FEDERAL AID PROJECT NO.			
BR 2025(243), ETC			
CONT	SECT	JOB	HIGHWAY
0081	01	053, ETC	SS347, ETC
DIST	COUNTY		SHEET NO.
FTW	TARRANT		1

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL-AID PROJECT BR 2025(243), ETC

SS347, ETC.
TARRANT COUNTY

FUNCTIONAL CLASS: PRINCIPAL ARTERIAL
DESIGN SPEED: 40 MPH

AADT 2022: 35,634
AADT 2042: 44,899

INDEX OF SHEETS

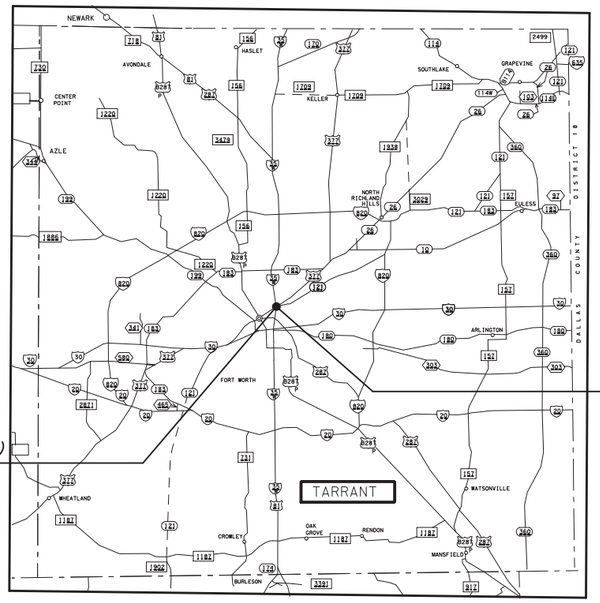
CSJ	HWY	LIMITS	ROADWAY LENGTH		BRIDGE LENGTH		PROJECT LENGTH	
			FEET	MILES	FEET	MILES	FEET	MILES
0081-01-053	SS 347	SH 121 WB @ IH 35W SB	0.00	0.00	197.00	0.037	197.00	0.037
0081-01-054	SS 347	SS 347 EB @ IH 35W SB	0.00	0.00	240.00	0.046	240.00	0.046

TOTAL PROJECT LENGTH = 0.083 MILES

FOR THE CONSTRUCTION OF BRIDGE MAINTENANCE WORK

CONSISTING OF: DECK REPLACEMENT, JOINT REPAIR, CRACK REPAIR, SPALL REPAIR, FLANGE REPAIR, WELD REPAIR.

PARSONS
TBPE Registration No. F-1481
7670 Woodway Dr #320, Houston, TX 77063



(NBI # 02-220-0-0014-16-192)
CSJ 0081-01-053
SH 121 WB @ IH 35W SB

(NBI # 02-220-0-0014-16-151)
CSJ 0081-01-054
SPUR 347 EB @ IH 35 W SB

TARRANT COUNTY

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)- 21 THRU BC (12)- 21 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, SEPTEMBER, 2024 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT:
REQUIRED CONTRACT PROVISIONS, FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 2023)

EQUATIONS : NONE
RAILROAD : NONE
EXCEPTIONS : NONE
NO TDLR REQUIRED

LETTING DATE: _____
CONTRACTOR: _____
_____
WORK BEGAN: _____
WORK COMPLETED: _____
WORK ACCEPTED: _____
CHANGE ORDERS: _____

Texas Department of Transportation

DocuSigned by: Maribel Rangel E0D25AC6252D429... : 9/3/2024
CORRECT FOR LETTING:
CONSULTANT PROJECT MANAGER

RECOMMENDED FOR LETTING: 9/20/2024
DocuSigned by: 7879B0B92E5D403...
DIRECTOR, TP&D

APPROVED FOR LETTING: 9/20/2024
DocuSigned by: David M Salazar, P.E. B741E64FAD8241F...
DISTRICT ENGINEER

SHEET NO.		DESCRIPTION
		GENERAL
1		TITLE SHEET
2		INDEX OF SHEETS
3, 3A-3E		GENERAL NOTES
4, 4A		ESTIMATE & QUANTITY SHEET
5-6		SUMMARY OF QUANTITIES
		PROJECT LAYOUT
7		PROJECT LAYOUT IH 35W SB UNDERPASS AT SH 121 WB
8		PROJECT LAYOUT IH 35W SB UNDERPASS AT SPUR 347 EB
9		LOCATION MAP IH 35W SB UNDERPASS AT SH 121 WB
10		LOCATION MAP IH 35W SB UNDERPASS AT SPUR 347 EB
		TRAFFIC CONTROL
11		TRAFFIC CONTROL NOTES
12		TRAFFIC CONTROL PLAN NARRATIVE IH 35W SB UNDERPASS AT SH 121 WB
13-19		DETOUR LAYOUT IH 35W SB UNDERPASS AT SH 121 WB
20		TRAFFIC CONTROL PLAN IH 35W SB UNDERPASS AT SPUR 347 EB
		TRAFFIC CONTROL STANDARDS
21-32	#	BC(1)-21 THRU BC(12)-21
33	#	TCP(2-6)-18
34	#	TCP(3-2)-13
35	#	TCP(5-1)-18
36	#	TCP(6-1)-12
37	#	TCP(6-2)-12
38	#	TCP(6-6)-12
		ROADWAY DETAILS
39		RAIL AND MBGF LAYOUT IH 35W SB UNDERPASS AT SH 121 WB
		ROADWAY STANDARDS
40	#	GF(31)MS-19
41-42	#	GF(31)TRTL3-20
43	#	GF(31)-19
44	#	SGT(10S)31-16
45	#	SGT(11S)31-18
46	#	BED-14
		BRIDGE DETAILS
		NBI # 02-220-0-0014-16-192
47		BRIDGE LAYOUT IH 35W SB UNDERPASS AT SH 121 WB
48		BRIDGE TYPICAL SECTIONS IH 35W SB UNDERPASS AT SH 121 WB
49		ABUTMENT 1 DEMOLITION AND MODIFICATION IH 35W SB UNDERPASS AT SH 121 WB
50		ABUTMENT 4 DEMOLITION AND MODIFICATION IH 35W SB UNDERPASS AT SH 121 WB
51		ABUTMENT 1 AND 4 DETAILS IH 35W SB UNDERPASS AT SH 121 WB
52-55		SUBSTRUCTURE REPAIR DETAILS IH 35W SB UNDERPASS AT SH 121 WB
56-59		197.00' CONTINUOUS I-BEAM UNIT IH 35W SB UNDERPASS AT SH 121 WB
60		RELIEF JOINT DETAILS IH 35W SB UNDERPASS AT SH 121 WB
61		STEEL BEAM REPAIRS (HS) IH 35W SB UNDERPASS AT SH 121 WB
62-63		STEEL BEAM REPAIRS (PAINT) IH 35W SB UNDERPASS AT SH 121 WB
64-65		BEARING REPAIR DETAILS IH 35W SB UNDERPASS AT SH 121 WB
66-67		TRANSITION RAIL DETAILS IH 35W SB UNDERPASS AT SH 121 WB
68-77		AS-BUILT PLANS IH 35W SB UNDERPASS AT SH 121 WB
		NBI # 02-220-0-0014-16-151
78-80		SUBSTRUCTURE REPAIR DETAILS IH 35W SB UNDERPASS AT SPUR 347 EB
81-82		SUPERSTRUCTURE REPAIR DETAILS IH 35W SB UNDERPASS AT SPUR 347 EB
83-86		STEEL BEAM REPAIRS (HS) IH 35W SB UNDERPASS AT SPUR 347 EB
87-88		STEEL BEAM REPAIRS (PAINT) IH 35W SB UNDERPASS AT SPUR 347 EB
89-90		BEARING REPAIR DETAILS IH 35W SB UNDERPASS AT SPUR 347 EB
91-95		AS-BUILT PLANS IH 35W SB UNDERPASS AT SPUR 347 EB
		BRIDGE STANDARDS
96	#	BAS-A (MOD)
97-98	#	SSTR (MOD)
99	#	SBMS
100	#	SBTS (MOD)
101	#	SEJ-M
102-103	#	PMDF
104	#	TRF
		PAVEMENT MARKING DETAILS
105		PAVEMENT MARKING LAYOUT IH 35W SB UNDERPASS AT SH 121 WB
		PAVEMENT MARKING STANDARDS
106	#	D&OM(1)-20
107	#	D&OM(2)-20
108	#	D&OM(6)-20
109	#	D&OM(VIA)-20
110	#	D&OM(ST-FTW)-21
111	#	PM(1)-22

SHEET NO.		DESCRIPTION
		ENVIRONMENTAL ISSUES
112-113		STORMWATER POLLUTION PREVENTION PLAN (SWP3)
114		EPIC
115		SWP3 LAYOUT IH 35W SB UNDERPASS AT SH 121 WB
116		SWP3 LAYOUT IH 35W SB UNDERPASS AT SPUR 347 EB
		ENVIRONMENTAL ISSUES STANDARDS
117-119	#	EC(9)-16

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

M.N. M , P.E. 8/13/2024

NIKO MOZAFFAR — DATE

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

M.N. M 8/13/2024

PARSONS
TBPE Registration No. F-1481

INDEX OF SHEETS

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	2
CONTROL	SECTION	JOB	
0081	01	053,ETC	

Basis of Estimate

344	Hot Mix (All Types)	115 lb./sq. yd.-in.	ton
344	Tack Coat - CSS-1P	0.20 gal./sq. yd.	gal.

Special Notes

Electronic files containing answered pre-letting questions and other project related design information will be placed in the following FTP site periodically.

Check this site for new information. Notices of new postings will not be sent out by the Engineer. The data located in these files is for non-construction purposes only and can be found at TxDOT's public FTP site at https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/.
Access is read-only.

All files in the FTP site are subject to the License Agreement shown on the FTP site.

To obtain a copy of the project plans free of charge, submit a request from the following site: http://www.txdot.gov/business/letting-bids/plans-online.html

Contractor questions on this project are to be addressed to the following

individual(s): Area Engineer's Email: Marible.Rangel@txdot.gov
Assistant Area Engineer's Email: Justin.Thomey@txdot.gov
Design Manager's Email: Raul.Orozco@txdot.gov

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

All 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.

Control: 0081-01-053, ETC.

County: Tarrant

Highway: SS 347

Single lane closures, except as otherwise shown in the plans, will be restricted to off-peak hours as defined in the following table:

Peak Hours		Off-Peak Hours	
6 to 9 AM Monday through Friday	3 to 7 PM Monday through Friday	9 AM to 3 PM and 7 PM to 6 AM Monday through Friday	All day Saturday and Sunday

Work that requires closure of multiple travel lanes in the same direction, except as otherwise shown in the plans, are restricted to night hours between 9 PM and 6 AM.

Modifications to Lane Closure / Work Restrictions:

Submit a request in writing for approval by the Engineer a minimum of 10 days in advance of implementing a change to lane closure restrictions.

When deemed necessary, the Engineer will lengthen, shorten, or otherwise modify lane closure restrictions as traffic conditions warrant.

When deemed necessary, the Engineer will modify the list of major events when new events develop, existing events are rescheduled, or when warranted.

Special Events/ Special Situations will be handled on a case-by-case basis. No work restricting lane closures is allowed from 3 PM a day before to 9 AM the day after the Special Event or Special Situation.

The State will perform certain preliminary work and will complete the work in such sequence and manner that the Contractor will be able to begin his work at the specified time.

The following standard detail sheets have been modified:

- BAS-A(MOD)
- SSTR(MOD)
- SBTS(MOD)

Item 4. Scope of Work

Reimbursement for project overhead will not be considered until project completion has extended beyond the original Contract Time.

Item 5. Control of the Work

When supplementary bridge plans, shop drawings, shop details, erection drawings, working drawings, forming plans, or other drawings are required, prepare and submit drawings on sheets 8-1/2 by 11 inches, 11 by 17 inches, or full-size drawings reduced to half scale if completely legible. If, in the opinion of the Engineer, the drawings are not completely legible, prepare and submit on sheets 22 by 34 inches, with a 1-1/2-inch left margin, and 1/2-inch top, right, and bottom margins.

Submit all sheets with a title in the lower right-hand corner. The title must include the sheet index data shown on the lower right corner of the project plans, name of the structure or element or stream, sheet numbering for the shop drawings, name of the fabricator and the name of the Contractor.

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.

Item 6. Control of Materials

The Buy America Material Classification Sheet is located at the below link. https://www.txdot.gov/business/resources/materials/buy-america-material-classification- sheet.html for clarification on material categorization.

Item 7. Legal Relations and Responsibilities

The total area disturbed for this project is 1 acre. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the right of way. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer and to the local government that operates a separate storm sewer system.

Control: 0081-01-053, ETC.

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When a bridge deck is milled, seal coated and overlaid, remove excess material. Do not just broom to the sides of the bridge, under guardrail, etc. Cover or protect all sealed expansion joints and rails on bridges and all railroad tracks encountered as approved. Clean and repair all of these features if they weren't properly protected at contractor's expense. This work is subsidiary work to applicable bid items.

Prevention of Migratory Bird Nesting

It is anticipated that migratory birds, a protected group of species, may try to nest on bridges, culverts, vegetation, or gravel substrate, at any time of the year. The preferred nesting season for migratory birds is from February 15 through October 1. When practicable, schedule construction operations outside of the preferred nesting season. Otherwise, avoid nests containing migratory birds and perform no work in the nesting areas until the young birds have fledged.

Structures

Do not begin bridge and culvert construction operations until swallow nesting prevention is implemented, until after October 1 if it's determined that swallow nesting is actively occurring, or until it's determined swallow nests have been abandoned. If the State installed nesting deterrent on the bridges and culverts, maintain the existing nesting deterrent to prevent swallow nesting until October 1 or completion of the bridge and culvert work, whichever occurs earlier. If new nests are built and occupied after the beginning of the work, do not perform work that can interfere with or discourage swallows from returning to their nests. Prevention of swallow nesting can be performed by one of the following methods:

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

2. By February 15 place a nesting deterrent (which prevents access to the bridge and culvert by swallows) on the entire bridge (except deck and railing) and culverts.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items.

The following Holiday/Event Lane closure restriction requirements apply to this project: No work that restricts or interferes with traffic shall be allowed between 3 PM on the day preceding a Holiday or Event and 9 AM on the day after the Holiday or Event.

Holiday Lane Closure Restrictions	
New Year's Eve and New Year's Day (December 31 through January 1)	3 PM December 30 through 9 AM January 2
Easter Holiday Weekend (Friday through Sunday)	3PM Thursday through 9 AM Monday
Memorial Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Independence Day (July 3 through July 5)	3 PM July 2 through 9 AM July 6
Labor Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Thanksgiving Holiday (Wednesday through Sunday)	3 PM Tuesday through 9 AM Monday
Christmas Holiday (December 23 through December 26)	3 PM December 22 through 9 AM December 27

Plan work schedules around the appropriate dates above to ensure productive work is performed without lane closures.

Event Lane Closure Restrictions 3 PM the day before Event to 9 AM the day after the Event			
NASCAR Races at Texas Motor Speedway (generally 3 events):	NASCAR Nationwide and Sprint Cup Series (Held in late March/early April)	NASCAR Nationwide and Sprint Cup Series (Held in Late October/early November)	Indy Series Racing and NASCAR Truck Series (Held in June)
Within one mile radius of major retail traffic generators i.e. malls (Thanksgiving Day through January 2)			
Fort Worth Stock Show and Rodeo			
Arlington Entertainment District			
Grapevine Festivals (Including but not limited to: Carol of Lights, Black Friday Weekend, Christmas Parade, and weekends during Christmas Capital of Texas)			
MayFest			
Weatherford Peach Festival			

Item 8. Prosecution and Progress

Working days will be computed and charged in accordance with Section 8.3.1.1, 'Calendar Day.'

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County: Tarrant

Highway: SS 347

The road-user cost liquidated damages are $11517 per day.

The number of working days for final acceptance will be 214 working days.

Item 100. Preparing Right of Way

Measurement for this item will be along the centerline of the project with the limits of measurements as shown on the plans.

- The following item that is to be removed in the plans for Contractor's information: Metal beam guard fence(MBGF) and appurtenances.

Removal of existing concrete pavement will be in accordance with Item 104, "Removing Concrete" except that this work will not be paid for directly, but will be subsidiary to Item 100, "Preparing Right of Way."

Item 104. Removing Concrete

When associated with a structure to be removed, removal of riprap as required, approach slabs, and shoulder drains are to be included in the unit price bid for Item 496, "Removing Structures."

Item 344. Superpave Mixtures

Provide aggregate with a Surface Aggregate Classification (SAC) value of A for the travel lanes and shoulders.

Provide aggregate with a Surface Aggregate Classification (SAC) value of A for the surfaces other than the travel lanes.

No blending, of the material retained on the No. 4 sieve, to meet SAC A will be allowed for surface mixes.

Natural (field) sands are not allowed.

Provide a PG 70-28 asphalt for the surface course and levelup course, if applicable.

Furnish a CSS-1P with greater than 50% asphalt residue for the tack coat on this project. A trackless tack can be used in lieu of CSS-1P tack coat or as directed by the Engineer. The Engineer will set the rate at time of application.

Warm Mix Asphalt (WMA) is not permitted in any mix type on this project. Grade substitution per Table 5 is not allowed.

Include the approved mix design number on each delivery ticket. Use a Material Transfer Device (MTD) unless otherwise directed.

Shoulders, crossovers, and other areas listed on the Plan sheets or as directed are not subject to in- place air void determination for this project.

Use Surface Test Type B for this project.

Item 428. Penetrating Concrete Surface Treatment

Provide a Type 1-Silane surface treatment to the areas shown on the detail sheets.

Item 440. Reinforcement for Concrete

Top and bottom layers of slab reinforcing steel shall be epoxy coated.

Item 446. Field Cleaning And Painting Steel

The existing coating to be removed may contain lead or other hazardous materials.

Item 454. Bridge Expansion Joints

For header-type expansion joints refer to the following TxDOT website for the approved systems:
http://www.txdot.gov/inside-txdot/division/bridge/approved-systems/expansion-joints.html

Item 496. Removing Structures

When required by the plans, partial or complete removal of a structure for staged construction shall be accomplished in a manner which does not cause damage to the remainder of the structure or its supporting members. The Contractor shall submit a demolition plan for all structures to be replaced and/or removed in accordance with Item 496. Submit the procedure for removal of superstructure or substructure in writing or plan drawing for approval prior to implementation.

Required on all projects removing or replacing a bridge structure.

The structure(s) to be removed have surface coatings that contain hazardous materials as follows:

- SH 121 WB Overpass at IH-35W SB, NBI# 02-220-0-0014-16-192(Asbestos in abutment joint sealer)
- Spur 347 EB Overpass at IH-35W SB, NBI# 02-220-0-0014-16-151(Asbestos in abutment joint sealer)

Control: 0081-01-053, ETC.

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- Asbestos will be abated prior to letting and/or prior to contractor mobilization. (The lead has been detected in the roadway yellow striping)
- SH 121 WB Overpass at IH-35 W SB, NBI#02-220-0-0014-16-192(LBP)
- Spur 347 EB Overpass at IH-35W SB, NBI#02-220-0-0014-16-151(LBP)

The Area Office shall notify the Texas Department of State Health Services (DSHS) prior to demolition or renovation of bridges or other structures, using DSHS Form APB#5, “Demolition/Renovation Notification Form”. The form and instructions may be found on the DSHS Asbestos Programs Branch web page at http://www.dshs.state.tx.us/asbestos/notification.shtm. The DSHS notification form must be hand-delivered or mailed to (received at) the DSHS Austin office at least ten working days (10)(not working days) prior to commencing demolition or renovation. Fax or e-mail notifications will not be accepted. For projects with multiple bridges, a single notification, with a listing of all bridges or structures to be demolished or renovated and the expected start dates of their demolition or renovation (the start date is defined as the first date of visible demolition activities). Notify the DSHS Regional or Local inspector of all start date changes. The expected project completion date may be used as the “end” date.

Removal of riprap as required, approach slabs and shoulder drains to be included in the unit price bid.

The structure(s) to be removed have surface coatings which may contain hazardous materials. Provide for the safety and health of employees and abide by all OSHA standards and regulations.

Item 502. Barricades, Signs, and Traffic Handling

The contractor force account ‘safety contingency’ that has been established for this project is intended to be utilized for work zone enhancements to improve the effectiveness of the traffic control plan that could typically 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.

Maintenance of roadways, not paid as Item 508, "Constructing Detours," and designated in the traffic control plan to carry traffic, will be the responsibility of the Contractor and will be paid for by "Contractor Force Account or Agreed Unit Price".

Permanent signs may be installed when construction in an area is complete and they will not conflict with the traffic control plan for the remainder of the job.

Existing signs are to remain as long as they do not interfere with construction and they do not conflict with the traffic control plan.

Any sign not detailed in the plans but called for in the layout will be as shown in the current "Standard Highway Sign Designs for Texas".

When traffic is obstructed, arrange warning devices in accordance with the latest edition of the "Texas Manual on Uniform Traffic Control Devices".

Cover or remove any work zone signs when work or condition referenced is not occurring.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets. Provide access to all driveways during all phases of construction unless otherwise noted in the plans or as directed.

Item 503. Portable Changeable Message Signs

Provide all portable changeable message signs and arrow panels with a photoelectric device to allow for automatic dimming of operations to approximately 50% of their normal brightness when ambient light drops to approximately five footcandles, and then increase back again for daytime operations.

Four electronic portable changeable message sign unit(s) will be required. Individual or collective use of signs will be required by the Engineer when deemed necessary to supplement the traffic control plan.

Each sign must have programmed in its permanent memory the following 15 messages:

1. Exit Closed Ahead
2. Use Other Routes
3. Right Lane
4. Left Lane
5. Closed Ahead
6. Two Lane
7. Detour Ahead
8. Thru Traffic
9. Prepare To Stop
10. Merging Traffic
11. Expect 15 Minute Delay
12. Max Speed ** MPH
13. Merge Right
14. Merge Left
15. No Exit Next ** Miles

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County: Tarrant

Highway: SS 347

Item 505. Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for this project, provide 2 additional shadow vehicle(s) with TMA for TCP (2-6)-18 and TCP (3-2)-13 as detailed on General Note of this standard sheets.

Therefore, 4 total shadow vehicles with TMA will be required for this type of work. Determine if one or more of these operations will be ongoing at the same time to determine the total numberof TMAs needed for the project.

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

The SW3P for this project will consist of using the following items as directed:

- Erosion control logs

Remove accumulated sediment or replace SW3P controls when the capacity has been reduced by 50% or when the depth of sediment at the control structure exceeds one foot.

Item 540. Metal Beam Guard Fence

The locations and lengths of guard fence shown on the plans are approximate. Actual lengths and locations are to be determined in the field.

The tops of timber posts will be domed. Beveled tops will not be permitted for timber or steel posts. When holes for timber posts are drilled below bottom of proposed grade, backfill the excessive depth with an acceptable sand. The furnishing and installation of the sand backfill will not be paid for directly but will be subsidiary to this Item.

When guardrail posts are placed in a finished surface, backfill the top 4 inches with an asphaltic material, domed to carry water away from the posts or as shown on the plans. The furnishing and installation of the asphaltic material backfill will not be paid for directly but will be subsidiary to this Item.

When connecting a Thrie-Beam to a concrete wingwall, bridge rail, CTB, etc., drill the holes for bolt placement using rotary or core type equipment. Use a core type drill when reinforcing steel is encountered. Do not use percussion or impact drilling. Repair damage to the concrete and spalls exceeding ½" from the edge of the hole.

Item 542. Removing Metal Beam Guard Fence

Remove existing metal beam guard fence only when authorized.

Control: 0081-01-053, ETC.

County: Tarrant

Highway: SS 347

Item 666. Reflectorized Pavement Markings with Retroreflective Requirements

If retroreflectivity readings are collected using a portable or handheld unit, then measurement is defined as a collective average of at least 20 readings taken along a 200-foot test section. A minimum of three measurements will be required per mile of roadway. Measurements collected on a centerline stripe will be averaged separately for stripe in each direction of travel. A TxDOT inspector must witness the calibration and collection of all retro-reflectivity data.

Control: 0081-01-053, ETC.

County: Tarrant

Highway: SS 347

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-01-053 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY SS 347

			CONTROL SECTION JOB		**0081-01-053**		**0081-01-054**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00193283**		**A00194848**			
			COUNTY		**Tarrant**		**Tarrant**			
			HIGHWAY		**SS 347**		**SS 347**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	100-7002	PREPARING ROW		STA	3.000		1.000		4.000	
	104-7030	REMOV CONC (APPR SLAB)		SY	166.000				166.000	
	105-7001	RMV (0"-4") TRT/UNTRT BASE & ASPH PAV		SY	167.000				167.000	
	105-7002	RMV (2"-6") TRT/UNTRT BASE & ASPH PAV		SY	423.000				423.000	
	344-7024	SP MIXES SP-C SAC-A PG70-28		TON	105.000				105.000	
	344-7077	TACK COAT		GAL	122.000				122.000	
	420-7052	CL C CONC (RAIL FOUNDATION)		CY	5.000				5.000	
	422-7002	REINF CONC SLAB (HPC)		SF	9,373.000				9,373.000	
	422-7014	APPROACH SLAB (HPC)		CY	60.000				60.000	
	428-7001	PENETRATING CONCRETE SURFACE TREATMENT		SY	251.000		358.000		609.000	
	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)		SF	20.000		5.000		25.000	
	432-7013	RIPRAP (MOW STRIP)(4 IN)		CY	52.000				52.000	
	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)		LF	79.000				79.000	
	438-7009	RESIZING AND SEALING JOINTS		LF	108.000				108.000	
	442-7008	STR STEEL (MISCELLANEOUS BRIDGE)		LB	260.000		260.000		520.000	
	442-7015	STR STEEL (SHEAR CONNECTOR)		LB	2,897.000				2,897.000	
	446-7011	CLEAN & PAINT EXIST STR (SYSTEM III-B)		LS	1.000		1.000		2.000	
	450-7066	RAIL (TY SSTR)(MOD)		LF	482.800				482.800	
	454-7004	SEALED EXPANSION JOINT (4 IN) (SEJ - M)		LF	141.000				141.000	
	496-7013	REMOV STR (BRIDGE SLAB)		EA	1.000				1.000	
	496-7014	REMOV STR (ABUTMENT)		EA	2.000				2.000	
	496-7017	REMOVE STR (RAIL)		LF	400.000				400.000	
	499-7001	ADJUST STL SHOES		EA	6.000		1.000		7.000	
	500-7001	MOBILIZATION		LS	0.800		0.200		1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING		MO	8.000		2.000		10.000	
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN		EA	2.000		2.000		4.000	
	505-7001	TMA (STATIONARY)		DAY	171.000		43.000		214.000	
	505-7002	TMA (MOBILE OPERATION)		HR	24.000				24.000	
	506-7044	BIODEG EROSN CONT LOGS (INSTL) (12")		LF	120.000		110.000		230.000	
	506-7046	BIODEG EROSN CONT LOGS (REMOVE)		LF	120.000		110.000		230.000	
	540-7001	MTL W-BEAM GD FEN (TIM POST)		LF	950.000				950.000	
	540-7016	MTL BM GD FEN TRANS (NON - SYM)		EA	1.000				1.000	
	540-7019	MTL THRIE-BEAM GD FEN (TIM POST)		EA	3.000				3.000	
	542-7001	REMOVE METAL BEAM GUARD FENCE		LF	975.000				975.000	
	542-7002	REMOVE TERMINAL ANCHOR SECTION		EA	2.000				2.000	
	542-7004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)		EA	1.000				1.000	
	542-7005	RM MTL BM GD FEN TRANS (T101)		EA	3.000				3.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-01-053 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY SS 347

			CONTROL SECTION JOB		**0081-01-053**		**0081-01-054**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00193283**		**A00194848**			
			COUNTY		**Tarrant**		**Tarrant**			
			HIGHWAY		**SS 347**		**SS 347**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	544-7001	GUARDRAIL END TREATMENT (INSTALL)		EA	2.000				2.000	
	658-7001	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GF2		EA	9.000				9.000	
	658-7012	INSTL DEL ASSM (D-SW)SZ 1(BRF)CTB		EA	2.000				2.000	
	658-7021	INSTL DEL ASSM (D-SY)SZ 1(YFLX)GF2		EA	4.000				4.000	
	658-7031	INSTL DEL ASSM (D-SY)SZ 1(BRF)CTB		EA	3.000				3.000	
	666-7172	RE PM TY II (W) 6" (BRK)		LF	185.000				185.000	
	666-7175	RE PM TY II (W) 6" (SLD)		LF	368.000				368.000	
	666-7213	RE PM TY II (Y) 6" (SLD)		LF	372.000				372.000	
	666-7347	PAVEMENT SLER 6"		LF	1,480.000				1,480.000	
	678-7002	PAV SURF PREP FOR MRK (6")		LF	1,480.000				1,480.000	
	778-7002	CONCRETE RAIL REPAIR (MISC)		LF			5.000		5.000	
	780-7002	CNC CRACK REPAIR (DISCRETE)(INJECT)		LF	13.000		24.000		37.000	
	780-7004	CNC CRACK REPAIR (DISCRETE)(SURF SEAL)		LF	46.000		6.000		52.000	
	784-7020	REP STL BRIDGE MBR (STRAIGHTEN MEMB)		EA	1.000		7.000		8.000	
	784-7022	REP STL BRIDGE MBR (WELD REPAIR)		EA	1.000		1.000		2.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)		LS	1.000				1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PART)		LS	1.000				1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)		LS	1.000				1.000	

SUMMARY OF BRIDGES QUANTITIES

NBI #	DESCRIPTIONS	0420-7052	0422-7002	0422-7014	0428-7001	0429-7001	0438-7007	0438-7009	0442-7008	0442-7015	0446-7011
		CL C CONC (RAIL FOUNDATION)	REINF CONC SLAB (HPC)	APPROACH SLAB (HPC)	PENETRATING CONCRETE SURFACE TREATMENT	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	CLEANING AND SEALING EXIST JOINTS (CL7)	RESIZING AND SEALING JOINTS	STR STEEL (MISCELLANEOUS BRIDGE)	STR STEEL (SHEAR CONNECTOR)	CLEAN & PAINT EXIST STR (SYSTEM III-B)
		CY	SF	CY	SY	SF	LF	LF	LB	LB	LS
02-220-0-0014-16-192	IH 35W SB UNDERPASS AT SH 121 WB	5	9373	60	251	20	79	108	260	2897	1
02-220-0-0014-16-151	IH 35W SB UNDERPASS AT SPUR 347 EB				358	5			260		1
TOTALS		**5**	**9,373**	**60**	**609**	**25**	**79**	**108**	**520**	**2,897**	**2**

SUMMARY OF BRIDGES QUANTITIES

NBI #	DESCRIPTIONS	0450-7066	0454-7004	0499-7001	0778-7002	0780-7002	0780-7004	0784-7020	0784-7022
		RAIL (TY SSTR) (MOD)	SEALED EXPANSION JOINT (4 IN) (SEJ - M)	ADJUST STL SHOES (RE-WELDS)	CONCRETE RAIL REPAIR (MISC)	CNC CRACK REPAIR (DISCRETE) (INJECT)	CNC CRACK REPAIR (DISCRETE) (SURF SEAL)	REP STL BRIDGE MBR (STRAIGHTEN MEMB)	REP STL BRIDGE MBR (WELD REPAIR)
		LF	LF	EA	LF	LF	LF	EA	EA
02-220-0-0014-16-192	IH 35W SB UNDERPASS AT SH 121 WB	482.8	141	6		13	46	1	1
02-220-0-0014-16-151	IH 35W SB UNDERPASS AT SPUR 347 EB			1	5	24	6	7	1
TOTALS		**482.8**	**141**	**7**	**5**	**37**	**52**	**8**	**2**

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Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

SUMMARY OF QUANTITIES

SHEET 1 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	5
CONTROL	SECTION	JOB	
0081	01	053,ETC	

SUMMARY OF SWP3 QUANTITIES

NBI #	DESCRIPTIONS	0506-7044 BIODEG EROSN CONT LOGS (INSTL) (12")	0506-7046 BIODEG EROSN CONT LOGS (REMOVE)
		LF	LF
02-220-0-0014-16-192	IH 35W SB UNDERPASS AT SH 121 WB	120	120
02-220-0-0014-16-151	IH 35W SB UNDERPASS AT SPUR 347 EB	110	110
TOTALS		**230**	**230**

NOTES: LOCATIONS AND TYPES OF BMPS MAY REQUIRE ADJUSTMENTS PRIOR TO OR AFTER PLACEMNT AS DIRECTED BY THE ENGINEER. ADJUSTMENTS SHOULD BE MADE TO ENSURE BMPS ARE WORKING EFFECTIVELY AND MAINTAIN COMPLIANCE WITH THE CONSTRUCTION GENERAL PERMIT. NOTIFY THE ENGINEER PRIOR TO MAKING ADJUSTMENTS.

SUMMARY OF PAVEMENT MARKING QUANTITIES

NBI #	DESCRIPTIONS	0658-7001 INSTL DEL ASSM (D-SW)SZ 1(WFLX)GF2	0658-7012 INSTL DEL ASSM (D-SW)SZ 1(BRF)CTB	0658-7021 INSTL DEL ASSM (D-SY)SZ 1(YFLX)GF2	0658-7031 INSTL DEL ASSM (D-SY)SZ 1(BRF)CTB	0666-7172 RE PM TY II (W) 6" (BRK)	0666-7175 RE PM TY II (W) 6" (SLD)	0666-7213 RE PM TY II (Y) 6" (SLD)	0666-7347 PAVEMENT SLER 6"	0678-7002 PAV SURF PREP FOR MRK (6")
		EA	EA	EA	EA	LF	LF	LF	LF	LF
02-220-0-0014-16-192	IH 35W SB UNDERPASS AT SH 121 WB	9	2	4	3	185	368	372	1480	925
TOTALS		**9**	**2**	**4**	**3**	**185**	**368**	**372**	**1,480**	**925**

SUMMARY OF REMOVAL QUANTITIES

NBI #	DESCRIPTIONS	0104-7030 REMOV CONC (APPR SLAB)	0105-7001 RMV (0"-4") TRT/UNTRT BASE & ASPH PAV	0105-7002 RMV (2"-6") TRT/UNTRT BASE & ASPH PAV	0496-7013 REMOV STR (BRIDGE SLAB)	0496-7014 REMOV STR (ABUTMENT)	0496-7017 REMOVE STR (RAIL)	0542-7001 REMOVE METAL BEAM GUARD FENCE	0542-7002 REMOVE TERMINAL ANCHOR SECTION	0542-7004 RM MTL BM GD FENCE TRANS (THRIE-BEAM)	0542-7005 RM MTL BM GD FEN TRANS (T101)
		SY	SY	SY	EA	EA	LF	LF	EA	EA	EA
02-220-0-0014-16-192	IH 35W SB UNDERPASS AT SH 121 WB	166	167	423	1	2	400.0	975.0	2	1	3
		166	**167**	**423**	**1**	**2**	**400.0**	**975.0**	**2**	**1**	**3**

SUMMARY OF TRAFFIC CONTROL PLAN QUANTITIES

NBI #	LOCATION	502 7001 BARRICADES, SIGNS AND TRAFFIC HANDLING	503 7002 PORTABLE CHANGEABLE MESSAGE SIGN	505 7001 TMA (STATIONARY)	505 7002 TMA (MOBILE OPERATION)
		MO	EA	DAY	HR
02-220-0-0014-16-192	IH 35W SB UNDERPASS AT SH 121 WB	6	2	171	24
02-220-0-0014-16-151	IH 35W SB UNDERPASS AT SPUR 347 EB	2	2	43	
PROJECT TOTALS		**8**	**4**	**214**	**24**

SUMMARY OF ROADWAY QUANTITIES

NBI #	DESCRIPTIONS	0100-7002 PREPARING ROW	0344-7024 * SP MIXES SP-C SAC-A PG70-28	0344-7077 ** TACK COAT	0432-7013 RIPRAP (MOW STRIP)(4 IN)	0540-7001 MTL W-BEAM GD FEN (TIM POST)	0540-7016 MTL BM GD FEN TRANS (NON - SYM)	0540-7019 MTL THRIE-BEAM GD FEN (TIM POST)	0544-7001 GUARDRAIL END TREATMENT (INSTALL)
		STA	TON	GAL	CY	LF	EA	EA	EA
02-220-0-0014-16-192	IH 35W SB UNDERPASS AT SH 121 WB	3	105	122	52	950.0	1	3	2
02-220-0-0014-16-151	IH 35W SB UNDERPASS AT SPUR 347 EB	1							
TOTALS		**4**	**105**	**122**	**52**	**950.0**	**1**	**3**	**2**

* QUANTITIY BASED ON APPLICATION RATE OF 115 LB/SY-IN
** QUANTITIY BASED ON APPLICATION RATE OF 0.20 GAL/SY

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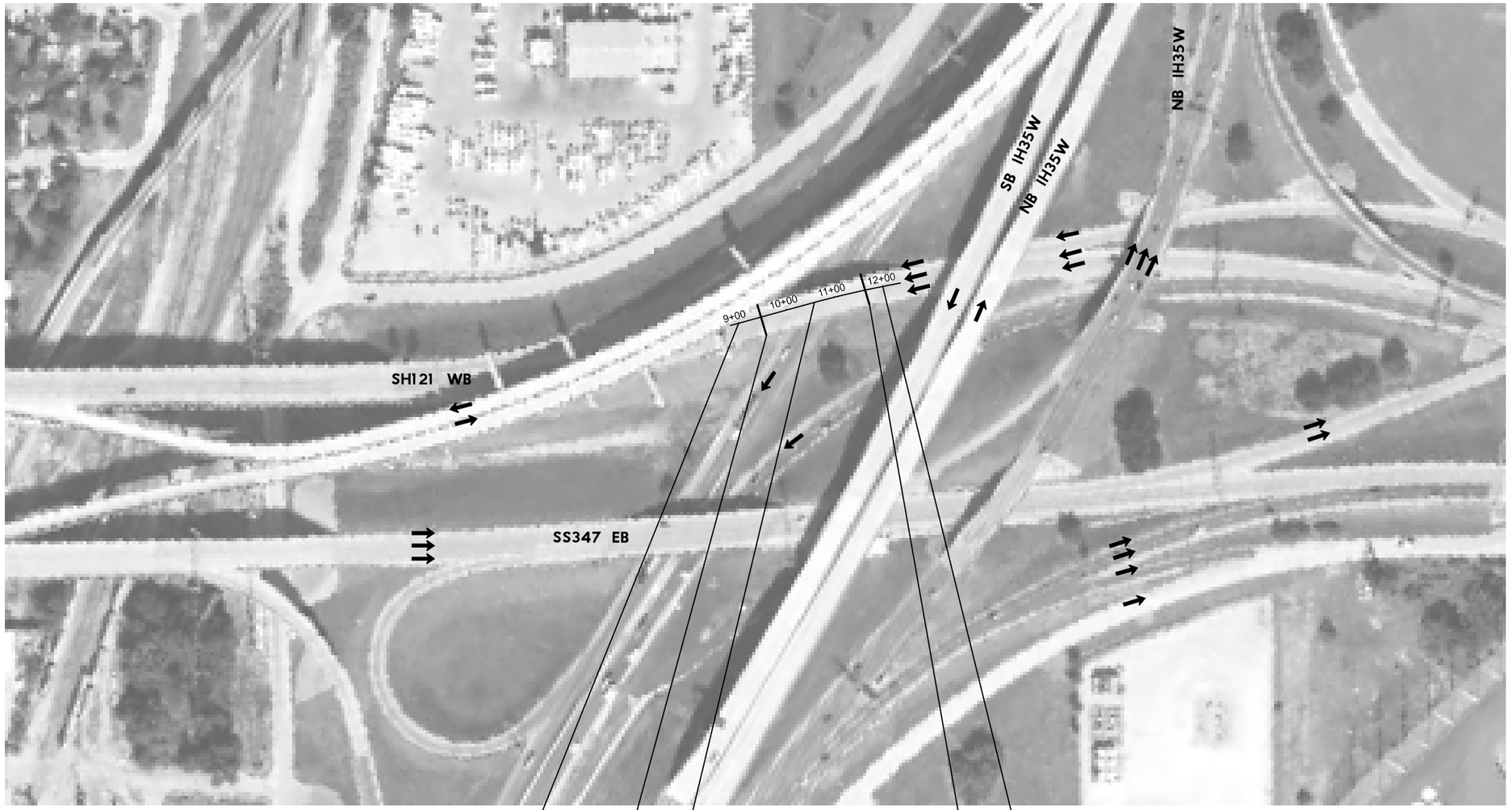
Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

SUMMARY OF QUANTITIES

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	6
CONTROL	SECTION	JOB	
0081	01	053, ETC	



LEGEND:

→ PROPOSED TRAFFIC FLOW

NOTES:

PREPARATION OF RIGHT OF WAY CONSISTS OF THE CLEARING OF VEGETATION TO ACCESS FOR THE WORK IF REQUIRED.

