HEIGHT



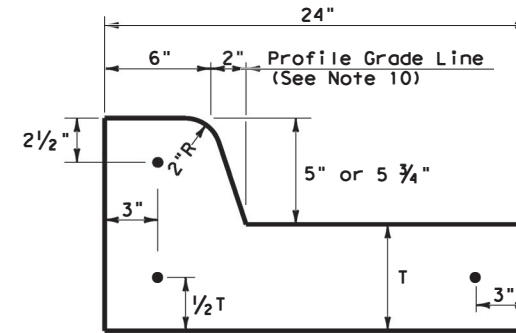
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



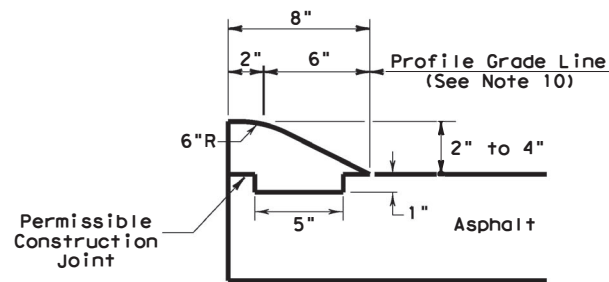
TYPE II CURB (MONOLITHIC)
5" - 5 3/4" HEIGHT



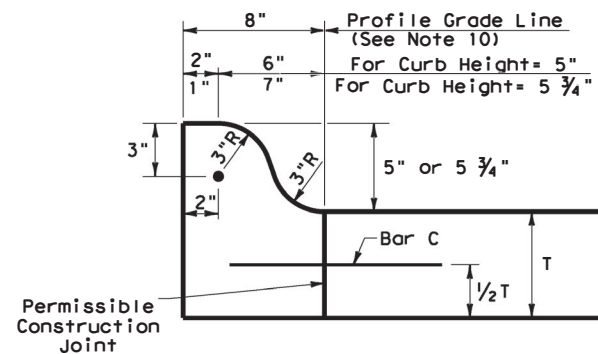
TYPE II CURB
5" - 5 3/4" HEIGHT



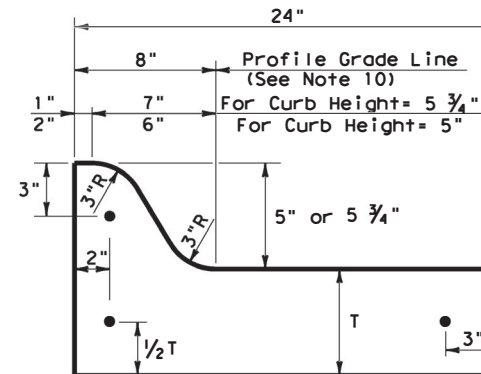
TYPE II CURB AND GUTTER
5" - 5 3/4" HEIGHT



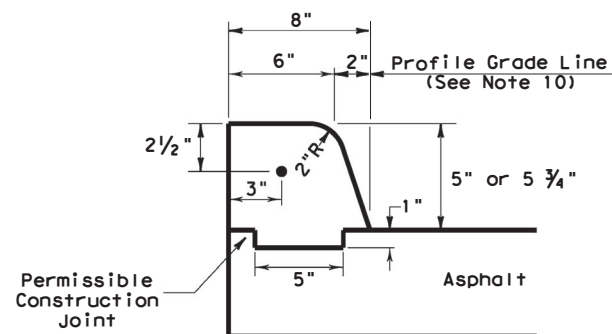
TYPE III CURB (KEYED)
2" - 4" HEIGHT



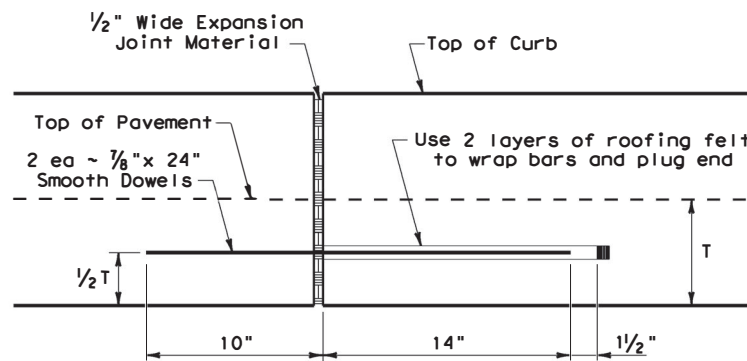
TYPE IIa CURB
5" - 5 3/4" HEIGHT



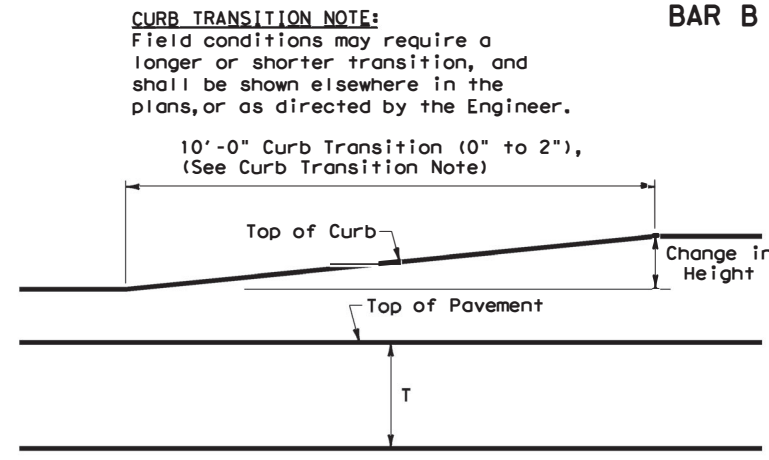
TYPE IIa CURB AND GUTTER
5" - 5 3/4" HEIGHT



TYPE IV CURB (KEYED)
5" - 5 3/4" HEIGHT



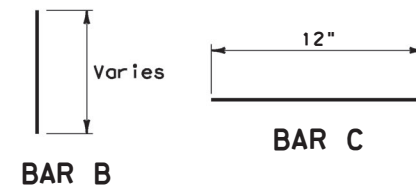
EXPANSION JOINT DETAIL



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

- All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
- Concrete shall be Class A.
- When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
- Round exposed sharp edges with a rounding tool, to a minimum radius of 1/4 inch.
- All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
- Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and the grouted in place, or may be inserted into fresh concrete.
- Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
- Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C-C.
- Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
- Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
- One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
- When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
- Bar B used as needed to support curb reinforcing steel during concrete placement.



CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.

		Design Division Standard	
<h2>CONCRETE CURB AND GUTTER</h2>			
<h3>CCCG-21</h3>			
FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: SS
© TXDOT: FEBRUARY 2021	CONT: 6389	SECT: 94	JOB: 001
REVISIONS	DIST: ELP	COUNTY: EL PASO	HIGHWAY: I10, ETC
			SHEET NO.: 40

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

Slope	Dia of Pipe (D)	Values for One Pipe						Values to be Added for Each Add'l Pipe			
		W	X	Y	L	Reinf (Lbs)	Conc (CY) (1)	X and W	Reinf (Lbs)	Conc (CY) (1)	
2:1	12"	4'-7 1/2"	2'-6"	2'-10"	3'-3 1/4"	88	0.6	1'-9"	20	0.2	
2:1	15"	5'-5 3/4"	2'-9 1/2"	3'-4"	3'-10 1/4"	103	0.7	2'-2"	24	0.3	
2:1	18"	6'-4 1/4"	3'-1"	3'-10"	4'-5"	124	0.9	2'-8"	32	0.3	
2:1	21"	7'-2 3/4"	3'-4 1/2"	4'-4"	5'-0"	143	1.1	3'-1"	43	0.4	
2:1	24"	8'-2 1/2"	3'-9 1/2"	4'-10"	5'-7"	164	1.3	3'-7"	50	0.5	
2:1	27"	9'-1"	4'-1"	5'-4"	6'-2"	179	1.5	3'-11"	56	0.6	
2:1	30"	9'-11 1/2"	4'-4 1/2"	5'-10"	6'-8 3/4"	203	1.7	4'-4"	65	0.8	
2:1	33"	10'-10"	4'-8"	6'-4"	7'-3 3/4"	224	2.0	4'-8"	71	0.9	
2:1	36"	11'-8 1/4"	4'-11 1/2"	6'-10"	7'-10 3/4"	249	2.2	5'-1"	81	1.0	
2:1	42"	13'-5 1/4"	5'-6 1/2"	7'-10"	9'-0 1/2"	298	2.8	5'-10"	97	1.3	
2:1	48"	15'-9"	6'-1 1/2"	9'-4"	10'-9 1/4"	360	3.8	6'-7"	117	1.7	
2:1	54"	17'-5 3/4"	6'-8 1/2"	10'-4"	11'-11 1/4"	427	4.5	7'-6"	151	2.1	
2:1	60"	19'-2 3/4"	7'-3 1/2"	11'-4"	13'-1"	481	5.3	8'-3"	174	2.5	
2:1	66"	20'-11 1/2"	7'-10 1/2"	12'-4"	14'-3"	544	6.2	8'-9"	194	2.9	
2:1	72"	22'-8 1/2"	8'-5 1/2"	13'-4"	15'-4 3/4"	601	7.1	9'-4"	213	3.3	
3:1	12"	6'-3"	2'-6"	4'-3"	4'-11"	118	0.8	1'-9"	22	0.2	
3:1	15"	7'-5"	2'-9 1/2"	5'-0"	5'-9 1/4"	137	1.1	2'-2"	28	0.3	
3:1	18"	8'-6 3/4"	3'-1"	5'-9"	6'-7 3/4"	170	1.3	2'-8"	37	0.5	
3:1	21"	9'-8 3/4"	3'-4 1/2"	6'-6"	7'-6"	195	1.6	3'-1"	48	0.6	
3:1	24"	11'-0"	3'-9 1/2"	7'-3"	8'-4 1/2"	227	2.0	3'-7"	58	0.7	
3:1	27"	12'-2"	4'-1"	8'-0"	9'-2 3/4"	251	2.3	3'-11"	67	0.8	
3:1	30"	13'-4"	4'-4 1/2"	8'-9"	10'-1 1/4"	293	2.7	4'-4"	77	1.0	
3:1	33"	14'-5 3/4"	4'-8"	9'-6"	10'-11 3/4"	318	3.1	4'-8"	84	1.2	
3:1	36"	15'-7 3/4"	4'-11 1/2"	10'-3"	11'-10"	351	3.5	5'-1"	96	1.4	
3:1	42"	17'-11 1/2"	5'-6 1/2"	11'-9"	13'-6 3/4"	432	4.5	5'-10"	119	1.7	
3:1	48"	21'-1 3/4"	6'-1 1/2"	14'-0"	16'-2"	537	6.1	6'-7"	146	2.3	
3:1	54"	23'-5 1/2"	6'-8 1/2"	15'-6"	17'-10 3/4"	630	7.3	7'-6"	186	2.9	
3:1	60"	25'-9 1/4"	7'-3 1/2"	17'-0"	19'-7 1/2"	719	8.7	8'-3"	219	3.4	
3:1	66"	28'-1"	7'-10 1/2"	18'-6"	21'-4 1/4"	811	10.1	8'-9"	242	3.9	
3:1	72"	30'-4 3/4"	8'-5 1/2"	20'-0"	23'-1 1/4"	924	11.7	9'-4"	272	4.4	
4:1	12"	7'-10 3/4"	2'-6"	5'-8"	6'-6 1/2"	148	1.1	1'-9"	24	0.3	
4:1	15"	9'-4"	2'-9 1/2"	6'-8"	7'-8 1/2"	181	1.5	2'-2"	32	0.4	
4:1	18"	10'-9 1/2"	3'-1"	7'-8"	8'-10 1/4"	221	1.9	2'-8"	42	0.5	
4:1	21"	12'-2 3/4"	3'-4 1/2"	8'-8"	10'-0"	260	2.3	3'-1"	57	0.7	
4:1	24"	13'-9 1/2"	3'-9 1/2"	9'-8"	11'-2"	301	2.8	3'-7"	67	0.9	
4:1	27"	15'-3"	4'-1"	10'-8"	12'-3 3/4"	334	3.3	3'-11"	77	1.0	
4:1	30"	16'-8 1/4"	4'-4 1/2"	11'-8"	13'-5 3/4"	385	3.8	4'-4"	89	1.3	
4:1	33"	18'-1 3/4"	4'-8"	12'-8"	14'-7 1/2"	425	4.5	4'-8"	101	1.4	
4:1	36"	19'-7"	4'-11 1/2"	13'-8"	15'-9 1/4"	472	5.1	5'-1"	115	1.7	
4:1	42"	22'-5 3/4"	5'-6 1/2"	15'-8"	18'-1"	583	6.5	5'-10"	141	2.1	
4:1	48"	26'-6 1/4"	6'-1 1/2"	18'-8"	21'-6 3/4"	730	8.9	6'-7"	175	2.8	
4:1	54"	29'-5"	6'-8 1/2"	20'-8"	23'-10 1/4"	875	10.7	7'-6"	226	3.6	
4:1	60"	32'-3 3/4"	7'-3 1/2"	22'-8"	26'-2"	996	12.7	8'-3"	264	4.3	
4:1	66"	35'-2 1/2"	7'-10 1/2"	24'-8"	28'-5 3/4"	1,140	14.9	8'-9"	300	4.9	
4:1	72"	38'-1 1/4"	8'-5 1/2"	26'-8"	30'-9 1/2"	1,297	17.3	9'-4"	334	5.6	
6:1	12"	11'-2"	2'-6"	8'-6"	9'-9 3/4"	224	1.9	1'-9"	28	0.4	
6:1	15"	13'-2 1/4"	2'-9 1/2"	10'-0"	11'-6 1/2"	268	2.5	2'-2"	37	0.5	
6:1	18"	15'-2 1/2"	3'-1"	11'-6"	13'-3 1/4"	330	3.2	2'-8"	50	0.7	
6:1	21"	17'-2 3/4"	3'-4 1/2"	13'-0"	15'-0 1/4"	387	3.9	3'-1"	69	0.9	
6:1	24"	19'-4 1/2"	3'-9 1/2"	14'-6"	16'-9"	453	4.8	3'-7"	80	1.2	
6:1	27"	21'-4 3/4"	4'-1"	16'-0"	18'-5 3/4"	512	5.7	3'-11"	96	1.4	
6:1	30"	23'-5 1/4"	4'-4 1/2"	17'-6"	20'-2 1/2"	593	6.7	4'-4"	110	1.7	
6:1	33"	25'-5 1/2"	4'-8"	19'-0"	21'-11 1/4"	675	7.8	4'-8"	127	2.0	
6:1	36"	27'-5 3/4"	4'-11 1/2"	20'-6"	23'-8"	735	9.0	5'-1"	144	2.3	
6:1	42"	31'-6 1/4"	5'-6 1/2"	23'-6"	27'-1 1/2"	922	11.5	5'-10"	179	3.0	
6:1	48"	37'-3 1/2"	6'-1 1/2"	28'-0"	32'-4"	1,191	15.9	6'-7"	231	4.0	
6:1	54"	41'-4 1/4"	6'-8 1/2"	31'-0"	35'-9 1/2"	1,424	19.2	7'-6"	300	5.0	
6:1	60"	45'-4 3/4"	7'-3 1/2"	34'-0"	39'-3"	1,631	22.9	8'-3"	353	6.0	

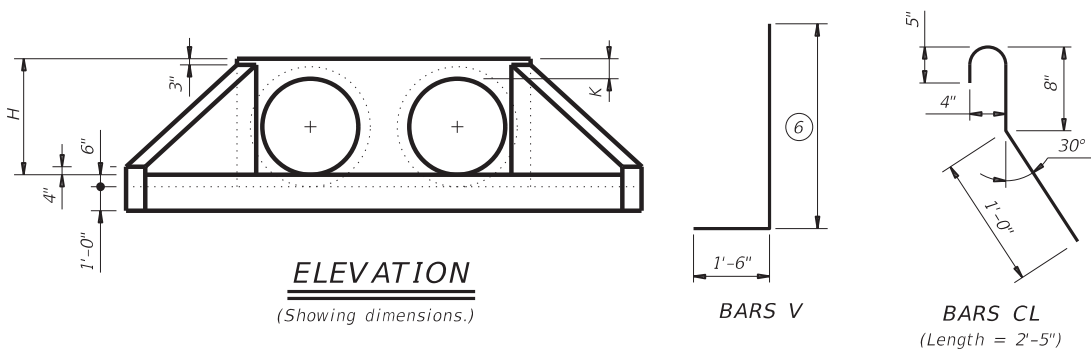
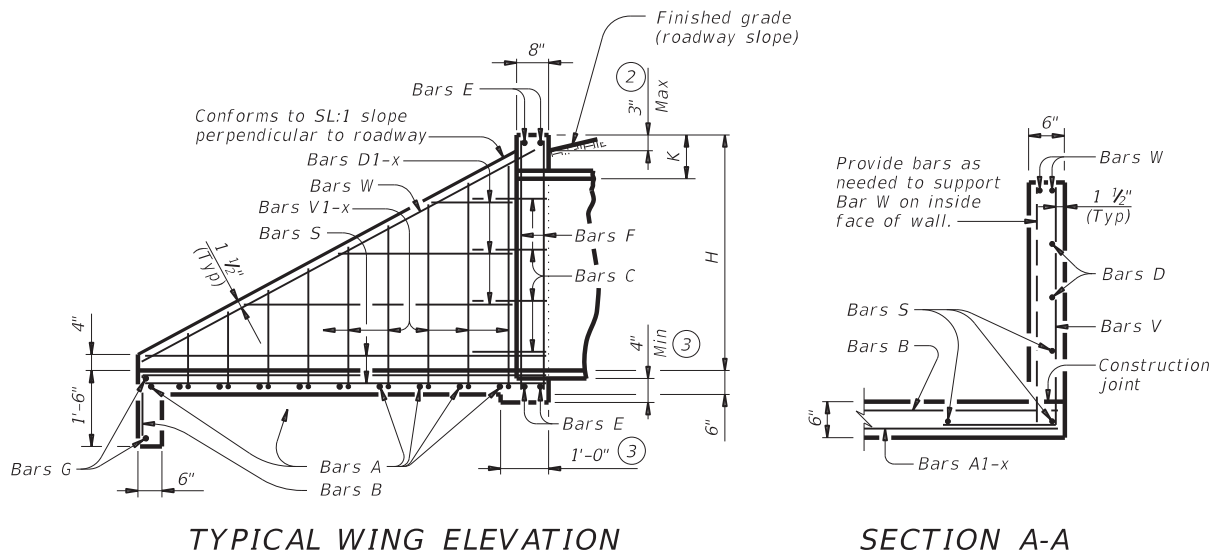
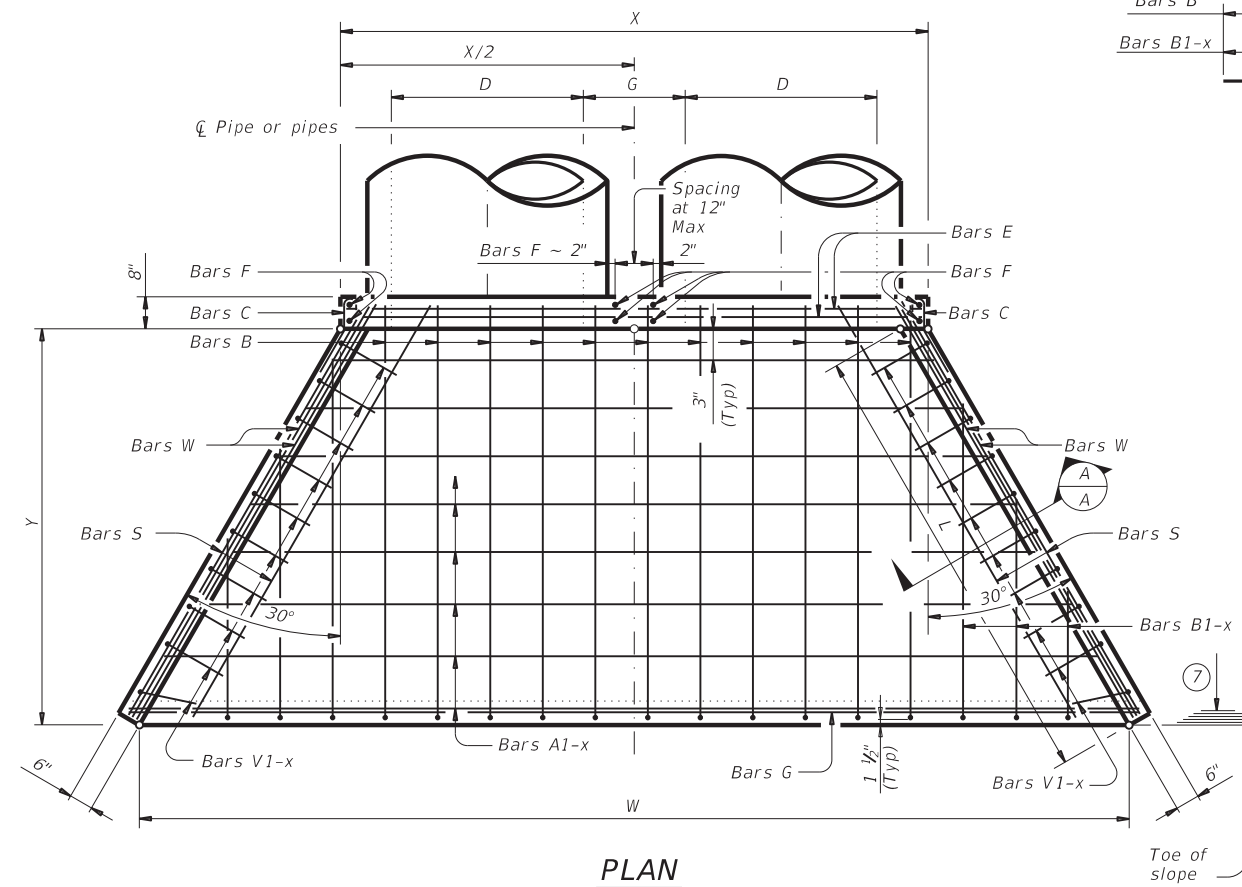
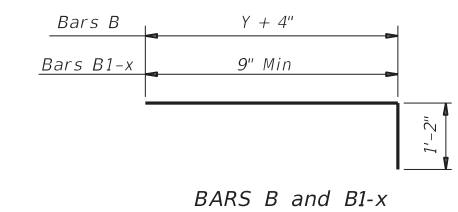


