STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
3136	01	191, etc	SL 0001
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		1

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT NUMBER
C 3136-1-191
3136-01-191, ETC.

	ROADWAY LENGTH		BRIDGE LENGTH		TOTAL LENGTH	
CSJ	(FT)	(MI)	(FT)	(MI)	(FT)	(MI)
3136-01-191 (SL 1)	4,638.40	0.88	0.00	0.00	4,638.40	0.88
3417-03-025 (FM 734)	1,880.79	0.35	0.00	0.00	1,880.79	0.35
TOTAL	6,519.19	1.23	0.00	0.00	6,519.19	1.23

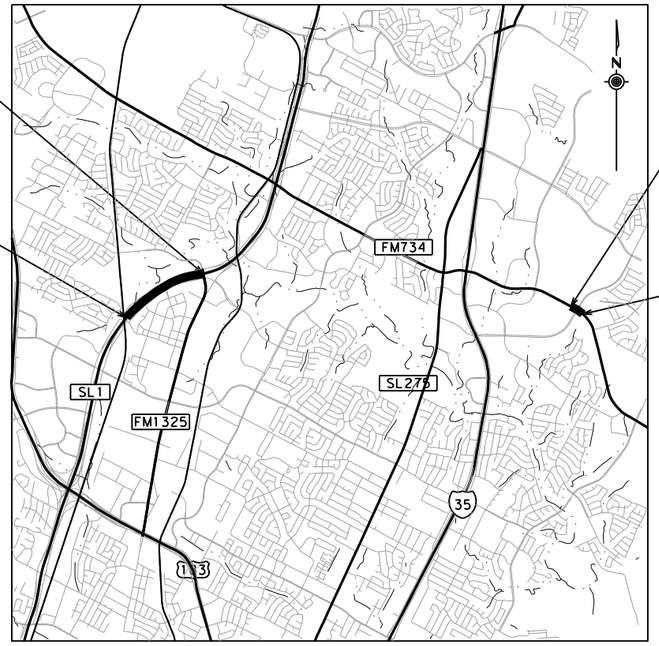
TRAVIS COUNTY
SL 1, ETC.

FROM: DUVAL ROAD, ETC.
TO: 0.8 MILES WEST OF DUVAL ROAD, ETC.

FOR THE CONSTRUCTION OF NEW RAMP AND INTERSECTION IMPROVEMENTS CONSISTING OF RECONFIGURE NB EXIT RAMP, ADD ILLUMINATION, WITH INTERSECTION AND OPERATIONAL IMPROVEMENTS, CONSTRUCT RIGHT TURN LANE AT HARRIS RIDGE AND RIGHT TURN DECEL AT NEW DRIVEWAY.

BEGIN PROJECT SL 1 (N MOPAC EXPY)
CSJ: 3136-01-191
STA. 68+61.60
REF MRKR: 418+1.313
MILE PT: 5.307
DFO: 5.082

END PROJECT SL 1 (N MOPAC EXPY)
CSJ: 3136-01-191
STA 115+00.00
REF MRKR: 430+0.291
MILE PT: 6.213
DFO: 5.988



BEGIN PROJECT FM 734 (PARMER LN)
CSJ: 3417-03-025
STA 44+86.09
REF MRKR: 432+0.987
MILE PT: 1.156
DFO: 12.762

END PROJECT FM 734 (PARMER LN)
CSJ: 3417-03-025
STA 63+66.88
REF MRKR: 432+1.244
MILE PT: 1.413
DFO: 13.019

EXCEPTIONS: FM 734 STA 52+50.10 TO STA 57+55.50
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

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

Texas Department of Transportation

DESIGN SPEED

SL1 MAIN LANES: N/A MPH
SL1 FRONTAGE ROAD: 50 MPH
SL1 RAMP: 30 MPH

FM734 MAIN LANES: 50 MPH
FM734 CROSS STREET: 50 MPH

A.D.T.

SL1 2020: 21,800 VPD
SL1 2040: 39,200 VPD

FM734 2015: 32,725 VPD
FM734 2035: 88,080 VPD

FINAL PLANS

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED AND ACCEPTED: _____

FINAL CONTRACT COST: $_____

CONTRACTOR: _____

LIST OF APPROVED CHANGE ORDERS:

I CERTIFY THAT THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THE FINAL AS-BUILT PLANS AND SPECIFICATIONS.

_____ P.E. _____ DATE

RECOMMENDED FOR LETTING: 3/11/2021

DocuSigned by:
Dwayne Hellmann, P.E.
19801249248D40...
DISTRICT DESIGN ENGINEER

SUBMITTED FOR LETTING: 3/11/2021

DocuSigned by:
Victor Vargas, P.E.
65066A1473104FD...
AREA ENGINEER

APPROVED FOR LETTING: 3/12/2021

DocuSigned by:
Heather Ashley-Nguyen
8912AF48F4B4416...
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\1. General\SL0001*GEN*TITLE.dgn
DATE: 3/3/2021 2:05:46 PM

STATE OF TEXAS
RACHEL R. LARCOM
95872
LICENSED
PROFESSIONAL ENGINEER

>> INDICATES THE STANDARD SHEETS SPECIFICALLY IDENTIFIED HAVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION AND ARE APPLICABLE TO THIS PROJECT.

RACHEL R. LARCOM P.E. 3/4/2021
RACHEL R. LARCOM — DATE

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER

# INDICATES THE STANDARD SHEETS SPECIFICALLY IDENTIFIED HAVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION AND ARE APPLICABLE TO THIS PROJECT.

ARMANDO CASTRO, JR. P.E. 12/29/2020
ARMANDO CASTRO, JR. — DATE

Austin District
North Travis Area Office

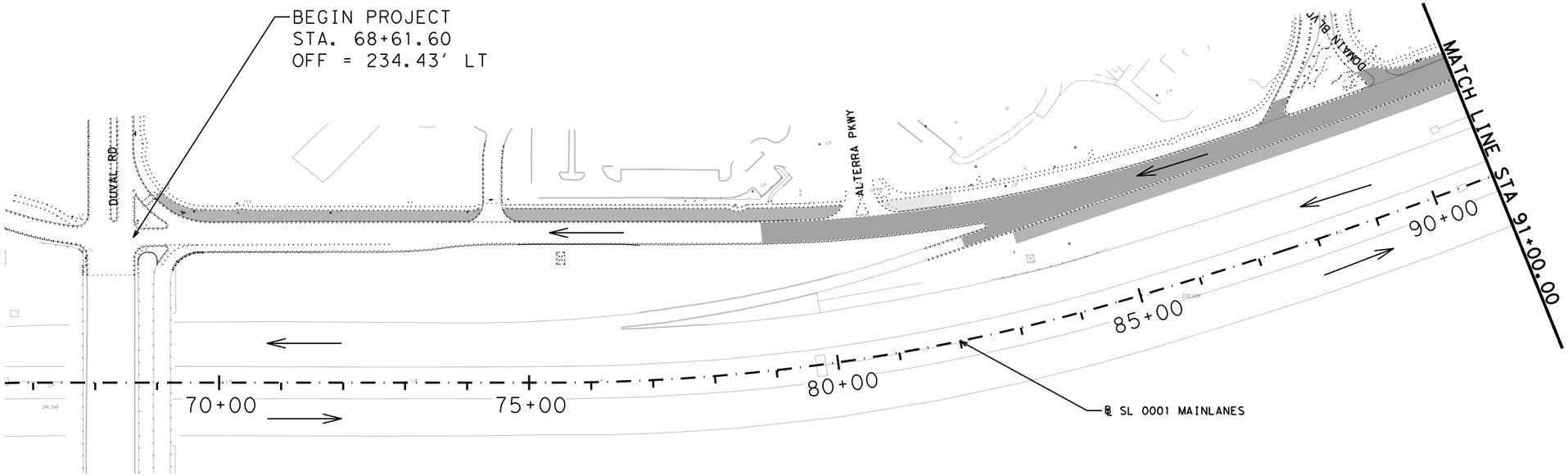
Texas Department of Transportation

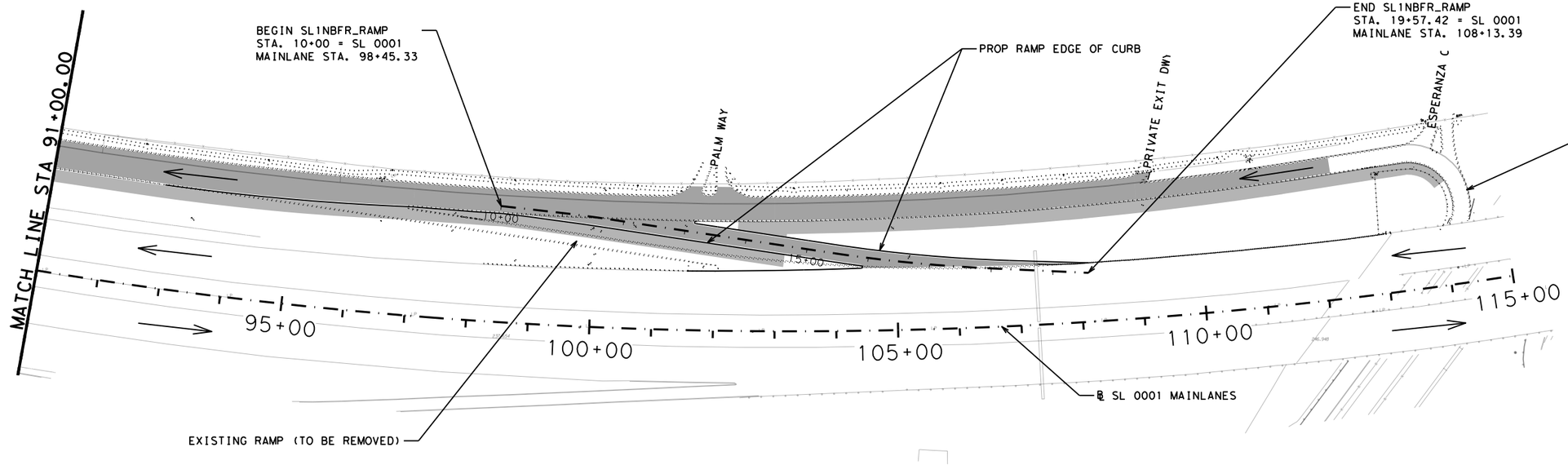
SL 1, etc.

INDEX OF SHEETS

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3136	01	191,etc	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		2

DATE: 3/4/2021 4:28:13 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\1. General\002_INDEX.dgn





STATE OF TEXAS
RACHEL R. LARCOM
95872
LICENSED
PROFESSIONAL ENGINEER

12/29/2020

SCALE (IN FEET):
0 200

Austin District
North Travis Area Office

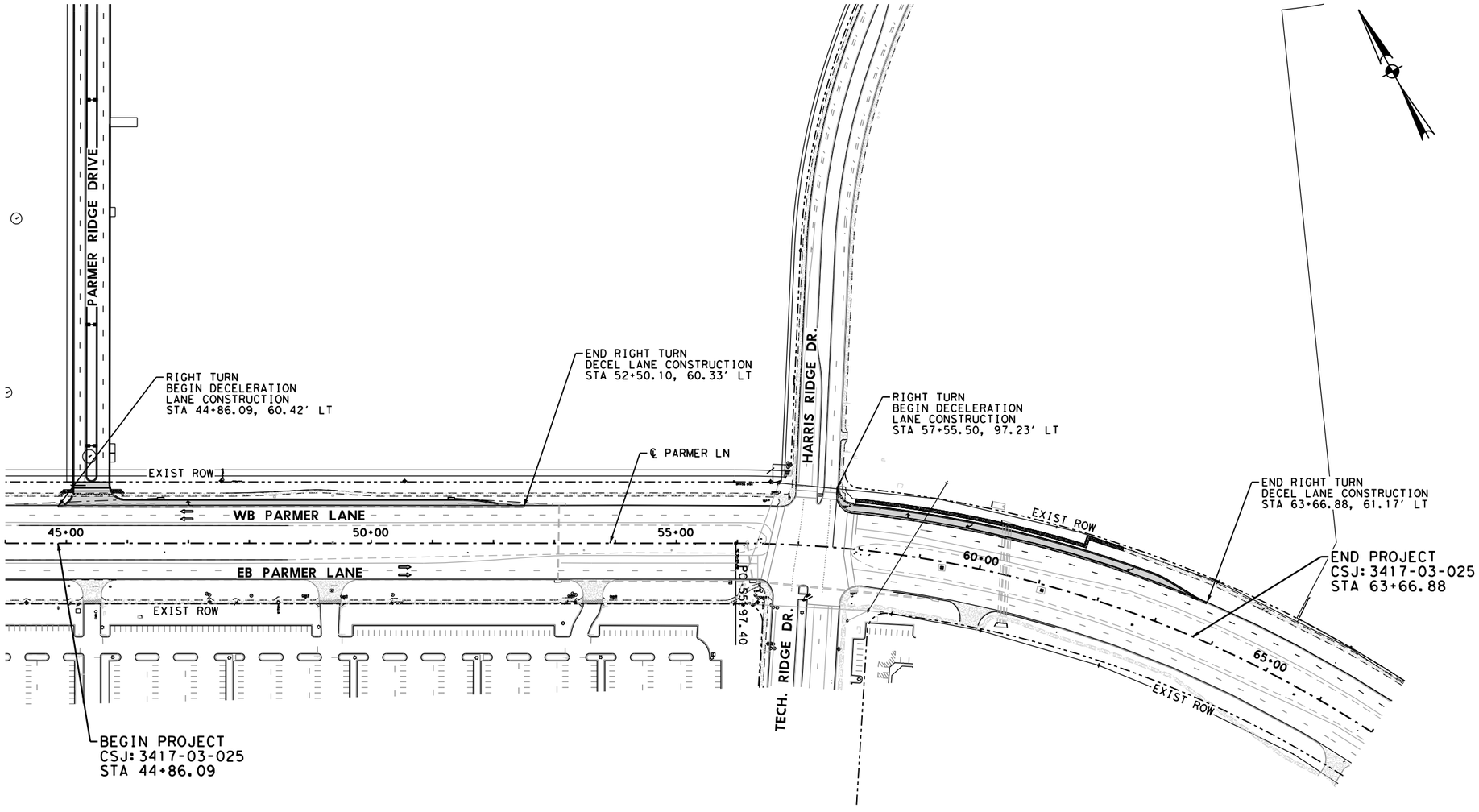
Texas Department of Transportation

SL 1

PROJECT LAYOUT

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3136	01	191,etc	SL 0001
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	TRAVIS		3

DATE: 12/29/2020 12:03:47 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\1. General\SL1_PRJLO.dgn



LEGEND

- EXISTING DIRECTION OF TRAFFIC
- PROPOSED DIRECTION OF TRAFFIC
- EXIST ROW
- SAWCUT LINE
- OE — OVERHEAD ELECTRICAL
- PROPOSED PAVEMENT

NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING OVERHEAD AND UNDERGROUND FACILITIES IF ADJACENT TO WORK AREA.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK I.E. FADED.
3. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR ADDITIONAL ALIGNMENT INFORMATION.
4. REFER TO SIGNING AND PAVEMENT MARKING LAYOUT SHEETS FOR ADDITIONAL SIGNING AND PAVEMENT MARKING INFORMATION.
5. PROPOSED ELEVATIONS TO BE DETERMINED BY EXTENDING EXISTING PAVEMENT CROSS-SLOPE TO STATIONS AND OFFSETS SHOWN IN PLAN VIEW.
6. PROPOSED STATION AND OFFSETS ARE CALLED OUT AT LIP OF GUTTER UNLESS OTHERWISE STATED.

0 50 100 200

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
12/9/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

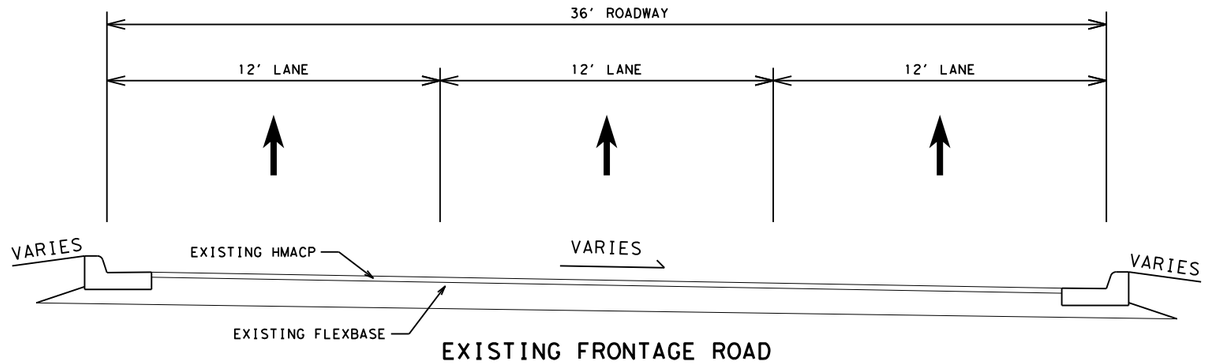
PARMER LANE

ROADWAY PROJECT LAYOUT

SHEET 1 OF 1

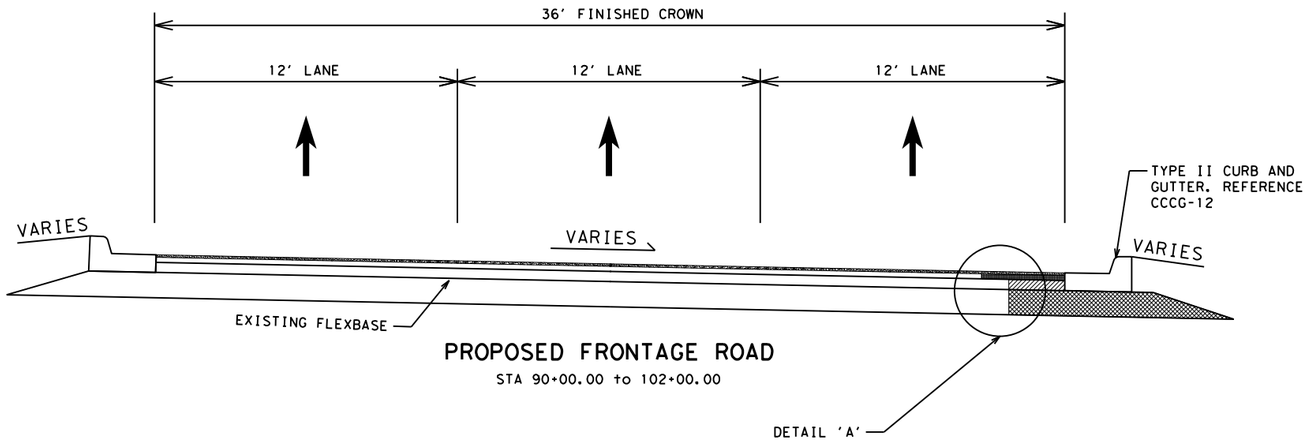
© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		4

V:\2220\active\222010025\civil\cad\CD Design\DRWY ACCESS RT\GENERAL\222010025_PRJT.dgn 12/9/2020 11:11:49 AM KMcClure 100%



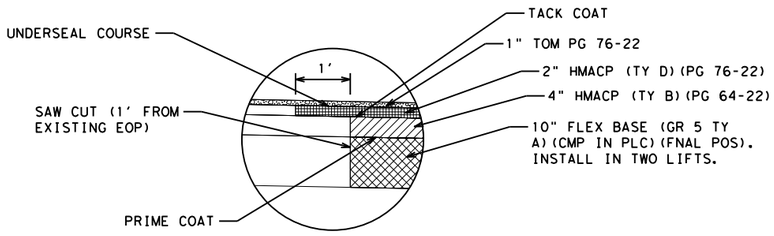
EXISTING FRONTAGE ROAD

STA 90+00.00 to 102+00.00

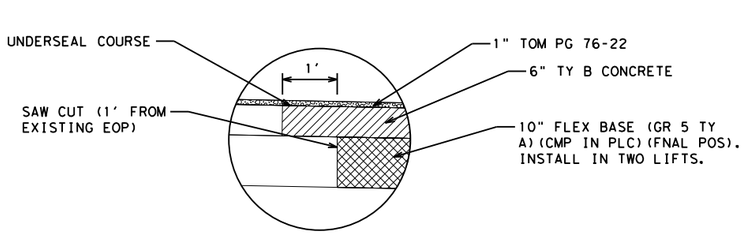


PROPOSED FRONTAGE ROAD

STA 90+00.00 to 102+00.00



DETAIL 'A'



DETAIL 'A'

<6' WIDENING

DocuSigned by:
Shane Swimm
F0E6FDD2B5994AD...

12/17/2020

STATE OF TEXAS
SHANE V. SWIMM
138362
LICENSED PROFESSIONAL ENGINEER

Austin District
North Travis Area Office

Texas Department of Transportation

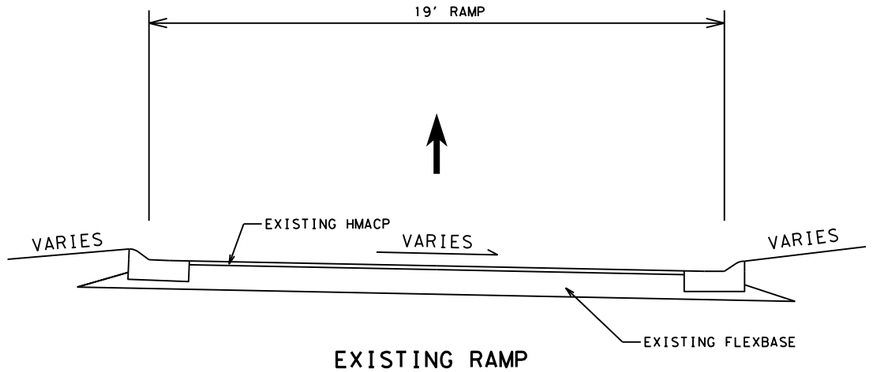
SL 1

FRONTAGE ROAD TYPICAL SECTIONS

SHEET 1 OF 2

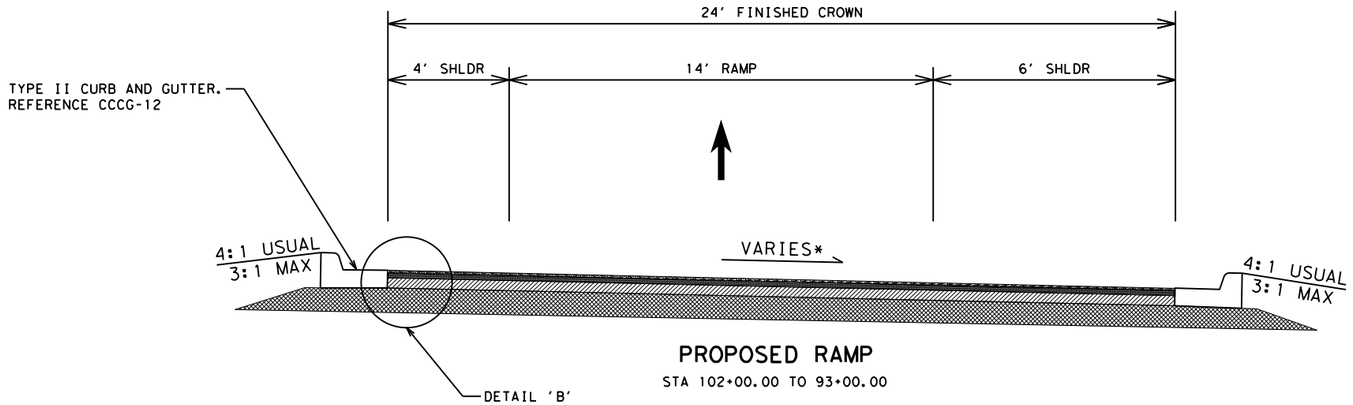
DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3136	01	191,etc	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		5

DATE: 12/17/2020 1:04:07 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\1. General\SL1_GEN_TYP.dgn



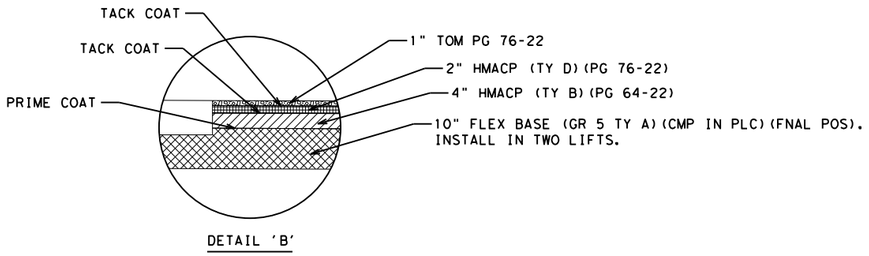
EXISTING RAMP

STA 102+00.00 TO 93+00.00

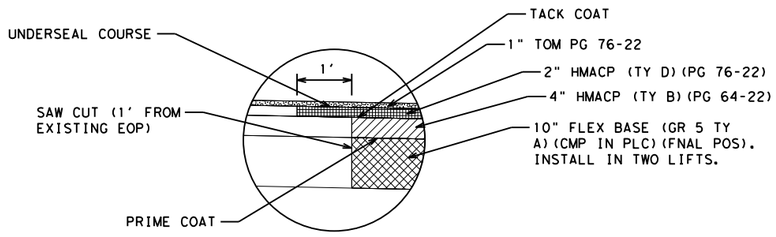


PROPOSED RAMP

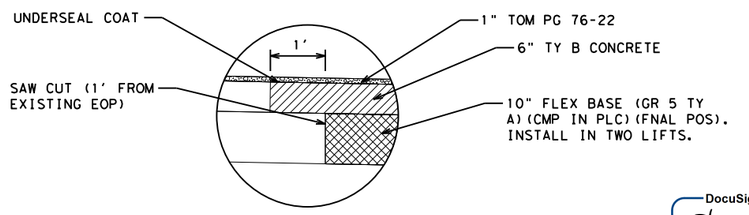
STA 102+00.00 TO 93+00.00



DETAIL 'B'



WIDENING @ SL 1



WIDENING @ SL 1

<6' WIDENING

*NOTE: RAMP TRANSITIONS FROM EXISTING FRONTAGE ROAD SLOPE TO 2.0% TO EXISTING MAINLANE SLOPE.

DocuSigned by:
Shane Swimm
F0E6FDD2B5994AD...

12/17/2020

STATE OF TEXAS
SHANE V. SWIMM
138362
LICENSED
PROFESSIONAL ENGINEER

Austin District
North Travis Area Office

Texas Department of Transportation

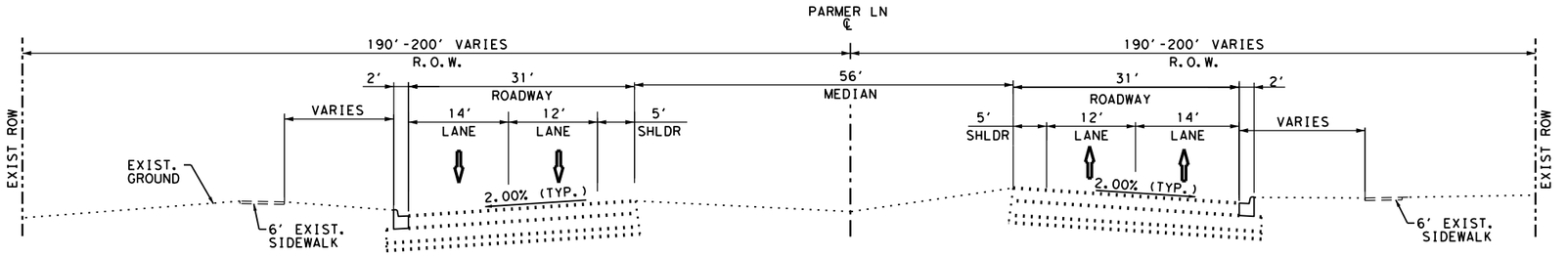
SL 1

EXIT RAMP TYPICAL SECTIONS

SHEET 2 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3136	01	191,etc	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		6

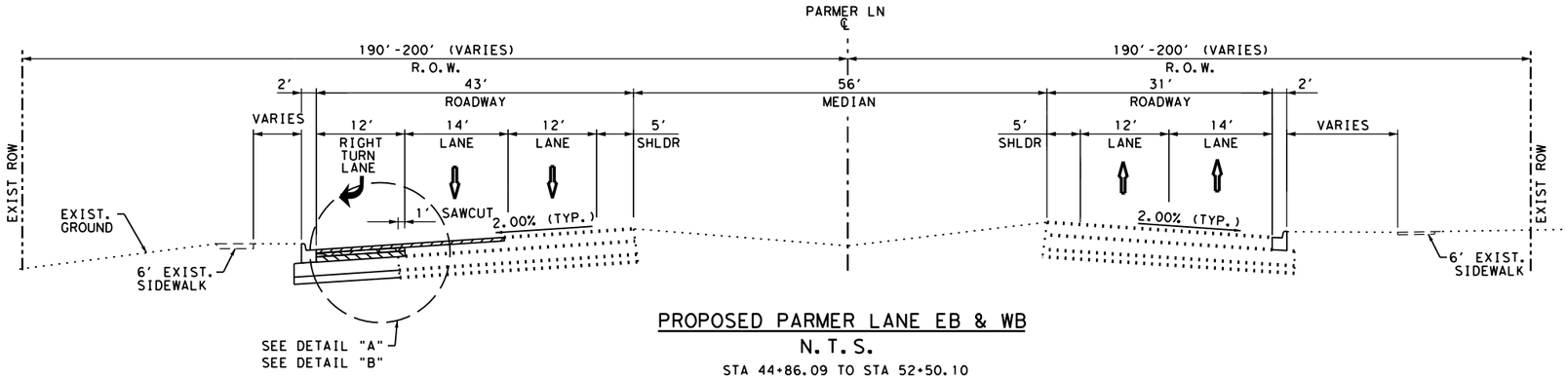
DATE: 12/17/2020 1:10:49 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\1. General\SL1_GEN_TYP_2.dgn



EXISTING PARMER LANE EB & WB

N.T.S.

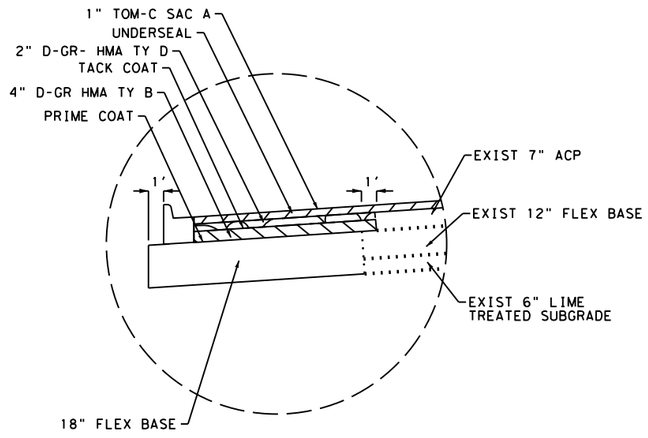
STA 44+86.09 TO STA 52+50.10



PROPOSED PARMER LANE EB & WB

N.T.S.

STA 44+86.09 TO STA 52+50.10
EXCEPTION: STA 52+50.10 TO STA 57+55.50



DETAIL "A"

N.T.S.

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
12/9/2020

NO.	REVISIONS	BY	DATE

Stantec

Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

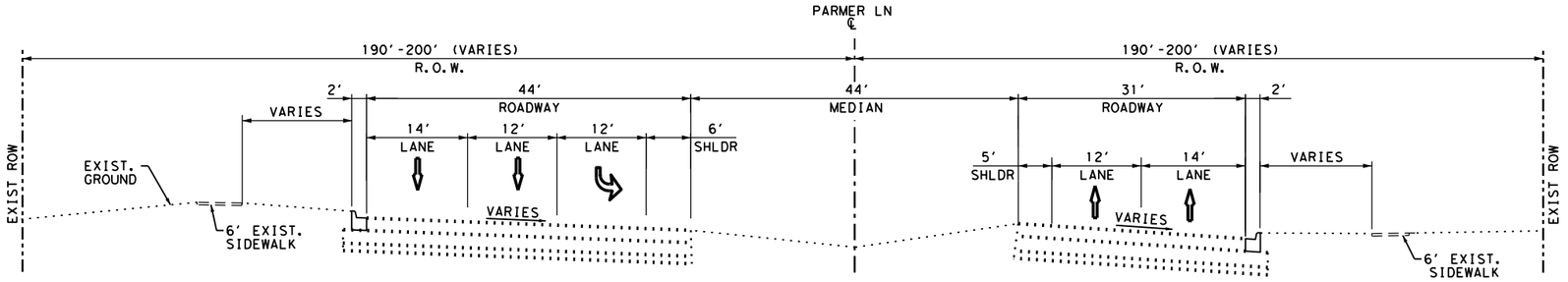
PARMER LANE

TYPICAL SECTIONS

SHEET 1 OF 1

© 2020	CONT	SECT	JOB	HIGHWAY
DS: CK:	3417	03	025	FM 734
DW: CK:	DIST	COUNTY		SHEET NO.
	14	TRAVIS		7

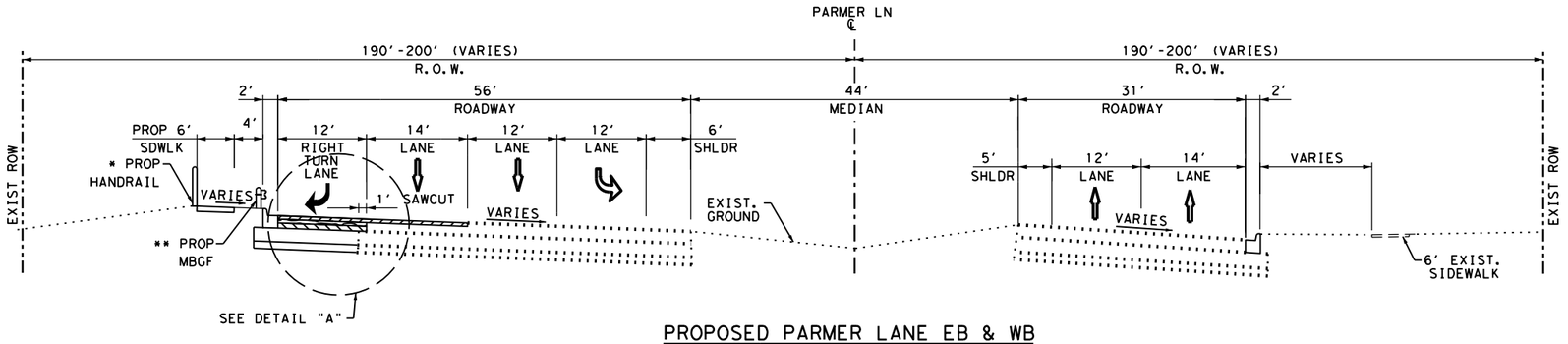
V:\2220\active\222010025\civil\cad\CD Design\DRWY ACCESS RT\GENERAL\222010025_TYP.dgn 12/9/2020 11:15:08 AM KMcClure 100%



EXISTING PARMER LANE EB & WB

N. T. S.

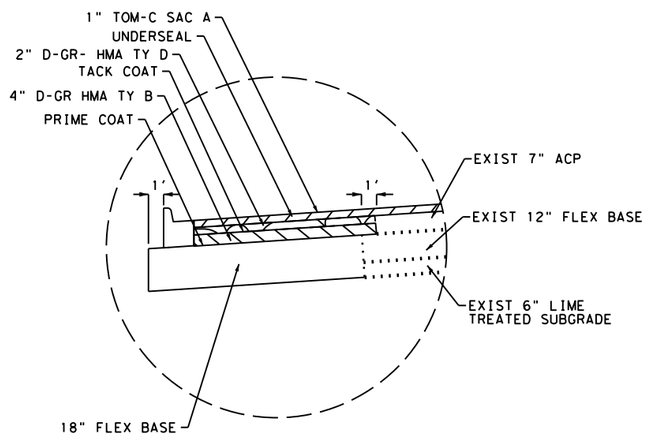
STA 57+55.50 TO STA 63+66.88



PROPOSED PARMER LANE EB & WB

N. T. S.

STA 57+55.50 TO STA 63+66.88
* STA 60+01.00 TO STA 60+52.00
** STA 59+65.08 TO STA 61+57.00



DETAIL "A"

N. T. S.

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
12/9/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

PARMER LANE

TYPICAL SECTIONS

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		8

GENERAL NOTES: Version: October 26, 2020

Item	Description	**Rate
**204	**Sprinkling**	
	(Dust)	30 GAL/CY
	(Item 132)	30 GAL/CY
	(Item 247)	30 GAL/CY
**210	**Rolling (Flat Wheel)**	
	(Item 247)	1 HR/200 TON
	(Item 316)	1 HR/6000 SY
**210	**Rolling (Tamping and Heavy Tamping)**	1 HR/200 CY
**210	**Rolling (Lt Pneumatic Tire)**	
	(Item 132)	1 HR/500 CY
	(Item 247)	1 HR/200 TON
	(Item 316 - Seal Coat)	1 HR/6000 SY
	(Item 316 - Two Course)	1 HR/3000 SY
247	**Flexible Base (CMP IN PLC)**	
310	**Prime Coat**	0.20 GAL/SY
316	**Underseals Asphalts (Multi Option)**	0.20 GAL/SY
	Surface Treatments	
	Seal Coat	
	Grade 4	
	Asphalt	0.38 GAL/SY
	Aggregate	1 CY/120 SY
	Grade 5	
	Asphalt	0.32 GAL/SY
	Aggregate	1 CY/150 SY
	Two Course Surface Treatment	
	Asphalt 1st Application	0.28 GAL/SY
	Asphalt 2nd Application	0.24 GAL/SY
	Aggregate 1st Application Grade 4	1 CY/110 SY
	Aggregate 2nd Application Grade 4	1 CY/130 SY
341/3076	**Dense-Graded Hot-Mix Asphalt and Superpave**	110 LB/SY/IN
347/3081	**Thin Overlay Mixtures (TOM) - Surface**	
	Asphalt	7.0 LB/SY/IN
	Aggregate (SAC B)	106.0 LB/SY/IN
	Aggregate (SAC A)	109.0LB/SY/IN
3084	**Bonding Course**	0.09 GAL/SY
3085	**UnderSeal Course**	0.20 GAL/SY
	Tack Coat	0.08 GAL/SY

** For Informational Purposes Only

GENERAL

Contractor questions on this project are to be addressed to the following individual(s):
North Austin Susana.Ceballos@txdot.gov
North Austin Jason.Cavness@txdot.gov

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

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

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

References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved.

If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the work, if required.

The roadbed will be free of organic material prior to placing any section of the pavement structure.

Equip all construction equipment used in roadway work with highly visible omnidirectional flashing warning lights.

Intelligent Transportation Systems (ITS) Infrastructure may exist within the limits of this project and that the system must remain operational throughout construction. The exact location of ITS Infrastructure is not known. Contact the TxDOT Area Engineer's or Inspection Team's Office for the location(s) at least 48 hours before commencing any work that might affect present ITS Infrastructure. Use caution if working in these areas to avoid damaging or interfering with existing facilities. Repair any damage to this system within 8 hours of occurrence at no cost to the Department. In the event of system damage, notify TxDOT/CTECC at (512) 974-0883 within one hour of occurrence. Failure of the Contractor to repair damage to any infrastructure that conveys any corridor information to TxDOT/CTECC will result in the Contractor being billed for the full cost of emergency repairs.

Provide a smooth, clean sawcut along the existing asphalt or concrete pavement structure, as directed. Consider subsidiary to the pertinent Items.

Construct all manholes/valves to final pavement elevations prior to the placement of final surface. If the manholes/valves are going to be exposed to traffic, place temporary asphalt around the manhole/valve to provide a 50:1 taper. The asphalt taper is subsidiary to the ACP work.

Use a self-contained vacuum broom to sweep the roadway and keep it free of sediment as directed. The contractor will be responsible for any sweeping above and beyond the normal maintenance required to keep fugitive sediment off the roadway as directed by the Engineer.

Damage to existing pipes and SET's due to Contractor operations will be repaired at Contractor's expense.

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right of way, will be as directed. Use of right of way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist. The Contractor will not have exclusive use of right of way but will cooperate in the use of the right of way with the city/county and various public utility companies as required.

Coordinate and obtain approval for all bridgework over existing roadways.

During evacuation periods for Hurricane events the Contractor will cooperate with Department for the restricting of Lane Closures and arranging for Traffic Control to facilitate Coastal Evacuation Efforts.

ITEM 5 – CONTROL OF THE WORK
Place construction stakes at intervals of no more than 100 ft. This work is subsidiary.

Provide a 72-hour advance email notice to AUS_Locate@TxDOT.gov to request illumination, traffic signal, ITS, or toll equipment utility locates. Provide an electronic pdf of as-builts within 21 calendar days of illumination, traffic signal, ITS, or toll equipment being placed into operation. As-built shall include GPS coordinates of manholes and junction boxes. Include final version of RFI's and revised plan sheets.

Precast Alternate Proposals.
When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Electronic Shop Drawing Submittals:
Submit electronic shop drawing submittals according to the current Guide to Electronic Shop Drawing Submittal https://www.txdot.gov/business/resources/specifications/shop-drawings.html (TxDOT.gov Business > Resources - General > Shop Drawings). Pre-approved producers can be found online at TxDOT.gov > Business > Resources - Material Producer List. Use the following contact list for all submittals that are not required to be sent to Bridge Division and to copy the Engineer for all submittals to the Bridge Division.
Submittal Contact List
North Austin Susana.Ceballos@txdot.gov AUS_NA-ShopReview@txdot.gov

Alignment and Profile
Unless shown in the plans, profile and alignment data for roadways being overlaid or widened are for design verification only. Provide survey and construct the roadway in accordance with the typical section. Bid items and data may be provided to adjust cross slope and super elevations.

ITEM 6 - CONTROL OF MATERIALS
Give a minimum of 1 business day notice for materials, which require inspection at the Plant.

For structures with paint containing hazardous materials, provide locations of paint removal 60 days prior to begin removal.

For removal, tie, or tap of asbestos concrete (AC) pipe, contact TxDOT and the local utility company 60 days prior to performing the work. Expose the AC pipe to provide a minimum of 1 ft. of clearance around the top and sides. A minimal amount of soil may remain around the AC pipe to avoid disturbance. The local utility company will be responsible for the demo notice to DSHS and removal of the AC pipe. Tie or tap into existing AC pipe may require removing an entire section of pipe from collar to collar and replacement of pipe with new pipe using existing bid items.

ITEM 7 – LEGAL RELATIONS AND RESPONSIBILITIES
Roadway closures during key dates and/or special events are prohibited. See notes for Item 502 for the key dates and/or special events.

Refer to the Environmental Permits, Issues and Commitments (EPIC) plan sheets for additional requirements and permits.

When any abandoned well is encountered, cease construction operations in this area and notify the Engineer who will coordinate the proper plugging procedures. A water well driller licensed in the State of Texas must be used to plug a well.

Erosion control and stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days. Track all exposed soil, stockpiles, and slopes. Tracking consists of operating a tracked vehicle or equipment up and down the slope, leaving track marks perpendicular to the direction of the slope. Re-track slopes and stockpiles after each rain event or every 14 days, whichever occurs first. This work is subsidiary.

Perform maintenance of vehicles or equipment at designated maintenance sites. Keep a spill kit on-site during fueling and maintenance. This work is subsidiary.

Maintain positive drainage for permanent and temporary work for the duration of the project. Be responsible for any items associated with the temporary or interim drainage and all related maintenance. This work is subsidiary.

Suspend all activities near any significant recharge features, such as sinkholes, caves, or any other subterranean openings that are discovered during construction or core sampling. Do not proceed until the designated Geologist or TCEQ representative is present to evaluate and approve remedial action.

Locate aboveground storage tanks kept on-site for construction purposes in a contained area as to not allow any exposure to soils. The containment will be sized to capture 150% of the total capacity of the storage tanks.

PSL in Edwards Aquifer Recharge and Contributing Zone.
Obtain written approval from the Engineer for all on or off right of way PSLs not specifically addressed in the plans. Provide a signed SW3P sketch of the location 30 business days prior to use of the PSL. Include a list of materials, equipment and portable facilities that will be stored at the PSL.

PSL in USACE Jurisdictional Area.
Do not initiate activities in a PSL associated with a U.S. Army Corps of Engineers (USACE) jurisdictional area that have not been previously evaluated by the USACE as part of the permit review of this project. Such activities include, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Associated defined here means materials are delivered to or from the PSL. The jurisdictional area includes all waters of the U.S. including wetlands or associated wetlands affected by activities associated with this project. Special restrictions may be required for such work. Consult with the USACE regarding activities, including PSLs that have not been previously evaluated by the USACE. Provide the Department with a copy of all USACE coordination and approvals before initiating activities.

Proceed with activities in PSLs that do not affect a USACE jurisdictional area if self-determination has been made that the PSL is non-jurisdictional or proper clearances have been obtained in USACE jurisdictional areas or have been previously evaluated by the USACE as part of the permit review of this project. Document any determinations that PSL activities do not affect a USACE jurisdictional area. Maintain copies of PSL determinations for review by the Department or any regulatory agency. The Contractor must document and coordinate with the USACE, if required, before any excavation material hauled from or embankment material hauled into a USACE jurisdictional area by either (1) or (2) below.

1. **Restricted Use of Materials for the Previously Evaluated Permit Areas.** When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:
    a. suitable excavation of required material in the areas shown on the plans and cross sections as specified in Standard Specification Item 110, Excavation is used for permanent or temporary fill within a USACE jurisdictional area;
    b. suitable embankment from within the USACE jurisdictional area is used as fill within a USACE evaluated area;
    c. Unsuitable excavation or excess excavation that is disposed of at an approved location within a USACE evaluated area.

2. **Contractor Materials from Areas Other than Previously Evaluated Areas.** Provide the Department with a copy of all USACE coordination and approvals before initiating any activities in a jurisdictional area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to, haul roads, equipment staging areas, borrow and disposal sites:
    a. Standard Specification Item 132, Embankment is used for temporary or permanent fill within a USACE jurisdictional area;
    b. Unsuitable excavation or excess excavation that is disposed of outside a USACE evaluated area.

Work over or near Bodies of Water (Lakes, Rivers, Ponds, Creeks, etc.).
Keep on site a universal spill kit adequate for the body of water and the work being performed. Debris is not allowed to fall into the ordinary high-water level (OHWL). Debris that falls into the OHWL must be removed at the end of each work day. Debris that falls into the floodway must be removed at the end of each work week or prior to a rain event. Install and maintain traffic control devices to maintain a navigable corridor for water traffic, except during bridge demo and beam placement. This work is subsidiary.

Migratory Birds and Bats.
Migratory birds and bats may be nesting within the project limits and concentrated on roadway structures such as bridges and culverts. Remove all old and unoccupied migratory bird nests from any structures, trees, etc. between September 16 and February 28. Prevent migratory birds from re-nesting between March 1 and September 15. Prevention shall include all areas within 25 ft. of proposed work. All methods used for the removal of old nesting areas and the prevention of re-nesting must be submitted to TxDOT 30 business days prior to begin work. This work is subsidiary.

If active nests are encountered on-site during construction, all construction activity within 25 ft. of the nest must stop. Contact the Engineer to determine how to proceed.

Tree and Brush Trimming and Removal.
Work will be conducted September 16 thru February 28. Work conducted outside this timeframe will require a bird survey. Submit a survey request to TxDOT 30 business days prior to begin work.

No extension of time or compensation will be granted for a delay or suspension due to the above bird, bat and tree/brush requirements.

Law Enforcement Personnel.
Submit charge summary and invoices using the Department forms.

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

No payment will be made for law enforcement personnel needed for moving equipment or payment for drive time to/from the event site. A minimum number of hours is not guaranteed. Payment is for work performed. If the Contractor has a field office, provide an office location for a supervisory officer when event requires a supervising officer. This work is subsidiary.

A maximum combined rate of $70 per hour for the law enforcement personnel and the patrol vehicle will be allowed. Any scheduling fee is subsidiary per Standard Specification 502.4.2.

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

Alterations to the cancellation and maximum rate must be approved by the Engineer or pre-determined by official policy of the officers governing authority.

Back Up Alarm.
For hours 9 P to 5 A, utilize a non-intrusive, self-adjusting noise level reverse signal alarm. This is not applicable to hotmix or seal coat operations. This is subsidiary.

ITEM 8 – PROSECUTION AND PROGRESS
Electronic versions of schedules will be saved in Primavera P6 format.

Working days will be charged in accordance with 8.3.1.4, "Standard Workweek."

Lane Closure Assessment Fee.
The monthly estimate will be deducted a fee per 15-minute interval according to the following schedule for each closure or obstruction that extends beyond the allowable closure time.

Lane Closure Assessment Fee			
Roadway =	**SL1**	**Peak Direction Number of Lanes Closed**	
	Time	**1**	**2**
	0:00 - 0:15	$1,800	$2,400
	0:16 - 0:30	$3,600	$4,800
	0:31 - 0:45	$5,400	$7,200
	0:46 - 1:00	$7,200	$9,600
Each additional 15 minutes	+0:15	$1,800	$5,368
Roadway =	**SL1**	**Off- Peak Direction Number of Lanes Closed**	
	Time	**1**	**2**
	0:00 - 0:15	$1,350	$1,800
	0:16 - 0:30	$2,700	$3,600
	0:31 - 0:45	$4,050	$5,400
	0:46 - 1:00	$5,400	$7,200
Each additional 15 minutes	+0:15	$1,350	$4,026

ITEM 100 - PREPARING RIGHT OF WAY
Prep ROW must not begin until accessible trees designated for preservation have been protected, items listed in the EPIC have been addressed, and SW3P controls installed in accessible areas.

Backfill material will be Type B Embankment using ordinary compaction.

Unless shown otherwise in the plans or a designated non-mow area, perform trimming or removal for areas within 30 ft. of edge of pavement under construction. Trim or remove to provide minimum of 5 ft. of horizontal clearance and 7 ft. of vertical clearance for the following: sidewalks, paths, guard fence, rails, signs, object markers, and structures. Trim to provide a minimum of 14 ft. vertical clearance under all trees. This work is subsidiary.

ITEM 110 – EXCAVATION
The Engineer will define unsuitable material.

ITEM 132 – ALL EMBANKMENT
The Engineer will define unsuitable material. Material which the Contractor might deem to be unsuitable due to moisture content will not be considered unsuitable material.

Prior to begin embankment of existing area, correct or replace unstable material to a depth of 6 in. below existing grade. Embankment areas will be inspected prior to beginning work.

Rock or broken concrete produced by the project is allowed in earth embankments. The size of the rock or broken concrete will not exceed the layer thickness requirements in Section 132.3.4., "Compaction Methods." The material will not be placed vertically within 5 ft. of the finished subgrade elevation.

Embankment placed vertically within 5 ft. of the finished subgrade elevation or within the edges of the subgrade and treated with lime, cement, or other calcium based additives must have a sulfate content less than 3000 ppm. Allow 5 business days for testing. Treatment of sulfate material 3000 ppm to 7000 ppm requires 7 days of mellowing and continuous water curing, in accordance TxDOT guidelines for Treatment of Sulfate-Rich Soils and Bases in Pavement Structures (9/2005). Material over 7000 ppm is not allowed.

ITEM 160 - TOPSOIL
Off-site topsoil will have a minimum PI of 25.

No Sandy Loam allowed.

Obtain approval of the actual depth of the topsoil sources for both on-site and off-site sources. Construct topsoil stockpiles of no more than five (5) feet in height.

Seed or track slopes within 14 days of placement.

Salvage topsoil from sites of excavation and embankment. Maximum salvage depth is 6 inches.

Windrowing of topsoil obtained from the Right of Way (ROW) is not allowed.

ITEM 168 – VEGETATIVE WATERING
Water all areas of project to be seeded or sodded.

Maintain the seedbed in a condition favorable for the growth of grass. Watering can be postponed immediately after a rainfall on the site of ½ inch or greater, but will be resumed before the soil dries out. Continue watering until final acceptance.

Vegetative watering rates and quantities are based on ¼ inch of watering per week over a 3-month watering cycle. The actual rates used and paid for will be as directed and will be based on prevailing weather conditions to maintain the seedbed.

Obtain water at a source that is metered (furnish a current certification of the meter being used) or furnish the manufacturer's specifications showing the tank capacity for each truck used. Notify the Engineer, each day that watering takes place, before watering, so that meter readings or truck counts can be verified.

ITEM 169 – SOIL RETENTION BLANKETS
Type A blankets containing straw fibers are not allowed.

ITEM 247 - FLEXIBLE BASE
The lift thickness will be 4" to 6" unless shown in the plans. When compacted in multiple lifts, the density of the bottom and middle lifts will be 95% and 98% of the maximum dry density, respectively.

Correction of subgrade soft spots is subsidiary.

Complete all subgrade, ditches, slopes, and place all drainage structures to conform to required lines, grades, and cross-sections, as shown and directed, prior to the placement of Flex Base.
Do not use a vibratory roller to compact the material directly over a box culvert.

ITEM 300s – SURFACE COURSES AND PAVEMENTS
Asphalt season is May 1 thru September 15. Emulsified Asphalt season is April 1 thru October 15. The latest work start date for asphalt season is August 1.

If an under seal is not provided, furnish a tack coat. Apply tack coat at 0.08 GAL/SY (residual). Apply non-tracking tack coat using manufacturer recommend rates.

ITEM 310 – PRIME COAT
Apply blotter material to all driveways and intersections. This work is subsidiary.

Rolling to ensure penetration is required.

ITEMS 347/3081 - THIN OVERLAY MIXTURES (TOM)
For SAC A, blending SAC B aggregate with an RSSM greater than the SAC A rating or 10, whichever is greater, is prohibited.

When using a Thermal Imaging System follow the Weather Condition requirements for When Not Using a Thermal Imaging System.

Produce mixture with a Department approved WMA additive or process to facilitate compaction when the haul distance is greater than 40 miles or when the air temperature is 70°F and falling. WMA processes such as water or foaming processes are not allowed under these circumstances.

ITEM 351 – FLEXIBLE PAVEMENT STRUCTURE REPAIR
Use HMA D-GR Type B PG 64-22 SAC B for repairs 3 in. or greater and HMA D-GR Type C PG 64-22 SAC B for repairs less than 3 in. unless otherwise shown on the plans.

ITEM 354 - PLANING AND TEXTURING PAVEMENT
Contractor retains ownership of salvaged materials.

Mill and fill the work area during each shift unless otherwise shown on the plans.

Taper permanent transverse faces 50 ft. per 1 in. Taper temporary transverse faces 25 ft. per 1 in. Taper permanent longitudinal faces 6 ft. per 1 in. HMA may be used as temporary tapers. Provide minimum 1 in. butt joints at bridge ends and paving ends. This work is subsidiary.

ITEM 400 - EXCAVATION AND BACKFILL FOR STRUCTURES
Unless shown on the plans, the following backfill will apply to cutting and restoring flexible pavement. Backfill with cement-stabilized backfill. The cement-stabilized backfill is subsidiary. Cap the backfill with Type B hot-mix to a depth equal to the adjacent hot-mix. At locations where the backfill surface is final, place 1-1/2 in. Type D for the surface. The minimum hot-mix depth will be 4 in.

Saw-cut the pavement at the edge of the excavation. This work is subsidiary.

ITEM 416 - DRILLED SHAFT FOUNDATIONS
Stake all Foundations, for approval, before beginning drilling operations.

Calculate the vertical signal head clearance before placing any signal pole foundation.

For mast-arm signal and strain pole anchor bolts, set two in tension and two in compression.

Obtain approval of placement prior to placing concrete.

Remove spoils from a flood plain at the end of each work day.

ITEM 420 – CONCRETE SUBSTRUCTURES
Mass placements are defined as placements with a least dimension greater than or equal to 5 ft., or designated elsewhere on the plans.

Perform work during good weather unless otherwise directed. If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by the weather, the Contractor is responsible for all costs associated with repairs/replacement.

Bonding agents are required at construction joints. Do not use membrane curing for structural concrete as defined in Item 421, Table 8.

Remove all loose Formwork and other Materials from the floodplain or drainage areas daily.

ITEM 465 – JUNCTION BOXES, MANHOLES, AND INLETS
Maintain drainage at curb inlets until the final roadway surface is placed.

For inlets not placed in roadway, construct cast-in-place reinforced concrete apron as shown in the standards. This work is subsidiary.

Backfill shall use cohesionless material per Item 400 or flowable fill if width between structure and extent of excavation is 2 ft. or less. This is subsidiary.

ITEM 466 - HEADWALLS AND WINGWALLS
Remove all loose formwork and materials from the waterway at the end of each work week or prior to a rain event. Debris that falls into the waterway must be removed at the end of each work day. This work is subsidiary.

ITEM 496 - REMOVING STRUCTURES
No debris is allowed to fall into a body of water. Debris that falls into the water must be removed at the end of each work day. Debris that falls into the floodway must be removed at the end of each work week or prior to a rain event.

ITEM 502 - BARRICADES, SIGNS, AND TRAFFIC HANDLING

Table 1

Roadway	Limits	Allowable Closure Time
LP 1	William Cannon to Parmer Lane	8 P to 5 A
FM 734	FM 1431 to US 290 E	8 P to 5 A
All	Within 200' of a signalized intersection	9 P to 5 A
All	All (Full Closure, see allowable work below)	11 P to 4 A

Table 2

Roadway	Limits	Allowable Closure Time
N/A	N/A	N/A

Table 3 (Mobile Operations)

Roadway	Allowable Sun Night thru Fri Noon	Allowable Sat thru Sun Morn
Within Austin City Limits	10 A to 2 P and 7 P to 6 A	7 P to 10 A
Outside Austin City Limits	9 A to 3 P and 7 P to 7 A	6 P to 11 A
IH 35 main lanes	10 P to 5 A	9 P to 9 A
AADT over 50,000	8 P to 6 A	8 P to 10 A

For roadways without defined allowable closure times, nighttime lane closures will be allowed from 7 P to 6 A. Unless stated, daytime or Friday night lane closures will not be allowed and one lane in each direction will remain open at all times for all roadways.

No closures will be allowed on the weekends, working day prior, and working day after the National Holidays defined in the Standard Specifications, Good Friday, and Easter weekend. Closures the Sunday of the Super Bowl will not be allowed from 1 P to 11 P. No closures will be allowed on Friday and the weekends for projects within 20 miles of Formula 1 at COTA, ACL Fest, SXSW, ROT Rally, UT home football games (includes games not on a Friday or weekend), sales tax holiday, Dell Match Play (includes Thursday) or other special events that could be impacted by the construction. All lanes will be open by noon of the day before these special events.

To account for directional traffic volumes, begin and end times of closures may be shifted equally by the Engineer. The closure duration will remain. Added compensation is not allowed.

Submit an emailed request for a lane closure (LCN) to TxDOT. The email will be submitted in the format provided. Receive concurrence prior to implementation. Submit a cancellation of lane closures a minimum of 18 hours prior to implementation. Blanket requests for extended periods are not allowed. Max duration of a request is 2 weeks prior to requiring resubmittal.

Provide 2-hour notice prior to implementation and immediately upon removal of the closure.

For roadways listed in Table 1: Submit the request 96 hours prior to implementation.

For roadways not listed in Table 1: Submit the request a minimum of 48 hours prior to the closure and by the following deadline immediately prior to the closure: 11A on Tuesday or 11A on Friday.

For all roadways: Submit request for traffic detours and full roadway closures 168 hours prior to implementation. Submit request for nighttime work 96 hours to implementation date.

Cancellations of accepted closures (not applicable to full closures or detours) due to weather will not require resubmission in accordance with the above restrictions if the work is completed during the next allowable closure time.

Closures that conflict with adjacent contractor will be prioritized according to critical path work per latest schedule. Conflicting critical path or non-critical work will be approved for first LCN submitted. Denial of a closure due to prioritization or other reasons will not be reason for time suspension, delay, overhead, etc.

Cover, relocate or remove existing signs that conflict with traffic control. Install all permanent signs, delineation, and object markers required for the operation of the roadway before opening to traffic. Use of temporary mounts is allowed or may be required until the permanent mounts are installed or not impacted by construction. Maintain the temporary mounts. This work is subsidiary.

Meet with the Engineer prior to lane closures to ensure that sufficient equipment, materials, devices, and workers will be used. Take immediate action to modify traffic control, if at any time the queue becomes greater than 20 minutes. Have a contingency plan of how modification will occur. Consider inclement weather prior to implementing the lane closures. Do not set up traffic control when the pavement is wet.

Place a 28-inch cone, meeting requirements of BC (10), on top of foundations that have protruding studs. This work is subsidiary.

Edge condition treatment types must be in accordance with the TxDOT standard. Installation and removal of a safety slope is subsidiary.

To determine a speed limit or an advisory speed limit, submit a request to TxDOT 60 business days prior to manufacture of the sign.

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

ITEM 504 - FIELD OFFICE AND LABORATORY

All labs and offices will include cleaning at least once a week. The cleaning will include sweeping and mopping of floors, cleaning the toilet and lavatory, and emptying wastebaskets. Space heaters are not considered adequate heating.

Projects with more than 500 CY of structural class concrete, 5000 SY of Class P concrete, and/or 2000 CY of non-structural concrete will include a concrete testing facility. Provide a structure with at least 200 sq. ft. of gross floor area in room 8 ft. high. The structure will include the laboratory equipment and all other related items to perform the contract-controlling test procedures.

Projects with HMAC, furnish a Type D structure for the Engineer’s exclusive use. The structure will include high speed internet service with WIFI signal, one desk, two chairs, and one file cabinet. Provide a minimum of three 120-volt circuits with 20-amp breakers and at most two grounded convenience outlets per circuit.

ITEM 506 - TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROLS

Install, maintain, remove erosion, sedimentation and environmental control measures in areas of the right of way utilized by the contractor that are outside the limits of disturbance required for construction. Permanently stabilize the area. This work is subsidiary.

ITEM 512 – PORTABLE TRAFFIC BARRIER
In lieu of a crash cushion, place 25:1 Class C concrete transition where PTB terminates adjacent to existing concrete barrier. Installation and removal will be paid using Item 512.

Where applicable, provide slotted PTB to allow proper drainage and prevent water ponding on the roadway.

Any increase in temporary barrier quantities that occur due to Contractor changes in the sequence of work or the traffic control plan will not be paid.

ITEM 531– MISCELLANEOUS CONSTRUCTION
Reinforcement will be in accordance with Item 432.3.1 unless shown on the plans. Fiber reinforcement is not allowed. Class A and B Concrete are allowed to use Coarse Aggregate Grades 1-8. Expansion joints will be placed every 40 ft. Expansion joints must be 1" wide asphalt board and flush with the surface. The bottom of the joint shall be at half the depth of the concrete. Sidewalk cross slope must not exceed 1.5%.

Unless shown on the plans or in the pay items, all concrete will be 5 in. thick and have 2 in. sand, base, or RAP bedding. Furnish base meeting the requirement for any type or grade in accordance with Item 247. Base compressive strengths are waived. RAP must be 100% passing a 1 in. sieve. Bedding must be placed using ordinary compaction.

If roots are encountered verify with the Engineer prior to accommodating or removing 2 in. diameter or larger roots. Root removal must be in accordance with Item 752.4.2. Roots may remain in the bedding or base. For improvements within 6 in. of a root, the concrete thickness may be reduced by 1 in. and the bedding increased by 1 in. to minimize impacts to the roots. Adjust bedding and surface profile to provide a 1 in. bedding cushion around the roots. The surface profile may be adjusted to the extent allowed by ADA. This work is subsidiary.

ITEM 540, 542, & 544 - METAL BEAM GUARD FENCE AND GUARDRAIL END TREATMENTS
Furnish round timber posts for guard fence. Steel posts for low fill culverts are subsidiary. Stake the locations for approval prior to installation. Adjust the limits of the fence to meet field conditions. Install delineators before opening the road to traffic.

Retain all materials. Contractor may reuse all existing materials that are structurally sound and dent free. All reused material shall be from this project and in compliance with current standards. Structurally sound rust spots with the largest dimension of 4 in. may be cleaned and repaired in accordance with 540.3.5. Contractor may punch or field drill holes in the metal rail element to accommodate post spacing. Additional holes for splice or connections are not allowed. The holes shall be spaced in accordance with the latest standard and shall not be closer than the minimum spacing shown on the current standard.

Provide a 3-foot-wide 4" depth concrete mow strip with guard fence installation.

Remove, replace, and install mow strip block out material. Construct new block outs and backfill unused block outs with class B concrete. This work is subsidiary.

Repair of mow strip damage, not caused by contractor negligence, and installation of new mow strip will be paid with appropriate bid items. Backfill and shoulder up of area around fence and mow strip will be paid using embankment item.

ITEM 545 - CRASH CUSHION ATTENUATORS
Use a coring machine or saw cut to remove the mounting hardware/bolts from the existing pavement. Cutting the hardware flush with the surface is not allowed. Refill voids in accordance with the pavement specification. This work is subsidiary.

ITEM 585 - RIDE QUALITY FOR PAVEMENT SURFACES
Use Surface Test Type B Pay Schedule 03 to evaluate ride quality of travel lanes, including service roads.

ITEM 600s & 6000s – ITS, LIGHTING, SIGNING, MARKINGS, AND SIGNALS
Meet the requirements of the NEC, Texas MUTCD, TxDOT standards, and TxDOT Standard Specifications. Notify the Engineer if existing elements to remain do not meet code or specification.

Contractor shall provide all service, equipment and material required to provide a functional item and interface with existing equipment and software.

For signal shop contact Charles Vaughn Jr (Charles.Vaughn@txdot.gov) and Douglas Turner (Douglas.L.Turner@txdot.gov).

Use the TxDOT provided form to submit an electrical, illumination, and signal checklist prior to request for signal activation or a punch list.

Provide a 7-day advance email notice to the Engineer to request illumination or traffic signal punch list inspection.

Provide a 14-day advance email notice to the Engineer with signal technician contact information and signal locations prior to working or assuming operations of illumination or traffic signal.

Provide a 60-day advance email notice to the Engineer to request signal timing if timing is not provided in the plans.

Provide a 180-day advance email notice to the Engineer for equipment to be provided by TxDOT.

Prior to relief of maintenance, a Test Period is required for signals and ITS equipment in accordance with Item 680.3.1.8. Response time to reported trouble calls shall be less than 2 hours. Complete repairs within 24 hours. Notify the Engineer and maintain a logbook in the controller cabinet of each trouble call. Do not clear the error log in the conflict monitor without approval.

Maintain the existing ITS equipment and HUB buildings operational during construction. ITS downtime is allowed from 12A to 4A. Downtime is restricted to one time per HUB or equipment.

Definitions of abbreviations used to designate ITS equipment, material, etc. can be provided by the Engineer.

ITEM 610 - ROADWAY ILLUMINATION ASSEMBLIES
Upon removal, contact signal shop to stockpile a maximum of 10 assemblies that meet the current TxDOT standards at the Austin District Headquarters located at 7901 North IH 35, 78753. If signal shop declines receipt of these assemblies, Contractor will be responsible for disposal.

For each assembly, paint the service, circuit, run and assembly number/letter using 3 in. tall characters and black paint. The marking shall be stacked vertically with the service on top and the assembly number/letter on the bottom. Paint 6 ft. above the roadway surface on the hand access door side of the pole or adjacent to the assembly if mounted to a structure. This work is subsidiary.

For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holder.

Provide 10-amp time delay fuses.

Maintain all new and existing illumination for the duration of the contract. All existing illumination will remain operational until replaced by new illumination or required to be removed due to construction.

ITEM 618 - CONDUIT
Fit PVC and HDPE conduit terminations with bell ends.

Shift the locations of conduit and ground boxes to accommodate field conditions
.
Install conduit not exceeding 2 feet in any direction from a straight line. Install conduit at a minimum depth of 2 ft. below finished grade. Installation of the conduit by jacking or boring method will be at a depth of at least 1 ft. below subgrade.

Install a high tension, non-metallic pull rope in all conduit runs. Cap all empty conduit using standard weather tight conduit caps. This work is subsidiary.

Use a coring device when drilling holes through concrete structures.

Structurally mounted junction boxes will be as shown on the plans. When used for traffic signal installations, these boxes will be 12" x 12" x 8". This work is subsidiary.

When using existing conduit, ensure that all conduits have bushings and cleaned of dirt, mud, grease, and other debris. Re-strap existing or relocated conduit per the specification. This work is subsidiary. Abandon existing underground conduit that is unusable is allowed if all conductors are removed. Replacement conduit will be paid using the existing bid items.

ITEM 620 - ELECTRICAL CONDUCTORS
Provide 10-amp time delay fuses.

For Pedestal Poles (Item 687) provide single-pole breakaway disconnects.

Install a minimum size 8 AWG equipment grounding conductor (EGC) in all conduits including loop detectors and traffic signal cables. Payment and the size of the EGC will be in accordance with standard ED (3)-14 note 12.

Permanently mark “illumination” on the luminaire conductors installed inside a traffic signal pole. Make the marks easily visible from the hand hole.

ITEM 624 – GROUND BOXES
Aggregate for fill under the box will be crushed, have a maximum size of 2 in., minimum size of ½ in., and requirements per Item 302 are waived.

ITEM 628 – ELECTRICAL SERVICES
Contact the utility company upon execution of contract and prior to the pre-construction meeting to make arrangements for all work and materials provided by the utility company. Contact AUS_Business_Services@txdot.gov for account approval and information. Accounts shall be placed in the name of TxDOT.

ITEM 644 – SMALL ROADSIDE SIGN ASSEMBLIES
Triangular slip base that use set screws to secure the post will require 1 of the set screws to penetrate the post by drilling a hole in the post at the location of the screw. All set screws shall be treated with anti-seize compound.

ITEM 658 – DELINEATOR AND OBJECT MARKER ASSEMBLIES
Installation and maintenance of portable CTB reflectors will be subsidiary to the barrier.

ITEM 662 - WORK ZONE PAVEMENT MARKINGS
Notify the Engineer at least 24 hours in advance of work for this item.

Maintain removable and short-term markings daily. Remove within 48 hours after permanent striping has been completed.

Item 668 is not allowed for use as Item 662.

ITEM 666 - RETROREFLECTORIZED PAVEMENT MARKINGS
Notify the Engineer at least 24 hr. before beginning work.

Place longitudinal markings no later than 7 calendar days after placement of the surface for roadways with AADT greater than 20,000.

When the raised portion of a profile marking is placed as a separate operation from the pavement marking, the raised portion must be placed first then covered with TY I.

When using black shadow to cover existing stripe apply a non-retroreflective angular abrasive bead drop. The marking color shall be adjusted to resemble the pavement color. If Item 677 is not used prior to placement of black shadow, scrape the top of the marking with a blade or large piece of equipment unless surface is a seal coat. The scraping of the marking is subsidiary.

ITEM 682 – VEHICLE AND PEDESTRIAN SIGNAL HEADS
Install signal head attachments so the wiring to each passes from the signal pole through the attachment hardware to the signal head. Use UV rated tie wraps.

Traffic signal heads will be aluminum unless otherwise shown on the plans. Back plates will be black aluminum.

Provide louvers, which have five vanes with a black finish on inside surfaces when required. Fasten a hardware cloth screen, securely, with ⅝" or smaller mesh size to the front face of each louver to prevent bird nesting.

Use the four-point mounting system (TY A) for signal heads, except in cases of skewed or vertical heads when (TY B) will be used.

ITEM 684 – TRAFFIC SIGNAL CABLES
For each cable run, coil an extra 2 ft. of cable in each steel pole and 5 ft. in the controller cabinet. Provide a separate multi-conductor signal cable (14 AWG) inside pedestal poles and mast-arm signal poles from the terminal strip to each signal head as shown on the plans.

ITEM 687 – PEDESTAL POLE ASSEMBLIES
Verify the required pole height prior to ordering material.

ITEM 3085 – UNDERSEAL COURSE
The minimum application rates are listed in Table UC. The target shear bond strengths are listed in Table UCS. The informational test cores shall be taken once a shift for first 5 lots of placement or a change to placement method of bonding course, bonding material, or hot mix material. The remaining informational test cores shall be taken once every 3 lots for surface mix. Informational tests are not required for non-surface mix beyond the first 5 lots unless there is a change to placement method of bonding course, bonding material, or hot mix material. Results from these informational tests will not be used for specification compliance.

Table UC

Material	Minimum Application Rate (gal. per square yard)
TRAIL – Hot Asphalt	0.15
Spray Applied Underseal Membrane	0.20
Seal Coat – Tier II emulsion	0.25
Seal Coat – Tier II asphalt	0.23

Table UCS

Material	Minimum Shear Strength (psi)
SMA – Stone-Matrix Asphalt	60.0
PFC – Permeable Friction Course	40.0
All Other Materials	40.0

ITEM 6000s – ITS
Provide an email notice 180 days in advance for DMS signs and 120 days in advance for other items to AUS_Signal-Shop@txdot.gov to obtain TxDOT provided material from 7901 North IH 35, 78753.

Maintain the existing equipment and HUB buildings operational during construction. Network downtime is allowed from 12A to 4A. Downtime is restricted to one time per HUB or equipment.

Definitions of abbreviations used to designate ITS equipment, material, etc. can be provided by the Engineer.

ITEM 6001 – PORTABLE CHANGEABLE MESSAGE SIGN
Provide 2 PCMS. Provide a replacement within 12 hours. PCMS will be available for traffic control, event notices, roadway conditions, service announcements, etc.

Place PCMS 10 calendar days prior to begin work stating, “Road Work Begin Soon, Contact 832-7000 For Info”.

Place PCMS at time of LCN request. Place the PCMS at the expected end of queue caused by the closure. When the closure is active, revise the message to reflect the actual condition during the closure, such as “RIGHT LN CLOSED XXX FT”.

ITEM 6185 – TRUCK MOUNTED ATTENUATOR AND TRAILER ATTENUATOR
The TMA/TA used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

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 TMA/TA required for the work. TMA/TAs paid by the day is full compensation for all worksite locations during an entire day.

TMA/TAs used to protect damaged attenuators will be paid by the day using the force account item for the repair.

ITEM 680 - HIGHWAY TRAFFIC SIGNALS
The list of material below is for the Contractor’s information only and is subsidiary. It is the responsibility of the Contractor to verify all items and quantities listed below.

DESCRIPTION	UNIT	QUANTITY
40 FT TIMBER POLE (CLASS 2)	EA	X
8 FT LUMINAIRE ARM	EA	X
CABLE STRAPS	EA	X
⅜" ZINC-COATED STRANDED STEEL CABLE	LF	X
¼" ZINC-COATED STRANDED STEEL CABLE	LF	X
GROUND ANCHORS	EA	X
YELLOW PLASTIC GUY GUARD	EA	X
DOUBLE EYE ANCHOR ROD	EA	X
⅝" X 8' COPPERCLAD GROUND ROD W/CLAMP	EA	X
1 INCH RM CONDUIT (PHONE LINE)	LF	X

1½" WEATHERHEAD	EA	X
2 INCH WEATHERHEAD	EA	X
3 INCH WEATHERHEAD	EA	X
250W HPS LUMINAIRE	EA	X
8 PHASE NEMA CONTROLLER COMPLETE W/ CABINET AND ACCESSORIES	EA	X
ON-STREET ARTERIAL MASTER CONTROLLER UNIT	EA	X
2-CHANNEL DETECTOR CARDS	EA	X
INSTALL OPTICOM EQUIPMENT (INTERSECTION)	LS	X
INTERSECTION DISPLAY BOARD	EA	X
DIAL-UP COMMUNICATIONS MODEM/PHONE LINE	EA	X
REGULATORY SIGN PANEL (R10-12, ETC)	EA	X
SINGLE STREET NAME SIGN PANEL	EA	X
DUAL STREET NAME SIGN PANEL	EA	X
REMOVE EXISTING STOP SIGN PANEL	EA	X
CONCRETE PAD (8' X 9' X 6", Class B)	SF	72

QUANTITY SHEET

CONTROLLING PROJECT ID 3136-01-191 **DISTRICT** Austin **COUNTY** Travis
HIGHWAY FM 734, SL 1

			CONTROL SECTION JOB	**3136-01-191**		**3417-03-025**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00130992**		**A00065137**			
			COUNTY	**Travis**		**Travis**			
			HIGHWAY	**SL 1**		**FM 734**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL		
	100-6002	PREPARING ROW	STA	16.000		14.000		30.000	
	104-6011	REMOVING CONC (MEDIANS)	SY	218.000				218.000	
	104-6022	REMOVING CONC (CURB AND GUTTER)	LF	798.000		1,421.000		2,219.000	
	104-6036	REMOVING CONC (SIDEWALK OR RAMP)	SY			54.000		54.000	
	105-6016	REMOVING STAB BASE & ASPH PAV(16")	SY	1,927.000				1,927.000	
	105-6030	REMOVING STAB BASE & ASPH PAV (8"-14")	SY			146.000		146.000	
	106-6002	OBLITERATING ABANDONED ROAD	SY	2,329.000				2,329.000	
	110-6001	EXCAVATION (ROADWAY)	CY			1,300.000		1,300.000	
	110-6004	EXCAVATION (ROADWAY AND CHANNEL)	CY	1,051.000				1,051.000	
	132-6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	5,581.000		578.000		6,159.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	7,438.000		2,075.000		9,513.000	
	164-6039	DRILL SEEDING (PERM) (URBAN) (CLAY)	SY	7,438.000				7,438.000	
	164-6041	DRILL SEEDING (TEMP) (WARM)	SY			2,075.000		2,075.000	
	168-6001	VEGETATIVE WATERING	MG	149.000		42.000		191.000	
	169-6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	7,438.000		2,075.000		9,513.000	
	247-6366	FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS)	CY	770.000		1,104.000		1,874.000	
	310-6001	PRIME COAT (MULTI OPTION)	GAL	356.000		440.000		796.000	
	347-6001	TOM (ASPHALT) PG 76-22	TON	75.000		7.000		82.000	
	347-6002	TOM-C (AGGREGATE) SAC-A	TON			103.000		103.000	
	347-6006	TOM - C (AGGREGATE) SAC - B	TON	1,130.000				1,130.000	
	347-6008	TACK COAT	GAL	1,688.000				1,688.000	
	351-6012	FLEXIBLE PAVEMENT STRUCTURE REPAIR(2")	SY	1,489.000				1,489.000	
	354-6001	PLAN & TEXT ASPH CONC PAV(0" TO 1")	SY	14,886.000				14,886.000	
	354-6002	PLAN & TEXT ASPH CONC PAV(0" TO 2")	SY			2,180.000		2,180.000	
	400-6007	CUT & RESTORE CONC PAVING	SY			53.000		53.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	302.000		155.000		457.000	
	403-6001	TEMPORARY SPL SHORING	SF	825.000				825.000	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	136.000				136.000	
	416-6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF			14.000		14.000	
	420-6012	CL B CONC (MISC)	CY	21.000				21.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	5.950				5.950	
	432-6002	RIPRAP (CONC)(5 IN)	CY	9.440				9.440	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	27.000		5.000		32.000	
	450-6052	RAIL (HANDRAIL)(TY F)	LF			53.000		53.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF	475.000		390.000		865.000	
	464-6009	RC PIPE (CL III)(42 IN)	LF			30.000		30.000	
	465-6002	MANH (COMPL)(PRM)(48IN)	EA	1.000				1.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 3136-01-191 **DISTRICT** Austin **COUNTY** Travis
HIGHWAY FM 734, SL 1

			CONTROL SECTION JOB	**3136-01-191**		**3417-03-025**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00130992**		**A00065137**			
			COUNTY	**Travis**		**Travis**			
			HIGHWAY	**SL 1**		**FM 734**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL		
	465-6015	INLET (COMPL)(PCO)(3FT)(RIGHT)	EA	5.000				5.000	
	465-6025	INLET (COMPL)(PCO)(6FT)(NONE)	EA			2.000		2.000	
	466-6102	HEADWALL (CH - PW - 0) (DIA= 42 IN)	EA			1.000		1.000	
	479-6006	ADJUSTING INLET (CAP)	EA	1.000				1.000	
	496-6002	REMOV STR (INLET)	EA			2.000		2.000	
	496-6005	REMOV STR (WINGWALL)	EA			1.000		1.000	
	496-6006	REMOV STR (HEADWALL)	EA			1.000		1.000	
	496-6007	REMOV STR (PIPE)	LF	90.000				90.000	
	496-6016	REMOV STR (PIPE)	EA			1.000		1.000	
	496-6069	REMOV STR (SLOTTED DRAIN INLET)	LF	60.000				60.000	
	500-6001	MOBILIZATION	LS	65.00%		35.00%		100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000				4.000	
	506-6036	SANDBAGS FOR EROSION CONTROL (6")	LF			325.000		325.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1,696.000		1,257.000		2,953.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1,696.000		1,257.000		2,953.000	
	512-6005	PORT CTB (FUR & INST)(F-SHAPE)(TY 1)	LF	720.000				720.000	
	512-6029	PORT CTB (MOVE)(F-SHAPE)(TY 1)	LF	720.000				720.000	
	512-6053	PORT CTB (REMOVE)(F-SHAPE)(TY 1)	LF	720.000				720.000	
	529-6008	CONC CURB & GUTTER (TY II)	LF	2,201.000		1,402.000		3,603.000	
	531-6002	CONC SIDEWALKS (5")	SY			252.000		252.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	825.000		125.000		950.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1.000		1.000		2.000	
	540-6035	MTL BM GD FEN TRANS (31"-28")	EA	1.000				1.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	540.000		277.000		817.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA			1.000		1.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA			1.000		1.000	
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	1.000				1.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	1.000				1.000	
	545-6022	CRASH CUSH ATTEN (INSTL)(S)(W)(TL3)	EA	1.000				1.000	
	610-6007	REMOVE RD IL ASM (SHOE-BASE)	EA	1.000				1.000	
	610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	4.000				4.000	
	610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	17.000				17.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF	3,650.000				3,650.000	
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	360.000				360.000	
	618-6030	CONDT (PVC) (SCH 40) (3") (BORE)	LF			855.000		855.000	
	618-6033	CONDT (PVC) (SCH 40) (4")	LF			15.000		15.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	180.000				180.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 3136-01-191 **DISTRICT** Austin **COUNTY** Travis
HIGHWAY FM 734, SL 1

			CONTROL SECTION JOB	**3136-01-191**		**3417-03-025**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00130992**		**A00065137**			
			COUNTY	**Travis**		**Travis**			
			HIGHWAY	**SL 1**		**FM 734**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL		
	620-6007	ELEC CONDR (NO.8) BARE	LF	3,730.000		870.000		4,600.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	7,480.000				7,480.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF			5.000		5.000	
	624-6002	GROUND BOX TY A (122311)W/APRON	EA	6.000				6.000	
	624-6028	REMOVE GROUND BOX	EA	2.000				2.000	
	628-6018	ELC SRV TY A 120/240 100(NS)AL(E)PS(U)	EA	1.000				1.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	3.000				3.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	6.000		2.000		8.000	
	644-6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	1.000				1.000	
	644-6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA	1.000				1.000	
	644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA			2.000		2.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	1.000				1.000	
	658-6010	INSTL DEL ASSM (D-SW)SZ 2(WC)GND	EA	9.000				9.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	400.000				400.000	
	662-6110	WK ZN PAV MRK SHT TERM (TAB)TY Y	EA	55.000				55.000	
	666-6029	REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	200.000				200.000	
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	2,935.000				2,935.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF			1,011.000		1,011.000	
	666-6041	REFL PAV MRK TY I (W)12"(SLD)(090MIL)	LF	692.000				692.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF			24.000		24.000	
	666-6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	48.000				48.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF			24.000		24.000	
	666-6053	REFL PAV MRK TY I (W)(ARROW)(090MIL)	EA	2.000				2.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA			4.000		4.000	
	666-6077	REFL PAV MRK TY I (W)(WORD)(090MIL)	EA	2.000				2.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA			4.000		4.000	
	666-6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	4,129.000				4,129.000	
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	1,144.000				1,144.000	
	666-6176	REFL PAV MRK TY II (W) 8" (DOT)	LF	200.000				200.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	2,935.000		1,011.000		3,946.000	
	666-6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	692.000		24.000		716.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	48.000		24.000		72.000	
	666-6184	REFL PAV MRK TY II (W) (ARROW)	EA	2.000		4.000		6.000	
	666-6192	REFL PAV MRK TY II (W) (WORD)	EA	2.000		4.000		6.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	1,706.000				1,706.000	
	666-6299	RE PM W/RET REQ TY I (W)4"(BRK)(090MIL)	LF	4,129.000				4,129.000	
	666-6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	1,144.000				1,144.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 3136-01-191 **DISTRICT** Austin **COUNTY** Travis
HIGHWAY FM 734, SL 1

			CONTROL SECTION JOB	**3136-01-191**		**3417-03-025**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00130992**		**A00065137**			
			COUNTY	**Travis**		**Travis**			
			HIGHWAY	**SL 1**		**FM 734**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL		
	666-6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	1,706.000				1,706.000	
	672-6007	REFL PAV MRKR TY I-C	EA	131.000		51.000		182.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	16.000				16.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA			1.000		1.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA			1.000		1.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA			1.000		1.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF			165.000		165.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF			80.000		80.000	
	684-6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF			200.000		200.000	
	684-6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF			405.000		405.000	
	686-6282	RELOC TRF SG PL AM(S)SNGL MST ARM POLE	EA			1.000		1.000	
	687-6002	PEDESTRIAN PUSH BUTTON POLE	EA			1.000		1.000	
	690-6032	INSTALL OF PEDESTRIAN PUSH BUTTONS	EA			1.000		1.000	
	690-6033	REMOVAL OF TRAFFIC SIGNAL POLE FND	LF			14.000		14.000	
	690-6105	REROUTE CABLES	LF	560.000				560.000	
	3076-6001	D-GR HMA TY-B PG64-22	TON	370.000		435.000		805.000	
	3076-6040	D-GR HMA TY-D PG70-22	TON			218.000		218.000	
	3076-6048	D-GR HMA TY-D PG76-22	TON	186.000				186.000	
	3076-6066	TACK COAT	GAL	132.000		440.000		572.000	
	3085-6001	UNDERSEAL COURSE	GAL	32.000		44.000		76.000	
	6000-6005	REMOVE UNDERGROUND CONDUIT	LF	350.000				350.000	
	6000-6058	REMOVE GROUND BOX	EA	3.000				3.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	64.000		66.000		130.000	
	6027-6003	CONDUIT (PREPARE)	LF	560.000		220.000		780.000	
	6185-6002	TMA (STATIONARY)	DAY	64.000		66.000		130.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	24.000		16.000		40.000	
	18	FLAGGING	LS	1.000				1.000	
		SAFETY CONTINGENCY	LS	1.000				1.000	
		LAW ENFORCEMENT	LS	1.000				1.000	
		ELECTRICAL: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000				1.000	
		EROSION CONTROL MAINTENANCE	LS	1.000				1.000	

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION	402 6001	403 6001	512 6005	512 6029	512 6053	545 6003	545 6005	545 6022	662 6109	662 6110	6001 6001	6185 6002	6185 6003
	TRENCH EXCAVATION PROTECTION	TEMPORARY SPL SHORING	PORT CTB (FUR & INST)(F-SHAPE)(TY 1)	PORT CTB (MOVE)(F-SHAPE)(TY 1)	PORT CTB (REMOVE)(F-SHAPE)(TY 1)	CRASH CUSH ATTEN (MOVE & RESET)	CRASH CUSH ATTEN (REMOVE)	CRASH CUSH ATTEN (INSTL)(S)(W)(TL3)	WK ZN PAV MRK SHT TERM (TAB)TYW	WK ZN PAV MRK SHT TERM (TAB)TYY	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	LF	SF	LF	LF	LF	EA	EA	EA	EA	EA	DAY	DAY	HR
CONSTRUCTION NARRATIVE	302	825	720	720	720	1	1	1	400	55	64	64	24
CSJ 3136-01-191 PROJECT TOTALS	**302**	**825**	**720**	**720**	**720**	**1**	**1**	**1**	**400**	**55**	**64**	**64**	**24**

SUMMARY OF REMOVAL ITEMS

LOCATION	100 6002	104 6011	104 6022	105 6016	106 6002	479 6006	496 6007	496 6069	542 6001	624 6028	690 6105	6000 6005
	PREPARING ROW	REMOVING CONC (MEDIANS)	REMOVING CONC (CURB AND GUTTER)	REMOVING STAB BASE & ASPH PAV(16")	OBLITERATING ABANDONED ROAD	ADJUSTING INLET (CAP)	REMOV STR (PIPE)	REMOV STR (SLOTTED DRAIN INLET)	REMOVE METAL BEAM GUARD FENCE	REMOVE GROUND BOX	REROUTE CABLES	REMOVE UNDERGROUND CONDUIT
	STA	SY	LF	SY	SY	EA	LF	LF	LF	EA	LF	LF
PLAN AND PROFILE 1	11											
PLAN AND PROFILE 2	5											
REMOVAL LAYOUT		218	798	1927	2329				540			
GROUND BOX LAYOUT										2	560	350
STORM SEWER P&P						1	90	60				
CSJ 3136-01-191 PROJECT TOTALS	**16**	**218**	**798**	**1927**	**2329**	**1**	**90**	**60**	**540**	**2**	**560**	**350**

SUMMARY OF ROADWAY ITEMS

LOCATION	110 6004	132 6003	247 6366	310 6001	347 6001	347 6006	347 6008	351 6012	354 6001	420 6012	432 6002
	EXCAVATION (ROADWAY AND CHANNEL)	EMBANKMENT (FINAL)(ORD COMP)(TY B)	FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS)	PRIME COAT (MULTI OPTION)	TOM (ASPHALT) PG 76-22	TOM - C (AGGREGATE) SAC - B	TACK COAT	FLEXIBLE PAVEMENT STRUCTURE REPAIR(2")	PLAN & TEXT ASPH CONC PAV(0" TO 1")	CL B CONC (MISC)	RIPRAP (CONC)(5 IN)
	CY	CY	CY	GAL	TON	TON	GAL	SY	SY	CY	CY
PLAN AND PROFILE 1	67	3491	459	202						13	4.55
PLAN AND PROFILE 2	984	2090	311	154						4	4.88
SIGN AND PAVEMENT MARKINGS 1											
SIGN AND PAVEMENT MARKINGS 2					19	290	433	541	5407		
SIGN AND PAVEMENT MARKINGS 3					25	376	562	616	6156		
SIGN AND PAVEMENT MARKINGS 4					15	224	335	332	3323		
ROADWAY DETAILS 2					16	240	358			4	
CSJ 3136-01-191 PROJECT TOTALS	**1051**	**5581**	**770**	**356**	**75**	**1130**	**1688**	**1489**	**14886**	**21**	**9.44**

SUMMARY OF ROADWAY ITEMS

LOCATION	432 6045	529 6008	540 6001	540 6016	540 6035	3076 6001	3076 6048	3076 6066	3085 6001
	RIPRAP (MOW STRIP)(4 IN)	CONC CURB & GUTTER (TY II)	MTL W-BEAM GD FEN (TIM POST)	DOWNSTREAM ANCHOR TERMINAL SECTION	MTL BM GD FEN TRANS (31"-28")	D-GR HMA TY-B PG64-22	D-GR HMA TY-D PG76-22	TACK COAT	UNDERSEAL COURSE
	CY	LF	LF	EA	EA	TON	TON	GAL	GAL
PLAN AND PROFILE 1		1555				205	103	75	20
PLAN AND PROFILE 2	27	646	825	1	1	165	83	60	9
SIGN AND PAVEMENT MARKINGS 1									
SIGN AND PAVEMENT MARKINGS 2									
SIGN AND PAVEMENT MARKINGS 3									
SIGN AND PAVEMENT MARKINGS 4									
ROADWAY DETAILS 2									3
CSJ 3136-01-191 PROJECT TOTALS	**27**	**2201**	**825**	**1**	**1**	**370**	**186**	**135**	**32**

Austin District
North Travis Area Office

Texas Department of Transportation

SL 0001 QUANTITY SUMMARY

SHEET 1 OF 2

© 2020		CONT	SECT	JOB	HIGHWAY
DSn:	CKn:	3136	01	191,etc	SL 0001
		DIST	COUNTY		SHEET NO.
DWn:	CKn:	AUS	TRAVIS		11

DATE: 3/8/2021 12:12:57 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\1. General\SL0001_QTY_SUM_1.dgn

SUMMARY OF SIGNING ITEMS

LOCATION	644 6001	644 6004	644 6007	644 6068	644 6076	658 6010
	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	RELOCATE SM RD SN SUP&AM TY 10BWG	REMOVE SM RD SN SUP&AM	INSTL DEL ASSM (D-SW)SZ 2(WC)GND
	EA	EA	EA	EA	EA	EA
SIGN & PAVEMENT MARKINGS 1						
SIGN & PAVEMENT MARKINGS 2	1	2			1	6
SIGN & PAVEMENT MARKINGS 3	1	2		1		
SIGN & PAVEMENT MARKINGS 4	1	2	1			3
CSJ 3136-01-191 PROJECT TOTALS	**3**	**6**	**1**	**1**	**1**	**9**

SUMMARY OF DRAINAGE ITEMS

LOCATION	464 6003	465 6002	465 6015	479 6006
	RC PIPE (CL III)(18 IN)	MANH (COMPL)(PRM)(48 IN)	INLET (COMPL)(PCO)(3FT)(RIGHT)	ADJUSTING INLET (CAP)
	LF	EA	EA	EA
STORM SEWER P&P	475	1	5	1
CSJ 3136-01-191 PROJECT TOTALS	**475**	**1**	**5**	**1**

SUMMARY OF PAVEMENT MARKING ITEMS

LOCATION	666 6029	666 6035	666 6041	666 6047	666 6053	666 6077	666 6167	666 6170	666 6176	666 6178	666 6180	666 6182	666 6184
	REFL PAV MRK TY I (W)8"(DOT)(090MIL)	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	REFL PAV MRK TY I (W)12"(SLD)(090MIL)	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	REFL PAV MRK TY I (W)(ARROW)(090MIL)	REFL PAV MRK TY I (W)(WORD)(090MIL)	REFL PAV MRK TY II (W) 4" (BRK)	REFL PAV MRK TY II (W) 4" (SLD)	REFL PAV MRK TY II (W) 8" (DOT)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 12" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (W)(ARROW)
	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	LF	EA	EA
SIGN AND PAVEMENT MARKINGS 1													
SIGN AND PAVEMENT MARKINGS 2		878	128		1	1	1721			878	128		1
SIGN AND PAVEMENT MARKINGS 3	200	1017	158		1	1	1508	212	200	1017	158		1
SIGN AND PAVEMENT MARKINGS 4		1040	406	48			900	932		1040	406	48	
CSJ 3136-01-191 PROJECT TOTALS	**100**	**2935**	**692**	**48**	**2**	**2**	**4129**	**1144**	**100**	**2935**	**692**	**48**	**2**

SUMMARY OF PAVEMENT MARKING ITEMS

LOCATION	666 6192	666 6207	666 6299	666 6302	666 6314	672 6007	672 6009
	REFL PAV MRK TY II (W) (WORD)	REFL PAV MRK TY II (Y) 4" (SLD)	RE PM W/RET REQ TY I (W)4"(BRK)(090MIL)	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
	EA	LF	LF	LF	LF	EA	EA
SIGN AND PAVEMENT MARKINGS 1							
SIGN AND PAVEMENT MARKINGS 2	1		1721			44	
SIGN AND PAVEMENT MARKINGS 3	1	1211	1508	212	1211	53	
SIGN AND PAVEMENT MARKINGS 4		495	900	932	495	34	16
CSJ 3136-01-191 PROJECT TOTALS	**2**	**1706**	**4129**	**1144**	**1706**	**131**	**16**

SUMMARY OF TRAFFIC ITEMS

LOCATION	618 6023	618 6047	624 6002	620 6008	6027 6003
	CONDT (PVC)(SCH 40)(2")	CONDT (PVC)(SCH 80)(2")(BORE)	GROUND BOX TY A (122311) W/APRON	ELEC CONDR (NO.8) INSULATED	CONDUIT (PREPARE)
	LF	LF	EA	LF	LF
GROUND BOX LAYOUT	280	180	3	20	560
CSJ 3136-01-191 TOTAL	280	180	3	20	560

SUMMARY OF EROSION CONTROL ITEMS

LOCATION	160 6003	164 6039	168 6001	169 6001	506 6038	506 6039
	FURNISHING AND PLACING TOPSOIL (4")	DRILL SEEDING (PERM) (URBAN) (CLAY)	VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 1) (TY A)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	MG	SY	LF	LF
EROSION CONTROL LAYOUT	7438	7438	149	7438	1696	1696
CSJ 3136-01-191 PROJECT TOTALS	**7438**	**7438**	**149**	**7438**	**1696**	**1696**

Austin District
North Travis Area Office

Texas Department of Transportation

SL 0001
QUANTITY SUMMARY

SHEET 2 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	3136	01	191,etc	SL 0001
		DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		12

DATE: 3/8/2021 12:11:57 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\1. General\SL0001_QTY_SUM_2.dgn

ROADWAY

STA TO STA	100 6002 PREPARING ROW	104 6022 REMOVING CONC (CURB & GUTTER)	104 6036 REMOVING CONC (SIDEWALK OR RAMP)	105 6030 REMOVING STAB BASE & ASPH PAV (8"-14")	110 6001 EXCAVATION (ROADWAY)	132 6003 EMBANKMENT (FINAL) (ORD COMP) (TY B)	247 6366 FL BS (CMP IN PLC) (TY A GR 5) (FINAL POS)	310 6001 PRIME COAT (MULTI OPTION)	347 6001 TOM (ASPHALT) PG 76-22	347 6002 TOM-C (AGGREGATE) SAC-A	354 6002 PLAN & TEXT ASPH CON PAV (0"-2")	400 6007 CUT & RESTORE CONC PAVING	432 6045 RIP RAP (MOW STRIP) (4 IN)	450 6052 HANDRAIL (TY F)	502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING	529 6008 CONC CURB & GUTTER (TY II)	531 6002 CONC SIDEWALKS (6')	540 6001 MTL W-BEAM GD FEN (TIM POST)
	STA	LF	SY	SY	CY	CY	CY	GAL	TON	TON	SY	SY	CY	LF	MO	LF	SY	LF
BEGIN PROJECT TO END PROJECT	14	1421	54	146	1300	578	1104	440	7	103	2180	53	55	53	4	1402	252	125
CSJ: 3417-03-025 PROJECT TOTALS	14	1421	54	146	1300	578	1104	440	7	103	2180	53	55	53	4	1402	252	125

ROADWAY CONT.

STA TO STA	540 6016 DOWNSTREAM ANCHOR TERMINAL SECTION	542 2001 REMOVING MBGF	544 6001 GUARDRAIL END TREATMENT (INSTALL)	544 6003 GUARDRAIL END TREATMENT (REMOVE)	3076 6001 D-GR HMA TY-B PG64-22	3076 6040 D-GR HMA TY-D PG70-22	3076 6066 TACK COAT	3085 6001 UNDERSEAL COURSE	6001 6001 PORTABLE CHANGEABLE MESSAGE SIGN	6185 6002 TMA (STATIONARY)	6185 6003 TMA (MOBILE)
	EA	LF	EA	EA	TON	TON	GAL	GAL	DAY	DAY	DAY
BEGIN PROJECT TO END PROJECT	1	277	1	1	435	218	440	44	66	66	16
CSJ: 3417-03-025 PROJECT TOTALS	1	277	1	1	435	218	440	44	66	66	16

DRAINAGE

STA TO STA	402 6001 TRENCH EXCAVATION PROTECTION	464 6003 (CLIII) (18IN)	464 6009 RC PIPE (CL III) (42 IN)	465 6025 INLET (COMPL) (CURB) (PCO) (6') (NONE)	466 6102 HEADWALL (CH-PW-0) (DIA=42IN)	496 6002 REMOV STR (INLET)	496 6005 REMOV STR (WINGWALL)	496 6006 REMOV STR (HEADWALL)	496 6016 REMOV PIPE
	LF	LF	LF	EA	EA	EA	EA	EA	LF
BEGIN PROJECT TO END PROJECT	155	390	30	2	1	2	1	1	385
CSJ: 3417-03-025 PROJECT TOTALS	155	390	30	2	1	2	1	1	385

TRAFFIC AND PAVEMENT MARKINGS

STA TO STA	644 6004 IN SM RD SN SUP&AM TY10BWG (1) SA (T)	644 6070 RELOCATE SM RD SN SUP&AM TY TY S80	666 6036 REFL PAV MRK TY I (W) 8" (SLD) (100 MIL)	666 6042 REFL PAV MRK TY I (W) 12" (SLD) (100 MIL)	666 6180 REFL PAV MRK TY II (W) 12" (SLD)	666 6048 REFL PAV MRK TY I (W) 24" (SLD) (100 MIL)	666 6054 REFL PAV MRK TY I (W) (ARROW) (100 MIL)	666 6078 REFL PAV MRK TY I (W) (WORD) (100 MIL)	666 6178 REF PAV MRK TY II (W) 8" (SLD)	666 6182 REF PAV MRK TY II (W) 24" (SLD)	666 6184 REF PAV MRK TY II (W) (ARROW)	666 6192 REF PAV MRK TY II (W) (WORD)	672 6007 REFL PAV MRKR TY I-C
	EA	EA	LF	LF	LF	LF	EA	EA	LF	LF	EA	EA	EA
BEGIN PROJECT TO END PROJECT	2	2	1011	24	24	24	4	4	1011	24	4	4	51
CSJ: 3417-03-025 PROJECT TOTALS	2	2	1011	24	24	24	4	4	1011	24	4	4	51

EROSION CONTROL

STA TO STA	160 6003 FURNISHING AND PLACING TOPSOIL (4")	164 6041 BROADCAST (TEMP) (WARM)	168 6001 VEGETATIVE WATERING	169 6001 SOIL RETENTION BLANKETS (CL 1) (TY A)	506 6036 SANDBAGS FOR EROSION CONTROL (6")	506 6038 TEMPORARY SEDIMENT CONTROL FENCE (INSTALL)	506 6039 TEMPORARY SEDIMENT CONTROL FENCE (REMOVE)
	SY	SY	MG	SY	LF	LF	LF
BEGIN PROJECT TO END PROJECT	2075	2075	42	2075	325	1257	1257
CSJ: 3417-03-025 PROJECT TOTALS	2075	2075	42	2075	325	1257	1257

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

FM 734/PARMER LANE

SUMMARY OF QUANTITIES

SHEET 1 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	3417	03	025	FM 734
		DIST	COUNTY		SHEET NO.
		14	TRAVIS		13

ESTIMATE SUMMARY

TXDOT BID ITEM NO.	DESCRIPTION	UNIT	QUANTITY
416-6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	14
618-6030	CONDT (PVC) (SCH 40) (3") (BORE)	LF	855
618-6033	CONDT (PVC) (SCH 40) (4")	LF	15
620-6007	ELEC CONDR (NO.8) BARE	LF	870
620-6010	ELEC CONDR (NO.6) INSULATED	LF	5
682-6001	VEH SIG SEC (12")LED(GRN)	EA	1
682-6003	VEH SIG SEC (12")LED(YEL)	EA	1
682-6005	VEH SIG SEC (12")LED(RED)	EA	1
684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	165
684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	80
684-6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	200
684-6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF	405
686-6282	RELOC TRF SIG PL AM(S) SNGL MST ARM POLE	EA	1
687-6002	PEDESTRIAN PUSH BUTTON POLE	EA	1
690-6032	INSTALL PEDESTRIAN PUSH BUTTONS	EA	1
690-6033	REMOVAL OF TRAFFIC SIGNAL FND	LF	14
6027-6003	CONDUIT (PREPARE)	LF	220
834S-B**	TRAFFIC SIGNAL PULL BOX, TYPE B	EA	1
N/A	MIOVISION CABLE	LF	225
N/A	MIOVISION DETECTION UNIT	EA	1
N/A	OPTICOM DETECTOR	EA	4
N/A	OPTICOM DETECTOR CABLE	LF	960

**CITY OF AUSTIN BID ITEM

NO.	REVISIONS	BY	DATE

Stantec

Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

FM 734/PARMER LANE
TRAFFIC SIGNAL ESTIMATE & QUANTITIES

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	3417	03	025	FM 734
		DIST	COUNTY		SHEET NO.
		14	TRAVIS		14

TRAFFIC CONTROL PLAN: SEQUENCE OF WORK

CSJ 3136-01-191 SL 1

PHASE 1 - NORTHBOUND FRONTAGE SIGNS, "EXIT ONLY" PRIVATE DRIVEWAY, AND MILL & INLAY

1. INSTALL ADVANCED WARNING SIGNS AND TRAFFIC CONTROL DEVICES ACCORDING TO BC STANDARDS.
2. RECONFIGURE CURB & GUTTER AND PLACE PAVEMENT AT THE PRIVATE EXIT DRIVEWAY JUST NORTH OF ESPERANZA CROSSING AS SHOWN IN THE PLANS. COORDINATE TEMPORARY CLOSURE OF DRIVEWAY WITH PROPERTY OWNER PRIOR TO THIS WORK.
3. REMOVE EXISTING SIGNS ALONG NORTHBOUND FRONTAGE ROAD PER REMOVAL LAYOUT. INSTALL NEW SIGNS ALONG NORTHBOUND FRONTAGE ROAD PER PLANS USING APPLICABLE TCP STANDARDS. KEEP SIGNS BAGGED UNTIL FINAL STRIPING FOR NEW LANE CONFIGURATION IS COMPLETE.
4. PERFORM 1" EDGE MILLING OPERATIONS ON NB FRONTAGE AS SHOWN ON THE STRIPING LAYOUTS. USE TCP STANDARDS FOR MOBILE OPERATIONS.
5. PLACE 1" TOM FINAL COURSE PAVING AS SHOWN ON THE STRIPING LAYOUTS.
6. PLACE TEMPORARY TABS FOR SHORT TERM WORK ZONE PAVEMENT MARKINGS USING TCP(7-1)
7. SEVEN (7) DAYS PRIOR TO PERMANENT STRIPING, PROVIDE ONE PORTABLE CHANGEABLE MESSAGE BOARD PCMB) ON THE NORTHBOUND FRONTAGE ROAD TO WARN TRAVELERS OF NEW TRAFFIC PATTERN. PCMB SHALL REMAIN IN PLACE A MINIMUM OF SEVEN (7) DAYS AFTER STRIPING NEW LANE CONFIGURATION.
8. INSTALL PERMANENT PAVEMENT MARKINGS PER PLANS USING TCP STANDARDS FOR MOBILE OPERATIONS.

PHASE 2 - CONSTRUCT NEW RAMP AND UNDERGROUND INFRASTRUCTURE

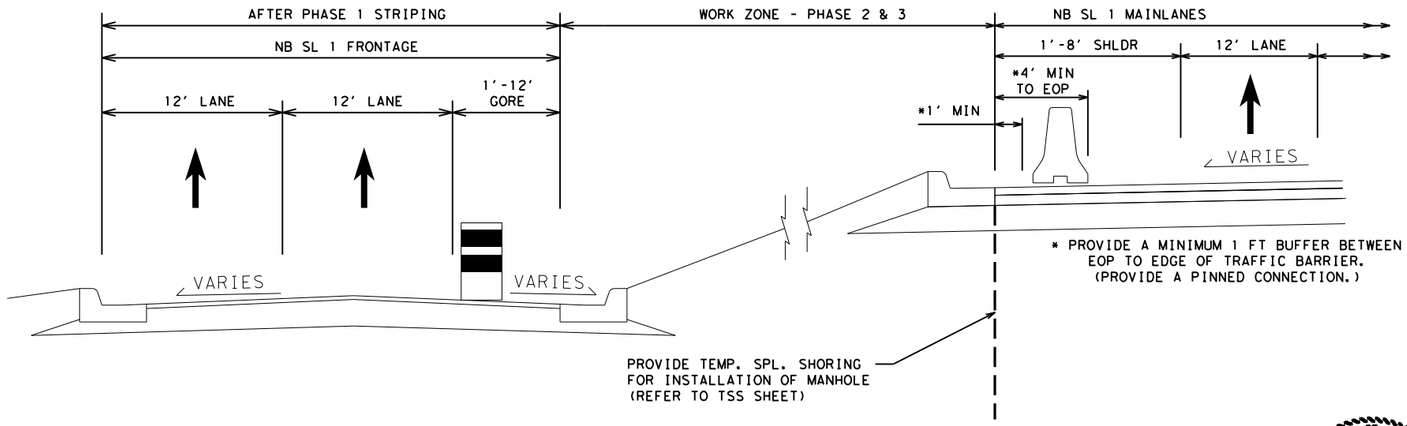
1. INSTALL ADVANCED WARNING SIGNS AND TRAFFIC CONTROL DEVICES ACCORDING TO BC STANDARDS. EXISTING EXIT RAMP IS TO REMAIN OPEN DURING THIS PHASE. USE OF TCP(6-4b) NEAR THE EXIT RAMP AND TCP(2-4a) MAYBE USED TO COMPLETE WORK NEAR TIE-IN TO EXISTING PAVEMENT.
2. INSTALL TEMPORARY EROSION CONTROL DEVICES PER PLANS.
3. INSTALL TEMP. CONCRETE TRAFFIC BARRIER PER PLANS.
4. PREPARE WORK AREA PER REMOVAL LAYOUTS. EXCAVATE WITH CARE SO AS TO NOT DAMAGE EXISTING DRAINAGE AND CONDUIT INFRASTRUCTURE TO BE CONNECTED TO THE PROPOSED.
5. INSTALL PROPOSED DRAINAGE PER PLANS. PRIOR TO INSTALLATION, INSTALL TEMPORARY SPECIAL SHORING (TSS) ALONG THE EXISTING RAMP PER PLANS AND TRENCH EXCAVATION PROTECTION (TEP) FOR EXCAVATIONS > THAN 5 FT FROM GROUND SURFACE.
6. INSTALL PROPOSED GROUND BOXES AND CONDUITS PER PLANS.
7. INSTALL ILLUMINATION CONDUIT PROPOSED UNDER PAVEMENT STRUCTURE IN THE WORK AREA.
8. RE-GRADE ROAD-SIDE DITCHES PER PLANS AND PLACE PERMANENT EROSION CONTROL.
9. COMPLETE ALL UNDERGROUND INFRASTRUCTURE PRIOR TO PLACING NEW RAMP PAVEMENT.
10. PLACE FLEXBASE, CURB & GUTTER, AND PAVEMENT PER TYPICAL SECTIONS FOR PROPOSED RAMP.
11. INSTALL NEW SIGNS AT THE PROPOSED RAMP PER PLANS. KEEP NEW SIGNS BAGGED FOR THE EXTENT THE RAMP IS CLOSED TO TRAFFIC.
12. PERFORM MBGF UPGRADE PER PLANS.
13. KEEP NEW RAMP CLOSED TO TRAFFIC UNTIL CLOSURE OF EXISTING RAMP IN PHASE 3. PROVIDE BARRICADES AT THE ENTRANCE AND EXIT OF THE NEW RAMP TO PROHIBIT TRAFFIC ACCESS.

PHASE 3 - OPEN PROPOSED RAMP & OBLITERATE EXISTING RAMP

1. INSTALL TEMPORARY SIGNS AND TRAFFIC CONTROL DEVICES ACCORDING TO BC STANDARDS.
2. CLOSE EXISTING SL1 NB EXIT RAMP AND OPEN NEW RAMP INSTALLED IN PHASE 2 ACCORDING TO TCP(6-3a) FOR EXIT RAMP CLOSED.
3. CLOSE SL1 NB FRONTAGE INSIDE LANE PER TCP(2-4a) TO COMPLETE WORK AT PAVEMENT TIE-IN TO FRONTAGE ROAD.
4. OBLITERATE EXISTING RAMP AND PREPARE WORK AREA PER REMOVAL LAYOUTS.
5. CUT AND PLACE TEMPORARY CAP ON RCP AS INDICATED ON PLANS AND ATTACH TO PROPOSED DRAINAGE INFRASTRUCTURE INSTALLED IN PHASE 2.
6. FILL AND ABANDONED EXISTING GROUND BOXES PER REMOVAL PLAN.
7. INSTALL ILLUMINATION INFRASTRUCTURE PROPOSED WITHIN WORK AREA.
8. RE-GRADE ROAD-SIDE DITCHES PER PLANS AND PLACE PERMANENT EROSION CONTROL.

PHASE 4 - INSTALL SAFETY LIGHTING

1. INSTALL TEMPORARY SIGNS AND TRAFFIC CONTROL DEVICES ACCORDING TO BC STANDARDS.
2. INSTALL REMAINING POLE FOUNDATIONS AND CONDUITS.
3. INSTALL AND WIRE ILLUMINATION ASSEMBLIES.
4. CONNECT ELECTRICAL SERVICE.
5. REMOVE ALL TRAFFIC CONTROL DEVICES.
6. REMOVE TEMPORARY EROSION CONTROL DEVICES ONCE VEGETATION IS ESTABLISHED AS APPROVED BY THE ENGINEER.
7. PERFORM FINAL CLEAN UP AND PUNCHLIST ITEMS.



TRAFFIC CONTROL PLAN
TYPICAL SECTION

TRAFFIC CONTROL GENERAL NOTES

ALL EXISTING LANES OF TRAFFIC MUST BE SAFELY OPEN TO TRAFFIC AT THE END OF EACH WORK SHIFT. LANE RENTAL FEES WILL APPLY TO SL 1 MAIN LANE CLOSURES WHEN APPLICABLE.

PROVIDE A SAFETY SLOPE TO ELIMINATE DROPOFFS. PROVIDE EDGE OF BACKFILL MATERIAL TO ACHEIVE A MINIMUM OF 3:1 SAFETY SLOPE STARTING FROM THE OUTSIDE EDDGE OF CHANNELIZING DEVICES. BACKFILL MATERIAL MUST BE ACCEPTED BY THE ENGINEER. THIS WORK IS SUBSIDIARY TO PERTINENT ITEMS.

CONTRACTOR MAY SUBMIT AN ALTERNATIVE PHASING PLAN FOR APPROVAL BY THE ENGINEER. CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL COSTS ASSOCIATED WITH THE REVISED PLAN.

STATE OF TEXAS
RACHEL R. LARCOM
95872
LICENSED PROFESSIONAL ENGINEER

12/08/2020

Austin District
North Travis Area Office

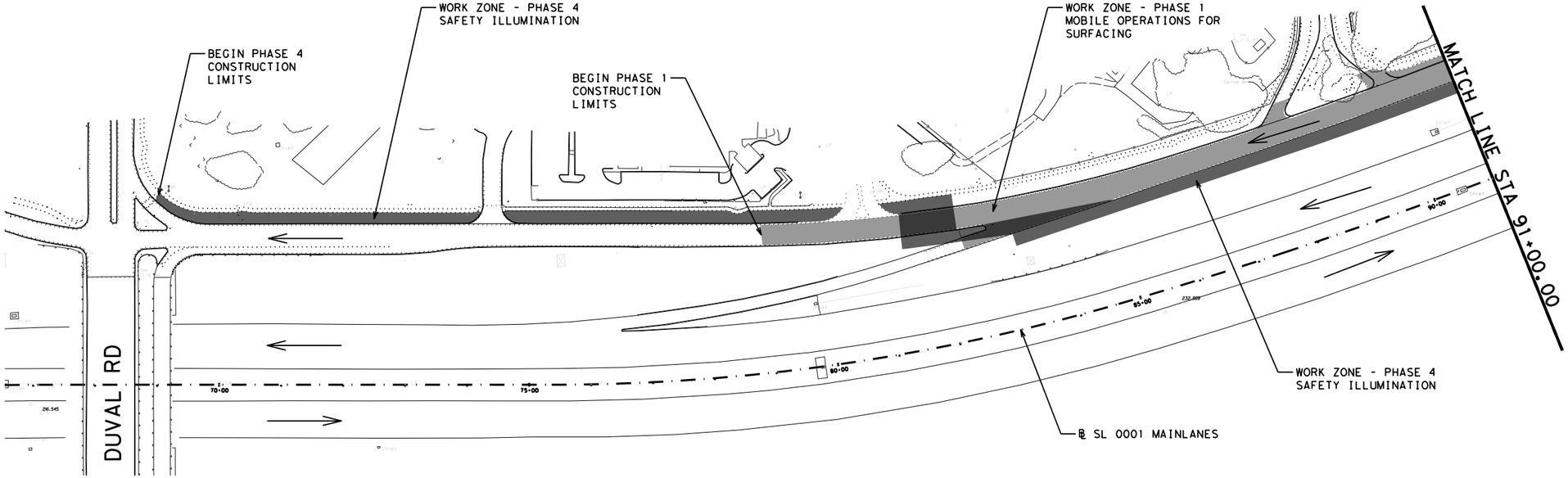
Texas Department of Transportation

SL 0001
TCP
SEQUENCE OF WORK

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3136	01	191,etc	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		15

DATE: 12/7/2020 10:16:18 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\2. TCP\SL0001_TCP_SOW.dgn



WORK ZONE LIMITS - PHASES 1 & 4

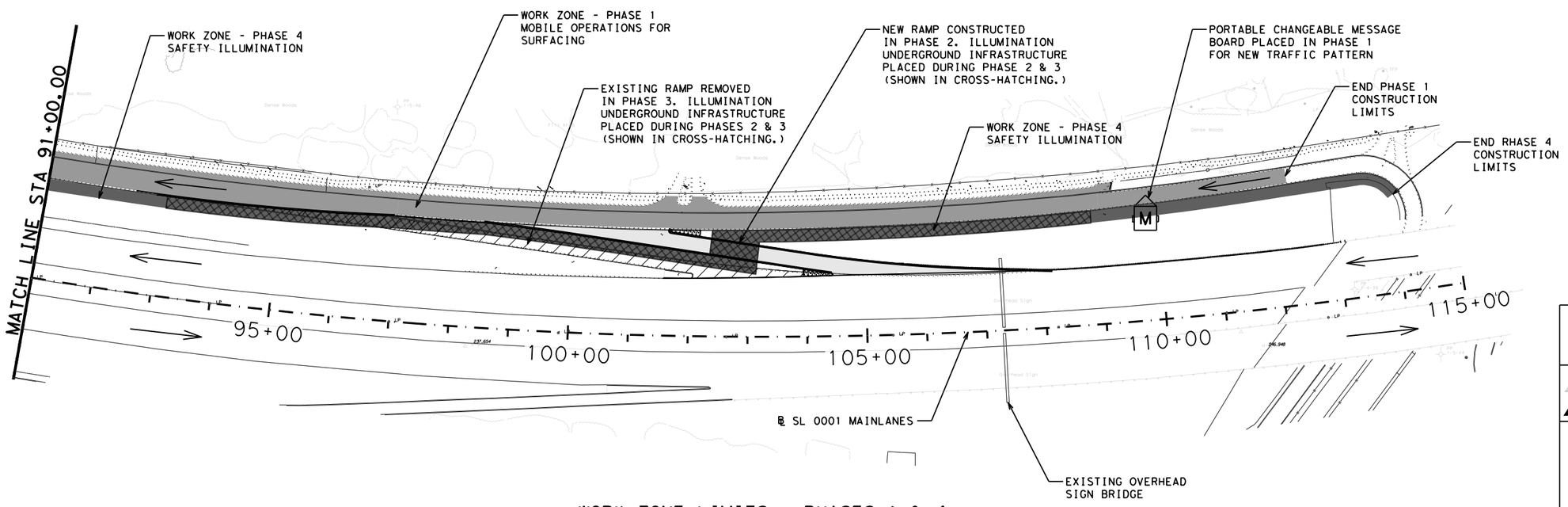
N

NOTE:

FOR MORE DETAILED INFORMATON, REFER TO TCP SEQUENCE OF WORK, TXDOT TCP STANDARDS, AND GENERAL NOTES FOUND IN THIS PLAN SET.

- PHASE 1 CONSTRUCTION
- PHASE 4 CONSTRUCTION
- EXISTING RAMP (TO BE REMOVED)
- ILLUMINATION UNDERGROUND INFRASTRUCTURE (PLACED IN PHASE 2)

STATE OF TEXAS
RACHEL R. LARCOM
95872
LICENSED
PROFESSIONAL ENGINEER
12/29/2020



WORK ZONE LIMITS - PHASES 1 & 4

N

SCALE (IN FEET):
0 200

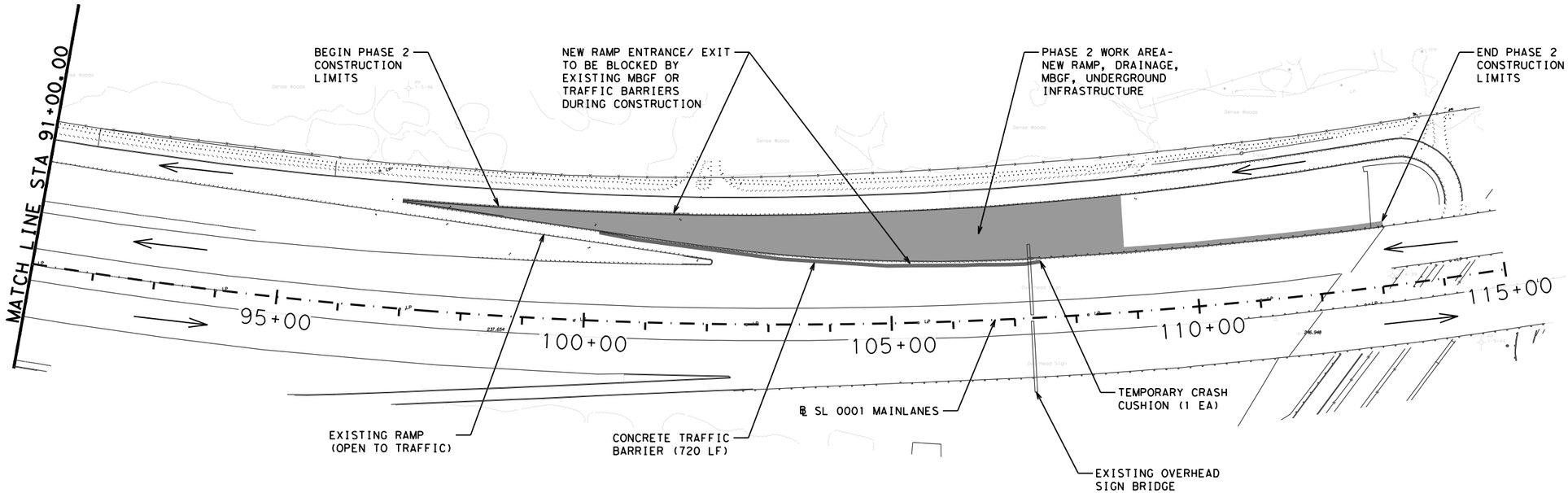
Austin District
North Travis Area Office

Texas Department of Transportation

SL 1
TRAFFIC CONTROL LAYOUT PHASE 1 & 4

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3136	01	191,etc	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		16

DATE: 12/29/2020 3:50:17 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011914 - Design\Plan Set\2. TCP\SL001_TCP_plan_p3_4.dgn



WORK ZONE LIMITS - PHASE 2

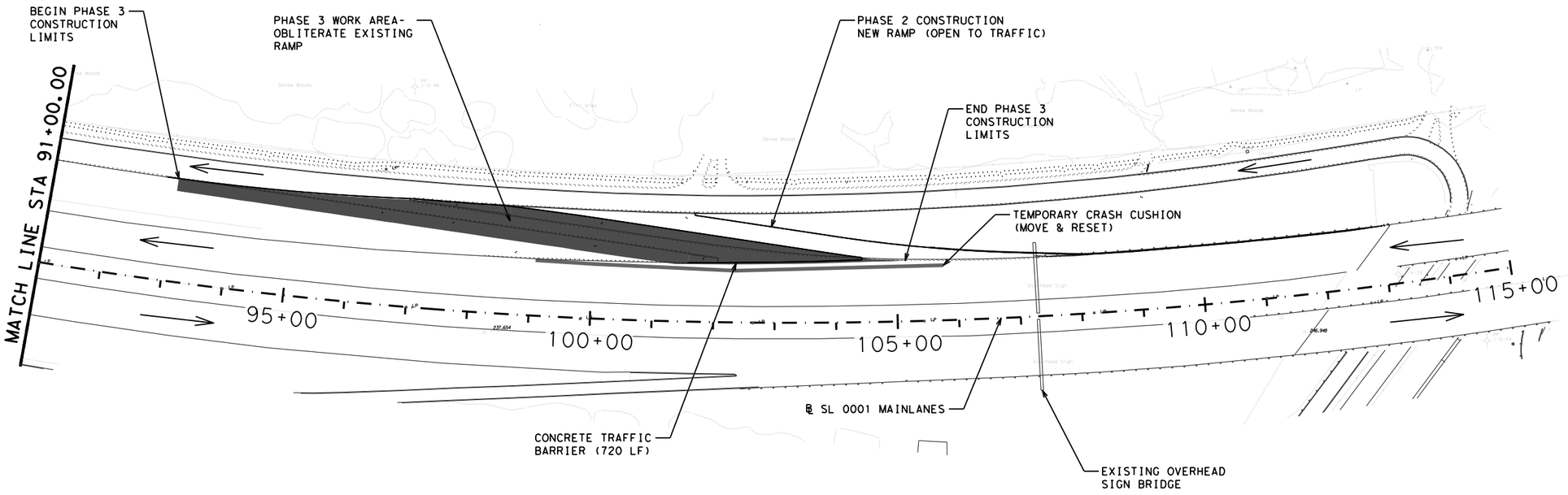
NOTES:

FOR MORE DETAILED INFORMATON, REFER TO TCP SEQUENCE OF WORK, TXDOT TCP STANDARDS, AND GENERAL NOTES FOUND IN THIS PLAN SET.