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED PROFESSIONAL ENGINEER
6/26/2024

NBI# 02-220-0-0014-16-192

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

PROJECT LAYOUT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	7
CONTROL	SECTION	JOB	
0081	01	053, ETC	

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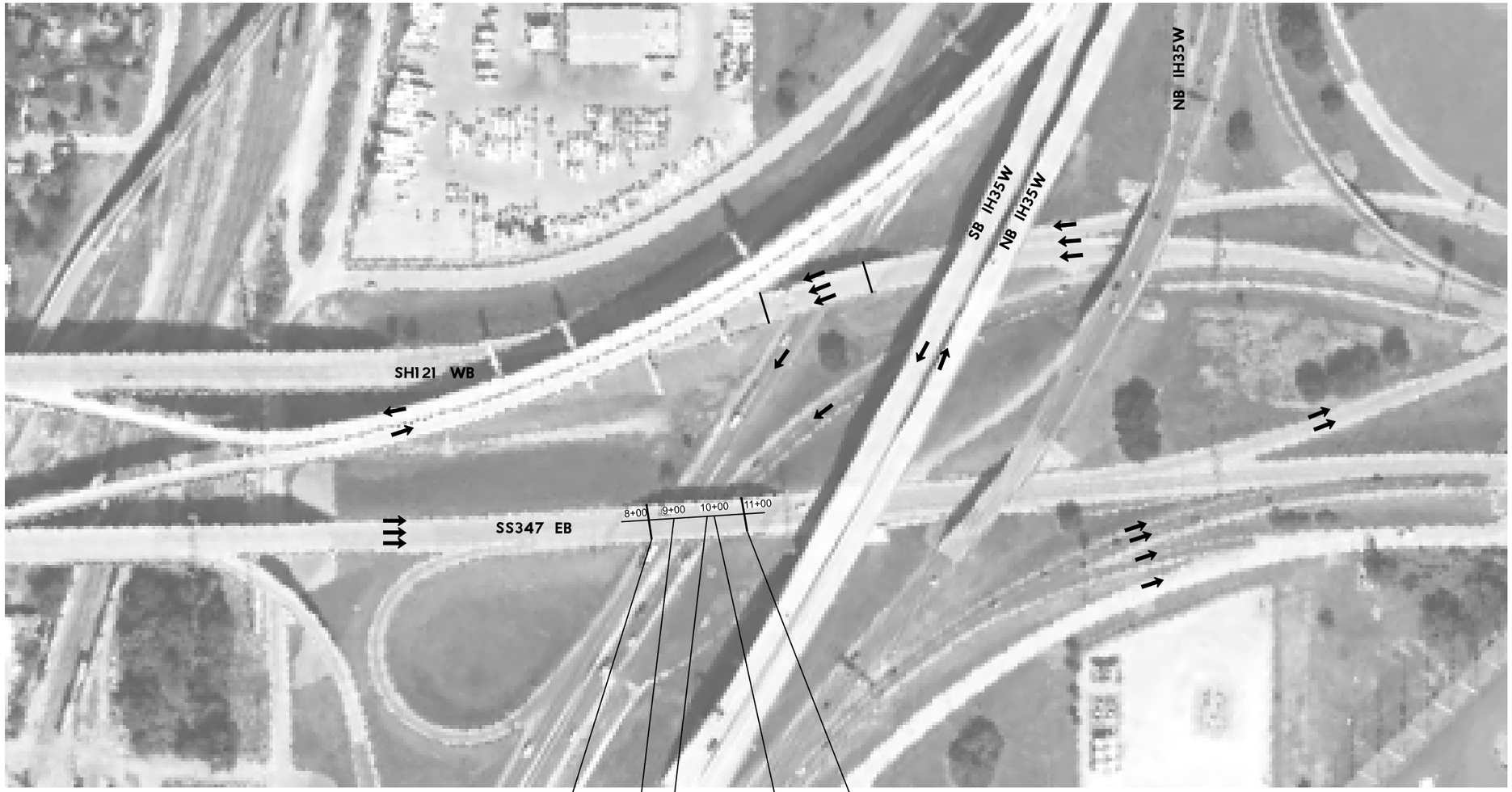

LEGEND:

→ PROPOSED TRAFFIC FLOW

NOTES:

PREPARATION OF RIGHT OF WAY CONSISTS OF THE CLEARING OF VEGETATION TO ACCESS FOR THE WORK IF REQUIRED.

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED PROFESSIONAL ENGINEER
6/26/2024

NBI# 02-220-0-0014-16-151

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

PROJECT LAYOUT
IH 35W SB UNDERPASS
AT SPUR 347 EB

SCALE: N.T.S

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	8
CONTROL	SECTION	JOB	
0081	01	053,ETC	

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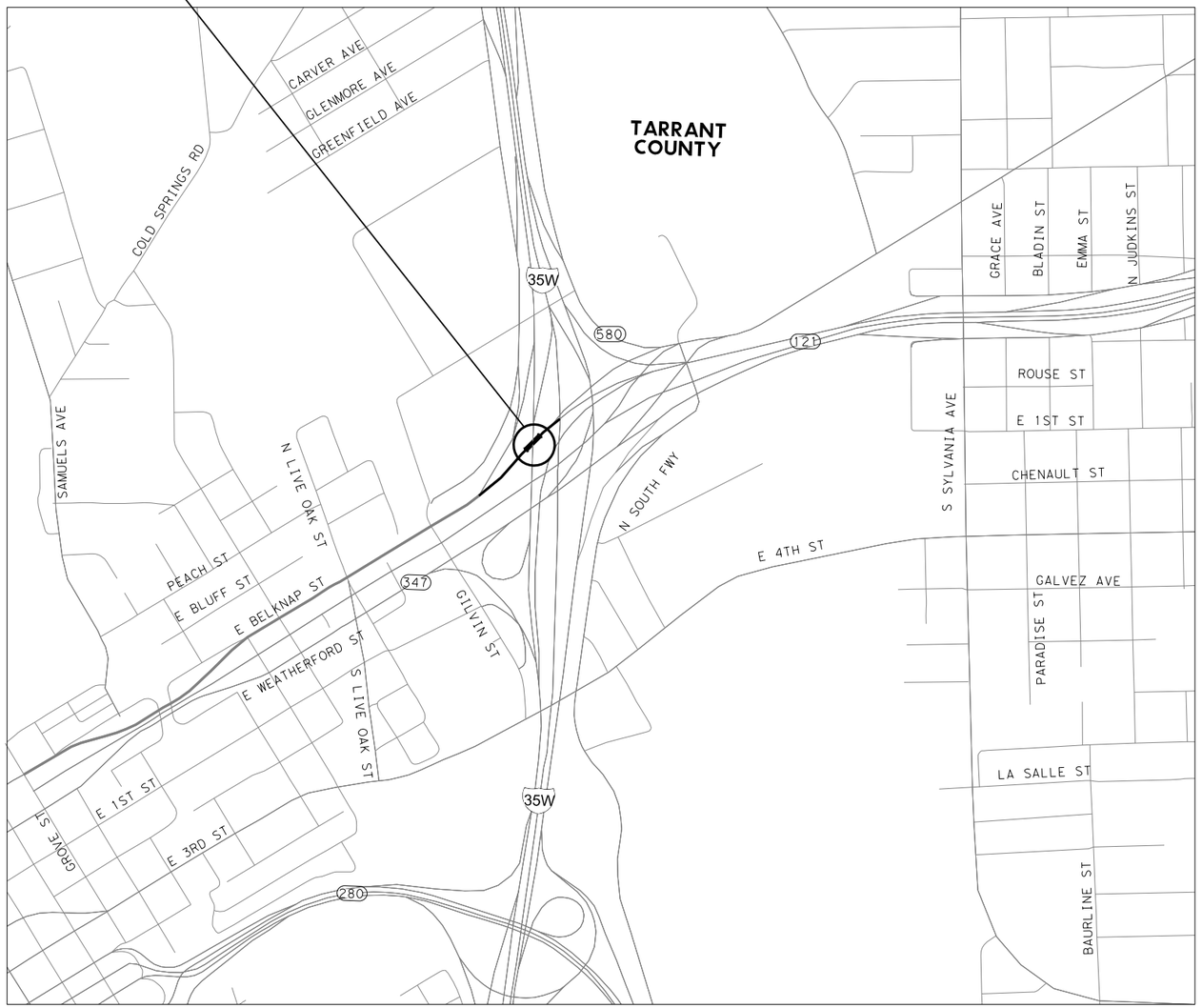
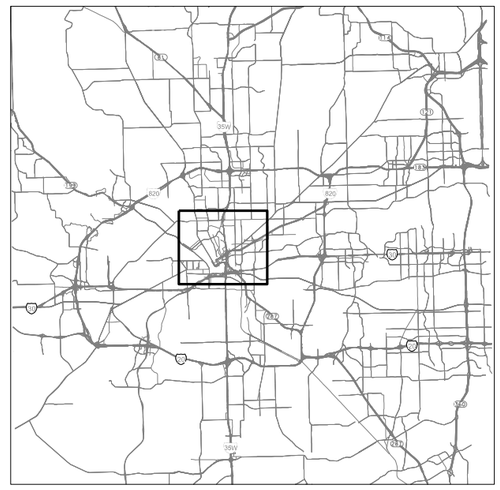
NBI # 02-220-0-0014-16-192
SH 121 WB @ IH 35W SB



LOCATION MAP
N.T.S



TARRANT COUNTY

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
6/26/2024

NBI# 02-220-0-0014-16-192

Texas Department of Transportation
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PARSONS
TBPE Registration No. F-1481

LOCATION MAP
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	9
CONTROL	SECTION	JOB	
0081	01	053,ETC	

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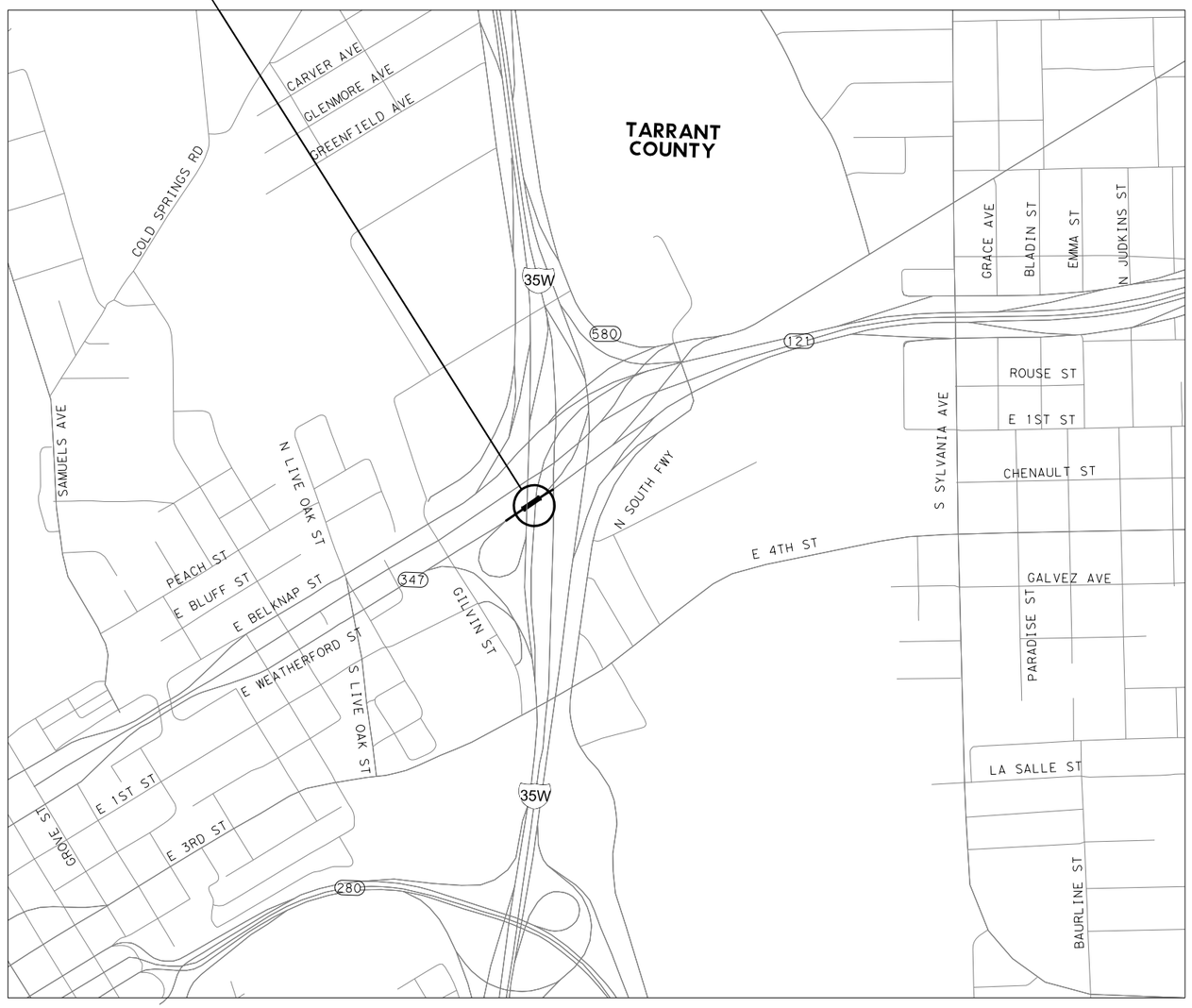
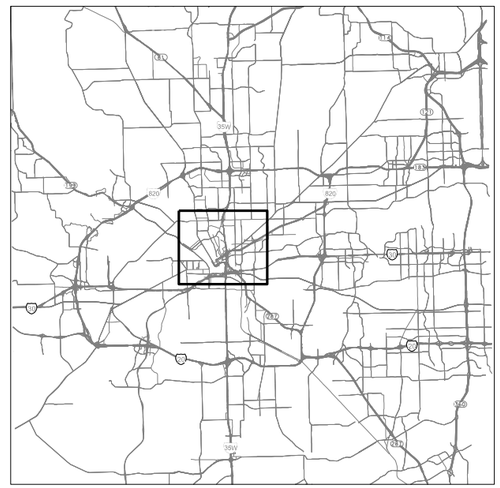
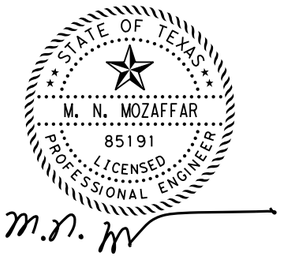
NBI # 02-220-0-0014-16-151
SPUR 347 EB @ IH 35 W SB



LOCATION MAP
N.T.S



TARRANT COUNTY



NBI# 02-220-0-0014-16-151

PARSONS
TBPE Registration No. F-1481

LOCATION MAP
IH 35W SB UNDERPASS
AT SPUR 347 EB

SCALE: N.T.S

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	10
CONTROL	SECTION	JOB	
0081	01	053, ETC	

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TRAFFIC CONTROL NOTES

1. THIS IS A SUGGESTED TRAFFIC CONTROL PLAN (TCP). THE CONTRACTOR MAY SUBMIT AN ALTERNATE TRAFFIC CONTROL PLAN, SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER IN TEXAS,FOR APPROVAL BY THE ENGINEER.WHEN MUTUALLY BENEFICIAL CHANGES ARE PROPOSED TO THE EXISTING TRAFFIC CONTROL PLAN AND AGREED UPON BY THE CONTRACTOR AND THE TEXAS DEPARTMENT OF TRANSPORTATION,THE PLAN SHEET MAY BE DEVELOPED AND SIGNED AND SEALED BY THE ENGINEER.

2.FURNISH AND INSTALL ALL TRAFFIC CONTROL PLANS DEVICES, INCLUDING BUT NOT LIMITED TO BARRICADES, SIGNS, AND WORK ZONE MARKINGS, IN COMPLIANCE WITH THE LATEST VERSION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TXMUTCD), THE STATE STANDARD TRAFFIC CONTROL PLAN (TCP) SHEETS, AND THE BARRICADES AND CONSTRUCTION (BC) SHEETS.

3. VERIFY THE LOCATION AND SPACING OF SIGNS, BARRICADES, AND CHANNELIZING DEVICES PRIOR TO THEIR PLACEMENT ALONG VERTICAL CURVES, HORIZONTAL CURVES, AND OTHER GEOMETRIC CONSTRAINTS TO ENSURE VISIBILITY TO ALL MOTORISTS.

4. COVER ALL EXISTING SIGNS THAT CONFLICT WITH THE TRAFFIC CONTROL PLAN AND UNCOVER DURING NON-WORKING HOURS OR AS DIRECTED BY THE ENGINEER. PARTIAL COVERAGE OF THE SIGN OR COVERAGE BY MATERIAL THAT WILL NOT COVER THE ENTIRE SIGN ALL THE TIME IS NOT PERMITTED.

5. VARY THE SPACING OF SIGNS TO MEET TRAFFIC CONDITIONS OR AS DIRECTED BY THE ENGINEER AND ENSURE THAT ALL TRAFFIC CONTROL DEVICES ARE KEPT IN A HIGHLY VISIBLE CONDITION (CLEAN, UPRIGHT AND AT PROPER LOCATION.

6. CONDUCT CONSTRUCTION OPERATIONS SO AS TO PROVIDE THE LEAST POSSIBLE INTERFERENCE TO TRAFFIC AND TO PERMIT THE CONTINUOUS MOVEMENT OF TRAFFIC IN ALL ALLOWABLE DIRECTIONS AT ALL TIMES. PROVIDE FOR SAFE AND CONVENIENT ACCESS TO ABUTTING PROPERTIES, HIGHWAYS, PUBLIC ROADS, AND STREET CROSSINGS.

7.REGULATE ALL CONSTRUCTION TRAFFIC SO AS TO CAUSE A MINIMAL INCONVENIENCE TO THE TRAVELING PUBLIC. AT THE TIMES WHEN IT IS NECESSARY FOR TRUCKS TO STOP, UNLOAD OR CROSS ROADWAYS UNDER TRAFFIC, PROVIDE WARNING SIGNS AND FLAGGERS AS NEEDED TO ADEQUATELY PROTECT THE TRAVELING PUBLIC.

8. USE OF PORTABLE CHANGEABLE MESSAGE SIGNS AS ADVANCE NOTICE OF LANE CLOSURES WILL BE REQUIRED, AS DIRECTED BY THE ENGINEER. FOR LOCATIONS THAT ARE ADJACENT TO EACH OTHER, A SINGLE PORTABLE CHANGEABLE MESSAGE SIGN IN ADVANCE OF THE ENTIRE WORK AREA IS ACCEPTABLE.

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

10. PROVIDED LIGHTS TO ILLUMINATE THE FLAGGERS AND WORK AREA DURING NIGHTTIME OPERATIONS. CLASS 3 GARMENTS WILL BE REQUIRED FOR ALL WORKERS AND FLAGGERS DURING NIGHTTIME WORK.

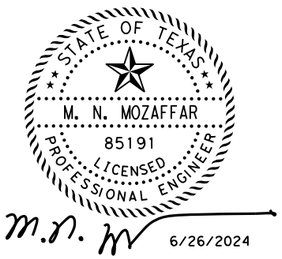
11. CONTRACTOR SHALL SUBMIT PROPOSED DEMOLITION PLAN AND SEQUENCE DEFINITION FOR PROPOSED WORK INCLUDING SLAB DEMOLITION; HEADED STUD WELDING; STEEL BEAM REPAIR; AND SLAB FORMING, REINFORCEMENT, AND PLACEMENT. NO WORK SHALL BE PERFORMED OVER TRAFFIC. SEE TRAFFIC CONTROL PLANS FOR RELIEF CLOSURE, LANE SHIFT, AND DETOUR ALTERNATIVES.

12. CONTRACTOR SHALL FOLLOW SEQUENCE OF TRAFFIC CONTROL STEPS FOR DEMOLITION OF BRIDGE SPAN.

13. CONTRACTOR SHALL COORDINATE TCP WITH ADJACENT CONSTRUCTION PROJECTS TO ENSURE NO CONFLICTING TRAFFIC CONTROL EXISTS.

14. BEFORE BEGINNING WORK, PLACE APPLICABLE BARRICADES IN ACCORDANCE WITH TXDOT STANDARDS BC (1 THRU 12)-21.

15. ALL TCP DEVICES SHALL BE PICKED UP PRIOR TO OPENING AFFECTED LANES TO TRAFFIC.



PARSONS
TBPE Registration No. F-1481

TRAFFIC CONTROL NOTES

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	11
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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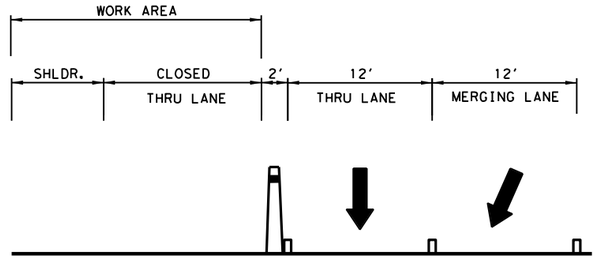
PHASE 1 NOTES

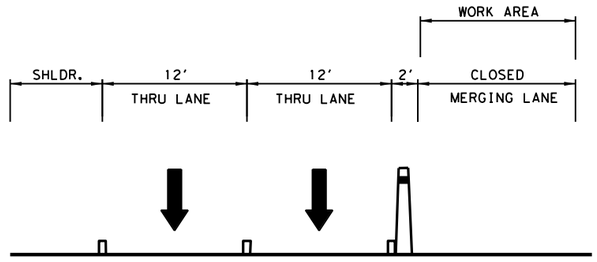
- CONTRACTOR SHALL EXECUTE PHASE 1 NOTES AS SOON AS WORK WILL BE UNDERWAY FOR DEMOLITION OF SPAN 1 OF THE BRIDGE. THE STEP 1 PROCEDURE SHALL BE DISCONTINUED AS SOON AS THE DEMOLITION OF THE SPAN 1 WILL BE COMPLETED. CONTRACTOR SHALL FOLLOW THE PHASE 1 TRAFFIC PATTERN TO ALLOW TRAFFIC OPERATIONAL ALONG IH 35W SB HIGHWAY UNDERNEATH THE BRIDGE. CONTRACTOR SHALL FOLLOW THE DETOUR LAYOUT FOR TRAFFIC OPERATING ON SH 121 WB OVERPASS.
- CONTRACTOR SHALL CLOSE THE ADJACENT LANE OF IH35 SB NEAR WORK AREA FOLLOWING THE PROVIDED TYPICAL SECTION GUIDELINES. CONTRACTOR SHALL FOLLOW TCP(6-1) TXDOT STANDARDS FOR EXECUTING LANE CLOSER, TRAFFIC CHANNELIZATION AND WORK ZONE SIGNS.
- NIGHTTIME OPERATIONS REFER TO GENERAL NOTES FOR NIGHTTIME LIGHTING REQUIREMENTS.
- CONTRACTOR SHALL CO-ORDINATE WITH AREA OFFICE PRIOR TO COMMENCING WORK.



IH 35W SB
N.T.S

PHASE 2 NOTES

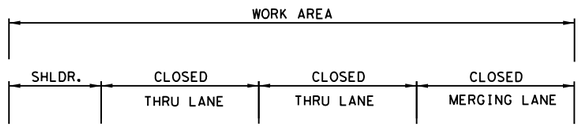
- CONTRACTOR SHALL EXECUTE PHASE 2 NOTES AS SOON AS THE WORK WILL BE UNDERWAY FOR DEMOLOTION OF SPAN 3 OF THE BRIDGE. THE PHASE 2 PROCEDURE SHALL BE DISCONTINUED AS SOON AS THE DEMOLITION OF THE SPAN 3 WILL BE COMPLETED. CONTRACTOR SHALL FOLLOW THE PHASE 2 TRAFFIC PATTERN TO ALLOW TRAFFIC OPERATIONAL ALONG IH 35W SB HIGHWAY UNDERNEATH THE BRIDGE. CONTRACTOR SHALL FOLLOW THE DETOUR LAYOUT FOR TRAFFIC OPERATING ON SH 121 WB OVERPASS.
- CONTRACTOR SHALL CLOSE THE ADJACENT LANE UNDERNEATH THE BRIDGE OF IH35 SB NEAR WORK AREA FOLLOWING THE PROVIDED TYPICAL SECTION GUIDELINES. CONTRACTOR SHALL MAKE SURE THAT MERGING OPERATION FOR TRAFFIC SHALL BE COMPLETED BEFORE ENTERING INTO THE BRIDGE AREA. CONTRACTOR SHALL FOLLOW TCP (6-2) TXDOT STANDARD FOR EXECUTING LANE CLOSURE, TRAFFIC CHANNELIZATION AND WORK ZONE SIGNS.
- NIGHTTIME OPERATIONS REFER TO GENERAL NOTES FOR NIGHTTIME LIGHTING REQUIREMENTS.
- CONTRACTOR SHALL CO-ORDINATE WITH AREA OFFICE PRIOR TO COMMENCING WORK.



IH 35W SB
N.T.S

PHASE 3 NOTES

- CONTRACTOR SHALL CLOSE ALL LANES OF IH35 SB DURING DEMOLITION OF SPAN 2 OF THE BRIDGE. CONTRACTOR SHALL FOLLOW PROPOSED DETOUR LAYOUT, DETOUR 3, FOR IH 35W SB AND SH 121 WB OVERPASS.
- CONTRACTOR SHALL PLACE APPLICABLE BARRICADES ACCORDING TO TXDOT STANDARDS BC(1 THRU 12)-21 BEFORE COMMENCING THE WORK.
- CONTRACTOR SHALL CO-ORDINATE WITH AREA OFFICE PRIOR TO COMMENCING WORK.



IH 35W SB
N.T.S

LEGENDS:

PROPOSED TRAFFIC FLOW

CONE OR DRUM
(SEE BC STANDARDS)

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
8/7/2024

PARSONS
TBPE Registration No. F-1481

TRAFFIC CONTROL PLAN NARRATIVE
IH 35W SB UNDERPASS AT SH 121 WB

SCALE: N.T.S SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	12
0081	01	053,ETC	

DRAWING DATE: 8/7/2024
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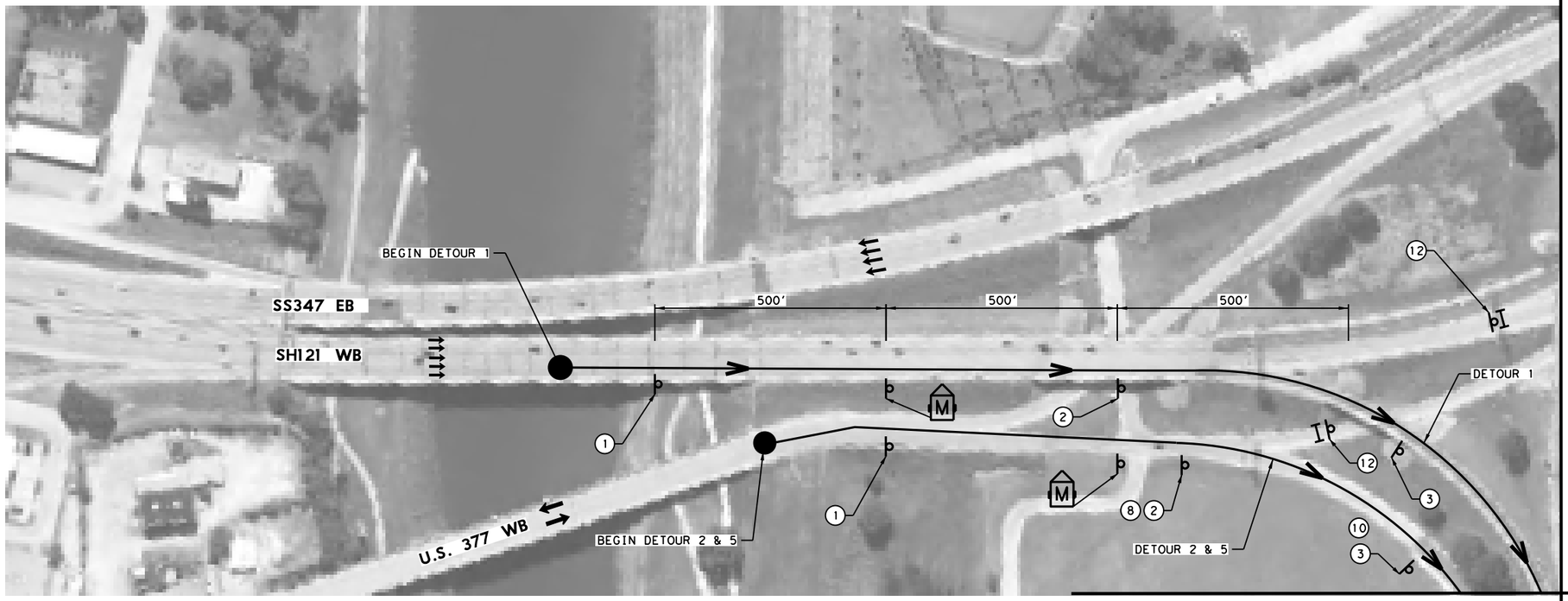

LEGEND:

- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- TYPE III BARRICADE
- SIGNS
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

DETOUR 1: SH 121 WESTBOUND TRAFFIC

1. TRAFFIC ON SH 121 WESTBOUND TURN RIGHT ON THE RAMP TO IH 35W.
2. CONTINUE ON IH 35W NORTHBOUND.
3. TURN RIGHT ON IH 35W RAMP TO N FREEWAY .
4. TAKE U-TURN ON N FREEWAY.
5. TURN LEFT ON IH 35W RAMP TO IH 35W SOUTHBOUND.
6. STAY ON IH 35W SOUTHBOUND.
7. TAKE RIGHT ON IH 35W RAMP TO SH 121 WB.

DETOUR 2: US 377 WESTBOUND TO SH121 WB TRAFFIC

1. TRAFFIC ON US 377 WESTBOUND KEEP RIGHT TO STAY ON US 377.
2. TURN LEFT ON PHARR ST.
3. TURN LEFT ON NORTH FWY.
4. TURN LEFT ON THE RAMP TO SH 121 WB.

DETOUR 5: US 377 TO IH 35W SOUTHBOUND TRAFFIC

1. STAY ON US 377 / FRONTAGE ROAD NORTH TO PHARR STREET.
2. TURN LEFT ON PHARR STREET, WEST TO GILVIN STREET.
3. TURN LEFT ON GILVIN STREET, SOUTH TO E.1ST STREET.
4. TURN LEFT ON E. 1ST STREET / ENTRANCE RAMP TO SB IH 35W.

DETOUR AHEAD — CW20-2D 36"x36" — (1)

ROAD CLOSED — R11-2 48"x30" — (12)

(2): DETOUR M4-8 24"x12" / WEST M3-4 24"x12" / TEXAS 121 M1-6T 24" x 24" / M6-1 21"x15"

(3): DETOUR M4-8 24"x12" / WEST M3-4 24"x12" / TEXAS 121 M1-6S 24" x 24" / M6-3 21"x15"

(8): DETOUR M4-8 24"x12" / SOUTH M3-3 24"X 12" / INTERSTATE TEXAS 35 M1-6F 24"x24" / M6-1 21"x15"

(10): DETOUR M4-8 24"x12" / SOUTH M3-3 24"X 12" / INTERSTATE TEXAS 35 M1-6F 24"x24" / M6-3 21"x15"

STATE OF TEXAS
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85191
LICENSED PROFESSIONAL ENGINEER
6/26/2024

PARSONS
TBPE Registration No. F-1481

DETOUR LAYOUT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S — SHEET 1 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	13
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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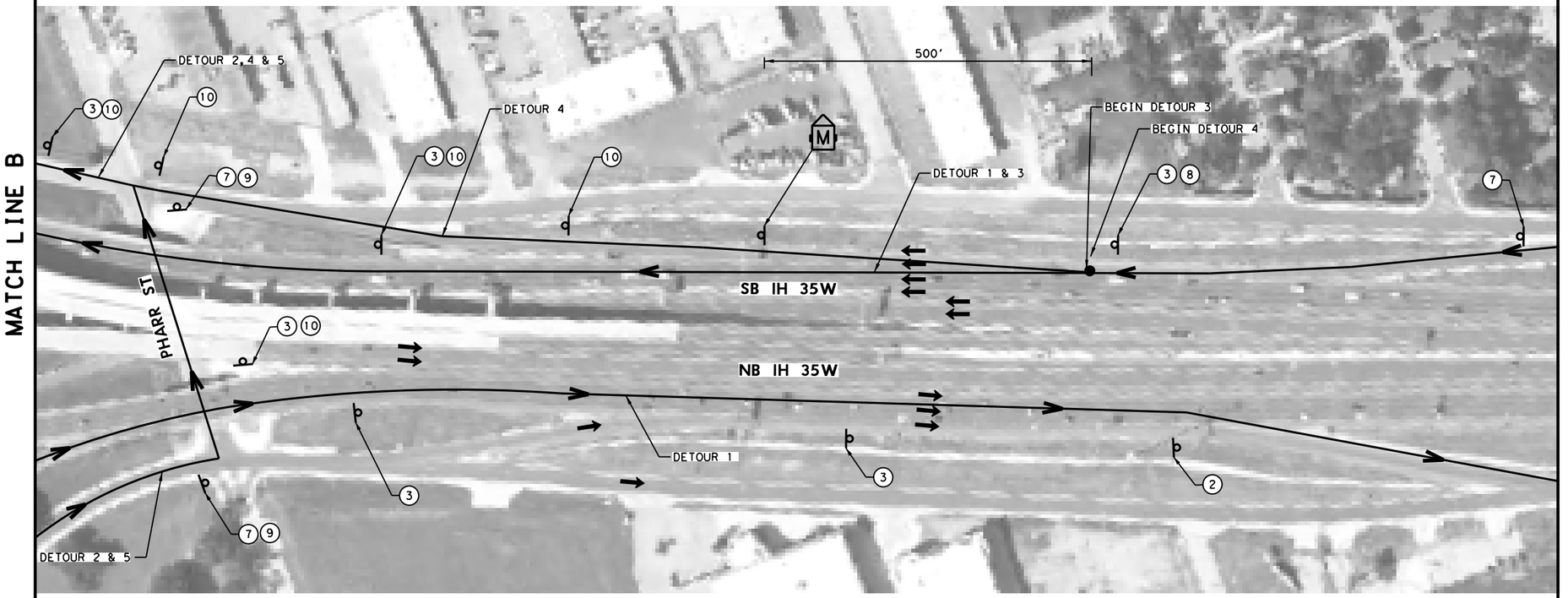


LEGEND:

- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- TYPE III BARRICADE
- SIGNS
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

DETOUR 1: SH 121 WESTBOUND TRAFFIC

1. TRAFFIC ON SH 121 WESTBOUND TURN RIGHT ON THE RAMP TO IH 35W.
2. CONTINUE ON IH 35W NORTHBOUND.
3. TURN RIGHT ON IH 35W RAMP TO N FREEWAY .
4. TAKE U-TURN ON N FREEWAY.
5. TURN LEFT ON IH 35W RAMP TO IH 35W SOUTHBOUND.
6. STAY ON IH 35W SOUTHBOUND.
7. TAKE RIGHT ON IH 35W RAMP TO SH 121 WB.

DETOUR 2: US 377 WESTBOUND TO SH121 WB TRAFFIC

1. TRAFFIC ON US 377 WESTBOUND KEEP RIGHT TO STAY ON US 377.
2. TURN LEFT ON PHARR ST.
3. TURN LEFT ON NORTH FWY.
4. TURN LEFT ON THE RAMP TO SH 121 WB.

DETOUR 3: IH 35W SOUTHBOUND TRAFFIC

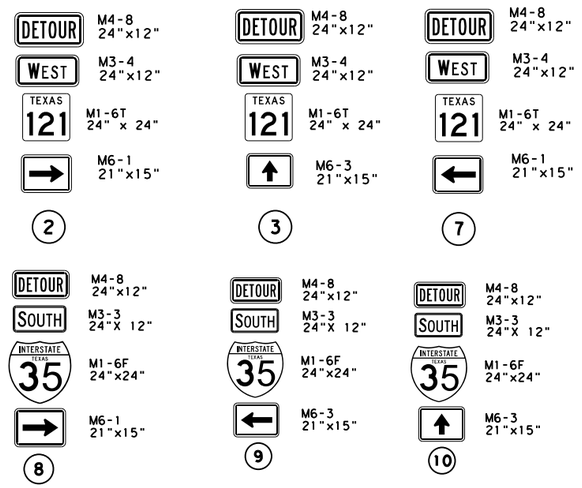
1. TRAFFIC ON IH 35 W TURN RIGHT ON THE RAMP TO SPUR 347W.
2. STAY ON SPUR 347W.
3. TAKE U-TURN ON N HAMPTON ST.
4. TURN RIGHT ON THE RAMP TO IH 35W.

DETOUR 4: IH 35W SOUTHBOUND TRAFFIC (ADDITIONAL ROUTE OTHER THAN SH121 WB U-TURN)

1. TAKE PHARR ST. EXIT, FOLLOW FRONTAGE ROAD WEST TO GILVIN STREET.
2. TURN LEFT ON GILVIN STREET, SOUTH TO E.1ST STREET
3. TURN LEFT ON E. 1ST STREET/ ENTRANCE RAMP TO SB IH 35W.

DETOUR 5: US 377 TO IH 35W SOUTHBOUND TRAFFIC

1. STAY ON US 377 / FRONTAGE ROAD NORTH TO PHARR STREET.
2. TURN LEFT ON PHARR STREET, WEST TO GILVIN STREET.
3. TURN LEFT ON GILVIN STREET, SOUTH TO E.1ST STREET.
4. TURN LEFT ON E. 1ST STREET / ENTRANCE RAMP TO SB IH 35W.



