

7/2/2021 2:30:37 PM
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STATE OF TEXAS DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NUMBER
F 2021(948)

CSJ: 0015-09-194

NET LENGTH OF PROJECT = 12,107.04 FEET = 2.293 MILES
 ROADWAY = 10,623.79 FEET = 2.012 MILES
 BRIDGE = 1,483.25 FEET = 0.281 MILES

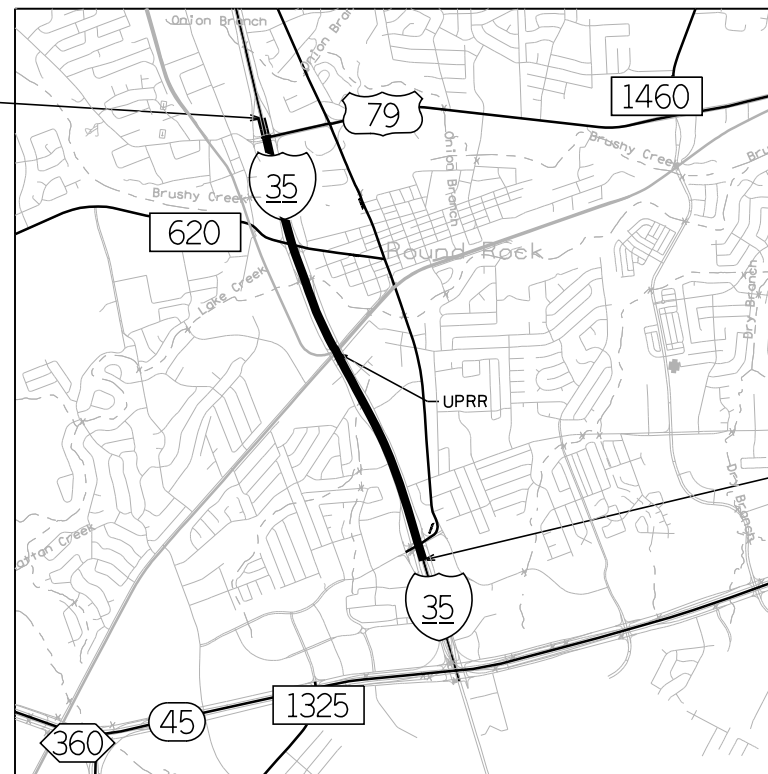
WILLIAMSON COUNTY

IH 35

FROM: US 79
TO: SH 45N

FOR THE CONSTRUCTION OF FREEWAY OPERATIONAL IMPROVEMENTS
 CONSISTING OF: ADDITION OF AN AUXILIARY LANE, REALIGNING THE MAINLANE
 BARRIER ON IH 35, MILL & OVERLAY SBML, AND RESTRIPIING OF LANES.

BEGIN PROJECT
CSJ: 0015-09-194
STA 1299+00.00
REF MRKR: 253+0.261
MILE PT: 2.875
DFO: 252.389



END PROJECT
CSJ: 0015-09-194
STA 1420+07.04
REF MRKR: 250+0.968
MILE PT: 0.597
DFO: 250.111

LOCATION MAP NOT TO SCALE
 EXCEPTIONS: NONE
 EQUATIONS: NONE
 RAILROAD CROSSINGS: UPRR STA 1366+00

CONT	SECT	JOB	HIGHWAY
0015	09	194	IH 35
DIST		COUNTY	SHEET NO.
AUS		WILLIAMSON	1

DESIGN SPEED

MAIN LANES: 70 MPH
RAMP: 45 MPH

A. D. T.

SOUTHBOUND:
2019: 80,900 VPD
2040: 113,500 VPD

NORTHBOUND:
2019: 78,700 VPD
2040: 110,500 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. _____
 AREA ENGINEER _____ DATE _____



CORRECT: 07/02/2021

Cher W. Moore
 PROJECT MANAGER
 BRIDGEFARMER & ASSOCIATES, INC.

RECOMMENDED FOR LETTING: 7/7/2021

DocuSigned by:
Dwight M. Hillman, P.E.
 198012497A804A0
 DISTRICT DESIGN ENGINEER

SUBMITTED FOR LETTING: 7/6/2021

DocuSigned by:
J.P. P.E.
 089654558998492...
 AREA ENGINEER

APPROVED FOR LETTING: 7/7/2021

DocuSigned by:
Heather Ashby-Nguyen
 8912AF18F45A416
 DIRECTOR OF TRANSPORTATION
 PLANNING & DEVELOPMENT

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



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

PROJECT ENGINEER, P.E. DATE

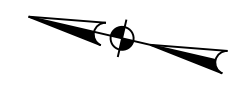


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PROJECT ENGINEER, P.E. DATE

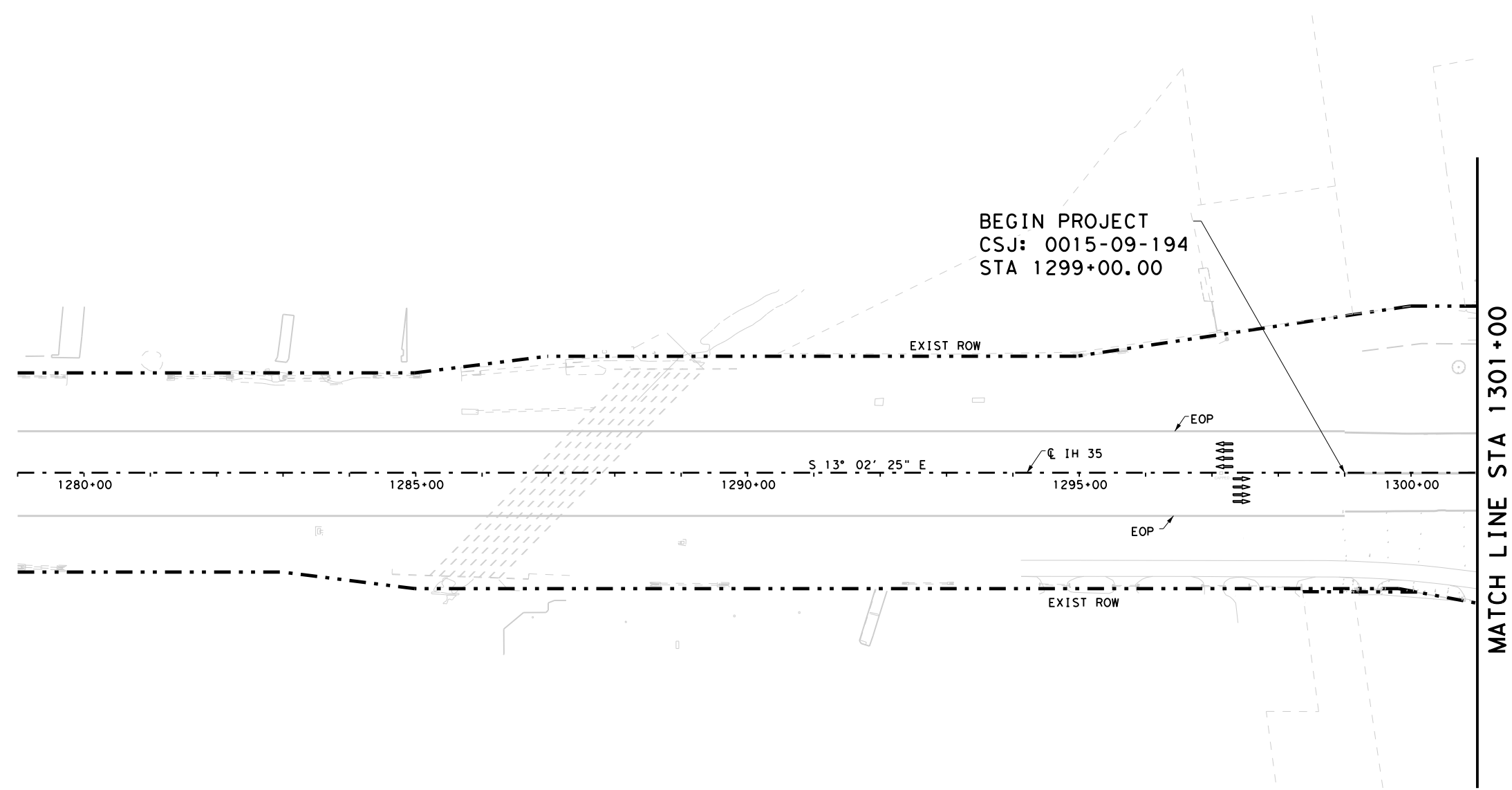
BRIDGEMAN & ASSOCIATES, INC. CONSULTING ENGINEERS
Texas Department of Transportation
IH 35 INDEX OF SHEETS SHEET 1 OF 1
CONT SECT JOB HIGHWAY
MH DH 0015 09 194 IH 35
DIST COUNTY SHEET NO.
FP MRM AUS WILLIAMSON 002

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7/8/2021
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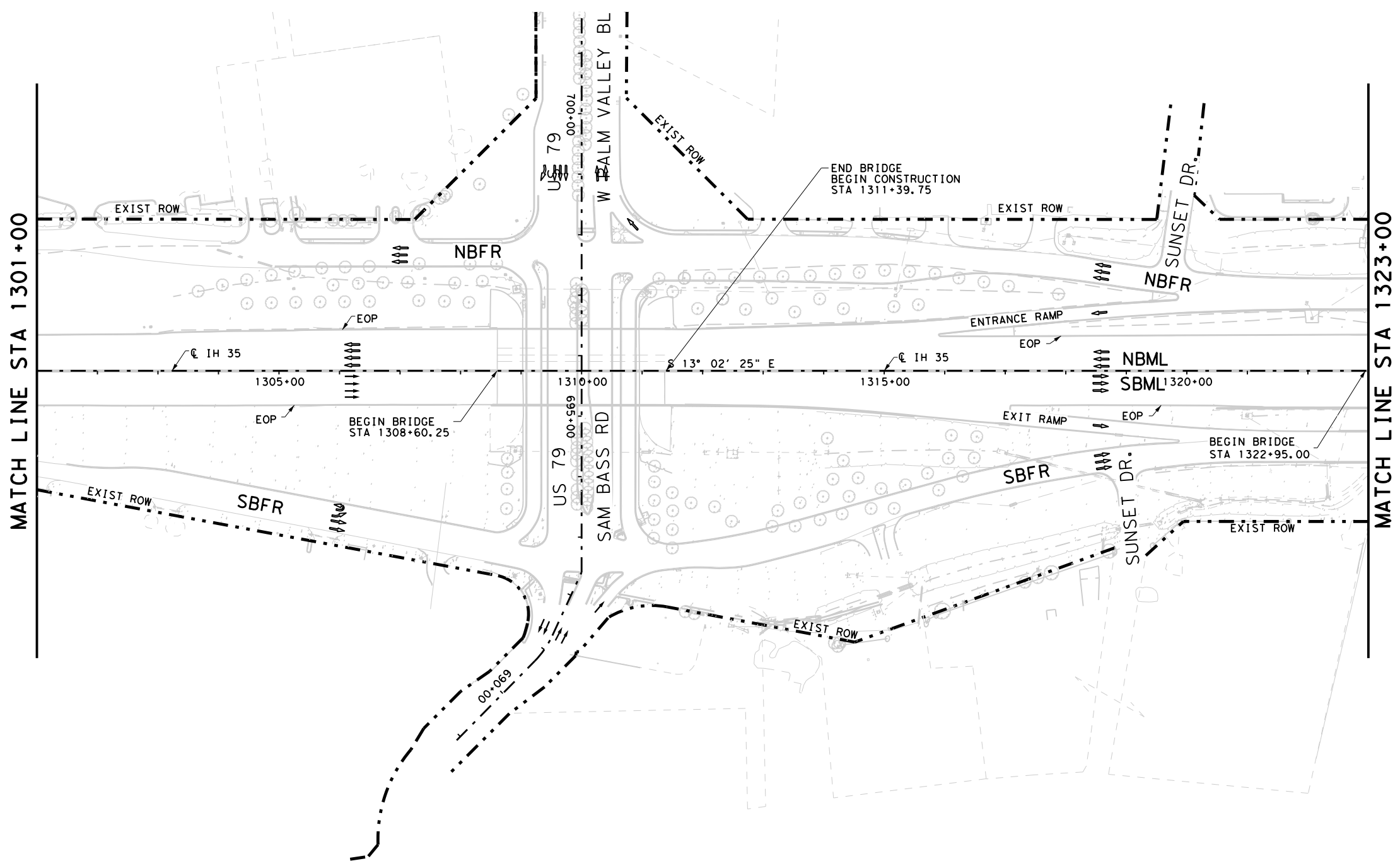
BRIDGEFARMER & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 TBPE REGISTRATION NO. 264



IH 35
**PROJECT LAYOUT
 BEGIN PROJECT TO
 STA 1301+00**

SCALE: 1" = 200' SHEET 1 OF 7

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MH	DH	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
FP	MRM	AUS	WILLIAMSON	003	



STATE OF TEXAS
 MANSAR. MOTON
 111594
 LICENSED
 PROFESSIONAL ENGINEER
Mansar. Moton
 07.08.2021

BRIDGEFARMER & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

IH 35
PROJECT LAYOUT
STA 1301+00 TO
STA 1323+00

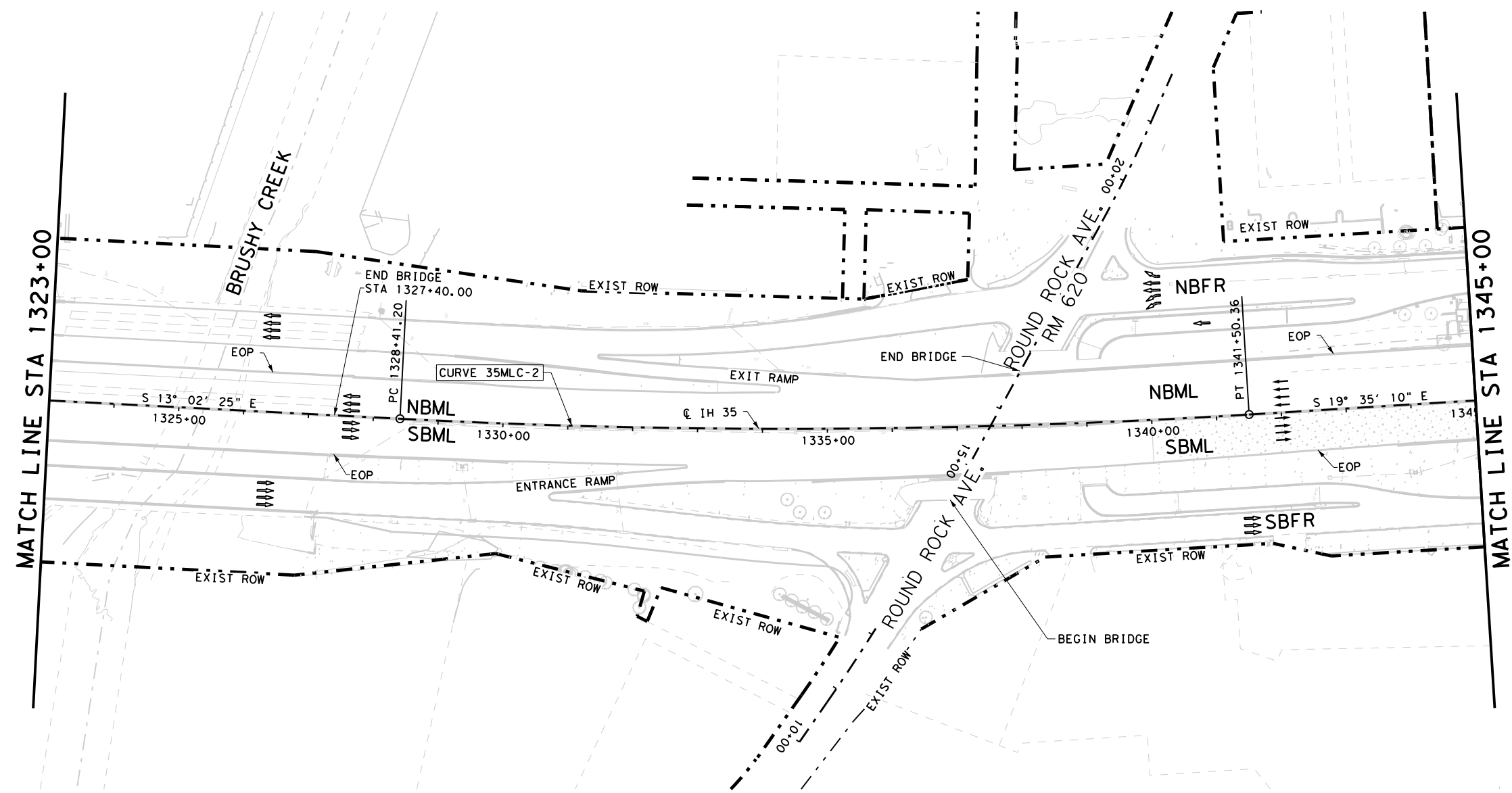
SCALE: 1" = 200' SHEET 2 OF 7

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FP	MRM	AUS	WILLIAMSON	004	



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STATE OF TEXAS
 MANSAR. MOTON
 111594
 LICENSED PROFESSIONAL ENGINEER
Mansar. Moton
 07.08.2021

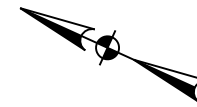
BRIDGEFARMER & ASSOCIATES, INC.
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2021
 Texas Department of Transportation

IH 35
 PROJECT LAYOUT
 STA 1323+00 TO
 STA 1345+00

SCALE: 1" = 200' SHEET 3 OF 7

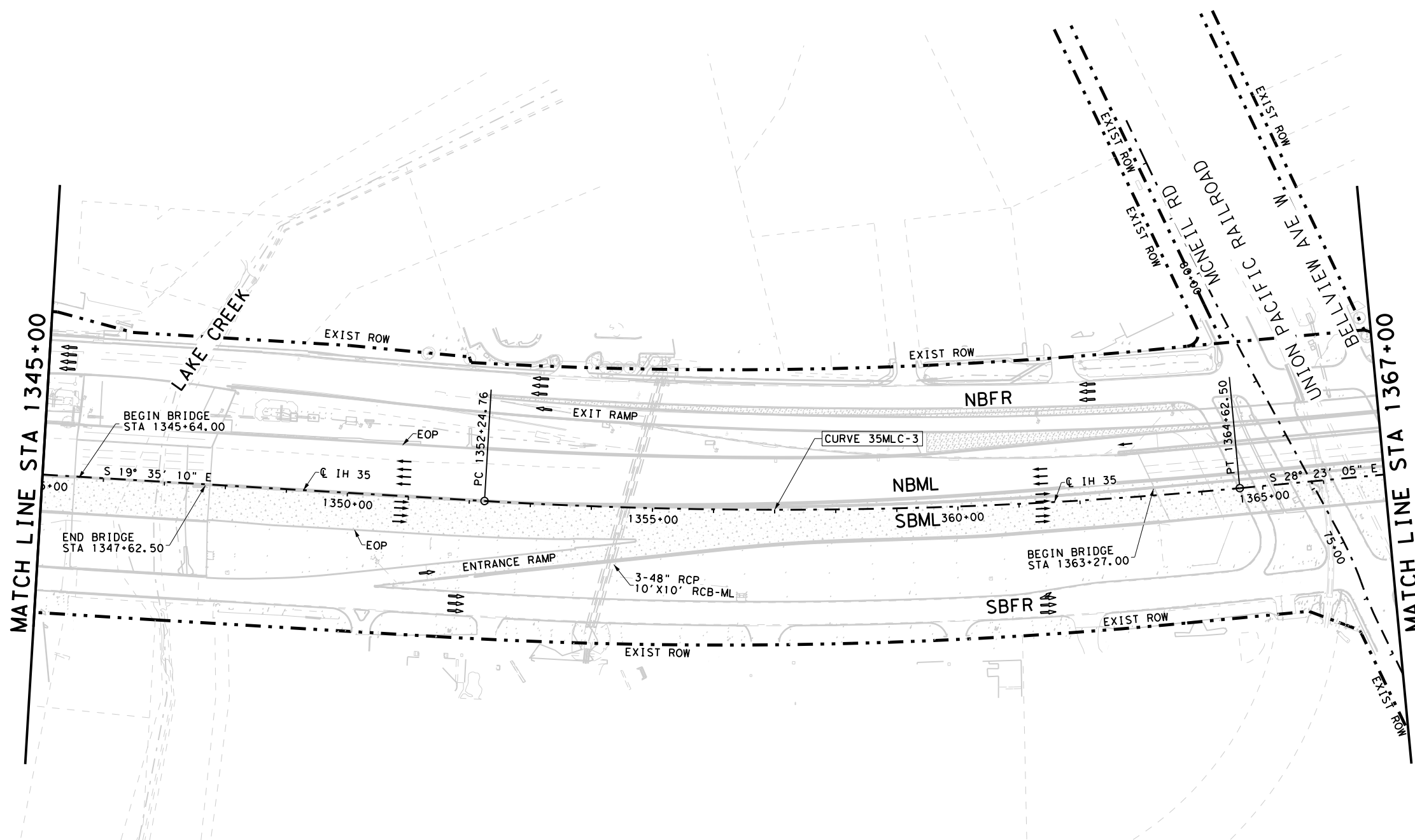
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Mansa R. Moton
 07.08.2021

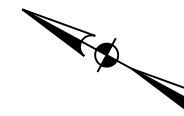
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 CONSULTING ENGINEERS
 TBPE REGISTRATION NO. 264

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IH 35
PROJECT LAYOUT
STA 1345+00 TO
STA 1367+00

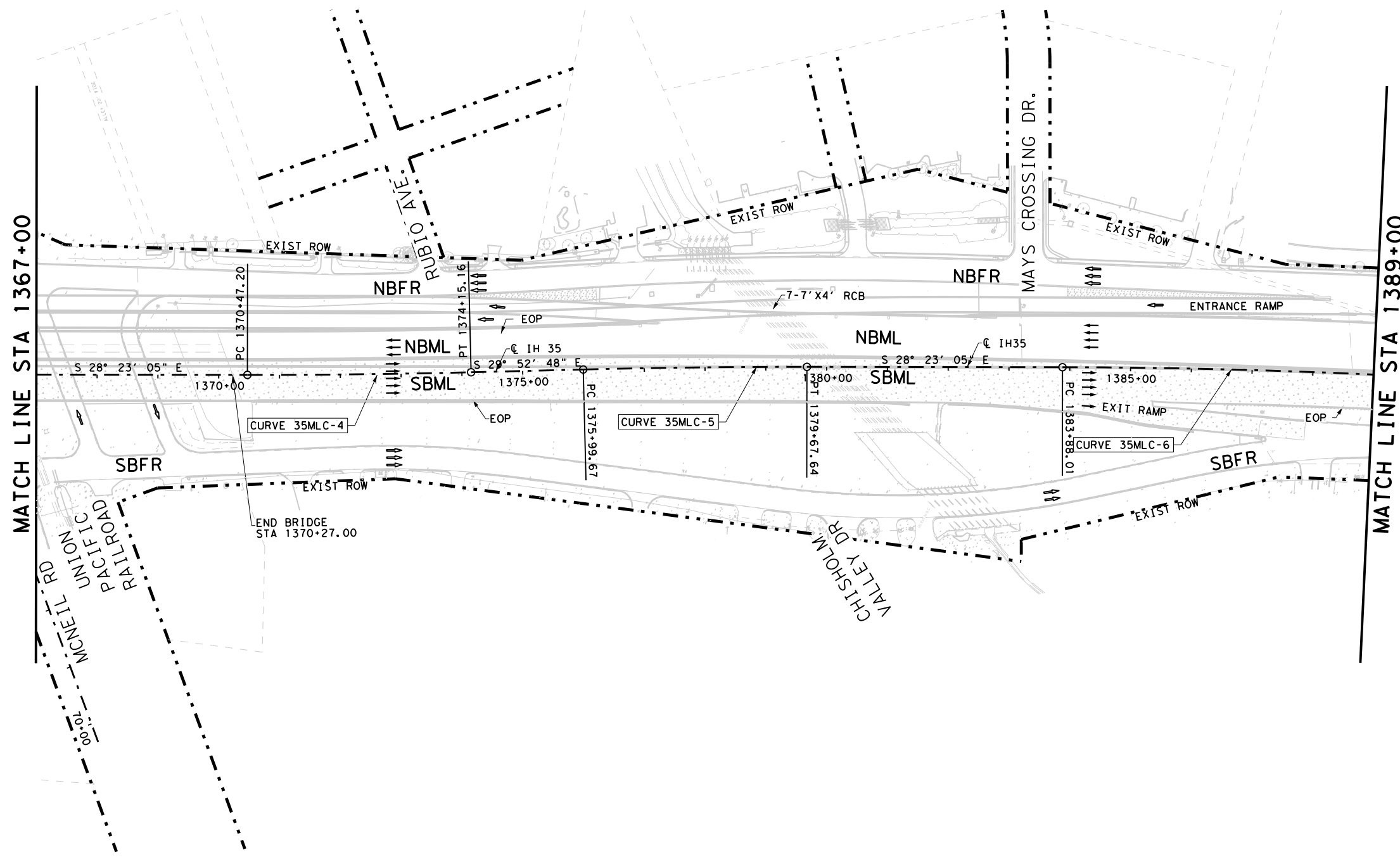
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STATE OF TEXAS
 MANSAR. MOTON
 111594
 LICENSED PROFESSIONAL ENGINEER
Mansar. Moton
 07.08.2021

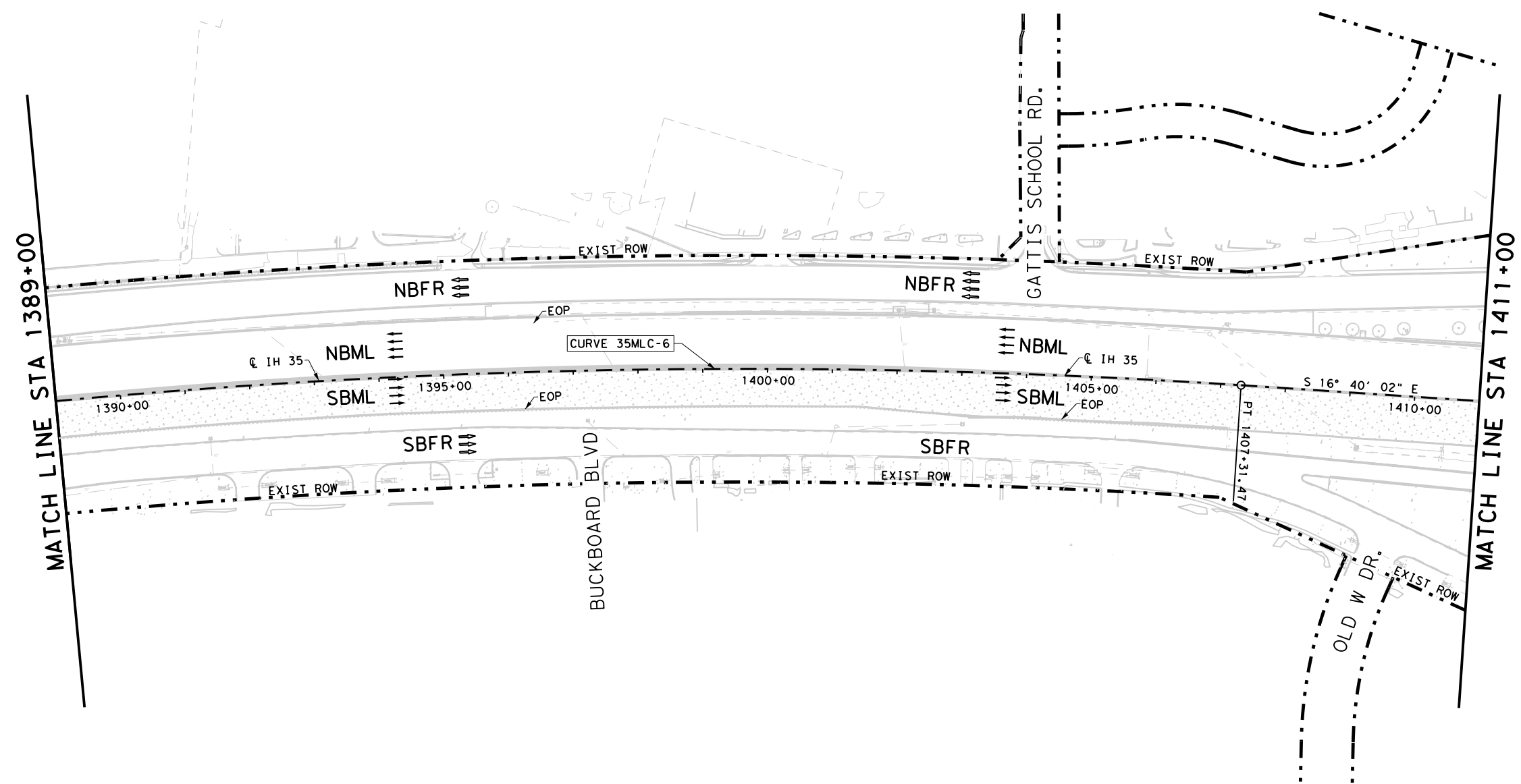
BRIDGEFARMER & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

IH 35
PROJECT LAYOUT
STA 1367+00 TO
STA 1389+00

SCALE: 1" = 200' SHEET 5 OF 7

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MH	DH	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
FP	MRM	AUS	WILLIAMSON	007	



STATE OF TEXAS
 MANSAR. MOTON
 111594
 LICENSED PROFESSIONAL ENGINEER
Mansar. Moton
 07.08.2021

BRIDGEFARMER & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

IH 35
PROJECT LAYOUT
STA 1389+00 TO
STA 1411+00

SCALE: 1" = 200' SHEET 6 OF 7

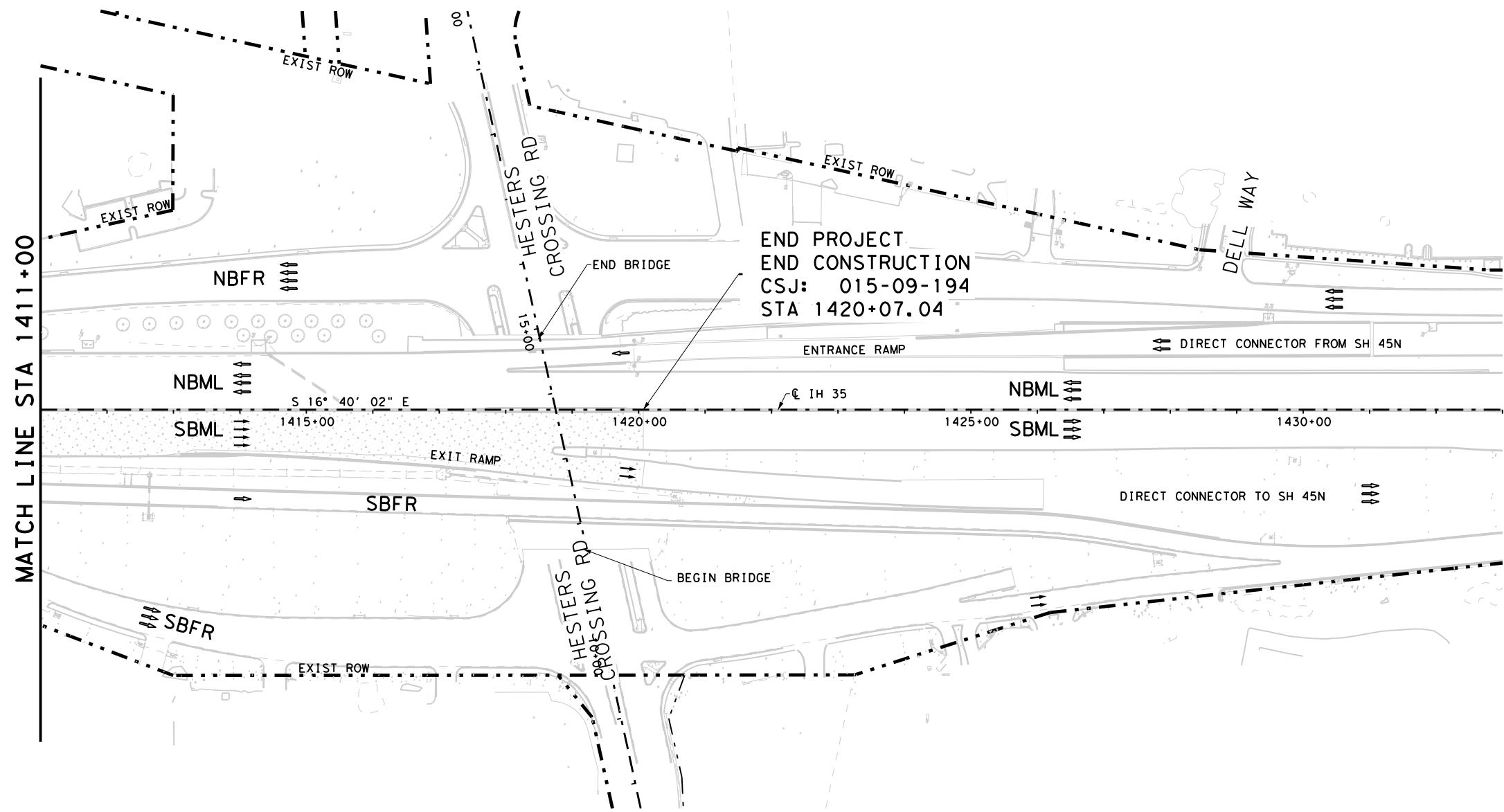
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END PROJECT
 END CONSTRUCTION
 CSJ: 015-09-194
 STA 1420+07.04



Mansa R. Moton
 07.08.2021

BRIDGEFARMER & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 TBPE REGISTRATION NO. 264

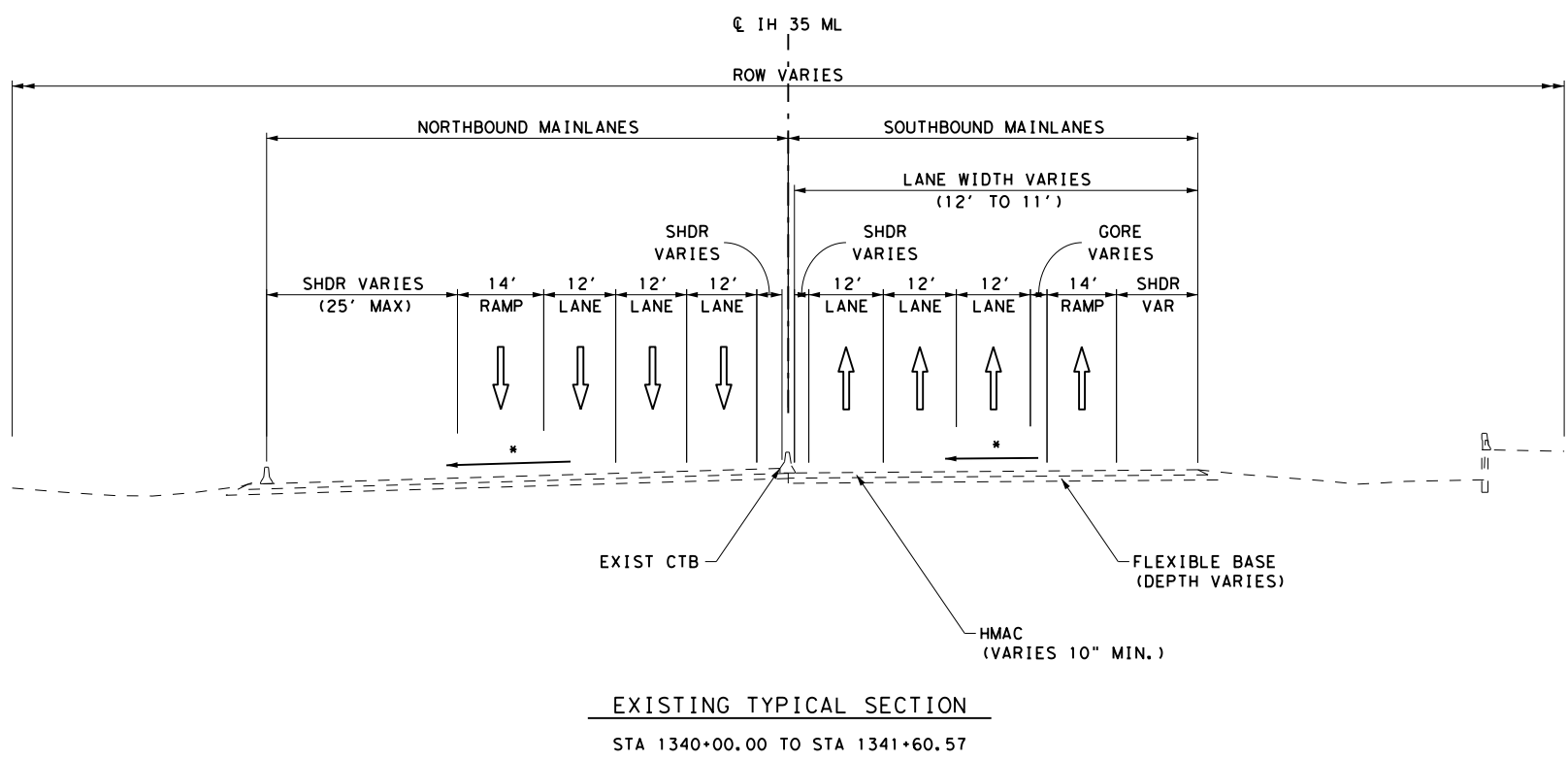


IH 35
PROJECT LAYOUT
STA 1411+00 TO
END PROJECT

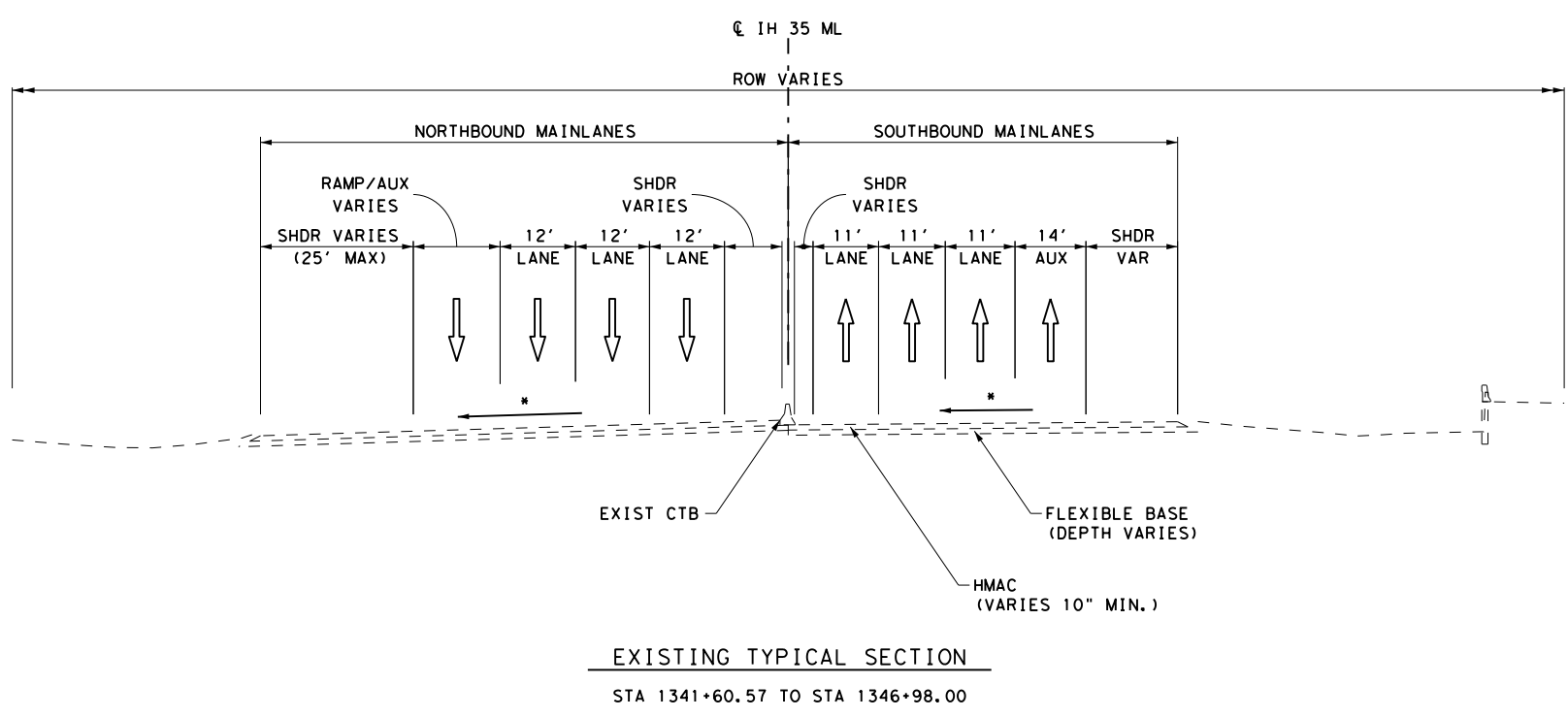
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DW:	CK:	DIST	COUNTY	SHEET NO.	
DW	CK2	AUS	WILLIAMSON	9	

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- NOTES:**
1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
 2. REFER TO THE EXISTING SUPERELEVATION DATA TABLE AND THE DESIGN CROSS SECTIONS FOR ADDITIONAL INFORMATION.
 3. EXISTING PAVEMENT CROSS SLOPES AND TRANSITIONS SHOWN ARE BASED ON AS-BUILTS AND ARE PROVIDED FOR INFORMATION ONLY. ALL PAVEMENT WIDENING SHALL MATCH THE CROSS SLOPE OF THE EXISTING PAVEMENT ADJACENT TO THE WIDENING. CONTRACTOR SHALL FIELD VERIFY EXISTING PAVEMENT ELEVATION AND CROSS SLOPE PRIOR TO WIDENING. FIELD VERIFICATION IS SUBSIDIARY TO ROADWAY QUANTITIES.
 4. SEE TXDOT TAPERED EDGE DETAILS HMAC PAVEMENT (TE (HMAC)-11) STANDARD AND PROFILES FOR ADDITIONAL PAVING INFORMATION.
 5. SEE BRIDGE LAYOUT SHEETS FOR BRIDGE LIMITS AND ADDITIONAL DETAILS.
 6. SAWCUT LOCATION IS 2' OFFSET FROM FACE OF EXISTING CONCRETE TRAFFIC BARRIER. SAWCUT LOCATION IS PGL TO BE USED FOR CONSTRUCTION.
- * MATCH EXISTING ROADWAY SLOPE



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

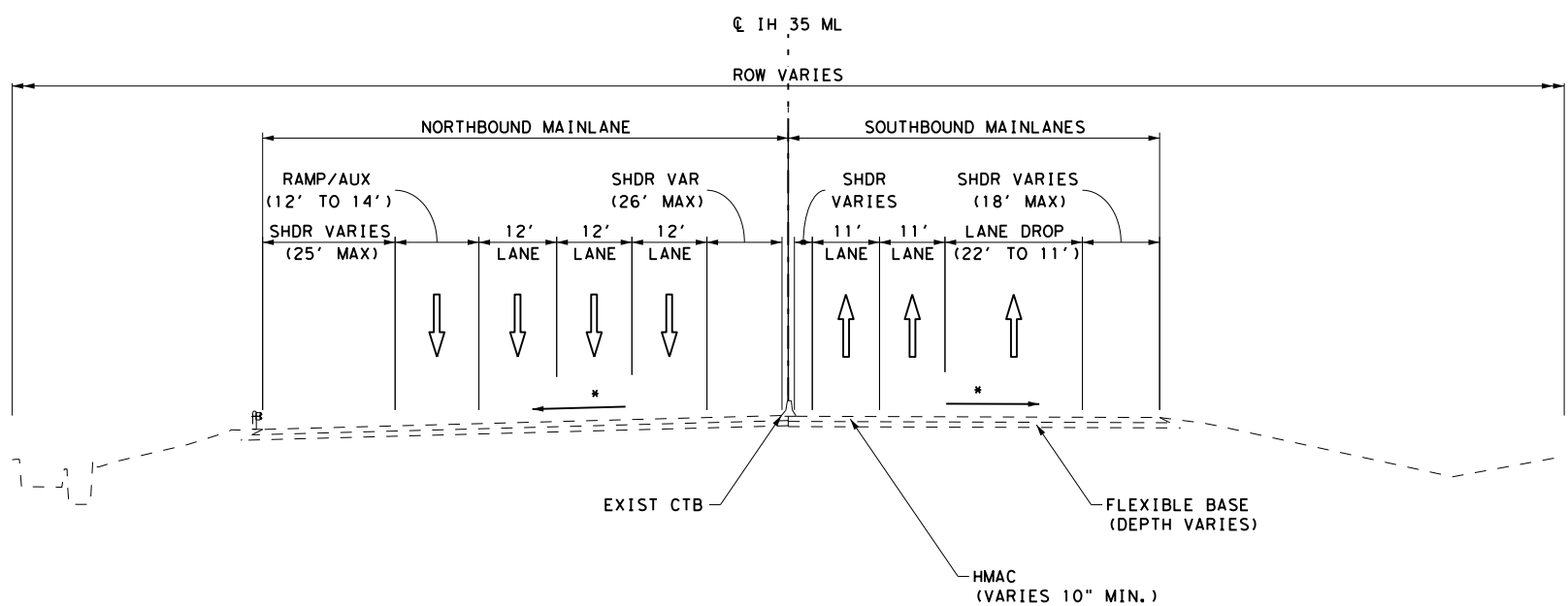
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EXISTING
TYPICAL SECTIONS

SCALE: NTS SHEET 1 OF 6

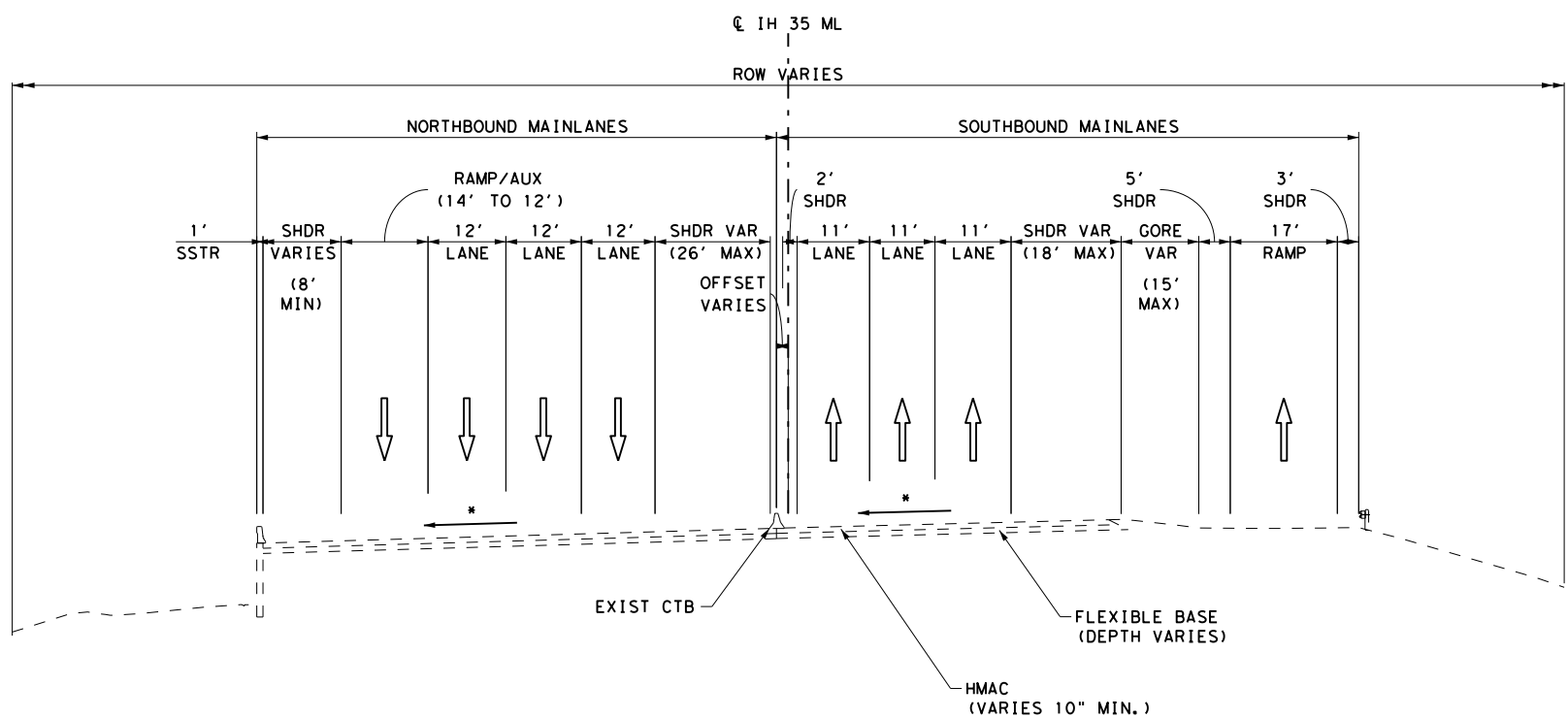
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EXISTING TYPICAL SECTION
STA 1346+98.00 TO STA 1353+75.08



EXISTING TYPICAL SECTION
STA 1353+75.08 TO STA 1357+27.15

- NOTES:**
1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
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 4. SEE TXDOT TAPERED EDGE DETAILS HMAC PAVEMENT (TE (HMAC)-11) STANDARD AND PROFILES FOR ADDITIONAL PAVING INFORMATION.
 5. SEE BRIDGE LAYOUT SHEETS FOR BRIDGE LIMITS AND ADDITIONAL DETAILS.
 6. SAWCUT LOCATION IS 2' OFFSET FROM FACE OF EXISTING CONCRETE TRAFFIC BARRIER. SAWCUT LOCATION IS PGL TO BE USED FOR CONSTRUCTION.
- * MATCH EXISTING ROADWAY SLOPE



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

2021
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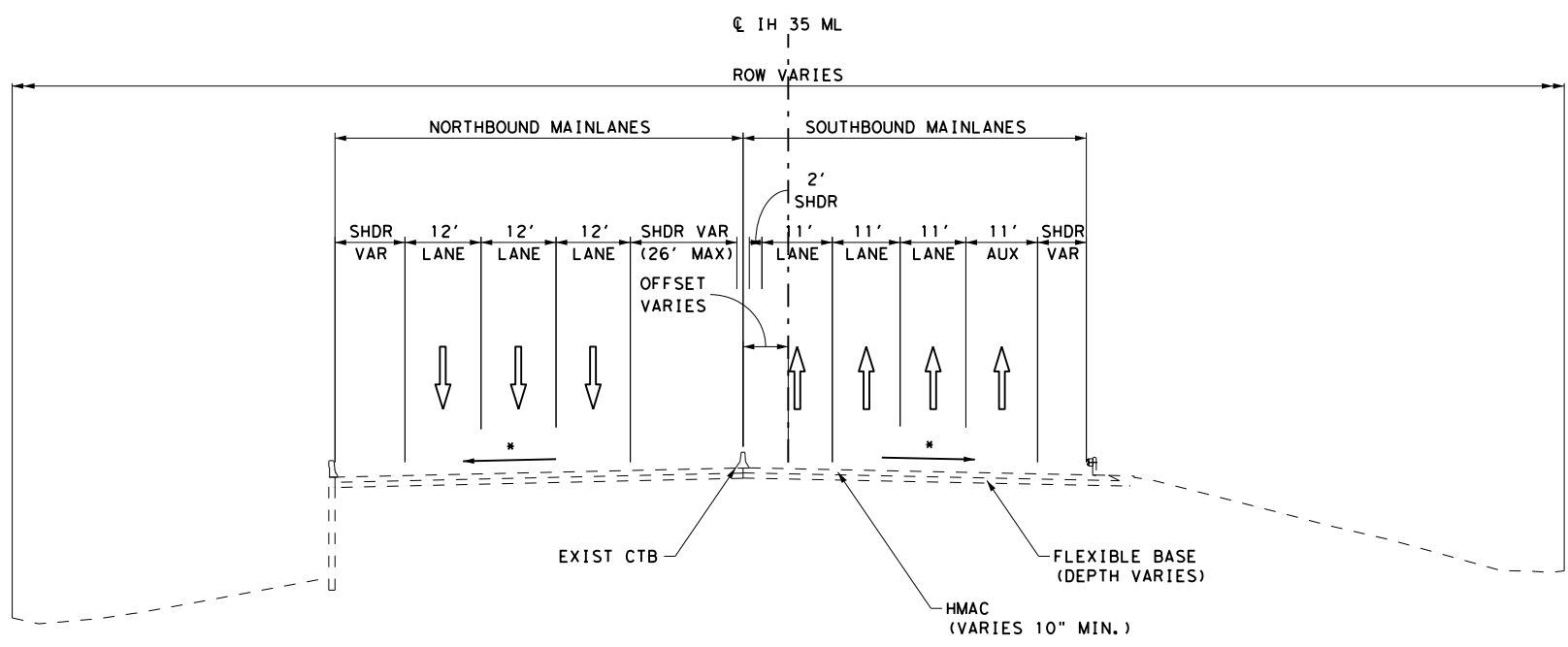
**IH 35
EXISTING
TYPICAL SECTIONS**

SCALE: NTS SHEET 2 OF 6

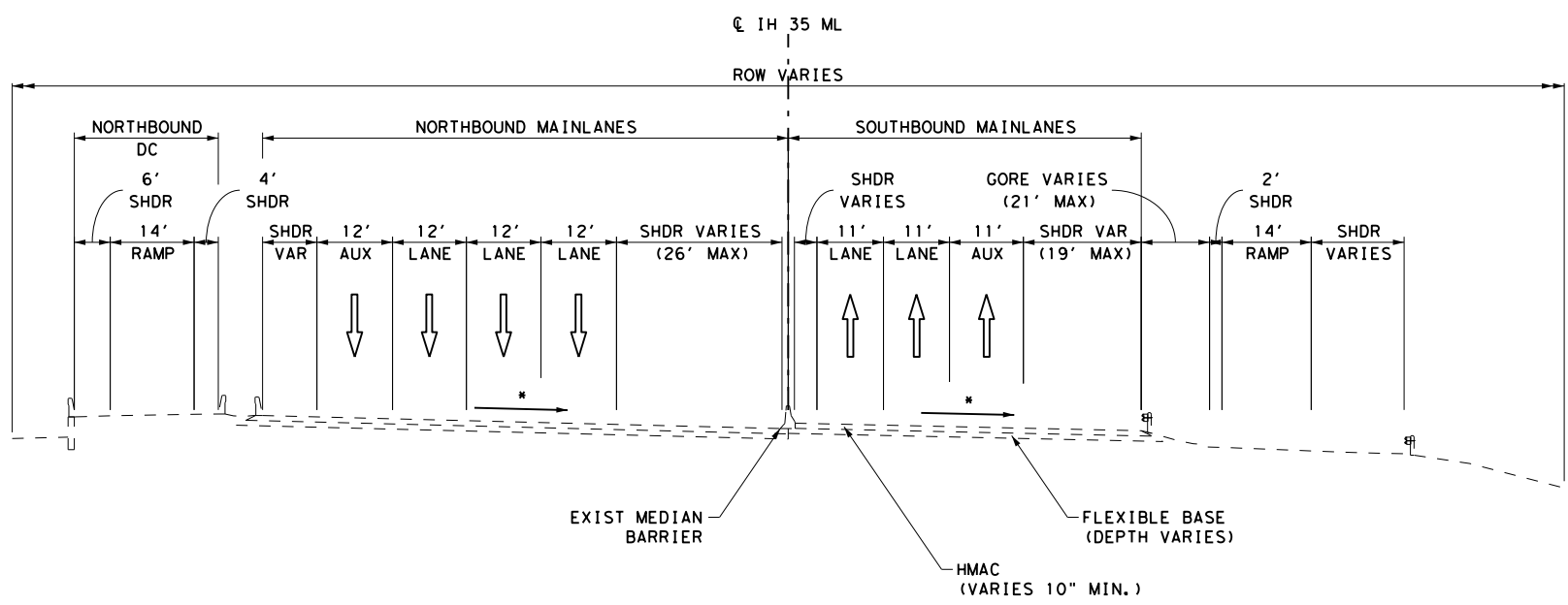
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EXISTING TYPICAL SECTION
STA 1357+27.15 TO STA 1381+67.42



EXISTING TYPICAL SECTION
STA 1381+67.42 TO STA 1387+49.47

NOTES:

1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
 2. REFER TO THE EXISTING SUPERELEVATION DATA TABLE AND THE DESIGN CROSS SECTIONS FOR ADDITIONAL INFORMATION.
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 4. SEE TXDOT TAPERED EDGE DETAILS HMA PAVEMENT (TE (HMA)-11) STANDARD AND PROFILES FOR ADDITIONAL PAVING INFORMATION.
 5. SEE BRIDGE LAYOUT SHEETS FOR BRIDGE LIMITS AND ADDITIONAL DETAILS.
 6. SAWCUT LOCATION IS 2' OFFSET FROM FACE OF EXISTING CONCRETE TRAFFIC BARRIER. SAWCUT LOCATION IS PGL TO BE USED FOR CONSTRUCTION.
- * MATCH EXISTING ROADWAY SLOPE



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264



**IH 35
EXISTING
TYPICAL SECTIONS**

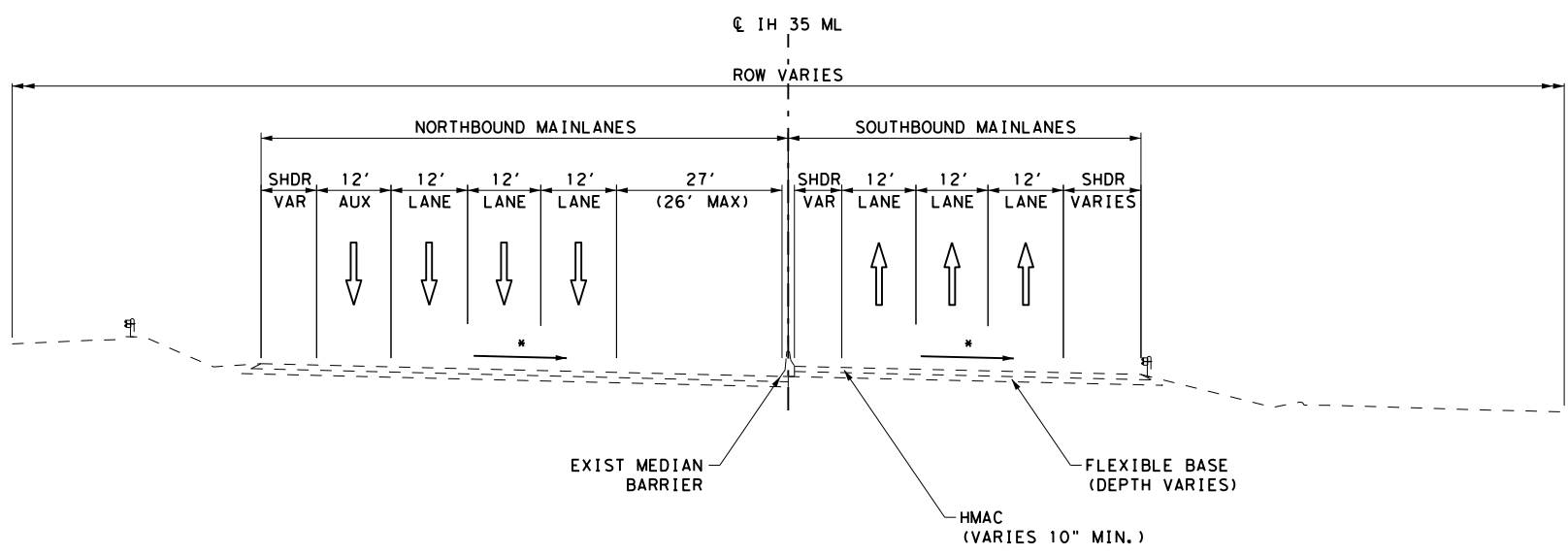
SCALE: NTS SHEET 3 OF 6

DS:	CONT	SECT	JOB	HIGHWAY
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DW:	DIST	COUNTY	SHEET NO.	
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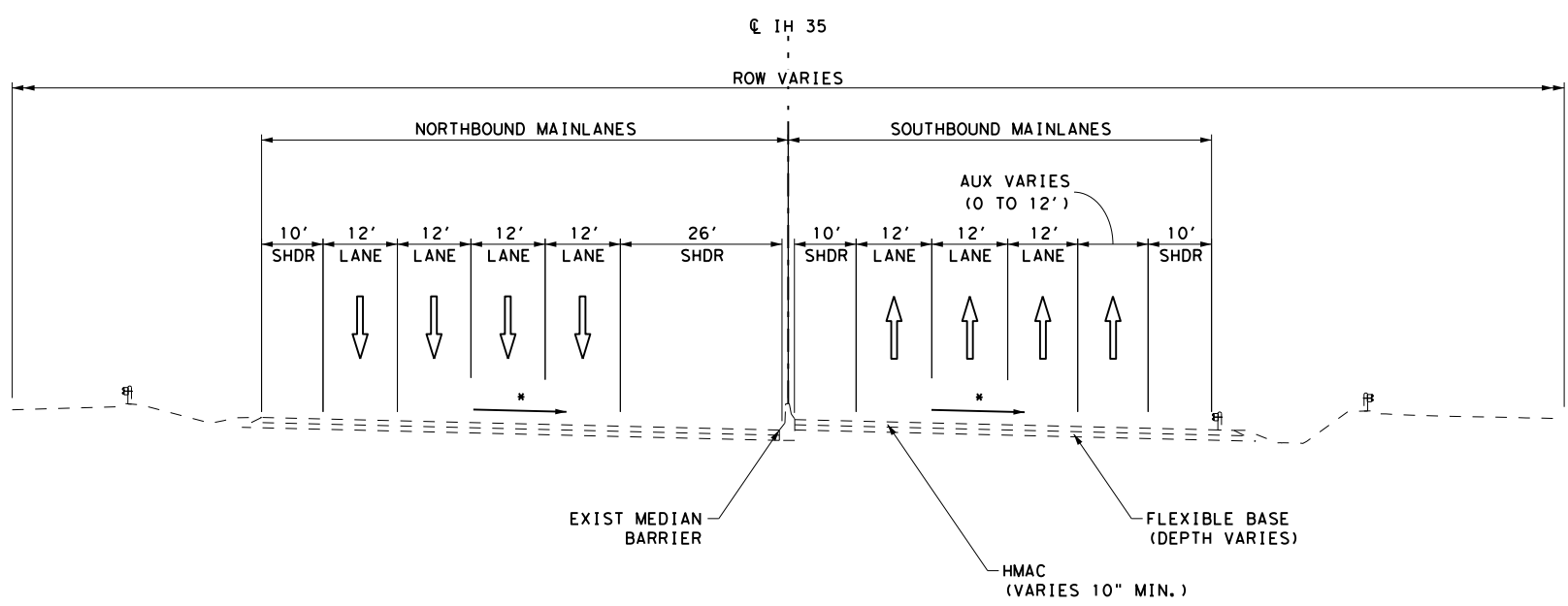
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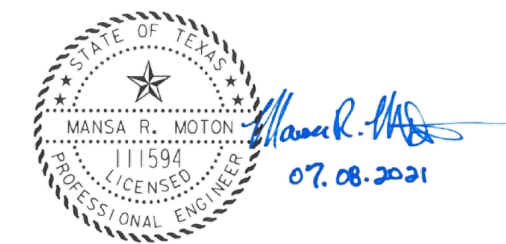
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EXISTING TYPICAL SECTION
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NOTES:

1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
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- * MATCH EXISTING ROADWAY SLOPE



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2021
Texas Department of Transportation

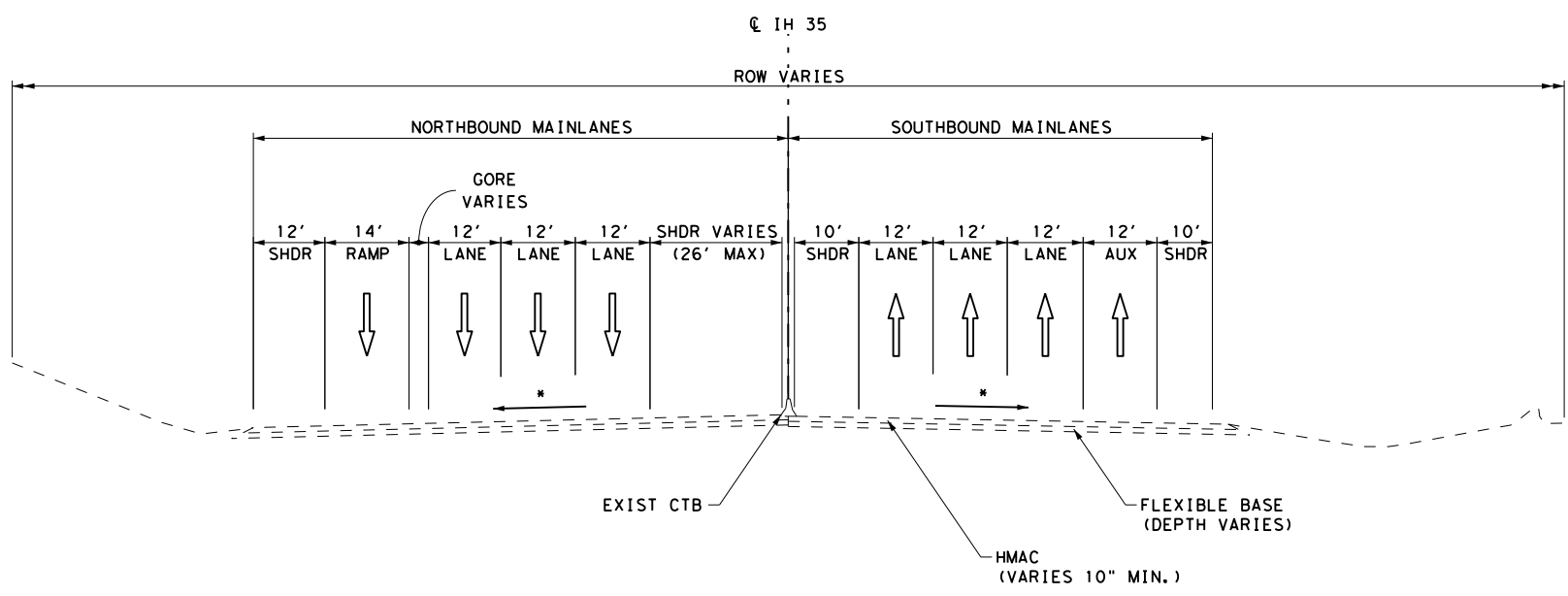
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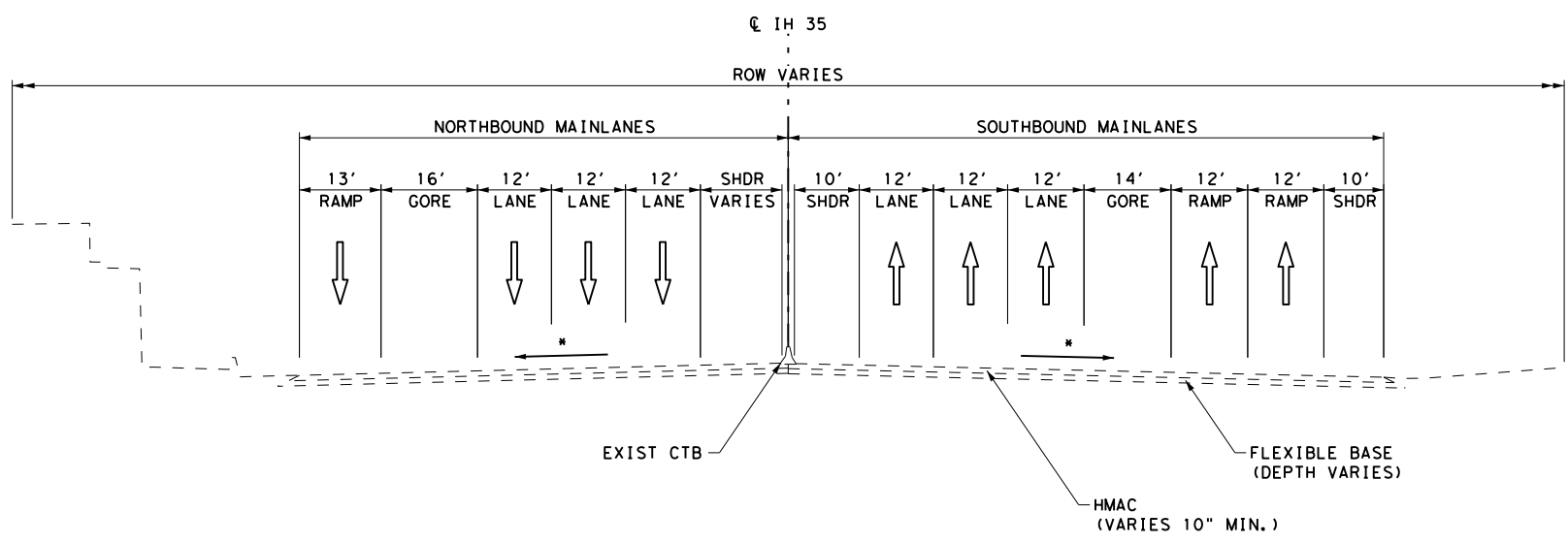
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EXISTING TYPICAL SECTION
STA 1403+58.11 TO STA 1414+43.96



EXISTING TYPICAL SECTION
STA 1414+43.96 TO STA 1418+76.69

NOTES:

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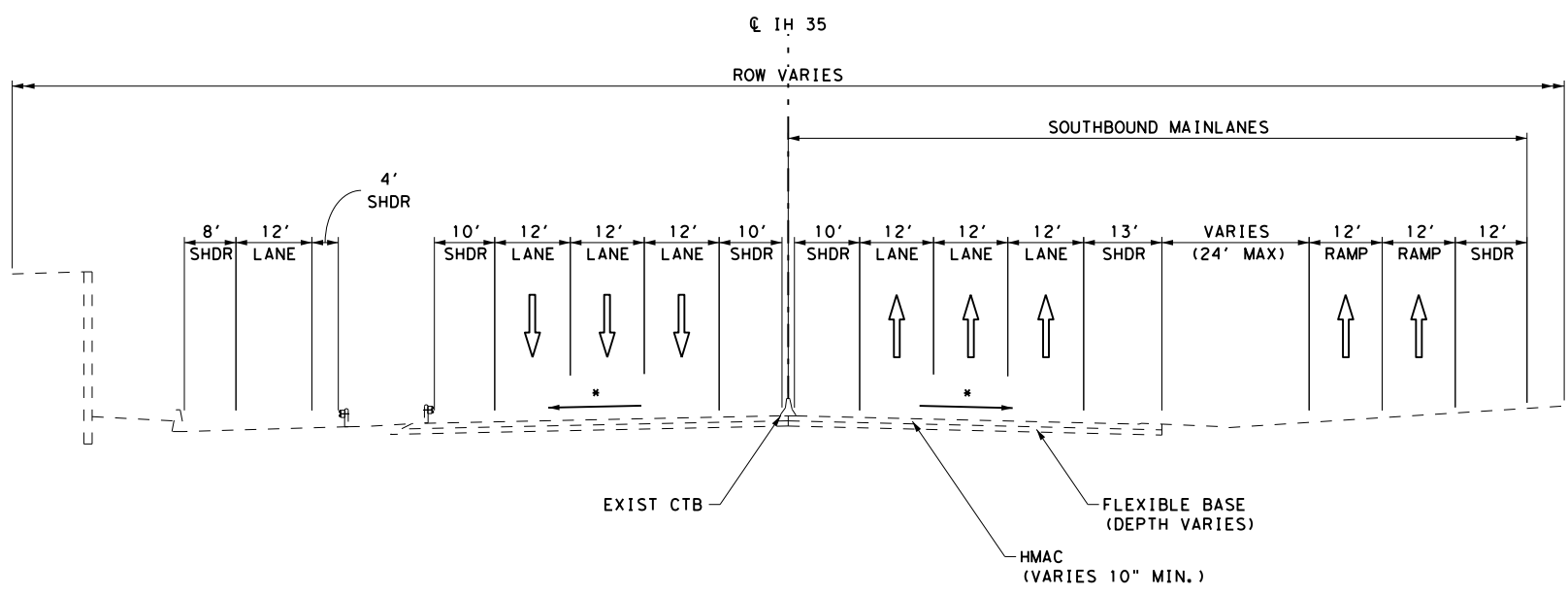
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TBPB REGISTRATION NO. 264



**IH 35
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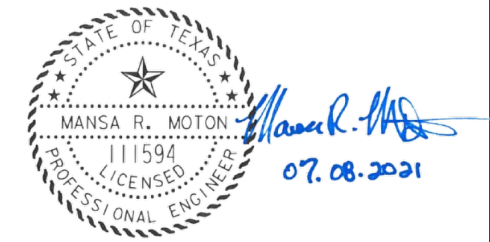
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EXISTING TYPICAL SECTION
STA 1418+76.69 TO STA 1420+07.04

- NOTES:**
1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
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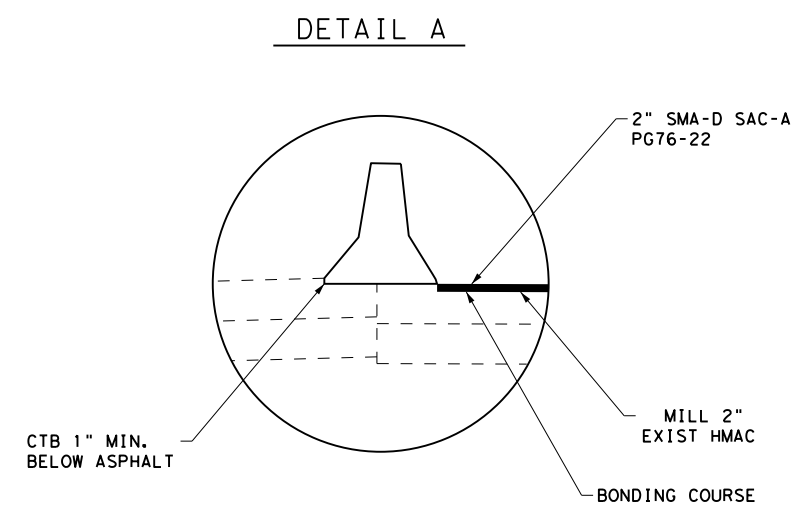
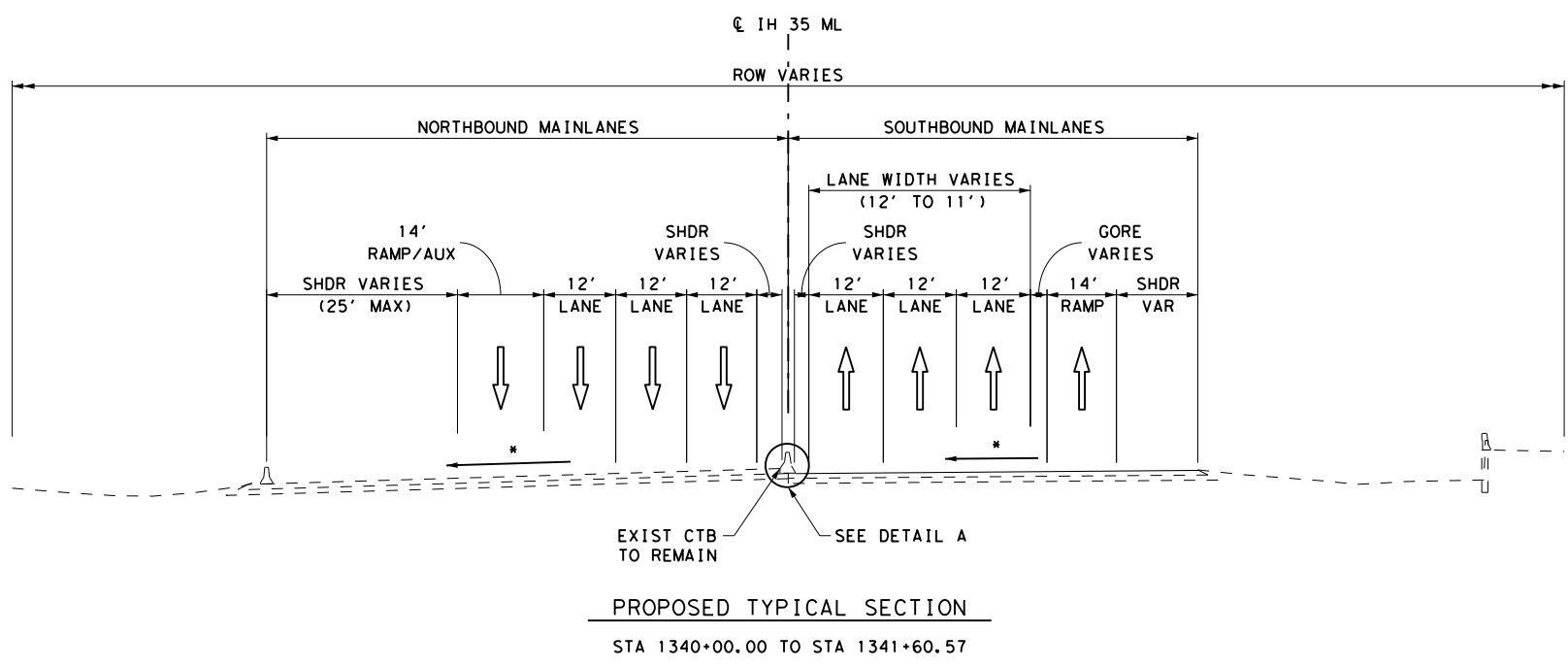
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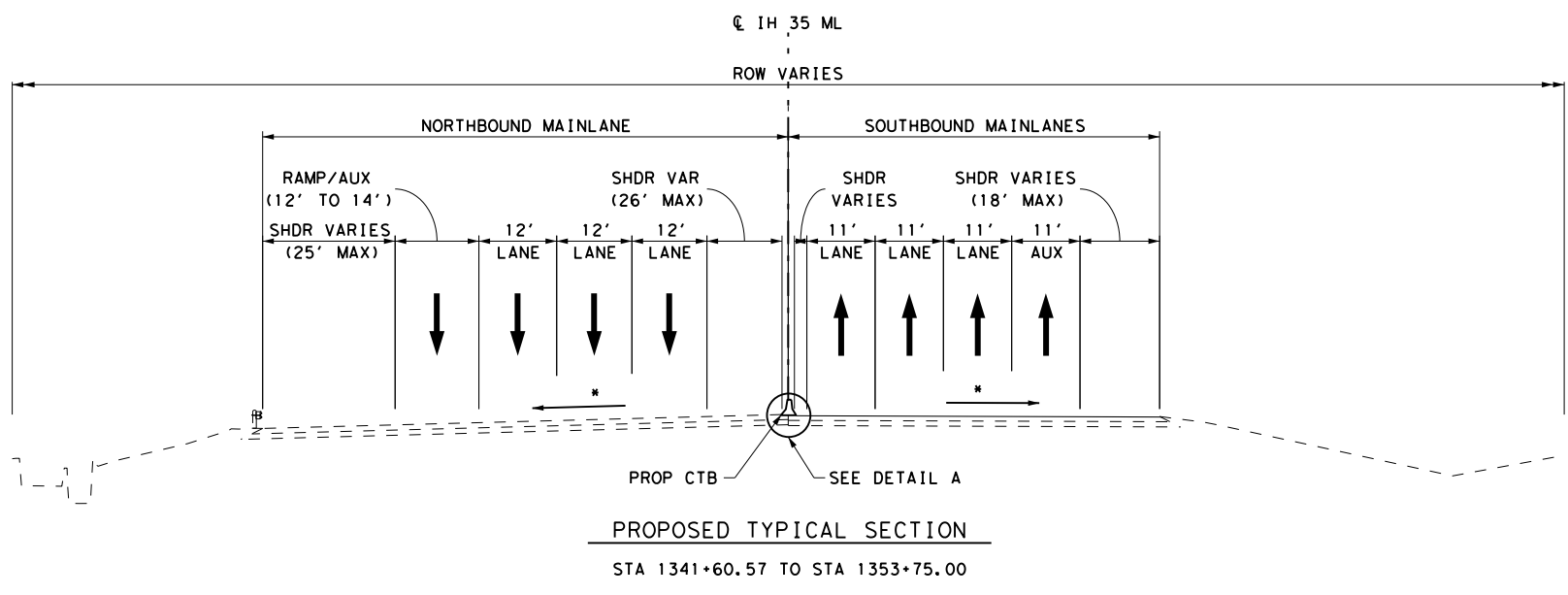
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- NOTES:**
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Texas Department of Transportation

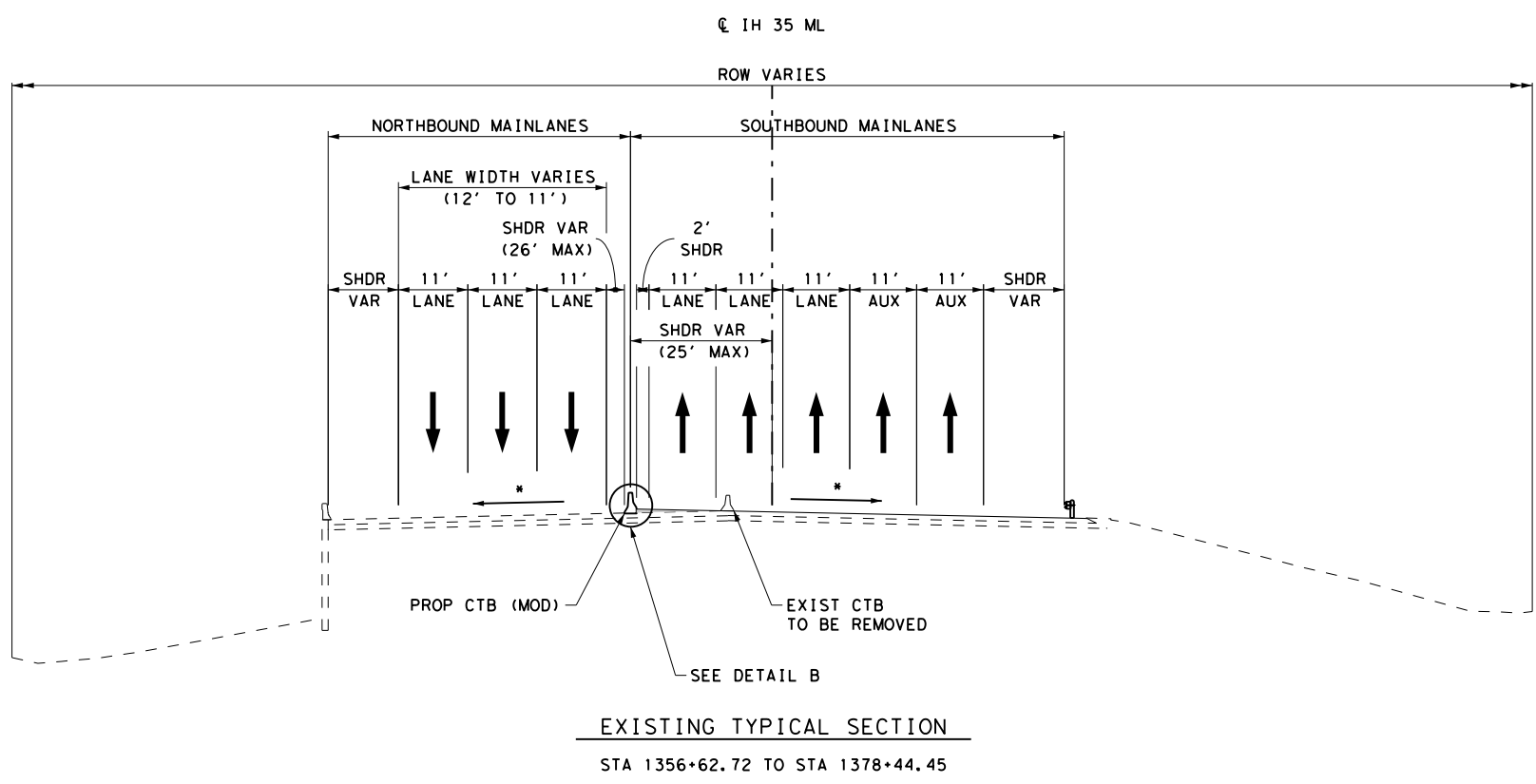
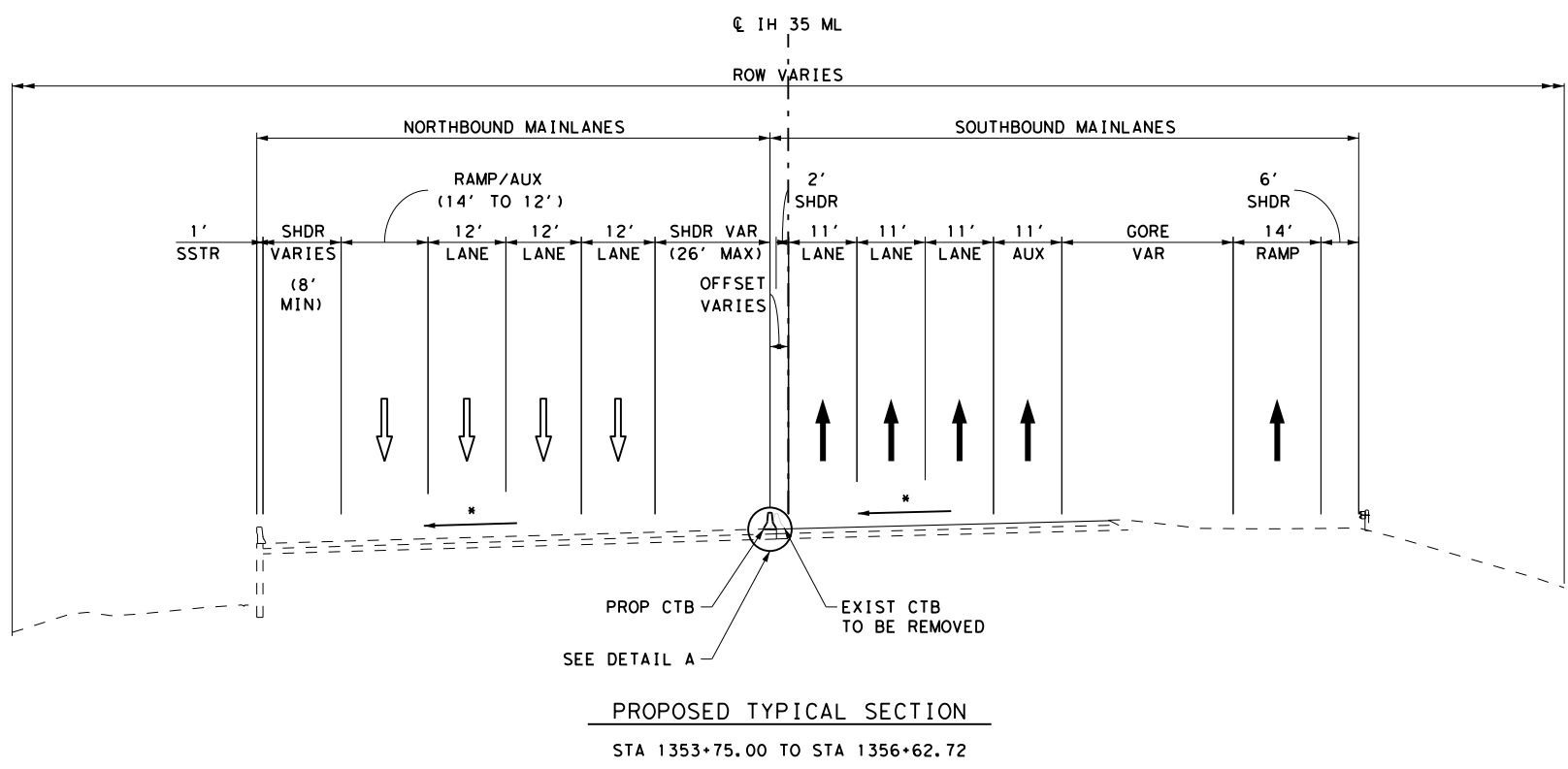
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PROPOSED
TYPICAL SECTIONS

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SHEET NO.				016

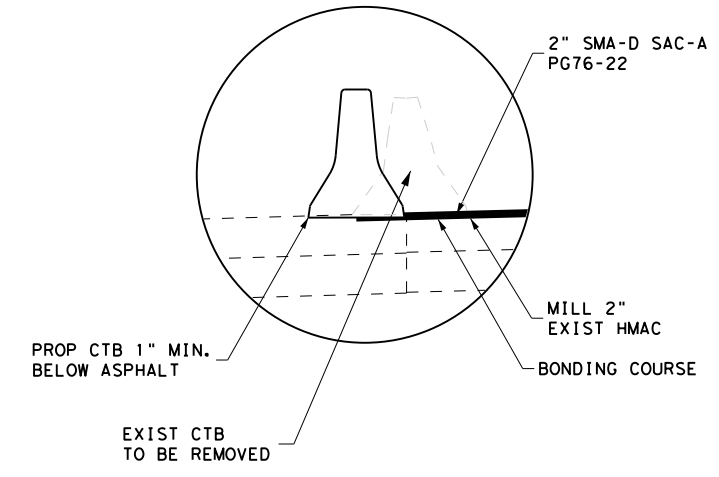
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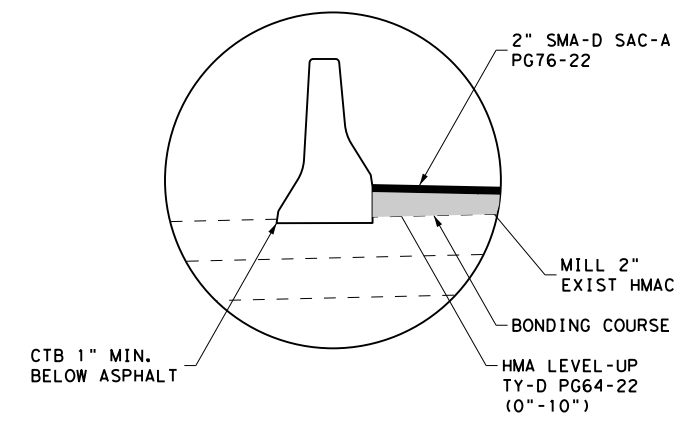
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DETAIL A



DETAIL B



NOTES:

1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
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 4. SEE TXDOT TAPERED EDGE DETAILS HMA PAVEMENT (TE (HMA)-11) STANDARD AND PROFILES FOR ADDITIONAL PAVING INFORMATION.
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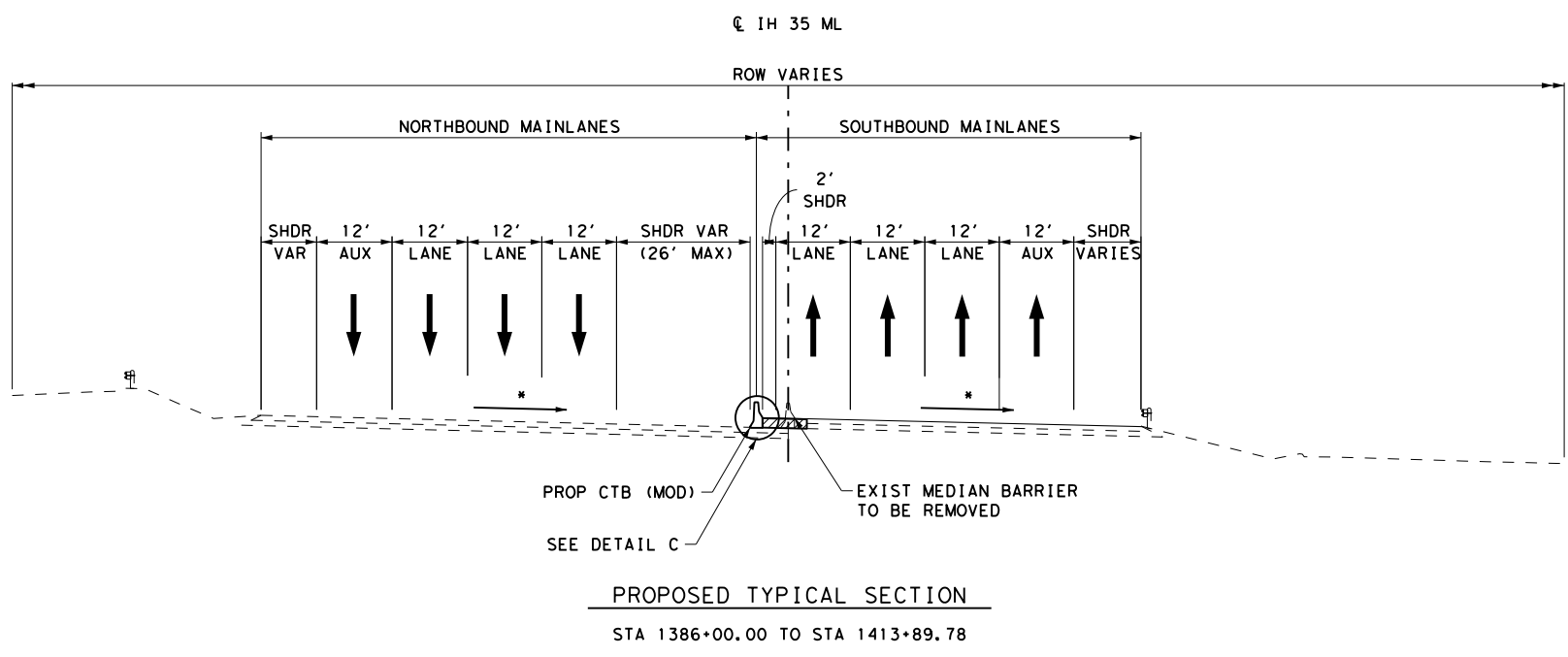
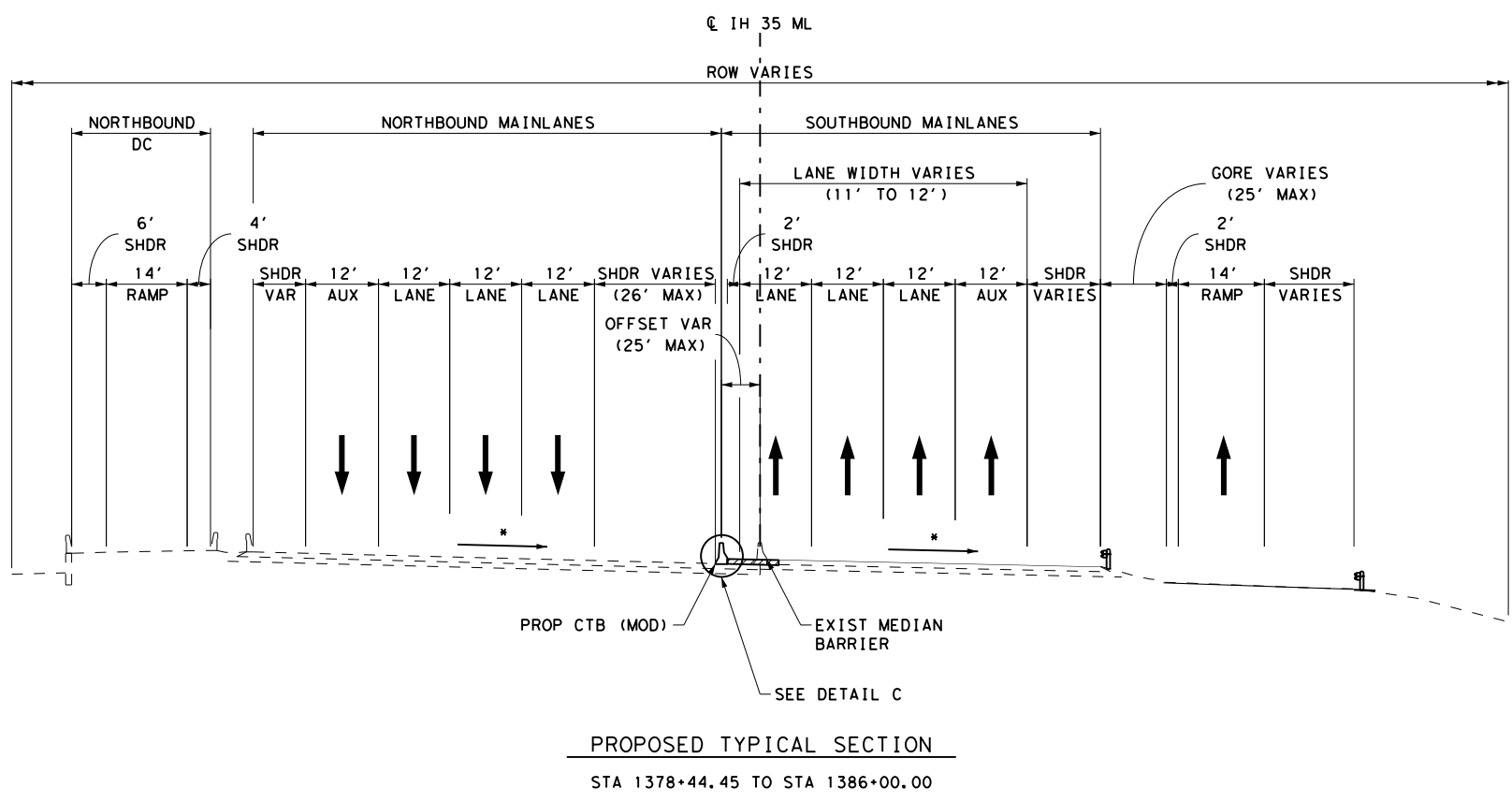
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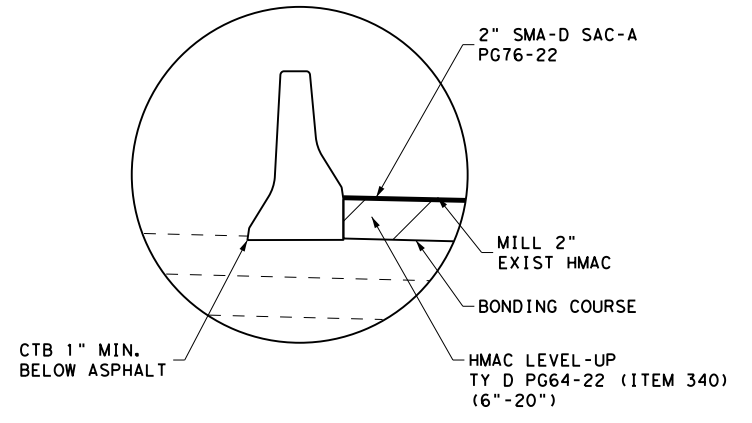
IH 35
PROPOSED
TYPICAL SECTIONS

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DW: FP	CK: MRM	DIST: AUS	COUNTY: WILLIAMSON
			SHEET NO.: 017

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DETAIL C



- NOTES:**
1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
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STATE OF TEXAS
MANSAR. MOTON
111594
LICENSED PROFESSIONAL ENGINEER
07.08.2021

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CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
PROPOSED
TYPICAL SECTIONS**

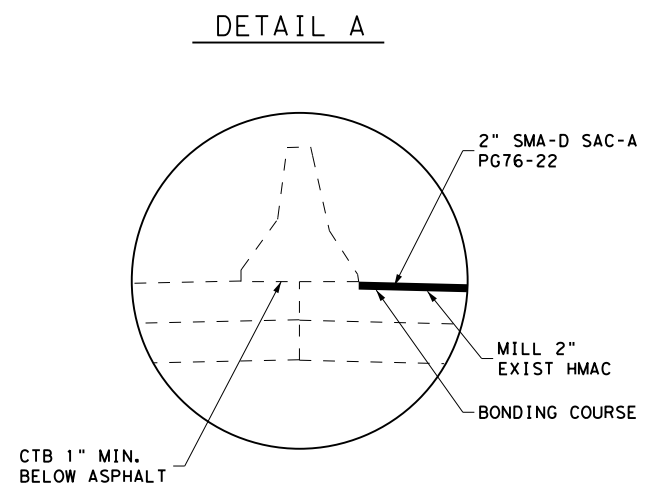
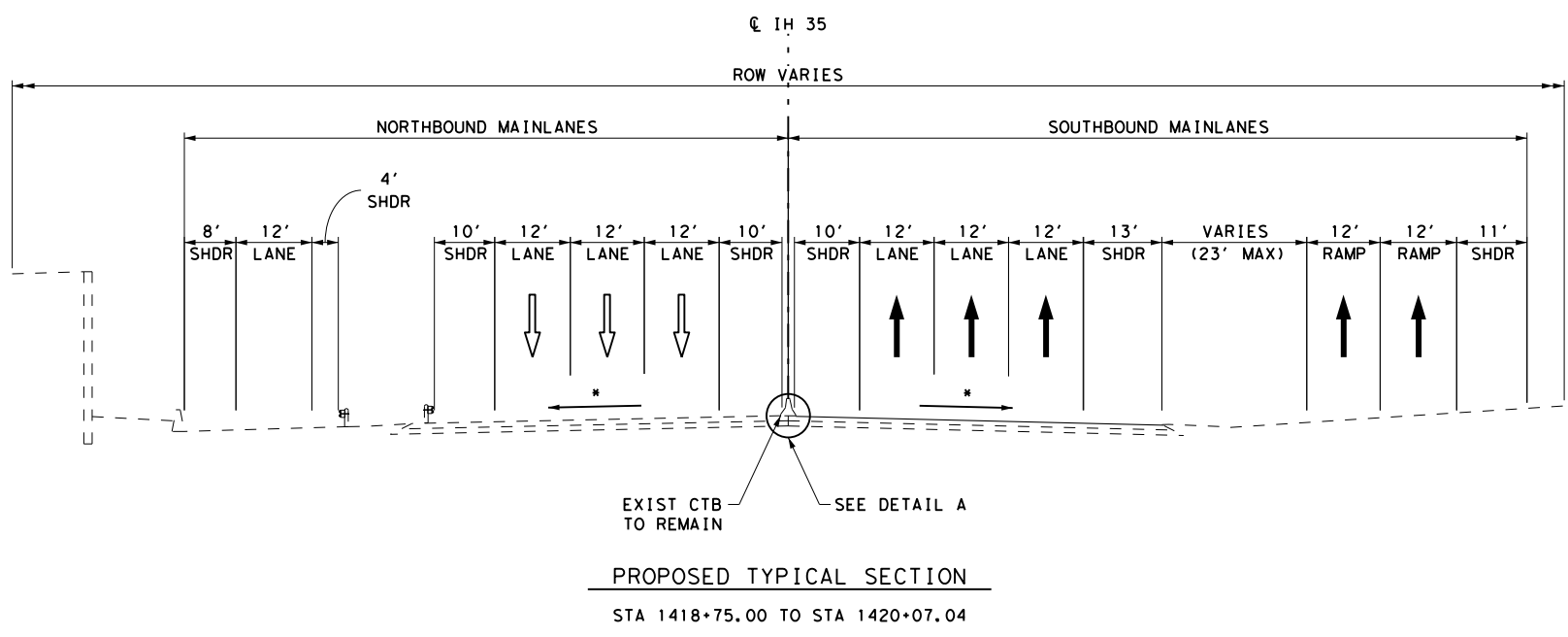
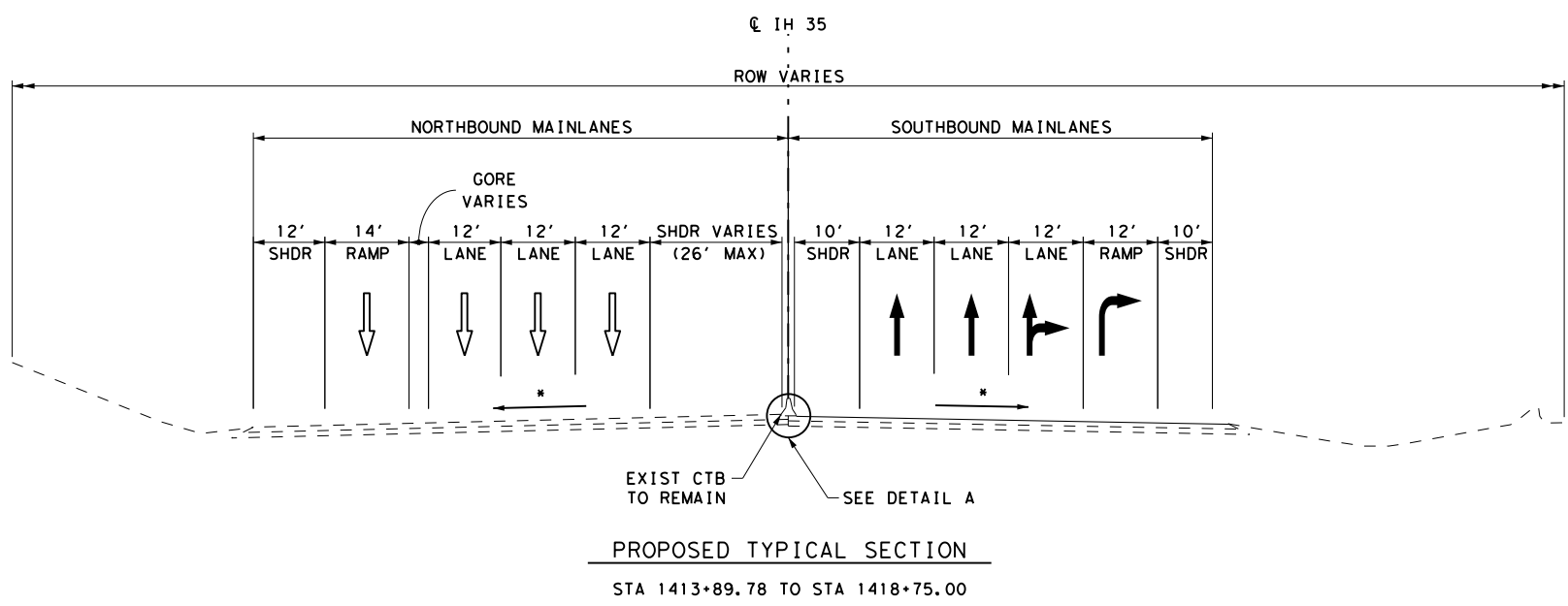
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CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
PROPOSED
TYPICAL SECTIONS**

SCALE: NTS		SHEET 4 OF 4		
DS:	CONT	SECT	JOB	HIGHWAY
MH	DH	0015 09	194	IH 35
DW:	DIST	COUNTY	SHEET NO.	
FP	MRM	AUS	WILLIAMSON	019

Project Number:
County: Williamson
Highway: IH 35

Sheet:
Control: 0015-09-194

GENERAL NOTES: Version: July 2, 2021

Item	Description	**Rate
340	Dense-Graded Hot-Mix Asphalt and Superpave	110 LB/SY/IN
346	Stone-Matrix Asphalt	113 LB/SY/IN
3084	Bonding Course	0.09 GAL/SY

** For Informational Purposes Only

GENERAL

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

Georgetown Jason.Hudson@txdot.gov
Georgetown John.Peters@txdot.gov

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:
<https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/>

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

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.

Contact the supervisor for the passenger facility at Capital Metro and request the relocation of Capital Metro signs. Contact the supervisor at (512) 385-0190.

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

Project Number:
County: Williamson
Highway: IH 35

Sheet: 20
Control: 0015-09-194

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.

Supply litter barrels in enough numbers at locations as directed to control litter within the project. Consider subsidiary to pertinent Items.

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.

Bridge Vertical Clearance and Traffic Handling.

Notify TxDOT project staff and the local bridge engineer 10 business days prior to the following: change in vertical clearance, placing beams/girders over traffic, opening or removing traffic from a bridge or portion of a bridge, and completion of bridge work. This requirement includes bridge class culverts. Provide vertical clearance for all structures (including signal mast arms, span wires, and overhead sign bridge structures) within the project limit. Submit information and notices to local bridge engineer at AUS_BRG_Notify@txdot.gov.

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 or silt fence 2 ft. inside TxDOT ROW along the Railroad ROW. If work is to be performed inside the Railroad ROW, then the Contractor will coordinate with the Railroad for a Railroad Flagger. This work is subsidiary.

Place construction stakes at intervals of no more than 100 ft. This work is subsidiary.

Project Number:
County: Williamson
Highway: IH 35

Sheet:
Control: 0015-09-194

Provide a 72 hour advance email notice to AUS_Locate@TxDOT.gov to request illumination, traffic signal, ITS, or toll equipment utility locates. Provide AUS_Locate@TxDOT.gov 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) (<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

Georgetown Ruben.Carrasco@txdot.gov AUS_GE-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.

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

Project Number:
County: Williamson
Highway: IH 35

Sheet: 20A
Control: 0015-09-194

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 above ground 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 within 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. Obtain written approval from the Engineer for activities not specifically addressed in the plans. Provide a signed sketch and description of the location 60 business days prior to begin work at the location. Complete and return any forms provided by TxDOT. Approval of the work is not guaranteed. Un approved work is not a compensable impact.

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.

Obtain written approval from the Engineer for temporary fill or crossings not specifically addressed in the plans. Provide a signed sketch of the location 60 business days prior to begin

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work at the location. Complete and return any forms provided by TxDOT. Approval of the work is not guaranteed. Unapproved work is not a compensable impact.

DSHS Asbestos and Demolition Notification.

Complete and provide the Texas Department of State Health Services (DSHS) notification form to the Engineer and email to AUS_BRG_Notify@txdot.gov at least 30 calendar days prior to bridge removal or renovation for each phase or step of work. Notify the Engineer via email of any changes to the work start and end dates.

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.

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.

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Water Quality Ponds.

Provide a sample of filter media for approval prior to installation. Confirm elevations of underdrain pipe after installation and prior to covering with filter media. Provide an electronic pdf of as-builts within 60 calendar days of a water quality pond becoming active. As-built shall include GPS coordinates and elevations of all flowlines for inlets, flowlines for outlets, elevations of underdrain pipes, top of the pond, and bottom of the pond. Schedule and conduct a walk thru inspection with a TxDOT registered professional engineer prior to providing the as-built. Clean the pond as directed. Cleaning of the pond will be paid using force account in accordance with Item 9.7, "Payment for Extra Work and Force Account Method."

ITEM 8 – PROSECUTION AND PROGRESS

Electronic versions of schedules will be saved in Primavera P6 format.

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

The road-user cost liquidated damages are \$10,000 per day.

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 =IH 35	Number of Lanes Closed		
		1	2	
	Time			
	0:00-0:15	\$2,400	\$10,013	
	0:16 - 0:30	\$4,800	\$20,026	
	0:31 - 0:45	\$7,200	\$30,039	
	0:46 - 1:00	\$9,600	\$40,052	
	Each additional 15 minutes	+0:15	\$3,149	\$13,811

All schedule activities shall be cost loaded using the contract items and unit prices. The monthly schedule report must include a line diagram showing the actual and projected monthly estimates thru the end of the project.

The Contractor shall provide a three-week look ahead weekly in Gantt chart format. The look ahead shall include upcoming work items, possible lane and full road closures. Submit the weekly look ahead by 9:00 AM the morning following the weekly project meeting. The chart shall have a specific section dedicated solely to lane closures and detours. Each lane closure and detour shall be a specific item on the schedule.

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Maintain a project fact sheet to be reviewed and distributed to TxDOT. Update the fact sheet monthly and submit to TxDOT by the 10th of each month. The fact sheet template will be provided by TxDOT.

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.

Follow Item 752.4 Work Methods and Item 752 general notes when removing or working on or near trees and brush.

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 340 - DENSE-GRADED HOT-MIX ASPHALT

Use the SGC for design and production testing of all mixtures. Design all Dense-Graded Type D mixtures as a surface mix, maximum 15% RAP and no RAS.

When using substitute binders, mold specimens for mix design and production at the temperature required for the substitute binder used to produce the HMA.

The Hamburg Wheel minimum number of passes for PG 64 or lower is reduced to 7,000. The Engineer may accept Hamburg Wheel test results for production and placement if no more than 1 of the 5 most recent tests is below the specified number of passes and the failing test is no more than 2,000 passes below the specified number of passes.

ITEM 346 - STONE-MATRIX ASPHALT (SMA)

For SAC A, blending SAC B aggregate with an RSSM greater than the SAC A rating or 10, whichever is greater, is prohibited for travel lanes.

The use of RAP is prohibited.

The minimum rut depth at 20,000 passes of the Hamburg Wheel test is 3 mm.

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.

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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.

Micro-milling

Micro-milling equipment may use a drum narrower than 12 ft.

ITEM 416 - DRILLED SHAFT FOUNDATIONS

Stake all Foundations, for approval, before beginning drilling operations.

Obtain approval of placement prior to placing concrete.

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

ITEM 432 - RIPRAP

Mow strip riprap will be 4 in. and all other riprap will be 5 in. unless otherwise shown on the plans or in the pay items. Mow strip for cable barrier may be placed monolithically with the barrier foundations if using concrete in accordance with Item 543. Fiber reinforcement is not allowed except in mow strip for cable barrier if foundation and mow strip are placed monolithically.

Saw-cut existing riprap then epoxy 12 in. long No. 3 or No. 4 bars 6 in. deep at a maximum spacing of 18 in. in each direction to tie new riprap to existing riprap. This work is subsidiary.

For cement-stabilized riprap, provide Type A Grade 5 flexible base. Compressive strengths for Item 247 are waived.

SGT approach taper, paid using mow strip item, shall be installed using concrete, flexible base coated with SS-1 at a rate of 0.12 GAL/SY, or HMA Type B/C/D. Placement shall be ordinary compaction and does not require placement using an asphalt paver.

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 496 - REMOVING STRUCTURES

Submit a demolition plan to the Engineer. Have the plan signed and sealed by a licensed professional engineer when the structure will continue to accommodate traffic after removal has begun and the removal impacts any part of the structure below the deck or riding surface. If applicable, the plan must detail requirements for meeting the U.S. Army Corps of Engineers' Section 404 Permit. The demolition plan must detail handling of roadway and waterway traffic. Waterway traffic must be maintained at all times unless a closure is approved by the Engineer.

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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
IH 35	All (1 lane closed)	9 P to 5 A
IH 35	All (2 lanes closed, see allowable work below)	9 P to 5 A
IH 35	All (2 lanes closed, all work)	11 P to 5 A
SH 45	US 183 to SH130	8 P to 5 A
RM 620	All	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 3 (Mobile Operations)

Roadway	Allowable Sun Night thru Fri Noon	Allowable Sat thru Sun Morn
IH 35 main lanes	10 P to 5 A	9 P to 9 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.

Two lanes closed on IH 35 allowed to begin at 9 P for main lane (shoulder work not included) hotmix overlay or pavement repair operations (does not include bridge joint work).

Full closures only allowed Friday night thru Monday morning for bridge beam installation, bridge demolition, or OSB truss removal/installation. Full closures only allowed for roadways with frontage roads or if a designated detour route is provided in the plans.

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.

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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.

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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.

Submit an emailed request for a lane closure (LCN) to TxDOT. The email will be submitted in the format provided or in the electronic notification system, as indicated by the engineer. Receive concurrence before implementation. Submit a cancellation of lane closures a minimum of 18 hours before application. 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 the 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 before the closure and by the following deadline immediately before the closing: 11A on Tuesday or 11A on Friday.

For all roadways: Submit a request for traffic detours and full roadway closures 168 hours before implementation. Submit a request for nighttime work 96 hours to the 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 an adjacent contractor will be prioritized according to critical path work per latest schedule. Conflicting critical path or non-critical work will be approved for the first LCN submitted. Denial of a closure due to prioritization or other reasons will not be a reason for time suspension, delay, overhead, etc.

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

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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.

Consider the SW3P for this project to consist of the following items, as directed: Temporary Sediment Control Fence, Erosion Control Logs and Rock Filter Dams for Erosion and Sediment Control.

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.

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 540 & 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.

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

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.

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Install and maintain three 42 in. cones, vertical panels, or plastic drums in advance of the attenuator. Place at spacing per channelizing devices on BC (9). This work is subsidiary.

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,

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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.

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 Flashing Beacons (Item 685) and 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.

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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.

Oncor Energy requires all underground conduits on the service lateral (utility side) of the meter enclosures to be Schedule 80 PVC. Size may vary. Consult with Oncor to clarify all utility requirements.

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 650 - OVERHEAD SIGN SUPPORTS

Use lengths of trusses, tower heights, and posts shown in the summaries for bidding purposes only. Verify these dimensions and vertical clearances prior to shop drawing production.

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 nightly for IH 35 main lanes or roadways with AADT greater than 100,000. Use of temporary flexible reflective roadway marker tabs is subsidiary and at the Contractor's option. Replace missing or damaged tabs nightly. If using tabs, place longitudinal markings weekly by 5 AM Friday for all weekday work and by 5 AM Monday for all weekend work. Failure to maintain tabs or place longitudinal markings by deadline will require nightly placement of longitudinal markings.

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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 677 - ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS

Dispose of removed materials and debris at locations off the right of way.

Elimination using a pavement marking will not be allowed in lieu of methods listed in specification.

Remove pavement markings on concrete surfaces by a blasting method. Flail milling will be allowed when total quantity of removal on concrete surfaces is less than 1000 ft.

Strip seal is only method allowed on seal coat surface unless project includes placement of a new surface. If total quantity of removal on a seal coat surface is less than 2000 ft., elimination using a pavement marking is allowed if a test section is approved by the Engineer. Test section shall demonstrate the thermo marking color matches the existing pavement color.

Remove pavement markings outside the limits of the new surface by a blasting method.

Use a TRAIL or a non-retroreflective paint to cover stripe remnants that remain after elimination. The test requirements for these materials are waived. The paint color shall be adjusted to resemble the existing pavement color. Installation and maintenance is subsidiary.

ITEM 3084 – BONDING COURSE

The minimum application rates are listed in Table BC. Miscellaneous Tack is allowed for use with dense-graded Type B HMA. If a tack bid item is not provided, use bonding course item.

The target shear bond strengths are listed in Table BCS. 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 BC

Material	Minimum Application Rate (gal. per square yard)
TRAIL – Emulsified Asphalt	0.06

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TRAIL – Hot Asphalt	0.12
Spray Applied Underseal Membrane	0.10

Table BCS (For Informational Tests)

Material	Target Shear Bond Strength (Tex-249-F psi)
SMA – Stone-Matrix Asphalt	60.0
PFC – Permeable Friction Course	N/A
All Other Materials	40.0

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 6302 – TEMPORARY QUEUE DETECTION SYSTEM

The Temporary Queue Detection System Type 1 and Type 2 have been designed for both short-term and long-term implementations.

The smart work zone (SWZ) systems are considered directional. For example, queue detection systems that cover both directions of travel in a work zone should be counted as two systems in the quantity of work. In some cases, two or more systems may overlap. In the interest of public safety and competitive pricing, the Contractor may choose to multi-purpose some of the devices and still be paid for all the systems as if they were constructed and operated as independent systems provided they meet the requirements for the independent systems. For example, a trailer may be used for mounting a closed-circuit television (CCTV) camera and be used as a detection point for queue detection, travel time systems or speed monitoring system. If the Contractor attempts to use a single counting device for both directions simultaneously, and one of the directions does not meet the minimum 90% accuracy requirement, then the Contractor must

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install a second detector to correct the problem. At the discretion of the Department the contractor could use existing structures to mount temporary intelligent transportation systems.

Long-term deployment is defined as an operation lasting more than 72 hours. These deployments are meant to last for the duration of barricades in the project. Equipment used in long-term deployments shall be placed in locations that require minimal equipment relocation. Type 1 or Type 2 setups shall be used per Standard Sheets WZ-ITS (1)-19 and WZ-ITS (3)-19. The Contractor shall install sensors capable of accurately detecting volumes, speeds, gap, headway, occupancy and vehicle classification of traffic per lane and direction.

Short-term deployment is defined as an operation lasting less than or equal to 72 hours. The equipment shall be removed upon completion of the lane closure except for a portable changeable message sign (PCMS) used for other purposes. Nighttime lane closures that span one day to the next will be measured as one calendar day. Lane closures with use longer than a 24-hour period will be measured by every 24-hour period or any portion the unit is operational.

The Contractor shall install quickly deployable sensors for short-term deployments when closing mainlanes. Type 1 or Type 2 setups shall be used per Standard Sheets WZ-ITS (1)-19 and WZ-ITS (3)-19. If doppler sensors are used to detect speeds, the Contractor shall install additional side fire radar at the PCMS to allow for accurate volume, gap, headway, occupancy and vehicle classification of traffic per lane and direction detection. The side fire radar shall be installed at a minimum height of 18 feet from the ground. Regardless of the type deployed, the system shall be in place and be fully operational at least an hour before any lane closure operation begins. The construction activities will not be allowed to proceed until the Temporary Queue Detection System is deployed and operational unless approved by the Engineer.

When traffic is routed to frontage roads, then additional temporary sensors are placed along the frontage road and the system temporarily replaces the data stream for the mainlane system that is not collecting data. The spacing of the sensor should match that of the type 2.

For high volume locations where it is hazardous to relocate detection units during construction, and the lane closure taper is moved, the long-term Type 1 (7 miles) or Type 2 (3.5 miles) Queue Detection System shall be designed for the furthest downstream lane taper. As new lane tapers occur upstream, add additional short-term Type 1 or Type 2 Queue Detection Systems, and do not remove the equipment downstream from the new taper.

The number of Queue Detection Systems for short term deployments shall be equal to the number of "first encounter lane tapers." These are the first tapers a motorist encounters as they approach the work zone. When a second lane is being closed past the first lane, an additional Queue Detection System is not warranted.

For short-term deployments, the Contractor shall submit an after-action report demonstrating that the system worked well.

For long-term deployments, in addition to the system administrator described on the Special Specification, the Contractor shall employ a traffic engineering firm to perform quality control

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checks. The purpose of the quality control checks is to ensure that traffic counts and other data collected by the surveillance trailers adequately represent flow conditions, and therefore provide accurate information for traffic monitoring and motorist information purposes. The Contractor, upon request, can get an electronic copy of the Validation of Work Zone Trailers study done by Texas A&M Transportation Institute on April 30, 2019. The Validation of Work Zone Trailers study shall be used as a guideline to perform the validation at the location of each data point per direction. As a minimum, the validation shall occur at the beginning of the project to approve the System Administrator Operational Test report and then every three months to continue validation of the system. This validation is independent of the Contractor's quality control process used to monitor daily operations. The engineering firm is not required if there is a GEC involved in the project responsible for data verification.

Regardless of the term and type of deployment, the SWZ systems are required to utilize compatible communication software to integrate with the TxDOT Traffic Management Center at the Combined Transportation, Emergency & Communications Center (CTECC.) The Contractor shall ensure that the SWZ systems are compatible with functions supplied in the base Automated Traffic Management System and make the communication feed available to the Mobility35 General Engineering Consultant (GEC.) The Contractor should contact the Mobility35 GEC to assist in the impact estimation for significant closures.

Lane Closure are defined as follows:

- Ordinary Event – A main lane closure, one or two lanes on cross streets or one lane on frontage roads.
- Significant Event – Two or more main lanes closed. Includes rolling main lane closures, alternating lanes, and full closures on crossing streets and frontage roads.
- Emergency Event – Unplanned or urgent in consideration of public safety.

SWZ deployment and performance shall be a topic for discussion in the TxDOT Area Office weekly partnering meetings.

Upon request, the Contractor may obtain an electronic copy of the Design Guidelines for Deployment of Work Zone Intelligent Transportation Systems (ITS) to provide a better understanding of the SWZ deployments.

ITEM 6307 - TEMPORARY SPEED MONITORING SYSTEM

The smart work zone (SWZ) portable units shall have a speed feedback trailer, a side fire sensor for detecting speeds and volumes and a doppler sensor to detect the velocity and display on the digital board. Unless otherwise indicated in the plans; at the Contractor's option, the side fire radar can be installed on the same speed feedback trailer at a minimum height of 18 feet from the ground. The Contractor can propose the equipment layout provided they meet all the requirements to get an operational system.

The smart work zone (SWZ) systems are considered directional. For example, temporary speed monitoring systems that cover both directions of travel in a work zone should be counted as two systems in the quantity of work. In some cases, two or more systems may overlap. In the interest

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of public safety and competitive pricing, the Contractor may choose to multi-purpose some of the devices and still be paid for all the systems as if they were constructed and operated as independent systems provided they meet the requirements for the independent systems. For example, a trailer may be used for mounting a closed-circuit television (CCTV) camera and be used as a detection point for queue detection, travel time systems or speed monitoring system. If the Contractor attempts to use a single counting device for both directions simultaneously, and one of the directions does not meet the minimum 90% accuracy requirement, then the Contractor must install a second detector to correct the problem. At the discretion of the Department the contractor could use existing structures to mount temporary intelligent transportation systems.

Regardless of the term and type of deployment the SWZ systems are required to utilize compatible communication software to integrate with the TxDOT Traffic Management Center at the Combined Transportation, Emergency & Communications Center (CTECC.) The Contractor shall ensure that the SWZ is compatible with functions supplied in the base Automated Traffic Management System and make the communication feed available to the Mobility35 General Engineering Consultant (GEC.) Data such as volumes, speed, occupancy, vehicles classification, headways and gap must be included on the feed.

In addition to the system administrator described in the Special Specification, the Contractor shall employ a traffic engineering firm to perform quality control checks. The purpose of the quality control checks is to ensure that traffic counts and other data collected by the surveillance trailers adequately represent flow conditions, and therefore provide accurate information for traffic monitoring and motorist information purposes. The Contractor, upon request, can get an electronic copy of the Validation of Work Zone Trailers study done by Texas A&M Transportation Institute on April 30, 2019. The Validation of Work Zone Trailers study shall be used as a guideline to perform the validation at the location of each data point per direction. As a minimum, the validation shall occur at the beginning of the project to approve the System Administrator Operational Test report and then every three months to continue validation of the system. This validation is independent of the Contractor's quality control process used to monitor daily operations. The engineering firm is not required if there is a GEC involved in the project responsible for data verification.

SWZ deployment and performance shall be a topic for discussion in the TxDOT Area Office weekly partnering meetings.

Upon request, the contractor may obtain an electronic copy of the Design Guidelines for Deployment of Work Zone Intelligent Transportation Systems (ITS) to provide a better understanding of the SWZ deployments.



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0015-09-194

DISTRICT Austin
HIGHWAY IH 35

COUNTY Williamson

CONTROL SECTION JOB				0015-09-194		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00059475			
COUNTY				Williamson			
HIGHWAY				IH 35			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	100-6002	PREPARING ROW	STA	121.100		121.100	
	104-6023	REMOVING CONC (CTB)	LF	5,730.000		5,730.000	
	104-6054	REMOVING CONCRETE(MOW STRIP)	LF	6,587.500		6,587.500	
	105-6039	REMOVE STAB BASE AND ASPH PAV (6"-20")	SY	1,810.000		1,810.000	
	105-6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	5,005.000		5,005.000	
	340-6242	D-GR HMA(SQ)TY-B OR D PG64-22(LVL-UP)	TON	3,837.000		3,837.000	
	346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	6,864.000		6,864.000	
	354-6206	PLANE ASPH CONC PAV (3/4"-2")	SY	62,350.000		62,350.000	
	356-6021	PAV JT UNDERSEAL (24")	LF	670.000		670.000	
	400-6005	CEM STABIL BKFL	CY	214.000		214.000	
	400-6009	CEMENT STAB BACKFILL (INLET OR MH)	CY	156.000		156.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	2,581.000		2,581.000	
	416-6007	DRILL SHAFT (54 IN)	LF	27.000		27.000	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	96.000		96.000	
	416-6095	DRILL SHAFT (HIGH MAST POLE) (48")	LF	476.000		476.000	
	428-6001	PENETRATING CONCRETE SURFACE TREATMENT	SY	670.000		670.000	
	429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	36.000		36.000	
	429-6009	CONC STR REPAIR (STANDARD)	SF	12.000		12.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	92.000		92.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	200.000		200.000	
	438-6006	CLEANING AND SEALING JOINTS (CL 3)	LF	408.000		408.000	
	454-6007	HEADER TYPE EXPANSION JOINT	LF	408.000		408.000	
	454-6009	JOINT SEALANT	LF	408.000		408.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	1,901.000		1,901.000	
	464-6008	RC PIPE (CL III)(36 IN)	LF	20.000		20.000	
	465-6006	JCTBOX(COMPL)(PJB)(4FTX4FT)	EA	6.000		6.000	
	465-6535	INLET (COMPL)(SSB)(10 FT)(FTW)	EA	60.000		60.000	
	465-6558	INL(CMP)(PAZD-CZ)(FG)(3FTX3FT-3FTX3FT)	EA	1.000		1.000	
	479-6006	ADJUSTING INLET (CAP)	EA	1.000		1.000	
	496-6007	REMOV STR (PIPE)	LF	20.000		20.000	
	496-6023	REMOVE STR (JUNCTION BOX)	EA	7.000		7.000	
	496-6041	REMOV STR (LARGE)	EA	1.000		1.000	
	496-6069	REMOV STR (SLOTTED DRAIN INLET)	LF	240.000		240.000	
	499-6001	ADJUST STL SHOES	EA	1.000		1.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	21.000		21.000	
	506-6003	ROCK FILTER DAMS (INSTALL) (TY 3)	LF	125.000		125.000	

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Estimate & Quantity Sheet

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DISTRICT Austin
HIGHWAY IH 35

COUNTY Williamson

CONTROL SECTION JOB				0015-09-194		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00059475			
COUNTY				Williamson			
HIGHWAY				IH 35			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	125.000		125.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	8,755.000		8,755.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	8,755.000		8,755.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	525.000		525.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	525.000		525.000	
	512-6005	PORT CTB (FUR & INST)(F-SHAPE)(TY 1)	LF	12,240.000		12,240.000	
	512-6053	PORT CTB (REMOVE)(F-SHAPE)(TY 1)	LF	12,240.000		12,240.000	
	514-6009	PERM CTB (SGL SLOPE) (TY 1) (54)	LF	5,700.000		5,700.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	6,487.500		6,487.500	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	6.000		6.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	6,587.500		6,587.500	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	4.000		4.000	
	542-6003	REMOVE DOWNSTREAM ANCHOR TERMINAL	EA	2.000		2.000	
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	7.000		7.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	14.000		14.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	7.000		7.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	1.000		1.000	
	545-6007	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA	1.000		1.000	
	610-6008	REMOVE RD IL ASM (CTB MOUNT)	EA	43.000		43.000	
	610-6009	REMOVE RD IL ASM (TRANS-BASE)	EA	28.000		28.000	
	610-6101	REPLACE LUMINAIRE W/LED (150W EQ)	EA	2.000		2.000	
	610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	46.000		46.000	
	610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	12.000		12.000	
	613-6001	HI MST IL POLE (100 FT)(80 MPH)	EA	17.000		17.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF	9,190.000		9,190.000	
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	3,265.000		3,265.000	
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	70.000		70.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	12,055.000		12,055.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	24,840.000		24,840.000	
	620-6011	ELEC CONDR (NO.4) BARE	LF	2,995.000		2,995.000	
	620-6012	ELEC CONDR (NO.4) INSULATED	LF	5,990.000		5,990.000	
	624-6002	GROUND BOX TY A (122311)W/APRON	EA	60.000		60.000	
	628-6046	ELC SRV TY A 240/480 060(NS)SS(E)SP(U)	EA	4.000		4.000	
	628-6077	ELC SRV TY A 240/480 100(NS)SS(E)SP(U)	EA	1.000		1.000	
	636-6001	ALUMINUM SIGNS (TY A)	SF	18.000		18.000	
	636-6003	ALUMINUM SIGNS (TY O)	SF	133.210		133.210	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1.000		1.000	



Estimate & Quantity Sheet

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DISTRICT Austin
HIGHWAY IH 35

COUNTY Williamson

CONTROL SECTION JOB				0015-09-194		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00059475			
COUNTY				Williamson			
HIGHWAY				IH 35			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	644-6076	REMOVE SM RD SN SUP&AM	EA	9.000		9.000	
	650-6045	INS OH SN SUP(40 FT CANT)	EA	1.000		1.000	
	650-6204	REMOVE OVERHD SIGN SUP	EA	1.000		1.000	
	662-6060	WK ZN PAV MRK REMOV (W)4"(BRK)	LF	6,790.000		6,790.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	16,703.000		16,703.000	
	662-6064	WK ZN PAV MRK REMOV (W)6"(BRK)	LF	7,520.000		7,520.000	
	662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	12,409.000		12,409.000	
	662-6071	WK ZN PAV MRK REMOV (W)8"(SLD)	LF	7,099.000		7,099.000	
	662-6073	WK ZN PAV MRK REMOV (W)12"(SLD)	LF	4,556.000		4,556.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	14,636.000		14,636.000	
	662-6098	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF	14,748.000		14,748.000	
	662-6123	WK ZN PAV MRK REMOV (W)12"(DOT)	LF	4,560.000		4,560.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	3,309.000		3,309.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	3,041.000		3,041.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	7.000		7.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	5.000		5.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	20.000		20.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	3,083.000		3,083.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	7,520.000		7,520.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	1,006.000		1,006.000	
	666-6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	12,409.000		12,409.000	
	666-6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	14,748.000		14,748.000	
	666-6350	REFL PAV MRK TY I (W)12"(DOT)(100MIL)	LF	3,078.000		3,078.000	
	672-6008	REFL PAV MRKR TY I-R	EA	140.000		140.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	1,709.000		1,709.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	26,650.000		26,650.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	1,420.000		1,420.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	1,778.000		1,778.000	
	764-6021	SLOTTED DRAIN CLEANING	LF	336.000		336.000	
	780-6005	CNC CRACK REPAIR (DISCRETE)(ROUT)	LF	700.000		700.000	
	780-6010	CNC CRACK REPAIR (DISCRETE)(SURF SEAL)	LF	1,540.000		1,540.000	
	3084-6001	BONDING COURSE	GAL	5,012.000		5,012.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000	
	6156-6002	LED HI MST IL ASM (6 FIXT)(ASYM)(TY A)	EA	3.000		3.000	
	6156-6003	LED HI MST IL ASM (6 FIXT) (ASYM)(TY B)	EA	11.000		11.000	
	6156-6005	REPLC LED HI MST IL(6 FIXT)(SYM)(TY S)	EA	4.000		4.000	
	6156-6007	REPLC LED HI MST IL(6 FIXT)(ASYM)(TY B)	EA	5.000		5.000	



DISTRICT	COUNTY	CCSJ	SHEET
Austin	Williamson	0015-09-194	21B



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0015-09-194


DISTRICT Austin
HIGHWAY IH 35


COUNTY Williamson

CONTROL SECTION JOB				0015-09-194		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00059475			
COUNTY				Williamson			
HIGHWAY				IH 35			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	6156-6010	LED HI MST IL AM(6 FIXT)ASYM(TY B)SHLD	EA	3.000		3.000	
	6185-6002	TMA (STATIONARY)	DAY	388.000		388.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	86.000		86.000	
	6302-6004	TEMP Q-DETECT (TY2) (2 SYS)	DAY	326.000		326.000	
	6307-6002	TEMP SPEED MONITOR (2 SYS)	DAY	326.000		326.000	
	6319-6001	LED WRONG WAY DRIVER SYSTEM	EA	5.000		5.000	
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

SUMMARY OF REMOVAL ITEMS															
LOCATION	104 6054	104 6023	105 6039	105 6046	354 6206	542 6001	542 6002	542 6003	542 6004	544 6003	644 6076	650 6204	677 6001	677 6003	677 6005
	REMOVING CONCRETE (MOW STRIP)	REMOVING CONC (CTB)	REMOVE STAB BASE AND ASPH PAV (6"-20")	REMOVING STAB BASE & ASPH PAV (0"-10")	PLANE ASPH CONC PAV (3/4"-2")	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	REMOVE DOWNSTREAM ANCHOR TERMINAL	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (REMOVE)	REMOVE SM RD SN SUP&AM	REMOVE OVERHD SIGN SUP	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (12")
	LF	LF	SY	SY	SY	LF	EA	EA	EA	EA	EA	EA	LF	LF	LF
SHEET 1 OF 12															
SHEET 2 OF 12	62.5					62.5			1						
SHEET 3 OF 12	575					575			1	1	2				
SHEET 4 OF 12	287.5					287.5			1		1				
SHEET 5 OF 12	450				3365	450	1			2	3		1250		202
SHEET 6 OF 12	462.5	810		310	8495	462.5			1	1	2		2750		333
SHEET 7 OF 12	737.5	1110		1495	8300	737.5			1				2730	825	280
SHEET 8 OF 12	750	1110		2015	8580	750			1			1	2680	75	
SHEET 9 OF 12	1000	1110	525	1185	9815	1000	2	2		2	1		7625	520	498
SHEET 10 OF 12	1100	1110	980		7660	1100							7770		279
SHEET 11 OF 12	712.5	480	305		8210	712.5	1						1845		186
SHEET 12 OF 12	450				7925	450			1	1					
PROJECT TOTALS	6587.5	5730	1810	5005	62350	6587.5	4	2	7	7	9	1	26650	1420	1778

SUMMARY OF ROADWAY ITEMS										
LOCATION	100 6002	340 6242	346 6014	432 6001	432 6045	514 6009	540 6001	540 6006	544 6001	3084 6001
	PREPARING ROW	D-GR HMA (SQ) TY-B OR D PG64-22 (LVL-U P)	STONE-MTRX-ASP H SMA-D SAC-A PG76-22	RIPRAP (CONC) (4 IN)	RIPRAP (MOW STRIP) (4 IN)	PERM CTB (SGL SLOPE) (TY 1) (54)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	BONDING COURSE
	STA	TON	TON	CY	CY	LF	LF	EA	EA	GAL
PLAN & PROFILE - SHEET 1 OF 12	2.00									
PLAN & PROFILE - SHEET 2 OF 12	11.00				3		38	1		
PLAN & PROFILE - SHEET 3 OF 12	11.00				26		563	1	2	
PLAN & PROFILE - SHEET 4 OF 12	11.00				13		263	1	1	
PLAN & PROFILE - SHEET 5 OF 12	11.00		371		20		438		3	303
PLAN & PROFILE - SHEET 6 OF 12	11.00	80	935		20	810	438	1	1	765
PLAN & PROFILE - SHEET 7 OF 12	11.00	555	913		32	1110	738	1		747
PLAN & PROFILE - SHEET 8 OF 12	11.00	837	944		33	1110	750	1		168
PLAN & PROFILE - SHEET 9 OF 12	11.00	1138	1080	11	33	1110	1000		4	884
PLAN & PROFILE - SHEET 10 OF 12	11.00	946	845	49		1110	1100			690
PLAN & PROFILE - SHEET 11 OF 12	11.00	281	904	32		450	713		1	740
PLAN & PROFILE - SHEET 12 OF 12	9.07		872		20		450		2	715
PROJECT TOTALS	121.07	3837	6864	92	200	5700	6487.5	6	14	5012





IH 35
SUMMARY SHEET

SHEET 1 OF 6

DS:	MM	MM	0015	09	194	IH 35
DW:	MH	AR	AUS	WILLIAMSON	022	

SUMMARY OF PAVEMENT MARKING ITEMS													
LOCATION	666 6036	666 6042	666 6054	666 6078	666 6300	666 6303	666 6306	666 6315	666 6343	666 6347	666 6350	672 6008	672 6010
	REFL PAV MRK TY I (W) 8" (SLD) (10 OMIL)	REFL PAV MRK TY I (W) 12" (SLD) (1 00MIL)	REFL PAV MRK TY I (W) (ARROW) (10 OMIL)	REFL PAV MRK TY I (W) (WORD) (100 MIL)	RE PM W/RET REQ TY I (W) 4" (BRK) (10 OMIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (10 OMIL)	RE PM W/RET REQ TY I (W) 6" (BRK) (10 OMIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (10 OMIL)	REF PROF PAV MRK TY I (W) 6" (SLD) (1 00MIL)	REF PROF PAV MRK TY I (Y) 6" (SLD) (1 00MIL)	REFL PAV MRK TY I (W) 12" (DOT) (1 00MIL)	REFL PAV MRKR TY I-R	REFL PAV MRKR TY II-C-R
	LF	LF	EA	EA	LF	LF	LF	LF	LF	LF	LF	EA	EA
SIGNING & PVMT MARKS- SHEET 1 OF 12													
SIGNING & PVMT MARKS- SHEET 2 OF 12													
SIGNING & PVMT MARKS- SHEET 3 OF 12												28	
SIGNING & PVMT MARKS- SHEET 4 OF 12													
SIGNING & PVMT MARKS- SHEET 5 OF 12	323	437				162	520		840	1001	102	28	122
SIGNING & PVMT MARKS- SHEET 6 OF 12	609	73	1	1		472	1120	398	2073	2201	534	28	247
SIGNING & PVMT MARKS- SHEET 7 OF 12	536	536	1	1		623	1120	284	1861	2197	453		262
SIGNING & PVMT MARKS- SHEET 8 OF 12	76		1	1			1120		2125	2200	552		217
SIGNING & PVMT MARKS- SHEET 9 OF 12	1342	1182				1205	1120	191	1049	2203	369	28	298
SIGNING & PVMT MARKS- SHEET 10 OF 12			2	1			1120		2204	2204	555		214
SIGNING & PVMT MARKS- SHEET 11 OF 12							940		1834	1834	462		180
SIGNING & PVMT MARKS- SHEET 12 OF 12	423	813	2	1	20	621	460	133	423	908	51		169
SIGNING & PVMT MARKS- INCIDENTALS												28	
PROJECT TOTALS	3309	3041	7	5	20	3083	7520	1006	12409	14748	3078	140	1709

SUMMARY OF SIGNING ITEMS					
LOCATION	416 6007	636 6001	636 6003	644 6004	650 6045
	DRILL SHAFT (54 IN)	ALUMINUM SIGNS (TY A)	ALUMINUM SIGNS (TY O)	IN SM RD SN SUP&AM TY10BWG(1)SA (T)	INS OH SN SUP (40 FT CANT)
	LF	SF	SF	EA	EA
SIGNING & PVMT MARKS- SHEET 1 OF 12					
SIGNING & PVMT MARKS- SHEET 2 OF 12					
SIGNING & PVMT MARKS- SHEET 3 OF 12					
SIGNING & PVMT MARKS- SHEET 4 OF 12				1	
SIGNING & PVMT MARKS- SHEET 5 OF 12					
SIGNING & PVMT MARKS- SHEET 6 OF 12					
SIGNING & PVMT MARKS- SHEET 7 OF 12					
SIGNING & PVMT MARKS- SHEET 8 OF 12	27	18	133.21		1
SIGNING & PVMT MARKS- SHEET 9 OF 12					
SIGNING & PVMT MARKS- SHEET 10 OF 12					
SIGNING & PVMT MARKS- SHEET 11 OF 12					
SIGNING & PVMT MARKS- SHEET 12 OF 12					
PROJECT TOTALS	27	18	133.21	1	1

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

2021
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IH 35
SUMMARY SHEET

SHEET 2 OF 6

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	MM	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY		SHEET NO.
MH	AR	AUS	WILLIAMSON		023

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7/8/2021
mmoton

SUMMARY OF DRAINAGE ITEMS													
LOCATION	400 6005	400 6009	402 6001	464 6005	464 6008	465 6006	465 6535	465 6558	479 6006	496 6007	496 6023	496 6041	496 6069
	CEM STABIL BKFL	CEMENT STAB BACKFILL (INLET OR MH)	TRENCH EXCAVATION PROTECTION	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (36 IN)	JCTBOX (COMPL) (PJB) (4FTX4FT)	INLET (COMPL) (SSB) (10 FT) (FTW)	INL (CMP) (PAZD-CZ) (FG) (3FTX3FT-3FTX3FT)	ADJUSTING INLET (CAP)	REMOV STR (PIPE)	REMOVE STR (JUNCTION BOX)	REMOV STR (LARGE)	REMOV STR (SLOTTED DRAIN INLET)
	CY	CY	LF	LF	LF	EA	EA	EA	EA	LF	EA	EA	LF
STA 1341+00 TO STA 1351+00	8	5	97	69		1	1				1		24
STA 1351+00 TO STA 1361+00	73	63	1000	652			28		1		1		216
STA 1361+00 TO STA 1371+00	5	20	108	39			8						
STA 1371+00 TO STA 1381+00													
STA 1381+00 TO STA 1391+00	53	24	555	474		2	8				2		
STA 1391+00 TO STA 1401+00	54	29	580	482		2	10				2		
STA 1401+00 TO STA 1411+00	21	15	241	185		1	5				1		
STA 1411+00 TO STA 1421+00													
BEGIN PROJECT TO END PROJECT					20			1		20		1	
PROJECT TOTALS	214	156	2581	1901	20	6	60	1	1	20	7	1	240

BRIDGE # 1: MCNEIL ROAD OVR - 14-246-0-0015-09-416									
LOCATION	356 6021	429 6007	429 6009	438 6006	454 6007	454 6009	764 6021	780 6005	780 6010
	PAV JT UNDERSEAL (24")	CONC STR REPAIR (VERTICAL & OVERHEAD)	CONC STR REPAIR (STANDARD)	CLEANING AND SEALING JOINTS (CL 3)	HEADER TYPE EXPANSION JOINT	JOINT SEALANT	SLOTTED DRAIN CLEANING	CNC CRACK REPAIR (DISCRETE) (RO UT)	CNC CRACK REPAIR (DISCRETE) (SU RF SEAL)
	LF	SF	SF	LF	LF	LF	LF	LF	LF
BRIDGE REPAIR - MCNEIL ROAD OVERPASS SHEET 1 OF 2	144	6		144	144	144	180	375	770
BRIDGE REPAIR - MCNEIL ROAD OVERPASS SHEET 2 OF 2	144		12	144	144	144	156	325	770
PROJECT TOTALS	288	6	12	288	288	288	336	700	1540

BRIDGE # 2: LAKE CR BRG - 14-246-0-0015-09-182							
LOCATION	356 6021	428 6001	429 6007	438 6006	454 6007	454 6009	499 6001
	PAV JT UNDERSEAL (24")	PENETRATING CONCRETE SURFACE TREATMENT	CONC STR REPAIR (VERTICAL & OVERHEAD)	CLEANING AND SEALING JOINTS (CL 3)	HEADER TYPE EXPANSION JOINT	JOINT SEALANT	ADJUST STL SHOES
	LF	SY	SF	LF	LF	LF	EA
BRIDGE REPAIR - LAKE CREEK BRIDGE	382	670	30	120	120	120	1
PROJECT TOTALS	382	670	30	120	120	120	1

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**IH 35
SUMMARY SHEET**

SHEET 3 OF 6

DS:	MM	MM	0015	09	194	IH 35
DW:	MH	AR	AUS	WILLIAMSON	024	

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...\\3680_6\037403-Summary-04.dgn

SUMMARY OF ILLUMINATION ITEMS														
LOCATION	416 6029	416 6095	610 6008	610 6009	610 6101	610 6102	610 6214	613 6001	618 6023	618 6024	618 6046	620 6009	620 6010	620 6011
	DRILL SHAFT (RDWY ILL POLE) (30 IN)	DRILL SHAFT (HIGH MAST POLE) (48")	REMOVE RD IL ASM (CTB MOUNT)	REMOVE RD IL ASM (TRANS-BASE)	REPLACE LUMINAIRE W/LED (150W EQ)	REPLACE LUMINAIRE W/LED (250W EQ)	IN RD IL (TY SA) 40T-8 (250W EQ) LED	HI MST IL POLE (100 FT) (80 MPH)	CONDT (PVC) (SCH 40) (2")	CONDT (PVC) (SCH 40) (2") (BORE)	CONDT (PVC) (SCH 80) (2")	ELEC CONDR (NO.6) BARE	ELEC CONDR (NO.6) INSULATED	ELEC CONDR (NO.4) BARE
	LF	LF	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF	LF	LF
ILLUMINATION PLAN- SHEET 1 OF 15		28	1					1	305	45	10	370	740	
ILLUMINATION PLAN- SHEET 2 OF 15		28	4		2	5		1	715	305		1040	2080	
ILLUMINATION PLAN- SHEET 3 OF 15		56	4	1		1		2	920	35		975	1950	
ILLUMINATION PLAN- SHEET 4 OF 15		28	4	2				1	625	35		675	1350	
ILLUMINATION PLAN- SHEET 5 OF 15		56	4	9		10		2	905	200		1125	2250	
ILLUMINATION PLAN- SHEET 6 OF 15		56	4	10		2		2	705	300	10	1040	2080	
ILLUMINATION PLAN- SHEET 7 OF 15		28	4	2		8		1	1190	160	10	1395	2790	
ILLUMINATION PLAN- SHEET 8 OF 15		56	4			12		2	790	55	20	2100	4200	
ILLUMINATION PLAN- SHEET 9 OF 15		28	4	1		5		1	725			730	1460	
ILLUMINATION PLAN- SHEET 10 OF 15		56	4	1		1		2	255	480				750
ILLUMINATION PLAN- SHEET 11 OF 15		28	4	2				1	435	620				1070
ILLUMINATION PLAN- SHEET 12 OF 15	96	28	2			2	12	1	1620	1030	20	1555	3840	1175
ILLUMINATION PLAN- SHEET 13 OF 15												1050	2100	
ILLUMINATION PLAN- SHEET 14 OF 15														
ILLUMINATION PLAN- SHEET 15 OF 15														
PROJECT TOTALS	96	476	43	28	2	46	12	17	9190	3265	70	12055	24840	2995

SUMMARY OF ILLUMINATION ITEMS										
LOCATION	620 6012	624 6002	628 6046	628 6077	6156 6002	6156 6003	6156 6005	6156 6007	6156 6010	6319 6001
	ELEC CONDR (NO.4) INSULATED	GROUND BOX TY A (122311)W/APR ON	ELC SRV TY A 240/480 060 (NS)SS(E)S P(U)	ELC SRV TY A 240/480 100 (NS)SS(E)S P(U)	LED HI MST IL ASM (6 FIXT) (ASYM) (TY A)	LED HI MST IL ASM (6 FIXT) (ASYM) (TY B)	REPLC LED HI MST IL(6 FIXT) (SYM) (TY S)	REPLC LED HI MST IL(6 FIXT) (ASYM) (TY B)	LED HI MST IL AM(6 FIXT)ASYM(TY B)SHLD	LED WRONG WAY DRIVER SYSTEM
	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA
ILLUMINATION PLAN- SHEET 1 OF 15		3	1			1				
ILLUMINATION PLAN- SHEET 2 OF 15		5				1				
ILLUMINATION PLAN- SHEET 3 OF 15		4				2				1
ILLUMINATION PLAN- SHEET 4 OF 15		3							1	1
ILLUMINATION PLAN- SHEET 5 OF 15		4				1			1	
ILLUMINATION PLAN- SHEET 6 OF 15		8	1			2				1
ILLUMINATION PLAN- SHEET 7 OF 15		5	1			1				
ILLUMINATION PLAN- SHEET 8 OF 15		5	1			2				
ILLUMINATION PLAN- SHEET 9 OF 15		1				1				1
ILLUMINATION PLAN- SHEET 10 OF 15	1500	4				1			1	
ILLUMINATION PLAN- SHEET 11 OF 15	2140	3				1				
ILLUMINATION PLAN- SHEET 12 OF 15	2350	15		1		1		1		
ILLUMINATION PLAN- SHEET 13 OF 15								2		1
ILLUMINATION PLAN- SHEET 14 OF 15								2		
ILLUMINATION PLAN- SHEET 15 OF 15							4			
PROJECT TOTALS	5990	60	4	1	3	11	4	5	3	5

BRIDGEFARMER & ASSOCIATES, INC.
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**IH 35
SUMMARY SHEET**

SHEET 4 OF 6

DS: MM	CK: MM	CONT: 0015	SECT: 09	JOB: 194	HIGHWAY: IH 35
DW: MH	CK: AR	DIST: AUS	COUNTY: WILLIAMSON	SHEET NO. 025	

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS												
LOCATION	502 6001	512 6005	512 6053	545 6005	545 6007	662 6060	662 6063	662 6064	662 6067	662 6071	662 6073	662 6095
	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORT CTB (FUR & INST) (F-SHAPE) (TY 1)	PORT CTB (REMOVE) (F-SH APE) (TY 1)	CRASH CUSH ATTEN (REMOVE)	CRASH CUSH ATTEN (INSTL) (L) (N) (TL3)	WK ZN PAV MRK REMOV (W) 4" (BRK)	WK ZN PAV MRK REMOV (W) 4" (SLD)	WK ZN PAV MRK REMOV (W) 6" (BRK)	WK ZN PAV MRK REMOV (W) 6" (SLD)	WK ZN PAV MRK REMOV (W) 8" (SLD)	WK ZN PAV MRK REMOV (W) 12" (SLD)	WK ZN PAV MRK REMOV (Y) 4" (SLD)
	MO	LF	LF	EA	EA	LF	LF	LF	LF	LF	LF	LF
TCP- PHASE 1- SHEET 1 OF 6												
TCP- PHASE 1- SHEET 2 OF 6		1740	1740			1610	3215			780	105	3215
TCP- PHASE 1- SHEET 3 OF 6		4440	4440			2210	4530			1440	435	4535
TCP- PHASE 1- SHEET 4 OF 6		4440	4440			2210	4405			1570	975	4410
TCP- PHASE 1- SHEET 5 OF 6		1620	1620	1	1	740	1470					1470
TCP- PHASE 1- SHEET 6 OF 6												
BEGIN PROJECT TO END PROJECT	21					20	3083	7520	12409	3309	3041	1006
PROJECT TOTALS	21	12240	12240	1	1	6790	16703	7520	12409	7099	4556	14636

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS							
LOCATION	662 6098	662 6123	6001 6002	6185 6002	6185 6005	6302 6004	6307 6002
	WK ZN PAV MRK REMOV (Y) 6" (SLD)	WK ZN PAV MRK REMOV (W) 12" (DOT)	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)	TEMP Q-DETECT (TY2) (2 SYS)	TEMP SPEED MONITOR (2 SYS)
	LF	LF	EA	DAY	DAY	DAY	DAY
TCP- PHASE 1- SHEET 1 OF 6							
TCP- PHASE 1- SHEET 2 OF 6		387					
TCP- PHASE 1- SHEET 3 OF 6		441					
TCP- PHASE 1- SHEET 4 OF 6		378					
TCP- PHASE 1- SHEET 5 OF 6		276					
TCP- PHASE 1- SHEET 6 OF 6							
BEGIN PROJECT TO END PROJECT	14748	3078	2	388	86	326	326
PROJECT TOTALS	14748	4560	2	388	86	326	326

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**IH 35
SUMMARY SHEET**

SHEET 5 OF 6

DS:	MM	MM	0015	09	194	IH 35
DW:	MH	AR	AUS	WILLIAMSON	026	

SUMMARY OF EROSION CONTROL ITEMS						
LOCATION	506	506	506	506	506	506
	6003	6011	6038	6039	6041	6043
	ROCK FILTER DAMS (INSTALL) (TY 3)	ROCK FILTER DAMS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
	LF	LF	LF	LF	LF	LF
SW3P SITE MAP- SHEET 1 OF 12			200	200		
SW3P SITE MAP- SHEET 2 OF 12			890	890		
SW3P SITE MAP- SHEET 3 OF 12			940	940	125	125
SW3P SITE MAP- SHEET 4 OF 12	40	40	675	675	55	55
SW3P SITE MAP- SHEET 5 OF 12			845	845	100	100
SW3P SITE MAP- SHEET 6 OF 12	85	85	1050	1050	35	35
SW3P SITE MAP- SHEET 7 OF 12			890	890	70	70
SW3P SITE MAP- SHEET 8 OF 12			815	815		
SW3P SITE MAP- SHEET 9 OF 12			590	590		
SW3P SITE MAP- SHEET 10 OF 12					70	70
SW3P SITE MAP- SHEET 11 OF 12			460	460	70	70
SW3P SITE MAP- SHEET 12 OF 12			1400	1400		
PROJECT TOTALS	125	125	8755	8755	525	525

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IH 35
SUMMARY SHEET

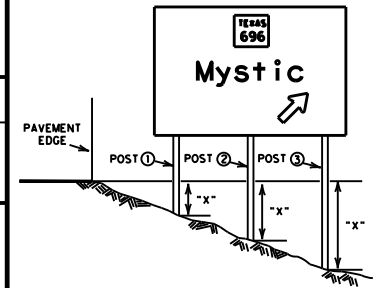
SHEET 6 OF 6

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	MM	0015	09	194	IH 35
DW:	CK:	DIST		COUNTY	SHEET NO.
MH	AR	AUS		WILLIAMSON	027

SUMMARY OF LARGE SIGNS

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PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION			GALVANIZED STRUCTURAL STEEL				DRILLED SHAFT					
					DIRECT APPLY	* ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post 1	post 2	post 3	SIZE	LINEAR FEET			TOTAL WEIGHT LBS.	LINEAR FEET REINFORCED				
8	1	GREEN	TxTag	36" X 36"		9		9														
			PAY BY MAIL	36" X 36"		9		9														
			EXIT 250	102" X 30"				21.25														
			TOLL ROAD	123" X 24"				20.50														
			45 TOLL , 1 TOLL																			
			1 MILE	123" X 86"				73.46														
PAGE TOTALS						18		133.21														
PAGE TOTALS																						



⊙ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

Wind Design Zone

Series No.

- 0 Aluminum/Fiberglass
- 1 Aluminum
- 2 Fiberglass

SIGN TYPE 1 3 0

No. of Posts

See sheet SMD(8W1)

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IH 35 SUMMARY OF LARGE SIGN

SHEET 1 OF 1

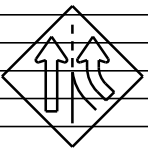
DS:	CONT:	SECT:	JOB:	HIGHWAY:
MH	MM	0015	09	194
DW:	DIST:	COUNTY:	SHEET NO.	
MH	AR	AUS	WILLIAMSON	
				028

SUMMARY OF SMALL SIGNS

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PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80		1 or 2			UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic
4	1	W4-3R	 W4-3R	48x48	X		10BWG	1	SA	T	-	-

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).

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IH 35 SUMMARY OF SMALL SIGNS

SHEET 1 OF 1

DS:	CONT	SECT	JOB	HIGHWAY
MH	MM	0015	09 194	IH 35
DW:	DIST	COUNTY		SHEET NO.
MH	AR	AUS	WILLIAMSON	029A

LOC NO.	TCP PHASE	SPECIFIC TCP PLAN SHEET OR TCP STANDARD SHEET SHEET NUMBER					6185 6002	6185 6005
			FURNISH TMA/TA	RELOCATE/REUSE TMA/TA	TOTAL TMA/TA PER SET UP	DURATION OF TMA/TA SET UP	TMA (STATIONARY)	TMA (MOBILE OPERATION)
			EA	EA	EA	DAYS PER TMA/TA USE	DAY	DAY
X	X	TCP-PHASE 1 STEPS 1-3	2	2	2	149	298	
X	X	TCP-PHASE 1 STEP 4	2	2	2	45	90	
X	X	TCP-PHASE 2 STEP 1	2	2	2	43		86
TOTALS							388	86

NOTE.
 FURNISH TMA/TA - THE NUMBER OF ATTENUATORS BEING FURNISHED FOR THE SPECIFIC TCP.
 RELOCATE/REUSE TMA/TA - THE NUMBER OF ATTENUATORS BEING REUSED FROM A PREVIOUS TCP FOR THE SPECIFIC TCP.
 TOTAL TMA/TA PER SET UP = (FURNISH TMA/TA) + (RELOCATE/REUSE TMA/TA)
 DURATION OF TMA/TA SET UP - THE NUMBER OF DAYS THE ATTENUATORS WILL BE USED FOR THE SPECIFIC TCP.
 TMA/TA (STATIONARY) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)
 TMA/TA (MOBILE OPERATION) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)

TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA) SUMMARY SHEET

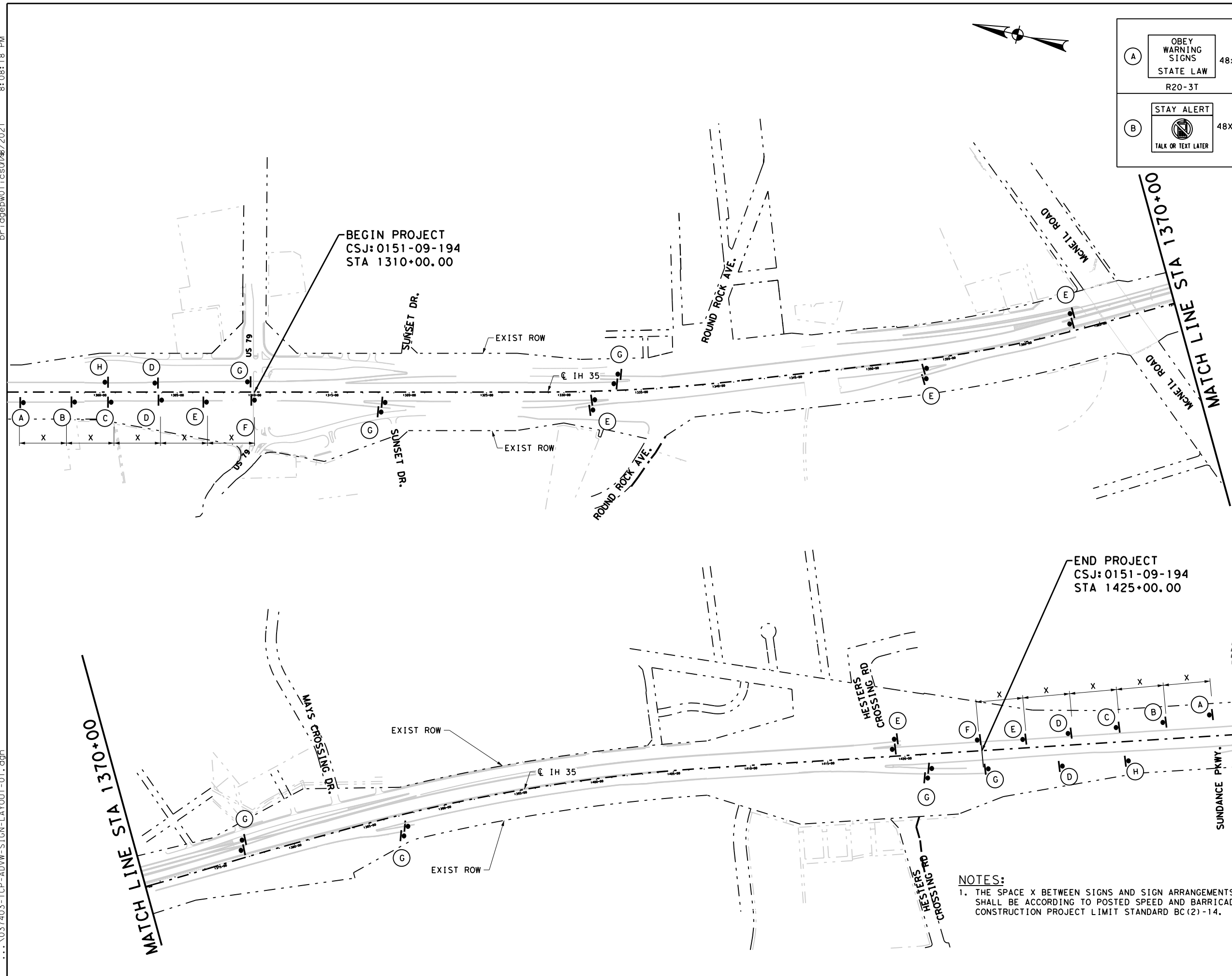
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 TBPE REGISTRATION NO. 264

2021
 Texas Department of Transportation

IH 35
**TMA AND TA
 SUMMARY
 SHEET**

SHEET 1 OF 1

DS:	CK1	CONT	SECT	JOB	HIGHWAY
DS	CK1	0015	09	194	IH 35
DW:	CK2	DIST	COUNTY	SHEET NO.	
DW	CK2	AUS	WILLIAMSON	029B	



NOTES:
1. THE SPACE X BETWEEN SIGNS AND SIGN ARRANGEMENTS SHALL BE ACCORDING TO POSTED SPEED AND BARRICADE CONSTRUCTION PROJECT LIMIT STANDARD BC(2)-14.

(A) 48x42	(C) 36x30
(B) 48X60	(C) 36x36
	(C) 36x18
	(D) PORTABLE SWZ UNIT
	(E) 48x48 CW20-1D
	(F) 48x30 48x30
	(G) 48x24 G20-2
	(H) 48x24 G20-2bT

STATE OF TEXAS
MANSUR R. MOTON
111594
LICENSED PROFESSIONAL ENGINEER
Mansur R. Moton
07.08.2021

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
TRAFFIC CONTROL
ADVANCED SIGNING**

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MH	MM	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
MH	AR	AUS	WILLIAMSON	030	

5:39:10 PM
 7/8/2021
 CWM
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THE FOLLOWING SEQUENCE OF WORK IS THE METHOD OF PROSECUTION OF THE CONSTRUCTION ACTIVITIES OF THIS PROJECT. THIS SEQUENCE OF WORK MAY BE REVISED WITH THE APPROVAL OF THE ENGINEER.

GENERAL

1. INSTALL ALL ENVIRONMENTAL BMP'S AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER PRIOR TO ANY CONSTRUCTION ACTIVITIES.
2. MAINTAIN POSITIVE DRAINAGE DURING CONSTRUCTION.
3. CONTRACTOR SHALL ORDER HIGH MAST ILLUMINATION POLES UPON RECEIVING EXECUTED CONTRACT.

SUGGESTED SEQUENCE OF CONSTRUCTION

PHASE 1 STEP 1

1. SET BARRICADES AND ADVANCE WARNING SIGNS
2. INSTALL AND MAINTAIN STORM WATER POLLUTION PREVENTION PLAN ITEMS

ROADWAY

1. ELIMINATE EXISTING PAVEMENT MARKINGS ALONG THE SOUTHBOUND (SB) AND NORTHBOUND (NB) MAINLANES. EXISTING PAVEMENT MARKING REMOVAL SHALL BE COMPLETED USING WATER BLASTING.
 - A. SB PAVEMENT MARKING REMOVAL LIMITS ARE FROM STA. 1340+00.00 TO STA. 1407+31.47.
 - B. NB PAVEMENT MARKING REMOVAL LIMITS ARE FROM STA. 1340+00.00 TO STA. 1407+31.47.
2. INSTALL WORK ZONE PAVEMENT MARKINGS ALONG THE NB AND SB MAINLANES.
 - A. REMOVABLE BUTTONS SHALL BE USED IN PLACE OF WORK ZONE PAVEMENT MARKINGS.
3. INSTALL PCTB ALONG THE NB AND SB MAINLANES AS SHOWN IN THE PLANS.

PHASE 1 STEP 2

ROADWAY

1. REMOVE EXISTING CENTER MEDIAN BARRIER BETWEEN STA. 1348+00.00 TO STA. 1404+50.00.

DRAINAGE

1. REMOVE EXISTING SLOT DRAIN INLETS, JUNCTION BOXES AND DRAINAGE PIPES AS SHOWN IN THE PLANS.
2. CONSTRUCT PROPOSED DRAINAGE LINES AND MEDIAN BARRIER INLETS ALONG IH 35 AS SHOWN IN THE PLANS.
 - A. PROPOSED DRAINAGE SYSTEM SHALL BE FULLY FUNCTIONAL PRIOR TO CONTINUING ROADWAY CONSTRUCTION.
 - B. POSITIVE DRAINAGE SHALL BE MAINTAIN DURING THE CONSTRUCTION OF THE DRAINAGE SYSTEM.

ILLUMINATION

1. INSTALL ILLUMINATION POLE FOUNDATION, CONDUIT RUN AND GROUND BOXES AS SHOWN IN THE PLANS.

PHASE 1 STEP 3

ROADWAY

1. CONSTRUCT THE SB PAVEMENT WIDENING.
2. CONSTRUCT CONCRETE TRAFFIC BARRIER ALONG THE MEDIAN AS SHOWN IN THE PLANS.

ILLUMINATION

1. INSTALL HIGH MAST POLES AND LUMINAIRES.
2. INSTALL CABLE IN CONDUITS AND POWER POLES.

PHASE 1 STEP 4

BRIDGE

1. PERFORM BRIDGE REPAIRS ALONG LAKE CREEK BRIDGE AND MCNEIL ROAD OVERPASS.

PHASE 2 STEP 1

GENERAL

1. CONSTRUCTION FOR THE SUBSEQUENT PHASE AND STEP SHALL BE DONE USING NIGHTLY LANE CLOSURES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. LANE CLOSURES SHALL BE DONE IN ACCORDANCE WITH APPLICABLE TCP STANDARDS.
3. NO LANE CLOSURES WILL BE PERMITTED DURING NATIONAL HOLIDAYS.

PHASE 2 STEP 1 CONTINUED

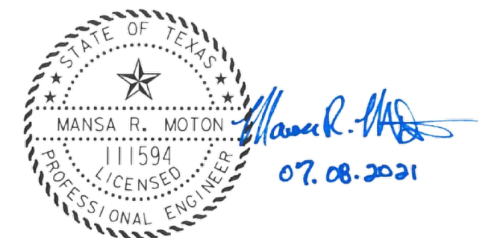
ROADWAY

1. PERFORM MILLING OPERATIONS.
 - A. MILL 2-INCHES EXISTING ASPHALTIC CONCRETE PAVEMENT ALONG TO SB MAINLANES. MILLING ON LAKE CREEK AND MCNEIL ROAD BRIDGE SHOULD BE DONE TO THE BRIDGE DECK. LAKE CREEK BRIDGE LIMITS ARE FROM STA. 1345+52.57 TO STA. 1347+74.57. MCNEIL BRIDGE LIMITS ARE FROM STA. 1363+26.00 TO STA. 1370+27.00.
 - a. EXISTING ASPHALTIC CONCRETE PAVEMENT ALONG THE BRIDGE DECK IS AT VARIABLE DEPTHS.
 - B. INSTALL WORK ZONE PAVEMENT MARKINGS ALONG THE SB MAINLANES.
 - a. WORK ZONE PAVEMENT MARKINGS SHALL BE INSTALLED TO ALIGN WITH THE PROPOSED CONFIGURATION AS SHOWN IN THE PLANS.
2. INSTALL WORK ZONE PAVEMENT MARKINGS ALONG THE NB MAINLANES.
 - A. REMOVABLE BUTTONS SHALL BE USED IN PLACE OF WORK ZONE PAVEMENT MARKINGS.
 - B. WORK ZONE PAVEMENT MARKINGS SHALL BE INSTALLED TO ALIGN WITH THE PROPOSED CONFIGURATION AS SHOWN IN THE PLANS.
3. INSTALL, RELOCATE, AND REMOVE EXISTING LARGE GUIDE SIGNS AND SMALL SIGNS AS SHOWN IN THE PLANS.
4. REMOVE AND INSTALL METAL BEAM GUARD FENCE (MBGF) AS SHOWN IN THE PLANS.
5. PERFORM OVERLAY OPERATION
 - A. PLACE BONDING COURSE ON TOP OF THE MILLED ASPHALTIC CONCRETE PAVEMENT SURFACE.
 - B. AFTER THE BONDING COURSE, PERFORM PAVEMENT OVERLAY. OVERLAY IS TO BE DONE IN ACCORDANCE WITH THE STONE-MATRIX ASPHALT (SMA) STANDARD SPECIFICATIONS.
 - a. FINAL PAVEMENT JOINTS SHALL LINE UP WITH THE FINAL PROPOSED LANE CONFIGURATION.
 - C. INSTALL SHORT TERM PAVEMENT MARKINGS AFTER PLACEMENT OF THE OVERLAY. REMOVABLE BUTTONS SHALL BE USED IN PLACE OF SHORT TERM PAVEMENT MARKINGS. SHORT TERM MARKINGS SHALL BE PLACED TO THE PROPOSED CONFIGURATION.
6. INSTALL PERMANENT PAVEMENT MARKINGS. SHORT TERM PAVEMENT MARKINGS SHALL BE REPLACED BY PERMANENT MARKINGS NO LATER THAN 14 CALENDAR DAYS FOLLOWING PLACEMENT OF THE SURFACE.

PHASE 2 STEP 2

GENERAL

1. REMOVE SW3P DEVICES
2. FINAL CLEAN UP
3. REMOVE BARRICADES AND WARNING SIGNS.



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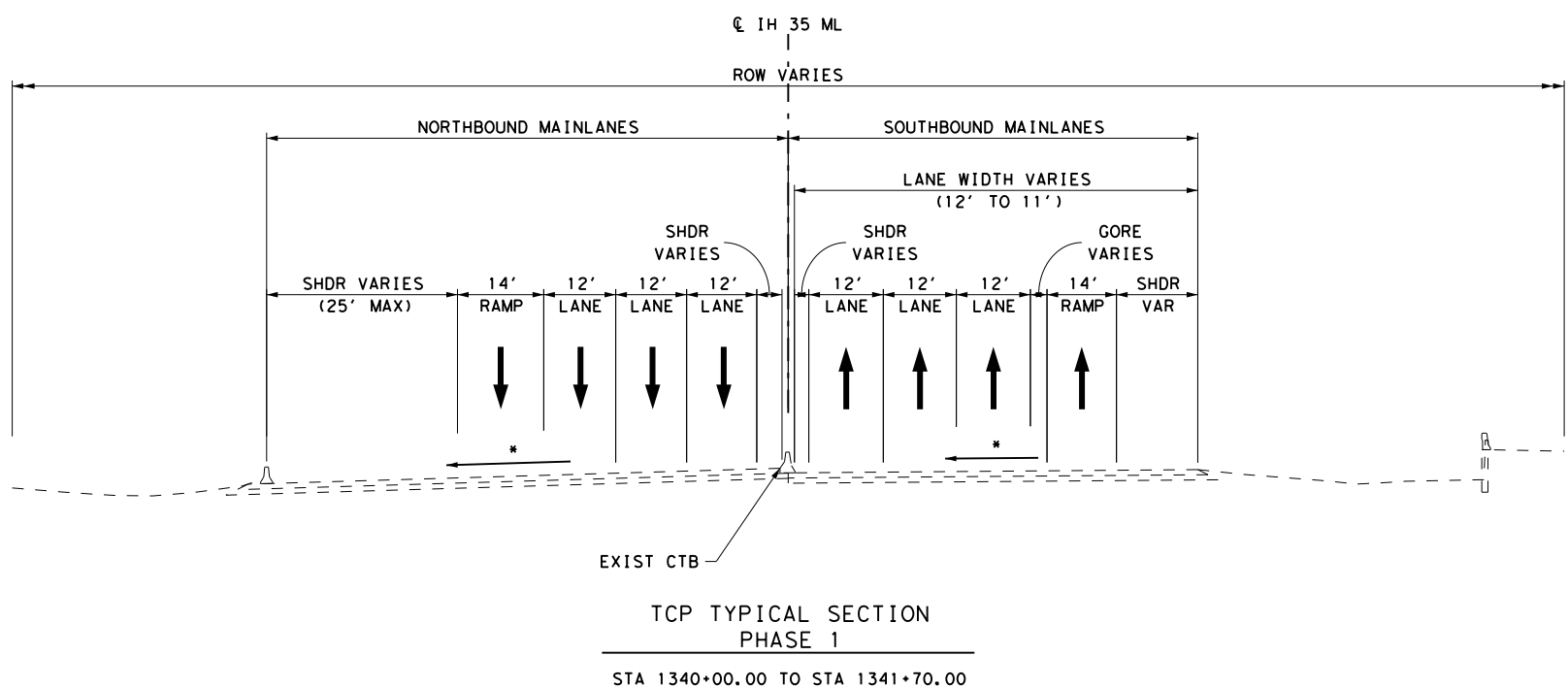
**IH 35
 TRAFFIC CONTROL
 PLAN
 NARRATIVE**

SHEET 1 OF 1

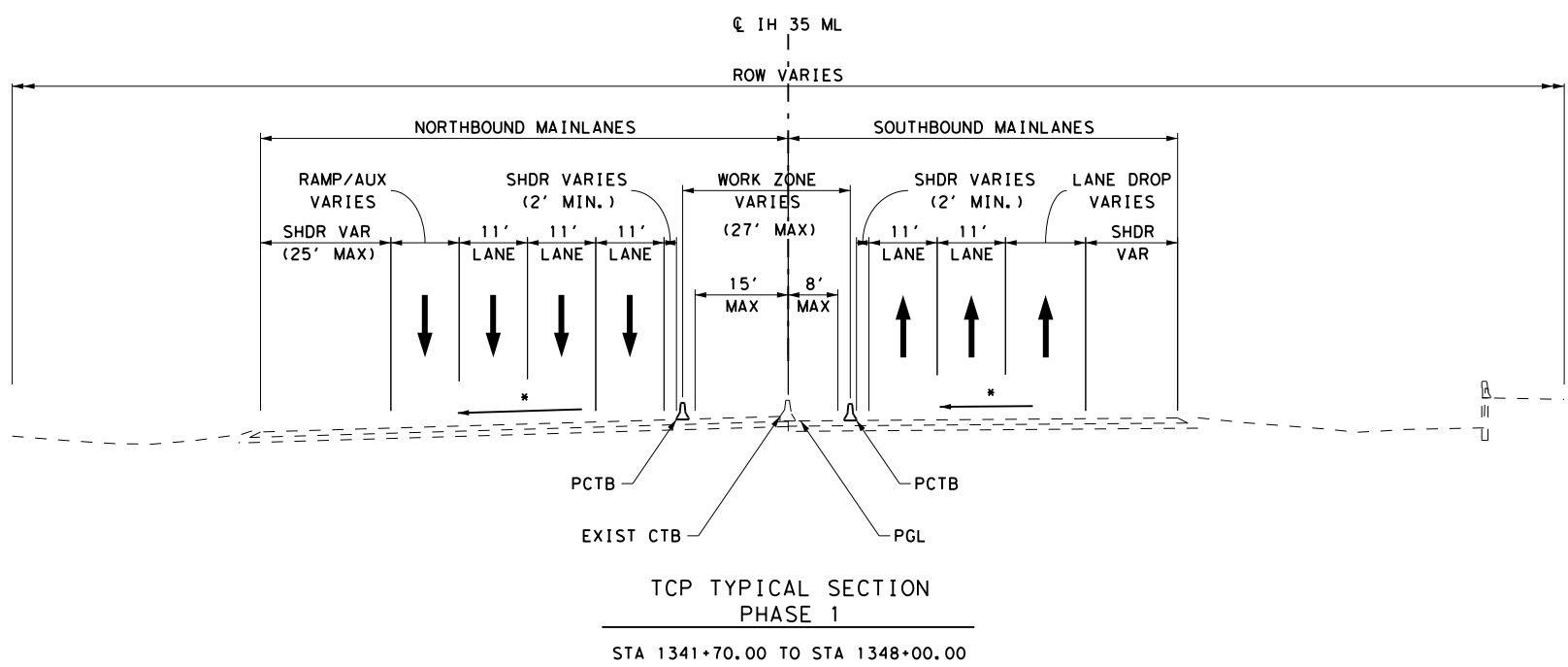
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TCP TYPICAL SECTION
PHASE 1
STA 1340+00.00 TO STA 1341+70.00



TCP TYPICAL SECTION
PHASE 1
STA 1341+70.00 TO STA 1348+00.00

NOTES:

1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
 2. REFER TO THE EXISTING SUPERELEVATION DATA TABLE AND THE DESIGN CROSS SECTIONS FOR ADDITIONAL INFORMATION.
 3. EXISTING PAVEMENT CROSS SLOPES AND TRANSITIONS SHOWN ARE BASED ON AS-BUILTS AND ARE PROVIDED FOR INFORMATION ONLY. ALL PAVEMENT WIDENING SHALL MATCH THE CROSS SLOPE OF THE EXISTING PAVEMENT ADJACENT TO THE WIDENING. CONTRACTOR SHALL FIELD VERIFY EXISTING PAVEMENT ELEVATION AND CROSS SLOPE PRIOR TO WIDENING. FIELD VERIFICATION IS SUBSIDIARY TO ROADWAY QUANTITIES.
 4. SEE BRIDGE LAYOUT SHEETS FOR BRIDGE LIMITS AND ADDITIONAL DETAILS.
 5. SAWCUT LOCATION IS 2' OFFSET FROM FACE OF EXISTING CONCRETE TRAFFIC BARRIER. SAWCUT LOCATION IS PGL TO BE USED FOR CONSTRUCTION.
 6. REFER TO TRAFFIC CONTROL PLAN FOR ADDITIONAL STRIPING DETAILS.
- * MATCH EXISTING ROADWAY SLOPE



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2021
Texas Department of Transportation

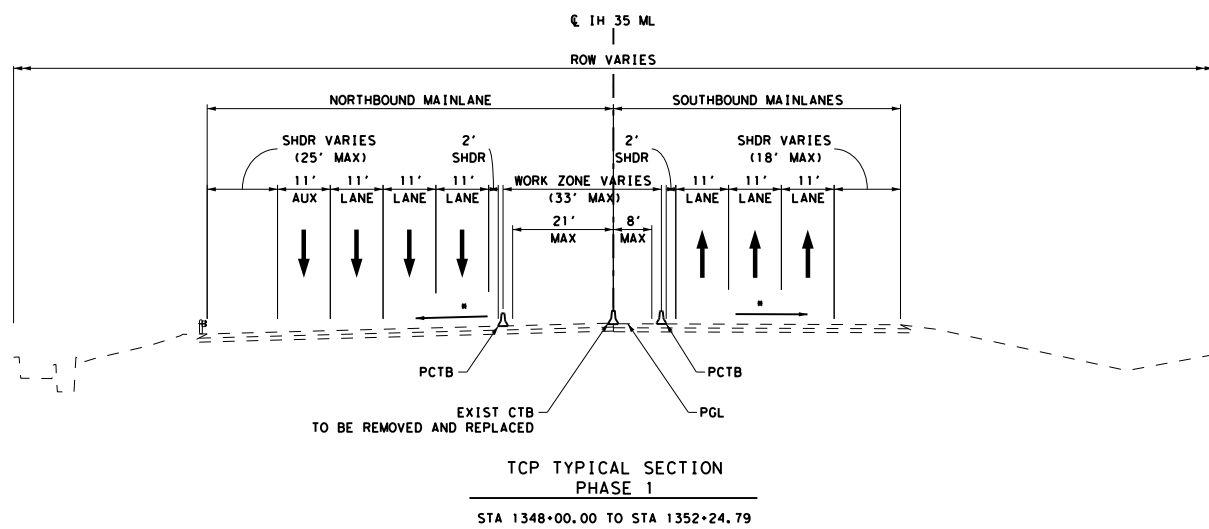
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TCP
TYPICAL SECTIONS**

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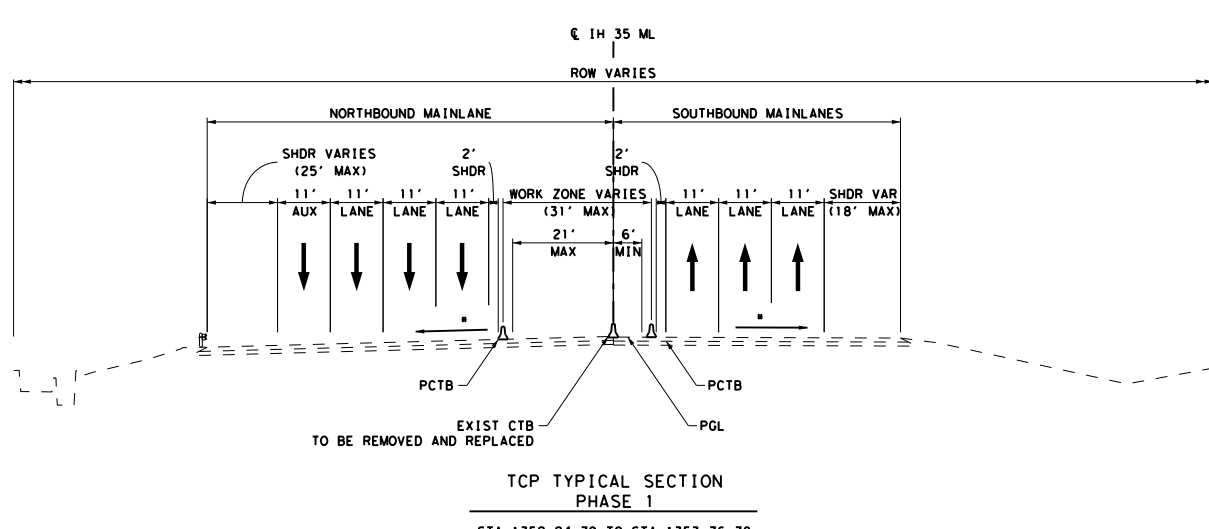
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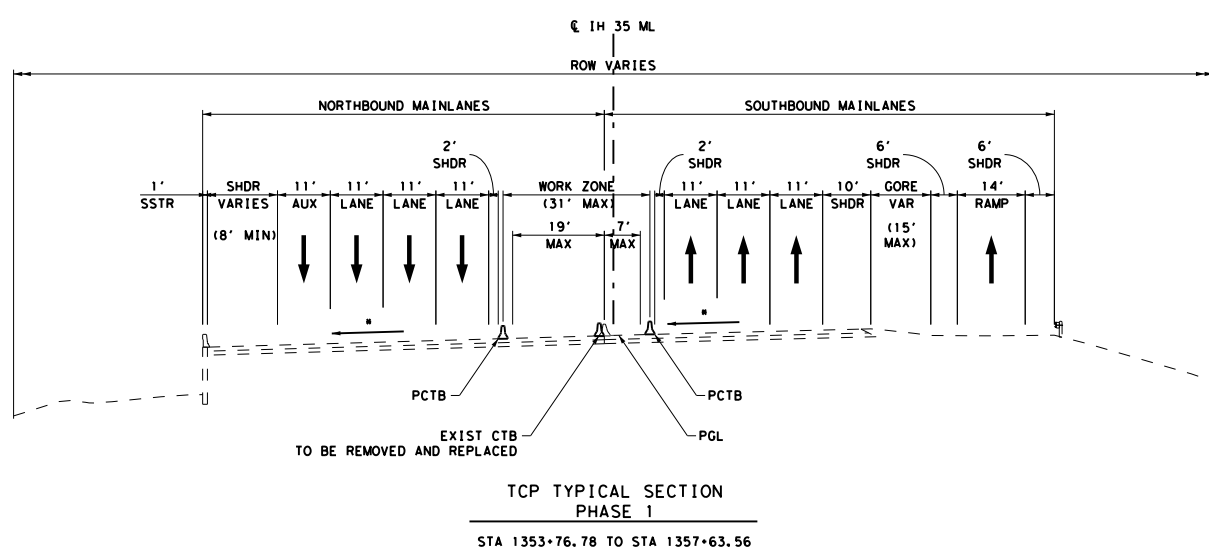
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TCP TYPICAL SECTION
PHASE 1
STA 1348+00.00 TO STA 1352+24.79



TCP TYPICAL SECTION
PHASE 1
STA 1352+24.79 TO STA 1353+76.78



TCP TYPICAL SECTION
PHASE 1
STA 1353+76.78 TO STA 1357+63.56

NOTES:

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- * MATCH EXISTING ROADWAY SLOPE



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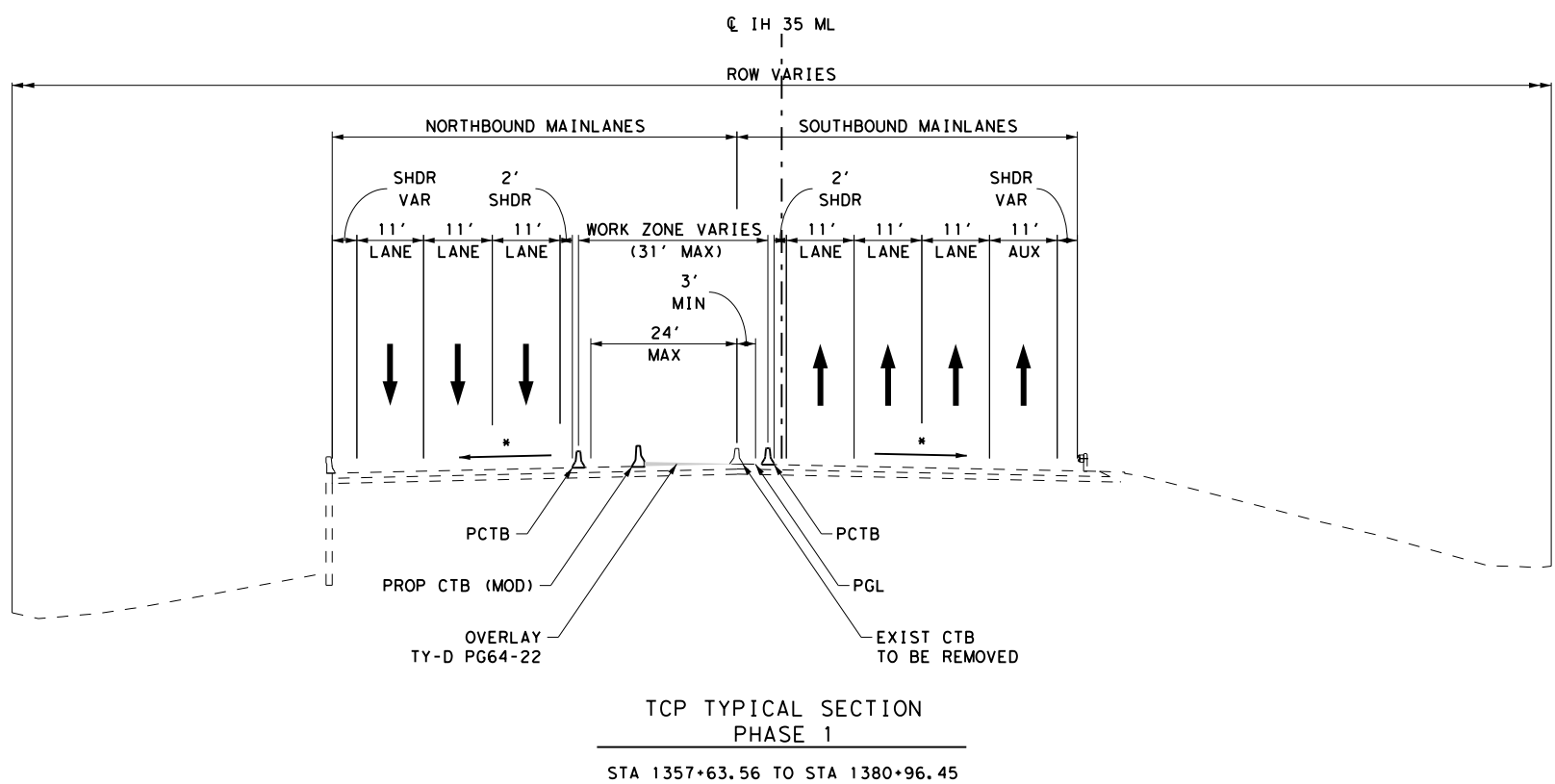
2021
Texas Department of Transportation

**IH 35
TCP
TYPICAL SECTIONS**

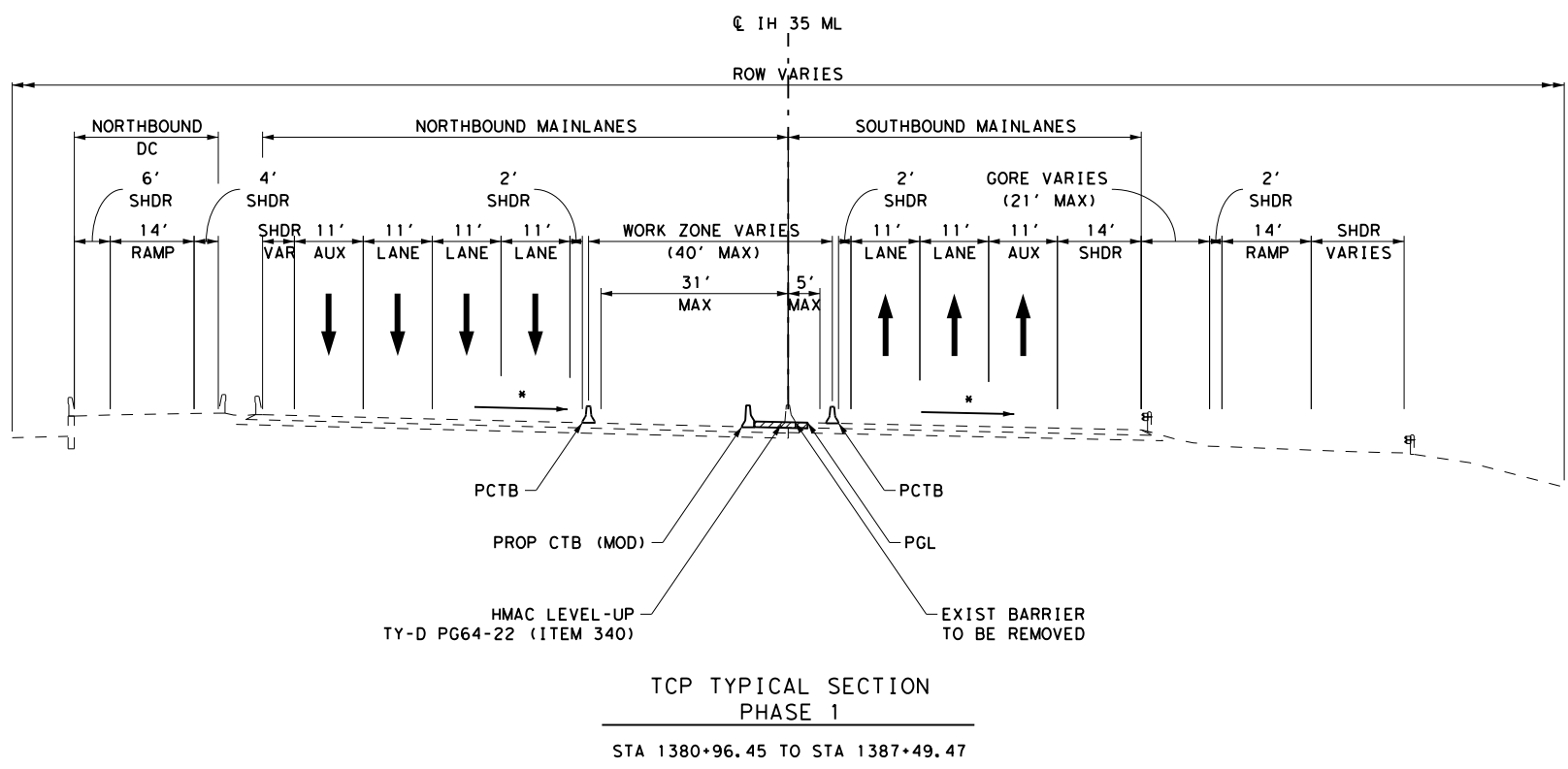
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- NOTES:**
1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
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- * MATCH EXISTING ROADWAY SLOPE



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**IH 35
TCP
TYPICAL SECTIONS**

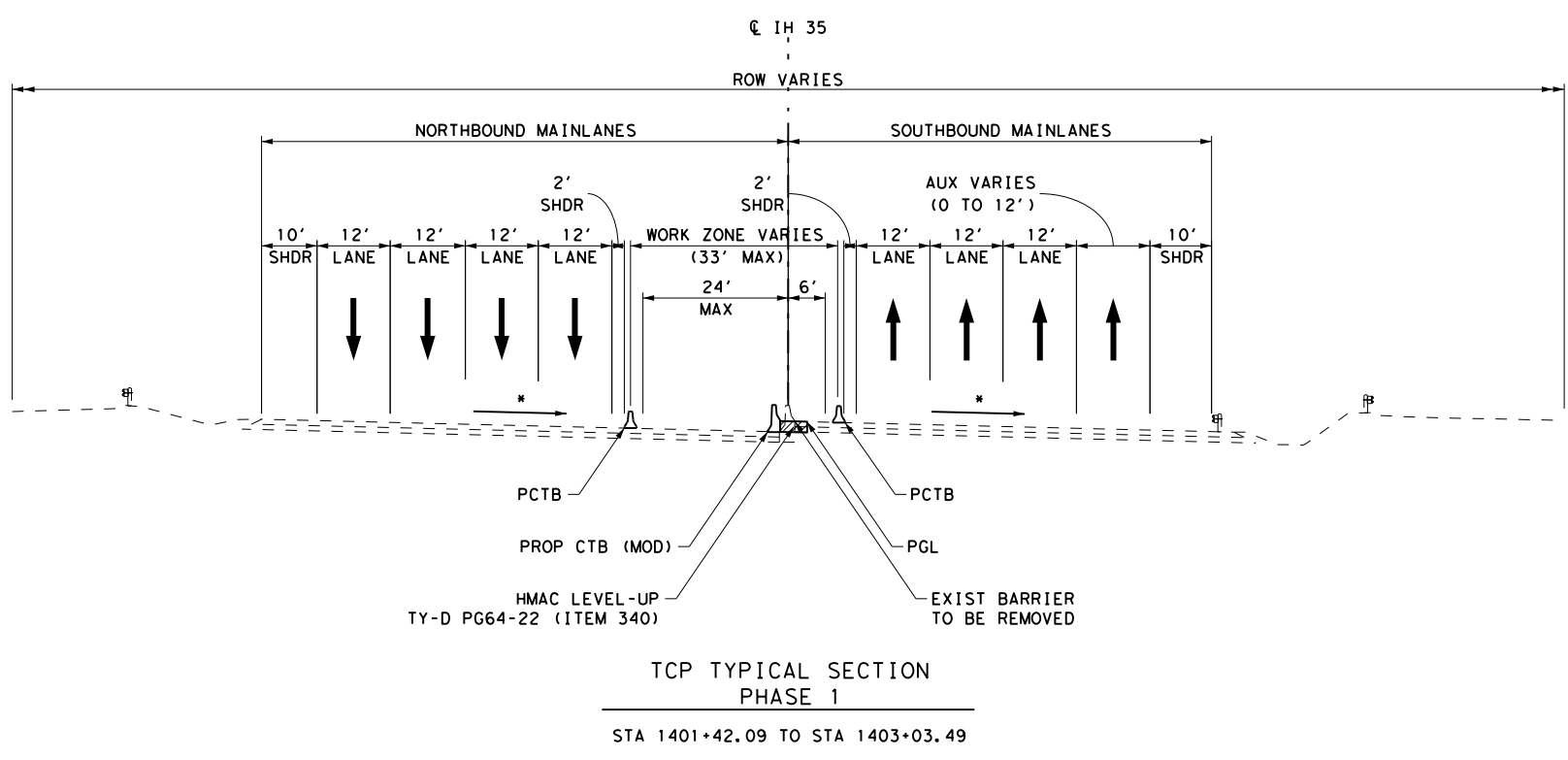
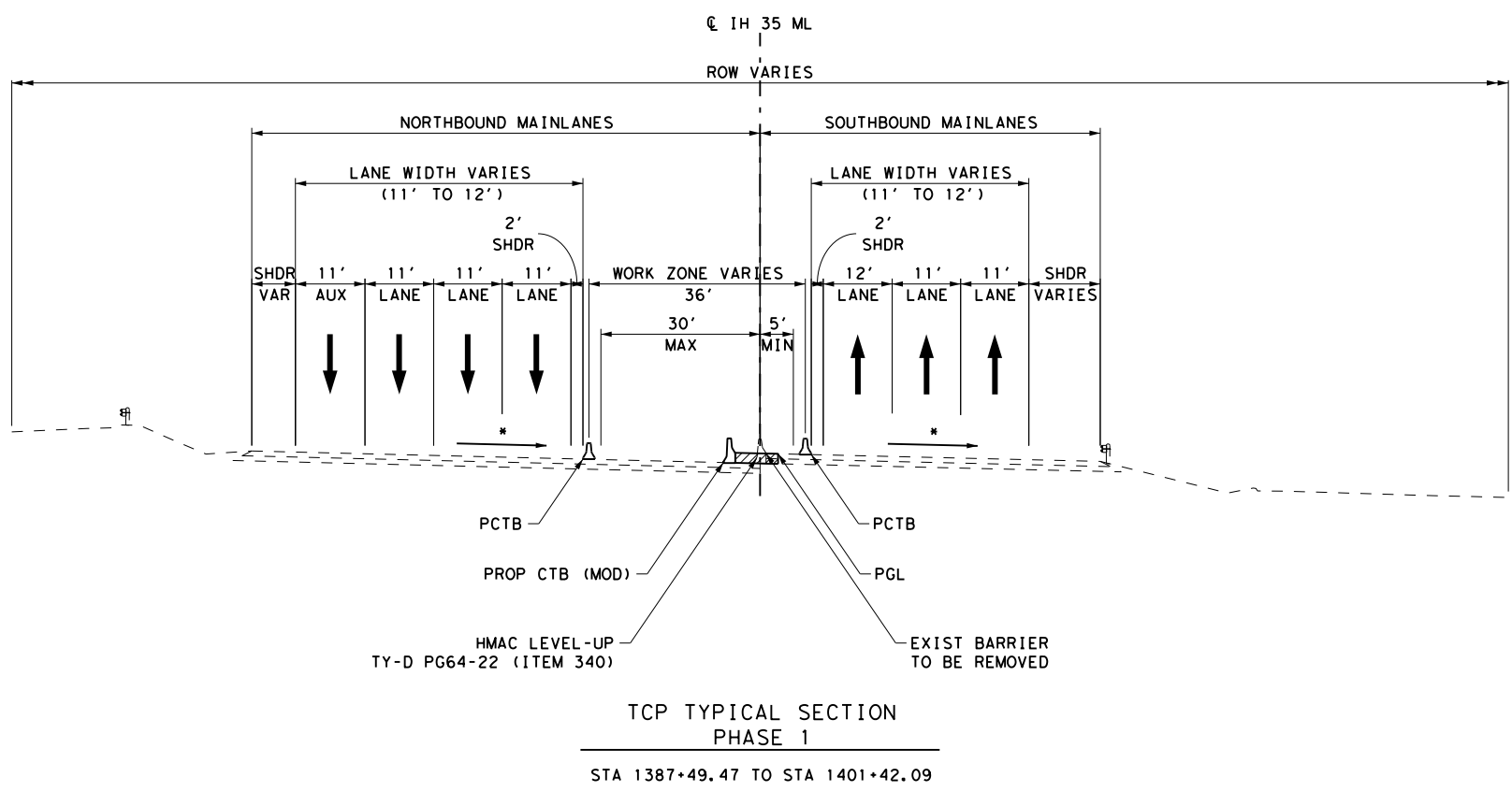
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- NOTES:**
1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
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- * MATCH EXISTING ROADWAY SLOPE



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2021
Texas Department of Transportation

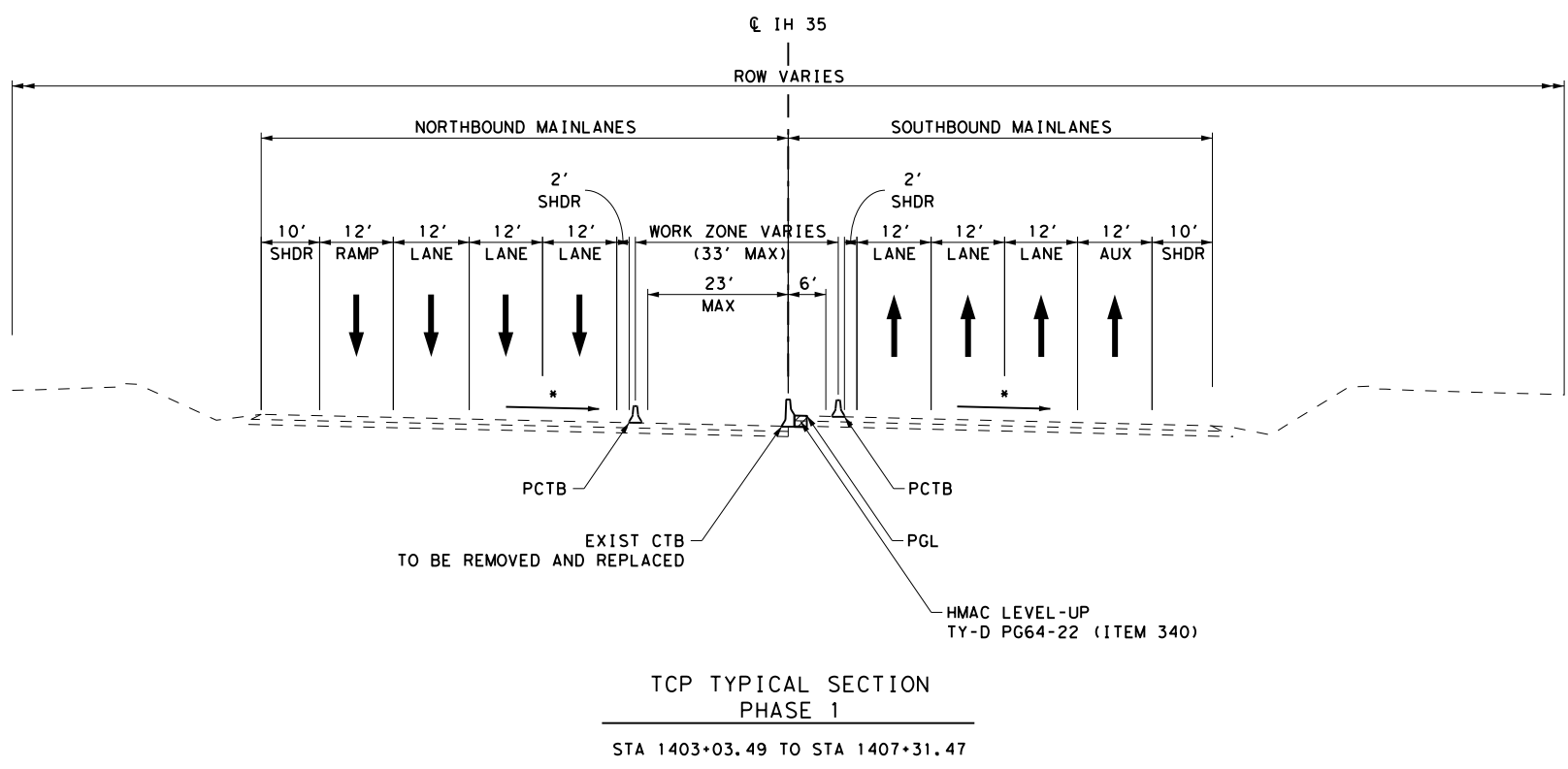
**IH 35
TCP
TYPICAL SECTIONS**

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- NOTES:**
1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
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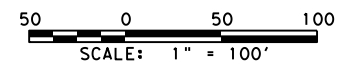
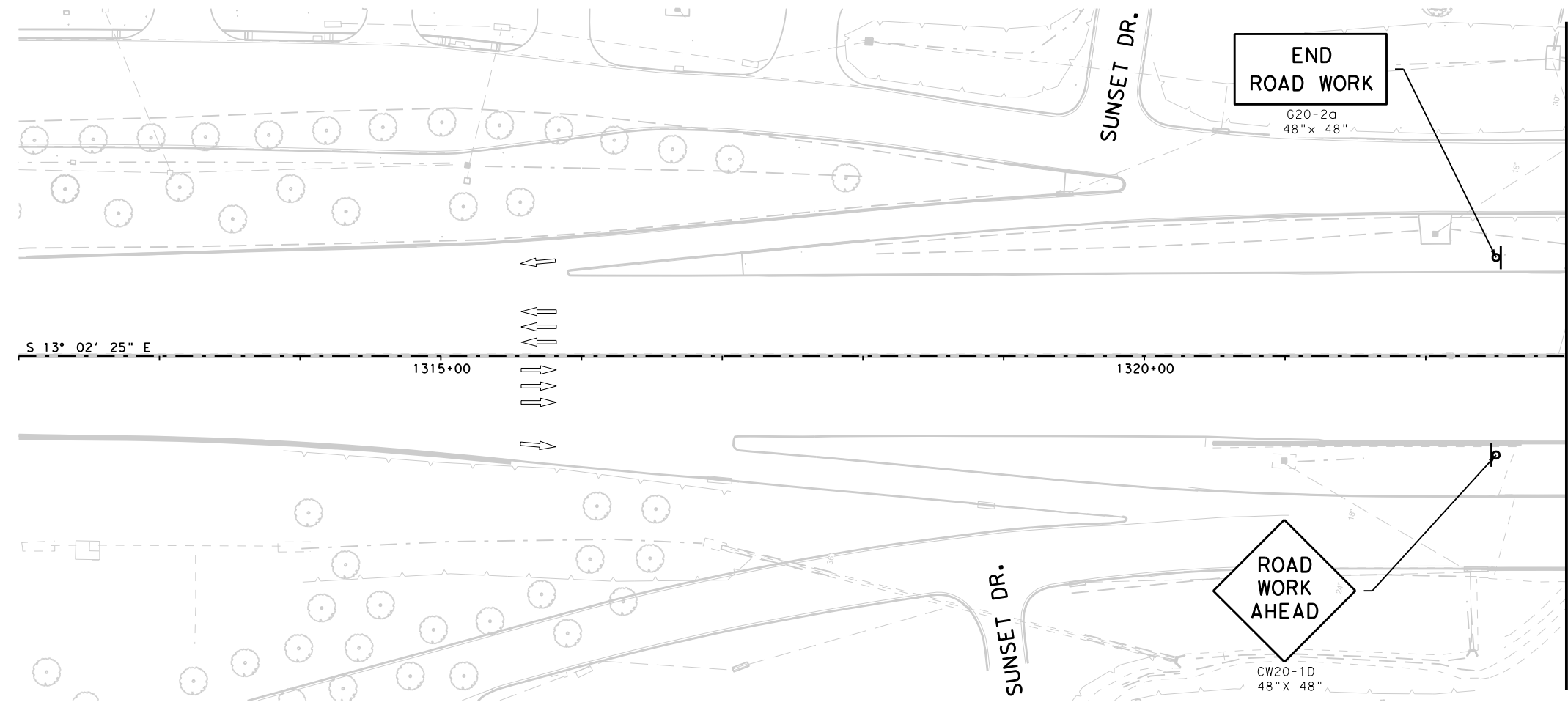
I H 35
TCP
TYPICAL SECTIONS

SCALE: NTS SHEET 5 OF 5

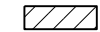




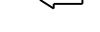









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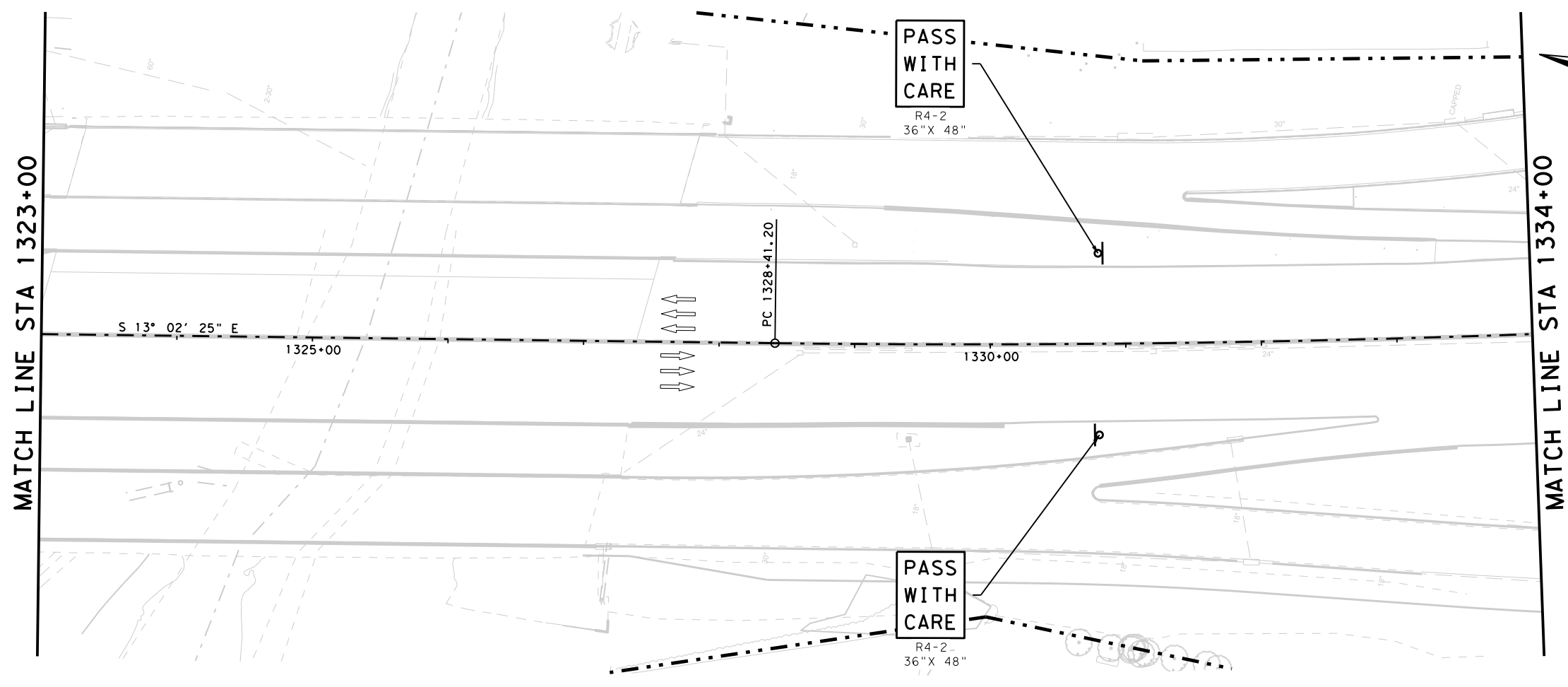
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LEGEND

-  CONSTRUCTION WORK ZONE
-  TRAILER MOUNTED FLASHING ARROW BOARD
-  PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
-  DRUM (CHANNELIZING DEVICES)
-  EXIST TRAFFIC FLOW
-  PROP TRAFFIC FLOW
-  SIGN
-  TYPE 3 BARRICADE
-  CONSTRUCT CONC TRAF BARRIER (PCTB)
-  4" WHITE SOLID (REMOVABLE)
-  4" YELLOW SOLID (REMOVABLE)
-  4" WHITE BROKEN (REMOVABLE) (W/TY II-C-R @ 80' SPACING)
-  8" WHITE SOLID (REMOVABLE)
-  12" WHITE DOTTED (REMOVABLE)
-  12" WHITE SOLID (REMOVABLE)



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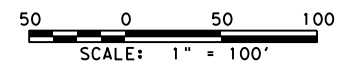
**IH 35
TRAFFIC
CONTROL PLAN
PHASE 1**

SCALE: 1" = 100' SHEET 1 OF 6

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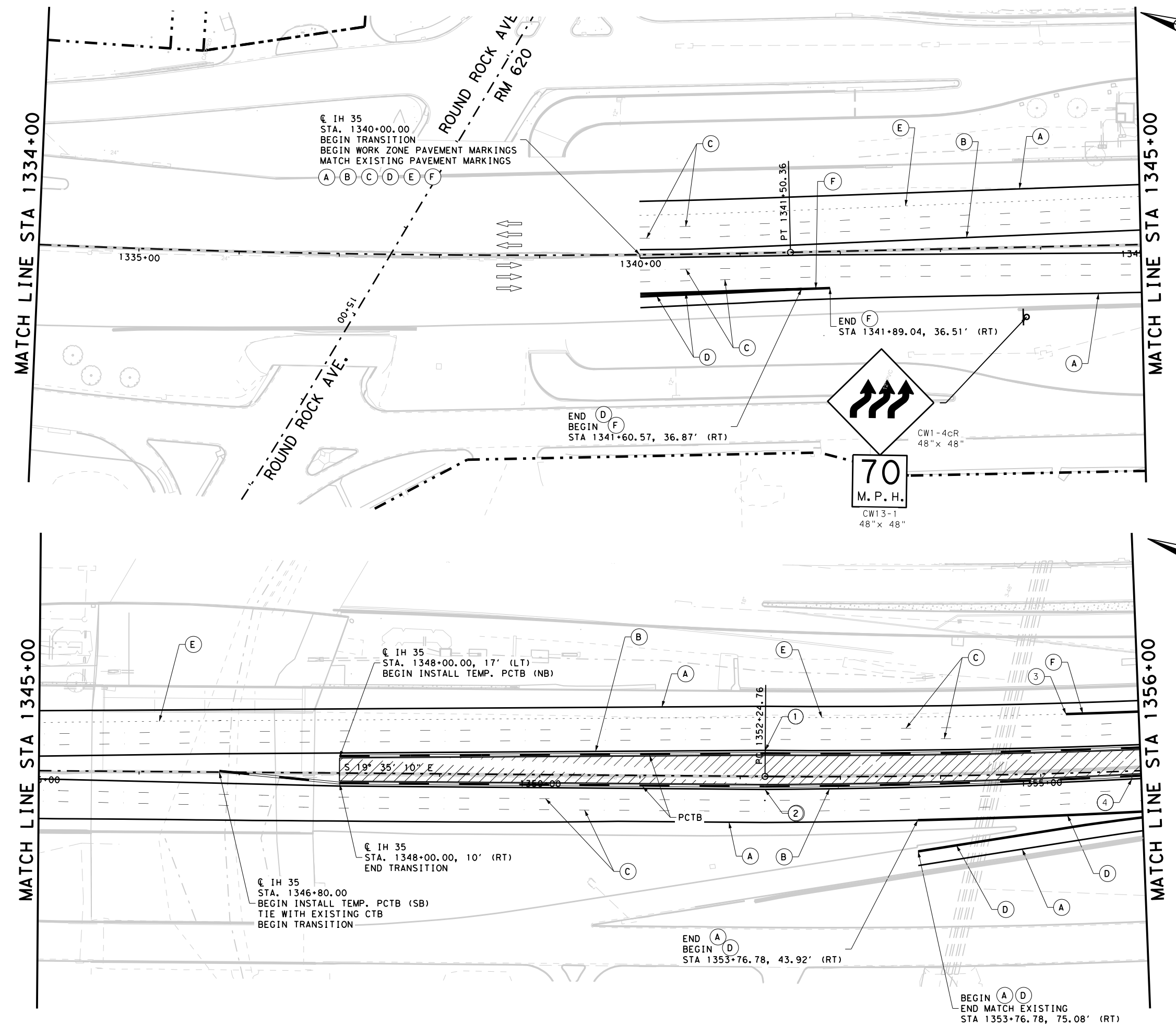
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LEGEND

- CONSTRUCTION WORK ZONE
- TRAILER MOUNTED FLASHING ARROW BOARD
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- DRUM (CHANNELIZING DEVICES)
- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW
- SIGN
- TYPE 3 BARRIcade
- CONSTRUCT CONC TRAF BARRIER (PCTB)
- A** 4" WHITE SOLID (REMOVABLE)
- B** 4" YELLOW SOLID (REMOVABLE)
- C** 4" WHITE BROKEN (REMOVABLE)
(W/TY II-C-R @ 80' SPACING)
- D** 8" WHITE SOLID (REMOVABLE)
- E** 12" WHITE DOTTED (REMOVABLE)
- F** 12" WHITE SOLID (REMOVABLE)

- 1** END TRANSITION (NB)
STA 1352+24.76
- 2** STA 1352+24.76, 13' (RT)
4" (Y) (SLD)
- 3** END **E**
BEGIN **F**
STA 1355+26.91, 59' (LT)
- 4** STA 1355+90.78, 8' (RT)
4" (Y) (SLD)



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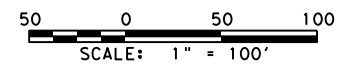
**IH 35
TRAFFIC CONTROL PLAN
PHASE 1**

SCALE: 1" = 100' SHEET 2 OF 6

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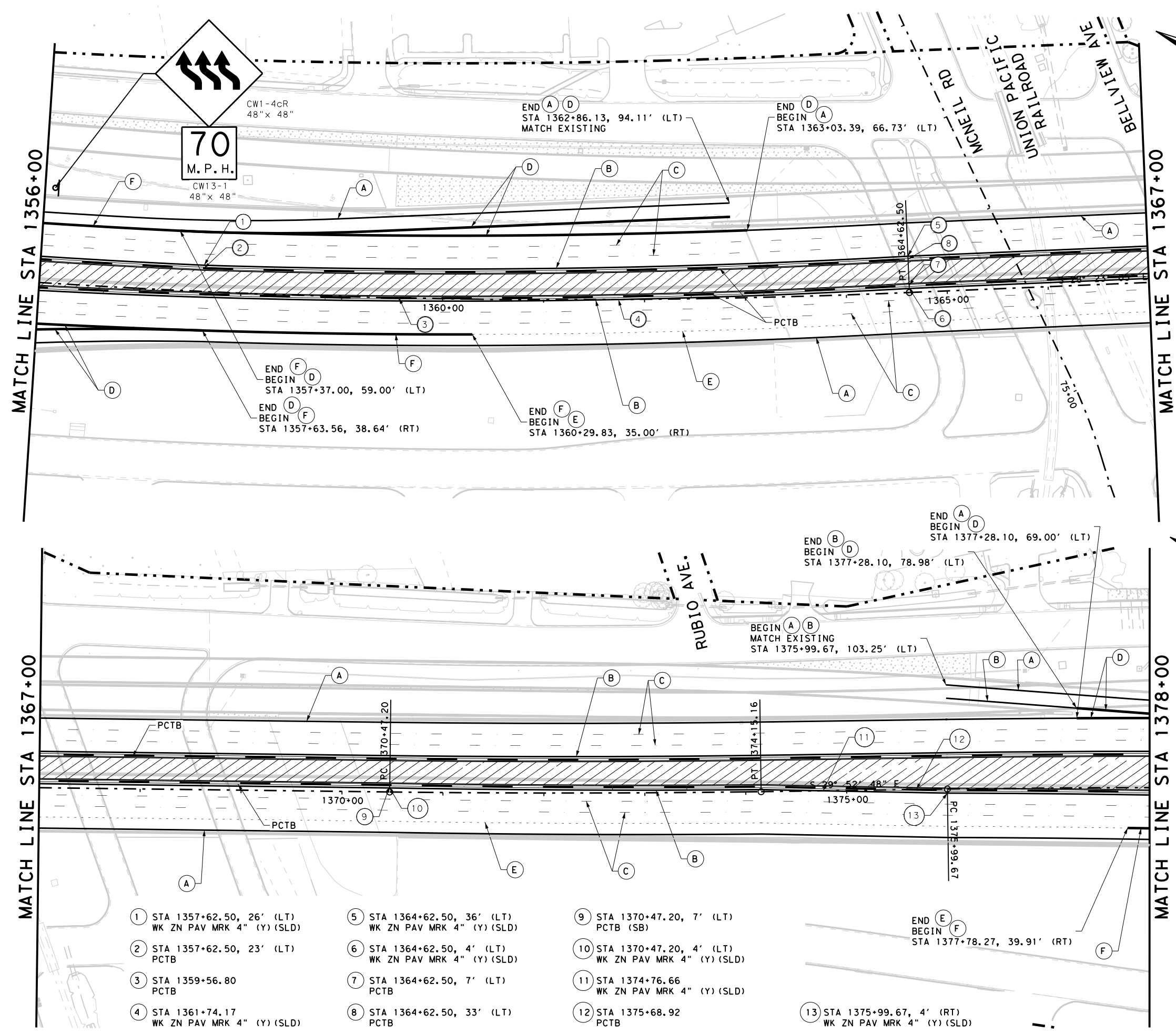
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LEGEND

- CONSTRUCTION WORK ZONE
- TRAILER MOUNTED FLASHING ARROW BOARD
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- DRUM (CHANNELIZING DEVICES)
- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW
- SIGN
- TYPE 3 BARRICADE
- CONSTRUCT CONC TRAF BARRIER (PCTB)
- 4" WHITE SOLID (REMOVABLE)
- 4" YELLOW SOLID (REMOVABLE)
- 4" WHITE BROKEN (REMOVABLE) (W/TY II-C-R @ 80' SPACING)
- 8" WHITE SOLID (REMOVABLE)
- 12" WHITE DOTTED (REMOVABLE)
- 12" WHITE SOLID (REMOVABLE)



- | | | |
|--|--|--|
| 1 STA 1357+62.50, 26' (LT)
WK ZN PAV MRK 4" (Y) (SLD) | 5 STA 1364+62.50, 36' (LT)
WK ZN PAV MRK 4" (Y) (SLD) | 9 STA 1370+47.20, 7' (LT)
PCTB (SB) |
| 2 STA 1357+62.50, 23' (LT)
PCTB | 6 STA 1364+62.50, 4' (LT)
WK ZN PAV MRK 4" (Y) (SLD) | 10 STA 1370+47.20, 4' (LT)
WK ZN PAV MRK 4" (Y) (SLD) |
| 3 STA 1359+56.80
PCTB | 7 STA 1364+62.50, 7' (LT)
PCTB | 11 STA 1374+76.66
WK ZN PAV MRK 4" (Y) (SLD) |
| 4 STA 1361+74.17
WK ZN PAV MRK 4" (Y) (SLD) | 8 STA 1364+62.50, 33' (LT)
PCTB | 12 STA 1375+68.92
PCTB |
| | | 13 STA 1375+99.67, 4' (RT)
WK ZN PAV MRK 4" (Y) (SLD) |



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TXPE REGISTRATION NO. 284



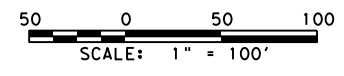
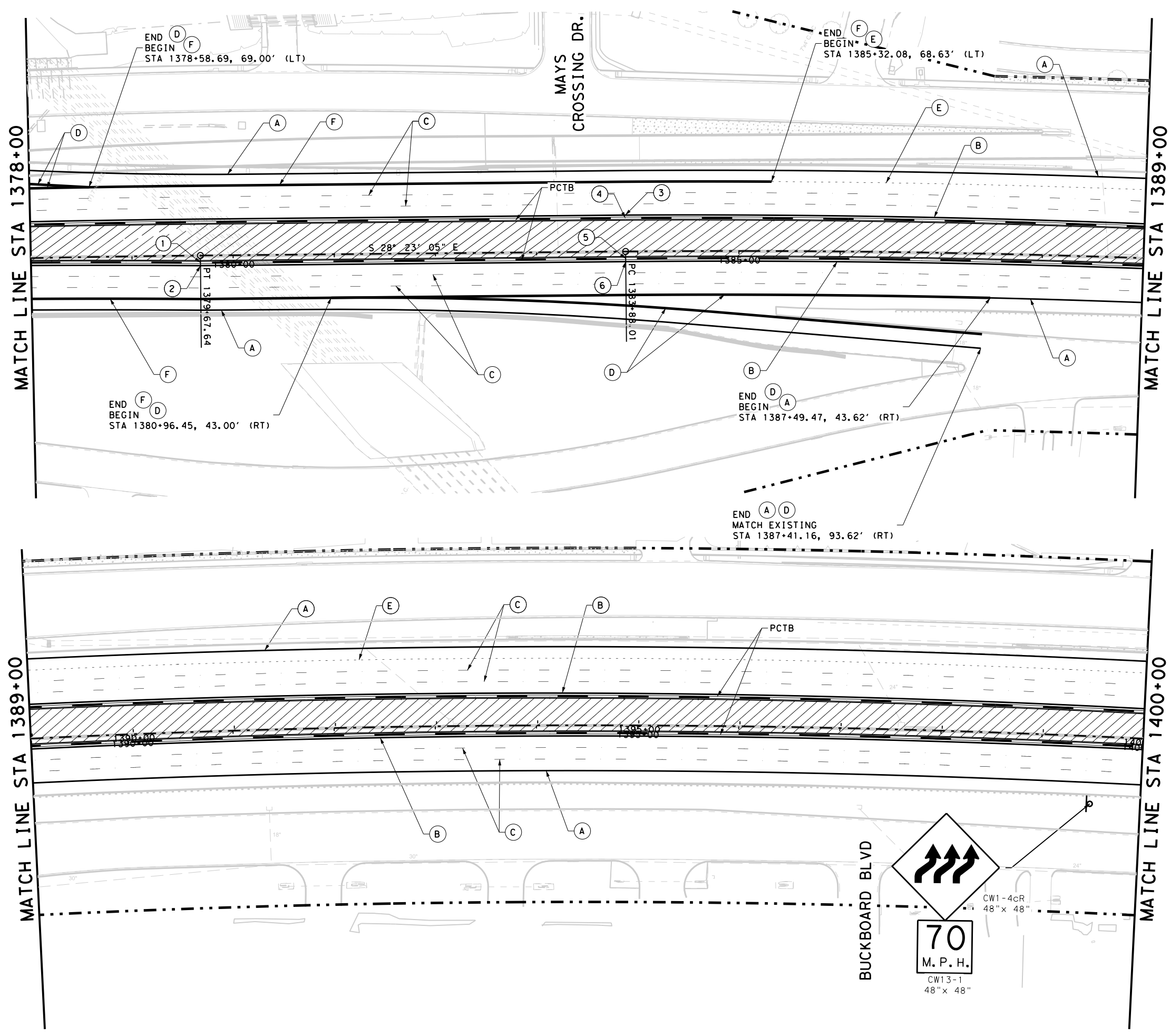
IH 35 TRAFFIC CONTROL PLAN PHASE 1

SCALE: 1" = 100' SHEET 3 OF 6

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LEGEND

- CONSTRUCTION WORK ZONE
- TRAILER MOUNTED FLASHING ARROW BOARD
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- DRUM (CHANNELIZING DEVICES)
- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW
- SIGN
- TYPE 3 BARRICADE
- CONSTRUCT CONC TRAF BARRIER (PCTB)
- (A)** 4" WHITE SOLID (REMOVABLE)
- (B)** 4" YELLOW SOLID (REMOVABLE)
- (C)** 4" WHITE BROKEN (REMOVABLE) (W/TY II-C-R @ 80' SPACING)
- (D)** 8" WHITE SOLID (REMOVABLE)
- (E)** 12" WHITE DOTTED (REMOVABLE)
- (F)** 12" WHITE SOLID (REMOVABLE)
- 1** STA 1379+67.64, 7' (RT) PCTB (SB)
- 2** STA 1379+67.64, 10' (RT) WK ZN PAV MRK 4" (Y) (SLD)
- 3** STA 1383+88.01, 36' (LT) WK ZN PAV MRK 4" (Y) (SLD)
- 4** STA 1383+88.01, 33' (LT) PCTB (NB)
- 5** STA 1383+88.01, 7' (RT) PCTB (SB)
- 6** STA 1383+88.01, 10' (RT) WK ZN PAV MRK 4" (Y) (SLD)



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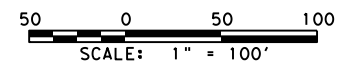
**IH 35
TRAFFIC CONTROL PLAN
PHASE 1**

SCALE: 1" = 100' SHEET 4 OF 6

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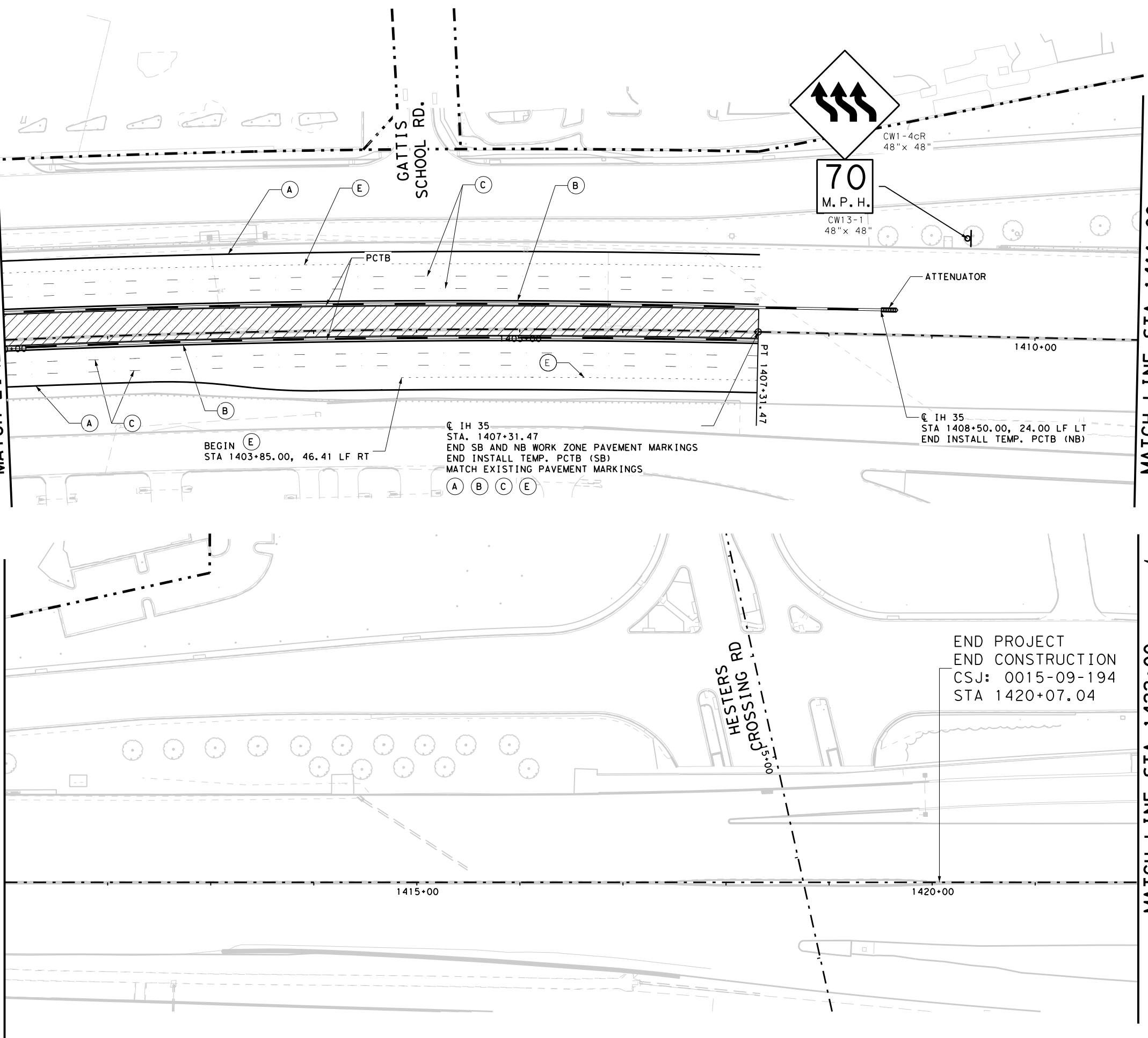
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- DRUM (CHANNELIZING DEVICES)
- EXIST TRAFFIC FLOW
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- 8" WHITE SOLID (REMOVABLE)
- 12" WHITE DOTTED (REMOVABLE)
- 12" WHITE SOLID (REMOVABLE)

MATCH LINE STA 1400+00

MATCH LINE STA 1411+00

MATCH LINE STA 1411+00

MATCH LINE STA 1422+00



END PROJECT
 END CONSTRUCTION
 CSJ: 0015-09-194
 STA 1420+07.04



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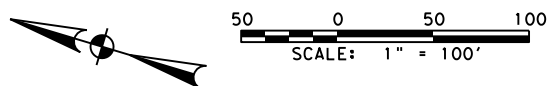
**IH 35
 TRAFFIC
 CONTROL PLAN
 PHASE 1**

SCALE: 1" = 100' SHEET 5 OF 6
















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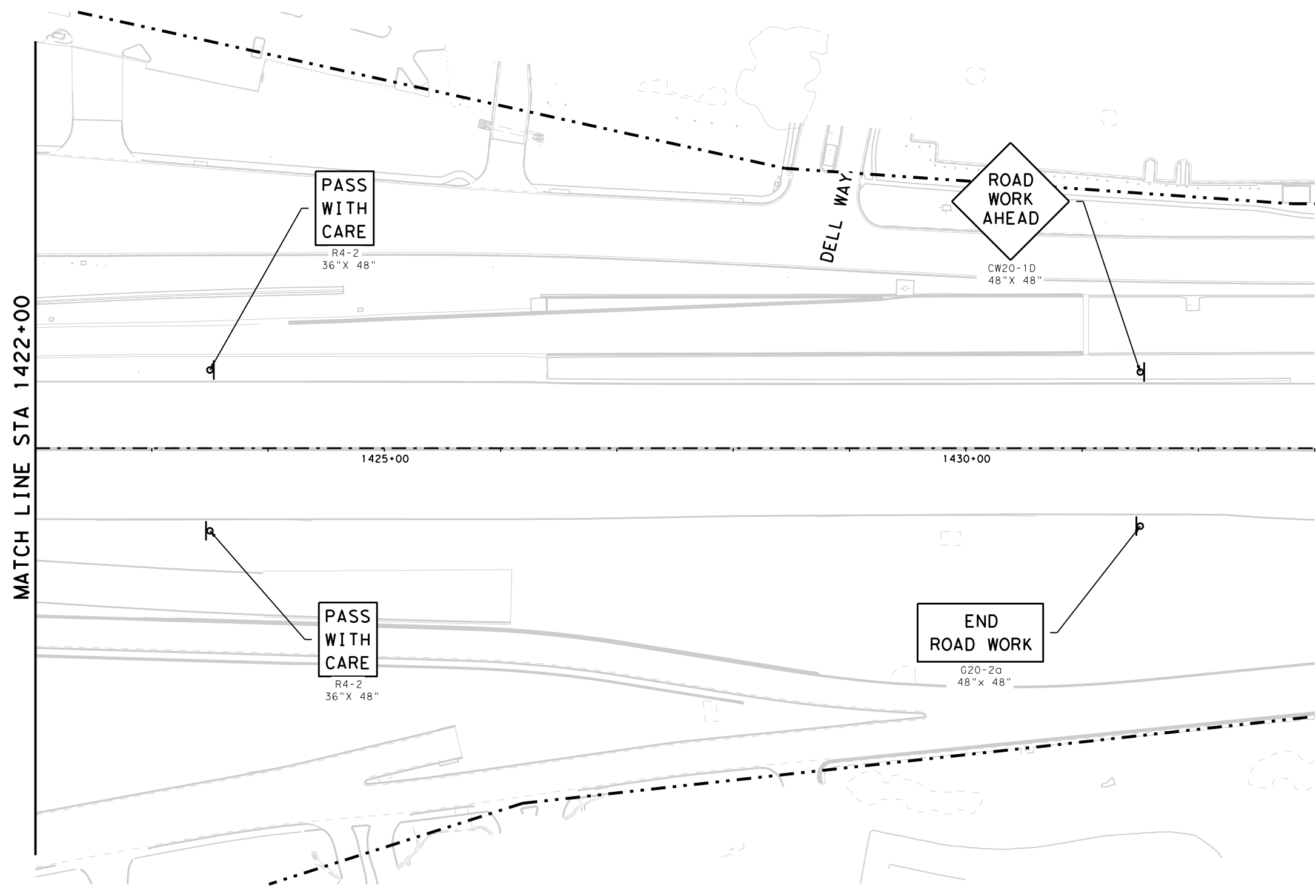
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LEGEND

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-  PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
-  DRUM (CHANNELIZING DEVICES)
-  EXIST TRAFFIC FLOW
-  PROP TRAFFIC FLOW
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IH 35 TRAFFIC CONTROL PLAN PHASE 1

SCALE: 1" = 100' SHEET 6 OF 6

DS:	CK:	CONT	SECT	JOB	HIGHWAY
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DW	CK2	AUS	WILLIAMSON	42	

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- 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).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
- Traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:


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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

- Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
- Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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

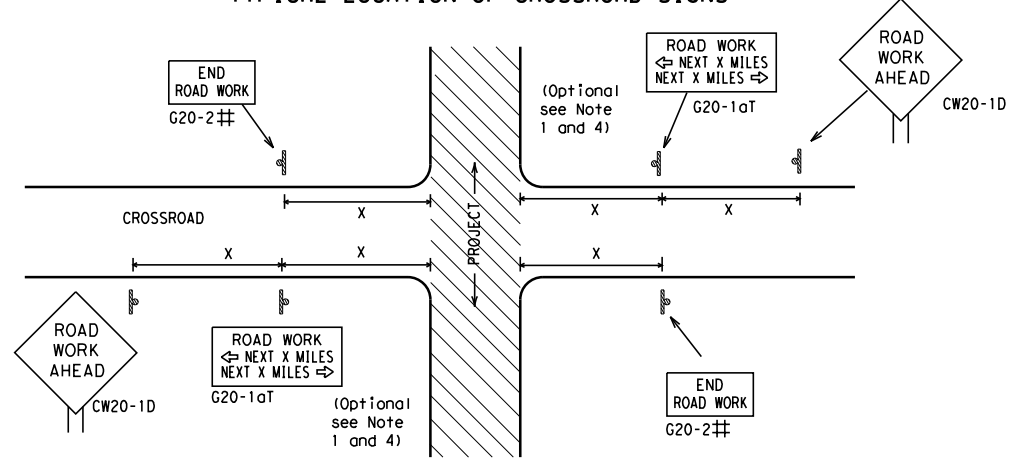
SHEET 1 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard	
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS			
BC (1) - 21			
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5-10 5-21	DIST	COUNTY	SHEET NO.
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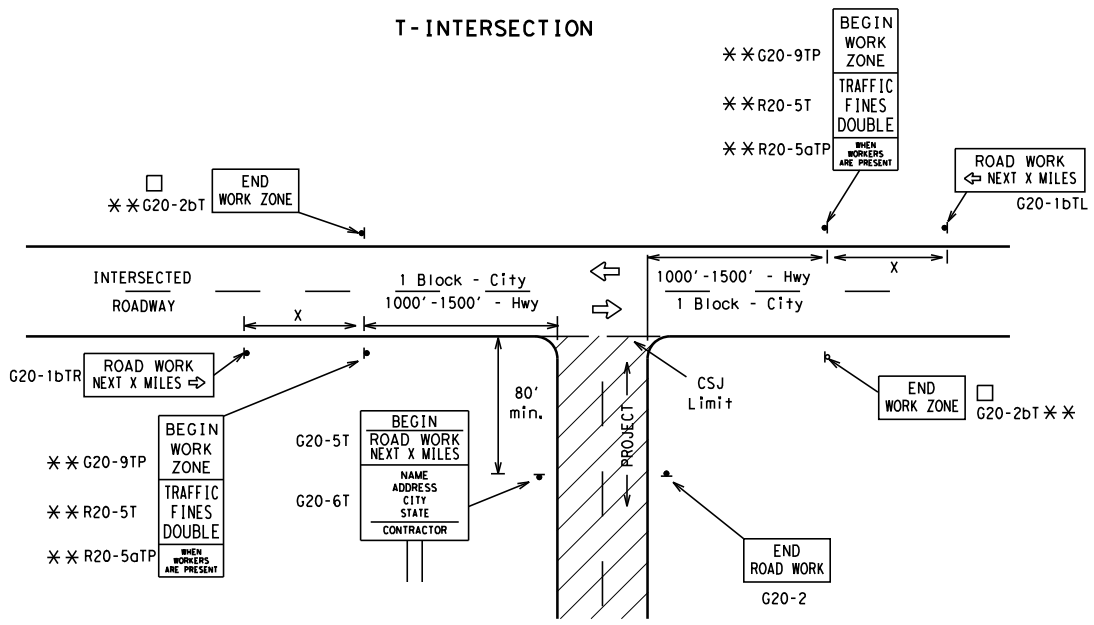
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TYPICAL LOCATION OF CROSSROAD SIGNS