PHASE 2 CONSTRUCTION

PHASE 3 CONSTRUCTION

STATE OF TEXAS
RACHEL R. LARCOM
95872
LICENSED PROFESSIONAL ENGINEER
12/29/2020



WORK ZONE LIMITS - PHASE 3

SCALE (IN FEET):
0 200

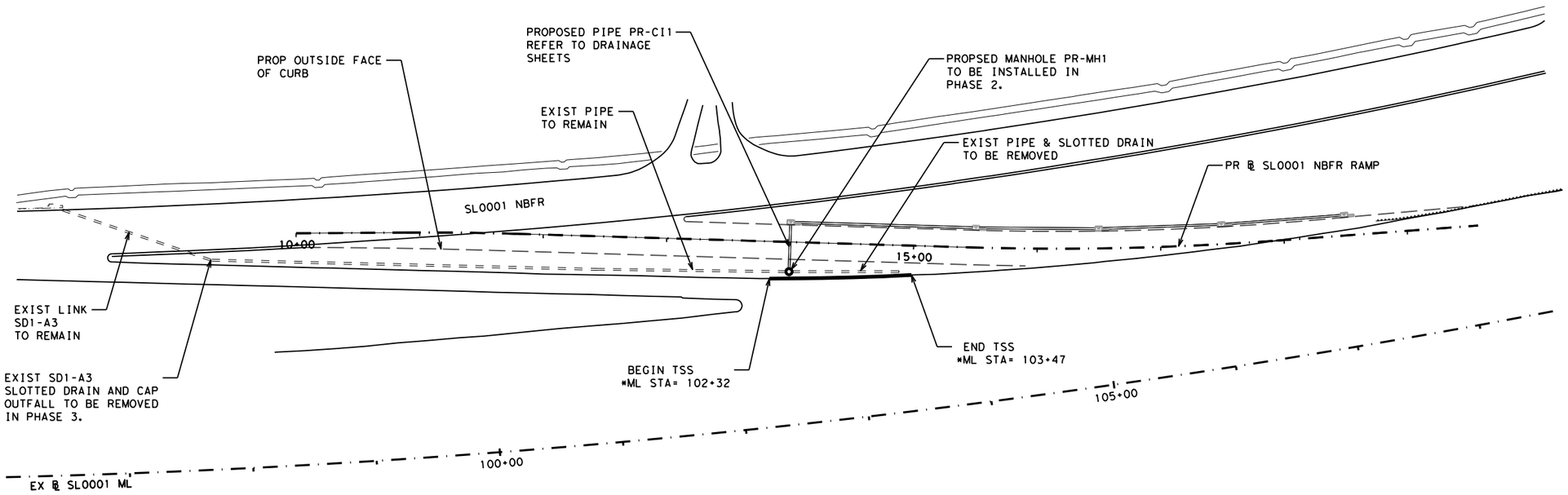
Austin District
North Travis Area Office

Texas Department of Transportation

SL 1
TRAFFIC CONTROL LAYOUT PHASE 2 & 3

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	3136	01	191,etc	SL 0001
		DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		17

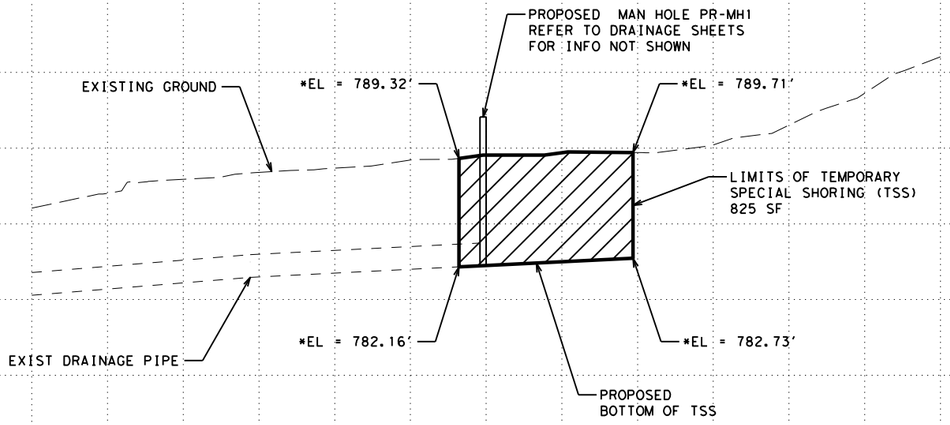
DATE: 12/29/2020 3:28:36 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\2. TCP\SL001_TCP_plan_pl.dgn



*NOTES:

PROVIDE TEMPORARY SPECIAL SHORING (TSS) TO BRACE EDGE OF PAVEMENT ON EXISTING RAMP DURING THE INSTALLATION OF NEW MANHOLE AND REMOVAL OF EXISTING STORM PIPE AND SLOTTED DRAIN.

ALL STATIONS AND ELEVATIONS SHOWN ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY AND MAKE ADJUSTMENTS ACCORDING TO FIELD CONDITIONS.



RACHEL R. LARCOM
95872
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

12/8/2020

SCALES (IN FEET):
HORZ- 0 100
VERT- 0 10

Austin District
North Travis Area Office

Texas Department of Transportation

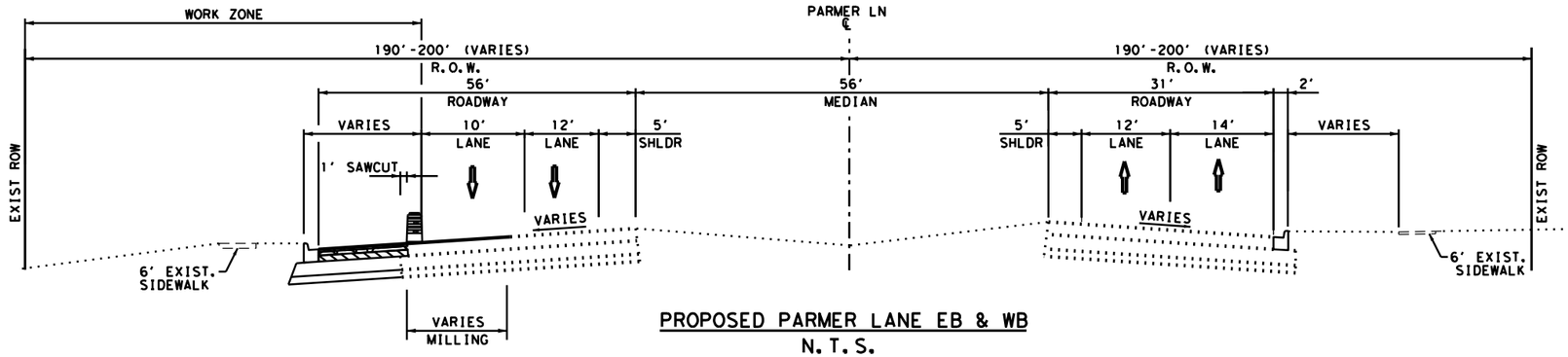
SL0001

TEMPORARY SPECIAL SHORING

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3136	01	191	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		17A

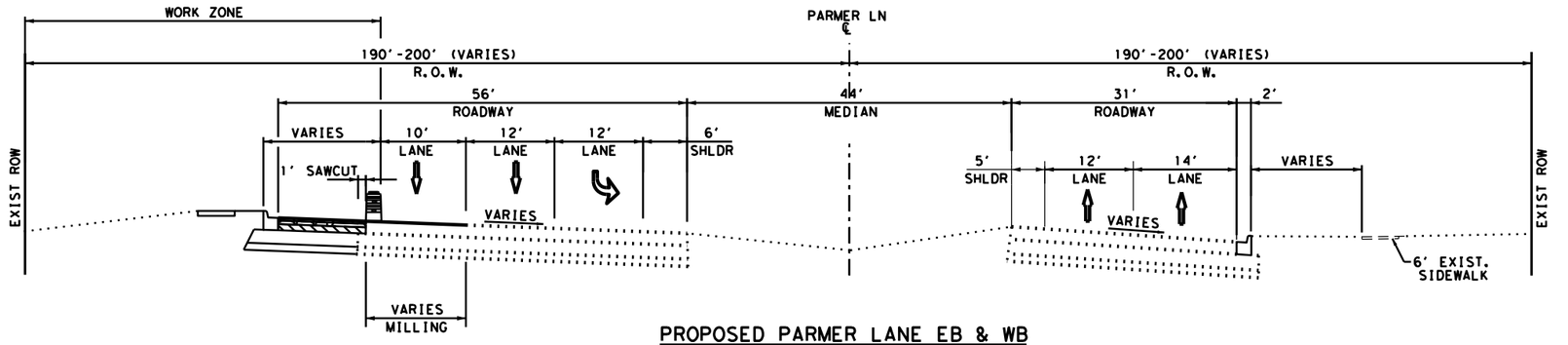
DATE: 12/3/2020 9:29:35 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\2. TCP\SL0001_TCP_DTL.dgn



PROPOSED PARMER LANE EB & WB

N.T.S.

STA 44+86.09 TO STA 52+50.10



PROPOSED PARMER LANE EB & WB

N.T.S.

STA 57+55.50 TO STA 63+66.88

GENERAL NOTES

1. PROVIDE BARRICADES AND SIGN LOCATIONS IN ACCORDANCE WITH THE LATEST VERSION AND REVISION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) AND TXDOT "BC(1)-14 THROUGH BC(12)-14" STANDARD SHEETS.
2. PERFORM ALL WORK DURING DAYLIGHT HOURS, EXCEPT IN EMERGENCY SITUATIONS, AND AS PERMITTED BY THE ENGINEER.
3. ACCESS TO ALL SIDE STREETS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES AT THE SOLE EXPENSE OF THE CONTRACTOR. THE CONTRACTOR SHALL CONTACT THE BUSINESS OR PROPERTY OWNER AT LEAST FIVE (5) DAYS IN ADVANCE OF SIDE STREET AND/OR DRIVEWAY CONSTRUCTION. IF THE PROPERTY OWNER HAS MORE THAN ONE DRIVEWAY CONSTRUCTION WILL ONLY BE PERMITTED ON ONE (1) DRIVEWAY AT A TIME. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ADEQUATE TEMPORARY SURFACING FOR THE TRANSITIONS BETWEEN PAVEMENT ELEVATIONS.
4. MAINTAIN EXISTING DRAINAGE CONDITIONS DURING ALL PHASES OF CONSTRUCTION.
5. INSTALL 3:1 SAFETY SLOPE AT END OF EACH DAY ALONG EDGE OF EXISTING PAVEMENT.

TRAFFIC CONTROL NARRATIVE

1. INSTALL TRAFFIC CONTROL BARRICADES AND ADVANCED WARNING SIGNS IN ACCORDANCE WITH STANDARD "BC(2)-14" AND TRAFFIC CONTROL PLAN.
2. INSTALL EROSION CONTROL DEVICES AS SHOWN ON EROSION CONTROL PLAN SHEETS.
3. INSTALL TRAFFIC CONTROL DEVICES AS SHOWN IN TRAFFIC CONTROL PLAN. REFER TO TCP(2-1)-18 FOR ADDITIONAL DETAILS.
4. SAW CUT AND REMOVE EXISTING PAVEMENT TO LIMITS SHOWN IN PLANS (REFER TO PLAN AND PROFILE SHEETS). CONTRACTOR SHALL INSTALL A 3:1 SAFETY WEDGE AT THE END OF EACH DAY'S WORK.
5. PREFORM EXCAVATION AND GRADING TO TOP OF PROPOSED SUBGRADE.
6. CONSTRUCT PROPOSED TURN LANES, DRIVEWAYS, AND INLET EXTENSIONS. (SEE DRAINAGE PLAN AND PROFILE.)
7. PERFORM FINAL STRIPING.
8. REMOVE EROSION CONTROL DEVICES
9. FINAL CLEAN UP.
10. REMOVE PROJECT BARRICADES WHEN DIRECTED BY THE ENGINEER.

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
12/9/2020

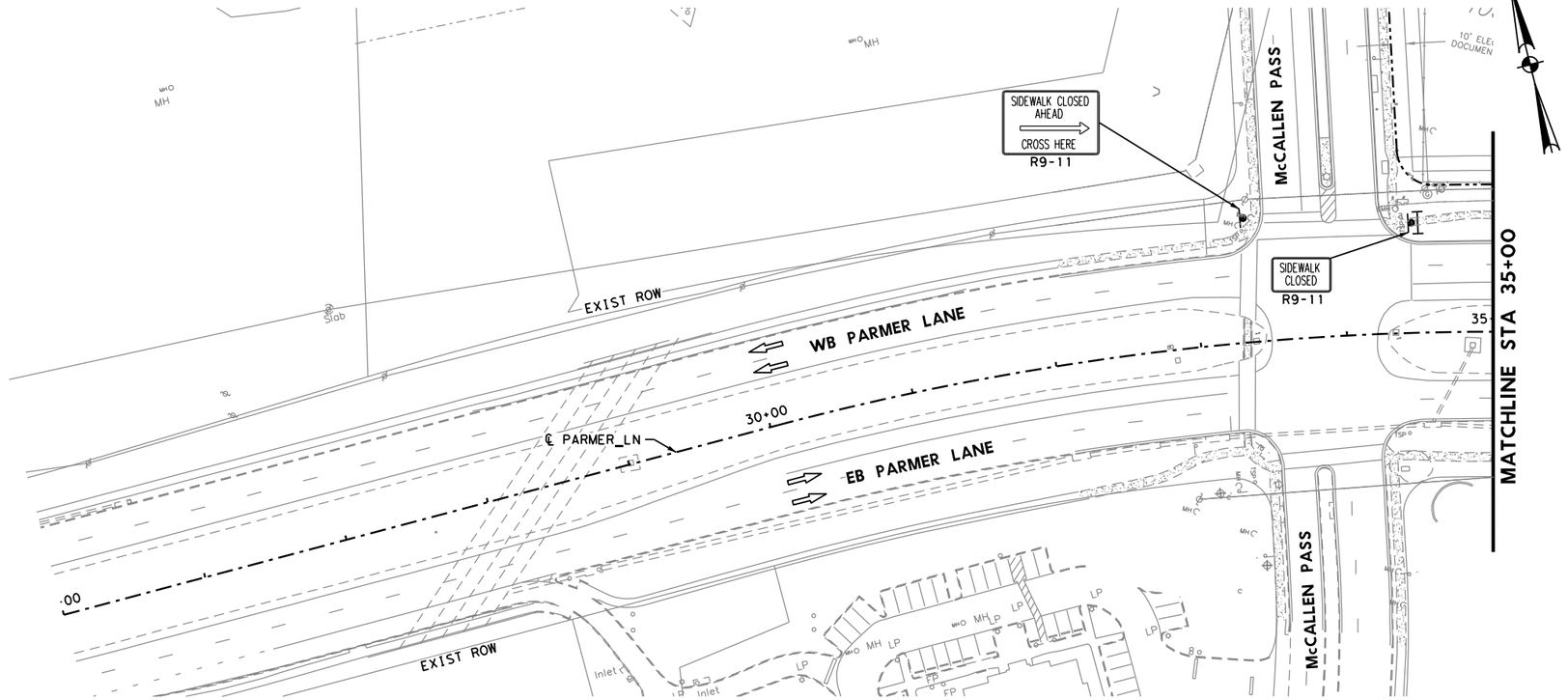
NO.	REVISIONS	BY	DATE

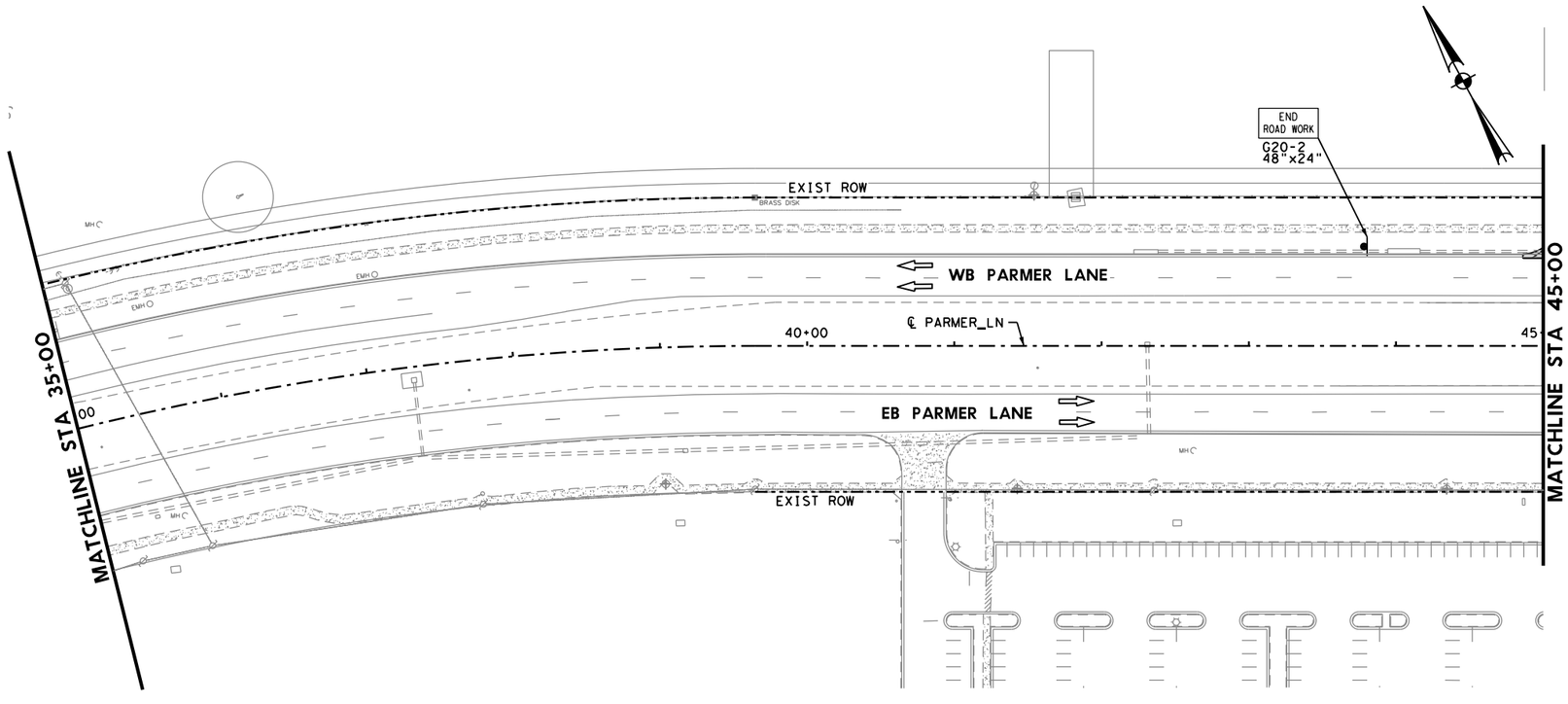
Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

PARMER LANE
TRAFFIC CONTROL PLAN TYPICAL SECTIONS AND NARRATIVE

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		18





LEGEND

- EXISTING RIGHT OF WAY BOUNDARY
- SLOPE EASEMENT
- EXISTING DIRECTION OF TRAFFIC
- PROPOSED DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- CHANNELIZING DEVICE @ 80'C-C ON TANGENT AND @ 40'C-C ON TAPER
- CONSTRUCTION SIGN
- CONSTRUCTION AREA

NOTES:

1. INTENT OF TCP IS TO SERVE AS A VISUAL REFERENCE FOR A PHASED CONSTRUCTION PLAN AND ITEMS UNIQUE TO THE PARTICULAR PHASE ONLY. REFER TO SPECIFIC SHEETS WITHIN FOR MORE INFORMATION.
2. SHOULD CONTRACTOR DESIRE TO UTILIZE EXISTING INTERSECTION PAVEMENT AS A CONSTRUCTION ENTRANCE, CONTRACTOR SHALL ERECT TMUTCD CW8-6 SIGNAGE IN LOCATIONS SHOWN.

0 25 50 100

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
11/25/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

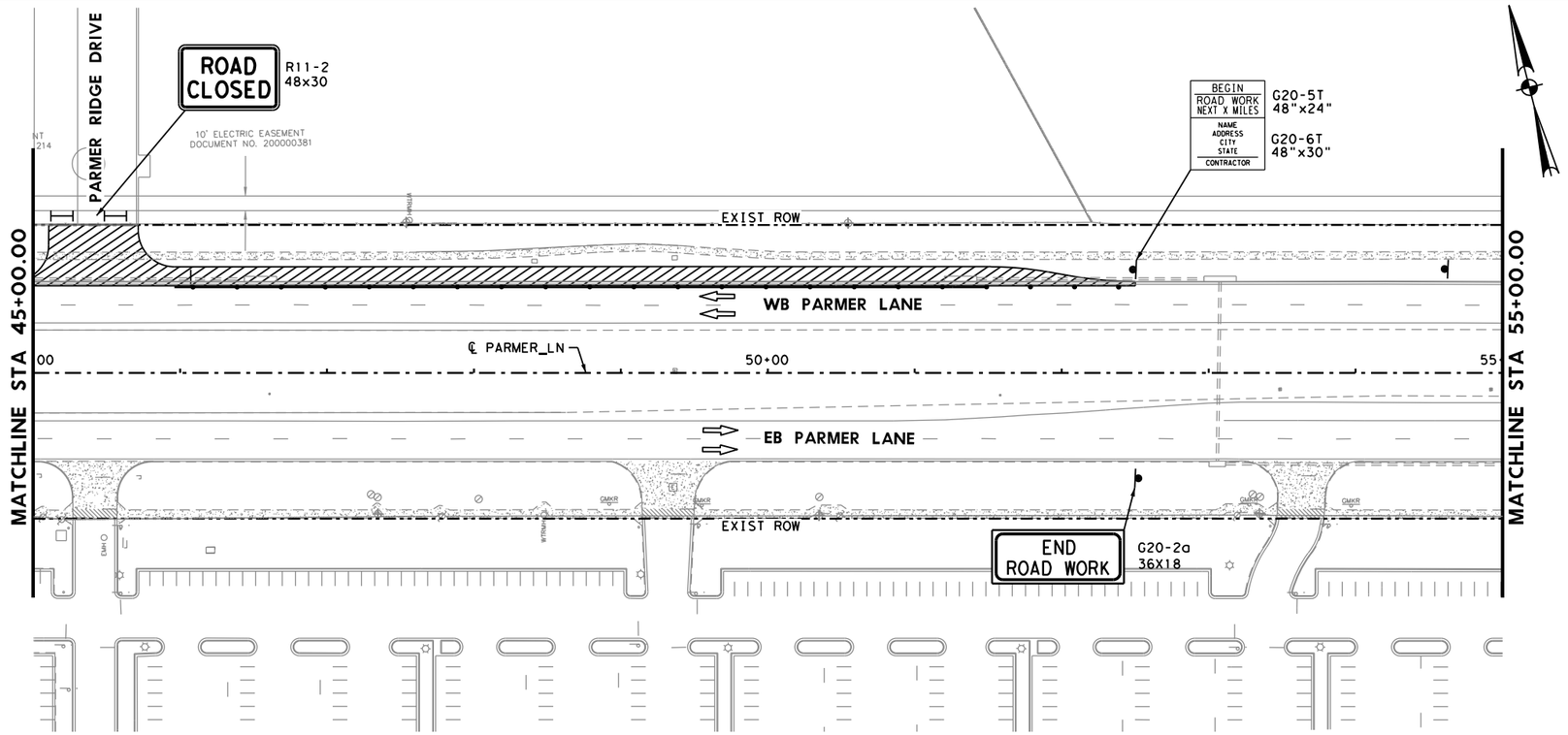
PARMER LANE

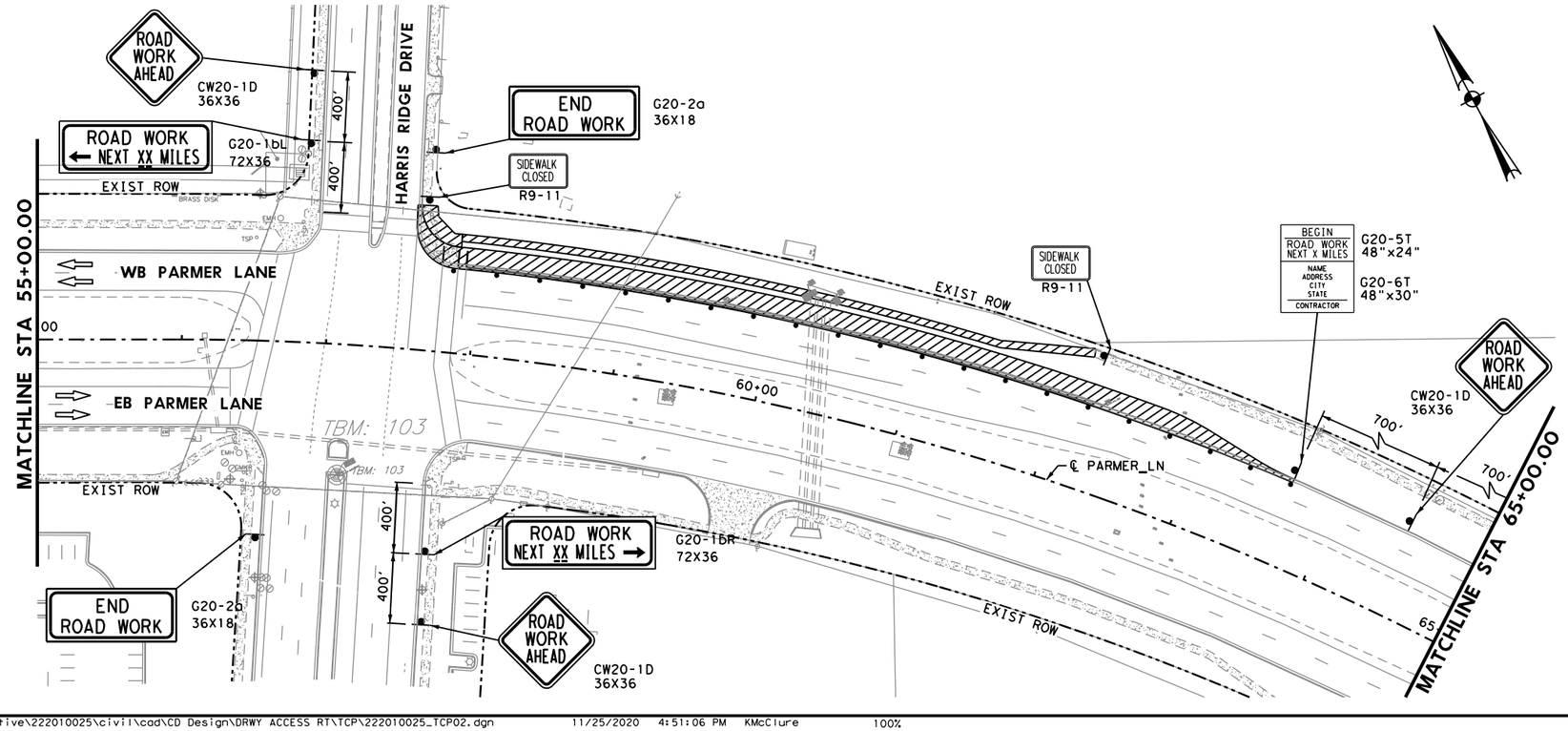
TRAFFIC CONTROL PLAN

SHEET 1 OF 3

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		19

V:\2220\active\222010025\civil\cad\CD Design\DRWY ACCESS RT\TCP\222010025_TCP01.dgn 11/25/2020 4:51:01 PM KMcClure 100%





LEGEND

- EXISTING RIGHT OF WAY BOUNDARY
- SLOPE EASEMENT
- EXISTING DIRECTION OF TRAFFIC
- PROPOSED DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- CHANNELIZING DEVICE @ 80'C-C ON TANGENT AND @ 40'C-C ON TAPER
- CONSTRUCTION SIGN
- CONSTRUCTION AREA

NOTES:

1. INTENT OF TCP IS TO SERVE AS A VISUAL REFERENCE FOR A PHASED CONSTRUCTION PLAN AND ITEMS UNIQUE TO THE PARTICULAR PHASE ONLY. REFER TO SPECIFIC SHEETS WITHIN FOR MORE INFORMATION.
2. SHOULD CONTRACTOR DESIRE TO UTILIZE EXISTING INTERSECTION PAVEMENT AS A CONSTRUCTION ENTRANCE, CONTRACTOR SHALL ERECT TMUTCD CW8-6 SIGNAGE IN LOCATIONS SHOWN.

0 25 50 100

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
11/25/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

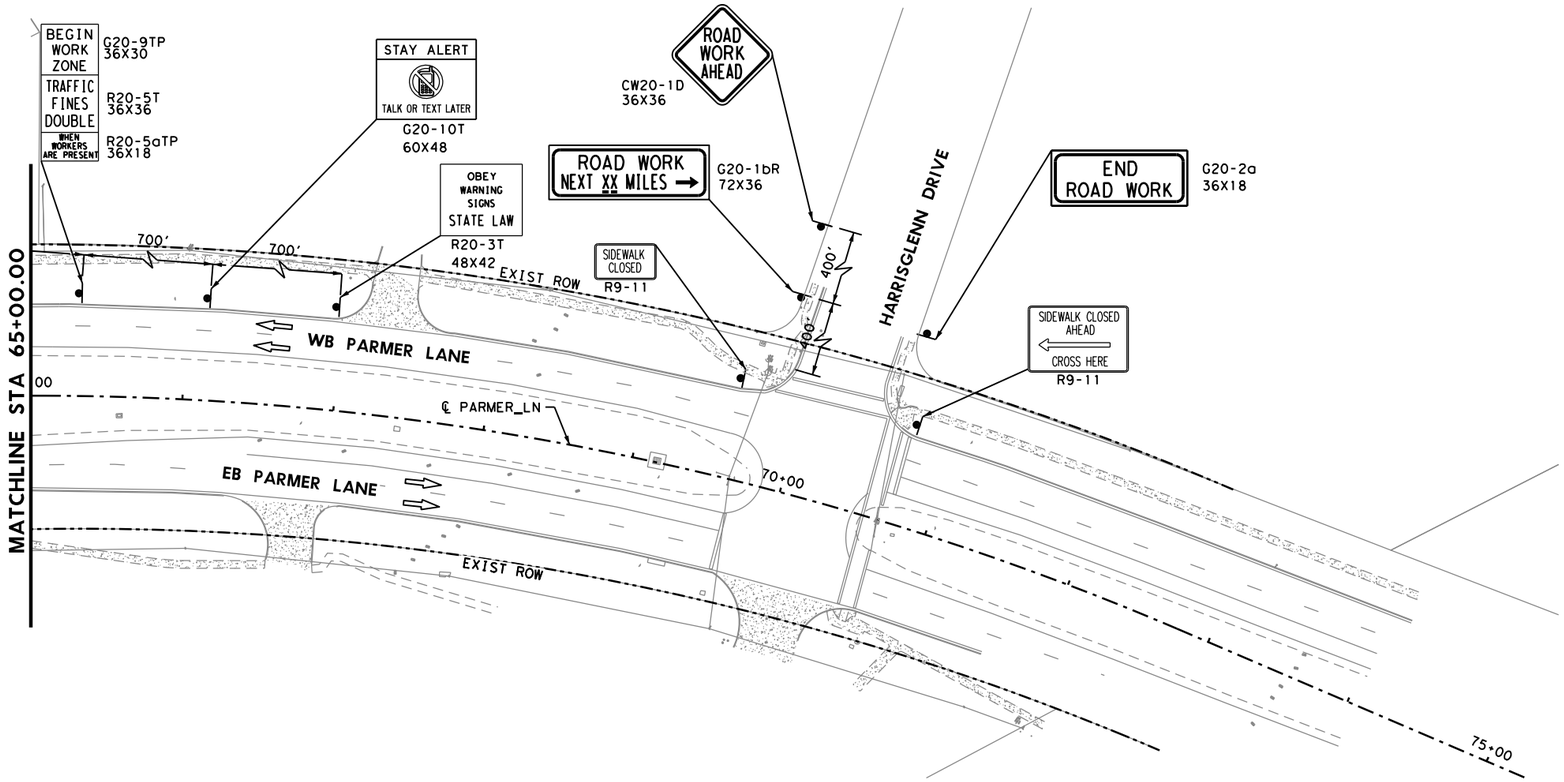
Texas Department of Transportation

PARMER LANE

TRAFFIC CONTROL PLAN

SHEET 2 OF 3

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		20



LEGEND

- EXISTING RIGHT OF WAY BOUNDARY
- SLOPE EASEMENT
- EXISTING DIRECTION OF TRAFFIC
- PROPOSED DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- CHANNELIZING DEVICE @ 80'C-C ON TANGENT AND @ 40'C-C ON TAPER
- CONSTRUCTION SIGN
- CONSTRUCTION AREA

NOTES:

1. INTENT OF TCP IS TO SERVE AS A VISUAL REFERENCE FOR A PHASED CONSTRUCTION PLAN AND ITEMS UNIQUE TO THE PARTICULAR PHASE ONLY. REFER TO SPECIFIC SHEETS WITHIN FOR MORE INFORMATION.
2. SHOULD CONTRACTOR DESIRE TO UTILIZE EXISTING INTERSECTION PAVEMENT AS A CONSTRUCTION ENTRANCE, CONTRACTOR SHALL ERECT TMUTCD CW8-6 SIGNAGE IN LOCATIONS SHOWN.

0 25 50 100

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER

11/25/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

PARMER LANE

TRAFFIC CONTROL PLAN

SHEET 3 OF 3

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		21

LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC.#	N	W	N	W	N	W
1	2	17	SL 1 EXIT RAMP	~107+30.00	TL-3	UNI	-	-	PTCB	24"	32"	21'MIN	X								X	
2	3	17	SL 1 EXIT RAMP	~105+70.00	TL-3	UNI	-	-	PTCB	24"	32"	21'MIN			X	1					X	
												TOTALS										

LEGEND:
L=LOW MAINTENANCE
R=REUSABLE
S=SACRIFICIAL
N=NARROW
W=WIDE

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwyIse.htm

CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:		CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191,etc	SL 0001
	DIST	COUNTY		
	AUS	TRAVIS		
	FEDERAL AID PROJECT			SHEET NO.
				21A

DATE: 11/6/2020 1:37:33 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601g14 - Design\Plan Set\2. TCP\TCP STD\bc-14.dgn

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. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.

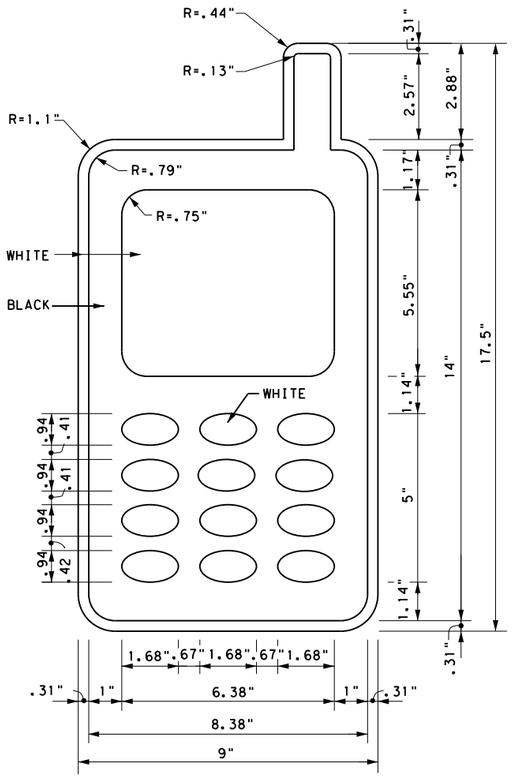
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

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 APPAREL 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.



3.0" Radius, 1.25" Border, 0.75" Indent, Black on Yellow;
[STAY ALERT] Font: D
3.0" Radius, 1.25" Border, 0.75" Indent, Black on Orange;
[TALK OR TEXT LATER] Font: C specified length;

SIGN DETAIL (G20-10T)

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3118

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

Texas Department of Transportation | Traffic Operations Division Standard

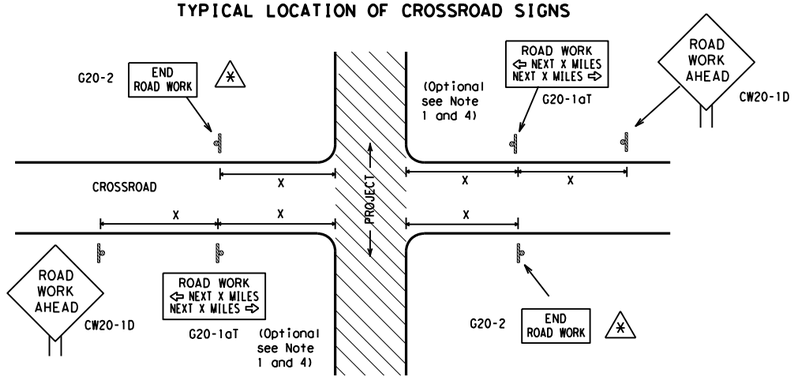
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
4-03 5-10 8-14	DIST	COUNTY		SHEET NO.
9-07 7-13	AUS	TRAVIS		22

DATE: 11/6/2020 1:37:34 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601\Level2_TCP\TCP STD\bc-14.dgn

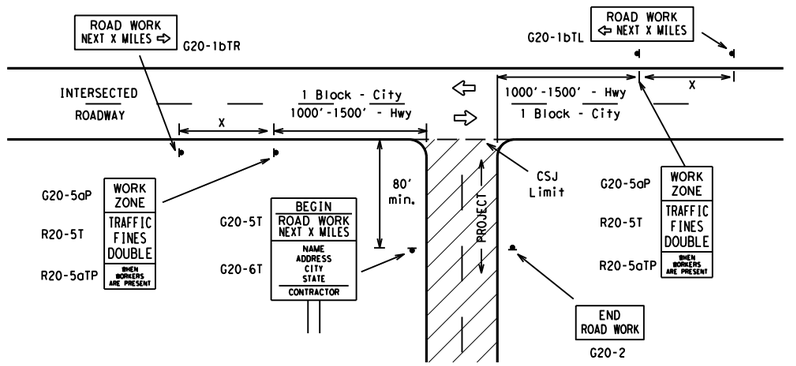
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE			SPACING	
Sign Number or Series	Conventional Road	Expressway/ Freeway	Posted Speed	Sign Spacing "X" △
			MPH	Feet (Apprx.)
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"	30	120
			35	160
			40	240
			45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	50	400
			55	500[2]
			60	600[2]
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	65	700[2]
			70	800[2]
			75	900[2]
			80	1000[2]
			✱	✱ [3]

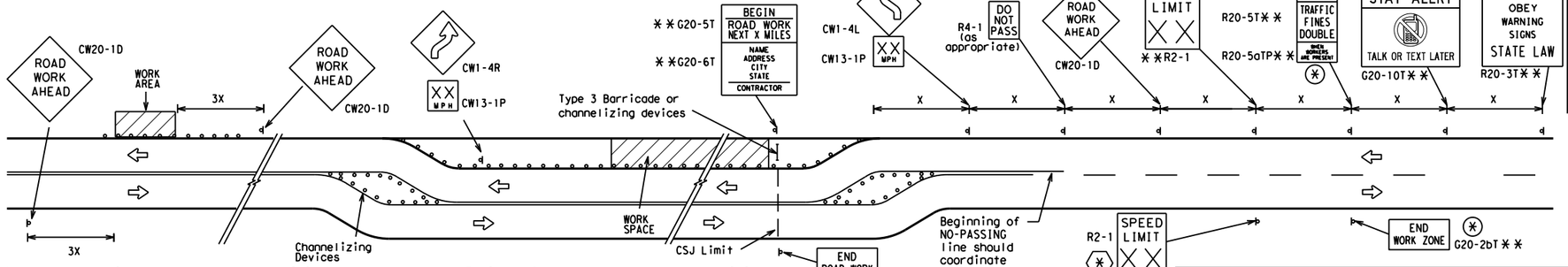
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

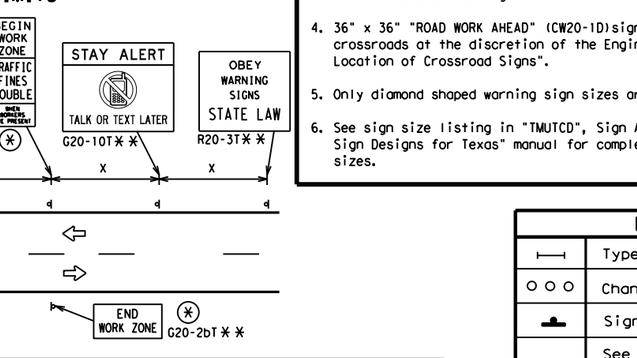
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

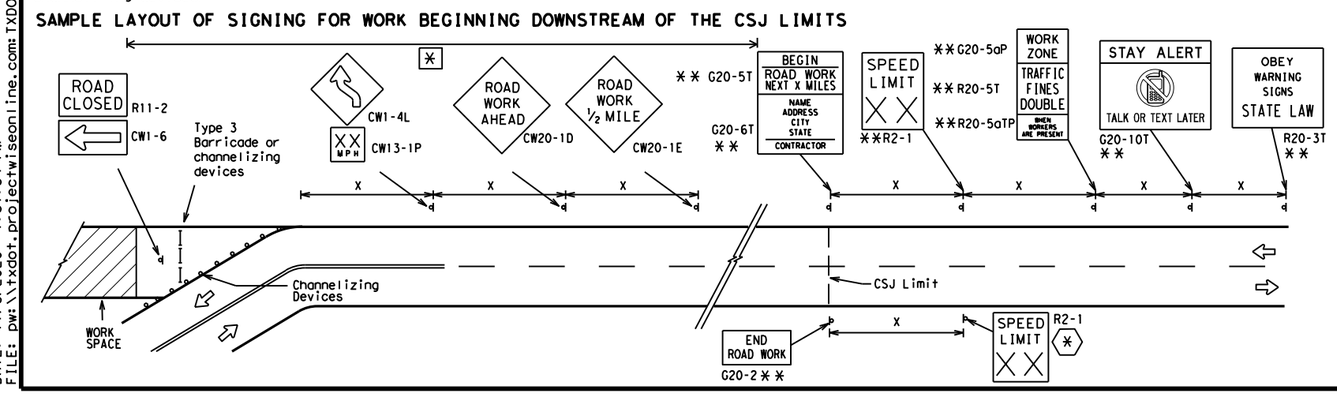


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

✱✱ Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.

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

(✱) Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	TRAVIS		23

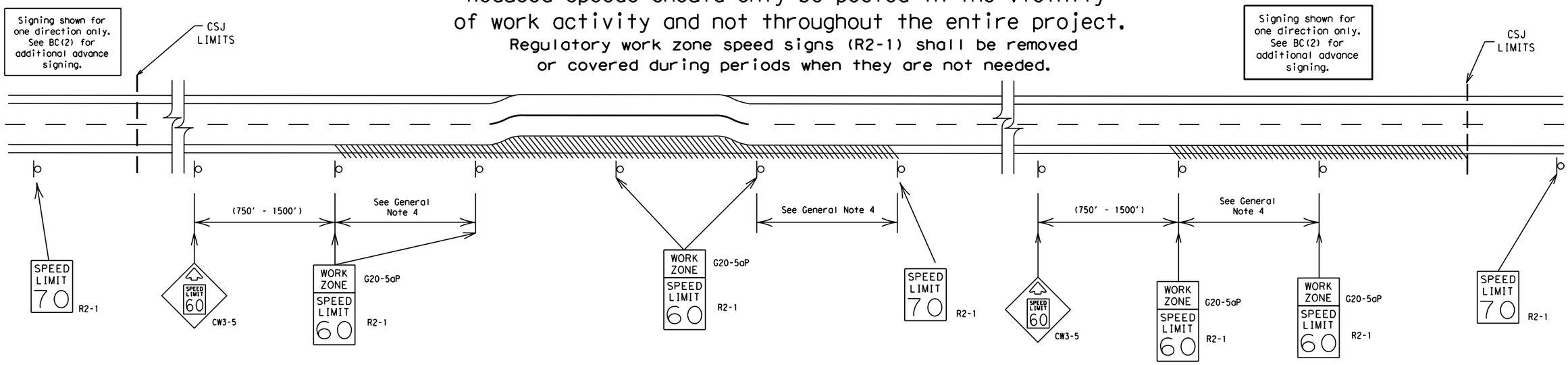
DATE: 11/6/2020 1:37:36 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\STD\bc-14.dgn

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

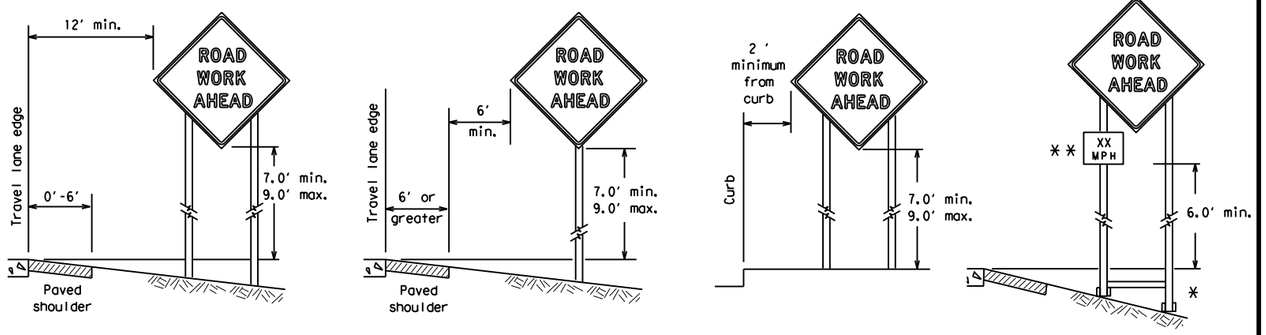
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		24

DATE: 11/6/2020 1:37:37 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\136019\4 - Design\Plan Set\2. TCP\TCP STD\bc-14.dgn

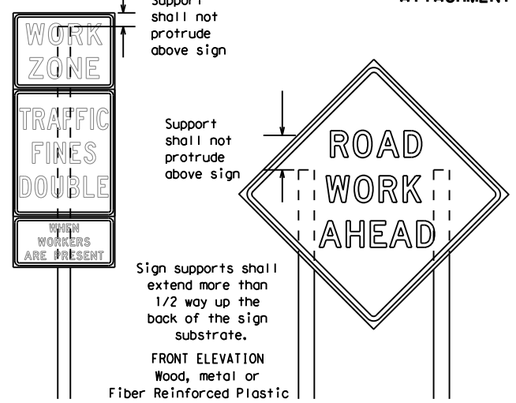
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



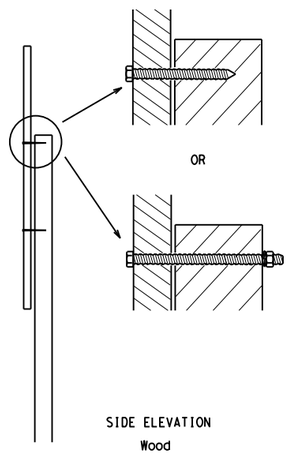
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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 spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

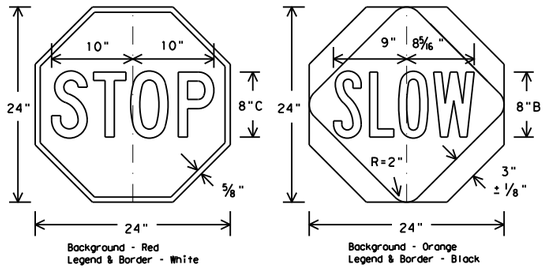


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

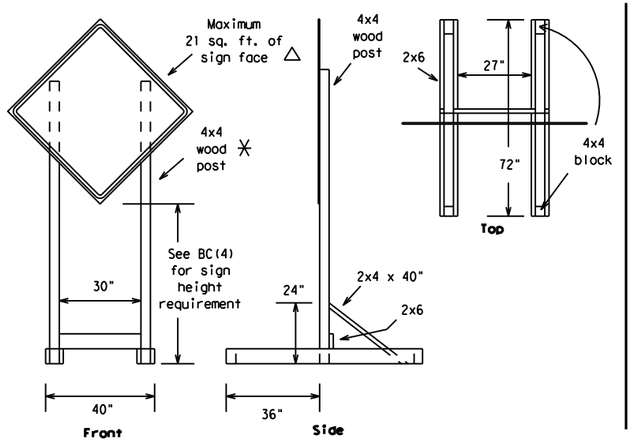
Texas Department of Transportation | Traffic Operations Division Standard

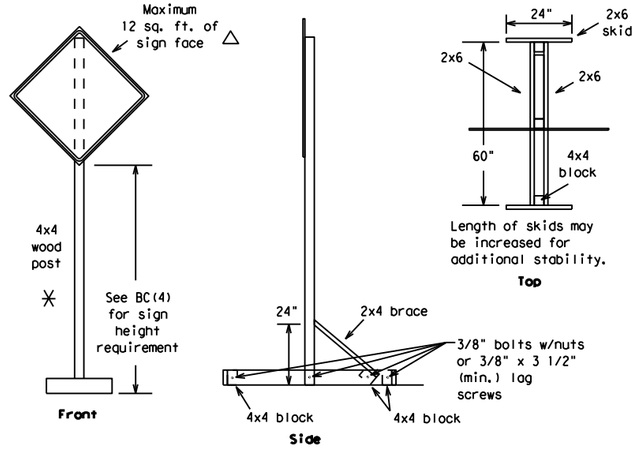
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	TRAVIS		25

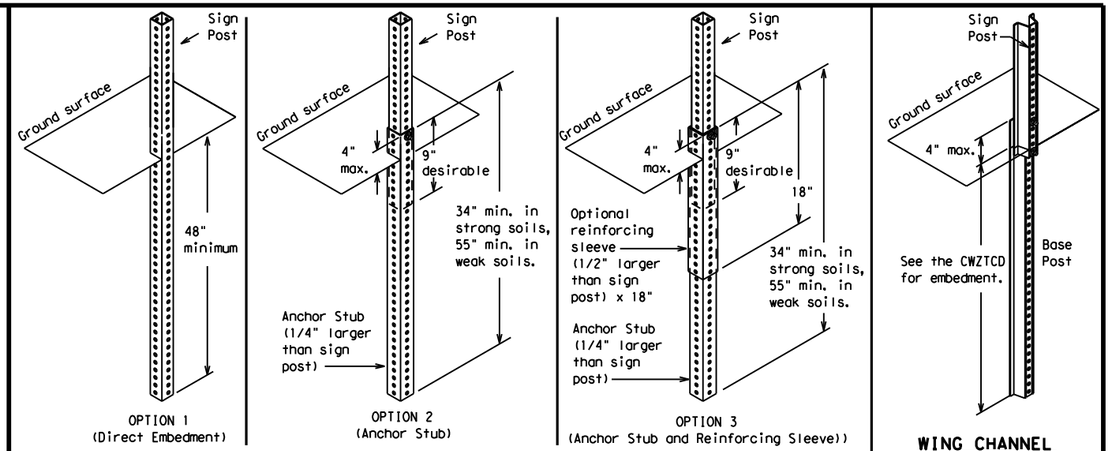
DATE: 11/6/2020 1:37:39 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011914 - Design\Plan Set\2. TCP\TCP STD\bc-14.dgn





SKID MOUNTED WOOD SIGN SUPPORTS

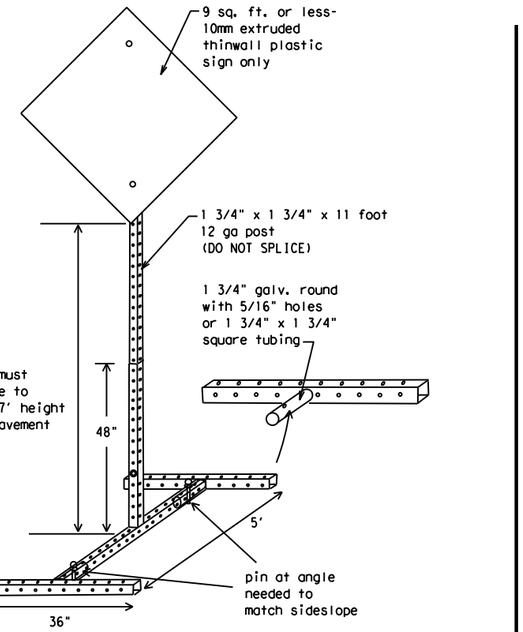
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

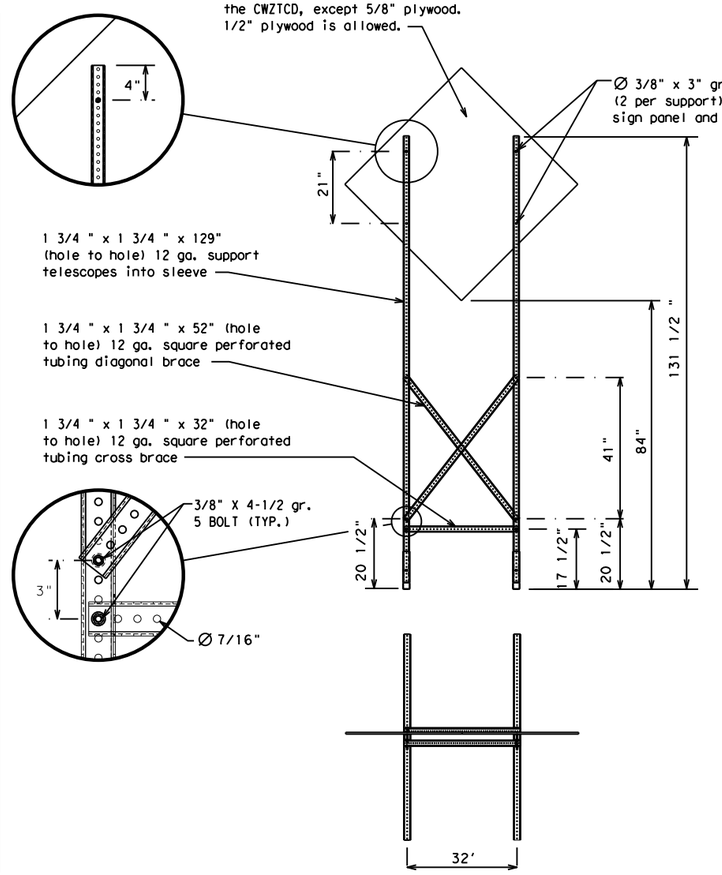


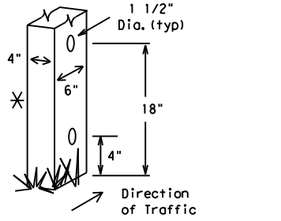
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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

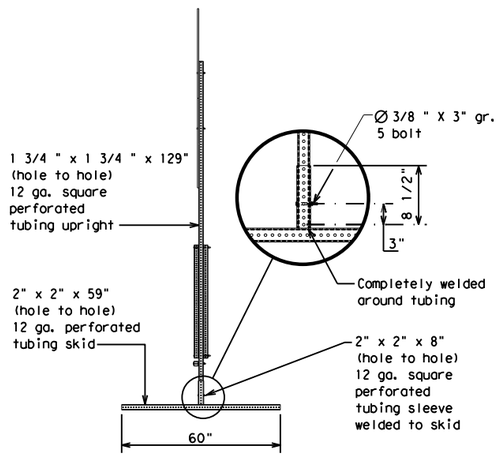






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	TRAVIS		26

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

PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List		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	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX-XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM- XX AM
STAY IN LANE *				

* * See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

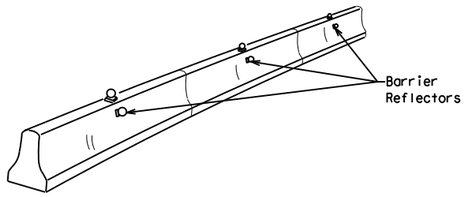
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	TRAVIS		27

100

DATE: 11/6/2020 1:37:41 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\31360119\14 - Design\Plan Set\2. TCP\TCP STD\bc-14.dgn

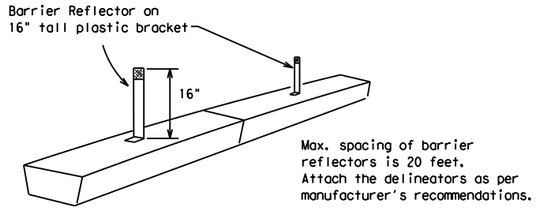
DATE: 11/6/2020 1:37:42 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601914 - Design\Plan Set\2. TCP\TCP STD\bc-14.dgn

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

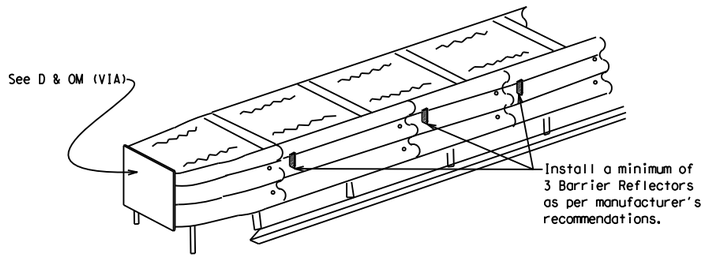


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

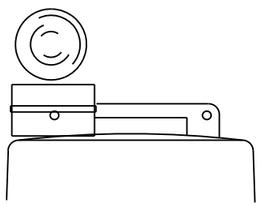


DELINEATION OF END TREATMENTS

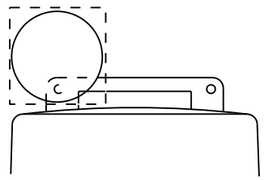
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

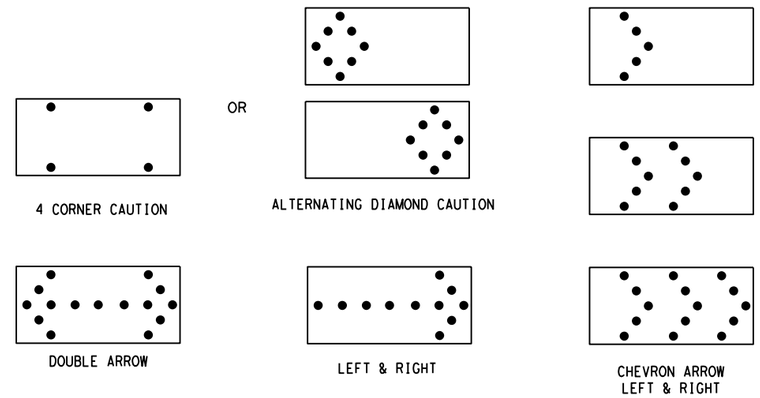
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

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

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation — *Traffic Operations Division Standard*

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

BC(7)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	TRAVIS		28

DATE: 11/6/2020 1:37:44 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601914 - Design\Plan Set\2. TCP\TCP STD\bc-14.dgn

GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

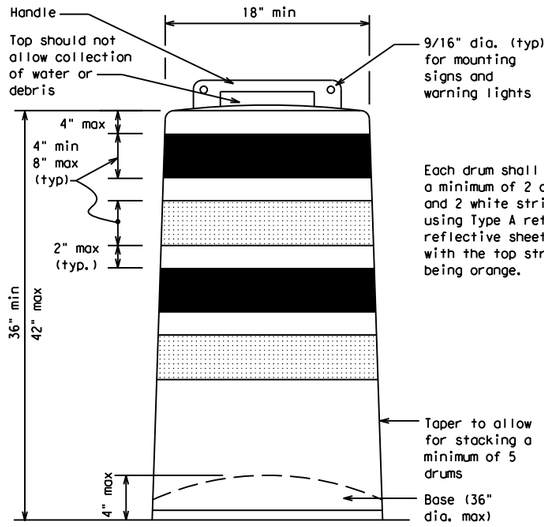
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

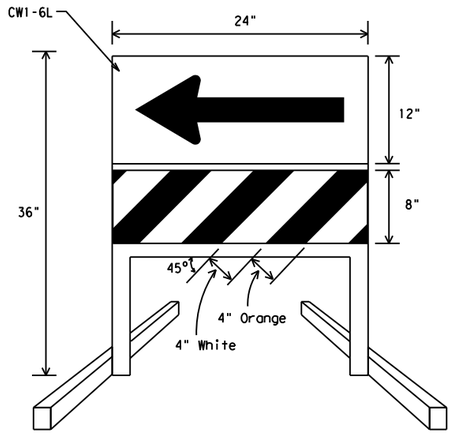
RETROREFLECTIVE SHEETING

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

BALLAST

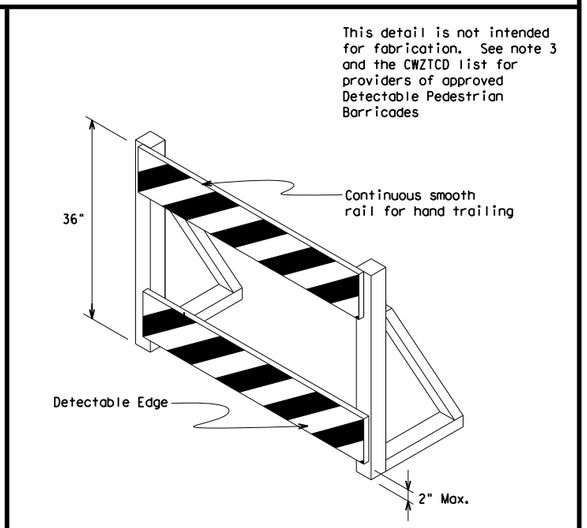
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other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





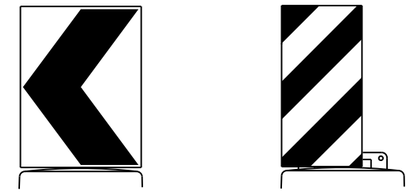
DIRECTION INDICATOR BARRICADE

1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



DETECTABLE PEDESTRIAN BARRICADES

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



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

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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

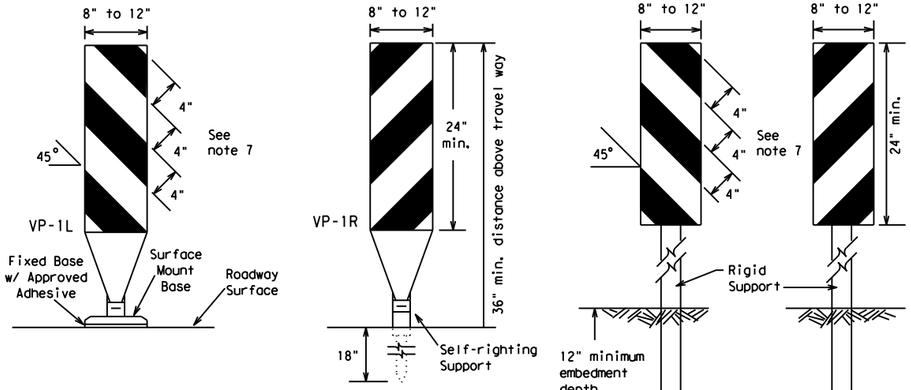
Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

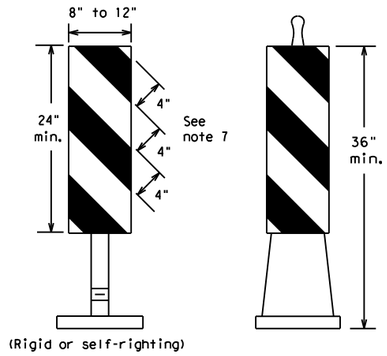
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	AUS	TRAVIS		29

DATE: 11/6/2020 1:37:46 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\2. TCP\TCP STD\bc-14.dgn



FIXED
(Rigid or self-righting)

DRIVEABLE

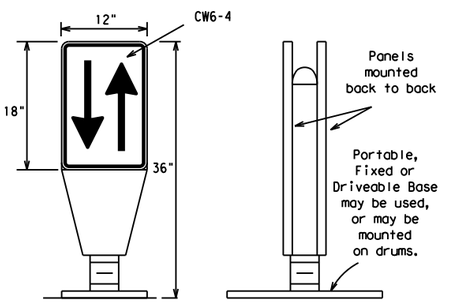


(Rigid or self-righting)

PORTABLE

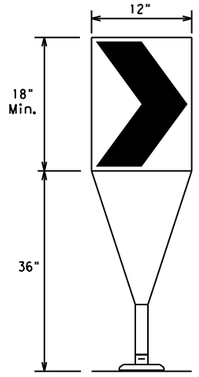
VERTICAL PANELS (VPs)

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



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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



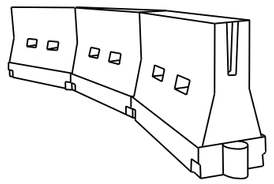
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	TRAVIS		30

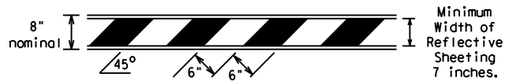
103

DATE: 11/6/2020 1:37:47 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\2. TCP\TCP STD\bc-14.dgn

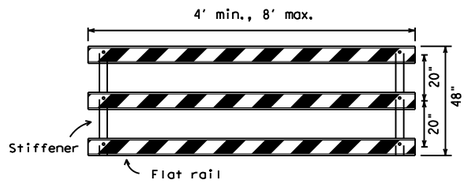
TYPE 3 BARRICADES

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 conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



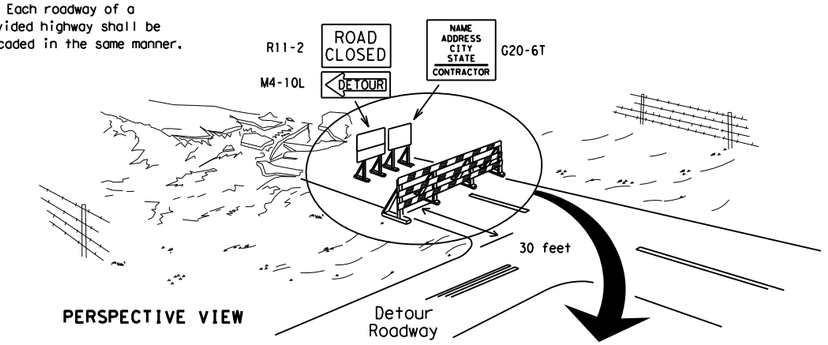
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

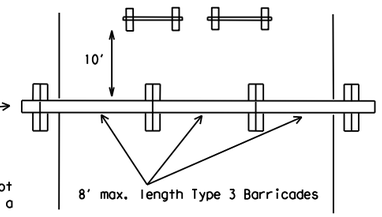
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

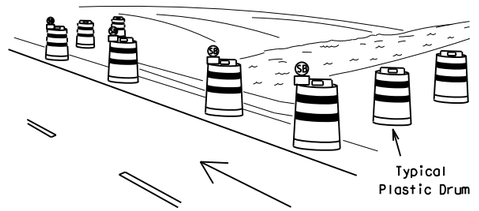
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

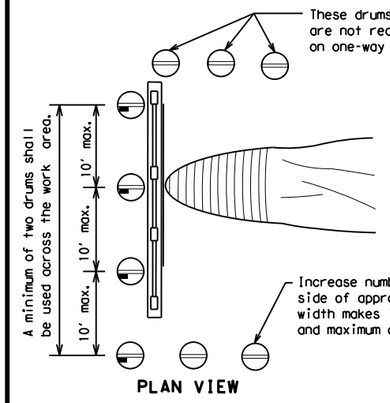
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

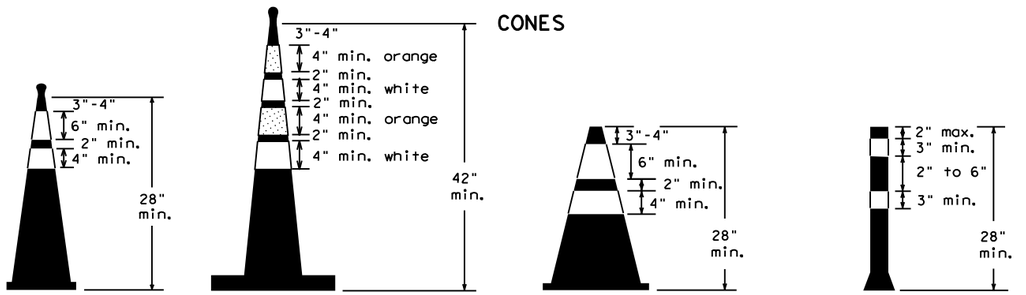
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

PLAN VIEW

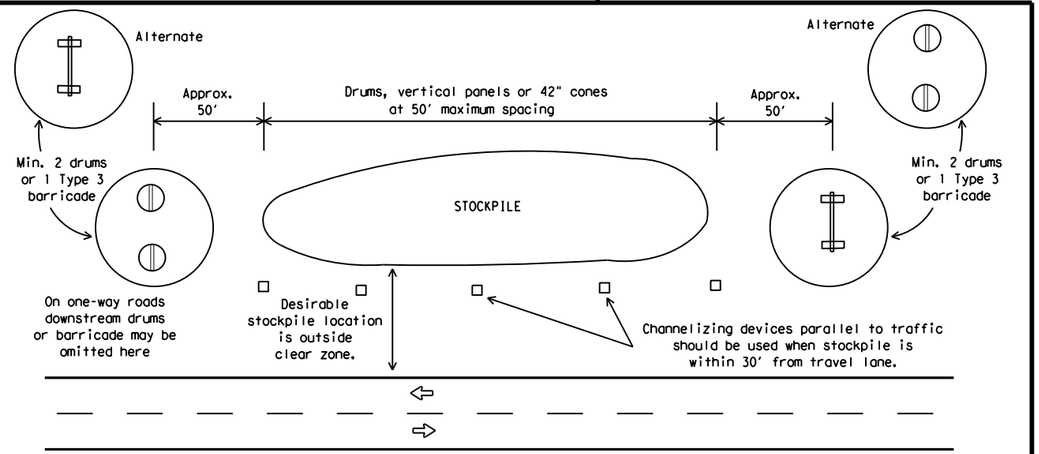
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

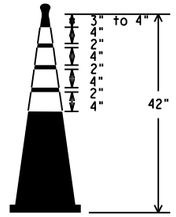
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers used at night 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.
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

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		31

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

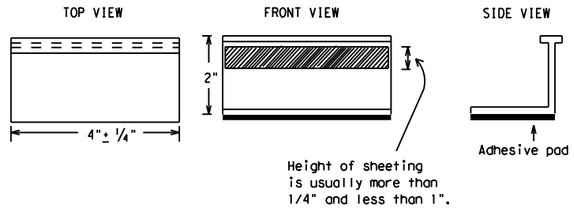
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

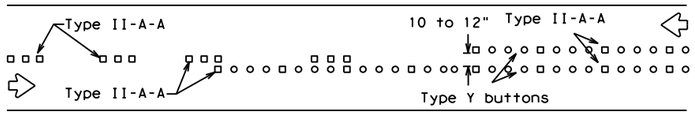
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
2-98 9-07	DIST	COUNTY		SHEET NO.
1-02 7-13	AUS	TRAVIS		32
11-02 8-14				

105

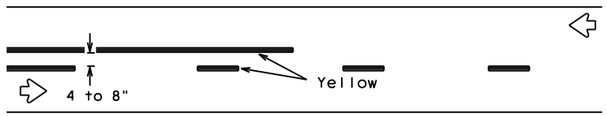
DATE: 11/6/2020 1:37:50 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601914 - Design\Plan Set\2. TCP\TCP STD\bc-14.dgn

PAVEMENT MARKING PATTERNS

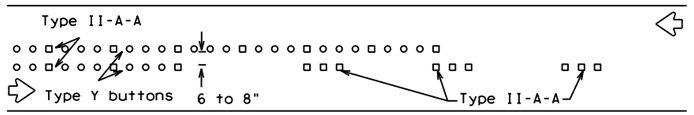
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



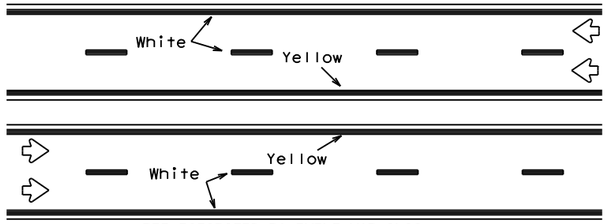
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



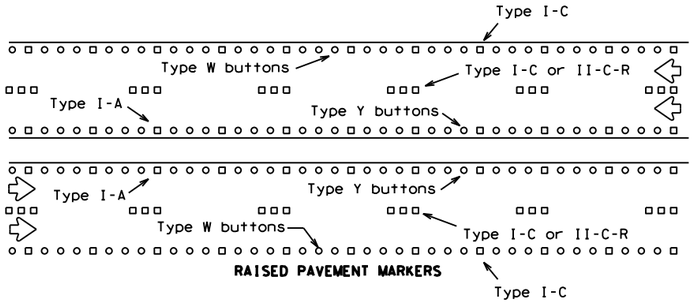
RAISED PAVEMENT MARKERS - PATTERN B

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

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



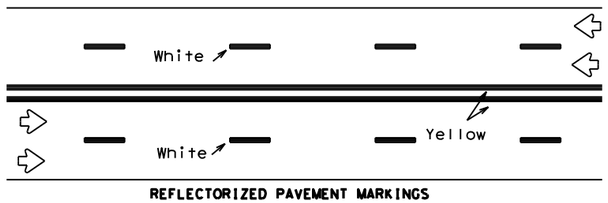
REFLECTORIZED PAVEMENT MARKINGS



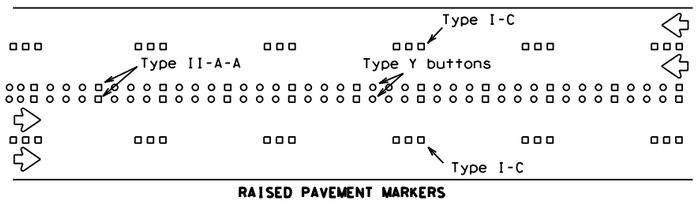
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



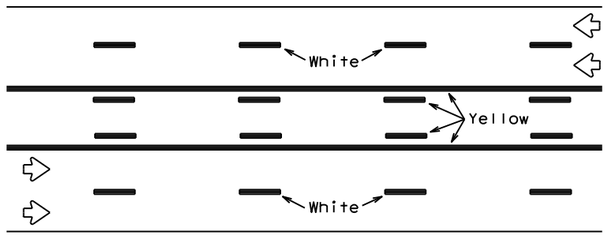
REFLECTORIZED PAVEMENT MARKINGS



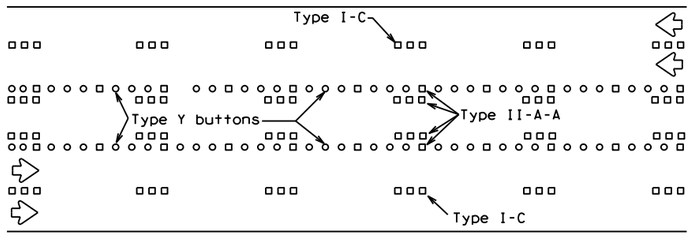
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

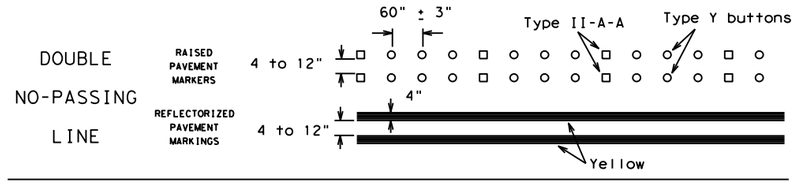
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

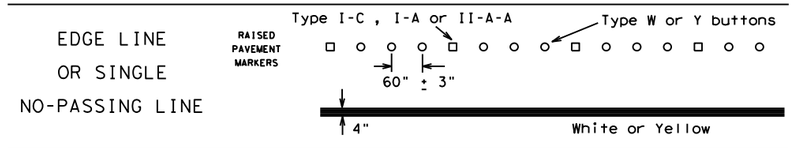
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

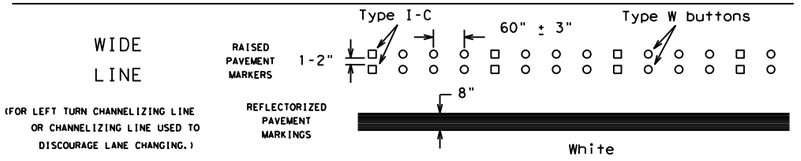


EDGE LINE OR SINGLE NO-PASSING LINE



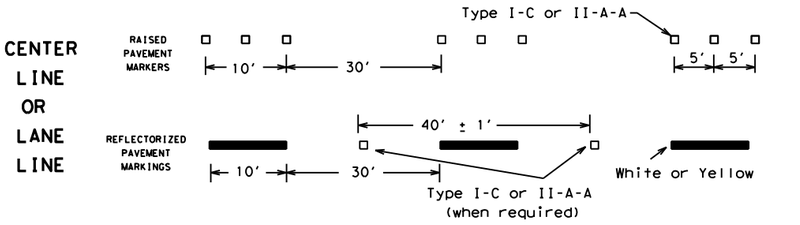
WIDE LINE

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

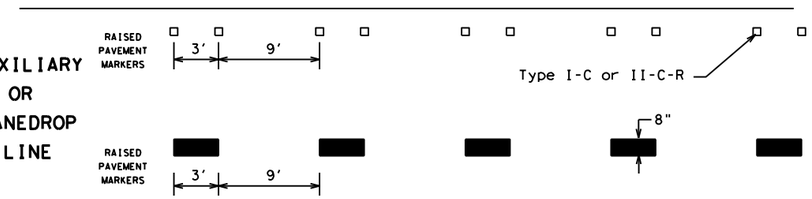


BROKEN LINES

CENTER LINE OR LANE LINE

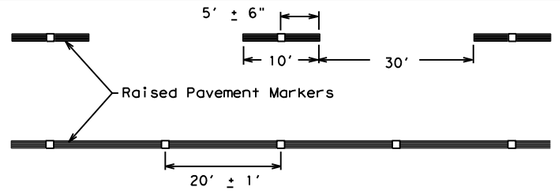


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Operations Division Standard

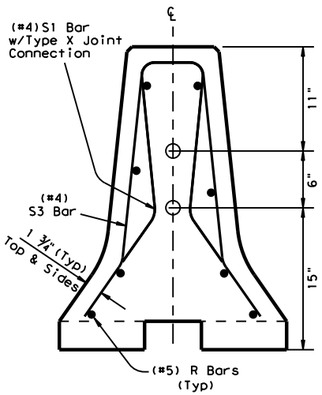
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
1-97 9-07	DIST	COUNTY		SHEET NO.
2-98 7-13	AUS	TRAVIS		33
11-02 8-14				

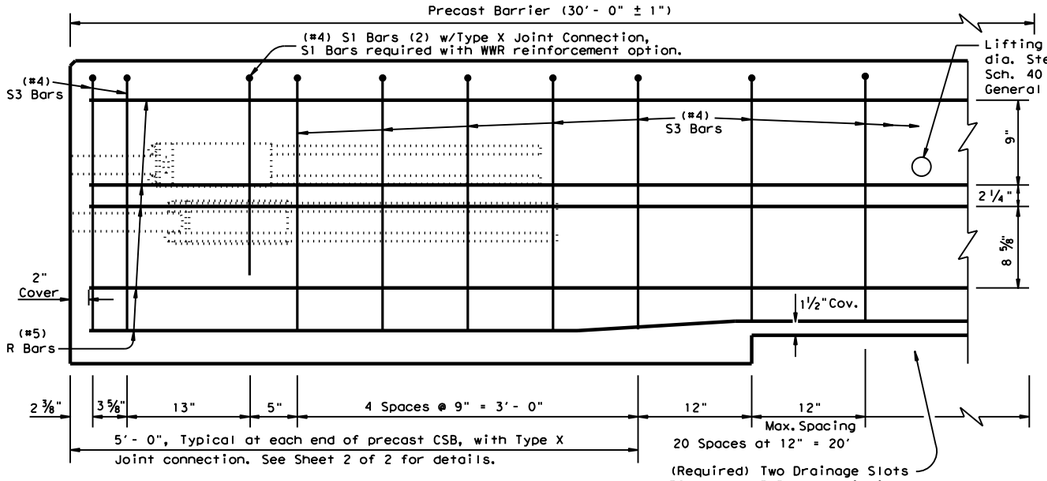
106

DATE: 11/6/2020 1:39:10 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\2. TCP\TCP STD\csb110.dgn



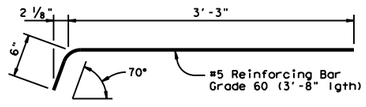
End View Precast Barrier

See sheet 2 of 3 for Joint connection Type X



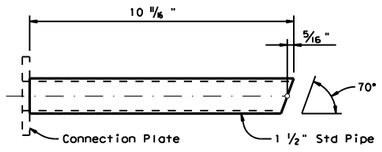
Reinforcement for Precast (CSB) Concrete Safety Barrier (Type 1)

Showing reinforcement for Joint Type X



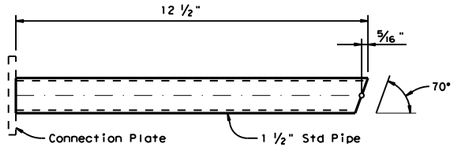
DEFORMED BAR ANCHOR DETAILS

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



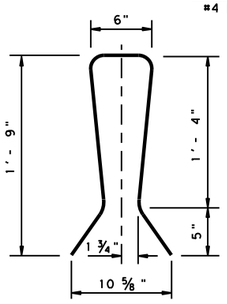
UPPER CONNECTION PIPE DETAILS

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



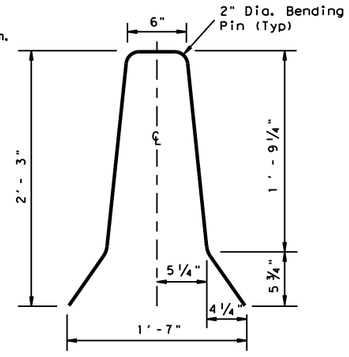
LOWER CONNECTION PIPE DETAILS

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



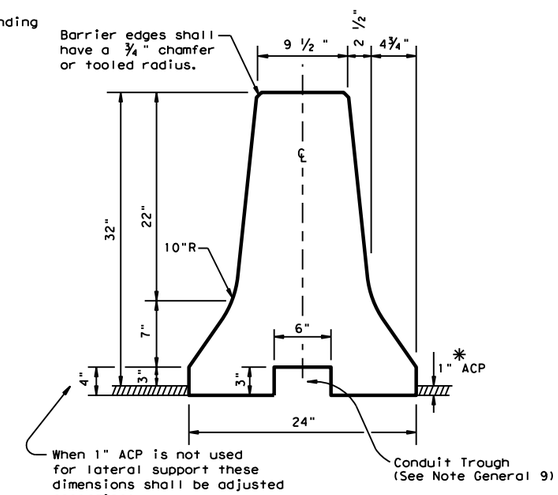
S1 Bar

#4 Bar (2)
(Joint Type X)



S3 Bar

#4 Bar

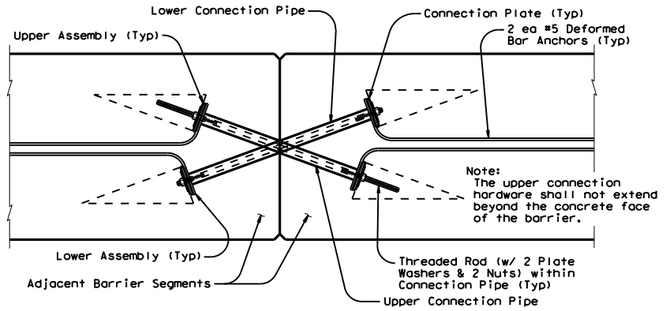


Concrete Safety Barrier

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

GENERAL NOTES

1. Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
4. All precast barrier edges shall have a ¾" chamfer or tooled radius.
5. All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
6. All steel assemblies for joint shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
7. Regardless of the method of handling, barrier lifting points shall be approx. 7.5 feet from the ends of the barrier. Lifting devices and attachments to barrier sections shall be approved by the Engineer.
8. Surface finishing and grouting (where required) shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will assure a smooth surface. Surface finishing shall be considered subsidiary to the various bid items involved.
9. Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.



TYPE X JOINT INSTALLATION DETAIL

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

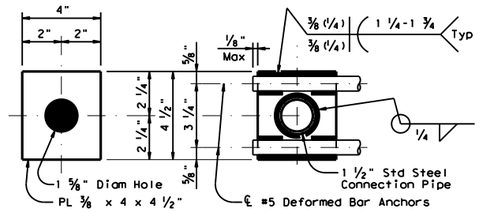
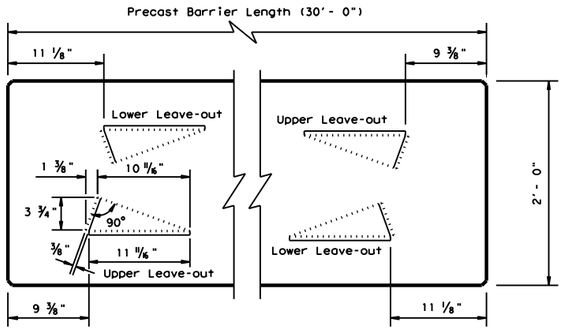


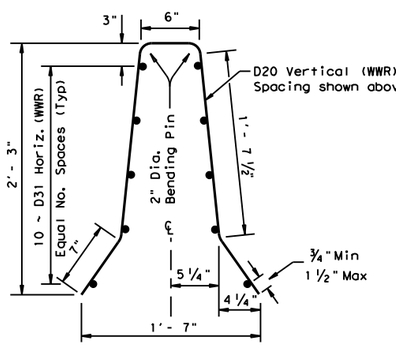
PLATE DIMENSIONS WELDING DETAILS

CONNECTION PLATE DETAILS

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



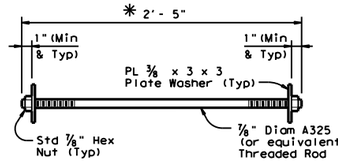
BARRIER PLAN AT END JOINTS



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

(WWR) General Notes

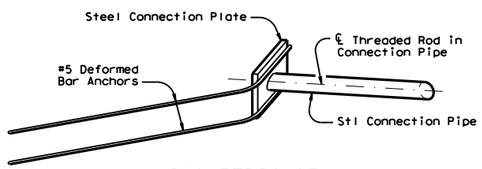
1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
3. All reinforcement shall comply with Item 440, "Reinforcing Steel."
4. Combinations of reinforcing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



CONNECTION BOLT OR THREADED ROD DETAIL

Two (2) Threaded Rods (Or Equivalent Hex Hd. Bolts) (w/ Two (2) PL ⅜ x 3 x 3 Plate Washers & Two (2) Std Hex Nuts) required per Joint.

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



ISOMETRIC OF TYPICAL WELDED ASSEMBLY

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

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

SHEET 1 OF 2

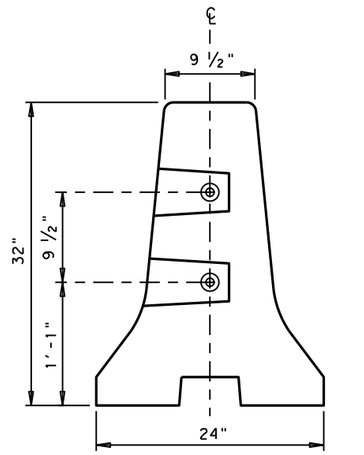
Texas Department of Transportation | Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER (TYPE 1)

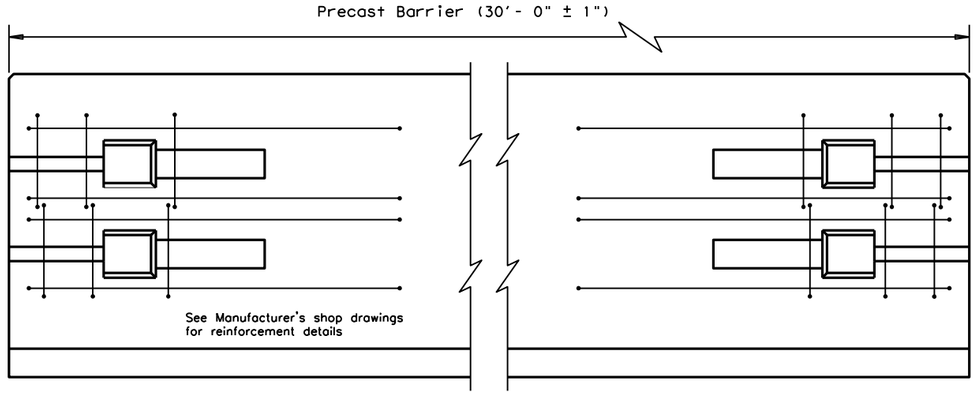
CSB(1)-10

FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD	CK: VP
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		34



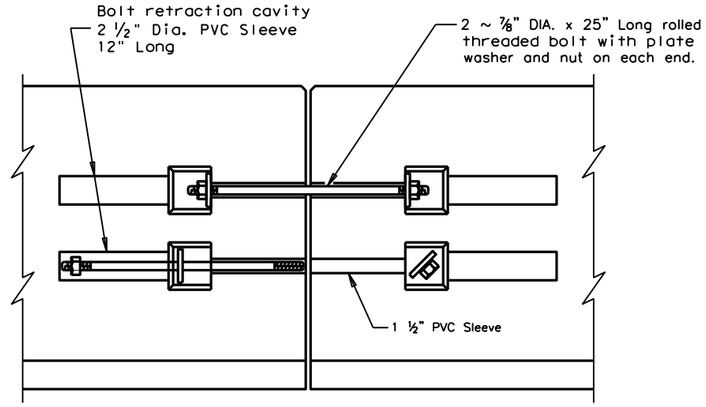
END VIEW (CSB) QUICK-BOLT

QUICK-BOLT POCKET LOCATIONS



ELEVATION (CSB) QUICK-BOLT

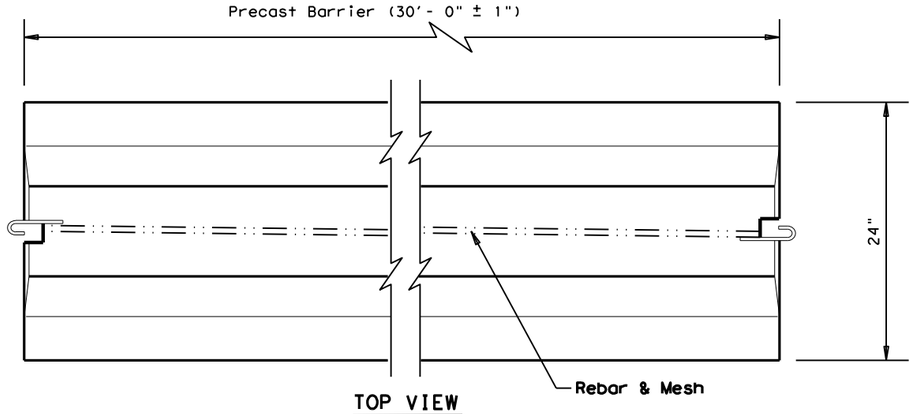
See Manufacturer's shop drawing for additional details



ELEVATION VIEW SHOWING JOINT CONNECTION

"QUICK-BOLT"

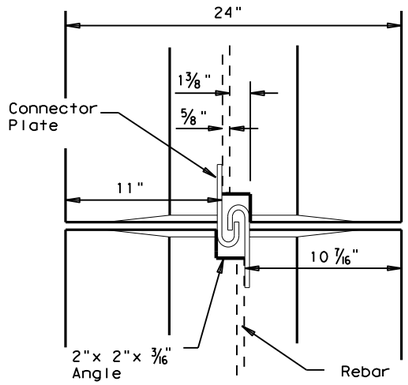
Joint Connection (Type Q)



TOP VIEW

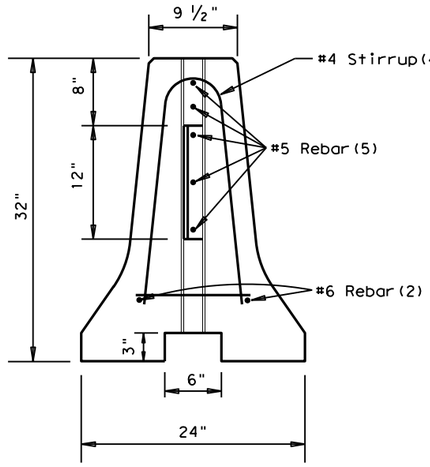
PRECAST (CSB) WITH J-J HOOKS

See Manufacturer's shop drawing for additional details



VIEW FROM ABOVE

J-J HOOK CONNECTION



END VIEW

J-J HOOK CONNECTION

Joint Connection (Type J)

Proprietary Joint Connections (CSB)

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

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

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

SHEET 2 OF 2

Texas Department of Transportation

Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

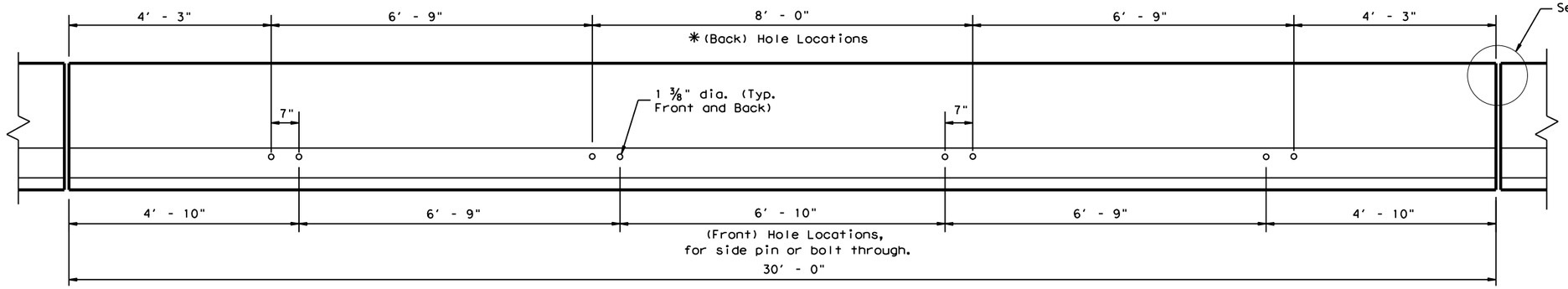
PRECAST BARRIER (TYPE 1)

CSB(1)-10

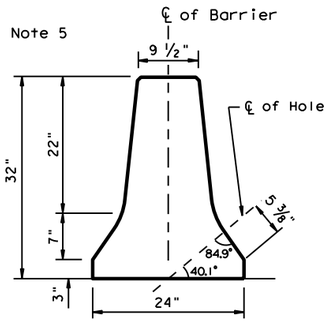
FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD	CK: VP
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		34A

DATE: 11/13/2020 12:45:27 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\2. TCP\TCP STD\csb110.dgn

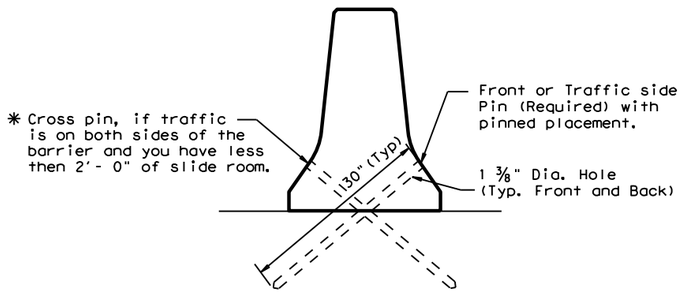
DATE: 11/13/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\2. TCP\TCP STD\csb710.dgn



DETAIL 1

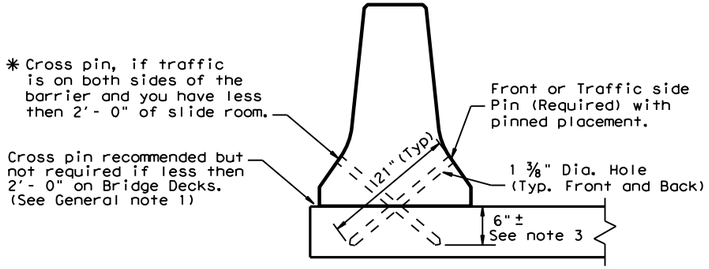


HOLE LOCATION DETAIL



DETAIL 2

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

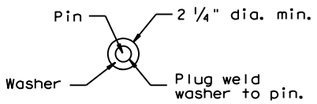


DETAIL 3

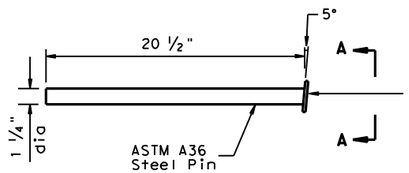
Bridge Deck or CRCP
(21" pin required)

GENERAL NOTES

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



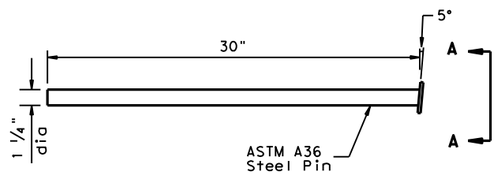
VIEW A-A



Steel washer welded to pin at 5° angle so that the washer is flush to the barrier surface. (See View A-A)

(21") PIN DETAIL

See Detail 3

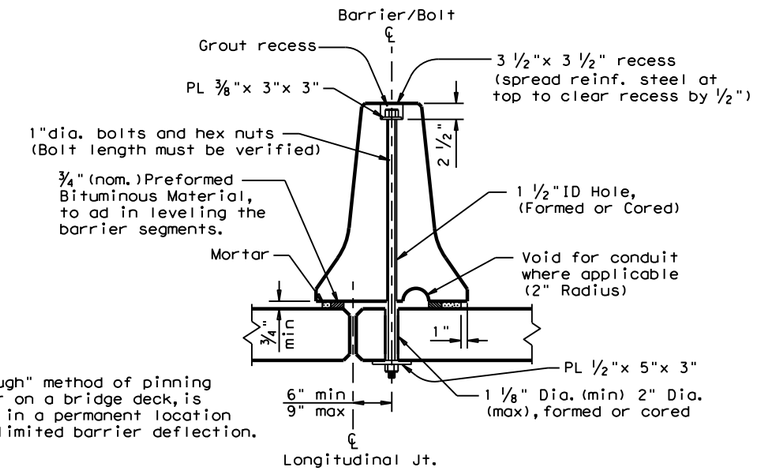


(30") PIN DETAIL

See Detail 2

CORE DRILLING EXISTING BARRIER

Core drilling existing concrete barrier is permitted. Holes shall be drilled with coring or masonry drilling type equipment. Percussion (star) drilling shall not be used. A special drill bit (to cut through existing reinforcing) will likely be required. Spalls in the concrete exceeding 1/2" shall be patched.



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

PRECAST CSB (BOLT THROUGH) PLACEMENT OVER LONGITUDINAL EXPANSION JOINT

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

Texas Department of Transportation

Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

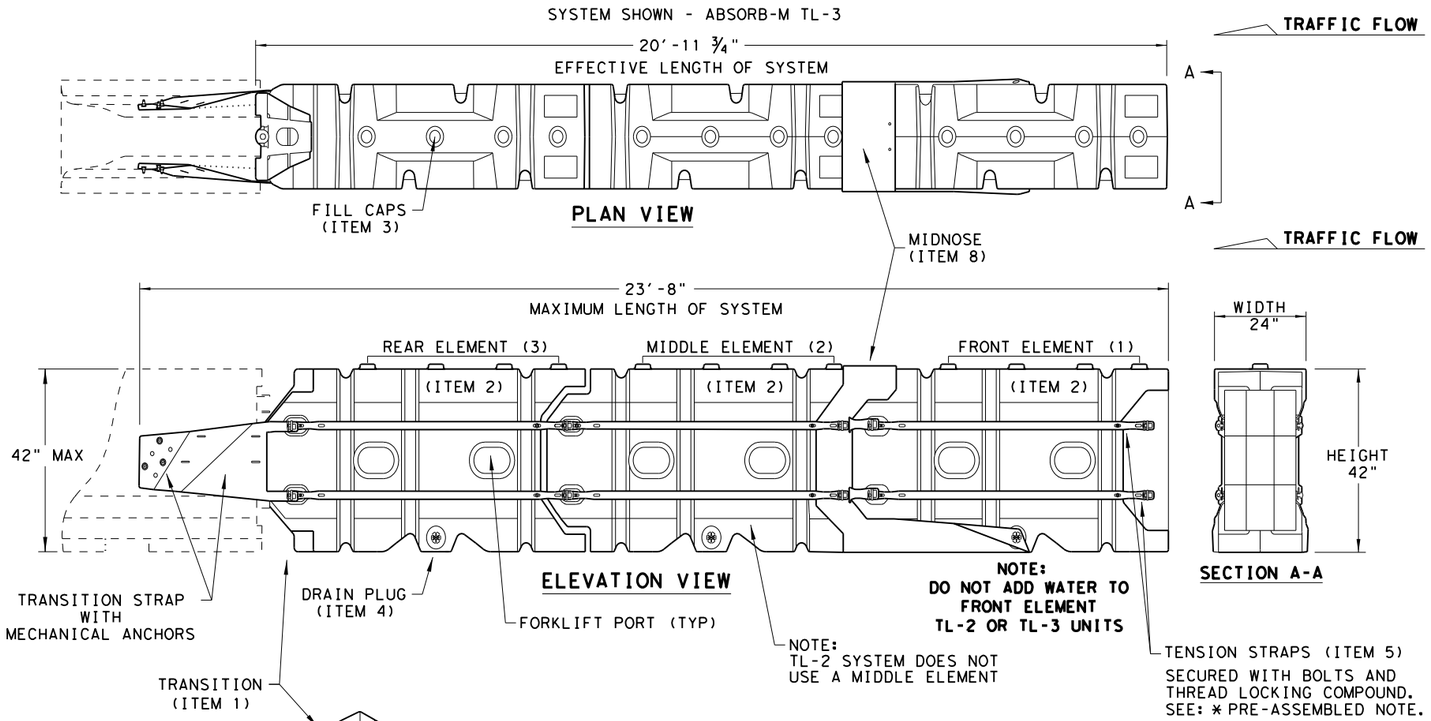
PRECAST BARRIER
(TYPE 1)
PINNED PLACEMENT

CSB(7)-10

FILE: csb710.dgn	DN: TxDOT	CK: AM	DW: BD	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		35

DATE: 11/13/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\4 - AUS\Design Projects\3136011911\4 - Design\Plan Set\2. TCP\TCP STD\absorbm19.dgn

SYSTEM SHOWN - ABSORB-M TL-3



THE ABSORB-M IS A NON-REDIRECTIVE, GATING, CRASH CUSHION DESIGNED TO MEET THE LATEST TL-3 & TL-2 MASH REQUIREMENTS.

THE SYSTEM IS DESIGNED TO ACCOMMODATE A VARIETY OF F-SHAPE AND SINGLE SLOPE CONCRETE BARRIERS. CONTACT THE MANUFACTURER FOR GUIDANCE REGARDING OTHER ALLOWABLE SHAPES.

TEST LEVEL	NUMBER OF ELEMENTS	EFFECTIVE LENGTH	MAXIMUM LENGTH
TL-2	2	14'- 7 3/4"	17'- 4"
TL-3	3	20'- 11 3/4"	23'- 8"

NOTE:
CROSS SLOPES OF UP TO 8% (OR 1:12 SLOPE) CAN BE ACCOMMODATED WITH STANDARD HARDWARE SHOWN WITHIN THE INSTRUCTIONS MANUAL. FOR SLOPES WITH EXCESS OF 8% (OR 1:12) CONTACT, LINDSAY TRANSPORTATION SOLUTIONS.

GENERAL NOTES

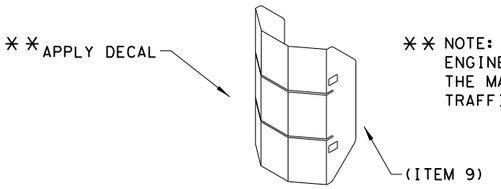
1. FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
2. THE ABSORB-M SYSTEM IS ONLY APPROVED FOR USE IN (TEMPORARY WORK ZONE) LOCATIONS.
3. THE ABSORB-M IS A WATER FILLED NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO A FOUNDATION AND CAN BE INSTALLED ON TOP OF CONCRETE, ASPHALT, OR ANY SURFACE CAPABLE OF BEARING THE WEIGHT OF THE SYSTEM.
4. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
5. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
6. THE ABSORB-M SHOULD BE LOCATED APPROXIMATELY PARALLEL WITH THE BARRIER.
7. THE USE OF THE ABSORB-M IS RESTRICTED TO A BARRIER HEIGHT OF UP TO 42 INCHES.
8. DO NOT ADD WATER TO FRONT ELEMENT (TL-2 OR TL-3 UNIT).

BILL OF MATERIALS (BOM) ABSORB-M TL-3 & TL-2 SYSTEMS			QTY	QTY
ITEM #	PART NUMBER	PART DESCRIPTION	TL-2 SYSTEM	TL-3 SYSTEM
1	BSI-1809036-00	TRANSITION-(GALV)	1	1
* 2	BSI-1808002-00	PRE-ASSEMBLED ABSORBING (ELEMENTS)	2	3
* 3	BSI-4004598	FILL CAPS	8	12
* 4	BSI-4004599	DRAIN PLUGS	2	3
* 5	BSI-1809053-00	TENSION STRAP-(GALV)	8	12
* 6	BSI-2001998	C-SCR FH 3/8-16 X 1 1/2 GR5 PLT	8	12
* 7	BSI-2001999	C-SCR FH 3/8-16 X 1 GR5 PLT	8	12
8	BSI-1809035-00	MIDNOSE-(GALV)	1	1
9	BSI-1808014-00	NOSE PLATE	1	1
10	BSI-1809037-00	TRANSITION STRAP (LEFT-HAND)-(GALV)	1	1
11	BSI-1809038-00	TRANSITION STRAP (RIGHT-HAND)-(GALV)	1	1
12	BSI-1808005-00	PIN ASSEMBLY	8	10
13	BSI-2002001	ANC MECH 5/8-11X5 (GALV)	6	6
14	ABSORB-M	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

*COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY

DELINEATION DECAL PLACEMENT GUIDE

TRAFFIC FLOW LEFT-SIDE BARRIER | TRAFFIC FLOW BOTH-SIDE BARRIER | TRAFFIC FLOW RIGHT-SIDE BARRIER



NOSE PLATE

** NOTE: (PROVIDED BY OTHERS)
ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

NOTE:
APPLY A HIGH REFLECTIVE DECAL TO THE NOSE PLATE. DELINEATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALs ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

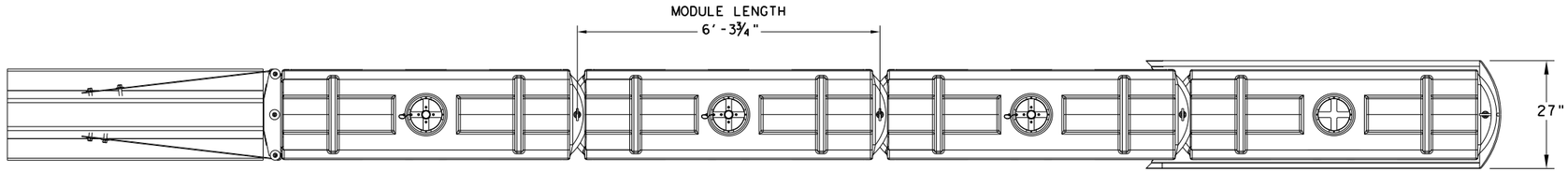
NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE ABSORB-M, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

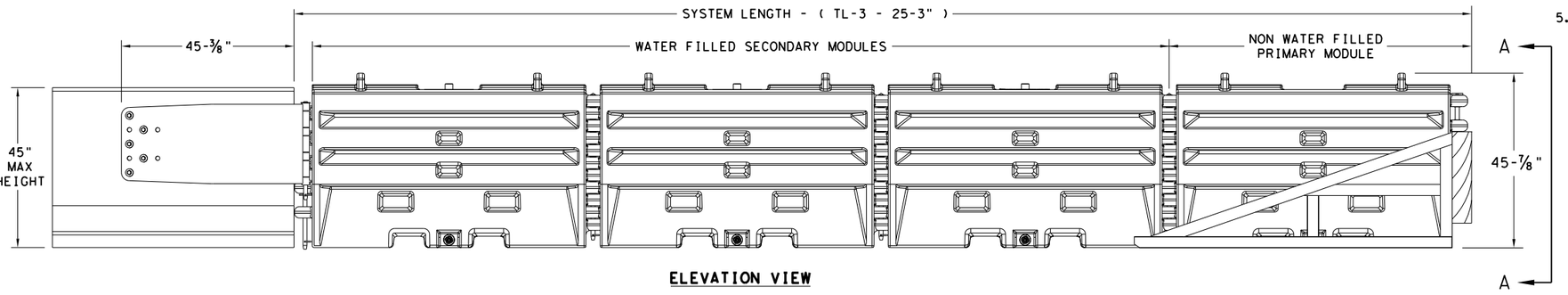
Texas Department of Transportation — Design Division Standard

LINDSAY TRANSPORTATION SOLUTIONS
CRASH CUSHION
(MASH TL-3 & TL-2)
TEMPORARY - WORK ZONE
ABSORB(M)-19

FILE: absorbm19	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: JULY 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		35A



PLAN VIEW



ELEVATION VIEW

GENERAL NOTES

1. REFER TO THE INSTALLATION MANUAL FOR SPECIFIC SYSTEM ASSEMBLY AND MODULE ORIENTATION. FOR ADDITIONAL INFORMATION, CONTACT TRAFFIX, INC. AT (949) 361-5663.
2. THE SLED SYSTEM IS A MASH APPROVED TEST LEVEL 3 (TL-3) CRASH CUSHION APPROVED FOR USE IN TEMPORARY WORK ZONES. THE SLED SYSTEM IS A NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO THE GROUND AND CAN BE INSTALLED ON CONCRETE, ASPHALT, GRAVEL OR COMPACTED SOIL.
3. MAXIMUM PERMISSIBLE CROSS SLOPE IS 8° (DEGREES) (14%).
4. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
5. THE SLED SYSTEM CAN BE ATTACHED TO:

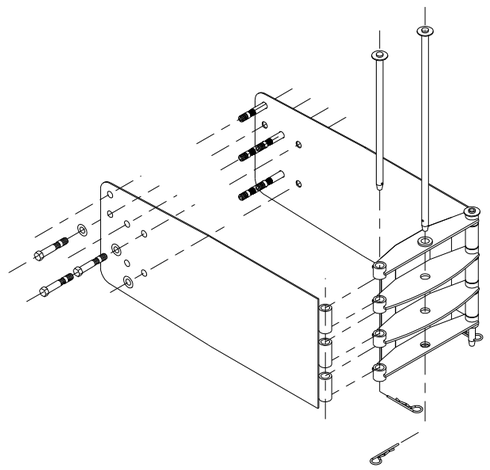
- CONCRETE BARRIER, TEMPORARY OR PERMANENT, 45" MAXIMUM HEIGHT
- STEEL BARRIER
- PLASTIC BARRIER
- CONCRETE BRIDGE ABUTMENTS
- W-BEAM GUARD RAIL
- THRIE BEAM GUARD RAIL

TEST LEVEL	NUMBER OF SECONDARY MODULES	SYSTEM LENGTH
TL-3	3	25' 3"

SECTION A-A

NOSE SHEETING PANEL DELINEATION

NOTE:
SEE INSTALLATION MANUAL FOR CUSTOMIZED DELINEATION NOSE SHEETING FOR DECAL PLACEMENT.



SLED TRANSITION COMPONENTS FOR ATTACHMENT TO CMB

NOTE:
SEE MANUFACTURER'S INSTALLATION MANUAL FOR FURTHER DETAILS.