STATE OF TEXAS
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6/26/2024

PARSONS
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DETOUR LAYOUT
IH 35W UNDERPASS
AT SH 121 WB

SCALE: N.T.S

SHEET 2 OF 7

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	14
CONTROL	SECTION	JOB	
0081	01	053, ETC	

DRAWING DATE: 6/26/2024
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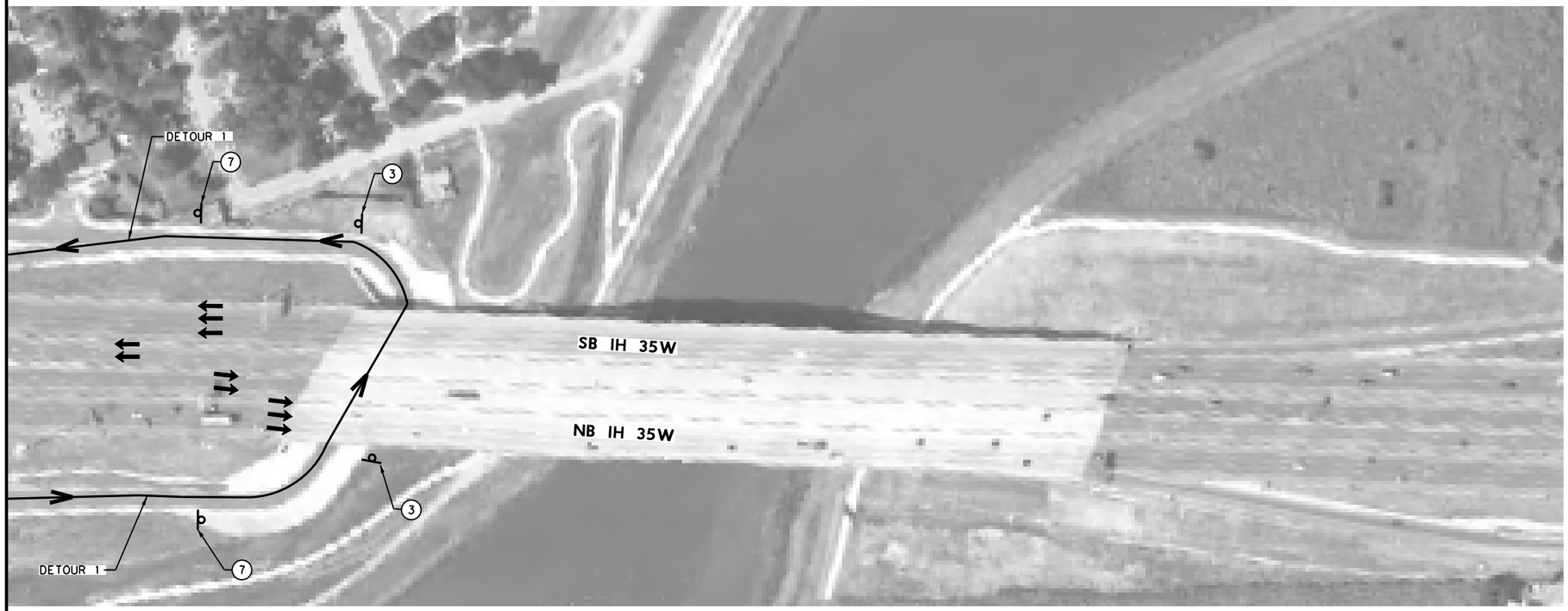

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LEGEND:

- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- TYPE III BARRICADE
- SIGNS
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

DETOUR 1: SH 121 WESTBOUND TRAFFIC

1. TRAFFIC ON SH 121 WESTBOUND TURN RIGHT ON THE RAMP TO IH 35W.
2. CONTINUE ON IH 35W NORTHBOUND.
3. TURN RIGHT ON IH 35W RAMP TO N FREEWAY .
4. TAKE U-TURN ON N FREEWAY.
5. TURN LEFT ON IH 35W RAMP TO IH 35W SOUTHBOUND.
6. STAY ON IH 35W SOUTHBOUND.
7. TAKE RIGHT ON IH 35W RAMP TO SH 121 WB.

DETOUR	M4-8 24"x12"	DETOUR	M4-8 24"x12"
WEST	M3-4 24"x12"	WEST	M3-4 24"x12"
TEXAS 121	M1-6T 24" x 24"	TEXAS 121	M1-6T 24" x 24"
←	M6-1 21"x15"	↑	M6-3 21"x15"
7		3	

STATE OF TEXAS
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6/26/2024

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

DETOUR LAYOUT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S SHEET 3 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	15
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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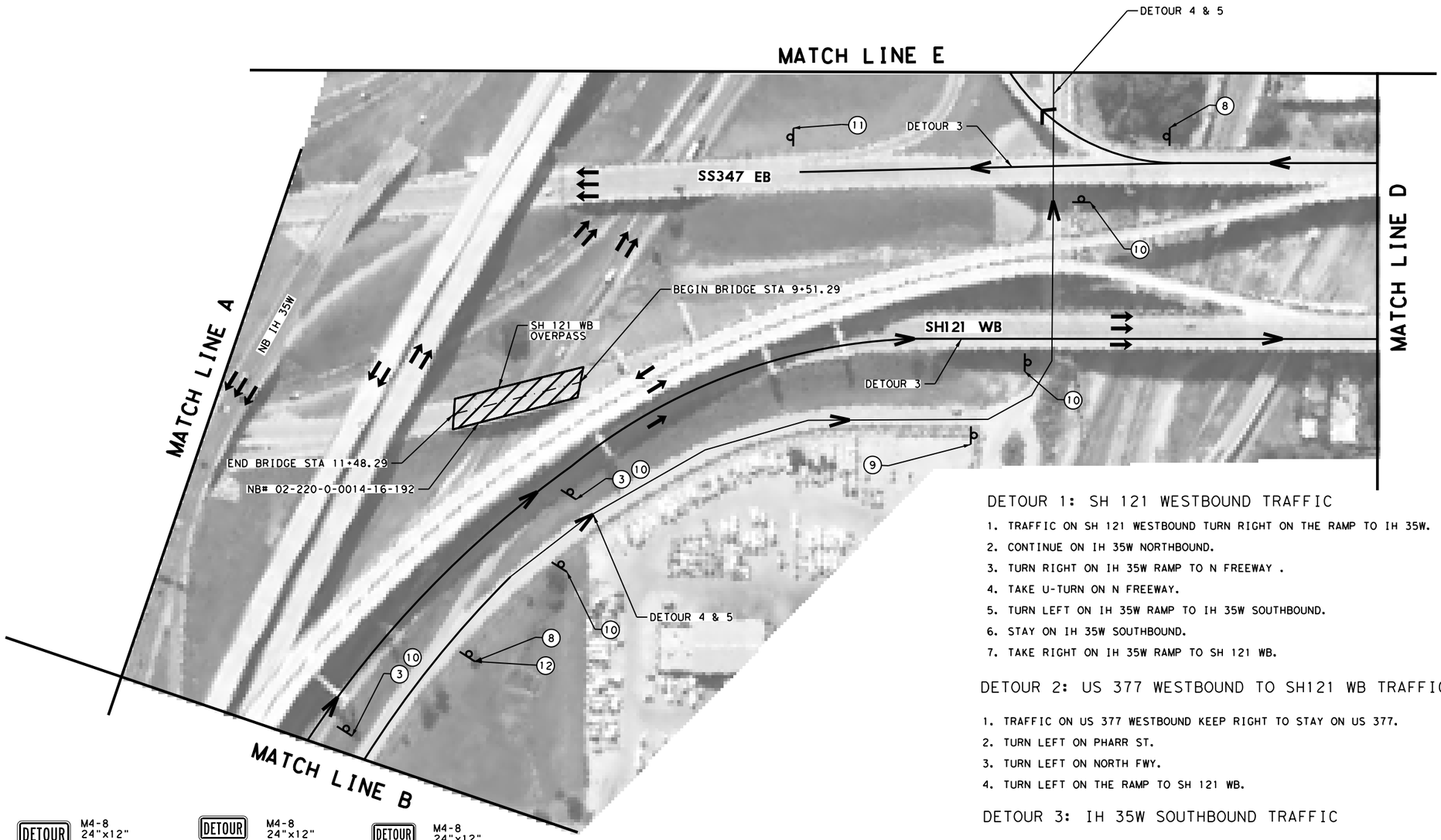

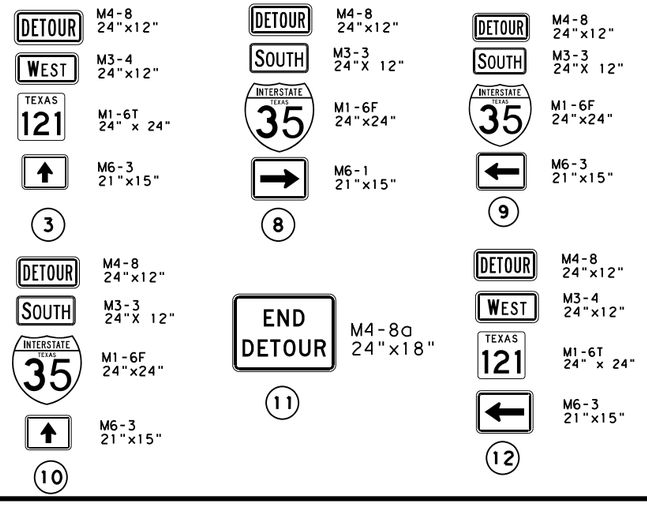

LEGEND:

- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- TYPE III BARRICADE
- SIGNS
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- WORK SPACE

DETOUR 1: SH 121 WESTBOUND TRAFFIC

1. TRAFFIC ON SH 121 WESTBOUND TURN RIGHT ON THE RAMP TO IH 35W.
2. CONTINUE ON IH 35W NORTHBOUND.
3. TURN RIGHT ON IH 35W RAMP TO N FREEWAY .
4. TAKE U-TURN ON N FREEWAY.
5. TURN LEFT ON IH 35W RAMP TO IH 35W SOUTHBOUND.
6. STAY ON IH 35W SOUTHBOUND.
7. TAKE RIGHT ON IH 35W RAMP TO SH 121 WB.

DETOUR 2: US 377 WESTBOUND TO SH121 WB TRAFFIC

1. TRAFFIC ON US 377 WESTBOUND KEEP RIGHT TO STAY ON US 377.
2. TURN LEFT ON PHARR ST.
3. TURN LEFT ON NORTH FWY.
4. TURN LEFT ON THE RAMP TO SH 121 WB.

DETOUR 3: IH 35W SOUTHBOUND TRAFFIC

1. TRAFFIC ON IH 35 W TURN RIGHT ON THE RAMP TO SPUR 347W.
2. STAY ON SPUR 347W.
4. TAKE U-TURN ON N HAMPTON ST.
4. TAKE LEFT TURN ON E WEATHERFORD ST.
5. TURN RIGHT ON THE RAMP TO IH 35W.

DETOUR 4: IH 35W SOUTHBOUND TRAFFIC ADDITIONAL ROUTE OTHER THAN SH121 WB U-TURN)

1. TAKE PHARR ST EXIT, FOLLOW FRONTAGE ROAD WEST TO GILVIN STREET
2. TURN LEFT ON GILVIL STREET, SOUTH TO E. 1ST STREET.
3. TURN LEFT ON E. 1ST STREET/ ENTRANCE RAMP TO SB IH 35W

DETOUR 5: US 377 TO IH 35W SOUTHBOUND TRAFFIC

1. STAY ON US 377 / FRONTAGE ROAD NORTH TO PHARR STREET.
2. TURN LEFT ON PHARR STREET, WEST TO GILVIN STREET.
3. TURN LEFT ON GILVIN STREET, SOUTH TO E. 1ST STREET.
4. TURN LEFT ON E. 1ST STREET / ENTRANCE RAMP TO SB IH 35W.

STATE OF TEXAS
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6/26/2024

PARSONS
TBPE Registration No. F-1481

DETOUR LAYOUT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S SHEET 4 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	16
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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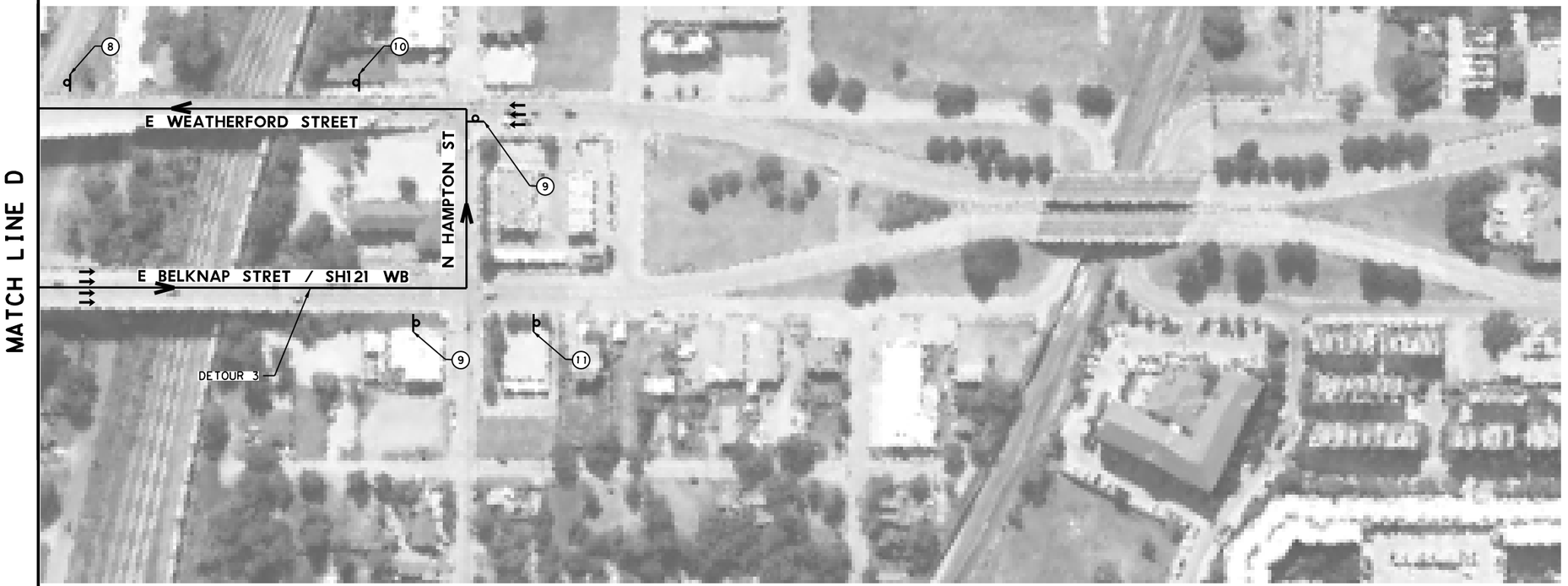

LEGEND:

- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- TYPE III BARRICADE
- SIGNS
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

DETOUR 3: IH 35W SOUTHBOUND TRAFFIC

1. TRAFFIC ON IH 35 W TURN RIGHT ON THE RAMP TO SPUR 347W.
2. STAY ON SPUR 347W.
4. TAKE U-TURN ON N HAMPTON ST.
4. TAKE LEFT TURN ON E WEATHERFORD ST.
5. TURN RIGHT ON THE RAMP TO IH 35W.

DETOUR	M4-8 24"x12"	
SOUTH	M3-3 24"X 12"	
INTERSTATE TEXAS 35	M1-6F 24"x24"	
	M6-1 21"x15"	8

DETOUR	M4-8 24"x12"	
SOUTH	M3-3 24"X 12"	
INTERSTATE TEXAS 35	M1-6F 24"x24"	
	M6-3 21"x15"	9

DETOUR	M4-8 24"x12"	
SOUTH	M3-3 24"X 12"	
INTERSTATE TEXAS 35	M1-6F 24"x24"	
	M6-3 21"x15"	10

END DETOUR	M4-8a 24"x18"	11

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PARSONS
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DETOUR LAYOUT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S SHEET 5 OF 6

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	17
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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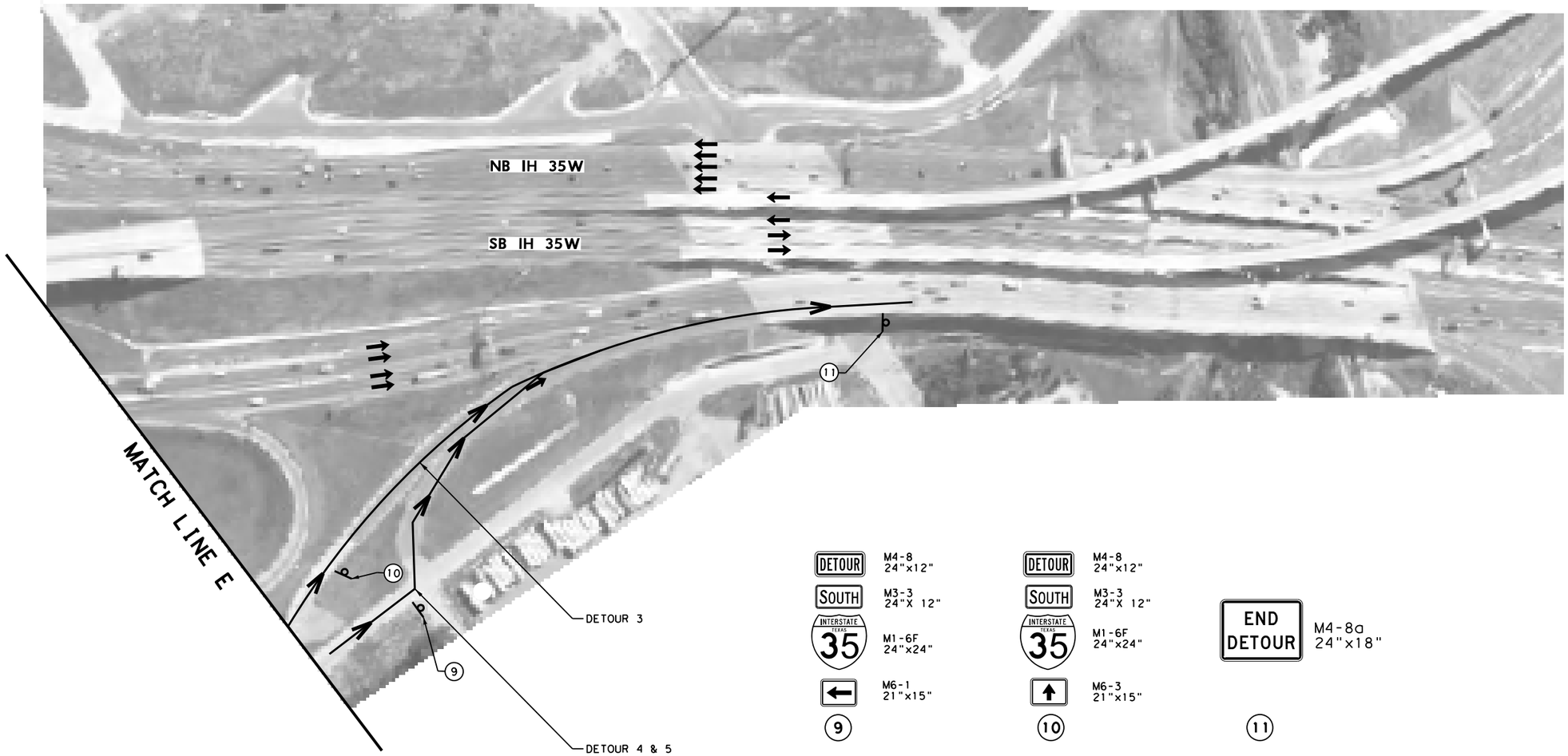

LEGEND:

- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- TYPE III BARRICADE
- SIGNS
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

DETOUR	M4-8 24"x12"	DETOUR	M4-8 24"x12"
SOUTH	M3-3 24"X 12"	SOUTH	M3-3 24"X 12"
INTERSTATE TEXAS 35	M1-6F 24"x24"	INTERSTATE TEXAS 35	M1-6F 24"x24"
←	M6-1 21"x15"	↑	M6-3 21"x15"
9		10	

END DETOUR M4-8a 24"x18"

11

DETOUR 3: IH 35W SOUTHBOUND TRAFFIC

1. TRAFFIC ON IH 35 W TURN RIGHT ON THE RAMP TO SPUR 347W.
2. STAY ON SPUR 347W.
3. TAKE U-TURN ON N HAMPTON ST.
4. TAKE LEFT TURN ON E WEATHERFORD ST.
5. TURN RIGHT ON THE RAMP TO IH 35W.

DETOUR 4: IH 35W SOUTHBOUND TRAFFIC (ADDITIONAL ROUTE OTHER THAN SH121 WB U-TURN)

1. TAKE PHARR ST EXIT, FOLLOW FRONTAGE ROAD WEST TO GILVIN STREET
2. TURN LEFT ON GILVIL STREET, SOUTH TO E. 1ST STREET.
3. TURN LEFT ON E. 1ST STREET/ ENTRANCE RAMP TO SB IH 35W

DETOUR 5: US 377 TO IH 35W SOUTHBOUND TRAFFIC

1. STAY ON US 377 / FRONTAGE ROAD NORTH TO PHARR STREET.
2. TURN LEFT ON PHARR STREET, WEST TO GILVIN STREET.
3. TURN LEFT ON GILVIN STREET, SOUTH TO E. 1ST STREET.
4. TURN LEFT ON E. 1ST STREET / ENTRANCE RAMP TO SB IH 35W.

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6/26/2024

PARSONS
TBPE Registration No. F-1481

DETOUR LAYOUT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S SHEET 6 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	18
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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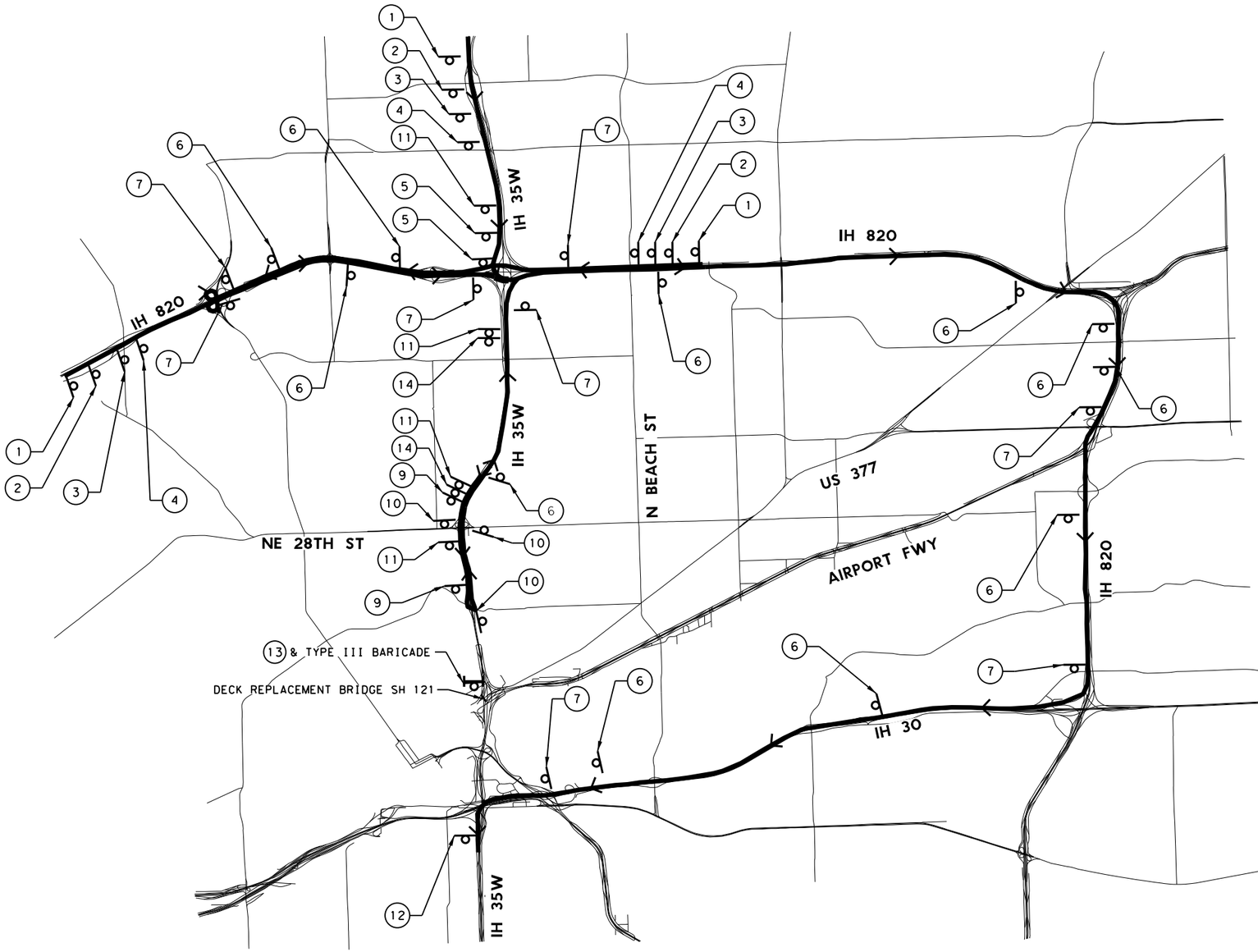
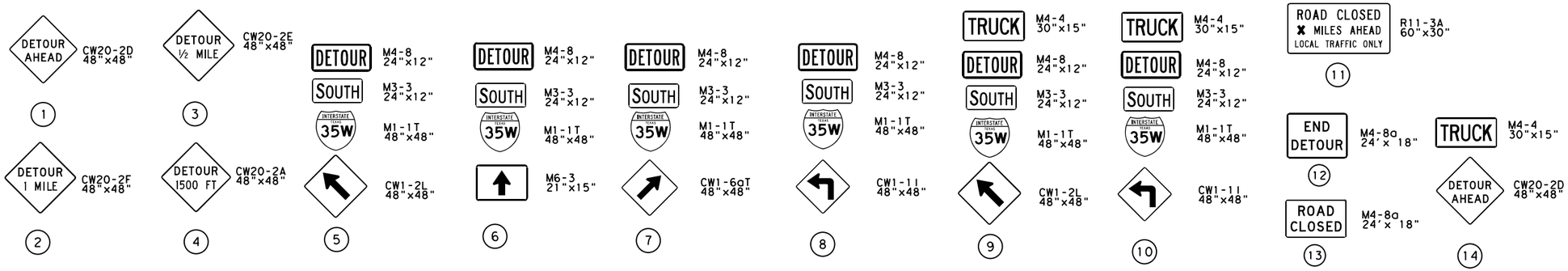


NOT TO SCALE

LEGEND:

- DETOUR ROUTE
- SIGNS
- (#) SIGN NUMBER
- TYPE III BARRICADE



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DETOUR LAYOUT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S SHEET 7 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	19
CONTROL	SECTION	JOB	
0081	01	053,ETC	

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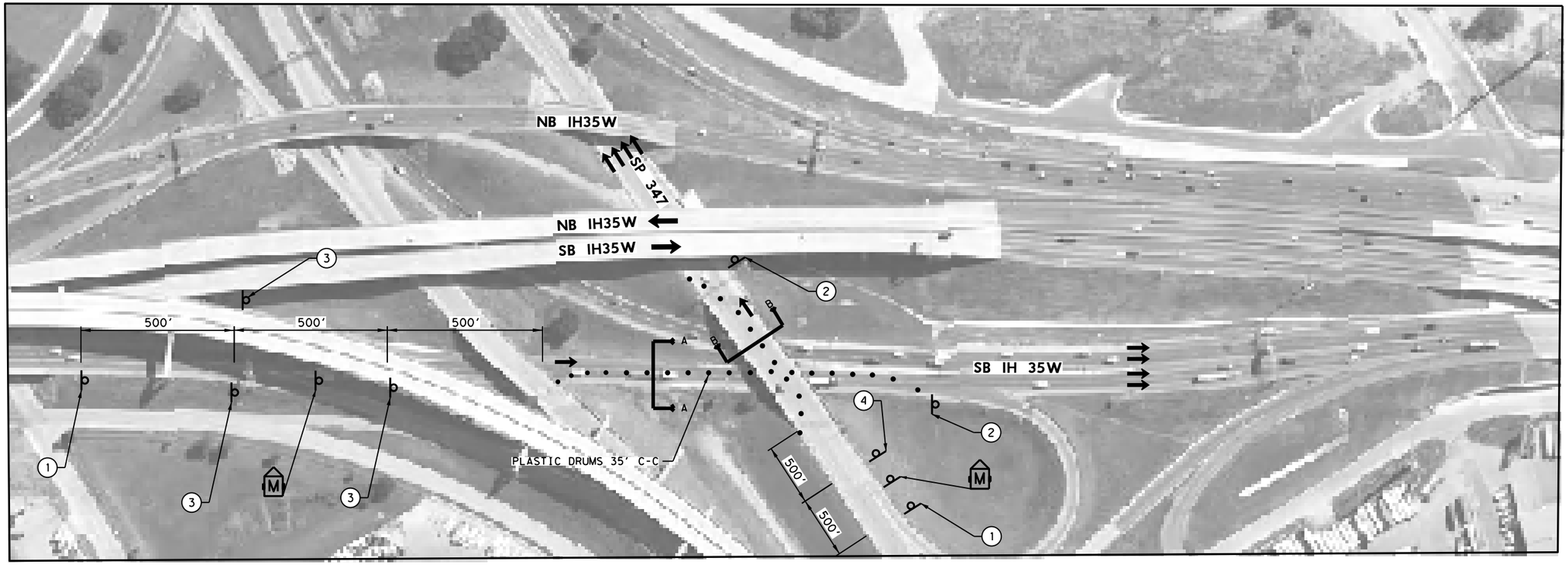


LEGEND:

- TRAFFIC FLOW
- SIGNS
- CONE, DRUM, OR CTB (SEE BC STANDARDS)
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

NOTES

- NIGHTTIME OPERATIONS REFER TO GENERAL NOTES FOR NIGHTTIME LIGHTING REQUIREMENTS.
- FOR THE REPAIR OF THE BRIDGE BEAMS,CONTRACTOR MUST RESTRICT SIMULTANEOUS TRAFFIC TO ONE LANE AT THE TOP OF THE BRIDGE.
- CONTRACTOR SHALL CO-ORDINATE WITH AREA OFFICE PRIOR TO COMMENCING WORK.
- CONTRACTOR SHALL FOLLOW TXDOT STANDARD TCP (2-6)-18 FOR REQUIRED SIGNAGE AND LANE MARKINGS FOR LANE CLOUSRE OPERATION IN THE ROADWAYS.
- LANE CLOSURE WILL DEPEND ON THE LOCATION OF THE WORKSPACE. CONTRACTOR SHALL IDENTIFY THE LOCATION OF WORKSPACE AND ADJUST THE LANE CLOSURE AS PER FIELD CONDITION.

CW20-1D
30"x30"

1

G20-2
36"x18"

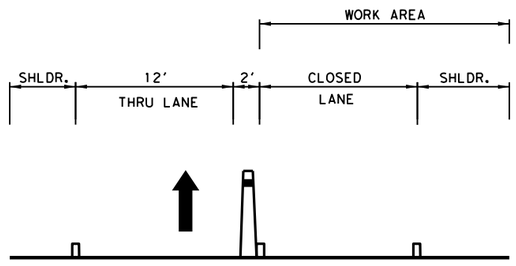
2

CW20-5DR
30"x30"

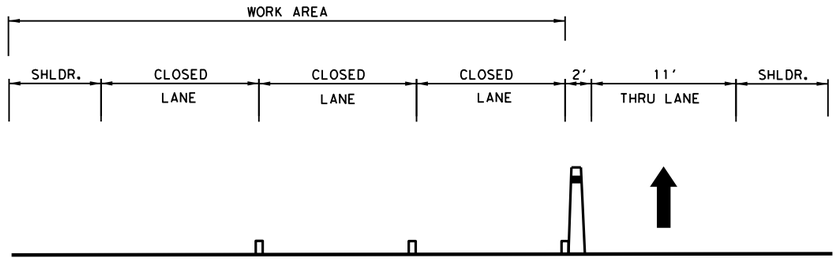
3

CW20-5DR
30"x30"

4



TYPICAL SECTION A-A
SB IH 35W
N.T.S



TYPICAL SECTION B-B
NB TX 121
N.T.S

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
6/26/2024

Texas Department of Transportation
© 2024

PARSONS
TBPE Registration No. F-1481

TRAFFIC CONTROL PLAN
IH 35W SB UNDERPASS
AT SPUR 347 EB

SCALE: N.T.S

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	20
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
FILENAME: c:\pw*working\texas\parsons*p0092151\d0268180\CEC*Assign4*TCP*N08.dgn

DATE: 6/26/2024 9:52:05 AM
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

SHEET 1 OF 12

Texas Department of Transportation

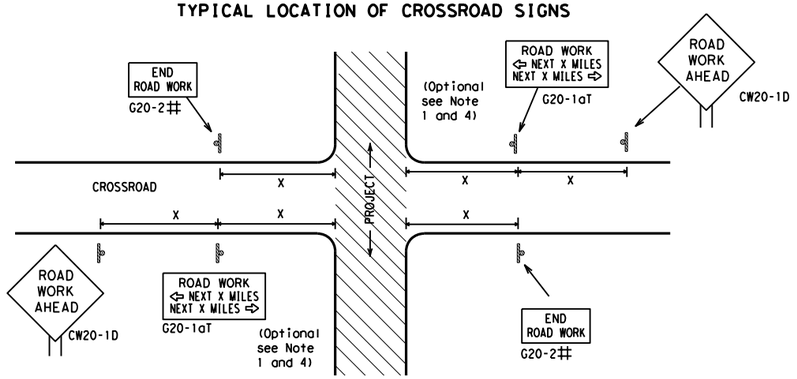
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	FTW	TARRANT		21
5-10 5-21				

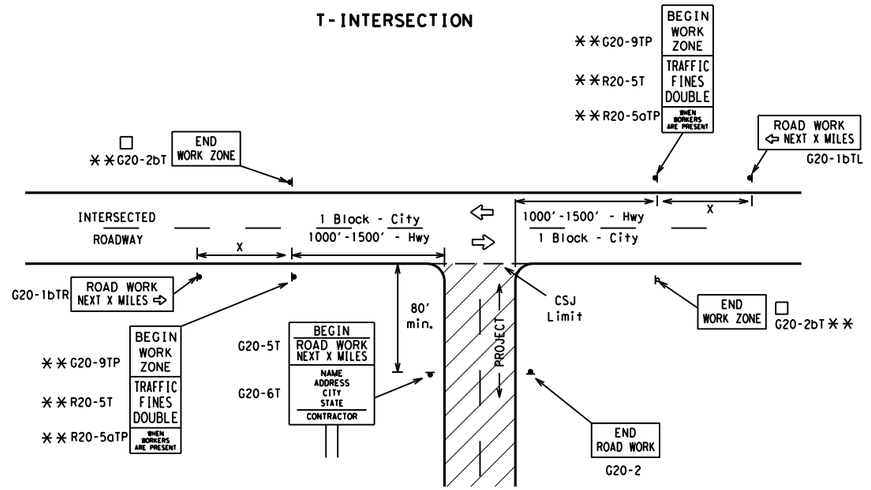
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

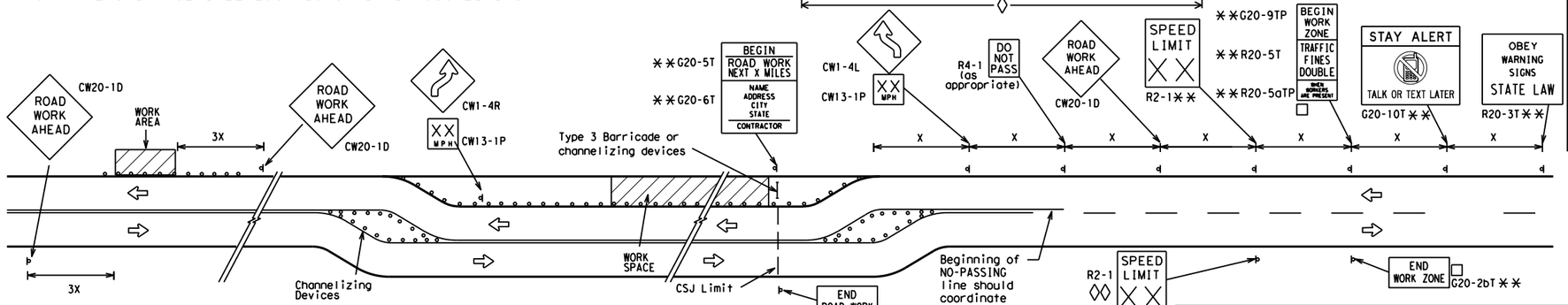
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

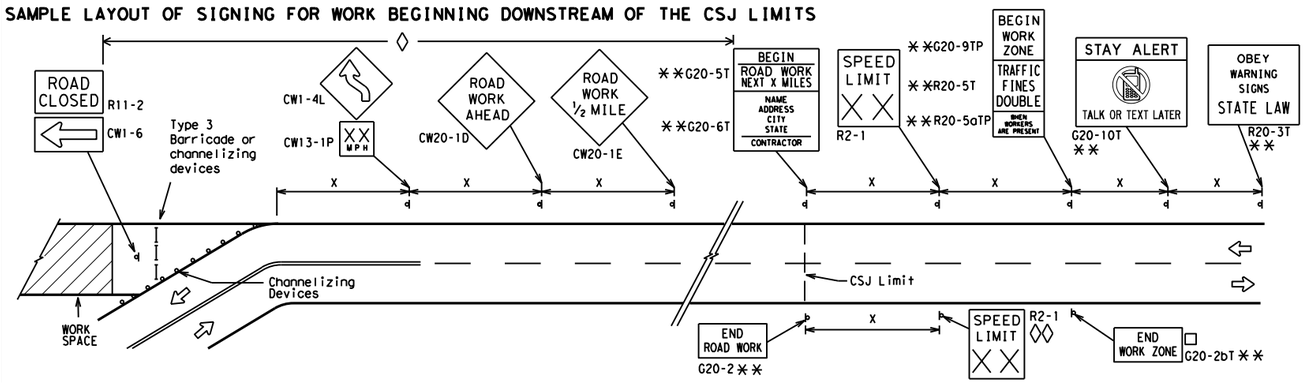
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.

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

◊◊ Contractor will install a regulatory speed limit sign at the end of the work zone.