- ## May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)
- 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.
 - The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK" (G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TMUTCD Part 5. This information shall be shown in the plans.
 - 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.
 - 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.
 - Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
 - 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

- 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.
- 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}

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

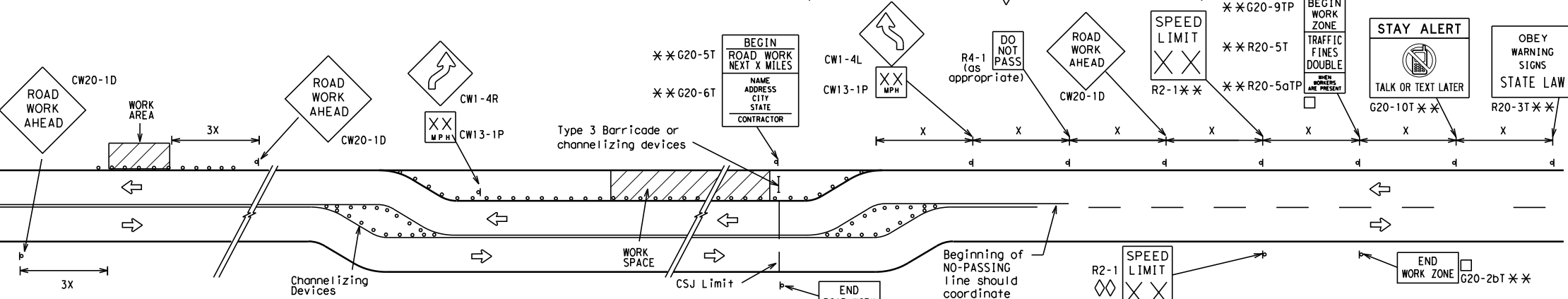
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

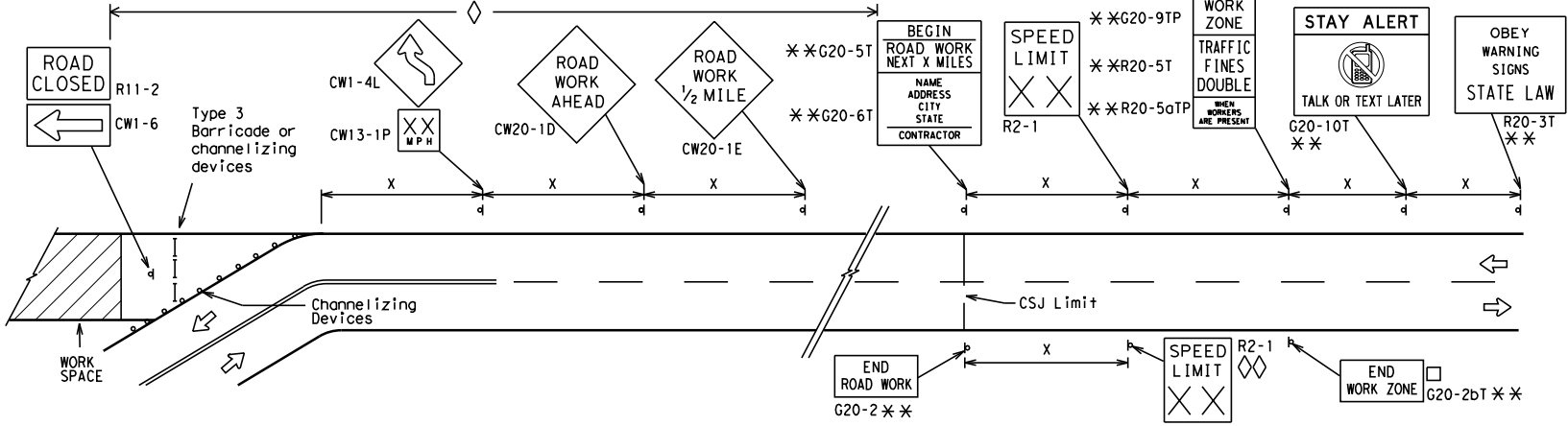
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

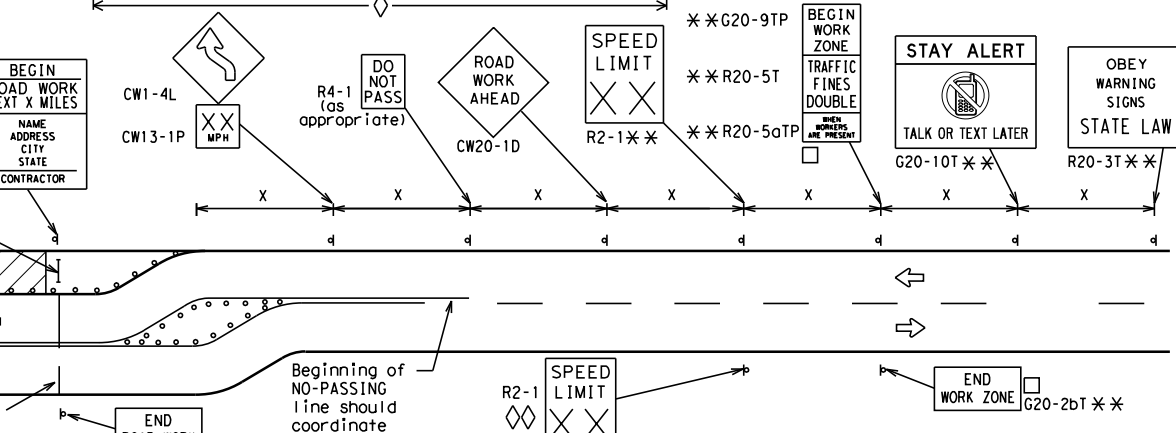


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "x" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
 - CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
 - Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
 - Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

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

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

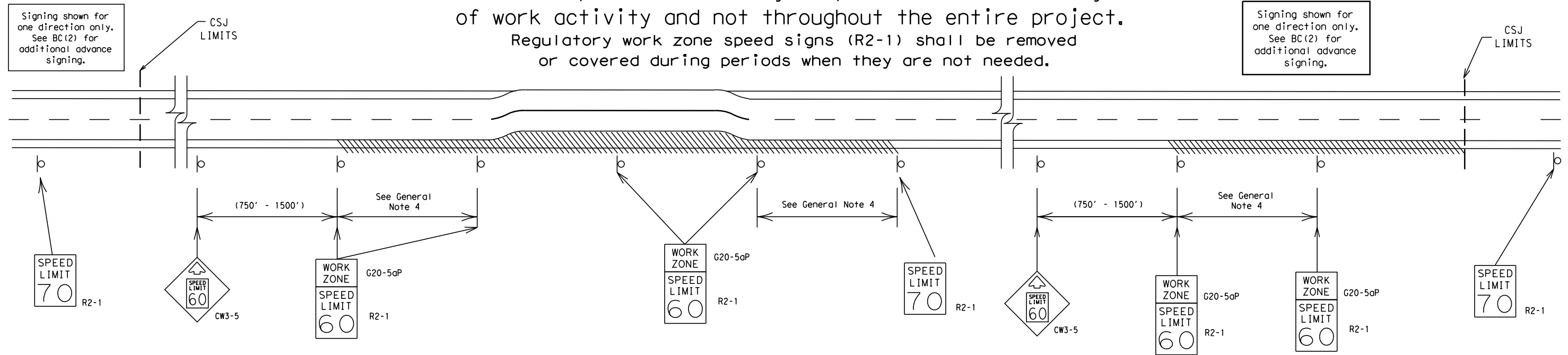
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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	AUS	WILLIAMSON	44	

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project. Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- other conditions readily apparent to the driver

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- Frequency of work zone speed limit signs should be:

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

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SHEET 3 OF 12



BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

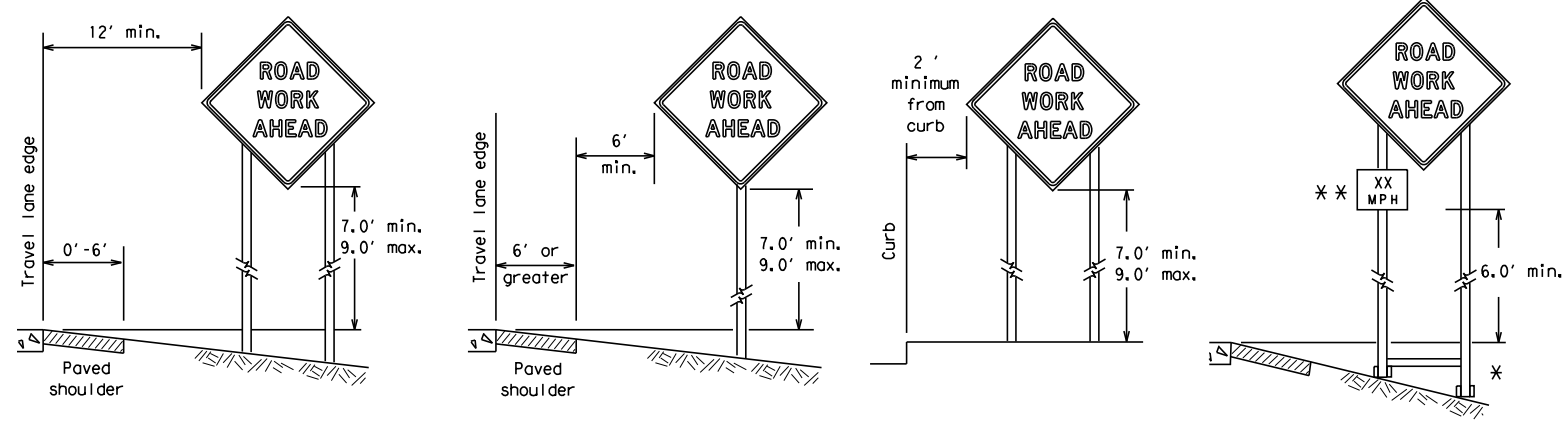
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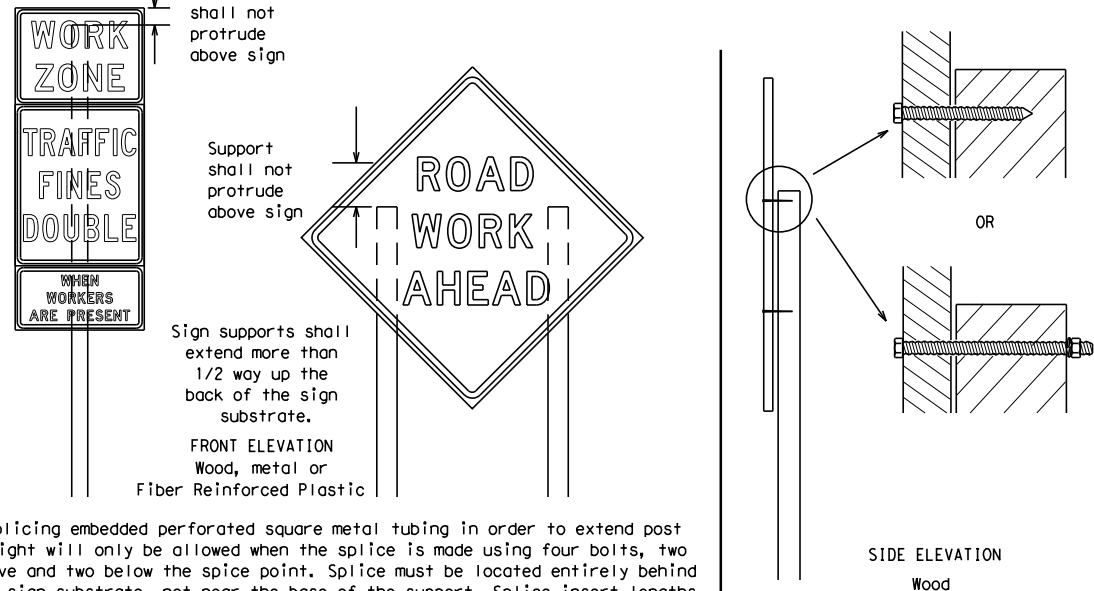
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TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.
 ** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the splice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

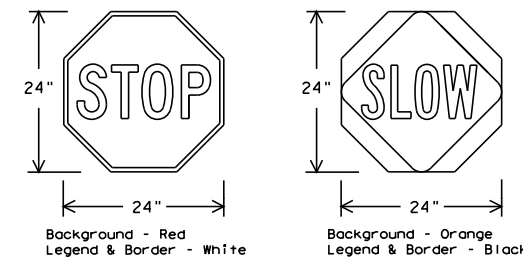
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not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

FLAGS ON SIGNS

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

STOP/SLOW PADDLES

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



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B _{FL} OR C _{FL} SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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



BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

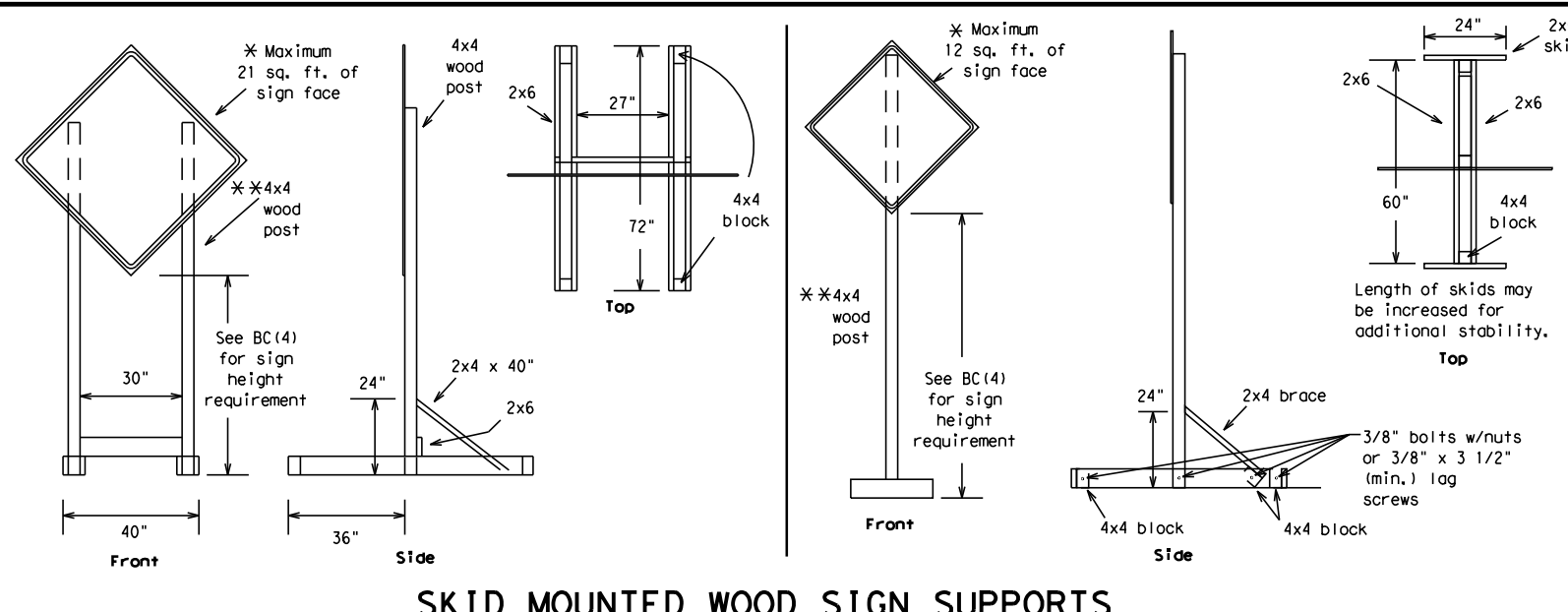
BC (4) - 21

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9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	AUS	WILLIAMSON	46					

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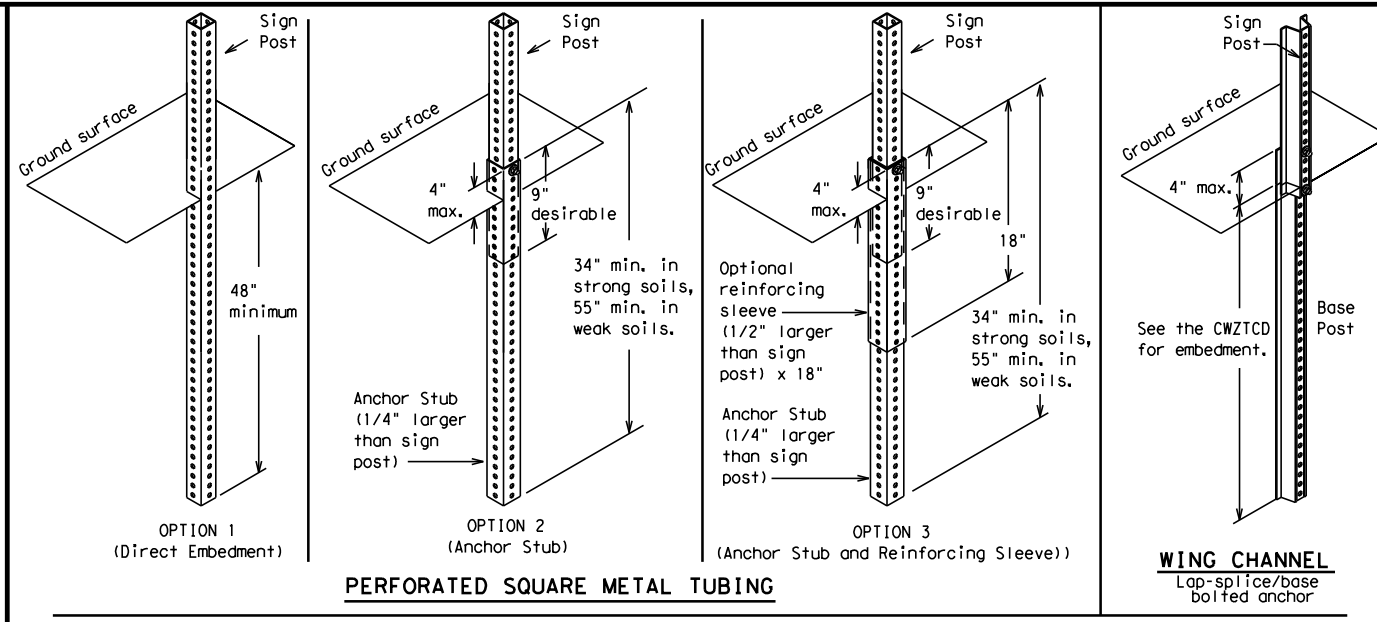
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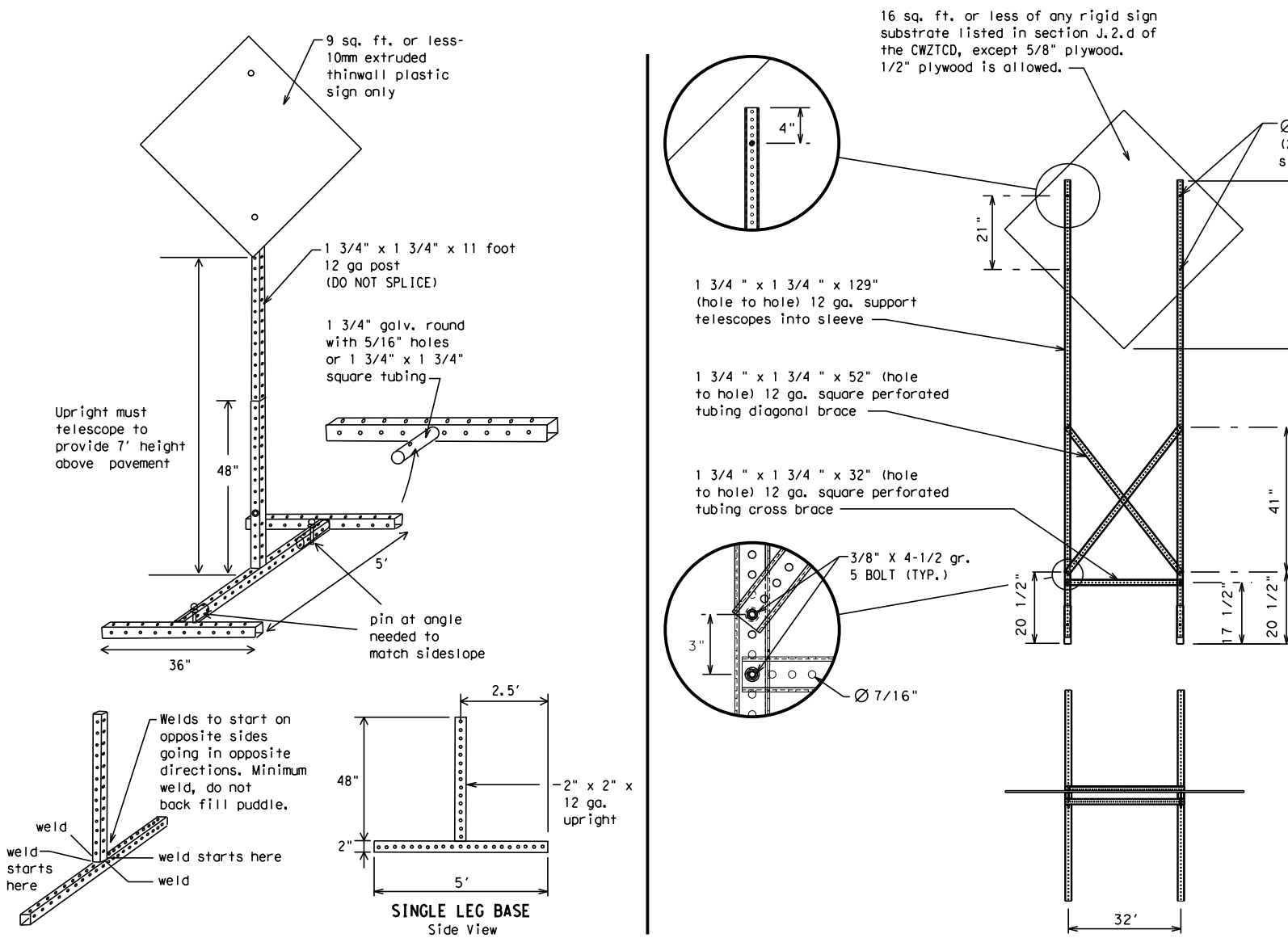
SKID MOUNTED WOOD SIGN SUPPORTS

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



GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

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

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

- GENERAL NOTES**
- Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
 - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
 - When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.
- * See BC(4) for definition of "Work Duration."
 ** Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
 ☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	AUS	WILLIAMSON	47	

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

Other Condition List

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

MERGE RIGHT
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE

Location List

AT FM XXXX
BEFORE RAILROAD CROSSING
NEXT X MILES
PAST US XXX EXIT
XXXXXXXX TO XXXXXX
US XXX TO FM XXXX

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

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

FULL MATRIX PCMS SIGNS

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

WORDING ALTERNATIVES

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

SHEET 6 OF 12



BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
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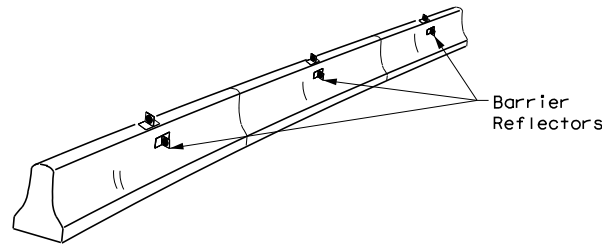
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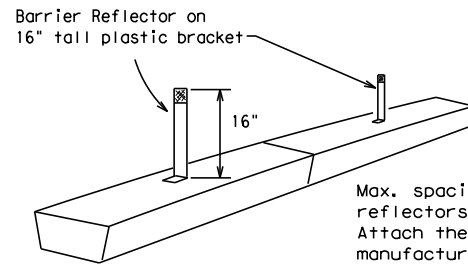
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

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

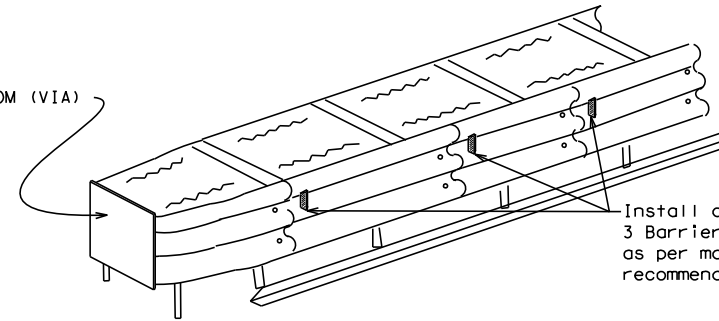


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

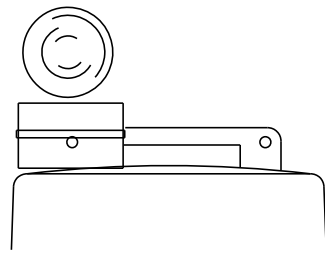
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

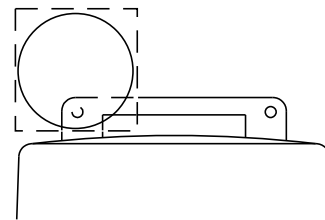
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



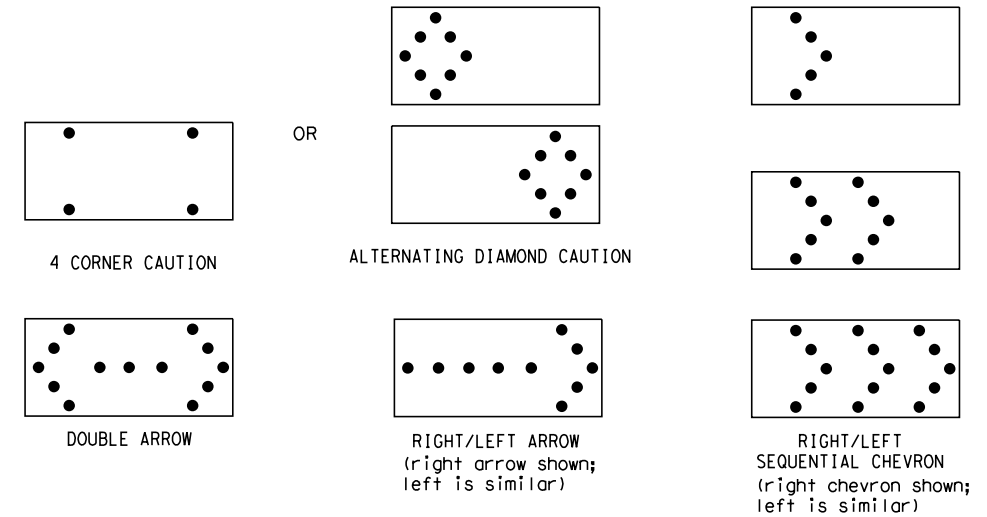
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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

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



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

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

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

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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



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

BC (7) - 21

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REVISIONS		0015	09	194	IH 35				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	AUS	WILLIAMSON	49					

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

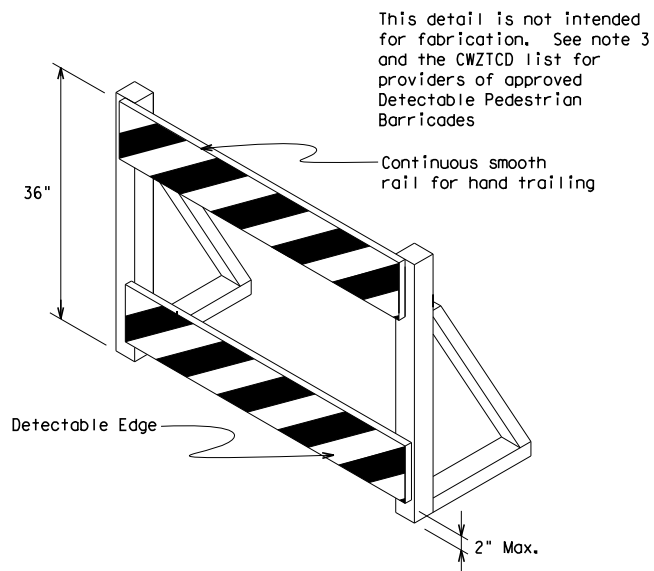
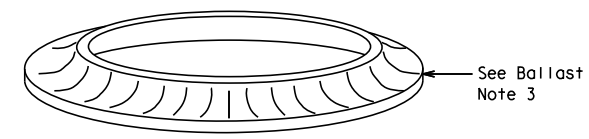
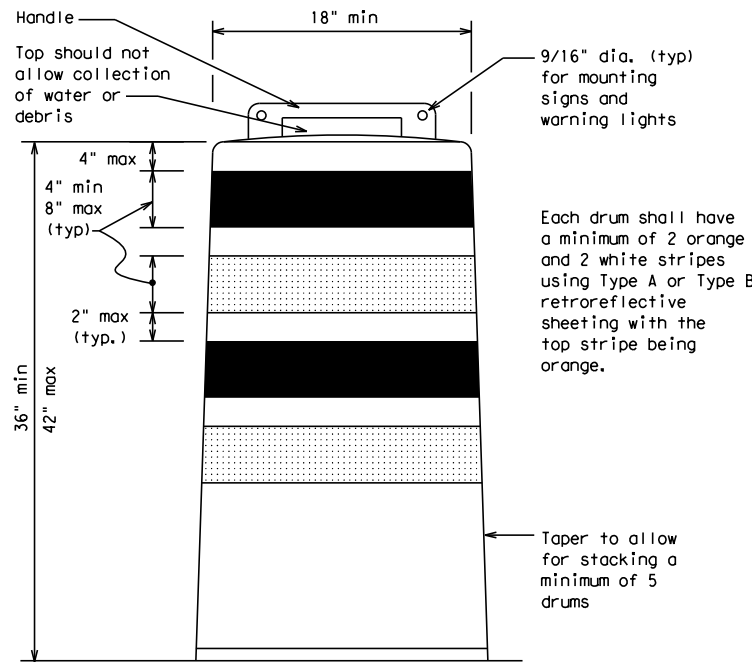
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

RETROREFLECTIVE SHEETING

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

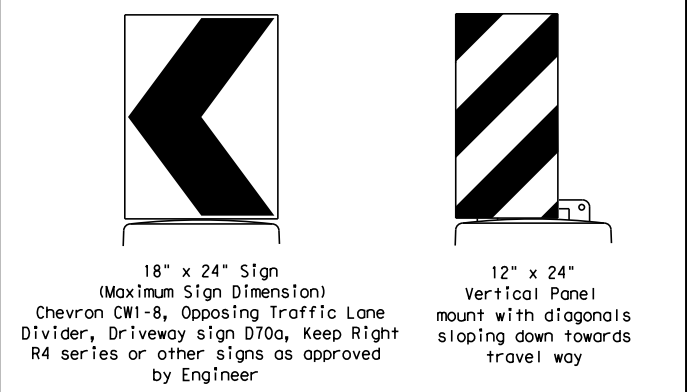
BALLAST

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



DETECTABLE PEDESTRIAN BARRICADES

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



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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12

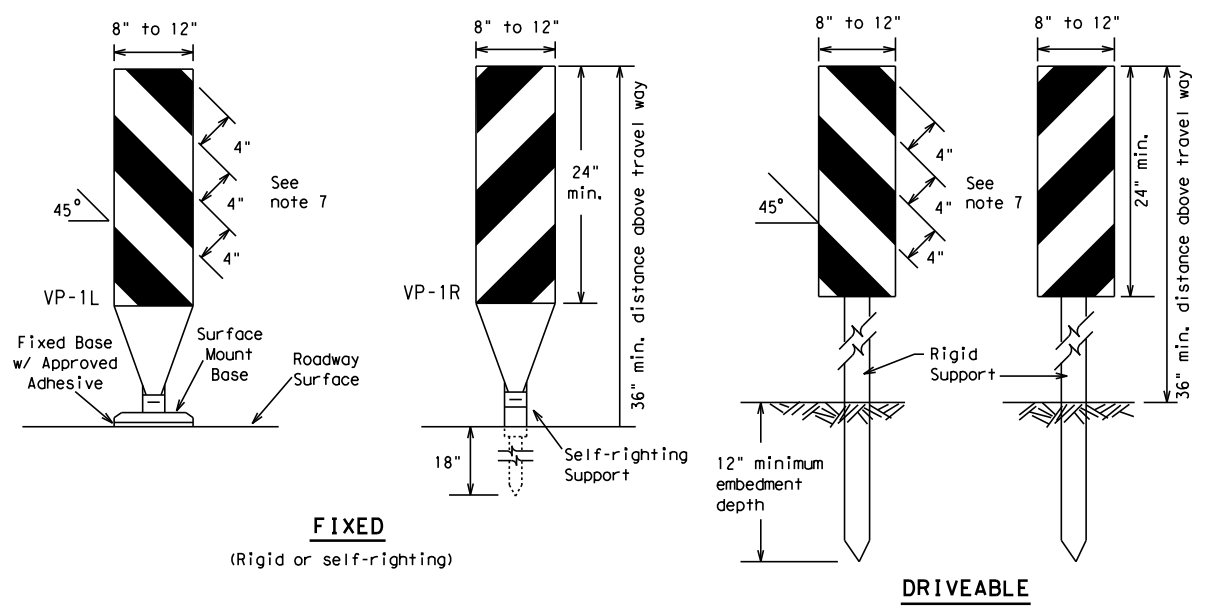
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

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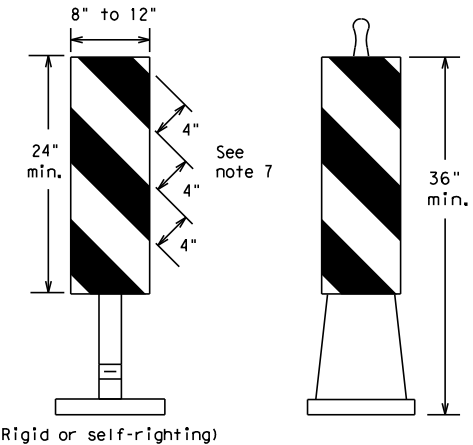
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FIXED
(Rigid or self-righting)

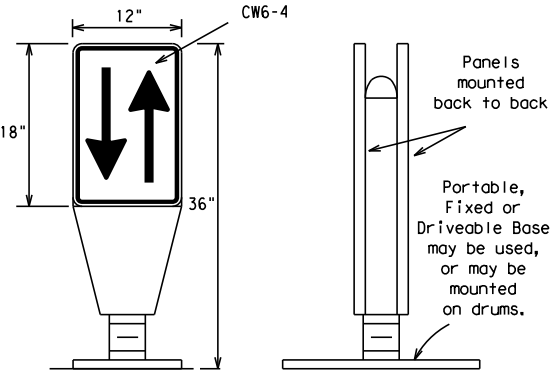
DRIVEABLE



PORTABLE

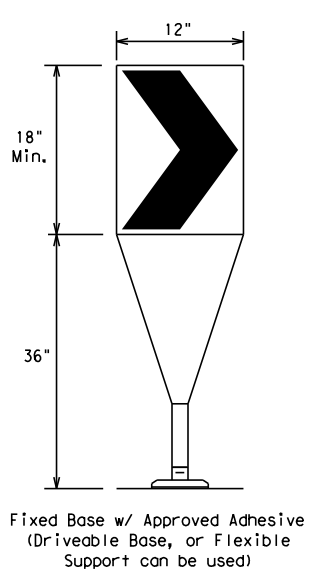
VERTICAL PANELS (VPs)

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



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

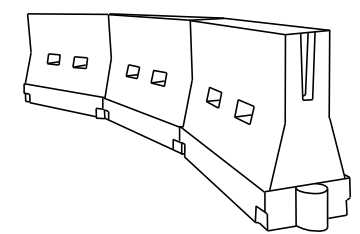
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base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



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

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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long 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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

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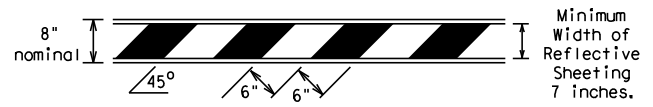
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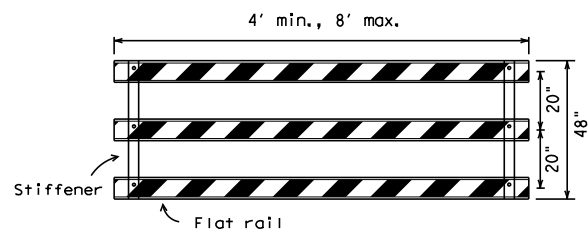
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



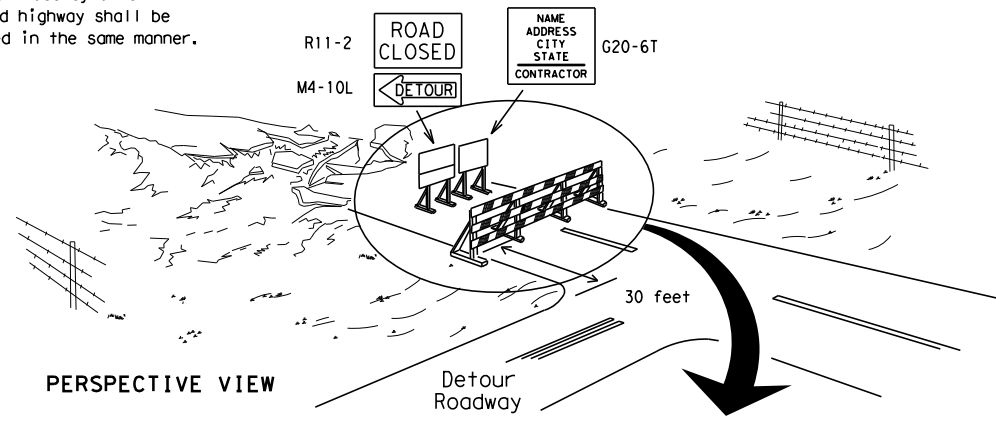
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

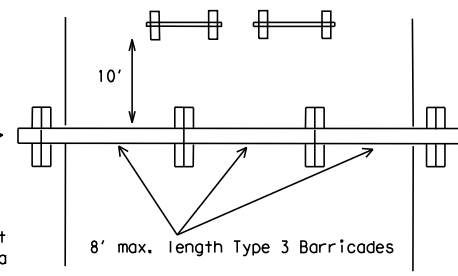
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

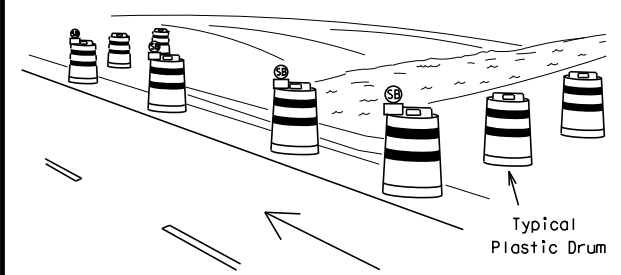
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



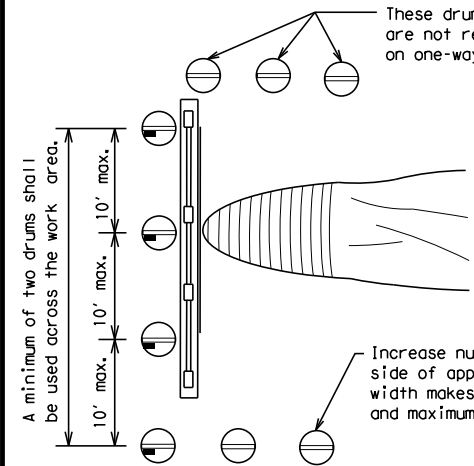
PLAN VIEW

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

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

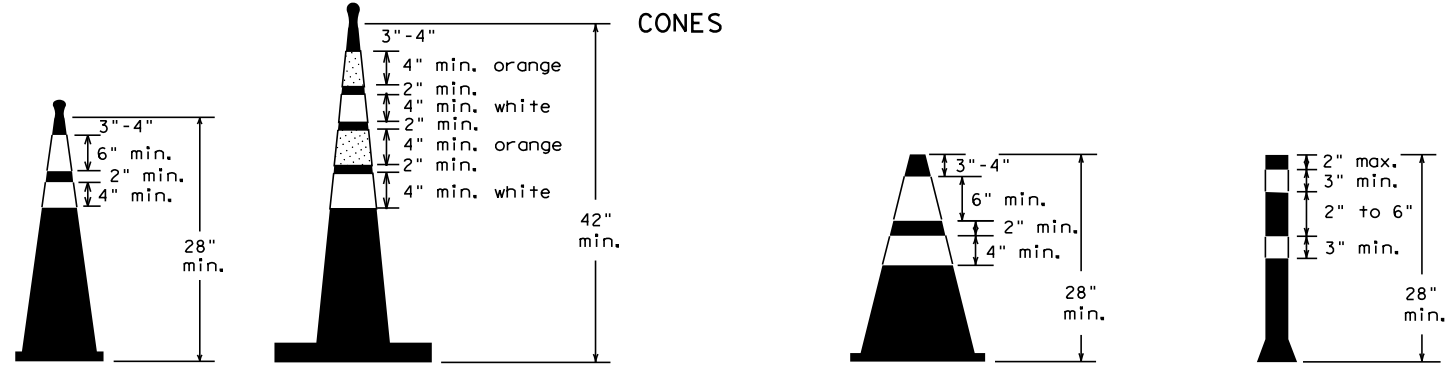


PLAN VIEW

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

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



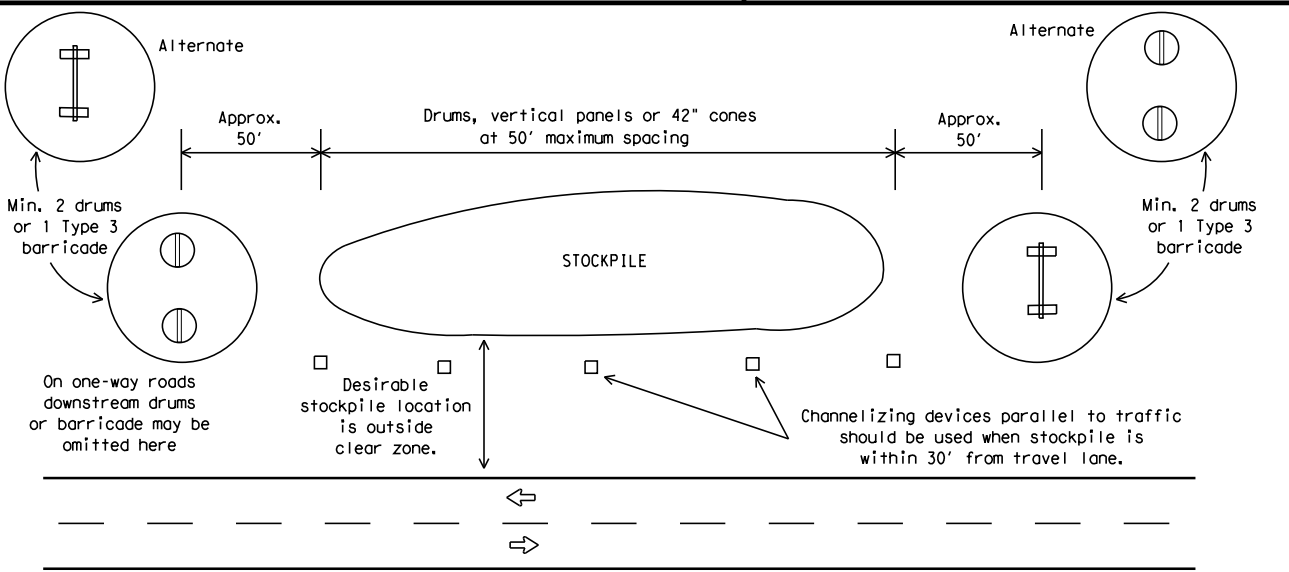
Two-Piece cones

One-Piece cones

Tubular Marker

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	AUS	WILLIAMSON	52	

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

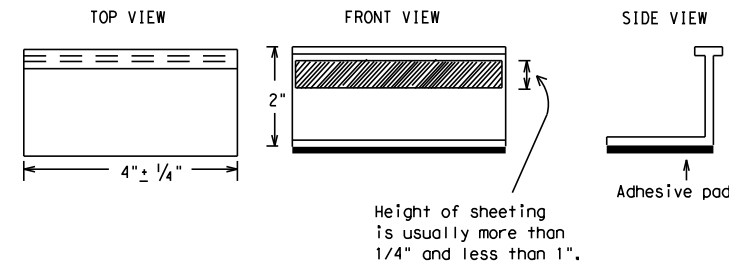
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
2-98 9-07 5-21	DIST	COUNTY	SHEET NO.	
1-02 7-13	AUS	WILLIAMSON	53	
11-02 8-14				

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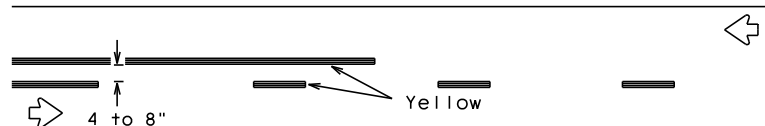
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PAVEMENT MARKING PATTERNS

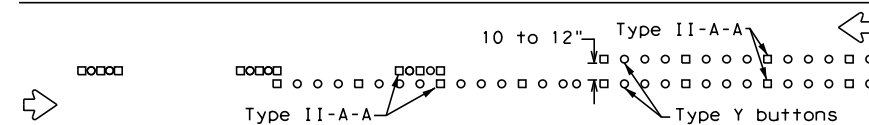


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

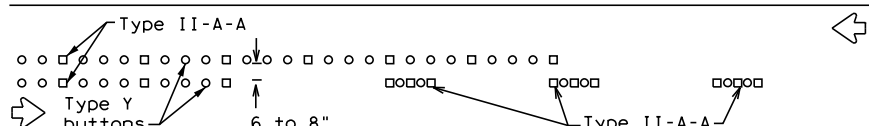


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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

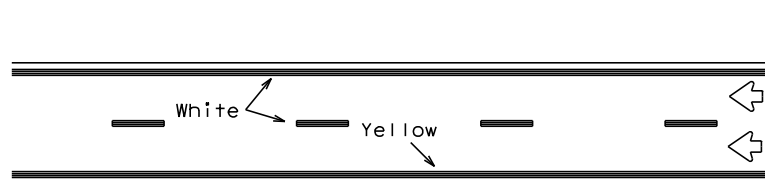


RAISED PAVEMENT MARKERS - PATTERN A



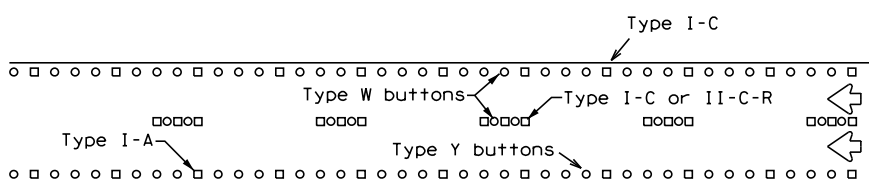
RAISED PAVEMENT MARKERS - PATTERN B

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



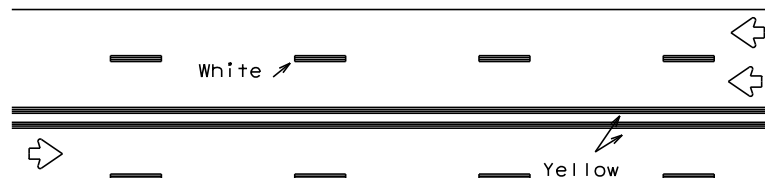
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



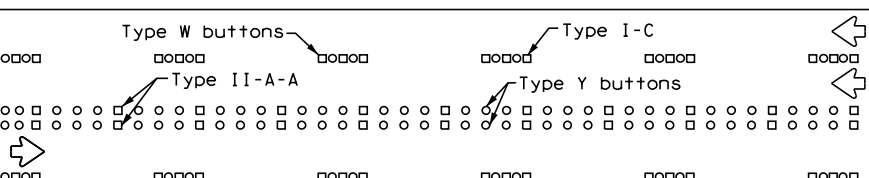
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



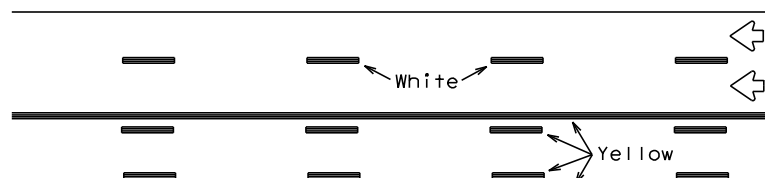
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



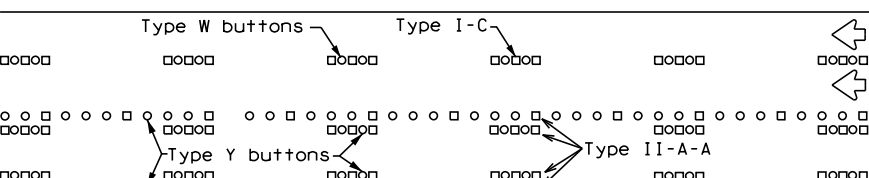
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

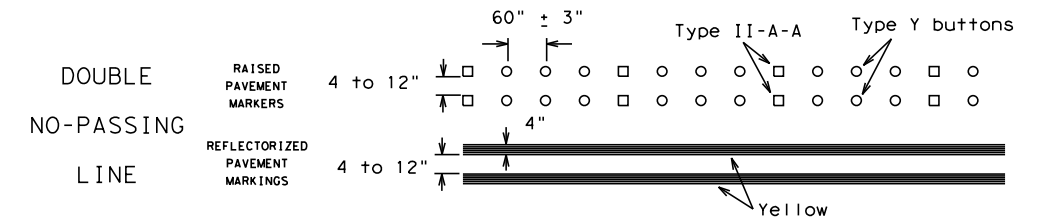
Prefabricated markings may be substituted for reflectORIZED pavement markings.



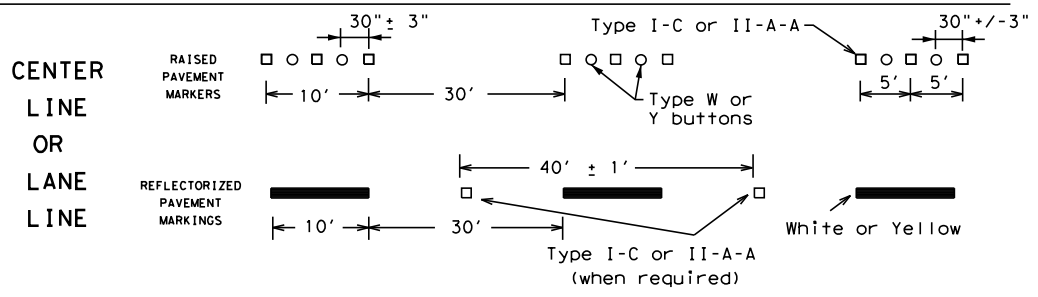
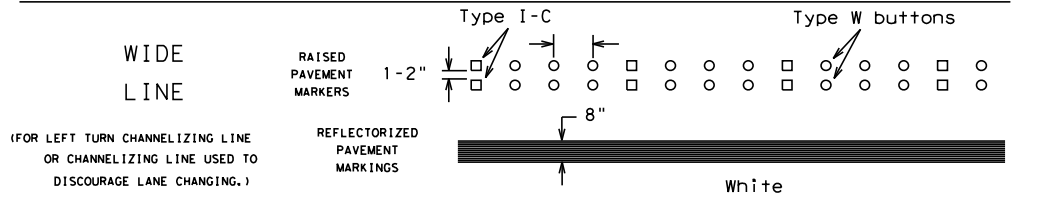
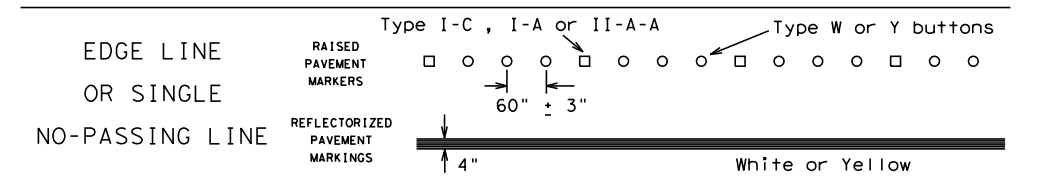
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

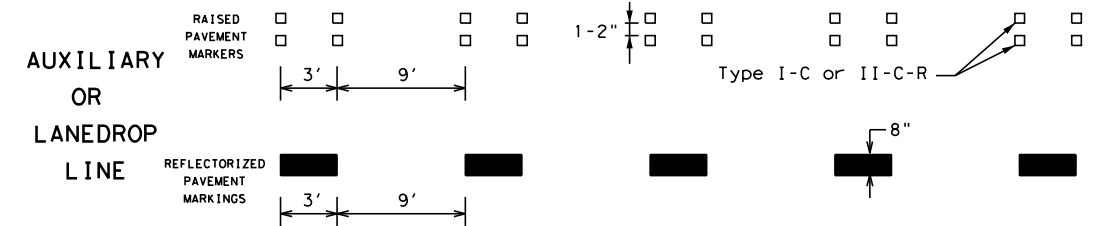
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SOLID LINES

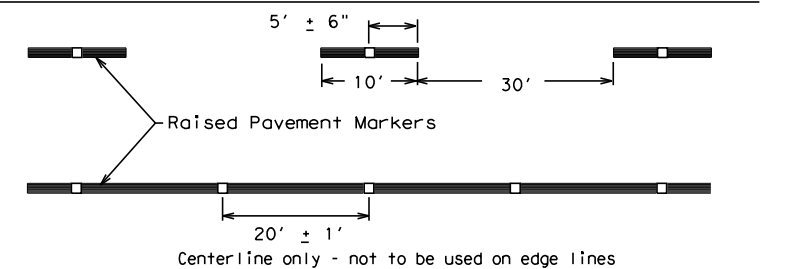


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 21

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	IH 35
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	AUS	WILLIAMSON	54	
11-02 8-14				

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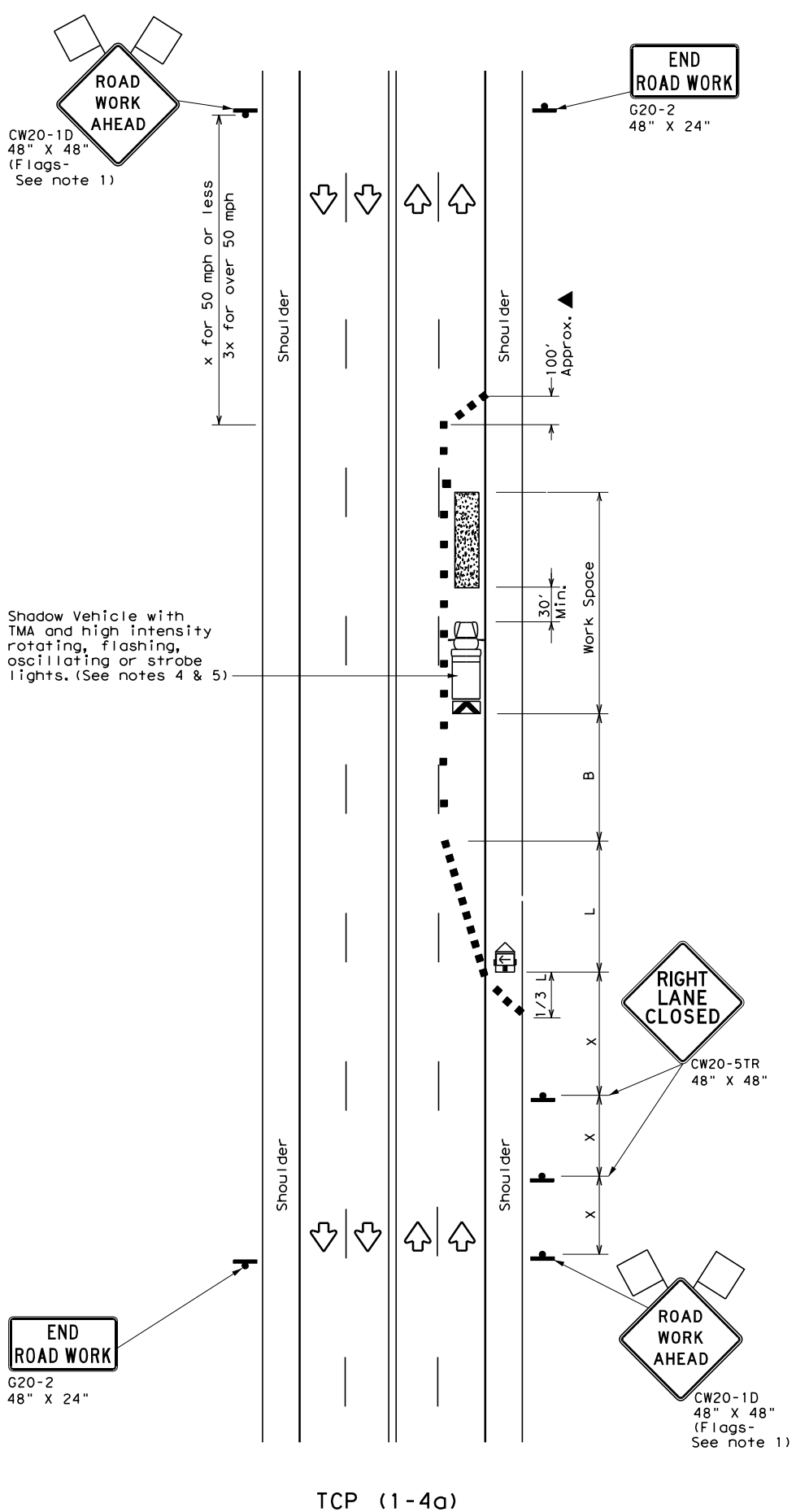
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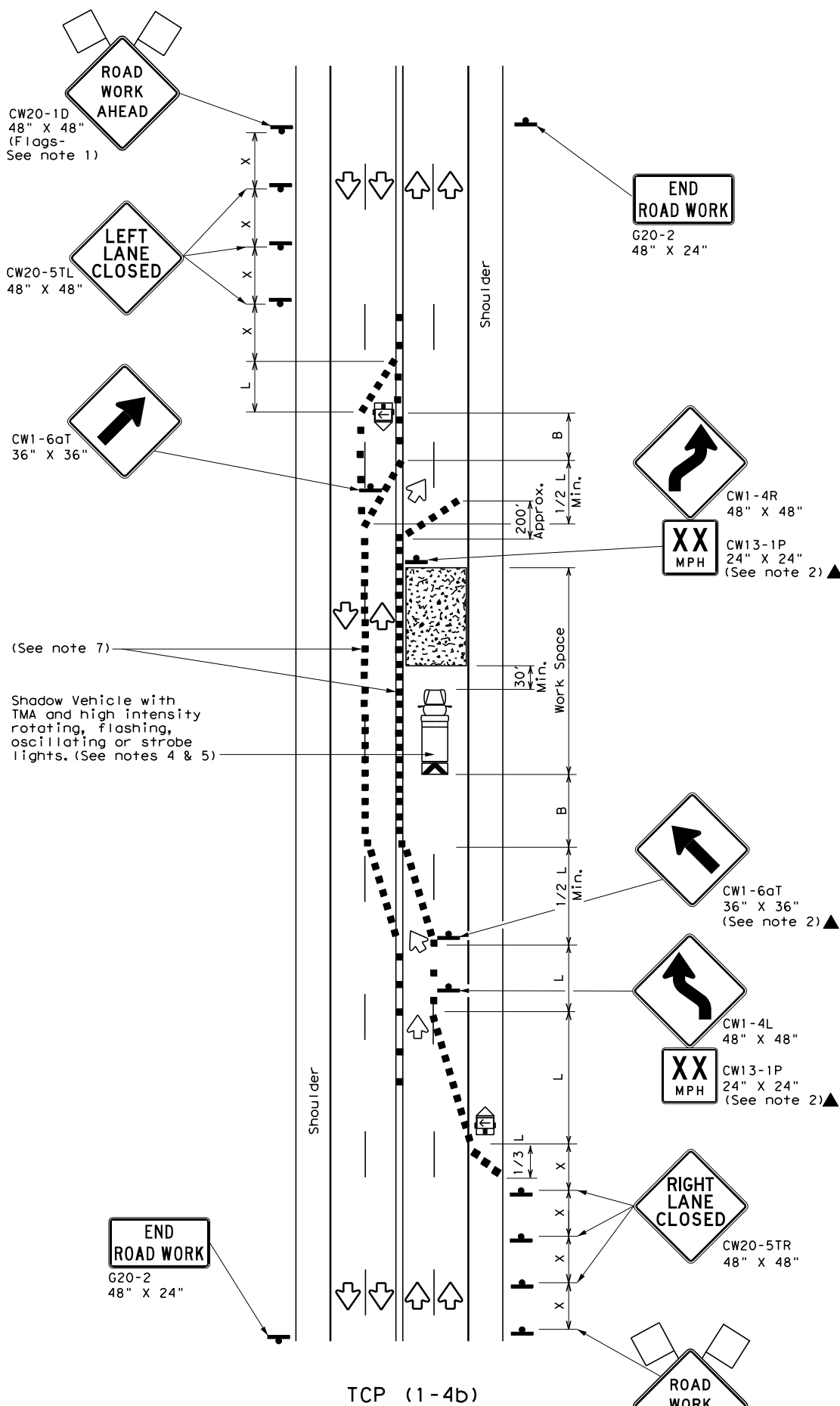
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TCP (1-4a)
ONE LANE CLOSED



TCP (1-4b)
TWO LANES CLOSED

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

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

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

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

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

- TCP (1-4a)**
- If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

- TCP (1-4b)**
- Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation
 Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN
 LANE CLOSURES ON MULTILANE
 CONVENTIONAL ROADS**

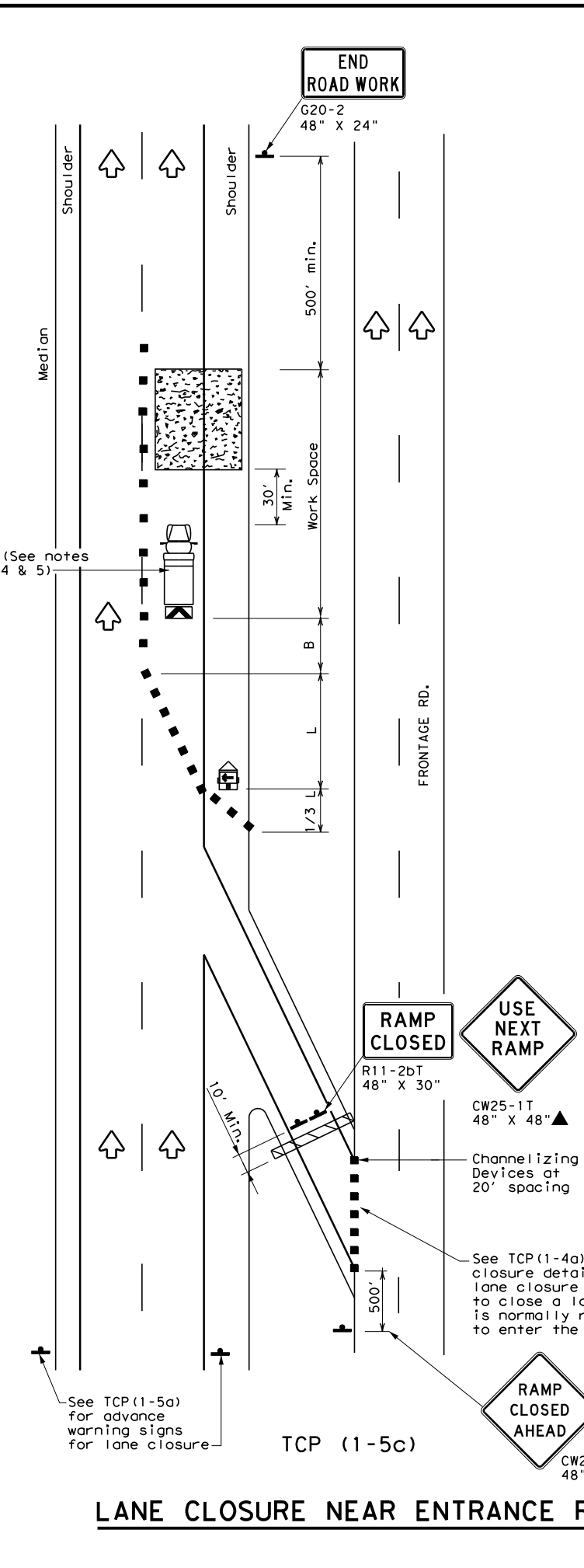
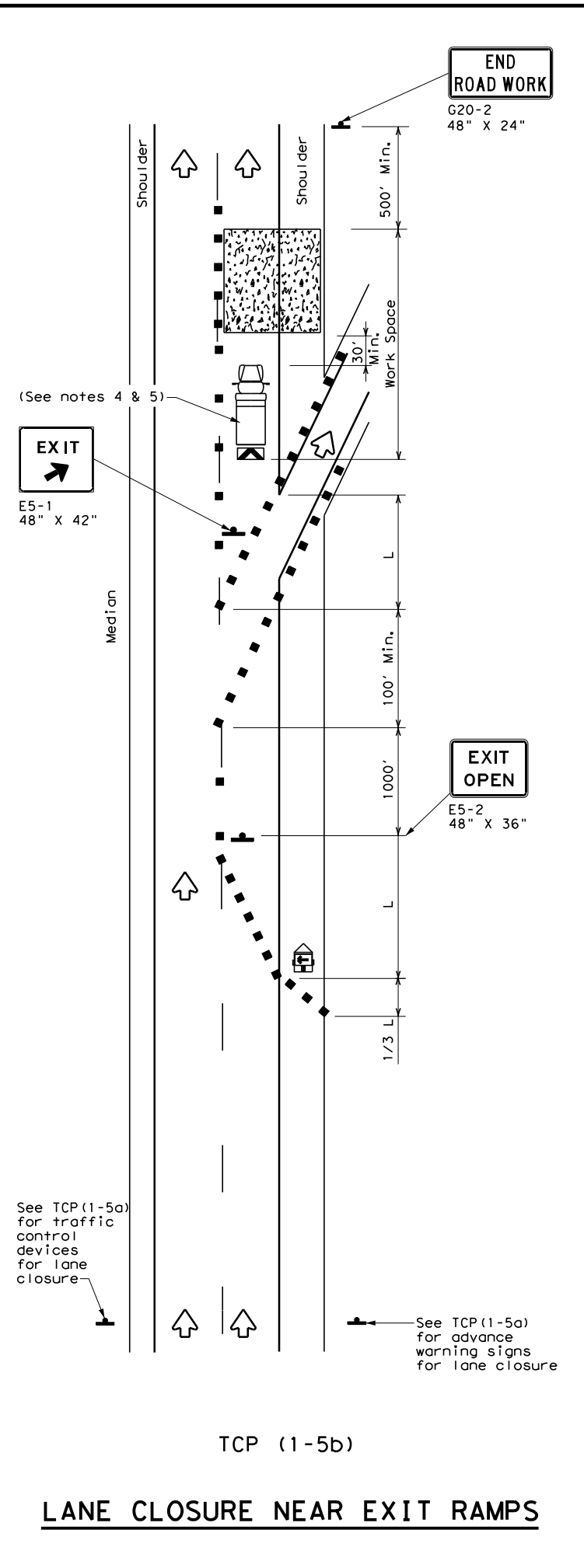
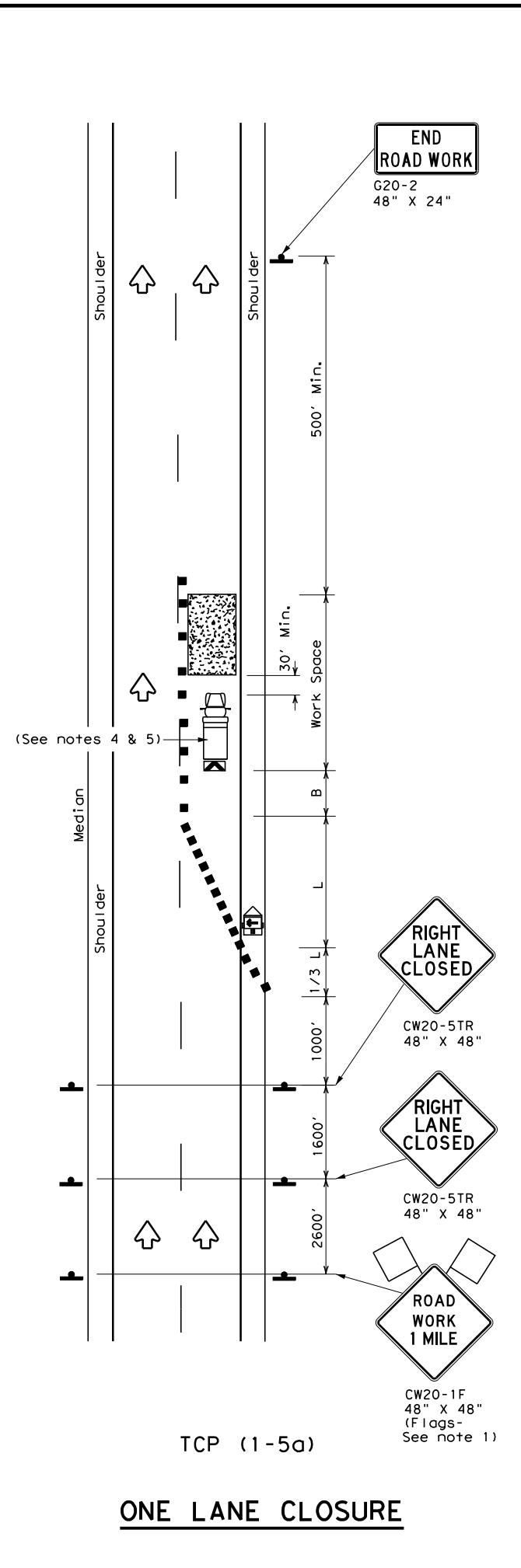
TCP (1-4) - 18

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2-94	4-98			DIST	COUNTY
8-95	2-12			AUS	WILLIAMSON
1-97	2-18				SHEET NO.
					55

154

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

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
 - Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation Traffic Operations Division Standard

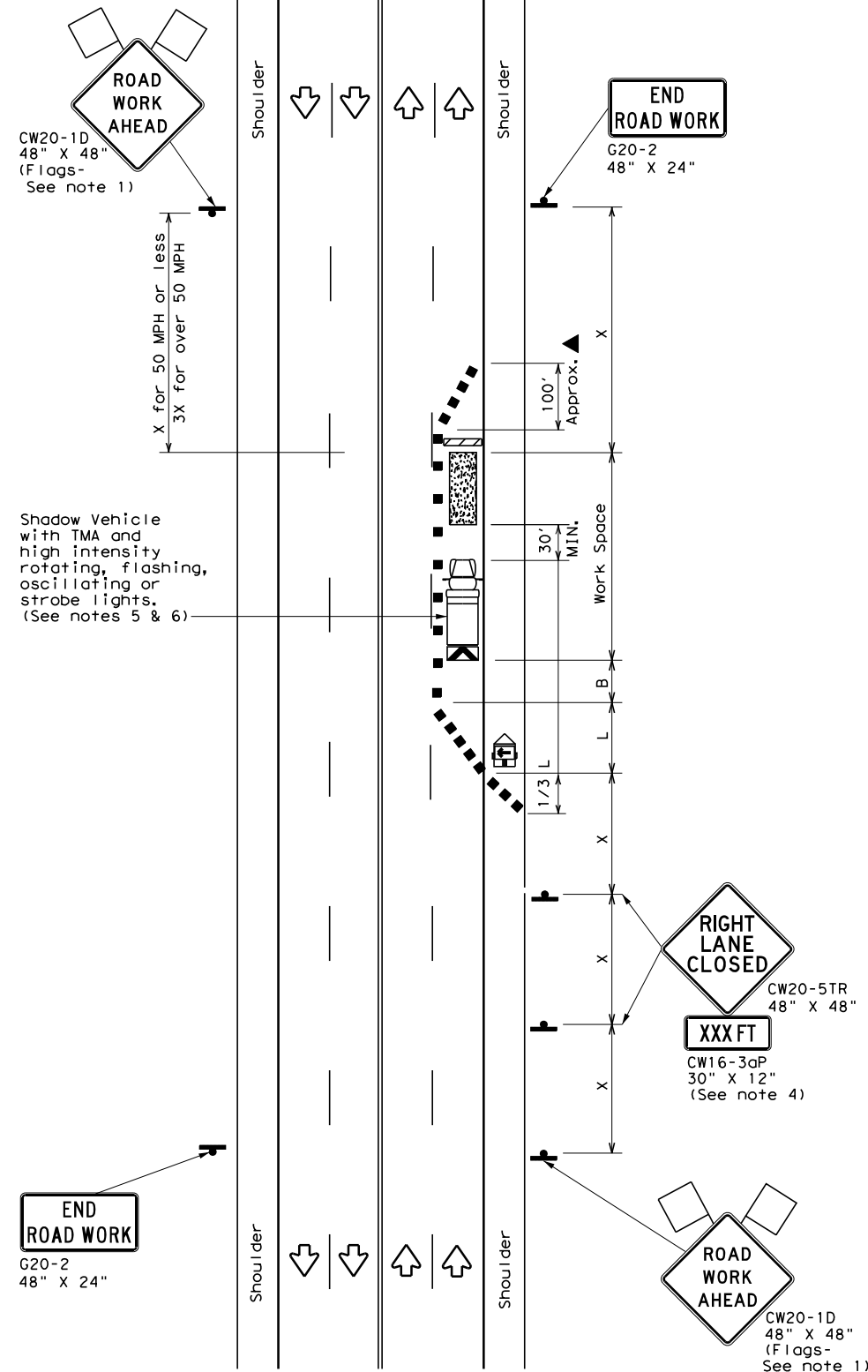
TRAFFIC CONTROL PLAN
LANE CLOSURES FOR
DIVIDED HIGHWAYS

TCP (1-5) - 18

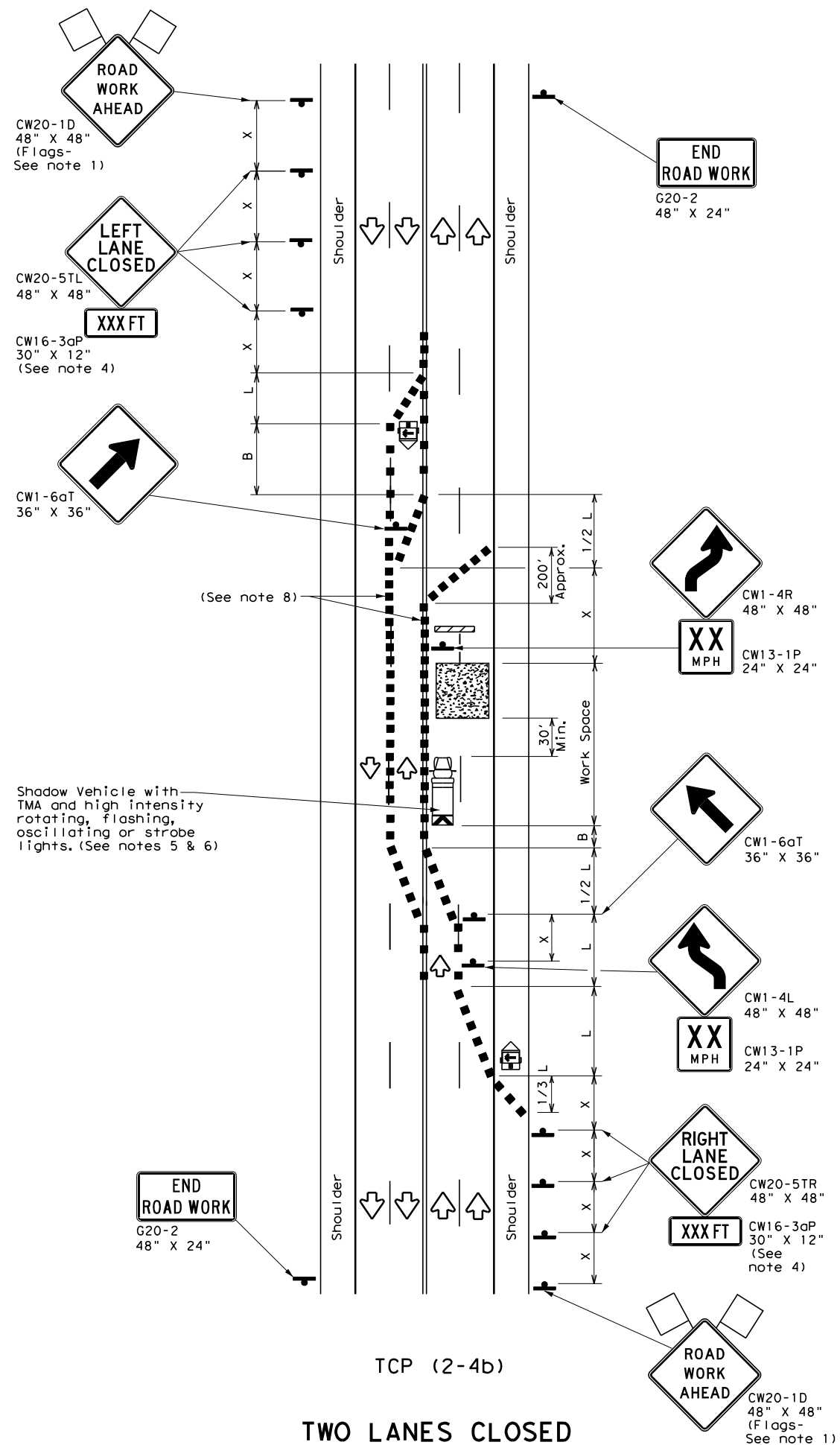
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© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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	AUS	WILLIAMSON	56	

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TCP (2-4a)
ONE LANE CLOSED



TCP (2-4b)
TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		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 = WS ² / 60	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L = WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

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

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

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

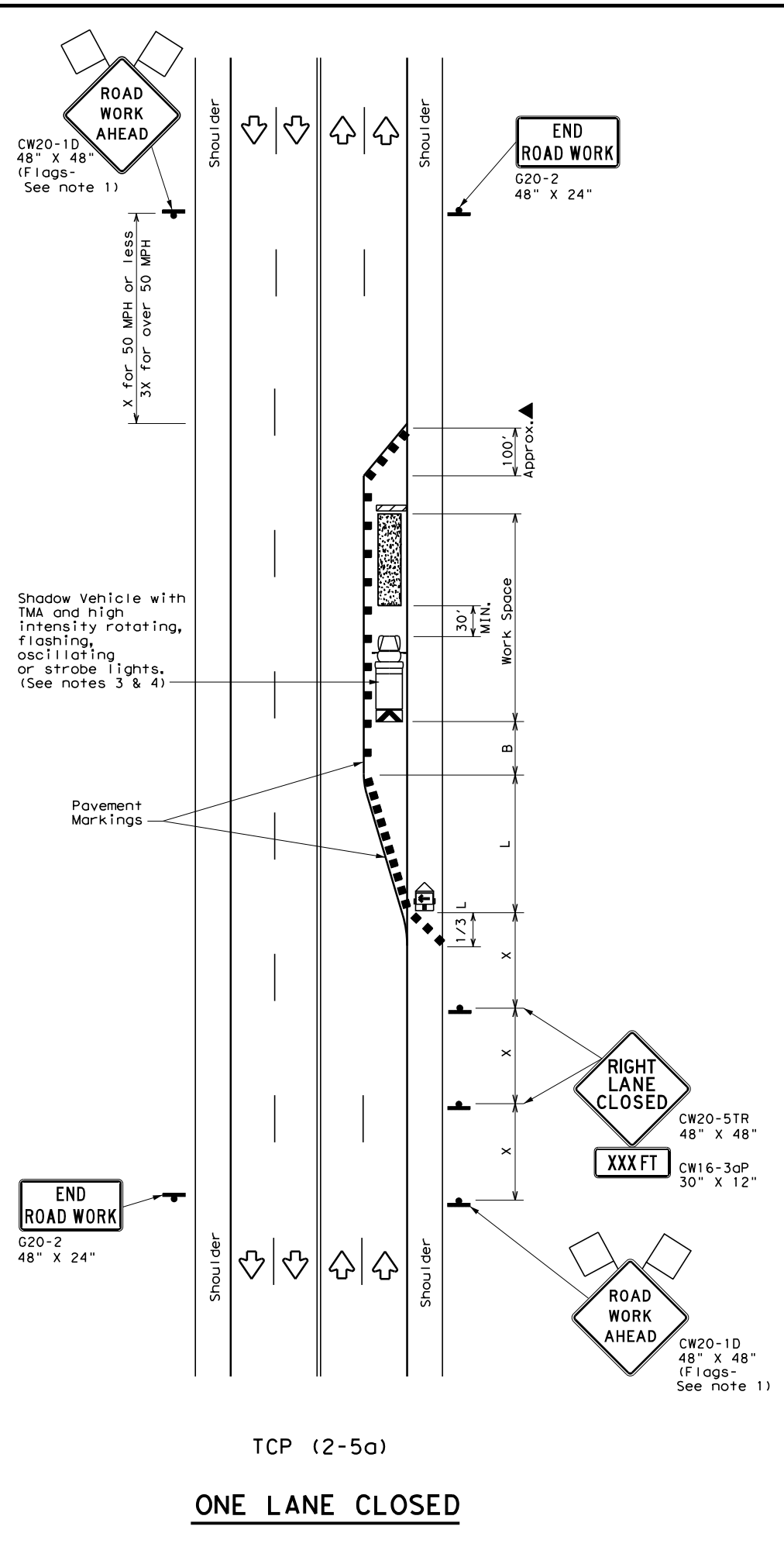
TCP (2-4) - 18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
8-95 3-03	DIST	COUNTY	SHEET NO.	
1-97 2-12	AUS	WILLIAMSON	57	
4-98 2-18				

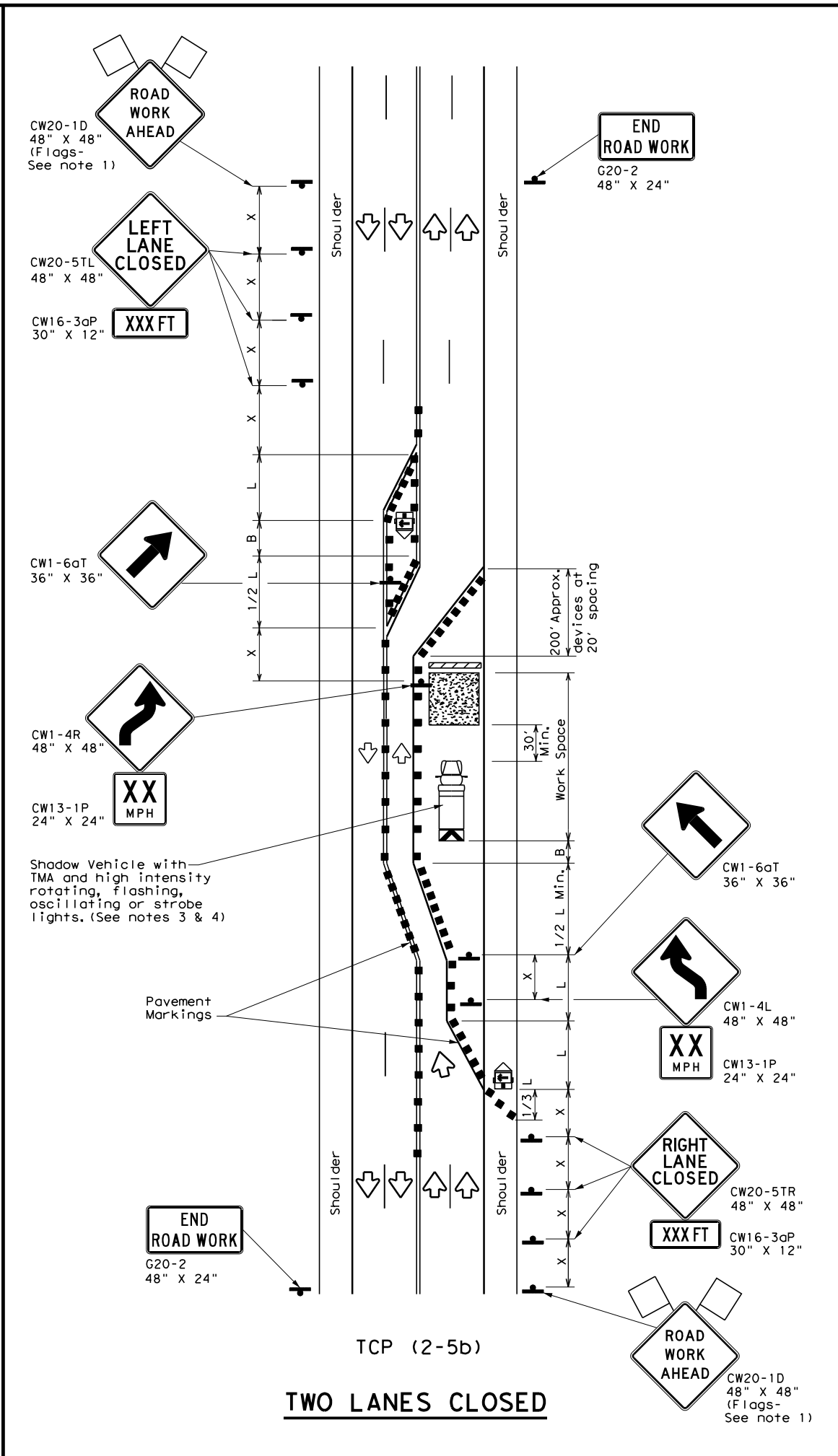
164

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DATE: 7/2/2021 9:22:40 PM
 FILE: c:\bms\br1\dgeformar-pw\managa_mofon\dms03688\037403-TCP(2-5)-18.dgn



TCP (2-5a)
ONE LANE CLOSED



TCP (2-5b)
TWO LANES CLOSED

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

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

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

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

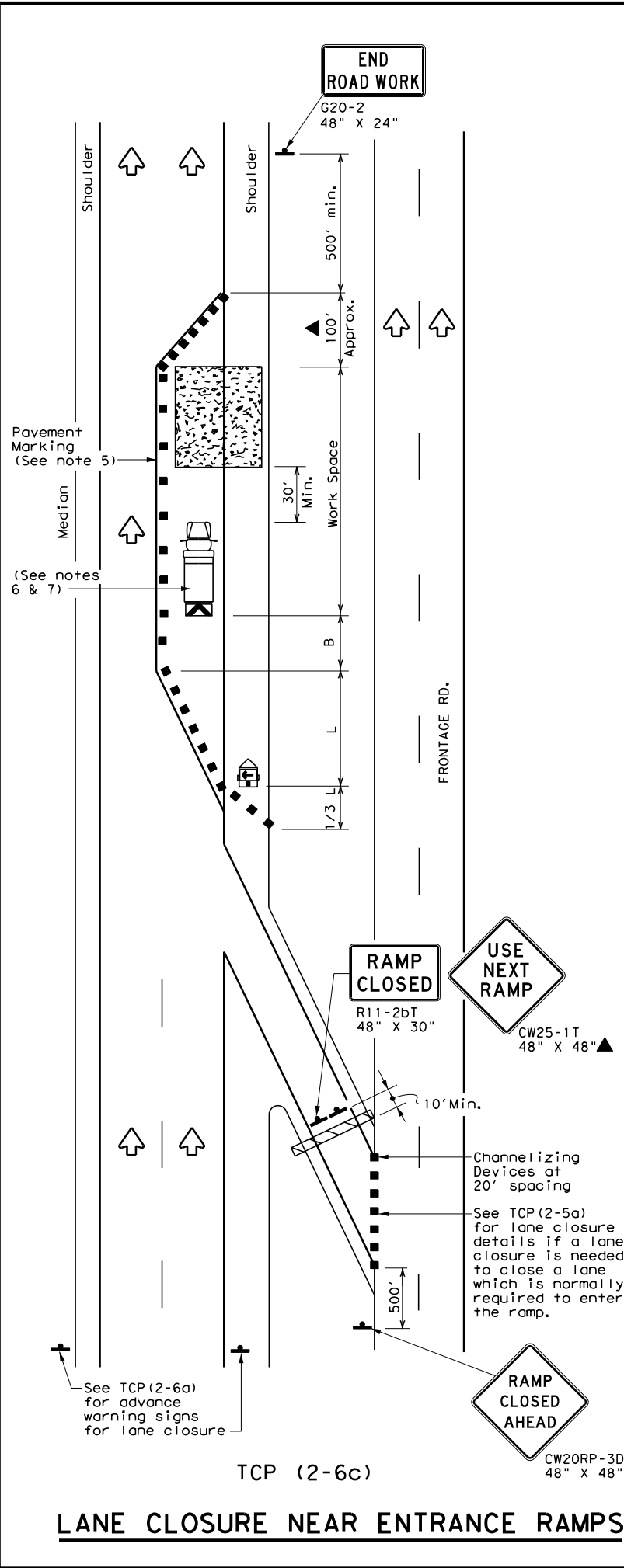
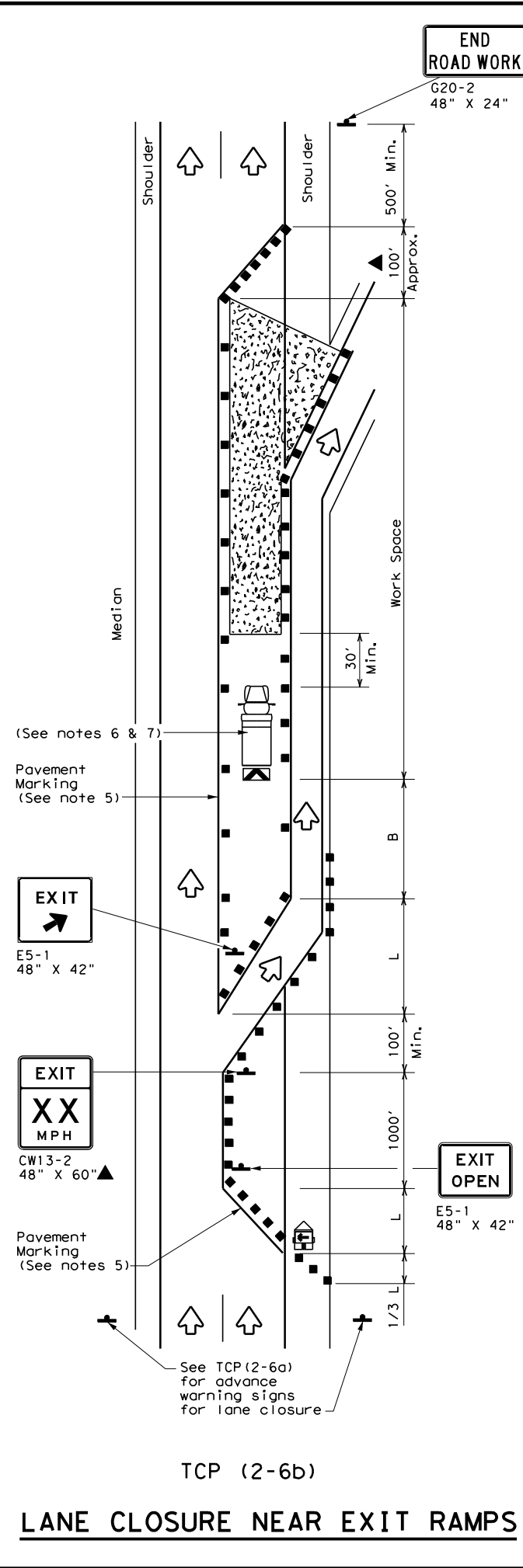
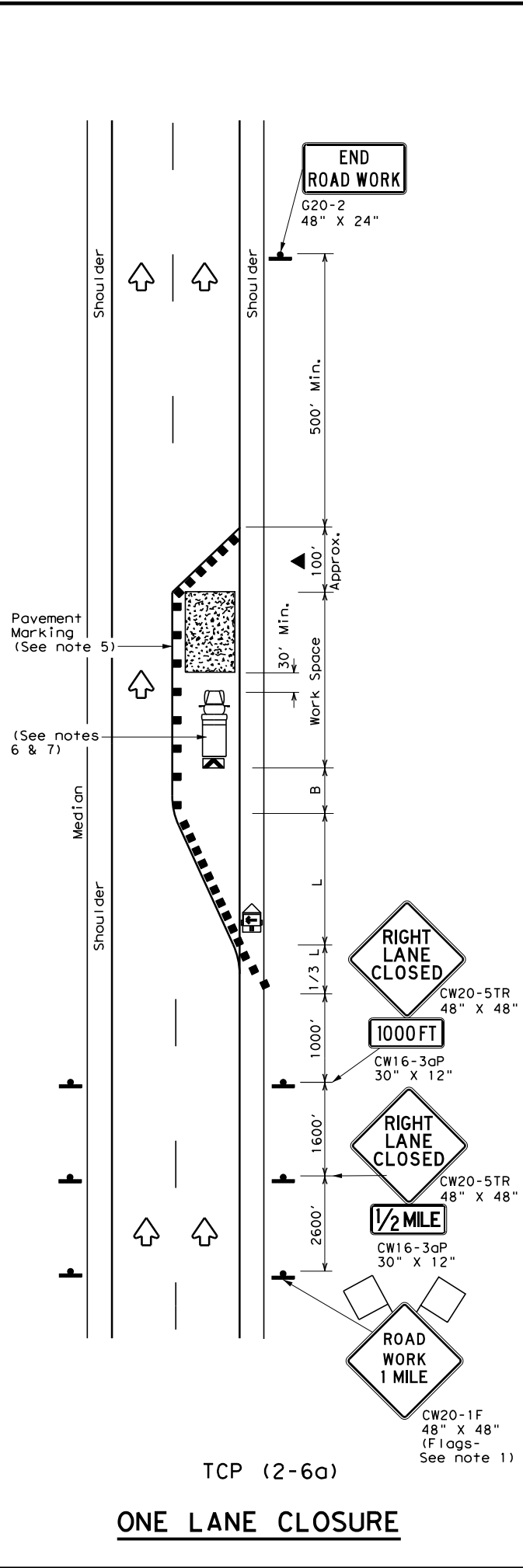
- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - A Shadow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

- TCP (2-5a)**
- If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic, with the arrow board placed in the closed lane near the end of the merging taper.
- TCP (2-5b)**
- Conflicting pavement markings shall be removed for long-term projects.

		Traffic Operations Division Standard	
TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.			
TCP (2-5) - 18			
FILE: tcp2-5-18.dgn	DN:	CK:	DW:
© TxDOT December 1985	CONT	SECT	JOB
REVISIONS	0015	09	194
8-95 2-12	DIST	COUNTY	SHEET NO.
1-97 3-03	AUS	WILLIAMSON	58
4-98 2-18			

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DATE: 7/2/2021 9:22:42 PM
 FILE: c:\bms\br1\dgefarmer-pw\mansa.mofon\dms03688\037403-TCP(2-6)-18.dgn



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

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
 - Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on every other channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
 - The placement of pavement markings may be omitted on intermediate-term stationary work zones with the approval of the Engineer.
 - Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation
 Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

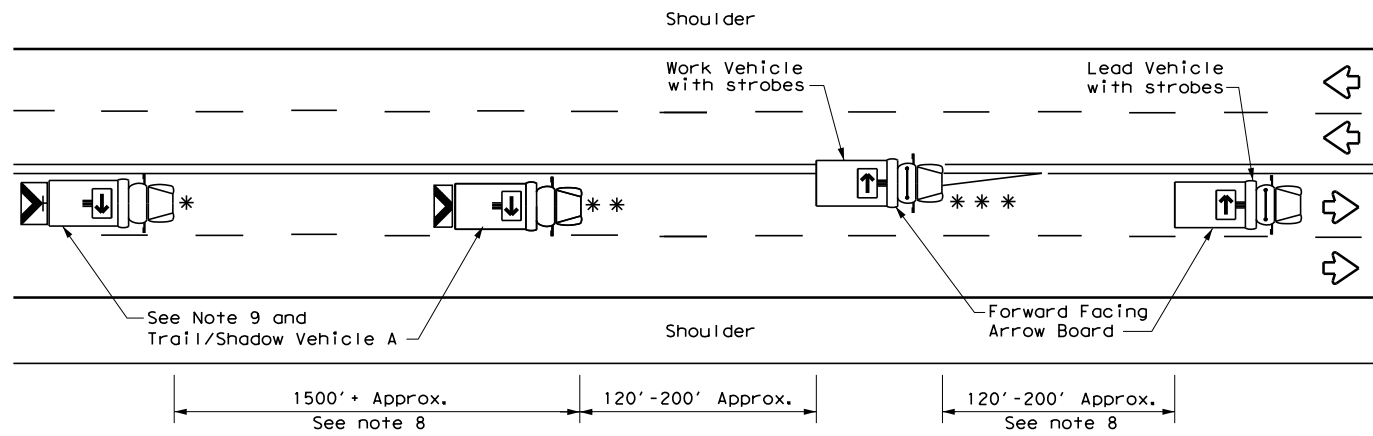
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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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8-95 2-12	AUS	WILLIAMSON	59	
1-97 2-18				

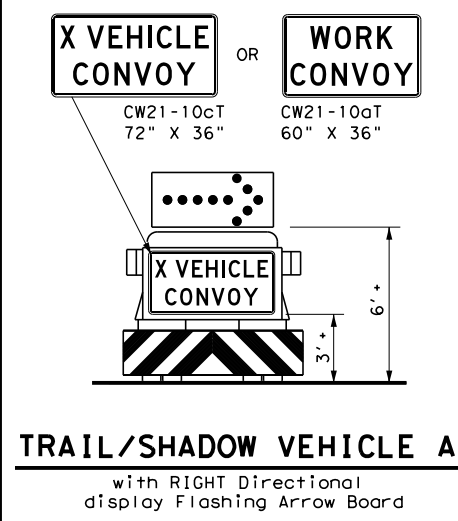
166

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DATE: 7/2/2021 9:22:45 PM
 FILE: c:\bms\br\1dger\formar-pw\manisa\dms03688\037403-TCP(3-1)-13.dgn



TCP (3-1a)
UNDIVIDED MULTILANE ROADWAY



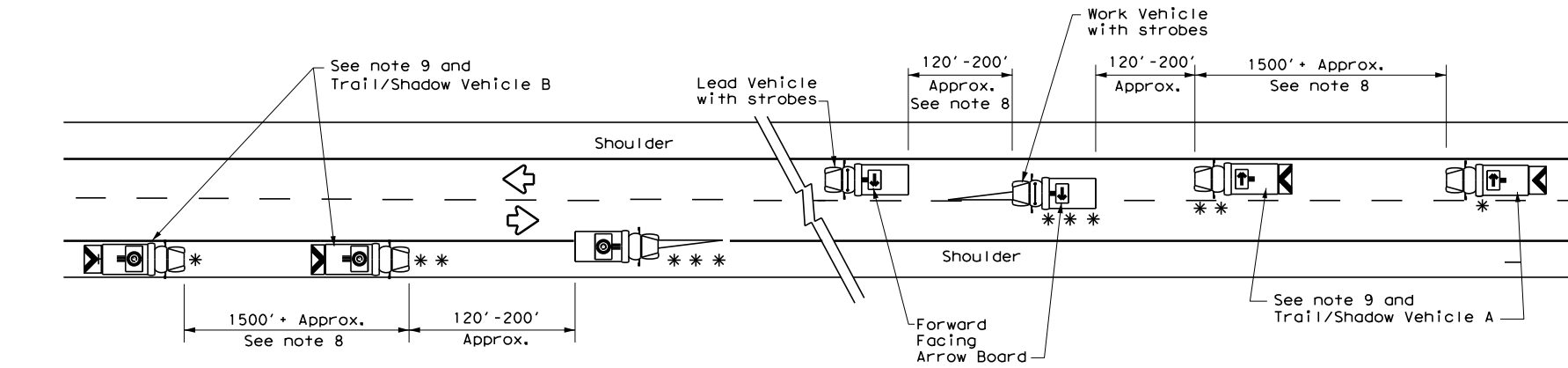
TRAIL/SHADOW VEHICLE A
 with RIGHT Directional display Flashing Arrow Board

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

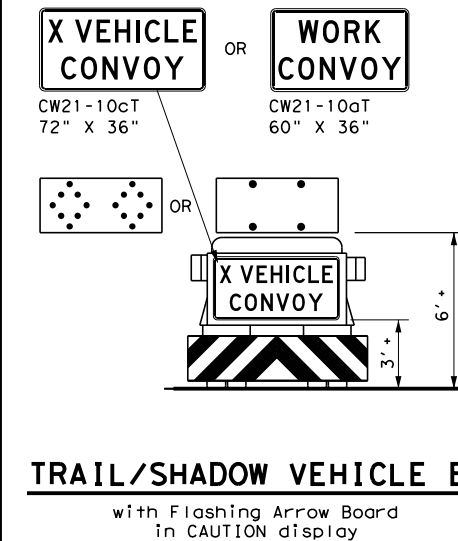
TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
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GENERAL NOTES

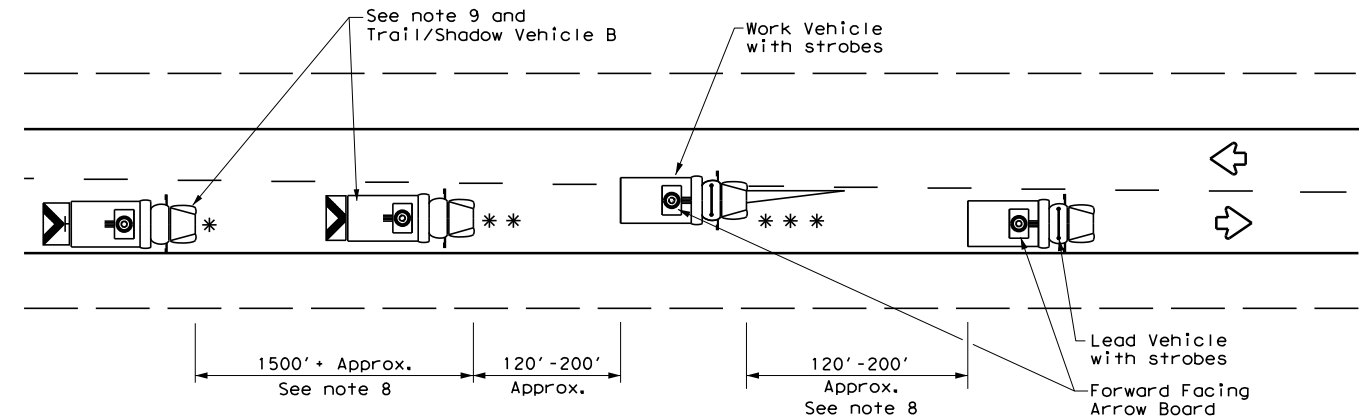
1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic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



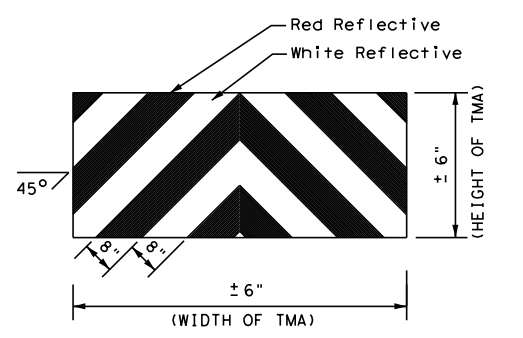
TCP (3-1b)
TWO-WAY ROADWAY WITH PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B
 with Flashing Arrow Board in CAUTION display



TCP (3-1c)
TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



STRIPING FOR TMA

Texas Department of Transportation
 Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN
 MOBILE OPERATIONS
 UNDIVIDED HIGHWAYS**

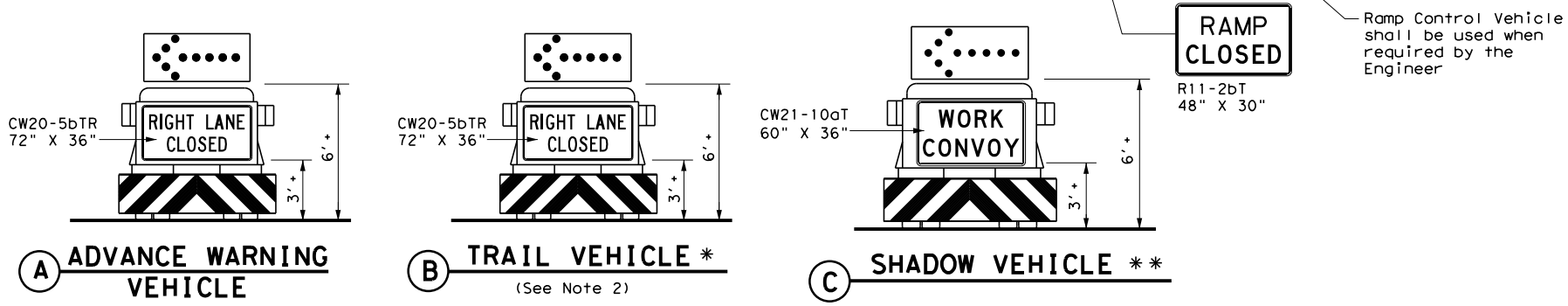
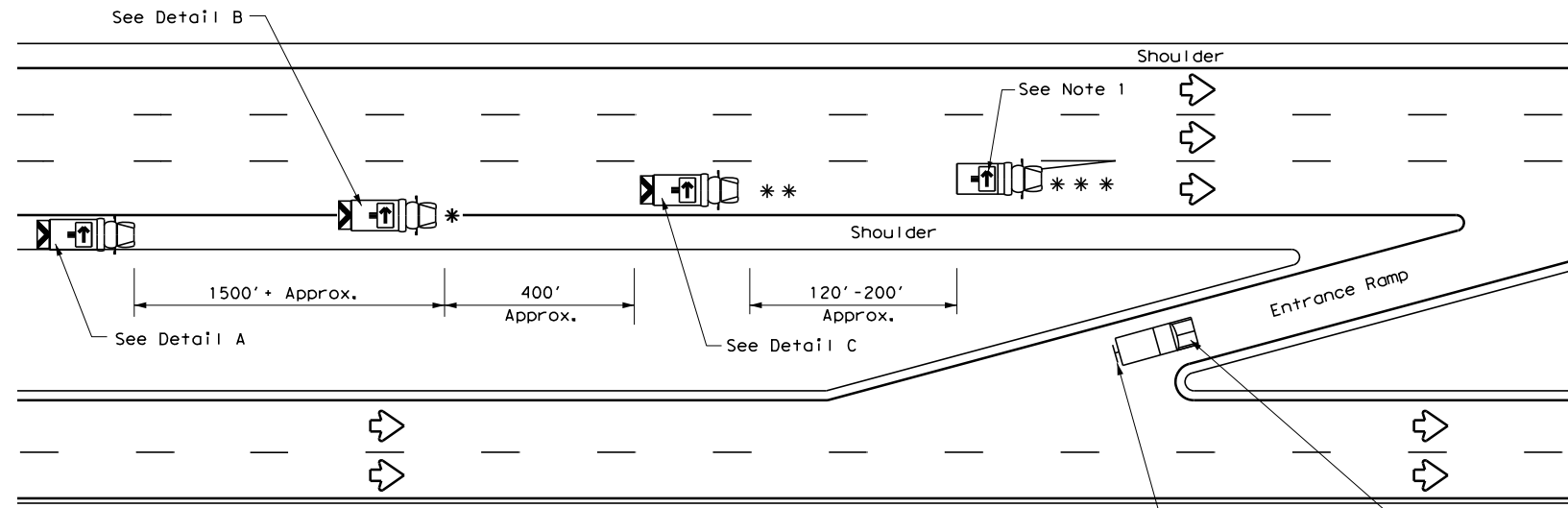
TCP(3-1)-13

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© TxDOT	December 1985	CONT	SECT	JOB	HIGHWAY				
REVISIONS	0015	09	194	1H	35				
2-94	4-98	DIST	COUNTY	SHEET NO.					
8-95	7-13	AUS	WILLIAMSON	60					
1-97									

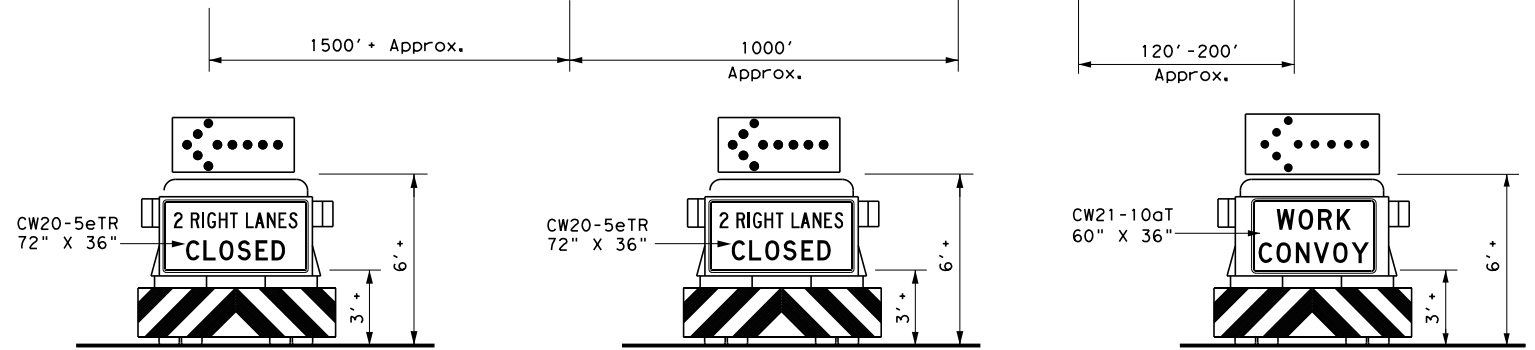
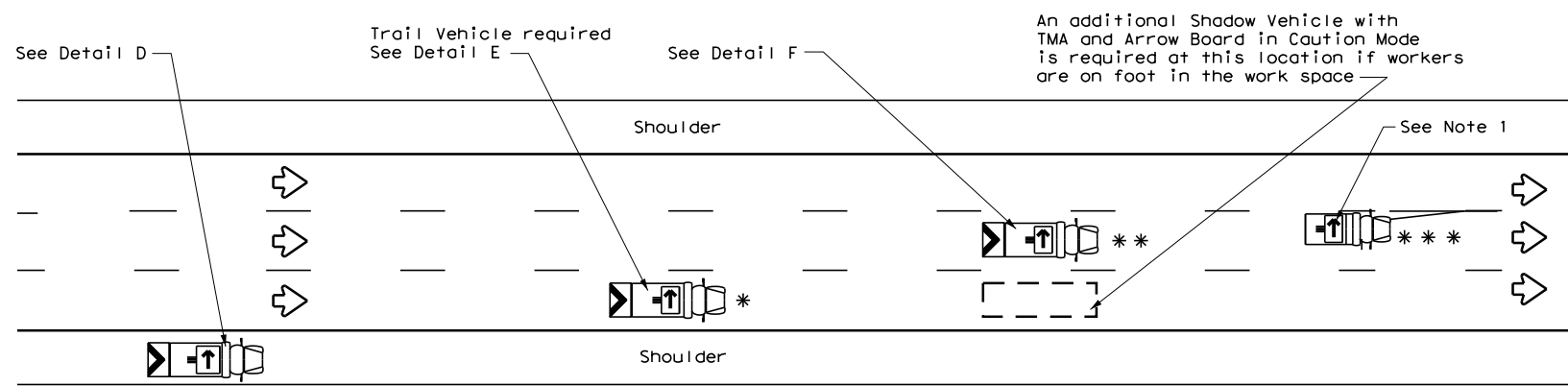
175

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DATE: 7/2/2021 9:22:47 PM
 FILE: c:\bms\br1\dge\former-pw\manisa_moton.dms\03688\037403-TCP(3-2)-13.dgn



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



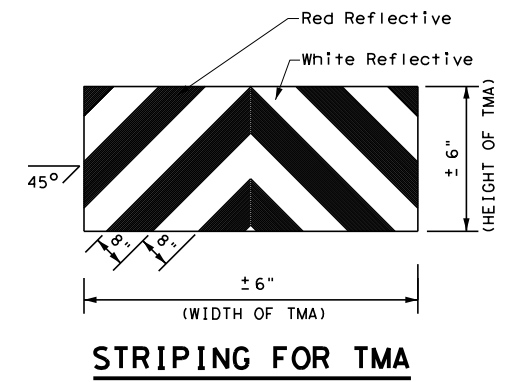
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

- 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.
- 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.
- 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.
- The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
- Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
- Each vehicle shall have two-way radio communication capability.
- When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
- 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.
- Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
- 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.
- Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
- 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.
- Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
- The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.

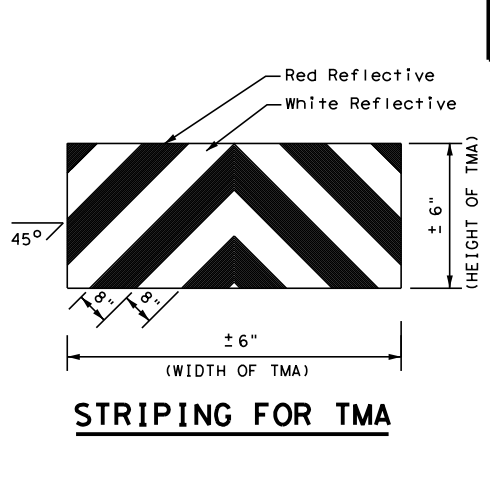
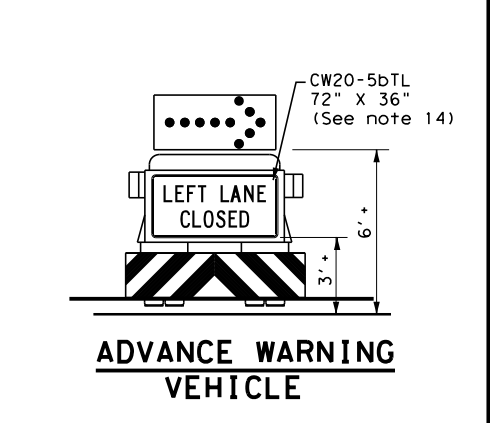
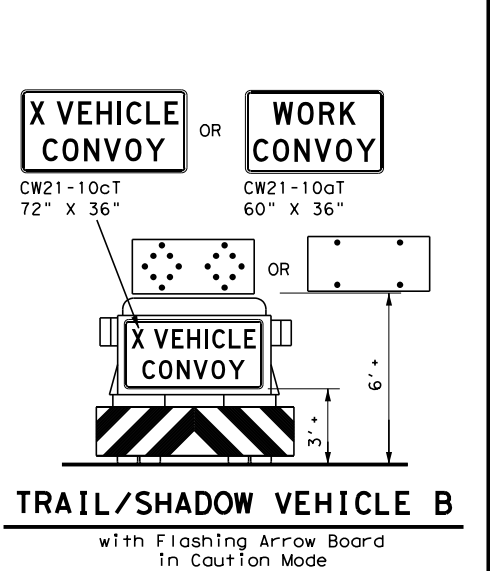
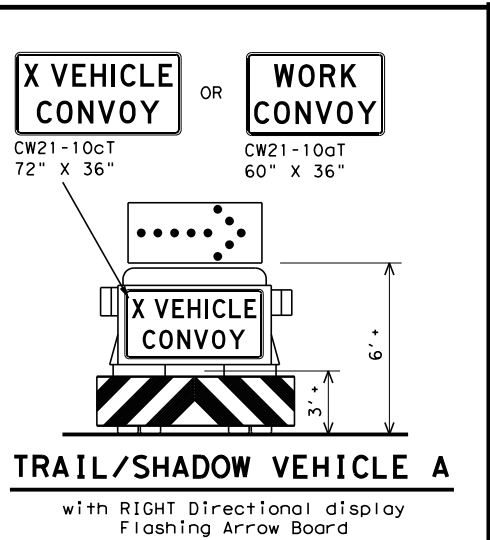
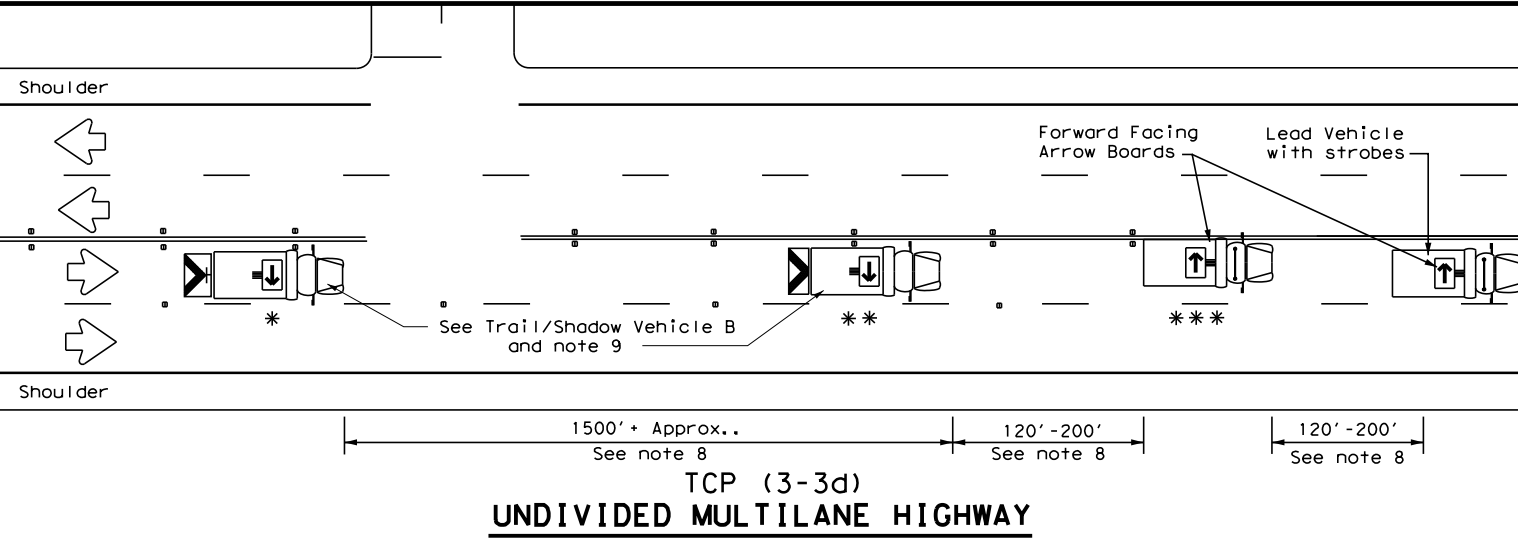
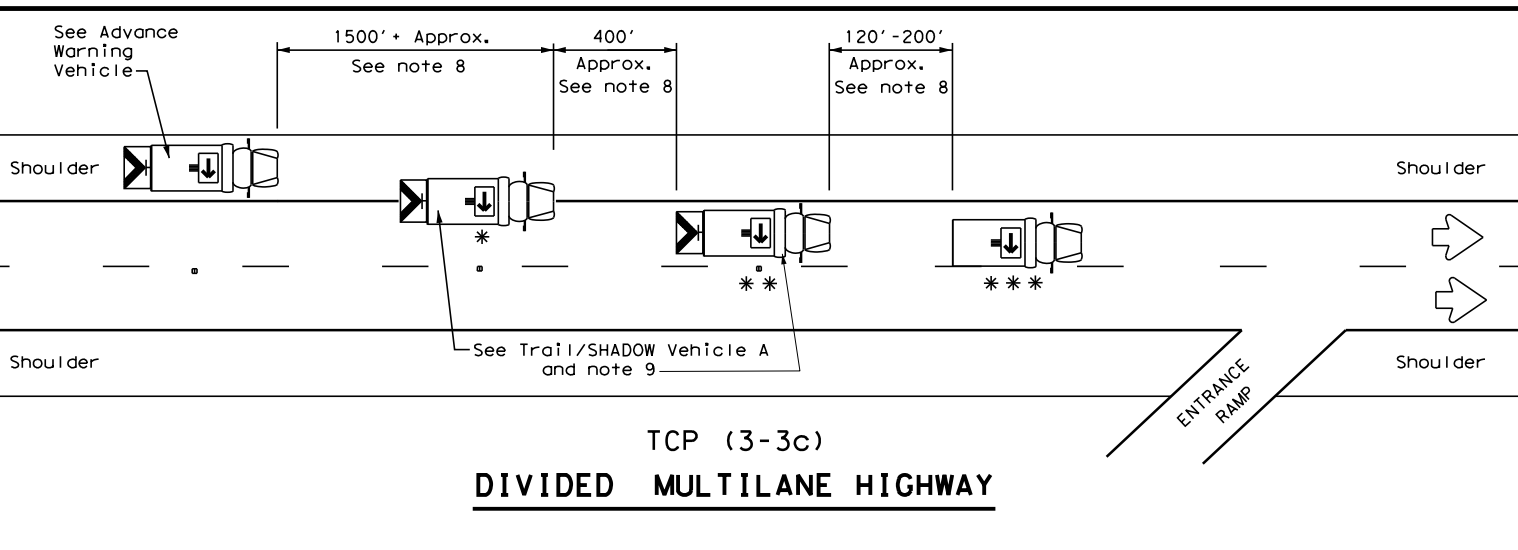
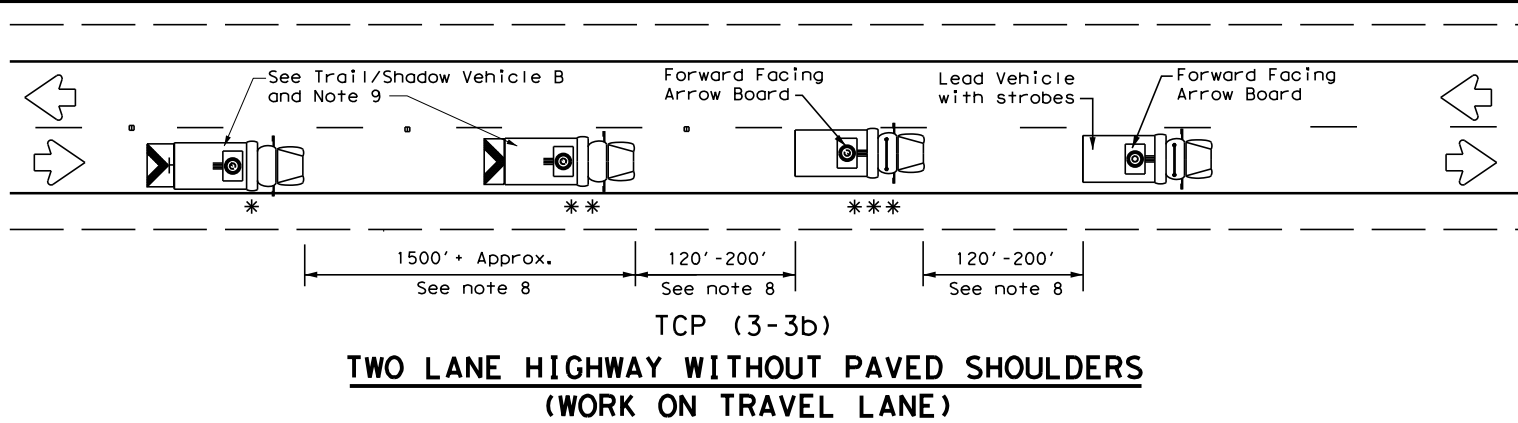
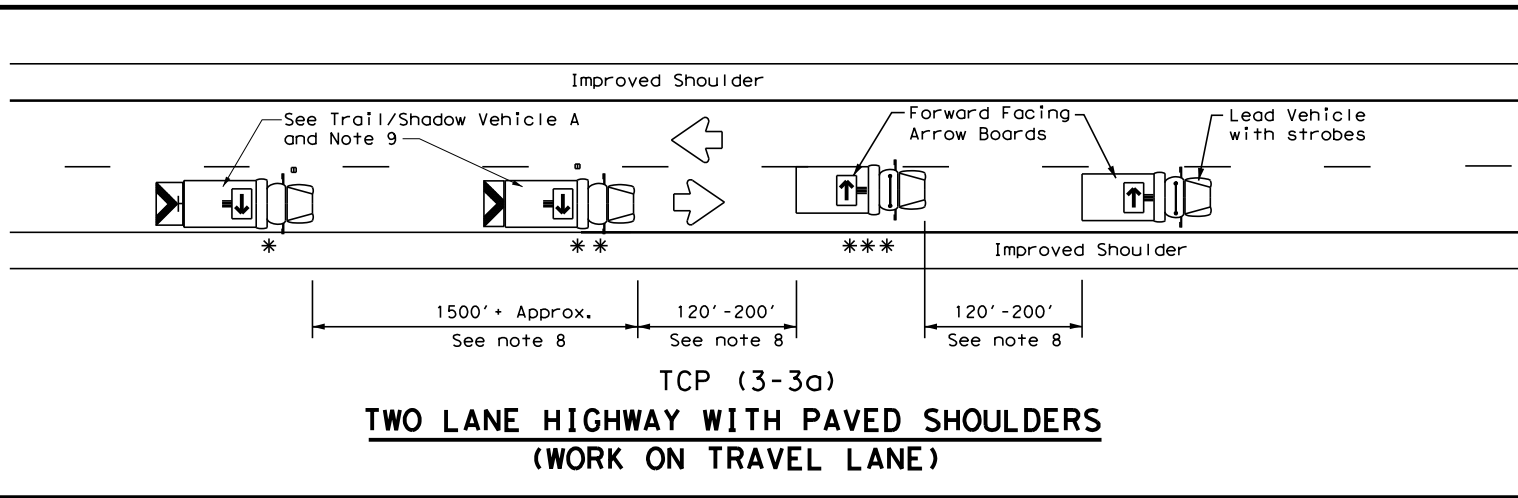


STRIPING FOR TMA

		Traffic Operations Division Standard	
TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS			
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FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT December 1985	CONT SECT	JOB	HIGHWAY
REVISIONS	0015 09	194	IH 35
2-94 4-98			
8-95 7-13			
1-97			
AUS	WILLIAMSON	SHEET NO. 61	

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DATE: 7/2/2021 9:22:50 PM
 FILE: c:\bms\br1\dge\formar-pw\manisa.mot\on.dms\03688\037403-TCP(3-3)-14.dgn



LEGEND		
* Trail Vehicle		ARROW BOARD DISPLAY
** Shadow Vehicle		
*** Work Vehicle		RIGHT Directional
		LEFT Directional
		Double Arrow
		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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.

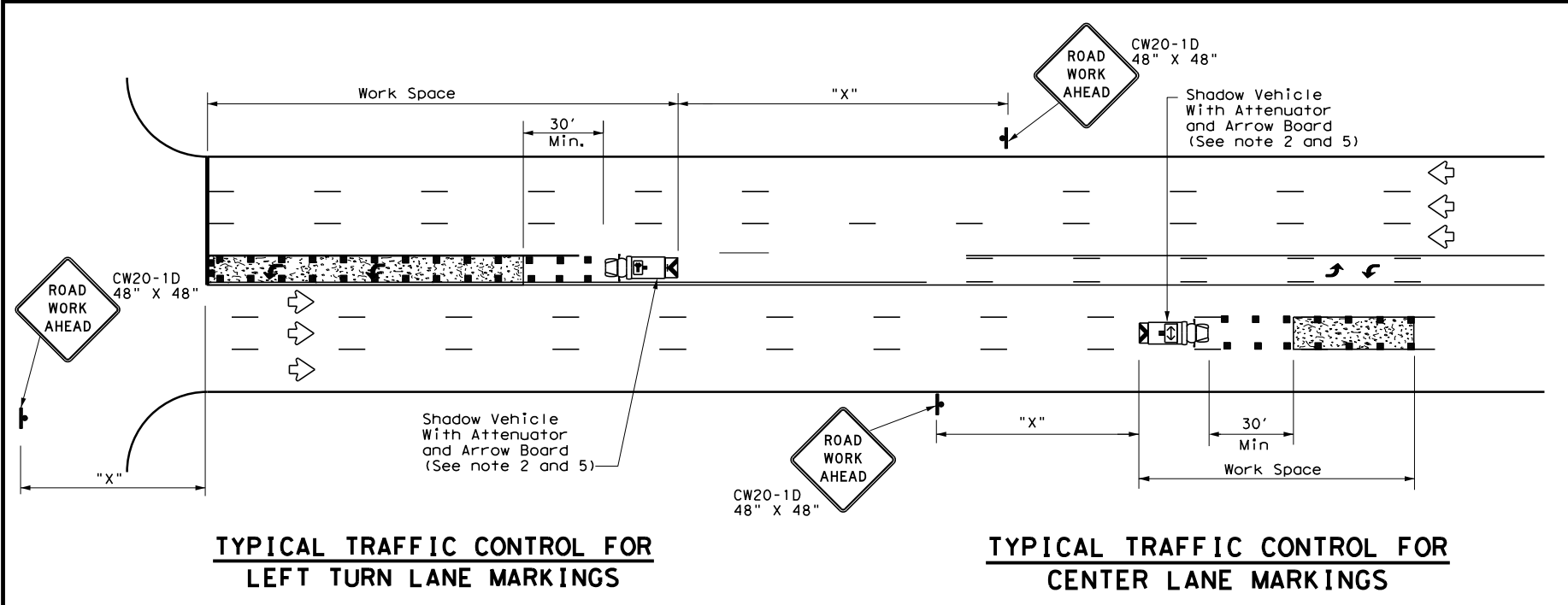
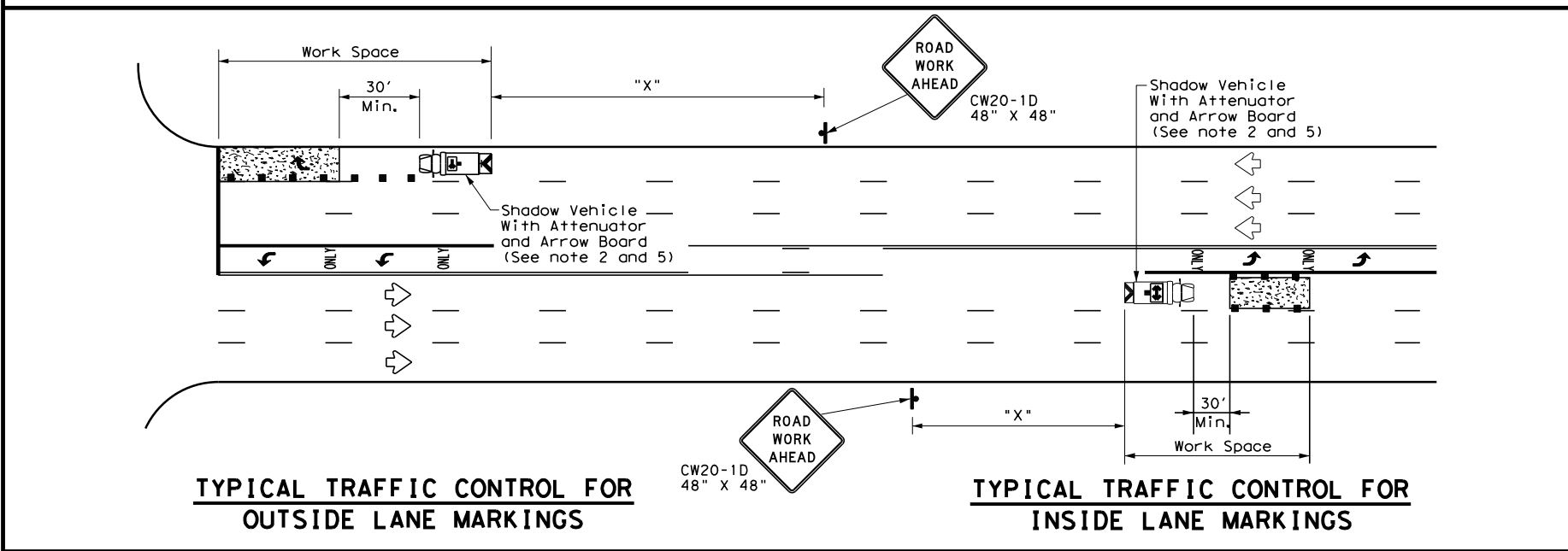
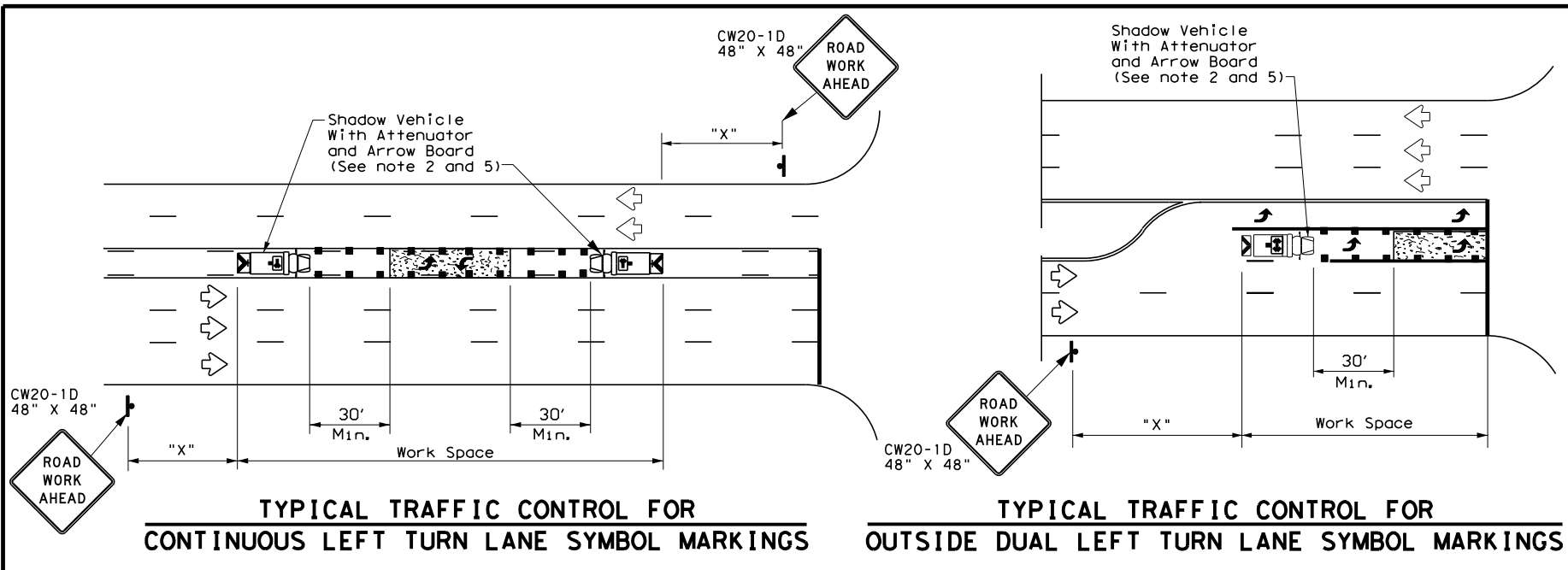
Texas Department of Transportation

**TRAFFIC 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	0015	09	194	1H 35
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	AUS	WILLIAMSON	62	
1-97 7-14				

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DATE: 7/2/2021 9:22:52 PM
 FILE: c:\bms\br\1d\geformer-pw\manisa.moton\dms03688\037403-TCP(3-4)-13.dgn



LEGEND		
*	Trail Vehicle	ARROW BOARD DISPLAY
**	Shadow Vehicle	
***	Work Vehicle	RIGHT Directional
	Heavy Work Vehicle	LEFT Directional
	Truck Mounted Attenuator (TMA)	Double Arrow
	Traffic Flow	Channelizing Devices

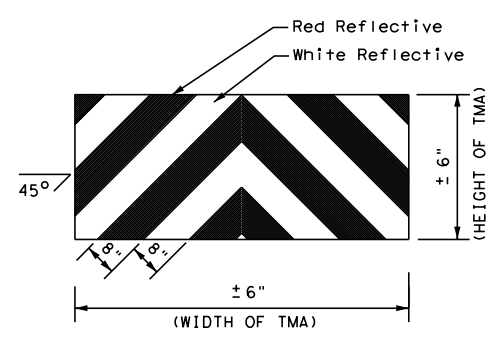
Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = WS ² / 60	150'	165'	180'	30'	60'	120'	90'
35		205'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

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

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

GENERAL NOTES

1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.
2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.
3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.
4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

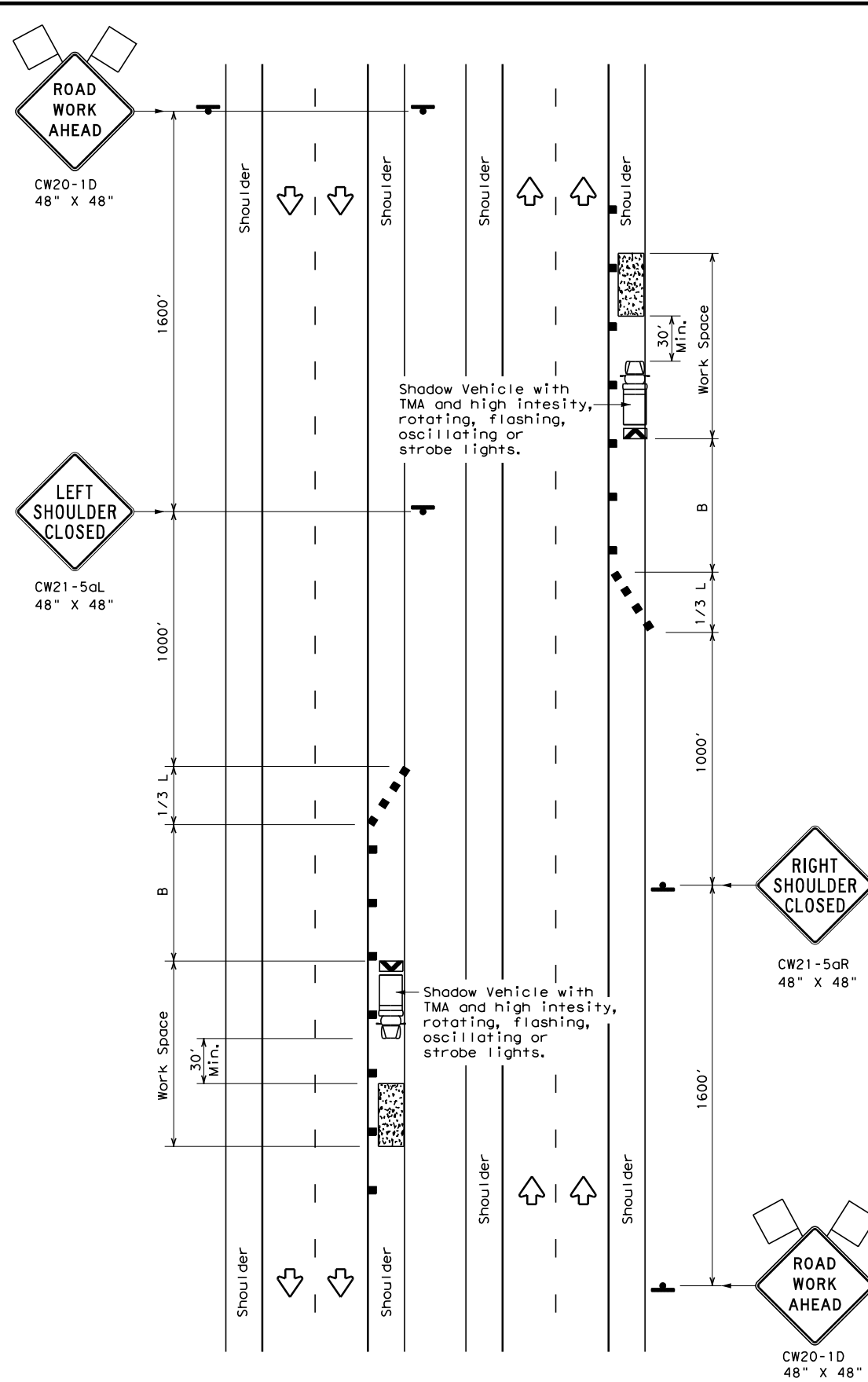
Texas Department of Transportation
 Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN
 MOBILE OPERATIONS FOR
 ISOLATED WORK AREAS
 UNDIVIDED HIGHWAYS
 TCP(3-4)-13**

FILE: tcp3-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT July, 2013	CONT: 0015	SECT: 09	JOB: 194	HIGHWAY: IH 35
REVISIONS	DIST: AUS	COUNTY: WILLIAMSON	SHEET NO. 63	

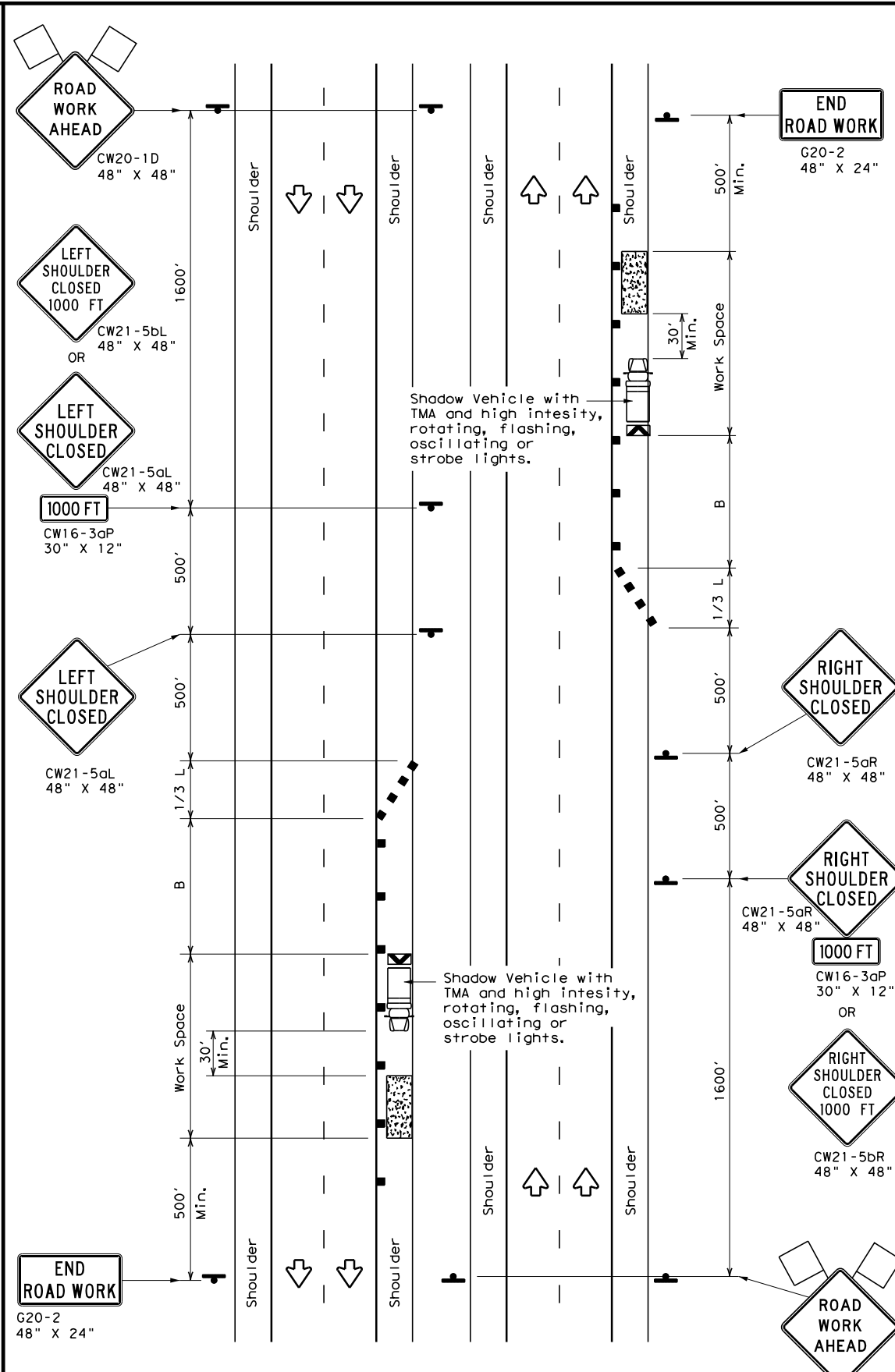
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 7/2/2021 9:22:55 PM
 FILE: c:\bms\br\edgeformer-pw\manisa.moton\dms03688\037403-TCP(5-1)-18.dgn



TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		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'	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 affecting 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.



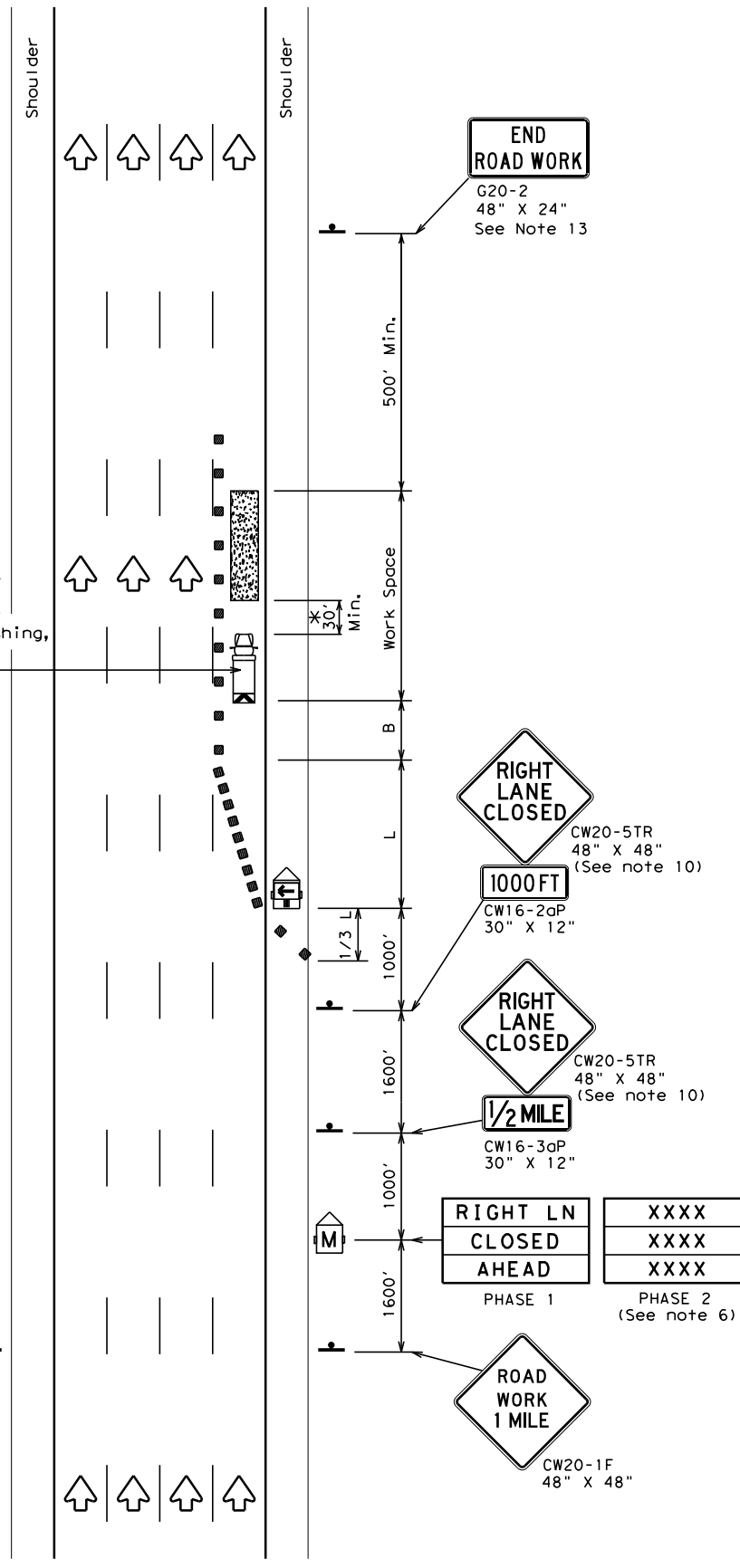
**TRAFFIC CONTROL PLAN
 SHOULDER WORK FOR
 FREEWAYS / EXPRESSWAYS**

TCP (5-1) - 18

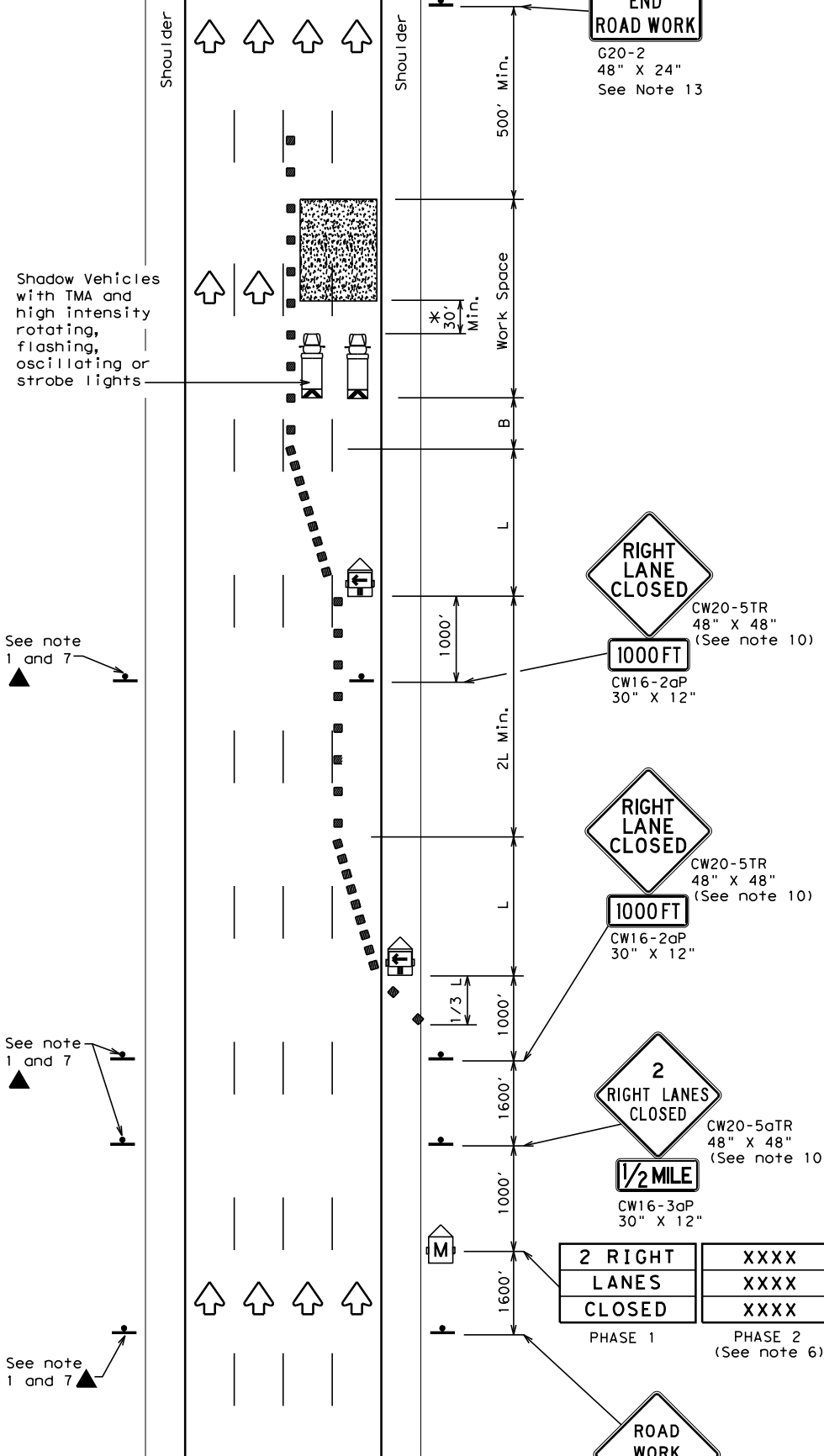
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© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
2-18	DIST	COUNTY	SHEET NO.	
	AUS	WILLIAMSON	64	

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DATE: 7/2/2021 9:22:57 PM
 FILE: c:\bms\br1\dgefarmer-pw\mansa.moton\dms03688\037403-TCP (6-1)-12.dgn



TCP (6-1a)
TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)
TYPICAL FREEWAY TWO LANE CLOSURE

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

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

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

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

GENERAL NOTES

- All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
- 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.
- All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
- The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
- 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.
- 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.
- Duplicate construction warning signs should be erected on the medians side of freeways where median width will permit and traffic volume justifies the signing.
- 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.
- Warning signs for intermediate term stationary work should be mounted at 7' to the bottom of the sign.
- 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.
- 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.
- 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.
- 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.



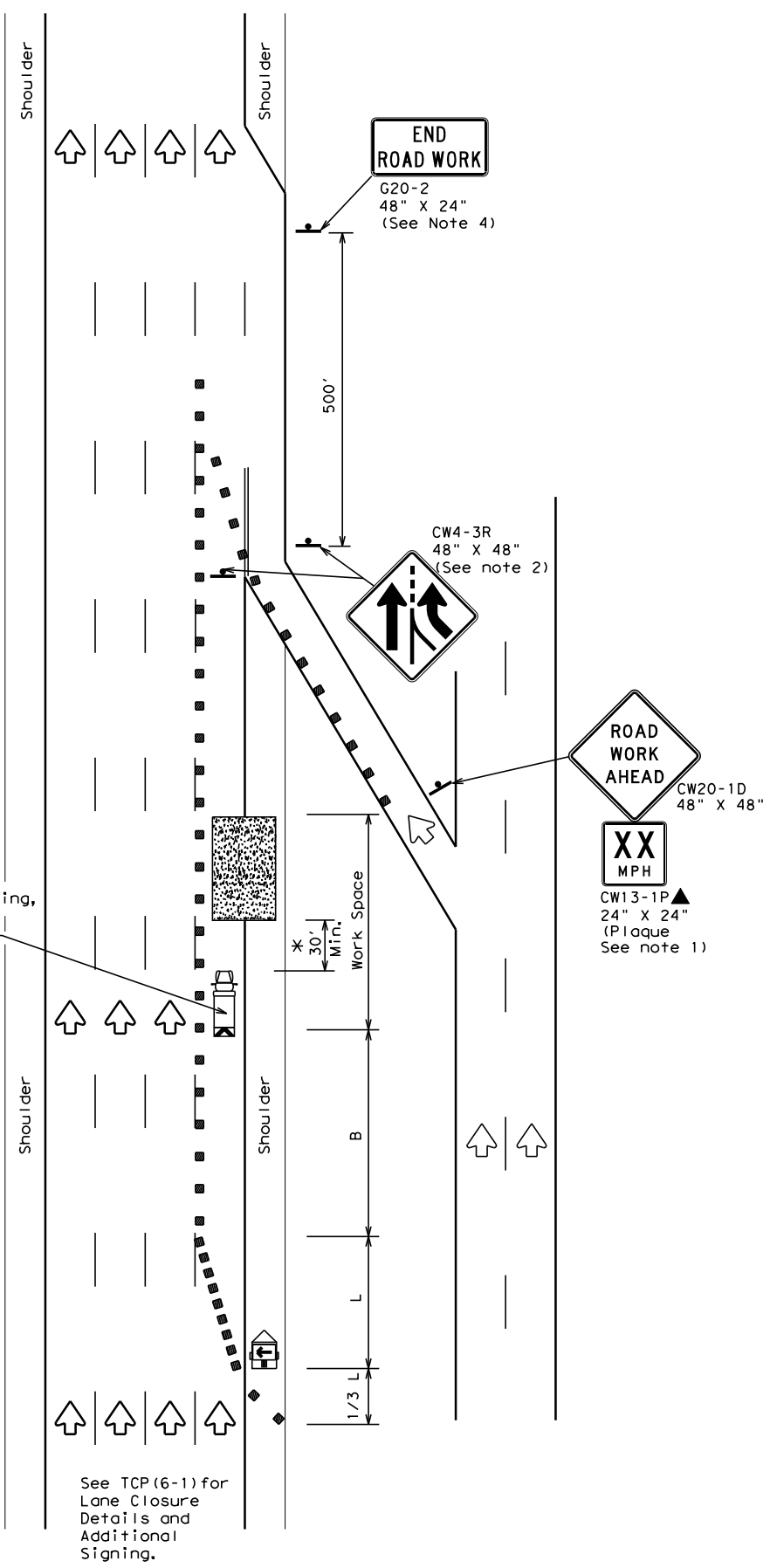
**TRAFFIC CONTROL PLAN
 FREEWAY LANE CLOSURES**

TCP (6-1) - 12

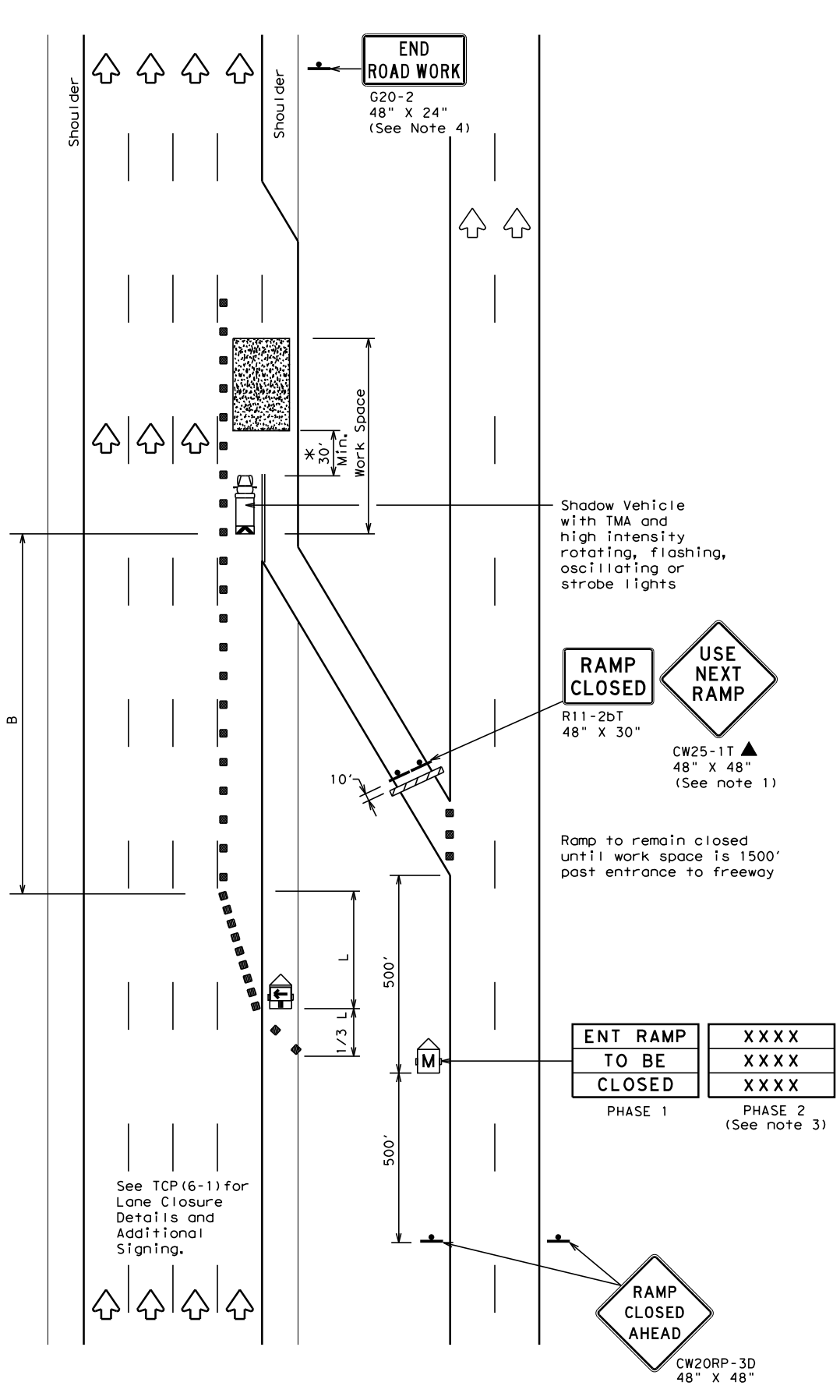
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© TxDOT	February 1998	CONT	SECT	JOB	HIGHWAY				
8-12	REVISIONS	0015	09	194	IH 35				
	DIST	COUNTY		SHEET NO.					
	AUS	WILLIAMSON		65					

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DATE: 7/2/2021 9:23:00 PM
 FILE: c:\bms\br1\dgefarmer-pw\mamsa_moton\dms03688\037403-TCP(6-2)-12.dgn



TCP (6-2a)
ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)
ENTRANCE RAMP CLOSED

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

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

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

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

GENERAL NOTES

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

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

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



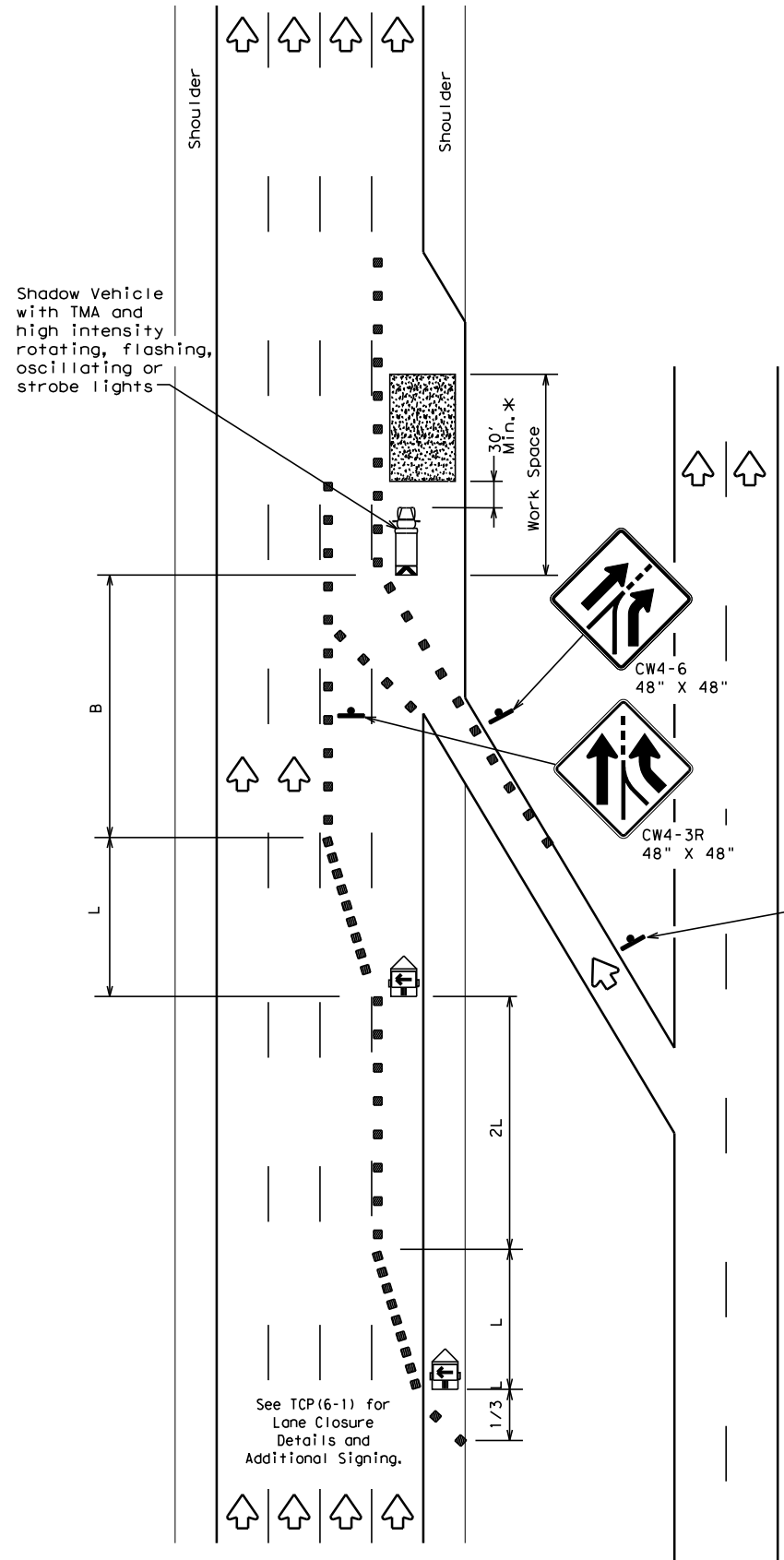
TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP (6-2) - 12

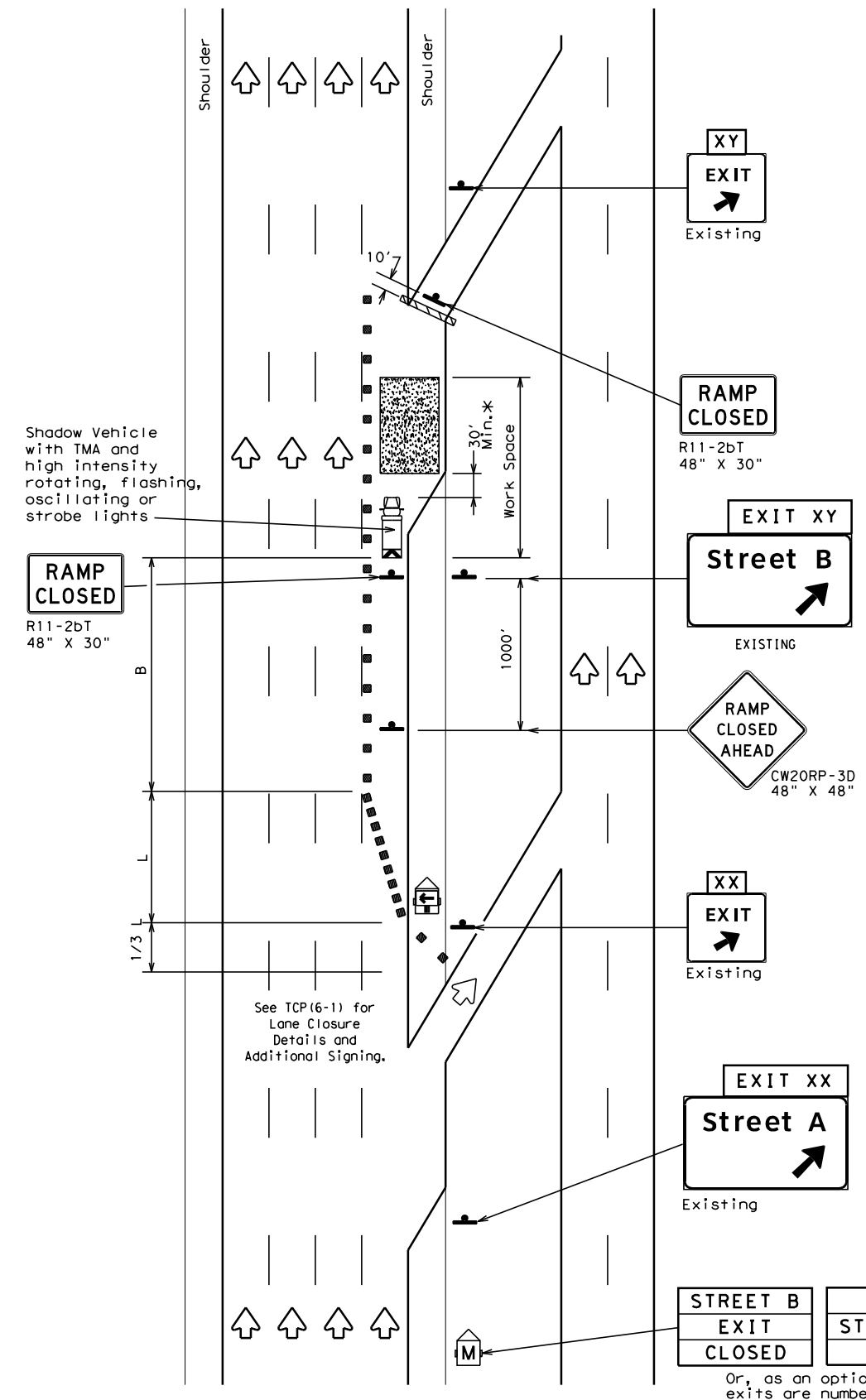
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©TxDOT	February 1994	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0015	09	194	1H 35				
1-97	8-98	DIST	COUNTY	SHEET NO.					
4-98	8-12	AUS	WILLIAMSON	66					

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DATE: 7/2/2021 9:23:02 PM
 FILE: c:\bms\br1\dgefarmer-pw\mansa_moton\dms03688\037403-TCP(6-3)-12.dgn



TCP (6-3a)
ENTRANCE RAMP OPEN



TCP (6-3b)
EXIT RAMP CLOSED
TRAFFIC EXITS PRIOR TO CLOSED RAMP

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

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

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

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

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

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

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

Texas Department of Transportation
 Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

TCP (6-3) - 12

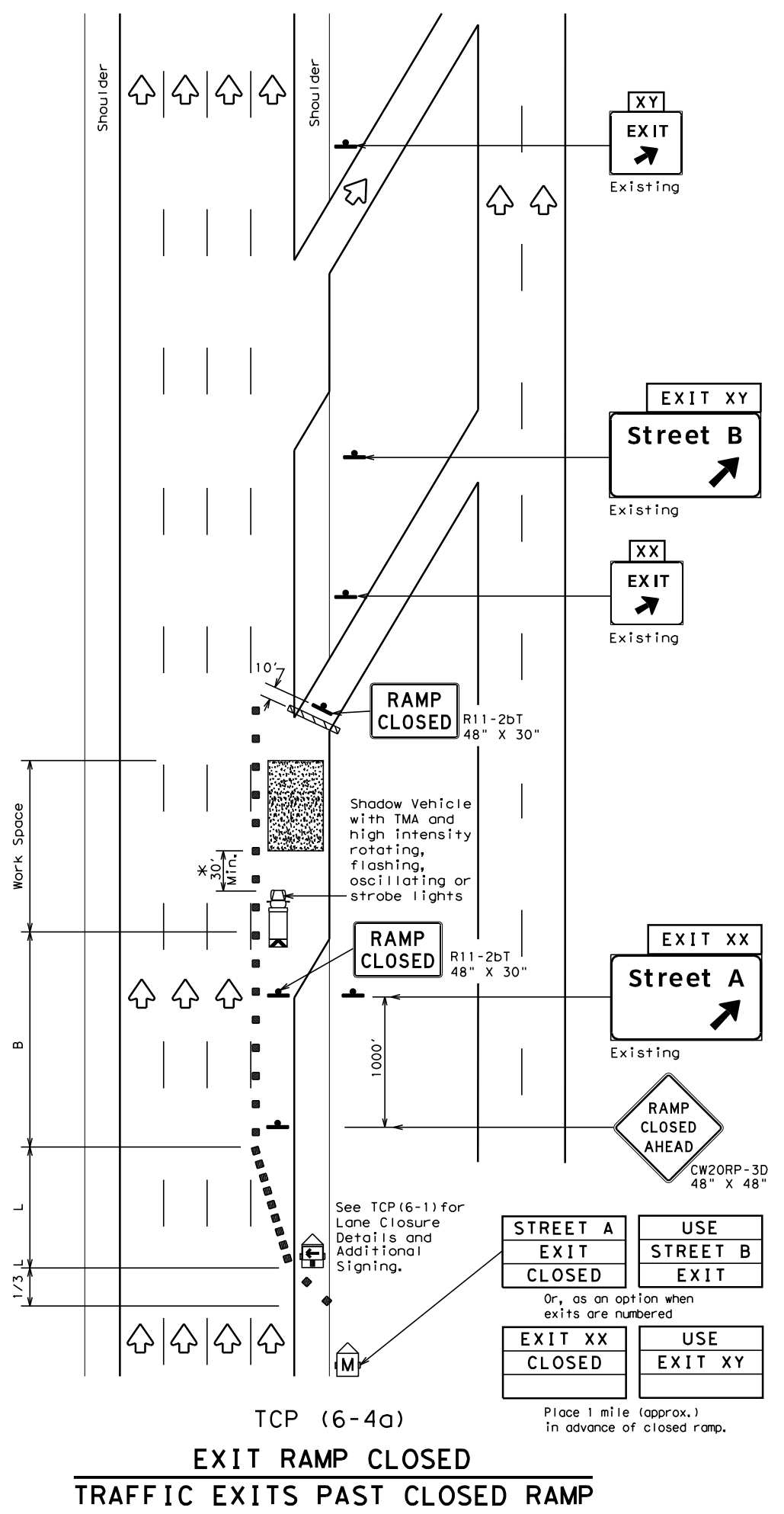
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©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
1-97 8-98	DIST	COUNTY	SHEET NO.	
4-98 8-12	AUS	WILLIAMSON	67	

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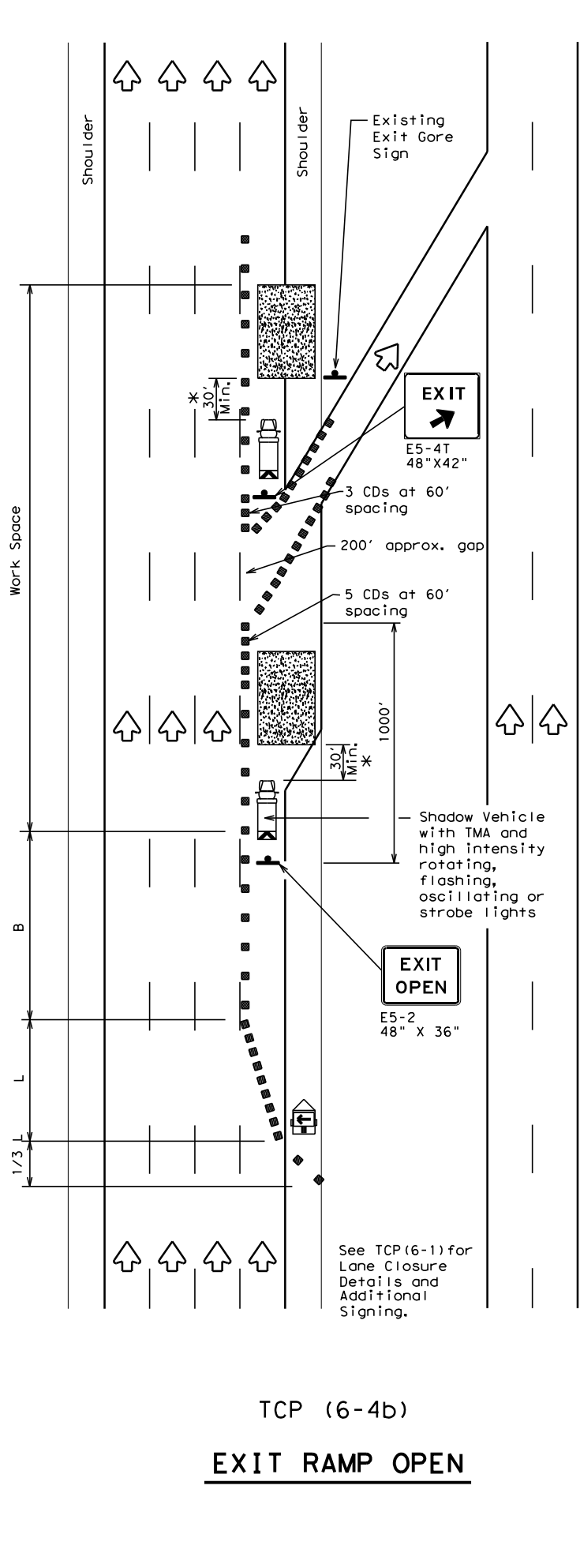
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mofon
c:\bms\br\dge\formar-pw\manasa\mofon\dms03688\037403-TCP(6-4)-12.dgn



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

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

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

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

GENERAL NOTES

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



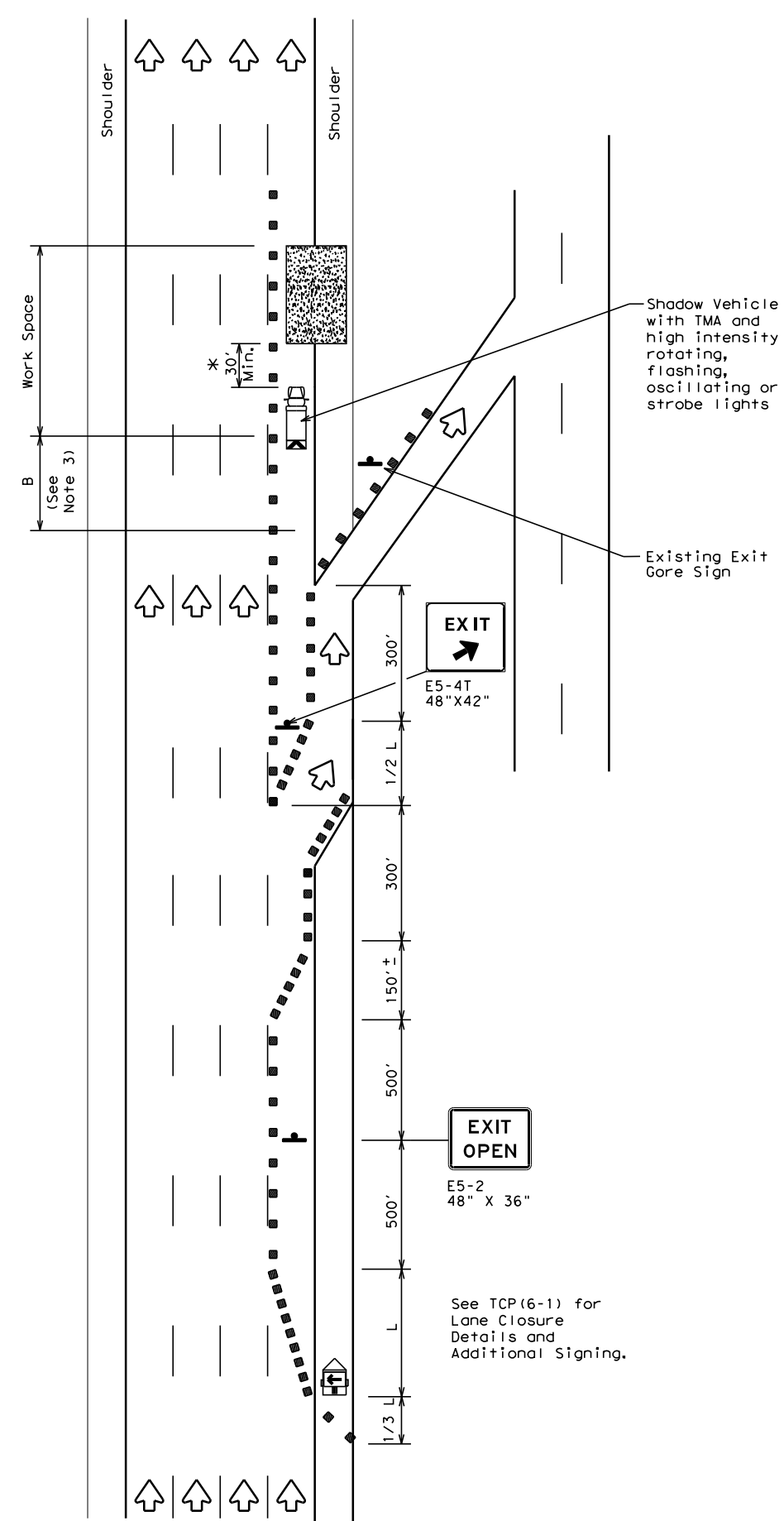
TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP (6-4) - 12

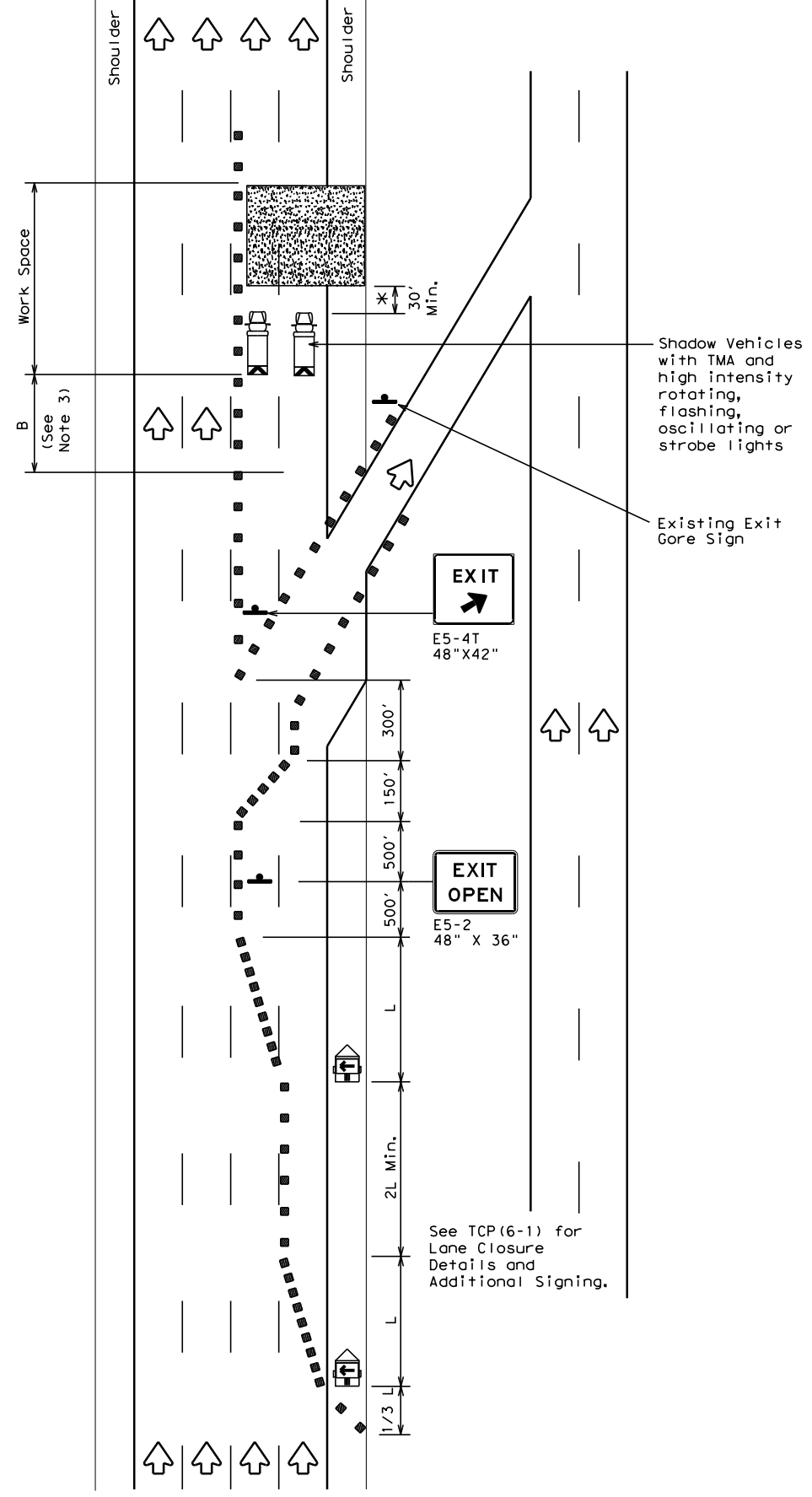
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©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
1-97 8-98	DIST	COUNTY	SHEET NO.	
4-98 8-12	AUS	WILLIAMSON	68	

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TCP (6-5a)
EXIT RAMP OPEN



TCP (6-5b)
EXIT RAMP OPEN
TWO LANE CLOSURE WITHIN
1500' PAST EXIT RAMP

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

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

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

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

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

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

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

Texas Department of Transportation
 Traffic Operations Division Standard

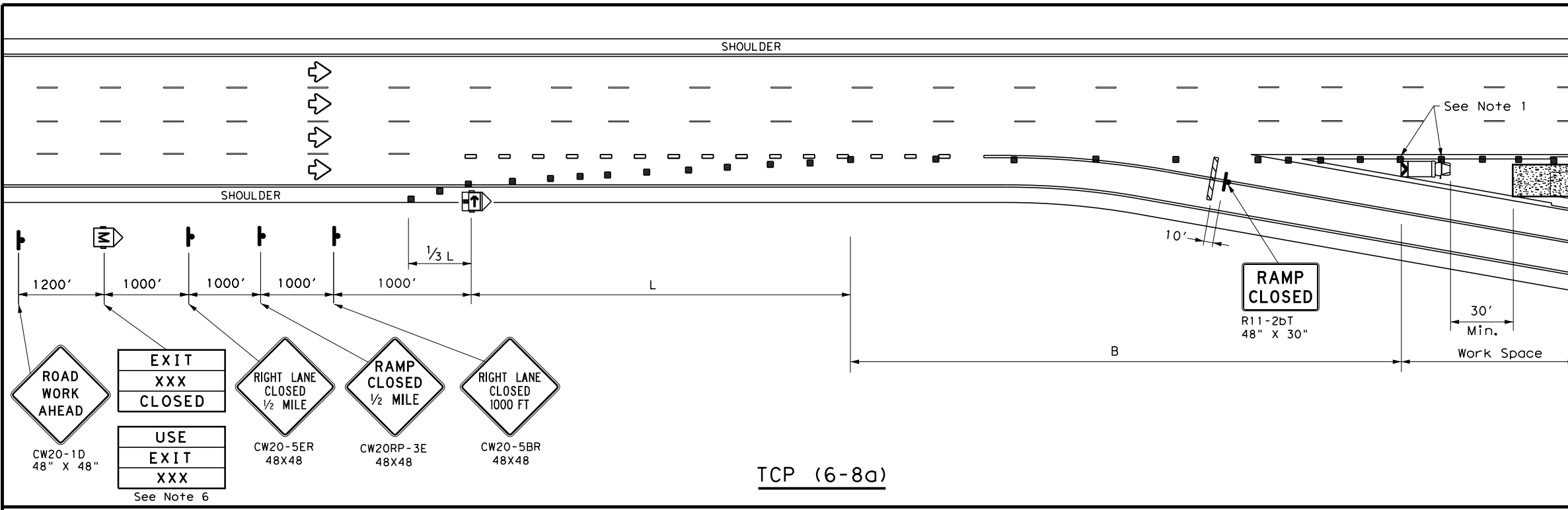
TRAFFIC CONTROL PLAN
WORK AREA BEYOND EXIT RAMP

TCP (6-5) - 12

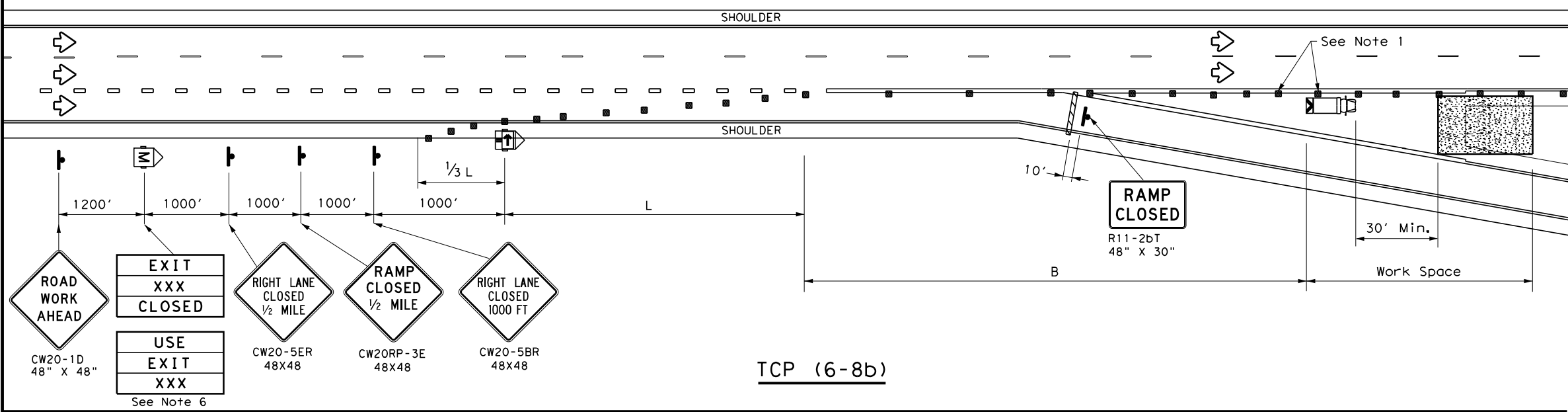
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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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1-97 8-98	DIST	COUNTY	SHEET NO.	
4-98 8-12	AUS	WILLIAMSON	69	

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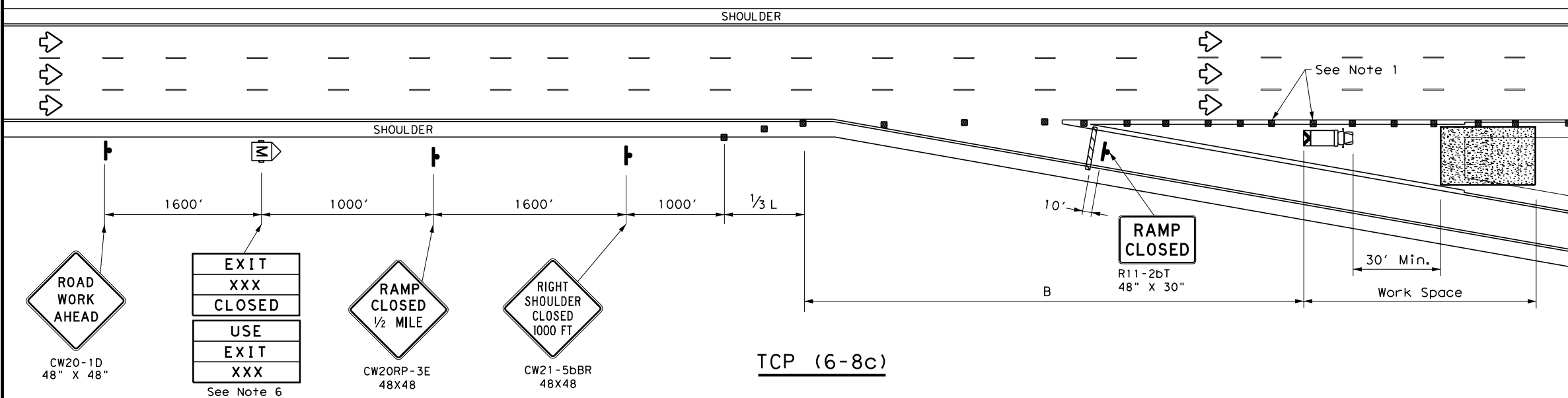
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TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

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

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

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

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

- GENERAL NOTES**
- Place channelizing devices in the gore at 20' spacing.
 - See the Standard Highway Sign Design for Texas (SHSD) for sign details.
 - The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
 - When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) for traffic control details.
 - Truck mounted attenuator is required.
 - The PCMS may be omitted if replaced with a "RAMP CLOSED" AHEAD (CW20RP-3D) Sign.
 - Roadway ADT should be greater than 10,000.



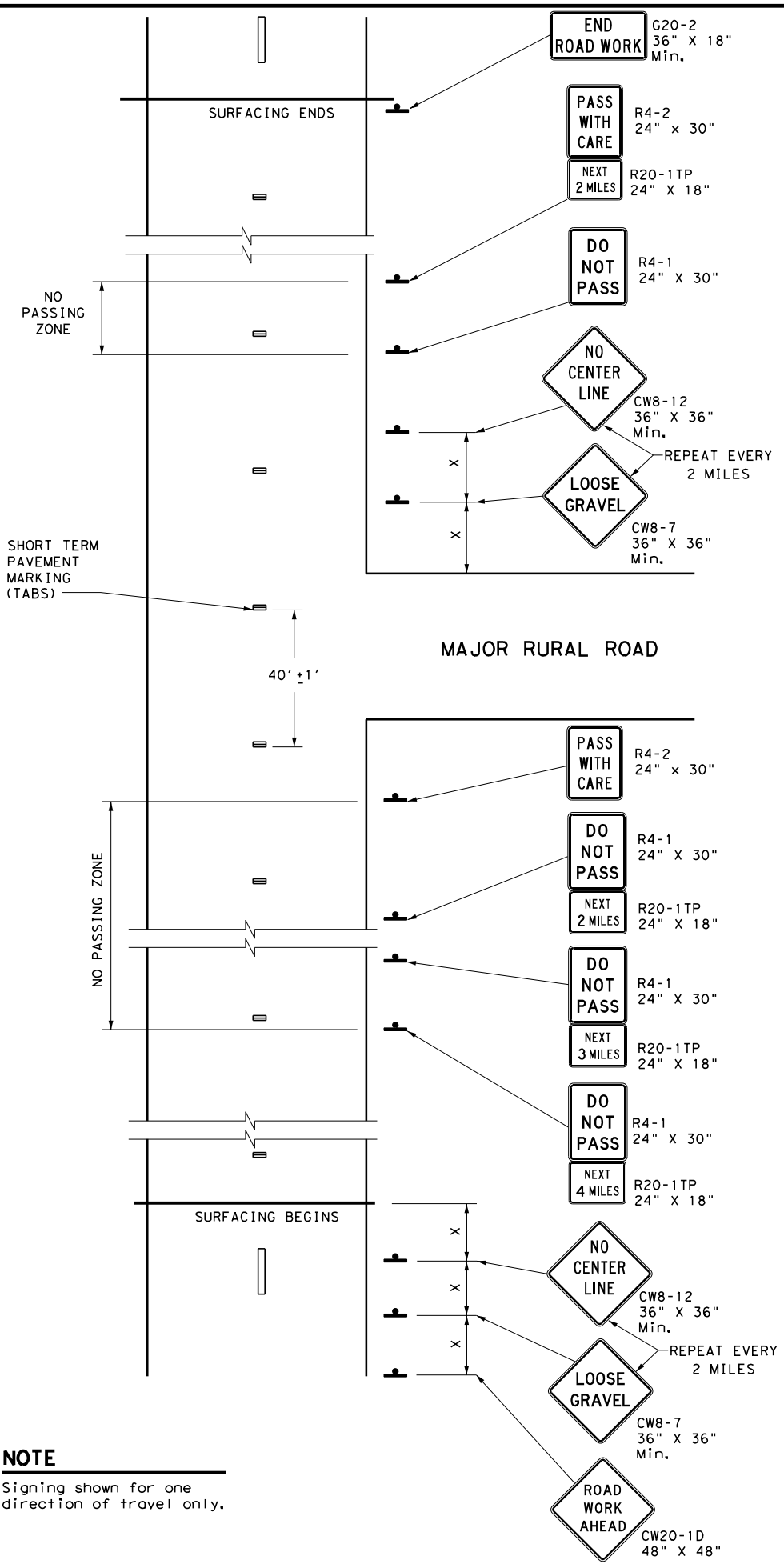
WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP (6-8) - 14

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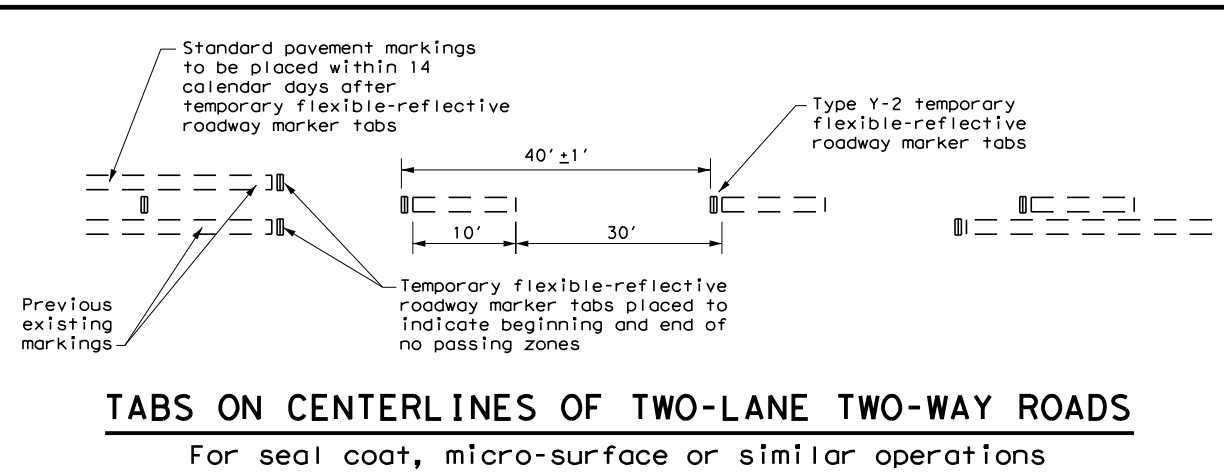
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NOTE
 Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



"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.



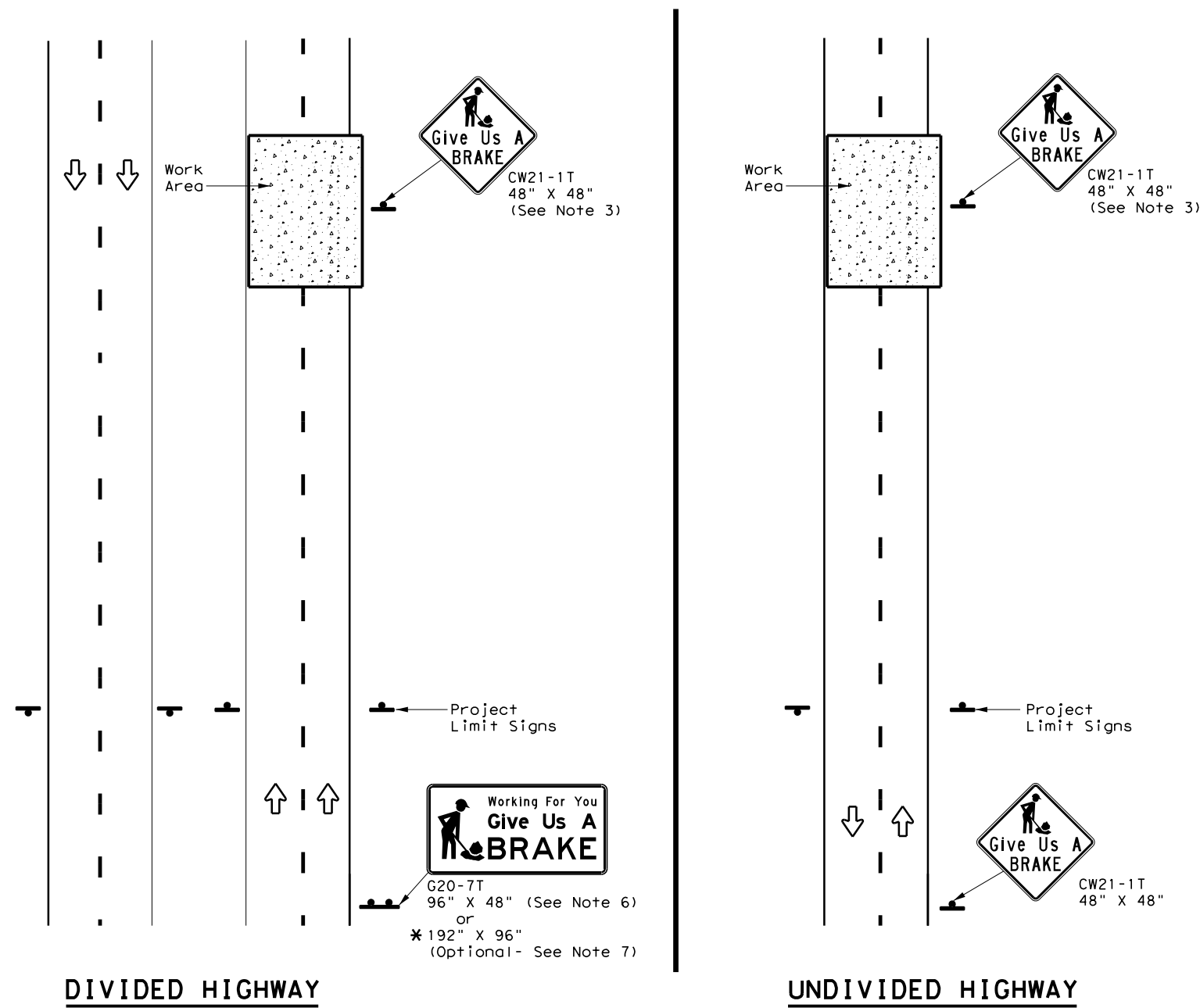
TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS
TCP(7-1)-13

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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		DRILLED SHAFT
						Size	(LF)	
							① ②	24" DIA. (LF)
Orange	G20-7T		96" X 48"	Type B _{FL} or C _{FL}	32	▲	▲ ▲	▲
Orange	G20-7T		192" X 96"	Type B _{FL} or C _{FL}	128	W8x18	16 17	12

▲ See Note 6 Below

LEGEND

	Sign
	Large Sign
	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

- See BC and SMD sheets for additional sign support details.
- Sign locations shall be approved by the Engineer.
- 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.
- 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.
- Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
- 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.
- 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
- 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.



WORK ZONE
 "GIVE US A BRAKE"
 SIGNS

WZ (BRK) - 13

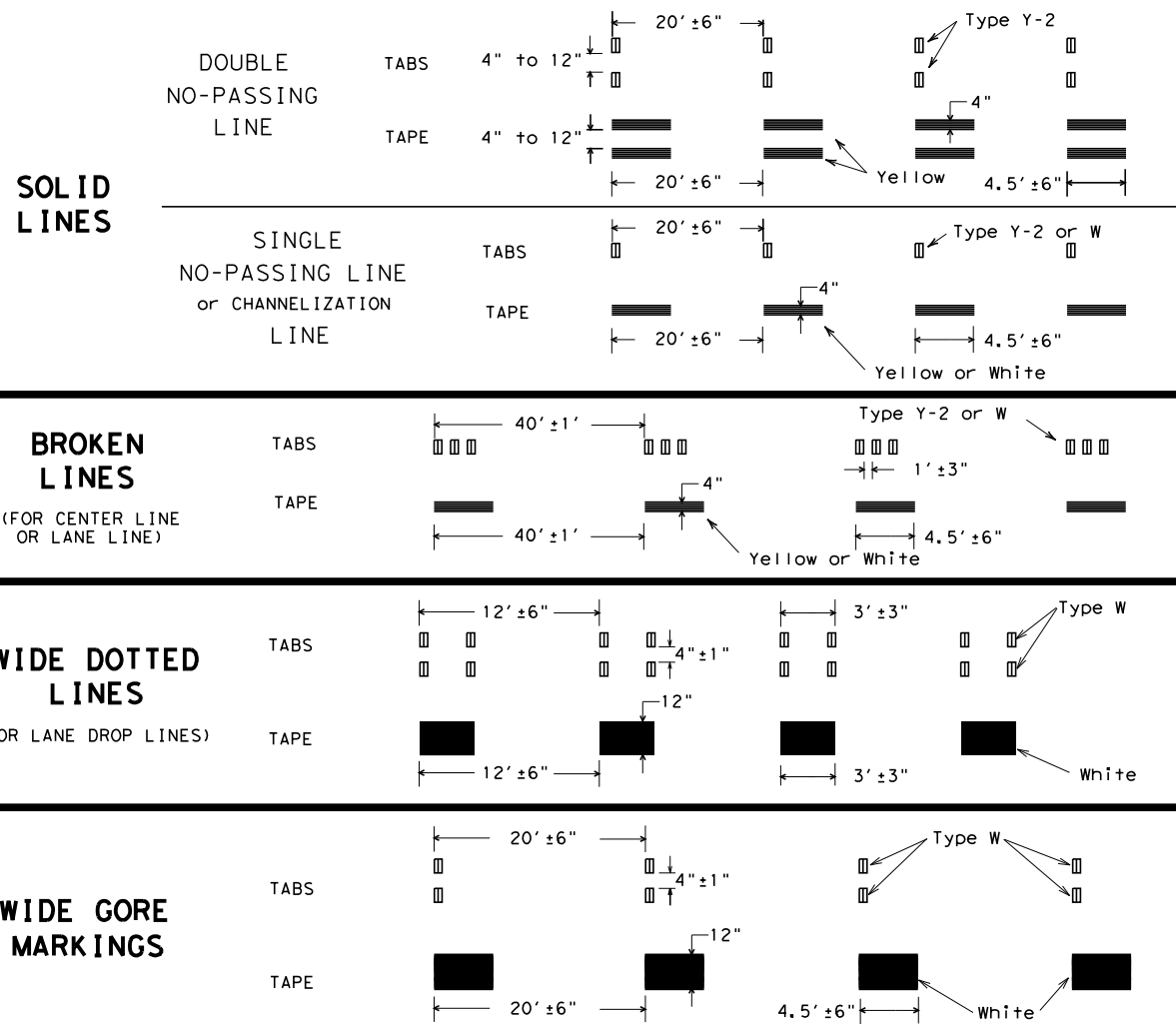
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WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



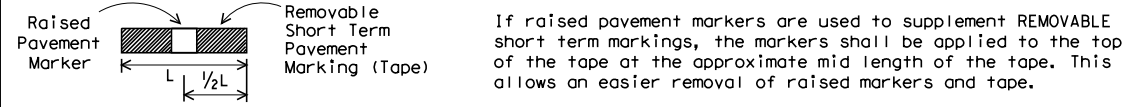
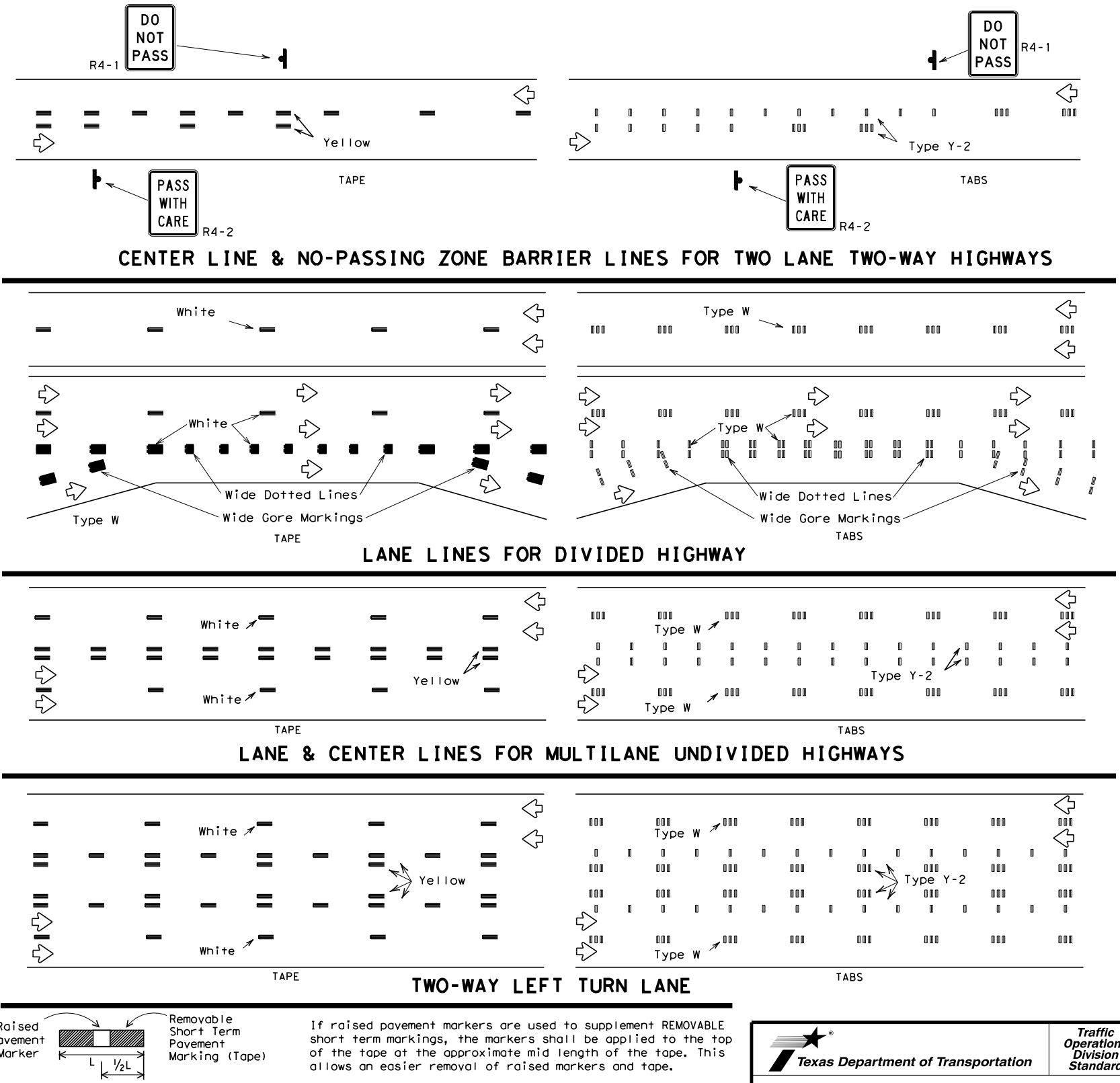
NOTES:

- Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible-reflective roadway marker tabs unless otherwise specified elsewhere in plans.
- Short term pavement markings shall NOT be used to simulate edge lines.
- 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.
- 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.
- 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.
- 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.
- 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).
- 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)

- 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).
- Tabs shall meet requirements of Departmental Material Specification DMS-8242.
- 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.
- No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

- 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)

- 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



WORK ZONE SHORT TERM PAVEMENT MARKINGS

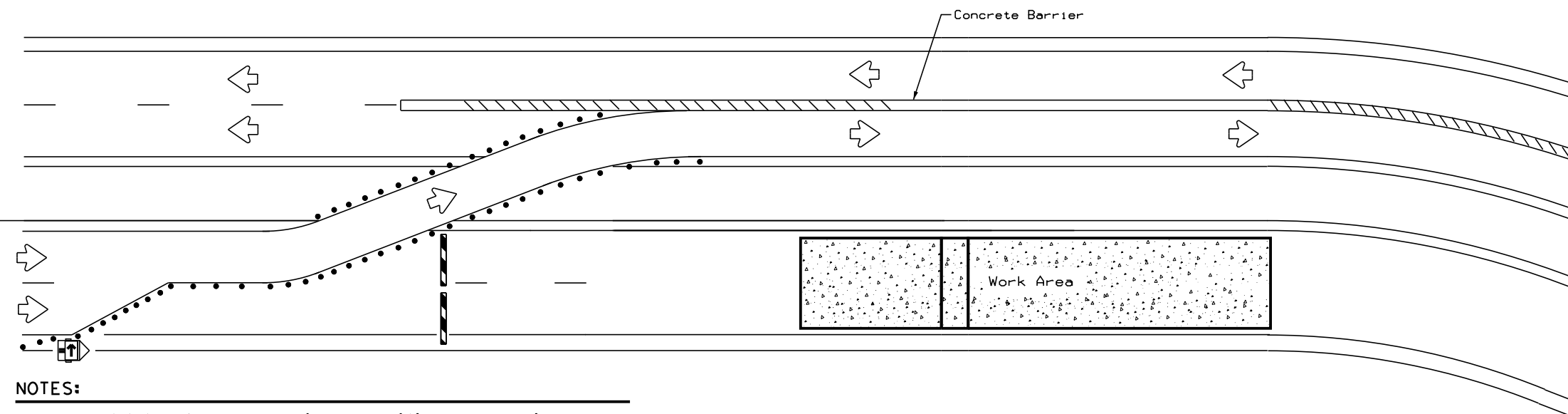
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LEGEND	
	Type 3 Barricade
	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
	Safety glare screen

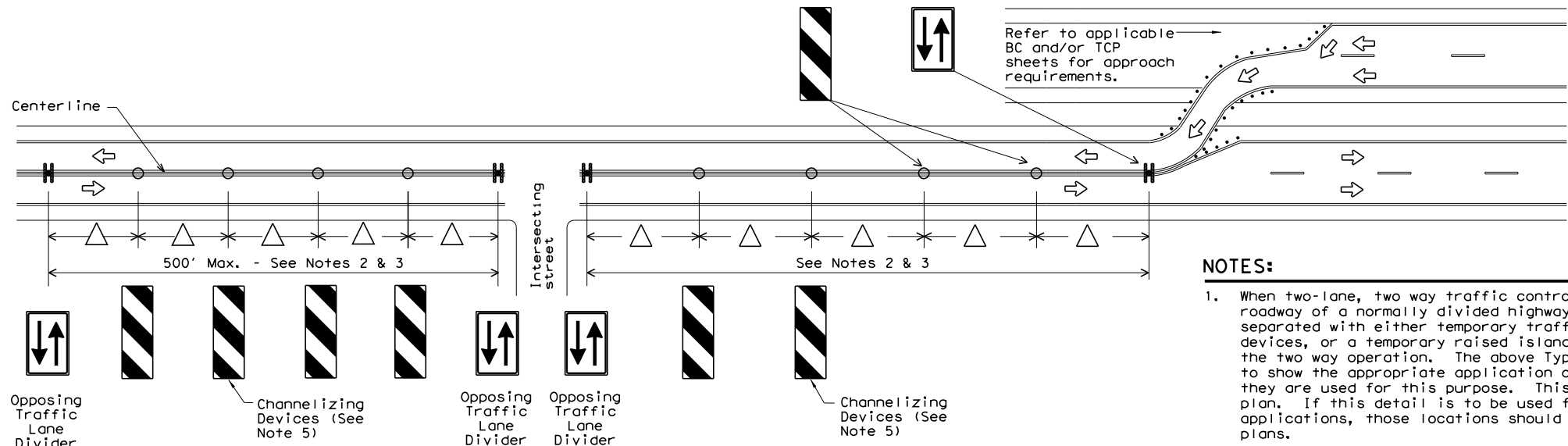
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
<http://www.txdot.gov/business/resources/producer-list.html>

NOTES:

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

BARRIER DELINEATION WITH MODULAR GLARE SCREENS



NOTES:

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

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



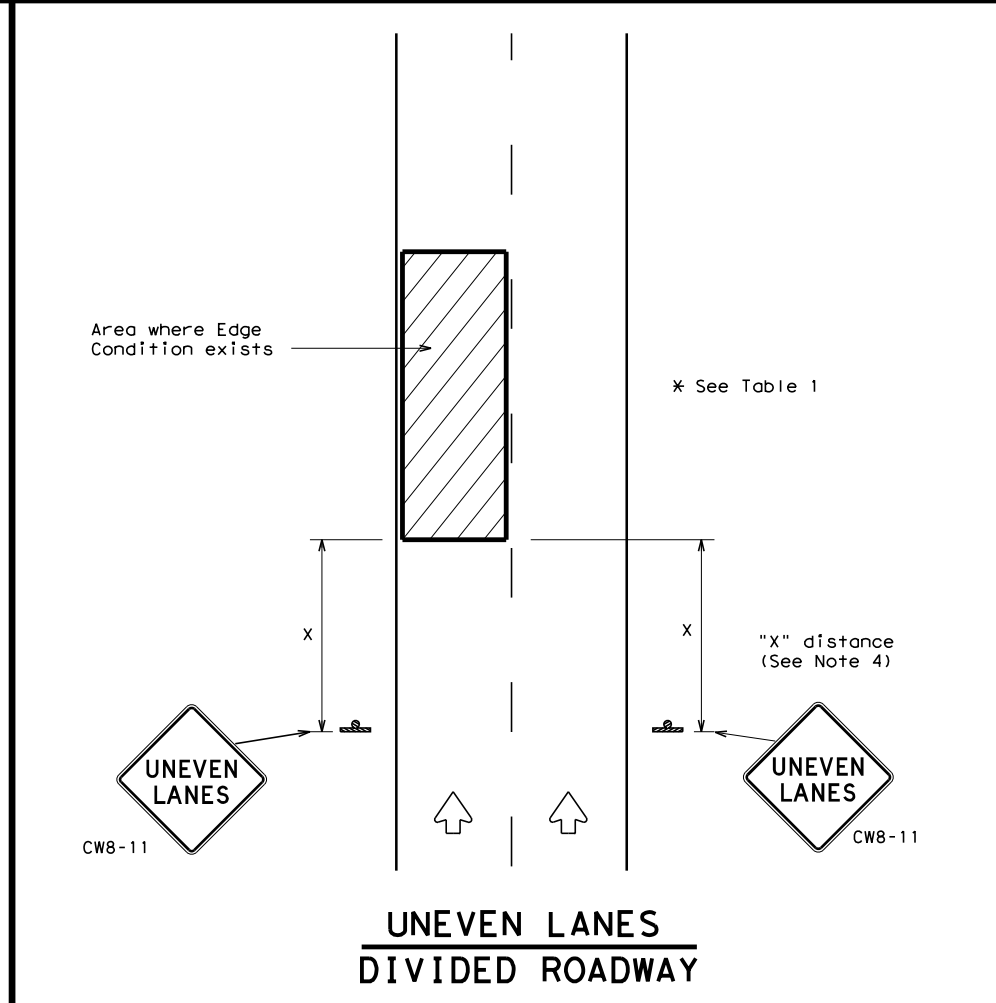
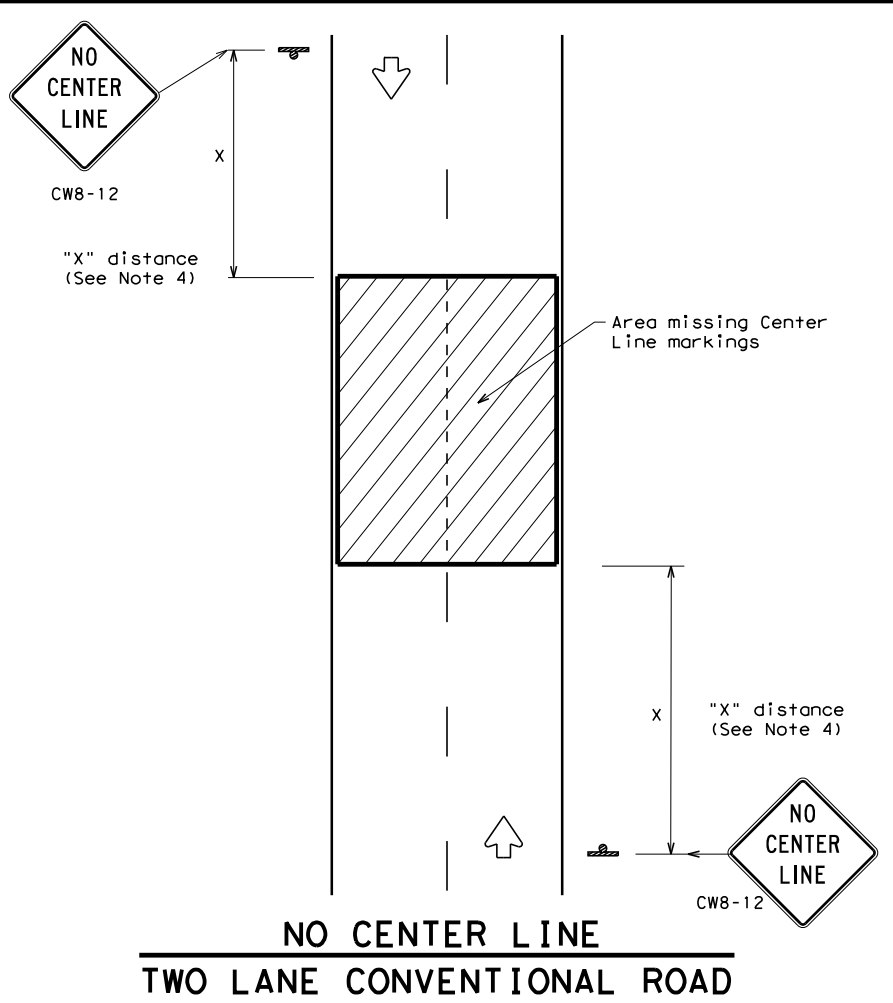
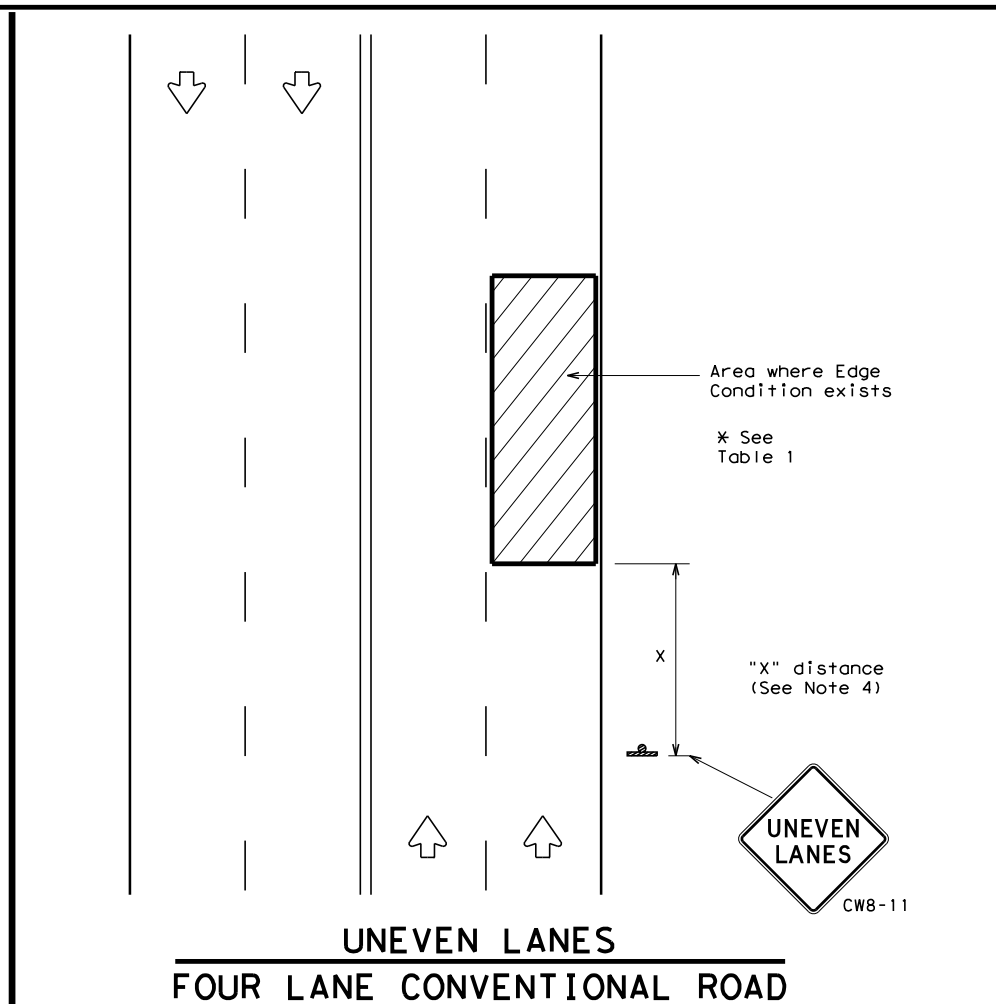
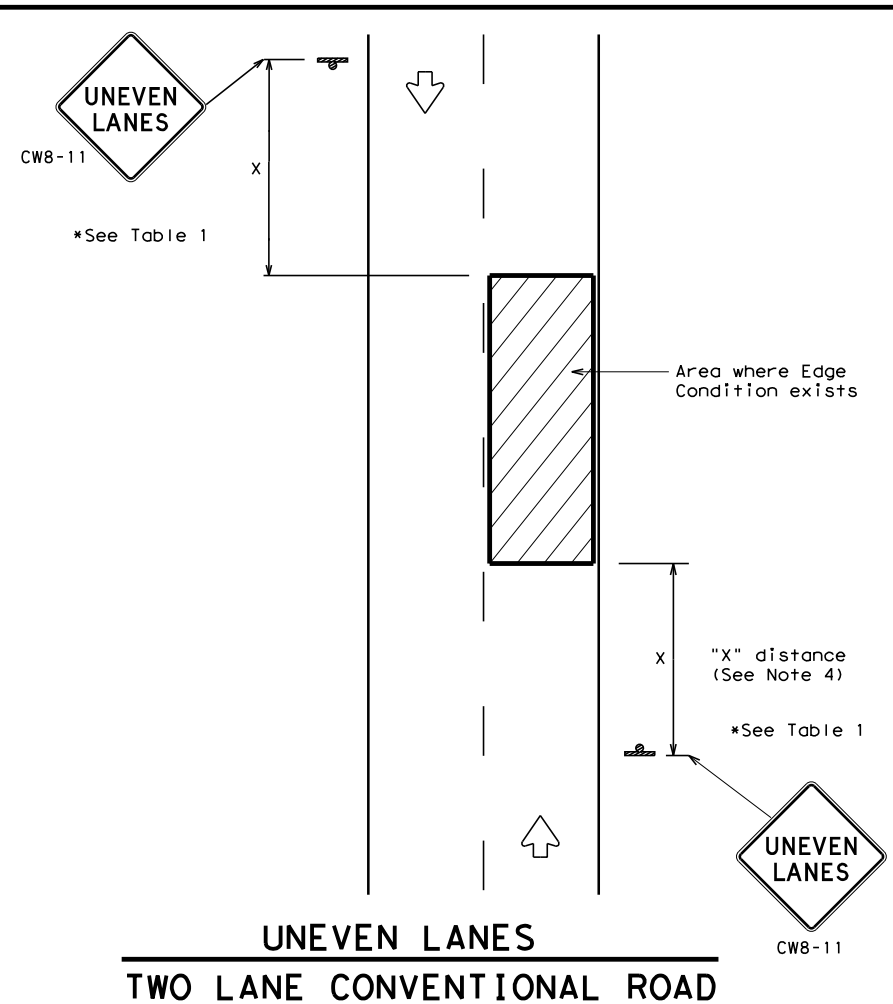
TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD) - 17

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3-03		DIST	COUNTY		SHEET NO.				
7-13		AUS	WILLIAMSON		74				

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

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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.

Edge Condition	Edge Height (D)	* Warning Devices
①	Less than or equal to: 1/4" (maximum-planing) 1/2" (typical-overlay)	Sign: CW8-11
②	Less than or equal to 3"	Sign: CW8-11
③	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"



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	0015	09	194	1H 35
8-95 2-98 7-13	DIST	COUNTY	SHEET NO.	
1-97 3-03	AUS	WILLIAMSON	75	

8:11:26 PM
bridgepww011cs0748/2021

IH 35 CENTERLINE

Beginning chain ML035CL501 description
Description: Mainline Centerline

Point MLC01 N 10,180,647.9787 E 3,127,910.5182 Sta 1130+07.56

Course from MLC01 to PC 35MLC-1 S 2° 04' 40.05" E Dist 10,318.4702

Curve Data

Curve 35MLC-1
 P.I. Station 1244+25.63 N 10,169,237.4144 E 3,128,324.4956
 Delta = 10° 57' 44.73" (LT)
 Degree = 0° 30' 00.00"
 Tangent = 1,099.6013
 Length = 2,192.4895
 Radius = 11,459.1798
 External = 52.6369
 Long Chord = 2,189.1469
 Mid. Ord. = 52.3963
 P.C. Station 1233+26.03 N 10,170,336.2927 E 3,128,284.6281
 P.T. Station 1255+18.52 N 10,168,166.1697 E 3,128,572.6041
 C.C. N 10,170,751.7606 E 3,139,736.2738
 Back = S 2° 04' 40.05" E
 Ahead = S 13° 02' 24.78" E
 Chord Bear = S 7° 33' 32.41" E

Course from PT 35MLC-1 to PC 35MLC-2 S 13° 02' 24.78" E Dist 7,322.6758

Curve Data

Curve 35MLC-2
 P.I. Station 1334+96.49 N 10,160,393.9372 E 3,130,372.7122
 Delta = 6° 32' 44.89" (LT)
 Degree = 0° 30' 00.00"
 Tangent = 655.2930
 Length = 1,309.1603
 Radius = 11,459.1559
 External = 18.7212
 Long Chord = 1,308.4484
 Mid. Ord. = 18.6907
 P.C. Station 1328+41.20 N 10,161,032.3315 E 3,130,224.8553
 P.T. Station 1341+50.36 N 10,159,776.5599 E 3,130,592.3807
 C.C. N 10,163,617.9170 E 3,141,388.5017
 Back = S 13° 02' 24.78" E
 Ahead = S 19° 35' 09.66" E
 Chord Bear = S 16° 18' 47.22" E

Course from PT 35MLC-2 to PC 35MLC-3 S 19° 35' 09.66" E Dist 1,074.4003

Curve Data

Curve 35MLC-3
 P.I. Station 1358+44.85 N 10,158,180.1129 E 3,131,160.4109
 Delta = 8° 47' 55.32" (LT)
 Degree = 0° 42' 39.12"
 Tangent = 620.0911
 Length = 1,237.7441
 Radius = 8,060.0000
 External = 23.8180
 Long Chord = 1,236.5282
 Mid. Ord. = 23.7478
 P.C. Station 1352+24.76 N 10,158,764.3252 E 3,130,952.5429
 P.T. Station 1364+62.50 N 10,157,634.5720 E 3,131,455.1957
 C.C. N 10,161,466.2116 E 3,138,546.1856
 Back = S 19° 35' 09.66" E
 Ahead = S 28° 23' 04.98" E
 Chord Bear = S 23° 59' 07.32" E

Course from PT 35MLC-3 to PC 35MLC-4 S 28° 23' 04.98" E Dist 584.6983

Curve Data

Curve 35MLC-4
 P.I. Station 1372+31.19 N 10,156,958.2967 E 3,131,820.6233
 Delta = 1° 29' 42.84" (LT)
 Degree = 0° 24' 22.87"
 Tangent = 183.9925
 Length = 367.9642
 Radius = 14,100.0000
 External = 1.2004
 Long Chord = 367.9538
 Mid. Ord. = 1.2003
 P.C. Station 1370+47.20 N 10,157,120.1688 E 3,131,733.1552
 P.T. Station 1374+15.16 N 10,156,798.7620 E 3,131,912.2855
 C.C. N 10,163,823.1612 E 3,144,137.9886
 Back = S 28° 23' 04.98" E
 Ahead = S 29° 52' 47.82" E
 Chord Bear = S 29° 07' 56.40" E

Course from PT 35MLC-4 to PC 35MLC-5 S 29° 52' 47.82" E Dist 184.5103

IH 35 CENTERLINE (CONT.)

Curve Data

Curve 35MLC-5
 P.I. Station 1377+83.67 N 10,156,479.2438 E 3,132,095.8679
 Delta = 1° 29' 42.84" (RT)
 Degree = 0° 24' 22.87"
 Tangent = 183.9925
 Length = 367.9642
 Radius = 14,100.0000
 External = 1.2004
 Long Chord = 367.9538
 Mid. Ord. = 1.2003
 P.C. Station 1375+99.67 N 10,156,638.7785 E 3,132,004.2056
 P.T. Station 1379+67.64 N 10,156,317.3717 E 3,132,183.3360
 C.C. N 10,149,614.3793 E 3,119,778.5026
 Back = S 29° 52' 47.82" E
 Ahead = S 28° 23' 04.98" E
 Chord Bear = S 29° 07' 56.40" E

Course from PT 35MLC-5 to PC 35MLC-6 S 28° 23' 04.98" E Dist 420.3758

Curve Data

Curve 35MLC-6
 P.I. Station 1395+63.84 N 10,154,913.0707 E 3,132,942.1547
 Delta = 11° 43' 02.87" (RT)
 Degree = 0° 30' 00.03"
 Tangent = 1,175.8282
 Length = 2,343.4545
 Radius = 11,458.9693
 External = 60.1691
 Long Chord = 2,339.3728
 Mid. Ord. = 59.8548
 P.C. Station 1383+88.01 N 10,155,947.5354 E 3,132,383.1782
 P.T. Station 1407+31.47 N 10,153,786.6430 E 3,133,279.3975
 C.C. N 10,150,500.0614 E 3,122,301.8587
 Back = S 28° 23' 04.98" E
 Ahead = S 16° 40' 02.11" E
 Chord Bear = S 22° 31' 33.54" E

Course from PT 35MLC-6 to MLC02 S 16° 40' 02.11" E Dist 5,478.2503

Point MLC02 N 10,148,538.5527 E 3,134,850.6310 Sta 1462+09.72

Ending chain ML035CL501 description

NOTES:

This project meets the basic safety requirements of the 4R design criteria. Guard fence (including connections to structures, post spacing and end treatments), signing, and pavement markings meet current standards. Cross drainage box and pipe culverts, parallel and driveway culverts, mailbox supports, luminaire supports and sign supports within the required obstruction clearance of 30 feet have been treated or upgraded to standard.



BRIDGEFARMER & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 TBPE REGISTRATION NO. 264

2021
 Texas Department of Transportation

**IH 35
 HORIZONTAL
 CONTROL
 DATA**

SHEET 1 OF 3

DS:	MM	AR	0015	09	194	IH 35
DW:	MH	MM	AUS	WILLIAMSON	076	

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8:04:37 PM
br:idgepww011cs0748/2021
...\\3676_16\037403-HC-Data-02.dgn

MEDIAN BARRIER BASELINE *

Beginning chain MEDBAR description
Description: Proposed Median Barrier Alignment

Point MED01 N 10,159,164.5046 E 3,130,810.1554 Sta 1348+00.00

Course from MED01 to PC MEDBAR1 S 19° 35' 09.66" E Dist 433.1531

Curve Data

Curve MEDBAR1
P.I. Station 1352+93.49 N 10,158,699.5641 E 3,130,975.5855
Delta = 2° 36' 28.27" (LT)
Degree = 2° 09' 40.64"
Tangent = 60.3413
Length = 120.6618
Radius = 2,651.0000
External = 0.6866
Long Chord = 120.6514
Mid. Ord. = 0.6865
P.C. Station 1352+33.15 N 10,158,756.4140 E 3,130,955.3577
P.T. Station 1353+53.81 N 10,158,643.6934 E 3,130,998.3789
C.C. = N 10,159,645.0866 E 3,133,452.9690
Back = S 19° 35' 09.66" E
Ahead = S 22° 11' 37.93" E
Chord Bear = S 20° 53' 23.79" E

Course from PT MEDBAR1 to PC MEDBAR2 S 22° 11' 37.92" E Dist 60.2791

Curve Data

Curve MEDBAR2
P.I. Station 1357+96.76 N 10,158,233.5619 E 3,131,165.6993
Delta = 5° 50' 35.72" (LT)
Degree = 0° 45' 50.93"
Tangent = 382.6700
Length = 764.6766
Radius = 7,498.0000
External = 9.7587
Long Chord = 764.3452
Mid. Ord. = 9.7460
P.C. Station 1354+14.09 N 10,158,587.8803 E 3,131,021.1488
P.T. Station 1361+78.77 N 10,157,895.8008 E 3,131,345.5708
C.C. = N 10,161,420.1875 E 3,137,963.6296
Back = S 22° 11' 37.93" E
Ahead = S 28° 02' 13.65" E
Chord Bear = S 25° 06' 55.79" E

Course from PT MEDBAR2 to PC MEDBAR3 S 28° 02' 13.65" E Dist 73.9671

Curve Data

Curve MEDBAR3
P.I. Station 1362+72.51 N 10,157,813.0600 E 3,131,389.6337
Delta = 0° 51' 16.01" (RT)
Degree = 2° 09' 37.71"
Tangent = 19.7749
Length = 39.5491
Radius = 2,652.0000
External = 0.0737
Long Chord = 39.5488
Mid. Ord. = 0.0737
P.C. Station 1362+52.74 N 10,157,830.5142 E 3,131,380.3386
P.T. Station 1362+92.29 N 10,157,795.4691 E 3,131,398.6675
C.C. = N 10,156,583.9586 E 3,129,039.5688
Back = S 28° 02' 13.65" E
Ahead = S 27° 10' 57.64" E
Chord Bear = S 27° 36' 35.64" E

Curve Data

Curve MEDBAR4
P.I. Station 1363+76.59 N 10,157,720.4806 E 3,131,437.1776
Delta = 1° 12' 07.34" (LT)
Degree = 0° 42' 46.76"
Tangent = 84.2989
Length = 168.5916
Radius = 8,036.0009
External = 0.4421
Long Chord = 168.5885
Mid. Ord. = 0.4421
P.C. Station 1362+92.29 N 10,157,795.4691 E 3,131,398.6675
P.T. Station 1364+60.88 N 10,157,646.3165 E 3,131,477.2525
C.C. = N 10,161,466.5473 E 3,138,547.1286
Back = S 27° 10' 57.64" E
Ahead = S 28° 23' 04.98" E
Chord Bear = S 27° 47' 01.31" E

Course from PT MEDBAR4 to PC MEDBAR5 S 28° 23' 04.98" E Dist 584.6983

MEDIAN BARRIER BASELINE (CONT.) *

Curve Data

Curve MEDBAR5
P.I. Station 1371+46.81 N 10,157,042.8538 E 3,131,803.3355
Delta = 0° 49' 26.72" (LT)
Degree = 0° 24' 25.37"
Tangent = 101.2299
Length = 202.4563
Radius = 14,076.0000
External = 0.3640
Long Chord = 202.4546
Mid. Ord. = 0.3640
P.C. Station 1370+45.58 N 10,157,131.9134 E 3,131,755.2119
P.T. Station 1372+48.03 N 10,156,954.4956 E 3,131,852.7351
C.C. = N 10,163,823.4965 E 3,144,138.9307
Back = S 28° 23' 04.98" E
Ahead = S 29° 12' 31.70" E
Chord Bear = S 28° 47' 48.34" E

Course from PT MEDBAR5 to PC MEDBAR6 S 29° 22' 12.18" E Dist 0.0056

Curve Data

Curve MEDBAR6
P.I. Station 1380+03.51 N 10,156,297.1618 E 3,132,225.0968
Delta = 3° 17' 01.08" (RT)
Degree = 0° 13' 02.58"
Tangent = 755.4684
Length = 1,510.5232
Radius = 26,356.9610
External = 10.8248
Long Chord = 1,510.3165
Mid. Ord. = 10.8203
P.C. Station 1372+48.04 N 10,156,954.4907 E 3,131,852.7379
P.T. Station 1387+58.56 N 10,155,619.5838 E 3,132,559.1934
C.C. = N 10,143,963.5429 E 3,108,919.6903
Back = S 29° 31' 49.35" E
Ahead = S 26° 14' 48.27" E
Chord Bear = S 27° 53' 18.81" E

Curve Data

Curve MEDBAR7
P.I. Station 1394+29.56 N 10,155,019.2123 E 3,132,858.8517
Delta = 6° 42' 00.39" (RT)
Degree = 0° 29' 59.41"
Tangent = 670.9951
Length = 1,340.4606
Radius = 11,462.9083
External = 19.6220
Long Chord = 1,339.6970
Mid. Ord. = 19.5884
P.C. Station 1387+58.57 N 10,155,619.5794 E 3,132,559.1955
P.T. Station 1400+99.03 N 10,154,387.9838 E 3,133,086.4148
C.C. = N 10,150,500.4206 E 3,122,302.8570
Back = S 26° 31' 29.17" E
Ahead = S 19° 49' 28.77" E
Chord Bear = S 23° 10' 28.97" E

Curve Data

Curve MEDBAR8
P.I. Station 1402+74.08 N 10,154,222.4784 E 3,133,143.4242
Delta = 1° 45' 01.31" (RT)
Degree = 0° 30' 00.01"
Tangent = 175.0488
Length = 350.0703
Radius = 11,459.0674
External = 1.3369
Long Chord = 350.0567
Mid. Ord. = 1.3368
P.C. Station 1400+99.03 N 10,154,387.9838 E 3,133,086.4148
P.T. Station 1404+49.10 N 10,154,055.3090 E 3,133,195.3516
C.C. = N 10,150,656.0305 E 3,122,252.0829
Back = S 19° 00' 23.72" E
Ahead = S 17° 15' 22.40" E
Chord Bear = S 18° 07' 53.06" E

Ending chain MEDBAR description

NOTES:

This project meets the basic safety requirements of the 4R design criteria. Guard fence (including connections to structures, post spacing and end treatments), signing, and pavement markings meet current standards. Cross drainage box and pipe culverts, parallel and driveway culverts, mailbox supports, luminaire supports and sign supports within the required obstruction clearance of 30 feet have been treated or upgraded to standard.

* INFORMATION PROVIDED FOR CONTRACTOR'S INFORMATION ONLY.