TRANSITION OPTIONS
SLED TRANSITION TO CONCRETE TRAFFIC BARRIER (TEMPORARY OR PERMANENT)
SLED TRANSITION TO STEEL TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO PLASTIC TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO W-BEAM OR THRIE BEAM GUARD RAIL (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO CONCRETE BRIDGE ABUTMENT

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SLED, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

BILL OF MATERIAL

PART NUMBER	DESCRIPTION	QTY: TL-3
45131	TRANSITION FRAME, GALVANIZED	1
45150	TRANSITION PANEL, GALVANIZED	2
45147-CP	TRANSITION SHORT DROP PIN W/ KEEPER PIN, GALVANIZED	2
45148-CP	TRANSITION LONG DROP PIN W/ KEEPER PIN, GALVANIZED	1
45050	ANCHOR BOLTS	9
12060	WASHER, 3/4" ID X 2" OD	9
45044-Y	SLED YELLOW WATER FILLED MODULE	3
45044-YH	SLED YELLOW "NO FILL" MODULE	1
45044-S	CIS (CONTAINMENT IMPACT SLED), GALVANIZED	1
45043-CP	T-PIN W/ KEEPER PIN	4
18009-B-I	FILL CAP W/ "DRIVE BY" FLOAT INDICATOR	3
45033-RC-B	DRAIN PLUG	3
45032-DPT	DRAIN PLUG REMOVAL TOOL	1

Texas Department of Transportation

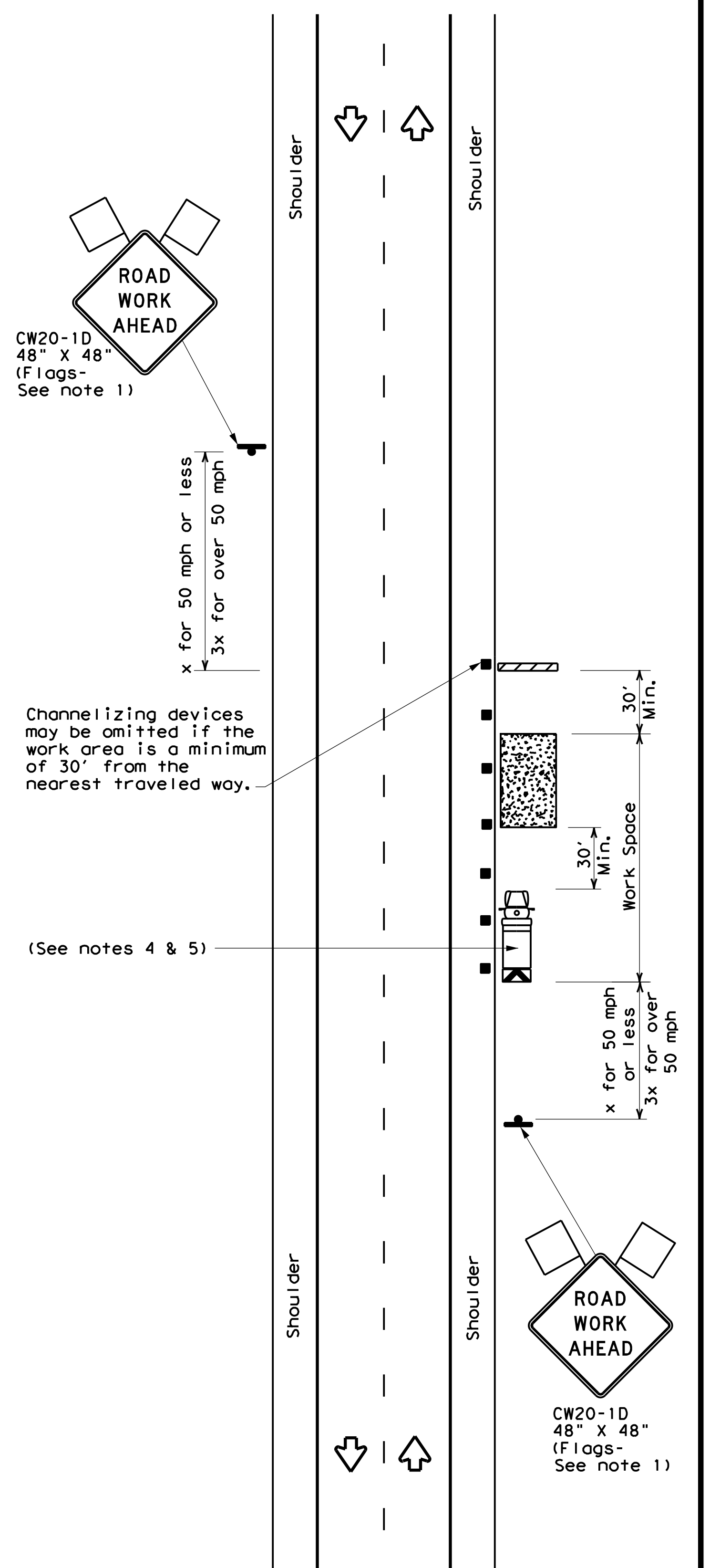
Design Division Standard

SLED
CRASH CUSHION
TL-3 MASH COMPLIANT
(TEMPORARY, WORK ZONE)
SLED-19

FILE: sled19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		35C

DATE: 11/13/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\2. TCP\TCP STD\sled19.dgn

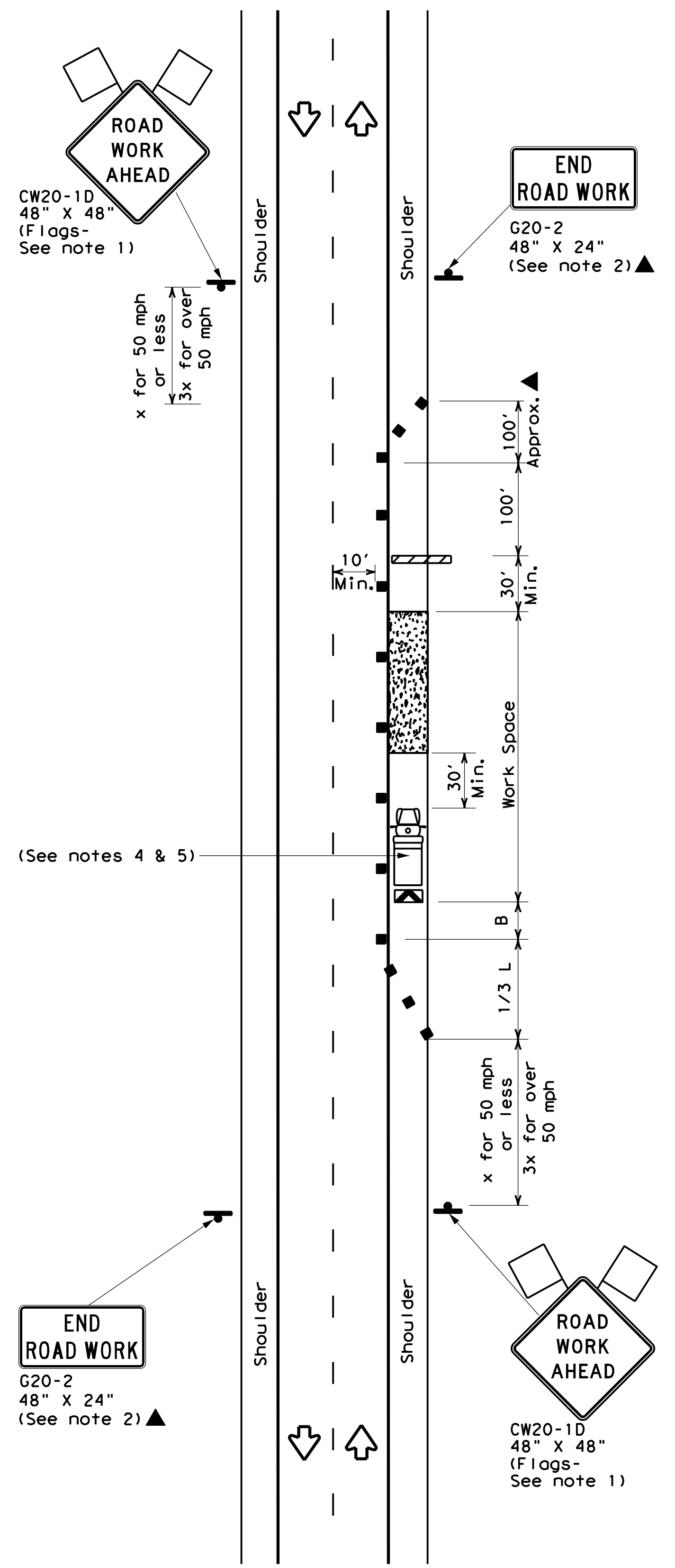
DATE: 11/6/2020 1:38:04 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\



TCP (2-1a)

WORK SPACE NEAR SHOULDER

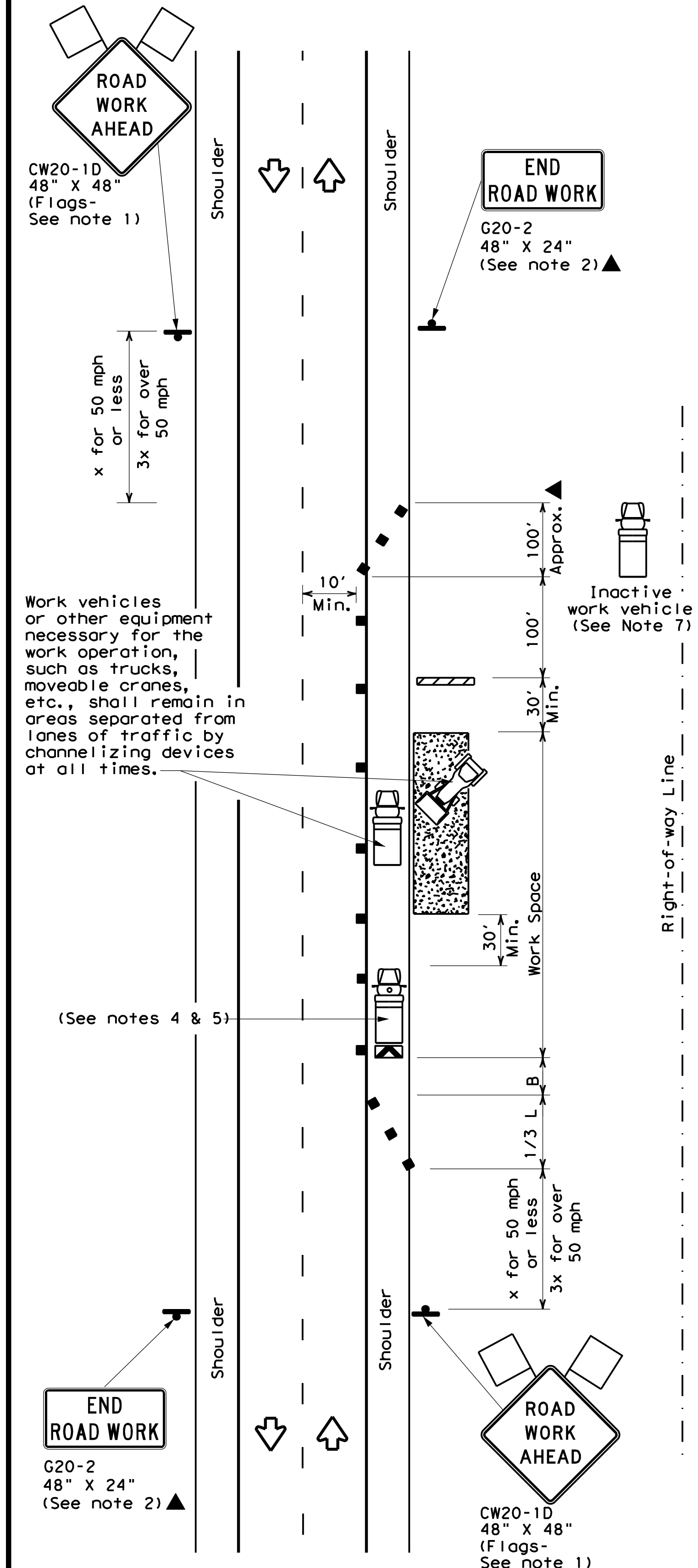
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER

Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER

Conventional Roads

LEGEND

Symbol	Description	Symbol	Description
	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

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

Texas Department of Transportation

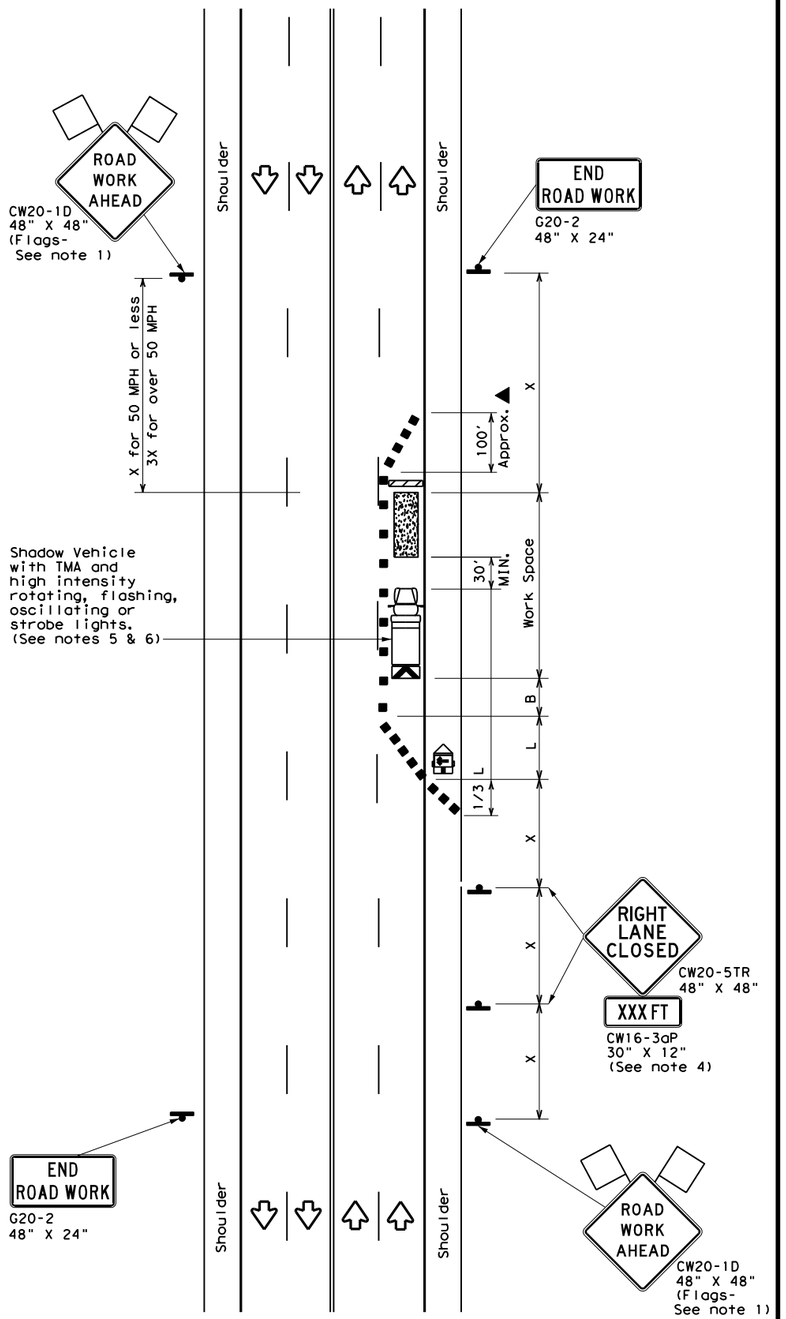
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

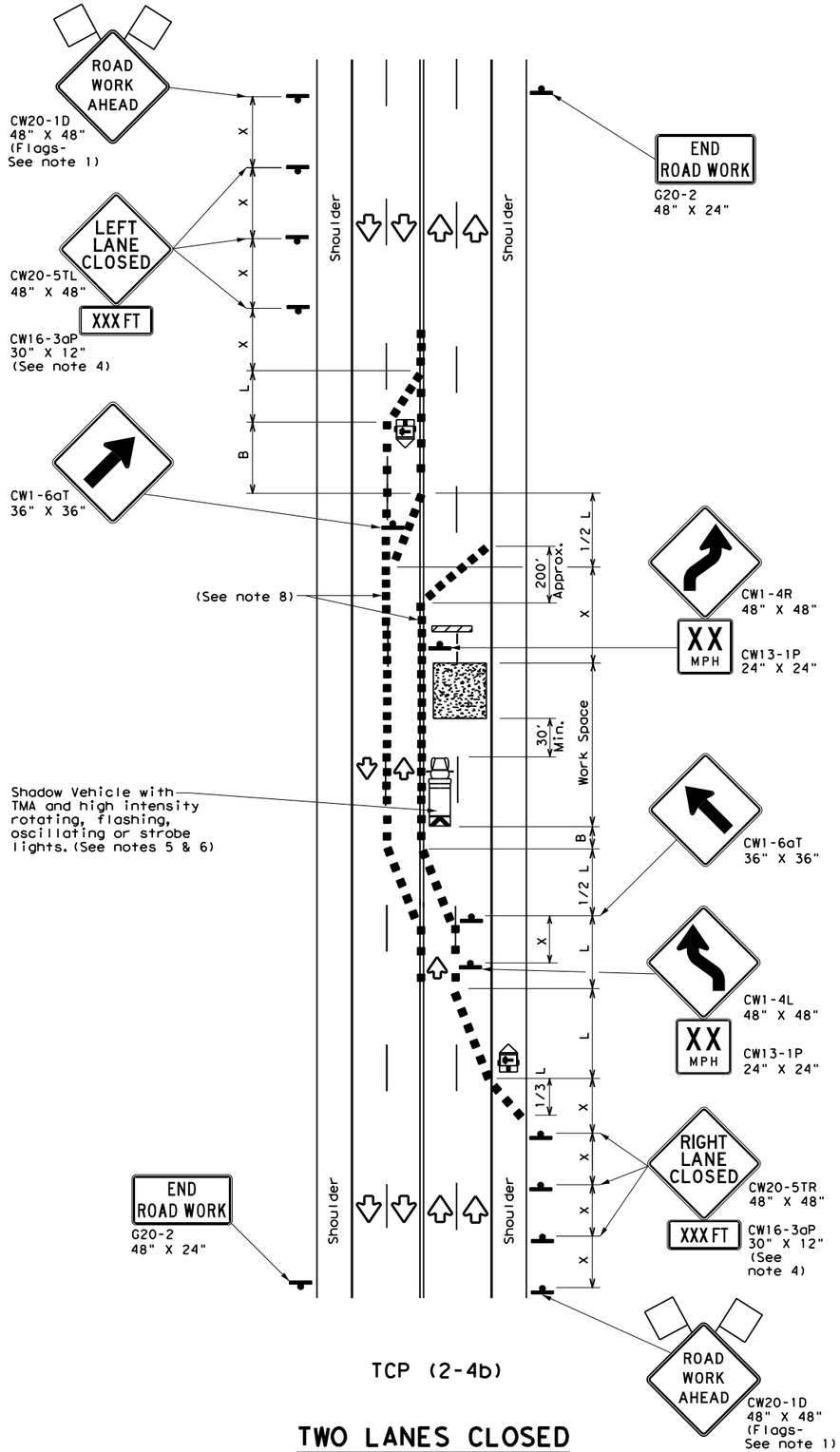
FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	3136	01	191	SL 0001
	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	36

DATE: 11/6/2020 1:38:17 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\93669\tcp2-4-18.dgn



TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

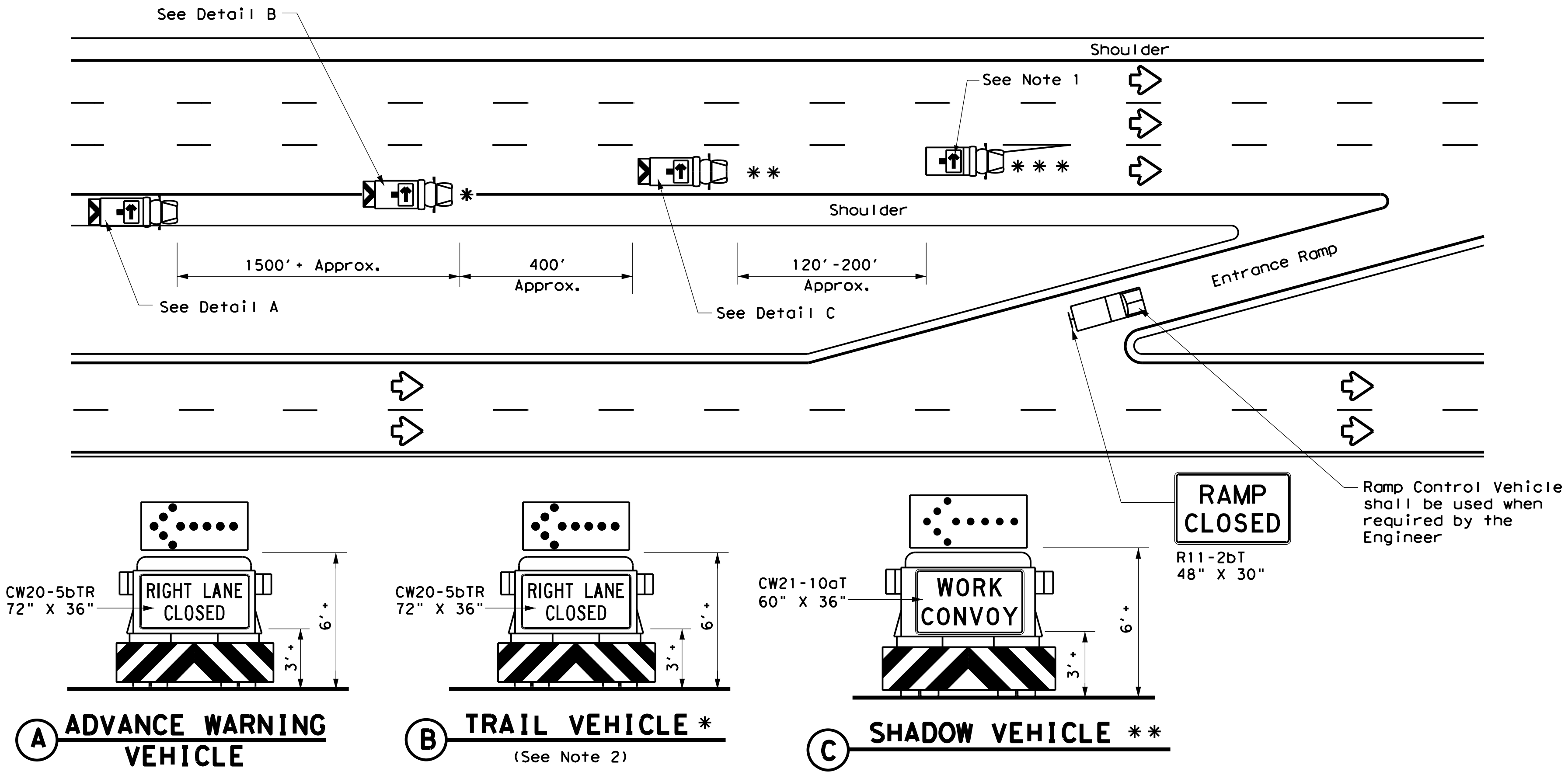
8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing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

Texas Department of Transportation | *Traffic Operations Division Standard*

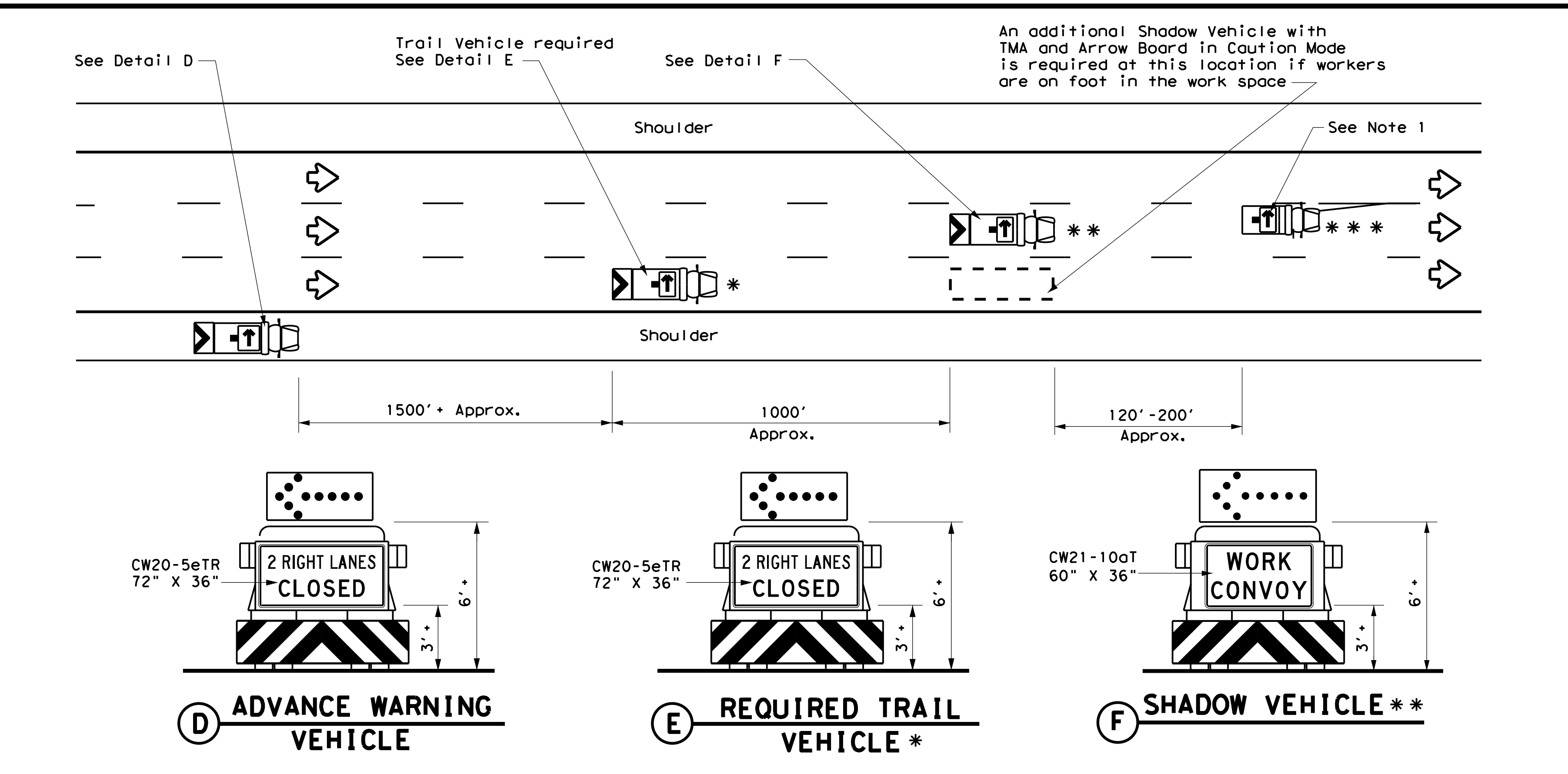
TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	3136	01	191	SL 0001
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	AUS	TRAVIS		37



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



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

LEGEND

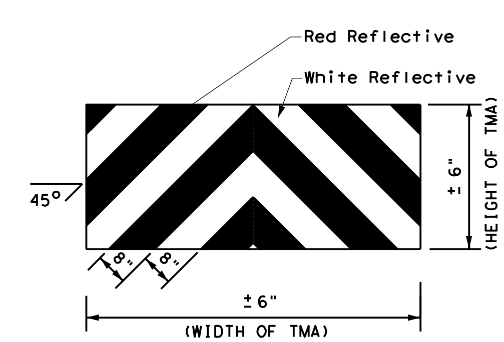
Symbol	Description	Symbol	ARROW BOARD DISPLAY
*	Trail Vehicle		
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

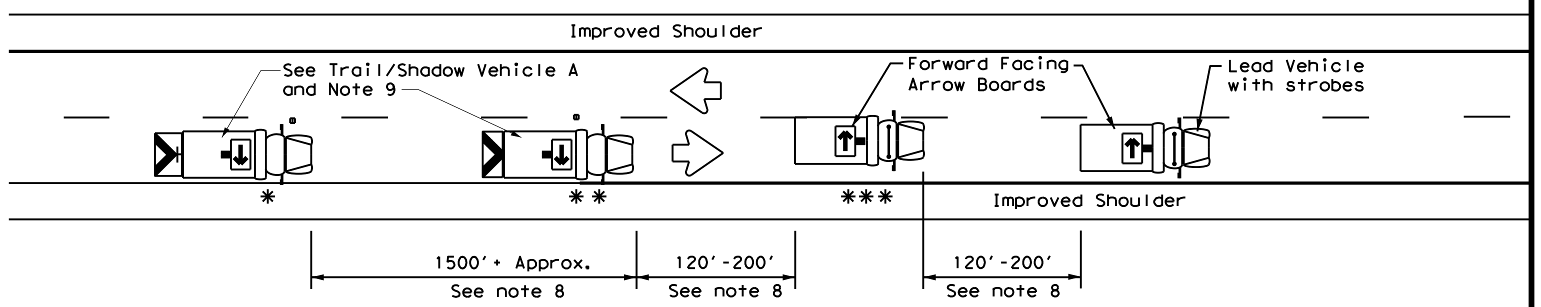
TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	3136	01	191	SL 0001
	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	38

176

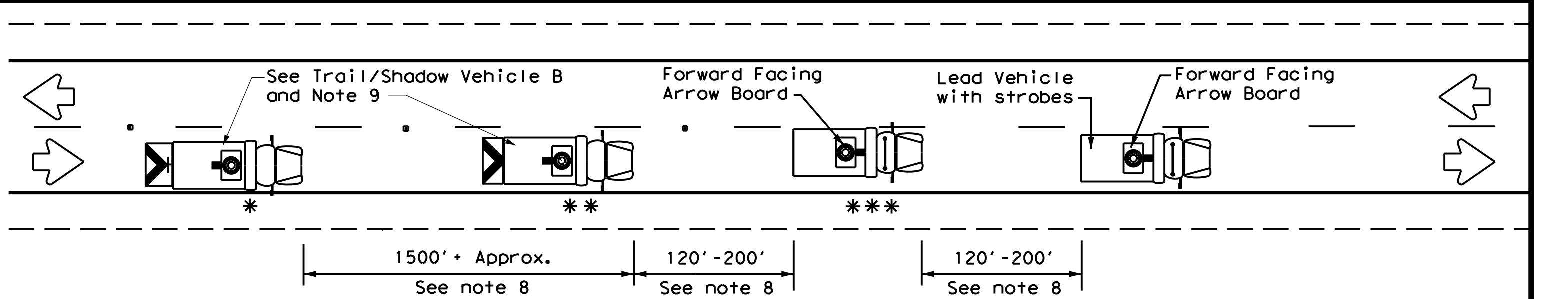
DATE: 11/6/2020 1:38:31 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136-01-191

DATE: 11/6/2020 1:38:41 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136...



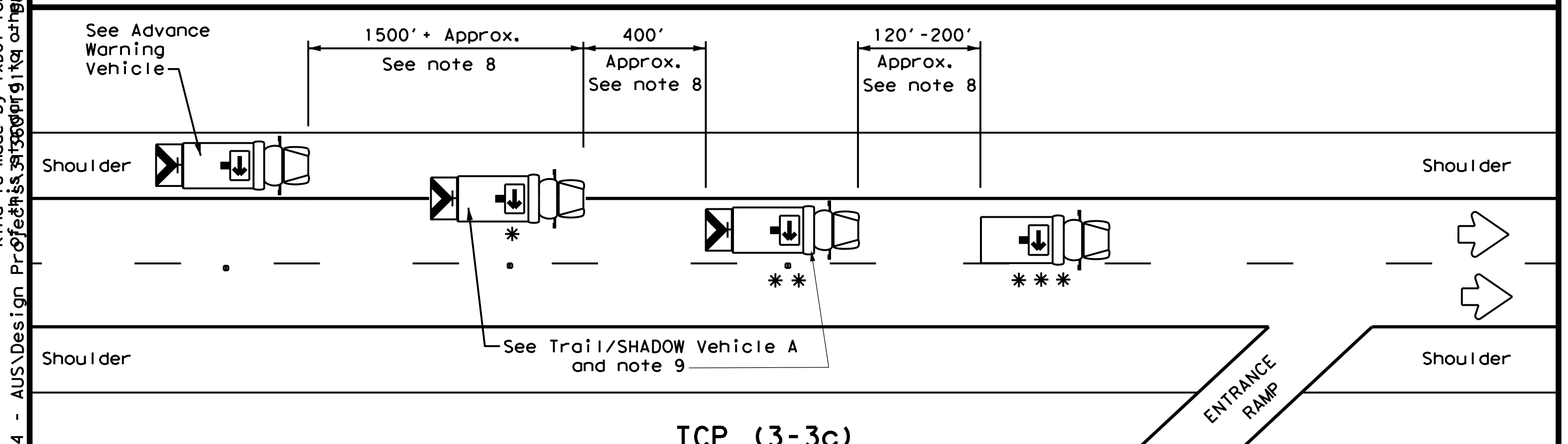
TCP (3-3a)

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



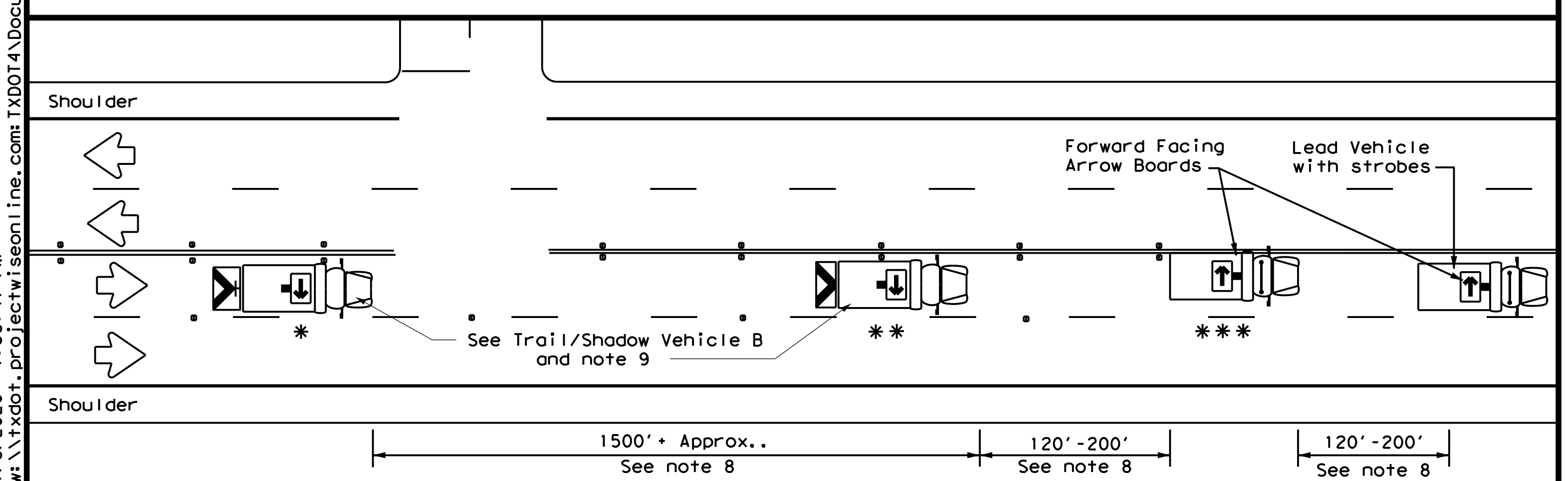
TCP (3-3b)

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



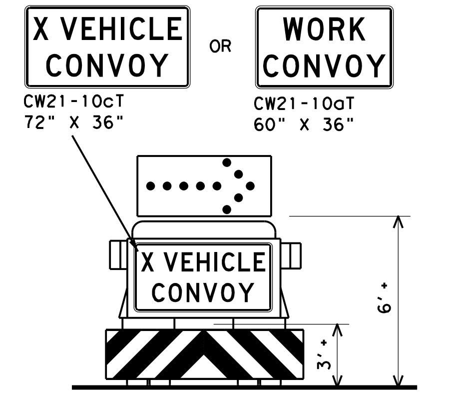
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



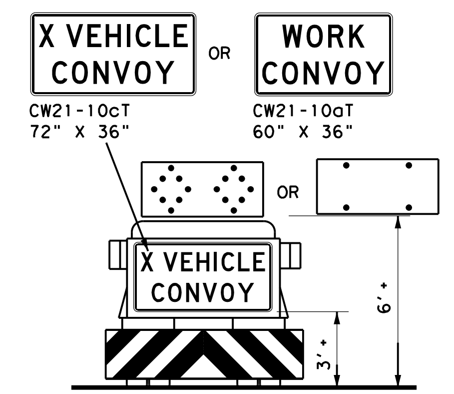
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



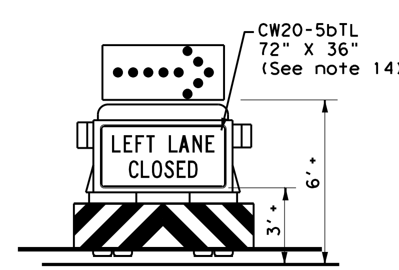
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

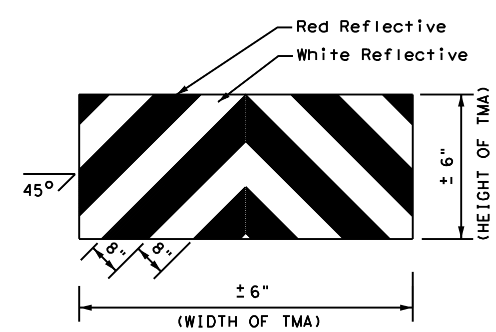


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND

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

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

GENERAL NOTES

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

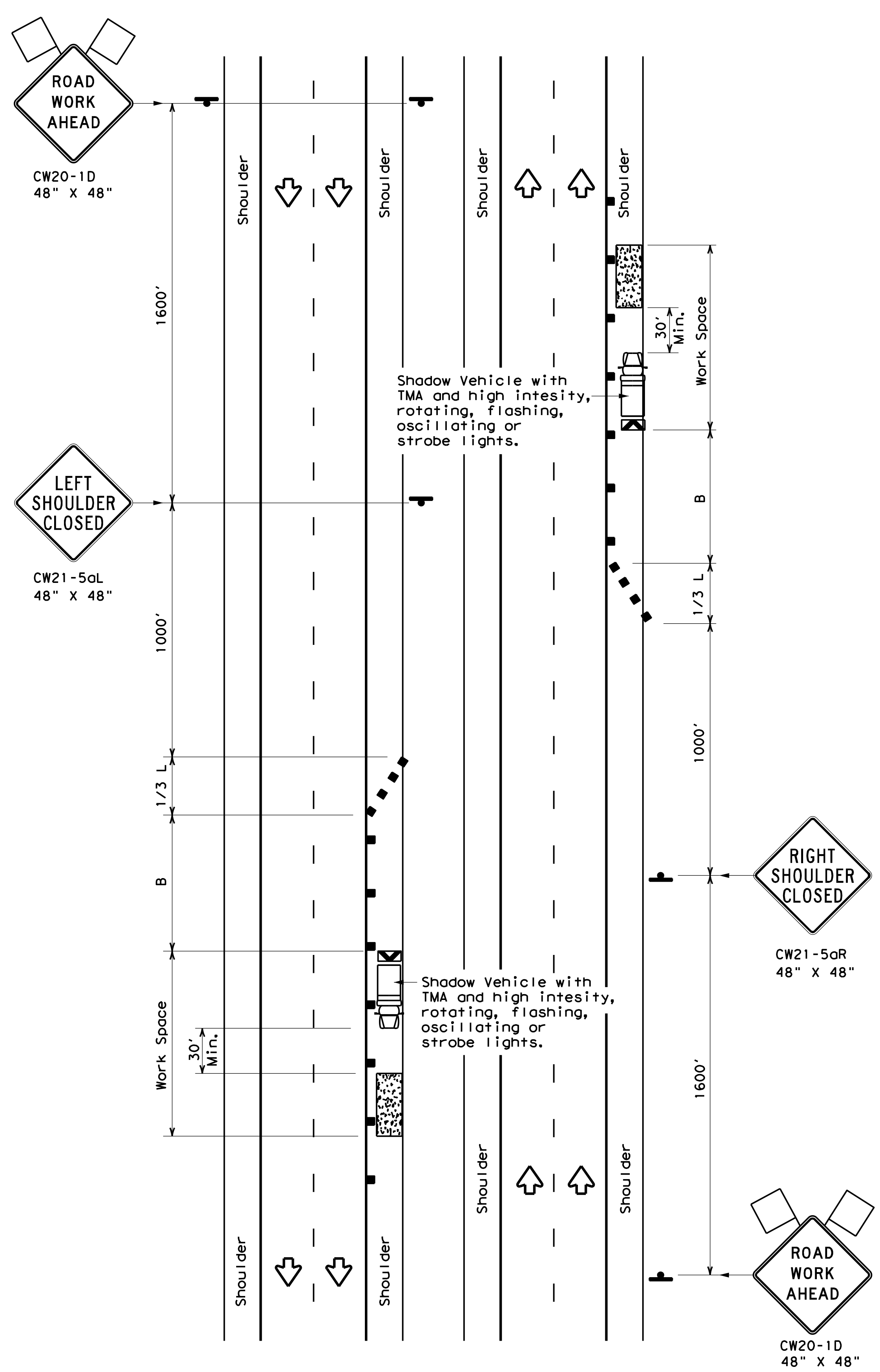
Texas Department of Transportation

Traffic Operations Division Standard

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

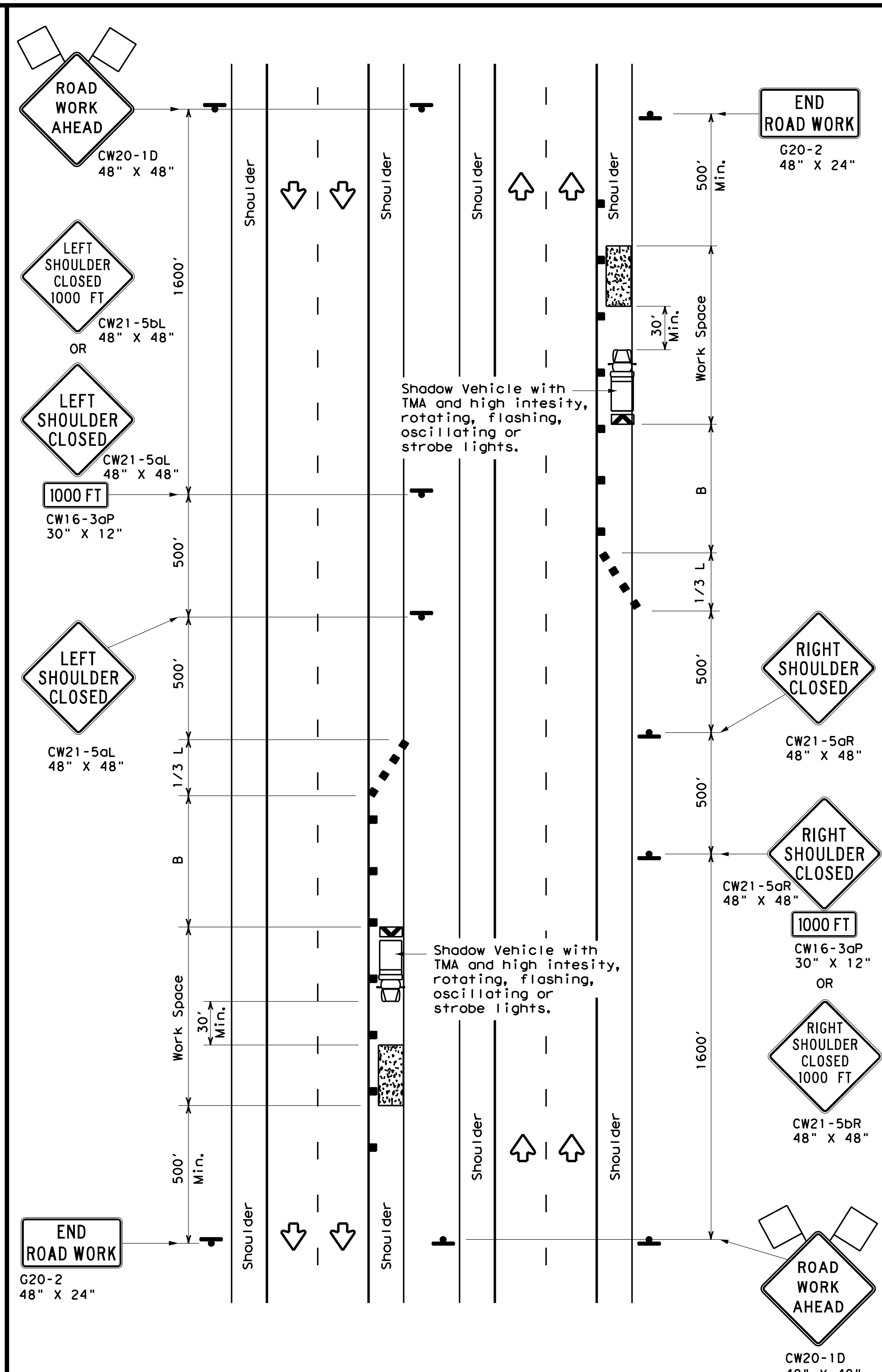
FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
2-94 4-98 8-95 7-13 1-97 7-14	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	39

DATE: 11/6/2020 4:31:19 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\31360191



TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L = WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	TCP(5-1a)	TCP(5-1b)	TCP(5-1b)	

GENERAL NOTES

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

Texas Department of Transportation

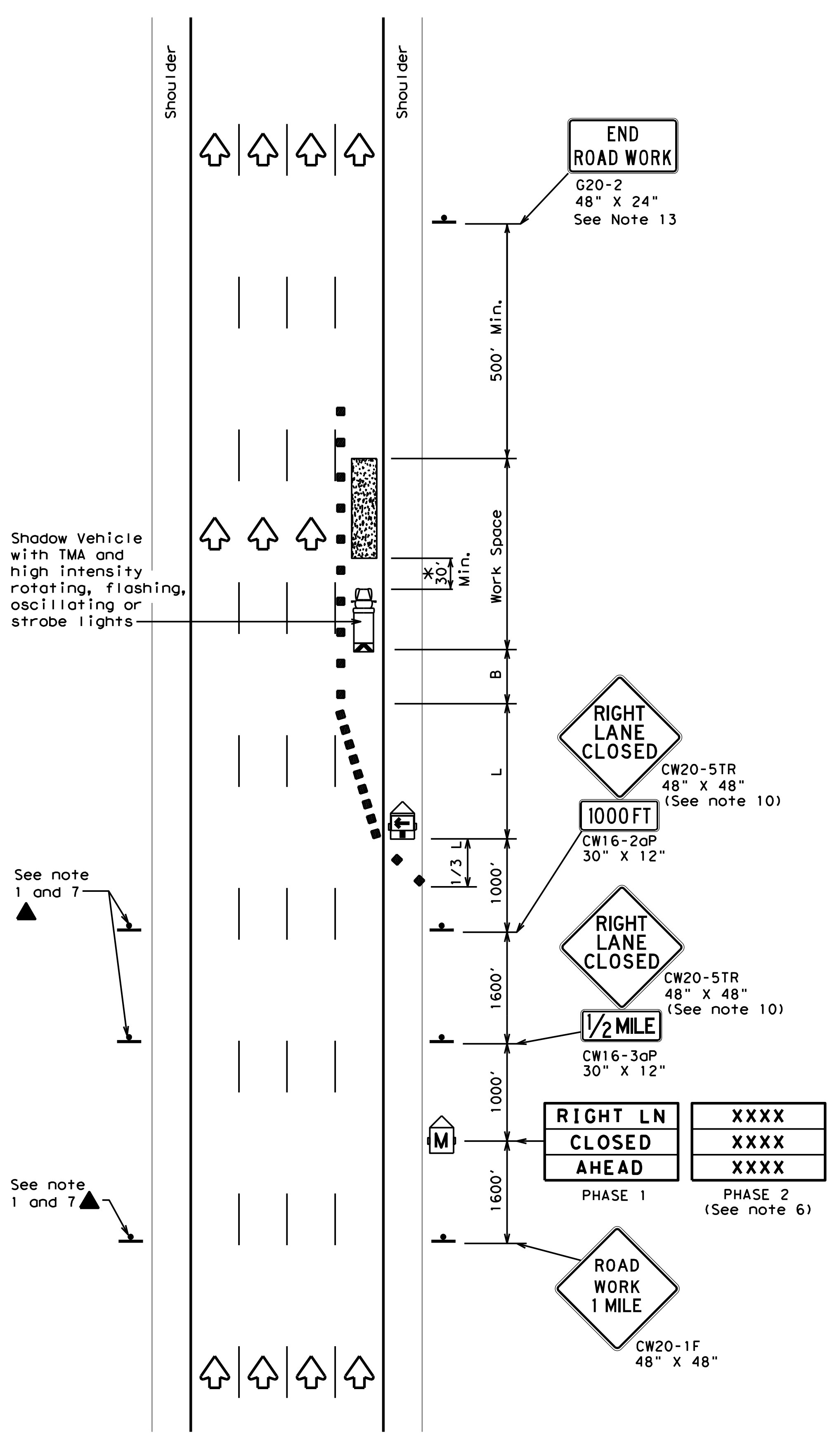
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

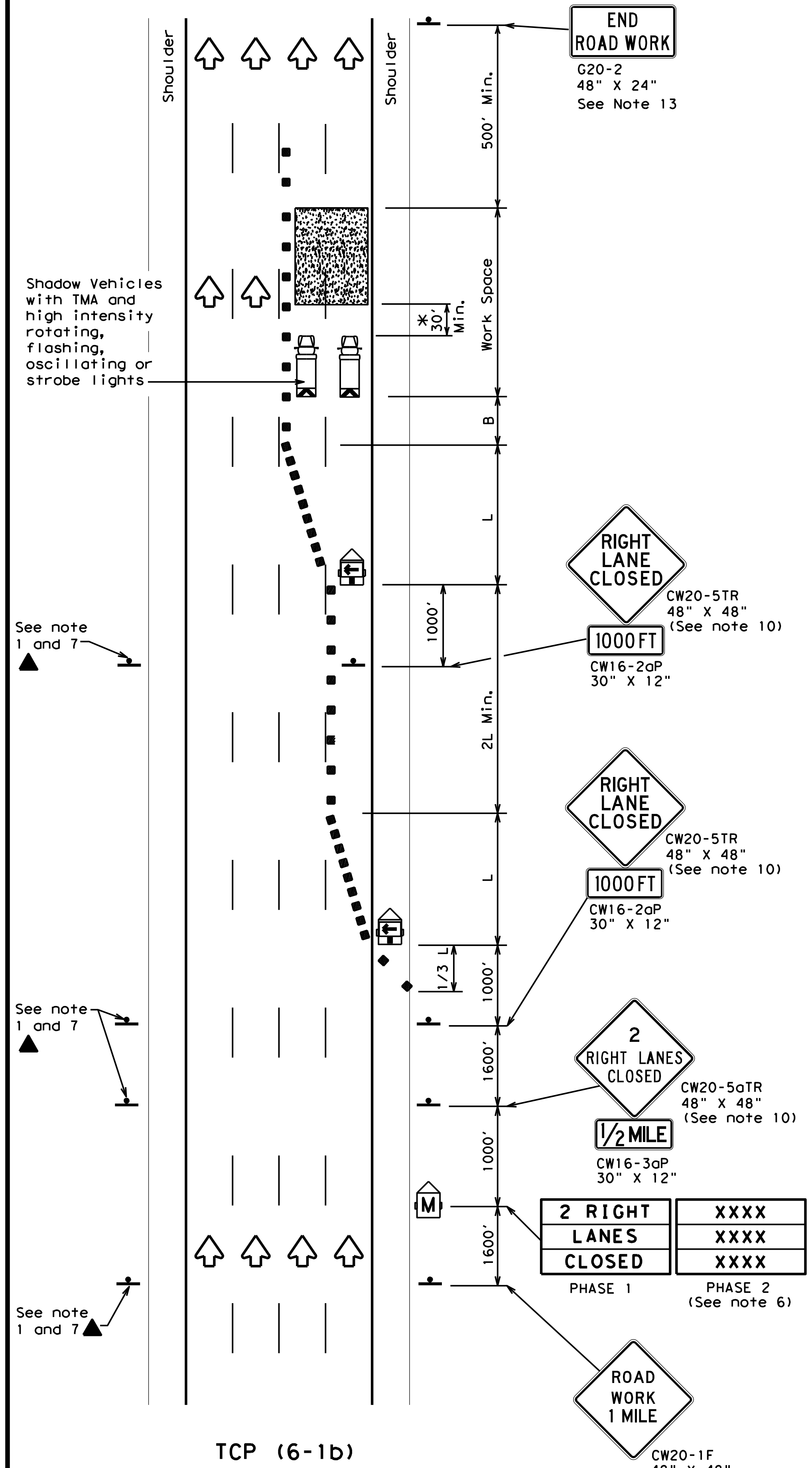
FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2012	CONT 3136	SECT 01	JOB 191	HIGHWAY SL 0001
REVISIONS 2-18	DIST AUS		COUNTY TRAVIS	SHEET NO. 40

DATE: 11/17/2020 1:44:56 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\...



TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

LEGEND

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

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

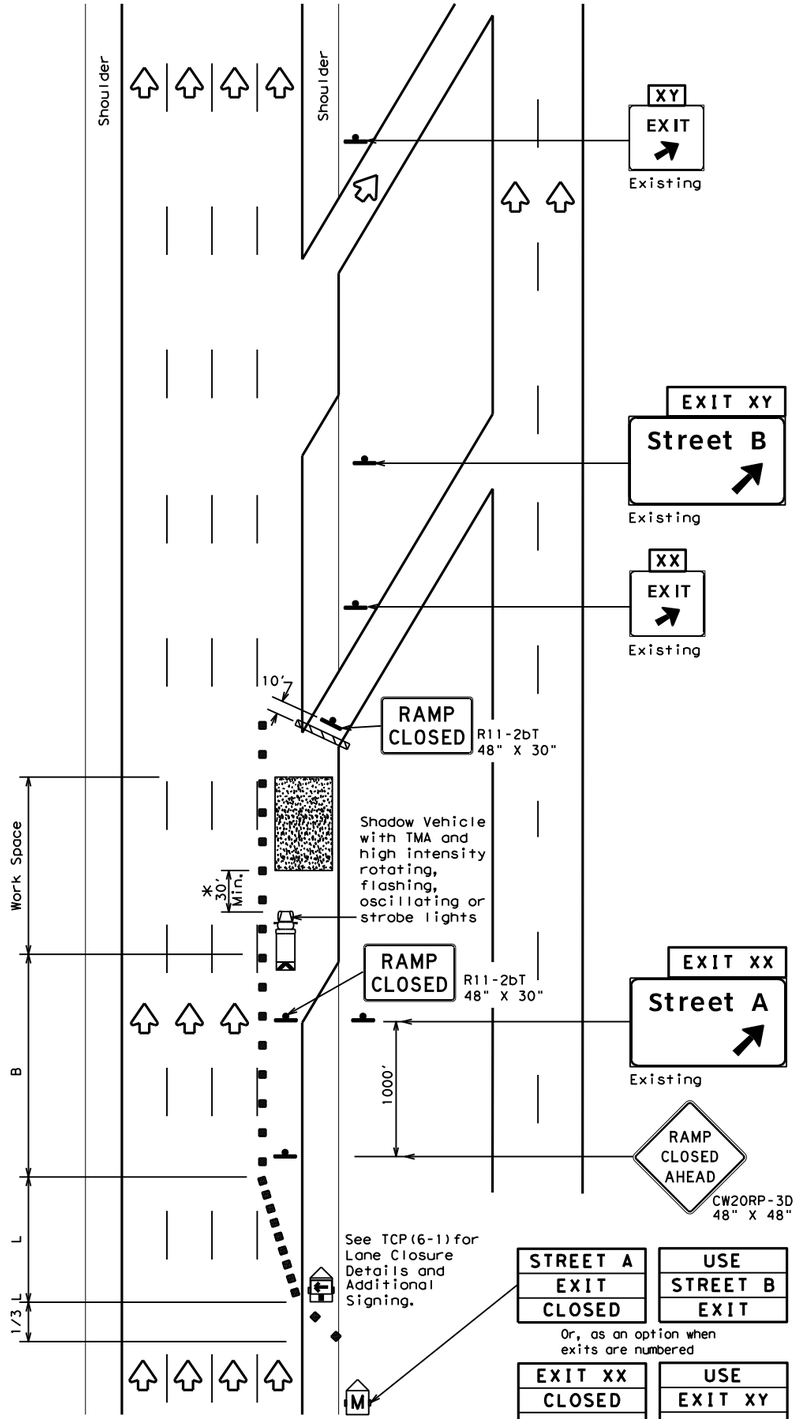
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

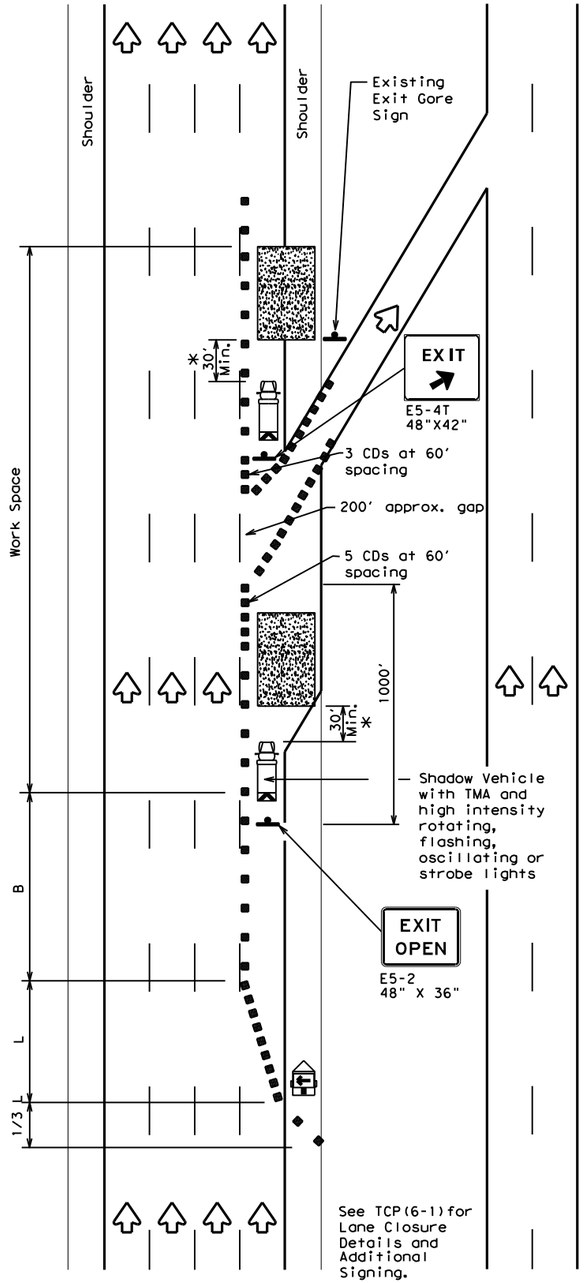
FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT 3136	SECT 01	JOB 191	HIGHWAY SL 0001
REVISIONS 8-12	DIST AUS	COUNTY TRAVIS		SHEET NO. 41

DATE: 11/17/2020 1:46:41 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\93669\tcp6-4.dgn



TCP (6-4a)

EXIT RAMP CLOSED
TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC Standards for sign details.

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

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

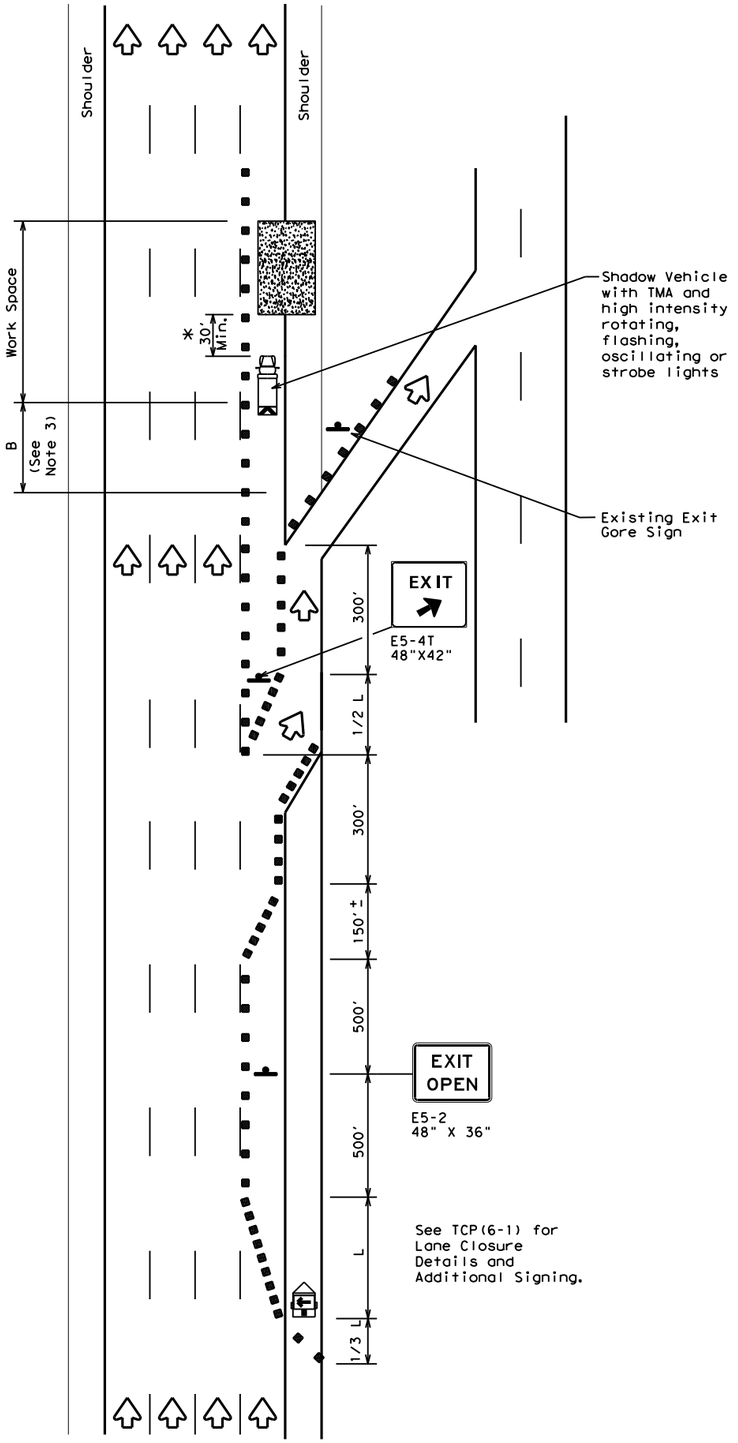
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	AUS	TRAVIS		41A

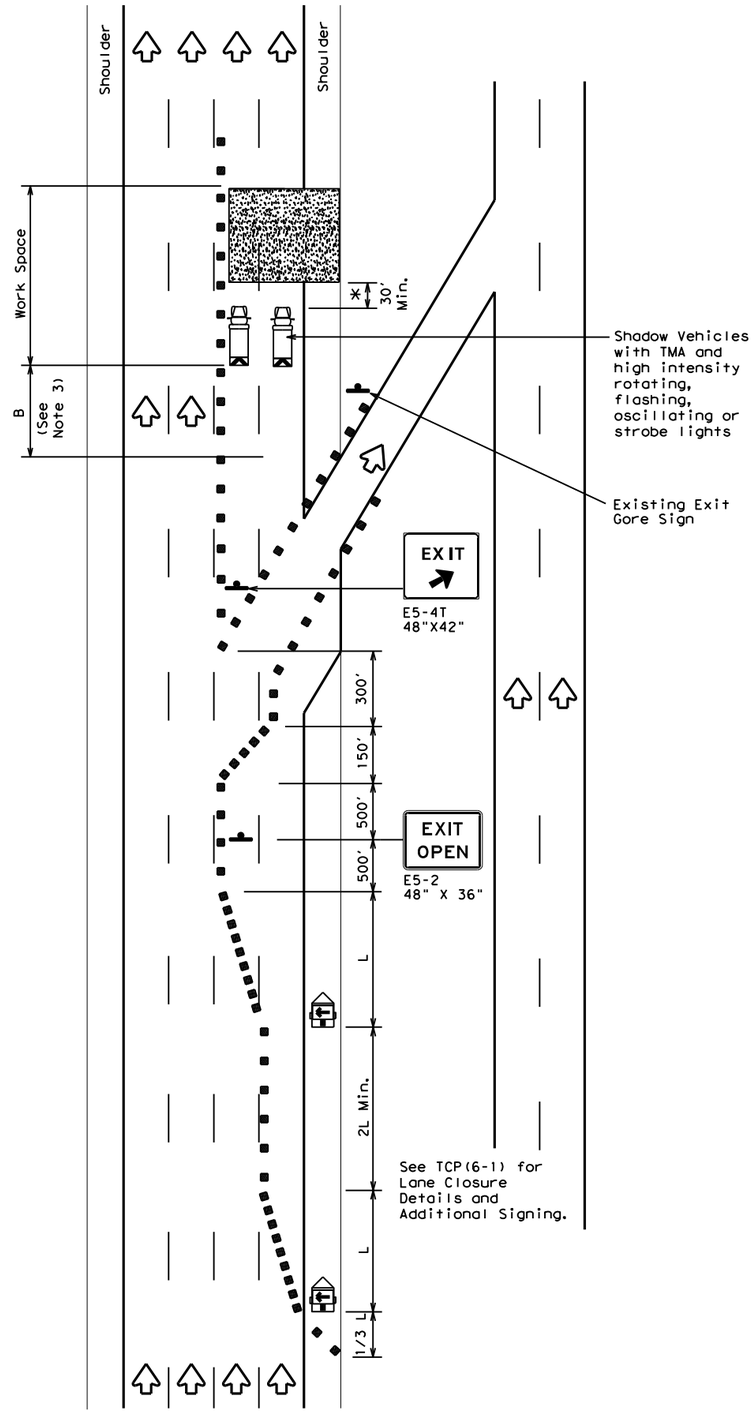
DATE: 11/17/2020 1:45:50 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\93669\dgn\tcp6-5.dgn



See TCP(6-1) for Lane Closure Details and Additional Signing.

TCP (6-5a)

EXIT RAMP OPEN



See TCP(6-1) for Lane Closure Details and Additional Signing.

TCP (6-5b)

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

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

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

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

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

GENERAL NOTES

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

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

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

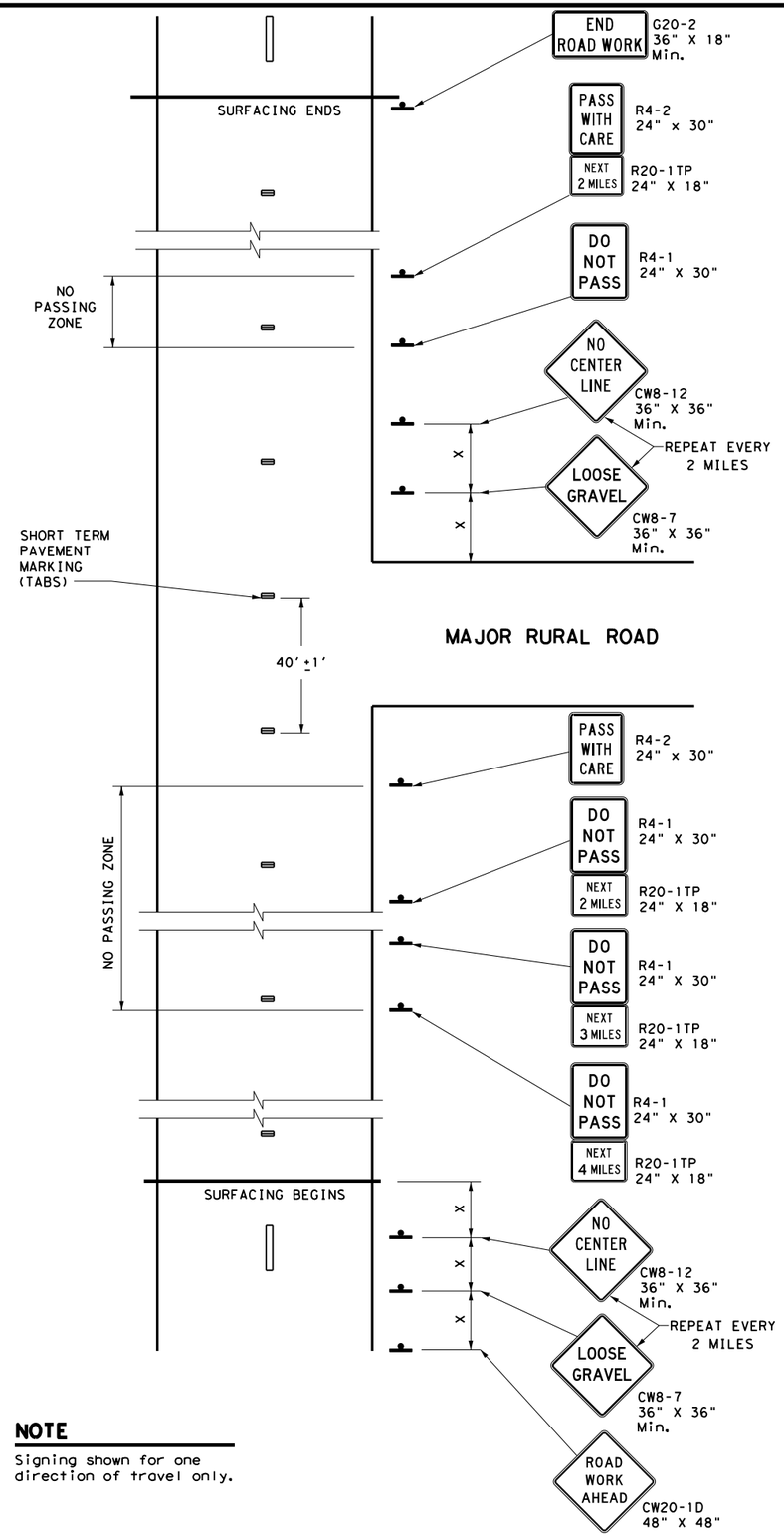
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND EXIT RAMP

TCP(6-5)-12

FILE: tcp6-5.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	AUS	TRAVIS		41B

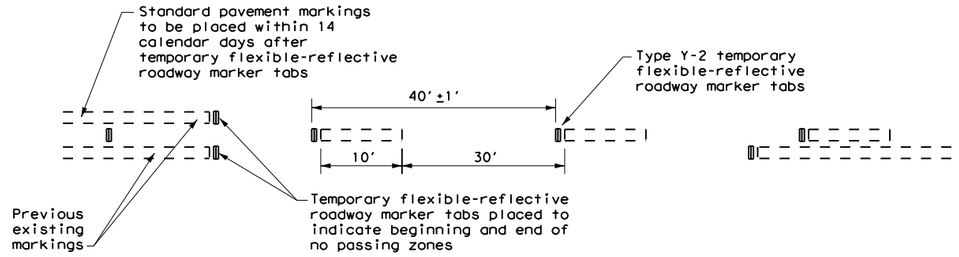
DATE: 11/6/2020 1:39:01 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Profiles\tcp1-1-13.dgn



NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS

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

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

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

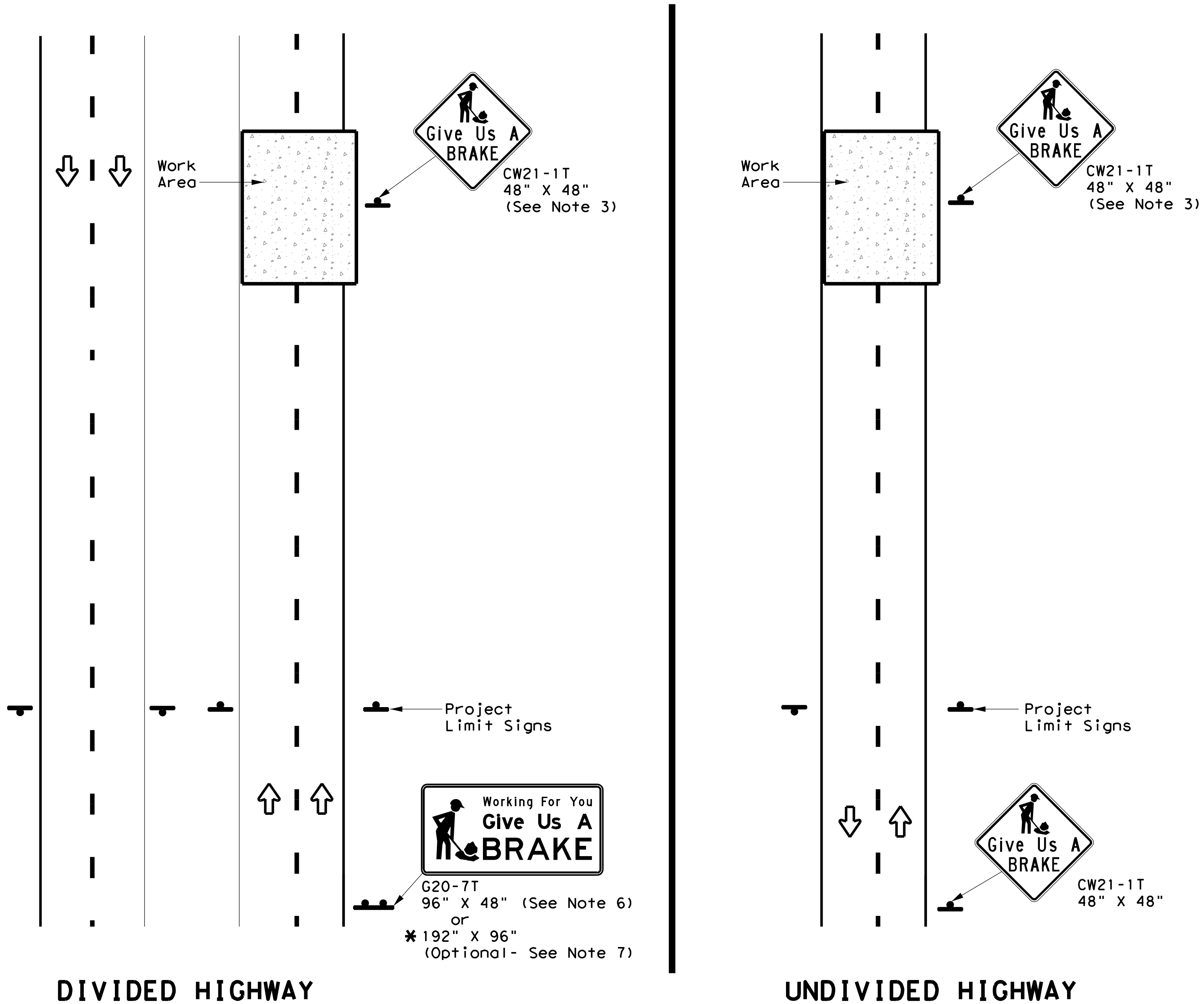
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

FILE: tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	AUS	TRAVIS		42



SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND

Symbol	Meaning
(single post)	Sign
(double post)	Large Sign
(arrow)	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS

PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

Texas Department of Transportation — Traffic Operations Division Standard

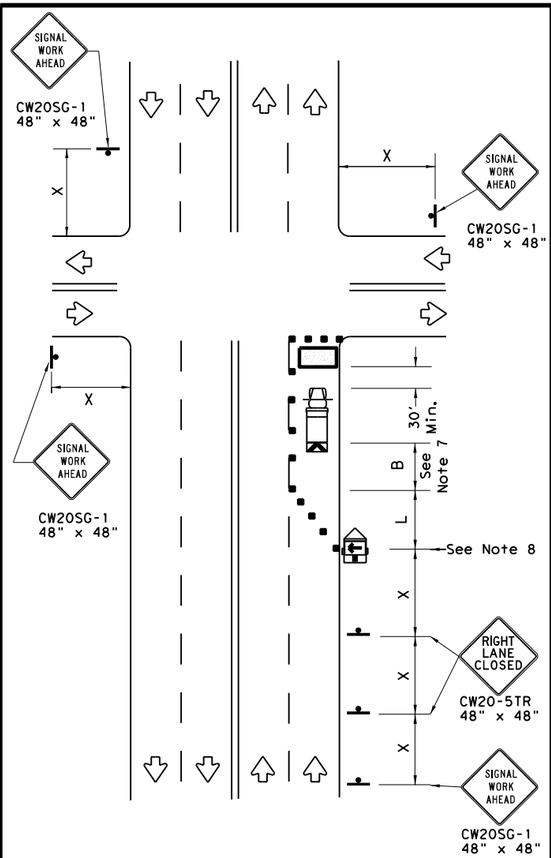
WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 1995	CONT 3136	SECT 01	JOB 191	HIGHWAY SL 0001
REVISIONS 6-96 5-98 7-13 8-96 3-03	DIST AUS	COUNTY TRAVIS		SHEET NO. 43

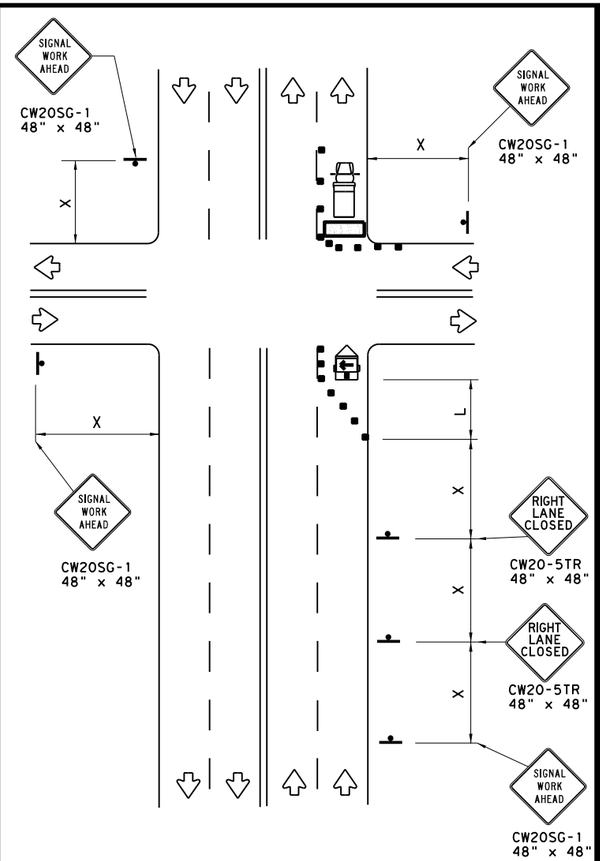
116

DATE: 11/6/2020 1:39:32 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\WZBTS-1-13.dgn



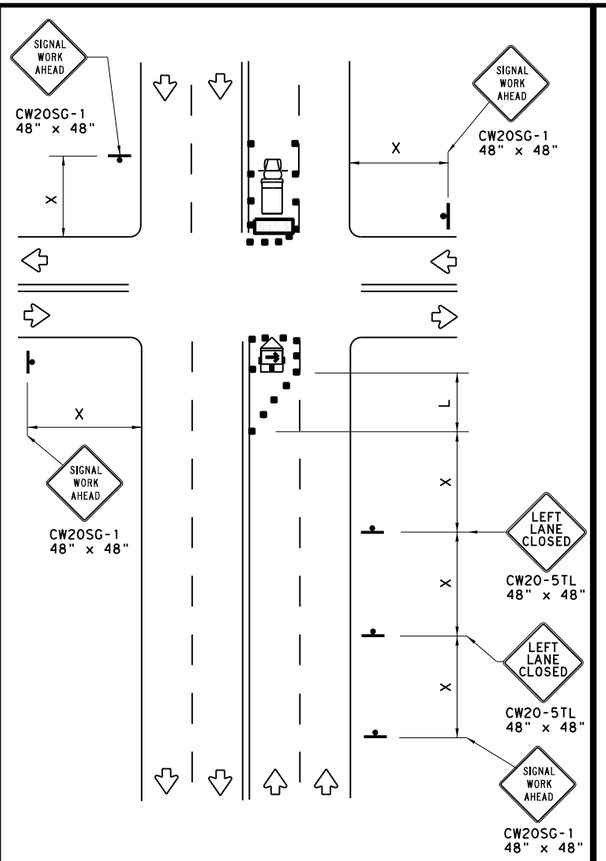
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



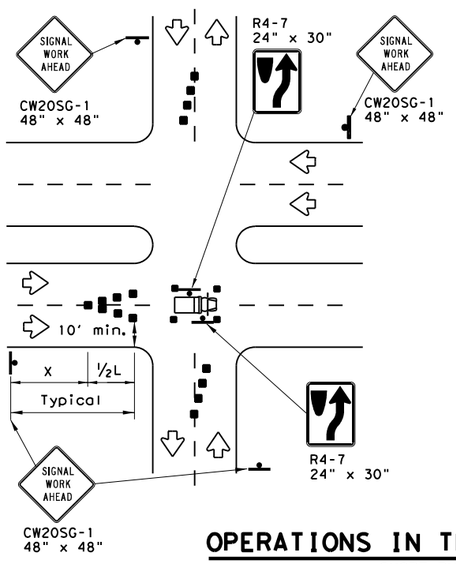
FAR SIDE RIGHT LANE CLOSURE

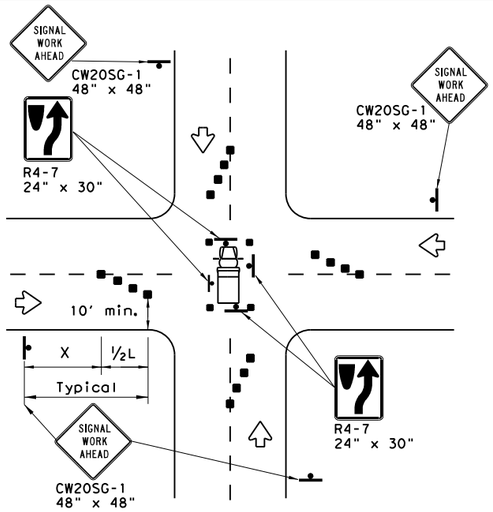
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

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

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

* Conventional Roads Only

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

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.

GENERAL NOTES

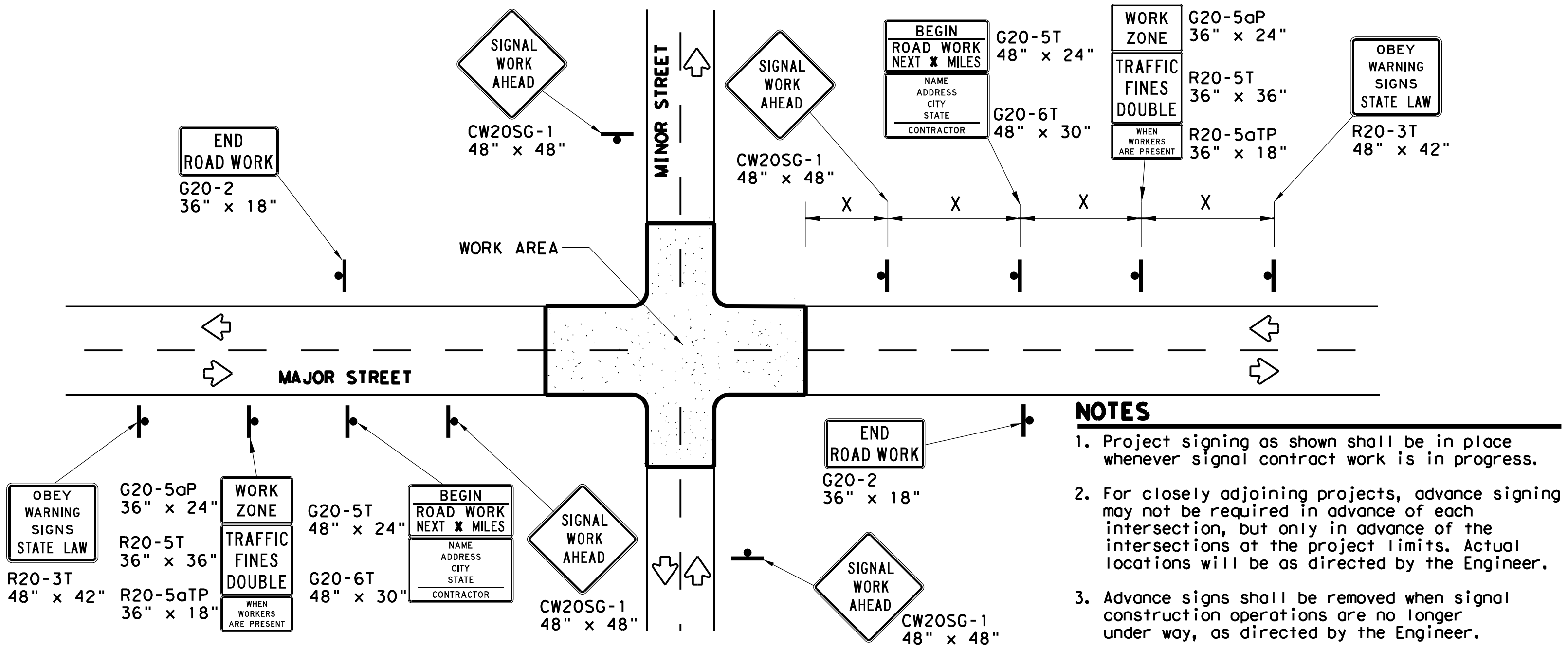
1. The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
2. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
4. Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
5. High level warning devices (flag trees) may be used at corners of the vehicle.
6. When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
9. Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	AUS	TRAVIS		44

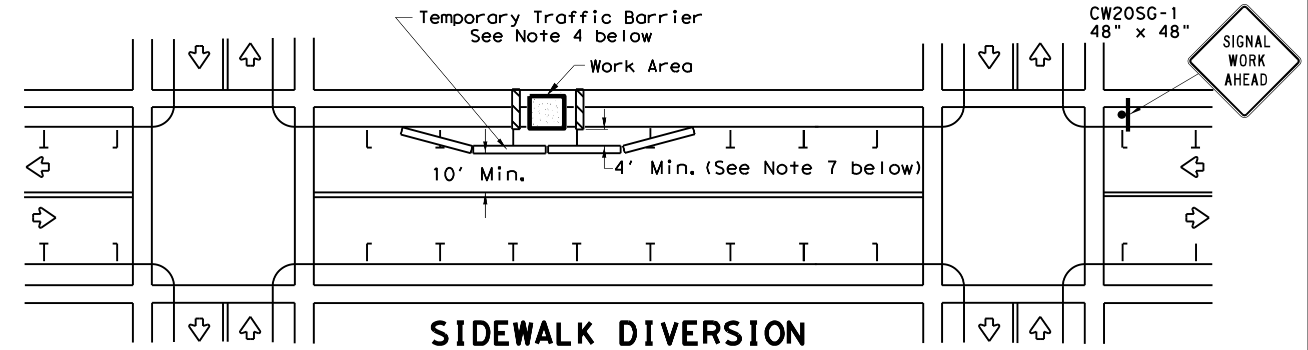


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

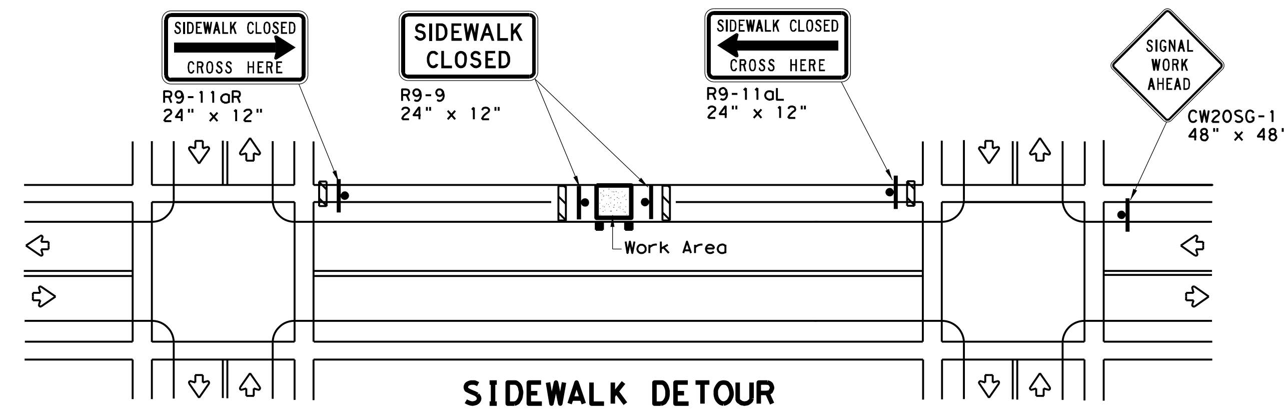
FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

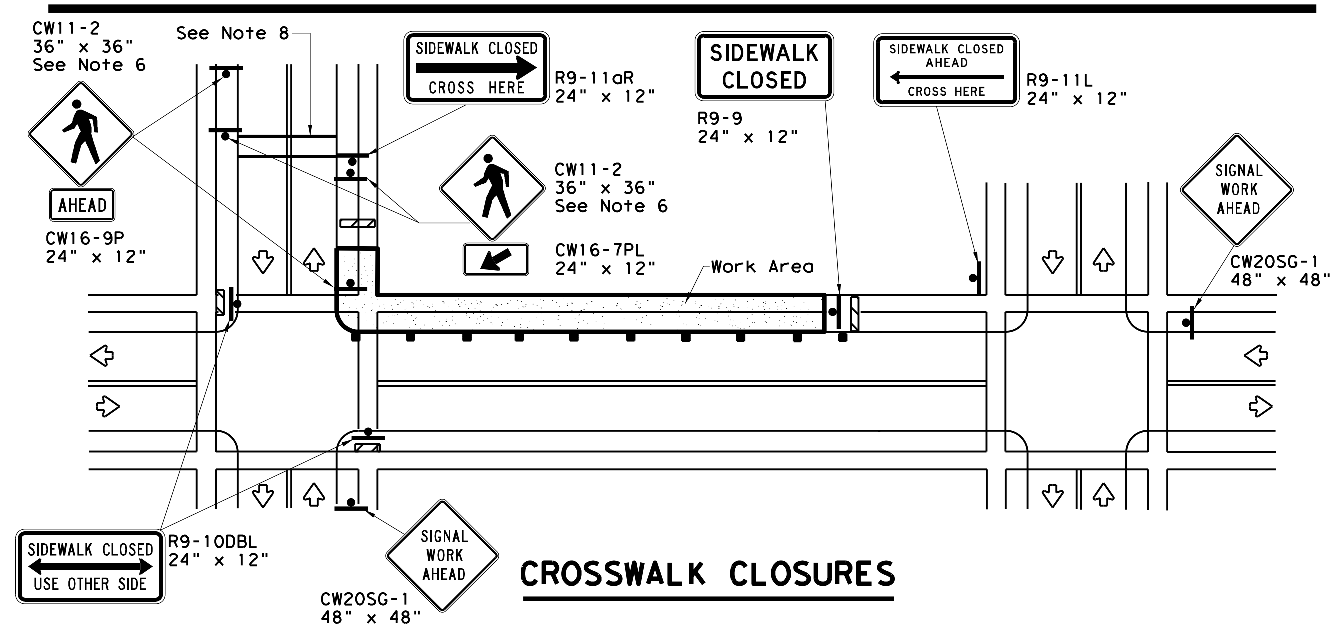
1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
4. Warning sign spacing shown is typical for both directions.
5. See the Table on sheet 1 of 2 for Typical warning sign spacing.



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. 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".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 6G.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. 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, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

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

LEGEND	
(symbol)	Sign
(symbol)	Channelizing Devices
(symbol)	Type 3 Barricade

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

Texas Department of Transportation

Traffic Operations Division Standard

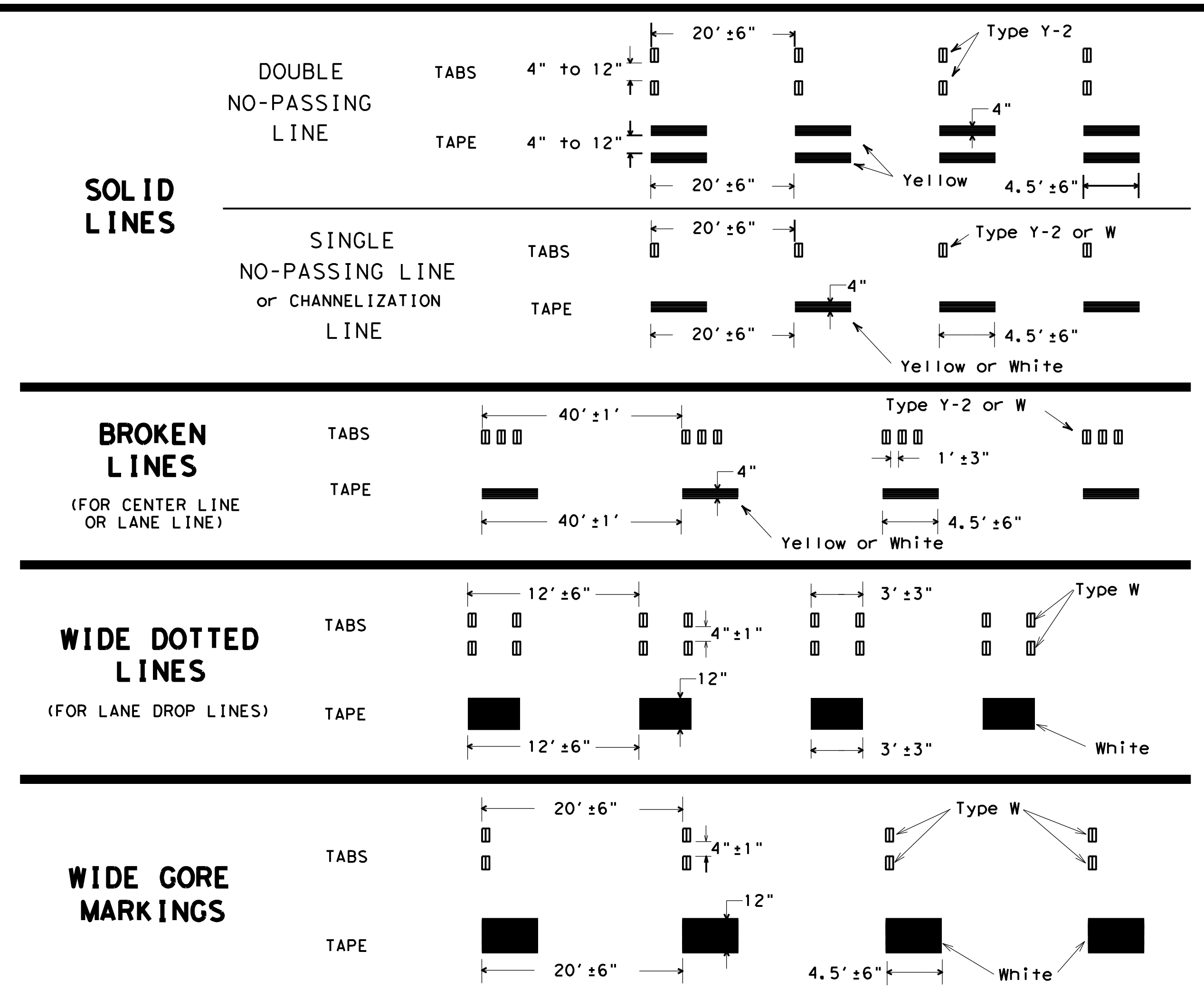
TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

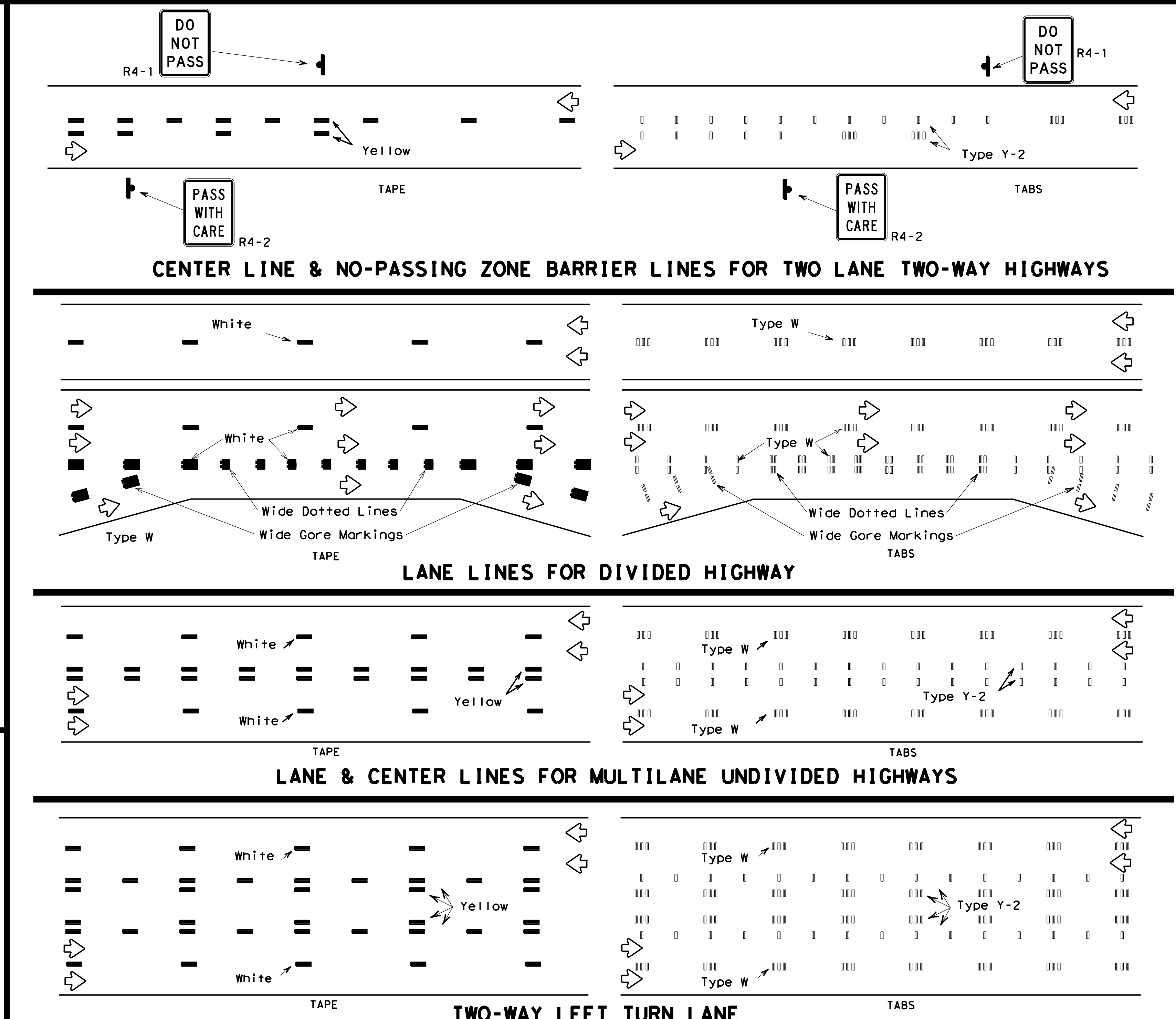
FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT 3136	SECT 01	JOB 191	HIGHWAY SL 0001
REVISIONS 2-98 10-99 7-13 4-98 3-03	DIST AUS		COUNTY TRAVIS	SHEET NO. 45

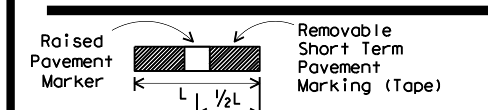
DATE: 11/6/2020 1:39:33 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\...

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS





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

NOTES:

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

TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

DATE: 11/6/2020 1:39:43 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\31360119...

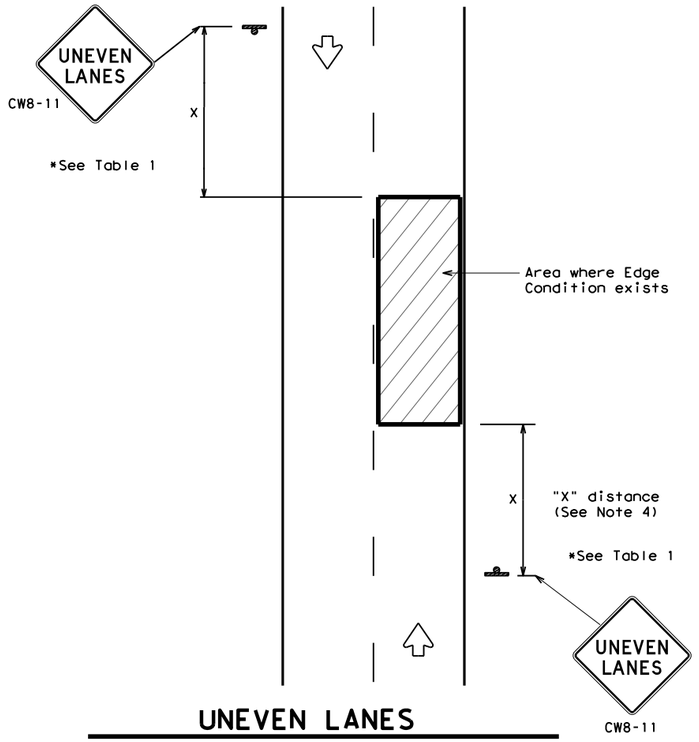
Texas Department of Transportation
Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

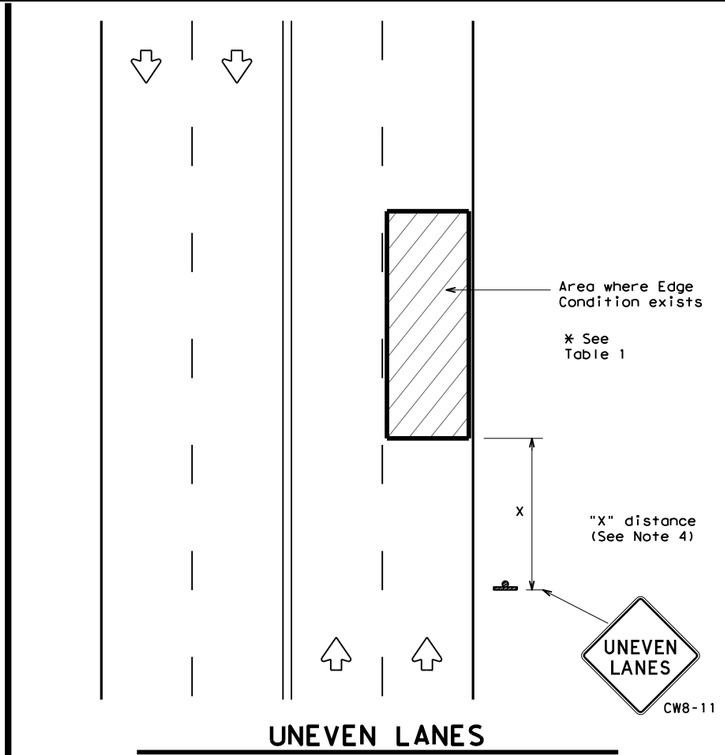
WZ(STPM)-13

FILE: wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 3-03 7-13	3136	01	191	SL 0001
	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	46

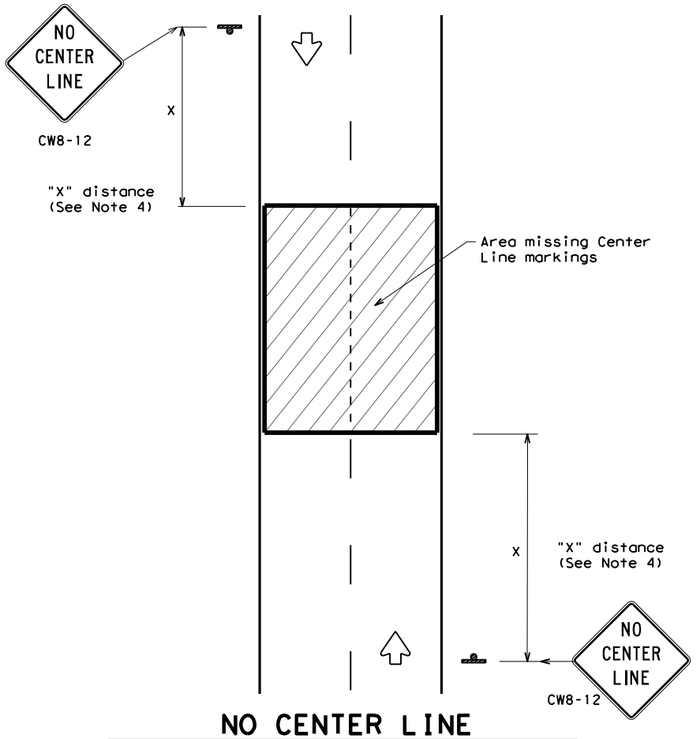
DATE: 11/6/2020 1:39:53 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136 01 191 dgn\wzul-13.dgn



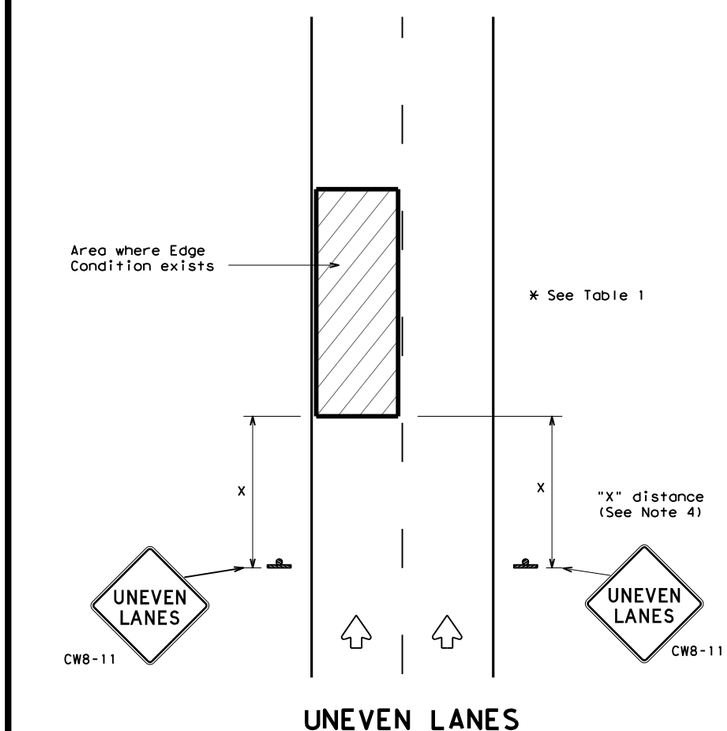
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

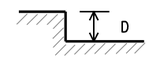
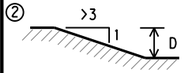
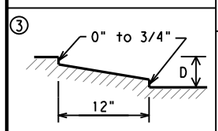
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

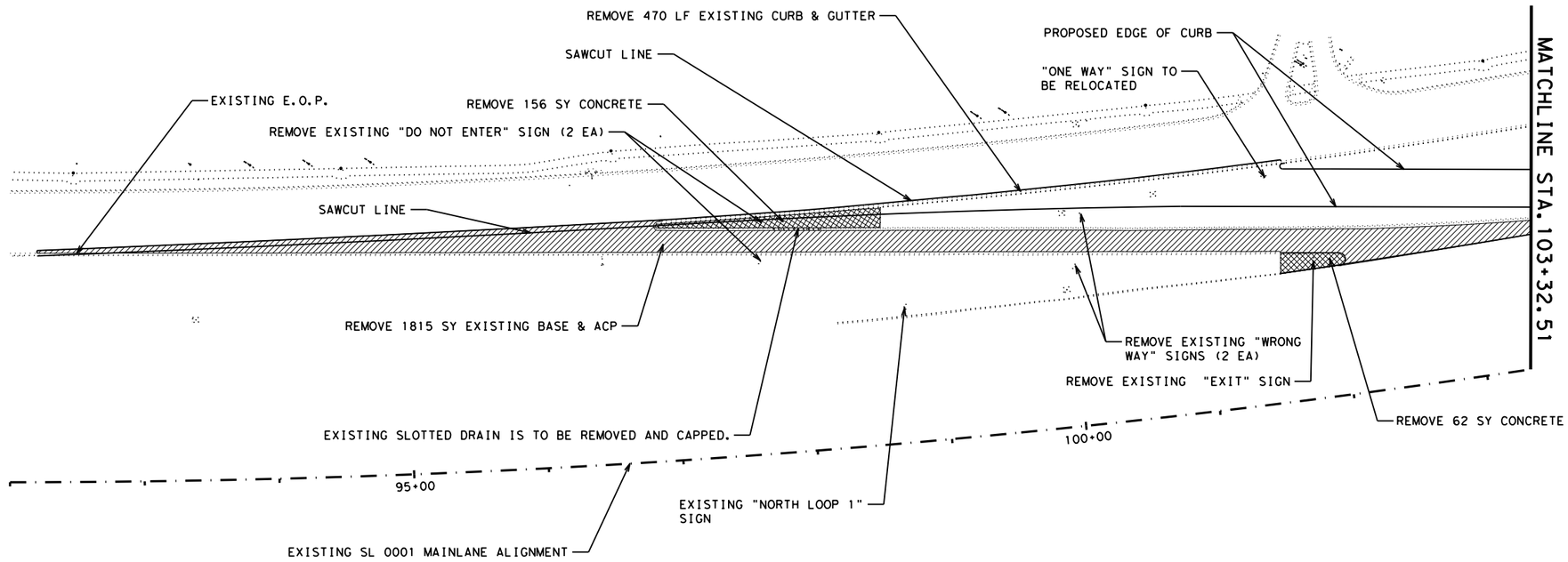
Texas Department of Transportation

Traffic Operations Division Standard

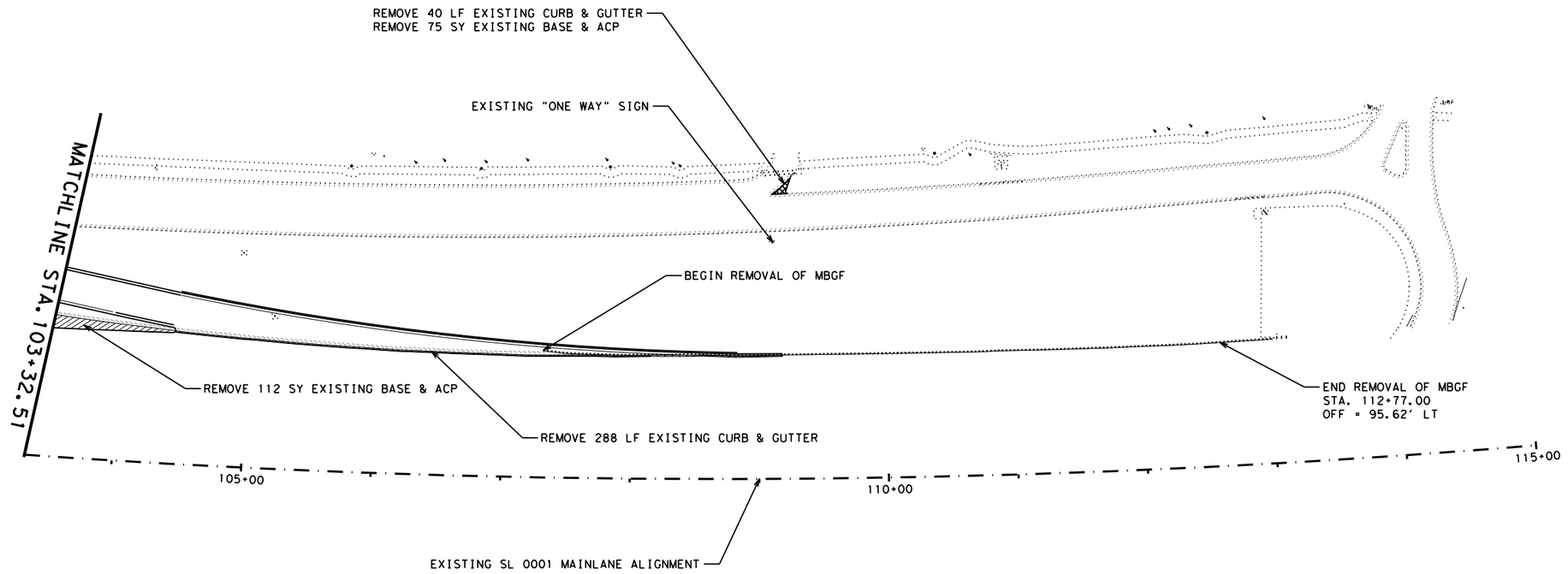
SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	AUS	TRAVIS		47



NOTE: SIGNS NOT IN CONFLICT WITH PROPOSED RAMP ARE TO REMAIN IN-PLACE UNTIL PROPOSED RAMP IS OPENED FOR TRAFFIC.



DocuSigned by:
Shane Swimm
F0E6FDD2B5994AD...

3/8/2021

STATE OF TEXAS
SHANE V. SWIMM
138362
LICENSED PROFESSIONAL ENGINEER

Austin District
North Travis Area Office

Texas Department of Transportation

SL 0001

REMOVAL LAYOUT

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3136	01	191,etc	SL 0001
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	TRAVIS		48

DATE: 3/4/2021 4:38:04 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\3. Roadway\SL0001_RDW_REMOVAL.dgn

Chain SL1NBRAMP contains:
 50 CUR SL1NBRAMP_3 CUR SL1NBRAMP_6 51

Beginning chain SL1NBRAMP description
Feature: Road_Centerline
==========

Point 50 X 3,119,503.6479 Y 10,121,909.0886 Sta 8+00.00

Course from 50 to PC SL1NBRAMP_3 S 53° 40′ 12.27" W Dist 100.0051

Curve Data

Curve SL1NBRAMP_3
P.I. Station 10+88.70 X 3,119,272.2163 Y 10,121,736.5030
Delta = 2° 44′ 49.17" (RT)
Degree = 0° 43′ 40.90"
Tangent = 188.6960
Length = 377.3198
Radius = 7,870.0000
External = 2.2618
Long Chord = 377.2837
Mid. Ord. = 2.2612
P.C. Station 9+00.01 X 3,119,423.0819 Y 10,121,849.8422
P.T. Station 12+77.32 X 3,119,116.0922 Y 10,121,630.5243
C.C. X 3,114,696.0113 Y 10,128,142.0360
Back = S 53° 05′ 02.20" W
Ahead = S 55° 49′ 51.37" W
Chord Bear = S 54° 27′ 26.78" W

Course from PT SL1NBRAMP_3 to PC SL1NBRAMP_6 S 56° 56′ 28.87" W Dist 350.9237

Curve Data

Curve SL1NBRAMP_6
P.I. Station 18+46.41 X 3,118,641.0874 Y 10,121,317.1370
Delta = 10° 50′ 13.41" (LT)
Degree = 2° 29′ 28.04"
Tangent = 218.1645
Length = 435.0275
Radius = 2,300.0000
External = 10.3237
Long Chord = 434.3793
Mid. Ord. = 10.2776
P.C. Station 16+28.25 X 3,118,821.9787 Y 10,121,439.0964
P.T. Station 20+63.28 X 3,118,486.3525 Y 10,121,163.3421
C.C. X 3,120,107.7362 Y 10,119,532.0496
Back = S 56° 00′ 41.77" W
Ahead = S 45° 10′ 28.35" W
Chord Bear = S 50° 35′ 35.06" W

Course from PT SL1NBRAMP_6 to 51 S 44° 06′ 36.61" W Dist 35.0000

Point 51 X 3,118,461.9911 Y 10,121,138.2120 Sta 20+98.28

==========
Ending chain SL1NBRAMP description

DocuSigned by:
Shane Swimm
F0E6FDD2B5994AD...

3/8/2021

STATE OF TEXAS
SHANE V. SWIMM
138362
LICENSED PROFESSIONAL ENGINEER

Austin District
North Travis Area Office

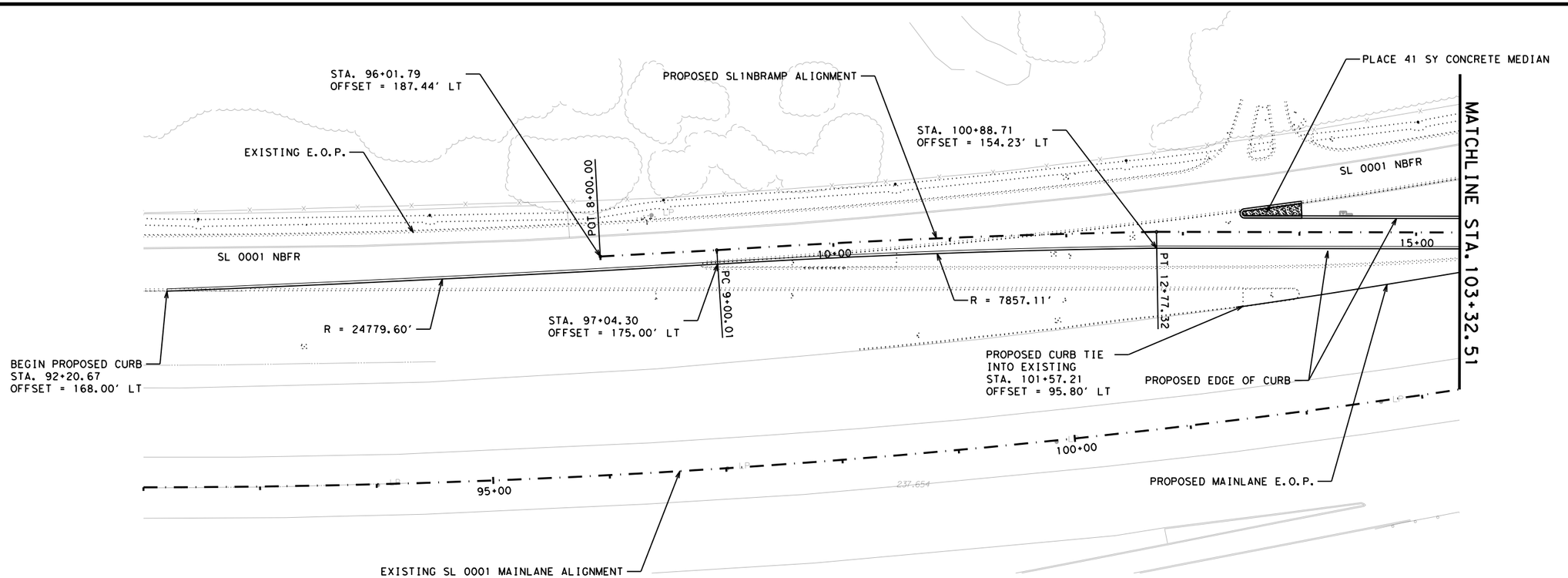
Texas Department of Transportation

SL 0001
HORIZONTAL ALIGNMENT DATA

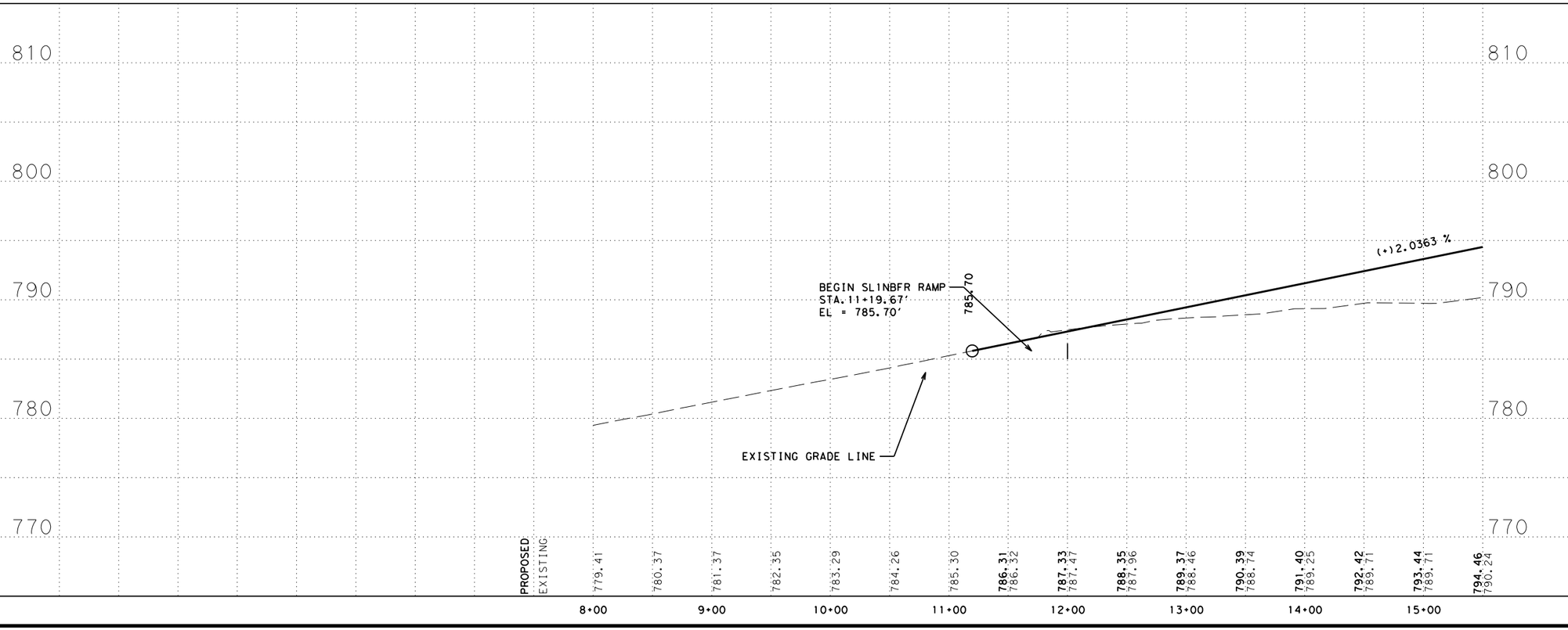
SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3136	01	191,etc	SL 0001
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	TRAVIS		49

DATE: 3/4/2021 3:55:32 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\3. Roadway\SL0001_RDW_HAD.dgn



NOTE: SL 0001 STA. 98+45.33 = SL1NBRAMP STA. 10+00



DocuSigned by:
Shane Swimm
F0E6FDD2B5994AD...
3/8/2021

STATE OF TEXAS
SHANE V. SWIMM
138362
LICENSED
PROFESSIONAL ENGINEER

SCALES (IN FEET):
HORZ- 0 100
VERT- 0 10

Austin District
North Travis Area Office

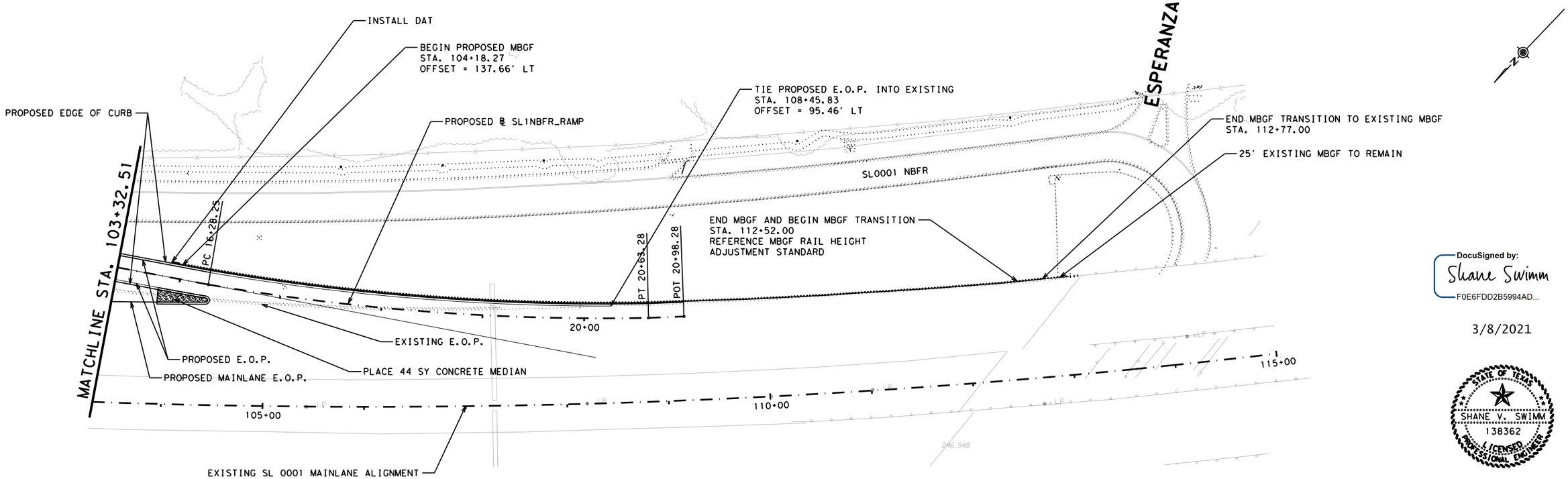
Texas Department of Transportation

SL 0001
PLAN & PROFILE

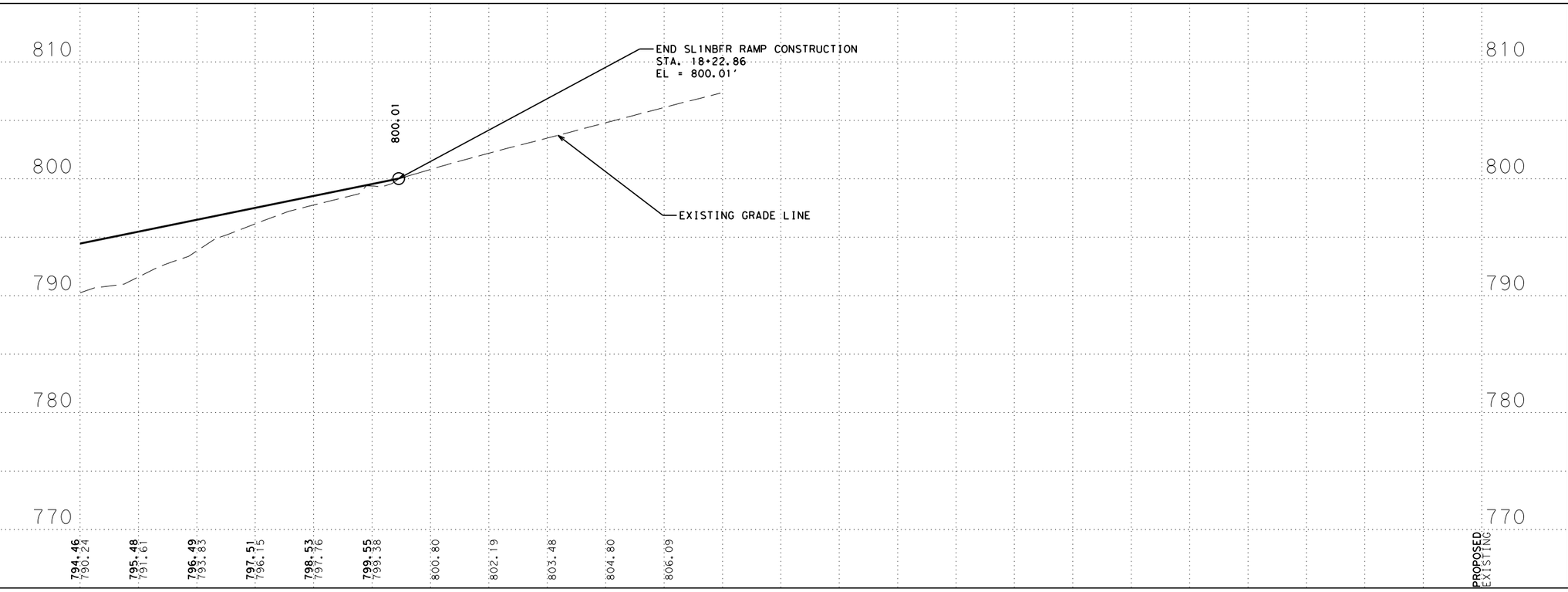
SHEET 1 OF 2

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3136	01	191,etc	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		50

DATE: 3/8/2021 10:25:52 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\SL0001_RDW_P&P_1.dgn



NOTE: SL 0001 STA. 109+18.32 = SL1NBRAMP STA. 20+98.28



DocuSigned by:
Shane Swimm
F0E6FDD2B5994AD...

3/8/2021

STATE OF TEXAS
SHANE V. SWIMM
138362
LICENSED PROFESSIONAL ENGINEER

SCALES (IN FEET):
HORZ- 0 100
VERT- 0 10

Austin District
North Travis Area Office

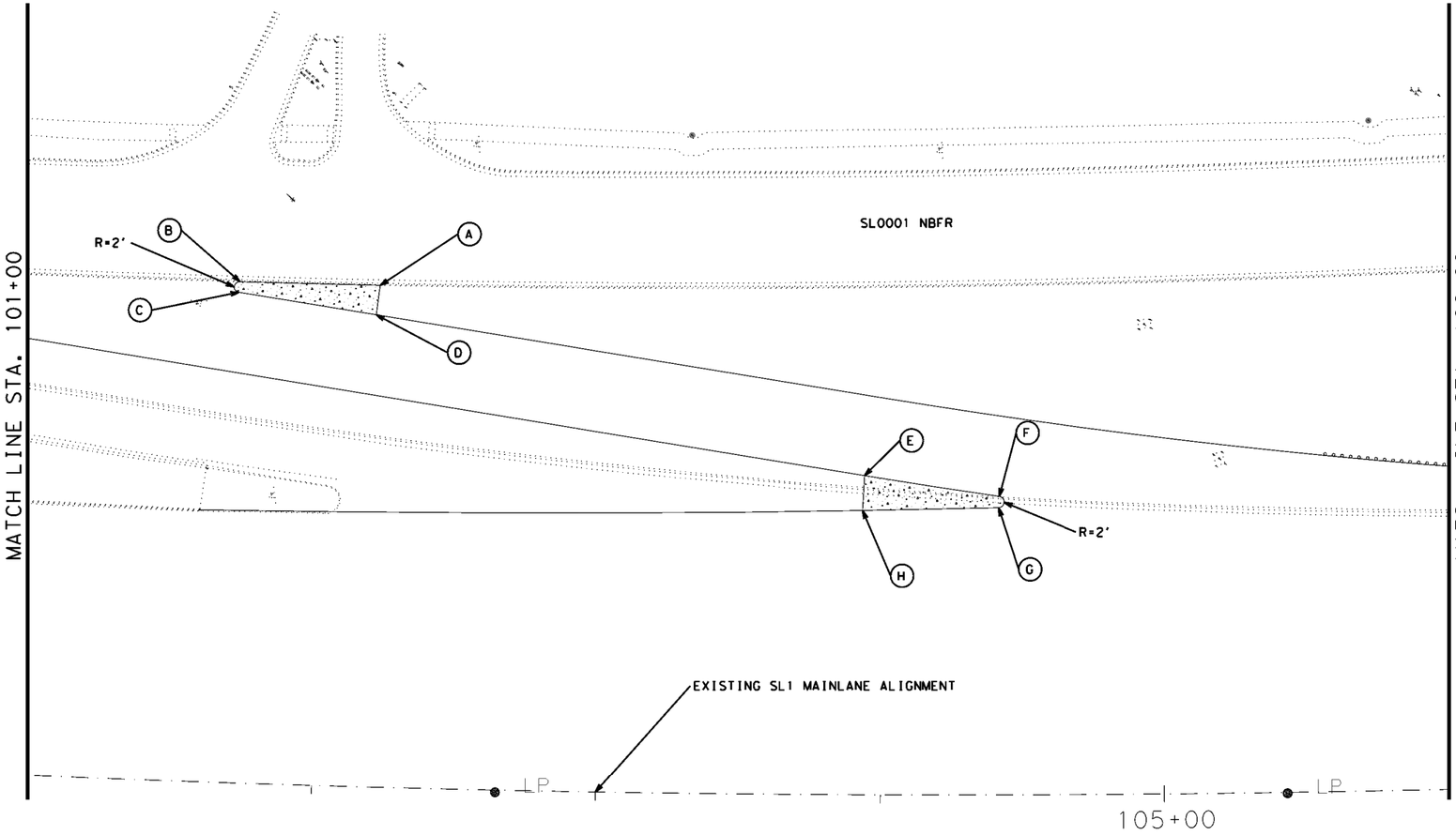
Texas Department of Transportation

SL 0001
PLAN & PROFILE

SHEET 2 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3136	01	191,etc	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		51

DATE: 3/8/2021 10:31:49 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\SL0001_RDW_P&P_2.dgn



	STATION	OFFSET
(A)	102+58.10	178.14' LT
(B)	101+68.93	176.71' LT
(C)	101+68.67	172.73' LT
(D)	102+18.71	166.56' LT
(E)	103+94.02	112.46' LT
(F)	104+42.07	105.23' LT
(G)	104+41.74	101.22' LT
(H)	103+93.35	100.19' LT

STATE OF TEXAS
SHANE V. SWIMM
138362
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Shane Swimm
F0E6FDD2B5994AD...

11/13/2020

Austin District
North Travis Area Office

Texas Department of Transportation

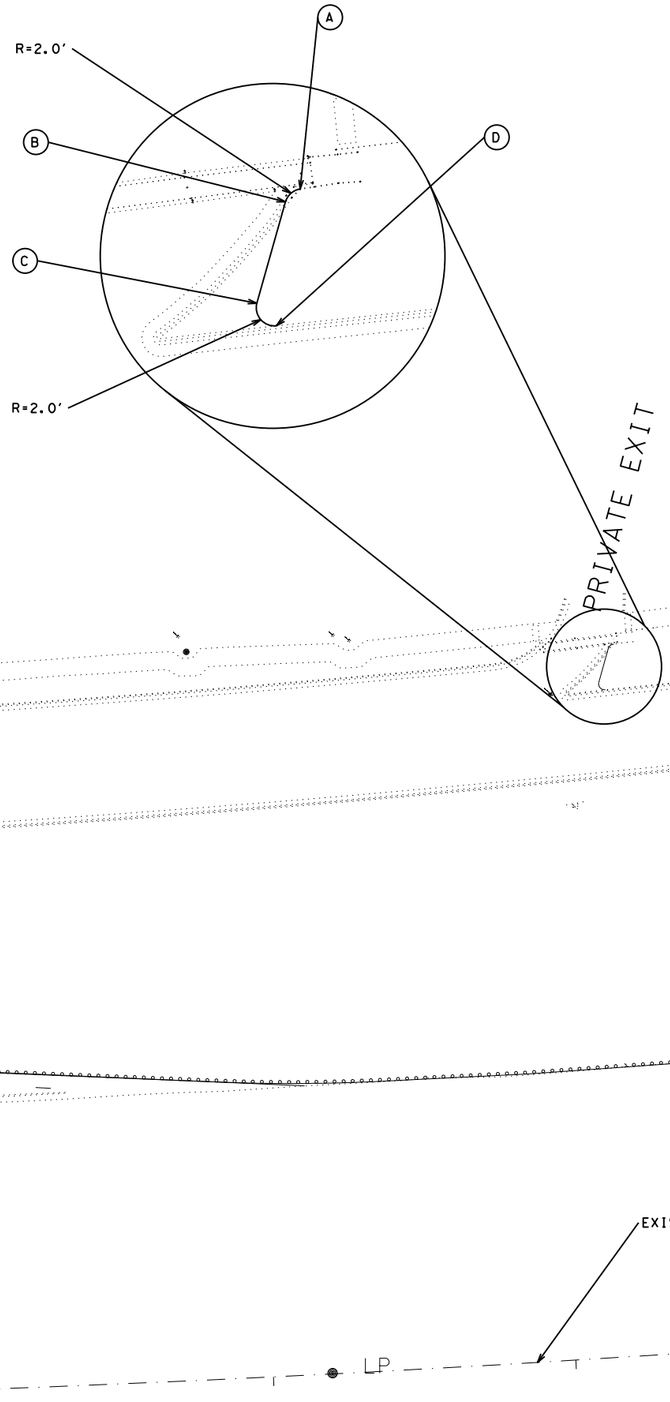
SL 0001

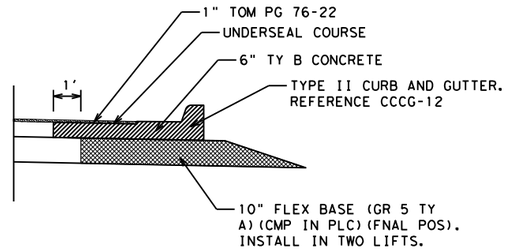
ROADWAY DETAILS

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
3136	01	191	SL 0001
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		52

DATE: 11/13/2020 9:34:08 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011914 - Design\Plan Set\3. Roadway\SL0001_RDW_DETAILS.dgn





DETAIL
NOT TO SCALE

	STATION	OFFSET
A	109+27.82	235.08' LT
B	109+28.96	234.86' LT
C	109+22.06	222.83' LT
D	109+24.11	220.22' LT

Prior to beginning work near the private exit driveway, notify property owner a minimum of 48 hr. in advance. Coordinate and contact the listed person below prior to access closure. Only close access for reconstruction if duration and alternate access are approved. Install and maintain material across a work zone as temporary access. Temporary access must not have grade breaks that exceed 8%. This work is subsidiary.

Simon Malls Point of Contact: Irma Castor
Phone: (512) 873-8099
E-mail: icastor@simon.com

DocuSigned by:
Shane Swimm
F0E6FDD2B5994AD...