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		22

DATE: 6/26/2024 9:52:05 AM
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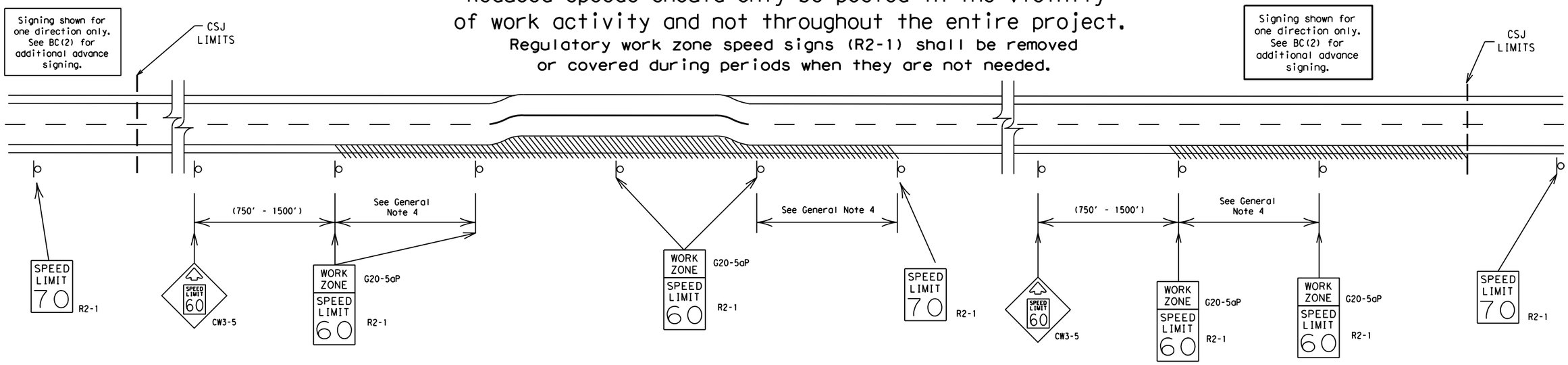
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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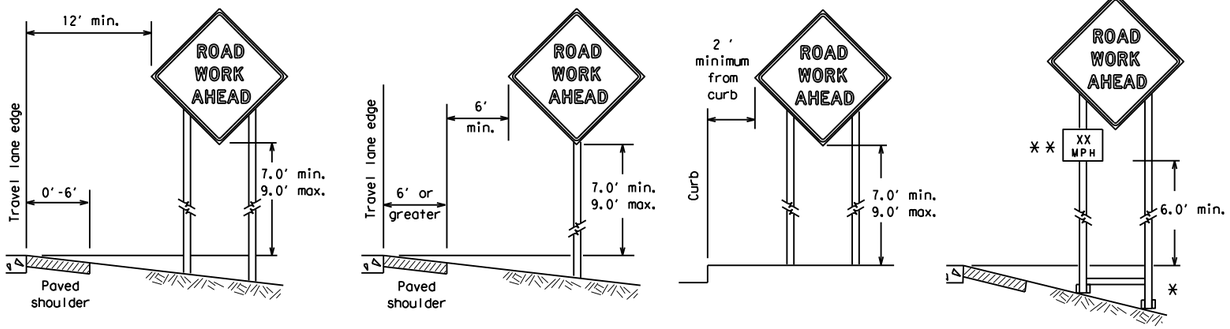
REVISIONS	0081	01	053,ETC	SS347, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		23

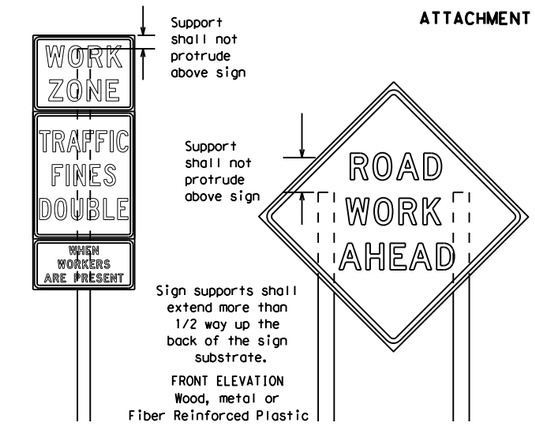
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



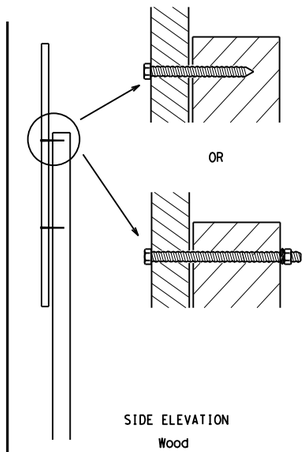
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



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

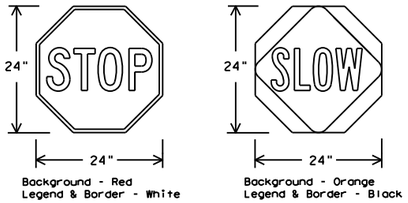


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

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BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0081	01	053,ETC	SS347, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		24

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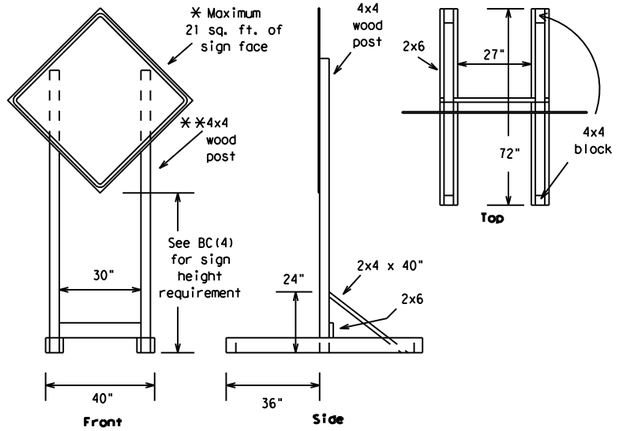
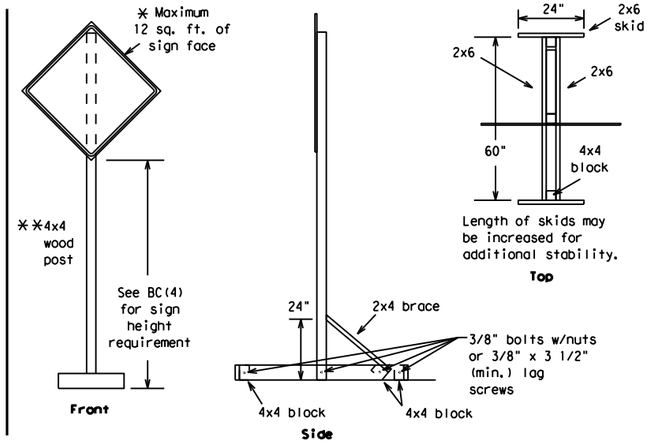
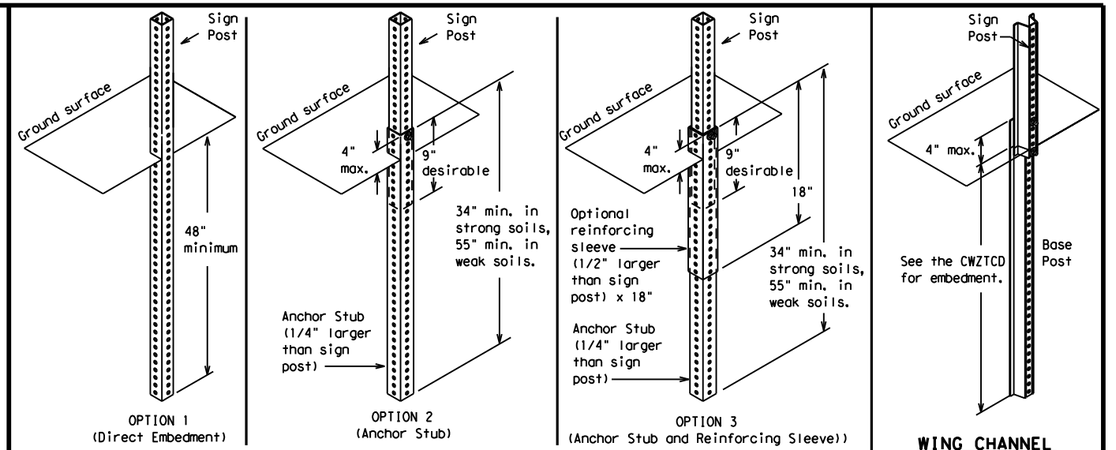




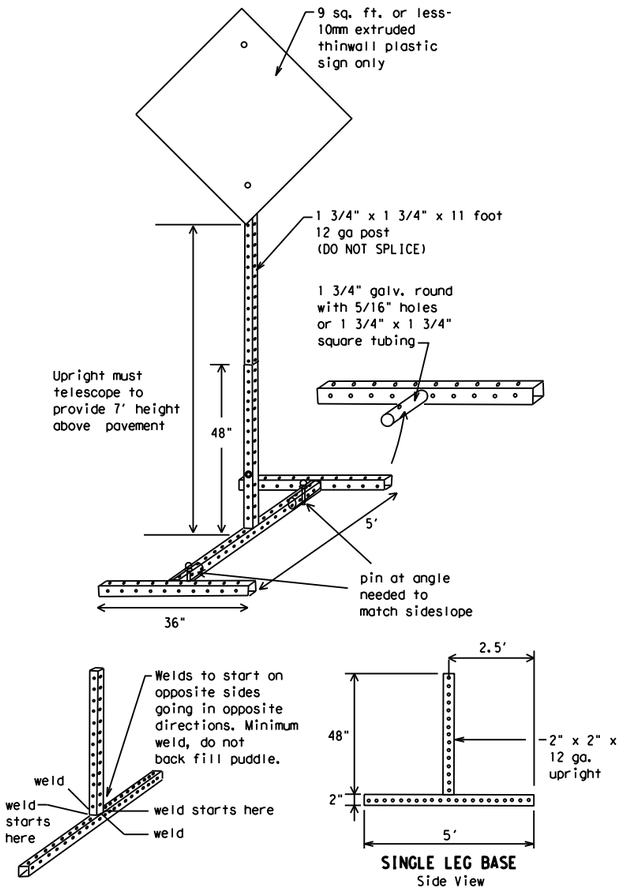
SKID MOUNTED WOOD SIGN SUPPORTS

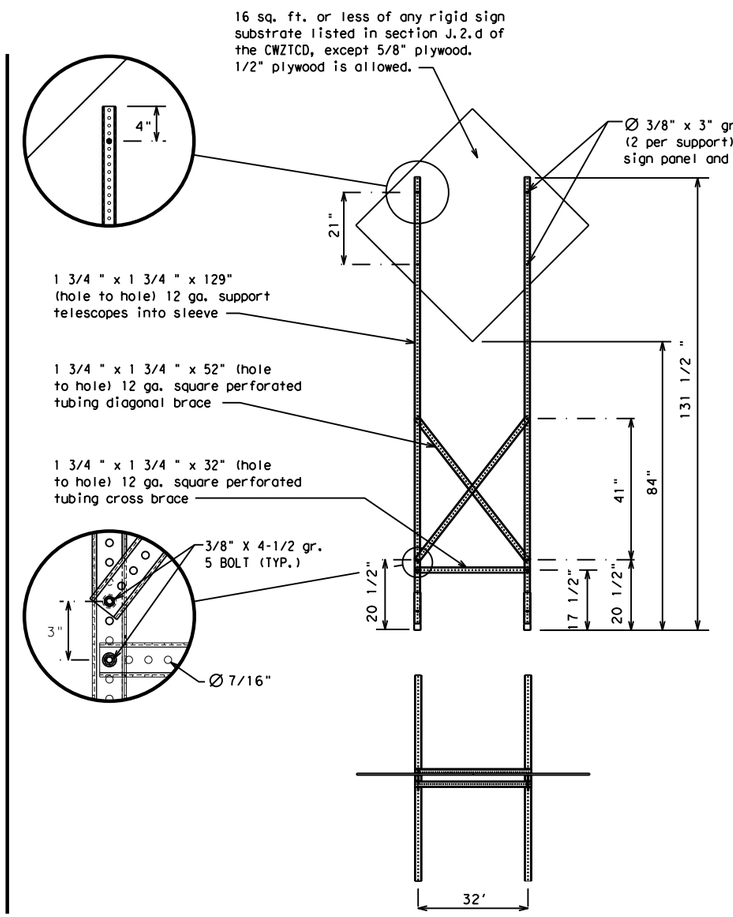
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

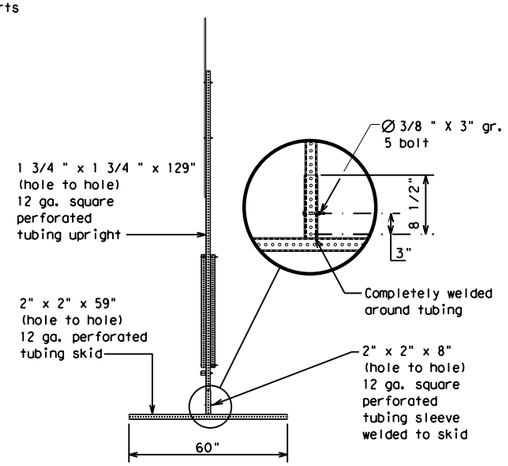


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		25

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
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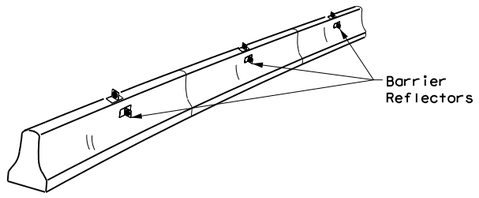
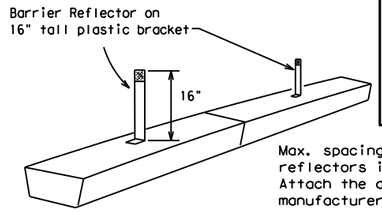
100

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



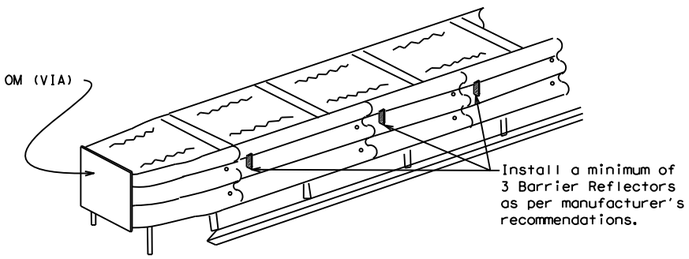
CONCRETE TRAFFIC BARRIER (CTB)

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



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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

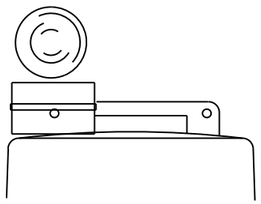
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

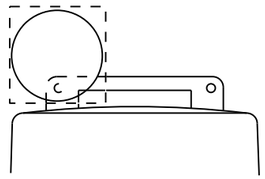
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

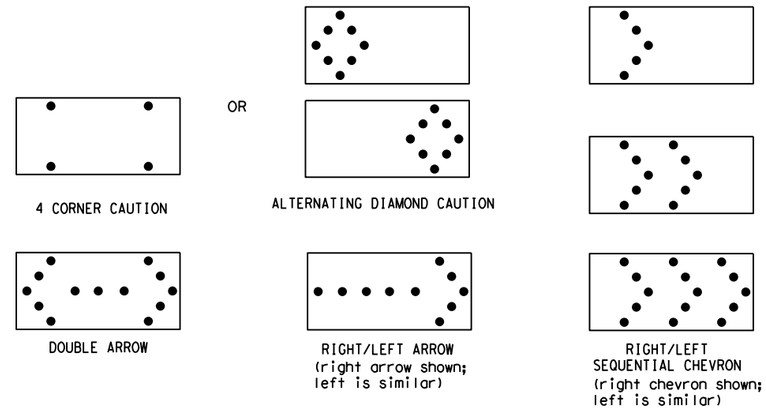
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		27

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

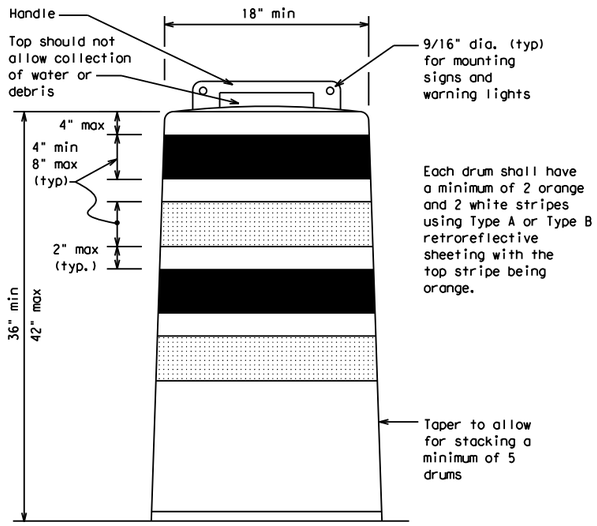
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

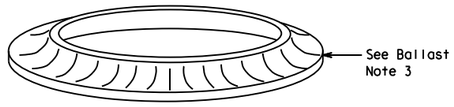
RETROREFLECTIVE SHEETING

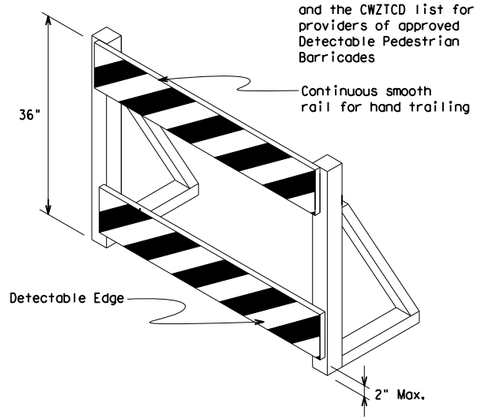
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

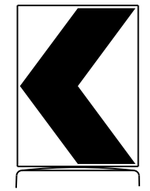




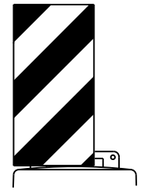


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
4-03 8-14	DIST	COUNTY		SHEET NO.
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7-13				

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DATE: 6/26/2024 9:52:07 AM
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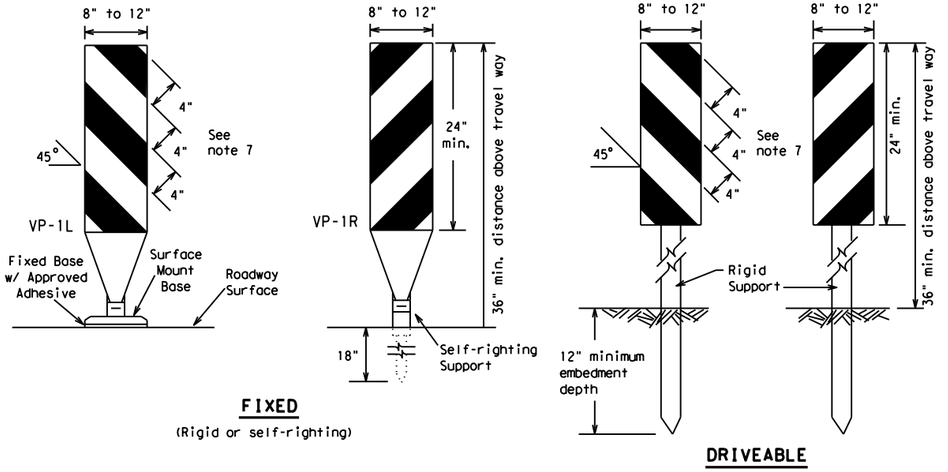
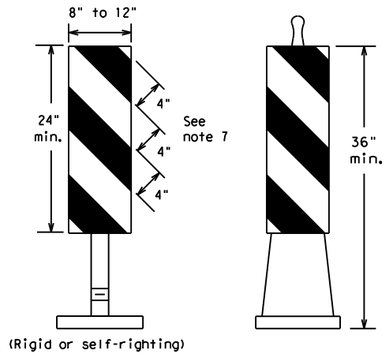


FIXED
(Rigid or self-righting)

DRIVEABLE

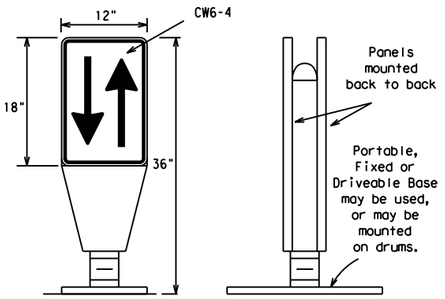


(Rigid or self-righting)

PORTABLE

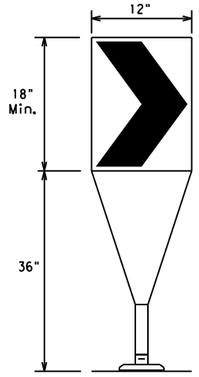
VERTICAL PANELS (VPs)

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



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



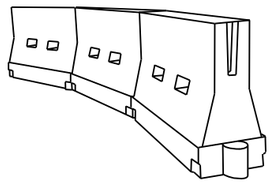
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0081	01	053,ETC	SS347, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
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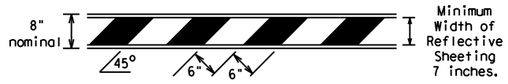
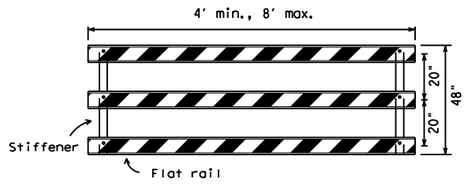
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



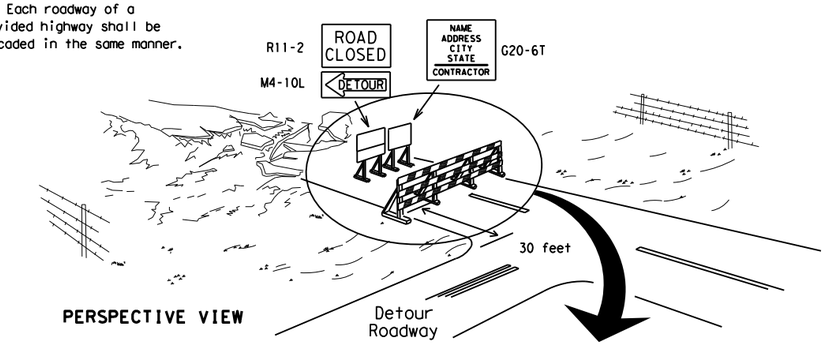
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

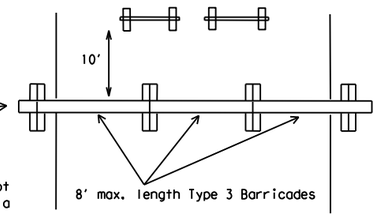
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

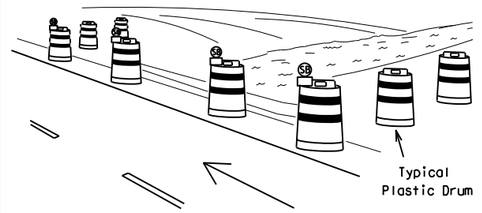
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

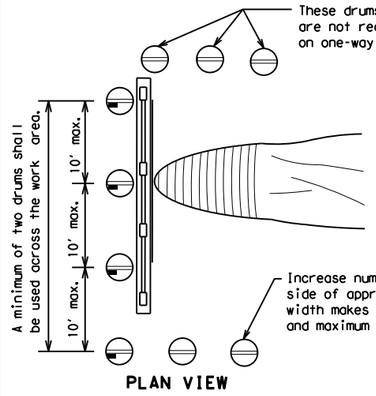
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

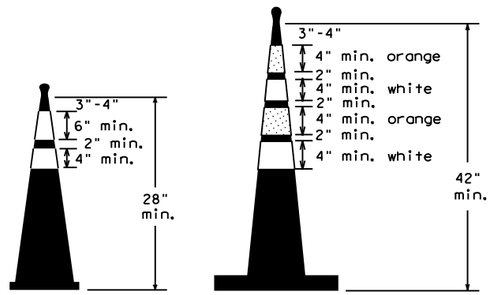
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



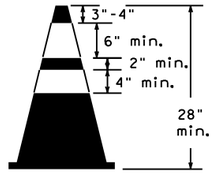
PLAN VIEW

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

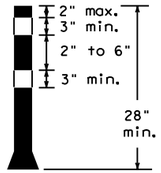
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

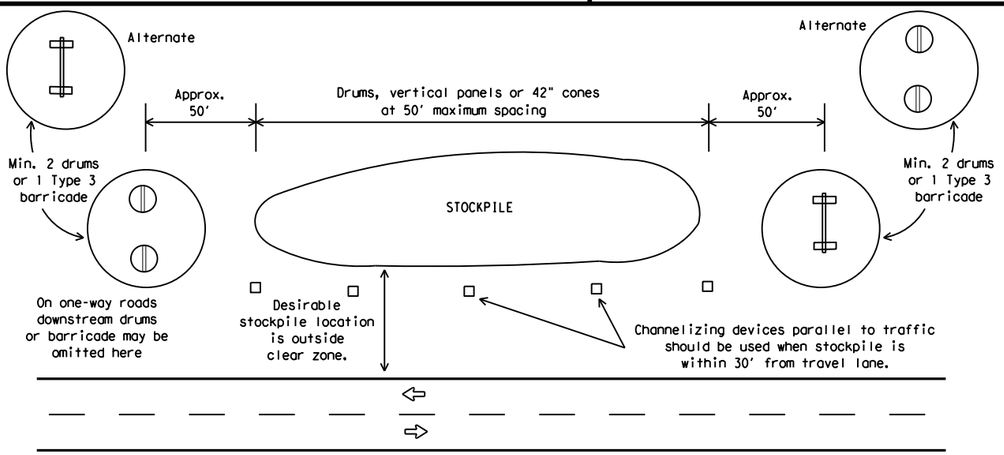


Tubular Marker

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

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

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 9-07 8-14 7-13 5-21	0081	01	053,ETC	SS347, ETC
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	FTW	TARRANT		30

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

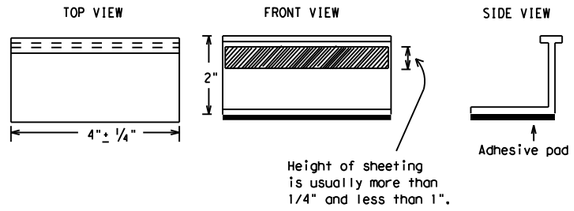
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 2-98 9-07 5-21	0081	01	053,ETC	SS347, ETC
1-02 7-13	DIST	COUNTY		SHEET NO.
11-02 8-14	FTW	TARRANT		31

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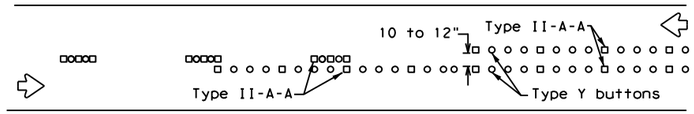
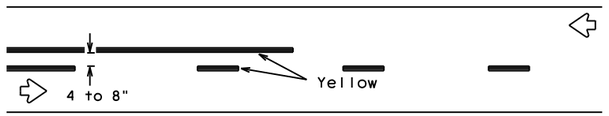
PAVEMENT MARKING PATTERNS

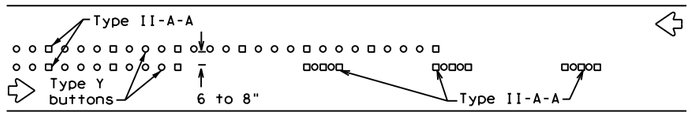
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



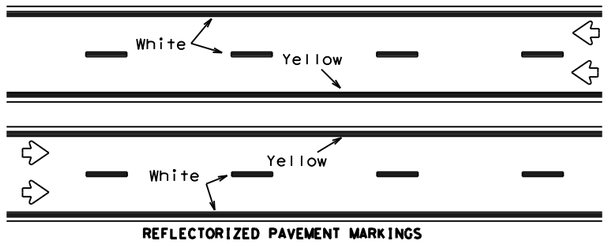
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



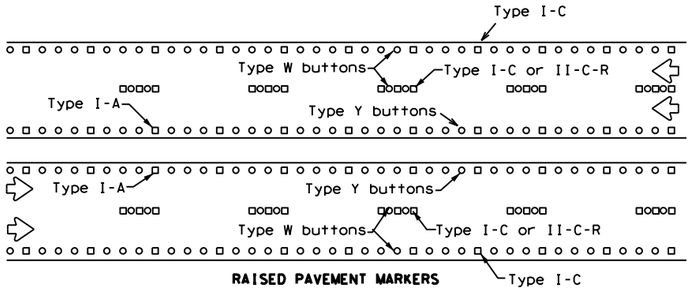
RAISED PAVEMENT MARKERS - PATTERN B

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

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



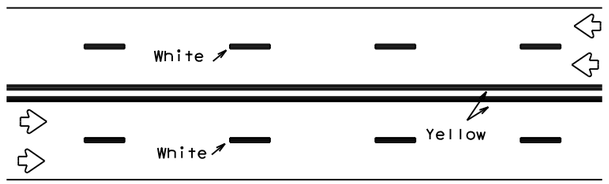
REFLECTORIZED PAVEMENT MARKINGS



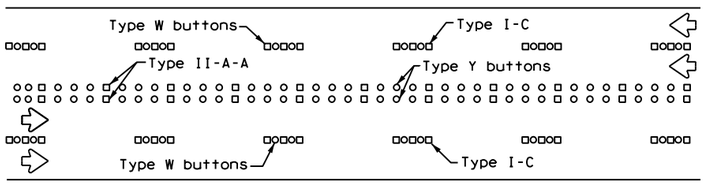
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



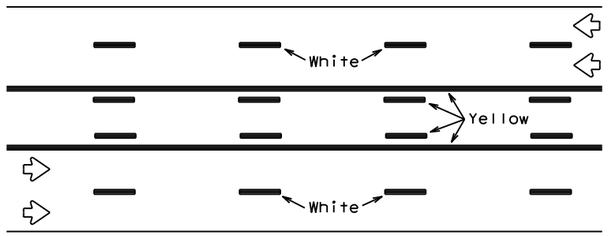
REFLECTORIZED PAVEMENT MARKINGS



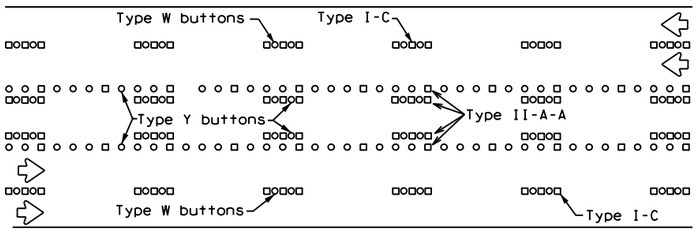
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

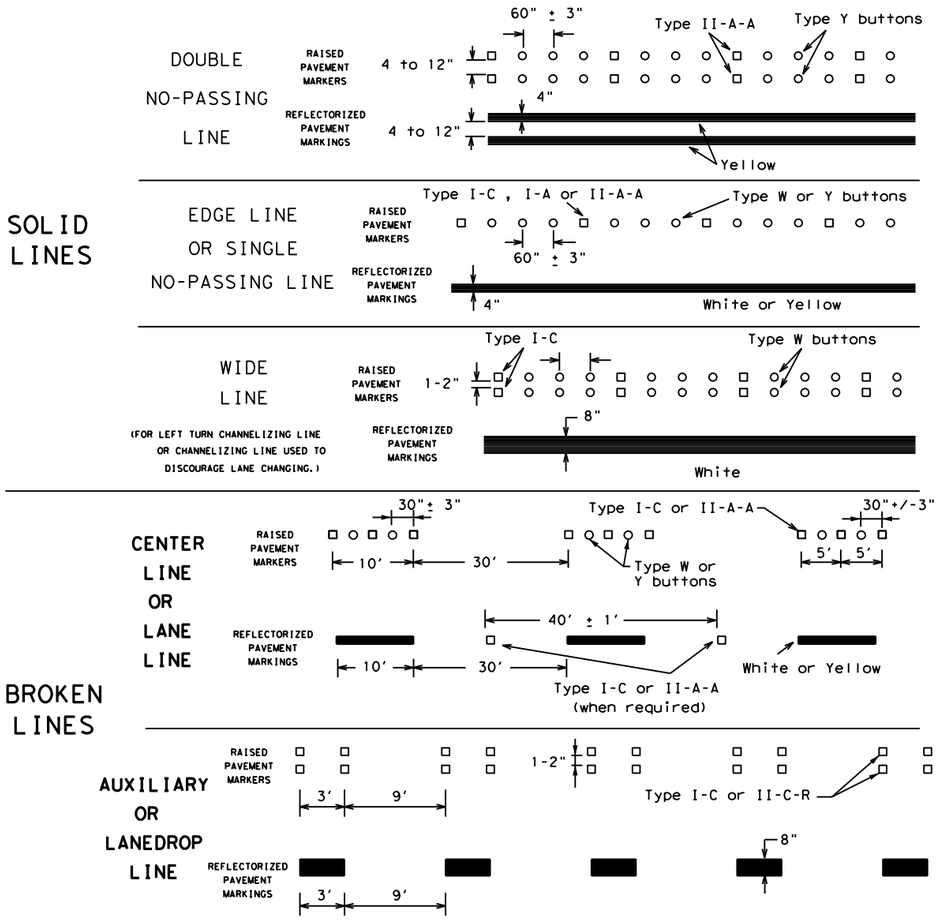


RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

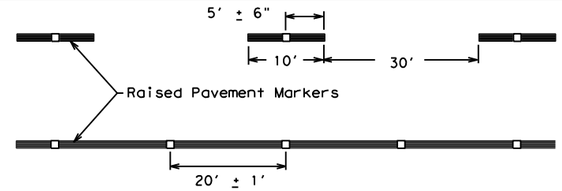
TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		32

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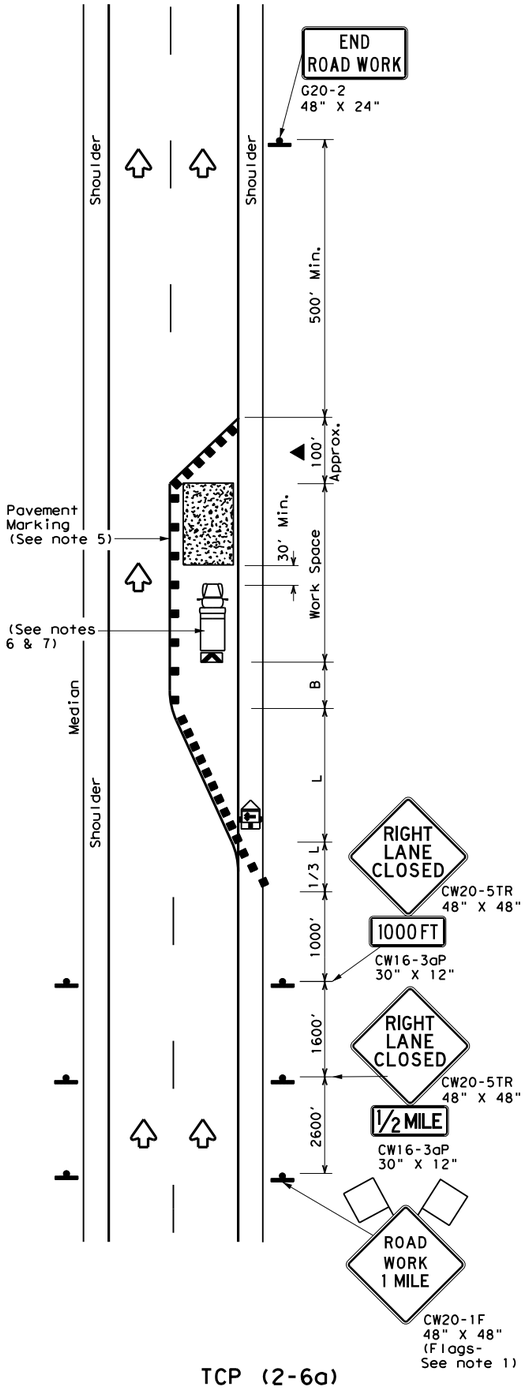
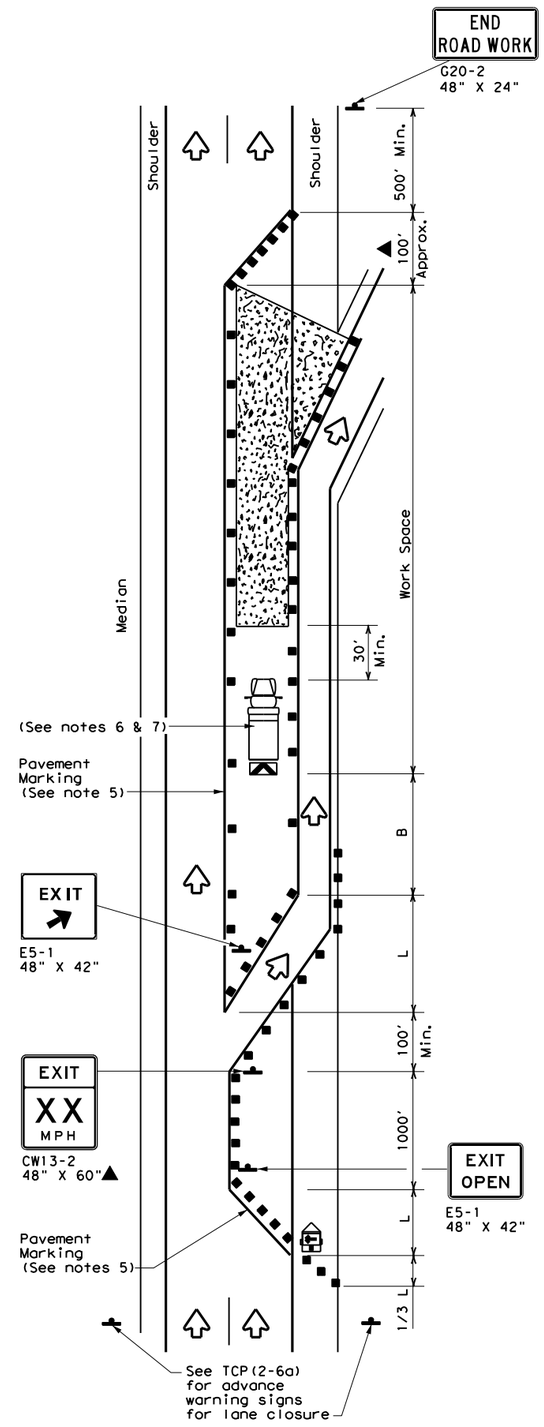


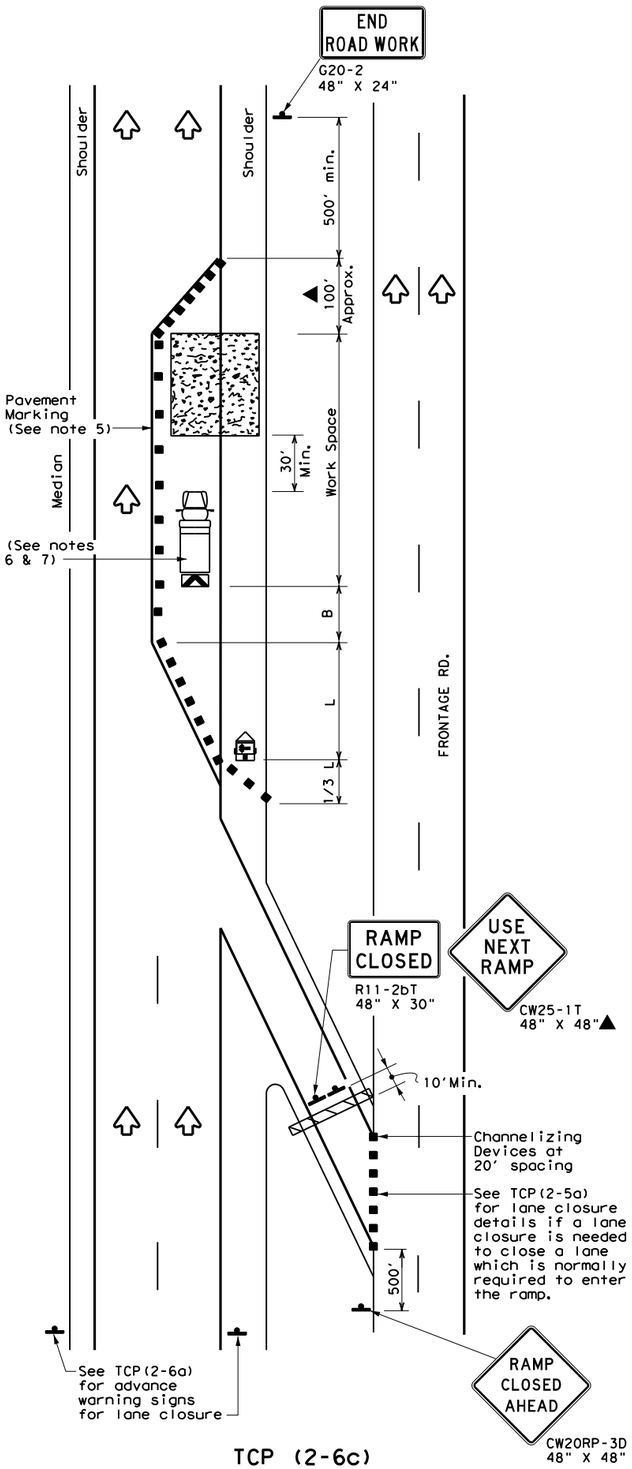
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on everyother channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
5. The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
6. 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.
7. 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

TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
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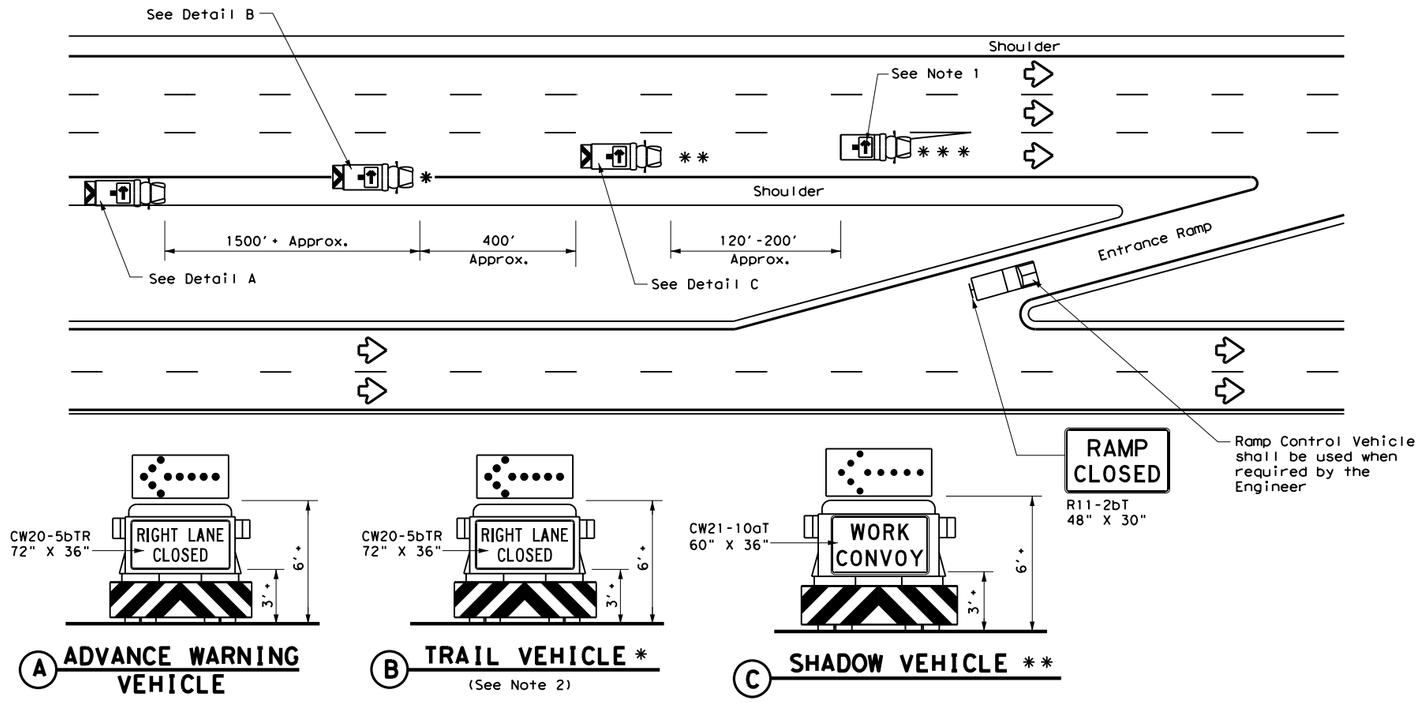
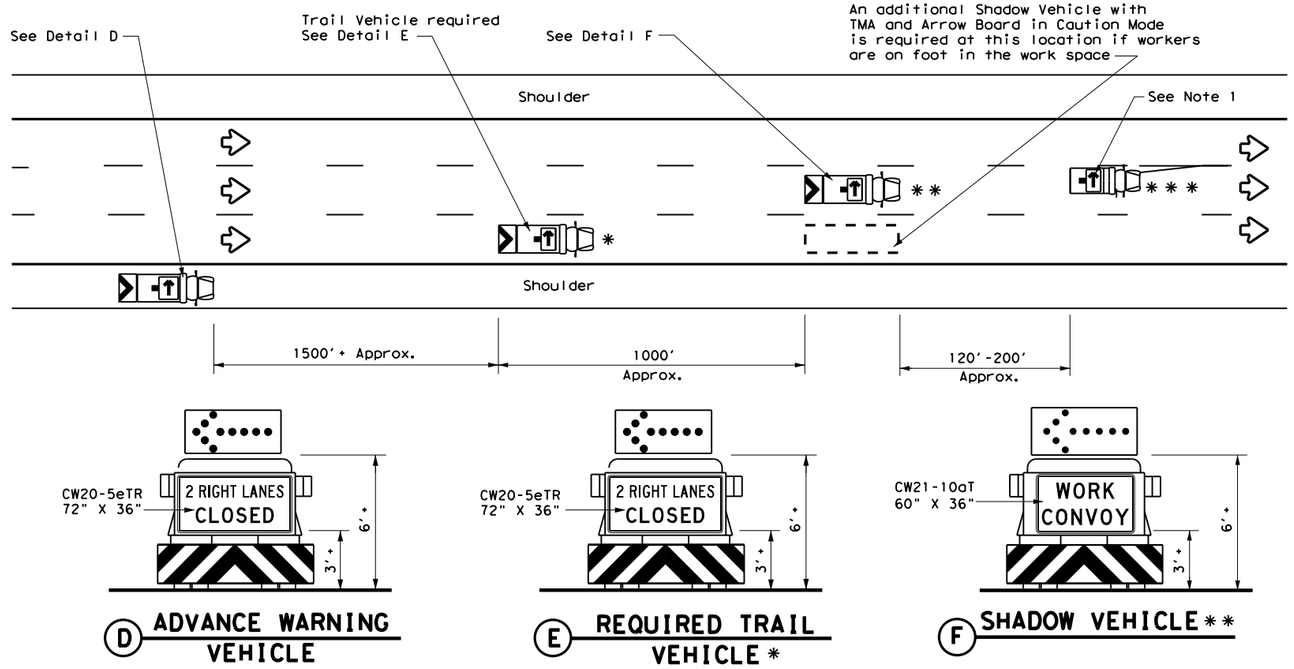
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		33



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



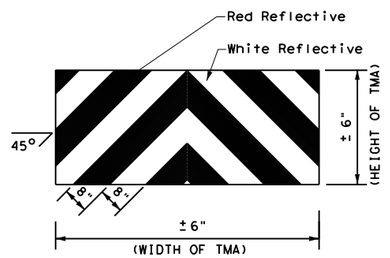
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

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	FTW	TARRANT		34

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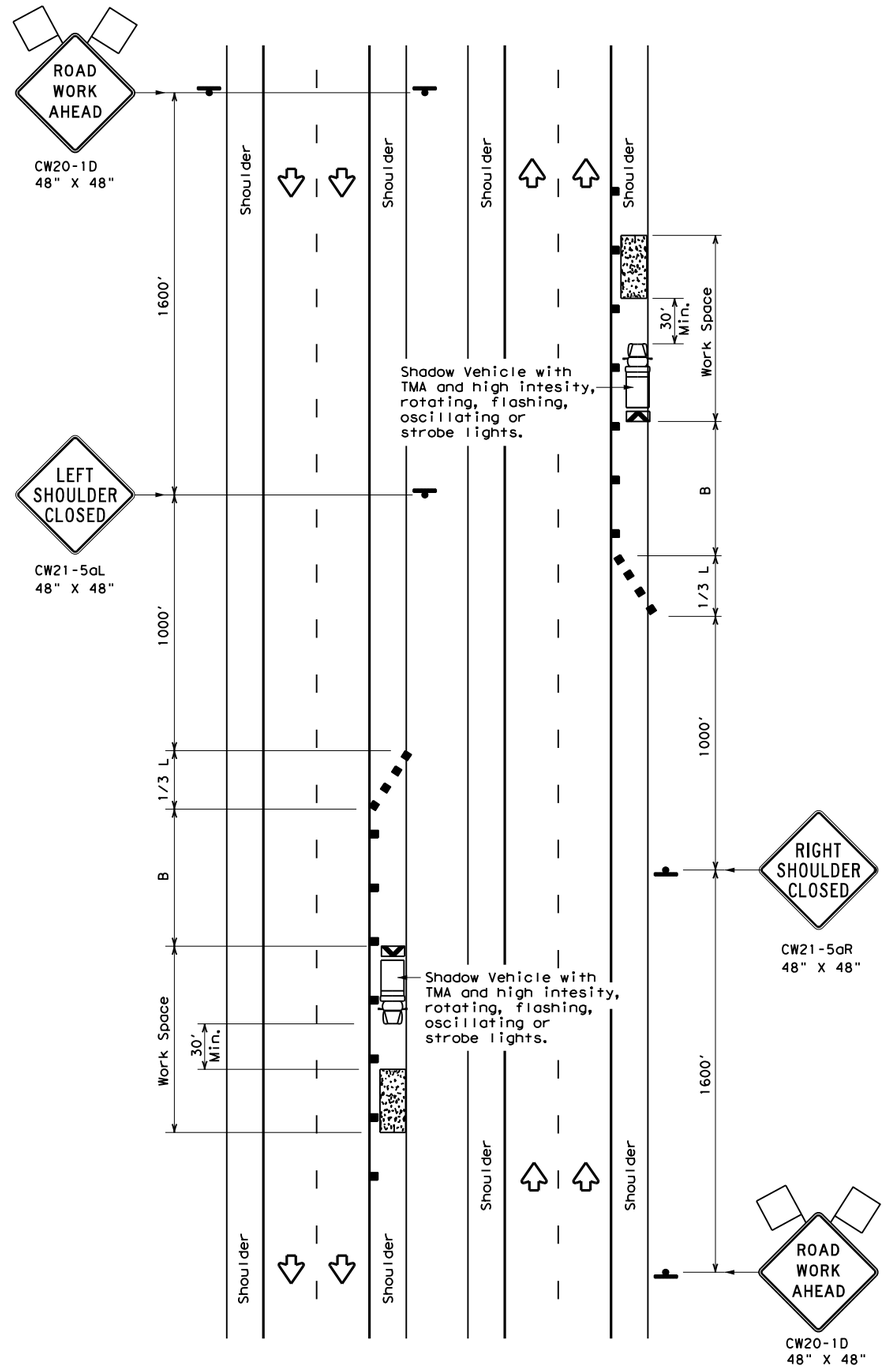
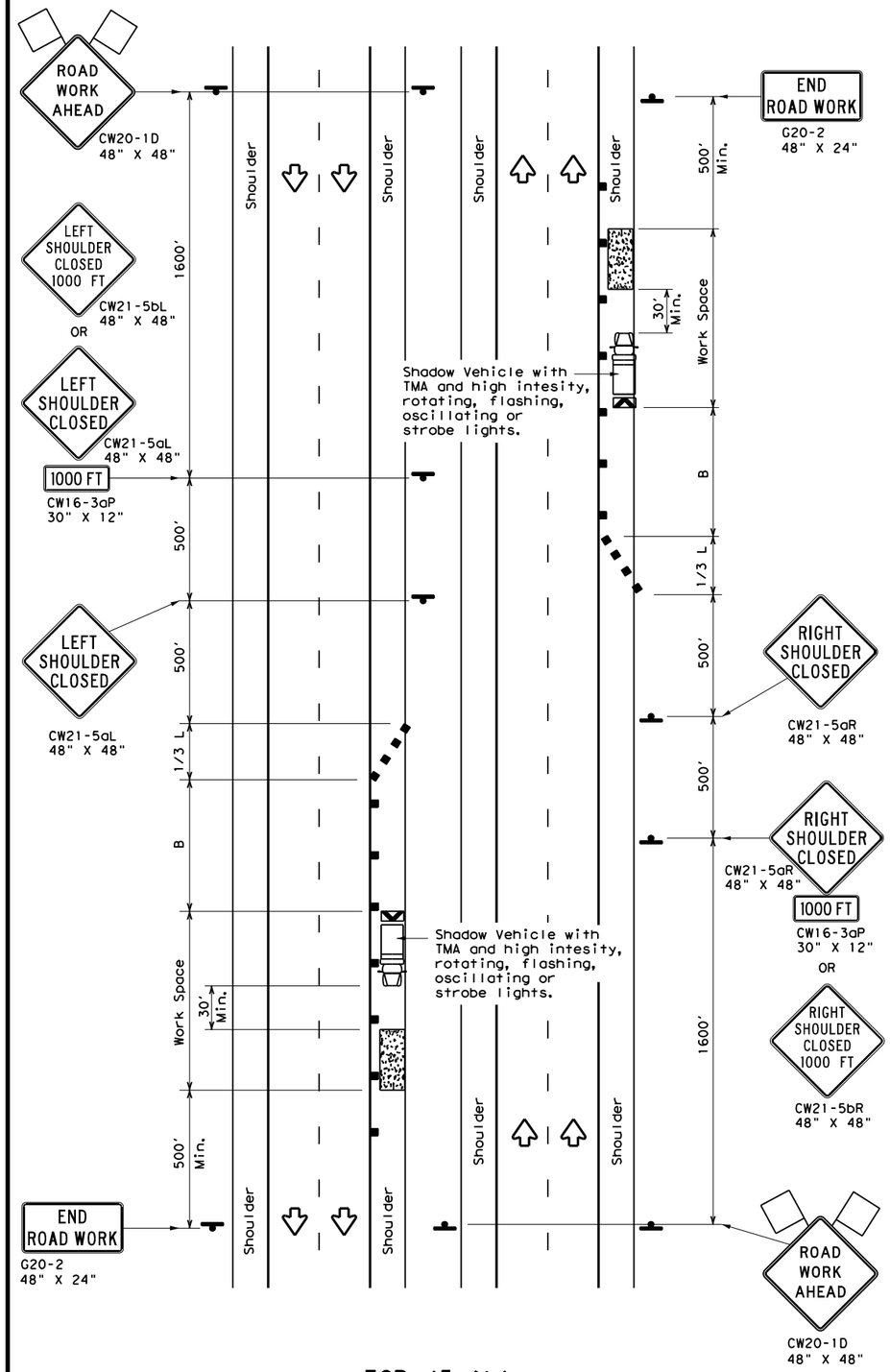


TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

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

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

* Conventional Roads Only

** Taper lengths have been rounded off.

L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		35

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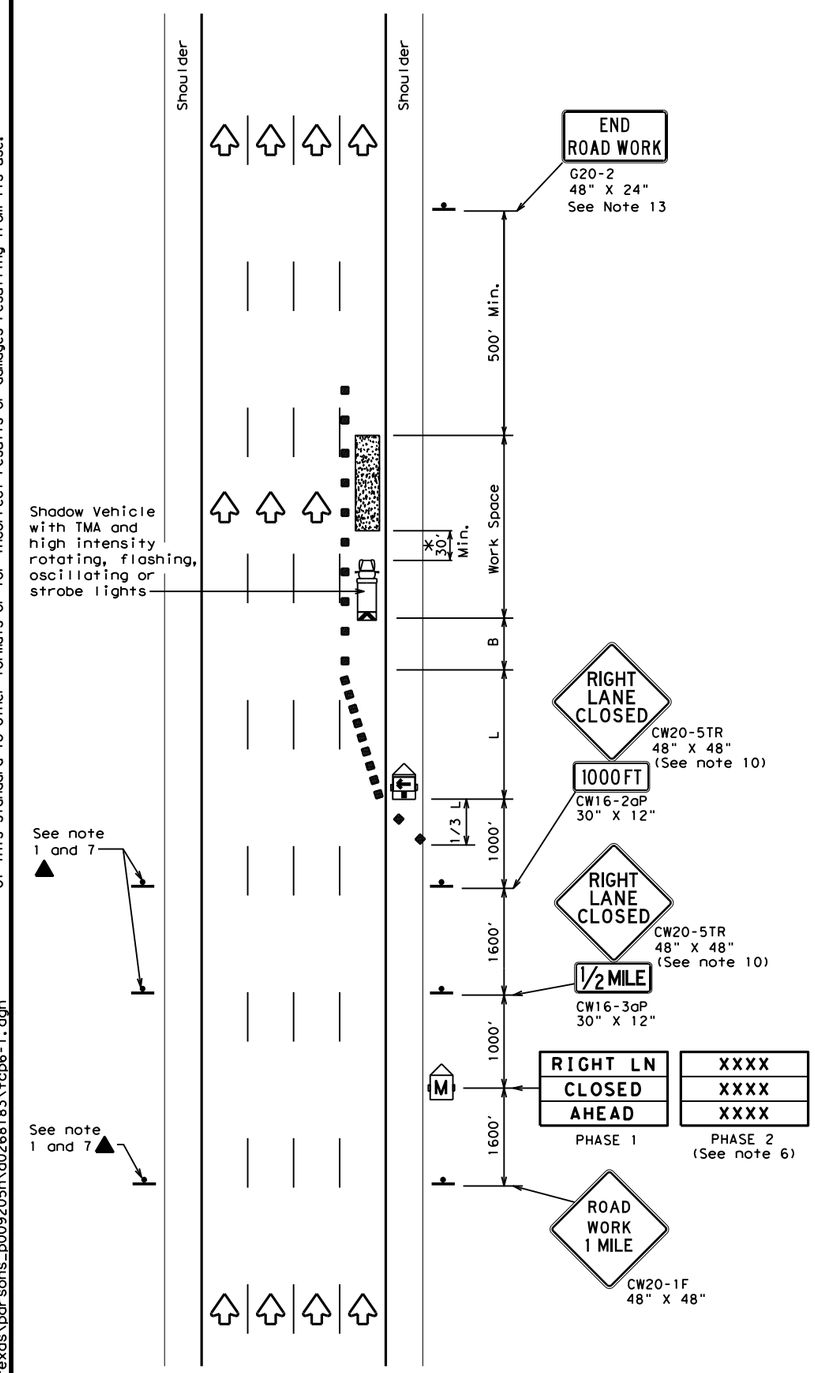
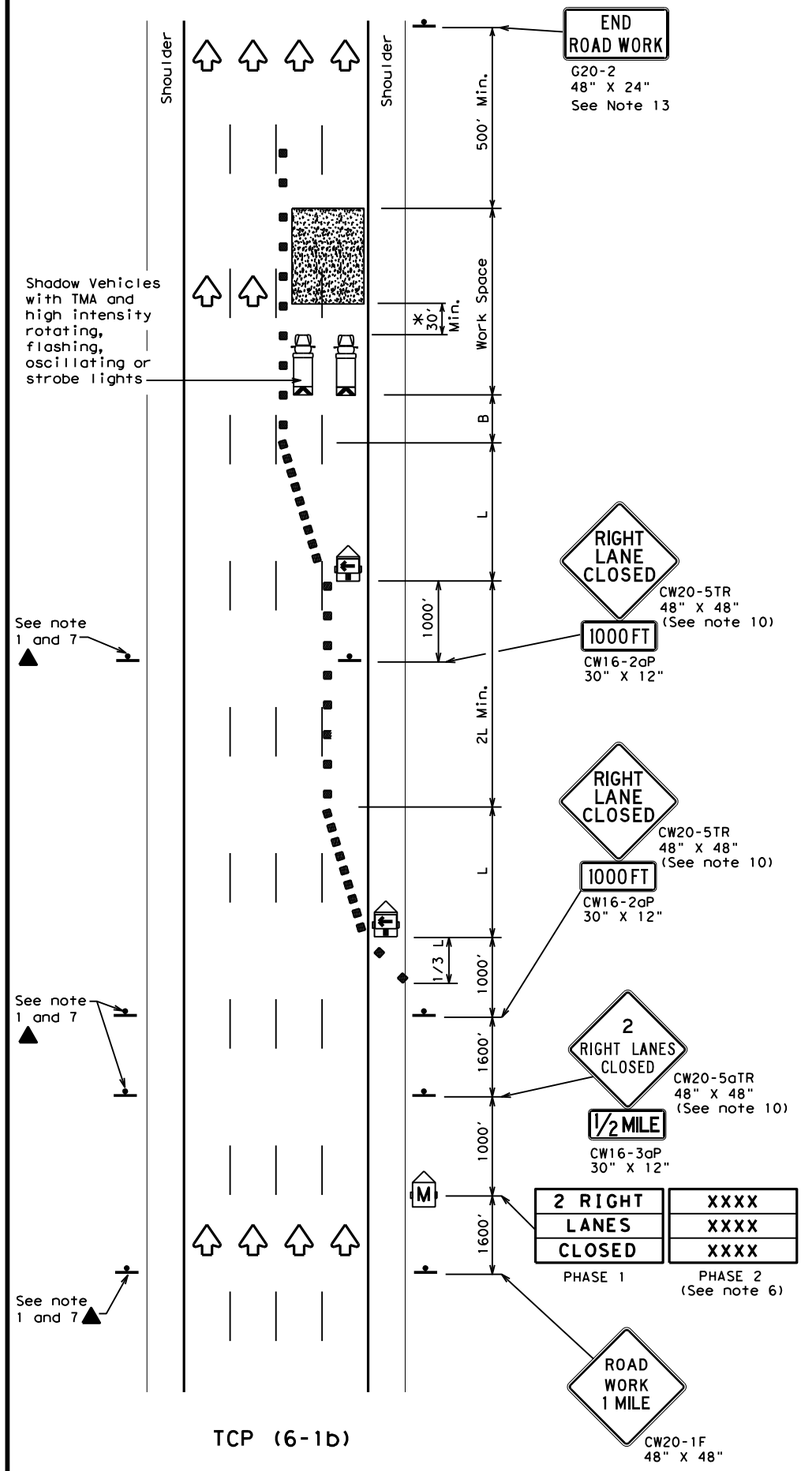


TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

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

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

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

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

GENERAL NOTES

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-12	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		36

201

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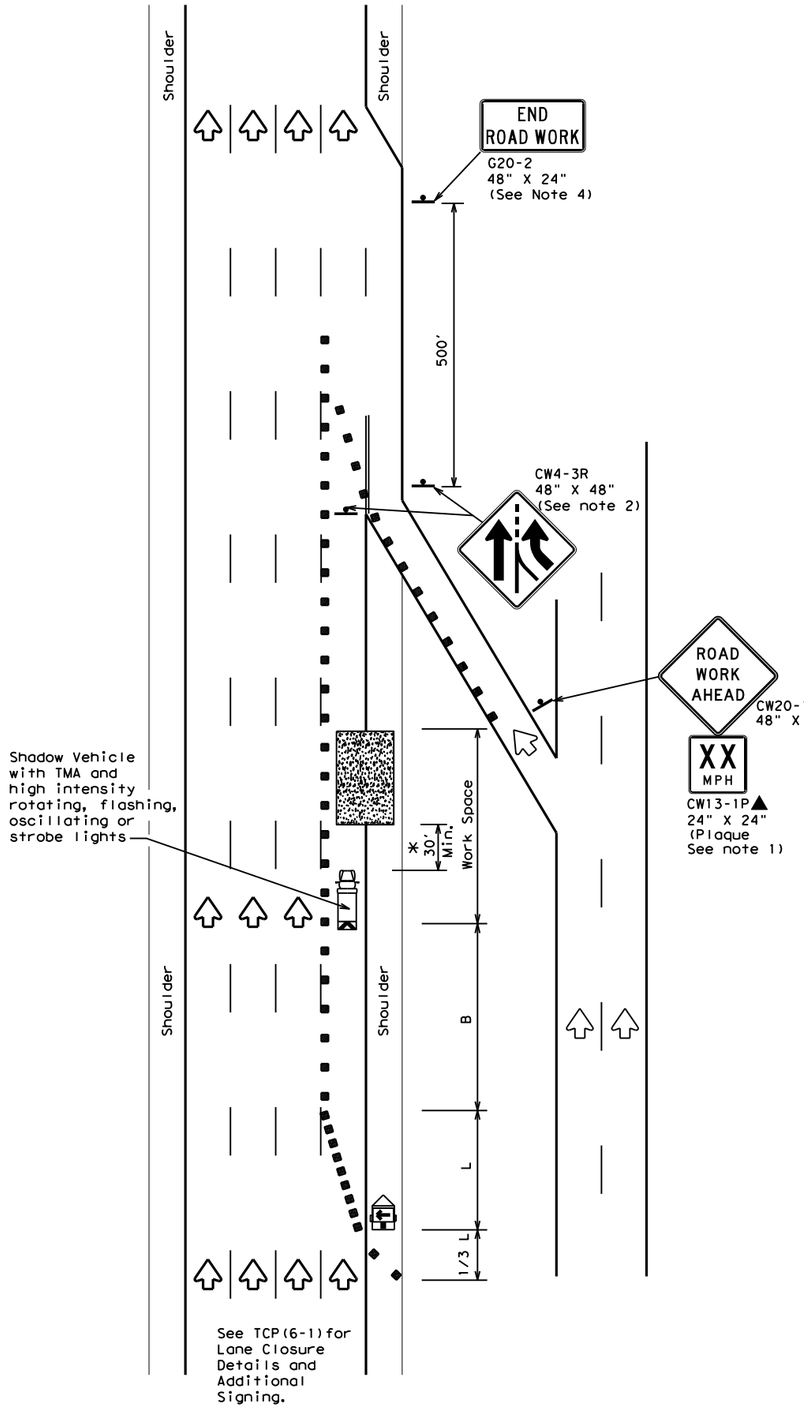
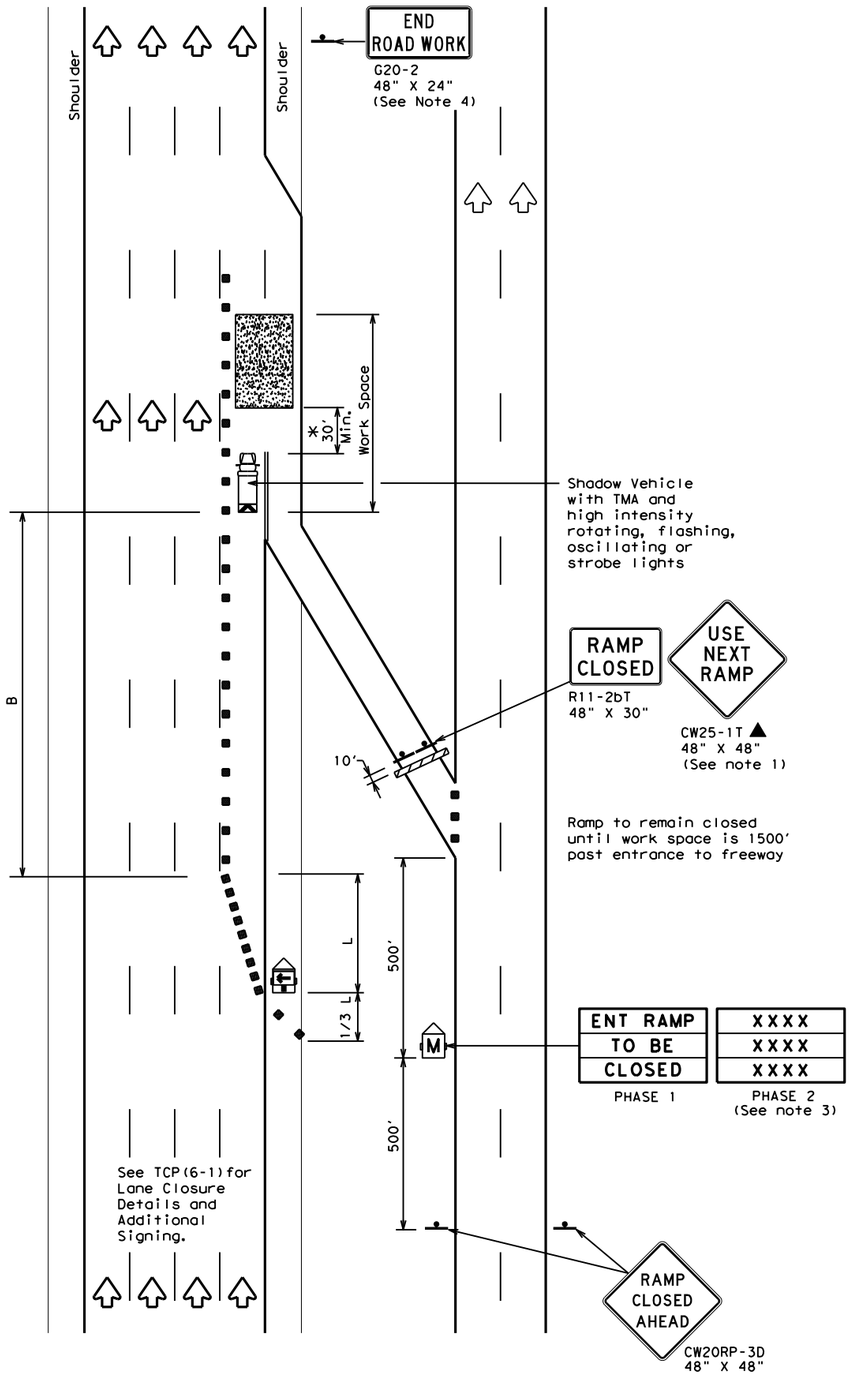


TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

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

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

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

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

GENERAL NOTES

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

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©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	FTW	TARRANT		37

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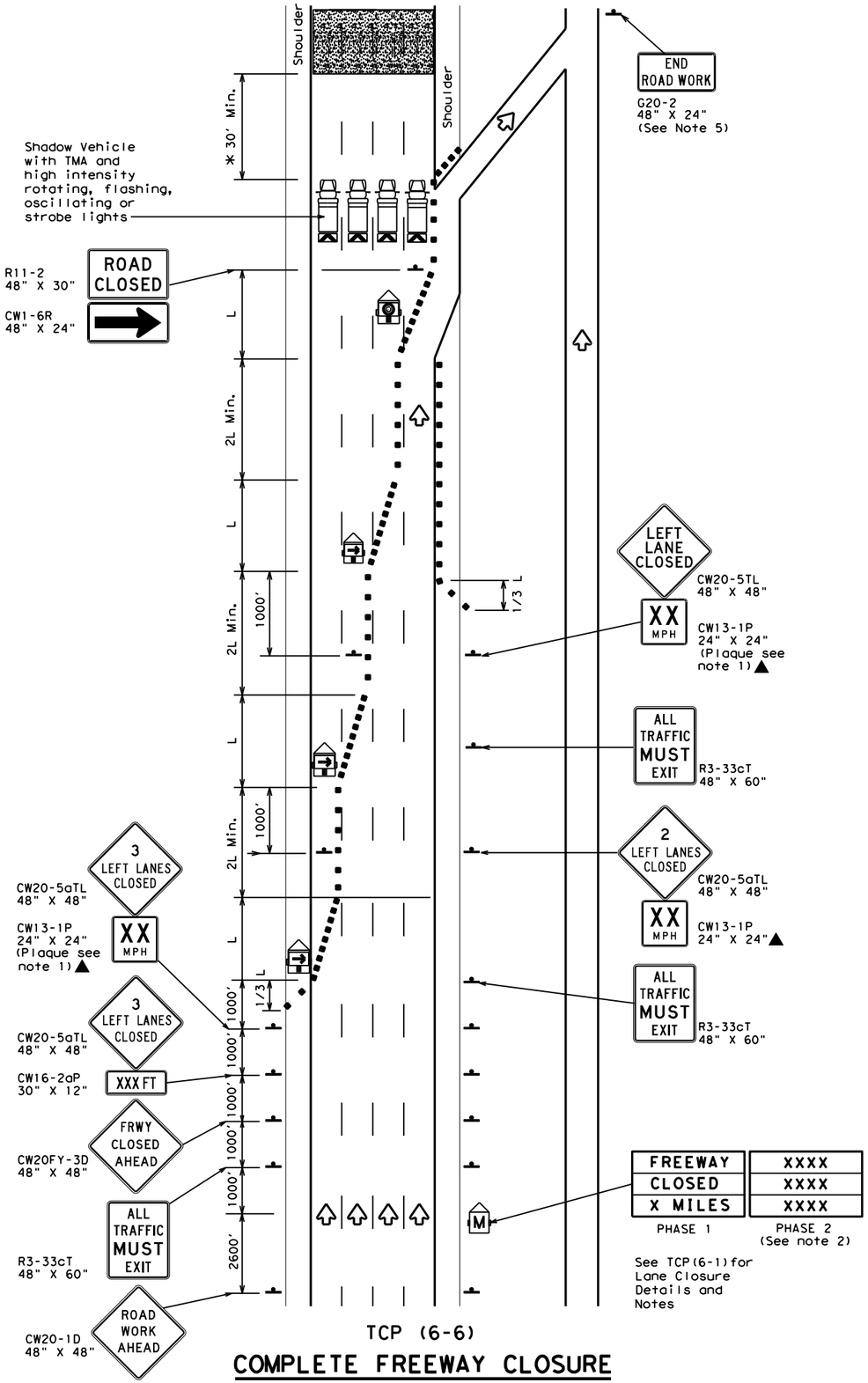


TCP (6-6)

COMPLETE FREEWAY CLOSURE

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

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

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

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

GENERAL NOTES

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

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

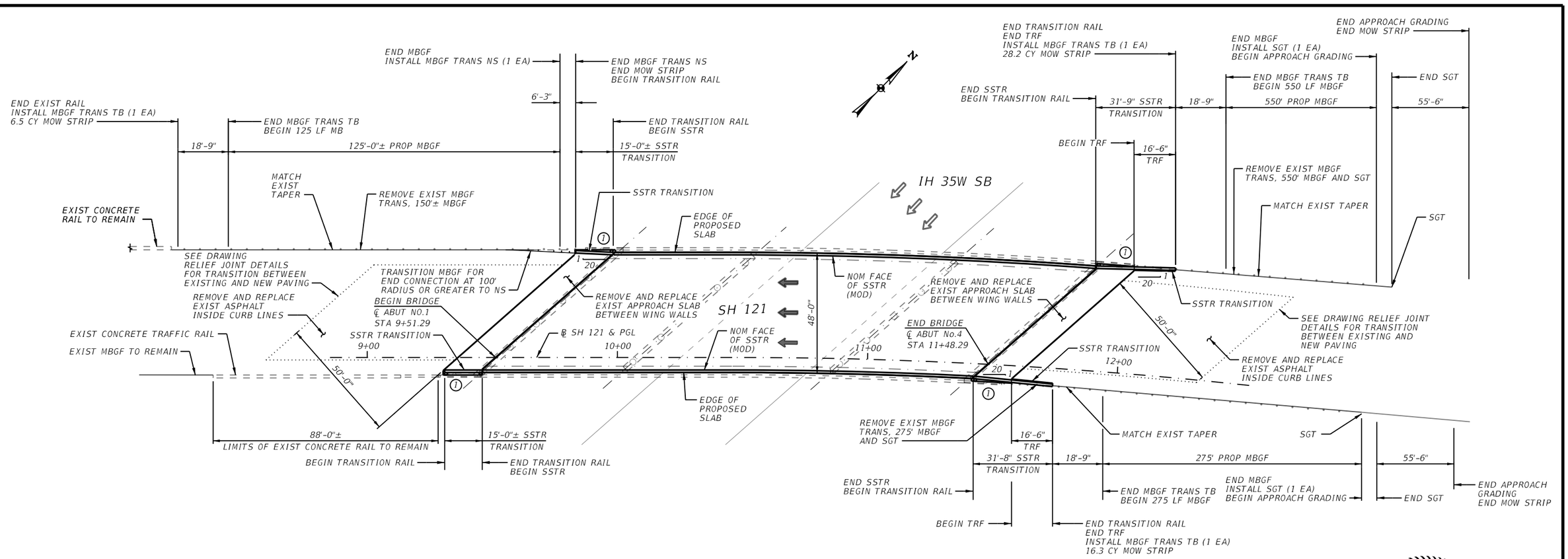
Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY CLOSURE

TCP(6-6)-12

FILE: tcp6-6.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	FTW	TARRANT		38



PLAN - APPROACH, RAIL AND MBGF LAYOUT

SCALE = 1" = 40'-0"

① EXIST RAIL AND WINGWALL TO REMAIN
TB - THRIE BEAM
NS - NON-SYMETRICAL

BID CODE	DESCRIPTION	UNIT	TOTAL
0104-7030	REMOV CONC (APPR SLAB)	SY	167
0105-7001	RMV (0"-4") TRT/UNTRT BASE & ASPH PAV	SY	167
0105-7002	RMV (2"-6") TRT/UNTRT BASE & ASPH PAV	SY	423
0344-7024	SP MIXES SP-C SAC-A PG70-28	TON	105
0344-7077	TACK COAT	GAL	122
0420-7052	CL C CONC (RAIL FOUNDATION)	CY	5
0422-7014	APPROACH SLAB (HPC)	CY	60
0432-7013	RIPRAP (MOW STRIP) (4")	CY	51
0438-7009	RESIZING AND SEALING JOINTS	LF	108
0450-7066	RAIL (TY SSTR) (MOD)	LF	93.4
0540-7001	MTL W-BEAM GD FEN (TIM POST)	LF	950.0
0540-7016	MTL BM GD FEN TRANS (NON - SYM)	EA	1
0540-7019	MTL THRIE-BEAM GD FEN (TIM POST)	EA	3
0542-7001	REMOVE METAL BEAM GUARD FENCE	LF	975.0
0542-7002	REMOVE TERMINAL ANCHOR SECTION	EA	2
0542-7004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	1
0542-7005	RM MTL BM GD FEN TRANS (T101)	EA	3
0544-7001	GUARDRAIL END TREATMENT (INSTALL)	EA	2

NOTES:

1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD. MAJOR DISCREPANCIES BETWEEN DRAWING AND ACTUAL CONSTRUCTED CONDITION SHALL BE VERIFIED WITH TXDOT PRIOR TO DEMOLITION AND CONSTRUCTION.
2. SEE TXDOT STANDARD BAS-A (MOD) FOR APPROACH SLAB DETAILS.
3. ALL "SSTR" NOTE DESIGNATIONS ARE EQUIVALENT TO "SSTR (MOD)". SEE TXDOT STANDARD TYPE SSTR (MOD) AND DRAWINGS TRANSITION RAIL DETAILS FOR TRANSITION RAIL DETAILS.
4. SEE STANDARD TRF FOR TRAFFIC RAIL FOUNDATION DETAILS.
5. SEE STANDARDS BED-14, GF (31) - 19, GF (31) TR TL3-20, SGT (10S) 31-16, AND GF (31) MS-19 FOR MBGF DETAILS.
6. CONTRACTOR SHALL PROVIDE FIELD SURVEY DATA AT 10-FT MAXIMUM INTERVALS COVERING END OF BRIDGE AT ABUTMENTS EXTENDING TO END LIMITS OF PAVING REMOVAL PRIOR TO DEMOLITION. SUBMIT SURVEY DATA TO TXDOT FOR ASSESSMENT AND CONCURRENCE BEFORE RE-CONSTRUCTION OF THE PAVING AND CONCRETE WORK.