IH 35
HORIZONTAL
CONTROL
DATA

DS:		CONT	SECT	JOB	HIGHWAY
MM	AR	0015	09	194	IH 35
DW:		DIST	COUNTY		SHEET NO.
MH	MM	AUS	WILLIAMSON		077

8:11:35 PM

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EXISTING MEDIAN BARRIER BASELINE *

Beginning chain EX_BAR description
Description: Existing Median Barrier Alignment

Point EXBAR01 N 10,159,729.7881 E 3,130,609.0225 Sta 1342+00.00

Course from EXBAR01 to PC EX_BAR1 S 19° 35' 09.66" E Dist 1,024.7561

Curve Data

Curve EX_BAR1
P.I. Station 1358+44.30 N 10,158,183.2204 E 3,131,167.3782
Delta = 8° 41' 11.54" (LT)
Degree = 0° 42' 08.59"
Tangent = 619.5458
Length = 1,236.7173
Radius = 8,157.2982
External = 23.4934
Long Chord = 1,235.5332
Mid. Ord. = 23.4259
P.C. Station 1352+24.76 N 10,158,764.3252 E 3,130,952.5429
P.T. Station 1364+61.47 N 10,157,641.2274 E 3,131,467.5126
C.C. N 10,161,592.9706 E 3,138,603.7049
Back = S 20° 17' 21.93" E
Ahead = S 28° 58' 33.47" E
Chord Bear = S 24° 37' 57.70" E

Course from PT EX_BAR1 to EXBAR02 S 28° 23' 04.98" E Dist 584.6983

Point EXBAR02 N 10,157,126.8243 E 3,131,745.4720 Sta 1370+46.17

Course from EXBAR02 to EXBAR03 S 28° 24' 38.37" E Dist 920.2925

Point EXBAR03 N 10,156,317.3717 E 3,132,183.3360 Sta 1379+66.46

Course from EXBAR03 to PC EX_BAR2 S 28° 23' 04.98" E Dist 420.3758

Curve Data

Curve EX_BAR2
P.I. Station 1395+62.67 N 10,154,913.0707 E 3,132,942.1547
Delta = 11° 43' 02.87" (RT)
Degree = 0° 30' 00.03"
Tangent = 1,175.8282
Length = 2,343.4545
Radius = 11,458.9693
External = 60.1691
Long Chord = 2,339.3728
Mid. Ord. = 59.8548
P.C. Station 1383+86.84 N 10,155,947.5355 E 3,132,383.1782
P.T. Station 1407+30.29 N 10,153,786.6430 E 3,133,279.3975
C.C. N 10,150,500.0614 E 3,122,301.8587
Back = S 28° 23' 04.98" E
Ahead = S 16° 40' 02.11" E
Chord Bear = S 22° 31' 33.54" E

Course from PT EX_BAR2 to EXBAR04 S 16° 40' 02.11" E Dist 268.5325

Point EXBAR04 N 10,153,529.3925 E 3,133,356.4161 Sta 1409+98.83

Ending chain EX_BAR description

APPROXIMATE EXISTING SUPERELEVATION DATA

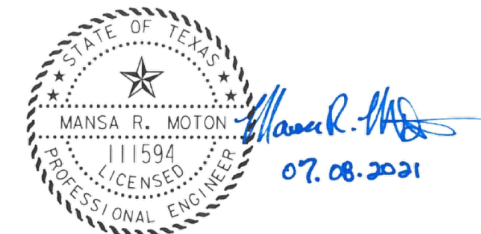
STATION	CROSS SLOPE (%)
1299+00.00	2.50%, 2.00%
1322+70.00	2.50%, 2.00%
1322+95.00	2.00%
1327+60.00	2.00%
1328+85.00	2.50%
1341+00.00	2.50%
1342+30.00	2.50%, 2.00%
1345+40.00	2.50%, 2.00%
1345+65.00	2.00%
1347+65.00	2.00%
1347+90.00	2.50%, 2.00%
1351+40.00	2.50%, 2.00%
1352+05.00	2.80%
1362+25.00	2.80%
1363+00.00	2.00%
1370+20.00	2.00%
1370+50.00	2.50%, 2.00%
1380+70.00	2.50%, 2.00%
1380+95.00	2.00%
1385+30.00	-2.50%
1405+90.00	-2.50%
1410+25.00	2.00%
1410+50.00	2.50%, 2.00%
1420+07.04	2.50%, 2.00%

NOTES:

This project meets the basic safety requirements of the 4R design criteria. Guard fence (including connections to structures, post spacing and end treatments), signing, and pavement markings meet current standards. Cross drainage box and pipe culverts, parallel and driveway culverts, mailbox supports, luminaire supports and sign supports within the required obstruction clearance of 30 feet have been treated or upgraded to standard.

* INFORMATION PROVIDED FOR CONTRACTOR'S INFORMATION ONLY.

THE "APPROXIMATE EXISTING SUPERELEVATION DATA" IS FROM AS-BUILT CSJ: 0015-09-093 OF 09/02/1987 AND CSJ: 0015-09-173 OF 10/29/2015 FOR THE SOUTHBOUND AND NORTHBOUND MAIN LANES RESPECTIVELY. THE DATA IS FOR CONTRACTOR'S INFORMATION ONLY. THEY ARE NOT TO BE USED FOR BIDDING OR CONSTRUCTION PURPOSES.



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

IH 35
HORIZONTAL CONTROL DATA

SHEET 3 OF 3

DS:	MM	AR	0015	09	194	IH 35
DW:	MH	MM	AUS	WILLIAMSON	078	

NOTES:

This project meets the basic safety requirements of the 4R design criteria. Guard fence (including connections to structures, post spacing and end treatments), signing, and pavement markings meet current standards. Cross drainage box and pipe culverts, parallel and driveway culverts, mailbox supports, luminaire supports and sign supports within the required obstruction clearance of 30 feet have been treated or upgraded to standard.

IH 35 CURVE VERTICAL CURVE DATA						
PI	ELEV	LENGTH	E	C1	C2	K
	(FT)	(FT)		%	%	
1299+00.00						
1304+86.60	742.05			0.05	-0.15	
1311+00.00	741.13	530.00	-1.21	-0.15	-1.98	290
1320+10.69	723.10	500.00	1.35	-1.98	0.18	232
1327+40.00	724.40			0.18	0.34	
1328+11.00	724.64			0.34	-0.05	
1332+00.00	724.45	200.00	0.06	-0.05	0.19	829
1340+00.00	725.99	200.00	0.1	0.19	0.61	479
1343+44.03	728.09	200.00	-0.09	0.61	0.25	555
1352+99.08	730.48	700.00	2.73	0.25	3.37	224
1366+50.00	776.00	1840.00	-14.58	3.37	-2.97	290
1379+50.00	737.43	700.00	4.07	-2.97	1.69	150
1405+00.00	760.43	200.00	-0.04	1.69	1.51	1162
1417+00.00	798.60	800.00	0.21	1.51	1.73	3775
1428+50.00	818.45	500.00	-0.97	1.73	0.18	323
1446+99.00	821.73			0.18		



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2021
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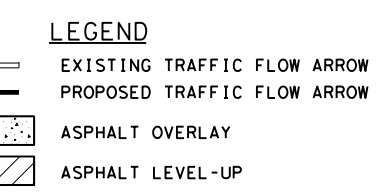
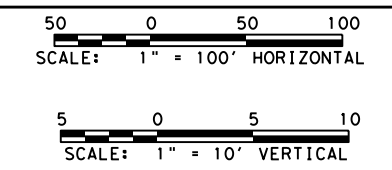
**IH 35
VERTICAL
CONTROL
DATA**

SHEET 1 OF 1

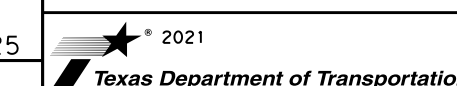
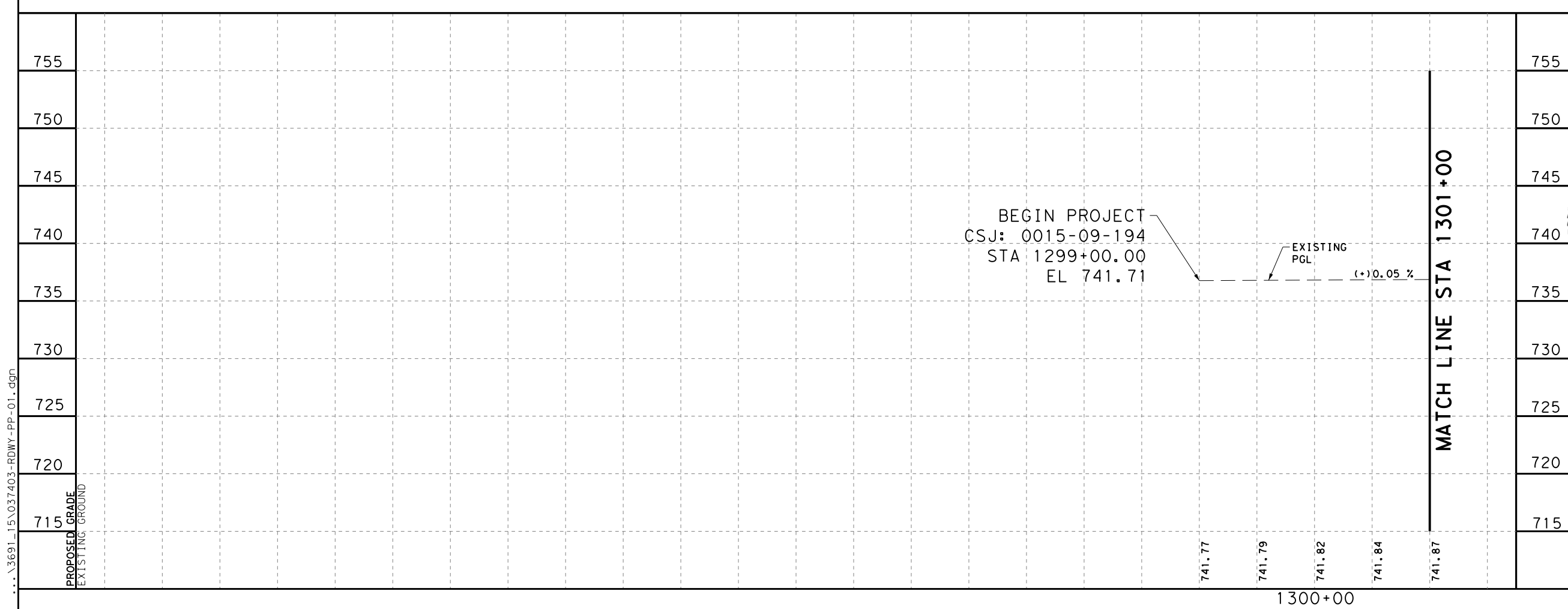
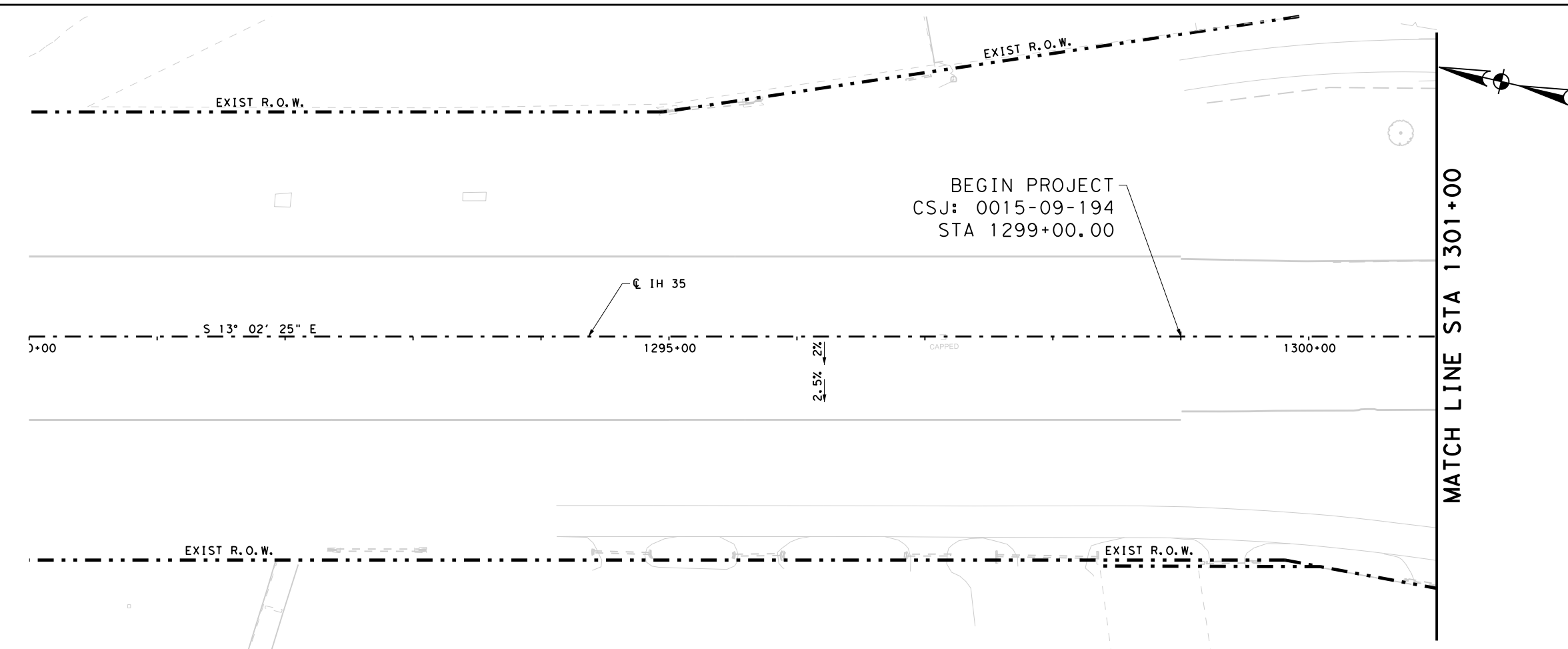
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DW:	MH	MM	AUS	WILLIAMSON	079	

8:17:38 PM

br:\dgpw011cs0748/2021



- NOTES:**
- REFER TO THE EXISTING SUPERELEVATION DATA TABLE AND THE DESIGN CROSS SECTIONS FOR ADDITIONAL INFORMATION.
 - EXISTING PAVEMENT CROSS SLOPES, PROFILE AND TRANSITIONS SHOWN ARE BASED ON AS-BUILTS AND ARE PROVIDED FOR INFORMATION ONLY. ALL PAVEMENT WIDENING SHALL MATCH THE CROSS SLOPE OF THE EXISTING PAVEMENT ADJACENT TO THE WIDENING. CONTRACTOR SHALL FIELD VERIFY EXISTING PAVEMENT ELEVATION AND CROSS SLOPE PRIOR TO WIDENING. FIELD VERIFICATION IS SUBSIDIARY TO ROADWAY QUANTITIES.
 - SAWCUT LOCATION IS 2' OFFSET FROM FACE OF EXISTING CONCRETE TRAFFIC BARRIER. SAWCUT LOCATION IS PGL TO BE USED FOR CONSTRUCTION.

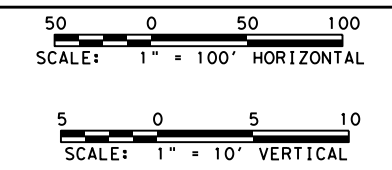


IH 35
PLAN AND PROFILE
BEGIN PROJECT TO
STA 1301+00

SHEET 1 OF 12				
DES:	MM	CK:	AR	CONTRACT NO. 0015 09
DIST:	AUS	COUNTY:	WILLIAMSON	JOB NO. 194
DIST:	AUS	COUNTY:	WILLIAMSON	HIGHWAY IH 35
DIST:	AUS	COUNTY:	WILLIAMSON	SHEET NO. 080

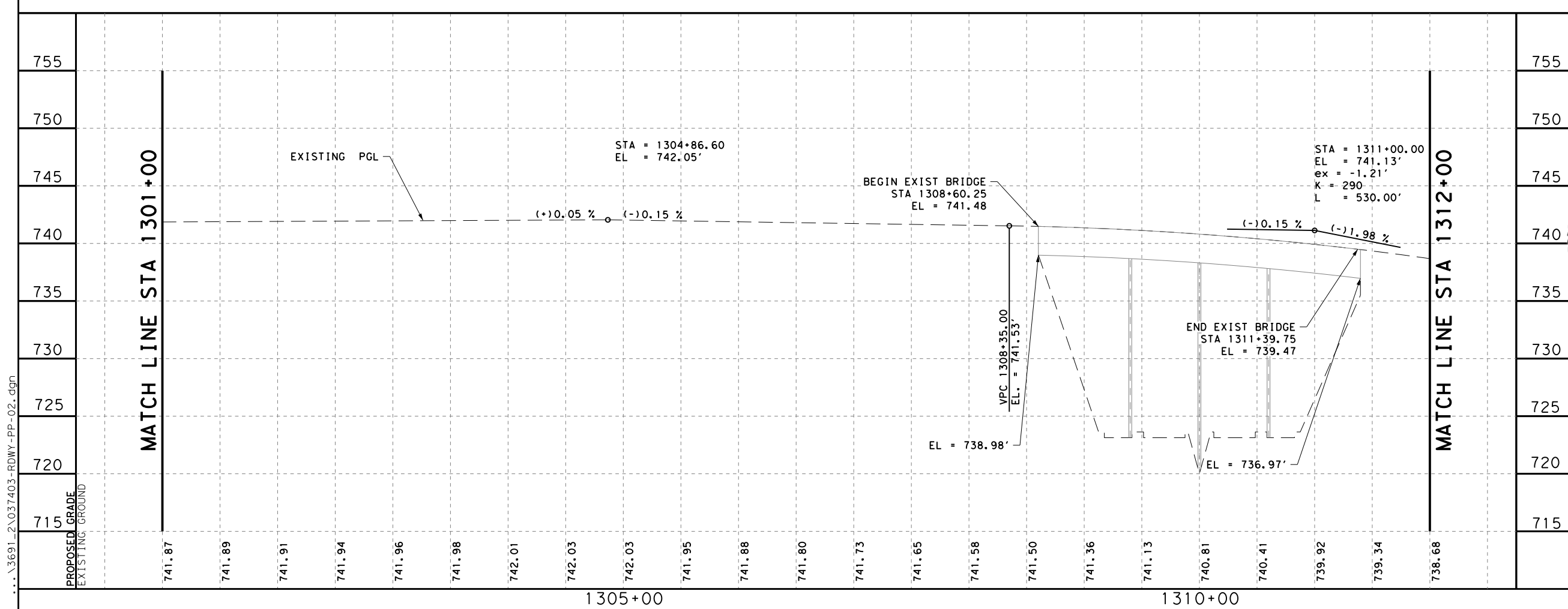
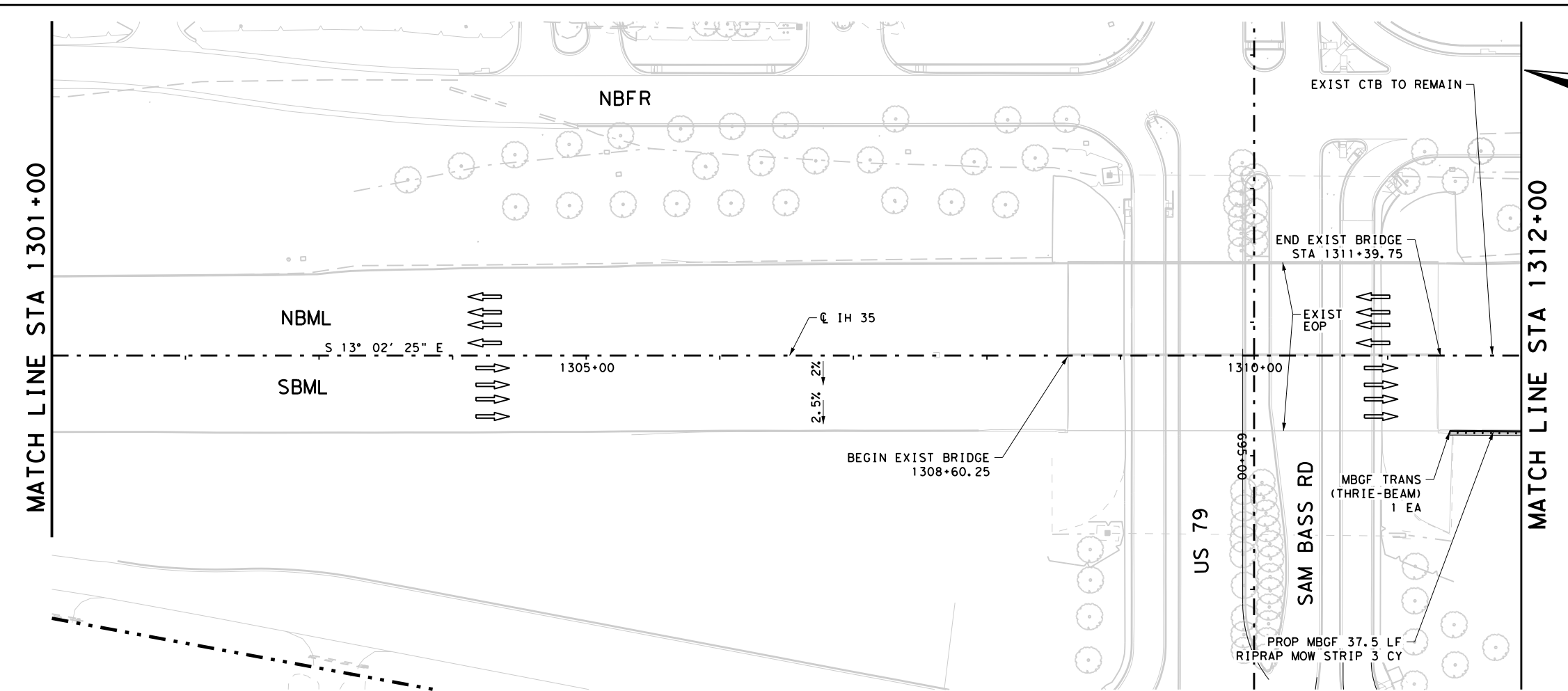
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- LEGEND**
- EXISTING TRAFFIC FLOW ARROW
 - PROPOSED TRAFFIC FLOW ARROW
 - ASPHALT OVERLAY
 - ASPHALT LEVEL-UP

- NOTES:**
1. REFER TO THE EXISTING SUPERELEVATION DATA TABLE AND THE DESIGN CROSS SECTIONS FOR ADDITIONAL INFORMATION.
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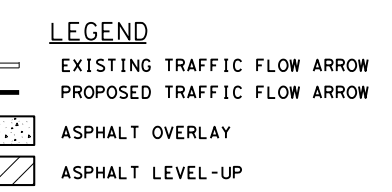
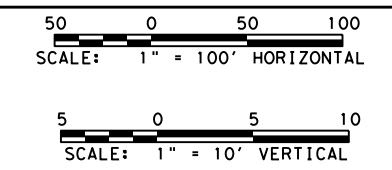
IH 35
PLAN AND PROFILE
STA 1301+00 TO
STA 1312+00

SHEET 2 OF 12

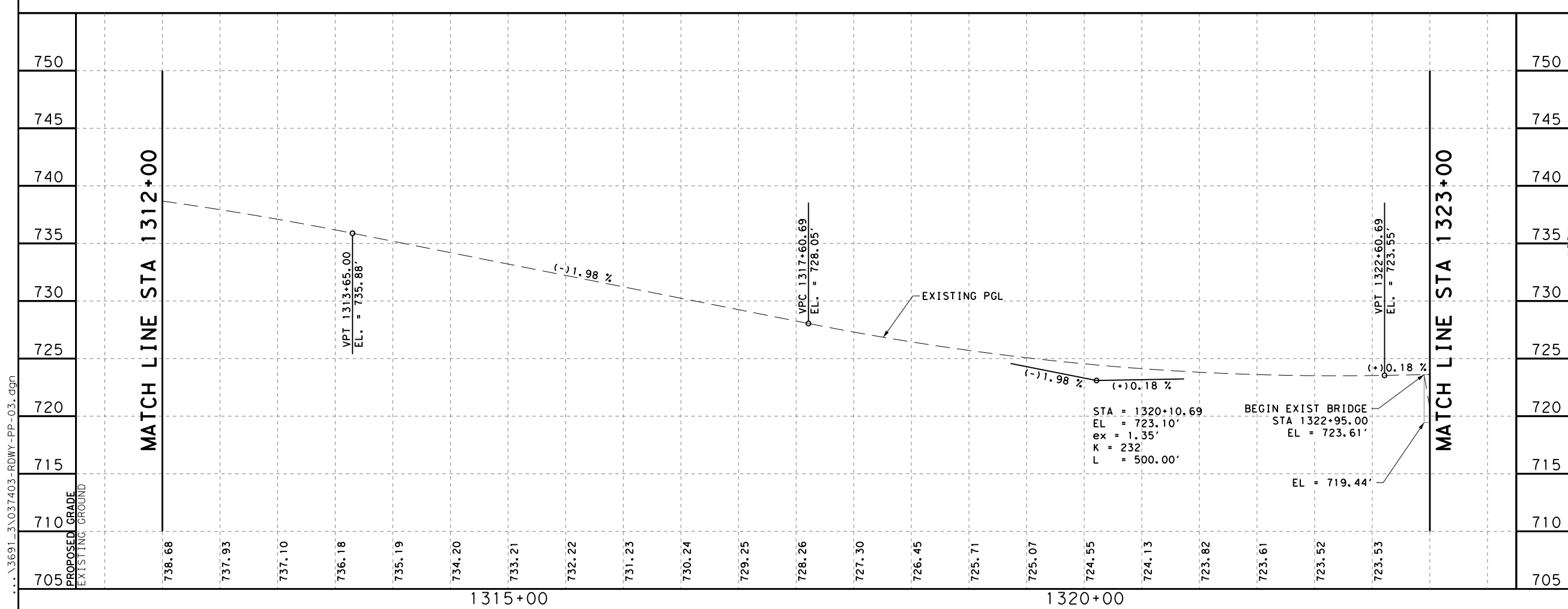
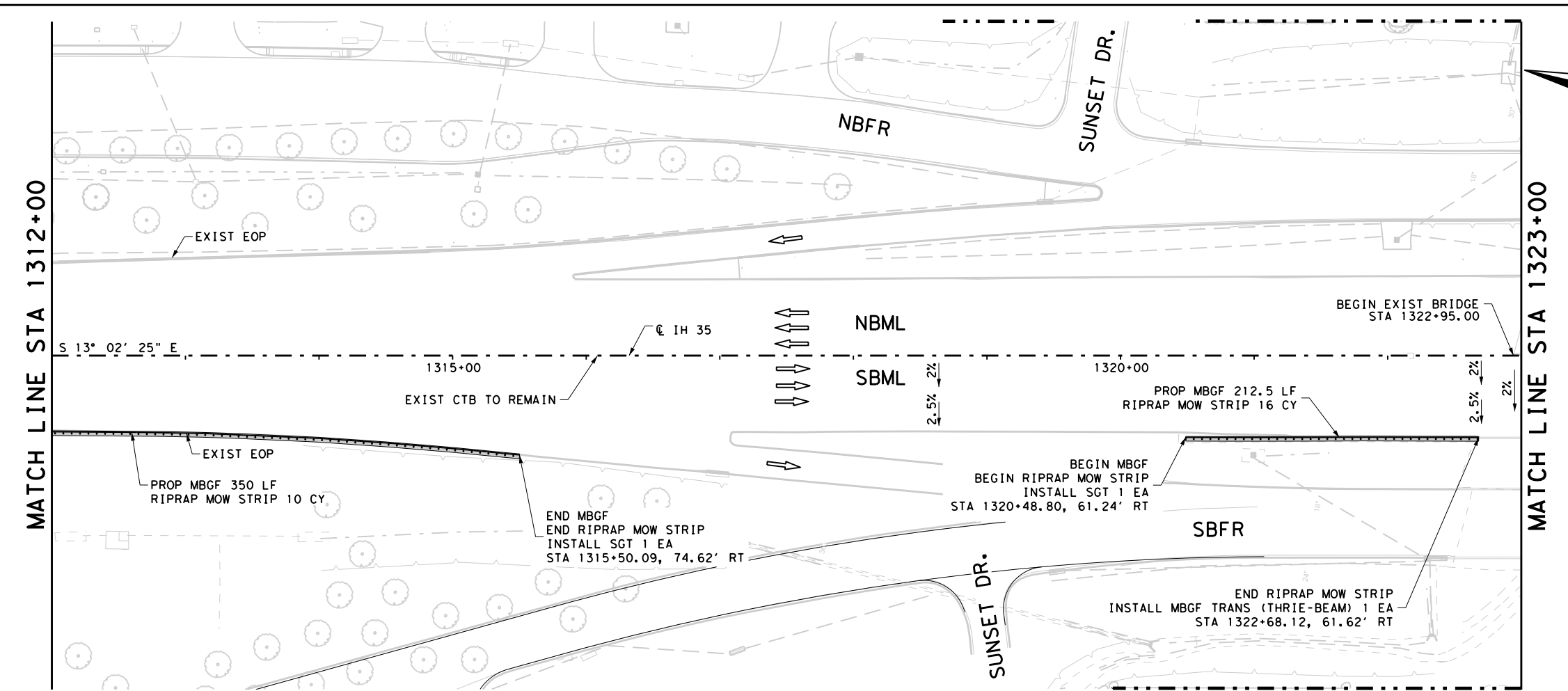
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- NOTES:**
- REFER TO THE EXISTING SUPERELEVATION DATA TABLE AND THE DESIGN CROSS SECTIONS FOR ADDITIONAL INFORMATION.
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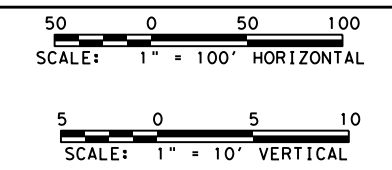
**IH 35
PLAN AND PROFILE
STA 1312+00 TO
STA 1323+00**

SHEET 3 OF 12

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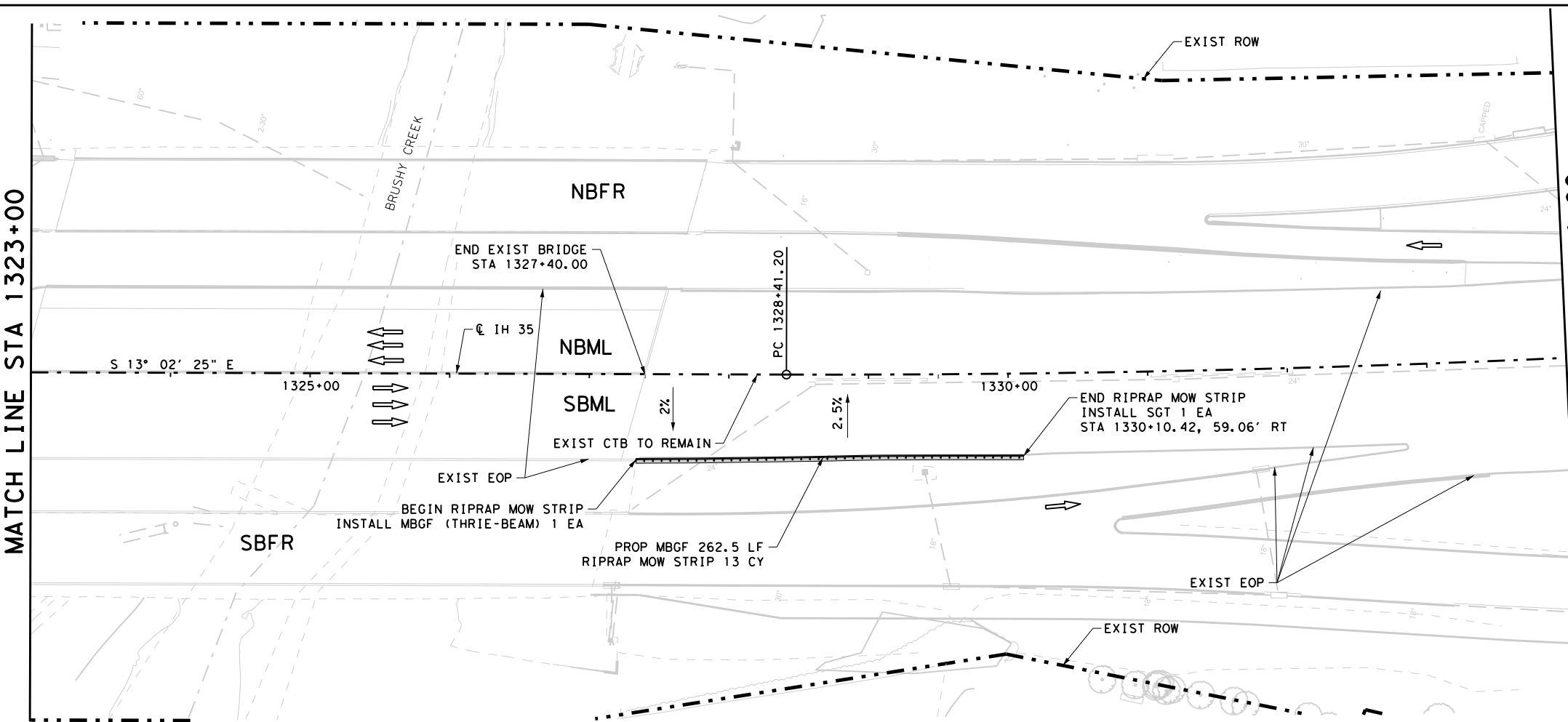
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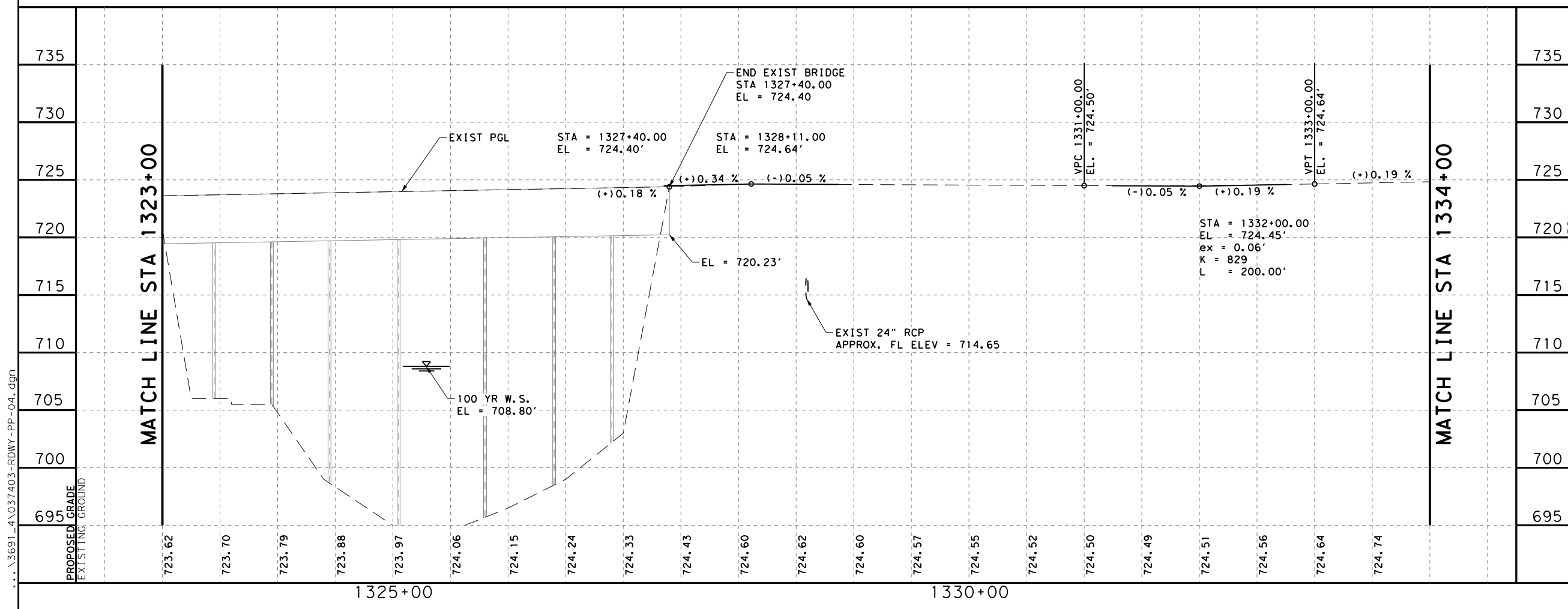
MATCH LINE STA 1323+00

MATCH LINE STA 1334+00



- LEGEND**
- EXISTING TRAFFIC FLOW ARROW
 - PROPOSED TRAFFIC FLOW ARROW
 - ASPHALT OVERLAY
 - ASPHALT LEVEL-UP

- NOTES:**
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BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

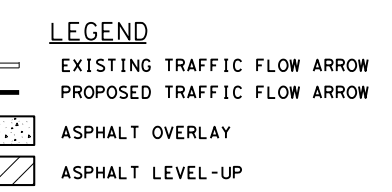
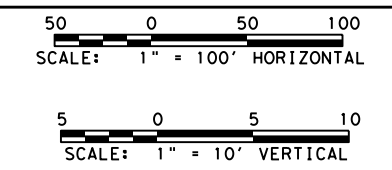
IH 35
PLAN AND PROFILE
STA 1323+00 TO
STA 1334+00

SHEET 4 OF 12

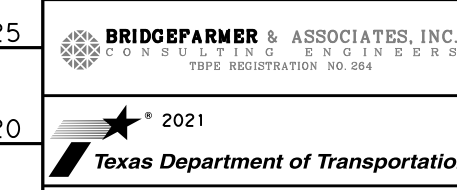
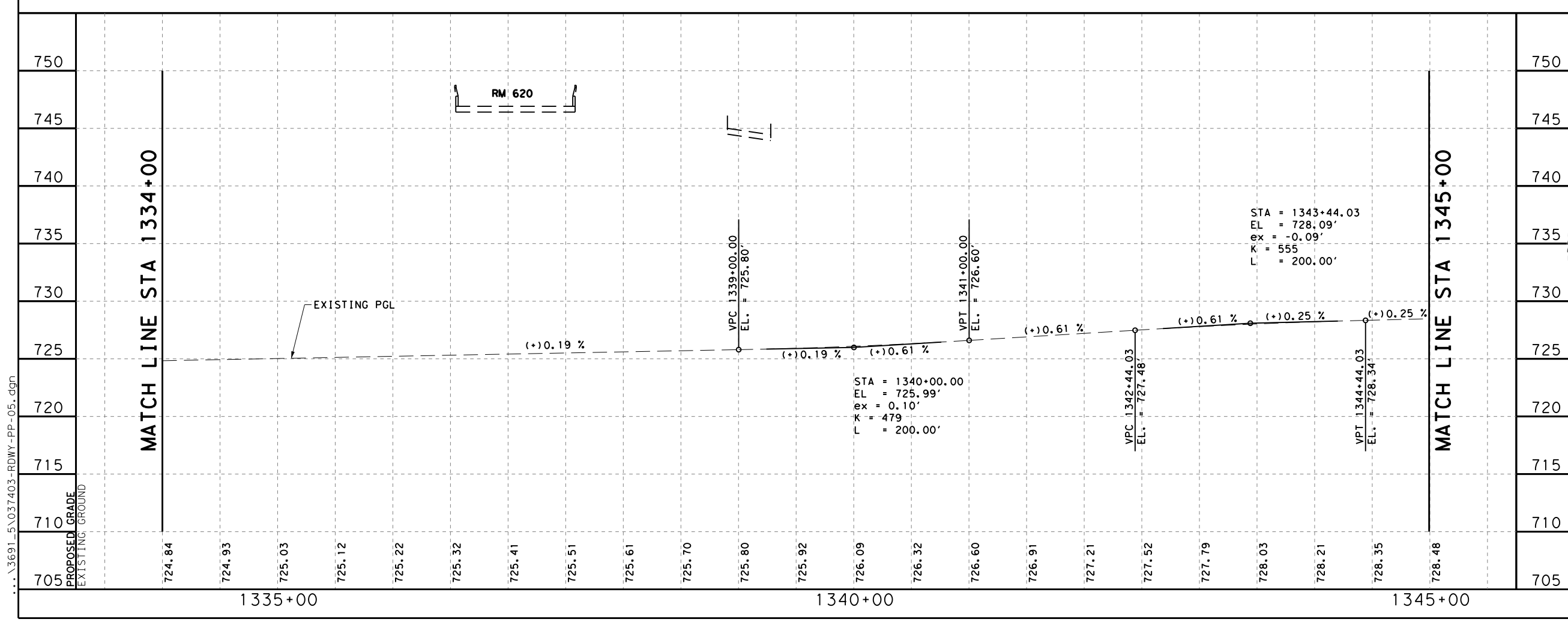
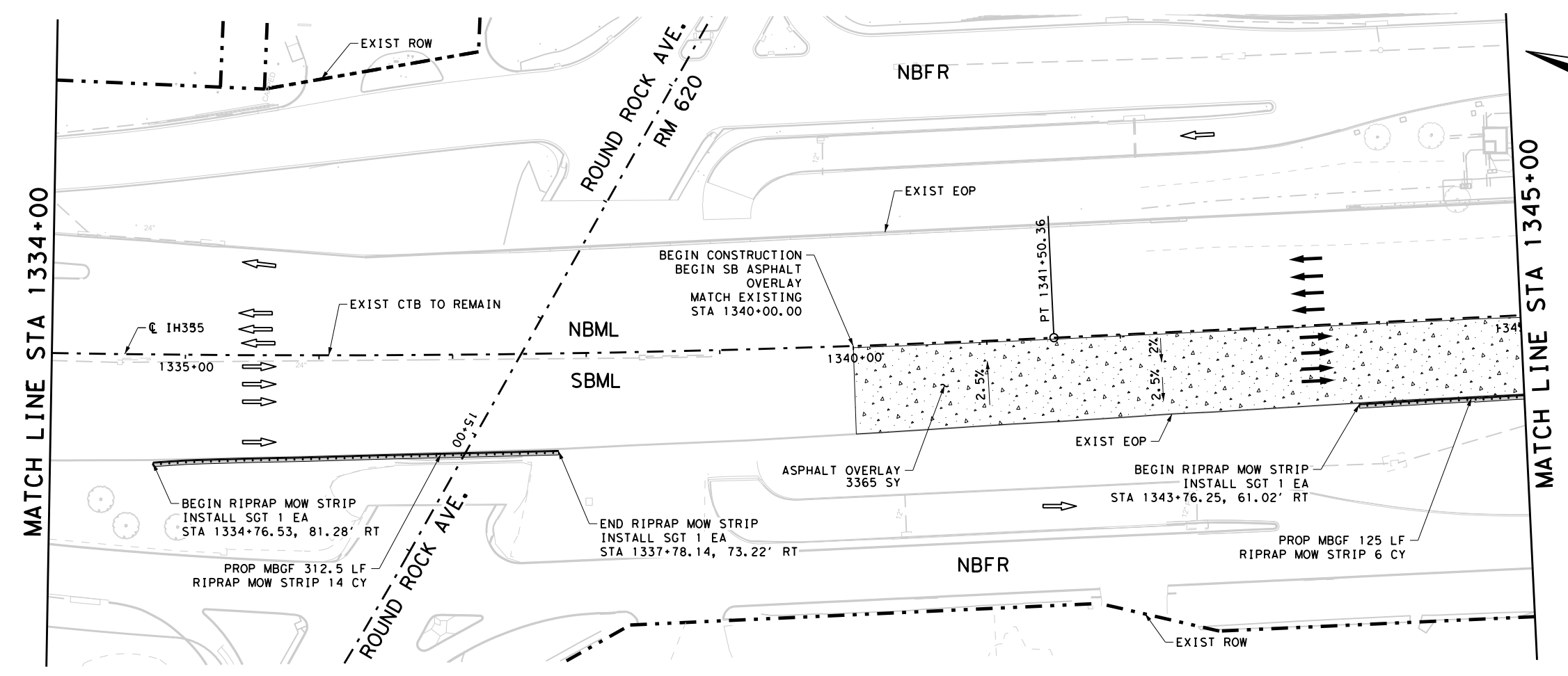
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8:14:47 PM

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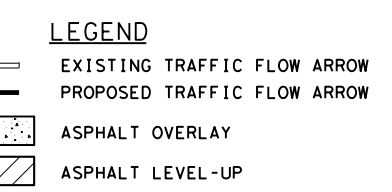
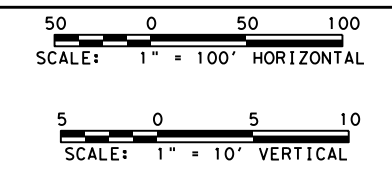
- NOTES:**
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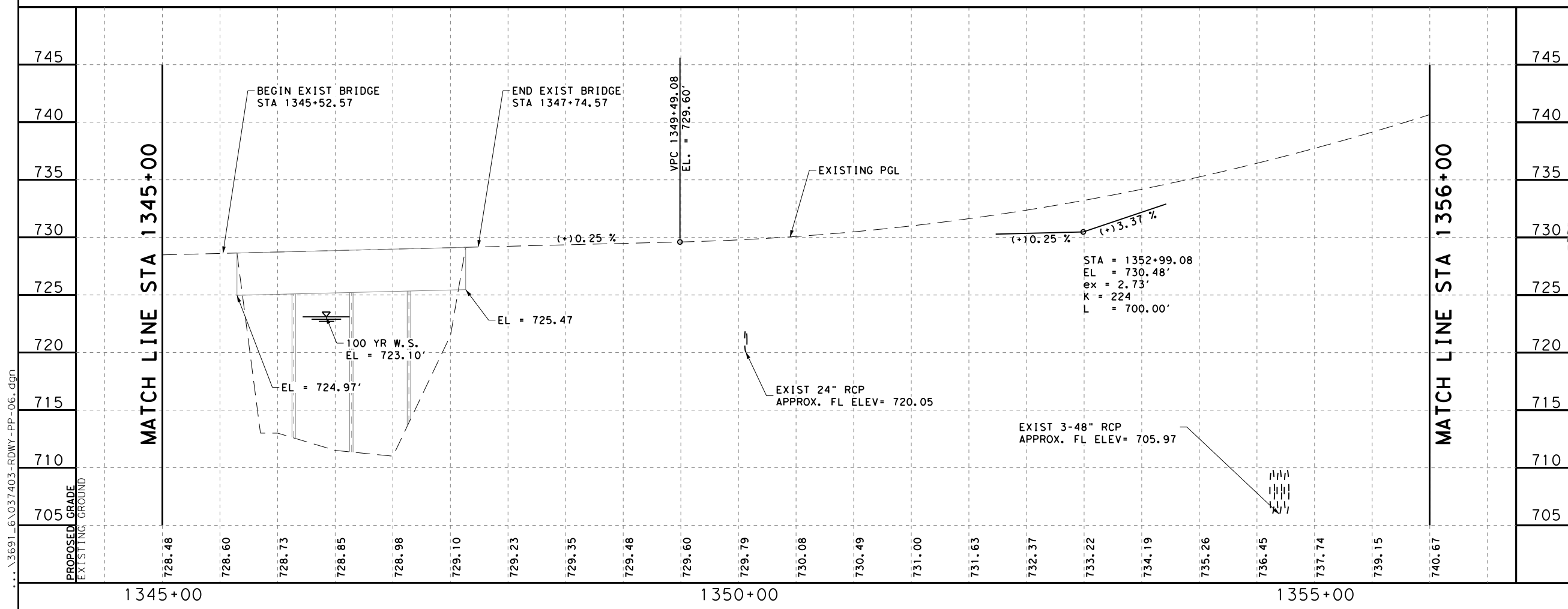
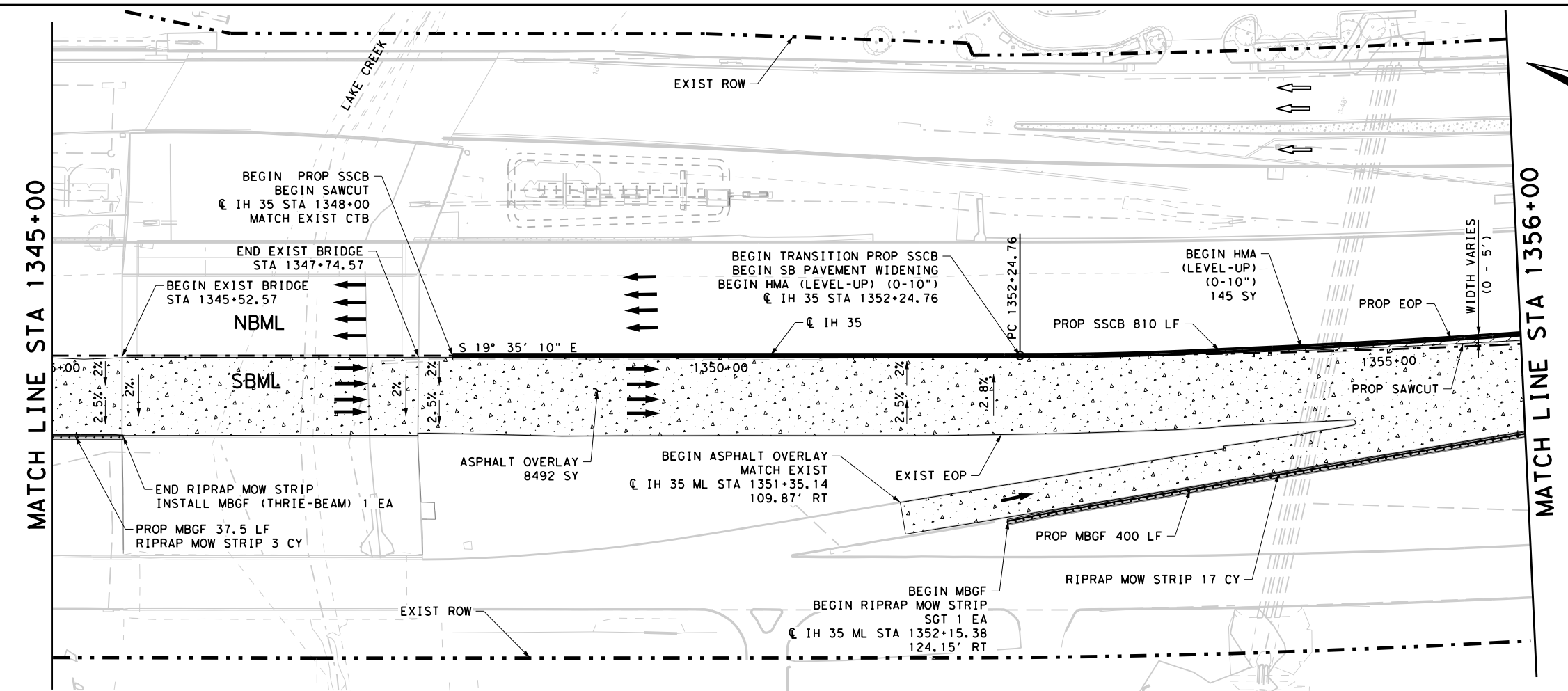
IH 35 PLAN AND PROFILE STA 1334+00 TO STA 1345+00			
SHEET 5 OF 12			
CONTRACT NO.	SECTION	JOB NO.	HIGHWAY
0015	09	194	IH 35
DISTRICT	COUNTY	SHEET NO.	
AUS	WILLIAMSON	084	

8:14:27 PM

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- NOTES:**
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BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

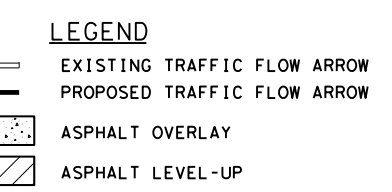
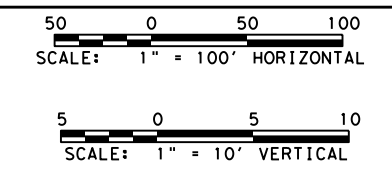
**IH 35
PLAN AND PROFILE
STA 1345+00 TO
STA 1356+00**

SHEET 6 OF 12

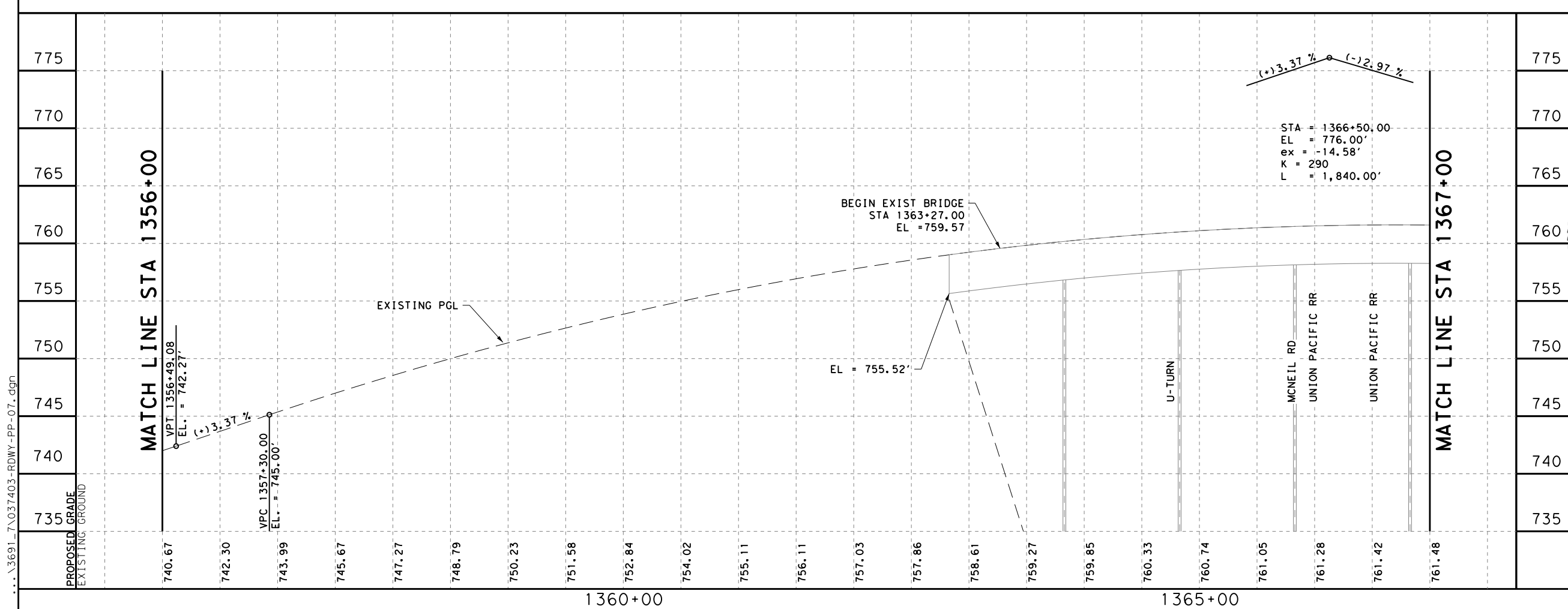
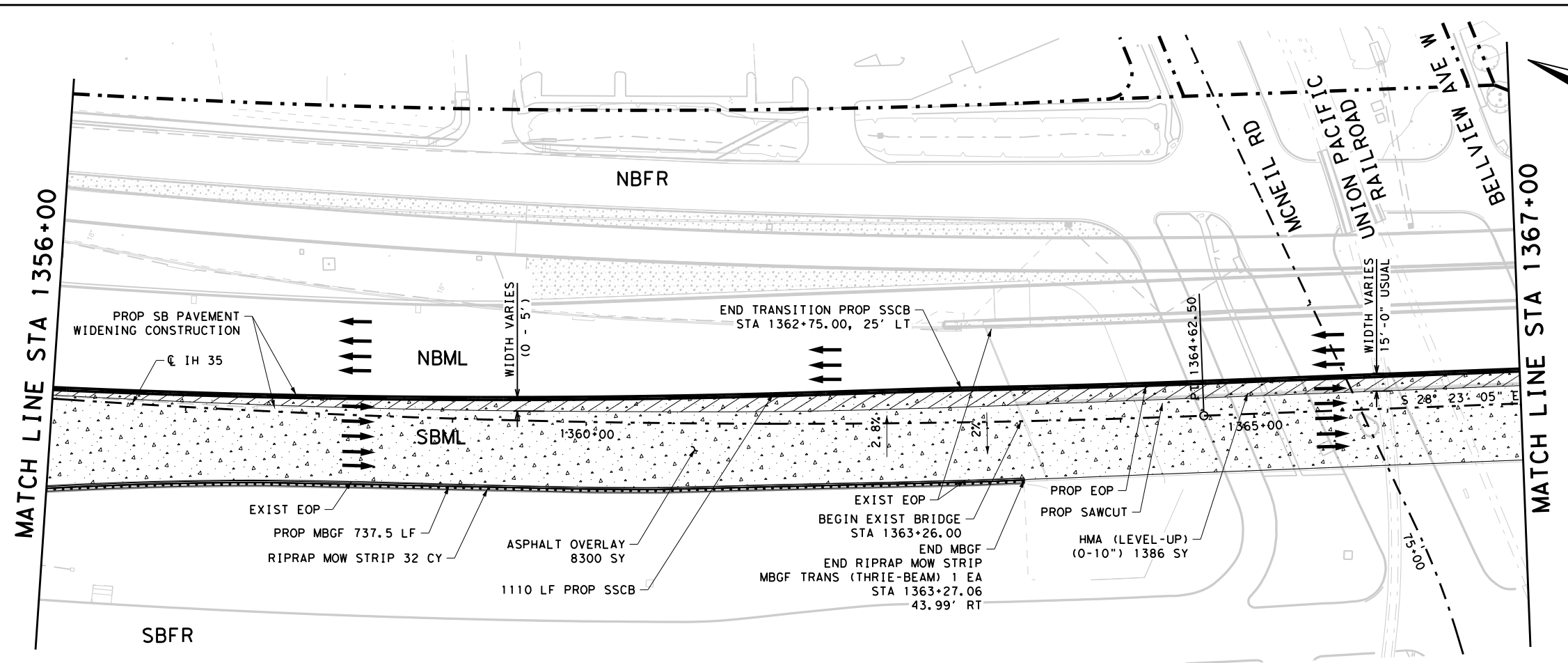
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- NOTES:**
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BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TXPE REGISTRATION NO. 264

2021
Texas Department of Transportation

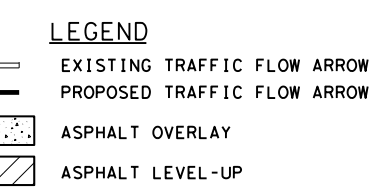
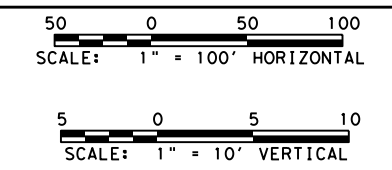
IH 35
PLAN AND PROFILE
STA 1356+00 TO
STA 1367+00

SHEET 7 OF 12

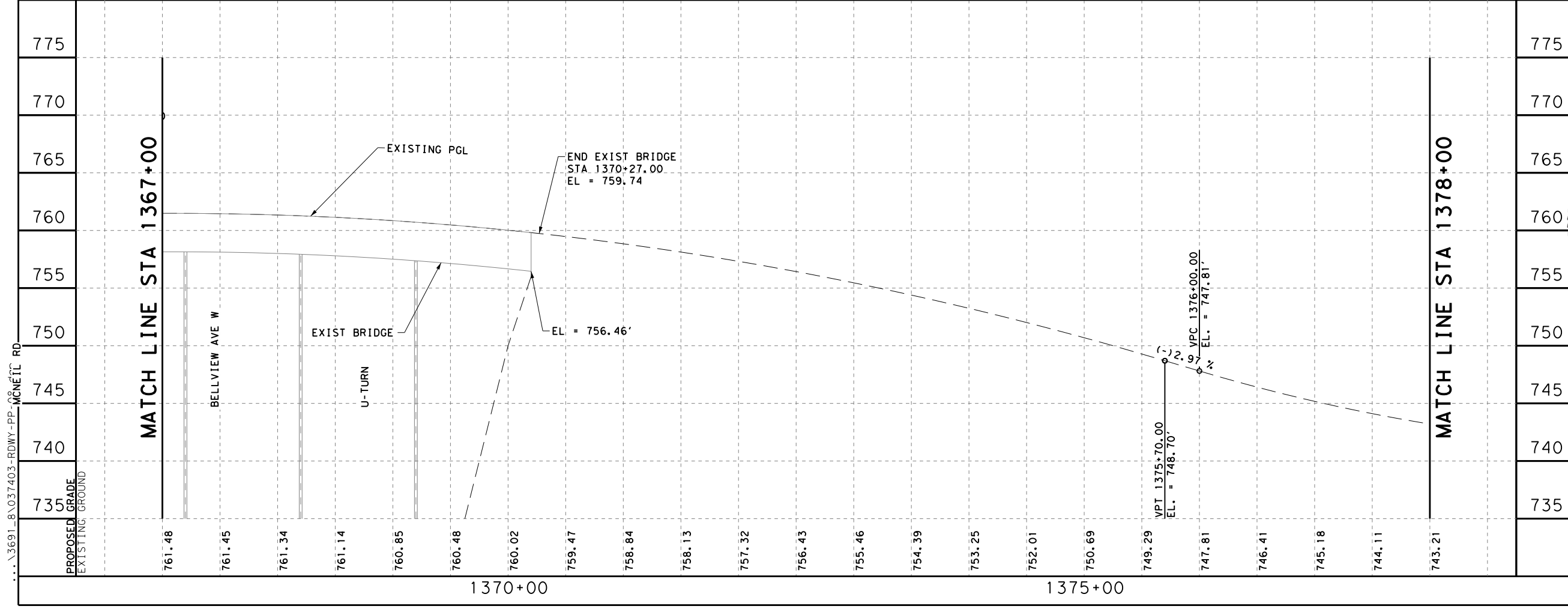
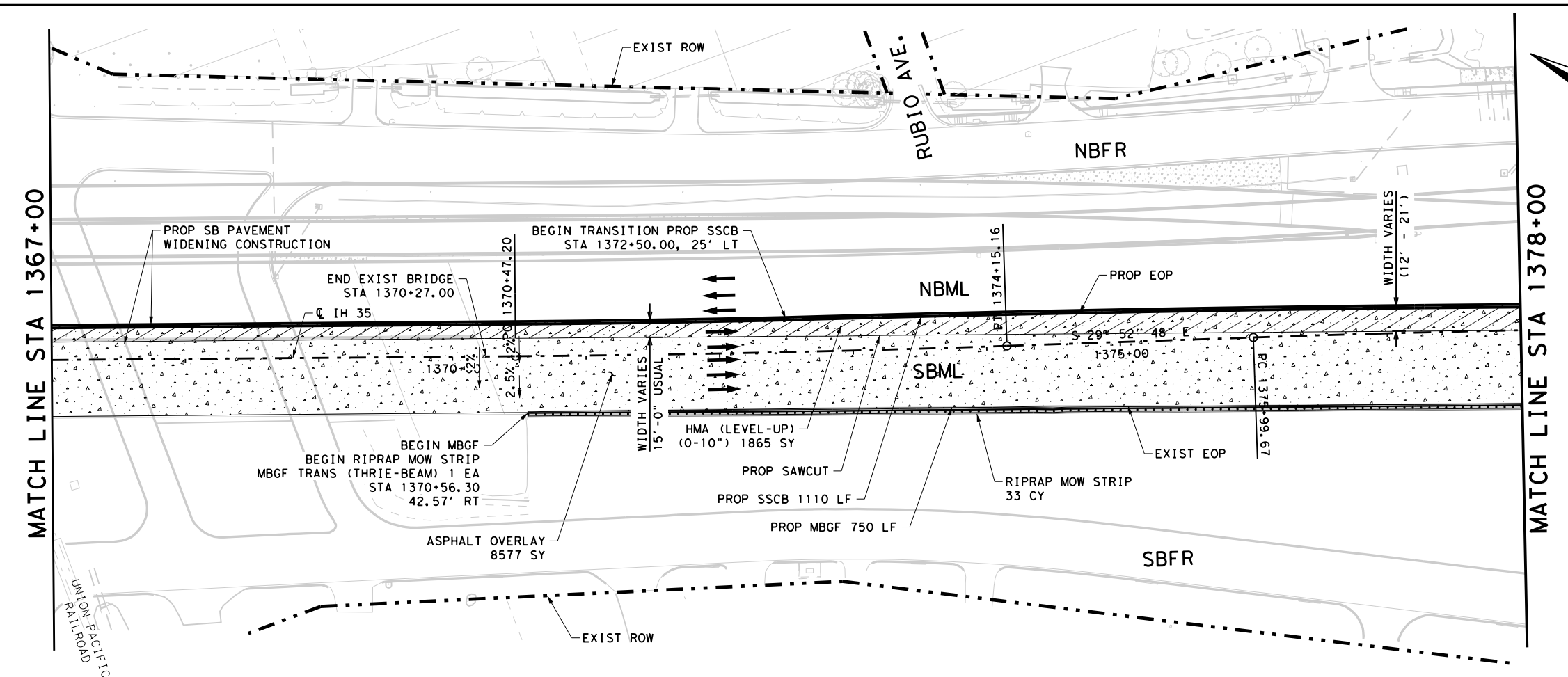
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DW:	MH	CK:	MM	DIST:	AUS	COUNTY:	WILLIAMSON	SHEET NO.:	086		

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BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBP REGISTRATION NO. 264

2021
Texas Department of Transportation

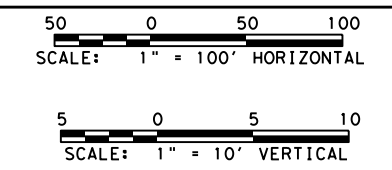
IH 35
PLAN AND PROFILE
STA 1367+00 TO
STA 1378+00

SHEET 8 OF 12

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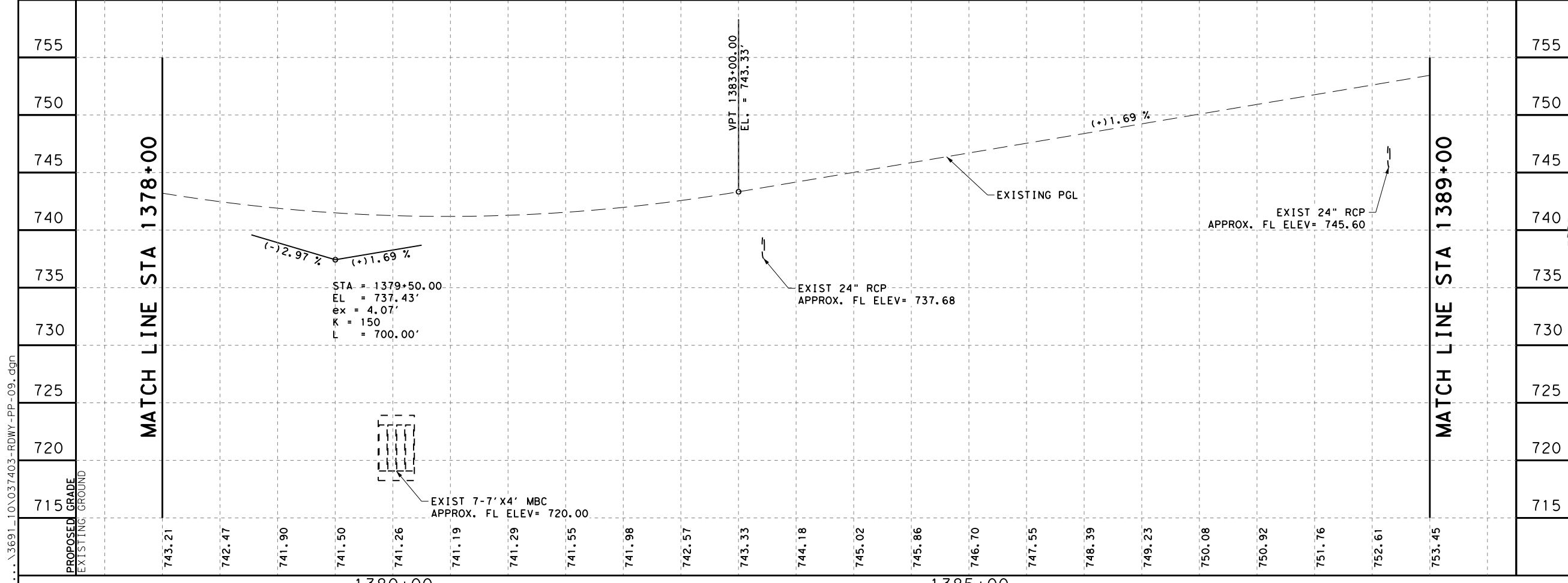
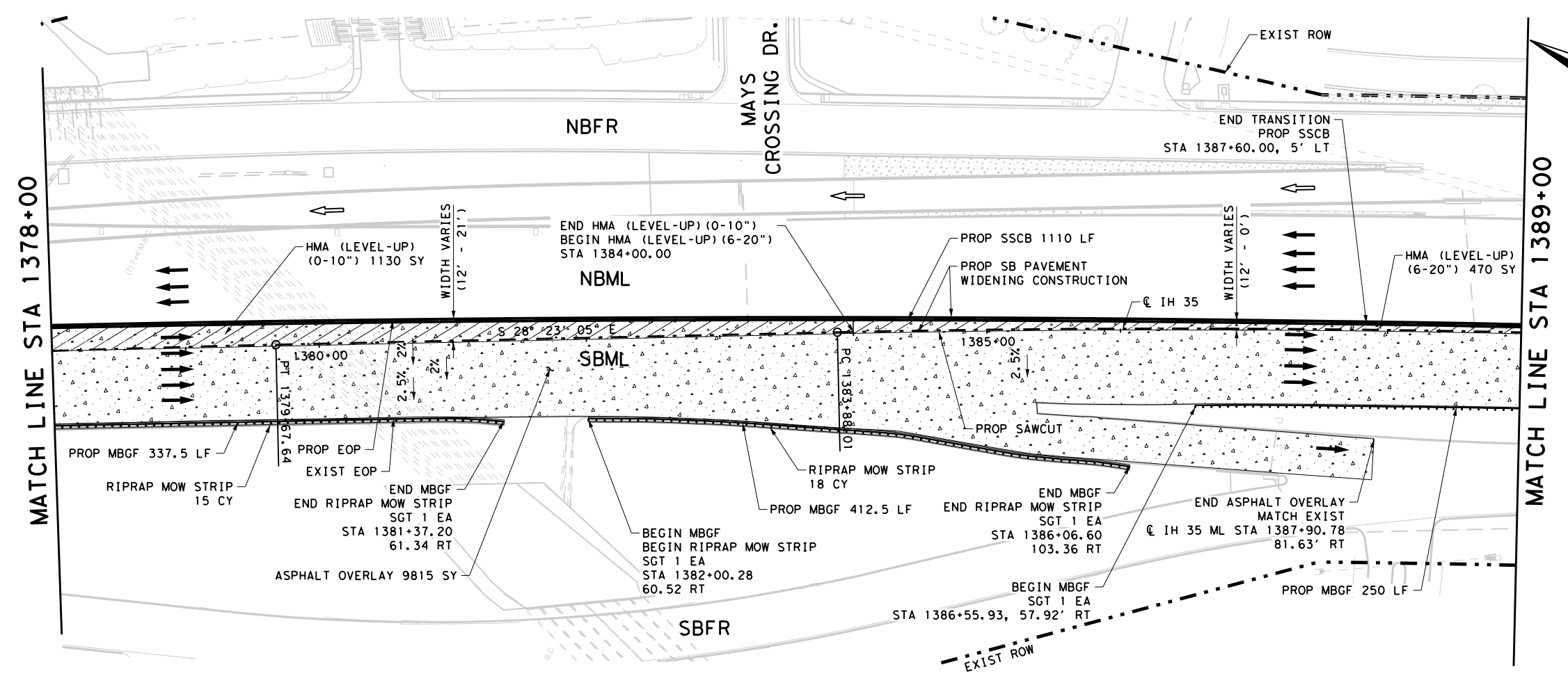
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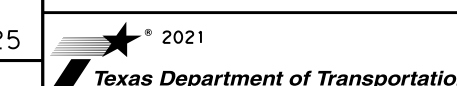
LEGEND

- EXISTING TRAFFIC FLOW ARROW
- PROPOSED TRAFFIC FLOW ARROW
- ASPHALT OVERLAY
- ASPHALT LEVEL-UP

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BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264



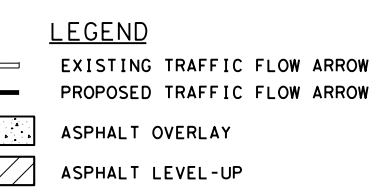
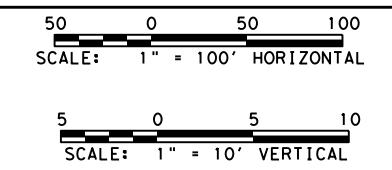
**IH 35
PLAN AND PROFILE
STA 1378+00 TO
STA 1389+00**

SHEET 9 OF 12

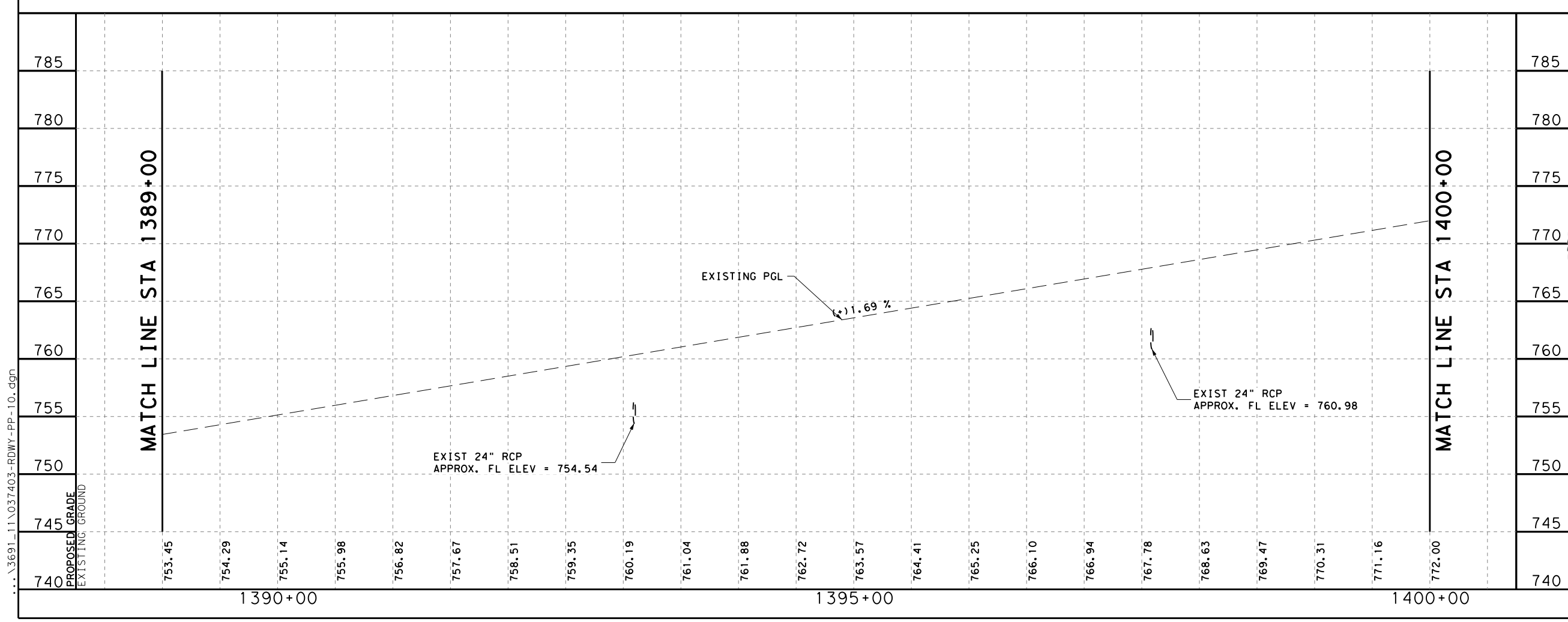
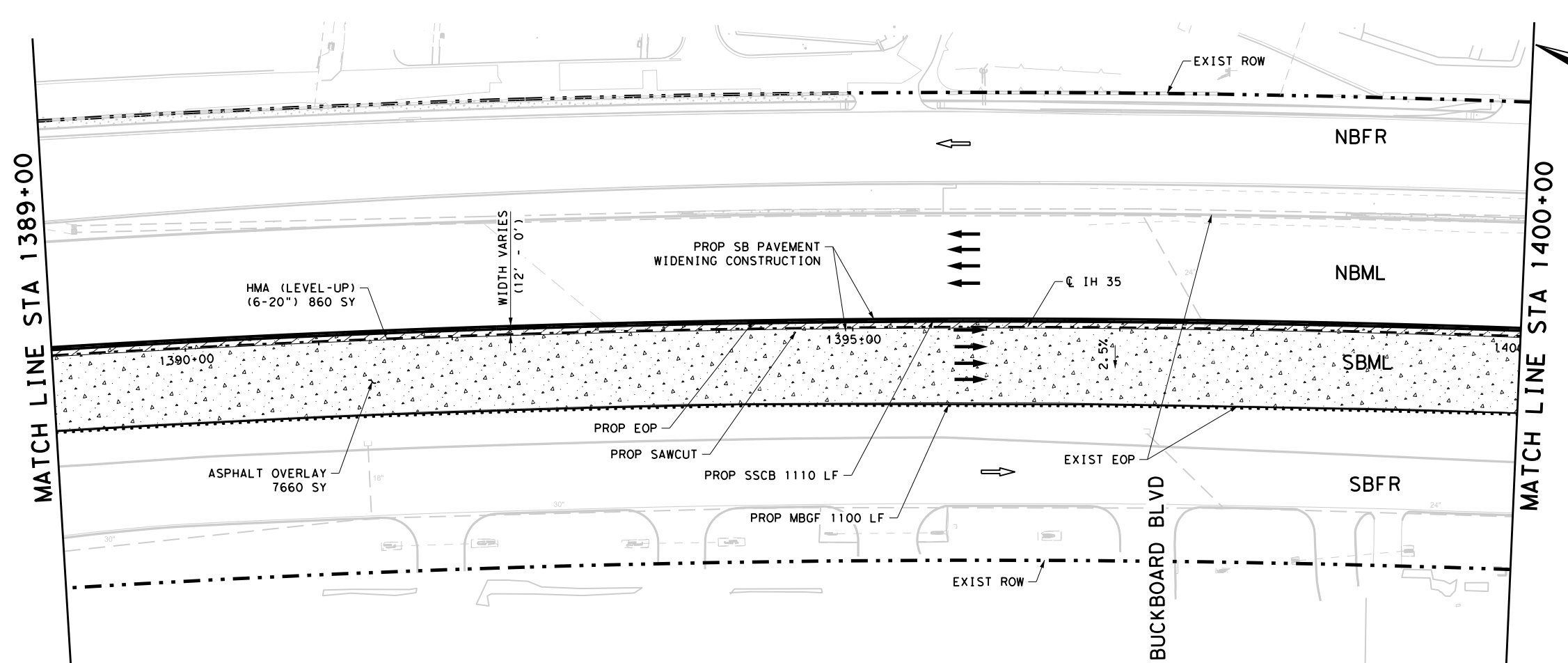
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DIST:	MH	MM	AUS	COUNTY:	WILLIAMSON	SHEET NO.:	088				

8:19:34 PM

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- NOTES:**
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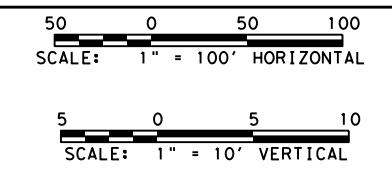
**IH 35
PLAN AND PROFILE
STA 1389+00 TO
STA 1400+00**

SHEET 10 OF 12

DES:	MM	CK:	AR	CONT:	0015	SECT:	09	JOB:	194	HIGHWAY:	IH 35
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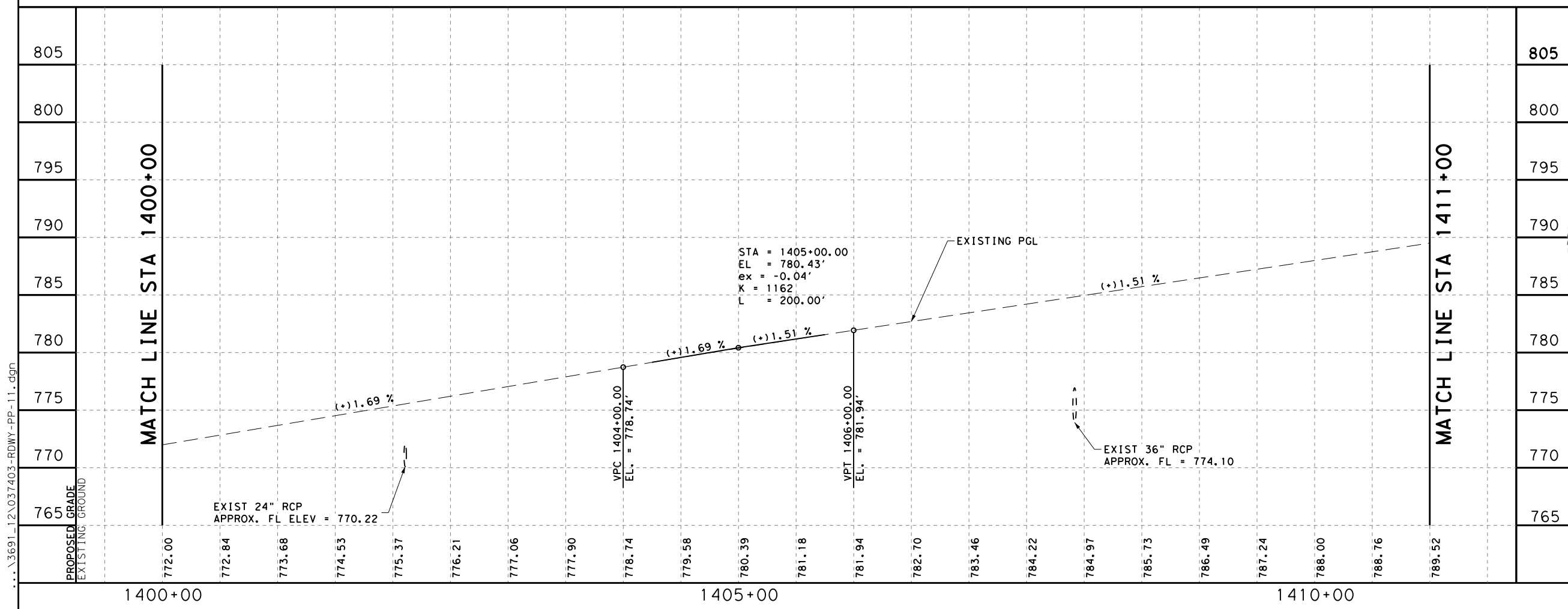
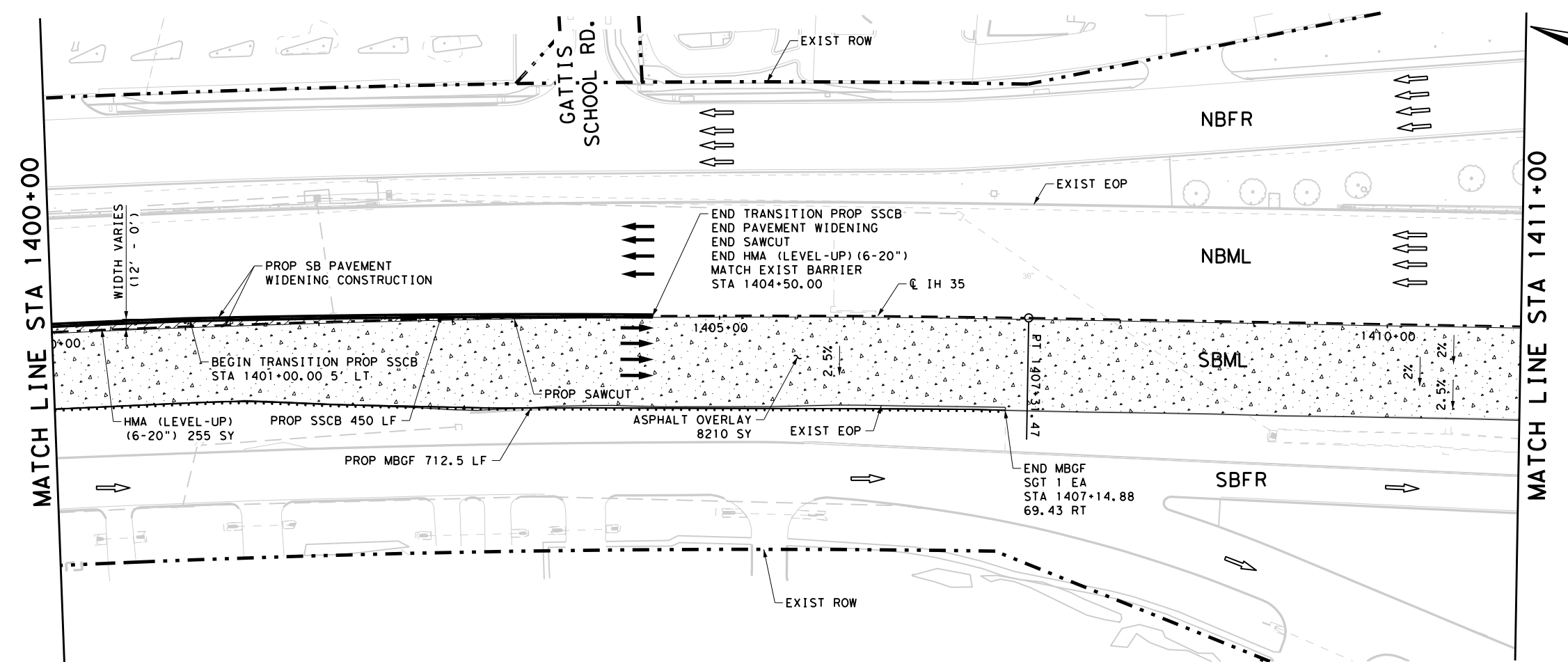
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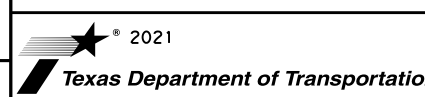


- LEGEND**
- EXISTING TRAFFIC FLOW ARROW
 - PROPOSED TRAFFIC FLOW ARROW
 - ASPHALT OVERLAY
 - ASPHALT LEVEL-UP

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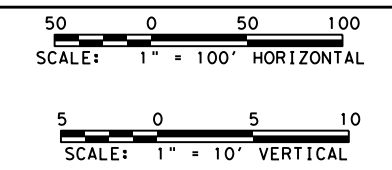
**IH 35
PLAN AND PROFILE
STA 1400+00 TO
STA 1411+00**

SHEET 11 OF 12

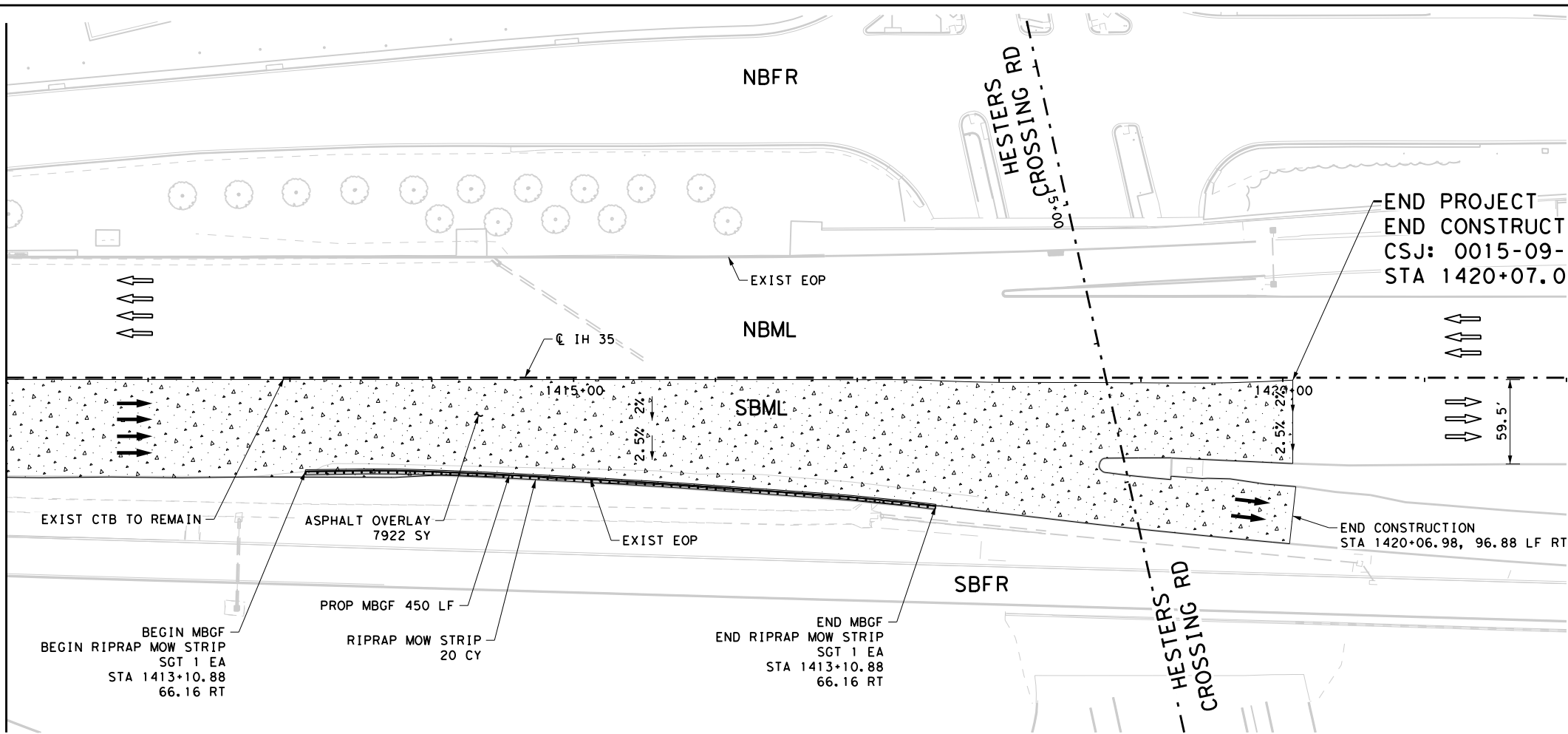
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DW:	MH	CK:	MM	DIST:	AUS	COUNTY:	WILLIAMSON	SHEET NO.:	090		

8:19:35 PM

br:dgpep011cs0748/2021



MATCH LINE STA 1411+00



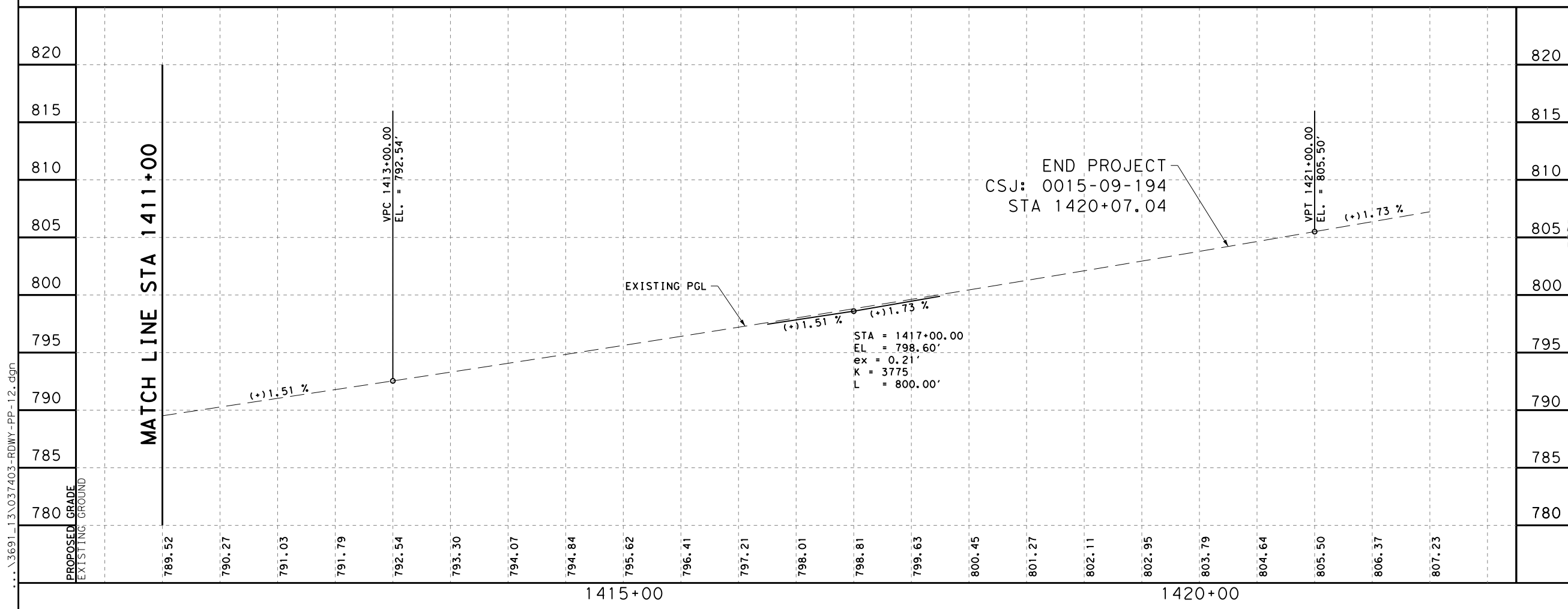
LEGEND

- EXISTING TRAFFIC FLOW ARROW
- PROPOSED TRAFFIC FLOW ARROW
- ASPHALT OVERLAY
- ASPHALT LEVEL-UP

NOTES:

1. REFER TO THE EXISTING SUPERELEVATION DATA TABLE AND THE DESIGN CROSS SECTIONS FOR ADDITIONAL INFORMATION.
2. EXISTING PAVEMENT CROSS SLOPES, PROFILE AND TRANSITIONS SHOWN ARE BASED ON AS-BUILTS AND ARE PROVIDED FOR INFORMATION ONLY. ALL PAVEMENT WIDENING SHALL MATCH THE CROSS SLOPE OF THE EXISTING PAVEMENT ADJACENT TO THE WIDENING. CONTRACTOR SHALL FIELD VERIFY EXISTING PAVEMENT ELEVATION AND CROSS SLOPE PRIOR TO WIDENING. FIELD VERIFICATION IS SUBSIDIARY TO ROADWAY QUANTITIES.
3. SAWCUT LOCATION IS 2' OFFSET FROM FACE OF EXISTING CONCRETE TRAFFIC BARRIER. SAWCUT LOCATION IS PGL TO BE USED FOR CONSTRUCTION.

MATCH LINE STA 1411+00



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

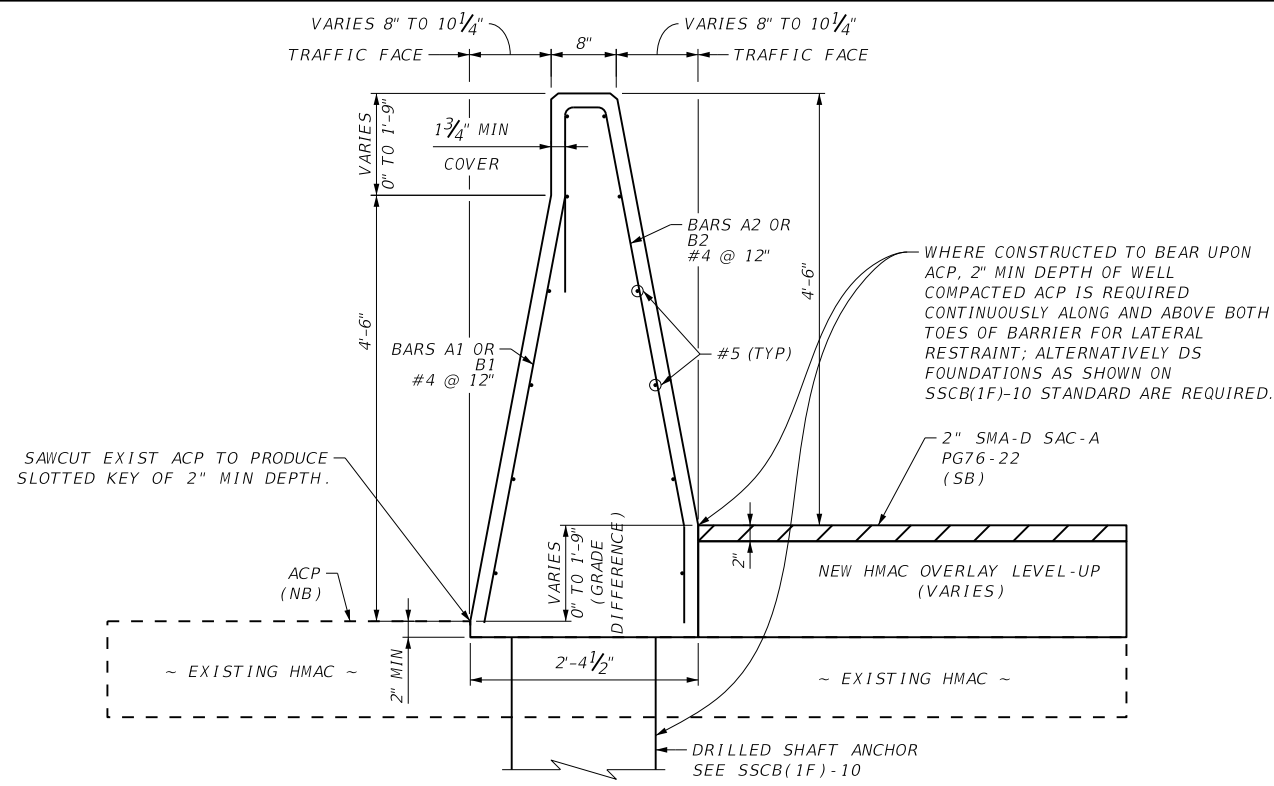


**IH 35
PLAN AND PROFILE
STA 1411+00 TO
END PROJECT**

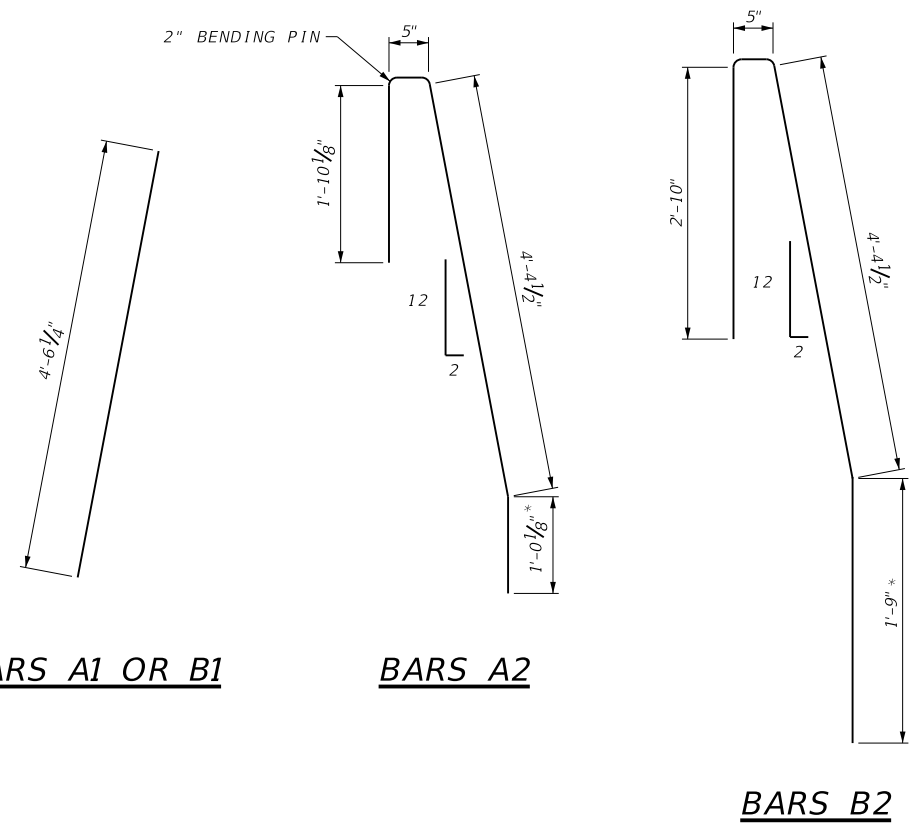
SHEET 12 OF 12

DS:	MM	CK:	AR	CONT:	0015	SECT:	09	JOB:	194	HIGHWAY:	IH 35
DW:	MH	CK:	MM	DIST:	AUS	COUNTY:	WILLIAMSON	SHEET NO.:	091		

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TYPE A OR B SECTION
NOT TO SCALE



BARS A1 OR B1

BARS A2

BARS B2

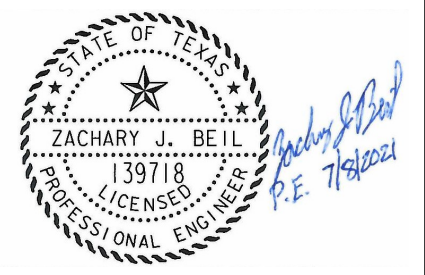
* FABRICATE TO DIMENSIONS AS SHOWN, CUT IN FIELD AS REQUIRED.

ESTIMATE OF QUANTITIES		
TYPE	CONCRETE (CY/LF)	STEEL (LB/LF) **
A	0.32	17.95
B	0.45	25.07

** WEIGHT BASED ON FABRICATED LENGTHS FOR CONTRACTOR'S INFORMATION ONLY

NOTES:

1. SEE SHEET 2 OF 4 FOR LOCATIONS OF DIFFERENTIAL BARRIER.
2. SEE BARRIER TRANSITION SHEETS FOR TRANSITION DETAILS NOT SHOWN.



BRIDGEFARMER & ASSOCIATES, INC.
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TBPB REGISTRATION NO. 264



IH 35
SSCB DIFFERENTIAL BARRIER
TYPES A & B

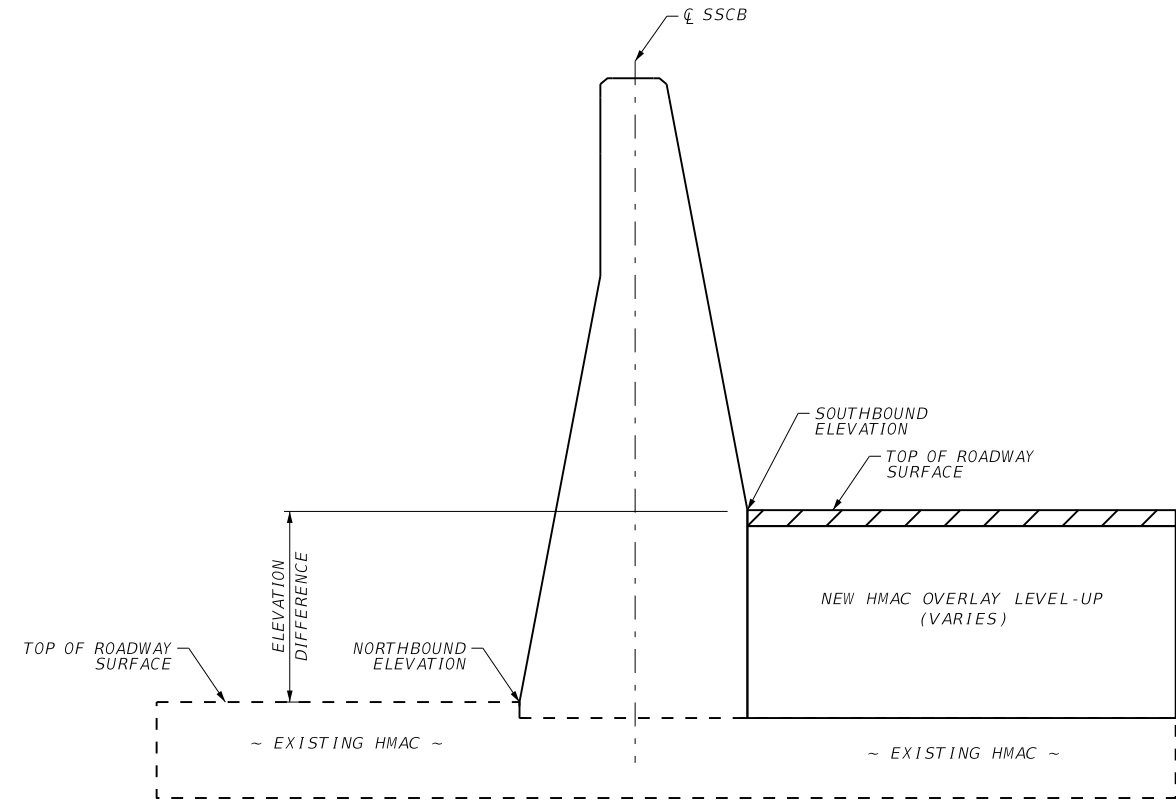
SHEET 1 OF 2

DS:	MM	AR	0015	09	194	IH 35
DW:	MH	MM	AUS	WILLIAMSON	092	

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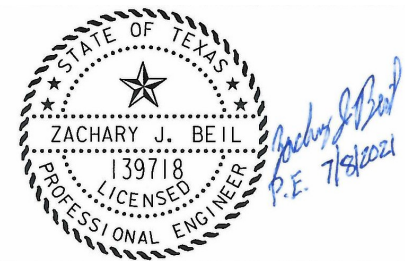
STATION	NORTHBOUND SSCB ELEVATION	SOUTHBOUND SSCB ELEVATION	ELEVATION DIFFERENCE (FT)	TYPE
1349+00.00	729.73	729.74	0.01	A
1350+00.00	730.15	730.06	-0.09 *	A
1351+00.00	730.87	730.89	0.02	A
1352+00.00	731.94	732.04	0.1	A
1353+00.00	733.49	733.62	0.13	A
1354+00.00	735.51	735.53	0.02	A
1355+00.00	737.93	737.96	0.03	A
1356+00.00	740.84	740.87	0.03	A
1357+00.00	744.01	744.08	0.07	A
1358+00.00	747.28	747.44	0.16	A
1359+00.00	750.17	750.27	0.1	A
1360+00.00	752.75	752.95	0.2	A
1361+00.00	755.02	755.13	0.11	A
1362+00.00	756.85	757.17	0.32	A
1363+00.00	758.63	759.12	0.49	A
1364+00.00	760.09	760.46	0.37	A
1365+00.00	760.98	761.31	0.33	A
1366+00.00	761.54	761.89	0.35	A
1367+00.00	761.74	762.07	0.33	A
1368+00.00	761.55	761.96	0.41	A
1369+00.00	761.07	761.45	0.38	A
1370+00.00	760.19	760.58	0.39	A
1371+00.00	758.79	759.2	0.41	A
1372+00.00	757.26	757.82	0.56	A
1373+00.00	755.4	755.99	0.59	A
1374+00.00	753.11	753.75	0.64	A
1375+00.00	750.51	751.27	0.76	A
1376+00.00	747.61	748.24	0.63	A
1377+00.00	745.04	745.75	0.71	A
1378+00.00	743.17	743.94	0.77	A
1379+00.00	741.91	742.64	0.73	A
1380+00.00	741.31	741.87	0.56	A
1381+00.00	741.43	741.95	0.52	A
1382+00.00	742.3	742.67	0.37	A
1383+00.00	743.69	743.82	0.13	A
1384+00.00	745.2	745.42	0.22	A
1385+00.00	746.54	747.08	0.54	A
1386+00.00	747.83	748.8	0.97	A
1387+00.00	749.24	750.39	1.15	B
1388+00.00	750.85	752.16	1.31	B
1389+00.00	752.43	753.93	1.5	B
1390+00.00	754.11	755.6	1.49	B
1391+00.00	755.79	757.27	1.48	B
1392+00.00	757.47	758.96	1.49	B
1393+00.00	759.14	760.71	1.57	B
1394+00.00	760.73	762.31	1.58	B
1395+00.00	762.41	763.97	1.56	B
1396+00.00	764.05	765.61	1.56	B
1397+00.00	765.75	767.28	1.53	B
1398+00.00	767.57	769.27	1.7	B
1399+00.00	769.72	771.38	1.66	B
1400+00.00	771.35	773.03	1.68	B
1401+00.00	772.76	774.48	1.72	B
1402+00.00	774.41	775.92	1.51	B
1403+00.00	776.12	777.83	1.71	B
1404+00.00	777.62	779.25	1.63	B

* NEGATIVE VALUE MEANS THE SOUTHBOUND ELEVATION IS LOWER THAN THE NORTHBOUND ELEVATION



SSCB ELEVATIONS DETAIL

TYPE B SHOWN, TYPE A SIMILAR
N.T.S.



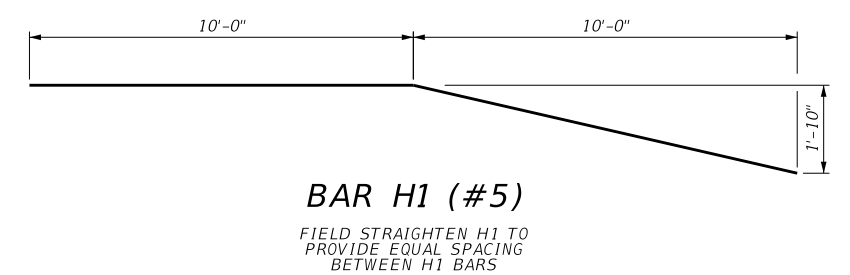
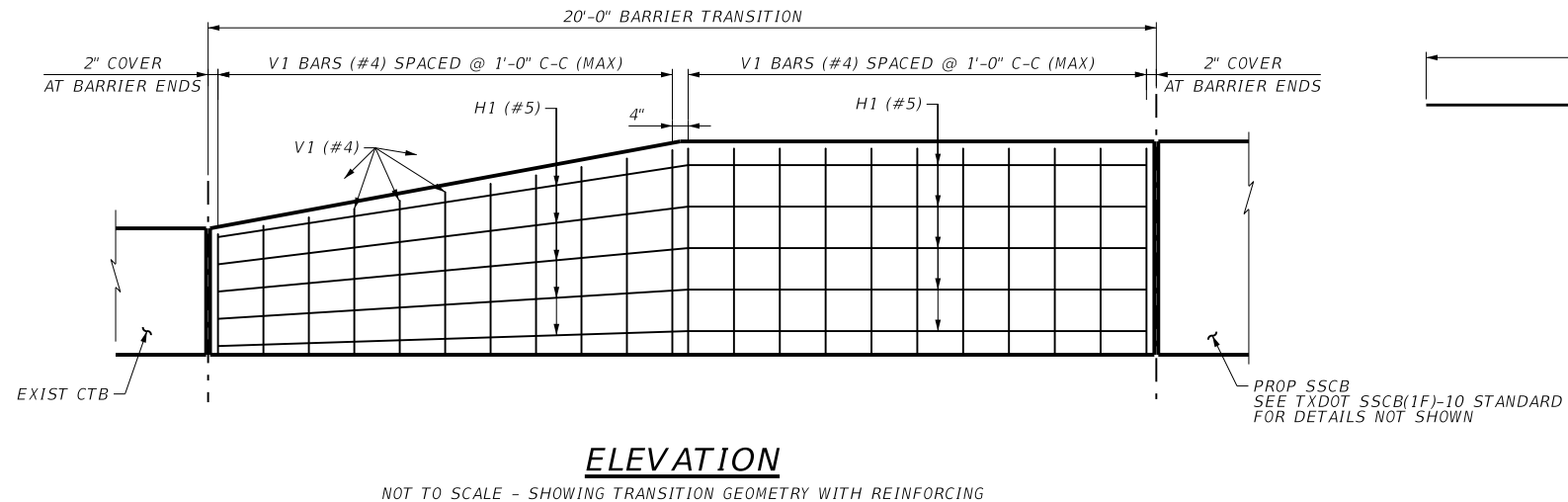
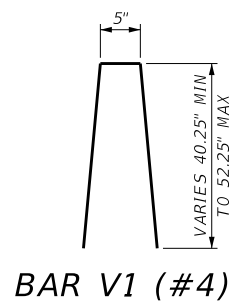
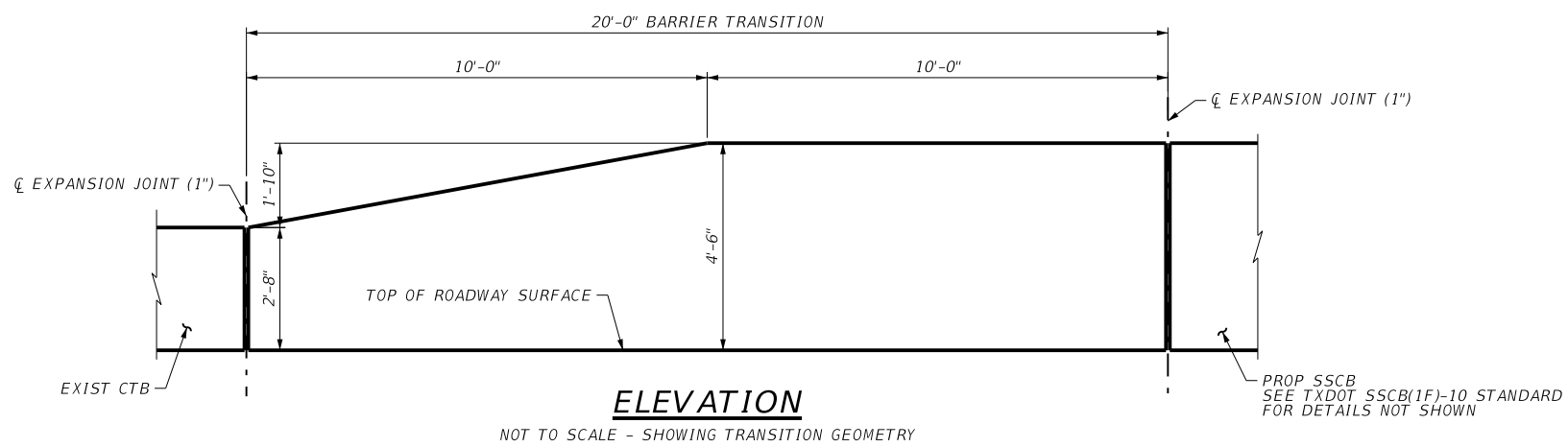
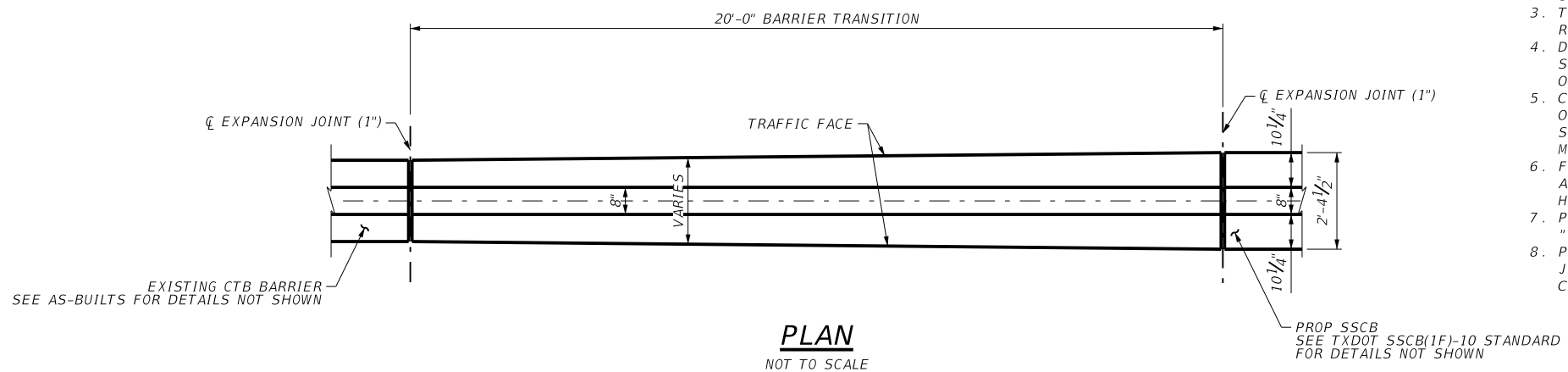
BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

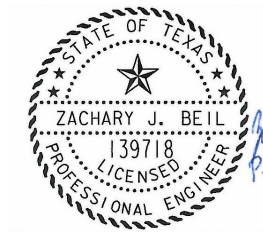
IH 35
**SSCB DIFFERENTIAL
BARRIER
ELEVATIONS**

SHEET 2 OF 2

DS:	MM	AR	0015	09	194	IH 35
DW:	MH	MM	AUS	WILLIAMSON	093	



- NOTES:**
1. CONCRETE SHALL BE CLASS C, UNLESS OTHERWISE SPECIFIED IN THE PLANS.
 2. WHERE USED, REBAR REINFORCEMENT SHALL BE GRADE 60 AND CONFORM TO ASTM A615.
 3. TOP EDGES OF CIP BARRIER SHALL HAVE A 3/4" CHAMFER OR 1" RADIUS.
 4. DRAINAGE SLOT DEPTHS MAY BE INCREASED 1" TO ACCOMODATE ACP. SLOT LOCATIONS (12'-0", C-C MIN. SPACING) ARE SHOWN ELSEWHERE, OR AS DIRECTED BY THE ENGINEER.
 5. CAST-IN-PLACE BARRIER MAY BE SLIP FORMED. BRACING MAY BE TIED OR TACK WELDED TO THE REINFORCEMENT CAGE TO PROVIDE CAGE STABILITY. DO NOT WELD TO ANCHOR BARS. THE REINFORCEMENT CAGE MAY REST OF THE TOP OF FINISHED GRADE.
 6. FOR DRILLED SHAFT ANCHORS, DWEL CONNECTIONS, EXPANSION JOINT AND OTHER DETAILS NOT SHOWN HERE, SEE SSCB(1F)-10 STANDARD SHEETS.
 7. PAYMENT FOR TRANSITION BARRIER WILL BE AS PER ITEM 514, "PERMANENT CONCRETE TRAFFIC BARRIER".
 8. PAYMENT FOR DRILLED SHAFT ANCHOR, DWEL CONNECTIONS, EXPANSION JOINT DETAIL, AND OTHERS ARE SUBSIDIARY TO ITEM 514 "PERMANENT CONCRETE TRAFFIC BARRIER".



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

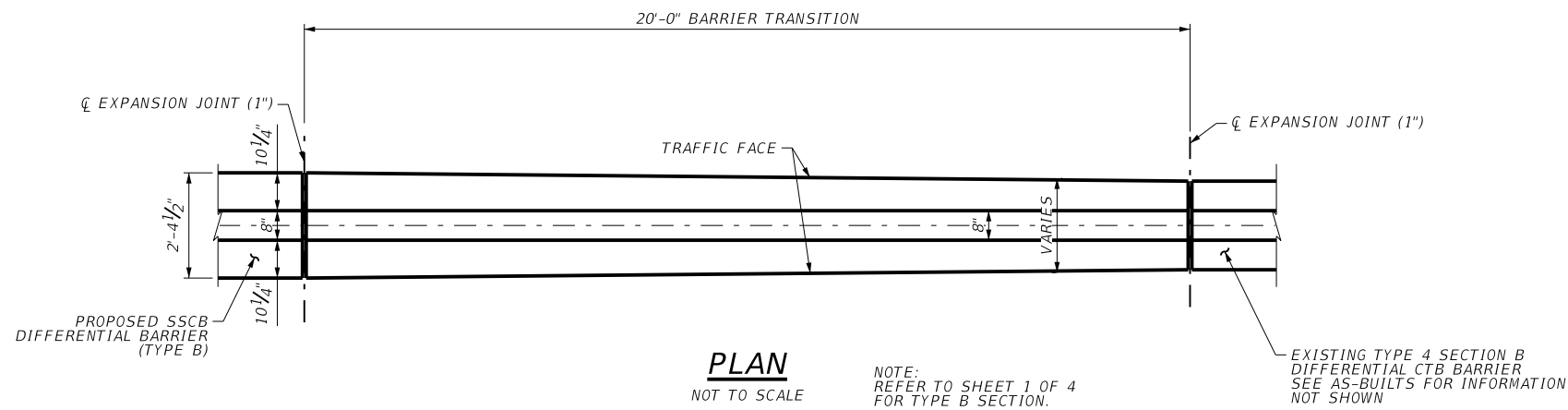
2021
Texas Department of Transportation

IH 35
**BARRIER TRANSITION
EXIST CTB TO
PROPOSED SSCB**

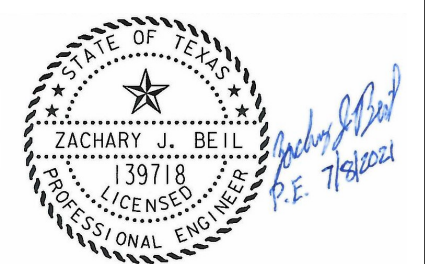
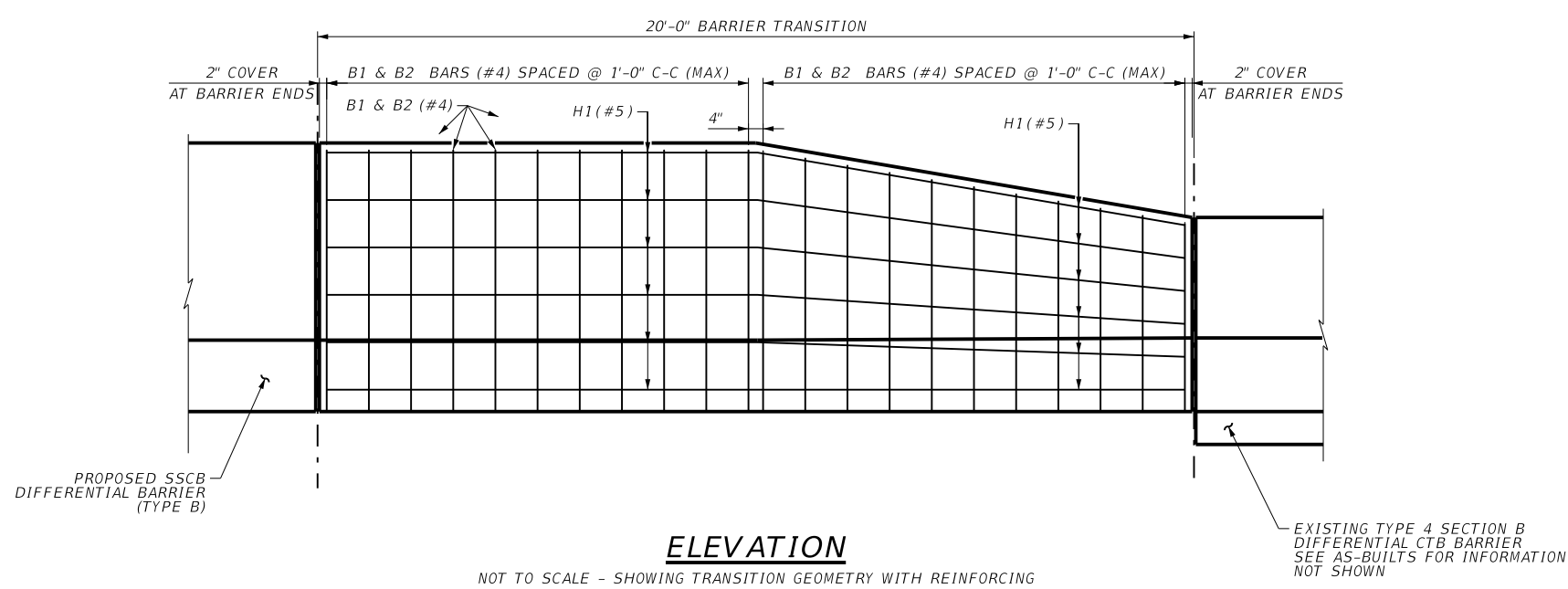
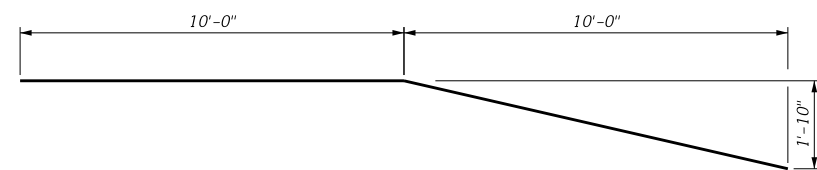
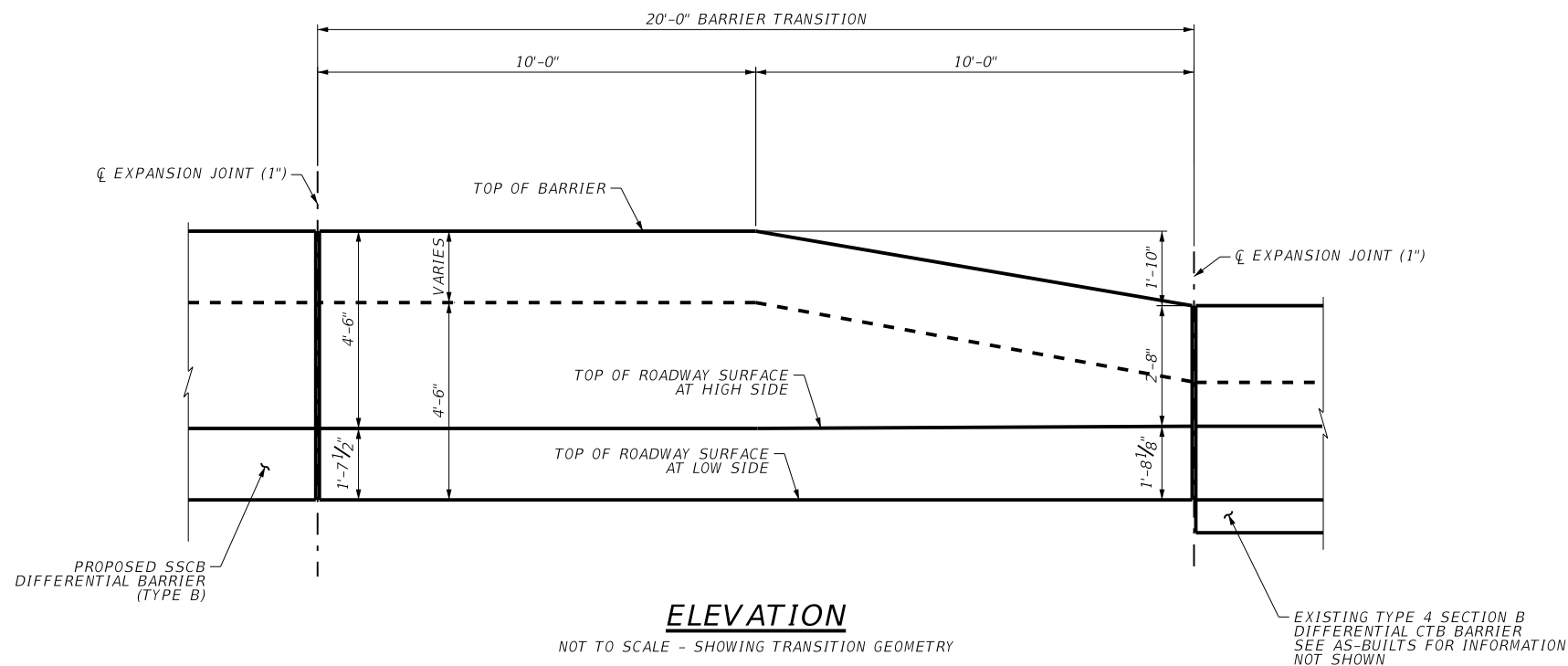
SHEET 1 OF 2

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brIDGEPW011cs0748/2021



- NOTES:**
1. CONCRETE SHALL BE CLASS C, UNLESS OTHERWISE SPECIFIED IN THE PLANS.
 2. WHERE USED, REBAR REINFORCEMENT SHALL BE GRADE 60 AND CONFORM TO ASTM A615.
 3. TOP EDGES OF CIP BARRIER SHALL HAVE A 3/4" CHAMFER OR 1" RADIUS.
 4. DRAINAGE SLOT DEPTHS MAY BE INCREASED 1" TO ACCOMMODATE ACP. SLOT LOCATIONS (12'-0", C-C MIN. SPACING) ARE SHOWN ELSEWHERE, OR AS DIRECTED BY THE ENGINEER.
 5. CAST-IN-PLACE BARRIER MAY BE SLIP FORMED. BRACING MAY BE TIED OR TACK WELDED TO THE REINFORCEMENT CAGE TO PROVIDE CAGE STABILITY. DO NOT WELD TO ANCHOR BARS. THE REINFORCEMENT CAGE MAY REST ON THE TOP OF FINISHED GRADE.
 6. FOR DRILLED SHAFT ANCHORS, DOWEL CONNECTIONS, EXPANSION JOINT AND OTHER DETAILS NOT SHOWN HERE, SEE SSCB(1F)-10 STANDARD SHEETS.
 7. PAYMENT FOR TRANSITION BARRIER WILL BE AS PER ITEM 514, "PERMANENT CONCRETE TRAFFIC BARRIER".
 8. PAYMENT FOR DRILL SHAFT ANCHOR, DOWEL CONNECTION, EXPANSION JOINT, AND OTHERS ARE SUBSIDIARY TO ITEM 514 "PERMANENT CONCRETE TRAFFIC BARRIER".



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CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
BARRIER TRANSITION
SSCB TYPE B TO
EXIST CTB TYPE 4B**

SHEET 2 OF 2

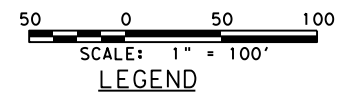
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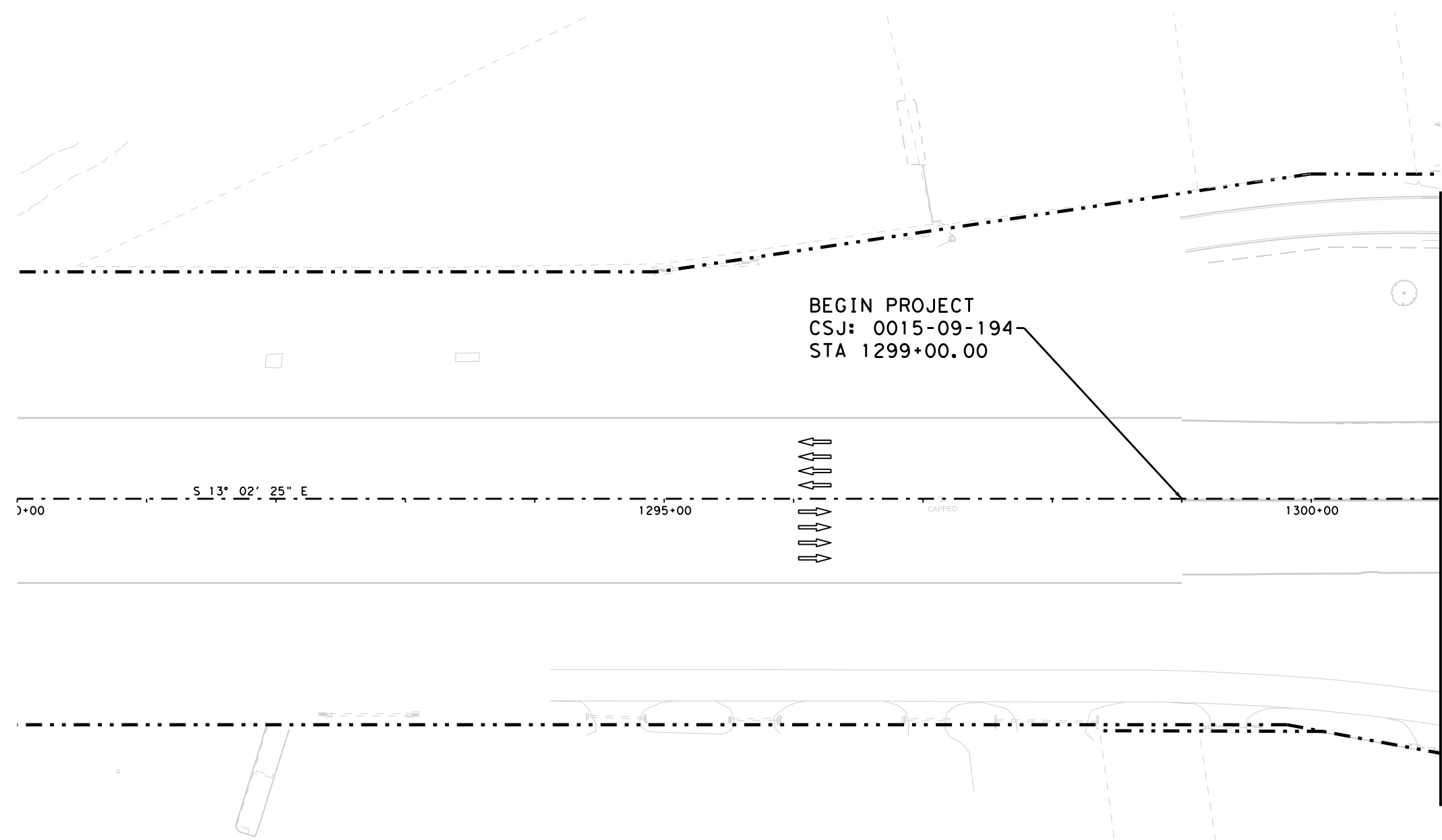
 MILL EXISTING ASPHALT
(DEPTH VARIES 3/4" TO 2")

 REMOVE CONCRETE

 REMOVE PAVEMENT

 EXIST DIRECTION OF TRAVEL

 PROP DIRECTION OF TRAVEL



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPPE REGISTRATION NO. 264



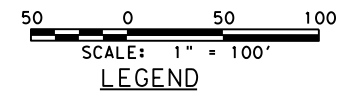
IH 35
REMOVAL PLAN
BEGIN PROJECT TO
STA 1301+00

SCALE: 1" = 100' SHEET 1 OF 12

DS:	MM	MM	0015	09	194	IH 35
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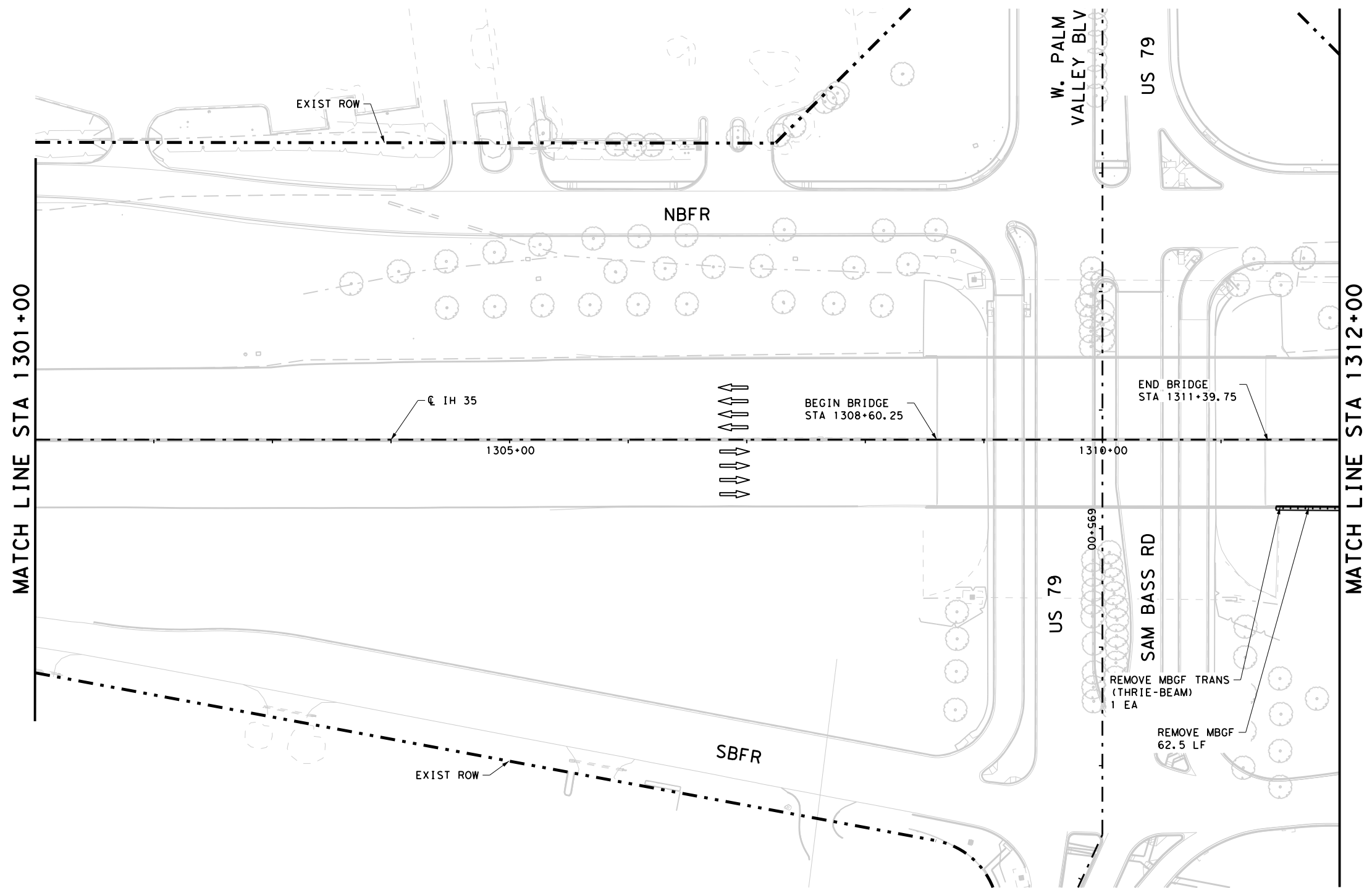
MILL EXISTING ASPHALT (DEPTH VARIES 3/4" TO 2")

REMOVE CONCRETE

REMOVE PAVEMENT

EXIST DIRECTION OF TRAVEL

PROP DIRECTION OF TRAVEL



Mansa R. Moton
07.08.2021

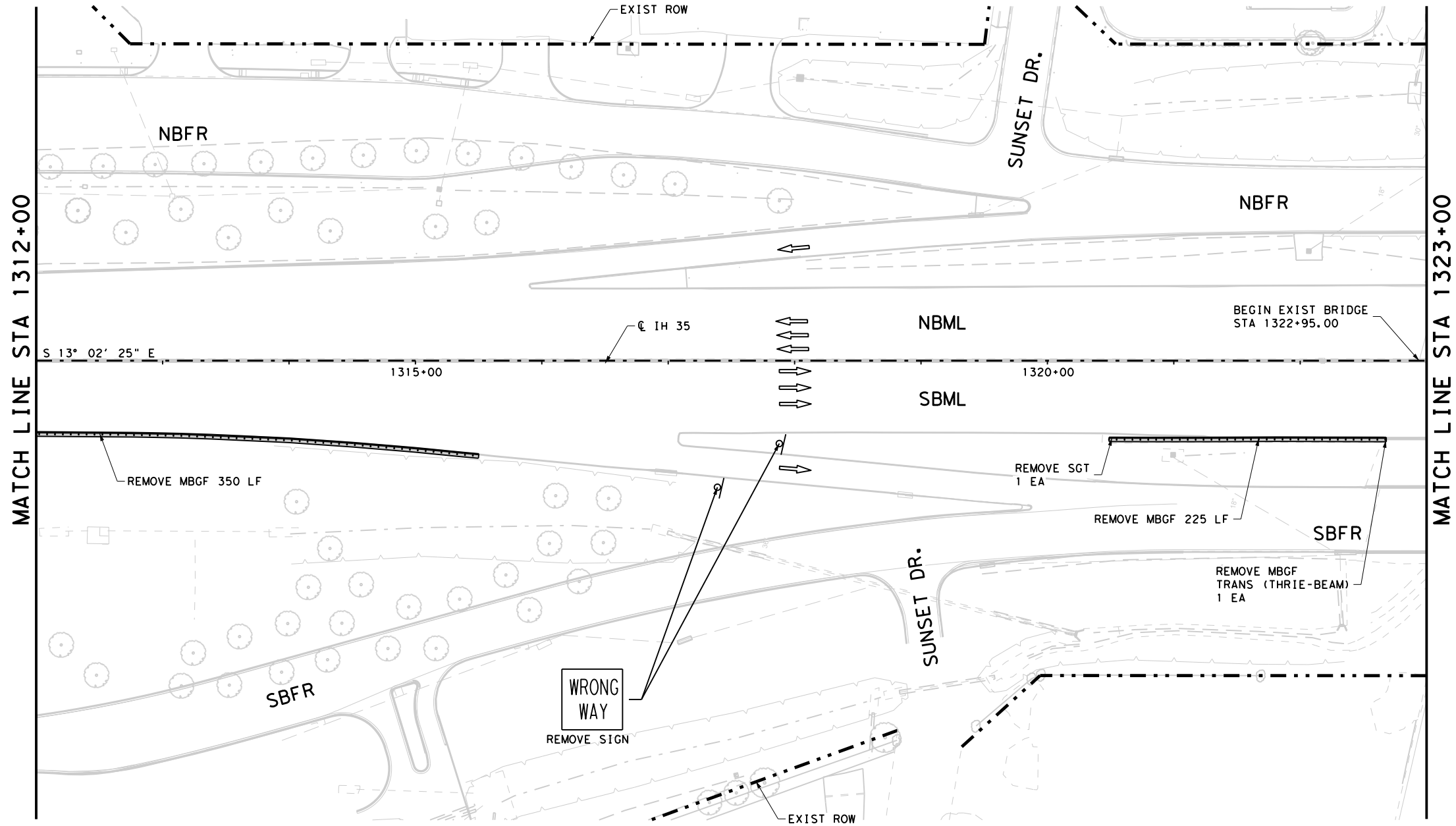
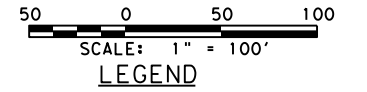
BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

IH 35
REMOVAL PLAN
STA 301+00 TO
STA 1312+00

SCALE: 1" = 100' SHEET 2 OF 12

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	MM	0015	09	194	IH 35
DR:	CK:	DIST		COUNTY	SHEET NO.
ADT	SM	AUS		WILLIAMSON	097



- LEGEND**
- MILL EXISTING ASPHALT (DEPTH VARIES 3/4" TO 2")
 - REMOVE CONCRETE
 - REMOVE PAVEMENT
 - EXIST DIRECTION OF TRAVEL
 - PROP DIRECTION OF TRAVEL



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TXPE REGISTRATION NO. 264



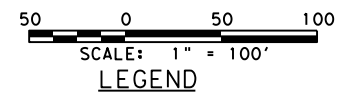
**IH 35
REMOVAL PLAN
STA 1312+00 TO
STA 1323+00**



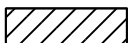


SCALE: 1" = 100' SHEET 3 OF 12

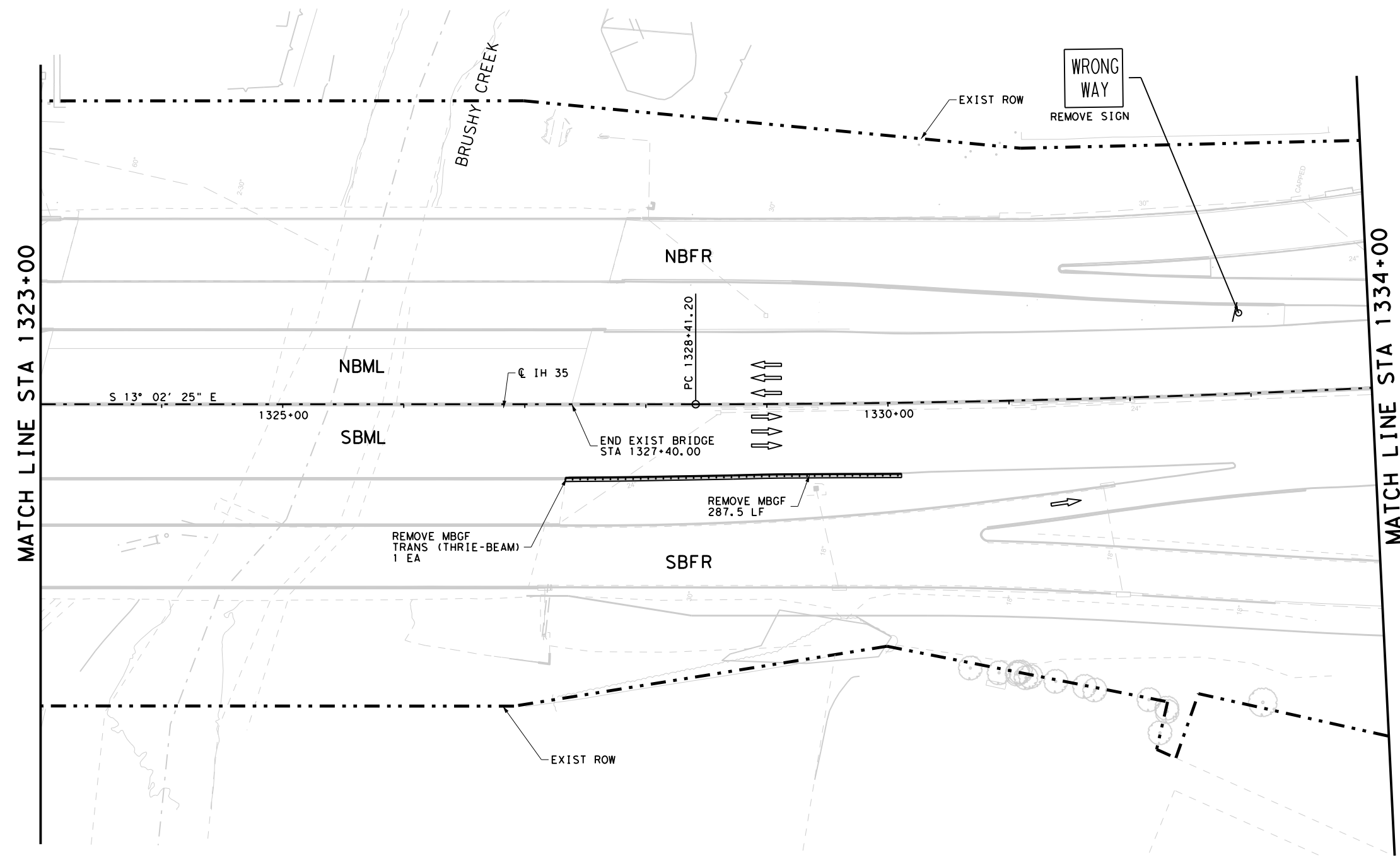
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-  MILL EXISTING ASPHALT (DEPTH VARIES 3/4" TO 2")
-  REMOVE CONCRETE
-  REMOVE PAVEMENT
-  EXIST DIRECTION OF TRAVEL
-  PROP DIRECTION OF TRAVEL



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CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264



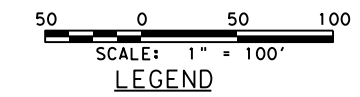
IH 35
REMOVAL PLAN
STA 1323+00 TO
STA 1334+00



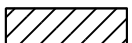


SCALE: 1" = 100' SHEET 4 OF 12

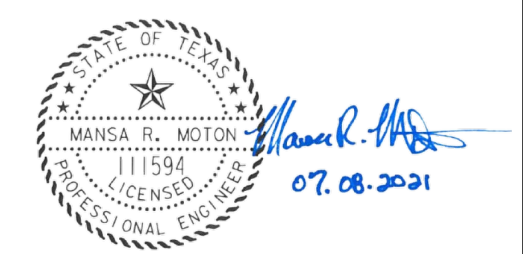
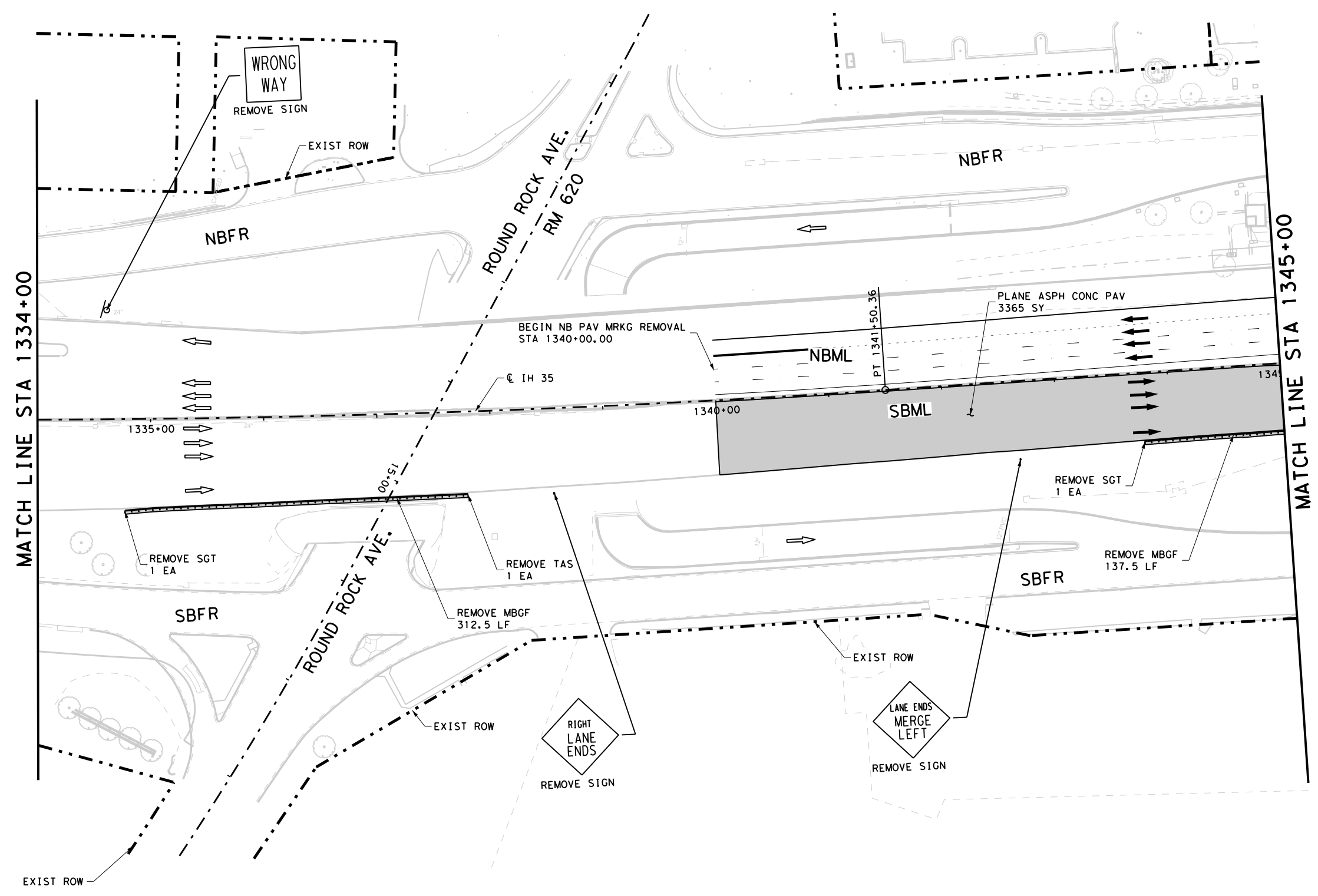
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ADT	SM	AUS		WILLIAMSON	099

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-  MILL EXISTING ASPHALT (DEPTH VARIES 3/4" TO 2")
-  REMOVE CONCRETE
-  REMOVE PAVEMENT
-  EXIST DIRECTION OF TRAVEL
-  PROP DIRECTION OF TRAVEL



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CONSULTING ENGINEERS
TXPE REGISTRATION NO. 284

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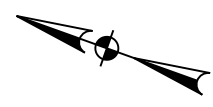
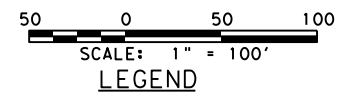
IH 35
REMOVAL PLAN
STA 1334+00 TO
STA 1345+00



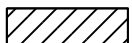


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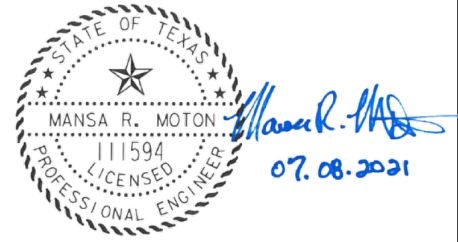
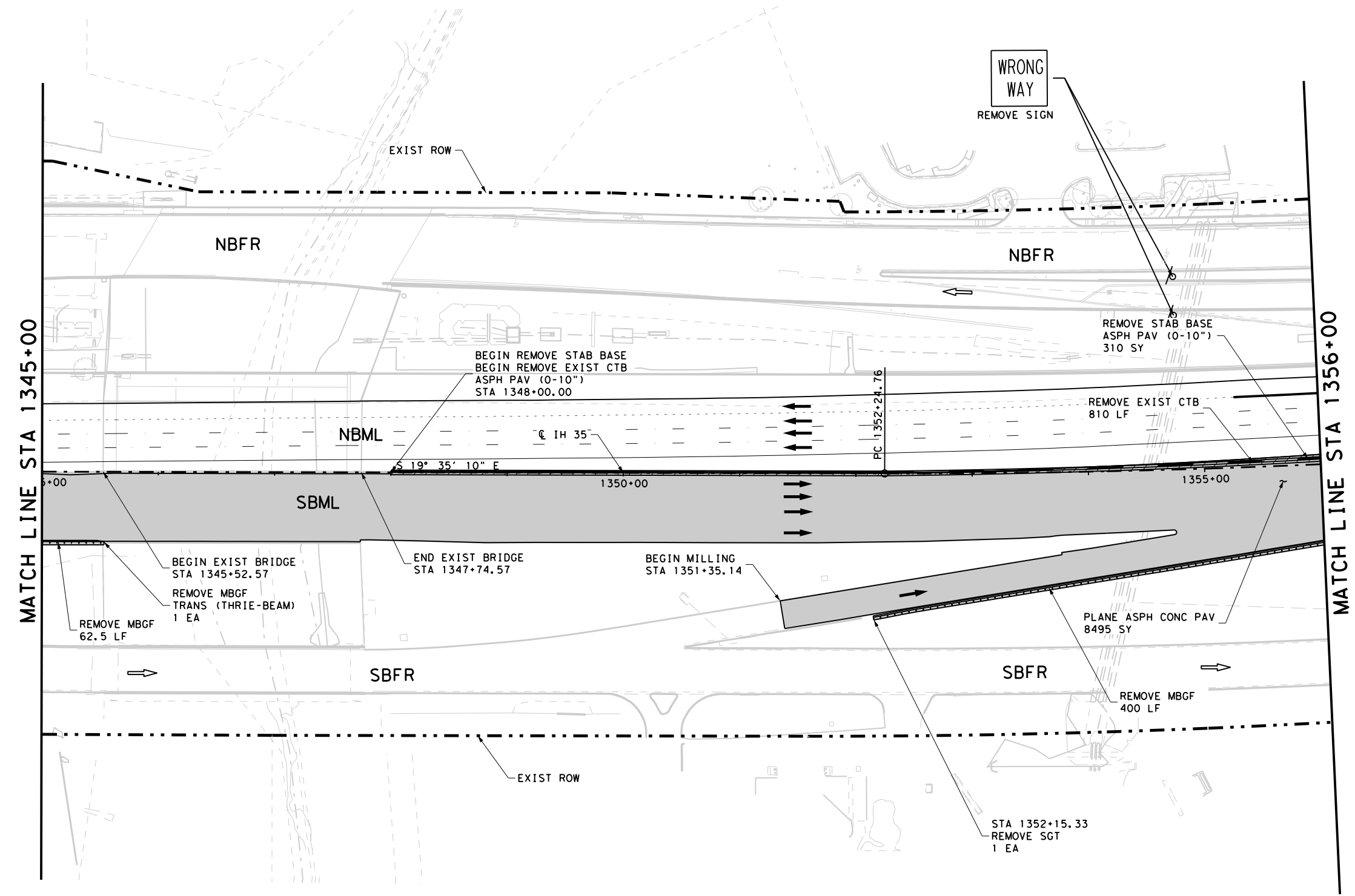
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MM	MM	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY		SHEET NO.
ADT	SM	AUS	WILLIAMSON		100

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br:dgpepw011cs0748/2021

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-  MILL EXISTING ASPHALT (DEPTH VARIES 3/4" TO 2")
-  REMOVE CONCRETE
-  REMOVE PAVEMENT
-  EXIST DIRECTION OF TRAVEL
-  PROP DIRECTION OF TRAVEL



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TXPE REGISTRATION NO. 284

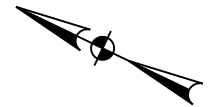
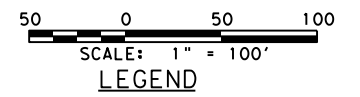
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Texas Department of Transportation

**IH 35
REMOVAL PLAN
STA 1345+00 TO
STA 1356+00**

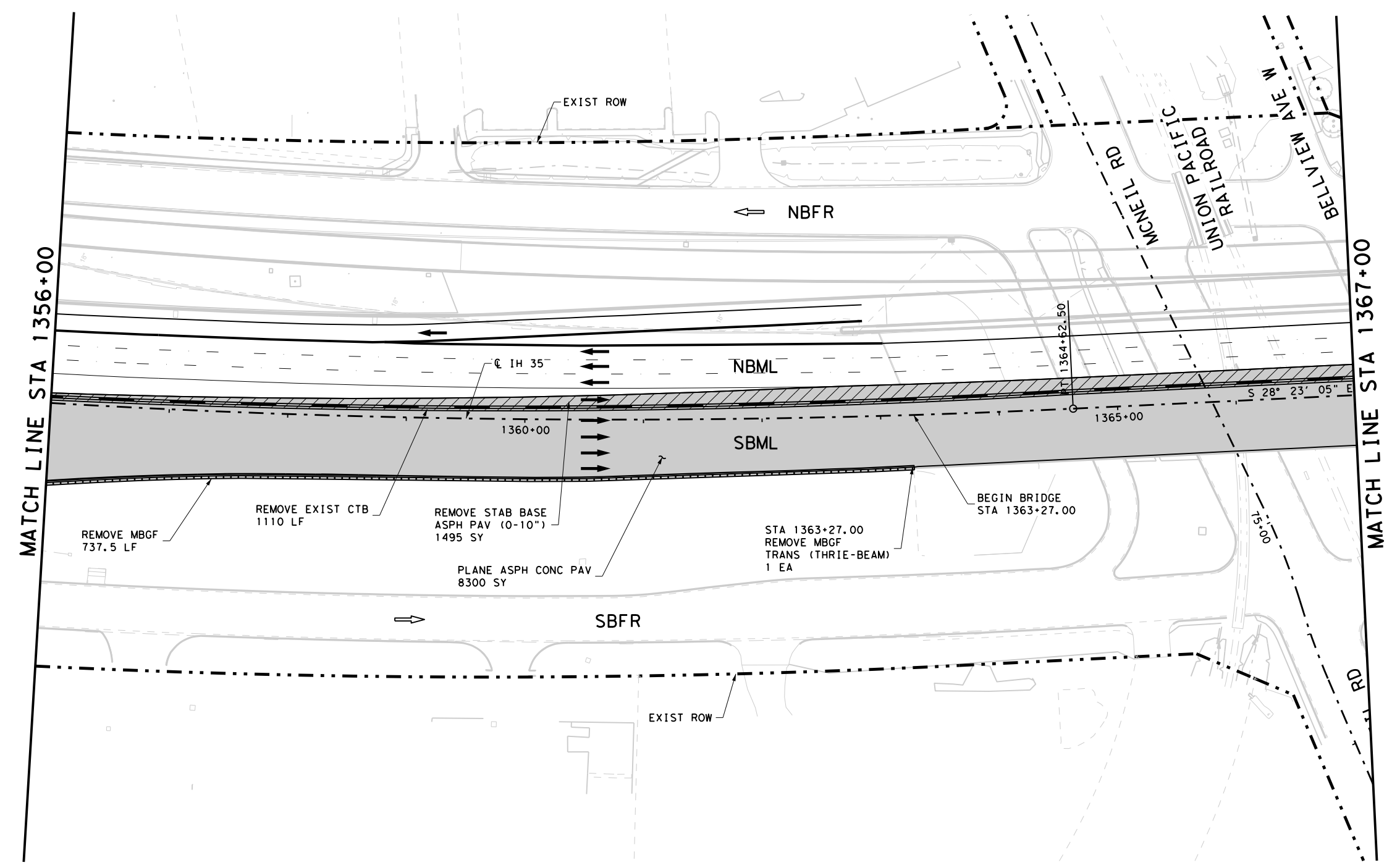
SCALE: 1" = 100' SHEET 6 OF 12

DS:	CK:	CONT	SECT	JOB	HIGHWAY
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DW:	CK:	DIST		COUNTY	SHEET NO.
ADT	SM	AUS		WILLIAMSON	101

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- MILL EXISTING ASPHALT
(DEPTH VARIES 3/4" TO 2")
- REMOVE CONCRETE
- REMOVE PAVEMENT
- EXIST DIRECTION OF TRAVEL
- PROP DIRECTION OF TRAVEL



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TXPE REGISTRATION NO. 264



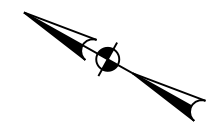
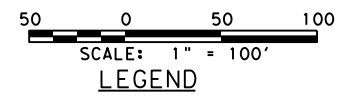
**IH 35
REMOVAL PLAN
STA 1356+00 TO
STA 1367+00**

SCALE: 1" = 100' SHEET 7 OF 12

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	MM	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
ADT	SM	AUS	WILLIAMSON	102	

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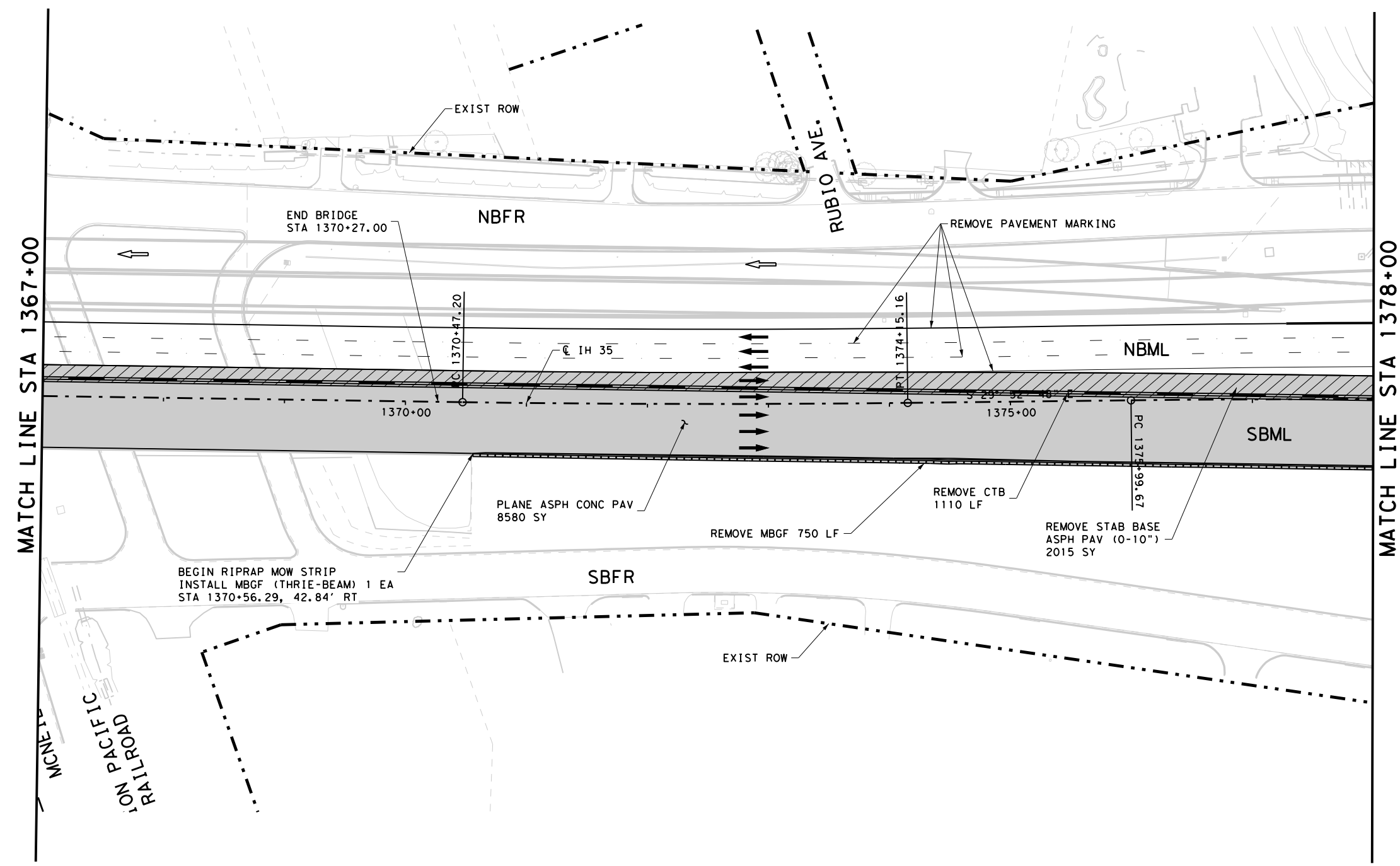
MILL EXISTING ASPHALT (DEPTH VARIES 3/4" TO 2")

REMOVE CONCRETE

REMOVE PAVEMENT

EXIST DIRECTION OF TRAVEL

PROP DIRECTION OF TRAVEL



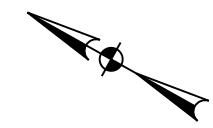
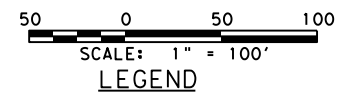
BRIDGEFARMER & ASSOCIATES, INC.
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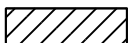




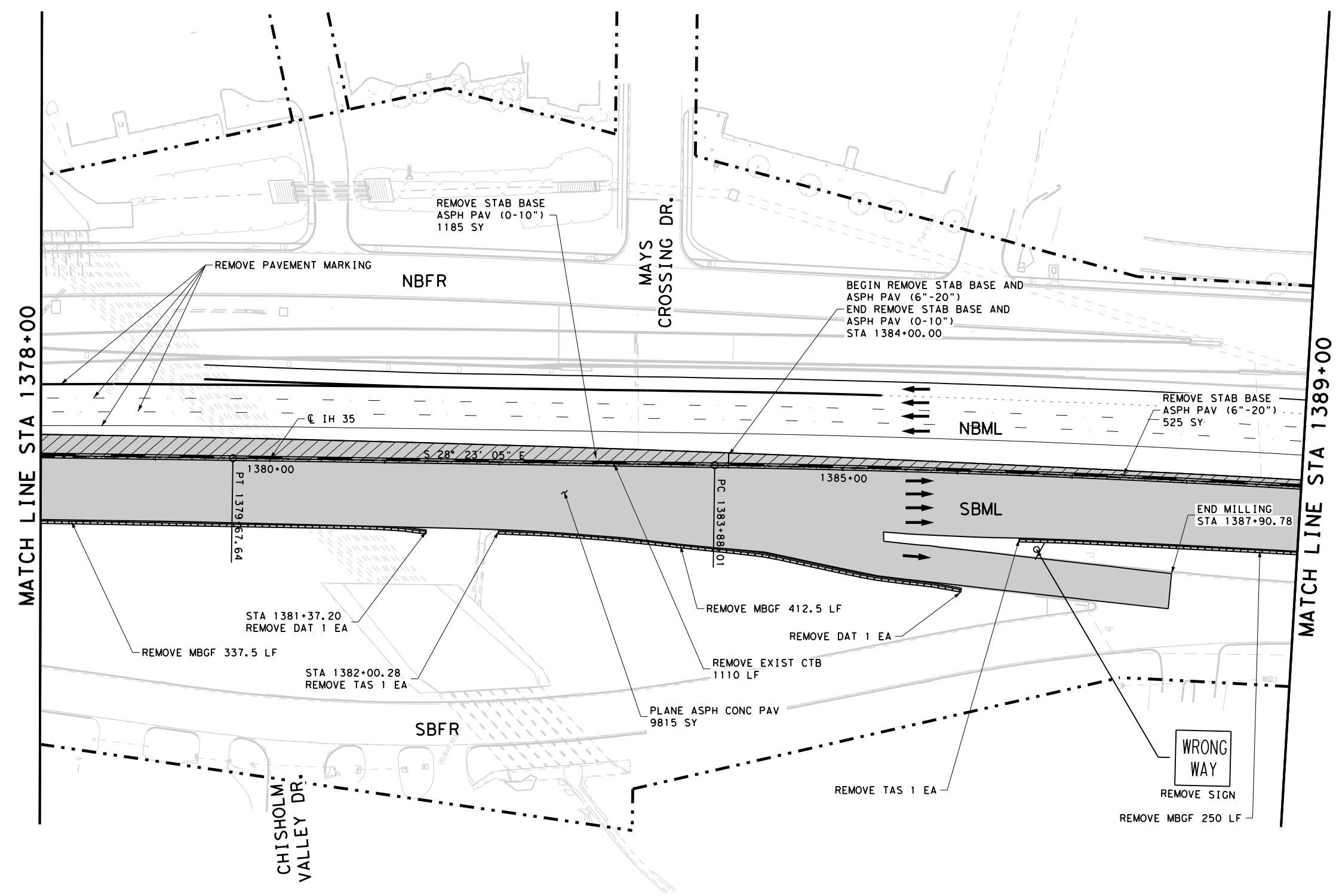
IH 35
REMOVAL PLAN
STA 1367+00 TO
STA 1378+00

SCALE: 1" = 100' SHEET 8 OF 12

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	MM	0015	09	194	IH 35
DW:	CK:	DIST		COUNTY	SHEET NO.
ADT	SM	AUS		WILLIAMSON	103



- LEGEND**
-  MILL EXISTING ASPHALT (DEPTH VARIES 3/4" TO 2")
 -  REMOVE CONCRETE
 -  REMOVE PAVEMENT
 -  EXIST DIRECTION OF TRAVEL
 -  PROP DIRECTION OF TRAVEL



STATE OF TEXAS
 MANSAR. MOTON
 111594
 LICENSED
 PROFESSIONAL ENGINEER
Mansar. Moton
 07.08.2021

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**IH 35
 REMOVAL PLAN
 STA 1378+00 TO
 STA 1389+00**

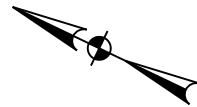
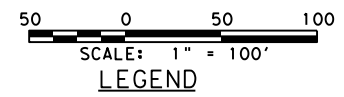
SCALE: 1" = 100' SHEET 9 OF 12

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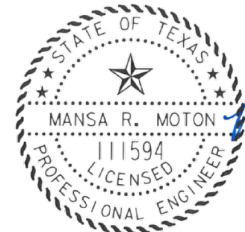
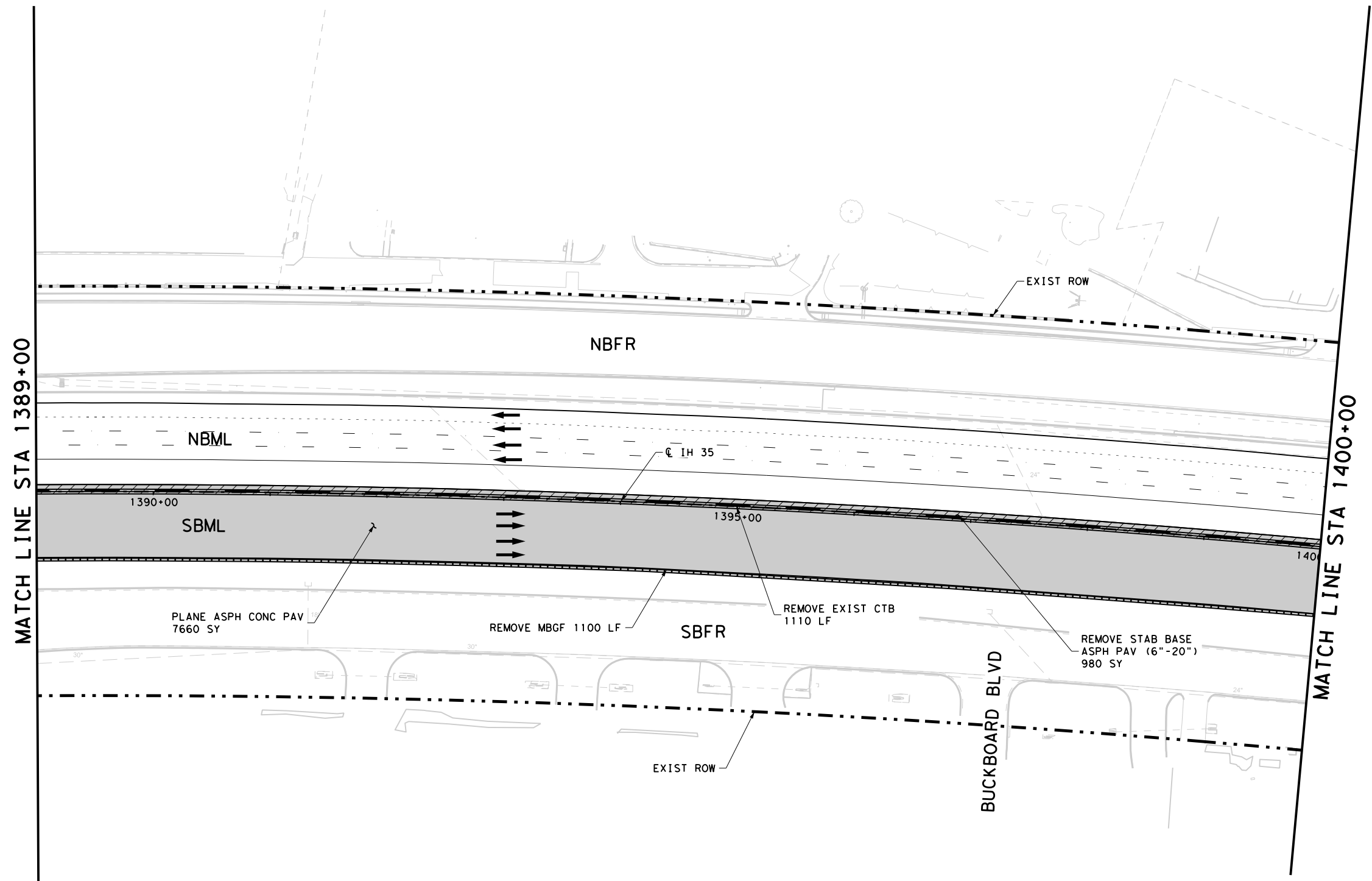
MILL EXISTING ASPHALT (DEPTH VARIES 3/4" TO 2")

REMOVE CONCRETE

REMOVE PAVEMENT

EXIST DIRECTION OF TRAVEL

PROP DIRECTION OF TRAVEL



Mansa R. Moton
07.08.2021

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IH 35
REMOVAL PLAN
STA 1389+00 TO
STA 1400+00

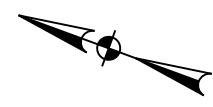
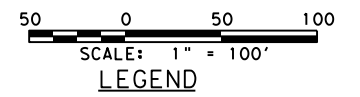
SCALE: 1" = 100' SHEET 10 OF 12

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	MM	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
ADT	SM	AUS	WILLIAMSON	105	

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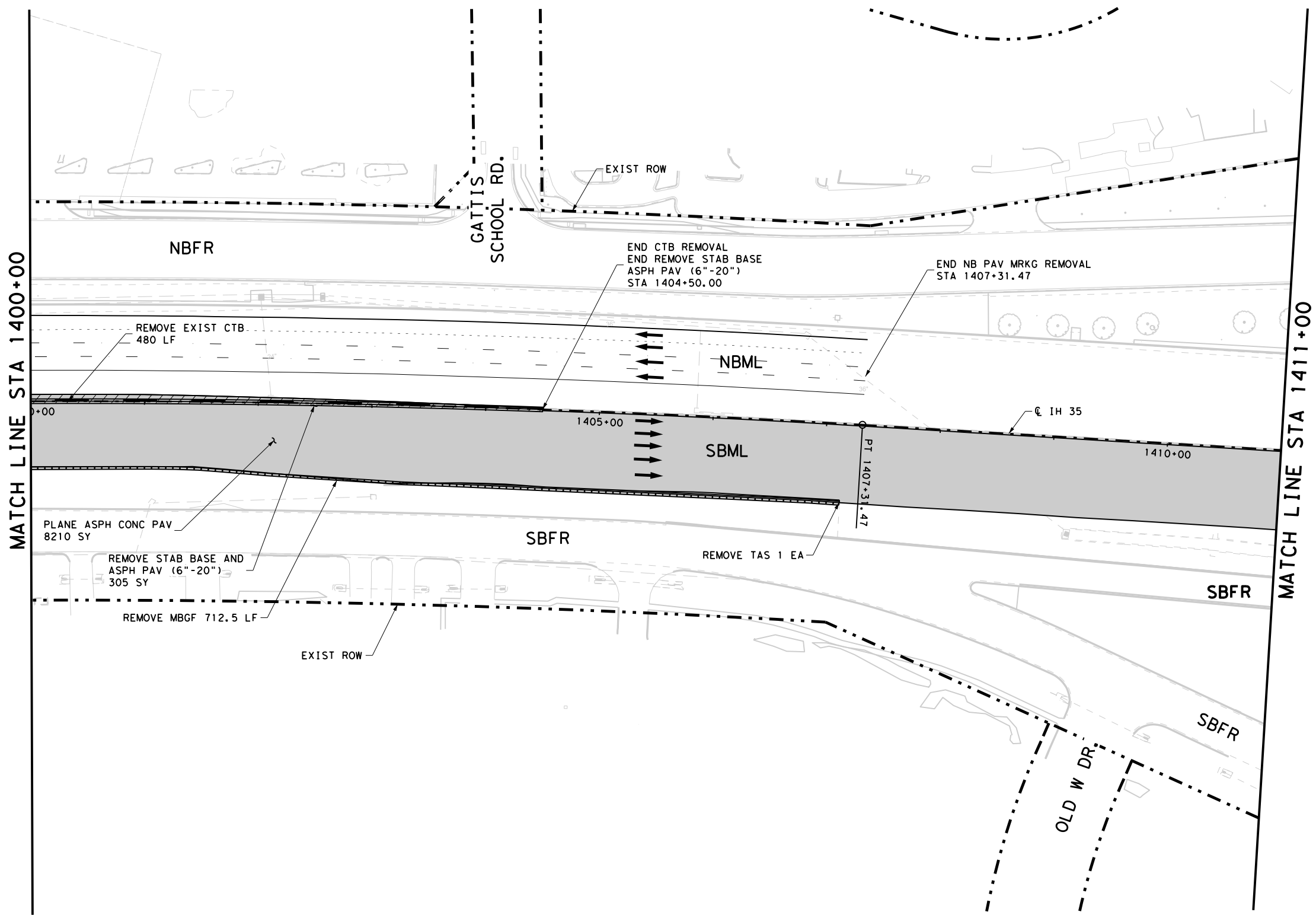
MILL EXISTING ASPHALT
(DEPTH VARIES 3/4" TO 2")

REMOVE CONCRETE

REMOVE PAVEMENT

EXIST DIRECTION OF TRAVEL

PROP DIRECTION OF TRAVEL



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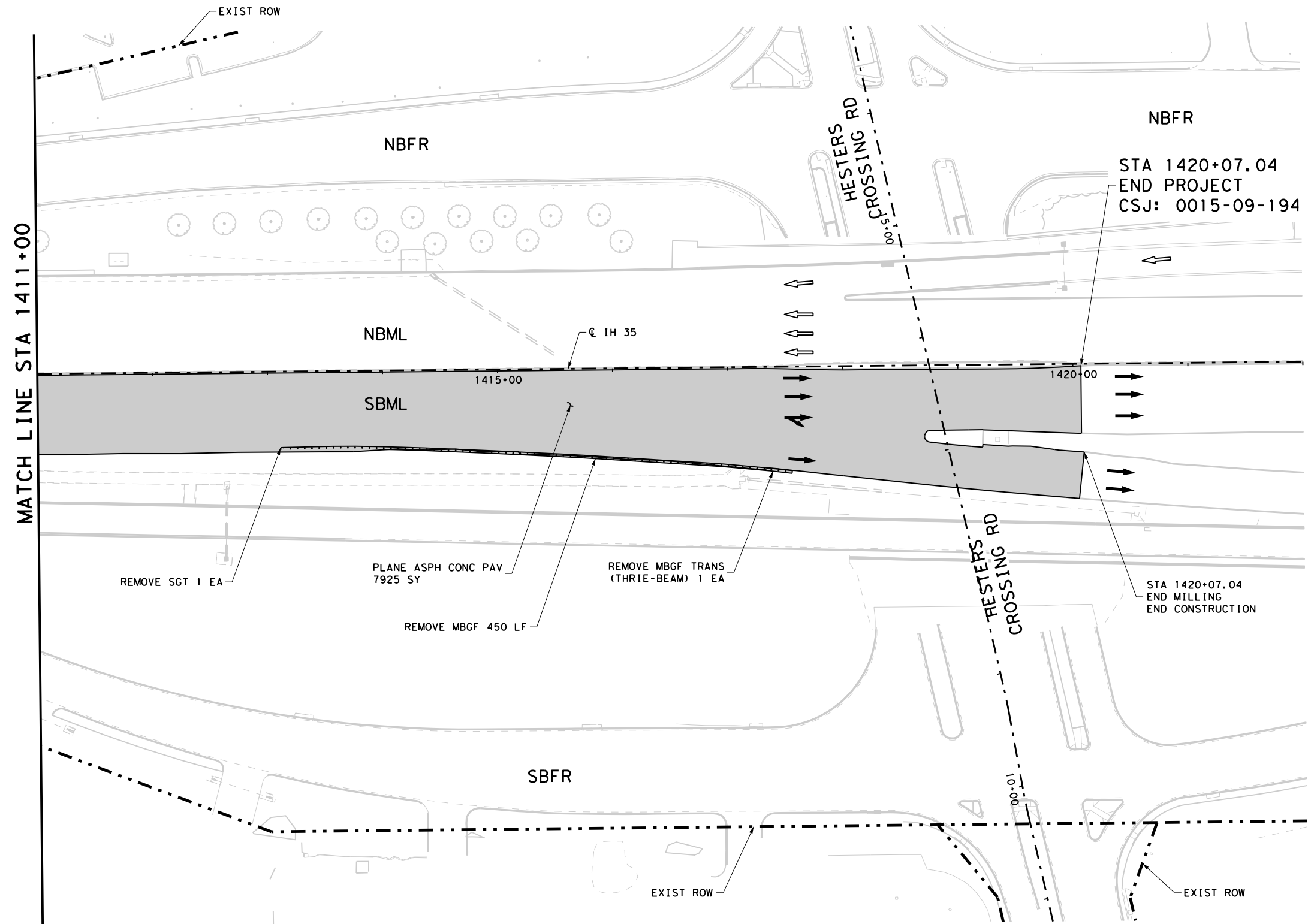
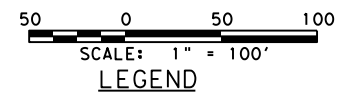
**IH 35
REMOVAL PLAN
STA 1400+00 TO
STA 1411+00**



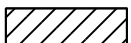


SCALE: 1" = 100' SHEET 11 OF 12

DS:	CK:	CONT	SECT	JOB	HIGHWAY
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DW:	CK:	DIST		COUNTY	SHEET NO.
ADT	SM	AUS		WILLIAMSON	106

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-  MILL EXISTING ASPHALT (DEPTH VARIES 3/4" TO 2")
-  REMOVE CONCRETE
-  REMOVE PAVEMENT
-  EXIST DIRECTION OF TRAVEL
-  PROP DIRECTION OF TRAVEL



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
REMOVAL PLAN
STA 1411+00 TO
END PROJECT**

SCALE: 1" = 100' SHEET 12 OF 12

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	MM	0015	09	194	IH 35
DW:	CK:	DIST		COUNTY	SHEET NO.
ADT	SM	AUS		WILLIAMSON	107

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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													
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE / RESET		L	L	R	R	S	S				
															MOVE/RESET	FROM LOC.#	N	W	N	W	N	W				
	PHASE 1	41	IH 35 NBML SOUTH OF GATTIS SCHOOL RD.	STA 1408+50	TL3	UNI	ASPHALT						X	X			X									
TOTALS																										

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

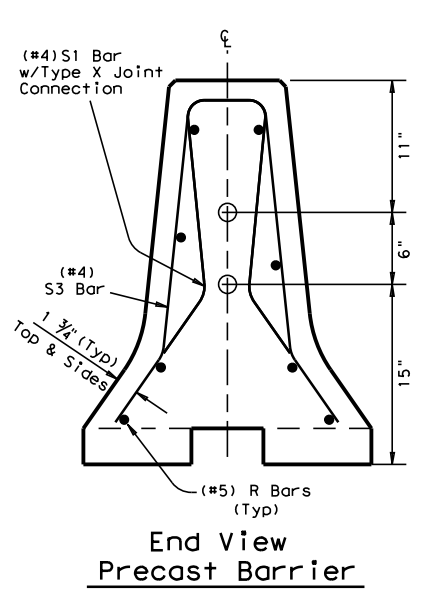
FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
<http://www.dot.state.tx.us/insdot/orgchart/cmd/cserve/standard/rdwylse.htm>

CRASH CUSHION SUMMARY SHEET

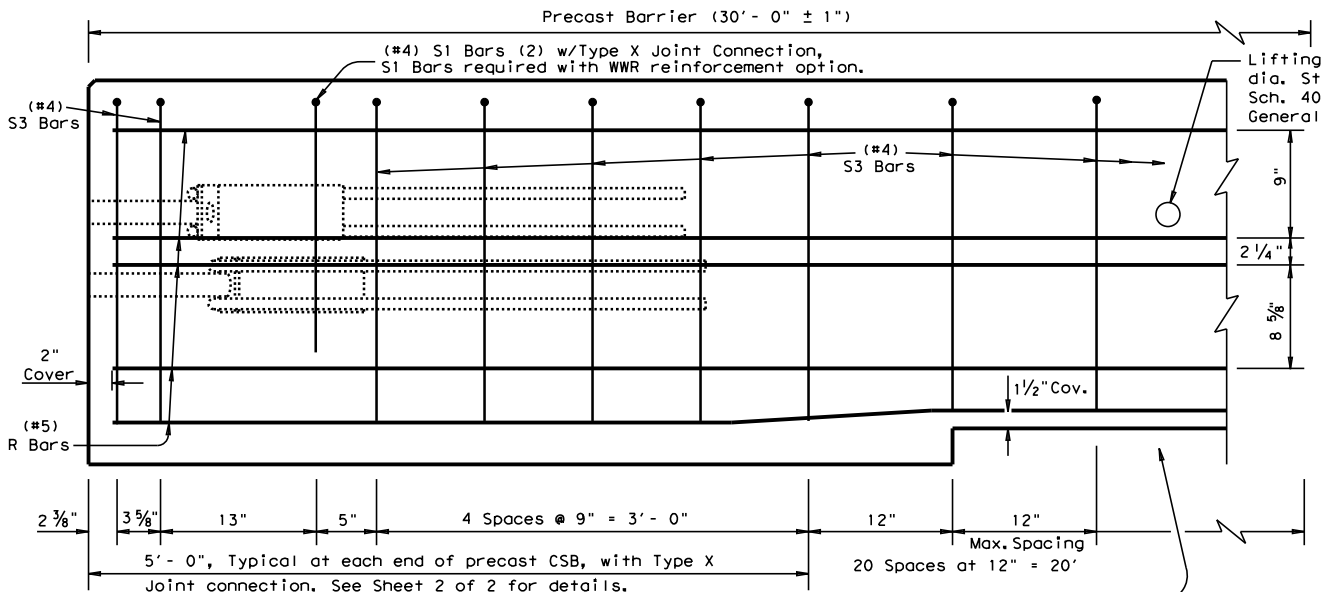
FILE: CCSS.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT	SECT	JOB
REVISIONS	0015	09	194
	DIST		COUNTY
	AUS		WILLIAMSON
	FEDERAL AID PROJECT		SHEET NO.
			108A

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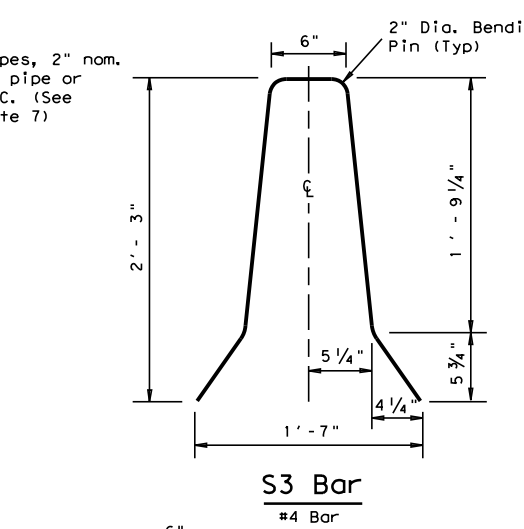
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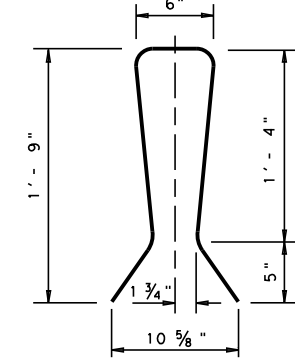
End View Precast Barrier
 See sheet 2 of 3 for Joint connection Type X



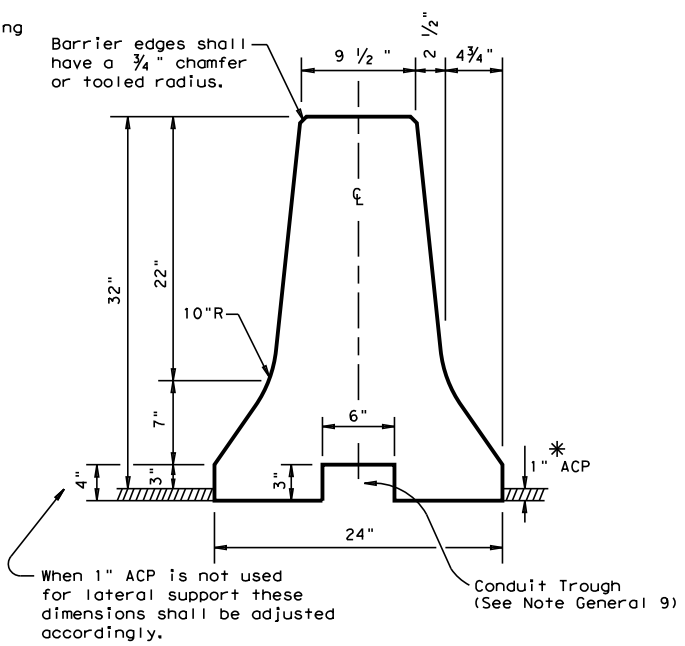
Reinforcement for Precast (CSB) Concrete Safety Barrier (Type 1)
 Showing reinforcement for Joint Type X



S3 Bar
 #4 Bar



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

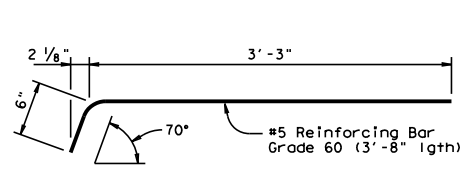


Concrete Safety Barrier

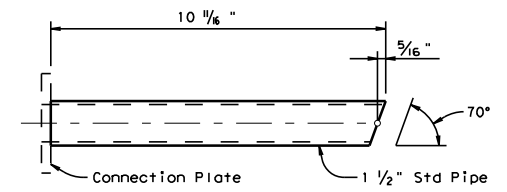
* When 1" ACP is "not" used as lateral support for permanent barrier placement. A permissible method of attaining the equivalent lateral support may be used, See CSB(6) sheet.

GENERAL NOTES

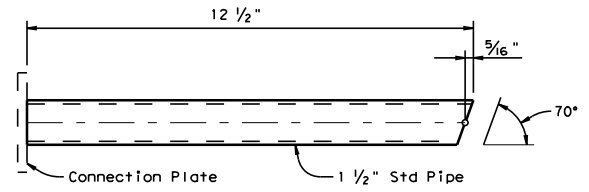
- Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
- Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
- All precast barrier edges shall have a 3/4" chamfer or toolled radius.
- All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
- All steel assemblies for joint shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
- 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.
- Surface finishing and grouting (where required) shall be two parts sand and 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.
- Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.



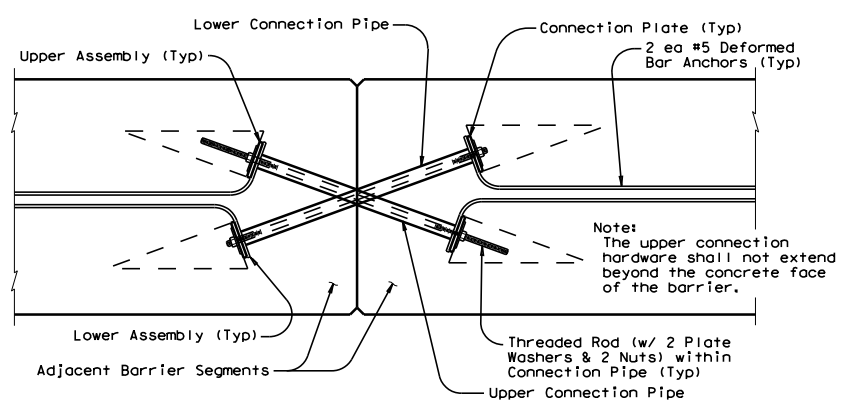
DEFORMED BAR ANCHOR DETAILS
 Two (2) Bars required per assembly. Eight (8) required per joint.



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

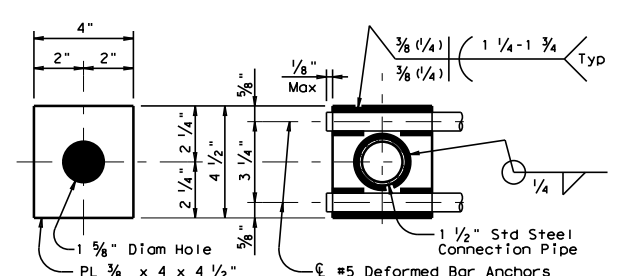


LOWER CONNECTION PIPE DETAILS
 One (1) Steel Pipe required per Lower Assembly. Two (2) required per joint.

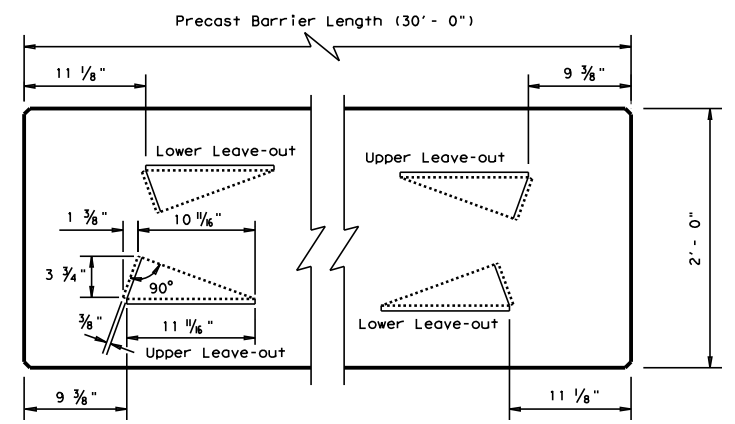


TYPE X JOINT INSTALLATION DETAIL

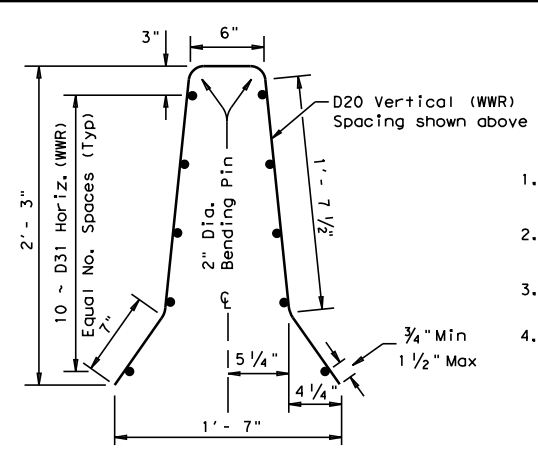
Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.



CONNECTION PLATE DETAILS
 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.

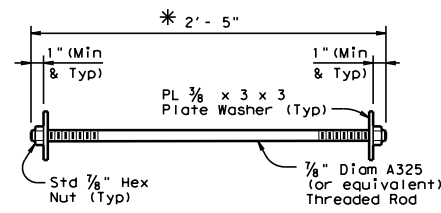


BARRIER PLAN AT END JOINTS



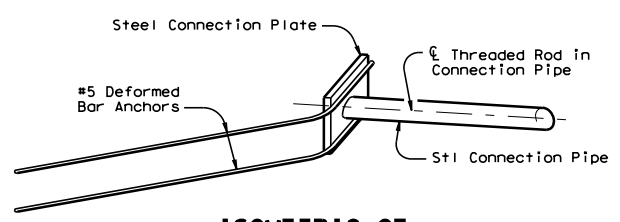
Welded Wire Reinforcement (WWR) Option for Bars R and S3
 (WWR) General Notes

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



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

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



ISOMETRIC OF TYPICAL WELDED ASSEMBLY

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

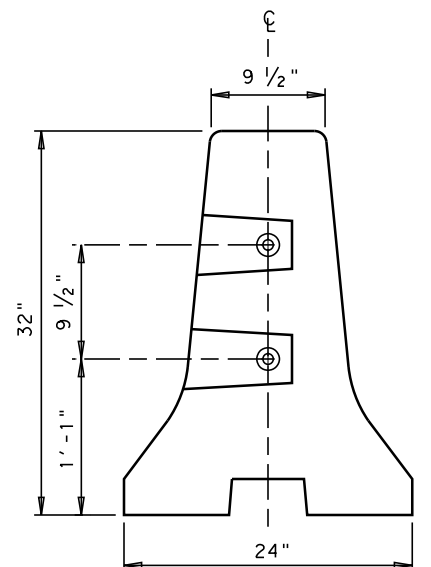
Weight of one Precast 30 ft. (CSB) segment = Approx. 6.5 Tons or 440 lbs per ft.

		Design Division Standard	
CONCRETE SAFETY BARRIER (F-SHAPE)			
PRECAST BARRIER (TYPE 1)			
CSB(1)-10			
FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD
© TxDOT December 2010	CONT SECT	JOB	HIGHWAY
REVISIONS	0015 09	194	IH 35
	DIST	COUNTY	SHEET NO.
	AUS	WILLIAMSON	108B

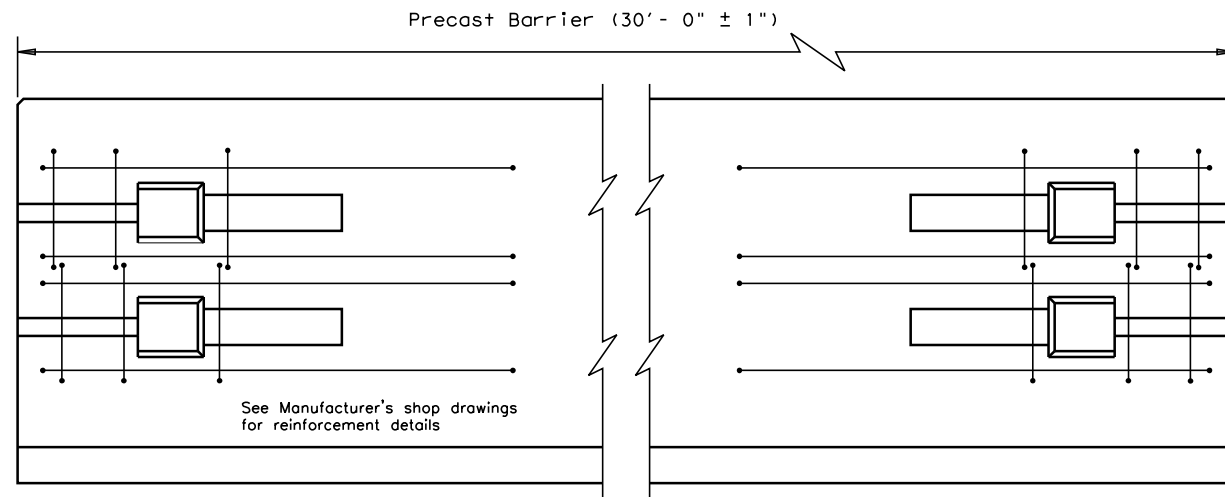
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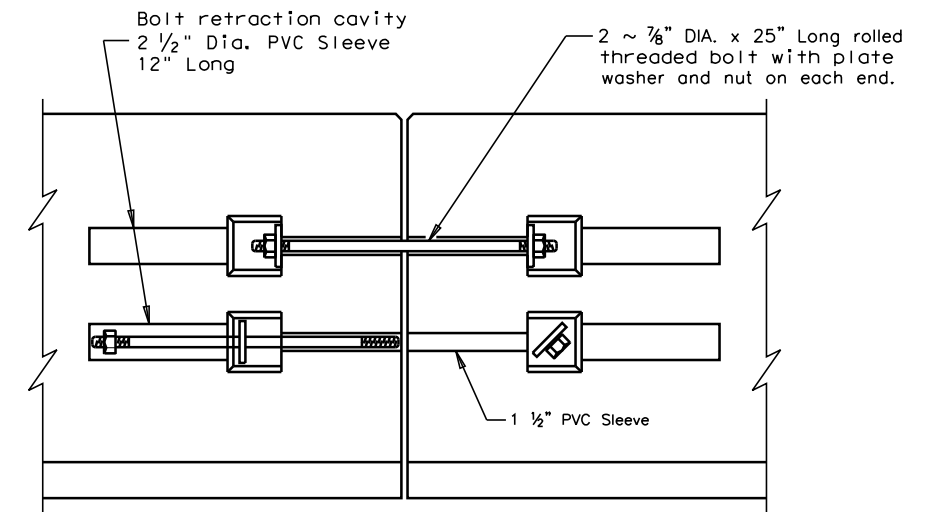
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END VIEW (CSB) QUICK-BOLT
QUICK-BOLT POCKET LOCATIONS

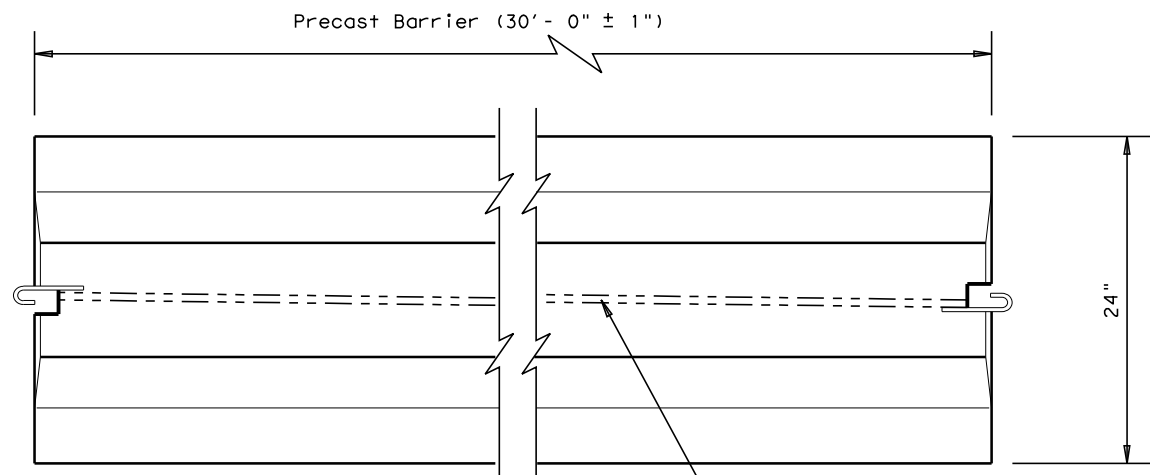


ELEVATION (CSB) QUICK-BOLT
See Manufacturer's shop drawing for additional details

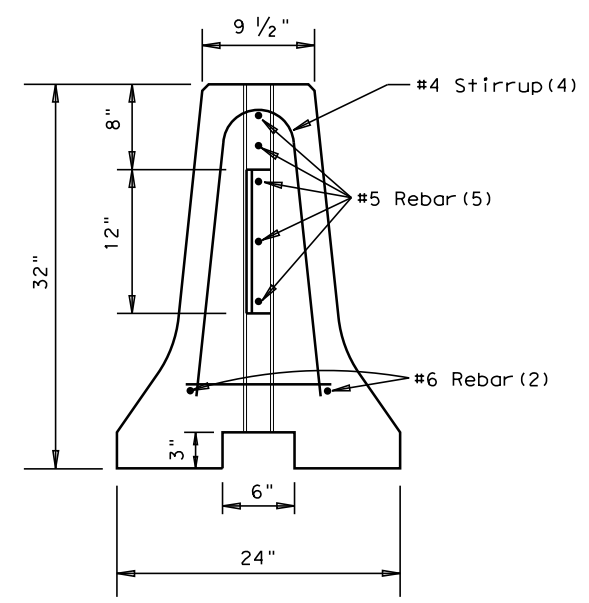


ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

Joint Connection (Type Q)

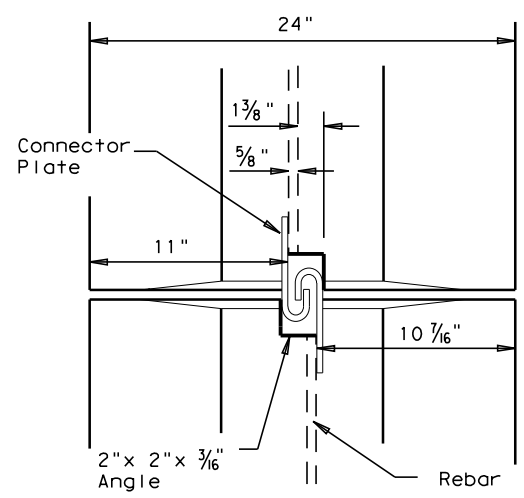


TOP VIEW
PRECAST (CSB) WITH J-J HOOKS
See Manufacturer's shop drawing for additional details



END VIEW
J-J HOOK CONNECTION

Joint Connection (Type J)



VIEW FROM ABOVE
J-J HOOK CONNECTION

Proprietary Joint Connections (CSB)

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

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

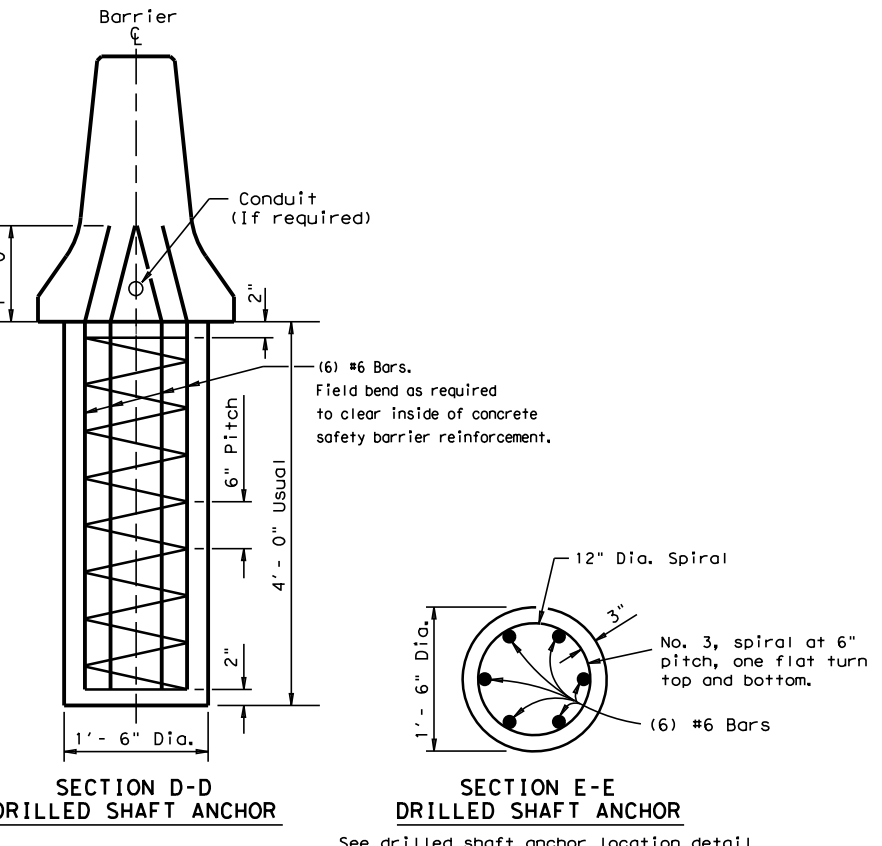
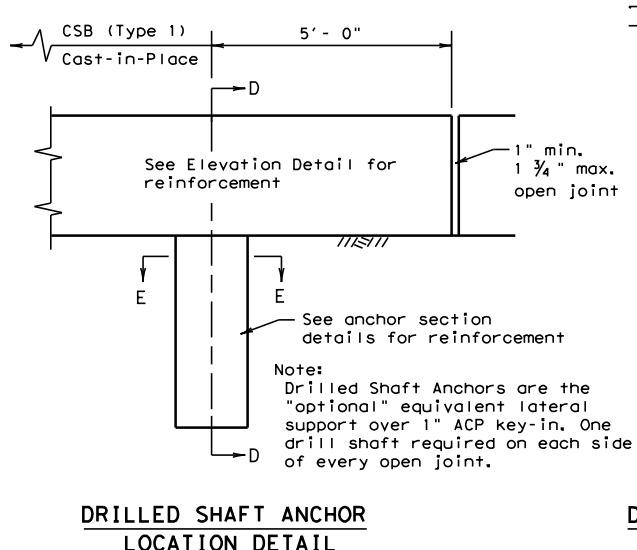
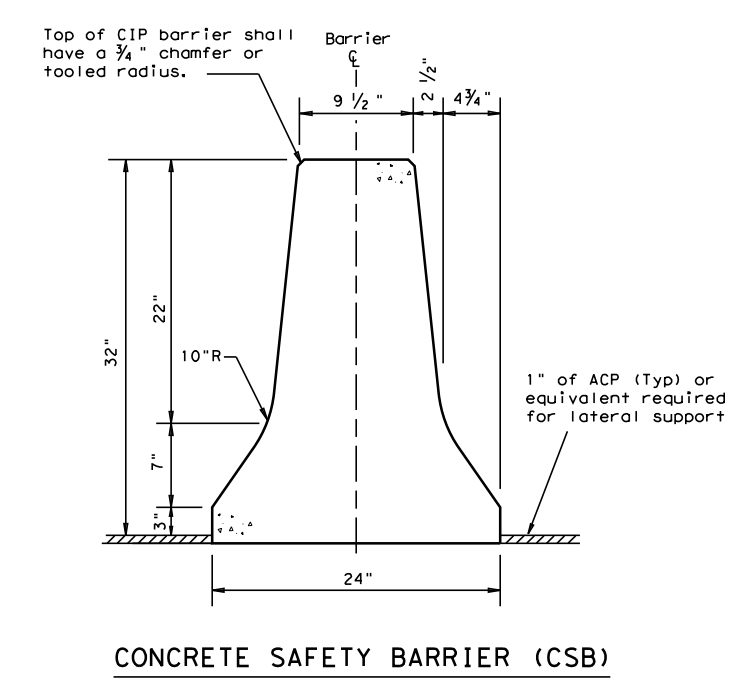
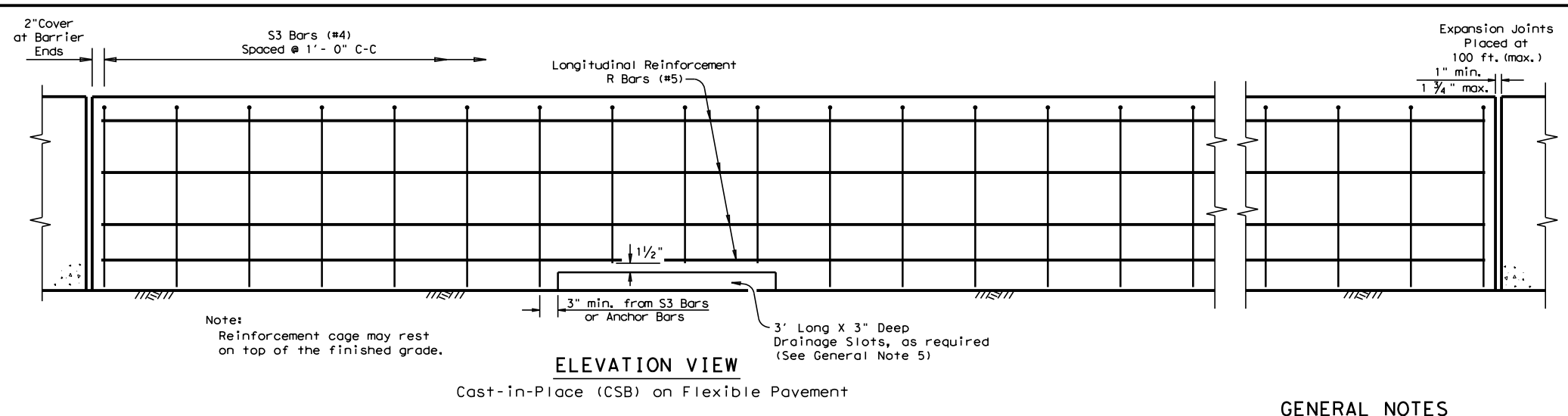
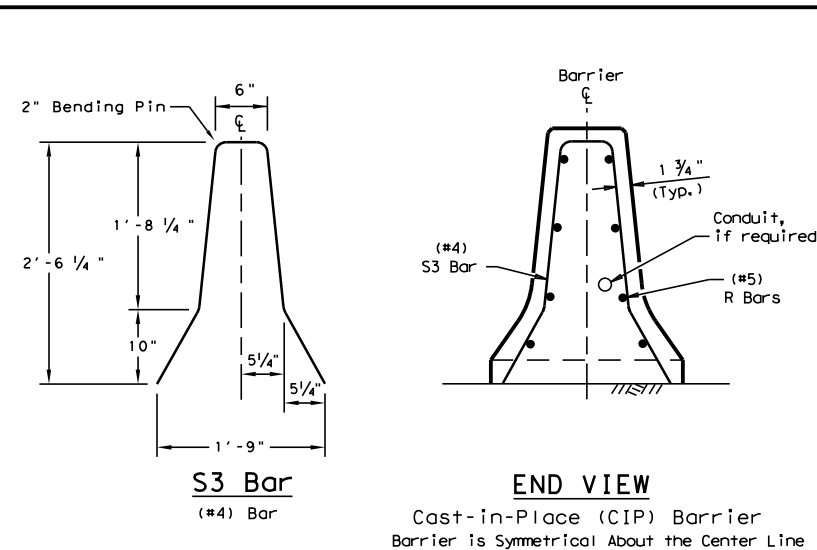
If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.

SHEET 2 OF 2

		Design Division Standard	
CONCRETE SAFETY BARRIER (F-SHAPE) PRECAST BARRIER (TYPE 1) CSB(1)-10			
FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD
© TxDOT December 2010	CONT	SECT	JOB
REVISIONS	0015	09	194
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		109

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DATE: 7/2/2021
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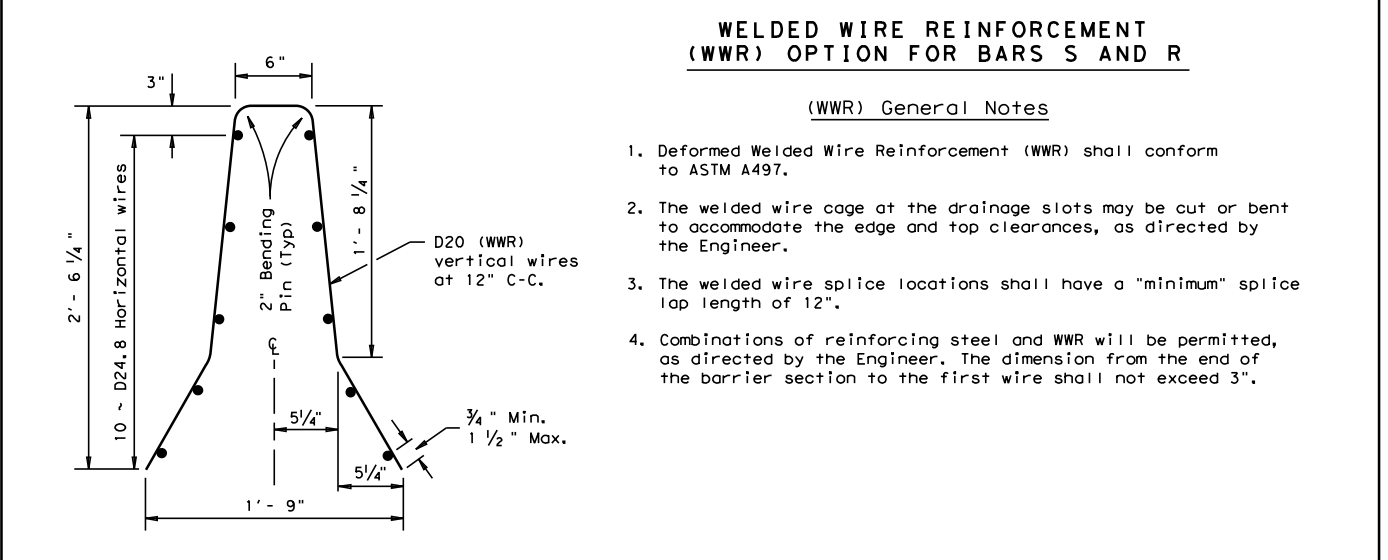
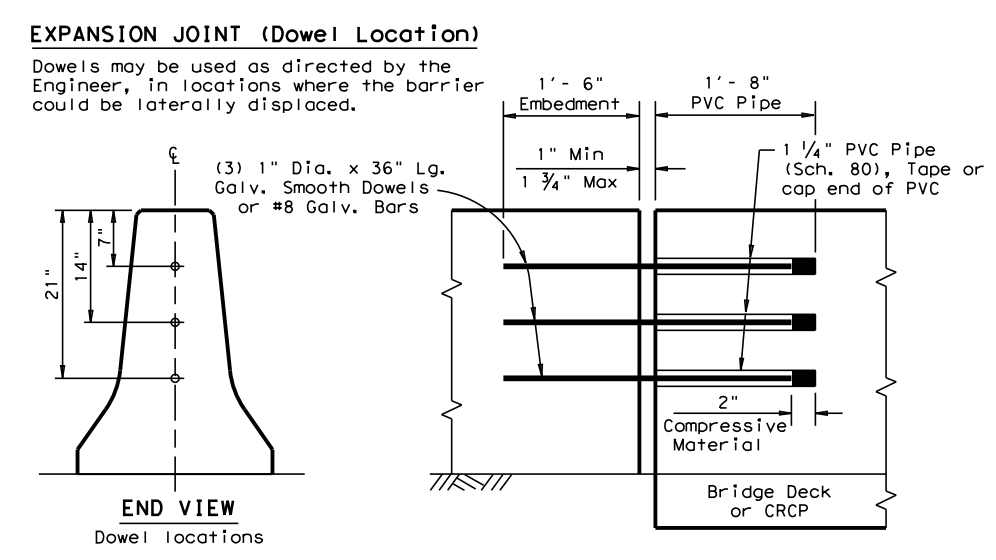


- GENERAL NOTES**
- Concrete shall be Class C, unless otherwise specified in the plans.
 - Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
 - Axis of cast-in-place barrier shall be vertical, except where roadway is superelevated, then axis is normal to roadway surface.
 -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

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

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

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



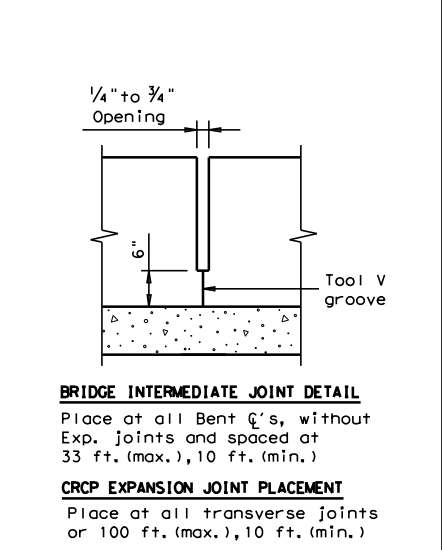
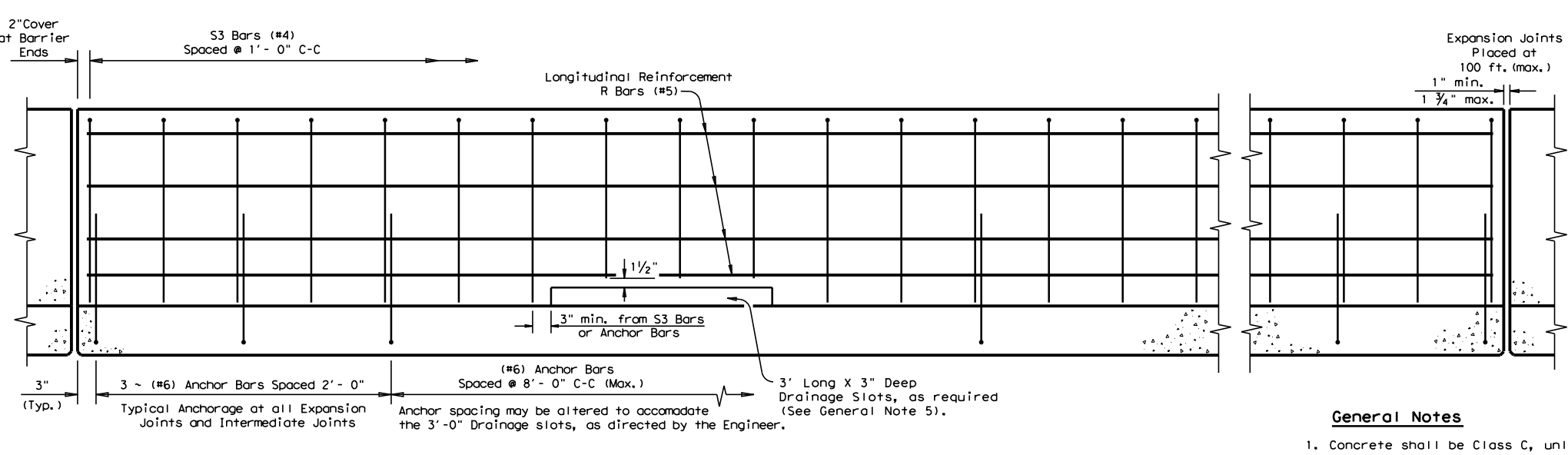
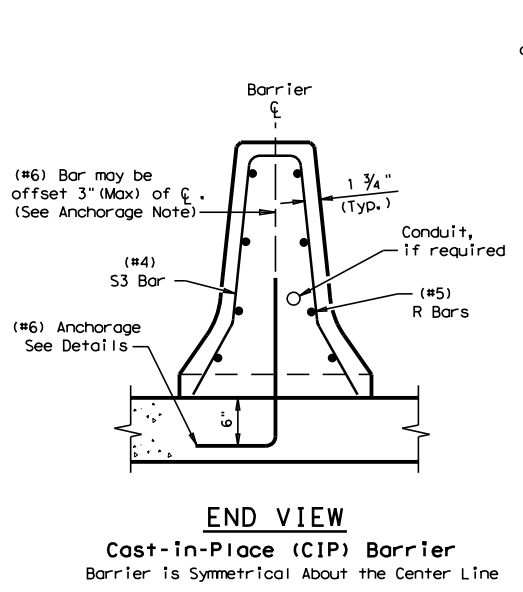
Texas Department of Transportation
 Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE) CAST-IN-PLACE (TYPE 1) (FLEXIBLE PAVEMENT) CSB (2) - 13

FILE: csb213.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
	DIST	COUNTY	SHEET NO.	
	AUS	WILLIAMSON	110	

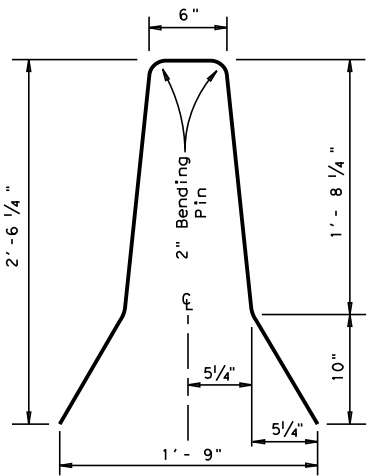
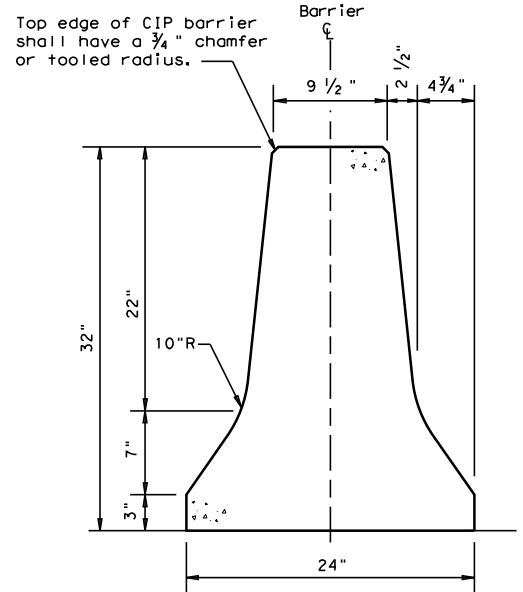
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General Notes

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

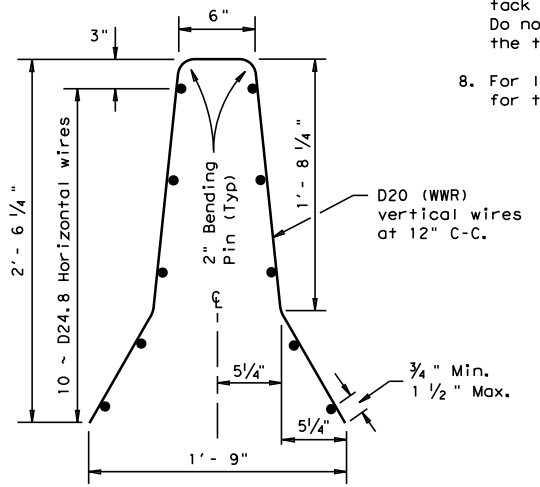
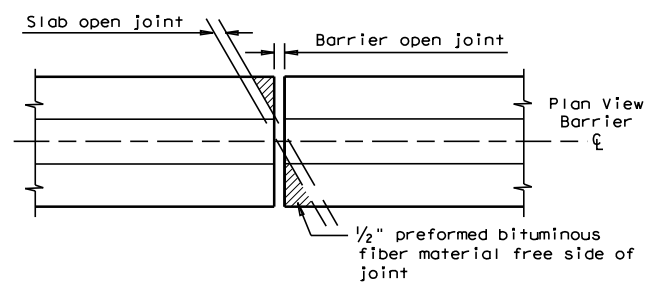


BARRIER PLACEMENT OVER (CRCP) JOINTS

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

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

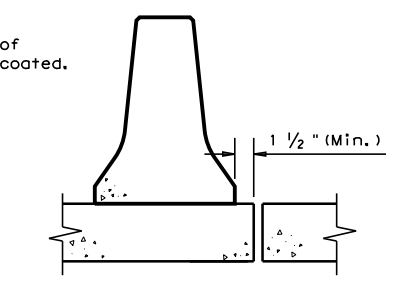
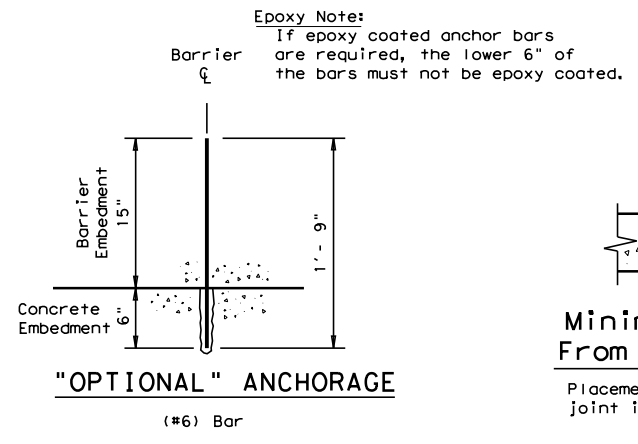
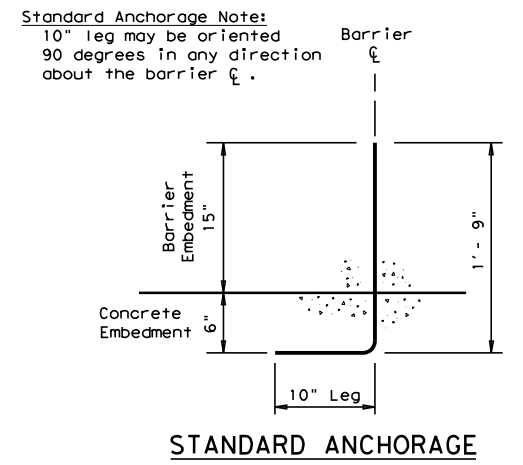
Barrier Anchorage Note: Anchorage must be located at least 3" from a longitudinal joint.



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

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

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



Minimum Edge Distance From Longitudinal Joint

Placement over a longitudinal bridge joint is not recommended.

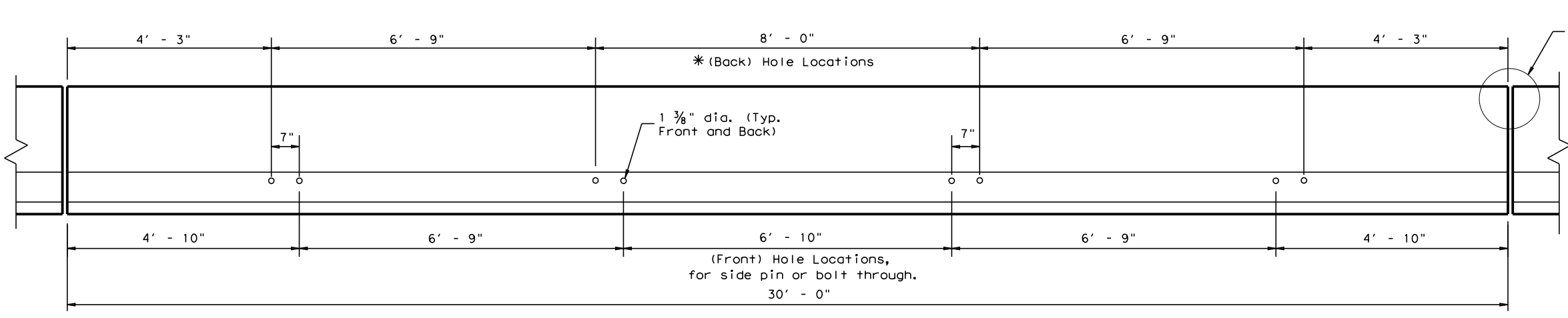
Welded Wire Reinforcement (WWR) Option for Bars S and R

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

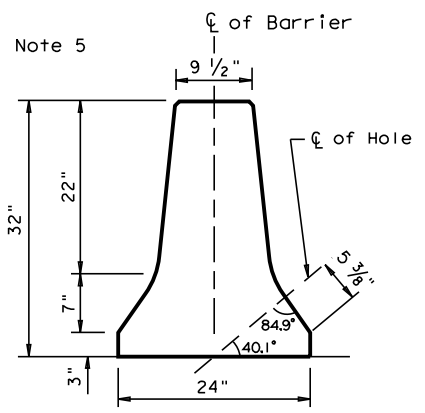
		Design Division Standard	
CONCRETE SAFETY BARRIER (F-SHAPE) CAST-IN-PLACE (TYPE 1) (BRIDGE DECK or CRCP) CSB(3)-16			
FILE: csb316.dgn	DN: TxDOT	CK: HC/AN	DW: BD/VP
© TxDOT January 2016	CONT SECT	JOB	HIGHWAY
0015	09	194	1H 35
CST 01-2016	DIST	COUNTY	SHEET NO.
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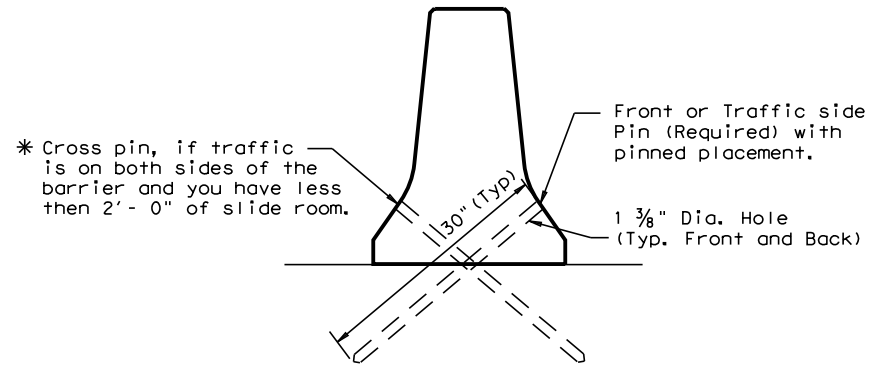
DETAIL 1



HOLE LOCATION DETAIL

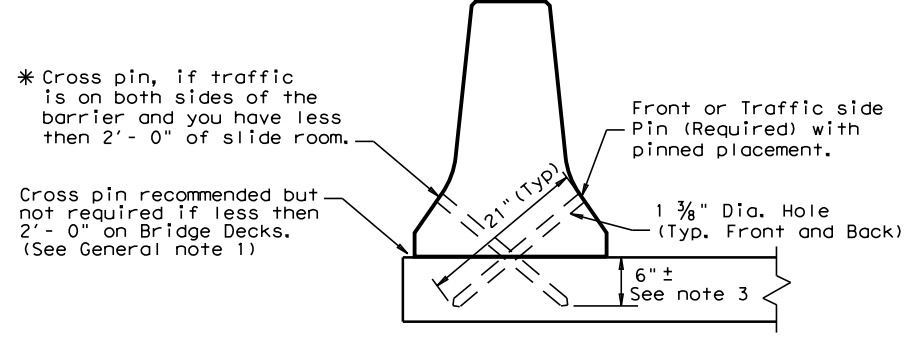
GENERAL NOTES

- 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 than 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.
- 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.
- 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 through 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.
- 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.
- See CSB(1) standard sheets for reinforcement requirements and joint connection types.
- 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.
- The barrier and travel surface will be repaired as directed by the Engineer in accordance with Item 429, "Concrete Structure Repair."
- Provide galvanized bolts, nuts, and plate washers. All steel pins shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
- Weight of barrier is approx. 440 lbs per foot.



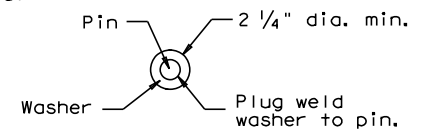
DETAIL 2

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



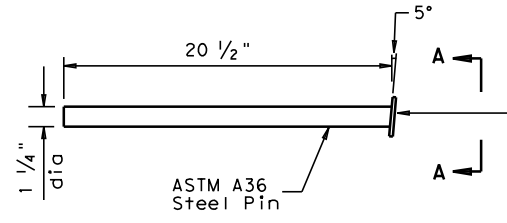
DETAIL 3

Bridge Deck or CRCP (21" pin required)



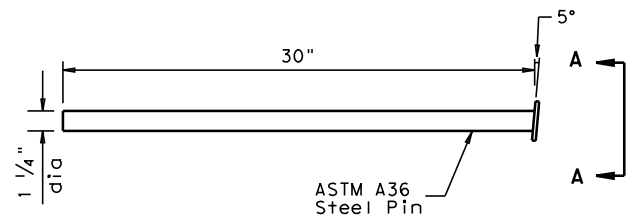
VIEW A-A

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.



(21") PIN DETAIL
See Detail 3

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

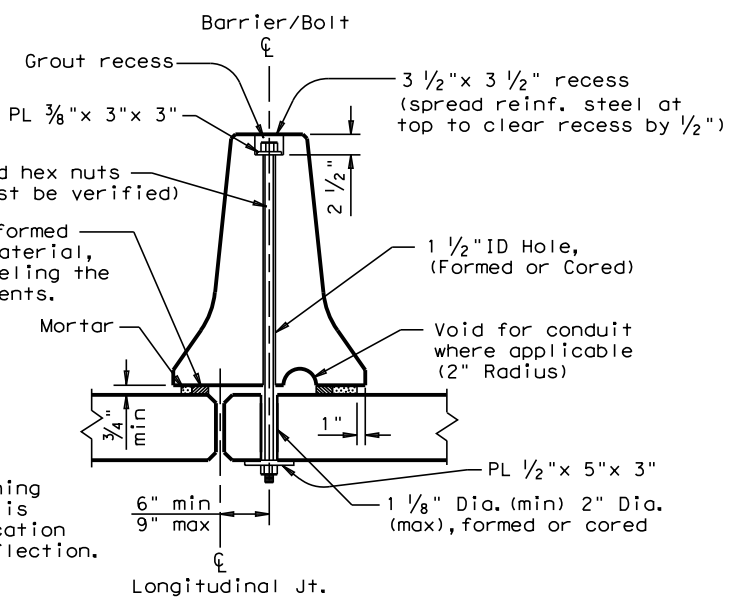


(30") PIN DETAIL
See Detail 2

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

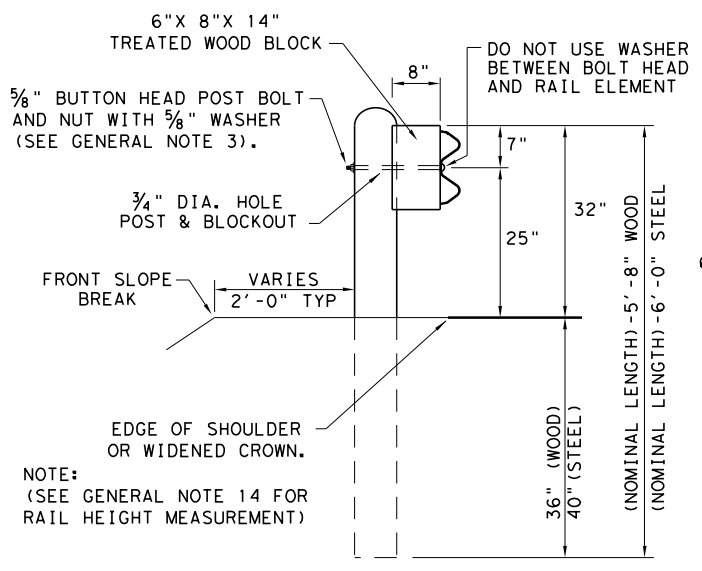
For bolt through locations, use the (Front) hole locations shown on Detail 1.