TABLE OF REINFORCING STEEL

Bar	Size	Spa	No.
A	#4	1' - 0"	~
B	#3	1' - 6"	~
C	#4	1' - 0"	~
D	#3	1' - 0"	~
E	#5	~	4
F	#5	~	~
G	#3	~	2
S	#4	~	6
V	#4	1' - 0"	~
W	#5	~	4

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (4)	H
12"	0' - 9"	1' - 0"	2' - 0"
15"	0' - 11"	1' - 0"	2' - 3"
18"	1' - 2"	1' - 0"	2' - 6"
21"	1' - 4"	1' - 0"	2' - 9"
24"	1' - 7"	1' - 0"	3' - 0"
27"	1' - 8"	1' - 0"	3' - 3"
30"	1' - 10"	1' - 0"	3' - 6"
33"	1' - 11"	1' - 0"	3' - 9"
36"	2' - 1"	1' - 0"	4' - 0"
42"	2' - 4"	1' - 0"	4' - 6"
48"	2' - 7"	1' - 3"	5' - 3"
54"	3' - 0"	1' - 3"	5' - 9"
60"	3' - 3"	1' - 3"	6' - 3"
66"	3' - 3"	1' - 3"	6' - 9"
72"	3' - 4"	1' - 3"	7' - 3"



- Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
 - For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
 - Provide a 1'-0" footing as shown where required to maintain 4" minimum cover for pipes.
 - Dimensions shown are usual and maximum.
 - Quantities shown are for one structure end only (one headwall).
 - Min Length = $6" + 3" \times \left(\frac{12 \times H - 7}{12 \times L} \right)$
Max Length = $12 \times H - 3" \times \left(\frac{12 \times H - 7}{12 \times L} \right) - 1"$
 - Lengths of wings based on SL:1 slope along this line.
- MATERIAL NOTES:**
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).
- GENERAL NOTES:**
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

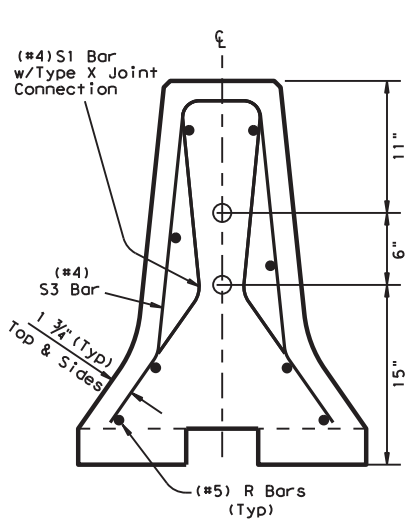
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation
CONCRETE HEADWALLS WITH FLARED WINGS FOR 0° SKEW PIPE CULVERTS
CH-FW-0

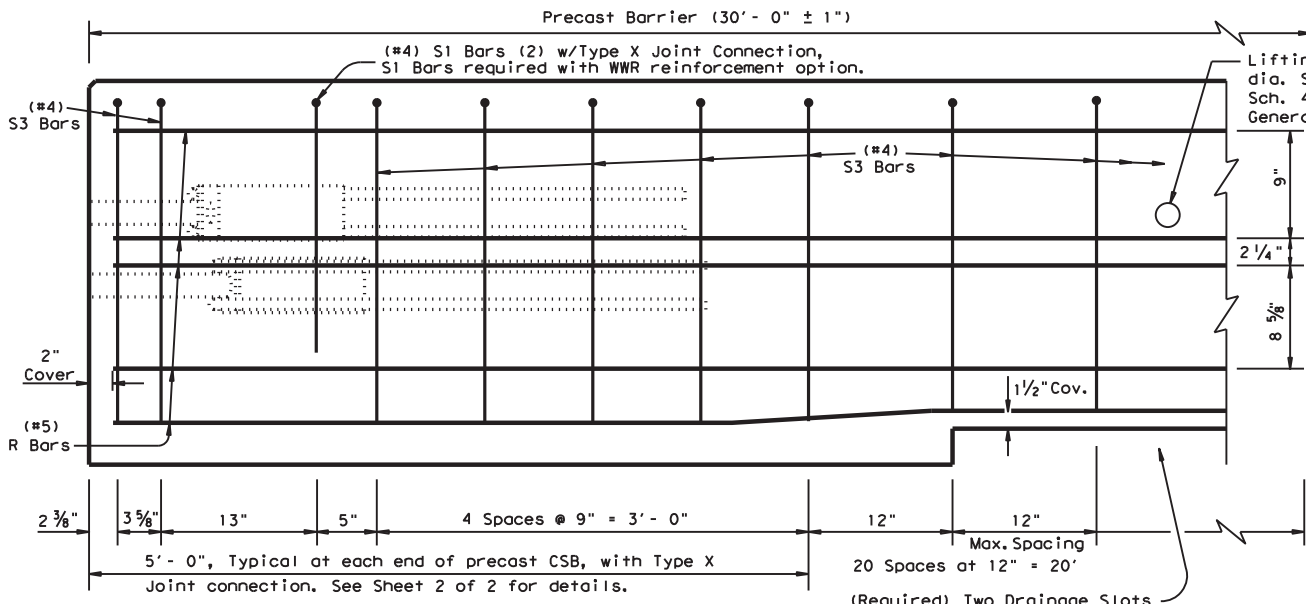
FILE: chfw00se-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	CONTRACT NO. 6389 94	SECTION 001	JOB NO. IH 10, ETC	SHEET NO. 41
DIST. ELP	COUNTY EL PASO	SHEET NO. 41		

DATE: 9/16/2021 10:36:27 AM
 FILE: \\FS-ELPH0.dot.stote.tx.us\DATA1\Districtwide\MMC Projects\051 East Area Office\RM 6388-50-001_Miscellaneous Concrete\1 - DESIGN\Plan_Set\Standards\Roadway\chfw00se-20.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

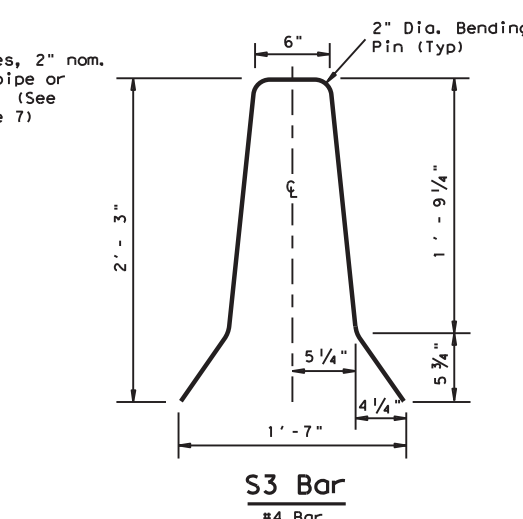
DATE: 9/16/2021 10:36:29 AM
 FILE: \\FS-ELPH0.dot.state.tx.us\DATA\1\Districtwide\051 Area Office\RMC_6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan_Set\Standards\Roadway\csb110.dwg



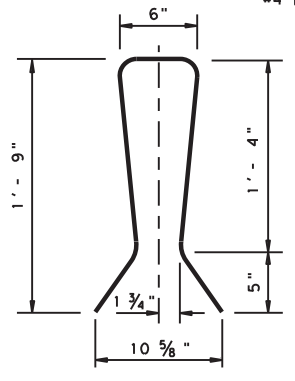
End View Precast Barrier
See sheet 2 of 3 for Joint connection Type X



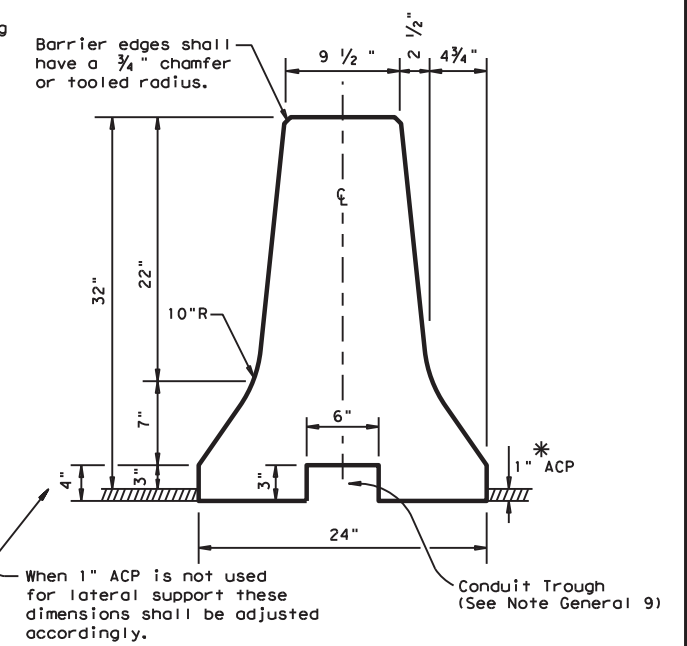
Reinforcement for Precast (CSB) Concrete Safety Barrier (Type 1)
Showing reinforcement for Joint Type X



S3 Bar
#4 Bar

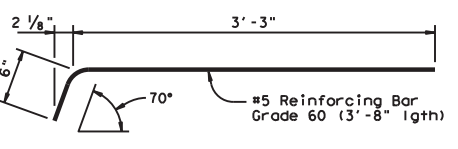


S1 Bar
#4 Bar (2)
(Joint Type X)

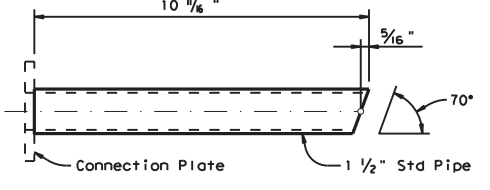


Concrete Safety Barrier

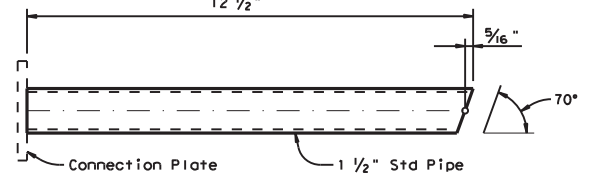
* When 1" ACP is "not" used as lateral support for permanent barrier placement. A permissible method of attaining the equivalent lateral support may be used, See CSB(6) sheet.



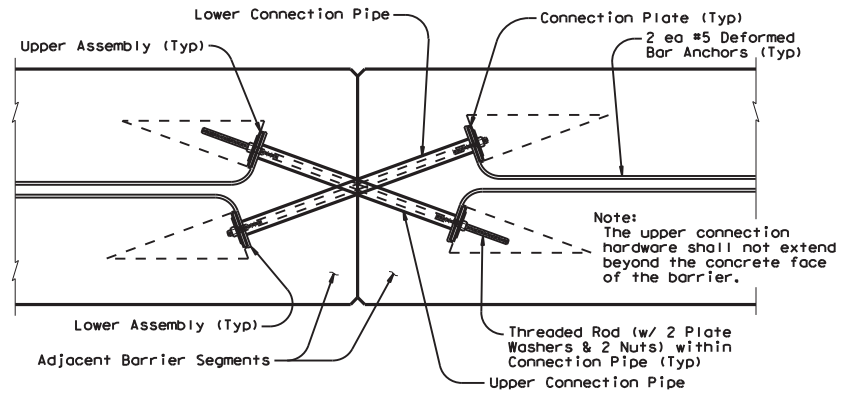
DEFORMED BAR ANCHOR DETAILS
Two (2) Bars required per assembly. Eight (8) required per joint.



UPPER CONNECTION PIPE DETAILS
One (1) Steel Pipe required per Upper Assembly. Two (2) required per joint.

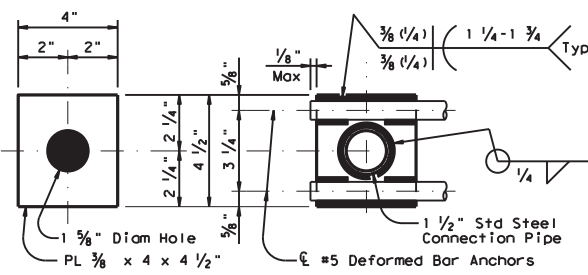


LOWER CONNECTION PIPE DETAILS
One (1) Steel Pipe required per Lower Assembly. Two (2) required per joint.

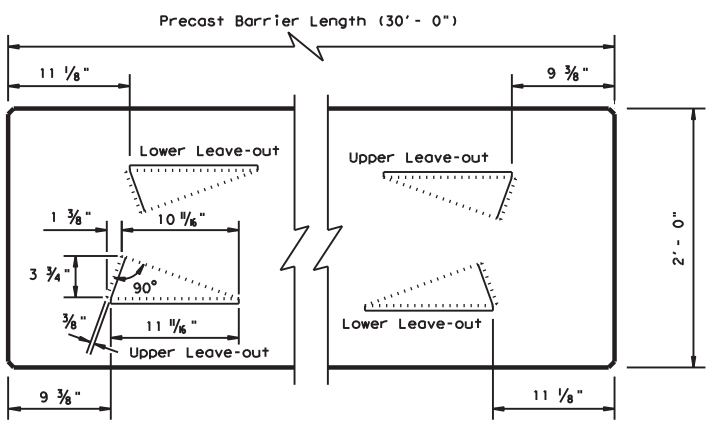


TYPE X JOINT INSTALLATION DETAIL

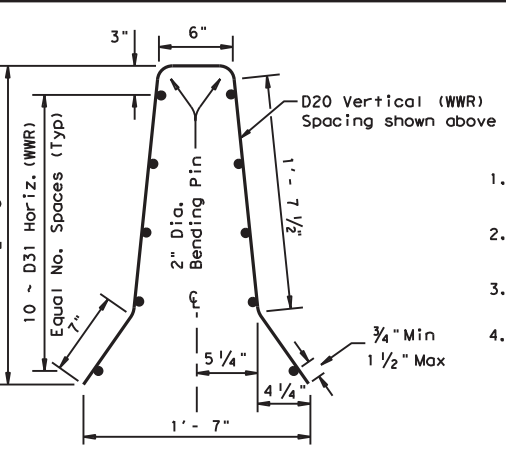
Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.



CONNECTION PLATE DETAILS



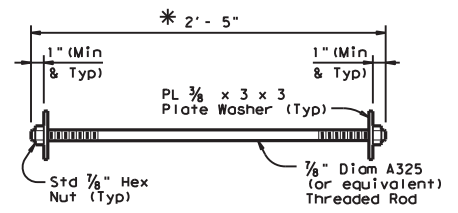
BARRIER PLAN AT END JOINTS



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

(WWR) General Notes

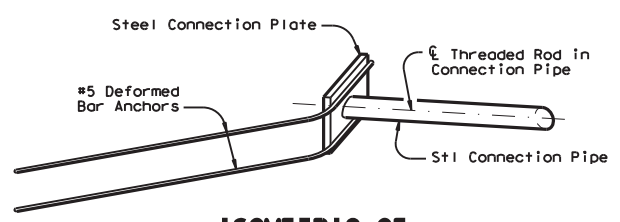
1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
3. All reinforcement shall comply with Item 440, "Reinforcing Steel."
4. Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".



CONNECTION BOLT OR THREADED ROD DETAIL

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

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



ISOMETRIC OF TYPICAL WELDED ASSEMBLY

Four (4) [2 Upper & 2 Lower] Assemblies required per joint.