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED
PROFESSIONAL ENGINEER

9/5/2024

HL 93 LOADING (DECK AND RAIL REPLACEMENT)
NBI# 02-220-0-0014-16-192

PARSONS
TBPE Registration No. F-1481

RAIL AND MBGF LAYOUT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: 1" = 40'-0" SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	39
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 9/5/2024
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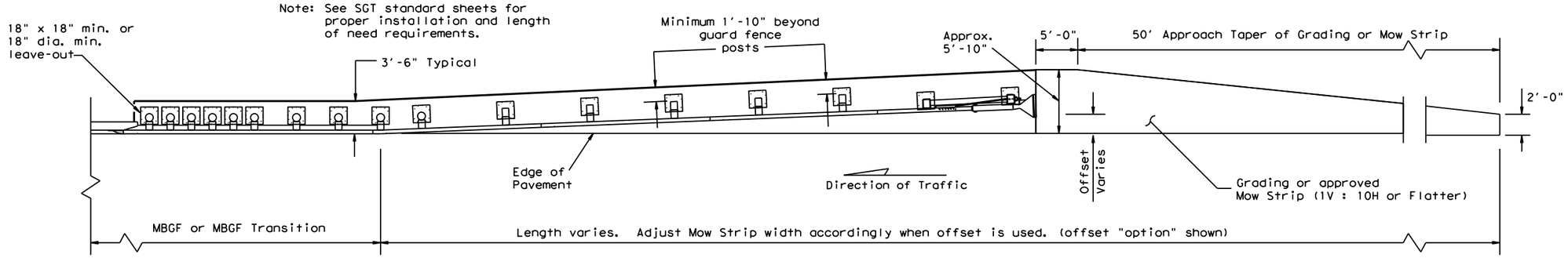
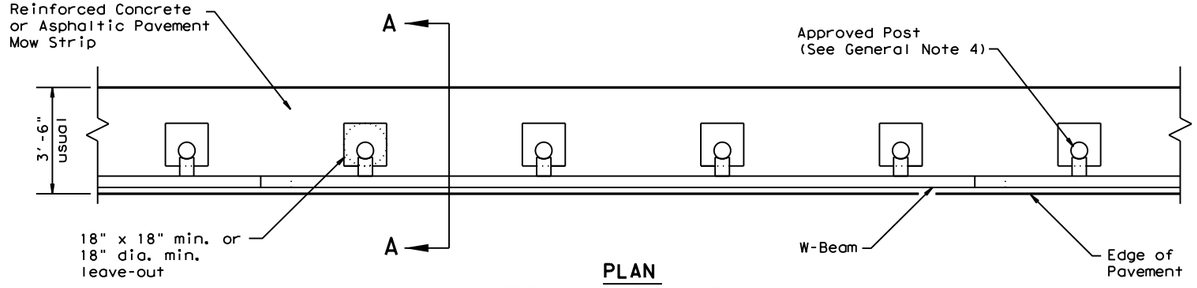
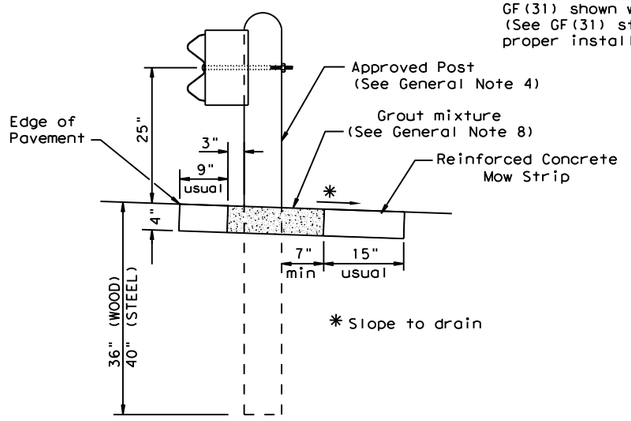


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



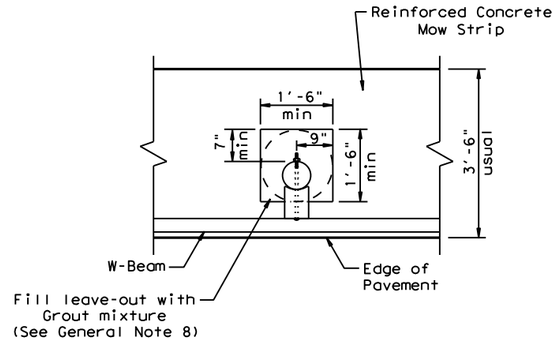
PLAN

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



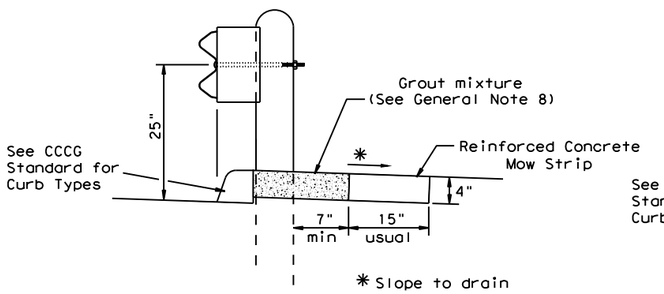
SECTION A-A

Typical



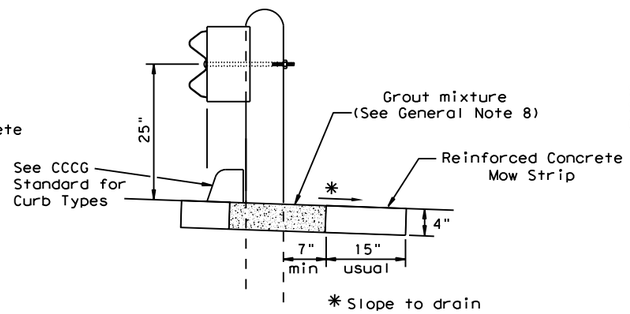
MOW STRIP DETAIL

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



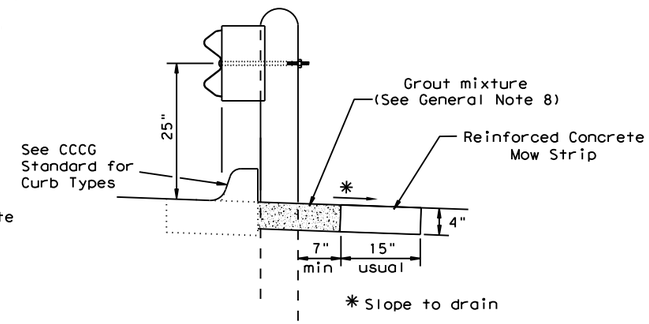
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

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

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

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

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		40

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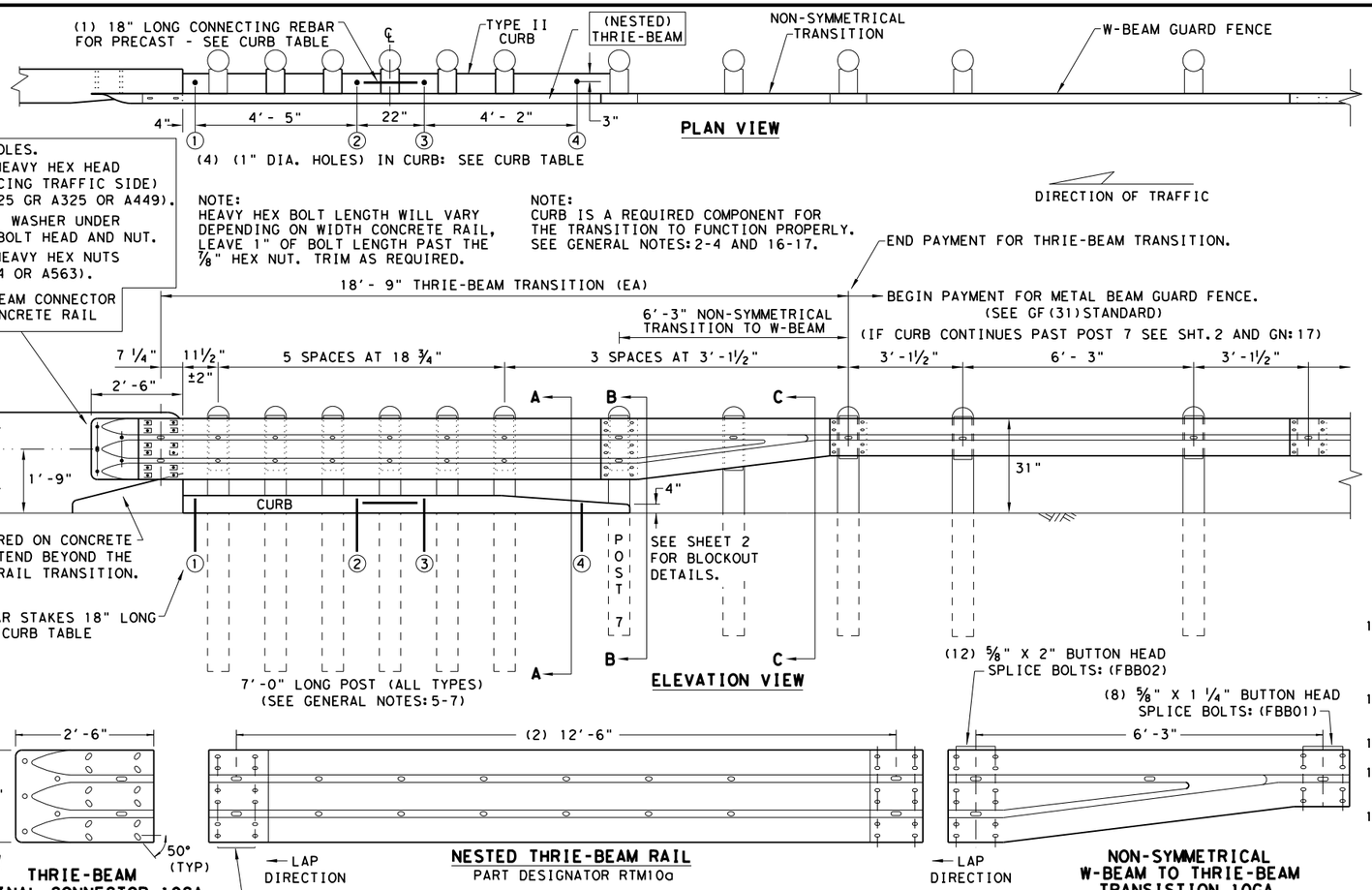


GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. 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- ¾" HEIGHT); SEE CURRENT CCCG 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.
3. 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.
4. 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.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. 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.
7. 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 ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. 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.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. 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.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. 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.
17. 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.

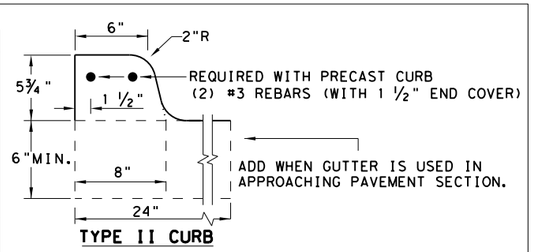
THRIE-BEAM TERMINAL - CURB TABLE

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 ½" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.



TYPE II CURB

NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

* 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

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

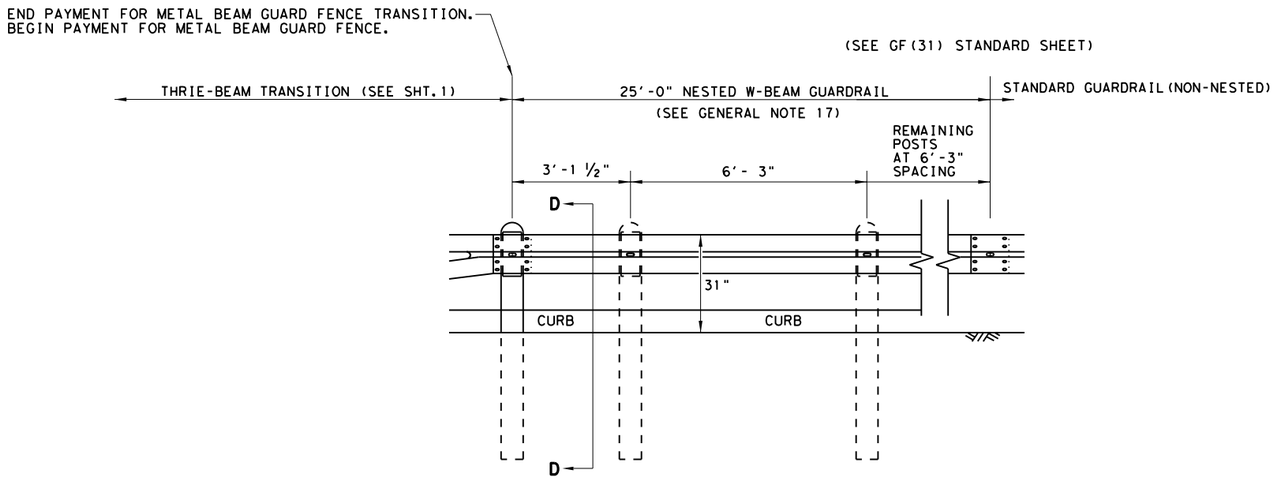
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

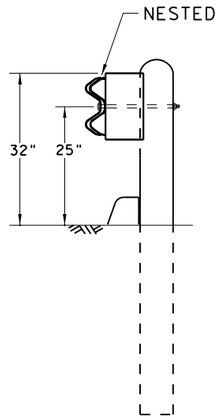
FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0081	01	053,ETC	SS347, ETC	
	DIST	COUNTY		SHEET NO.	
	FTW	TARRANT		41	

DATE: 6/26/2024
FILE: c:\pw_working\texas\parsons_p009206h\d0268185\gf31trt1320.dgn

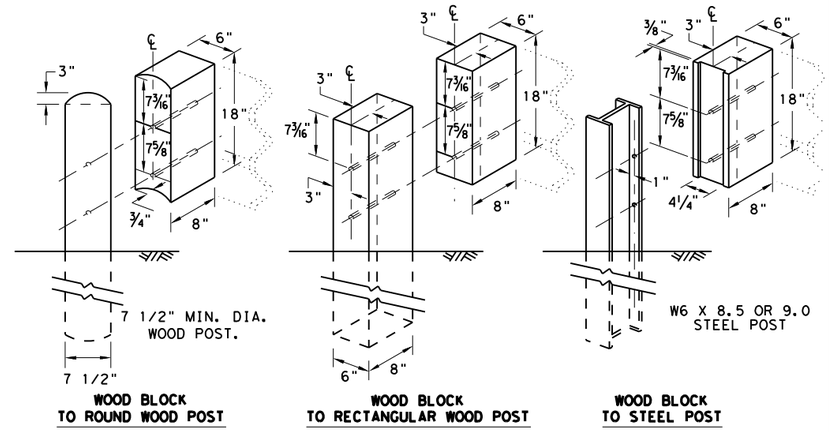
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 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

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
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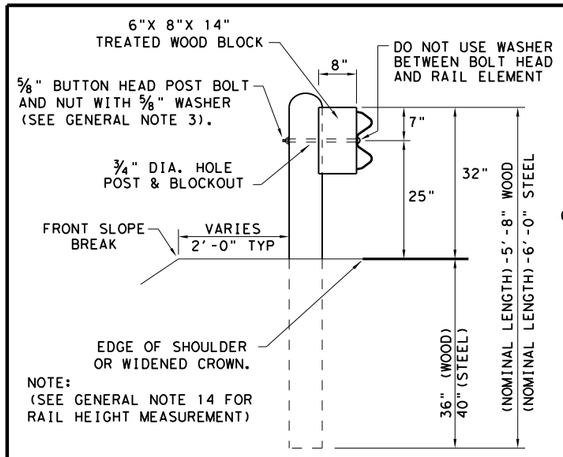
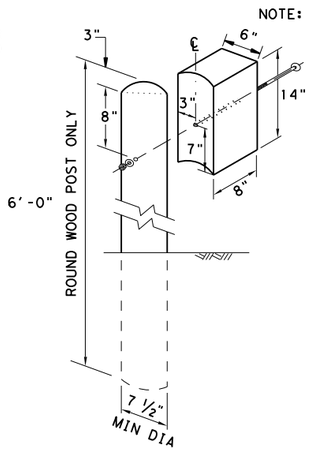
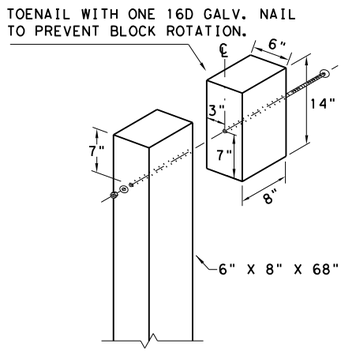


TYPICAL POST PLACEMENT

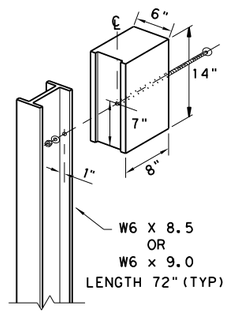


WOOD BLOCK TO ROUND WOOD POST

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

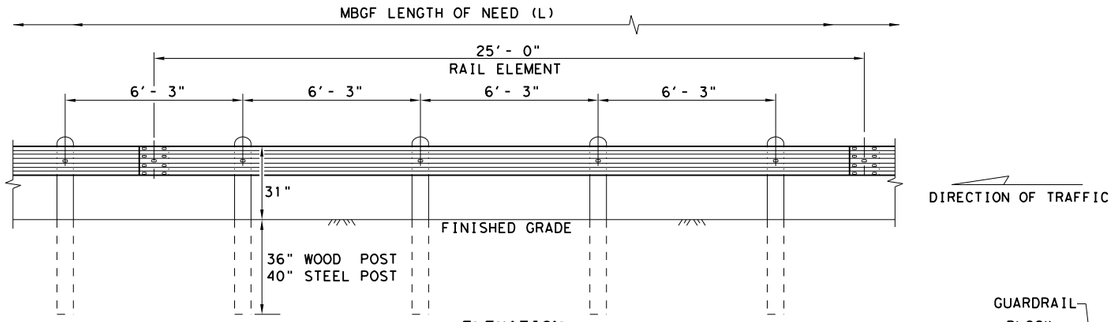


WOOD BLOCK TO RECTANGULAR WOOD POST



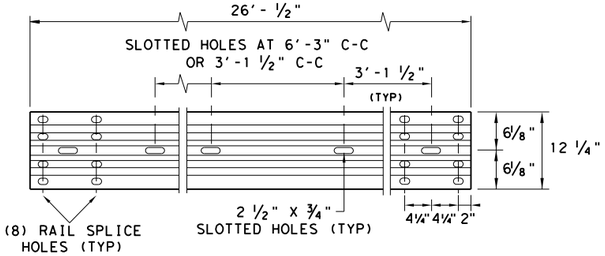
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



ELEVATION
MID-SPAN RAIL SPLICE

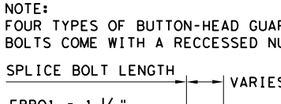
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



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

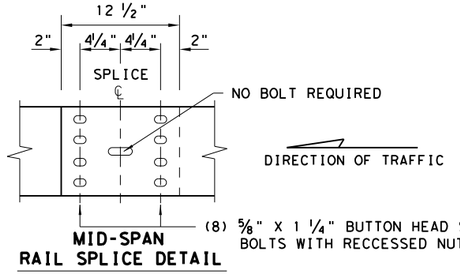
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

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



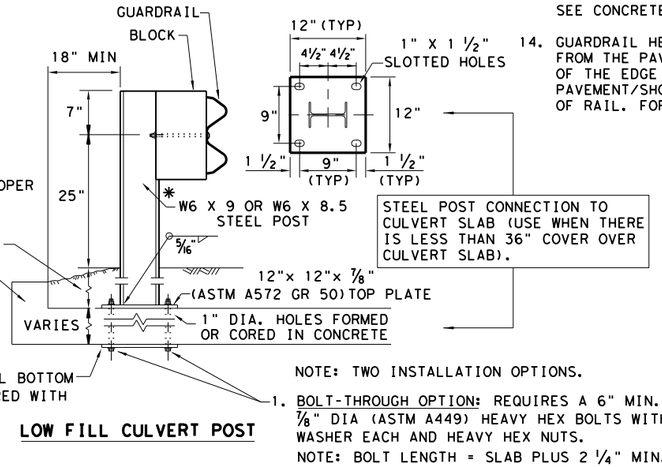
BUTTON HEAD BOLT

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



MID-SPAN RAIL SPLICE DETAIL

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



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

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

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

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

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

GENERAL NOTES

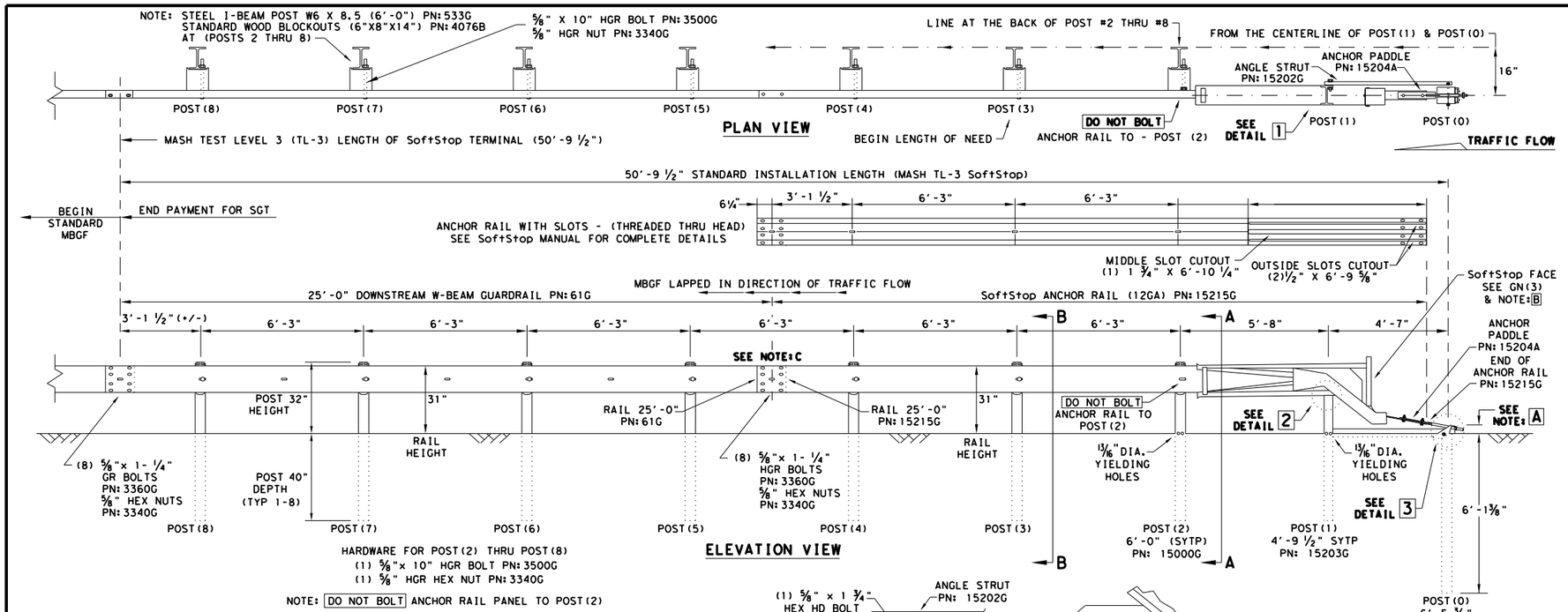
1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS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

Texas Department of Transportation

Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		43



GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE: A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-3/4" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE: B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE: C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 7/8")
15203G	1	POST #1 - (SYTP) (4'- 9 1/2")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 1/2" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (1/2" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	3/4" x 2 1/2" HEX BOLT A325
3701G	4	3/4" ROUND WASHER F436
3704G	2	3/4" HEAVY HEX NUT A563 GR.DH
3360G	16	5/8" x 1 1/4" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	5/8" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	5/8" x 10" HGR POST BOLT A307
3391G	1	5/8" x 1 3/4" HEX HD BOLT A325
4489G	1	5/8" x 9" HEX HD BOLT A325
4372G	4	5/8" WASHER F436
105285G	2	5/8" x 2 1/2" HEX HD BOLT GR-5
105286G	1	5/8" x 1 1/2" HEX HD BOLT GR-5
3240G	6	5/8" ROUND WASHER (WIDE)
3245G	3	5/8" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE: B

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT(10S)31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP	
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	DIST	COUNTY		SHEET NO.	
	FTW	TARRANT		44	

DATE:
FILE:

(SEE GN NOTE 15)
STANDARD 31" MBGF

ITEM (6)
INNER SIDE SLIDER
(ISS) PANEL FOR RAIL 3

FIELD-SIDE
(RAIL 3)

NOTE:
RECESSED HEX NUTS FACING
TRAFFIC-SIDE **SEE DETAIL (C)**

REFERENCE LINE USED TO INSTALL
LINE POST(9) THRU POST(2)

POST 1 OFFSET DISTANCE MEASURED
7-5/8" FROM REFERENCE LINE

POST 9 POST 8 POST 7 POST 6 POST 5 POST 4 POST 3 POST 2

RAIL 4 RAIL 3 RAIL 2 RAIL 1

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

NO BLOCKOUT
AT (POST 1)

CABLES

NOTES:
1. ITEM (12) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST(9) THRU LINE POST(2).
2. DO NOT INSTALL A BLOCKOUT AT LINE POST(1).

PLAN VIEW

ITEM (5)
TRAFFIC SIDE SLIDER
(TSS) PANEL FOR RAIL 2

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

MBGF
RAIL 2

INSTALL GUARD FENCE RECESSED
HEX NUTS ON TRAFFIC-SIDE

MBGF
RAIL 1

DETAIL (C)

TRAFFIC FLOW

END PAYMENT (SGT) BY EACH

DO NOT BOLT
RAIL TO POST 6

BEGIN LENGTH OF NEED

INSTALLATION LENGTH 55'- 1/2"

49'-8 5/16"

ITEM (25)
MAX-TENSION HEAD
SEE DETAIL (A)

6'-3" 6'-3" 6'-3" 6'- 3/4" 6'-3" 6'-3" 6'-3" 37 1/2" 5'-3 11/16"

RAIL
HEIGHT
31"

ARROWS

ITEM (13) RAIL 4 ITEM (13) RAIL 3 ITEM (13) RAIL 2 ITEM (13) RAIL 1

DETAIL (D)

RAIL
HEIGHT
31"

HEAD
HEIGHT

DETAIL (B)

A

32-1/4"

68-1/8"

FINISHED
GRADE

CABLES

FINISHED
GRADE

ITEM (10)
CABLE
ASSEMBLY

ITEM (2)
GROUNDSTRUT

POST 9 POST 8 POST 7 POST 6 POST 5 POST 4 POST 3 POST 2

POST 1
ITEM (4)
I-BEAM
W6 X 9

NO BLOCKOUT
AT (POST 1)

SOIL
ANCHOR POST
ITEM (1)

(8) X-LITE LINE POST - ITEM (11)

ELEVATION VIEW

A

TSS PANEL
GALVANIZED
ITEM (5)

RSS PLATE
GALVANIZED
ITEM (8)

INSTALL THE TSS AND RSS
WITH THE ARROWS POINTING
TOWARDS THE MAX-HEAD

TSS PANEL AND RSS PLATE
DETAIL (D)

NOTE:
USE THE MASH APPROVED
X-TENSION CABLE ASSEMBLY.

7 5/16"
2 1/8"

UPPER CABLE
(BACK SIDE)

LOWER CABLE
(TRAFFIC SIDE)

DETAIL (B)

HEAD
HEIGHT
32-1/4"

TOP OF POST

31-7/8"

FINISHED
GRADE

40-1/8"

68-1/8"
ANCHOR POST
DEPTH

ITEM (1)
ANCHOR

ITEM (11)
LINE POSTS
2 THRU 9
(NOTE: ITEM (4) POST 1 (NOT SHOWN),
TO BE INSTALLED AT SAME DEPTH
AS LINE POSTS.)

**SOIL ANCHOR, POST 1
& LINE POST 2 THRU 9**

SECTION VIEW A-A

CABLE
FRICTION PLATE
HEAD UNIT
ITEM (9)

NOTE:
INSTALL 5/8" RECESSED HEX
NUTS ON TRAFFIC SIDE.

ITEM (24)
ITEM (21)

ITEM (20)
8X

ITEM (17)
8X

ITEM (23)
6X
3 SCREWS
EACH SIDE

(RAIL 1)

ITEM (22)
BRACKET
SHIPPED FLAT

ITEM (3)

ITEM (16)
4X

* ITEM (25)
HIGH INTENSITY
REFLECTIVE SHEETING

NOTE: DELINEATION MARKER IN
ACCORDANCE WITH TEXAS MUTCD.

SPLICE FOR IMPACT-HEAD
TO GUARD FENCE (RAIL1)

DETAIL (A)

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

** ALTERNATIVE ITEMS NOT SHOWN.
ITEM(26) 8" WOOD-BLOCKOUTS
ITEM(27) 25'GUARD FENCE PANELS

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD
MBGF

2'-0"

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX.
RAIL OFFSET

APPROACH GRADING
(1V:10H OR FLATTER)
SEE PRODUCT ASSEMBLY MANUAL
FOR ADDITIONAL GUIDANCE.

TRAFFIC FLOW

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT
USED FOR ALL TANGENT TYPE END TREATMENTS.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURE'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST(MPL)FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	5/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	5/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
* 25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
** 26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
** 27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

Texas Department of Transportation

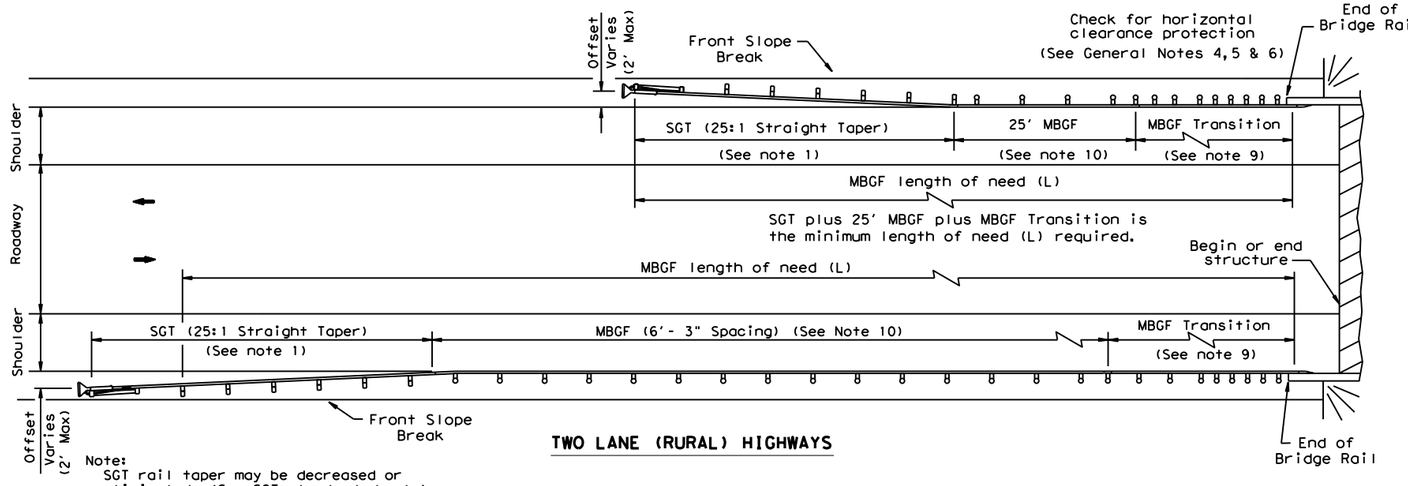
Design Division Standard

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

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		45

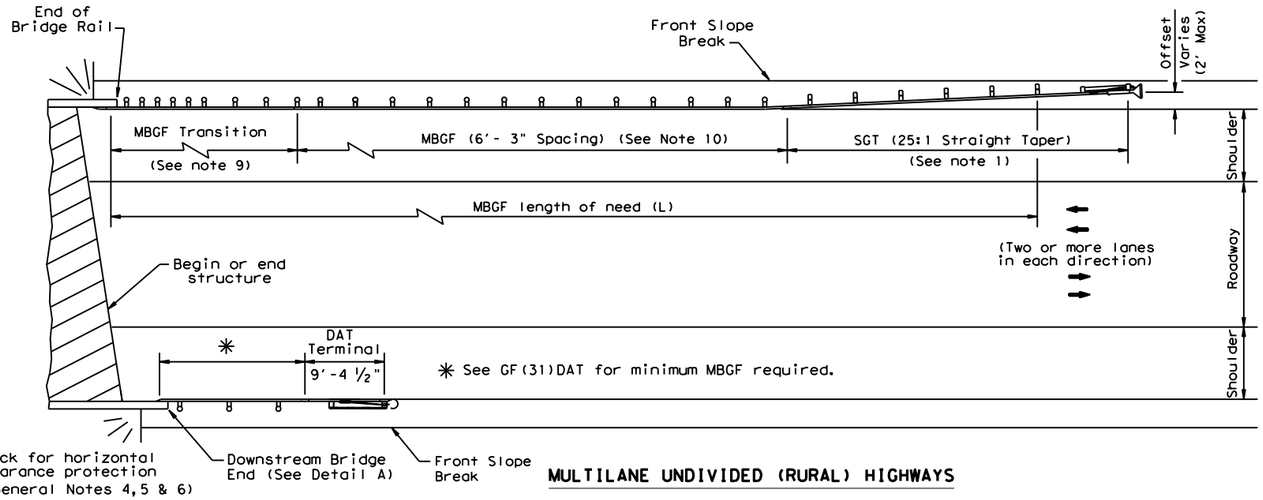
DATE: 8/7/2024
FILE: c:\pw_working\texas\parsons_p009205h\d0268185\sgt11s3118.dgn

DATE: 6/26/2024
FILE: c:\pw_working\texas\parsons_p009206h\d0253089\bed14.dgn

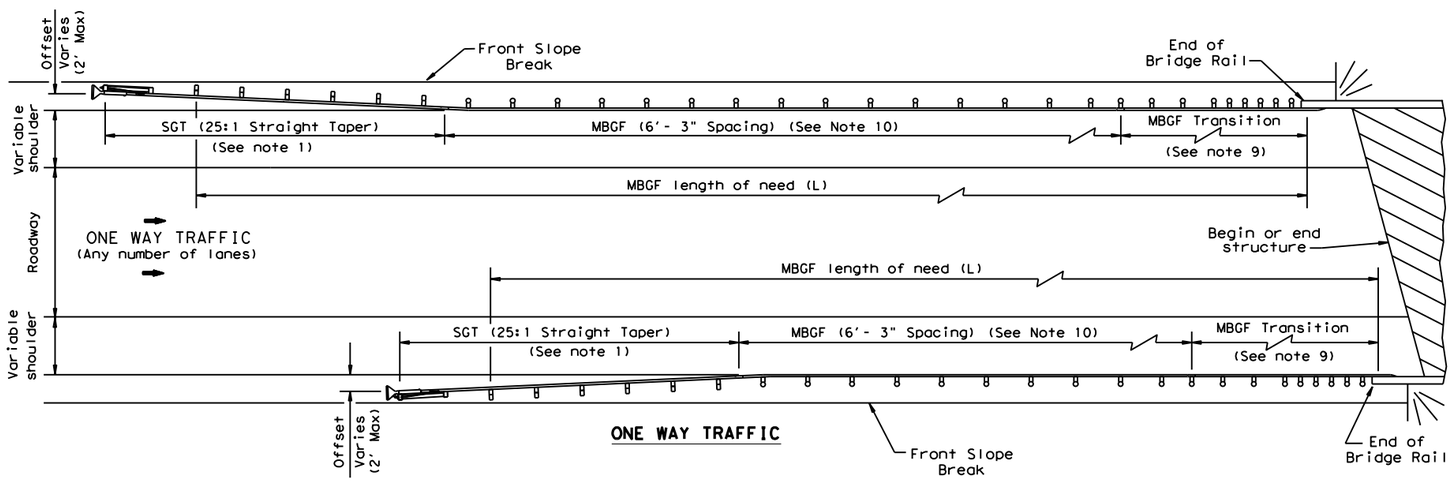


TWO LANE (RURAL) HIGHWAYS

Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)



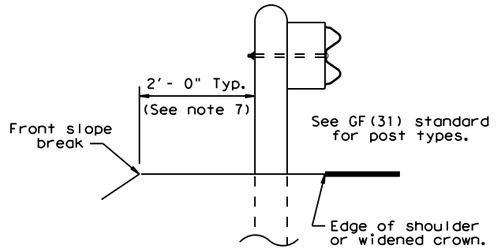
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



ONE WAY TRAFFIC

GENERAL NOTES

1. For more detail: See GF(31), SGT( )31, GF(31)TR, and GF(31)TL2 standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
3. Use average daily traffic (ADT) for the current year to determine MBGF length of need in accordance with the Roadway Design Manual unless otherwise specified. Where significant traffic volume growth is anticipated on low volume (0-750 ADT) highways, use length determinations for the higher volume category.
4. MBGF may not be required to shield departure end of bridge unless other obstacles within the horizontal clearance limits or opposing traffic indicate a MBGF consideration.
5. Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. Direct connection of MBGF to concrete rails are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (This requires a minimum of three standard line posts plus the DAT terminal, See Detail A)
7. The crown shall be widened to accommodate MBGF. Typically the "front slope" break should be 2'- 0" from the back of the MBGF post. This applies to new construction on new alignment or where existing roadway cross section is to be widened to increase roadway width. This does not apply to rehabilitation work where existing roadway crown width is to be retained (See Typical Cross Section at MBGF).
8. For restrictive bridge widths: The MBGF should be properly transitioned from the existing bridge rail to the adjoining MBGF (See MBGF Transition Standards). Metal beam guard fence at these bridge location(s) shall be flared at the rate of 25:1 or flatter, and be of the length necessary to locate the terminal end at the 2 ft. "maximum" offset from the shoulder edge in the approach direction.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.
10. A minimum 25' length of MBGF will be required.



TYPICAL CROSS SECTION AT MBGF

Note:
All rail elements shall be lapped in the direction of adjacent traffic.

DETAIL A

Showing Downstream Rail Attachment

Texas Department of Transportation

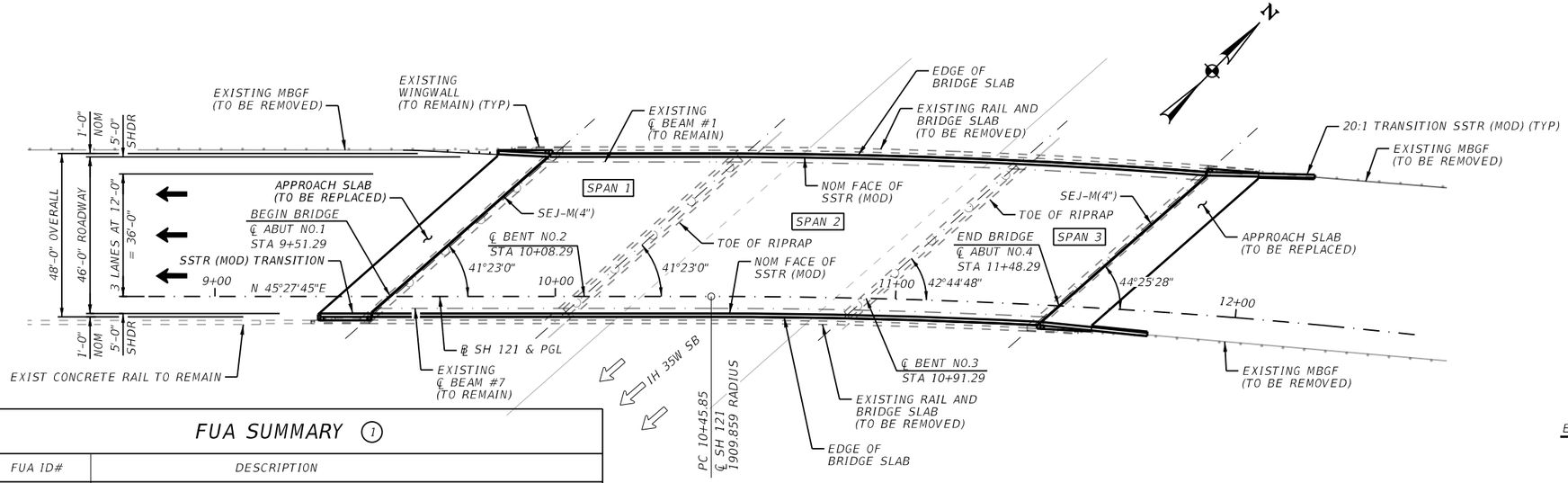
Design Division Standard

BRIDGE END DETAILS

(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
© TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
REVISED APRIL 2014 SEE (MEMO 0414)	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		46



PLAN

FUA SUMMARY ①		
	FUA ID#	DESCRIPTION
1	694702	CONCRETE APPROACH SLABS HAVE MODERATE CRACKS.
2	694703	ROCKER BEARING 3 OVER SOUTHWEST ABUTMENT HAS 2" SECTION OF BROKEN WELD BETWEEN BEAM AND SOLE PLATE; SEE PHOTO. ONE NUT OF BEARING 4 FROM NORTHWEST ON BENT 2 FROM NORTHEAST IS MISSING.
3	694704	WESTERN SECTION OF SOUTHEAST BRIDGE RAIL HAS BEEN DAMAGED; RAIL POSTS HAVE BEEN BROKEN. REPLACE DAMAGED RAIL SECTION.
4	694714	CONCRETE BRIDGE DECK HAS WIDESPREAD MODERATE MAP CRACKS, 2" DEEP SPALLS, AND REPAIRED AREAS IN SURFACE AND SOFFIT OF SOUTHWEST SPAN.
5	694738	RELIEF JOINT SEALS HAVE SHRUNK, LOST ADHESION, AND FILLED WITH DEBRIS
6	694818	STEEL BEAMS AND DIAPHRAGMS HAVE MODERATE RUST AT BEAM ENDS AND UNDER DECK JOINTS.

① ONCE A REPAIR IS COMPLETED AND IS ASSOCIATED WITH AN FUA ID, THE AREA OFFICE CONSTRUCTION INSPECTOR SHALL PHOTOGRAPH THE REPAIR AND SUBMIT THE PHOTOGRAPH(S) TO THE TXDOT BRIDGE INSPECTION COORDINATOR (MARK BURWELL) FOR FURTHER PROCESSING. ALL FUAS SHOWN IN THE FUA SUMMARY TABLE SHALL HAVE A PHOTOGRAPH ASSOCIATED WITH IT THAT DISPLAYS THE REPAIRED AREA.