12/17/2020

Austin District
North Travis Area Office

Texas Department of Transportation

SL 0001

ROADWAY DETAILS

SHEET 2 OF 2

© 2020	CONT	SECT	JOB	HIGHWAY
DS: CK:	3136	01	191,etc	SL 0001
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		52A

DATE: 12/7/2020 4:03:44 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\SL0001_RDW_DETAILS_A.dgn

HORIZONTAL ALIGNMENT DATA - PARMER-LN

Chain PARMER_LN contains:
GJ400 CUR PARMER_LN-1 CUR PARMER_LN-2 CUR PARMER_LN-3 GJ401

Beginning chain PARMER_LN description

Point GJ400 N 10,121,659.9970 E 3,135,703.1729 Sta 10+00.00

Course from GJ400 to PC PARMER_LN-1 S 64° 01′ 56.47" E Dist 559.7387

Curve PARMER_LN-1					
P.I. Station	20+17.58	N	10,121,214.4355	E	3,136,618.0200
Delta =	26° 51′ 23.69" (LT)				
Degree =	2° 59′ 16.30"				
Tangent =	457.8420				
Length =	898.8566				
Radius =	1,917.6190				
External =	53.8987				
Long Chord =	890.6504				
Mid. Ord. =	52.4252				
P.C. Station	15+59.74	N	10,121,414.9078	E	3,136,206.4011
P.T. Station	24+58.60	N	10,121,221.5385	E	3,137,075.8069
C.C.		N	10,123,138.9268	E	3,137,046.0566
Back = S 64° 01′ 56.47" E					
Ahead = N 89° 06′ 39.84" E					
Chord Bear = S 77° 27′ 38.32" E					

Course from PT PARMER_LN-1 to PC PARMER_LN-2 N 89° 06′ 39.84" E Dist 546.5093

Curve PARMER_LN-2					
P.I. Station	34+95.35	N	10,121,237.6230	E	3,138,112.4378
Delta =	28° 48′ 10.52" (RT)				
Degree =	3° 00′ 03.84"				
Tangent =	490.2463				
Length =	959.7565				
Radius =	1,909.1812				
External =	61.9389				
Long Chord =	949.6825				
Mid. Ord. =	59.9925				
P.C. Station	30+05.10	N	10,121,230.0172	E	3,137,622.2505
P.T. Station	39+64.86	N	10,121,008.1163	E	3,138,545.6446
C.C.		N	10,119,321.0657	E	3,137,651.8699
Back = N 89° 06′ 39.84" E					
Ahead = S 62° 05′ 09.64" E					
Chord Bear = S 76° 29′ 14.90" E					

Course from PT PARMER_LN-2 to PC PARMER_LN-3 S 62° 05′ 09.64" E Dist 1,632.5438

Curve PARMER_LN-3					
P.I. Station	64+96.19	N	10,119,823.0849	E	3,140,782.4588
Delta =	50° 23′ 01.80" (RT)				
Degree =	2° 59′ 55.14"				
Tangent =	898.7873				
Length =	1,680.2178				
Radius =	1,910.7198				
External =	200.8362				
Long Chord =	1,626.6021				
Mid. Ord. =	181.7341				
P.C. Station	55+97.40	N	10,120,243.8482	E	3,139,988.2441
P.T. Station	72+77.62	N	10,118,942.9788	E	3,140,964.7548
C.C.		N	10,118,555.4380	E	3,139,093.7491
Back = S 62° 05′ 09.64" E					
Ahead = S 11° 42′ 07.84" E					
Chord Bear = S 36° 53′ 38.74" E					

Course from PT PARMER_LN-3 to GJ401 S 11° 42′ 07.84" E Dist 456.4409

Point GJ401 N 10,118,496.0249 E 3,141,057.3322 Sta 77+34.06

Ending chain PARMER_LN description

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
11/25/2020

NO.	REVISIONS	BY	DATE

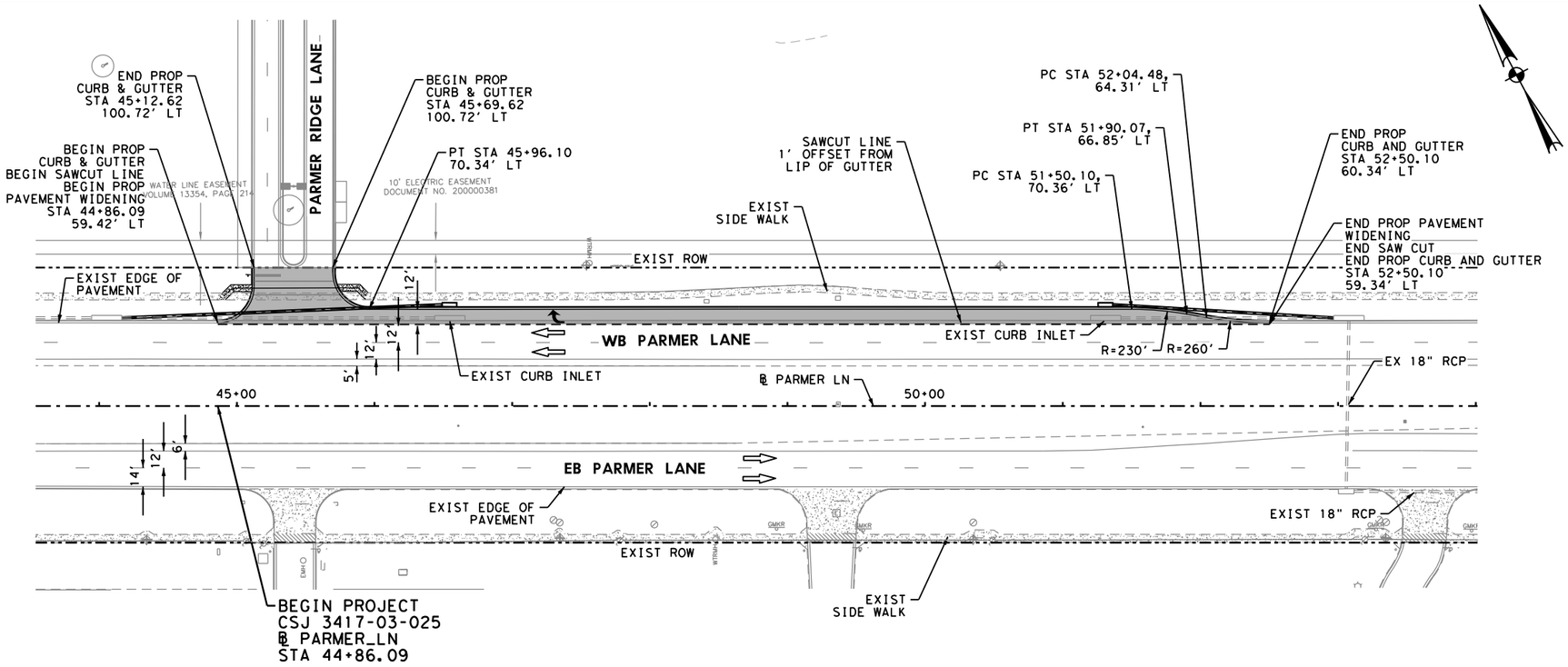
Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

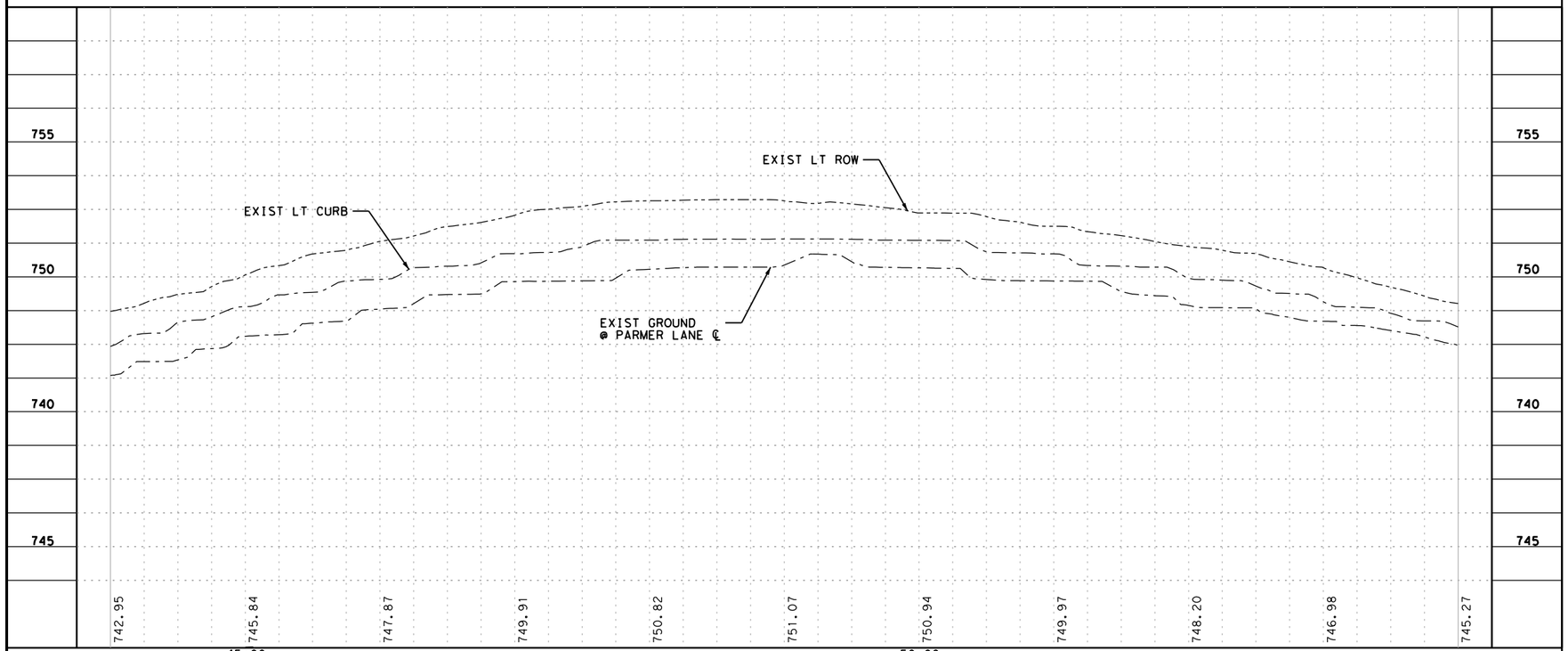
Texas Department of Transportation

PARMER LANE
HORIZONTAL
ALIGNMENT
DATA SHEET

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		53





LEGEND

- EXISTING DIRECTION OF TRAFFIC
- PROPOSED DIRECTION OF TRAFFIC
- EXIST ROW
- SAWCUT LINE
- OE — OVERHEAD ELECTRICAL
- PROPOSED PAVEMENT

NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING OVERHEAD AND UNDERGROUND FACILITIES IF ADJACENT TO WORK AREA.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK I.E. FADED.
3. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR ADDITIONAL ALIGNMENT INFORMATION.
4. REFER TO SIGNING AND PAVEMENT MARKING LAYOUT SHEETS FOR ADDITIONAL SIGNING AND PAVEMENT MARKING INFORMATION.
5. PROPOSED ELEVATIONS TO BE DETERMINED BY EXTENDING EXISTING PAVEMENT CROSS-SLOPE TO STATIONS AND OFFSETS SHOWN IN PLAN VIEW.
6. PROPOSED STATION AND OFFSETS ARE CALLED OUT AT LIP OF GUTTER UNLESS OTHERWISE STATED.

0 25 50 100(H)
0 5 10(V)

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
12/9/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

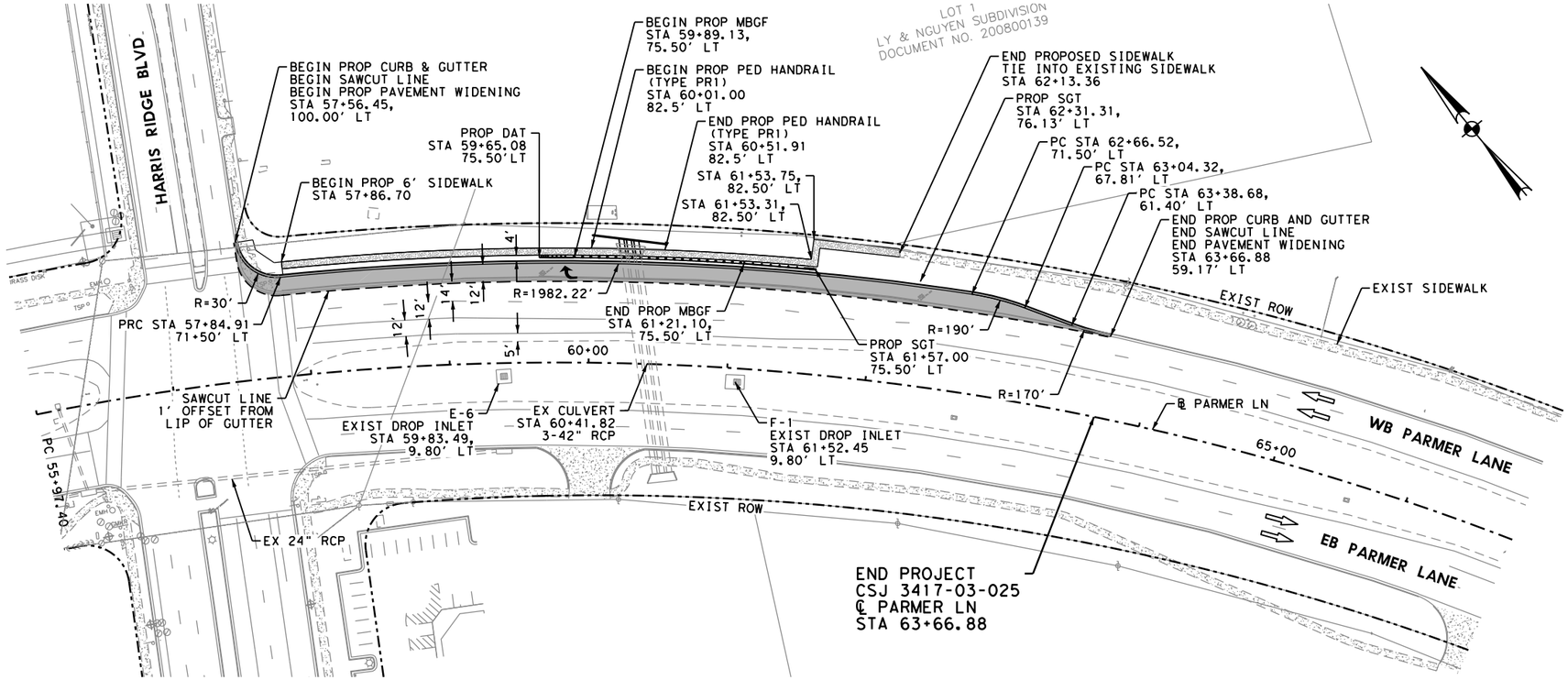
PARMER LANE

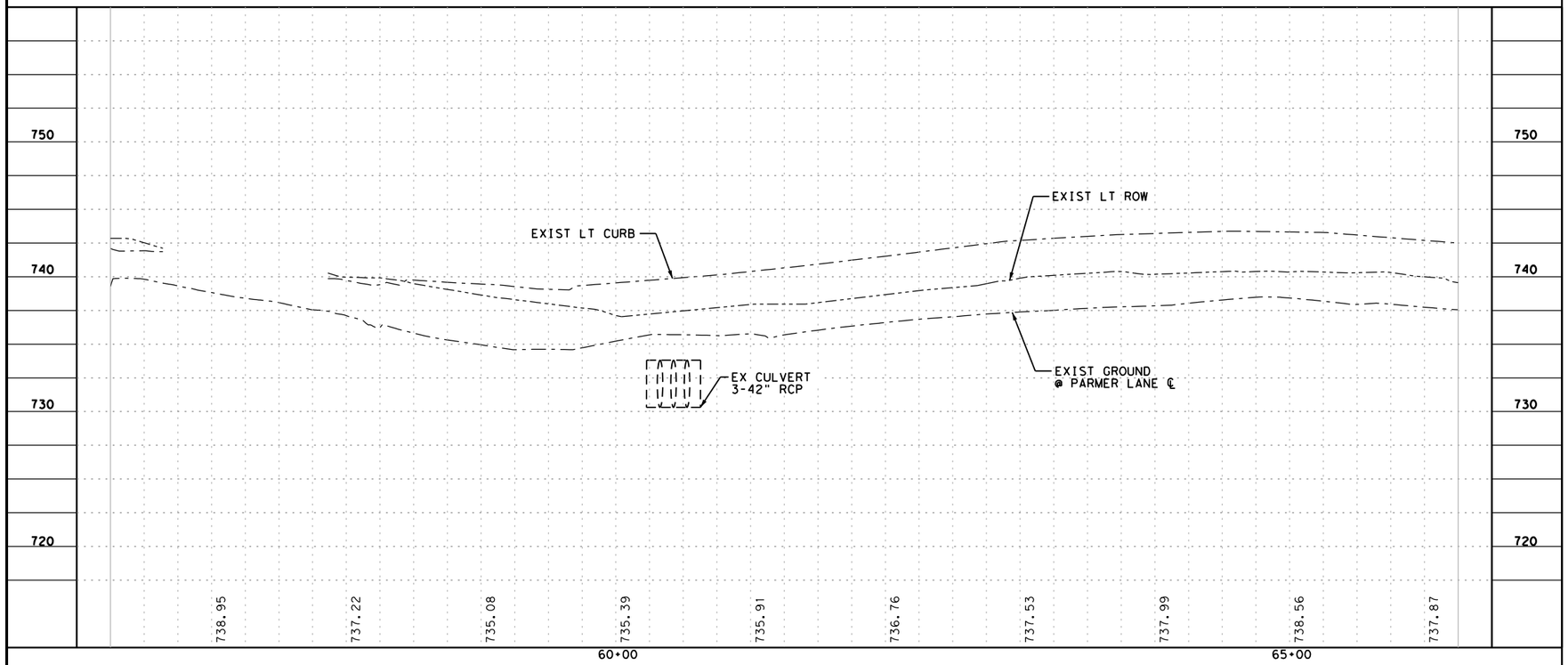
ROADWAY PLAN & PROFILE

SHEET 1 OF 2

© 2020	CONT	SECT	JOB	HIGHWAY
DS: CK:	3417	03	025	FM 734
DW: CK:	DIST	COUNTY		SHEET NO.
	14	TRAVIS		54

V:\2220\active\222010025\civil\cad\CD Design\DRWY ACCESS RT\ROADWAY\222010025_PP01.dgn 12/9/2020 11:37:34 AM KMcClure 100%





LEGEND

- EXISTING DIRECTION OF TRAFFIC
- PROPOSED DIRECTION OF TRAFFIC
- EXIST ROW
- SAWCUT LINE
- OE — OVERHEAD ELECTRICAL
- PROPOSED PAVEMENT

NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING OVERHEAD AND UNDERGROUND FACILITIES IF ADJACENT TO WORK AREA.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK I.E. FADED.
3. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR ADDITIONAL ALIGNMENT INFORMATION.
4. REFER TO SIGNING AND PAVEMENT MARKING LAYOUT SHEETS FOR ADDITIONAL SIGNING AND PAVEMENT MARKING INFORMATION.
5. PROPOSED ELEVATIONS TO BE DETERMINED BY EXTENDING EXISTING PAVEMENT CROSS-SLOPE TO STATIONS AND OFFSETS SHOWN IN PLAN VIEW.
6. PROPOSED STATION AND OFFSETS ARE CALLED OUT AT LIP OF GUTTER UNLESS OTHERWISE STATED.

0 25 50 100(H)
0 5 10(V)

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
12/9/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

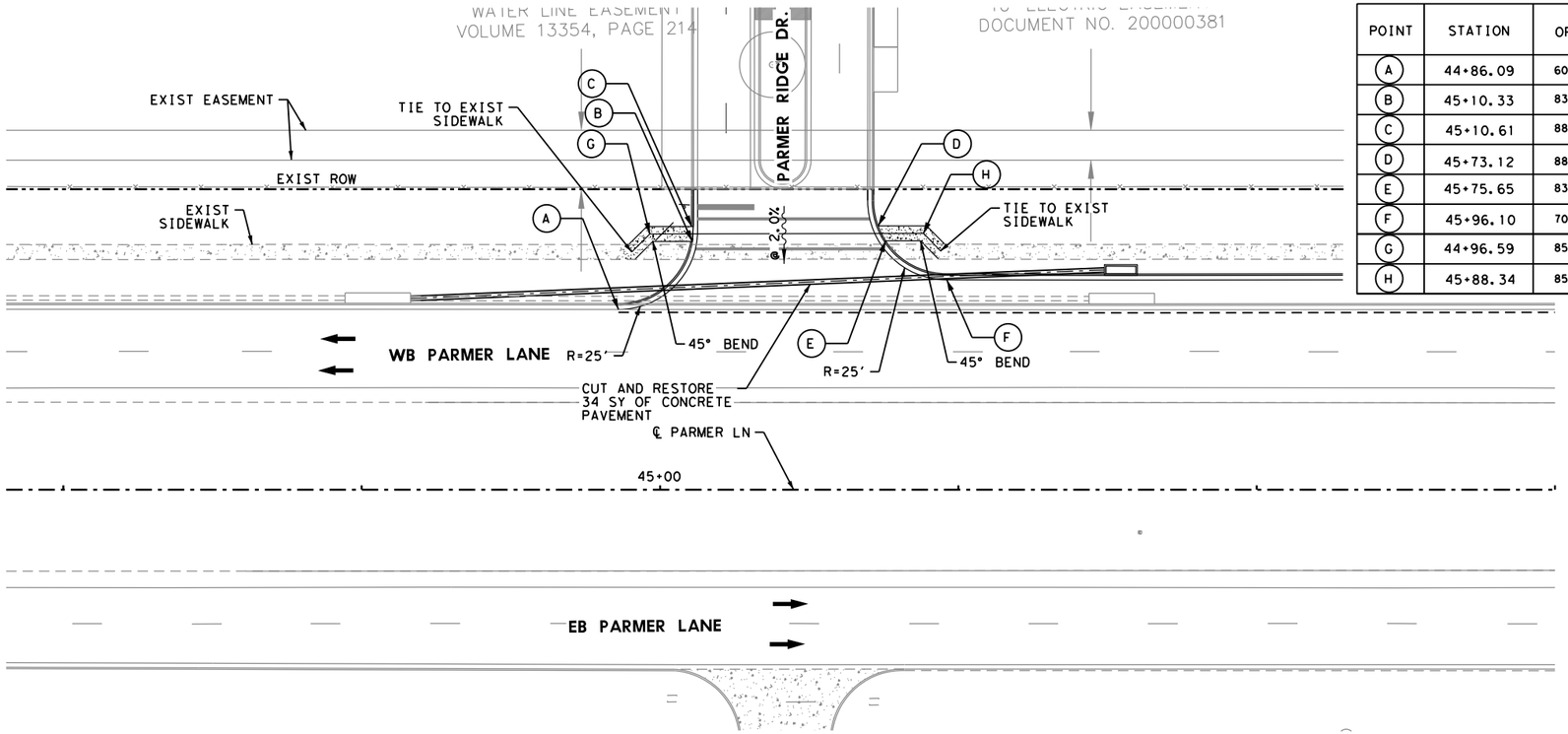
PARMER LANE

ROADWAY PLAN & PROFILE

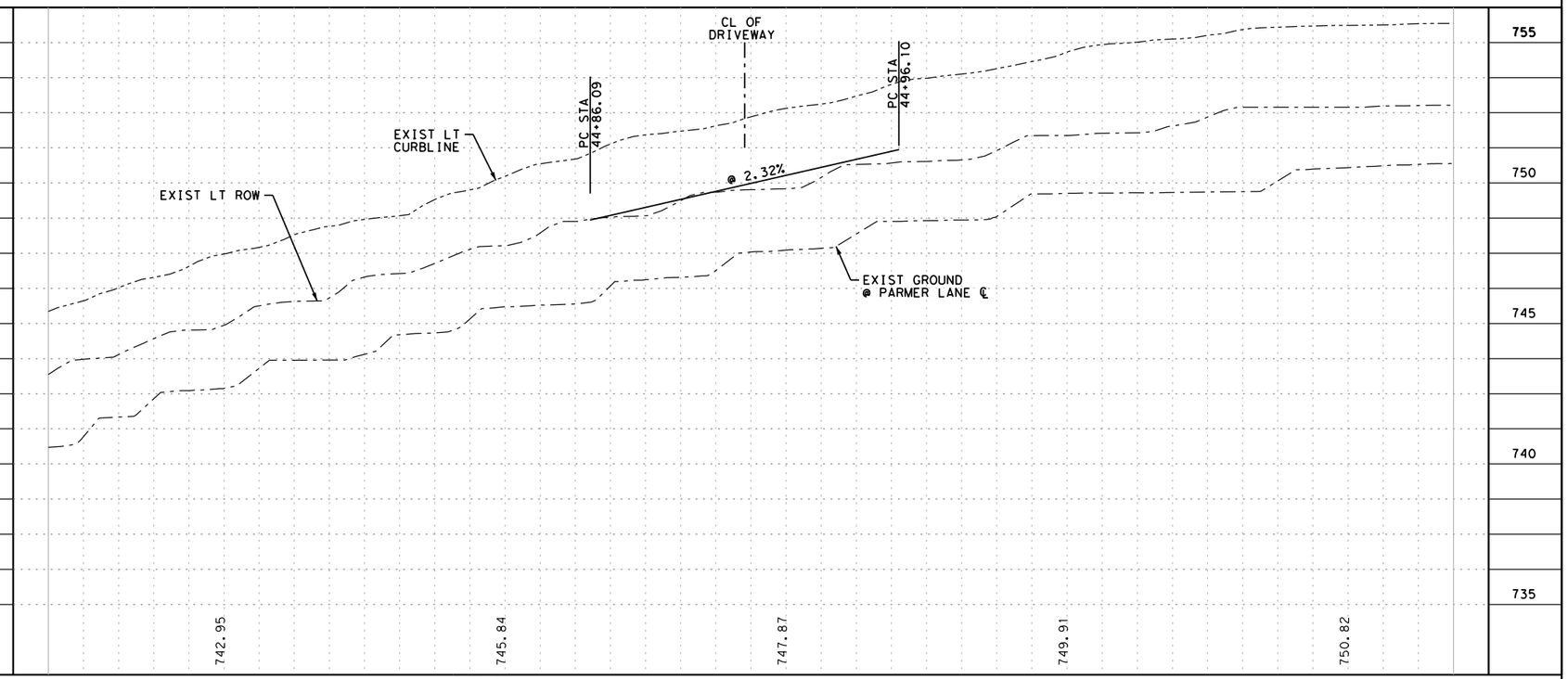
SHEET 2 OF 2

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
		DIST	COUNTY		SHEET NO.
DW:	CK:	14	TRAVIS		55

V:\2220\active\222010025\civil\cad\CD Design\DRWY ACCESS RT\ROADWAY\222010025_PP02.dgn 12/9/2020 11:38:28 AM KMcClure 100%



POINT	STATION	OFFSET
A	44+86.09	60.43' LT
B	45+10.33	83.23' LT
C	45+10.61	88.23' LT
D	45+73.12	88.38' LT
E	45+75.65	83.38' LT
F	45+96.10	70.39' LT
G	44+96.59	85.73' LT
H	45+88.34	85.89' LT



LEGEND

- EXISTING DIRECTION OF TRAFFIC
- PROPOSED DIRECTION OF TRAFFIC
- EXIST ROW
- SAWCUT LINE
- OE — OVERHEAD ELECTRICAL

NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING OVERHEAD AND UNDERGROUND FACILITIES IF ADJACENT TO WORK AREA.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK I.E. FADED.
3. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR ADDITIONAL ALIGNMENT INFORMATION.
4. REFER TO INTERSECTION LAYOUT SHEETS FOR ADDITIONAL INTERSECTION INFORMATION.
5. REFER TO SIGNING AND PAVEMENT MARKING LAYOUT SHEETS FOR ADDITIONAL SIGNING AND PAVEMENT MARKING INFORMATION.
6. PROPOSED ELEVATIONS TO BE DETERMINED BY EXTENDING EXISTING PAVEMENT CROSS-SLOPE TO STATIONS AND OFFSETS SHOWN IN PLAN VIEW.
7. PROPOSED STATION AND OFFSETS ARE CALLED OUT AT LIP OF GUTTER UNLESS OTHERWISE STATED.

0 12.5 25 50 (H)
0 2.5 5 (V)

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
11/25/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

PARMER LANE

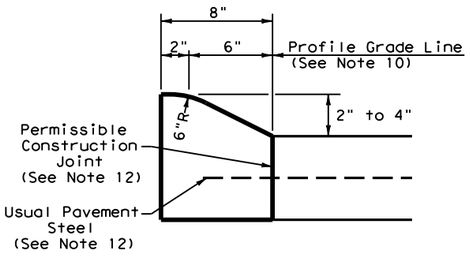
DRIVEWAY PLAN & PROFILE

SHEET 1 OF 1

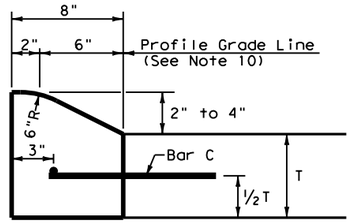
© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
		DIST	COUNTY		SHEET NO.
DW:	CK:	14	TRAVIS		56

V:\2220\active\222010025\civil\cad\CD Design\DRWY ACCESS RT\ROADWAY\222010025_DRWY.dgn 11/25/2020 4:52:06 PM KMcClure 100%

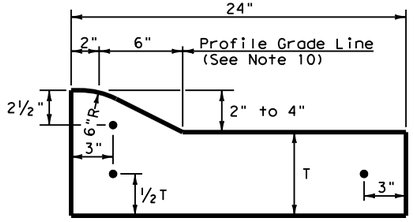
DATE: 11/6/2020 1:41:27 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\31360119\14 - Design\Plan Set\3. Roadway\ROADWAY STD\cccg12.dgn



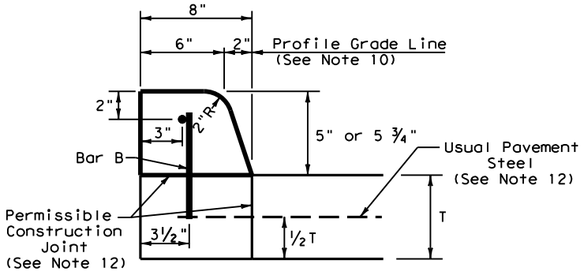
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



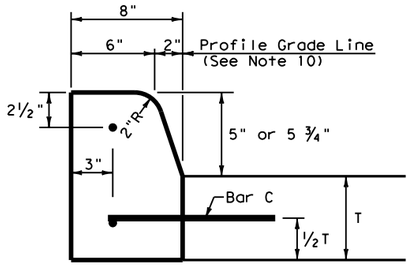
TYPE I CURB
2" - 4" HEIGHT



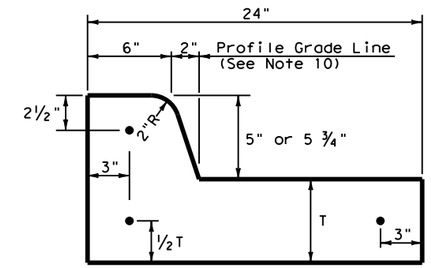
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



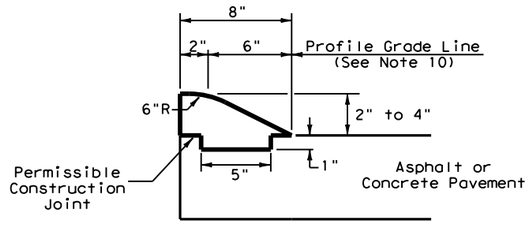
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



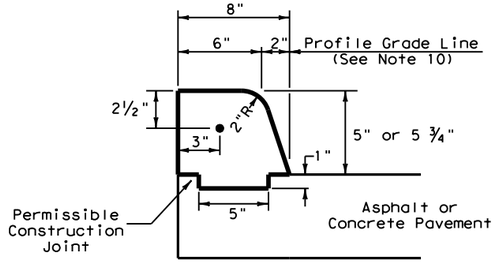
TYPE II CURB
5" - 5 ¾" HEIGHT



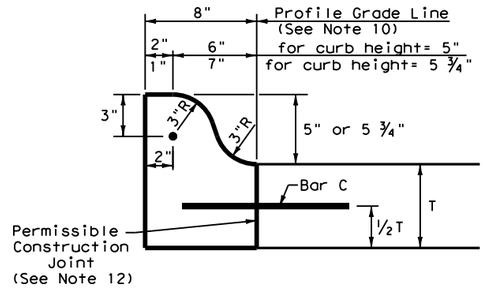
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



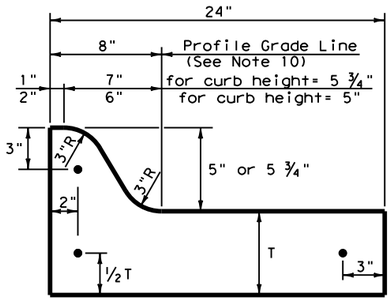
TYPE III CURB (KEYED)
2" - 4" HEIGHT



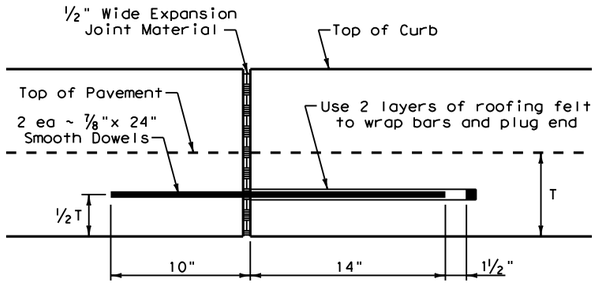
TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



TYPE IIa CURB
5" - 5 ¾" HEIGHT

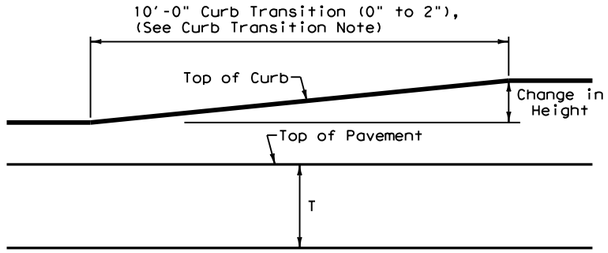


TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

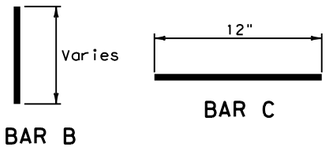
Curb Transition Note:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

General Notes

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No. 4 unless otherwise shown. The use of synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Producer List (MPL), maintained by TxDOT, Construction Division.
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is placed on existing concrete pavement, the pavement shall be drilled and the reinforcing bars grouted in place.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C-C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When vertical permissible construction joints are used, resulting in a longitudinal construction joint in the pavement, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans for longitudinal construction joints. Reinforcing steel for curb section shall then conform to that required for concrete curb.



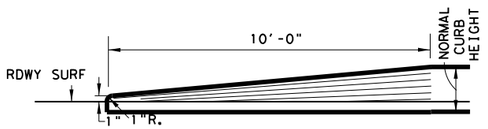
BAR B
BAR C

Texas Department of Transportation
Design Division Standard

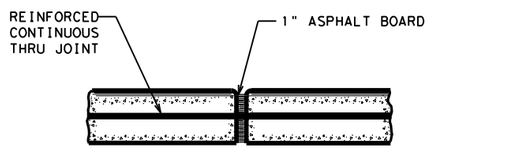
CONCRETE CURB AND CURB AND GUTTER

CCCG-12

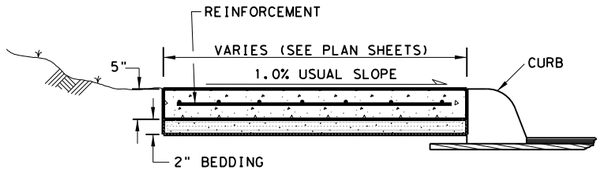
FILE: cccg12.dgn	DN: TxDOT	CK: AM	DW: VP	CK: VP
© TxDOT: 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS UPDATED 2012 - VP	3136	01	191	SLHDDT01
	DIST	COUNTY		SHEET NO.
	DIST	TRAVIS		57



TRANSITION FOR CONCRETE CURB ENDS



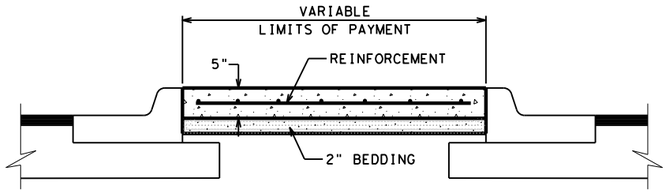
EXPANSION JOINT DETAIL



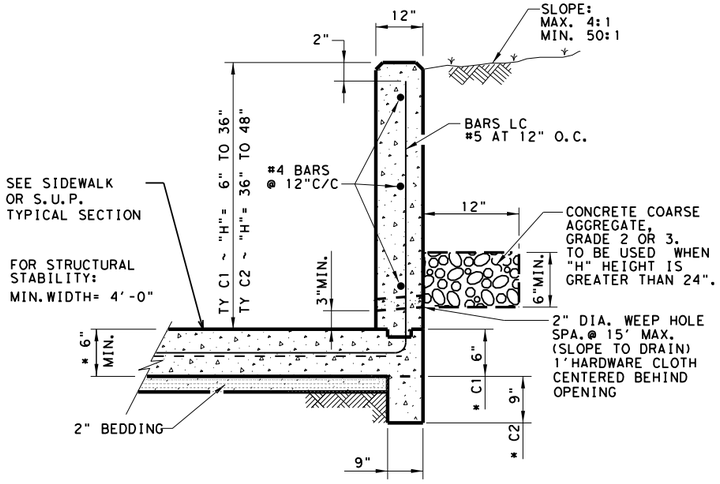
SIDEWALK & SHARED USE PATH (S.U.P.) TYP. SECT.

SIDEWALK OR S.U.P. EXPANSION JOINTS ARE TO BE AT A MAX. SPACING OF 40' AND COINCIDE WITH THE CURB EXPANSION JOINTS.

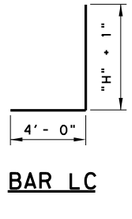
NOTE: TOOLED OR SAWED CONTRACTION JOINTS ARE NOT ALLOWED.



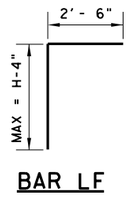
RIPRAP MEDIAN DETAIL



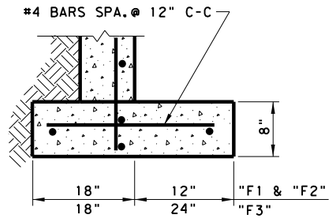
CONC CURB (TY C1) & (TY C2)



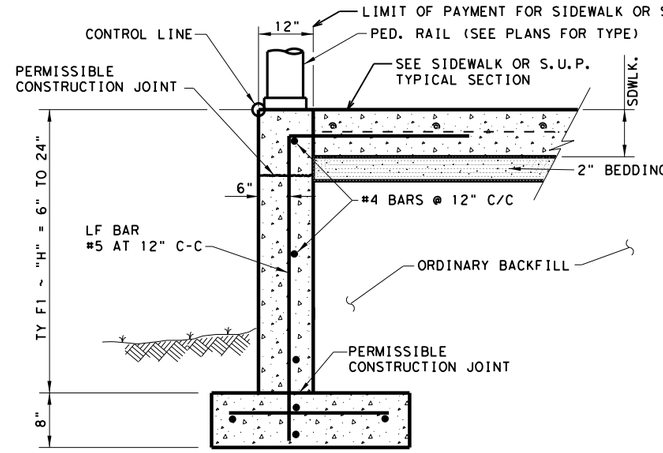
BAR LC



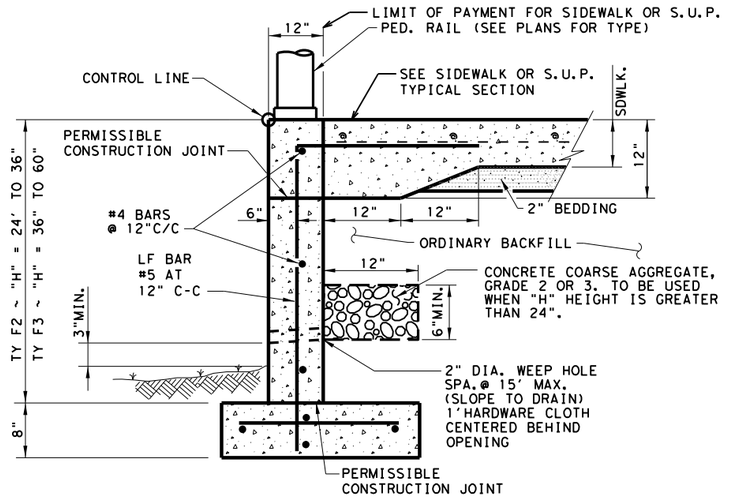
BAR LF



FOOTING DETAIL



CONC CURB (TY F1)‡



CONC CURB (TY F2) & (TY F3)‡

SIDEWALK, SHARED USE PATH, AND MEDIAN NOTES

Reinforcement will be in accordance with Item 432.3.1. Fiber reinforcement is not allowed. Class A and B Concrete are allowed to use Coarse Aggregate Grades 1-8.

Bedding may be sand, base, or RAP bedding. Furnish base meeting the requirement for any type or grade in accordance with Item 247. Base compressive strengths are waived. RAP must be 100% passing a 1 in. sieve. Bedding must be placed using ordinary compaction.

If roots are encountered verify with the Engineer prior to accommodating or removing 2 in. diameter or larger roots. Root removal must be in accordance with Item 752.4.2. Roots may remain in the bedding or base. For improvements within 6 in. of a root, the concrete thickness may be reduced by 1 in. and the bedding increased by 1 in. to minimize impacts to the roots. Adjust bedding and surface profile to provide a 1 in. bedding cushion around the roots. The surface profile may be adjusted to the extent allowed by ADA. This work is subsidiary.

CONCRETE CURB NOTES:
All Concrete, including adjacent sidewalk or S.U.P., shall be Class "C".
All Reinforcing Steel shall be Grade 60.
Minimum 4' sidewalk width for CONC CURB (TYPES C1 & C2).

‡ Until the sidewalk is complete, lateral support for the "F" curbs will be required.

ALL WORK SHOWN BEYOND TYPICAL SIDEWALK, S.U.P., AND PED RAIL IS SUBSIDIARY.

DESIGN SOIL PARAMETERS:
Soil Unit Wt.= 120 pcf
Phi = 30 Degrees
Cohesion = 50 psf
Min. PI = 15
Max. PI = 30
SURCHARGE:
TYPE F CURB q = 2' Adjacent to sidewalk
Max. slope behind TYPE C Curb = 4:1
Min. Factor of Safety against sliding is 1.5.
Designed in accordance with current AASHTO Standards and Interim Specifications.

NOT TO SCALE

Texas Department of Transportation | Austin District Standard

MISCELLANEOUS CURB, PATH, SIDEWALK, AND MEDIAN DETAILS

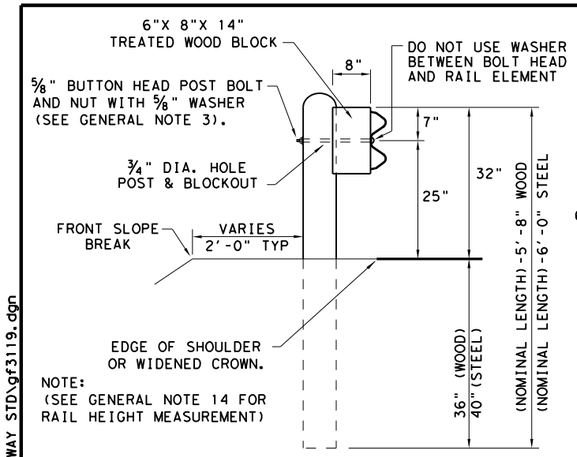
MCPSWMD-19 (AUS)

REVISIONS
04/19: APPROVED

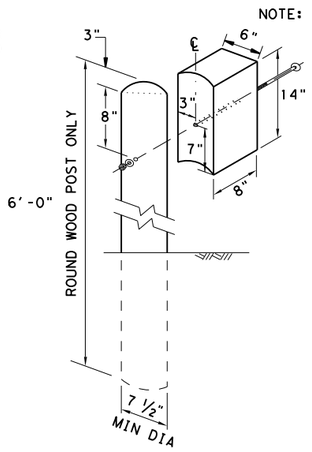
CONT	SECT	JOB	HIGHWAY
3136	01	191	SL 0001
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		58

DATE: 11/6/2020 1:41:37 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\ROADWAY STD\MCPSWMD-19(AUS).dgn

DATE: 11/6/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\ROADWAY STD\gf3119.dgn

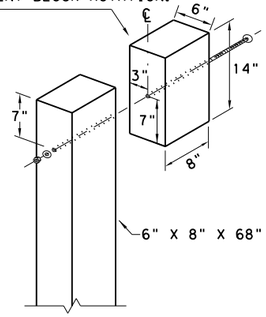


TYPICAL POST PLACEMENT

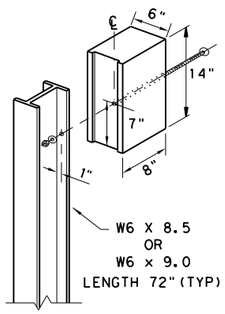


WOOD BLOCK TO ROUND WOOD POST

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

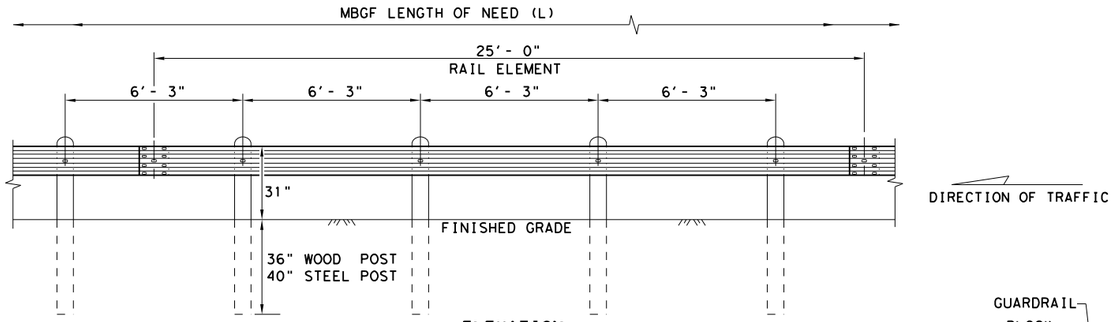


WOOD BLOCK TO RECTANGULAR WOOD POST



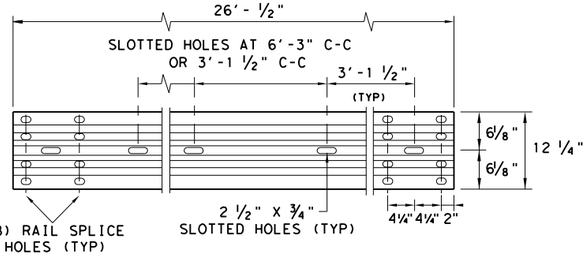
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



ELEVATION
MID-SPAN RAIL SPLICE

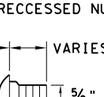
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.

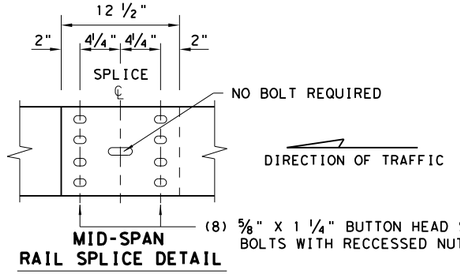


FBB01 = 1 ¼"
FBB02 = 2"

POST & BLOCK LENGTH
FBB03 = 10"
FBB04 = 18"

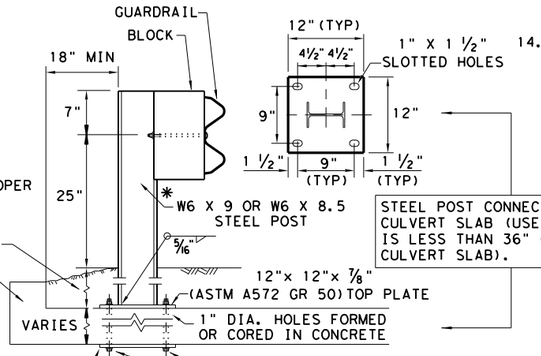
BUTTON HEAD BOLT

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. ⅞" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 ¼" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE ⅞" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS ¼" MIN. BEYOND NUT.

NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

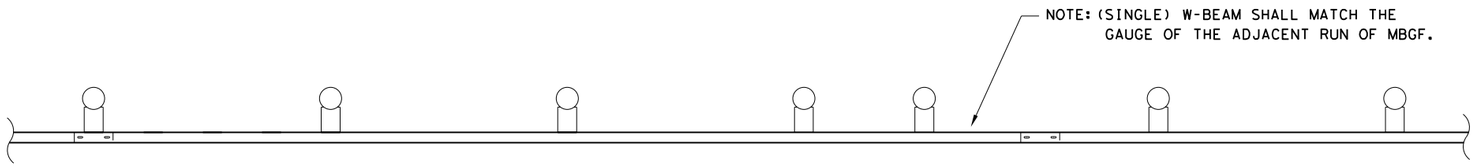
GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540,"METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 ½" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210,"COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

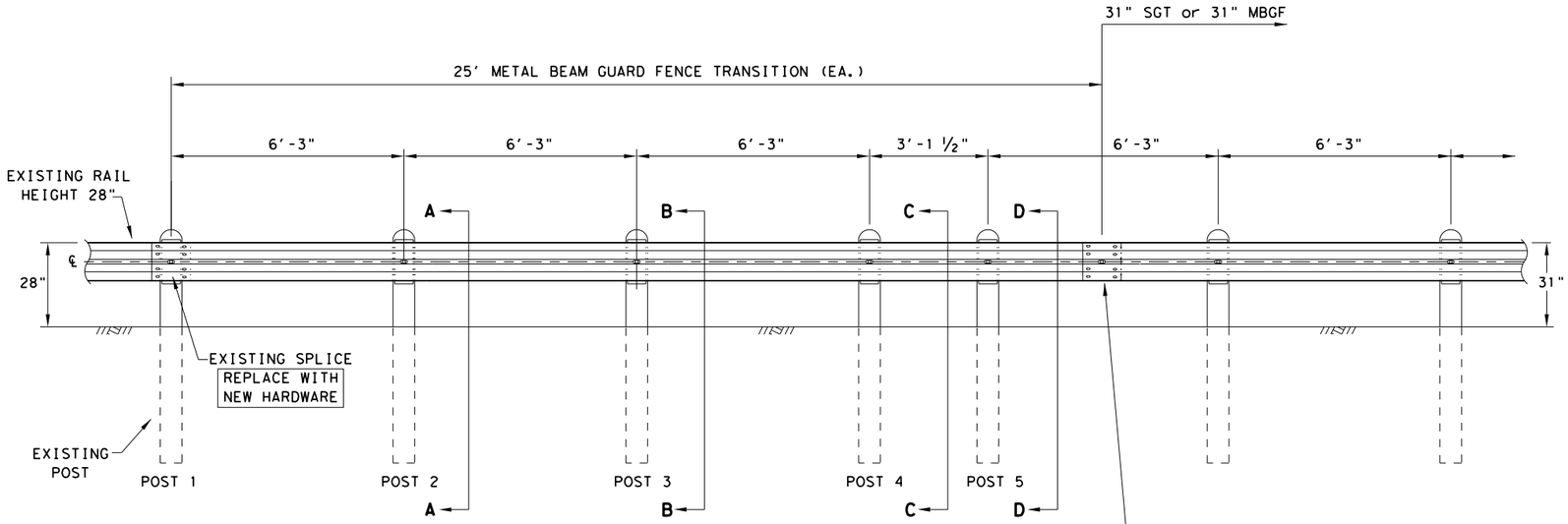
Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		59

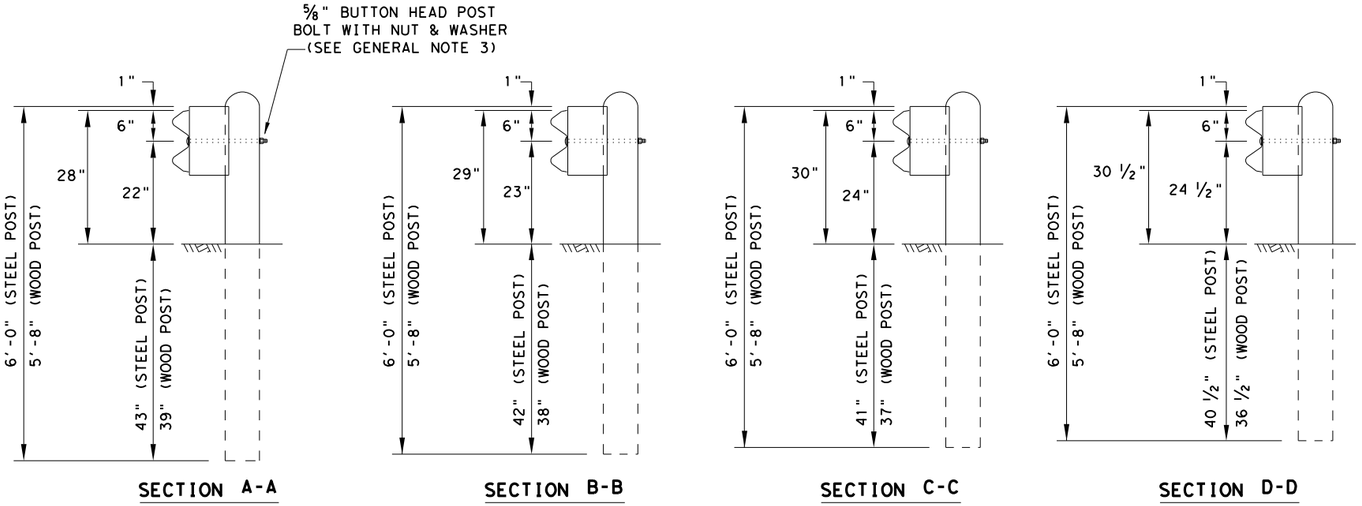


PLAN VIEW



ELEVATION VIEW

* "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



SECTION A-A | SECTION B-B | SECTION C-C | SECTION D-D

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENT SHALL MEET THE REQUIREMENTS OF ITEM 540,"METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'- 1 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST" BOLTS (ASTM A307) SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT (ASTM A563) AND 5/8" ROUND WASHER (ASTM F436) AND NOT MORE THAN 1" BEYOND IT. BUTTON HEAD "SPLICE" BOLTS (ASTM A307) ARE 5/8" X 1- 1/4" WITH 5/8" NUTS (ASTM A563).
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TRANSITION.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. SEE GF(31) STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210,"COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
11. REFER TO STANDARD GF(31) FOR ADDITIONAL DETAILS.
12. RAIL HEIGHT ADJUSTMENT IS ASSESSED AT TL-3 MASH COMPLIANT FOR STEEL POST HEIGHT TRANSITION TO 28" STEEL POST GUARDRAIL.

HARDWARE LIST

QTY	DESCRIPTION
1	25'-0" W-BEAM RAIL ELEMENT 12GA. (TYP)
5	7 1/2" DIA X 6'-0" DOMED ROUND WOOD POSTS (TYP)
5	6" X 8" X 68" RECTANGULAR WOOD POSTS (TYP)
5	W6 X 8.5 OR W6 X 9 X 72" STEEL POSTS (TYP)
5	6" X 8" X 14" WOOD BLOCKS OR COMPOSITE (TYP)
5	5/8" X 18" GUARDRAIL BOLTS AND NUTS (FBB04)
5	5/8" ROUND WASHERS (ASTM F436)(FWC16a)
5	5/8" X 10" GUARDRAIL BOLTS AND NUTS (FBB03)
16	5/8" X 1- 1/4" GUARDRAIL SPLICE BOLTS WITH DOUBLE RECESSED NUTS (ASTM A563) (FBB01)

POST AND BLOCK-OUT TYPES AVAILABLE
FOR WOOD POST
FOR STEEL POST

NOTE: HARDWARE SHALL MEET THE FOLLOWING REQUIREMENTS.

GUARDRAIL POST BOLTS (ASTM A307 GR.A)
GUARDRAIL ROUND WASHERS (ASTM F436)
GUARDRAIL DOUBLE RECESSED NUTS (ASTM A563)
GUARDRAIL SPLICE BOLTS (ASTM A307 GR.A)
GUARDRAIL SPLICE NUTS (ASTM A563)

Texas Department of Transportation

Design Division Standard

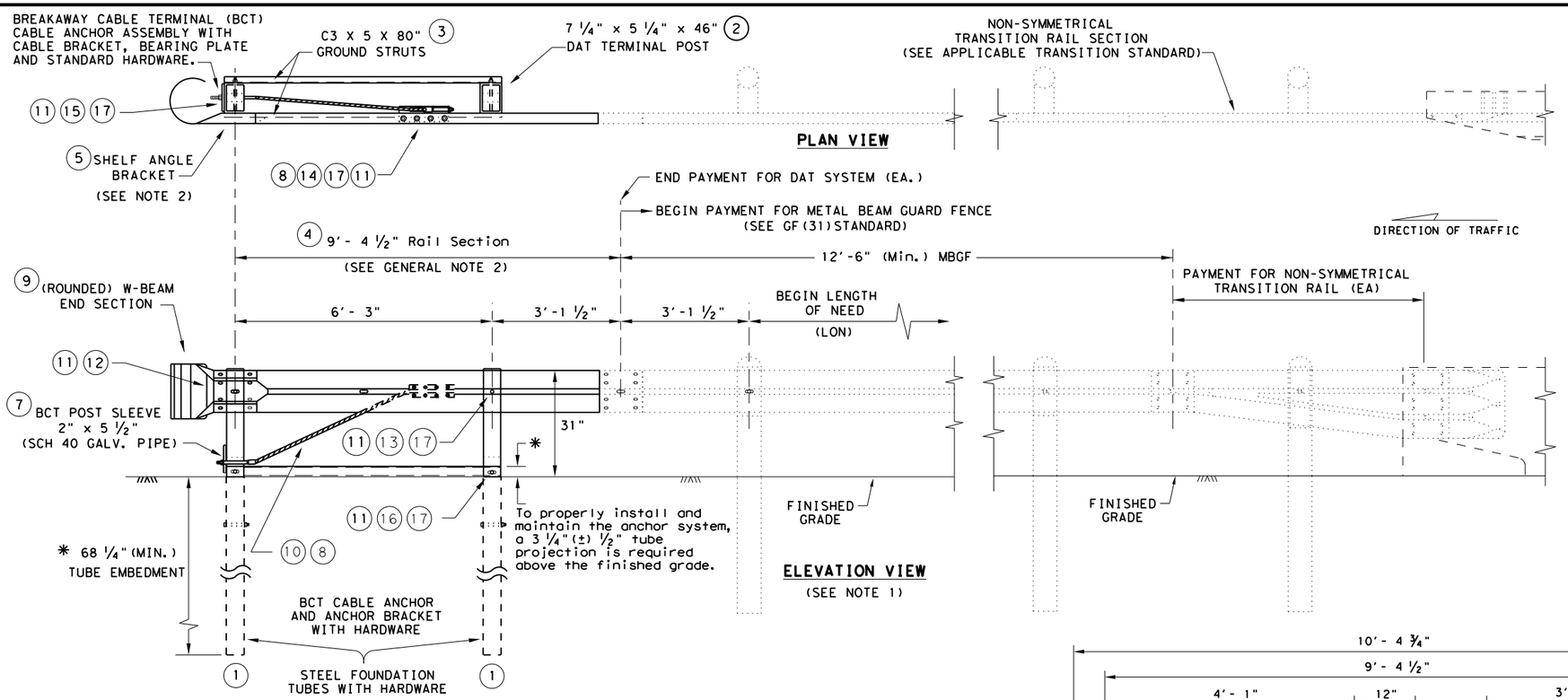
METAL BEAM GUARD FENCE RAIL HEIGHT ADJUSTMENT (28" TO 31") TL-3 MASH COMPLIANT

RAIL-ADJ(B)-19

FILE: railadjb19	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		59A

DATE: $DATE$
FILE: $FILE$

DATE: 11/6/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\ROADWAY STD\gf31dat19.dgn



DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

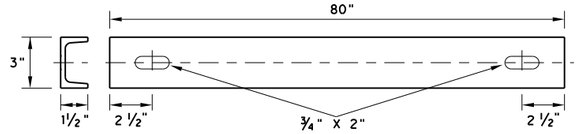
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

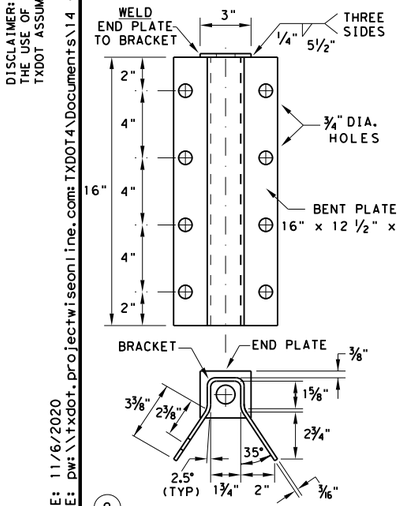
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED) W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 1/4" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	5/8" X 2" HEX HEAD BOLT	8
(15)	5/8" X 8" HEX HEAD BOLT	4
(16)	5/8" X 10" HEX HEAD BOLT	2
(17)	5/8" FLAT WASHER	18

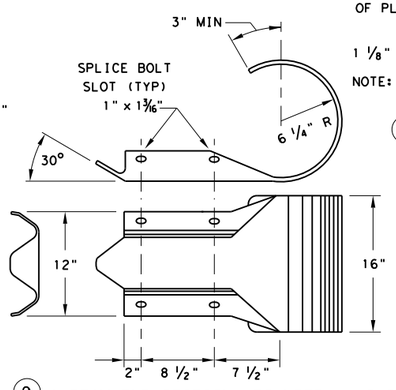
(4) TERMINAL RAIL ELEMENT FOR DAT



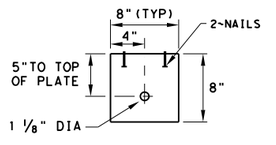
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

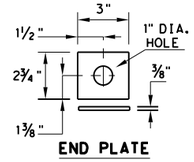


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

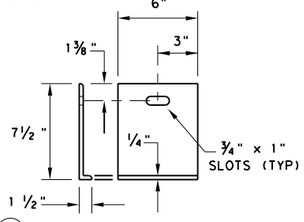


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

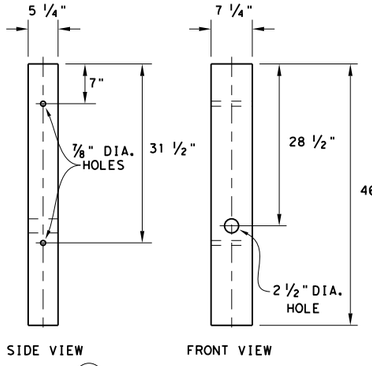
(6) BEARING PLATE
8"x 8"x 5/8" PL



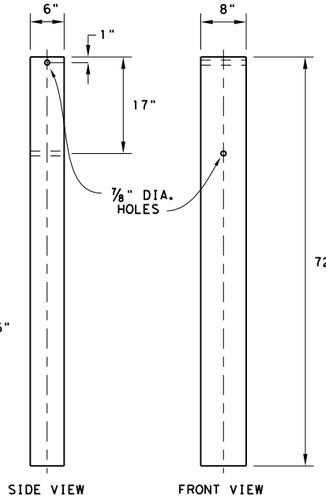
END PLATE



(5) SHELF ANGLE BRACKET



(2) TERMINAL POST
7 1/4"x 5 1/4"x 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation

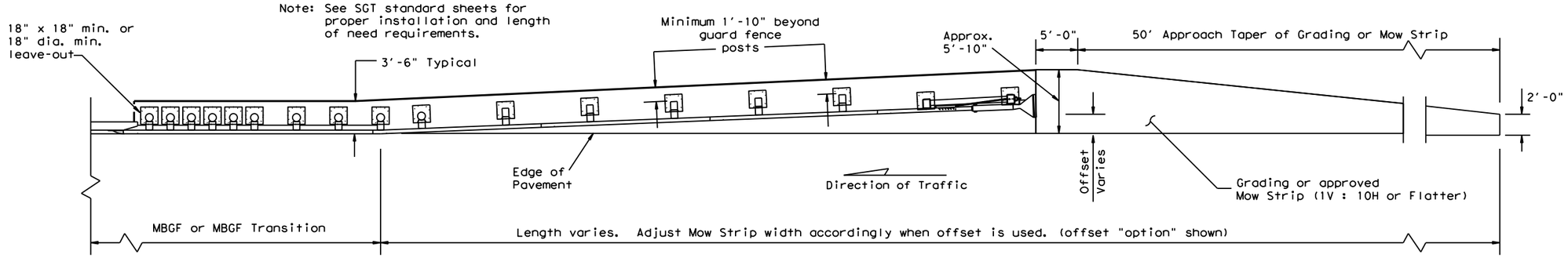
Design Division Standard

METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

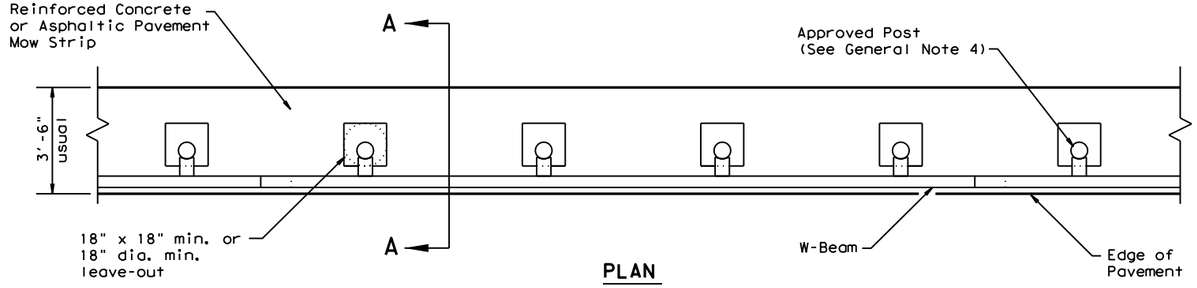
GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		60

DATE: 11/6/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\ROADWAY STD\gf31ms19.dgn

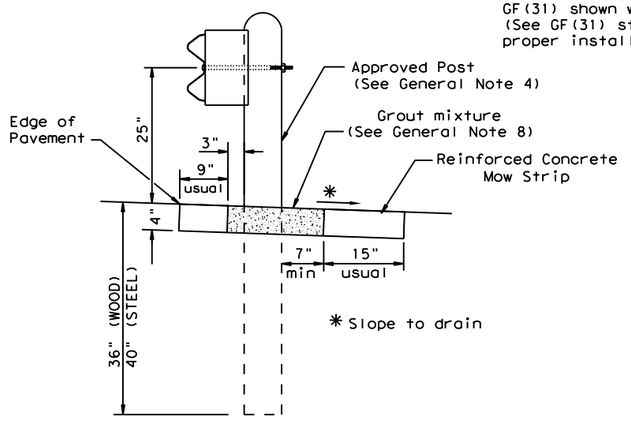


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



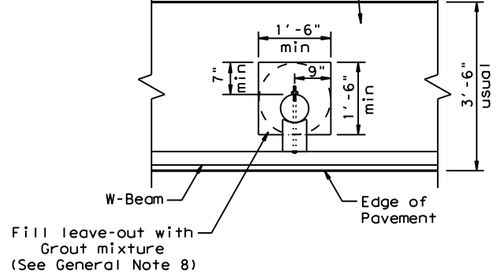
PLAN

GF(31) shown with Mow Strip
(See GF(31) standard sheet for proper installation)



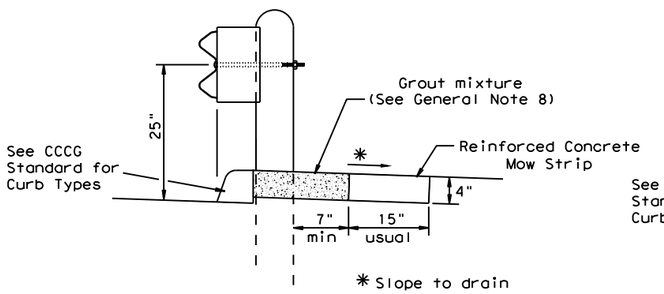
SECTION A-A

Typical



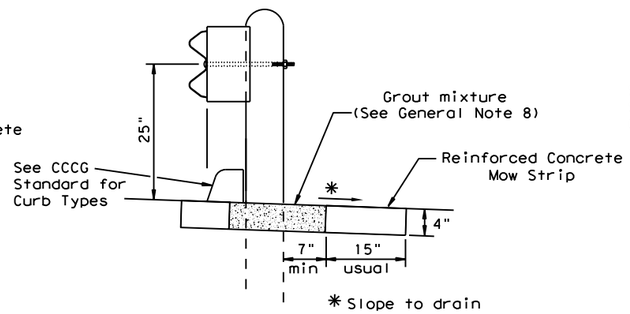
MOW STRIP DETAIL

Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.



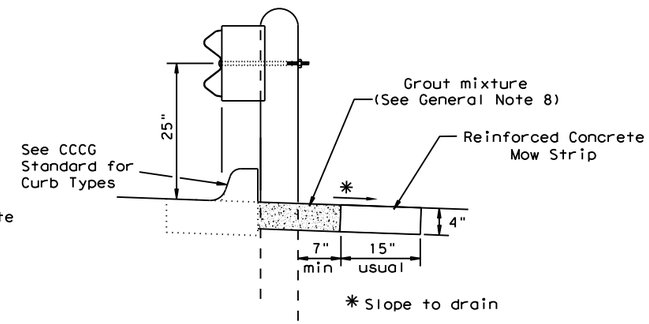
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type 1 or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		61

DATE: 12/17/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\ROADWAY STD\sgt10s3116.dgn

NOTE: STEEL I-BEAM POST W6 X 8.5 (6'-0") PN: 533G
STANDARD WOOD BLOCKOUTS (6"X8"X14") PN: 4076B
AT (POSTS 2 THRU 8)

⅝" X 10" HGR BOLT PN: 3500G
⅝" HGR NUT PN: 3340G

LINE AT THE BACK OF POST #2 THRU #8

FROM THE CENTERLINE OF POST(1) & POST(0)

ANCHOR PADDLE PN: 15204A

ANGLE STRUT PN: 15202G

16"

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3) POST(1) POST(0)

DO NOT BOLT ANCHOR RAIL TO - POST (2)

SEE DETAIL 1

TRAFFIC FLOW

PLAN VIEW

MASH TEST LEVEL 3 (TL-3) LENGTH OF SoftStop TERMINAL (50'-9 ½")

BEGIN LENGTH OF NEED

50'-9 ½" STANDARD INSTALLATION LENGTH (MASH TL-3 SoftStop)

BEGIN STANDARD MBGF

END PAYMENT FOR SGT

6¼" 3'-1 ½" 6'-3" 6'-3"

ANCHOR RAIL WITH SLOTS - (THREADED THRU HEAD)
SEE SoftStop MANUAL FOR COMPLETE DETAILS

MIDDLE SLOT CUTOUT (1) 1 ¾" X 6'-10 ¼"

OUTSIDE SLOTS CUTOUT (2)1½" X 6'-9 ⅝"

MBGF LAPPED IN DIRECTION OF TRAFFIC FLOW

25'-0" DOWNSTREAM W-BEAM GUARDRAIL PN: 61G

SoftStop ANCHOR RAIL (12GA) PN: 15215G

SoftStop FACE SEE GN(3) & NOTE:B

3'-1 ½"(+/-) 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 5'-8" 4'-7"

ANCHOR PADDLE PN: 15204A

END OF ANCHOR RAIL PN: 15215G

SEE NOTE:C

POST 32" HEIGHT

31"

RAIL HEIGHT

RAIL 25'-0" PN: 61G

RAIL 25'-0" PN: 15215G

(8) ⅝"× 1- ¼" GR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

POST 40" DEPTH (TYP 1-8)

(8) ⅝"× 1- ¼" HGR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

DO NOT BOLT ANCHOR RAIL TO POST(2)

SEE DETAIL 2

SEE DETAIL 3

SEE NOTE: A

13/16" DIA. YIELDING HOLES

13/16" DIA. YIELDING HOLES

6'-1⅜"

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3) POST(2) 6'-0" (SYTP) PN: 15000G POST(1) 4'-9 ½" SYTP PN: 15203G POST(0) 6'-5 ⅜" PN: 15205A

ELEVATION VIEW

HARDWARE FOR POST(2) THRU POST(8)
(1) ⅝"× 10" HGR BOLT PN: 3500G
(1) ⅝" HGR HEX NUT PN: 3340G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)

ALTERNATE BLOCKOUT SEE GENERAL NOTE:6

4" X 7 ½" X 14" BLOCKOUT COMPOSITE PN: 6777B

6" X 8" X 14" BLOCKOUT WOOD PN: 4076B

NOTE: DO NOT BOLT ANCHOR RAIL TO POST(2)

8" 6" 14"

⅝" HGR NUT PN: 3340G

⅝" X 10" HGR POST BOLT PN: 3500G

13/16" DIAMETER YIELDING HOLES LOCATED IN FLANGES

FINISHED GRADE

(HOLES APROXIMATELY CENTERED AT FINISHED GRADE)

ISOMETRIC VIEW POST(1 & 2)

W6 X 8.5 I-BEAM POST SHOWING STANDARD WOOD BLOCKOUT

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

(1) ⅝" x 1 ¾" HEX HD BOLT PN 3391G

ANGLE STRUT PN: 15202G

(2) ⅝" WASHERS PN 4372G

(1) ⅝" HGR HEX NUT PN 3340G

DETAIL 1

SHOWN AT POST(1) NEAR GROUND

(1) ⅝" HEX NUT

(1) ⅝" x 1- ½" HEX HD BOLT-GR-5 PN: 105286

(2) ⅝" ROUND WASHERS PN: 3240G

DETAIL 2

SHOWN AT POST(1)

ANCHOR KEEPER PLATE (24 GA) PN: 15207G

ANCHOR PLATE WASHER ½" THICK PN: 15206G

1" ROUND WASHER F463 PN: 4902G

(2) ⅝" x 2 ½" HEX HD BOLT GR-5 PN: 105285G

ALTERNATE BLOCKOUT SEE GENERAL NOTE:6

(2) ⅝" ROUND WASHER (WIDE) PN: 3240G

1" NUT PN: 3908G SHALL BE SECURELY TIGHTENED AFTER FINAL ASSEMBLY, BUT NOT DEFORMING THE KEEPER PLATE.

ANCHOR PADDLE PN: 15204A

(2) ⅝" HEX NUT A563 GR.DH PN: 3245G

W-BEAM FLATTENED (4 PLIES)

ANGLE STRUT PN: 15202G

SEE NOTE: A

(2) ¾" x 2 ½" HEX BOLT (TYP) PN: 3717G

(4) ¾" FLAT WASHER (TYP) PN: 3701G

(2) ¾" HEX NUT (TYP) PN: 3704G

6'- 1 ⅜" POST DEPTH

(2) ANCHOR POST ANGLE PN: 15201G

DETAIL 3 AT POST(0)

6'-5 ⅜" (W6 X 15) I-BEAM POST PN: 15205A

W-BEAM RAIL 25'-0"

6" X 8" X 14" BLOCKOUT WOOD

⅝" X 10" HGR POST BOLT PN: 3500G

⅝" HGR NUT PN: 3340G

POST HEIGHT 32"

31" RAIL HEIGHT

40"

LINE POST (3, 4, 5, 6, 7 & 8)

FINISHED GRADE

SECTION VIEW B-B

6'-0" (W6 X 8.5)
I-BEAM POST PN: 533G

POST(2)

SECTION VIEW A-A

6'-0" (W6 X 8.5)
(SYTP) I-BEAM POST PN: 15000G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)

POST 17"- ½" HEIGHT

4'- 9 ½"

13/16" DIA. YIELDING HOLES

40"

POST(1)

FRONT VIEW POST(1)

4'-9 ½" (W6 X 8.5)
(SYTP) I-BEAM POST PN: 15203G

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

2'-0"

STANDARD MBGF

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX. RAIL OFFSET

APPROACH GRADING (1V:10H OR FLATTER) SEE PRODUCT ASSEMBLY MANUAL FOR ADDITIONAL GUIDANCE.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE: A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-¾" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE: B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE: C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 ⅞")
15203G	1	POST #1 - (SYTP) (4'- 9 ½")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 ½" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (½" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	¾" x 2 ½" HEX BOLT A325
3701G	4	¾" ROUND WASHER F436
3704G	2	¾" HEAVY HEX NUT A563 GR.DH
3360G	16	⅝" x 1 ¼" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	⅝" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	⅝" x 10" HGR POST BOLT A307
3391G	1	⅝" x 1 ¾" HEX HD BOLT A325
4489G	1	⅝" x 9" HEX HD BOLT A325
4372G	4	⅝" WASHER F436
105285G	2	⅝" x 2 ½" HEX HD BOLT GR-5
105286G	1	⅝" x 1 ½" HEX HD BOLT GR-5
3240G	6	⅝" ROUND WASHER (WIDE)
3245G	3	⅝" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE:B

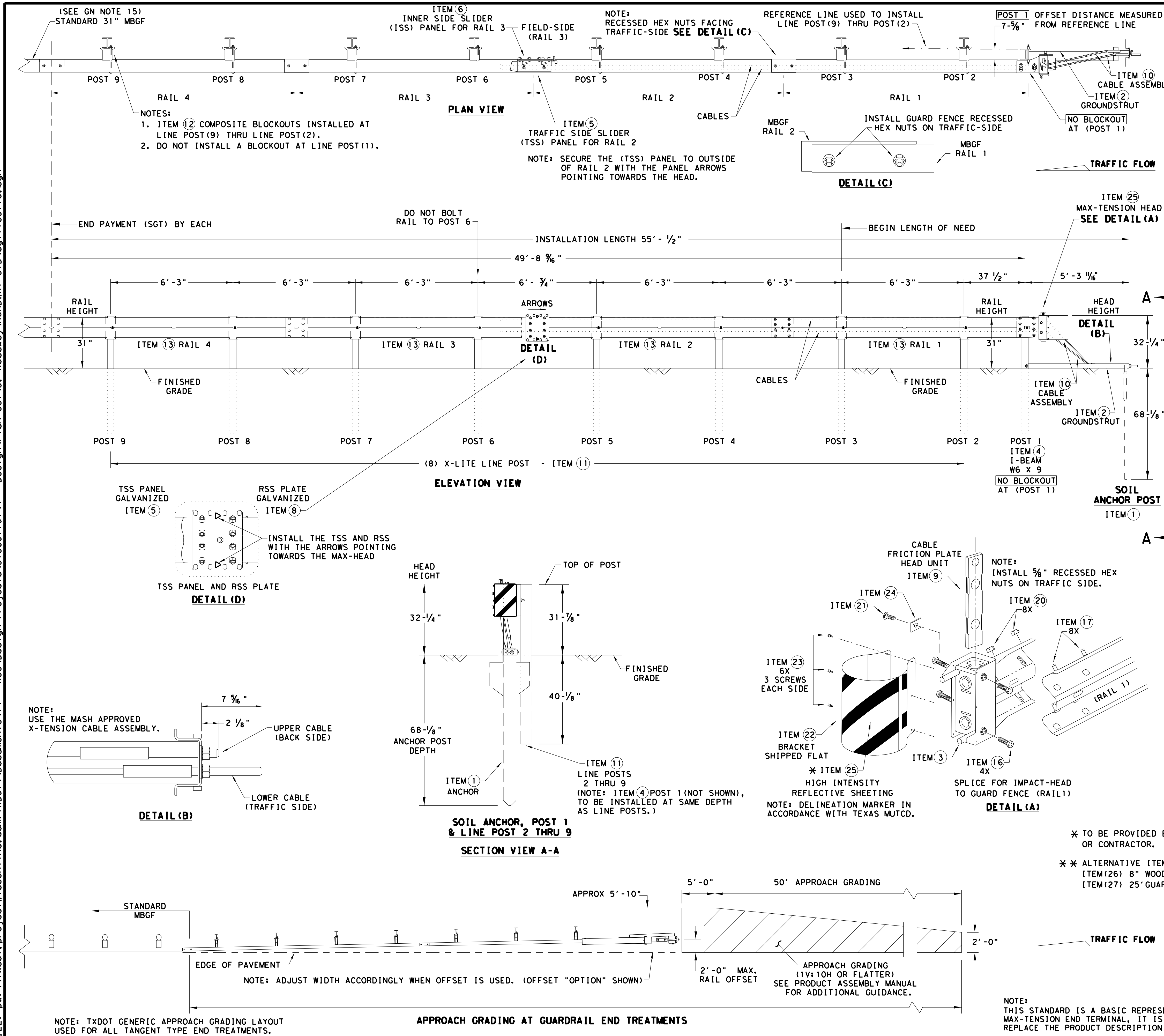
NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT(10S)31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191,etc	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		62



(SEE GN NOTE 15)
STANDARD 31" MBGF
ITEM 6 INNER SIDE SLIDER (ISS) PANEL FOR RAIL 3
FIELD-SIDE (RAIL 3)
NOTE: RECESSED HEX NUTS FACING TRAFFIC-SIDE SEE DETAIL (C)
REFERENCE LINE USED TO INSTALL LINE POST(9) THRU POST(2)
POST 1 OFFSET DISTANCE MEASURED FROM REFERENCE LINE
7-5/8"
POST 9
POST 8
POST 7
POST 6
POST 5
POST 4
POST 3
POST 2
RAIL 4
RAIL 3
RAIL 2
RAIL 1
ITEM 10 CABLE ASSEMBLY
ITEM 2 GROUNDSTRUT
NO BLOCKOUT AT (POST 1)
PLAN VIEW
CABLES
NOTES:
1. ITEM 12 COMPOSITE BLOCKOUTS INSTALLED AT LINE POST(9) THRU LINE POST(2).
2. DO NOT INSTALL A BLOCKOUT AT LINE POST(1).
ITEM 5 TRAFFIC SIDE SLIDER (TSS) PANEL FOR RAIL 2
NOTE: SECURE THE (TSS) PANEL TO OUTSIDE OF RAIL 2 WITH THE PANEL ARROWS POINTING TOWARDS THE HEAD.
MBGF RAIL 2
INSTALL GUARD FENCE RECESSED HEX NUTS ON TRAFFIC-SIDE
MBGF RAIL 1
DETAIL (C)
TRAFFIC FLOW
ITEM 25 MAX-TENSION HEAD SEE DETAIL (A)
END PAYMENT (SGT) BY EACH
DO NOT BOLT RAIL TO POST 6
INSTALLATION LENGTH 55'-1/2"
BEGIN LENGTH OF NEED
49'-8 9/16"
6'-3"
6'-3"
6'-3"
6'-3/4"
6'-3"
6'-3"
6'-3"
37 1/2"
5'-3 11/16"
A
RAIL HEIGHT
ARROWS
HEAD HEIGHT
DETAIL (B)
31"
ITEM 13 RAIL 4
ITEM 13 RAIL 3
DETAIL (D)
ITEM 13 RAIL 2
ITEM 13 RAIL 1
32-1/4"
FINISHED GRADE
CABLES
ITEM 10 CABLE ASSEMBLY
ITEM 2 GROUNDSTRUT
68-1/8"
POST 1
ITEM 4 I-BEAM W6 X 9
NO BLOCKOUT AT (POST 1)
(8) X-LITE LINE POST - ITEM 11
ELEVATION VIEW
SOIL ANCHOR POST
ITEM 1
TSS PANEL GALVANIZED ITEM 5
RSS PLATE GALVANIZED ITEM 8
INSTALL THE TSS AND RSS WITH THE ARROWS POINTING TOWARDS THE MAX-HEAD
TSS PANEL AND RSS PLATE
DETAIL (D)
HEAD HEIGHT
TOP OF POST
32-1/4"
31-7/8"
FINISHED GRADE
40-1/8"
68-1/8" ANCHOR POST DEPTH
ITEM 1 ANCHOR
ITEM 11 LINE POSTS 2 THRU 9
(NOTE: ITEM 4 POST 1 (NOT SHOWN), TO BE INSTALLED AT SAME DEPTH AS LINE POSTS.)
SOIL ANCHOR, POST 1 & LINE POST 2 THRU 9
SECTION VIEW A-A
NOTE: USE THE MASH APPROVED X-TENSION CABLE ASSEMBLY.
7 5/16"
2 1/8"
UPPER CABLE (BACK SIDE)
LOWER CABLE (TRAFFIC SIDE)
DETAIL (B)
CABLE FRICTION PLATE HEAD UNIT ITEM 9
NOTE: INSTALL 5/8" RECESSED HEX NUTS ON TRAFFIC SIDE.
ITEM 24
ITEM 21
ITEM 20 8X
ITEM 17 8X
ITEM 23 6X 3 SCREWS EACH SIDE
(RAIL 1)
ITEM 22 BRACKET SHIPPED FLAT
ITEM 3
ITEM 16 4X
* ITEM 25 HIGH INTENSITY REFLECTIVE SHEETING
NOTE: DELINEATION MARKER IN ACCORDANCE WITH TEXAS MUTCD.
SPLICE FOR IMPACT-HEAD TO GUARD FENCE (RAIL1)
DETAIL (A)
STANDARD MBGF
APPROX 5'-10"
5'-0"
50' APPROACH GRADING
2'-0"
TRAFFIC FLOW
EDGE OF PAVEMENT
2'-0" MAX. RAIL OFFSET
APPROACH GRADING (1V:10H OR FLATTER) SEE PRODUCT ASSEMBLY MANUAL FOR ADDITIONAL GUIDANCE.
NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)
NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.
APPROACH GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURE'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST(MPL)FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

	ITEM#	PART NUMBER	DESCRIPTION	QTY
	1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
	2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
	3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
	4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
	5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
	6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
	7	BSI-1610066-00	TOOTH - GEOMET	1
	8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
	9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
	10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
	11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
	12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
	13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
	14	BSI-1102027-00	X-LITE SQUARE WASHER	1
	15	BSI-2001886	5/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
	16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
	17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
	18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
	19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
	20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
	21	BSI-2001888	5/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
	22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
	23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
	24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
*	25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
**	26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
**	27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
	28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

** ALTERNATIVE ITEMS NOT SHOWN. ITEM(26) 8" WOOD-BLOCKOUTS ITEM(27) 25' GUARD FENCE PANELS

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation — Design Division Standard

MAX-TENSION END TERMINAL MASH - TL-3

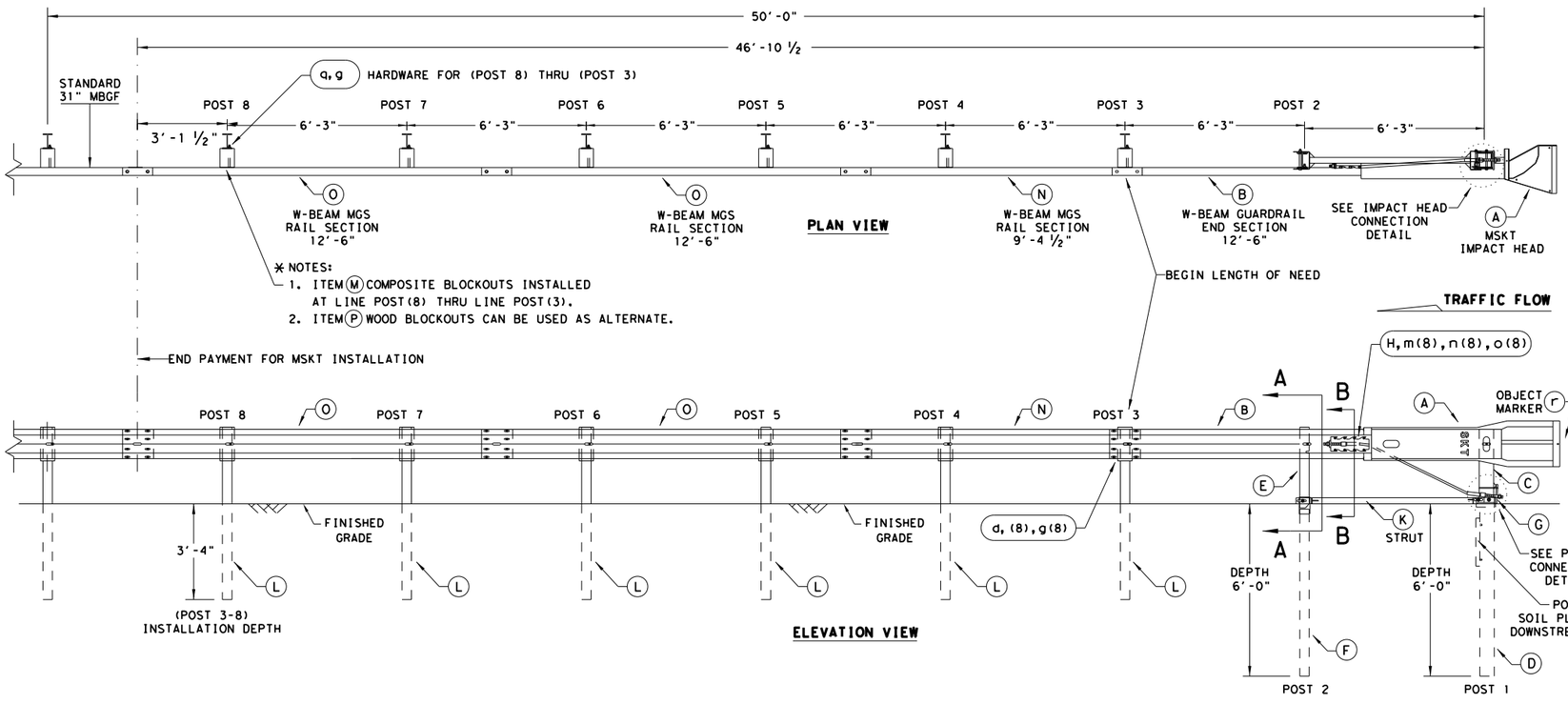
SGT(11S)31-18

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT 3136	SECT 01	JOB 191,etc	HIGHWAY SL 0001
REVISIONS	DIST AUS	COUNTY TRAVIS		SHEET NO. 62A

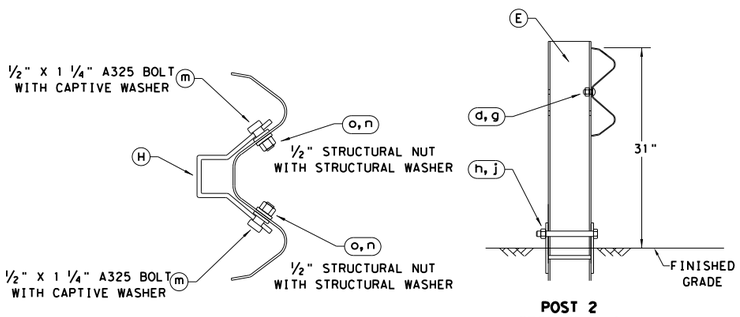
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 12/17/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136...

DATE: 12/17/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\ROADWAY STD\sgt12s3118.dgn

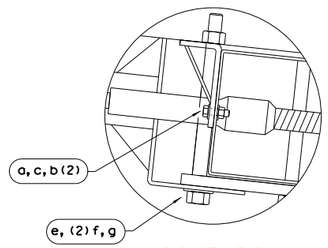


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.

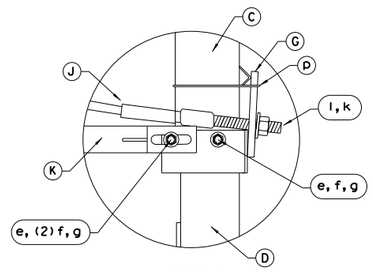


SECTION B-B
ANCHOR BRACKET

POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL

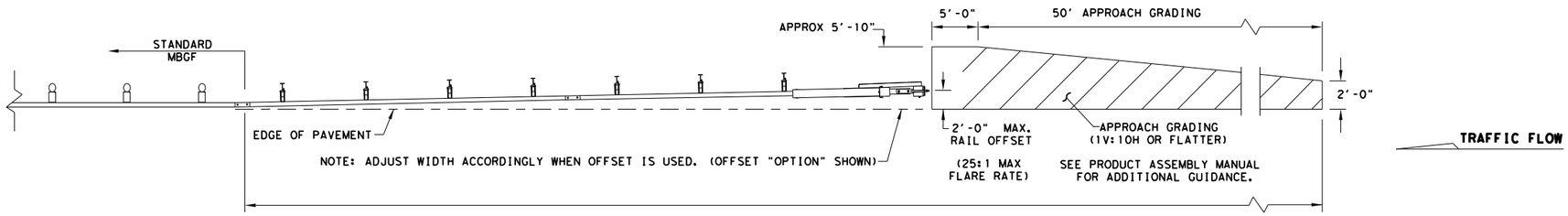
SEE NOTES: *

ALTERNATIVE ITEMS NOT SHOWN. **
* ITEM(P) 8" WOOD-BLOCKOUT
** ITEM(Q) 25'GUARD FENCE PANEL

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
7. A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
13. THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
14. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
		SMALL HARDWARE	
a	2	5/16" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/16" WASHER	W0516
c	2	5/16" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 5/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

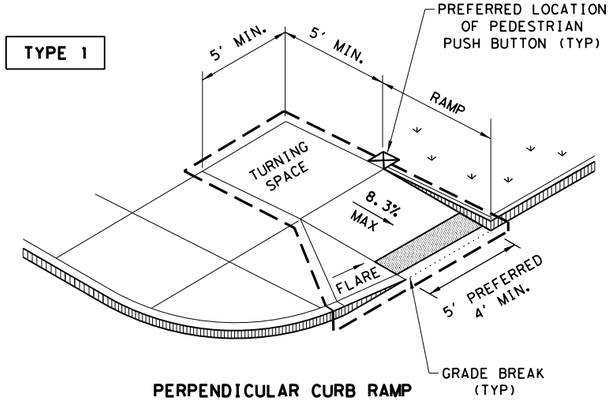
Design Division Standard

SINGLE GUARDRAIL TERMINAL
MSKT-MASH-TL-3
SGT(12S)31-18

FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL	
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY	
REVISIONS	3136	01	191, etc	SL 0001	
	DIST	COUNTY		SHEET NO.	
	AUS	TRAVIS		62B	

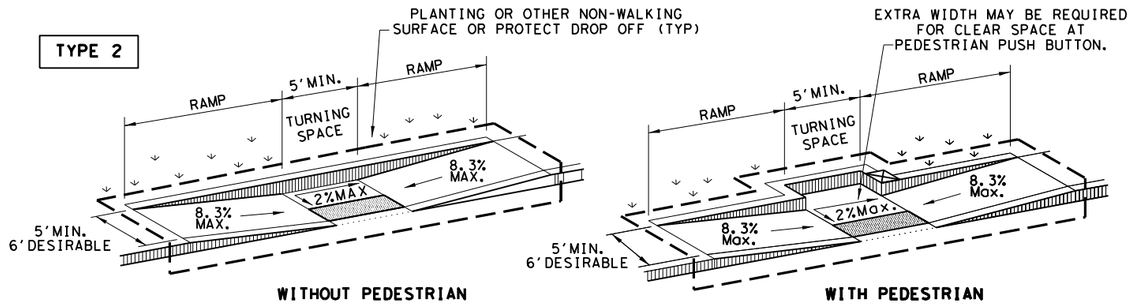
DATE: 11/13/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011914 - Design\Plan Set\3. Roadway\ROADWAY STD\ped18.dgn

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

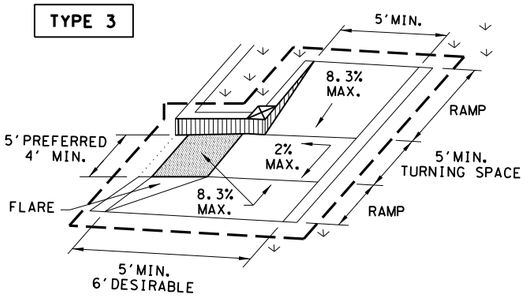


WITHOUT PEDESTRIAN PUSH BUTTON

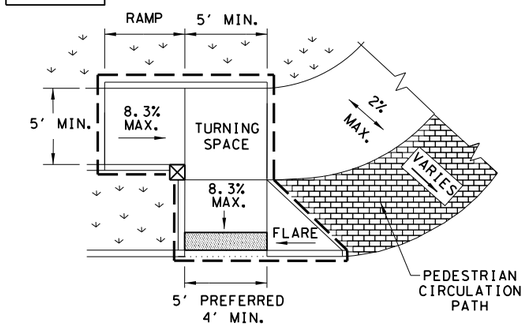
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

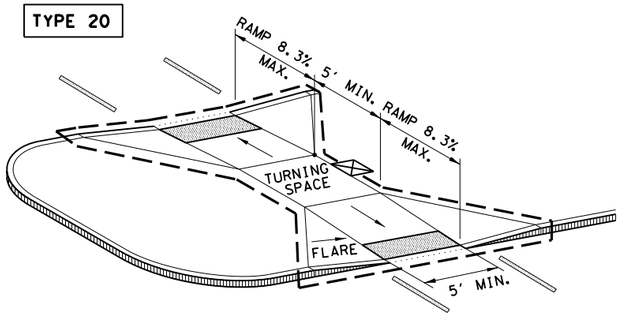


TYPE 6



COMBINATION CURB RAMPS

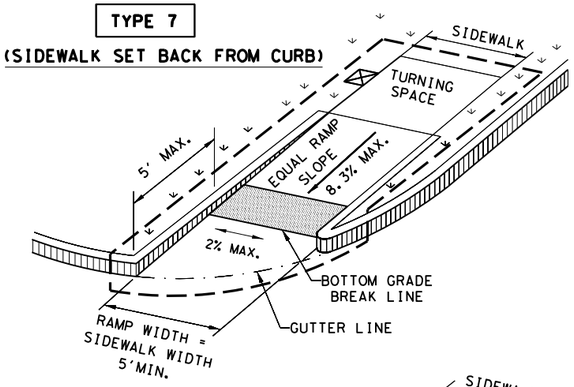
TYPE 20



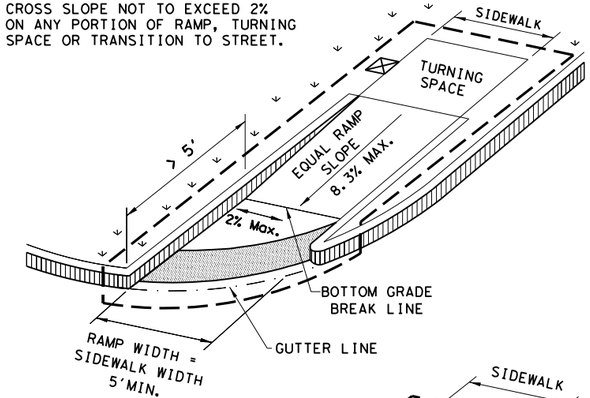
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

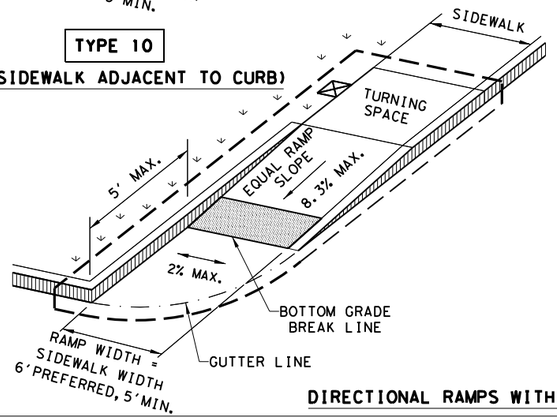


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

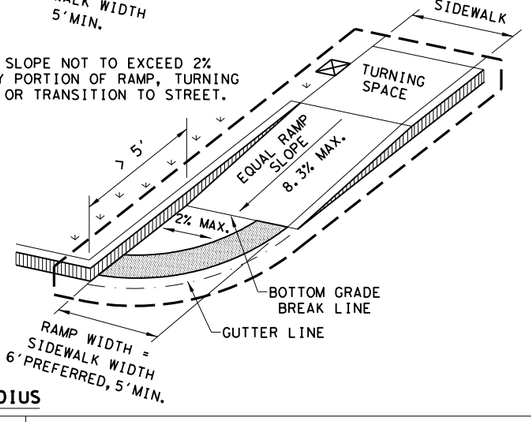


TYPE 10

(SIDEWALK ADJACENT TO CURB)

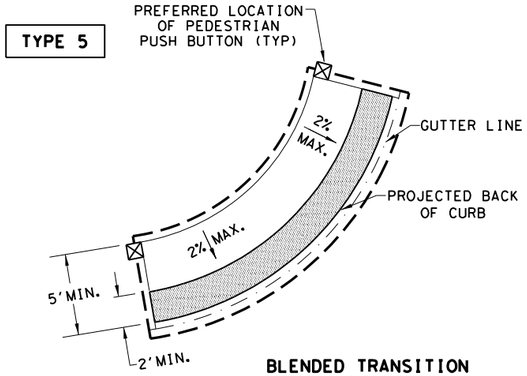


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

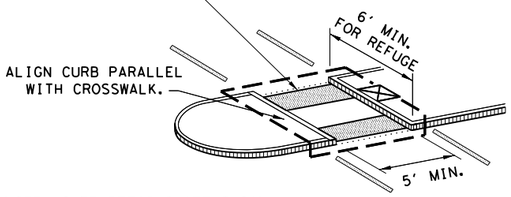
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

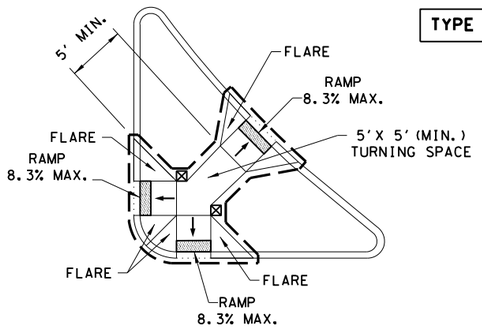
TYPE 21

INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.



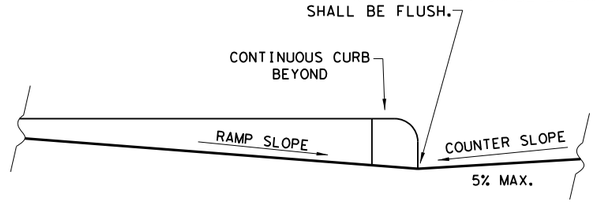
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

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

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

Texas Department of Transportation

Design Division Standard

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	3136	01	191	SL 0001
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		63

DATE: 11/13/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\ROADWAY STD\ped18.dgn

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 applicalble 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.

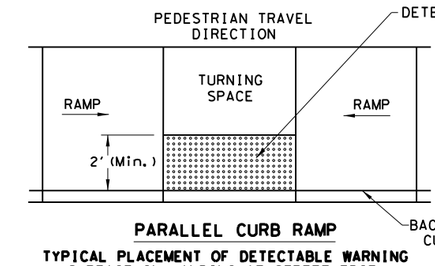
DETECTABLE WARNING PAVERS (IF USED)

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

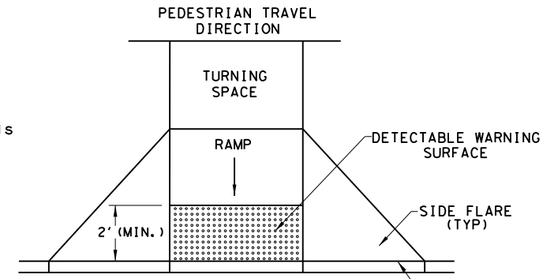
27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items 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.

DETECTABLE WARNING SURFACE DETAILS



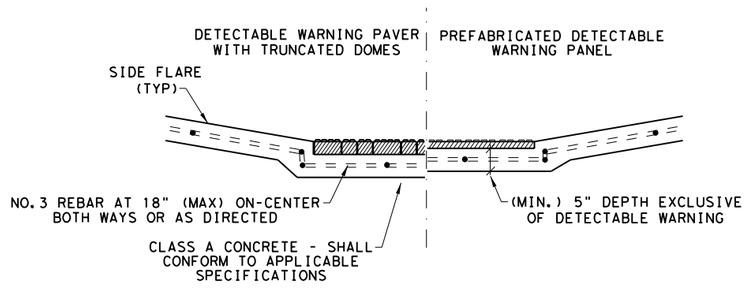
PARALLEL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.

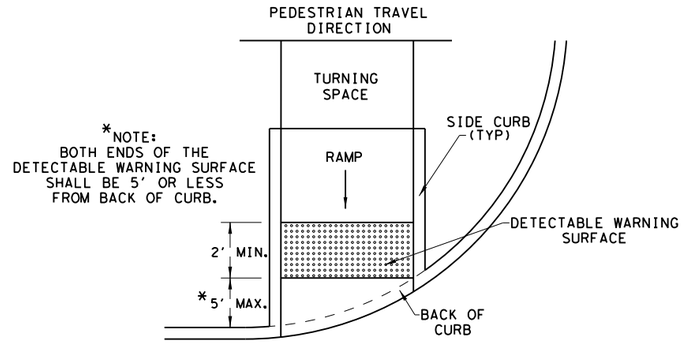


PERPENDICULAR CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS



DIRECTIONAL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

SHEET 2 OF 4

Texas Department of Transportation | Design Division Standard

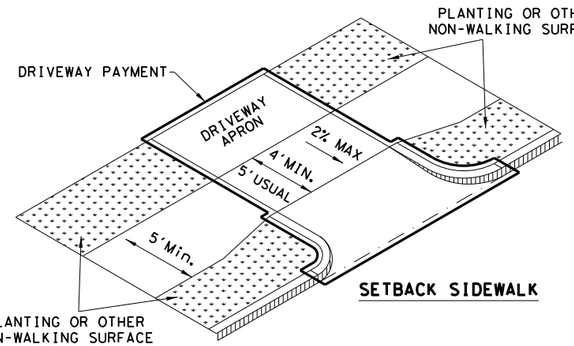
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

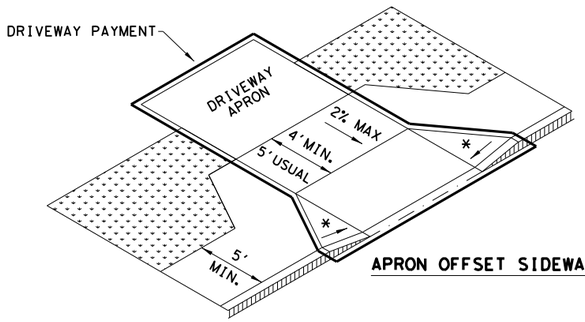
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	3136	01	191		SL 0001
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY			SHEET NO.
	AUS	TRAVIS			64

DATE: 11/13/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\ROADWAY STD\ped18.dgn

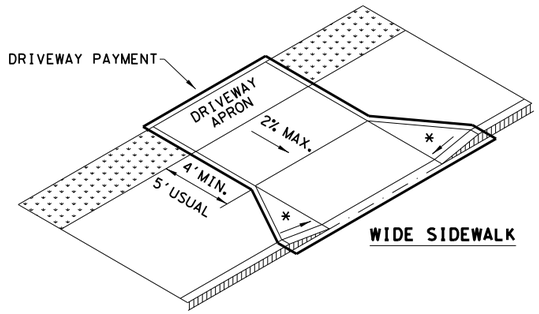
SIDEWALK TREATMENT AT DRIVEWAYS



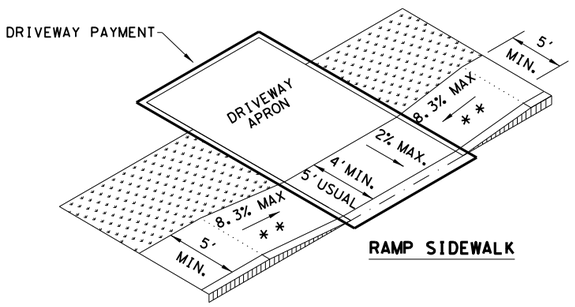
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

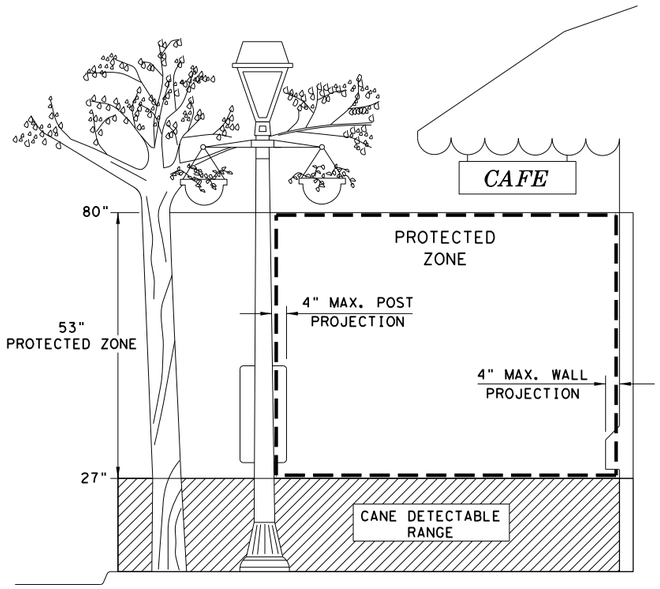


RAMP SIDEWALK

NOTES:

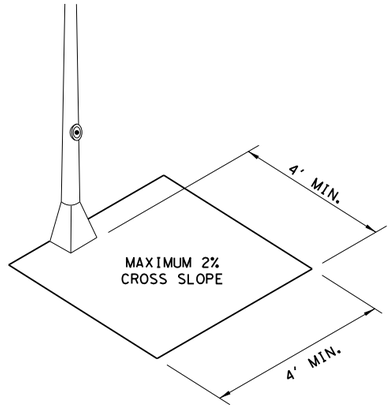
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.

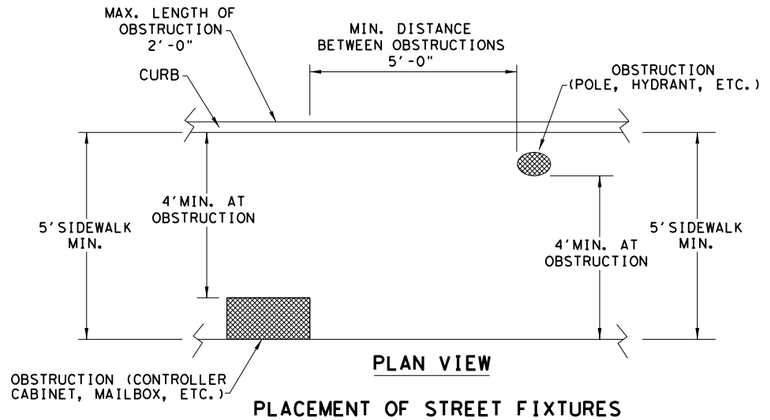


PROTECTED ZONE

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



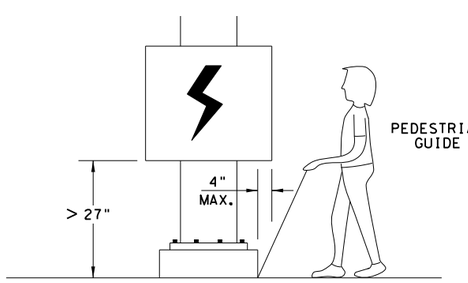
CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



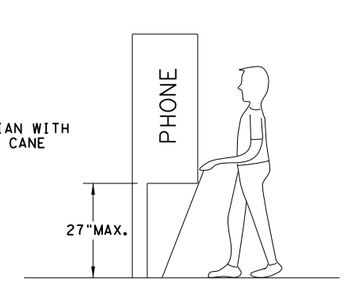
PLAN VIEW

PLACEMENT OF STREET FIXTURES

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



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

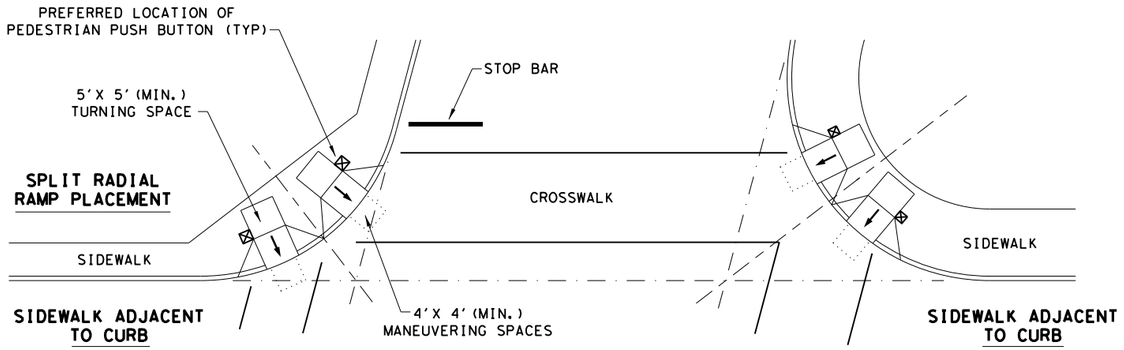
PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG	
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY	
REVISIONS	3136	01	191	SL 0001	
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.	
	AUS	TRAVIS		65	

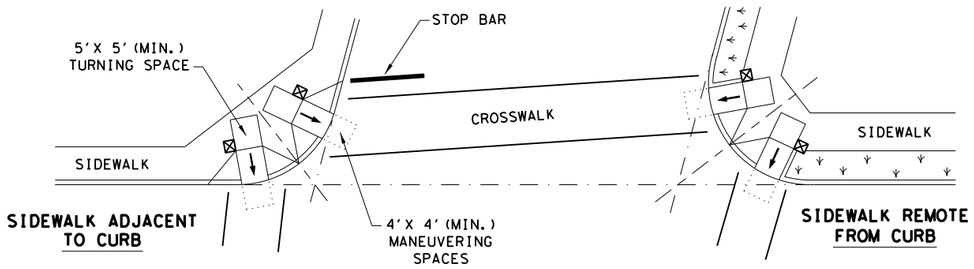
DATE: 11/13/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\ROADWAY STD\ped18.dgn

TYPICAL CROSSING LAYOUTS

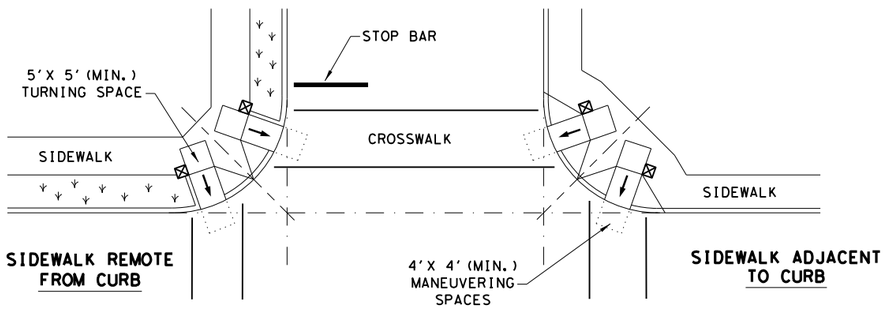
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



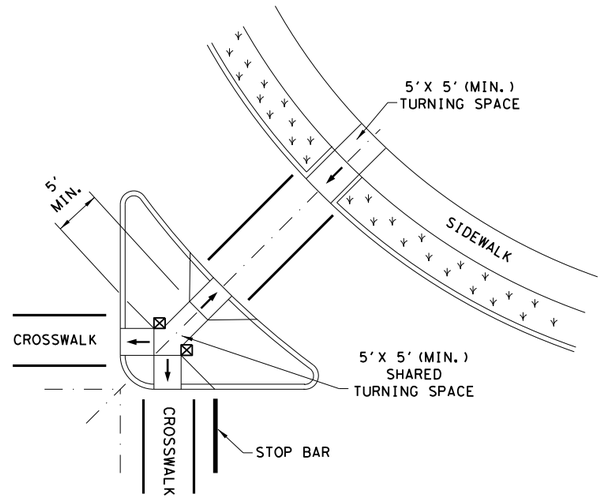
SKEWED INTERSECTION WITH "LARGE" RADIUS



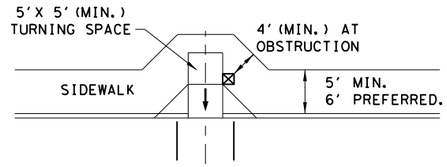
SKEWED INTERSECTION WITH "SMALL" RADIUS

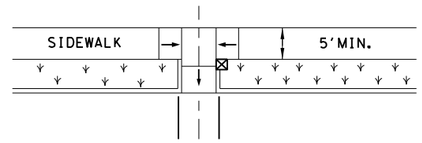


NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND





MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

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.

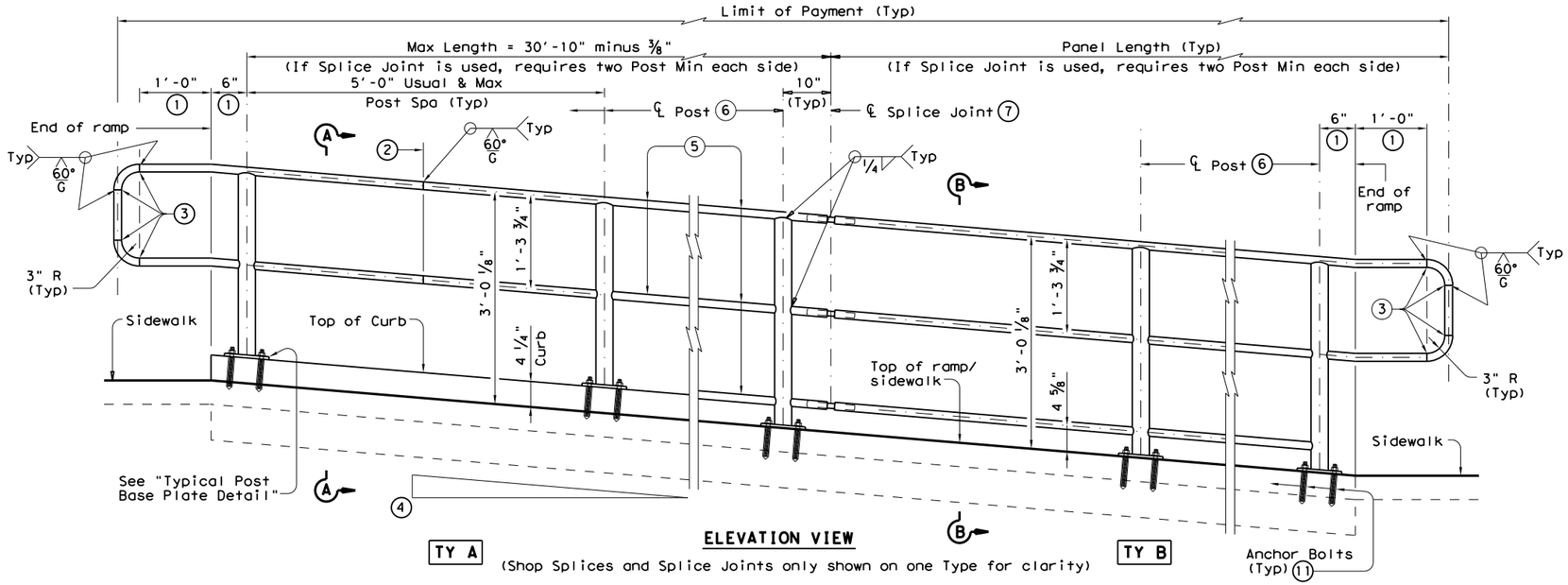
Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

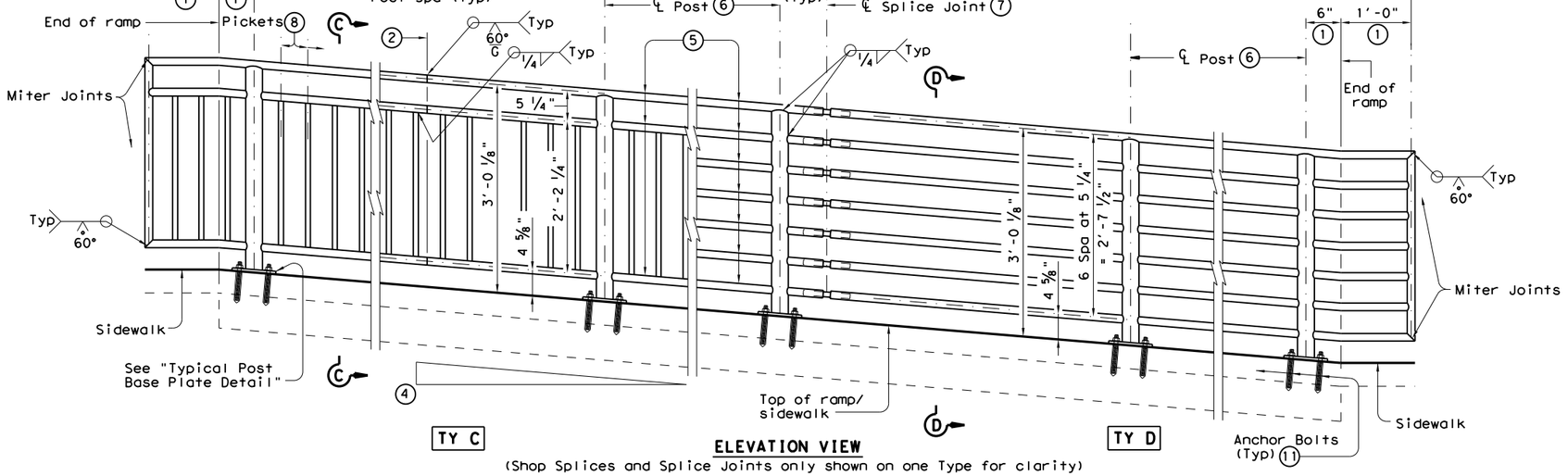
FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		66

DATE: 11/13/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\31360119\4 - Design\Plan Set\3. Roadway\ROADWAY STD\prd13.dgn



ELEVATION VIEW

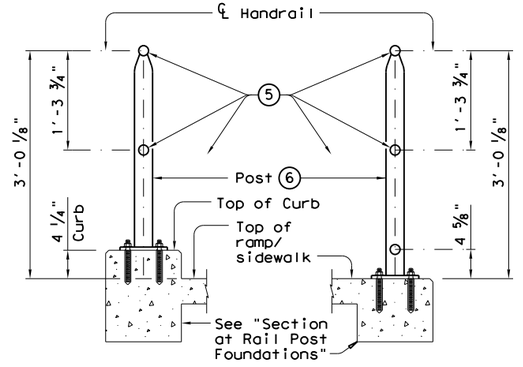
(Shop Splices and Splice Joints only shown on one Type for clarity)



ELEVATION VIEW

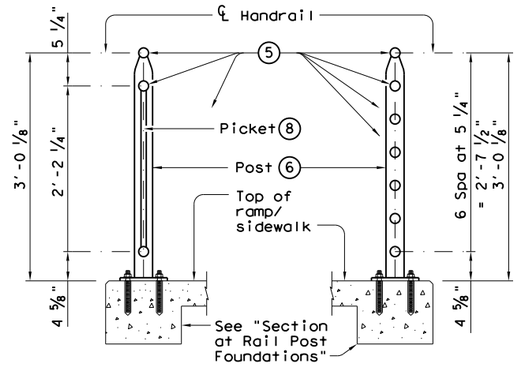
(Shop Splices and Splice Joints only shown on one Type for clarity)

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



SECTION A-A
(Showing Handrail **TY A**)

SECTION B-B
(Showing Handrail **TY B**)



SECTION C-C
(Showing Handrail **TY C**)

SECTION D-D
(Showing Handrail **TY D**)

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 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.
6. 2 ½" 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. ℄ ⅝" Dia. Round Bar equal spacing at 4 ½" 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

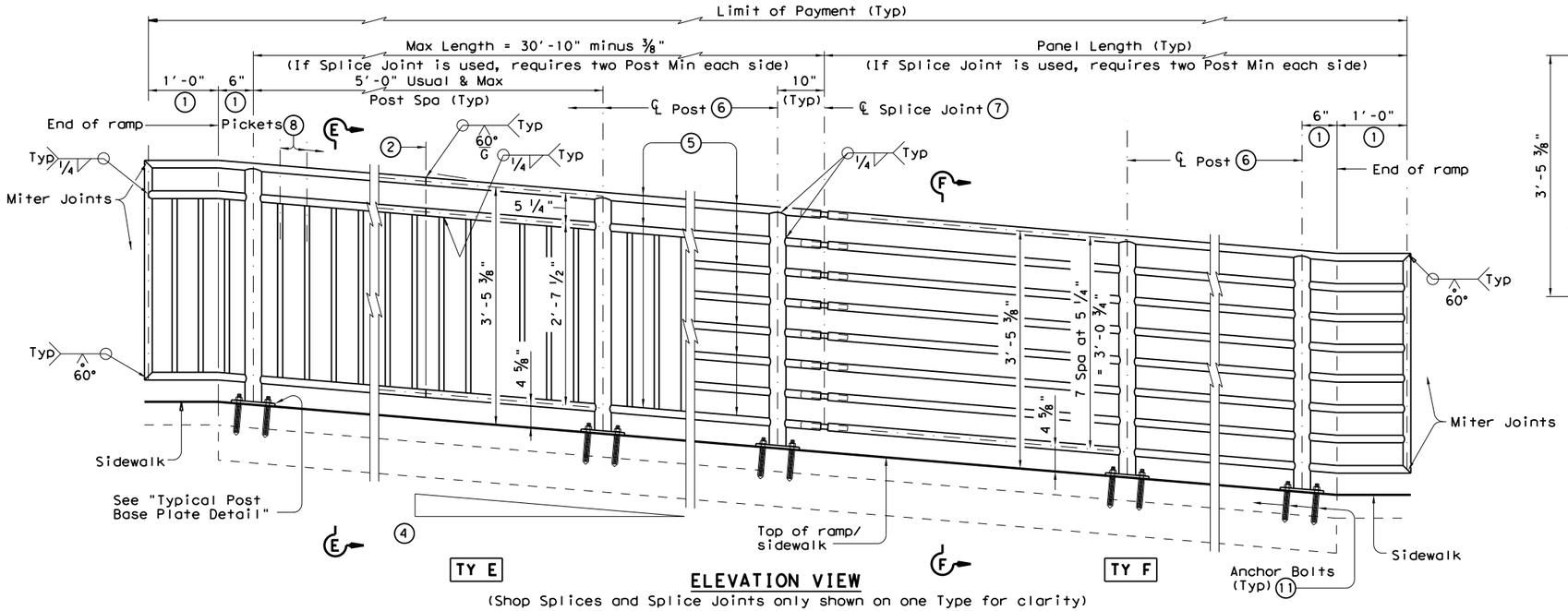
Texas Department of Transportation — Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

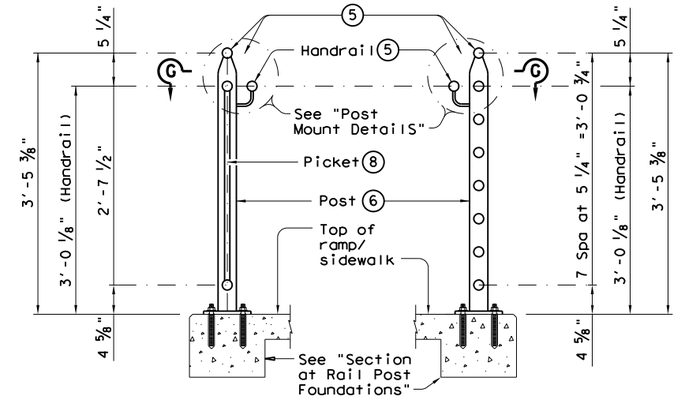
PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
© TxDOT Decmeber 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED MAY, 2013 (VP)	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		67

DATE: 11/13/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011914 - Design\Plan Set\3. Roadway\ROADWAY STD\prd13.dgn

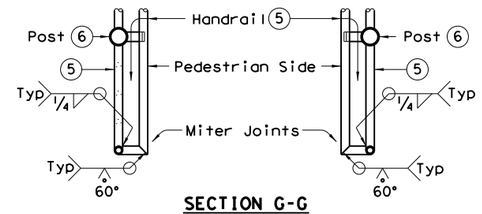


ELEVATION VIEW
(Shop Splices and Splice Joints only shown on one Type for clarity)

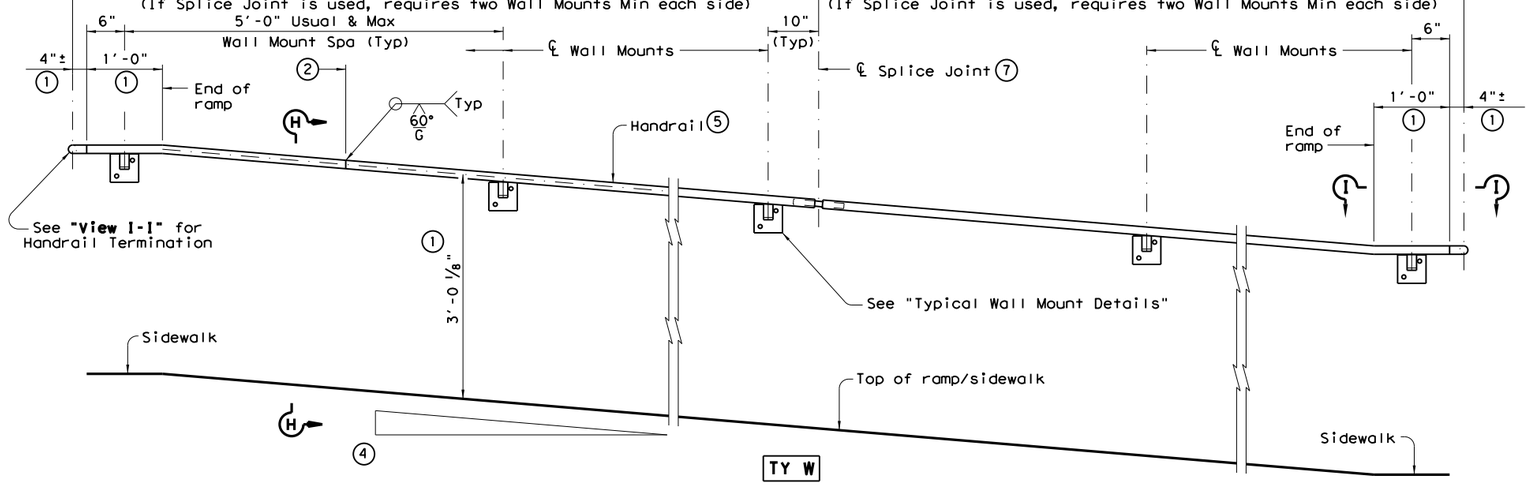


SECTION E-E
(Showing Handrail **TY E**)

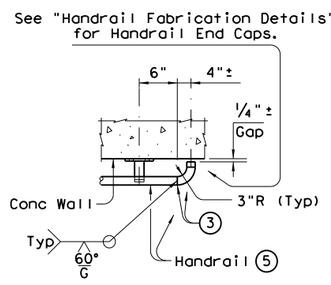
SECTION F-F
(Showing Handrail **TY F**)



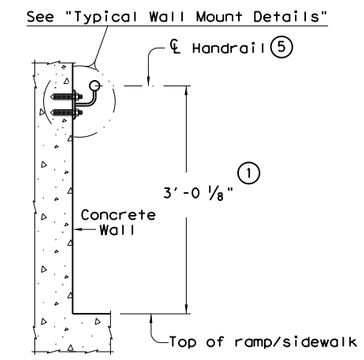
SECTION G-G
(Showing Handrail Termination)



ELEVATION VIEW



VIEW I-I
(Showing Handrail Termination)



SECTION H-H
(Showing Handrail **TY W**)

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 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.
6. 2 ½" 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. ℄ ⅝" Dia. Round Bar equal spacing at 4 ½" Max. Plumb all pickets.
11. See "General Notes" for anchor bolt information.