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

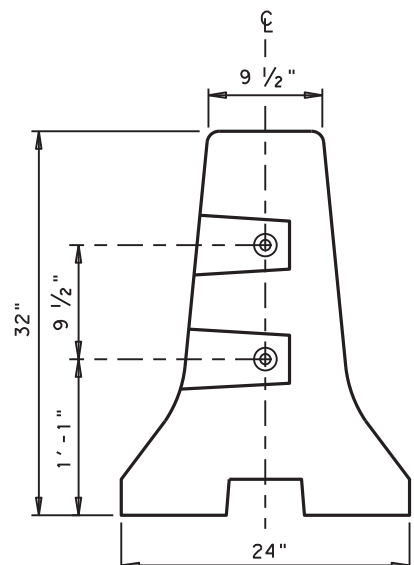
GENERAL NOTES

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

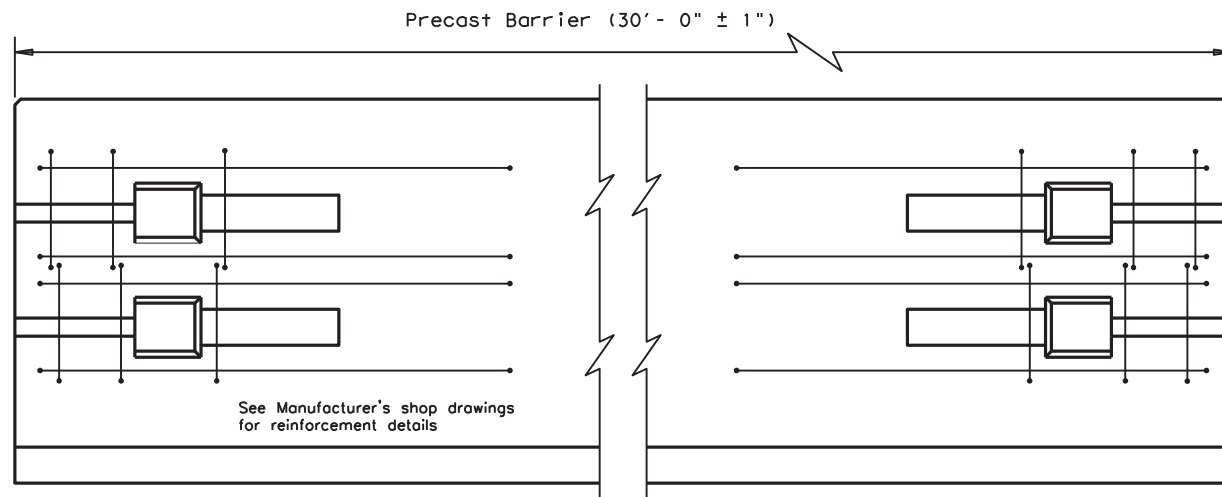
		Design Division Standard	
CONCRETE SAFETY BARRIER (F-SHAPE)			
PRECAST BARRIER (TYPE 1)			
CSB(1)-10			
FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD
© TxDOT December 2010	CONT: 6389	SECT: 94	JOB: 001
REVISIONS			HIGHWAY: IH 10, ETC
	DIST: ELP	COUNTY: EL PASO	SHEET NO.: 42

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

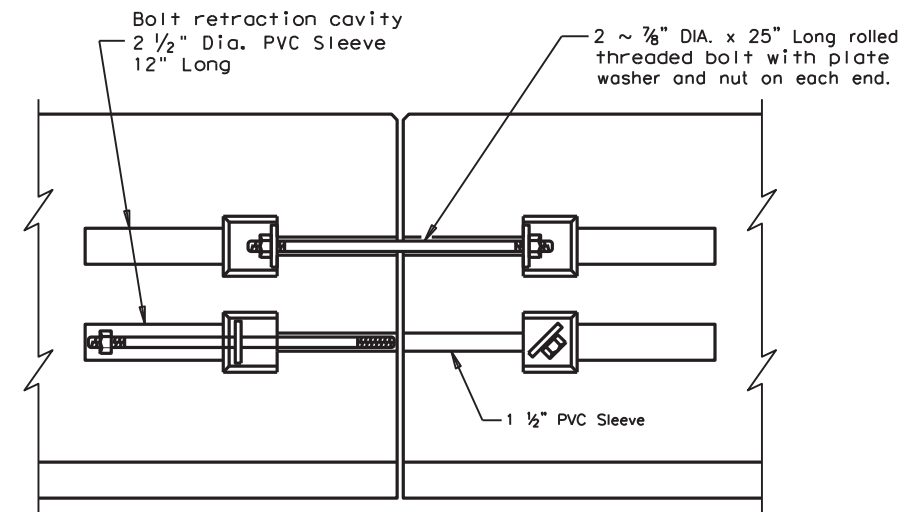
DATE: 9/16/2021 10:36:30 AM
 FILE: \\FS-ELPHO.dot.state.tx.us\DATA1\Districtwide\MMC Projects\051 East Area Office\RMC_6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\Roadway\csb110.dgn



END VIEW (CSB) QUICK-BOLT
 QUICK-BOLT POCKET LOCATIONS

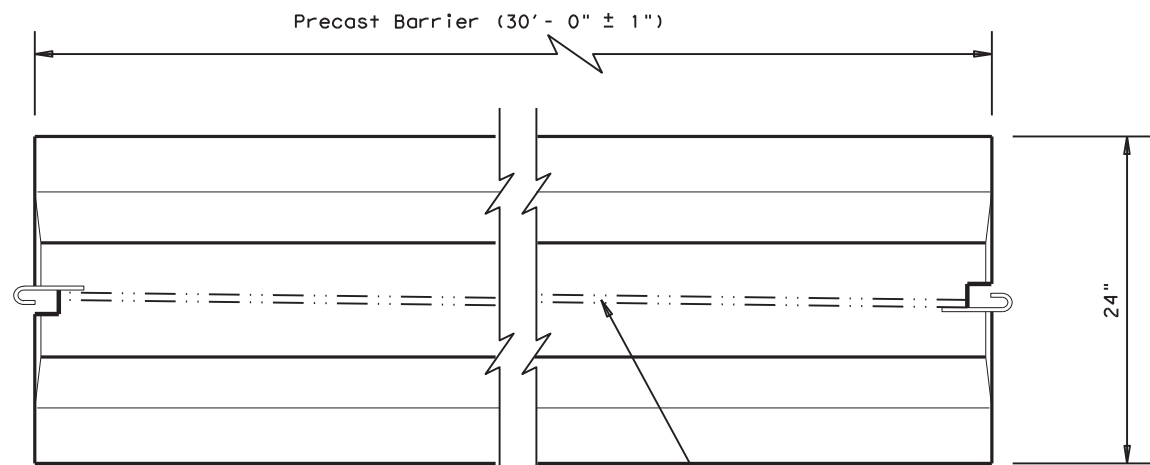


ELEVATION (CSB) QUICK-BOLT
 See Manufacturer's shop drawing for additional details

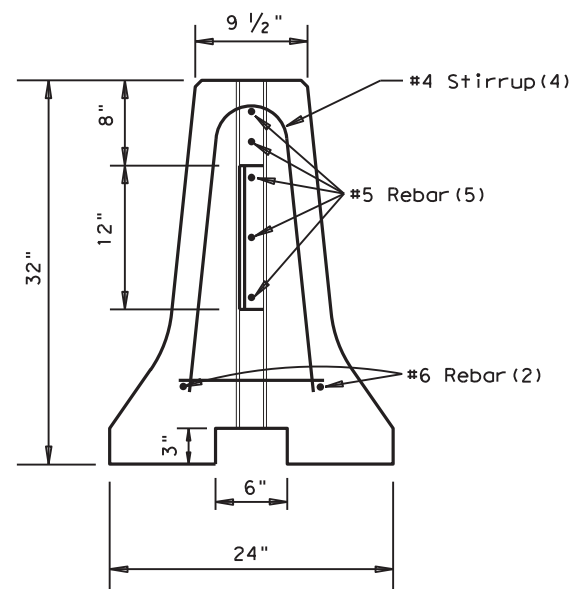


ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

Joint Connection (Type Q)

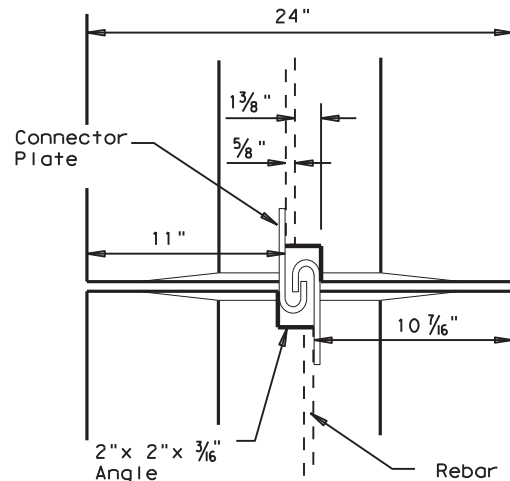


TOP VIEW
PRECAST (CSB) WITH J-J HOOKS
 See Manufacturer's shop drawing for additional details



END VIEW
J-J HOOK CONNECTION

Joint Connection (Type J)



VIEW FROM ABOVE
J-J HOOK CONNECTION

Proprietary Joint Connections (CSB)

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

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

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

SHEET 2 OF 2



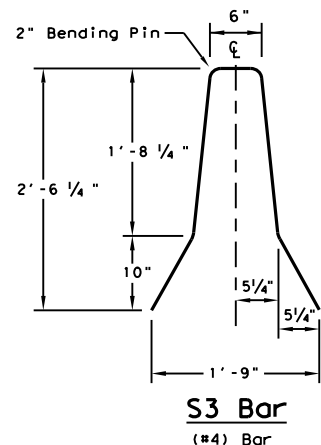
CONCRETE SAFETY BARRIER (F-SHAPE)
PRECAST BARRIER (TYPE 1)

CSB(1)-10

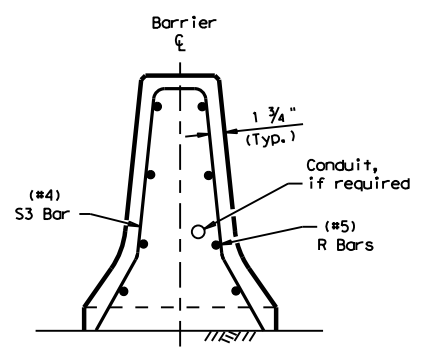
FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD	CK: VP
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389	94	001	IH 10, ETC
DIST	COUNTY	SHEET NO.		
ELP	EL PASO	43		

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

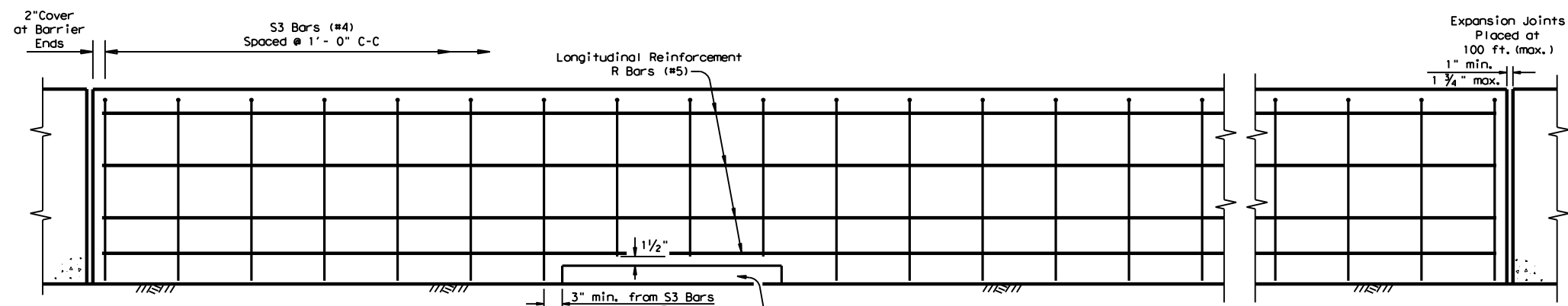
DATE: 9/16/2021 1:05:40 PM
 FILE: \\FS-ELPHO.dot.state.tx.us\DATA1\DistrictWide\RMC - MMC Projects\052 West Area Office\RMC_6389-94-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\Roadway\csb213.dgn



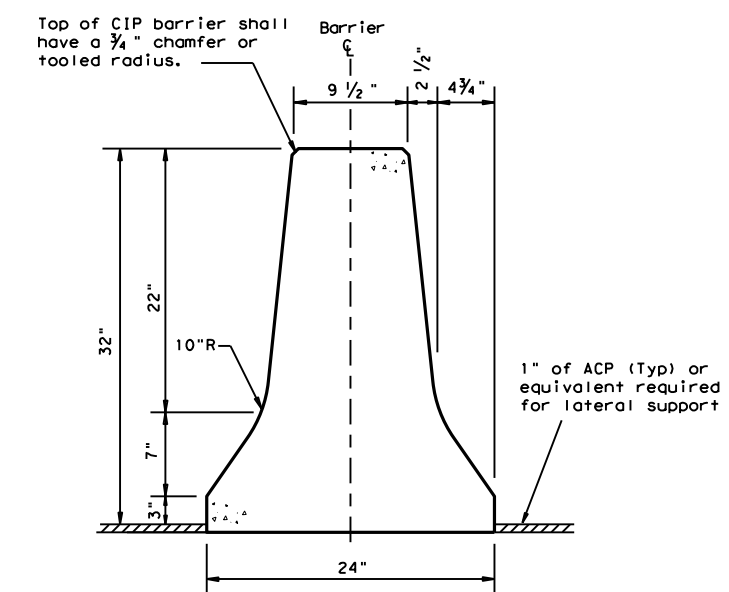
S3 Bar
 (#4) Bar



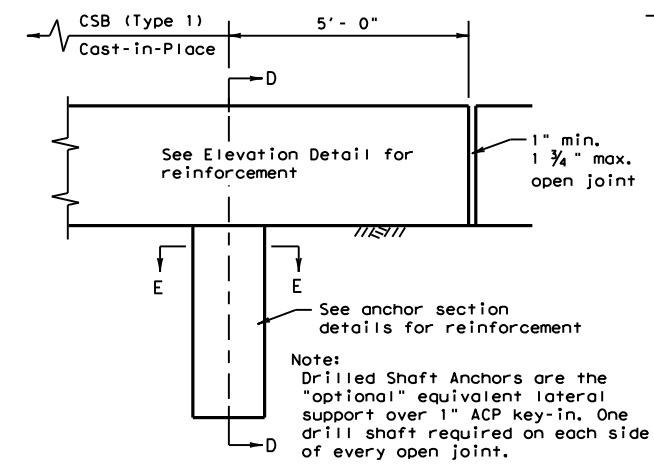
END VIEW
 Cast-in-Place (CIP) Barrier
 Barrier is Symmetrical About the Center Line



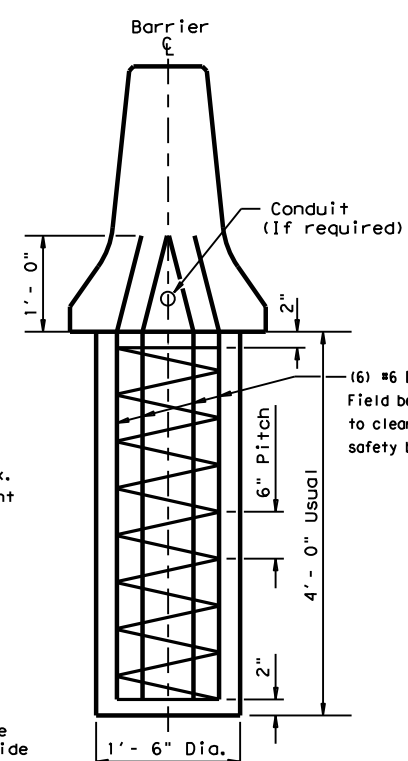
ELEVATION VIEW
 Cast-in-Place (CSB) on Flexible Pavement



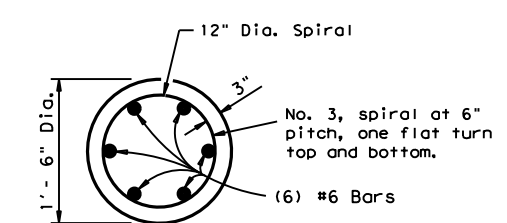
CONCRETE SAFETY BARRIER (CSB)



**DRILLED SHAFT ANCHOR
 LOCATION DETAIL**



**SECTION D-D
 DRILLED SHAFT ANCHOR**



**SECTION E-E
 DRILLED SHAFT ANCHOR**

GENERAL NOTES

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

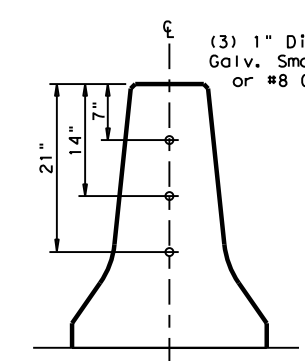
Cast-In-Place or Slip-Formed (CSB)

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

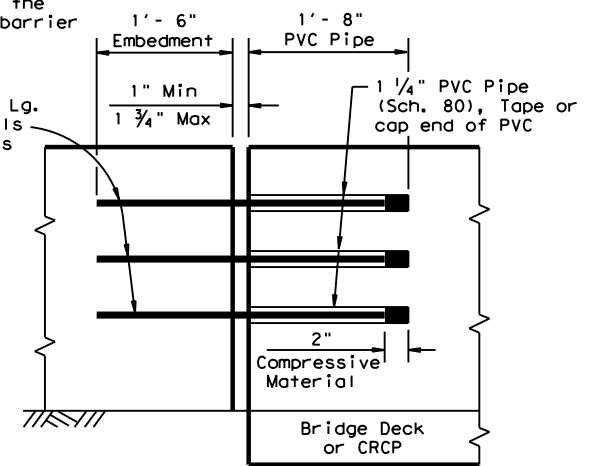
The weight of Cast-in-Place (CSB) (F-Shape) is approx. 440 lbs per ft.

EXPANSION JOINT (Dowel Location)

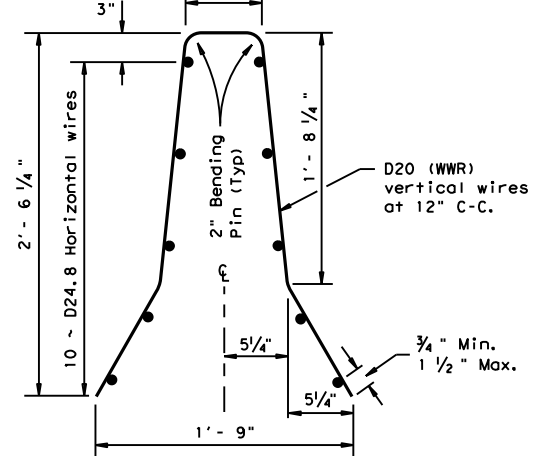
Dowels may be used as directed by the Engineer, in locations where the barrier could be laterally displaced.



END VIEW
 Dowel locations



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

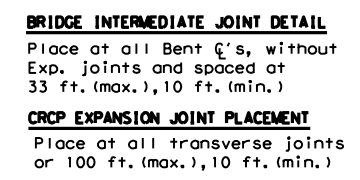
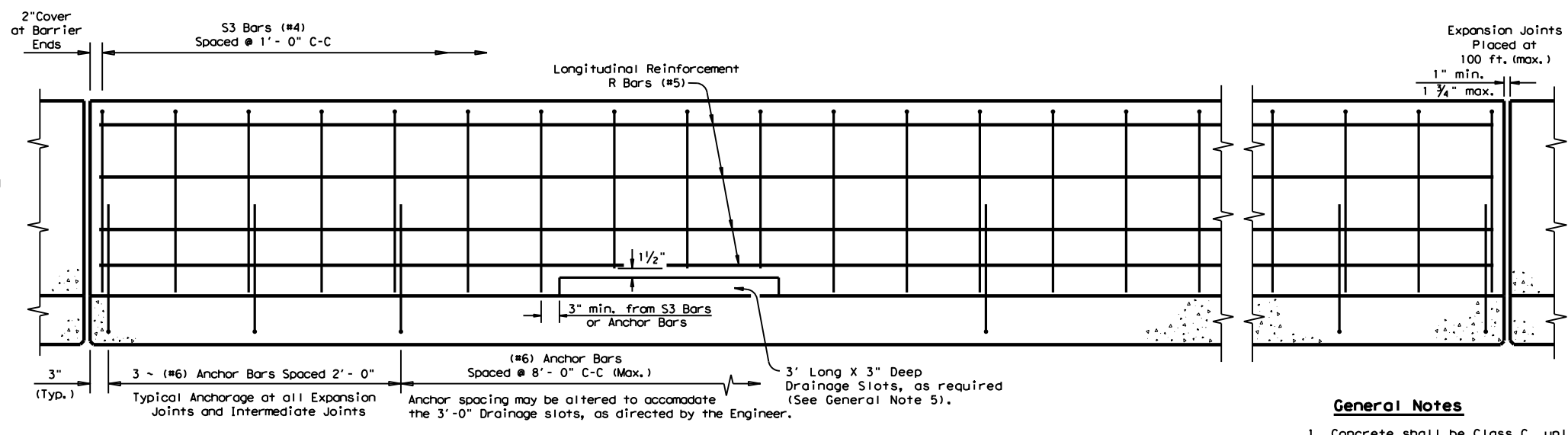
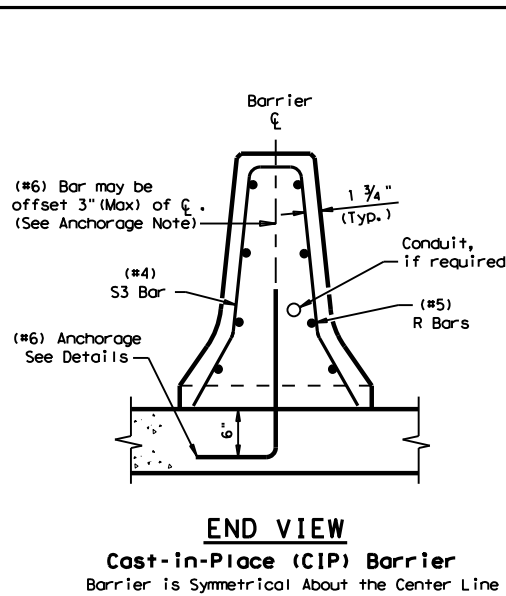


(WWR) General Notes

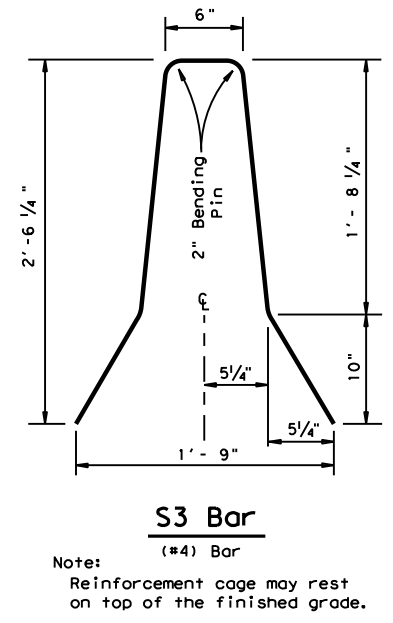
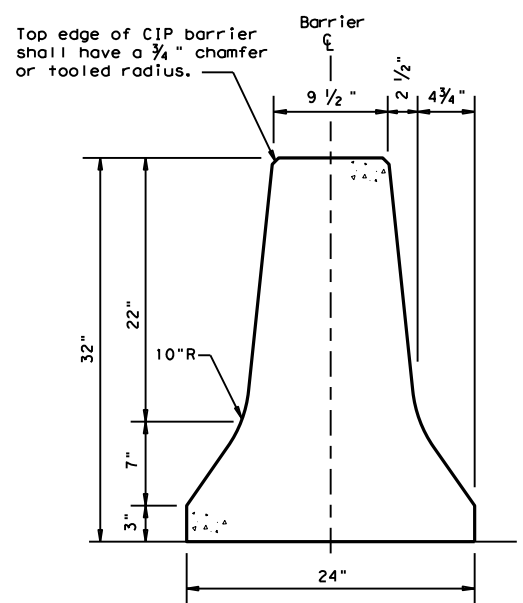
- Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
- The welded wire cage at the drainage slots may be cut or bent to accommodate the edge and top clearances, as directed by the Engineer.
- The welded wire splice locations shall have a "minimum" splice lap length of 12".
- Combinations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

		Design Division Standard	
CONCRETE SAFETY BARRIER (F-SHAPE) CAST-IN-PLACE (TYPE 1) (FLEXIBLE PAVEMENT) CSB (2) - 13			
FILE: csb213.dgn	DN: TxDOT	CK: AM	DW: VP
©TxDOT December 2010	CONT	SECT	JOB
REVISIONS	6389	94	001
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	43A	

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



- General Notes**
- Concrete shall be Class C, unless otherwise specified in the plans.
 - Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615. If the bridge deck requires epoxy "coated" reinforcement, the barrier and/or anchorage may require the same, as shown elsewhere in the plans.
 - Axis of cast-in-place barrier shall be vertical, except where the roadway is superelevated, then axis shall be normal to roadway surface.
 - Top edges of cast-in-place barrier shall have a 3/4" chamfer or tooled radius.
 - Anchorage: The "Optional" Anchor system shall be embedded 6" into fresh concrete or using a Type III, Class C Epoxy anchorage system. Follow the manufacturer's directions for installing the expoxied anchor bars. All anchorage shown is the minimum required, and considered subsidiary to the bid item.
 - Drainage slot depths may be increased 1" to accommodate ACP. Slot locations (12'-0", C-C Min. Spacing) are shown elsewhere, or as directed by the Engineer.
 - Cast-in-place barrier may be slip formed. Bracing may be tied or tack welded to the reinforcement cage to provide cage stability. Do not weld to anchor bars. The reinforcement cage may rest on the top of the finished grade.
 - For locations where lighting is required, see the CSB(4) sheet for the proper reinforcement and anchorage.