		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
© TxDOT December 2010	CONT SECT	JOB	HIGHWAY
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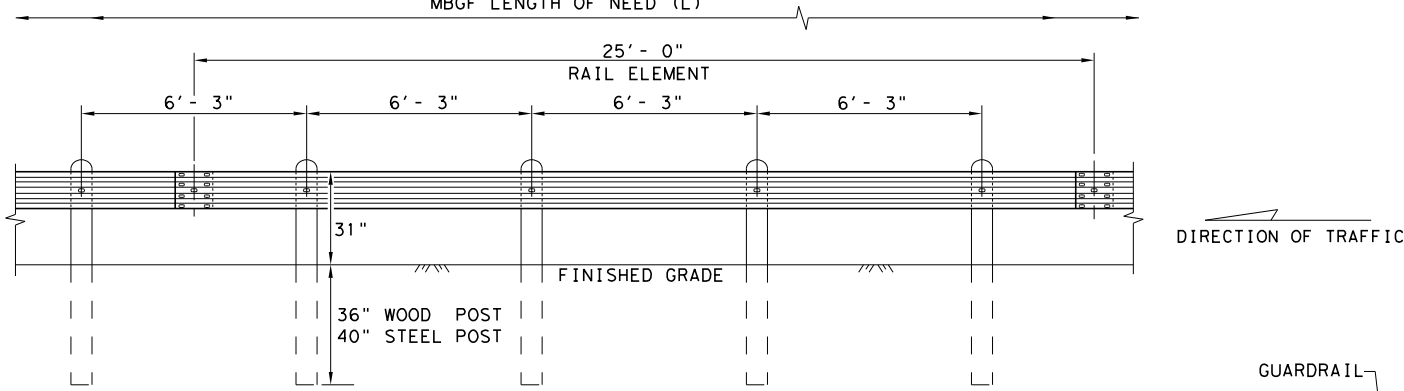
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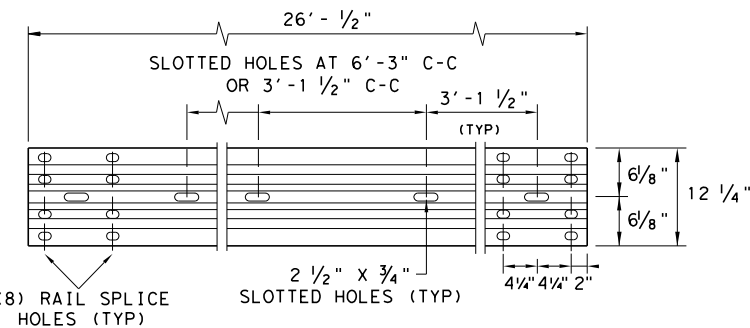
TYPICAL POST PLACEMENT

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



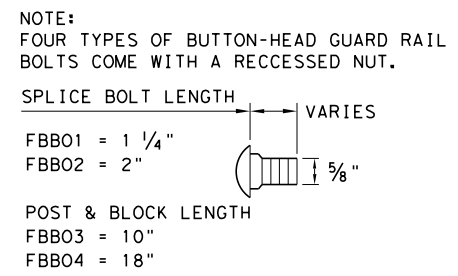
ELEVATION MID-SPAN RAIL SPLICE

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



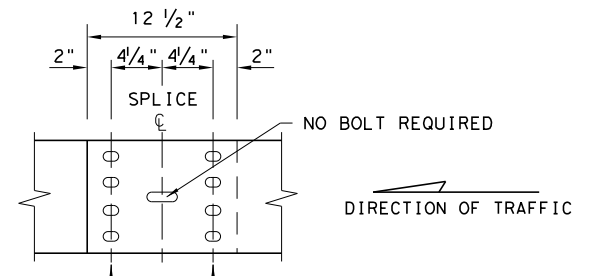
ELEVATION 25' - 0" (NOM.) W-BEAM SECTION

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



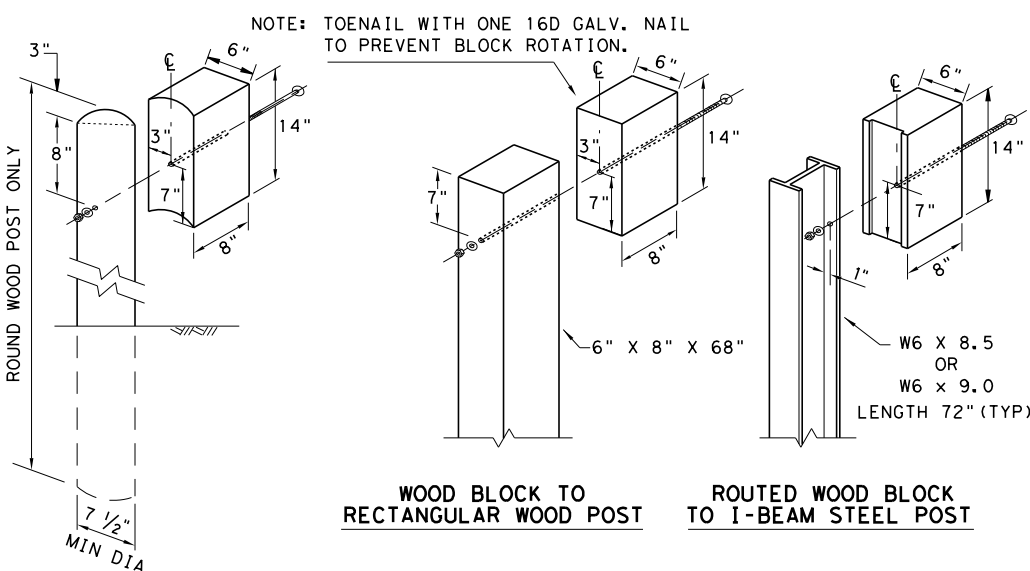
BUTTON HEAD BOLT

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.

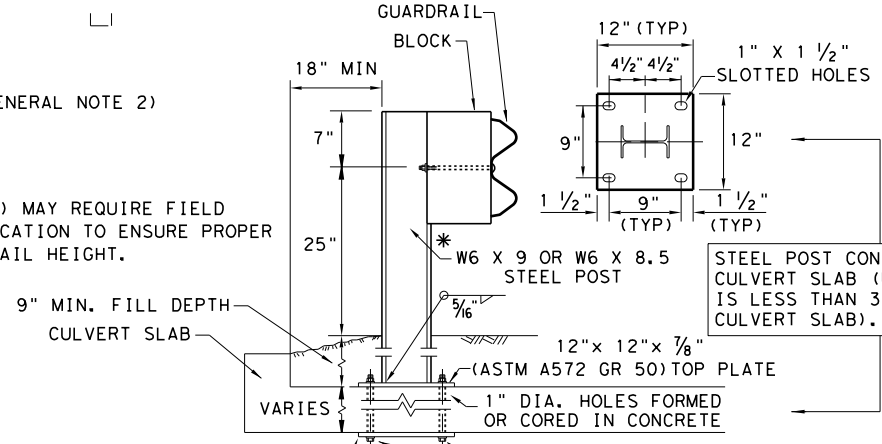


WOOD BLOCK TO ROUND WOOD POST **ROUTED WOOD BLOCK TO I-BEAM STEEL POST**

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 1/2" 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 5/8" WASHER (FWC160) 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.

* POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.



LOW FILL CULVERT POST

12" X 12" X 7/8" (ASTM A36) STEEL BOTTOM PLATE WITH 1" DIA. HOLES REQUIRED WITH BOLT-THROUGH INSTALLATION.

NOTE: TWO INSTALLATION OPTIONS.

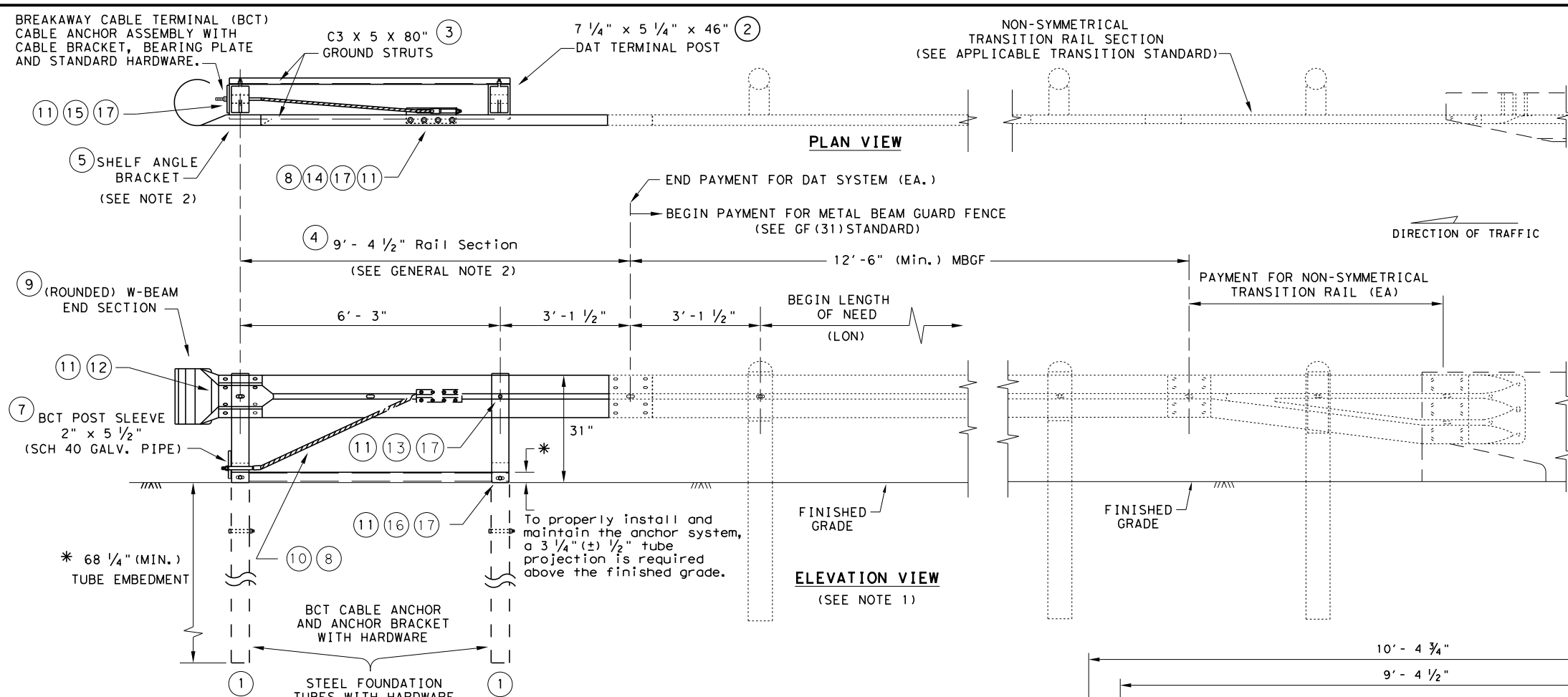
1. **BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS. NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
2. **EPOXY ANCHOR OPTION:** THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" 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 1/4" MIN. BEYOND NUT.

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

NOTE: TRANSITIONS 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.

		Design Division Standard	
METAL BEAM GUARD FENCE TL-3 MASH COMPLIANT GF(31)-19			
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- 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.

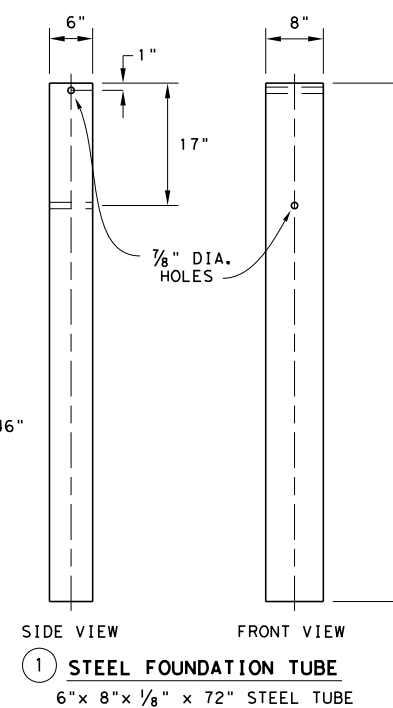
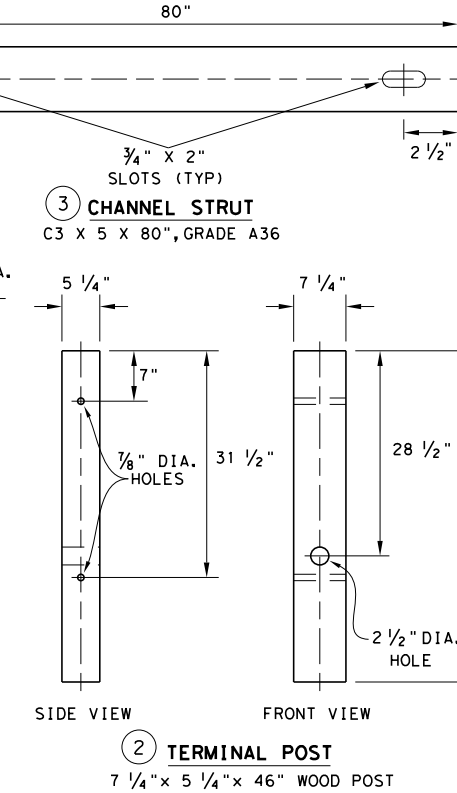
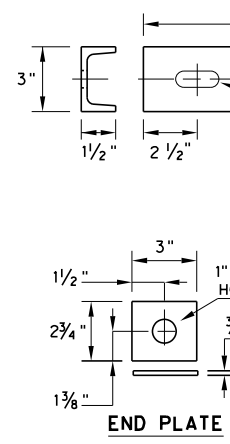
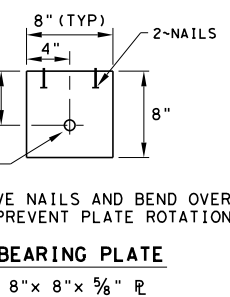
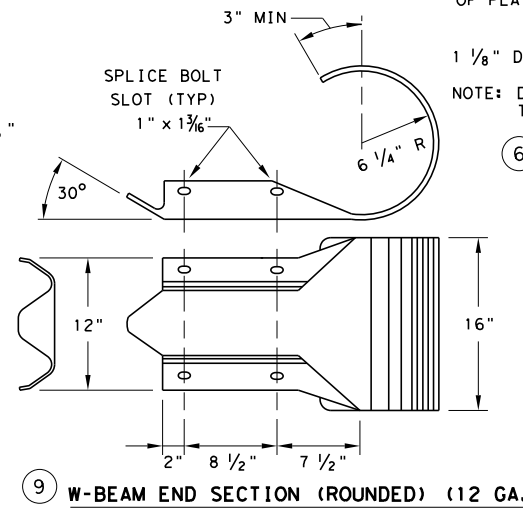
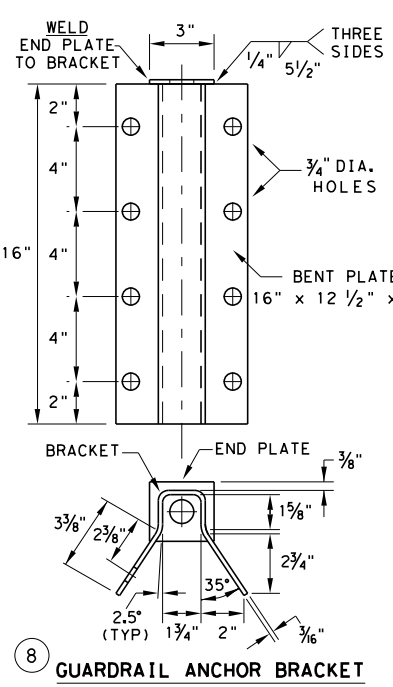
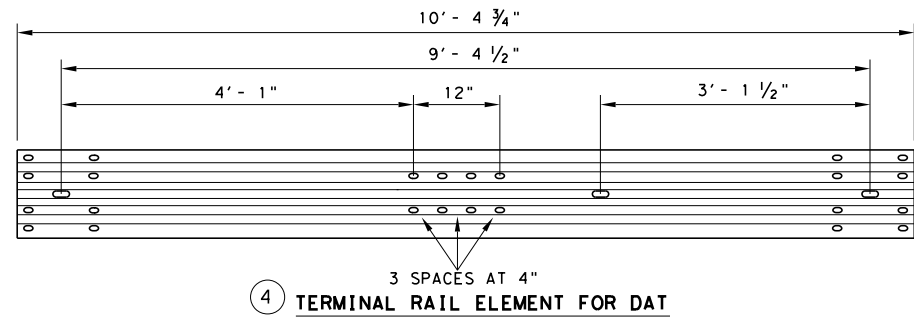
MOW STRIP INSTALLATION

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.

DOWNSTREAM ANCHOR TERMINAL (DAT)

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

#	(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

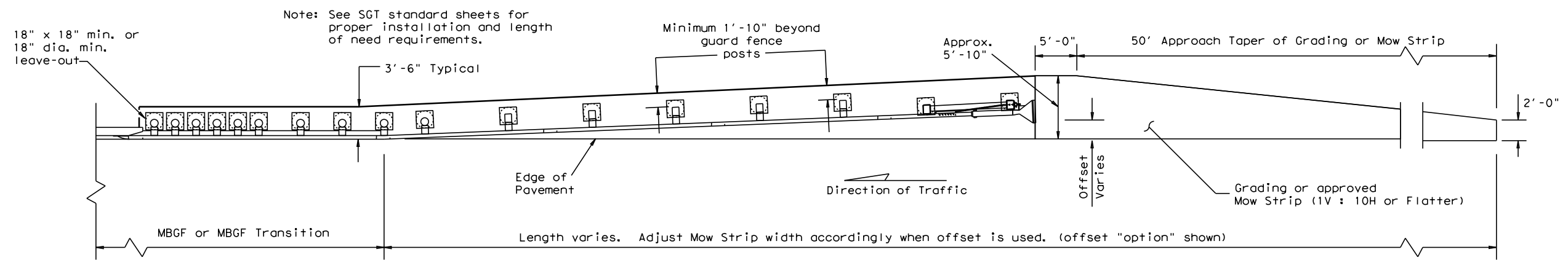


Design Division Standard

METAL BEAM GUARD FENCE (DOWNSTREAM ANCHOR TERMINAL) TL-3 MASH COMPLIANT GF (31) DAT-19

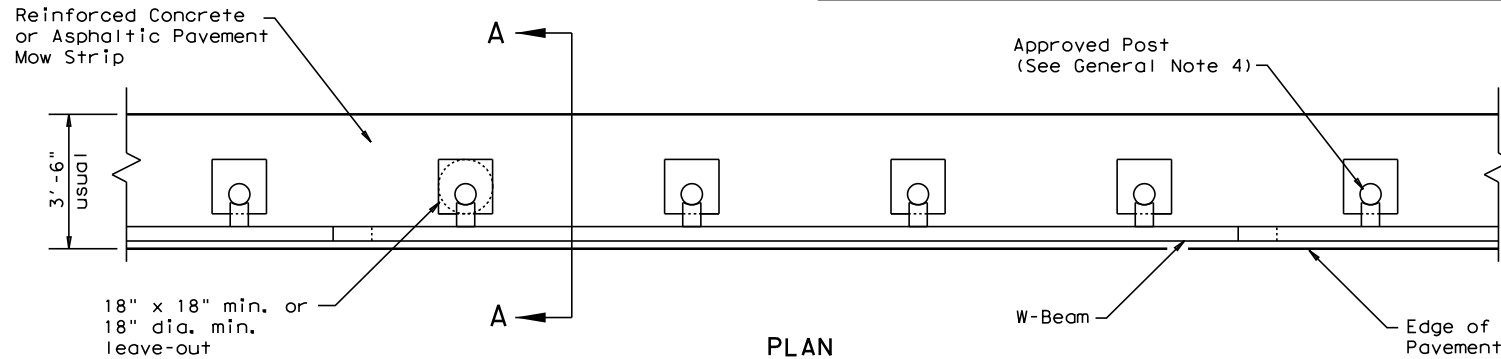
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© TXDOT: NOVEMBER 2019 REVISIONS	CONT: 0015	SECT: 09	JOB: 194	HIGHWAY: IH 35
	DIST: AUS	COUNTY: WILLIAMSON	SHEET NO. 114	

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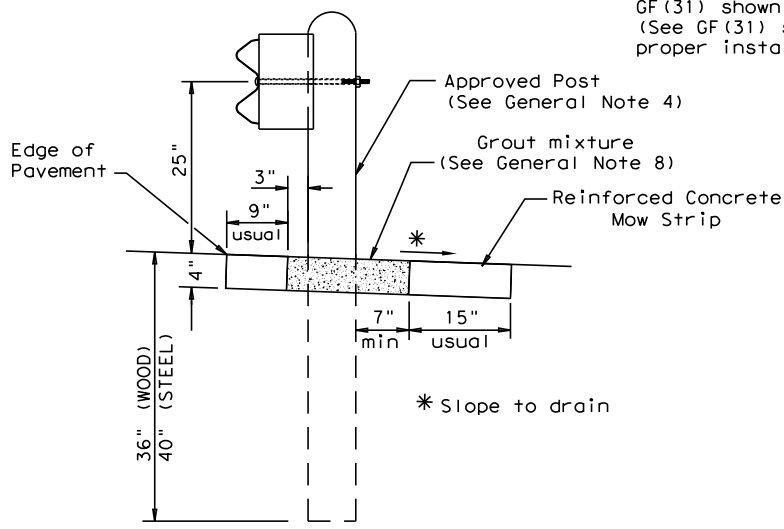
GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS

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.



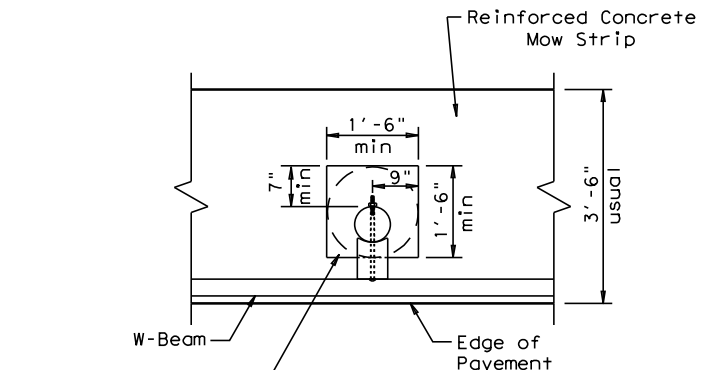
PLAN

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



SECTION A-A

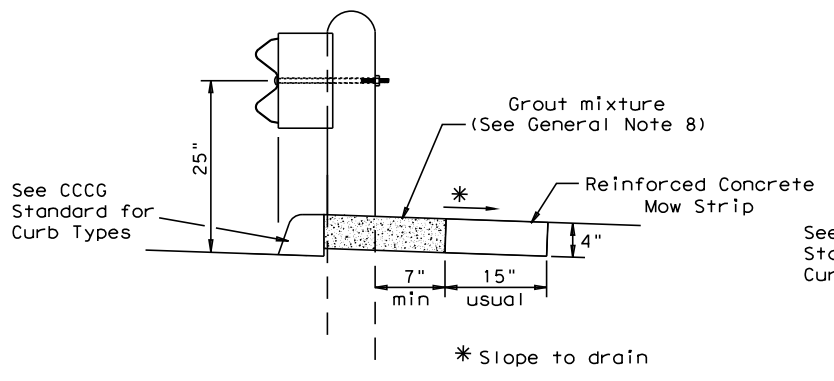
Typical



MOW STRIP DETAIL

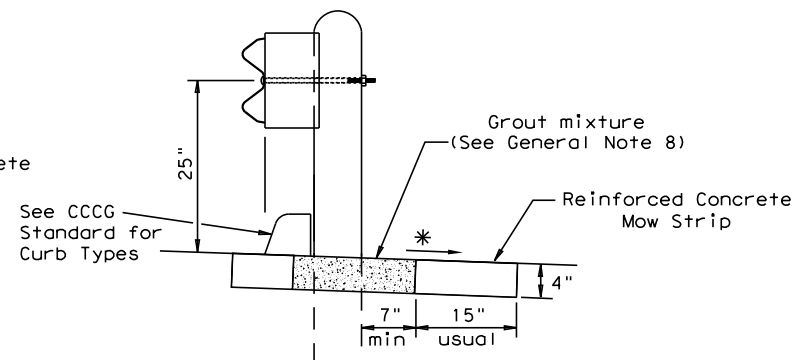
Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.

- 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 1/2" 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.



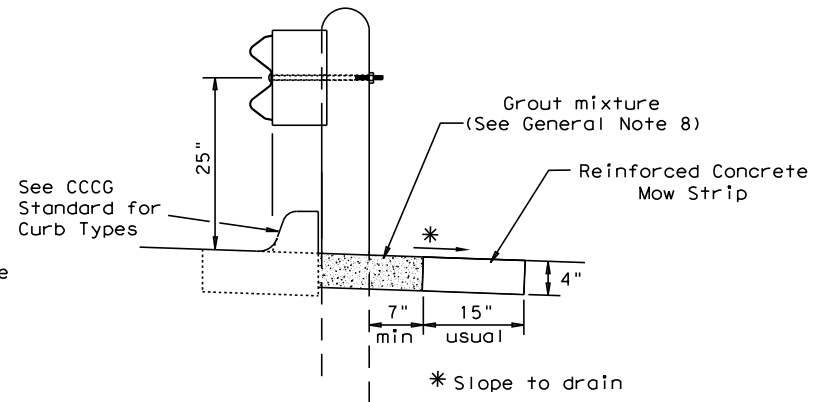
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip

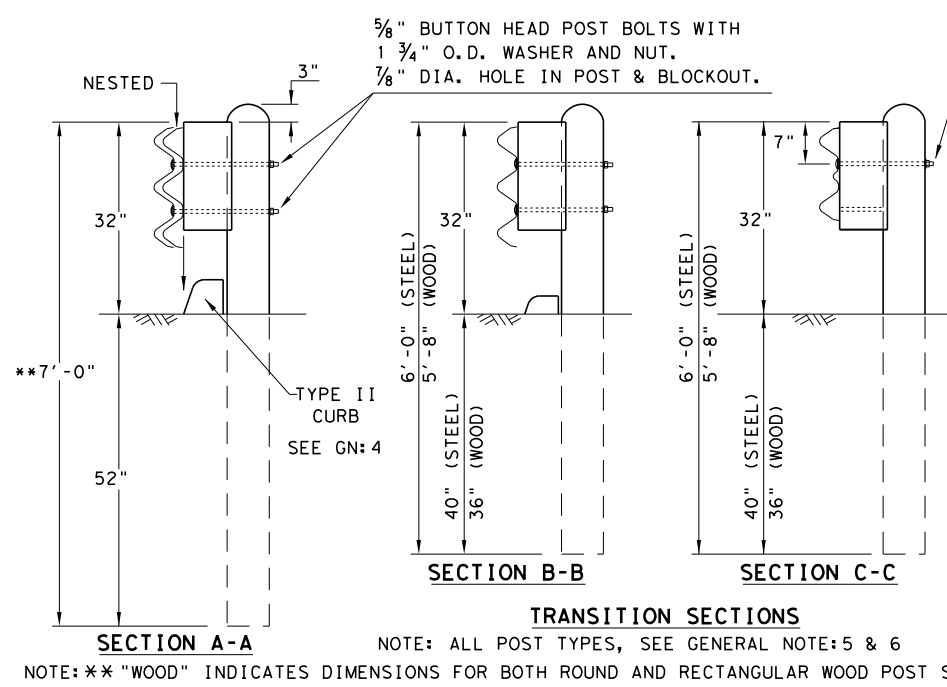
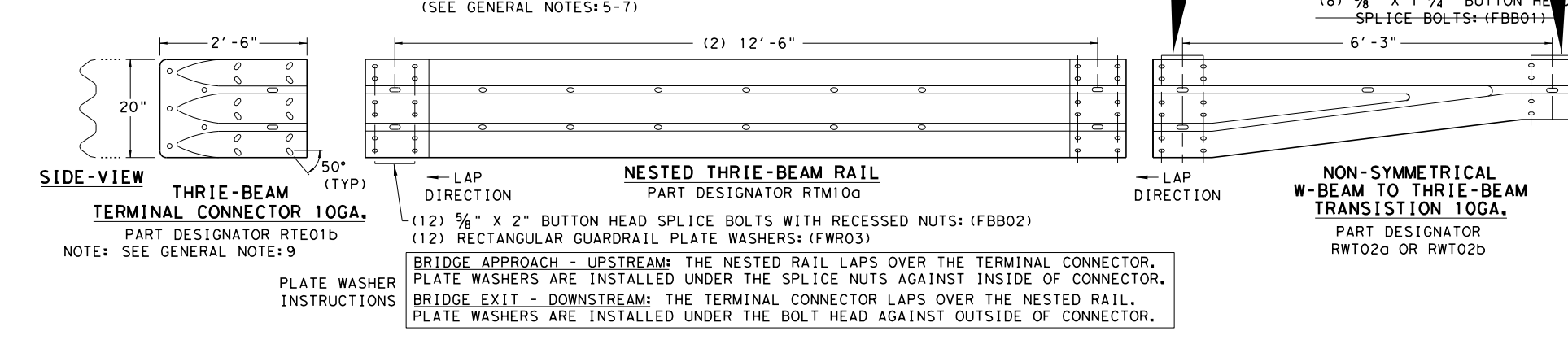
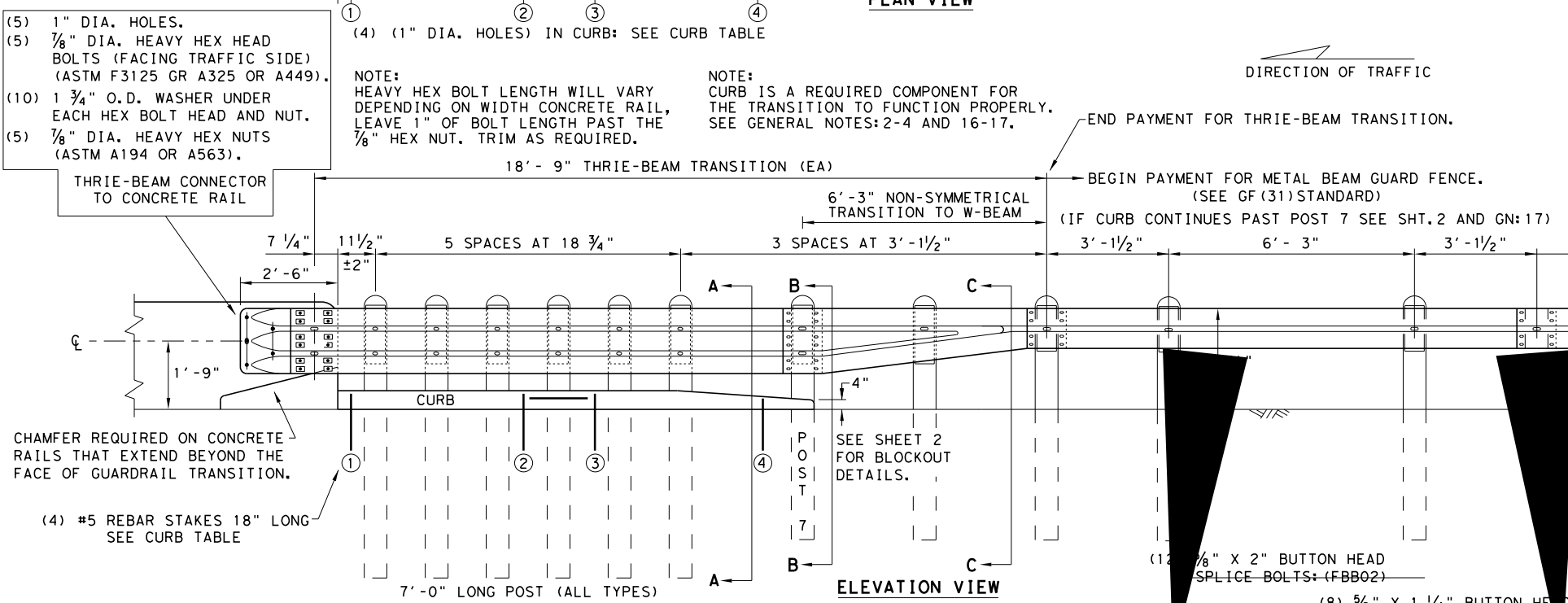
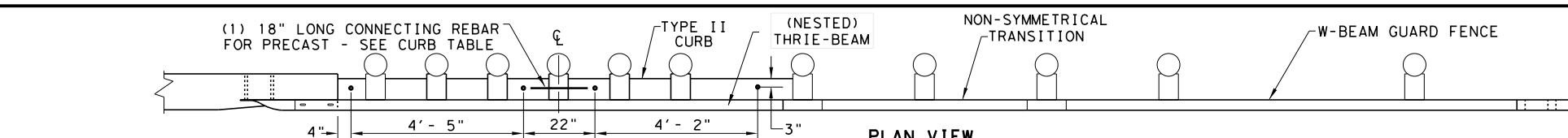


CURB OPTION (3)

		Design Division Standard	
METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT GF(31)MS-19			
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© TXDOT: NOVEMBER 2019	CONT	SECT	JOB
REVISIONS	0015	09	194
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		115

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THRIE-BEAM TERMINAL - CURB TABLE

PRECAST CURB FULL LENGTH EQUALS 12'-2" THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.

CURB (1) LENGTH 5'-8"

CURB (2) LENGTH 6'-6"

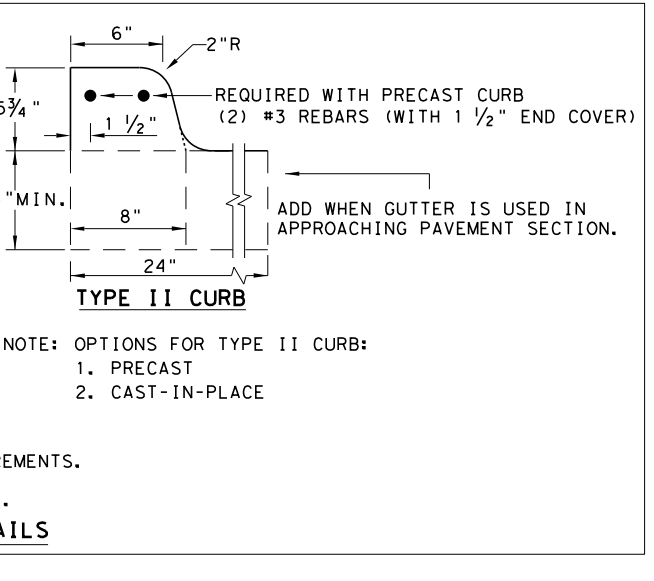
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7

CONNECTING PRECAST CURB SECTIONS (1) & (2): FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END. USE (1) #5 GR. 60 REBAR 18" LONG TO CONNECT BOTH CURBS.

SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE * : FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR. 60 REBAR STAKES 18" LONG INTO THE GROUND AND 1/2" BELOW TOP OF CURB. FILL HOLES WITH APPROVED GROUT MIXTURE.

* NOTES: NOT NEEDED FOR CAST-IN-PLACE. SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS. PERCUSSION DRILLING IS NOT PERMITTED WITH: TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.

TYPE II CURB DETAILS



GENERAL NOTES

- CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
- CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- 3/4" HEIGHT); SEE CURRENT CCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
- CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
- UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
- FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 1/2" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
- THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
- THE POST LENGTH SHALL BE MARKED ON ALL 7'-0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST 5/8" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
- POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
- RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
- 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 5/8" WASHER (FWC16G) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
- FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
- CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
- WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
- 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. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
- REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
- THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
- IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT. 2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED) (TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED) (STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT. 2 FOR ADDITIONAL INFORMATION.

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31) TR TL3-20

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© TXDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
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	AUS	WILLIAMSON	116	

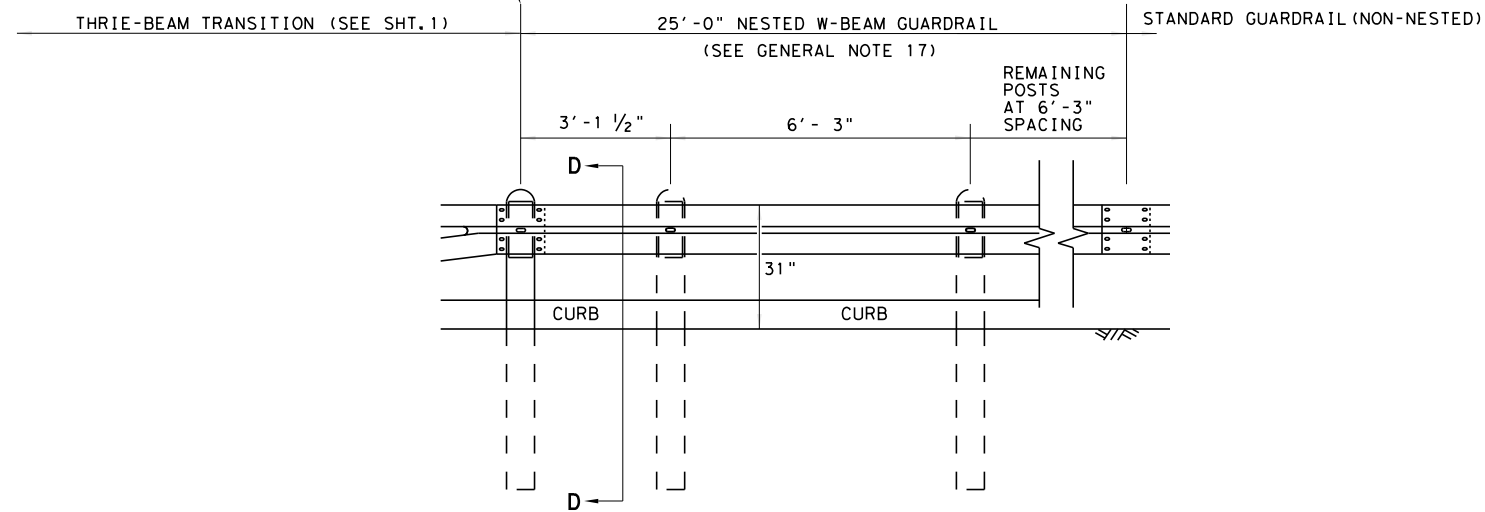
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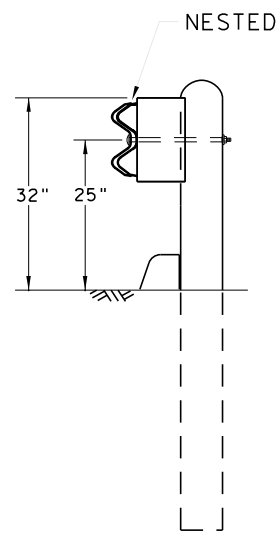
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)

END PAYMENT FOR METAL BEAM GUARD FENCE TRANSITION.
 BEGIN PAYMENT FOR METAL BEAM GUARD FENCE.

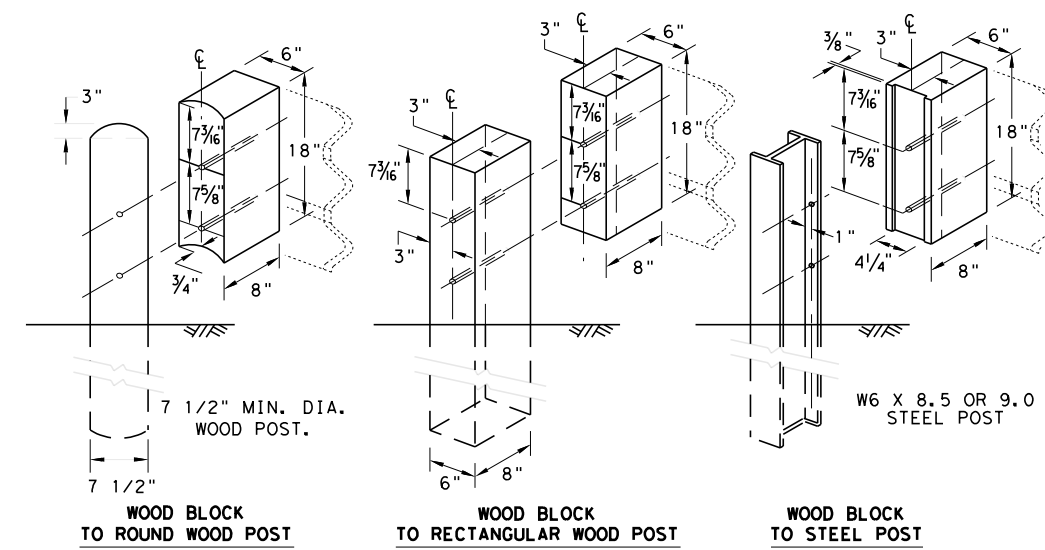
(SEE GF (31) STANDARD SHEET)



ELEVATION VIEW



SECTION D-D



THREE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2



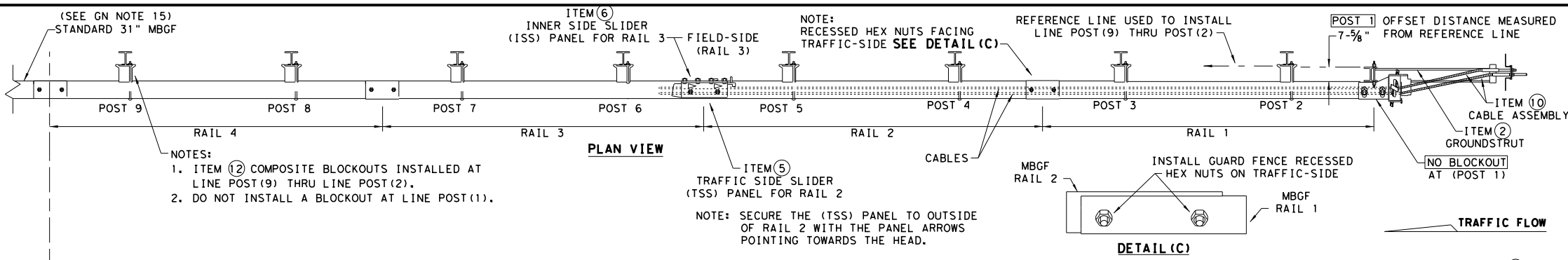
METAL BEAM GUARD FENCE
 THREE-BEAM TRANSITION
 TL-3 MASH COMPLIANT

GF (31) TR TL3-20

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	DIST	COUNTY	SHEET NO.	
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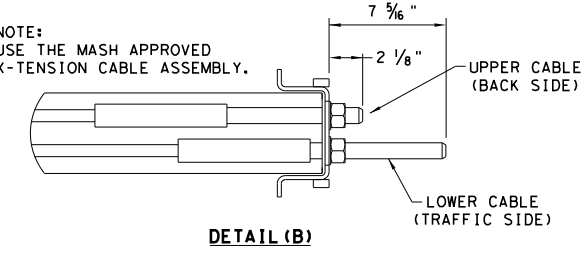
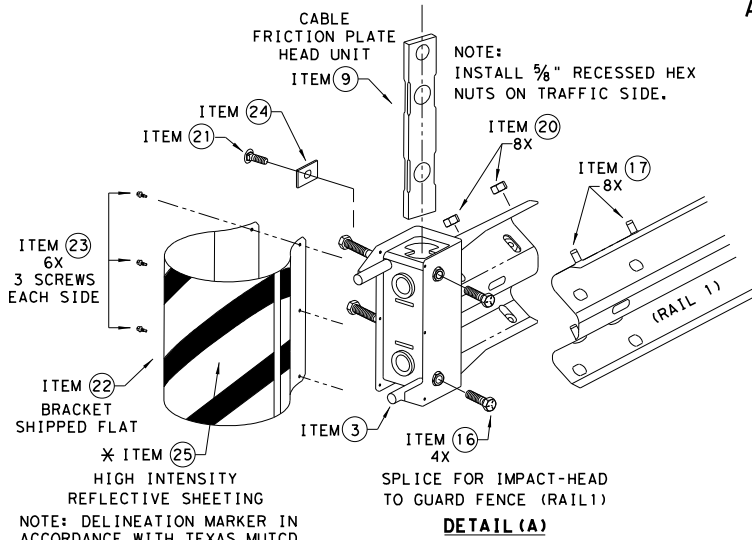
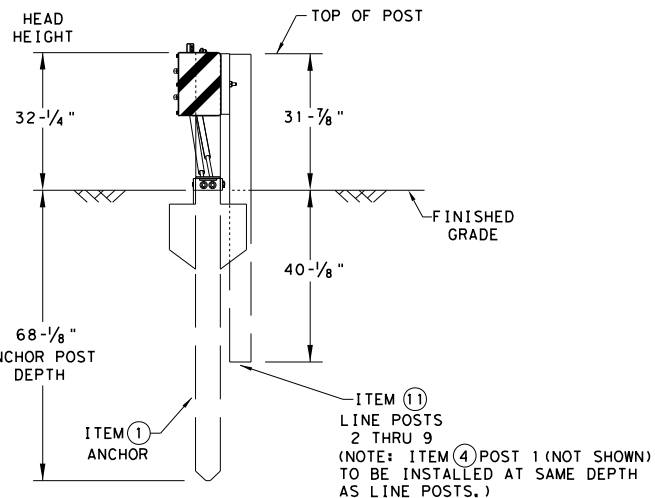
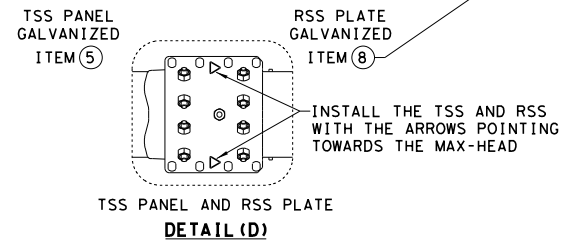
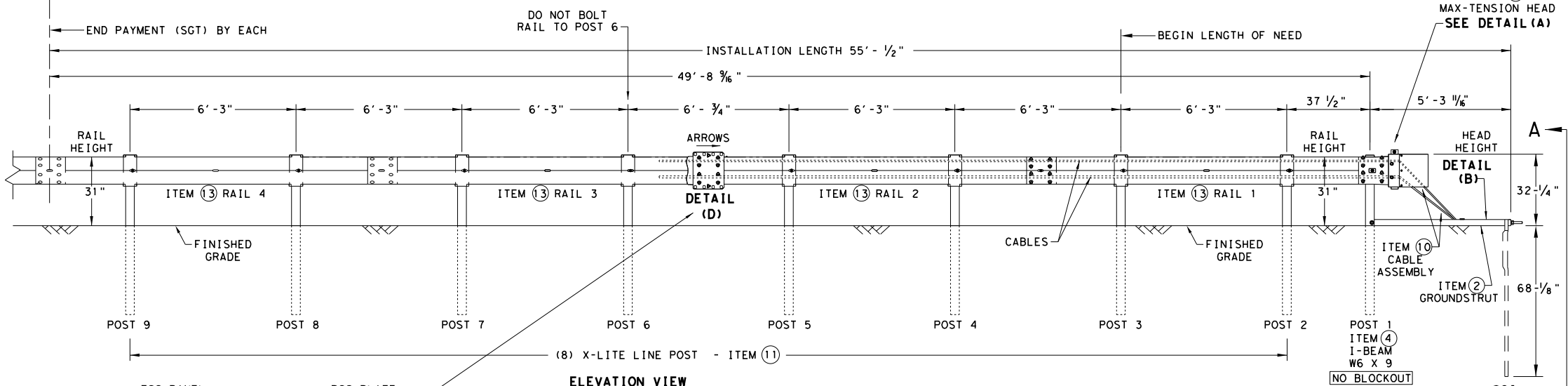
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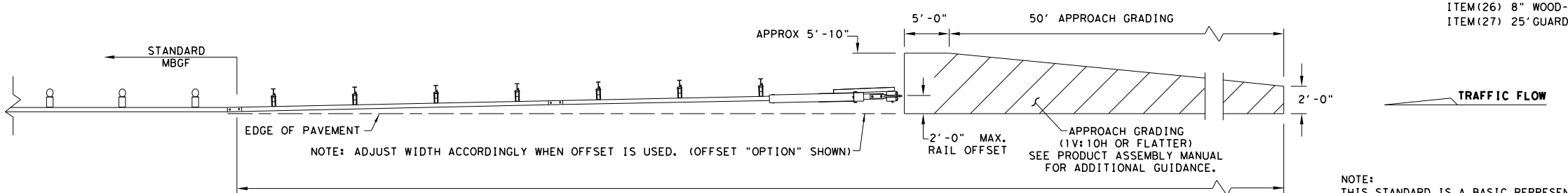
NOTES:
 1. ITEM (2) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST (9) THRU LINE POST (2).
 2. DO NOT INSTALL A BLOCKOUT AT LINE POST (1).

NOTE: SECURE THE (TSS) PANEL TO OUTSIDE OF RAIL 2 WITH THE PANEL ARROWS POINTING TOWARDS THE HEAD.

- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
 - FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
 - 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.
 - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TxDOT'S LATEST ROADWAY MOW STRIP STANDARD.
 - ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
 - SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
 - 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.
 - REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
 - IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - 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.
 - MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
 - IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
 - THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
 - 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 FWRO3	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.

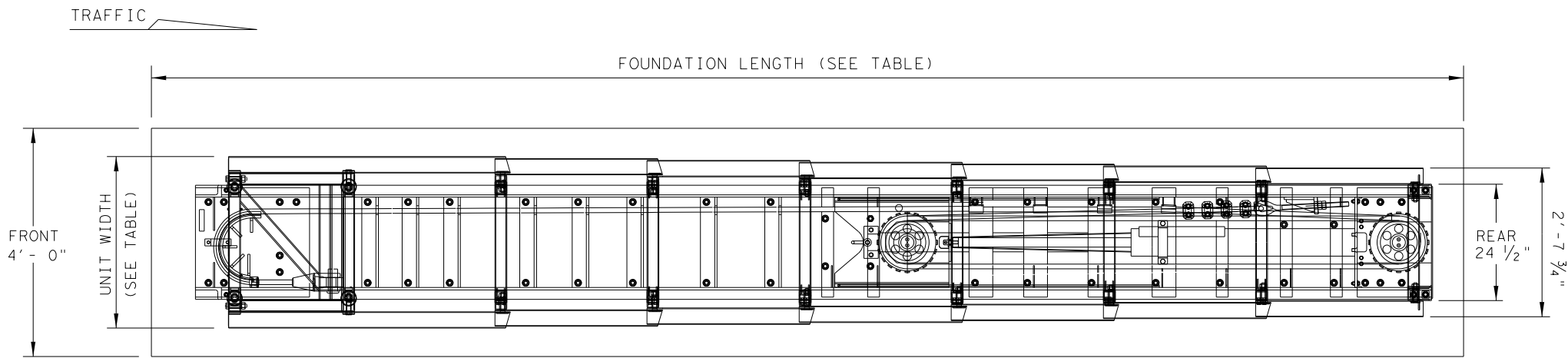
Texas Department of Transportation
Design Division Standard

MAX-TENSION END TERMINAL
MASH - TL-3
SGT (11S) 31-18

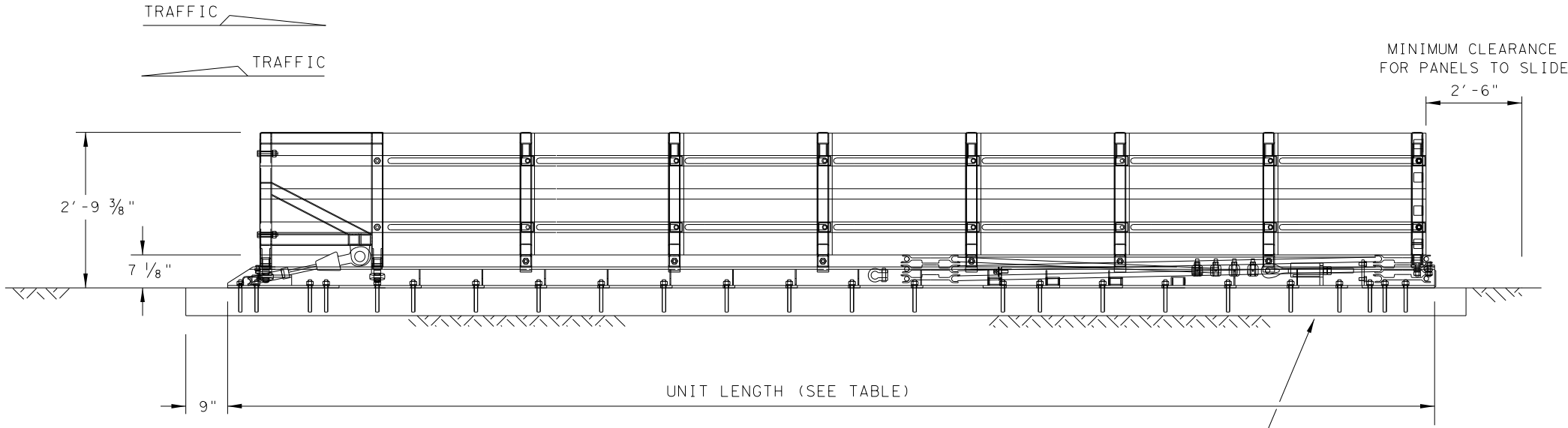
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PLAN VIEW



ELEVATION VIEW

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: WORK AREA PROTECTION, CORP. AT (800) 327-4417, OR (630) 377-9100.
2. FOR BI-DIRECTIONAL TRAFFIC, APPROPRIATE TRANSITION PANELS WILL BE REQUIRED.
3. ADDITIONAL DETAILS FOR THE TRANSITION OPTION AND FOUNDATION OPTION WILL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS FURNISHED TO THE ENGINEER.
4. CONCRETE SHALL BE CLASS "S" WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.
5. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE SCI100GM & SCI70GM SYSTEMS SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTERLINE OF MERGING BARRIERS.

NOTE:
 FOR ATTACHMENT AND TRANSITIONS TO OTHER SHAPES, BARRIERS, RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE. (SEE MANUFACTURER'S PRODUCT MANUAL)

NOTE:
 SIDE PANELS CAN TRAVEL 30" BEYOND THE LAST TERMINAL BRACE AT THE REAR OF THE CUSHION. ALL OBJECTS THAT MAY INTERFERE WITH THIS MOTION CAN AFFECT PERFORMANCE OF AND MAY CAUSE UNDUE DAMAGE TO THE CRASH CUSHION.

MODEL	TEST LEVEL	UNIT LENGTH (approx.)	UNIT WIDTH	FOUNDATION LENGTH	OBSTACLE WIDTH
SCI70GM	TL-2	13'-6"	2'-10 5/8"	15'- 6 1/4"	24" to 36"
SCI100GM	TL-3	21'-6"	3'-1 1/2"	23'- 0"	24" to 36"

SYSTEM AND PAD LENGTHS VARY DEPENDING ON BACKUP TYPE.

FOUNDATION OPTIONS
6" REINFORCED CONCRETE (5 1/2" ANCHOR EMBEDMENT)
8" UNREINFORCED CONCRETE (5 1/2" ANCHOR EMBEDMENT)
3" MIN. ASPHALT OVER 3" MIN. CONCRETE (16 1/2" ANCHOR EMBED.)
6" ASPHALT OVER 6" COMPACT SUBBASE (16 1/2" ANCHOR EMBED.)
8" MINIMUM ASPHALT (16 1/2" ANCHOR EMBEDMENT)

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

TRANSITION OPTIONS
CONCRETE VERTICAL WALL
CONCRETE TRAFFIC BARRIERS
GUARDRAIL (W-BEAM)
GUARDRAIL (THRIE-BEAM)

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

FOR BI-DIRECTIONAL TRANSITION PANEL AND END SHOE DETAILS, SEE MANUFACTURER'S PRODUCT MANUAL.



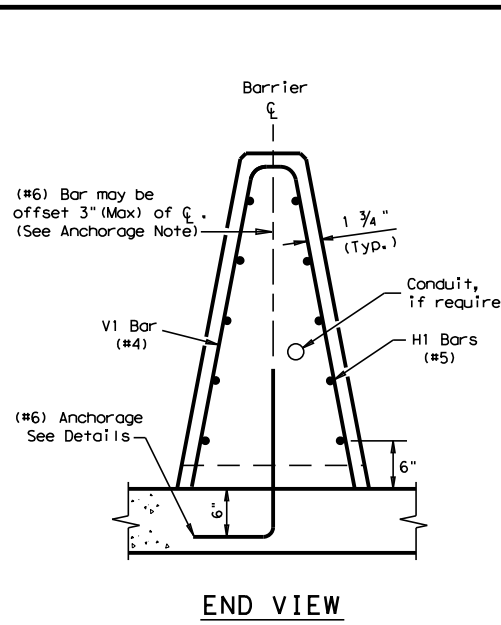
WORK AREA PROTECTION
 CORP
 (SMART-NARROW)
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LOW MAINTENANCE

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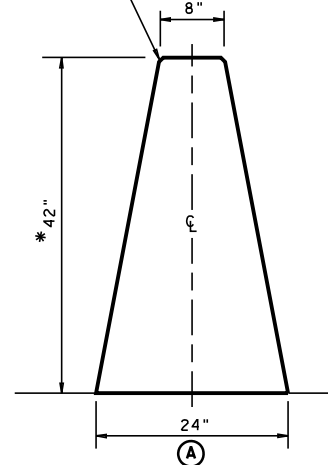
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END VIEW

CAST-IN-PLACE (CIP) BARRIER
Barrier is Symmetrical About the Center Line

Top edges of CIP barrier shall have a 3/4" chamfer or tooling radius.

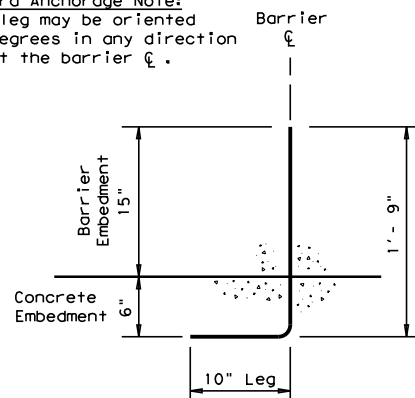


SINGLE SLOPE CONCRETE BARRIER (SSCB) (42")

* Barrier height (IN.)	Dimensions (IN.)		
	(A)	(B)	(C)
42	24	40 1/4	20 1/2
48	26 1/4	46 1/4	22 3/4
54	28 1/2	52 1/4	25 1/6

* (SSCB) (42") Barrier height may be increased to 48" or 54". This would increase the barrier and reinforcement dimensions accordingly.

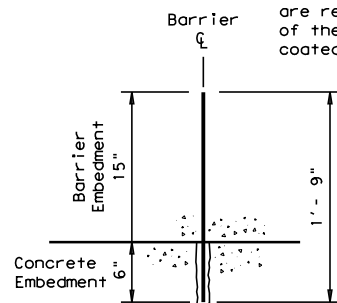
Standard Anchorage Note:
10" leg may be oriented 90 degrees in any direction about the barrier centerline.



STANDARD ANCHORAGE

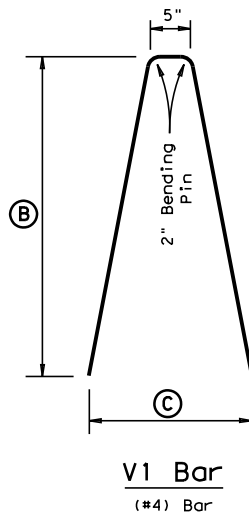
(#6) Bar
Concrete Pavement / Bridge Deck Anchorage:
Cast-in-Place or Slip-Formed Barrier
(See General Notes 2)

Epoxy Note:
If epoxy coated anchor bars are required, the lower 6" of the bars must not be epoxy coated.

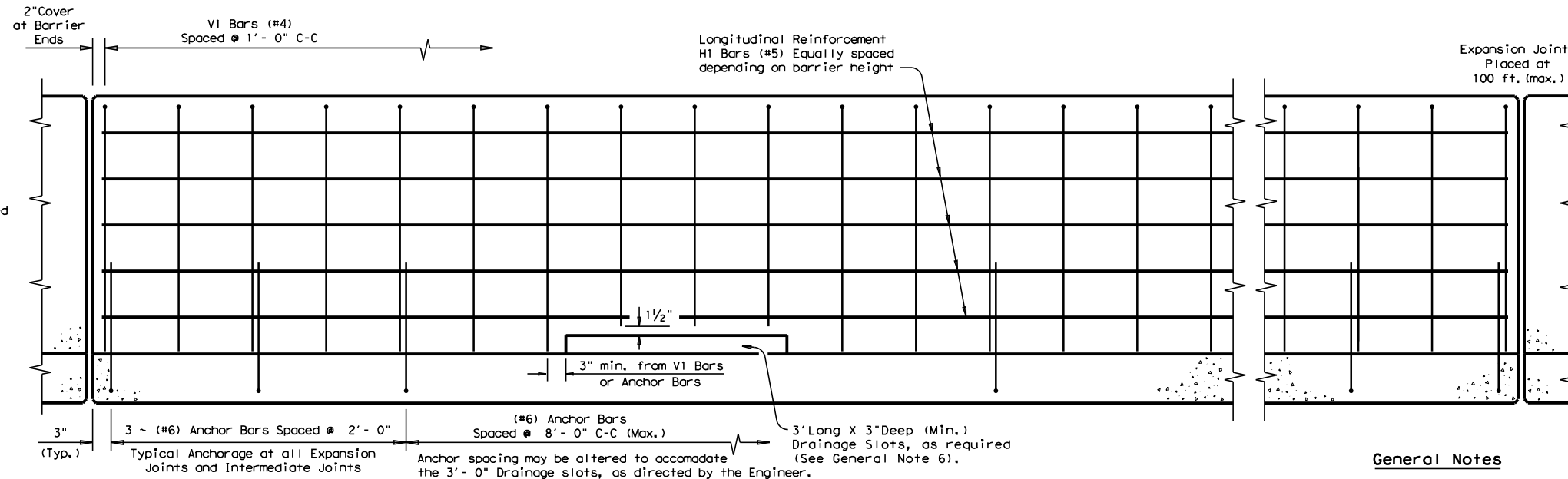


"OPTIONAL" ANCHORAGE

(#6) Bar
Fresh insertion method or Type III, Class C Epoxy Method
Concrete Pavement / Bridge Deck Anchorage:
Cast-in-Place or Slip-Formed Barrier
(See General Notes 2 & 4)



V1 Bar (#4) Bar



ELEVATION VIEW

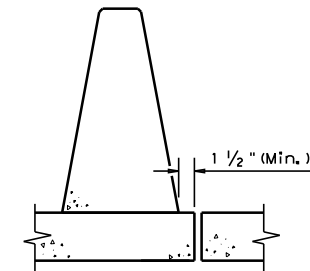
Cast-in-Place (SSCB) on Bridge Decks or Continuously Reinforced Concrete Pavement (CRCP) (Showing Reinforcement and Anchor Placement)

BARRIER PLACEMENT OVER (CRCP) JOINTS

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

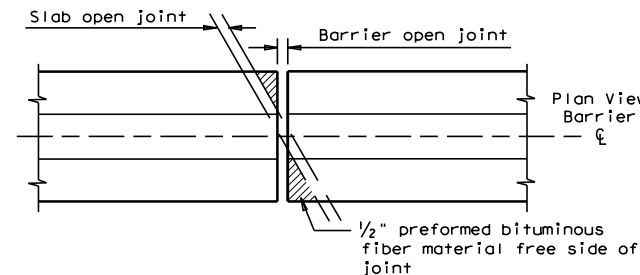
CRCP Joints (with or without tiebars): Two layers of 30 lb roofing felt or 1/2" preformed bituminous fiber material.

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

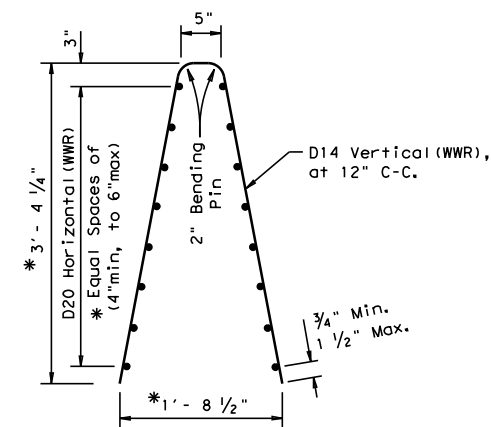


MINIMUM EDGE DISTANCE FROM LONGITUDINAL JOINT

Barrier placement over a longitudinal bridge joint is not recommended.



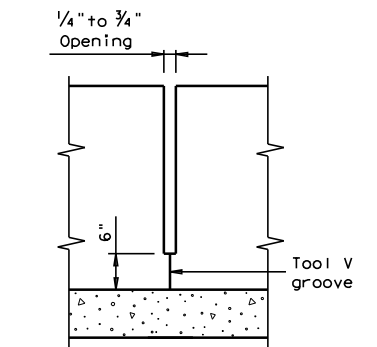
BARRIER OVER TRANSVERSE OPEN JOINT



Welded Wire Reinforcement (WWR) Option for Bars V1 and H1

(WWR) General Notes

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



INTERMEDIATE JOINT DETAIL

Place at all Bent C's, without expansion joints and spaced at 33 ft. (max.), 10 ft. (min.)

EXPANSION JOINT PLACEMENT

Place at all transverse joints or 100 ft. (max.), 10 ft. (min.)

General Notes

- Concrete shall be Class C. Unless otherwise specified in the plans.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615. If the bridge slab requires epoxy "coated" reinforcement, the barrier and/or anchorage may require the same, if shown elsewhere in the plans.
- These details cover barrier per Item 514, "Permanent Concrete Traffic Barrier".
- Anchorage: The "Optional" Anchor system shall be embedded 6" into fresh concrete or using a Type III, Class C Epoxy anchorage system. Follow the manufacturer's directions for installing the expoxied anchor bars. All anchorage shown is the minimum required, and considered subsidiary to the bid item.
- Top edges of CIP barrier shall have a 3/4" chamfer or tooling radius.
- Drainage slot locations (12'-0", C-C Min. Spacing) are shown elsewhere, or as directed by the Engineer. Drainage slot heights on the SSCB may be increased to a maximum of 5 inches, without geometric changes to the barrier face.
- Cast-in-place barrier may be slip formed. Bracing may be tied or tack welded to the reinforcement cage to provide cage stability. Do not weld to anchor bars. The reinforcement cage may rest on the top of the finished grade.
- For locations where lighting is required, see the SSCB(4) sheet for the proper reinforcement and anchorage.

Cast-in-Place (CIP) or Slip-Formed (SSCB)

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

The weight of Cast-in-Place (SSCB)42" is approx. 717 lbs per ft.

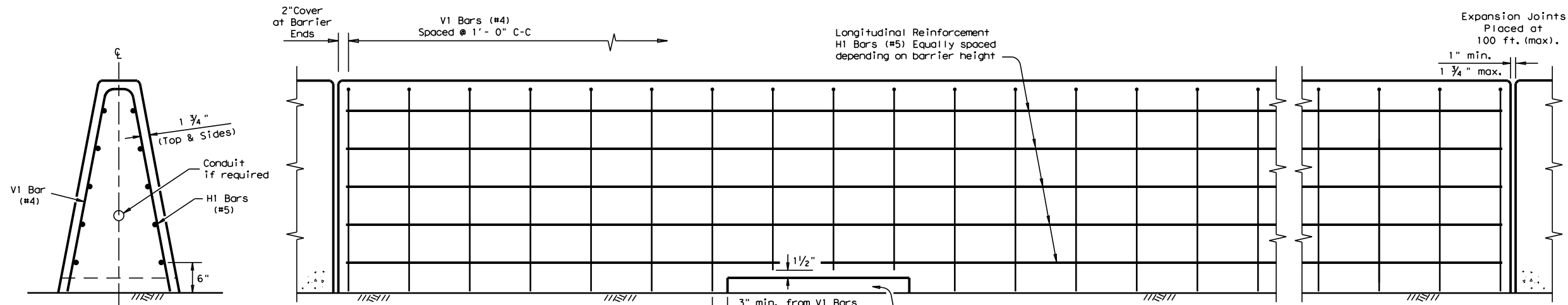
Design Division Standard

SINGLE SLOPE CONCRETE BARRIER
CAST-IN-PLACE (TYPE 1)
(BRIDGE DECK OR CRCP)
SSCB(1)-16

FILE: sscb116.dgn	DN: TxDOT	CK: HC/AN	DN: BD/VP	CK: KM
© TxDOT January 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
CST 01-2016	DIST	COUNTY	SHEET NO.	
	AUS	WILLIAMSON	121	

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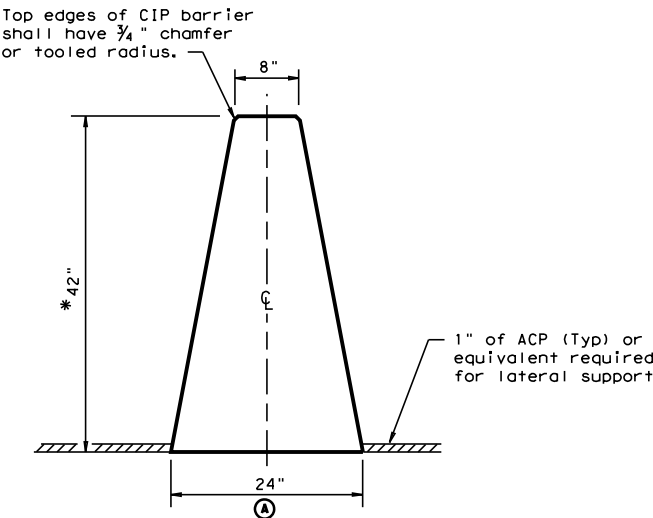
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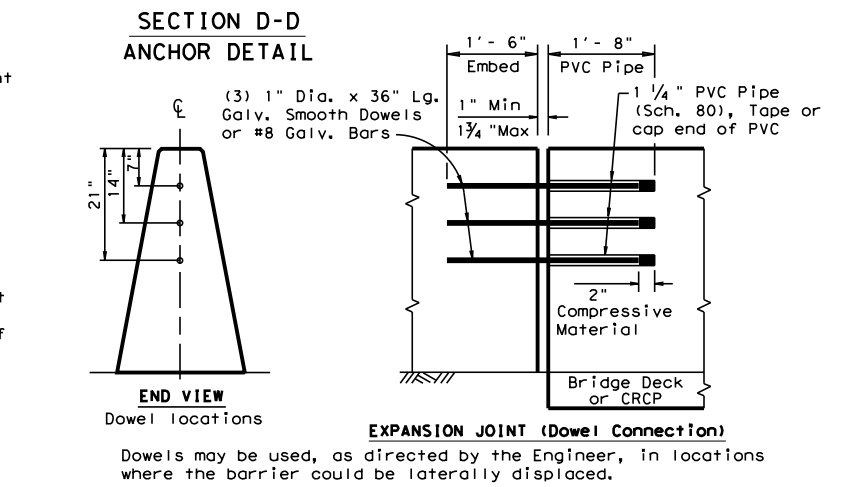
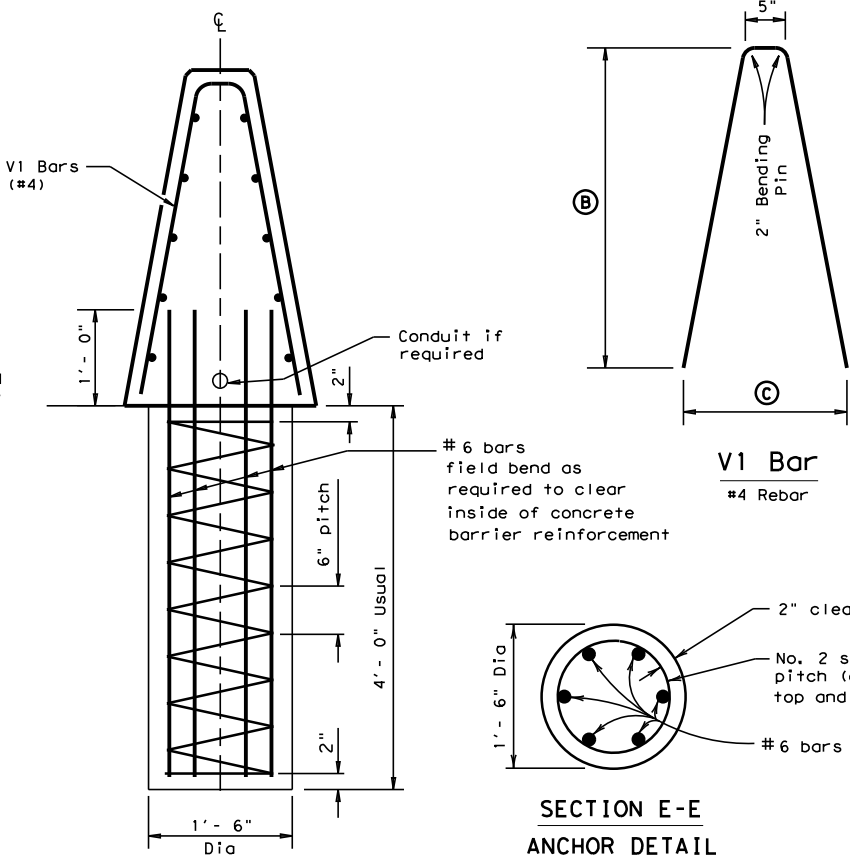
END VIEW
CAST-IN-PLACE (CIP) BARRIER
 Barrier is Symmetrical About the Center Line

ELEVATION VIEW
 Cast-in-Place (SSCB) (Type 2) on Roadway

- GENERAL NOTES**
- Concrete shall be Class C. Unless otherwise specified in the plans.
 - Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
 - These details cover barrier per Item 514, "Permanent Concrete Traffic Barrier".
 - The Anchorage shown is considered subsidiary to the bid item.
 - Top edges of CIP barrier shall have a 3/4" chamfer or tooled radius.
 - Drainage slot locations (12'-0", C-C Min. Spacing) are shown elsewhere, or as directed by the Engineer. Drainage slot heights on the SSCB may be increased to a maximum of 5 inches, without geometric changes to the barrier face.
 - Cast-in-place barrier may be slip formed. Bracing may be tied or tack welded to the reinforcement cage to provide cage stability. Do not weld to anchorage.
 - For locations where lighting is required, see the SSCB(4) sheet for the proper reinforcement and anchorage.

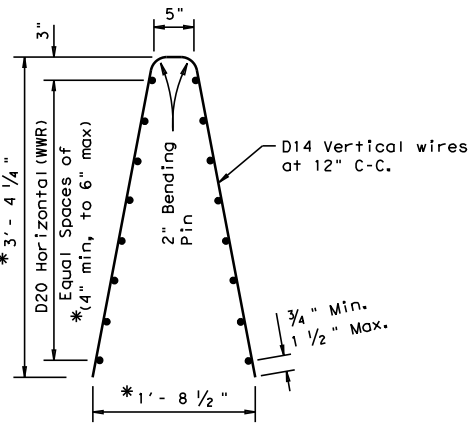


SINGLE SLOPE CONCRETE BARRIER
 (SSCB) (42")



BARRIER HEIGHT (IN.)	* DIMENSIONS (IN.)		
	A	B	C
42	24	40 1/4	20 1/2
48	26 1/4	46 1/4	22 3/4
54	28 1/2	52 1/4	25 1/6

*(SSCB) (42") Barrier height may be increased to 48" or 54". This would increase the barrier and reinforcement dimensions accordingly.



Welded Wire Reinforcement (WWR) Option for Bars V1 and H1

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

Cast-In-Place (CIP) or Slip-Formed (SSCB)

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

The weight of Cast-in-Place (SSCB)42" is approx. 717 lbs per ft.

Texas Department of Transportation

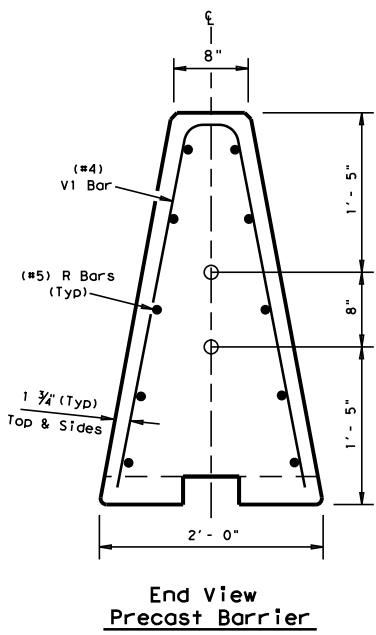
Design Division Standard

SINGLE SLOPE CONCRETE BARRIER
CAST-IN-PLACE (TYPE 1)
(FLEXIBLE PAVEMENT)
SSCB(1F) - 10

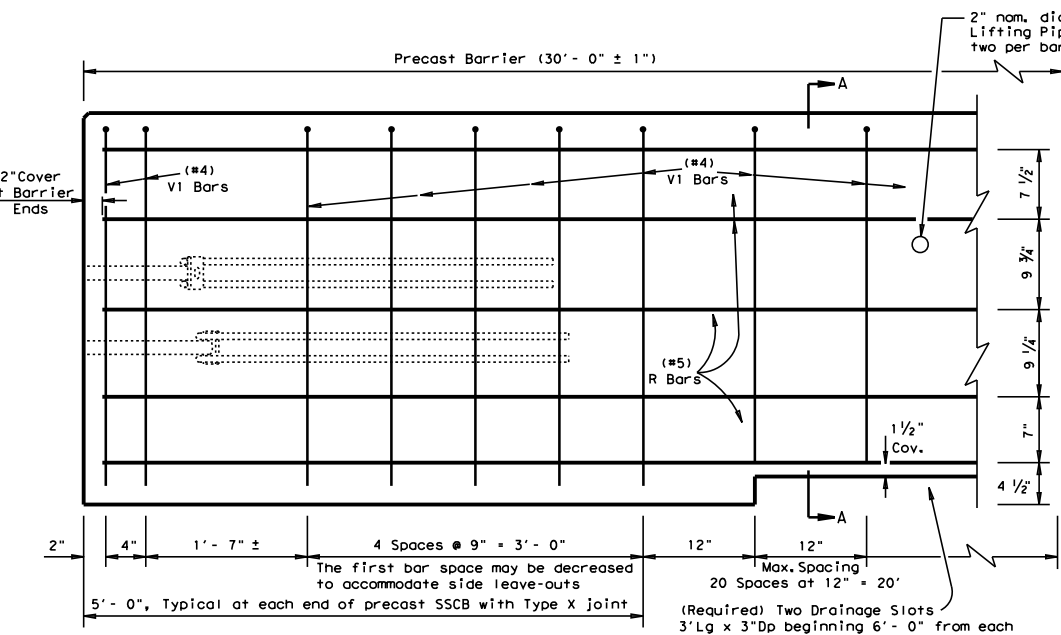
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© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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	AUS	WILLIAMSON	122	

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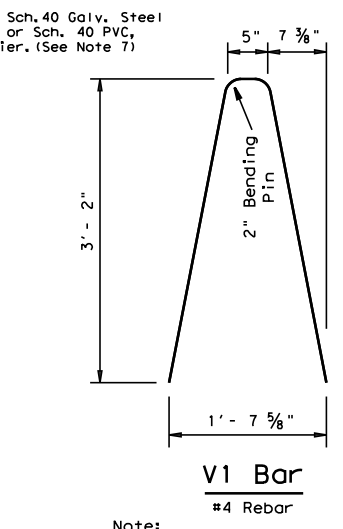
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End View Precast Barrier
 Pipe locations for Joint Type X connection

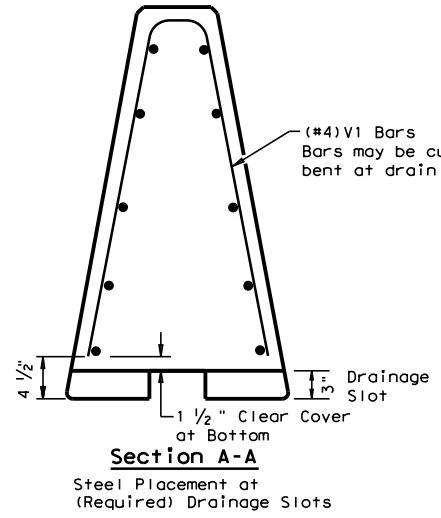


Reinforcement for Precast (SSCB) Single Slope Concrete Barrier (Type 1)
 Showing reinforcement for Joint Connection (Type X)



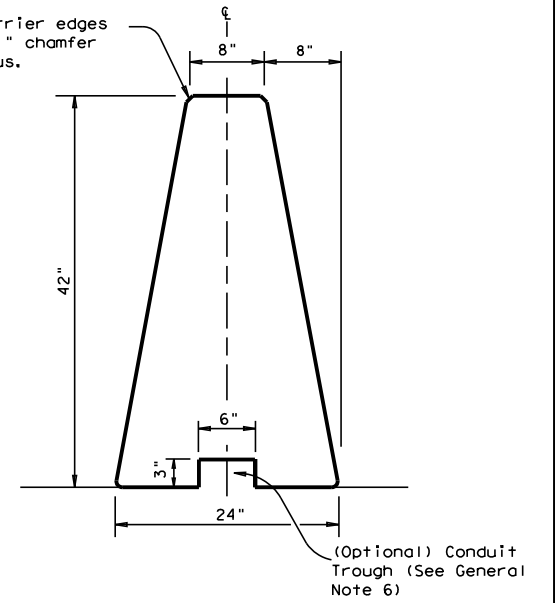
V1 Bar
 #4 Rebar

Note:
 V1 Bars above the drainage slots may be bent to accommodate 1 1/2" clear cover as directed by the Engineer.



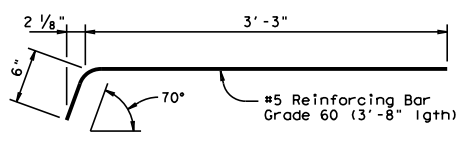
Section A-A
 Steel Placement at (Required) Drainage Slots

All precast barrier edges shall have a 3/4" chamfer or tooled radius.

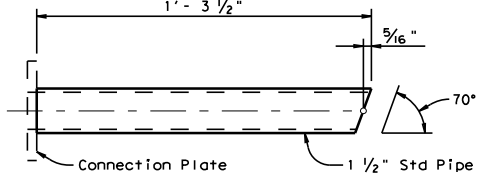


Single Slope Concrete Traffic Barrier

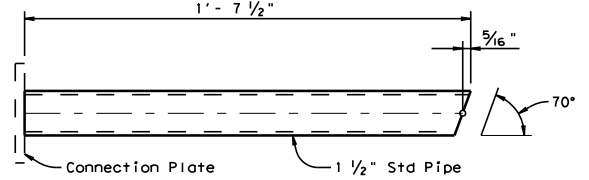
Precast SSCB barrier may be connected to cast-in-place SSBC. The joint connection "Types" may be used in the cast-in-place barrier, to match the precast barrier connection.



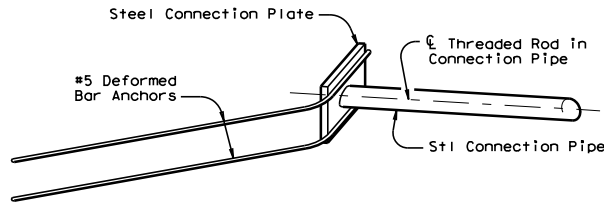
DEFORMED BAR ANCHOR DETAILS
 Two (2) Bars required per assembly. Eight (8) required per Joint.



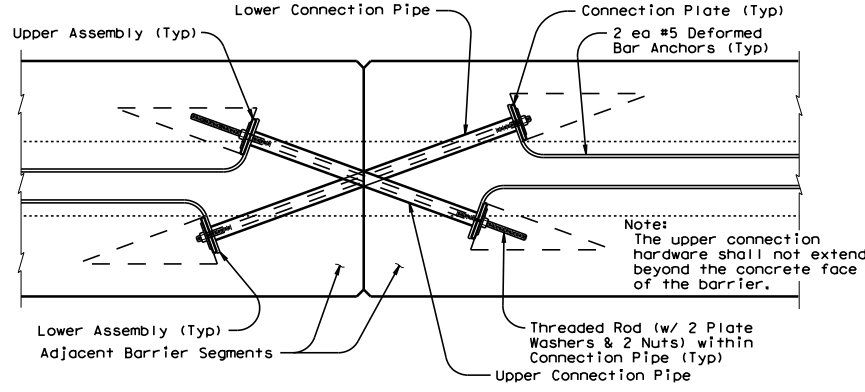
UPPER CONNECTION PIPE DETAILS
 One (1) Steel Pipe required per Upper Assembly. Two (2) required per Joint.



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



ISOMETRIC OF TYPICAL WELDED ASSEMBLY
 Four (4) [2 Upper & 2 Lower] Assemblies required per Joint.



TYPE X JOINT INSTALLATION DETAIL

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

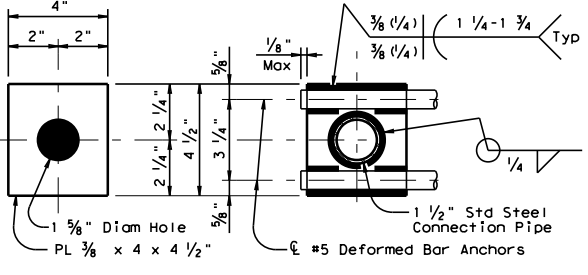
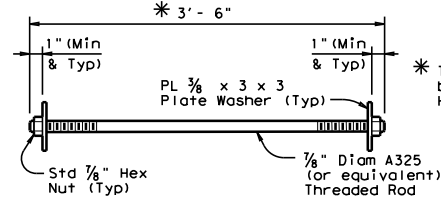


PLATE DIMENSIONS WELDING DETAILS

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.

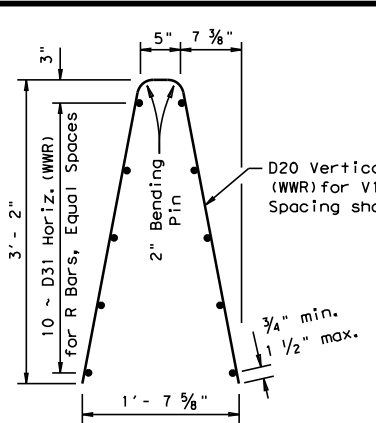


CONNECTION BOLT OR THREADED ROD DETAIL

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

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

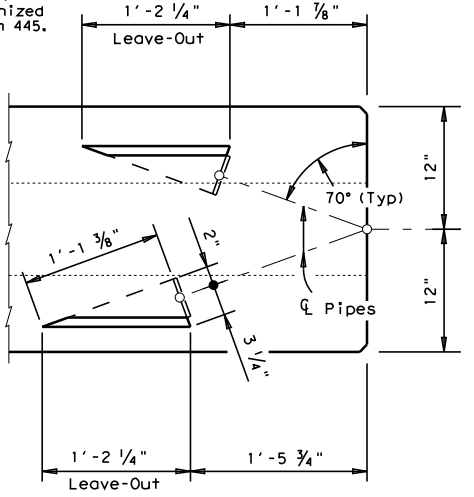
Weight of one precast 30 ft. (SSCB) segment = Approx. 10.5 Tons or 717 lbs per ft.



Welded Wire Reinforcement (WWR) Option for Bars R and V1

(WWR) General Notes

- Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
- Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
- All reinforcement shall comply with Item 440, "Reinforcing Steel."
- 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".

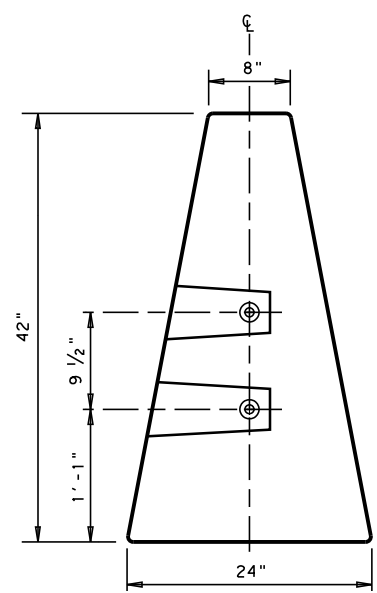


BARRIER PLAN AT JOINT

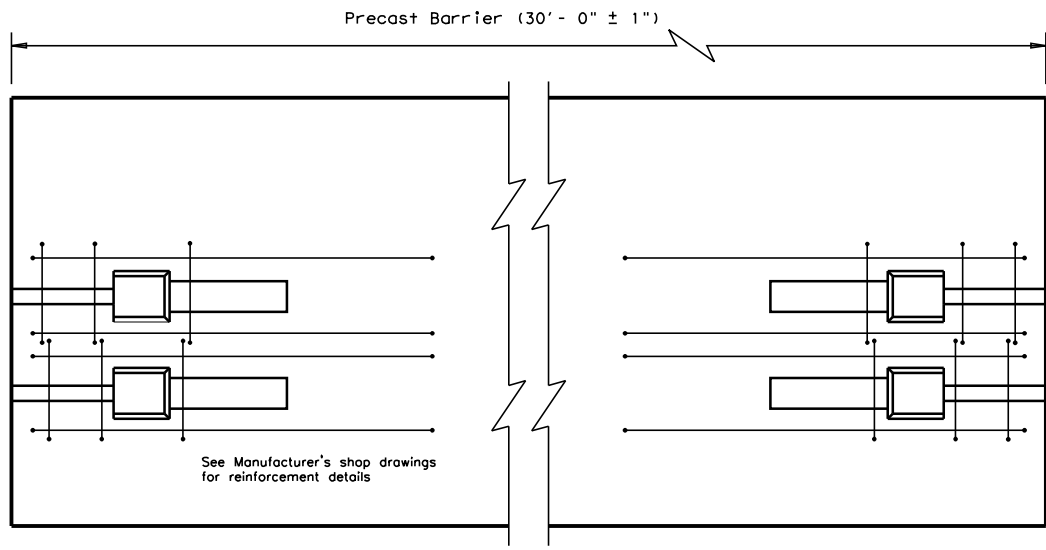
		Design Division Standard	
<h1>SINGLE SLOPE CONCRETE BARRIER</h1> <h2>PRECAST BARRIER (TYPE 1)</h2> <h3>SSCB(2)-10</h3>			
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REVISIONS	0015 09	194	1H 35
DIST	COUNTY	SHEET NO.	
AUS	WILLIAMSON	123	

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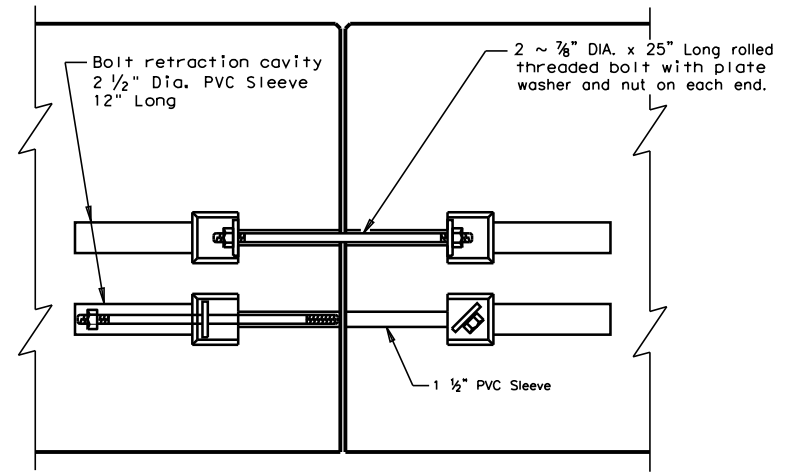
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END VIEW
 "QUICK-BOLT" POCKET LOCATIONS

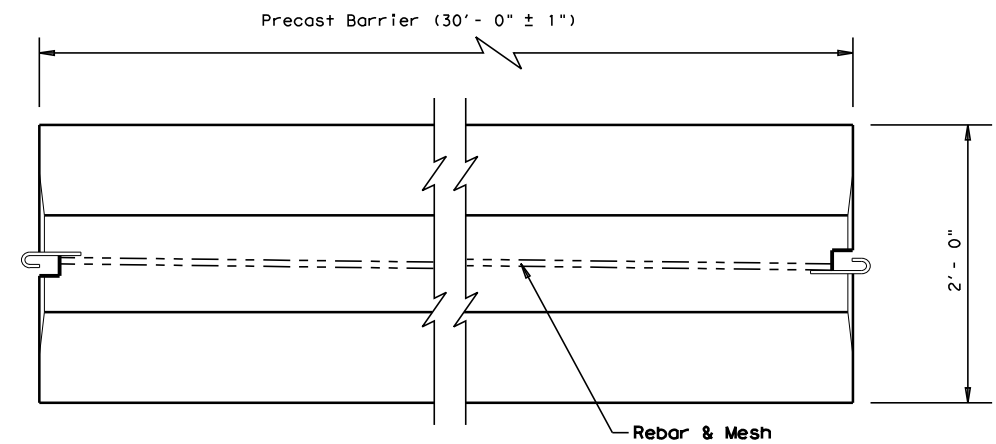


ELEVATION VIEW
 "QUICK-BOLT" (SSCB)
 See Manufacturer's shop drawing for additional details

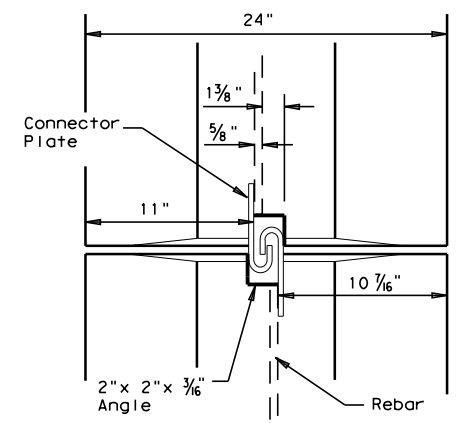


ELEVATION VIEW SHOWING JOINT CONNECTION
 "QUICK-BOLT"

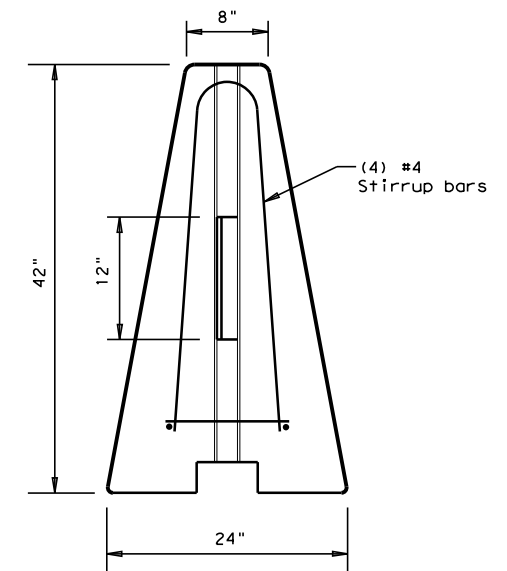
Joint Connection (Type Q)



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



VIEW FROM ABOVE
 J-J HOOK CONNECTION



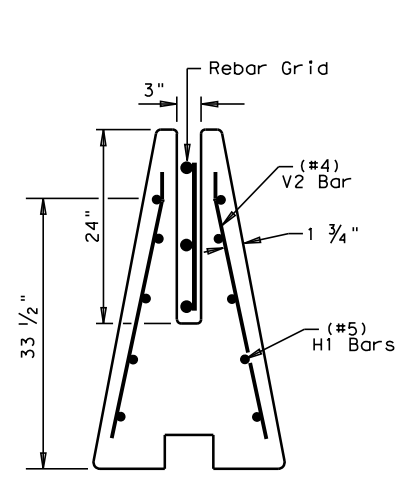
END VIEW

Proprietary Joint Connections (SSCB)

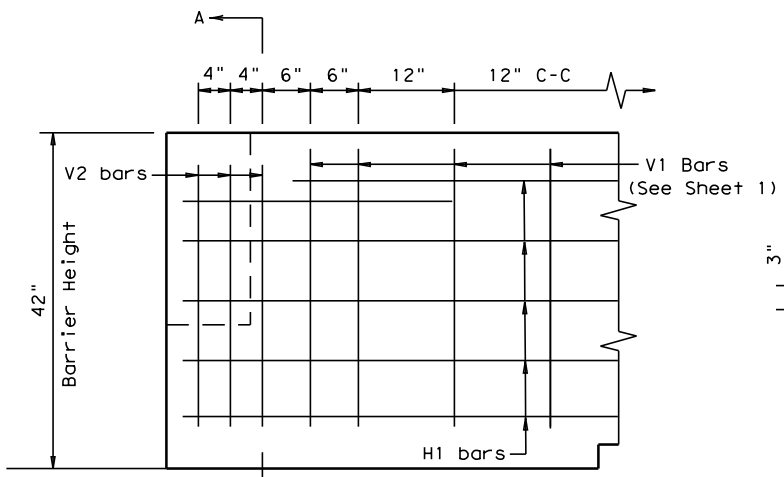
Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

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

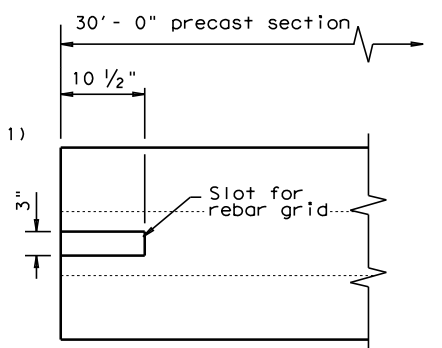
If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.



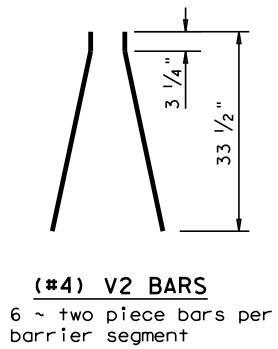
SECTION A-A
 Showing (Type R)
 Rebar Grid



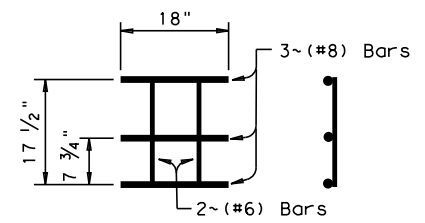
ELEVATION
 V1 Bars (See Sheet 1)



TOP VIEW
 JOINT CONNECTION
 Typical at both ends of barrier segment



(#4) V2 BARS
 6 ~ two piece bars per barrier segment



WELDED REBAR GRID

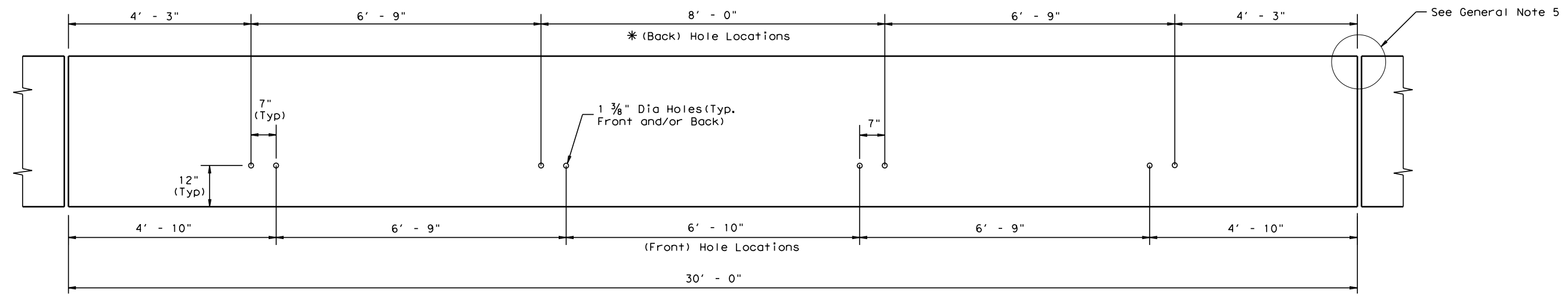
Joint Connection (Type R)

SINGLE SLOPE CONCRETE BARRIER
 PRECAST BARRIER (TYPE 1)
 SSCB(2) - 10

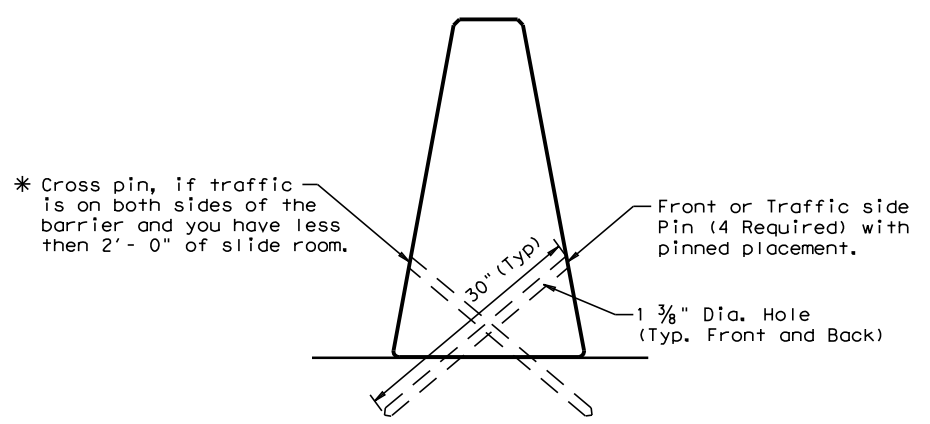
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AUS	WILLIAMSON		124	

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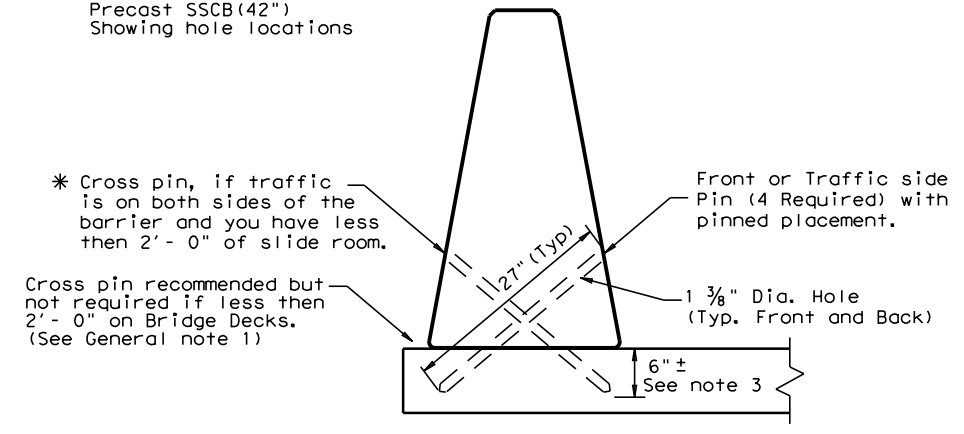
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DETAIL 1
 Precast SSCB (42")
 Showing hole locations



DETAIL 2
 Placement on (ACP)
 Asphalt Conc. Pavement
 or Treated Base Material
 (30" Pin required)

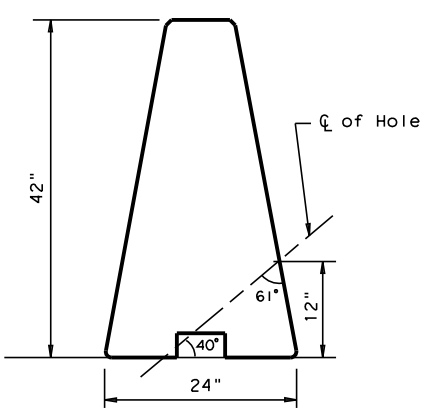


DETAIL 3
 Bridge Deck or CRCP
 (27" Pin required).

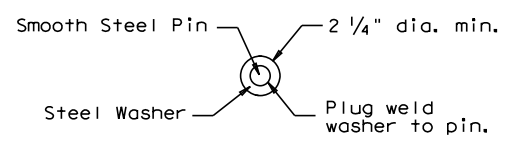
GENERAL NOTES

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 than 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 in. 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 through 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 SSCB(2) standard sheet 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 in. 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. All steel pins shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
9. Weight of barrier is approx. 700 lbs per foot.

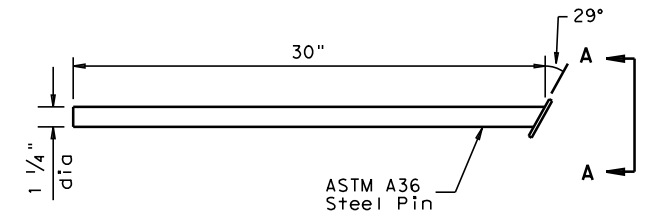
CORE DRILLING EXISTING BARRIER
 Core drilling existing concrete barrier is permitted. Holes shall be drilled with coring or masonry drilling type equipment. Percussion (star) drilling shall not be used. A special drill bit (to cut through existing reinforcing) will likely be required. Spalls in the concrete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



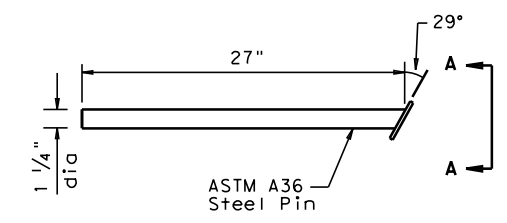
HOLE LOCATION DETAIL



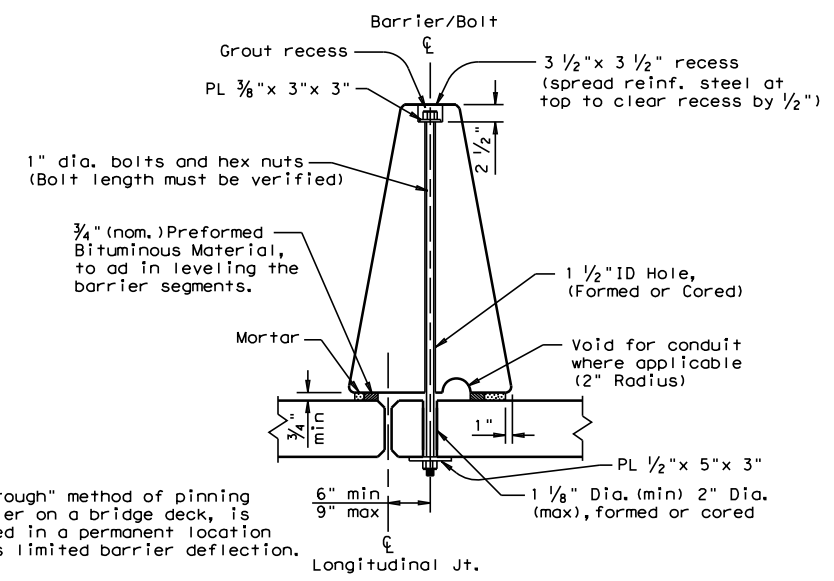
VIEW A-A



(30") PIN DETAIL
 See Detail 2



(27") PIN DETAIL
 See Detail 3



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 SSCB (BOLT THROUGH) PLACEMENT OVER LONGITUDINAL EXPANSION JOINT

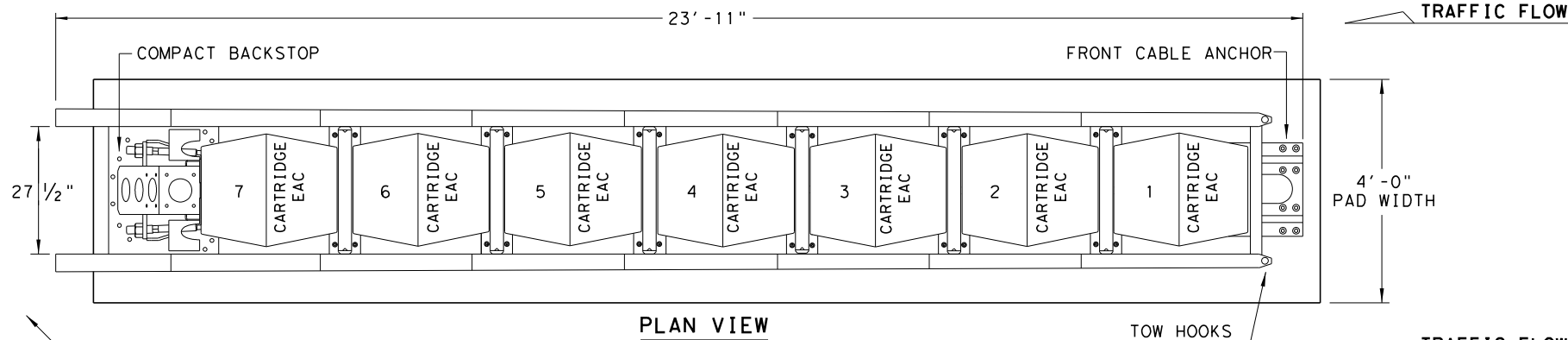
For bolt through locations, use the (Front) hole locations shown on Detail 1.

		Design Division Standard	
<h1>SINGLE SLOPE CONCRETE BARRIER</h1> <h2>PRECAST BARRIER (TYPE 1) PINNED PLACEMENT</h2> <h3>SSCB(5) - 10</h3>			
FILE: sscb510.dgn	DN: TxDOT	CK: AM	DW: BD
© TxDOT December 2010	CONT SECT	JOB	HIGHWAY
REVISIONS	0015 09	194	1H 35
DIST	COUNTY	SHEET NO.	
AUS	WILLIAMSON	125	

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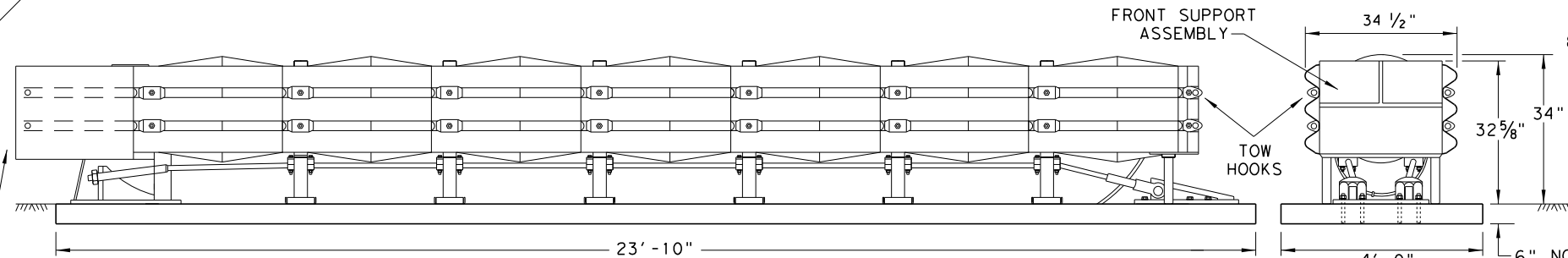
TAU(M) (N) TL-3 SYSTEM LENGTH VARIES WITH TRANSITION TYPE



PLAN VIEW

NOTE:
 TAU(M) (N) TL-2 SYSTEM CONTAINS (4) TYPE B (EAC) CARTRIDGES,
 INSTALLED ON ROADWAYS WITH MAXIMUM SPEEDS OF 45 MPH.

PROTECTS HAZARDS
 UP TO 30" WIDTH



ELEVATION VIEW

TAU(M) (N) TL-3 CONCRETE PAD LENGTH

NOTES:
 TRANSITIONS AND ATTACHMENTS TO VARIOUS BARRIER SHAPES,
 RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE.
 SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS MANUAL FOR
 ADDITIONAL TRANSITION DETAILS.

NOTE:
 CONCRETE FOUNDATION PAD LENGTH VARIES WITH TL-3 AND
 TL-2 SYSTEMS, SEE SYSTEM & FOUNDATION LENGTH TABLE.

FOUNDATION OPTIONS
6" REINFORCED CONCRETE
8" UNREINFORCED CONCRETE
ASPHALT OVER CONCRETE WITH MINIMUM 6" EMBEDMENT IN CONCRETE
* 6" ASPHALT OVER 6" COMPACT SUBBASE
* 8" MINIMUM ASPHALT

SYSTEM & FOUNDATION LENGTH TABLE	
SYSTEM LENGTH	FOUNDATION LENGTH
TL-2 = 15'-5"	TL-2 = 15'-4"
TL-3 = 23'-11"	TL-3 = 23'-10"

* NOTE:
 REQUIRES AN ASPHALT ANCHORAGE PACKAGE: INCLUDES ADDITIONAL BRACES
 FOR THE FRONT CABLE ANCHOR AND THE COMPACT BACKSTOP, AND ASPHALT
 HARDWARE KIT. THE TL-3 ASPHALT CONFIGURATION ALSO REQUIRES NESTED
 SLIDER PANELS AND SHIMS AT THE LAST TWO BAYS. SEE MANUFACTURER'S
 INSTALLATION INSTRUCTION MANUAL FOR DETAILS.

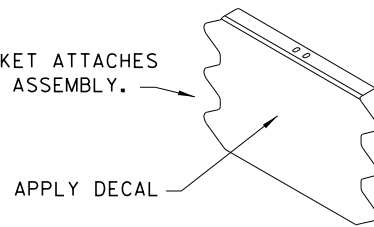
NOTE:
 SEE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL FOR FOUNDATION
 SPECIFICATIONS THAT INCLUDE, STONE AGGREGATE MIX, COMPRESSION
 STRENGTH, STEEL SIZE, ANCHOR SIZE, AND EMBEDMENT DEPTH.

TRANSITION OPTIONS	
USE THE COMPACT BACKSTOP	VERTICAL WALL
	CONCRETE TRAFFIC BARRIERS
	W-BEAM GUARDRAIL
	THRIE BEAM GUARDRAIL

NOTE:
 FOR BI-DIRECTIONAL TRANSITION PANELS AND BRIDGE RAIL END SHOE
 DETAILS. SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS MANUAL.

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

NOTE:
 DELINEATION BRACKET ATTACHES
 TO FRONT SUPPORT ASSEMBLY.



DELINEATION BRACKET

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

NOTES:
 UPGRADE KITS ARE AVAILABLE TO RETROFIT EXISTING
 NCHRP 350 TAU-II SYSTEMS TO MASH COMPLIANT SYSTEMS.
 SEE MANUFACTURER'S PRODUCT INFORMATION.

THE TAU(M) (N) UNIDIRECTIONAL SYSTEM IS FREE STANDING
 AND IS NOT REQUIRED TO BE CONNECTED TO THE HAZARD.

TRANSITIONS TO GUARD FENCE, BRIDGE RAILS AND ROADSIDE
 BARRIERS SHALL BE IN ACCORDANCE WITH TxDOT'S POLICY.

NOTE:
 THIS STANDARD IS A BASIC REPRESENTATION OF THE
 UNIVERSAL TAU(M) (N) SYSTEM, IT IS NOT INTENDED TO
 REPLACE THE INSTALLATION INSTRUCTION MANUAL.

REUSABLE

GENERAL NOTES

- FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
- REFER TO THE LATEST (LTS) INSTALLATION INSTRUCTION MANUAL FOR IMPORANT SAFETY MESSAGES, COMPLETE SYSTEM ASSEMBLY, AND ANCHOR INSTALLATION REQUIREMENTS FOR THE NINE (9) DIFFERENT SITE TRANSITIONS.
- INSTALLATION DETAILS FOR THE COMPACT BACKSTOP, FRONT CABLE ANCHOR AND FOUNDATION OPTIONS ARE SHOWN ON THE INSTALLATION INSTRUCTION MANUAL FURNISHED TO THE ENGINEER.
- CONCRETE SHALL BE CLASS "S" WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 P.S.I.
- IF THE CROSS-SLOPES VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%
- THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
- THE TAU(M) (N) SYSTEM SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTER LINE OF MERGING BARRIERS.
- THIS DRAWING REPRESENTS THE UNIVERSAL TAU(M) (N) TL-3 SYSTEM, A RE-DIRECTIVE NON-GATING CRASH CUSHION THAT CAN PROTECT HAZARDS UP TO 30-INCHES IN WIDTH. ALSO AVAILABLE IN TL-2 CONFIGURATION.

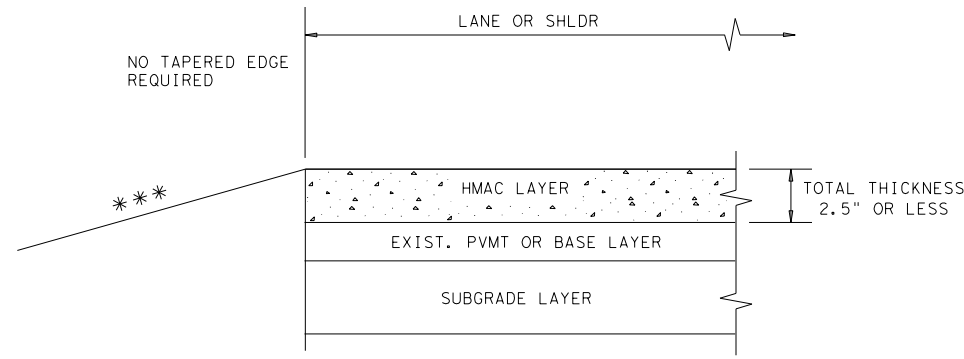
NOTE:
 PAD THICKNESS VARIES - SEE FOUNDATION OPTIONS

BILL OF MATERIALS FOR TAU(M) (N) TL-3 & TL-2 SYSTEMS		QUANTITIES	
PART NUMBER	PART DESCRIPTION	TL-3 SYSTEM	TL-2 SYSTEM
BSI-1708019-00	SLIDING PANEL GALVANIZED TAU(M) (N)	14	8
BSI-1708030-00	END PANEL, THRIE BEAM, GALV, TAU(M) (N)	2	2
BSI-1706001-00	CABLE ASSEMBLY, 7 BAY, TAU(M) (N)	2	-
BSI-1805036-00	CABLE ASSEMBLY, 4 BAY, TAU(M) (N)	-	2
BSI-1708018-00	FRONT CABLE ANCHOR	1	1
BSI-1707034-00	COMPACT BACKSTOP	1	1
B030703	MIDDLE SUPPORT ASSEMBLY	6	3
B030704	FRONT SUPPORT	1	1
B010722	ENERGY ABSORBING CARTRIDGE, TYPE B	7	4
K001005	TAU-II FRONT SUPPORT LEG KIT	1	1
BSI-1709083-KT	TETHER KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1809041-KT	SLIDER KIT (INCLUDES ALL HARDWARE)	7	4
BSI-1808033-KT	CABLE GUIDE KIT (INCLUDES ALL HARDWARE)	6	3
BSI-1809040-KT	TOW HOOK KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1808034-KT	DELINEATION BRACKET KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1808035-KT	END PANEL MOUNT KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1808036-KT	CONCRETE ANCHORING KIT	1	1
* * SEE NOTE	HIGH REFLECTIVE DECAL	1	1
ECN 3883	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

		Design Division Standard	
LINDSAY TRANSPORTATION SOLUTIONS UNIVERSAL CRASH CUSHION (MASH TL-3 & TL-2) TAU(M) (N) - 19			
FILE: tau(m)19.dgn	DN: TxDOT	CK: KM	DW: VP
© TxDOT: APRIL 2019	CONT SECT	JOB	HIGHWAY
REVISIONS	0015 09	194	IH 35
DIST	COUNTY	SHEET NO.	
AUS	WILLIAMSON	126A	

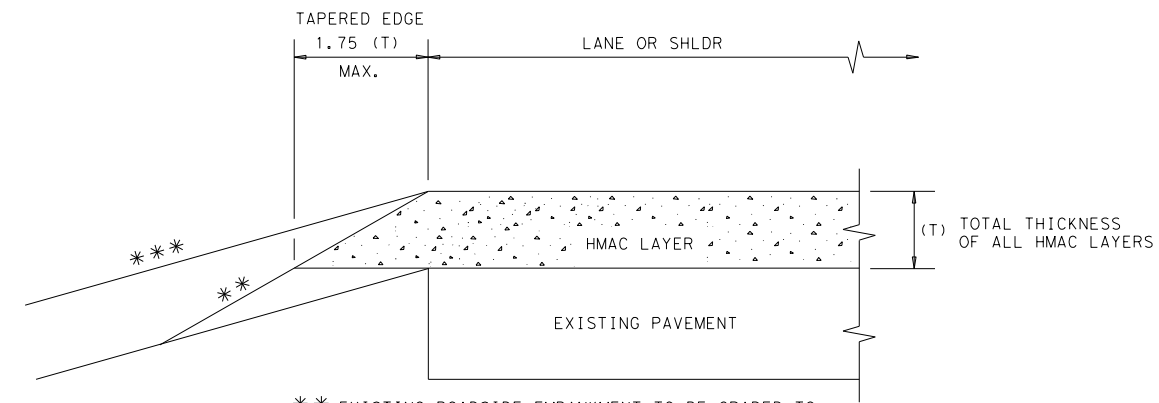
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*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

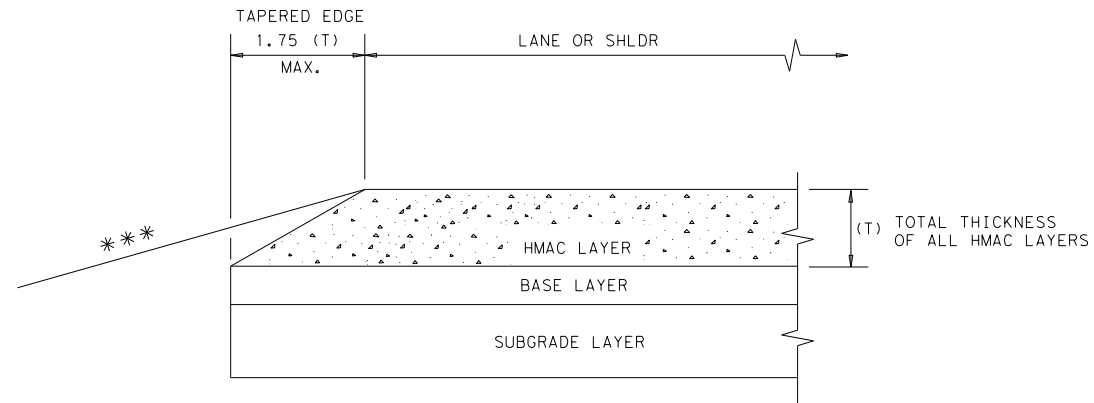
CONDITION - 1
 THIN HMAC SURFACES OR HMAC OVERLAY
 WITH THICKNESS OF 2.5" OR LESS



** 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.

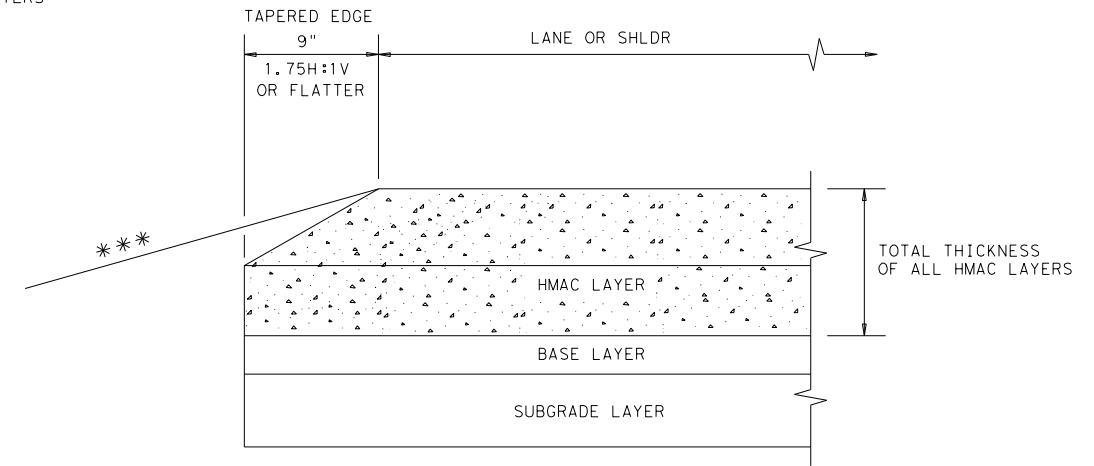
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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

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.

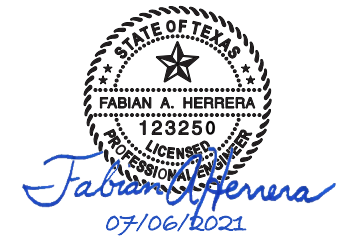
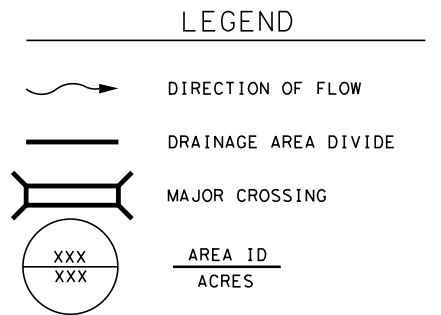
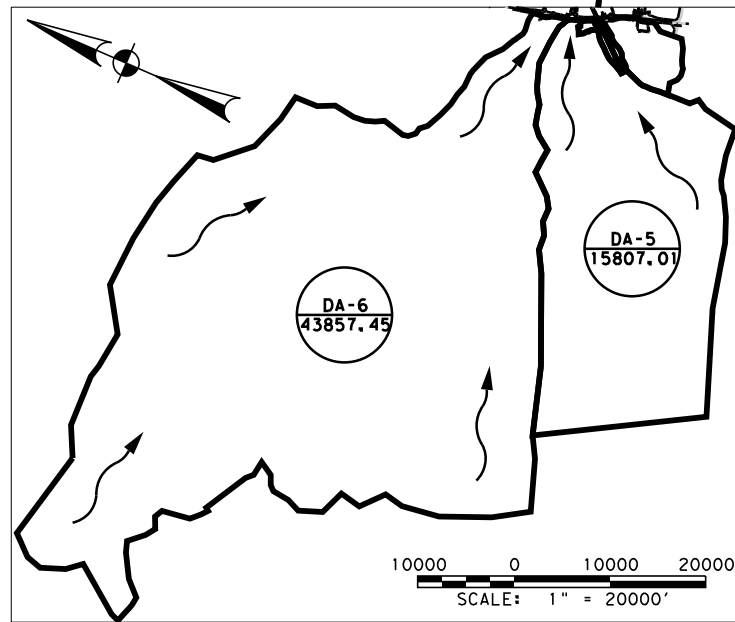
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				Design Division Standard	
TAPERED EDGE DETAILS HMAC PAVEMENT TE (HMAC) - 11					
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© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0015	09	194	IH 35	
	DIST	COUNTY		SHEET NO.	
	AUS	WILLIAMSON		126B	

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SCALE: 1" = 2000'
HORIZONTAL



RUNOFF CALCULATIONS

DRAINAGE AREA ID	METHOD	DRAINAGE AREA (ACRES)	Cr, Ci, Cv, Cs,					Tc (MIN)	I10 (IN/HR)	I25 (IN/HR)	I50 (IN/HR)	I100 (IN/HR)	Q10 (CFS)	Q25 (CFS)	Q50 (CFS)	Q100 (CFS)
			0.18	0.15	0.12	0.08	0.53									
DA-1	RATIONAL	45.00	0.18	0.15	0.12	0.08	0.53	40	3.66	4.46	5.12	5.83	87.4	106	122	139
DA-2	RATIONAL	77.98	0.16	0.10	0.12	0.10	0.48	110	1.93	2.42	2.83	3.28	72.4	90.5	106	123
DA-3	RATIONAL	75.63	0.16	0.10	0.14	0.10	0.50	100	2.06	2.57	2.99	3.46	77.9	97.0	113	131

RUNOFF CALCULATIONS

DRAINAGE AREA ID	METHOD	TIME OF CONCENTRATION HR	COMPOSITE AREA		COMPOSITE CN	S	Ia	10 YR		25 YR		50 YR		100 YR	
			ACRES	SQ. MI				RAINFALL DEPTH (P)	DISCHARGE (Q) (CFS)	RAINFALL DEPTH (P)	DISCHARGE (Q) (CFS)	RAINFALL DEPTH (P)	DISCHARGE (Q) (CFS)	RAINFALL DEPTH (P)	DISCHARGE (Q) (CFS)
			DA-4	NRCS				2.25	940.47	1.47	69	4.49	0.90	6.51	826.044
DA-5	NRCS	9	15807.01	24.70	66	5.15	1.03	6.51	4036.512	8.36	6151.645	9.96	8092.997	11.8	10411.344
DA-6	NRCS	13	43857.45	68.53	65	5.38	1.08	6.51	7852.765	8.36	12050.145	9.96	15915.970	11.8	20543.078

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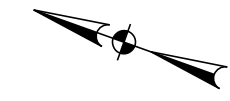
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OFFSITE
DRAINAGE AREA MAP

SHEET 1 OF 1

DS#	CONT	SECT	JOB	HIGHWAY
FH	0015	09	194	IH 35
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MVE	AUS	WILLIAMSON	127	

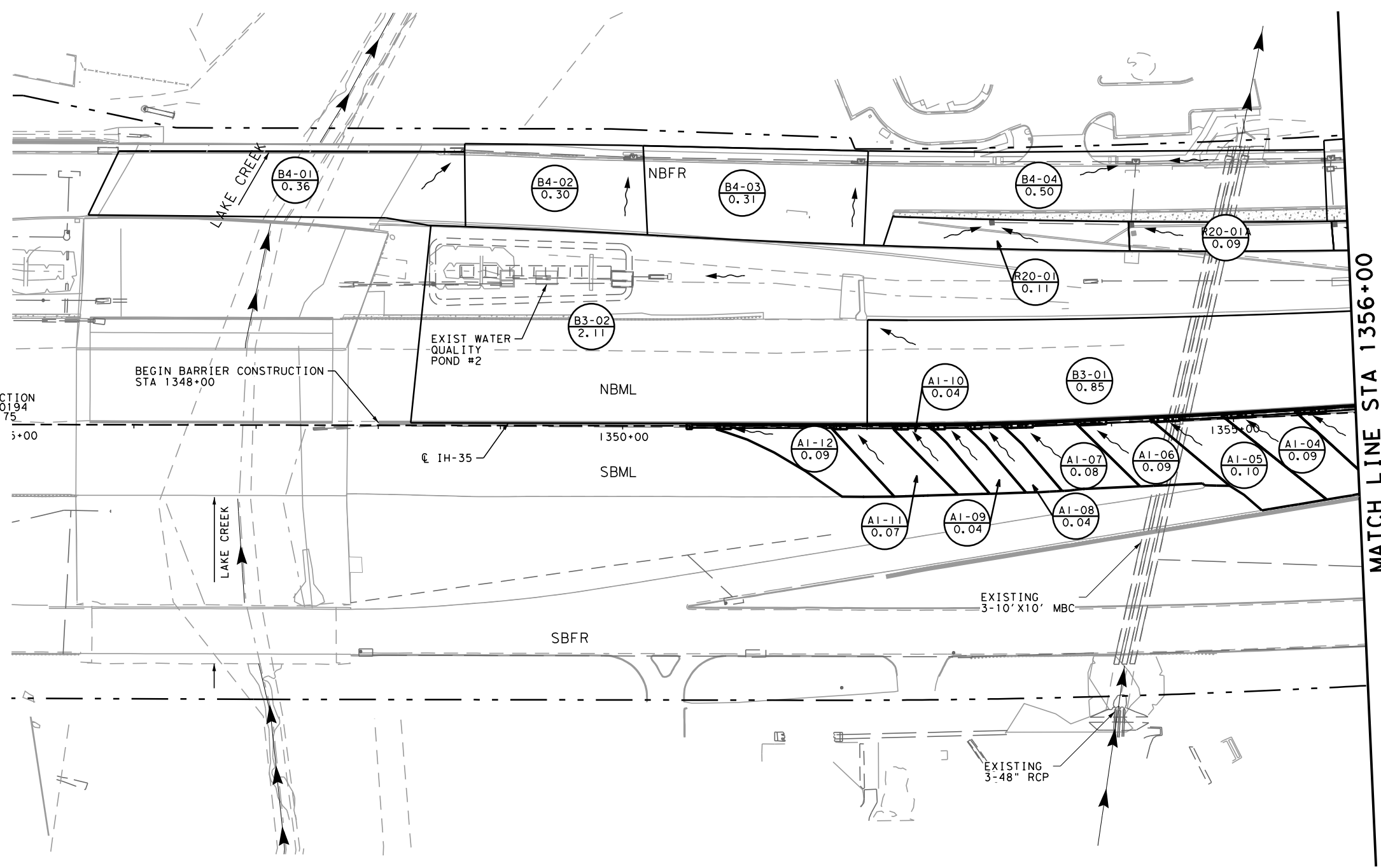
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 SCALE: 1" = 100'
 HORIZONTAL



LEGEND

- DIRECTION OF FLOW
- DRAINAGE AREA DIVIDE
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- AREA ID
ACRES



MATCH LINE STA 1356+00

BEGIN CONSTRUCTION
 CSJ 0015-09-0194
 STA 1311+3.75



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**IH 35
 DRAINAGE
 AREA MAP
 BEGIN TO STA 1356+00**

SHEET 1 OF 8

DS#	CONT	SECT	JOB	HIGHWAY
FH	GB	0015	09 194	IH 35
DW#	DIST	COUNTY	SHEET NO.	
MVE	AUS	WILLIAMSON	128	

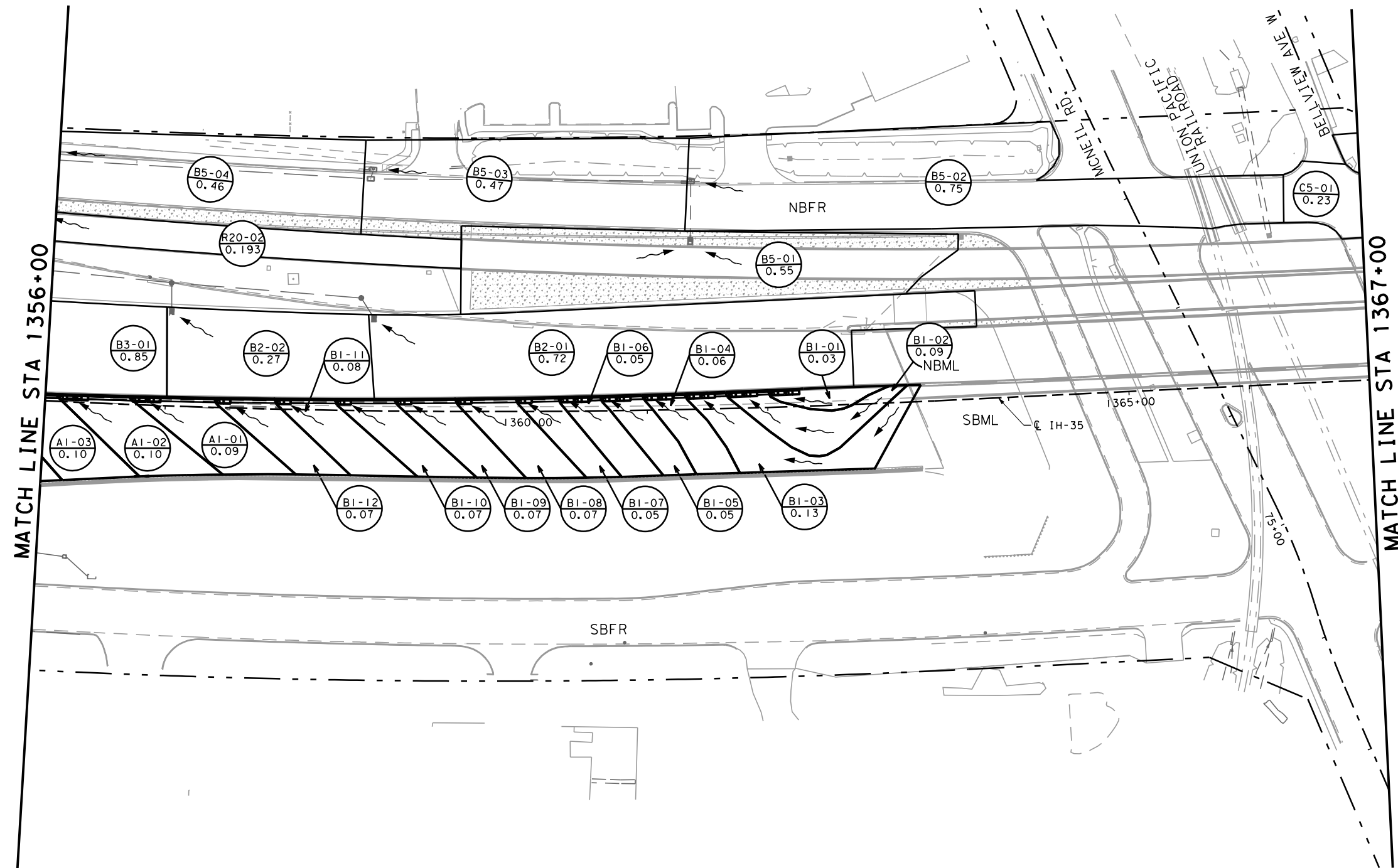
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 SCALE: 1" = 100'
 HORIZONTAL



LEGEND

- DIRECTION OF FLOW
- DRAINAGE AREA DIVIDE
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- AREA ID
ACRES



Fabian Herrera
 07/06/2021

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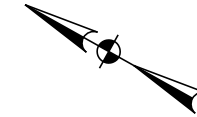
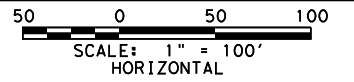
2021
 Texas Department of Transportation

**IH 35
 DRAINAGE
 AREA MAP**

SHEET 2 OF 8

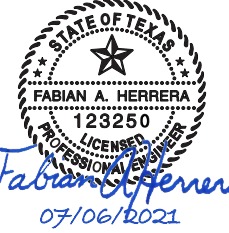
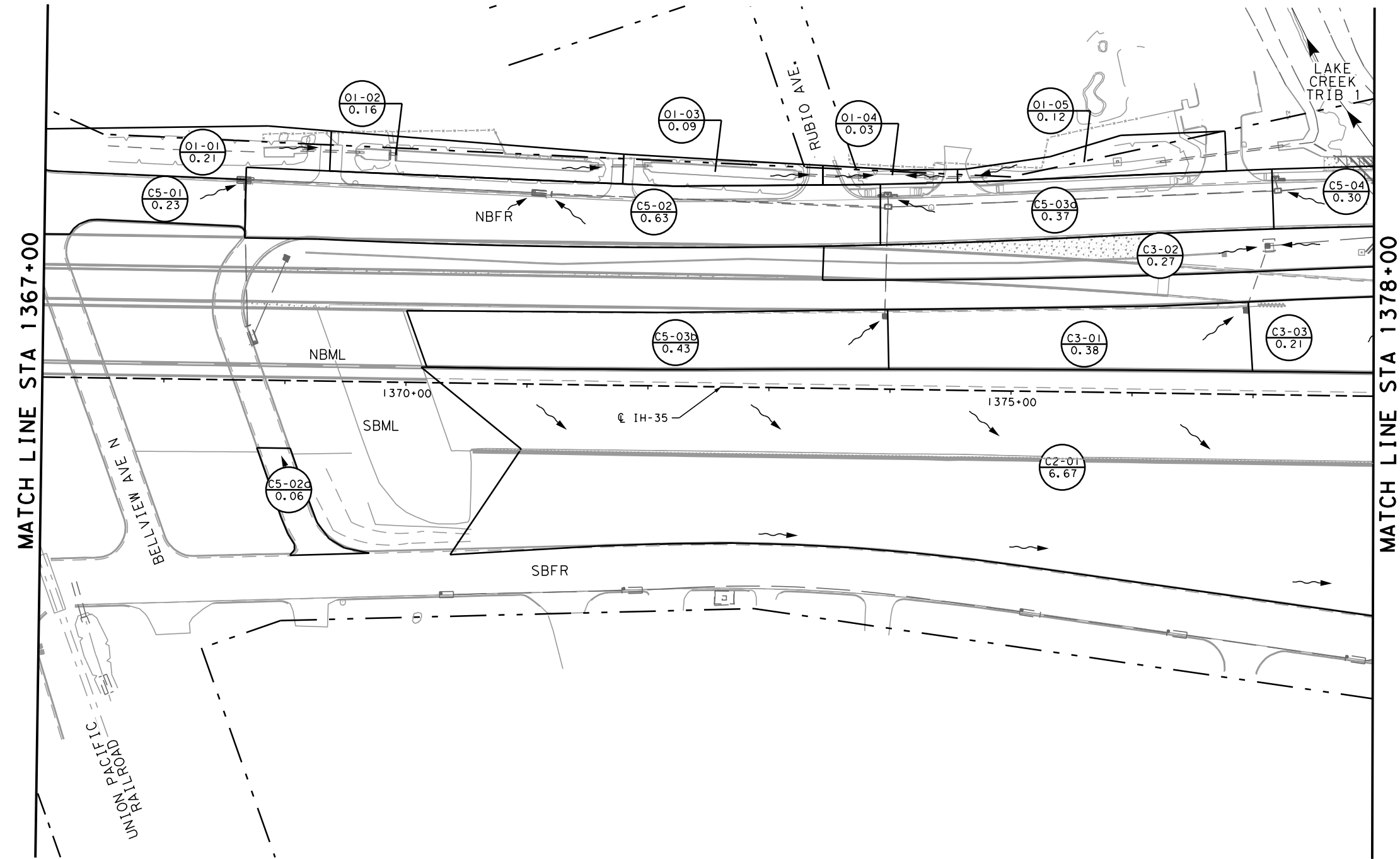
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DW#	CK#	DIST	COUNTY	SHEET NO.	
MVE	DH	AUS	WILLIAMSON	129	

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LEGEND

- DIRECTION OF FLOW
- DRAINAGE AREA DIVIDE
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- AREA ID
XXX
ACRES



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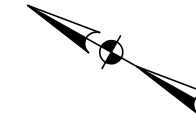
**IH 35
 DRAINAGE
 AREA MAP
 STA 1367+00 TO STA 1378+00**

SHEET 3 OF 8

DS#	CONT	SECT	JOB	HIGHWAY
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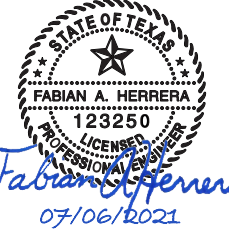
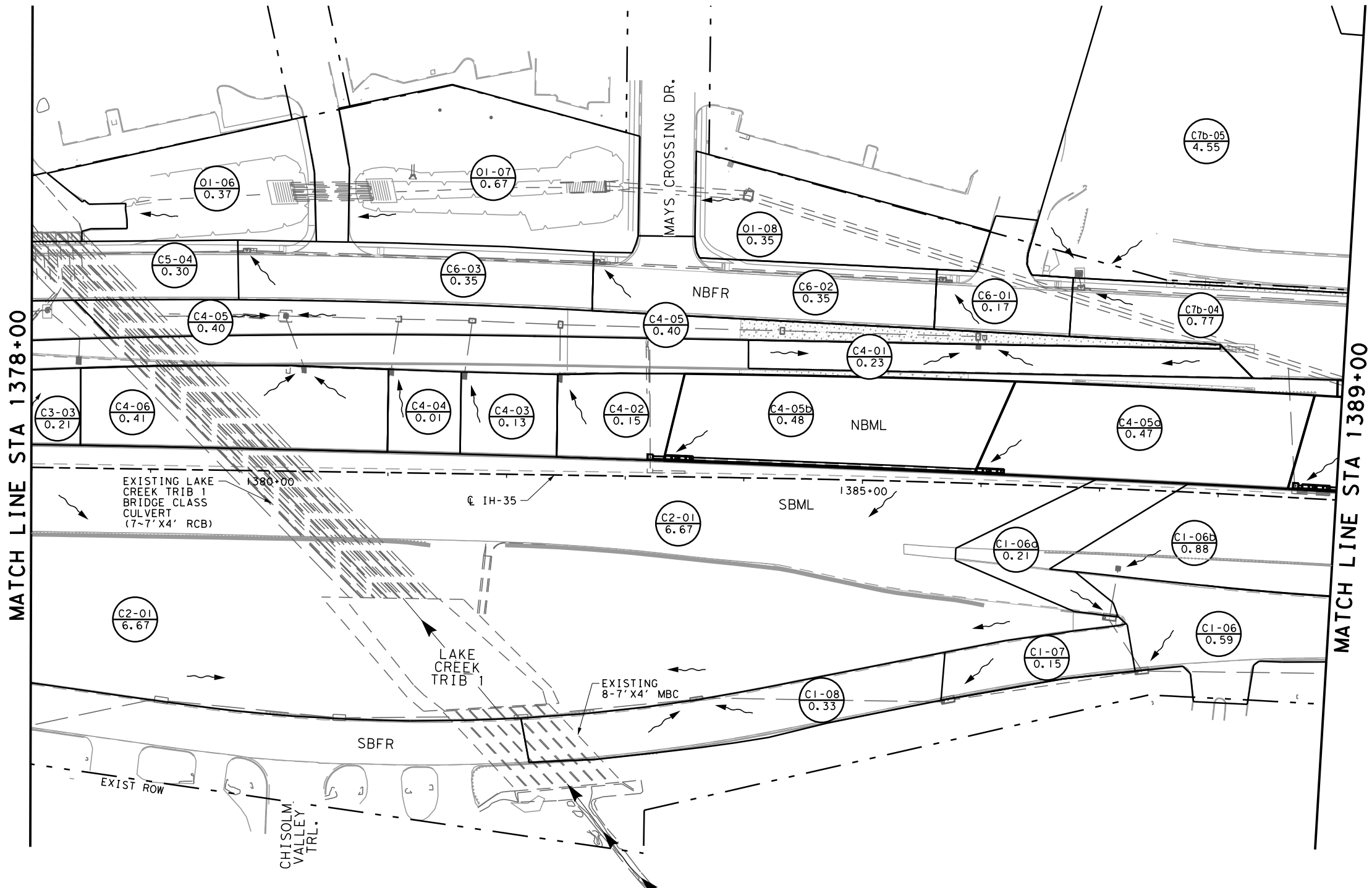
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 SCALE: 1" = 100'
 HORIZONTAL



LEGEND

- DIRECTION OF FLOW
- DRAINAGE AREA DIVIDE
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- AREA ID
ACRES



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Texas Department of Transportation

**IH 35
 DRAINAGE
 AREA MAP
 STA 1378+00 TO STA 1389+00**

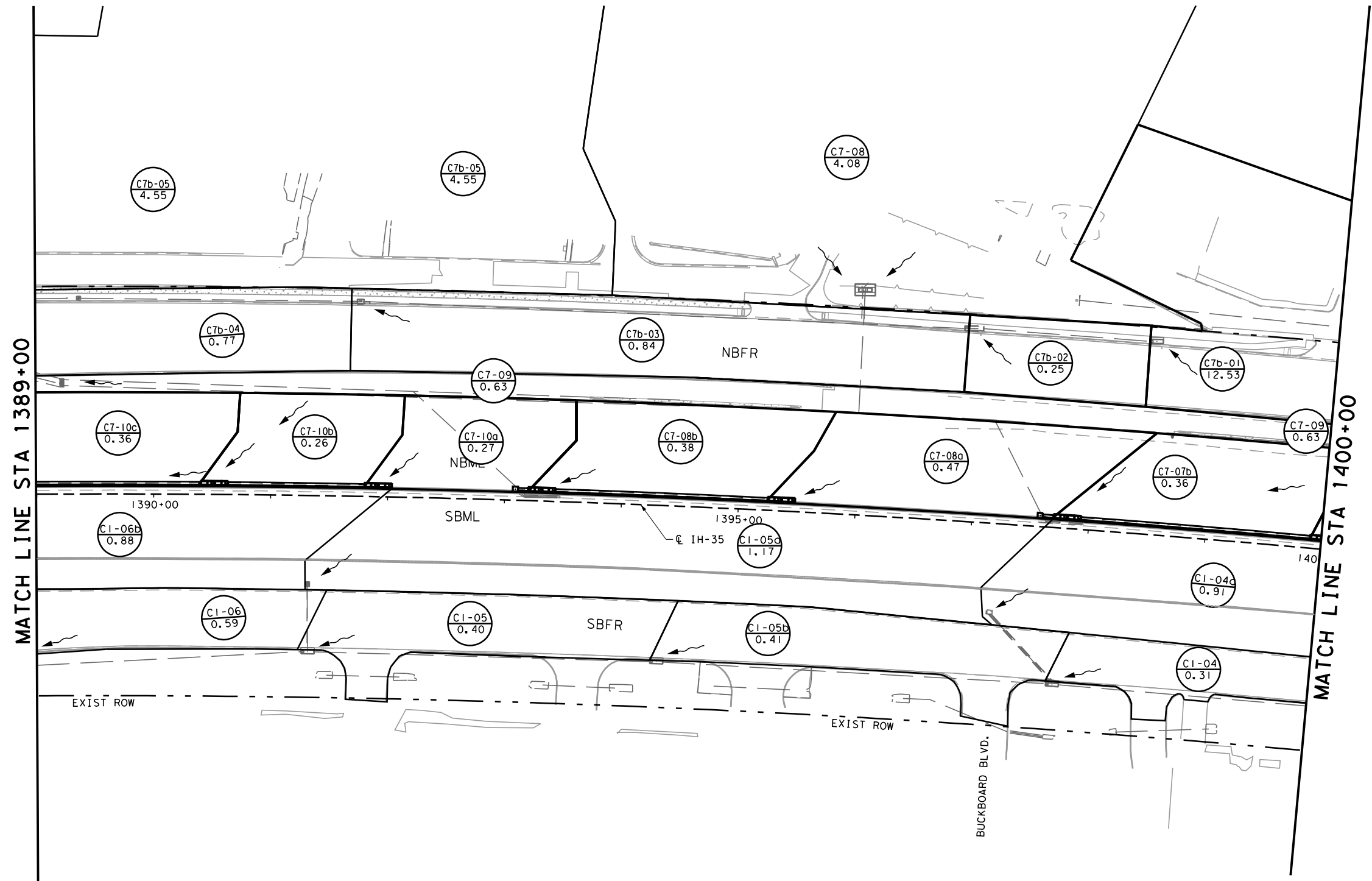
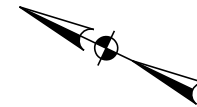
SHEET 4 OF 8

DS#	CK#	CONT	SECT	JOB	HIGHWAY
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MVE	DH	AUS	WILLIAMSON	131	

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SCALE: 1" = 100'
HORIZONTAL



LEGEND

- DIRECTION OF FLOW
- DRAINAGE AREA DIVIDE
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- AREA ID
ACRES



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TBPE FIRM REGISTRATION NO. F-9474

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264



IH 35
DRAINAGE
AREA MAP
1389+00 TO STA 1400+00

SHEET 5 OF 8

DS#	CONT	SECT	JOB	HIGHWAY
FH	GB	0015	09 194	IH 35
DW#	DIST	COUNTY	SHEET NO.	
MVE	AUS	WILLIAMSON	132	

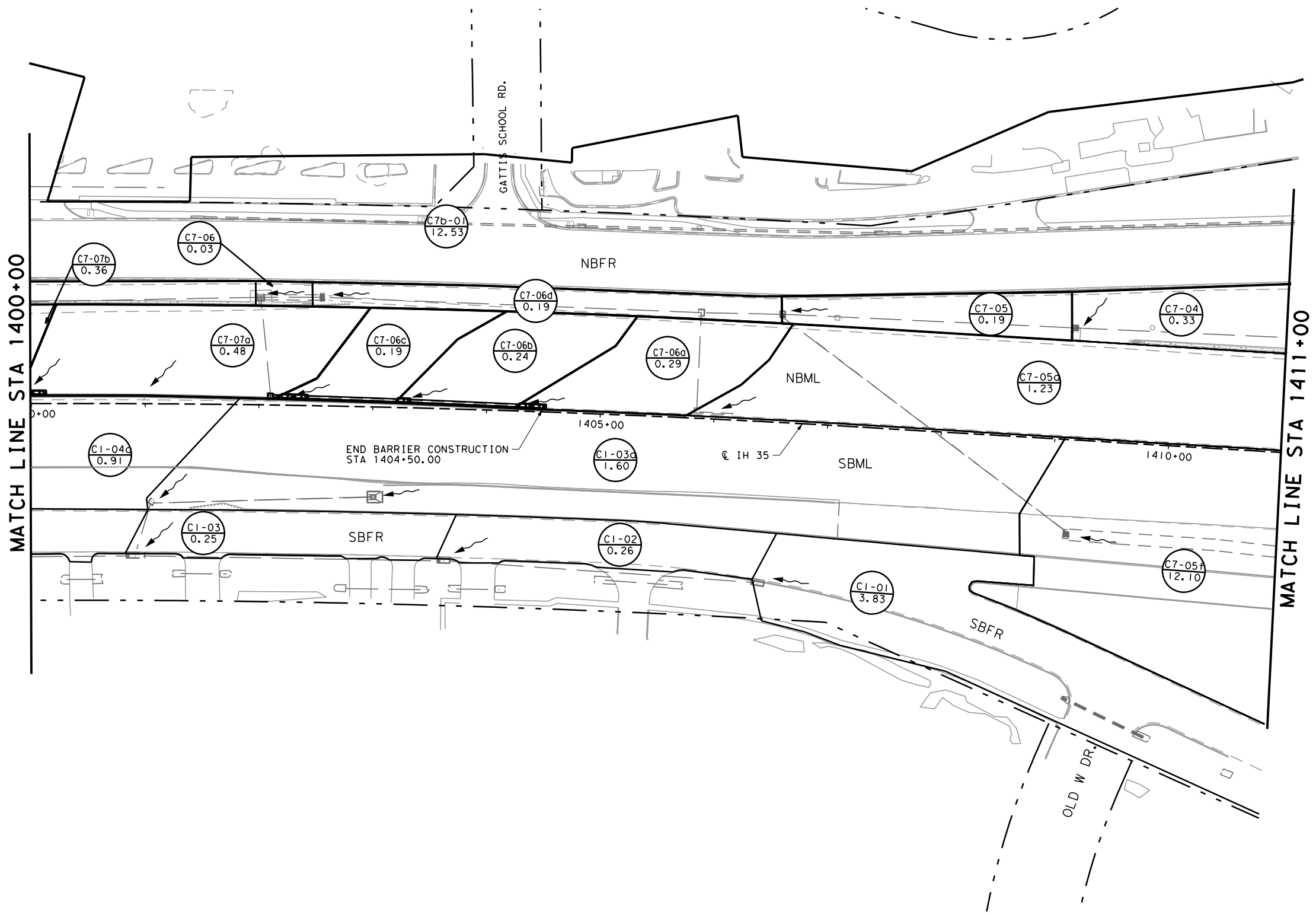
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 SCALE: 1" = 100'
 HORIZONTAL



LEGEND

- DIRECTION OF FLOW
- DRAINAGE AREA DIVIDE
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- AREA ID
XXX
ACRES



STATE OF TEXAS
 FABIAN A. HERRERA
 123250
 LICENSED PROFESSIONAL ENGINEER
Fabian Herrera
 07/06/2021

mve MV Engineering, Inc.
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 TBPE FIRM REGISTRATION NO. F-9474

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 CONSULTING ENGINEERS
 TBPE REGISTRATION NO. 264

2021
 Texas Department of Transportation

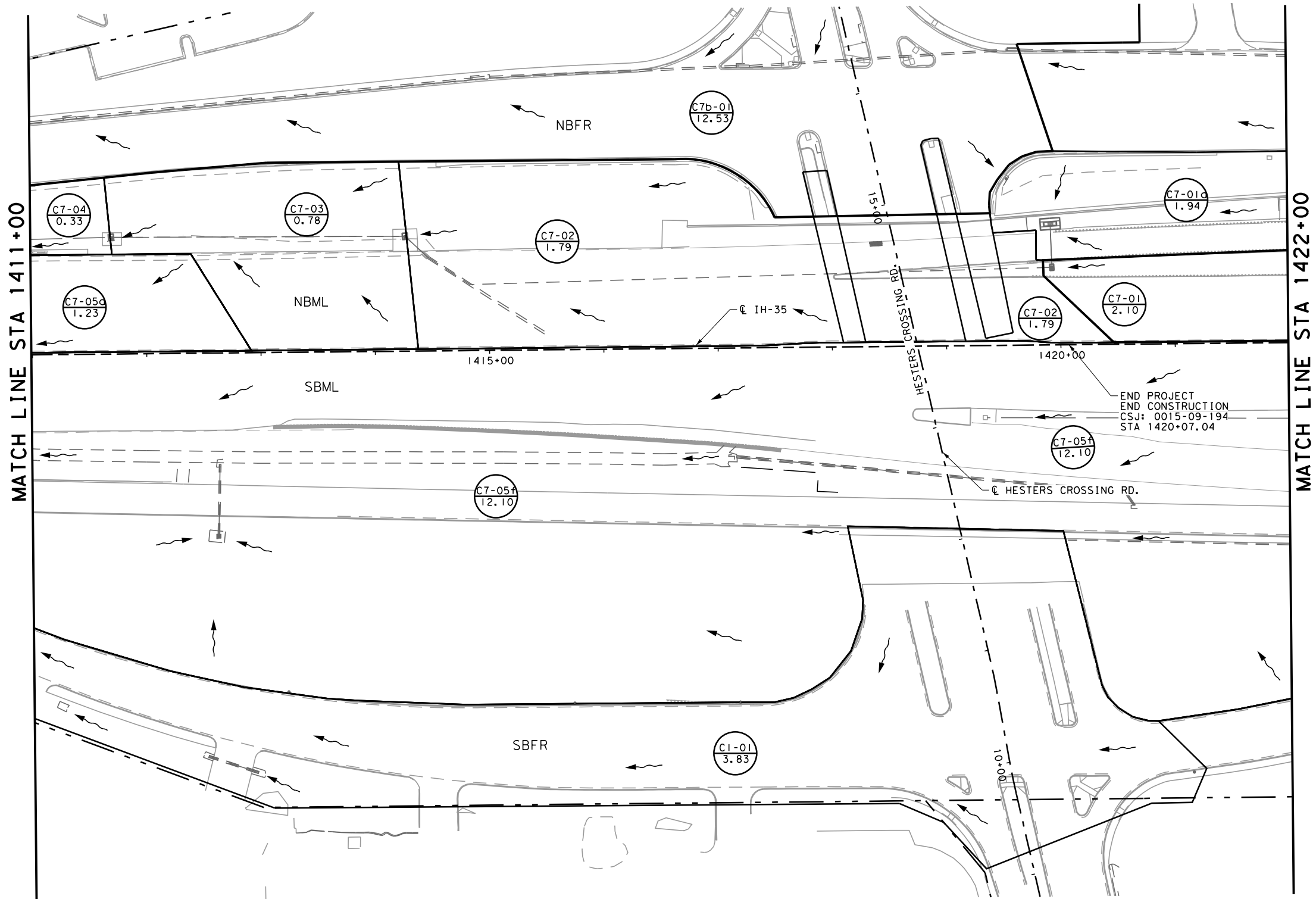
IH 35
 DRAINAGE
 AREA MAP
 STA 1400+00 TO STA 1411+00

SHEET 6 OF 8

DS#	CONT	SECT	JOB	HIGHWAY
FH	0015	09	194	IH 35
DW#	DIST	COUNTY	SHEET NO.	
MVE	AUS	WILLIAMSON	133	

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 SCALE: 1" = 100'
 HORIZONTAL



LEGEND

- DIRECTION OF FLOW
- DRAINAGE AREA DIVIDE
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- AREA ID
ACRES

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IH 35
DRAINAGE
AREA MAP
STA 1411+00 TO 1422+00

SHEET 7 OF 8

DS#	CONT	SECT	JOB	HIGHWAY
FH	0015	09	194	IH 35
DW#	DIST	COUNTY	SHEET NO.	
MVE	AUS	WILLIAMSON	134	

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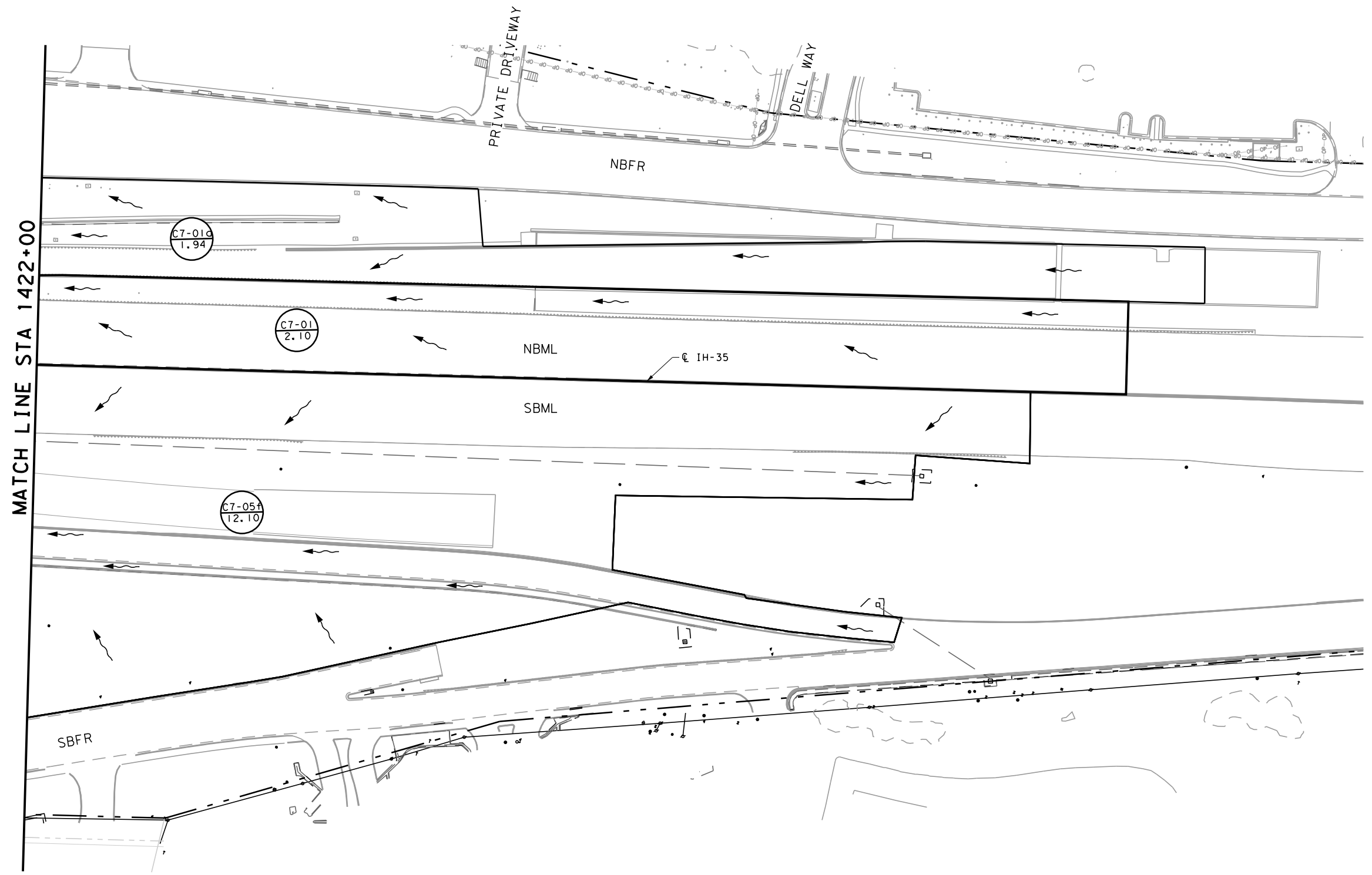
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SCALE: 1" = 100'
HORIZONTAL



LEGEND

- DIRECTION OF FLOW
- DRAINAGE AREA DIVIDE
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- AREA ID
ACRES



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TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

IH 35
DRAINAGE AREA MAP
STA 1422+00 TO END

SHEET 8 OF 8

DS#	CONT	SECT	JOB	HIGHWAY
FH	GB	0015	09 194	IH 35
DW#	DIST	COUNTY	SHEET NO.	
MVE	DH	AUS	WILLIAMSON	135

SYSTEM B1

CONVEYANCE CONFIGURATION DATA

Table with 12 columns: Link - ID, Link - Upstream Node, Link - Downstream Node, Link - Shape, Link - Number of Barrels, Link - Rise (ft), Link - Span (ft), Link - Invert Upstream (ft), Link - Invert Downstream (ft), Link - Actual Length (ft), Link - Slope (%), Link - Manning's N Value.

CUMULATIVE DISCHARGE

Table with 12 columns: Link - ID, Link - HGL Upstream (ft), Link - HGL Downstream (ft), Link - Friction Slope, Link - Uniform Depth (ft), Link - Actual Depth Downstream (ft), Link - Actual Depth Upstream (ft), Uniform Velocity (fps), Actual Velocity Downstream (fps), Actual Velocity Upstream (fps), Link - Discharge (cfs), Link - Capacity (cfs).

LINK CONFIGURATION SUBJECT TO CHANGE WITH FUTURE ADDENDUM. NOT FOR CONSTRUCTION SYSTEM B2

NOTES:

- 1. INTENSITIES USED ARE FROM SECTION 7.3 NORTH SEGMENT INTERPOLATED RAINFALL INTENSITIES (IN/HR) FOR GEOPAK/SUDA INPUT. IN THE MOBILITY35 WHITE PAPER: APPLICATION OF ATLAS 14 RAINFALL DATA TO THE CAPITAL EXPRESS PROJECT.
2. STORM SEWER MODEL CREATED WITH GEOPAK DRAINAGE SOFTWARE USING TXDOT_V81 DRAINAGE LIBRARY.
3. STORM DESIGN FREQUENCY MAINLANES: 10 YR FRONTAGE: 5 YR RAMP: 5 YR
4. ALL PROPOSED INLET SPACING BASED ON 10 YR DESIGN FREQUENCY.
5. NODES AND LINKS MARKED WITH (*) ARE EXISTING AND WILL REMAIN IN PLACE. EXISTING LINKS NOT MEETING CURRENT PROJECT CRITERIA WILL REMAIN IN PLACE. THESE NODES ARE INCLUDED TO CORRECTLY MODEL THE PROPOSED SYSTEMS.
6. MINIMUM TIME OF CONCENTRATION USED: 10 MIN. TIME OF CONCENTRATION WAS CALCULATED USING SHEET FLOW AND SHALLOW CONCENTRATED FLOW.
7. COMPOSITE C VALUE BASED ON C VALUES FROM TABLE 4-10. RUNOFF COEFFICIENTS FOR URBAN WATER SHEDS OF TXDOT HYDRAULIC DESIGN MANUAL
PAVEMENT/IMPERVIOUS= 0.9
DEVELOPED AREAS= 0.65
UNIMPROVED/GRASSY AREAS=0.35

RUNOFF COMPUTATION FOR DESIGN FREQUENCY - 10 YR

Table with 7 columns: Area - ID, Area - Composite C Value, Area - Area (ac), Area - Time of Concentration (min), Area - Tc Used (min), Area - Intensity (in/hr), Area - Discharge (cfs).

INLET CONFIGURATION DATA

Table with 12 columns: Inlet - ID, Inlet - Type, Inlet - Profile, Inlet - Curb Length (ft), Inlet - Spread N, Inlet - Grate Width (ft), Inlet - Grate Type, Inlet - Composite Spread Slope, Inlet - Spread Slope 1 (Longitudinal) (%), Inlet - Spread Width 1 (ft), Inlet - Spread Slope 2 (Lateral) (%), Inlet - Spread Width 2 (ft).

INLET COMPUTATION DATA

Table with 12 columns: Inlet - ID, Inlet - Type, Inlet - Discharge (cfs), Inlet - Capacity (cfs), Inlet - Max By Pass (cfs), Inlet - By Pass Flow (cfs), Inlet - By Pass Flow Into, Inlet - Length Required (ft), Inlet - Curb Length (ft), Inlet - Max Pondered Width (ft), Inlet - Computed Pondered Width (ft).

CONVEYANCE CONFIGURATION DATA

Table with 12 columns: Link - ID, Link - Upstream Node, Link - Downstream Node, Link - Invert Upstream (ft), Link - Invert Downstream (ft), Link - Shape, Link - Number of Barrels, Link - Span (ft), Link - Rise (ft), Link - Hydraulic Length (ft), Link - Slope (%), Link - Manning's N Value.



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BRIDGEFARMER & ASSOCIATES, INC. CONSULTING ENGINEERS TBPE REGISTRATION NO. 264



IH 35 HYDRAULIC CALCULATIONS SYSTEM B3 & B4 SHEET 3 OF 14

Project information table with columns: DIST, COUNTY, SHEET NO. Values: FH, GB, 0015, 09, 194, IH 35, DIST, COUNTY, SHEET NO., MVE, DH, AUS, WILLIAMSON, 138.

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SYSTEM B2

CUMULATIVE DISCHARGE

Link - ID	Link - HGL Upstream (ft)	Link - HGL Downstream (ft)	Link - Friction Slope	Link - Uniform Depth (ft)	Link - Actual Depth Downstream (ft)	Link - Actual Depth Upstream (ft)	Uniform Velocity (fps)	Actual Velocity Downstream (fps)	Actual Velocity Upstream (fps)	Link - Discharge (cfs)	Link - Capacity (cfs)
* B-2-MH	723.92	722.75	0.002	1.35	1.00	1.67	3.50	5.02	2.81	7.88	10.73
* B-2-02	723.96	723.92	0.002	0.68	1.50	1.50	2.83	1.25	1.25	2.21	5.48
* B-2-MH1	724.79	722.96	0.008	0.71	0.71	1.29	5.87	5.87	2.73	5.84	23.46
* B-2-01	725.04	724.79	0.005	0.95	1.29	1.44	4.97	3.61	3.35	5.84	8.69

SYSTEM B3

RUNOFF COMPUTATION FOR DESIGN FREQUENCY - 10 YR

Area - ID	Area - Composite C Value	Area - Composite Area (ac)	Area - Time of Concentration (min)	Area - Tc Used (min)	Area - Intensity (in/hr)	Area - Discharge (cfs)
* B3-02	0.54	2.145	10	10	7.38	8.55
* B3-01	0.9	0.913	10	10	7.38	6.06

CONVEYANCE CONFIGURATION DATA

Link - ID	Link - Upstream Node	Link - Downstream Node	Link - Invert Upstream (ft)	Link - Invert Downstream (ft)	Link - Shape	Link - Number of Barrels	Link - Rise (ft)	Link - Span (ft)	Link - Actual Length (ft)	Link - Slope (%)	Link - Manning's N Value
* B3-Out	B3-SB-OUT	B3-Out	715.50	714.08	Circular	1	2.50	n/a	210.91	0.67	0.012
* BS-SB2	B3-SB	B3-SB-OUT	716.43	715.50	n/a	1	3.15	12.00	9.25	10.00	0.012
* B3-SB1	B3-SN-IN	B3-SB	719.49	718.60	n/a	1	3.15	12.00	8.94	10.00	0.012
* B3-SB-I	B3-02	B3-SN-IN	719.72	718.60	Circular	1	2.50	n/a	13.67	8.20	0.012
* B3-02	B3-01a	B3-02	720.00	719.72	n/a	1	7.00	2.00	173.35	0.16	0.035
* B3-01	B3-01	B3-01a	724.45	721.00	n/a	1	0.50	3.00	34.54	10.00	0.012
* B3-01a	B2-Out	B3-01a	714.75	714.00	n/a	1	7.00	2.00	197.09	0.38	0.012

CUMULATIVE DISCHARGE

Link - ID	Link - HGL Upstream (ft)	Link - HGL Downstream (ft)	Link - Friction Slope	Link - Uniform Depth (ft)	Link - Actual Depth Downstream (ft)	Link - Actual Depth Upstream (ft)	Uniform Velocity (fps)	Actual Velocity Downstream (fps)	Actual Velocity Upstream (fps)	Link - Discharge (cfs)	Link - Capacity (cfs)
* B3-Out	717.50	715.60	0.007	1.52	1.52	2.00	7.97	7.97	5.94	24.95	24.95
* BS-SB2	717.45	717.50	0.100	0.17	2.00	1.03	11.96	1.04	2.02	24.95	24.95
* B3-SB1	720.64	718.83	0.100	0.17	0.23	1.14	11.96	8.88	1.82	24.95	24.95
* B3-SB-I	721.69	719.69	0.082	0.75	1.09	1.97	20.12	12.18	6.03	24.95	24.95
* B3-02	721.77	721.69	0.002	1.48	1.97	1.77	1.51	0.91	1.09	17.58	17.58
* B3-01	725.11	721.19	0.100	0.19	0.19	0.50	11.25	10.82	3.15	7.86	7.86
* B3-01a	721.78	721.77	0.004	0.41	7.00	7.00	3.26	0.02	0.02	4.87	4.87

SYSTEM B4

RUNOFF COMPUTATION FOR DESIGN FREQUENCY - 5 YR

Area - ID	Area - Composite C Value	Area - Composite Area (ac)	Area - Time of Concentration (min)	Area - Tc Used (min)	Area - Intensity (in/hr)	Area - Discharge (cfs)
* B4-04	0.90	0.503	10	10	6.24	2.83
* B4-03	0.90	0.309	10	10	6.24	1.74
* R20-01A	0.90	0.092	10	10	6.24	0.52
* B4-02	0.90	0.229	10	10	6.24	1.29
* R20-01	0.90	0.108	10	10	6.24	0.61
* B4-01	0.90	0.025	10	10	6.24	0.14

INLET CONFIGURATION DATA

Inlet - ID	Inlet - Type	Inlet-Profile	Inlet - Curb Length (ft)	Inlet - Spread N	Inlet - Curb Height (ft)	Inlet - Grate Width (ft)	Inlet - Grate Type	Inlet - Composite Spread Slope	Inlet - Spread Slope 1 (Longitudinal)	Inlet - Spread Width 1 (ft)	Inlet - Spread Slope 2 (Lateral) (%)	Inlet - Spread Width 2 (ft)
* B4-04	Curb	Sag	9.50	0.015	0.50	n/a	n/a	0.02	2.00	12.50	2.00	36.00
* B4-03	Curb	On Grade	9.50	0.015	0.50	n/a	n/a	0.02	2.00	12.50	2.00	65.00
* R20-01A	Grate	On Grade	n/a	0.015	n/a	3.17	parallel 1 7/8	0.02	2.00	24.00	0.00	0.00
* B4-02	Curb	On Grade	14.00	0.015	0.50	n/a	n/a	0.02	2.00	12.50	2.00	52.00
* R20-01	Grate	Sag	n/a	0.015	n/a	3.17	parallel 1 7/8	0.02	2.00	24.00	0.00	0.00
* B4-01	Curb	On Grade	15.00	0.015	0.50	n/a	n/a	0.02	2.00	12.50	2.00	48.00

NOTES:

- INTENSITIES USED ARE FROM SECTION 7.3 NORTH SEGMENT INTERPOLATED RAINFALL INTENSITIES (IN/HR) FOR GEOPAK/SUDA INPUT, IN THE MOBILITY35 WHITE PAPER; APPLICATION OF ATLAS 14 RAINFALL DATA TO THE CAPITAL EXPRESS PROJECT.
- STORM SEWER MODEL CREATED WITH GEOPAK DRAINAGE SOFTWARE USING TXDOT_V81 DRAINAGE LIBRARY.
- STORM DESIGN FREQUENCY MAINLANES: 10 YR FRONTAGE: 5 YR RAMPS: 5 YR
- ALL PROPOSED INLET SPACING BASED ON 10 YR DESIGN FREQUENCY.
- NODES AND LINKS MARKED WITH (*) ARE EXISTING AND WILL REMAIN IN PLACE. EXISTING LINKS NOT MEETING CURRENT PROJECT CRITERIA WILL REMAIN IN PLACE. THESE NODES ARE INCLUDED TO CORRECTLY MODEL THE PROPOSED SYSTEMS.
- MINIMUM TIME OF CONCENTRATION USED: 10 MIN. TIME OF CONCENTRATION WAS CALCULATED USING SHEET FLOW AND SHALLOW CONCENTRATED FLOW.
- COMPOSITE C VALUE BASED ON C VALUES FROM TABLE 4-10. RUNOFF COEFFICIENTS FOR URBAN WATER SHEDS OF TXDOT HYDRAULIC DESIGN MANUAL
PAVEMENT/IMPERVIOUS= 0.9
DEVELOPED AREAS= 0.65
UNIMPROVED/GRASSY AREAS=0.35



MV Engineering, Inc. 14850 Quorum Drive, Suite 120 Dallas, Texas 75254, Ph: 972.733.3618 <small>MV Engineering, Inc. Committed to Excellence TBPE FIRM REGISTRATION NO. F-9474</small>				
BRIDGEFARMER & ASSOCIATES, INC. CONSULTING ENGINEERS <small>TBPE REGISTRATION NO. 264</small>				
Texas Department of Transportation				
IH 35 HYDRAULIC CALCULATIONS SYSTEM B5				
SHEET 4 OF 14				
DS#	CONT	SECT	JOB	HIGHWAY
FH	0015	09	194	IH 35
DW#	CK#	DIST	COUNTY	SHEET NO.
MVE	DH	AUS	WILLIAMSON	139

SYSTEM C3

CONVEYANCE CONFIGURATION DATA

Link - ID	Link - Upstream Node	Link - Downstream Node	Link - Invert Upstream (ft)	Link - Invert Downstream (ft)	Link - Shape	Link - Number of Barrels	Link - Rise (ft)	Link - Actual Length (ft)	Link - Slope (%)	Link - Manning's N Value
* C-3-05	C3-MH1	C3-Out	716.79	716.14	Circular	1	1.50	20.23	2.96	0.012
* C-3-03	C3-02	C3-MH1	718.25	716.79	Circular	1	1.50	99.87	1.43	0.012
* C-3-04	C3-03	C3-MH1	716.89	716.79	Circular	1	1.50	47.69	0.17	0.012
* C-3-02	C3-JN2	C3-02	718.36	718.25	Circular	1	1.50	26.07	0.41	0.012
* C-3-01	C3-01	C3-JN2	718.44	718.36	Circular	1	1.50	30.20	0.26	0.012

CUMULATIVE DISCHARGE

Link - ID	Link - HGL Upstream (ft)	Link - HGL Downstream (ft)	Link - Friction Slope	Link - Uniform Depth (ft)	Link - Actual Depth Downstream (ft)	Link - Actual Depth Upstream (ft)	Uniform Velocity (fps)	Actual Velocity Downstream (fps)	Actual Velocity Upstream (fps)	Link - Discharge (cfs)	Link - Capacity (cfs)
* C-3-05	719.29	717.03	0.030	0.77	0.89	1.50	11.18	9.30	5.77	10.19	21.06
* C-3-03	719.81	719.29	0.014	0.73	1.50	1.50	7.61	3.69	3.69	6.51	14.64
* C-3-04	719.46	719.29	0.002	1.01	1.50	1.50	2.97	2.13	2.13	3.77	5.27
* C-3-02	719.88	719.81	0.004	0.88	1.50	1.50	4.36	2.66	2.66	4.69	7.81
* C-3-01	719.92	719.88	0.003	0.66	1.50	1.49	3.15	1.34	1.34	2.36	6.29

NOTES:

1. INTENSITIES USED ARE FROM SECTION 7.3 NORTH SEGMENT INTERPOLATED RAINFALL INTENSITIES (IN/HR) FOR GEOPAK/SUDA INPUT. IN THE MOBILITY35 WHITE PAPER: APPLICATION OF ATLAS 14 RAINFALL DATA TO THE CAPITAL EXPRESS PROJECT.
2. STORM SEWER MODEL CREATED WITH GEOPAK DRAINAGE SOFTWARE USING TXDOT_V8I DRAINAGE LIBRARY.
3. STORM DESIGN FREQUENCY MAINLANES: 10 YR FRONTAGE: 5 YR RAMPS: 5 YR
4. ALL PROPOSED INLET SPACING BASED ON 10 YR DESIGN FREQUENCY.
5. NODES AND LINKS MARKED WITH (*) ARE EXISTING AND WILL REMAIN IN PLACE. EXISTING LINKS NOT MEETING CURRENT PROJECT CRITERIA WILL REMAIN IN PLACE. THESE NODES ARE INCLUDED TO CORRECTLY MODEL THE PROPOSED SYSTEMS.
6. MINIMUM TIME OF CONCENTRATION USED: 10 MIN. TIME OF CONCENTRATION WAS CALCULATED USING SHEET FLOW AND SHALLOW CONCENTRATED FLOW.
7. COMPOSITE C VALUE BASED ON C VALUES FROM TABLE 4-10. RUNOFF COEFFICIENTS FOR URBAN WATER SHEDS OF TXDOT HYDRAULIC DESIGN MANUAL
PAVEMENT/IMPERVIOUS= 0.9
DEVELOPED AREAS= 0.65
UNIMPROVED/GRASSY AREAS=0.35

SYSTEM C4

RUNOFF COMPUTATION FOR DESIGN FREQUENCY - 10 YR

Area - ID	Area - Composite C Value	Area - Composite Area (ac)	Area - Time of Concentration (min)	Area - Tc Used (min)	Area - Intensity (in/hr)	Area - Discharge (cfs)
* C4-05	0.90	0.396	10	10	7.38	2.63
* C4-06	0.90	0.415	10	10	7.38	2.76
* C4-04	0.90	0.099	10	10	7.38	0.66
* C4-03	0.90	0.131	10	10	7.38	0.87
* C4-02	0.90	0.164	10	10	7.38	1.09
* C4-01	0.90	0.227	10	10	7.38	1.51
C4-05b	0.67	0.395	4.04	10	7.38	1.953
C4-05a	0.67	0.473	1.42	10	7.38	2.338

AREA CONFIGURATION
SUBJECT TO CHANGE
WITH FUTURE ADDENDUM.
NOT FOR CONSTRUCTION

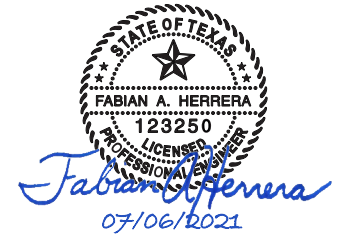
INLET CONFIGURATION DATA

Inlet - ID	Inlet - Type	Inlet-Profile	Inlet - Spread N	Inlet - Grate Width (ft)	Inlet - Grate Type	Inlet - Composite Spread Slope	Inlet - Spread Slope 1 (Longitudinal) (%)	Inlet - Spread Width 1 (ft)	Inlet - Spread Slope 2 (Lateral) (%)	Inlet - Spread Width 2 (ft)
* C4-05	Grate	Sag	0.015	3.17	parallel 1 7/8	0.05	5.00	10.00	0.00	0.00
* C4-06	Grate	Sag	0.015	3.17	parallel 1 7/8	0.02	2.00	10.00	0.00	0.00
* C4-04	Grate	On Grade	0.015	3.17	parallel 1 7/8	0.03	3.00	32.00	2.00	48.00
* C4-03	Grate	On Grade	0.015	3.17	parallel 1 7/8	0.03	3.00	32.00	2.00	48.00
* C4-02	Grate	On Grade	0.015	3.17	parallel 1 7/8	0.03	3.00	32.00	2.00	48.00
* C4-01	Grate	Sag	0.015	3.17	parallel 1 7/8	0.02	2.00	24.00	0.00	0.00
C4-05b	Curb	On Grade	0.015	n/a	n/a	0.02	2	82	0	0
C4-05a	Curb	On Grade	0.015	n/a	n/a	0.02	2	82	0	0

INLET COMPUTATION DATA

Inlet - ID	Inlet - Type	Inlet - Discharge (cfs)	Inlet - Capacity (cfs)	Inlet - Max By Pass (cfs)	Inlet - By Pass Flow (cfs)	Inlet - By Pass Flow Into	Inlet - Length Required (ft)	Inlet - Length (ft)	Inlet - Max Pondered Width (ft)	Inlet - Computed Pondered Width (ft)
* C4-05	Grate	2.63	6.91	1.00	0.00		n/a	n/a	19.00	5.25
* C4-06	Grate	2.77	9.10	1.00	0.00		n/a	n/a	15.00	11.32
* C4-04	Grate	0.68	0.67	1.00	0.01	C4-06	n/a	n/a	10.00	6.33
* C4-03	Grate	0.91	0.89	1.00	0.03	C4-04	n/a	n/a	10.00	5.42
* C4-02	Grate	1.09	1.05	1.00	0.04	C4-03	n/a	n/a	10.00	5.52
* C4-01	Grate	1.51	6.91	1.00	0.00		n/a	n/a	19.00	9.06
C4-05b	Curb	1.953	1.953	1	0		5.622	9	24	7.962
C4-05a	Curb	2.338	2.338	1	0	C4-05b	5.982	9	24	8.92

INLET CONFIGURATION SUBJECT TO CHANGE WITH FUTURE ADDENDUM. NOT FOR CONSTRUCTION



IH 35 HYDRAULIC CALCULATIONS SYSTEM C4 & C5

SHEET 8 OF 14

DS#	CONT	SECT	JOB	HIGHWAY
FH	GB	0015	09	194
DIST	COUNTY		SHEET NO.	
MVE	DH	AUS	WILLIAMSON	143

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SYSTEM C5

INLET COMPUTATION DATA

Inlet - ID	Inlet - Type	Inlet - Discharge (cfs)	Inlet - Capacity (cfs)	Inlet - Max By Pass (cfs)	Inlet - By Pass Flow (cfs)	Inlet - By Pass Flow Into	Inlet - Length Required (ft)	Inlet - Curb Length (ft)	Inlet - Max Poned Width (ft)	Inlet - Computed Poned Width (ft)
* C5-04	Curb	1.66	1.66	1.00	0.00	C5-03a	8.65	9.50	13.00	9.72
* C5-02	Curb	3.55	14.39	1.00	0.00		14.62	15.00	13.00	9.83
* C5-03a	Curb	2.59	2.59	1.00	0.00	C5-02	11.14	14.00	13.00	11.48
* C5-03b	Grate	2.09	1.59	1.00	0.50	C5-03a	n/a	n/a	13.00	10.58
* C5-01	Curb	1.30	1.30	1.00	0.00	C5-02	7.52	10.00	13.00	8.85
* C5-02a	Curb	1.30	1.30	1.00	0.00	C5-01	7.52	15.00	13.00	8.85
* C5-01a	Grate	1.30	9.10	1.00	0.00		n/a	n/a	13.00	6.83

CONVEYANCE CONFIGURATION DATA

Link - ID	Link - Upstream Node	Link - Downstream Node	Link - Invert Upstream (ft)	Link - Invert Downstream (ft)	Link - Shape	Link - Number of Barrels	Link - Span (ft)	Link - Rise (ft)	Link - Actual Length (ft)	Link - Slope (%)	Link - Manning's N Value
* C-5-07	C5-MH1	C5-JN1	715.65	714.92	Circular	1	n/a	1.50	78.00	0.90	0.012
* C-5-05	C5-MH2	C5-MH1	718.01	715.65	Circular	1	n/a	1.50	317.30	0.73	0.012
* C-5-06	C5-04	C5-MH1	716.68	715.65	Circular	1	n/a	1.50	7.35	10.00	0.012
* C-5-02	C5-02	C5-MH2	718.93	718.01	Circular	1	n/a	1.50	276.03	0.32	0.012
* C-5-03	C5-03a	C5-MH2	719.02	718.01	Circular	1	n/a	1.50	7.13	10.00	0.012
* C-5-04	C5-03b	C5-MH2	720.12	718.01	Circular	1	n/a	1.50	87.53	2.34	0.012
* C-5-01	C5-01	C5-02	719.56	718.93	Circular	1	n/a	1.50	251.74	0.25	0.012
* C-5-02a	C5-02a	C5-01	719.88	719.56	Circular	1	n/a	1.50	121.46	0.25	0.012
* C-5-01a	C5-01a	C5-02a	720.05	719.88	Circular	1	n/a	1.50	67.94	0.25	0.012

CUMULATIVE DISCHARGE

Link - ID	Link - HGL Upstream (ft)	Link - HGL Downstream (ft)	Link - Friction Slope	Link - Uniform Depth (ft)	Link - Actual Depth Downstream (ft)	Link - Actual Depth Upstream (ft)	Uniform Velocity (fps)	Actual Velocity Downstream (fps)	Actual Velocity Upstream (fps)	Link - Discharge (cfs)	Link - Capacity (cfs)
* C-5-07	719.46	716.21	0.009	1.32	1.29	1.50	6.90	7.04	6.43	11.36	11.63
* C-5-05	723.13	719.46	0.007	1.32	1.50	1.50	6.21	5.79	5.79	10.23	10.47
* C-5-06	719.47	719.46	0.100	0.22	1.50	1.50	10.37	0.94	0.94	1.66	38.71
* C-5-02	724.19	723.13	0.003	1.32	1.50	1.50	4.14	3.85	3.85	6.81	6.97
* C-5-03	723.15	723.13	0.100	0.25	1.50	1.50	11.10	1.19	1.19	2.09	38.71
* C-5-04	723.18	723.13	0.023	0.35	1.50	1.50	6.63	1.18	1.18	2.09	18.71
* C-5-01	724.56	724.19	0.002	0.90	1.50	1.50	3.36	2.11	2.11	3.73	6.00
* C-5-02a	724.67	724.56	0.002	0.70	1.50	1.50	3.13	1.44	1.44	2.55	6.11
* C-5-01a	724.69	724.67	0.002	0.48	1.50	1.50	2.63	0.73	0.73	1.30	6.10

RUNOFF COMPUTATION FOR DESIGN FREQUENCY - 5 YR

Area - ID	Area - Composite Value C	Area - Composite Area (ac)	Area - Time of Concentration (min)	Area - Tc Used (min)	Area - Intensity (in/hr)	Area - Discharge (cfs)
* C6-03	0.9	0.347	10	10	6.24	1.95
* C6-02	0.9	0.349	10	10	6.24	1.96
* C6-01	0.9	0.172	10	10	6.24	0.97

INLET CONFIGURATION DATA

Inlet - ID	Inlet - Type	Inlet-Profile	Inlet - Curb Length (ft)	Inlet - Spread N	Inlet - Curb Height (ft)	Inlet - Grate Width (ft)	Inlet - Grate Type	Inlet - Composite Spread Slope	Inlet - Spread Slope (Longitudinal)	Inlet - Spread Width (ft)
* C6-03	Curb	On Grade	9.50	0.015	0.50	n/a	n/a	0.02	2.00	13.00
* C6-02	Curb	On Grade	9.50	0.015	0.50	n/a	n/a	0.02	2.00	13.00
* C6-01	Curb	On Grade	9.50	0.015	0.50	n/a	n/a	0.02	2.00	13.00

INLET CONFIGURATION DATA

Inlet - ID	Inlet - Type	Inlet - Discharge (cfs)	Inlet - Capacity (cfs)	Inlet - Max By Pass (cfs)	Inlet - By Pass Flow (cfs)	Inlet - By Pass Flow Into	Inlet - Length Required (ft)	Inlet - Curb Length (ft)	Inlet - Max Poned Width (ft)	Inlet - Computed Poned Width (ft)
* C6-03	Curb	2.16	1.95	1.00	0.21	C6-out	13.09	9.50	13.00	8.53
* C6-02	Curb	1.96	1.75	1.00	0.21	C6-03	13.38	9.50	13.00	7.72
* C6-01	Curb	0.97	0.97	1.00	0.00	C6-02	9.60	9.50	13.00	5.61

NOTES:

- INTENSITIES USED ARE FROM SECTION 7.3 NORTH SEGMENT INTERPOLATED RAINFALL INTENSITIES (IN/HR) FOR GEOPAK/SUDA INPUT. IN THE MOBILITY35 WHITE PAPER: APPLICATION OF ATLAS 14 RAINFALL DATA TO THE CAPITAL EXPRESS PROJECT.
- STORM SEWER MODEL CREATED WITH GEOPAK DRAINAGE SOFTWARE USING TXDOT_V81 DRAINAGE LIBRARY.
- STORM DESIGN FREQUENCY MAINLANES: 10 YR FRONTAGE: 5 YR RAMPS: 5 YR
- ALL PROPOSED INLET SPACING BASED ON 10 YR DESIGN FREQUENCY.
- NODES AND LINKS MARKED WITH (*) ARE EXISTING AND WILL REMAIN IN PLACE. EXISTING LINKS NOT MEETING CURRENT PROJECT CRITERIA WILL REMAIN IN PLACE. THESE NODES ARE INCLUDED TO CORRECTLY MODEL THE PROPOSED SYSTEMS.
- MINIMUM TIME OF CONCENTRATION USED: 10 MIN. TIME OF CONCENTRATION WAS CALCULATED USING SHEET FLOW AND SHALLOW CONCENTRATED FLOW.
- COMPOSITE C VALUE BASED ON C VALUES FROM TABLE 4-10. RUNOFF COEFFICIENTS FOR URBAN WATER SHEDS OF TXDOT HYDRAULIC DESIGN MANUAL

PAVEMENT/IMPERVIOUS= 0.9
 DEVELOPED AREAS= 0.65
 UNIMPROVED/GRASSY AREAS=0.35

SYSTEM C6



IH 35
HYDRAULIC CALCULATIONS
SYSTEM C7

SHEET 10 OF 14

Dist	Cont	Sect	Job	Highway
FH	CK+	GB	0015 09	194
DW+	CK+	DH	AUS	WILLIAMSON

SHEET NO. **145**

1:27:21 PM
 7/6/2021
 fherrera
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SYSTEM C6

CONVEYANCE CONFIGURATION DATA

Link - ID	Link - Upstream Node	Link - Downstream Node	Link - Invert Upstream (ft)	Link - Invert Downstream (ft)	Link - Shape	Link - Number of Barrels	Link - Span (ft)	Link - Rise (ft)	Link - Actual Length (ft)	Link - Slope (%)	Link - Manning's N Value
* C-6-03	C6-03	C6-out	722.52	722.20	Circular	1	n/a	1.50	126.02	0.25	0.012
* C-6-02	C6-02	C6-03	728.92	722.52	Circular	1	n/a	1.50	294.58	2.15	0.012
* C-6-01	C6-01	C6-02	737.09	728.92	Circular	1	n/a	1.50	292.36	2.77	0.012

CUMULATIVE DISCHARGE

Link - ID	Link - HGL Upstream (ft)	Link - HGL Downstream (ft)	Link - Friction Slope	Link - Uniform Depth (ft)	Link - Actual Depth Downstream (ft)	Link - Actual Depth Upstream (ft)	Uniform Velocity (fps)	Actual Velocity Downstream (fps)	Actual Velocity Upstream (fps)	Link - Discharge (cfs)	Link - Capacity (cfs)
* C-6-03	723.57	723.02	0.003	1.01	0.82	1.06	3.62	4.63	3.46	4.60	6.12
* C-6-02	729.64	722.94	0.021	0.42	0.42	0.72	7.04	7.04	3.40	2.83	17.96
* C-6-01	737.59	729.15	0.028	0.23	0.23	0.50	5.62	5.62	1.89	0.97	20.36

SYSTEM C7

RUNOFF COMPUTATION FOR DESIGN FREQUENCY - 10 YR

Area - ID	Area - Composite C Value	Area - Composite Area (ac)	Area - Time of Concentration (min)	Area - Tc Used (min)	Area - Intensity (in/hr)	Area - Discharge (cfs)
* C7b-04	0.90	0.770	10	10	7.38	5.11
* C7b-05	0.59	4.522	17	17	5.80	15.40
* C7-09	0.35	0.626	10	10	7.38	1.62
C7-10b	0.90	0.542	2	10	7.38	3.60
* C7b-03	0.90	0.837	10	10	7.38	5.56
C7-10a	0.90	0.344	2	10	7.38	2.28
* C7B-2	0.90	0.245	10	10	7.38	1.63
* C7B-1	0.75	12.533	12	12	6.92	65.43
* C7-08	0.84	4.083	10	10	7.38	25.34
C7-08a	0.90	0.202	2	10	7.38	1.34
* C7-06	0.35	0.032	10	10	7.38	0.08
* C7-06d	0.90	0.194	10	10	7.38	1.29
C7-07b	0.90	0.188	2	10	7.38	1.25
C7-06c	0.90	0.159	2	10	7.38	1.06
C7-07a	0.90	0.480	2	10	7.38	3.19
* C7-05	0.69	0.189	2	10	7.38	0.96
C7-06b	0.90	0.208	2	10	7.38	1.38
* C7-04	0.35	0.328	10	10	7.38	0.85
* C7-05f	0.63	12.099	23	23	5.01	38.03
* C7-05a	0.90	1.233	10	10	7.38	8.19
C7-06a	0.90	0.712	2	10	7.38	4.73
* C7-03	0.58	0.779	10	10	7.38	3.35
* C7-02	0.70	1.790	10	10	7.38	9.22
* C7-01	0.82	2.104	10	10	7.38	12.67
* C7-01a	0.68	1.937	10	10	7.38	9.78

AREA CONFIGURATION
 SUBJECT TO CHANGE
 WITH FUTURE ADDENDUM.
 NOT FOR CONSTRUCTION

NOTES:

- INTENSITIES USED ARE FROM SECTION 7.3 NORTH SEGMENT INTERPOLATED RAINFALL INTENSITIES (IN/HR) FOR GEOPAK/SUDA INPUT. IN THE MOBILITY35 WHITE PAPER: APPLICATION OF ATLAS 14 RAINFALL DATA TO THE CAPITAL EXPRESS PROJECT.
- STORM SEWER MODEL CREATED WITH GEOPAK DRAINAGE SOFTWARE USING TXDOT_V81 DRAINAGE LIBRARY.
- STORM DESIGN FREQUENCY MAINLANES: 10 YR FRONTAGE: 5 YR RAMPS: 5 YR
- ALL PROPOSED INLET SPACING BASED ON 10 YR DESIGN FREQUENCY.
- NODES AND LINKS MARKED WITH (*) ARE EXISTING AND WILL REMAIN IN PLACE. EXISTING LINKS NOT MEETING CURRENT PROJECT CRITERIA WILL REMAIN IN PLACE. THESE NODES ARE INCLUDED TO CORRECTLY MODEL THE PROPOSED SYSTEMS.
- MINIMUM TIME OF CONCENTRATION USED: 10 MIN. TIME OF CONCENTRATION WAS CALCULATED USING SHEET FLOW AND SHALLOW CONCENTRATED FLOW.
- COMPOSITE C VALUE BASED ON C VALUES FROM TABLE 4-10. RUNOFF COEFFICIENTS FOR URBAN WATER SHEDS OF TXDOT HYDRAULIC DESIGN MANUAL

PAVEMENT/IMPERVIOUS= 0.9
 DEVELOPED AREAS= 0.65
 UNIMPROVED/GRASSY AREAS=0.35



MV Engineering, Inc.
 14850 Quorum Drive, Suite 120
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 TBPE FIRM REGISTRATION NO. F-9474

BRIDGEFARMER & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 TBPE REGISTRATION NO. 264

2021
 Texas Department of Transportation

IH 35
 HYDRAULIC
 CALCULATIONS
 SYSTEM C7

SHEET 11 OF 14

DS#	CK#	CONT	SECT	JOB	HIGHWAY
FH	GB	0015	09	194	IH 35
DW#	CK#	DIST	COUNTY	SHEET NO.	
MVE	DH	AUS	WILLIAMSON	146	

SYSTEM C7

CONVEYANCE CONFIGURATION DATA

Link - ID	Link - Upstream Node	Link - Downstream Node	Link - Invert Upstream (ft)	Link - Invert Downstream (ft)	Link - Shape	Link - Number of Barrels	Link - Span (ft)	Link - Rise (ft)	Link - Actual Length (ft)	Link - Slope (%)	Link - Manning's N Value
* C-07-JN13	C7-JN13	C7-OUT	735.14	726.42	Box	1	7.00	4.00	116.44	7.27	0.012
* C-07-JN9	C7-JN9	C7-JN13	736.00	735.14	Box	1	7.00	4.00	254.90	0.33	0.012
* C-07b-04	C7b-04	C7-JN9	736.25	736.00	Circular	1	n/a	3.00	31.25	0.74	0.012
* C-07-JN8	C7-JN8	C7-JN9	745.22	736.00	Box	1	7.00	4.00	218.18	4.23	0.012
* C-07b-05	C7b-05	C7b-04	737.50	737.00	Circular	1	n/a	2.00	8.84	4.05	0.012
* C-07-MH1	C7-MH1	C7b-04	739.00	736.50	Circular	1	n/a	3.00	257.69	0.95	0.012
* C-07-09	C7-09	C7-JN8	748.50	745.22	Box	1	7.00	4.00	66.32	4.58	0.012
C-07-10b	C7-10b	C7-JN8	745.60	745.22	Circular	1	n/a	2.00	100.62	0.37	0.012
* C-07b-03	C7b-03	C7-MH1	746.36	744.00	Circular	1	n/a	3.00	236.86	0.98	0.012
* C-07-JN12	C7-JN12	C7-09	752.40	749.04	Box	1	5.00	3.00	299.69	1.10	0.012
C-07-10a	C7-10a	C7-10b	750.35	745.60	Circular	1	n/a	2.00	275.19	1.70	0.012
* C-07B-2	C7B-2	C7b-03	759.70	756.00	Circular	1	n/a	3.00	515.13	0.70	0.012
* C-07-JN7	C7-JN7	C7-JN12	756.42	752.50	Box	1	5.00	3.00	377.29	1.04	0.012
* C-07-JN11	C7-JN11	C7-JN12	754.53	752.90	Circular	1	n/a	2.00	114.34	1.40	0.012
* C-07B-1	C7B-1	C7B-2	760.70	759.70	Circular	1	n/a	3.00	143.55	0.64	0.012
* C-07-08	C7-08	C7-JN7	761.00	756.92	Circular	1	n/a	2.00	103.32	3.88	0.012
* C-07-JN6	C7-JN6	C7-JN7	757.48	756.52	Box	1	5.00	3.00	116.43	0.83	0.012
C-07-08a	C7-08a	C7-JN11	754.57	754.53	Circular	1	n/a	2.00	11.73	0.25	0.012
* C-07-06	C7-06	C7-JN6	768.65	765.82	Box	1	5.00	2.00	489.04	0.58	0.012
* C-07-JN5	C7-JN5	C7-JN6	760.98	757.98	Circular	1	n/a	2.00	88.23	3.32	0.012
* C-07-06d	C7-06d	C7-06	769.29	768.65	Box	1	5.00	2.00	51.07	1.18	0.012
* C-07-JN4	C7-JN4	C7-06	769.54	768.65	Circular	1	n/a	3.00	83.36	1.03	0.012
C-07-07b	C7-07b	C7-JN5	761.02	760.98	Circular	1	n/a	2.00	11.53	0.25	0.012
* C-07-JN3	C7-JN3	C7-06d	773.14	769.29	Box	1	4.00	2.00	329.37	1.16	0.012
C-07-06c	C7-06c	C7-JN4	770.24	770.22	Circular	1	n/a	2.00	5.82	0.25	0.012
C-07-07a	C7-07a	C7-07b	765.23	761.11	Circular	1	n/a	2.00	215.15	1.87	0.012
* C-07-05	C7-05	C7-JN3	773.90	773.14	Box	1	4.00	2.00	67.49	1.06	0.012
* C-07-JN2	C7-JN2	C7-JN3	776.43	773.14	Circular	1	n/a	2.00	82.09	3.82	0.012
C-07-06b	C7-06b	C7-06c	771.82	770.24	Circular	1	n/a	2.00	100.00	1.50	0.012
* C-07-04	C7-04	C7-05	775.00	773.90	Box	1	3.00	2.00	253.77	0.43	0.012
* C-07-05f	C7-05f	C7-05	775.72	773.90	Circular	1	n/a	3.00	312.38	0.57	0.012
* C-07-05a	C7-05a	C7-JN2	776.53	776.43	Circular	1	n/a	2.00	1.82	2.62	0.012
C-07-06a	C7-06a	C7-06b	773.39	771.82	Circular	1	n/a	2.00	99.99	1.50	0.012
* C-07-03	C7-03	C7-04	776.19	775.00	Box	1	3.00	2.00	253.25	0.46	0.012
* C-07-02	C7-02	C7-03	784.00	776.19	Circular	1	n/a	2.00	255.31	3.04	0.012
* C-07-JN1a	C7-JN1a	C7-02	789.51	789.19	Circular	1	n/a	2.00	25.03	1.17	0.012
* C-07-JN1	C7-JN1	C7-JN1a	790.04	789.51	Circular	1	n/a	2.00	44.73	1.20	0.012
* C-07-01	C7-01	C7-JN1	796.00	790.04	Circular	1	n/a	2.00	507.85	1.17	0.012
* C-07-01a	C7-01a	C7-01	797.19	796.00	Circular	1	n/a	2.00	35.47	3.13	0.012

NOTES:

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- STORM SEWER MODEL CREATED WITH GEOPAK DRAINAGE SOFTWARE USING TXDOT_V81 DRAINAGE LIBRARY.
- STORM DESIGN FREQUENCY MAINLANES: 10 YR
FRONTAGE: 5 YR
RAMPS: 5 YR
- ALL PROPOSED INLET SPACING BASED ON 10 YR DESIGN FREQUENCY.
- NODES AND LINKS MARKED WITH (*) ARE EXISTING AND WILL REMAIN IN PLACE. EXISTING LINKS NOT MEETING CURRENT PROJECT CRITERIA WILL REMAIN IN PLACE. THESE NODES ARE INCLUDED TO CORRECTLY MODEL THE PROPOSED SYSTEMS.
- MINIMUM TIME OF CONCENTRATION USED: 10 MIN. TIME OF CONCENTRATION WAS CALCULATED USING SHEET FLOW AND SHALLOW CONCENTRATED FLOW.
- COMPOSITE C VALUE BASED ON C VALUES FROM TABLE 4-10. RUNOFF COEFFICIENTS FOR URBAN WATER SHEDS OF TXDOT HYDRAULIC DESIGN MANUAL
PAVEMENT/IMPERVIOUS= 0.9
DEVELOPED AREAS= 0.65
UNIMPROVED/GRASSY AREAS=0.35

LINK CONFIGURATION SUBJECT TO CHANGE WITH FUTURE ADDENDUM. NOT FOR CONSTRUCTION



IH 35 HYDRAULIC CALCULATIONS SYSTEM C7

SHEET 13 OF 14

DS#		CONT	SECT	JOB	HIGHWAY
FH	GB	0015	09	194	IH 35
DW#		COUNTY			SHEET NO.
MVE	DH	WILLIAMSON			148

SYSTEM C7

CUMULATIVE DISCHARGE												
Link - ID	Link - HGL Upstream (ft)	Link - HGL Downstream (ft)	Link - Friction Slope	Link - Uniform Depth (ft)	Link - Actual Depth Downstream (ft)	Link - Actual Depth Upstream (ft)	Uniform Velocity (fps)	Actual Velocity Downstream (fps)	Actual Velocity Upstream (fps)	Link - Discharge (cfs)	Link - Capacity (cfs)	
* C-07-JN13	737.75	727.41	0.073	0.86	0.99	2.61	26.08	22.75	8.61	157.11	1097.97	
* C-07-JN9	741.39	737.62	0.003	2.48	2.48	4.00	9.07	9.07	5.61	157.11	234.92	
* C-07b-04	746.98	741.39	0.011	3.00	3.00	3.00	11.59	11.30	11.30	79.84	62.19	
* C-07-JN8	747.48	736.75	0.042	0.73	0.75	2.26	18.24	17.85	5.93	93.56	837.10	
* C-07b-05	747.40	746.98	0.041	0.77	2.00	2.00	13.88	4.90	4.90	15.40	49.33	
* C-07-MH1	749.45	746.98	0.010	2.40	3.00	3.00	11.41	9.77	9.77	69.09	70.56	
* C-07-09	750.40	746.05	0.046	0.71	0.83	1.90	18.60	15.72	6.90	91.74	871.76	
C-07-10b	747.62	747.48	0.004	0.88	2.00	2.00	4.42	1.87	1.87	5.89	14.89	
* C-07b-03	751.74	749.45	0.010	2.38	3.00	3.00	11.51	9.77	9.77	69.09	71.45	
* C-07-JN12	754.81	750.52	0.011	1.47	1.48	2.41	12.31	12.23	7.54	90.70	186.77	
C-07-10a	751.07	745.96	0.017	0.36	0.36	0.71	5.89	5.88	2.28	2.28	31.92	
* C-07B-2	762.89	758.61	0.007	3.00	2.61	3.00	9.62	10.17	9.37	66.25	60.64	
* C-07-JN7	759.53	754.00	0.010	1.49	1.50	3.00	12.05	12.00	5.99	89.83	181.36	
* C-07-JN11	755.12	753.19	0.014	0.29	0.29	0.59	4.70	4.70	1.76	1.34	29.01	
* C-07B-1	766.09	762.89	0.007	3.00	3.00	3.00	9.50	9.26	9.26	65.43	57.75	
* C-07-08	764.91	758.00	0.039	1.03	1.08	2.00	15.57	14.62	8.07	25.34	48.30	
* C-07-JN6	761.57	757.98	0.008	1.40	1.46	3.00	10.51	10.13	4.92	73.78	161.57	
C-07-08a	755.18	755.12	0.002	0.45	0.59	0.61	2.56	1.76	1.66	1.34	12.25	
* C-07-06	771.55	767.40	0.006	1.58	1.58	2.00	9.16	9.16	7.23	72.28	75.18	
* C-07-JN5	762.08	758.41	0.033	0.43	0.43	1.10	9.08	9.00	2.50	4.44	44.67	
* C-07-06d	771.86	771.55	0.012	1.17	2.00	2.00	11.54	6.74	6.74	67.37	107.66	
* C-07-JN4	771.60	771.55	0.010	0.64	2.90	2.06	6.67	1.06	1.44	7.42	73.25	
C-07-07b	762.11	762.08	0.002	0.84	1.10	1.09	3.57	2.50	2.53	4.44	12.25	
* C-07-JN3	776.36	770.72	0.012	1.42	1.43	2.00	11.81	11.74	8.40	67.23	81.28	
C-07-06c	771.63	771.60	0.003	1.12	1.38	1.39	4.12	3.21	3.20	7.42	12.25	
C-07-07a	766.08	761.53	0.019	0.42	0.42	0.85	6.74	6.74	2.51	3.19	33.53	
* C-07-05	778.42	776.36	0.011	1.38	2.00	2.00	11.18	7.74	7.74	61.90	77.95	
* C-07-JN2	777.49	773.71	0.038	0.56	0.57	1.06	11.40	11.06	4.84	8.19	47.91	
C-07-06b	772.78	770.87	0.015	0.63	0.63	0.96	7.58	7.51	4.28	6.36	30.02	
* C-07-04	779.43	778.42	0.004	1.61	2.00	2.00	6.79	5.46	5.46	32.76	34.53	
* C-07-05f	779.75	778.42	0.006	1.85	3.00	3.00	8.32	5.38	5.38	38.03	54.76	
* C-07-05a	778.04	777.28	0.026	0.62	0.85	1.51	9.94	6.46	3.22	8.19	39.63	
C-07-06a	774.46	772.35	0.015	0.53	0.54	1.07	6.94	6.91	2.74	4.67	30.02	
* C-07-03	780.48	779.43	0.005	1.52	2.00	2.00	7.04	5.34	5.34	32.01	35.95	
* C-07-02	788.05	777.43	0.030	1.24	1.24	2.00	14.71	14.61	9.54	29.98	42.70	
* C-07-JN1d	791.28	790.69	0.012	1.41	1.50	1.77	9.48	8.89	7.62	22.40	26.50	
* C-07-JN1	793.02	790.96	0.012	1.39	1.46	2.00	9.59	9.15	7.13	22.40	26.85	
* C-07-01	799.21	791.45	0.012	1.41	1.41	2.00	9.48	9.46	7.13	22.40	26.50	
* C-07-01a	799.42	799.21	0.031	0.65	2.00	2.00	11.15	3.11	3.11	9.78	43.39	

LINK CONFIGURATION SUBJECT TO CHANGE WITH FUTURE ADDENDUM. NOT FOR CONSTRUCTION

NOTES:

- INTENSITIES USED ARE FROM SECTION 7.3 NORTH SEGMENT INTERPOLATED RAINFALL INTENSITIES (IN/HR) FOR GEOPAK/SUDA INPUT, IN THE MOBILITY35 WHITE PAPER: APPLICATION OF ATLAS 14 RAINFALL DATA TO THE CAPITAL EXPRESS PROJECT.
- STORM SEWER MODEL CREATED WITH GEOPAK DRAINAGE SOFTWARE USING TXDOT_V81 DRAINAGE LIBRARY.
- STORM DESIGN FREQUENCY MAINLANES: 10 YR
FRONTAGE: 5 YR
RAMPS: 5 YR
- ALL PROPOSED INLET SPACING BASED ON 10 YR DESIGN FREQUENCY.
- NODES AND LINKS MARKED WITH (*) ARE EXISTING AND WILL REMAIN IN PLACE. EXISTING LINKS NOT MEETING CURRENT PROJECT CRITERIA WILL REMAIN IN PLACE. THESE NODES ARE INCLUDED TO CORRECTLY MODEL THE PROPOSED SYSTEMS.
- MINIMUM TIME OF CONCENTRATION USED: 10 MIN. TIME OF CONCENTRATION WAS CALCULATED USING SHEET FLOW AND SHALLOW CONCENTRATED FLOW.
- COMPOSITE C VALUE BASED ON C VALUES FROM TABLE 4-10. RUNOFF COEFFICIENTS FOR URBAN WATER SHEDS OF TXDOT HYDRAULIC DESIGN MANUAL

PAVEMENT/IMPERVIOUS= 0.9
DEVELOPED AREAS= 0.65
UNIMPROVED/GRASSY AREAS=0.35

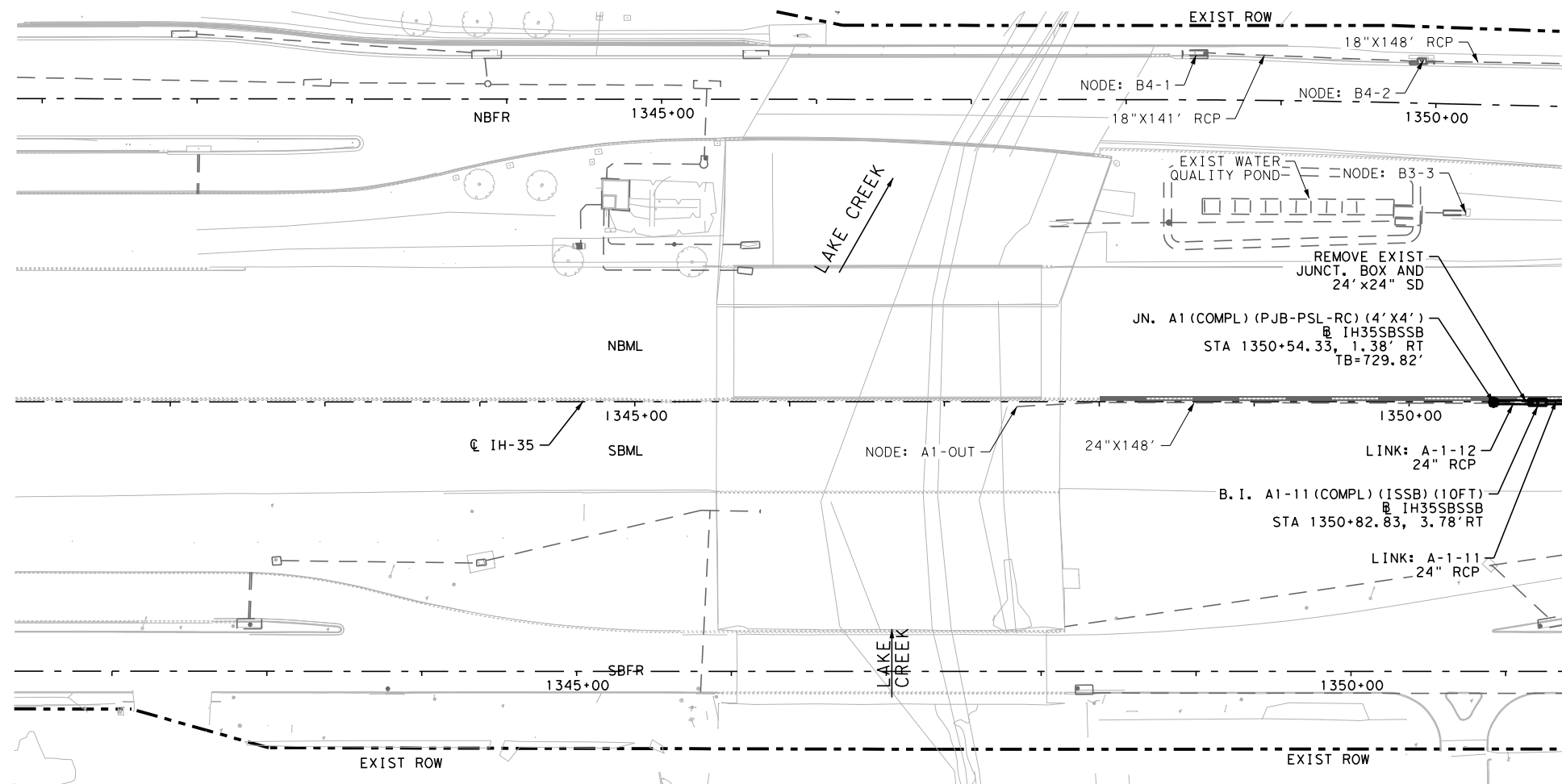


**IH 35
HYDRAILIC
DATA SHEET
SYSTEM C7**

DS#		CONT		SECT		JOB		HIGHWAY	
FH	GB	0015	09	194	IH 35				
DW#		DIST		COUNTY		SHEET NO.			
MVE	DH	AUS	WILLIAMSON	149					

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MATCH LINE STA 1351+00

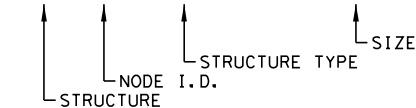
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SCALE: 1" = 10' VERTICAL



PROP DRAINAGE STRUCTURE LEGEND

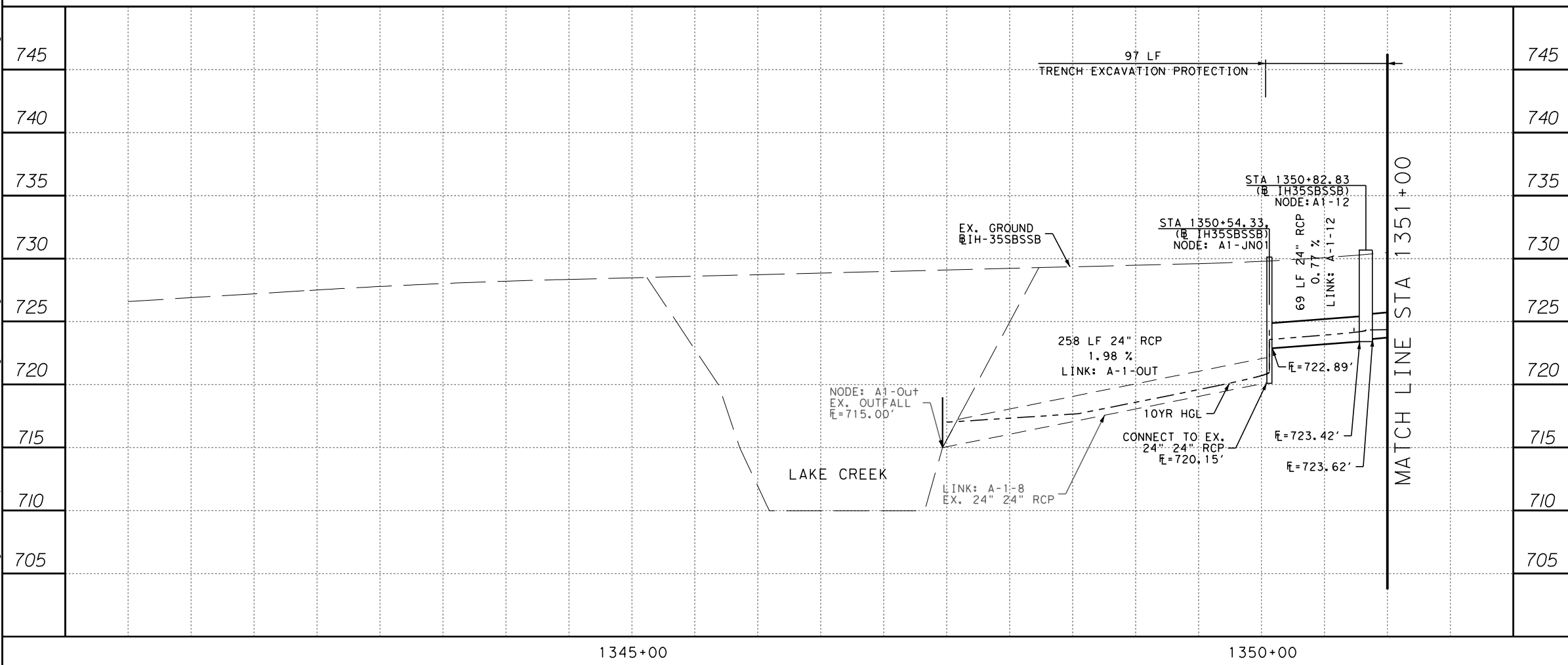
B. I. A1-2 (COMPL) (PMBD) (X FT)



- B. I. = BARRIER INLET
- JN. = JUNCTION BOX
- OUT = OUTLET
- RCP = REINFORCED CONCRETE PIPE
- TB = TOP OF BOX
- = CONCRETE TRAFFIC BARRIER (CTB)

DRAINAGE NOTES:

1. OFFSETS TO ALL PROP B. I. S, MANHOLES OR JUNCTION BOXES ARE TO CENTER OF STRUCTURE.
2. CONNECTING PIPES SHOULD ENTER WITHIN 10° OF NORMAL TO THE INLET/MH WALL. IF NECESSARY, PRECAST PIPE ELBOWS OR CURVED APPROACH ALIGNMENT SHOULD BE USED TO STAY WITHIN THIS LIMIT.



MATCH LINE STA 1351+00



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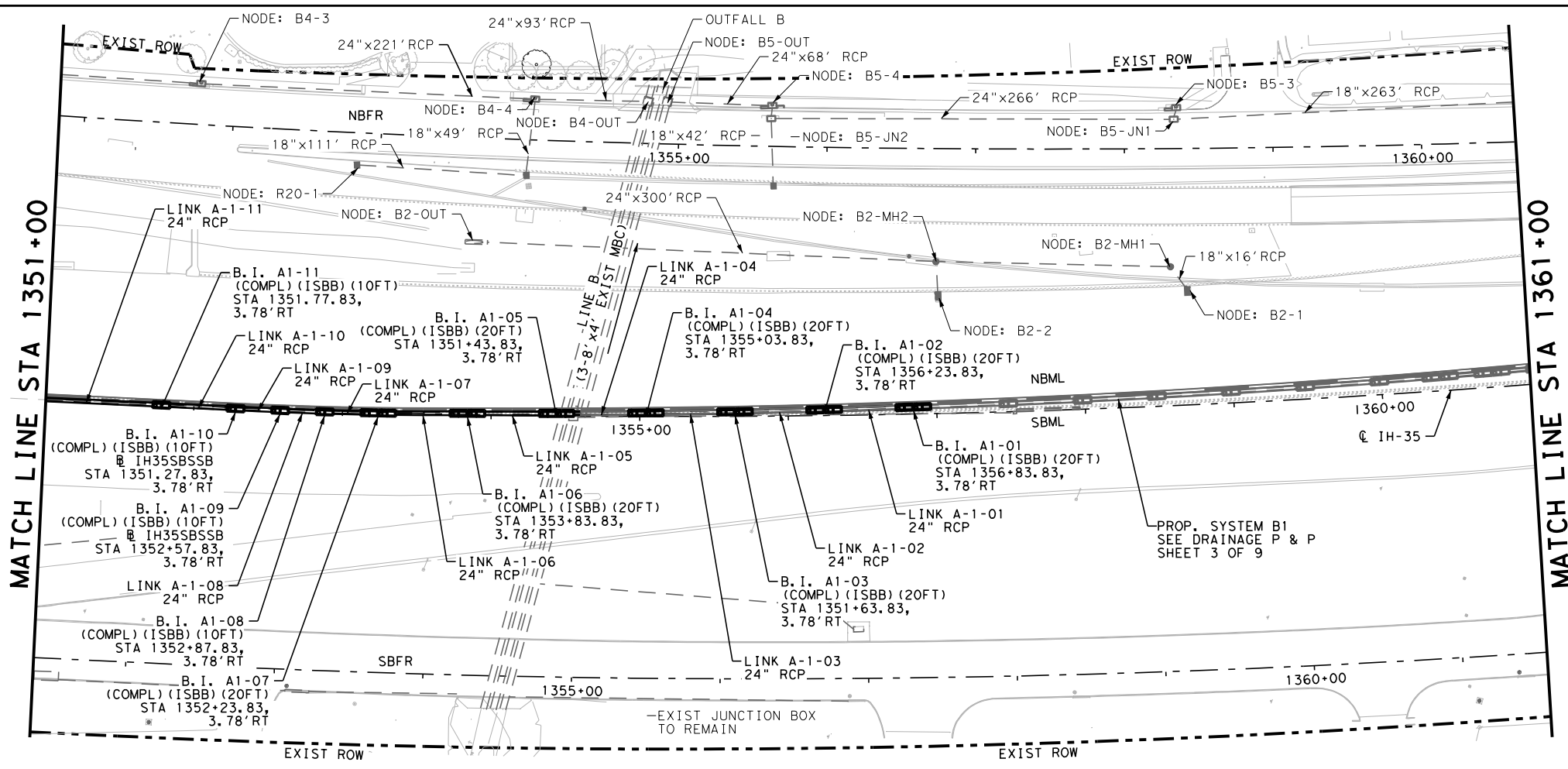
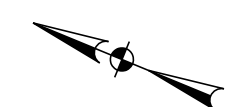
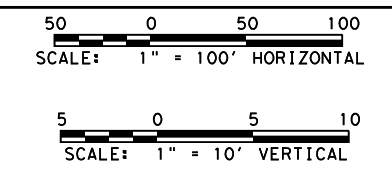
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**IH-35
DRAINAGE
PLAN AND PROFILE
STA 1341+00 TO STA 1351+00**

SHEET 1 OF 9			
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FH	0015	09	194
DIST	COUNTY		SHEET NO.
DW#	AUS	WILLIAMSON	150

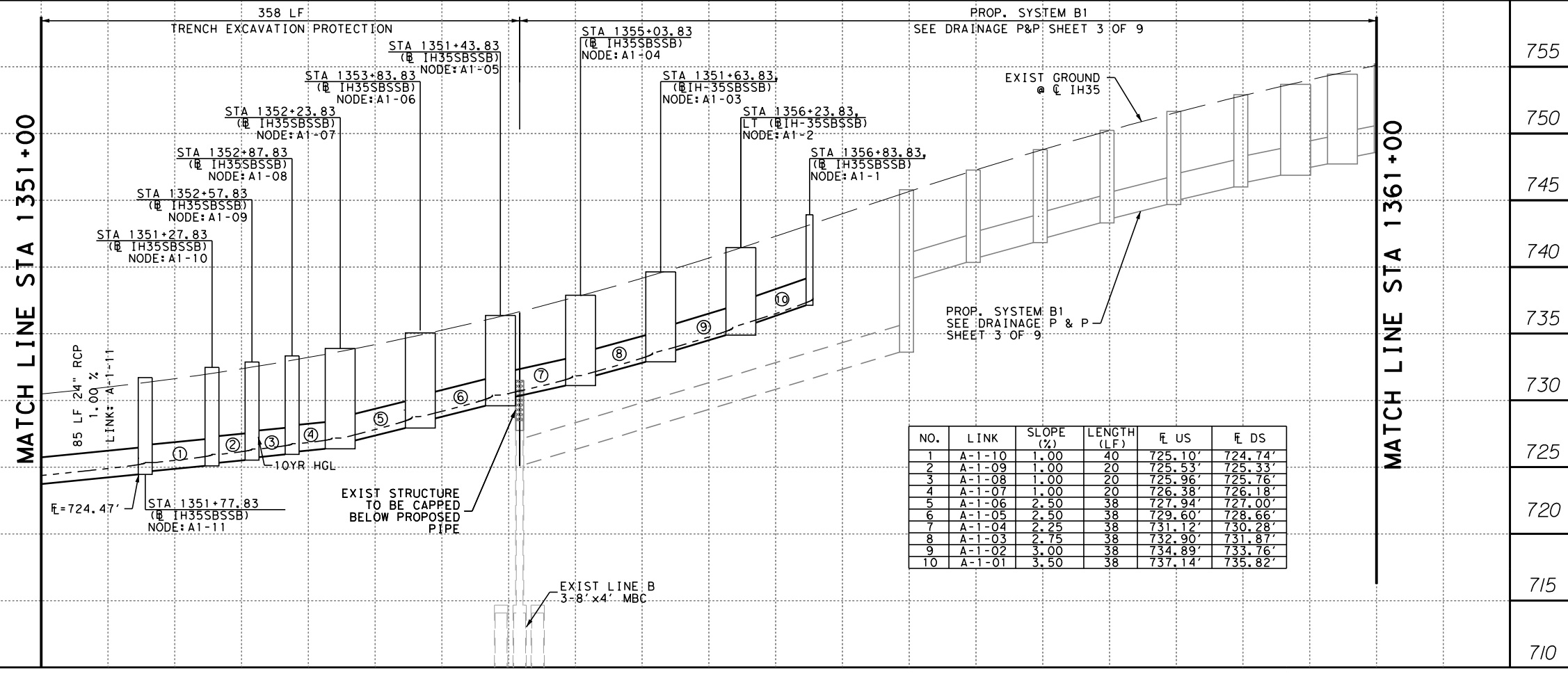
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- PROP DRAINAGE STRUCTURE LEGEND**
- B. I. A1-2 (COMPL) (ISBB) (X FT)
- STRUCTURE TYPE → SIZE
- NODE I. D. → STRUCTURE
- B. I. = BARRIER INLET
 JN. = JUNCTION BOX
 OUT = OUTLET
 RCP = REINFORCED CONCRETE PIPE
 TB = TOP OF BOX
 = CONCRETE TRAFFIC BARRIER (CTB)

- DRAINAGE NOTES:**
- OFFSETS TO ALL PROP B. I. S, MANHOLES OR JUNCTION BOXES ARE TO CENTER OF STRUCTURE.
 - CONNECTING PIPES SHOULD ENTER WITHIN 10° OF NORMAL TO THE INLET/MH WALL. IF NECESSARY, PRECAST PIPE ELBOWS OR CURVED APPROACH ALIGNMENT SHOULD BE USED TO STAY WITHIN THIS LIMIT.



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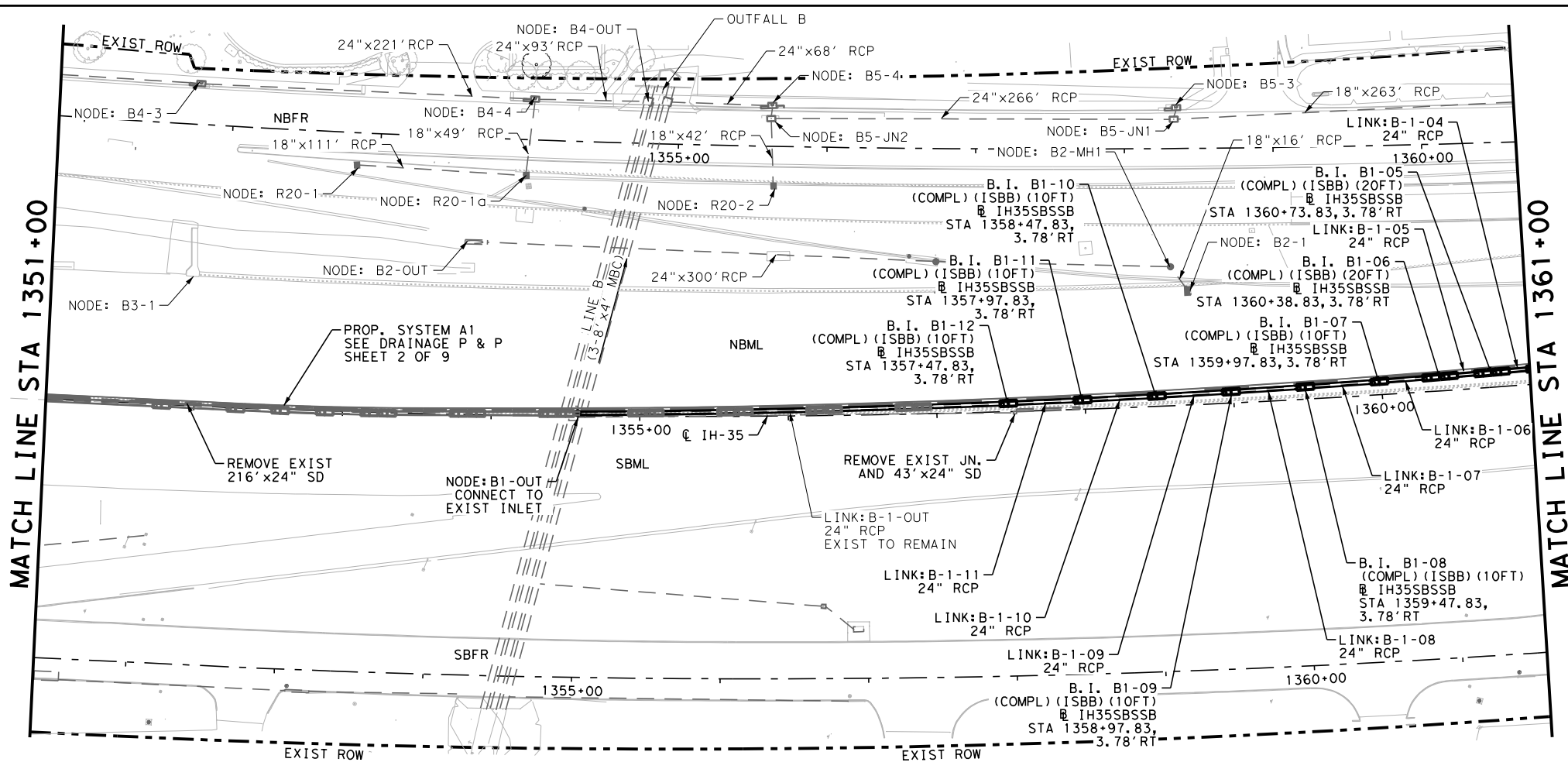
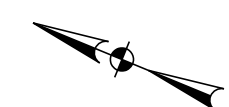
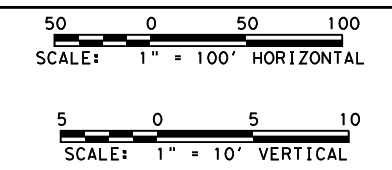
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**IH-35
 DRAINAGE
 PLAN AND PROFILE
 STA 1351+00 TO STA 1361+00**

SHEET 2 OF 9

DS1	CONT	SECT	JOB	HIGHWAY
FH	0015	09	194	IH 35
DW#	DIST	COUNTY	SHEET NO.	
MVE	AUS	WILLIAMSON	151	

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PROP DRAINAGE STRUCTURE LEGEND

B. I. A1-2 (COMPL) (ISBB) (X FT)

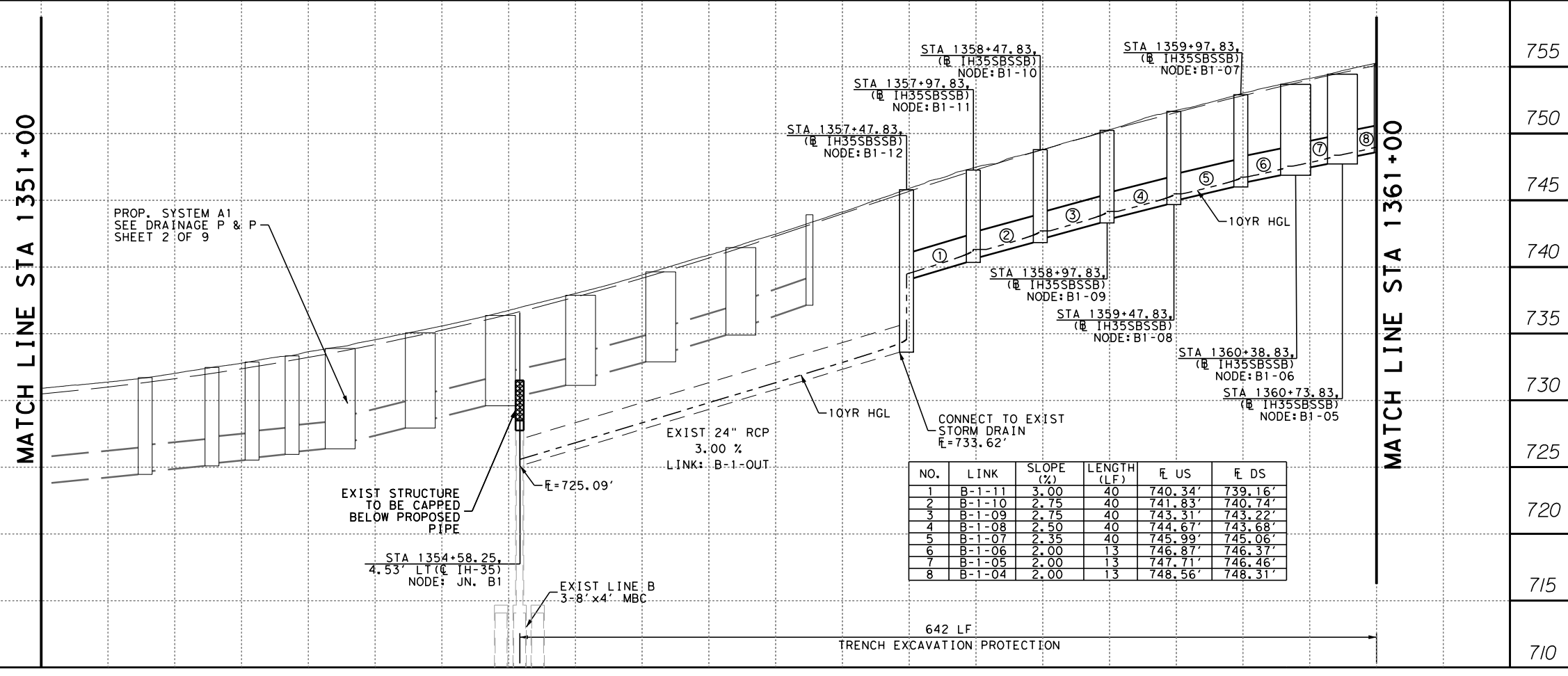
STRUCTURE TYPE → SIZE

NODE I. D. → STRUCTURE

B. I. = BARRIER INLET
 JN. = JUNCTION BOX
 OUT = OUTLET
 RCP = REINFORCED CONCRETE PIPE
 TB = TOP OF BOX
 CTB = CONCRETE TRAFFIC BARRIER (CTB)

- DRAINAGE NOTES:**
1. OFFSETS TO ALL PROP B. I. S, MANHOLES OR JUNCTION BOXES ARE TO CENTER OF STRUCTURE.
 2. CONNECTING PIPES SHOULD ENTER WITHIN 10° OF NORMAL TO THE INLET/MH WALL. IF NECESSARY, PRECAST PIPE ELBOWS OR CURVED APPROACH ALIGNMENT SHOULD BE USED TO STAY WITHIN THIS LIMIT.

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NO.	LINK	SLOPE (%)	LENGTH (LF)	ℓ US	ℓ DS
1	B-1-11	3.00	40	740.34'	739.16'
2	B-1-10	2.75	40	741.83'	740.74'
3	B-1-09	2.75	40	743.31'	743.22'
4	B-1-08	2.50	40	744.67'	743.68'
5	B-1-07	2.35	40	745.99'	745.06'
6	B-1-06	2.00	13	746.87'	746.37'
7	B-1-05	2.00	13	747.71'	746.46'
8	B-1-04	2.00	13	748.56'	748.31'



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DRAINAGE PLAN AND PROFILE
 STA 1351+00 TO STA 1361+00

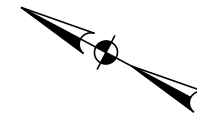
SHEET 3 OF 9

DESIGNED BY	CONT	SECT	JOB	HIGHWAY
FH	0015	09	194	IH 35
DRAWN BY	DIST	COUNTY	SHEET NO.	
MVE	AUS	WILLIAMSON	152	

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5 0 5 10
SCALE: 1" = 10' VERTICAL

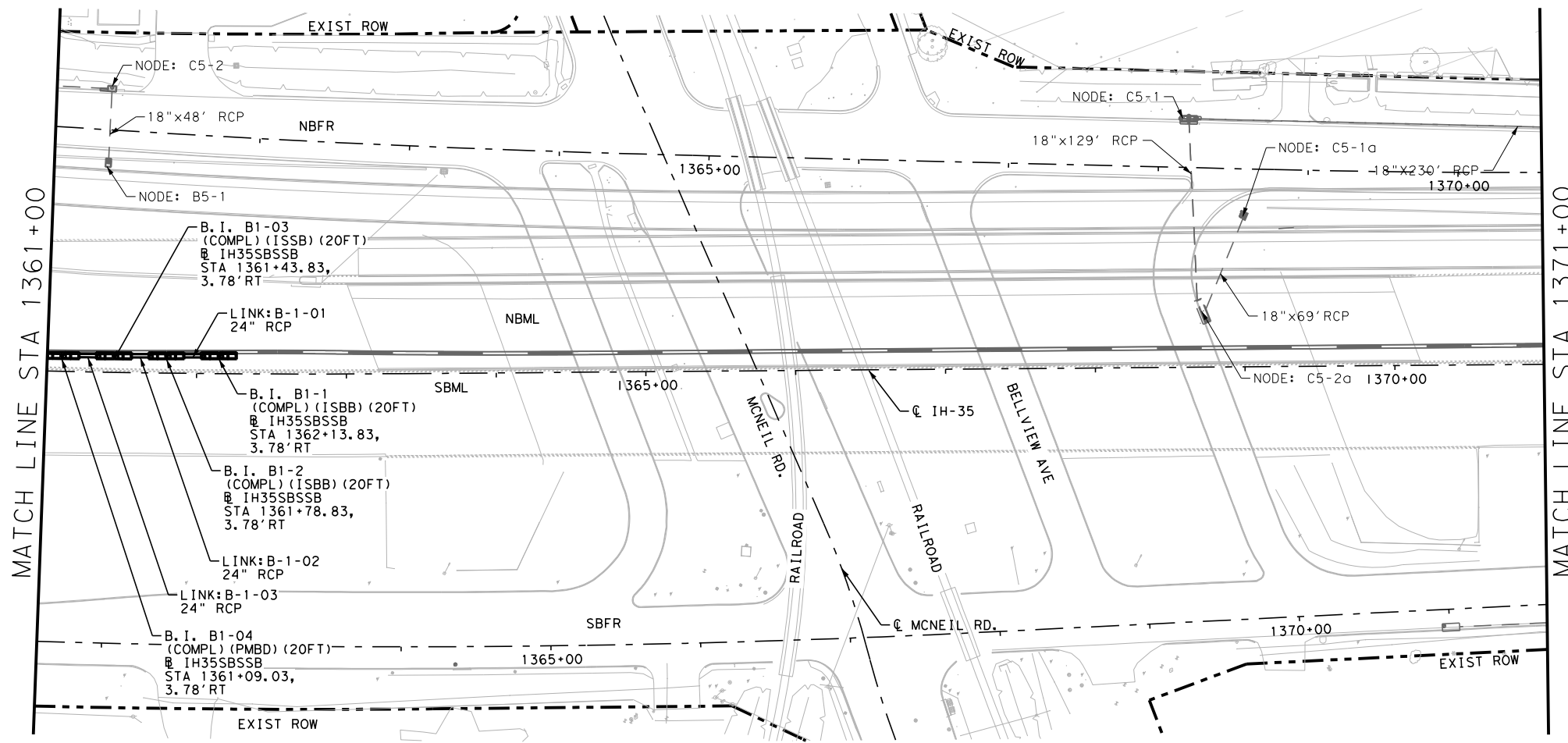


PROP DRAINAGE STRUCTURE LEGEND

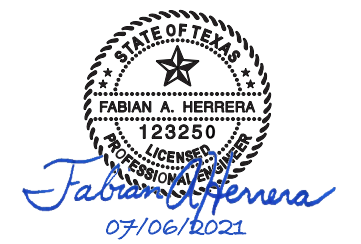
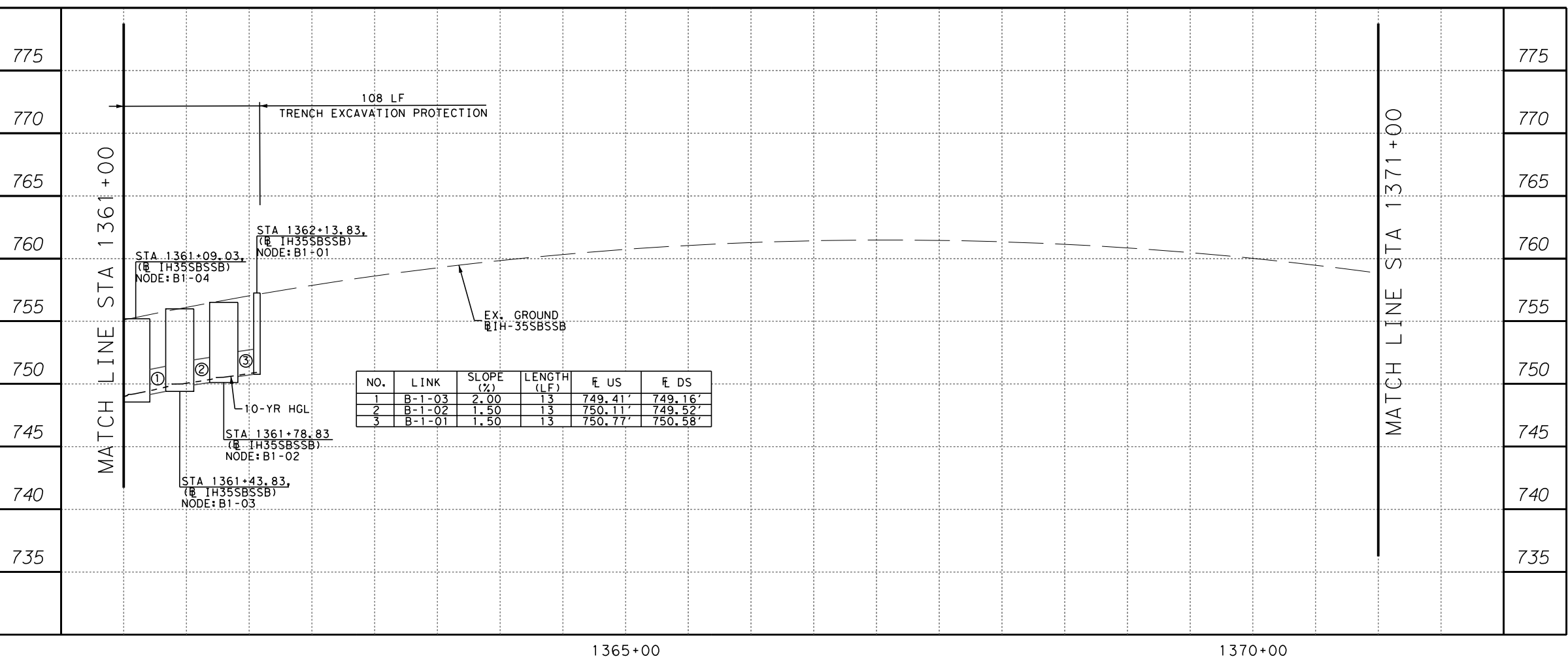
- B. I. A1-2 (COMPL) (ISSB) (X FT)
 ↑ STRUCTURE TYPE ↑ SIZE
 ↑ NODE I.D.
 ↑ STRUCTURE
- B. I. = BARRIER INLET
 JN. = JUNCTION BOX
 OUT = OUTLET
 RCP = REINFORCED CONCRETE PIPE
 TB = TOP OF BOX
 = CONCRETE TRAFFIC BARRIER (CTB)

DRAINAGE NOTES:

- OFFSETS TO ALL PROP B. I. S, MANHOLES OR JUNCTION BOXES ARE TO CENTER OF STRUCTURE.
- CONNECTING PIPES SHOULD ENTER WITHIN 10° OF NORMAL TO THE INLET/MH WALL. IF NECESSARY, PRECAST PIPE ELBOWS OR CURVED APPROACH ALIGNMENT SHOULD BE USED TO STAY WITHIN THIS LIMIT.