0' 10' 20' 40'

SCALE IN FEET

NOTES:

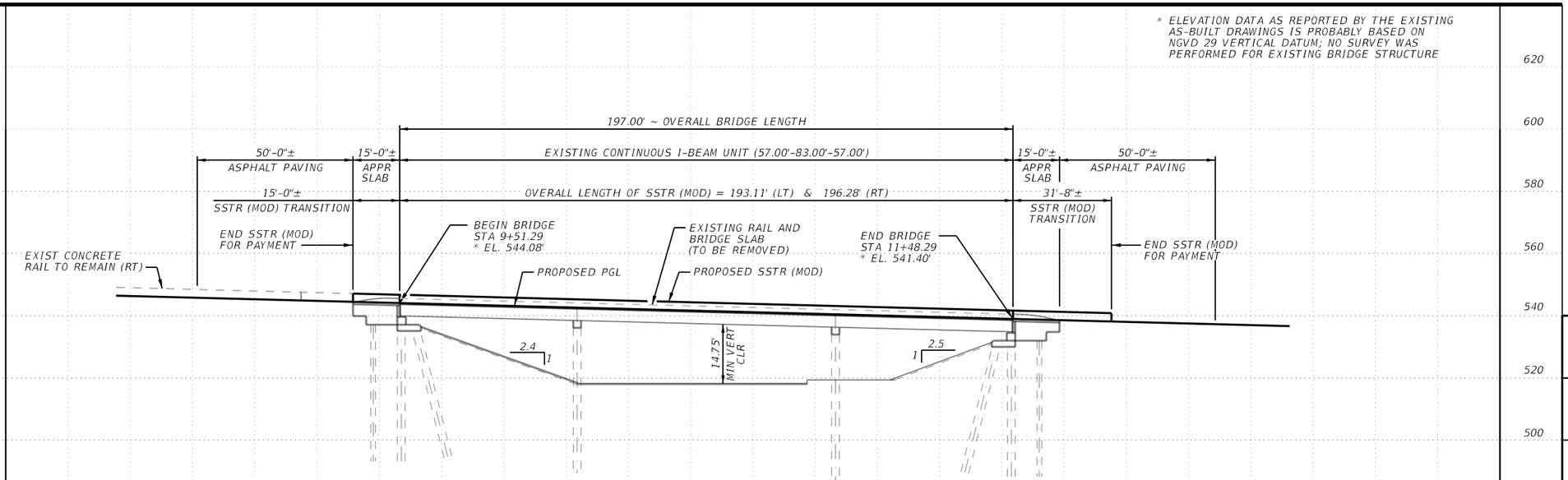
1. DESIGN OF THE PROPOSED BRIDGE SLAB IS IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9th (2020) EDITION AND MODIFIED BY THE TXDOT BRIDGE DESIGN MANUAL – LRFD 2021.
2. BRIDGE SLAB AND GIRDER SYSTEM IS DESIGNED FOR THREE (3) LANES. CAPACITY CHECKS OF EXISTING STEEL BEAMS AND DIAPHRAGMS ARE BASED ON THREE (3) LANES.
3. CONTRACTOR SHALL SUBMIT PROPOSED DEMOLITION PLAN AND SEQUENCE DEFINITION FOR PROPOSED WORK INCLUDING SLAB DEMOLITION; HEADED STUD WELDING; STEEL BEAM REPAIR; AND SLAB FORMING, REINFORCEMENT, AND PLACEMENT. NO WORK SHALL BE PERFORMED OVER TRAFFIC UNLESS APPROVED BY TXDOT. SEE TRAFFIC CONTROL PLANS FOR RELIEF CLOSURE, LANE SHIFT, AND DETOUR ALTERNATIVES.
4. SEE APPROACH, RAIL, AND MBGF LAYOUT FOR PROPOSED RAIL DEMOLITION AND REPLACEMENT BEYOND BRIDGE.
5. SEE BRIDGE TYPICAL SECTION FOR EXISTING AND PROPOSED SLAB.
6. REMOVAL OF EXISTING BRIDGE SLAB, RAILS, AND ARMOR JOINTS SHALL BE IN ACCORDANCE WITH ITEM 496.
7. SEE STANDARD BAS-A (MOD) FOR BRIDGE APPROACH SLAB DETAIL AND TYPE SSTR (MOD) FOR BRIDGE RAIL DETAIL, AND SEJ-M FOR JOINT DETAILS.

℄ SH121
EXISTING HORIZONTAL ALIGNMENT DATA

PI STATION	= 11+41.94
DEGREE OF CURVE	= 3° 00' 00.00"
TANGENT	= 96.18
LENGTH	= 192.19
RADIUS	= 1909.859
PC STATION	= 10+45.85
PT STATION	= 12+38.04

EXISTING VERTICAL CURVE DATA

STATION	= 11+00
EL	= 545.65
EX	= 3.22'
L	= 500.00'
G1	= +0.70%
G2	= -4.45%



ELEVATION

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER
7/22/2024

HL 93 LOADING (DECK REPLACEMENT)
HS 20 LOADING (STEEL BEAM EVALUATION)
NBI# 02-220-0-0014-16-192

PARSONS
TBPE Registration No. F-1481

BRIDGE LAYOUT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: 1" = 40'

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	47
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 7/22/2024
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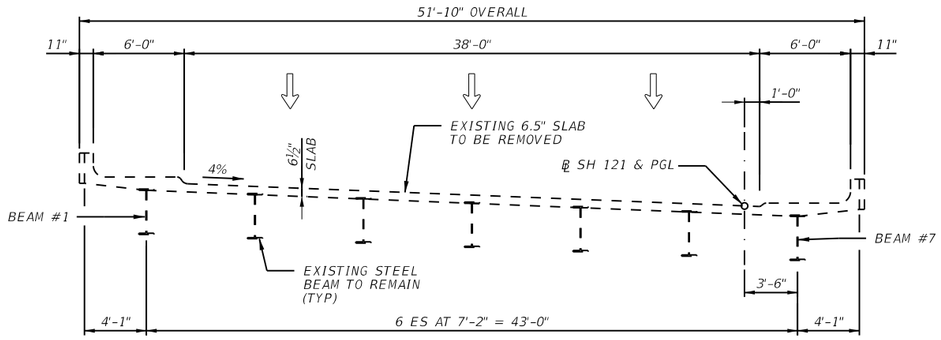
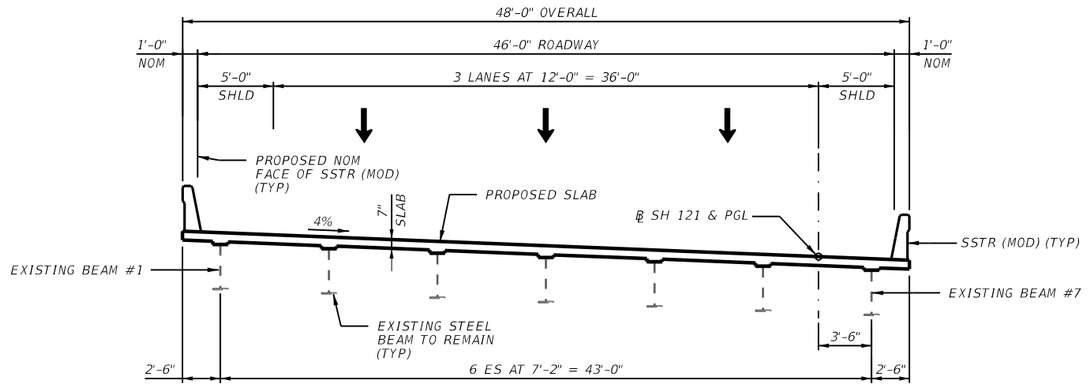


EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION

BID CODE	DESCRIPTION	UNIT	TOTAL
0496-7013	REMOV STR (BRIDGE SLAB)	EA	1
0496-7017	REMOV STR (RAIL)	LF	400.0

NOTES:

1. EXISTING TYPICAL SECTION IS DEVELOPED AND BASED ON AS-BUILT PLANS NORTH LANE SH 121 UNDERPASS (WEST LANE IH35W) DATED 08/25/1959. NO FIELD VERIFICATION WAS PERFORMED.
2. DEMOLITION OF EXISTING DECK SLAB, RAILS AND SIDEWALKS SHALL NOT DAMAGE OTHER EXISTING BRIDGE MEMBERS AND ELEMENTS. ANY DAMAGE SHALL BE IDENTIFIED TO TXDOT FOR EVALUATION AND WILL BE REPAIRED AT CONTRACTOR'S EXPENSE.
3. CONTRACTOR SHALL DEVELOP AND SUBMIT DEMOLITION PLAN AND TRAFFIC CONTROL PLAN FOR TXDOT'S APPROVAL PRIOR TO PERFORMING PROJECT WORK.
4. CONTRACTOR SHALL NOT PERFORM WORK OVER LIVE TRAFFIC. WITHOUT TXDOT'S PRIOR APPROVAL.
5. THE ANALYSIS ASSUMES FULL CROSS-SECTION CAPACITY OF THE EXISTING GIRDER SYSTEM. THE DISTRICT SHALL CONDUCT AN INSPECTION OF ALL STEEL COMPONENTS AND CONNECTIONS AFTER THE EXISTING SLAB IS REMOVED. ANY LOSS IN STEEL SECTION (GREATER THAN 10%) OR IN COMPONENT CONNECTIONS SHALL BE DOCUMENTED AND REPORTED TO THE ENGINEER FOR EVALUATION. THE ENGINEER WILL NEED A MINIMUM OF THREE (3) WEEKS FOR THE EVALUATION AND DEVELOPMENT OF THE PROPOSED SOLUTION FOR CONDITION(S) REPORTED.
6. SEE PDMF STANDARD FOR SLAB FORMING DETAILS; PCP FORMING IS NOT PERMISSIBLE.
7. SEE TYPE SSTR (MOD) STANDARD FOR BRIDGE RAILS DETAILS.
8. NO OVERLAY IS CONSIDERED FOR THIS BRIDGE SLAB REPLACEMENT.

HL 93 LOADING (DECK REPLACEMENT)
HS 20 LOADING (STEEL BEAM EVALUATION)

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

7/22/2024

PARSONS
TBPE Registration No. F-1481

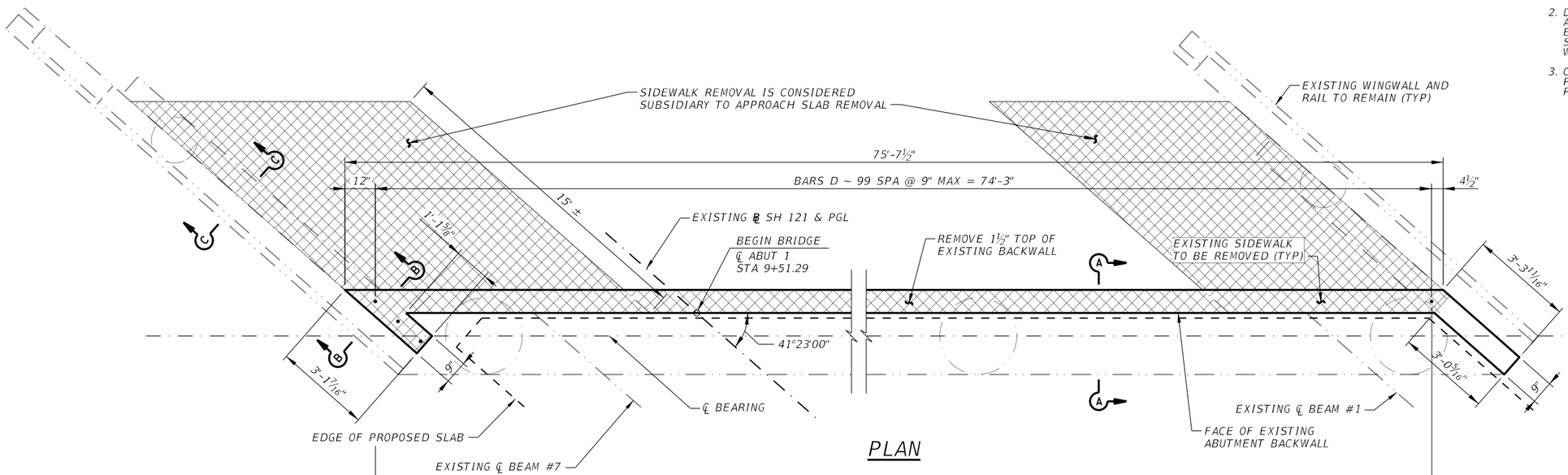
BRIDGE TYPICAL SECTIONS
IH 35W SB UNDERPASS
AT SH 121 WB

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	48
CONTROL	SECTION	JOB	
0081	01	053,ETC	

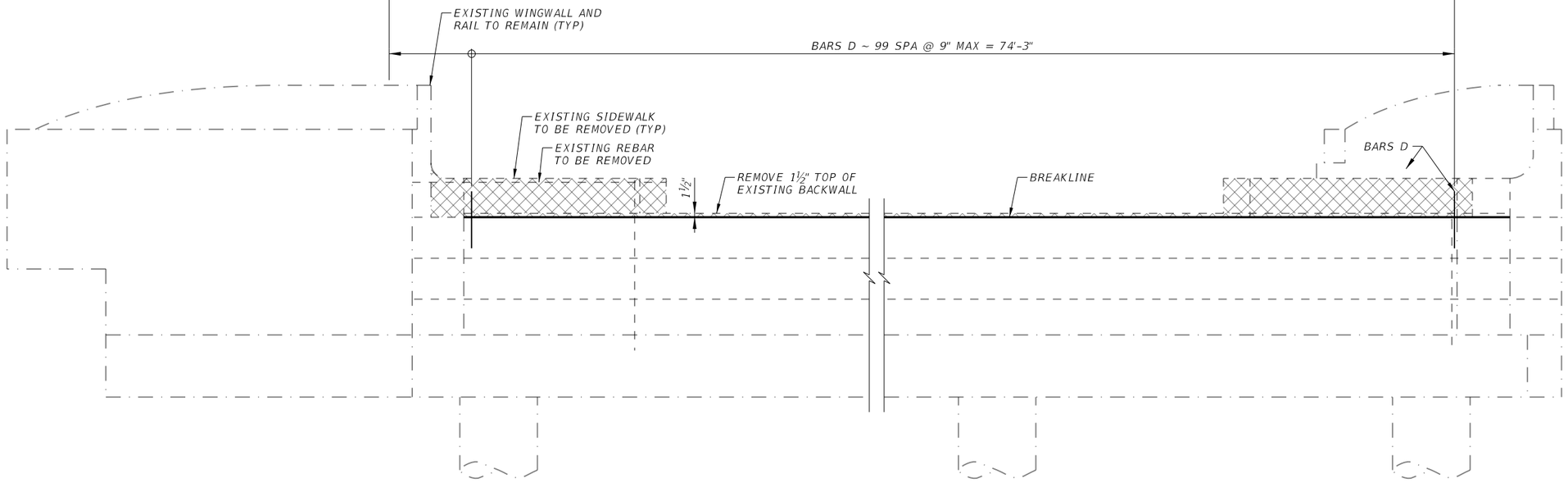
DRAWING DATE: 7/22/2024
FILENAME: c:\pw\working\texas\parsons\p009206h\d0248781\CEC\Assign4*SH121*BRIDGE TYP SECTION.dgn

NOTES:

1. EXISTING ABUTMENT PLAN AND ELEVATION DEFINITION IS BASED ON AS-BUILT PLANS NORTH LANE SH 121 UNDERPASS (WEST LANE IH35W) DATED 08/25/1959. NO FIELD VERIFICATION OR SURVEY OF GEOMETRICS WERE PERFORMED.
2. DEMOLITION OF EXISTING BACKWALL (PARTIAL DEPTH) AND SIDEWALK (FULL DEPTH) SHALL NOT DAMAGE OTHER EXISTING BRIDGE MEMBERS AND ELEMENTS. ANY DAMAGE SHALL BE IDENTIFIED TO TXDOT FOR EVALUATION AND WILL BE REPAIRED AT CONTRACTOR'S EXPENSE.
3. CONTRACTOR SHALL DEVELOP AND SUBMIT DEMOLITION PLAN AND TRAFFIC CONTROL PLAN FOR TXDOT'S APPROVAL PRIOR TO COMMENCING PROJECT WORK.



PLAN



ELEVATION

DEMOLITION AREA AT BACKWALL AND SIDEWALK:
BRIDGE BUILT: 1961
FIELD DEMOLITION OF EXISTING SIDEWALK AT ABUTMENT AND APPROACH: 158 SF
FIELD DEMOLITION AT TOP 1.5" OF BACKWALL AT ABUTMENT: 37 SF

BID CODE	DESCRIPTION	UNIT	TOTAL
0496-7014	REMOV STR (ABUTMENT)	EA	1

LEGEND:

EXISTING TO BE REMOVED

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER
6/26/2024

PARSONS
TBPE Registration No. F-1481

ABUTMENT 1
DEMOLITION AND MODIFICATION
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: ⅛" = 1'-0" SHEET 1 OF 3

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	49
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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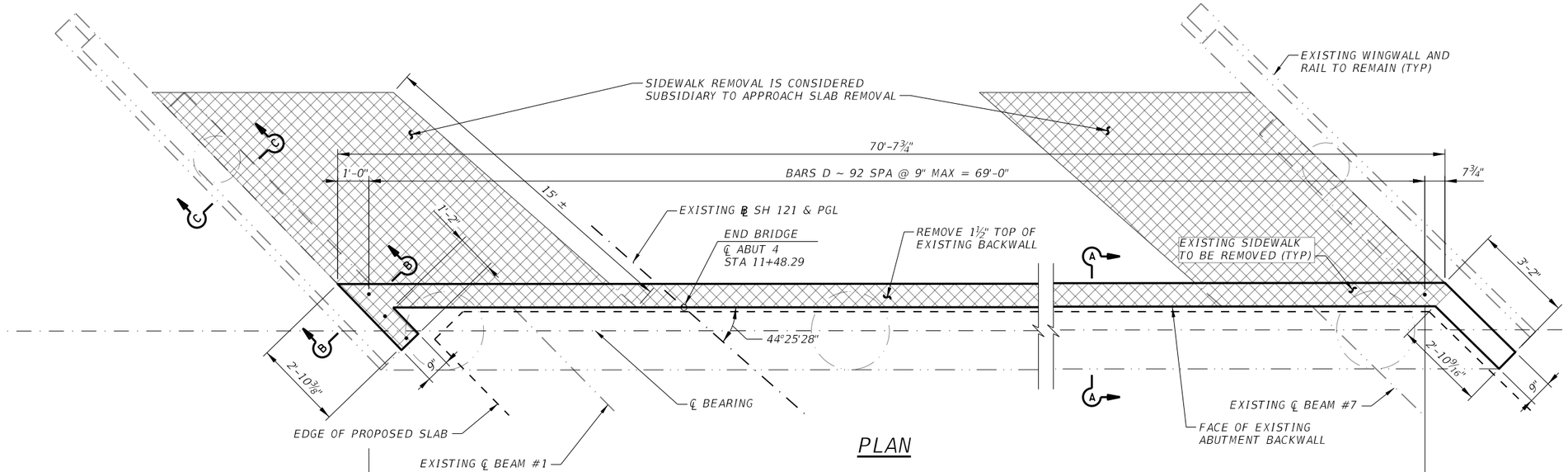
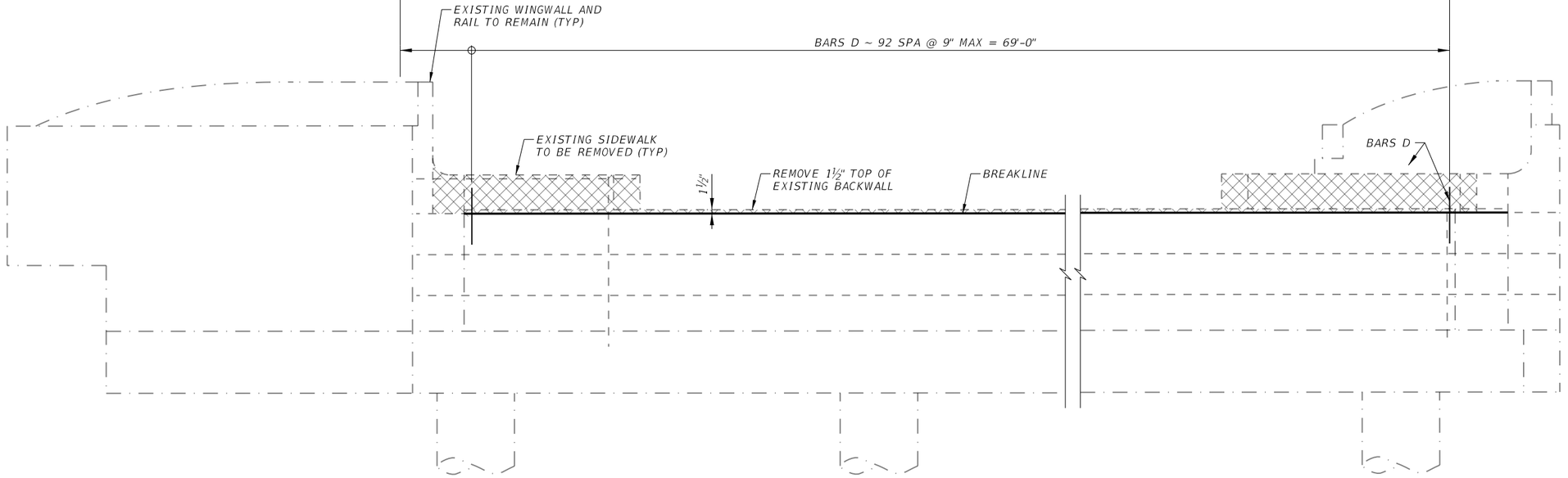
NOTES:

1. SEE SHEET 1 OF 3 FOR NOTES.



PLAN



ELEVATION

DEMOLITION AREA AT BACKWALL AND SIDEWALK:
BRIDGE BUILT: 1961
FIELD DEMOLITION OF EXISTING SIDEWALK AT ABUTMENT AND APPROACH: 156 SF
FIELD DEMOLITION AT TOP 1.5" OF BACKWALL AT ABUTMENT: 37 SF

BID CODE	DESCRIPTION	UNIT	TOTAL
0496-7014	REMOV STR (ABUTMENT)	EA	1

LEGEND:

EXISTING TO BE REMOVED

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

Texas Department of Transportation

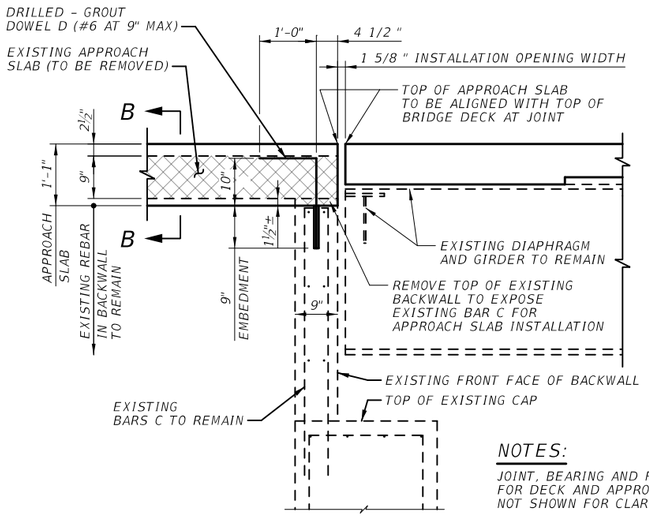
PARSONS
TBPE Registration No. F-1481

ABUTMENT 4
DEMOLITION AND MODIFICATION
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: ⅛" = 1'-0" SHEET 2 OF 3

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	50
CONTROL	SECTION	JOB	
0081	01	053,ETC	

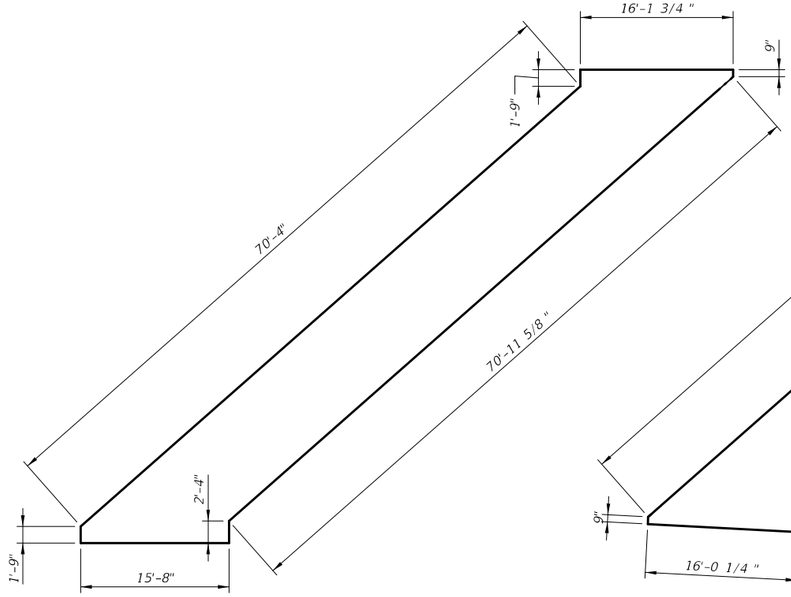
DRAWING DATE: 6/26/2024
FILENAME: c:\pw\working\texas\parsons\p009206h\d0248781\CEC\assign4\SH121_AB4.dgn



NOTES:

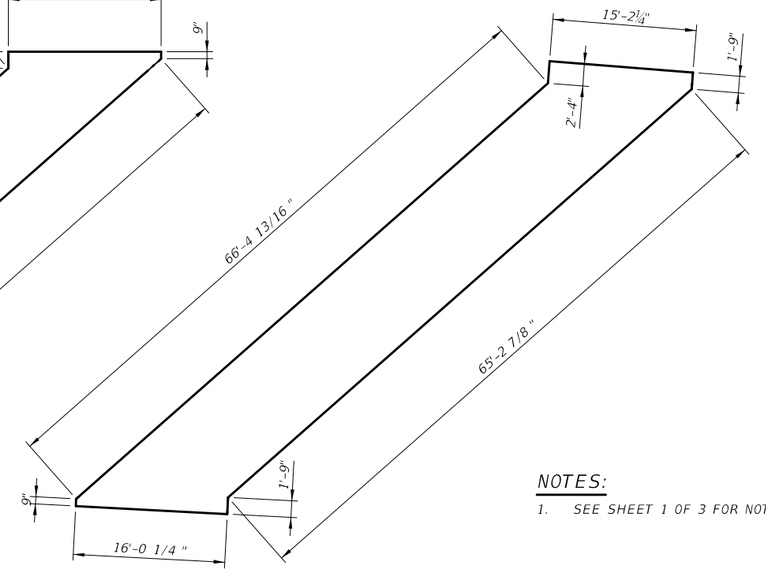
JOINT, BEARING AND REBAR FOR DECK AND APPROACH SLAB NOT SHOWN FOR CLARITY.

SECTION A-A



PLAN - APPROACH SLAB (WEST END)

ESTIMATED AREA = 753 SF



PLAN - APPROACH SLAB (EAST END)

ESTIMATED AREA = 742 SF

NOTES:

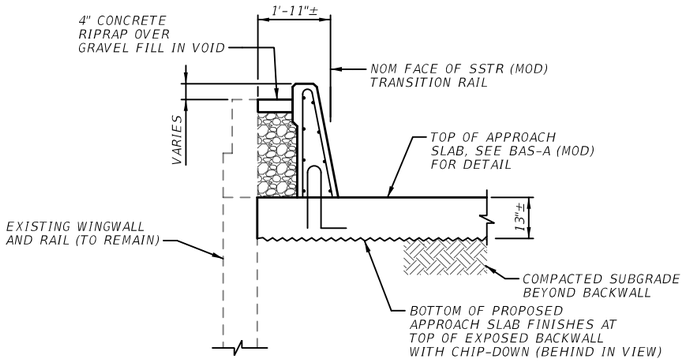
1. SEE SHEET 1 OF 3 FOR NOTES.

LEGEND:

INDICATES AREA TO BE REMOVED

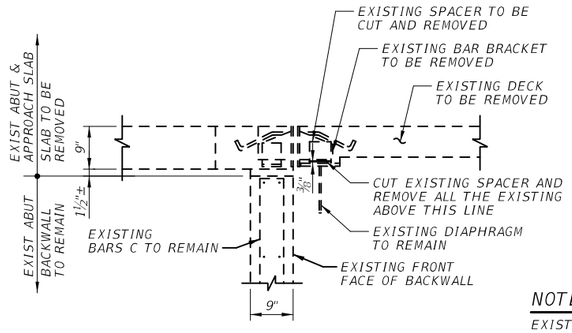
SECTION B-B

(EXISTING STRUCTURE)



SECTION C-C

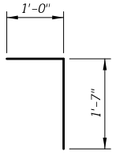
(PROPOSED STRUCTURE)



DEMOLITION DETAIL AT EXISTING ABUTMENT EXPANSION JOINT

NOTES:

EXISTING GIRDER TO REMAIN BUT NOT SHOWN FOR CLARITY.



BARS D (#6)

6/26/2024

Texas Department of Transportation

PARSONS

TBPE Registration No. F-1481

ABUTMENT 1 AND 4 DETAILS IH 35W SB UNDERPASS AT SH 121 WB

SHEET 3 OF 3

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	51
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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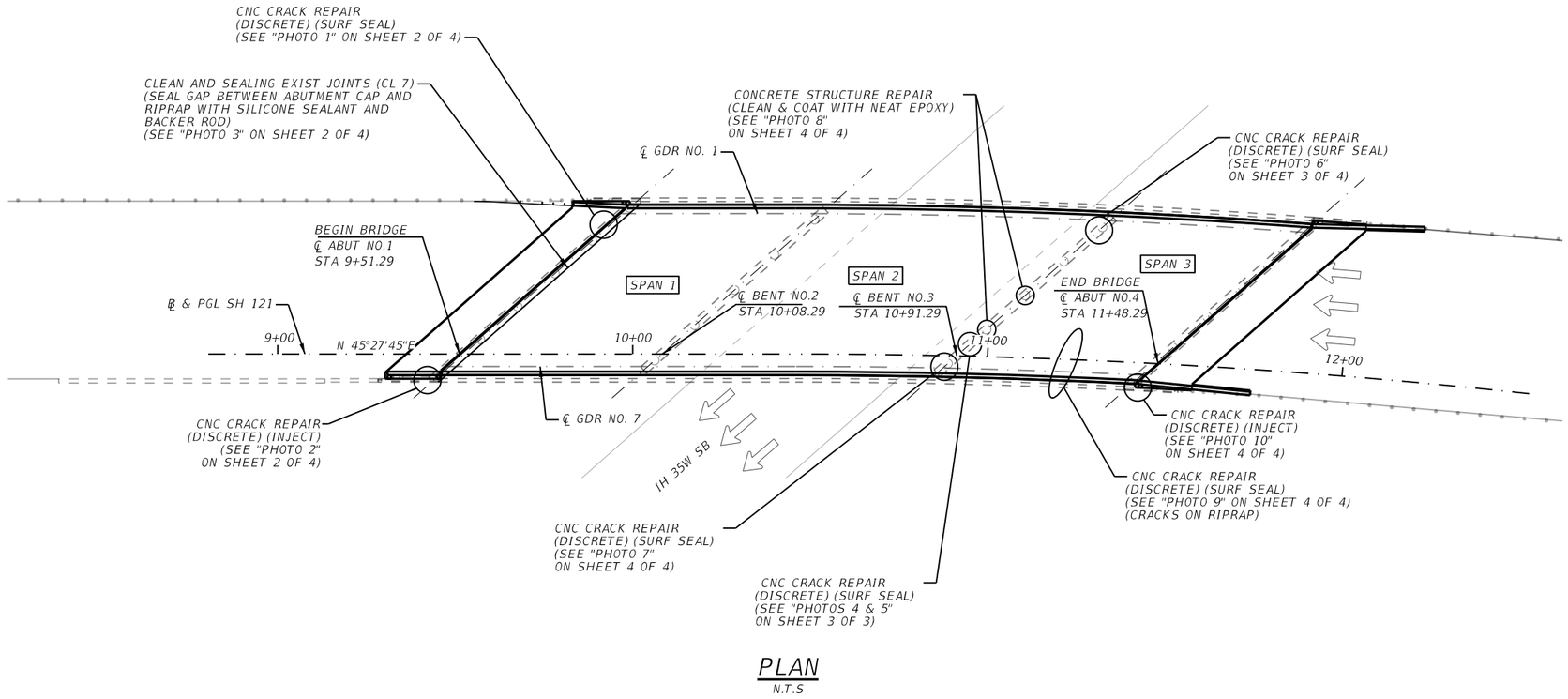


PLAN
N.T.S

NOTES:

ALL INFORMATION SHOWN BASED ON AS-BUILTS DRAWINGS NORTH LANE SH 121 UNDERPASS (WEST LANE I35W) DATED 08/28/1959. STATIONS ARE FROM AS-BUILT PLANS. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD.

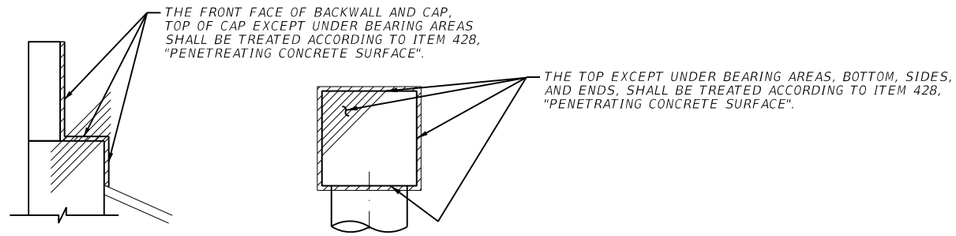
DAMAGED AREAS ARE SHOWN FOR INFORMATION ONLY AND MAY NOT ACCURATE IN SIZE, LENGTH, LOCATION AND AREA. CONTRACTOR TO VERIFY, IN THE PRESENCE OF THE ENGINEER, THE EXTEND OF THE DAMAGES AND REPORT ANY DISCREPANCIES TO EOR BEFORE BEGINNING THE REPAIR.

PHOTOS ARE FOR CONTRACTORS INFORMATION ONLY. ALL PHOTOS ARE BASED ON BRIDGE CONDITION SURVEY REPORT DATED 12/19/2022 AND ISE SITE VISIT OF 08/04/2023, CURRENT CONDITION MAY VARY.

ALL CONCRETE REPAIR SHALL BE IN ACCORDANCE WITH TXDOT CONCRETE REPAIR MANUAL, MARCH 2021.

ESTIMATED QUANTITIES

	DESCRIPTION		TOTAL
0428-7001	PENETRATING CONCRETE SURFACE TREATMENT	SY	251
0429-7001	CONC STR REPAIR (CLEAN & COAT WITH EPOXY)	SF	20
0438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	LF	79
0780-7002	CNC CRACK REPAIR (DISCRETE) (INJECT)	LF	13
0780-7004	CNC CRACK REPAIR (DISCRETE) (SURF SEAL)	LF	46



ABUTMENT
ABUT #1 = 43 SY
ABUT #4 = 41 SY

INTERIOR BENT
BENT #2 = 85 SY
BENT #3 = 82 SY

PENETRATING CONCRETE SURFACE TREATMENT DETAILS

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
6/26/2024

PARSONS
TBPE Registration No. F-1481

SUBSTRUCTURE REPAIR DETAILS
IH 35W SB UNDERPASS AT SH 121 WB

SCALE: NTS
SHEET 1 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6	(SEE TITLE SHEET)	SS347, ETC
STATE	DISTRICT / COUNTY	SHEET NO.
TEXAS	FTW / TARRANT	
CONTROL	SECTION / JOB	52
0081	01 / 053,ETC	

DRAWING DATE: 6/26/2024
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CNC CRACK REPAIR
(DISCRETE) (SURF SEAL)
= 6 LF

PHOTO 1

(SHOWING ABUTMENT #1 BACKWALL, BEAM #1, LOOKING WEST)

CLEANING AND SEALING EXIST JOINTS (CL 7) =79 LF

PHOTO 3

(SHOWING ABUTMENT #1- GAP BETWEEN RIPRAP AND ABUTMENT)

CNC CRACK REPAIR
(DISCRETE) (INJECT) = 3 LF
(INJECT EPOXY WITH LOW PRESSURE)

PHOTO 2

(SHOWING ABUTMENT #1, LOOKING WEST)

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

6/26/2024

PARSONS
TBPE Registration No. F-1481

SUBSTRUCTURE REPAIR DETAILS
IH 35W SB UNDERPASS AT SH 121 WB

SCALE: NTS SHEET 2 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	53
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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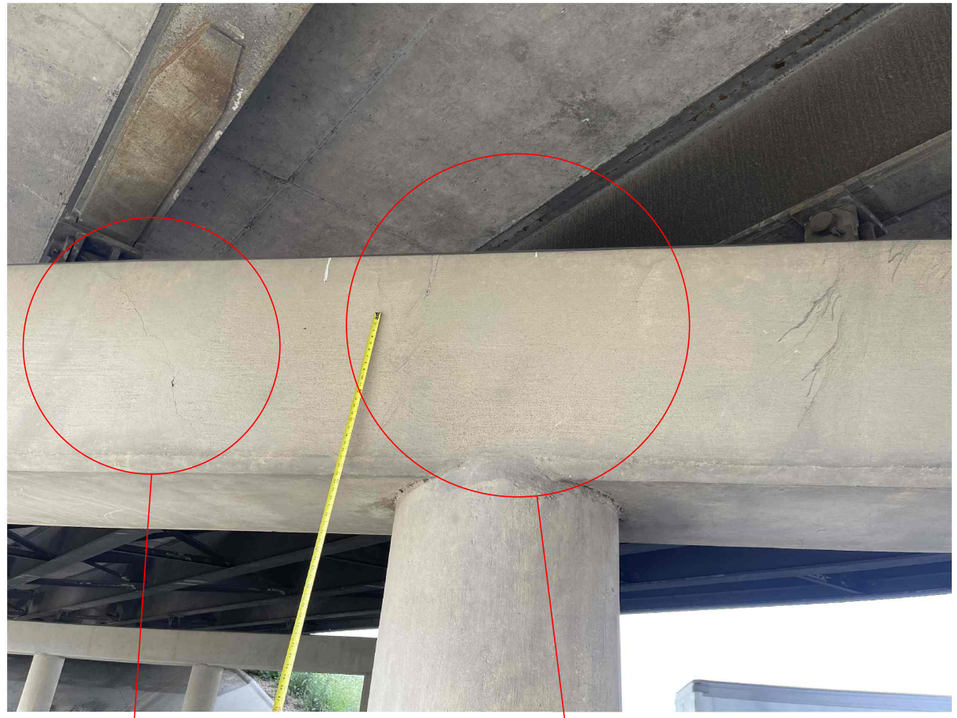
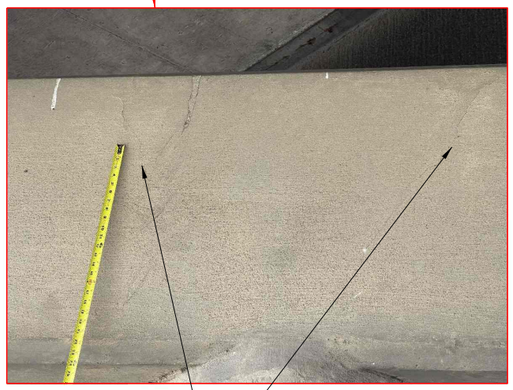


CNC CRACK REPAIR
(DISCRETE) (SURF SEAL)
= 4 LF

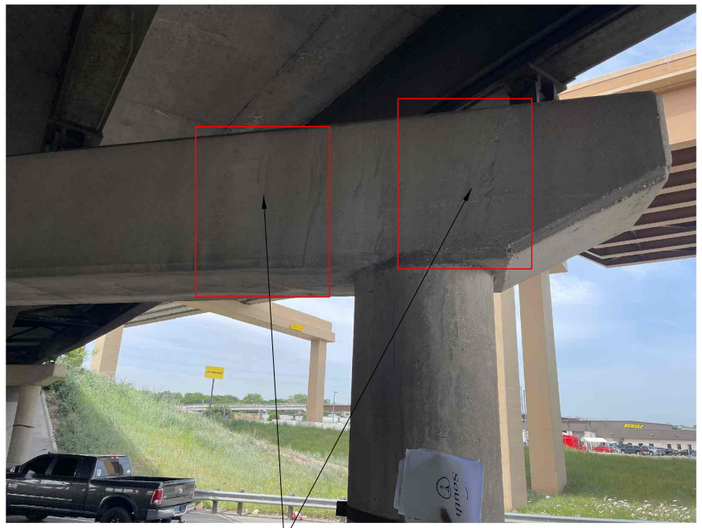


CNC CRACK REPAIR
(DISCRETE) (SURF SEAL)
= 6 LF

PHOTO 4
(SHOWING BENT #3, LOOKING WEST)

CNC CRACK REPAIR
(DISCRETE) (SURF SEAL)
= 7 LF

PHOTO 5
(SHOWING BENT #3, LOOKING WEST)



CNC CRACK REPAIR
(DISCRETE) (SURF SEAL)
= 8 LF

PHOTO 6
(SHOWING BENT #3 NORTH END LOOKING WEST)

STATE OF TEXAS
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PROFESSIONAL ENGINEER
6/26/2024