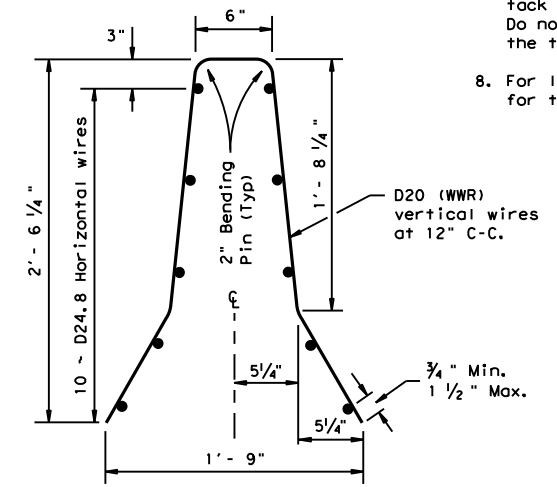
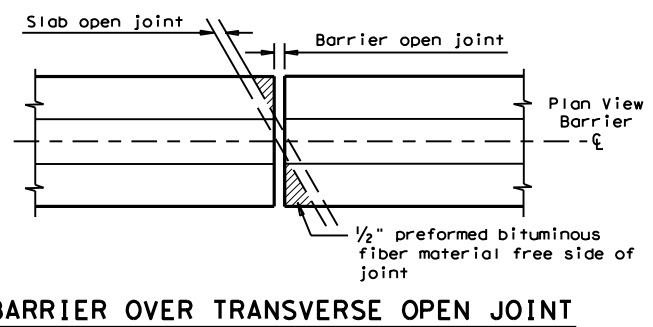


BARRIER PLACEMENT OVER (CRCP) JOINTS

Barrier may be cast over a "Longitudinal" CRCP joint.

CRCP Joints (with or without tiebars): Two layers of 30# roofing felt or 1/2" preformed bituminous fiber material.

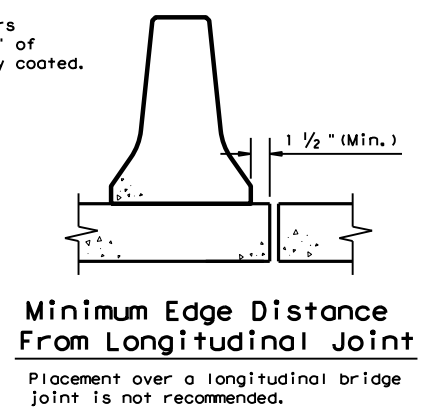
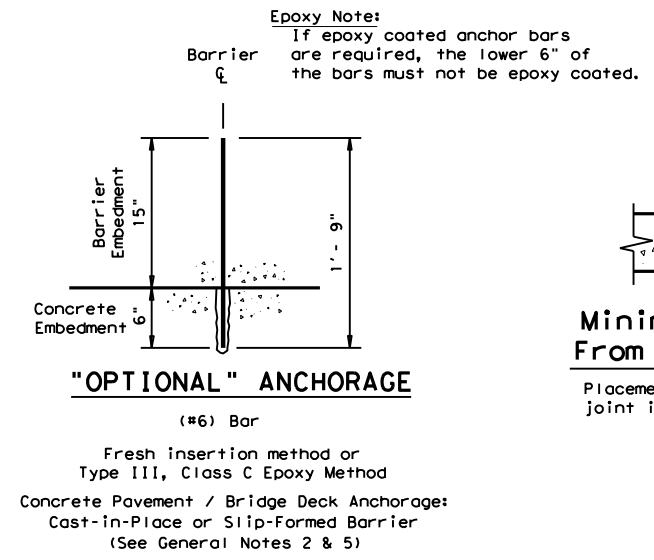
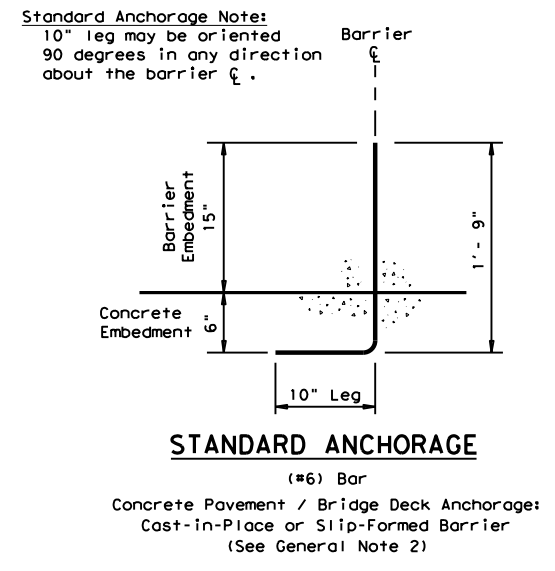
Barrier Anchorage Note: Anchorage must be located at least 3" from a longitudinal joint.



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

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

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



		Design Division Standard	
CONCRETE SAFETY BARRIER (F-SHAPE) CAST-IN-PLACE (TYPE 1) (BRIDGE DECK or CRCP) CSB(3)-16			
FILE: csb316.dgn	DW: TxDOT	CK: HC/AN	DW: BD/VP
© TxDOT January 2016	CONT: 6389	SECT: 94	JOB: 001
CST 01-2016	REVISIONS	DIST: ELP	COUNTY: EL PASO
			SHEET NO.: 43B

DATE: FILE:

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5' x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5' x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4' x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5' x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicable standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

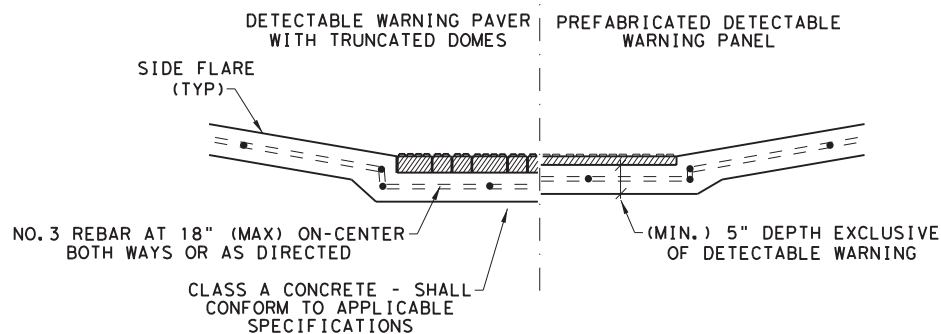
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

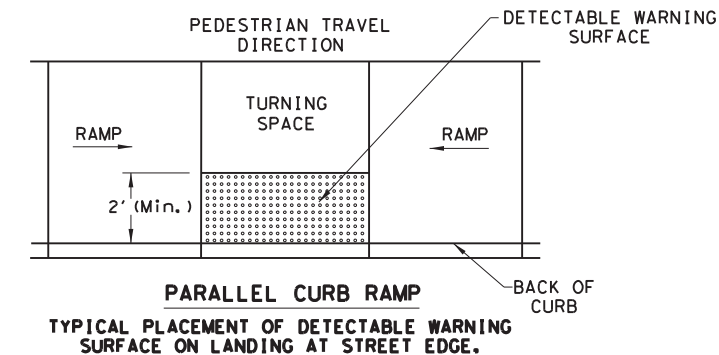
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

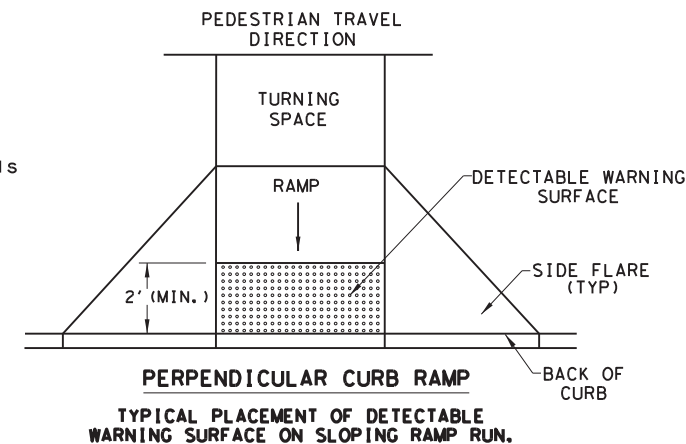


**SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS**

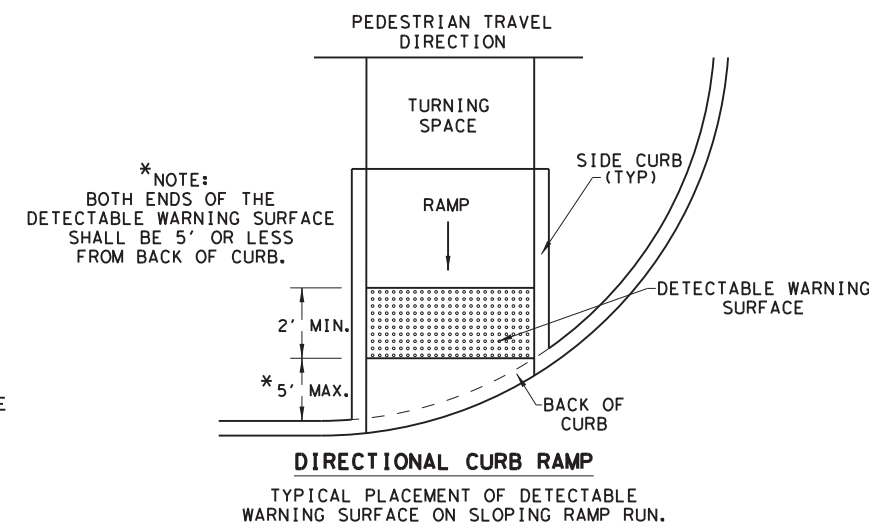
DETECTABLE WARNING SURFACE DETAILS



**PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.**



**PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.**



**DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.**

SHEET 2 OF 4

		Design Division Standard	
<h1>PEDESTRIAN FACILITIES CURB RAMPS</h1> <h2>PED-18</h2>			
FILE: ped18	DN: TxDOT	DW: VP	CK: KM
© TxDOT: MARCH, 2002	CONT	SECT	JOB
REVISIONS	6389 94	001	IH 10, ETC
REVISOR	DIST	COUNTY	SHEET NO.
ELP	EL PASO		45

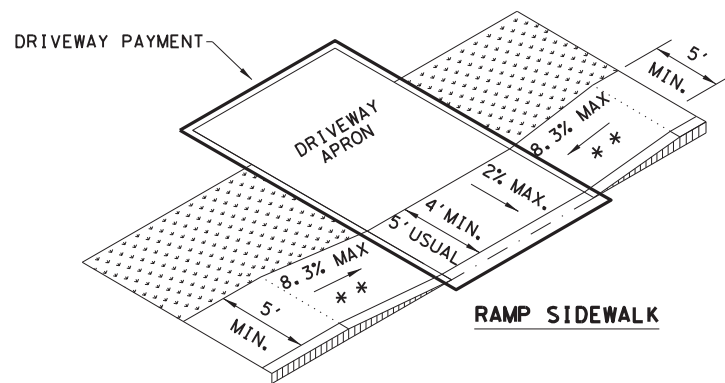
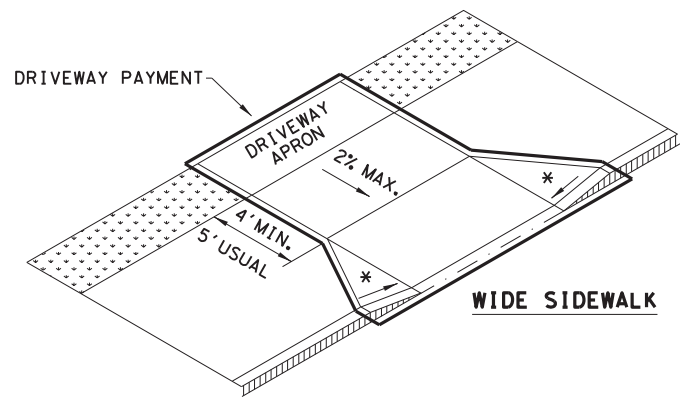
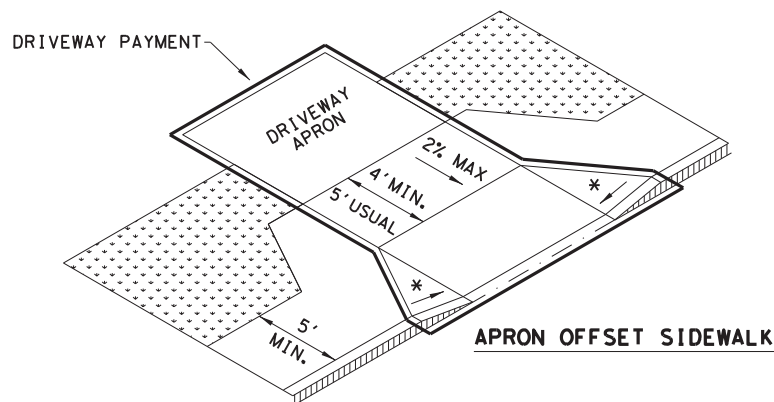
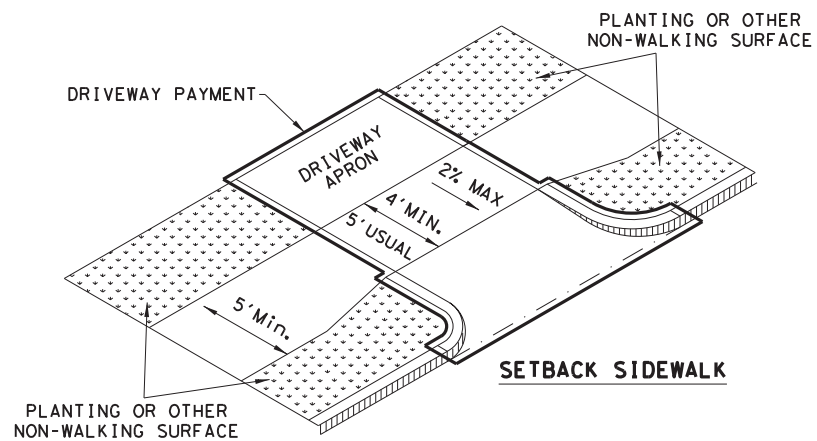
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 9/16/2021
 FILE: \\FS-ELPH0.dot.state.tx.us\DATA1\Districtwide\MMC Projects\051 East Area Office\RMC_6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan_Set\Standards\Roadway\ped18.c

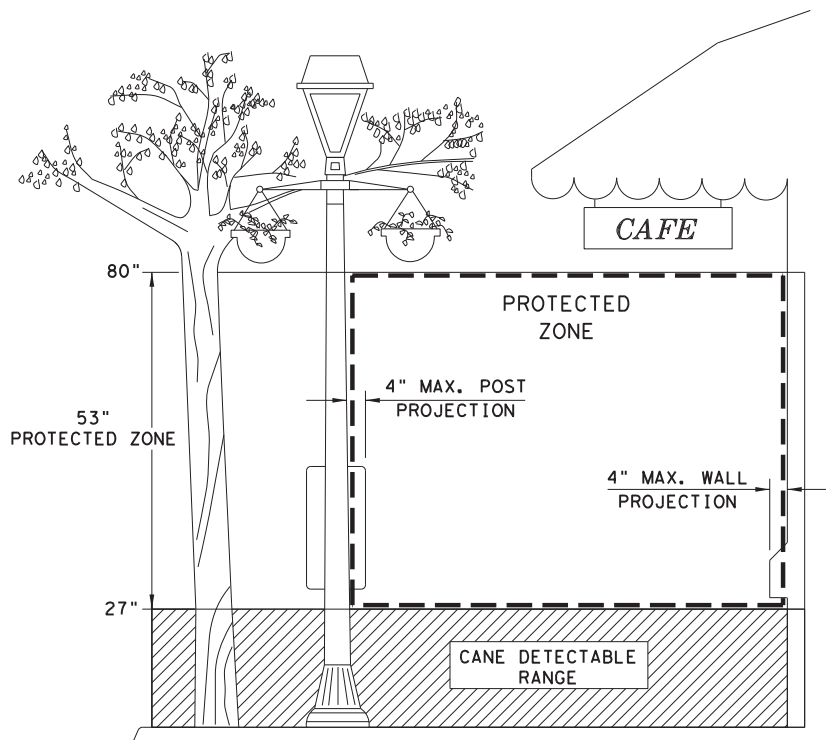
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 9/16/2021
 FILE: \\FS-ELPH01.dot.state.tx.us\DATA\1\District\Wide\RM - MMC Projects\051 East Area Office\RM 6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\Roadway\ped18.c