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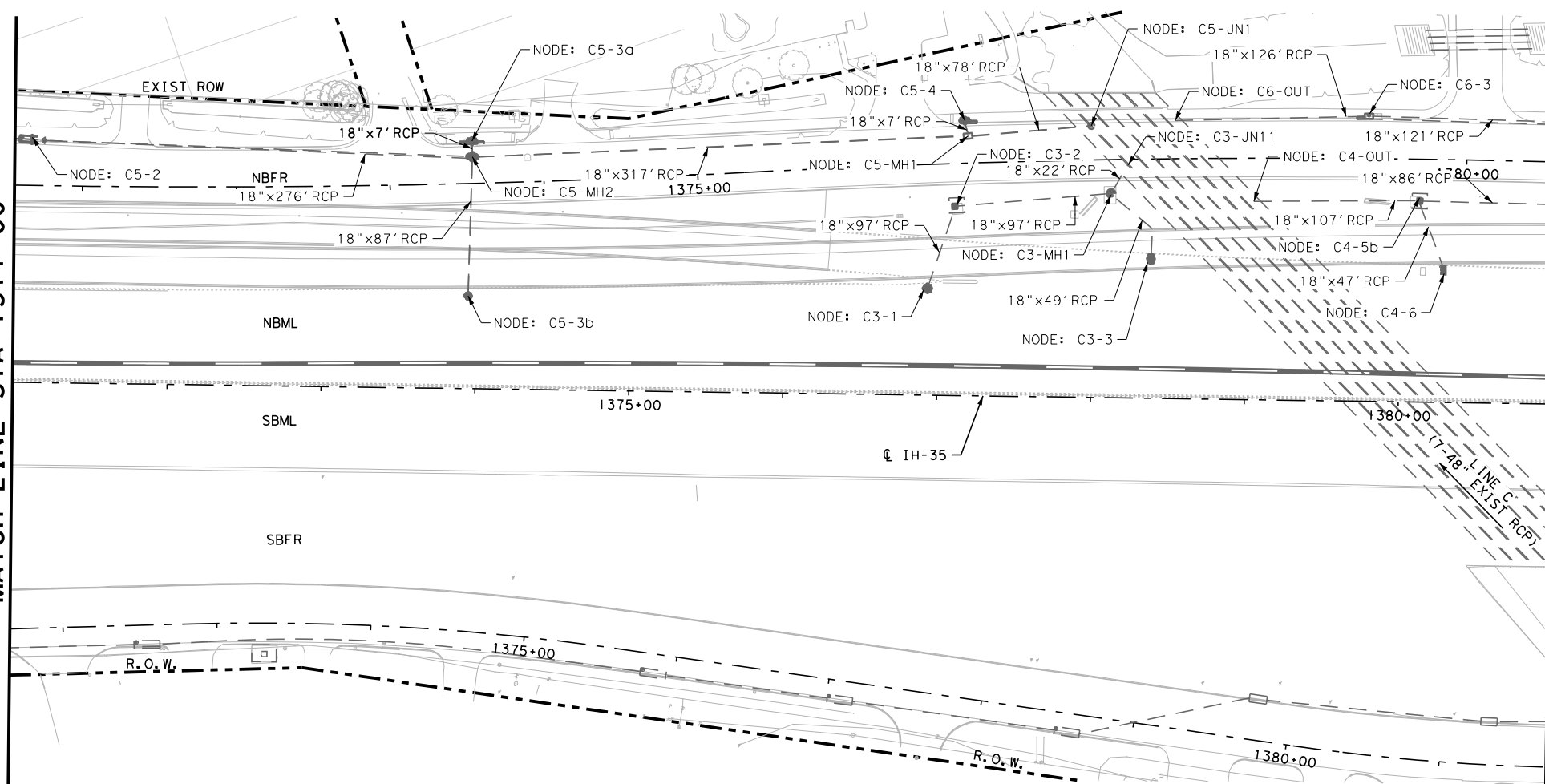
**IH-35
 DRAINAGE
 PLAN AND PROFILE
 STA 1361+00 TO STA 1371+00**

SHEET 4 OF 9

DS#	CONT	SECT	JOB	HIGHWAY
FH	0015	09	194	IH 35
DW#	DIST	COUNTY	SHEET NO.	
MVE	AUS	WILLIAMSON	153	

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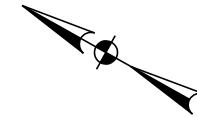
MATCH LINE STA 1371+00



MATCH LINE STA 1381+00

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SCALE: 1" = 100' HORIZONTAL

5 0 5 10
SCALE: 1" = 10' VERTICAL



PROP DRAINAGE STRUCTURE LEGEND

B. I. A1-2 (COMPL) (ISSB) (X FT)
STRUCTURE TYPE SIZE
NODE I. D.

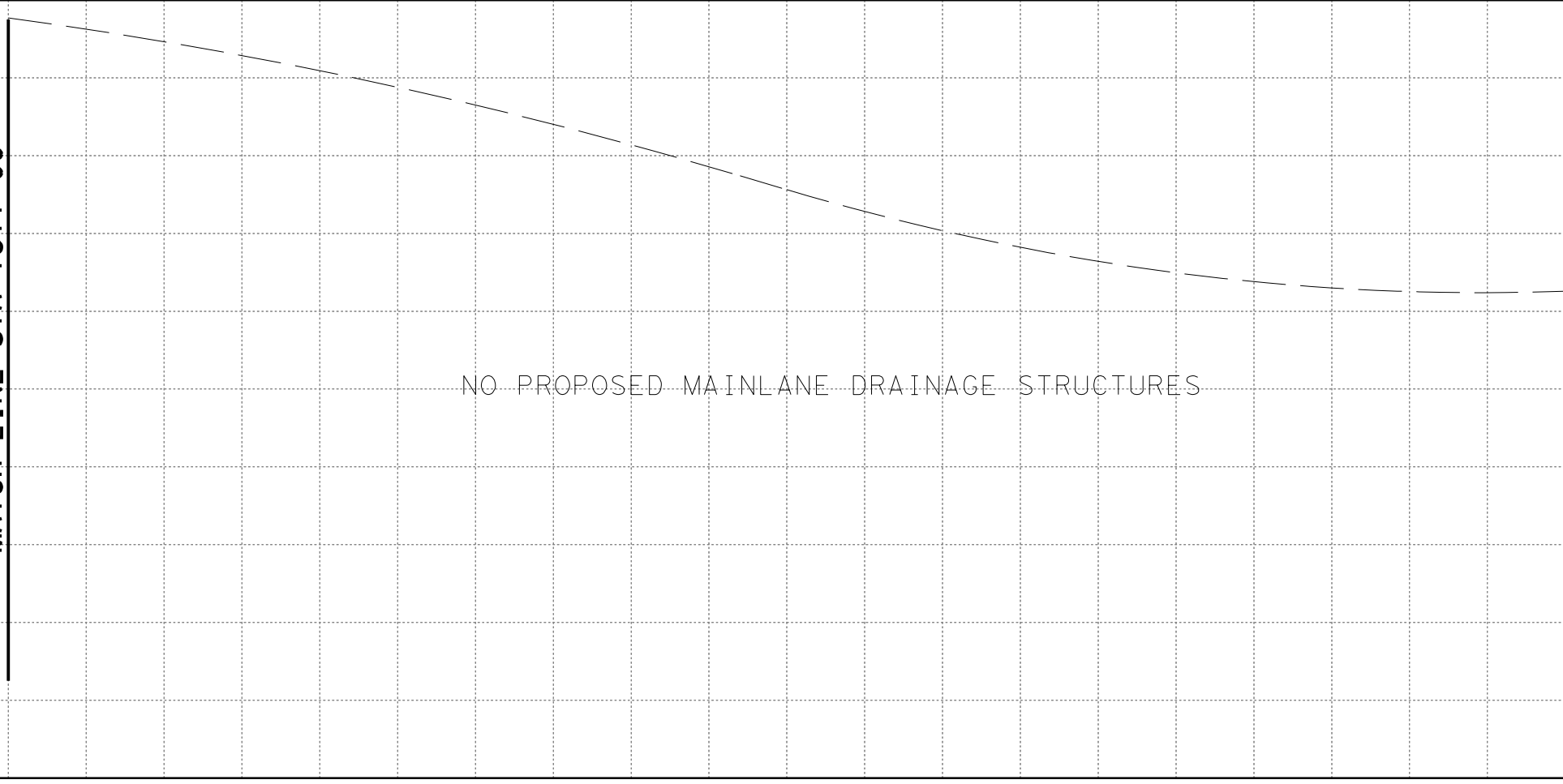
B. I. = BARRIER INLET
JN. = JUNCTION BOX
OUT = OUTLET
RCP = REINFORCED CONCRETE PIPE
TB = TOP OF BOX
= CONCRETE TRAFFIC BARRIER (CTB)

DRAINAGE NOTES:

1. OFFSETS TO ALL PROP B. I. S, MANHOLES OR JUNCTION BOXES ARE TO CENTER OF STRUCTURE.
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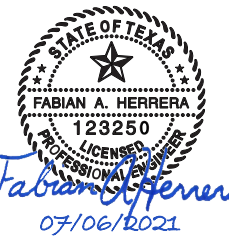
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MATCH LINE STA 1371+00



MATCH LINE STA 1381+00

NO PROPOSED MAINLANE DRAINAGE STRUCTURES



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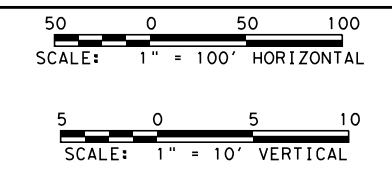
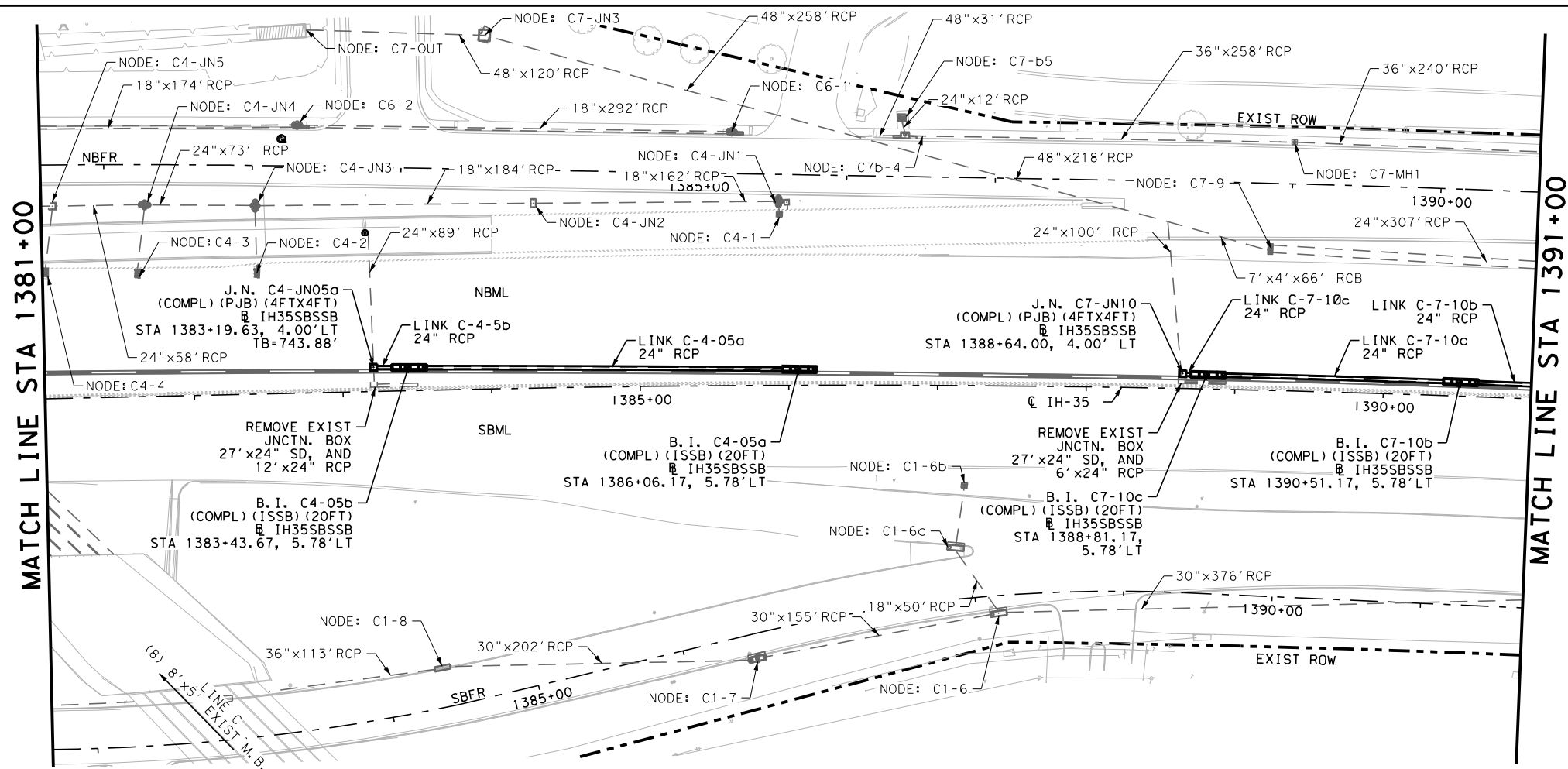


IH 35
DRAINAGE
PLAN AND PROFILE
STA 1371+00 TO STA 1381+00

SHEET 5 OF 9					
DS#	CK#	CONT	SECT	JOB	HIGHWAY
FH	GB	0015	09	194	IH 35
DW#	CK#	DIST		COUNTY	SHEET NO.
MVE	DH	AUS		WILLIAMSON	154

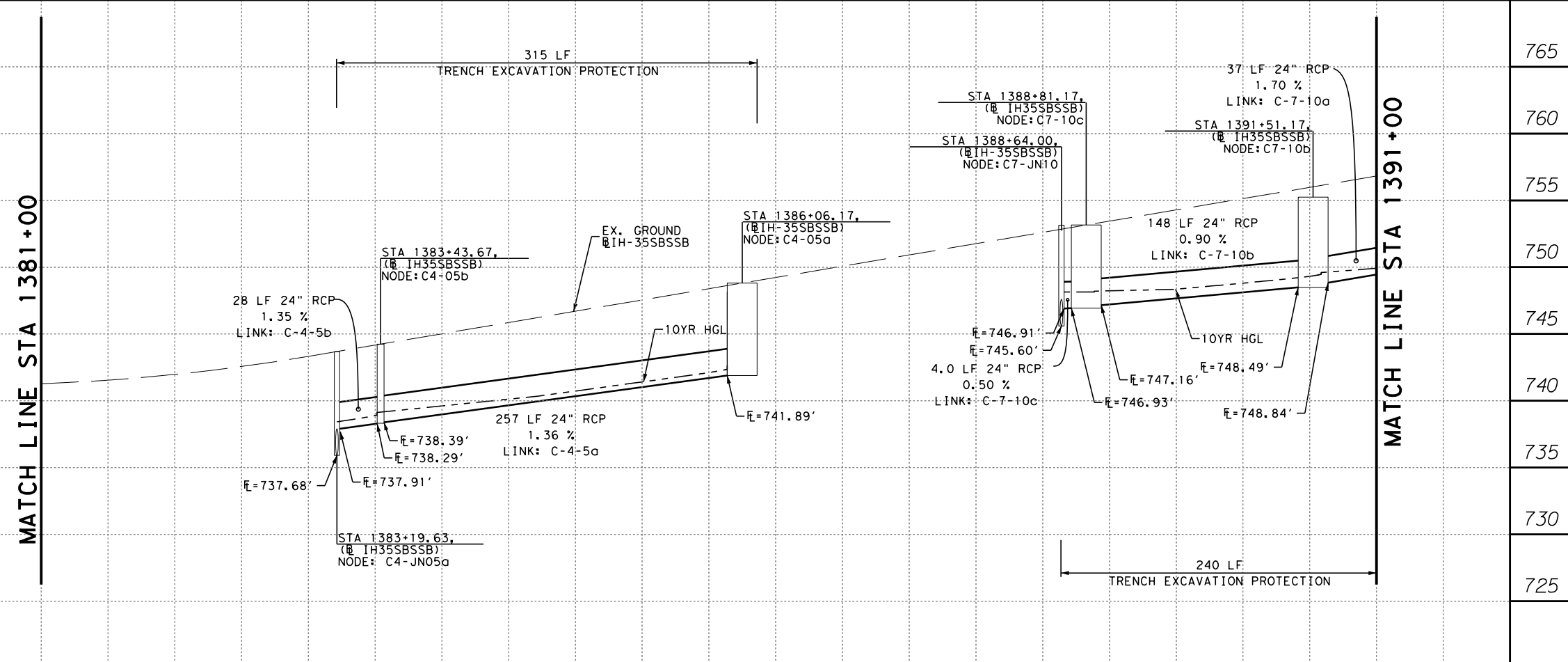
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c:\bms\brIDGEFARMER-ENGIN...



- PROP DRAINAGE STRUCTURE LEGEND**
- B. I. A1-2 (COMPL) (ISSB) (X FT)
- STRUCTURE TYPE
- SIZE
- NODE I.D.
- STRUCTURE
- B. I. = BARRIER INLET
JN. = JUNCTION BOX
OUT = OUTLET
RCP = REINFORCED CONCRETE PIPE
TB = TOP OF BOX
= CONCRETE TRAFFIC BARRIER (CTB)

- DRAINAGE NOTES:**
- OFFSETS TO ALL PROP B.I.S, MANHOLES OR JUNCTION BOXES ARE TO CENTER OF STRUCTURE.
 - CONNECTING PIPES SHOULD ENTER WITHIN 10' OF NORMAL TO THE INLET/MH WALL. IF NECESSARY, PRECAST PIPE ELBOWS OR CURVED APPROACH ALIGNMENT SHOULD BE USED TO STAY WITHIN THIS LIMIT.



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**IH 35
DRAINAGE
PLAN AND PROFILE
STA 1381+00 TO STA 1391+00**

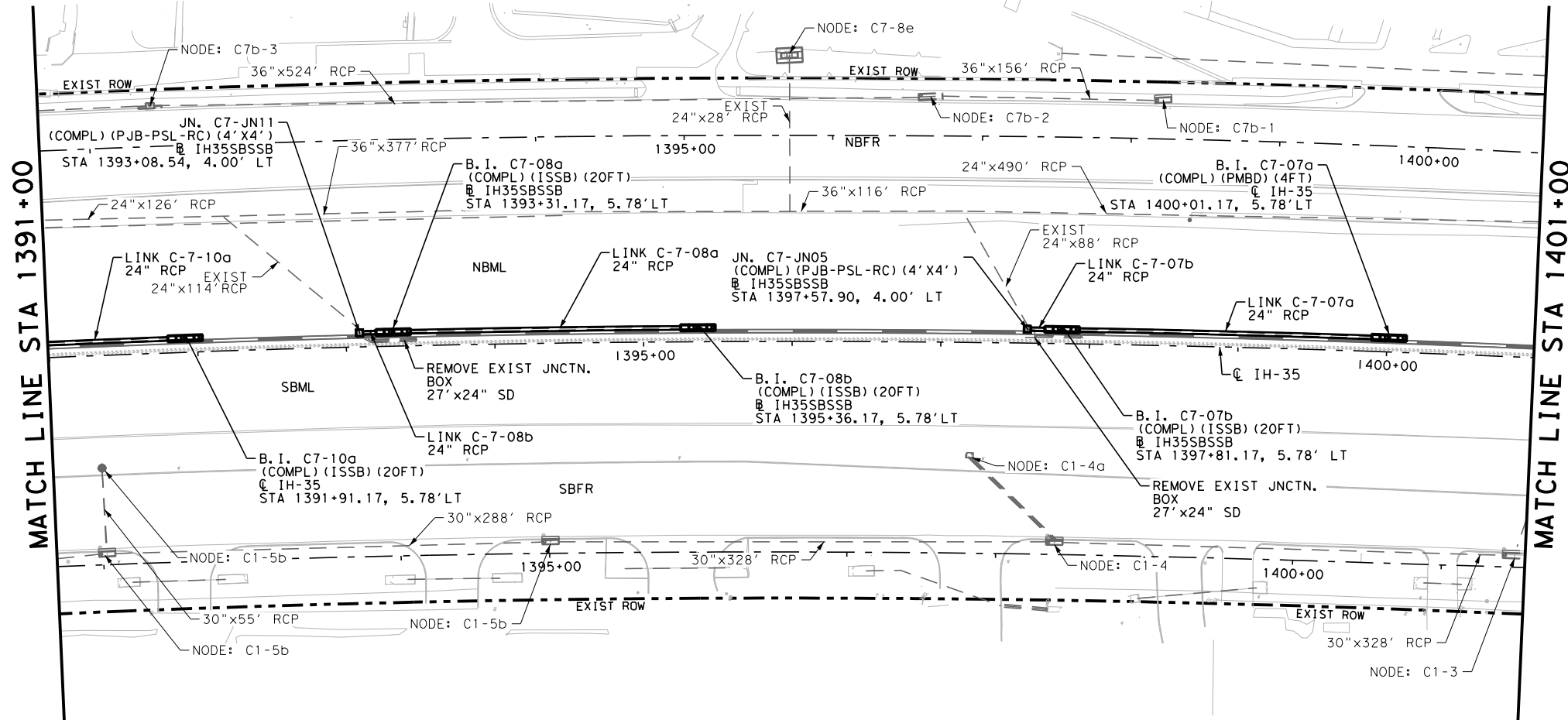
SHEET 6 OF 9

DS#	CONT	SECT	JOB	HIGHWAY
FH	0015	09	194	IH 35
DIST	COUNTY			SHEET NO.
DW#	AUS	WILLIAMSON		155

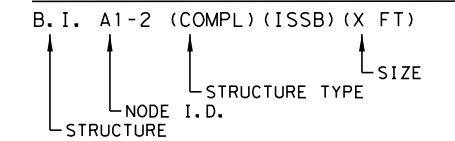
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SCALE: 1" = 100' HORIZONTAL

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SCALE: 1" = 10' VERTICAL



PROP DRAINAGE STRUCTURE LEGEND

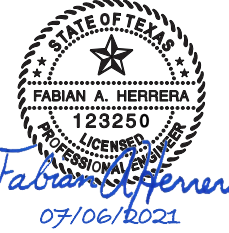
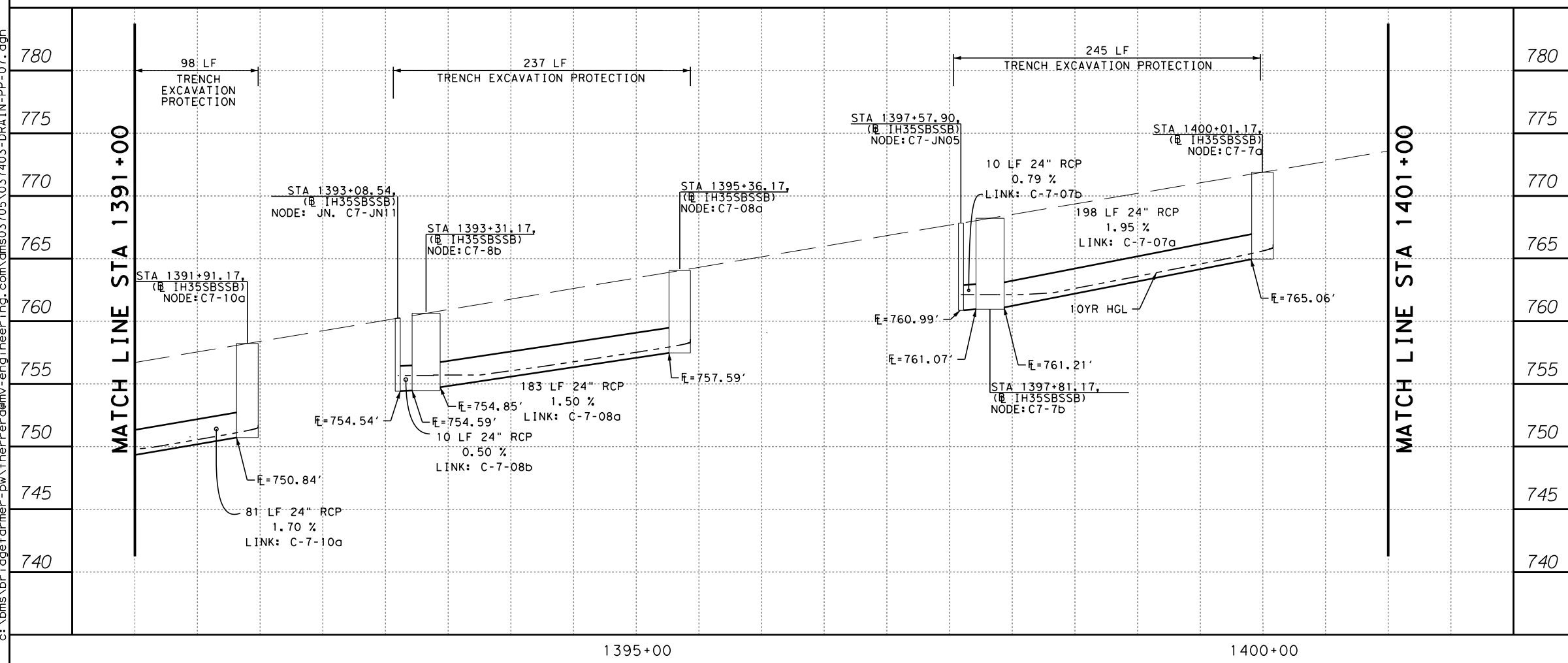


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- OUT = OUTLET
- RCP = REINFORCED CONCRETE PIPE
- TB = TOP OF BOX
- = CONCRETE TRAFFIC BARRIER (CTB)

DRAINAGE NOTES:

1. OFFSETS TO ALL PROP B.I.S, MANHOLES OR JUNCTION BOXES ARE TO CENTER OF STRUCTURE.
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**IH 35
DRAINAGE
PLAN AND PROFILE
STA 1391+00 TO STA 1401+00**

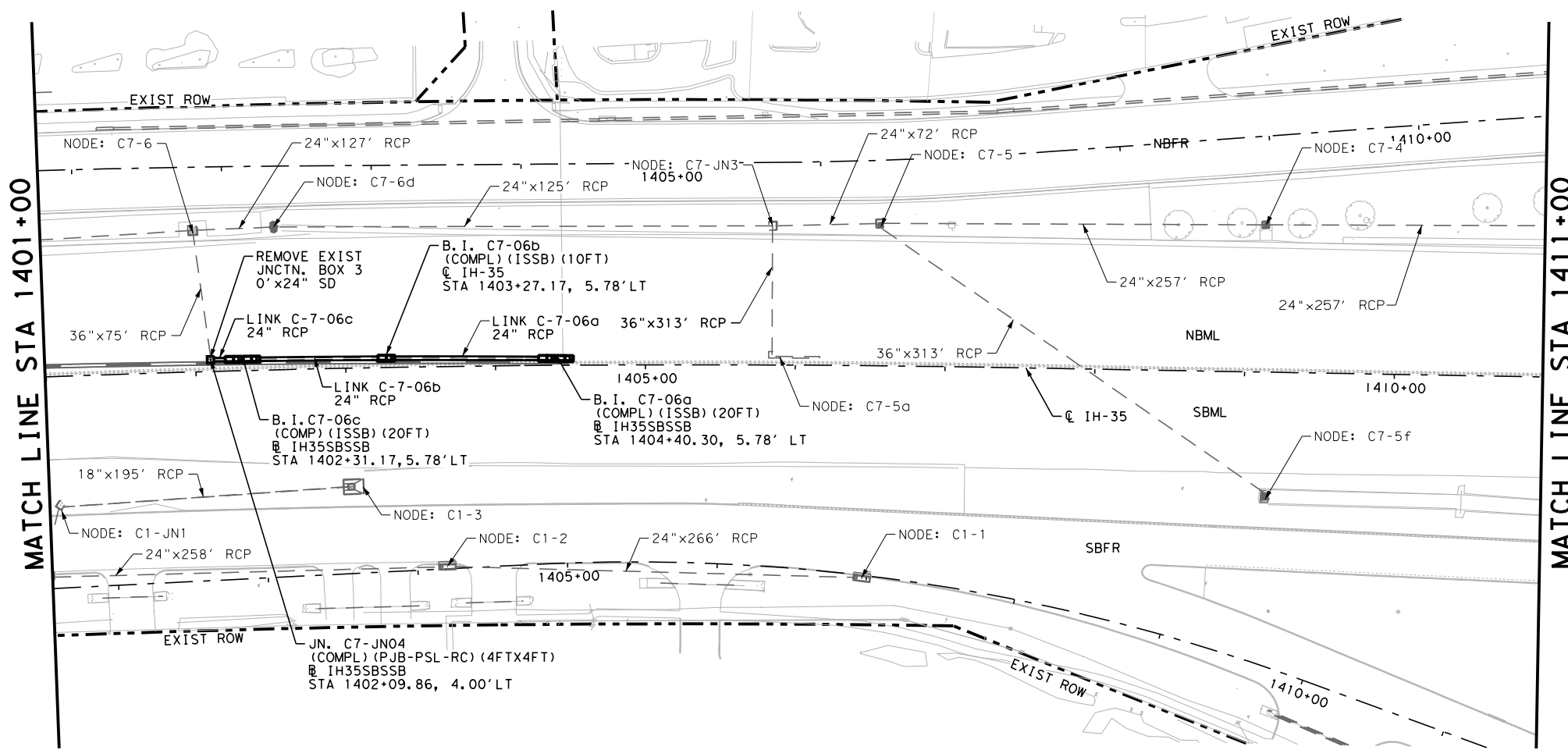
SHEET 7 OF 9

DS#	CONT	SECT	JOB	HIGHWAY
FH	0015	09	194	IH 35
DW#	DIST	COUNTY	SHEET NO.	
MVE	AUS	WILLIAMSON	156	

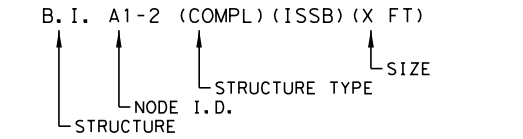
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SCALE: 1" = 100' HORIZONTAL

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SCALE: 1" = 10' VERTICAL



PROP DRAINAGE STRUCTURE LEGEND

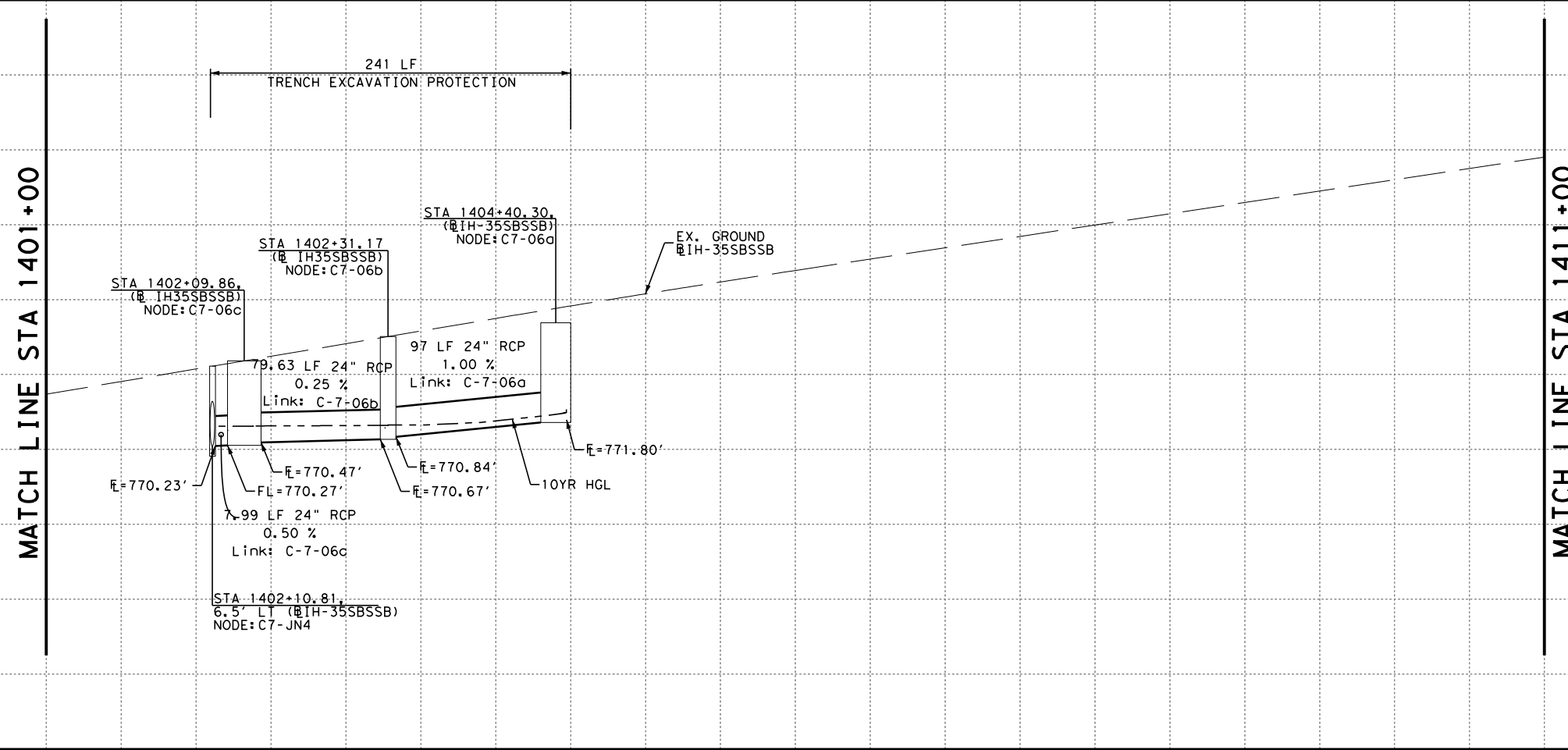


- B. I. = BARRIER INLET
- JN. = JUNCTION BOX
- OUT = OUTLET
- RCP = REINFORCED CONCRETE PIPE
- TB = TOP OF BOX
- CTB = CONCRETE TRAFFIC BARRIER (CTB)

DRAINAGE NOTES:

1. OFFSETS TO ALL PROP B. I. S, MANHOLES OR JUNCTION BOXES ARE TO CENTER OF STRUCTURE.
2. CONNECTING PIPES SHOULD ENTER WITHIN 10' OF NORMAL TO THE INLET/MH WALL. IF NECESSARY, PRECAST PIPE ELBOWS OR CURVED APPROACH ALIGNMENT SHOULD BE USED TO STAY WITHIN THIS LIMIT.

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14850 Quorum Drive, Suite 120
Dallas, Texas 75254, Ph: 972.733.3618
TBPE FIRM REGISTRATION NO. F-9474

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**IH 35
DRAINAGE
PLAN AND PROFILE
STA 1401+00 TO STA 1411+00**

SHEET 8 OF 9

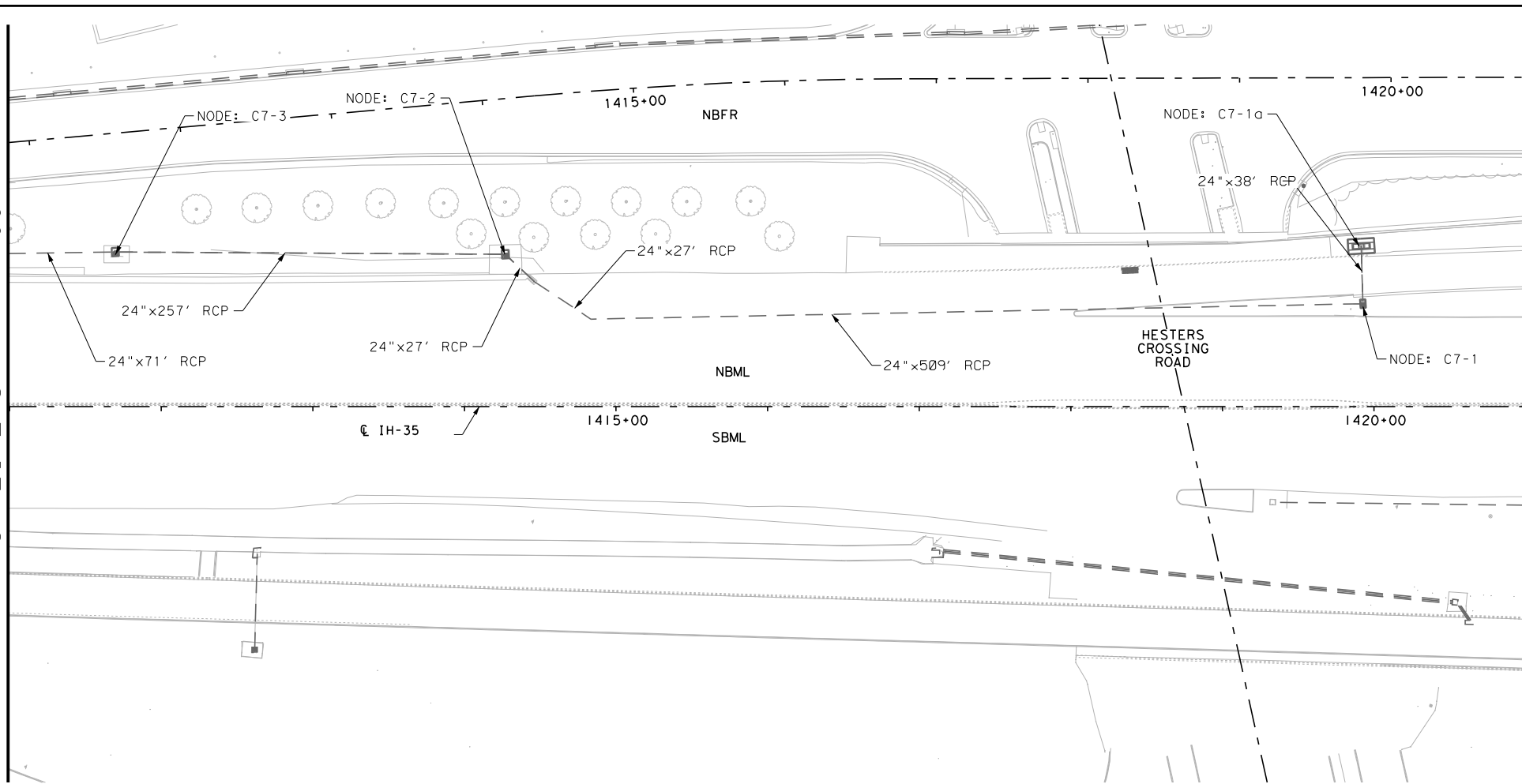
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FH	0015	09	194	IH 35
DW#	DIST	COUNTY	SHEET NO.	
MVE	AUS	WILLIAMSON	157	

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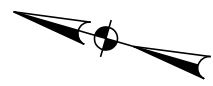
MATCH LINE STA 1411+00

MATCH LINE STA 1411+00



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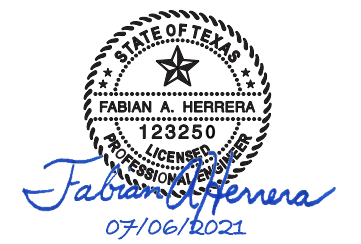


PROP DRAINAGE STRUCTURE LEGEND

- B. I. A1-2 (COMPL) (ISSB) (X FT)
- STRUCTURE TYPE SIZE
NODE I.D.
- B. I. = BARRIER INLET
 - JN. = JUNCTION BOX
 - OUT = OUTLET
 - RCP = REINFORCED CONCRETE PIPE
 - TB = TOP OF BOX
 - CTB = CONCRETE TRAFFIC BARRIER (CTB)

- DRAINAGE NOTES:
- OFFSETS TO ALL PROP B. I. S, MANHOLES OR JUNCTION BOXES ARE TO CENTER OF STRUCTURE.
 - CONNECTING PIPES SHOULD ENTER WITHIN 10° OF NORMAL TO THE INLET/MH WALL. IF NECESSARY, PRECAST PIPE ELBOWS OR CURVED APPROACH ALIGNMENT SHOULD BE USED TO STAY WITHIN THIS LIMIT.

NO PROPOSED MAINLANE DRAINAGE STRUCTURES



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2021
Texas Department of Transportation

IH 35
DRAINAGE PLAN AND PROFILE
STA 1411+00 TO STA 1421+00

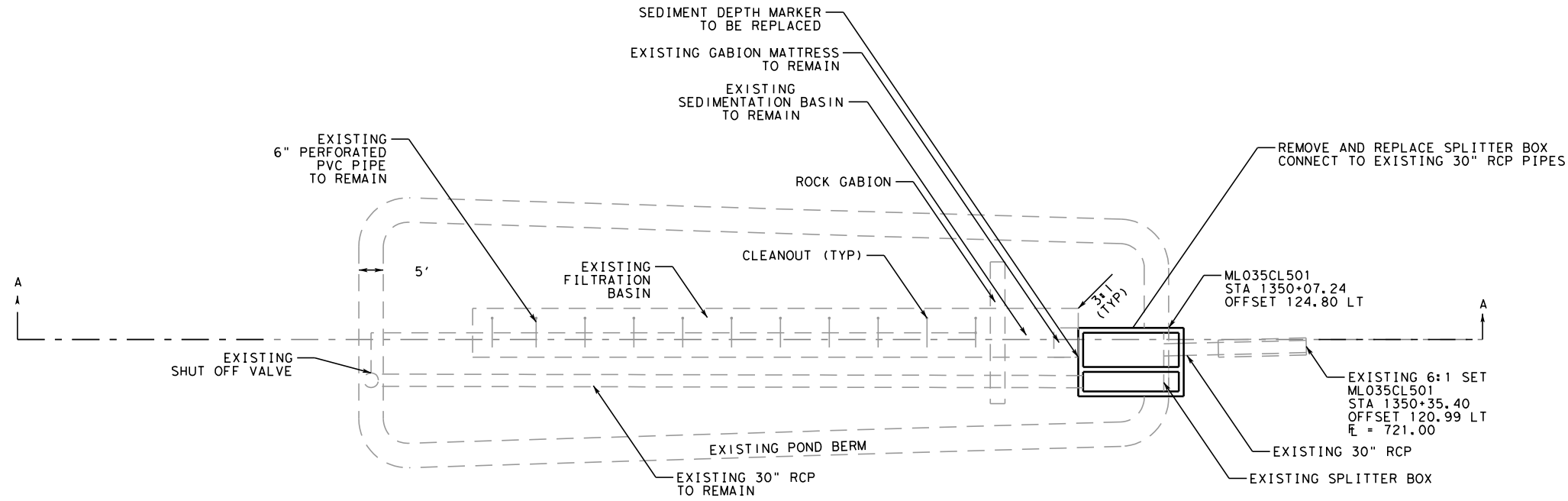
SHEET 9 OF 9

DS#	CONT	SECT	JOB	HIGHWAY
FH	0015	09	194	IH 35
DIST	COUNTY		SHEET NO.	
DW#	AUS	WILLIAMSON	158	

1415+00

1420+00

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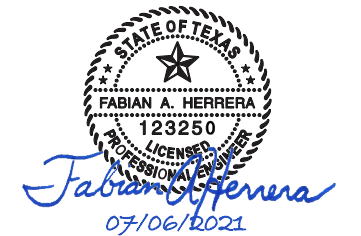
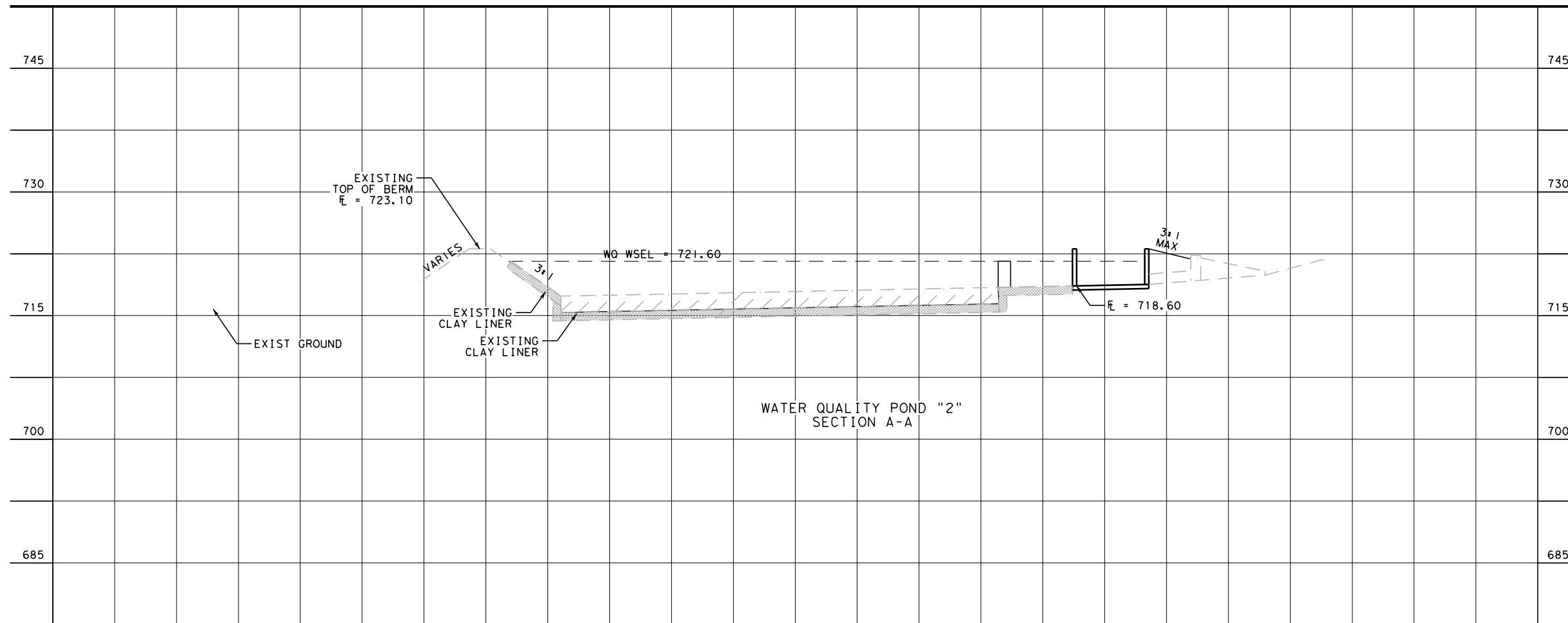
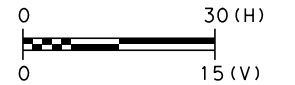


NOTES

- EXISTING POND TO REMAIN. CONTRACTOR TO TAKE NECESSARY MEASURE TO PROTECT ALL EXISTING FEATURES, INCLUDING GABION MATTRESSES, CLAY DAMS, PIPES, ETC. DURING INSTALLATION OF PROPOSED SPLITTER BOX.

STAGE-STORAGE	
ELEV (FT)	STORAGE VOLUME (CF)
717.0	0.0
717.5	348.3
718.0	895.3
718.5	1654.6
719.0	2639.7
719.5	3864.1
720.0	5341.2
720.5	7084.7
721.0	11384.9
721.6	11923.7

WATER QUALITY CALCULATIONS						
DRAINAGE AREA (AC.)	PRE-DEVELOPMENT IMPERVIOUS COVER (AC.)	POST-DEVELOPMENT IMPERVIOUS COVER (AC.)	RUNOFF CAPTURED (IN.)	LOAD REMOVED (LBS.)	VOLUME REQUIRED (CF)	VOLUME PROVIDED (CF)
4.65	3.42	3.21	1.00	2585	11,038	11,923.7



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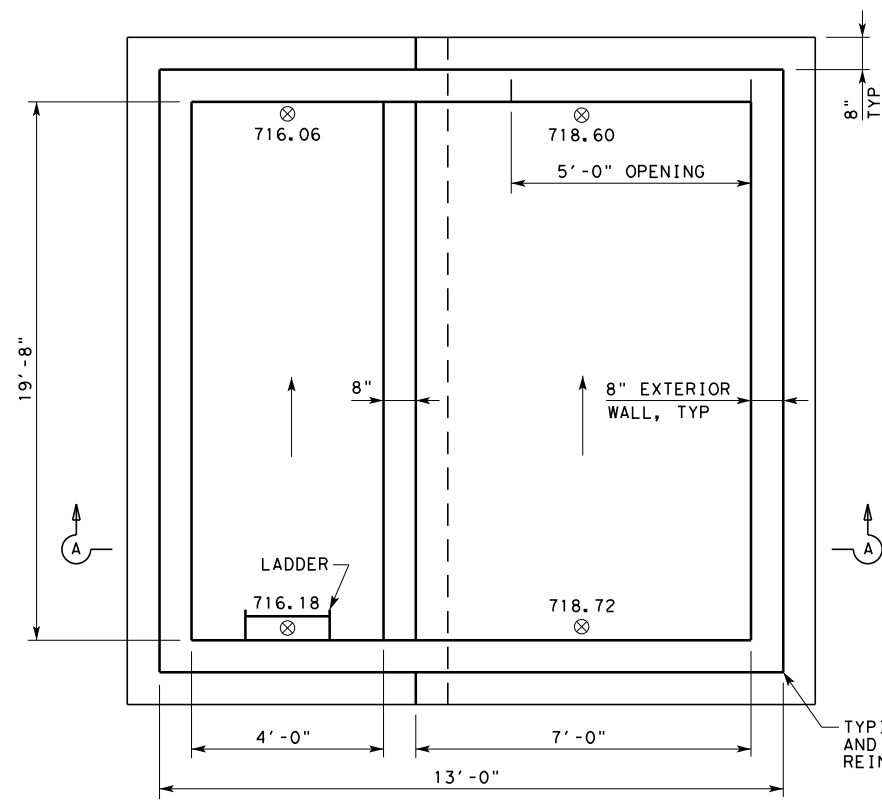
2021
Texas Department of Transportation

**IH 35
 WATER QUALITY
 POND #2
 PLAN AND PROFILE**

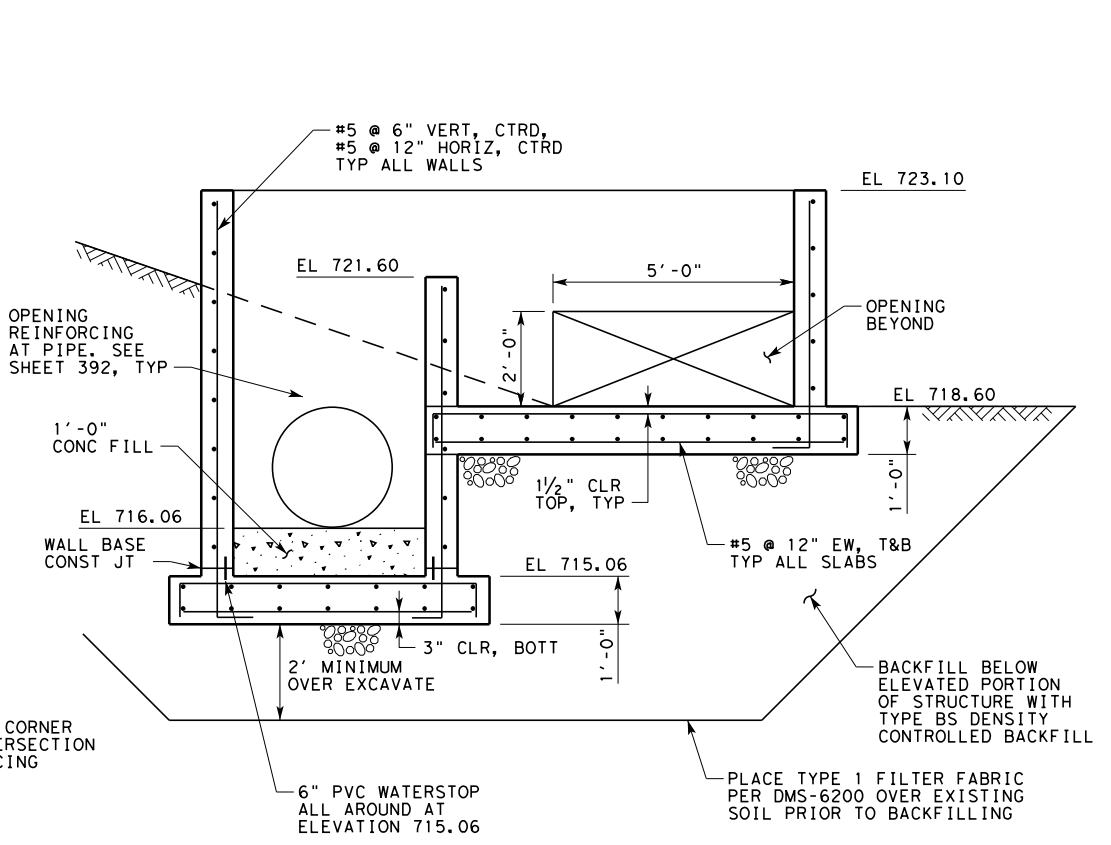
SHEET 1 OF 1

DS#	CONT	SECT	JOB	HIGHWAY
FH	0015	09	194	IH 35
DIST	COUNTY		SHEET NO.	
MVE	AUS	WILLIAMSON	159	

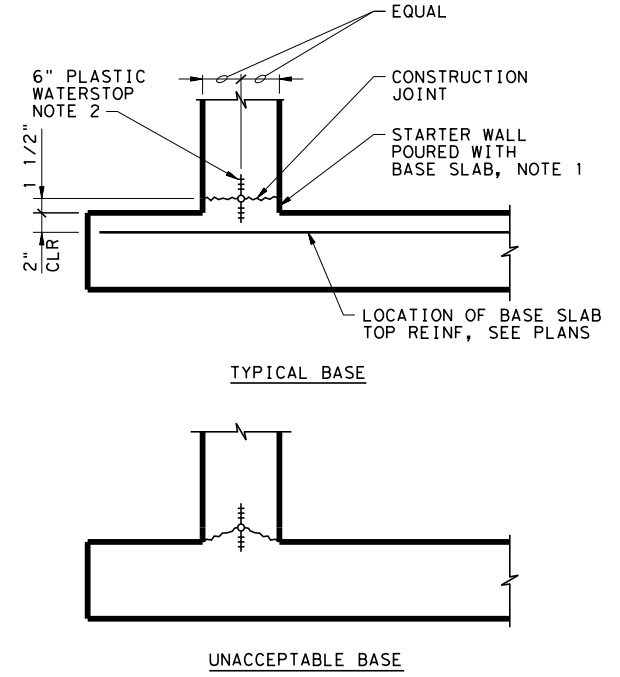
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PLAN
NTS

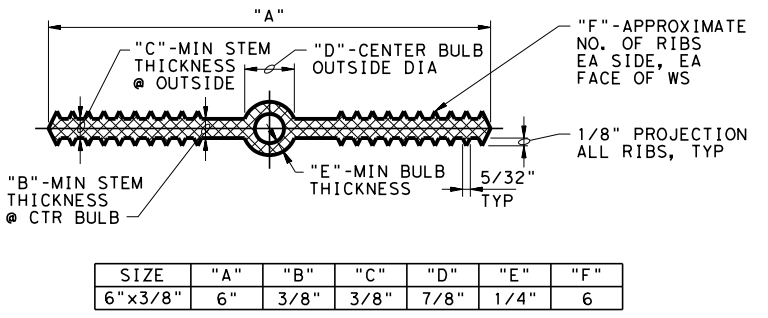


SECTION A-A
NTS



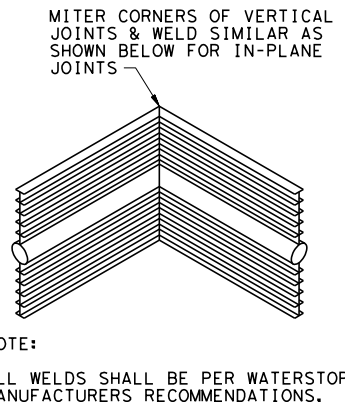
- NOTES:**
1. STARTER WALL REQUIRED FOR ALL CONSTRUCTION JOINTS WITH WATERSTOPS, UNLESS SPECIFICALLY INDICATED OTHERWISE.
 2. FOR WALLS W/SINGLE MAT OF REINFORCING LOCATE WATERSTOP ON LIQUID FACE, 1" CLEAR OF REINFORCING.
 3. SECURE WATERSTOP IN-PLACE AS SPECIFIED.

WALL BASE CONSTRUCTION JOINT
NTS



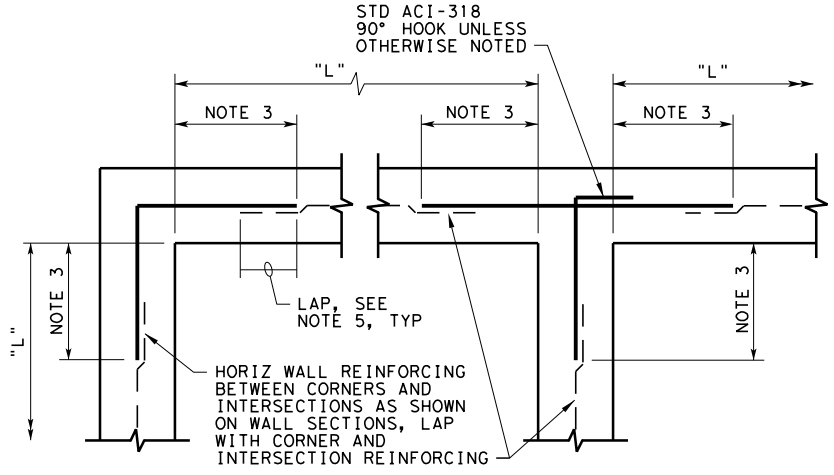
- NOTES:**
1. NON-ROUND CENTER BULBS SHALL HAVE A MINIMUM OUTSIDE DIMENSION OF 'D'.
 2. SEE WATERSTOP JOINT DETAIL, THIS SHEET.
 3. BULB TYPE WATERSTOP SHOWN IS REQUIRED FOR EXPANSION AND CONTROL JOINTS. SIMILAR WATERSTOPS WITHOUT CENTER BULB MAY BE SUBSTITUTED AT CONSTRUCTION JOINTS.
 4. WATERSTOP SHALL CONFORM TO DMS-6160 REQUIREMENTS FOR PVC.

PLASTIC WATERSTOP
NTS



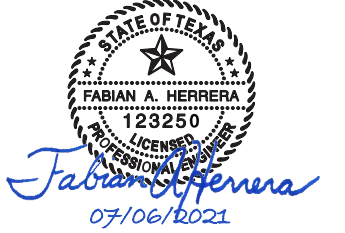
WATERSTOP JOINT
NTS

- GENERAL NOTES:**
1. ALL CONCRETE SHALL BE CLASS C, 28-DAY COMPRESSIVE STRENGTH SHALL BE 3600 PSI MINIMUM PER TXDOT REQUIREMENTS
 2. ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 60.
 3. WATERSTOP SHALL CONFORM TO DMS-6160 REQUIREMENTS FOR PVC.



TYPICAL WALL CORNER AND INTERSECTION REINFORCING
NTS

- NOTES:**
1. TYPICAL HORIZONTAL WALL CORNER AND INTERSECTION REINFORCING LAYOUT IS SHOWN TO AVOID CONGESTION AND PERMIT PROPER PLACEMENT. ALL HORIZONTAL REINFORCING AT CORNERS AND INTERSECTIONS SHALL BE FABRICATED AND INSTALLED WITH SPLICES LOCATED WHERE SHOWN REGARDLESS OF BAR SIZE AND SPACING.
 2. WHERE THE CORNER OR INTERSECTION REINFORCING SIZE AND SPACING IS NOT SHOWN, NOTED OR TABULATED ON THE PLANS, THE SIZE AND SPACING SHALL BE THE SAME AS THE WALL HORIZONTAL REINFORCING SHOWN ON THE WALL SECTIONS OR AS NOTED FOR THE REINFORCING BETWEEN THE CORNERS OR INTERSECTIONS.
 3. EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 3" SHALL BE THE LESSER OF L/4, 10 FEET, OR 1.0 TIMES THE HEIGHT OF THE WALL, EXCEPT THAT IN NO CASE SHALL IT BE LESS THAN 2 FEET.
 4. L = LENGTH OF WALL PARALLEL TO THE BAR LENGTH IN QUESTION.
 5. EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 5" SHALL BE EQUAL TO ONE "LAP LENGTH" AS REQUIRED BY THE GENERAL STRUCTURAL NOTES.



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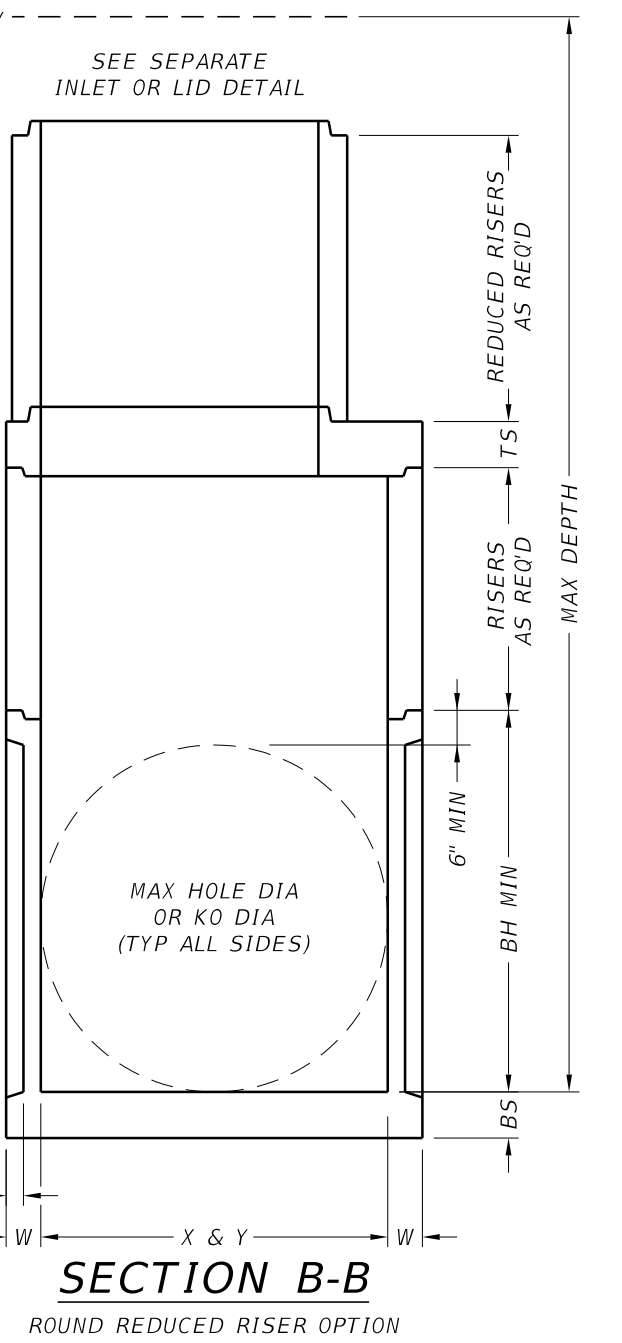
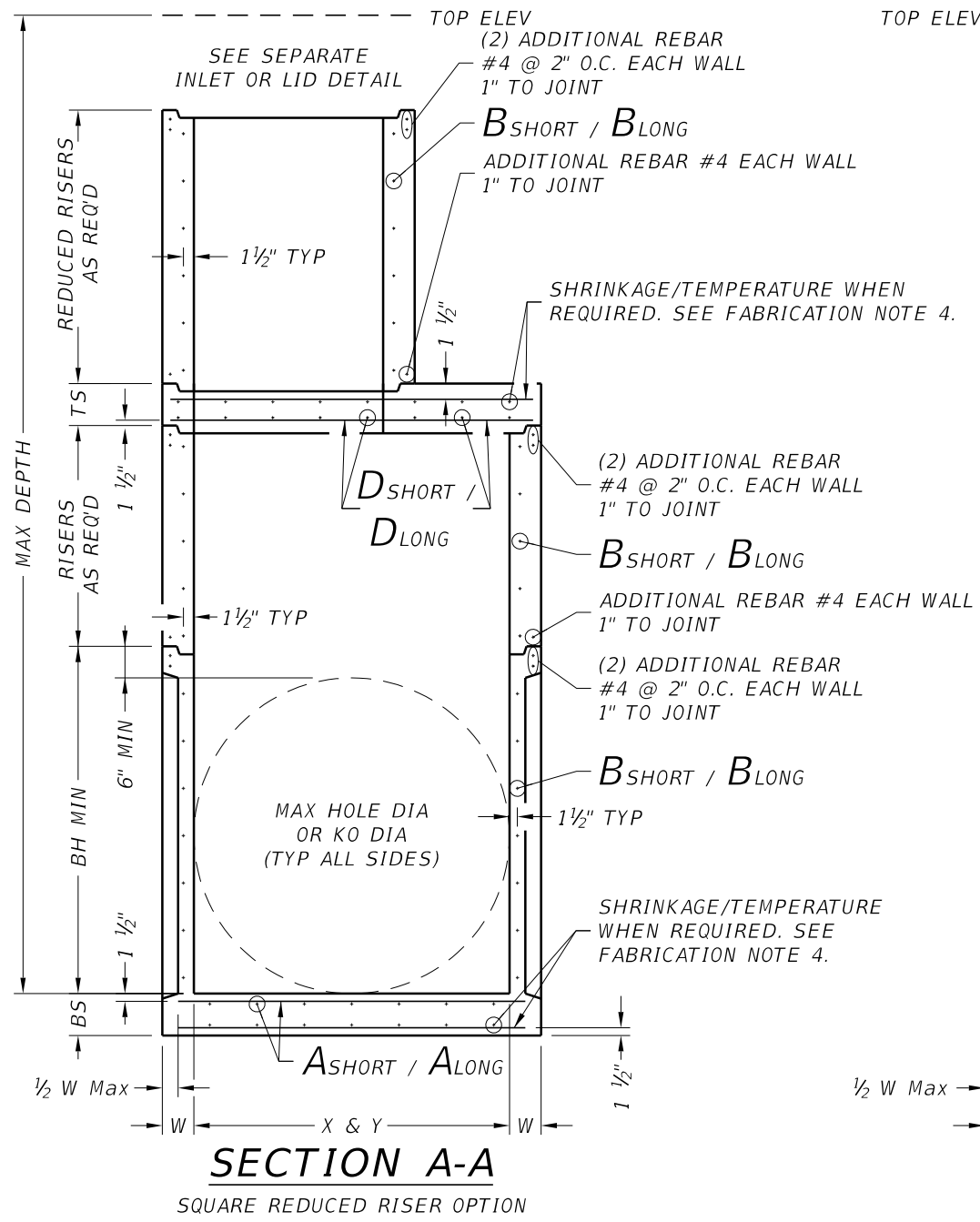
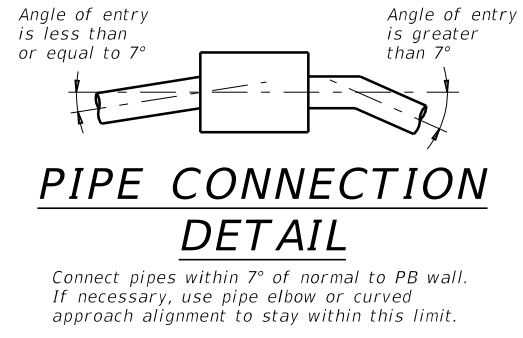
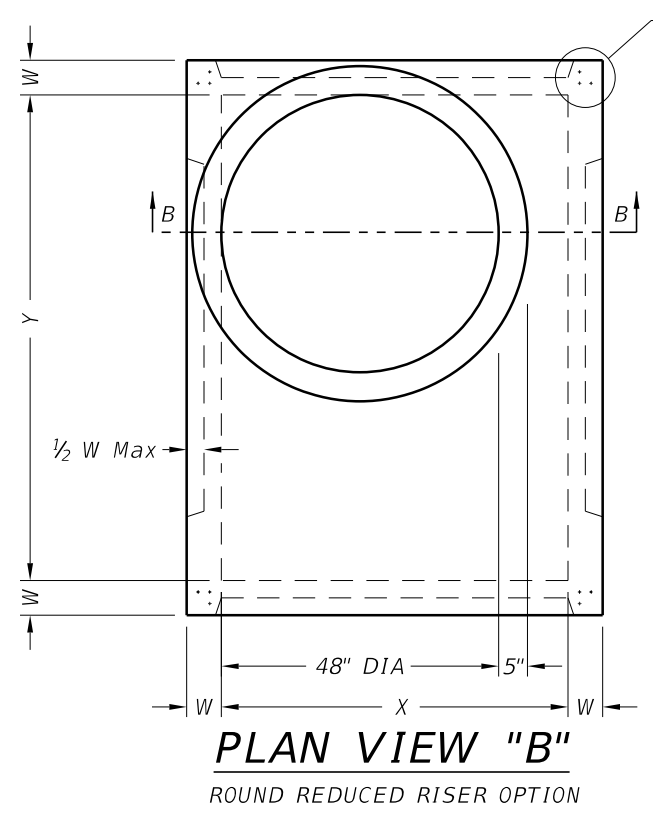
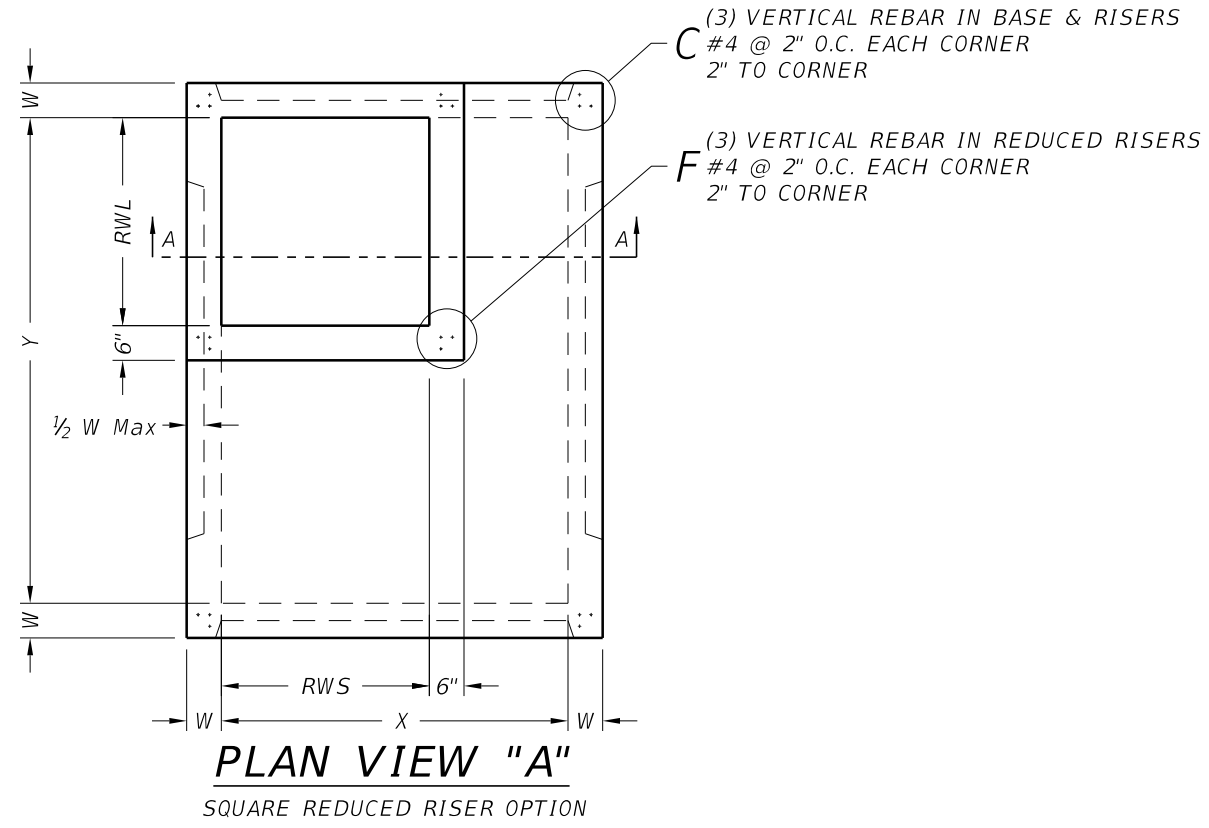
IH 35
WATER QUALITY POND #2
STRUCT DETAIL

DESIGNED BY		CONT	SECT	JOB	HIGHWAY
FH	GB	0015	09	194	IH 35
DRAWN BY		DIST		COUNTY	SHEET NO.
MVE	DH	AUS		WILLIAMSON	160

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DATE:
FILE:



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 1/2" 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 3/4".
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 1/2 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:

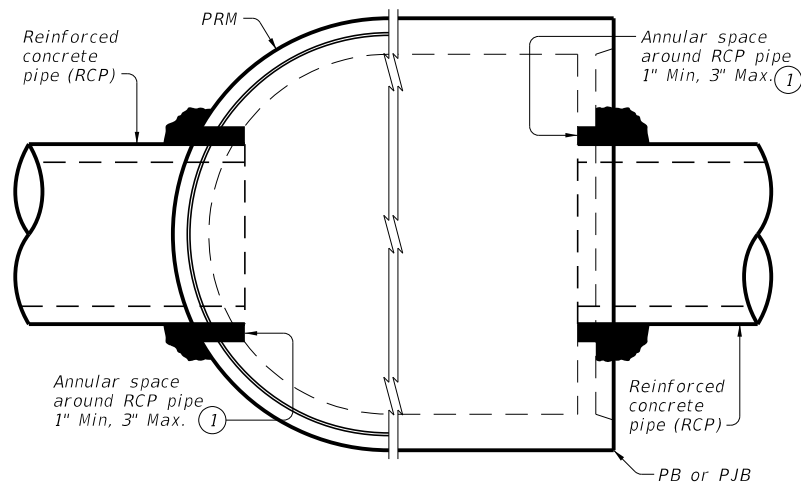
1. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for precast base is subsidiary to the specified inlet, per Item 465, "Junction Boxes, Manholes, and Inlets."

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING		Texas Department of Transportation		Bridge Division Standard
PRECAST BASE				
PB				
FILE: prest01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT 0015	SECT 09	JOB 194	HIGHWAY 1H 35
REVISIONS	DIST AUS	COUNTY WILLIAMSON	SHEET NO. 169	

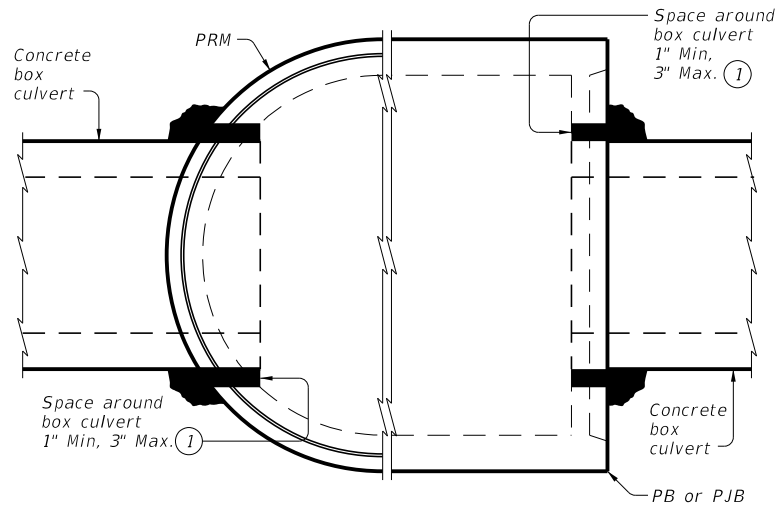
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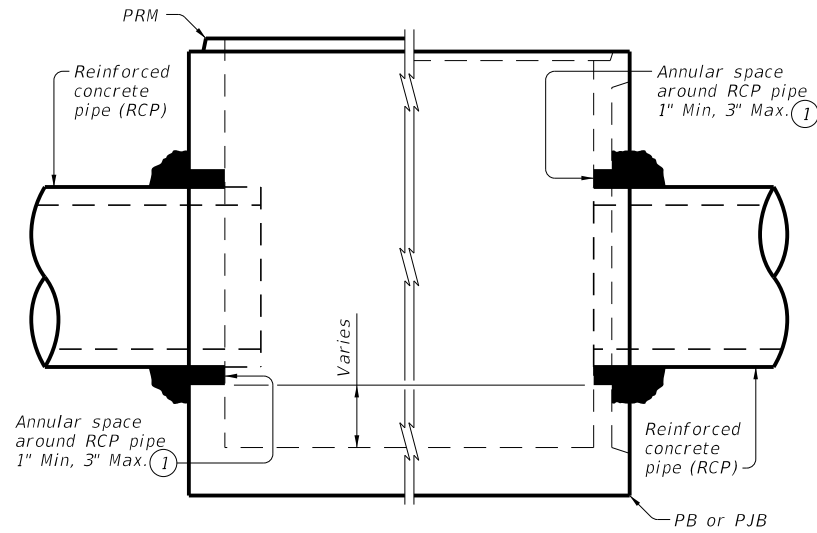
PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE
PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF PLAN



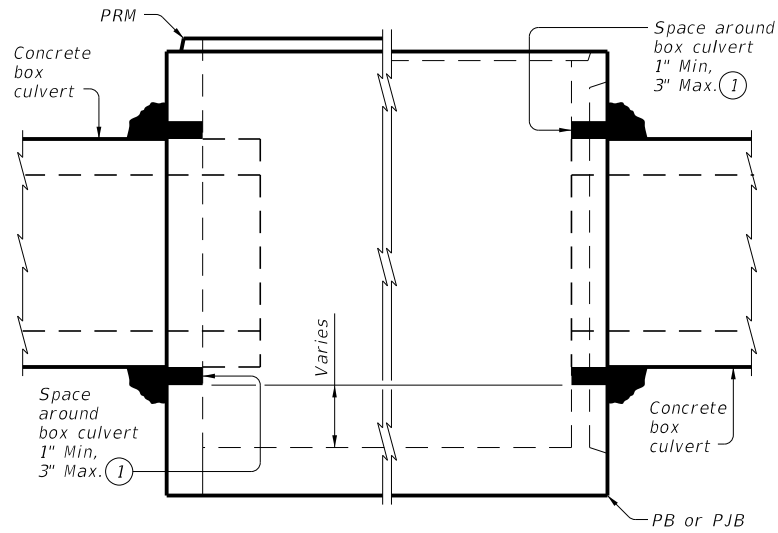
PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE
PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF PLAN



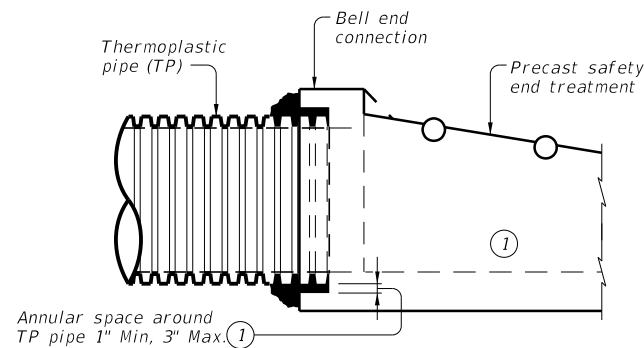
PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE
PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

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.

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.

PIPE AND BOX GROUTED CONNECTIONS FOR PRECAST STRUCTURES

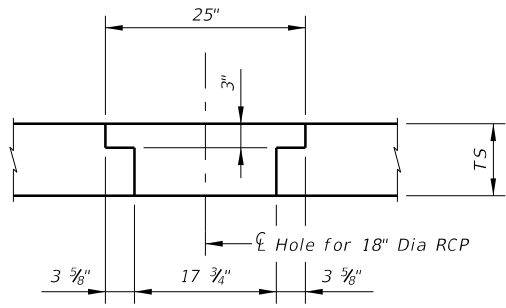
PBGC

FILE: pbgcstd1-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	IH 35
	DIST	COUNTY	SHEET NO.	
	AUS	WILLIAMSON	170	

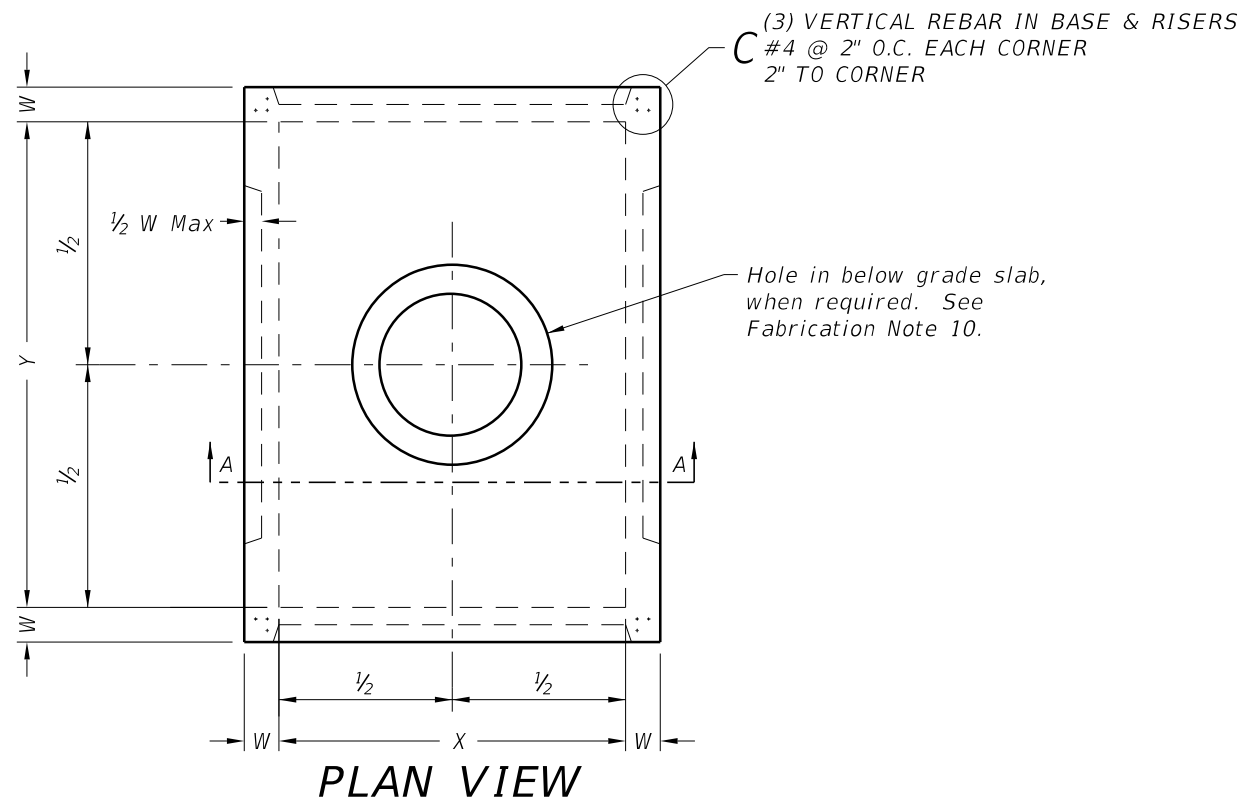
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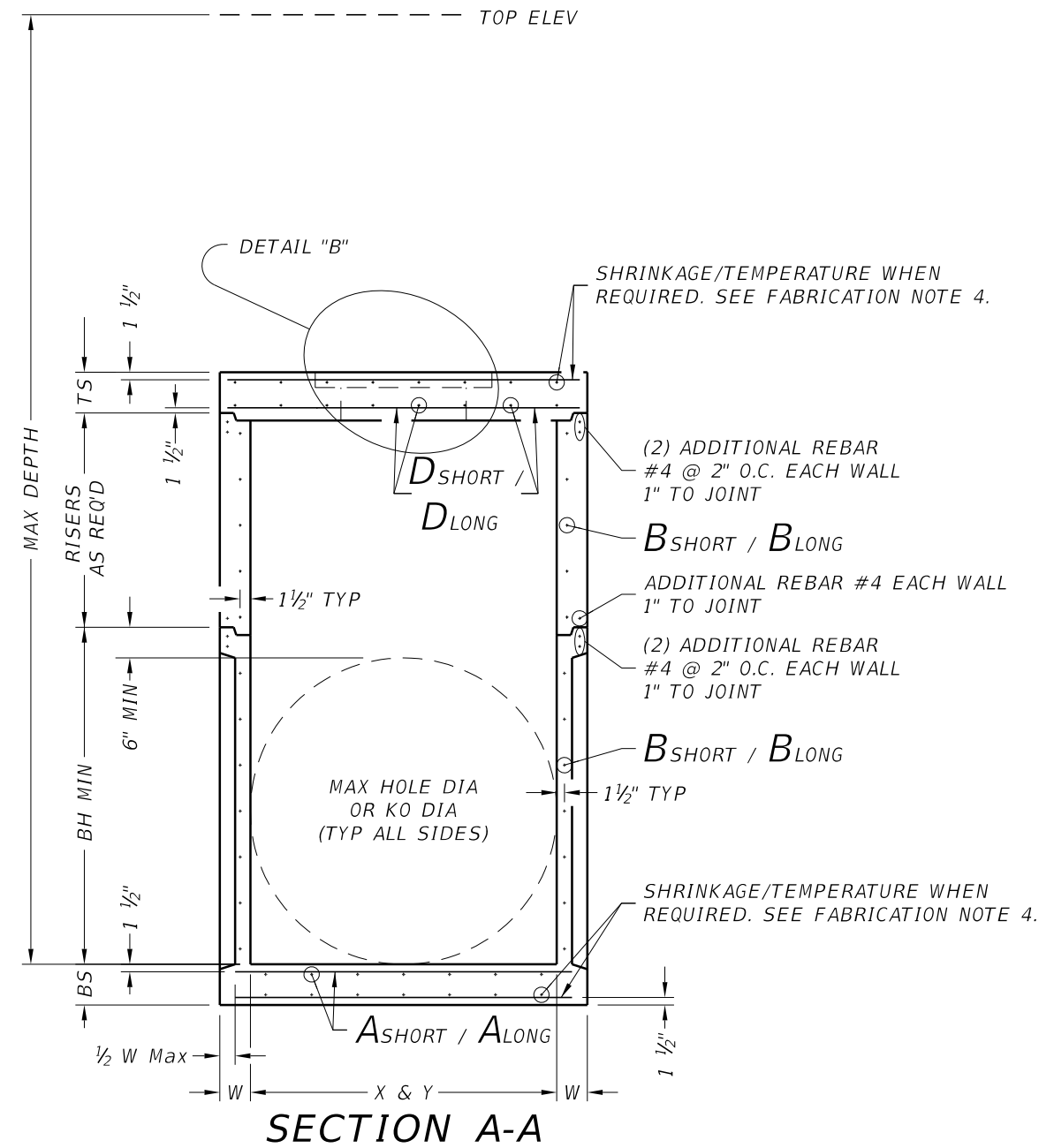
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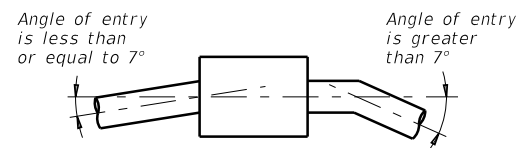
DETAIL "B"



PLAN VIEW



SECTION A-A



PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PJB wall. If necessary, use pipe elbow or curved approach alignment to stay within this limit.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 1/2" 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 3/4".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.
10. Provide hole in below grade slab only when PJB is installed with inlet type POD.

INSTALLATION NOTES:

1. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to junction box.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or 1/2 the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for junction box is per Item 465 "Junction Boxes, Manholes, and Inlets" by type and size.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING



PRECAST JUNCTION BOX

PJB

FILE: prest09-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
	DIST	COUNTY	SHEET NO.	
	AUS	WILLIAMSON	171	

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Size	MAX DEPTH = 15 ft. to top of BASE SLAB											MAX DEPTH = 25 ft. to top of BASE SLAB											Min Height (See Gen Note 3)	Max HOLE DIA (See Fab Note 2)	Max KO DIA (See Fab Note 2)
	Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)					Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)							
	Short Span Reinft. Area	Long Span Reinft. Area	Thickness	Short Span Reinft. Area	Long Span Reinft. Area	Thickness	Reduced Riser Size	Short Span Reinft. Area	Long Span Reinft. Area	Thickness	Short Span Reinft. Area	Long Span Reinft. Area	Thickness	Short Span Reinft. Area	Long Span Reinft. Area	Thickness	Reduced Riser Size	Short Span Reinft. Area	Long Span Reinft. Area	Thickness	Reduced Riser Size	Short Span Reinft. Area			
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



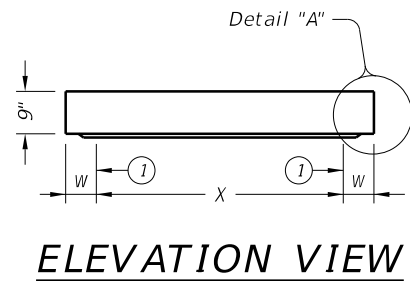
DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

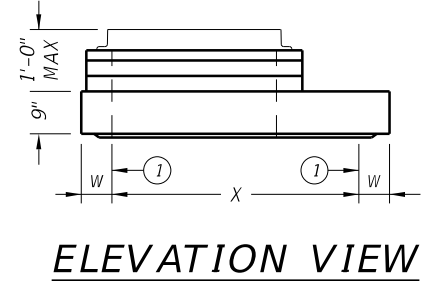
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©TxDOT February 2020	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
DIST:	AUS	COUNTY	WILLIAMSON	SHEET NO. 172

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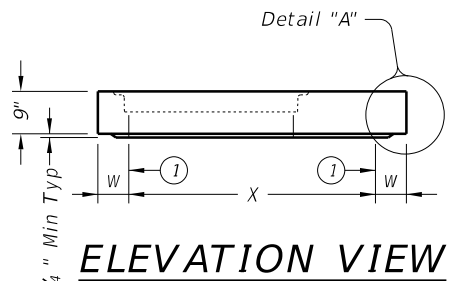
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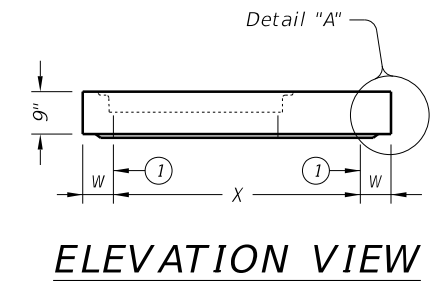
ELEVATION VIEW



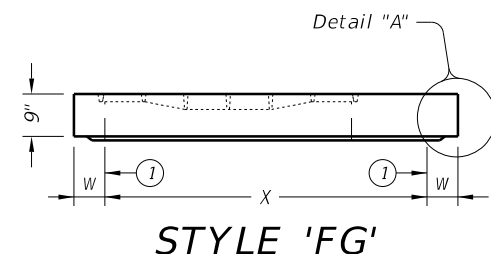
ELEVATION VIEW



ELEVATION VIEW

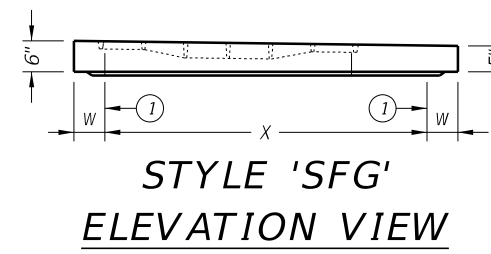


ELEVATION VIEW

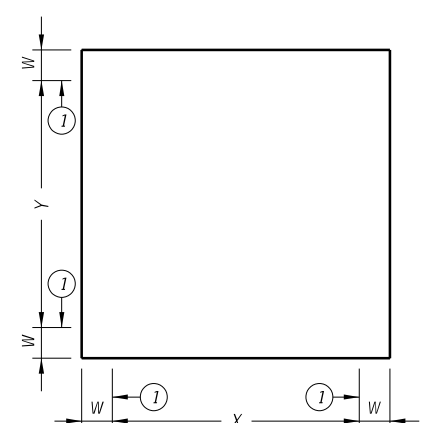


STYLE 'FG'

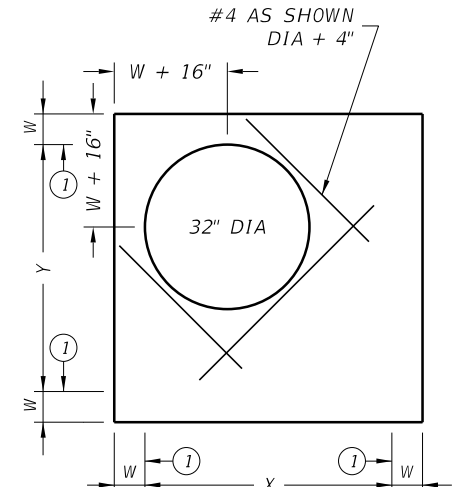
ORIENT TAPER TO CORRESPOND WITH ROADWAY CROSS-SLOPE.



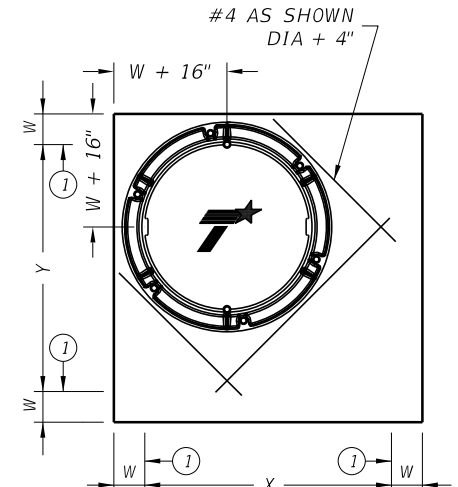
STYLE 'SFG'
ELEVATION VIEW



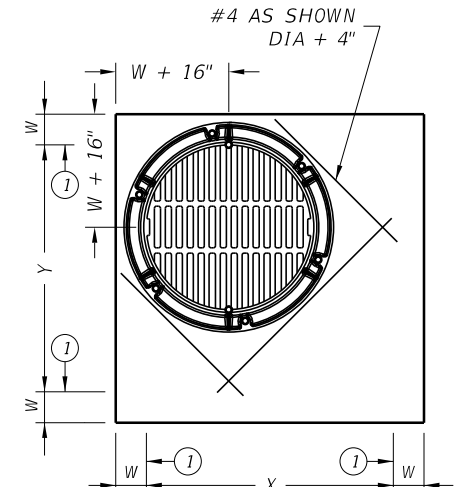
PLAN VIEW
NO OPENINGS
STYLE 'SL'



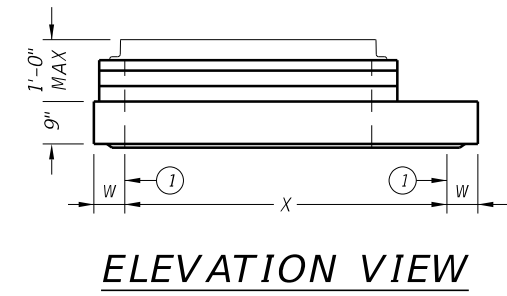
PLAN VIEW
SHIP LOOSE RING & COVER
STYLE 'RH'



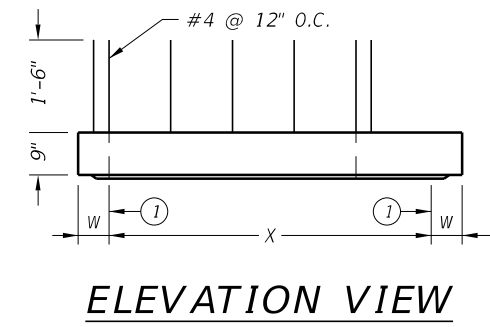
PLAN VIEW
32" DIA CAST-IN RING & COVER
STYLE 'RC'



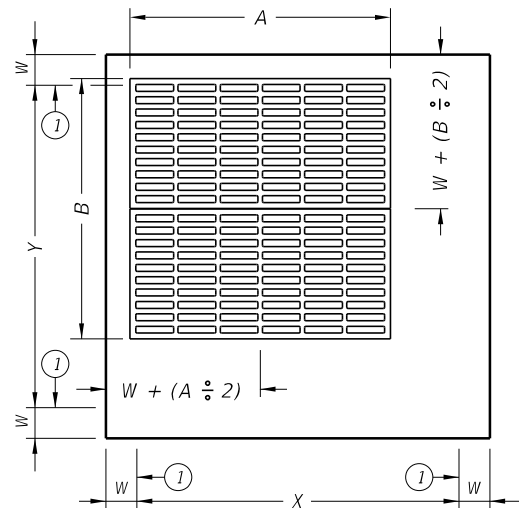
PLAN VIEW
32" DIA CAST-IN RING & GRATE
STYLE 'RG'



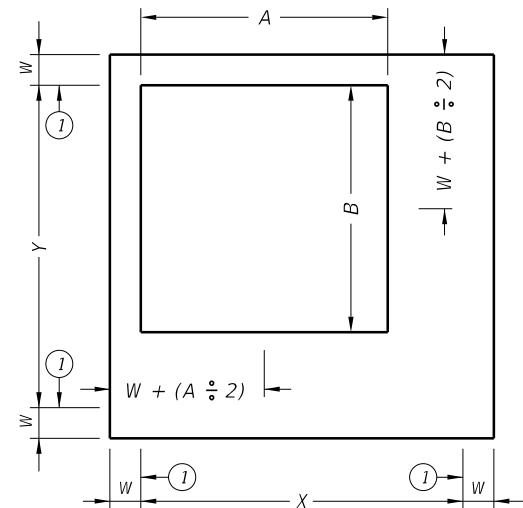
ELEVATION VIEW



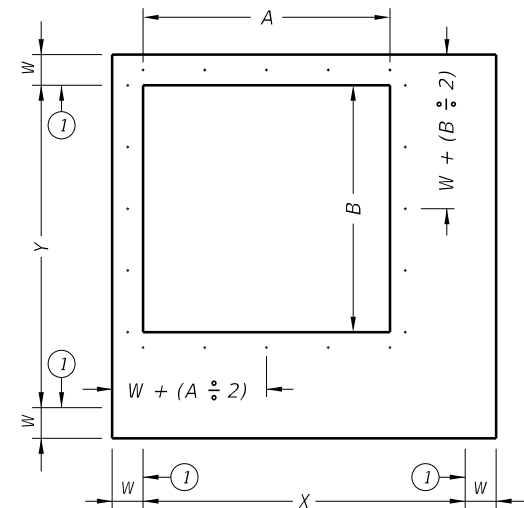
ELEVATION VIEW



PLAN VIEW
CAST-IN FRAME & GRATE
STYLES 'FG' & 'SFG'



PLAN VIEW
SHIP LOOSE FRAME & GRATE
STYLE 'SH'



PLAN VIEW
EXPOSED REBAR
STYLE 'SI'

① Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING		SHEET 1 OF 2	
		Bridge Division Standard	
PRECAST SLAB LID			
PSL			
FILE: prest05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT February 2020	CONTRACT: 0015	SECTION: 09	JOB: 194
REVISIONS:			HIGHWAY: 1H 35
	DIST: AUS	COUNTY: WILLIAMSON	SHEET NO: 173

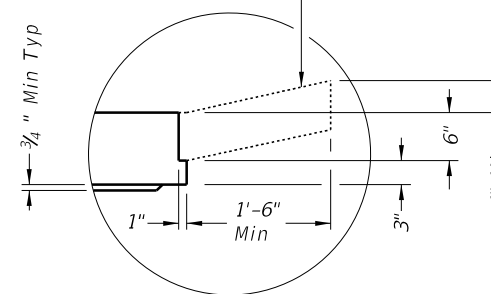
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Style	Size (X x Y)	W ②	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in ² /ft	0.37 in ² /ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in ² /ft	0.37 in ² /ft
SFG	3'x3'	6"	3'x3'	0.32 in ² /ft	0.32 in ² /ft
SL	4'x4'	6"	n/a	0.34 in ² /ft	0.34 in ² /ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in ² /ft	0.41 in ² /ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in ² /ft	0.41 in ² /ft
SFG	4'x4'	6"	4'x4'	0.32 in ² /ft	0.32 in ² /ft
SL	3'x5'	6"	n/a	0.39 in ² /ft	0.39 in ² /ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in ² /ft	0.48 in ² /ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in ² /ft	0.48 in ² /ft
SFG	3'x5'	6"	3'x5'	0.32 in ² /ft	0.32 in ² /ft
SL	4'x5'	6"	n/a	0.42 in ² /ft	0.42 in ² /ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in ² /ft	0.42 in ² /ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in ² /ft	0.63 in ² /ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in ² /ft	0.66 in ² /ft
SL	5'x5'	6"	n/a	0.36 in ² /ft	0.36 in ² /ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in ² /ft	0.43 in ² /ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in ² /ft	0.63 in ² /ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in ² /ft	0.63 in ² /ft
SL	5'x6'	6"/8"	n/a	0.48 in ² /ft	0.48 in ² /ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in ² /ft	0.48 in ² /ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in ² /ft	0.60 in ² /ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in ² /ft	0.60 in ² /ft
SL	6'x6'	6"/8"	n/a	0.43 in ² /ft	0.43 in ² /ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in ² /ft	0.56 in ² /ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in ² /ft	0.56 in ² /ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in ² /ft	0.59 in ² /ft
SL	8'x8'	8"/10"	n/a	0.45 in ² /ft	0.45 in ² /ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in ² /ft	0.45 in ² /ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in ² /ft	0.45 in ² /ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in ² /ft	0.45 in ² /ft

② See sheet PDD for corresponding wall thickness (W) of base unit or riser.

Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PSL. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)
 When an apron is to be cast around PSL, use detail above to create an apron ledge on all 4 sides.

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of 3/4" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in²/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is 3/4".
8. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or 1/2 the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans.

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for lid is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

SHEET 2 OF 2




PRECAST SLAB LID

PSL

FILE: prest05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
	DIST	COUNTY	SHEET NO.	
	AUS	WILLIAMSON	174	

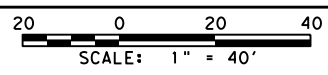
1. A written notice of construction must be submitted to the TCEQ regional office at least 48 hours prior to the start of any regulated activities. This notice must include:
 - the name of the approved project;
 - the activity start date; and
 - the contact information of the prime contractor.
2. All 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 than when 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.

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)			
<small>©TxDOT</small>	<small>REVISIONS</small>	<small>CONT</small>	<small>SECT</small>
<small>01/10/14: REQUIREMENTS AND ADDRESS UPDATED</small>	<small>0015</small>	<small>09</small>	<small>194</small>
<small>01/21/16: REQUIREMENTS UPDATED</small>	<small>DIST</small>	<small>COUNTY</small>	
<small>09/24/19: UPDATED RELEASE YEAR</small>	<small>AUS</small>	<small>WILLIAMSON</small>	
<small>JOB</small>			<small>HIGHWAY</small>
<small>1H 35</small>			<small>SHEET NO.</small>
<small>175</small>			

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7:42:22 PM
br:dgpepw011cs0708/2021



- NOTES:**
- BRIDGE MODIFICATION ARE DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATION 7TH ED.
 - EXISTING BRIDGE WAS DESIGNED IN ACCORDANCE WITH AASHTO 1983 SPECIFICATIONS (HS-20 LOADING).
 - SEE AS BUILT FOR ADDITIONAL DIMENSIONS AND DETAIL.
 - REPAIR OF CONCRETE SPALLS AND CRACKS SHOULD BE IN ACCORDANCE WITH ITEM 429, "CONCRETE STRUCTURE REPAIR" AND TxDOT'S CONCRETE REPAIR MANUAL.
 - SEE TO PSN STANDARD SHEET FPR DETAILS ON PAINTING STRUCTURE NUMBER.
 - SEE BRIDGE REPAIR DETAIL SHEETS FOR HEADER JOINT REPAIR DETAIL AND FABRIC UNDERSEAL.

CONTRACTOR NOTES:
ALL BRIDGE DIMENSIONS AND SKEW ANGLES SHALL BE VERIFIED PRIOR TO COMMENCING BRIDGE ALTERATIONS.

A.D.T.
2017: 189,168 VPD
2037: 231,579 VPD

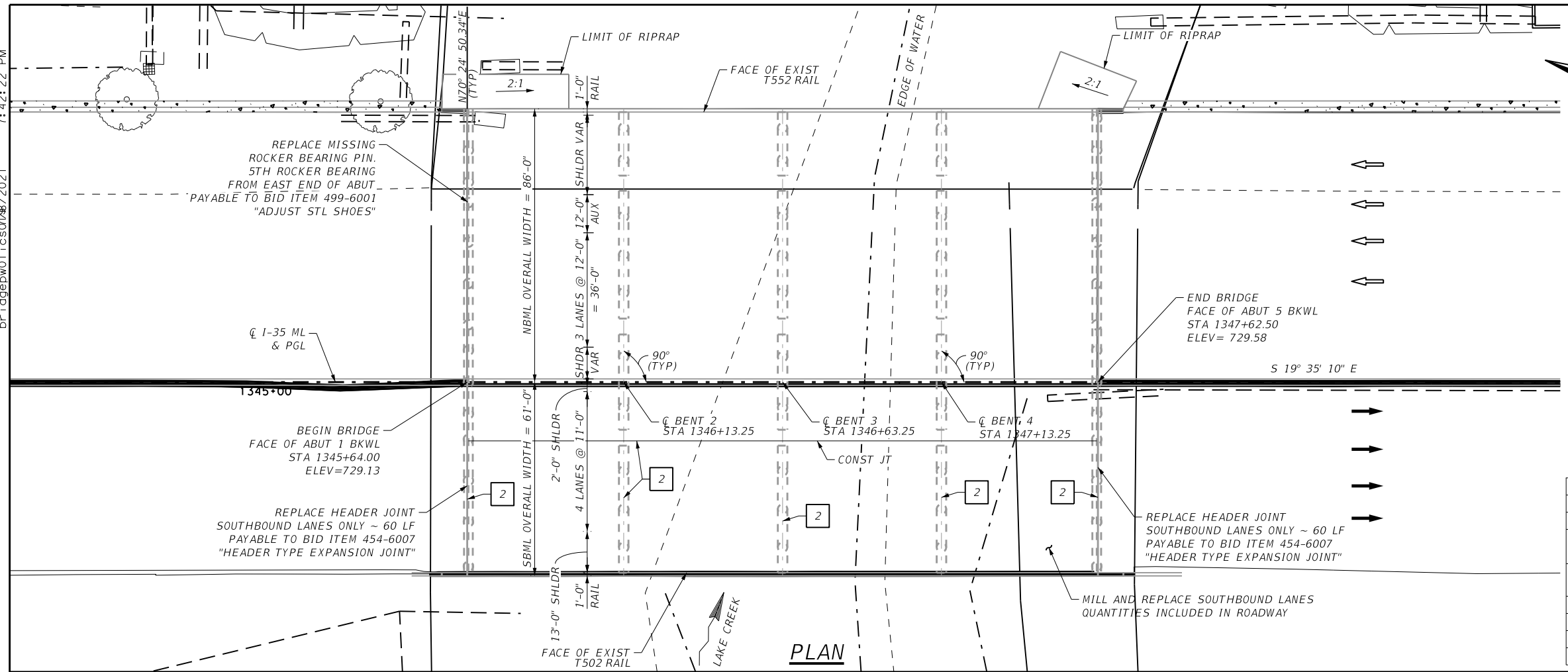
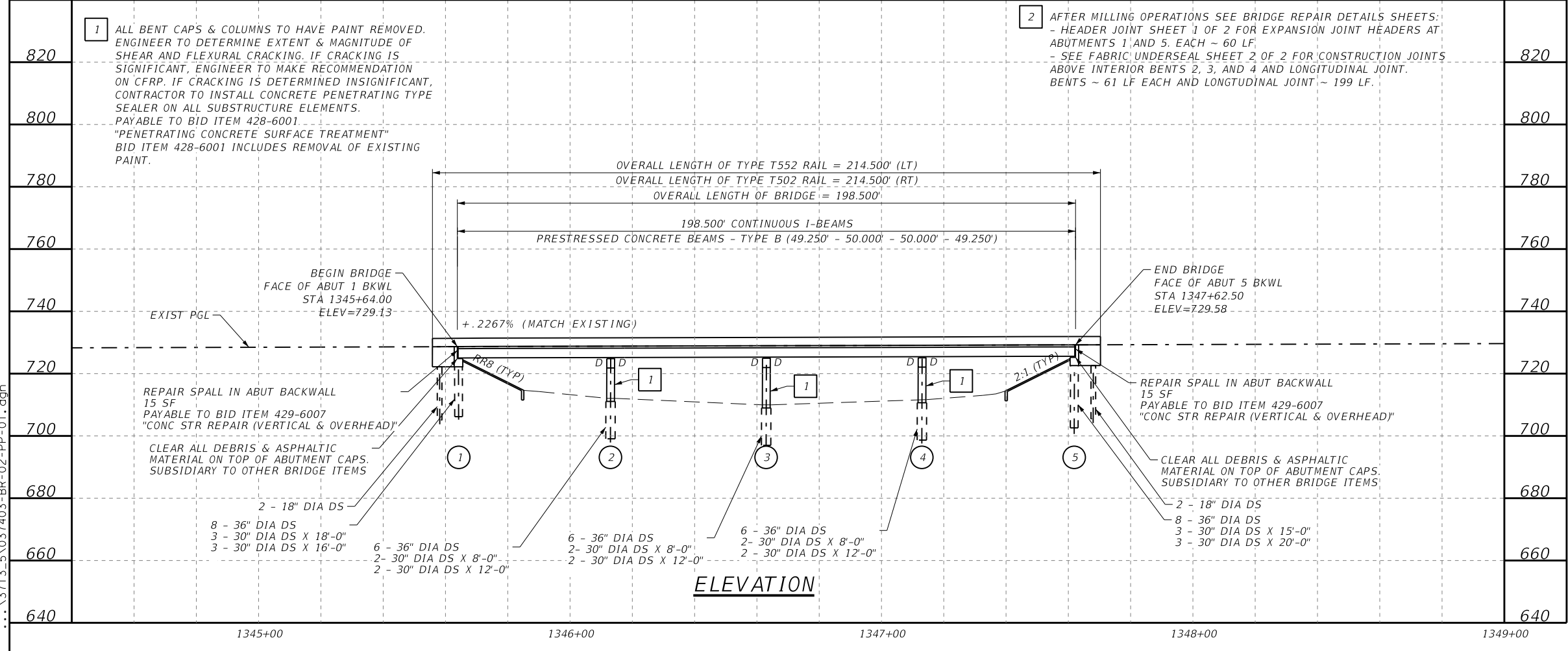


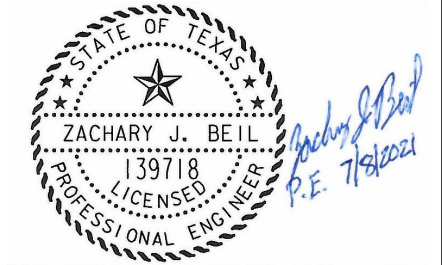
TABLE OF ESTIMATED QUANTITIES

ITEM	DESCRIPTION	QUANTITY	UNIT
356-6021	PAV JT UNDERSEAL (24")	382	LF
428-6001	PENETRATING CONCRETE SURFACE TREATMENT	670	SY
429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	30	SF
438-6006	CLEANING AND SEALING JOINTS (CL 3)	120	LF
454-6007	HEADER TYPE EXPANSION JOINT	120	LF
454-6009	JOINT SEALANT	120	LF
499-6001	ADJUST STL SHOES	1	EA



BRIDGE REPAIR LOCATIONS AND QUANTITIES ARE IN REFERENCE TO THE 2019 BRIDGE CONDITION SURVEY.

EXIST NBI NO. 14-246-0-0015-09-182



HS 20 LOADING

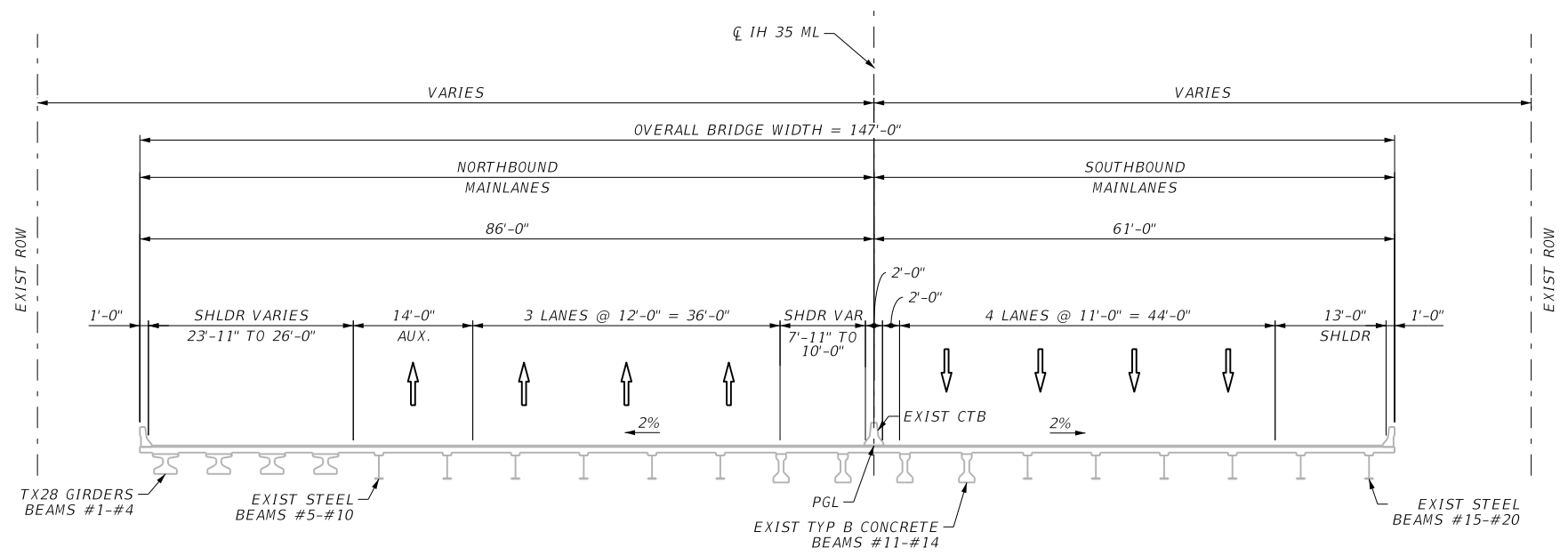


**IH 35
LAKE CREEK
BRIDGE LAYOUT
& REPAIRS**

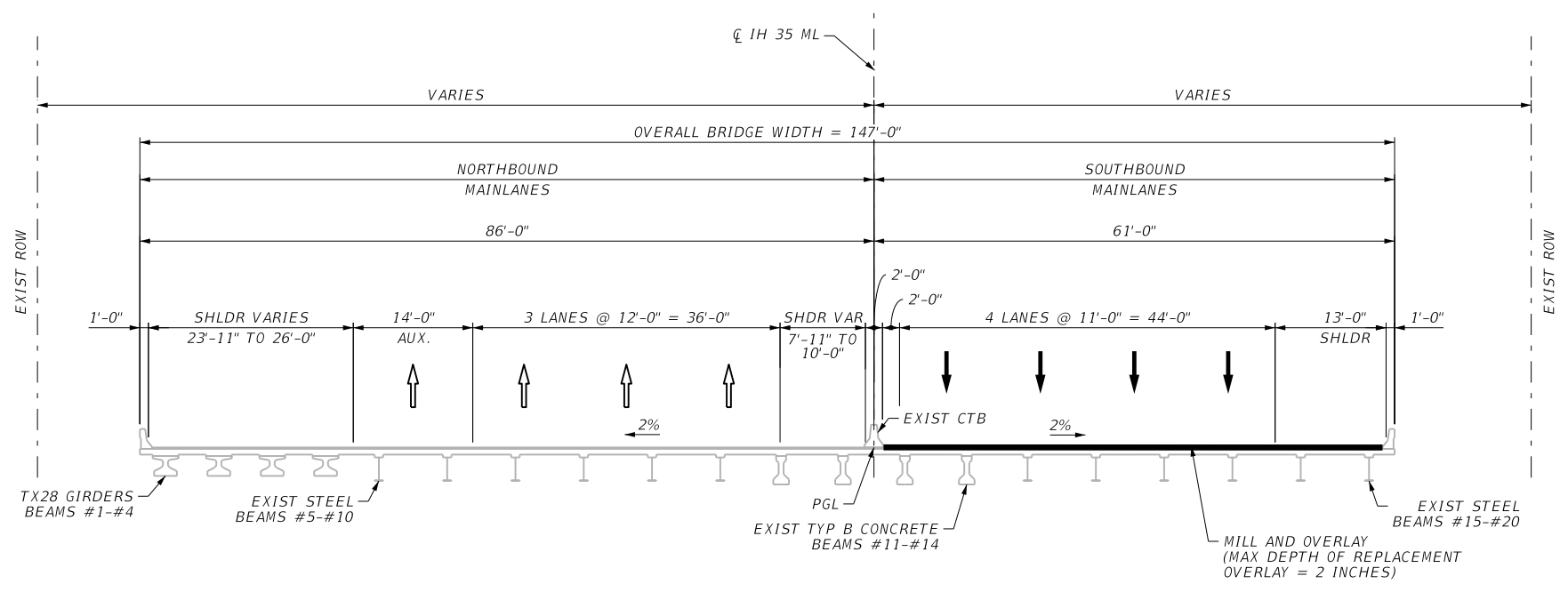
SCALE: 1" = 40" SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
ZB	ZB	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
AKH	STS	AUS	WILLIAMSON	177	

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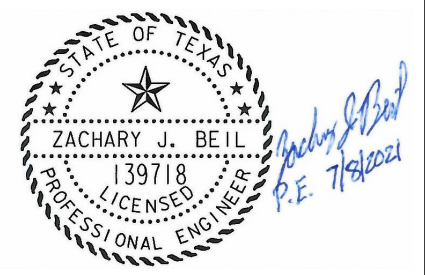
EXISTING TYPICAL
STA 1345+64.00 TO STA 1347+62.50



PROPOSED TYPICAL
STA 1345+64.00 TO STA 1347+62.50

1 SEE AS BUILT FOR ADDITIONAL DETAILS AND DIMENSIONS.

EXIST NBI NO. 14-246-0-0015-09-182



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPPE REGISTRATION NO. 264

2021
Texas Department of Transportation

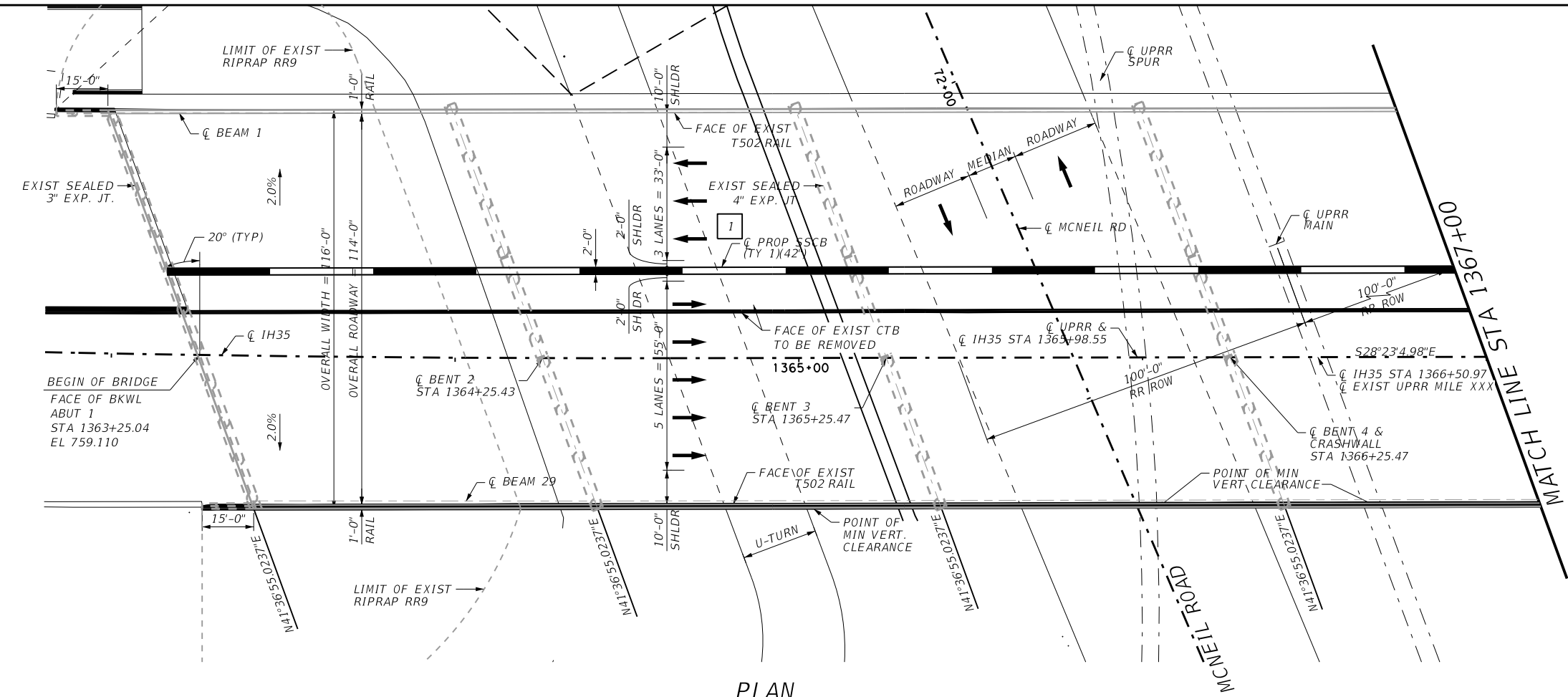
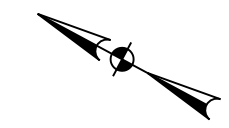
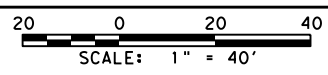
IH 35
EXISTING & PROPOSED
BRIDGE TYPICAL
SECTION @ LAKE CK

NOT TO SCALE SHEET 1 OF 1

DS:	CK:	CONT:	SECT:	JOB:	HIGHWAY:
ZB	ZB	0015	09	194	IH 35
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AKH	STS	AUS		WILLIAMSON	178

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PLAN

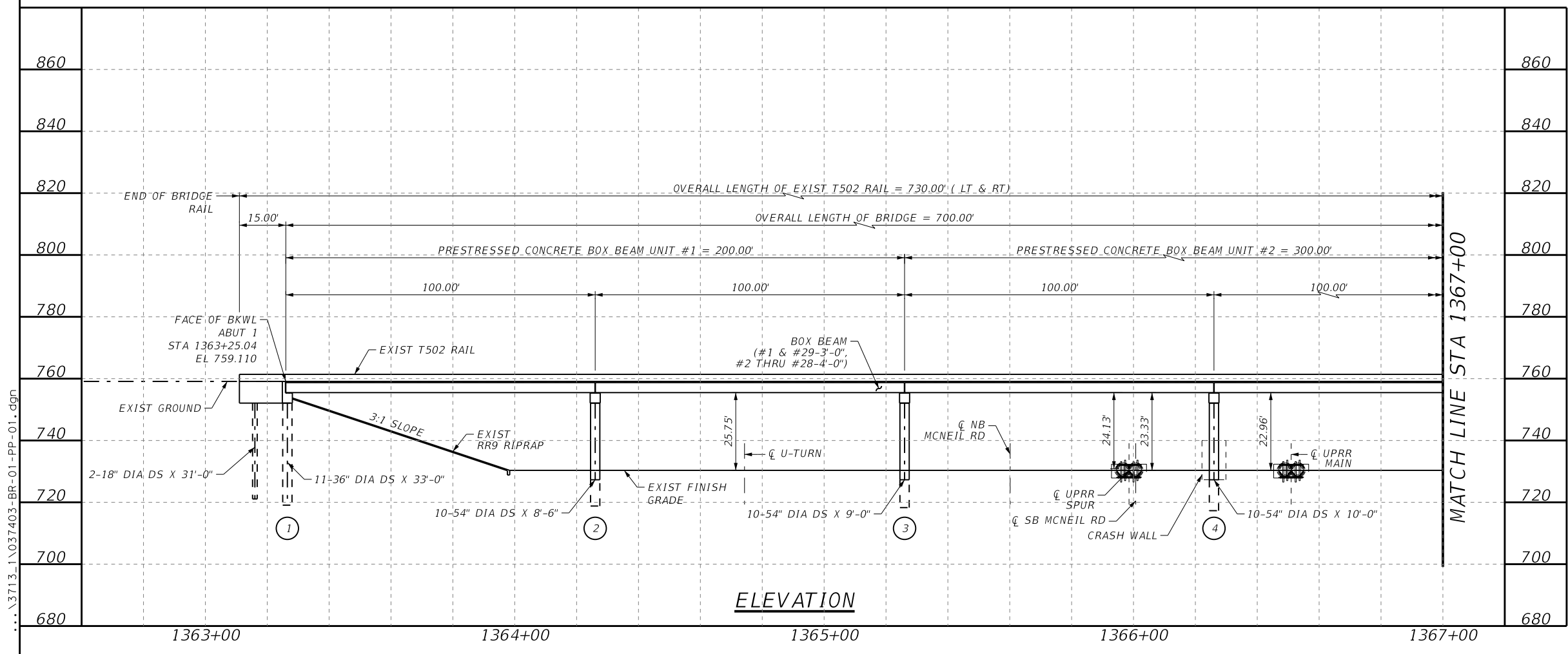
- NOTES:**
- BRIDGE MODIFICATION ARE DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATION 7TH ED.
 - EXISTING BRIDGE WAS DESIGNED IN ACCORDANCE WITH AASHTO 1983 SPECIFICATIONS (HS-20 LOADING).
 - SEE AS BUILT FOR ADDITIONAL DIMENSIONS AND DETAIL.
 - FOR LIMITS OF MEDIAN BARRIER, PLEASE REFER TO THE PLAN AND PROFILE SHEETS.

CONTRACTOR NOTES:
ALL BRIDGE DIMENSIONS AND SKEW ANGLES SHALL BE VERIFIED PRIOR TO COMMENCING BRIDGE ALTERATIONS.

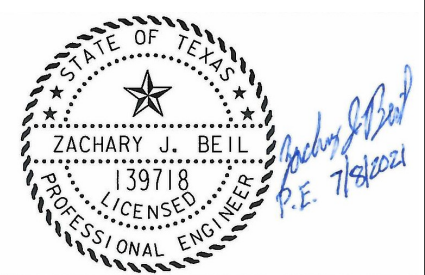
A.D.T.
2017: 189,168 VPD
2037: 231,579 VPD

1 TRANSITION SSCB (TY 1)(42") TO SSCB (TY 1)(42") OVER LENGTH OF APPROACH SLAB IN SIMILAR FASHION TO TRANSITION SHOWN ON SHEET 94.

EXIST NBI NO. 14-246-0-0015-09-416



ELEVATION



HS 20 LOADING

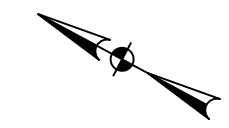
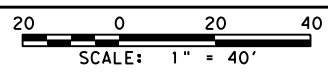


**IH 35
BRIDGE LAYOUT
MCNEIL ROAD
OVERPASS**

SCALE: 1" = 40' SHEET 1 OF 2

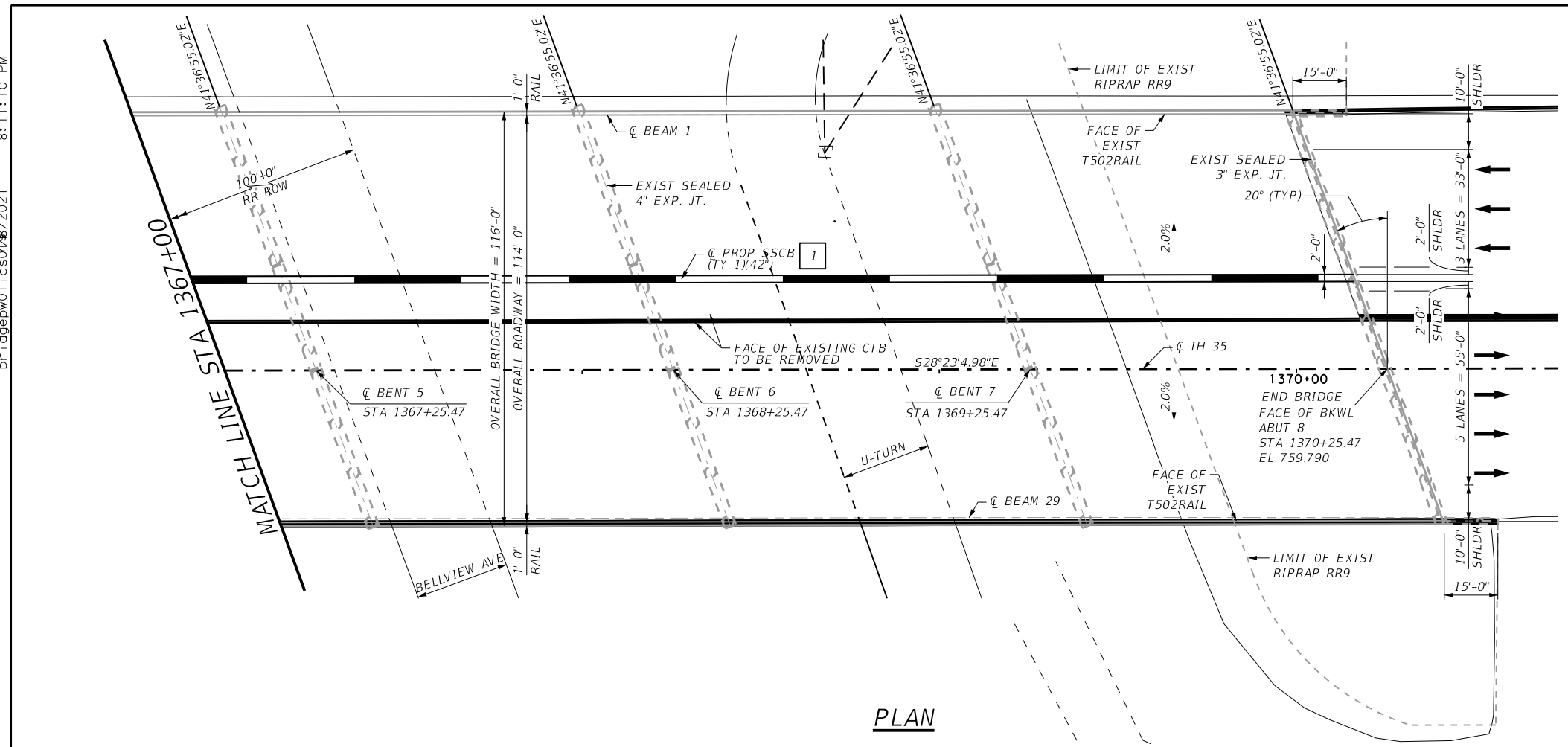
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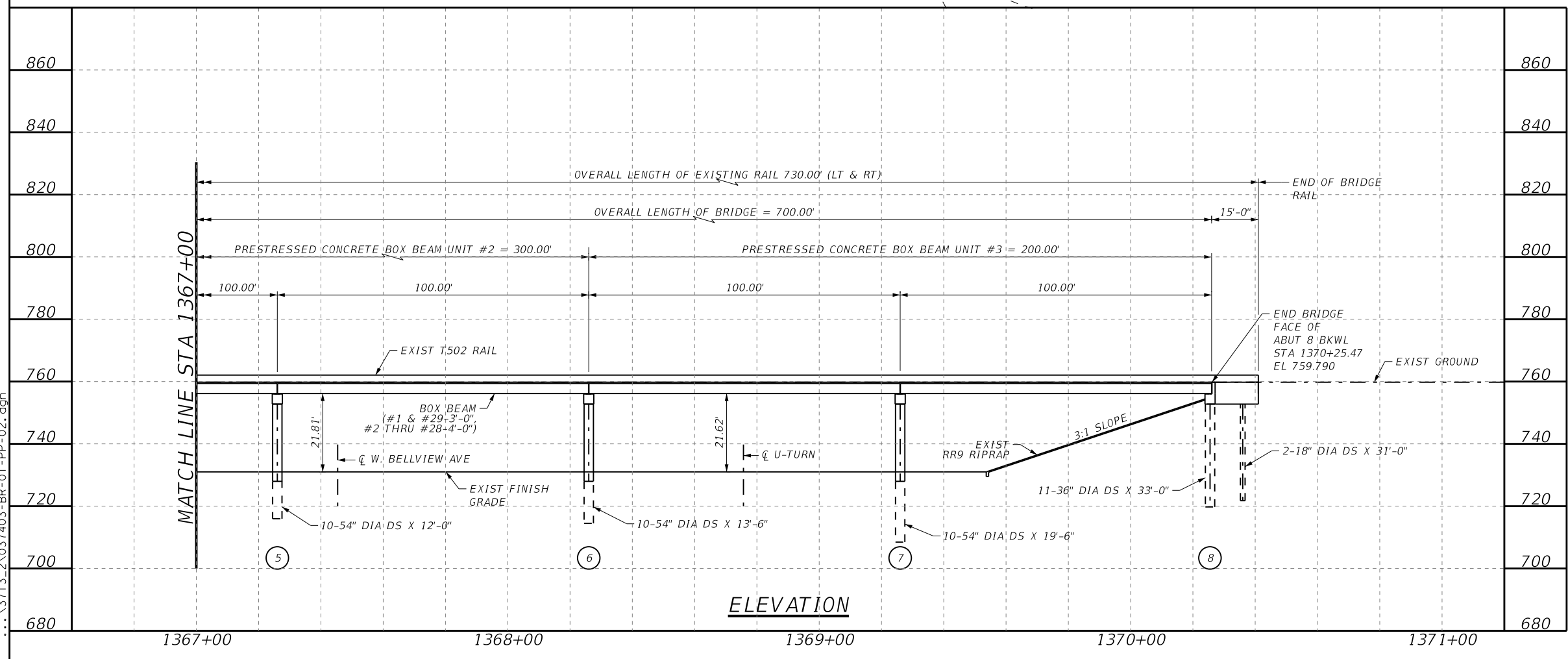


NOTES:
1. SEE SHEET 1 OF 2 FOR GENERAL NOTES.

1 TRANSITION SSCB (TY 1X42") TO SSCB (TY 1X54") OVER LENGTH OF APPROACH SLAB IN SIMILAR FASHION TO TRANSITION SHOWN ON SHEET 94.



PLAN



ELEVATION



HS 20 LOADING

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 284



**IH 35
BRIDGE LAYOUT
MCNEIL ROAD
OVERPASS**

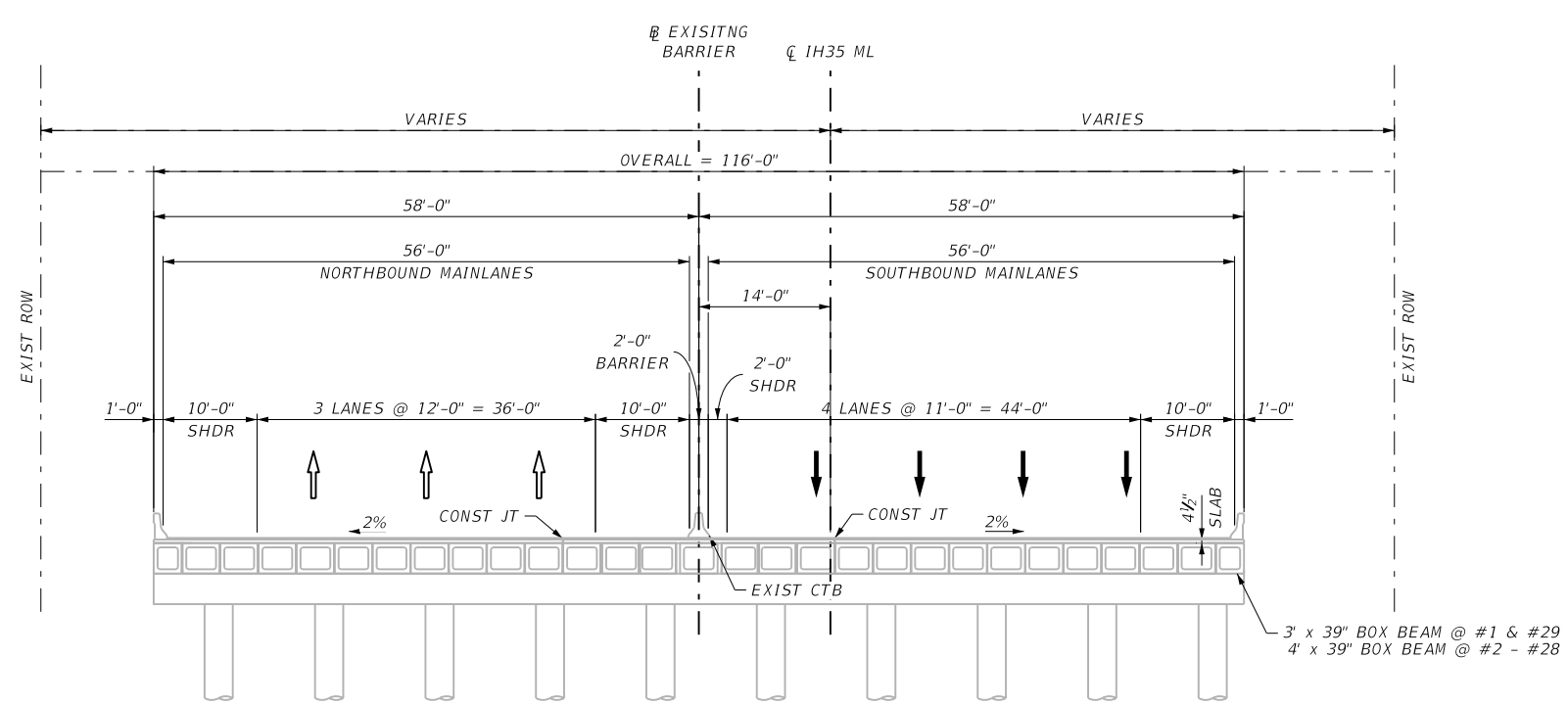
SCALE: 1" = 40' SHEET 2 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
ZB	ZB	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
AKH	STS	AUS	WILLIAMSON	180	

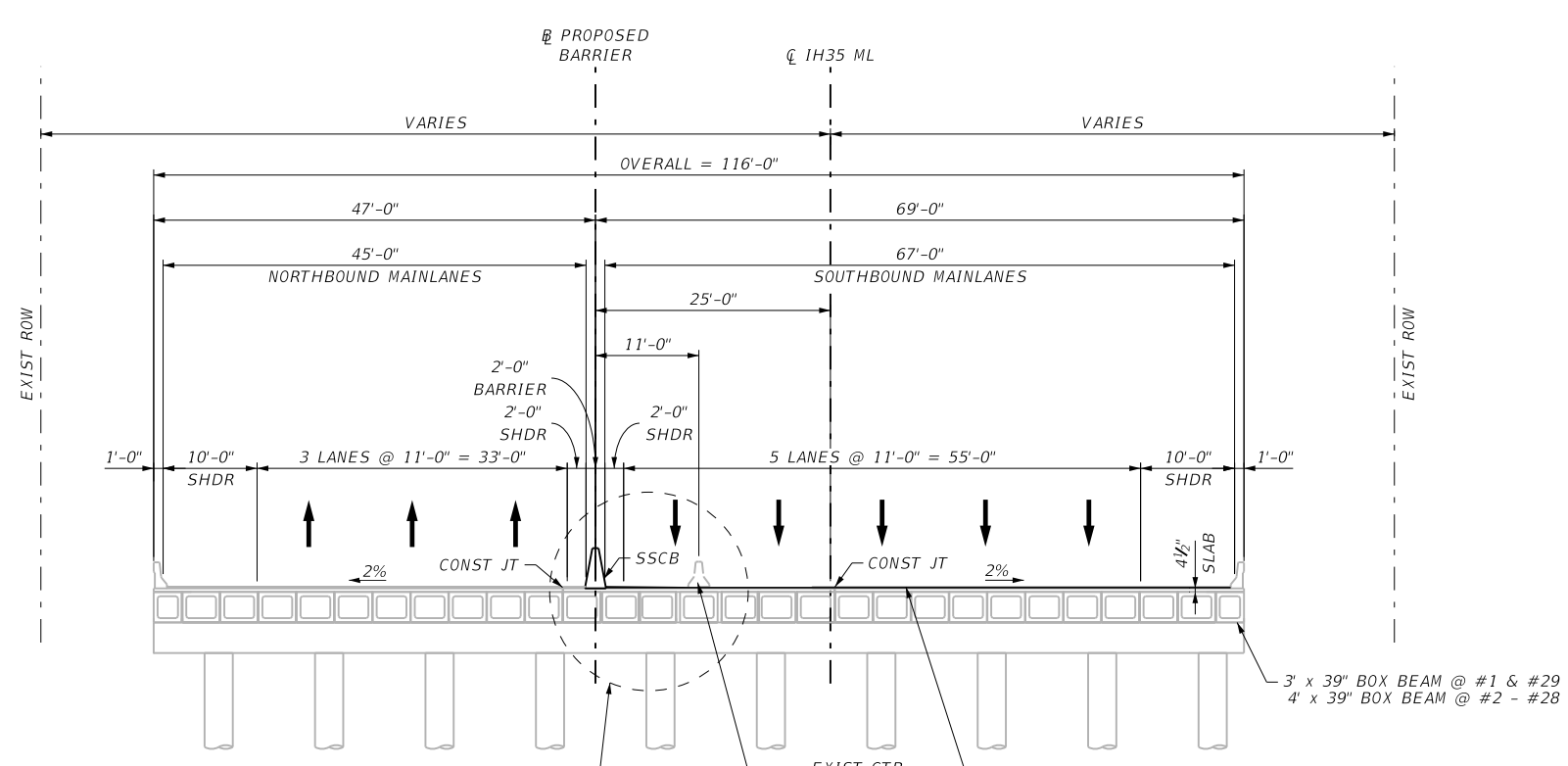
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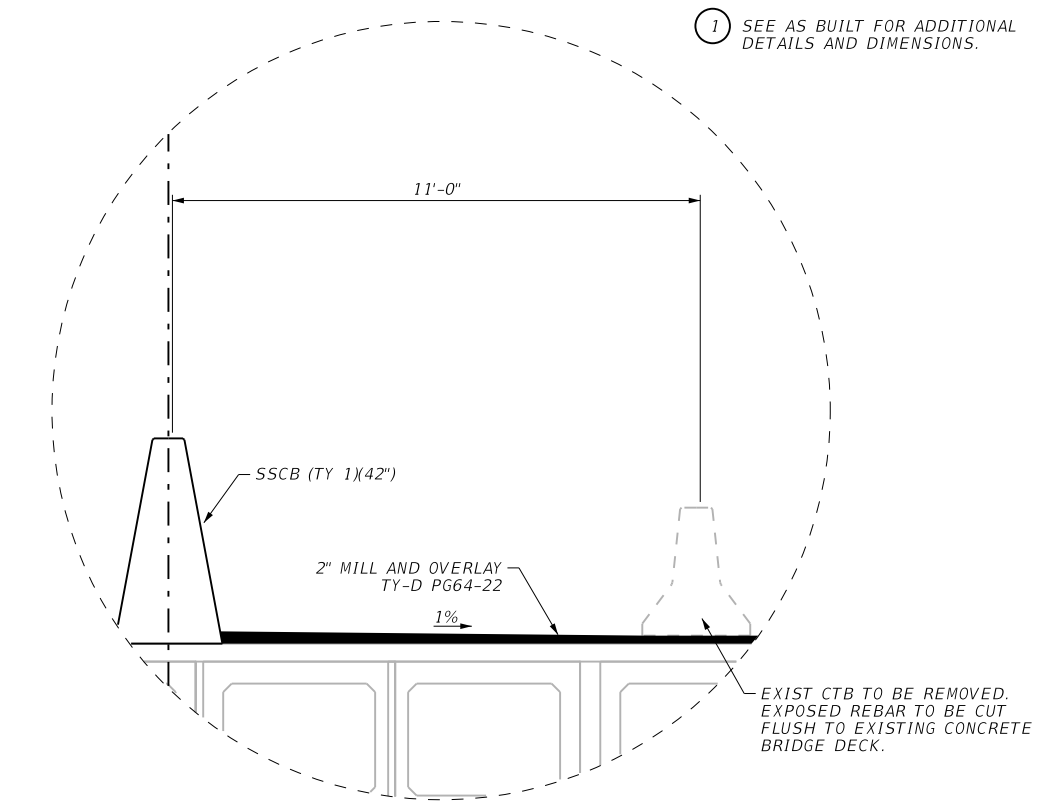
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EXISTING TYPICAL
STA 1363+25.04 TO 1370+25.47

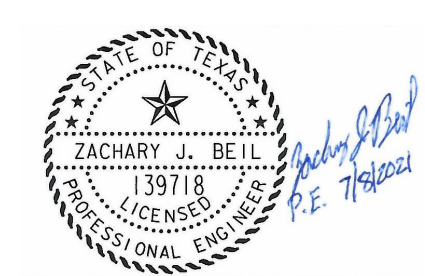


PROPOSED TYPICAL
STA 1363+25.04 TO 1370+25.47



DETAIL A

EXIST NBI NO. 14-246-0-0015-09-416



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

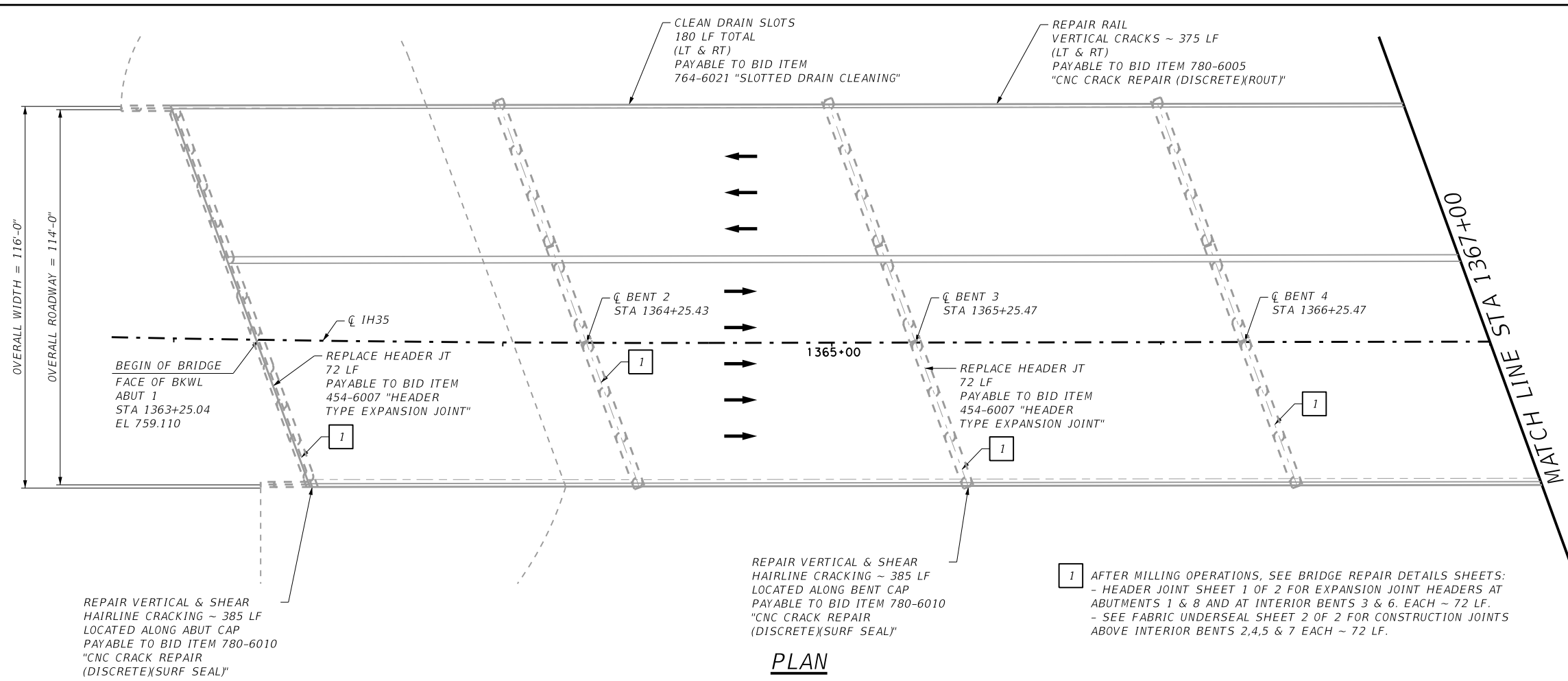
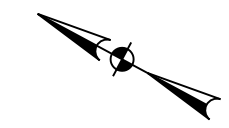
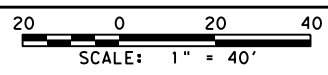
IH 35
EXISTING & PROPOSED
BRIDGE TYPICAL
SECTION @ MCNEIL

NOT TO SCALE SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
ZB	ZB	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
AKH	STS	AUS	WILLIAMSON	181	

8:01:56 PM

...037403-BR-01-PP-01-Repair.dgn



- NOTES:**
- BRIDGE MODIFICATION ARE DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATION 7TH ED.
 - EXISTING BRIDGE WAS DESIGNED IN ACCORDANCE WITH AASHTO 1983 SPECIFICATIONS (HS-20 LOADING).
 - SEE AS BUILT PLANS FOR ADDITIONAL DIMENSIONS AND DETAIL.
 - REPAIR OF CONCRETE SPALLS AND CRACKS SHOULD BE IN ACCORDANCE WITH ITEM 429, "CONCRETE STRUCTURE REPAIR", AND TxDOT'S CONCRETE REPAIR MANUAL.
 - REFER TO PSN STANDARD SHEET FOR DETAILS ON PAINTING STRUCTURE NUMBER.
 - SEE BRIDGE REPAIR DETAIL SHEETS FOR HEADER JOINT REPAIR DETAIL AND FABRIC UNDERSEAL.

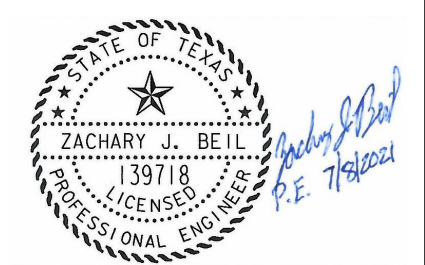
CONTRACTOR NOTES:
ALL BRIDGE DIMENSIONS AND SKEW ANGLES SHALL BE VERIFIED PRIOR TO COMMENCING BRIDGE ALTERATIONS.

1 AFTER MILLING OPERATIONS, SEE BRIDGE REPAIR DETAILS SHEETS:
- HEADER JOINT SHEET 1 OF 2 FOR EXPANSION JOINT HEADERS AT ABUTMENTS 1 & 8 AND AT INTERIOR BENTS 3 & 6. EACH ~ 72 LF.
- SEE FABRIC UNDERSEAL SHEET 2 OF 2 FOR CONSTRUCTION JOINTS ABOVE INTERIOR BENTS 2,4,5 & 7 EACH ~ 72 LF.

EXIST NBI NO. 14-246-0-0015-09-416

PLAN

BRIDGE REPAIR LOCATIONS AND QUANTITIES ARE IN REFERENCE TO THE 2019 BRIDGE CONDITION SURVEY.



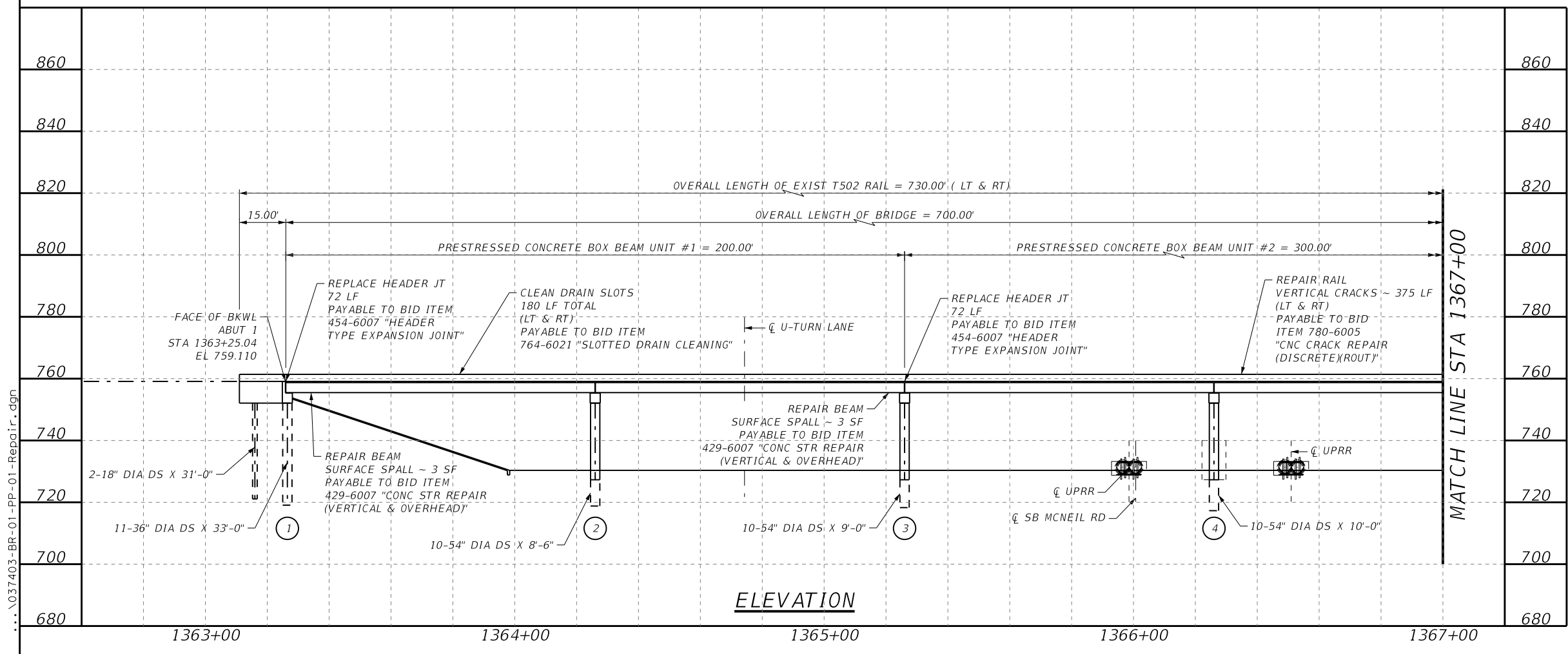
HS 20 LOADING



**IH 35
BRIDGE REPAIR
MCNEIL ROAD
OVERPASS**

SCALE: 1" = 40' SHEET 1 OF 2

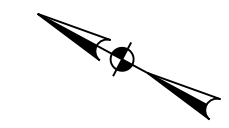
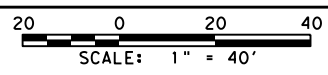
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ZB	ZB	0015	09	194	IH 35
DW:	CK:	DIST:	COUNTY:	SHEET NO.	
AKH	STS	AUS	WILLIAMSON	182	



ELEVATION

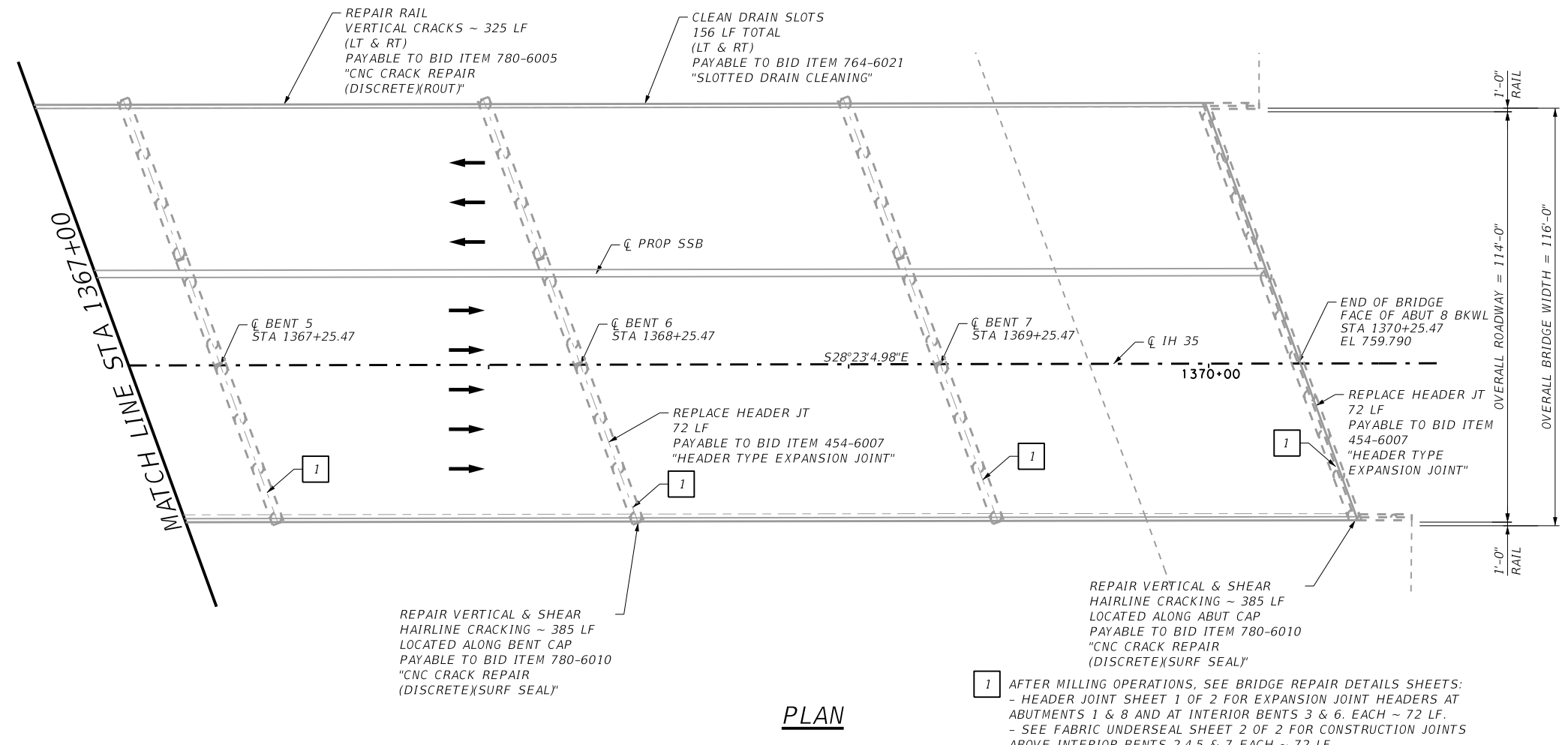
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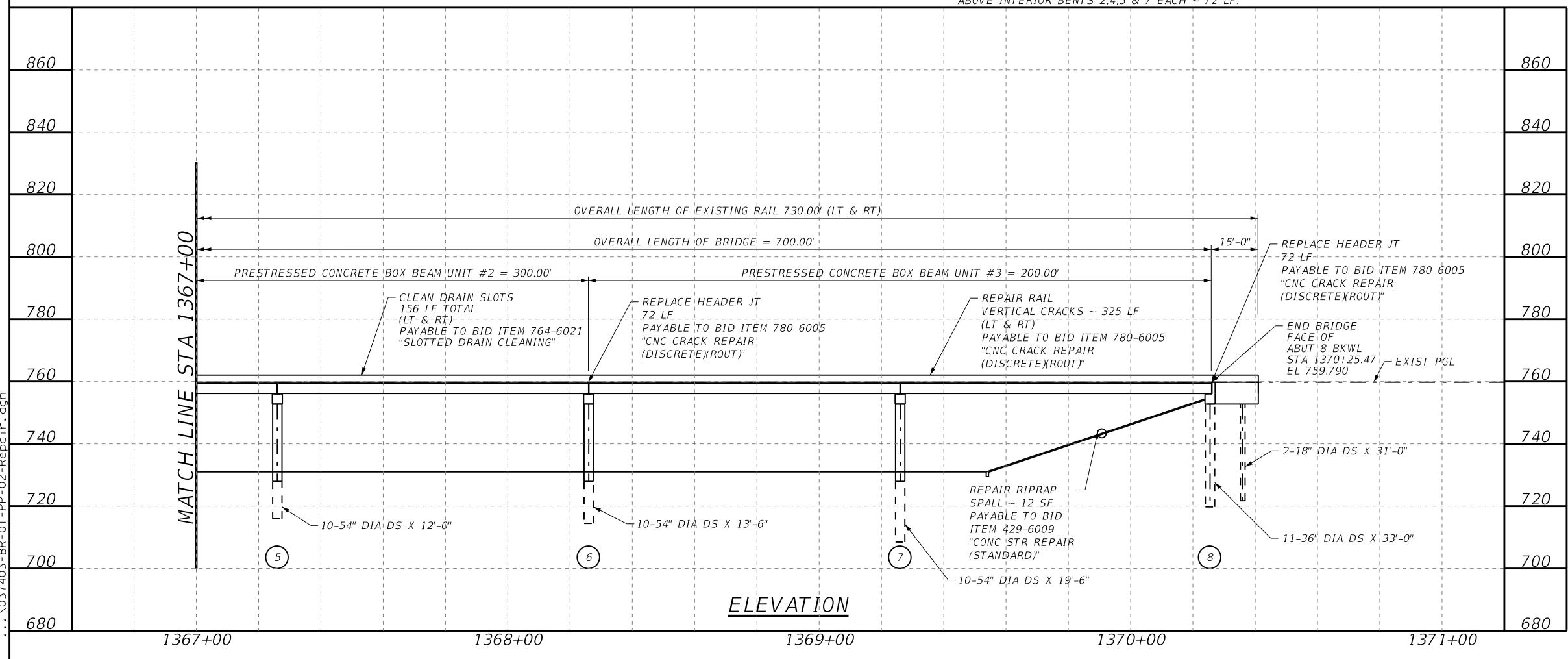
NOTES:
1. SEE SHEET 1 OF 2 FOR GENERAL NOTES.

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	QUANTITY	UNIT
356-6021	PAV JT UNDERSEAL (24")	288	LF
429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	6	SF
429-6009	CONC STR REPAIR (STANDARD)	12	SF
438-6006	CLEANING AND SEALING JOINTS (CL 3)	288	LF
454-6007	HEADER TYPE EXPANSION JOINT	288	LF
454-6009	JOINT SEALANT	288	LF
764-6021	SLOTTED DRAIN CLEANING	336	LF
780-6005	CNC CRACK REPAIR (DISCRETE)(ROUT)	700	LF
780-6010	CNC CRACK REPAIR (DISCRETE)(SURF SEAL)	1540	LF

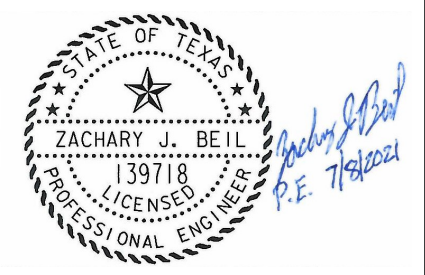


PLAN

1 AFTER MILLING OPERATIONS, SEE BRIDGE REPAIR DETAILS SHEETS:
 - HEADER JOINT SHEET 1 OF 2 FOR EXPANSION JOINT HEADERS AT ABUTMENTS 1 & 8 AND AT INTERIOR BENTS 3 & 6. EACH ~ 72 LF.
 - SEE FABRIC UNDERSEAL SHEET 2 OF 2 FOR CONSTRUCTION JOINTS ABOVE INTERIOR BENTS 2,4,5 & 7 EACH ~ 72 LF.



ELEVATION



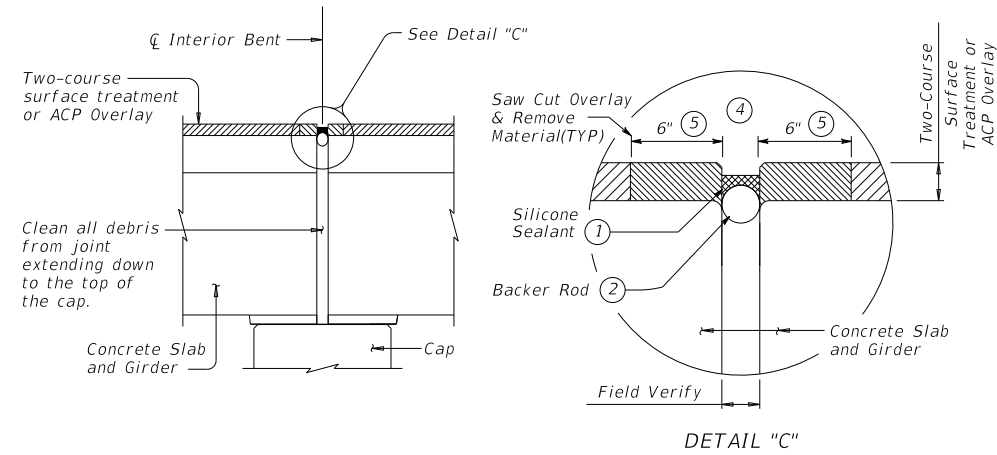
HS 20 LOADING



**IH 35
BRIDGE REPAIR
MCNEIL ROAD
OVERPASS**

SCALE: 1" = 40' SHEET 2 OF 2

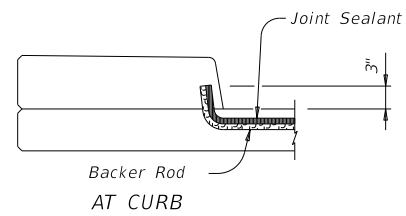
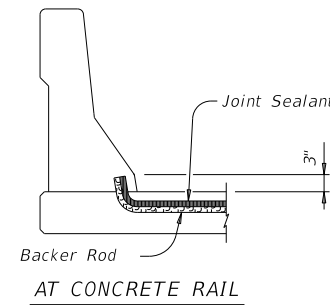
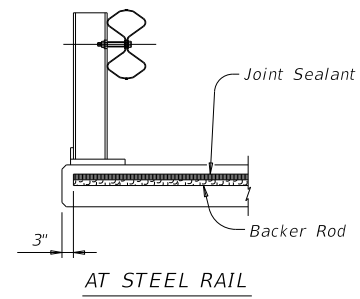
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DW: AKH	CK: STS	DIST: AUS	COUNTY: WILLIAMSON	SHEET NO. 183	



EXPANSION JOINT HEADER
(ACP Overlay with Joints > 100' apart)

PROCEDURE:

- 1) After existing overlay is removed, clean joint opening of all old expansion materials/devices, dirt, and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints". Clean joint out full depth of the joint.
- 2) Repair deck spalls that leave less than 6" of original deck in accordance with Item 785, "Bridge Joint Repair or Replacement". Spalls that are not as deep may be filled with header material.
- 3) Place overlay/surface treatment in accordance with plans.
- 4) Saw cut overlay to top of deck and remove all asphaltic material to expose joint.
- 5) Place header material in accordance with notes ④ & ⑤
- 6) Place backer rod ② into joint opening 1" below top of header material.
- 7) Seal the joint with a Class 7 Silicone. Recess seal 1/2" below top of header material in travel lanes and 1/8" below top of header material in shoulders.



JOINT SEALANT TERMINATION DETAILS

- ① Use Class 7 silicone sealant and primer in accordance with DMS-6310, "Joint Sealants and Fillers". Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Exist Joints (CL 7)".
- ② Backer rod must be 25% larger than joint opening and must be compatible with the sealant. Backer rod used with Class 3 sealant must be rated for a minimum of 400°F.
- ③ Match existing joint opening or set at a minimum:
 - a. 1" at 70°F when the distance between joints is 150' or less
 - b. 2" at 70°F when the distance between joints is greater than 150'
 - c. or as directed by the Engineer
- ④ Use header material in accordance with DMS-6140, "Polymer Concrete for Bridge Joint Systems". Match the thickness of the header material with the thickness of the overlay as shown in the plans. Place header material flush with roadway surface. Do not cantilever header material over the joint opening.

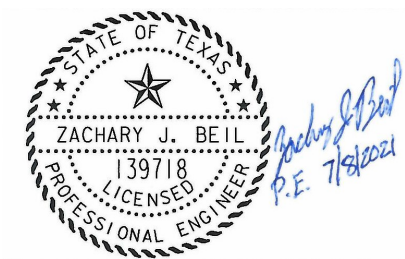
GENERAL NOTES:

Field verify all quantities, joint locations and joint types prior to ordering materials and beginning work.

Cleaning existing joint opening (full depth) of all debris, providing and placing backer rod, saw-cutting joint opening, and sealing joint is paid for by Item 438, "Cleaning and Sealing Joints" of the sealant type specified and measured by the linear foot of joint placed or, in the case of Expansion Joint Headers, by Item 454, "Header Type Expansion Joint", measured by the linear foot of header material and Item 454, "Joint Sealant", measured by the linear foot of sealant placed.

Extend sealant up into rail or curb 3 inches on low side or sides of deck. If the Class 7 Sealant cannot be effectively placed in the vertical position, a Class 4 Sealant compatible with the Class 7 sealant is allowed for the extension of the seal into the curb or rail.

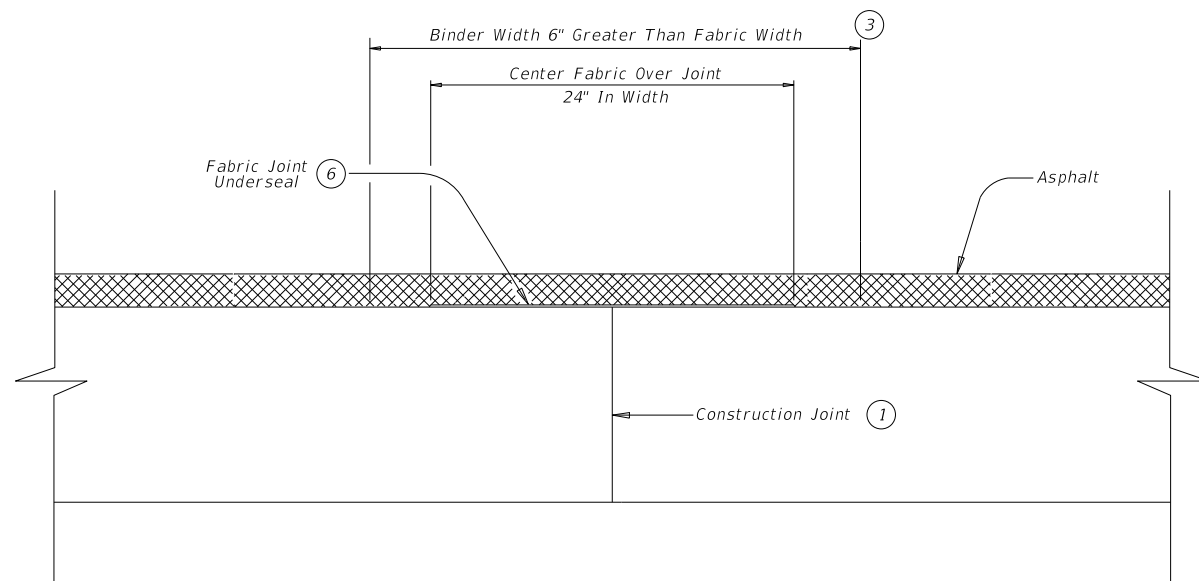
Repair of damaged concrete caused by the Contractor must be repaired at the Contractor's expense in accordance with Item 429, "Concrete Structure Repair", and TxDOT's Concrete Repair Manual.



**IH 35
BRIDGE REPAIR
DETAILS
HEADER JOINT**

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
ZB	ZB	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
AKH	STS	AUS	WILLIAMSON	184	



FABRIC UNDERSEAL AT CONSTRUCTION JOINT

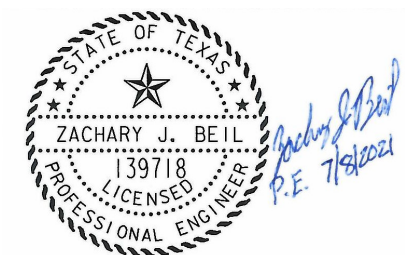
NOTE:

Expansion and Construction Joints

- ① Prior to placement of the fabric joint underseal, clean joint of all bituminous materials, dirt, grease and all other deleterious materials. Joint openings will be cleaned of all old expansion materials and devices in accordance with Item 438, "Cleaning and Sealing Joints and Cracks."
 - ② Repair any significant spalled or cracked areas, as determined by the Engineer, with an approved concrete repair material.
 - ③ Place tack coat or binder on the surface of deck and on top of fabric as required by the fabric joint underseal manufacturer's installation instructions. A tack coat is required on the surface of deck if it has been milled.
 - ④ When using the self-adhesive type fabric underseal, pressure roll fabric joint underseal to improve adhesion.
- Expansion Joints
- ⑤ Install backer rod before placing tack coat. The backer rod will be 25% larger than the opening and placed 1" below the concrete surface.
 - ⑥ Tuck fabric down approximately 1" into the joint opening. Install underseal in accordance with manufacturer's recommendations. Just prior to paving, fill tucked in portion of underseal with sand flush with surface. Apply a tack coat to fabric joint underseal as required by the manufacturer's installation instructions. Mark location of centerline of joint on curb or barrier as approved.
 - ⑦ After the asphaltic concrete pavement operations are complete, saw cut through the asphalt at centerline of joint to the sand layer. Make multiple saw cuts to create a 1/2" minimum joint opening or match the existing opening, whichever is greater, not to exceed 1". Do not damage the underseal. Blow sand out of the joint with oil- and water-free compressed air. Seal the joint opening with hot poured rubber flush with the top of the asphaltic concrete pavement.

GENERAL NOTES:

Concrete repair material will be in accordance with DMS 4655 "Concrete Repair Materials" or as approved by the Engineer.
 Fabric underseal will be in accordance with DMS-6260, "Reinforced Fabric Joint Underseal". At expansion joints a fabric underseal meeting DMS 6220 "Fabric For Underseals" may be used.
 Class 3 sealant, hot poured rubber, will be in accordance with DMS-6310, "Joint Sealants and Fillers."
 Obtain approval for all tools, equipment, materials and techniques proposed for use in construction of the joint.
 Repair of spalled or cracked areas will be paid for by "Extra Work As Directed by the Engineer". Repair of damage caused by contractor operations will not be paid for.
 Tack coat and fabric underseal for expansion and construction joints will be paid for by Item 356, "Fabric Underseal", measured by the linear foot of joint unless shown otherwise in the plans.
 All work associated with cleaning and sealing expansion joints will be paid for by Item 438 "Cleaning and Sealing Joints and Cracks", measured by the linear foot of joint unless shown otherwise in the plans. All work associated with cleaning of construction joints will not be paid for directly but will be considered subsidiary.



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 TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

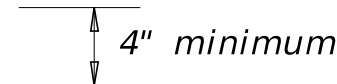
IH 35
**BRIDGE REPAIR
 DETAILS
 FABRIC UNDERSEAL**

SHEET 1 OF 1

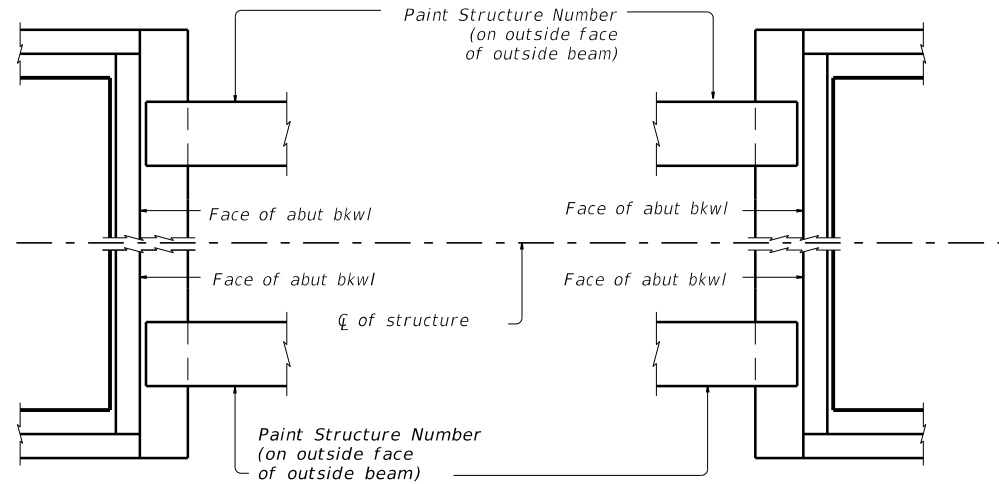
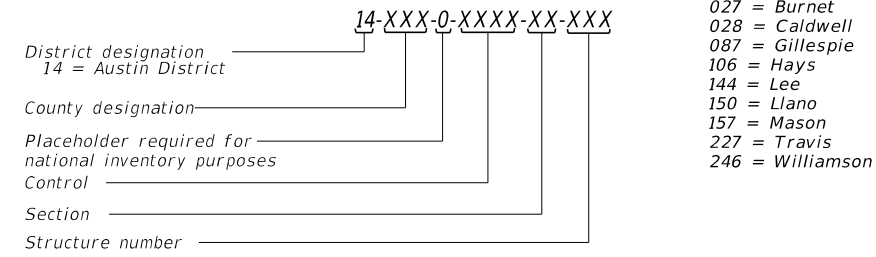
DS:	CONT	SECT	JOB	HIGHWAY
ZB	ZB	0015	09 194	IH 35
DW:	DIST	COUNTY	SHEET NO.	
AKH	STS	AUS	WILLIAMSON	185

14-XXX-0-XXXX-XX-XXX

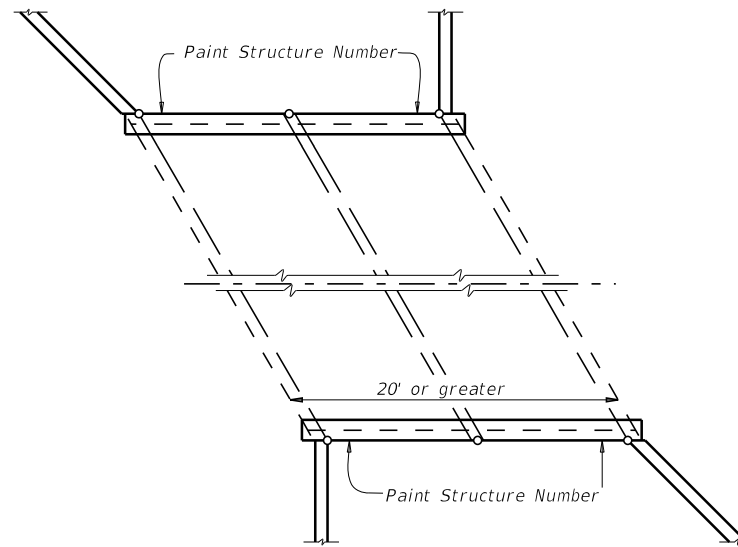
District designation County designation Placeholder Control Section Structure number



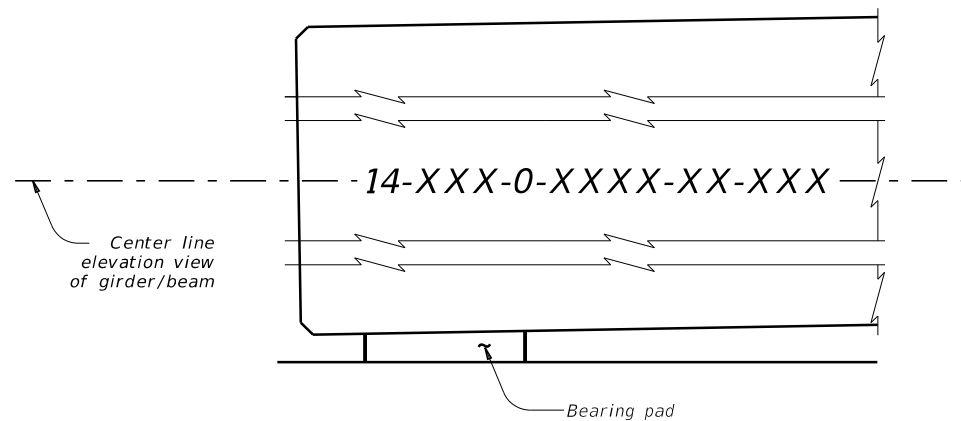
PAINTED STRUCTURE NUMBER LEGEND



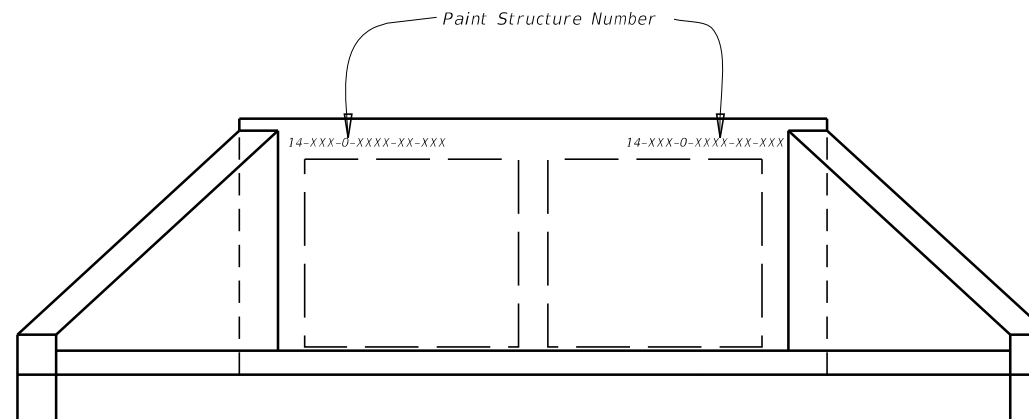
AT BRIDGE LOCATIONS



AT CULVERT LOCATIONS



ELEVATION VIEW DETAIL



ELEVATION VIEW DETAIL

GENERAL NOTES:
 Permanently mark each structure with the painted structure number in accordance with the plans.
 Each Structure shall have 4 (four) Structure numbers painted per structure.
 Painting structure number work will not be measured or paid for directly but will be considered subsidiary to other pertinent items.

MATERIAL:
 Provide black, lead free, CFC free, and CFHC free paint that is water proof, weather resistant, and dries instantly on all surfaces without smearing, smudging, or rippling

Austin District Standard

PAINTING STRUCTURE NUMBERS

PSN-19 (AUS)

©TxDOT 2021	CONT	SECT	JOB	HIGHWAY
	0015	09	194	IH 35
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		191

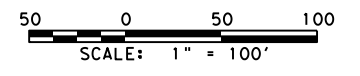
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br:idgepww011cs0746/2021

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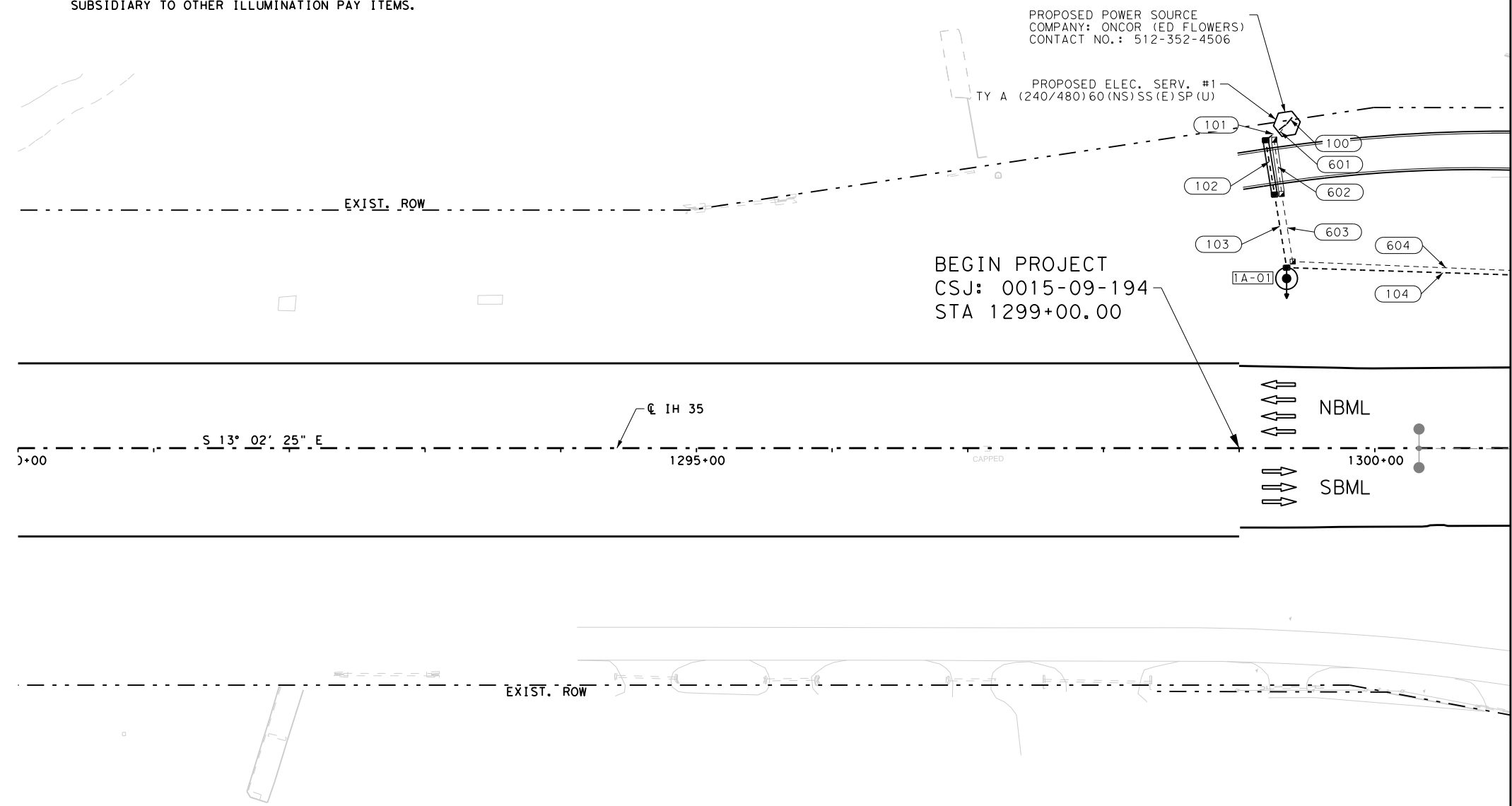
NOTES:

1. VERIFY LOCATIONS OF ALL UTILITIES IN THE FIELD PRIOR TO LIGHTING INSTALLATION.
2. ALL EXISTING ELECTRICAL ELEMENTS SHOWN ON PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY THAT NO CONFLICTS EXIST PRIOR TO PLACEMENT OF CONDUIT.
3. ALL ELECTRICAL WORK SHALL MEET THE NATIONAL ELECTRICAL CODE (NEC).
4. COORDINATE AND VERIFY ALL SERVICE POLE LOCATIONS AND SERVICE DROPS WITH RESPECTIVE ELECTRICAL COMPANY REPRESENTATIVES.
5. EXISTING CONDUIT AND CONDUCTORS, ILLUMINATION ASSEMBLIES AND ELECTRICAL SERVICES TO REMAIN AND UTILIZED MUST BE VERIFIED IN THE FIELD. ALL EXISTING ELECTRICAL ELEMENTS ON THE PLANS ARE APPROXIMATE AND HAVE BEEN EXACTED FROM PRIOR AS-BUILTS.
6. EXISTING ILLUMINATION CONDUIT AND CONDUCTORS, INCLUDING ALL ASSOCIATED APPURTENANCE SUCH AS ELBOWS, SWEEPS, SPLICES, JUNCTION BOXES, AND PULL BOXES SHALL BE REMOVED WHERE CONFLICTING WITH PROPOSED ELEMENTS OR AS DIRECTED. REMOVAL SHALL NOT BE PAID FOR DIRECTLY BUT CONSIDERED SUBSIDIARY TO OTHER ILLUMINATION PAY ITEMS.



LEGEND

- PROP WRONG WAY DETECTION ZONE
- PROP WRONG WAY DETECTION DEVICE
- PROP. HIGH MAST ILL POLE (ASYM) (100')
- PROP. HIGH MAST ILL POLE (SYM) (100')
- PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
- PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
- EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. UNDERPASS FIXTURE (TO REMAIN)
- EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
- EXIST. ILL POLE W/ TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY A W/ APRON
- EXIST. JUNCTION BOX
- EXIST. FUSED DISCONNECT
- EXIST. CONDUIT
- CONDUIT AND CONDUCTORS (TRENCH)
- CONDUIT AND CONDUCTORS (BORED)
- RIGID METAL CONDUIT
- (208) CONDUIT RUN NUMBER
- (IA-01) POLE DESIGNATION
- ELECTRICAL SERVICE



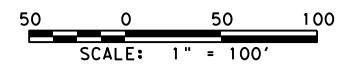
**IH 35
ILLUMINATION
PLAN
BEGIN TO 1301+00**

SCALE: 1" = 100' SHEET 1 OF 15

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DW:	MH	CK:	MM	AUS	WILLIAMSON	192	

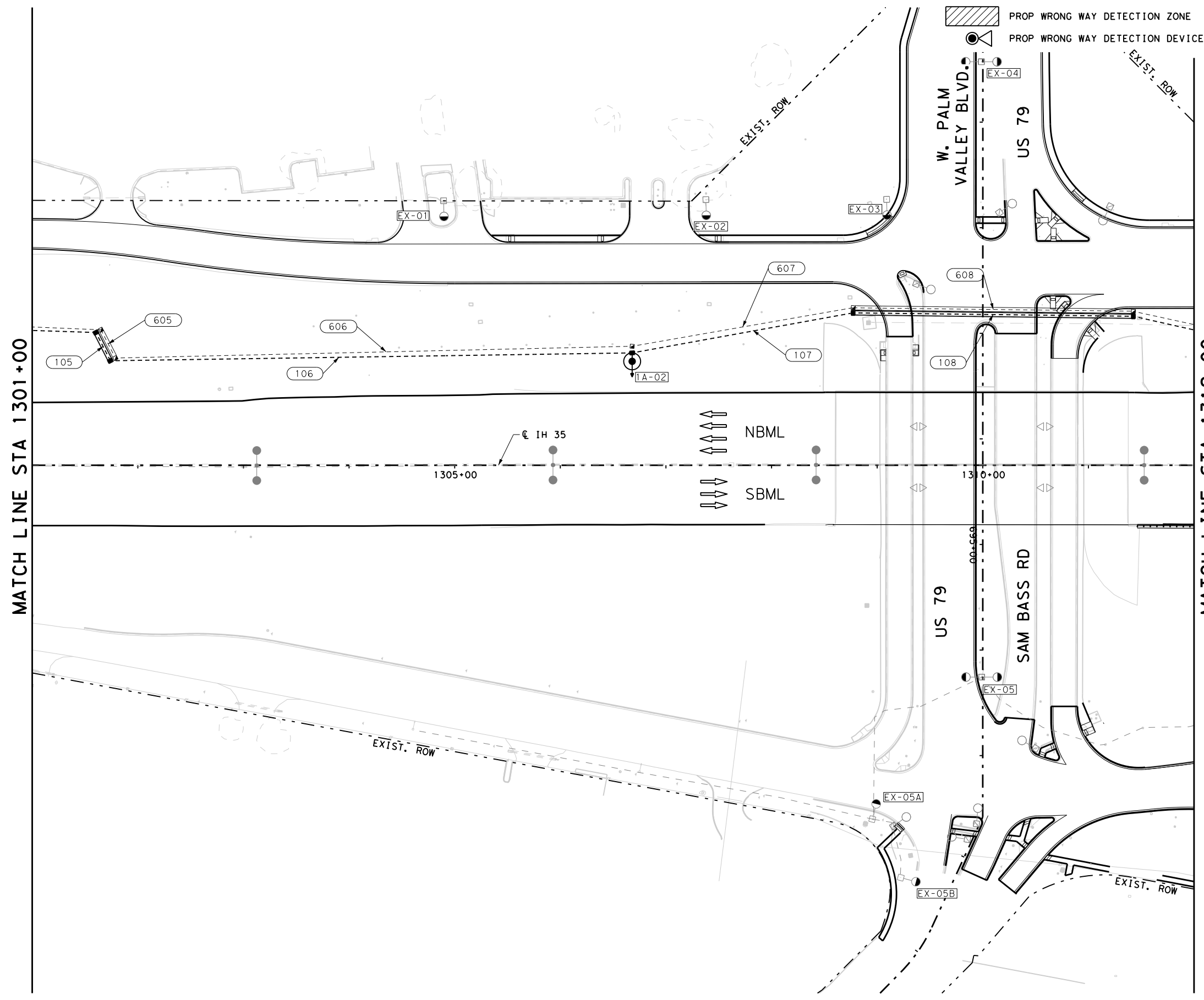
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LEGEND

- PROP. HIGH MAST ILL POLE (ASYM) (100')
- PROP. HIGH MAST ILL POLE (SYM) (100')
- PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
- PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
- EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. UNDERPASS FIXTURE (TO REMAIN)
- EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
- EXIST. ILL POLE W/ TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY A W/ APRON
- EXIST. JUNCTION BOX
- EXIST. FUSED DISCONNECT
- EXIST. CONDUIT
- CONDUIT AND CONDUCTORS (TRENCH)
- CONDUIT AND CONDUCTORS (BORED)
- RIGID METAL CONDUIT
- CONDUIT RUN NUMBER
- POLE DESIGNATION
- ELECTRICAL SERVICE



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**IH 35
ILLUMINATION
PLAN
1301+00 TO 1312+00**

SCALE: 1" = 100' SHEET 2 OF 15

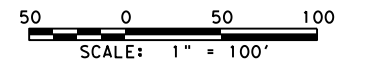
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DW:	MH	CK:	MM	AUS	WILLIAMSON	193	

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NOTES:

- 1. REQUIRED:
TYPE D GROUND BOX
LED WRONG WAY SIGN
- 2. REQUIRED:
WRONG WAY DRIVER SYSTEM
THERMAL IMAGING DETECTION AND
CONFIRMATION CAMERA ON MANUFACTURER
RECOMMENDED POLE WITH EQUIPMENT CABINET,
12-COUNT PATCH PANEL
FOC JUMPERS
SFP
INSTALL ETHERNET SWITCH



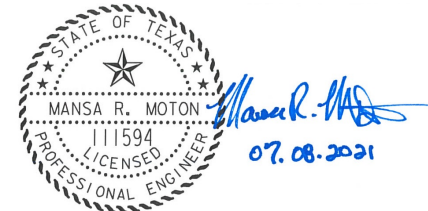
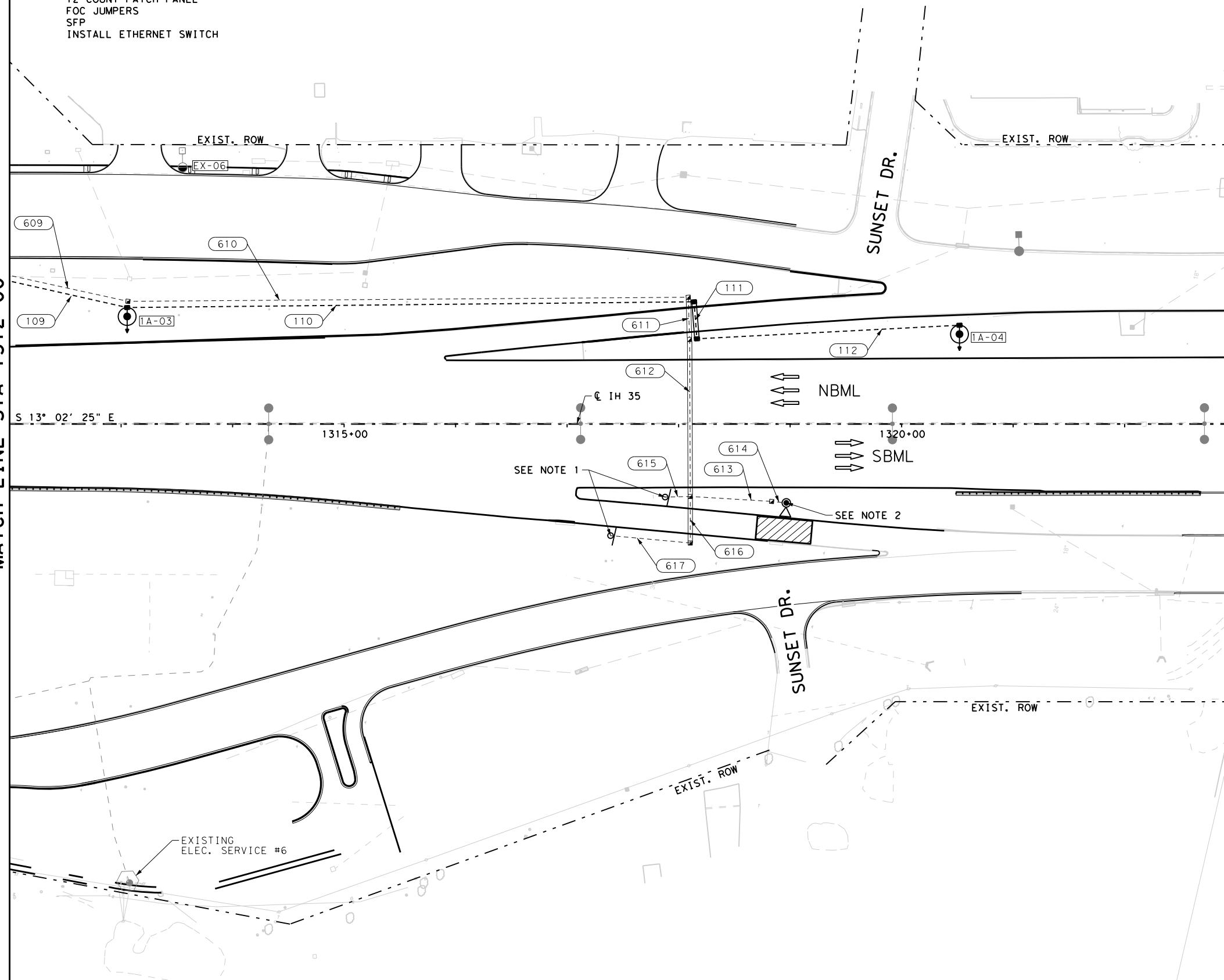
LEGEND

- PROP WRONG WAY DETECTION ZONE
- PROP WRONG WAY DETECTION DEVICE

- PROP. HIGH MAST ILL POLE (ASYM) (100')
- PROP. HIGH MAST ILL POLE (SYM) (100')
- PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
- PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
- EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. UNDERPASS FIXTURE (TO REMAIN)
- EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
- EXIST. ILL POLE W/ TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY A W/ APRON
- EXIST. JUNCTION BOX
- EXIST. FUSED DISCONNECT
- EXIST. CONDUIT
- CONDUIT AND CONDUCTORS (TRENCH)
- CONDUIT AND CONDUCTORS (BORED)
- RIGID METAL CONDUIT
- CONDUIT RUN NUMBER
- POLE DESIGNATION
- ELECTRICAL SERVICE

MATCH LINE STA 1312+00

MATCH LINE STA 1323+00



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CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

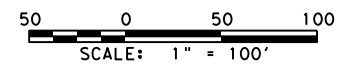
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ILLUMINATION
PLAN
STA 1312+00 TO 1323+00**

SCALE: 1" = 100' SHEET 3 OF 15





























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DW:	CK:	DIST	COUNTY	SHEET NO.	
MH	MM	AUS	WILLIAMSON	194	

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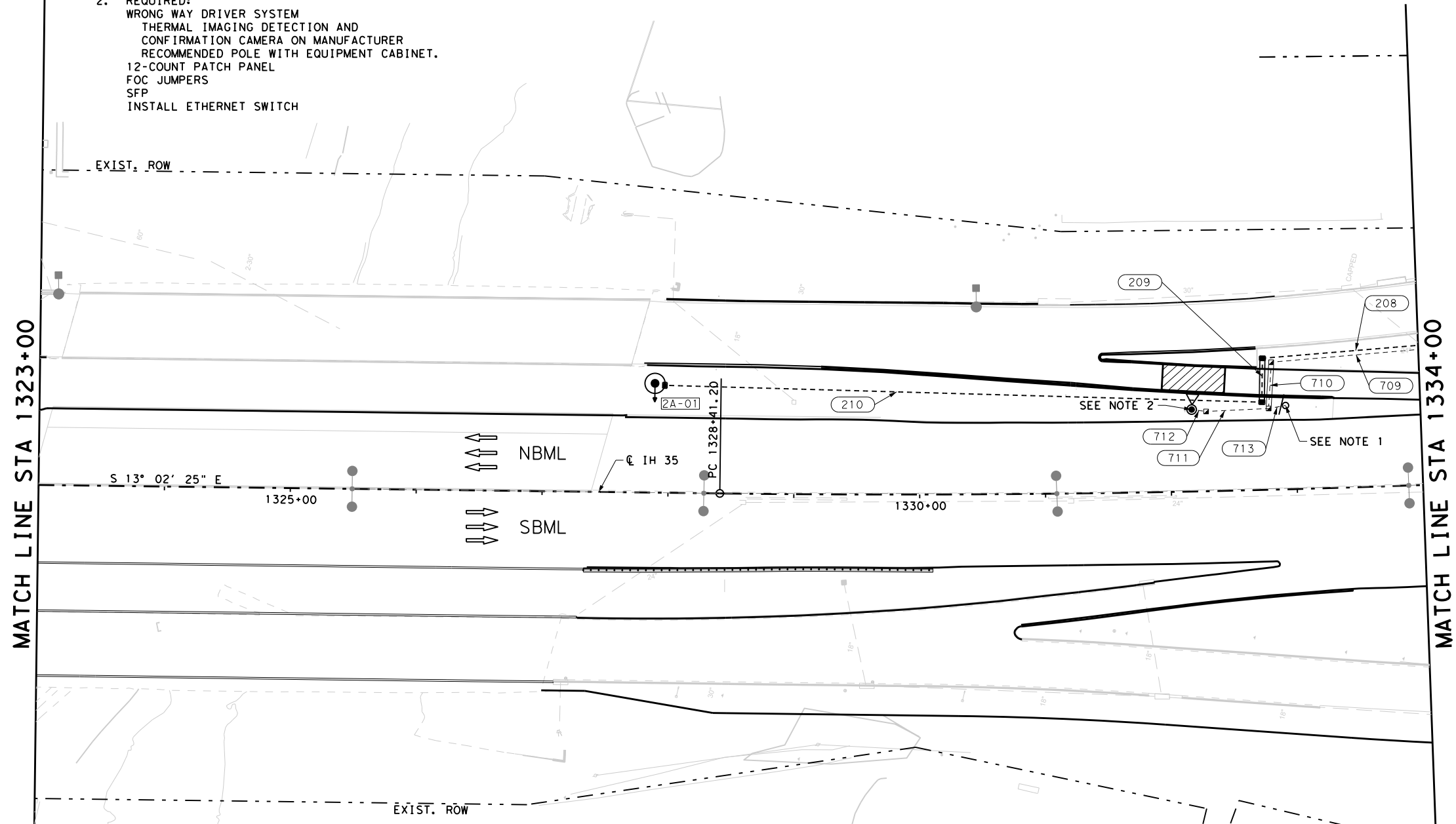


LEGEND

-  PROP WRONG WAY DETECTION ZONE
-  PROP WRONG WAY DETECTION DEVICE
-  PROP. HIGH MAST ILL POLE (ASYM) (100')
-  PROP. HIGH MAST ILL POLE (SYM) (100')
-  PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
-  PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
-  EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. UNDERPASS FIXTURE (TO REMAIN)
-  EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
-  EXIST. ILL POLE W/TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
-  PROP. GROUND BOX TY A
-  PROP. GROUND BOX TY A W/ APRON
-  EXIST. JUNCTION BOX
-  EXIST. FUSED DISCONNECT
-  EXIST. CONDUIT
-  CONDUIT AND CONDUCTORS (TRENCH)
-  CONDUIT AND CONDUCTORS (BORED)
-  RIGID METAL CONDUIT
-  CONDUIT RUN NUMBER
-  POLE DESIGNATION
-  ELECTRICAL SERVICE

NOTES:

1. REQUIRED:
TYPE D GROUND BOX
LED WRONG WAY SIGN
2. REQUIRED:
WRONG WAY DRIVER SYSTEM
THERMAL IMAGING DETECTION AND
CONFIRMATION CAMERA ON MANUFACTURER
RECOMMENDED POLE WITH EQUIPMENT CABINET.
12-COUNT PATCH PANEL
FOC JUMPERS
SFP
INSTALL ETHERNET SWITCH



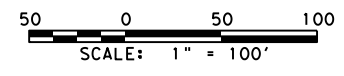
**IH 35
ILLUMINATION
PLAN
STA 1323+00 TO 1334+00**

SCALE: 1" = 100' SHEET 4 OF 15

DS:	MM	CK:	AR	0015	09	194	IH 35
DW:	MH	CK:	MM	AUS	WILLIAMSON		195

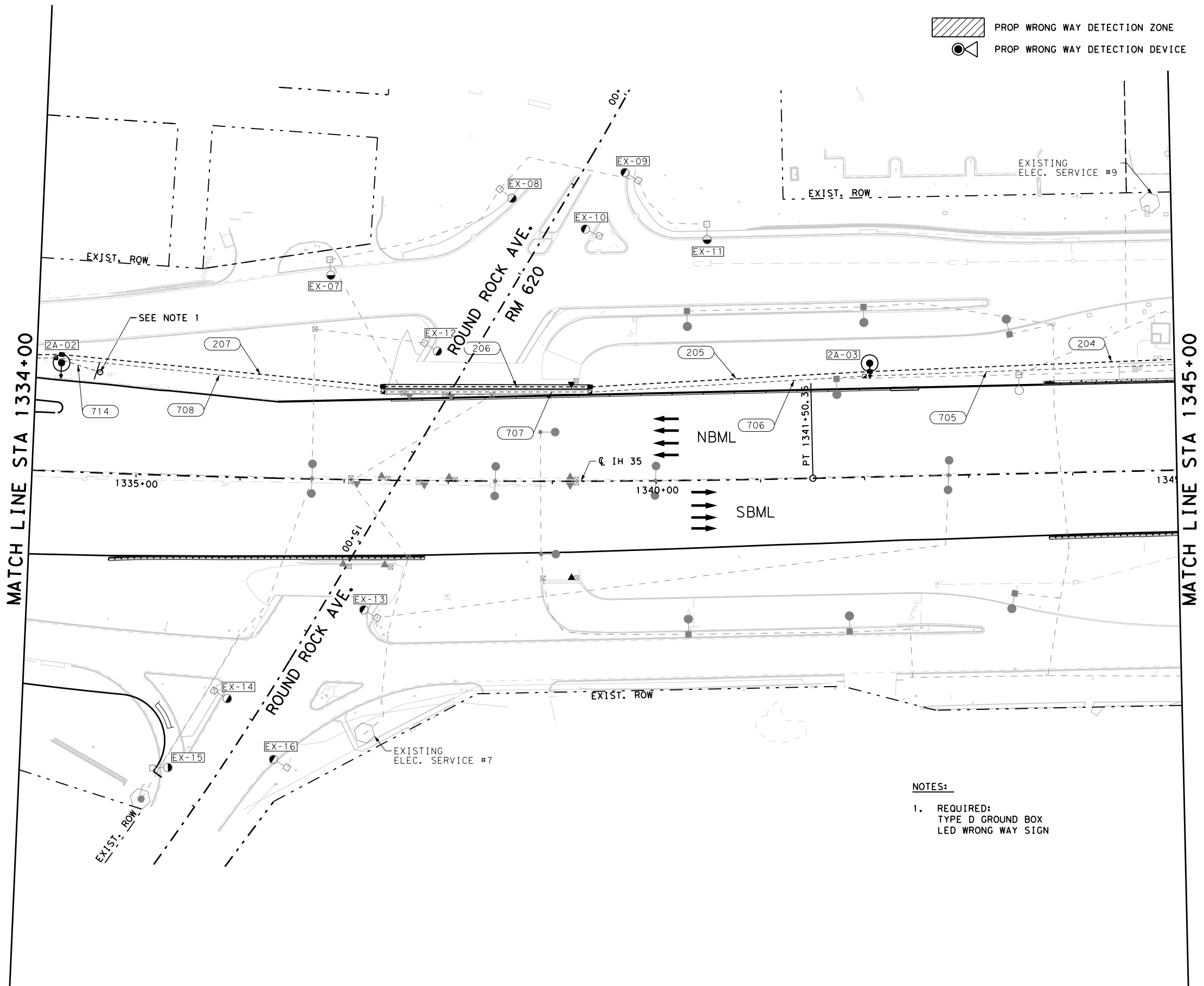
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LEGEND

- PROP WRONG WAY DETECTION ZONE
- PROP WRONG WAY DETECTION DEVICE
- PROP. HIGH MAST ILL POLE (ASYM) (100')
- PROP. HIGH MAST ILL POLE (SYM) (100')
- PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
- PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
- EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
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- EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
- EXIST. ILL POLE W/TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY A W/ APRON
- EXIST. JUNCTION BOX
- EXIST. FUSED DISCONNECT
- EXIST. CONDUIT
- CONDUIT AND CONDUCTORS (TRENCH)
- CONDUIT AND CONDUCTORS (BORED)
- RIGID METAL CONDUIT
- CONDUIT RUN NUMBER
- POLE DESIGNATION
- ELECTRICAL SERVICE



SEE NOTE 1

NOTES:

1. REQUIRED:
TYPE D GROUND BOX
LED WRONG WAY SIGN



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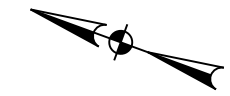
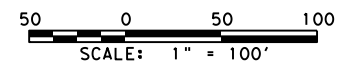
**IH 35
ILLUMINATION
PLAN
STA 1334+00 TO 1345+00**

SCALE: 1" = 100' SHEET 5 OF 15

DS:	MM	AR	0015	09	194	IH 35
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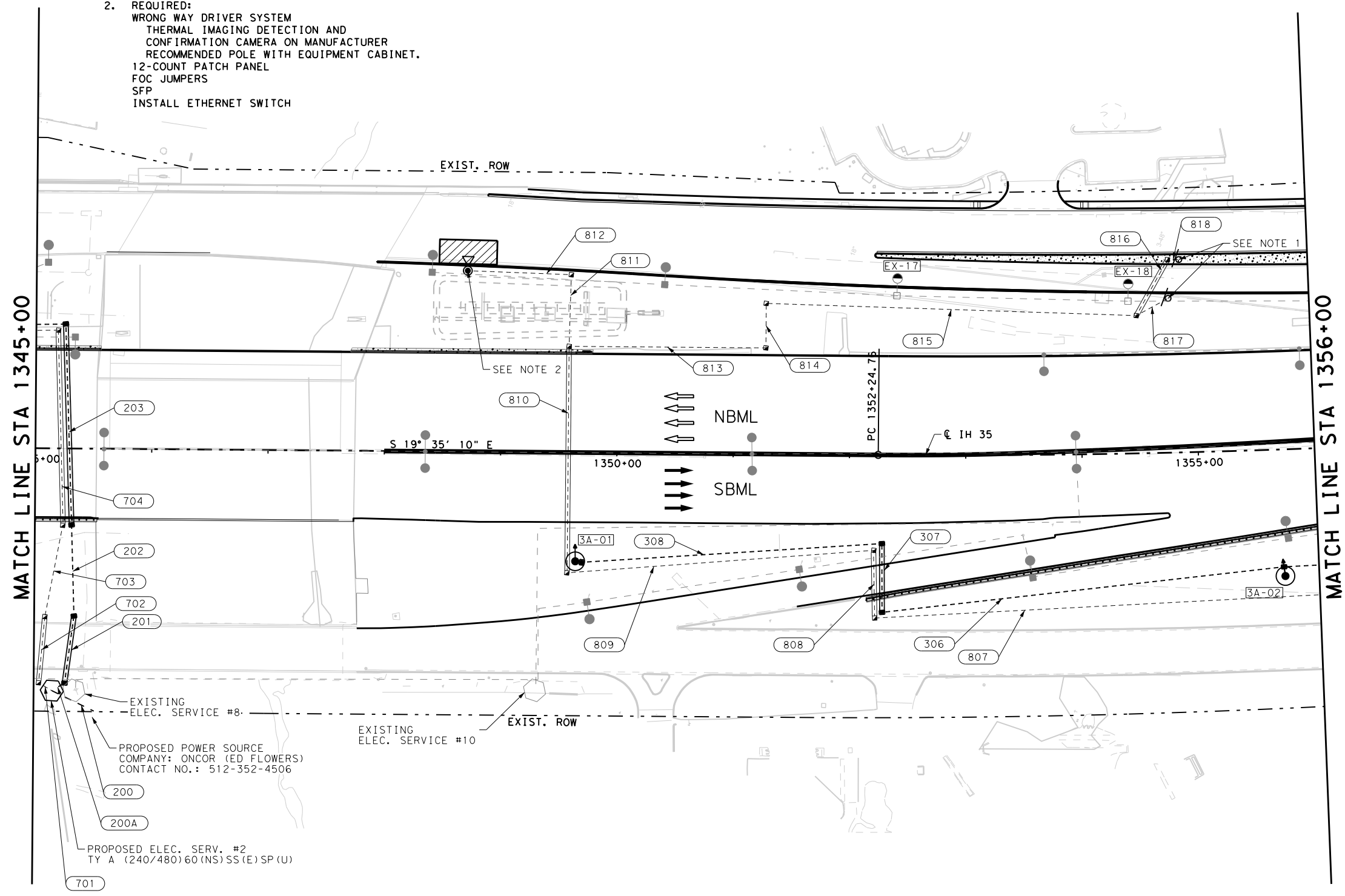


LEGEND

- PROP WRONG WAY DETECTION ZONE
- PROP WRONG WAY DETECTION DEVICE
- PROP. HIGH MAST ILL POLE (ASYM) (100')
- PROP. HIGH MAST ILL POLE (SYM) (100')
- PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
- PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
- EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. UNDERPASS FIXTURE (TO REMAIN)
- EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
- EXIST. ILL POLE W/TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY A W/ APRON
- EXIST. JUNCTION BOX
- EXIST. FUSED DISCONNECT
- EXIST. CONDUIT
- CONDUIT AND CONDUCTORS (TRENCH)
- CONDUIT AND CONDUCTORS (BORED)
- RIGID METAL CONDUIT
- CONDUIT RUN NUMBER
- POLE DESIGNATION
- ELECTRICAL SERVICE

NOTES:

1. REQUIRED:
TYPE D GROUND BOX
LED WRONG WAY SIGN
2. REQUIRED:
WRONG WAY DRIVER SYSTEM
THERMAL IMAGING DETECTION AND
CONFIRMATION CAMERA ON MANUFACTURER
RECOMMENDED POLE WITH EQUIPMENT CABINET.
12-COUNT PATCH PANEL
FOC JUMPERS
SFP
INSTALL ETHERNET SWITCH



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CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

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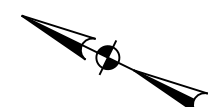
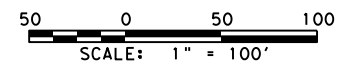
**IH 35
ILLUMINATION
PLAN
STA 1345+00 TO 1356+00**

SCALE: 1" = 100' SHEET 6 OF 15





























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DW:	CK:	DIST	COUNTY	SHEET NO.	
MH	MM	AUS	WILLIAMSON	197	

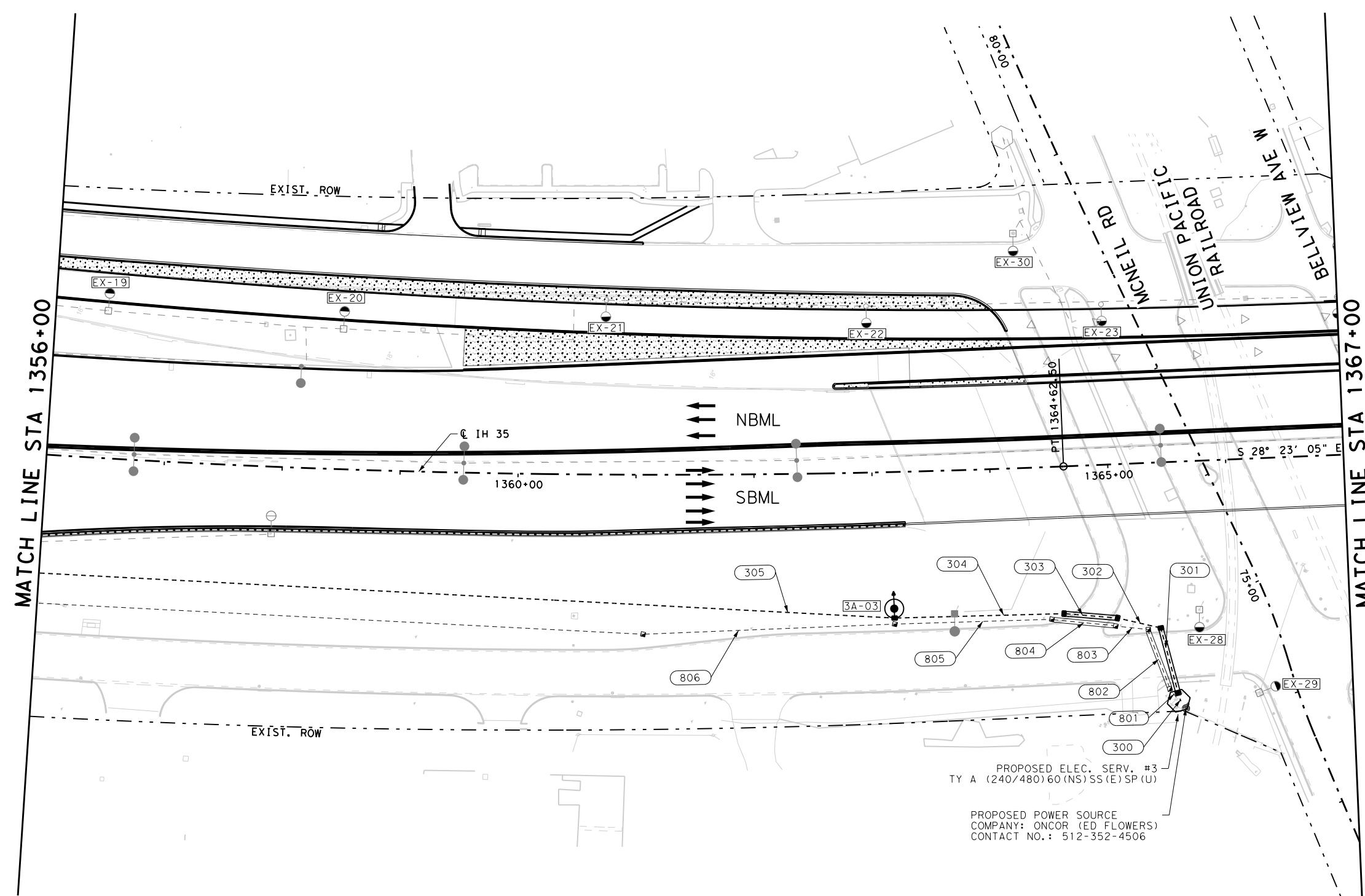
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LEGEND

-  PROP WRONG WAY DETECTION ZONE
-  PROP WRONG WAY DETECTION DEVICE
-  PROP. HIGH MAST ILL POLE (ASYM) (100')
-  PROP. HIGH MAST ILL POLE (SYM) (100')
-  PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
-  PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
-  EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. UNDERPASS FIXTURE (TO REMAIN)
-  EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
-  EXIST. ILL POLE W/TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
-  PROP. GROUND BOX TY A
-  PROP. GROUND BOX TY A W/ APRON
-  EXIST. JUNCTION BOX
-  EXIST. FUSED DISCONNECT
-  EXIST. CONDUIT
-  CONDUIT AND CONDUCTORS (TRENCH)
-  CONDUIT AND CONDUCTORS (BORED)
-  RIGID METAL CONDUIT
-  CONDUIT RUN NUMBER
-  POLE DESIGNATION
-  ELECTRICAL SERVICE



PROPOSED ELEC. SERV. #3
TY A (240/480) 60(NS) SS(E) SP(U)

PROPOSED POWER SOURCE
COMPANY: ONCOR (ED FLOWERS)
CONTACT NO. : 512-352-4506



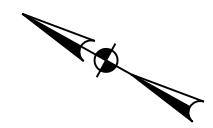
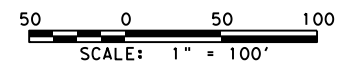
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CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264



**IH 35
ILLUMINATION
PLAN
STA 1356+00 TO 1367+00**

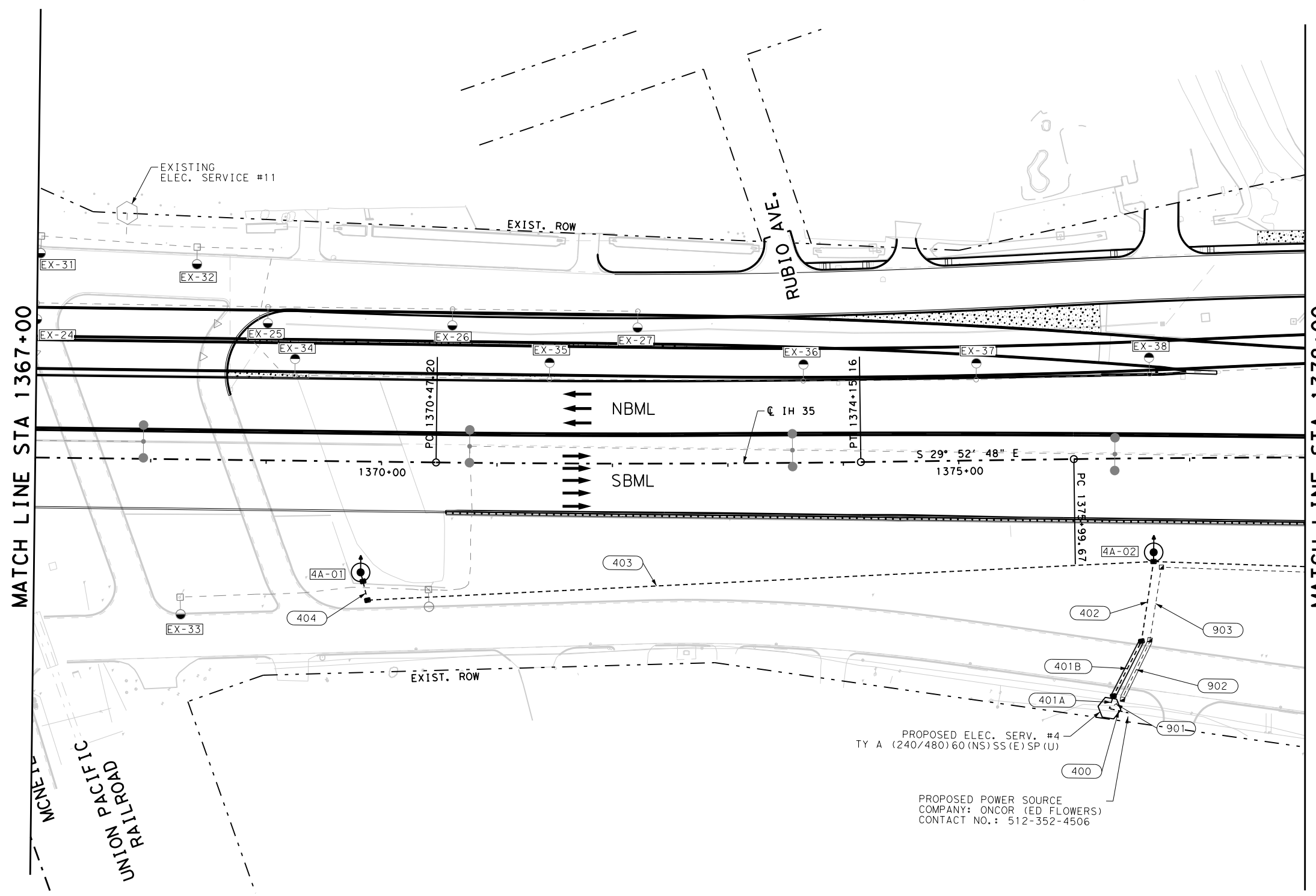
SCALE: 1" = 100' SHEET 7 OF 15

DES:	CK:	CONT:	SECT:	JOB:	HIGHWAY:
MM	AR	0015	09	194	IH 35
DW:	CK:	DIST:	COUNTY:	SHEET NO.	
MH	MM	AUS	WILLIAMSON	198	



LEGEND

- PROP WRONG WAY DETECTION ZONE
- PROP WRONG WAY DETECTION DEVICE
- PROP. HIGH MAST ILL POLE (ASYM) (100')
- PROP. HIGH MAST ILL POLE (SYM) (100')
- PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
- PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
- EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. UNDERPASS FIXTURE (TO REMAIN)
- EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
- EXIST. ILL POLE W/TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY A W/ APRON
- EXIST. JUNCTION BOX
- EXIST. FUSED DISCONNECT
- EXIST. CONDUIT
- CONDUIT AND CONDUCTORS (TRENCH)
- CONDUIT AND CONDUCTORS (BORED)
- RIGID METAL CONDUIT
- CONDUIT RUN NUMBER
- POLE DESIGNATION
- ELECTRICAL SERVICE



PROPOSED ELEC. SERV. #4
TY A (240/480) 60 (NS) SS (E) SP (U)

PROPOSED POWER SOURCE
COMPANY: ONCOR (ED FLOWERS)
CONTACT NO.: 512-352-4506



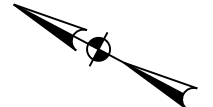
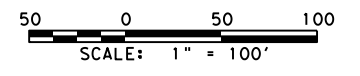
**IH 35
ILLUMINATION
PLAN**

STA 1367+00 TO 1378+00

SCALE: 1" = 100' SHEET 8 OF 15

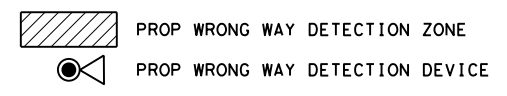
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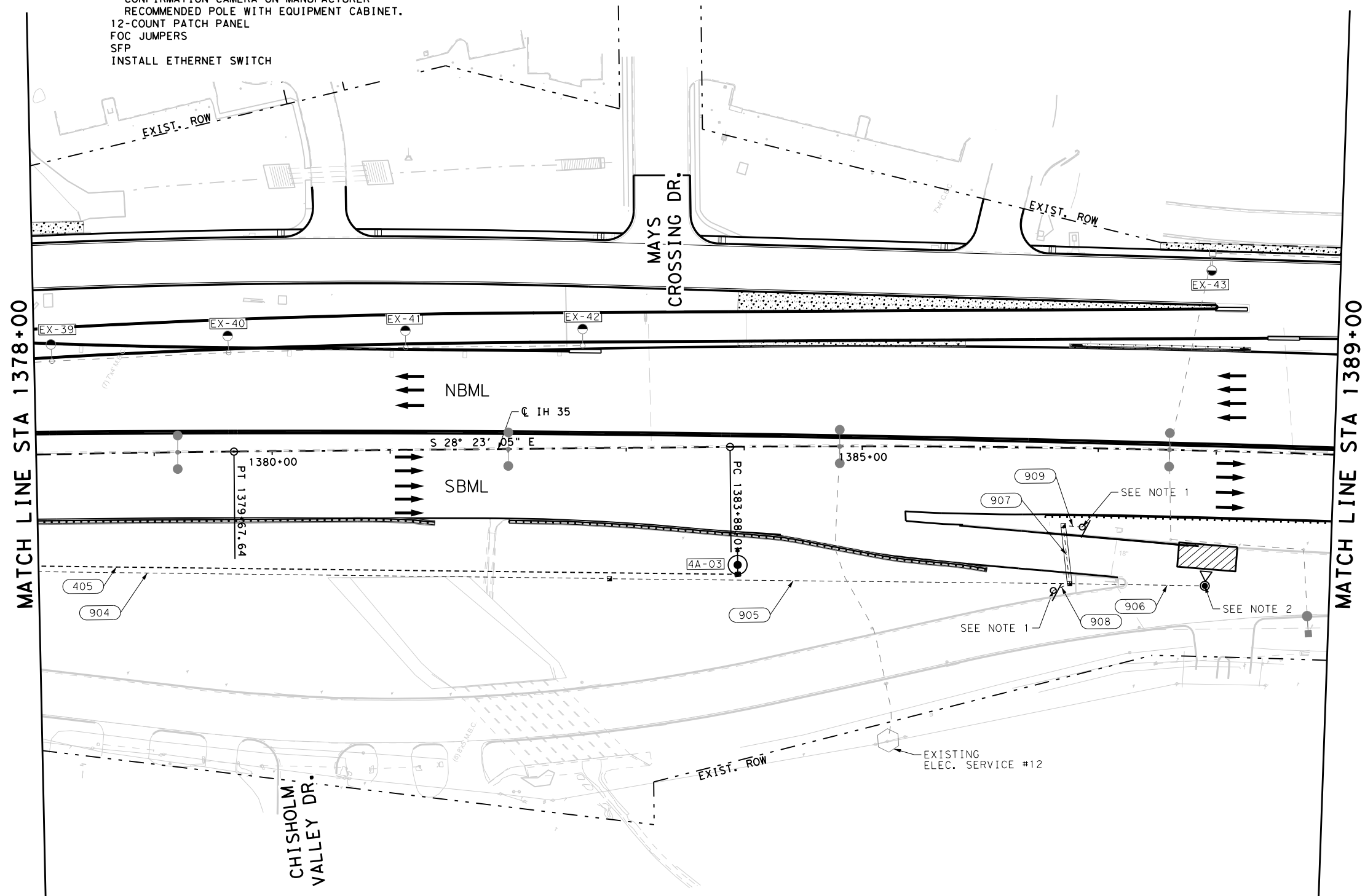
NOTES:

1. REQUIRED:
 TYPE D GROUND BOX
 LED WRONG WAY SIGN
2. REQUIRED:
 WRONG WAY DRIVER SYSTEM
 THERMAL IMAGING DETECTION AND
 CONFIRMATION CAMERA ON MANUFACTURER
 RECOMMENDED POLE WITH EQUIPMENT CABINET,
 12-COUNT PATCH PANEL
 FOC JUMPERS
 SFP
 INSTALL ETHERNET SWITCH



LEGEND

- PROP. HIGH MAST ILL POLE (ASYM) (100')
- PROP. HIGH MAST ILL POLE (SYM) (100')
- PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
- PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
- EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. UNDERPASS FIXTURE (TO REMAIN)
- EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
- EXIST. ILL POLE W/ TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY A W/ APRON
- EXIST. JUNCTION BOX
- EXIST. FUSED DISCONNECT
- EXIST. CONDUIT
- CONDUIT AND CONDUCTORS (TRENCH)
- CONDUIT AND CONDUCTORS (BORED)
- RIGID METAL CONDUIT
- CONDUIT RUN NUMBER
- POLE DESIGNATION
- ELECTRICAL SERVICE



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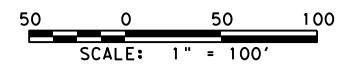
**IH 35
 ILLUMINATION
 PLAN
 STA 1378+00 TO 1389+00**

SCALE: 1" = 100' SHEET 9 OF 15





























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MH	MM	AUS	WILLIAMSON	200	

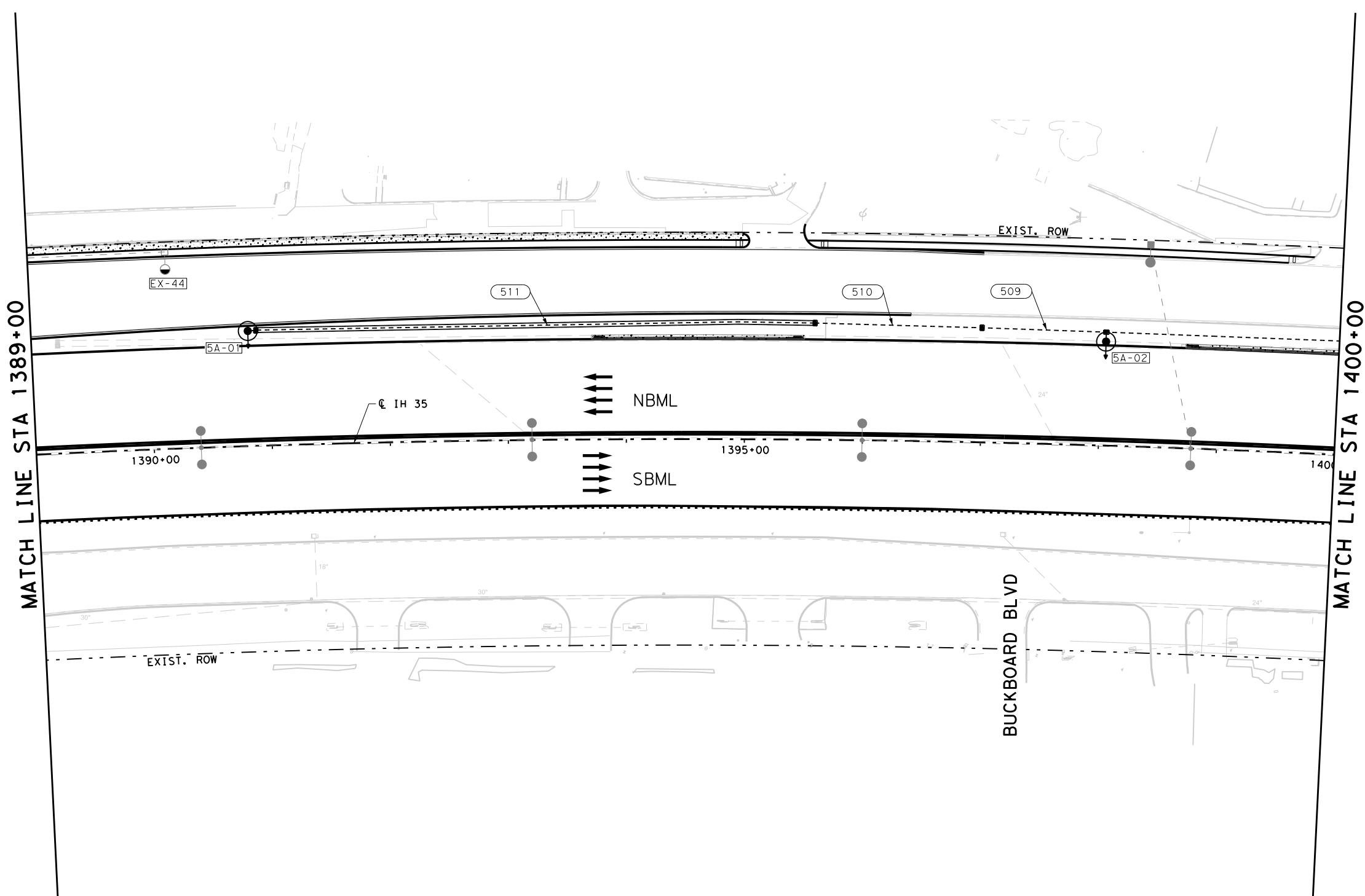
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LEGEND

-  PROP WRONG WAY DETECTION ZONE
-  PROP WRONG WAY DETECTION DEVICE
-  PROP. HIGH MAST ILL POLE (ASYM) (100')
-  PROP. HIGH MAST ILL POLE (SYM) (100')
-  PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
-  PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
-  EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. UNDERPASS FIXTURE (TO REMAIN)
-  EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
-  EXIST. ILL POLE W/ TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
-  PROP. GROUND BOX TY A
-  PROP. GROUND BOX TY A W/ APRON
-  EXIST. JUNCTION BOX
-  EXIST. FUSED DISCONNECT
-  EXIST. CONDUIT
-  CONDUIT AND CONDUCTORS (TRENCH)
-  CONDUIT AND CONDUCTORS (BORED)
-  RIGID METAL CONDUIT
-  208 CONDUIT RUN NUMBER
-  1A-01 POLE DESIGNATION
-  ELECTRICAL SERVICE



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CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

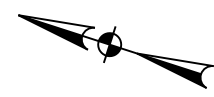
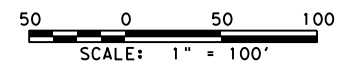
**IH 35
ILLUMINATION
PLAN
STA 1389+00 TO 1400+00**

SCALE: 1" = 100' SHEET 10 OF 15





























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DW:	MH	CK:	MM	AUS	WILLIAMSON		201