SHEET 2 OF 3

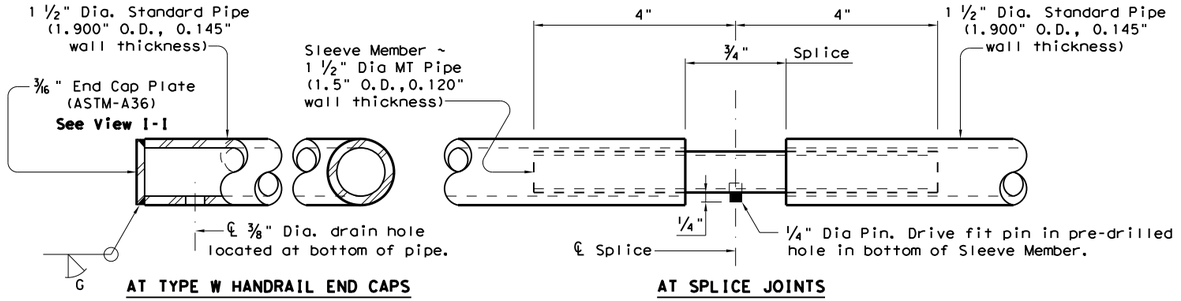
Texas Department of Transportation — Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
REVISED MAY, 2013 (VP)	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		68

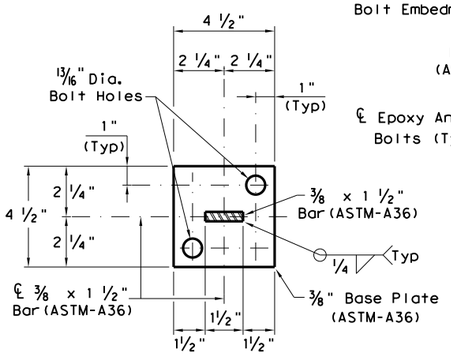
DATE: 11/13/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011914 - Design\Plan Set\3. Roadway\ROADWAY STD\prd13.dgn



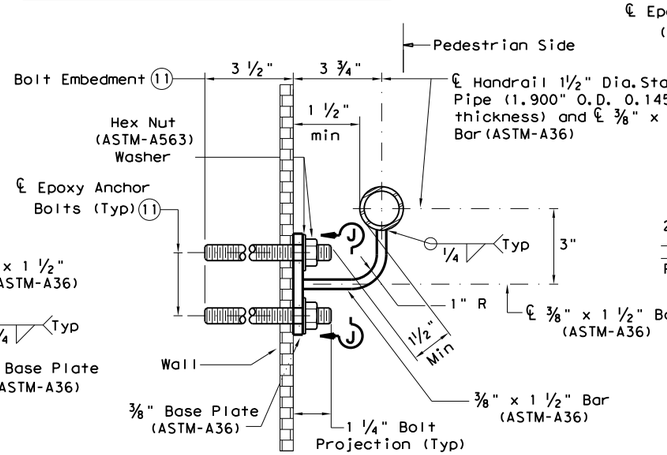
AT TYPE W HANDRAIL END CAPS

AT SPLICE JOINTS

HANDRAIL FABRICATION DETAILS



SECTION J-J
(Anchor Bolts not shown for clarity)



SECTION AT WALL MOUNT

TYPICAL WALL MOUNT DETAILS

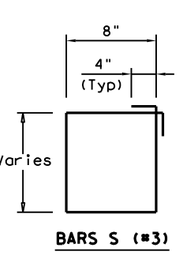
(5) 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp/sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.

(6) 2 ½" 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 diamenter of top rail. Provide holes as needed in post for galvanizing drainage and venting.

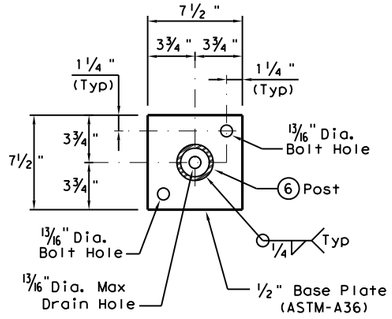
(11) See "General Notes" for anchor bolt information.

(12) Bars S(#3) spaced at 12" Max (Spaced 3" from outside edge of overall length of Ramp/Sidewalk).

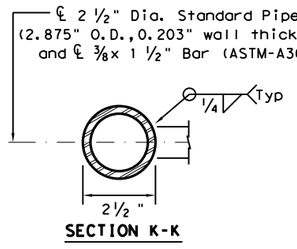
(13) Provide 1 ½" end cover to Bars D(#4) from outside edge of overall length of Ramp/Sidewalk.



BARS S (#3)

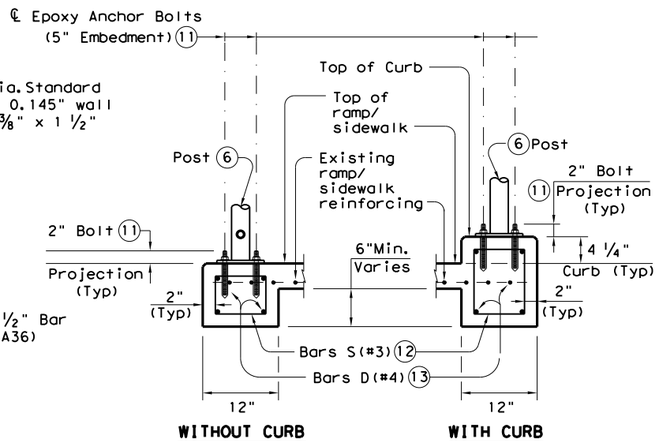


TYPICAL POST BASE PLATE DETAIL



SECTION K-K

POST MOUNT DETAILS

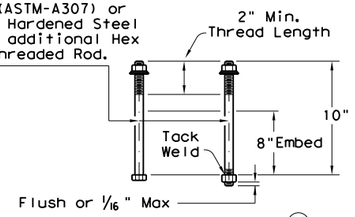


WITHOUT CURB

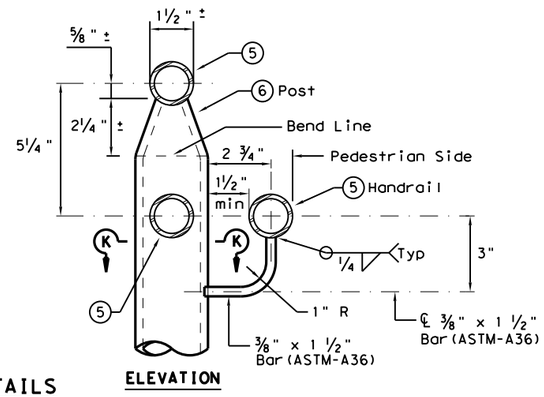
WITH CURB

SECTION AT RAIL POST FOUNDATIONS

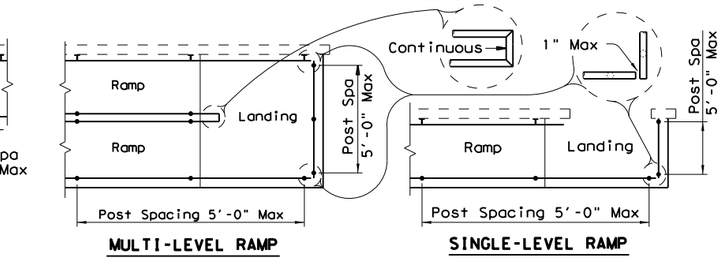
℄ 5/8" Dia. Hex Head Anchor Bolt (ASTM-A307) or Threaded Rod (ASTM-A36) with one Hardened Steel Washer placed under Hex Nut. One additional Hex Nut will be furnished for each Threaded Rod.



CAST-IN-PLACE ANCHOR BOLT OPTIONS
(Used for Post Base Plate only)



ELEVATION



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 ⅝" Dia. ASTM A36 threaded rods with one hex nut and one hardened steel washer at each bolt. ⅝" Dia. threaded rod embedment depth for wall mounts is 3 ½" 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, "Epoxies 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 ⅝" 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 ⅛" by grinding.

Texas Department of Transportation

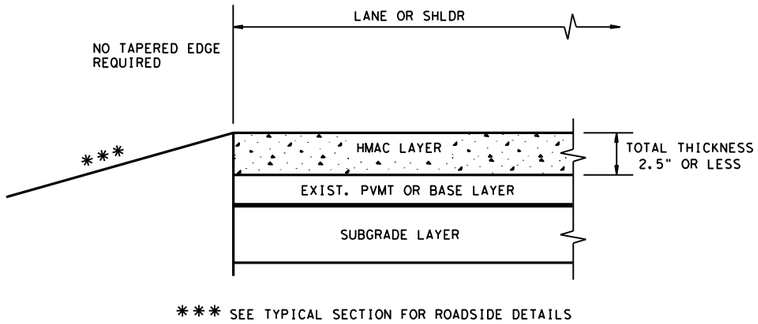
Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

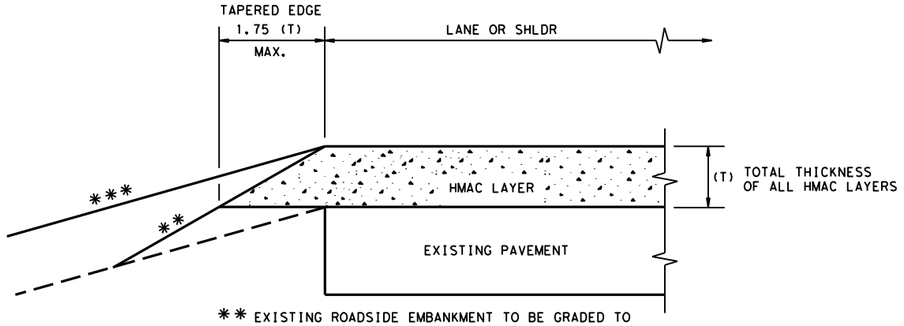
FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
REVISED MAY, 2013 (VP)	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		69

DATE: 11/6/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\3. Roadway\ROADWAY STD\tehmac11.dgn



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

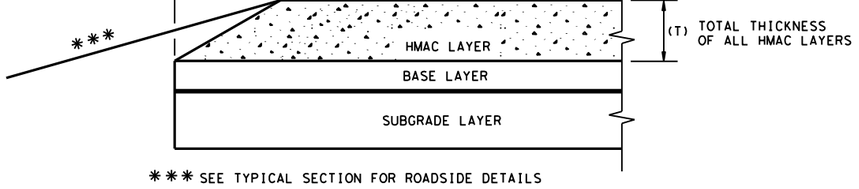
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

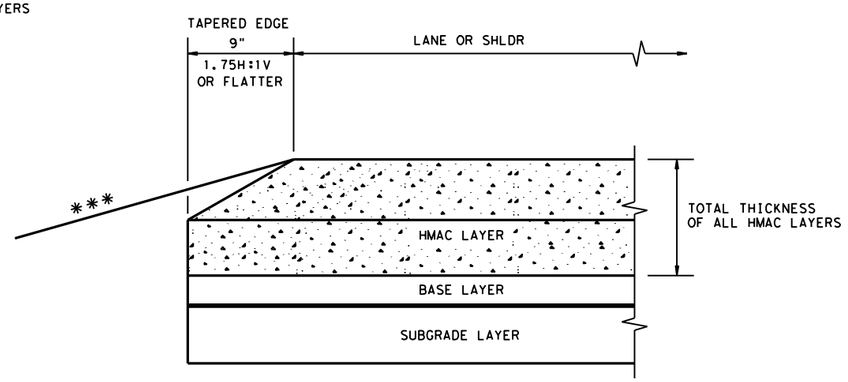
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2
OVERLAY OF EXISTING PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

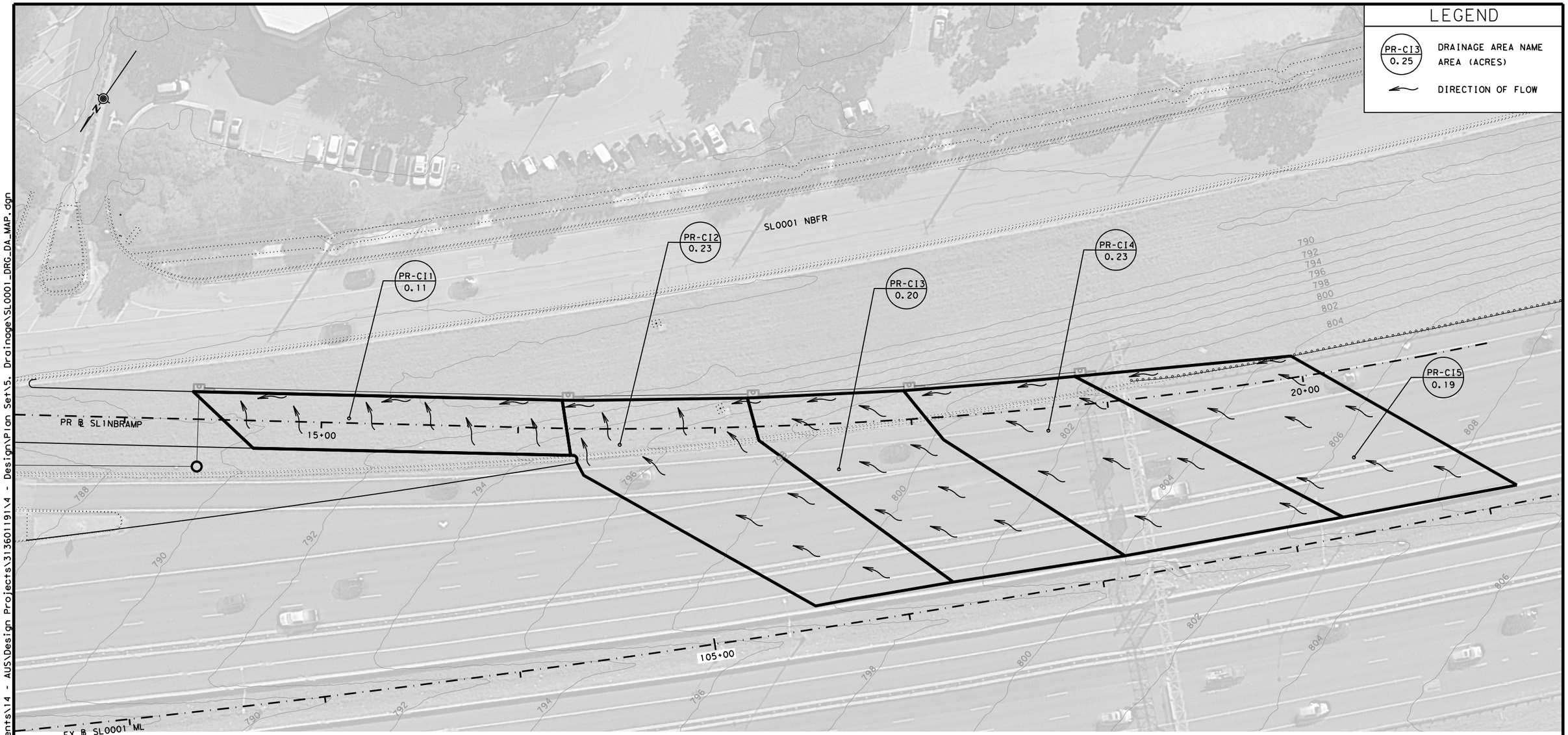
Texas Department of Transportation

Design Division Standard

TAPERED EDGE DETAILS HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		70



DRAINAGE AREA ID	AREA (AC)	C	TC (MIN)	DESIGN STORM	INTENSITY (IN/HR)	DISCHARGE (CFS)
PR-CI1	0.11	0.95	10	10-YR	7.418	0.790
PR-CI2	0.23	0.95	10	10-YR	7.418	1.615
PR-CI3	0.20	0.95	10	10-YR	7.418	1.395
PR-CI4	0.23	0.95	10	10-YR	7.418	1.601
PR-CI5	0.19	0.95	10	10-YR	7.418	1.367

NOTES

- ATLAS-14 RAINFALL INTENSITIES WERE USED IN THE DRAINAGE CALCULATIONS FOR THIS PROJECT.
- ALL CALCULATIONS WERE COMPUTED WITH GEOPAK DRAINAGE USING THE RATIONAL METHOD.
- CONTOURS ARE 2017 TNRIS 2 FT.

DocuSigned by:
102EF1917E2C49D...
3/8/2021

STATE OF TEXAS
MATT SANNER
135459
LICENSED PROFESSIONAL ENGINEER

SCALE (IN FEET):
0 50

Austin District
North Travis Area Office

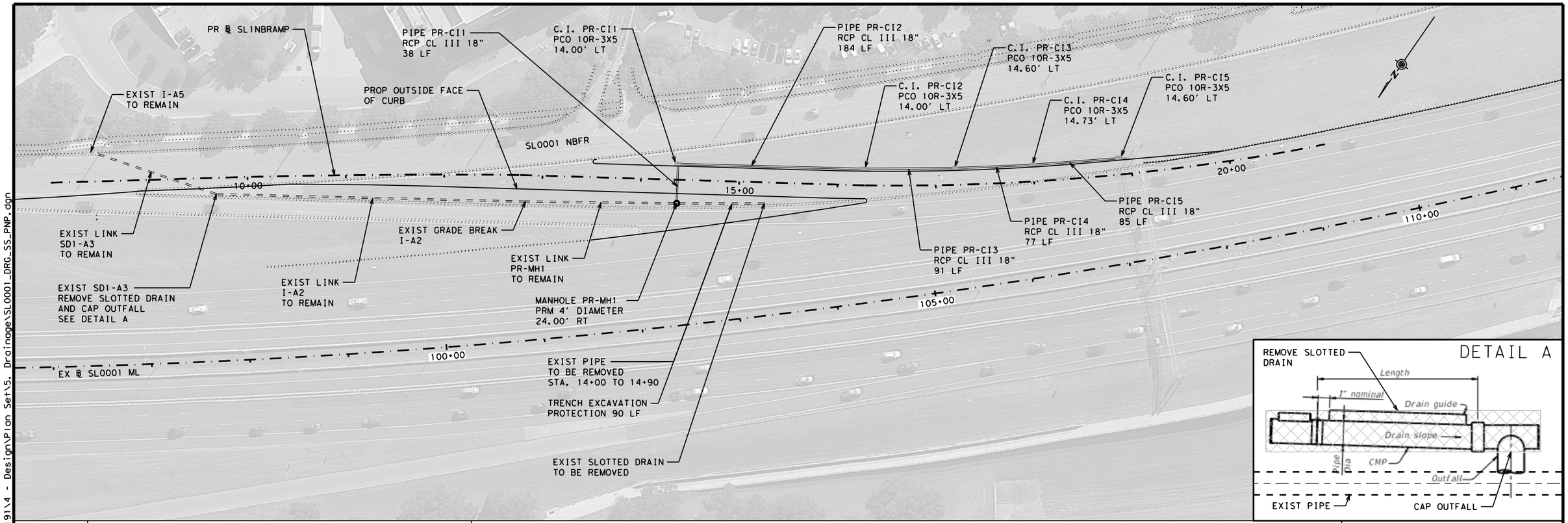
Texas Department of Transportation

SL0001
INTERNAL DRAINAGE AREA MAP

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3136	01	191,etc	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		71

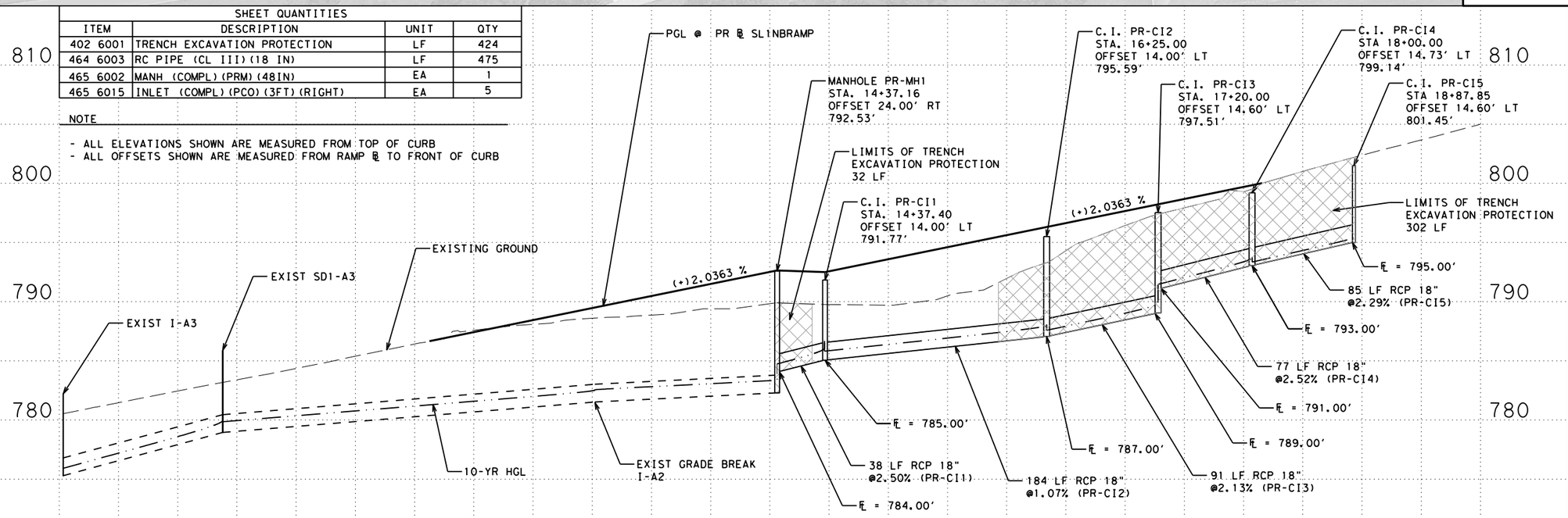
DATE: 3/5/2021 1:58:45 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\5. Drainage\SL0001_DRG_DA_MAP.dgn



SHEET QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
402 6001	TRENCH EXCAVATION PROTECTION	LF	424
464 6003	RC PIPE (CL III)(18 IN)	LF	475
465 6002	MANH (COMPL)(PRM)(48IN)	EA	1
465 6015	INLET (COMPL)(PCO)(3FT)(RIGHT)	EA	5

NOTE

- ALL ELEVATIONS SHOWN ARE MEASURED FROM TOP OF CURB
- ALL OFFSETS SHOWN ARE MEASURED FROM RAMP ℄ TO FRONT OF CURB



STATE OF TEXAS
MATT SANNER
135459
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
102EF1917E2C49D...
3/8/2021

SCALES (IN FEET):
HORZ- 0 100
VERT- 0 10

Austin District
North Travis Area Office

Texas Department of Transportation

SL0001

STORM SEWER PLAN & PROFILE

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	3136	01	191,etc	SL 0001
		DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		72

DATE: 3/5/2021 1:57:25 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\5. Drainage\SL0001_DRG_SS_PNP.dgn

INLET ID	STATION	ALIGNMENT	TYPE	INLET DESCRIPTION	PROFILE TYPE	CURB LENGTH (FT)	PROFILE SLOPE (%)	CROSS SLOPE (%)	SPREAD MANNING'S N	DEPRESSION (FT)	DESIGN STORM	DISCHARGE (CFS)	BYPASS (CFS)	BYPASS TO	ALLOWABLE PONDED WIDTH (FT)	PONDED WIDTH (FT)	ALLOWABLE PONDED DEPTH (FT)	PONDED DEPTH (FT)
PR-CI1	14+37.40	SL1NBRAMP	CURB	PCO 10R-3X5	ON GRADE	9.5	2.036	2.0	0.012	0.25	10-YR	0.88	0.000	N/A	7.5	5.87	0.5	0.12
PR-CI2	16+25.00	SL1NBRAMP	CURB	PCO 10R-3X5	ON GRADE	9.5	2.036	2.0	0.012	0.25	10-YR	1.66	0.085	PR-CI1	7.5	7.46	0.5	0.15
PR-CI3	17+20.00	SL1NBRAMP	CURB	PCO 10R-3X5	ON GRADE	9.5	2.036	2.0	0.012	0.25	10-YR	1.48	0.042	PR-CI2	7.5	7.15	0.5	0.14
PR-CI4	18+00.00	SL1NBRAMP	CURB	PCO 10R-3X5	ON GRADE	9.5	2.036	2.0	0.012	0.25	10-YR	1.65	0.082	PR-CI3	7.5	7.45	0.5	0.15
PR-CI5	18+87.85	SL1NBRAMP	CURB	PCO 10R-3X5	ON GRADE	9.5	2.687	2.0	0.012	0.25	10-YR	1.37	0.047	PR-CI4	7.5	6.59	0.5	0.13

LINK ID	US NODE ID	DS NODE ID	US FLOW ELEV (FT)	US HGL (FT)	DS FLOW ELEV (FT)	DS HGL (FT)	ACTUAL VELOCITY US (FPS)	ACTUAL VELOCITY DS (FPS)	SIZE	NO OF BARRELS	ACTUAL LENGTH (FT)	LINK SLOPE (%)	MANNING'S N	DESIGN STORM	TC (MIN)	DISCHARGE (CFS)	CAPACITY (CFS)
* SD1-A3	SD1-A3	OUT	778.90	779.95	775.24	775.87	5.13	9.69	18" RCP	1	134.7	2.72	0.012	10-YR	10	6.77	20.18
* I-A2	I-A2	SD1-A3	781.47	782.50	778.90	779.79	5.23	6.19	18" RCP	1	314.3	0.82	0.012	10-YR	10	6.77	11.07
* PR-MH1	PR-MH1	I-A2	782.24	783.83	781.47	782.50	3.83	5.23	18" RCP	1	151.8	0.50	0.012	10-YR	10	6.77	8.66
PR-CI1	PR-CI1	PR-MH1	785.00	786.63	784.00	784.68	3.83	8.68	18" RCP	1	36.5	2.50	0.012	10-YR	10	6.77	19.35
PR-CI2	PR-CI2	PR-CI1	787.00	788.02	785.00	785.96	4.65	6.66	18" RCP	1	182.6	1.07	0.012	10-YR	10	5.98	12.64
PR-CI3	PR-CI3	PR-CI2	789.00	789.87	787.00	787.53	4.10	7.85	18" RCP	1	89.1	2.13	0.012	10-YR	10	4.36	17.85
PR-CI4	PR-CI4	PR-CI3	793.00	793.73	791.00	791.41	3.49	7.48	18" RCP	1	74.4	2.52	0.012	10-YR	10	2.97	19.43
PR-CI5	PR-CI5	PR-CI4	795.00	795.60	793.00	793.29	2.10	5.80	18" RCP	1	82.2	2.29	0.012	10-YR	10	1.37	18.54

* EXISTING STRUCTURE

NOTES

- ANALYSIS WAS PERFORMED USING THE CURRENT EDITION OF GEOPAK DRAINAGE.
- ALLOWABLE PONDING WIDTHS ARE IN ACCORDANCE WITH THE TxDOT HYDRAULIC DESIGN MANUAL (2019).
- ALLOWABLE PONDING DEPTHS ARE IN ACCORDANCE WITH THE TxDOT HYDRAULIC DESIGN MANUAL (2019) AND DO NOT EXCEED CURB HEIGHT.
- FLOWS WERE CALCULATED USING THE RATIONAL METHOD.
- TIME OF CONCENTRATIONS WERE CALCULATED USING THE KERBY-KERPICH METHOD.

STATE OF TEXAS
MATT SANNER
135459
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
3/8/2021
102EF1917E2C49D...

Austin District
North Travis Area Office

Texas Department of Transportation

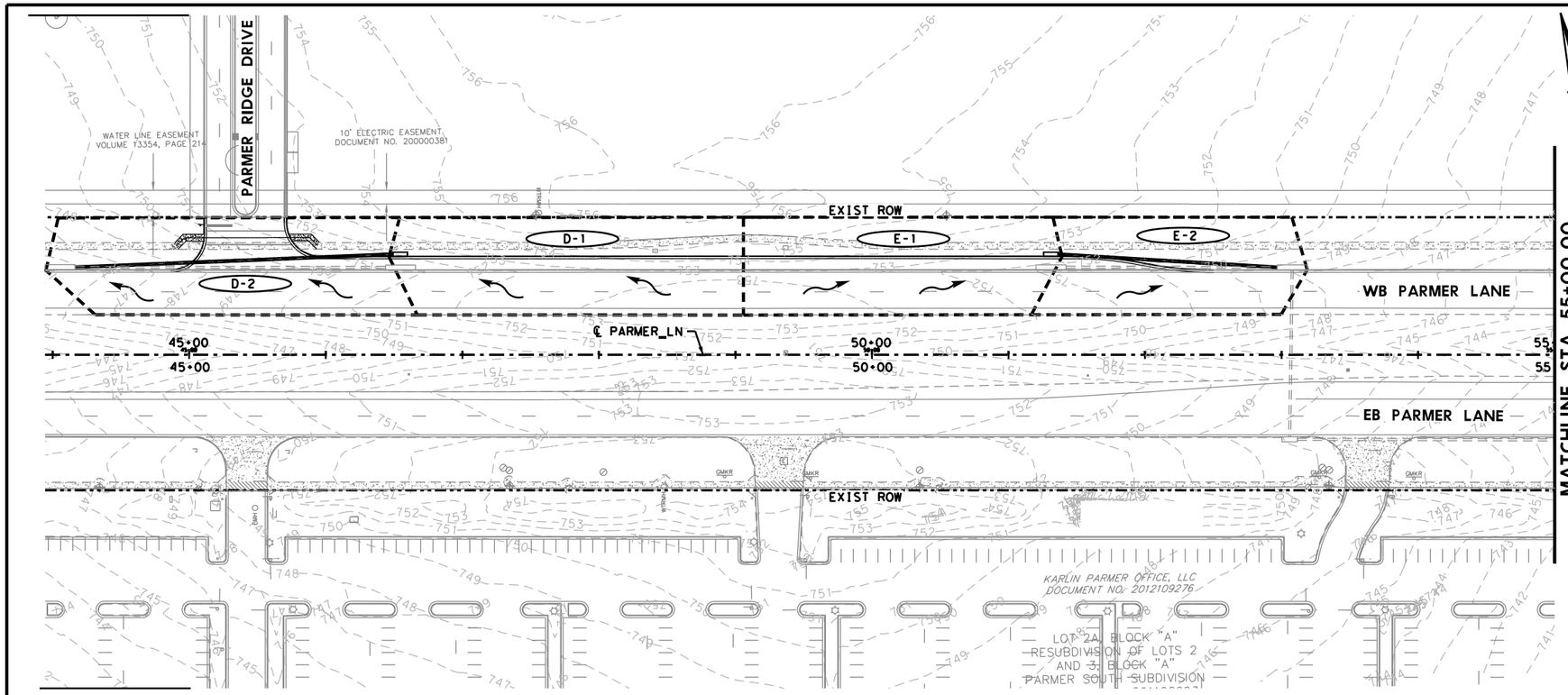
SL0001

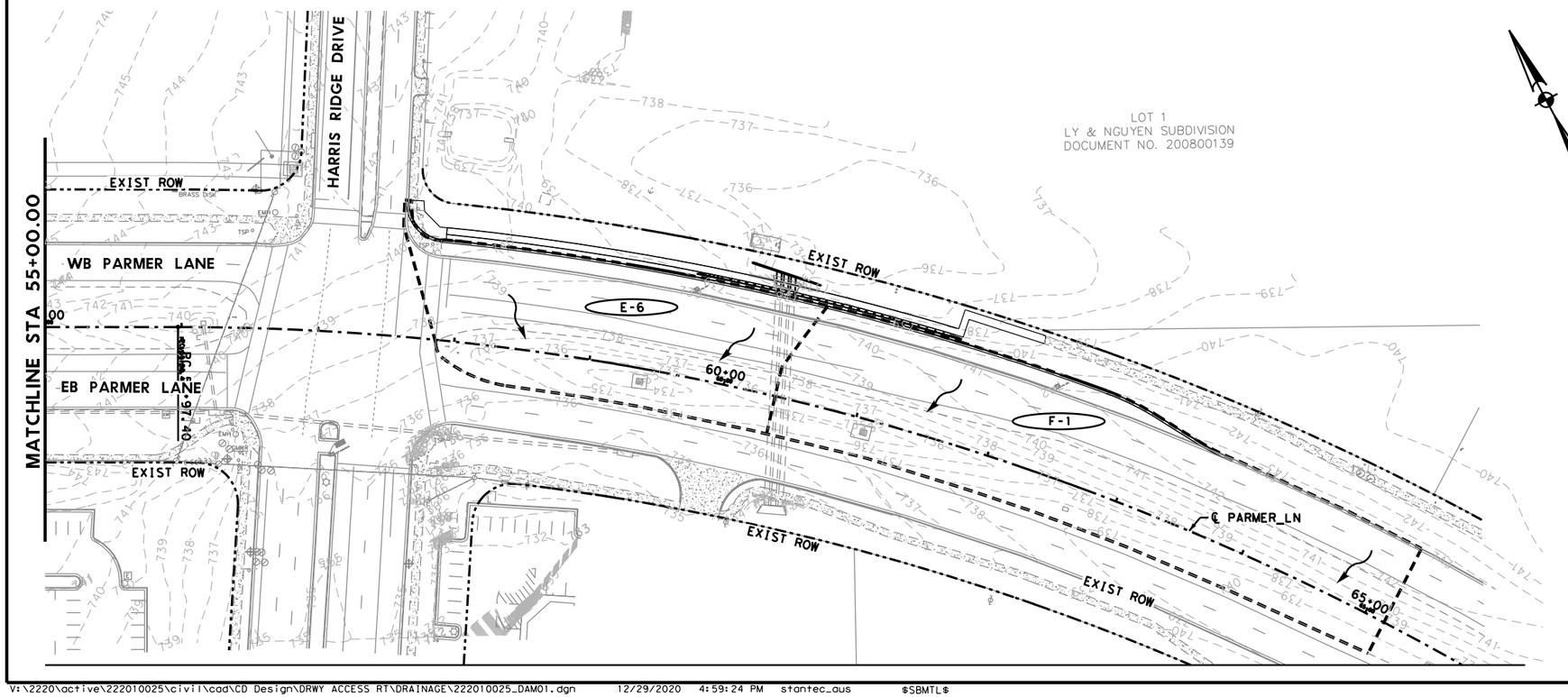
DRAINAGE CALCULATIONS

SHEET 1 OF 1

© 2020	CONT	SECT	JOB	HIGHWAY
DS: CK:	3136	01	191,etc	SL 0001
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		73

DATE: 3/5/2021 2:00:08 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\5. Drainage\SL0001_DRG_CALCULATIONS





LEGEND

- AREA ID — DRAINAGE AREA
- DRAINAGE FLOW
- 535 — CONTOURS
- DRAINAGE BOUNDARY

NOTES:

1. STATION AND OFFSET ARE BASED ON PARMER_LN CENTER LINE UNLESS OTHERWISE NOTED.
2. REFER TO APPLICABLE TXDOT STANDARDS DETAILS FOR ALL STRUCTURES AND END TREATMENTS (AS SHOWN ON PLANS).
3. ALL EXISTING DRAINAGE STRUCTURES TO REMAIN IN PLACE UNLESS NOTED OTHERWISE.
4. CALCULATIONS BASED ON DRAINAGE HYDRAULIC DATA PROVIDED CARTER-BURGESS, INC., CSJ 3417-03-002 DATED 8-18-95.
5. ATLAS-14 RAINFALL INTENSITIES WERE NOT USED FOR THIS PROJECT AND A REVIEW WAS PERFORMED TO DETERMINE IF THE PROPOSED DESIGN MEETS CRITERIA WITH ATLAS-14 INTENSITIES FOR THIS PROJECT.

0 25 50 100

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
12/29/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

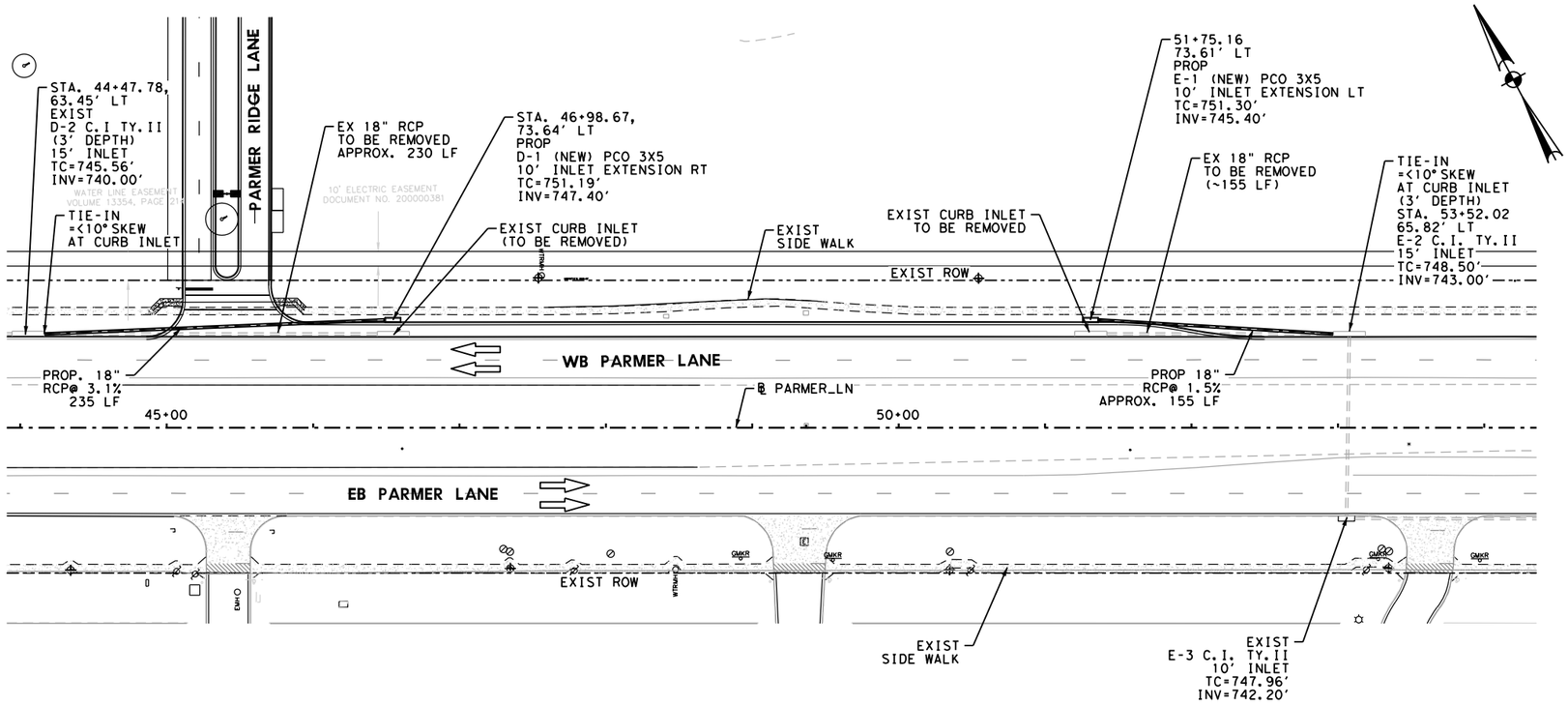
PARMER LANE

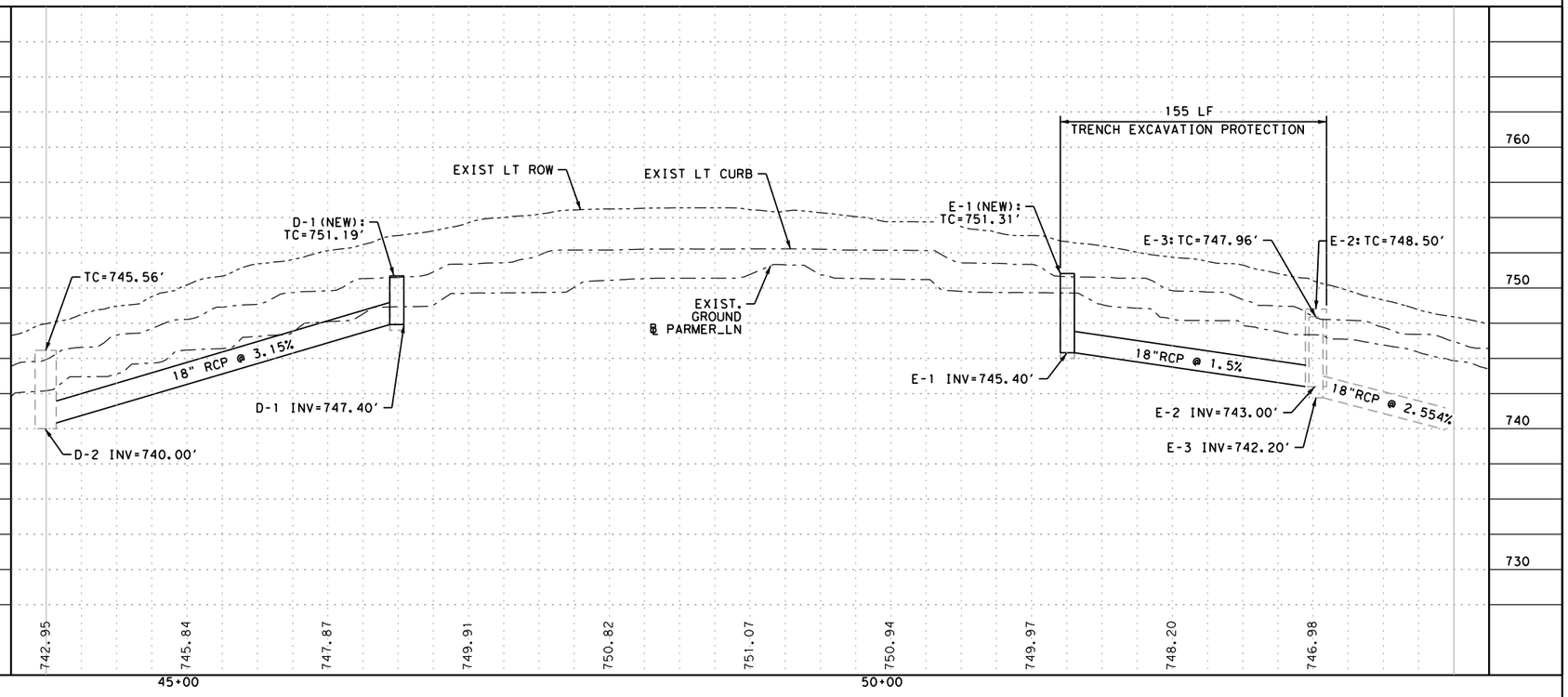
DRAINAGE AREA MAP

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		74

V:\2220\active\222010025\civil\cad\CD Design\DRWY ACCESS RT\DRAINAGE\222010025_DAM01.dgn 12/29/2020 4:59:24 PM stantec_aus $SBMTL$





LEGEND

- EXISTING DIRECTION OF TRAFFIC
- PROPOSED DIRECTION OF TRAFFIC
- DRAINAGE FLOW
- EXIST ROW
- 535 CONTOURS
- PROPOSED GRATE INTLET
- CUT & RESTORE PAVEMENT

NOTES:

1. STATION AND OFFSET ARE BASED ON PARMER_LN CENTER LINE UNLESS OTHERWISE NOTED.
2. REFER TO APPLICABLE TXDOT STANDARDS DETAILS FOR ALL STRUCTURES AND END TREATMENTS (AS SHOWN ON PLANS).
3. ALL EXISTING DRAINAGE STRUCTURES TO REMAIN IN PLACE UNLESS NOTED OTHERWISE.
4. CALCULATIONS BASED ON DRAINAGE HYDRAULIC DATA PROVIDED CARTER-BURGESS, INC., CSJ 3417-03-002 DATED 8-18-95.
5. ATLAS-14 RAINFALL INTENSITIES WERE NOT USED FOR THIS PROJECT AND A REVIEW WAS PERFORMED TO DETERMINE IF THE PROPOSED DESIGN MEETS CRITERIA WITH ATLAS-14 INTENSITIES FOR THIS PROJECT.

0 25 50 100 (H)
0 5 10 (V)

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
12/29/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

PARMER LANE

DRAINAGE PLAN & PROFILE

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		75

V:\2220\active\222010025\civil\cad\CD Design\DRWY ACCESS RT\DRAINAGE\222010025_DRN01.dgn 12/29/2020 4:52:43 PM KMcClure 100%

Drainage Area ID	Ultimate Area A_U (ac)	Ultimate CA	Ultimate Calculated C	Ultimate Design Q (cfs)	Ultimate Design Pond Width	Ultimate Design Carryover (cfs)	Ultimate Design Intensity (in/hr)	Proposed Impervious Cover A_P (ac)	Proposed Calculated Area A_C (ac)	New Intensity (in/hr)	New Calculated C	New Q(cfs) 5-yr	Exist Q(cfs) 5-yr	New Q(cfs) 2-yr	Exist Q(cfs) 2-yr	New Q(cfs) 10-yr	Exist Q(cfs) 10-yr	New Q(cfs) 25-yr	Exist Q(cfs) 25-yr	New Q(cfs) 50-yr	Exist Q(cfs) 50-yr	New Q(cfs) 100-yr	Exist Q(cfs) 100-yr	New Design Pond Width	Inlet Capacity (cfs)	Carryover (cfs)
D-1	1.28	0.63	0.49	4.47	9.93	0.23	7.06	0.05	0.34	5.99	0.67	1.37	1.29	1.04	0.99	1.61	1.52	1.91	1.81	2.18	2.06	2.45	2.32	3.04	4.23	0.00
D-2	1.75	0.87	0.50	6.13	10.14	0.11	7.06	0.13	0.44	5.99	0.73	1.91	0.81	1.46	1.03	2.25	0.96	2.67	1.14	3.05	1.30	3.43	1.46	3.16	6.25	0.00
E-1	1.23	0.61	0.50	3.56	9.22	0.00	5.86	0.07	0.43	5.10	0.66	1.45	1.21	1.10	0.92	1.71	1.42	2.04	1.70	2.33	1.95	2.64	2.20	3.76	3.91	0.00
E-2	1.18	0.59	0.50	3.43	14.06	0.00	5.86	0.01	0.32	5.10	0.59	1.04	0.84	0.79	0.64	1.23	0.99	1.47	1.19	1.68	1.36	1.90	1.54	4.26	4.87	0.00
E-6	0.49	0.38	0.78	2.72	N/A	0.00	7.06	0.15	0.86	5.99	0.57	2.93	2.22	2.23	1.69	3.45	2.61	4.10	3.11	4.67	3.54	5.26	3.98	N/A	21.07	0.00
F-1	0.62	0.44	0.71	3.10	N/A	0.00	7.06	0.07	1.36	5.99	0.47	3.85	3.38	2.93	2.58	4.53	3.98	5.38	4.73	6.13	5.39	6.90	6.07	N/A	21.07	0.00

D-1-D-2, D-4, E-1-E-2, E-6 and F-1 inlets are associated with the proposed additional EB decel/left turn lane at Tech Ridge.
D-1 will have a design Q of 1.37 which is lower than the design Q of 4.47, ponded width will not be increased.
D-2 will have a design Q of 2.24 which is lower than the design Q of 6.13, ponded width will not be increased.
E-1 will have a design Q of 1.45 which is lower than the design Q of 3.56, carryover will not be added and ponded width will not be exceed max allowable of 14'.
E-2 will have a design Q of 1.04 which is lower than the design Q of 3.43, ponded width will not be increased.
E-6 will have a design Q of 2.93 which is higher than the design Q of 2.72, ponded width not applicable and carryover will not be added.
F-1 will have a design Q of 3.85 which is lower than the design Q of 4.47, ponded width not applicable and carryover will not be added.

Based on as-built construction plans for Parmer Lane developed by Carter-Burgess, Inc., CSJ 3417-03-002 dated 8-18-95, hydraulic analysis for the existing storm sewer for inlets D1, D11-15, and E1-E5 were over-designed to accommodate the future ultimate 6-lane condition. The additional impervious cover (between 0.02 and 0.15 ac) developed by the deceleration lane are deemed insignificant and are accommodated by the current system design. Atlas-14 Rainfall Intensities were not used for this project and a review was performed to determine if the proposed design meets criteria with Atlas-14 intensities for this project.

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
12/29/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

PARMER LANE

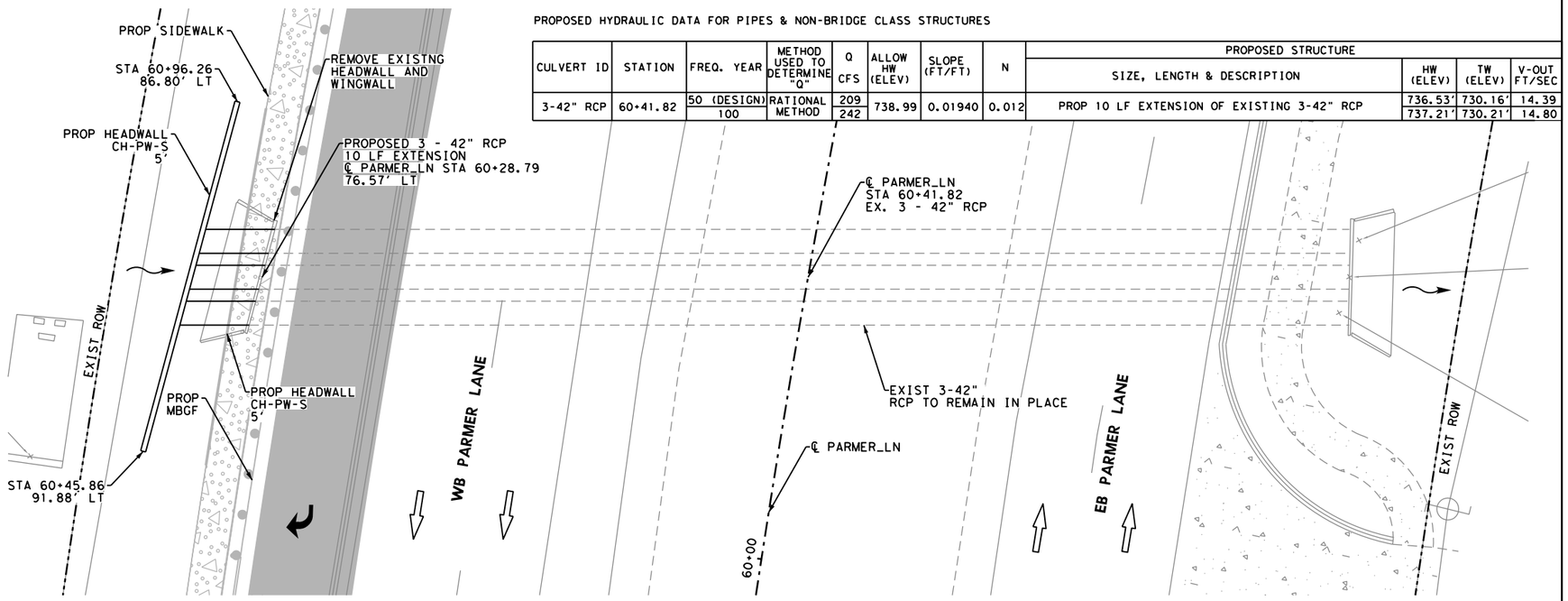
DRAINAGE CALCULATIONS

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		76

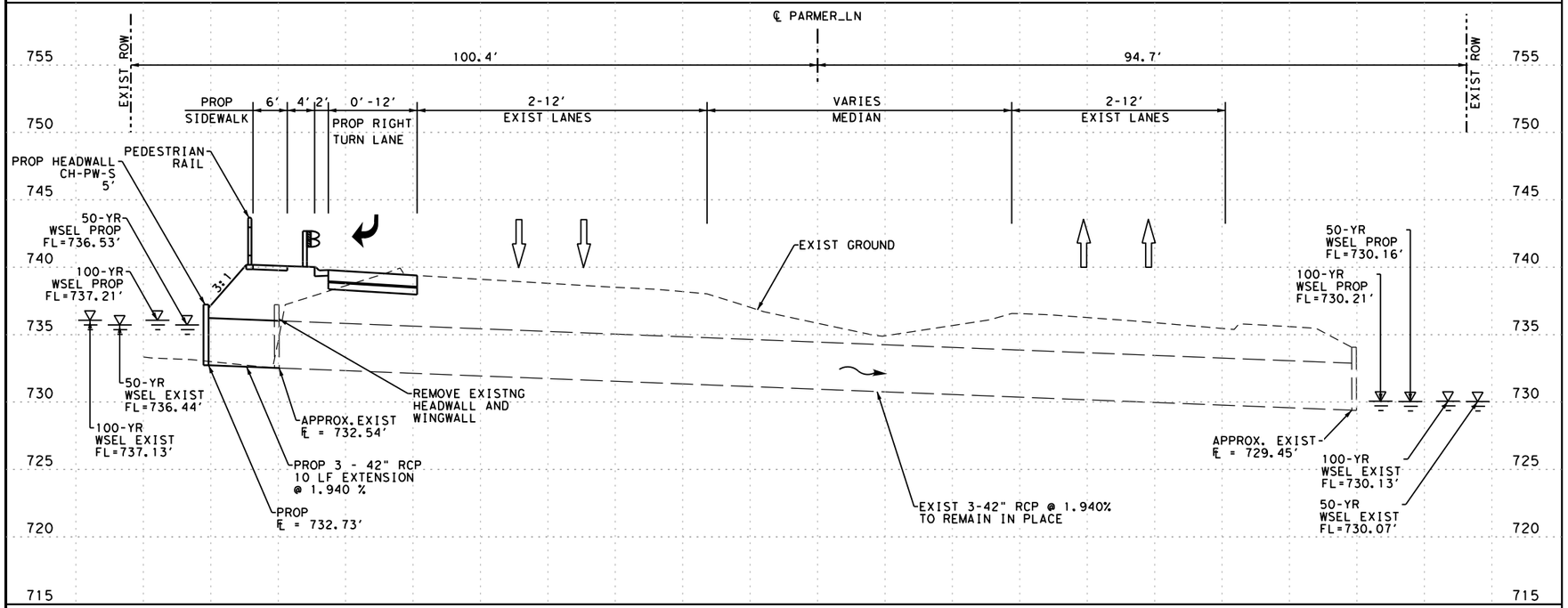
PROPOSED HYDRAULIC DATA FOR PIPES & NON-BRIDGE CLASS STRUCTURES

CULVERT ID	STATION	FREQ. YEAR	METHOD USED TO DETERMINE "Q"	Q CFS	ALLOW HW (ELEV)	SLOPE (FT/FT)	N	PROPOSED STRUCTURE SIZE, LENGTH & DESCRIPTION	HW (ELEV)	TW (ELEV)	V-OUT FT/SEC
3-42" RCP	60+41.82	50 (DESIGN)	RATIONAL METHOD	209	738.99	0.01940	0.012	PROP 10 LF EXTENSION OF EXISTING 3-42" RCP	736.53'	730.16'	14.39
		100		242					737.21'	730.21'	14.80



STA 60+41.82

EXIST 3 -42" X 159' REINFORCED CONCRETE PIPE CULVERT W/ WINGWALLS
PROPOSED 10' EXTENSION



LEGEND

- EXISTING DIRECTION OF TRAFFIC
- PROPOSED DIRECTION OF TRAFFIC
- DRAINAGE FLOW
- EXIST ROW
- 535 CONTOURS
- PROPOSED GRATE INTLET
- CUT & RESTORE PAVEMENT

NOTES:

1. STATION AND OFFSET ARE BASED ON PARMER_LN CENTER LINE UNLESS OTHERWISE NOTED.
2. REFER TO APPLICABLE TXDOT STANDARDS DETAILS FOR ALL STRUCTURES AND END TREATMENTS (AS SHOWN ON PLANS).
3. ALL EXISTING DRAINAGE STRUCTURES TO REMAIN IN PLACE UNLESS NOTED OTHERWISE.
4. CALCULATIONS BASED ON DRAINAGE HYDRAULIC DATA PROVIDED CARTER-BURGESS, INC., CSJ 3417-03-002 DATED 8-18-95.
5. ATLAS-14 RAINFALL INTENSITIES WERE NOT USED FOR THIS PROJECT AND A REVIEW WAS PERFORMED TO DETERMINE IF THE PROPOSED DESIGN MEETS CRITERIA WITH ATLAS-14 INTENSITIES FOR THIS PROJECT.

0 5 10 20
SCALE: 1"=20' H
1"=10' V

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
12/29/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

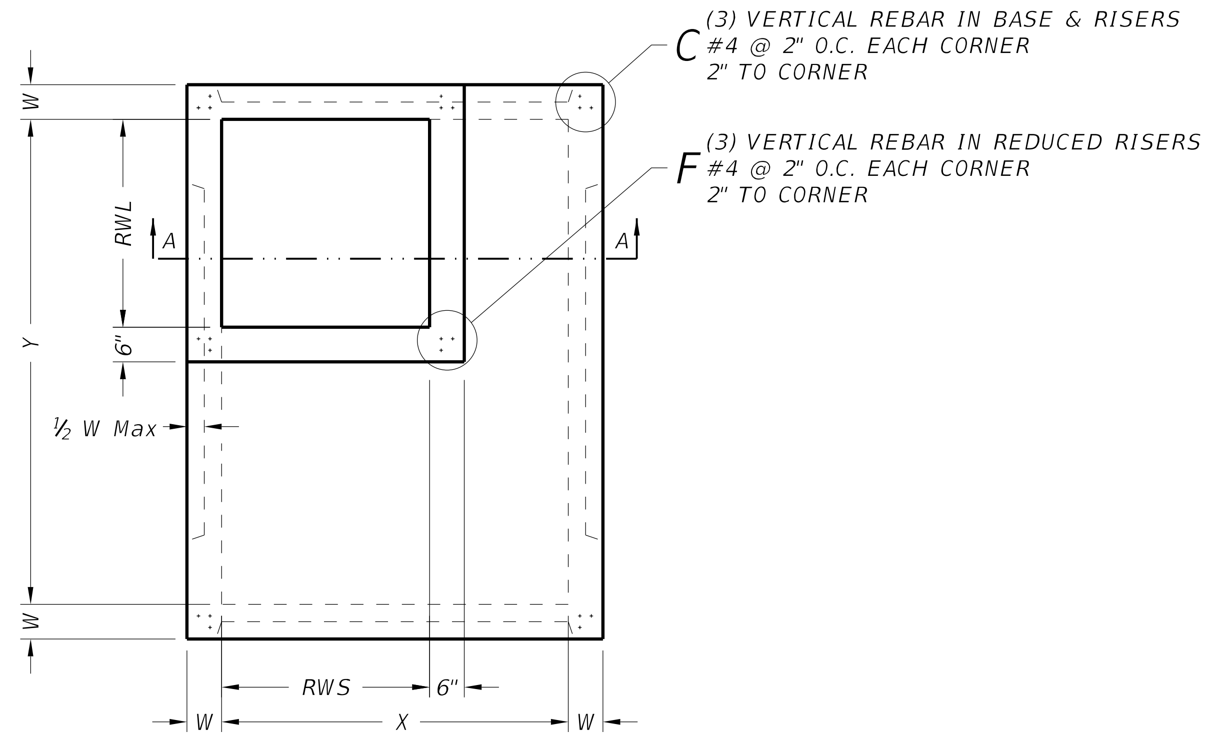
Texas Department of Transportation

PARMER LANE
DRAINAGE
CULVERT LAYOUT
STA 60+41.82

SHEET 1 OF 1

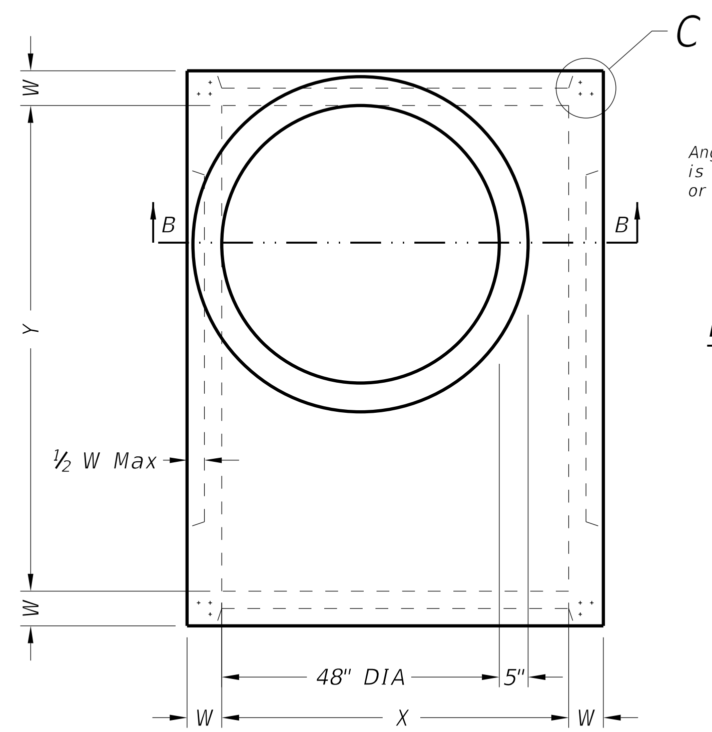
© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
		DIST	COUNTY		SHEET NO.
DW:	CK:	14	TRAVIS		77

V:\2220\active\222010025\civil\cad\CD Design\DRWY ACCESS RT\DRAINAGE\222010025_DRN_02.dgn 12/29/2020 5:02:46 PM KMcClure 100%



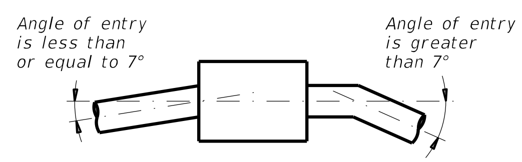
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



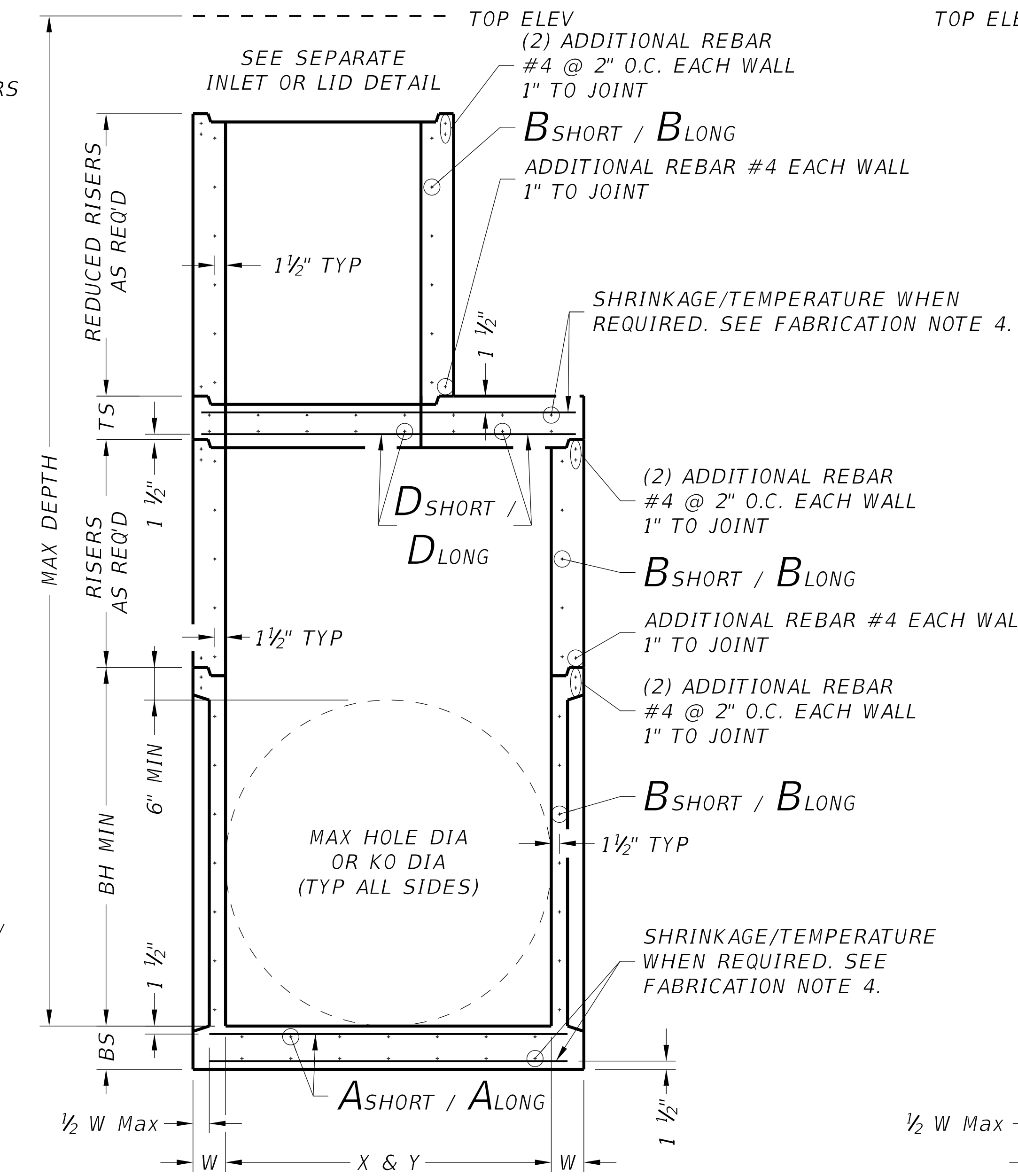
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



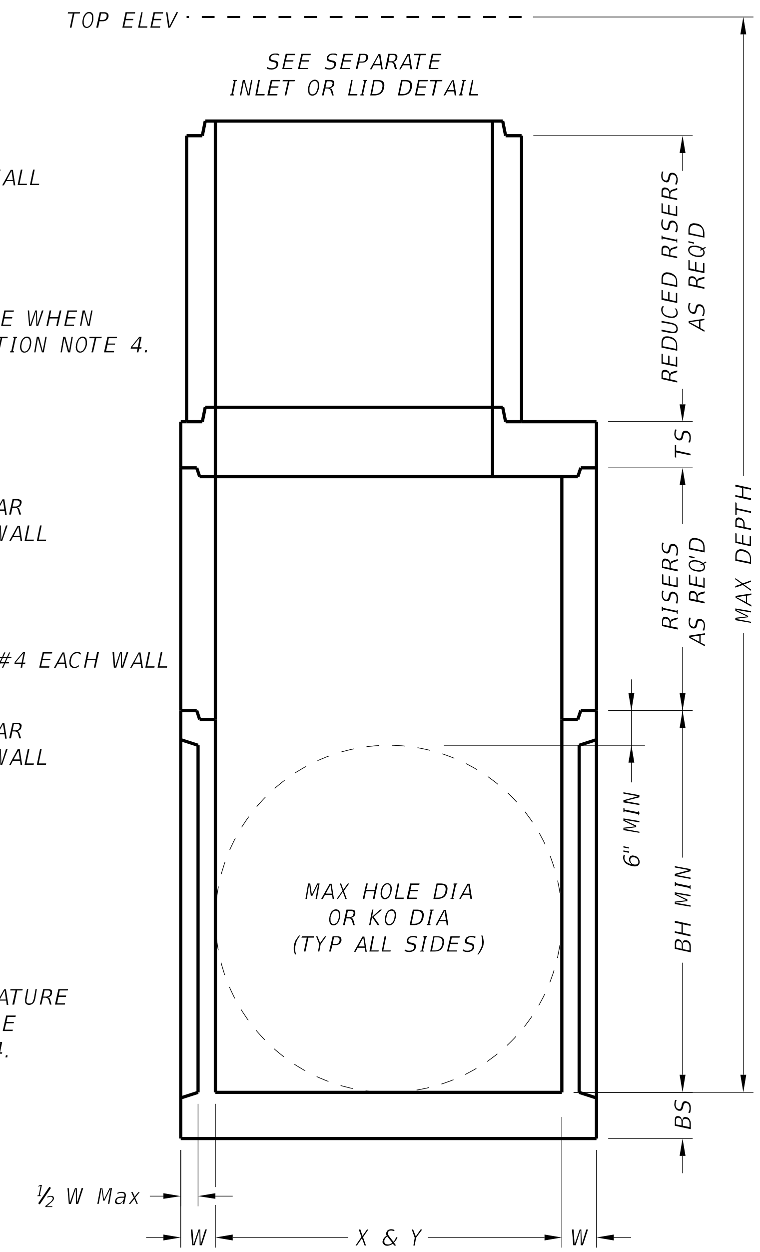
PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PB wall. If necessary, use pipe elbow or curved approach alignment to stay within this limit.



SECTION A-A

SQUARE REDUCED RISER OPTION



SECTION B-B

ROUND REDUCED RISER OPTION

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.

INSTALLATION NOTES:

1. If required elsewhere. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to specified inlet or manhole.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for precast base is subsidiary to the specified inlet, per Item 465, "Junction Boxes, Manholes, and Inlets."

Cover dimensions are clear dimensions, unless noted otherwise.

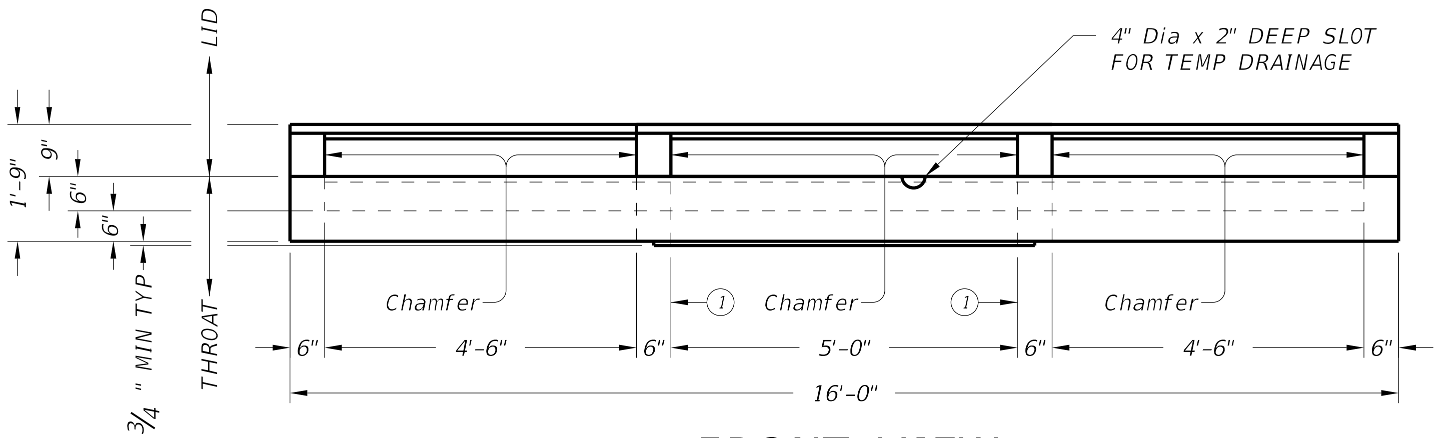
HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

PRECAST BASE

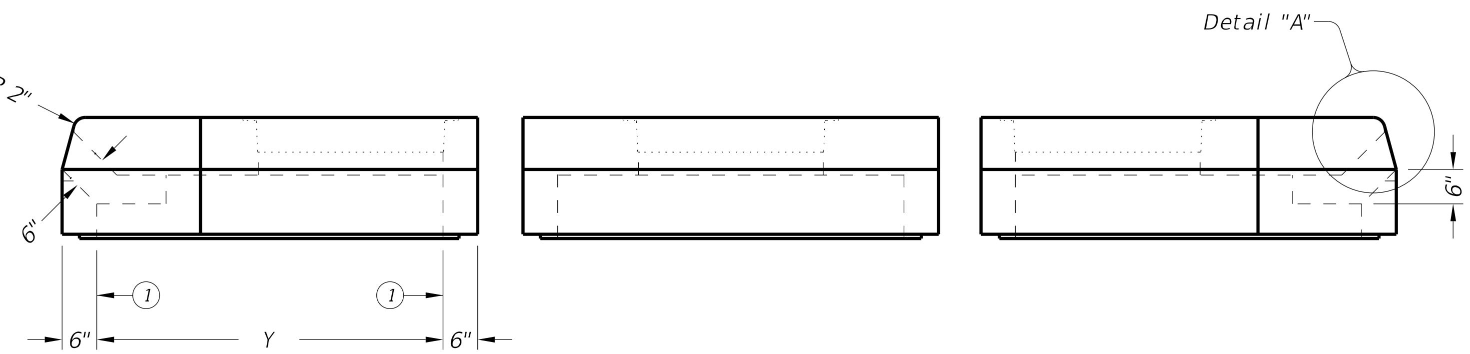
PB

FILE: prestd01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT 3136	SECT 01	JOB 191	HIGHWAY SL 0001
REVISIONS	DIST AUS	COUNTY TRAVIS		SHEET NO. 78



FRONT VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



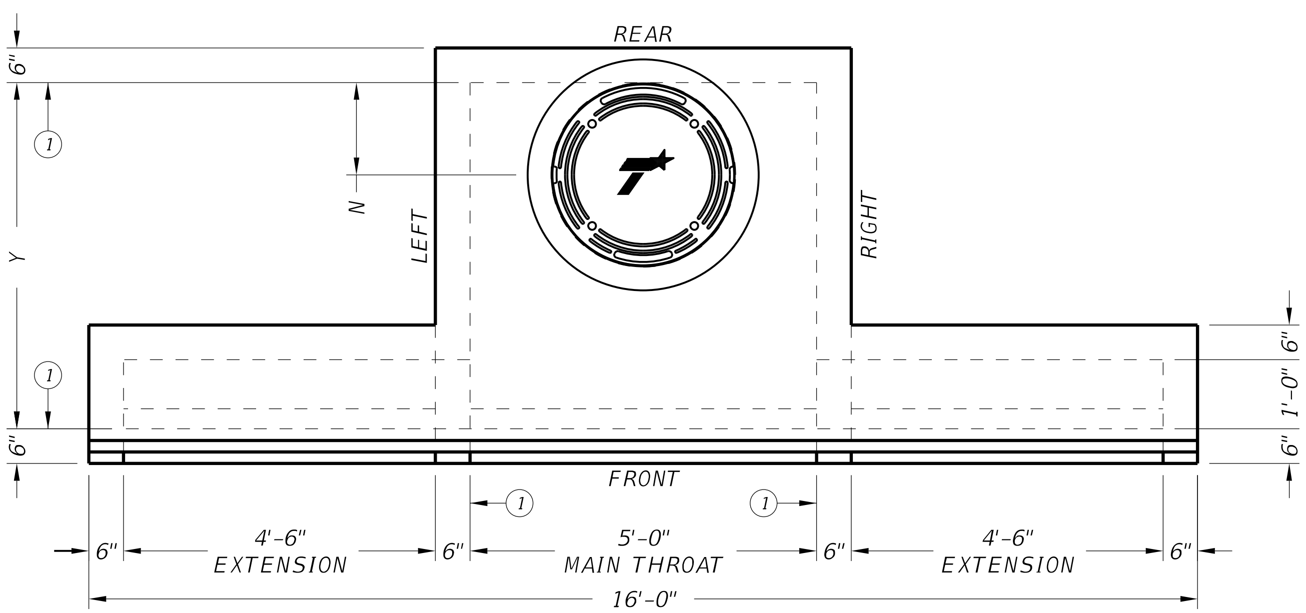
RIGHT VIEW

REAR VIEW

(EXTENSIONS NOT SHOWN)

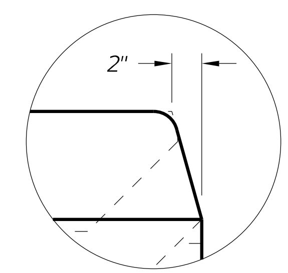
LEFT VIEW

(1) Matches inside face of wall of precast base or riser below inlet.



PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



DETAIL "A"

HS20 LOADING SHEET 1 OF 2

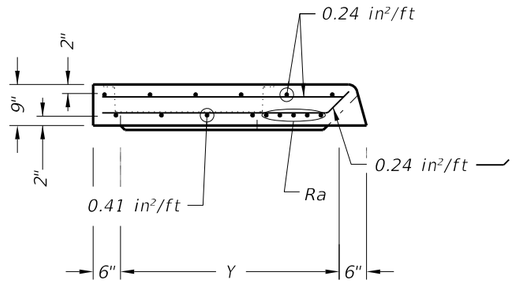
Texas Department of Transportation | Bridge Division Standard

PRECAST CURB INLET
OUTSIDE ROADWAY

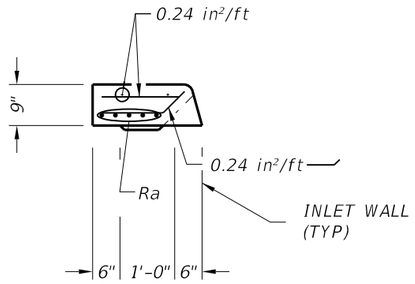
PCO

FILE: prestd03-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		79

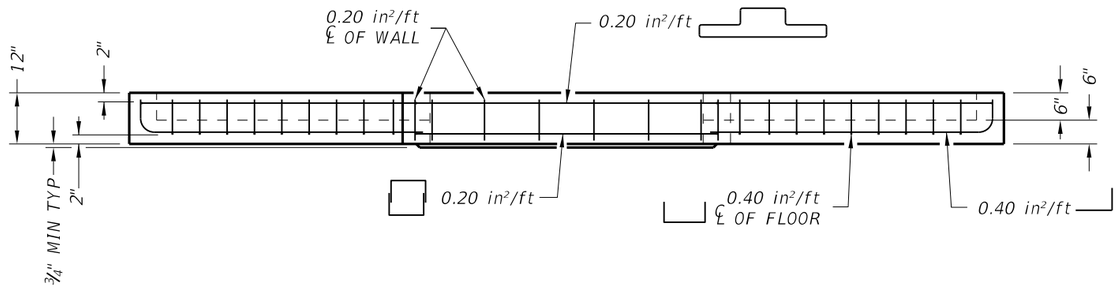
DATE: 11/9/2020 8:52:06 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\5. Drainage\DRAINAGE STD\prestd03-20.dgn



LID SECTION A-A

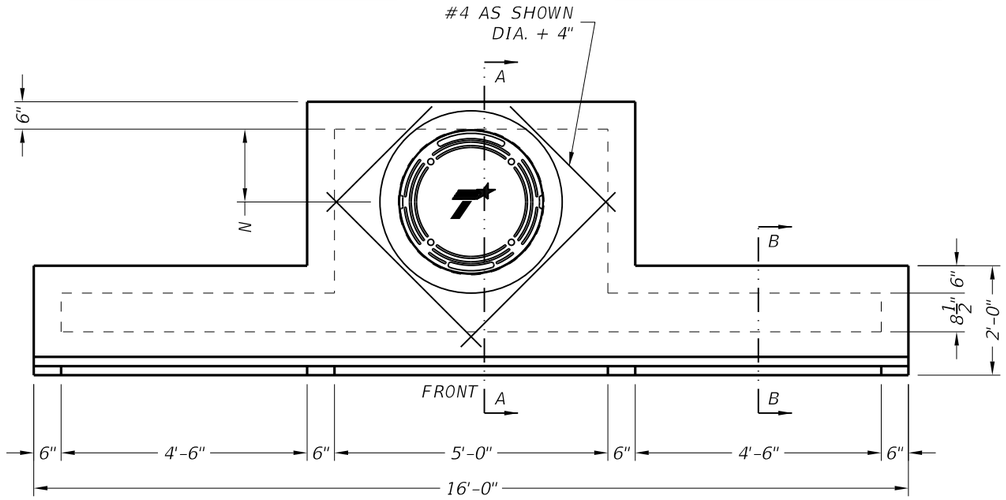


LID SECTION B-B



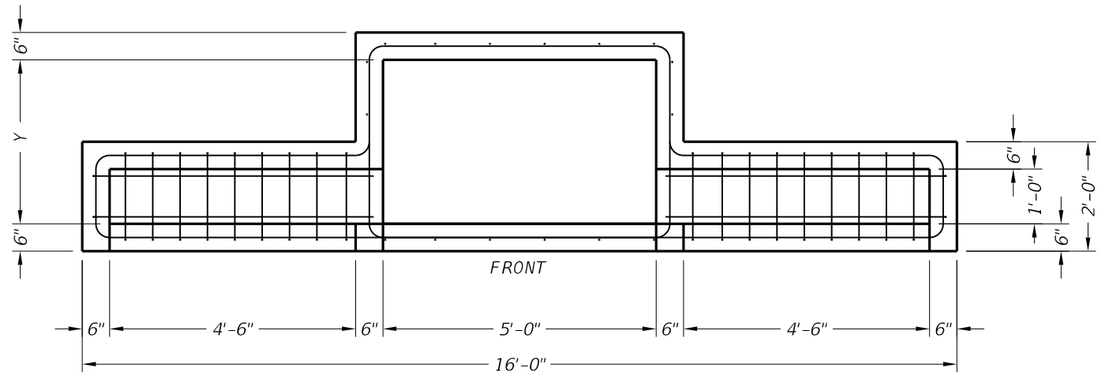
THROAT ELEVATION VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



LID PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



THROAT PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)

SIZE(Y)	N	MH DIA*	Ra
3'	9"	18"	(4) #5 Additional
4'	16"	32"	(4) #5 Additional
5'	16"	32"	(4) #5 Additional
6'	16"	32"	(4) #5 Additional

* Nominal ring and cover size.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Extensions may be right, left, both or none. Provide extensions as specified elsewhere in the plans.
4. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾". Lid may employ a butt joint with dowels at the Contractor's option.
5. Provide lifting devices in conformance with Manufacturer's recommendations.
6. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.
7. Chamfer vertical edges of inlet lid ¾" as shown in Front View, sheet 1.

INSTALLATION NOTES:

1. Inlet throat and lid are not intended for direct traffic. Do not place in roadway.
2. Seal tongue and groove joints and butt joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Open area of main throat = 360 sq in. Open area of one extension throat = 324 sq in.
3. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, size, and extension placement. Extensions are subsidiary to inlet.

Cover dimensions are clear dimensions, unless noted otherwise.

HS20 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

PRECAST CURB INLET OUTSIDE ROADWAY

PCO

FILE: prestd03-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		80

DATE: 11/9/2020 8:52:08 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\361911\4 Design\DRAFTING\STD\prestd03-20.dgn

	Size	MAX DEPTH = 15 ft. to top of BASE SLAB										MAX DEPTH = 25 ft. to top of BASE SLAB												
		Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Min Height (See Gen Note 3)	Max HOLE DIA (See Fab Note 2)	Max KO DIA (See Fab Note 2)
		Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness			
	X x Y	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	BH MIN	HOLE DIA	KO DIA
	ft.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	ft.	in.	in.
Precast Junction Box (PJB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	0.37	0.37	9	0.29	0.29	6	0.24	0.24	6	N/A	0.37	0.37	9	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60
	5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.54	8	N/A	0.48	0.48	9	5.5	60/72	60/72
	6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72
	8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72
Precast Base (PB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60
	5x5	0.38	0.38	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60
	5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72
	5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72
	6x6	0.29	0.29	9	0.45	0.45	6	3x3	0.41	0.41	9	0.52	0.52	9	0.54	0.54	8	3x3	0.74	0.74	9	6.5	72	72
	6x6	0.27	0.27	9	0.45	0.45	6	4x4	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72

** Unless otherwise indicated.

FABRICATION NOTES:

1. Maximum spacing of reinforcement is 8".
2. At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.

GENERAL NOTES:

1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
2. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
3. Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-6".

HL93 LOADING

Texas Department of Transportation

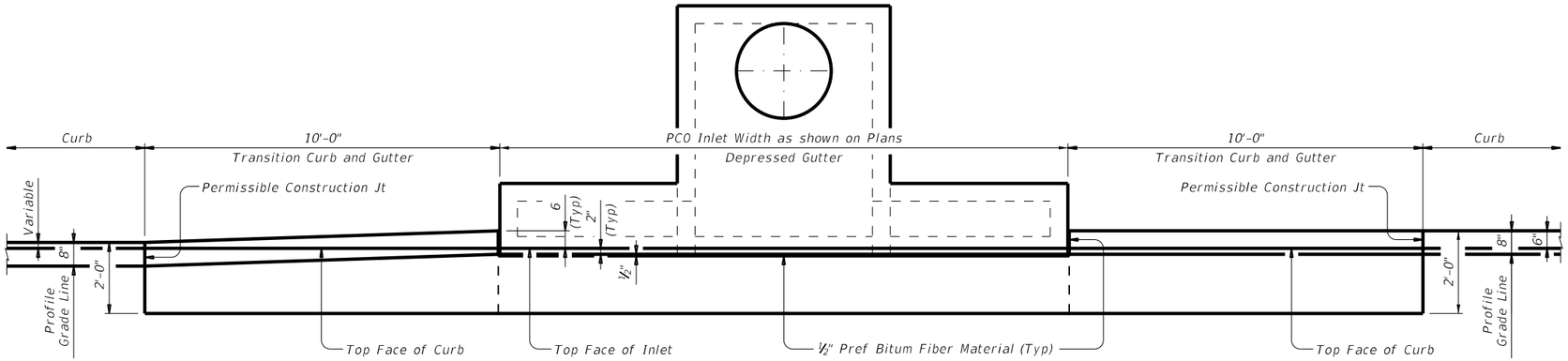
Bridge Division Standard

DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

FILE: prestd10-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		81

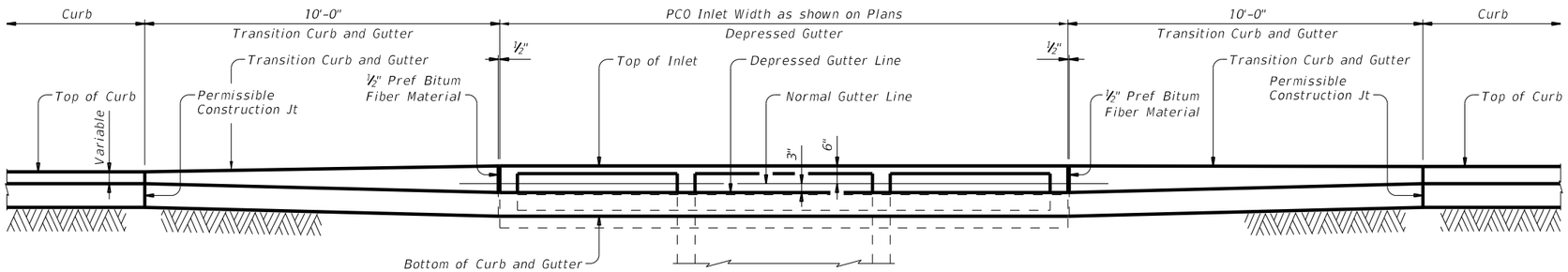
DATE: 11/6/2020 1:43:52 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136019\14 Design\DRAFTING\STD\prestd13-20.dgn



SHOWING TYPE I, IIa & III Curb and Gutter

SHOWING TYPE II & IV Curb and Gutter

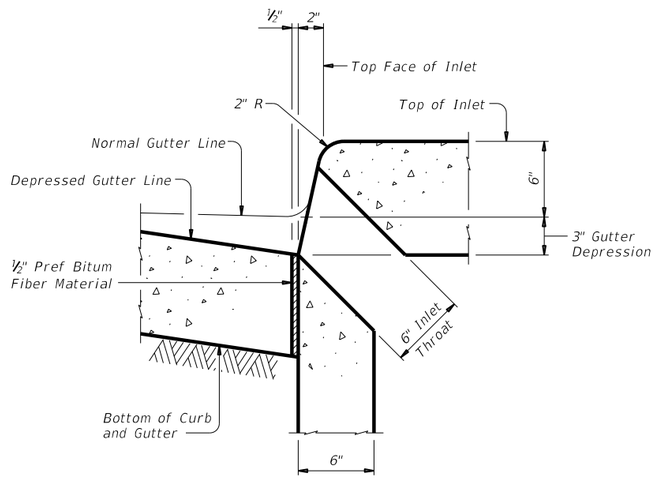
PLAN



SHOWING TYPE I, IIa & III Curb and Gutter

SHOWING TYPE II & IV Curb and Gutter

ELEVATION



SECTION AT GUTTER AND INLET

Reinforcing steel not shown for clarity.

CONSTRUCTION NOTES:
Align top face of curb with PCO Inlet as shown.

MATERIAL NOTES:
Provide ½" Preformed Bituminous Fiber Material.

GENERAL NOTES:
See Precast Curb Inlet Outside Roadway (PCO) standard for details and notes not shown.
See Concrete Curb and Curb and Gutter (CCCG-12) standard for details and notes not shown.
Curb and Gutter Transitions is paid for and in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
Preformed Bituminous Fiber Material is subsidiary to PCO Inlet.

Texas Department of Transportation

Bridge Division Standard

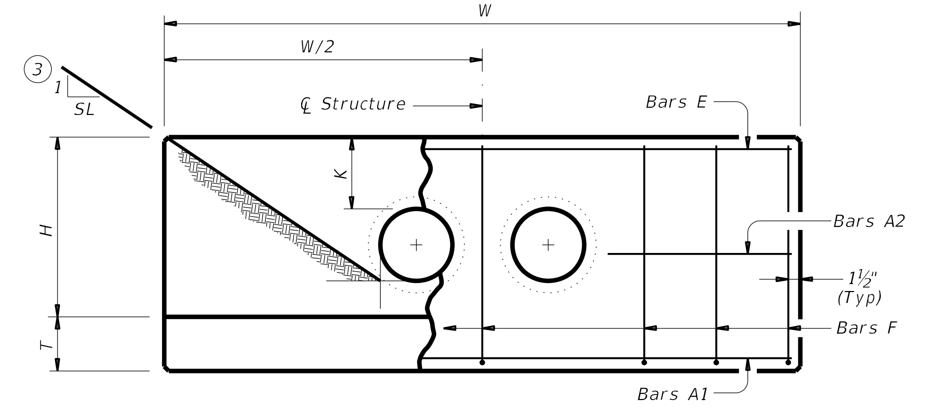
CURB AND GUTTER TRANSITION DETAILS FOR PCO INLET

CGT-PCO

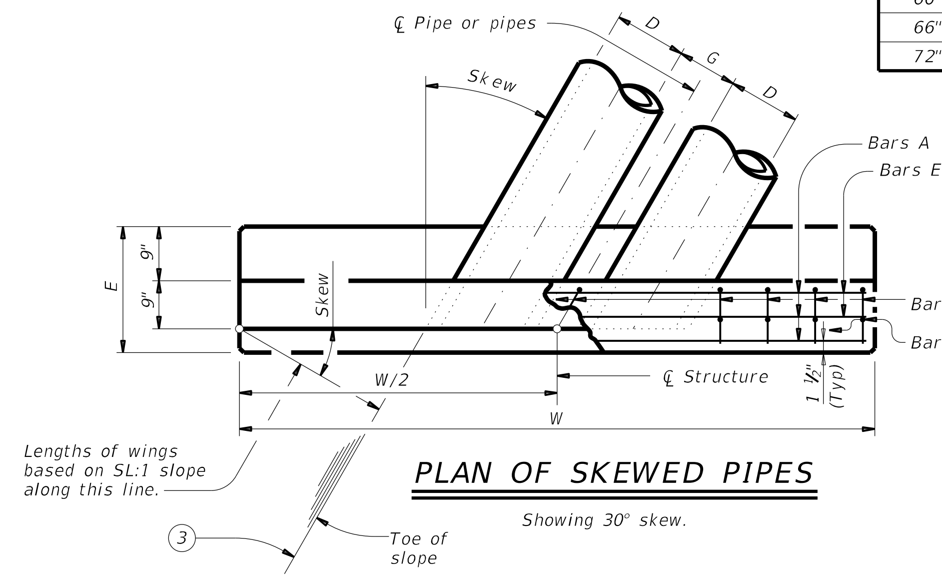
FILE: prestd13-20.dgn	DN: TxDOT	CK: AES	DW: JTR	CK: AES
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		82

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

Slope	Dia of Pipe (D)	15° Skew: Values for One Pipe W	Reinf (Lbs) (1)	Conc (CY) (2)	15° Skew: Values To Be Added for Each Addt'l Pipe W	Reinf (Lbs) (1)	Conc (CY) (2)	30° Skew: Values for One Pipe W	Reinf (Lbs) (1)	Conc (CY) (2)	30° Skew: Values To Be Added for Each Addt'l Pipe W	Reinf (Lbs) (1)	Conc (CY) (2)	45° Skew: Values for One Pipe W	Reinf (Lbs) (1)	Conc (CY) (2)	45° Skew: Values To Be Added for Each Addt'l Pipe W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' - 4"	124	1.1	1' - 9 ¾"	15	0.2	10' - 5"	130	1.2	2' - 0"	16	0.2	12' - 9"	159	1.5	2' - 5 ¾"	17	0.3
	15"	10' - 7"	136	1.3	2' - 3"	17	0.2	11' - 10"	159	1.5	2' - 6"	18	0.2	14' - 6"	191	1.8	3' - 0 ¾"	20	0.3
	18"	11' - 11"	165	1.5	2' - 9"	19	0.3	13' - 3"	174	1.7	3' - 1"	29	0.3	16' - 3"	207	2.1	3' - 9 ¼"	33	0.4
	21"	13' - 2"	203	1.9	3' - 2 ¼"	31	0.4	14' - 9"	233	2.1	3' - 6 ¾"	33	0.4	18' - 0"	276	2.6	4' - 4 ¼"	36	0.5
	24"	14' - 6"	240	2.1	3' - 8 ¼"	34	0.4	16' - 2"	251	2.4	4' - 1 ¾"	36	0.5	19' - 10"	318	2.9	5' - 0 ¾"	39	0.6
	27"	15' - 9"	258	2.5	4' - 0 ¾"	38	0.5	17' - 7"	292	2.8	4' - 6 ¼"	39	0.6	21' - 7"	342	3.4	5' - 6 ¼"	44	0.7
	30"	17' - 1"	297	2.8	4' - 5 ¾"	40	0.6	19' - 1"	311	3.1	5' - 0"	42	0.6	23' - 4"	388	3.8	6' - 1 ¾"	47	0.8
	33"	18' - 5"	320	3.3	4' - 9 ¾"	43	0.6	20' - 6"	358	3.6	5' - 4 ¾"	46	0.7	25' - 1"	439	4.4	6' - 7 ¼"	51	0.9
	36"	19' - 8"	401	4.0	5' - 3"	47	0.9	21' - 11"	422	4.5	5' - 10 ¾"	50	0.9	26' - 10"	517	5.5	7' - 2 ¼"	55	1.2
	42"	22' - 3"	476	5.0	6' - 0 ¾"	53	1.1	24' - 10"	528	5.6	6' - 8 ¾"	56	1.2	30' - 5"	634	6.9	8' - 3"	76	1.4
	48"	25' - 11"	577	6.6	6' - 9 ¾"	60	1.3	28' - 10"	637	7.3	7' - 7 ¼"	79	1.5	35' - 4"	791	9.0	9' - 3 ¾"	88	1.8
	54"	28' - 6"	711	7.8	7' - 9"	83	1.6	31' - 9"	781	8.7	8' - 8"	81	1.8	38' - 11"	958	10.7	10' - 7 ¼"	97	2.2
	60"	31' - 1"	805	9.2	8' - 6 ¼"	91	1.9	34' - 8"	881	10.2	9' - 6 ¼"	97	2.1	42' - 5"	1,113	12.5	11' - 8"	124	2.6
	66"	33' - 8"	907	10.6	9' - 0 ¾"	98	2.1	37' - 6"	1,028	11.8	10' - 1 ¼"	102	2.4	46' - 0"	1,235	14.5	12' - 4 ¼"	132	2.9
	72"	36' - 3"	1,071	12.1	9' - 8"	105	2.4	40' - 5"	1,207	13.5	10' - 9 ¼"	110	2.6	49' - 6"	1,446	16.6	13' - 2 ¼"	141	3.2
3:1	12"	13' - 6"	178	1.6	1' - 9 ¾"	15	0.2	15' - 0"	189	1.8	2' - 0"	15	0.2	18' - 5"	237	2.2	2' - 5 ¾"	17	0.2
	15"	15' - 3"	212	1.9	2' - 3"	17	0.2	17' - 0"	223	2.1	2' - 6"	17	0.3	20' - 10"	276	2.6	3' - 0 ¾"	20	0.3
	18"	17' - 1"	231	2.3	2' - 9"	19	0.3	19' - 1"	259	2.5	3' - 1"	29	0.3	23' - 4"	318	3.1	3' - 9 ¼"	32	0.4
	21"	18' - 11"	306	2.7	3' - 2 ¼"	31	0.4	21' - 1"	339	3.0	3' - 6 ¾"	33	0.4	25' - 10"	413	3.7	4' - 4 ¼"	36	0.5
	24"	20' - 8"	345	3.1	3' - 8 ¾"	35	0.4	23' - 1"	384	3.5	4' - 1 ¾"	36	0.5	28' - 3"	462	4.2	5' - 0 ¾"	40	0.6
	27"	22' - 6"	376	3.7	4' - 0 ¾"	38	0.5	25' - 1"	438	4.1	4' - 6 ¼"	39	0.6	30' - 9"	522	5.0	5' - 6 ¼"	44	0.7
	30"	24' - 4"	422	4.1	4' - 5 ¾"	40	0.6	27' - 2"	466	4.6	5' - 0"	42	0.6	33' - 3"	578	5.6	6' - 1 ¾"	47	0.8
	33"	26' - 2"	476	4.8	4' - 10"	43	0.6	29' - 2"	522	5.3	5' - 4 ¾"	46	0.7	35' - 9"	644	6.5	6' - 7 ¼"	51	0.9
	36"	27' - 11"	590	5.9	5' - 3"	47	0.8	31' - 2"	645	6.6	5' - 10 ¾"	50	0.9	38' - 2"	787	8.0	7' - 2 ¼"	56	1.2
	42"	31' - 7"	684	7.3	6' - 0 ¼"	53	1.1	35' - 3"	776	8.2	6' - 8 ¾"	56	1.2	43' - 2"	933	10.0	8' - 3"	79	1.4
	48"	36' - 9"	880	9.6	6' - 9 ¾"	61	1.3	41' - 0"	953	10.7	7' - 7 ¼"	81	1.5	50' - 2"	1,166	13.1	9' - 3 ¾"	88	1.8
	54"	40' - 5"	1,065	11.4	7' - 9"	85	1.6	45' - 0"	1,185	12.7	8' - 8"	89	1.8	55' - 2"	1,435	15.5	10' - 7 ¼"	97	2.2
	60"	44' - 0"	1,224	13.3	8' - 6 ¼"	93	1.9	49' - 1"	1,356	14.8	9' - 6 ¼"	96	2.1	60' - 1"	1,635	18.2	11' - 8"	124	2.6
	66"	47' - 7"	1,357	15.4	9' - 1"	98	2.1	53' - 1"	1,497	17.2	10' - 1 ¼"	103	2.3	65' - 1"	1,892	21.1	12' - 4 ¼"	130	2.9
	72"	51' - 3"	1,624	17.7	9' - 8"	105	2.3	57' - 2"	1,787	19.7	10' - 9 ¼"	109	2.6	70' - 0"	2,218	24.1	13' - 2 ¼"	139	3.2
4:1	12"	17' - 7"	232	2.1	1' - 9 ¾"	15	0.2	19' - 8"	259	2.4	2' - 0"	16	0.2	24' - 0"	314	2.9	2' - 5 ¾"	18	0.2
	15"	19' - 11"	272	2.5	2' - 3"	17	0.2	22' - 3"	301	2.8	2' - 6"	18	0.3	27' - 3"	361	3.5	3' - 0 ¾"	21	0.3
	18"	22' - 3"	313	3.0	2' - 9"	19	0.3	24' - 10"	344	3.3	3' - 1"	29	0.3	30' - 5"	427	4.0	3' - 9 ¼"	32	0.4
	21"	24' - 7"	407	3.6	3' - 2 ¼"	31	0.4	27' - 5"	446	4.0	3' - 6 ¾"	33	0.4	33' - 7"	549	4.9	4' - 4 ¼"	36	0.5
	24"	26' - 11"	455	4.1	3' - 8 ¾"	35	0.4	30' - 0"	499	4.5	4' - 1 ¾"	36	0.5	36' - 9"	609	5.6	5' - 0 ¾"	40	0.6
	27"	29' - 3"	514	4.8	4' - 0 ¾"	38	0.5	32' - 7"	562	5.4	4' - 6 ¼"	40	0.6	39' - 11"	703	6.6	5' - 6 ¼"	43	0.7
	30"	31' - 7"	568	5.4	4' - 5 ¾"	40	0.6	35' - 3"	620	6.0	5' - 0"	42	0.6	43' - 2"	768	7.4	6' - 1 ¾"	49	0.8
	33"	33' - 11"	634	6.2	4' - 10"	43	0.7	37' - 10"	710	7.0	5' - 4 ¾"	46	0.7	46' - 4"	848	8.5	6' - 7 ¼"	52	0.9
	36"	36' - 3"	776	7.7	5' - 3"	48	0.9	40' - 5"	868	8.6	5' - 10 ¾"	49	0.9	49' - 6"	1,058	10.6	7' - 2 ¼"	56	1.1
	42"	40' - 11"	921	9.6	6' - 0 ¼"	53	1.0	45' - 7"	1,022	10.7	6' - 8 ¾"	57	1.2	55' - 10"	1,262	13.1	8' - 3"	78	1.4
	48"	47' - 7"	1,152	12.6	6' - 10"	61	1.3	53' - 1"	1,268	14.0	7' - 7 ¼"	80	1.5	65' - 1"	1,587	17.2	9' - 3 ¾"	86	1.8
	54"	52' - 3"	1,416	14.9	7' - 9 ¼"	86	1.6	58' - 4"	1,589	16.6	8' - 8"	89	1.8	71' - 5"	1,924	20.4	10' - 7 ¼"	95	2.2
	60"	56' - 11"	1,606	17.5	8' - 6 ¾"	92	1.9	63' - 6"	1,806	19.5	9' - 6 ¼"	95	2.1	77' - 9"	2,192	23.9	11' - 8"	122	2.6
	66"	61' - 7"	1,819	20.2	9' - 0 ¾"	97	2.1	68' - 8"	2,019	22.5	10' - 1 ¼"	101	2.4	84' - 2"	2,472	27.6	12' - 4 ¼"	131	2.9
	72"	66' - 3"	2,150	23.2	9' - 8"	104	2.4	73' - 11"	2,379	25.9	10' - 9 ¼"	108	2.6	90' - 6"	2,937	31.7	13' - 2 ¼"	138	3.2
6:1	12"	25' - 11"	342	3.1	1' - 9 ¾"	15	0.2	28' - 10"	374	3.5	2' - 0"	16	0.2	35' - 4"	456	4.3	2' - 5 ¾"	17	0.2
	15"	29' - 3"	390	3.7	2' - 3"	17	0.2	32' - 7"	442	4.2	2' - 6"	18	0.2	39' - 11"	549	5.1	3' - 0 ¾"	20	0.3
	18"	32' - 7"	459	4.4	2' - 9"	20	0.3	36' - 4"	515	4.9	3' - 1"	29	0.3	44' - 7"	629	6.0	3' - 9 ¼"	33	0.4
	21"	36' - 0"	608	5.3	3' - 2 ¼"	31	0.4	40' - 2"	660	5.9	3' - 6 ¾"	33	0.4	49' - 2"	823	7.2	4' - 4 ¼"	38	0.5
	24"	39' - 4"	672	6.0	3' - 8 ¾"	35	0.4	43' - 11"	748	6.7	4' - 1 ¾"	36	0.5	53' - 9"	920	8.2	5' - 0 ¾"	42	0.6
	27"	42' - 8"	770	7.1	4' - 0 ¾"	38	0.5	47' - 8"	852	8.0	4' - 6 ¼"	41	0.5	58' - 4"	1,039	9.7	5' - 6 ¼"	45	0.7
	30"	46' - 1"	839	8.0	4' - 5 ¾"	40	0.6	51' - 5"	949	8.9	5' - 0"	44	0.6	62' - 11"	1,162	10.9	6' - 1 ¾"	48	0.8
	33"	49' - 5"	947	9.2	4' - 10"	45	0.7	55' - 2"	1,040	10.3	5' - 4 ¾"	48	0.7	67' - 6"	1,292	12.6	6' - 7 ¼"	50	0.9
	36"	52' - 10"	1,151	11.4	5' - 3"	49	0.8	58' - 11"	1,287	12.7	5' - 10 ¾"	51	1.0	72' - 1"	1,583	15.6	7' - 2 ¼"	55	1.1
	42"	59' - 6"	1,365	14.2	6' - 0 ¼"	55	1.0	66' - 5"	1,530	15.8	6' - 8 ¾"	57	1.2	81' - 4"	1,875	19.4	8' - 3"	76	1.4
	48"	69' - 4"	1,737	18.5	6' - 10"	59	1.3	77' - 4"	1,942	20.7	7' - 7 ¼"	79	1.5	94' - 9"	2,368	25.3	9' - 3 ¾"	86	1.8
	54"	76' - 1"	2,138	22.0	7' - 9 ¼"	83	1.6	84' - 10"	2,378	24.6	8' - 8"	87	1.8	103' - 11"	2,912	30.1	10' - 7 ¼"	95	2.2
	60"	82' - 10"	2,426	25.8	8' - 6 ¾"	90	1.9	92' - 5"	2,681	28.8	9' - 6 ¼"	94	2.1	113' - 2"	3,294	35.3	11' - 8"	122	2.6
	66"	89' - 7"	2,730	29.9	9' - 0 ¾"	96	2.1	99' - 11"	3,038	33.3	10' - 1 ¼"	101	2.4	122' - 4"	3,697	40.8	12' - 4 ¼"	130	2.9
	72"	96' - 3"	3,218	34.2	9' - 8"	102	2.4	107' - 5"	3,580	38.2	10' - 9 ¼"	108	2.6	131' - 6"	4,372	46.8	13' - 2 ¼"	139	3.2

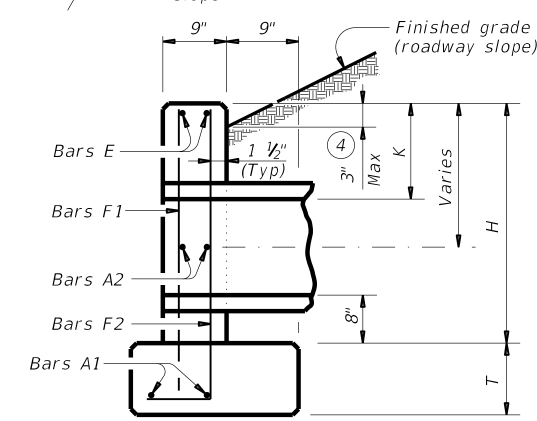


ELEVATION



PLAN OF SKEWED PIPES

Showing 30° skew.



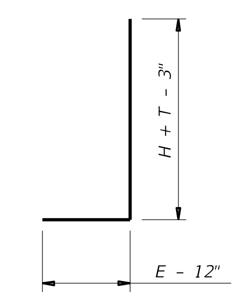
SECTION AT CENTER OF PIPE

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0' - 9"	1' - 0"	2' - 8"	0' - 9"	1' - 9"
15"	0' - 11"	1' - 0"	2' - 11"	0' - 9"	1' - 9"
18"	1' - 2"	1' - 0"	3' - 2"	0' - 9"	1' - 9"
21"	1' - 4"	1' - 0"	3' - 5"	0' - 9"	2' - 0"
24"	1' - 7"	1' - 0"	3' - 8"	0' - 9"	2' - 0"
27"	1' - 8"	1' - 0"	3' - 11"	0' - 9"	2' - 3"
30"	1' - 10"	1' - 0"	4' - 2"	0' - 9"	2' - 3"
33"	1' - 11"	1' - 0"	4' - 5"	0' - 9"	2' - 6"
36"	2' - 1"	1' - 0"	4' - 8"	1' - 0"	2' - 6"
42"	2' - 4"	1' - 0"	5' - 2"	1' - 0"	2' - 9"
48"	2' - 7"	1' - 3"	5' - 11"	1' - 0"	3' - 0"
54"	3' - 0"	1' - 3"	6' - 5"	1' - 0"	3' - 3"
60"	3' - 3"	1' - 3"	6' - 11"	1' - 0"	3' - 6"
66"	3' - 3"	1' - 3"	7' - 5"	1' - 0"	3' - 9"
72"	3' - 4"	1' - 3"	7' - 11"	1' - 0"	4' - 0"

TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1' - 6"	~
E	#5	~	2
F	#5	1' - 0"	~



BARS F2

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.

(1) Total quantites include one 3'-1" lap for bars over 60' in length.

(2) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(3) Indicated slope is perpendicular to centerline pipe or pipes.

(4) For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(5) Dimensions shown are usual and maximum.

(6) Quantities shown are for one structure end only (one headwall).

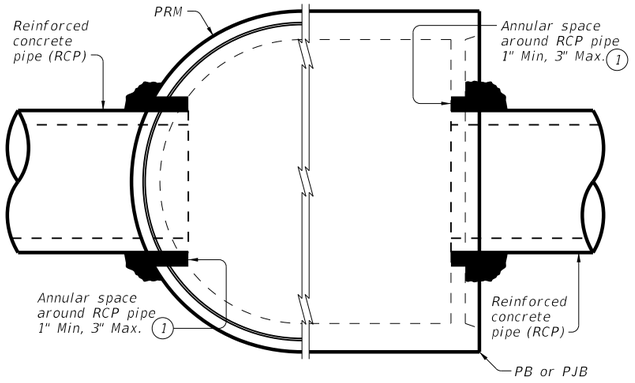
Texas Department of Transportation — Bridge Division Standard

CONCRETE HEADWALLS WITH PARALLEL WINGS FOR SKEWED PIPE CULVERTS

CH-PW-S

FILE: chpwsste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT 3136	SECT 01	JOB 191	HIGHWAY SL 0001
REVISIONS	DIST AUS	COUNTY TRAVIS		SHEET NO. 83

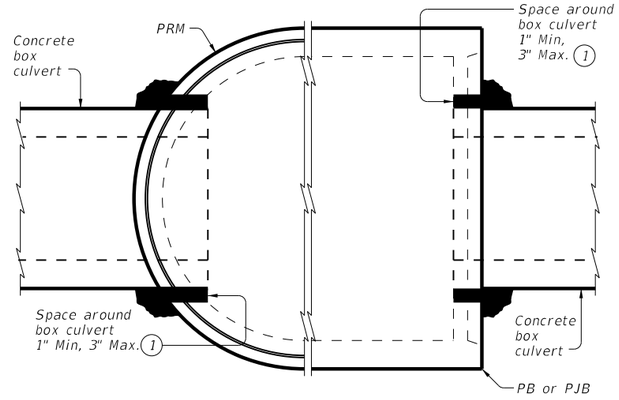
DATE: 11/6/2020 1:44:14 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136019\N4 Design\DRAFTING\STD\pbgcstd1-20.dgn



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

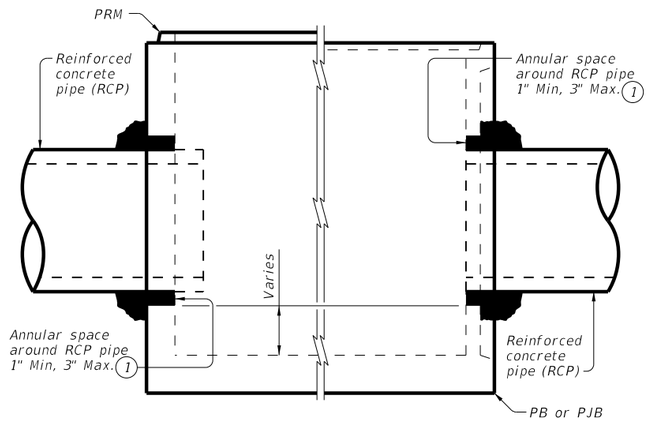
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

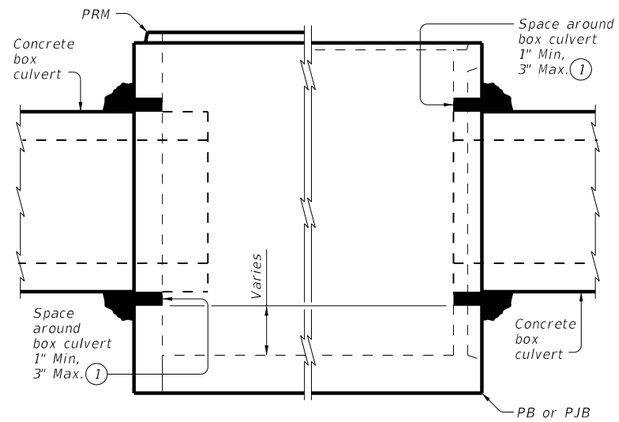
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

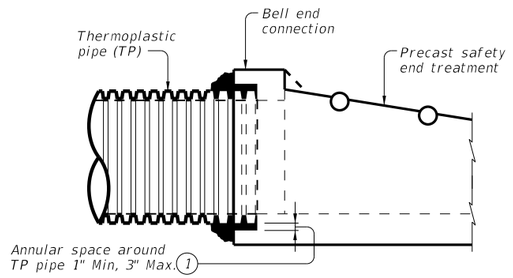
TYPICAL HALF ELEVATION



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF ELEVATION



TYPICAL PARTIAL ELEVATION OF PRECAST SAFETY END TREATMENTS

Showing square PSET for parallel drainage, cross drainage shown similar.

(1) Completely fill the void between the precast structure and the connecting pipe or box with cementitious grouts and mortars in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

CONSTRUCTION NOTES:

Do not grout rubber gasket joints without Manufacturer's recommendations.

Do not use bricks, masonry blocks, native stone, or similar materials in conjunction with grouted connections when filling void spaces around pipes or box culverts.

MATERIAL NOTES:

Provide grouted connections in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

GENERAL NOTES:

See applicable standards for notes and details not shown:

- Precast Base (PB)
- Precast Junction Box (PJB)
- Precast Round Manhole (PRM)
- Precast Safety End Treatments C/D Square (PSET-SC)
- Precast Safety End Treatments P/D Square (PSET-SP)

Provide Concrete Box Culverts in accordance with Item 462 "Concrete Box Culverts and Drains".

Provide Reinforced Concrete Pipe (RCP) in accordance with Item 464 "Reinforced Concrete Pipe".

Provide Thermoplastic Pipe (TP) in accordance with Special Specification Thermoplastic Pipe.

Payment for grouted connections is considered subsidiary to other bid Items.

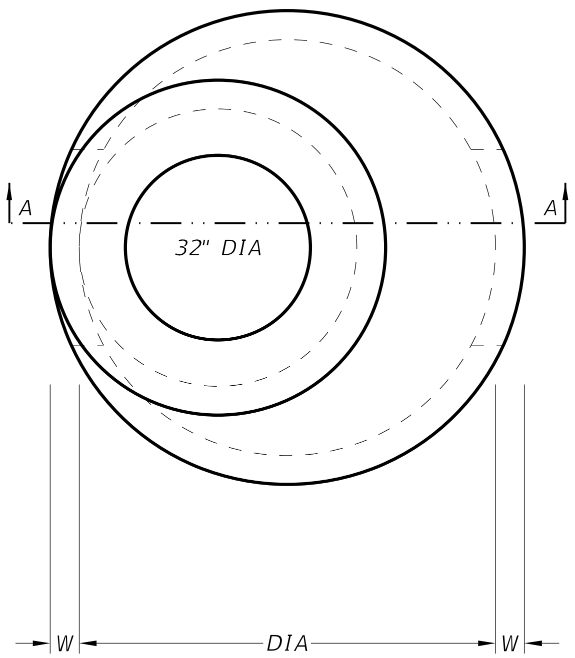
Texas Department of Transportation

Bridge Division Standard

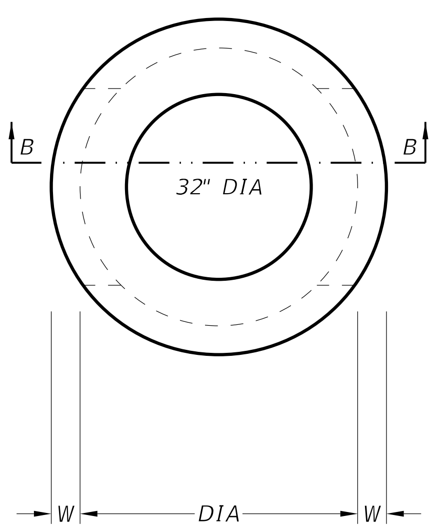
PIPE AND BOX GROUTED CONNECTIONS FOR PRECAST STRUCTURES

PBGC

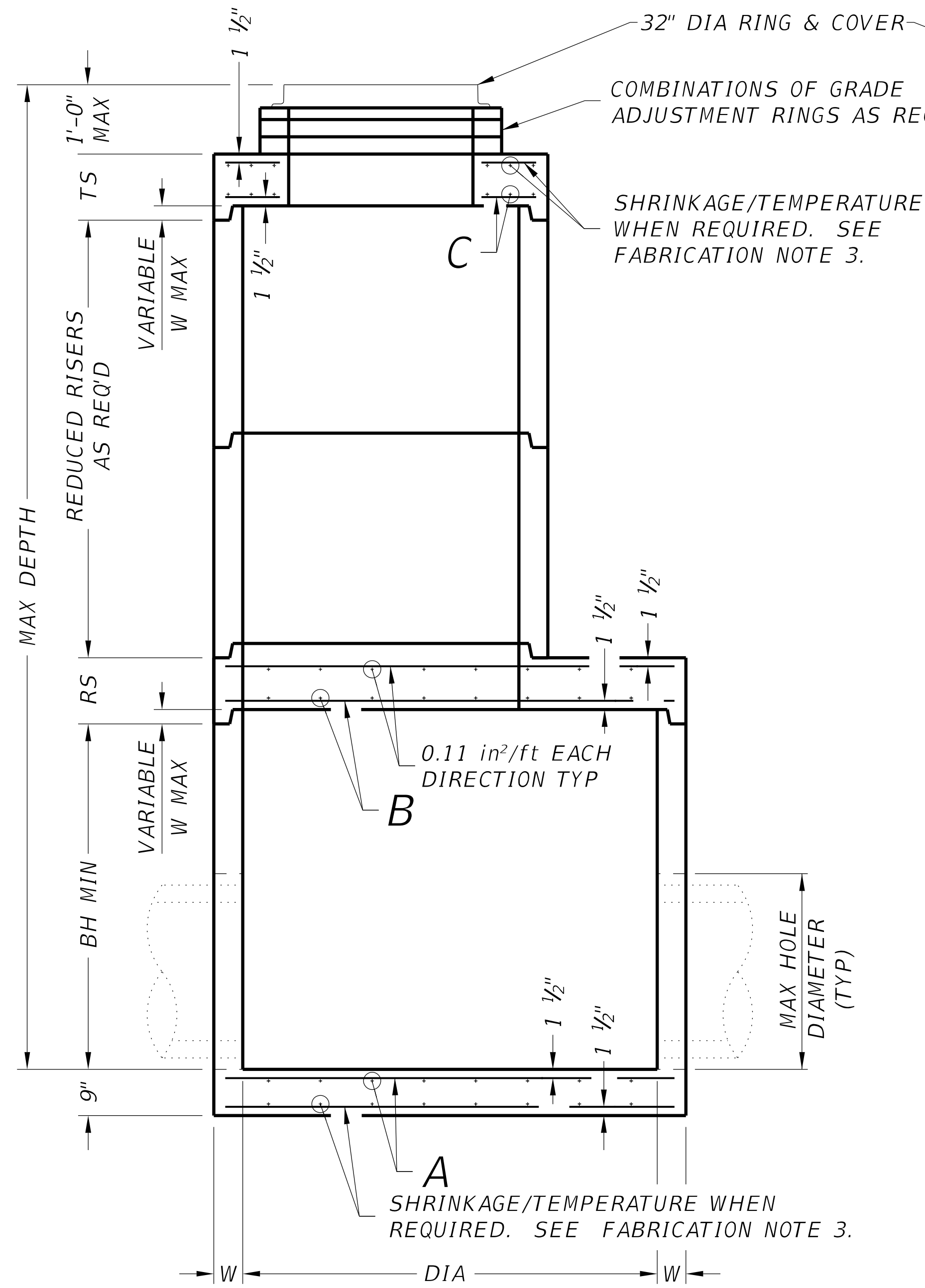
FILE: pbgcstd1-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		84



PLAN VIEW "A"

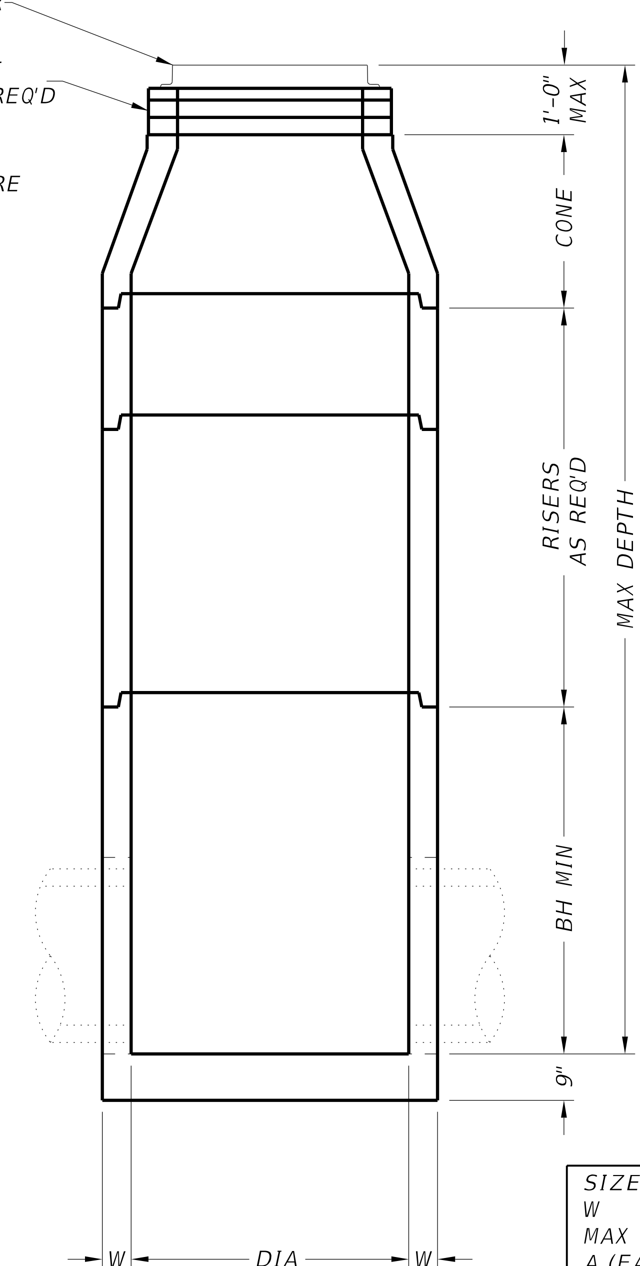


PLAN VIEW "B"



SECTION A-A

ROUND REDUCED RISER OPTION
SHOWING FLAT SLAB TOP



SECTION B-B

ROUND RISER OPTION
SHOWING CONE

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR. Provide circumferential reinforcing steel in vertical walls of base, riser and cone in accordance with ASTM C478.
3. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
4. Manufacture base and risers to nearest 3" increment.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
6. Provide lifting devices in conformance with Manufacturer's recommendations.
7. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.