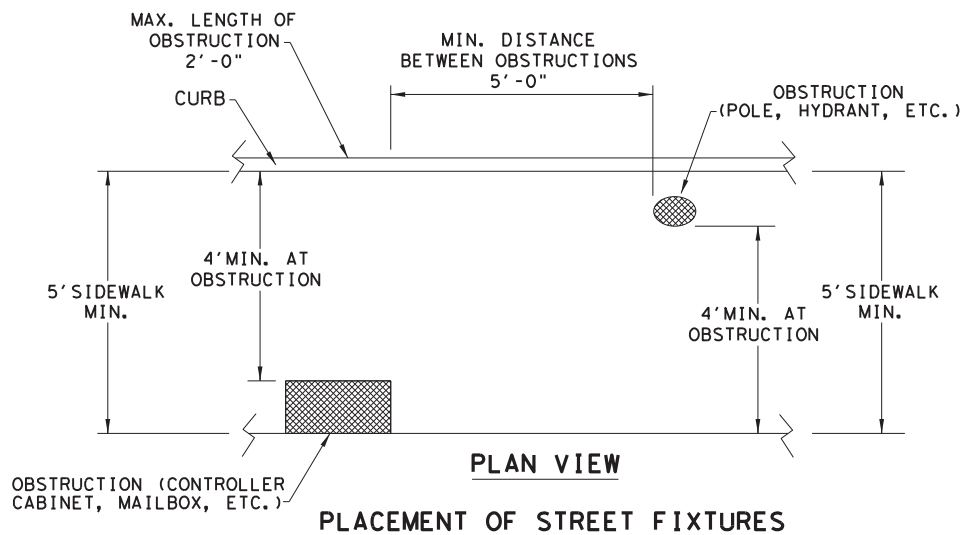
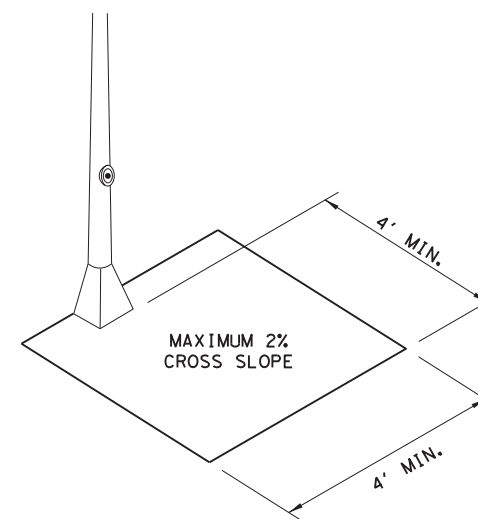
SIDEWALK TREATMENT AT DRIVEWAYS



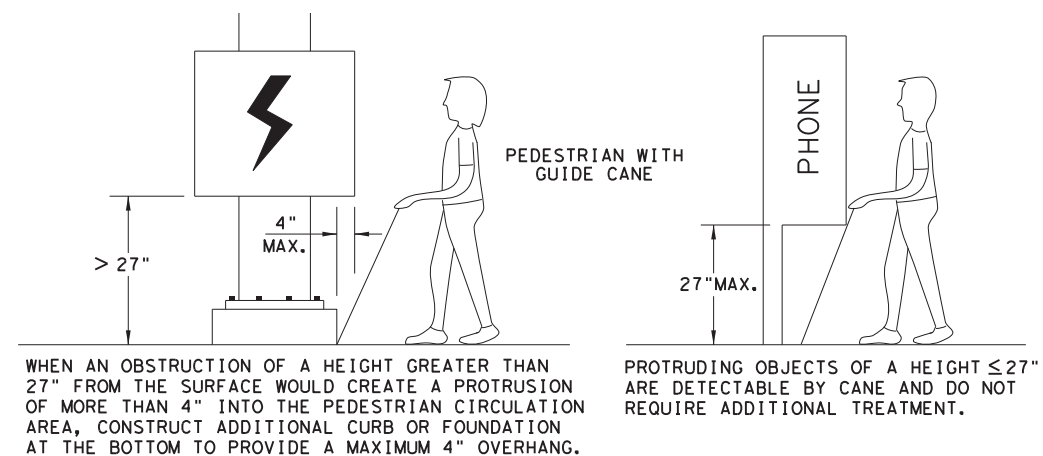
- NOTES:**
- * WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.
 - ** IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



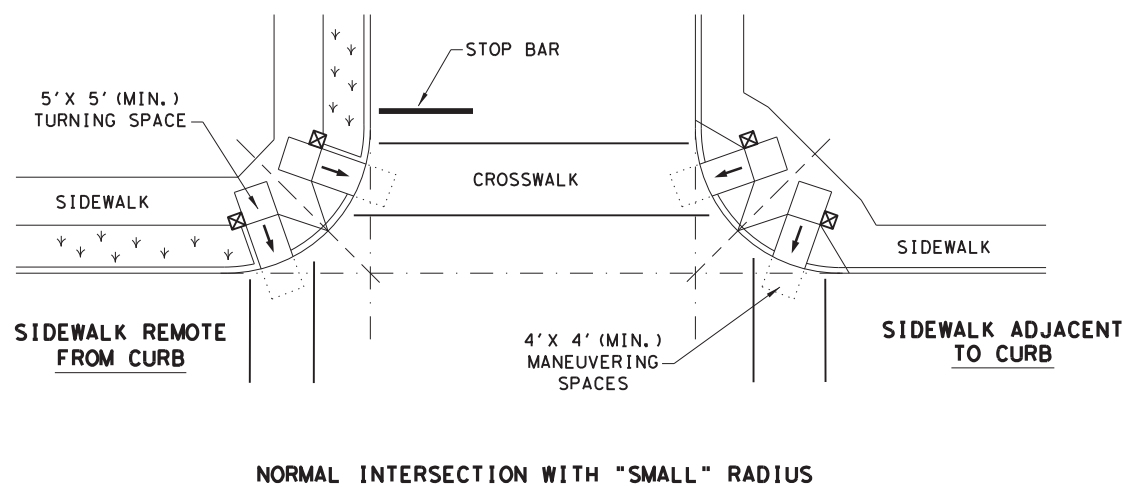
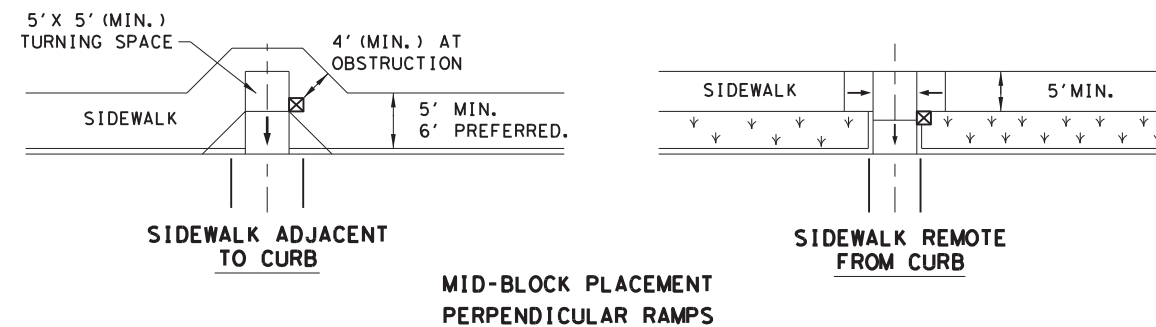
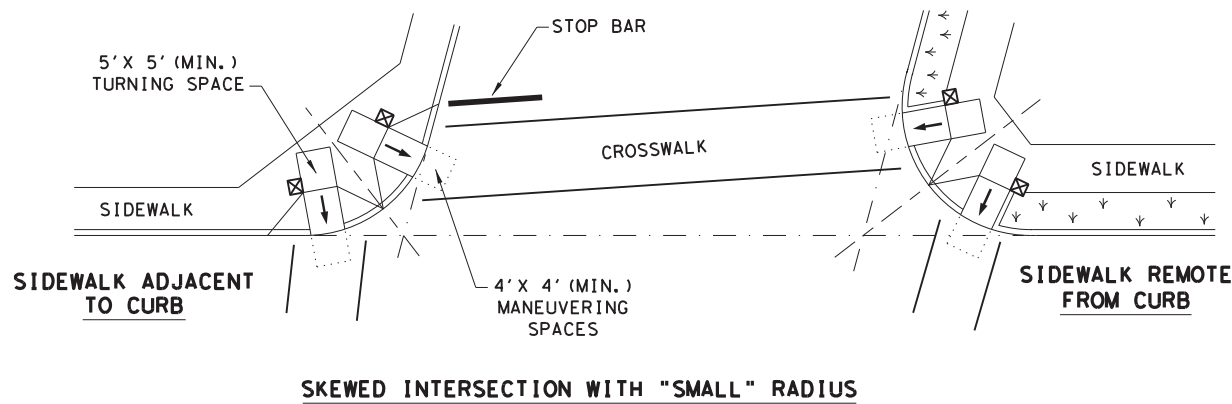
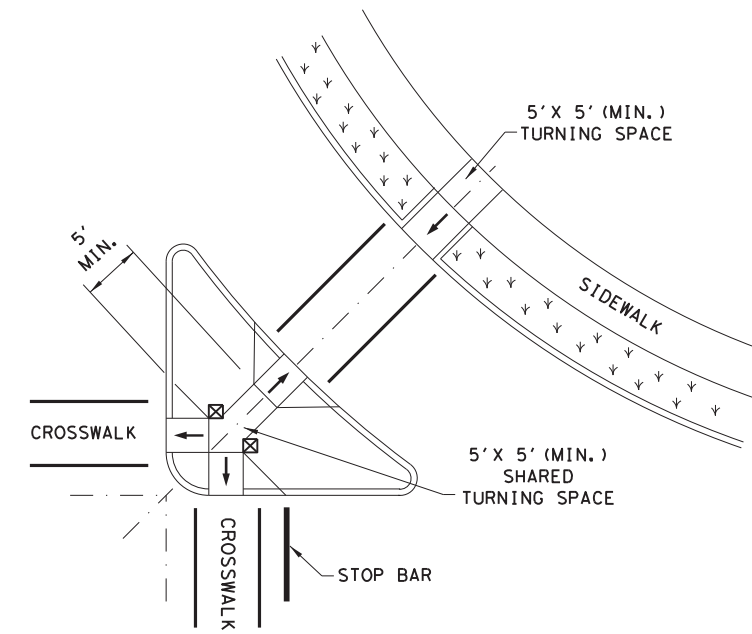
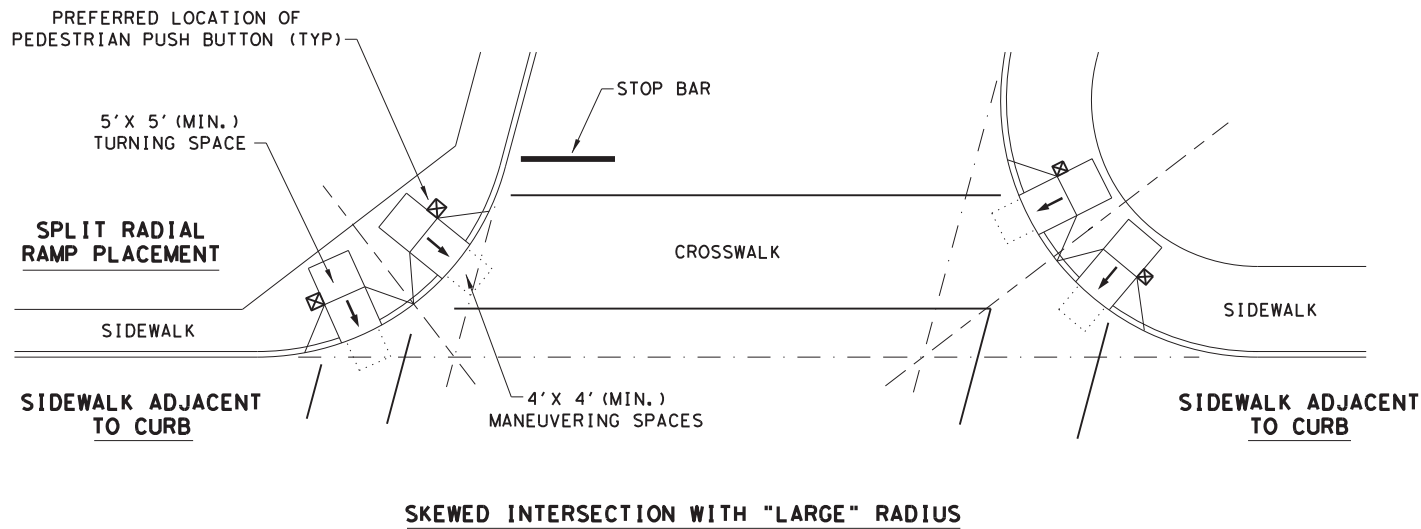
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



SHEET 3 OF 4

		Design Division Standard	
<h2>PEDESTRIAN FACILITIES</h2> <h3>CURB RAMPS</h3> <h1>PED-18</h1>			
FILE: ped18	DN: TxDOT	DW: VP	CK: KM
© TxDOT: MARCH, 2002	CONT	SECT	JOB
REVISIONS	6389	94	001
REVISOR	DIST	COUNTY	SHEET NO.
REVISOR: 08, 2005	ELP	EL PASO	46

TYPICAL CROSSING LAYOUTS
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ☒

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH. ↙ ↘ ↙ ↘ ↙ ↘

SHEET 4 OF 4



PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

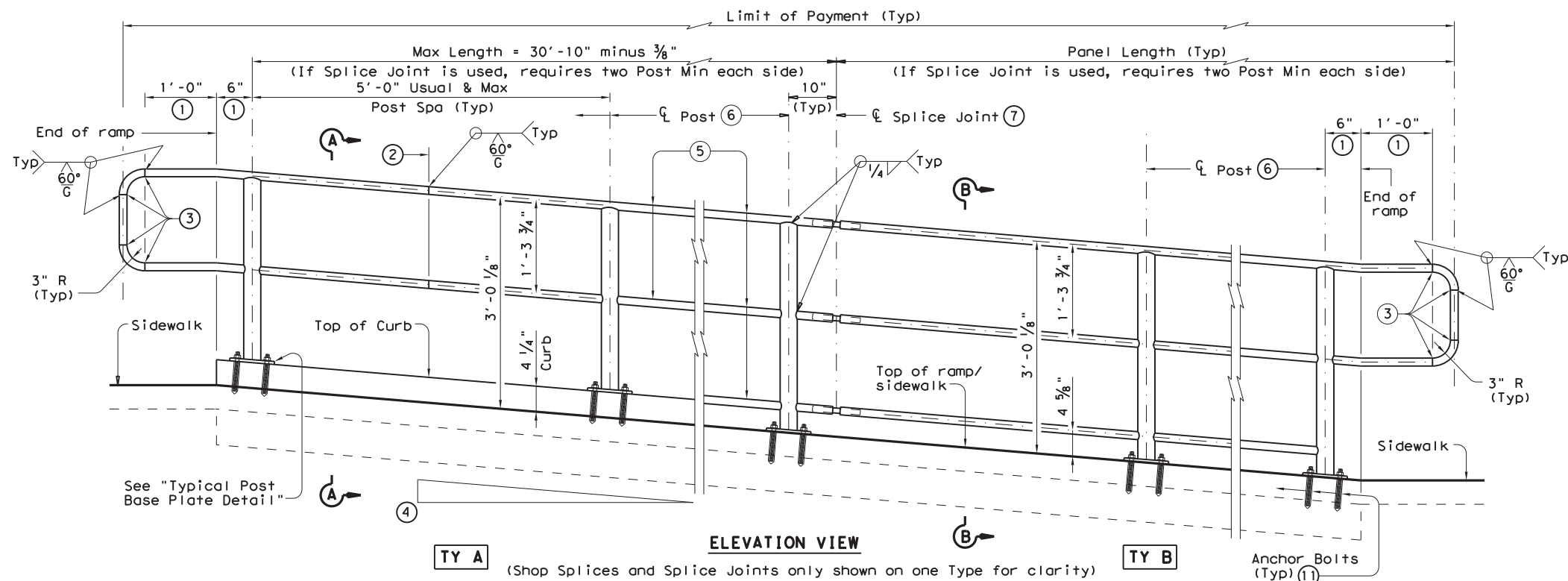
FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389	94	001	IH 10, ETC
REVISED 08, 2005	DIST	COUNTY	SHEET NO.	
REVISED 06, 2012	ELP	EL PASO	47	
REVISED 01, 2018				

DATE: 9/16/2021
FILE: \\FS-ELPH0.dot.state.tx.us\DATA1\Districtwide\RMC - MMC Projects\051 East Area Office\RMC 6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\Roadway\ped18.c

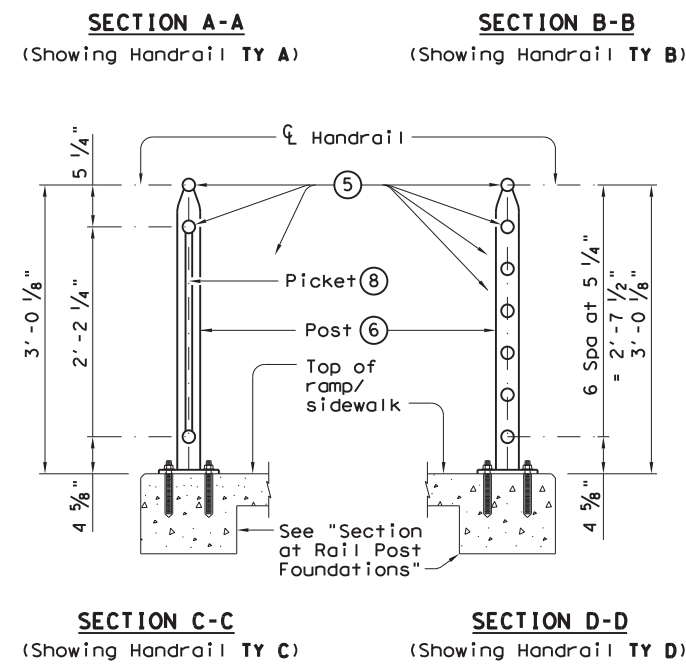
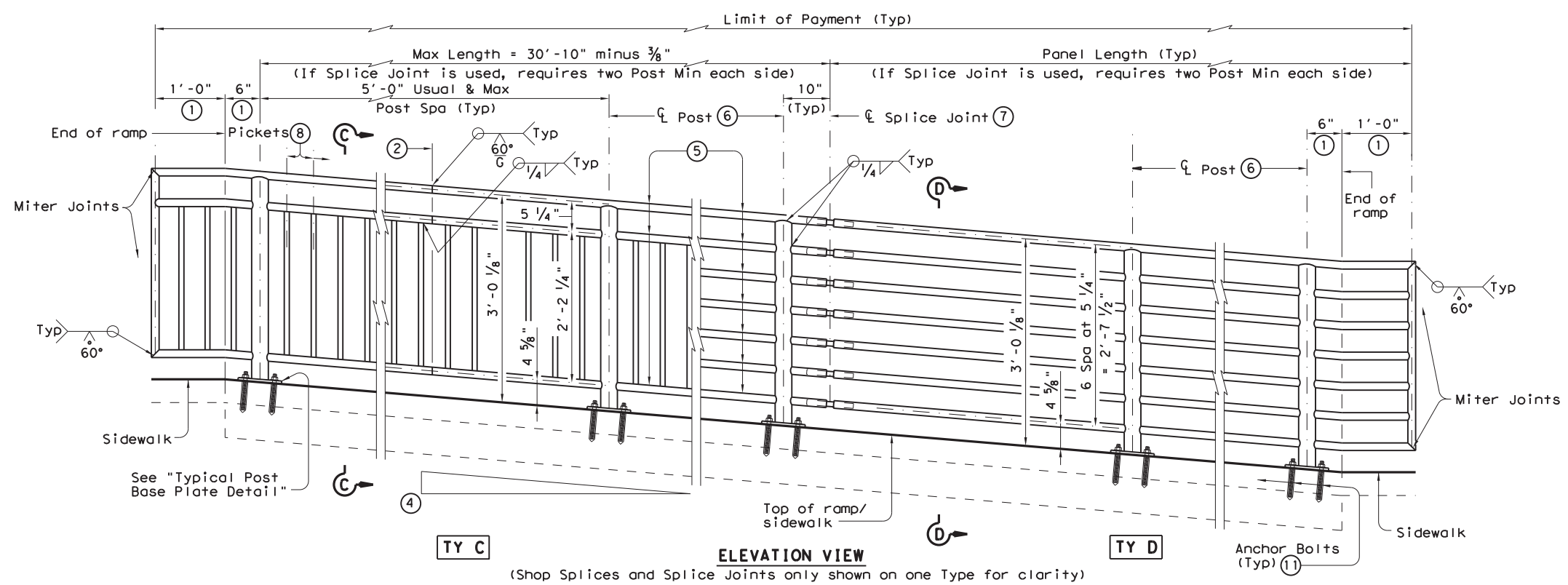
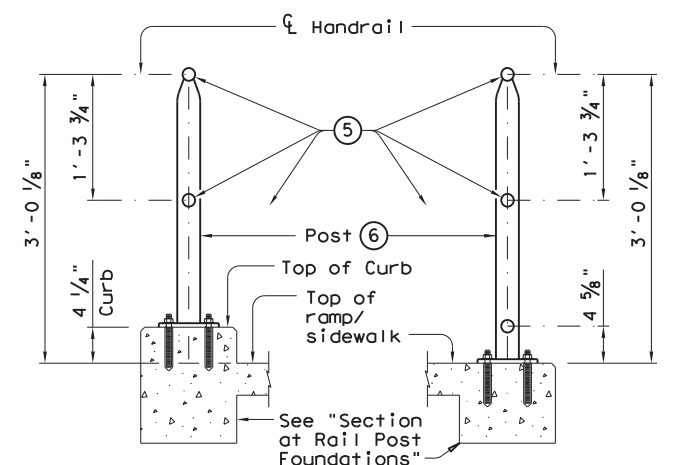
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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

DATE: 9/16/2021
 FILE: \\FS-ELPH0.dot.state.tx.us\DATA\1\Districtwide\MMC Projects\051 East Area Office\MMC 6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\Roadway\prdl3.c



RECOMMENDED USAGE ⑨ ⑩	
Dropoff Height/Condition	Recommended Rail Options
< 30" dropoff	TY A, TY B, TY C, or TY D
≥ 30" dropoff, or along Bike Path	TY E or TY F



- ① Parallel to ground.
- ② One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ③ Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ④ See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
- ⑤ 1 1/2" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 1/2" Dia. pipe for galvanizing drainage and venting.
- ⑥ 2 1/2" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
- ⑦ See "Handrail Fabrication Details" for Splice Joints.
- ⑧ 5/8" Dia. Round Bar equal spacing at 4 1/2" Max. Plumb all pickets.
- ⑨ When needed for accessibility (grade > 5 percent) or as needed for pedestrian safety.
- ⑩ Not to be used on bridges.
- ⑪ See "General Notes" for anchor bolt information.