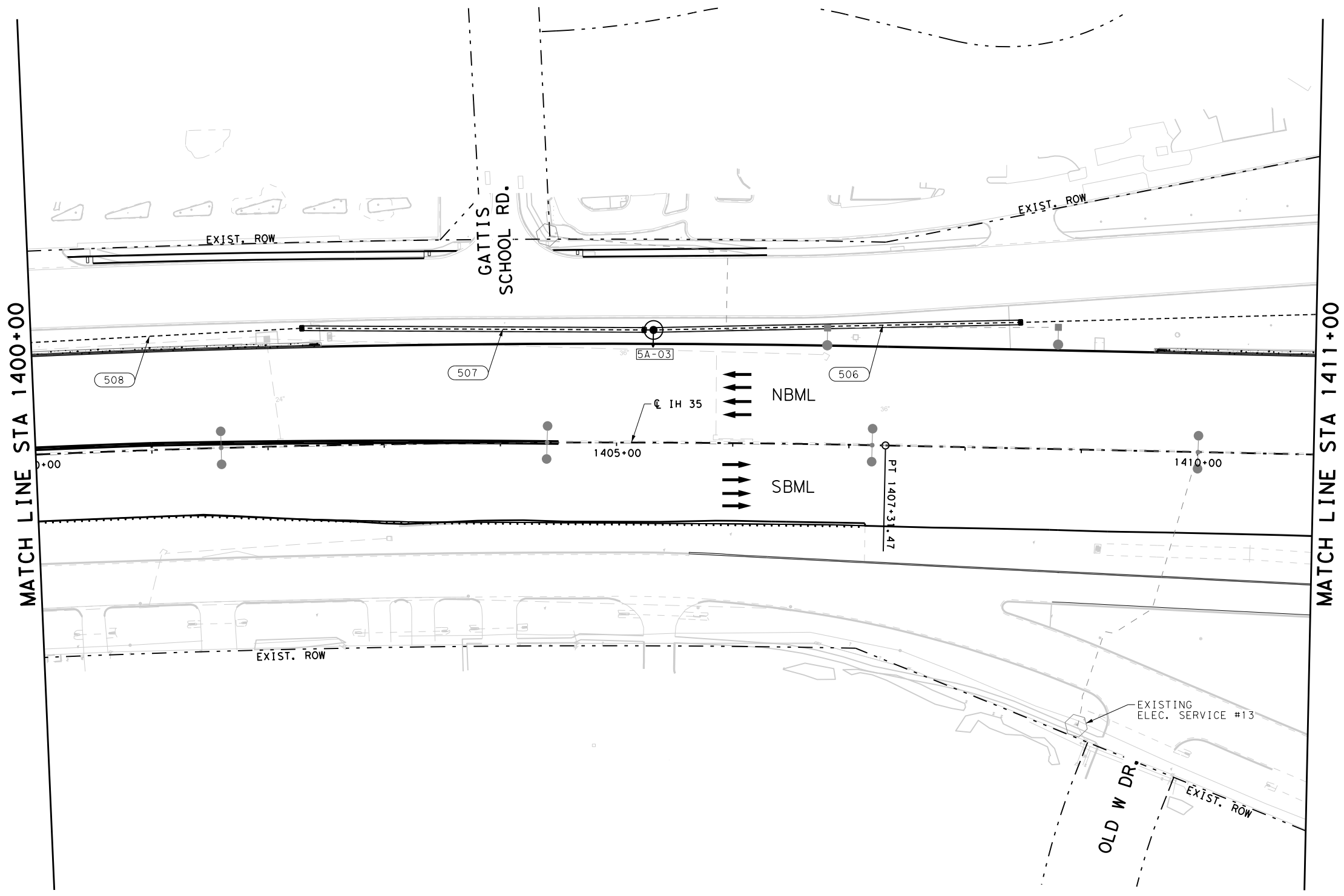
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LEGEND

-  PROP WRONG WAY DETECTION ZONE
-  PROP WRONG WAY DETECTION DEVICE
-  PROP. HIGH MAST ILL POLE (ASYM) (100')
-  PROP. HIGH MAST ILL POLE (SYM) (100')
-  PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
-  PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
-  EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. UNDERPASS FIXTURE (TO REMAIN)
-  EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
-  EXIST. ILL POLE W/TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
-  PROP. GROUND BOX TY A
-  PROP. GROUND BOX TY A W/ APRON
-  EXIST. JUNCTION BOX
-  EXIST. FUSED DISCONNECT
-  EXIST. CONDUIT
-  CONDUIT AND CONDUCTORS (TRENCH)
-  CONDUIT AND CONDUCTORS (BORED)
-  RIGID METAL CONDUIT
-  CONDUIT RUN NUMBER
-  POLE DESIGNATION
-  ELECTRICAL SERVICE



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TBPB REGISTRATION NO. 264



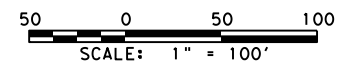
**IH 35
ILLUMINATION
PLAN**

STA 1400+00 TO 1411+00

SCALE: 1" = 100' SHEET 11 OF 15

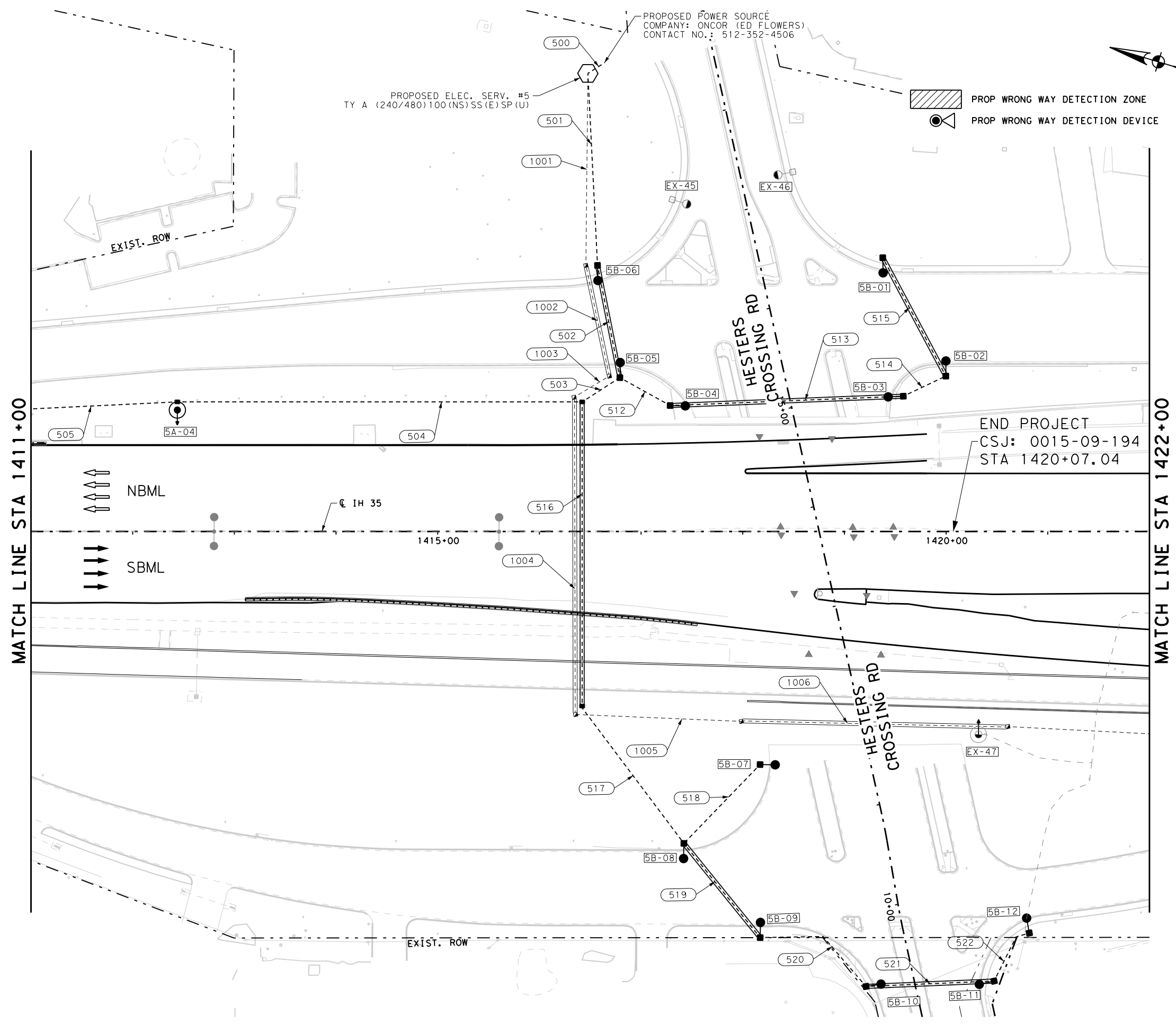
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LEGEND

- PROP. HIGH MAST ILL POLE (ASYM) (100')
- PROP. HIGH MAST ILL POLE (SYM) (100')
- PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
- PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
- EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
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- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY A W/ APRON
- EXIST. JUNCTION BOX
- EXIST. FUSED DISCONNECT
- EXIST. CONDUIT
- CONDUIT AND CONDUCTORS (TRENCH)
- CONDUIT AND CONDUCTORS (BORED)
- RIGID METAL CONDUIT
- 208 CONDUIT RUN NUMBER
- 1A-01 POLE DESIGNATION
- ELECTRICAL SERVICE



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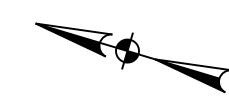
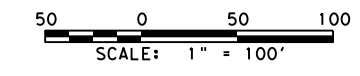
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ILLUMINATION
PLAN
STA 1411+00 TO 1422+00**

SCALE: 1" = 100' SHEET 12 OF 15




























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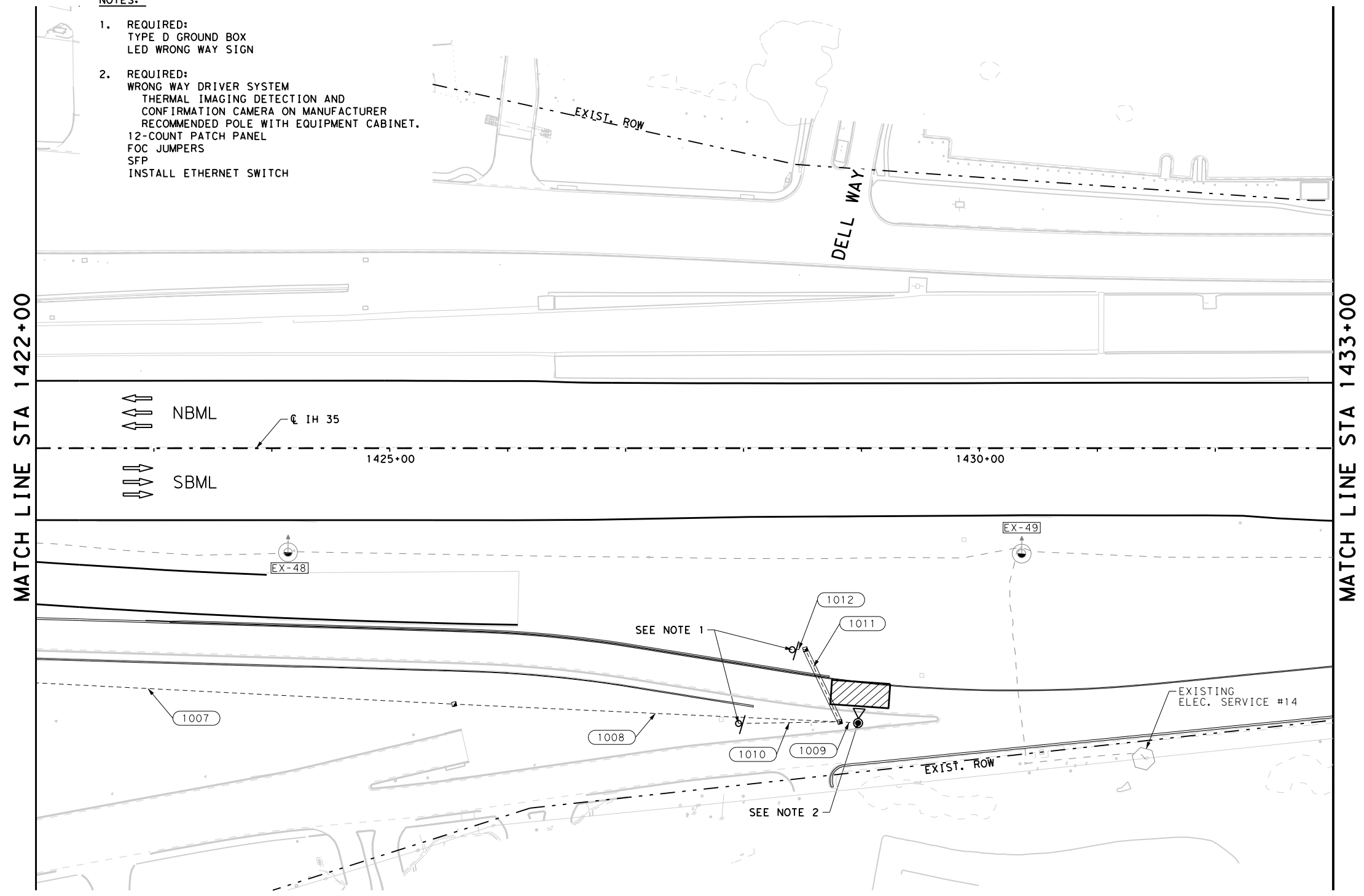


LEGEND

-  PROP WRONG WAY DETECTION ZONE
-  PROP WRONG WAY DETECTION DEVICE
-  PROP. HIGH MAST ILL POLE (ASYM) (100')
-  PROP. HIGH MAST ILL POLE (SYM) (100')
-  PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
-  PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
-  EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. UNDERPASS FIXTURE (TO REMAIN)
-  EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
-  EXIST. ILL POLE W/ TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
-  PROP. GROUND BOX TY A
-  PROP. GROUND BOX TY A W/ APRON
-  EXIST. JUNCTION BOX
-  EXIST. FUSED DISCONNECT
-  EXIST. CONDUIT
-  CONDUIT AND CONDUCTORS (TRENCH)
-  CONDUIT AND CONDUCTORS (BORED)
-  RIGID METAL CONDUIT
-  208 CONDUIT RUN NUMBER
-  1A-01 POLE DESIGNATION
-  ELECTRICAL SERVICE

NOTES:

1. REQUIRED:
TYPE D GROUND BOX
LED WRONG WAY SIGN
2. REQUIRED:
WRONG WAY DRIVER SYSTEM
THERMAL IMAGING DETECTION AND
CONFIRMATION CAMERA ON MANUFACTURER
RECOMMENDED POLE WITH EQUIPMENT CABINET.
12-COUNT PATCH PANEL
FOC JUMPERS
SFP
INSTALL ETHERNET SWITCH



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TBPE REGISTRATION NO. 264



**IH 35
ILLUMINATION PLAN
STA 1422+00 TO
STA 1433+00**

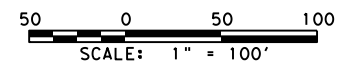
SCALE: 1" = 100' SHEET 13 OF 15

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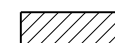

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




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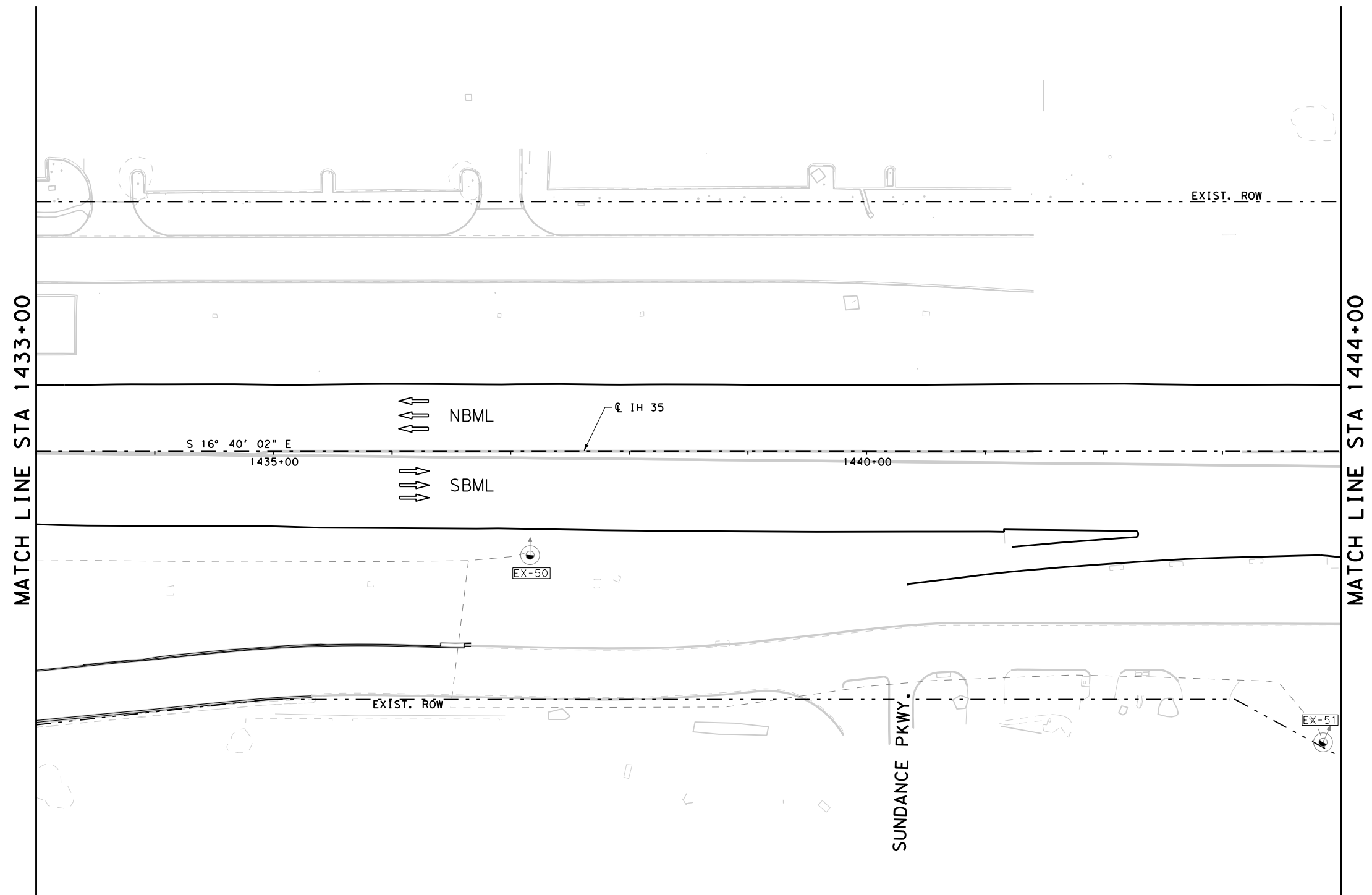
...464\3724_14\037403-111-14.dgn



LEGEND

-  PROP WRONG WAY DETECTION ZONE
-  PROP WRONG WAY DETECTION DEVICE

-  PROP. HIGH MAST ILL POLE (ASYM) (100')
-  PROP. HIGH MAST ILL POLE (SYM) (100')
-  PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
-  PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
-  EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. UNDERPASS FIXTURE (TO REMAIN)
-  EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
-  EXIST. ILL POLE W/TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
-  EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
-  PROP. GROUND BOX TY A
-  PROP. GROUND BOX TY A W/ APRON
-  EXIST. JUNCTION BOX
-  EXIST. FUSED DISCONNECT
-  EXIST. CONDUIT
-  CONDUIT AND CONDUCTORS (TRENCH)
-  CONDUIT AND CONDUCTORS (BORED)
-  RIGID METAL CONDUIT
-  208 CONDUIT RUN NUMBER
-  1A-01 POLE DESIGNATION
-  ELECTRICAL SERVICE



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TBPB REGISTRATION NO. 264

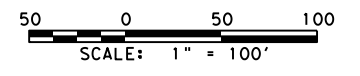


**IH 35
ILLUMINATION PLAN
STA 1433+00 TO
STA 1444+00**





























SCALE: 1" = 100' SHEET 14 OF 15

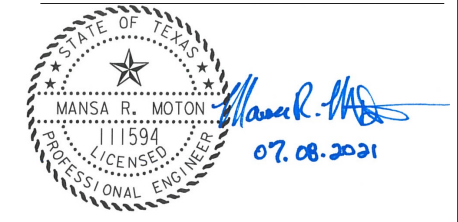
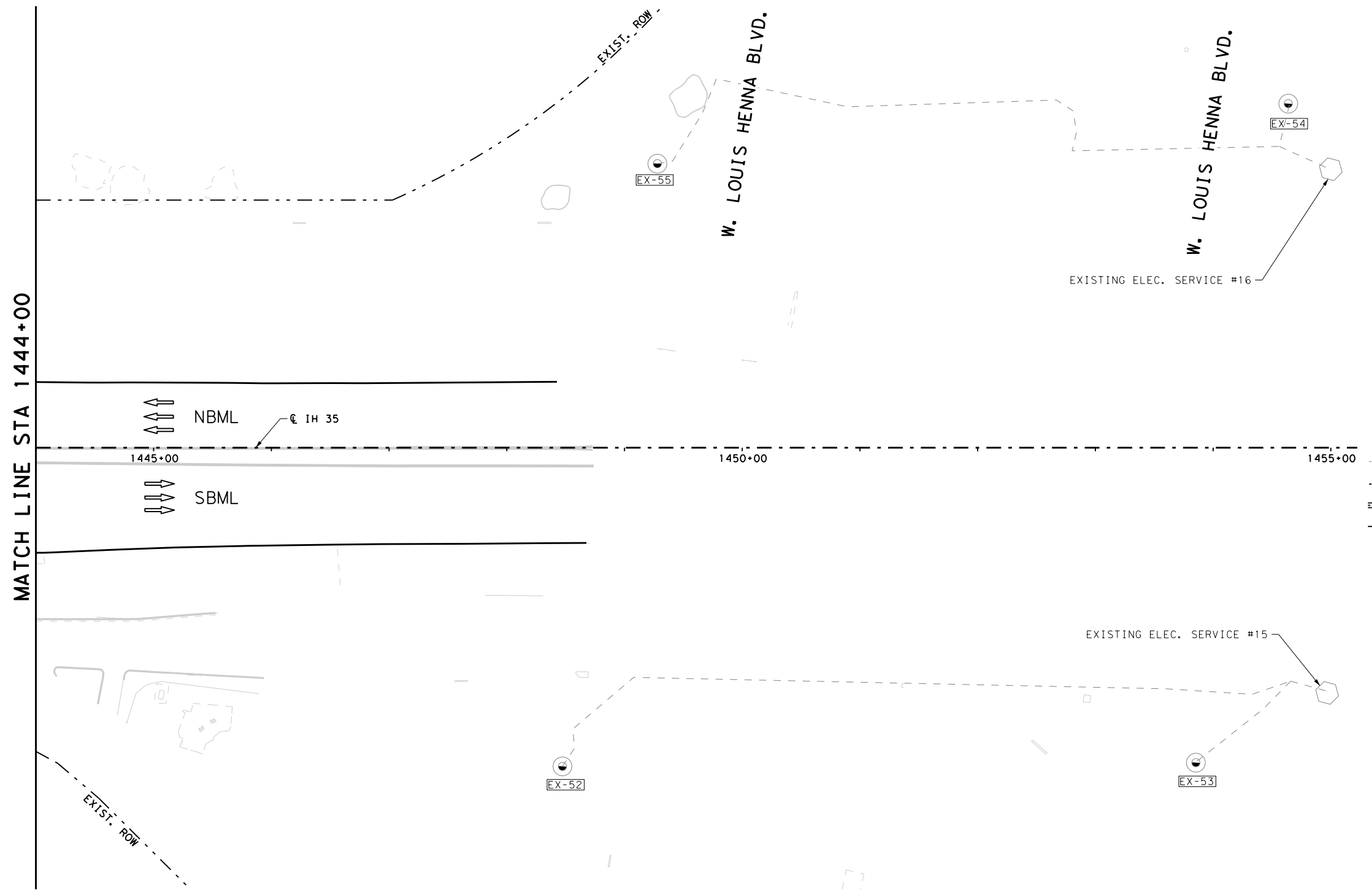
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DW:	CK:	DIST	COUNTY	SHEET NO.	
MH	MM	AUS	WILLIAMSON	205	

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LEGEND

-  PROP WRONG WAY DETECTION ZONE
-  PROP WRONG WAY DETECTION DEVICE
-  PROP. HIGH MAST ILL POLE (ASYM) (100')
-  PROP. HIGH MAST ILL POLE (SYM) (100')
-  PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
-  PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
-  EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
-  EXIST. UNDERPASS FIXTURE (TO REMAIN)
-  EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
-  EXIST. ILL POLE W/TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
-  EXIST. ILL POLE W/ TWIN ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
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-  EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
-  PROP. GROUND BOX TY A
-  PROP. GROUND BOX TY A W/ APRON
-  EXIST. JUNCTION BOX
-  EXIST. FUSED DISCONNECT
-  EXIST. CONDUIT
-  CONDUIT AND CONDUCTORS (TRENCH)
-  CONDUIT AND CONDUCTORS (BORED)
-  RIGID METAL CONDUIT
-  CONDUIT RUN NUMBER
-  POLE DESIGNATION
-  ELECTRICAL SERVICE



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2021
Texas Department of Transportation

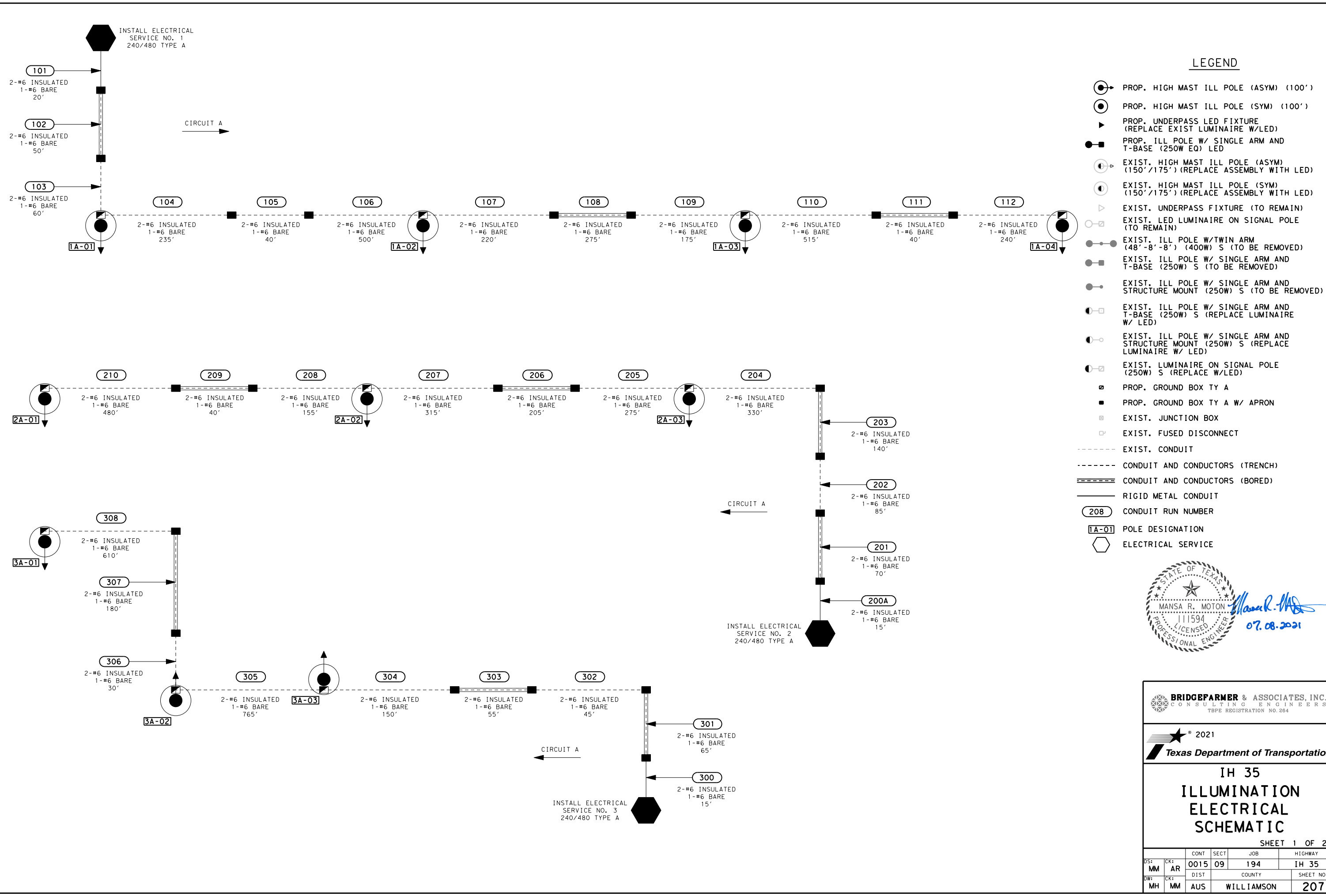
**IH 35
 ILLUMINATION
 PLAN
 STA 1444+00 TO END**

SCALE: 1" = 100' SHEET 15 OF 15

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MM	AR	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
MH	MM	AUS	WILLIAMSON	206	

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LEGEND

- PROP. HIGH MAST ILL POLE (ASYM) (100')
- PROP. HIGH MAST ILL POLE (SYM) (100')
- PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
- PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
- EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. UNDERPASS FIXTURE (TO REMAIN)
- EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
- EXIST. ILL POLE W/ TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY A W/ APRON
- EXIST. JUNCTION BOX
- EXIST. FUSED DISCONNECT
- EXIST. CONDUIT
- CONDUIT AND CONDUCTORS (TRENCH)
- CONDUIT AND CONDUCTORS (BORED)
- RIGID METAL CONDUIT
- CONDUIT RUN NUMBER
- POLE DESIGNATION
- ELECTRICAL SERVICE



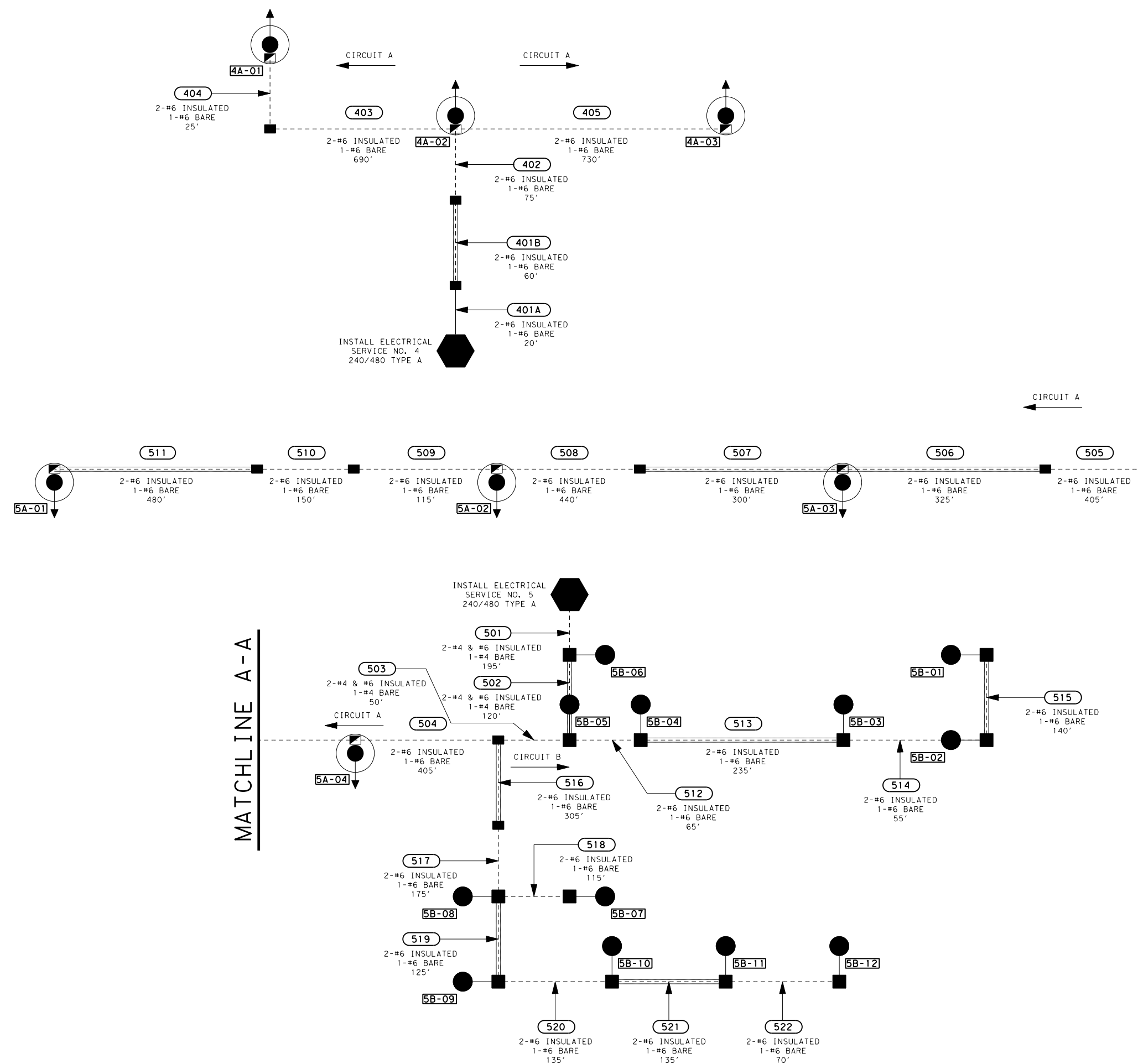
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TBPB REGISTRATION NO. 264

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IH 35 ILLUMINATION ELECTRICAL SCHEMATIC

SHEET 1 OF 2

DS:	MM	CK:	AR	CONT	SECT	JOB	HIGHWAY
				0015	09	194	IH 35
DW:	MH	CK:	MM	DIST	COUNTY	SHEET NO.	
				AUS	WILLIAMSON	207	



LEGEND

- PROP. HIGH MAST ILL POLE (ASYM) (100')
- PROP. HIGH MAST ILL POLE (SYM) (100')
- PROP. UNDERPASS LED FIXTURE (REPLACE EXIST LUMINAIRE W/LED)
- PROP. ILL POLE W/ SINGLE ARM AND T-BASE (250W EQ) LED
- EXIST. HIGH MAST ILL POLE (ASYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. HIGH MAST ILL POLE (SYM) (150'/175') (REPLACE ASSEMBLY WITH LED)
- EXIST. UNDERPASS FIXTURE (TO REMAIN)
- EXIST. LED LUMINAIRE ON SIGNAL POLE (TO REMAIN)
- EXIST. ILL POLE W/ TWIN ARM (48'-8'-8') (400W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (TO BE REMOVED)
- EXIST. ILL POLE W/ SINGLE ARM AND T-BASE (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. ILL POLE W/ SINGLE ARM AND STRUCTURE MOUNT (250W) S (REPLACE LUMINAIRE W/ LED)
- EXIST. LUMINAIRE ON SIGNAL POLE (250W) S (REPLACE W/LED)
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY A W/ APRON
- EXIST. JUNCTION BOX
- EXIST. FUSED DISCONNECT
- EXIST. CONDUIT
- CONDUIT AND CONDUCTORS (TRENCH)
- CONDUIT AND CONDUCTORS (BORED)
- RIGID METAL CONDUIT
- CONDUIT RUN NUMBER
- POLE DESIGNATION
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 TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
 ILLUMINATION
 ELECTRICAL
 SCHEMATIC**

SHEET 2 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	AR	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
MH	MM	AUS	WILLIAMSON	208	

SCHEDULE OF HIGH MAST/ROADWAY ILLUMINATION ASSEMBLIES (CSJ: 0015-09-194)										
SHEET NO.	POLE NO.	ITEM DESCR.	ILLUMINATION ASSEMBLY DESCRIPTION	FOUNDATION			CHAIN	LOCATION		
				SIZE	LENGTH	TOP ELEV		STATION	OFFSET	SIDE
SHEET 1	1A-01	6156-6003	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B)	48" DIA	28	TBD	CL IH 35	1299+35.00	125.0	LT
SHEET 2	1A-02	6156-6003	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B)	48" DIA	28	TBD	CL IH 35	1306+68.03	98.4	LT
SHEET 3	1A-03	6156-6003	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B)	48" DIA	28	TBD	CL IH 35	1313+05.42	96.4	LT
SHEET 3	1A-04	6156-6003	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B)	48" DIA	28	TBD	CL IH 35	1320+51.88	80.6	LT
SHEET 4	2A-01	6156-6010	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B) SHLD	48" DIA	28	TBD	CL IH 35	1327+88.67	86.8	LT
SHEET 5	2A-02	6156-6010	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B) SHLD	48" DIA	28	TBD	CL IH 35	1334+24.11	104.2	LT
SHEET 5	2A-03	6156-6003	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B)	48" DIA	28	TBD	CL IH 35	1342+07.30	109.3	LT
SHEET 6	3A-01	6156-6003	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B)	48" DIA	28	TBD	CL IH 35	1349+64.90	93.6	RT
SHEET 6	3A-02	6156-6003	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B)	48" DIA	28	TBD	CL IH 35	1355+71.17	108.9	RT
SHEET 7	3A-03	6156-6003	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B)	48" DIA	28	TBD	CL IH 35	1363+16.18	115.8	RT
SHEET 8	4A-01	6156-6002	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY A)	48" DIA	28	TBD	CL IH 35	1369+82.98	96.0	RT
SHEET 8	4A-02	6156-6002	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY A)	48" DIA	28	TBD	CL IH 35	1376+68.08	81.5	RT
SHEET 9	4A-03	6156-6002	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY A)	48" DIA	28	TBD	CL IH 35	1383+93.56	100.1	RT
SHEET 10	5A-01	6156-6010	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B) SHLD	48" DIA	28	TBD	CL IH 35	1390+82.31	97.6	LT
SHEET 10	5A-02	6156-6003	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B)	48" DIA	28	TBD	CL IH 35	1398+03.85	88.2	LT
SHEET 11	5A-03	6156-6003	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B)	48" DIA	28	TBD	CL IH 35	1405+31.42	96.9	LT
SHEET 12	5A-04	6156-6003	100' LED HI MAST IL ASM (6 FIXT) (ASYM) (TY B)	48" DIA	28	TBD	CL IH 35	1412+43.94	119.5	LT
SHEET 12	5B-01	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1419+37.71	269.4	LT
SHEET 12	5B-02	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1419+99.75	152.9	LT
SHEET 12	5B-03	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1419+57.90	133.1	LT
SHEET 12	5B-04	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1417+28.59	124.0	LT
SHEET 12	5B-05	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1416+79.15	151.4	LT
SHEET 12	5B-06	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1416+57.17	261.9	LT
SHEET 12	5B-07	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1418+17.04	229.3	RT
SHEET 12	5B-08	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1417+42.10	306.9	RT
SHEET 12	5B-09	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1418+17.14	399.6	RT
SHEET 12	5B-10	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1419+21.20	447.6	RT
SHEET 12	5B-11	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1420+47.20	442.3	RT
SHEET 12	5B-12	0610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	30" DIA	8	N/A	CL IH 35	1420+81.81	395.1	RT

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

2022
Texas Department of Transportation

**IH 35
ILLUMINATION
SUMMARIES**

SHEET 1 OF 9

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0015	09	194	IH 35
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		209


4:20:35 PM

7/5/2021

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SCHEDULE OF HIGH MAST/ROADWAY ILLUMINATION ASSEMBLIES (CSJ: 0015-09-194)

SHEET NO.	POLE NO.	ITEM DESCR.	ILLUMINATION ASSEMBLY DESCRIPTION	FOUNDATION			CHAIN	LOCATION		
				SIZE	LENGTH	TOP ELEV		STATION	OFFSET	SIDE
SHEET 2	EX-01	0610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1304+89.51	250.5	LT
SHEET 2	EX-02	0610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1307+37.81	251.6	LT
SHEET 2	EX-03	0610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1309+08.97	251.8	LT
SHEET 2	EX-04	0610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1309+98.64	382.2	LT
SHEET 2	EX-05	0610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1309+99.14	200.8	RT
SHEET 2	EX-05A	0610-6101	REPLACE LUMINAIRE W/LED (150W EQ)	N/A	N/A	N/A	CL IH 35	1308+95.37	335.2	RT
SHEET 2	EX-05B	0610-6101	REPLACE LUMINAIRE W/LED (150W EQ)	N/A	N/A	N/A	CL IH 35	1309+22.32	390.6	RT
SHEET 3	EX-06	0610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1313+54.88	245.0	LT
SHEET 5	EX-07	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1336+82.27	210.9	LT
SHEET 5	EX-08	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1338+48.29	280.5	LT
SHEET 5	EX-09	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1339+84.86	288.6	LT
SHEET 5	EX-10	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1339+46.16	235.6	LT
SHEET 5	EX-11	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1340+51.73	245.9	LT
SHEET 5	EX-12	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1337+75.71	132.2	LT
SHEET 5	EX-13	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1337+33.55	132.3	RT
SHEET 5	EX-14	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1335+80.57	205.5	RT
SHEET 5	EX-15	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1335+24.79	281.6	RT
SHEET 5	EX-16	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1336+50.85	277.6	RT
SHEET 6	EX-17	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1352+40.00	137.0	LT
SHEET 6	EX-18	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1354+42.00	131.0	LT
SHEET 7	EX-19	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1356+45.00	125.0	LT
SHEET 7	EX-20	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1358+48.00	119.0	LT
SHEET 7	EX-21	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1360+74.00	148.0	LT
SHEET 7	EX-22	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1362+98.00	141.0	LT
SHEET 7	EX-23	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1365+00.00	136.0	LT
SHEET 8	EX-24	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1367+00.00	134.0	LT
SHEET 8	EX-25	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1369+00	133.0	LT
SHEET 8	EX-26	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1370+60.00	133.0	LT
SHEET 8	EX-27	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1372+22	132.0	LT
SHEET 7	EX-28	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1365+72.45	126.2	RT
SHEET 7	EX-29	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1366+20.29	199.0	RT
SHEET 7	EX-30	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1364+27	199.0	LT
SHEET 8	EX-31	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1367+03	192.0	LT
SHEET 8	EX-32	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1368+38	184.0	LT
SHEET 8	EX-33	0610-6203	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1368+27.80	119.3	RT
SHEET 8	EX-34	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1369+24	74.0	LT
SHEET 8	EX-35	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1371+45	73.0	LT
SHEET 8	EX-36	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1373+66	71.0	LT
SHEET 8	EX-37	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1375+16	70.0	LT
SHEET 8	EX-38	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1376+66	73.0	LT
SHEET 9	EX-39	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1378+15	79.0	LT
SHEET 9	EX-40	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1379+64	84.0	LT
SHEET 9	EX-41	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1381+14	87.0	LT
SHEET 9	EX-42	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1382+64	87.0	LT
SHEET 9	EX-43	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1387+92.75	167.7	LT
SHEET 10	EX-44	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1390+14.96	167.1	LT
SHEET 12	EX-45	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1417+30.76	326.6	LT
SHEET 12	EX-46	0610-6202	REPLACE LUMINAIRE W/LED (250W EQ)	N/A	N/A	N/A	CL IH 35	1418+49.19	353.8	LT
SHEET 12	EX-47	6156-6007	REPLC LED HI MST IL (6 FIXT) (ASYM) (TY B)	N/A	N/A	N/A	CL IH 35	1420+31.85	199.8	RT
SHEET 13	EX-48	6156-6007	REPLC LED HI MST IL (6 FIXT) (ASYM) (TY B)	N/A	N/A	N/A	CL IH 35	1424+13.73	88.3	RT
SHEET 13	EX-49	6156-6007	REPLC LED HI MST IL (6 FIXT) (ASYM) (TY B)	N/A	N/A	N/A	CL IH 35	1430+35.85	89.4	RT
SHEET 14	EX-50	6156-6007	REPLC LED HI MST IL (6 FIXT) (ASYM) (TY B)	N/A	N/A	N/A	CL IH 35	1437+16.38	87.7	RT
SHEET 14	EX-51	6156-6007	REPLC LED HI MST IL (6 FIXT) (ASYM) (TY B)	N/A	N/A	N/A	CL IH 35	1443+84.83	245.5	RT
SHEET 15	EX-52	6156-6005	REPLC LED HI MST IL (6 FIXT) (SYM) (TY S)	N/A	N/A	N/A	CL IH 35	1448+47.30	270.7	RT
SHEET 15	EX-53	6156-6005	REPLC LED HI MST IL (6 FIXT) (SYM) (TY S)	N/A	N/A	N/A	CL IH 35	1453+85.36	267.5	RT
SHEET 15	EX-54	6156-6005	REPLC LED HI MST IL (6 FIXT) (SYM) (TY S)	N/A	N/A	N/A	CL IH 35	1454+63.86	292.2	LT
SHEET 15	EX-55	6156-6005	REPLC LED HI MST IL (6 FIXT) (SYM) (TY S)	N/A	N/A	N/A	CL IH 35	1449+27.91	241.2	LT



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBE REGISTRATION NO. 284

2022
Texas Department of Transportation

IH 35 ILLUMINATION SUMMARIES

SHEET 2 OF 9

CONT	SECT	JOB	HIGHWAY
0015	09	194	IH 35
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		210

SUMMARY OF CONDUIT - PROPOSED ELECTRICAL SERVICE CENTER NO. 1 (ESC01) (CSJ: 0015-09-194)																		
RUN #	CIRCUIT	SHEET NO.	0618-6023	0618-6024	0618-6046	0620-6007		0620-6008		0620-6009		0620-6010		0620-6011		0620-6012		
			2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80	#8 BARE		#8 XHHW		#6 BARE		#6 XHHW		#4 BARE		#4 XHHW		
			COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH
100	A & B	SHEET 1			10	PROVIDED BY ONCOR												
101	A	SHEET 1	20							1	25	2	50					
102	A	SHEET 1		45						1	50	2	100					
103	A	SHEET 1	55							1	60	2	120					
104	A	SHEET 1	230							1	235	2	470					
105	A	SHEET 2		35						1	40	2	80					
106	A	SHEET 2	500							1	505	2	1010					
107	A	SHEET 2	215							1	220	2	440					
108	A	SHEET 2		270						1	275	2	550					
109	A	SHEET 3	170							1	175	2	350					
110	A	SHEET 3	510							1	515	2	1030					
111	A	SHEET 3		35						1	40	2	80					
112	A	SHEET 3	240							1	245	2	490					
TOTALS:			1940	385	10						2385		4770					

SUMMARY OF CONDUIT - PROPOSED ELECTRICAL SERVICE CENTER NO. 2 (ESC02) (CSJ: 0015-09-194)																		
RUN #	CIRCUIT	SHEET NO.	0618-6023	0618-6024	0618-6046	0620-6007		0620-6008		0620-6009		0620-6010		0620-6011		0620-6012		
			2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80	#8 BARE		#8 XHHW		#6 BARE		#6 XHHW		#4 BARE		#4 XHHW		
			COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH
200	A & B	SHEET 6			10	PROVIDED BY ONCOR												
200A	A	SHEET 6	15							1	20	2	40					
201	A	SHEET 6		65						1	70	2	140					
202	A	SHEET 6	80							1	85	2	170					
203	A	SHEET 6		175						1	180	2	360					
204	A	SHEET 5	325							1	330	2	660					
205	A	SHEET 5	270							1	275	2	550					
206	A	SHEET 5		200						1	205	2	410					
207	A	SHEET 5	310							1	315	2	630					
208	A	SHEET 4	150							1	155	2	310					
209	A	SHEET 4		35						1	40	2	80					
210	A	SHEET 4	475							1	480	2	960					
TOTALS:			1625	475	10						2155		4310					

SUMMARY OF CONDUIT - PROPOSED ELECTRICAL SERVICE CENTER NO. 3 (ESC03) (CSJ: 0015-09-194)																		
RUN #	CIRCUIT	SHEET NO.	0618-6023	0618-6024	0618-6046	0620-6007		0620-6008		0620-6009		0620-6010		0620-6011		0620-6012		
			2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80	#8 BARE		#8 XHHW		#6 BARE		#6 XHHW		#4 BARE		#4 XHHW		
			COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH
300	A & B	SHEET 7			10	PROVIDED BY ONCOR												
301	A	SHEET 7		60						1	65	2	130					
302	A	SHEET 7	40							1	45	2	90					
303	A	SHEET 7		50						1	55	2	110					
304	A	SHEET 7	145							1	150	2	300					
305	A	SHEET 7	760							1	765	2	1530					
306	A	SHEET 6	350							1	355	2	710					
307	A	SHEET 6		60						1	65	2	130					
308	A	SHEET 6	260							1	265	2	530					
TOTALS:			1555	170	10						1765		3530					

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 284

2022
Texas Department of Transportation

**IH 35
ILLUMINATION
SUMMARIES**

SHEET 3 OF 9

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
		AUS	WILLIAMSON	211	

SUMMARY OF CONDUIT - PROPOSED ELECTRICAL SERVICE CENTER NO. 4 (ESC04) (CSJ: 0015-09-194)																
RUN #	CIRCUIT	SHEET NO.	0618-6023	0618-6024	0618-6046	0620-6007		0620-6008		0620-6009		0620-6010		0620-6011		0620-6012
			2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80	#8 BARE		#8 XHHW		#6 BARE		#6 XHHW		#4 BARE		#4 XHHW
			COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH
400	A & B	SHEET 8			20	PROVIDED BY ONCOR										
401A	A	SHEET 8	15							1	20	2	40			
401B	A	SHEET 8		55						1	60	2	120			
402	A	SHEET 8	70							1	75	2	150			
403	A	SHEET 8	685							1	690	2	1380			
404	A	SHEET 8	20							1	25	2	50			
405	A	SHEET 9	725							1	730	2	1460			
TOTALS:			1515	55	20						1600		3200			

SUMMARY OF CONDUIT - PROPOSED ELECTRICAL SERVICE CENTER NO. 5 (ESC05) (CSJ: 0015-09-194)																	
RUN #	CIRCUIT	SHEET NO.	0618-6023	0618-6024	0618-6046	0620-6007		0620-6008		0620-6009		0620-6010		0620-6011		0620-6012	
			2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80	#8 BARE		#8 XHHW		#6 BARE		#6 XHHW		#4 BARE		#4 XHHW	
			COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	
500	A, B, & C	SHEET 12			20	PROVIDED BY ONCOR											
501	A & B	SHEET 12	190									2	390	1	195	2	390
502	A & B	SHEET 12		115								2	240	1	120	2	240
503	A	SHEET 12	45									2	100	1	50	2	100
504	A	SHEET 12	400											1	405	2	810
505	A	SHEET 12	400											1	405	2	810
506	A	SHEET 11		320										1	325	2	650
507	A	SHEET 11		300										1	305	2	610
508	A	SHEET 11	435											1	440	2	880
509	A	SHEET 10	110											1	115	2	230
510	A	SHEET 10	145											1	150	2	300
511	A	SHEET 10		480										1	485	2	970
512	B	SHEET 12	60							1	65	2	130				
513	B	SHEET 12		230						1	235	2	470				
514	B	SHEET 12	50							1	55	2	110				
515	B	SHEET 12		135						1	140	2	280				
516	B	SHEET 12		300						1	305	2	610				
517	B	SHEET 12	170							1	175	2	350				
518	B	SHEET 12	110							1	115	2	230				
519	B	SHEET 12		120						1	125	2	250				
520	B	SHEET 12	130							1	135	2	270				
521	B	SHEET 12		130						1	135	2	270				
522	B	SHEET 12	65							1	70	2	140				
TOTALS:			2310	2130	20						1555		3840		2995		5990

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2022
Texas Department of Transportation

**IH 35
ILLUMINATION
SUMMARIES**

SHEET 4 OF 9

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
		AUS	WILLIAMSON	212	

* SUMMARY OF CONDUIT - PROPOSED ELECTRICAL SERVICE CENTER NO. 6 (ESC06) (CSJ: 0015-09-194)																	
RUN #	CIRCUIT	SHEET NO.	0618-6023	0618-6024	0618-6046	0620-6007		0620-6008		0620-6009		0620-6010		0620-6011		0620-6012	
			2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80	#8 BARE		#8 XHHW		#6 BARE		#6 XHHW		#4 BARE		#4 XHHW	
			COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	
100	A & B	SHEET 1			10	PROVIDED BY ONCOR											
601	B	SHEET 1	15							1	20	2	40				
602	B	SHEET 1		40						1	45	2	90				
603	B	SHEET 1	55							1	60	2	120				
604	B	SHEET 1	230							1	235	2	470				
605	B	SHEET 2		30						1	35	2	70				
606	B	SHEET 2	490							1	495	2	990				
607	B	SHEET 2	215							1	220	2	440				
608	B	SHEET 2		265						1	270	2	540				
609	B	SHEET 3	170							1	175	2	350				
610	B	SHEET 3	505							1	510	2	1020				
611	B	SHEET 3		35						1	40	2	80				
612	B	SHEET 3		140						1	145	2	290				
613	B	SHEET 3	75							1	80	2	160				
614	B	SHEET 3	15							1	20	2	40				
615	B	SHEET 3	25							1	30	2	60				
616	B	SHEET 3		45						1	50	2	100				
617	B	SHEET 3	75							1	80	2	160				
TOTALS:			1870	555	10						2510		5020				

* SUMMARY OF CONDUIT - PROPOSED ELECTRICAL SERVICE CENTER NO. 7 (ESC07) (CSJ: 0015-09-194)																	
RUN #	CIRCUIT	SHEET NO.	0618-6023	0618-6024	0618-6046	0620-6007		0620-6008		0620-6009		0620-6010		0620-6011		0620-6012	
			2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80	#8 BARE		#8 XHHW		#6 BARE		#6 XHHW		#4 BARE		#4 XHHW	
			COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	
200	A & B	SHEET 6			10	PROVIDED BY ONCOR											
701	B	SHEET 6	15							1	20	2	40				
702	B	SHEET 6		55						1	60	2	120				
703	B	SHEET 6	85							1	90	2	180				
704	B	SHEET 6		165						1	170	2	340				
705	B	SHEET 5	320							1	325	2	650				
706	B	SHEET 5	265							1	270	2	540				
707	B	SHEET 5		200						1	205	2	410				
708	B	SHEET 5	320							1	325	2	650				
709	B	SHEET 4	140							1	145	2	290				
710	B	SHEET 4		35						1	40	2	80				
711	B	SHEET 4	50							1	55	2	110				
712	B	SHEET 4	15							1	20	2	40				
713	B	SHEET 4	15							1	20	2	40				
714	B	SHEET 5	45							1	50	2	100				
TOTALS:			1270	455	10						1795		3590				

* FOR CONTRACTOR'S INFORMATION ONLY.
NOT TO BE PAID FOR DIRECTLY, BUT
SUBSIDIARY TO ITEM 6319

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 284

2022
Texas Department of Transportation

**IH 35
ILLUMINATION
SUMMARIES**

SHEET 5 OF 9

DS:	CK1	0015	09	194	IH 35
DW:	CK2	AUS	WILLIAMSON	213	

* SUMMARY OF CONDUIT - PROPOSED ELECTRICAL SERVICE CENTER NO. 8 (ESC08) (CSJ: 0015-09-194)																	
RUN #	CIRCUIT	SHEET NO.	0618-6023	0618-6024	0618-6046	0620-6007		0620-6008		0620-6009		0620-6010		0620-6011		0620-6012	
			2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80	#8 BARE		#8 XHHW		#6 BARE		#6 XHHW		#4 BARE		#4 XHHW	
			COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	
300	A & B	SHEET 7			10	PROVIDED BY ONCOR											
801	B	SHEET 7	15							1	20	2	40				
802	B	SHEET 7		50						1	55	2	110				
803	B	SHEET 7	30							1	35	2	70				
804	B	SHEET 7		55						1	60	2	120				
805	B	SHEET 7	135							1	140	2	280				
806	B	SHEET 7	215							1	220	2	440				
807	B	SHEET 6	900							1	905	2	1810				
808	B	SHEET 6		55						1	60	2	120				
809	B	SHEET 6	265							1	270	2	540				
810	B	SHEET 6		195						1	200	2	400				
811	B	SHEET 6	65							1	70	2	140				
812	B	SHEET 6	90							1	95	2	190				
813	B	SHEET 6	170							1	175	2	350				
814	B	SHEET 6	40							1	45	2	90				
815	B	SHEET 6	320							1	325	2	650				
816	B	SHEET 6		60						1	65	2	130				
817	B	SHEET 6	35							1	40	2	80				
818	B	SHEET 6	15							1	20	2	40				
TOTALS:			2295	415	10						2800		5600				

* SUMMARY OF CONDUIT - PROPOSED ELECTRICAL SERVICE CENTER NO. 9 (ESC09) (CSJ: 0015-09-194)																	
RUN #	CIRCUIT	SHEET NO.	0618-6023	0618-6024	0618-6046	0620-6007		0620-6008		0620-6009		0620-6010		0620-6011		0620-6012	
			2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80	#8 BARE		#8 XHHW		#6 BARE		#6 XHHW		#4 BARE		#4 XHHW	
			COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	
400	A & B	SHEET 8			20	PROVIDED BY ONCOR											
901	B	SHEET 8	15							1	20	2	40				
902	B	SHEET 8		55						1	60	2	120				
903	B	SHEET 8	65							1	70	2	140				
904	B	SHEET 9	610							1	615	2	1230				
905	B	SHEET 9	390							1	395	2	790				
906	B	SHEET 9	115							1	120	2	240				
907	B	SHEET 9		50						1	55	2	110				
908	B	SHEET 9	15							1	20	2	40				
909	B	SHEET 9	20							1	25	2	50				
TOTALS:			1230	105	20						1380		2760				

* SUMMARY OF CONDUIT - PROPOSED ELECTRICAL SERVICE CENTER NO. 10 (ESC10) (CSJ: 0015-09-194)																	
RUN #	CIRCUIT	SHEET NO.	0618-6023	0618-6024	0618-6046	0620-6007		0620-6008		0620-6009		0620-6010		0620-6011		0620-6012	
			2 IN. PVC SCH 40	2 IN. PVC SCH 40 BORE	2 IN. PVC SCH 80	#8 BARE		#8 XHHW		#6 BARE		#6 XHHW		#4 BARE		#4 XHHW	
			COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	COUNT	LENGTH	
500	A, B & C	SHEET 12			10	PROVIDED BY ONCOR											
1001	C	SHEET 12	190							1	195	2	390				
1002	C	SHEET 12		110						1	115	2	230				
1003	C	SHEET 12	45							1	50	2	100				
1004	C	SHEET 12		310						1	315	2	630				
1005	C	SHEET 12	165							1	170	2	340				
1006	C	SHEET 12		260						1	265	2	530				
1007	C	SHEET 13	495							1	500	2	1000				
1008	C	SHEET 13	330							1	335	2	670				
1009	C	SHEET 13	20							1	25	2	50				
1010	C	SHEET 13	90							1	95	2	190				
1011	C	SHEET 13		70						1	75	2	150				
1012	C	SHEET 13	15							1	20	2	40				
TOTALS:			1350	750	10						2160		4320				

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BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2022
Texas Department of Transportation

IH 35 ILLUMINATION SUMMARIES

SHEET 6 OF 9

DS:	CK1	0015	09	194	IH 35
DW:	CK2	AUS	WILLIAMSON	214	

SCHEDULE OF HIGH MAST/ROADWAY ILLUMINATION ASSEMBLIES (CSJ: 0015-09-194)					
SHEET	ITEM DESCR.	ILLUMINATION ASSEMBLY DESCRIPTION	CHAIN	STATION	OFFSET
SHEET 1	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1300+32.57	CTR
SHEET 2	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1303+12.60	CTR
SHEET 2	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1305+93.06	CTR
SHEET 2	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1308+42.15	CTR
SHEET 2	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1311+52.77	CTR
SHEET 3	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1314+32.38	CTR
SHEET 3	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1317+12.12	CTR
SHEET 3	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1319+91.73	CTR
SHEET 3	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1322+71.57	CTR
SHEET 3	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1321+04.99	LT
SHEET 4	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1325+49.13	CTR
SHEET 4	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1328+28.53	CTR
SHEET 4	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1331+08.95	CTR
SHEET 4	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1333+88.58	CTR
SHEET 4	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1323+13.79	LT
SHEET 4	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1330+45.65	LT
SHEET 5	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1336+69.05	CTR
SHEET 5	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1338+45.09	CTR
SHEET 5	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1339+99.08	CTR
SHEET 5	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1342+80.69	CTR
SHEET 5	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1338+90.54	LT
SHEET 5	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1340+31.23	LT
SHEET 5	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1341+75.16	LT
SHEET 5	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1342+02.60	LT
SHEET 5	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1343+42.23	LT
SHEET 5	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1338+89.14	RT
SHEET 5	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1340+29.05	RT
SHEET 5	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1341+82.26	RT
SHEET 5	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1343+41.83	RT
SHEET 6	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1345+58.92	CTR
SHEET 6	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1348+35.21	CTR
SHEET 6	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1351+16.19	CTR
SHEET 6	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1353+94.86	CTR
SHEET 6	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1345+10.00	LT
SHEET 6	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1345+33.57	LT
SHEET 6	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1348+40.00	LT
SHEET 6	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1350+40.00	LT
SHEET 6	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1353+68.00	LT
SHEET 6	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1355+90.00	LT
SHEET 6	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1349+75.16	RT
SHEET 6	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1351+57.55	RT
SHEET 6	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1353+56.82	RT
SHEET 6	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1355+74.78	RT
SHEET 7	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1356+74.05	CTR
SHEET 7	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1359+53.88	CTR
SHEET 7	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1362+36.38	CTR
SHEET 7	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1365+45.44	CTR
SHEET 7	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1358+13.00	LT
SHEET 7	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1363+66.45	RT
SHEET 8	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1367+93.53	CTR
SHEET 8	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1370+76.13	CTR
SHEET 8	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1373+56.01	CTR
SHEET 8	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1376+35.23	CTR
SHEET 9	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1379+19.95	CTR
SHEET 9	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1382+00.10	CTR
SHEET 9	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1384+80.97	CTR
SHEET 9	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1387+60.41	CTR
SHEET 9	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1388+83.18	RT

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 284



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IH 35
ILLUMINATION
SUMMARIES


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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0015	09	194	IH 35
DW:	CK:	DIST		COUNTY	SHEET NO.
		AUS		WILLIAMSON	215


SCHEDULE OF HIGH MAST/ROADWAY ILLUMINATION ASSEMBLIES (CSJ: 0015-09-194)					
SHEET	ITEM DESCR.	ILLUMINATION ASSEMBLY DESCRIPTION	CHAIN	STATION	OFFSET
SHEET 10	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1390+39.81	CTR
SHEET 10	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1393+20.12	CTR
SHEET 10	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1395+99.71	CTR
SHEET 10	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1398+78.38	CTR
SHEET 10	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1398+38.75	LT
SHEET 11	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1401+59.68	CTR
SHEET 11	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1404+40.22	CTR
SHEET 11	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1407+19.95	CTR
SHEET 11	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1410+00.46	CTR
SHEET 11	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1406+79.92	LT
SHEET 11	0610-6009	REMOVE RD IL ASM (TRANS-BASE)	CL IH 35	1408+78.06	LT
SHEET 12	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1412+80.06	CTR
SHEET 12	0610-6008	REMOVE RD IL ASM (CTB MOUNT)	CL IH 35	1415+60.28	CTR

					
					
IH 35 ILLUMINATION SUMMARIES					
SHEET 8 OF 9					
DS:	CK1	CONT	SECT	JOB	HIGHWAY
DS	CK1	0015	09	194	IH 35
DW:	CK2	DIST	COUNTY	SHEET NO.	
DW	CK2	AUS	WILLIAMSON	216	

SHEET NO.	ITEM NO.	ELEC. SERV. NO.	ELEC. SERV. DESC.	SERVICE CONDUIT	SERVICE CONDUCTOR	SAFETY SWITCH	MAIN BREAKER	TWO POLE CONTACTOR	LOAD CENTER	PERMANENT			
										CIRCUIT	BRANCH BREAKER	BRANCH CIRCUIT	MAX LOAD (KVA)
SHEET 1 OF 15	0628-6046	1	ELEC SERV TY A (240/480)60(NS)SS(E)SP(U)	2"	3/#6	N/A	2P/60	60	N/A	A	2P/40	23.8	11.4
										B	WWDS		
										C	SPARE		
										D	SPARE		
SHEET 6 OF 15	0628-6046	2	ELEC SERV TY A (240/480)60(NS)SS(E)SP(U)	2"	3/#6	N/A	2P/60	60	N/A	A	2P/30	17.8	8.6
										B	WWDS		
										C	SPARE		
										D	SPARE		
SHEET 7 OF 15	0628-6046	3	ELEC SERV TY A (240/480)60(NS)SS(E)SP(U)	2"	3/#6	N/A	2P/60	60	N/A	A	2P/30	17.8	8.6
										B	WWDS		
										C	SPARE		
										D	SPARE		
SHEET 8 OF 15	0628-6046	4	ELEC SERV TY A (240/480)60(NS)SS(E)SP(U)	2"	3/#6	N/A	2P/60	60	N/A	A	2P/30	17.8	8.6
										B	WWDS		
										C	SPARE		
										D	SPARE		
SHEET 12 OF 15	0628-6077	5	ELEC SERV TY A (240/480)100(NS)SS(E)SP(U)	2"	3/#2	N/A	2P/100	60	N/A	A	2P/40	23.8	13.4
										B	2P/20	4.2	
										C	WWDS		
										D	SPARE		



 BRIDGEFARMER & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 TBPE REGISTRATION NO. 264



 Texas Department of Transportation

IH 35
**ILLUMINATION
 SUMMARIES**

SHEET 9 OF 9

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0015	09	194	IH 35
DW:	CK:	DIST COUNTY			SHEET NO.
		AUS WILLIAMSON			217

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 1/2 in. or less in diameter.
4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.
5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.
6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.
2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.
3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.
5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.
6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.
7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.



8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.
9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.
10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.
2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.
3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.
4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.
5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."
6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.
7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.
8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.
9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.
10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.
11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.
12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).
13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.
14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

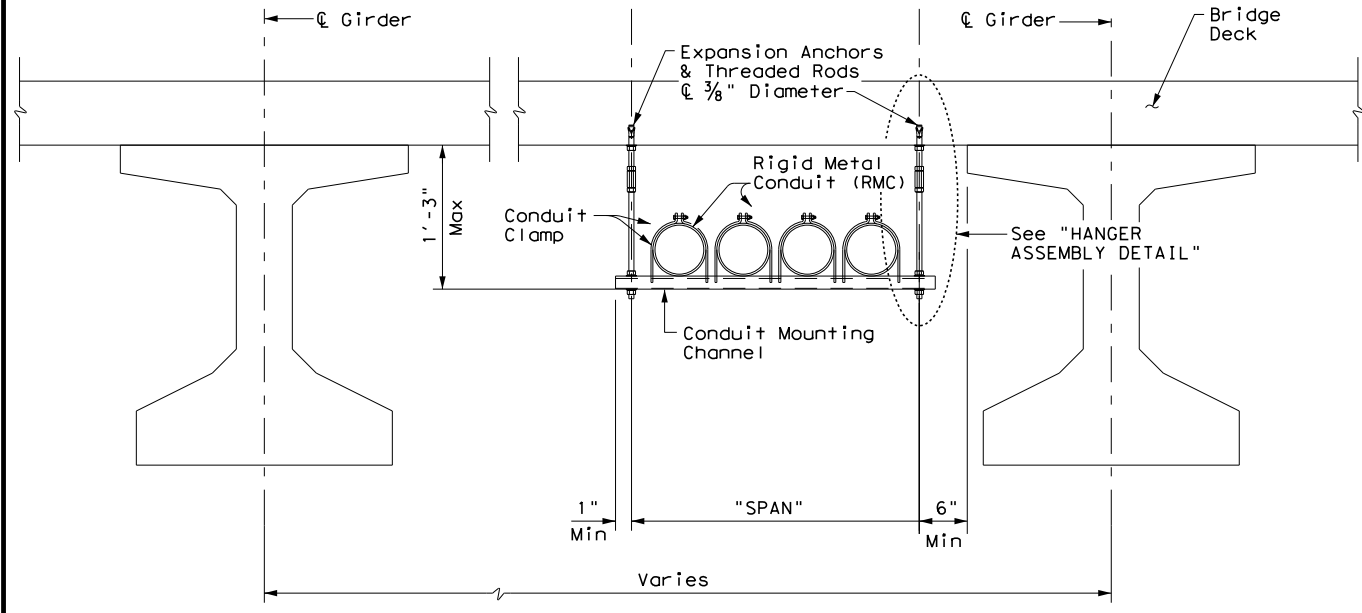
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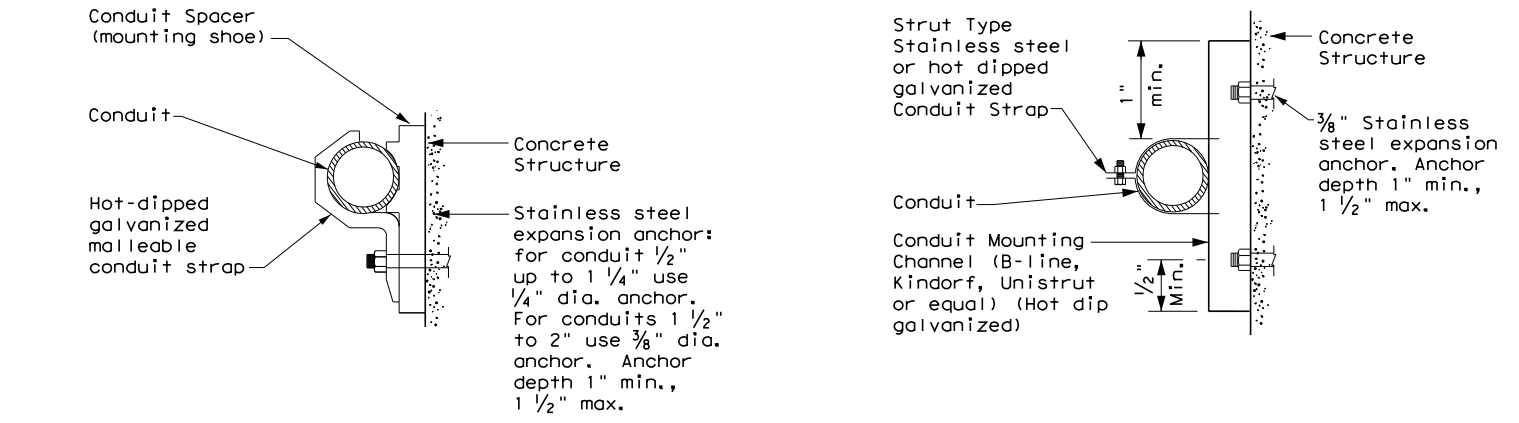
			
<h2>ELECTRICAL DETAILS CONDUITS & NOTES</h2>			
<h3>ED(1) - 14</h3>			
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© TxDOT	October 2014	CONT	SECT
REVISIONS		0015	09
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		AUS	WILLIAMSON
		SHEET NO.	
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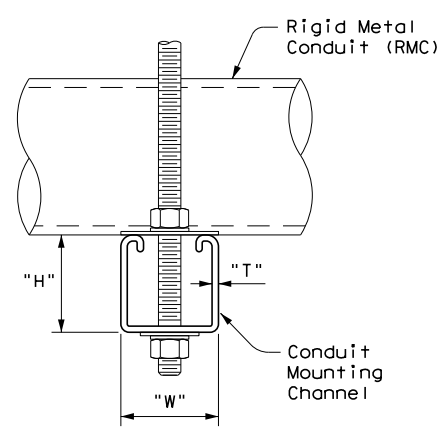
CONDUIT HANGING DETAIL



CONDUIT MOUNTING OPTIONS
 Attachment to concrete surfaces
 See ED(1)B.2

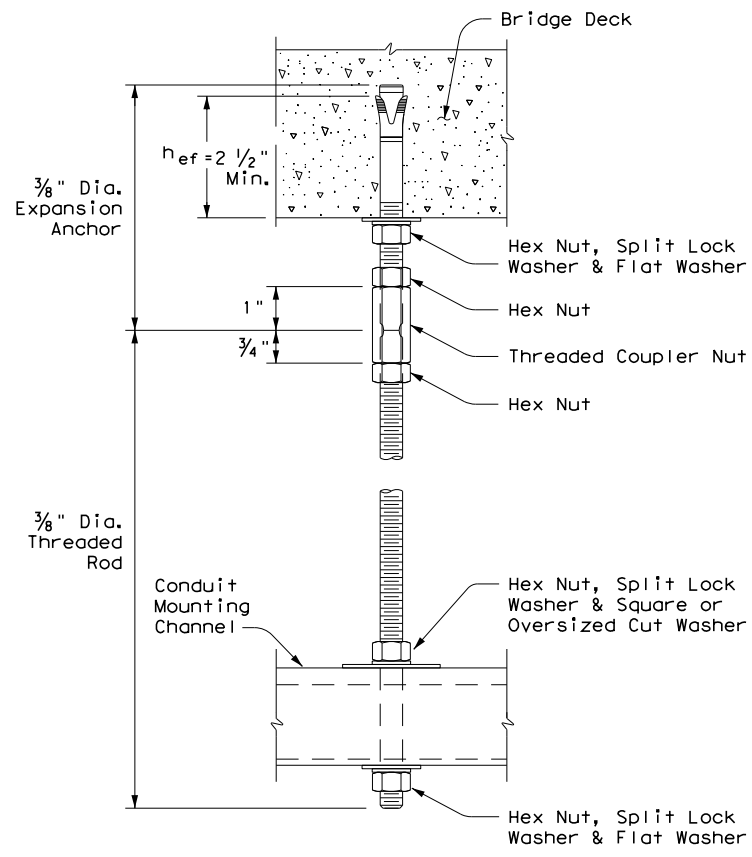
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

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



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.
2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.
3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.
4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.
5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (hef), as shown. Increase (hef) 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 (hef). No lateral loads shall be introduced after conduit installation.

		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS CONDUIT SUPPORTS</h2>			
<h3>ED(2) - 14</h3>			
FILE: ed2-14.dgn	DWG: TxDOT	CHK: TxDOT	DWG: TxDOT
© TxDOT October 2014	CONT: 0015	SECT: 09	JOB: 194
REVISIONS		HIGHWAY: IH 35	
DIST: AUS	COUNTY: WILLIAMSON	SHEET NO.: 219	

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 1/2 in. or less in diameter.
4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.
5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.
6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.
2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.
3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.
5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.
6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.
7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.
9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.
10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.



B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.
2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.
3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.
4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.
5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."
6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.
7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.
8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.
9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.
10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.
11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.
12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).
13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.
14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

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<h2>ELECTRICAL DETAILS CONDUITS & NOTES</h2> <h3>ED(1) - 14</h3>					
FILE:	ed1-14.dgn	DN:	CK:	DW:	CK:
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REVISIONS		0015	09	194	1H 35
		DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		215

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 1/2 in. or less in diameter.
4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.
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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."
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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.

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				Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS CONDUITS & NOTES</h2> <h3>ED(1) - 14</h3>					
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REVISIONS		0015	09	194	1H 35
		DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		221

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 1/2 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 1/2 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 1/2 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 photoceII 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.

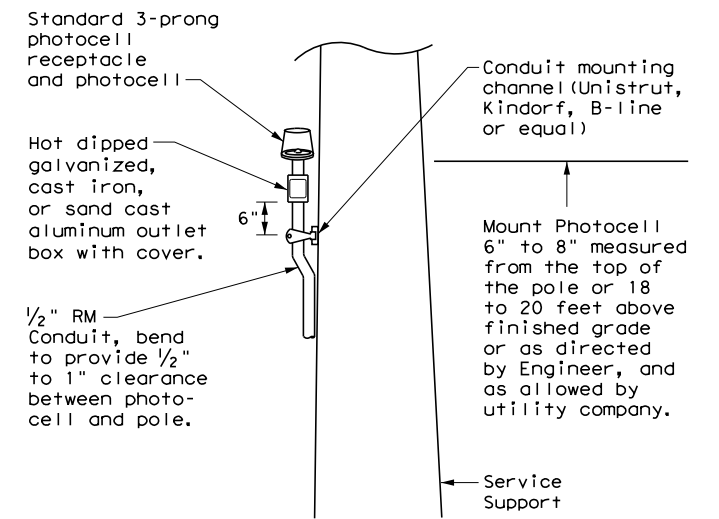
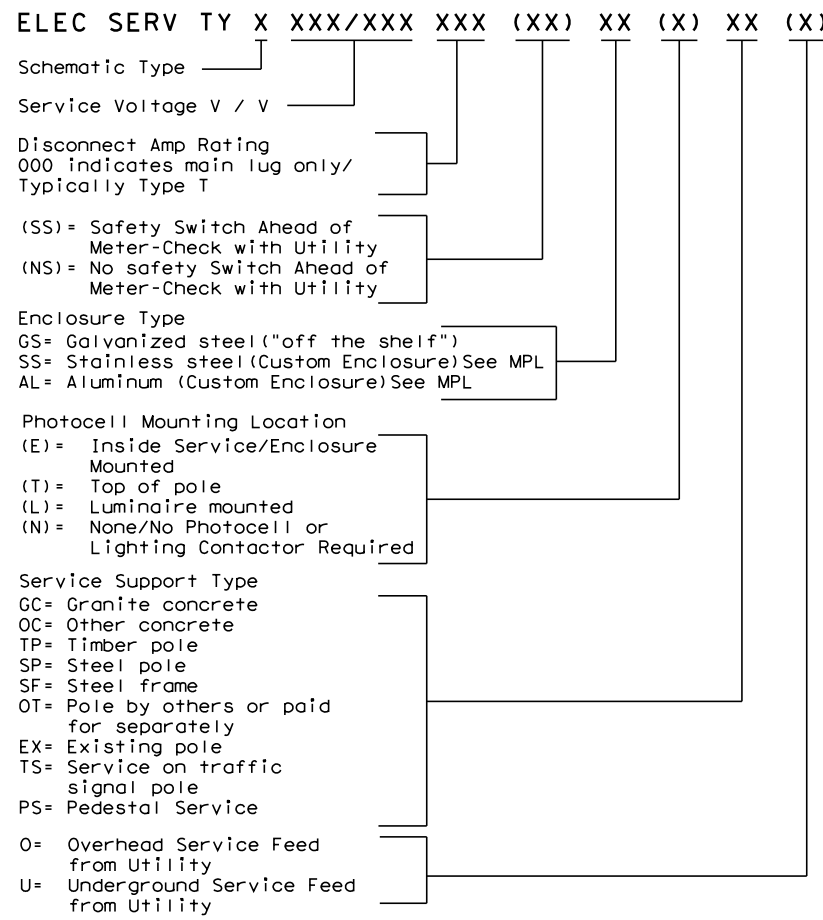
PHOTOELECTRIC CONTROL

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 *xSize	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 1/4"	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 1/4"	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



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	0015	09	194	1H 35
	DIST	COUNTY	SHEET NO.	
	AUS	WILLIAMSON	222	

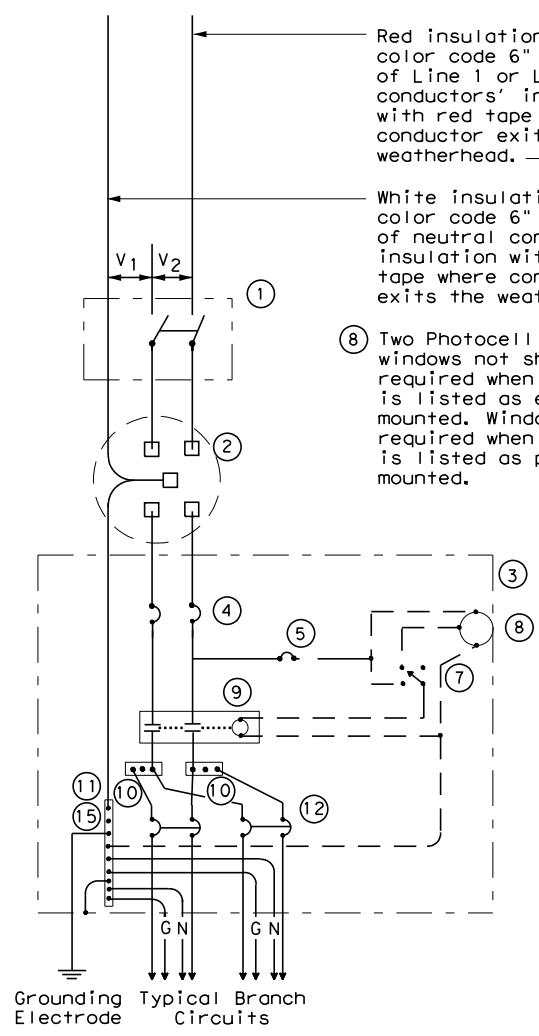
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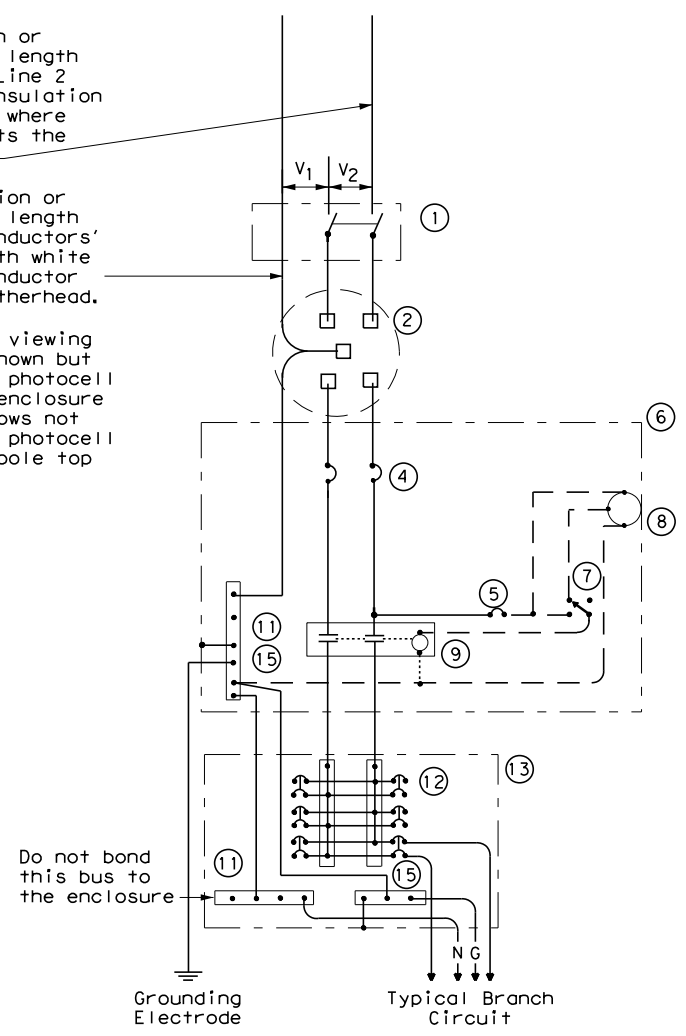


**SCHEMATIC TYPE A
THREE WIRE**

Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.

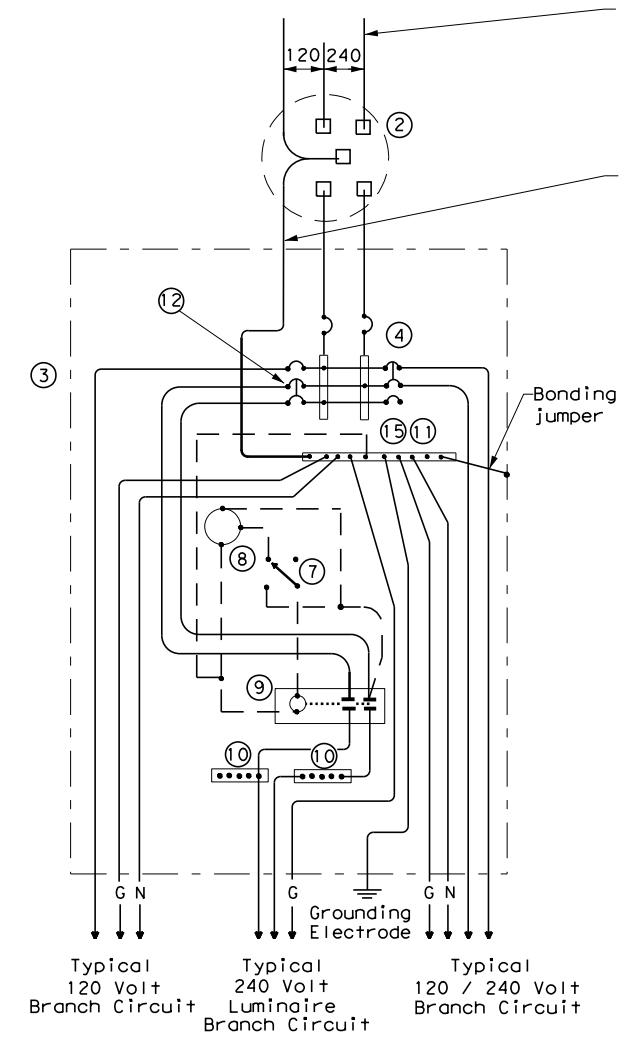
White insulation or color code 6" length of neutral conductors' insulation with white tape where conductor exits the weatherhead.

⑧ Two Photocell viewing windows not shown but required when photocell is listed as enclosure mounted. Windows not required when photocell is listed as pole top mounted.



**SCHEMATIC TYPE C
THREE WIRE**

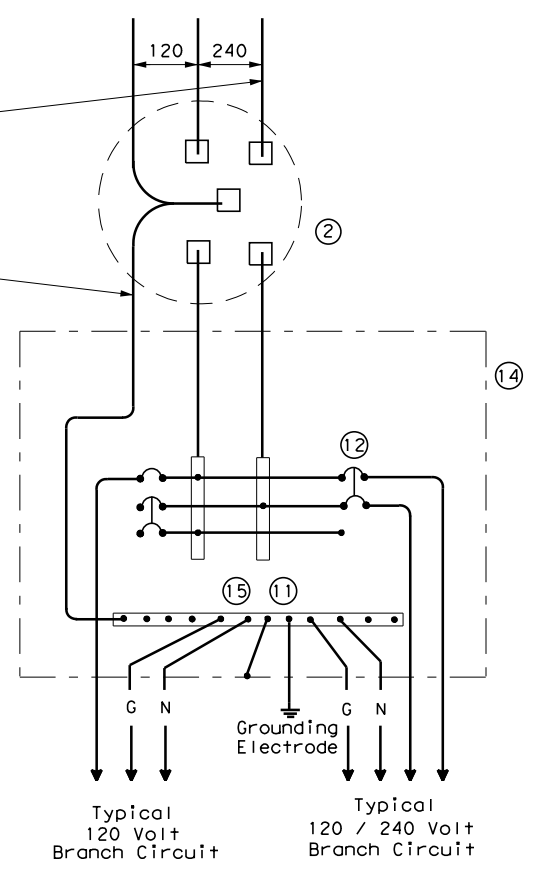
WIRING LEGEND	
—	Power Wiring
- - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required



**SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE**

Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.

White insulation or color code 6" length of neutral conductors' insulation with white tape where conductor exits the weatherhead.



**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.

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

				Traffic Operations Division Standard	
ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES					
ED(6) - 14					
FILE:	ed6-14.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2014	CON:	0015	SECT:	09
REVISIONS		JOB:	194	HIGHWAY:	1H 35
DIST:	AUS	COUNTY:	WILLIAMSON	SHEET NO.:	223

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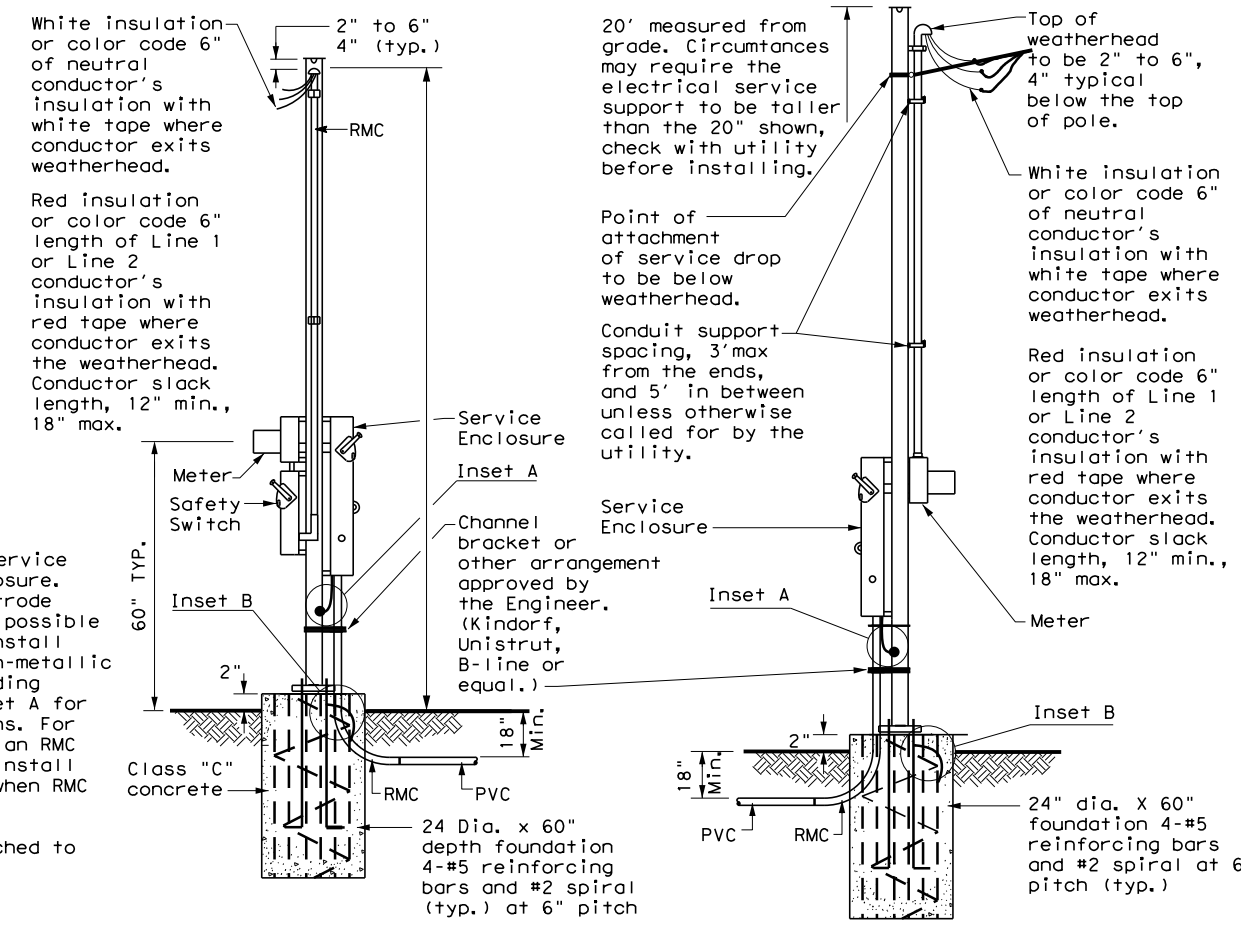
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SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

- 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 1/2 in. or 1 3/8 in. wide by 1 in. up to 3 3/4 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.
- 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.
- Provide and install galvanized 3/4 in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized 3/4 in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 1/4 in. to 3 1/2 in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.
- 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.
- Furnish and install rigid metallic ellis in all steel pole and steel frame foundations for all conduits entering the service from underground.
- Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.
- Drill and tap steel poles and frames for 1/2 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.
- If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.
- Provide 1/4" - 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.
- Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.
- Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

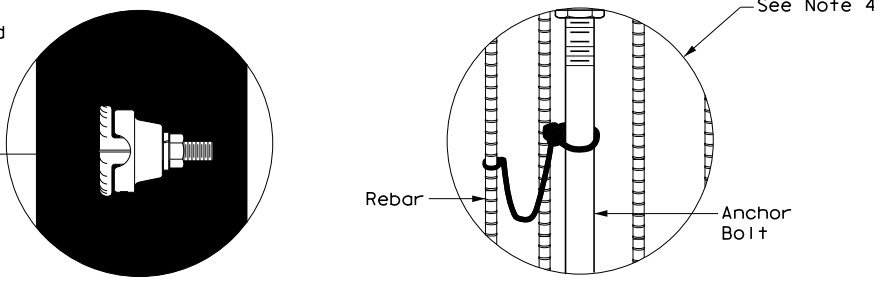
White insulation or color code 6" of neutral conductor's insulation with white tape where conductor exits weatherhead.

Red insulation or color code 6" length of Line 1 or Line 2 conductor's insulation with red tape where conductor exits the weatherhead. Conductor slack length, 12" min., 18" max.

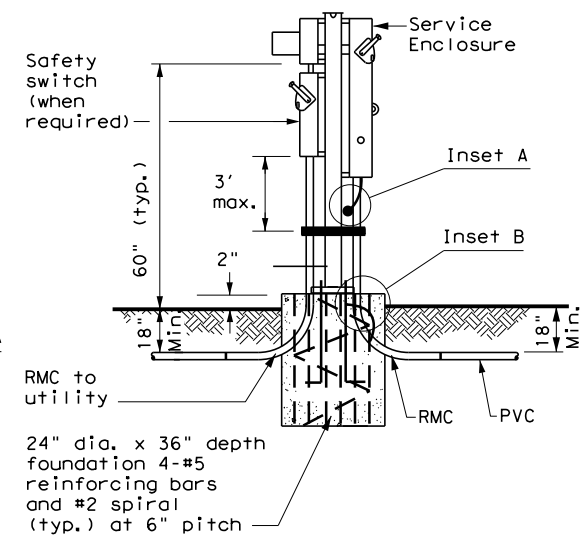


WITH SAFETY SWITCH WITHOUT SAFETY SWITCH
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE

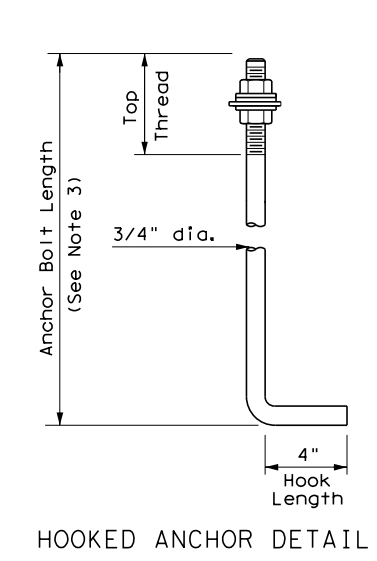
Drill, top, and thread 1/2" X 13 UNC. Install tank ground fitting, connect electrical service grounding electrode conductor. See Note 7.



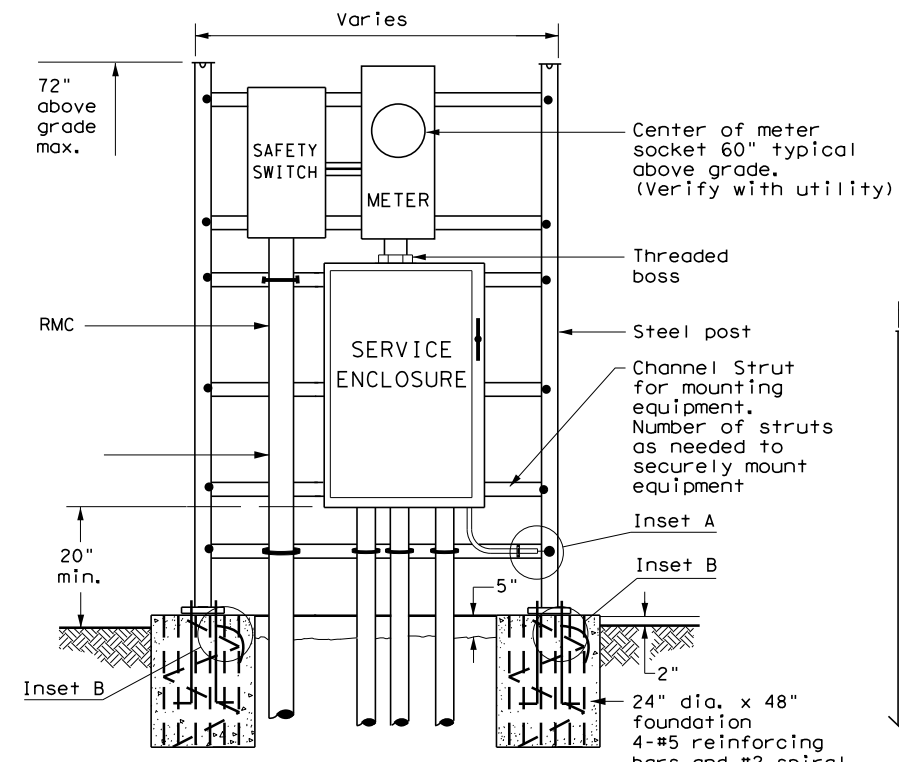
FRONT VIEW INSET A INSET B



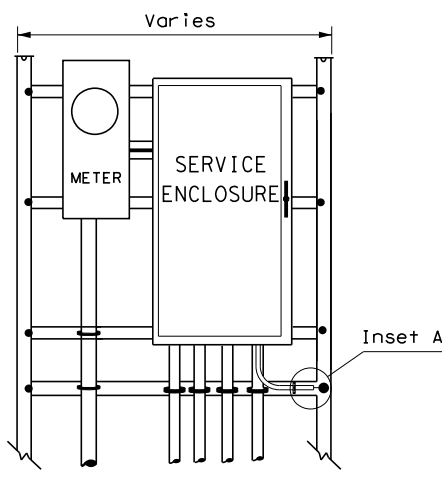
WITH SAFETY SWITCH
SERVICE SUPPORT TYPE SP (U) - UNDERGROUND SERVICE



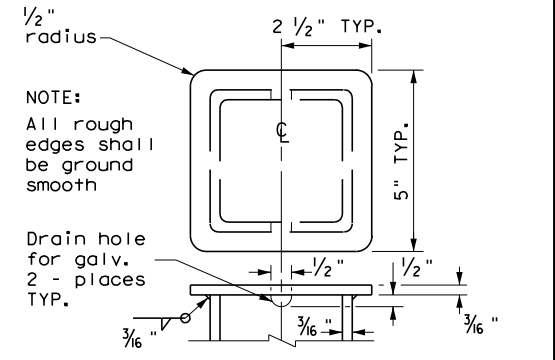
HOOKED ANCHOR DETAIL



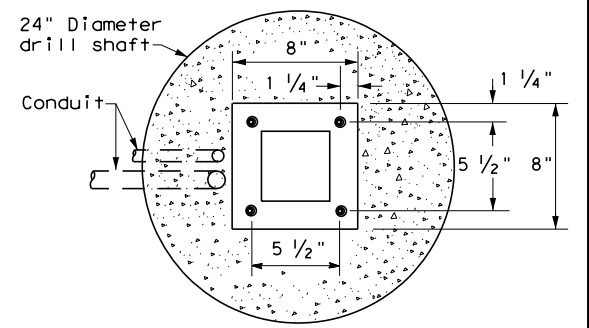
WITH SAFETY SWITCH
FRONT VIEW
SERVICE SUPPORT TYPE SF (U) - UNDERGROUND SERVICE



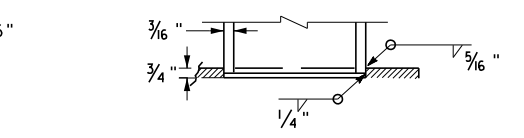
WITHOUT SAFETY SWITCH



POLE TOP PLATE

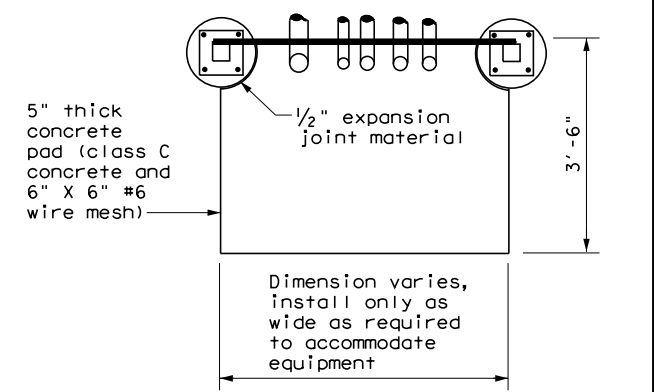


BASE PLATE DETAIL



BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



TOP VIEW
SERVICE SUPPORT TY SF (O) & SF (U)

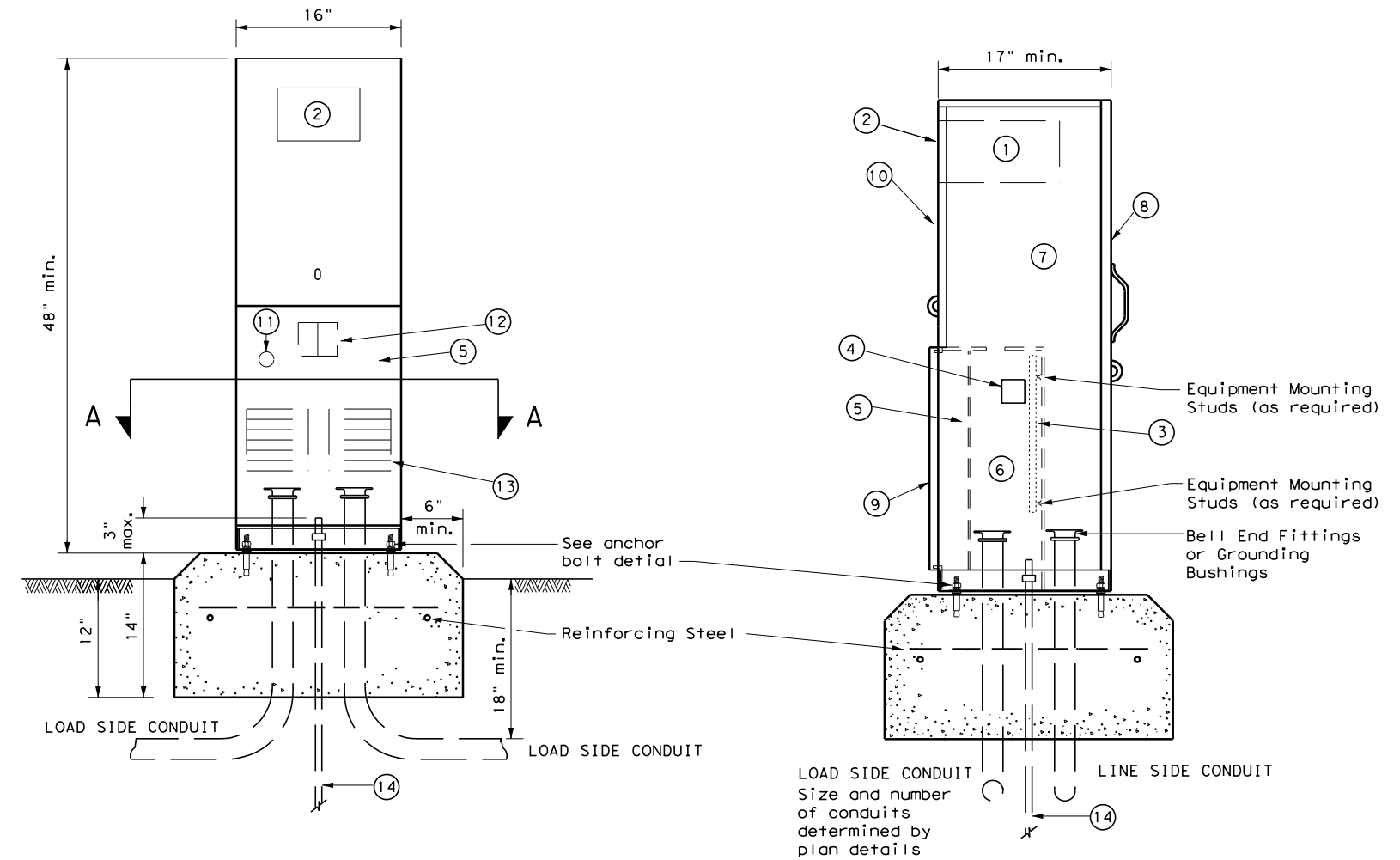
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ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP ED(7)-14			
FILE: ed7-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CON: 0015	SECT: 09	JOB: 194
REVISIONS			HIGHWAY: IH 35
	DIST: AUS	COUNTY: WILLIAMSON	SHEET NO.: 224

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PEDESTAL SERVICE NOTES

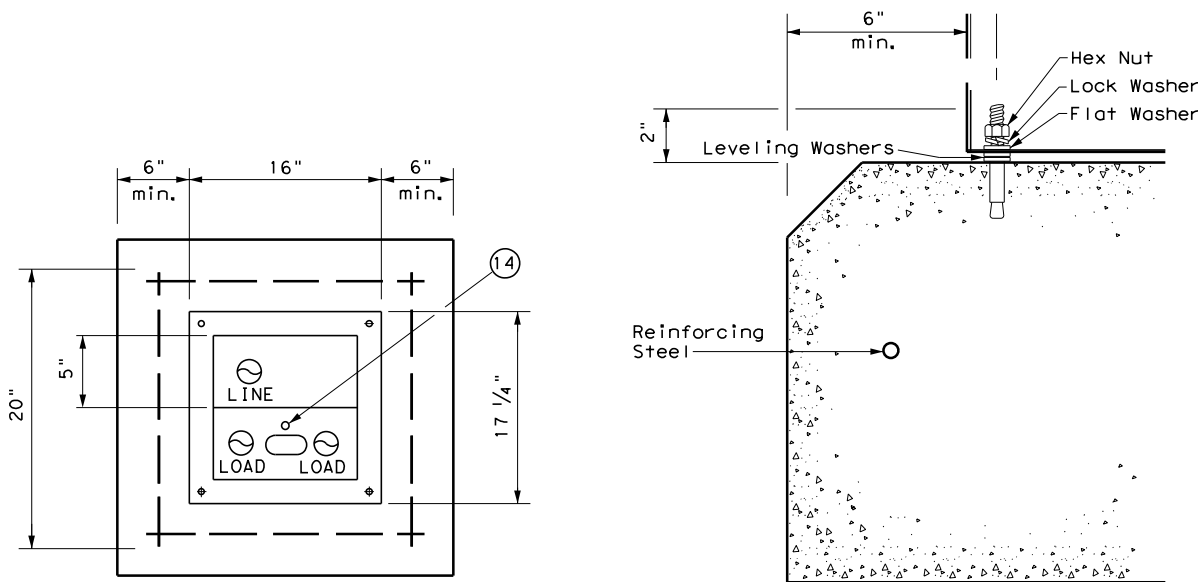
1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS) 11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services." Provide pedestal electrical services as listed on the Material Producers List (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.
2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.
3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."
5. Install 1/2 in. X 2 1/16 in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a 1/2 in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than 1/8 in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of 1/8 in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within 1/4 in. Repair rocking or movement of the service enclosure at no additional cost to the department.
7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.
8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.



FRONT VIEW

SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A

ANCHOR BOLT DETAIL

LEGEND

Number	Description
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

		Traffic Operations Division Standard	
ELECTRICAL DETAILS ELECTRICAL SERVICE SUPPORT PEDESTAL SERVICE TYPE PS			
ED(9) - 14			
FILE: ed9-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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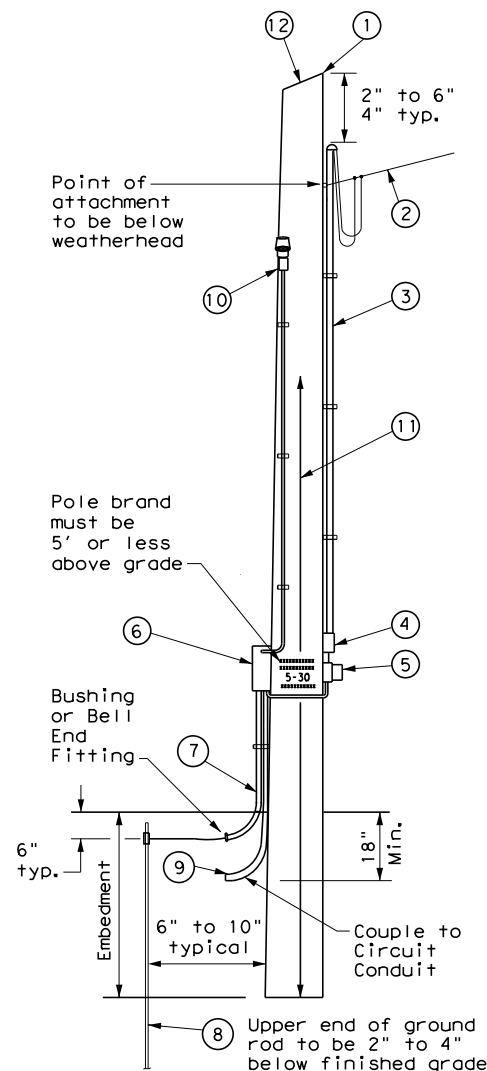
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TIMBER POLE (TP) SERVICE SUPPORT NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627 "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Conduit and electrical conductors attached to the electrical service pole and underground within 12 in. of service pole are not paid for directly but are subsidiary to the electrical service.
3. Install pole-top mounted photocell (T) on north side of pole, or in service enclosure (E) as required. See Electrical Service Data chart in plan set.
4. Gain pole as required to provide flat surface for each channel. Gain timber pole to 3/8 in. max. depth and 1 7/8 in. max. height. Gain pole in a neat and workmanlike manner.
5. Mount meter and service equipment on stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Provide channel sized 1 in. to 3 3/4 in. maximum depth, and 1 1/2 in. to 1 5/8 in. maximum width. File smooth the cut ends of galvanized channel and paint with zinc rich paint before installing on pole. Secure each channel section to timber pole with two galvanized or SS lag bolts, 1/4 in. minimum diameter by 1 1/2 in. minimum length. Use a galvanized or SS flat washer on each lag bolt. Do not stack channel.
6. When excess length must be trimmed from poles, trim from the top end only.

- 1 Class 5 pole, height as required
- 2 Service drop from utility company (attached below weatherhead)
- 3 Service conduit (RMC) and service entrance conductors - One Red, One Black, One White (See Electrical Service Data)
- 4 Safety switch (when required)
- 5 Meter (when required)
- 6 Service enclosure
- 7 6 AWG bare grounding electrode conductor in 1/2 in. PVC to ground rod - extend 1/2 in. PVC 6 in. underground.
- 8 5/8 in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.
- 9 RMC same size as branch circuit conduit.
- 10 See pole-top mounted photocell detail on ED(5).
- 11 When required by the serving utility provide bare 6 AWG copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor with non-conductive material to a height of 8 ft. above finished grade.
- 12 When required by utility, cut top of pole at an angle to enhance rain run off.

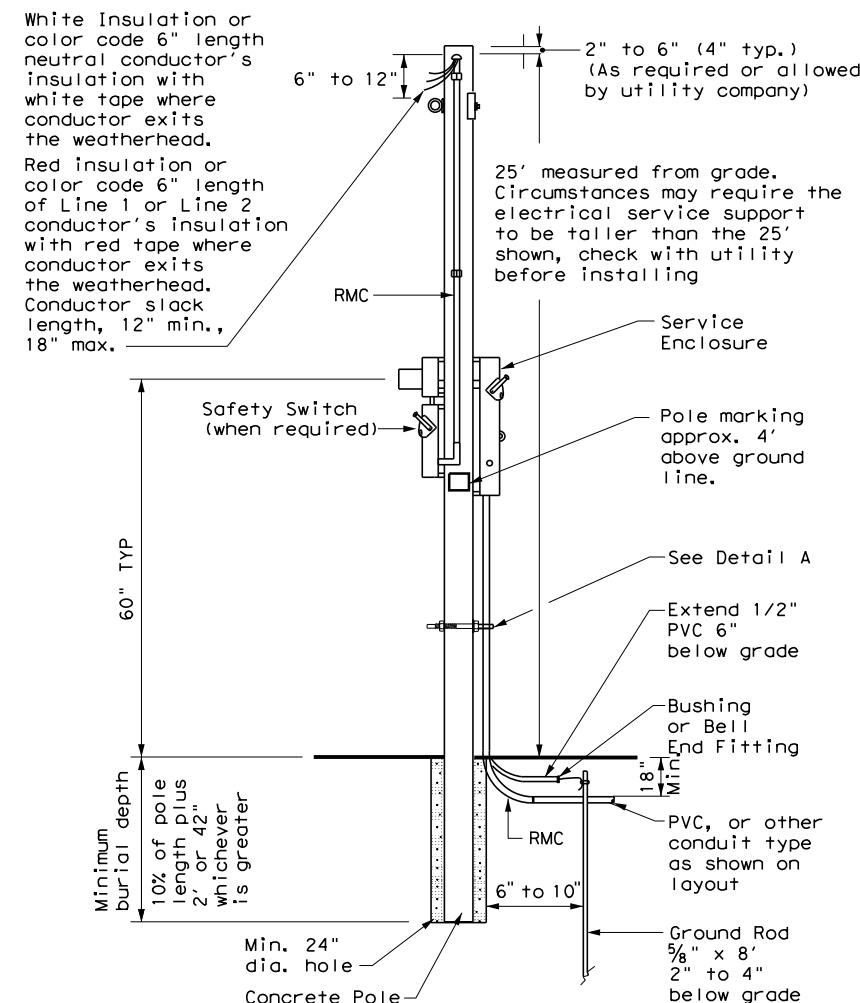


SERVICE SUPPORT TYPE TP (O)

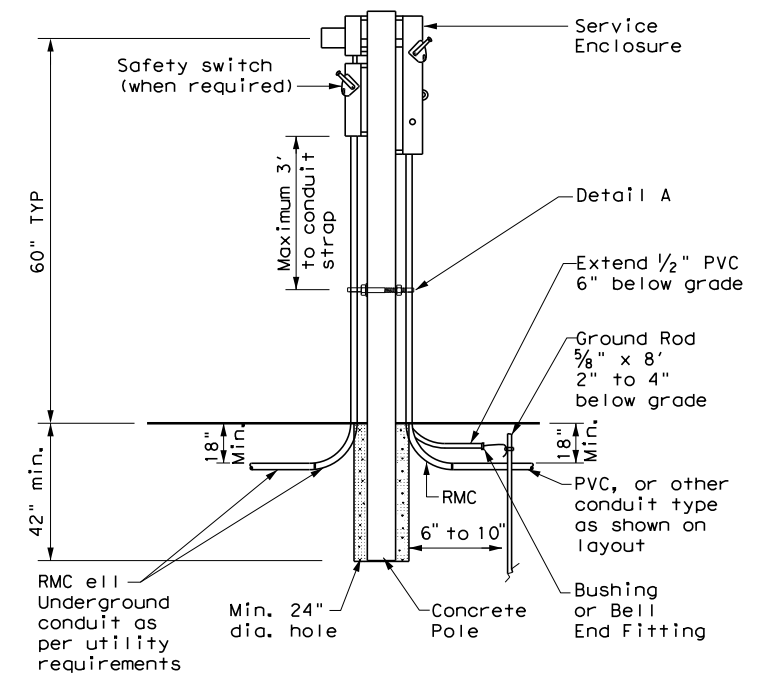
GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

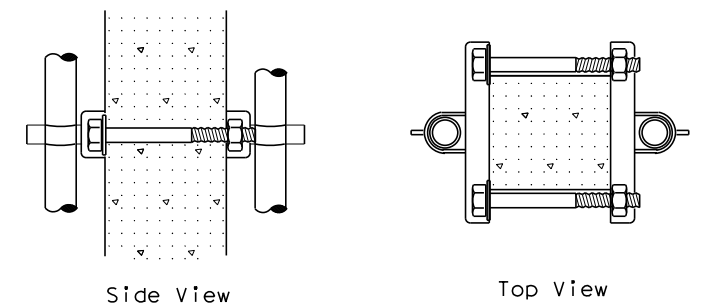
1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' above final grade. Use the two-point pickup locations when handling pole in horizontal position, and one-point pickup location for use in raising the pole to a vertical position. These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., whichever is greater.
5. Ensure all installation details of services are in accordance with utility company specifications.
6. Install a one point rack or eye bolt bracket 6 inches to 12 inches below the weatherhead as an overhead service drop anchoring point for the electric utility.
7. Furnish and install galvanized or stainless steel channel strut 1 1/2 in. or 1 5/8 in. wide by 1 in. up to 3 3/4 in. deep (Unistrut, Kindorf, B-line or equal). Attach channel strut with stainless steel concrete anchors (max. 1" depth), square U-bolts or back to back channel strut with long bolts, or other secure mounting as approved by the Engineer. Ensure bolts are galvanized in accordance with ASTM A153. Do not stack channel struts.
8. Backfill the holes thoroughly by tamping in 6 in. lifts. After tamping to grade, place additional backfill material in a 6 inch high cone around the pole to allow for settling. Use material equal in composition and density to the surrounding area. Backfilling will not be paid for directly but is subsidiary to various bid items.



**CONCRETE SERVICE SUPPORT
Overhead (O)**



**CONCRETE SERVICE SUPPORT
Underground (U)**



DETAIL A

See Note 7. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.

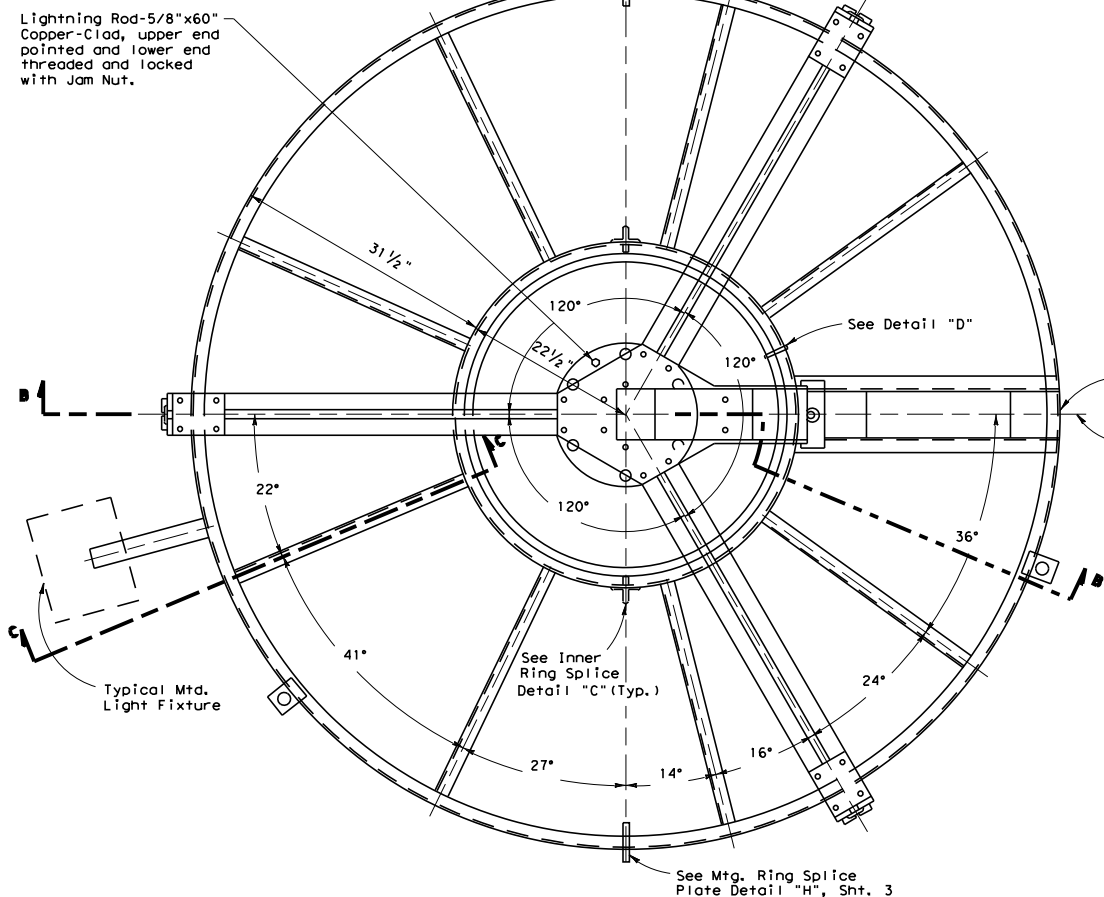
ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP			
ED(10)-14			
FILE: ed10-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CONT	SECT	JOB
REVISIONS	0015	09	194
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		226

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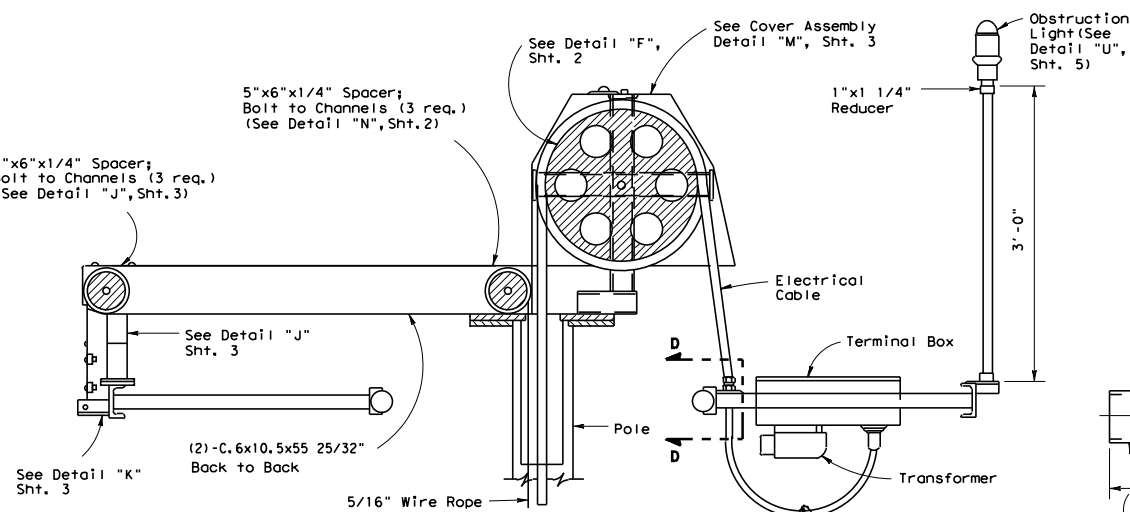
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NOTES:

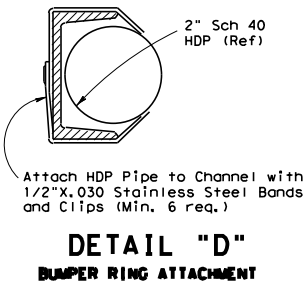
1. Pole, Ring, and Ring Support shall be assembled and erected so that Reference Line is parallel to center line of roadway or as shown on "Lighting Layouts" sheets.
2. Fixture Placement on ring shall provide a min. Clearance of 7" between Fixtures.



LIGHT MOUNTING RING & SUPPORT ASSEMBLY

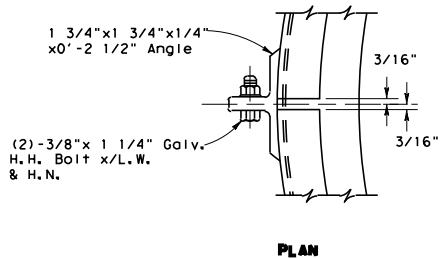


SECTION B-B

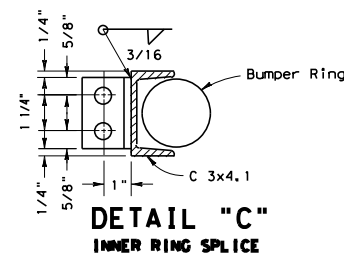


**DETAIL "D"
BUMPER RING ATTACHMENT**

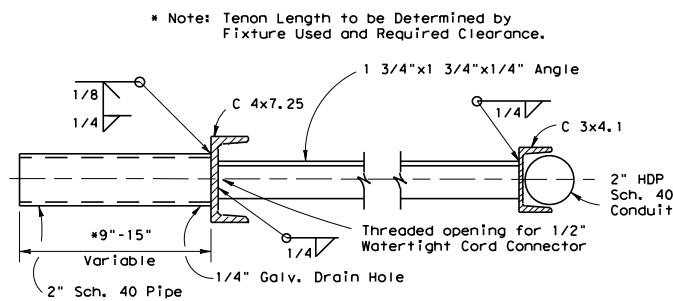
Handhole Located on Reference Line. See Lighting Layout.
 Reference Line (See Light Setting Diagrams)



PLAN

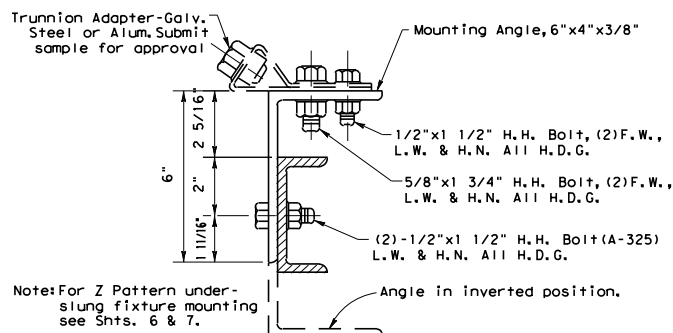
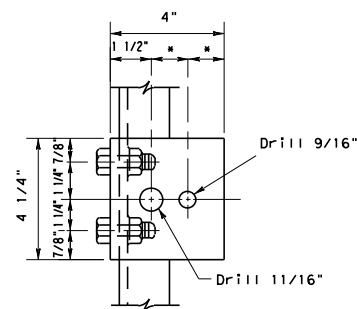


**DETAIL "C"
INNER RING SPLICE**



**SECTION C-C
(FOR AREAL LIGHTS)**

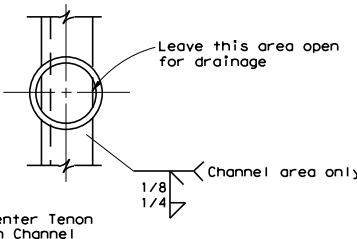
* As required by Trunnion Adapter supplied.



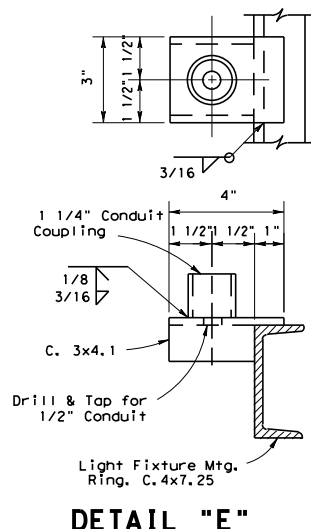
Note: For Z Pattern underslung fixture mounting see Shts. 6 & 7.

**SECTION C-C
(FOR TRUNNION MOUNT)**

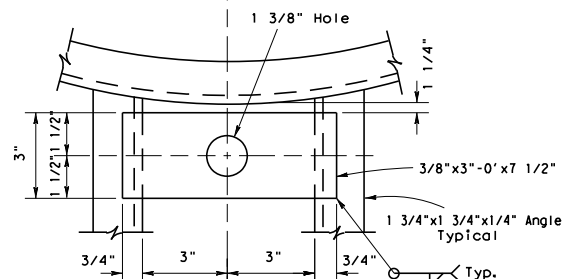
NOTE: Provide S.S. or galv. cable safety lanyard for Light Fixture when Trunnion Mount is used.



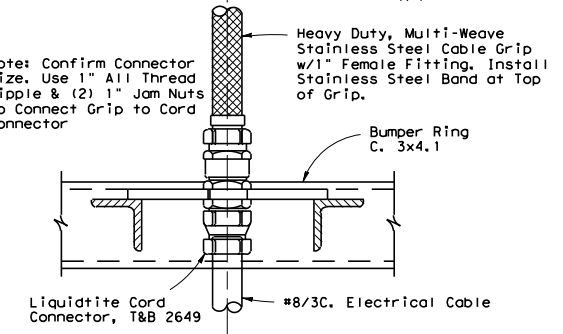
**SECTION C-C
(FOR FLOODLIGHTS)**



**DETAIL "E"
(CONDUIT ATTACHMENT FOR OBSTRUCTION LIGHTS, TYPICAL (3) PLACES)**



Note: Confirm Connector Size. Use 1" All Thread Nipple & (2) 1" Jam Nuts to Connect Grip to Cord Connector.



NOTE: COVER CORD WITH HEAT SHRINK TUBING FROM CABLE GRIP TO WITHIN ONE INCH OF GRIP TO CONNECTOR TRANSITION PRIOR TO INSTALLING CABLE GRIP.

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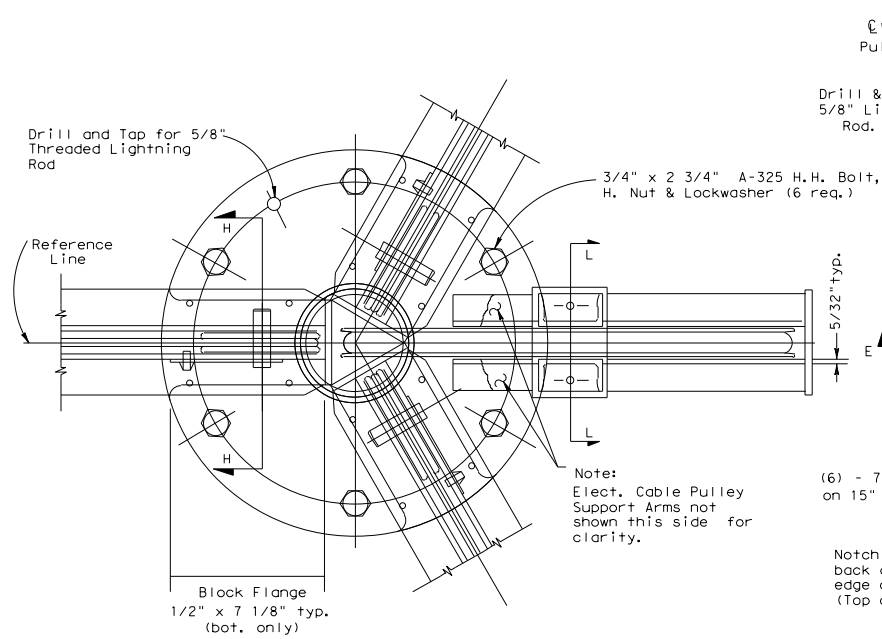
HIGH MAST ILLUMINATION DETAILS

HMID(1)-03

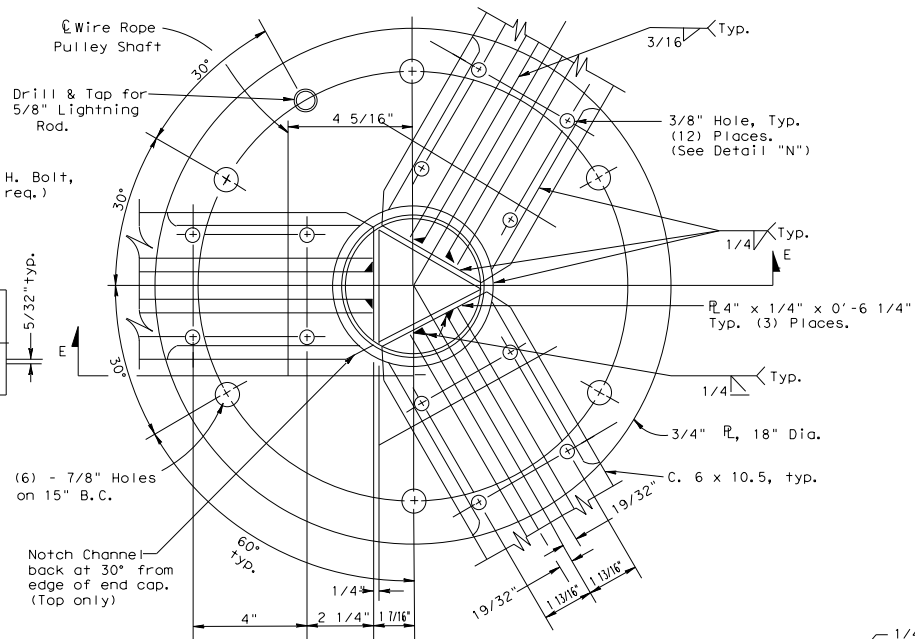
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5-86	REVISIONS	CONT	SECT	JOB	HIGHWAY
4-87	10-14-87	0015	09	194	1H 35
5-87	4-96				
10-1-87		DIST	COUNTY	SHEET NO.	
		AUS	WILLIAMSON	227	

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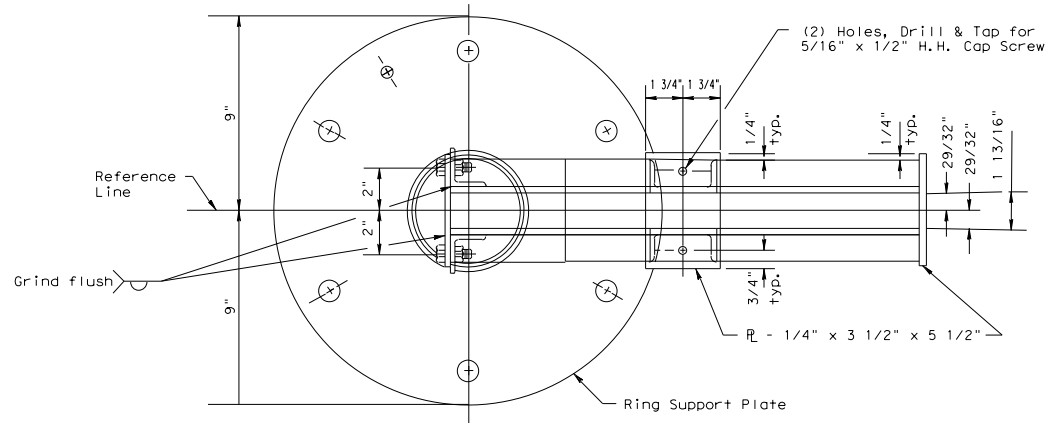
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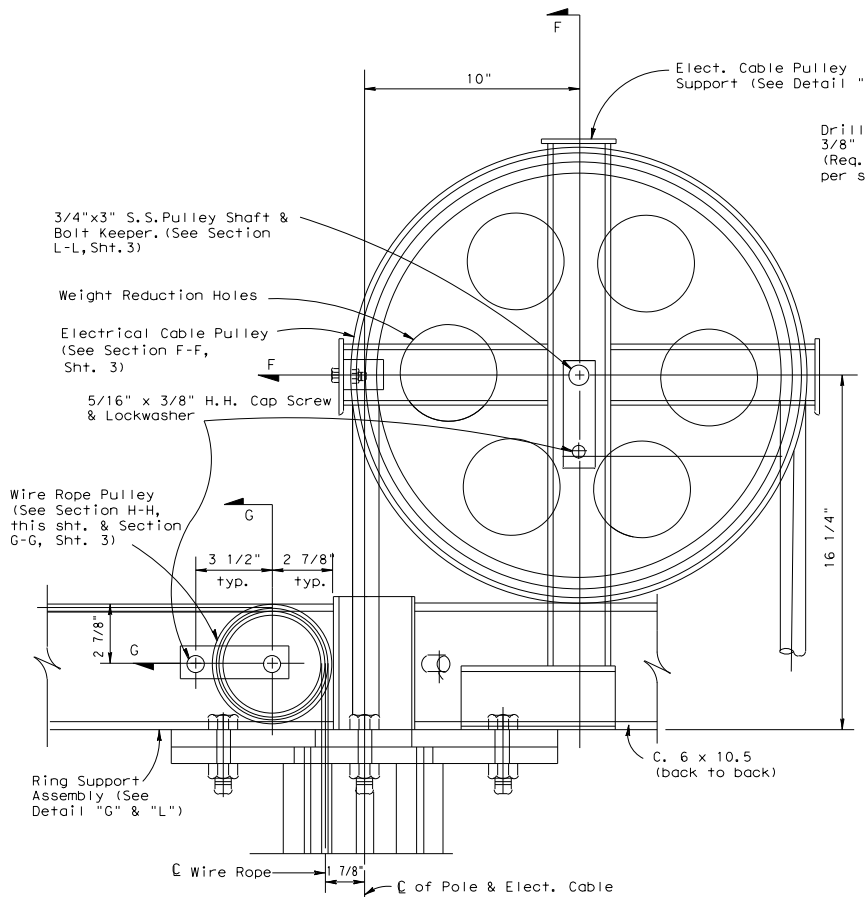
PLAN VIEW



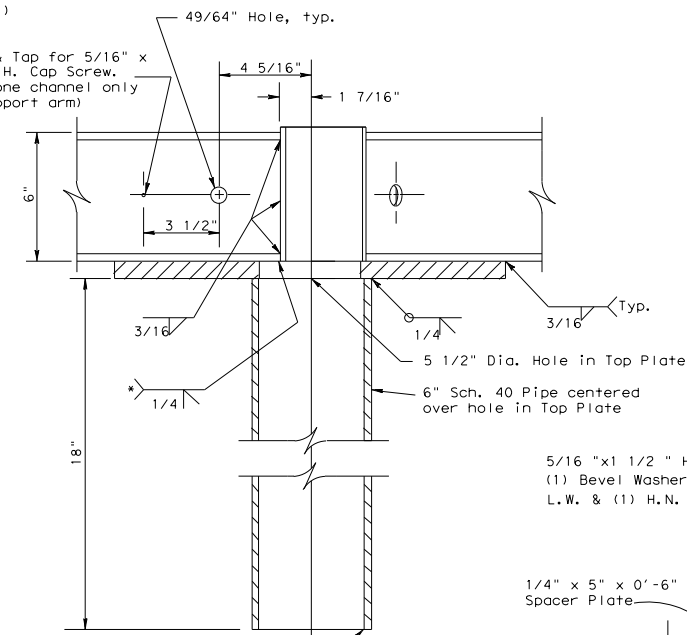
DETAIL "G"
 TOP PLATE CONNECTION
 (LESS ELECT. CABLE PULLEY SUPPORT)
 (SEE DETAIL "L")



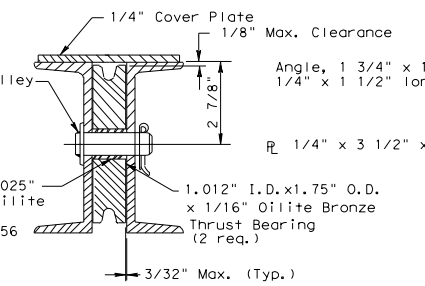
PLAN VIEW



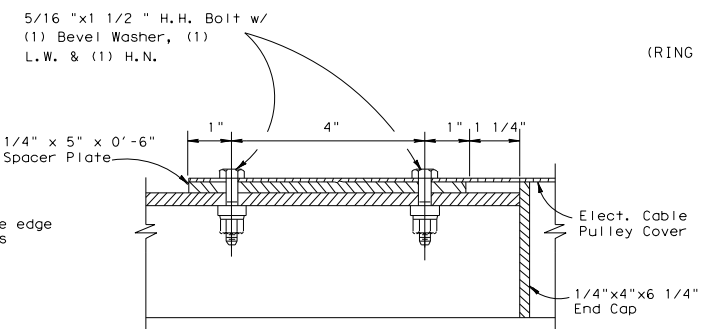
DETAIL "F"
 RING SUPPORT ASSEMBLY
 (NEAR SIDE SUPPORT ARM & ELECT. CABLE
 PULLEY COVER NOT SHOWN FOR CLARITY)



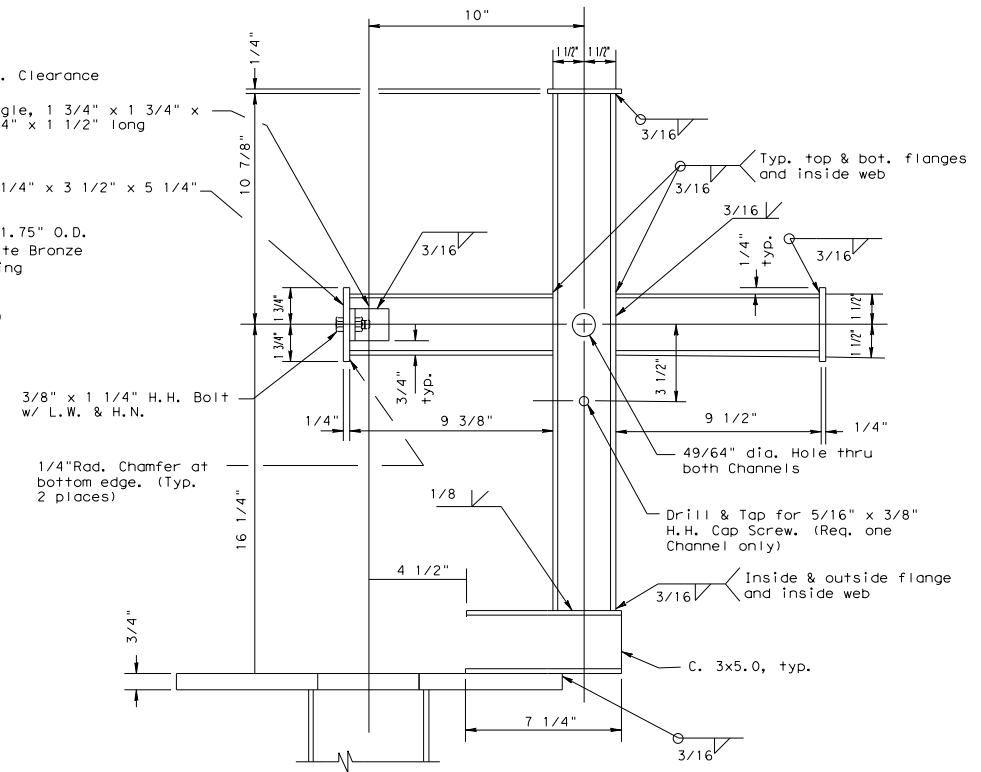
SECTION "E - E"



SECTION "H-H"
 PULLEY MOUNTING FOR
 RING SUPPORT ARMS



DETAIL "N"



DETAIL "L"
 ELECT. CABLE PULLEY SUPPORT
 (RING SUPPORT ARMS NOT SHOWN FOR CLARITY)

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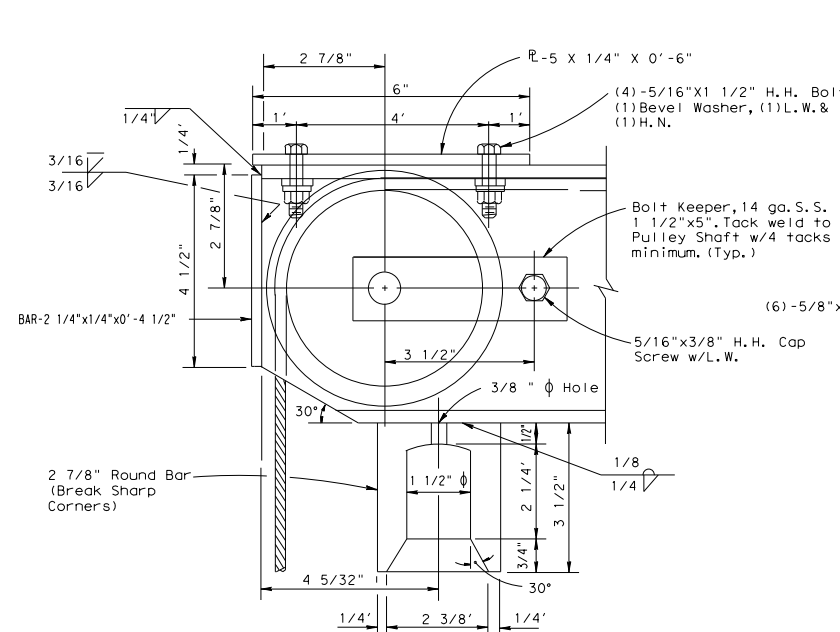
HIGH MAST
 ILLUMINATION
 DETAILS

HMID (2) -03

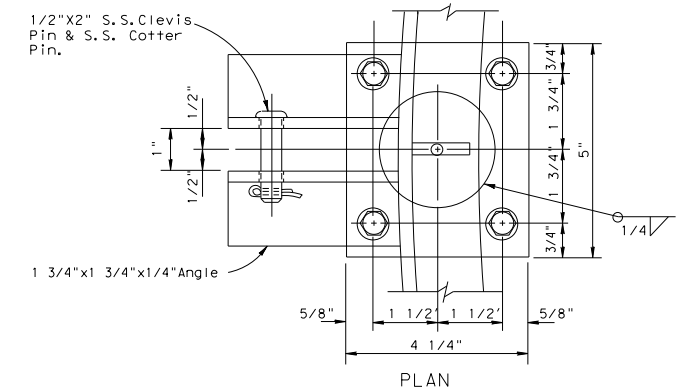
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5-86	4-96	0015	09	194	1H 35
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12-87		AUS	WILLAMSON		228

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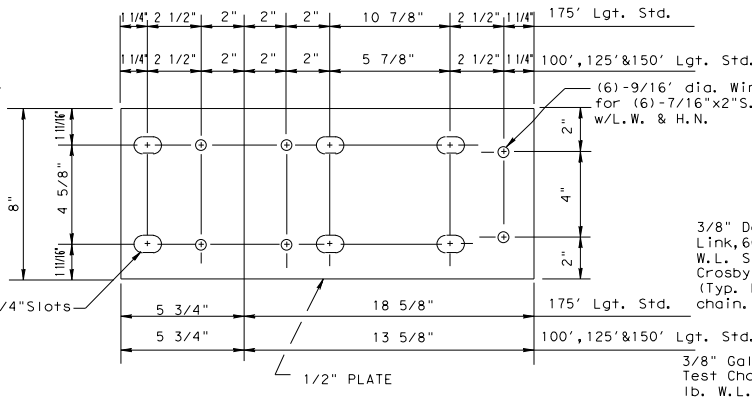


DETAIL "J"



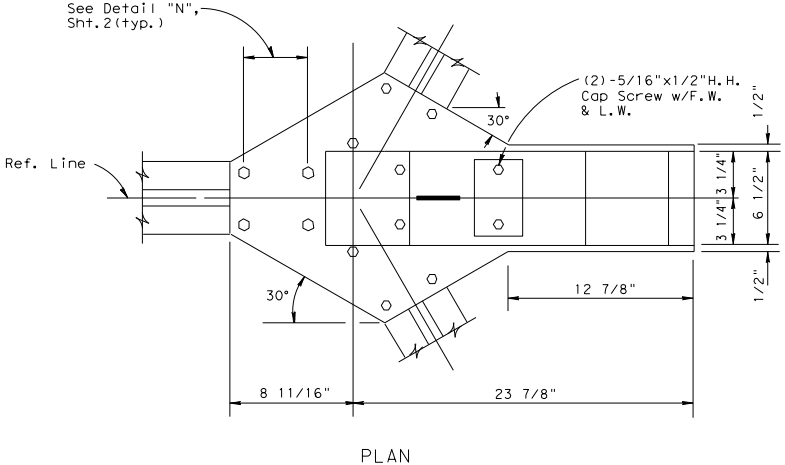
DETAIL "K"
 MOUNTING RING CONNECTION & STABILIZER

* EXTRA 2'-0" of wire cable to be attached to ring with SS Bands as directed by Engineer.

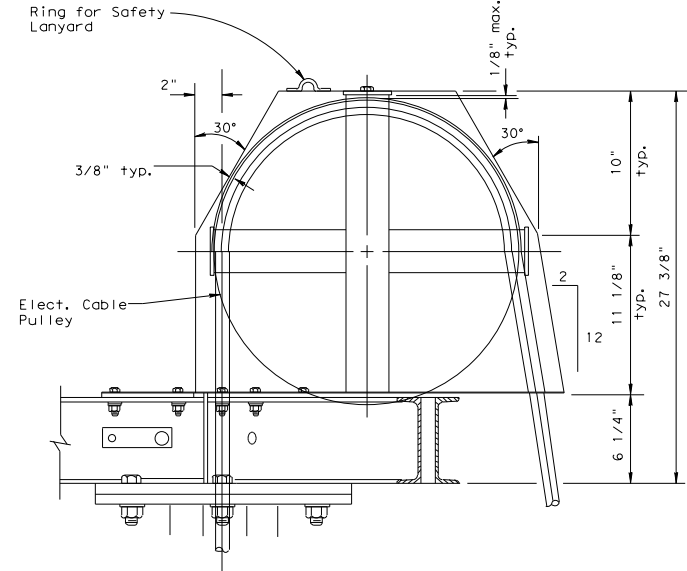


DETAIL "V"
 WINCH MOUNTING PLATE

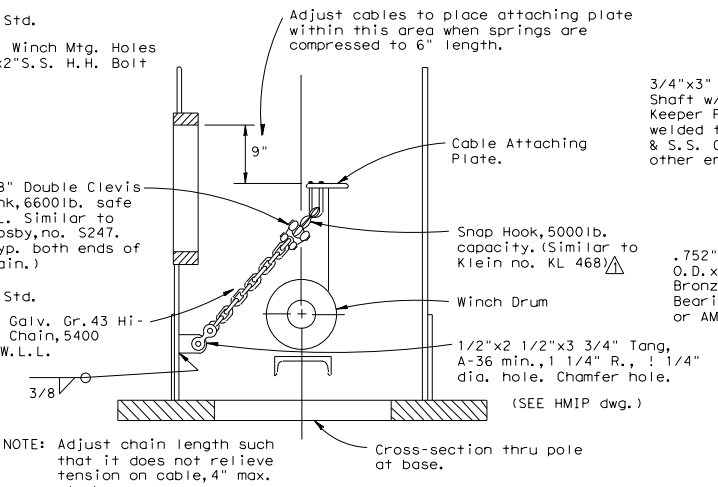
NOTE: Dimensions may vary-Verify with winch manufacturer.



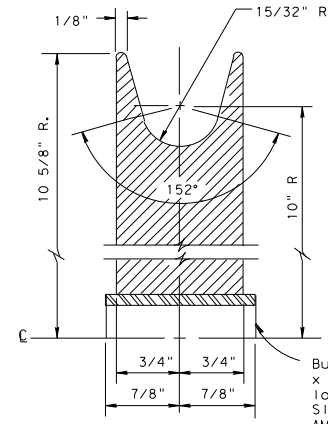
DETAIL "M"
 COVER CAP ASSEMBLY



DETAIL "M"

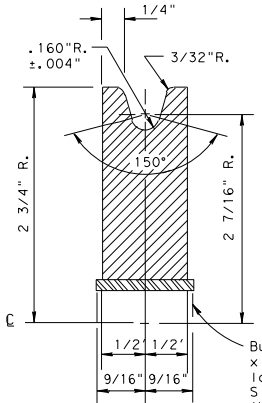


SAFETY LANYARD DETAIL



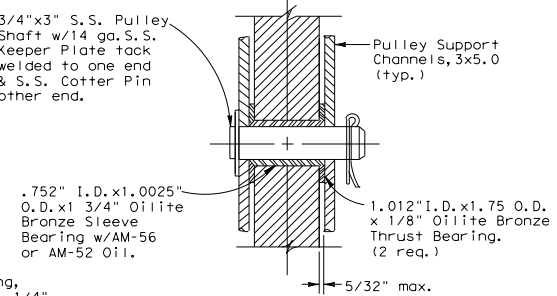
SECTION F-F
 ELECTRICAL CABLE PULLEY

(Pulley material to be aluminum alloy, Type 356-T6 or equal)

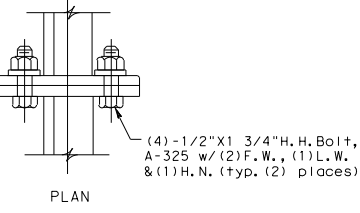


SECTION G-G
 WIRE ROPE PULLEY

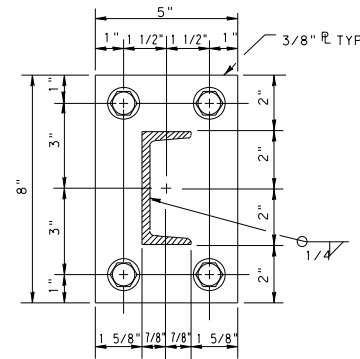
(Pulley material to be plated steel or Stainless Steel)



SECTION L-L
 ELECTRICAL CABLE PULLEY MOUNTING



PLAN



DETAIL "H"
 MOUNTING RING SPLICE PLATE

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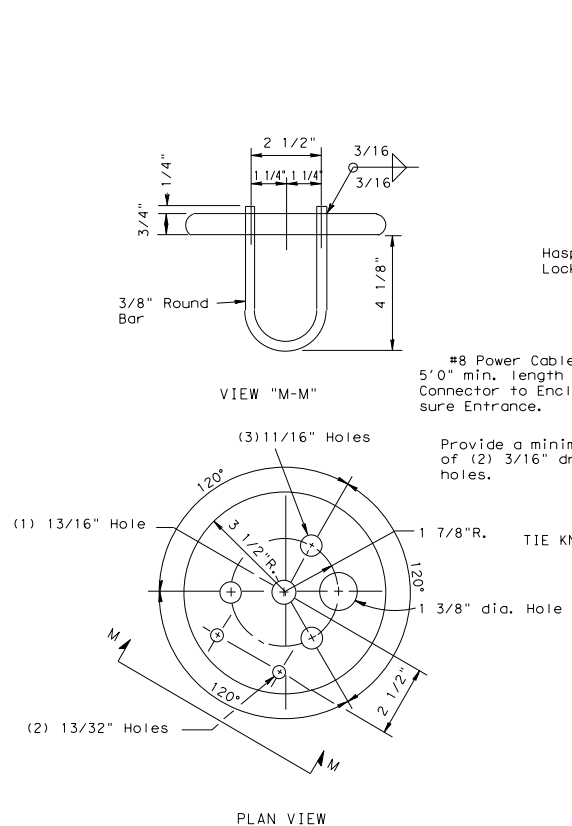
HIGH MAST ILLUMINATION DETAILS

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10-87		DIST	COUNTY		SHEET NO.
10-88		AUS	WILLIAMSON		229

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50 A 480V. Circuit Breaker, NEMA 4 for total lamp watts exceeding 9000, 30A, 480V. Circuit Breaker, NEMA 4 for 9000 or less total lamp watts. Enclosure shall be stainless steel, 14 ga., weatherproof with full length vertical door hinge, welded hasp, lock and two sets of keys. Hinge pin shall be tack-welded to prevent removal. Lock (Master# 2195) and keys shall be furnished by the contractor and shall be the same type as used for the service enclosures. Enclosure dimensions shall be approx. 20" high x 9" wide x 5" deep. Attach enclosure with (4) 1/4" S.S. Bolts & Nuts w/ 1/4" Spacers Breakers are to be mounted on a dielectric mounting board or high voltage insulating paper.

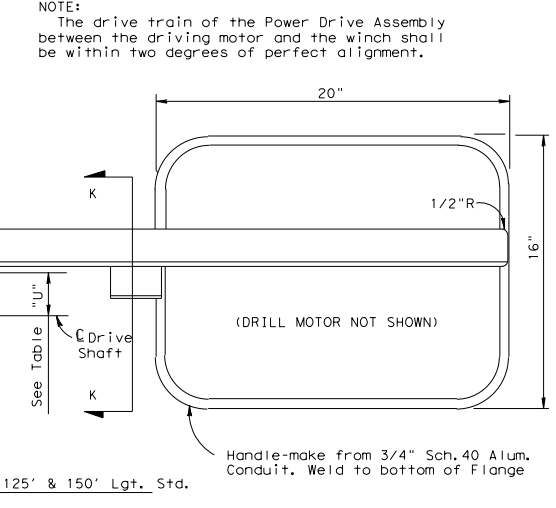
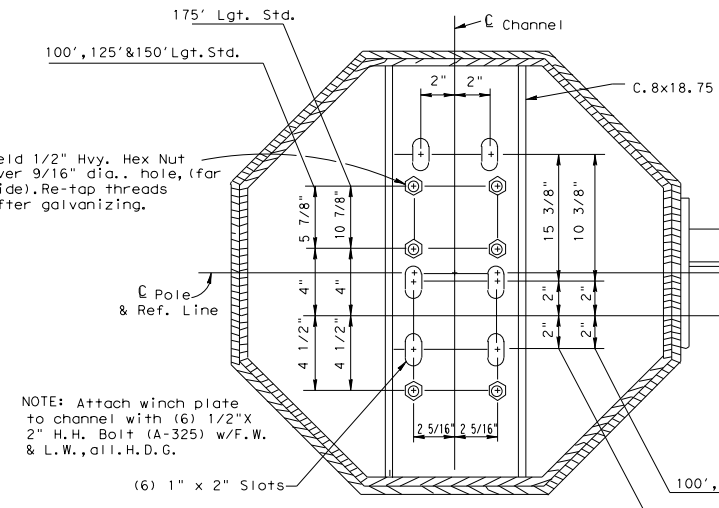
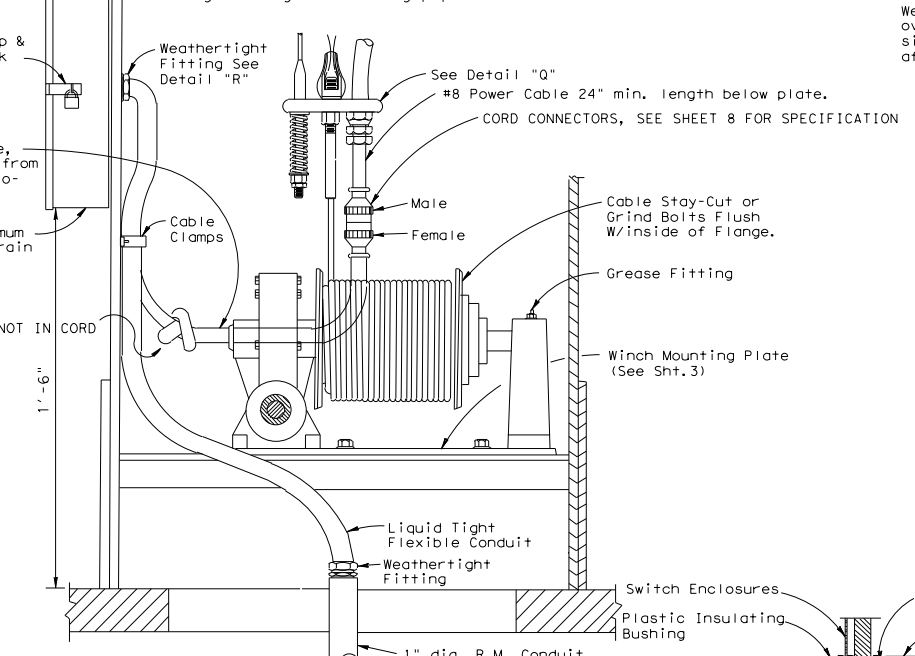
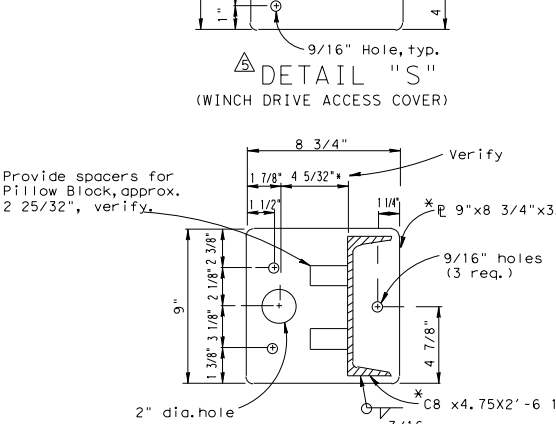
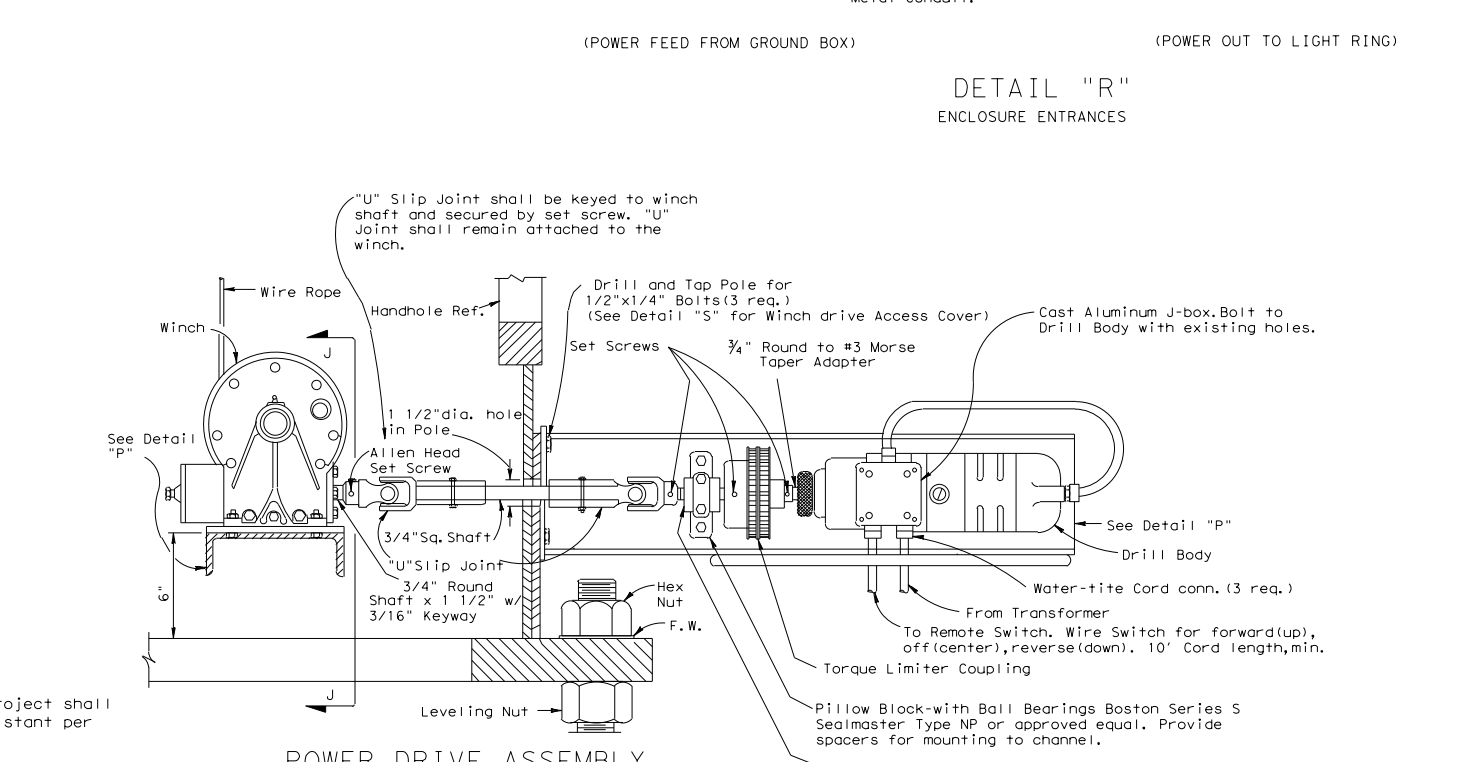
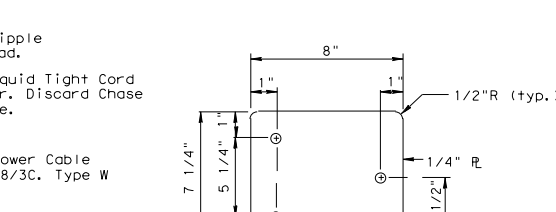
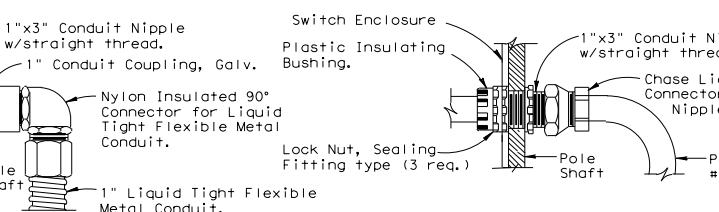
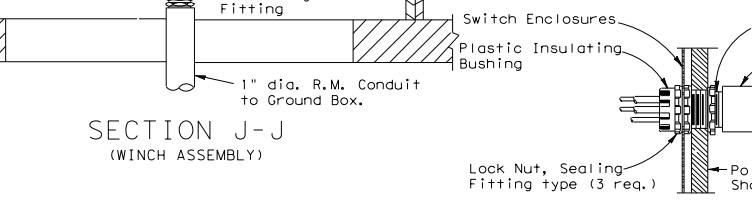
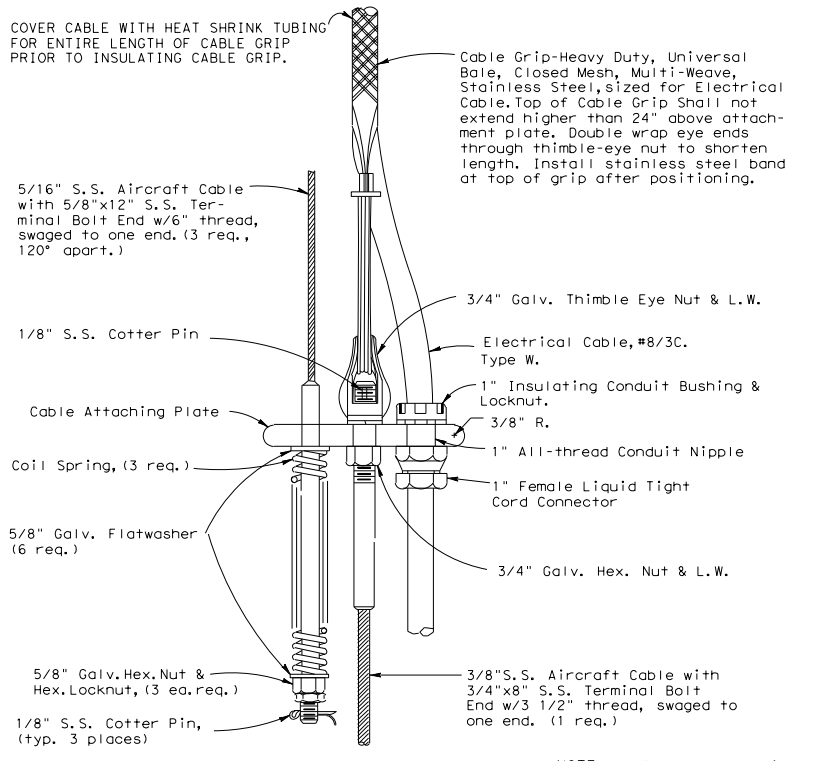


TABLE OF "U" DIMENSIONS

Pole Ht. Ft.	8 Sided 80 MPH	8 Sided 100 MPH	12 Sided 80 MPH	12 Sided 100 MPH
100	3 1/2"	3 1/2"	2 1/2"	2 1/2"
125	3 1/2"	3 1/2"	2 1/2"	2 1/2"
150	3 1/2"	3 1/2"	2 1/2"	2 1/2"
175	4 1/2"	4 1/2"	3 1/2"	3 1/2"



SECTION K-K (DRILL MOTOR MOUNTING PLATE)
 * Make from 6061-T6 Aluminum

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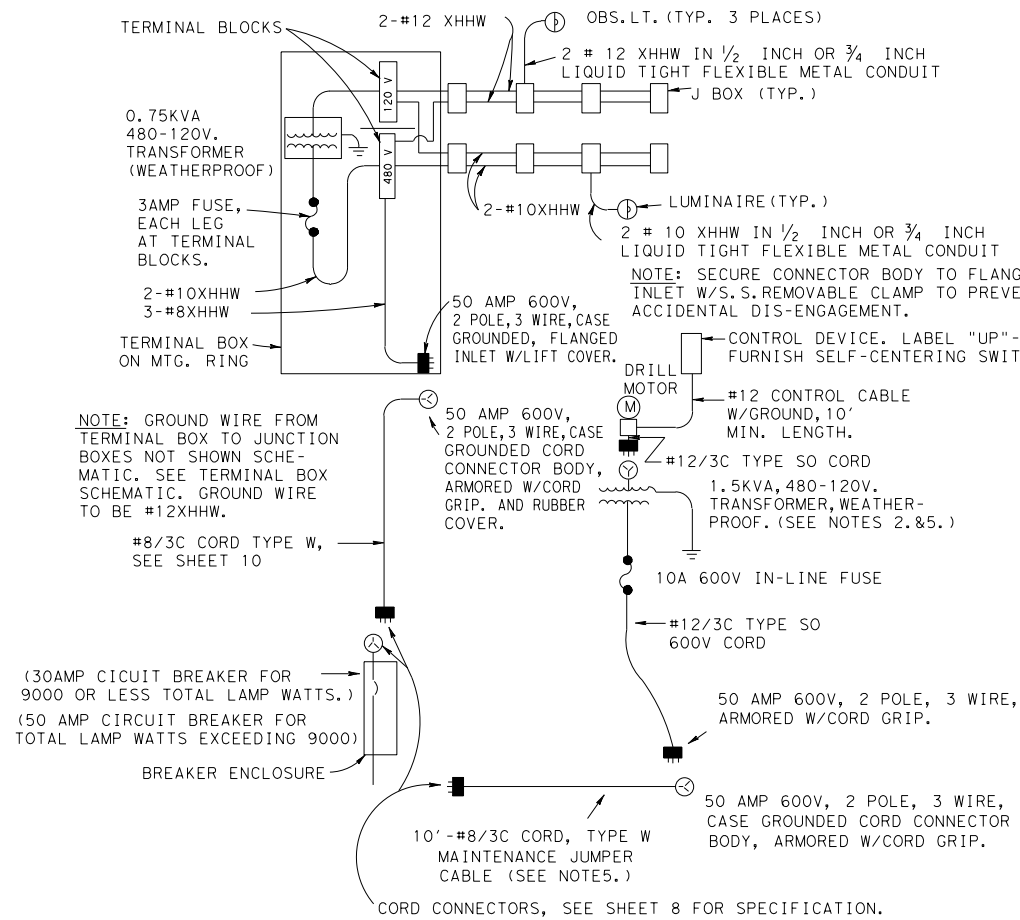
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 HMID (4) - 03

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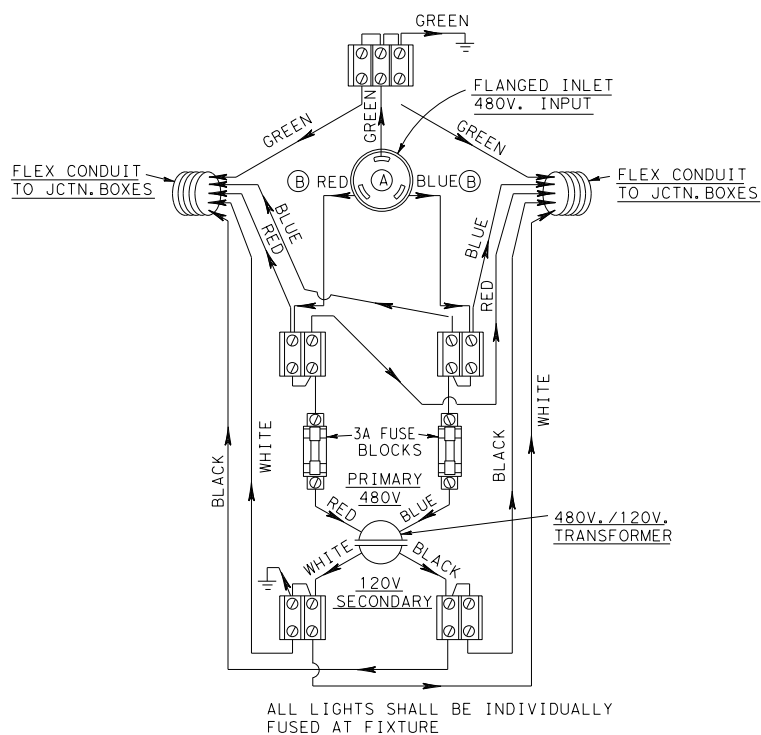
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5-86	0015	09	194	1H 35
12-3-86	DIST	COUNTY	SHEET NO.	
12-8-86	AUS	WILLIAMSON	230	

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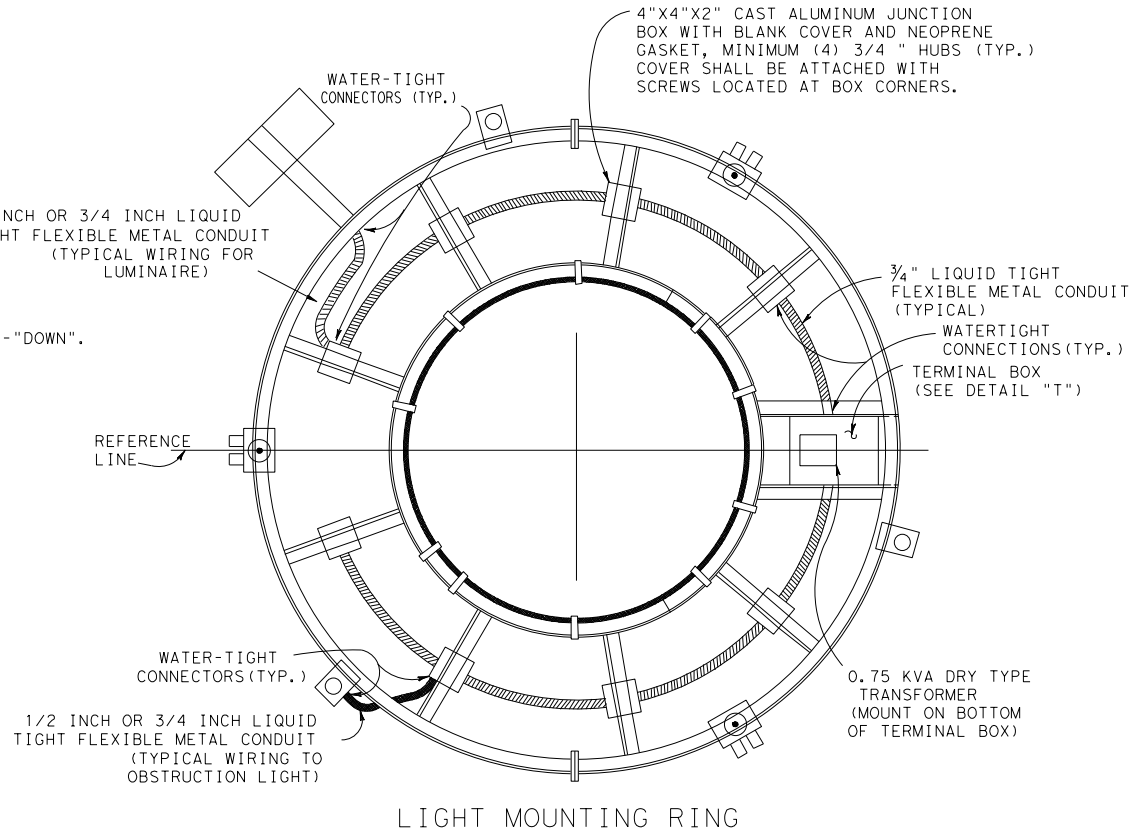
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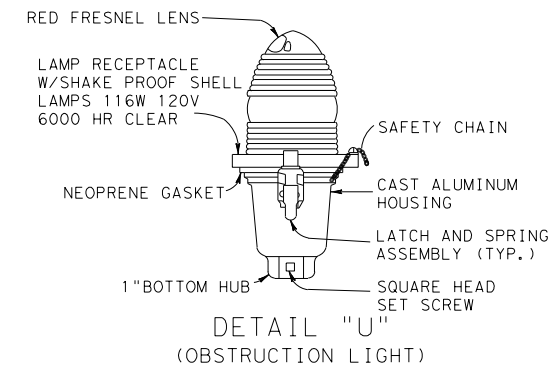
ONE-LINE SCHEMATIC



TERMINAL BOX SCHEMATIC

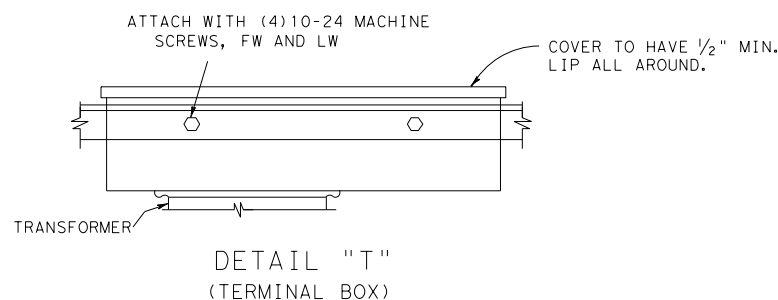
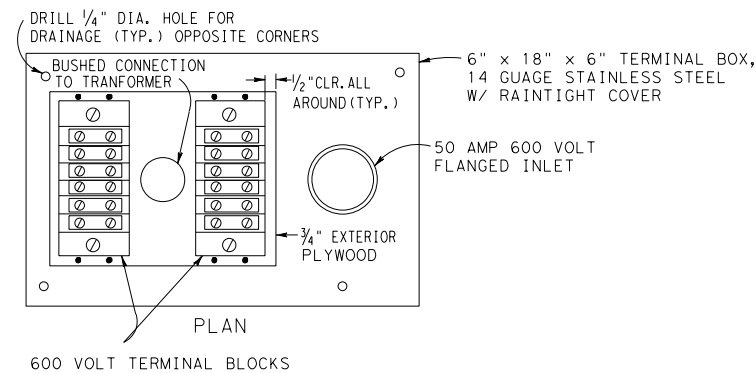


LIGHT MOUNTING RING



NOTES:

1. PLUGS, CONNECTOR BODIES AND FLANGED INLETS AT CORD TO RING CONNECTION SHALL BE "TWIST LOCK" TYPE, 3-PRONG, RATED 50 AMPS AT 600V, AND 20 AMPS FOR 120 V. 50 AMP CONNECTORS SHALL BE 3 WIRE CASE GROUNDED, ARMORED, WITH CORD GRIP, 20 AMP CONNECTOR SHALL BE 3 WIRE GROUNDING WITH CORD GRIP, NEMA TYPE L5-20.
2. PROVIDE HANDLE ON 1.5KVA TRANSFORMER FOR PORTABILITY. (SEE ONE-LINE SCHEMATIC)
3. CIRCUIT BREAKERS SHALL BE ITE #E43B030 OR #E43B050, SQUARE "D" #FAL24030 S/N OR #FAL24050 S/N, OR EQUAL.
4. CONDUIT ENTRIES INTO TERMINAL BOX SHALL BE INTO THE SIDE OF THE BOX.
5. A MINIMUM OF ONE (1) MAINTENANCE JUMPER CABLE SHALL BE SUPPLIED FOR EACH PROJECT. SUPPLY ONE (1) PORTABLE TRANSFORMER FOR EACH POWER DRIVE UNIT REQUIRED FOR PROJECT.



NOTES:

1. OBSTRUCTION LIGHTS COLOR CODE: FROM SECONDARY SIDE OF TRANSFORMER THROUGH-OUT-CIRCUIT TO SOCKET, WHITE-NEUTRAL, BLACK-LOAD.
2. POWER SUPPLY CORD TO FLANGED INLET: GREEN-GROUND, WHITE LINE, BLACK LINE. FROM FLANGED INLET (A) TO TERMINAL BLOCKS: GREEN-GROUND, RED LINE, BLUE-LINE. FROM THERE ON ALL 480V. CIRCUIT WIRES TO BE RED AND BLUE TO JUNCTION BOXES.
3. WIRE SIZE FROM POWER SUPPLY TO TERMINAL BLOCKS SHALL BE #8 AWG-SEE (B).
4. WIRE SIZE FROM TERMINAL BLOCKS TO JUNCTION BOXES SHALL BE #12 AWG.
5. MOUNT TERMINAL BLOCKS ON 3/4" EXTERIOR GRADE PLYWOOD.
6. FOR 2-WIRE, 480V. SERVICE, OMIT FUSE IN GROUNDED CONDUCTOR IN LEADS TO TRANSFORMER.

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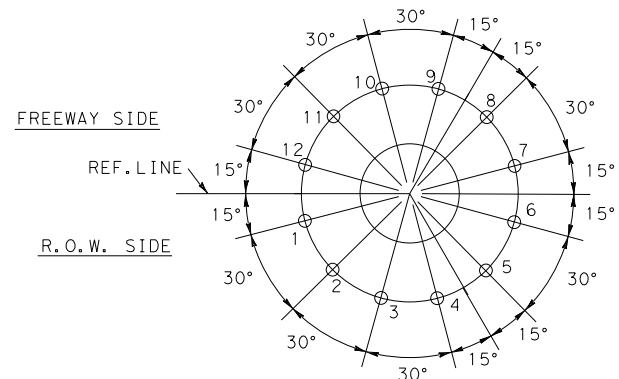
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HMID (5) - 03

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10-88		DIST	COUNTY		SHEET NO.
10-93		AUS	WILLIAMSON		231

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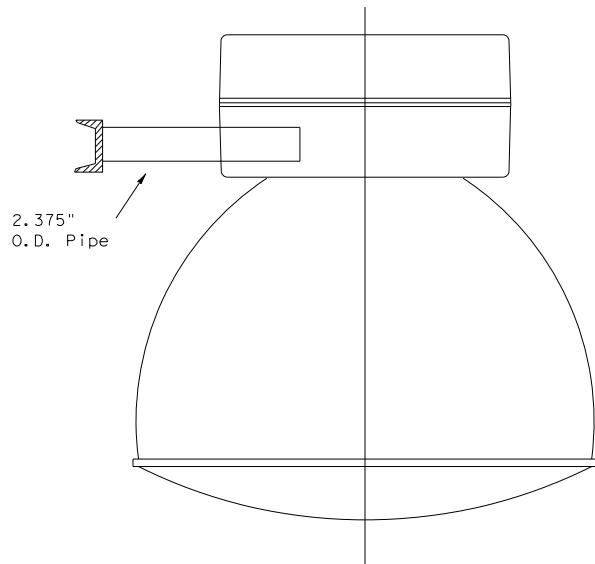
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12-LIGHT SETTING

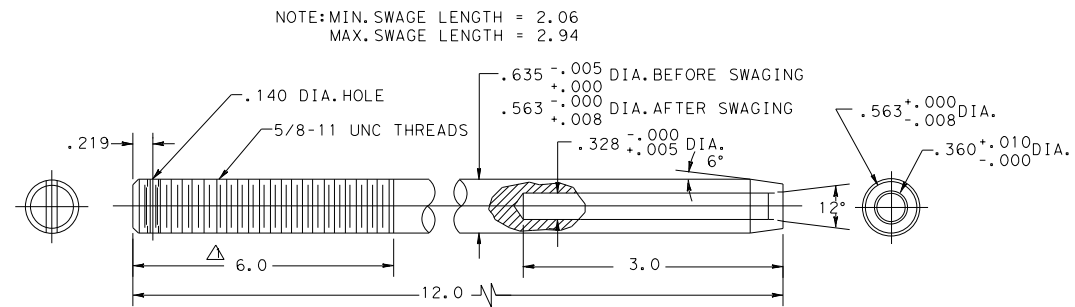
LUMINAIRE LOCATIONS

NOTE: AIRCRAFT OBSTRUCTION LIGHT LOCATIONS NOT SHOWN.
 THREE ARE REQUIRED LOCATED APPROX. 120° APART.
 LOCATIONS WILL VARY DEPENDENT ON THE LIGHT SETTING USED.



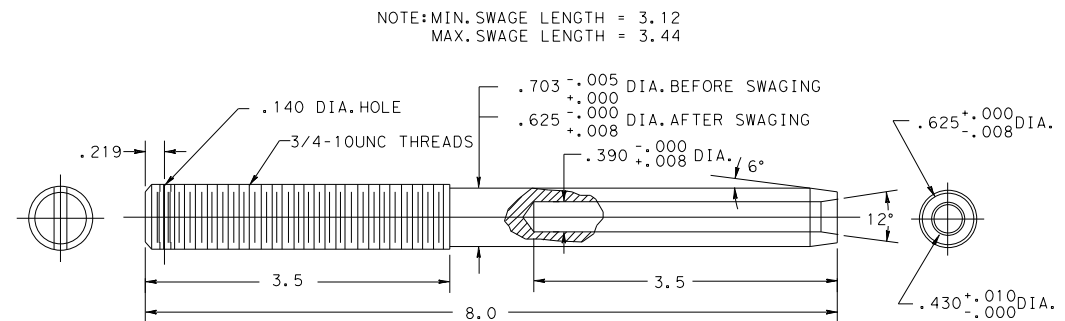
AREALIGHT MOUNTING ASSEMBLY
 (SYMMETRIC AND ASYMMETRIC)

NOTES: IF ASYMMETRIC FIXTURES ARE USED, THE REFRACTORS SHALL BE ORIENTED TO PROPERLY ILLUMINATE THE ADJACENT ROADWAYS. ORIENTATION SHALL BE AS SHOWN IN PLANS.



NOTE: MIN. SWAGE LENGTH = 2.06
 MAX. SWAGE LENGTH = 2.94

TERMINAL FOR 3/8" WIRE ROPE
 MATERIAL: STAINLESS STEEL, TYPE 303SE OR 304
 WITH 115,000 P. S. I. MAX. ULTIMATE TENSILE STRENGTH.



NOTE: MIN. SWAGE LENGTH = 3.12
 MAX. SWAGE LENGTH = 3.44

TERMINAL FOR 3/8" WIRE ROPE
 MATERIAL: STAINLESS STEEL, TYPE 303SE OR 304
 WITH 115,000 P. S. I. MAX. ULTIMATE TENSILE STRENGTH.

GENERAL NOTES:

1. AFTER FINAL AIMING HAS BEEN COMPLETED AND APPROVED BY THE ENGINEER, FIXTURES MUST BE LOCKED IN POSITION. CONTRACTOR MUST SUBMIT PROPOSED LOCKING SCHEME WITH THE FIXTURE SUBMITTAL. (FLOODLIGHTS ONLY).

3/03 Revision
 Removed obsolete diagrams and updated drawings.

Texas Department of Transportation
 Traffic Operations Division

HIGH MAST
 ILLUMINATION
 DETAILS

HMID (6) - 03

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1. AREA LIGHTING (Bid under Item 614, "High Mast Illumination Assemblies")


- A. Area lighting shall be symmetric or asymmetric, as shown on the descriptive code. The number and wattage of the fixtures on each pole shall be as shown on the lighting layouts. The lighting pattern for symmetric fixtures shall be IES Type V; for asymmetric fixtures, it shall be IES Type II, III, or IV.
- B. All luminaires shall be pre-qualified before installation. A sample of each type of luminaire to be considered for pre-qualification shall be submitted to TxDOT's Traffic Operations Division - Traffic Engineering Section (TRF-TE).

Traffic Operations Division - TE
 Texas Department of Transportation
 125 East 11th Street
 Austin, TX 78701-2483

Sample luminaires are non-returnable. A list of pre-qualified luminaires may be obtained by contacting TRF-TE. In addition, luminaires will be sampled and tested in accordance with Item 614. Luminaires that inconsistently pass testing or that are inconsistent with published photometric information will be removed from the pre-qualified list at the discretion of the Engineer. Once a fixture has been approved, no changes shall be made in any material or manufacturing methods without prior approval of the Department. Unapproved changes will result in rejection of all fixtures.
- C. Symmetric and Asymmetric fixtures shall meet the following requirements unless otherwise approved by the Engineer:
 - 1. Luminaire Construction
 - a) The luminaire housing shall be formed, cast or drawn from low copper aluminum and shall be free of cracks and excessive porosity. Formed aluminum shall have a minimum thickness of 0.090, and shall have all seams welded. The minimum thickness of cast parts shall be as approved by the Engineer. Nuts, screws, and washers shall be made of Type 316 stainless steel. The housing shall be marked with minimum 2" letters to indicate the photometric type as being either A, B, C, or S as specified. Marking shall be permanent and shall be by stencil or stick on labels similar to "wattage" label on cobra heads. Wattage label will not be required on high mast fixtures. The fixture housing shall be constructed separate from the fixture reflector.
 - b) Fixtures shall be natural aluminum in color or shall be painted gray.
 - c) The slipfitter shall securely attach the luminaire to the tenon on the ring assembly with a minimum of 2 bolts and clamp. A positive means of vertical adjustment shall be provided.
 - d) For optical assemblies with lenses, reflectors shall be polished aluminum with Alzak or equal coating and shall not be painted. The optic assembly shall be sealed. The lens shall be tempered glass or prismatic glass, either flat or sag. The optic assembly shall be provided with a resilient seamless or sonically welded silicone rubber gasket, and constructed so that a positive seal against weather and other contaminants will be maintained. The latches shall be stainless steel, spring loaded, and hand operated (2 latches minimum, 3 attachment points), and shall provide a positive means of maintaining closure of the luminaire.
 - e) For optical assemblies without lenses, optical assembly shall consist of an open ventilated borosilicate glass reflector. The reflecting prisms shall be protected from dirt depreciation by a spun on hermetically sealed aluminum cover. There shall be no glass lens/refractor on this optical assembly.
 - f) Asymmetric fixtures shall have field rotatable optics with accurate degree of rotation markings. Reflector shall have "house side" and "street side" markings.
 - g) The socket shell shall be nickel plated and shall be rigidly attached to a high grade porcelain mogul base, which shall extend and enclose the metal shell. A locking means shall be incorporated in the shell of the socket to positively resist the removal of the lamp. This locking means shall be a spring loaded center tip. Lamp socket shall be non-adjustable and shall be riveted, welded, or otherwise permanently installed. Lamps shall be held securely in the proper position with a lamp support.
 - h) The terminal block shall use nickel plated brass connectors.
 - i) Fixture weight including ballast shall not exceed 80 pounds, and effective projected area (EPA) shall not exceed 2.62 square feet.
 - j) The Contractor may be responsible for fixture testing costs. See TxDOT's "Manual of Testing Procedures," Chapter 11 - "Traffic Systems and Illumination," TEX-1110-T - "Sampling Lighting Assemblies," at <http://manuals.dot.state.tx.us/dynaweb/>.
 - 2. Photometrics
 - a) The Contractor shall submit a computer generated light level array of the area to be lighted by high mast poles. All computer generated arrays shall have 400 watt fixtures derated to 40,000 lumens per lamp.
 - b) The Type "A" 400 watt asymmetric fixture shall be IES cutoff. The Department will use the measured photometric data of sampled fixtures to run the following tests on a computer simulation:
 - (1) When mounted in the level position, 50 ft. above the midpoint and 20 ft outside of either long side of a rectangular area measuring 340 ft. by 50 ft., the fixture shall pass the following tests:
 - (a) The fixture shall provide a measured minimum intensity of 0.15 horizontal foot-candles at any point on the surface of this area.
 - (b) The fixture shall provide a measured maximum to minimum light ratio, based on horizontal foot-candles, of less than 25.
 - (c) The fixture shall provide an average measured intensity of 0.6 horizontal foot-candles on the surface area.
 - (2) When mounted in the level position, 50 ft. above the midpoint and 20 ft outside of either long side of a rectangular area measuring 260 ft. by 30 ft., the fixture shall provide a measured minimum intensity of 0.30 horizontal foot-candles at any point on the surface of this area.
 - c) The Type "B" 400 watt asymmetric fixture shall be IES cutoff. The Department will use the measured photometric data of sampled fixtures to run the following tests on a computer simulation:
 - (1) When mounted in the level position, 50 ft. above the midpoint and 20 ft outside of either long side of a rectangular area measuring 260 ft. by 65 ft., the fixture shall pass the following tests:
 - (a) The fixture shall provide a measured minimum intensity of 0.15 horizontal foot-candles at any point on the surface of this area.
 - (b) The fixture shall provide a measured maximum to minimum light ratio, based on horizontal foot-candles, of less than 25.
 - (c) The fixture shall provide an average measured intensity of 0.6 horizontal foot-candles on the surface area.
 - (2) When mounted in the level position, 50 ft. above the midpoint and 20 ft outside of either long side of a rectangular area measuring 200 ft. by 40 ft., the fixture shall provide a measured minimum intensity of 0.30 horizontal foot-candles at any point on the surface of this area.
 - d) The Type "C" 400 watt asymmetric fixture shall be IES cutoff. The Department will use the measured photometric data of sampled fixtures to run the following tests on a computer simulation:
 - (1) When mounted in the level position, 50 ft. above the midpoint and 20 ft. outside of either long side of a rectangular area measuring 220 ft. by 80 ft., the fixture shall pass the following tests:
 - (a) The fixture shall provide a measured minimum intensity of 0.15 horizontal foot-candles at any point on the surface of this area.
 - (b) The fixture shall provide a measured maximum to minimum light ratio, based on horizontal foot-candles, of less than 25.
 - (c) The fixture shall provide an average measured intensity of 0.6 horizontal foot-candles on the surface area.
 - (2) When mounted in the level position, 50 ft. above the midpoint and 20 ft. outside of either long side of a rectangular area measuring 160 ft. by 50 ft., the fixture shall provide a measured minimum intensity of 0.30 horizontal foot-candles at any point on the surface of this area.
 - e) The Type "S" 400 watt Symmetric fixture shall be IES cutoff. The Department will use the measured photometric data of sampled fixtures to run the following tests on a computer simulation:
 - (1) When mounted in the level position at 50 foot mounting height, the fixture shall provide the minimum light levels as shown below:
 - (a) 0.15 horizontal foot-candles within a 130 foot radius.
 - (b) 0.30 horizontal foot-candles within a 100 foot radius.
 - (c) 0.50 horizontal foot-candles within a 60 foot radius.

- (1) When mounted in the level position, 50 ft. above the midpoint and 20 ft outside of either long side of a rectangular area measuring 340 ft. by 50 ft., the fixture shall pass the following tests:
 - (a) The fixture shall provide a measured minimum intensity of 0.15 horizontal foot-candles at any point on the surface of this area.
 - (b) The fixture shall provide a measured maximum to minimum light ratio, based on horizontal foot-candles, of less than 25.
 - (c) The fixture shall provide an average measured intensity of 0.6 horizontal foot-candles on the surface area.
 - (2) When mounted in the level position, 50 ft. above the midpoint and 20 ft outside of either long side of a rectangular area measuring 260 ft. by 30 ft., the fixture shall provide a measured minimum intensity of 0.30 horizontal foot-candles at any point on the surface of this area.
 - c) The Type "B" 400 watt asymmetric fixture shall be IES cutoff. The Department will use the measured photometric data of sampled fixtures to run the following tests on a computer simulation:
 - (1) When mounted in the level position, 50 ft. above the midpoint and 20 ft outside of either long side of a rectangular area measuring 260 ft. by 65 ft., the fixture shall pass the following tests:
 - (a) The fixture shall provide a measured minimum intensity of 0.15 horizontal foot-candles at any point on the surface of this area.
 - (b) The fixture shall provide a measured maximum to minimum light ratio, based on horizontal foot-candles, of less than 25.
 - (c) The fixture shall provide an average measured intensity of 0.6 horizontal foot-candles on the surface area.
 - (2) When mounted in the level position, 50 ft. above the midpoint and 20 ft outside of either long side of a rectangular area measuring 200 ft. by 40 ft., the fixture shall provide a measured minimum intensity of 0.30 horizontal foot-candles at any point on the surface of this area.
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 - (1) When mounted in the level position, 50 ft. above the midpoint and 20 ft. outside of either long side of a rectangular area measuring 220 ft. by 80 ft., the fixture shall pass the following tests:
 - (a) The fixture shall provide a measured minimum intensity of 0.15 horizontal foot-candles at any point on the surface of this area.
 - (b) The fixture shall provide a measured maximum to minimum light ratio, based on horizontal foot-candles, of less than 25.
 - (c) The fixture shall provide an average measured intensity of 0.6 horizontal foot-candles on the surface area.
 - (2) When mounted in the level position, 50 ft. above the midpoint and 20 ft. outside of either long side of a rectangular area measuring 160 ft. by 50 ft., the fixture shall provide a measured minimum intensity of 0.30 horizontal foot-candles at any point on the surface of this area.
 - e) The Type "S" 400 watt Symmetric fixture shall be IES cutoff. The Department will use the measured photometric data of sampled fixtures to run the following tests on a computer simulation:
 - (1) When mounted in the level position at 50 foot mounting height, the fixture shall provide the minimum light levels as shown below:
 - (a) 0.15 horizontal foot-candles within a 130 foot radius.
 - (b) 0.30 horizontal foot-candles within a 100 foot radius.
 - (c) 0.50 horizontal foot-candles within a 60 foot radius.
3. Ballasts
- a) All ballasts shall be isolated-winding lag-type magnetic regulators designed to operate 400 watt high pressure sodium lamps rated 480 volts. Ballasts shall be capable of starting lamps at an ambient temperature of -20 degrees F. Ballast wiring shall include a grounding terminal bonded to metal housing. Ballasts shall be fused with a 5 amp time-delay fuse in an insulated fuse holder. Fuse holders shall be internal to the housing. Ballast wiring to the terminal board shall be through a quick-disconnect plug. Windings shall be made from copper wire.
 - b) When the circuit voltage indicated on the plans is applied, the ballast input wattage during fluctuations of the test voltage of +10% and -10% shall not exceed 552 watts for a 400 watt HPS lamp.

3/03 Revision
 Revised Area Lighting Requirements



Texas Department of Transportation
Traffic Operations Division

HIGH MAST ILLUMINATION DETAILS

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- c) During fluctuation of the line voltage of +10% or -10%, the lamp wattage fluctuation shall not exceed a total of 20%. Ballast shall maintain lamp wattage between 280 and 475 watts for a 400 watt HPS lamp.
- d) The power factor of any ballast when tested at the circuit voltage indicated in the plans shall not be less than 90% at any point in life. Ballast factor shall be between .95 and 1.0.
- e) The electronic starting aid shall provide a starting pulse with an amplitude of 2500 volts minimum, 4000 volts maximum. The pulse width shall be a minimum of 0.8 microseconds at 2250 volts. The pulse shall occur when the open-circuit voltage is equal to or greater than 90 percent of peak open-circuit voltage. Pulse repetition rate shall be a minimum of one per cycle and pulse current shall be a minimum of 0.18 amperes. Electronic starting aids shall be replaceable without the use of tools. The starting aid shall discontinue to pulse when the lamp starts. Starter shall sense an inoperative or missing HPS lamp and automatically shut down luminaire to protect ballast after 10 minutes.
- f) Ballasts shall permanently and clearly indicate the following: lamp type, catalog number, voltage rating, connection diagram, and manufacturer. Capacitors in all luminaires shall be non-PCB type.

4. Lamps

- a) All lamps shall be new and of recent manufacture.
- b) Lamps shall be high pressure sodium and shall meet ANSI C78 requirements. Lamps shall be the type that extinguish at the end of usable lamp life and remain extinguished without cycling. 400 watt lamps shall contain less than 4.0 mg of mercury. Lamps shall be lead free and shall pass the Federal Toxic Characteristic Leachate Procedure (TCLP). Lamp shall be Osram-Sylvania LU400/Eco Plus. No alternatives will be approved.
- c) 400 watt high pressure sodium lamps shall have average initial lumens of 50000 and average rated life of 24000 hours.

2. GENERAL

- A. All material shall be in accordance with the applicable sections of the NEC. All conduit and conductors shall be in accordance with the materials and construction methods requirements of Items 618 and 620. Heat shrink tubing for use with cable grips and cable splicing shall meet the requirements of Item 620.
- B. Where stainless steel bands are called for on the HMI sheets, stainless steel hose clamps may be provided. Stainless steel bands and stainless steel hose clamps shall be provided with stainless steel clips or stainless steel screws.
- C. Obstruction Lights

- 1. When obstruction lights are required by layout sheets, summary sheets or general notes, the entire high mast assembly shall be controlled by an FAA approved photocell mounted inside the service enclosure. Ring mounted luminaires shall be controlled by up to 4 additional ring mounted photocells, with each photocell controlling up to 3 fixtures. Photocells shall meet the following requirements:
 - a) All photocells shall consist of a photoelectric cell, an internal lightning arrester, and a relay or bimetallic switch mounted inside a weather proof enclosure with standard 3-prong twist lock photocell plug and receptacle. The enclosure shall be made of poly-acrylic with clear acrylic window. Enclosure chassis shall be molded thermosetting plastic. The photocell shall have an arrester rated 2.0kV sparkover with 5000 amps follow-through. Relay or switch shall be time delay type with normally closed contacts. Photocell shall be rated a minimum of 1800 VA.
 - b) Service enclosure mounted photocell (FAA photocell) shall turn on at light levels below 35 foot-candles and off at levels above 58 foot-candles, in accordance with FAA requirements. This photocell shall be rated for operation at 240 volts. A permanent placard shall be installed on the inside of the service enclosure door to indicate that an FAA approved photocell is required.
 - c) High mast assembly ring mounted photocells (one foot-candle photocells) shall turn on at light levels below 1.0 (plus or minus 0.5) foot-candle, and shall turn off at 2 foot-candles higher than this level. These photocells shall be rated for operation at 480 volts. Photocells shall be mounted upright on the terminal box or on various junction boxes around the ring as approved by the Engineer. Conduit entries shall not be made into the top of the terminal box or junction boxes. The Contractor shall submit mounting details to the Engineer for approval.

- 2. When obstruction lights are not required, eliminate the 3 obstruction light fixtures, 3 mounting posts, 480/120 volt transformer, 120 volt wiring, and 3 mounting post support connections shown on detail "E", sheet 1.

- D. The male cord connector on the lower end of the Type W cord running up the pole, the female cord connector for the Type W cord running to the circuit breaker enclosure and the male connector on the maintenance jumper shall meet the following or approved equal specifications:
 - 1. Arrow Hart pin and sleeve watertight connectors UL listed, catalog numbers AH330C7W and AH330P6W.
 - 2. Bryant watertight pin and sleeve connectors UL listed, catalog numbers 330C6W and 330P6W.

- 3. Hubble pin and sleeve connectors UL listed, catalog numbers HBL330C7W and HBL 330P7W.
- 4. The male connector for use with the Type W maintenance jumper shall be a pin and sleeve connector of one of the above types. The Contractor shall attach a 50 amp twist lock receptacle to the opposite end of the maintenance jumper to match the flange mounted plug on the ring and the portable transformer.
- 5. The Contractor shall make a brochure submittal on the cord connectors.
- E. When shown on the plans, spill light shall be restricted to less than 0.15 horizontal footcandles.
- F. The Contractor shall provide shop drawings for high mast illumination assemblies in accordance with this Item and Item 441. An Engineer licensed in the State of Texas shall seal the shop drawings.

3. TESTING

- A. Fixtures, lamps and ballasts will be sampled and tested in accordance with the Department "Manual of Testing Procedures" except as noted in these specifications.
- B. Ballasts and fixtures will be tested using a reference lamp.
- C. The Department will bear the cost of all testing of equipment that complies with the specification requirements. However, the source of supply of fixtures and ballasts must be approved as required in Article 6.1 of the Standard Specifications. Such approval will be contingent on the supplier agreeing to bear the cost of testing any equipment that fails to comply with the specification requirements listed in this specification.
- D. All other equipment will be tested in accordance with Item 614 of the Standard Specifications and Materials and Test Division Test Standards.
- E. After High Mast Assembly has been completely assembled, the Engineer may require Contractor to fully lower and raise each high mast ring one time to demonstrate proper operation of the lowering mechanism, or may require the ring to be lowered for ring or fixture inspection. If any malfunction occurs, the problem shall be corrected at the Contractor's expense and the lowering test will be repeated.

4. MOUNTING RING AND SUPPORT ASSEMBLY

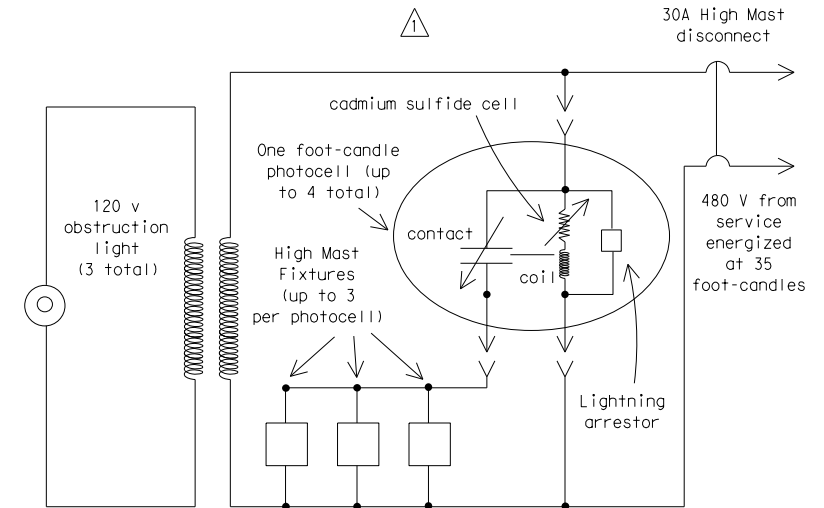
- A. Ring and support assembly shall be fabricated from steel having a minimum yield strength of 36 KSI.
- B. Cover assemblies, fittings and miscellaneous parts shall be as outlined on the plans.
- C. All hardware shall be hot-dipped galvanized per ASTM A153 or shall be stainless steel, unless noted otherwise on the plans.

5. WINCH

- A. Housing shall be high tensile strength die-cast silicon aluminum. Cable drum shall be fabricated from seamless steel tubing with stamped steel flanges and shall be hot-dipped galvanized. Drum shall have a minimum diameter of 4.5 inches. Drum shall be keyed to drum shaft. Drum and flanges shall be sized so that, when the fixture mounting ring is in the raised position, the cable including one full layer will fill the drum to no more than two-thirds of full capacity. Drum shaft shall be ground from stainless steel and mounted on lubricated bronze bearings with seals. Wormgear shall be made of nickel-bronze and worm shaft shall be high-strength stress-proofed steel, ground and polished and supported by tapered roller bearings.
- B. Gear ratio shall be 36:1 with safe hoisting capacity of not less than 4000 pounds.
- C. Winch shall incorporate adjustable automatic brake to assure positive load suspension. Brake shall be multiple disc with friction plates running in oil bath and one-direction clutch which operates only when load is suspended or lowered. Winch shall not have throw-out clutch.
- D. Any winch that is operated without oil shall be considered damaged and shall be replaced by the contractor at the contractor's expense.

6. WIRE ROPE AND TERMINALS

- A. 5/16 and 3/8 wire rope shall be 19x7 Rotation Resistant IWRC stainless steel. 19x7 rotation resistant wire rope shall meet the construction requirements of Fed. Spec. RR-W-410D, Type IV, class 2, modified for stainless steel with a nominal breaking strength of 11,100 lbs. All wire rope shall be pre-formed and factory lubricated. Wire rope shall meet the requirements of the applicable specification except where modified by this specification. Quality Assurance testing shall be the responsibility of the manufacturer and shall meet recognized wire rope industry standards. No special tensile or torsion testing will be required. Mill Test Reports shall be furnished.
- B. Winch cable shall be of sufficient length to leave a minimum of one full layer of cable on the drum when the fixture mounting ring is in the full down position.
- C. Wire rope terminals shall be stainless steel, solid stud type as shown on Sheet 7. All terminals shall be drilled for cotter pin. Material to be 303 SE or 304 stainless steel with a maximum tensile strength of 115,000 p.s.i. Mill Test Reports shall be furnished.



One foot-candle photocell keeps High Mast fixtures off when FAA photocell energizes circuit at 35 foot-candles. Fixtures come on when sun goes down at 1 foot-candle.

One Foot-candle PhotoCell Schematic

Use on ring when obstruction lights are installed and FAA photocell is installed in electrical service.

- 3/03 Revision
- ⚠ Revised General requirements; add diagram
- ⚠ Revised Wire Rope and Terminals

HIGH MAST ILLUMINATION DETAILS

 HMI (8) -03

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D. All terminals shall be proof-tested by the manufacturer to 40% of rated strength of the wire rope. Each terminal shall be identified by manufacturer's logo permanently incised on terminal. Manufacturer shall furnish certification of tests. Contractor shall also furnish one sample of each size of terminal with 5 ft. of wire rope for load tests by the State. Samples tested must withstand test load not less than 100% of rated breaking strength of wire rope. If sample fails test, all terminals of same size will be rejected.

E. Wire rope shall be delivered from the manufacturer on a reel.

7. SPRINGS

- A. Provide three steel springs as shown on plans.
- B. Springs shall have an uncompressed length of approximately 8 inches and shall compress 3 inches under 700-pound load.
- C. Springs shall contain approximately 19 total coils with ID of 0.875 and OD of 1.375 inches. Ends shall be closed and ground. Springs shall be zinc-plated.
- D. Springs shall be made from 1/4" diameter oil-tempered MB Steel treated for overstress. Springs shall not develop permanent set from 3-inch compression.

8. ELECTRICAL POWER CABLE

A. Power cable shall be No. 8 AWG three-conductor round Type W, rated 90 degrees C, 600 volt or 2000 volt. Each conductor shall be tinned copper and shall consist of 133 strands. Insulation shall be ethylene propylene rubber. Jacket shall be chlorosulfonated polyethylene (CSPE), with glass fiber or nylon reinforcing mesh between two layers of CSPE. Nominal diameter shall be 0.91". Filler shall be rubber compound or other approved non-hygroscopic compound. Jacket shall be Hypalon Power Flex 90, with no substitutions allowed.

9. POWER DRIVE ASSEMBLY (ONE ONLY THIS CONTRACT UNLESS OTHERWISE SHOWN ELSEWHERE ON THE PLANS)

A. Drive Motor

- 1. Drive motor shall be 1-1/4" heavy-duty reversible portable electric drill modified as shown on plans.
- 2. Shall have a minimum of 6 radial ball bearings, one thrust bearing, and one needle bearing.
- 3. Shall have No. 3 Morse Taper socket.
- 4. Shall be designed for 115 volt 60 Hertz single phase operation 250 RPM at no load.
- 5. Shall be designed for continuous rated duty of 160 RPM and 15 amperes at 115 volts with delivery of 33-pound-feet of torque. Drill motor to be operated only at low speed range. (i.e. 150 to 160 RPM)
- 6. Shall develop 240 pound-feet of torque at stalled rotor condition.

B. Torque Limiter Coupling

- 1. Torque limiter coupling shall consist of standard torque limiter with Type A sprocket center member coupled to a Type B sprocket by an ASA double strand roller chain. Type A sprocket shall be chrome-plated.
- 2. Coupling shall have torque capacity minimum of 15 pound-feet and a maximum of 55 pound-feet.
- 3. Limiter section of coupling shall consist of integral hub and pressure plate, two friction facings, sintered iron bushing, pilot plate, disk spring, lock washer and hex adjustment nut. All major components except spring and friction facings shall be cadmium-plated with dichromate treatment.
- 4. Type A center sprocket shall have ground face (63 micro-inch) and shall be run-in for 4 minutes at approximately 60 RPM at a torque setting 70% to 80% of spring rating. Contractor shall provide written certification that run-in has been accomplished.
- 5. The torque limiter coupling shall, after run-in, be set to a torque limit of 35 pound-feet or as directed by the Engineer. The proper setting of the coupling shall be demonstrated to the Engineer.

C. Universal Joints

- 1. Shall be slip-type with 4-inch barrel. A grease fitting shall be so located in the spider that all caps and needle bearings may be adequately serviced. The assembly shall be disassembled and zinc-plated, then reassembled and properly lubricated.
- 2. Shall have a minimum torque rating of 1270 inch-pounds at 200 RPM.
- 3. Shall have set screw and keyed coupling as shown on plans.



10. CONSTRUCTION METHODS

A. Fabrication

- 1. Fabrication and welding shall be in accordance with Item 441, "Steel Structures".
- 2. All holes supporting pulley shafts shall be drilled (not punched) prior to galvanizing.
- 3. All component parts shall be galvanized where galvanizing is applicable, after fabrication.
- 4. Galvanizing on all parts which have become scratched, chipped or otherwise damaged shall be thoroughly cleaned and the cleaned area painted with two coats of zinc dust-zinc oxide paint conforming to the requirements of repair compounds meeting Federal Specification TT-P-641 b.
- 5. Mounting rings and ring support assemblies shall be fabricated with the use of jigs that have been inspected and approved by Material and Test Division personnel prior to their usage.
- 6. The fabricator shall submit his proposed welding procedures in accordance with Item 441, "Steel Structures".

B. Installing Wire Rope

- 1. Extreme care shall be used to prevent wire rope from kinking, nicking, or from sustaining other damage during installation. Rope shall not be installed by pulling from flat coil, but shall be carefully unrolled its full length or placed on a horizontal axis and unreel according to wire rope industry standards.
- 2. For right lay rope, the rope shall be attached to the drum on the end opposite the winch gear train, and wound on drum so that the free end of the rope comes off the backside of the drum during normal operation of the winch. Rope must be unreel carefully as stated above. Care must be taken to insure that all layers lay full and tight on drum.
- 3. Installation of all wire rope shall be accomplished only under direct supervision of the Engineer or his authorized representative. Contractor shall not remove wire rope from manufacturer's reel until authorized by the Engineer. Installation of wire rope on winch shall be in accordance with the above and accepted industry practice. Installation of the three hoist cables shall be made from the top end of the pole and as directed by the Engineer or his representative.

C. Installing Wire Rope Clips

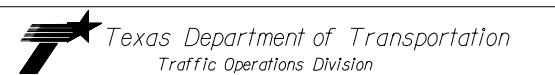
- 1. Turn back approx. 2' 3" of rope, measured from the top of thimble. Apply seizing to pigtail end of wire rope prior to cutting to length. See detail "K", Sheet 3. Apply first clip approx. 3" from the dead end of the wire rope with U-bolt over dead end and live end in clip saddle. Tighten nuts evenly to 30 pound-feet of torque, or as recommended by manufacturer.
- 2. Install second clip as near loop as possible, take out slack and torque nuts evenly to 30 pound-feet or as recommended by manufacturer.
- 3. After final erection and assembly of the pole and high mast assembly, retighten nuts to required torque.

D. Installing Light Ring and Luminaires

- 1. Prior to mounting luminaires to the light ring, Contractor shall ensure the ring is level. Luminaires shall be mounted level on the light ring. Luminaires shall be oriented as shown on plans.

3/03 Revision

Revised Construction Methods.



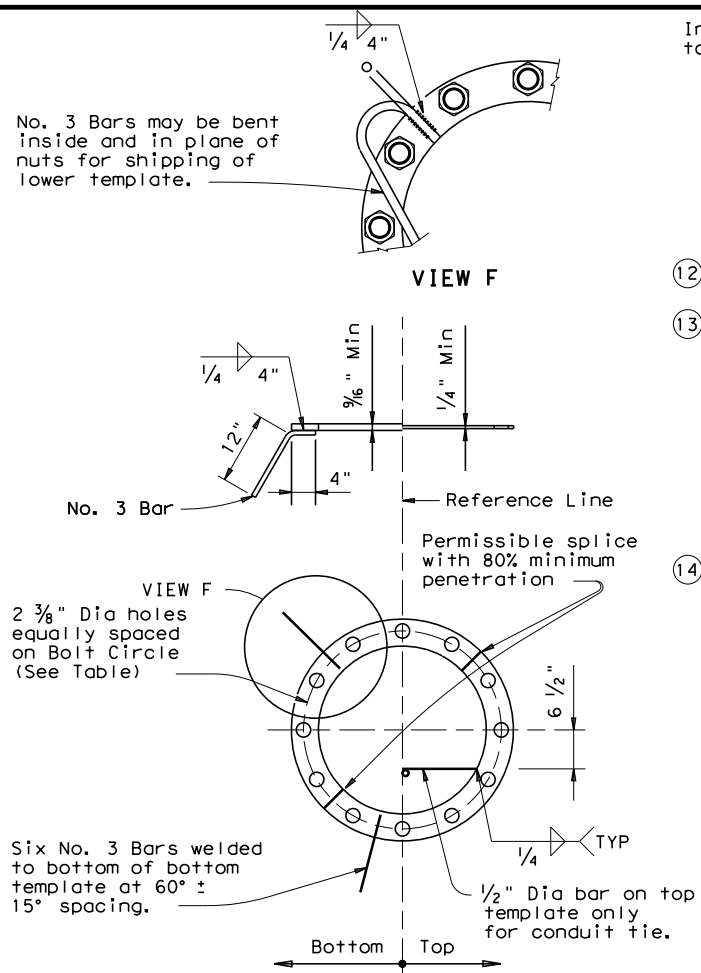
HIGH MAST ILLUMINATION DETAILS

HMID (9) -03

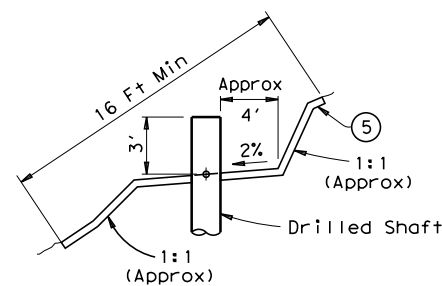
© TxDOT January 1986		DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
10-93	REVISIONS	CONT	SECT	JOB	HIGHWAY
10-95		0015	09	194	1H 35
4-96		DIST		COUNTY	SHEET NO.
3-03		AUS		WILLIAMSON	235

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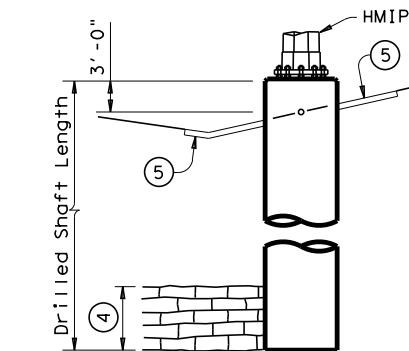
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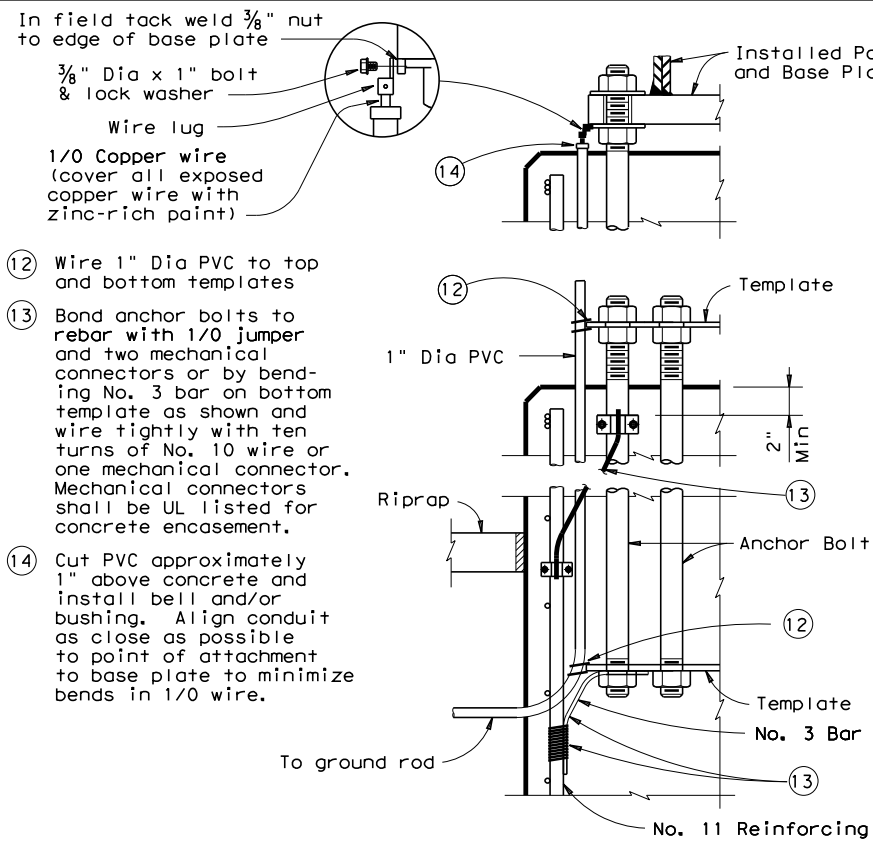
ANCHOR BOLT TEMPLATES



RIPRAP ON SLOPES



- ⑤ Match slope of finished ground if slope is less than approx 4 to 1. For steeper slopes, bench to provide work area with approx 2% slope around pole base. Other configurations may be shown elsewhere on the plans.
- ④ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.



LIGHTNING PROTECTION SYSTEM

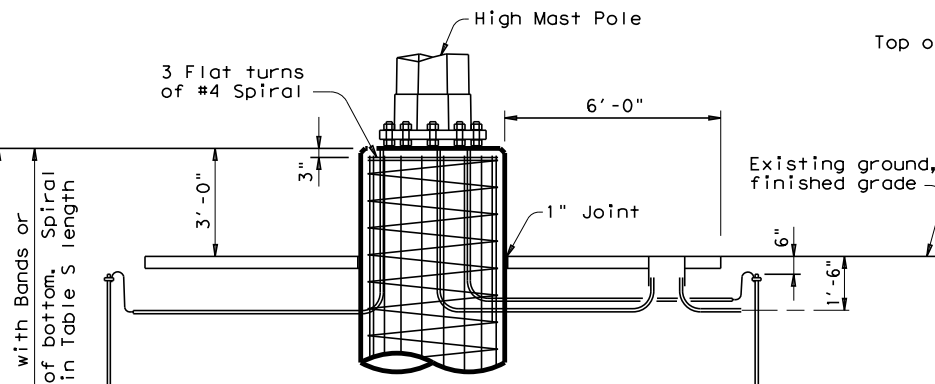


TABLE 5	
Shaft Dia (inches)	Min Spiral Length (feet)
48	19
54	21
60	23
66	26

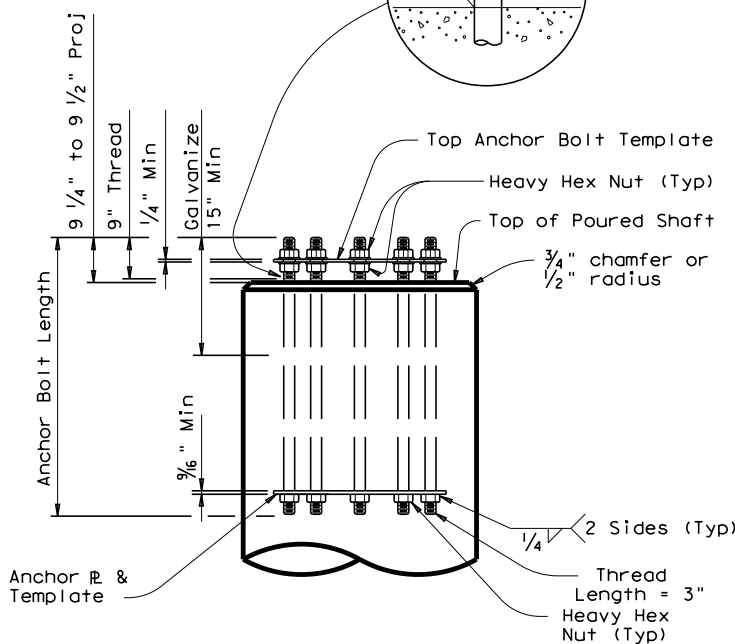
Drilled Shaft Length (See Chart)

Equally spaced Bands at 4'-0" Max spacing or Spiral at 9" pitch

Spiral (see Table S) with Bands or Spiral to within 1 ft of bottom. Spiral not to be welded within Table S length

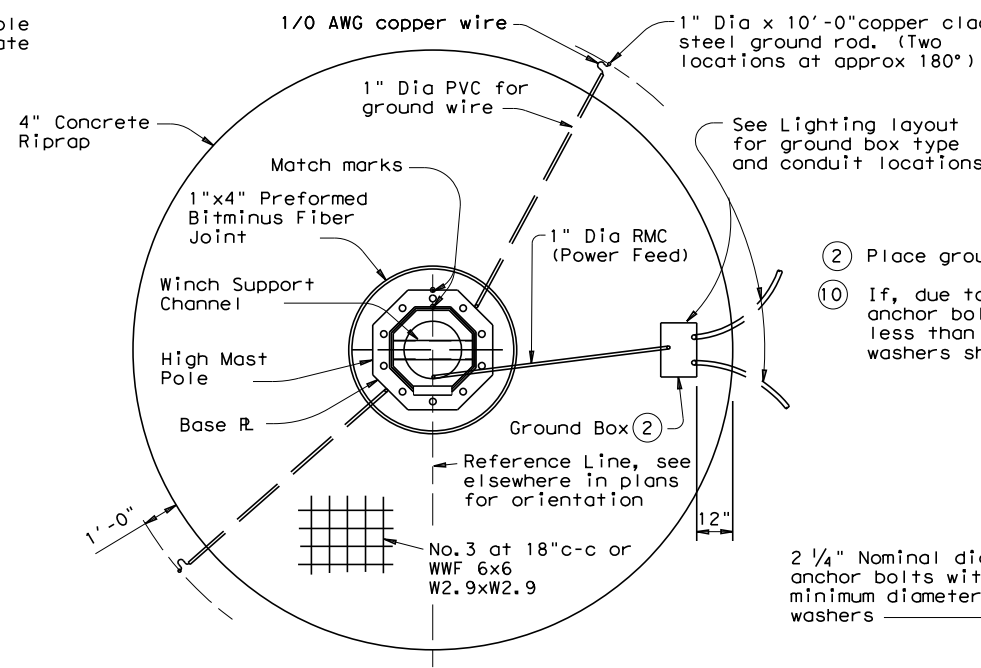
Vertical bars may be supported on bottom of drilled hole if material is firm enough to do so when concrete is placed

DRILLED SHAFT FOUNDATION DETAIL

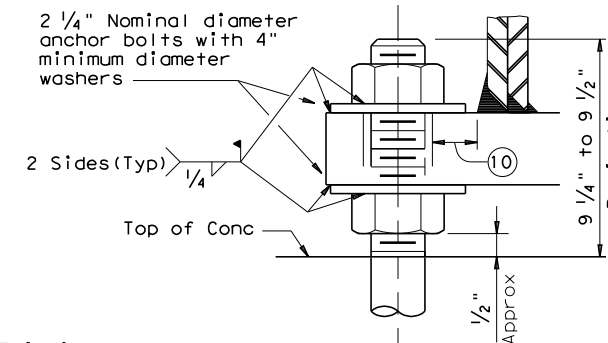


ANCHOR BOLT ASSEMBLY

(See Anchor Bolt Table for number of bolts required)



- ② Place ground box cover flush with riprap.
- ⑩ If, due to tolerances in fabrication, the anchor bolt hole to ground sleeve weld is less than approx 7/8", clipped 1/2" thick washers shall be supplied at those



Texas Department of Transportation
 Traffic Operations Division

HIGH MAST ILLUMINATION POLE FOUNDATIONS

SHEET 1 OF 2 HMIF (1) -98

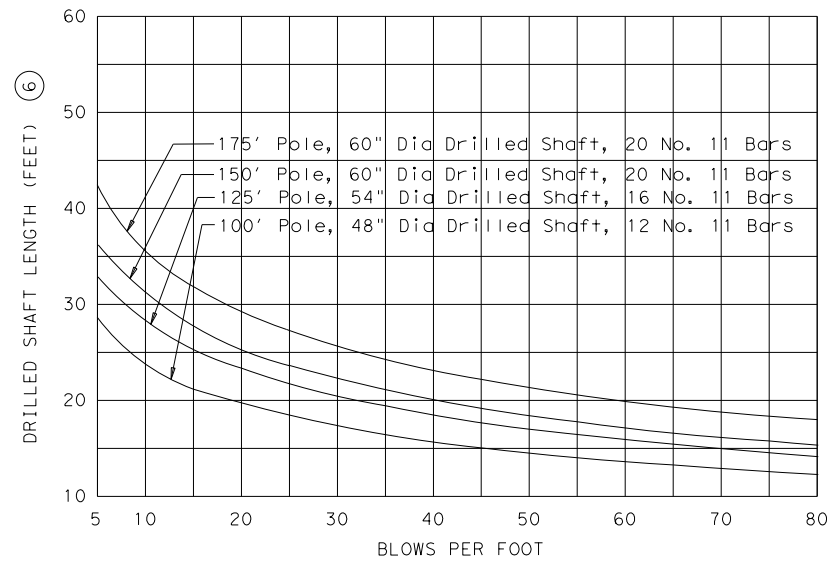
© TxDOT August 1995		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
11-97	REVISIONS	CONT	SECT	JOB	HIGHWAY
5-98	Anchor Bolt Circle Dia	0015	09	194	1H 35
		DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		236

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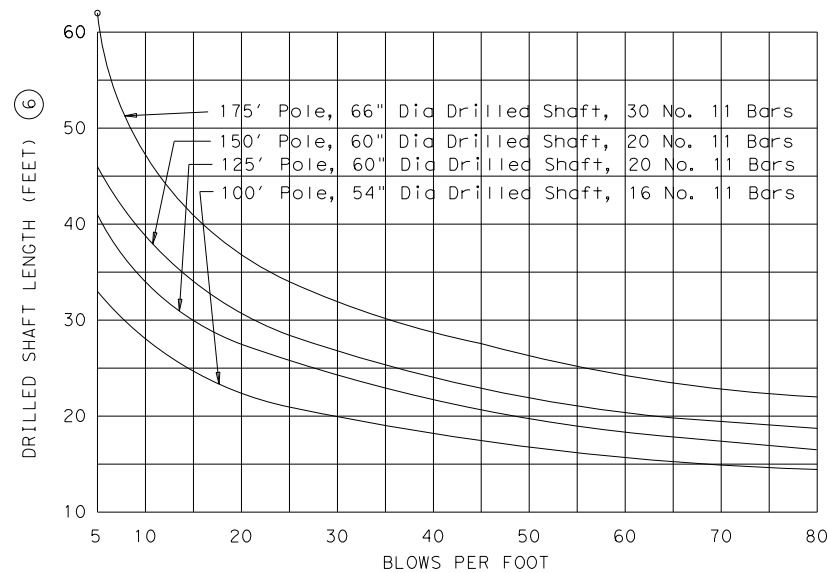
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⑥ Includes normal 3 Ft exposure. Shafts with more than 3 Ft exposure must have additional length.



80 MPH POLES

Do not extrapolate below 5 Blows/Ft. A special design will be required for soil less than 5 Blows/Ft.



100 MPH POLES

Do not extrapolate below 5 Blows/Ft. A special design will be required for soil less than 5 Blows/Ft.

TEXAS CONE PENETROMETER TEST TABLES

NOTE: Use average "N" value over the top third of the embedded shaft. Ignore the top 2' of soil.

ANCHOR BOLT TABLE						
Pole Height (feet)	Bolt Diameter (inches)	Bolt Length (feet)	Bolt Templates		No. of Bolts	Bolt Cir Dia (inches)
			O D (inches)	I D (inches)		
8 SIDED POLE						
175	2.25	4.83	45.5	36.5	16	41
150	2.25	4.83	42.5	33.5	12	38
125	2.25	4.83	39.5	30.5	8	35
100	2.25	4.83	35.5	26.5	6	31
12 SIDED POLE						
175	2.25	4.83	48.5	39.5	12	44
150	2.25	4.83	45.5	36.5	10	41
125	2.25	4.83	40.5	31.5	8	36
100	2.25	4.83	36.5	27.5	6	32
8 SIDED POLE						
175	2.25	4.83	50.5	41.5	20	46
150	2.25	4.83	47.5	38.5	16	43
125	2.25	4.83	43.5	34.5	12	39
100	2.25	4.83	38.5	29.5	10	34
12 SIDED POLE						
175	2.25	4.83	50.5	41.5	16	46
150	2.25	4.83	48.5	39.5	12	44
125	2.25	4.83	44.5	35.5	10	40
100	2.25	4.83	40.5	31.5	6	36

MISCELLANEOUS QUANTITIES - ONE HMIF			
Shaft Diameter (in) ⑦	48	54	60
Concrete Riprap (CY)	2.33	2.44	2.56
Reinforcing (Lbs) ⑧	94	99	103
Ground Box (ea)	1	1	1
R O W Marker (ea) ⑨	1	1	1

- ⑦ See elsewhere on plans for length of Drilled Shaft required.
- ⑧ For Contractors information only.
- ⑨ Designated elsewhere on plans if required.

GENERAL NOTES:

- Unless otherwise noted, the welded steel bands may be replaced with spiral as shown on the foundation details.
- Anchor bolts shall be placed in foundation so there are always two bolts on reference line.
- Drilled shaft lengths as determined from the foundation design chart or other acceptable methods are to be as shown elsewhere on the plans.
- ODSR may not be used for HMIF drilled shafts.
- Concrete for drilled shafts shall be Class C.
- Repair welded areas with zinc-rich paint.
- All Anchor Bolts, Nuts and Washers shall be galvanized in accordance with Item 445, "Galvanizing".



HIGH MAST ILLUMINATION POLE FOUNDATIONS

SHEET 2 OF 2 HMIF (2) - 98

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5-98 ~ Anchor Bolt Circle Dia	REVISIONS		CONT	SECT	JOB	HIGHWAY	
	0015		09	194	1H 35		
	DIST		COUNTY		SHEET NO.		
AUS		WILLIAMSON		237			

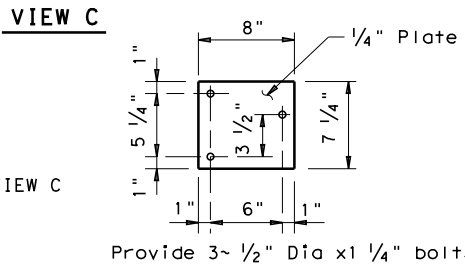
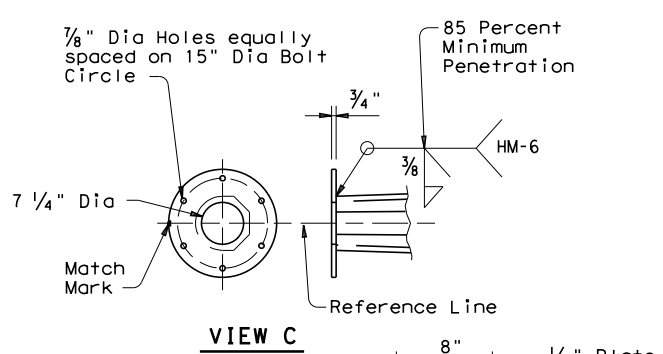
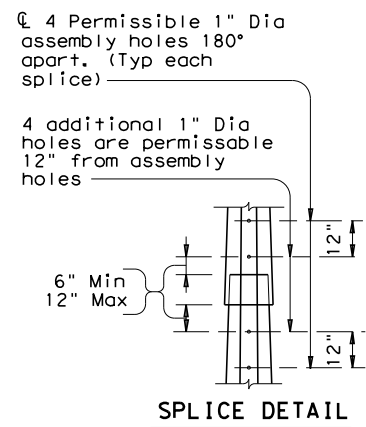
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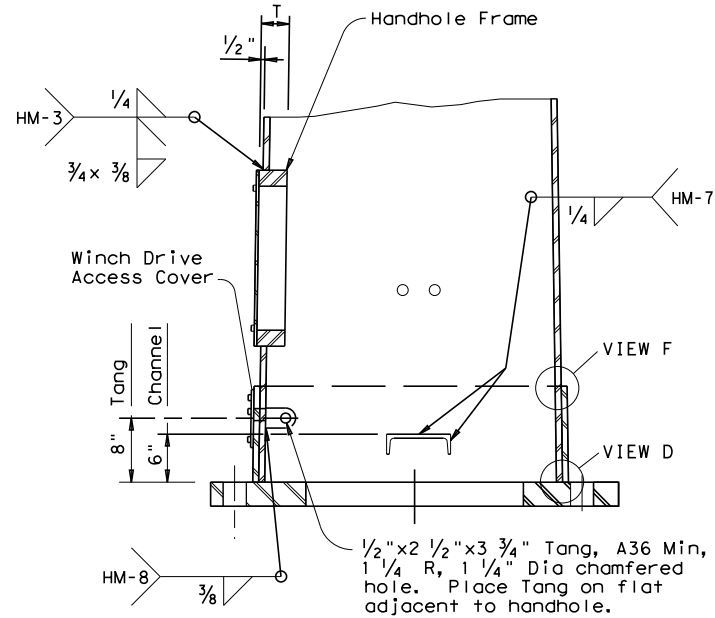
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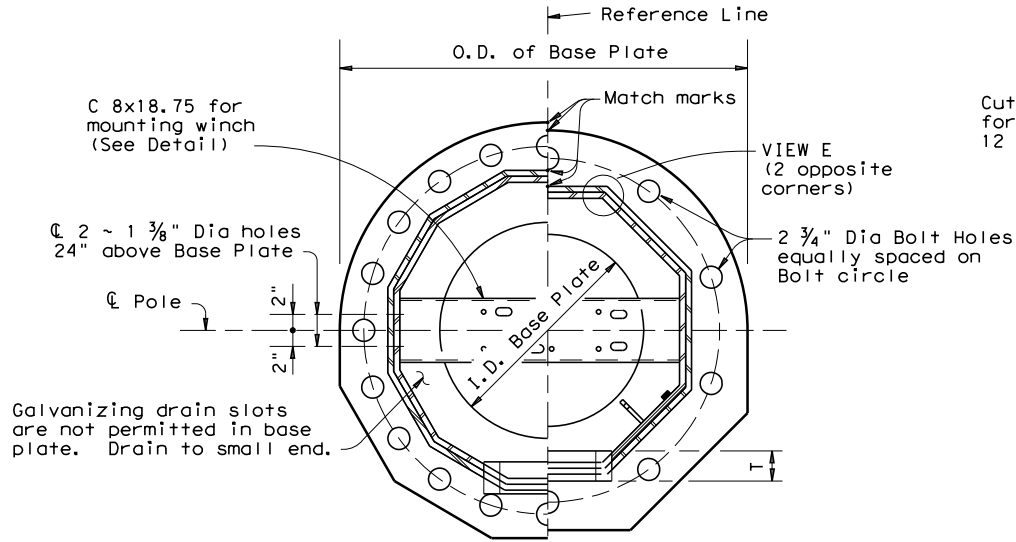
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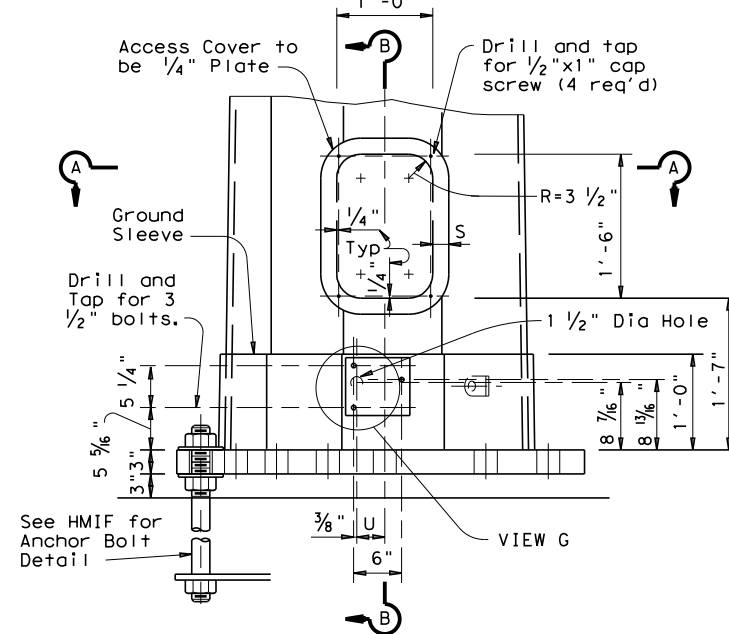
WINCH DRIVE ACCESS COVER



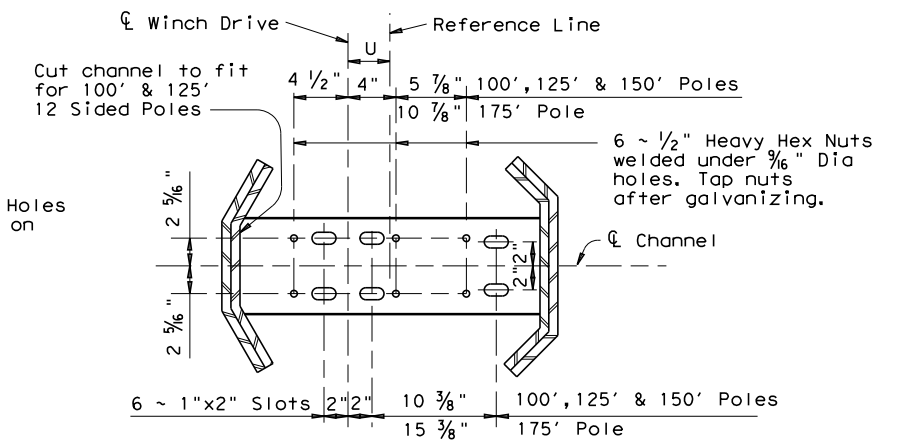
SECTION B-B



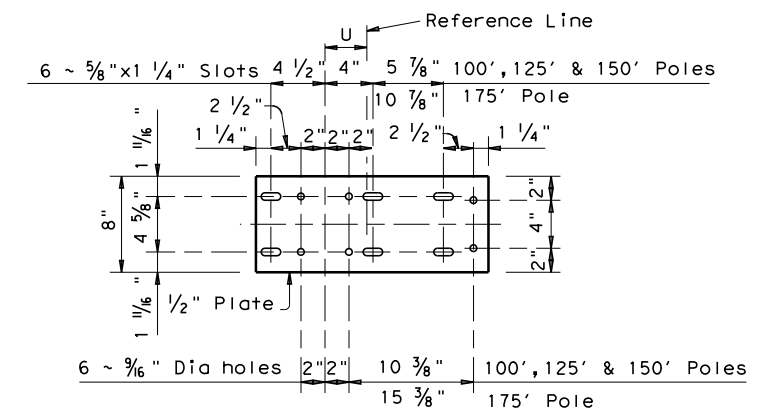
SECTION A-A



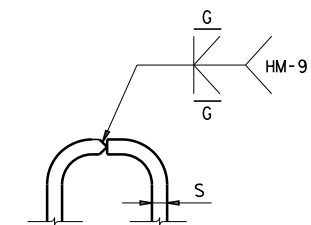
ELEV OF POLE BASE



WINCH MOUNTING CHANNEL



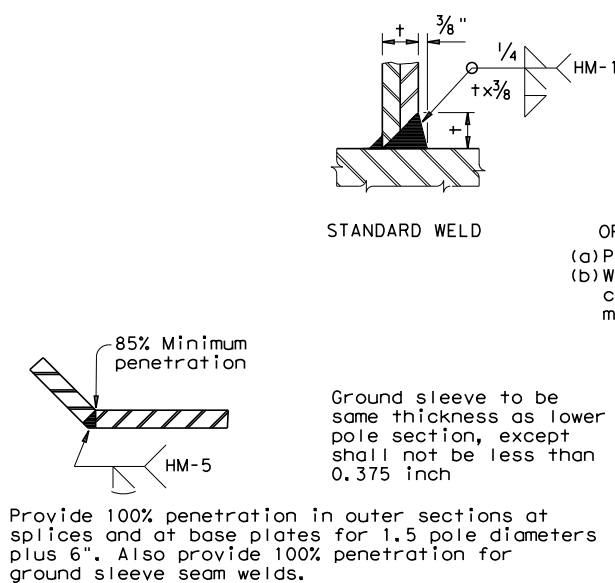
WINCH MOUNTING PLATE



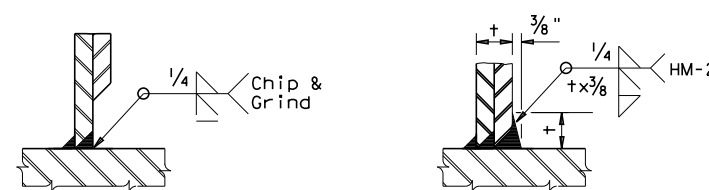
A bent and welded handhole frame is permissible. Heating, bending, and finish grinding must be approved with the HM-9 weld procedure.