INSTALLATION NOTES:

1. Cones may be concentric or eccentric. Reduction cones are acceptable. See Manufacturer for cone dimensions.
2. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to this item.
3. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
4. Do not grout rubber gasket joints without Manufacturer's recommendation.
5. Initial installation of grade adjustment rings is limited to 1'-0" Max as shown.
6. Grade adjustment rings may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments may be made up to the Max depth shown. Structure must be evaluated if Max depth will be exceeded.

GENERAL NOTES:

1. Designed according to ASTM C478.
2. Payment for manhole is per Item 465, "Junction Boxes, Manholes, and Inlets" by type and size.
3. Pipe OD + placement tolerance must be equal or less than Max hole diameter. For rigid pipe, placement tolerance is 4" Max, 2" Min. For flexible pipe, consult boot/seal manufacturer's specification for placement tolerance.

Cover dimensions are clear dimensions, unless noted otherwise.

SIZE (DIA)	48 in	60 in	72 in
W	5 in	6 in	7 in
MAX DEPTH	25 ft	25 ft	25 ft
A (EACH WAY)	0.22 in²/ft	0.30 in²/ft	0.45 in²/ft
B (EACH WAY)	N/A	0.37 in²/ft	0.62 in²/ft
C (EACH WAY)	0.24 in²/ft	0.46 in²/ft	0.46 in²/ft
BH MIN	12 in	36 in	36 in
TS	9 in	9 in	9 in
RS	N/A	9 in	12 in
REDUCED RISER DIA	N/A	48 in	48/60 in
MAX HOLE DIA	32 in	40 in	54 in

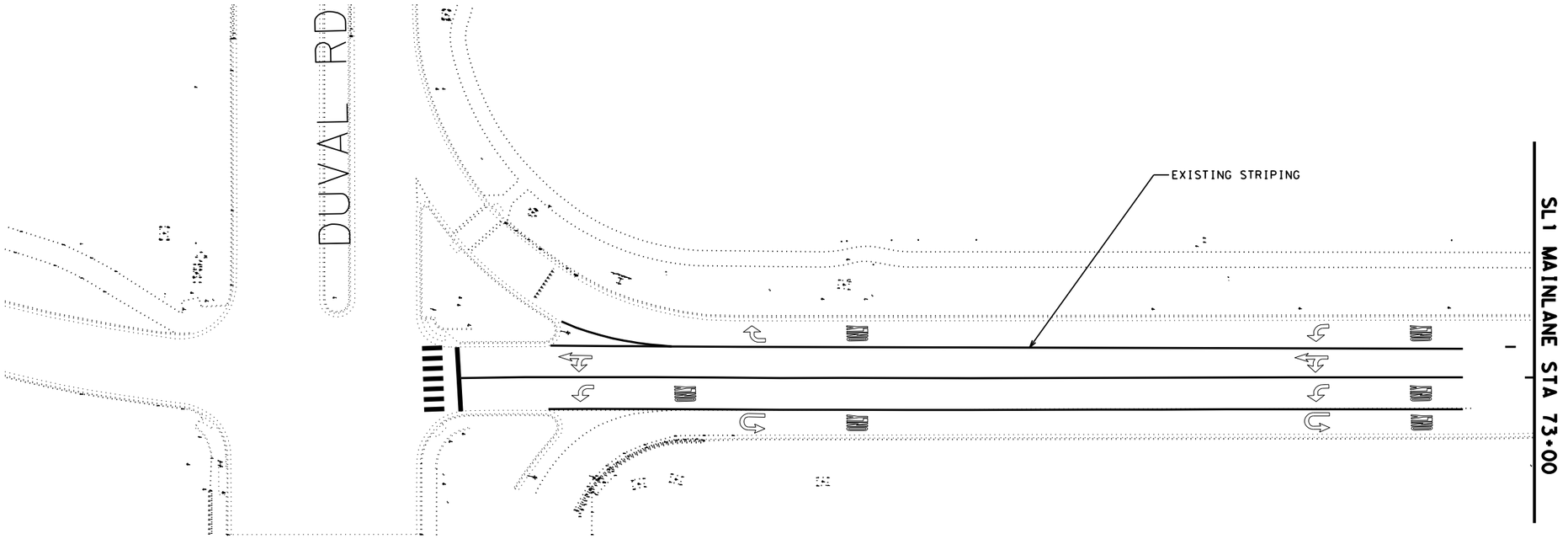
HL93 LOADING

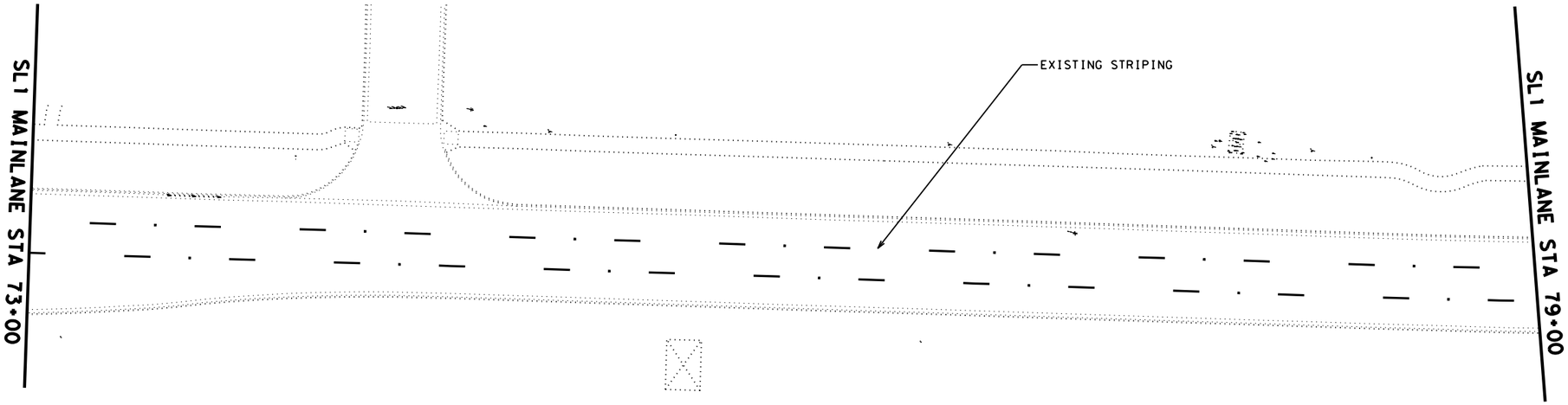
Texas Department of Transportation — Bridge Division Standard

PRECAST ROUND MANHOLE

PRM

FILE: prestd02-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		85





STATE OF TEXAS
RACHEL R. LARCOM
95872
LICENSED
PROFESSIONAL ENGINEER
12/8/2020

SCALE (IN FEET):
0 50

Austin District
North Travis Area Office

Texas Department of Transportation

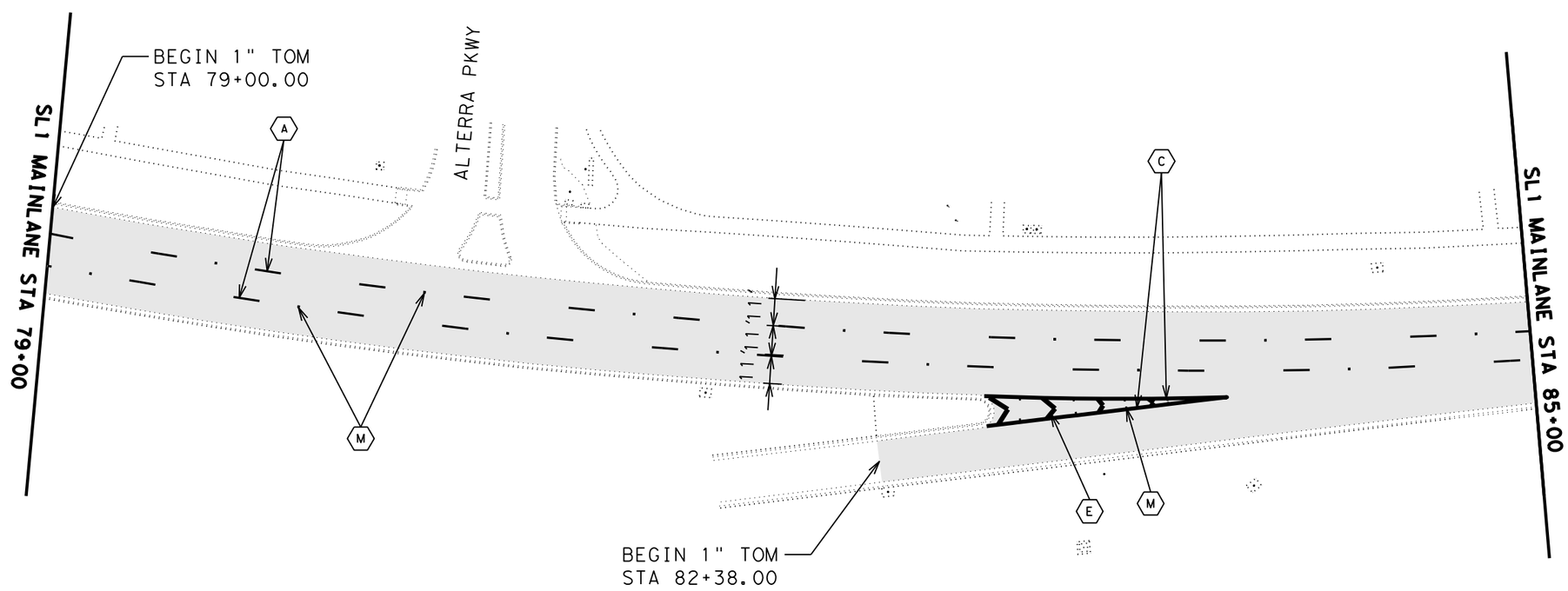
SL 1

SIGNS & PAVENMENT MARKINGS

SHEET 1 OF 4

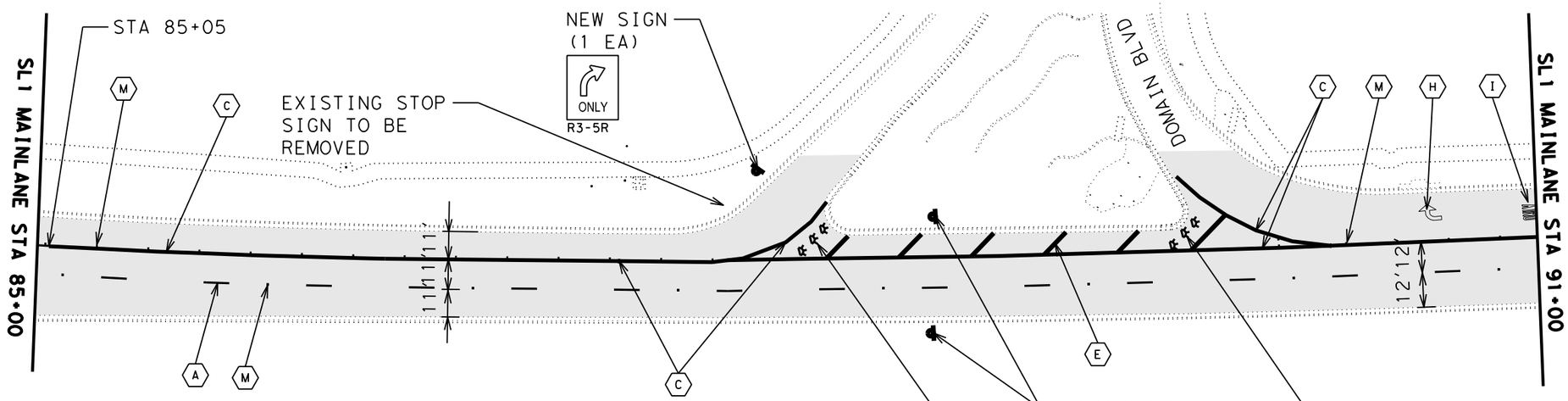
DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	3136	01	191	SL 0001
		DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		86

DATE: 11/23/2020 1:16:57 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\8. Traffic\SL0001_SPMD_01.dgn



LEGEND	
	APPROX> LIMITS OF 1" MILL & OVERLAY

STATE OF TEXAS
RACHEL R. LARCOM
95872
LICENSED PROFESSIONAL ENGINEER
3/4/2021



SCALE (IN FEET):
0 50

SUMMARY OF SIGNING AND PAVEMENT MARKINGS

ITEM 666											ITEM 672	ITEM 672
REFL PAV MRKS TY I & TY II											RAISED PAV MARKERS	RAISED PAV MARKERS
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
4" WHITE BRK	4" WHITE SLD	8" WHITE SLD	8" WHITE DOT	12" WHITE SLD	24" WHITE SLD	4" YELLOW SLD	ARROW	WORD	4" WHITE DOT	18" WHITE YLD TRI	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R
LF	LF	LF	LF	LF	LF	LF	EA	EA	LF	LF	EA	EA
1721	-	878	-	128	-	-	1	1	-	-	-	44

Austin District
North Travis Area Office

Texas Department of Transportation

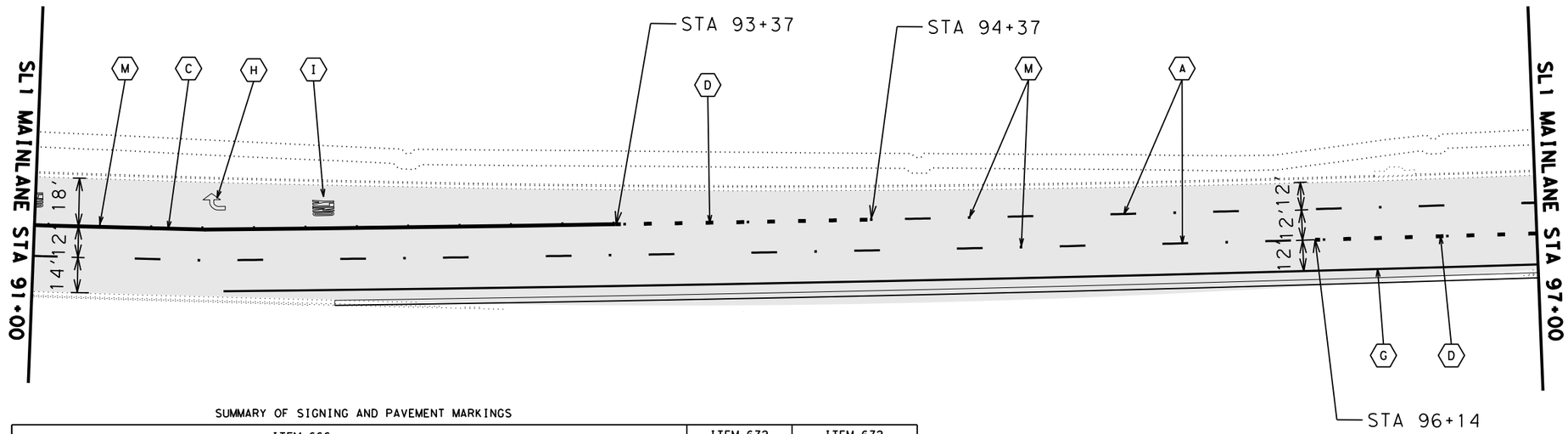
SL 1

SIGNS & PAVENMENT MARKINGS

SHEET 2 OF 4

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3136	01	191,etc	SL 0001
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	TRAVIS		87

DATE: 3/4/2021 2:44:50 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\8. Traffic\SL0001_SPMD_02.dgn

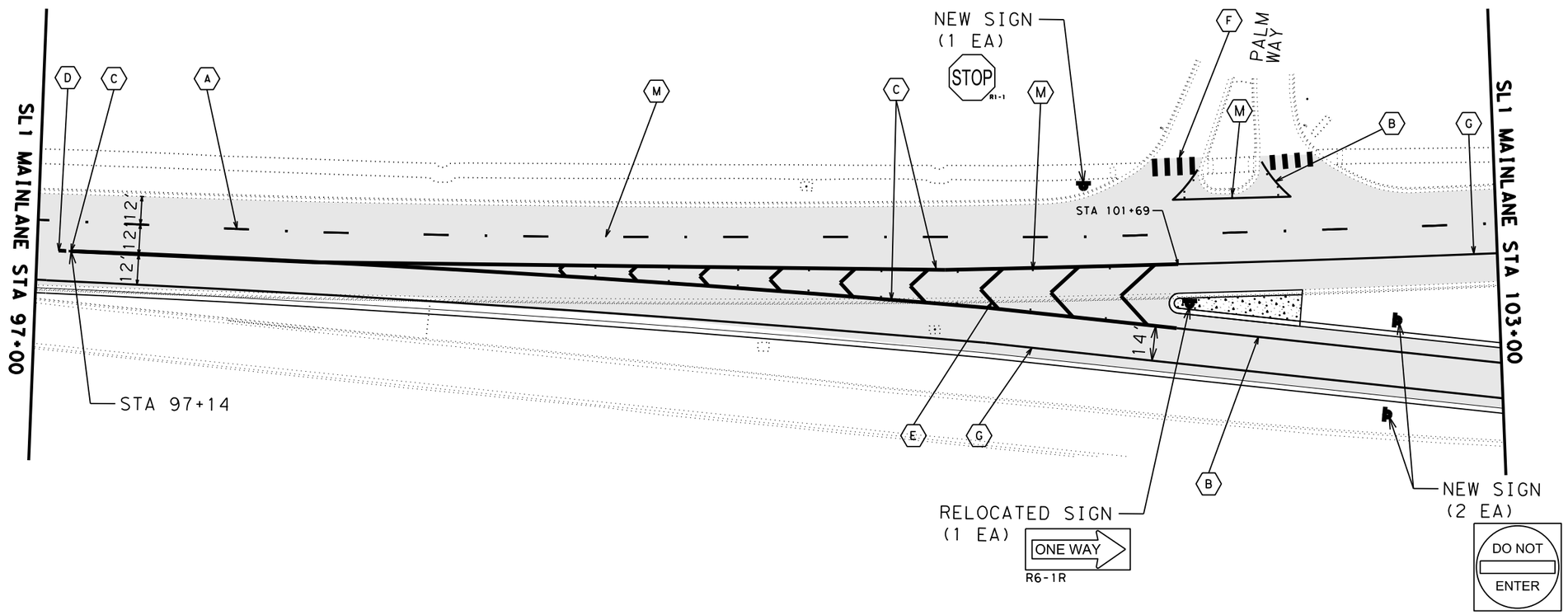


SUMMARY OF SIGNING AND PAVEMENT MARKINGS

ITEM 666											ITEM 672	ITEM 672
REFL PAV MRKS TY I & TY II											RAISED PAV MARKERS	RAISED PAV MARKERS
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
4" WHITE BRK	4" WHITE SLD	8" WHITE SLD	8" WHITE DOT	12" WHITE SLD	24" WHITE SLD	4" YELLOW SLD	ARROW	WORD	4" WHITE DOT	18" WHITE YLD TRI	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R
LF	LF	LF	LF	LF	LF	LF	EA	EA	LF	LF	EA	EA
1508	212	1017	200	158	48	1211	1	1	-	-	-	53

LEGEND	
	APPROX. LIMITS OF 1" MILL & OVERLAY
	DELINEATOR

STATE OF TEXAS
RACHEL R. LARCOM
95872
LICENSED PROFESSIONAL ENGINEER
3/4/2021



SCALE (IN FEET):
0 50

Austin District
North Travis Area Office

Texas Department of Transportation

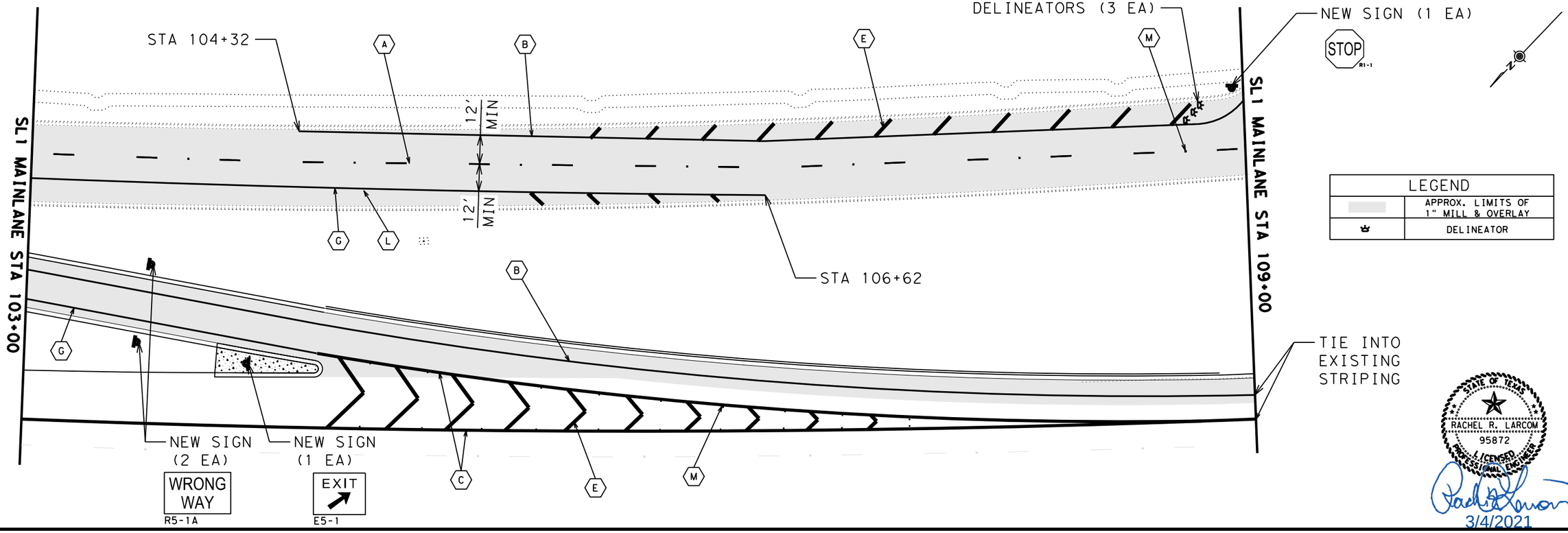
SL 1

SIGNS & PAVENMENT MARKINGS

SHEET 3 OF 4

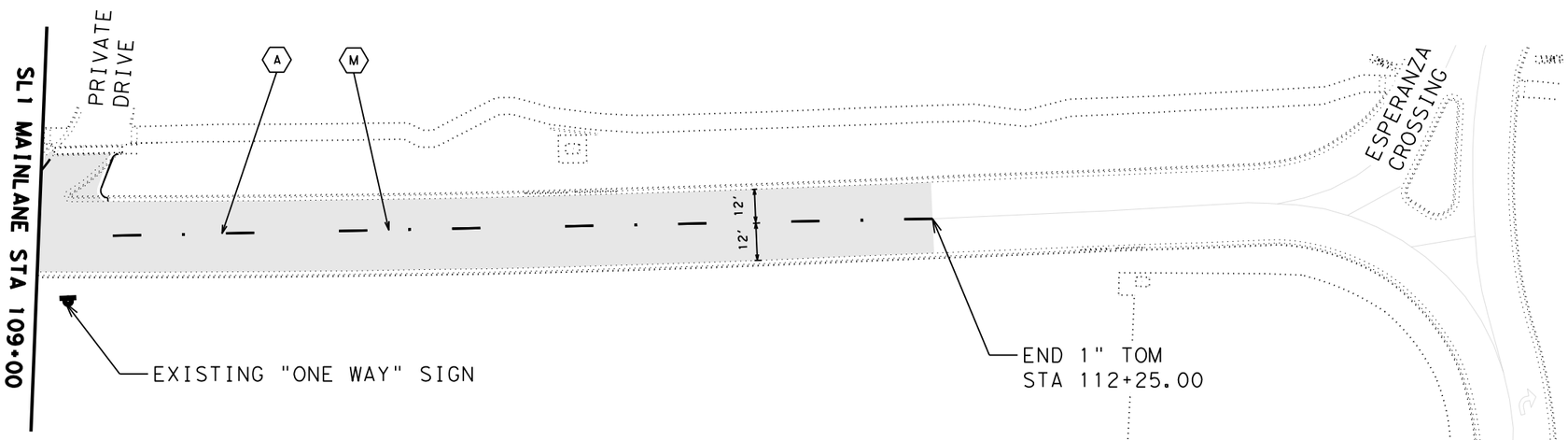
© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3136	01	191,etc	SL 0001
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	TRAVIS		88

DATE: 3/4/2021 2:33:20 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011914 - Design\Plan Set\8. Traffic\SL0001_SPMD_03.dgn



LEGEND	
	APPROX. LIMITS OF 1" MILL & OVERLAY
	DELINEATOR

STATE OF TEXAS
RACHEL R. LARCOM
95872
LICENSED PROFESSIONAL ENGINEER
3/4/2021



SCALE (IN FEET):
0 50

SUMMARY OF SIGNING AND PAVEMENT MARKINGS

ITEM 666											ITEM 672	ITEM 672
REFL PAV MRKS TY I & TY II											RAISED PAV MARKERS	RAISED PAV MARKERS
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
4" WHITE BRK	4" WHITE SLD	8" WHITE SLD	8" WHITE DOT	12" WHITE SLD	24" WHITE SLD	4" YELLOW SLD	ARROW	WORD	4" WHITE DOT	18" WHITE YLD TRI	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R
LF	LF	LF	LF	LF	LF	LF	EA	EA	LF	LF	EA	EA
900	932	1040	-	406	-	495	-	-	-	-	16	34

Austin District
North Travis Area Office

Texas Department of Transportation

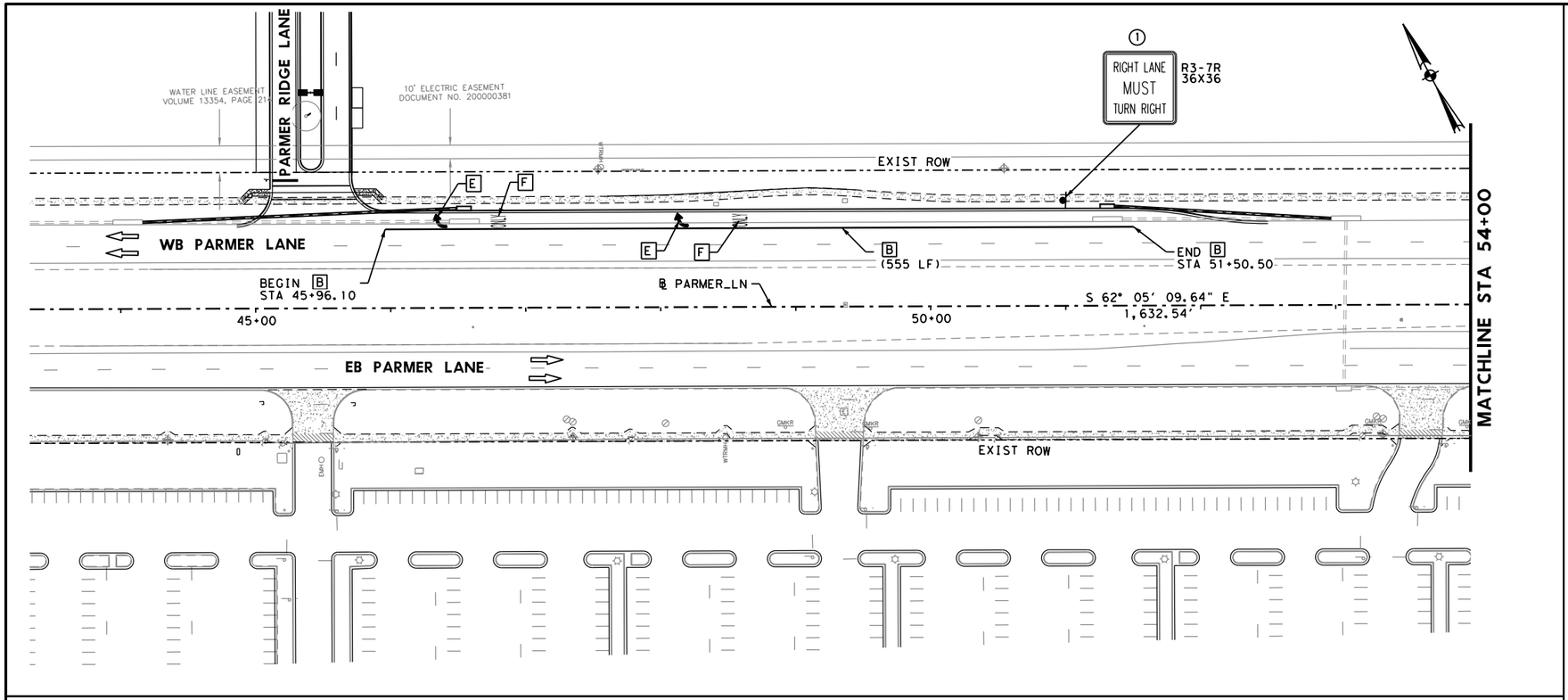
SL 1

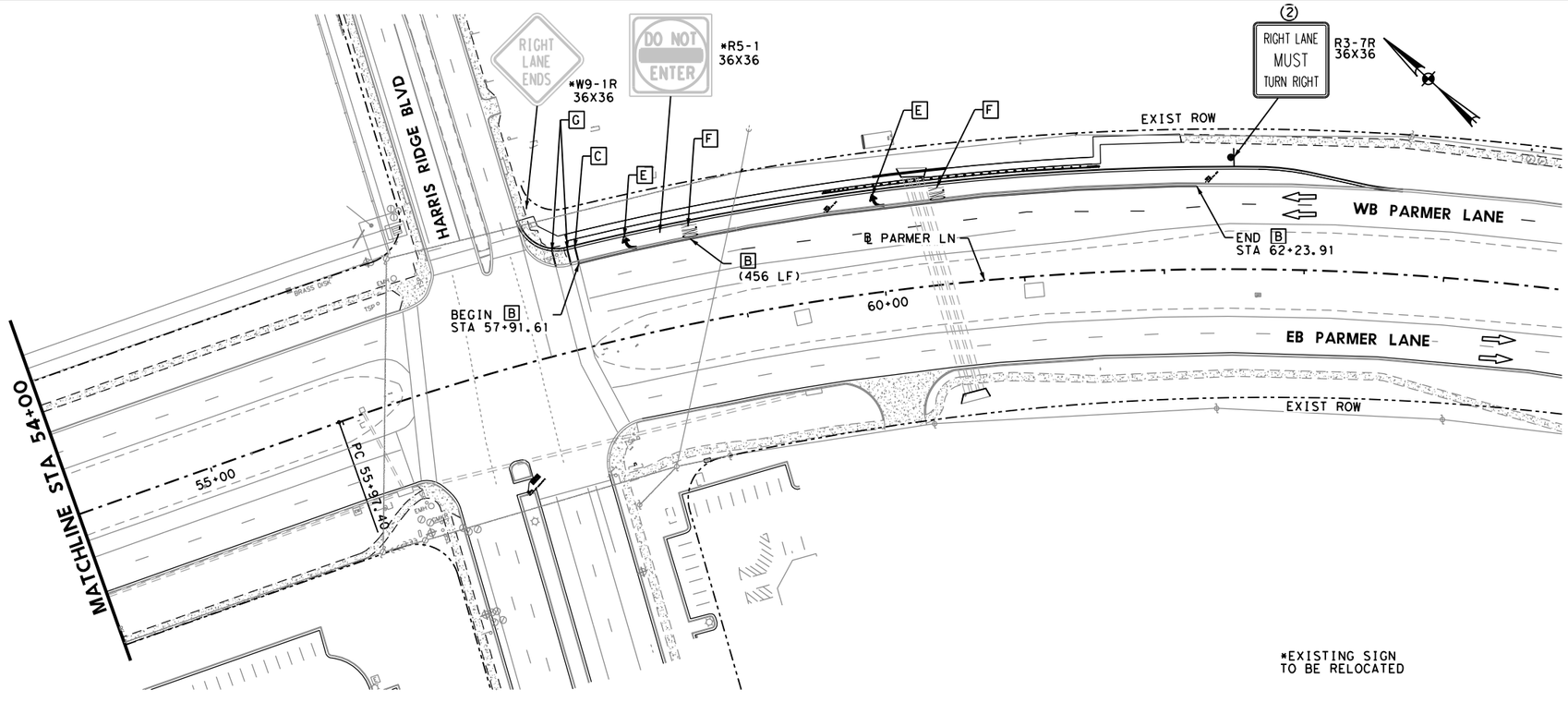
SIGNS & PAVEMENT MARKINGS

SHEET 4 OF 4

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3136	01	191,etc	SL 0001
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	TRAVIS		89

DATE: 3/4/2021 4:09:53 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\8. Traffic\SL0001_SPMD_04.dgn





*EXISTING SIGN TO BE RELOCATED

LEGEND

- A 4 INCH WIDE DBL YELLOW LINE (SLD)(REFL) W/RAIS PAV MRKR (REFL) TY II A-A @ 80'C-C
- B 8 INCH WIDE WHITE LINE (SLD)(REFL) W/RAIS PAV MRKR (REFL) TY I-C @ 20'C-C
- C 24 INCH WIDE WHITE LINE (SLD)(REFL) STOP BAR
- D 24 INCH WIDE YELLOW LINE (SLD)(REFL)@ 20'C-C
- E RIGHT/LEFT/THRU ARROW (REFL)
- F WORD "ONLY" WHITE (REFL)
- G 12 INCH WIDE WHITE LINE (SLD)(REFL)
- H 4 INCH WIDE WHITE LINE (BRK)(REFL) W/ TY I-C PAV MARKERS 80' C-C
- I 2 INCH WIDE WHITE LINE (BRK)(REFL) W/ TY I-C PAV MARKERS 80' C-C
- J 8 INCH WIDE WHITE LINE (DOT)(REFL)

0 25 50 100

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED PROFESSIONAL ENGINEER
11/25/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

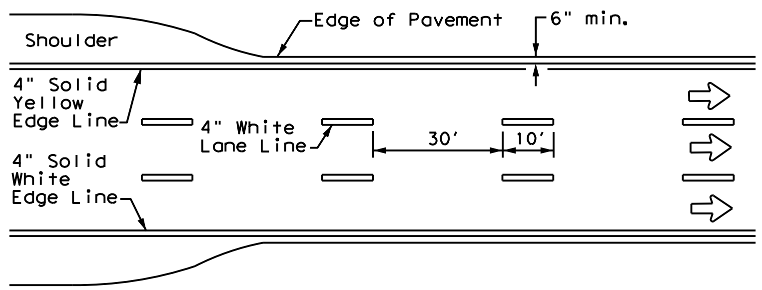
PARMER LANE

TRAFFIC PAVEMENT MARKINGS & SIGNS

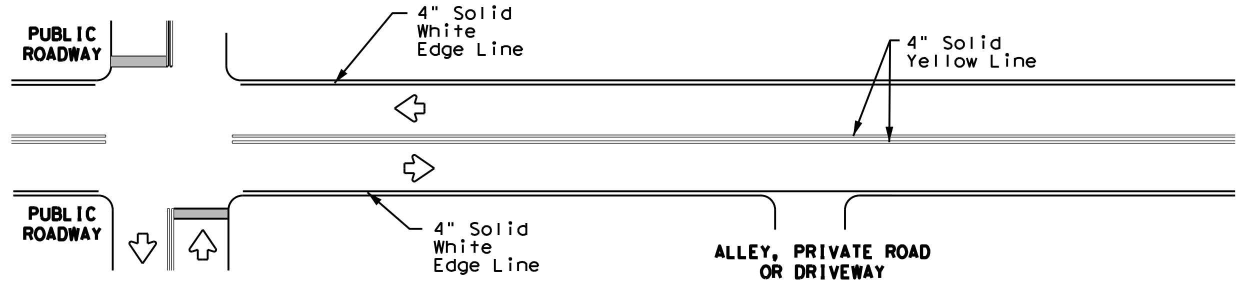
SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		90

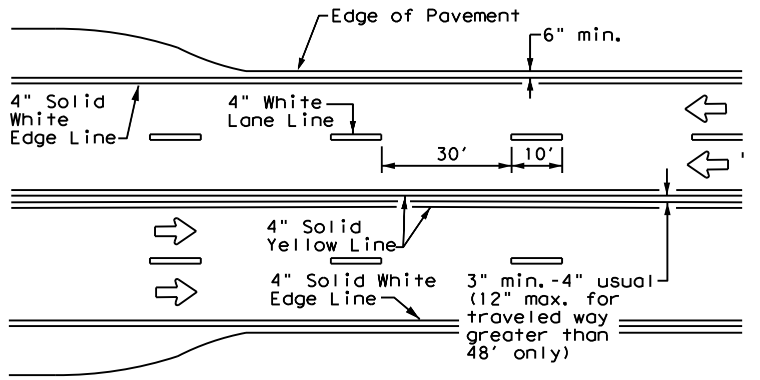
V:\2220\active\222010025\civil\cad\CD Design\DRWY ACCESS RT\TRAFFIC\222010025_PVMK01.dgn 11/25/2020 4:55:15 PM KMcClure 100%



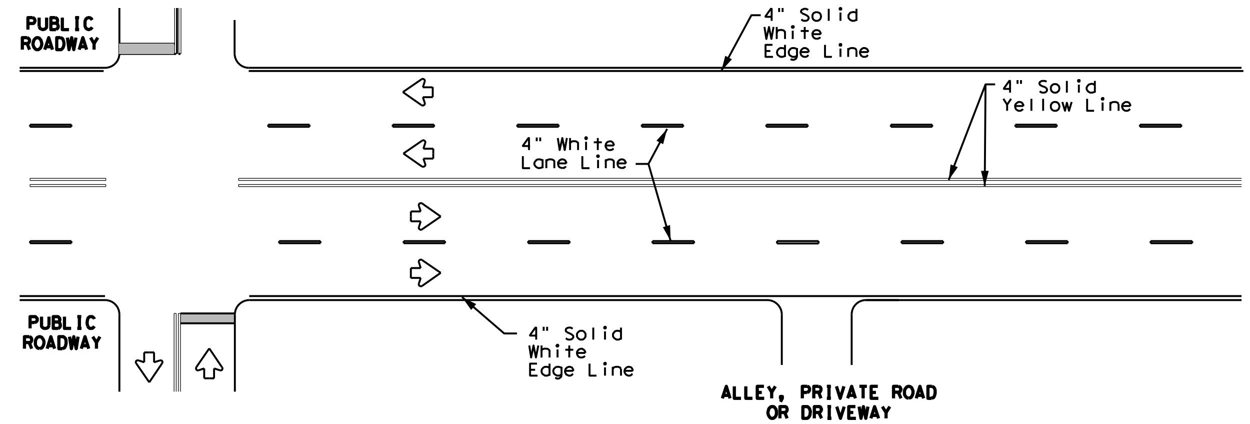
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



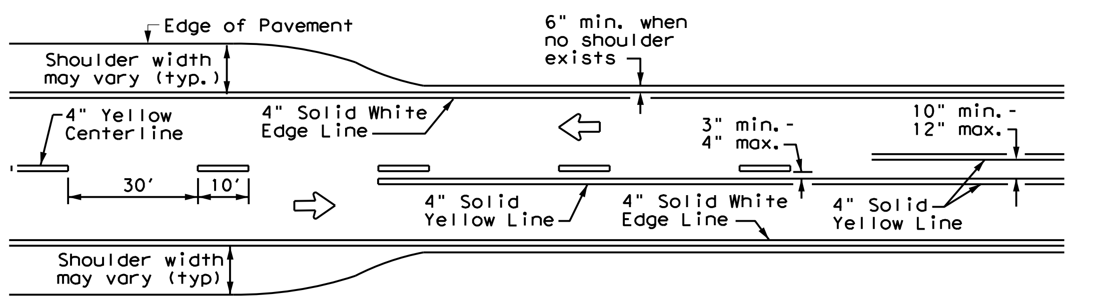
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



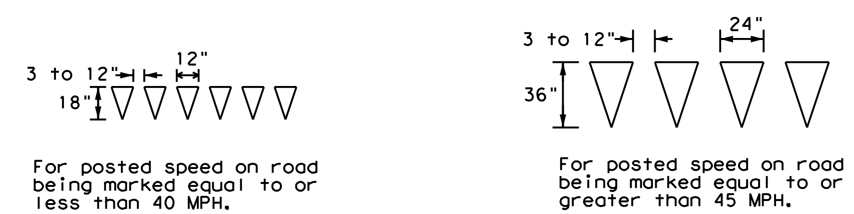
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



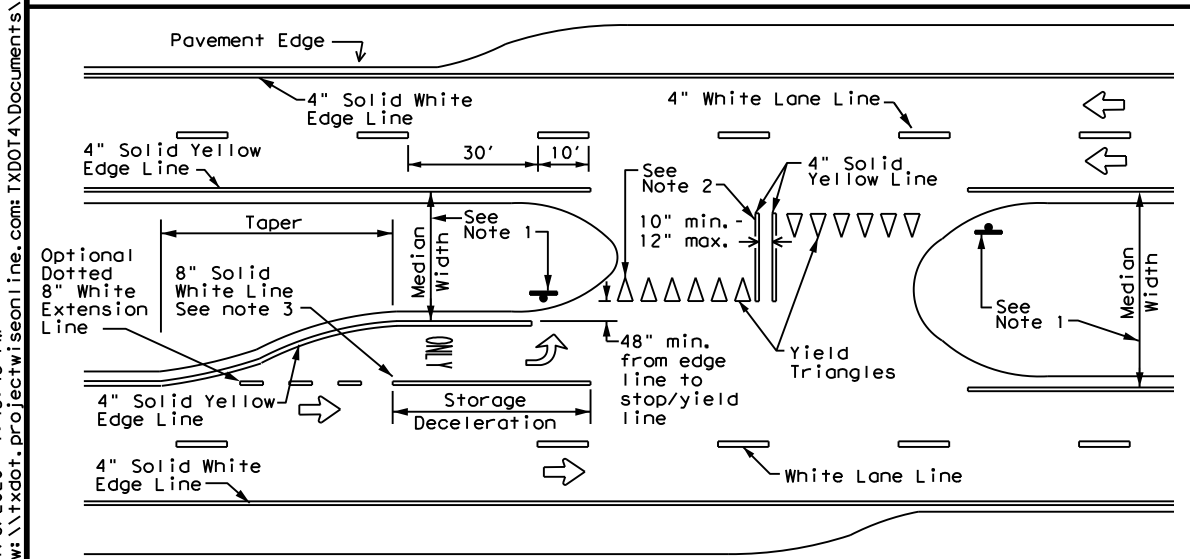
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

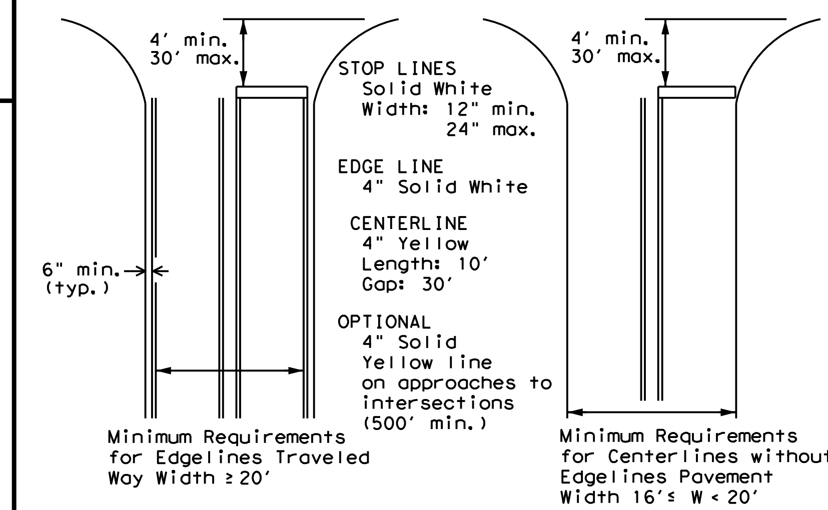
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield troingles shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

Texas Department of Transportation — Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

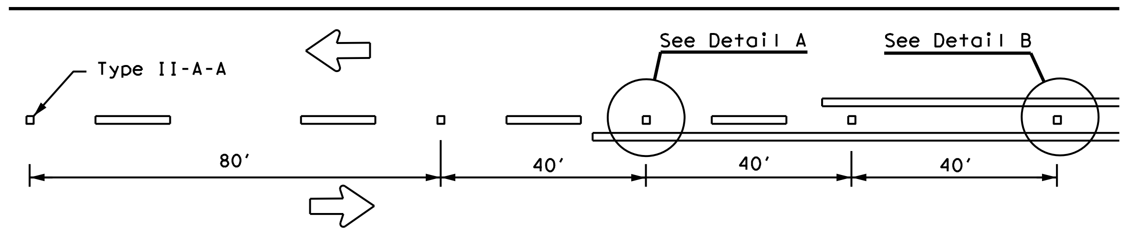
PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 5-00 2-12 8-00 6-20	3136	01	191	SL 0001
	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	91

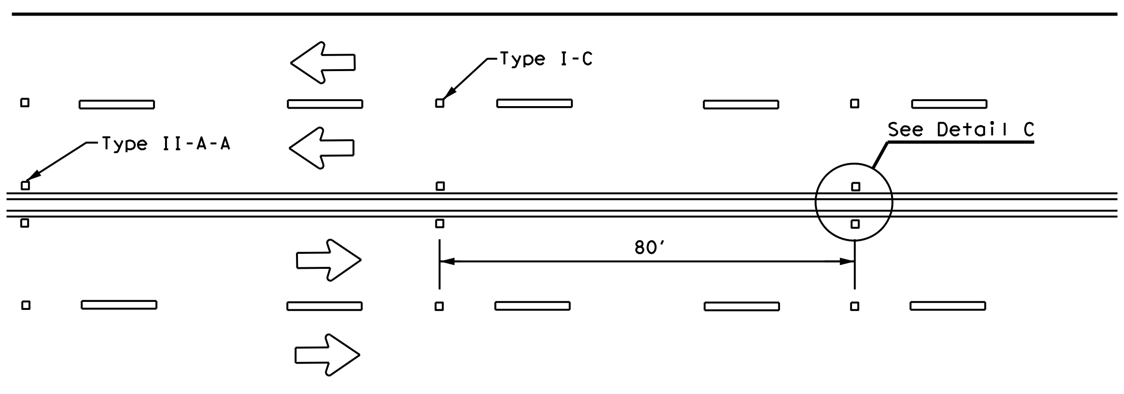
228

DATE: 11/6/2020 1:45:45 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\...

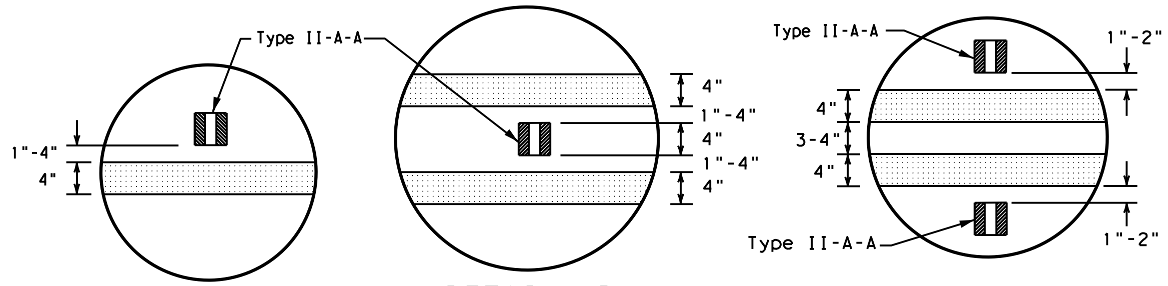
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



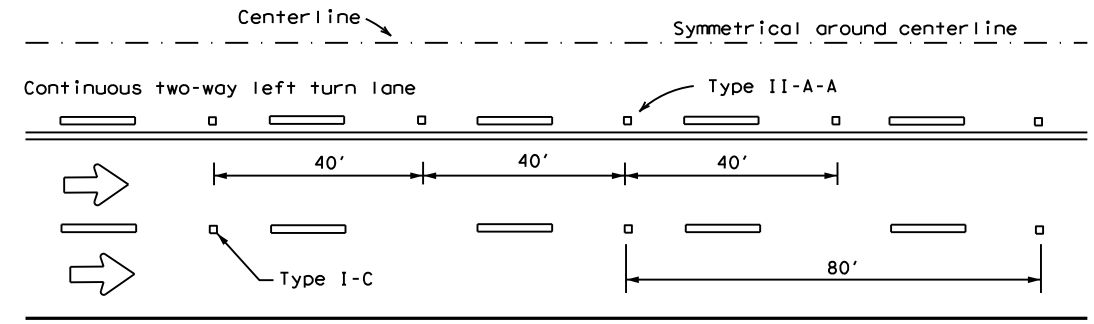
CENTERLINE FOR ALL TWO LANE ROADWAYS



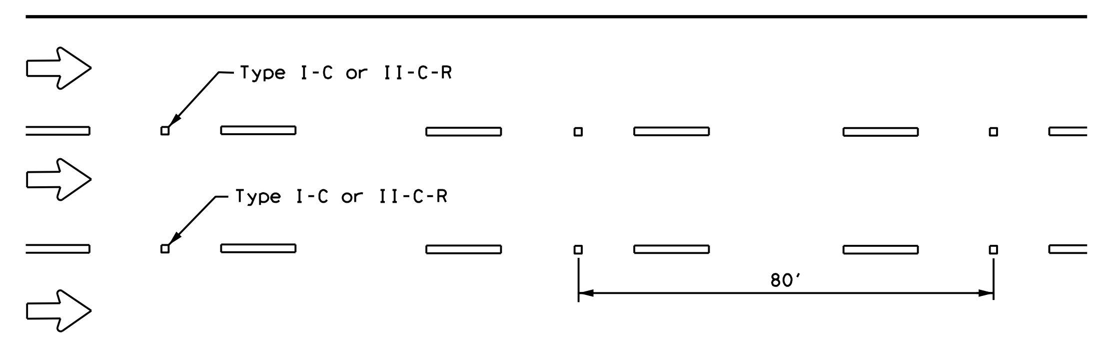
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" DETAIL "B" DETAIL "C"

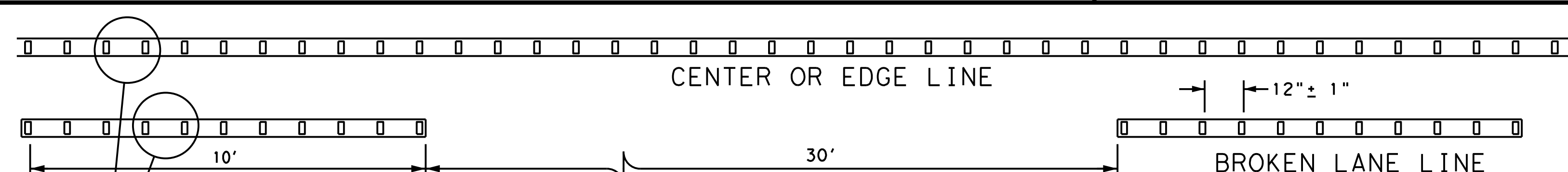


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



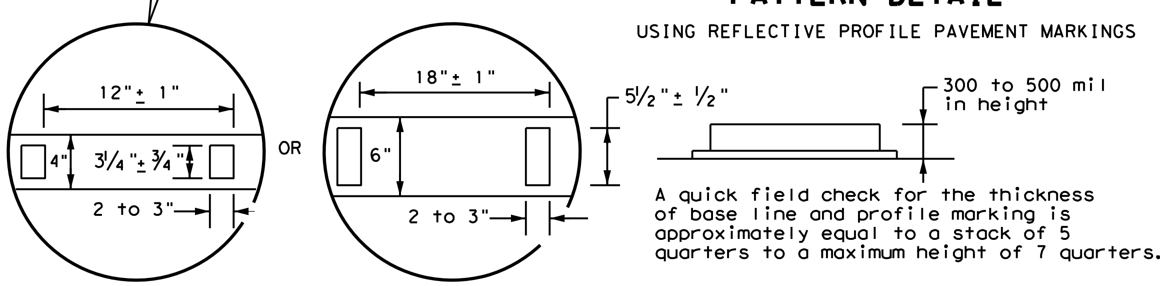
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

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

NOTE

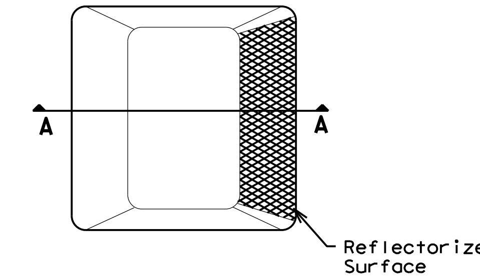
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

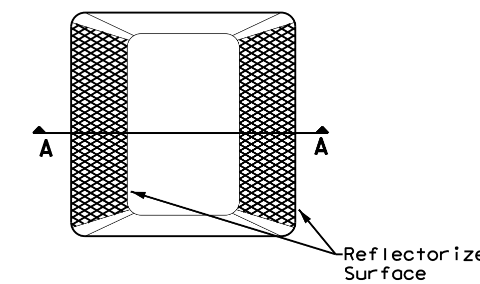
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

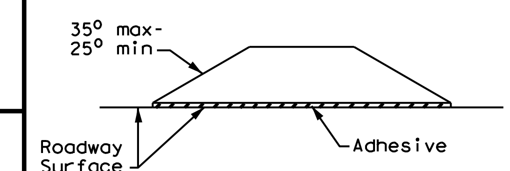
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

Traffic Safety Division Standard

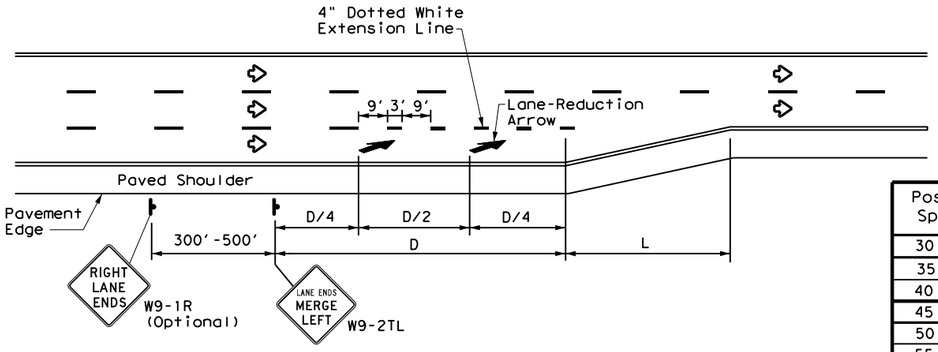
POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	3136	01	191	SL 0001
	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	92

228

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: 11/6/2020 1:45:55 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\...

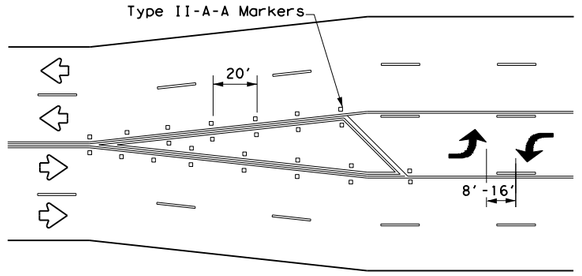


LANE REDUCTION

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

NOTES

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



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

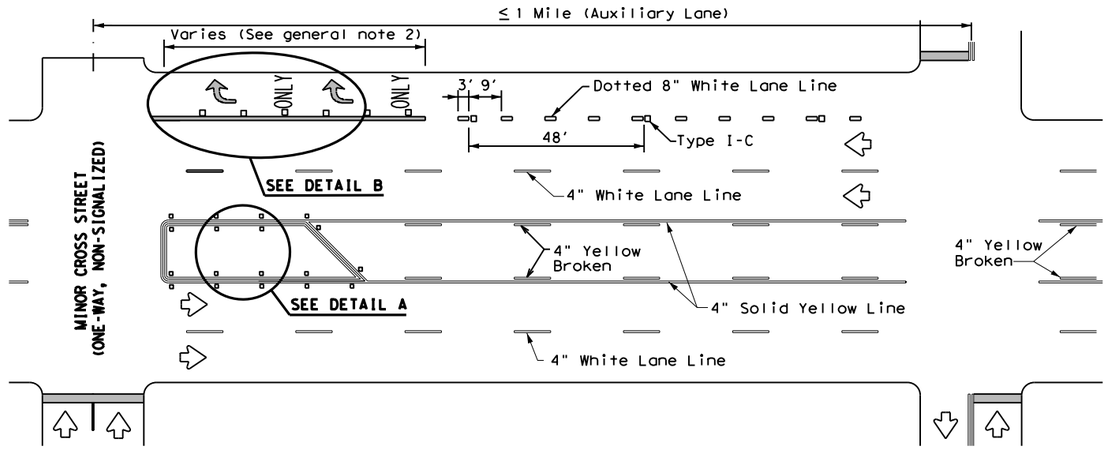
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

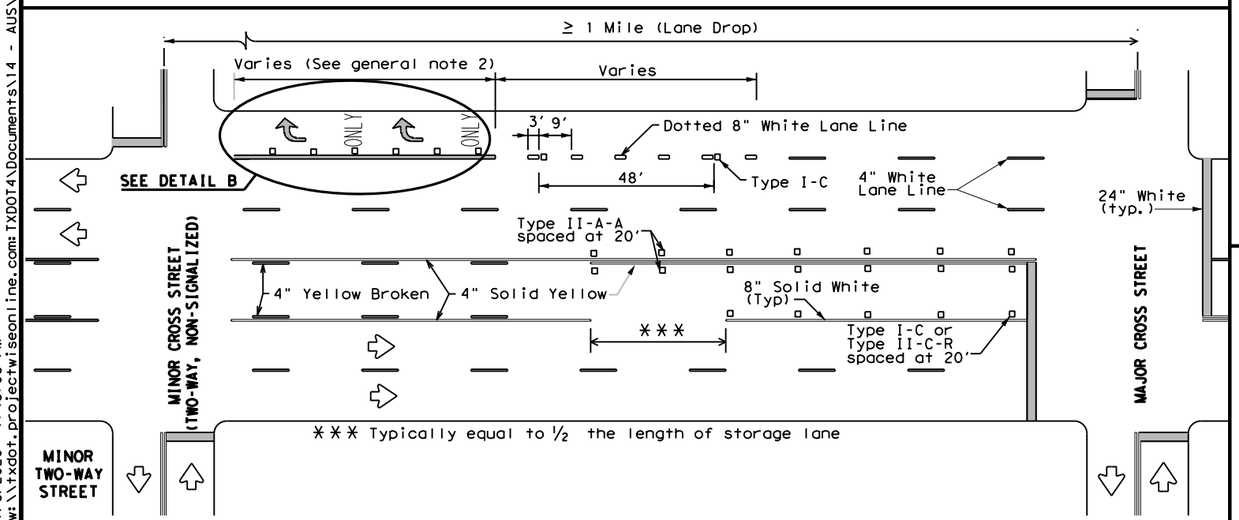
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

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

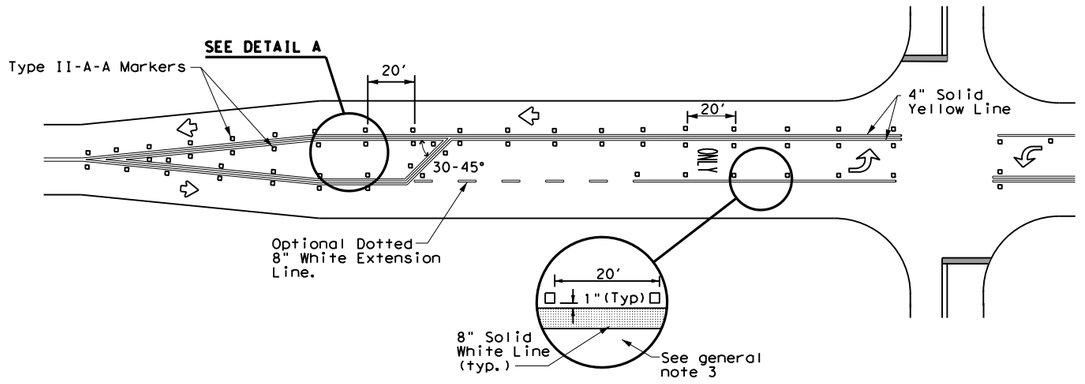
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



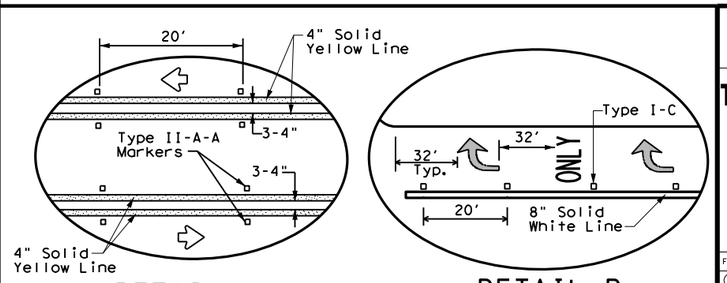
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



Texas Department of Transportation

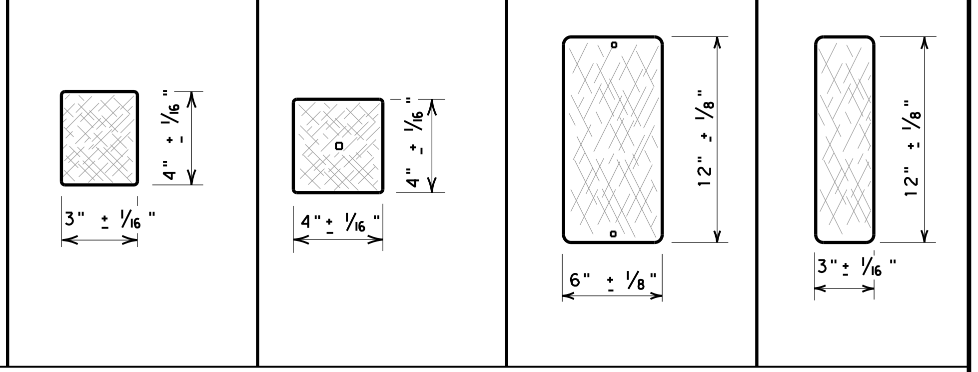
Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	AUS	TRAVIS		93
3-03 6-20				

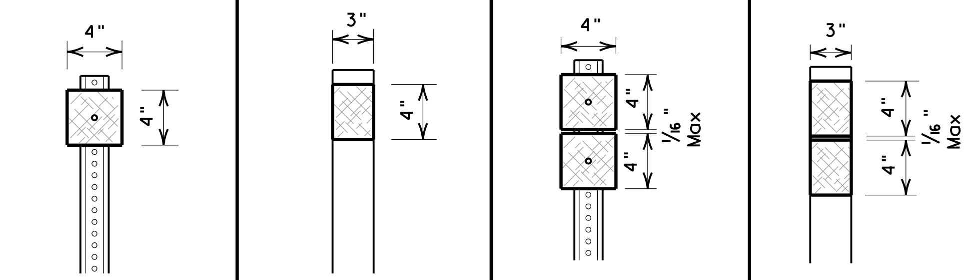
220

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS



	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS



	SINGLE		DOUBLE	
DEVICE	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
- S = Single
- D = Double

COLOR OF REFLECTORS
- W = White
- Y = Yellow
- R = Red

REFLECTOR UNIT SIZE
- 1 or 2

TYPE OF POST OR DELINEATOR
- WC = Wing Channel Post
- YFLX = Yellow Flexible Post
- WFLX = White Flexible Post
- BRF = Barrier Reflector

TYPE OF MOUNT
- GND = Embedded (drivable or set in concrete)
- CTB = Concrete Barrier Mount
- GF1 or GF2 = Guard Fence Attachment
- SRF = Surface Mount

DIRECTION
- If Required
- BI = Bi-Directional
- BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
- 1, 2, 3, or 4

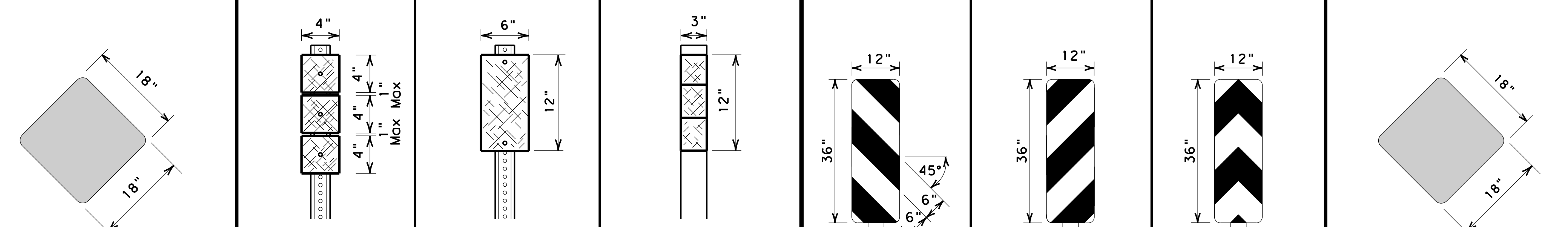
NUMBER OF REFLECTORS OR DIRECTION
- X = 3-Size 2 reflector units (Type 2 only)
- Y = 1-Size 3 reflector unit (Type 2 only)
- Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
- L = Left Side (Type 3 Object Marker only)
- R = Right Side (Type 3 Object Marker only)
- C = Center (Type 3 Object Marker only)

TYPE OF POST
- WC = Wing Channel Post
- WFLX = White Flexible Post
- TWT = Thin Walled Tubing

TYPE OF MOUNT
- GND = Embedded (drivable)
- SRF = Surface Mount
- WAS = Wedge Anchor Steel
- WAP = Wedge Anchor Plastic

DIRECTION
- If Required
- BI = Bi-Directional

OBJECT MARKERS

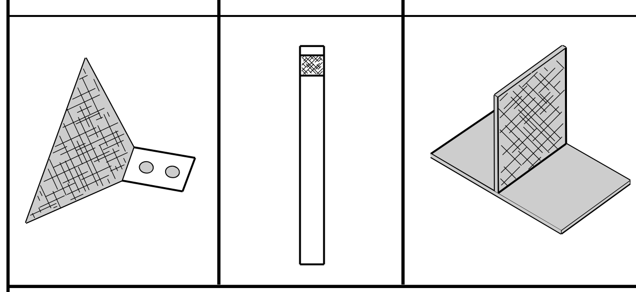


	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

DEPARTMENTAL MATERIAL SPECIFICATIONS

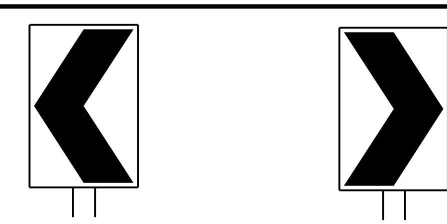
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)



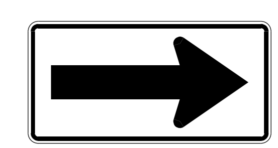
	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS



DEVICE	W1-8			
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

ONE DIRECTION LARGE ARROW



DEVICE	W1-6	
SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE

1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

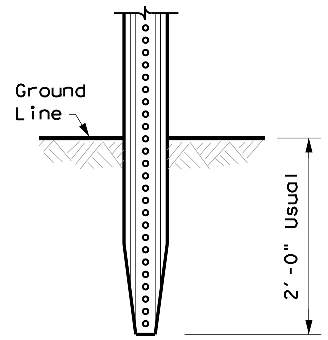
FILE: doml-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT 3136	SECT 01	JOB 191	HIGHWAY SL 0001
REVISIONS 10-09 3-15 4-10 7-20	DIST AUS		COUNTY TRAVIS	SHEET NO. 94

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

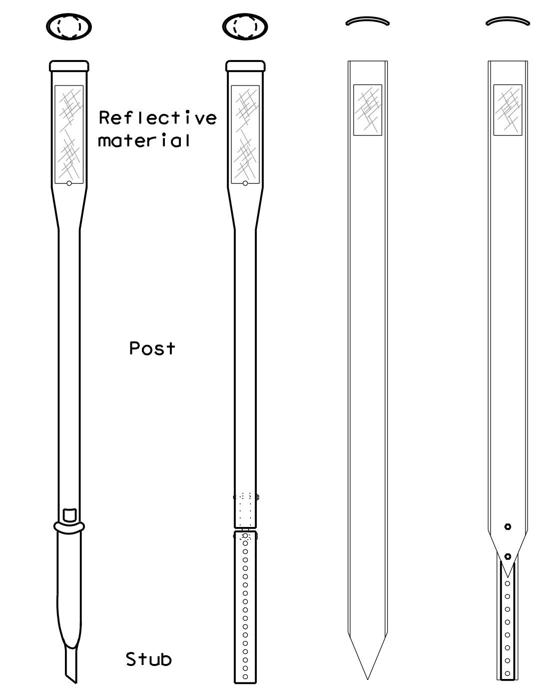


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

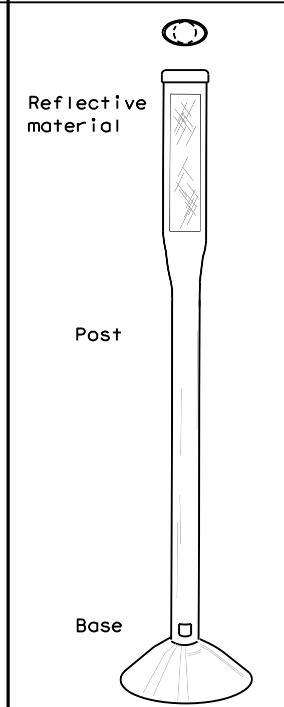
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



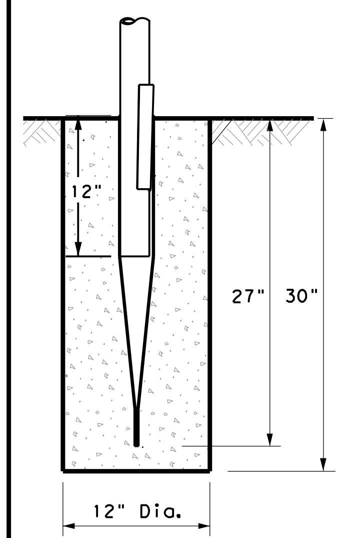
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

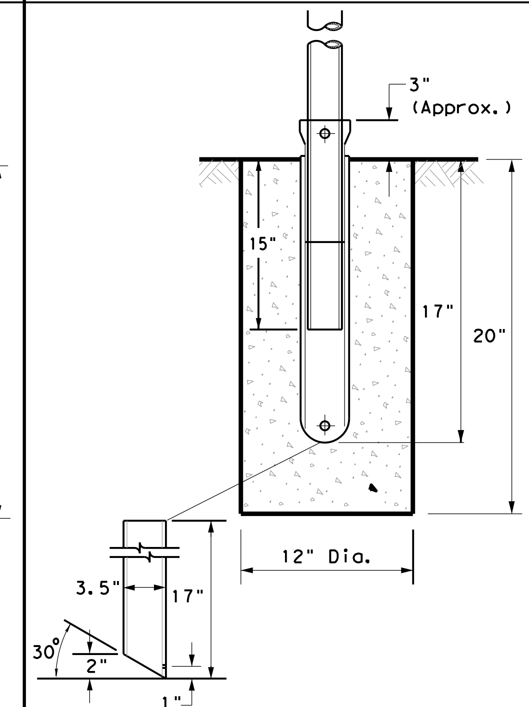
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

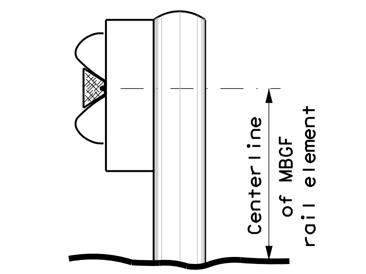
NOTE

1. Install per manufacturer's recommendations.

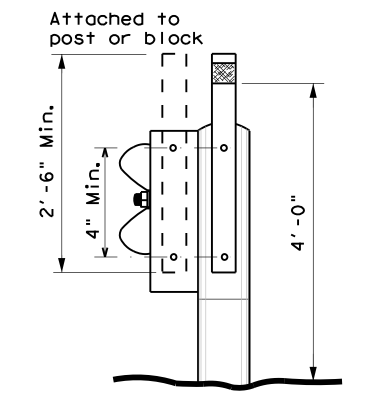
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

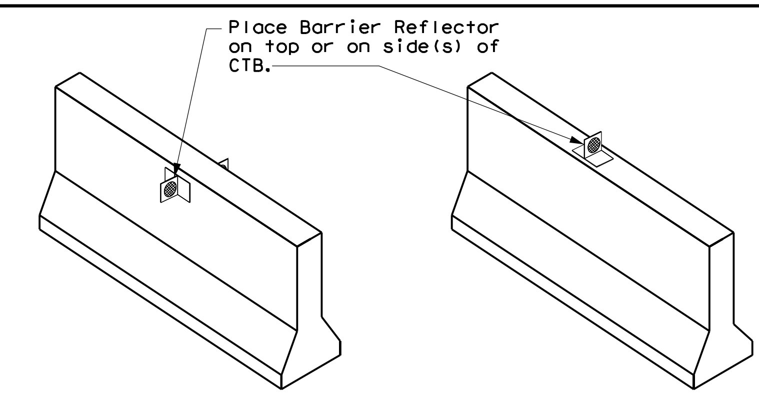
GF1



GF2



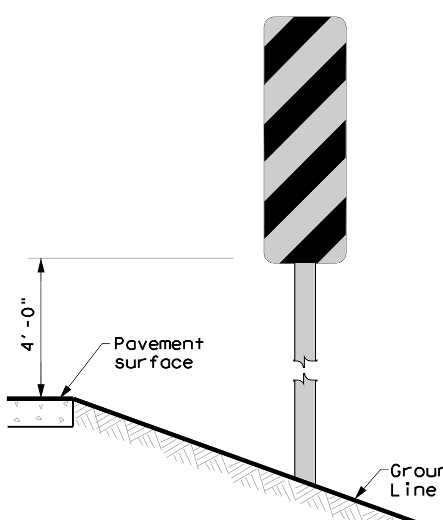
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

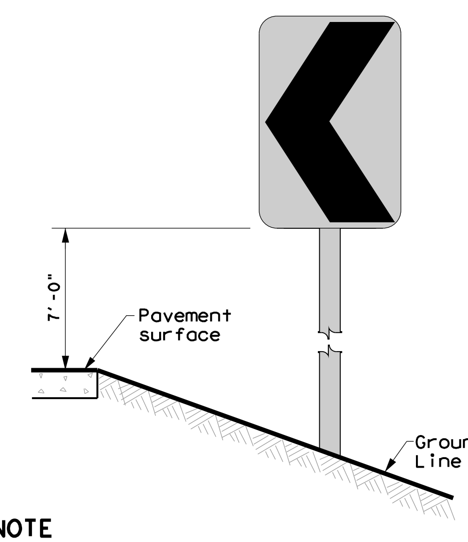
TYPES 1,3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

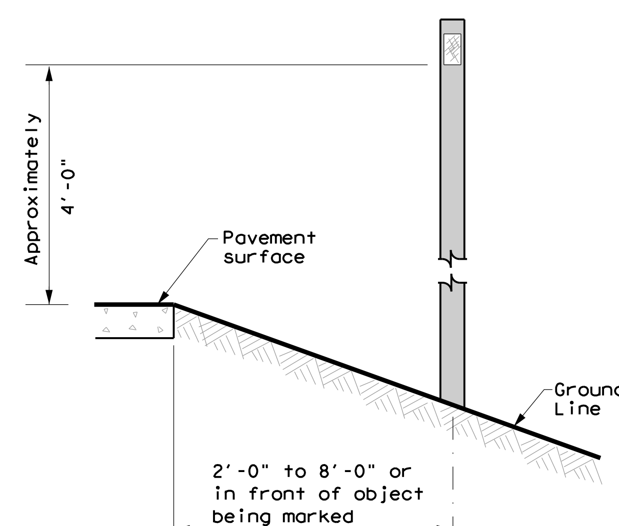
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

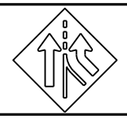
FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
10-09 3-15	DIST		COUNTY	SHEET NO.
4-10 7-20	AUS		TRAVIS	95

20B

DATE: 11/6/2020 1:46:26 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
87	1	R3-5R		30 x 36			10BWG	1	SA	P		
87	2	W4-3R		36 x 36			10BWG	1	SA	T		
88	1	R6-1R	 RELOCATE	54 x 18			10BWG	1	SA	T		
88	2	R5-1		36 x 36			10BWG	1	SA	T		
88,89	2	R1-1		30 x 30			10BWG	1	SA	P		
89	2	R5-1A		42 x 30			10BWG	1	SA	T		
89	1	E5-1		72 x 60			10BWG	1	SA	U		
90	2	R3-7R		36 x 36			10BWG	1	SA	T		

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

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

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).
4. To find the signs, please refer to SPMD sheets.

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191,etc	SL 0001
4-16	DIST	COUNTY		SHEET NO.
8-16	AUS	TRAVIS		96

18

DATE: 12/9/2020 4:13:45 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\396991\sums16.dgn

DATE: 11/6/2020 1:46:36 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601\91\4 - Design\Plan Set\8. Traffic\TRAFFIC STD\smdgen.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

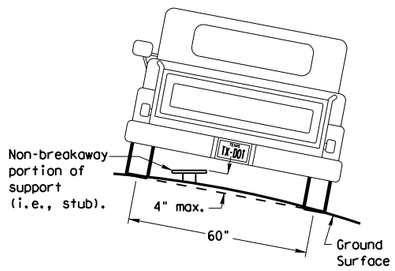
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1) to (SLIP-3))

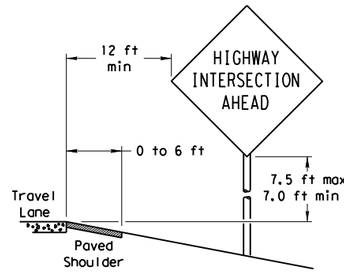
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

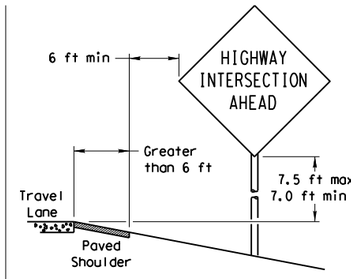
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

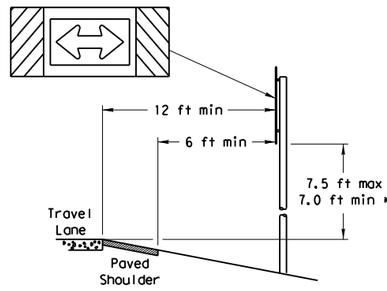
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



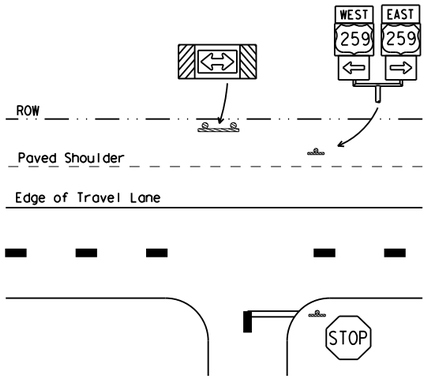
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

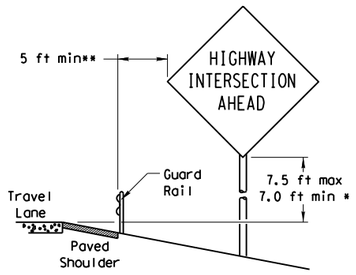
T-INTERSECTION



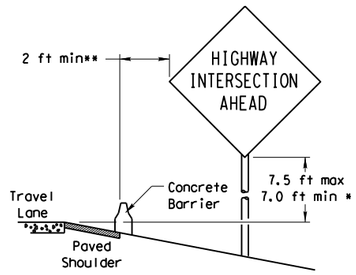
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



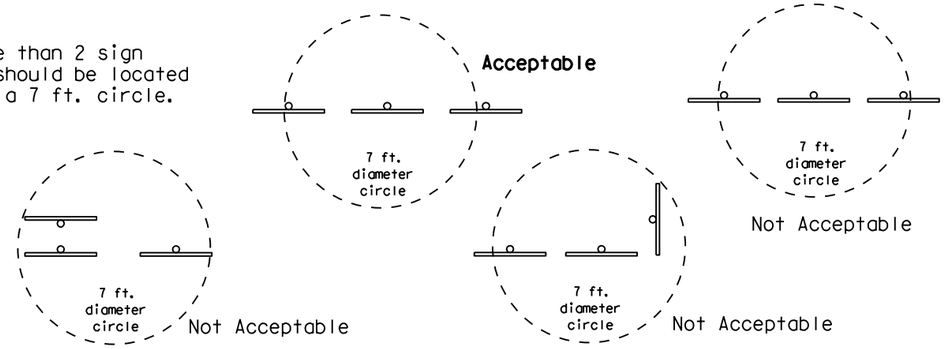
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

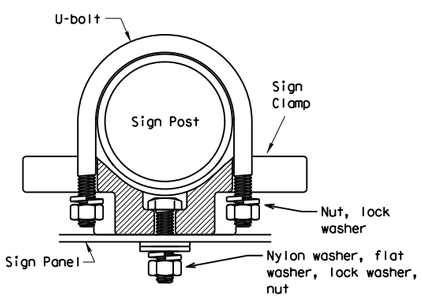
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

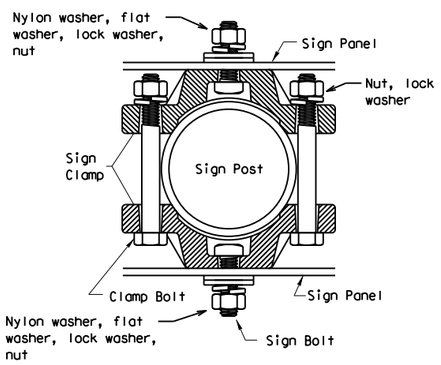


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

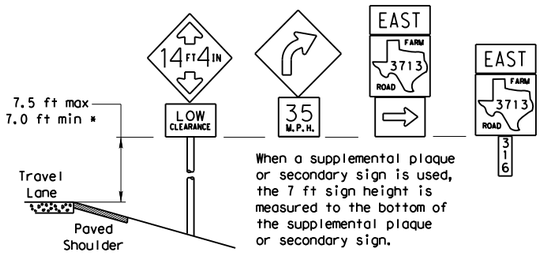
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



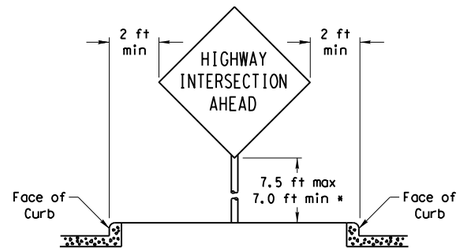
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



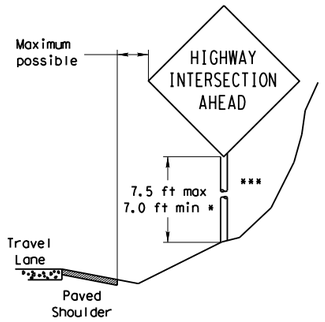
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation
Traffic Operations Division

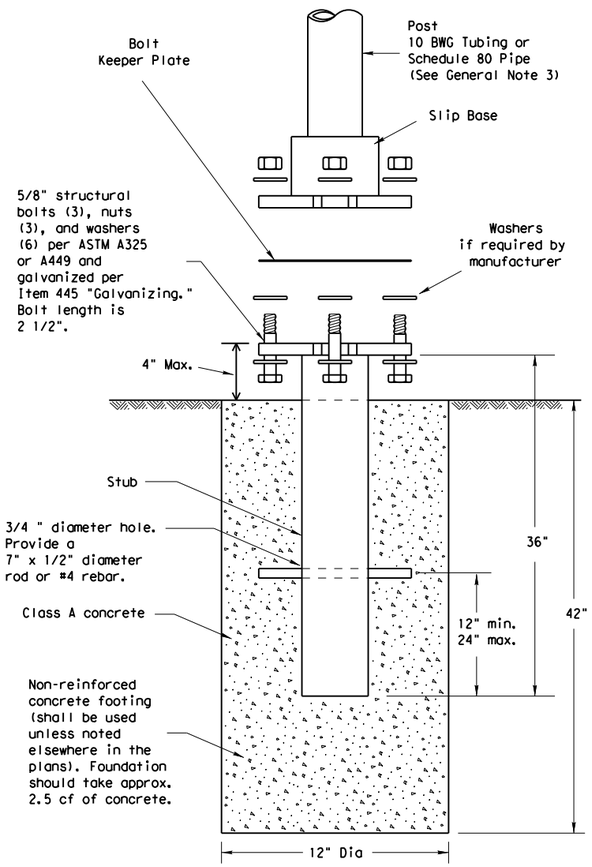
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		97

DATE: 11/6/2020 1:46:45 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011914 - Design\Plan Set\8. Traffic\TRAFFIC STD\smasl.dgn

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

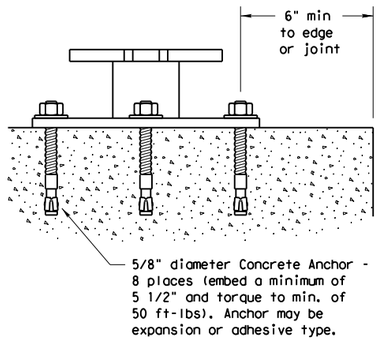
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



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

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

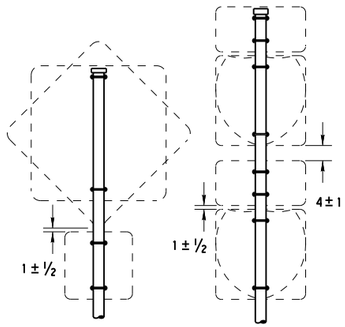
SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

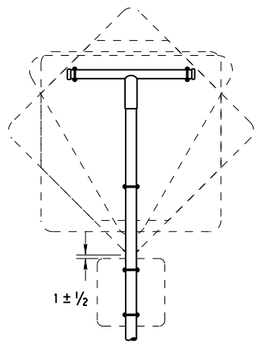
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
3136	01	191	SL 0001
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		98

9-08 REVISIONS

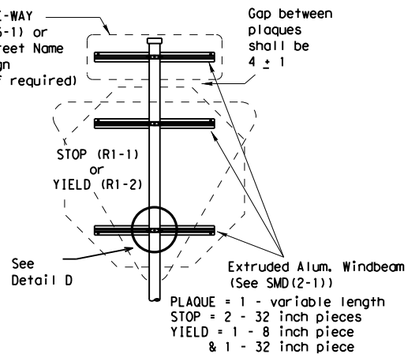
DATE: 11/6/2020 1:46:55 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\8. Traffic\TRAFFIC STD\smds2.dgn



SM RD SGN ASSM TY XXXXX(1)XX(P)

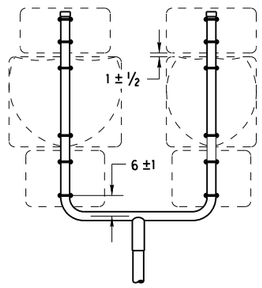


SM RD SGN ASSM TY XXXXX(1)XX(T)

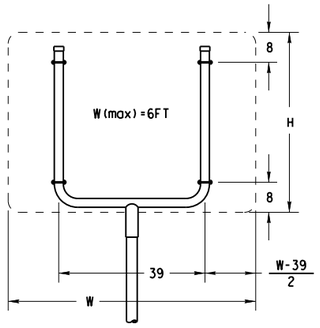


PLAQUE = 1 - variable length
STOP = 2 - 32 inch pieces
YIELD = 1 - 8 inch piece & 1 - 32 inch piece

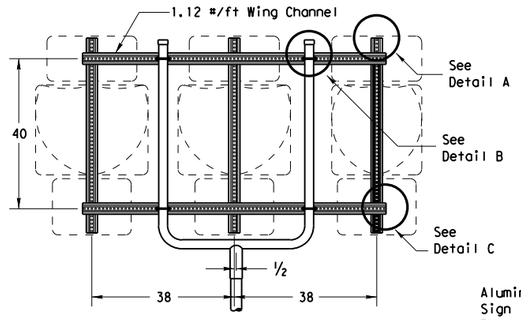
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



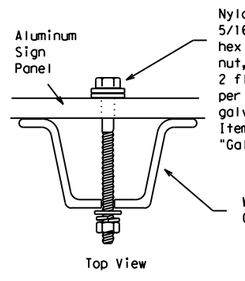
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)

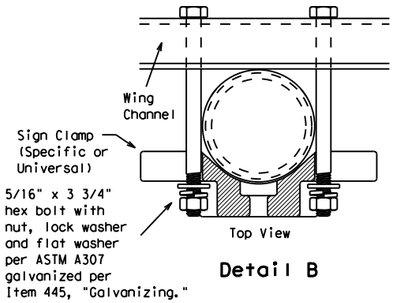


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)



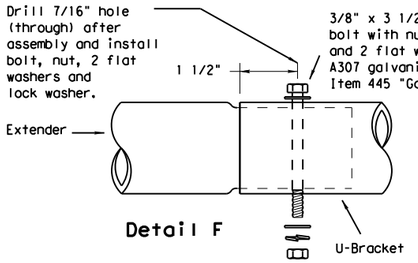
Top View

Detail A



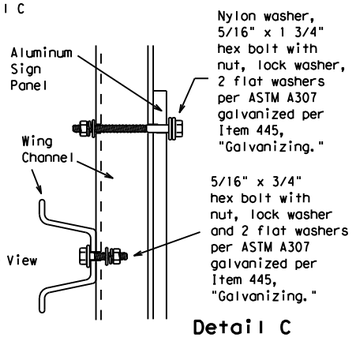
Top View

Detail B

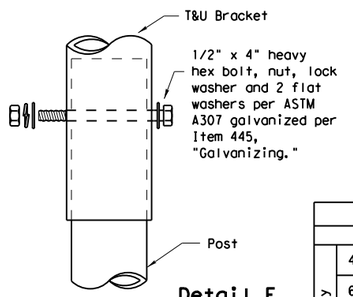


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C



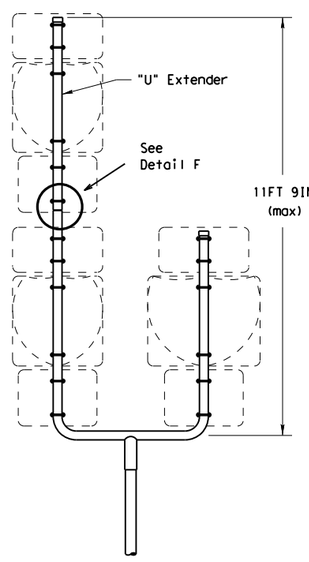
Detail E

GENERAL NOTES:

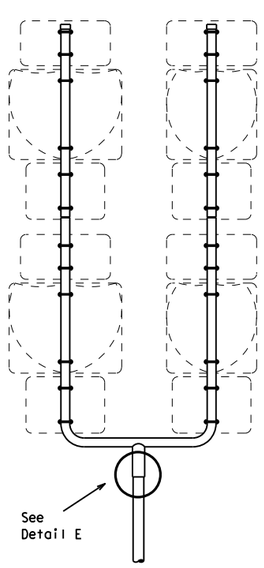
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

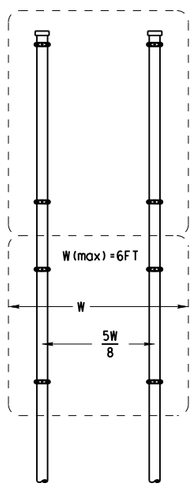
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



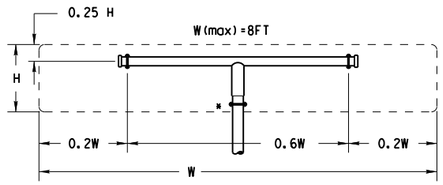
SM RD SGN ASSM TY S80(1)XX(U-1EXT)



SM RD SGN ASSM TY S80(1)XX(U-2EXT)



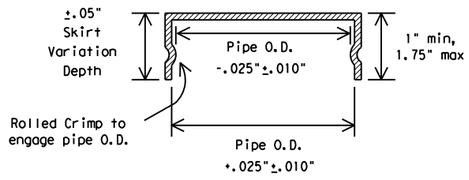
SM RD SGN ASSYM TY XXXXX(2)XX(P)



All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

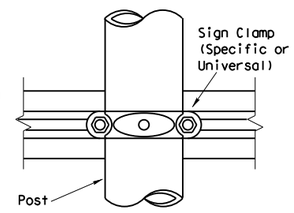
FRICTION CAP DETAIL



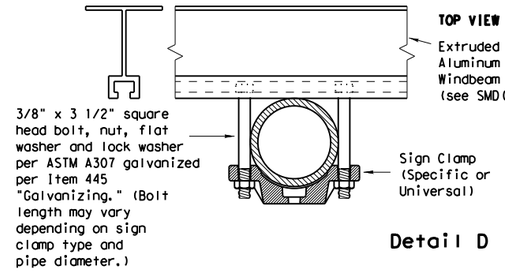
Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.



Detail D



Detail D

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

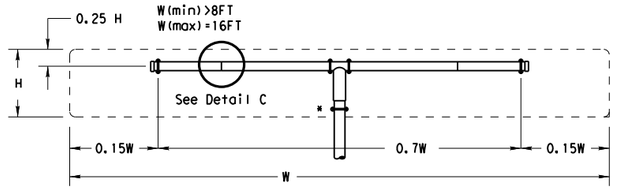
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

9-08 REVISIONS

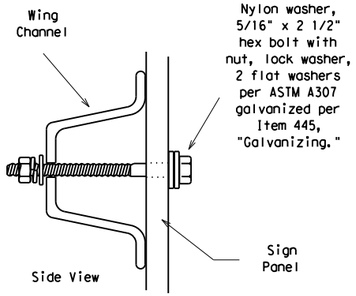
CONT	SECT	JOB	HIGHWAY
3136	01	191	SL 0001

DIST	COUNTY	SHEET NO.
AUS	TRAVIS	99

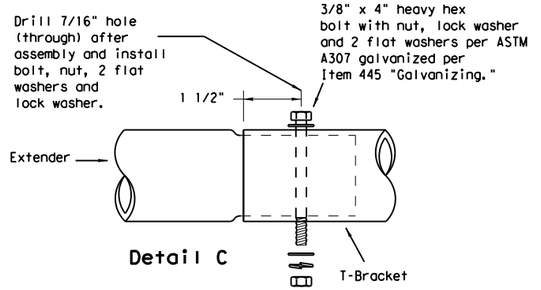
DATE: 11/6/2020 1:47:06 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\8. Traffic\TRAFFIC STD\smds3.dgn



SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



Detail B



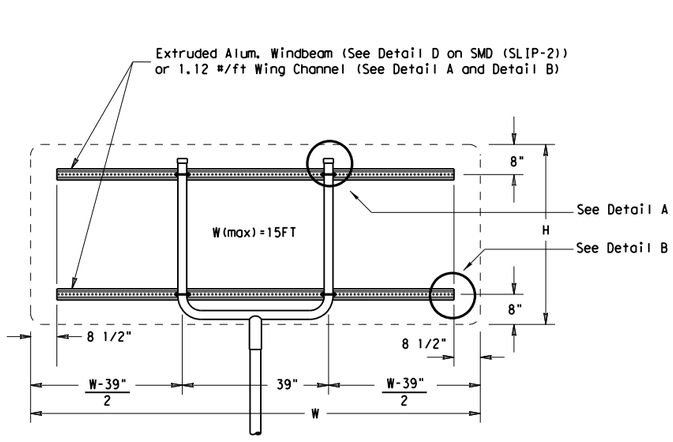
Detail C

Splices shall only be allowed behind the sign substrate.

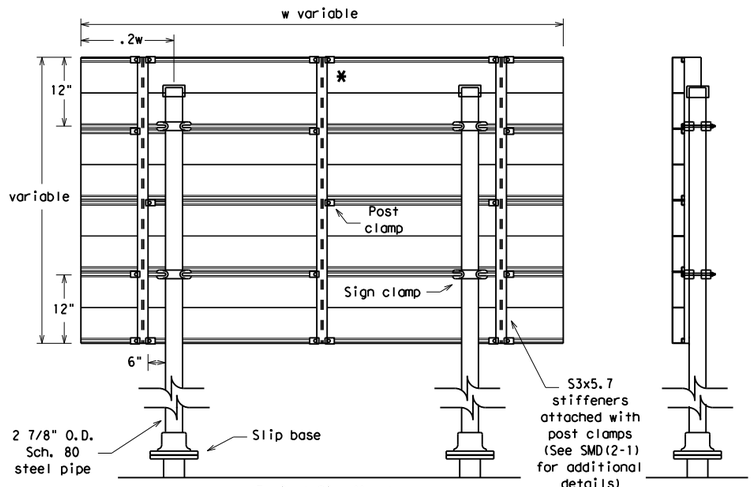
GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
6. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
11. Post open ends shall be fitted with Friction Caps.



SM RD SGN ASSM TY XXXXX(1)XX(U-XX)

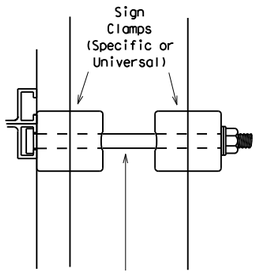


Typical Sign Mount

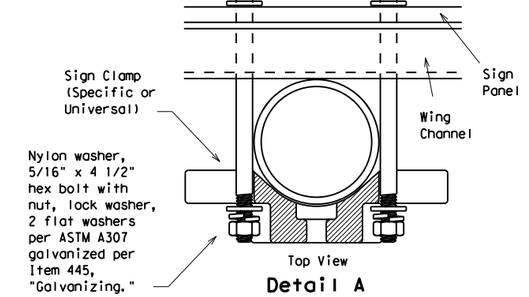
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

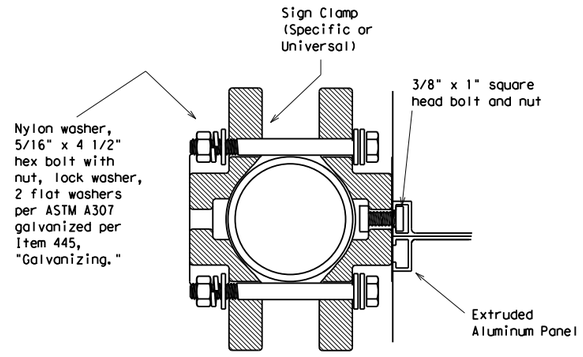
See Detail E
for clamp installation



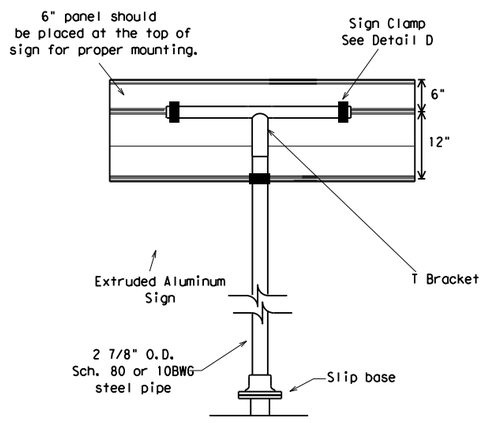
Detail E



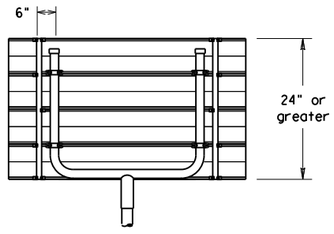
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

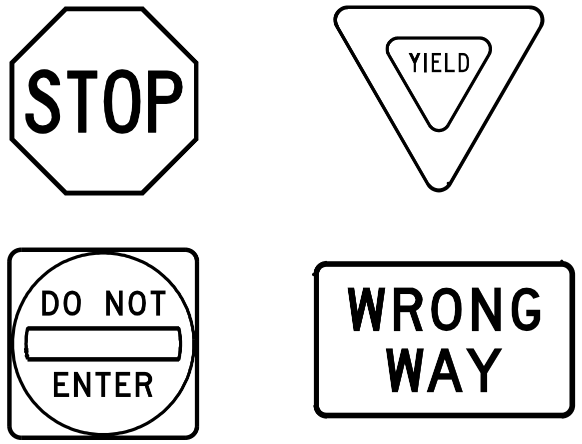
REVISIONS
9-08

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

CONT	SECT	JOB	HIGHWAY
3136	01	191	SL 0001

DIST	COUNTY	SHEET NO.
AUS	TRAVIS	100

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS
(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

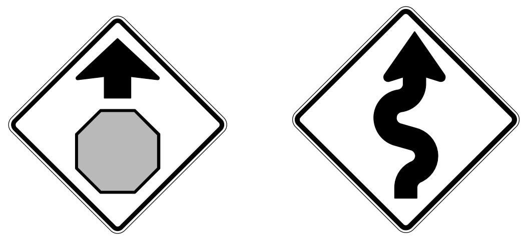
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

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

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
http://www.txdot.gov/

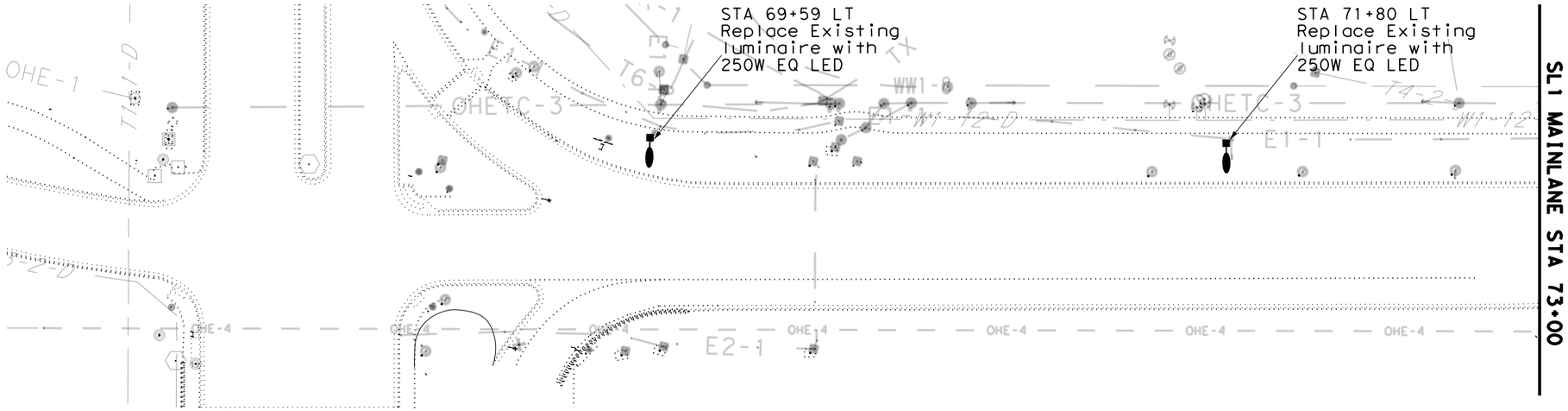
Texas Department of Transportation
Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-03 7-13 9-08	3136	01	191	SL 0001
	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	101

DATE: 11/6/2020 1:47:16 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\...



SHEET 1 OF 8 SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
610 6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	2

DS

STATE OF TEXAS
GREG JONES
99401
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Greg Jones
CE208F8BC5604A4...

11/12/2020

SCALE (IN FEET):
0 50

Austin District
North Travis Area Office

Texas Department of Transportation

SL 1

ILLUMINATION LAYOUT

SHEET 1 OF 8

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3136	01	191	SL 0001
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	TRAVIS		102

DATE: 11/9/2020 8:52:27 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\8. Traffic\Illumination\SL0001_ILLUM_01.dgn

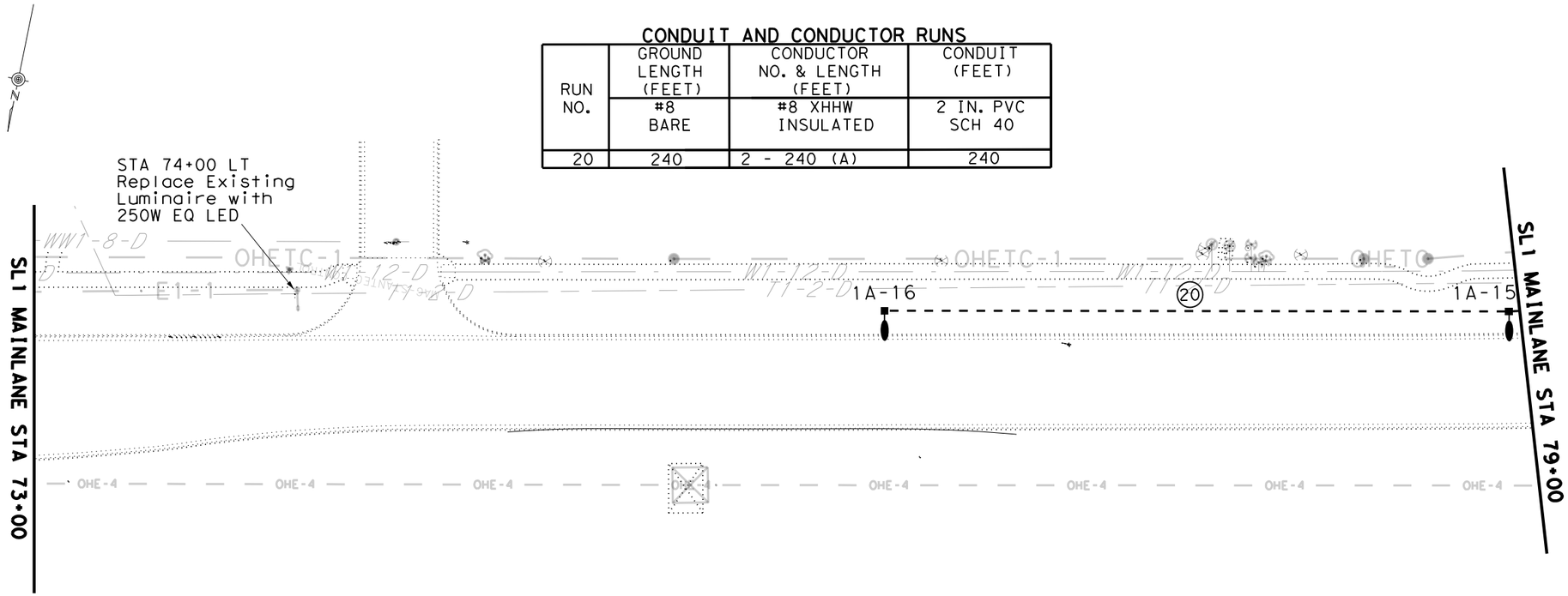
CONDUIT AND CONDUCTOR RUNS

RUN NO.	GROUND LENGTH (FEET)	CONDUCTOR NO. & LENGTH (FEET)	CONDUIT (FEET)
	#8 BARE	#8 XHHW INSULATED	2 IN. PVC SCH 40
20	240	2 - 240 (A)	240

LEGEND

⬡	ELECTRICAL SERVICE
— —	CONDUIT AND CONDUCTOR (TRENCHED)
═══	CONDUIT AND CONDUCTOR (BORED)
ⓘ	CONDUIT RUN NUMBER
□	GROUND BOX TY A (122311) W/APRON
●═●	ILLUMINATION POLE
⊃	ILLUMINATION POLE REMOVAL

1A-1 POLE DESIGNATION
- 1 — CIRCUIT NO.
- A — SERVICE NO.
- 1 — POLE or LUMINAIRE NO.



LUMINAIRE TABLE

POLE	LOCATION STA. NO.		FOUNDATION DEPTH
1A-15	78+68	15′ from edge of main lane or as conditions allow	8′
1A-16	76+27	15′ from edge of main lane or as conditions allow	8′

SHEET 2 OF 8 SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	16
432 6001	RIPRAP (CONC) (4 IN)	EA	0.7
610 6007	REMOVE RD IL ASM (SHOE-BASE)	EA	0
610 6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	1
610 6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	2
618 6023	CONDT (PVC) (SCH 40) (2")	LF	240
618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	0
620 6007	ELEC CONDR (NO.8) BARE	LF	240
620 6008	ELEC CONDR (NO.8) INSULATED	LF	480
624 6002	GROUND BOX TY A (122311)W/APRON	EA	0
628 6018	ELC SRV TY A 120/240 060(NS)SS(E)SP(U)	EA	0

DS

STATE OF TEXAS
GREG JONES
99401
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Greg Jones
CE208F8BC5604A4...

11/12/2020

SCALE (IN FEET):
0 50

Austin District
North Travis Area Office

Texas Department of Transportation

SL 1

ILLUMINATION LAYOUT

SHEET 2 OF 8

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	3136	01	191	SL 0001
		DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		103

DATE: 11/9/2020 8:52:34 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\8. Traffic\Illumination\SL0001_ILLUM_02.dgn

LUMINAIRE TABLE

POLE	LOCATION		FOUNDATION DEPTH
	STA. NO.		
1A-14	81+55	15' from edge of main lane or as conditions allow	8'

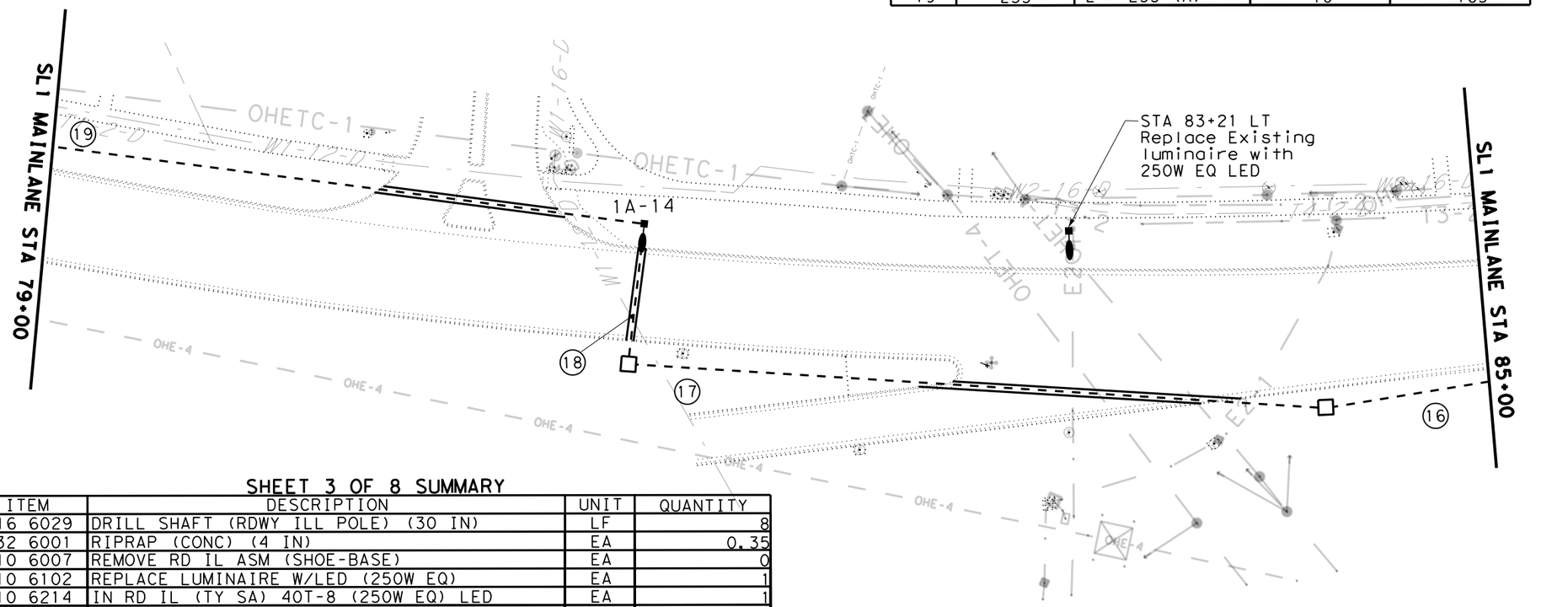
CONDUIT AND CONDUCTOR RUNS

RUN NO.	GROUND LENGTH (FEET) #8 BARE	CONDUCTOR NO. & LENGTH (FEET) #8 XHHW INSULATED	CONDUIT (FEET) 2 IN. PVC SCH 40 (BORE)	CONDUIT (FEET) 2 IN. PVC SCH 40
16	85	2 - 85 (A)		85
17	270	2 - 270 (A)	110	160
18	50	2 - 50 (A)	35	15
19	235	2 - 235 (A)	70	165

LEGEND

⬡	ELECTRICAL SERVICE
— —	CONDUIT AND CONDUCTOR (TRENCHED)
═ ═	CONDUIT AND CONDUCTOR (BORED)
ⓘ	CONDUIT RUN NUMBER
□	GROUND BOX TY A (122311) W/APRON
■●	ILLUMINATION POLE
⊠	ILLUMINATION POLE REMOVAL

1A-1 POLE DESIGNATION
- POLE or LUMINAIRE NO.
- CIRCUIT NO.
- SERVICE NO.



SHEET 3 OF 8 SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	8
432 6001	RIPRAP (CONC) (4 IN)	EA	0.35
610 6007	REMOVE RD IL ASM (SHOE-BASE)	EA	0
610 6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	1
610 6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	1
618 6023	CONDT (PVC) (SCH 40) (2")	LF	425
618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	215
620 6007	ELEC CONDR (NO.8) BARE	LF	640
620 6008	ELEC CONDR (NO.8) INSULATED	LF	1280
624 6002	GROUND BOX TY A (122311)W/APRON	EA	2
628 6018	ELC SRV TY A 120/240 060(NS)SS(E)SP(U)	EA	0

DS

STATE OF TEXAS
GREG JONES
99401
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Greg Jones
CE208F8BC5604A4...

11/12/2020

SCALE (IN FEET):
0 50

Austin District
North Travis Area Office

Texas Department of Transportation

SL 1

ILLUMINATION LAYOUT

SHEET 3 OF 8

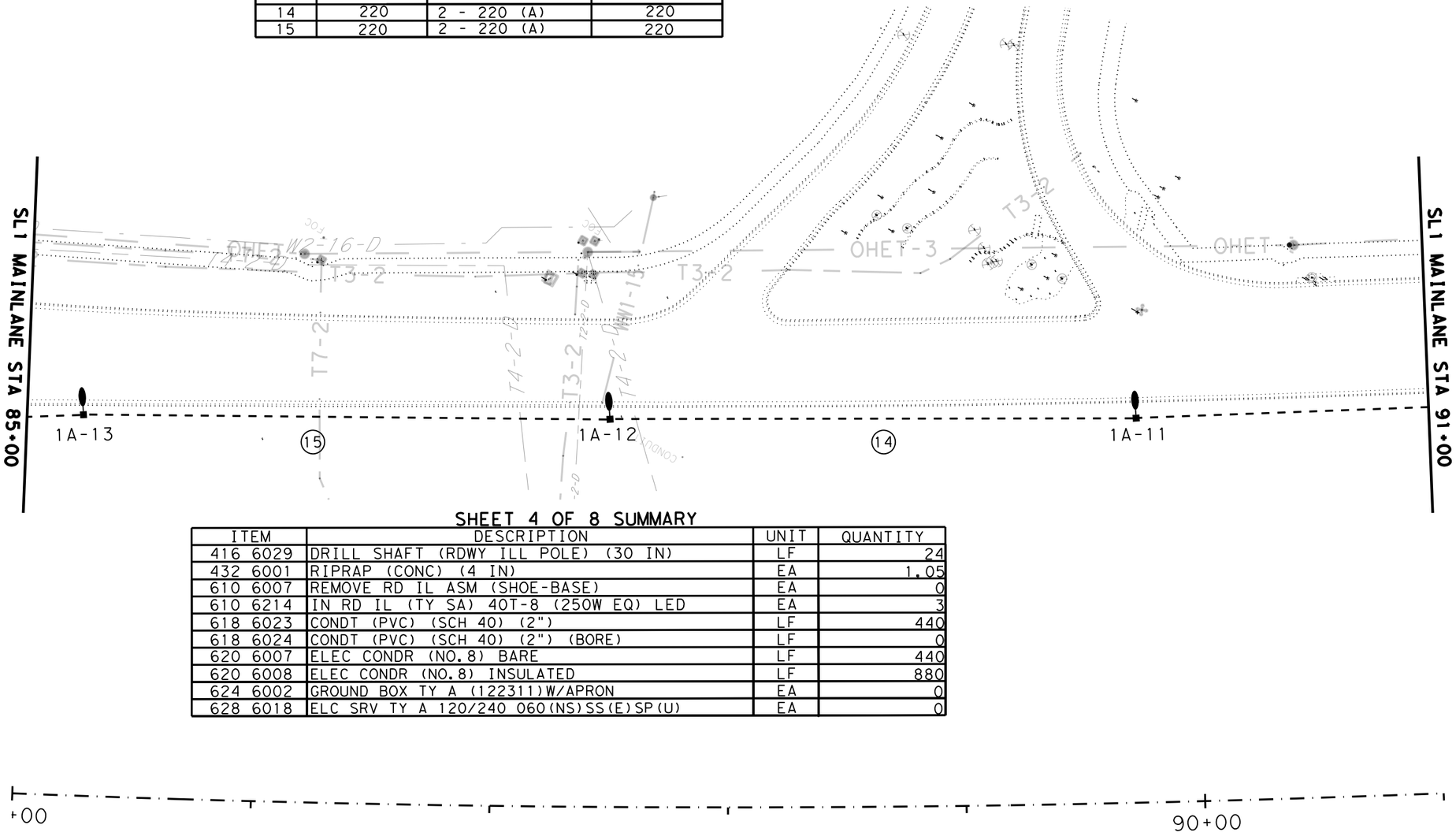
CONT	SECT	JOB	HIGHWAY
3136	01	191	SL 0001
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		104

DS: CK: DW: CK:

DATE: 11/9/2020 8:52:40 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\8. Traffic\Illumination\SL0001_ILLUM_03.dgn

CONDUIT AND CONDUCTOR RUNS

RUN NO.	GROUND LENGTH (FEET) #8 BARE	CONDUCTOR NO. & LENGTH (FEET) #8 XHHW INSULATED	CONDUIT (FEET) 2 IN. PVC SCH 40
14	220	2 - 220 (A)	220
15	220	2 - 220 (A)	220



SHEET 4 OF 8 SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	24
432 6001	RIPRAP (CONC) (4 IN)	EA	1.05
610 6007	REMOVE RD IL ASM (SHOE-BASE)	EA	0
610 6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	3
618 6023	CONDT (PVC) (SCH 40) (2")	LF	440
618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	0
620 6007	ELEC CONDR (NO.8) BARE	LF	440
620 6008	ELEC CONDR (NO.8) INSULATED	LF	880
624 6002	GROUND BOX TY A (122311)W/APRON	EA	0
628 6018	ELC SRV TY A 120/240 060(NS)SS(E)SP(U)	EA	0

LUMINAIRE TABLE

POLE	LOCATION STA. NO.		FOUNDATION DEPTH
1A-11	89+70	15' from edge of main lane or as conditions allow	8'
1A-12	87+50	15' from edge of main lane or as conditions allow	8'
1A-13	85+29	15' from edge of main lane or as conditions allow	8'

DS

STATE OF TEXAS
GREG JONES
99401
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Greg Jones
CE208F8BC5604A4...

11/12/2020

SCALE (IN FEET):
0 50

Austin District
North Travis Area Office

Texas Department of Transportation

SL 1

ILLUMINATION LAYOUT

SHEET 4 OF 8

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	3136	01	191	SL 0001
		DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		105

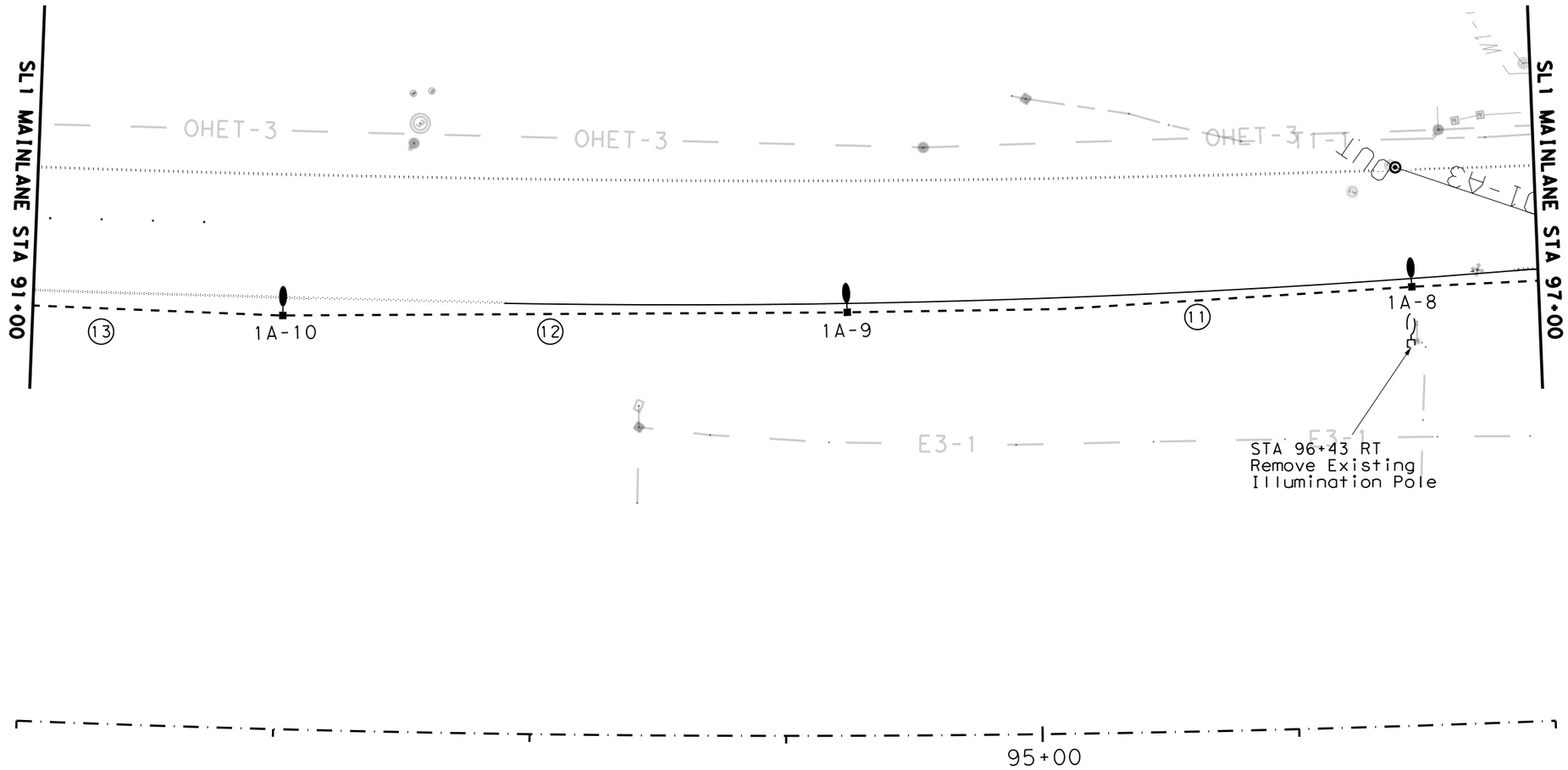
DATE: 11/9/2020 8:52:47 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\8. Traffic\Illumination\SL0001_ILLUM_04.dgn

CONDUIT AND CONDUCTOR RUNS

RUN NO.	GROUND LENGTH (FEET)	CONDUCTOR NO. & LENGTH (FEET)	CONDUIT (FEET)
	#8 BARE	#8 XHHW INSULATED	2 IN. PVC SCH 40
11	220	2 - 220 (A)	220
12	220	2 - 220 (A)	220
13	220	2 - 220 (A)	220

LUMINAIRE TABLE

POLE	LOCATION		FOUNDATION DEPTH
	STA. NO.		
1A-8	96+44	15' from edge of main lane or as conditions allow	8'
1A-9	94+24	15' from edge of main lane or as conditions allow	8'
1A-10	92+04	15' from edge of main lane or as conditions allow	8'



SHEET 5 OF 8 SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	24
432 6001	RIPRAP (CONC) (4 IN)	EA	1.05
610 6007	REMOVE RD IL ASM (SHOE-BASE)	EA	1
610 6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	3
618 6023	CONDT (PVC) (SCH 40) (2")	LF	660
618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	0
620 6007	ELEC CONDR (NO.8) BARE	LF	660
620 6008	ELEC CONDR (NO.8) INSULATED	LF	1320
624 6002	GROUND BOX TY A (122311)W/APRON	EA	0
628 6018	ELC SRV TY A 120/240 060(NS)SS(E)SP(U)	EA	0

DS

STATE OF TEXAS
GREG JONES
99401
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Greg Jones
CE208F8BC5604A4...