SHEET 1 OF 3



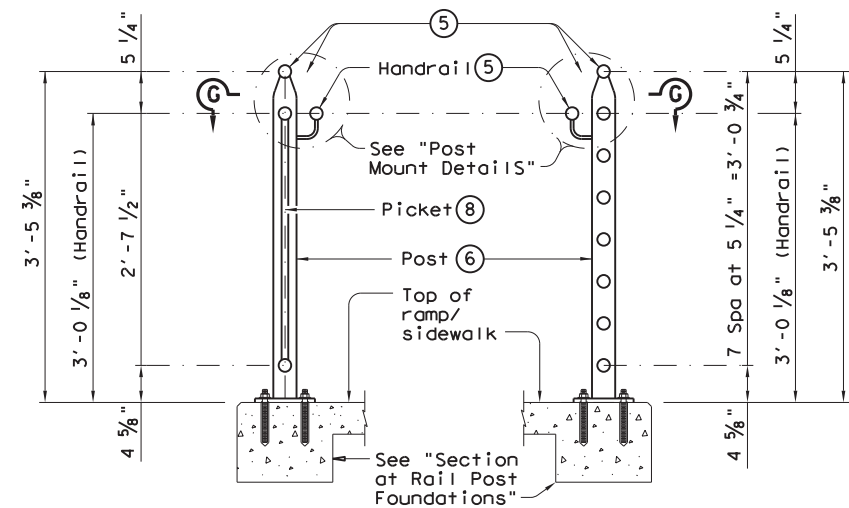
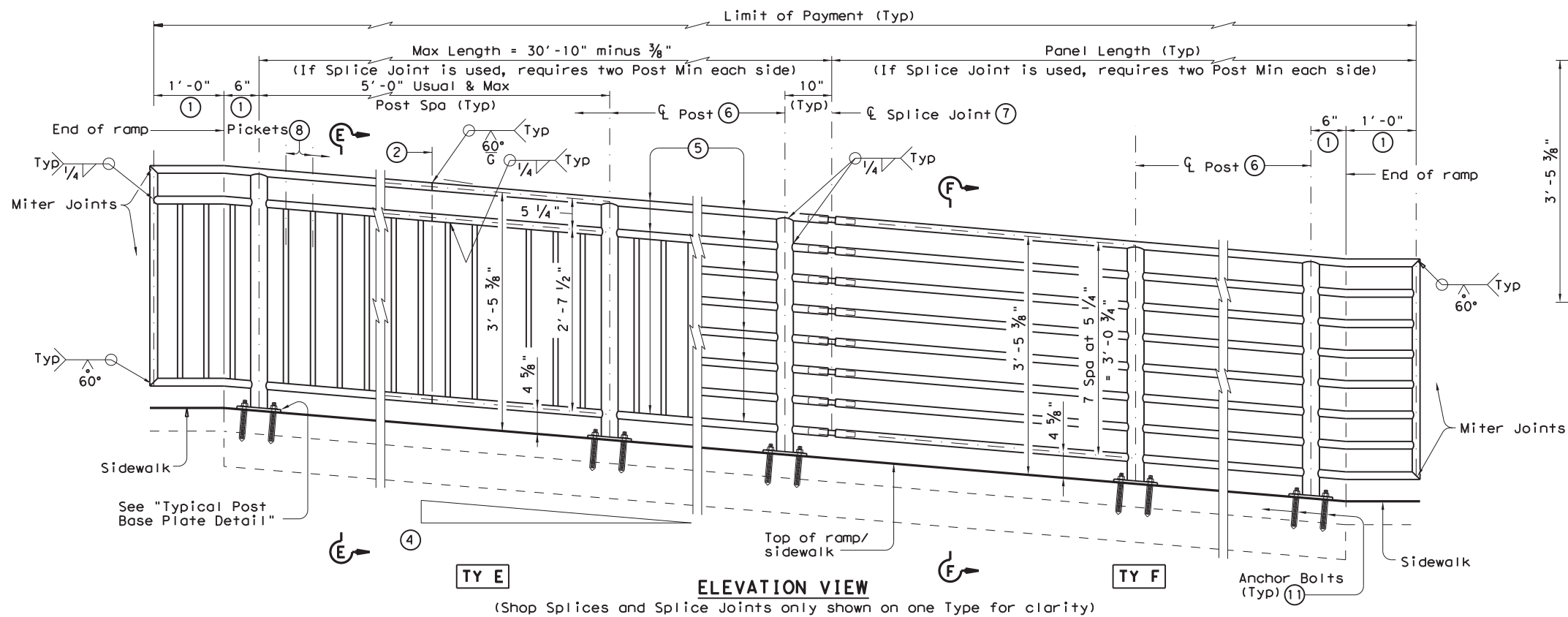
PEDESTRIAN HANDRAIL DETAILS

PRD-13

FILE: prdl3.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
© TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389	94	001	IH 10, ETC
REVISED MAY, 2013 (VP)	DIST	COUNTY	SHEET NO.	
	ELP	EL PASO	48	

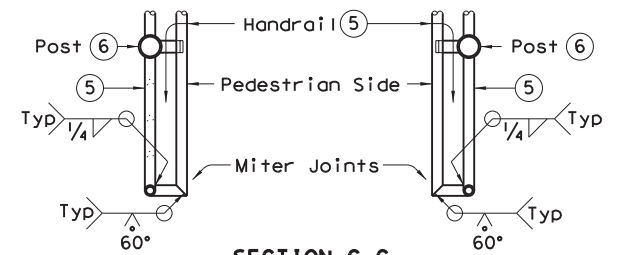
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 9/16/2021
 FILE: \\FS-ELPHO.dot.state.tx.us\DATA\1\DistrictWide\RMC - MMC Projects\051 East Area Office\RMC_6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\Roadway\prdl3.c

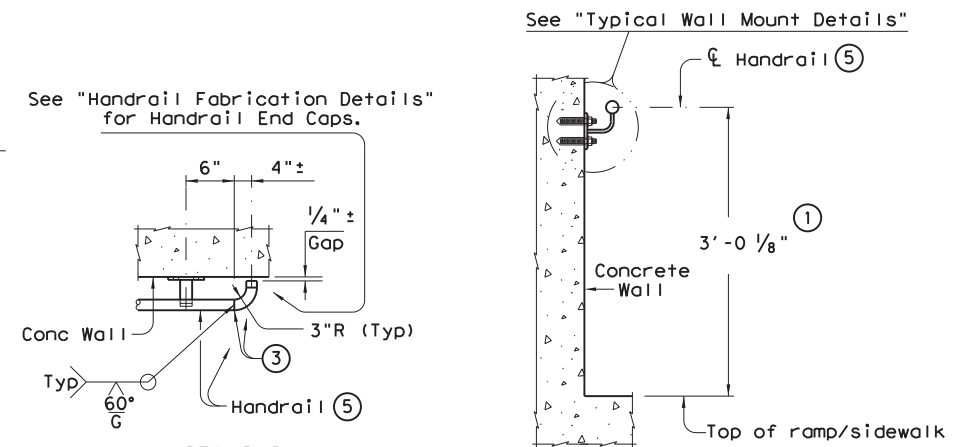
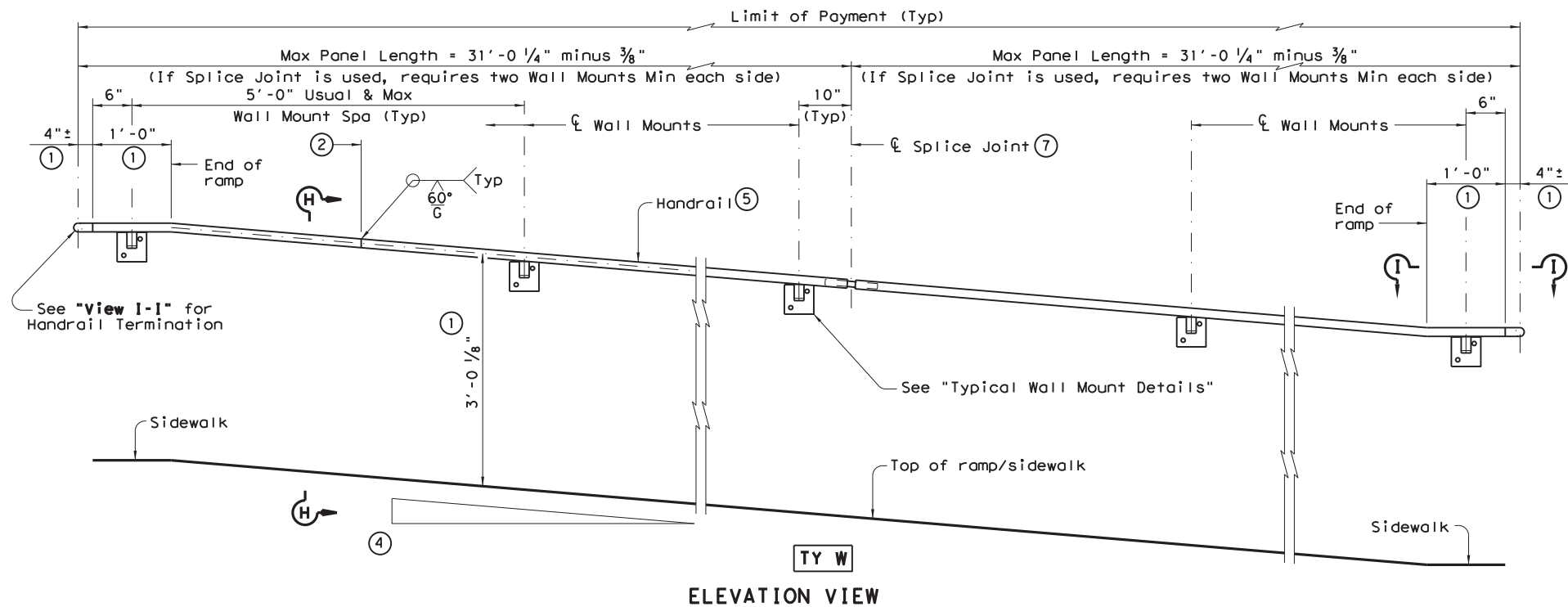


SECTION E-E
 (Showing Handrail TY E)

SECTION F-F
 (Showing Handrail TY F)



SECTION G-G
 (Showing Handrail Termination)



VIEW I-I
 (Showing Handrail Termination)

SECTION H-H
 (Showing Handrail TY W)

SHEET 2 OF 3

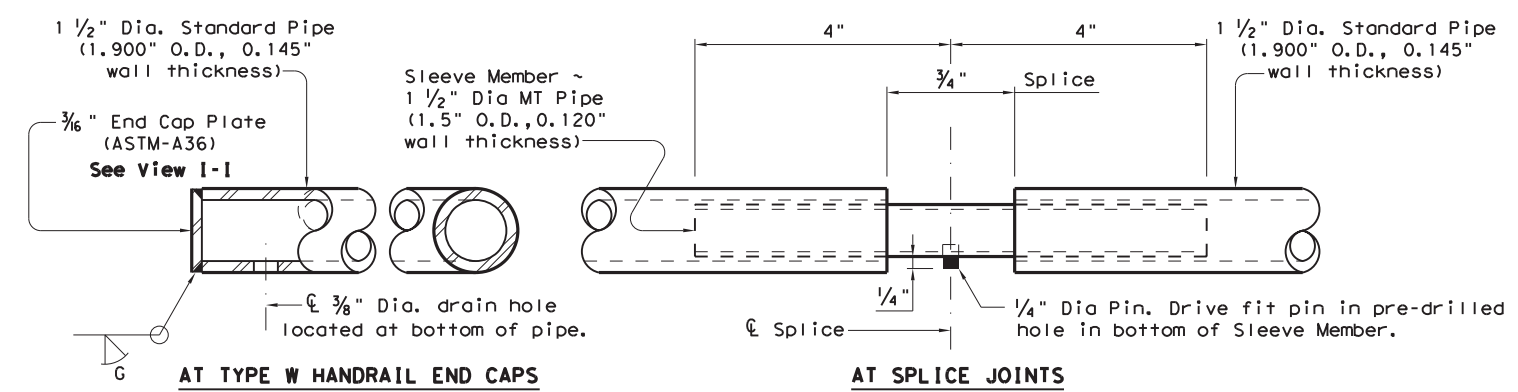


PEDESTRIAN HANDRAIL DETAILS PRD-13

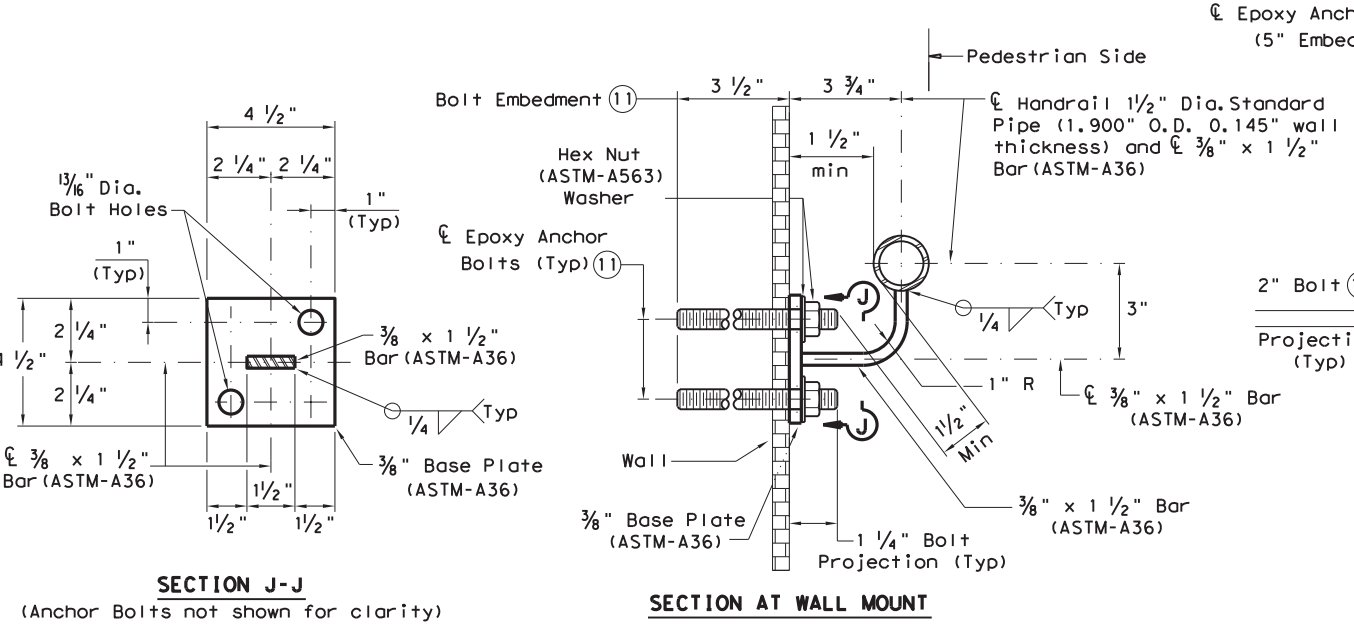
- ① Parallel to ground.
- ② One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ③ Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ④ See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
- ⑤ 1 1/2" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 1/2" Dia. pipe for galvanizing drainage and venting.
- ⑥ 2 1/2" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
- ⑦ See "Handrail Fabrication Details" for Splice Joints.
- ⑧ 1/2" Dia. Round Bar equal spacing at 4 1/2" Max. Plumb all pickets.
- ⑪ See "General Notes" for anchor bolt information.

FILE: prdl3.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
© TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389 94	001	IH 10, ETC	
REVISED MAY, 2013 (VP)	DIST	COUNTY	SHEET NO.	
	ELP	EL PASO	49	