OPTIONAL HANDHOLE FRAME

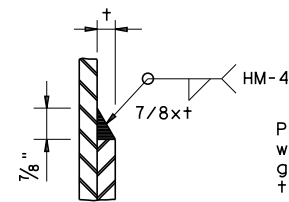
SHEET 1 OF 2



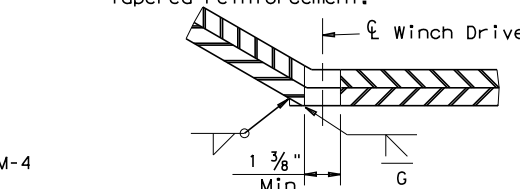
VIEW E



VIEWS D

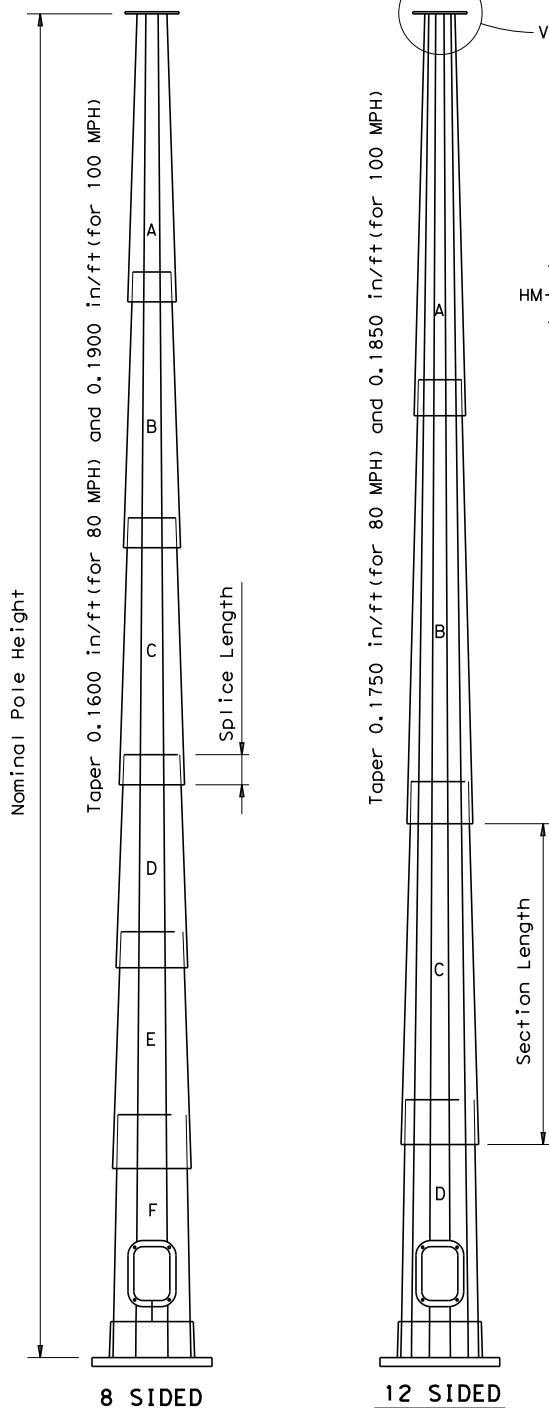


VIEW F



VIEW G

Provide welded and ground filler or cover plate where winch drive conflicts with bend line in ground sleeve for the 8 sided, 80 mph, 100' pole, the 12 sided, 100 mph, 100' pole, and the 12 sided, 80 mph, 175', 125' and 100' poles.



POLE ELEVATIONS

(Showing 175 Ft Poles)

				Traffic Operations Division Standard	
HIGH MAST ILLUMINATION POLES 100' - 125' - 150' - 175'					
HMIP(1)-16					
FILE: hmiip-16.dgn	DN:	CK:	DW:	CK:	
© TxDOT August 1995	CON: 0015	SECT: 09	JOB: 194	HIGHWAY: IH 35	
5-98	DIST: AUS	COUNTY: WILLIAMSON	SHEET NO.:	238	
8-16					
77A					

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TABLE OF VARIABLE POLE DIMENSIONS												
Ht (ft)	Section	8 SIDED POLE					12 SIDED POLE					
		Diameter (Inches)		Thickness (inches)	Length (feet)	Splice (inches)	Diameter (Inches)		Thickness (inches)	Length (feet)	Splice (inches)	
		Bottom	Top				Bottom	Top				
80 MPH DESIGNS	175	A	13.083	7.750	.250	33.33	19	16.792	7.750	.250	51.67	24
		B	17.792	12.205	.375	34.92	25	24.858	15.817	.313	51.67	36
		C	22.250	16.583	.375	35.42	32	32.625	23.583	.313	51.67	48
		D	25.375	20.948	.438	27.67	36	36.250	31.175	.375	29.00	~
		E	28.375	23.895	.500	28.00	41					
		F	31.250	26.703	.500	28.42	~					
	150	A	13.083	7.750	.250	33.33	19	16.792	7.750	.250	51.67	24
		B	17.792	12.205	.375	34.92	25	24.858	15.817	.313	51.67	36
		C	22.250	16.583	.375	35.42	32	32.625	23.583	.313	51.67	~
		D	25.375	20.948	.438	27.67	36					
		E	28.375	23.895	.500	28.00	~					
125	A	13.083	7.750	.250	33.33	19	16.792	7.750	.250	51.67	24	
	B	17.792	12.205	.375	34.92	25	24.858	15.817	.313	51.67	36	
	C	22.250	16.583	.375	35.67	32	28.250	23.583	.313	26.67	~	
	D	25.375	20.948	.438	27.67	~						
100	A	13.083	7.750	.250	33.33	19	16.792	7.750	.250	51.67	24	
	B	17.792	12.205	.375	34.67	25	24.625	15.817	.313	50.33	~	
	C	22.250	16.583	.375	35.67	~						
100 MPH DESIGNS	175	A	14.208	7.875	.313	33.33	20	17.433	7.875	.375	51.67	25
		B	19.792	13.142	.375	35.00	28	25.747	16.173	.438	51.75	37
		C	25.250	18.473	.438	35.67	36	33.750	24.176	.438	51.75	49
		D	29.000	23.680	.500	28.00	42	37.375	31.995	.500	29.08	~
		E	32.625	27.210	.563	28.50	47					
		F	36.125	30.631	.563	28.92	~					
	150	A	14.208	7.875	.313	33.33	20	17.433	7.875	.375	51.67	25
		B	19.792	13.142	.375	35.00	28	25.747	16.173	.438	51.75	37
		C	25.250	18.473	.438	35.67	36	33.750	24.176	.438	51.75	~
		D	29.00	23.680	.500	28.00	42					
		E	32.625	27.210	.563	28.50	~					
125	A	14.208	7.875	.313	33.33	20	17.433	7.875	.375	51.67	25	
	B	19.792	13.142	.375	35.00	28	25.747	16.173	.438	51.75	37	
	C	25.250	18.473	.438	35.67	36	29.125	24.176	.438	26.75	~	
	D	29.00	23.680	.500	28.00	~						
100	A	14.208	7.875	.313	33.33	20	17.433	7.875	.375	51.67	25	
	B	19.792	13.142	.375	35.00	28	25.500	16.173	.375	50.42	~	
	C	25.250	18.473	.438	35.67	~						

Diameters are measured across the flats.

MATERIALS	
Polygonal Shafts Ground Sleeves	ASTM A709 Grade 50 A572 Grade 50 ① ②
Base Plate and Handhole Frame	ASTM A709 Grade 50 A572 Grade 50 ① A633 Grade C ①
Miscellaneous Steel	ASTM A36 or equal

- ① ASTM A572 and A633 may have higher yield strength but shall not have less elongation than the grade indicated.
- ② The silicon content of all steel shall be controlled to ensure high quality galvanizing and to avoid discoloration.

TABLE OF VARIABLE BASE DIMENSIONS							
Ht (ft)	O.D. (inches)	I.D. (inches)	Bolt Cir (inches)	No. Bolts	S (inches)	T (inches)	U (inches)
80 MPH DESIGNS							
8 SIDED POLE							
175'	47	22	41	16	2.00	3.75	4.50
150'	44	18	38	12	2.00	4.00	3.50
125'	41	16	35	8	2.00	4.50	3.50
100'	37	14	31	6	2.00	5.00	3.50
12 SIDED POLE							
175'	50	24	44	12	1.75	3.50	3.50
150'	47	22	41	10	1.75	3.50	2.50
125'	42	18	36	8	1.75	3.75	2.50
100'	38	13	32	6	1.75	4.00	2.50
100 MPH DESIGNS							
8 SIDED POLE							
175'	52	27	46	20	1.75	3.50	4.50
150'	49	23	43	16	1.75	4.00	3.50
125'	45	21	39	12	1.75	4.50	3.50
100'	40	17	34	10	1.75	4.50	3.50
12 SIDED POLE							
175'	52	27	46	16	1.75	3.25	3.50
150'	50	25	44	12	1.75	3.50	2.50
125'	46	22	40	10	1.75	3.75	2.50
100'	42	19	36	6	1.75	4.00	2.50

NOTE: Base Plate may be round or with 8 or 12 equal segments matching the pole.

GENERAL NOTES:

- 1. Design conforms to AASHTO 1994 Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals and Interim Revisions thereto. The Design Wind Speed is 80 mph or 100 mph.
- 2. The required design height and wind speed shall be as shown elsewhere in the plans.
- 3. Each pole section, top flange plate and base plate shall be permanently marked on the reference line. The required mark locations are shown on the baseplate, top plate, and foundation plan details. These marks shall be used in pole assembly and erection alignment. The reference line and anchor bolt orientation shall be parallel to roadway centerline unless otherwise shown on Lighting Layouts.

SHEET 2 OF 2

		Traffic Operations Division Standard	
<h2>HIGH MAST ILLUMINATION POLES</h2> <h3>100' - 125' - 150' - 175'</h3> <h2>HMIP(2)-16</h2>			
FILE: hmip-16.dgn	DN:	CK:	DW:
© TxDOT August 1995	CONT	SECT	JOB
	0015	09	194
5-98	DIST	COUNTY	SHEET NO.
8-16	AUS	WILLIAMSON	239

ROADWAY ILLUMINATION ASSEMBLY NOTES

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1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.
2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.
3. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.
4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.
5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.
 - a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.
 - b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25' above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 6th Edition (2013) of the AASHTO Design Specifications. For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25' above the surrounding terrain, provide poles meeting the following requirements:
 - i. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).
 - ii. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to resist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.
6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.
7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.
8. Install T-Base with following procedure:
 - a. Anchor Bolt Tightening.
 - i. Coat the threads of the anchor bolts with electrically conductive lubricant.
 - ii. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.
 - iii. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.
 - iv. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.
 - v. Check top of T-base for level. If not level then foundation must be leveled.
 - b. Top Bolt Procedure
 - i. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.

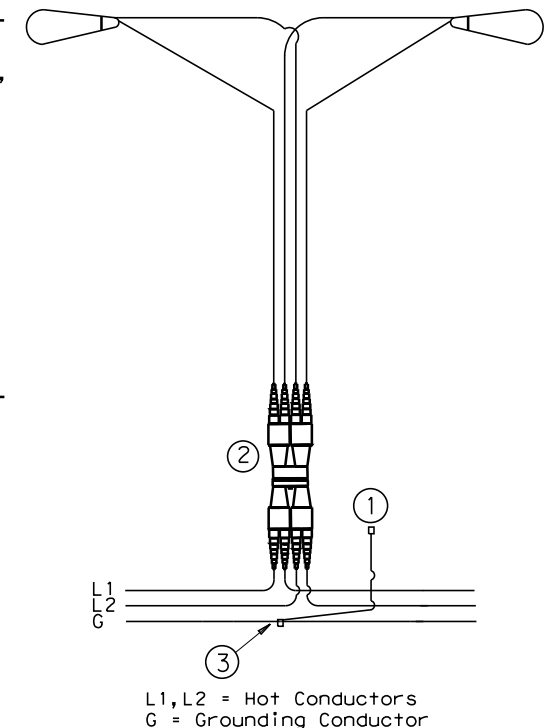
- ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."
- iii. Tighten each nut to 150 ft-lb. using a torque wrench.
- c. Level and Plumb
 - i. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.
9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).
10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150W HPS or 150W EQ LED.
11. Mount luminaires on arms level as shown by the luminaire level indicator.
12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

Wiring Diagram Notes:

- ① Use 1/2 in. -13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.
- ② Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.
- ③ Split Bolt or other connector.

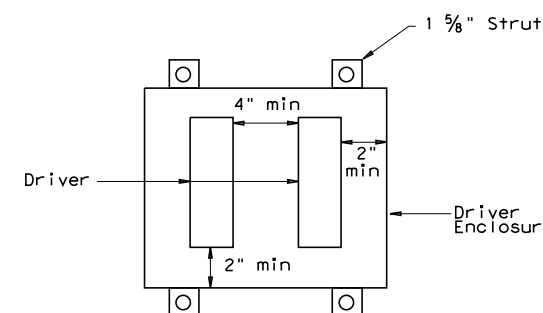
Decorative LED Lighting Notes:

1. LED Drivers in Remote Outdoor enclosures (for drivers that do not include an enclosure as part of a factory assembly):
 - a. Provide NEMA 3R outdoor enclosure or as approved.
 - b. Install enclosure at least 12" above ground or other horizontal surface. Mount vertically or on ceiling, and avoid direct sun where possible.
 - c. Install drivers with at least 2 inches of space from enclosure walls.
 - d. For multiple drivers in an enclosure, provide at least 4 inches side to side and 1 inch end to end from other drivers or electronic equipment
 - e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.
 - f. Provide remote drivers with a maximum of 100 watts
 - g. Provide drivers with documentation of 100,000 hr lifetime at Tcase of 65C or higher.



TYPICAL WIRING DIAGRAM

LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.

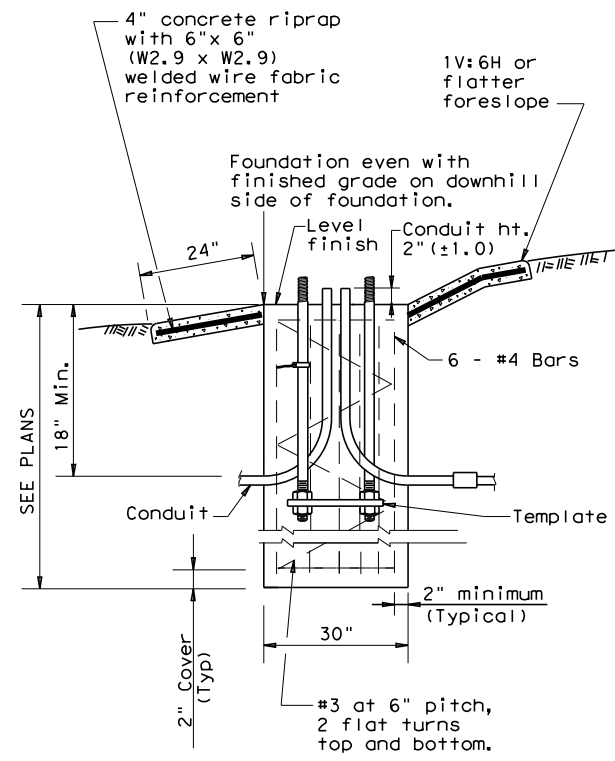


Driver Spacing In Remote Enclosure

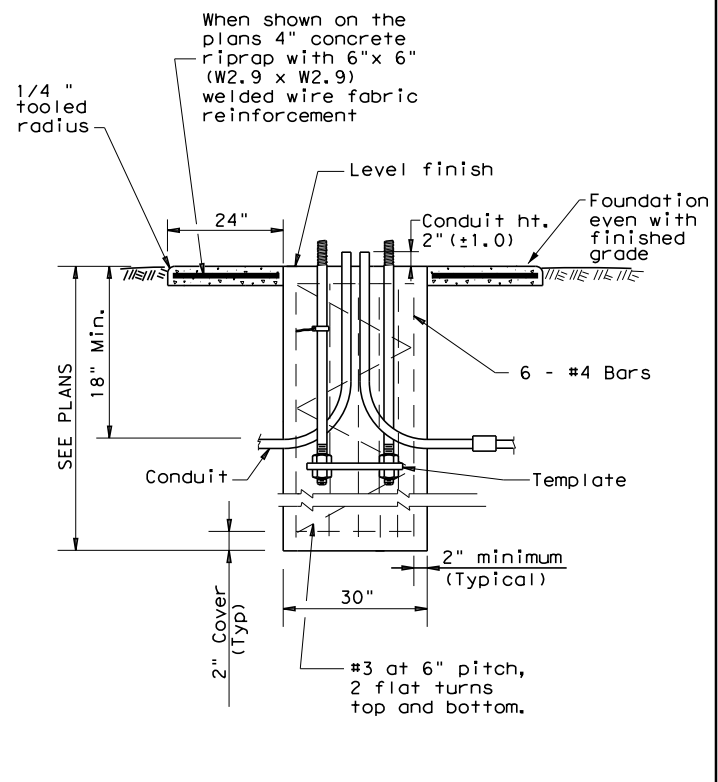
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© TxDOT	January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS		0015	09	194	1H 35
7-17		DIST	COUNTY	SHEET NO.	
12-20		AUS	WILLIAMSON	240	

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SECTION A-A
SHOWING SLOPED GRADE



SECTION A-A
SHOWING CONSTANT GRADE

TABLE 1
ANCHOR BOLTS

POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1 in. x 30 in.
40-50 ft.	15 in.	17 1/4 in.	1 1/4 in. x 30 in.

TABLE 2
RECOMMENDED FOUNDATION LENGTHS (See note 1)

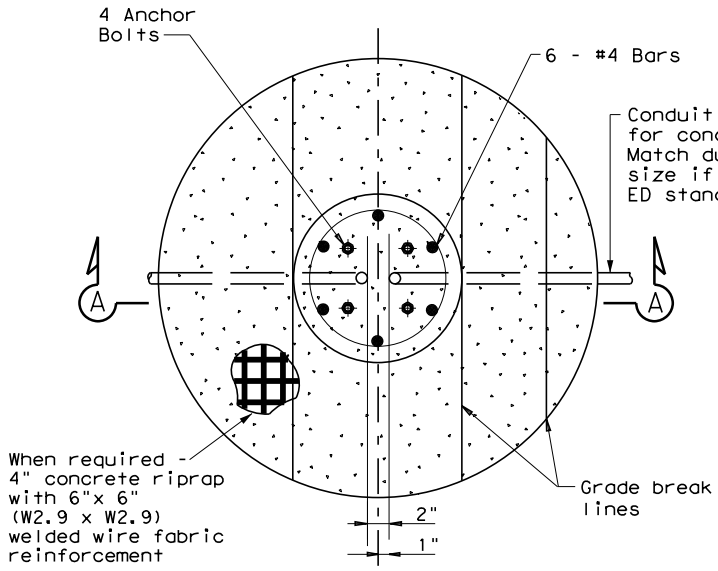
MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
≤20 ft.	6'	6'	6'
>20 ft. to 30 ft.	8'	6'	6'
>30 ft. to 40 ft.	8'	8'	6'
>40 ft. to 50 ft.	10'	8'	6'

TABLE 3
PAY QUANTITY OF RIPRAP PER FOUNDATION (Install only when shown on the plans)

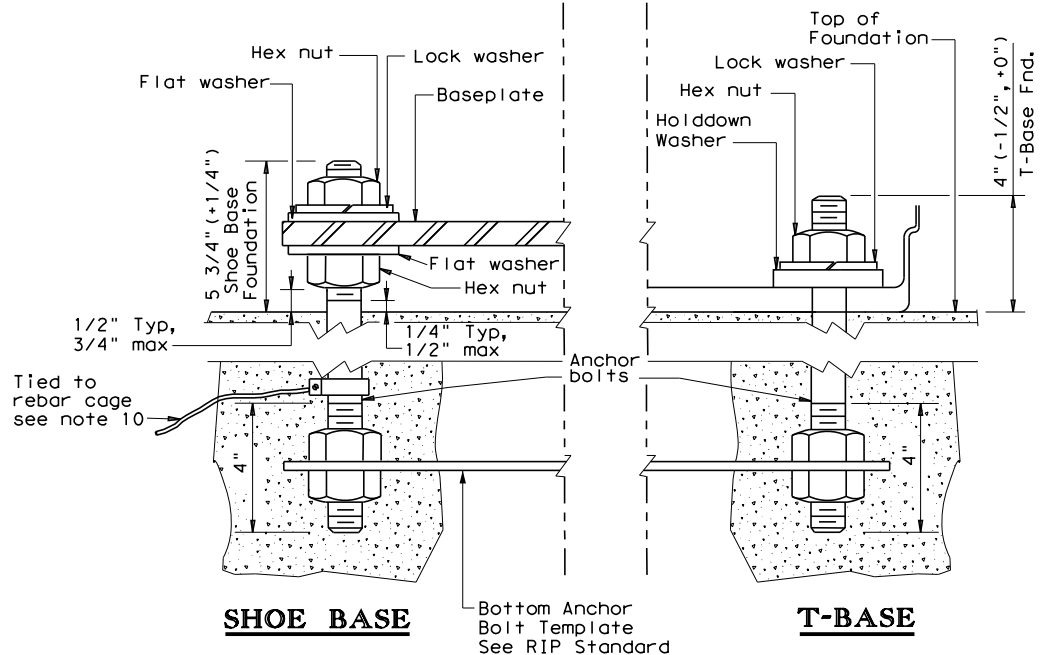
Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

GENERAL NOTES:

- "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.
- 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.
- 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.
- 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.
- Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
- 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.
- Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
- 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.
- Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
- 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.
- Grade earthwork around T-base foundations even with the finished grade as shown in Section A-A to ensure proper function of the breakaway device. Use riprap on T-base foundations that are located on sloped grades, and as shown on the plans for level grades.



FOUNDATION DETAIL



ANCHOR BOLT DETAIL

TABLE 4
BREAKAWAY POLE PLACEMENT (See note 6)

ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

* or as close to ROW line as is practical
 ** provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.

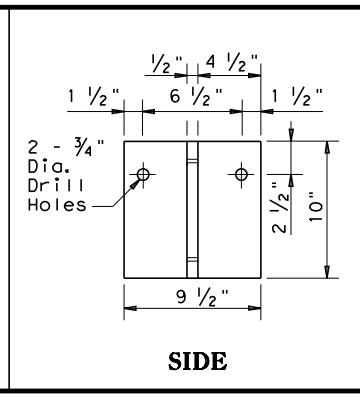
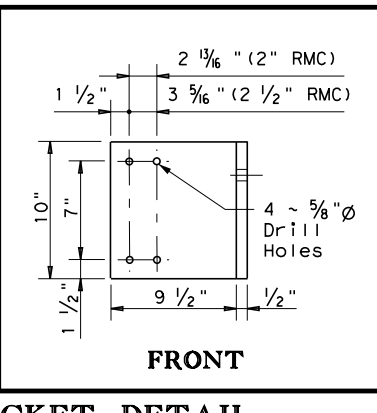
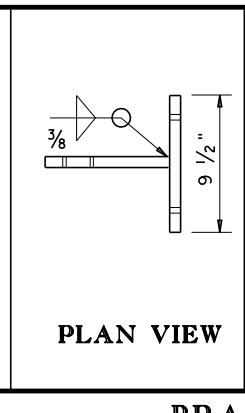
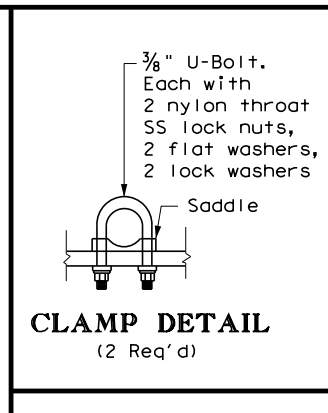
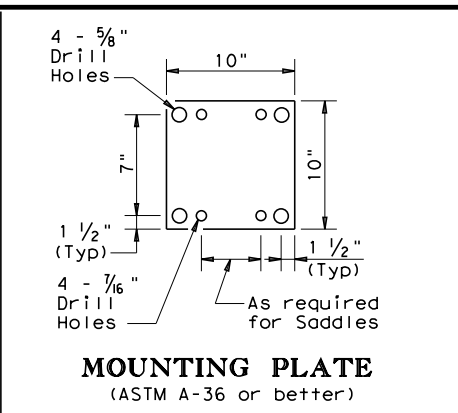
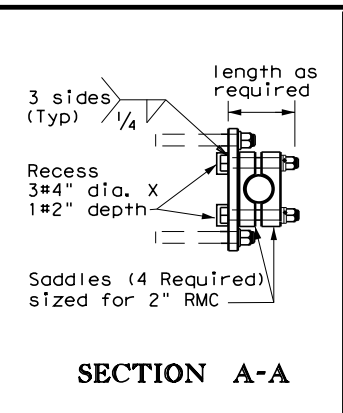
Texas Department of Transportation
 Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS (RDWY ILLUM FOUNDATIONS) RID(2)-20

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12-20				

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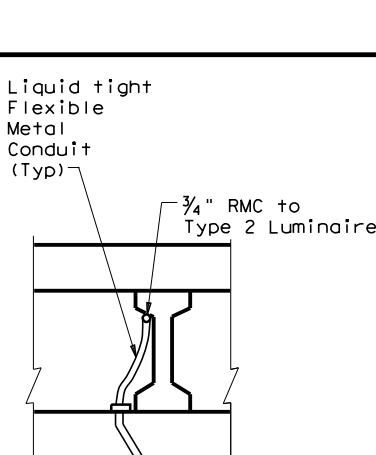
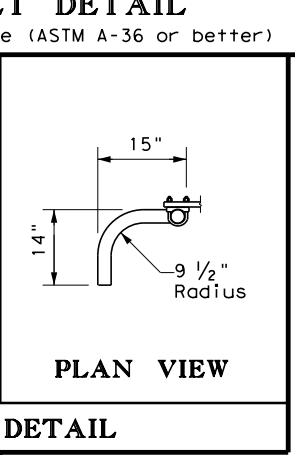
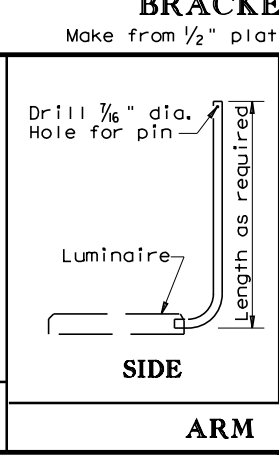
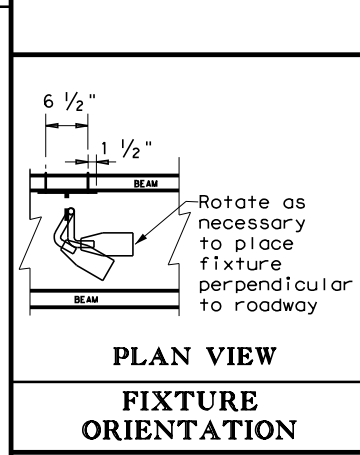
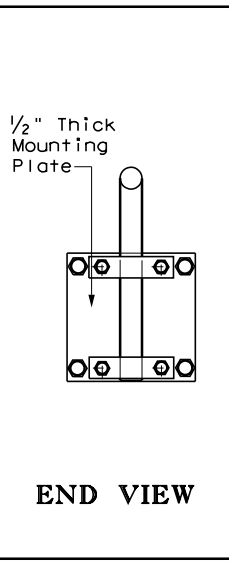
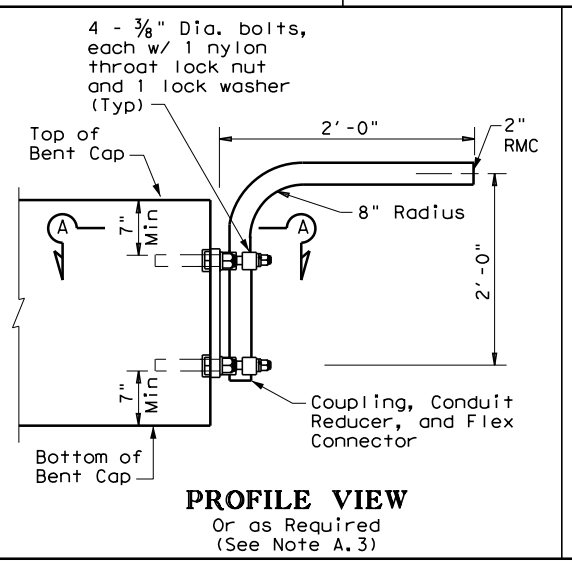
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GENERAL NOTES:

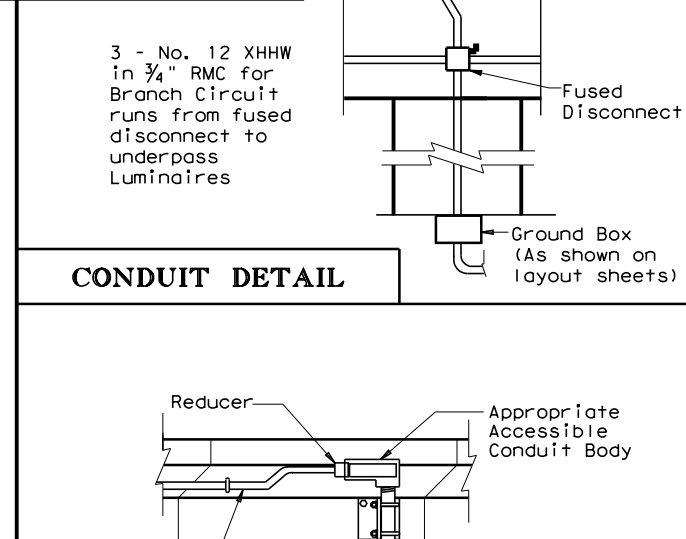
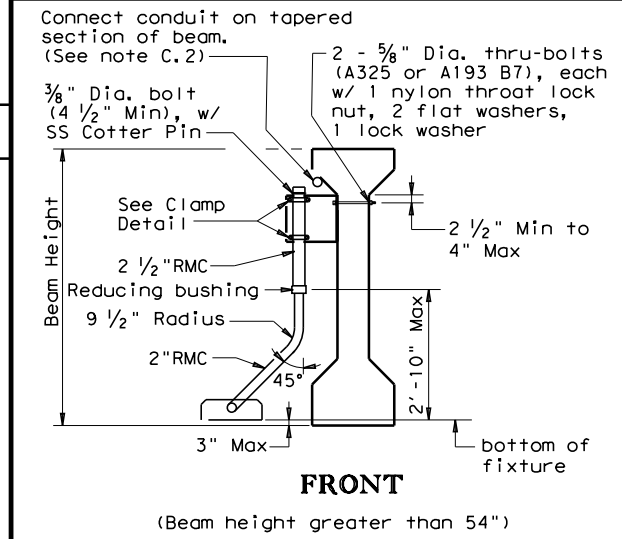
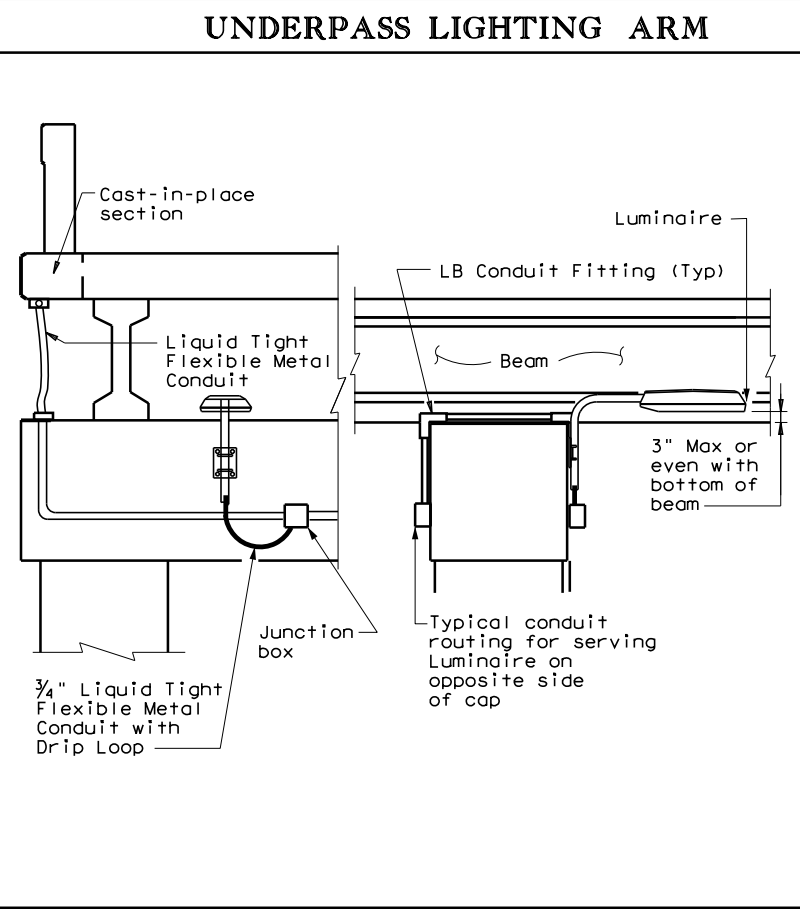
A. ALL 150 watt HPS and 150 watt equivalent LED Luminaires

- Luminaire locations, conduit and conductor sizes and routing are typical and diagrammatic only. See project layout sheets for specific details.
- 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.
- 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)
- Except as noted, galvanize all structural steel and exposed bolts, nuts, and washers in accordance with Item 445 "Galvanizing".
- Fabrication of brackets and support arms will not be paid for directly but is subsidiary to Item 610, "Roadway Illumination Assemblies."
- 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.
- 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.



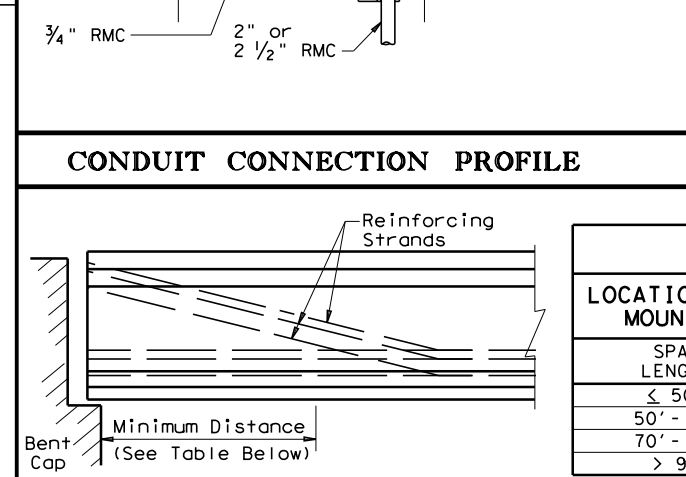
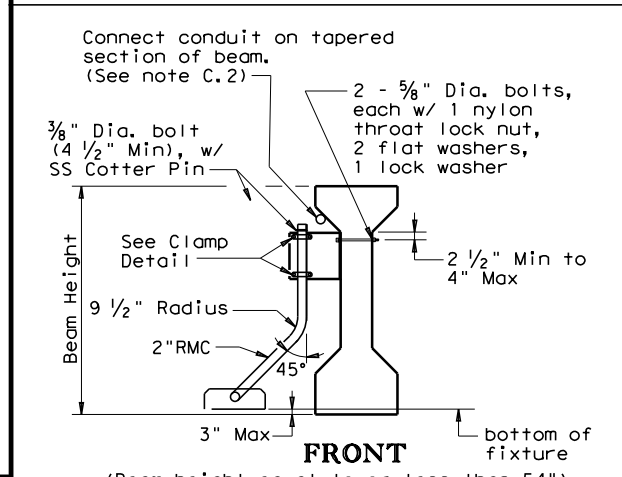
B. TYPE 1

- Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) for Type 1 arm shaft.
- 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.
- Attach conduit to plate with 4 saddles, four - 3/8 in. diameter bolts, nylon throat lock nuts, and lock washers.



C. TYPE 2

- 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.
- 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.
- 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.



SPAN LENGTH	MINIMUM DISTANCE
≤ 50'	10'-0"
50' - 70'	15'-0"
70' - 90'	20'-0"
> 90'	25'-0"

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

IN RD IL AM (U/P) (TY 2)
UNDERPASS LIGHTING TYPE 2

LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET

Texas Department of Transportation
ROADWAY ILLUMINATION DETAILS
 (UNDERPASS LIGHT FIXTURES)
RID(3)-20

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REVISIONS		COUNTY: WILLIAMSON		HIGHWAY: IH 35
2-14	7-17	DIST: AUS	SHEET NO.: 242	
12-20				

SHIPPING PARTS LIST - POLES AND LUMINAIRE ARMS

Nominal Mounting Ht. (ft)	Shoe Base					T-Base					CSB/SSCB Mounted				
	Designation				Quantity	Designation				Quantity	Designation				Quantity
	Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire	
20	(Type SA 20 S - 4)	(150W EQ)	LED			(Type SA 20 T - 4)	(150W EQ)	LED							
	(Type SA 20 S - 4 - 4)	(150W EQ)	LED			(Type SA 20 T - 4 - 4)	(150W EQ)	LED							
30	(Type SA 30 S - 4)	(250W EQ)	LED			(Type SA 30 T - 4)	(250W EQ)	LED				(Type SP 28 S - 4)	(250W EQ)	LED	
	(Type SA 30 S - 4 - 4)	(250W EQ)	LED			(Type SA 30 T - 4 - 4)	(250W EQ)	LED				(Type SP 28 S - 4 - 4)	(250W EQ)	LED	
	(Type SA 30 S - 8)	(250W EQ)	LED			(Type SA 30 T - 8)	(250W EQ)	LED				(Type SP 28 S - 8)	(250W EQ)	LED	
	(Type SA 30 S - 8 - 8)	(250W EQ)	LED			(Type SA 30 T - 8 - 8)	(250W EQ)	LED				(Type SP 28 S - 8 - 8)	(250W EQ)	LED	
40	(Type SA 40 S - 4)	(250W EQ)	LED			(Type SA 40 T - 4)	(250W EQ)	LED				(Type SP 38 S - 4)	(250W EQ)	LED	
	(Type SA 40 S - 4 - 4)	(250W EQ)	LED			(Type SA 40 T - 4 - 4)	(250W EQ)	LED				(Type SP 38 S - 4 - 4)	(250W EQ)	LED	
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	(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	
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	(Type SA 50 S - 12 - 12)	(400W EQ)	LED			(Type SA 50 T - 12 - 12)	(400W EQ)	LED				(Type SP 48 S - 12 - 12)	(400W EQ)	LED	

OTHER				
Designation				Quantity
Pole	A1	A2	Luminaire	

GENERAL NOTES:

- 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.
- 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.
- 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.
- 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.
 - 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.
 - 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.
 - 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.
 - Anchor Bolt Assembly. Anchor bolt assemblies for optionally designed poles shall be the same as those shown herein.
- Aluminum Pole Designs. Aluminum pole designs may be allowed, if aluminum poles are permitted or required, pending approval by the Department as outlined below.
 - Meet all of the requirements stated above for optional steel pole designs and the following:
 - Aluminum poles shall be fabricated in accordance with "Structural Welding Code-Aluminum" AWS D1.2.
 - 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.
 - Aluminum poles shall be equipped with vibration mitigation devices, as approved by the engineer.
 - 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.
- Special Designs. Poles with architectural treatments shall meet the requirements shown elsewhere in the plans.
- 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)

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Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

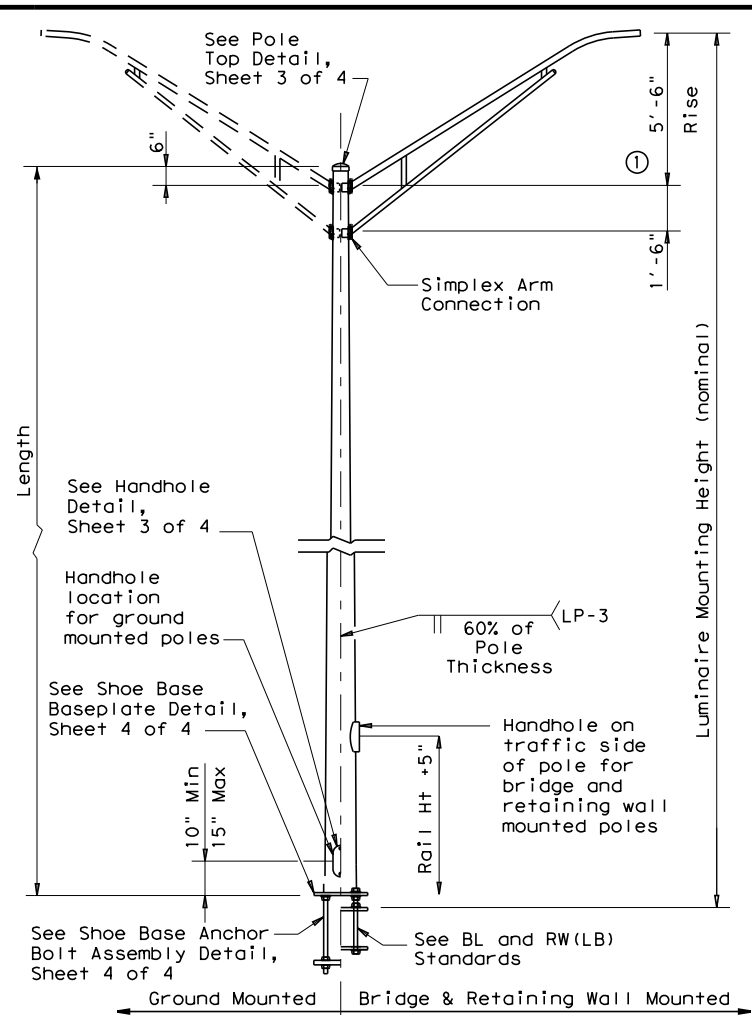
RIP(1) - 19

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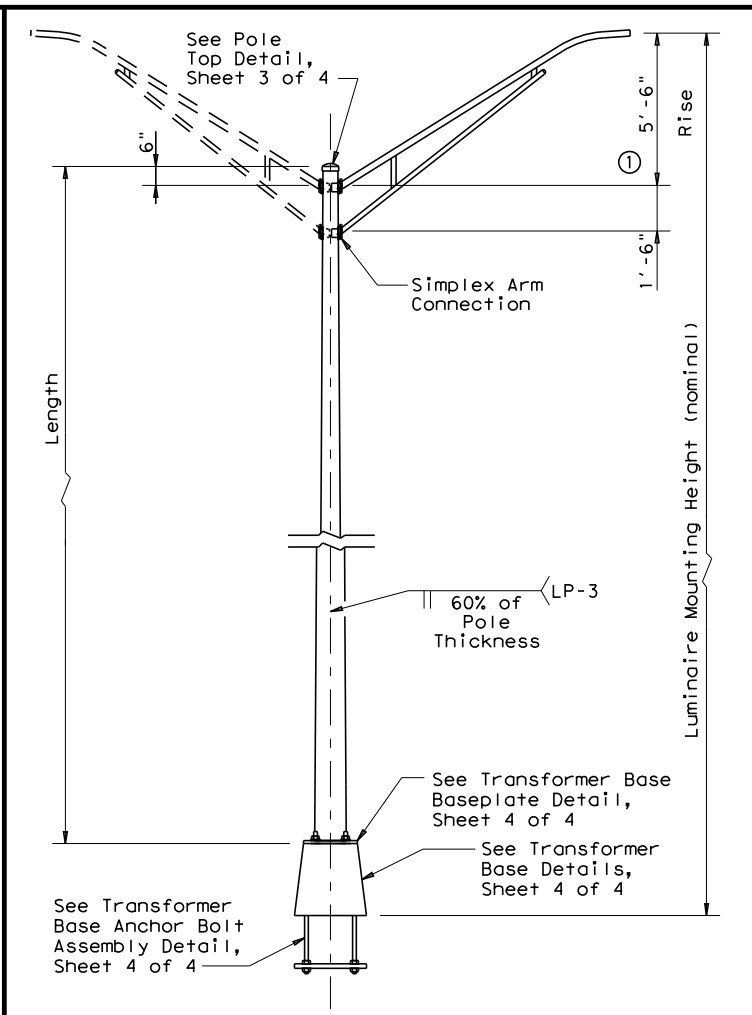
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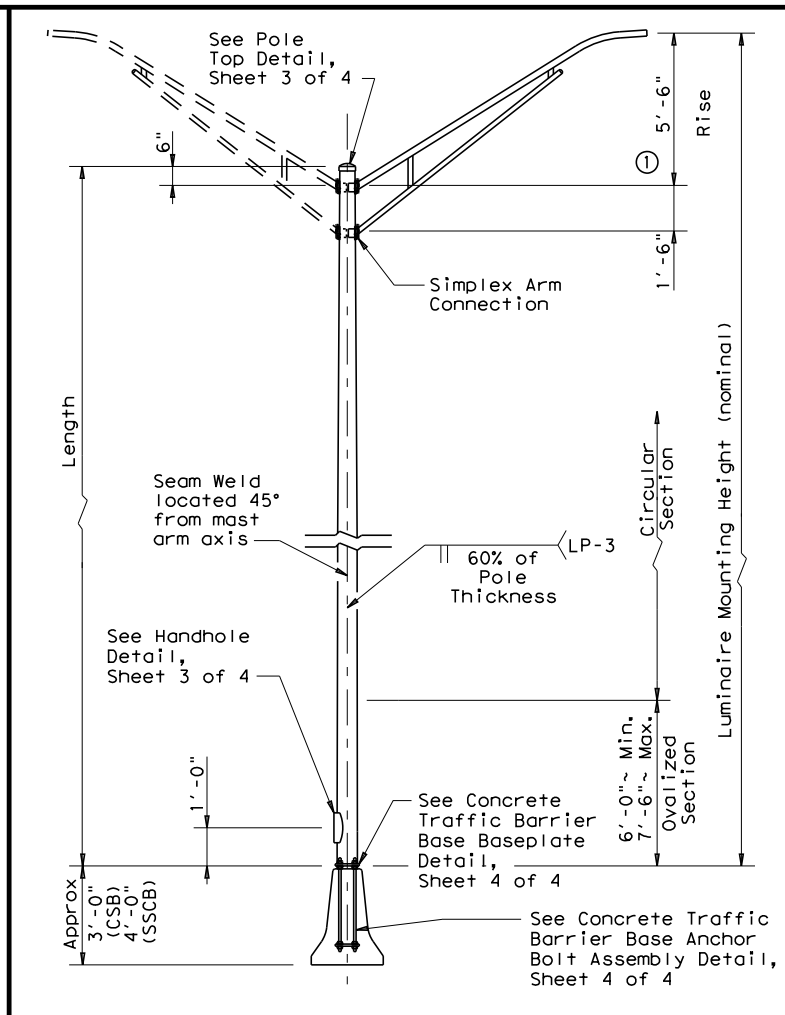
SHOE BASE POLE

SHOE BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	4.90	15.00	0.1196	7.1
30.00	7.50	4.00	25.00	0.1196	13.2
31.00-39.00	8.00	4.36-3.24	26.00-34.00	0.1196	20.7
40.00	8.50	3.60	35.00	0.1196	20.7
50.00	10.50	4.20	45.00	0.1196	30.3



TRANSFORMER BASE POLE

TRANSFORMER BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	5.11	13.50	0.1196	7.1
30.00	7.50	4.21	23.50	0.1196	13.2
31.00-39.00	8.00	4.57-3.45	24.50-32.50	0.1196	20.7
40.00	8.50	3.81	33.50	0.1196	20.7
50.00	10.00	3.91	43.50	0.1196	30.3



CONCRETE TRAFFIC BARRIER BASE POLE

CONCRETE TRAFFIC BARRIER BASE POLE (CSB/SSCB)						
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)	
					About C 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

GENERAL NOTES:

- 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.
- 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.
- 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.
- For mounting heights between values shown in the tables, use base diameter and thickness values for the larger height.
- Unless otherwise noted, all steel parts shall be galvanized in accordance with Item 445, "Galvanizing."
- 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.
- 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.
- Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
- Lubricate and tighten anchor bolts, when erecting shoe base poles and concrete traffic barrier base poles, in accordance with Item 449, "Anchor Bolts."
- 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.
- 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."
- 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.
- Erect transformer base poles in accordance with sheet RID(1).

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:

- 2'-6" rise for 4 ft. luminaire arms.
- Before ovalized as shown on Concrete Traffic Barrier Base Baseplate details, Sheet 4 of 4.
- 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"

SHEET 2 OF 4

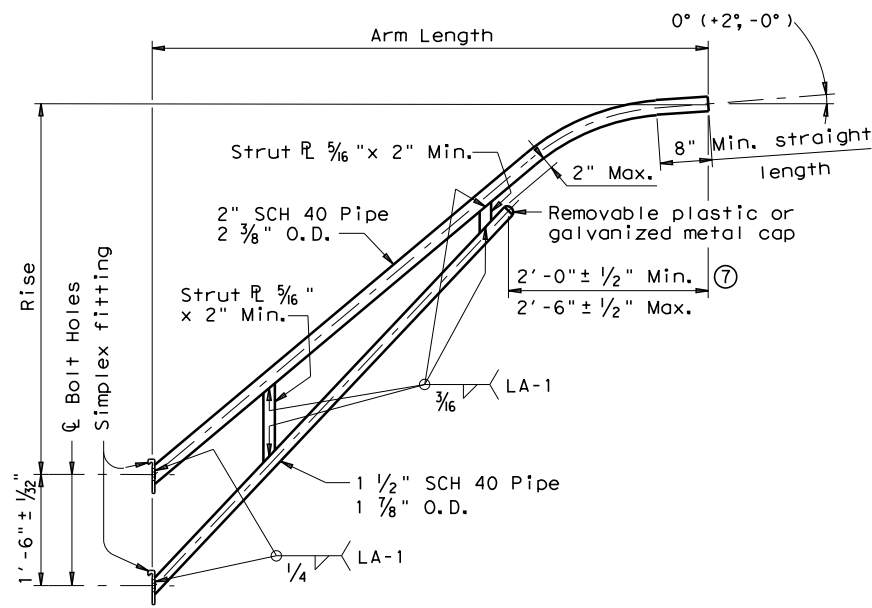


**ROADWAY ILLUMINATION POLES
 RIP(2) - 19**

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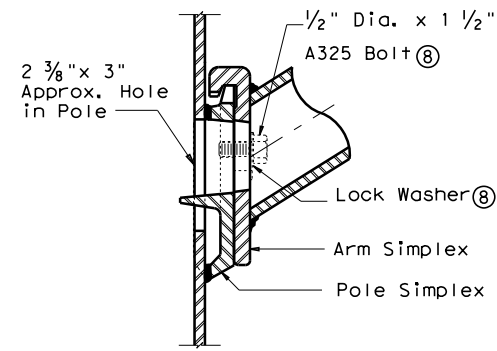
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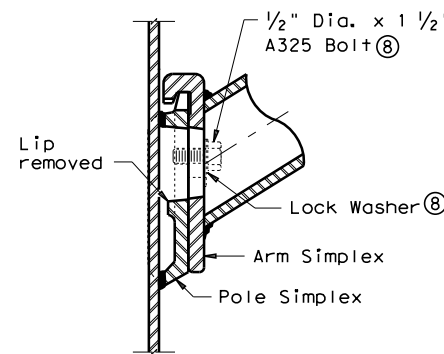
LUMINAIRE ARM

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"

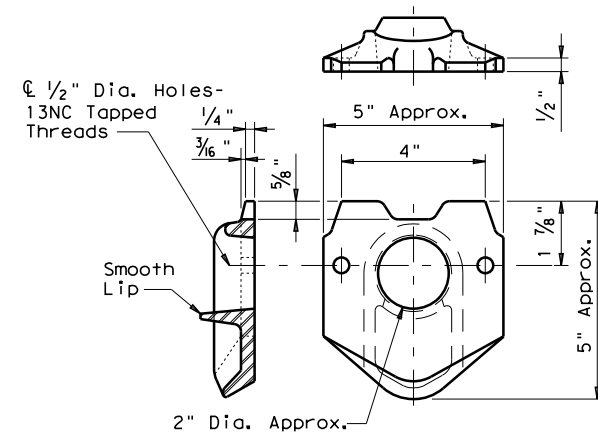
ARM ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Arm Length	±1"
Arm Rise	±1"
Deviation from flat	1/8" in 12"
Spacing between holes	±1/32"



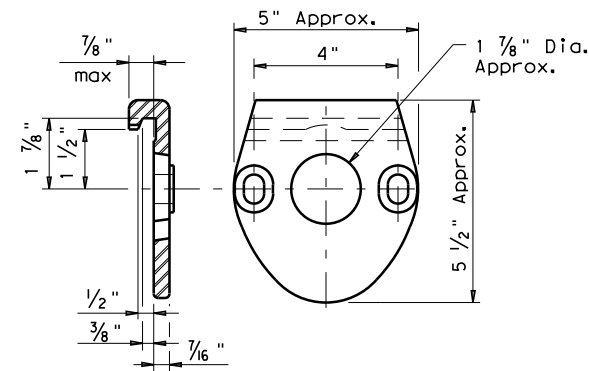
UPPER SIMPLEX FITTING
(Gusset not shown for clarity)



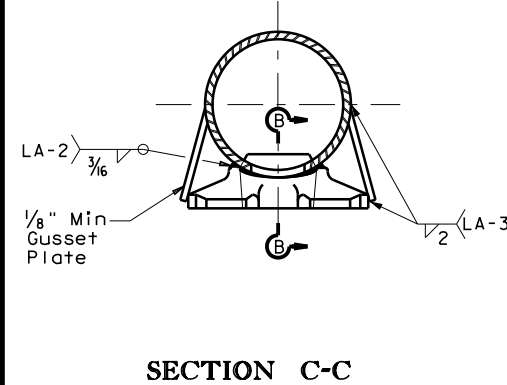
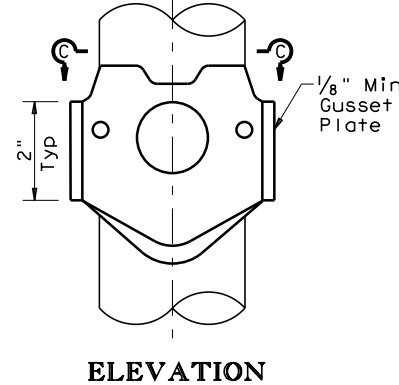
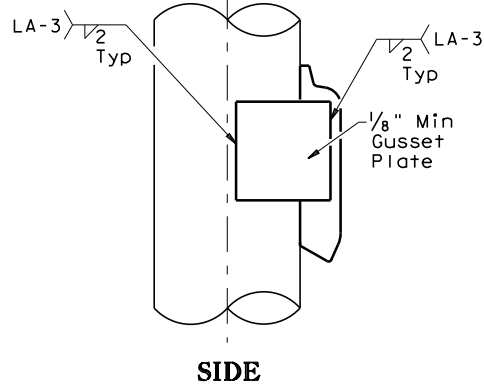
LOWER SIMPLEX FITTING
(Gusset not shown for clarity)
SECTION B-B



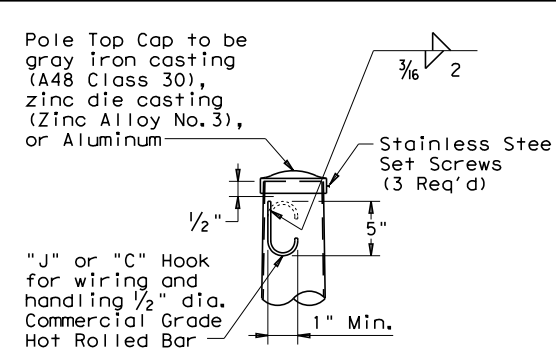
POLE SIMPLEX DETAIL ③



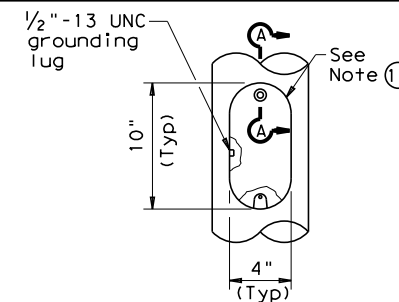
ARM SIMPLEX DETAIL ③



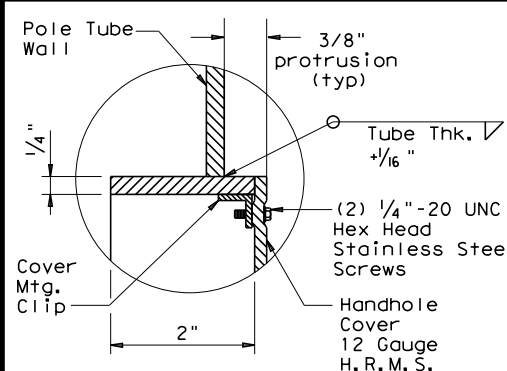
SIMPLEX ATTACHMENT DETAIL



POLE TOP



ELEVATION



SECTION A-A

HANDHOLE

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

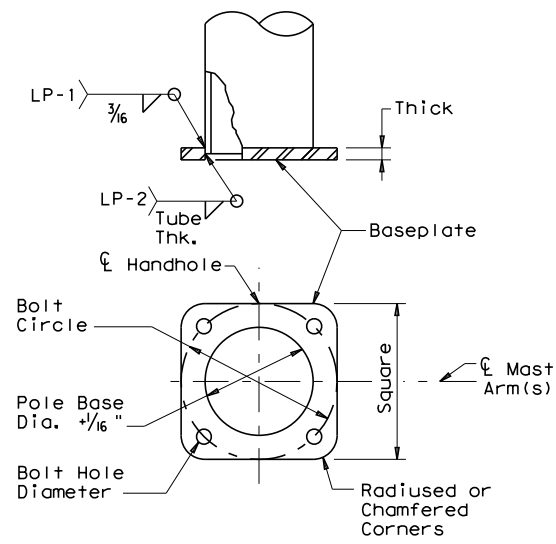
SHEET 3 OF 4



ROADWAY ILLUMINATION POLES
RIP(3) - 19

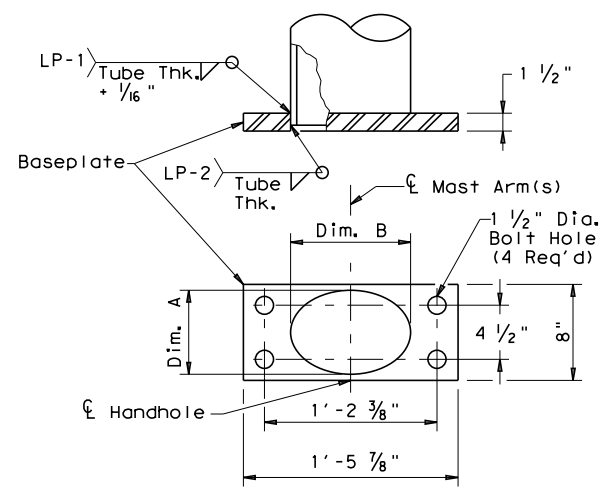
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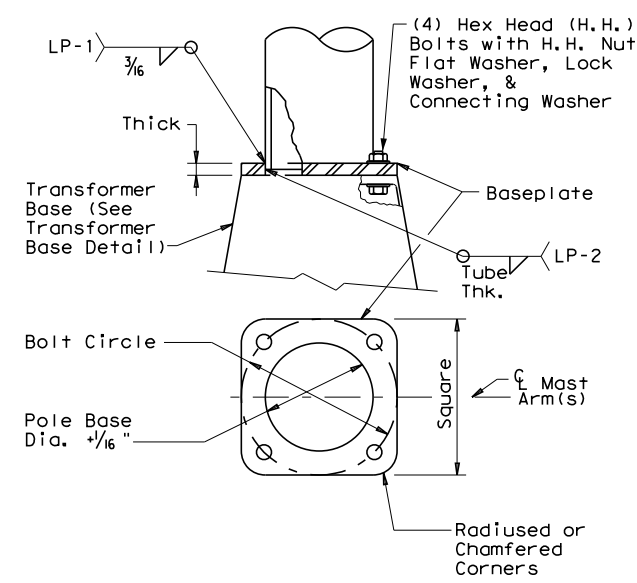
SHOE BASE BASEPLATE

SHOE BASE BASEPLATE TABLE				
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	BOLT HOLE DIAMETER
20' - 39'	13"	13"	1 1/4"	1 1/4"
40'	15"	15"	1 1/4"	1 1/2"
50'	15"	15"	1 1/2"	1 1/2"



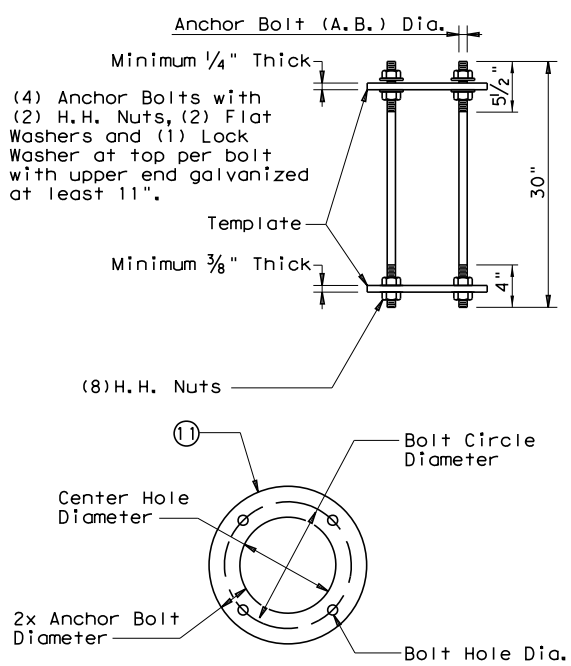
CONCRETE TRAFFIC BARRIER BASE BASEPLATE

CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA. (12)	DIM. A	DIM. B
28' - 38'	9"	7" ± 1/4"	10" ± 1/4"
48'	10 1/2"	7" ± 1/4"	13" ± 1/4"



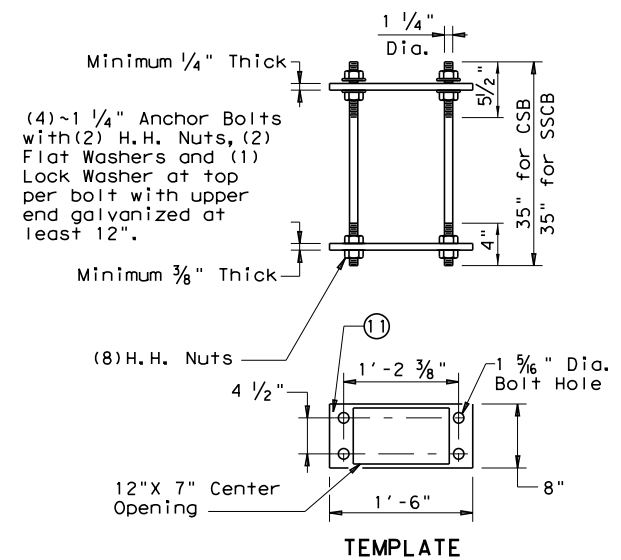
TRANSFORMER BASE BASEPLATE

TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFORMER BASE TYPE
20' - 39'	13"	13"	1 1/4"	1"	1 1/4"	A
40'	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50'	15"	15"	1 1/2"	1 1/4"	1 1/2"	B



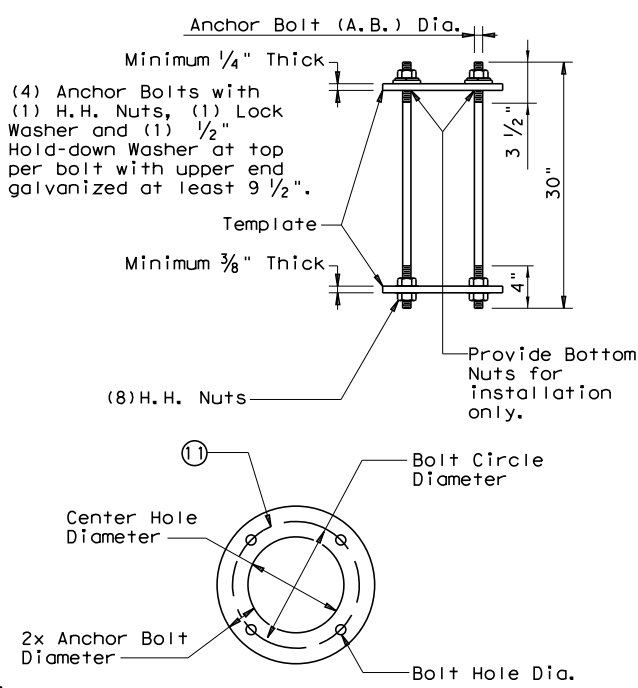
SHOE BASE ANCHOR BOLT ASSEMBLY

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"



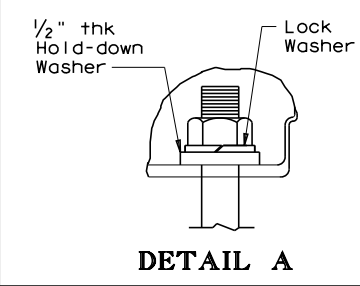
CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

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"

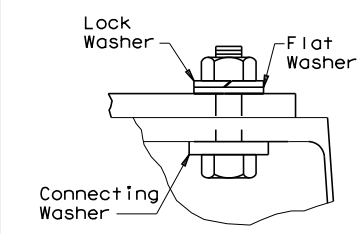


TRANSFORMER BASE ANCHOR BOLT ASSEMBLY

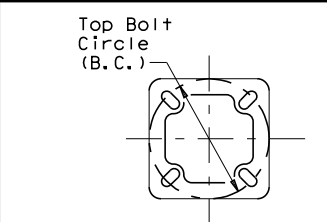
TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



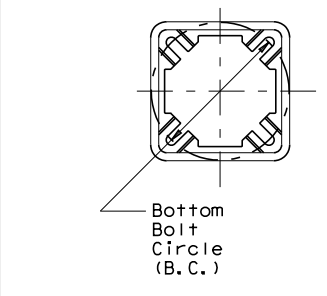
DETAIL A



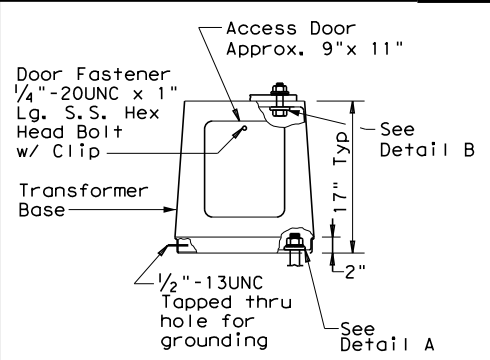
DETAIL B



TOP PLAN



BOTTOM PLAN



ELEVATION

TRANSFORMER BASE DETAILS

GENERAL NOTES:

- For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
- 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.
- 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.
- 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.
- 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:

- Anchor Bolt Templates do not need to be galvanized.
- Pole diameter before ovalized.

ANCHOR BOLT FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"



**ROADWAY ILLUMINATION POLES
RIP(4)-19**

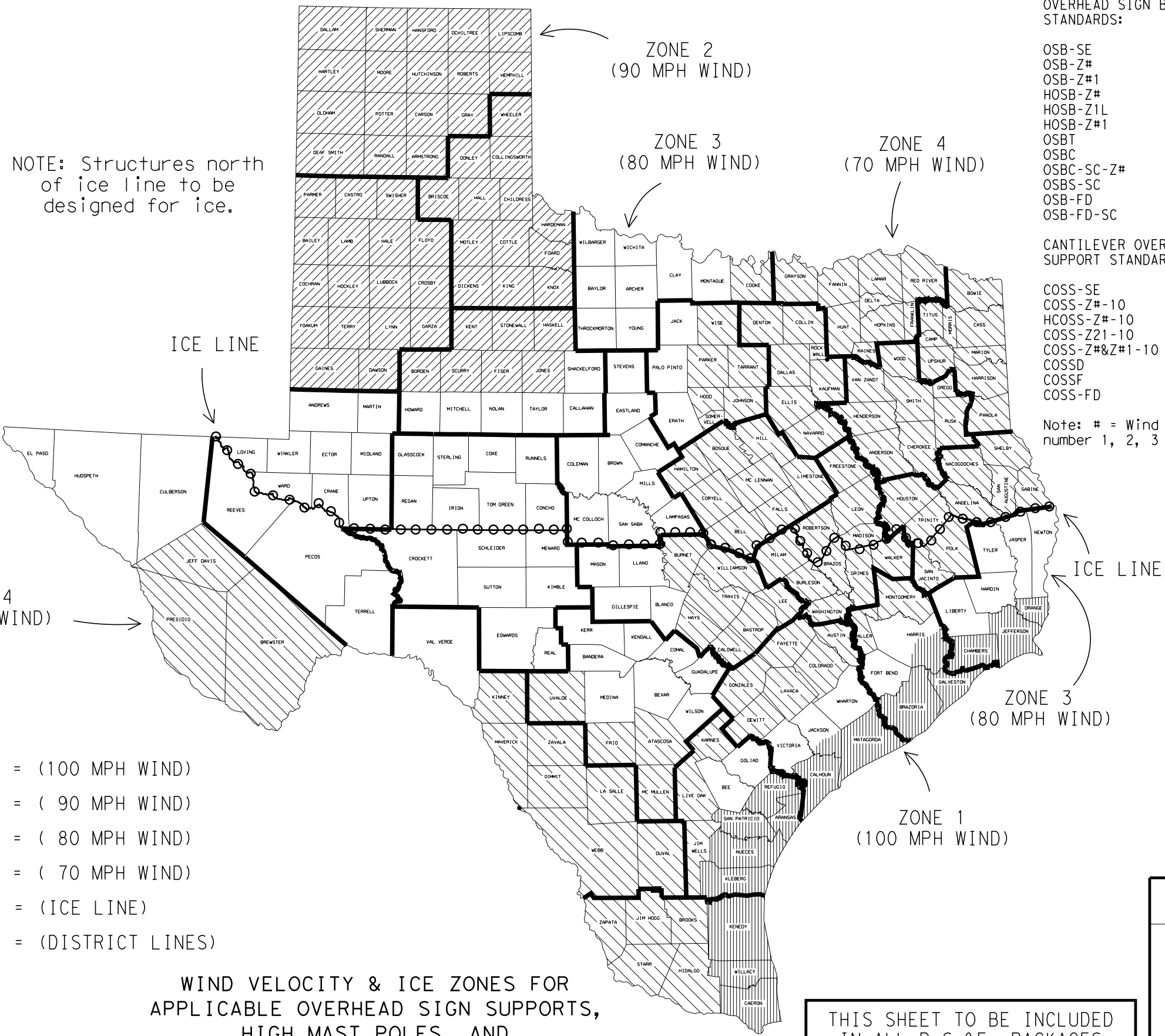
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©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
7-17	DIST	COUNTY	SHEET NO.	
12-19	AUS	WILLIAMSON	246	

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: 7/2/2021 10:00:13 PM
 FILE: c:\bms\br i dget\farmer-pw\manson.dms\03725\037403-w&i-z-14.dgn

APPLICABLE STANDARDS SHEETS

- OVERHEAD SIGN BRIDGE STANDARDS:
 OSB-SE
 OSB-Z#
 OSB-Z#1
 HOSB-Z#
 HOSB-Z1L
 HOSB-Z#1
 OSBT
 OSBC
 OSBC-SC-Z#
 OSBS-SC
 OSB-FD
 OSB-FD-SC
- HIGH MAST ILLUMINATION POLE STANDARDS:
 HMIP-98
 HMIF-98
- WALKWAYS AND BRACKETS STANDARDS:
 SWW
 SB(SWL-1)
- TRAFFIC SIGNAL POLE STANDARDS:
 SP-80
 SP-100
 SMA-80
 SMA-100
 DMA-80
 DMA-100
 MA-C
 MAC (ILSN)
 MAD-D
 TS-FD
 LUM-A
 CFA
 LMA
 TS-C
 MA-DPD
- CANTILEVER OVERHEAD SIGN SUPPORT STANDARDS:
 COSS-SE
 COSS-Z#-10
 HCOSS-Z#-10
 COSS-Z21-10
 COSS-Z#&Z#1-10
 COSSD
 COSSF
 COSS-FD
- Note: # = Wind Zone number 1, 2, 3 or 4



NOTE: Structures north of ice line to be designed for ice.

LEGEND

- ZONE 1 - [diagonal lines] = (100 MPH WIND)
- ZONE 2 - [diagonal lines] = (90 MPH WIND)
- ZONE 3 - [white box] = (80 MPH WIND)
- ZONE 4 - [diagonal lines] = (70 MPH WIND)
- [dashed line with circles] = (ICE LINE)
- [solid black line] = (DISTRICT LINES)

WIND VELOCITY & ICE ZONES FOR APPLICABLE OVERHEAD SIGN SUPPORTS, HIGH MAST POLES, AND TRAFFIC SIGNAL POLES

Based on 50 Year Mean Recurrence Interval of Fastest Mile Wind Velocity at 33 feet height.

THIS SHEET TO BE INCLUDED IN ALL P.S.&E. PACKAGES CONTAINING ONE OR MORE OF THE APPLICABLE STANDARD SHEETS LISTED HEREON

FOR HARRIS CO. ONLY
 Zone line is just North of US 90, around on the North, West and South sides of IH 610 and down the West side of SH 288.

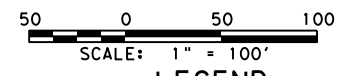
FOR JACKSON CO. ONLY
 Zone line is just North of SH 616.

		Traffic Operations Division Standard	
<h2>WIND VELOCITY AND ICE ZONES</h2> <h3>WV & IZ-14</h3>			
FILE:	windice.dgn	DN: TxDOT	CK: TxDOT
© TxDOT	April 1996	CONT SECT	JOB HIGHWAY
REVISIONS	0015	09	194 IH 35
8-14-Added list of applicable standards, restricting use to structures designed for Fastest Mile wind speeds.		DIST	COUNTY SHEET NO.
		AUS	WILLIAMSON 247

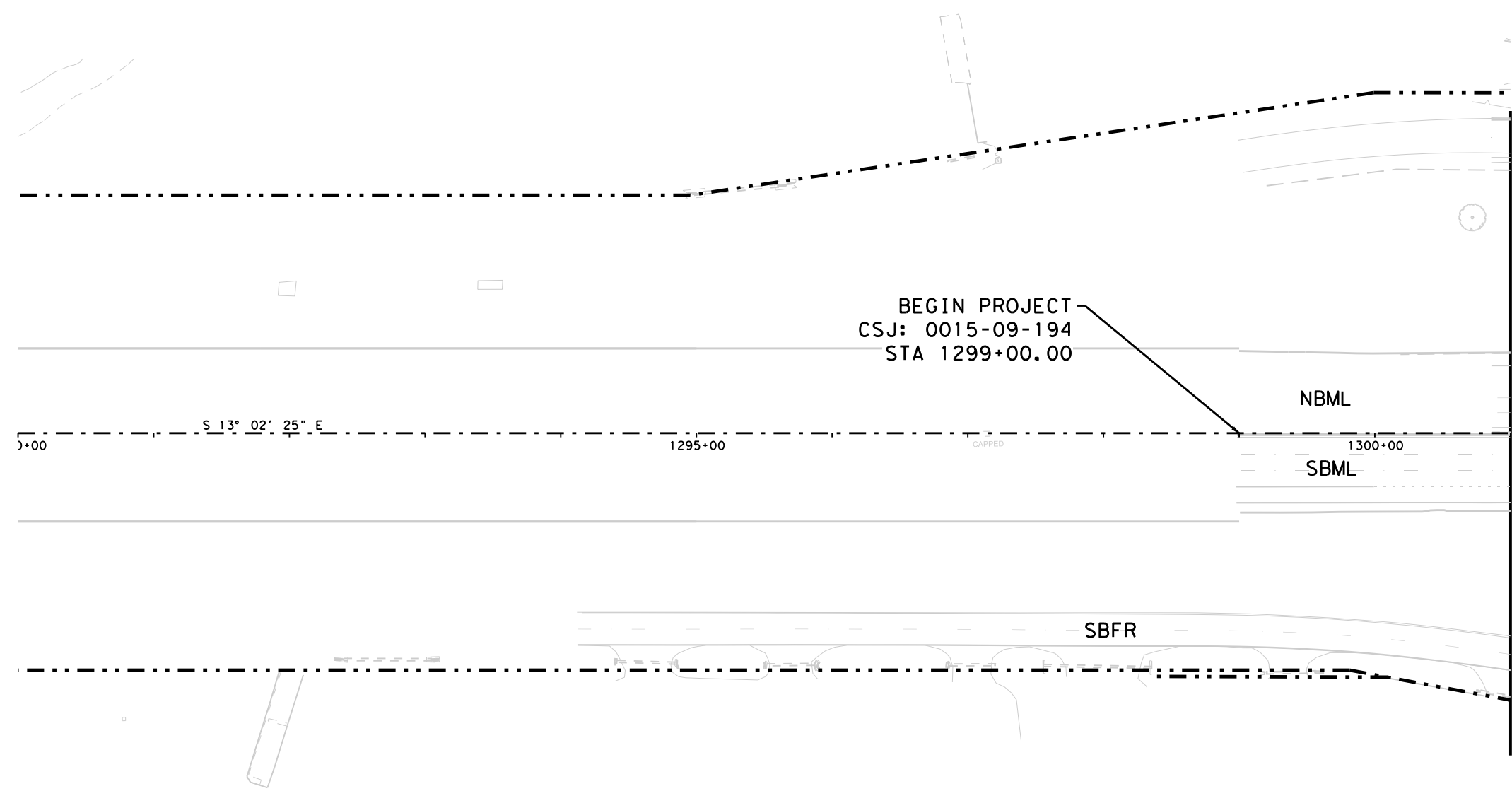
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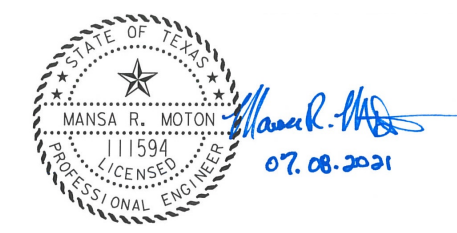


- LEGEND**
- (A) REF PM W/RET REQ TY I (W) (6") (BRK)
 - (B) REF PROF PAV MRK TY I (W) (6") (SLD)
 - (C) REF PAV MRK TY I (W) (8") (SLD)
 - (D) REF PAV MRK TY I (W) (12") (DOT)
 - (E) REF PAV MRK TY I (W) (12") (SLD)
 - (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
 - (H) REF PAV MRK TY I (W) (WORD)
 - (I) REF PAV MRK TY I (W) (ARROW)
 - (J) REF PAV MRKR TY II-C-R
 - (K) REF PM W/RET REQ TY I (W) (4") (BRK)
 - (L) REF PM W/RET REQ TY I (W) (4") (SLD)
 - (M) REF PM W/RET REQ TY I (Y) (4") (SLD)
 - (N) REF PAV MRKR TY I-R
 - (X) PROPOSED SMALL SIGN AND NUMBER
 - [X] PROPOSED LARGE SIGN AND NUMBER
 - ⊖ POST MOUNTED SIGN
 - ▭ OVERHEAD SIGN STRUCTURE
 - ☉ DEL ASSEM (D-DY) (CTB) (BI)
 - ▨ DEL ASSEM (D-SW) (GF2)



NOTES:

1. REFER TO FPM STANDARDS FOR INFORMATION NOT SHOWN.
2. REFER TO D&OM STANDARDS FOR INFORMATION NOT SHOWN.
3. REF PAV MRKR TY II-C-R SHALL BE INSTALLED AT 40' CENTER TO CENTER (C-C) ALONG REF PM W/RET REQ TY I (W) (6") (BRK)
4. DEL ASSEM SHALL BE INSTALLED AT 50' SPACING ALONG BARRIER/MBGF.
5. REF PAV MRKR TY I-R SHALL BE INSTALLED IN ACCORDANCE WITH THE WRONG WAY ARROW DETAIL, TXDOT STD FPM(1)-12



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264



IH 35
SIGNING & PAVEMENT MARKING PLAN
STA 1299+00 TO 1301+00

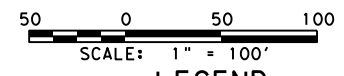
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DS:	MM	AR	0015	09	194	IH 35
DW:	MH	MM	AUS	WILLIAMSON	248	

7:58:24 PM

br:igepw011cs0748/2021

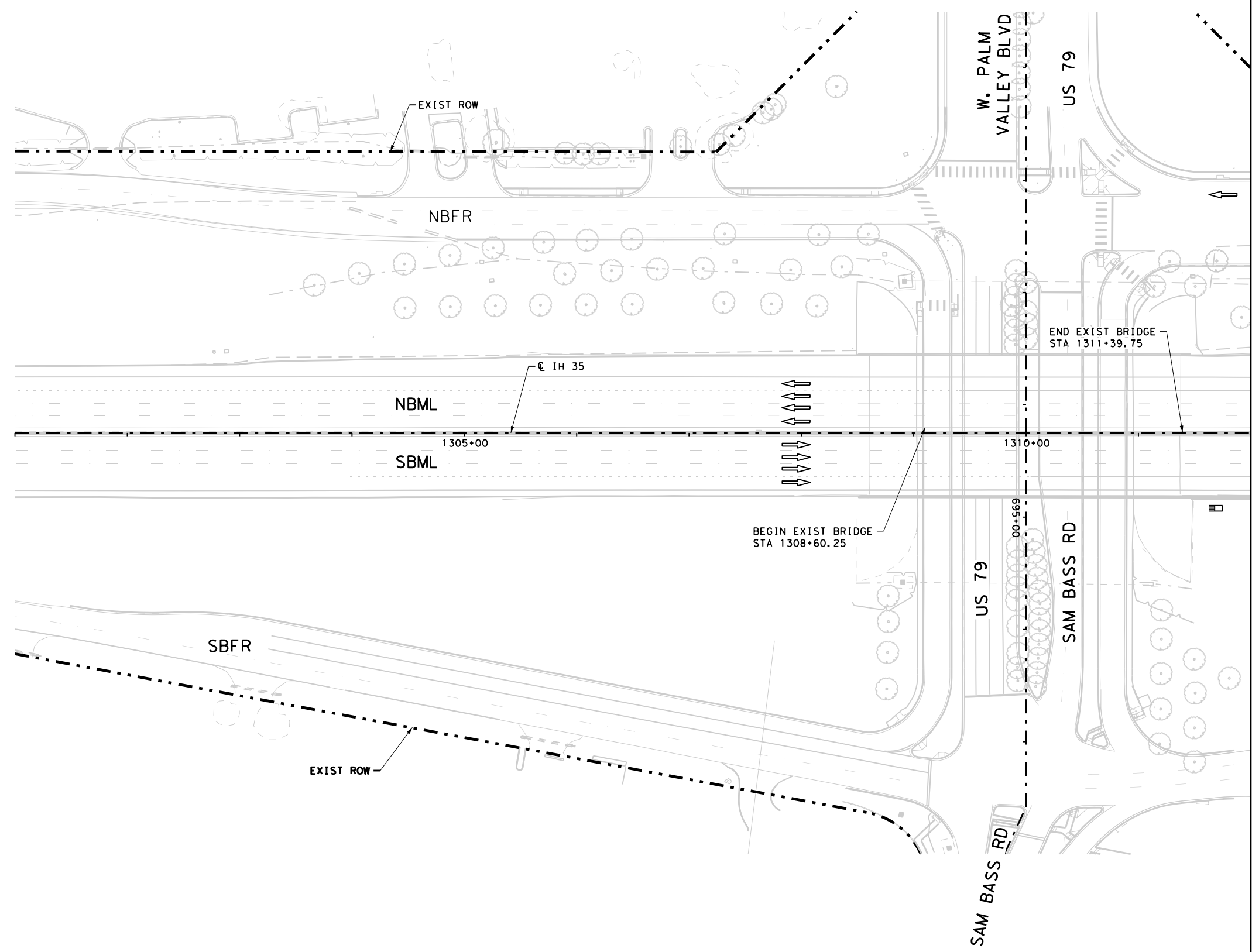
...3723_3\037403-si gn-PMRK-02_.dgn



- LEGEND**
- (A) REF PM W/RET REQ TY I (W) (6") (BRK)
 - (B) REF PROF PAV MRK TY I (W) (6") (SLD)
 - (C) REF PAV MRK TY I (W) (8") (SLD)
 - (D) REF PAV MRK TY I (W) (12") (DOT)
 - (E) REF PAV MRK TY I (W) (12") (SLD)
 - (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
 - (H) REF PAV MRK TY I (W) (WORD)
 - (I) REF PAV MRK TY I (W) (ARROW)
 - (J) REF PAV MRKR TY II-C-R
 - (K) REF PM W/RET REQ TY I (W) (4") (BRK)
 - (L) REF PM W/RET REQ TY I (W) (4") (SLD)
 - (M) REF PM W/RET REQ TY I (Y) (4") (SLD)
 - (N) REF PAV MRKR TY I-R
 - (X) PROPOSED SMALL SIGN AND NUMBER
 - (X) PROPOSED LARGE SIGN AND NUMBER
 - ⊕ POST MOUNTED SIGN
 - ▭ OVERHEAD SIGN STRUCTURE
 - ☀ DEL ASSEM (D-DY) (CTB) (BI)
 - ▨ DEL ASSEM (D-SW) (GF2)

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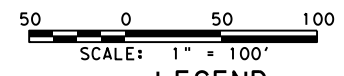
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CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

IH 35
SIGNING & PAVEMENT
MARKING PLAN
STA 1301+00 TO 1312+00

SCALE: 1" = 100' SHEET 2 OF 13

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	AR	0015	09	194	IH 35
DW:	CK:	DIST		COUNTY	SHEET NO.
MH	MM	AUS		WILLIAMSON	249



- LEGEND**
- (A) REF PM W/RET REQ TY I (W) (6") (BRK)
 - (B) REF PROF PAV MRK TY I (W) (6") (SLD)
 - (C) REF PAV MRK TY I (W) (8") (SLD)
 - (D) REF PAV MRK TY I (W) (12") (DOT)
 - (E) REF PAV MRK TY I (W) (12") (SLD)
 - (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
 - (H) REF PAV MRK TY I (W) (WORD)
 - (I) REF PAV MRK TY I (W) (ARROW)
 - (J) REF PAV MRKR TY II-C-R
 - (K) REF PM W/RET REQ TY I (W) (4") (BRK)
 - (L) REF PM W/RET REQ TY I (W) (4") (SLD)
 - (M) REF PM W/RET REQ TY I (Y) (4") (SLD)
 - (N) REF PAV MRKR TY I-R
 - (X) PROPOSED SMALL SIGN AND NUMBER
 - (X) PROPOSED LARGE SIGN AND NUMBER
 - ⊕ POST MOUNTED SIGN
 - ▭ OVERHEAD SIGN STRUCTURE
 - ☀ DEL ASSEM (D-DY) (CTB) (BI)
 - ▨ DEL ASSEM (D-SW) (GF2)

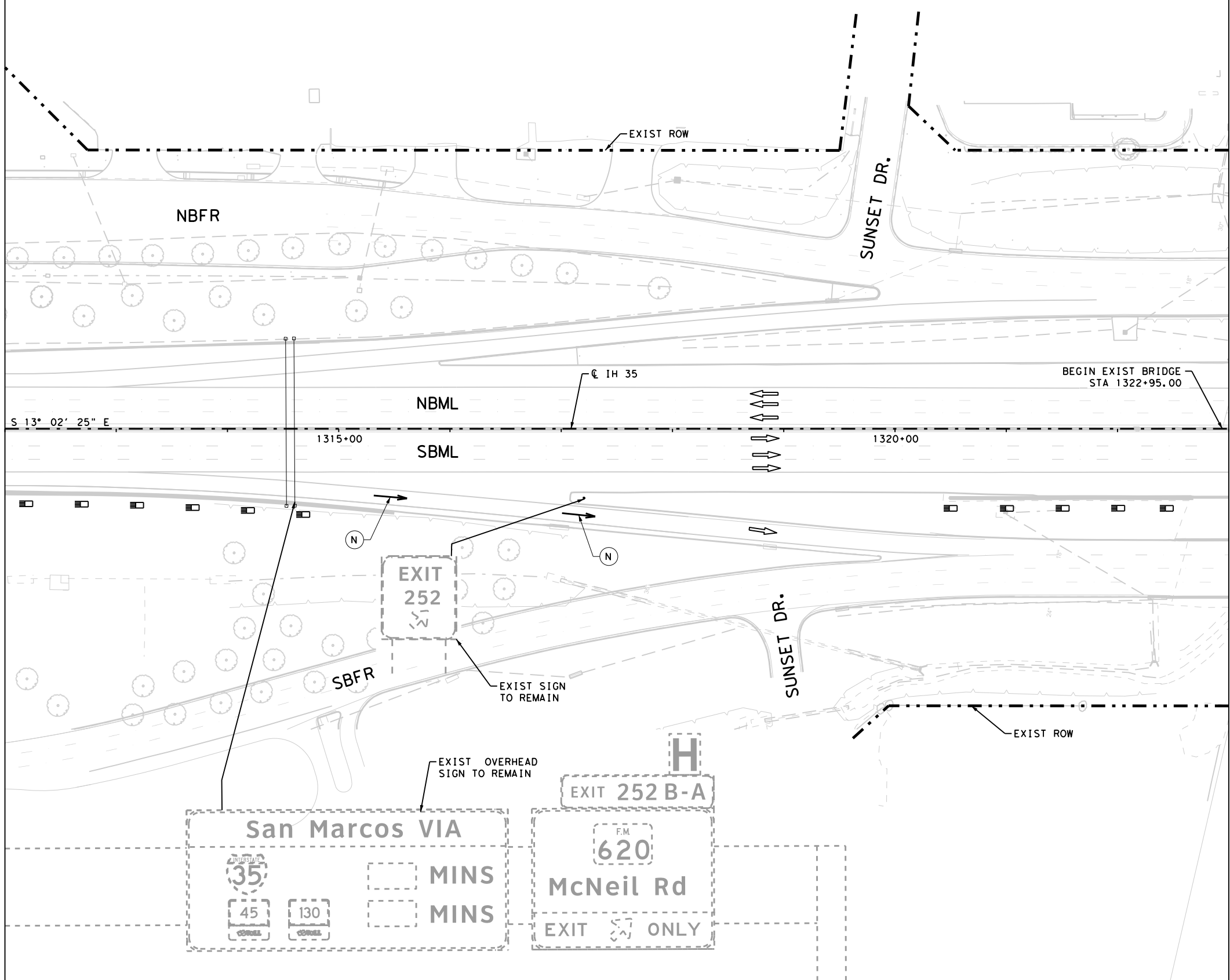
NOTES:

1. REFER TO FPM STANDARDS FOR INFORMATION NOT SHOWN.
2. REFER TO D&OM STANDARDS FOR INFORMATION NOT SHOWN.
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4. DEL ASSEM SHALL BE INSTALLED AT 50' SPACING ALONG BARRIER/MBGF.
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MATCH LINE STA 1312+00

MATCH LINE STA 1323+00



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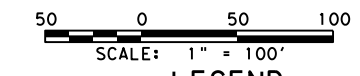
IH 35
SIGNING & PAVEMENT MARKING PLAN
STA 1312+00 TO 1323+00

SCALE: 1" = 100' SHEET 3 OF 13

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	AR	0015	09	194	IH 35
DW:	CK:	DIST		COUNTY	SHEET NO.
MH	MM	AUS		WILLIAMSON	250

br:dgpepw011cs0748/2021

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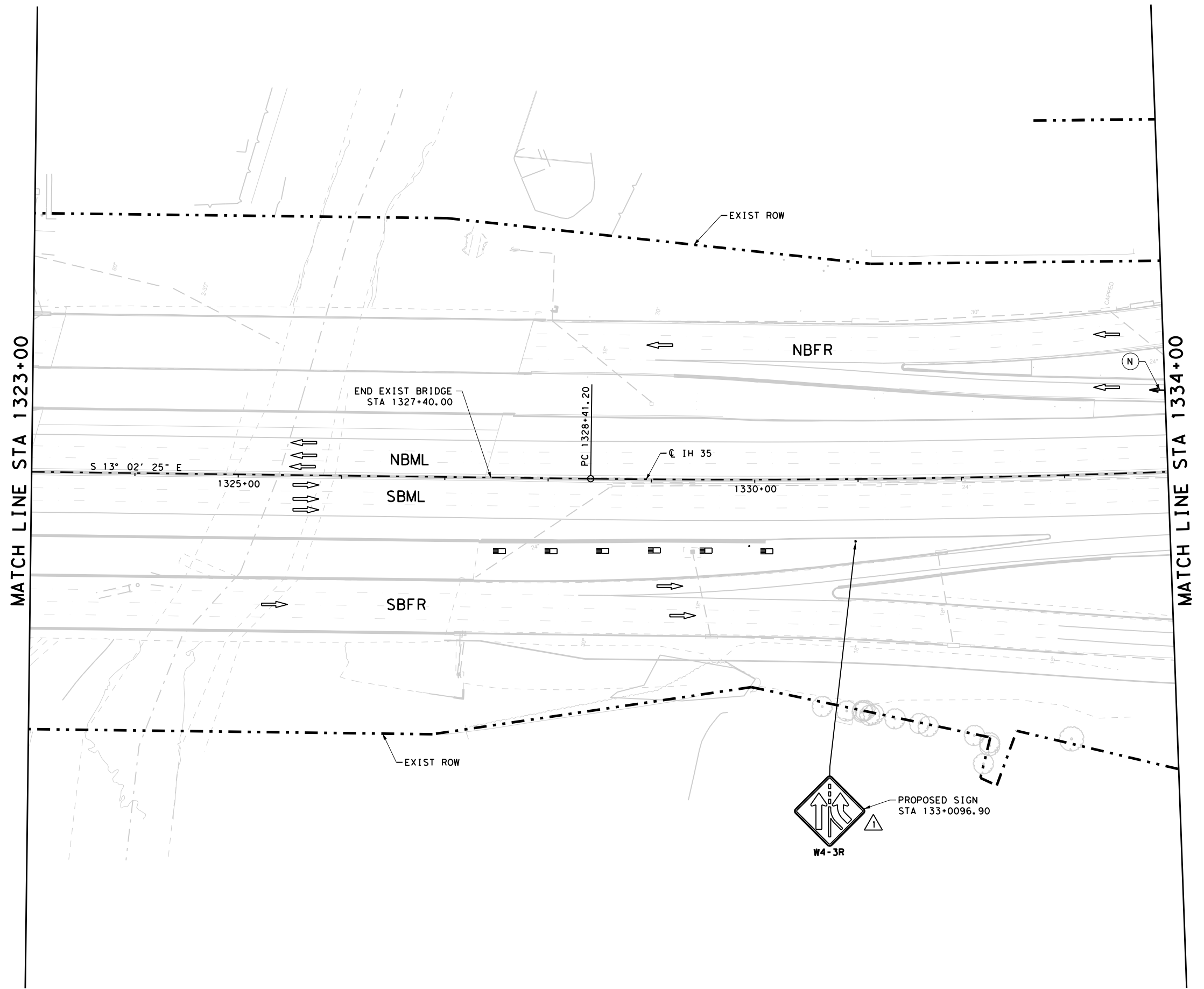
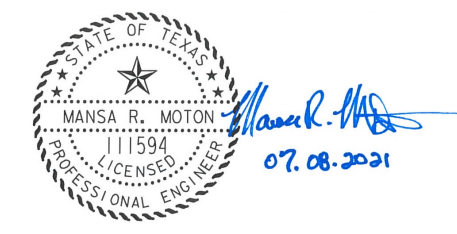


LEGEND

- (A) REF PM W/RET REQ TY I(W) (6") (BRK)
- (B) REF PROF PAV MRK TY I (W) (6") (SLD)
- (C) REF PAV MRK TY I (W) (8") (SLD)
- (D) REF PAV MRK TY I (W) (12") (DOT)
- (E) REF PAV MRK TY I (W) (12") (SLD)
- (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
- (H) REF PAV MRK TY I (W) (WORD)
- (I) REF PAV MRK TY I (W) (ARROW)
- (J) REF PAV MRKR TY II-C-R
- (K) REF PM W/RET REQ TY I(W) (4") (BRK)
- (L) REF PM W/RET REQ TY I(W) (4") (SLD)
- (M) REF PM W/RET REQ TY I(Y) (4") (SLD)
- (N) REF PAV MRKR TY I-R
- (X) PROPOSED SMALL SIGN AND NUMBER
- (X) PROPOSED LARGE SIGN AND NUMBER
- ⊕ POST MOUNTED SIGN
- ▭ OVERHEAD SIGN STRUCTURE
- ☀ DEL ASSEM (D-DY) (CTB) (BI)
- ▨ DEL ASSEM (D-SW) (GF2)

NOTES:

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2. REFER TO D&OM STANDARDS FOR INFORMATION NOT SHOWN.
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BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

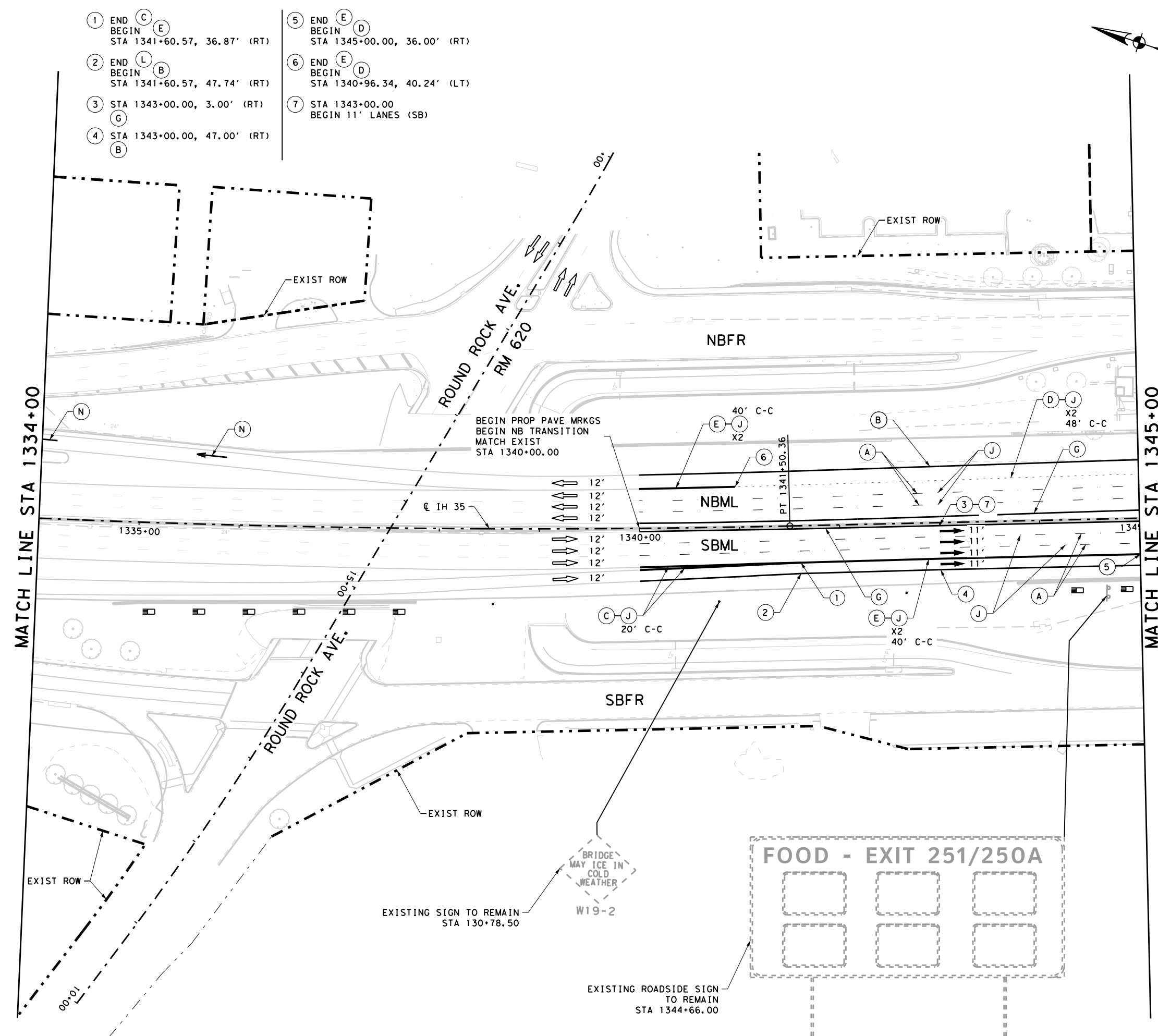
IH 35
SIGNING & PAVEMENT MARKING PLAN
STA 1323+00 TO 1334+00

SCALE: 1" = 100' SHEET 4 OF 13

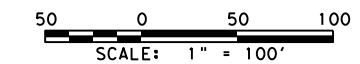
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DW:	MH	CK:	MM	AUS	WILLIAMSON		251

8:01:52 PM

...3723_6\037403-si gn-PMRK-05_.dgn



- ① END BEGIN (C) (E)
STA 1341+60.57, 36.87' (RT)
- ② END BEGIN (L) (B)
STA 1341+60.57, 47.74' (RT)
- ③ STA 1343+00.00, 3.00' (RT)
(G)
- ④ STA 1343+00.00, 47.00' (RT)
(B)
- ⑤ END BEGIN (E) (D)
STA 1345+00.00, 36.00' (RT)
- ⑥ END BEGIN (E) (D)
STA 1340+96.34, 40.24' (LT)
- ⑦ STA 1343+00.00
BEGIN 11' LANES (SB)

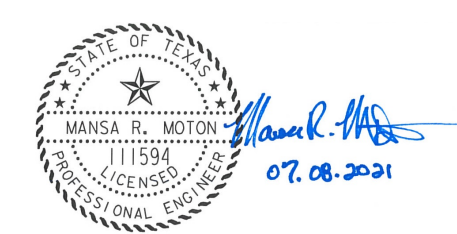


LEGEND

- (A) REF PM W/RET REQ TY I(W) (6") (BRK)
- (B) REF PROF PAV MRK TY I (W) (6") (SLD)
- (C) REF PAV MRK TY I (W) (8") (SLD)
- (D) REF PAV MRK TY I (W) (12") (DOT)
- (E) REF PAV MRK TY I (W) (12") (SLD)
- (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
- (H) REF PAV MRK TY I (W) (WORD)
- (I) REF PAV MRK TY I (W) (ARROW)
- (J) REF PAV MRKR TY II-C-R
- (K) REF PM W/RET REQ TY I(W) (4") (BRK)
- (L) REF PM W/RET REQ TY I(W) (4") (SLD)
- (M) REF PM W/RET REQ TY I(Y) (4") (SLD)
- (N) REF PAV MRKR TY I-R
- (X) PROPOSED SMALL SIGN AND NUMBER
- (X) PROPOSED LARGE SIGN AND NUMBER
- (P) POST MOUNTED SIGN
- (O) OVERHEAD SIGN STRUCTURE
- (S) DEL ASSEM (D-DY) (CTB) (BI)
- (T) DEL ASSEM (D-SW) (GF2)

NOTES:

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5. REF PAV MRKR TY I-R SHALL BE INSTALLED IN ACCORDANCE WITH THE WRONG WAY ARROW DETAIL, TXDOT STD FPM(1)-12



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
SIGNING & PAVEMENT
MARKING PLAN
STA 1334+00 TO 1345+00**

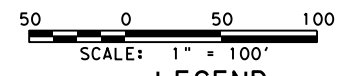
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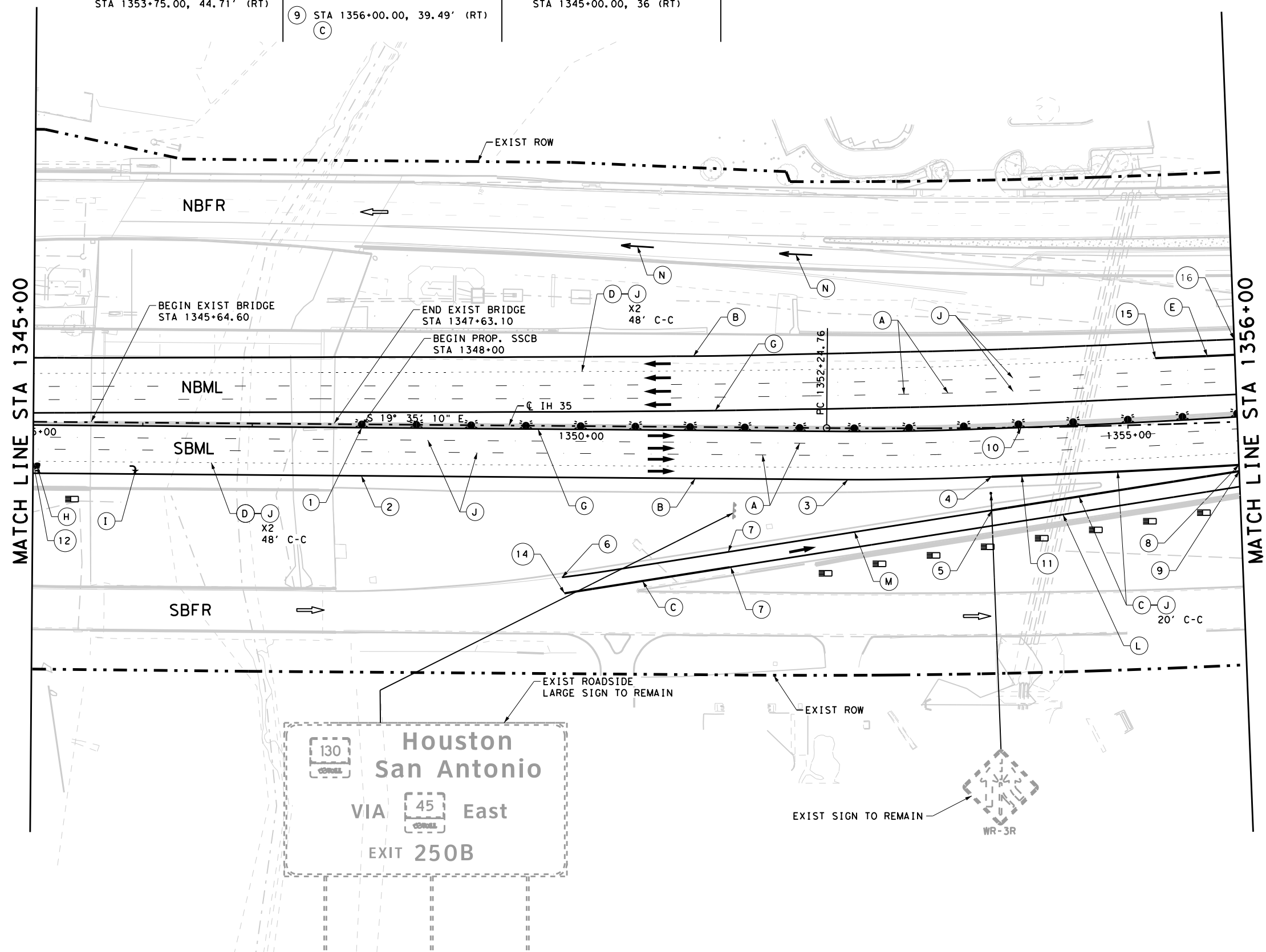
...3723_7\037403-si gn-PMRK-06.dgn

- ① STA 1348+00.00, 3.00' (RT) (G)
- ② STA 1348+00.00, 47.00' (RT) (B)
- ③ STA 1352+44.49, 47.00' (RT) (B)
- ④ STA 1349+86.48, 152.93' (RT) (C)
- ⑤ END BEGIN STA 1353+75.00, 44.71' (RT) (B, C)
- ⑥ END BEGIN STA 1353+75.00, 75.35' (RT) (M, C)
- ⑦ STA 1349+84.06, 138.38' (RT) (M)
- ⑧ END BEGIN STA 1351+38.10, 127.73' (RT) (C, L)
- ⑨ STA 1356+00.00, 39.49' (RT) (C)
- ⑩ STA 1356+00.00, 45.22' (RT) (C)
- ⑪ STA 1354+02.44 (G)
- ⑫ STA 1354+02.44, 44.01' (RT) (C)
- ⑬ END BEGIN STA 1345+00.00, 36 (RT) (E, D)
- ⑭ STA 1349+86.48, 152.93' (RT) (C)
- ⑮ END BEGIN STA 1355+26.91, 60.65' (LT) (D, E)
- ⑯ STA 1356+00.00, 75.33' (LT) (E)



- LEGEND**
- (A) REF PM W/RET REQ TY I (W) (6") (BRK)
 - (B) REF PROF PAV MRK TY I (W) (6") (SLD)
 - (C) REF PAV MRK TY I (W) (8") (SLD)
 - (D) REF PAV MRK TY I (W) (12") (DOT)
 - (E) REF PAV MRK TY I (W) (12") (SLD)
 - (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
 - (H) REF PAV MRK TY I (W) (WORD)
 - (I) REF PAV MRK TY I (W) (ARROW)
 - (J) REF PAV MRKR TY II-C-R
 - (K) REF PM W/RET REQ TY I (W) (4") (BRK)
 - (L) REF PM W/RET REQ TY I (W) (4") (SLD)
 - (M) REF PM W/RET REQ TY I (Y) (4") (SLD)
 - (N) REF PAV MRKR TY I-R
 - (X) PROPOSED SMALL SIGN AND NUMBER
 - (X) PROPOSED LARGE SIGN AND NUMBER
 - (P) POST MOUNTED SIGN
 - (O) OVERHEAD SIGN STRUCTURE
 - (S) DEL ASSEM (D-DY) (CTB) (BI)
 - (R) DEL ASSEM (D-SW) (GF2)

- NOTES:**
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CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

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**IH 35
SIGNING & PAVEMENT
MARKING PLAN
STA 1345+00 TO 1356+00**

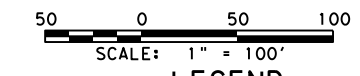
SCALE: 1" = 100' SHEET 6 OF 13

DS:	MM	CK:	AR	0015	09	194	IH 35
DW:	MH	CK:	MM	AUS	WILLIAMSON	253	

br:dgpepw011cs07MR/2021

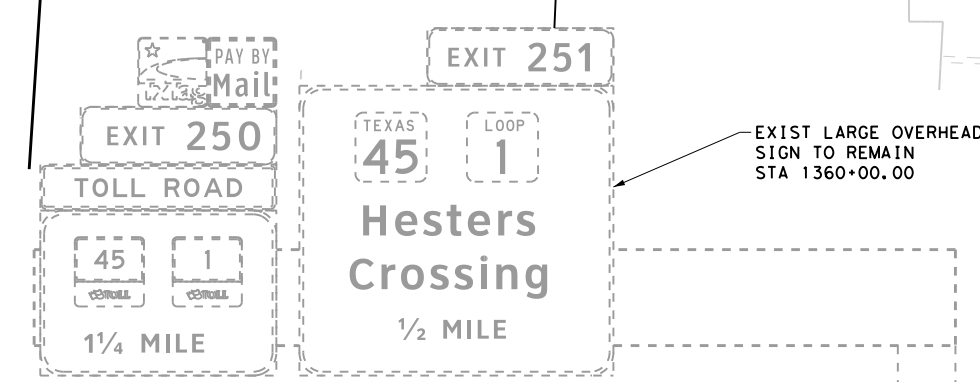
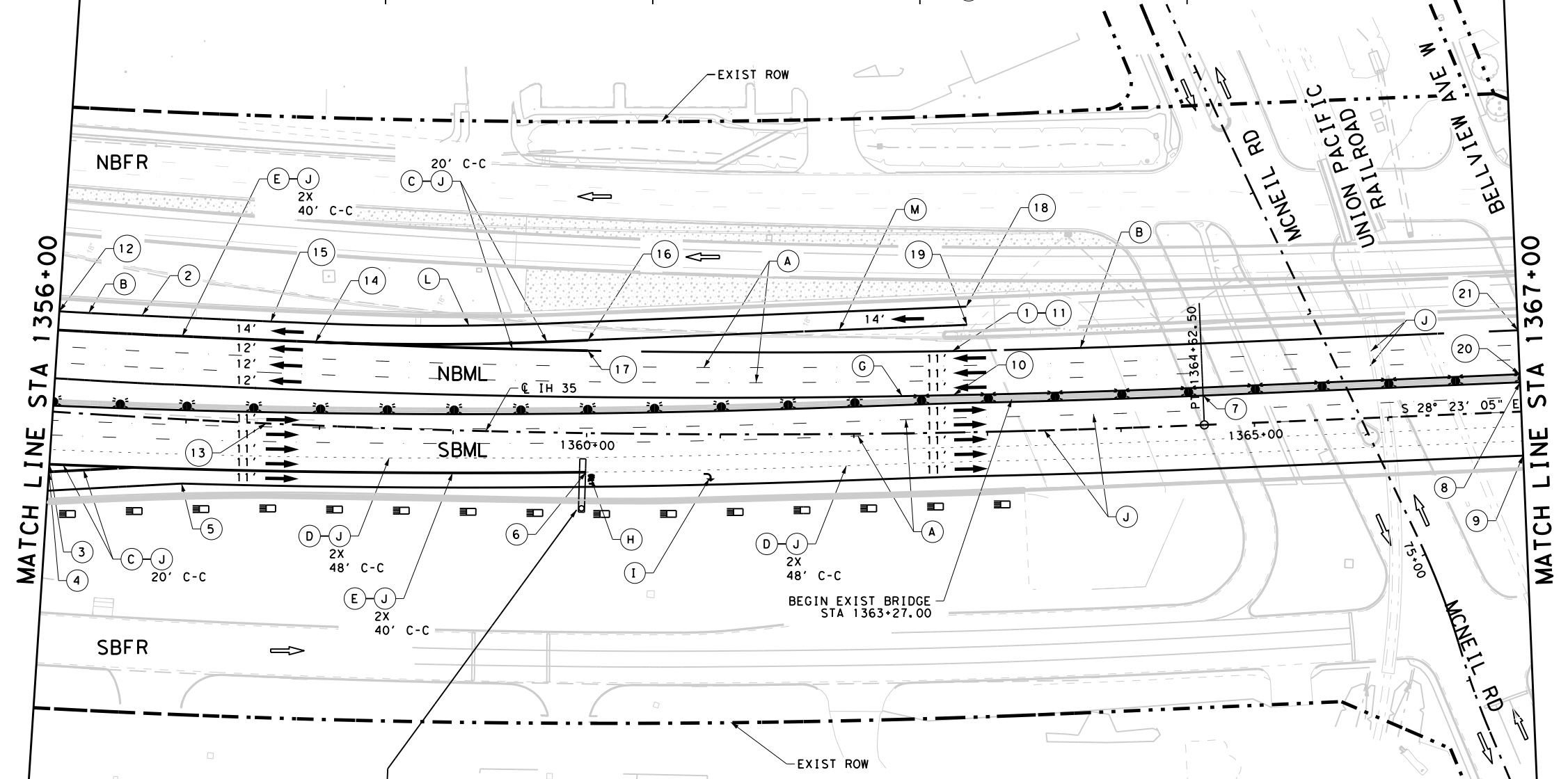
...3723_8\037403-si.gn-PMRK-07.dgn

- 1 STA 1362+75.00
BEGIN 11' LANES (NB)
- 2 END
BEGIN
STA 1356+62.72, 76.40' (LT)
- 3 STA 1356+00.00, 39.49' (RT)
- 4 STA 1356+00.00, 45.22' (RT)
- 5 END
BEGIN
STA 1356+99.09, 48.10' (RT)
- 6 END
BEGIN
STA 1360+00.00, 29.28' (RT)
- 7 STA 1364+62.65, 22.00' (LT)
- 8 STA 1367+00.00, 22.00' (LT)
- 9 STA 1367+00.00, 33.00' (RT)
- 10 STA 1362+75.00, 28.00' (LT)
- 11 STA 1362+75.00, 61.00' (LT)
- 12 STA 1356+00.00, 75.33' (LT)
- 13 BEGIN TRANSITION
END 12' LANES (NB)
- 14 END
BEGIN
STA 1357+94.36, 62.50' (LT)
- 15 END
BEGIN
STA 1357+60.00, 76.40' (LT)
- 16 END
BEGIN
STA 1360+00.00, 69.62' (LT)
- 17 END
BEGIN
STA 1360+00.00, 61.76' (LT)
- 18 STA 1362+86.13, 94.11' (LT)
MATCH EXISTING
END
- 19 STA 1362+86.41, 80.43' (LT)
MATCH EXISTING
END
- 20 STA 1367+00.00, 28.00' (LT)
- 21 STA 1367+00.00, 61.00' (LT)



- LEGEND**
- (A) REF PM W/RET REQ TY I (W) (6") (BRK)
 - (B) REF PROF PAV MRK TY I (W) (6") (SLD)
 - (C) REF PAV MRK TY I (W) (8") (SLD)
 - (D) REF PAV MRK TY I (W) (12") (DOT)
 - (E) REF PAV MRK TY I (W) (12") (SLD)
 - (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
 - (H) REF PAV MRK TY I (W) (WORD)
 - (I) REF PAV MRK TY I (W) (ARROW)
 - (J) REF PAV MRKR TY II-C-R
 - (K) REF PM W/RET REQ TY I (W) (4") (BRK)
 - (L) REF PM W/RET REQ TY I (W) (4") (SLD)
 - (M) REF PM W/RET REQ TY I (Y) (4") (SLD)
 - (N) REF PAV MRKR TY I-R
 - (X) PROPOSED SMALL SIGN AND NUMBER
 - (X) PROPOSED LARGE SIGN AND NUMBER
 - ⊕ POST MOUNTED SIGN
 - ▭ OVERHEAD SIGN STRUCTURE
 - ⊙ DEL ASSEM (D-DY) (CTB) (BI)
 - ▨ DEL ASSEM (D-SW) (GF2)

- NOTES:**
- REFER TO FPM STANDARDS FOR INFORMATION NOT SHOWN.
 - REFER TO D&OM STANDARDS FOR INFORMATION NOT SHOWN.
 - REF PAV MRKR TY II-C-R SHALL BE INSTALLED AT 40' CENTER TO CENTER (C-C) ALONG REF PM W/RET REQ TY I (W) (6") (BRK)
 - DEL ASSEM SHALL BE INSTALLED AT 50' SPACING ALONG BARRIER/MBGF.
 - REF PAV MRKR TY I-R SHALL BE INSTALLED IN ACCORDANCE WITH THE WRONG WAY ARROW DETAIL, TXDOT STD FPM(1)-12



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TXPE REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
SIGNING & PAVEMENT
MARKING PLAN
STA 1356+00 TO 1367+00**

SCALE: 1" = 100' SHEET 7 OF 13

DS:	MM	AR	0015	09	194	IH 35
DW:	MH	MM	AUS	WILLIAMSON	254	

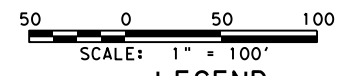
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br:idgepww011cs0748/2021

...3723_9\037403-si.gn-PMRK-08.dgn

MATCH LINE STA 1367+00

MATCH LINE STA 1378+00

- 1 STA 1367+00.00, 28.00' (LT) (G)
- 2 STA 1367+00.00, 22.00' (LT) (G)
- 3 STA 1367+00.00, 61.00' (LT) (B)
- 4 STA 1367+00.00, 33.00' (RT) (B)
- 5 STA 1374+15.16, 28.00' (LT) (G)
- 6 STA 1378+00.00, 27.00' (LT) (G)
- 7 STA 1374+15.16
BEGIN NB TRANSITION
END 11' LANES (G)
- 8 STA 1374+15.16, 61.00' (LT) (B)
- 9 STA 1376+50.00, 26.00' (LT) (G)
- 10 STA 1376+50.00
END NB TRANSITION
BEGIN 12' LANES (G)
- 11 STA 1376+50.00, 62.00' (LT) (B)
- 12 STA 1378+00.00, 63.00' (LT) (B)
- 13 END (B)
BEGIN (C)
STA 1377+25.00, 62.55' (LT)
- 14 STA 1374+15.16, 33.00' (RT) (B)
- 15 STA 1374+15.16, 22.00' (LT) (G)
- 16 STA 1375+99.67, 36.50' (RT) (B)
- 17 STA 1375+99.67, 18.50' (LT) (G)
- 18 STA 1378+00.00, 40.36' (RT) (B)
- 19 STA 1378+00.00, 15.28' (LT) (G)
- 20 END (D)
BEGIN (E)
STA 1378+00.00, 28.72' (RT)

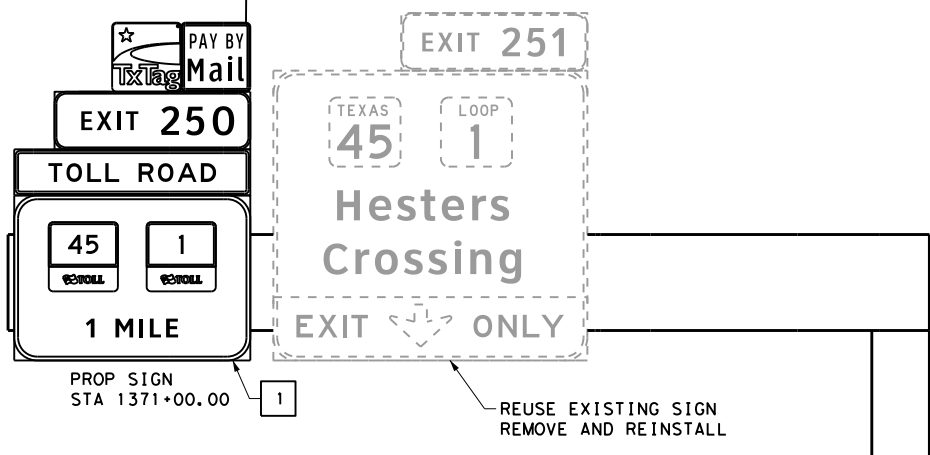
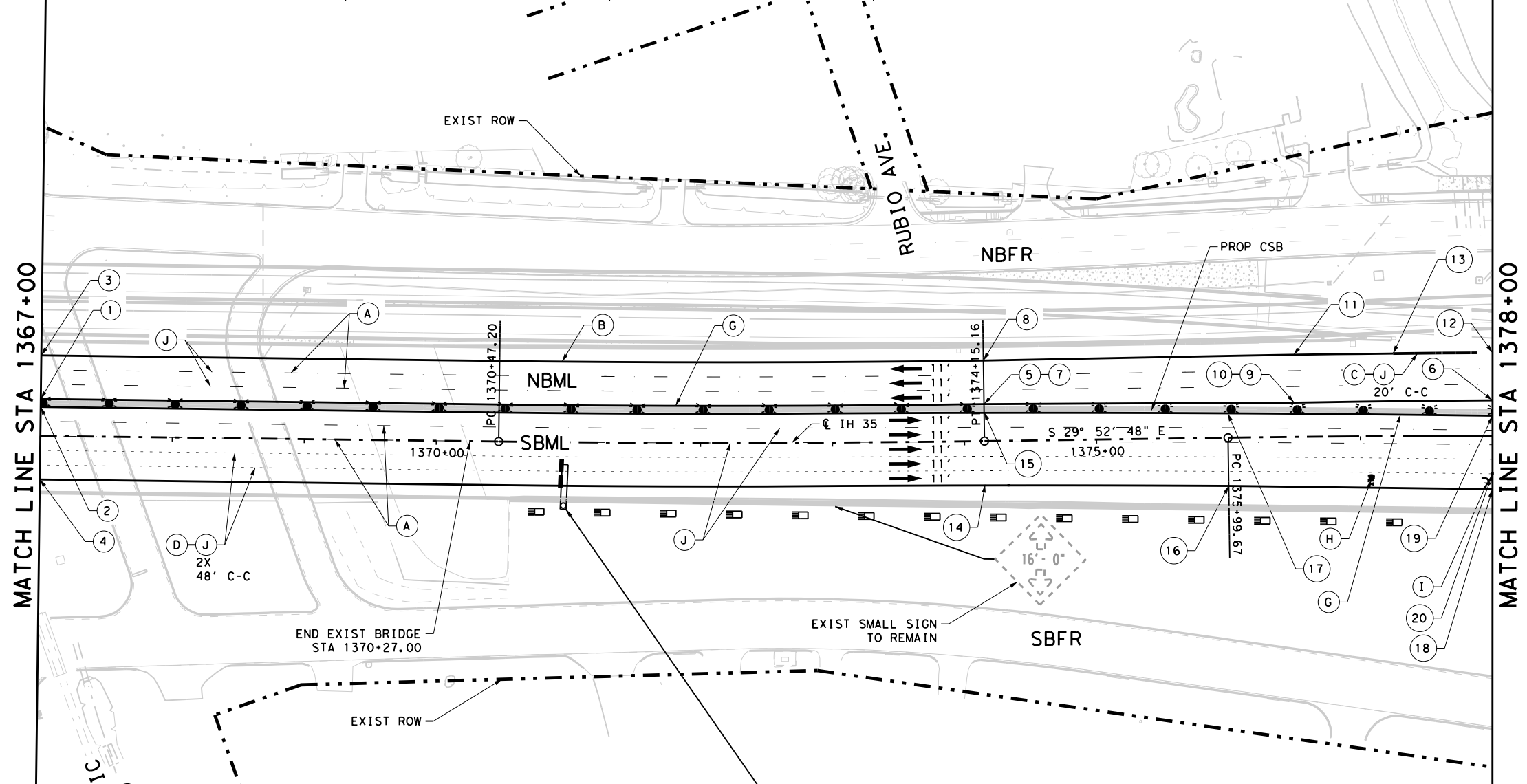
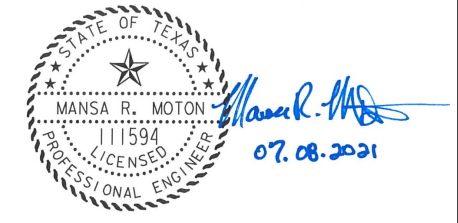


LEGEND

- (A) REF PM W/RET REQ TY I (W) (6") (BRK)
- (B) REF PROF PAV MRK TY I (W) (6") (SLD)
- (C) REF PAV MRK TY I (W) (8") (SLD)
- (D) REF PAV MRK TY I (W) (12") (DOT)
- (E) REF PAV MRK TY I (W) (12") (SLD)
- (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
- (H) REF PAV MRK TY I (W) (WORD)
- (I) REF PAV MRK TY I (W) (ARROW)
- (J) REF PAV MRKR TY II-C-R
- (K) REF PM W/RET REQ TY I (W) (4") (BRK)
- (L) REF PM W/RET REQ TY I (W) (4") (SLD)
- (M) REF PM W/RET REQ TY I (Y) (4") (SLD)
- (N) REF PAV MRKR TY I-R
- (X) PROPOSED SMALL SIGN AND NUMBER
- (X) PROPOSED LARGE SIGN AND NUMBER
- (P) POST MOUNTED SIGN
- (O) OVERHEAD SIGN STRUCTURE
- (S) DEL ASSEM (D-DY) (CTB) (BI)
- (R) DEL ASSEM (D-SW) (GF2)

NOTES:

- REFER TO FPM STANDARDS FOR INFORMATION NOT SHOWN.
- REFER TO D&OM STANDARDS FOR INFORMATION NOT SHOWN.
- REF PAV MRKR TY II-C-R SHALL BE INSTALLED AT 40' CENTER TO CENTER (C-C) ALONG REF PM W/RET REQ TY I (W) (6") (BRK)
- DEL ASSEM SHALL BE INSTALLED AT 50' SPACING ALONG BARRIER/MBGF.
- REF PAV MRKR TY I-R SHALL BE INSTALLED IN ACCORDANCE WITH THE WRONG WAY ARROW DETAIL, TXDOT STD FPM(1)-12



PROPOSED OVERHEAD SIGN STRUCTURE
SEE OVERHEAD SIGN STRUCTURE
DETAILS FOR ADDITIONAL INFORMATION

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

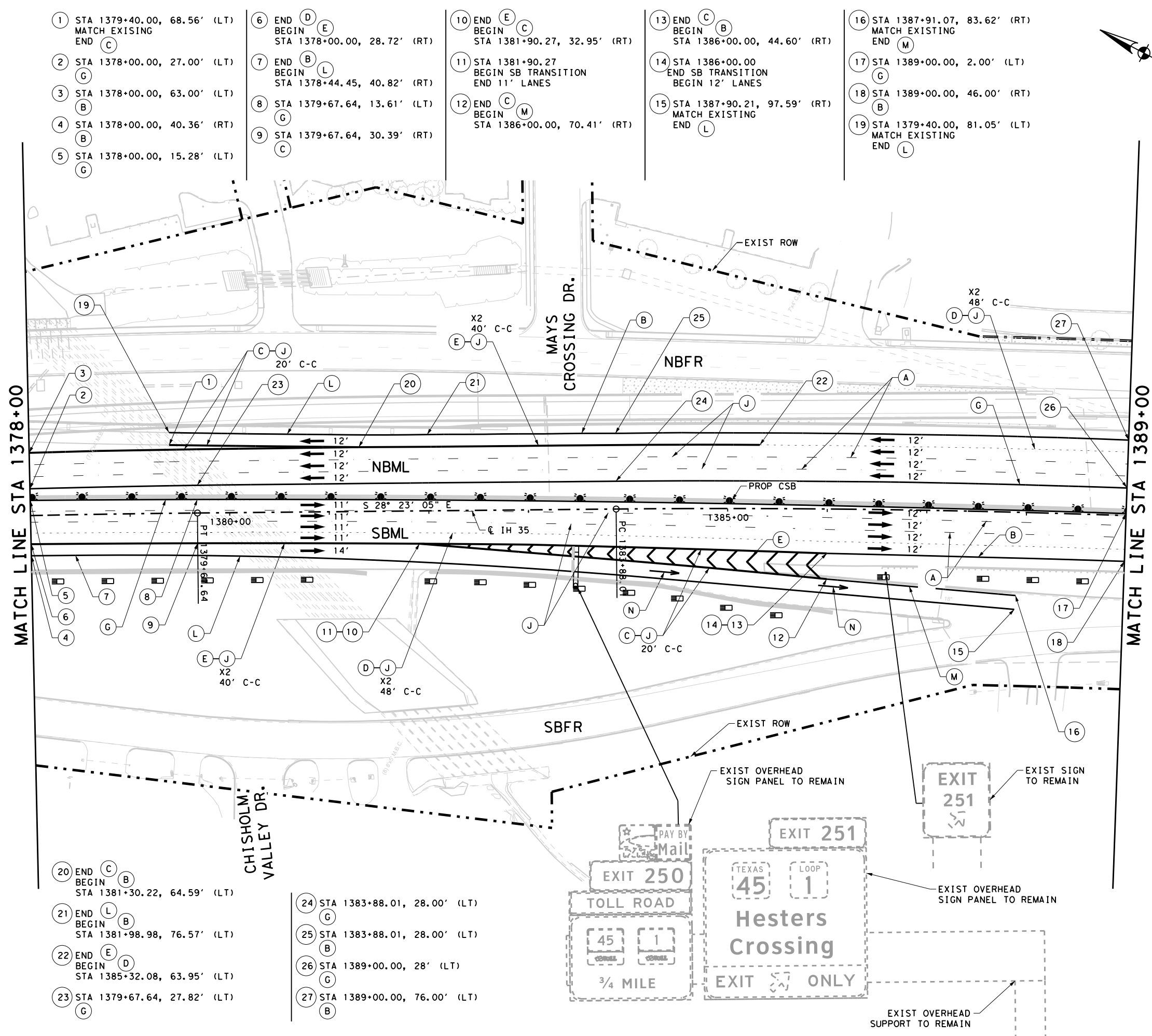
IH 35
**SIGNING & PAVEMENT
MARKING PLAN**
STA 1367+00 TO 1378+00

SCALE: 1" = 100' SHEET 8 OF 13

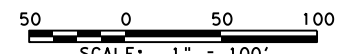
DS:	MM	AR	0015	09	194	IH 35
DW:	MH	MM	AUS	WILLIAMSON	255	

8:02:09 PM
br:igepw011cs0748/2021

...037403-Sign-PMRK-09.dgn



- ① STA 1379+40.00, 68.56' (LT)
MATCH EXISTING
END (C)
- ② STA 1378+00.00, 27.00' (LT)
(G)
- ③ STA 1378+00.00, 63.00' (LT)
(B)
- ④ STA 1378+00.00, 40.36' (RT)
(B)
- ⑤ STA 1378+00.00, 15.28' (LT)
(G)
- ⑥ END (D)
BEGIN (E)
STA 1378+00.00, 28.72' (RT)
- ⑦ END (B)
BEGIN (L)
STA 1378+44.45, 40.82' (RT)
- ⑧ STA 1379+67.64, 13.61' (LT)
(G)
- ⑨ STA 1379+67.64, 30.39' (RT)
(C)
- ⑩ END (E)
BEGIN (C)
STA 1381+90.27, 32.95' (RT)
- ⑪ STA 1381+90.27
BEGIN SB TRANSITION
END 11' LANES
- ⑫ END (C)
BEGIN (M)
STA 1386+00.00, 70.41' (RT)
- ⑬ END (C)
BEGIN (B)
STA 1386+00.00, 44.60' (RT)
- ⑭ STA 1386+00.00
END SB TRANSITION
BEGIN 12' LANES
- ⑮ STA 1387+90.21, 97.59' (RT)
MATCH EXISTING
END (L)
- ⑯ STA 1387+91.07, 83.62' (RT)
MATCH EXISTING
END (M)
- ⑰ STA 1389+00.00, 2.00' (LT)
(G)
- ⑱ STA 1389+00.00, 46.00' (RT)
(B)
- ⑲ STA 1379+40.00, 81.05' (LT)
MATCH EXISTING
END (L)



SCALE: 1" = 100'

- LEGEND**
- (A) REF PM W/RET REQ TY I (W) (6") (BRK)
 - (B) REF PROF PAV MRK TY I (W) (6") (SLD)
 - (C) REF PAV MRK TY I (W) (8") (SLD)
 - (D) REF PAV MRK TY I (W) (12") (DOT)
 - (E) REF PAV MRK TY I (W) (12") (SLD)
 - (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
 - (H) REF PAV MRK TY I (W) (WORD)
 - (I) REF PAV MRK TY I (W) (ARROW)
 - (J) REF PAV MRKR TY II-C-R
 - (K) REF PM W/RET REQ TY I (W) (4") (BRK)
 - (L) REF PM W/RET REQ TY I (W) (4") (SLD)
 - (M) REF PM W/RET REQ TY I (Y) (4") (SLD)
 - (N) REF PAV MRKR TY I-R
 - (X) PROPOSED SMALL SIGN AND NUMBER
 - (Y) PROPOSED LARGE SIGN AND NUMBER
 - ⊕ POST MOUNTED SIGN
 - ▭ OVERHEAD SIGN STRUCTURE
 - ⦿ DEL ASSEM (D-DY) (CTB) (BI)
 - ▨ DEL ASSEM (D-SW) (GF2)

NOTES:

1. REFER TO FPM STANDARDS FOR INFORMATION NOT SHOWN.
2. REFER TO D&OM STANDARDS FOR INFORMATION NOT SHOWN.
3. REF PAV MRKR TY II-C-R SHALL BE INSTALLED AT 40' CENTER TO CENTER (C-C) ALONG REF PM W/RET REQ TY I (W) (6") (BRK)
4. DEL ASSEM SHALL BE INSTALLED AT 50' SPACING ALONG BARRIER/MBGF.
5. REF PAV MRKR TY I-R SHALL BE INSTALLED IN ACCORDANCE WITH THE WRONG WAY ARROW DETAIL, TXDOT STD FPM(1)-12



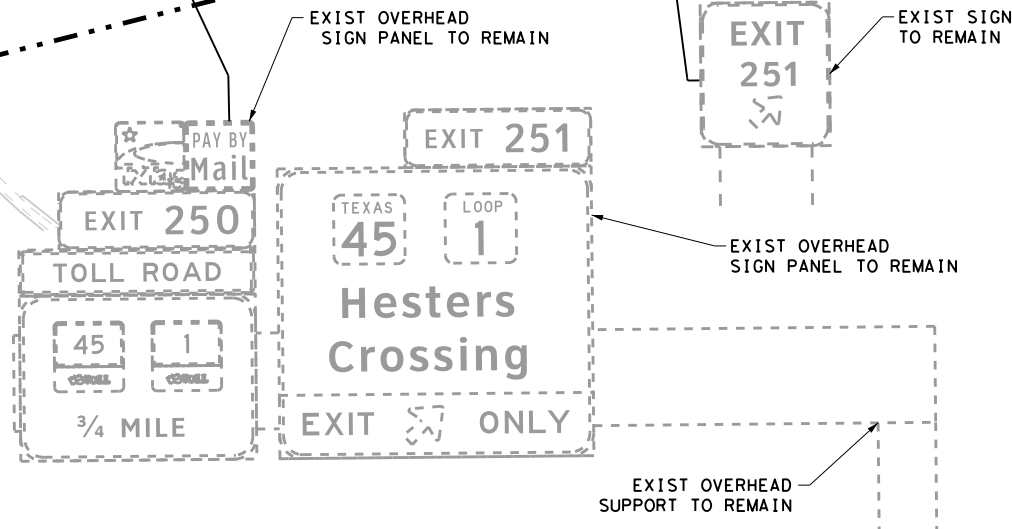
BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
SIGNING & PAVEMENT
MARKING PLAN
STA 1378+00 TO 1389+00**

SCALE: 1" = 100' SHEET 9 OF 13

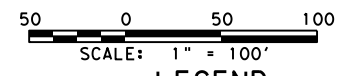
DS:	MM	AR	0015	09	194	IH 35
DW:	MH	MM	AUS	WILLIAMSON	256	



8:10:03 PM

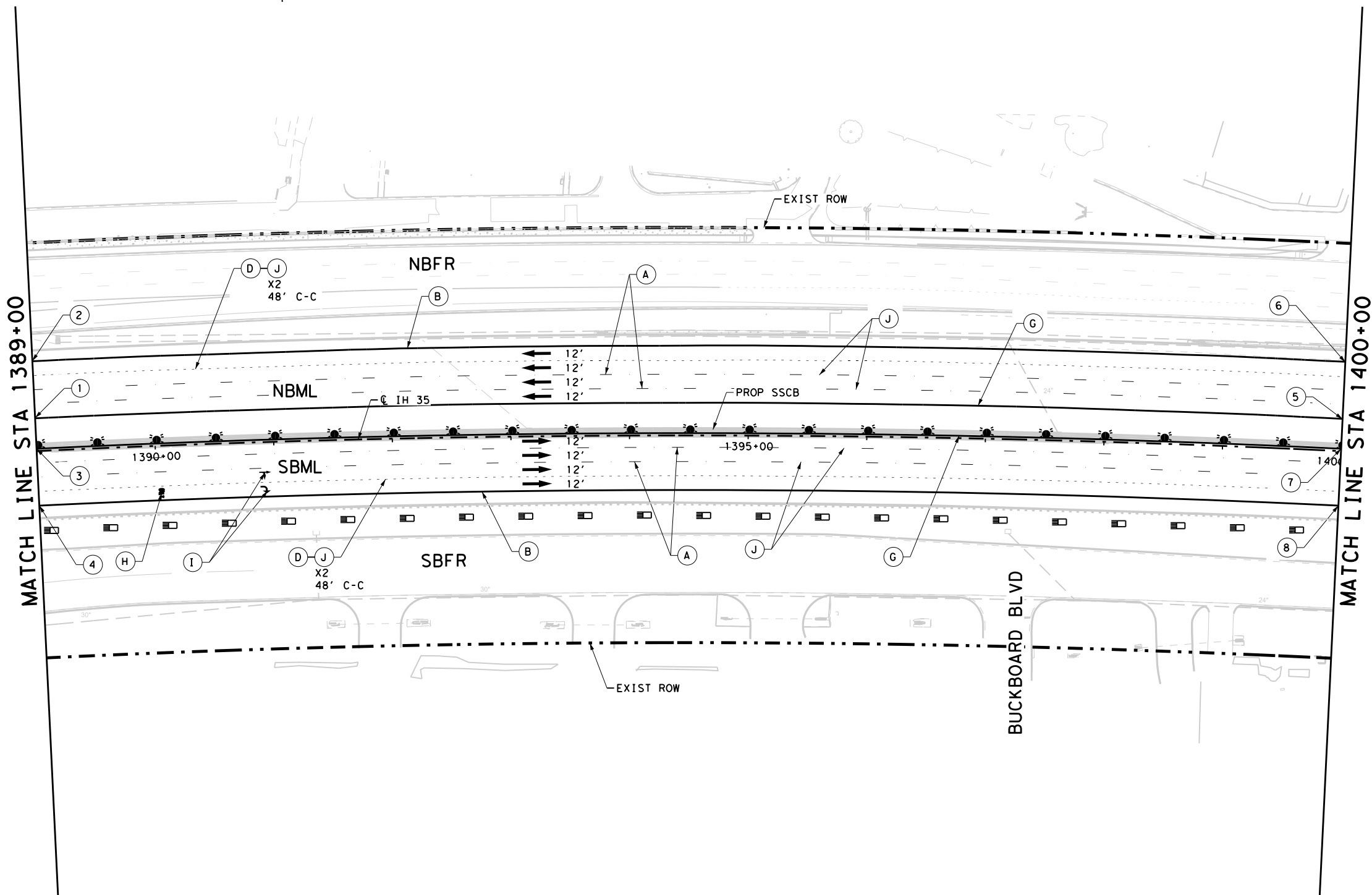
...037403-Sign-PMRK-10.dgn

- ① STA 1389+00.00, 28.00' (LT) (G)
- ② STA 1389+00.00, 76.00' (LT) (B)
- ③ STA 1389+00.00, 2.00' (LT) (G)
- ④ STA 1389+00.00, 46.00' (RT) (B)
- ⑤ STA 1400+00.00, 27.00' (LT) (G)
- ⑥ STA 1400+00.00, 75.00' (LT) (B)
- ⑦ STA 1400+00.00, 2.00' (LT) (G)
- ⑧ STA 1400+00.00, 46.00' (RT) (B)



- LEGEND**
- (A) REF PM W/RET REQ TY I(W) (6") (BRK)
 - (B) REF PROF PAV MRK TY I (W) (6") (SLD)
 - (C) REF PAV MRK TY I (W) (8") (SLD)
 - (D) REF PAV MRK TY I (W) (12") (DOT)
 - (E) REF PAV MRK TY I (W) (12") (SLD)
 - (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
 - (H) REF PAV MRK TY I (W) (WORD)
 - (I) REF PAV MRK TY I (W) (ARROW)
 - (J) REF PAV MRKR TY II-C-R
 - (K) REF PM W/RET REQ TY I(W) (4") (BRK)
 - (L) REF PM W/RET REQ TY I(W) (4") (SLD)
 - (M) REF PM W/RET REQ TY I(Y) (4") (SLD)
 - (N) REF PAV MRKR TY I-R
 - (X) PROPOSED SMALL SIGN AND NUMBER
 - (X) PROPOSED LARGE SIGN AND NUMBER
 - (P) POST MOUNTED SIGN
 - (O) OVERHEAD SIGN STRUCTURE
 - (S) DEL ASSEM (D-DY) (CTB) (BI)
 - (R) DEL ASSEM (D-SW) (GF2)

- NOTES:**
- REFER TO FPM STANDARDS FOR INFORMATION NOT SHOWN.
 - REFER TO D&OM STANDARDS FOR INFORMATION NOT SHOWN.
 - REF PAV MRKR TY II-C-R SHALL BE INSTALLED AT 40' CENTER TO CENTER (C-C) ALONG REF PM W/RET REQ TY I(W) (6") (BRK)
 - DEL ASSEM SHALL BE INSTALLED AT 50' SPACING ALONG BARRIER/MBGF.
 - REF PAV MRKR TY I-R SHALL BE INSTALLED IN ACCORDANCE WITH THE WRONG WAY ARROW DETAIL, TXDOT STD FPM(1)-12



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
SIGNING & PAVEMENT
MARKING PLAN
STA 1389+00 TO 1400+00**

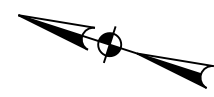
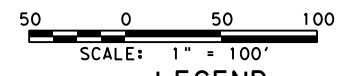
SCALE: 1" = 100' SHEET 10 OF 13

DES:	CK:	CONT:	SECT:	JOB:	HIGHWAY:
MM	AR	0015	09	194	IH 35
DW:	CK:	DIST:		COUNTY:	SHEET NO.:
MH	MM	AUS		WILLIAMSON	257

8:01:12 PM

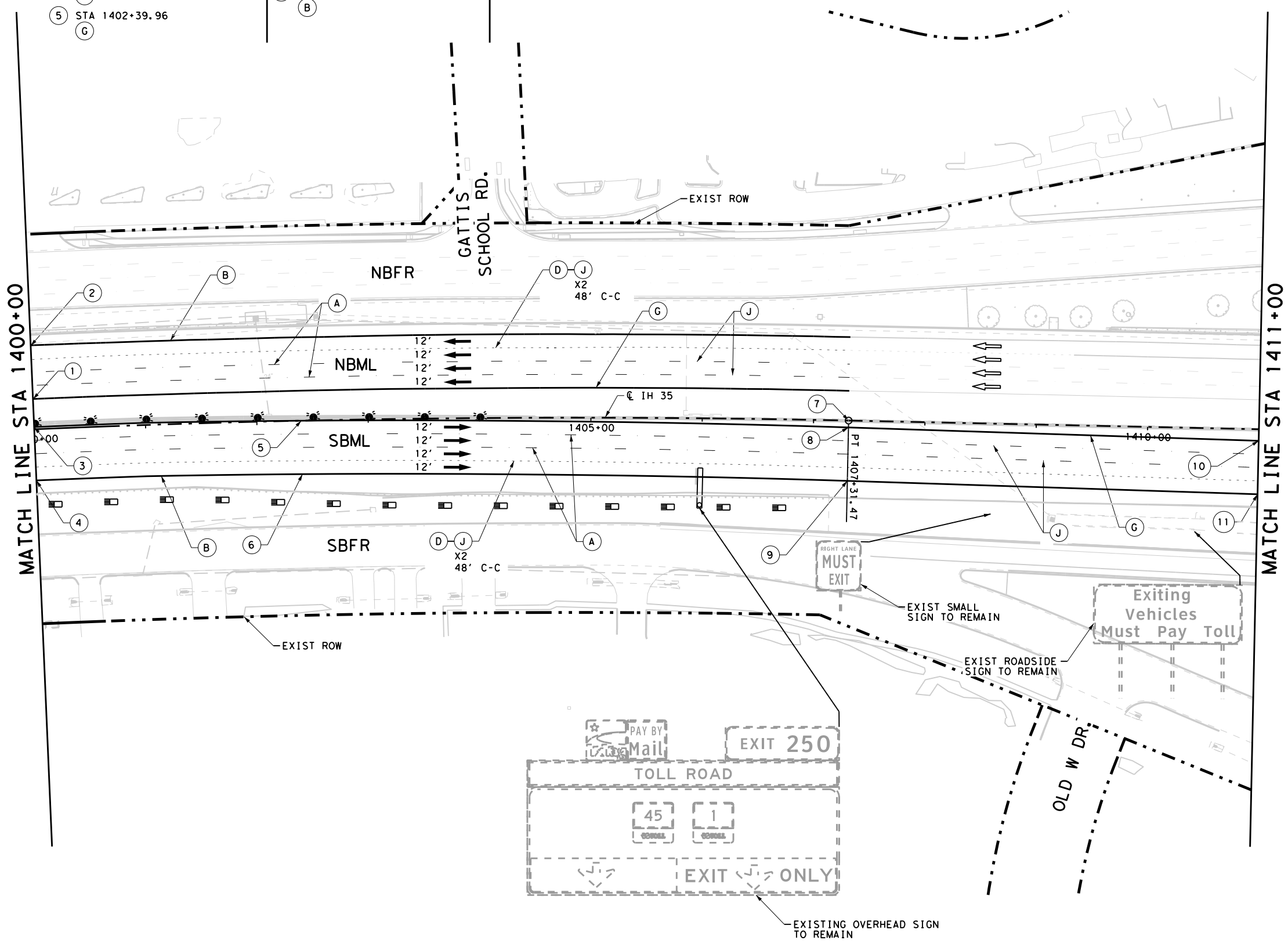
...037403-Sign-PMRK-11.dgn

- ① STA 1400+00.00, 27.00' (LT) (G)
- ② STA 1400+00.00, 75.00' (LT) (B)
- ③ STA 1400+00.00, 2.00' (LT) (G)
- ④ STA 1400+00.00, 46.00' (RT) (B)
- ⑤ STA 1402+39.96 (G)
- ⑥ STA 1402+39.96, 48.00' (RT) (B)
- ⑦ STA 1407+31.47 MATCH EXISTING END NB PAVE MRKGS (G)
- ⑧ STA 1407+31.47, 6.19' (RT) (G)
- ⑨ STA 1407+31.47, 54.19' (RT) (B)
- ⑩ STA 1411+00.00, 10.37' (RT) (G)
- ⑪ STA 1411+00.00, 58.37' (RT) (B)



- LEGEND**
- (A) REF PM W/RET REQ TY I(W) (6") (BRK)
 - (B) REF PROF PAV MRK TY I (W) (6") (SLD)
 - (C) REF PAV MRK TY I (W) (8") (SLD)
 - (D) REF PAV MRK TY I (W) (12") (DOT)
 - (E) REF PAV MRK TY I (W) (12") (SLD)
 - (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
 - (H) REF PAV MRK TY I (W) (WORD)
 - (I) REF PAV MRK TY I (W) (ARROW)
 - (J) REF PAV MRKR TY II-C-R
 - (K) REF PM W/RET REQ TY I(W) (4") (BRK)
 - (L) REF PM W/RET REQ TY I(W) (4") (SLD)
 - (M) REF PM W/RET REQ TY I(Y) (4") (SLD)
 - (N) REF PAV MRKR TY I-R
 - (X) PROPOSED SMALL SIGN AND NUMBER
 - (X) PROPOSED LARGE SIGN AND NUMBER
 - ⊕ POST MOUNTED SIGN
 - ▭ OVERHEAD SIGN STRUCTURE
 - ☀ DEL ASSEM (D-DY) (CTB) (BI)
 - ▭ DEL ASSEM (D-SW) (GF2)

- NOTES:**
1. REFER TO FPM STANDARDS FOR INFORMATION NOT SHOWN.
 2. REFER TO D&OM STANDARDS FOR INFORMATION NOT SHOWN.
 3. REF PAV MRKR TY II-C-R SHALL BE INSTALLED AT 40' CENTER TO CENTER (C-C) ALONG REF PM W/RET REQ TY I(W) (6") (BRK)
 4. DEL ASSEM SHALL BE INSTALLED AT 50' SPACING ALONG BARRIER/MBGF.
 5. REF PAV MRKR TY I-R SHALL BE INSTALLED IN ACCORDANCE WITH THE WRONG WAY ARROW DETAIL, TXDOT STD FPM(1)-12



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CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

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IH 35
SIGNING & PAVEMENT
MARKING PLAN
STA 1400+00 TO 1411+00

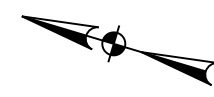
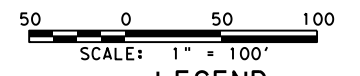
SCALE: 1" = 100' SHEET 11 OF 13

DS:	MM	AR	0015	09	194	IH 35
DW:	MH	MM	AUS	WILLIAMSON	258	

8:11:16 PM

...037403-Sign-PMRK-12.dgn

- ① STA 1411+00.00, 10.37' (RT) (G)
- ② STA 1411+00.00, 58.37' (RT) (B)
- ③ END BEGIN STA 1413+00.00, 47.50' (RT) (D, E)
- ④ END BEGIN STA 1413+89.12, 59.50' (RT) (B, L)
- ⑤ STA 1413+89.78, 47.50' (RT) (C)
- ⑥ STA 1412+00.00, 11.50' (RT) (G)
- ⑦ STA 1412+00.00, 59.50' (RT) (B)
- ⑧ BEGIN STA 1416+64.34, 47.50' (RT) (C)
- ⑨ END BEGIN STA 1418+75.00, 47.50' (RT) (C, B)
- ⑩ END BEGIN STA 1418+75.00, 69.84' (RT) (C, M)
- ⑪ END BEGIN STA 1419+50.00, 90.13' (RT) (E, K)



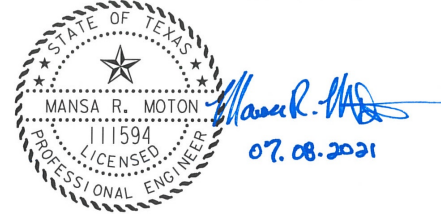
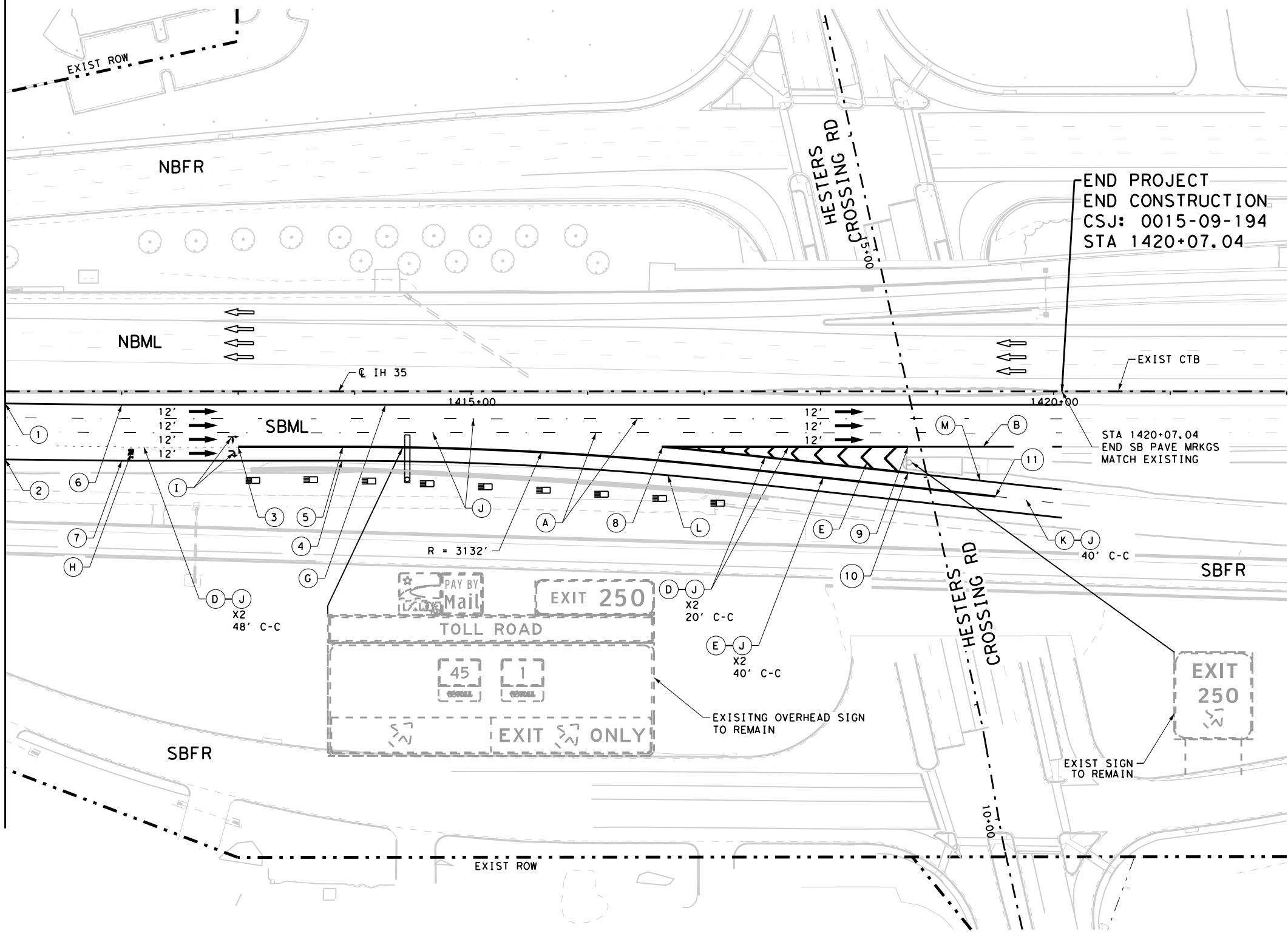
LEGEND

- (A) REF PM W/RET REQ TY I (W) (6") (BRK)
- (B) REF PROF PAV MRK TY I (W) (6") (SLD)
- (C) REF PAV MRK TY I (W) (8") (SLD)
- (D) REF PAV MRK TY I (W) (12") (DOT)
- (E) REF PAV MRK TY I (W) (12") (SLD)
- (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
- (H) REF PAV MRK TY I (W) (WORD)
- (I) REF PAV MRK TY I (W) (ARROW)
- (J) REF PAV MRKR TY II-C-R
- (K) REF PM W/RET REQ TY I (W) (4") (BRK)
- (L) REF PM W/RET REQ TY I (W) (4") (SLD)
- (M) REF PM W/RET REQ TY I (Y) (4") (SLD)
- (N) REF PAV MRKR TY I-R
- (X) PROPOSED SMALL SIGN AND NUMBER
- (X) PROPOSED LARGE SIGN AND NUMBER
- (P) POST MOUNTED SIGN
- (O) OVERHEAD SIGN STRUCTURE
- (S) DEL ASSEM (D-DY) (CTB) (BI)
- (SW) DEL ASSEM (D-SW) (GF2)

NOTES:

1. REFER TO FPM STANDARDS FOR INFORMATION NOT SHOWN.
2. REFER TO D&OM STANDARDS FOR INFORMATION NOT SHOWN.
3. REF PAV MRKR TY II-C-R SHALL BE INSTALLED AT 40' CENTER TO CENTER (C-C) ALONG REF PM W/RET REQ TY I (W) (6") (BRK)
4. DEL ASSEM SHALL BE INSTALLED AT 50' SPACING ALONG BARRIER/MBGF.
5. REF PAV MRKR TY I-R SHALL BE INSTALLED IN ACCORDANCE WITH THE WRONG WAY ARROW DETAIL, TXDOT STD FPM(1)-12

MATCH LINE STA 1411+00



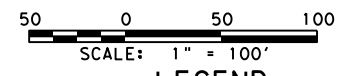
BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

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IH 35
SIGNING & PAVEMENT MARKING PLAN
STA 1411+00 TO 1422+00

SCALE: 1" = 100' SHEET 12 OF 13

DS:	MM	AR	0015	09	194	IH 35
DW:	MH	MM	AUS	WILLIAMSON	259	



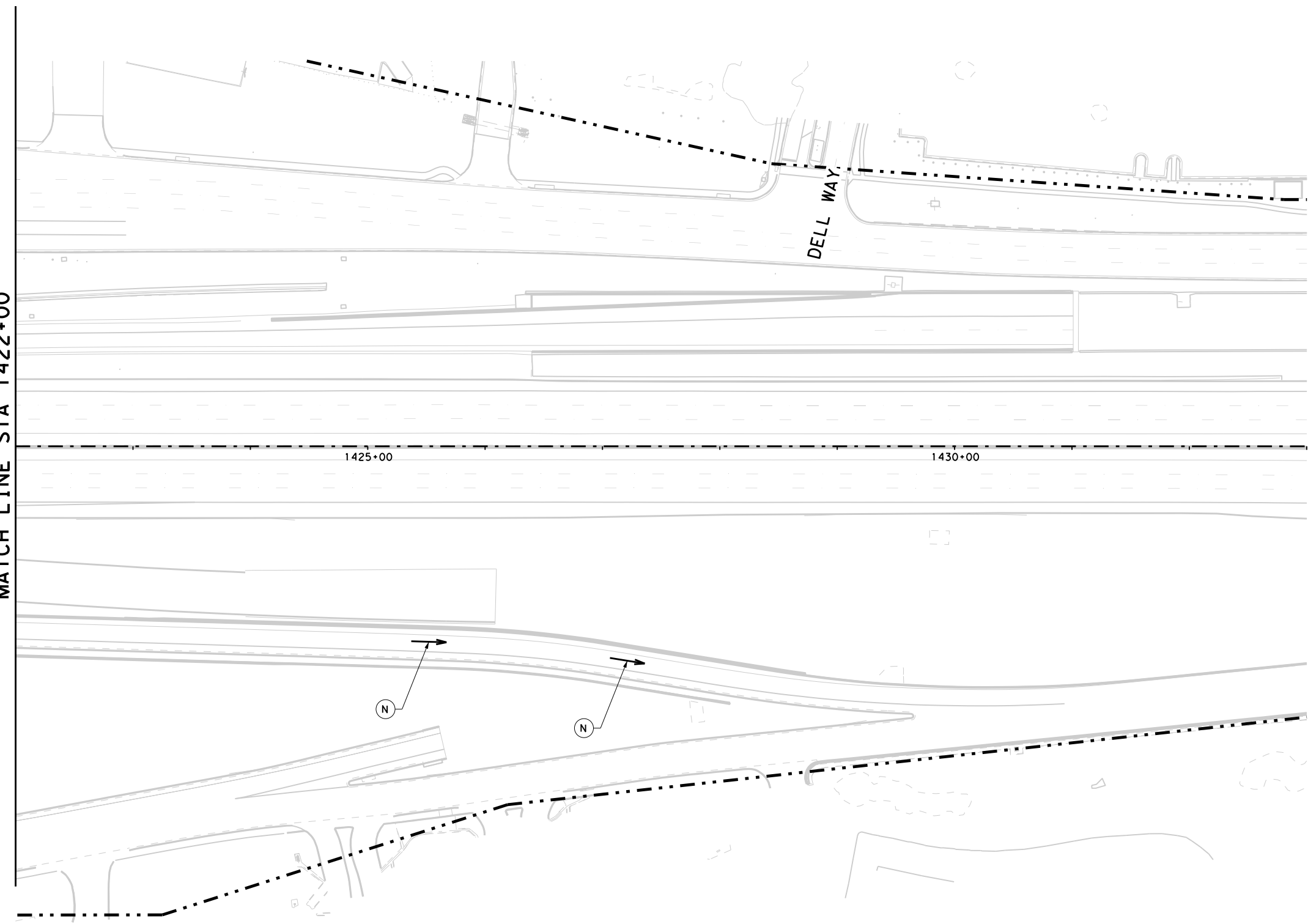
- LEGEND**
- (A) REF PM W/RET REQ TY I (W) (6") (BRK)
 - (B) REF PROF PAV MRK TY I (W) (6") (SLD)
 - (C) REF PAV MRK TY I (W) (8") (SLD)
 - (D) REF PAV MRK TY I (W) (12") (DOT)
 - (E) REF PAV MRK TY I (W) (12") (SLD)
 - (G) REF PROF PAV MRK TY I (Y) (6") (SLD)
 - (H) REF PAV MRK TY I (W) (WORD)
 - (I) REF PAV MRK TY I (W) (ARROW)
 - (J) REF PAV MRKR TY II-C-R
 - (K) REF PM W/RET REQ TY I (W) (4") (BRK)
 - (L) REF PM W/RET REQ TY I (W) (4") (SLD)
 - (M) REF PM W/RET REQ TY I (Y) (4") (SLD)
 - (N) REF PAV MRKR TY I-R
 - (X) PROPOSED SMALL SIGN AND NUMBER
 - (X) PROPOSED LARGE SIGN AND NUMBER
 - ⊕ POST MOUNTED SIGN
 - ▭ OVERHEAD SIGN STRUCTURE
 - ☉ DEL ASSEM (D-DY) (CTB) (BI)
 - ▨ DEL ASSEM (D-SW) (GF2)

NOTES:

1. REFER TO FPM STANDARDS FOR INFORMATION NOT SHOWN.
2. REFER TO D&OM STANDARDS FOR INFORMATION NOT SHOWN.
3. REF PAV MRKR TY II-C-R SHALL BE INSTALLED AT 40' CENTER TO CENTER (C-C) ALONG REF PM W/RET REQ TY I (W) (6") (BRK)
4. DEL ASSEM SHALL BE INSTALLED AT 50' SPACING ALONG BARRIER/MBGF.
5. REF PAV MRKR TY I-R SHALL BE INSTALLED IN ACCORDANCE WITH THE WRONG WAY ARROW DETAIL, TXDOT STD FPM(1)-12



MATCH LINE STA 1422+00



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
SIGNING & PAVEMENT
MARKING PLAN
INCIDENTAL WORK**

SCALE: 1" = 100' SHEET 13 OF 13

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	AR	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
MH	MM	AUS	WILLIAMSON	260	

7:57:06 PM

br:ideepw011.ccs01.dgn

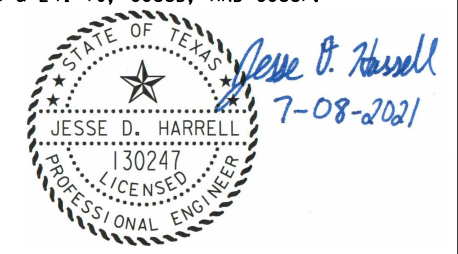
...037403-Sign-COSS-01.dgn

- ① "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures".
- ② "Carbon Steel" for non-bridge structures per Item 442, "Metal For Structures".

STRUCTURE NO.		COSS NO. 01
STATION		1371+00.00
DESIGN SPAN LENGTH (ft)		40
COLUMN HEIGHT, H (ft)		27
DESIGN WIND HEIGHT, Hd, (ft)		< 30
STRUCTURE CODE		COSS Z4 & Z41-10
ACTUAL SIGN AREA (sf)		227.92
DESIGN SIGN AREA (sf)		400.00
TRUSS DETAILS	LENGTH OF SPAN (ft)	40
	W x D = WIDTH x DEPTH	4.0 x 4.0
	SIZE OF H.S. BOLTS	5/8" Ø
	LENGTH OF TRUSS PANELS	End = 4.0 ft Other = 5.0 ft
	CHORD ①	L 3 x 3 x 7/8 [9]
	DEAD LOAD DIAGONAL ②	L 2 1/2 x 2 1/2 x 7/8 [3]
	WIND LOAD DIAGONAL ②	L 3 x 3 x 7/8 [2]
	DEAD LOAD VERTICAL ②	L 2 x 2 x 7/8 [2]
	WIND LOAD STRUT ②	L 2 x 2 x 7/8 [1]
	TRUSS DEAD LOAD (lb/ft)	56 lb/ft
TRUSS DEFLECTION, Δ (in)	3.5	
TOWER DETAILS	TOWER HEIGHT AT TRUSS C.L. (ft)	27
	TOWER PIPE DIA (in)	30
	TOWER PIPE WALL THICKNESS (in)	0.281
	TOWER PIPE Δ _w AT C TRUSS (in)	0.93
	NO. & SIZE OF ANCHOR BOLTS	8 ~ 2" x 4'-3"
	ANCHOR BOLT CIRCLE DIA. (in)	35.75
	BASE P SIZE (in)	40 1/2 x 1 5/8
DESIGN LOADS	SHEAR (Kips)	11.54
	TORSION (Kip-ft)	211.94
	MOMENT (Kip-ft)	329.18
FOUNDATION	SOIL (Sand or Clay) & "N"	Assumed Sand with N=12
	SHAFT DIA (in)	54
	LENGTH OF SHAFT (ft)	27
	MAIN SHAFT STEEL	18 ~ #10's
	SHAFT SPIRAL REINFORCING	#4 AT 6" PITCH (GRADE 60)
	BOTTOM OF BASE PLATE ELEV.	757.50
	TOP DRILLED SHAFT ELEV.	757.25
	GROUND ELEV.	756.25
BOTTOM DRILLED SHAFT ELEV.	730.25	

NOTES:

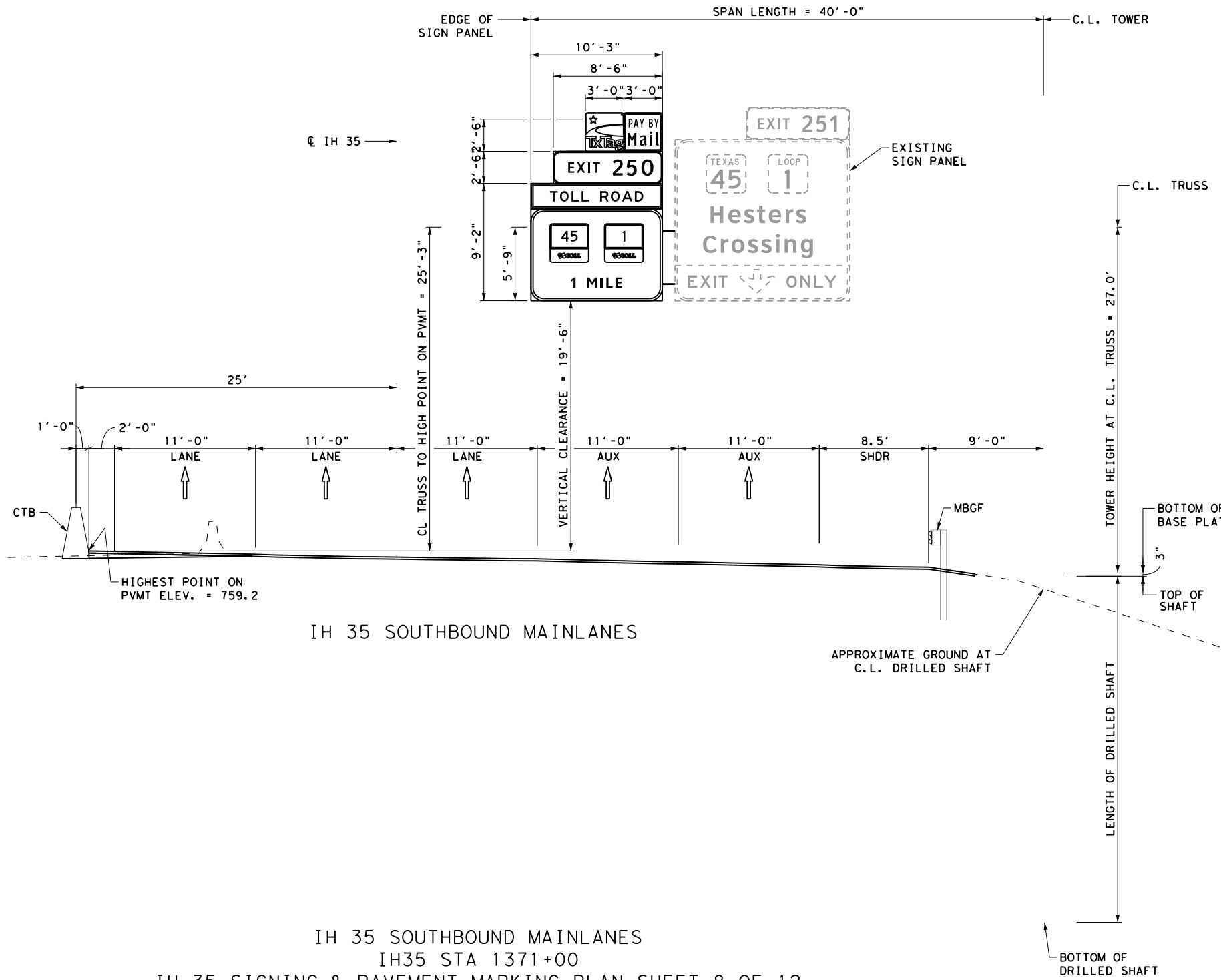
1. ELEVATIONS SHOWN ON THESE DRAWINGS ARE FOR ESTIMATING PURPOSES ONLY.
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO STAKE AND TAKE ACTUAL ELEVATIONS BEFORE ORDERING & FABRICATING COMPONENTS.
3. REFER TO COSS-Z4 & Z41-10, COSSD, AND COSSF.



**IH 35
OVERHEAD SIGN
STRUCTURE DETAILS**

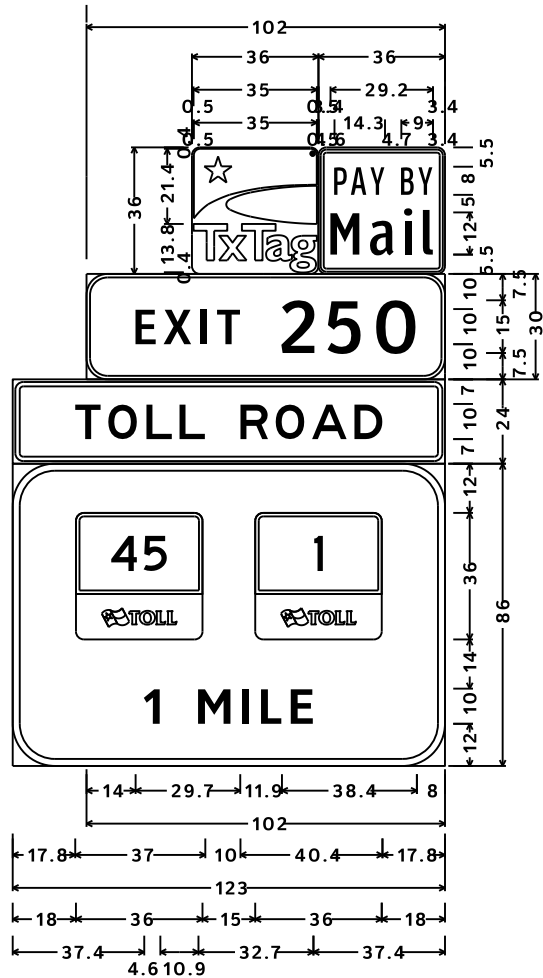
SHEET 1 OF 1

DES:	MM	AR	0015	09	194	IH 35
DIST:	AUS		WILLIAMSON		261	



IH 35 SOUTHBOUND MAINLANES
IH35 STA 1371+00
IH 35 SIGNING & PAVEMENT MARKING PLAN SHEET 8 OF 12
LARGE SIGN # 1

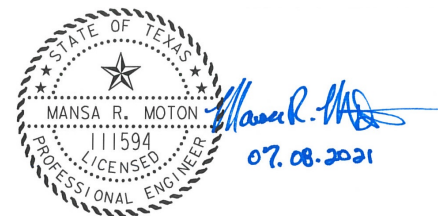
1



Identifier : E90-13T_102x114;
 Identifier : R91-1TP_36x36;
 2.3" Radius, No border, White;
 TxTag; [TxTag] White Humanst521 BT;
 Identifier : R91-2TP_36x36;
 2.3" Radius, 0.9" Border, 0.6" Indent, Black on White;
 [PAY BY] ClearviewHwy-1-W;
 [Mail] ClearviewHwy-2-W;
 Identifier : E1-5P_72x30Φ;
 6.0" Radius, 2.0" Border, White on Green;
 [EXIT 250] ClearviewHwy-4-W;
 3.0" Radius, 1.3" Border, 0.8" Indent, Black on Yellow;
 [TOLL ROAD] E;
 Identifier : E90-13TΦ;
 12.0" Radius, 2.0" Border, White on Green;
 [1 MILE] ClearviewHwy-5-W-R;

NOTES:

1. ALL DIMENSIONS ARE MEASURED TO FACE OF BARRIER, WHERE BARRIER IS PROPOSED OR EXIST, OR EDGE OF PAVEMENT, UNLESS NOTED OTHERWISE. SEE ROADWAY PLANS FOR ADDITIONAL INFORMATION.
 2. REFER TO THE EXISTING SUPERELEVATION DATA TABLE AND THE DESIGN CROSS SECTIONS FOR ADDITIONAL INFORMATION.
 3. EXISTING PAVEMENT CROSS SLOPES AND TRANSITIONS SHOWN ARE BASED ON AS-BUILTS AND ARE PROVIDED FOR INFORMATION ONLY. ALL PAVEMENT WIDENING SHALL MATCH THE CROSS SLOPE OF THE EXISTING PAVEMENT ADJACENT TO THE WIDENING. CONTRACTOR SHALL FIELD VERIFY EXISTING PAVEMENT ELEVATION AND CROSS SLOPE PRIOR TO WIDENING. FIELD VERIFICATION IS SUBSIDIARY TO ROADWAY QUANTITIES.
 4. SEE BRIDGE LAYOUT SHEETS FOR BRIDGE LIMITS AND ADDITIONAL DETAILS.
 5. SAWCUT LOCATION IS 2' OFFSET FROM FACE OF EXISTING CONCRETE TRAFFIC BARRIER. SAWCUT LOCATION IS PGL TO BE USED FOR CONSTRUCTION.
 6. REFER TO TRAFFIC CONTROL PLAN FOR ADDITIONAL STRIPING DETAILS.
- * MATCH EXISTING ROADWAY SLOPE



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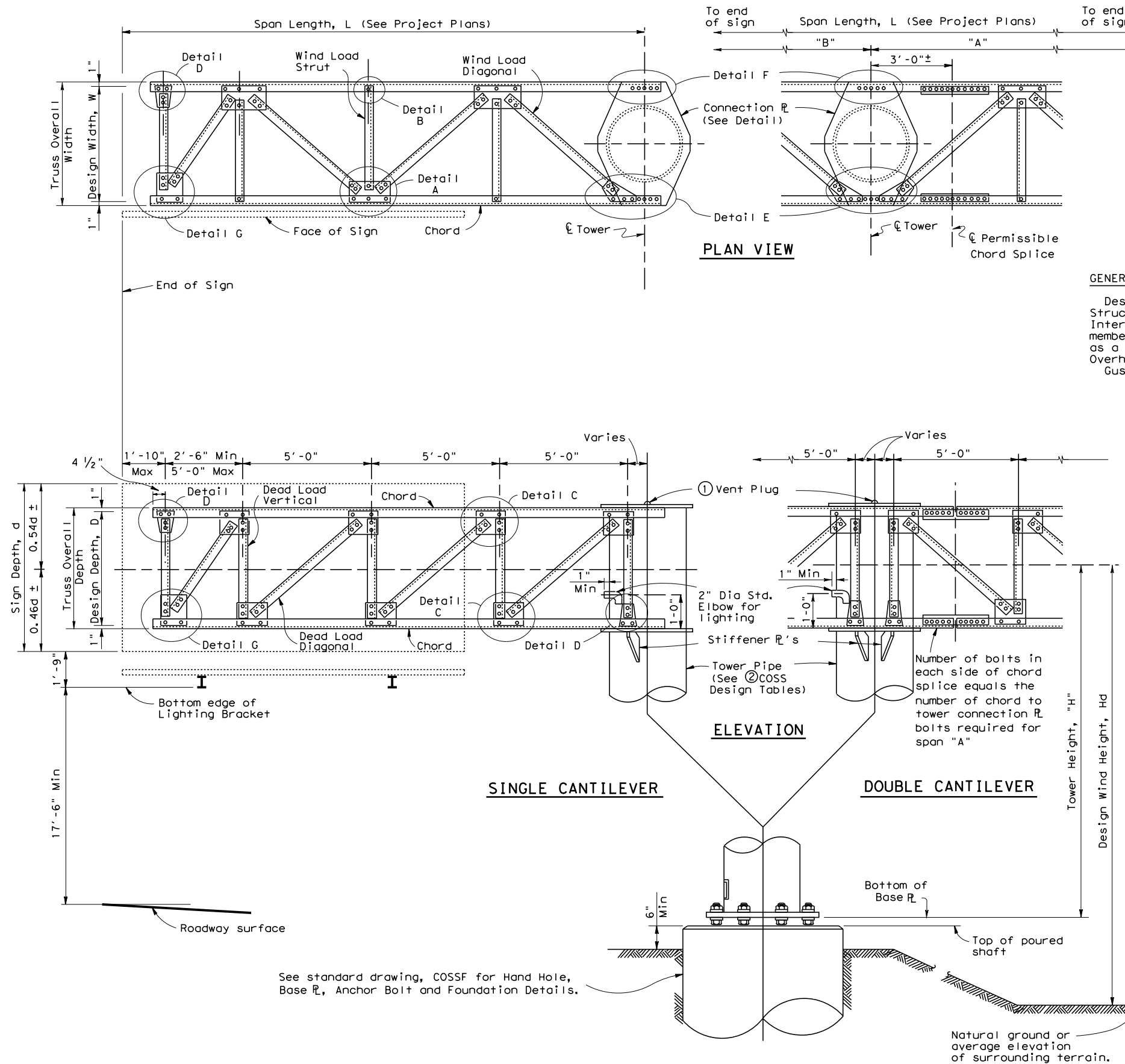


**IH 35
 LARGE SIGN
 DETAILS**

SCALE: NTS		SHEET 1 OF 1			
DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	AR	0015	09	194	IH 35
DW:	CK:	DIST		COUNTY	SHEET NO.
MH	MM	AUS		WILLIAMSON	262

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GENERAL NOTES:

Design conforms to 1975 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and Interim revisions thereto. Connection details are typical only. Actual size of member and number of bolts will vary. The details on this sheet are intended as a guide only. See "Cantilever Overhead Sign Supports" or "High Level Cantilever Overhead Sign Supports" sheets for number of bolts and size of members. Gusset plates to be same thickness as thickest web member in connection.

- ① Note: Cap shall be solid steel sheet $\frac{3}{8}$ " nominal thickness. Drill, tap and plug galvanizing vent. Weld plate to pipe with $\frac{3}{8}$ " weld all around.
- ② For COSS design tables see standard drawing, "Cantilever Overhead Sign Supports" or "High Level Cantilever Overhead Sign Supports".

SHEET 1 OF 2



CANTILEVER OVERHEAD SIGN SUPPORT DETAILS

COSSD

© TxDOT November 2007		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
		0015	09	194	1H 35
		DIST	COUNTY	SHEET NO.	
		AUS	WILLIAMSON	263	

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DATE: 7/2/2021 10:02:07 PM
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DATE: 7/2/2021 10:02:07 PM
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Washers shall conform to ASTM F436.

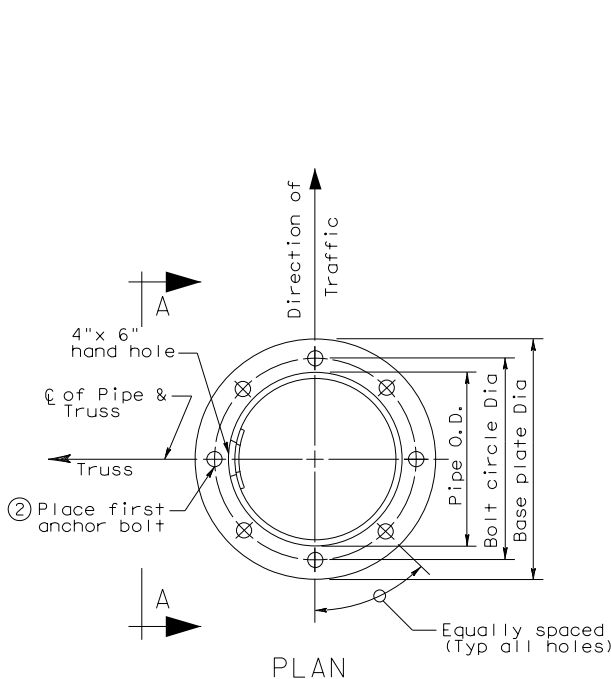
ANCHOR BOLT DIA. d	WASHER DIMENSIONS			HOLE IN BASE PLATE	
	OUTSIDE DIAMETER	HOLE DIAMETER	THICKNESS		
			MIN.		MAX.
1 1/2" or less	2d	d + 1/8"	0.136"	0.177"	d + 1/4"
1 3/4"	2d - 1/8"	d + 1/8"	0.178"	0.280"	d + 5/16"
2"	2d - 1/4"	d + 1/8"	0.178"	0.280"	d + 5/16"
Over 2"	2d - 1/2"	d + 1/8"	0.240"	0.340"	d + 5/16"

ANCHOR BOLT SIZE				
DIA	BOLT LENGTH	THREAD LENGTH	PROJECTION LENGTH	GALVAN. LENGTH
1 1/4"	2'-11"	5"	5 1/4"	11 1/4"
1 3/8"	3'-1"	5 1/2"	5 3/4"	11 3/4"
1 1/2"	3'-4"	6"	6 1/4"	1'-0 1/4"
1 3/4"	3'-10"	7"	7 1/4"	1'-1 1/4"
2"	4'-3"	8"	8 1/4"	1'-2 1/4"
2 1/4"	4'-9"	9"	9 1/4"	1'-3 1/4"
2 1/2"	5'-2"	10"	10 1/4"	1'-4 1/4"
2 3/4"	5'-8"	11"	11 1/4"	1'-5 1/4"
3"	6'-1"	1'-0"	1'-0 1/4"	1'-6 1/4"

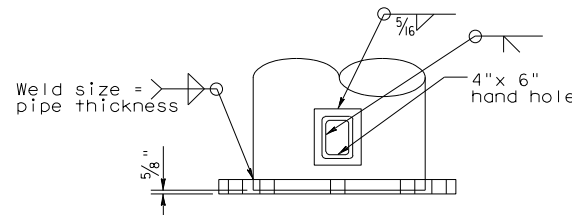
① Anchor Bolt Fabrication Tolerances:
 Bolt Length ~ ±1/2"
 Thread Length ~ ±1/2"
 Galvanized Length ~ -1/4"

ANCHOR BOLT SIZE	PIPE OUTSIDE DIAMETER											
	16"			20"			24"			30"		
	BOLT CIRCLE DIA	DRILLED SHAFT SIZE	DRILLED SHAFT REINF	BOLT CIRCLE DIA	DRILLED SHAFT SIZE	DRILLED SHAFT REINF	BOLT CIRCLE DIA	DRILLED SHAFT SIZE	DRILLED SHAFT REINF	BOLT CIRCLE DIA	DRILLED SHAFT SIZE	DRILLED SHAFT REINF
1 1/4" Dia x 2'-11"	20 1/2"	36" Dia	14-#8 (A)	24 1/2"	36" Dia	14-#8 (A)						
1 3/8" Dia x 3'-1"	20 3/4"	36" Dia	12-#9 (A)	24 3/4"	36" Dia	12-#9 (A)						
1 1/2" Dia x 3'-4"	21"	36" Dia	12-#9 (A)	25"	42" Dia	14-#9 (A)	29"	42" Dia	14-#9 (C)			
1 3/4" Dia x 3'-10"	21 1/2"	36" Dia	10-#10 (A)	25 3/8"	42" Dia	12-#10 (B)	29 3/8"	42" Dia	12-#10 (C)	35 3/8"	48" Dia	16-#10 (C)
2" Dia x 4'-3"	22"	36" Dia	12-#10 (A)	25 3/4"	42" Dia	12-#10 (B)	29 3/4"	48" Dia	16-#10 (C)	35 3/4"	54" Dia	18-#10 (C)
2 1/4" Dia x 4'-9"	22 1/2"	36" Dia	10-#11 (A)	26"	42" Dia	10-#11 (B)	30"	48" Dia	14-#11 (C)	36"	54" Dia	14-#11 (D)
2 1/2" Dia x 5'-2"				26 1/2"	42" Dia	12-#11 (B)	30 1/2"	48" Dia	16-#11 (C)	36 1/2"	54" Dia	16-#11 (D)
2 3/4" Dia x 5'-8"							31 1/2"	48" Dia	18-#11 (D)	37"	54" Dia	20-#11 (D)
3" Dia x 6'-1"										37 1/2"	54" Dia	24-#11 (D)

A = #3 Plain spiral at 6" pitch (Grade 40)
 B = #4 Plain spiral at 6" pitch (Grade 40)
 C = #4 Plain spiral at 6" pitch (Grade 60)
 D = #4 Plain spiral at 3 1/2" pitch (Grade 60)



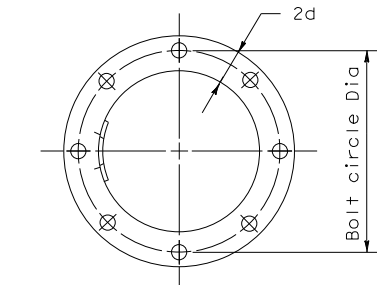
② Place first anchor bolt
 Equally spaced (Typ all holes)



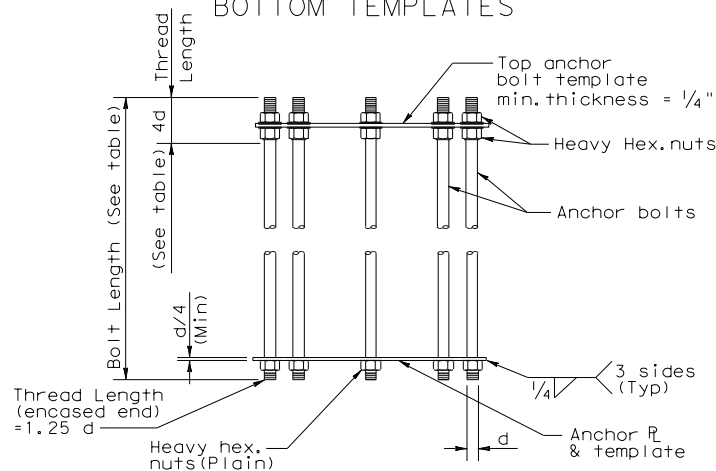
Cut 5" x 7" hole in pipe. Center 4" x 6" hand hole in 3/8" x 8" x 10" back up plate. Provide attachable cover made from section cut from pipe.

③ BASE PLATE & HANDHOLE DETAILS

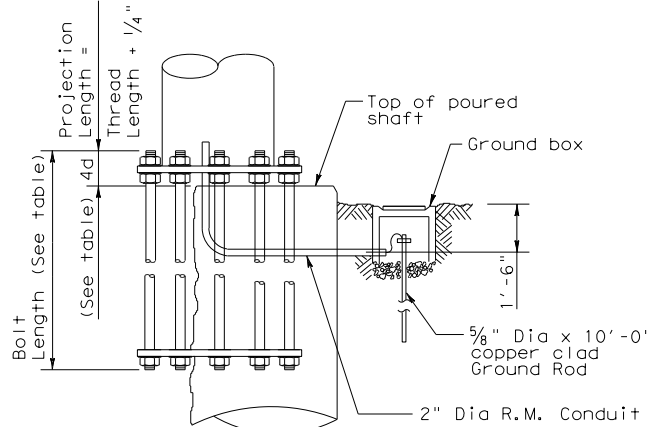
③ See "Cantilever Overhead Sign Support" or "High Level Cantilever Overhead Sign Support" sheets for Diameter and thickness of base plate.



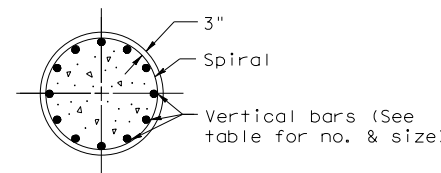
TOP VIEW OF TOP & BOTTOM TEMPLATES



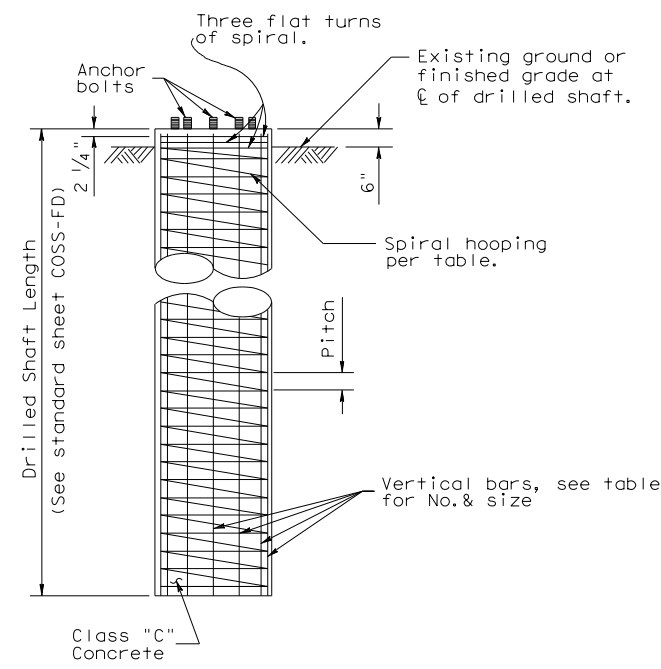
ANCHOR BOLT ASSEMBLY (PRIOR TO INSTALLATION)



BEARING SEAT ELEVATION



SECTION



FOUNDATION DETAIL

GENERAL NOTES:

Concrete shall be Class "C".
 Reinforcing shall conform to Item 440, "Reinforcing Steel".
 Anchor bolts and nuts for anchor bolts shall be "Alloy Steel" per Item 449, "Anchor Bolts".
 Anchor bolts shall be rigidly held in position during concrete placement using steel templates at the top and bottom. The top templates shall be removed after the concrete has set.
 Lubricate and tighten anchor bolts when erecting the structure per Item 449, "Anchor Bolts". After the structure has been aligned in its final position and the anchor bolts have been properly tightened, tack weld anchor bolt nuts to washer, and tack weld washers to base plate. Galvanizing in tack welded areas shall be repaired in accordance with Item 445, "Galvanizing".
 All vertical reinforcing shall be carried to the bottom of the Drilled Shaft.



CANTILEVER OVERHEAD SIGN SUPPORT FOUNDATION

COSSE

© TxDOT November 2007		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
		0015	09	194	1H 35
		DIST	COUNTY	SHEET NO.	
		AUS	WILLIAMSON	265	

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DATE: 9/4/2021
 FILE: br1dgpw01\cs01\7/8/2021...3725*24\037403-dcm(1)-20.dgn

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS				DELINEATORS				D & OM DESCRIPTIVE CODES		
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SINGLE		DOUBLE		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	
SHEETING	Yellow, White or Red Type B or C reflective 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 (fix). 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.				POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX	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 units (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
					MOUNT TYPE	GND	GND, SRF	GND	GND, SRF	

OBJECT MARKERS								
DEVICE	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
SHEETING	Yellow-Type B _{FL} or C _{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroreflective 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)			CHEVRONS				ONE DIRECTION LARGE ARROW		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.			
DEVICE	GF1	GF2	CTB	W1-8				W1-6				
				SIZE (W x L)	18" x 24" (Conventional)	24" x 30" (Conventional Oversize)	30" x 36" (Expressway)	36" x 48" (Freeway)	SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)	
				MOUNTING HEIGHT	4'-0" or 7'-0"				7'-0" Only	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).							
SHEETING	Yellow, White, Red											
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.											



DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION
D & OM(1)-20

FILE: dcm1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	AUS	WILLIAMSON	267	

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DATE: 7/8/2021 9:44:35 PM
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POST TYPE AND SUPPORT FOUNDATION DETAILS

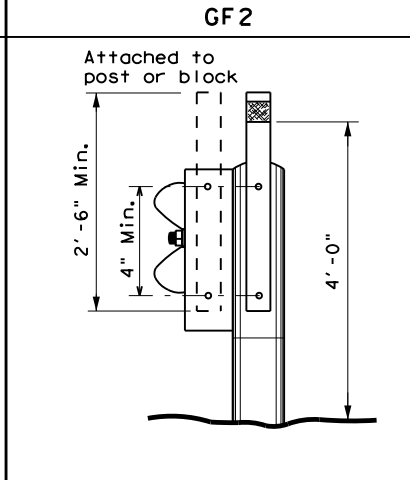
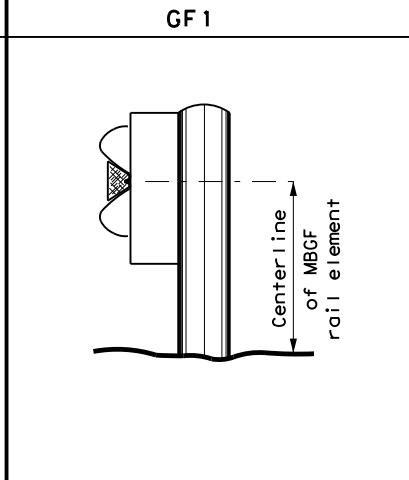
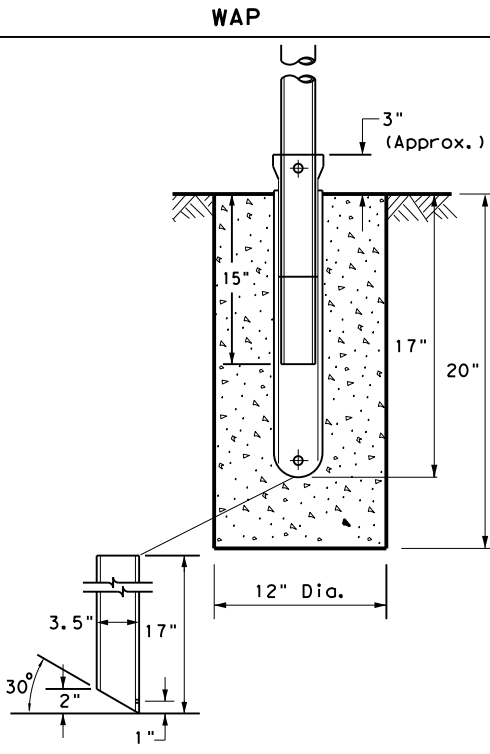
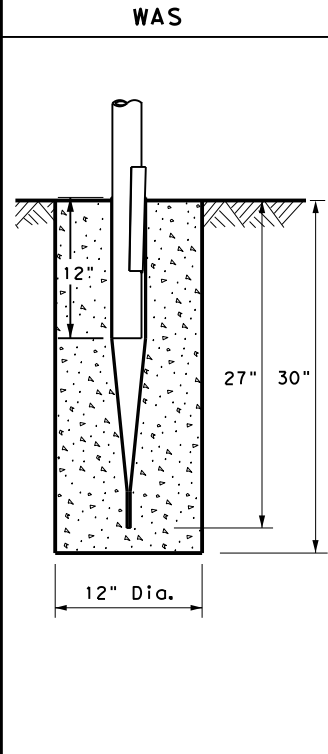
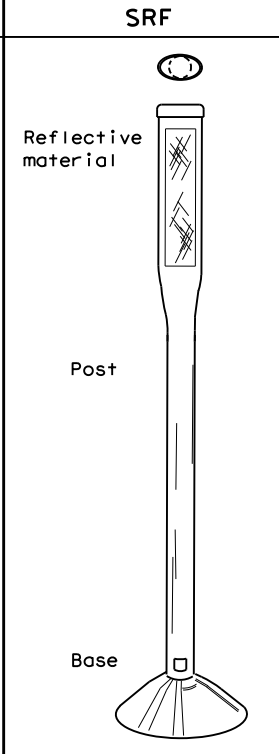
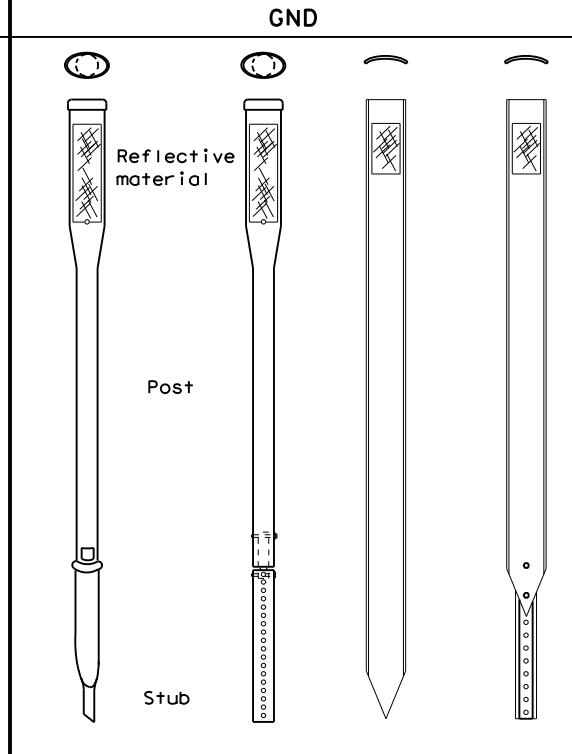
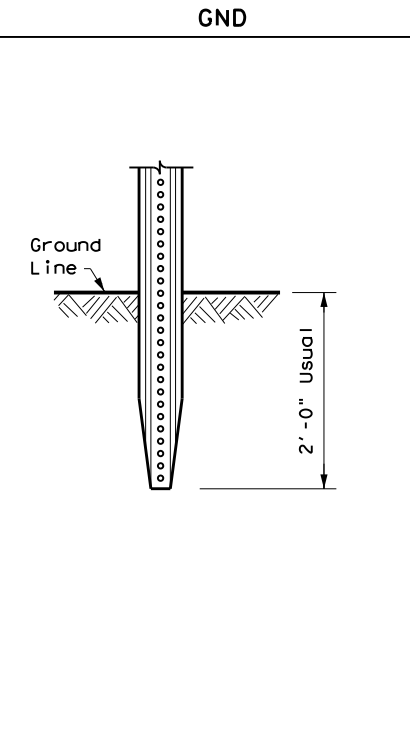
TYPE OF BARRIER MOUNTS

WING CHANNEL (WC)

FLEXIBLE POSTS (YFLX, WFLX)

WEDGE ANCHOR SYSTEMS

GUARD FENCE ATTACHMENT



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.

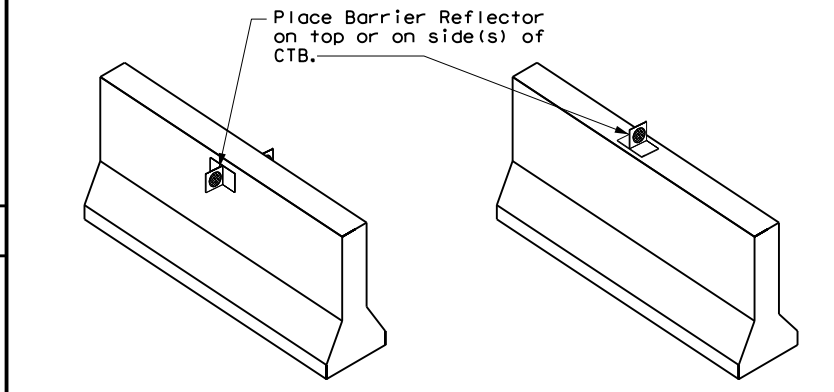
NOTES

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.

NOTE

1. Install per manufacturer's recommendations.

CONCRETE TRAFFIC BARRIER (CTB)



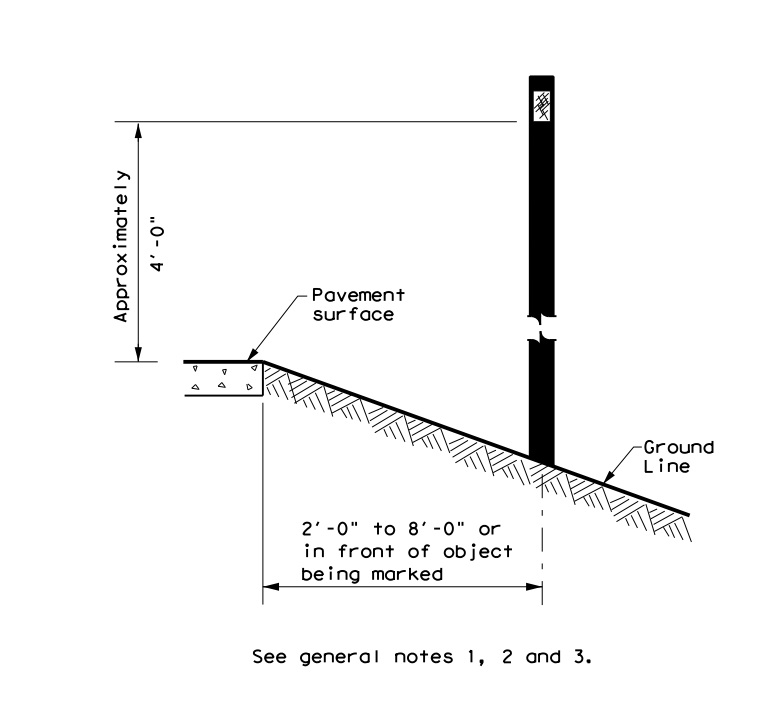
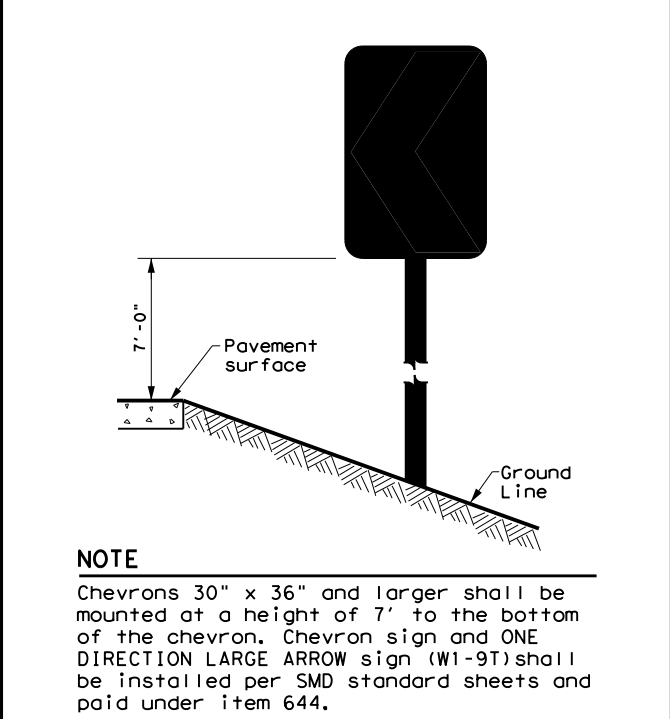
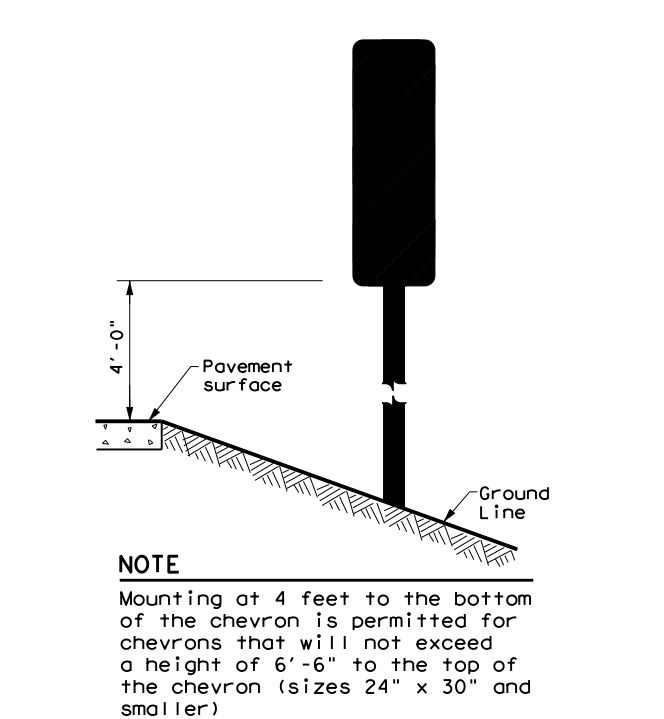
GENERAL NOTES

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

CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN

DELINEATORS AND TYPE 2 OBJECT MARKERS



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
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10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	AUS	WILLIAMSON	268	

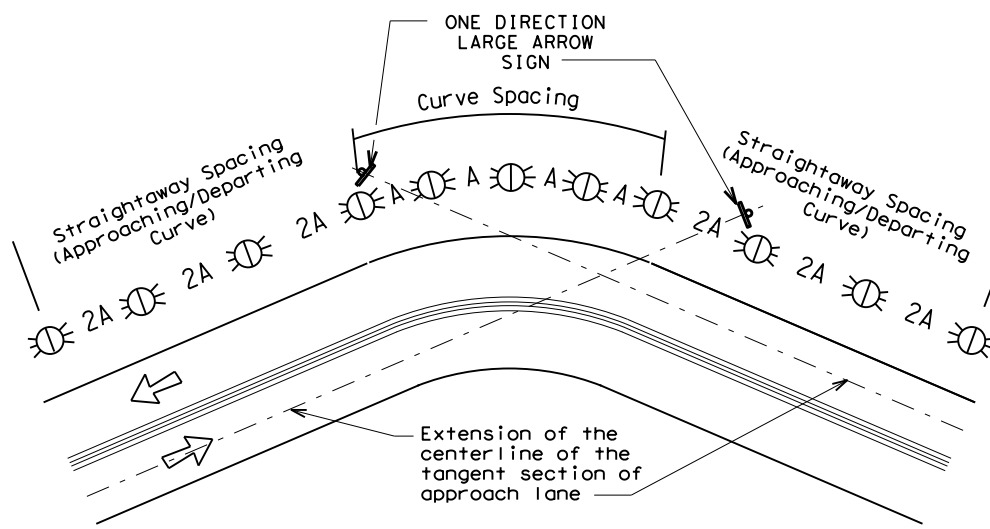
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 ...3725*26\037403-dam(3)-20.dgn

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

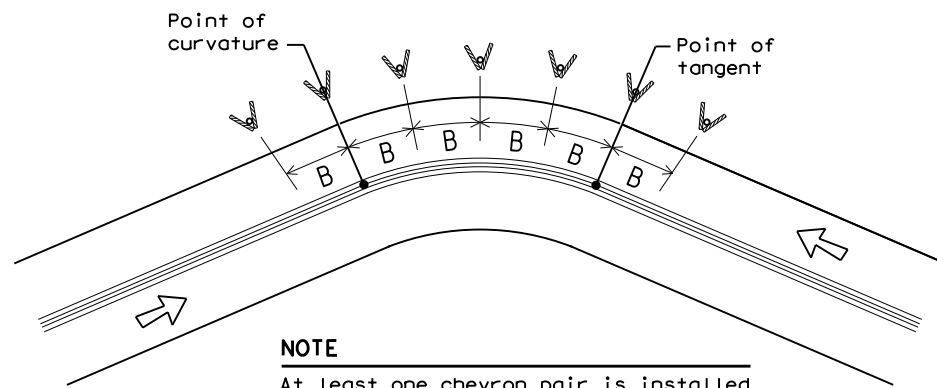
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN				
Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN			
Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp. Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete) and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100' max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100' max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

- Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
- Barrier reflectors may be used to replace required delineators.
- Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation
Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

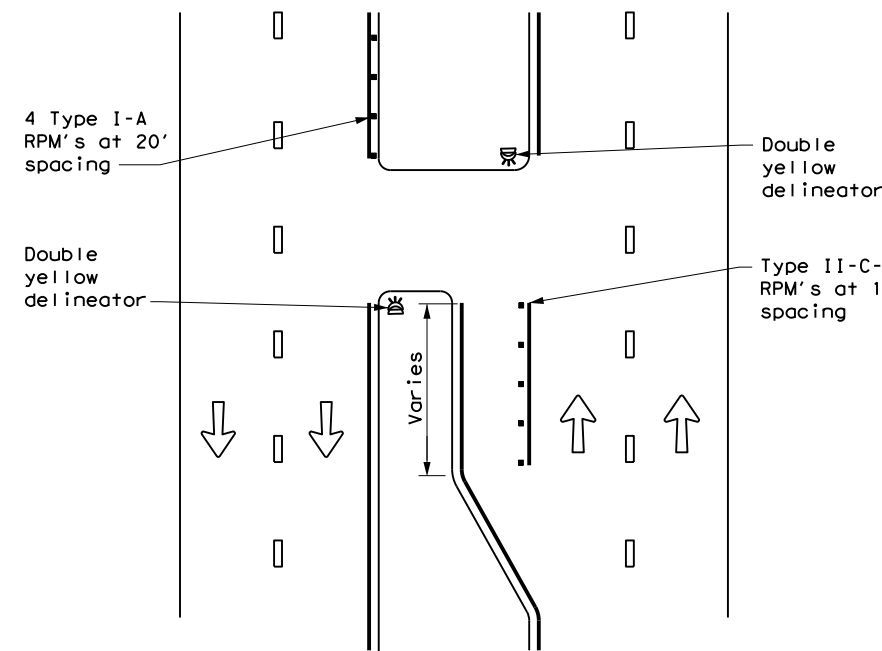
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3-15 8-15	DIST	COUNTY	SHEET NO.	
8-15 7-20	AUS	WILLIAMSON	269	

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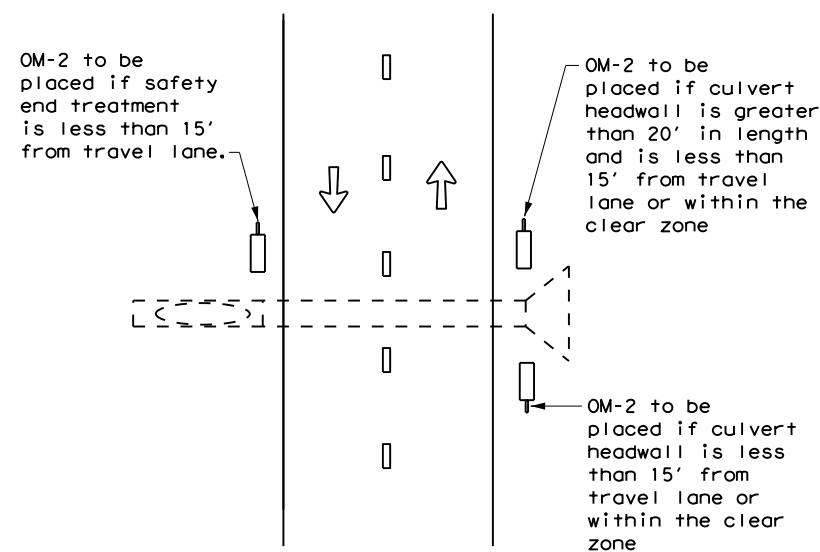
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CROSSOVERS



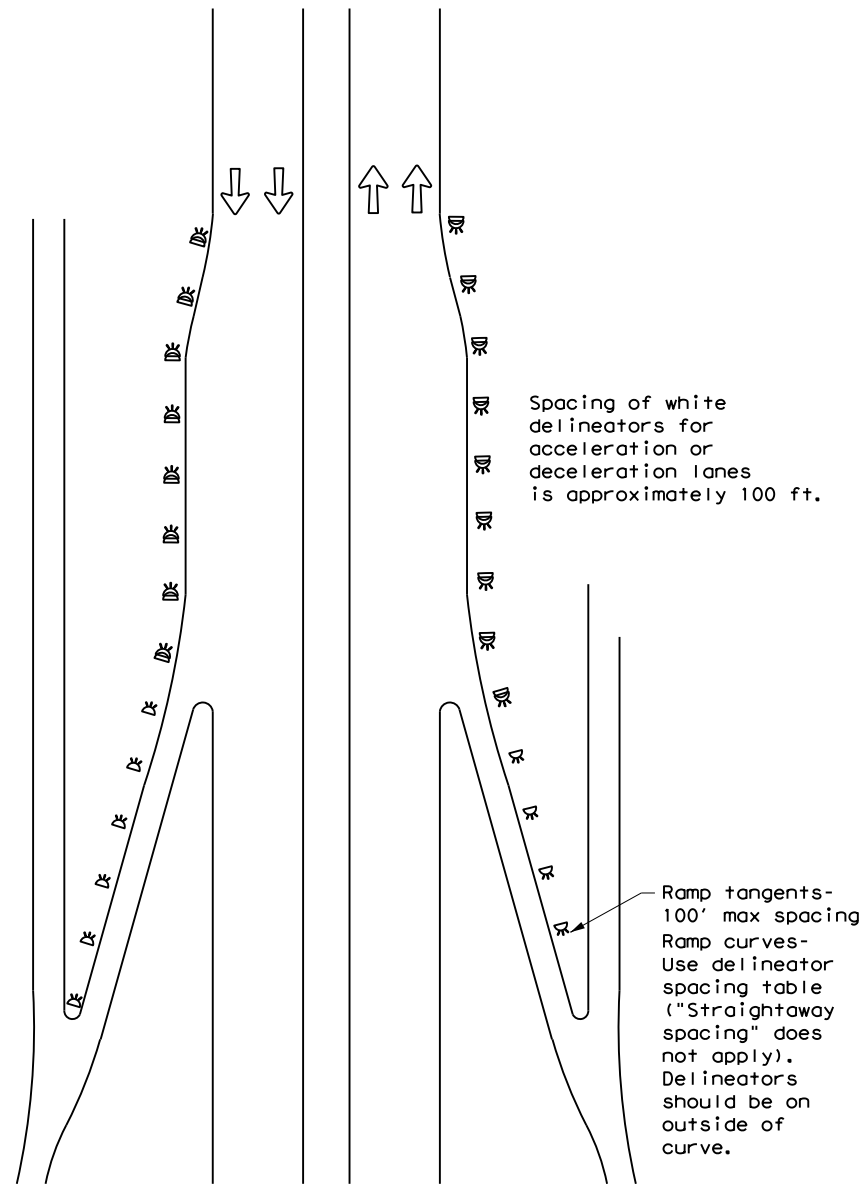
DETAIL 1

FOR CULVERTS WITHOUT MBGF



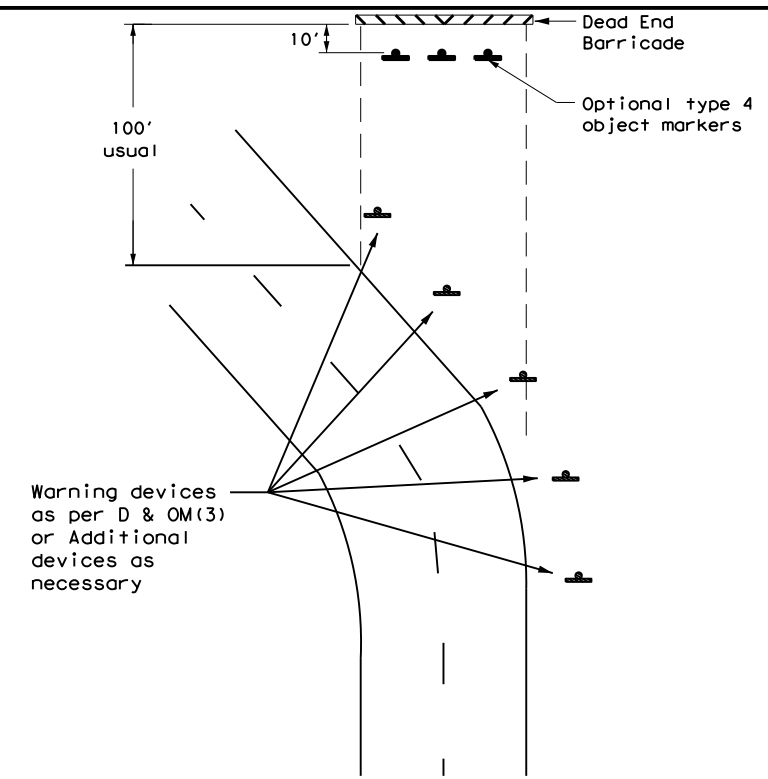
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



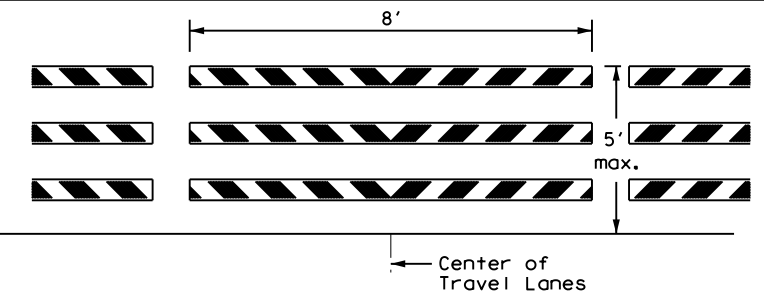
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

- Barricade striping shall be red and white reflective sheeting for all permanent road closures.
- Barricade striping is red and white sloping toward the center of the roadway.
- Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator



DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

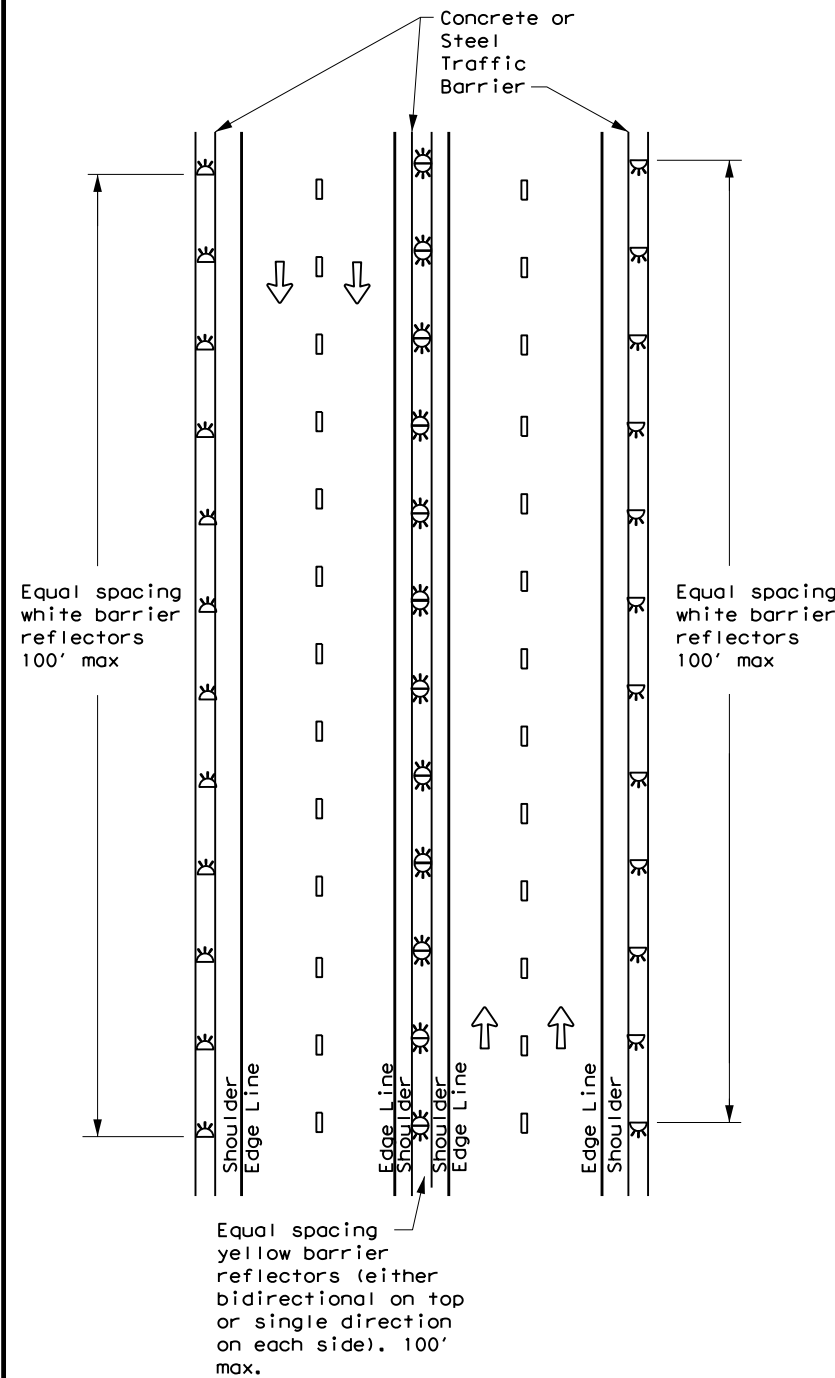
D & OM(4) -20

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© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
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3-15	DIST	COUNTY	SHEET NO.	
7-20	AUS	WILLIAMSON	270	

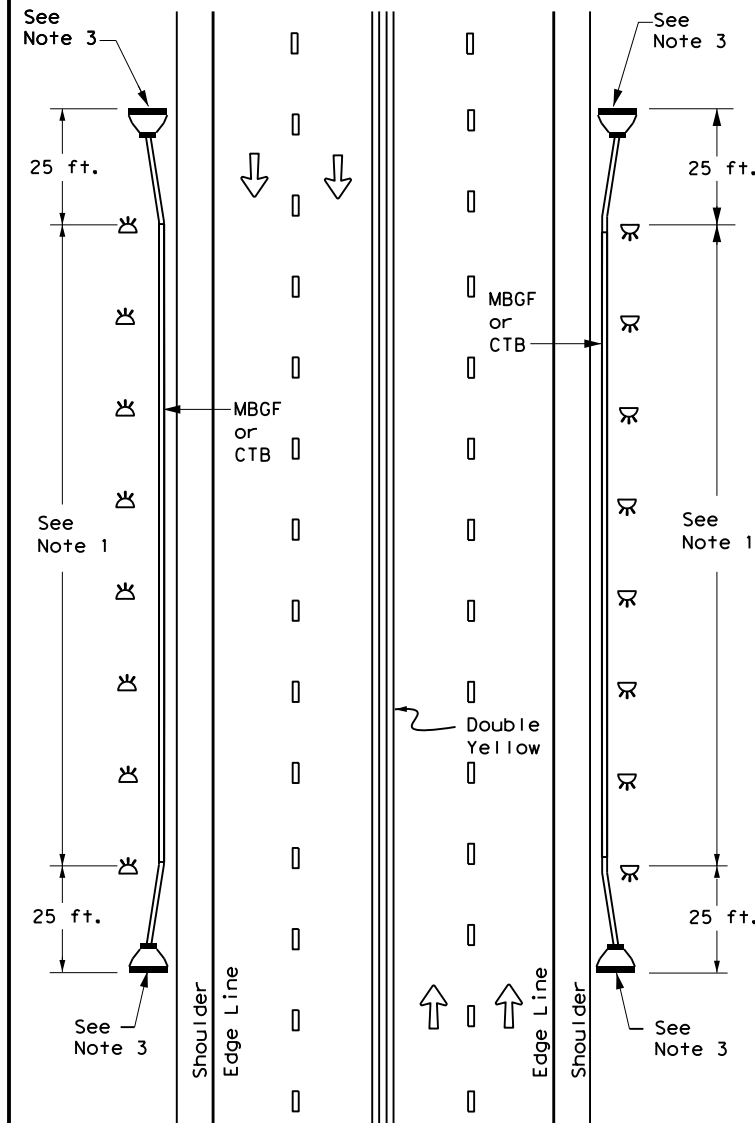
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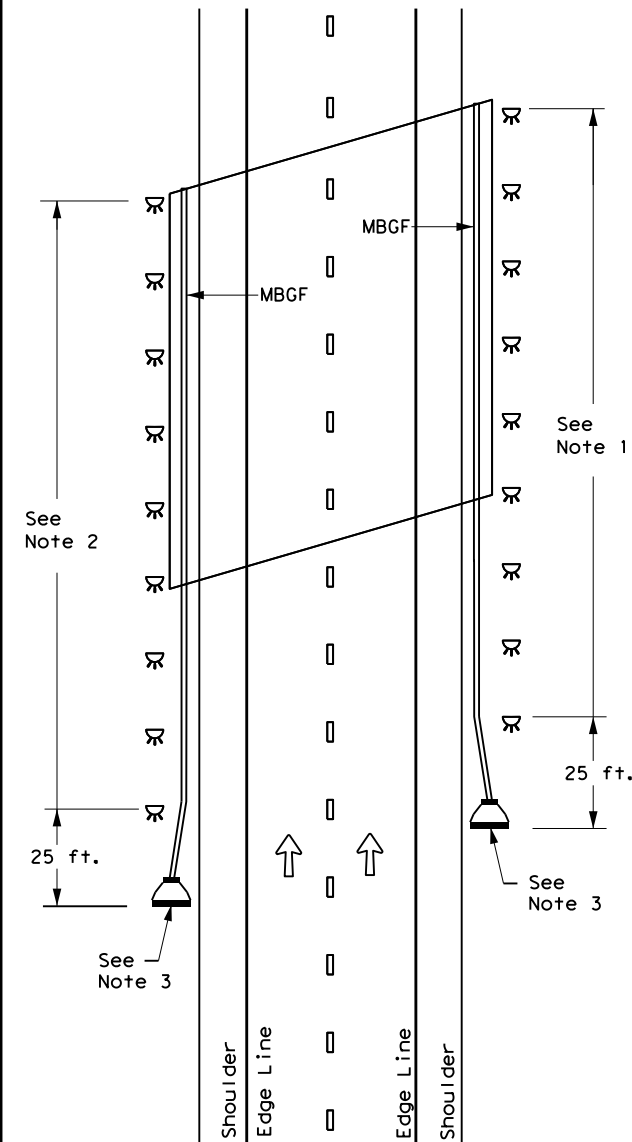
CONTINUOUS CONCRETE OR STEEL BARRIER



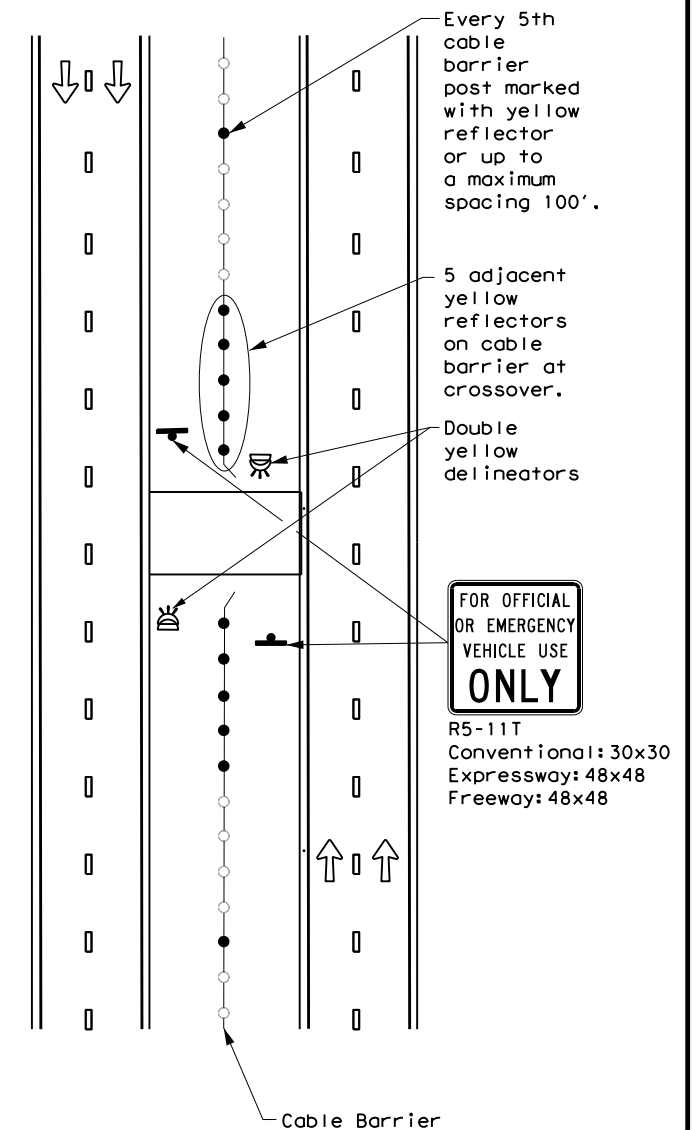
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

1. Equal spacing (100' max), but not less than 3 single directional white barrier reflectors or delineators. On Continuous Barrier, equal spacing (100' max.)
2. Equal spacing (100' max), but not less than 3 single directional yellow barrier reflectors or delineators.
3. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

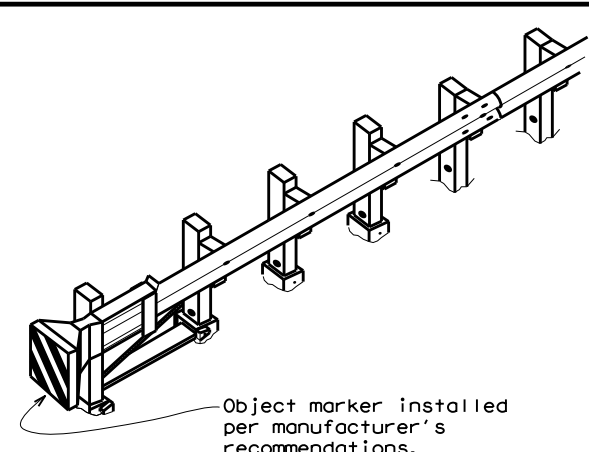
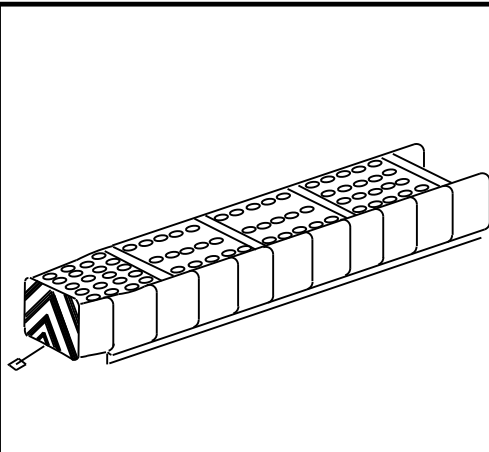
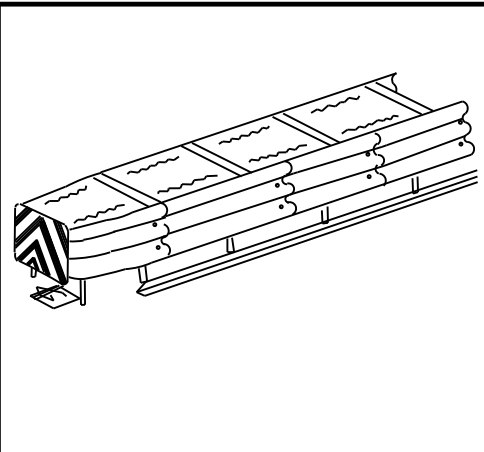
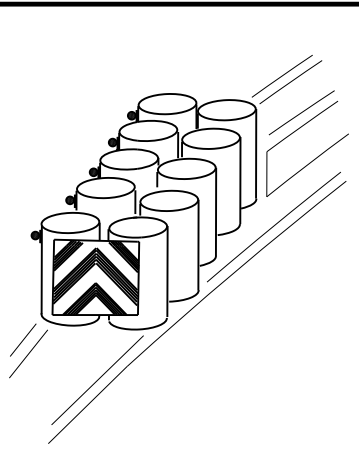


DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

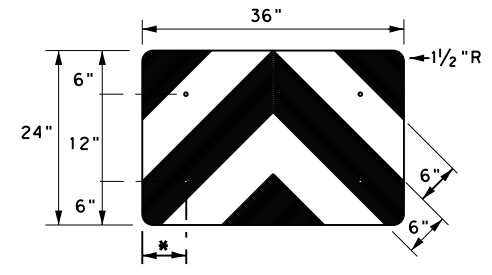
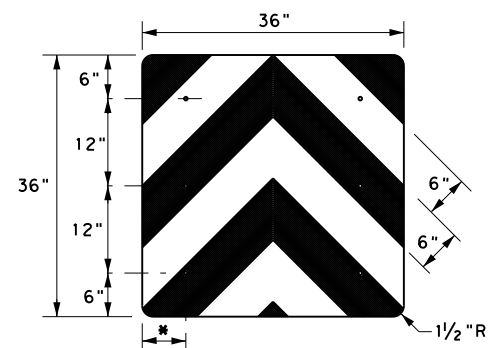
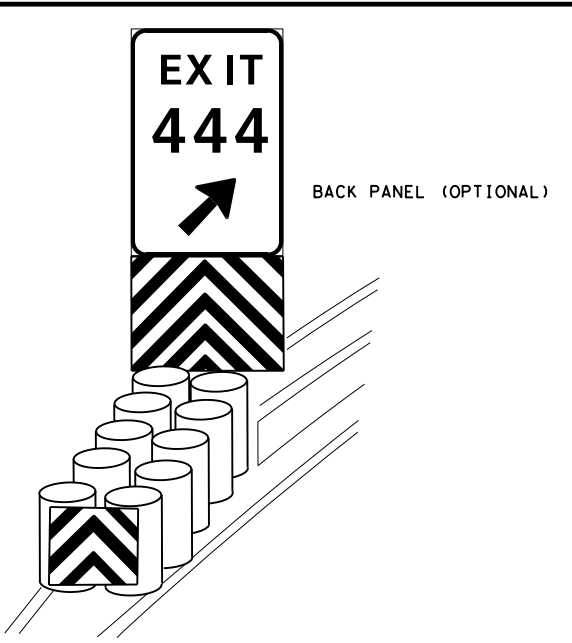
D & OM(6) - 20

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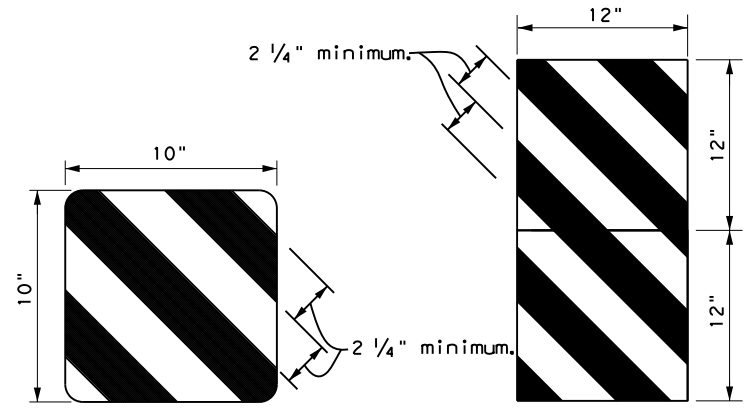
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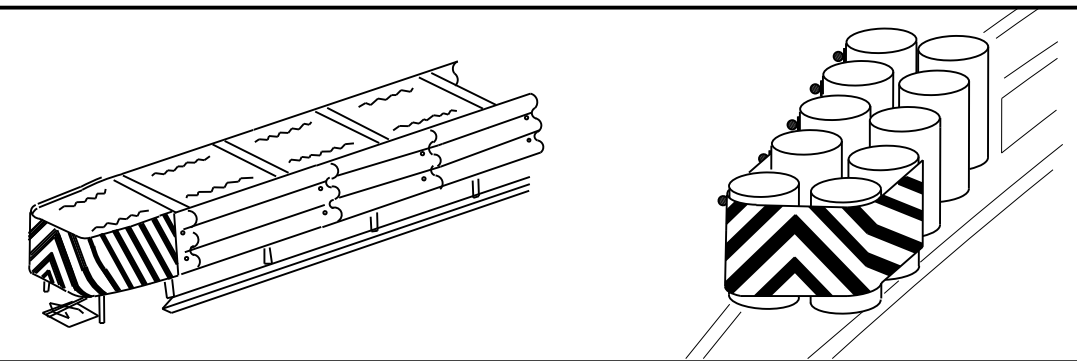
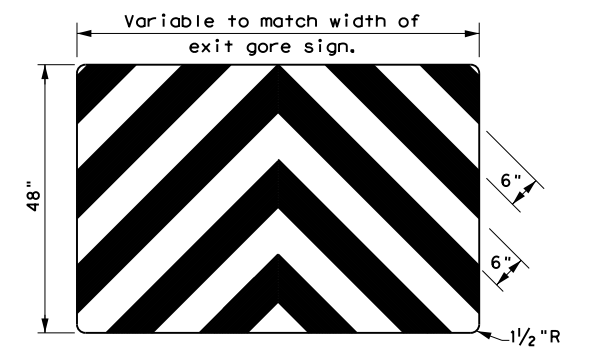
Object marker installed per manufacturer's recommendations.



* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer



OBJECT MARKERS SMALLER THAN 3 FT²

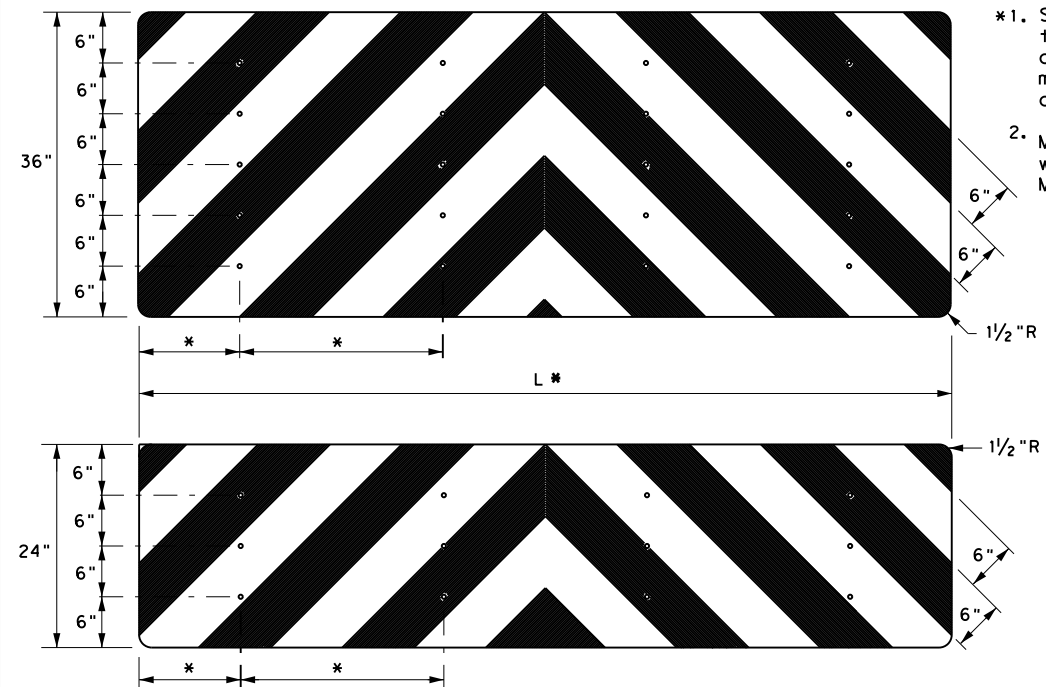


NOTES

- Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.
- Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.
- Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 1/4".
- Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.
- Object Marker at nose of attenuator is subsidiary to the attenuator.
- See D & OM (1-4) for required barrier reflectors.