11/12/2020

SCALE (IN FEET):
0 50

Austin District
North Travis Area Office

Texas Department of Transportation

SL 1

ILLUMINATION LAYOUT

SHEET 5 OF 8

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3136	01	191	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		106

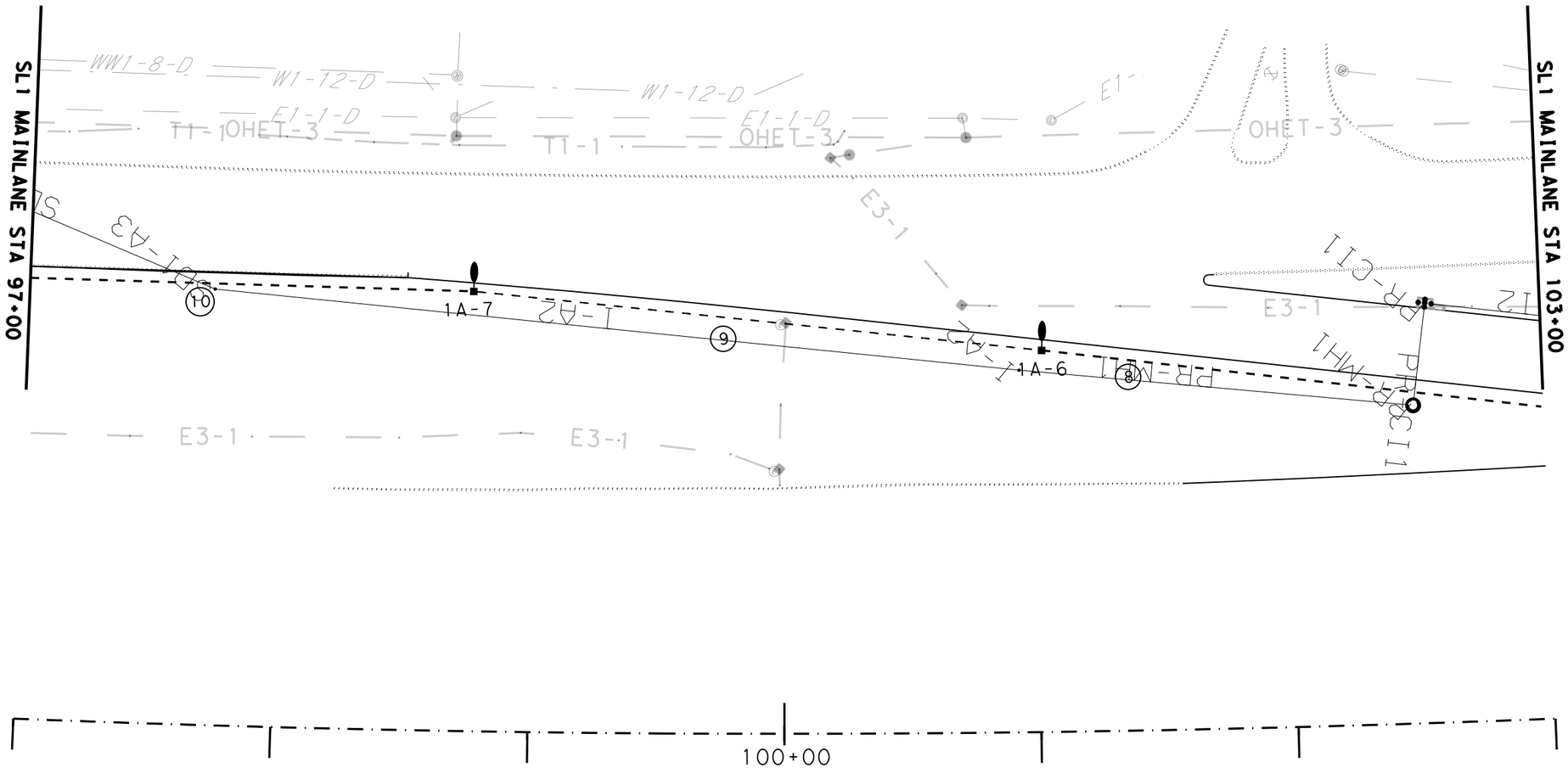
DATE: 11/9/2020 8:52:54 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\8. Traffic\Illumination\SL0001_ILLUM_05.dgn

CONDUIT AND CONDUCTOR RUNS

RUN NO.	GROUND LENGTH (FEET)	CONDUCTOR NO. & LENGTH (FEET)	CONDUIT (FEET)	CONDUIT (FEET)
	#8 BARE	#8 XHHW INSULATED	2 IN. PVC SCH 40 (BORE)	2 IN. PVC SCH 40
8	220	2 - 220 (A)	115	105
9	220	2 - 220 (A)		220
10	220	2 - 220 (A)		220

LUMINAIRE TABLE

POLE	LOCATION		FOUNDATION DEPTH
	STA. NO.		
1A-6	101+00	15' from edge of main lane or as conditions allow	8'
1A-7	98+79	15' from edge of main lane or as conditions allow	8'



SHEET 6 OF 8 SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	16
432 6001	RIPRAP (CONC) (4 IN)	EA	0.7
610 6007	REMOVE RD IL ASM (SHOE-BASE)	EA	0
610 6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	2
618 6023	CONDT (PVC) (SCH 40) (2")	LF	545
618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	115
620 6007	ELEC CONDR (NO.8) BARE	LF	660
620 6008	ELEC CONDR (NO.8) INSULATED	LF	1320
624 6002	GROUND BOX TY A (122311)W/APRON	EA	0
628 6018	ELC SRV TY A 120/240 060(NS)SS(E)SP(U)	EA	0

DS

STATE OF TEXAS
GREG JONES
99401
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Greg Jones
CE208F8BC5604A4...

11/12/2020

SCALE (IN FEET):
0 50

Austin District
North Travis Area Office

Texas Department of Transportation

SL 1

ILLUMINATION LAYOUT

SHEET 6 OF 8

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	3136	01	191	SL 0001
		DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		107

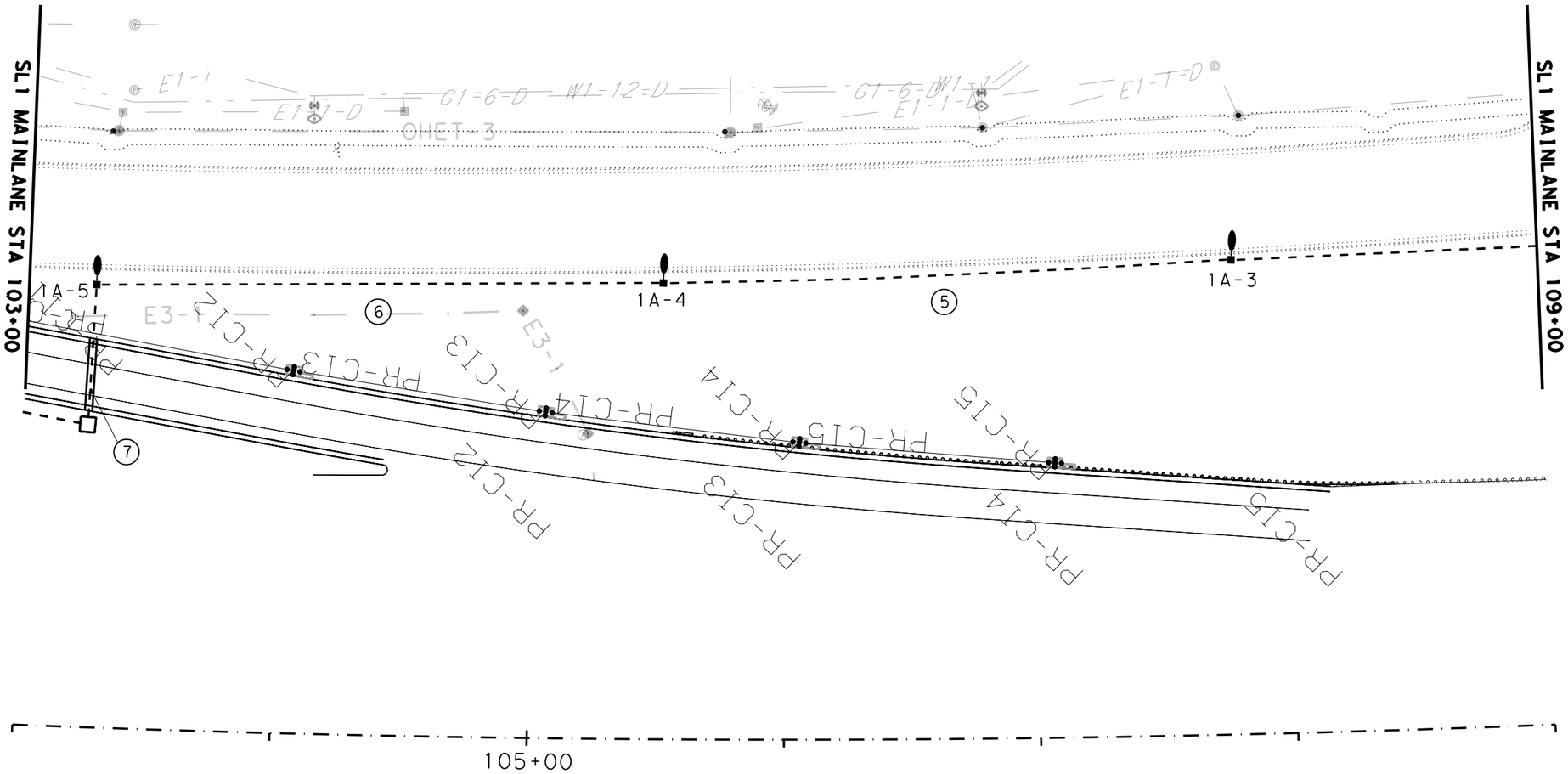
DATE: 11/9/2020 8:53:01 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011914 - Design\Plan Set\8. Traffic\Illumination\SL0001_ILLUM_06.dgn

CONDUIT AND CONDUCTOR RUNS

RUN NO.	GROUND LENGTH (FEET)	CONDUCTOR NO. & LENGTH (FEET)	CONDUIT (FEET)	CONDUIT (FEET)
	#8 BARE	#8 XHHW INSULATED	2 IN. PVC SCH 40 (BORE)	2 IN. PVC SCH 40
5	220	2 - 220 (A)		220
6	220	2 - 220 (A)		220
7	55	2 - 55 (A)	30	25

LUMINAIRE TABLE

POLE	LOCATION		FOUNDATION DEPTH
	STA. NO.		
1A-3	107+73	15' from edge of main lane or as conditions allow	8'
1A-4	105+53	15' from edge of main lane or as conditions allow	8'
1A-5	103+32	15' from edge of main lane or as conditions allow	8'



SHEET 7 OF 8 SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	24
432 6001	RIPRAP (CONC) (4 IN)	EA	1.05
610 6007	REMOVE RD IL ASM (SHOE-BASE)	EA	0
610 6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	3
618 6023	CONDT (PVC) (SCH 40) (2")	LF	440
618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	0
620 6007	ELEC CONDR (NO.8) BARE	LF	440
620 6008	ELEC CONDR (NO.8) INSULATED	LF	880
624 6002	GROUND BOX TY A (122311)W/APRON	EA	0
628 6018	ELC SRV TY A 120/240 060(NS)SS(E)SP(U)	EA	0

DS

STATE OF TEXAS
GREG JONES
99401
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Greg Jones
CE208F8BC5604A4...

11/12/2020

SCALE (IN FEET):
0 50

Austin District
North Travis Area Office

Texas Department of Transportation

SL 1

ILLUMINATION LAYOUT

SHEET 7 OF 8

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3136	01	191	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		108

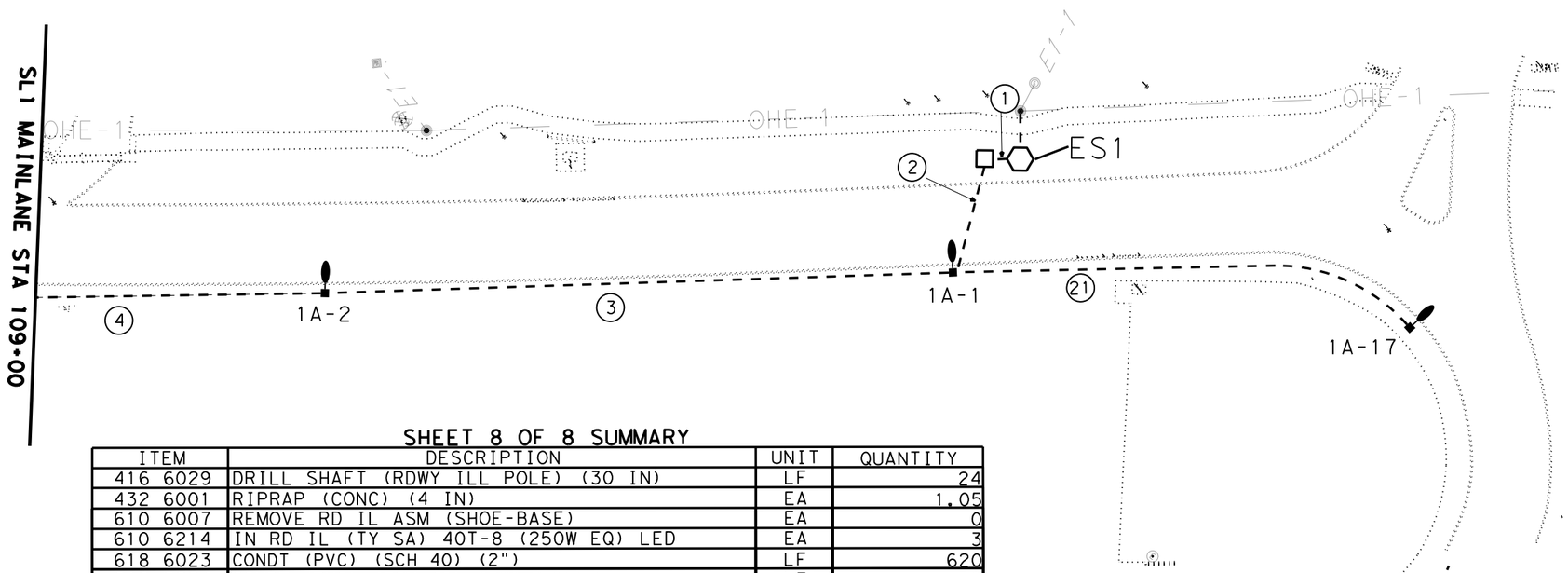
DATE: 11/9/2020 8:53:08 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\8. Traffic\Illumination\SL0001_ILLUM_07.dgn

CONDUIT AND CONDUCTOR RUNS

RUN NO.	GROUND LENGTH (FEET) #8 BARE	CONDUCTOR NO. & LENGTH (FEET) #8 XHHW INSULATED	CONDUIT (FEET) 2 IN. PVC SCH 40 (BORE)	CONDUIT (FEET) 2 IN. PVC SCH 40
1	5	2 - 5 (A)		5
2	40	2 - 40 (A)	30	10
3	220	2 - 220 (A)		220
4	220	2 - 220 (A)		220
21	165	2 - 165 (A)		165

LUMINAIRE TABLE

POLE	LOCATION STA. NO.		FOUNDATION DEPTH
1A-1	112+32	15' from edge of main lane or as conditions allow	8'
1A-2	110+10	15' from edge of main lane or as conditions allow	8'
1A-17	113+94	15' from edge of main lane or as conditions allow	8'



SHEET 8 OF 8 SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	24
432 6001	RIPRAP (CONC) (4 IN)	EA	1.05
610 6007	REMOVE RD IL ASM (SHOE-BASE)	EA	0
610 6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	3
618 6023	CONDT (PVC) (SCH 40) (2")	LF	620
618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	30
620 6007	ELEC CONDR (NO.8) BARE	LF	650
620 6008	ELEC CONDR (NO.8) INSULATED	LF	1300
624 6002	GROUND BOX TY A (122311)W/APRON	EA	1
628 6010	ELC SRV TY A 120/240 060(NS)SS(E)SP(U)	EA	1

Electrical Service Data

Electrical Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Lighting Contactor Amps	Panelbd/ Loadcenter	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
ES1	8	ELC SRV TY A 120/240 060(NS)SS(E)SP(U)	1 1/4"	3/#6	N/A	2P/60	2P/60	N/A	A	2P/20	12.07	2.9

DS

STATE OF TEXAS
GREG JONES
99401
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Greg Jones
CE208F8BC5604A4...

11/12/2020

SCALE (IN FEET): 0 50

Austin District
North Travis Area Office

Texas Department of Transportation

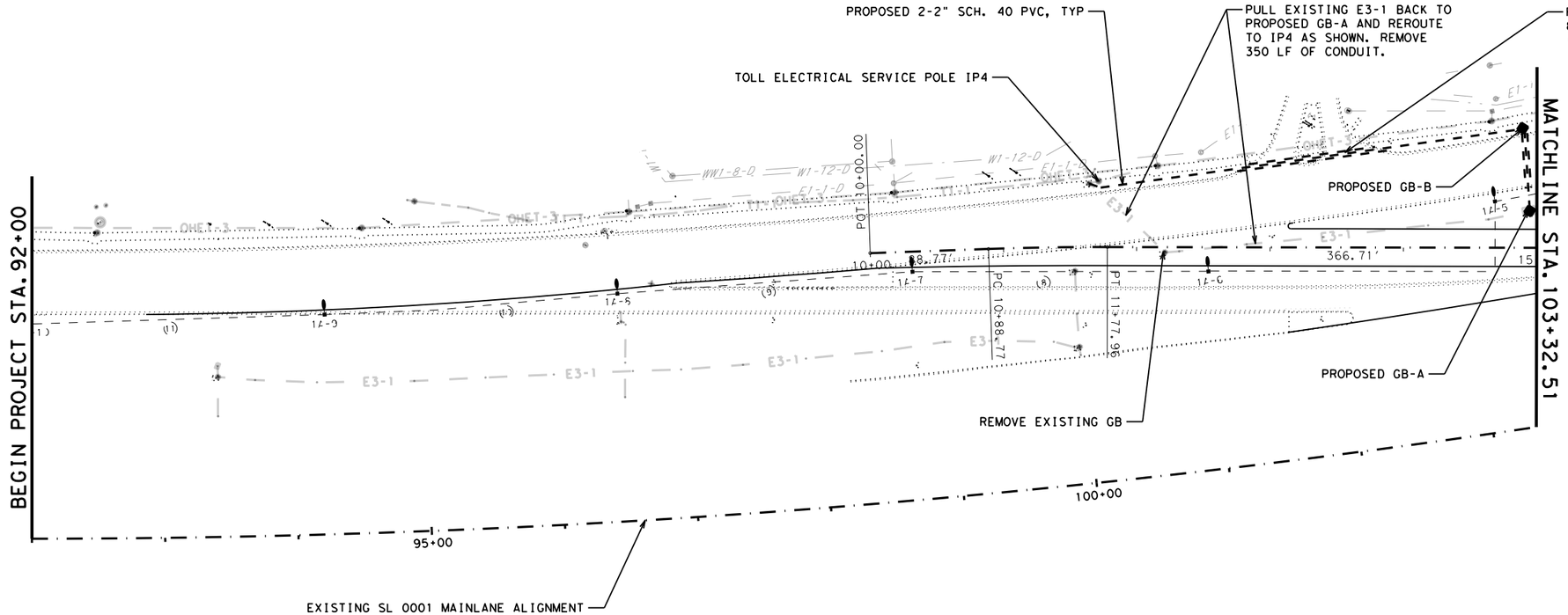
SL 1

ILLUMINATION LAYOUT

SHEET 8 OF 8

© 2020	CONT	SECT	JOB	HIGHWAY
DS: CK:	3136	01	191	SL 0001
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		109

DATE: 11/9/2020 8:53:17 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\8. Traffic\Illumination\SL0001_ILLUM_08.dgn



NOTES:

1. IF THE CONTRACTOR DAMAGES ANY DUCT BANK OR CABLE OR CONDUIT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF REPAIRING OR REPLACING ANY DAMAGED DUCT BANK OR CABLE OR CONDUIT TO THE ORIGINAL CONDITION. THIS ACTION, HOWEVER, SHALL IN NO WAY BE INTERPRETED AS RELIEVING THE CONTRACTOR OF THEIR RESPONSIBILITIES.

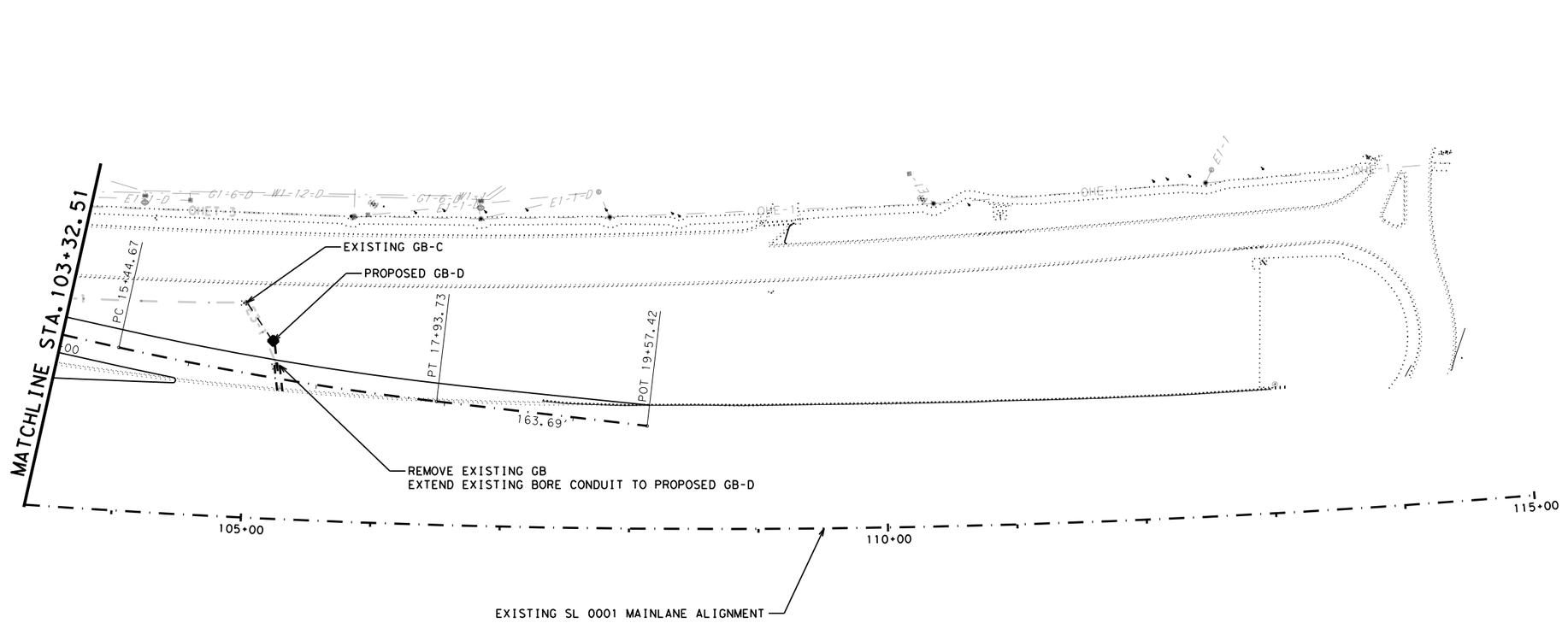
2. PROPOSED CONDUIT TO MEET TXDOT STANDARD SPECS ITEM 618 AND ITEM 624

3. CONTRACTOR MAY SPLICE POWER CABLES IF NEEDED AT GB-D. SPLICE SHALL ADHERE TO ED-14 DETAILS.

DocuSigned by:
Shane Swimm
F0E6FDD2B5994AD...

11/12/2020

STATE OF TEXAS
SHANE V. SWIMM
138362
LICENSED PROFESSIONAL ENGINEER



Austin District
North Travis Area Office

Texas Department of Transportation

SL 0001

GROUND BOX LAYOUT

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3136	01	191	SL 0001
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	TRAVIS		110

DATE: 11/6/2020 1:49:24 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\8. Traffic\CTRMA GROUND BOXES\SL0001_CTRMA_GB.dgn

TRAFFIC SIGNAL GENERAL NOTES:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ALL INCIDENTAL EQUIPMENT AND MATERIALS NECESSARY TO RESULT IN A COMPLETE AND OPERATIONAL TRAFFIC SIGNAL. ANY ITEMS REQUIRED, BUT OMITTED, ARE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE SUBSIDIARY TO THE APPROPRIATE BID ITEMS.

2. CONTRACTOR WILL LOCATE ALL UTILITIES IN THE FIELD PRIOR TO BEGINNING SIGNAL CONSTRUCTION WORK.

3. CONTRACTOR WILL COORDINATE WITH AUSTIN ENERGY AND SEEK THEIR APPROVAL TO ENSURE THAT NO CONFLICT EXISTS BETWEEN THE SIGNAL EQUIPMENT AND OVERHEAD ELECTRICAL LINES. ALL SIGNAL EQUIPMENT WILL HAVE A 3 FEET CLEARANCE FROM NEUTRAL LINES AND 10 FEET CLEARANCE FROM POWER LINES. CONTRACTOR WILL FOLLOW OSHA REQUIREMENTS FOR WORKING CLOSE TO ELECTRICAL LINES.

4. CONTRACTOR WILL INSTALL ALL SIGNAL EQUIPMENT AS SHOWN ON THE PLANS. ANY CHANGES WILL NEED TO BE APPROVED BY THE INSPECTING ENGINEER IN THE FILED.

5. SIGNAL POLE, CONTROLLER FOUNDATION, AND PULL BOX LOCATIONS WILL BE LOCATED/MARKED IN THE FIELD BY THE CONTRACTOR AND APPROVED BY THE INSPECTING ENGINEER PRIOR TO INSTALLATION. CONTACT BRIAN CRAIG AT 512-974-4061.

6. ALL SIGNAL FOUNDATIONS WILL NEED TO BE INSPECTED AND APPROVED BY THE INSPECTING ENGINEER PRIOR TO CONTRACTOR POURING CONCRETE. CONTACT BRIAN CRAIG AT 512-974-4061 WITH TWO(2) DAYS NOTICE.

7. ALL PROPOSED SIGNAL HEADS WILL BE WRAPPED IN BURLAP UNTIL READY FOR OPERATION.

8. COORDINATE WITH CITY(BRIAN CRAIG) PRIOR TO INSTALLING WIRES FOR THE TRAFFIC SIGNAL. ONCE THE WIRES ARE INSTALLED BY THE CONTRACTOR, THE CITY CREW WILL CONNECT THE WIRES TO THE SIGNAL CONTROLLER.

9. ANY EXISTING PAVEMENT, CURBS, SIDEWALK, AND DRIVEWAYS DAMAGED OR REMOVED DURING CONSTRUCTION WILL BE REPLACED TO CITY OF AUSTIN STANDARDS.

10. ALL NEW CONDUITS UNDER ROADWAYS AND DRIVEWAYS WILL BE BORED. CONDUITS UNDER NATURAL GROUND WILL BE TRENCHED AND BURIED; HOWEVER, THE CONTRACTOR WILL BACKFILL, COMPACT, AND RESTORE TRENCHED AREA TO ORIGINAL CONDITION AND MATCH EXISTING SURFACE CONDITION TO THE DENSITY OF ADJACENT AREA.

11. CONTRACTOR WILL CLEAN AND RESTORE THE CONSTRUCTION AREA TO ORIGINAL CONDITIONS PRIOR TO FINAL INSPECTION.

12. SIGNAL HEADS WILL BE 12" LED WITH SPECIFIED HEADS AS SHOWN IN THE PLANS.

13. STREET NAME SIGN AND SIGNS ON MAST ARM WILL BE DESIGNED AS PER CITY SPECIFICATION 824S. COORDINATE WITH CITY TRAFFIC SIGN SHOP AT 512-974-4055 FOR STREET BLOCK NUMBERS.

14. ALL SIGNAL EQUIPMENT WILL BE INSTALLED AS PER CITY OF AUSTIN STANDARDS AND SPECIFICATIONS.

15. CONTRACTOR WILL COORDINATE WITH AUSTIN ENERGY TO SET UP ELECTRICAL SERVICE FOR THE TRAFFIC SIGNAL. THIS ITEM WILL NOT BE PAID SEPARATELY. CONSIDER SUBSIDIARY TO 840S-TSI-TRAFIC SIGNAL INSTALLATION.

16. CONTRACTOR WILL PURCHASE SIGNAL CABINET, CONTROLLER, AND CONFLICT MONITOR FROM CITY OF AUSTIN OR APPROVED VENDOR.

17. CONTRACTOR SHALL REIMBURSE THE CITY OF AUSTIN FOR INSPECTING AND ACTIVATING THE SIGNAL.

STATE OF TEXAS
NICOLA GHENO
117180
LICENSED PROFESSIONAL ENGINEER

11/25/2020

Nicola Gheno

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

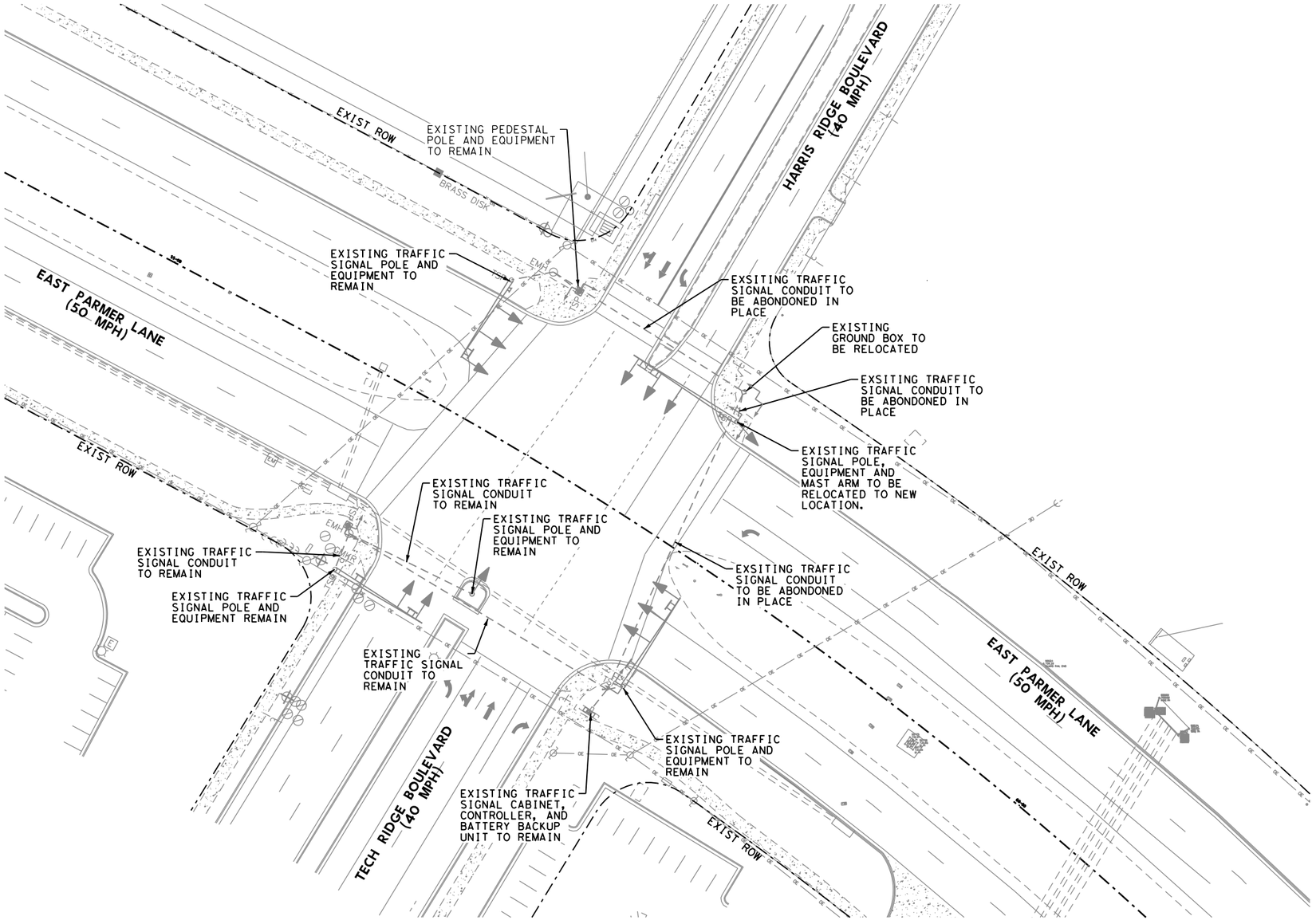
Texas Department of Transportation

PARMER LANE

TRAFFIC SIGNAL GENERAL NOTES

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		111



LEGEND

- EXISTING TRAFFIC FLOW ARROW
- EXISTING SINGLE MAST ARM
- EXISTING TRAFFIC CONTROL BOX
- EXISTING SIGNAL HEAD
- EXISTING PEDESTAL POLE
- EXISTING CONDUIT
- OE — EXISTING OVER HEAD ELECTRIC UTILITIES
- EXISTING PEDESTRIAN SIGNAL HEAD

NOTES:

1. RIGHT OF WAY LINE LOCATION IS APPROXIMATE.
2. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. CONTRACTOR SHALL DETERMINE THE EXISTING LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

STATE OF TEXAS
NICOLA GHENO
117180
LICENSED PROFESSIONAL ENGINEER

11/25/2020

Nicola Gheno

NO.	REVISIONS	BY	DATE

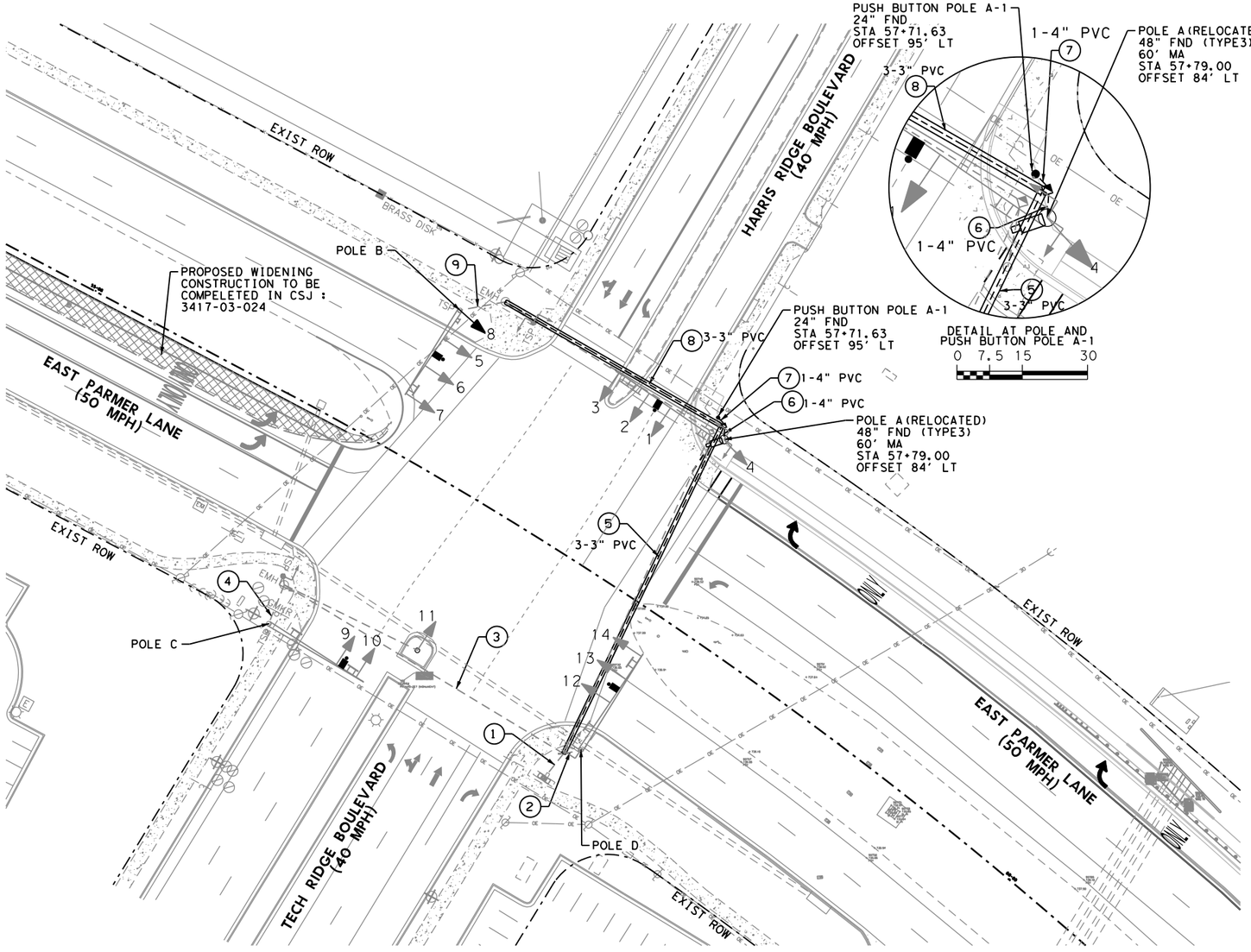
Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

PARMER LANE
EXISTING TRAFFIC SIGNAL PLAN

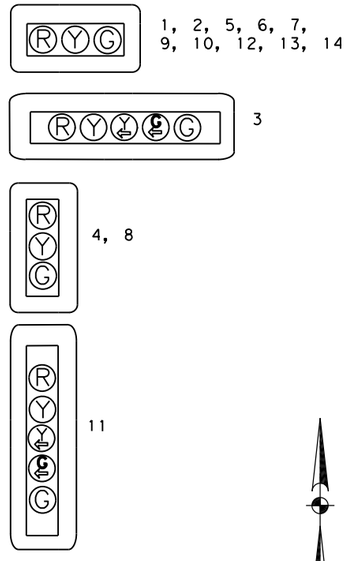
SHEET 1 OF 1

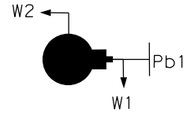
DS:	CK:	CONT	SECT	JOB	HIGHWAY
		3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		112

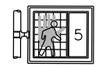


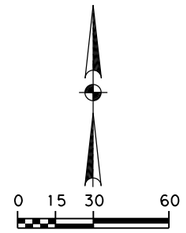
LEGEND

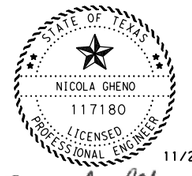
PROPOSED	EXISTING
TRAFFIC FLOW ARROW	EXISTING TRAFFIC FLOW ARROW
PROPOSED CONDUIT (BORE)	EXISTING SINGLE MAST ARM
PROPOSED CONDUIT (TRENCH)	EXISTING TRAFFIC CONTROL BOX
PROPOSED SIGNAL HEAD	EXISTING SIGNAL HEAD
PROPOSED TYPE B WITH APRON GROUND BOX	EXISTING PEDESTAL POLE
PROPOSED POLE FOUNDATION	EXISTING CONDUIT
PROPOSED MIOVISION CAMERA	EXISTING OVER HEAD ELECTRIC UTILITIES
PROPOSED OPTICOM	EXISTING PEDESTRIAN SIGNAL HEAD
PROPOSED PUSH BUTTON POLE	











NOTES:

1. THE STATION AND OFFSET ARE MEASURED FROM THE CENTERLINE OF PARMER LANE TO CENTER OF POLES. EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD AND VERIFIED WITH CITY OF AUSITN PRIOR TO ANY CONSTRUCTION.
2. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
3. ALL VEHICULAR TRAFFIC SIGNAL HEAD TYPES HAVE 12-INCH LENSES AND ARE LED.
4. SIDEWALK AND RAMP SHALL CONFORM TO ADA AND TDLR STANDARDS. SEE ROADWAY PLAN AND PROFILE SHEET 2 OF 2 FOR PEDESTRIAN RAMP LAYOUT.
5. ALL PEDESTRIAN PUSH BUTTONS SHALL BE ACCESSIBLE FROM A LEVEL LANDING AREA. LOCATION OF PUSH BUTTONS SHALL BE COMPLIANT WITH TMUTCD SECTION 4E RECOMMENDED LOCATIONS.
6. EXISTING Pb2 TO BE RELOCATED FROM NORTH SIDE OF EXISTING POLE A TO PROPOSED PUSH BUTTON POLE A-1.
7. CONTRACTOR SHALL POT HOLE LOCATIONS SHOWN BEFORE FOUNDATION INSTALLATION. SHOULD THE CONTRACTOR VISUALLY CONFIRM THE PRESENCE OF ROCK WITHIN SIX (6) FEET OF THE SURFACE, CONTRACTOR SHALL NOTIFY THE CITY OF AUSTIN TRAFFIC SIGNAL INSPECTOR TO EVALUATE THE POSSIBILITY OF UTILIZING A DIFFERENT FOUNDATION SPECIFICATION GIVEN THE PRESENCE OF ROCK WITHIN THE SUBGRADE. IF THE CITY OF AUSTIN TRAFFIC SIGNAL INSPECTOR DEEMS THAT THE PRESENCE OF ROCK IS ADEQUATE FOR THE USE OF A DIFFERENT FOUNDATION SPECIFICATION, CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD OF THE CHANGE PRIOR TO PROCEEDING. OTHERWISE, DESIGN FOR ALLOWABLE BEARING VALUE BETWEEN 2000 LBS/SQ FT. AND 8000 LBS/SQ FT.
8. SEE TRAFFIC PAVEMENT MARKING AND SIGNS SHEET FOR PAVEMENT MARKING DETAILS.

NO.	REVISIONS	BY	DATE

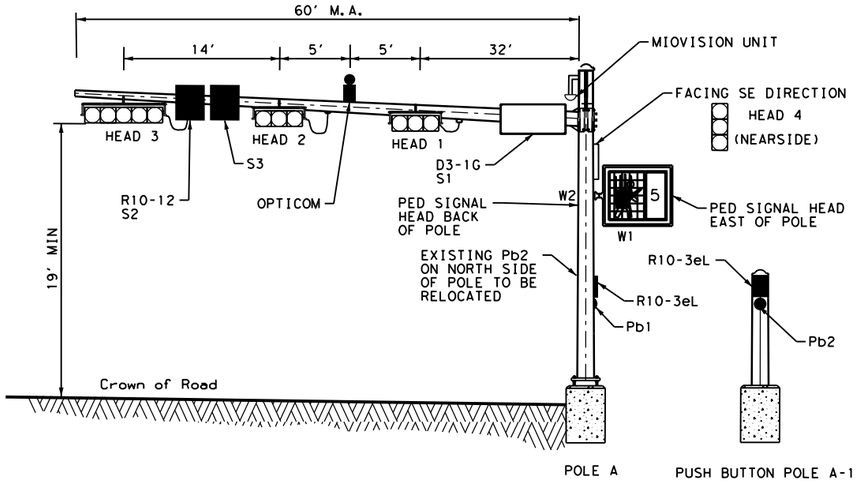
Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

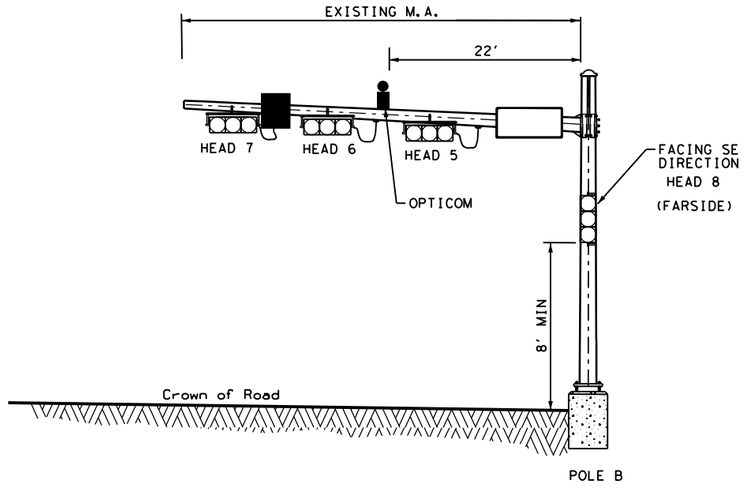
PARMER LANE PROPOSED TRAFFIC SIGNAL PLAN

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		113

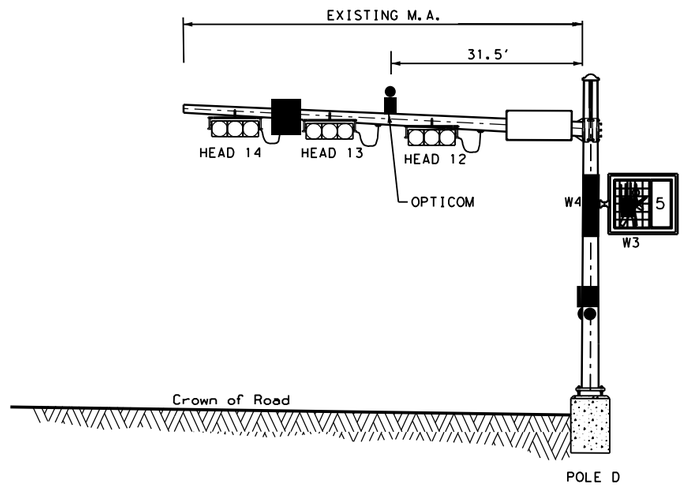


LOOKING NE ON HARRIS RIDGE BOULEVARD

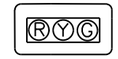


LOOKING NW ON PARMER LANE

LOOKING SW ON HARRIS RIDGE BOULEVARD

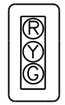


LOOKING SE ON PARMER LANE

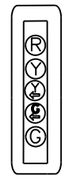


1, 2, 5, 6, 7, 9, 10, 12, 13, 14

3



4, 8



11

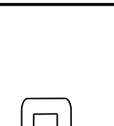
NOTES:

1. HEADS WILL BE CENTERED OVER THE LANES, OR AS DIRECTED BY ENGINEER. DISTANCE SHOWN ALONG MAST ARMS ARE APPROXIMATE AND WILL BE ADJUSTED IN THE FIELD AS NEEDED.
2. FOUNDATIONS WILL BE ADJUSTED IN THE FIELD IN ORDER TO MEET CLEARANCE. LOCATION OF FOUNDATION WILL BE APPROVED BY THE INSPECTING ENGINEER, PRIOR TO INSTALLATION CONTACT BRIAN CRAIG AT 512-974-4061
3. LOCATION OF MAST ARMS IS APPROXIMATE. ANY CHANGES WILL BE APPROVED BY THE INSPECTING ENGINEER BRIAN CRAIG AT 512-974-4061
4. MAST ARM ATTACHMENT HEIGHT WILL BE CALCULATED BY THE CONTRACTOR IN THE FIELD AND APPROVED BY THE ENGINEER.
5. AIR WINGS TO BE INSTALLED ON ARMS 40' OR LONGER.

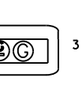
S1

D3-1G

S2

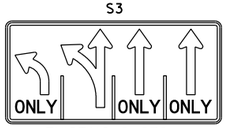


R10-12

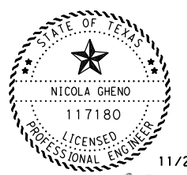


(R10-3eL)
PART OF APS
Pb 1,2

S3



EXISTING CUSTOM
INTERSECTION LANE
CONTROL



11/25/2020

Nicola Gheno

NO.	REVISIONS	BY	DATE

Stantec

Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

PARMER LANE

TRAFFIC SIGNAL ELEVATIONS

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		114

NOTES:

1. POLE E NOT SHOWN

RUN #	STATUS*	RUN LENGTH (LF)	CONDT (PVC) (SCHD 40) (3") (BORE)	CONDT (PVC) (SCHD 40) (4")	ELEC CONDR (NO. 8) BARE	TRF SIG CBL (TY C) (12 AWG) (2 CONDR)	TRF SIG CBL (TY A) (14 AWG) (20 CONDR)	MIOVISION DETECTION CONDUCTOR CABLE	OPTICOM
1	E	15				2	1	1	4
2	E	10							1
3	E	150							1
4	E	20							1
5	I	170	3		3	2	1	1	2
6	I	10		1	1	1	1	1	1
7	I	5		1	1	1			
8	I	115	3		3				1
9	E	25							1
		TOTAL QTY (LF)	855	15	870	385	195	195	730

*I = INSTALL; E = EXISTING

INSIDE CABINET	14 AWG	12 AWG	#6 AWG (BARE)	MIOVISION DETECTION CONDUCTOR CABLE	OPTICOM
	20C	2C			
TOTAL (LF)	5	10	5	5	10

SUMMARY OF TRAFFIC SIGNAL HEADS			
SIGNAL HEAD NUMBER	VEH SIG SEC (12 IN) LED (GRN)	VEH SIG SEC (12 IN) LED (YEL)	VEH SIG SEC (12 IN) LED (RED)
8	1	1	1
TOTAL	1	1	1

SUMMARY OF SIGNAL POLES				
SIGNAL POLE	MAST ARM LENGTH (FT)	DESCRIPTION	FOUNDATION TYPE	DRILL SHAFT (48 IN) (LF)
POLE A	60	EXISTING 60 FT TRAFFIC SIGNAL POLE ASSEMBLY	TYPE III - 48	14
			TOTAL	14

APS MESSAGE INFORMATION			
APS UNIT #	ACKNOWLEGEMENT DEFAULT "WAIT"	EXTENDED PRESS MESSAGE "Wait to Cross (Street Name) at (Cross Street Name)	WALK PRESS MESSAGE "(Street Name) Walk Sign is on to cross, (Street Name)" or tone
Pb1	YES	Parmer Lane at Harris Ridge Blvd	Australian Tone
Pb2	YES	Harris Ridge Blvd at Parmer Lane	Australian Tone

If, during construction, situations arise that force two APS units to be closer than 10 feet from each other, a verbal walk message will be required. Contact Engineer for approval.

INSIDE ARMS	14 AWG		OPTICOM
	5C	7C	
POLE A (LF)	75	60	40
POLE B (LF)	-	-	25
POLE C (LF)	-	-	40
POLE D (LF)	-	-	35
TOTAL (LF)	75	60	140

INSIDE POLES	14 AWG		12 AWG	MIOVISION DETECTION CONDUCTOR CABLE	OPTICOM
	5C	7C	2C		
POLE A (LF)	75	20	5	25	20
POLE B (LF)	15				20
POLE C (LF)					20
POLE D (LF)					20
PUSH BUTTON POLE A-1			5		
TOTAL (LF)	90	20	10	25	80

* Table shows only proposed cables. Existing cables in poles B, C and D to remain.

	20 CNDR	Signal Dir	Signal Colors	Corner 1 (Pull Box-A) Pole A Head 1 (THRU)	Head 2 (THRU)	Head 3 (LEFT)	N/S Ped (W1)	E/W Ped (W2)	Head 4 (NEARSIDE)	Corner 2 (Pull Box-B) Pole B Head 8 (FARSIDE)
CNDR #				5	5	7	5	5	5	5
1	Rd/Wh	Thru	Red	Red	Red	Red				Red
2	Bl/Wh		Yellow	Blue	Blue	Blue				Blue
3	Grn/Wh		Green	Green	Green	Green				Green
4	Rd	Left Turns FYA	<- R							
5	Or		<- Y			Orange				
6	Grn		FYA							
7	Blk		<- G			Black				
8	Bl		Spare							
9	Rd/Grn	Nearside	Red						Red	
10	Org/Rd		Yellow						Orange	
11	Bl/Rd		Green						Blue	
12	Rd/Blk	N/S Peds	Don't Walk				Red			
13	Grn/Blk		Walk				Green			
14	Blk/Wh	E/W Peds	Don't Walk					Red		
15	Bl/Blk		Walk					Green		
16	Wh/Blk	Right Arrows (Ball colors to thru)	Yellow Arrows							
17	Blk/Rd		Green Arrows							
18	Wh/Rd	Spare	Spare							
19	Or/Blk	Spare	Spare							
20	White	Neutral	AC Neutral	AC Neutral	AC Neutral	AC Neutral	AC Neutral	AC Neutral	AC Neutral	AC Neutral

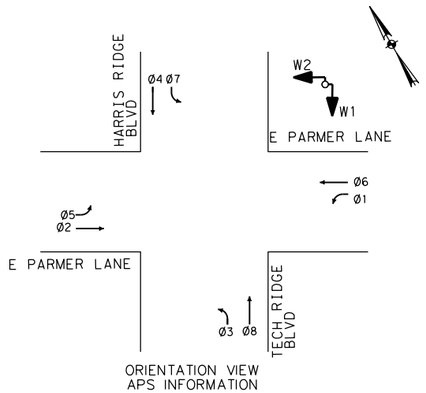
* Table shows only proposed cables. Existing cables in poles B, C and D to remain.

				Corner 1 (Pull Box-A) Pole A N/S Pb1	Push Button Pole E/W Pb2
	TY C (12 AWG) (2 CNDR) Color	Push Button Dir			
1	Rd	North/ South	Positive	Red	
2	Blk	North/ South	Negative	Black	
3	Wh	East/ West	Positive		White
4	Blk	East/ West	Negative		Black

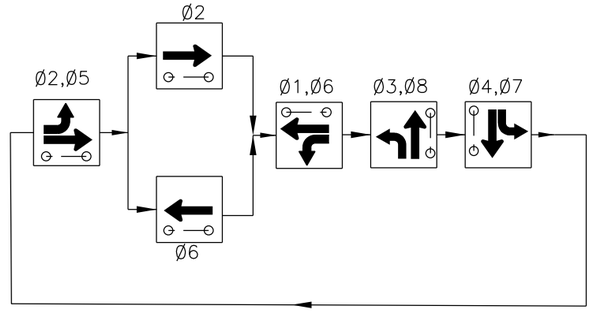
PROPOSED SIGNAL HEADS

8

12" LED SIGNAL SECTIONS

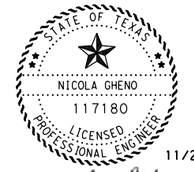


ORIENTATION VIEW
APS INFORMATION



PHASE SEQUENCE

PEDESTRIAN MOVEMENT
PROTECTED MOVEMENT
PERMISSIVE MOVEMENT



11/25/2020

Nicola Gheno

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

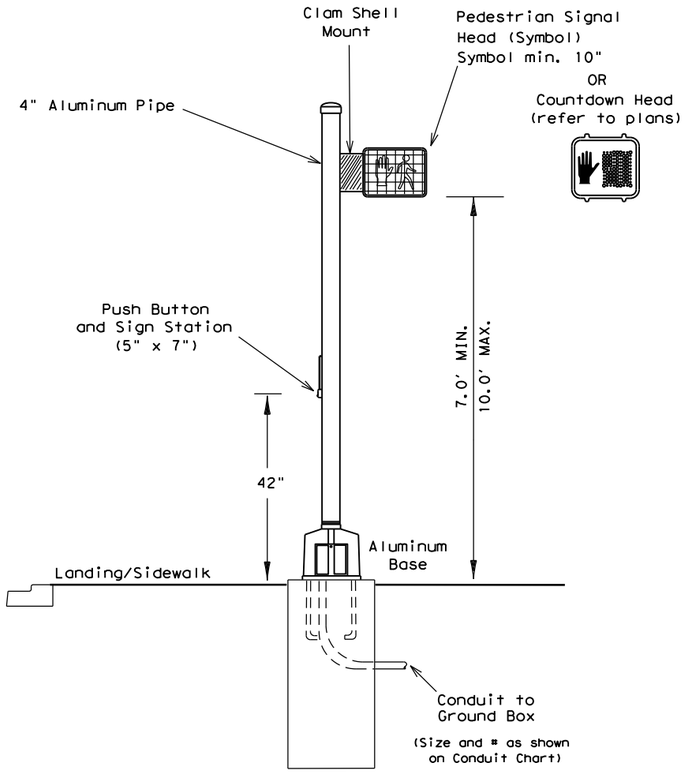
Texas Department of Transportation

PARMER LANE

TRAFFIC SIGNAL QUANTITY

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		115



Refer to Standard Sheet TS-FD for details of pedestal pole foundation.

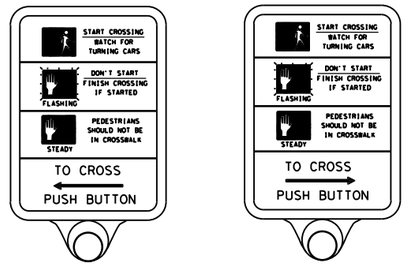
PEDESTAL POLE DETAILS

A separate 2/C wire is to be installed to each push button from the controller

Refer to Austin District General Notes for push button requirements.

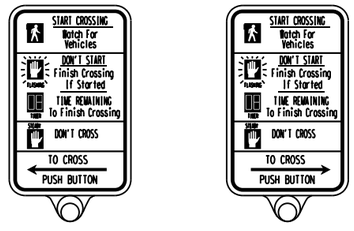
PUSH BUTTON STATIONS FRONT VIEW

STANDARD



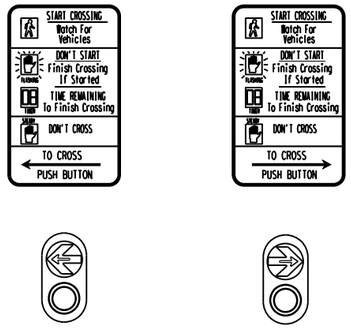
5" x 7" sign for pedestal pole
9" x 12" sign for standard signal pole

COUNTDOWN



5" x 9" station/sign for pedestal pole
9" x 15" station/sign for standard signal pole

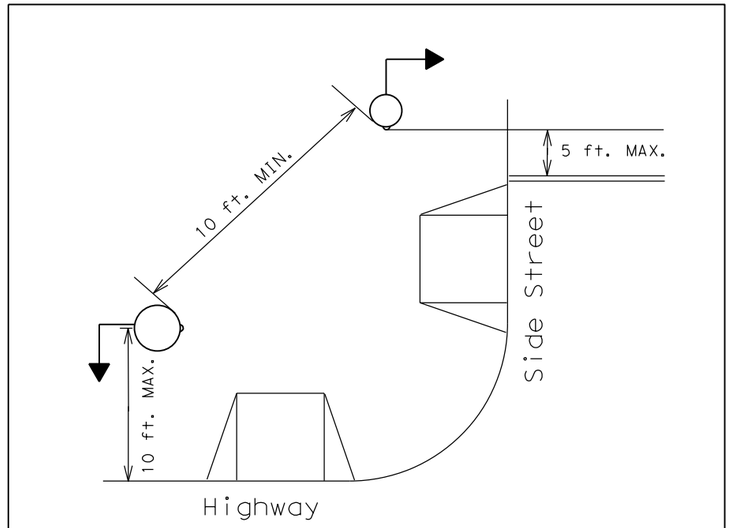
APS w/ COUNTDOWN



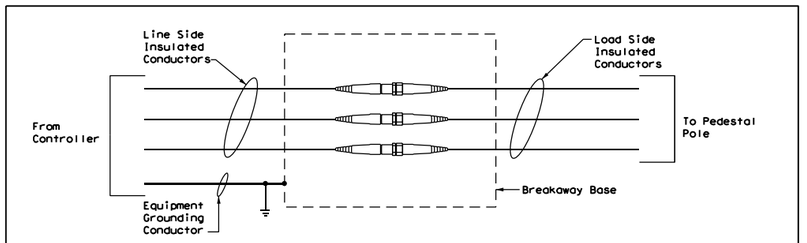
5" x 7" adhesive sign for pedestal pole and for standard signal pole

Adjustable Arrow - Inner arrow is embossed with small indicator light. Push Button can be part of sign assembly or separate. Button housing can be oval or circular.

Only install Double Arrow when called for in plans.



Refer to MUTCD SEC. 4E for guidance on accessible push button placement on one or two curb-cut ramps.



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS

Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies." Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse slug). For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).

NO SCALE

Texas Department of Transportation
Austin District Traffic

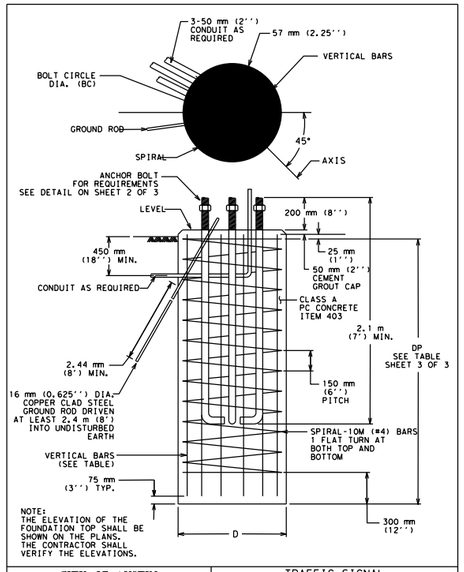
PPA-14(AUS) PEDESTAL POLE ASSEMBLY

Austin District Standard

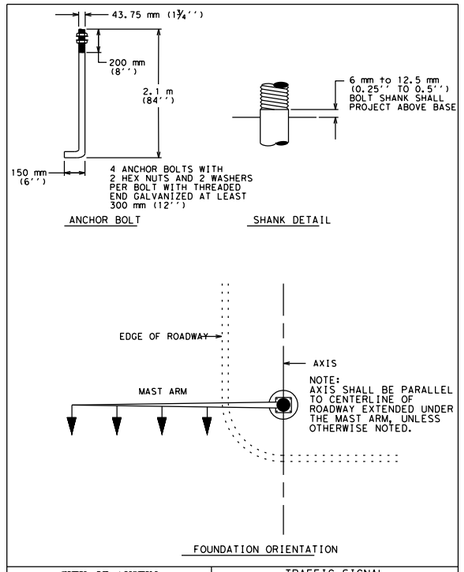
REVISIONS

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
14	6		126

COUNTY	CONTROL	SECTION	JOB	HIGHWAY
TRAVIS	3417	03	025	FM 734



CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		TRAFFIC SIGNAL DRILLED SHAFT FOUNDATION	
RECORD COPY SIGNED BY LEON BARBA	9/17/01 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 831S-1 1 OF 4



CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		TRAFFIC SIGNAL DRILLED SHAFT FOUNDATION	
RECORD COPY SIGNED BY LEON BARBA	9/17/01 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 831S-1 2 OF 4

FOUNDATION DATA

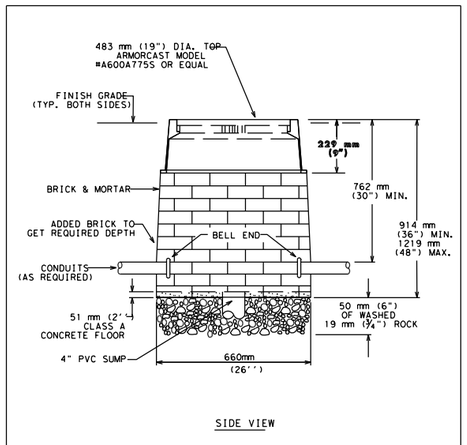
POLE TYPE	BASE PLATE WIDTH mm (in)	FOUNDATION DEPTH (DP) m (ft)	FOUNDATION BOLT CIRCLE DIA. (BC) mm (in)	FOUNDATION DIAMETER (D) m (in)	FOUNDATION VERTICAL BARS QUANTITY	FOUNDATION VERTICAL BARS SIZE
ALLOWABLE BEARING VALUE OVER 363kn/m² (8000 lbs/ft²)						
0	525 (21)	3 (10)	500 (20)	0.9 (36)	12	20M (#6)
1	419 (16.75)	2.4 (8)	375 (15)	0.75 (30)	8	20M (#6)
2	525 (21)	3 (10)	500 (20)	0.9 (36)	12	20M (#6)
3	525 (21)	3 (10)	500 (20)	0.9 (36)	12	20M (#6)
ALLOWABLE BEARING VALUE BETWEEN 96 kn/m² AND 383 kn/m² (2000 lbs/ft² AND 8000 lbs/ft²)						
0	525 (21)	4.2 (14)	500 (20)	1.2 (48)	16	20M (#6)
1	419 (16.75)	3.6 (12)	375 (15)	1.05 (42)	14	20M (#6)
2	525 (21)	4.2 (14)	500 (20)	1.2 (48)	16	20M (#6)
3	525 (21)	4.2 (14)	500 (20)	1.2 (48)	16	20M (#6)

CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		TRAFFIC SIGNAL DRILLED SHAFT FOUNDATION	
RECORD COPY SIGNED BY LEON BARBA	9/17/01 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 831S-1 3 OF 4

NOTES:

1. THE FOUNDATION IS DESIGNED IN ACCORDANCE WITH THE UNIFORM BUILDING CODE, LATEST EDITION.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER OR DESIGNATED REPRESENTATIVE.
3. LOCATION OF ALL UNDERGROUND UTILITIES SHALL BE VERIFIED BEFORE ANY EXCAVATION IS STARTED.
4. DESIGN IS BASED ON AN ALLOWABLE MINIMUM BEARING CAPACITY VALUE OF 144 kn/m² (3000 lbs/ft²).
5. EXCAVATION SHALL BE FREE OF ALL WATER AND LOOSE MATERIALS.
6. POLE FOUNDATIONS SHALL BE CONCRETED WITHIN 8 HOURS AFTER DRILLING.
7. IF NECESSARY, REINFORCEMENT MAY BE SPLICED, BUT SHALL BE LAPPED A MINIMUM OF 40 BAR DIAMETERS.
8. REINFORCEMENT SHALL BE NEW DOMESTIC, DEFORMED BILLET STEEL CONFORMING TO ASTM A615, GRADE 60.
9. CEMENT SHALL BE TYPE 1 PER ASTM C150. SEE SPECIFICATION 403.
10. FINE AND COURSE AGGREGATE SHALL MEET THE Q'S PF AST, C33-78. THE MAXIMUM SIZE COARSE AGGREATE SHALL BE IS 38 mm (1½'').
11. WATER SHALL BE CLEAR AND POTABLE AND FREE OF ALL SUBSTANCES WHICH ARE HARMFUL TO THE CONCRETE.
12. BEFORE PLACING CONCRETE, ALL HARDENED CONCRETE AND FOREIGN MATERIAL SHALL BE REMOVED FROM CONVEYING EQUIPMENT.
13. WHEN CONCRETE IS PLACED, STEEL REINFORCEMENT SHALL BE FREE OF RUST, SCALE AND OTHER COATINGS THAT WOULD REDUCE OR DESTROY THE BOND. REINFORCEMENT LEFT PROTRUCING FOR FUTURE BONDING SHALL BE CLEANED OF CONCRETE PASTE BEFORE COVERING WITH CONCRETE.
14. CONCRETE SHALL BE PROPORTIONED A MINIMUM OF 5 SACKS OF CEMENT PER 0.76 CUBIC METERS (1 CUBIC YARD) OF CONCRETE. QUANTITIES FOR FINE AND COARSE AGGREGATE AND WATER SHALL BE SELECTED TO PRODUCE A WELL PROPORTIONED MIX WITH THE RANGE OF WORKABILITY REQUIRED. THE MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 20.7 mPa (3000 PSI) IN 28 DAYS UNLESS OTHERWISE NOTED.
15. CONCRETE SLUMP SHALL BE 100 mm TO 125 mm (4'' TO 5'').
16. ALL EXCAVATIONS FOR FOUNDATIONS SHALL BE INSPECTED BY THE GEOTECHNICAL AND STRUCTURAL ENGINEERS PRIOR TO PLACEMENT OF CONCRETE.

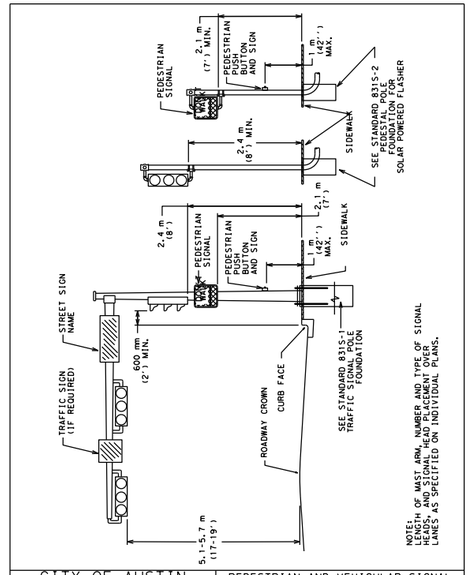
CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		TRAFFIC SIGNAL DRILLED SHAFT FOUNDATION	
RECORD COPY SIGNED BY LEON BARBA	9/17/01 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 831S-1 4 OF 4



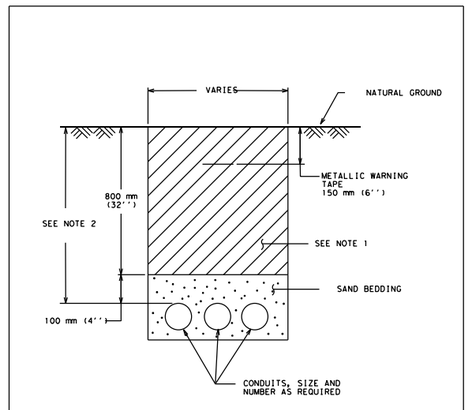
NOTES:

1. CONDUIT SHOULD ENTER PULL BOX BETWEEN SEPARATE BRICK LAYERS.
2. WHEN PULL BOX IS PLACED IN A SIDEWALK, THE LID SHALL BE FLUSH WITH THE SIDEWALK SURFACE.
3. WHEN A PULL BOX IS PLACED IN A NATURAL GROUND SURFACE, THE LID SHALL BE RAISED 13 mm (½") ABOVE GRADE.

CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		TYPE B PULL BOX	
RECORD COPY SIGNED BY LEON BARBA	11/17/03 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 834S-3



CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		PEDESTRIAN AND VEHICULAR SIGNAL INSTALLATION DETAIL	
RECORD COPY SIGNED BY LEON BARBA	9/17/01 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 839S-1



NOTES:

1. BACKFILL FOR TRENCHING BEHIND THE CURB (OR EDGE OF SHOULDER WHERE NO CURB EXISTS) SHALL BE COMPACTED TO THE DENSITY OF THE SURROUNDING SOIL. BACKFILL FOR OPEN CUT TRENCHING IN STREETS, DRIVEWAYS, SIDEWALKS OR MEDIANS SHALL CONFORM TO ALL REQUIREMENTS CONTAINED IN THE CITY OF AUSTIN'S UTILITY CRITERIA MANUAL, SECTION 5.
2. DEPTH OF CONDUIT SHALL BE 900 mm (36") FROM TOP OF PIPE TO FINISHED GRADE EXCEPT WHERE CONDUIT IS INSTALLED OR LOWERED AS PART OF A ROADWAY IMPROVEMENT PROJECT. THE CONDUIT DEPTH SHALL BE EITHER 900 mm (36") FROM FINISHED GRADE OR 450 mm (18") BELOW THE BOTTOM OF THE FINAL ROADWAY SUBGRADE, WHICHEVER IS GREATER.

CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		TRENCH DETAIL FOR TRAFFIC SIGNAL CONDUIT	
RECORD COPY SIGNED BY BILL GARDNER	11/18/04 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 835S-1

12/9/2020

Nicola Gheno

NO.	REVISIONS	BY	DATE

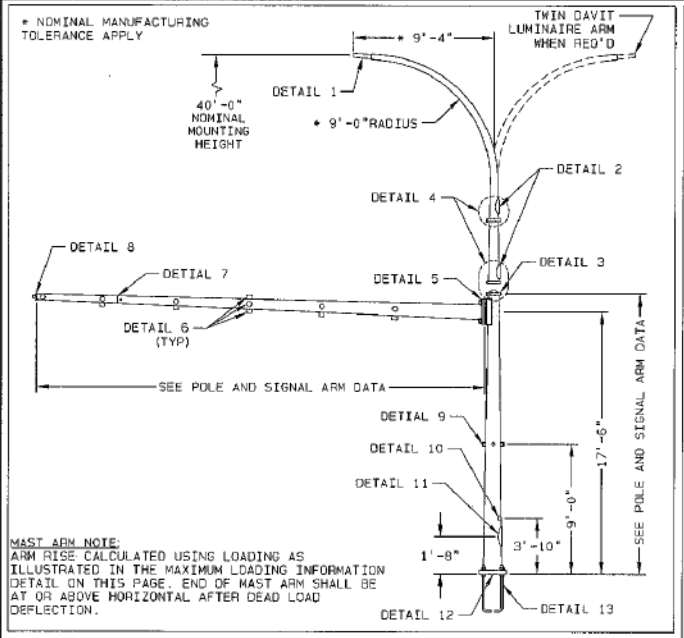
Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

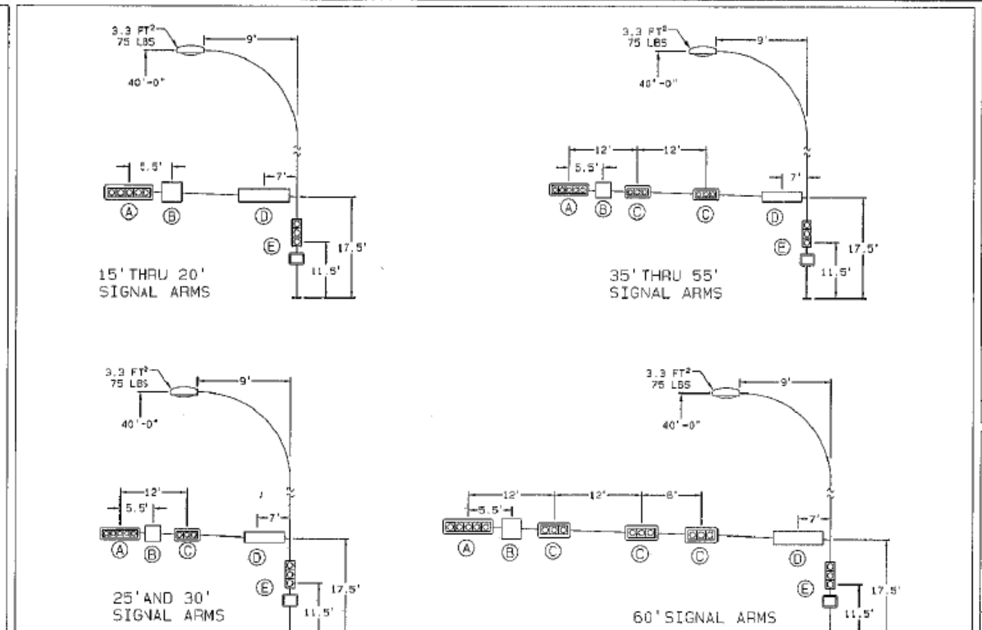
PARMER LANE
CITY OF AUSTIN TRAFFIC SIGNAL STANDARD DETAILS

SHEET 1 OF 3

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		116



MAST ARM NOTE:
ARM RISE CALCULATED USING LOADING AS ILLUSTRATED IN THE MAXIMUM LOADING INFORMATION DETAIL ON THIS PAGE. END OF MAST ARM SHALL BE AT OR ABOVE HORIZONTAL AFTER DEAD LOAD DEFLECTION.



DESIGN CRITERIA:

1994 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS.

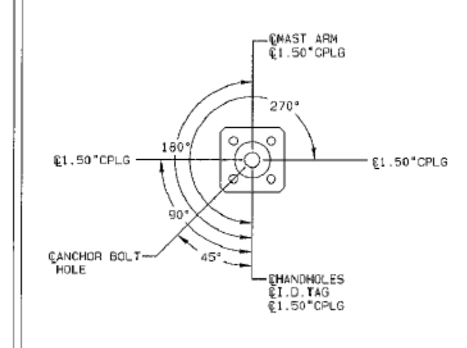
WIND VELOCITY:

80 MPH ISOTACH.

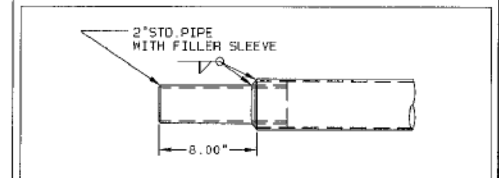
DEVICE	DESCRIPTION	PROJ.AREA (SQ.FT.)	WEIGHT (LBS.)
(A)	12"-5 SEC. SIGNAL W/BACKPLATES	13.33	83
(B)	36" X 36" DIRECTIONAL SIGN	9.00	27
(C)	12"-3 SEC. SIGNAL W/BACKPLATES	8.67	53
(D)	18" X 84" STREET NAME SIGN	10.50	27
(E)	12"-3 SEC. SIGNAL & PED SIGNALS	9.50	135

MAX. LOADING INFORMATION

ALL ANGLES MEASURED CLOCKWISE FROM LOWER HANDHOLE AS VIEWED FROM SMALL END OF POLE

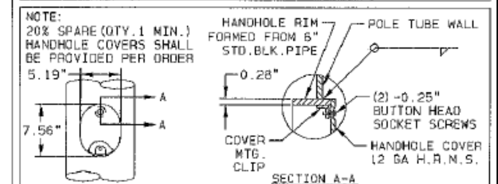


RADIAL INDEX



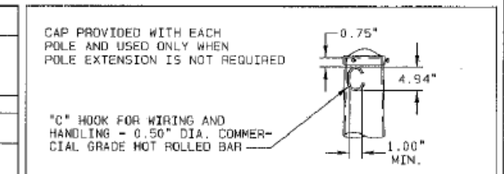
DETAIL 1 DAVIT ARM END TENON

NOTE:
20% SPARE (QTY.1 MIN.) HANDHOLE COVERS SHALL BE PROVIDED PER ORDER



DETAIL 2 UPPER HANDHOLE

CAP PROVIDED WITH EACH POLE AND USED ONLY WHEN POLE EXTENSION IS NOT REQUIRED



DETAIL 3 POLE TOP

MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
POLE SHAFTS (TYPE 1&2)	A595 GR.A	55	LUM.ARM CONN. BOLTS	A325	
POLE SHAFTS (TYPE 3)	A572 GR.65	65	ANCHOR BOLTS	F1554 GR.55	55
MAST ARM SHAFTS	A595 GR.A	55	GALVANIZING	A123	
LUMINAIRE ARM SHAFT	A595 GR.A	55	GALVANIZING-HARDWARE	HOT DIP ZINC	
BASE PLATES (TYPE 1&2)	A36	36			
BASE PLATES (TYPE 3)	A572 GR.42	42			
ARM ATTACHMENTS	A36	36			
MAST ARM CONN. BOLTS	A325				

POLE AND SIGNAL ARM DATA

POLE TYPE	POLE TUBE				SIGNAL ARM TUBE				SIGNAL ARM COUPLING LOCATIONS & ORIENTATIONS						
	BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	GAUGE OR THK. (IN)	ARM SPAN (FT)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THICK (IN)	1.50" COUPLING DISTANCE FROM SMALL END OF ARM. / ANGLES CW. FROM TOP OF SIMPLEX AS VIEWED FROM SMALL END OF MAST ARM.						
1	11.00	8.41	18.50	3	15.00	6.00	3.90	7	0.25'/90°						7.5'/ 0°
					18.00	6.00	3.48	7	0.25'/90°	12'/90&180°					9'/ 0°
					20.00	6.00	3.20	7	0.25'/90°	12'/90&180°					10'/ 0°
					25.00	7.00	3.50	7	0.25'/90°	12'/90&180°					12.5'/ 0°
					30.00	8.00	3.80	7	0.25'/90°	12'/90&180°		24'/90&180°			15'/ 0°
2	13.00	10.41	18.50	3	35.00	9.00	4.10	7	0.25'/90°	12'/90&180°		24'/90&180°			17.5'/ 0°
					40.00	10.00	4.40	7	0.25'/90°	12'/90&180°	18'/90&180°	24'/90&180°	30'/90&180°		20'/ 0°
					45.00	10.50	4.20	7	0.25'/90°	12'/90&180°	18'/90&180°	24'/90&180°	30'/90&180°		22.5'/ 0°
3	15.00	12.41	18.50	0.2188	50.00	12.00	5.00	7	0.25'/90°	12'/90&180°	18'/90&180°	24'/90&180°			25'/ 0°
					55.00	13.00	5.53	DET.7	0.25'/90°	12'/90&180°	18'/90&180°	24'/90&180°	30'/90&180°		27.5'/ 0°
					60.00	13.00	4.83	DET.7	0.25'/90°	12'/90&180°	18'/90&180°	24'/90&180°	30'/90&180°	36'/90&180°	30'/ 0°

DAVIT LUMINAIRE ARM

FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THICK (IN)	LENGTH (FT)	RISE (FT)
6.15	3.87	11	16.31	11.50

POLE EXTENSION

FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THICK (IN)	LENGTH (FT)	RISE (FT)
7.55	6.15	11	10.00	10.00

STATE OF TEXAS
BARRY N. SLADEK
91283
LICENSED PROFESSIONAL ENGINEER
8/8/13

REV	DRAWN BY-DATE	CHECK BY-DATE	DESCRIPTION
B	AC19 08/02/13	BDS 08/05/13	A.CAD TEM./-BS.CVR/-CPLGS@3'-6"/-SIG. BRKTS/+1.5CPLG/H.H./ATT.BLTS
A	HEM 04/22/99		ADDED RISE NOTE/REMOVED SHIM
—	BEG 12/16/96		— — — — — — — — — —

TITLE CITY OF AUSTIN, TX.
MASTARM & DAVIT EXTENSION TRAFFIC STRUCTURES

VALMONT INDUSTRIES, INC. RESERVES THE RIGHT TO INSTALL VARIOUS, ENGINEER APPROVED, MATERIAL HANGING ACCOMMODATIONS TO FACILITATE THE MANUFACTURING PROCESS.

valmont
Valley, NE 68064
(402) 359-2201

PAGE NUMBER: 1 OF 3
DRAWING NUMBER DB00410 REV B

STATE OF TEXAS
NICOLA GHENO
117180
LICENSED PROFESSIONAL ENGINEER
11/25/2020

NO.	REVISIONS	BY	DATE

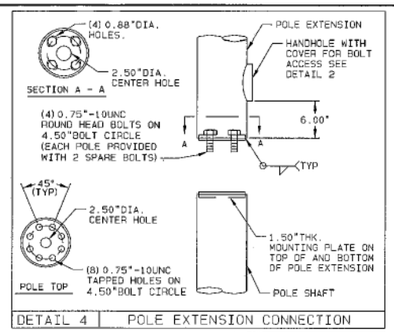
Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

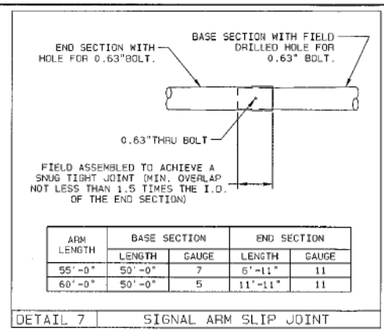
PARMER LANE
CITY OF AUSTIN
TRAFFIC SIGNAL
STANDARD DETAILS
SHEET 2 OF 3

© 2020	CONT	SECT	JOB	HIGHWAY
DS: CK:	3417	03	025	FM 734
	DIST		COUNTY	SHEET NO.
DW: CK:	14		TRAVIS	117

V:\2220\active\222010025\civil\cad\CD Traffic\Standards\COA\TRFDET03.dgn 11/25/2020 4:55:38 PM KMcClure 100%

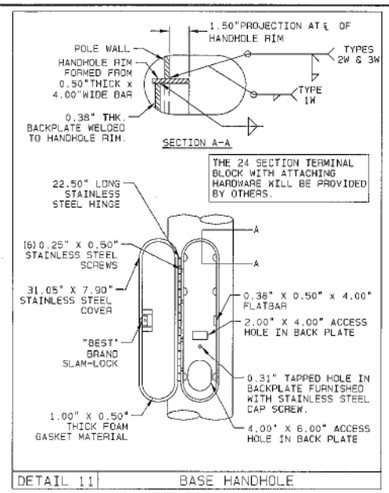


DETAIL 4 | POLE EXTENSION CONNECTION

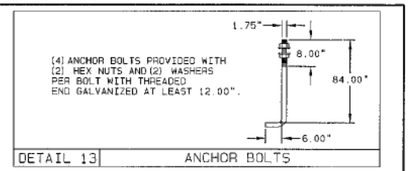


ARM LENGTH	BASE SECTION		END SECTION	
	LENGTH	GAUGE	LENGTH	GAUGE
55'-0"	50'-0"	7	5'-11"	11
60'-0"	50'-0"	5	11'-11"	11

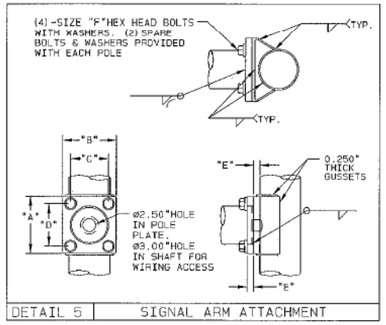
DETAIL 7 | SIGNAL ARM SLIP JOINT



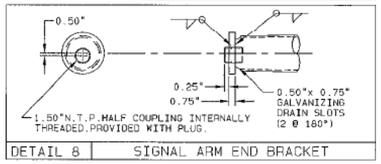
DETAIL 11 | BASE HANDHOLE



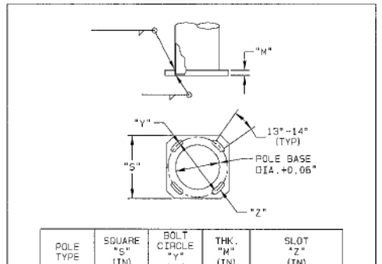
DETAIL 13 | ANCHOR BOLTS



DETAIL 5 | SIGNAL ARM ATTACHMENT



DETAIL 8 | SIGNAL ARM END BRACKET



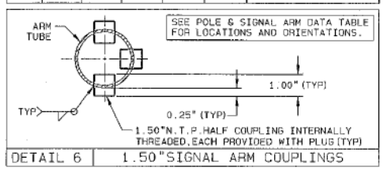
DETAIL 9 | 1.50"POLE COUPLINGS

POLE TYPE	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	SLOT "Z" (IN)
1	16.75	15.00	1.75	2.00 x 3.75
2 & 3	21.00	20.00	1.75	2.00 x 3.75

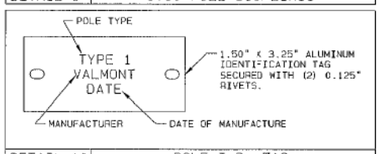
DETAIL 12 | POLE BASE

SIGNAL ARM ATTACHMENT DATA

POLE TYPE	"A" (IN)	"B" (IN)	"C" (IN)	"D" (IN)	"E" (IN)	"F" (IN)
1	18.00	9.75	6.50	14.00	2.00	1.25"-7UNC X 4.25"LG
2	18.00	18.00	14.75	14.75	2.00	1.25"-7UNC X 4.25"LG
3	19.25	19.25	16.00	16.00	2.00	1.25"-7UNC X 4.25"LG



DETAIL 6 | 1.50"SIGNAL ARM COUPLINGS



DETAIL 10 | POLE I.D. TAG

STATE OF TEXAS
BARRY N. SLADEK
91283
LICENSED PROFESSIONAL ENGINEER
8/8/13

TITLE: CITY OF AUSTIN, TX.
MASTARM & DAVIT EXTENSION TRAFFIC STRUCTURES

VALMONT INDUSTRIES, INC. RESERVES THE RIGHT TO INSTALL VARIOUS, ENGINEER APPROVED, MATERIAL HANGING ACCOMMODATIONS TO FACILITATE THE MANUFACTURING PROCESS.

valmont
Valley, NE 68064
(402) 359-2201

PAGE NUMBER: 2 OF 3
DRAWING NUMBER: DB00410
REV: B

STATE OF TEXAS
NICOLA GHENO
117180
LICENSED PROFESSIONAL ENGINEER
11/25/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

PARMER LANE
CITY OF AUSTIN TRAFFIC SIGNAL STANDARD DETAILS

SHEET 3 OF 3

© 2020	CONT	SECT	JOB	HIGHWAY
DS: CK:	3417	03	025	FM 734
DW: CK:	DIST	COUNTY		SHEET NO.
	14	TRAVIS		118

V:\2220\active\222010025\civil\cad\CD Traffic\Standards\COA\TRFDET04.dgn 11/25/2020 4:55:43 PM KMcClure 100%

DATE:
FILE:

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

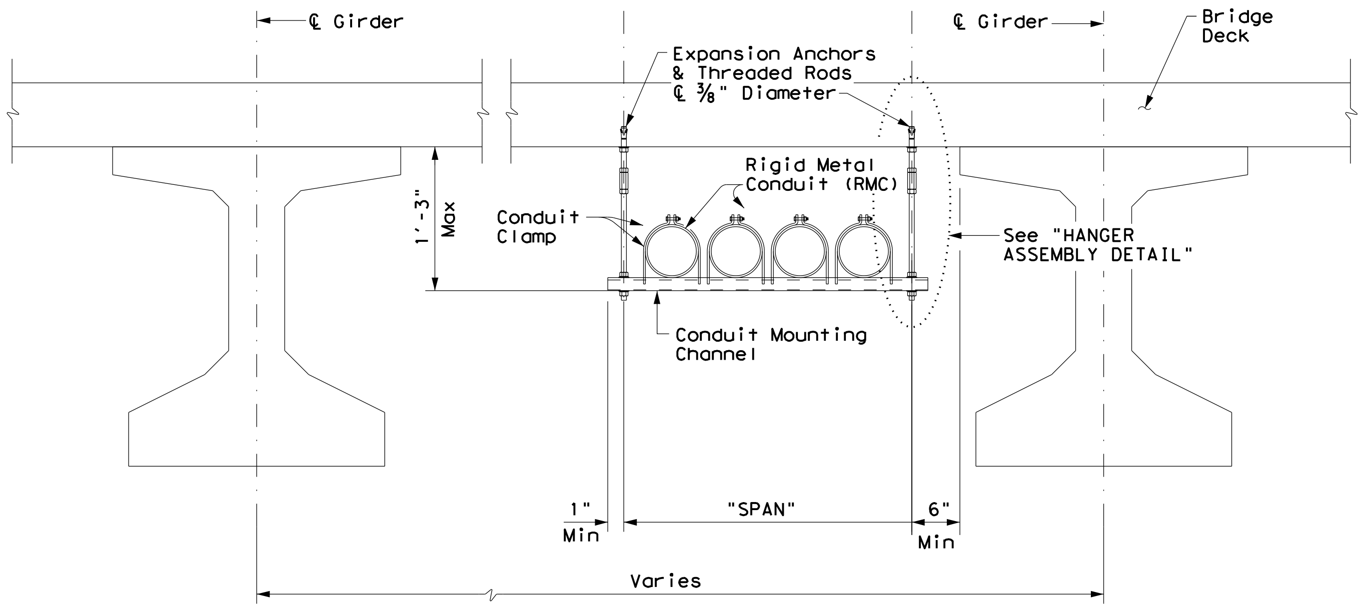
Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

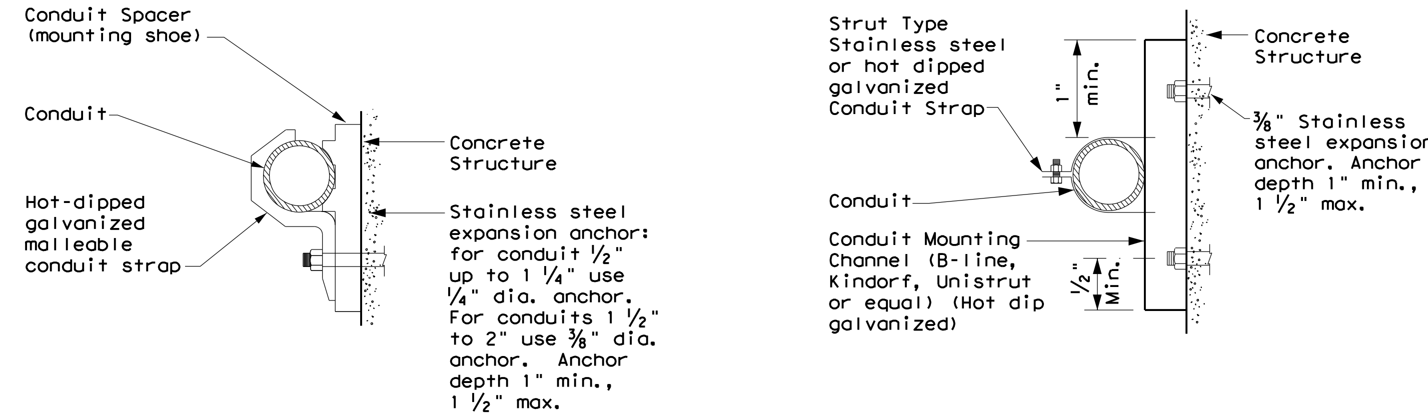
ED(1)-14

FILE:	ed1-14.dgn	DN:	CK:	DW:	CK:
© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS					
		DIST	COUNTY		SHEET NO.
					119

71A

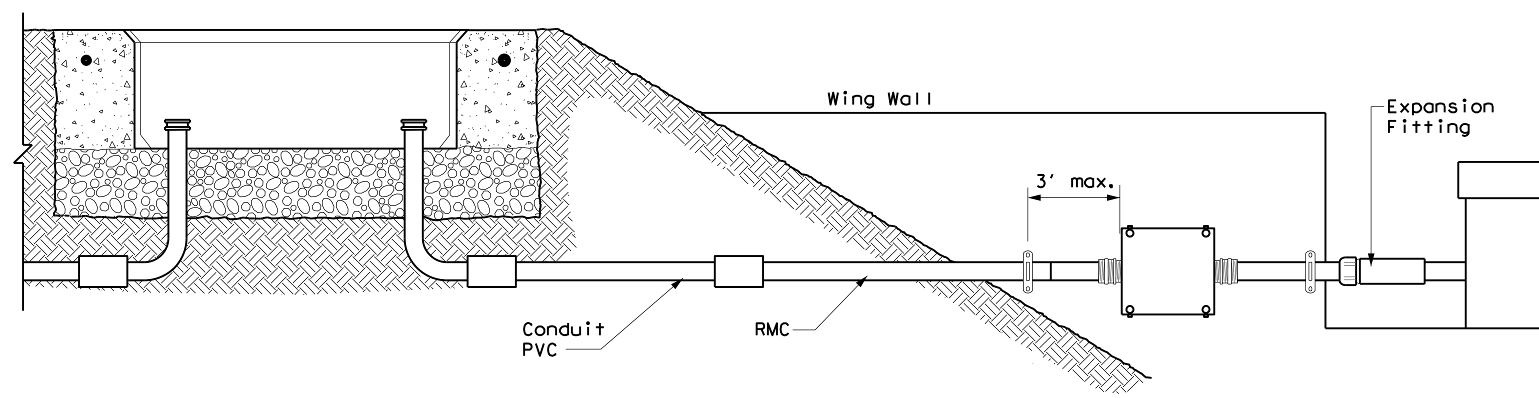


CONDUIT HANGING DETAIL



CONDUIT MOUNTING OPTIONS

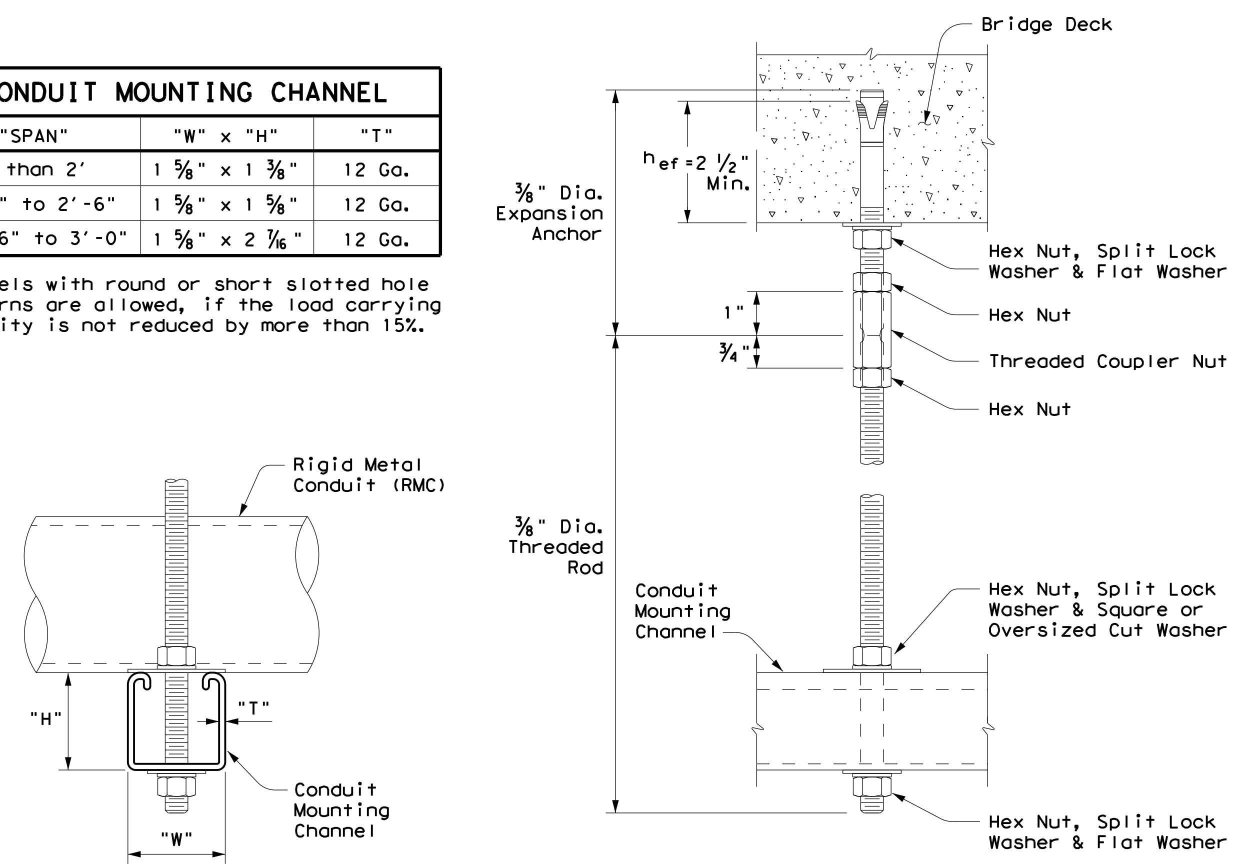
Attachment to concrete surfaces
See ED(1)B.2



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.



HANGER ASSEMBLY DETAIL

ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.
2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.
3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.
4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.
5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef}) as needed to ensure sufficient thread length for proper torqueing and tightening of anchors.
6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.

Texas Department of Transportation — Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUIT SUPPORTS

ED(2)-14

FILE: ed2-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	120

71B

DATE: 12/9/2020 1:24:36 PM
FILE: c:\txdot\pw_online\txdot4\pwonline_rachel.larcom\d0456651\ed3-14.dgn

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

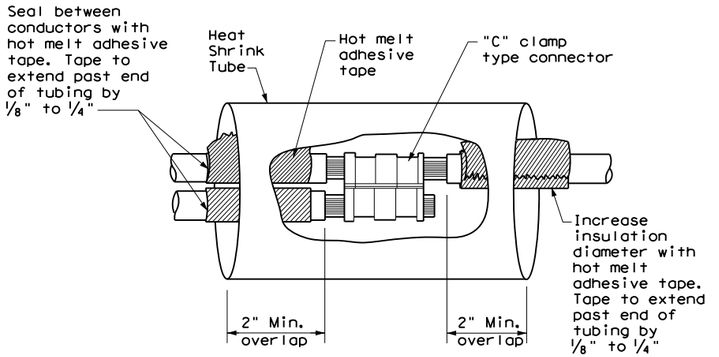
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

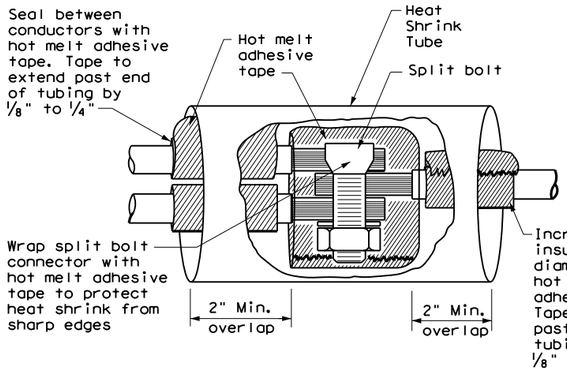
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

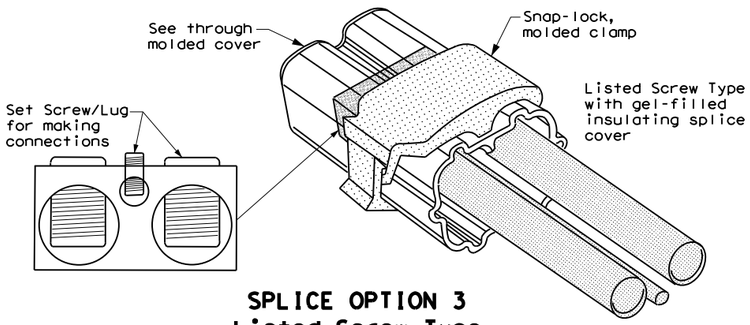
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation

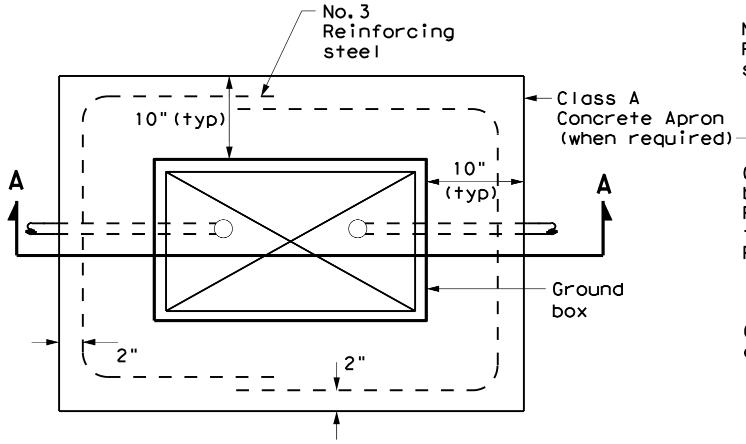
Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

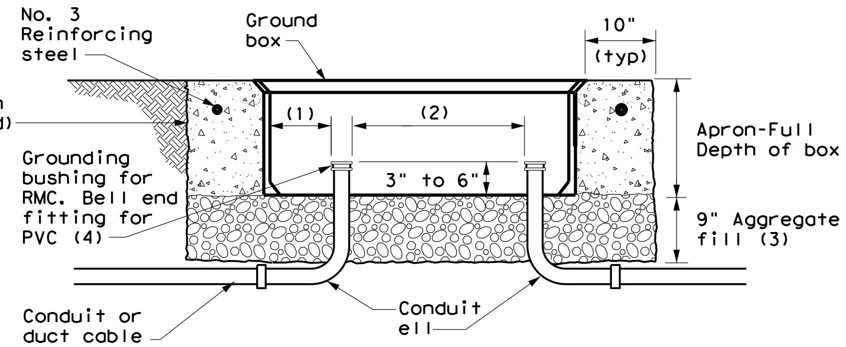
ED(3)-14

FILE:	ed3-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS		3136	01	191	SL 0001
		DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		121

71C



PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOXES

A. MATERIALS

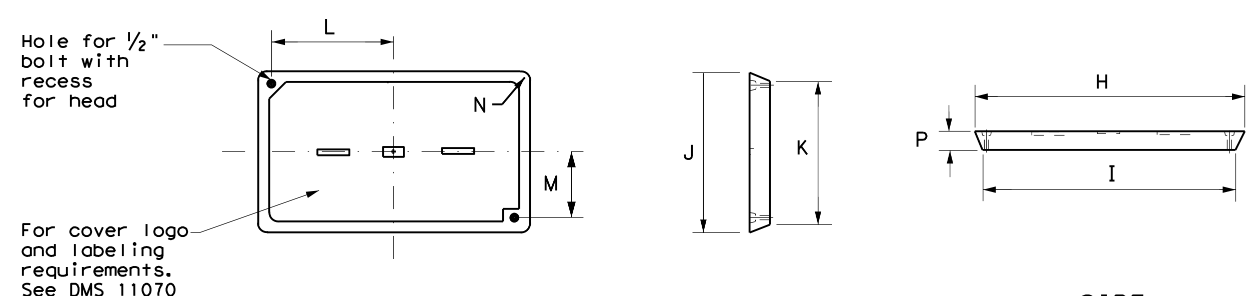
1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."
2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.
3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.
4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.
2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.
3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.
4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.
5. Temporarily seal all conduits in the ground box until conductors are installed.
6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.
7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.
8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.
9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.
10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.
11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW END SIDE

GROUND BOX COVER

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS GROUND BOXES

ED(4)-14

FILE: ed4-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	122

71D

DATE: 11/6/2020 1:50:18 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136-01-191...

ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services," DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

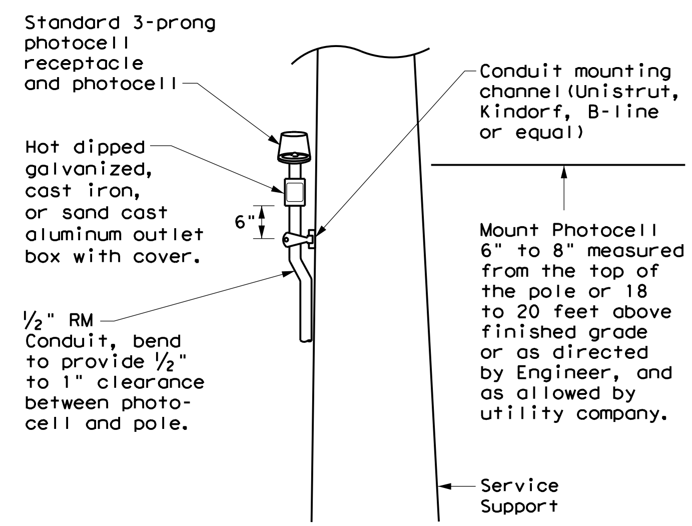
* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

- Schematic Type
- Service Voltage V / V
- Disconnect Amp Rating: 000 indicates main lug only/ Typically Type T
- (SS)= Safety Switch Ahead of Meter-Check with Utility
  (NS)= No safety Switch Ahead of Meter-Check with Utility
- Enclosure Type
  GS= Galvanized steel("off the shelf")
  SS= Stainless steel(Custom Enclosure)See MPL
  AL= Aluminum (Custom Enclosure)See MPL
- Photocell Mounting Location
  (E)= Inside Service/Enclosure Mounted
  (T)= Top of pole
  (L)= Luminaire mounted
  (N)= None/No Photocell or Lighting Contactor Required
- Service Support Type
  GC= Granite concrete
  OC= Other concrete
  TP= Timber pole
  SP= Steel pole
  SF= Steel frame
  OT= Pole by others or paid for separately
  EX= Existing pole
  TS= Service on traffic signal pole
  PS= Pedestal Service
- O= Overhead Service Feed from Utility
  U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation

Traffic Operations Division Standard

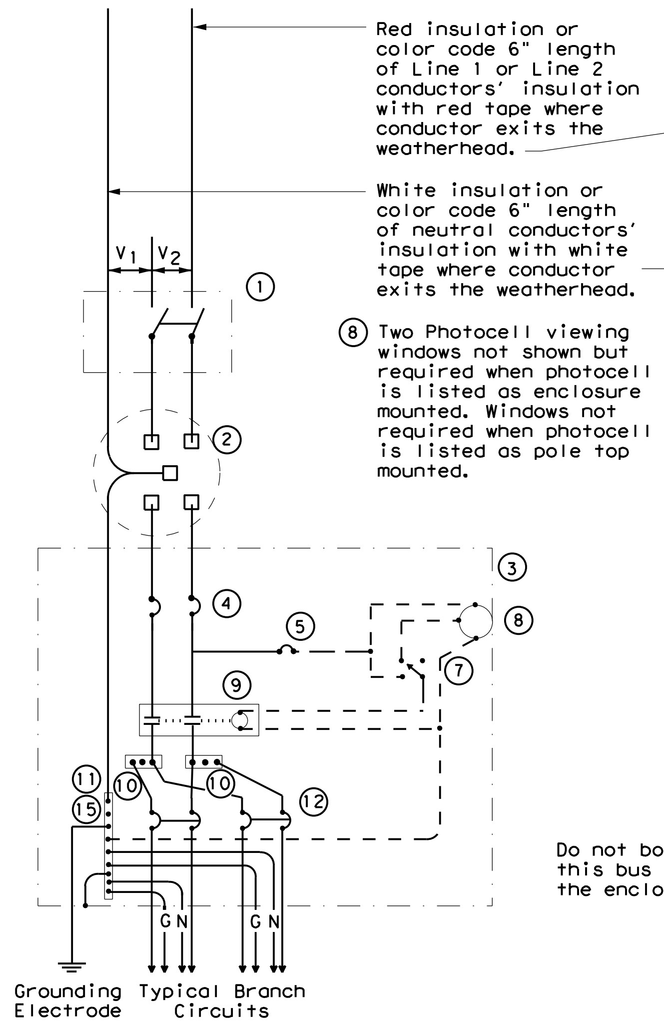
ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

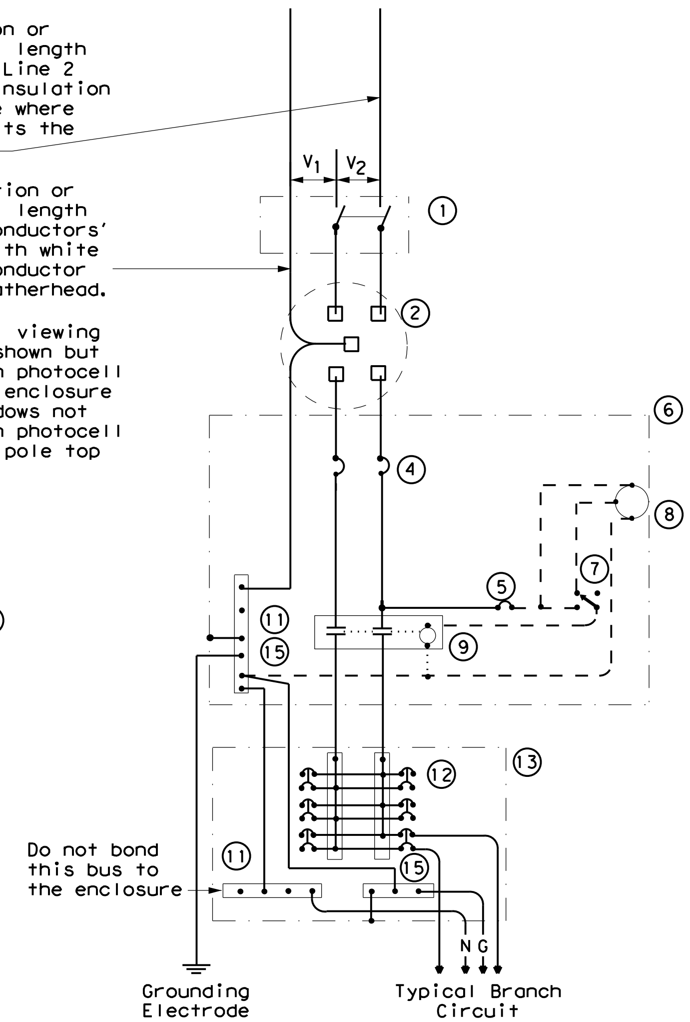
FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		123

71E

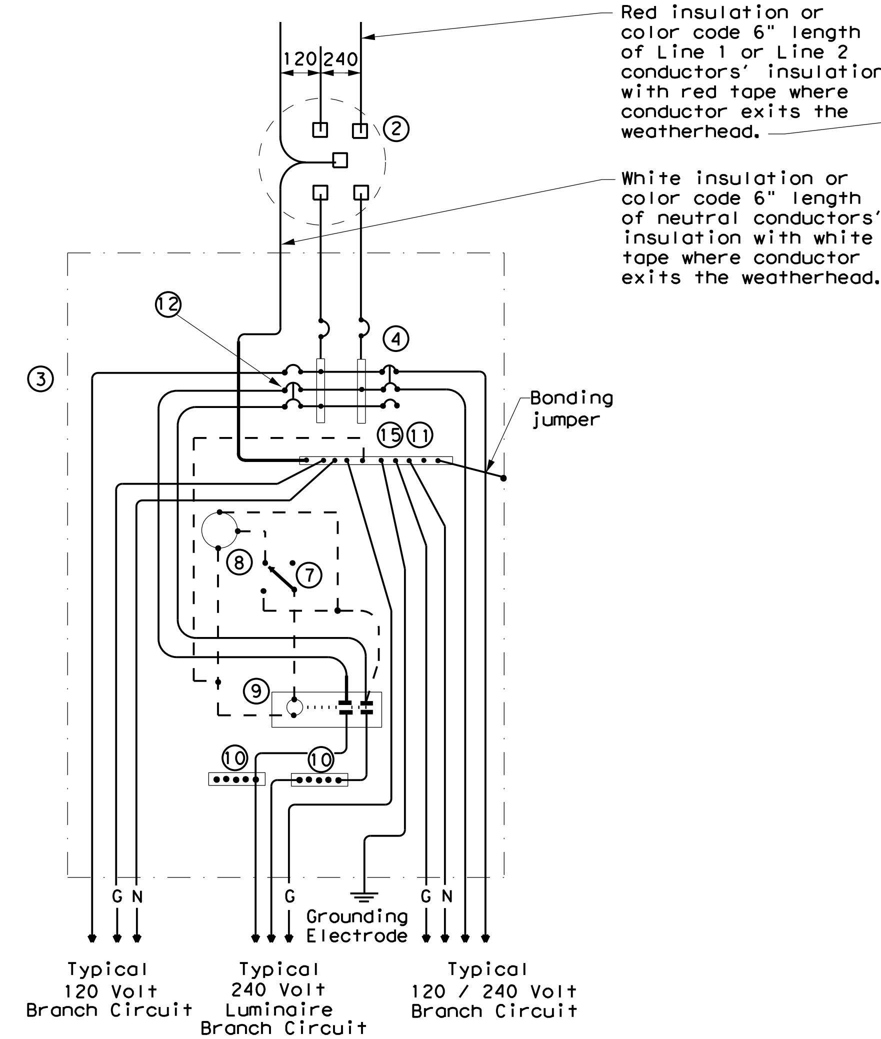
DATE: 11/6/2020 1:50:38 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\...



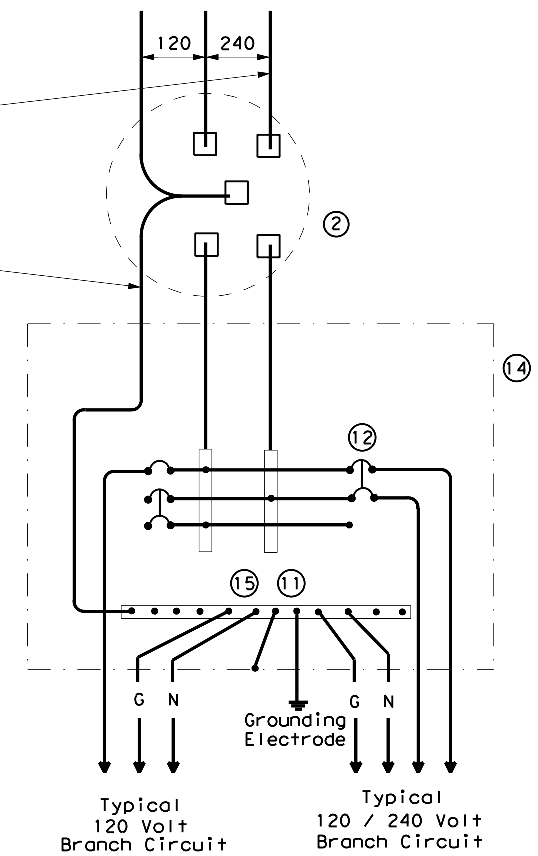
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE
Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND

———	Power Wiring
- - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND

1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

FILE: ed6-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		124

71F

DATE: 11/6/2020 1:50:47 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\ED(7)-14 SUPPORTS-TRAFFIC OPERATIONS\ed7-14.dgn

SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.

2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.

3. Provide and install galvanized ¾ in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized ¾ in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 ¼ in. to 3 ½ in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.

4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.

5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.

6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.

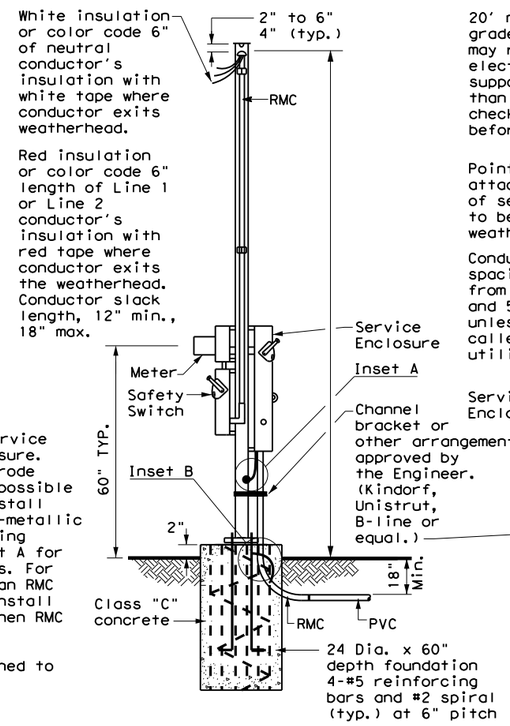
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.

8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.

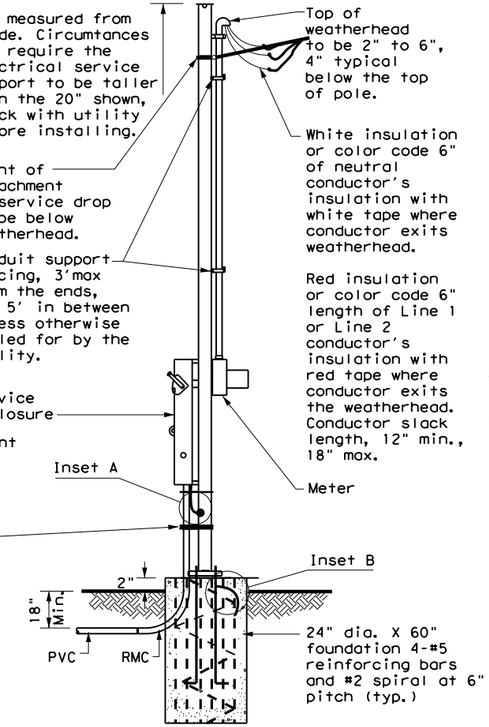
9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.

10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.

11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

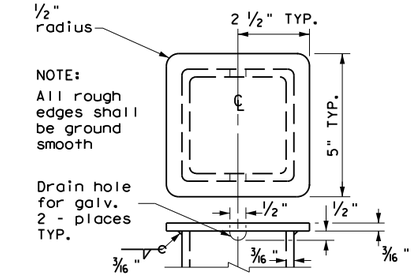


WITH SAFETY SWITCH

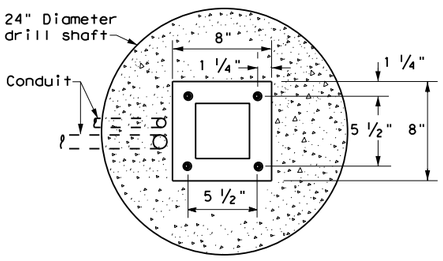


WITHOUT SAFETY SWITCH

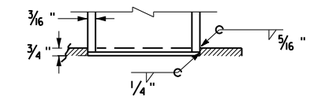
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE



POLE TOP PLATE

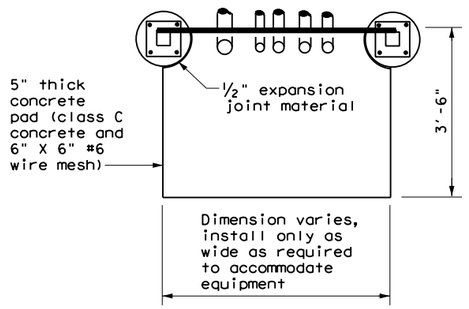


BASE PLATE DETAIL



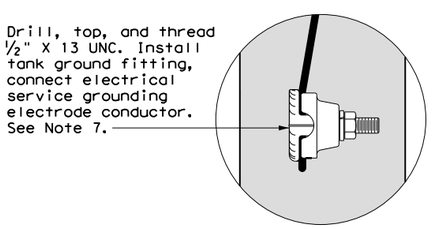
BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



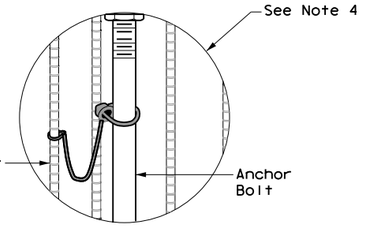
TOP VIEW

SERVICE SUPPORT TY SF (O) & SF (U)

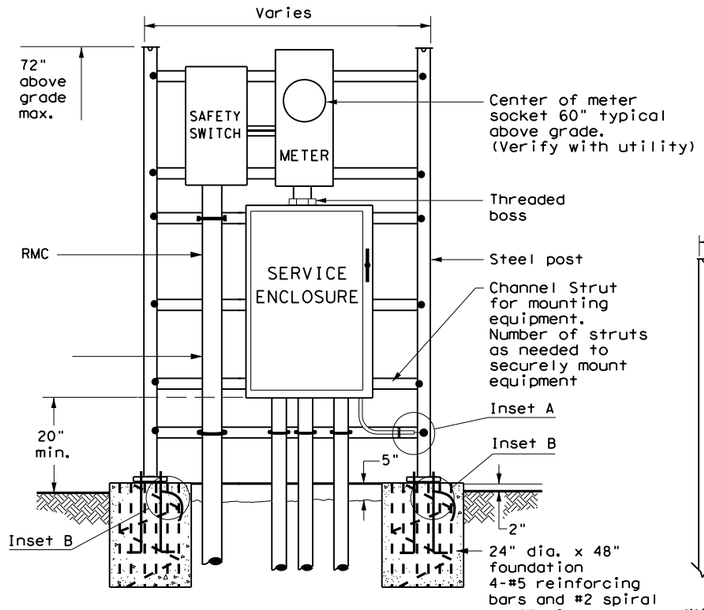


FRONT VIEW

INSET A

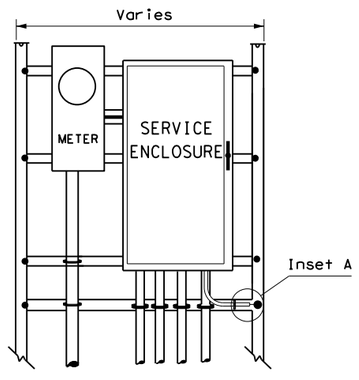


INSET B

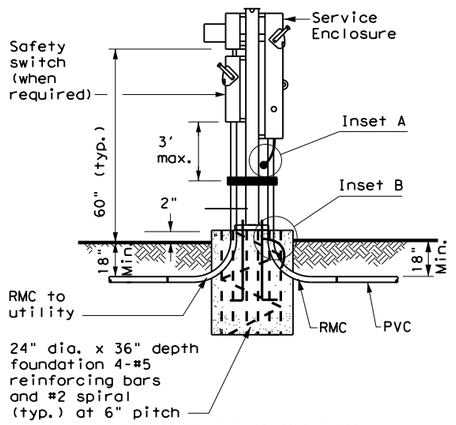


WITH SAFETY SWITCH

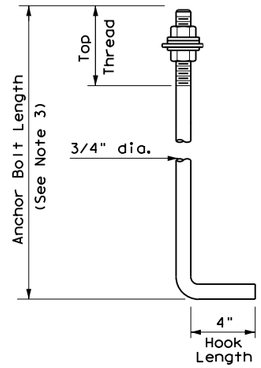
FRONT VIEW



WITHOUT SAFETY SWITCH



WITH SAFETY SWITCH



HOOKED ANCHOR DETAIL

SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE

SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP

ED(7)-14

FILE: ed7-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		125

71G

DATE: 11/9/2020 8:53:36 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Pro

ROADWAY ILLUMINATION ASSEMBLY NOTES

1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.

2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC),TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA),and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.

4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.

5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.

   a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.

   b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25' above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 4th Edition (2001) (AASHTO Design Specifications). For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25' above the surrounding terrain, provide poles meeting the following requirements:

      i. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).

      ii. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to resist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.

6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.

7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.

8. Install T-Base with following procedure:

   a. Anchor Bolt Tightening.

      i. Coat the threads of the anchor bolts with electrically conductive lubricant.

      ii. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.

      iii. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.

      iv. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.

      v. Check top of T-base for level. If not level then foundation must be leveled.

   b. Top Bolt Procedure

      i. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.

      ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."

      iii. Tighten each nut to 150 ft-lb. using a torque wrench.

   c. Level and Plumb

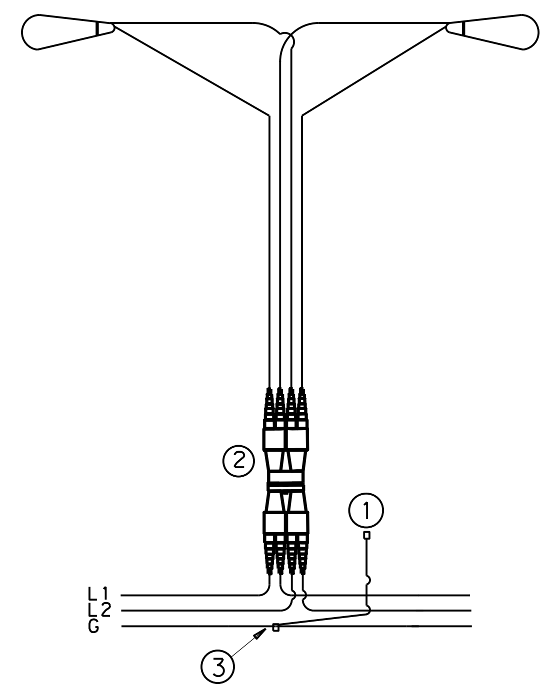
      i. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.

9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).

10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150W HPS or 150W EQ LED.

11. Mount luminaires on arms level as shown by the luminaire level indicator.

12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.



L1,L2 = Hot Conductors
G = Grounding Conductor

TYPICAL WIRING DIAGRAM

LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.

NOTES:

(1) Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.

(2) Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.

(3) Split Bolt or other connector.