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

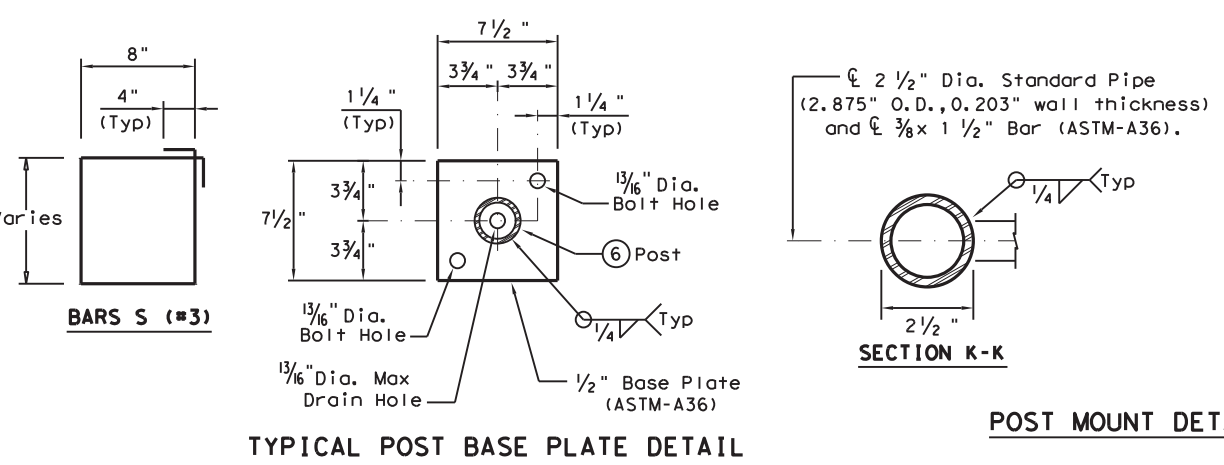


HANDRAIL FABRICATION DETAILS

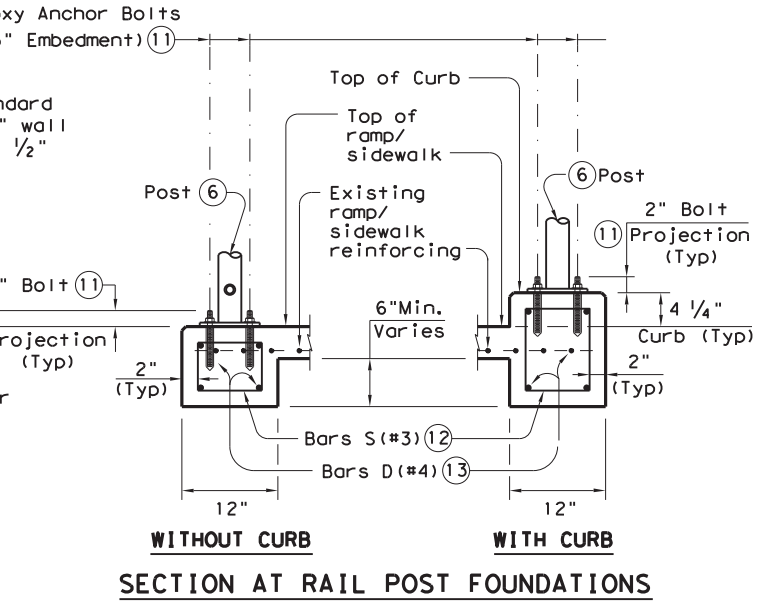


TYPICAL WALL MOUNT DETAILS

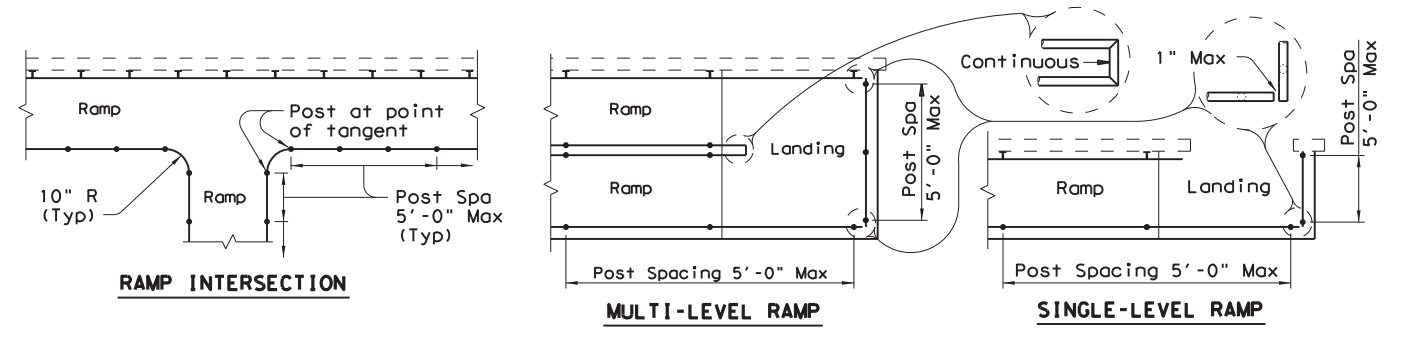
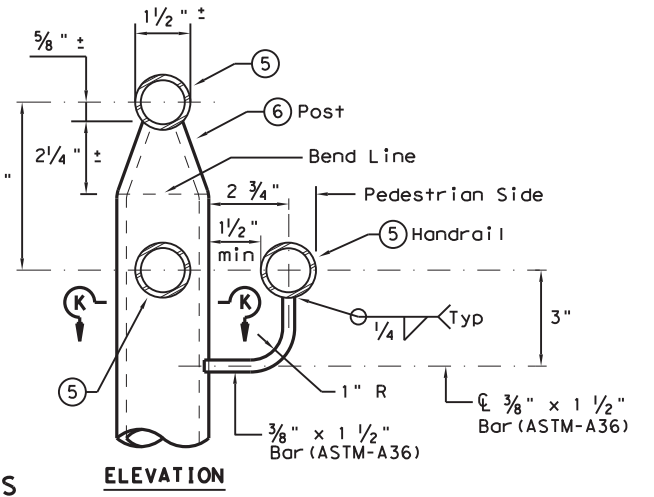
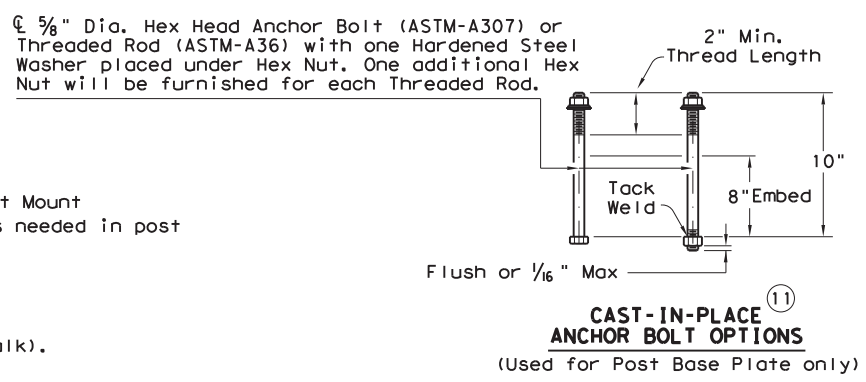
- (5) 1 1/2" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp/sidewalk. Provide holes as needed in 1 1/2" Dia. pipe for galvanizing drainage and venting.
- (6) 2 1/2" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). Plumb all posts. See "Post Mount Detail" for crimping and trimming post to fit the diameter of top rail. Provide holes as needed in post for galvanizing drainage and venting.
- (11) See "General Notes" for anchor bolt information.
- (12) Bars S(#3) spaced at 12" Max (Spaced 3" from outside edge of overall length of Ramp/Sidewalk).
- (13) Provide 1 1/2" end cover to Bars D(#4) from outside edge of overall length of Ramp/Sidewalk.



POST MOUNT DETAILS



SECTION AT RAIL POST FOUNDATIONS



PLAN SHOWING RAIL AT RAMP CONDITIONS

GENERAL NOTES

Designed according to ADAAG, Texas Accessibility Standards, Uniform Building Code, and AASHTO LRFD Specifications.

Handrail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Pipe will conform to ASTM-A53 Grade B or A500 Grade B. Steel plates and steel bars will conform to ASTM-A36. Mechanical tubing (MT) will conform to ASTM A513 Grade 1015 or higher. Galvanize all steel components except reinforcing steel unless noted otherwise.

Concrete for foundations will be in accordance with Item 531 "Sidewalks". All reinforcing steel must be Grade 60. Bar laps, where required, will be as follows: Uncoated #4 = 1'-5" Epoxy coated #4 = 2'-1"

When the plans require painted steel, follow the requirements for painting galvanized steel in Item 446, "Cleaning and Painting Steel". Sleeve Members will receive galvanization and only get field painted after installation unless directed otherwise by Engineer.

Epoxy Anchor bolts for wall mount and post base plate will be 5/8" Dia. ASTM A36 threaded rods with one hex nut and one hardened steel washer at each bolt. 3/8" Dia. threaded rod embedment depth for wall mounts is 3 1/2" and embedment depth for post base plate is 5".

Embed threaded rods into concrete with a Type III (Class C) epoxy meeting the requirements of DMS-6100, "Epoxyes and Adhesives". Mix and dispense adhesive with the manufacturer's static mixing nozzle/dual cartridge system. Core drill holes (percussion drilling not permitted).

At the contractor's option the post base plate anchor bolts may be cast with the Ramp/Sidewalk (See Cast-in-Place Anchor Bolt Options).

Optional cast-in-place anchor bolts will be 5/8" Dia ASTM A307 Grade A bolts (or A36 threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt. Embedment depth of cast-in-place bolt will be 8" for post base plate.

Handrails and any wall or other surface adjacent to them will be free of any sharp or abrasive elements.

Submit shop drawings to the Engineer unless otherwise noted. For curved handrail applications, fabricate the handrail to the curve if radius is less than 600 ft. Shop drawings are required when rail is fabricated to the curve.

For all handrails, erection drawings will be submitted to the Engineer for approval to ensure proper installation.

Drawings will show handrail mount locations with bolts setting, spacing, ramp slope, and/or splice joint locations, and handrail lengths with identification showing where each handrail goes on the layout.

Payment for concrete sidewalks or curb ramps will be paid for in accordance with Item 531 "Sidewalks".

Payment for all items shown is to be included in unit price bid in accordance with Item 450 "Railing" of the type specified.

All exposed edges will be rounded or chamfered to approximately 1/8" by grinding.

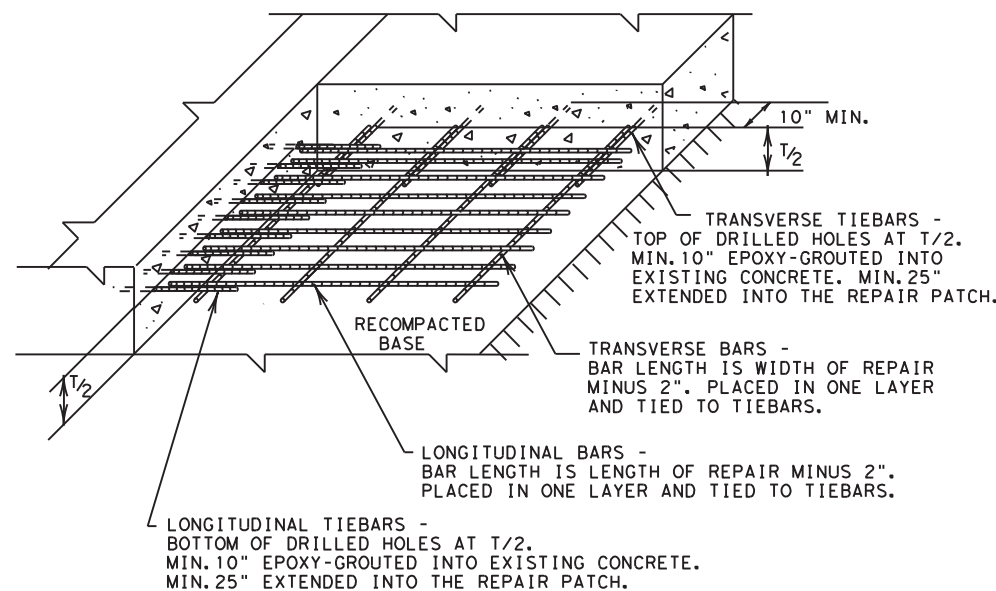
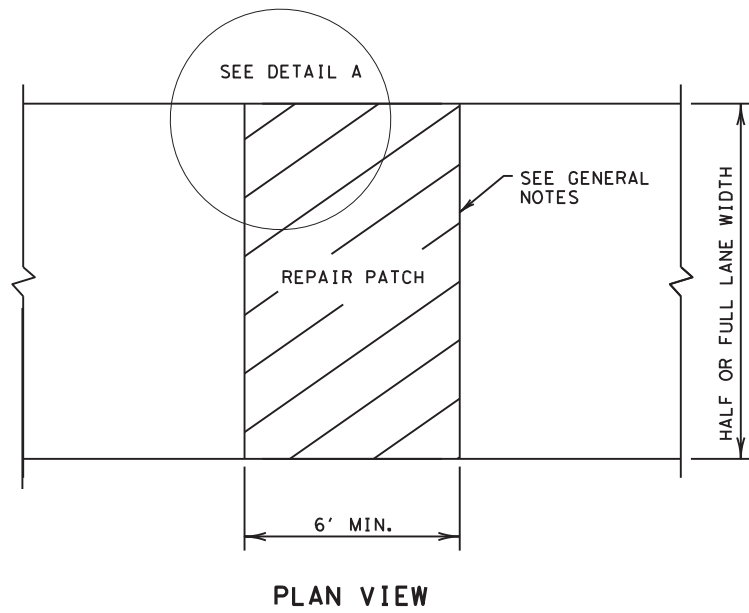
		Design Division Standard	
<h2>PEDESTRIAN HANDRAIL DETAILS</h2> <h3>PRD-13</h3>			
FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR
© TxDOT December 2006	CONT	SECT	JOB
REVISIONS	6389	94	001
REVISED MAY, 2013 (VP)	DIST	COUNTY	SHEET NO.
	ELP	EL PASO	50

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

DATE: 9/16/2021
 FILE: \\FS-ELPHO.dot.state.tx.us\DATA1\DistrictWide\RMC - MMC Projects\051 East Area Office\RMC 6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan_Set\Standards\Roadway\repcp14.dgn

TABLE NO.1 STEEL BAR SIZE AND SPACING						
TYPE PAVEMENT	SLAB THICKNESS AND BAR SIZE		LONGITUDINAL*		TRANSVERSE*	
			REGULAR BARS	TIEBARS	BARS	TIEBARS
	T (IN.)	BAR SIZE	SPACING (IN.)	SPACING (IN.)	SPACING (IN.)	SPACING (IN.)
CRCP	6.0	#5	7.5	7.5	24	24
	6.5		7.0	7.0		
	7.0		6.5	6.5		
	7.5		6.0	6.0		
	8.0	#6	9.0	9.0	24	24
	8.5		8.5	8.5		
	9.0		8.0	8.0		
	9.5		7.5	7.5		
	10.0		7.0	7.0		
	10.5		6.75	6.75		
11.0	6.5	6.5				
11.5	6.25	6.25				
≥12.0	6.0	6.0				
JRCP	<8.0	#5	24.0	12.0	24	24
	≥8.0	#6	24.0	12.0	24	24
CPCD	<8.0	#5	NONE	12.0	NONE	24
	≥8.0	#6	NONE	12.0	NONE	24

* USE 12" SPACING AS FIRST AND LAST SPACING AT END OR SIDE FOR ALL BARS.



DETAIL A
GROUTED TIEBARS & REINFORCEMENT

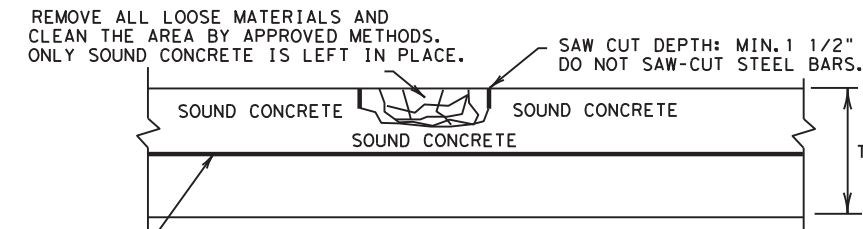
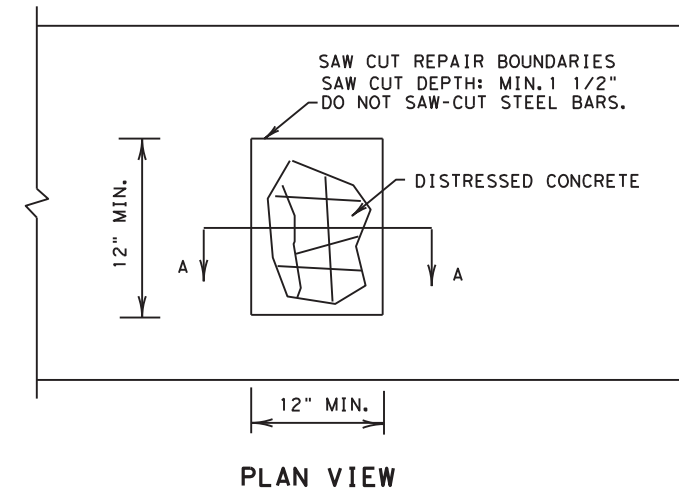
FULL-DEPTH REPAIR OF CRCP, JRCP, AND CPCD

GENERAL NOTES

- ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
- MULTIPLE PIECE TIEBARS SHALL BE USED WHEN THE REPAIR AREA MUST BE PLACED IN TWO STAGES DUE TO SEQUENCE OF CONSTRUCTION.
- FULL DEPTH SAW CUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE REPAIRED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTER LINE OF THE PAVEMENT.
- AT LEAST ONE LONGITUDINAL FULL DEPTH SAW CUT SHALL BE AT AN EXISTING LONGITUDINAL JOINT.
- ADDITIONAL SAW CUTS MAY BE REQUIRED WITHIN THE AREA OF THE REPAIR TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE REPAIR EDGE.
- THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
- EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."

GENERAL NOTES

- ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
- THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
- EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



- LONGITUDINAL STEEL BARS:
- *REPAIR AREAS MAY BE ADJUSTED AFTER REMOVING DISTRESSED CONCRETE. SWITCH THE HALF-DEPTH REPAIR TO FULL-DEPTH REPAIR IF EXPOSED EXISTING LONGITUDINAL BARS ARE DEFICIENT, AS APPROVED. COMPENSATION WILL BE MADE FOR UNEXPECTED VOLUMES OF REPAIR AREAS OR CHANGES IN SCOPE OF WORK.
 - *INCREASE THE REPAIR AREA AND PERFORM A FULL-DEPTH REPAIR AS DIRECTED IF LONGITUDINAL STEEL BARS WERE DAMAGED BY THE REMOVAL OPERATIONS. NO ADDITIONAL COMPENSATION WILL BE MADE.

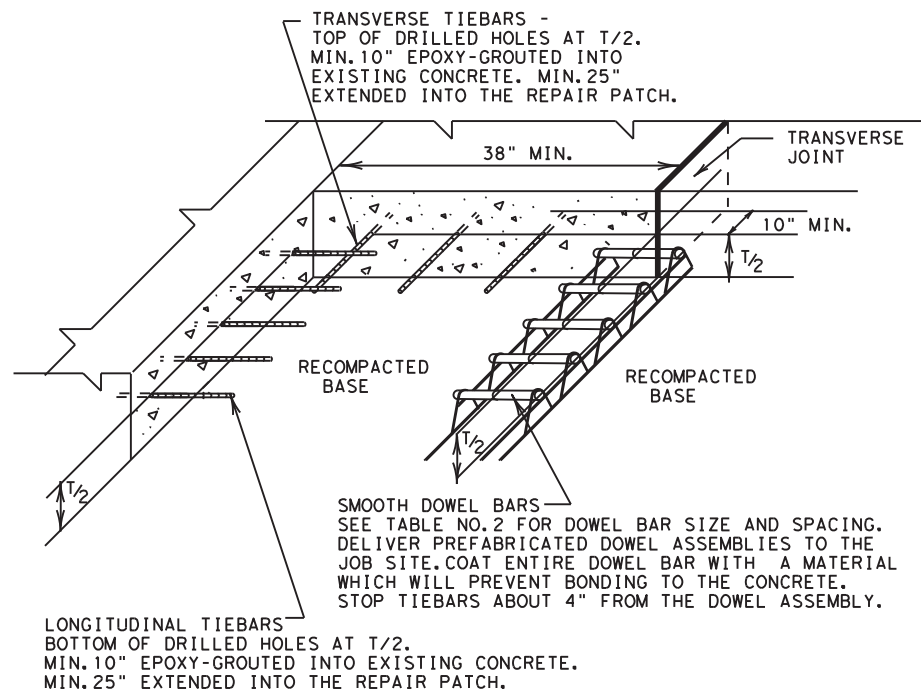
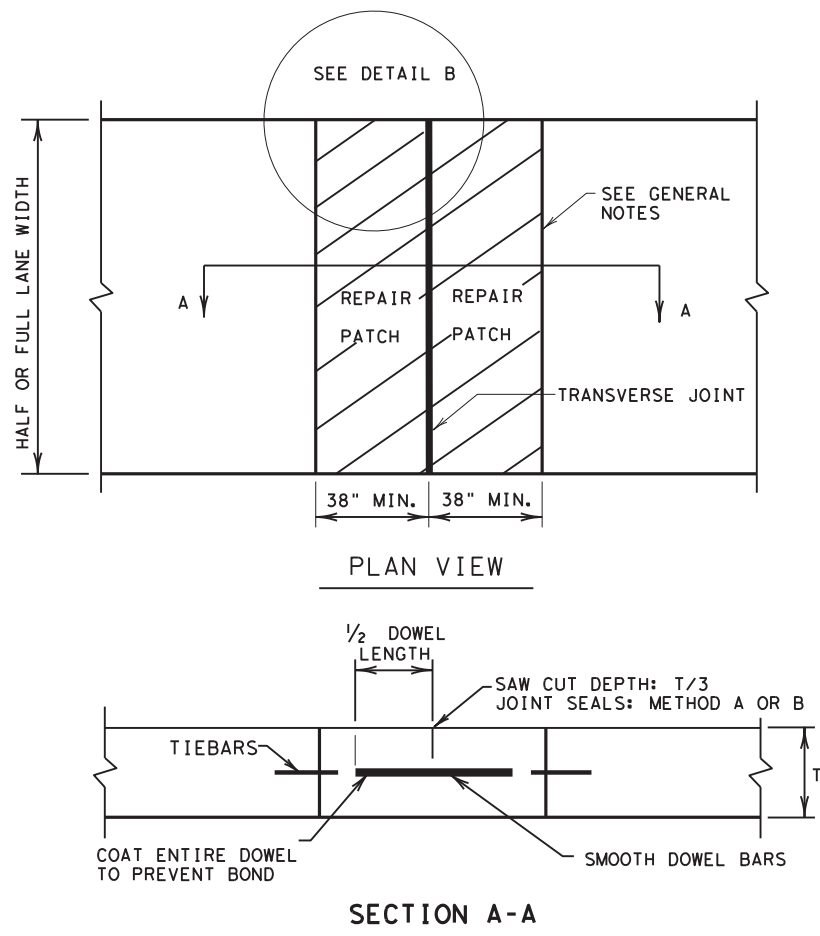
SECTION A-A
HALF-DEPTH REPAIR

SHEET 1 OF 2

				Design Division Standard	
REPAIR OF CONCRETE PAVEMENT					
REPCP-14					
FILE: repcp14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN	
© TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY	
REVISIONS	6389	94	001	IH 10, ETC	
	DIST	COUNTY	SHEET NO.		
	ELP	EL PASO	51		

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

DATE: 9/16/2021
 FILE: \\FS-ELPHO.dot.state.tx.us\DATA1\DistrictWide\RMC - MMC Projects\051 East Area Office\RMC_6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan_Set\Standards\Roadway\repcp14.dgn



DETAIL B
GROUTED TIEBARS & DOWELS

REPAIR OF TRANSVERSE JOINT OF CPCD

GENERAL NOTES

- ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
- MULTIPLE PIECE TIEBARS SHALL BE USED WHEN THE REPAIR AREA MUST BE PLACED IN TWO STAGES DUE TO SEQUENCE OF CONSTRUCTION.
- FULL DEPTH SAW CUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE REPAIRED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTER LINE OF THE PAVEMENT.
- AT LEAST ONE LONGITUDINAL FULL DEPTH SAW CUT SHALL BE AT AN EXISTING LONGITUDINAL JOINT.
- ADDITIONAL SAW CUTS MAY BE REQUIRED WITHIN THE AREA OF THE REPAIR TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE REPAIR EDGE.
- THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
- EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."
- DOWEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1/4 IN. HORIZONTALLY AND VERTICALLY UNLESS OTHERWISE SPECIFIED. WHERE DOWEL BAR BASKETS ARE USED, REMOVE THE SHIPPING WIRES.