NOTES

- Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturer's recommendation, or as directed by the Engineer.
- Mounting should be flush with top of attenuator. Minimum size 96" x 24".



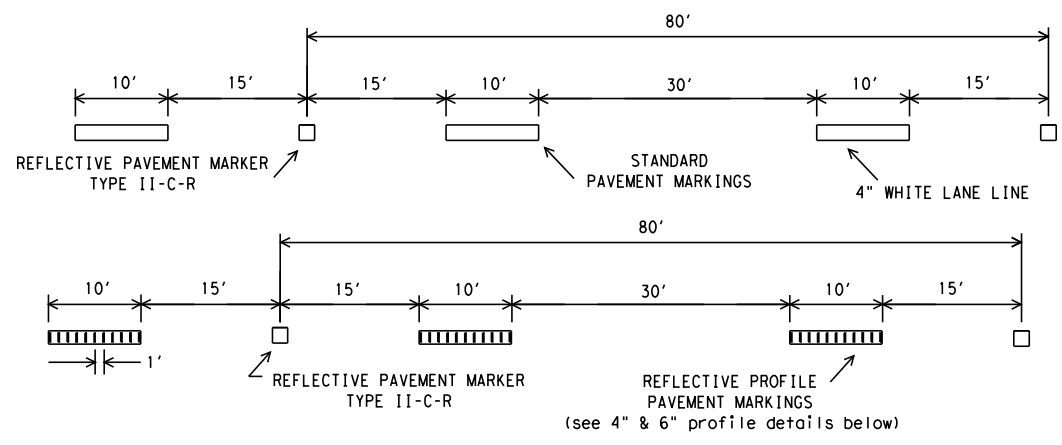
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		Traffic Safety Division Standard	
DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS D & OM(VIA) -20			
FILE: domvia20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT December 1989	CONT	SECT	JOB
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4-92 8-04			HIGHWAY
8-95 3-15			1H 35
4-98 7-20	DIST	COUNTY	SHEET NO.
	AUS	WILLIAMSON	272
20G			

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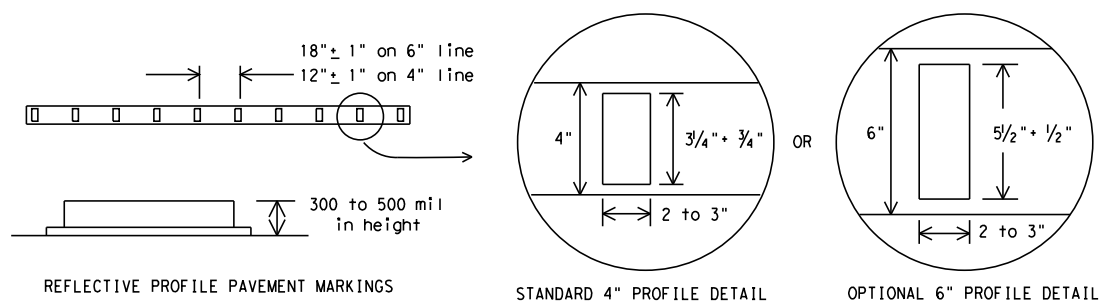
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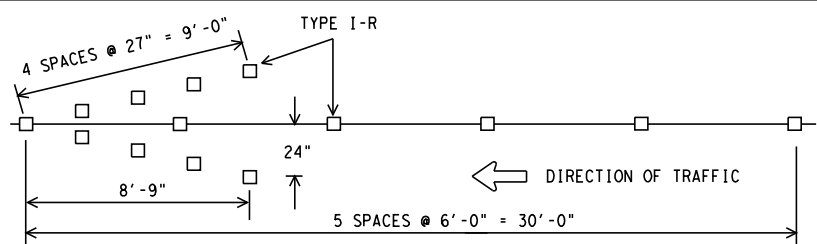
PAVEMENT MARKERS (REFL) TYPE II-C-R SHALL BE SPACED ON 80' CENTERS WITH THE CLEAR FACE TOWARD NORMAL TRAFFIC AND THE RED FACE TOWARD WRONG WAY TRAFFIC.

TRAFFIC LANE LINES PAVEMENT MARKING DETAILS

EDGE LINES SHOULD TYPICALLY BE 4" WIDE AND THE MATERIALS SHALL BE AS SPECIFIED IN THE PLANS. IF RAISED PROFILE PAVEMENT MARKINGS ARE USED SEE DETAILS BELOW.

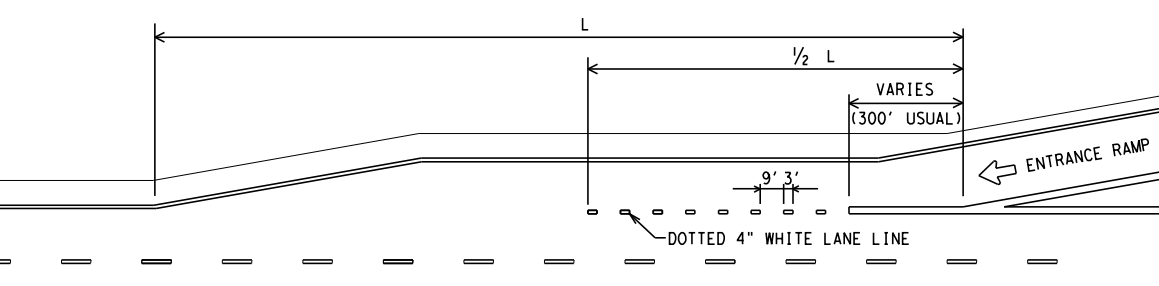


EDGE LINE PAVEMENT MARKINGS

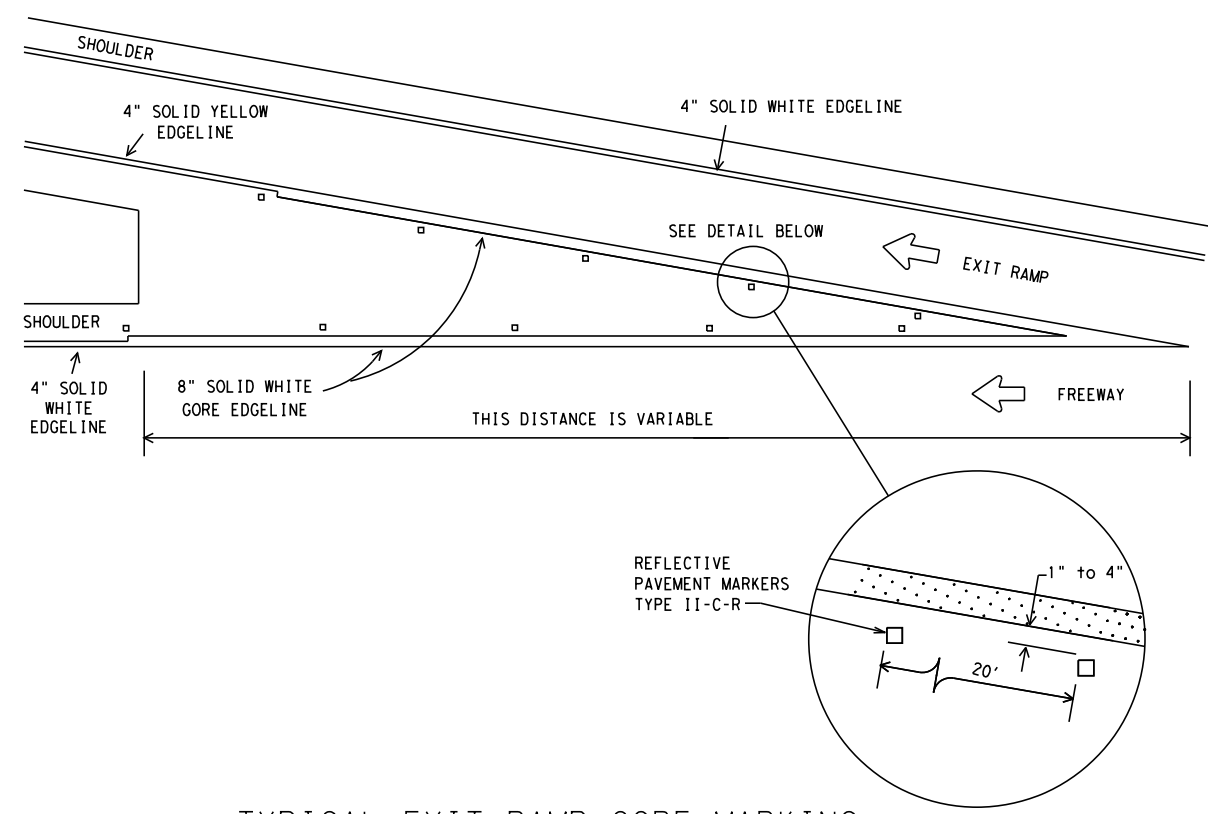


ALL RAISED MARKERS IN THE WRONG WAY ARROW SHALL BE TYPE I-R REFLECTORIZED PAVEMENT MARKERS WITH THE REFLECTORIZED SURFACE FACING THE WRONG WAY TRAFFIC. TYPE II-C-R SHALL NOT BE USED. REFLECTORIZED WRONG WAY ARROWS, NOT TO EXCEED TWO, MAY BE PLACED ON EXIT RAMP. LOCATION OF THE ARROWS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

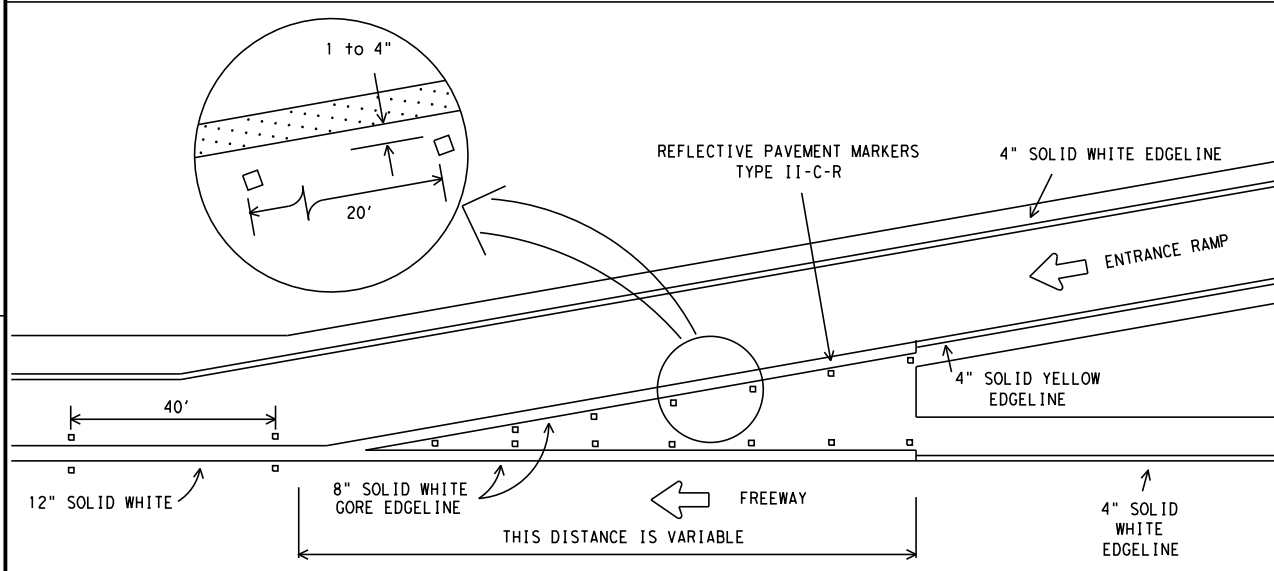
WRONG WAY ARROW DETAIL



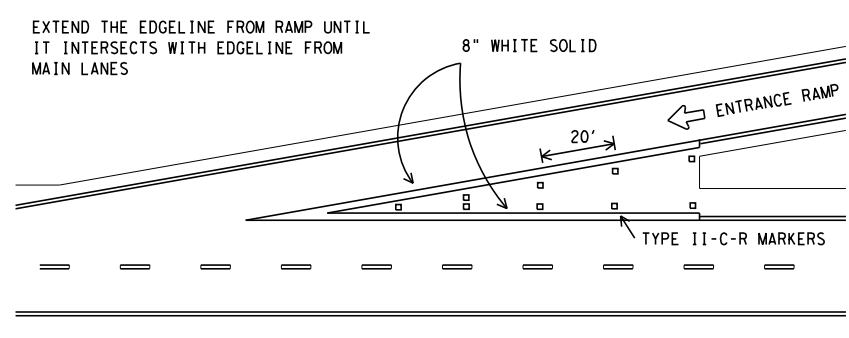
PARALLEL ACCELERATION LANE



TYPICAL EXIT RAMP GORE MARKING



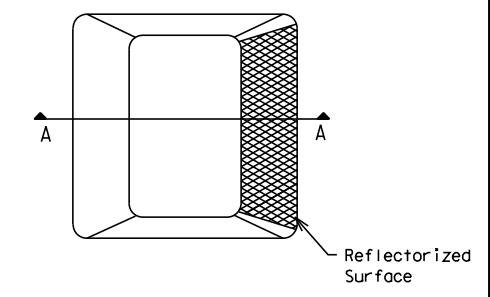
TYPICAL ENTRANCE RAMP GORE MARKING



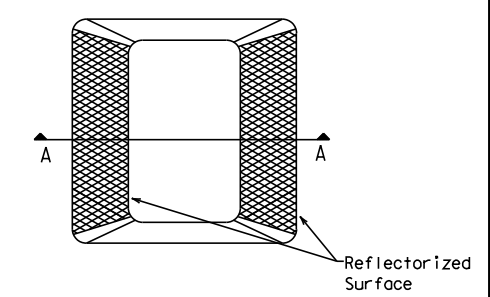
TAPERED ACCELERATION LANE

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

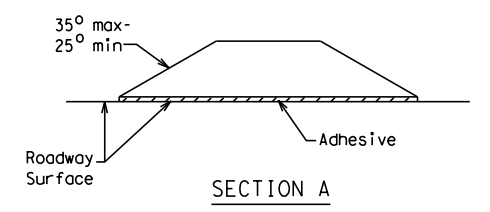
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

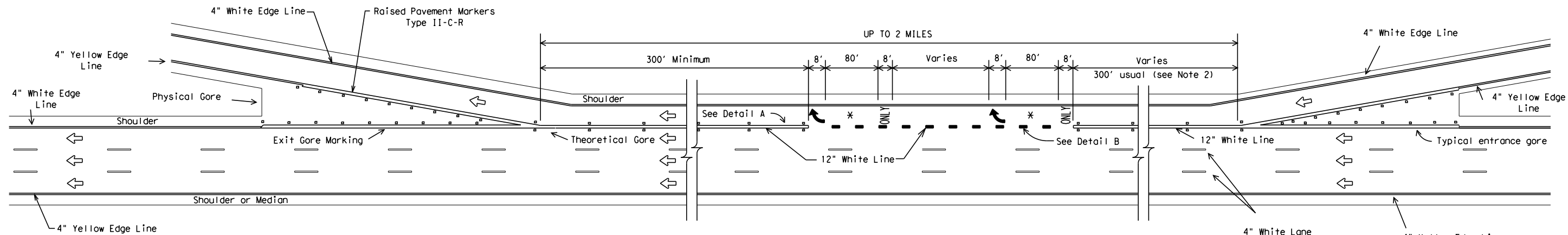
Texas Department of Transportation
 Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS
 FPM(1)-12

© TxDOT May 1974		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
4-92	2-10	0015	09	194	1H 35
5-00	2-12	DIST		COUNTY	SHEET NO.
8-00		AUS		WILLIAMSON	273
2-08					

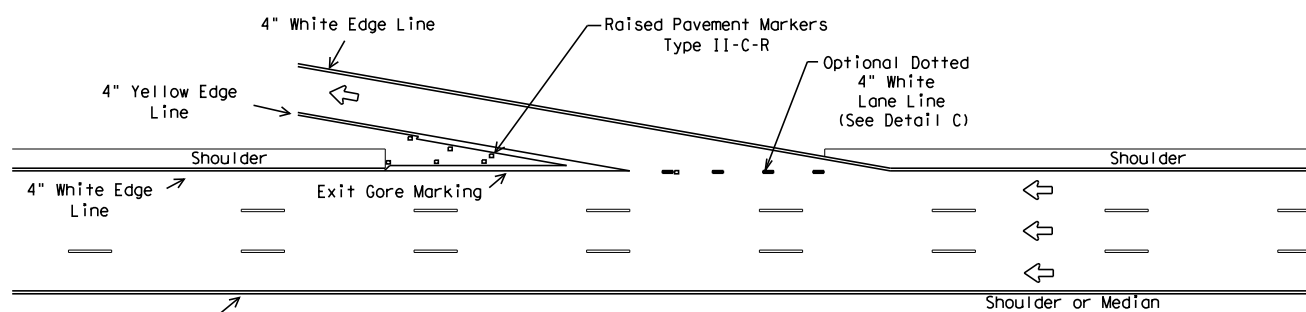
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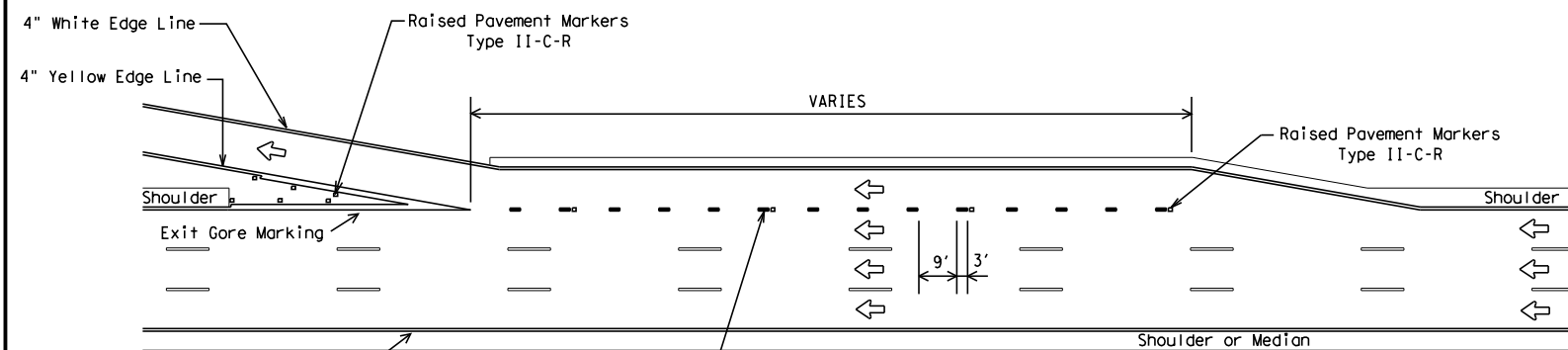


SINGLE LANE EXIT WITH AUXILIARY LANE

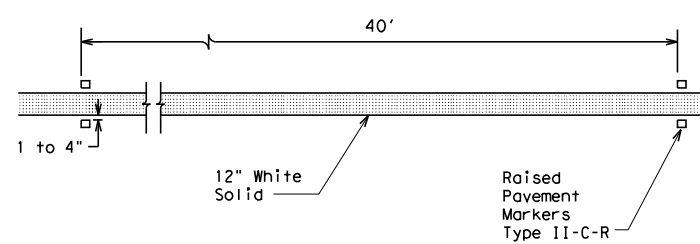
(See Note 2)



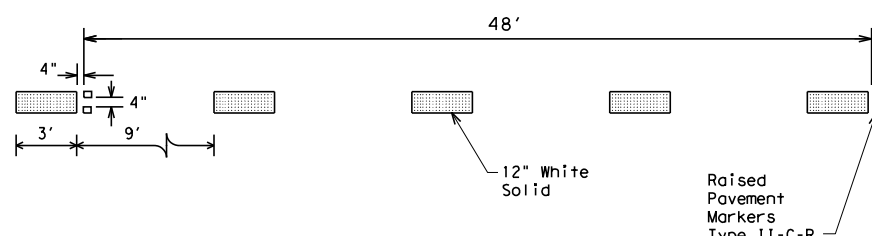
TAPERED DECELERATION LANE



PARALLEL DECELERATION LANE

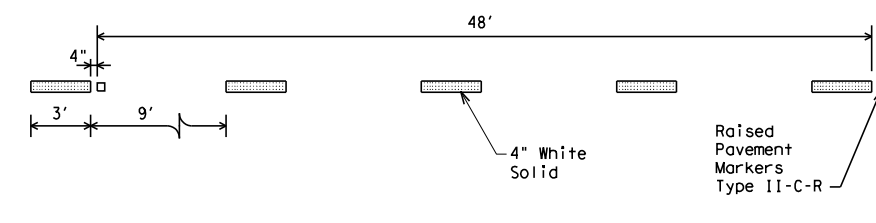


DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)



DETAIL C

Normal (4") Dotted Lane Line (See Note 4)

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.
4. Normal (4") Dotted Lane Line (See Detail C) is used at parallel acceleration and deceleration lanes.

LEGEND	
←	Denotes direction of traffic.
↶	Pavement marking arrows (white)
*	Arrow markings are optional, however "ONLY" is required if arrow is used

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.

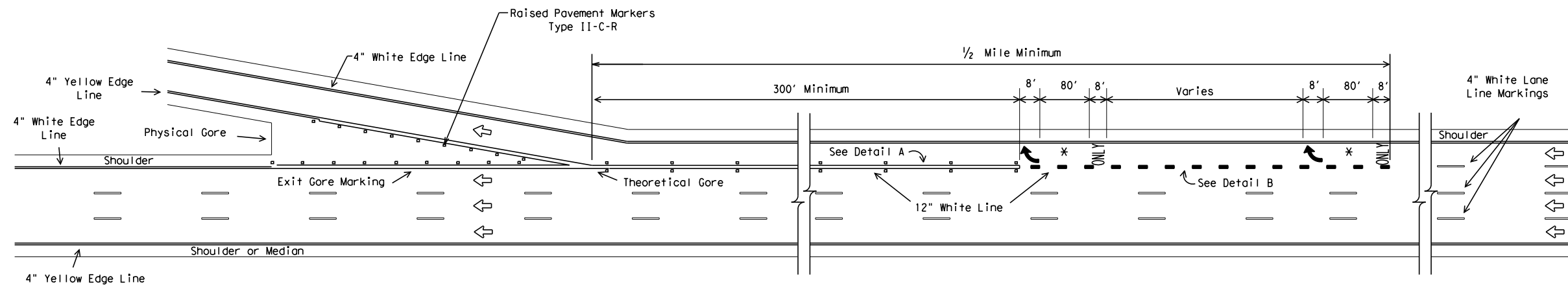


**TYPICAL STANDARD
 FREEWAY PAVEMENT MARKINGS
 ENTRANCE AND EXIT RAMP
 FPM(2)-12**

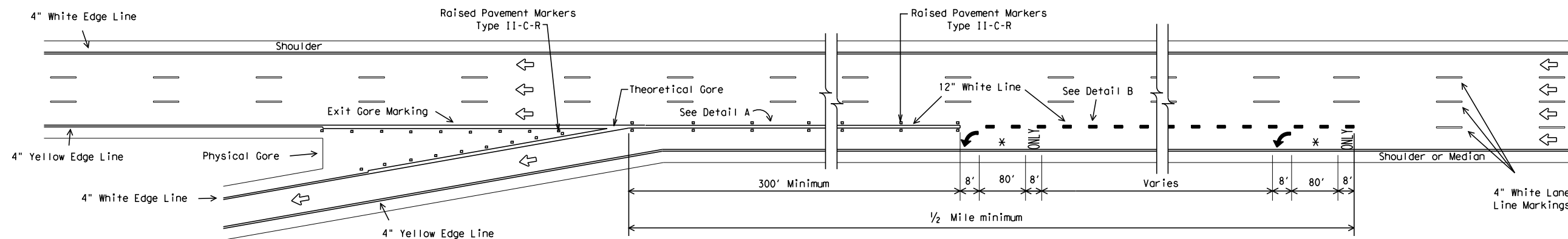
© TxDOT February 1977		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
4-92	2-10	0015	09	194	1H 35
8-95	2-12				
5-00		DIST	COUNTY		SHEET NO.
8-00		AUS	WILLIAMSON		274

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SINGLE LANE EXIT - LANE DROP OR EXIT ONLY

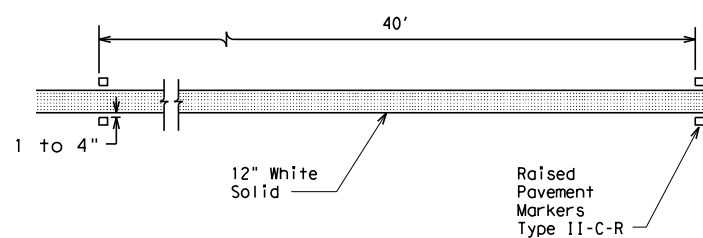


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY (LEFTHAND)

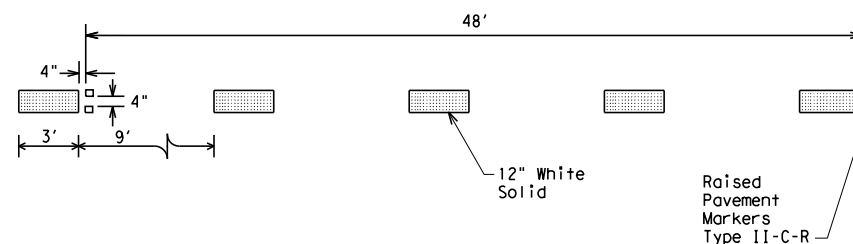
LEGEND	
←	Denotes direction of traffic.
↶	Pavement marking arrows (white)
✱	Arrow markings are optional, however "ONLY" is required if arrow is used

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.



DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)

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

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

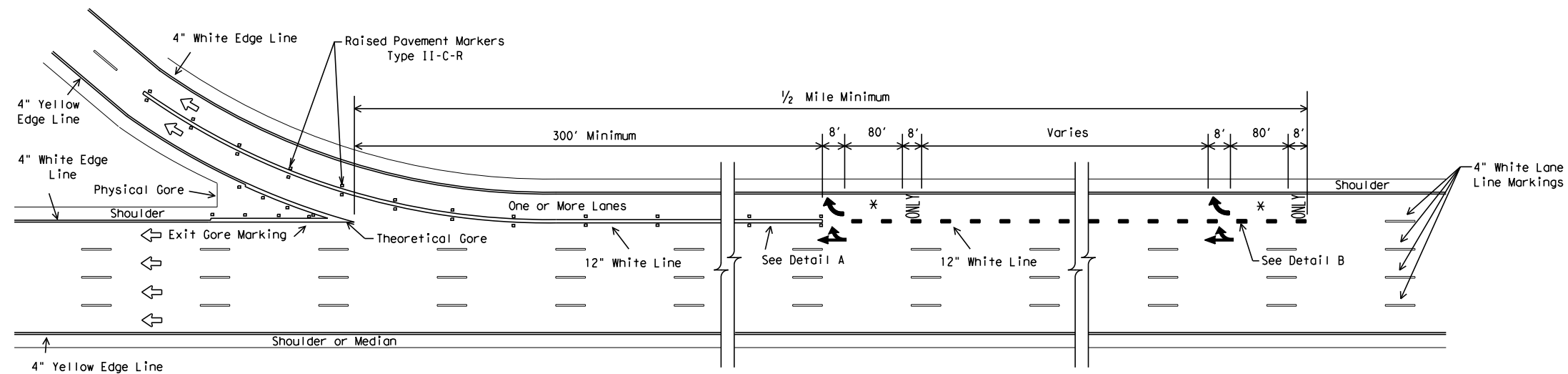
Texas Department of Transportation
 Traffic Operations Division

**TYPICAL STANDARD
 FREEWAY PAVEMENT MARKINGS
 LANE DROP (EXIT ONLY) EXIT RAMP**
 FPM(3) - 12

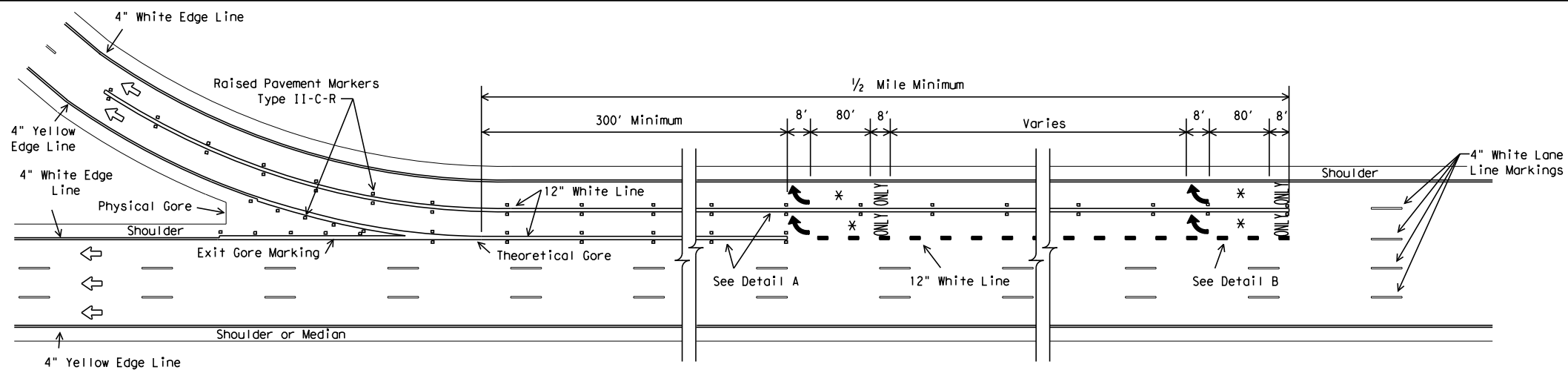
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5-00		CONT	SECT	JOB	HIGHWAY
8-00		0015	09	194	1H 35
2-10		DIST	COUNTY		SHEET NO.
2-12		AUS	WILLIAMSON		275

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MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE

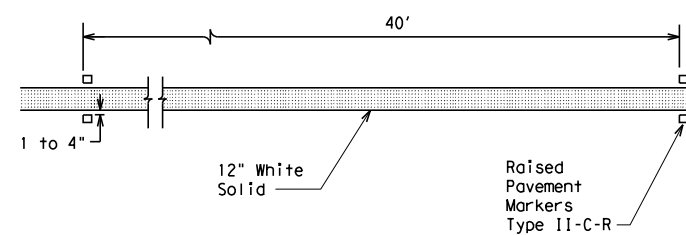


MULTIPLE LANE EXIT ONLY

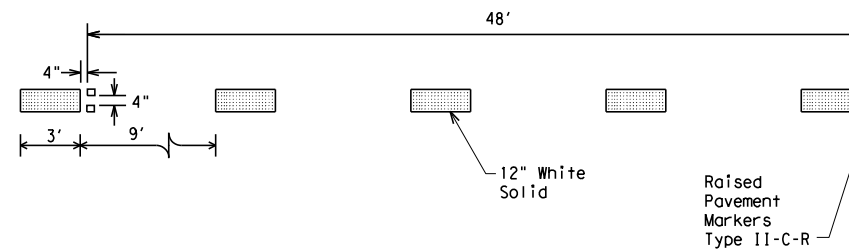
LEGEND	
	Denotes direction of traffic
	Pavement marking arrow (white)
	Optional Pavement Marking Arrows (white)
	Arrow markings are optional, however "ONLY" is required if arrow is used

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.



DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)

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

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



TYPICAL STANDARD
 FREEWAY PAVEMENT MARKINGS
 LANE DROP (EXIT ONLY) DETAILS
 FPM(4) - 12

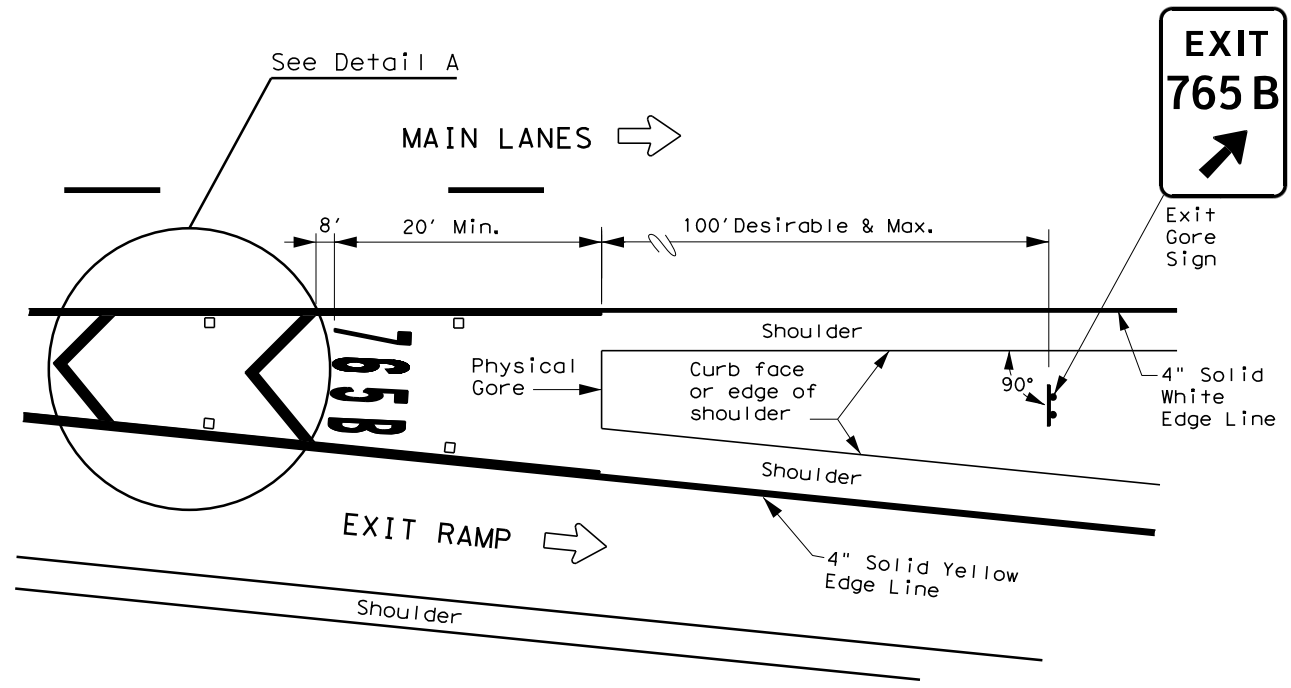
© TxDOT April 1992		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
5-00		0015	09	194	1H 35
8-00					
2-10		DIST		COUNTY	SHEET NO.
2-12		AUS		WILLIAMSON	276

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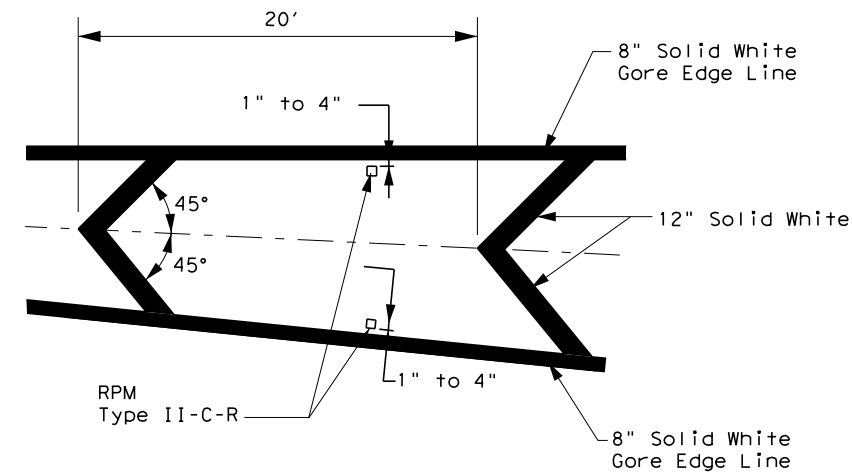
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EXIT NUMBER PAVEMENT MARKING NOTES

1. Minimum 8 foot white markings should be used, unless otherwise noted.
2. Spacing between letters and numbers should be approximately 4 inches.
3. Pavement markings are to be located as specified elsewhere in the plans.
4. All pavement marking materials shall meet the required Departmental Material Specifications or as specified in these plans.
5. Numbers and Letters details can be found in the Standard Highway Design for Texas (SHSD) Chapter 12 at <http://www.txdot.gov>



MARKINGS WITH EXIT NUMBER



NOTES

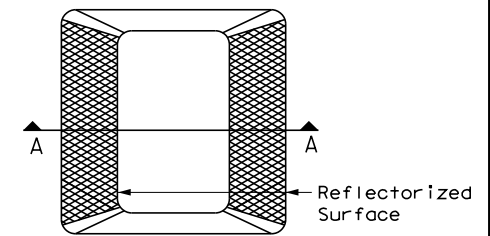
1. Raised pavement markers shall be centered between chevron or gore lines.
2. For more information, see ReflectORIZED Raised Pavement Marker Detail.

DETAIL A

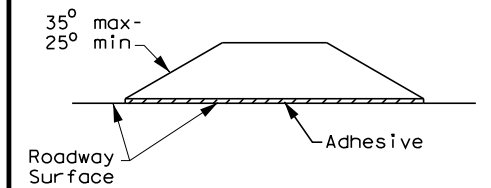
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

LEGEND	
←	Traffic flow
□	ReflectORIZED Raised Markers (RPM) Type II-C-R



Type II (Top View)



SECTION A

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)



EXIT GORE PAVEMENT MARKINGS

FPM(5) - 19

FILE: fpm(5)-19.dgn	DN:	CK:	DW:	CK:
© TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
	DIST	COUNTY	SHEET NO.	
	AUS	WILLIAMSON	277	

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

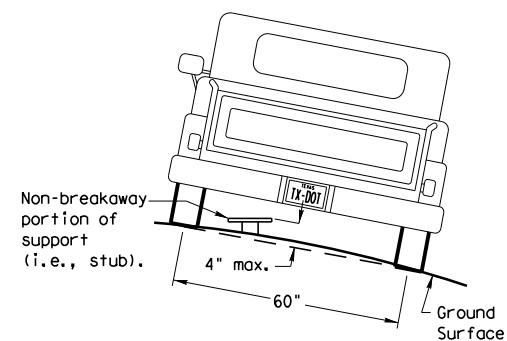
SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type
 FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
 TWT = Thin-Walled Tubing (see SMD(TWT))
 10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
 S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)
Anchor Type
 UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
 UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
 WS = Wedge Anchor Steel - (see SMD(TWT))
 WP = Wedge Anchor Plastic (see SMD(TWT))
 SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
 SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation
 P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
 T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
 U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
 IF REQUIRED
 1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
 BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
 WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
 EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

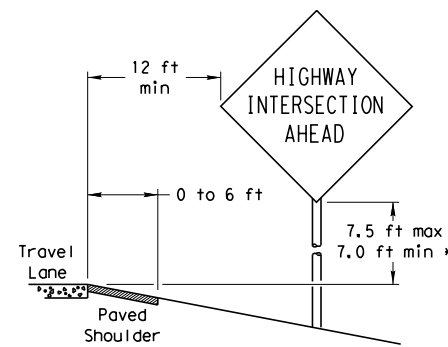
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

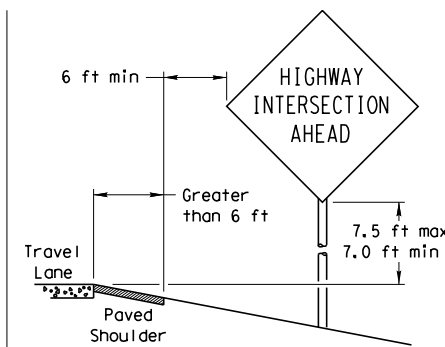
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

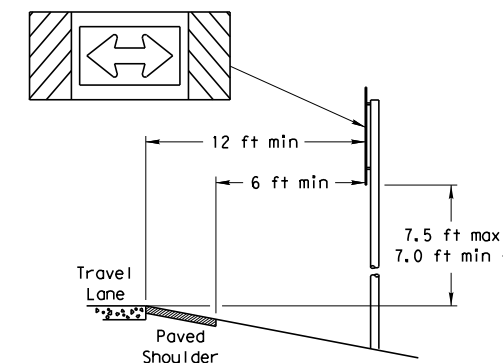
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

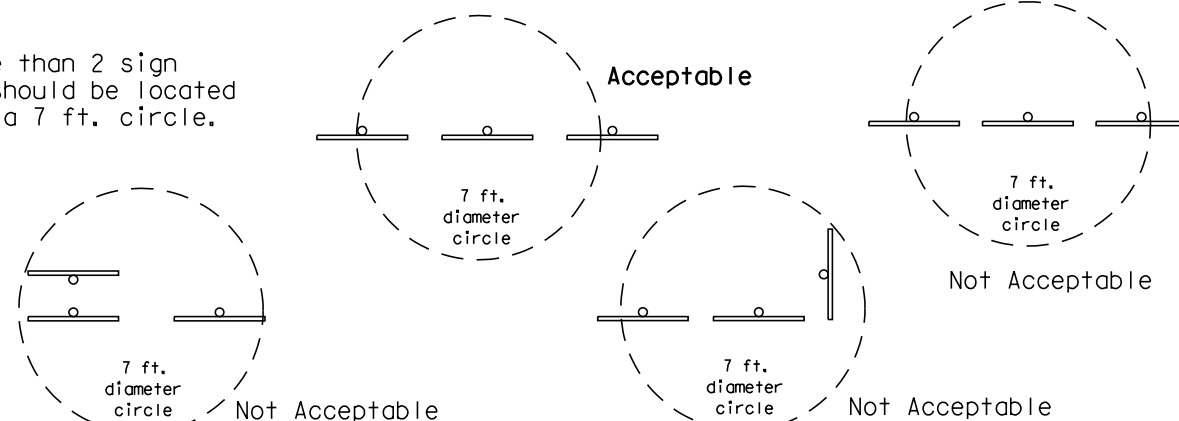
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

T-INTERSECTION

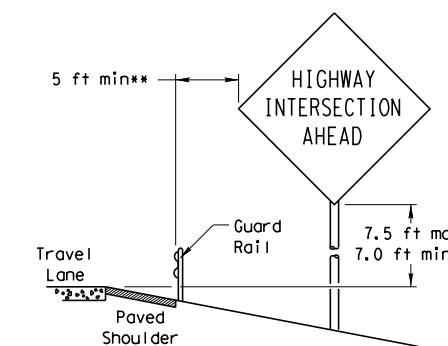


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

No more than 2 sign posts should be located within a 7 ft. circle.

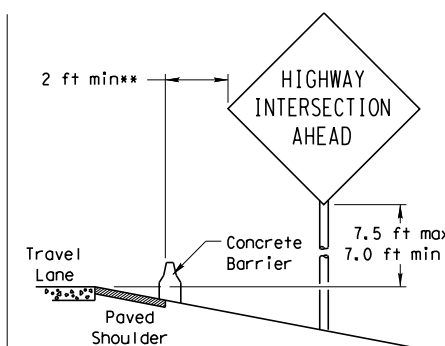


BEHIND BARRIER



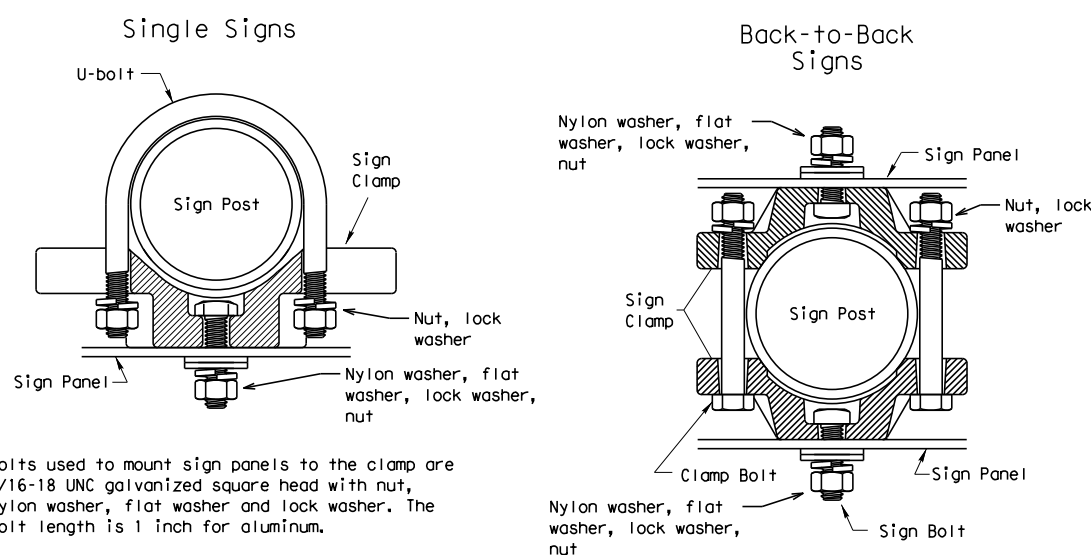
BEHIND GUARDRAIL

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.



BEHIND CONCRETE BARRIER

TYPICAL SIGN ATTACHMENT DETAIL



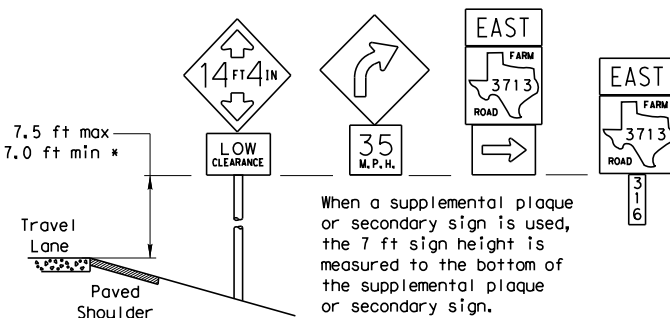
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

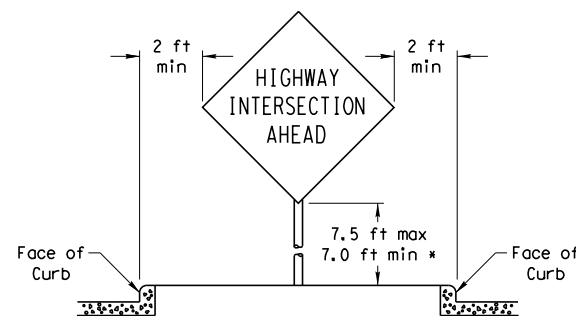
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

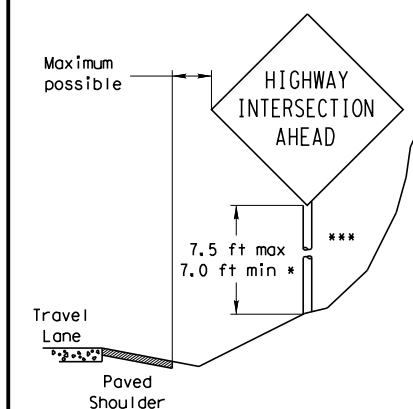


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



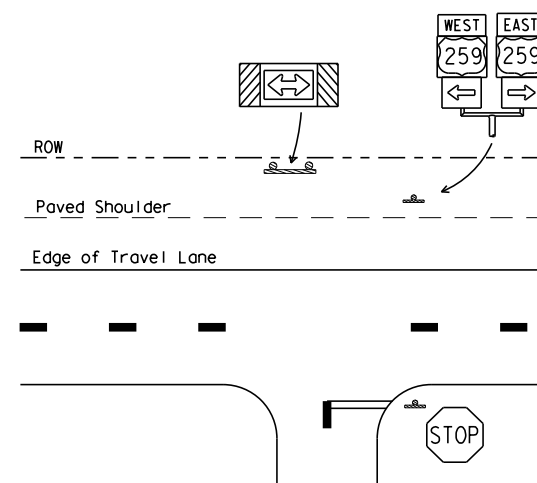
RESTRICTED RIGHT-OF-WAY (When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.



* 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>

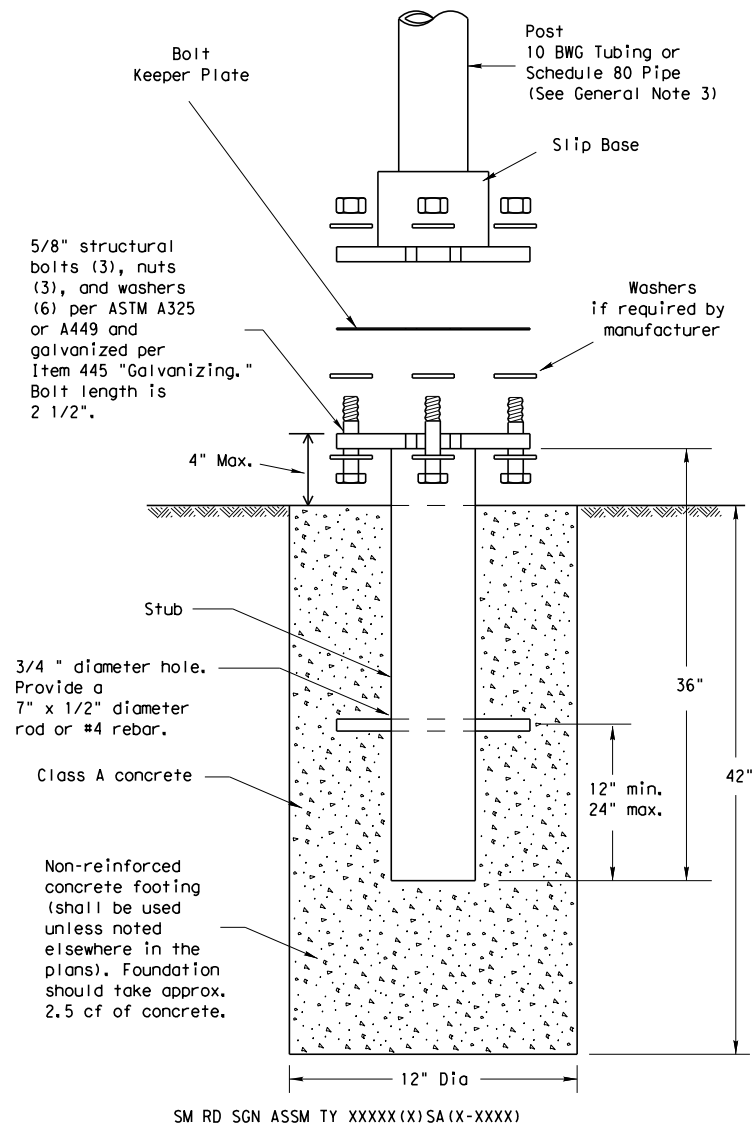
Texas Department of Transportation
 Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

© TxDOT July 2002	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	REVISIONS	CONT	SECT	JOB
		0015	09	194
		DIST	COUNTY	SHEET NO.
		AUS	WILLIAMSON	278

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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:

- 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.
- 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
- 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>
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

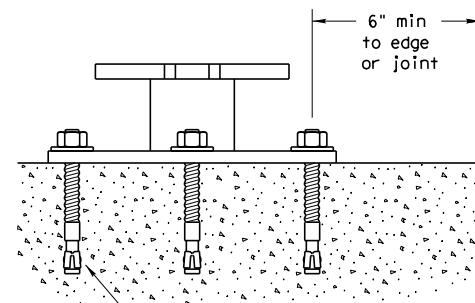
Foundation

- 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.
- 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.
- 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.
- Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
- The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

- 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.
- 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



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, "Epoxyes 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.

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

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Texas Department of Transportation
 Traffic Operations Division

SIGN MOUNTING DETAILS
 SMALL ROADSIDE SIGNS
 TRIANGULAR SLIPBASE SYSTEM

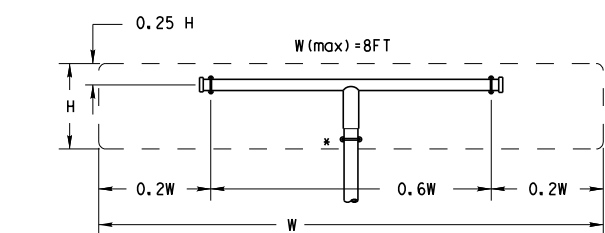
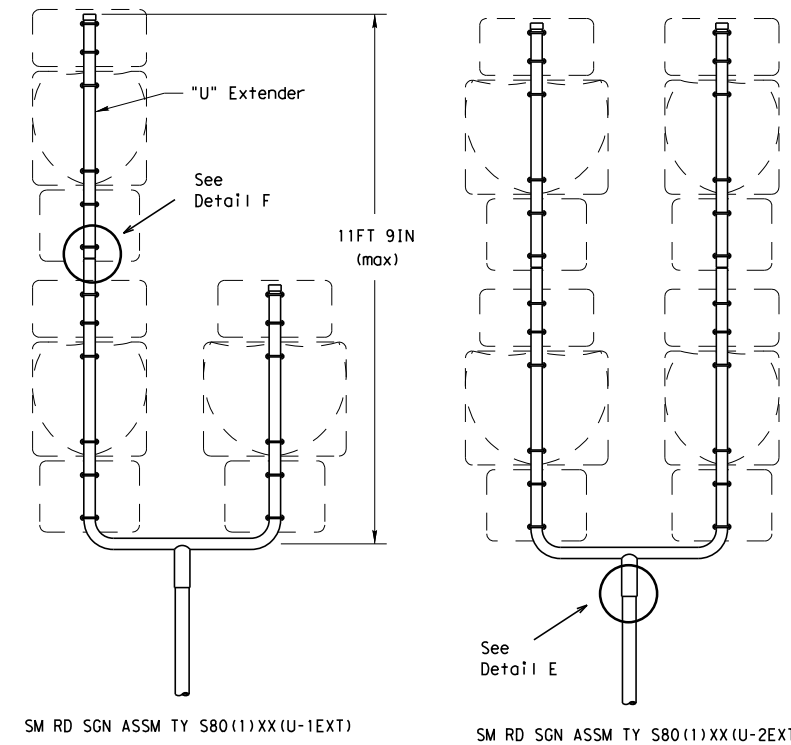
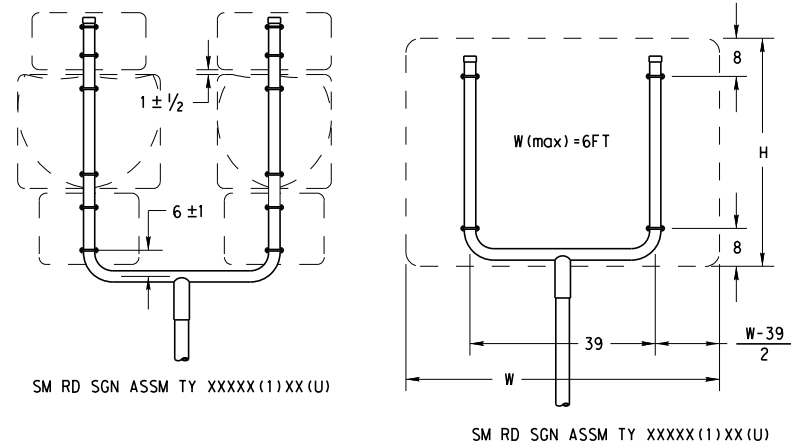
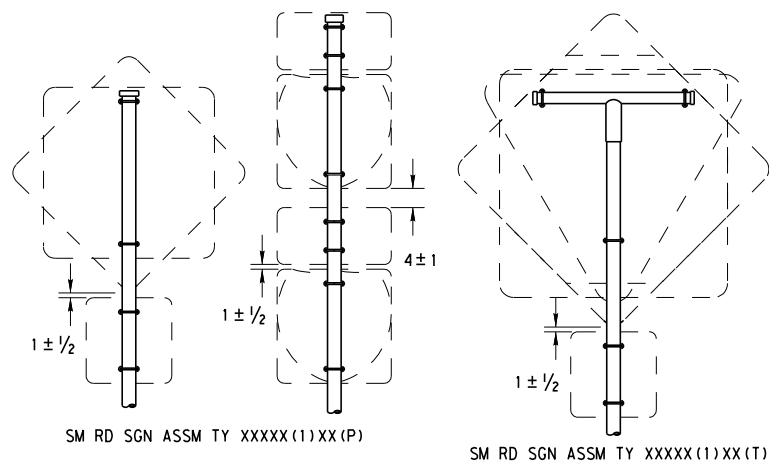
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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
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		DIST	COUNTY	SHEET NO.	
		AUS	WILLIAMSON	279	

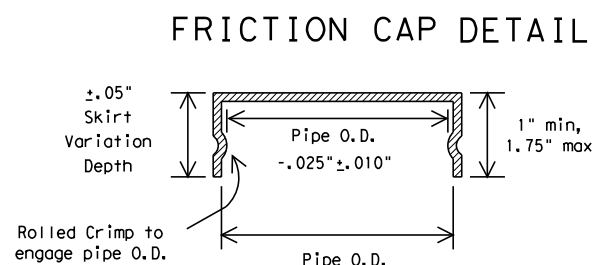
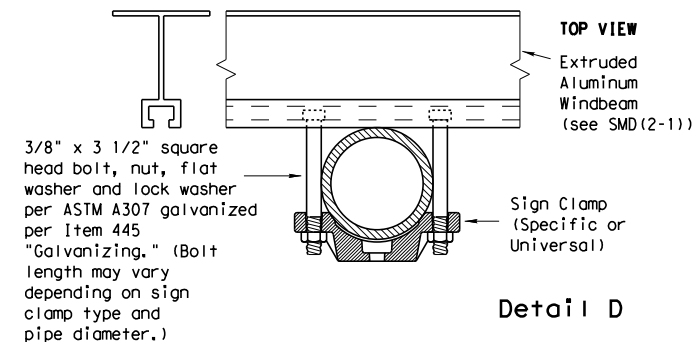
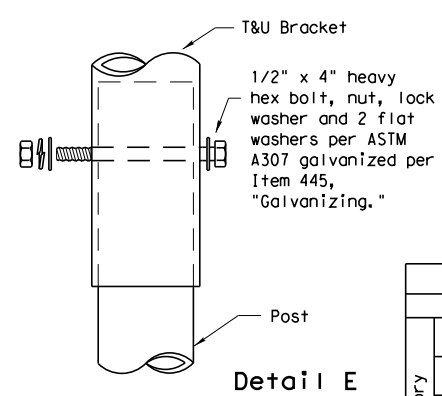
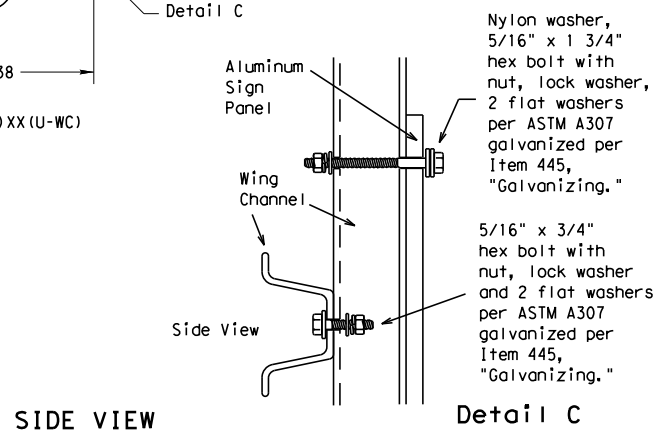
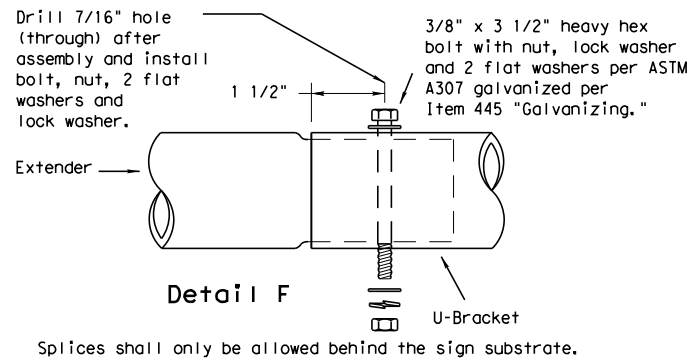
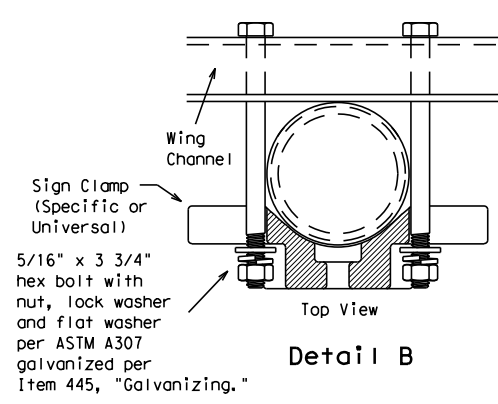
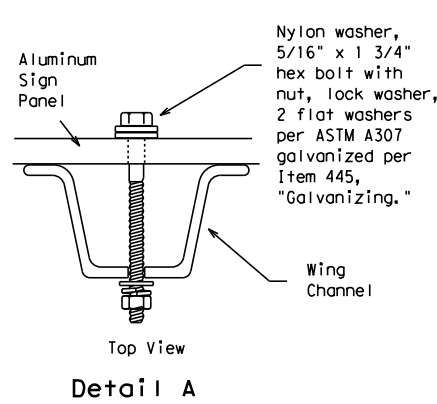
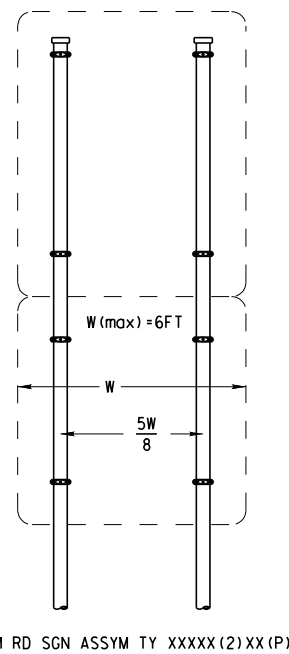
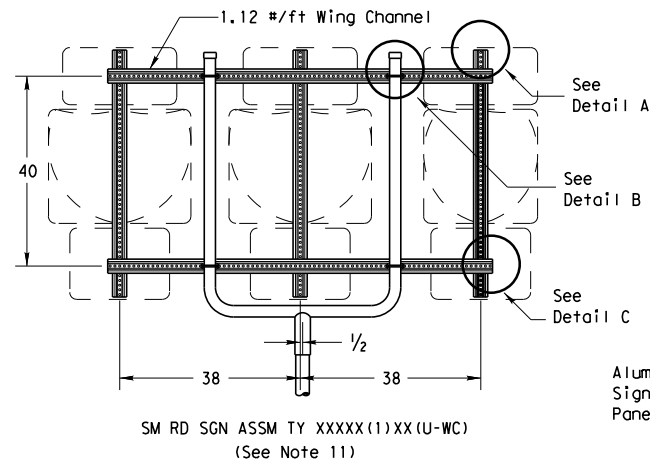
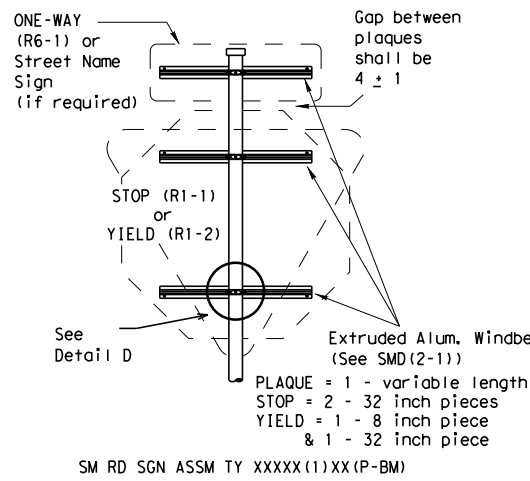
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All dimensions are in english unless detailed otherwise.



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes. The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture. Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

- | 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 |
- 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.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- 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.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- 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.
- 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.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- 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."
- Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
- 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.
- Post open ends shall be fitted with Friction Caps.
- Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY S80(1)XX(T)
	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)

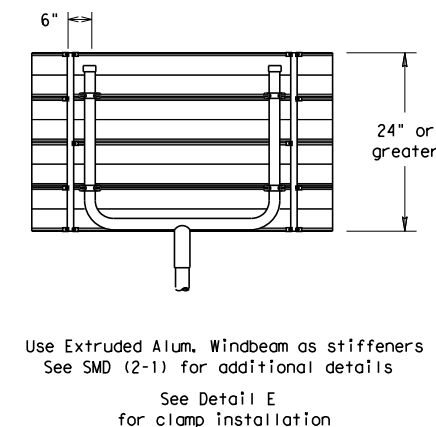
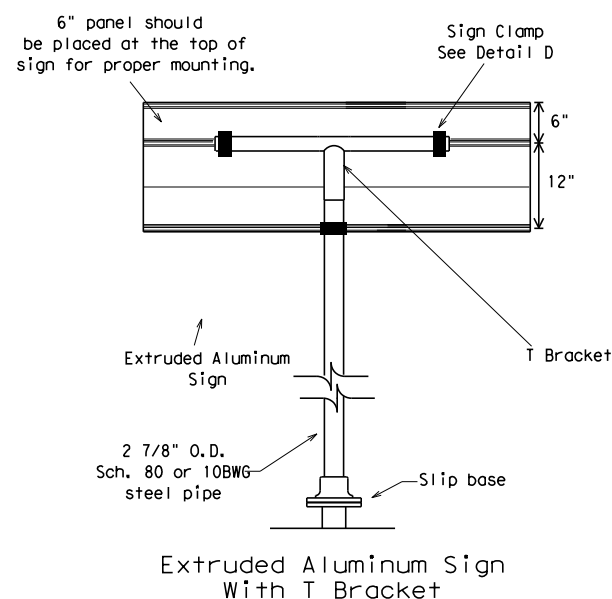
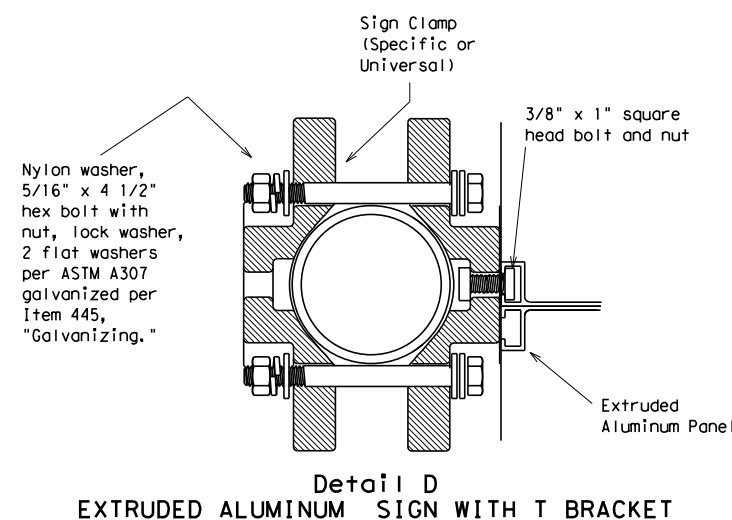
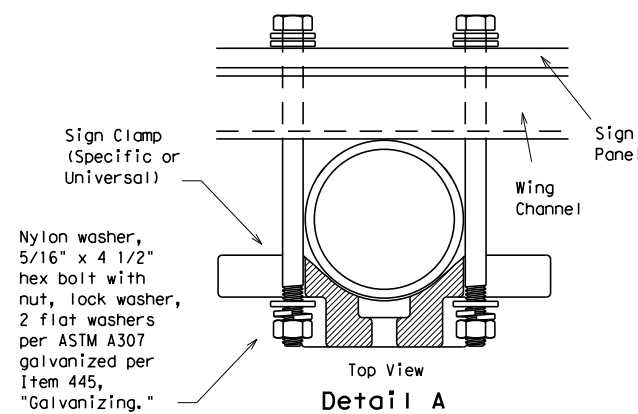
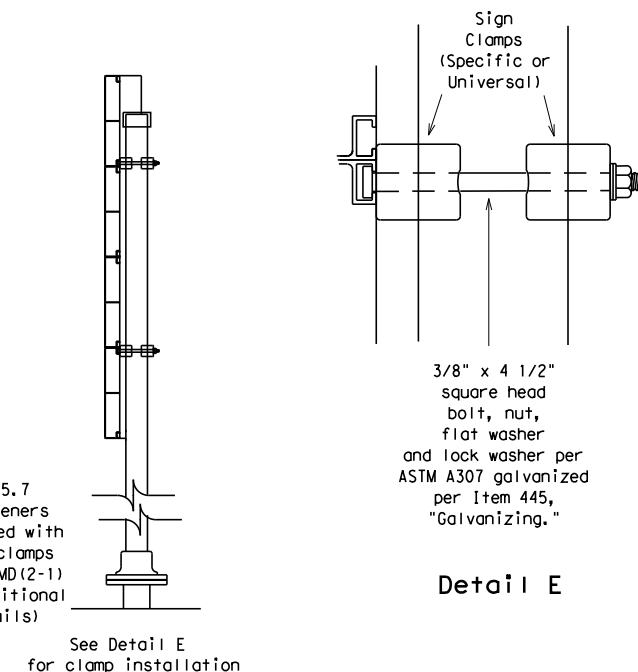
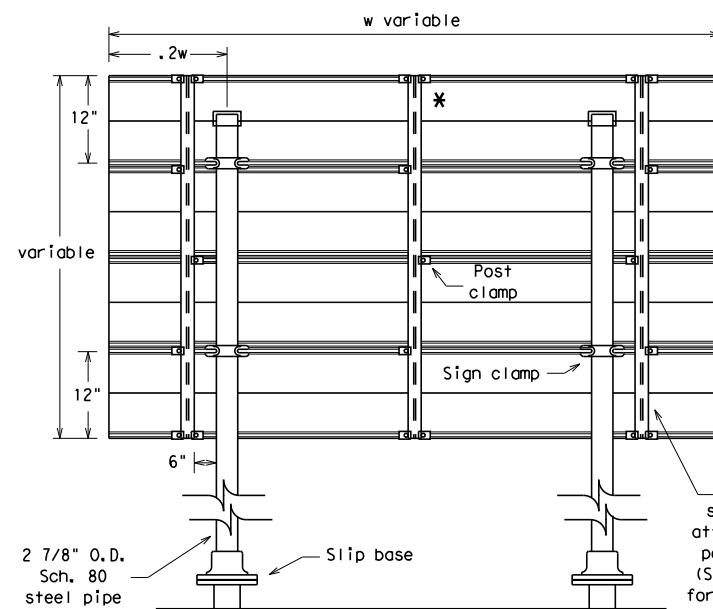
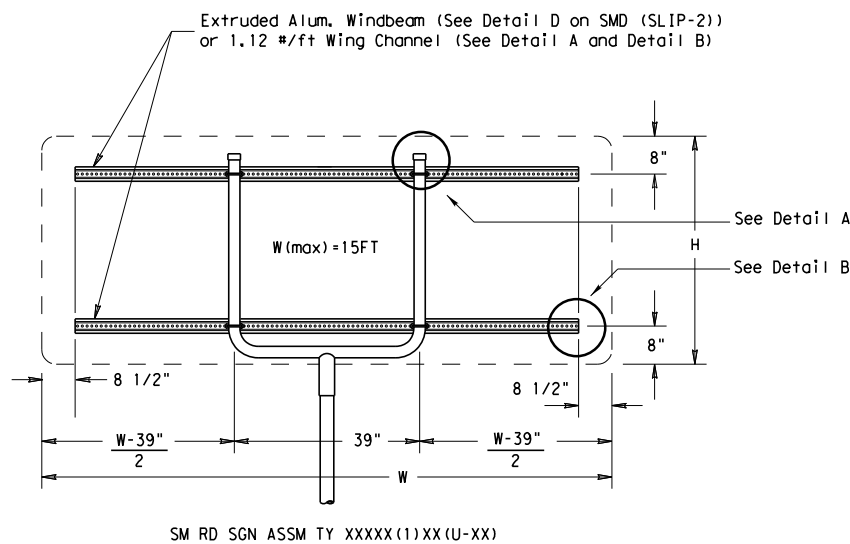
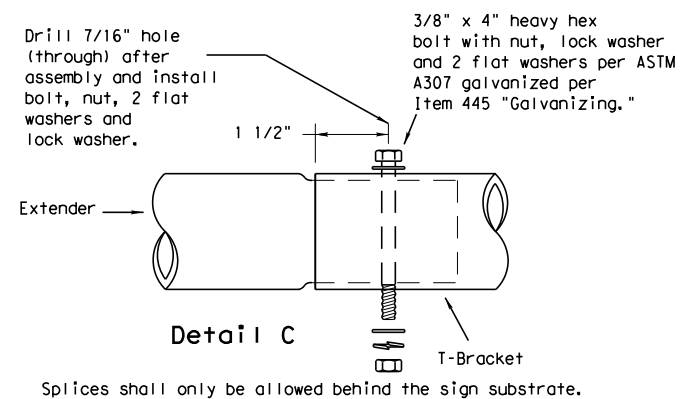
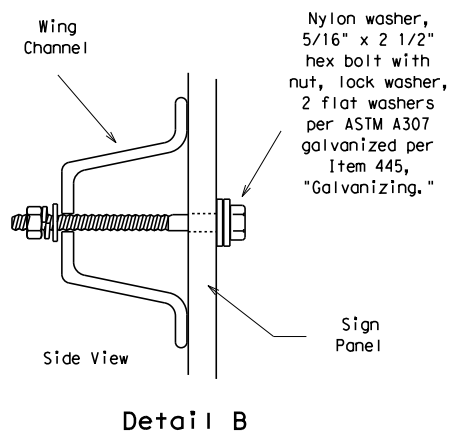
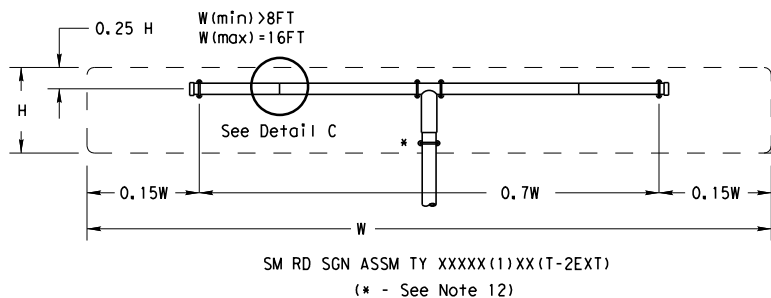
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Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-2)-08

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
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		DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		280

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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 |
- 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.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
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- 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.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- 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."
- Sign blanks shall be the sizes and shapes shown on the plans.
- 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.
- Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY S80(1)XX(T)
	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)

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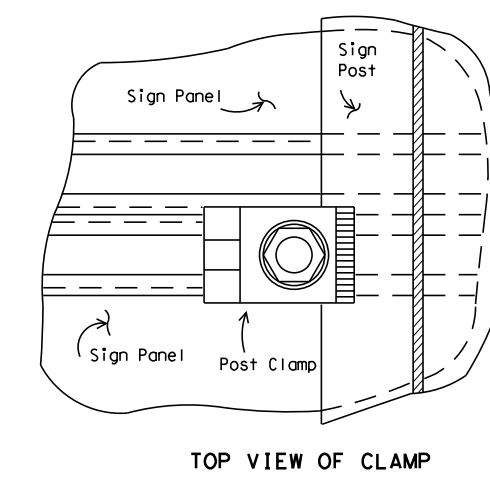
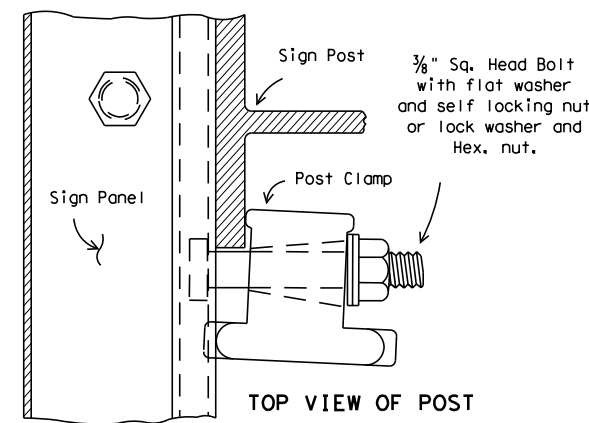
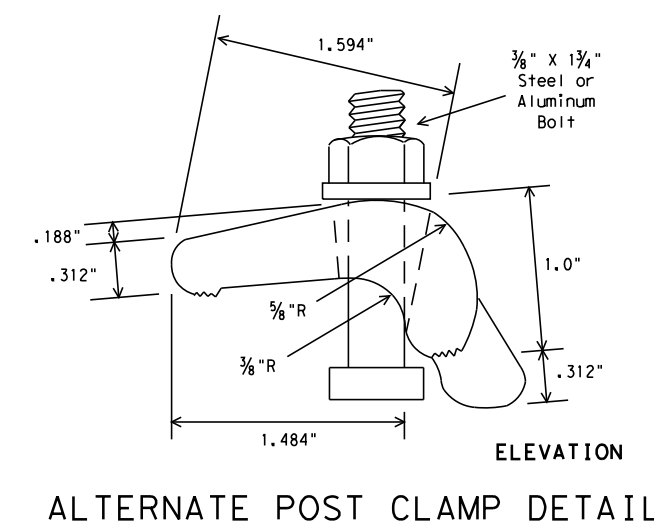
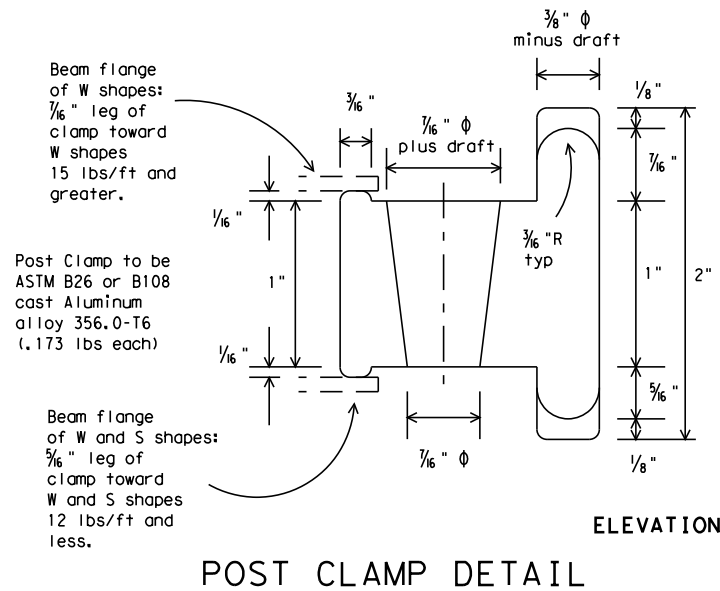
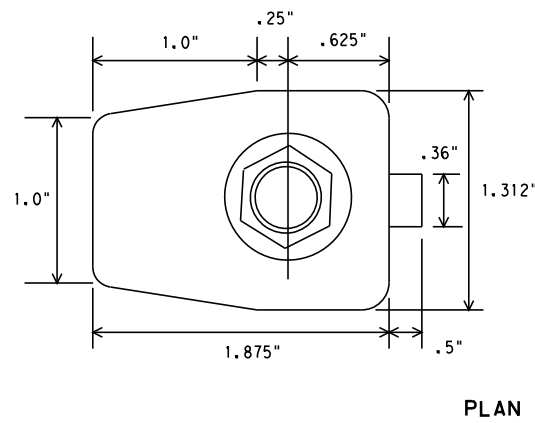
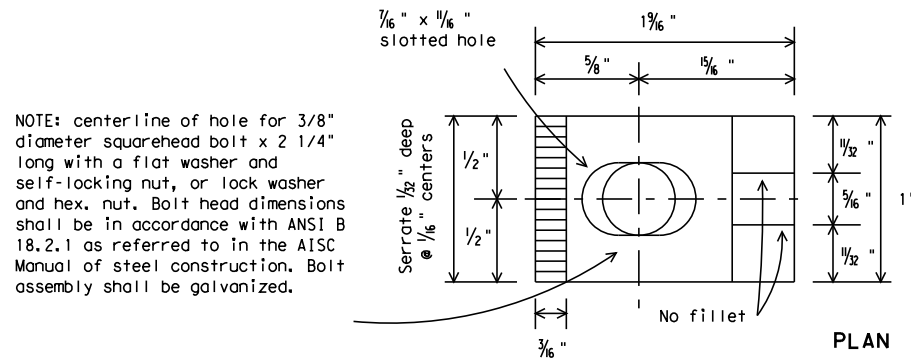
SIGN MOUNTING DETAILS
 SMALL ROADSIDE SIGNS
 TRIANGULAR SLIPBASE SYSTEM
 SMD(SLIP-3)-08

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	DIST	COUNTY	SHEET NO.	
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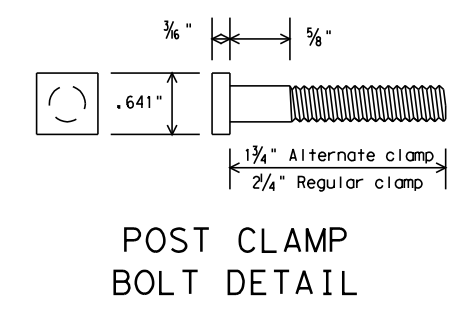
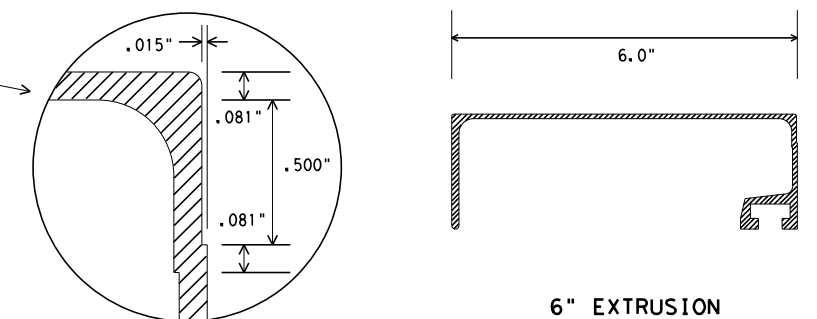
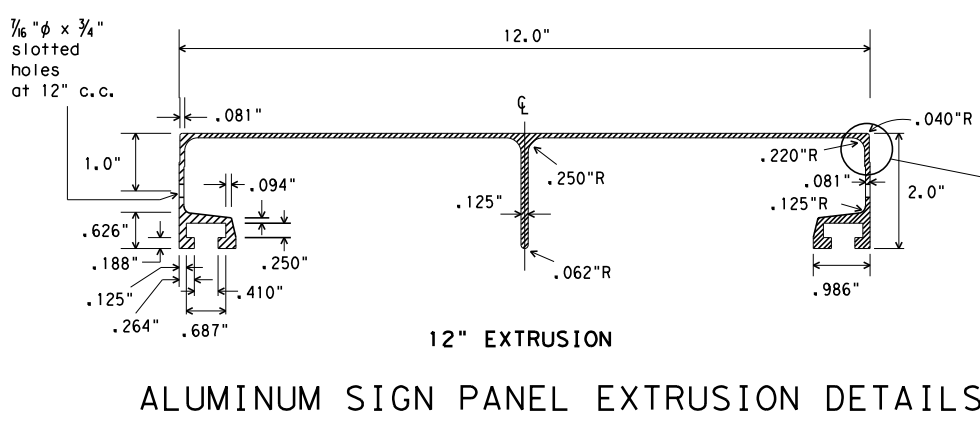
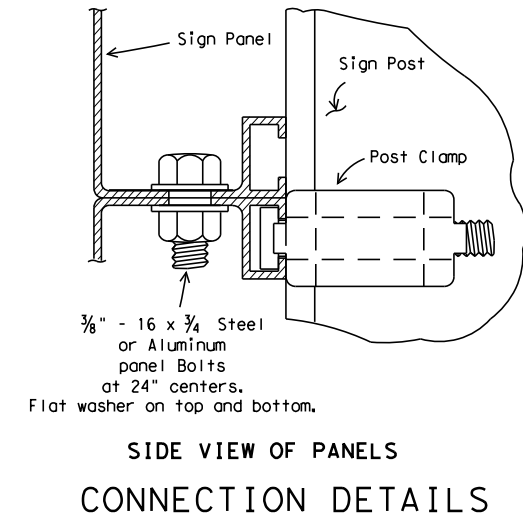
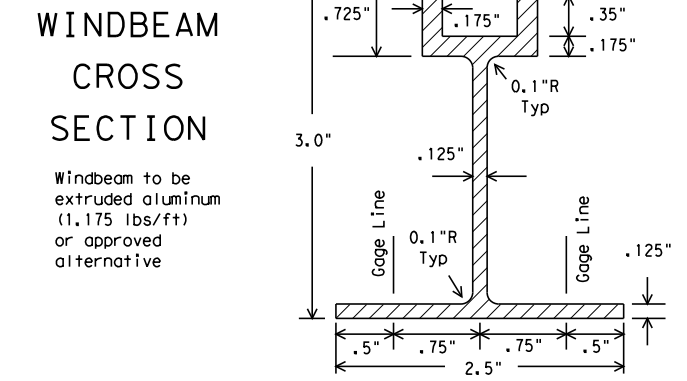
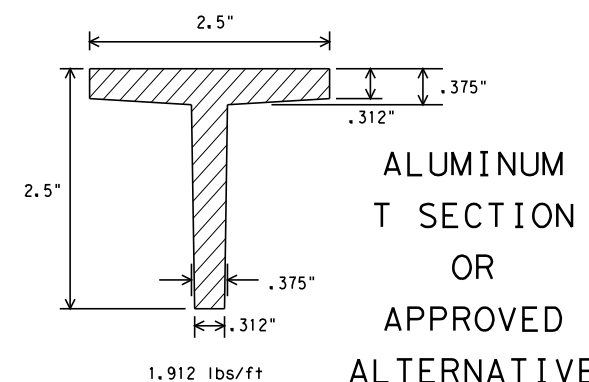
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DEPARTMENTAL MATERIAL SPECIFICATIONS
 SIGN HARDWARE DMS-7120

GENERAL NOTES:
 1. Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
 2. Materials and fabrication shall conform to the requirements of the Department material specifications.
 3. Structural steel shall be "low-alloy steel" for non-bridge structures per Item 442, "Metal For Structures."
 4. For fiberglass substrate connection details, see manufacturer's recommendations.



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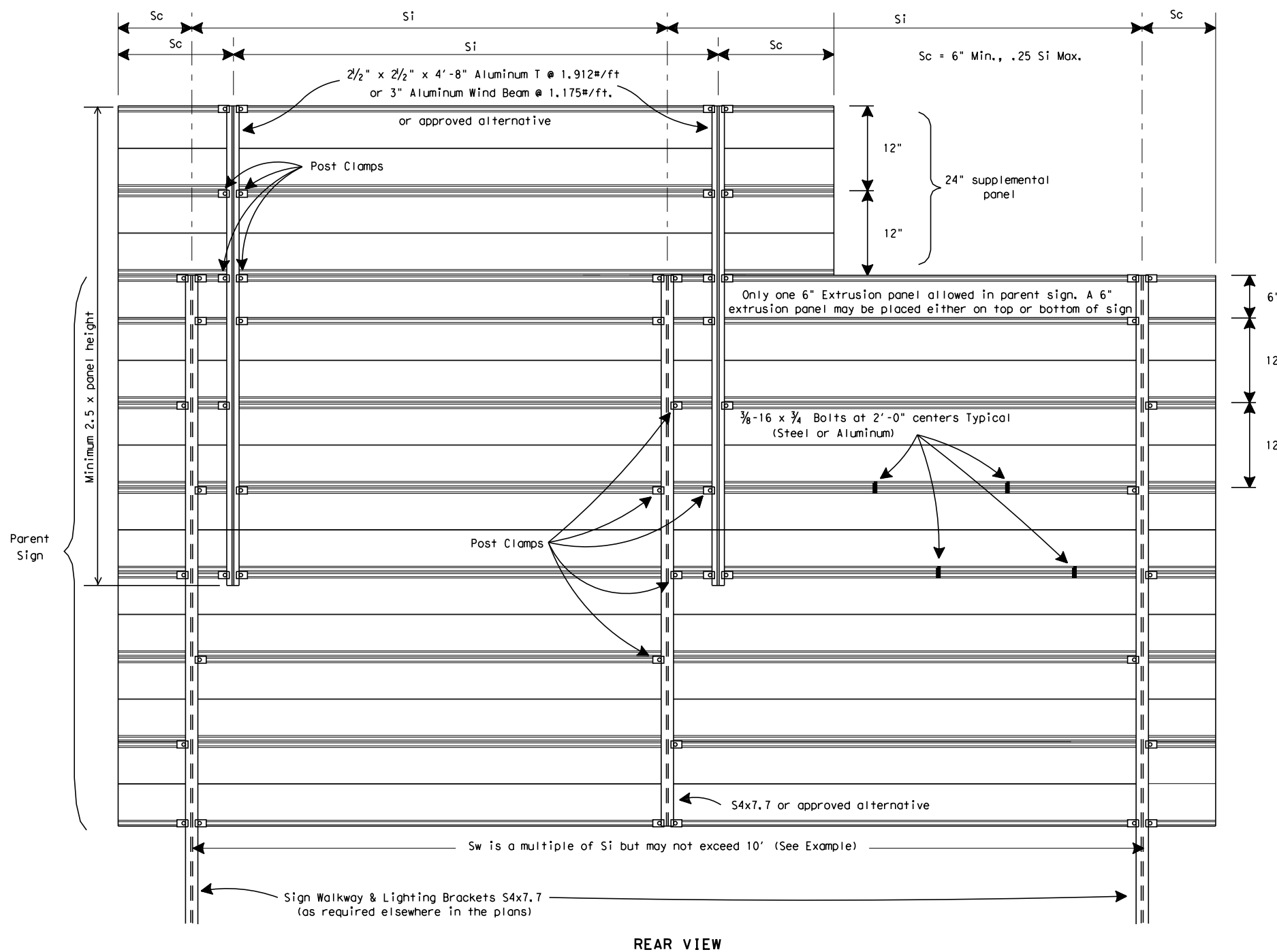
**SIGN MOUNTING DETAILS-
 EXTRUDED ALUMINUM
 SIGN PANELS & HARDWARE**

SMD(2-1)-08

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		DIST	COUNTY	SHEET NO.	
		AUS	WILLIAMSON	282	

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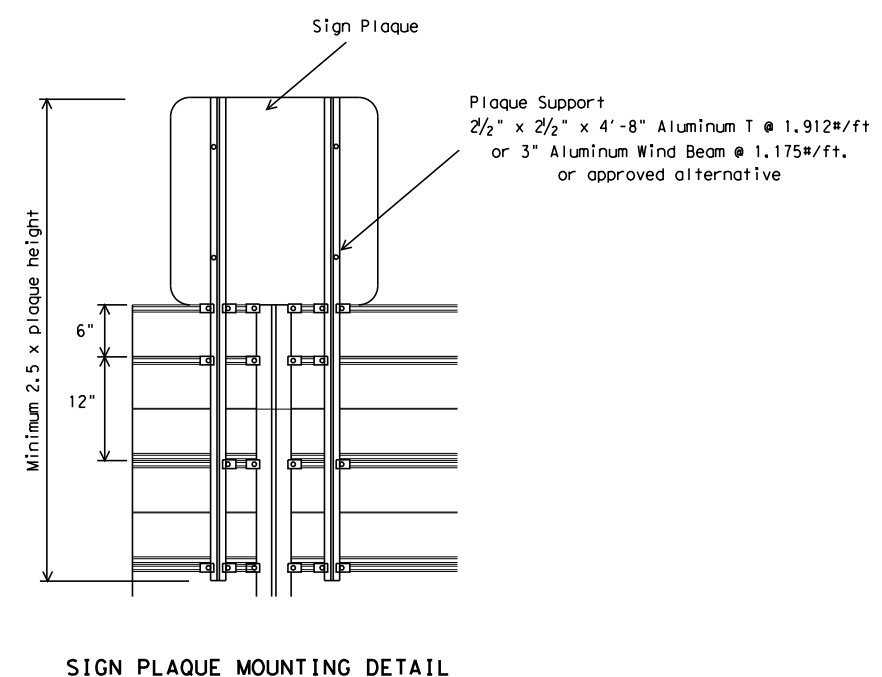
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EXAMPLES (FOR DETERMINING Si and Sw)

NO.	ZONE	"d"	EXIT PANEL	WALKWAY	Si	Sw	COMMENT
1	1	15.0	YES	YES	4.5	9.0	Sw=2x(Si)
2	2	14.0	YES	NO	7.5	7.5	Sw = Si
3	1	15.0	NO	NO	8.5	8.5	Sw = Si
4	3	14.0	NO	YES	10.0	10.0	Sw = Si

Values shown for Si are maximum values. Si may be varied for different sign lengths and Truss mounting conditions. Sw should not exceed two times Si (Max.) or 10 feet.



"d" Deepest Sign in Group (Ft.)	MAXIMUM SIGN SUPPORT SPACING "Si" (FEET)																		
	EXTRUDED ALUMINUM SIGN PANELS																		
	WITH EXIT NUMBER PANELS								WITHOUT EXIT NUMBER PANELS										
	WITH WALKWAYS				WITHOUT WALKWAYS				WITH WALKWAYS				WITHOUT WALKWAYS						
WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
15	4.5	7	8	10	5	7	8	10	7	8	9	10	8.5	10	10	10	10	10	10
14	6	7.5	9.5	10	6	7.5	9.5	10	8	9	10	10	10	10	10	10	10	10	10
13	7.5	9	10	10	7.5	9	10	10	9	10	10	10	10	10	10	10	10	10	10
12	8.5	10	10	10	8.5	10	10	10	10	10	10	10	10	10	10	10	10	10	10
11 or less	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

For fiberglass sign installations, see manufacturer's recommendations.

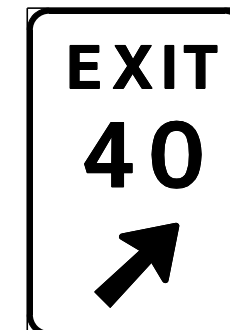
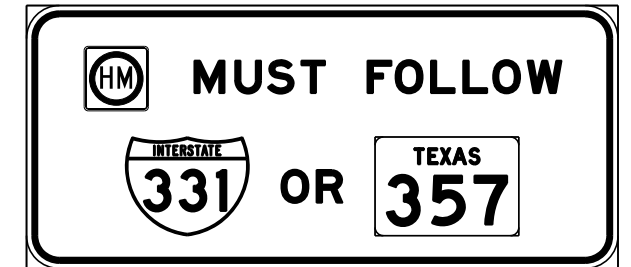
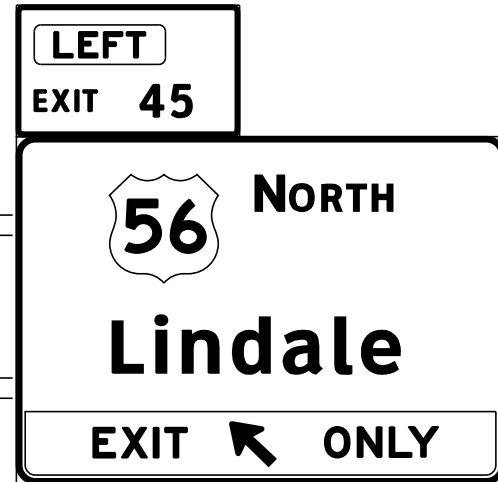
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**SIGN MOUNTING DETAILS-
 OVERHEAD SIGNS
 EXTRUDED ALUMINUM
 SMD (2-4) -08**

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0015	09	194	1H 35
		DIST	COUNTY	SHEET NO.	
		AUS	WILLIAMSON	283	

REQUIREMENTS FOR OVERHEAD AND LARGE GROUND-MOUNTED SIGNS

TYPICAL EXAMPLES



GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign summary sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Black legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod, or F). White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white FHWA lettering, when not specified in the SHSD or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

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 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 cut-out white sheeting applied to colored background sheeting.
6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius need not be trimmed or rounded if fabricated from an extruded material.
7. Sign substrate for ground-mounted signs shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative. Sign substrate for overhead signs shall be any material that meets DMS-7110. Exit Number Panels attached above the parent sign shall be made with the same substrate and sheeting as the parent sign.
8. Mounting details of attachments to parent sign face are shown on Standard Plan Sheet TSR(5). Mounting details of exit number panels above parent sign are shown in the "SMD series" Standard Plan Sheets.
9. Background sheeting shall be applied to the substrate per sheeting manufacturer's recommendations. Sheeting will not be allowed to bridge the horizontal gap between panels.
10. Cut all legend, symbols, borders, and direct applied sign attachments at panel joints.

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/>

SHEETING REQUIREMENTS

USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE B OR C SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM

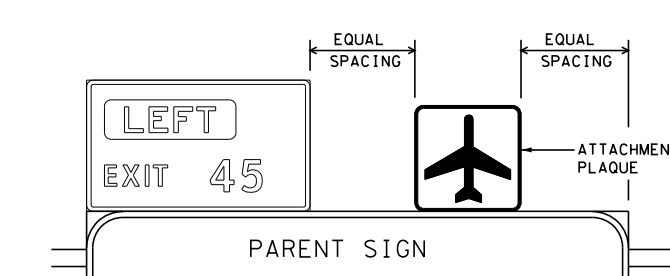
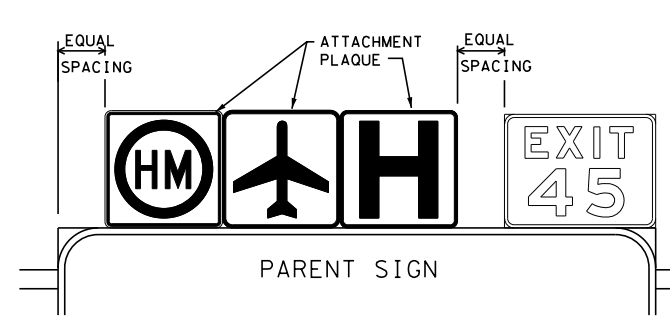
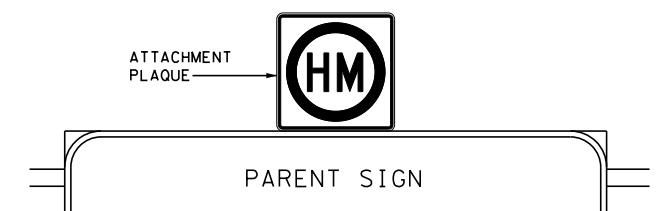
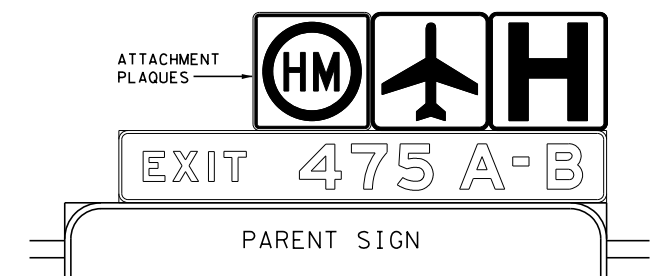
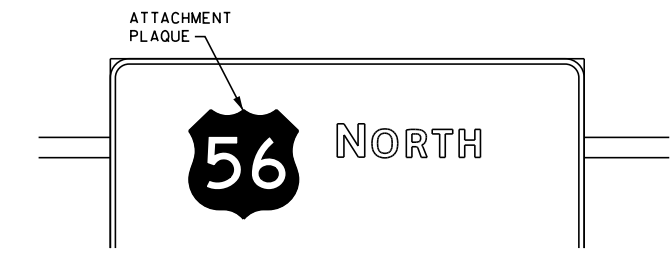
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Texas Department of Transportation				Traffic Operations Division Standard	
<h2>TYPICAL SIGN REQUIREMENTS</h2> <h3>TSR(1)-13</h3>					
FILE:	tsr1-13.dgn	DN:	TxDOT	CK:	TxDOT
©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS		0015	09	194	1H 35
12-03	7-13	DIST	COUNTY	SHEET NO.	
9-08		AUS	WILLIAMSON	284	

REQUIREMENTS FOR ATTACHMENTS TO OVERHEAD AND LARGE GROUND MOUNTED SIGNS

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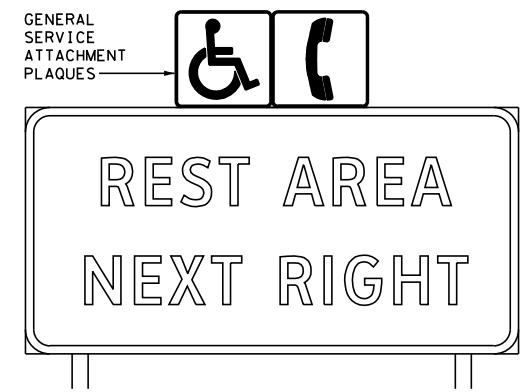
TYPICAL EXAMPLES

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

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B OR C SHEETING

GENERAL NOTES

- 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).
- Route Marker legends (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod, or F).
- 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.
- Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
- 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.
- Colored legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to white background sheeting, or combination thereof.
- Route markers and other attachments within the parent sign face shall be direct applied unless otherwise specified in the plans. Attachments not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
- General Service Plaques shall be 0.080 inch thick and Routing Plaques shall be 0.100 inch thick.
- The priority for Routing Plaques shall be (left to right) Hazardous Material, Airport then Hospital. See examples for mounting location.
- Mounting details of attachments to parent signs face are shown on Standard Plan Sheet TSR(5). Mounting details of sign plaque attachments above and below parent sign are shown in the "SMD series" Standard Plan Sheets.
- Plaques shall be horizontally centered at the top of the parent sign. If an exit number panel exists, the plaque shall be centered between the edge of the parent sign and the edge of the exit number panel. The plaque may be placed above the exit number panel when there is insufficient space.



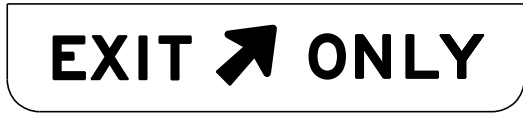
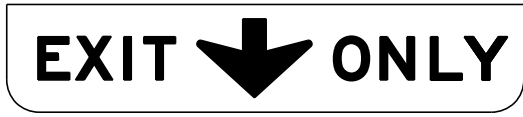
REQUIREMENTS FOR EXIT ONLY AND LEFT EXIT PANELS

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

SHEETING REQUIREMENTS FOR OVERHEAD EXIT PANELS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLUORESCENT YELLOW	TYPE B _{FL} OR C _{FL} SHEETING
LEGEND	BLACK	ACRYLIC NON-REFLECTIVE FILM

GENERAL NOTES

- 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). Individual panel sizes shown in the plans may be adjusted to fit actual parent sign sizes if necessary.
- Exit Panel legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets E Series.
- 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.
- Black legend shall be applied by screening process or cut-out acrylic non-reflective black film to yellow background sheeting, or combination thereof.
- Exit Only and Left Exit panels within the parent sign face shall be direct applied unless otherwise specified in the plans. Panels not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
- Mounting details of Exit Only and Left Exit panel attachments to parent signs face are shown on Standard Plan Sheet TSR(5).



TYPICAL EXAMPLES

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:
<http://www.txdot.gov/>

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Texas Department of Transportation
Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(2) - 13

FILE: tsr2-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0015	09	194	1H 35
12-03 7-13	DIST	COUNTY	SHEET NO.	
9-08	AUS	WILLIAMSON	285	

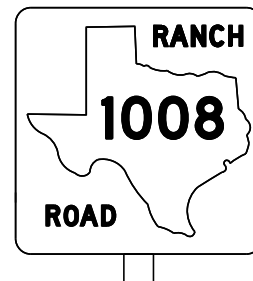
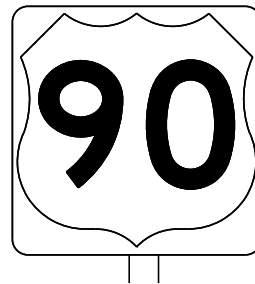
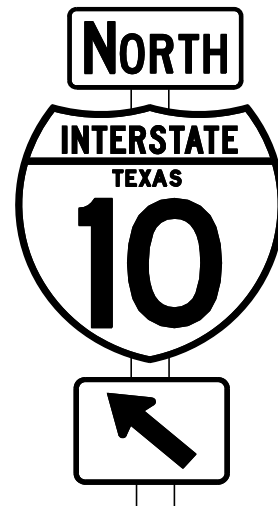
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REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

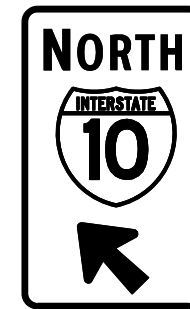
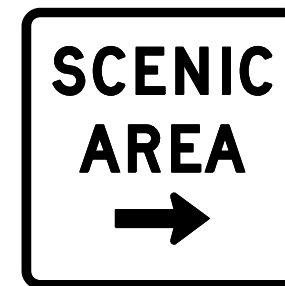
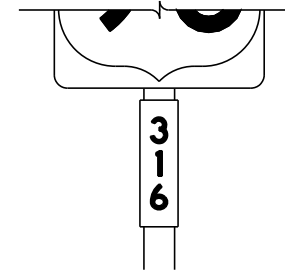
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES


- 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).
- White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W
- Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).
- 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.
- Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.
- Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

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/>

		Traffic Operations Division Standard	
<h3>TYPICAL SIGN REQUIREMENTS</h3>			
<h3>TSR(3) - 13</h3>			
FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2003	CONT	SECT	JOB
REVISIONS	0015	09	194
12-03 7-13	DIST	COUNTY	SHEET NO.
9-08	AUS	WILLIAMSON	286

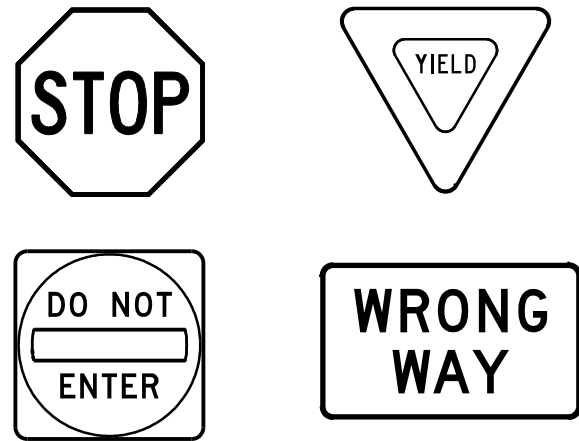
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REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(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

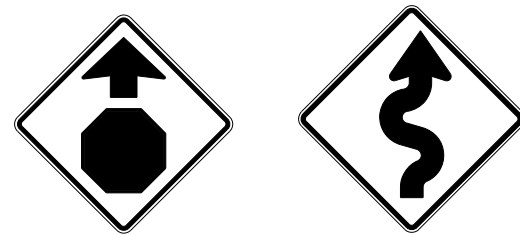
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



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

- 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).
- Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
- 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.
- Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
- 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.
- 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.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- 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/>

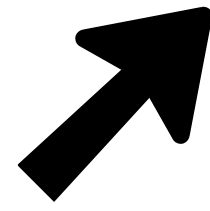
				Traffic Operations Division Standard	
<h2>TYPICAL SIGN REQUIREMENTS</h2>					
<h3>TSR(4) - 13</h3>					
FILE:	tsr4-13.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS		0015	09	194	1H 35
12-03	7-13	DIST	COUNTY	SHEET NO.	
9-08		AUS	WILLIAMSON	287	

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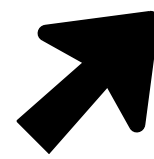
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ARROW DETAILS

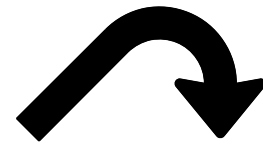
for Large Ground-Mounted and Overhead Guide Signs



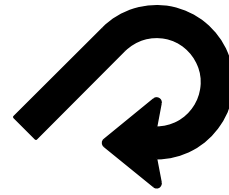
Type A



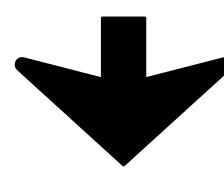
Type B



E-3



E-4



Down Arrow

TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

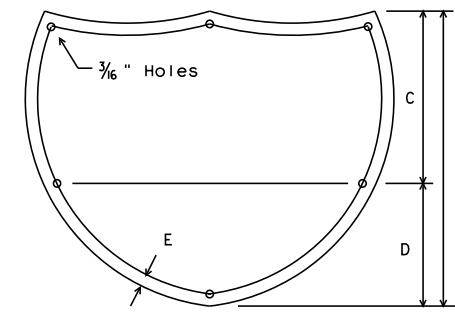
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

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

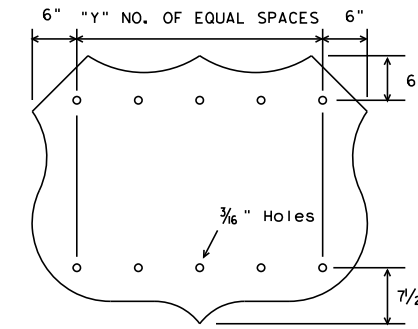
<http://www.txdot.gov/>

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)



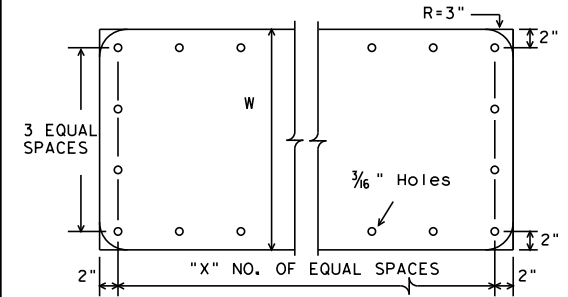
INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4



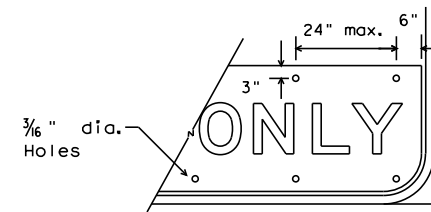
U.S. ROUTE MARKERS

Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



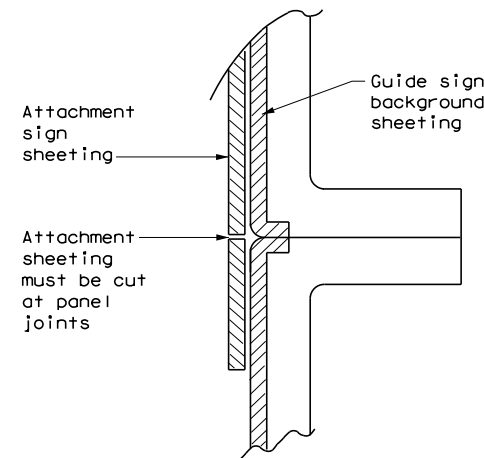
STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5



EXIT ONLY PANEL

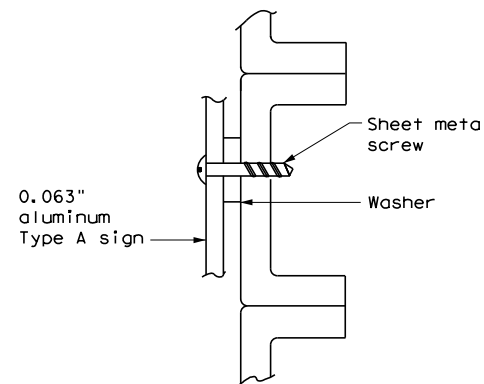
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



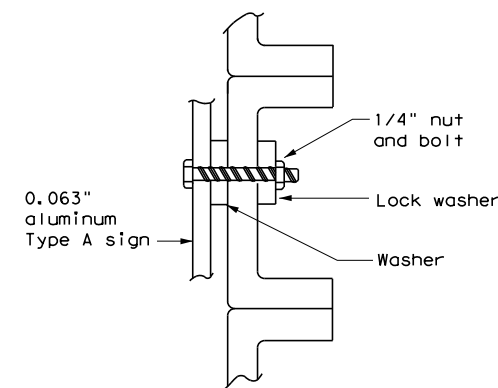
DIRECT APPLIED ATTACHMENT

NOTE:

- Sheeting for legend, symbols, and borders must be cut at panel joints.
- Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



SCREW ATTACHMENT

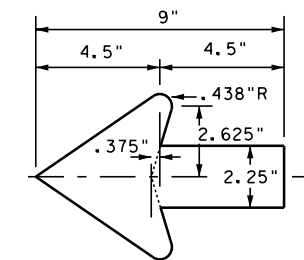


NUT/BOLT ATTACHMENT

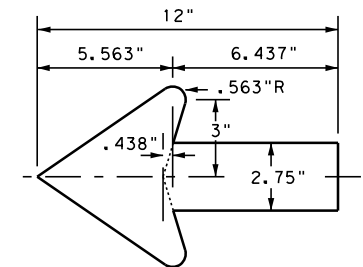
NOTE:

Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.



TYPICAL SIGN REQUIREMENTS

TSR(5) - 13

FILE:	tsr5-13.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0015	09	194	1H 35				
12-03	7-13	DIST	COUNTY	SHEET NO.					
9-08		AUS	WILLIAMSON	288					

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 FILE: c:\bms\br\idgefarmer-pw\mmsa.moton\dms03731\037403-EP1C-01.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

- 1.
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
<input type="checkbox"/> Temporary Vegetation	<input checked="" type="checkbox"/> Silt Fence	<input type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Blankets/Matting	<input checked="" type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input checked="" type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Mulch Filter Berm and Socks
<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks
<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input checked="" type="checkbox"/> Sediment Basins	<input type="checkbox"/> 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. (SEE NOTES ON SHEET 2 OF 2)

1. Cave myotis bat (Myotis velifer) see Notes
- 2.
- 3.
- 4.
5. Western hog nosed skunk (Conepatus leuconotus) see Notes

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used. Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

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

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

- Yes No

If "No", then no further action is required.

If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

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

- Yes No

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

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

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

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

- No Action Required Required Action

Action No.

- 1.
- 2.
- 3.


VII. OTHER ENVIRONMENTAL ISSUES

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

- No Action Required Required Action

Action No.

- 1.
- 2.
- 3.

		Design Division Standard	
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC			
SHEET 1 OF 2			
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP
©TxDOT: February 2015	CONT	SECT	JOB
12-12-2011 IDS REVISIONS	0015	09	194
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	AUS	WILLIAMSON	289

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

Notes

1. The Migratory Bird Treaty Act (MBTA) states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations.

A site survey did not identify active nests within the project action area. While no impact to migratory birds is expected, TxDOT will take all appropriate actions to prevent the take of migratory birds, their active nests, eggs, or young should they be discovered on the project site.

2. Cave myotis bat - Bat BMPs:
The following survey and exclusion protocols should be followed prior to commencement of construction activities. For the purposes of this document, structures are defined as bridges, culverts (concrete or metal), wells, and buildings. If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction. Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F AND minimum daytime temperatures are above 70°F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area.

See Section 2: Standard Recommendations for recommended acceptable methods for excluding bats from structures.

If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat friendly design or artificial roosts should be constructed to replace these features, as practicable.

In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.

Section 2: Standard Recommendations for recommended acceptable methods for excluding bats from structures.

Bat surveys of structures should include visual inspections of structural fissures (cracked or spalled concrete, damaged or split beams, split or damaged timber railings), crevices (expansion joints, space between parallel beams, spaces above supports piers), and alternative structures (drainage pipes, bolt cavities, open sections between support beams, swallow nests) for the presence of bats.

Before excluding bats from any occupied structure, bat species, weather, temperature, season, and geographic location must be incorporated into any exclusion plans to avoid unnecessary harm or death to bats. Winter exclusion must entail a survey to confirm either, 1) bats are absent or 2) present but active (i.e. continuously active - not intermittently active due to arousals from hibernation).

Avoid using materials that degrade quickly, like paper, steel wool or rags, to close holes.

Avoid using products or making structural modifications that may block natural ventilation, like hanging plastic sheeting over an active roost entrance, thereby altering roost microclimate.

Avoid using chemical and ultrasonic repellents. Avoid use of silicone, polyurethane or similar non-water-based caulk products.

Avoid use of expandable foam products at occupied sites


Avoid the use of flexible netting attached with duct tape.

In order to avoid entombing bats, exclusion activities should be only implemented by a qualified individual.

A qualified individual or company should possess at least the following minimum qualifications:

- Experience in bat exclusion (the individual, not just the company).
- Proof of rabies pre-exposure vaccinations.
- Demonstrated knowledge of the relevant bat species, including maternity season date range and habitat requirements.
- Demonstrated knowledge of rabies and histoplasmosis in relation to bat roosts.

Contact TPWD for additional resources and information to assist in executing successful bat exclusions that will avoid unnecessary harm or death in bats.

 Texas Department of Transportation		Design Division Standard	
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC			
SHEET 2 OF 2			
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP
© TxDOT: February 2015	CONT	SECT	JOB
12-12-2011 (DS) REVISIONS	0015	09	194
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	AUS	WILLIAMSON	290

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A. GENERAL SITE DATA

1. PROJECT LIMITS:
IH 35: FROM US 79 TO SH 45N / PROJECT LENGTH = 12,107.04 FEET = 2.293 MILES
- PROJECT COORDINATES:
IH 35: BEGIN PROJECT : STA 1299+00.00 / END PROJECT : STA 1420+07.04
- PROJECT LOCATION:
IH 35: BEG LATITUDE: 30.51711389 BEG LONGITUDE: 97.68797778
END LATITUDE: 30.48734167 END LONGITUDE: 97.67616389
2. PROJECT SITE MAPS:
* PROJECT LOCATION MAP: TITLE SHEET (SHEET 1)
* DRAINAGE PATTERNS: DRAINAGE AREA (SHEETS 66-73)
* SLOPES ANTICIPATED AFTER MAJOR GRADINGS OR AREAS OF SOIL DISTURBANCE: N/A
* LOCATION OF EROSION AND SEDIMENT CONTROLS: SW3P SITE MAPS (SHEETS 292-303)
* SURFACE WATERS AND DISCHARGE LOCATIONS: DRAINAGE AREA (SHEETS 66-73)
* 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: ADDITION OF AN AUXILIARY LANE, REALIGNING THE MAINLINE BARRIER ON IH 35, MILL & OVERLAY SBML, AND RESTRIPING OF LANES.
4. MAJOR SOIL DISTURBING ACTIVITIES: SOIL DISTURBING ACTIVITIES WILL BE REQUIRED FOR HIGH MAST LIGHTING DRILL SHAFTS, ELECTRICAL CONDUIT TRENCH AND DIRECTION BOX EXCAVATION. ADDITIONALLY, MODIFICATIONS TO THE EXISTING STORM SEWER SYSTEM REQUIRES ALTERATIONS TO AN EXISTING WATER QUALITY POND, WHICH MAY DISTURB SOIL.
5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:
GRASS SLOPES AND TREES: 5%
6. TOTAL PROJECT AREA: 133.47 ACRES
7. TOTAL AREA TO BE DISTURBED: N/A
8. WEIGHTED RUNOFF COEFFICIENT
BEFORE CONSTRUCTION: 0.46
AFTER CONSTRUCTION: 0.46
9. NAME OF RECEIVING WATERS: (SEGMENT NUMBER OF RECEIVING WATERS)
BRUSHY CREEK (SEGMENT ID 1244)
LAKE CREEK (SEGMENT ID 1244B)
ONION BRANCH (NO SEGMENT ID)
10. PROJECT SW3P FILE: IT IS ASSUMED THAT CONSTRUCTION IMPACTS WILL EXCEED 1 ACRE OF SOIL DISTURBANCE; AS SUCH, TXDOT WILL PREPARE AND MAINTAIN AN SW3P FILE WITH ALL PERTINENT ENVIRONMENTAL DOCUMENTS, CORRESPONDENCE, ETC. AT THE PROJECT FILED OFFICE. IF NO FILED 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
___ PERMANENT PLANTING, SODDING, OR SEEDING
___ MULCHING
___ SOIL RETENTION BLANKET
___ BUFFER ZONES
___ PRESERVATION OF NATURAL RESOURCES
OTHER: EROSION CONTROL LOGS
2. STRUCTURAL PRACTICES:
T 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
___ ROCK BEDDING AT CONSTRUCTION EXIT
___ TIMBER MATTING AT CONSTRUCTION EXIT
___ CHANNEL LINERS
___ SEDIMENT TRAPS
___ SEDIMENT BASINS
___ STORM INLET SEDIMENT TRAP
P STONE OUTLET STRUCTURES
___ CURBS AND GUTTERS
P STORM SEWERS
___ VELOCITY CONTROL DEVICES
OTHER:
3. STORM WATER MANAGEMENT:
STORM WATER DRAINAGE WILL BE PROVIDED BY DITCHES, INLETS AND STORM WATER SYSTEMS WHICH CARRY DRAINAGE WITHIN THE R.O.W. TO THE LOWS WITHIN THE ROADWAY AND PROJECT SITE WHICH DRAINS TO NATURAL FACILITIES.
4. STORM WATER MANAGEMENT ACTIVITIES: (SEQUENCE OF CONSTRUCTION)
1. INSTALL EROSION CONTROL LOGS AND SILT FENCES, PREP R.O.W, BEGIN CONSTRUCTION.
2. WHEN ALL CONSTRUCTION ACTIVITY IS COMPLETE AND THE SITE IS STABLE AND APPROVED BY THE ENGINEER, REMOVE ALL TEMPORARY CONTROLS AND RESEED ANY AREA DISTURBED BY THEIR REMOVAL.
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:
___ HAUL ROADS DAMPENED FOR DUST CONTROL
___ LOADED HAUL TRUCKS TO BE COVERED WITH TARPULIN
___ EXCESS DIRT ON ROAD REMOVED DAILY
___ 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.

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TXPE REGISTRATION NO. 264

2021
Texas Department of Transportation

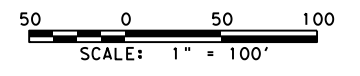
**IH 35
STORM WATER,
POLLUTION,
PREVENTION PLAN**

SHEET 1 OF 1

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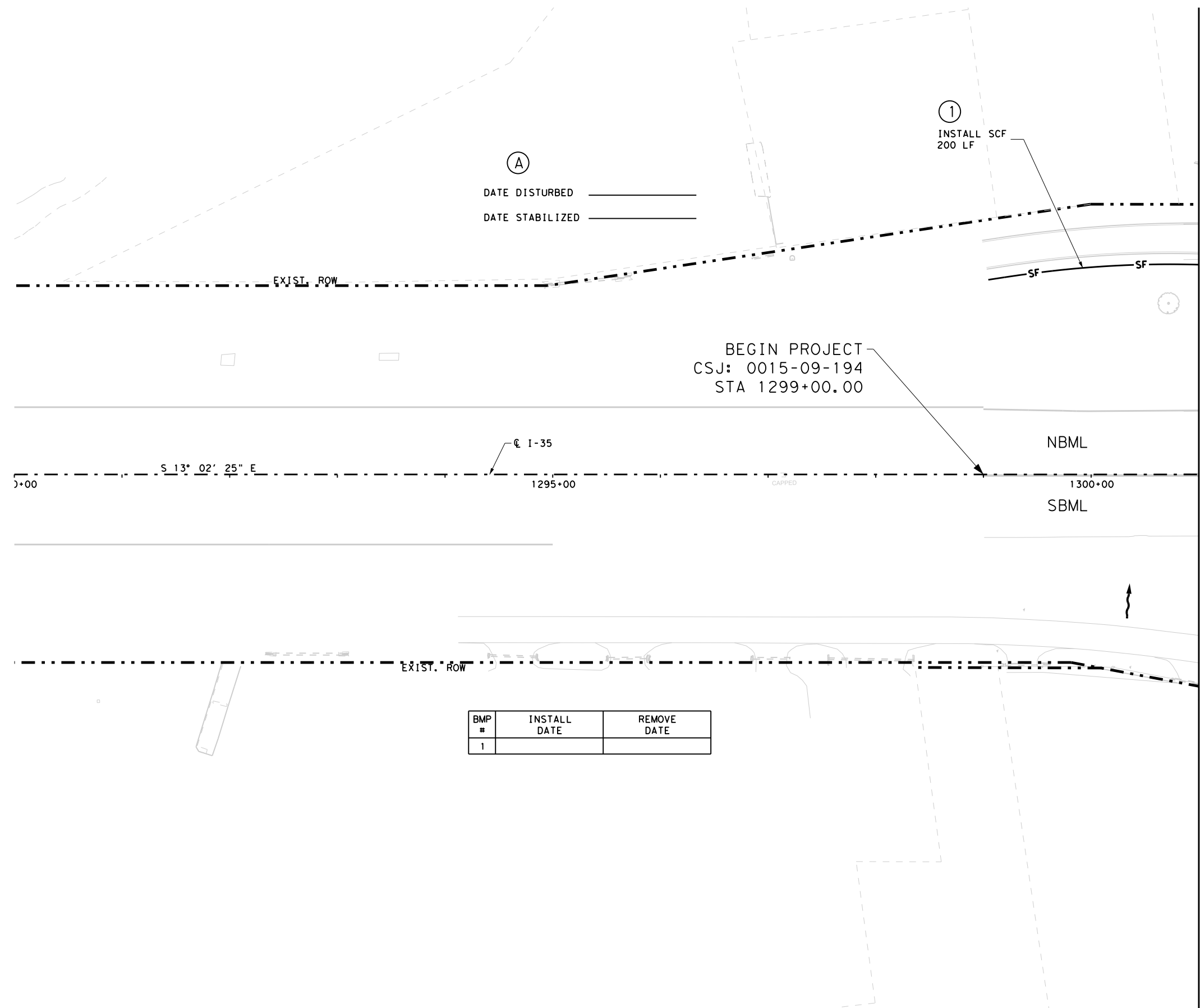
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LEGEND

- SF— TEMPORARY SEDIMENT CONTROL FENCE
- ~ SURFACE FLOW
- ECL— INLET PROTECTION (EROSION CONTROL LOG)
- ⊖(RFD)⊖ ROCK FILTER DAM (TYP 3)

1. LOCATIONS OF EROSION CONTROL DEVICES ARE APPROXIMATIONS. ACTUAL LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
2. EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY AND SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
3. ALL INLETS AND JUNCTION BOXES WITHIN THE PROJECT LIMITS OR AFFECTED BY CONSTRUCTION DEBRIS SHALL BE PROTECTED AT ALL TIMES.
4. EROSION CONTROL DEVICE INSTALLATION, MAINTENANCE, AND REMOVAL SHALL BE IN ACCORDANCE WITH TXDOT STANDARDS FOR EROSION CONTROL.
5. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.



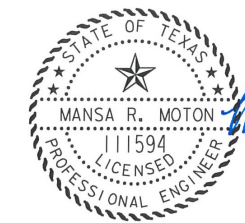
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 DATE STABILIZED _____

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 INSTALL SCF
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MATCH LINE STA 1301+00

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Mansa R. Moton
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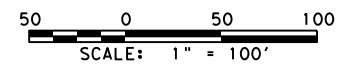
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BEGIN PROJECT TO
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SCALE: 1" = 100' SHEET 1 OF 12

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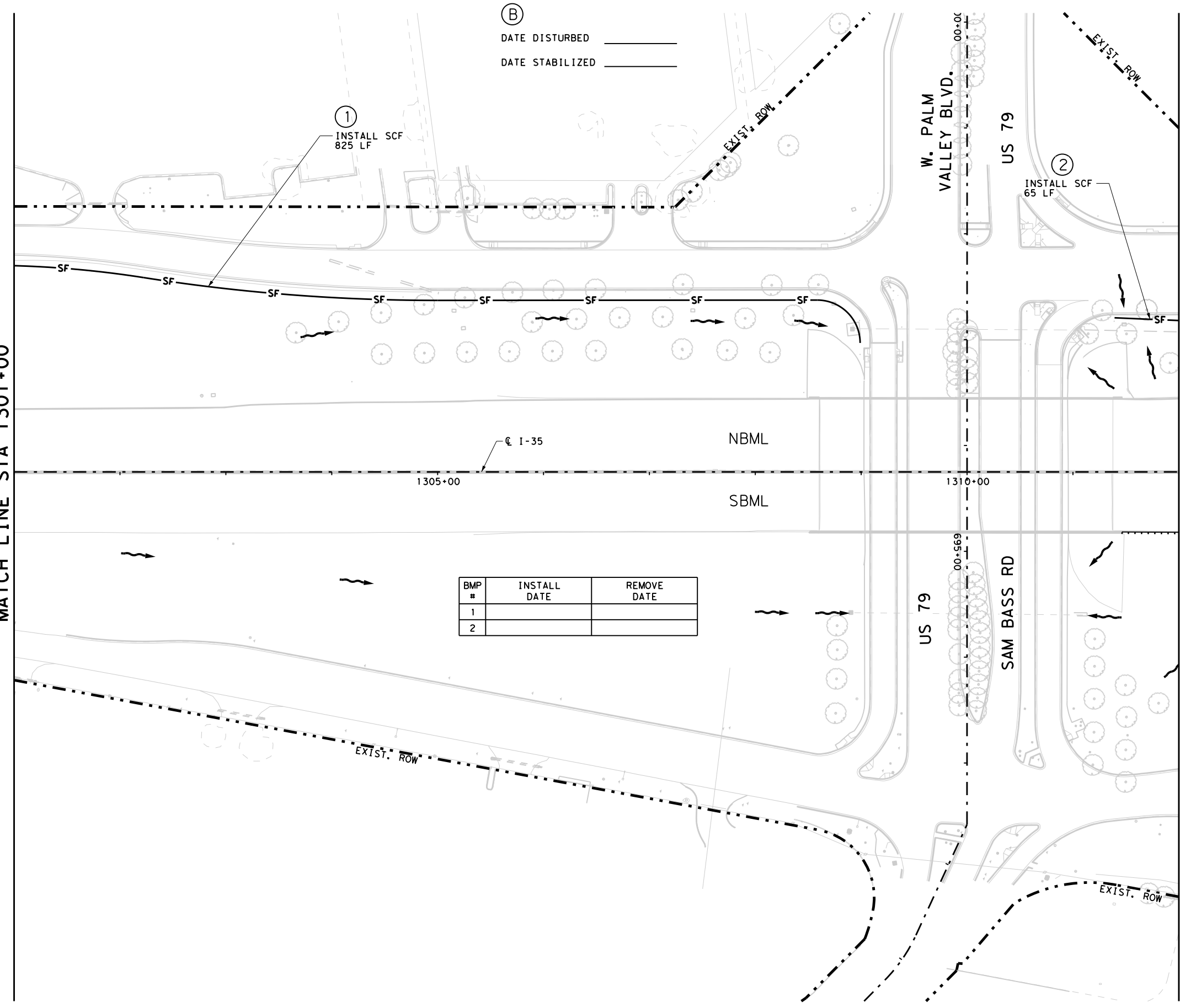
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- SF— TEMPORARY SEDIMENT CONTROL FENCE
- ~ SURFACE FLOW
- ECL— INLET PROTECTION (EROSION CONTROL LOG)
- ⊖(RFD)⊕ ROCK FILTER DAM (TYP 3)

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5. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

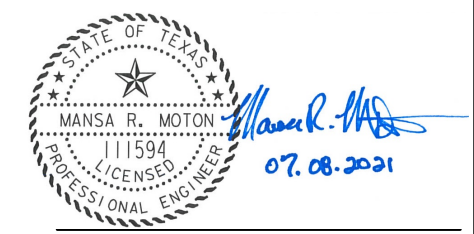
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(B)
DATE DISTURBED _____
DATE STABILIZED _____

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IH 35
SW3P SITE MAP
STA 1301+00 TO
STA 1312+00

SCALE: 1" = 100' SHEET 2 OF 12

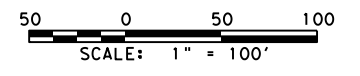
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(C) DATE DISTURBED _____
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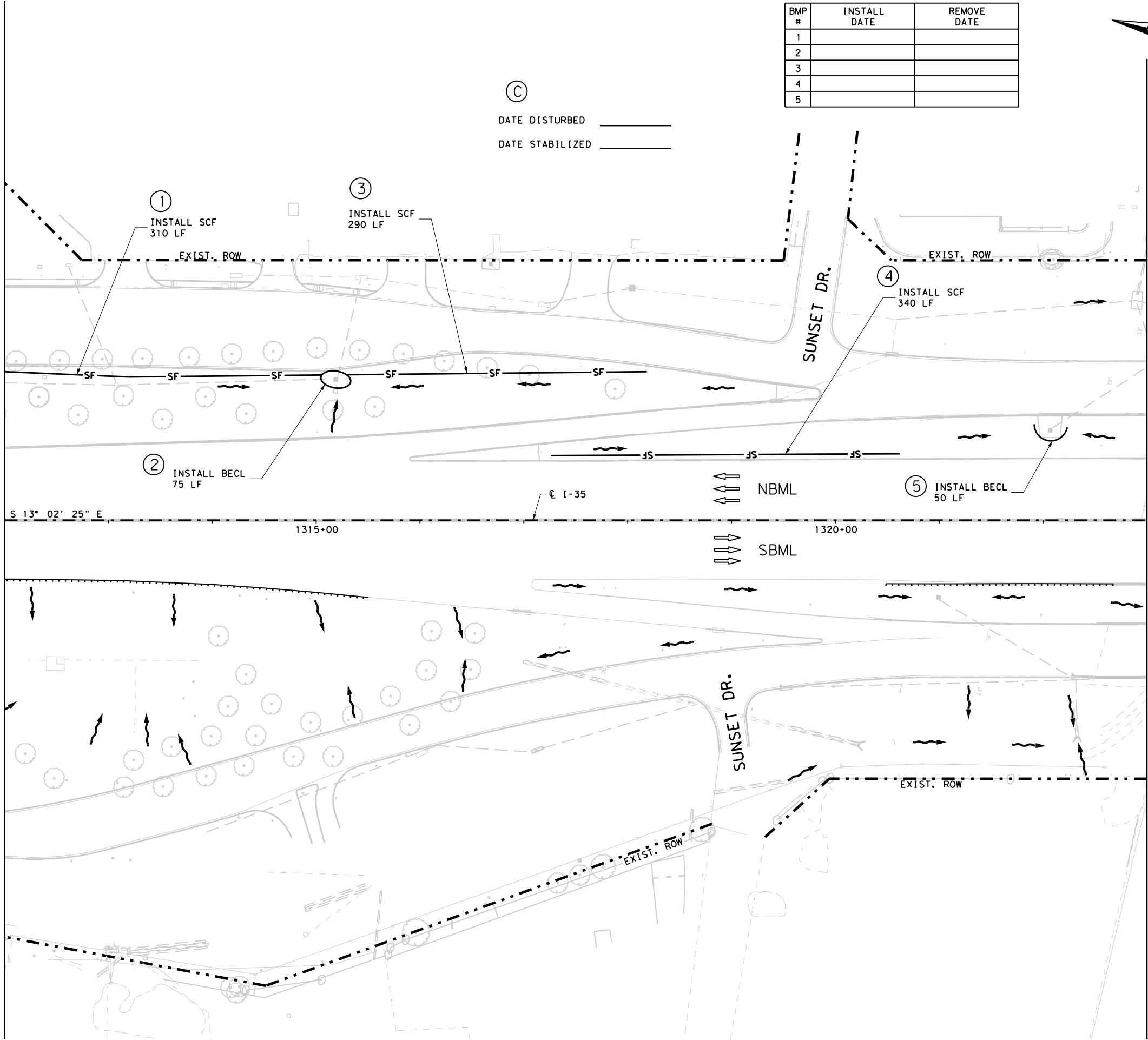


- LEGEND**
- SF— TEMPORARY SEDIMENT CONTROL FENCE
 - ~ SURFACE FLOW
 - ECL— INLET PROTECTION (EROSION CONTROL LOG)
 - ⊖(RFD)⊖ ROCK FILTER DAM (TYP 3)

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5. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

MATCH LINE STA 1312+00

MATCH LINE STA 1323+00



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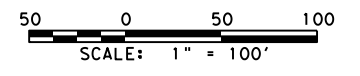
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SW3P SITE MAP
 STA 1312+00 TO
 STA 1323+00

SCALE: 1" = 100' SHEET 3 OF 12

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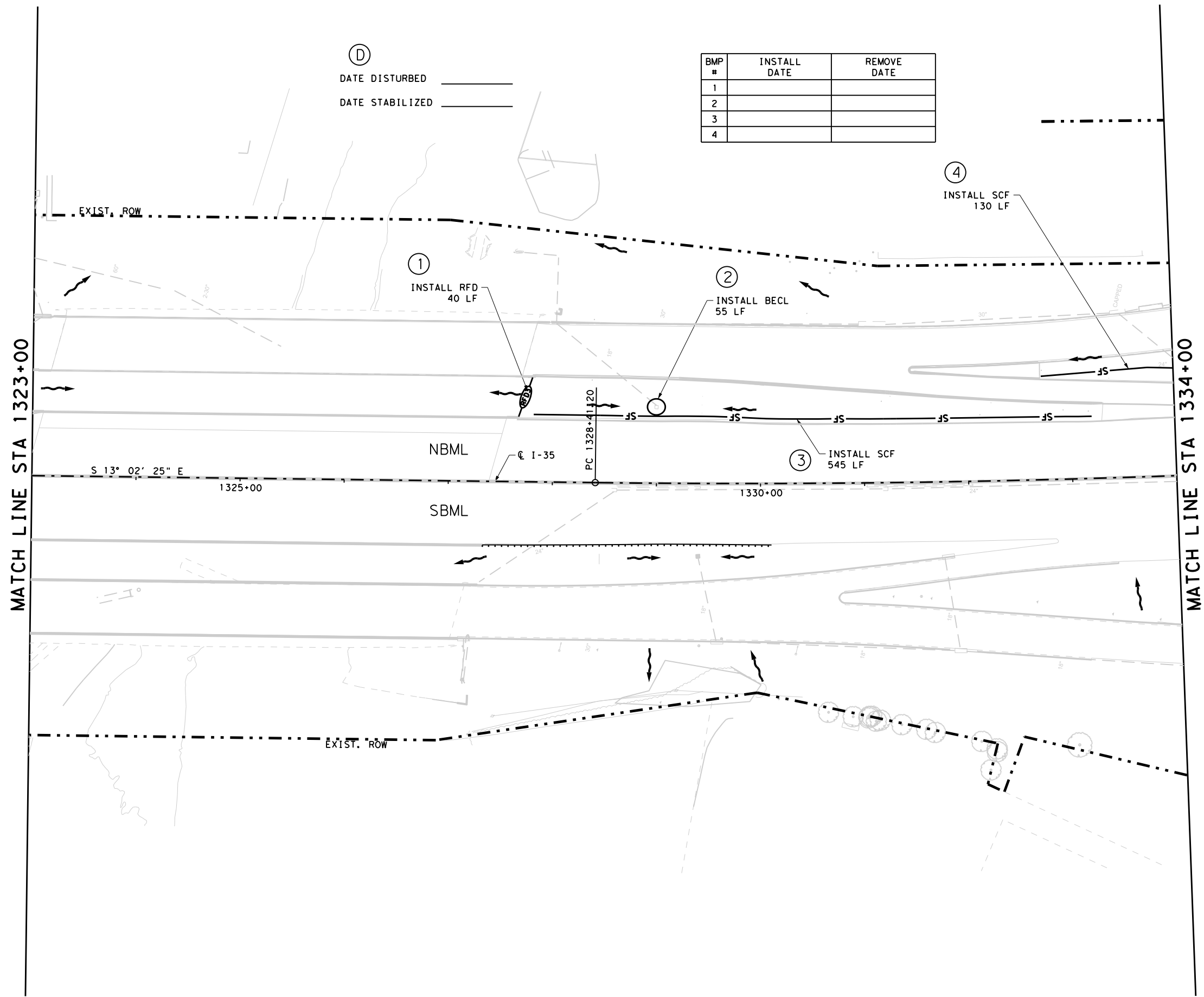
LEGEND

- SF— TEMPORARY SEDIMENT CONTROL FENCE
- >— SURFACE FLOW
- ECL— INLET PROTECTION (EROSION CONTROL LOG)
- RFD3— ROCK FILTER DAM (TYP 3)

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5. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

BMP #	INSTALL DATE	REMOVE DATE
1		
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ⓓ
DATE DISTURBED _____
DATE STABILIZED _____



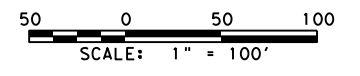
IH 35
SW3P SITE MAP
STA 1323+00 TO
STA 1334+00

SCALE: 1" = 100' SHEET 4 OF 12

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MM	AR	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
MH	MM	AUS	WILLIAMSON	295	

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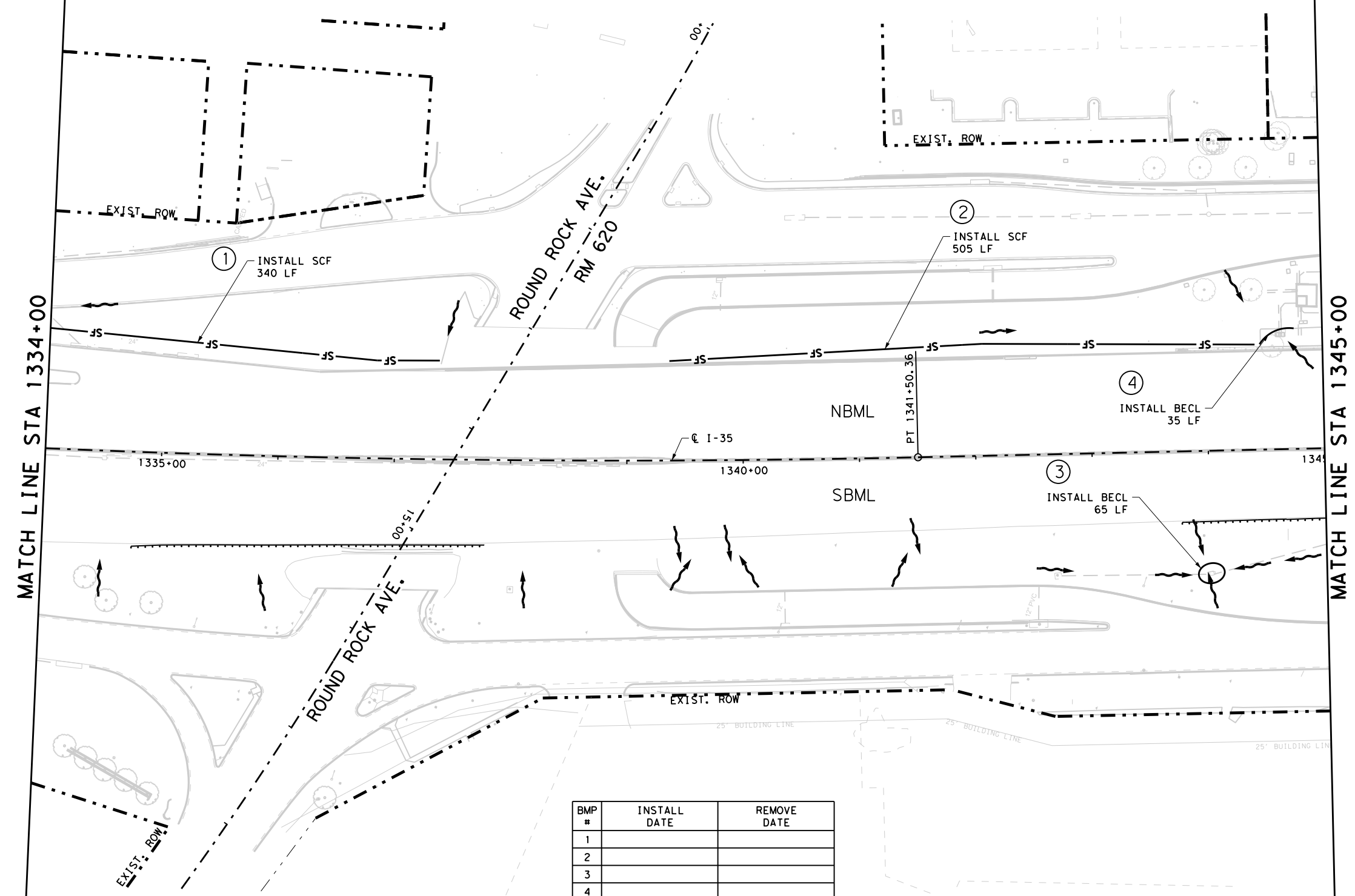


LEGEND

- SF— TEMPORARY SEDIMENT CONTROL FENCE
- ~ SURFACE FLOW
- ECL— INLET PROTECTION (EROSION CONTROL LOG)
- RFDS— ROCK FILTER DAM (TYP 3)

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5. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

(E)
 DATE DISTURBED _____
 DATE STABILIZED _____



BMP #	INSTALL DATE	REMOVE DATE
1		
2		
3		
4		



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 CONSULTING ENGINEERS
 TBPE REGISTRATION NO. 264

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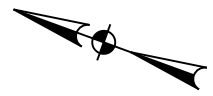
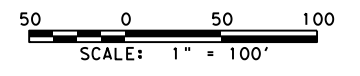
**IH 35
 SW3P SITE MAP
 STA 1334+00 TO
 STA 1345+00**

SCALE: 1" = 100' SHEET 5 OF 12

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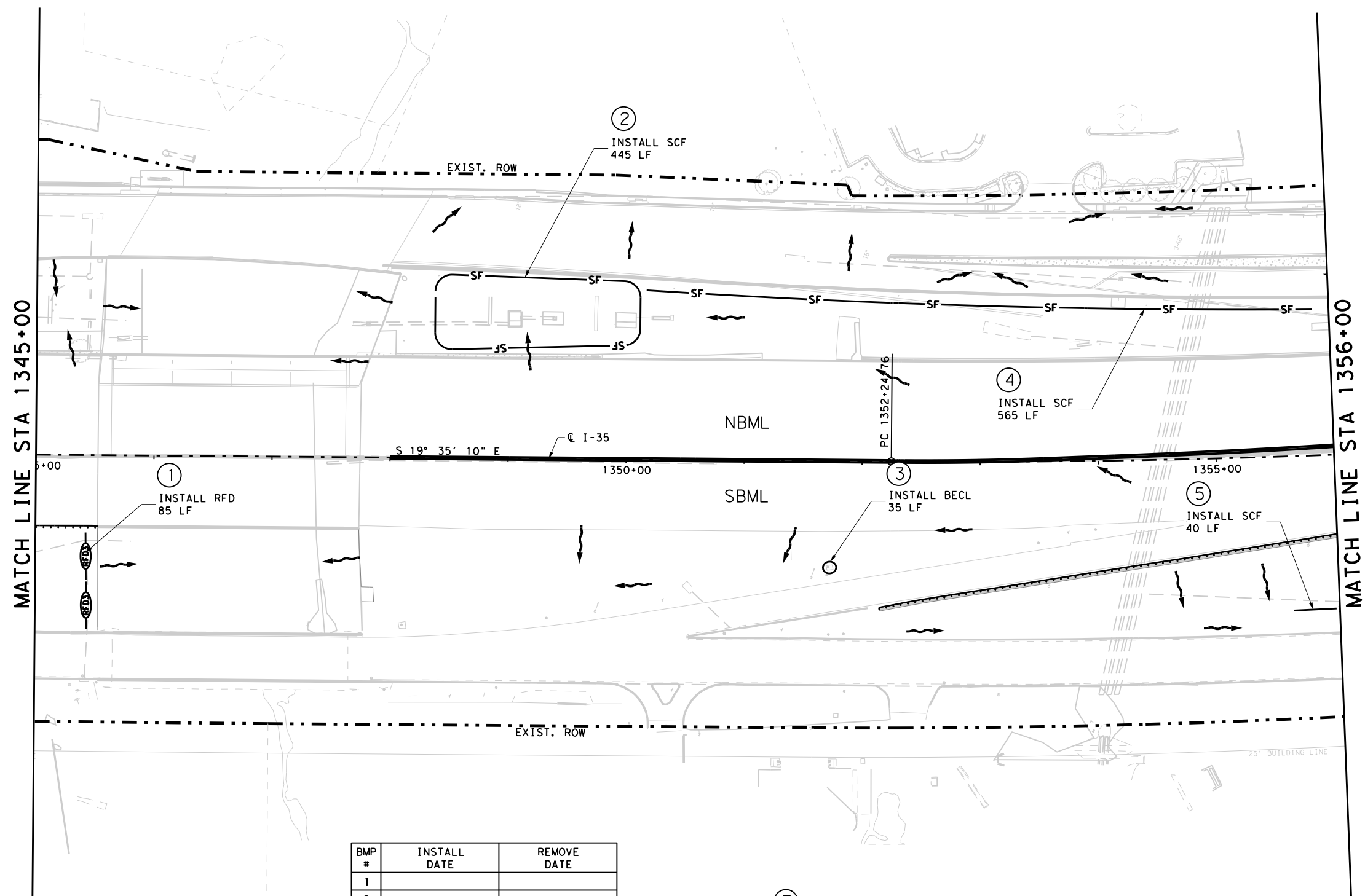
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LEGEND

- SF— TEMPORARY SEDIMENT CONTROL FENCE
- ~ SURFACE FLOW
- ECL— INLET PROTECTION (EROSION CONTROL LOG)
- ⊖(RFD)⊖ ROCK FILTER DAM (TYP 3)

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MATCH LINE STA 1345+00

MATCH LINE STA 1356+00

BMP #	INSTALL DATE	REMOVE DATE
1		
2		
3		
4		
5		

(F) DATE DISTURBED _____
DATE STABILIZED _____



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CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264



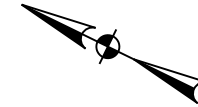
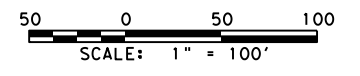
IH 35
SW3P SITE MAP
STA 1345+00 TO
STA 1356+00

SCALE: 1" = 100' SHEET 6 OF 12

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MH	MM	AUS	WILLIAMSON	297	

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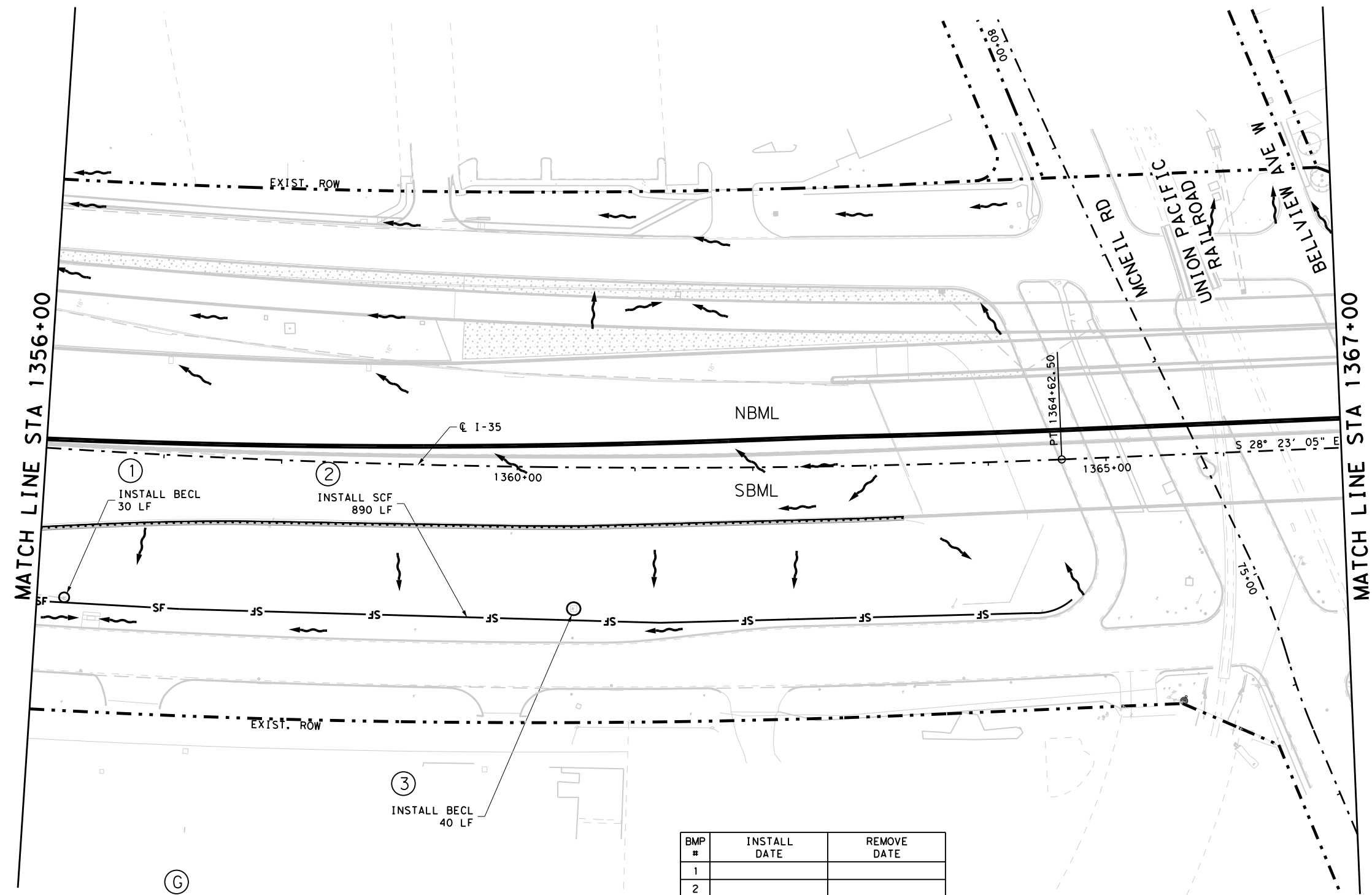
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LEGEND

- SF— TEMPORARY SEDIMENT CONTROL FENCE
- ~ SURFACE FLOW
- ECL— INLET PROTECTION (EROSION CONTROL LOG)
- ⊖(RFD)⊖ ROCK FILTER DAM (TYP 3)

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Ⓒ DATE DISTURBED _____
DATE STABILIZED _____

BMP #	INSTALL DATE	REMOVE DATE
1		
2		
3		



BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TXPE REGISTRATION NO. 264

2021
Texas Department of Transportation

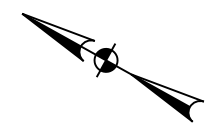
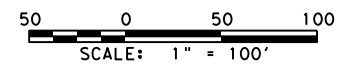
IH 35
SW3P SITE MAP
STA 1356+00 TO
STA 1367+00

SCALE: 1" = 100' SHEET 7 OF 12

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	AR	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
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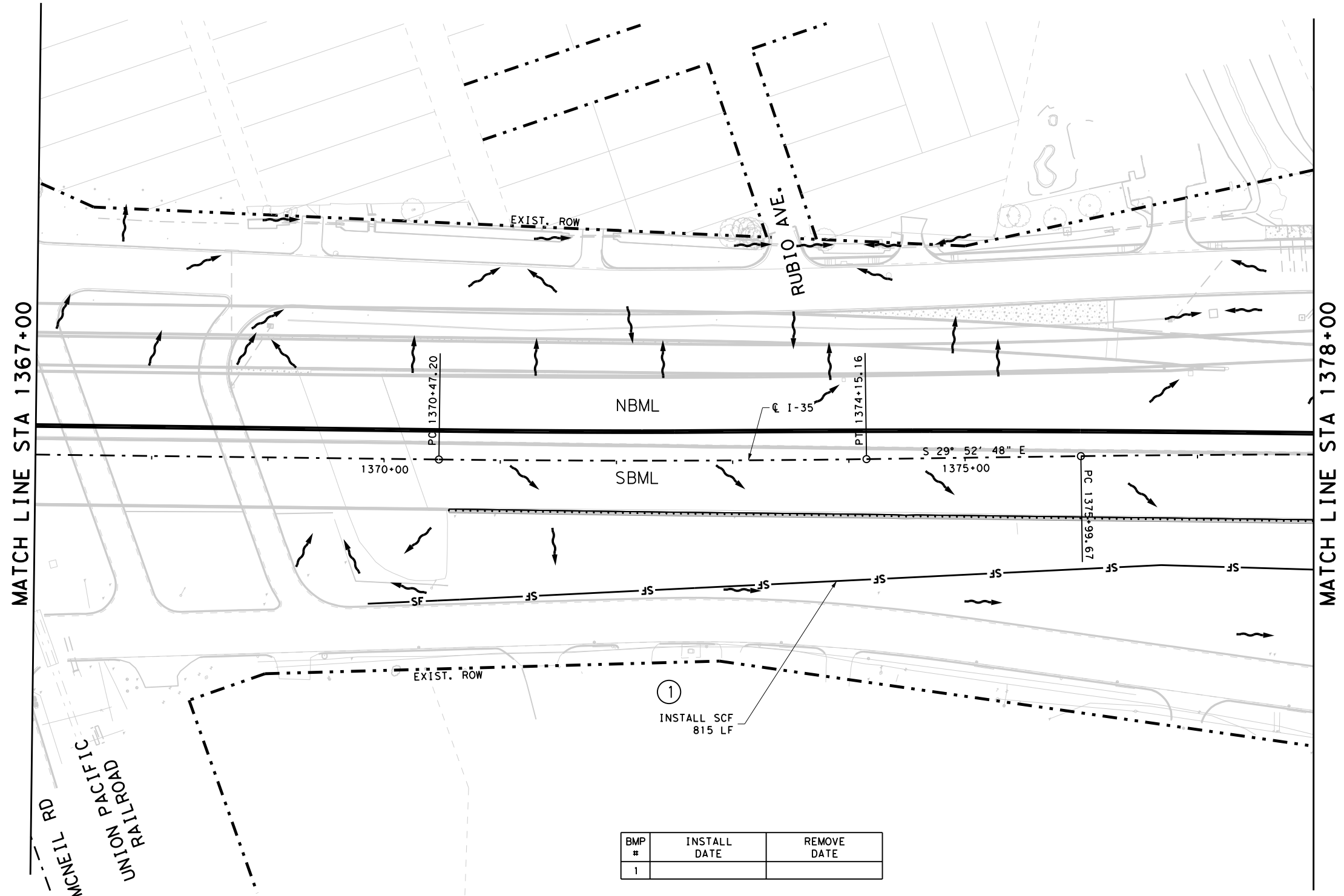
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LEGEND

- SF— TEMPORARY SEDIMENT CONTROL FENCE
- ~ SURFACE FLOW
- ECL— INLET PROTECTION (EROSION CONTROL LOG)
- ⊖(RFD)⊖ ROCK FILTER DAM (TYP 3)

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①
INSTALL SCF
815 LF

BMP #	INSTALL DATE	REMOVE DATE
1		

Ⓜ DATE DISTURBED _____
DATE STABILIZED _____



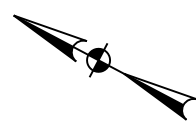
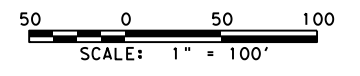
IH 35
SW3P SITE MAP
STA 1367+00 TO
STA 1378+00

SCALE: 1" = 100' SHEET 8 OF 12

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	AR	0015	09	194	IH 35
DW:	CK:	DIST	COUNTY	SHEET NO.	
MH	MM	AUS	WILLIAMSON	299	

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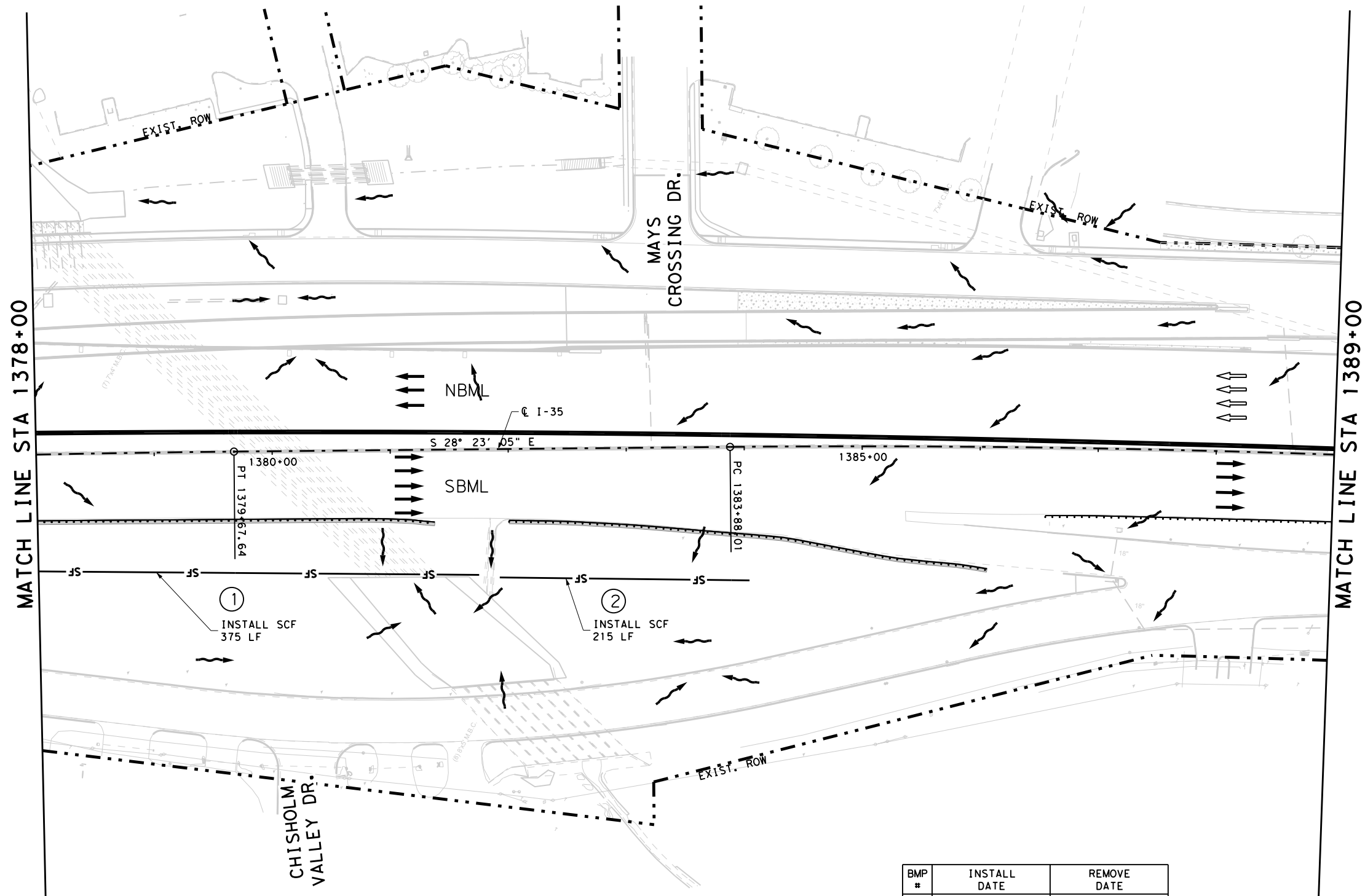


LEGEND

- SF— TEMPORARY SEDIMENT CONTROL FENCE
- W— SURFACE FLOW
- ECL— INLET PROTECTION (EROSION CONTROL LOG)
- RFD3— ROCK FILTER DAM (TYP 3)

①
DATE DISTURBED _____
DATE STABILIZED _____

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①
INSTALL SCF
375 LF

②
INSTALL SCF
215 LF



BMP #	INSTALL DATE	REMOVE DATE
1		
2		

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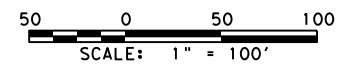
IH 35
SW3P SITE MAP
STA 1378+00 TO
STA 1389+00

SCALE: 1" = 100' SHEET 9 OF 12

DS:	CK:	CONT	SECT	JOB	HIGHWAY
MM	AR	0015	09	194	IH 35
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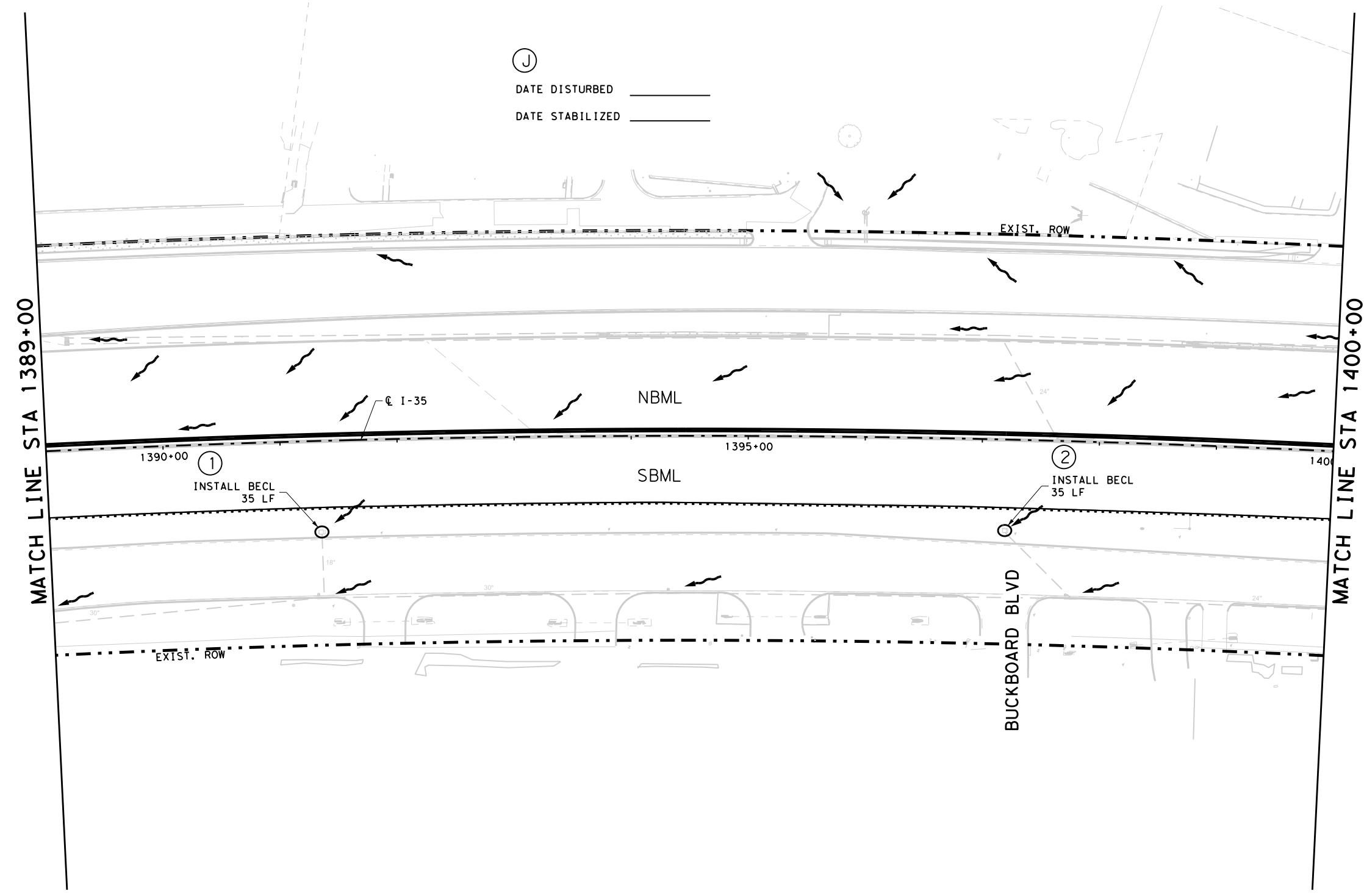
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LEGEND

- SF— TEMPORARY SEDIMENT CONTROL FENCE
- ~ SURFACE FLOW
- ECL— INLET PROTECTION (EROSION CONTROL LOG)
- ⊖(RFD)⊖ ROCK FILTER DAM (TYP 3)

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ⓐ
DATE DISTURBED _____
DATE STABILIZED _____



BMP #	INSTALL DATE	REMOVE DATE
1		
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CONSULTING ENGINEERS
TBPB REGISTRATION NO. 264



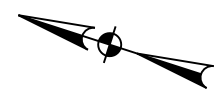
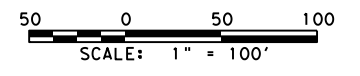
IH 35
SW3P SITE MAP
STA 1389+00 TO
STA 1400+00

SCALE: 1" = 100' SHEET 10 OF 12

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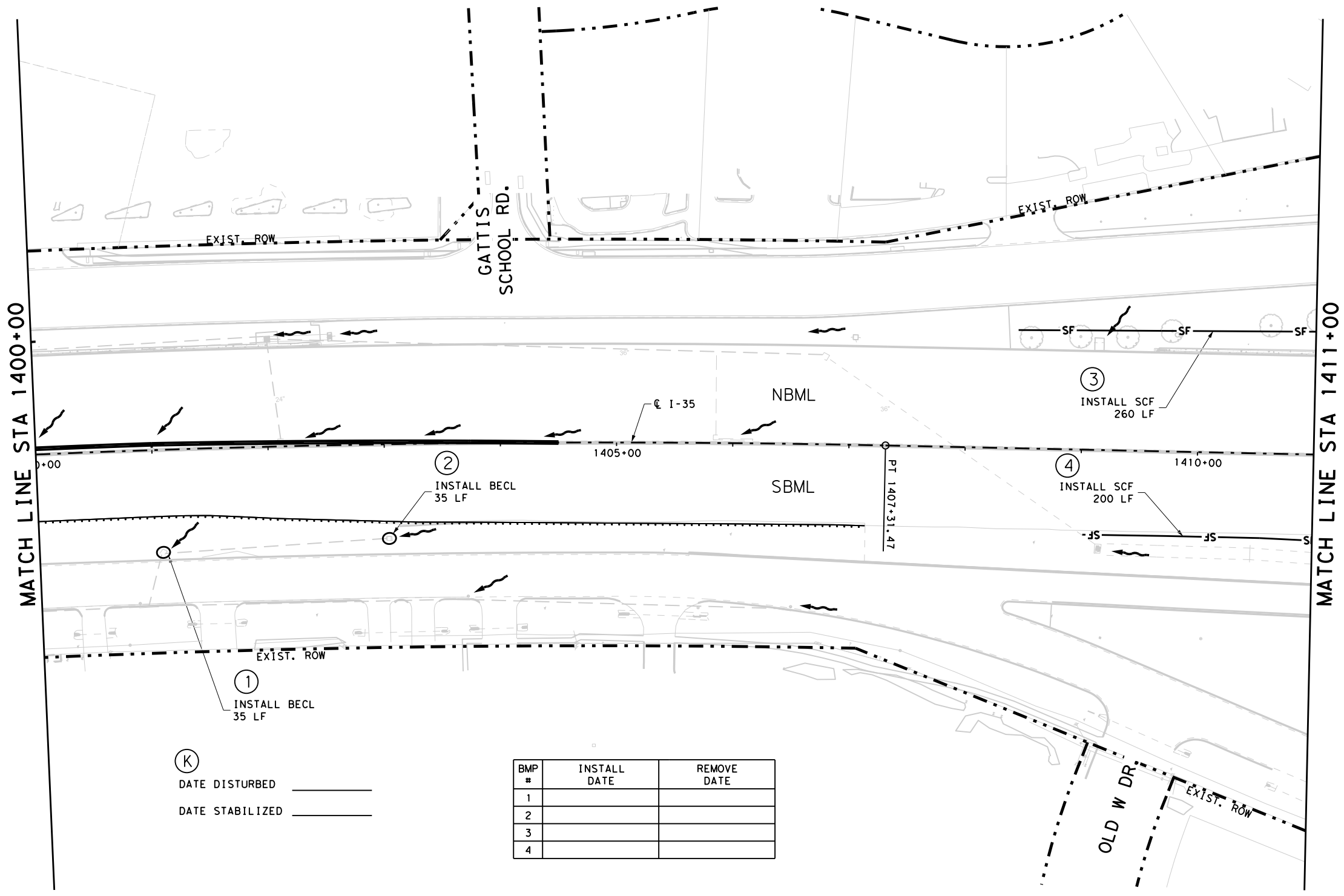
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LEGEND

- SF— TEMPORARY SEDIMENT CONTROL FENCE
- ~— SURFACE FLOW
- ECL— INLET PROTECTION (EROSION CONTROL LOG)
- (RFD3)— ROCK FILTER DAM (TYP 3)

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MATCH LINE STA 1400+00

MATCH LINE STA 1411+00

(K)
DATE DISTURBED _____
DATE STABILIZED _____

BMP #	INSTALL DATE	REMOVE DATE
1		
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3		
4		



Mansa R. Moton
07.08.2021



IH 35
SW3P SITE MAP
STA 1400+00 TO
STA 1411+00

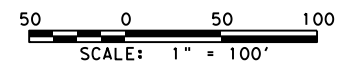
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DW:	CK:	DIST	COUNTY	SHEET NO.	
MH	MM	AUS	WILLIAMSON	302	

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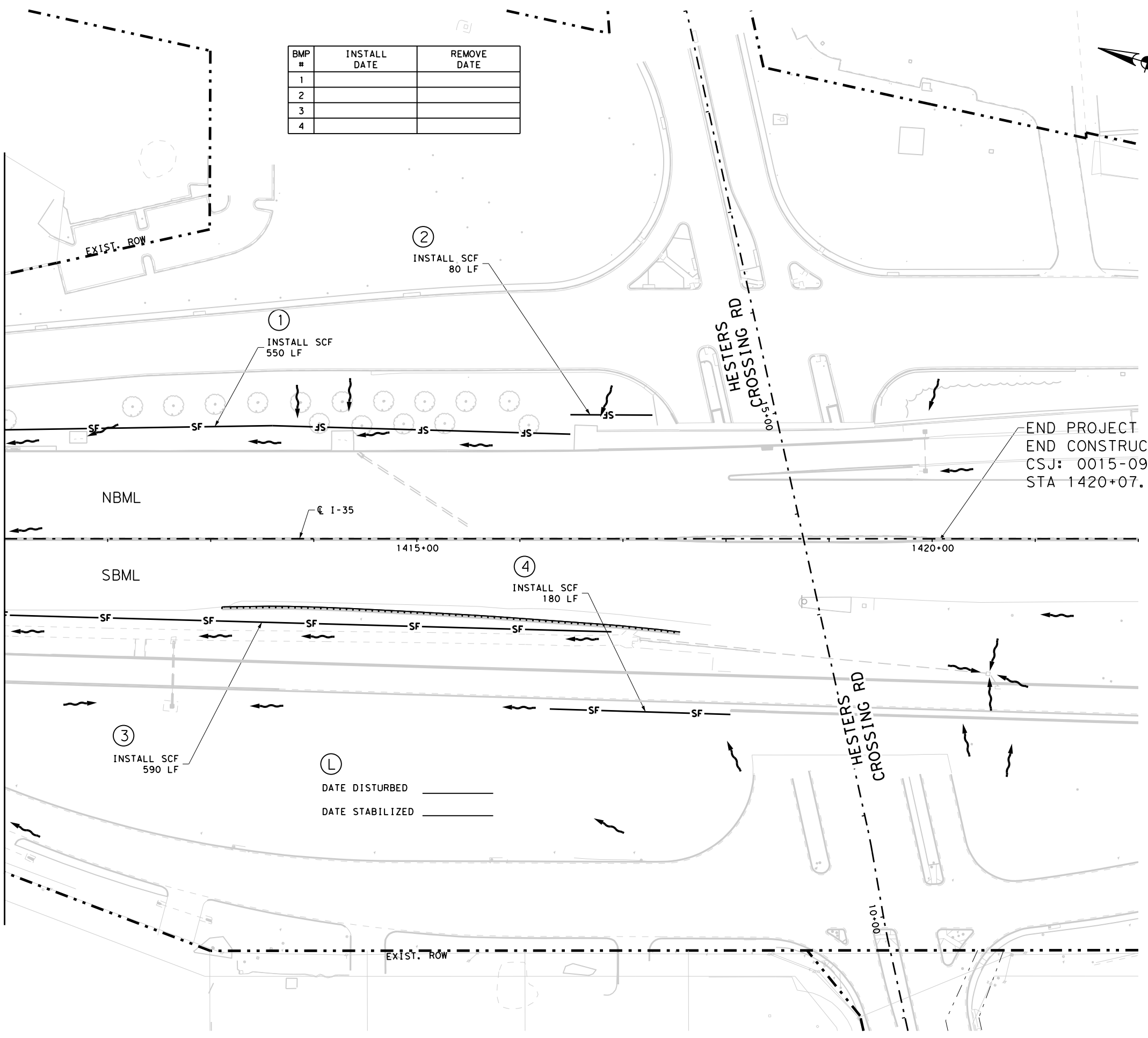
BMP #	INSTALL DATE	REMOVE DATE
1		
2		
3		
4		



- LEGEND**
- SF— TEMPORARY SEDIMENT CONTROL FENCE
 - ~ SURFACE FLOW
 - ECL— INLET PROTECTION (EROSION CONTROL LOG)
 - RFDS— ROCK FILTER DAM (TYP 3)

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MATCH LINE STA 1411+00



END PROJECT
 END CONSTRUCTION
 CSJ: 0015-09-194
 STA 1420+07.04

①
 INSTALL SCF
 550 LF

②
 INSTALL SCF
 80 LF

③
 INSTALL SCF
 590 LF

④
 INSTALL SCF
 180 LF

Ⓛ
 DATE DISTURBED _____
 DATE STABILIZED _____



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2021
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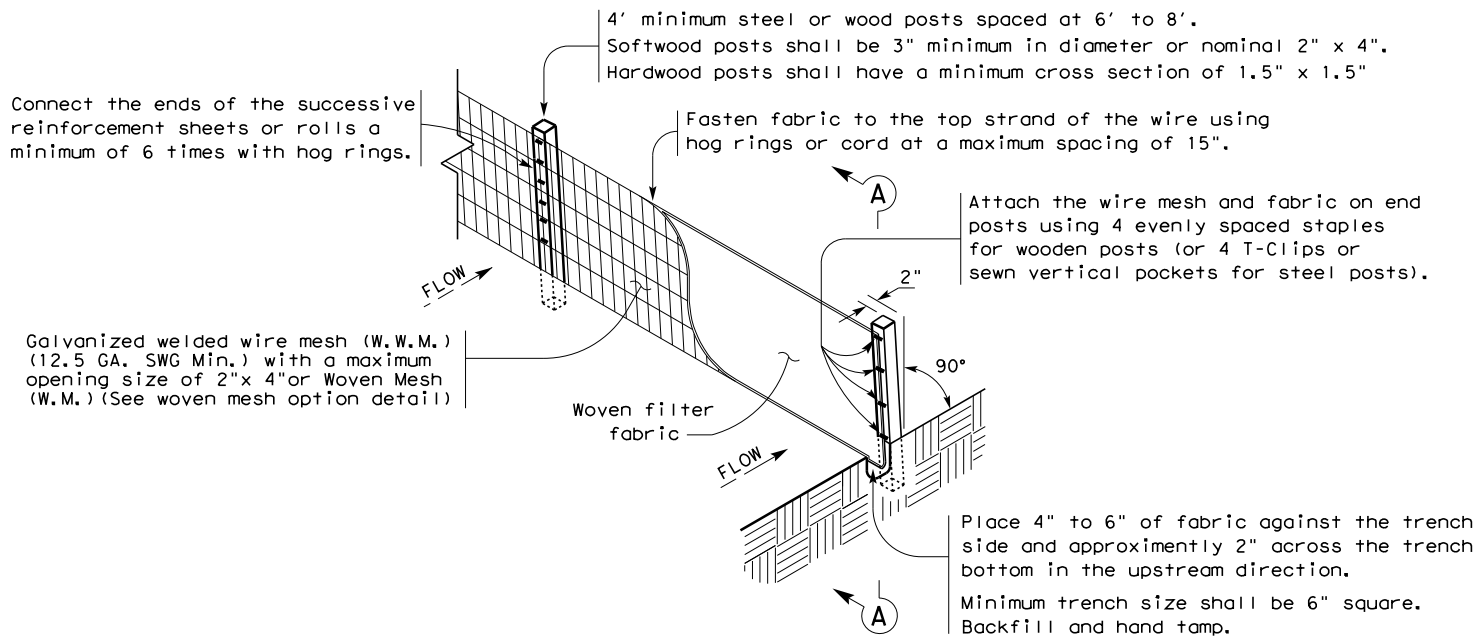
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 STA 1411+00 TO
 END PROJECT

SCALE: 1" = 100' SHEET 12 OF 12

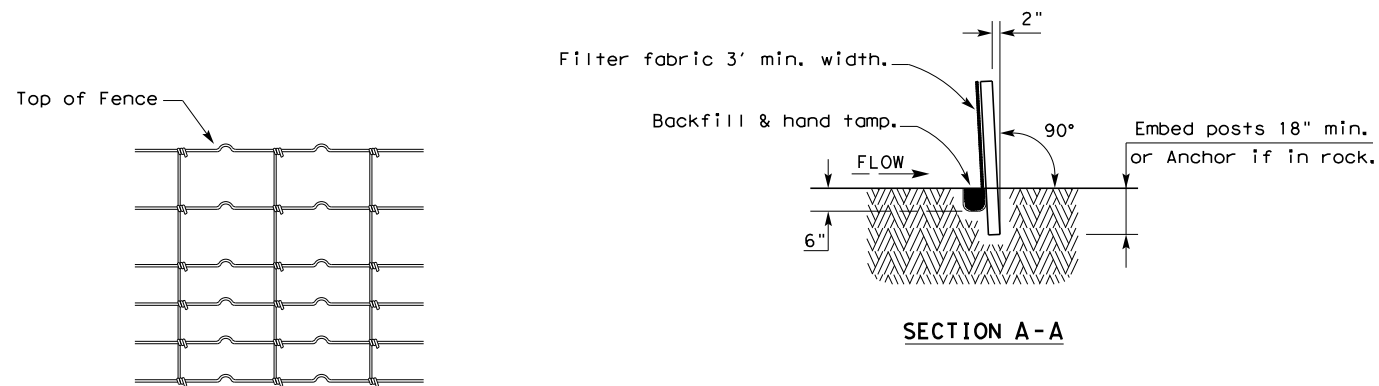
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MH	MM	AUS	WILLIAMSON	303	

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DATE: 7/8/16
 FILE: c:\p\ec16\br\agefarmer-pw\chase.myer\sabr\agefarmer.com\dms03729\037403-ec(1)-16.dgn
 CWM



TEMPORARY SEDIMENT CONTROL FENCE



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/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

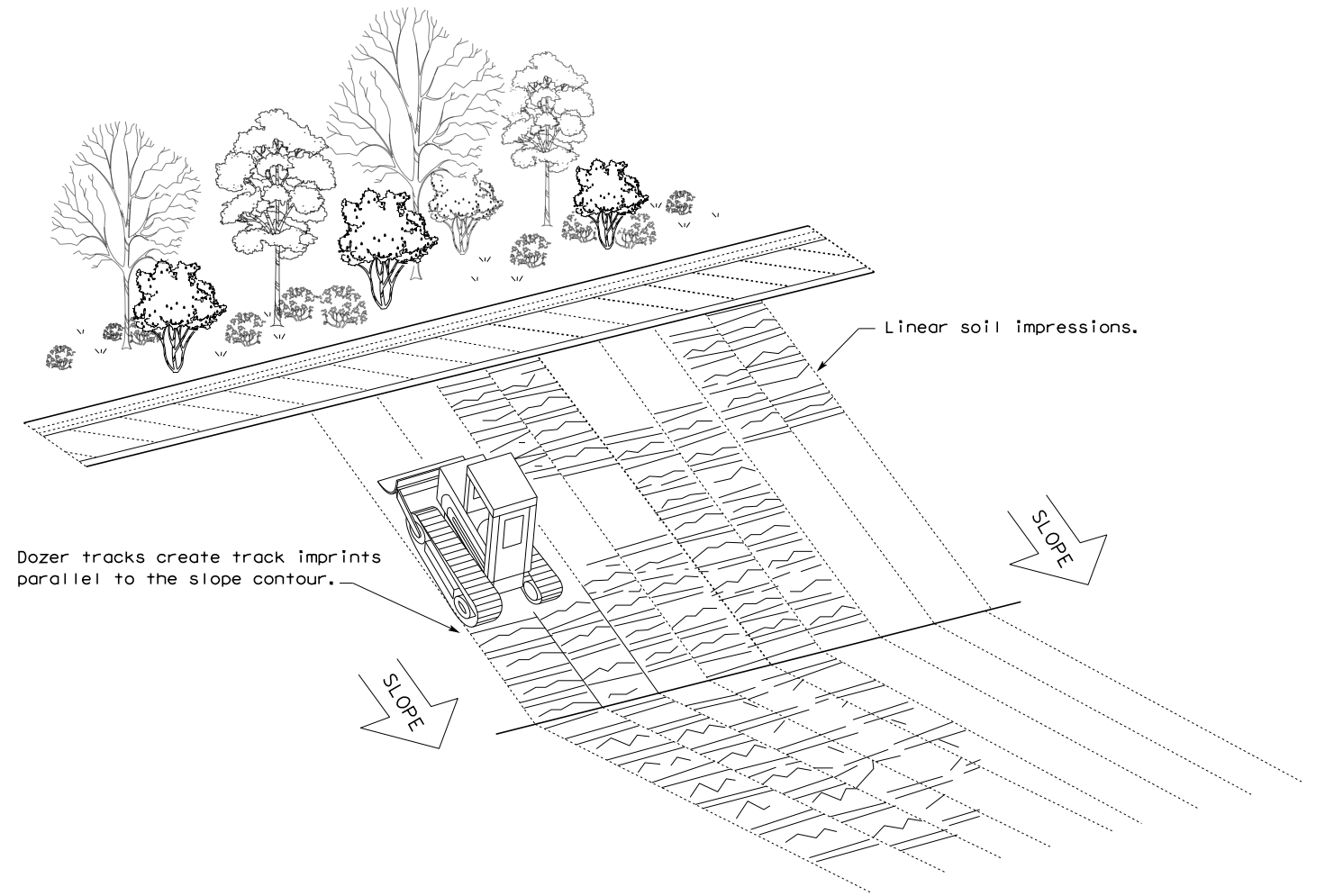
LEGEND

Sediment Control Fence



GENERAL NOTES

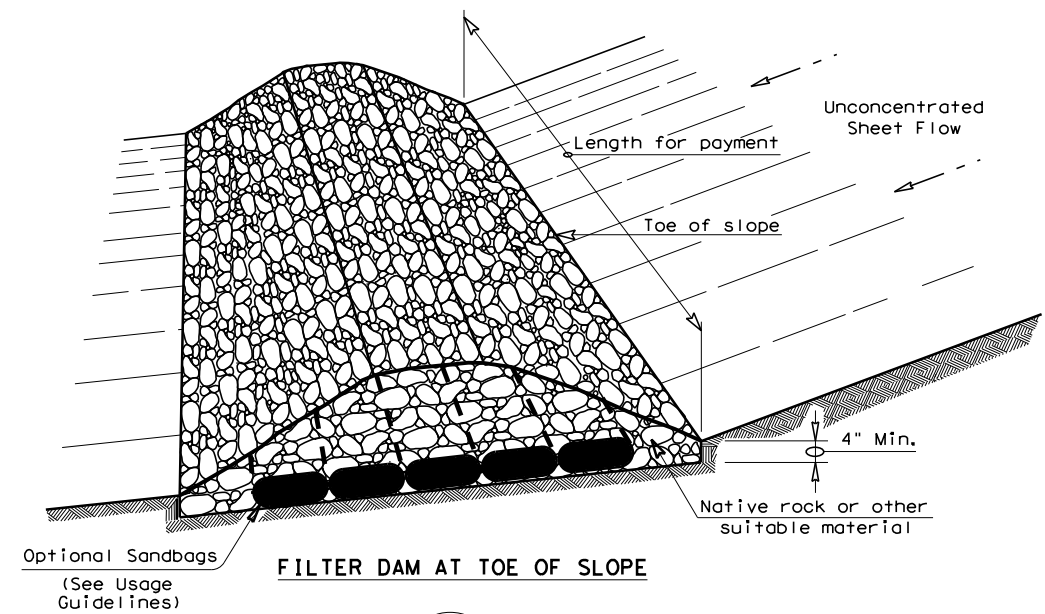
- Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
- Perform vertical tracking on slopes to temporarily stabilize soil.
- Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum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



		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
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS		194	1H 35
DIST	COUNTY	SHEET NO.	
AUS	WILLIAMSON	304A	

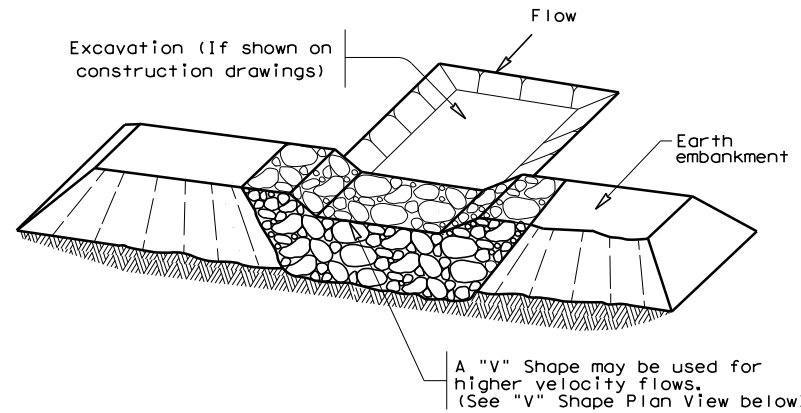
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 7/8/2021
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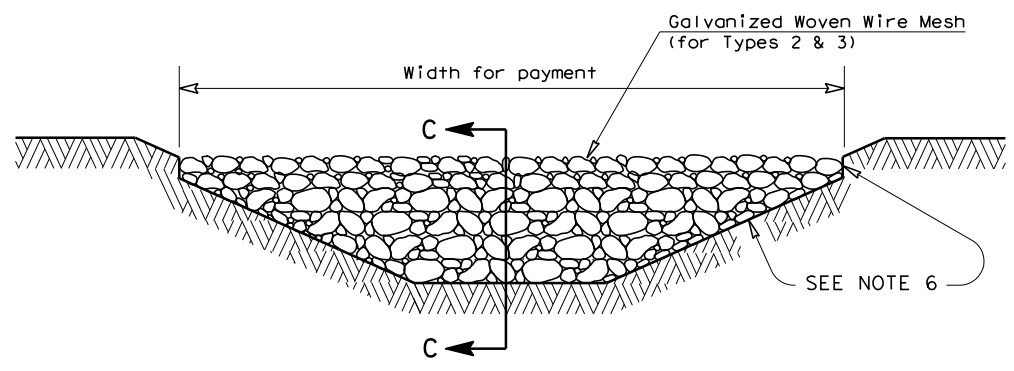
FILTER DAM AT TOE OF SLOPE

(RFD1)



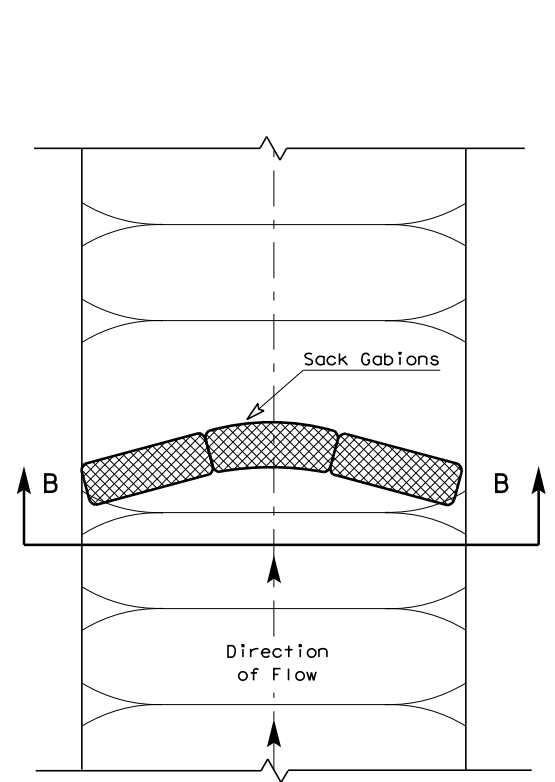
FILTER DAM AT SEDIMENT TRAP

(RFD1) OR (RFD2)

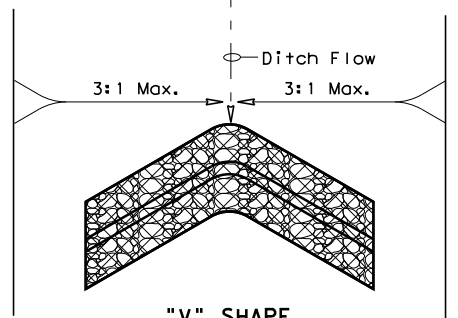


FILTER DAM AT CHANNEL SECTIONS

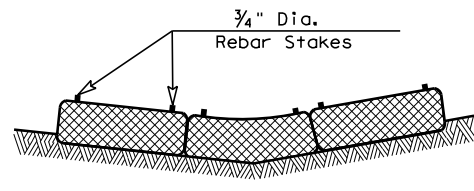
(RFD1) OR (RFD2) OR (RFD3)



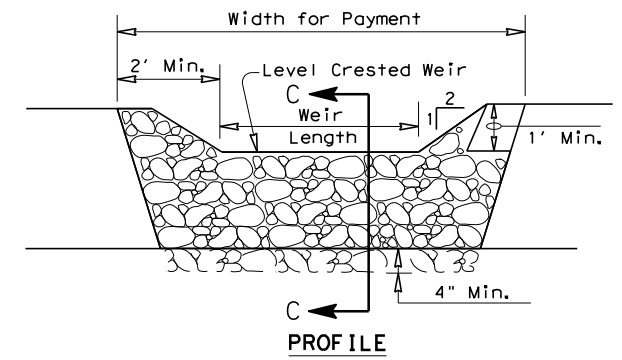
PLAN VIEW



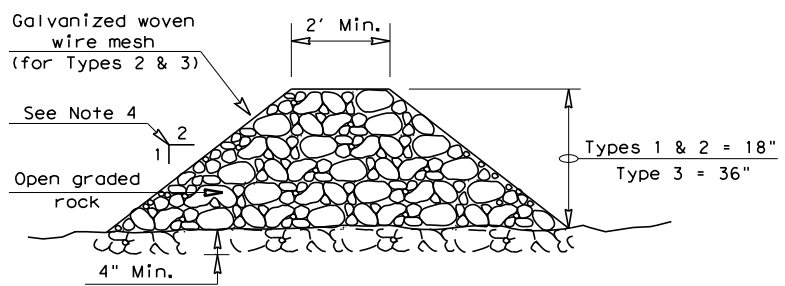
"V" SHAPE PLAN VIEW



SECTION B-B



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT² of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximately 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

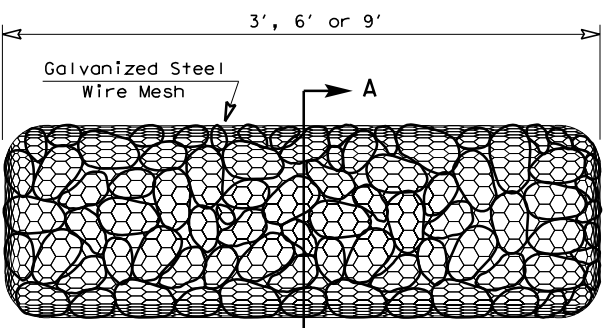
Type 5: Provide rock filter dams as shown on plans.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4".
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

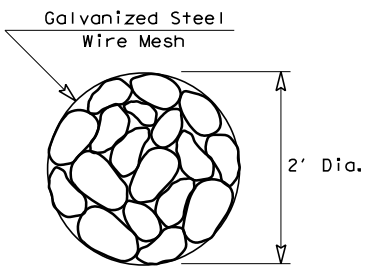
PLAN SHEET LEGEND

- Type 1 Rock Filter Dam (RFD1)
- Type 2 Rock Filter Dam (RFD2)
- Type 3 Rock Filter Dam (RFD3)
- Type 4 Rock Filter Dam (RFD4)



TYPE 4 (SACK GABIONS)

(RFD4)

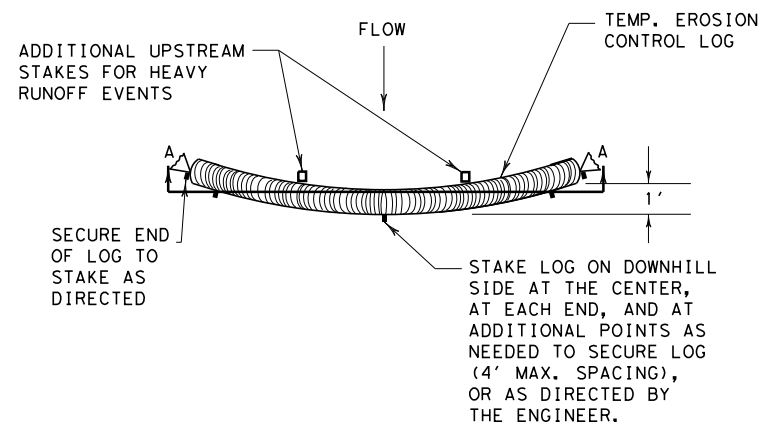


SECTION A-A

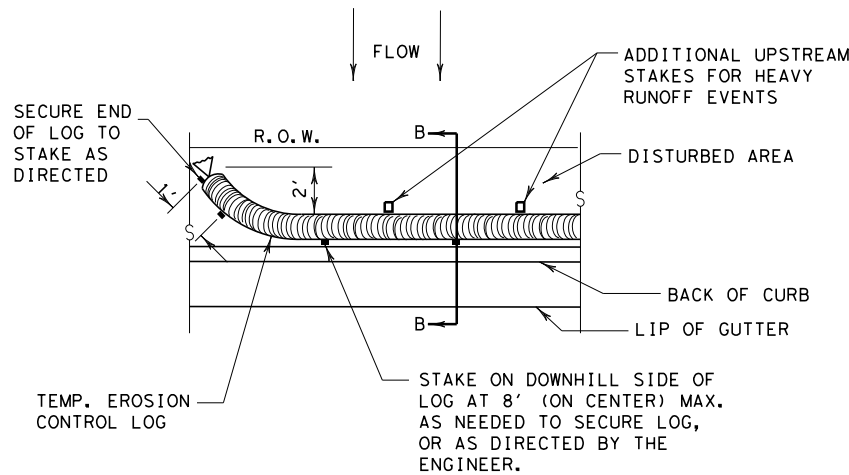
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES ROCK FILTER DAMS EC(2)-16			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0015 09	194	1H 35
DIST	COUNTY	SHEET NO.	
AUS	WILLIAMSON	304B	

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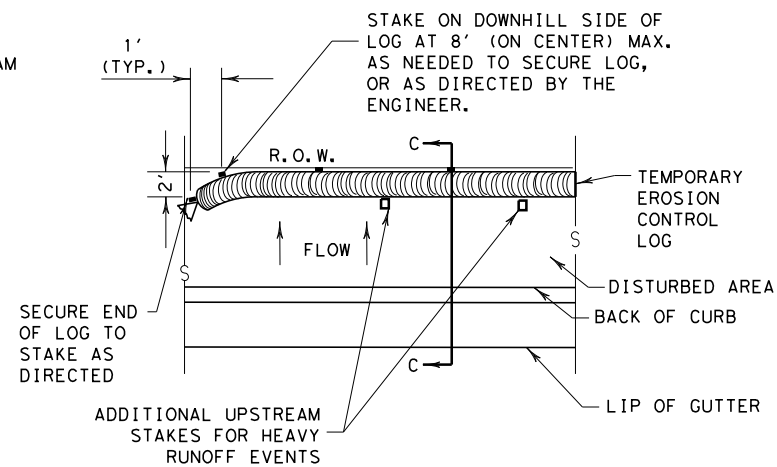
DATE: 7/8/2021 5:03:20 PM
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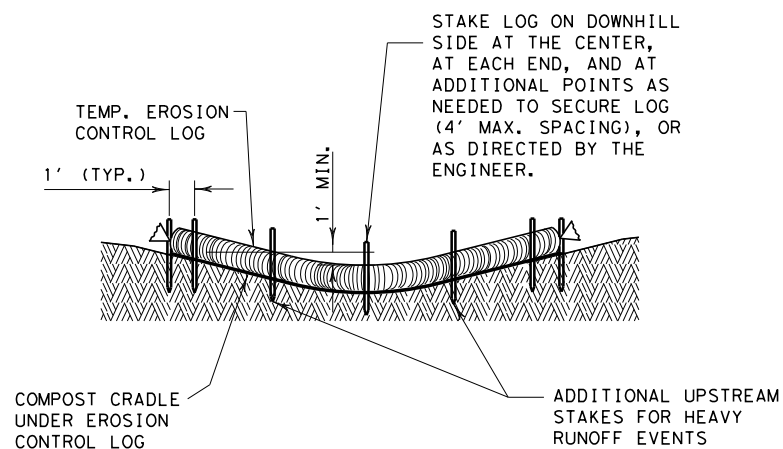
PLAN VIEW



PLAN VIEW



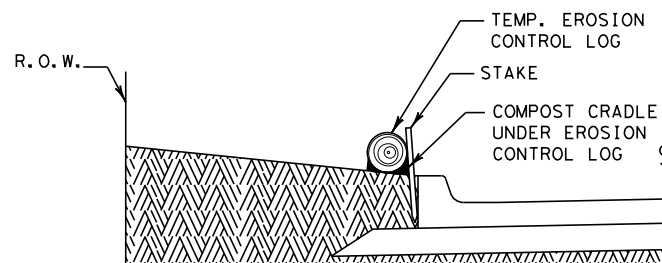
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

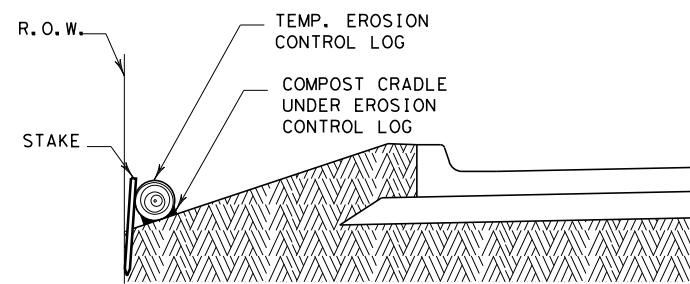
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

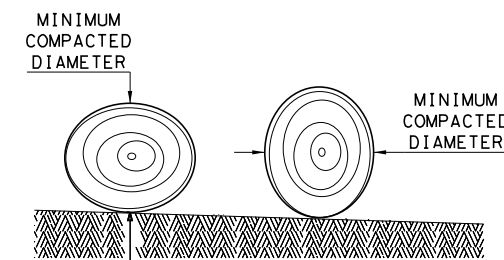
CL-BOC



SECTION C-C

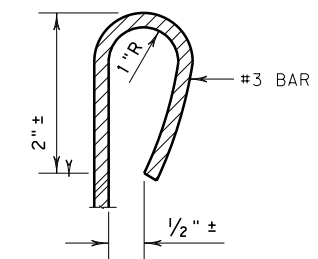
EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

- 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



REBAR STAKE DETAIL

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.

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'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.

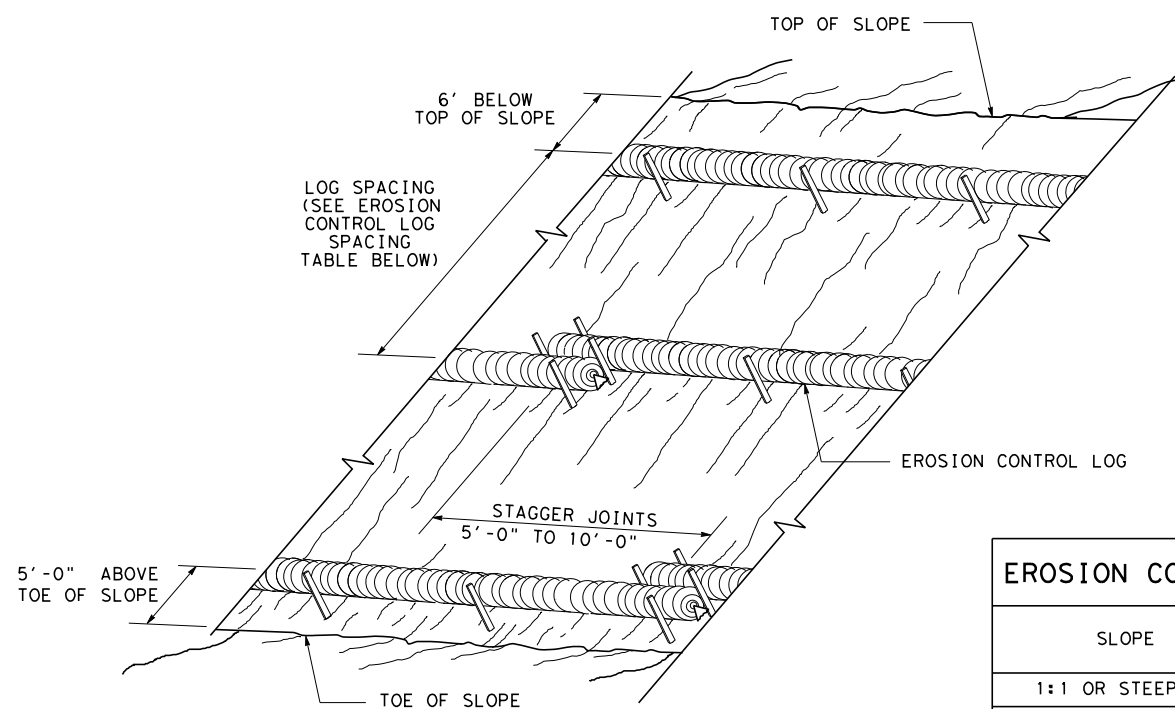
SHEET 1 OF 3

		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
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
	0015 09	194	1H 35
	DIST	COUNTY	SHEET NO.
	AUS	WILLIAMSON	304C

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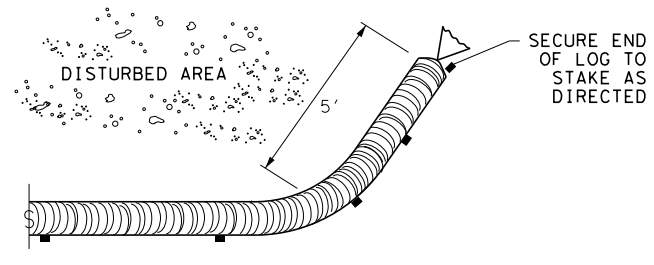
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**EROSION CONTROL LOGS ON SLOPES
 STAKE AND TRENCHING ANCHORING**

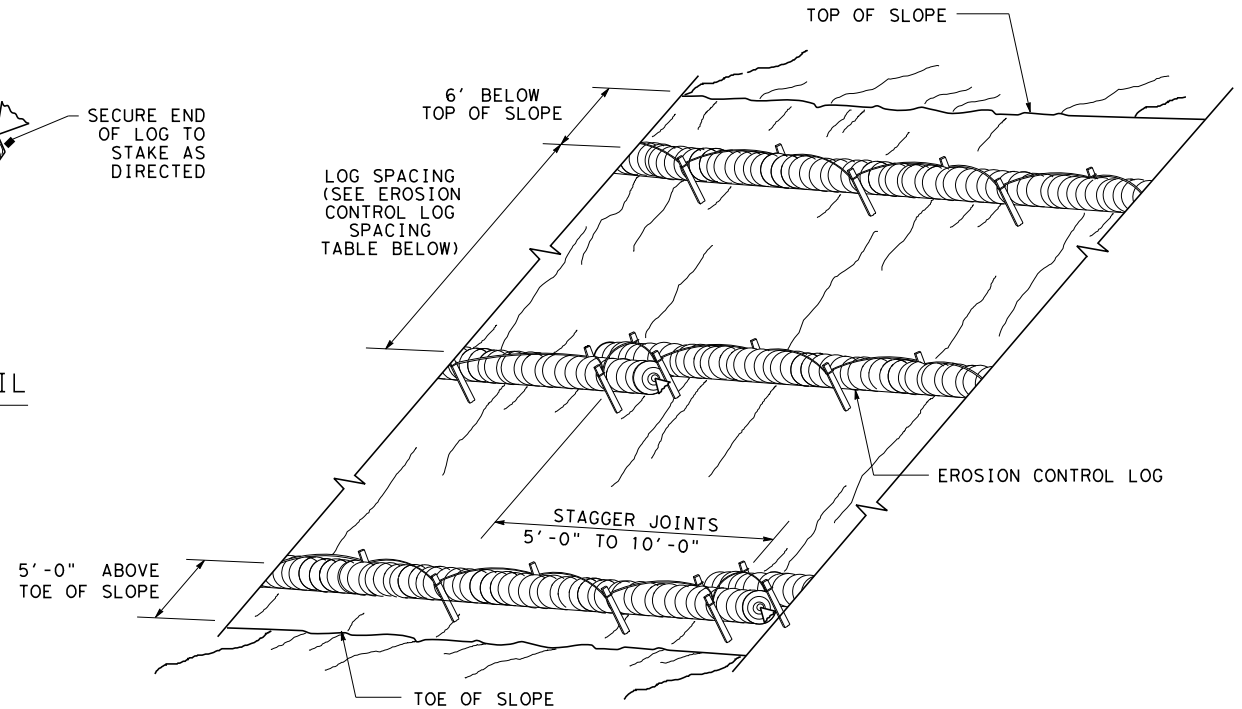
CL-SST



END SECTION RAP DETAIL

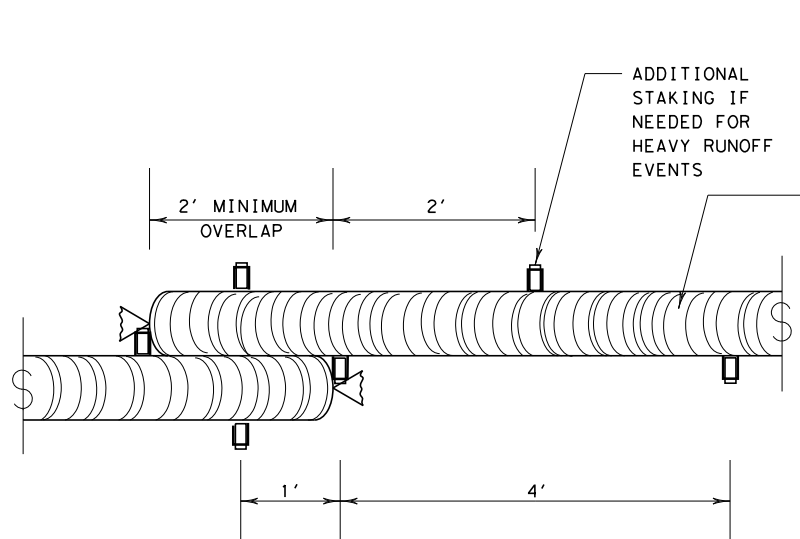
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

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



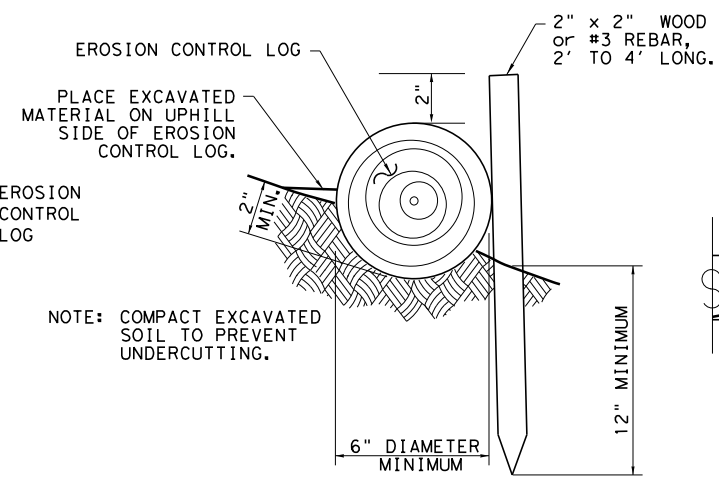
**EROSION CONTROL LOGS ON SLOPES
 STAKE AND LASHING ANCHORING**

CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

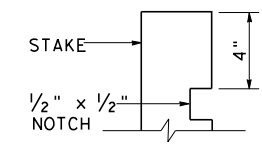
CL-SST



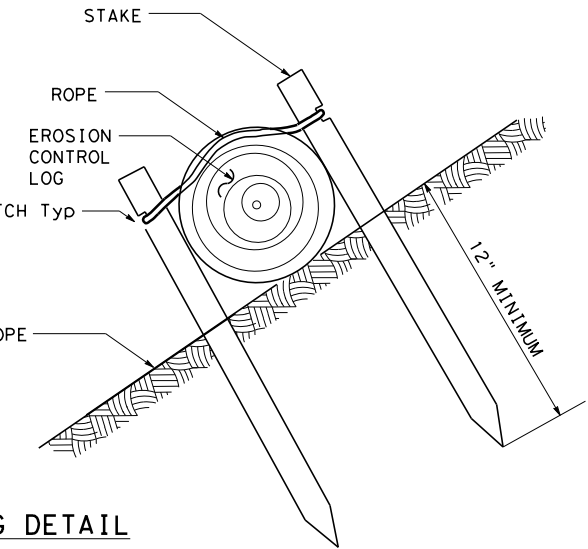
STAKE AND LASHING ANCHORING DETAIL

CL-SSL

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



STAKE NOTCH DETAIL



SHEET 2 OF 3

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	0015	09	194	1H 35
DIST	COUNTY		SHEET NO.	
AUS	WILLIAMSON		305	

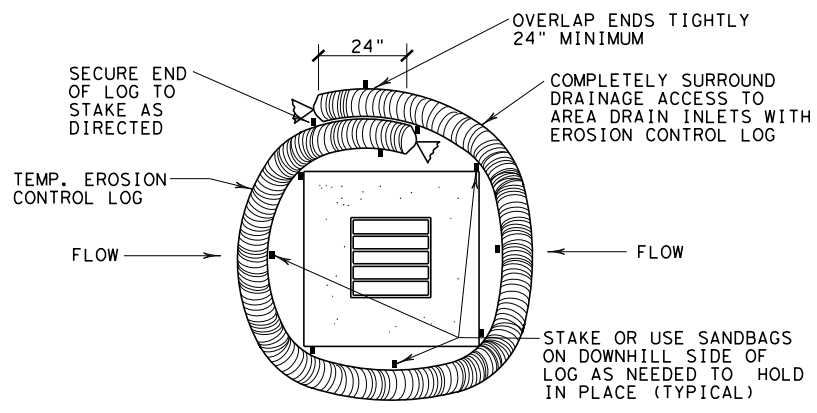
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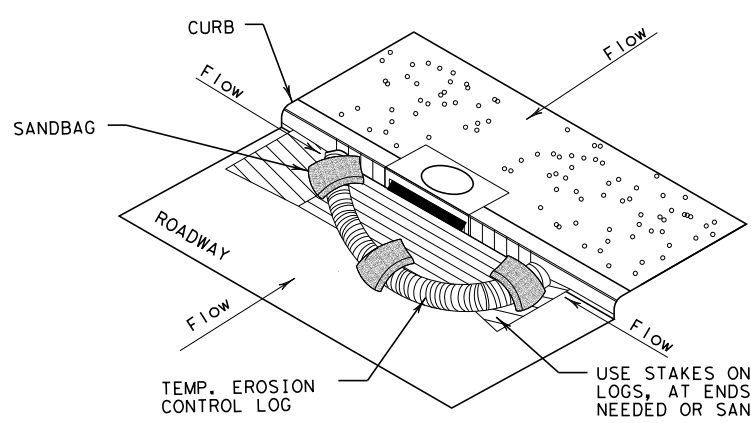
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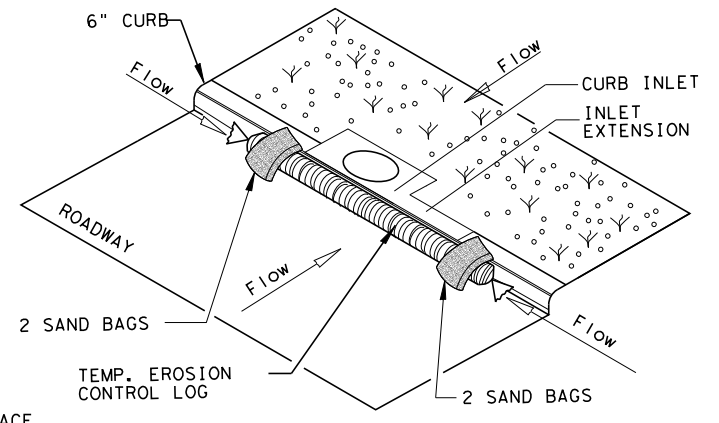
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

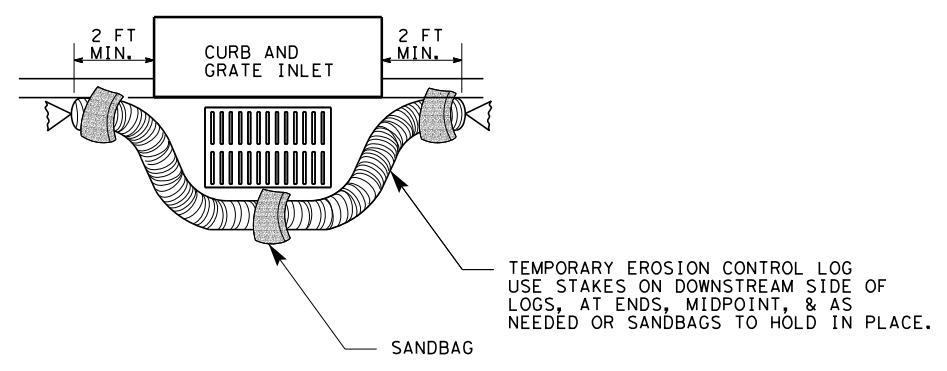
CL-CI



EROSION CONTROL LOG AT CURB INLET

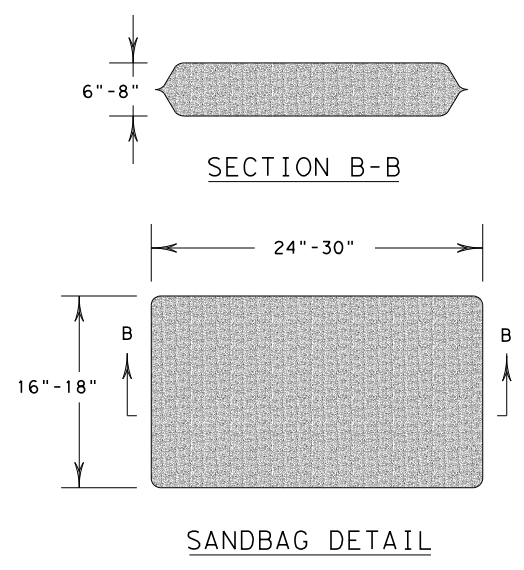
CL-CI

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



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SHEET 3 OF 3

		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
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0015	09	194
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		306

ASSET DESCRIPTION	ROADWAY	POLE ID	LATITUDE (DD° MM' SS.SS")	LONGITUDE (DD° MM' SS.SS")
ILLUMINATION	IH 35			
		HM 1A-01	30° 31' 11.27" N	97° 41' 17.49" W
		HM 1A-02	30° 31' 03.38" N	97° 41' 15.96" W
		HM 1A-03	30° 30' 56.56" N	97° 41' 15.02" W
		HM 1A-04	30° 30' 50.10" N	97° 41' 13.72" W
		HM 2A-01	30° 30' 42.90" N	97° 41' 11.68" W
		HM 2A-02	30° 30' 39.36" N	97° 41' 11.47" W
		HM 2A-03	30° 30' 30.22" N	97° 41' 07.50" W
		HM 3A-01	30° 30' 23.29" N	97° 41' 03.76" W
		HM 3A-02	30° 30' 17.20" N	97° 41' 01.93" W
		HM 3A-03	30° 30' 09.33" N	97° 40' 58.60" W
		HM 4A-01	30° 30' 03.58" N	97° 40' 54.44" W
		HM 4A-02	30° 29' 58.45" N	97° 40' 51.55" W
		HM 4A-03	30° 29' 53.12" N	97° 40' 47.54" W
		HM 5A-01	30° 29' 47.75" N	97° 40' 45.68" W
		HM 5A-02	30° 29' 40.00" N	97° 40' 42.03" W
HM 5A-03	30° 29' 32.76" N	97° 40' 39.58" W		
HM 5A-04	30° 29' 26.35" N	97° 40' 38.00" W		

Note: The asset locations specified in the table are provided in GPS coordinates.

The City of GEORGETOWN accepts the fixed responsibility to maintain, control, supervise and regulate the above on State Highway ROW through its corporate limits Code. This document is per chapter 311 of the Texas Transportation supplemental to the existing Municipal Maintenance Agreement with the City of GEORGETOWN. This document does not relieve the City of GEORGETOWN from their responsibility to maintain all roads within their city limits as stated in the MMA.

Executed on behalf of the City by: _____ Date: _____

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS
TBPE REGISTRATION NO. 264

2021
Texas Department of Transportation

**IH 35
ASSET MAINTENANCE**

SHEET 1 OF 1

DS:	MM	AR	0015	09	194	IH 35
DW:	MH	MM	AUS	WILLIAMSON	307	

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DATE: 7/2/2021 10:05:13 PM
 FILE: c:\bms\br\1dger\farmer - pw\mamsa.moton\dms03731\037403-RR*SCOPE-01.dgn

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 439692J
 Crossing Type: **** HIGHWAY OVERPASS**
 RR Company Owning Track at Crossing: UPRR
 Operating RR Company at Track: UPRR
 RR MP: 0161.820
 RR Subdivision: AUSTIN SUB
 City: ROUND ROCK
 County: WILLIAMSON
 CSJ at this Crossing: 0015-09-194
 Highway/Roadway name crossing the railroad: IH 35
 # of regularly scheduled trains per day at this crossing: 21
 # of switching movements per day at this crossing: 0
 % of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:
MINOR REPAIRS ON TOP OF AND UNDER THE BRIDGE
MILL AND OVERLAY OVER BRIDGE

Scope of Work at this Crossing to Be Performed by Railroad Company:
NONE

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 40
 On this project, night or weekend flagging is:
 Expected
 Not Expected
 Flagging services will be provided by:
 Railroad Company: TxDOT will pay flagging invoices
 Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT
 Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

UPRR - UP.info@railpros.com
 Call Center 877-315-0513, Select #1 for flagging
 BNSF - BNSF.info@railpros.com
 Call Center 877-315-0513, Select #1 for flagging
 KCS - KCS.info@railpros.com
 Call Center 877-315-0513, Select #1 for flagging
 - Bottom Line On-Track Safety Services
 bottomline076@aol.com, 903-767-7630

OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

Not Required
 Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:
 Required
 Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	\$500,000 / \$500,000 / \$500,000
Commercial General Liability	\$2,000,000 / \$4,000,000
Business Automobile	\$2,000,000 combined single limit
Railroad Protective Liability	
<input type="checkbox"/> Not Required	
<input checked="" type="checkbox"/> Non - Bridge Projects	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Projects	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:
 Not Required
 Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
 Required: Contractor to obtain (see Item 5, Article 8.4)
 With the following railroad companies: _____

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

<http://www.txdot.gov/inside-txdot/division/rail/samples.html>

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:
 Not Required
 Required


See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
 Call UNION PACIFIC RAILROAD (UPRR)
Railroad Emergency Line at 888-877-7267
 Location: DOT 439692J
 RR Milepost 0161.820
 Subdivision SOUTH TEXAS

				Rail Division	
RAILROAD SCOPE OF WORK PROJECT SPECIFIC DETAILS					
FILE:	RR Scope of Work.dgn	DN: IxDOT	CK:	DW:	CK:
© TxDOT	June 2014	CONT SECT	JOB	HIGHWAY	
REVISIONS		0015 09	194	IH 35	
3/2020	DIST	COUNTY	SHEET NO.		
	AUS	WILLIAMSON	308		

† THIS TABLE IS PRIMARILY REQUIRED FOR OVERPASS PROJECTS.
THIS TABLE IS NOT REQUIRED FOR UNDERPASS PROJECTS IF THE PROVIDED PLAN AND PROFILE SHEETS INDICATE THIS INFORMATION AT A MINIMUM OF EVERY 100 FT AND WITHIN BOUNDS INCLUDING 1500 FT BEFORE AND AFTER THE LIMITS OF TRACKWORK.

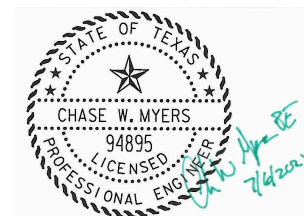
TABLE OF TOP OF RAIL PROFILE †				
(STATIONS INCREASE WITH MILEPOST INCREASE)				
	MAIN TRACK			
	ALIGNMENT: 100' STATIONS	LEFT RAIL ELEVATION	ALIGNMENT: 100' STATIONS	RIGHT RAIL ELEVATION
1000' PRIOR TO PROJECT	8534+00.00	722.47	8534+00.00	722.47
	8535+00.00	723.22	8535+00.00	723.22
	8536+00.00	723.87	8536+00.00	723.89
	8537+00.00	724.49	8537+00.00	724.52
	8538+00.00	725.26	8538+00.00	725.25
	8539+00.00	726.18	8539+00.00	726.16
	8540+00.00	727.20	8540+00.00	727.17
	8541+00.00	728.20	8541+00.00	728.19
	8542+00.00	729.27	8542+00.00	729.27
	8543+00.00	730.28	8543+00.00	730.26
WITHIN PROJECT	8544+00.00	731.36	8544+00.00	731.35
	8545+00.00	732.52	8545+00.00	732.51
1000' AFTER PROJECT	8546+00.00	733.87	8546+00.00	733.84
	8547+00.00	735.50	8547+00.00	735.48
	8548+00.00	736.76	8548+00.00	736.75
	8549+00.00	737.87	8549+00.00	737.86
	8550+00.00	738.98	8550+00.00	738.97
	8551+00.00	740.00	8551+00.00	740.00
	8552+00.00	741.00	8552+00.00	741.00
	8553+00.00	742.05	8553+00.00	742.04
	8554+00.00	743.04	8554+00.00	743.04
	8555+00.00	744.02	8555+00.00	744.02

† THIS TABLE IS PRIMARILY REQUIRED FOR OVERPASS PROJECTS.
THIS TABLE IS NOT REQUIRED FOR UNDERPASS PROJECTS IF THE PROVIDED PLAN AND PROFILE SHEETS INDICATE THIS INFORMATION AT A MINIMUM OF EVERY 100 FT AND WITHIN BOUNDS INCLUDING 1500 FT BEFORE AND AFTER THE LIMITS OF TRACKWORK.

TABLE OF TOP OF RAIL PROFILE †				
(STATIONS INCREASE WITH MILEPOST INCREASE)				
	SPUR TRACK			
	ALIGNMENT: 100' STATIONS	LEFT RAIL ELEVATION	ALIGNMENT: 100' STATIONS	RIGHT RAIL ELEVATION
1000' PRIOR TO PROJECT	100+00.00	721.65	100+00.00	721.58
	101+00.00	722.29	101+00.00	722.22
	102+00.00	723.00	102+00.00	722.93
	103+00.00	723.64	103+00.00	723.61
	104+00.00	724.45	104+00.00	724.38
	105+00.00	726.36	105+00.00	725.29
	106+00.00	726.31	106+00.00	726.31
	107+00.00	727.67	107+00.00	727.51
	108+00.00	728.62	108+00.00	728.62
	109+00.00	729.68	109+00.00	729.66
	110+00.00	730.89	110+00.00	730.90
WITHIN PROJECT	111+00.00	731.97	111+00.00	731.99
1000' AFTER PROJECT	112+00.00	733.07	112+00.00	733.07
	113+00.00	733.69	113+00.00	735.70
	114+00.00	734.43	114+00.00	734.24

TRACK INFORMATION IS BASED ON AS-BUILTS FROM CSJ 0015-09-173
NO NEW SURVEY WAS DONE FOR THIS PROJECT

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SHEET 1 OF 1

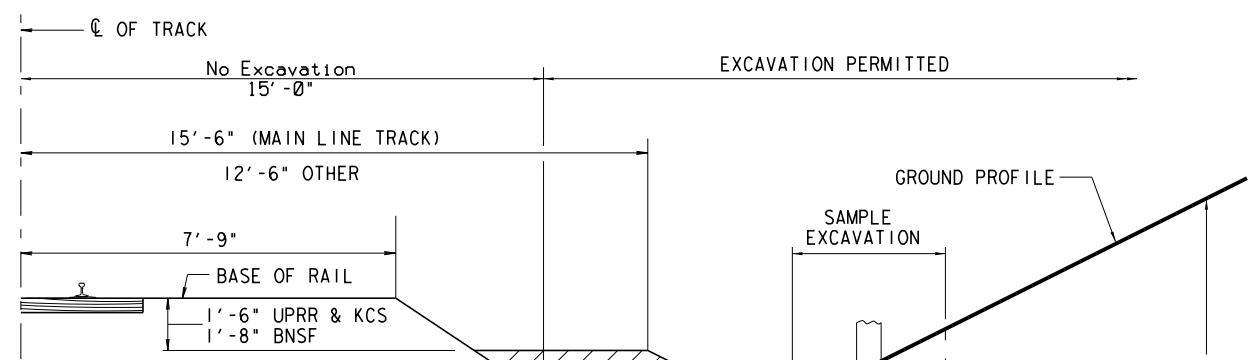


IH 35

TOP OF RAIL TABLES

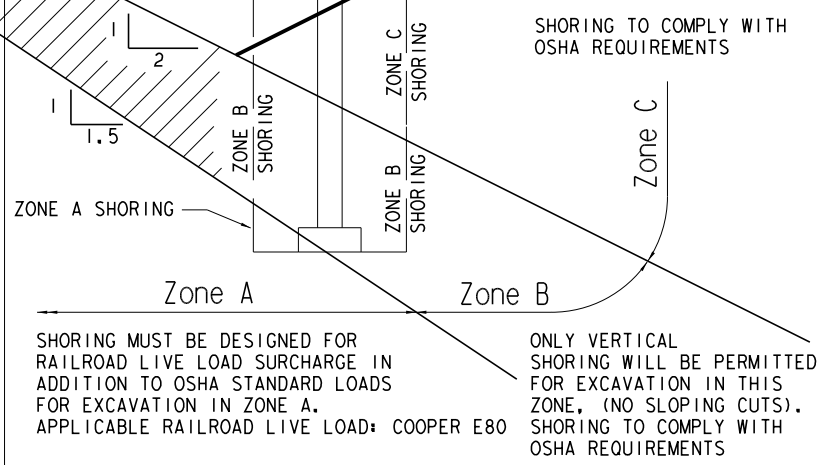
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0015	09	194	IH 35
	DIST	COUNTY	SHEET NO.	
	AUS	WILLIAMSON	309	

† THIS TABLE IS PRIMARILY REQUIRED FOR OVERPASS PROJECTS. THIS TABLE IS NOT REQUIRED FOR UNDERPASS PROJECTS IF THE PROVIDED PLAN AND PROFILE SHEETS INDICATE THIS INFORMATION AT A MINIMUM OF EVERY 100 FT AND WITHIN BOUNDS INCLUDING 1500 FT BEFORE AND AFTER THE LIMITS OF TRACKWORK.



GENERAL SHORING NOTES:

1. ALL DIMENSIONS ARE MEASURED PERPENDICULAR TO ϕ OF TRACK.
2. PRIOR TO COMMENCING ANY WORK, SUBMIT FOR APPROVAL BY THE RAILROAD DETAILED PLANS INDICATING THE NATURE AND EXTENT OF THE TRACK PROTECTION SHORING PROPOSED. INSTALL THE TEMPORARY SHORING SYSTEM PER THE APPROVED PLANS. COMPLY WITH DESIGN REQUIREMENTS IN THE BNSF/UPRR GUIDELINES FOR TEMPORARY SHORING.
3. FOR EXCAVATIONS WHICH ENCROACH INTO ZONE A OR B, PROVIDE SHORING PLANS AND DESIGN CALCULATIONS. PLANS AND CALCULATIONS MUST BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS.



GENERAL SHORING REQUIREMENTS †

RAILROAD GENERAL NOTES:

1. Railroad review and approval of shoring, erection, demolition, and falsework is required. Allow a minimum of four weeks for the review and approval of each submittal.
2. The proposed grade separation project shall not increase the quantity and/or characteristics of the flow in the Railroad's ditches and/or drainage structures. In the rare event that a grade separation project will increase the quantity and/or characteristics of flow in such elements, such a design must be reviewed and approved by the Railroad.
3. Verify the elevation of the existing top-of-rail profile before beginning construction. Bring all discrepancies to the attention of the Railroad prior to construction.
4. Submit a proposed method of erosion and sediment control for approval by the Railroad.
5. Design and construct all shoring systems that impact the Railroad's operations and/or support the Railroad's embankment per current Railroad Guidelines for Temporary Shoring.
6. Comply with Railroad Demolition Guidelines for all demolitions within the Railroad's right of way and/or demolition that may impact the Railroad's tracks or operations.
7. Design erection methods over the Railroad's right of way to cause no interruption to the Railroad's operation, enabling the track(s) to remain open to traffic per the Railroad's requirements. Coordinate construction work windows with the Railroad's Designated Representative.
8. Design all construction phasing that may impact the Railroad operations to cause no interruption to the Railroad's operations, enabling the track(s) to remain open to traffic per the Railroad's requirements. Coordinate construction work windows with the Railroad's Designated Representative.
9. Comply with minimum construction clearances for falsework outlined in the Railroad's Guidelines.
10. Verify all permanent clearances before project closing.
11. For Railroad coordination please refer to Sheets 2 and 3 and the TxDOT Standard Specifications.

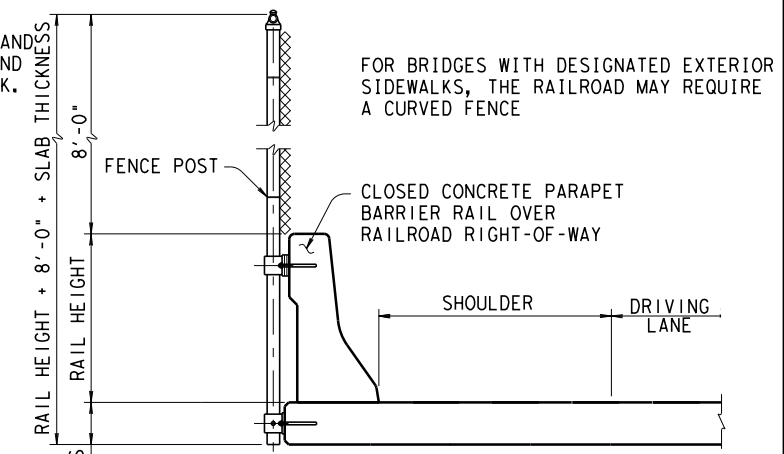
FOR SHORING/EXCAVATIONS IN ZONE A OR B, TXDOT REQUIRES A PREDESIGNED AND APPROVED SHORING DESIGN IN THE PS&E. IF THIS IS THE CASE NO CONTRACTOR SUBMITTAL IS REQUIRED.

FOR THE FOLLOWING INFORMATION PLEASE REFER TO THE PLAN AND ELEVATION DRAWINGS OF THE BRIDGE PLANS. THE PLAN AND ELEVATION DRAWINGS SHALL SHOW ALL REQUIRED INFORMATION PER BNSF/UPRR GUIDELINES FOR RAILROAD GRADE SEPARATION PROJECT PLAN NO. 711100 SHEET 2.

1. Centerline of bridge and/or centerline of project.
2. Track layout and limits of Railroad right of way with respect to centerline of main lines.
3. Future tracks, access roadways and existing tracks as main line, siding, spur, etc.
4. Point of minimum vertical clearance and distance, Measured perpendicular, from the centerline of nearest track.
5. Horizontal clearance at right angle from centerline of nearest existing or future track to the face of obstruction such as substructure above grade.
6. Horizontal clearance at right angle from centerline of nearest existing or future track to the face of nearest foundation below grade.
7. Horizontal spacing at right angle between centerlines of existing and/or future tracks.
8. Limits of shoring and minimum distance at right angle from centerline of nearest track.
9. All existing facilities and utilities and their proposed relocation, if required.
10. Toe of riprap or earth slope and/or limits of retaining wall.
11. Existing and proposed contours. (not required if the existing groundlines or drainage characteristics in Railroad ROW will not be altered).
12. Railroad Milepost and direction of increasing Milepost.
13. Direction of flow for all drainage systems within project limits.
14. Limits of barrier rail and fence with respect to centerline of track.
15. Depth of foundation below bottom of tie. (for footings only)
16. Top and bottom of pier protection wall elevation relative to top of rail elevation.
17. Controlling dimensions of drainage ditches and/or drainage structures.
18. Top of rail elevations for all tracks.
19. Minimum permanent vertical clearance above top of high rail to the lowest point under the bridge.
20. Existing and proposed groundline & roadway profile.
21. Type of riprap slope paving.
22. Location of deck drains.
23. Total width of superstructure.
24. Width of shoulder and/or sidewalk.

TABLE OF TOP OF RAIL PROFILE †			
(STATIONS INCREASE WITH MILEPOST INCREASE)			
	MAIN LINE		
	ALIGNMENT: 100' STATIONS	LEFT RAIL ELEVATION	
1000' PRIOR TO PROJECT			
WITHIN PROJECT	SEE TOP OF RAIL TABLES SHEET 1 OF 1		
1000' AFTER PROJECT			

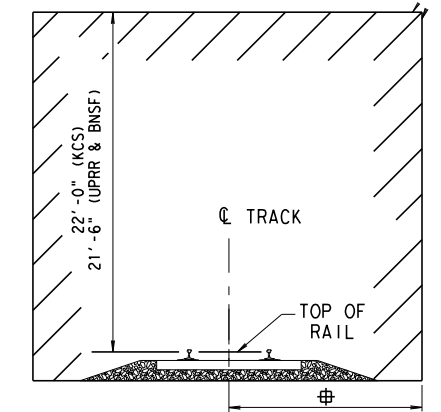
± EXISTING TRACK STA. 10+00
± CONSTRUCTION STA. XX+XX



TYPICAL FENCE ON BARRIER DETAIL

ONLY REQUIRED ON OVERPASSES IF SHOWN ON BRIDGE LAYOUT. (AREAS WITH PEDESTRIANS ON BRIDGE, RAIL YARDS, OR HISTORY OF VANDALISM)

NO CONSTRUCTION ACTIVITIES OR OTHER OBSTRUCTION SHALL BE PLACED WITHIN THESE LIMITS



MINIMUM CONSTRUCTION CLEARANCE ENVELOPE

(NORMAL TO RAILROAD)
15'-0" (UPRR), (BNSF) and 14'-0" (KCS)

GENERAL NOTES:

Design and Construction for Railroad Projects shall be in accordance with the AREMA Manual for Railway Engineering and BNSF/UPRR Guidelines for Railroad Grade Separation Projects or Kansas City Southern Guidelines for the Design and Construction of Overpasses and Underpasses, or DART Light Rail Project Design Criteria Manual, and the TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges AS APPLICABLE TO THE RAILROAD COMPANY INVOLVED. See BNSF/UPRR Guidelines for Grade Separation Projects Plan No. 711100 and TxDOT Railroad Fence Details Sheet for additional information. A curved top fence extending 8'-0" above top of sidewalk is acceptable only where there is a traffic rail between roadway and sidewalk. See Kansas City Southern Guidelines for the Design and Construction of Overpasses and Underpasses for corresponding BNSF/UPRR sheets referenced.

SHEET 1 OF 3



SIGNATURE IS FOR TOP OF RAIL TABLE INFORMATION ONLY

Texas Department of Transportation		Rail Division	
RAILROAD REQUIREMENTS FOR BRIDGE CONSTRUCTION			
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CON: TxDOT	SECT: HIGHWAY	JOB: 194
REVISIONS	0015	09	1H 35
March 2020	DIST: AUS	COUNTY: WILLIAMSON	SHEET NO.: 310

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PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad Company and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad's website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

- A. Perform all work in compliance with all applicable Railroad, FRA (Federal Railway Administration) and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of Railroad's train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.
- B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.
- C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor's machinery and materials at least 50 feet from the Railroad's nearest track.
- D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with railroad approval.
- E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

3.02 RAILROAD OPERATIONS

- A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.
- B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.
- C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

- 1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the Railroad's flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.
- 2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. A railroad flag person will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

- A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.
- B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.
- C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.18 for railroad flagging requirements.
- D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
 - 1. Exactly what the work entails.
 - 2. The days and hours that work will be performed.
 - 3. The exact location of work, and proximity to the tracks.
 - 4. The type of window requested and the amount of time requested.
 - 5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.
- E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

- A. Complete the Railroad's course "Orientation for Contractor's Safety", and maintain current registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information."
- B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES


Abide by the following minimum temporary clearances during the course of construction:

- A. 15' - 0" (BNSF) (UPRR), and 14' - 0" (KCS) horizontal from centerline of track
- B. 22' - 0" (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

- A. Maintain minimum track clearances during construction as specified in Section 3.07.
- B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.
- C. Do not commence work involving an approved infringement until receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

 Texas Department of Transportation		Rail Division		
RAILROAD REQUIREMENTS FOR BRIDGE CONSTRUCTION				
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