Texas Department of Transportation

Traffic Operations Division Standard

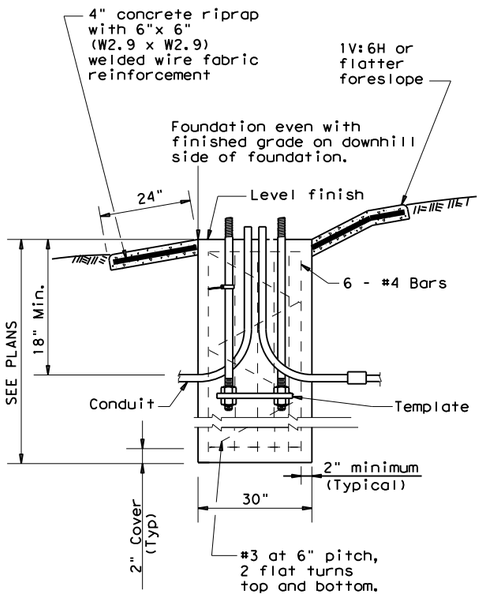
ROADWAY ILLUMINATION DETAILS

RID(1)-17

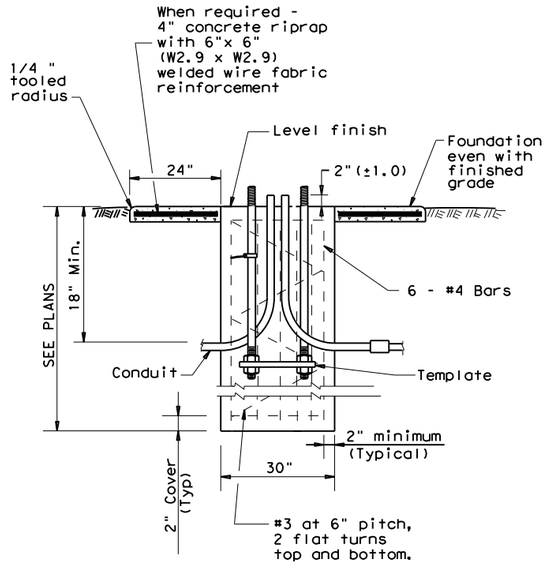
FILE: rid1-17.dgn	DN:	CK:	DW:	CK:
© TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
7-17	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	127

72A

DATE: 11/6/2020 1:51:06 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\391369\rid2-17.dgn



SECTION A-A
SHOWING SLOPED GRADE



SECTION A-A
SHOWING CONSTANT GRADE

TABLE 1

ANCHOR BOLTS

POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1in. x 30in.
40-50 ft.	15 in.	17 ¼in.	1 ¼in. x 30in.

TABLE 2

RECOMMENDED FOUNDATION LENGTHS
(See note 1)

MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
≤20 ft.	6′	6′	6′
>20 ft. to 30 ft.	8′	6′	6′
>30 ft. to 40 ft.	8′	8′	6′
>40 ft. to 50 ft.	10′	8′	6′

TABLE 3

PAY QUANTITY OF RIPRAP PER FOUNDATION (Install only when shown on the plans)

Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

GENERAL NOTES:

1. "Recommended Foundation Lengths" table is for information purposes only. Foundation lengths shall be as shown on the plans, or as directed by the Engineer. Foundations will be paid for under Item 416, "Drilled Shaft Foundations," unless otherwise shown on the plans.
2. Erect roadway illumination assembly poles plumb and true. Form and level the top 6" of the foundation so the pole will be plumb. Use leveling nuts to plumb shoe base poles. Do not use shims or leveling nuts under transformer bases. Do not grout between baseplate and the foundation.
3. Ensure Class 2A and 2B fit for anchor bolts and nuts. Tap and chase nuts after galvanizing. Anchor bolt body with rolled threads need not be full size.
4. Use appropriate class of concrete as specified in Items 416 and 432. Concrete for riprap may be upgraded to Class C at no extra cost to the Department.
5. Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
6. Locate breakaway roadway illumination assemblies as shown in the placement table, unless otherwise dimensioned on the plans. Protect non-breakaway illumination assemblies from vehicular impact (i.e. 2.5 ft. behind guard rail or mounted on traffic barrier), or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less. See Roadway Design Manual for further information.
7. Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
8. Install a minimum of 2 conduits in each foundation. See lighting layout sheets for locations of foundations with more than 2 conduits. Cap unused conduits in foundations on both ends.
9. Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
10. Bond anchor bolt to rebar cage with #6 bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. The bonded steel in the foundation creates a concrete encased grounding electrode which replaces the ground rod.
11. Use riprap on T-base foundations that are located on sloped grades.

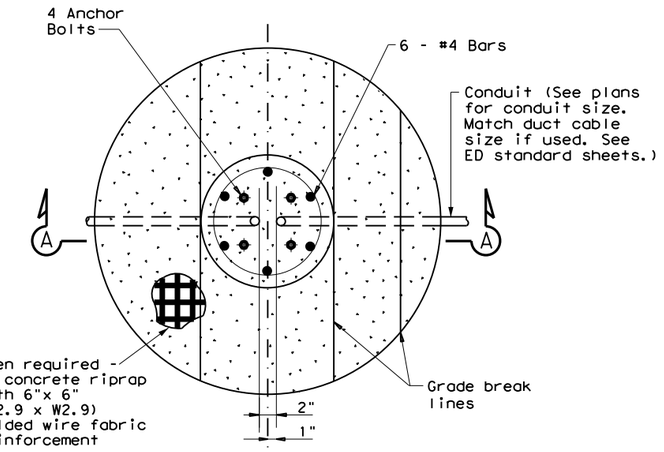
TABLE 4

BREAKAWAY POLE PLACEMENT (See note 6)

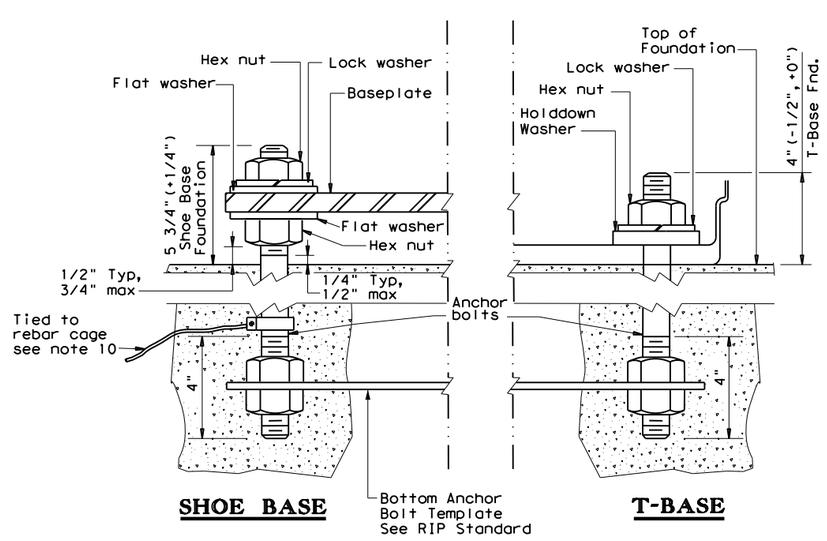
ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

* or as close to ROW line as is practical

** provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.



FOUNDATION DETAIL



ANCHOR BOLT DETAIL

Texas Department of Transportation

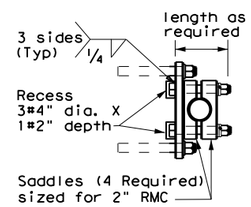
Traffic Operations Division Standard

ROADWAY ILLUMINATION DETAILS
(RDWY ILLUM FOUNDATIONS)
RID(2)-17

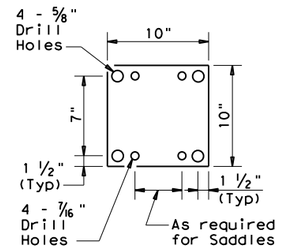
FILE: rid2-17.dgn	DN:	CK:	DW:	CK:
© TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-11 7-17	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		128

72B

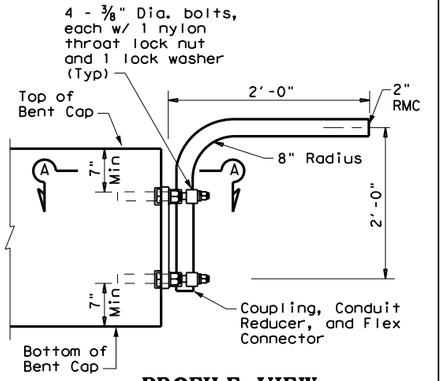
DATE: 11/6/2020 1:51:16 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\136\01\Standards\rid3-17.dgn



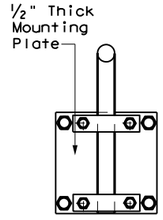
SECTION A-A



MOUNTING PLATE
(ASTM A-36 or better)

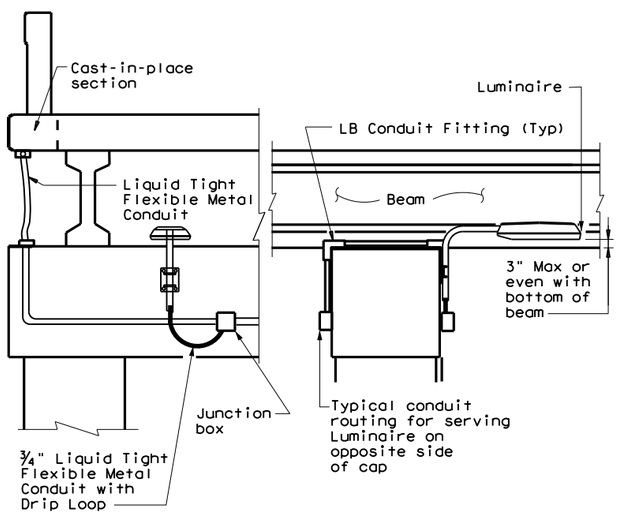


PROFILE VIEW
Or as Required
(See Note A.3)



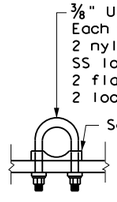
END VIEW

UNDERPASS LIGHTING ARM

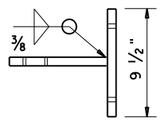


IN RD IL AM (U/P) (TY 1)
If bridge has pre-cast panels under deck, run circuit under deck edge.

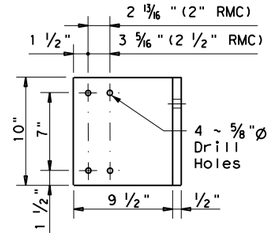
UNDERPASS LIGHTING TYPE 1



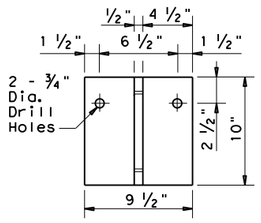
CLAMP DETAIL
(2 Req'd)



PLAN VIEW

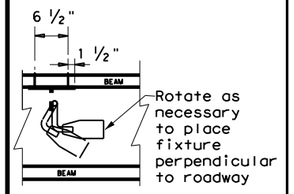


FRONT



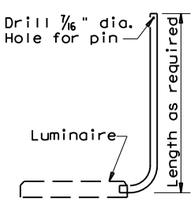
SIDE

BRACKET DETAIL
Make from 1/2" plate (ASTM A-36 or better)

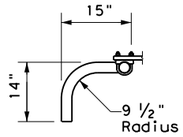


PLAN VIEW

FIXTURE ORIENTATION

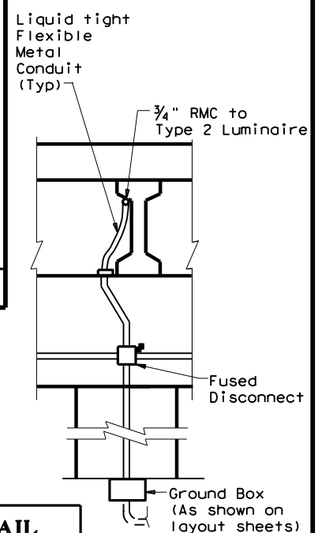


SIDE



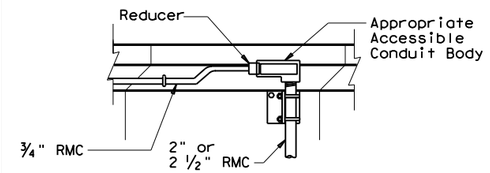
PLAN VIEW

ARM DETAIL

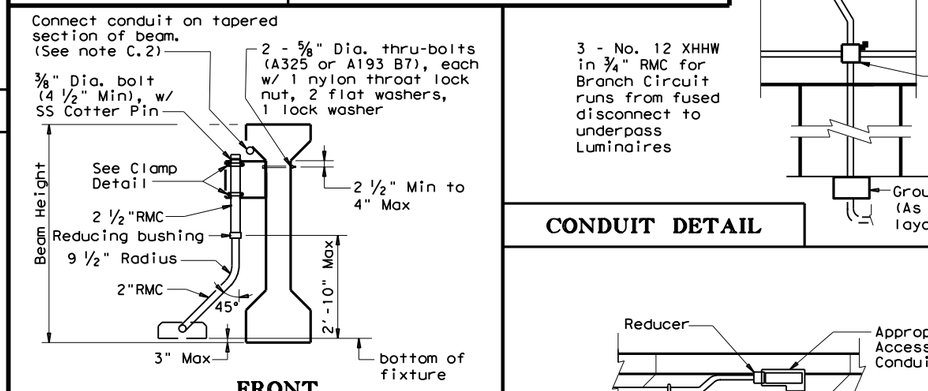


3 - No. 12 XHHW in 3/4" RMC for Branch Circuit runs from fused disconnect to underpass Luminaires

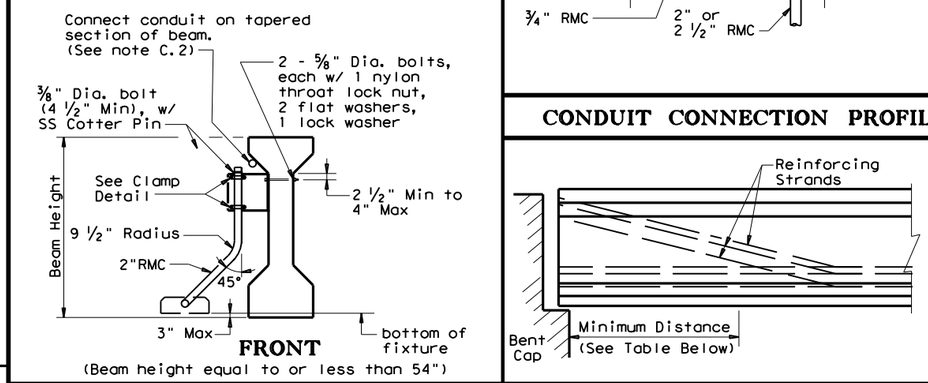
CONDUIT DETAIL



CONDUIT CONNECTION PROFILE



FRONT
(Beam height greater than 54")



FRONT
(Beam height equal to or less than 54")

IN RD IL AM (U/P) (TY 2)

LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET

TABLE 5

LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET TABLE

SPAN LENGTH	MINIMUM DISTANCE
≤ 50'	10'-0"
50' - 70'	15'-0"
70' - 90'	20'-0"
> 90'	25'-0"

UNDERPASS LIGHTING TYPE 2

GENERAL NOTES:

A. ALL 150 watt HPS and 150 watt equivalent LED Luminaires

1. Luminaire locations, conduit and conductor sizes and routing are typical and diagrammatic only. See project layout sheets for specific details.
2. Conduit will be paid for under Item 618, "Conduit" and conductors will be paid for under Item 620, "Electrical Conductors," unless otherwise shown on the plans.
3. Adjust conduit in saddles to place fixture height and orientation as required. See fixture orientation detail and plans. Where practicable, place luminaires so the bottom of luminaire is above the bottom of the beam, maximum of 3 in. (See detail UNDERPASS LIGHTING ARM TYPE 2)
4. Except as noted, galvanize all structural steel and exposed bolts, nuts, and washers in accordance with Item 445 "Galvanizing".
5. Fabrication of brackets and support arms will not be paid for directly but is subsidiary to Item 610, "Roadway Illumination Assemblies."
6. Install a heavy duty NEMA 3R fused disconnect or breaker enclosure rated at 30 amps and 480 volts to switch underpass luminaires as shown on plans, with at least one per bridge circuit. Install 20 amp time-delay fuses or inverse-time circuit breakers. Mount disconnect or breaker enclosure 10 ft. (min) above grade on columns or bent caps as approved by the Department. Modify disconnect to allow padlocking in the "ON" and "OFF" positions. Padlocks and disconnect switches or circuit breakers for underpass fixtures will not be paid for directly but are subsidiary to the various bid items of the contract.
7. Conduit on columns, caps, and slab is shown surface mounted. For new columns and caps, embed PVC conduit in concrete. Bond and ground metal junction boxes and conduit.

B. TYPE 1

1. Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) for Type 1 arm shaft.
2. Use 3/8 in. stainless steel bolt or stud non-epoxy type expansion anchors for concrete for Type 1 mounting. Except as noted, provide an allowable 2650 lbs minimum pull-out force (after consideration of adjustment factors for edge distance and bolt spacing) for each anchor. Install each anchor to the embedment depth recommended by the manufacturer.
3. Attach conduit to plate with 4 saddles, four - 3/8 in. diameter bolts, nylon throat lock nuts, and lock washers.

C. TYPE 2

1. Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) or provide a combination of 2 1/2 in. (2.875" O.D., 0.193" wall) and 2 in. (2.375" O.D., 0.146" wall) rigid metal conduits with a reducing bushing as beam height stipulated for Type 2 arm shaft. Field cutting and threading will be permitted. Paint cut and threaded areas with zinc rich paint after conduit is connected to adjacent fitting.
2. Connecting conduit may be strapped to tapered section only of precast beams as shown. Anchor as approved by the Engineer. Maximum anchor depth is 1 in.
3. Indiscriminate drilling into precast concrete beams may result in reduced beam strength. Use drilling location and method as directed by the Engineer. See Location of Underpass Lighting Mounting Bracket detail. The locations shown in the table are such that reinforcing strands will not be damaged.

Texas Department of Transportation

Traffic Operations Division Standard

ROADWAY ILLUMINATION DETAILS

(UNDERPASS LIGHT FIXTURES)

RID(3)-17

FILE: rid3-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
2-14 7-17	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		129

72C

SHIPPING PARTS LIST - POLES AND LUMINAIRE ARMS

Nominal Mounting Ht. (ft)	Shoe Base Designation Pole A1 A2	Shoe Base Luminaire	Shoe Base Quantity	T-Base Designation Pole A1 A2	T-Base Luminaire	T-Base Quantity	CSB/SSCB Mounted Designation Pole A1 A2	CSB/SSCB Luminaire	CSB/SSCB Quantity
20	(Type SA 20 S - 4)	(150W EQ) LED		(Type SA 20 T - 4)	(150W EQ) LED				
	(Type SA 20 S - 4 - 4)	(150W EQ) LED		(Type SA 20 T - 4 - 4)	(150W EQ) LED				
30	(Type SA 30 S - 4)	(250W EQ) LED		(Type SA 30 T - 4)	(250W EQ) LED		(Type SP 28 S - 4)	(250W EQ) LED	
	(Type SA 30 S - 4 - 4)	(250W EQ) LED		(Type SA 30 T - 4 - 4)	(250W EQ) LED		(Type SP 28 S - 4 - 4)	(250W EQ) LED	
	(Type SA 30 S - 8)	(250W EQ) LED		(Type SA 30 T - 8)	(250W EQ) LED		(Type SP 28 S - 8)	(250W EQ) LED	
	(Type SA 30 S - 8 - 8)	(250W EQ) LED		(Type SA 30 T - 8 - 8)	(250W EQ) LED		(Type SP 28 S - 8 - 8)	(250W EQ) LED	
40	(Type SA 40 S - 4)	(250W EQ) LED		(Type SA 40 T - 4)	(250W EQ) LED		(Type SP 38 S - 4)	(250W EQ) LED	
	(Type SA 40 S - 4 - 4)	(250W EQ) LED		(Type SA 40 T - 4 - 4)	(250W EQ) LED		(Type SP 38 S - 4 - 4)	(250W EQ) LED	
	(Type SA 40 S - 8)	(250W EQ) LED		(Type SA 40 T - 8)	(250W EQ) LED		(Type SP 38 S - 8)	(250W EQ) LED	
	(Type SA 40 S - 8 - 8)	(250W EQ) LED		(Type SA 40 T - 8 - 8)	(250W EQ) LED		(Type SP 38 S - 8 - 8)	(250W EQ) LED	
	(Type SA 40 S - 10)	(250W EQ) LED		(Type SA 40 T - 10)	(250W EQ) LED		(Type SP 38 S - 10)	(250W EQ) LED	
	(Type SA 40 S - 10 - 10)	(250W EQ) LED		(Type SA 40 T - 10 - 10)	(250W EQ) LED		(Type SP 38 S - 10 - 10)	(250W EQ) LED	
	(Type SA 40 S - 12)	(250W EQ) LED		(Type SA 40 T - 12)	(250W EQ) LED		(Type SP 38 S - 12)	(250W EQ) LED	
	(Type SA 40 S - 12 - 12)	(250W EQ) LED		(Type SA 40 T - 12 - 12)	(250W EQ) LED		(Type SP 38 S - 12 - 12)	(250W EQ) LED	
50	(Type SA 50 S - 4)	(400W EQ) LED		(Type SA 50 T - 4)	(400W EQ) LED		(Type SP 48 S - 4)	(400W EQ) LED	
	(Type SA 50 S - 4 - 4)	(400W EQ) LED		(Type SA 50 T - 4 - 4)	(400W EQ) LED		(Type SP 48 S - 4 - 4)	(400W EQ) LED	
	(Type SA 50 S - 8)	(400W EQ) LED		(Type SA 50 T - 8)	(400W EQ) LED		(Type SP 48 S - 8)	(400W EQ) LED	
	(Type SA 50 S - 8 - 8)	(400W EQ) LED		(Type SA 50 T - 8 - 8)	(400W EQ) LED		(Type SP 48 S - 8 - 8)	(400W EQ) LED	
	(Type SA 50 S - 10)	(400W EQ) LED		(Type SA 50 T - 10)	(400W EQ) LED		(Type SP 48 S - 10)	(400W EQ) LED	
	(Type SA 50 S - 10 - 10)	(400W EQ) LED		(Type SA 50 T - 10 - 10)	(400W EQ) LED		(Type SP 48 S - 10 - 10)	(400W EQ) LED	
	(Type SA 50 S - 12)	(400W EQ) LED		(Type SA 50 T - 12)	(400W EQ) LED		(Type SP 48 S - 12)	(400W EQ) LED	
	(Type SA 50 S - 12 - 12)	(400W EQ) LED		(Type SA 50 T - 12 - 12)	(400W EQ) LED		(Type SP 48 S - 12 - 12)	(400W EQ) LED	

OTHER Designation Pole	A1	A2	Luminaire	Quantity

GENERAL NOTES:

1. All work, materials and services not shown on the plans which may be necessary for complete and proper construction shall be performed, furnished and installed by the Contractor. Faulty fabrication or poor workmanship in any material, equipment or installation will be considered justification for rejection. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the Department such warranties or guarantees.

2. The location of poles and fixtures are diagrammatic only and may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. Standard Steel Pole Designs. Steel poles fabricated in accordance with the details and dimensions shown herein, shall be considered standard designs. Submission of shop drawings and design calculations for standard designs is not required.

4. Optional Steel Pole Designs. Multi-sided steel poles may be allowed as optional designs, if steel poles are permitted or required, pending approval by the Department as outlined below.

   a. Shop Drawings. Optional designs require submission of shop drawings and design calculations bearing the seal of an engineer licensed in the State of Texas, in accordance with Item 441, "Steel Structures." The Department may elect to pre-approve some shop drawings for optionally designed poles. Submission of shop drawings and design calculations is not required for structures fabricated in accordance with the details of shop drawings on the pre-approved list maintained by the TxDOT Traffic Operations Division. Any deviation from the pre-approved shop drawings will require submission of shop drawings of the complete assembly and design calculations as described above.
   b. Structural Support Design for Luminaires. Lighting support structures shall be designed for a 25 year design life in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto. All poles shall be designed for 110 mph 3-second gust wind speeds. The Gust Factor, G, and Wind Importance Factor, Ir, shall be applied as per the AASHTO Specifications assuming a 25-year design life. The design wind pressure for hurricane wind velocities greater than 100 mph shall not be less than the design wind pressure using 100 mph with the non-hurricane Wind Importance Factor, Ir, value. For transformer base poles, fabricator shall include transformer base and connecting hardware in design calculations and shop drawing submittals. All transformer bases shall have been structurally tested to resist the theoretical plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with the shop drawings. Shop drawings shall show breakaway base model number, and manufacturer's name and logo. Manufacturer's shop drawings shall include the ASTM designations for all materials to be used.
   c. Mast Arm Attachments. All poles and attachments shall be structurally designed to support two 12-foot mast arms and luminaires. Poles shall be supplied with mast arm combinations as shown in the plans. All mast arms shall be designed for a 60-pound luminaire having an effective projected area of 1.6 square feet.
   d. Anchor Bolt Assembly. Anchor bolt assemblies for optionally designed poles shall be the same as those shown herein.

5. Aluminum Pole Designs. Aluminum pole designs may be allowed, if aluminum poles are permitted or required, pending approval by the Department as outlined below.

   a. Meet all of the requirements stated above for optional steel pole designs and the following:
      1. Aluminum poles shall be fabricated in accordance with "Structural Welding Code-Aluminum" AWS D1.2.
      2. Aluminum pole designs shall use the same anchor bolt assembly and be subject to the same geometric restraints and other requirements for steel poles specified herein.
      3. Aluminum poles shall be equipped with vibration mitigation devices, as approved by the engineer.
      4. Pole components shall be constructed using the following material:
         Shaft: ASTM B221 or B241 Alloy 6063-T6, ASTM B209 Alloy 5086-H34, ASTM B221 Alloy 6005-T5.
         Base Flange: ASTM B26 Alloy 356.0-T6 or ASTM B108 Alloy 356.0-T6 (Yield strength test required).
         Mast Arm Fitting: ASTM B209 Alloy 6061-T6 or ASTM B221 Alloy 6005-T5.
         Mast Arms: ASTM B241 Alloy 6061-T6 or Alloy 6063-T6.
         Pole Cap: ASTM B209 Alloy 5086-H32 or ASTM B108 or B26 Alloy 356.0-T6.
         Bolts: Stainless Steel AISI 300 series. Bolts threading into aluminum threads shall be treated with anti-seize compound, Never-Seez Compound, Permatex 133K or equal.

6. Special Designs. Poles with architectural treatments shall meet the requirements shown elsewhere in the plans.

7. Luminaire Mounting Height. Actual luminaire mounting height shall be the nominal mounting height given on RIP(2) for all pole-arm combinations except for poles with 4 ft. luminaire arms, which shall be 3'-0" lower than the nominal height, unless otherwise shown or directed.

EXPLANATION OF ROADWAY ILLUMINATION ASSEMBLY DESIGNATIONS

(TYPE SA 50 T - X - X) (400W EQ) LED

SA: Pole and mast arm may be steel or aluminum.
ST: Pole and mast arm must be steel.
AL: Pole and mast arm must be aluminum.
SP: Special (ovalized) steel or aluminum pole for installing on CSB or SSCB. See standard sheet CSB (4), or SSCB (4).

Two numerical digits denote nominal mounting height in feet.

Next letter denotes type of base, (S-Shoe Base, T-Transformer Base, or B-Bridge/Ret.Wall Mount)

First number denotes length of mast arm in feet.

Use of second mast arm is indicated by second dashed number which denotes length in feet.

Luminaire rating in watts (i.e. 400W). Equivalent wattage LED fixtures will include EQ (i.e. 400W EQ)

Last letters indicate light source (S - High Pressure Sodium; LED - LED luminaire)

SHEET 1 OF 4

Texas Department of Transportation — Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

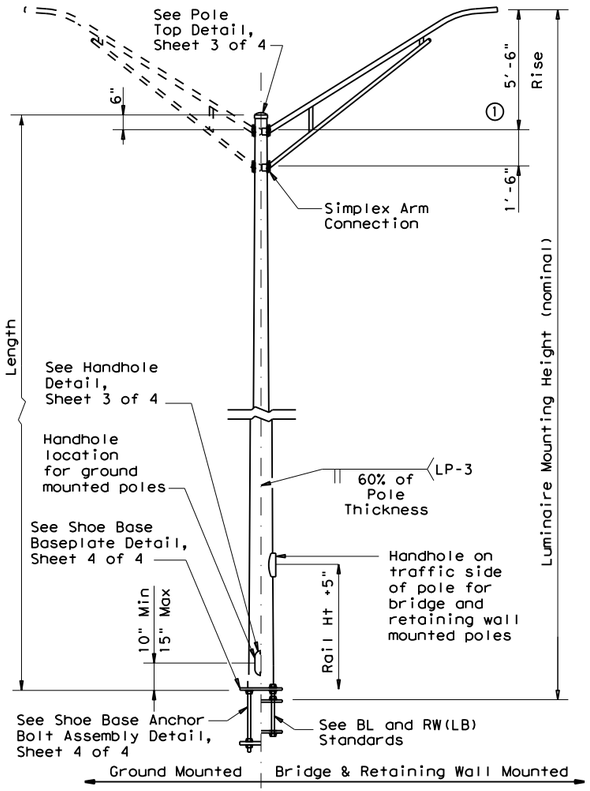
RIP(1)-19

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
© TxDOT January 2007	CONT 3136	SECT 01	JOB 191	HIGHWAY SL 0001
REVISIONS 7-17, 12-19	DIST AUS	COUNTY TRAVIS		SHEET NO. 130

73A

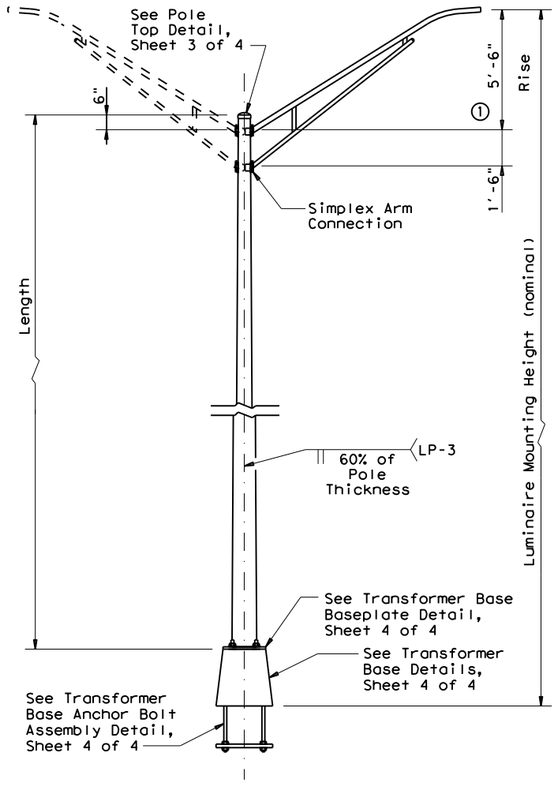
DATE: 11/6/2020 1:51:25 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136...

DATE: 11/6/2020 1:51:27 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\93669\rip-19.dgn



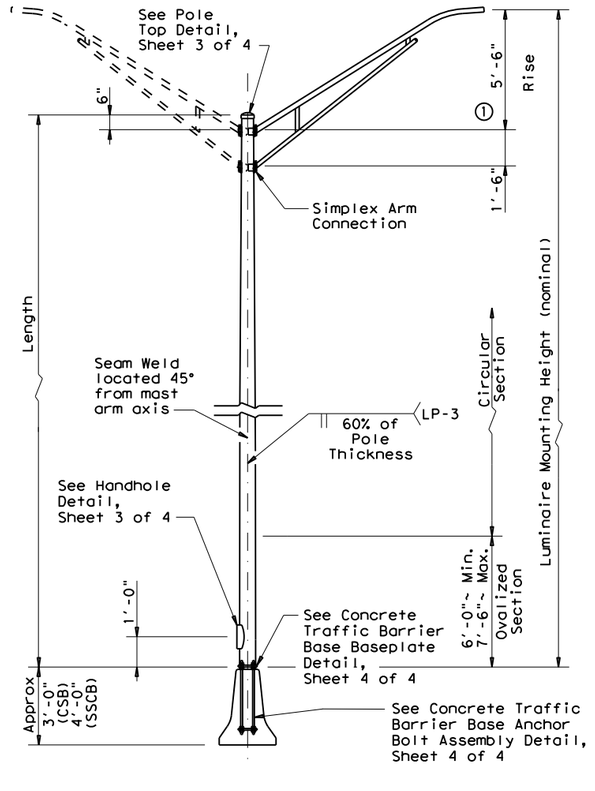
SHOE BASE POLE

SHOE BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	4.90	15.00	0.1196	7.1
30.00	7.50	4.00	25.00	0.1196	13.2
31.00-39.00	8.00	4.36-3.24	26.00-34.00	0.1196	20.7
40.00	8.50	3.60	35.00	0.1196	20.7
50.00	10.50	4.20	45.00	0.1196	30.3



TRANSFORMER BASE POLE

TRANSFORMER BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	5.11	13.50	0.1196	7.1
30.00	7.50	4.21	23.50	0.1196	13.2
31.00-39.00	8.00	4.57-3.45	24.50-32.50	0.1196	20.7
40.00	8.50	3.81	33.50	0.1196	20.7
50.00	10.00	3.91	43.50	0.1196	30.3



CONCRETE TRAFFIC BARRIER BASE POLE

CONCRETE TRAFFIC BARRIER BASE POLE (CSB/SSCB)						
Luminaire Mounting Height (Nominal) (ft)	Base ② Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)	
					About ℄ of Rail	Perp. to Rail
28.00	9.00	5.78	23.00	0.1196	10.3	13.2
38.00	9.00	4.38	33.00	0.1196	16.6	20.8
48.00	10.50	4.48	43.00	0.1345	25.1	30.5

MATERIAL DATA		
COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)
Pole Shaft (0.14"/ft. Taper)	A572 Gr 50, A595 Gr A, A1011 HSLAS Gr 50 Cl 2 ③, or A1008 HSLAS Gr 50 Cl 2	50
Base Plate and Handhole Frame	A572 Gr.50, or A36	36
T-Base Connecting Bolts	F3125 Gr A325	92
Anchor Bolts	F1554 Gr 55, A193-B7 or A321	55 105
Anchor Bolt Templates	A36	36
Heavy Hex (H.H.) Nuts	A194 Gr 2H, or A563 Gr DH	
Flat Washers	F436	

NOTES:

① 2'-6" rise for 4 ft. luminaire arms.

② Before ovalized as shown on Concrete Traffic Barrier Base Baseplate details, Sheet 4 of 4.

③ A1011 SS Gr 50 may be used instead of HSLAS, provided the material meets the elongation requirements for HSLAS.

POLE ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Shaft length	+1"
I.D. of outside piece of slip fitting pieces	+1/8", -1/16"
O.D. of inside piece of slip fitting pieces	+1/32", -1/8"
Shaft diameter: other	+3/16"
Out of "round"	1/4"
Straightness of shaft	±1/4" in 10 ft
Twist in multi-sided shaft	4° in 50 ft
Perpendicular to baseplate	1/8" in 24"
Pole centered on baseplate	±1/4"
Location of Attachments	±1/4"
Bolt hole spacing	±1/16"

GENERAL NOTES:

1. Designs conform to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals , 6th Edition (2013) and Interim Revisions thereto. Design 3-Second Gust Wind Speed equals 110 mph with a 1.14 gust factor. A wind importance factor of 0.80 is applied to adjust the wind speed to a 25 year recurrence interval. Design moments listed in tables assume base of pole is 25' above natural ground level.
2. Structures are designed to support two 12' luminaire mast arms and luminaires. Mast arms are designed to support a 60-pound luminaire having an effective projected area of 1.6 square feet.
3. Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Do not submit shop drawings for roadway illumination pole assemblies fabricated in accordance with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of these sheets and the Specifications. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
4. For mounting heights between values shown in the tables, use base diameter and thickness values for the larger height.
5. Unless otherwise noted, all steel parts shall be galvanized in accordance with Item 445, "Galvanizing."
6. Steel poles shall be fabricated in accordance with Item 441, "Steel Structures." Longitudinal seam welds for pole sections shall have 60% minimum penetration. All welding shall be in accordance with AWS D1.1, Structural Welding Code-Steel.
7. Two-section poles joined by circumferential welds will not be permitted, unless otherwise shown on the plans. Poles may be fabricated in two sections and field-assembled by the lap-joint method. The two sections shall telescope together with a lap length of not less than 1-1/2 times the shaft diameter at the lap joint.
8. Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
9. Lubricate and tighten anchor bolts, when erecting shoe base poles and concrete traffic barrier base poles, in accordance with Item 449, "Anchor Bolts."
10. All poles, except Transformer Base Poles, shall have hand holes with reinforcing frames and covers. For ground mounted shoe base poles, hand holes shall be placed 90 degrees to mast arm unless otherwise noted on the plans. For poles mounted on a concrete traffic barrier with one luminaire arm, hand holes shall be located 180 degrees from luminaire arm. For poles mounted on a concrete traffic barrier with two luminaire arms, all hand holes shall be on the same side of the barrier. For poles mounted on a bridge lighting bracket or a retaining wall lighting bracket, hand hole shall be on traffic side of the pole, at a height that will clear the barrier.
11. The finished pole shall have a smooth, uniform finish free of pits, blisters, or other defects. Scratched, chipped, and other damaged galvanized areas on poles and mast arms shall be repaired in accordance with Item 445, "Galvanizing."
12. Pole length is based on a 5'-6" luminaire arm rise. 4 ft. luminaire arms have a 2'-6" rise. A pole with 4 ft. luminaire arms will have an actual mounting height 3'-0" less than the nominal mounting height. Increasing the pole length to meet the nominal mounting height is allowed, but unnecessary unless otherwise directed by the engineer.
13. Erect transformer base poles in accordance with sheet RID(1).

Texas Department of Transportation

Traffic Safety Division Standard

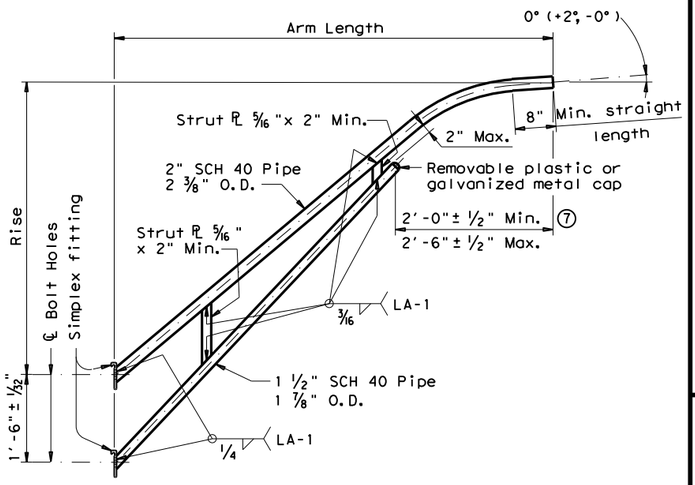
ROADWAY ILLUMINATION POLES

RIP(2)-19

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
7-17	DIST	COUNTY		SHEET NO.
12-19	AUS	TRAVIS		131

73B

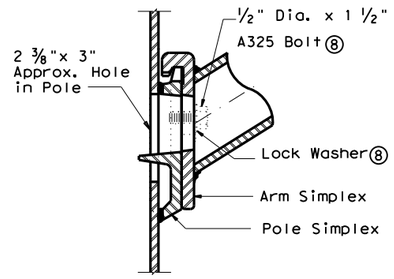
DATE: 11/6/2020 1:51:28 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\391369\rip-19.dgn



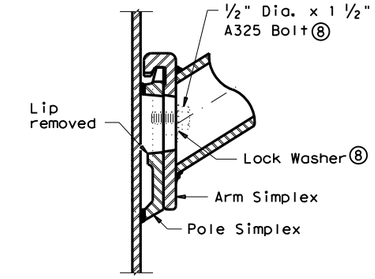
LUMINAIRE ARM

LUMINAIRE ARM DIMENSIONS		
Nominal Arm Length	Arm Length	Rise
4'-0"	3'-6"	2'-6"
6'-0"	5'-6"	5'-6"
8'-0"	7'-6"	5'-6"
10'-0"	9'-6"	5'-6"
12'-0"	11'-6"	5'-6"

ARM ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Arm Length	±1"
Arm Rise	±1"
Deviation from flat	1/8" in 12"
Spacing between holes	±1/32"

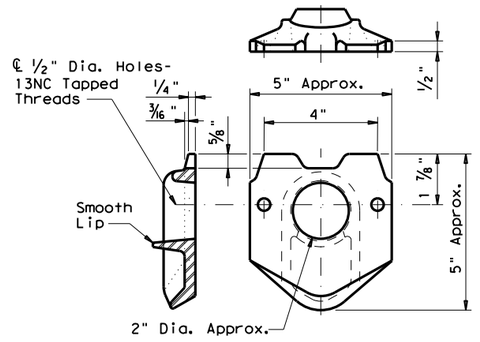


UPPER SIMPLEX FITTING
(Gusset not shown for clarity)

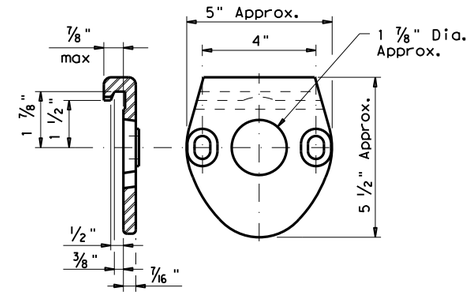


LOWER SIMPLEX FITTING
(Gusset not shown for clarity)

SECTION B-B



POLE SIMPLEX DETAIL ⑨



ARM SIMPLEX DETAIL ⑨

NOTES:

④ Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

⑤ A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

⑥ A572, A1008 HSLAS-F, and A1011 HSLAS-F materials may have higher yield strengths but shall not have less elongation than the grade indicated.

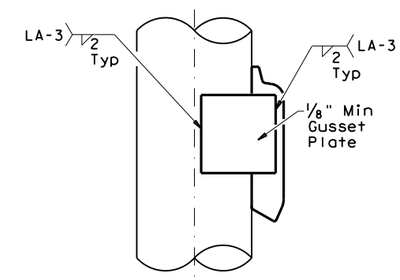
⑦ Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

⑧ Each pole simplex fitting shall be supplied with 2 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans.

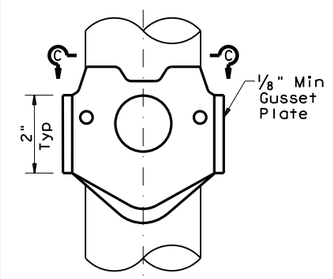
⑨ Proposed deviations in arm simplex dimensions or materials must be submitted to the Department for approval.

⑩ A welded handhole frame is permissible. Maximum of two (2) CJP weld splices is allowed.

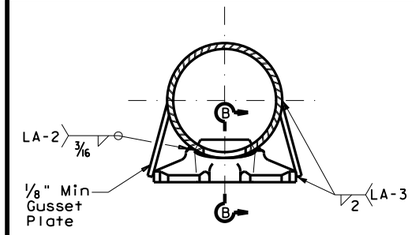
MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr 65-35 or Gr 70-36, A148 Gr 80-50, A576 Gr 1021 ⑤, or A36 (Arm only)
Arm Pipes	ASTM A53 Gr A or B, A500 Gr B, A501, A 1008 HSLAS-F Gr 50 ⑥, or A1011 HSLAS-F Gr 50 ⑥
Arm Struts and Gusset Plates ④	ASTM A36, A572 Gr 50 ⑥, or A588
Misc.	ASTM designations as noted



SIDE

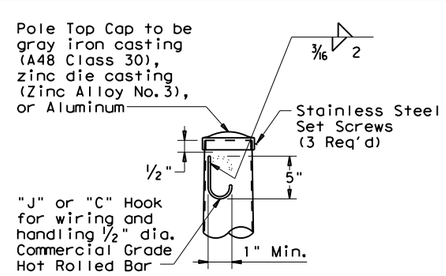


ELEVATION

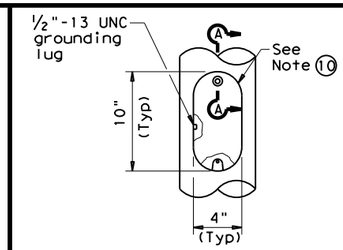


SECTION C-C

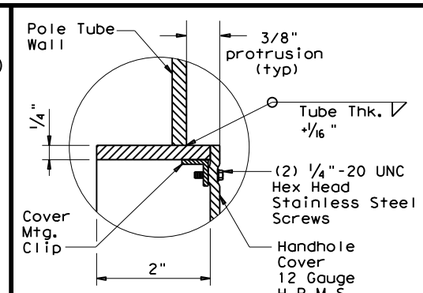
SIMPLEX ATTACHMENT DETAIL



POLE TOP



ELEVATION



SECTION A-A

HANDHOLE

Texas Department of Transportation

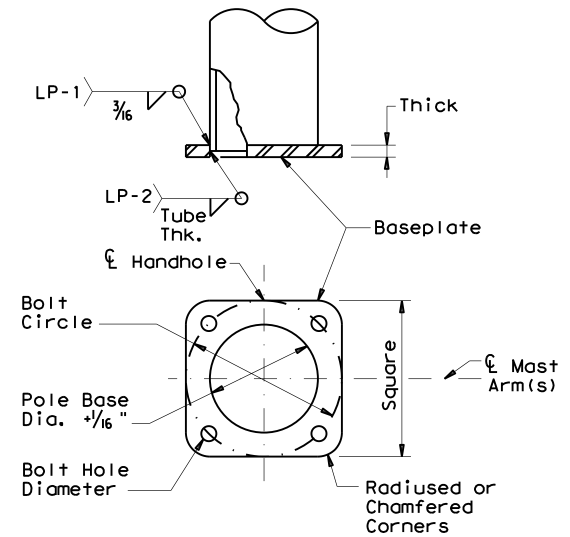
Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(3)-19

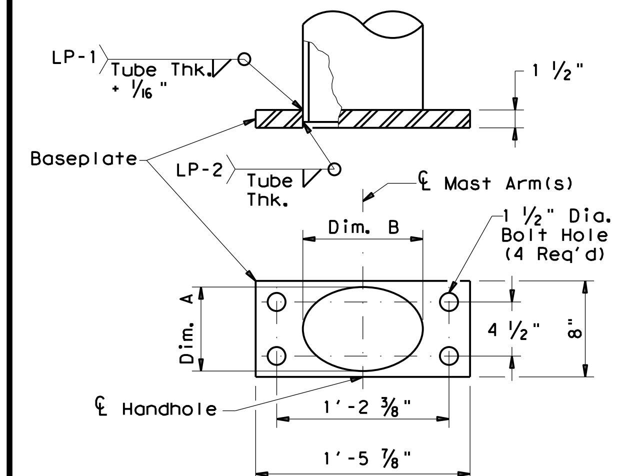
FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
7-17	DIST	COUNTY		SHEET NO.
12-19	AUS	TRAVIS		132

73C



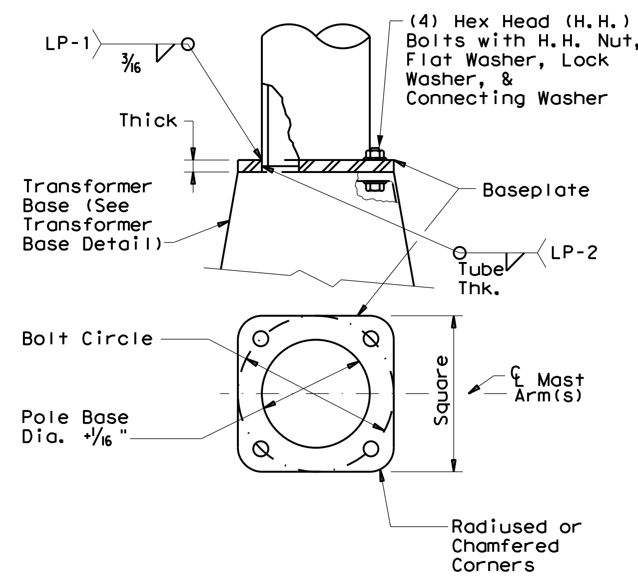
SHOE BASE BASEPLATE

SHOE BASE BASEPLATE TABLE				
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	BOLT HOLE DIAMETER
20'- 39'	13"	13"	1 1/4"	1 1/4"
40'	15"	15"	1 1/4"	1 1/2"
50'	15"	15"	1 1/2"	1 1/2"



CONCRETE TRAFFIC BARRIER BASE BASEPLATE

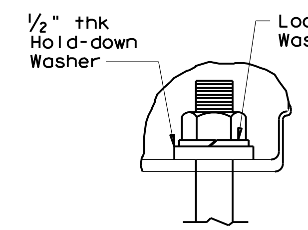
CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA. (12)	DIM. A	DIM. B
28'- 38'	9"	7"± 1/4"	10"± 1/4"
48'	10 1/2"	7"± 1/4"	13"± 1/4"



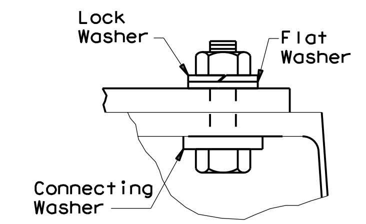
TRANSFORMER BASE BASEPLATE

TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFORMER BASE TYPE
20'- 39'	13"	13"	1 1/4"	1"	1 1/4"	A
40'	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50'	15"	15"	1 1/2"	1 1/4"	1 1/2"	B

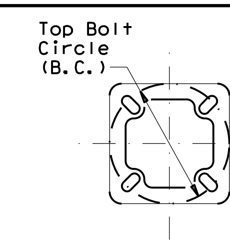
TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



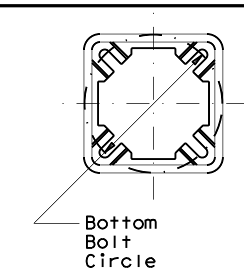
DETAIL A



DETAIL B



TOP PLAN



BOTTOM PLAN

GENERAL NOTES:

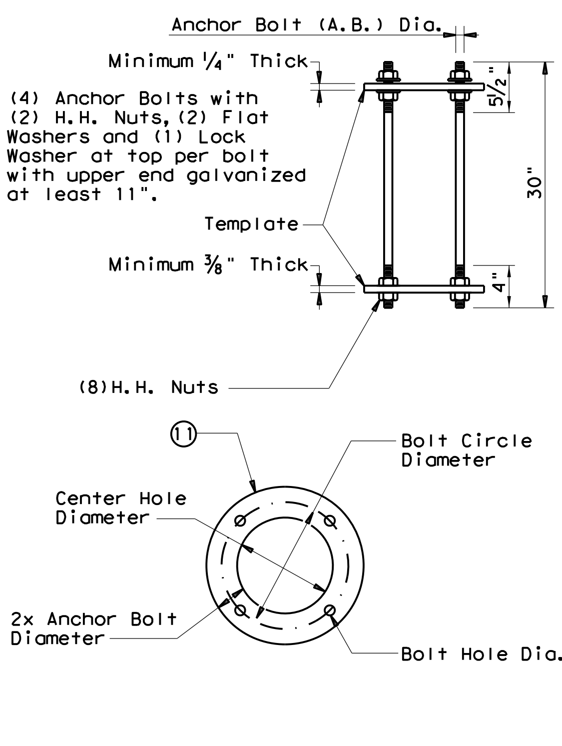
1. For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
2. All breakaway bases shall meet the breakaway requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to resist 150% of the design moment.
3. Transformer bases shall be cast from aluminum, ASTM B108 or B26 Alloy 356.0-T6, or other material approved by the Engineer. Four Hex Head (H.H.) bolts with four H.H. nuts, four lock washers, four flat washers, and connecting and hold-down washers as recommended by the manufacturer, galvanized to ASTM A153 Class C or D, or B695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A563 grade DH galvanized.
4. Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
5. Doors for transformer bases shall be made of plastic, fiberglass or other non-metallic material approved by the Engineer and shall be attached with stainless steel screws or bolts. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.

NOTES:

(11) Anchor Bolt Templates do not need to be galvanized.

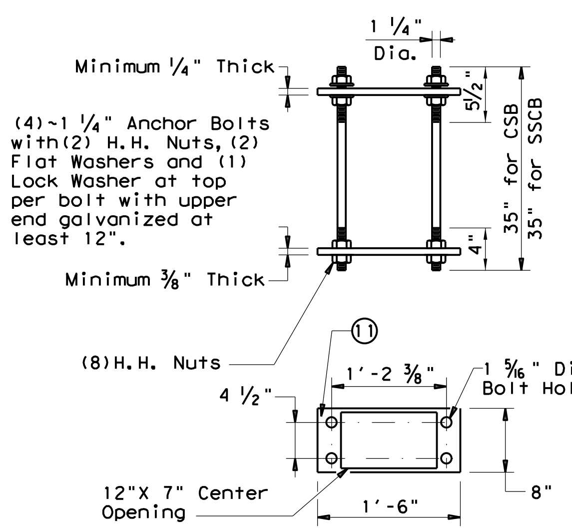
(12) Pole diameter before ovalized.

ANCHOR BOLT FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"



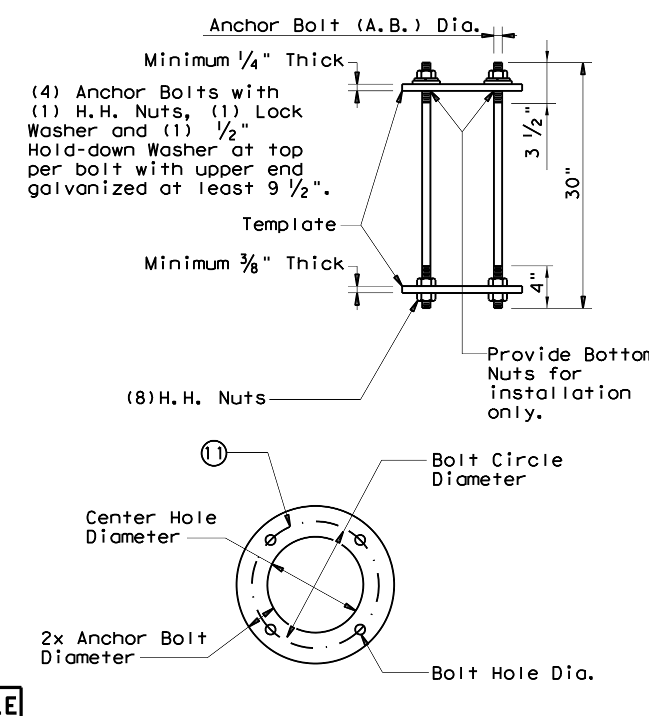
SHOE BASE ANCHOR BOLT ASSEMBLY

SHOE BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20'-39'	1"	13"	11"	1 1/16"
40'-50'	1 1/4"	15"	12 1/2"	1 5/16"

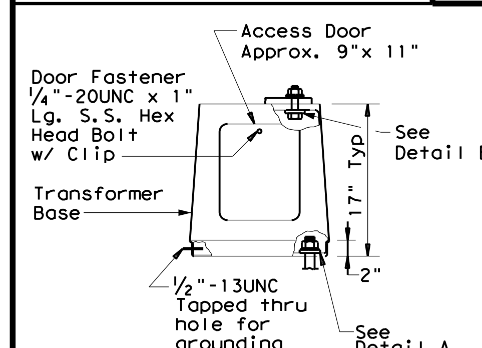


CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

TRANSFORMER BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20'- 39'	1"	14"	12"	1 1/16"
40'- 50'	1 1/4"	17 1/4"	14 3/4"	1 5/16"



TRANSFORMER BASE ANCHOR BOLT ASSEMBLY



ELEVATION

TRANSFORMER BASE DETAILS

Texas Department of Transportation | Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(4)-19

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT 3136	SECT 01	JOB 191	HIGHWAY SL 0001
REVISIONS 7-17 12-19	DIST AUS		COUNTY TRAVIS	SHEET NO. 133

730

DATE: 11/20/2020
FILE: PREPARED BY RACHEL LARCOM

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000

2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.

3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.

4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

☒ No Permit Required

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

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

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1.

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☒ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☐ No Action Required ☒ Required Action

Action No.

1. The Contractor's attention is directed to the fact there is the possibility that migratory birds may be nesting in any woody vegetation or existing structure within the project limits. The Contractor shall remove all old migratory nests from any woody vegetation or structures between September 16 and Februrary 28 while the nests are not occupied by a bird. In addition, the Contractor must be prepared to prevent migratiry birds from re-nesting between March 1 and September 15. All methods must be approved by the Austin District biologist well in advance of planned use.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

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

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

☐ Yes ☐ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1. A WPAP Exception Request was obtained for the project. Comply with the WPAP Exception Request and WPAP Exception Request Approval Letter. Maintain the WPAP Exception Request and Approval Letter onsite at all times.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.
05-07-14 ADDED NOTE SECTION IV.	AUS	TRAVIS		134
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.				

A. GENERAL SITE DATA

1. PROJECT LIMITS:
   SL 0001
   FROM DUVAL ROAD TO 0.8 MILES WEST OF DUVAL ROAD
   PROJECT COORDINATES:
   BEGIN PROJECT : SL 0001 68+61.62
   END PROJECT : SL 0001 115+00.00
   PROJECT LOCATION:
   BEG LATITUDE: +30.4085698 BEG LONGITUDE: -97.7153552
   END LATITUDE: +30.4024823 END LONGITUDE: -97.7284155

2. PROJECT SITE MAPS:
* PROJECT LOCATION MAP: **TITLE SHEET**
* DRAINAGE PATTERNS: **DRAINAGE AREA MAP**
* SLOPES ANTICIPATED AFTER MAJOR GRADINGS OR AREAS OF SOIL DISTURBANCE: **EXISTING AND PROPOSED TYPICAL SECTIONS**
* LOCATION OF EROSION AND SEDIMENT CONTROLS: **EROSION CONTROL PLAN**
* SURFACE WATERS AND DISCHARGE LOCATIONS: **DRAINAGE AND CULVERT LAYOUTS**
* PROJECT SPECIFIC LOCATIONS: TO BE SPECIFIED BY THE PROJECT FIELD OFFICE DURING CONSTRUCTION AND LOCATED IN THE PROJECT SW3P FILE. REFERENCE ITEM #10 BELOW

3. PROJECT DESCRIPTION: **RECONFIGURE NB EXIT RAMP**

4. MAJOR SOIL DISTURBING ACTIVITIES:
   OBLITERATE EXISTING RAMP, NEW RAMP CONSTRUCTION, & GRADING

5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:
   100% GRASSY DITCHES

6. TOTAL PROJECT AREA: **5.83 ACRES**

7. TOTAL AREA TO BE DISTURBED: **1.62 ACRES**

8. WEIGHTED RUNOFF COEFFICIENT
   BEFORE CONSTRUCTION: **0.95**
   AFTER CONSTRUCTION: **0.95**

9. NAME OF RECEIVING WATERS: (SEGMENT NUMBER OF RECEIVING WATERS)
   N/A

10. PROJECT SW3P FILE: FOR PROJECTS DISTURBING ONE ACRE OR MORE, TXDOT WILL MAINTAIN AN SW3P FILE WITH ALL PERTINENT ENVIRONMENTAL DOCUMENTS, CORRESPONDENCE, ETC. AT THE PROJECT FIELD OFFICE. IF NO FIELD OFFICE IS AVAILABLE THEN THE SW3P FILE SHALL BE KEPT IN THE INSPECTOR'S TRUCK.

B. EROSION AND SEDIMENT CONTROLS

1. SOIL STABILIZATION PRACTICES:

___ TEMPORARY SEEDING
__X__ PERMANENT PLANTING, SODDING, OR SEEDING
___ MULCHING
__X__ SOIL RETENTION BLANKET
___ BUFFER ZONES
__X__ PRESERVATION OF NATURAL RESOURCES

OTHER:

2. STRUCTURAL PRACTICES:

__X__ SILT FENCES
___ ROCK FILTER DAMS
___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
___ DIVERSION DIKE AND SWALE COMBINATIONS
___ PIPE SLOPE DRAINS
___ PAVED FLUMES
__X__ ROCK BEDDING AT CONSTRUCTION EXIT
___ TIMBER MATTING AT CONSTRUCTION EXIT
___ CHANNEL LINERS
___ SEDIMENT TRAPS
___ SEDIMENT BASINS
___ STORM INLET SEDIMENT TRAP
___ STONE OUTLET STRUCTURES
__X__ CURBS AND GUTTERS
__X__ STORM SEWERS
___ VELOCITY CONTROL DEVICES

OTHER:

3. STORM WATER MANAGEMENT:
   STORM WATER DRAINAGE WILL BE PROVIDED BY **DITCHES AND STORM SEWER**
   THIS SYSTEM WILL CARRY THE DRAINAGE WITHIN THE RIGHT-OF-WAY TO **AREAS WHERE CROSS DRAINAGE OCCURS.**

4. STORM WATER MANAGEMENT ACTIVITIES: (SEQUENCE OF CONSTRUCTION)
   REFERENCE TCP SEQUENCE OF WORK

5. NON-STORM WATER DISCHARGES:
   FILTER NON-STORM WATER DISCHARGES, OR HOLD RETENTION BASINS, BEFORE BEING ALLOWED TO MIX WITH STORM WATER. THESE DISCHARGES CONSIST OF NON-POLLUTED GROUND WATER, SPRING WATER, FOUNDATION AND/OR FOOTING DRAIN WATER; AND WATER USED FOR DUST CONTROL, PAVEMENT WASHING AND VEHICLE WASHWATER CONTAINING NO DETERGENTS.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:
   MAINTENANCE WILL BE PERFORMED AS INDICATED ON FIELD INSPECTION AND MAINTENANCE REPORT FORM 2118.

2. INSPECTION:
   INSPECTION WILL BE PERFORMED AS INDICATED ON FIELD INSPECTION AND MAINTENANCE REPORT FORM 2118.

3. WASTE MATERIALS:
   ALL WASTE MATERIALS WILL BE COLLECTED, STORED AND DISPOSED OF IN A LEGAL AND PROPER MANNER. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE.

4. HAZARDOUS WASTE (INCLUDING SPILL REPORTING):
   AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS. PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR MUST BE CONTACTED IMMEDIATELY.

5. SANITARY WASTE:
   ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

OFFSITE VEHICLE TRACKING:

__X__ HAUL ROADS DAMPENED FOR DUST CONTROL
__X__ LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
__X__ EXCESS DIRT ON ROAD REMOVED DAILY
__X__ STABILIZED CONSTRUCTION ENTRANCE

OTHER:

REMARKS: DISPOSAL AREAS, STOCKPILES AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL SEDIMENT FROM ENTERING RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WATERBODY OR STREAMBED.

CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED TO MINIMIZE THE RUNOFF OF POLLUTANTS.

DocuSigned by:
Shane Swimm
F0E6FDD2B5994AD...
11/12/2020

STATE OF TEXAS
SHANE V. SWIMM
138362
LICENSED PROFESSIONAL ENGINEER

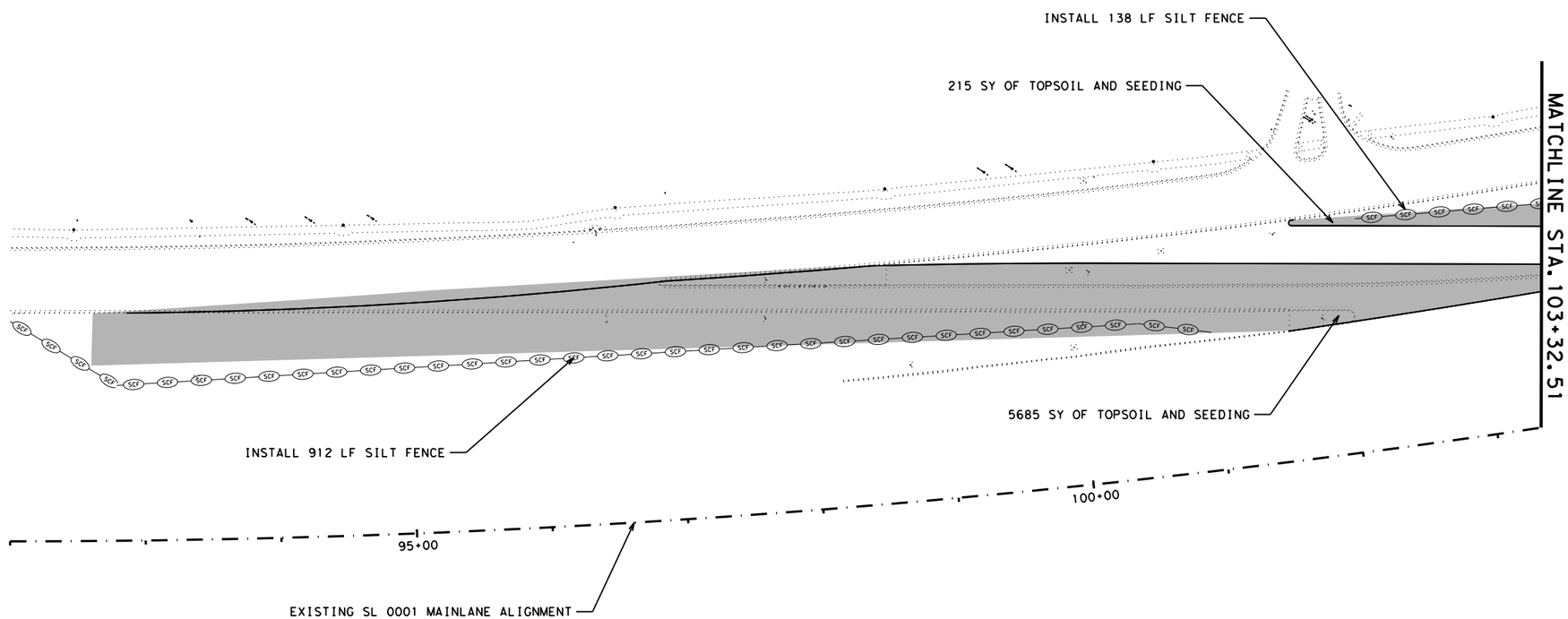
Austin District
North Travis Area Office

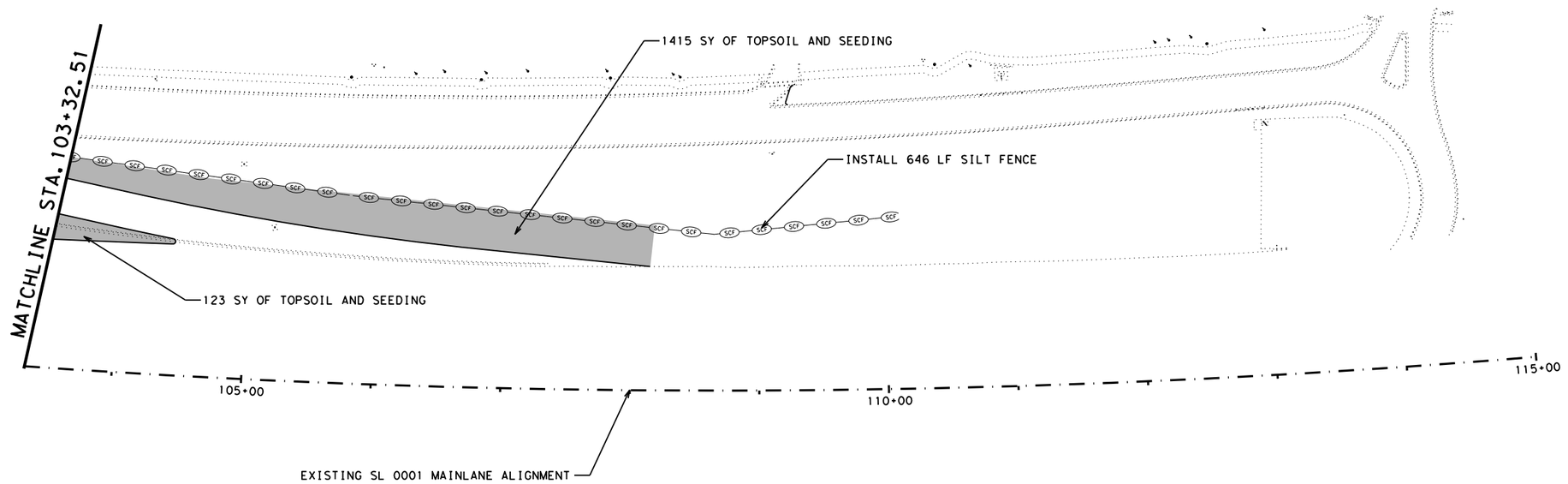
Texas Department of Transportation

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3136	01	191	SL 0001
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		135





DocuSigned by:
Shane Swimm
F0E6FDD2B5994AD...

11/12/2020

STATE OF TEXAS
SHANE V. SWIMM
138362
LICENSED
PROFESSIONAL ENGINEER

Austin District
North Travis Area Office

Texas Department of Transportation

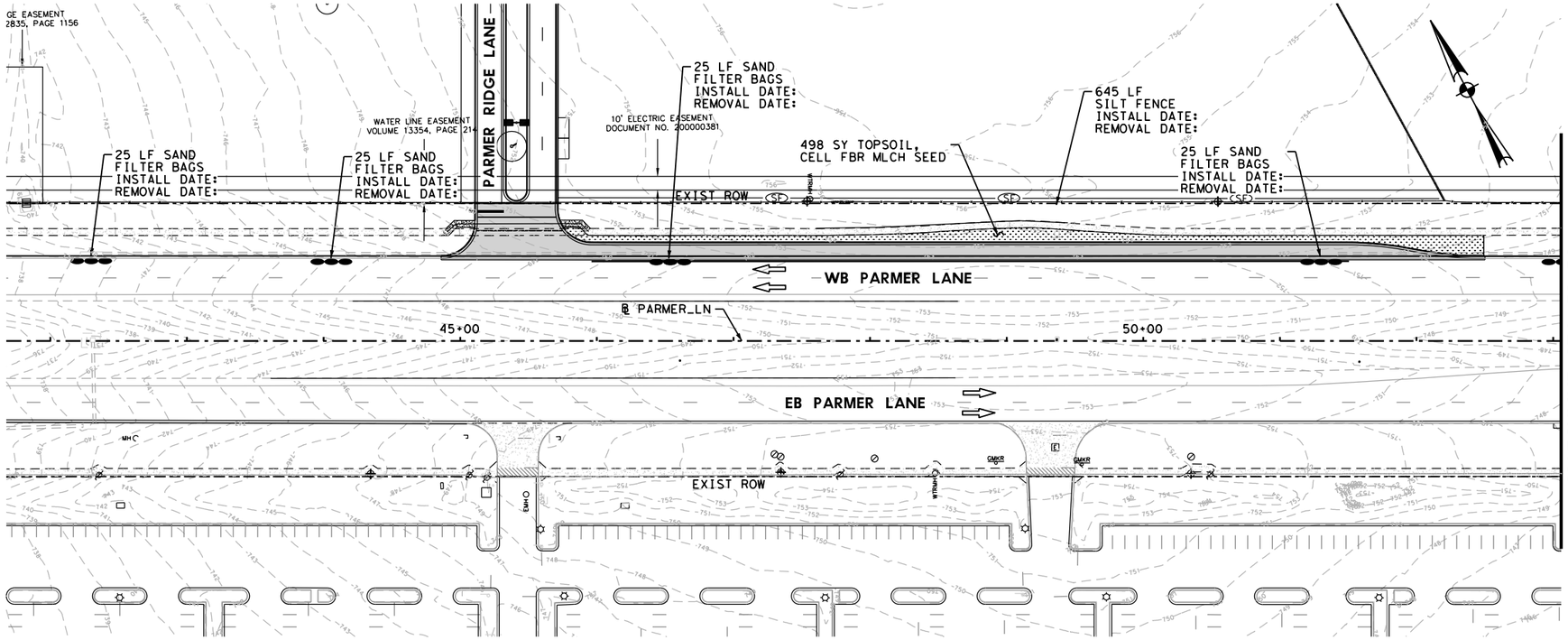
SL 0001

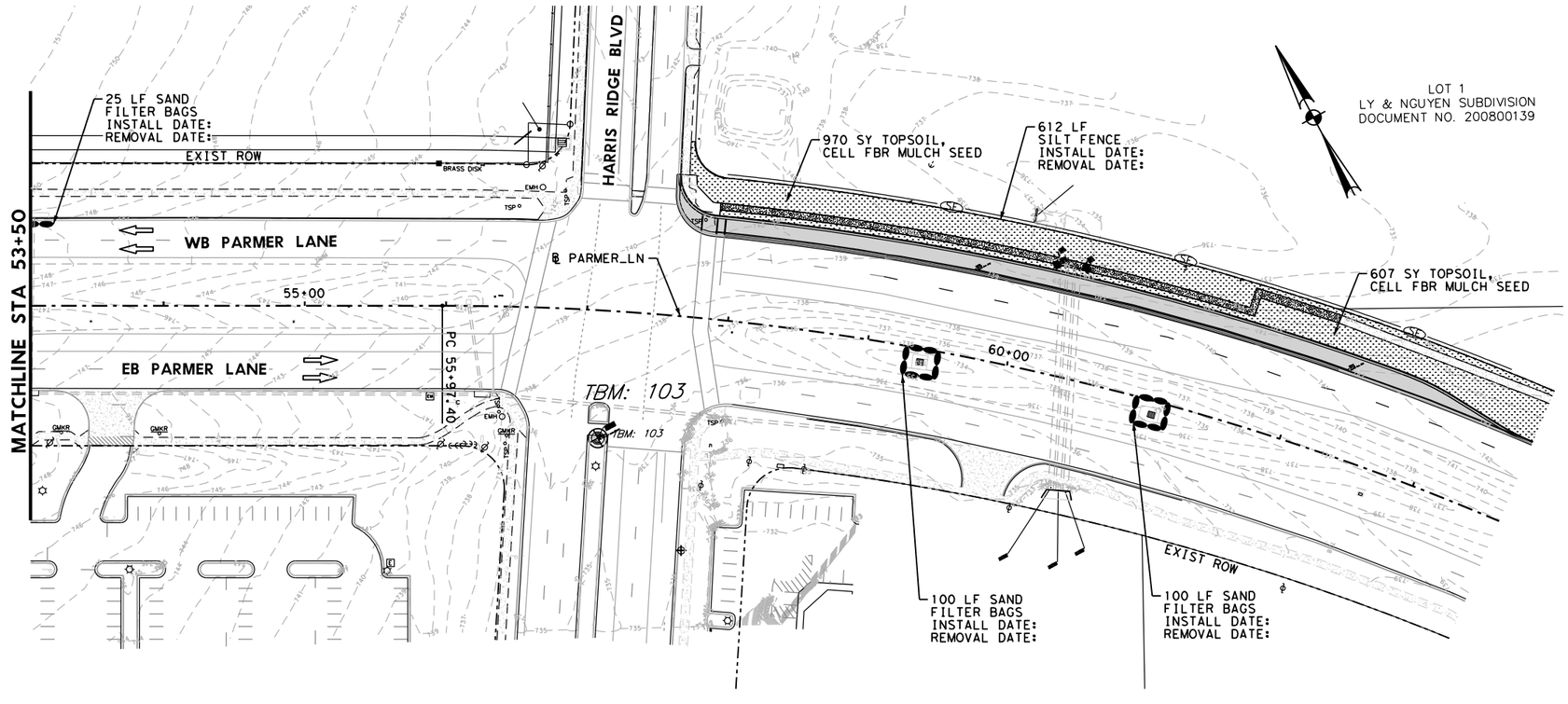
EROSION CONTROL LAYOUT

SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3136	01	191	SL 0001
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	TRAVIS		137

DATE: 11/6/2020 1:52:17 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011911\4 - Design\Plan Set\9. Environmental\SL0001_ENV_EC LAYOUT.dgn





LEGEND

- EXISTING DIRECTION OF TRAFFIC
- EXIST ROW
- 535 CONTOURS
- OE OVERHEAD ELECTRICAL
- DRAINAGE FLOW ARROW
- SF SILT FENCE
- SAND FILTER BAG
- TOPSOIL & SEEDING
- PROPOSED PAVEMENT

NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING OVERHEAD AND UNDERGROUND FACILITIES IF ADJACENT TO WORK AREA.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK I.E. FADED.
3. REFERENCE DRAINAGE PLAN AND PROFILE SHEETS FOR DRAINAGE DETAILS.

0 25 50 100 (H)
0 5 10 (V)

STATE OF TEXAS
ARMANDO CASTRO, JR.
111324
LICENSED
PROFESSIONAL ENGINEER
11/25/2020

NO.	REVISIONS	BY	DATE

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

PARMER LANE

EROSION CONTROL PLAN

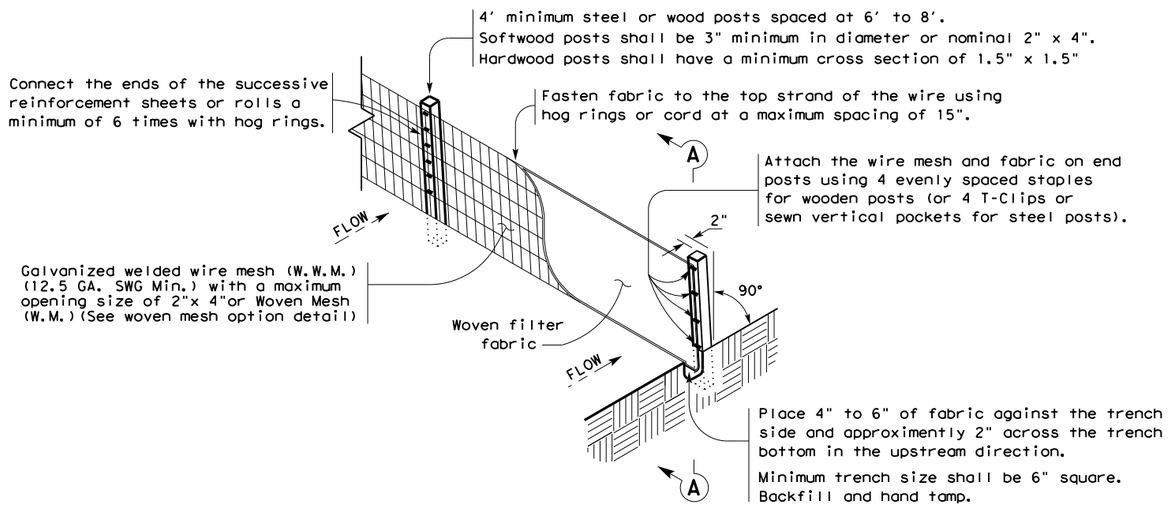
SHEET 1 OF 1

© 2020		CONT	SECT	JOB	HIGHWAY
DS:	CK:	3417	03	025	FM 734
DW:	CK:	DIST	COUNTY		SHEET NO.
		14	TRAVIS		138

V:\2220\active\222010025\civil\cad\CD Design\DRWY ACCESS RT\ECS\222010025_ECS_01.dgn 11/25/2020 4:56:43 PM KMcClure 100%

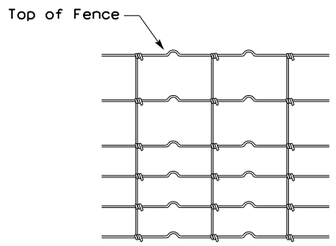
DATE: 2020
FILE: ec116.dgn
DW: TxDOT
CK: TxDOT

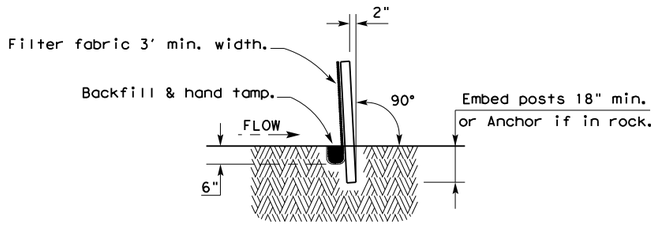
DGN: C:\Users\projectwiseonline.com\TXDOT4\Documents\14 - AUS\Design Projects\313601191\14 - Design\Plan Set\9. Environmental\ENV STD\ec116.dgn



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

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

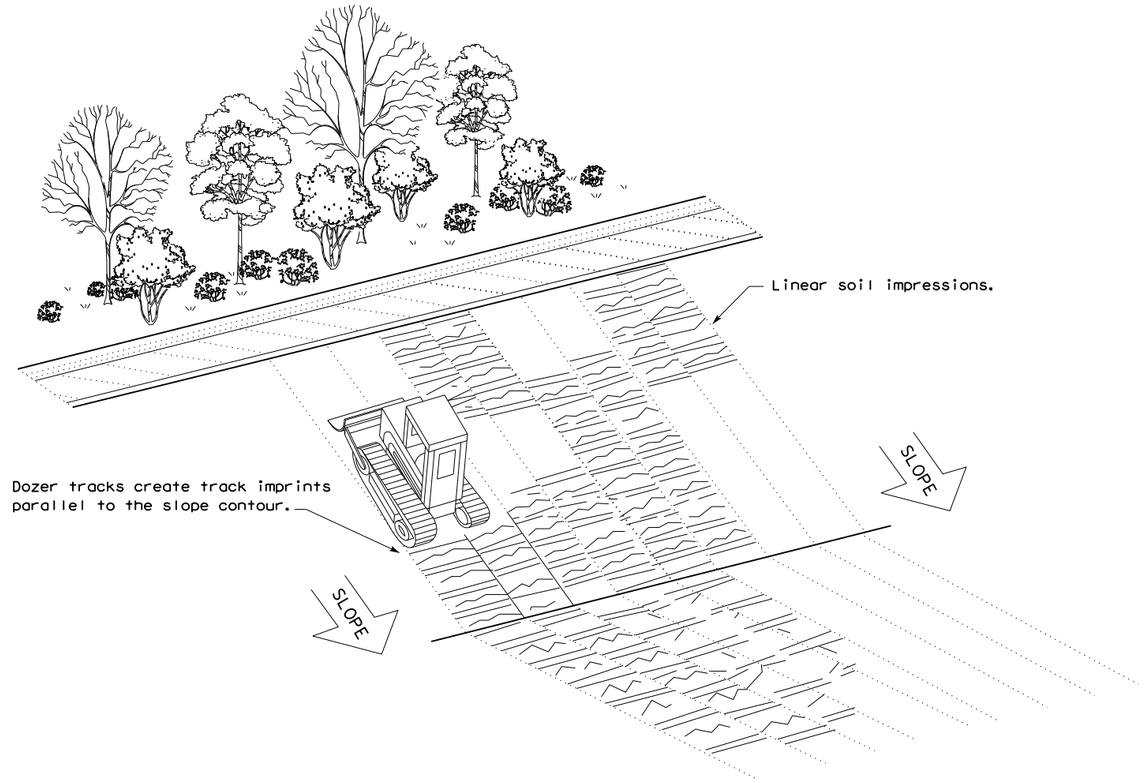
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

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



VERTICAL TRACKING

Texas Department of Transportation

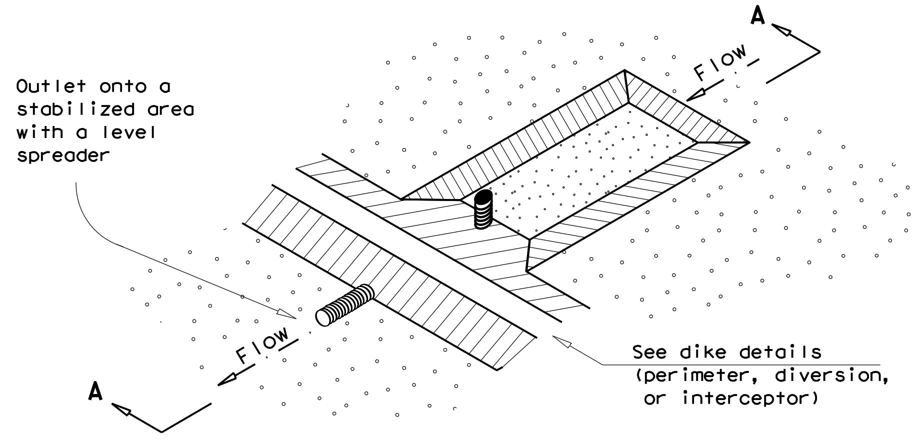
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

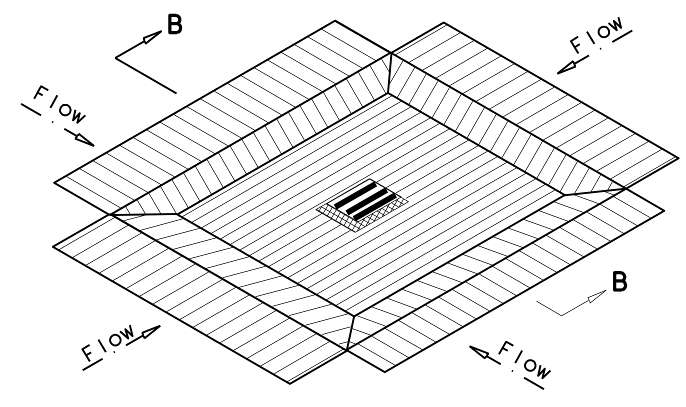
EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	3136	01	191		SL 0001	
	DIST	COUNTY			SHEET NO.	
	AUS	TRAVIS			139	



SEDIMENT BASIN AND/OR TRAP WITH PIPE OUTLET

ST/PO

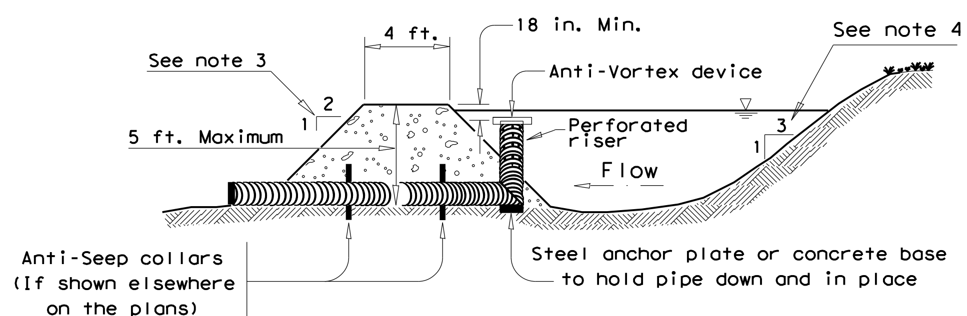


DROP INLET SEDIMENT TRAP

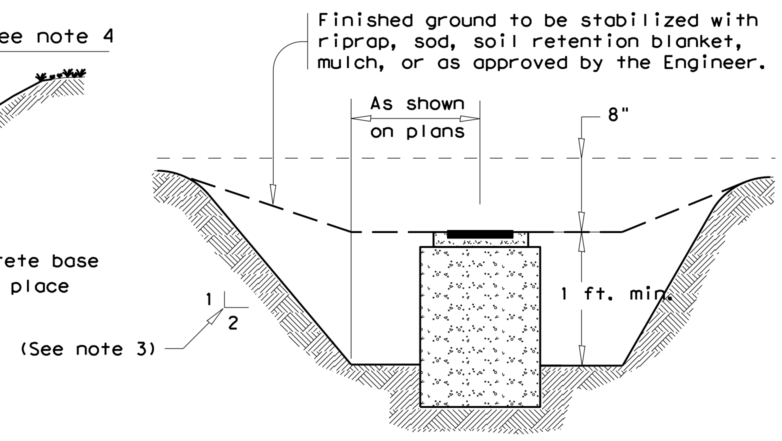
ST-DI

GENERAL NOTES

1. Pipe outlet material shall conform to the Item "Pipe Underdrains" or as accepted by the Engineer.
2. All pipe connections shall be watertight.
3. Side slopes within the safety clear zone of a roadway shall be 6:1 or flatter. Protect the traveling public from inlet stacks within the clear zone.
4. Sediment basins shall have side slopes of 3:1 or flatter.
5. The dimensions and limits of excavation for sediment basins and traps will be as shown elsewhere on the plans.
6. The sandbag material shall be made of polypropylene, polyethylene or polyamide woven fabric, min. unit weight 4 ounces /SY, Mullen burst strength exeeding 300 psi and ultraviolet stability exeeding 70%.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.



SECTION A-A



SECTION B-B

SEDIMENT BASIN & TRAP USAGE GUIDELINES

A sediment basin and/or trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

Basins: The drainage area for a sediment basin should not exceed 100 acres. The basin capacity shall be at least 1800 CF/Acre of drainage area (0.5" over the drainage area). If the disturbed area draining to the basin is larger than 10 acres, the basin capacity should be 3600 CF/Acre (1.0" over the drainage area).

The basin should have a 40 hour draw-down time with an emergency spillway. The spillway may be designed to pass the peak rate of runoff from a 25 year frequency storm. The 100 year storm should be investigated to consider possible flooding impacts.

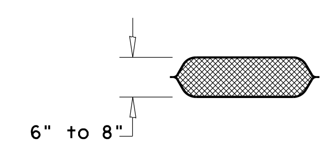
The entrance into the basin should be protected from erosion. The basin should be cleaned when the capacity has been reduced by 1/3.

Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

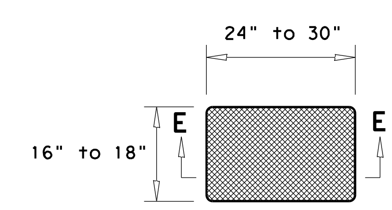
Sediment traps should be placed in the following locations:
1. Within drainage ditches spaced @ 500′ ± on center
2. Immediately preceding ditch inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way

The trap outlet may either be through a perforated riser and pipe assembly designed to achieve a 40 hour draw-down time or over a level stabilized area (vegetation, rock, etc.).

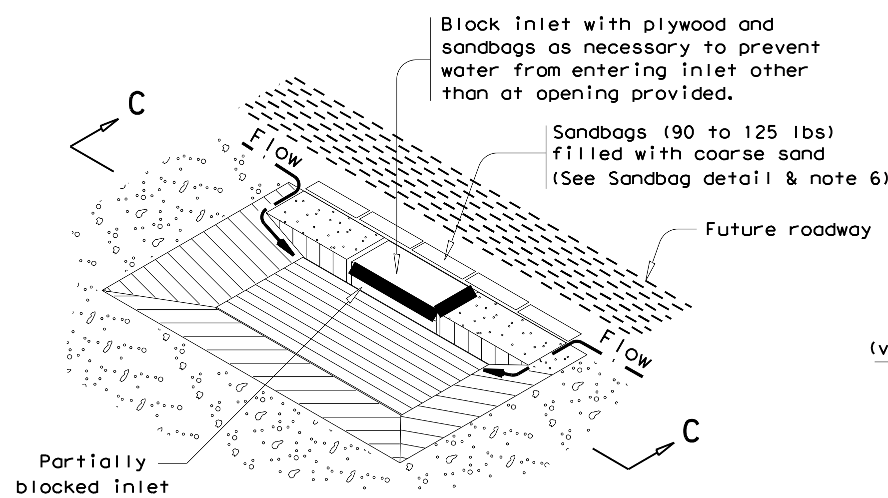
The trap should be cleaned when the capacity has been reduced by 1/2 or the sediment has accumulated to a depth of 1′, whichever is less.



SECTION E-E

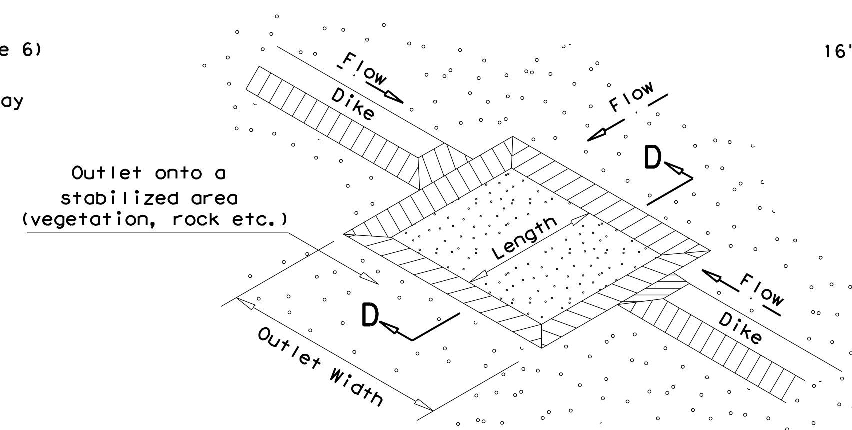


SANDBAG DETAIL



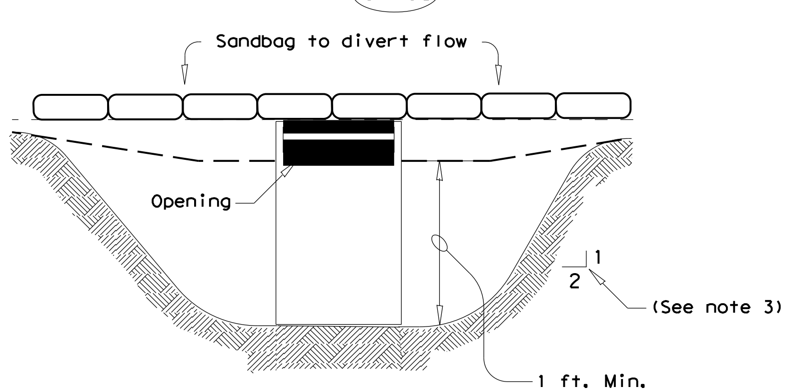
CURB INLET SEDIMENT TRAP

ST-CI

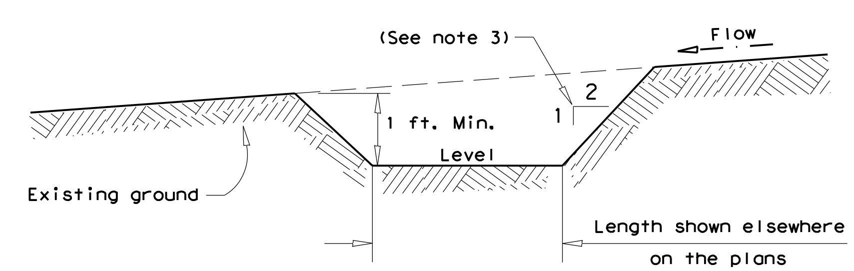


SEDIMENT TRAP WITH LEVEL STABILIZED OUTLET

ST



SECTION C-C



SECTION D-D

PLANS SHEET LEGEND

ST/PO — Sediment Basin and / or Trap with Pipe Outlet

ST-DI — Drop Inlet Sediment Trap

ST-CI — Curb Inlet Sediment Trap

ST — Sediment Trap with Level Stabilized Outlet

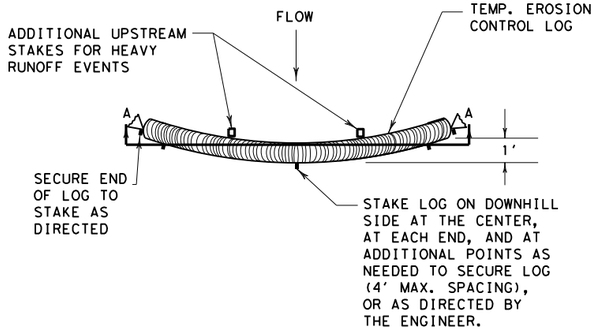
Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
SEDIMENT BASINS AND TRAPS (EARTHWORK FOR EROSION CONTROL)
EC(6)-16

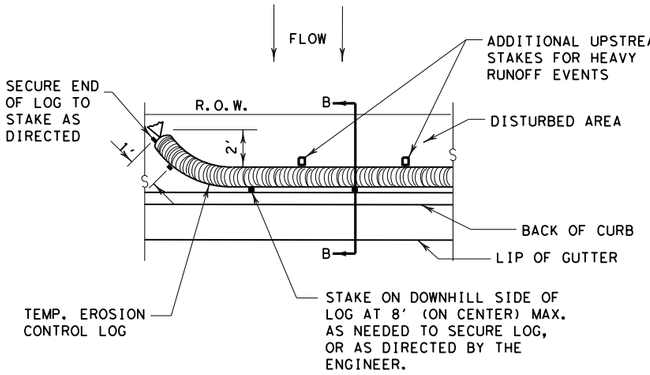
FILE: ec616	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	140

DATE: 11/6/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\...

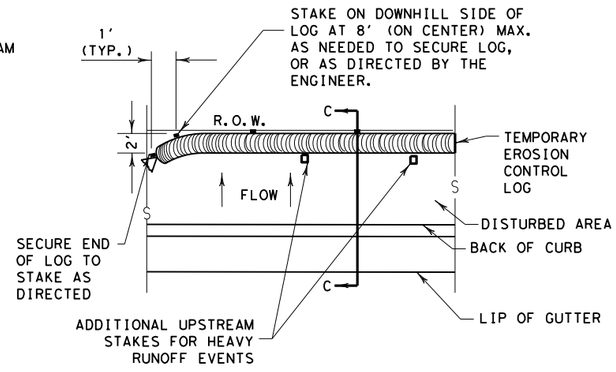
DATE: 11/6/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\9. Environmental\ENV STD\ec916.dgn



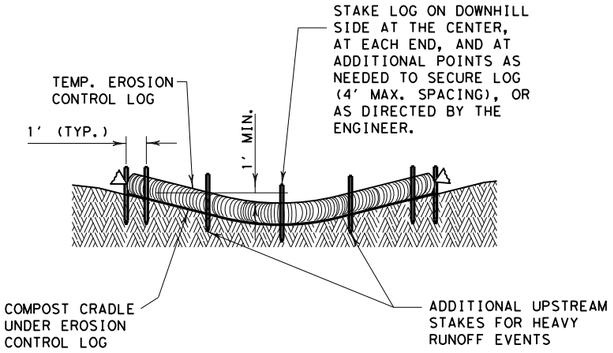
PLAN VIEW



PLAN VIEW



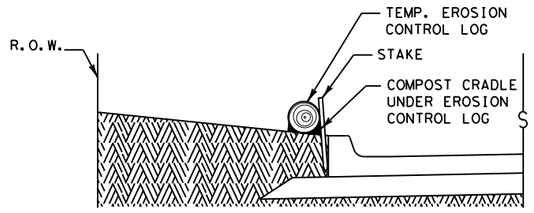
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

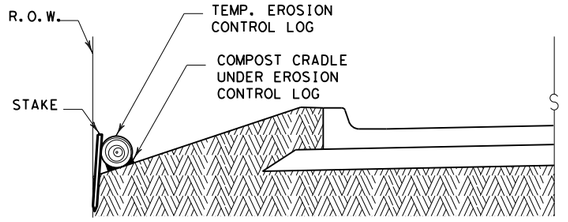
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

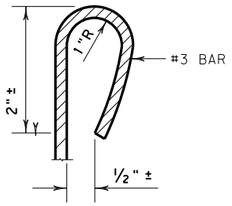
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

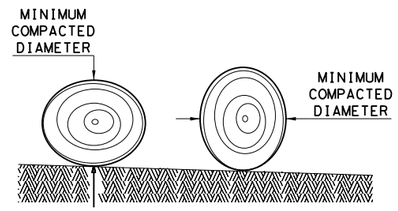
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation

Design Division Standard

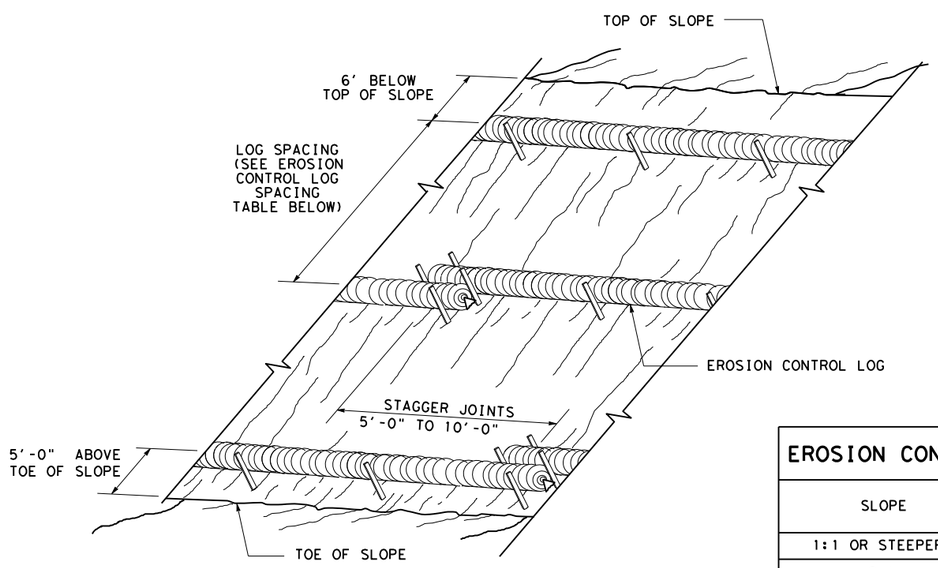
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

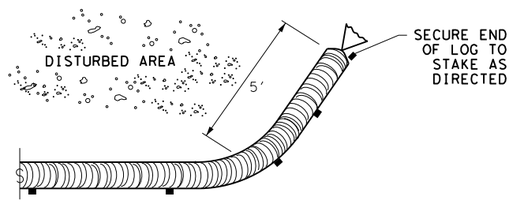
FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	3136	01	191		SL 0001		
	DIST	COUNTY			SHEET NO.		
	AUS	TRAVIS			141		

DATE: 11/6/2020
FILE: pw:\\txdot.projectwiseonline.com:TxDOT4\Documents\14 - AUS\Design Projects\313601191\4 - Design\Plan Set\9. Environmental\ENV STD\ec916.dgn



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

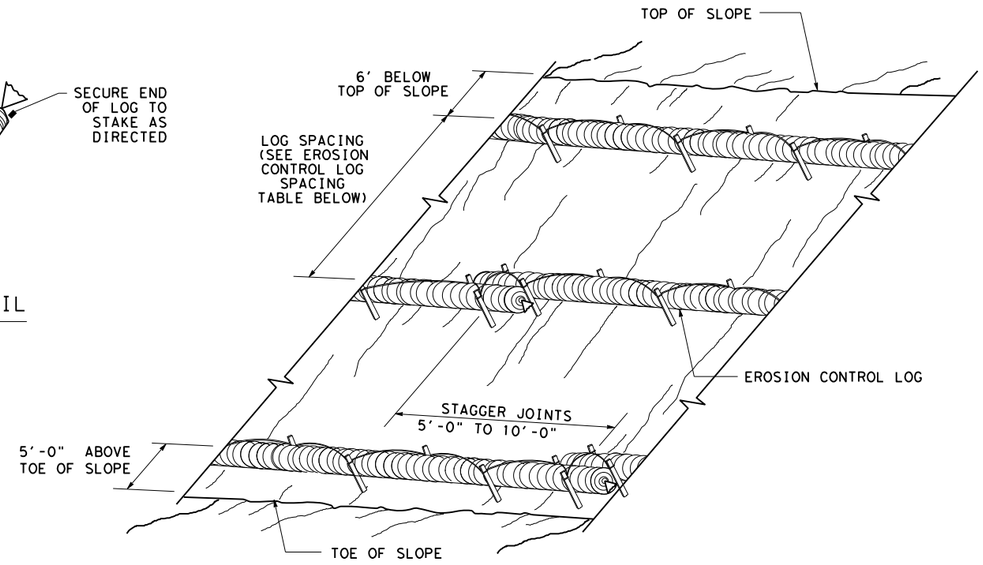
CL-SST



END SECTION RAP DETAIL

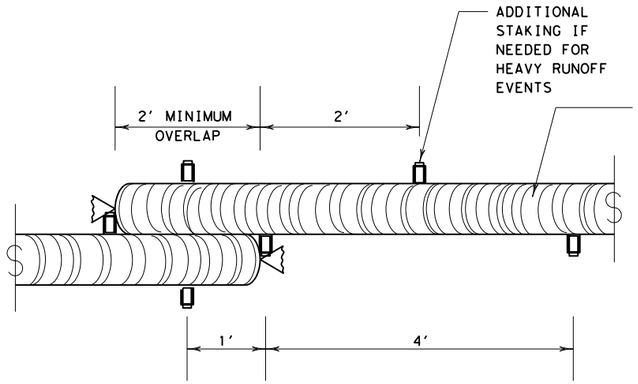
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

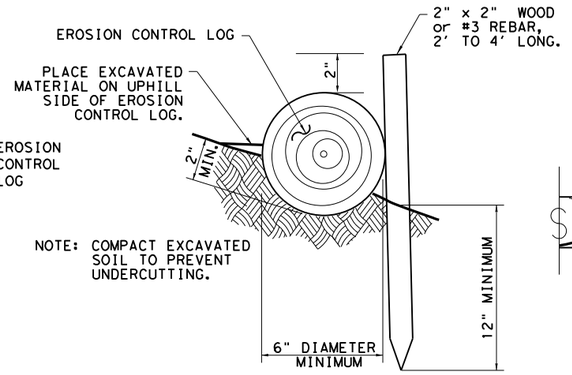
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

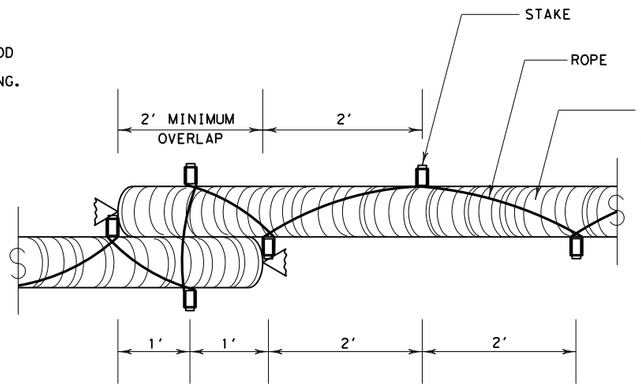


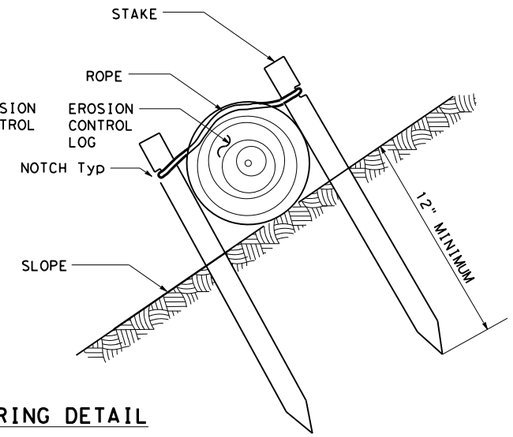


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

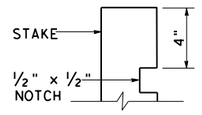
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



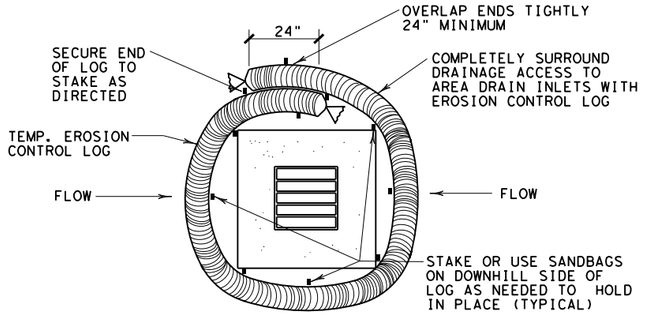
STAKE NOTCH DETAIL

Texas Department of Transportation — Design Division Standard

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

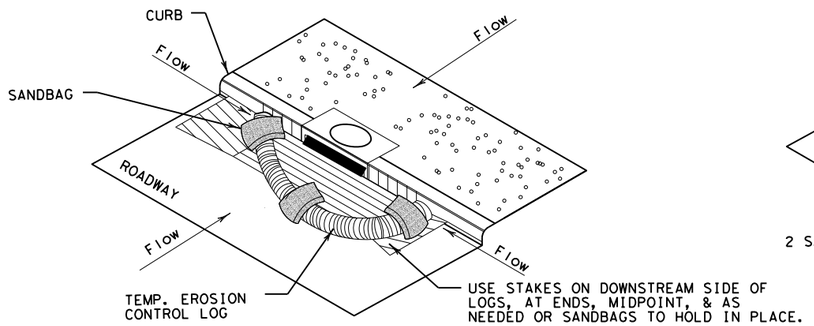
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	3136	01	191	SL 0001
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		142

DATE: 11/6/2020
FILE: pw:\\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\3136011914 - Design\Plan Set\9. Environmental\ENV STD\ec916.dgn



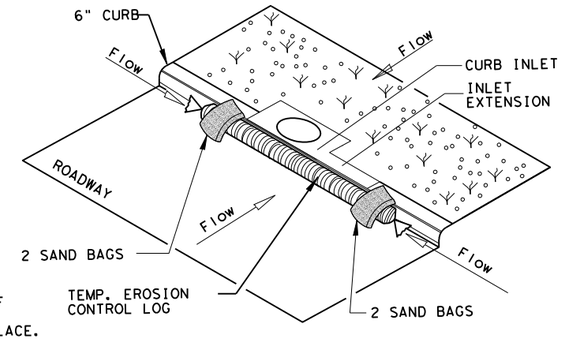
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

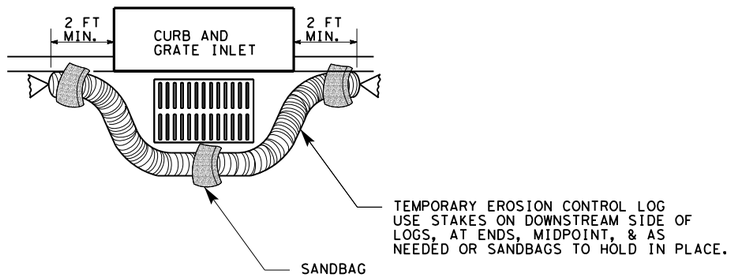
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

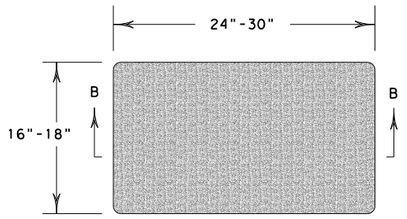
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	3136	01	191		SL 0001	
	DIST	COUNTY				SHEET NO.
	AUS	TRAVIS				143

The following TCEQ requirements (Form TCEQ-0592, Rev. 7/15/15) are applicable to all work in the recharge zone of the Edwards Aquifer in Hays, Travis and/or Williamson Counties and must be adhered to by the Contractor and all Subcontractors:

1. A written notice of construction must be submitted to the TCEQ regional office at least 48 hours prior to the start of any regulated activities. This notice must include:
   - the name of the approved project;
   - the activity start date; and
   - the contact information of the prime contractor.

2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan (WPAP) and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.

3. If any sensitive feature(s) (caves, solution cavity, sink hole, etc.) is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. Construction activities may not be resumed until the TCEQ has reviewed and approved the appropriate protective measures in order to protect any sensitive feature and the Edwards Aquifer from potentially adverse impacts to water quality.

4. No temporary or permanent hazardous substance storage tank shall be installed within 150 feet of a water supply source, distribution system, well, or sensitive feature.

5. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the approved plans and manufacturers specifications. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. These controls must remain in place until the disturbed areas have been permanently stabilized.

6. Any sediment that escapes the construction site must be collected and properly disposed of before the next rain event to ensure it is not washed into surface streams, sensitive features, etc.

7. Sediment must be removed from the sediment traps or sedimentation basins not later thanwhen it occupies 50% of the basin's design capacity.

8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from being discharged offsite.

9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.

10. If portions of the site will have a temporary or permanent cease in construction activity lasting longer than 14 days, soil stabilization in those areas shall be initiated as soon as possible prior to the 14th day of inactivity. If activity will resume prior to the 21st day, stabilization measures are not required. If drought conditions or inclement weather prevent action by the 14th day, stabilization measures shall be initiated as soon as possible.

11. The following records shall be maintained and made available to the TCEQ upon request:
    - the dates when major grading activities occur;
    - the dates when construction activities temporarily or permanently cease on a portion of the site; and
    - the dates when stabilization measures are initiated.

12. The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

    A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;
    B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;
    C. any development of land previously identified as undeveloped in the original water pollution abatement plan.

TCEQ REGIONAL OFFICE

Austin Regional Office
12100 Park 35 Circle
Bldg A, Room 179
Austin, Texas 78753
Phone: (512) 339-2929
Fax: (512) 339-3795

Texas Department of Transportation | Austin District Standard

TCEQ REQUIREMENTS FOR THE RECHARGE ZONE OF THE EDWARDS AQUIFER

TCEQ-RZ-19(AUS)

REVISIONS
01/10/14: REQUIREMENTS AND ADDRESS UPDATED
01/21/16: REQUIREMENTS UPDATED
09/24/19: UPDATED RELEASE YEAR

CONT	SECT	JOB	HIGHWAY
3136	01	191	SL 0001
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		144

VOIDS DEFINITION

- VOID GREATER THAN SIX INCHES ACROSS IN ANY DIRECTION AND/OR
- VOID IS GREATER THAN ONE SQUARE FOOT ALONG ANY PLANE AND/OR
- VOID BLOWS AIR AND/OR
- VOID CONTINUALLY RECEIVES WATER DURING A RAIN EVENT AND/OR
- VOID HAS WATER FLOWING THROUGH OR OUT OF IT AND/OR

GENERAL NOTES

1. USING EXPLOSIVES IS NOT ALLOWED.
2. THE PROJECT AREA IS A KNOWN KARST AREA. FRACTURED MATERIAL, BOULDERS,UNDERGROUND VOIDS, GROUNDWATER, UNSTABLE MATERIAL, AND DRASTICALLY VARYING STRATA CAN BE EXPECTED. THE CONTRACTOR SHALL WORK WITH TXDOT AND TXDOT'S PARTNERS TO ALLOW ACCESS AND ON-SITE MONITORING OF EXCAVATION.
3. THE VOID MITIGATION DETAILS ARE EXAMPLES. IMPLEMENTATION OF THE APPROVED MITIGATION PLAN SHOULD USE THE REFERENCED BID ITEMS.
4. CONCRETE USED FOR VOID MITIGATION SHALL BE 3,000 PSI IN ACCORDANCE WITH ITEM 420 CLASS A CONC (MISC). QUANTITIES UNDER 4 CY MAY BE HAND MIXED ON SITE USING 5,000 PSI RATED BAG MIX CONCRETE.
5. 3 IN. x 5 IN. ROCK SHALL BE IN ACCORDANCE WITH ITEM 506. LARGE ROCK > 1 FT. SHALL BE IN ACCORDANCE WITH 12 IN. ROCK PER ITEM 432.
6. FILTER FABRIC AND EROSION LOGS WILL BE IN ACCORDANCE WITH ITEM 506.
7. IMPERMEABLE LINER WILL BE IN ACCORDANCE WITH ITEM 5056. THE EDGE OF THE LINER SHALL BE ANCHORED IN A 6 IN. WIDE BY 18 IN. DEEP TRENCH.
8. STEEL CASING, USED FOR DRILL SHAFT CONSTRUCTION, SHALL BE IN ACCORDANCE WITH ITEM 416.
9. AGGREGATE OR OTHER BACKFILL WILL BE PAID FOR BY OVERRUN OF EXISTING EMBANKMENT ITEM. FILTER FABRIC OVER THE AGGREGATE IS SUBSIDIARY. SANDBAGS SHALL BE PAID USING SANDBAGS FOR EROSION CONTROL. THE SANDBAGS SHALL BE POLYPROPYLENE AND FILLED WITH PEA GRAVEL. CONNECTOR PIPE SHALL BE PAID USING PIPE(PVC)(SCH 80)(6 IN).
10. IF A SINGLE VOID IMPACT CAUSES DELAYS BY MORE THAN 20 WORKING DAYS, DELAY WILL BE CONSIDERED FOR THE IMPACT BEYOND THE INITIAL 20 DAYS. IF THE ACCUMULATION OF VOID IMPACTS CAUSE DELAYS BY MORE 40 WORKING DAYS, DELAY WILL BE CONSIDERED FOR THE IMPACT BEYOND THE 40 DAYS . OVERHEAD, BARRICADES AND DELAYS WILL BE EVALUATED AND PAID IN ACCORDANCE WITH THE CONTRACT. IMPACTS WILL NOT BE CONSIDERED IMPACT AFTER A RESPONSE PROCEDURE IS PROVIDED. ALL DELAYS CAUSED BY A VOID AND THE DURATION FOR IMPLEMENTATION OF A RESPONSE ARE NON-COMPENSABLE FOR LABOR, EQUIPMENT, STANDBY, MOBILIZATIONS, AND COST ESCALATIONS.

VOID MITIGATION AND PROTECTION MEASURES

REFER TO VOID MITIGATION DETAILS FOR ADDITIONAL INFORMATION. VOID MITIGATION DETAILS ARE TO BE APPROVED BY GEOSCIENTIST AND THE TCEQ (IF APPLICABLE) PRIOR TO IMPLEMENTATION.

1. IN THE EVENT THAT UNKNOWN KARST VOIDS ARE ENCOUNTERED, WORK AT THAT LOCATION WILL BE HALTED IMMEDIATELY AND THE FEATURE WILL BE INSPECTED PROMPTLY BY TXDOT.
2. WHEN REQUIRED, TXDOT WILL INSPECT ALL VOIDS TO DETERMINE THE POTENTIAL OF THE FEATURES TO PROVIDE SUITABLE HABITAT FOR ENDANGERED KARST INVERTEBRATES. WORK AT THAT LOCATION WILL NOT RESUME UNTIL AUTHORIZATION TO DISTURB THE FEATURE HAS BEEN OBTAINED. REFER TO THE EPIC SHEET FOR ADDITIONAL INFORMATION FOR THREATENED OR ENDANGERED SPECIES.

TXDOT WILL INSPECT ALL VOIDS TO DETERMINE THE APPROPRIATE VOID MITIGATION PLAN.

3. ADDITIONAL EXCAVATION OF THE VOID MAY BE REQUIRED BY TXDOT OR THE GEOSCIENTIST TO FULLY EVALUATE THE VOID AND/OR MITIGATION PLAN PREPERATION. TXDOT APPROVAL IS REQUIRED PRIOR THE EXCAVATION. THIS WORK IS SUBSIDIARY.

VOID DISCOVERY PROTOCOL

IF A VOID IS DISCOVERED, THE FOLLOWING PROTOCOL WILL BE FOLLOWED:

1. ALL VOIDS REQUIRE AN EMAIL NOTIFICATION TO TXDOT DESIGNATED REPRESENTATIVE WITHIN 2 HOURS OF DISCOVERY. THE EMAIL WILL REQUIRE LOCATION INFORMATION (STATION, LATITUDE & LONGITUDE), DATES OF DISCOVERY, VIDEO/PICTURE DOCUMENTATION, SIZE, ETC. CONTRACTOR SHALL SUPPLY A CAMERA AND DIGITAL PICTURE/VIDEO DOCUMENTATION OF ALL VOIDS AND PROVIDE A MEASUREMENT OF THE SIZE OF THE VOID. FOR VOIDS THAT CANNOT BE SAFELY EXPLORED, ANOTHER DEVICE SHALL BE PROVIDED TO DOCUMENT THE VOID. CONTACT THE DISTRICT CONSTRUCTION OFFICE FOR AN EXAMPLE EMAIL THAT SHALL BE FOLLOWED. THIS WORK IS SUBSIDIARY.
2. ALL ACTIVITY WITHIN A 50-FOOT RADIUS OF THE VOID SHALL STOP. BLOCK TRAFFIC FROM DRIVING NEAR THE VOID AND PREVENT CONSTRUCTION EQUIPMENT FROM OPERATING IN THE VICINITY OF THE VOID USING BARRELS, ORANGE CONSTRUCTION FENCE OR OTHER APPROVED HIGHLY VISIBLE BARRIER.
3. A DRY VOID THAT IS LESS THAN 1 CF IN VOLUME OR LESS THAN 6 IN. IN ALL DIRECTIONS WILL NOT REQUIRE ACTION BEYOND NOTIFICATION. TXDOT SHALL BE NOTIFIED IMMEDIATELY VIA EMAIL AND PHONE WHEN A VOID IS FOUND THAT REQUIRES ACTION. TXDOT WILL RESPOND WITHIN 6 BUSINESS DAYS FROM TIME OF EMAIL NOTIFICATION TO PROVIDE GUIDANCE TO THE CONTRACTOR.
4. COVER THE VOID TO PREVENT CONTAMINATION AND CHANGES IN AMBIENT CONDITIONS (TARPS AND PLYWOOD, OR SIMILAR MATERIALS ARE APPROPRIATE AS AVAILABLE). WHERE COVERING THE VOID IS NOT FEASIBLE, CONTRACTOR SHALL OBTAIN APPROVAL FROM TXDOT OF ALTERNATE TEMPORARY PROTECTION MEASURES. BIODEGRADABLE EROSION CONTROL LOG (BECL) SHOULD WRAP THE SURFACE PERIMETER OF THE VOID. TEMPORARY PROTECTIONS SHOULD REMAIN IN PLACE UNTIL FINAL MITIGATION AND PROTECTION MEASURES ARE APPROVED AND IN PLACE. AN EARTHEN BERM WILL BE MAINTAINED ON THE UP-GRADIENT SIDE OF VOID TO PREVENT ANY CONSTRUCTION RUNOFF FROM ENTERING ANY PART OF THE FEATURE WHICH MAY REMAIN. THIS WORK IS SUBSIDIARY.
5. WHEN REQUIRED TXDOT SHALL IMMEDIATELY NOTIFY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) AUSTIN REGIONAL OFFICE.
6. TXDOT WILL PROVIDE FOR THE EVALUATION OF THE VOID A QUALIFIED GEOSCIENTIST LICENSED BY THE TEXAS BOARD OF PROFESSIONAL GEOSCIENTISTS OR BY A PROFESSIONAL ENGINEER WHO QUALIFIES TO PRACTICE GEOSCIENCE ACCORDING TO THE TEXAS BOARD OF PROFESSIONAL GEOSCIENTISTS.
7. WHEN REQUIRED TXDOT WILL SUBMIT AND OBTAIN APPROVAL OF AN ENCOUNTERED FEATURE MITIGATION PLAN TO THE TCEQ AUSTIN REGION OFFICE.
8. WORK SHOULD CEASE IN THE AREA UNTIL ASSESSMENT OF THE VOID CAN BE COMPLETED, TCEQ APPROVES THE ENCOUNTERED FEATURE MITIGATION PLAN AND MITIGATION IS COMPLETED. WHEN THE VOID IS OUTSIDE TCEQ JURISDICTION, TXDOT WILL APPROVE THE ENCOUNTERED FEATURE MITIGATION PLAN.

VOIDS RELATED TO DRILLED SHAFTS, SOIL NAILS, ROCK NAILS AND OTHER SIMILAR FUNCTIONS

1. SUBMIT INSTALLATION PLAN FOR REVIEW NO LATER THAN 2 MONTHS BEFORE CONSTRUCTION.
2. THE USE OF DRILLING FLUIDS, UNDERWATER PLACEMENT, OR SLURRY METHOD WILL NOT BE ALLOWED IF A VOID IS EXPOSED DURING DRILLING OF SHAFTS OR NAILS. THE CONTRACTOR SHALL USE APPROPRIATE INDUSTRY APPROVED METHODS TO PROVIDE A PRODUCT IN COMPLIANCE WITH THE SPECIFICATIONS. ADDITIONAL TIME OR COMPENSATION WILL NOT BE ALLOWED FOR USE OF ALTERNATE METHODS OR CASING INSTALLATION.
3. DURING NON-WORK HOURS OPEN HOLES SHALL BE PROTECTED FOR SAFETY AND COVERED. SHAFTS SHALL BE SURROUNDED BY EROSION CONTROL LOGS AT AN OFFSET OF 10' FROM THE EDGE OF THE OPENING. THIS WORK IS SUBSIDIARY
4. VIDEO DOCUMENTATION SHALL BE CONDUCTED OF A DRILL SHAFT ONCE EXCAVATION IS COMPLETE AND PRIOR TO PLACING REINFORCEMENT. SUFFICIENT LIGHTING SHALL ACCOMPANY THE VIDEO CAMERA TO ENSURE THE SHAFT AND VOIDS ARE VISIBLE. THIS WORK IS SUBSIDIARY.
5. CONCRETE USED TO FILL THE VOIDS WILL BE PAID USING CLASS A CONC (MISC) ITEM BUT WILL USE THE CLASS OF CONCRETE AS REQUIRED BY THE SPECIFICATION. QUANTITY OF CONCRETE WILL BE BASED ON VISUAL INSPECTION PROVIDED BY THE CONTRACTOR. IF VISUAL INSPECTION IS UNABLE TO DETERMINE THE SIZE OF THE VOID THE CONCRETE FOR PAYMENT WILL BE MEASURED AS THE ADDITIONAL CONCRETE BEYOND THE AMOUNT REQUIRED TO PLACE A CLEAN SHAFT PLUS 10 PERCENT WASTE.
6. THE USE OF PERMANENT CASING SHALL BE IN ACCORDANCE WITH ITEM 416. MATERIAL COST FOR CASING THAT REMAINS WILL BE PAID BY INVOICE FROM SUPPLIER WITH MARK UP IN ACCORDANCE WITH MATERIAL FOR ITEM 9.7. ADDITIONAL LABOR, EQUIPMENT, TIME, ETC. FOR INSTALLATION OF THE CASING WILL NOT BE COMPENSABLE.
7. ADDITIONAL NAIL LENGTH WILL BE PAID BY OVERRUN OF EXISTING BID ITEM. ALTERNATE NAIL TYPE COST WILL BE PAID BY INVOICE FROM SUPPLIER WITH MARK UP IN ACCORDANCE WITH MATERIAL FOR ITEM 9.7. LABOR, EQUIPMENT, ADDITIONAL TIME, ETC. WILL NOT BE COMPENSABLE.
8. CORE HOLES ARE REQUIRED FOR ALL DRILLED SHAFTS.

Texas Department of Transportation | Austin District Standard

VOID MITIGATION NOTES

VMD-18(AUS)

SHEET 1 OF 7

CONT	SECT	JOB	HIGHWAY
3136	01	191	SL 0001
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		145