PAVEMENT THICKNESS (INCHES)	SIZE AND DIA.	LENGTH (IN.)	SPACING (IN.)
<10	#8 (1 IN.)	18.0	12.0
≥10	#10 (1 1/4 IN.)		

SHEET 2 OF 2



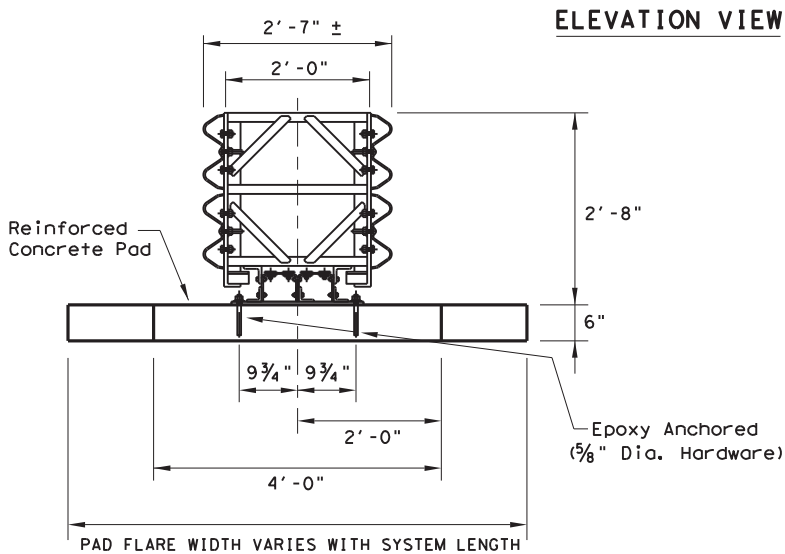
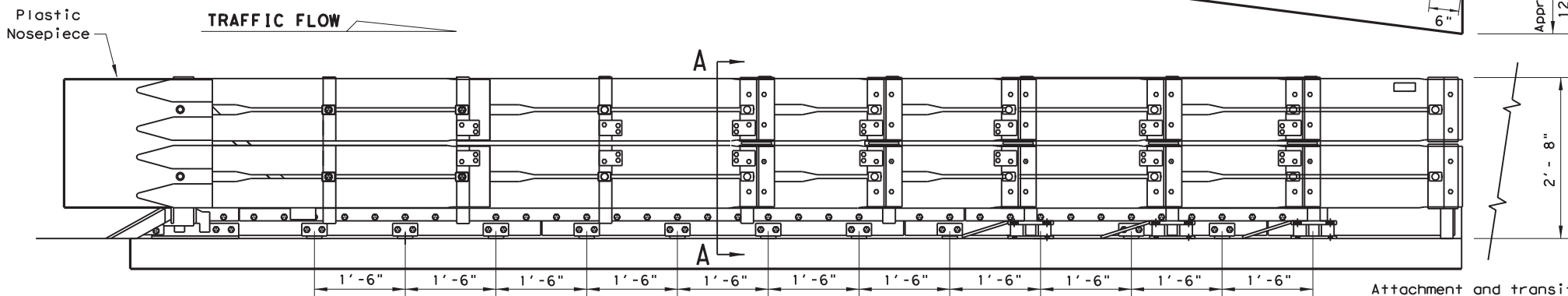
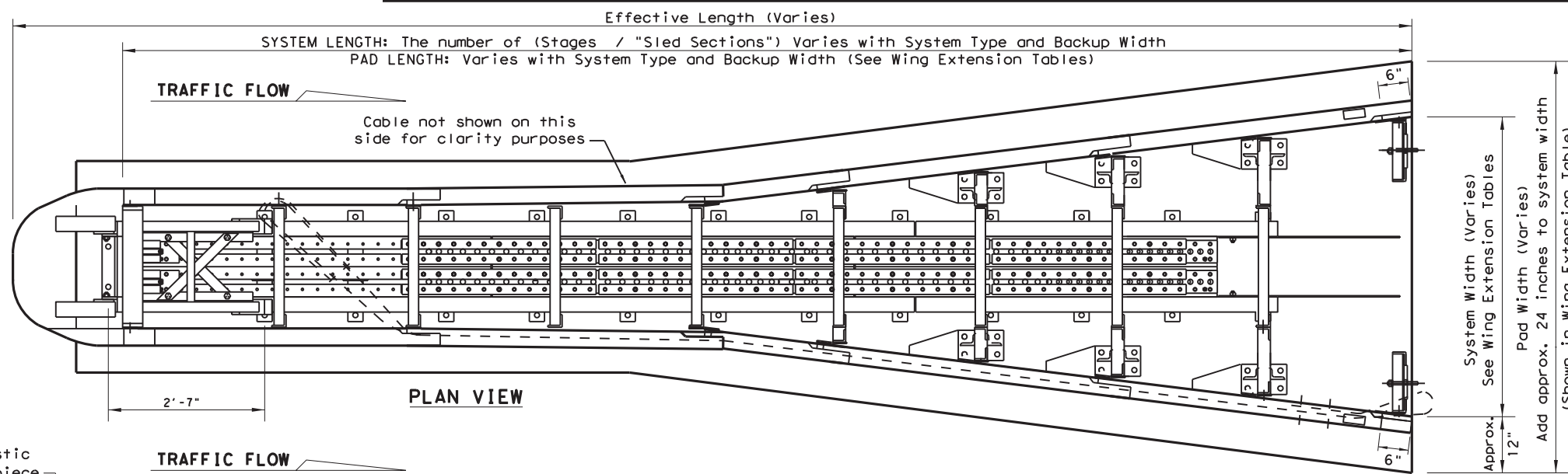
REPAIR OF CONCRETE PAVEMENT

REPCP - 14

FILE: repcp14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
© TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389	94	001	IH 10, ETC
	DIST	COUNTY	SHEET NO.	
	ELP	EL PASO	52	

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

DATE: 9/16/2021
 FILE: \\FS-ELPH0.dot.state.tx.us\DATA1\District\WideRMC - MMC Projects\051 East Area Office\RMC_6388-50-001 Miscellaneous Concrete\1 - DESIGN\Plan Set\Standards\Roadway\tracw16.dgn



TYPE (WIDE)	TEST LEVEL
FASTRACC (4 Stage System)	70
TRACC (3 Stage System)	TL-3
SHORTTRACC (2 Stage System)	TL-2

NOTE: The Stage System refers to number of replaceable "sled sections" that could be replaced independently.

Effective Length (Varies)
 SYSTEM LENGTH: The number of (Stages / "Sled Sections") Varies with System Type and Backup Width
 PAD LENGTH: Varies with System Type and Backup Width (See Wing Extension Tables)

Wide-FASTRACC WING EXTENSIONS				
NUMBER OF WING EXTENSIONS	WIDTH	SYSTEM LENGTH	EFFECTIVE LENGTH	Wide-FASTRACC EXTENSION PART NUMBER (LEFT# / RIGHT#)
0 (BASE UNIT)	71"	25'-11"	27'-11"	
1	78"	28'-3"	30'-3"	33940
2	85"	30'-7"	32'-7"	33941 / 33942
3	92"	32'-11"	34'-11"	33943 / 33944
4	99"	35'-2"	37'-2"	33945 / 33946
5	106"	37'-6"	39'-6"	33947 / 33948
6	113"	39'-10"	41'-10"	33949 / 33950
7	120"	42'-2"	44'-2"	33951 / 33952
8	127"	44'-5"	46'-5"	33953 / 33954
9	134"	46'-9"	48'-9"	33955 / 33956
10	141"	49'-1"	51'-1"	33957 / 33958
10+				CONSULT TRINITY SALES PERSON

Wide-TRACC WING EXTENSIONS				
NUMBER OF WING EXTENSIONS	WIDTH	SYSTEM LENGTH	EFFECTIVE LENGTH	Wide-TRACC EXTENSION PART NUMBER (LEFT# / RIGHT#)
0 (BASE UNIT)	58"	21'	23'	
1	65"	23'-4"	25'-4"	33940
2	72"	25'-8"	27'-8"	33941 / 33942
3	79"	28'	30'	33943 / 33944
4	86"	30'-4"	32'-4"	33945 / 33946
5	92"	32'-8"	34'-8"	33947 / 33948
6	99"	35'	37'	33949 / 33950
7	106"	37'-4"	39'-4"	33951 / 33952
8	113"	39'-8"	41'-8"	33953 / 33954
9	120"	42'	44'	33955 / 33956
10	127"	44'-4"	46'-4"	33957 / 33958
10+				CONSULT TRINITY SALES PERSON

Wide-SHORTTRACC WING EXTENSIONS				
NUMBER OF WING EXTENSIONS	WIDTH	SYSTEM LENGTH	EFFECTIVE LENGTH	Wide-SHORTTRACC EXTENSION PART NUMBER (LEFT# / RIGHT#)
0 (BASE UNIT)	39"	15'	17'	
1	46"	17'-4"	19'-4"	33940
2	53"	18'-9"	20'-9"	33941 / 33942
3	60"	21'-1"	23'-1"	33943 / 33944
4	66"	23'-5"	25'-5"	33945 / 33946
5	73"	25'-8"	27'-8"	33947 / 33948
6	80"	28'-1"	30'-1"	33949 / 33950
7	87"	30'-4"	32'-4"	33951 / 33952
8	94"	32'-7"	34'-7"	33953 / 33954
9	101"	34'-11"	36'-11"	33955 / 33956
10	108"	37'-3"	39'-3"	33957 / 33958
10+				CONSULT TRINITY SALES PERSON

BACKUP SUPPORT OPTIONS	
SQUARE CONCRETE BACKUP	
CONCRETE BARRIER (CTB) BACKUP	
SINGLE SLOPE CONCRETE BARRIER(SSCB)	
GUARDRAIL BACKUP (BASE-PLATED POST)	
GUARDRAIL BACKUP (DRIVEN POST)	

TRANSITION OPTIONS	
VERTICAL WALL	
MODIFIED (CTB) TO VERTICAL WALL	
CONCRETE BARRIER (CTB)	
GUARDRAIL (W-BEAM)	
GUARDRAIL (THRIE-BEAM)	

FOR BI-DIRECTIONAL TRANSITION PANEL DETAILS (SEE MANUFACTURER'S PRODUCT MANUAL).

BACKUP AND TRANSITION TYPES ARE SHOWN ELSEWHERE ON THE PLANS, (I.E. ATTENUATOR LOCATION DETAILS OR IN THE GENERAL NOTES).

FOUNDATION OPTIONS	
6" REINFORCED CONCRETE	
8" UNREINFORCED CONCRETE	
3" MIN. ASPHALT OVER 3" MIN. CONCRETE	
6" ASPHALT OVER 6" COMPACT SUBBASE	
8" MINIMUM ASPHALT	

FOR STEEL PLACEMENT IN CONCRETE FOUNDATIONS, (SEE MANUFACTURER'S PRODUCT MANUAL).

REUSABLE

GENERAL NOTES

- For specific information regarding installation and technical guidance of the system, contact: Trinity Highway at 1(888)323-6374, 2525 N. Stemmons Freeway - Dallas, TX 75207
- Contact the company for: Custom widths from 31" up to 57" wide, and transition panels for bi-directional traffic applications.
- Details of components for the WideTRACC, Backups and re-inforcing details will be shown on the manufacturer's shop drawings furnished to the Engineer.
- Concrete shall be class "S" with a min. compressive strength 4,000 p.s.i.
- If the cross-slope varies more than 2% over the length of the system, the concrete pad will require leveling. Maximum permissible cross-slope 8%.
- The installation area should be free from curbs, elevated objects, or depressions.
- The WideTRACC system should be approximately parallel with the barrier or ϕ of merging barriers.
- The Unit shown is flared on both sides, but can be flared on a single side either left or right. The flares will effect the length and width of the system. (See Wing Extension Tables)

Wide-TRACC - BILL OF MATERIAL				
PART #	FAST TRACC QTY	TRACC QTY	SHORT TRACC QTY	DESCRIPTION
25937A	1			WIDEFASTRACC UNIT ASSEMBLY
25939A		1		WIDETRACC UNIT ASSEMBLY
25997A			1	WIDESHORTTRACC UNIT ASSEMBLY
3310G	4	4	4	5/8" LOCKWASHER
4372G	4	4	4	5/8" FLATWASHER
4451G	4	4	4	5/8" DIA X 6" EXP. WEDGE ANCHOR
6531B	1	1	1	PLASTIC NOSEPIECE
6668B	4	4	4	REFLECTIVE SHEETING

ANCHOR HARDWARE (CONCRETE BASE)				
5204B	72	50	18	5/8" DIA X 7-1/16" THD ANCHOR STUD
4372G	72	50	18	5/8" FLATWASHER
3310G	72	50	18	5/8" LOCKWASHER
3361G	72	50	18	5/8" HEX NUT
5206B	6	4	2	Adhesive, Hilti Hit HY-150

ANCHOR HARDWARE (ASPHALT BASE)				
6380G	72	50	18	5/8" Dia x 18" Thd Anchor Stud
4372G	72	50	18	5/8" Flatwasher
3310G	72	50	18	5/8" Lockwasher
3361G	72	50	18	5/8" HEX NUT
5206B	15	11	4	ADHESIVE, HILTI HIT HY-150

ANCHOR HARDWARE (OPTIONAL ITEMS, AS NEEDED)				
5207B	A/R	A/R	A/R	NOZZLE, MIXER, HILTI HIT HY-150
5208B	A/R	A/R	A/R	EXT. TUBE, MIXER, HILTI HIT HY-150
5205B	A/R	A/R	A/R	DISPENSER GUN, HILTI HIT HY-150
5209B	A/R	A/R	A/R	DRILL BIT, 1/16", HILTI SDS



**TRINITY HIGHWAY
 CRASH CUSHION
 (WIDE UNIT)
 TRACC (W) - 16**

FILE: tracw16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
© TxDOT February 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	6389	94	001	IH 10, ETC
REVISED 06, 2013 (VP)	DIST	COUNTY	SHEET NO.	
REVISED 03, 2016 (VP)	ELP	EL PASO	54	

Certificate Of Completion

Envelope Id: 7C51FAF4850146C783D2733A97D08D0B	Status: Completed
Subject: Please DocuSign: RMC El Paso 6389-94-001.pdf	
Source Envelope:	
Document Pages: 59	Signatures: 2
Certificate Pages: 5	Initials: 0
AutoNav: Enabled	Envelope Originator:
Envelopeld Stamping: Enabled	Martin Sotelo
Time Zone: (UTC-06:00) Central Time (US & Canada)	125 E. 11th Street
	Austin, TX 78701
	Martin.Sotelo@txdot.gov
	IP Address: 204.64.21.250


Record Tracking

Status: Original	Holder: Martin Sotelo	Location: DocuSign
9/16/2021 12:14:45 PM	Martin.Sotelo@txdot.gov	

Signer Events

Signer Events	Signature	Timestamp
Monica Dubrule Monica.Dubrule@txdot.gov Contract Specialist TxDOT Security Level: Email, Account Authentication (None)	 <p>DocuSigned by: CEE6816D3535405...</p>	Sent: 9/16/2021 12:16:56 PM Viewed: 9/16/2021 12:20:26 PM Signed: 9/16/2021 12:20:44 PM
Signature Adoption: Uploaded Signature Image Using IP Address: 204.64.21.251		

Electronic Record and Signature Disclosure:
Not Offered via DocuSign

Omar Madrid Omar.Madrid@txdot.gov Director of Maintenance TxDOT Security Level: Email, Account Authentication (None)	 <p>DocuSigned by: 2D8D998F780488...</p>	Sent: 9/16/2021 12:16:55 PM Viewed: 9/16/2021 12:18:01 PM Signed: 9/16/2021 12:18:12 PM
Signature Adoption: Uploaded Signature Image Using IP Address: 204.64.21.250		

Electronic Record and Signature Disclosure:
Accepted: 4/27/2017 3:03:56 PM
ID: ebc27b03-30d0-4c6b-b180-29c6b17afa66

In Person Signer Events

Editor Delivery Events

Agent Delivery Events

Intermediary Delivery Events

Certified Delivery Events

Carbon Copy Events

Witness Events

Notary Events

Envelope Summary Events

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	9/16/2021 12:16:56 PM
Certified Delivered	Security Checked	9/16/2021 12:18:01 PM
Signing Complete	Security Checked	9/16/2021 12:18:12 PM

Envelope Summary Events	Status	Timestamps
Completed	Security Checked	9/16/2021 12:20:44 PM

Payment Events	Status	Timestamps
-----------------------	---------------	-------------------

Electronic Record and Signature Disclosure

ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

From time to time, Texas Department of Transportation (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through your DocuSign, Inc. (DocuSign) Express user account. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button at the bottom of this document.

Getting paper copies

At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. For such copies, as long as you are an authorized user of the DocuSign system you will have the ability to download and print any documents we send to you through your DocuSign user account for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a \$0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

Withdrawing your consent

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. To indicate to us that you are changing your mind, you must withdraw your consent using the DocuSign 'Withdraw Consent' form on the signing page of your DocuSign account. This will indicate to us that you have withdrawn your consent to receive required notices and disclosures electronically from us and you will no longer be able to use your DocuSign Express user account to receive required notices and consents electronically from us or to sign electronically documents from us.

All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through your DocuSign user account all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact Texas Department of Transportation:

You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:

To contact us by email send messages to: kevin.setoda@txdot.gov

To advise Texas Department of Transportation of your new e-mail address

To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at kevin.setoda@txdot.gov and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..

In addition, you must notify DocuSign, Inc to arrange for your new email address to be reflected in your DocuSign account by following the process for changing e-mail in DocuSign.

To request paper copies from Texas Department of Transportation

To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an e-mail to kevin.setoda@txdot.gov and in the body of such request you must state your e-mail address, full name, US Postal address, and telephone number. We will bill you for any fees at that time, if any.

To withdraw your consent with Texas Department of Transportation

To inform us that you no longer want to receive future notices and disclosures in electronic format you may:

- i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
- ii. send us an e-mail to kevin.setoda@txdot.gov and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows2000? or WindowsXP?
Browsers (for SENDERS):	Internet Explorer 6.0? or above
Browsers (for SIGNERS):	Internet Explorer 6.0?, Mozilla FireFox 1.0, NetScape 7.2 (or above)
Email:	Access to a valid email account
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	<ul style="list-style-type: none"> •Allow per session cookies •Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.

Acknowledging your access and consent to receive materials electronically

To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.

By checking the 'I Agree' box, I confirm that:

- I can access and read this Electronic CONSENT TO ELECTRONIC RECEIPT OF ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and
- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and
- Until or unless I notify Texas Department of Transportation as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by Texas Department of Transportation during the course of my relationship with you.