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

SUBSTRUCTURE REPAIR DETAILS
IH 35W SB UNDERPASS AT SH 121 WB

SCALE: NTS SHEET 3 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	54
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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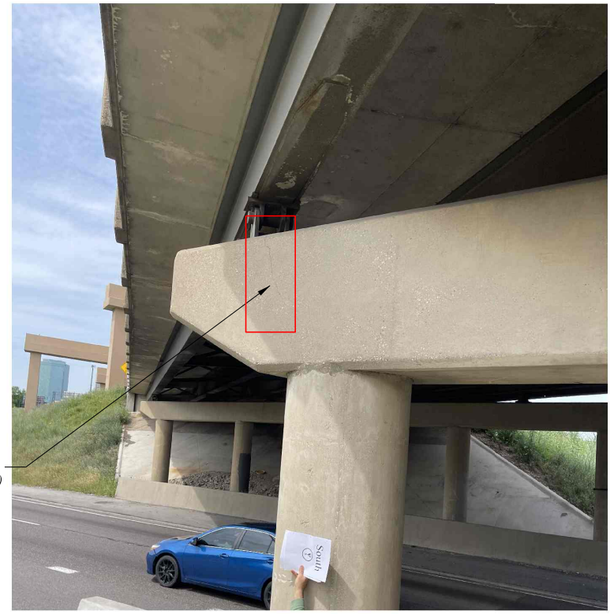

CNC CRACK REPAIR
(DISCRETE) (SURF SEAL)
= 2 LF

PHOTO 7
(SHOWING BENT #3 SOUTH END, LOOKING WEST)

CNC CRACK REPAIR
(DISCRETE) (SURF SEAL)
= 13 LF

PHOTO 9
(SHOWING ABUTMENT #4 RIPRAP
LOOKING EAST)

CONCRETE STRUCTURE REPAIR
(CLEAN & COAT WITH NEAT EPOXY)
= 15 SF

CONCRETE STRUCTURE REPAIR
(CLEAN & COAT WITH NEAT EPOXY)
= 5 SF

PHOTO 8
(SHOWING BENT #3, COLUMN 2 & 3, LOOKING SOUTH)

CNC CRACK REPAIR
(DISCRETE) (INJECT) = 10 LF
(INJECT EPOXY WITH LOW PRESSURE)

PHOTO 10
(SHOWING ABUTMENT #4, LOOKING NORTH)

STATE OF TEXAS
M. N. MOZAFFAR
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LICENSED
PROFESSIONAL ENGINEER

6/26/2024

PARSONS
TBPE Registration No. F-1481

SUBSTRUCTURE REPAIR DETAILS
IH 35W SB UNDERPASS AT SH 121 WB

SCALE: NTS SHEET 4 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	55
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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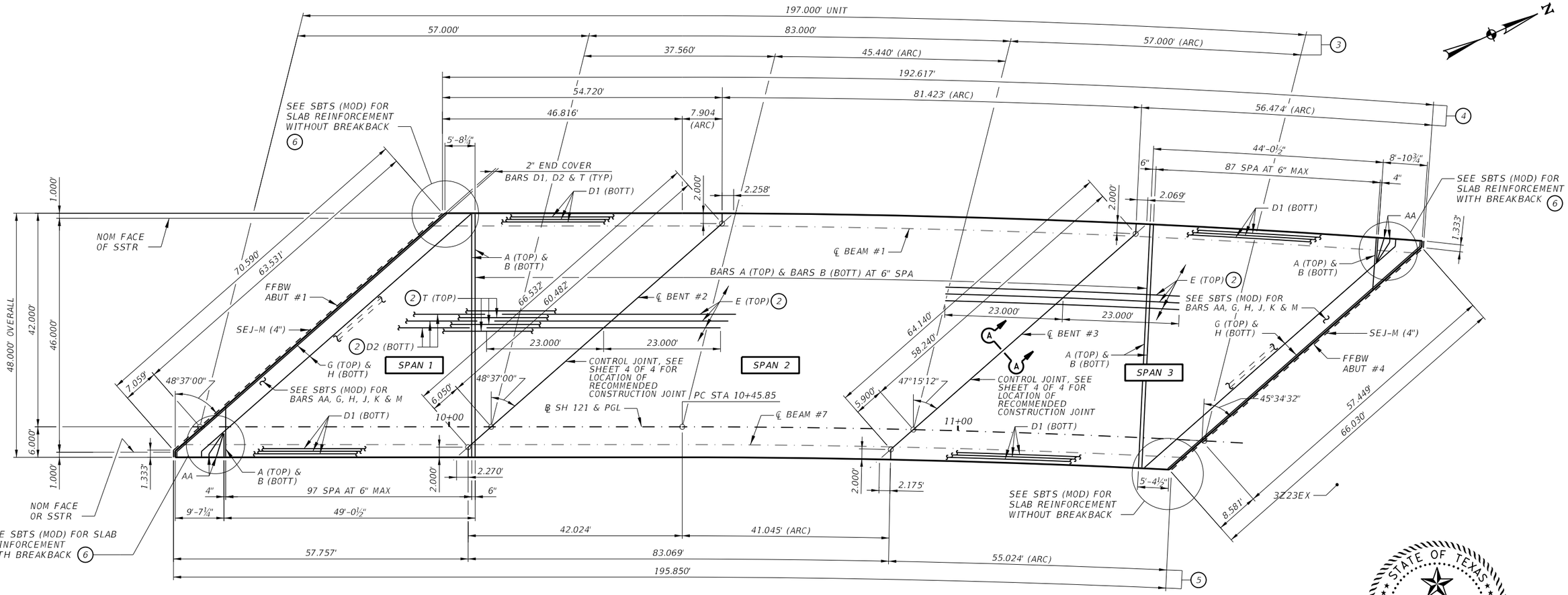
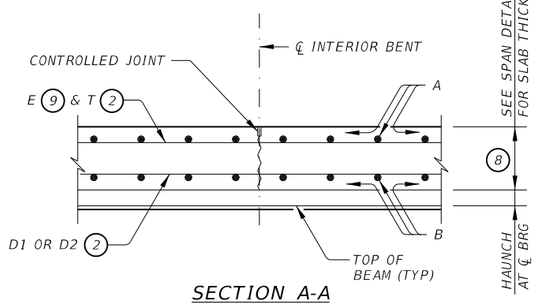
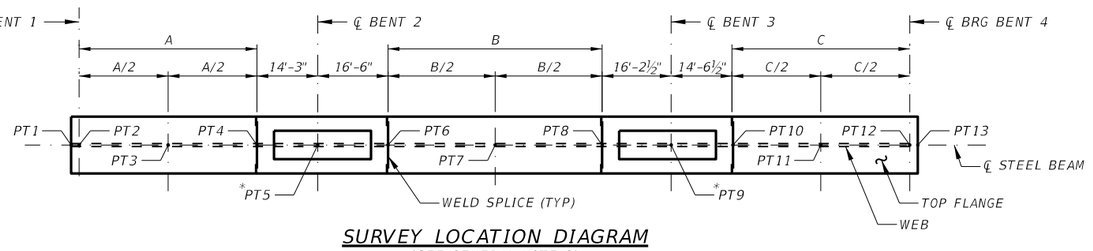


SLAB PLAN
SCALE: 1" = 20'



SECTION A-A
(BARS OA (TOP) NOT SHOWN FOR CLARITY)



SURVEY LOCATION DIAGRAM
(SEE GENERAL NOTE 8)

* PT5 AND PT9 ARE LOCATED AT TOP OF FLANGE COVER PLATE.

TABLE OF ESTIMATED QUANTITIES		
SPAN	REINF CONCRETE SLAB	TOTAL REINF STEEL (1) (7)
NO	SF	LB
1	2724	20430
2	3952	29640
3	2697	20228
TOTAL	9373	70298

1. PLACE REINFORCEMENT IN ACCORDANCE WITH ITEM 422. STEEL QUANTITY FOR CONTRACTOR'S INFORMATION ONLY.
2. TOP & BOTTOM MATS MUST BE CONTINUOUS THROUGH THE CONSTRUCTION JOINTS. DO NOT LAP OVER ℄ OF BENT.
3. MEASURED ALONG ℄ SH 121.
4. MEASURED ALONG LT EDGE OF SLAB
5. MEASURED ALONG RT EDGE OF SLAB
6. "OH" = 2.500', "B" = 1.333'. SEE SBTS (MOD) STANDARD FOR "OH" AND "B" DEFINITION.
7. REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 7.5 LBS/SF.
8. MAINTAIN A CONSTANT SLAB THICKNESS OVER THE BENT.
9. PLACE BARS E BETWEEN BARS T OVER INTERIOR BENT.

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

PARSONS
TBPE Registration No. F-1481

197.00' CONTINUOUS I-BEAM UNIT
IH 35W SB UNDERPASS
AT SH 121 WB

SHEET 1 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	56
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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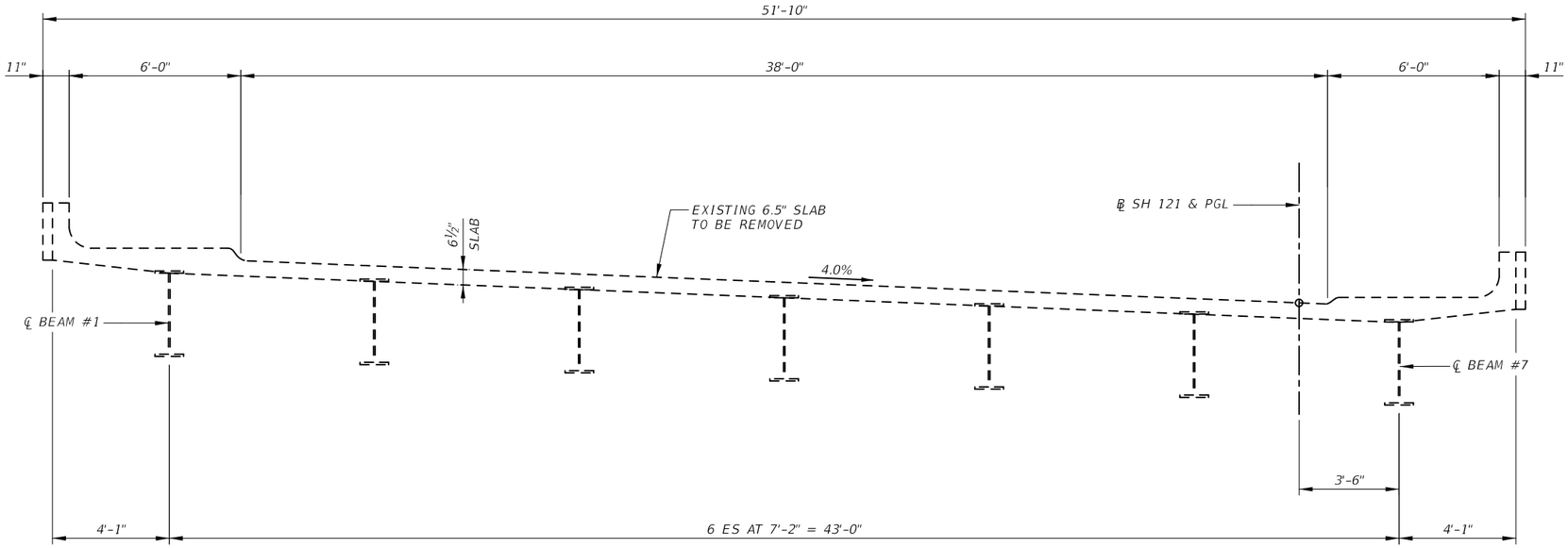
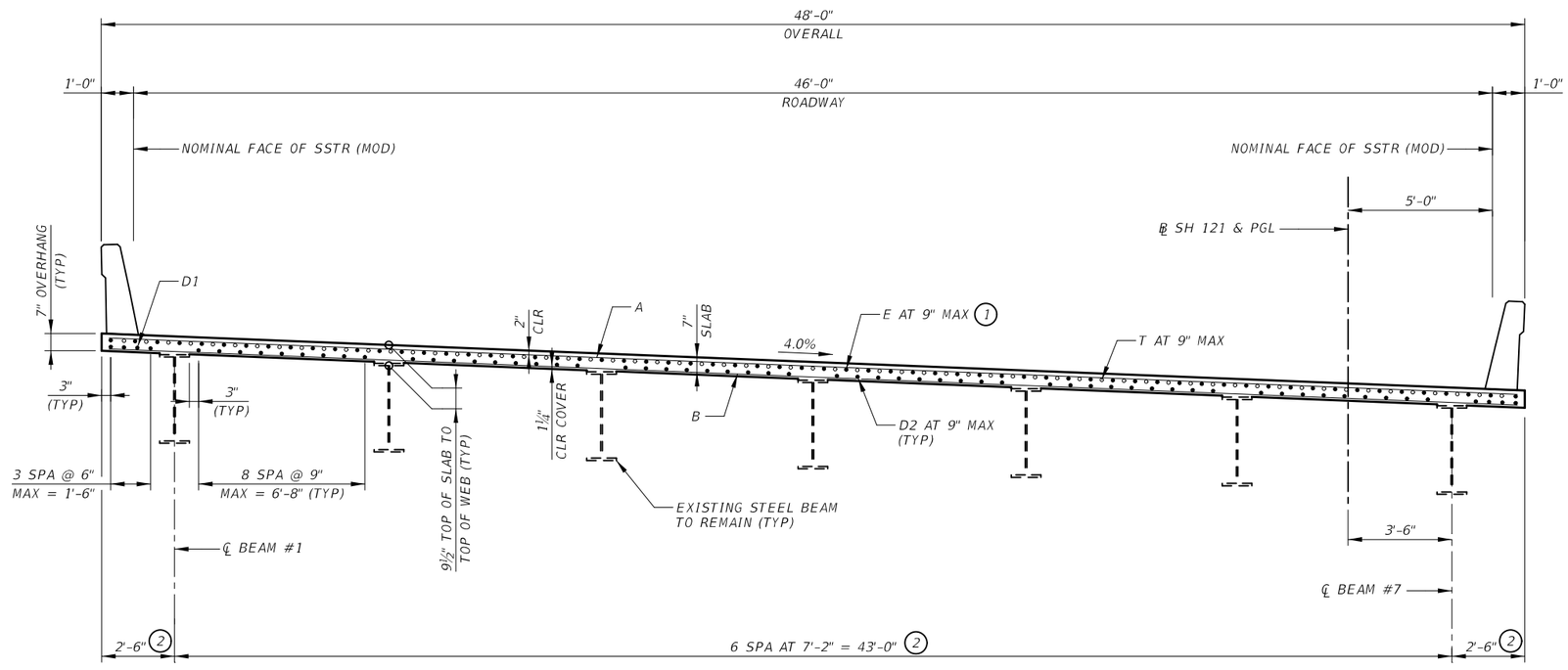


TYPICAL TRANSVERSE SECTION (EXISTING)



TYPICAL TRANSVERSE SECTION (PROPOSED)

GENERAL NOTES:

1. CONTINUOUS SLAB DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, 2020 FOR HL 93 LOADING.
2. SEE PMDF STANDARD FOR DETAILS AND QUANTITY ADJUSTMENT.
3. PRECAST CONCRETE PANELS SHALL NOT BE USED.
4. SEE SBTS (MOD) STANDARD FOR THICKEDED SLAB END DETAILS AND QUANTITY ADJUSTMENT.
5. SEE SBMS STANDARD SHEET FOR MISCELLANEOUS DETAILS.
6. SEE SSTR (MOD) STANDARD FOR RAIL ANCHORAGE IN SLAB.
7. ALL SPLICED BARS SHALL BE STAGGERED.
8. CONTRACTOR SHALL PROVIDE FIELD SURVEY DATA PER SURVEY LOCATION DIAGRAM ON SHEET 1 OF 4 ALONG TOP OF EACH STEEL BEAM (BEAMS 1 THRU 7) TOP FLANGE AFTER DECK REMOVAL. DATA POINTS PT1 THRU PT13 SHALL DEFINE TOP FLANGE ELEVATION AT POINT LOCATIONS AND LENGTH DIMENSIONS A, B AND C PER DIAGRAM. SUBMIT SURVEY DATA TO TXDOT FOR ASSESSMENT AND CONCURRENCE BEFORE RE-CONSTRUCTION OF THE PROPOSED SLAB WORK.

MATERIAL NOTES:

1. PROVIDE CLASS S (HPC) CONCRETE (F'C = 4,000 PSI).
2. PROVIDE GRADE 60 REINFORCING STEEL.
3. ALL REINFORCING STEEL SHALL BE EPOXY COATED OR GALVANIZED.
4. PROVIDE BAR LAPS, WHERE REQUIRED, AS FOLLOWS:
   EPOXY COATED ~#4 = 2'-5"
   ~#5 = 3'-0"

BAR TABLE	
BAR	SIZE
A	#5
AA	#5
B	#5
D1	#5
D2	#5
E	#5
G	#5
H	#5
J	#5
K	#4
M	#5
T	#4

(1) PLACE BARS E BETWEEN BARS T OVER INTERIOR BENT (SEE PLAN FOR PLACEMENT).

(2) DIMENSIONS SHOWN ARE GOOD FROM BEGINING OF BRIDGE TO PC (STA 10+45.85). DIMENSIONS ARE VARIABLE FROM PC TO END OF BRIDGE.

STATE OF TEXAS
CHRIS M. GILSTRAP
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REGISTERED PROFESSIONAL ENGINEER

6/26/2024

HL93 LOADING (DECK REPLACEMENT)
HS20 LOADING (STEEL BEAM EVALUATION)

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

197.00' CONTINUOUS I-BEAM UNIT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S. SHEET 2 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	57
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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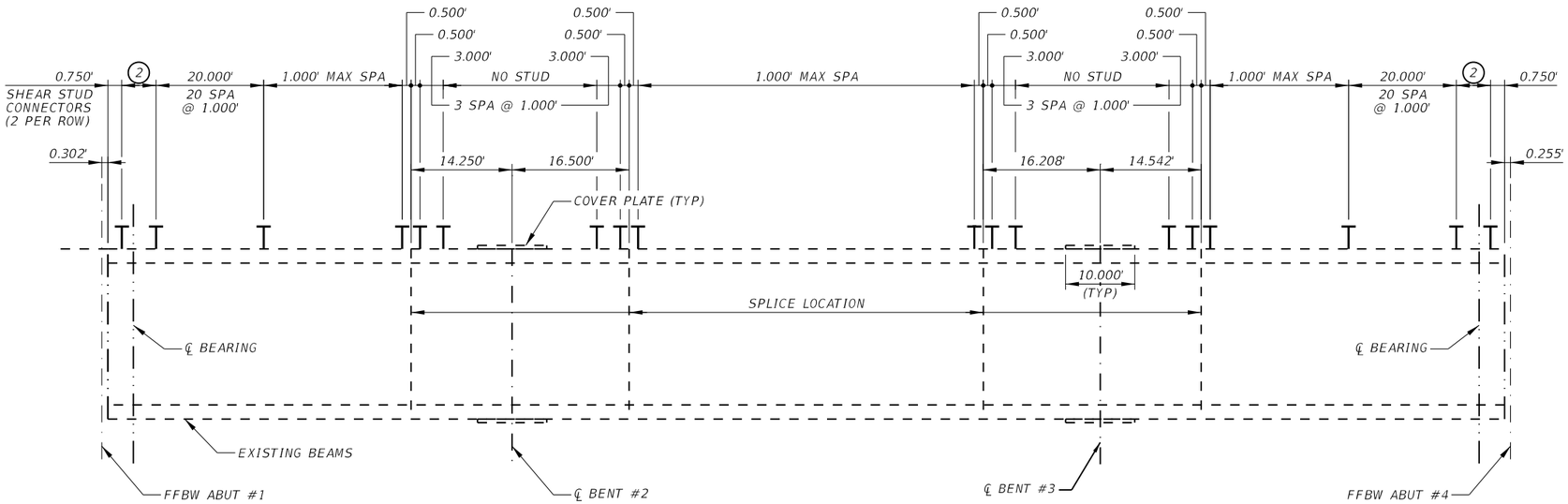


EXISTING STEAL BEAM ELEVATION

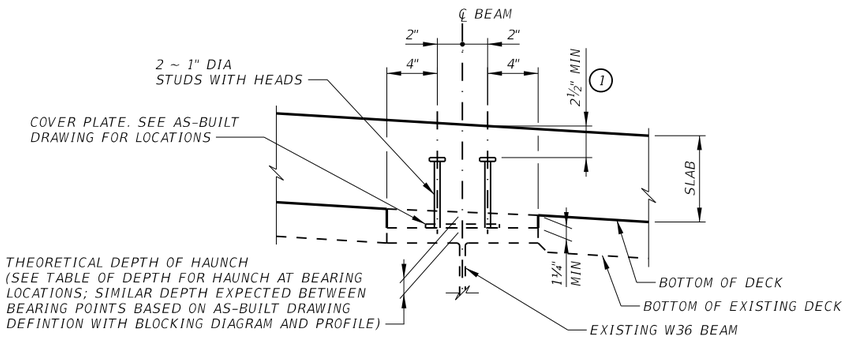
SCALE: N.T.S.

NOTES:

1. SHEAR STUD CONNECTORS DESIGNED IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 17TH EDITION, 2002 FOR HS 20 LOADING.
2. SHEAR STUD SHALL BE ELCTRIC ARC END WELDED TO THE FLANGES WITH COMPLETE FUSION.
3. ALL FIELD WELDING MUST BE PERFORMED IN ACCORDANCE WITH ITEM 448.

TABLE OF ESTIMATED QUANTITIES	
SPAN	STR STEEL (SHEAR CONNECTOR)
NO	LB
1	911
2	1075
3	911
TOTAL	2897

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	TOTAL
0442 - 7015	STR STEEL (SHEAR CONNECTOR)	LB	2897



STUD CONNECTOR DETAIL

WELD STUDS TO THE FLANGE IN ACCORDANCE WITH AWS D1.5.

(1) THE FABRICATOR IS REQUIRED TO PROVIDE STUDS MEETING THE RESTRICTIONS SHOWN. STUDS MUST BE AT LEAST 5" IN HEIGHT.

(2) 4 SPA AT 0.500' = 2.000'

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

HS 20 LOADING (SHEAR STUD)

Texas Department of Transportation
© 2024

PARSONS
TBPE Registration No. F-1481

197.00' CONTINUOUS I-BEAM UNIT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S

SHEET 3 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	58
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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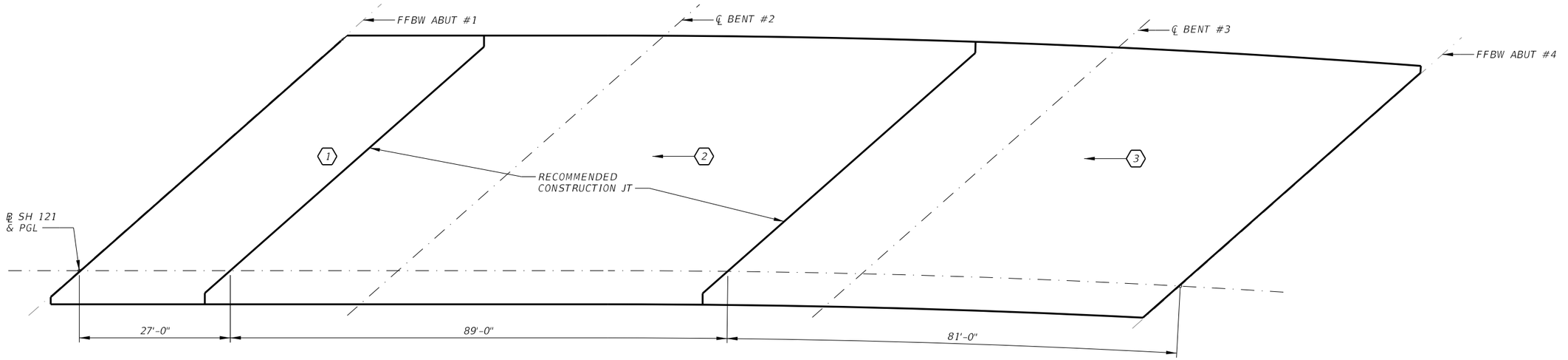


CONCRETE PLACEMENT SEQUANCE (1)(2)

(1) THE RATE OF PLACING CONCRETE SHALL EQUAL OR EXCEED ½ SPAN LENGTH PER HOUR BUT NEED NOT EXCEED 100 C.U. YDS PER HOUR.

(2) TWO OR MORE SEQUENTIAL POURS MAY BE COMBINED AND PLACED IN ONE CONTINUOUS OPERATION. CONTRACTOR IS ALLOWED TO HAVE DIFFERENT POURING SEQUENCE. SUBMIT PROPOSED PLACEMENT SEQUENCE FOR ENGINEERS APPROVAL.

(#) INDICATES POUR NUMBER AND DIRECTION OF POUR

TABLE OF DEAD LOAD DEFLECTIONS (3)

TOTAL DEAD LOAD DEFLECTION (DEC FT)

LOCATION		BEAM #1	BEAM #2	BEAM #3	BEAM #4	BEAM #5	BEAM #6	BEAM #7
SPAN 1	0	0.000'	0.000'	0.000'	0.000'	0.000'	0.000'	0.000'
	1	0.006'	0.007'	0.007'	0.007'	0.007'	0.007'	0.006'
	2	0.010'	0.012'	0.013'	0.012'	0.012'	0.012'	0.010'
	3	0.013'	0.016'	0.016'	0.016'	0.016'	0.016'	0.013'
	4	0.013'	0.016'	0.016'	0.016'	0.016'	0.016'	0.013'
	5	0.011'	0.014'	0.014'	0.014'	0.014'	0.014'	0.012'
	6	0.007'	0.009'	0.010'	0.009'	0.010'	0.010'	0.008'
	7	0.003'	0.004'	0.004'	0.004'	0.004'	0.004'	0.003'
	8	-0.001'	0.000'	0.000'	-0.001'	0.000'	0.000'	-0.001'
	9	-0.002'	-0.002'	-0.002'	-0.003'	-0.002'	-0.002'	-0.002'
SPAN 2	10	0.000'	0.000'	0.000'	0.000'	0.000'	0.000'	0.000'
	11	0.014'	0.015'	0.015'	0.015'	0.015'	0.014'	0.013'
	12	0.033'	0.036'	0.037'	0.037'	0.037'	0.036'	0.033'
	13	0.052'	0.056'	0.058'	0.058'	0.058'	0.056'	0.052'
	14	0.065'	0.070'	0.072'	0.073'	0.072'	0.070'	0.066'
	15	0.070'	0.075'	0.078'	0.078'	0.078'	0.075'	0.070'
	16	0.065'	0.071'	0.073'	0.073'	0.073'	0.070'	0.065'
	17	0.053'	0.057'	0.059'	0.059'	0.059'	0.057'	0.053'
	18	0.034'	0.037'	0.038'	0.038'	0.038'	0.036'	0.034'
	19	0.014'	0.015'	0.015'	0.016'	0.015'	0.015'	0.014'
SPAN 3	20	0.000'	0.000'	0.000'	0.000'	0.000'	0.000'	0.000'
	21	-0.002'	-0.002'	-0.003'	-0.003'	-0.003'	-0.003'	-0.003'
	22	-0.001'	0.000'	0.000'	0.000'	0.000'	0.000'	-0.003'
	23	0.004'	0.005'	0.005'	0.005'	0.005'	0.005'	0.003'
	24	0.008'	0.010'	0.010'	0.010'	0.010'	0.010'	0.008'
	25	0.012'	0.015'	0.015'	0.014'	0.015'	0.014'	0.012'
	26	0.014'	0.017'	0.017'	0.017'	0.017'	0.017'	0.014'
	27	0.014'	0.016'	0.016'	0.016'	0.016'	0.016'	0.013'
	28	0.011'	0.013'	0.013'	0.013'	0.013'	0.013'	0.011'
	29	0.006'	0.007'	0.007'	0.007'	0.007'	0.007'	0.006'
	30	0.000'	0.000'	0.000'	0.000'	0.000'	0.000'	0.000'

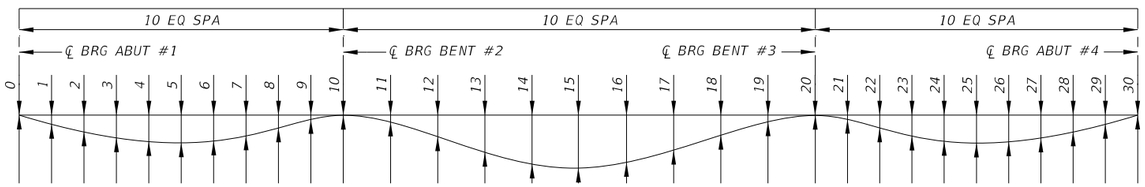
(3) THEORETICAL DEFLECTION DUE TO CAST IN PLACE CONCRETE DECK AND COMPOSITE RAIL LOAD

TABLE OF DEPTH FOR HAUNCH (4)(5)

BEAM	ABUT #1 ℄ BEARING	BENT #2 ℄ BEARING	BENT #3 ℄ BEARING	ABUT #4 ℄ BEARING
1	0.130'	0.131'	0.130'	0.129'
2	0.130'	0.131'	0.131'	0.129'
3	0.130'	0.131'	0.131'	0.130'
4	0.131'	0.130'	0.131'	0.131'
5	0.131'	0.130'	0.131'	0.131'
6	0.130'	0.130'	0.130'	0.131'
7	0.130'	0.130'	0.130'	0.130'

(4) THE VARIATION IN THEORETICAL HAUNCH DEPTH IS MINIMAL BETWEEN BEAM BEARING LOCATIONS BASED ON AS-BUILT DRAWING DEFINITION WITH BLOCKING DIAGRAM AND PROFILE INFORMATION

(5) SLAB PLACEMENT MUST CONSIDER THE EXPECTED DEAD LOAD DEFLECTION ALONG EACH BEAM



DEAD LOAD DEFLECTION DIAGRAM

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

HS 20 LOADING (DL DEFLECTIONS)

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

197.00' CONTINUOUS I-BEAM UNIT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S

SHEET 4 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	59
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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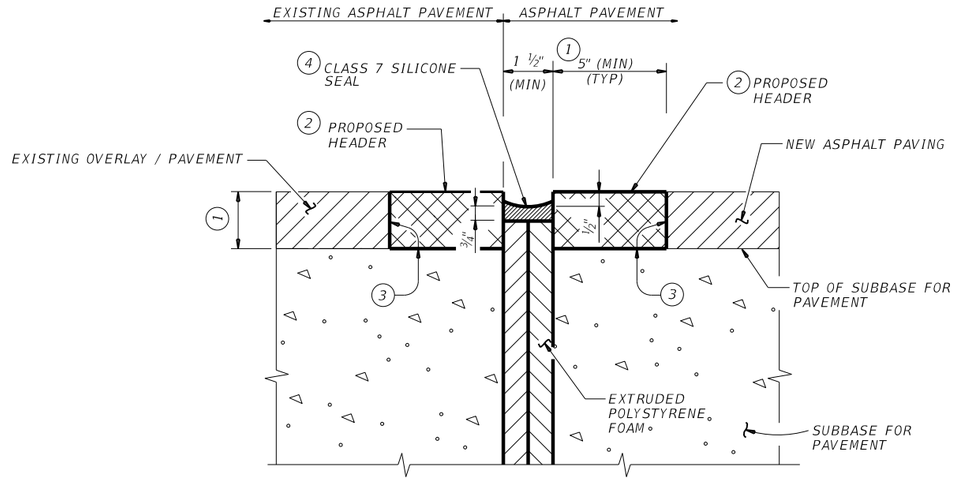

SECTION THRU RELIEF JOINT

(WITH HEADER/POLYMER NOSING AT JOINT BETWEEN EXISTING AND NEW ASPHALT PAVING)

(1) THICKNESS OF THE NOSING/HEADER SHALL MATCH THE THICKNESS OF THE OVERLAY. THE WIDTH OF THE NOSING/HEADER MATERIAL SHALL BE 2X THE THICKNESS OF THE EXISTING/NEW OVERLAY OR 5", WHICHEVER IS GREATER.

(2) REMOVE & REPLACE EXISTING ACP WHERE EXISTING ACP IS DAMAGED ADJACENT TO JOINT.

(3) SURFACE WHERE NOSING/HEADER MATERIAL IS TO BE PLACED SHALL BE CLEAN AND DRY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

(4) PREPARE SURFACES WHERE SEALANT IS TO BE PLACED IN ACCORDANCE WITH MANUFACTURER'S SPECFICATIONS.

NOTES:

SEAL JOINTS IN ACCORDANCE WITH ITEM 438, "RESIZING AND SEALING JOINTS".

IF THE WIDTH OF THE JOINT IS LESS THAN 1 ½" ANYWHERE ALONG ITS LENGTH, RESTORE THE 1 ½" JOINT OPENING BY CUTTING THE FULL DEPTH OF THE CONCRETE PAVEMENT. DO NOT CUT THE APPROACH SLAB OR THE SUPPORT (SLEEPER) SLAB. RESEAL THE JOINT AS SHOWN.

IF THE MINIMUM WIDTH OF THE JOINT IS 1 ½" AND LESS THAN 4", RESEAL THE JOINT AS SHOWN.

IF THE JOINT OPENING IS GREATER THAN 1 ½" BUT LESS THAN 4", THEN CUTTING IS NOT REQUIRED. IF OPENING IS GREATER THAN 4", THEN REFERENCE PLAN SHEETS FOR RETROFIT DETAILS AND/OR NOTES.

IF THE WIDTH OF THE JOINT IS LESS THAN 1 ½" ANYWHERE ALONG ITS LENGTH, RESTORE THE 1 ½" JOINT OPENING BY CUTTING THE FULL DEPTH OF THE CONCRETE PAVEMENT. DO NOT CUT THE APPROACH SLAB OR THE SUPPORT (SLEEPER) SLAB. RESEAL THE JOINT AS SHOWN.

IN EITHER CASE, BOTH SURFACES OF THE JOINT SHALL BE THOROUGHLY CLEANED BY SAND BLASTING AND AIR BLASTING, LEAVING A CLEAN, NEWLY EXPOSED CONCRETE SURFACE. FILL THE DEPTH OF THE JOINT WITH EXTRUDED POLYSTYRENE TO THE WIDTH OF THE JOINT. EXTRUDED POLYSTYRENE FOAM SHALL CONFORM TO ASTM C578 AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 25 PSI. THE SEALANT SHALL BE "CLASS 7", PER DMS-6310, "JOINT SEALANTS AND FILLERS".

PRIOR TO APPLYING CLASS 7 SEALANT, CONTRACTOR SHALL FILL ALL VOIDS ON TOP SURFACE OF EXTRUDED POLYSTYRENE WITH CLASS 4 SEALANT, PER DMS-6310, JOINT SEALANTS AND FILLERS". CLASS 4 SEALANT IS CONSIDERED SUBSIDIARY TO ITEM 438, "RESIZING AND SEALING JOINTS".

MEASUREMENT AND PAYMENT FOR HEADER SHALL BE IN ACCORDANCE WITH ITEM 454, "BRIDGE EXPANSION JOINTS". MEASUREMENT AND PAYMENT FOR RESIZING, CLEANING, AND SEALING SHALL BE IN ACCORDANCE WITH ITEM 438, "RESIZING AND SEALING JOINTS".

IF CONDITION IN THE FIELD DOESN'T MATCH WITH DETAIL, PLEASE CONTACT ENGINEER OF RECORD.

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

PARSONS
TBPE Registration No. F-1481

RELIEF JOINT DETAILS
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S

SHEET 1 of 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	60
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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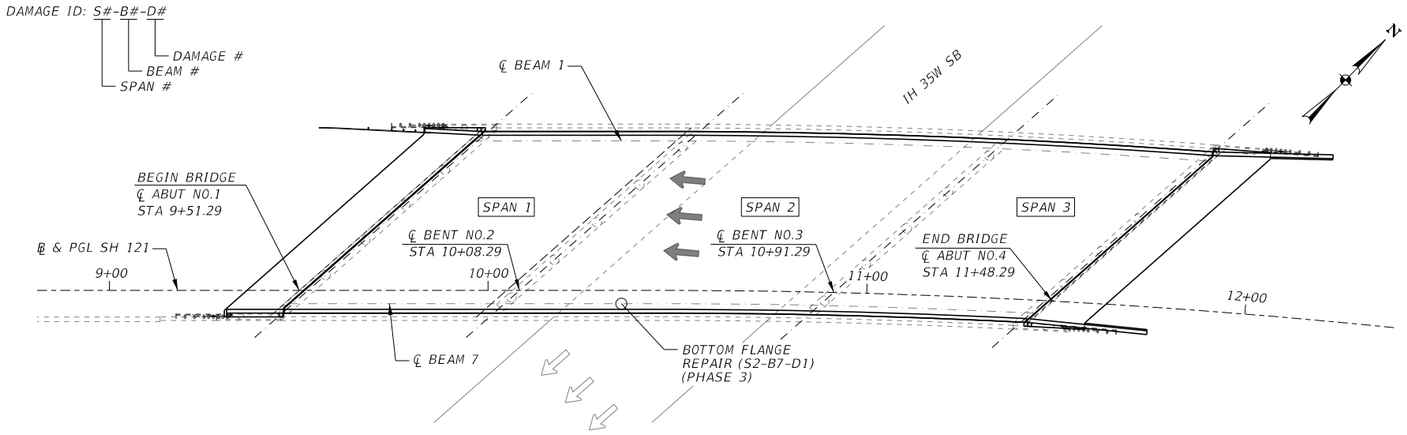


PLAN - STEEL BEAM REPAIR

SCALE: 1" = 40'-0"

HEAT STRAIGHTENING PROCEDURE:

1. SET TRAFFIC CONTROL. SH 121 OVERPASS BRIDGE SHALL BE CLOSED TO TRAFFIC.
2. HEAT STRAIGHTEN DISTORTED BEAMS IN ACCORDANCE WITH ITEM 784 "STEEL MEMBER REPAIR".
3. WELD FLANGE AT INDICATED LOCATIONS IN ACCORDANCE WITH ITEM 448 "STRUCTURAL FIELD WELDING".
4. RESTORE ANY DAMAGE CAUSE BY THE REPAIR PROCEDURE USED AT NO ADDITIONAL COST TO THE DEPARTMENT
5. RESTORE PAINT SYSTEM AND APPLY APPEARANCE COAT TO MATCH.
6. OPEN THE ROADWAYS TO NORMAL TRAFFIC.
7. ATTEMPTS WITH HS SHOULD STOP AT THE POINT WHEN THEY POSE A RISK OF DAMAGING THE MEMBER. PARTIAL SEGMENT REPLACMENT OF BOTTOM FLANGE SECTION MAY BE ALTERNATIVE SOLUTION WHEN HS PROVES UNSUCCESSFUL IN FIELD.

ALTERNATIVE FLANGE REPLACEMENT PROCEDURE

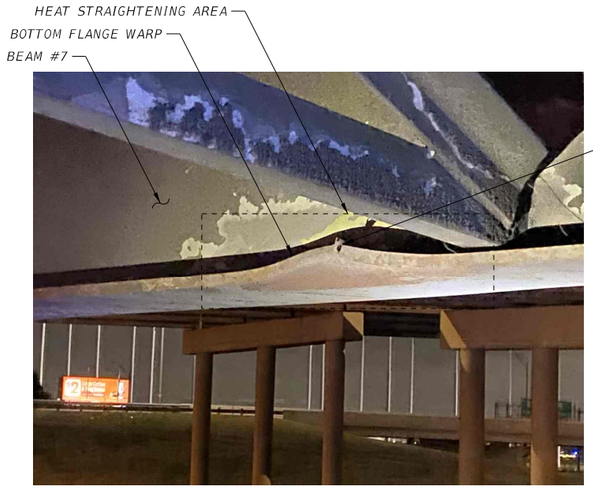
7. PROVIDE TEMPORARY SUPPORTS ON BOTH SIDES OF REPAIR.
8. INSTALL FLANGE SECTION REPLACEMENT MEMBER.
9. REPEAT STEPS 3-6.

GENERAL NOTES:

1. NOTIFY TXDOT BRIDGE DIVISION AT LEAST TWO WEEKS IN ADVANCE BY E-MAILING BRG-FO-STL@TXDOT.GOV PRIOR TO BEGINNING WORK TO ALLOW FOR INSPECTION OF REPAIRS BY A BRIDGE DIVISION STRUCTURAL STEEL INSPECTOR.
2. USE HEAT-STRAIGHTENING TO REPAIR AND RESTORE THE SHAPE OF BEAMS. HEAT STRAIGHTEN THE MEMBERS IN ACCORDANCE WITH ITEM 784, "STEEL MEMBER REPAIR". APPLY SUFFICIENT FORCE COMBINED WITH HEAT TO ACCOMPLISH WORK BUT DO NOT FRACTURE MEMBER. REPAIR ADDITIONAL DAMAGE CAUSED BY CONTRACTOR'S OPERATIONS AT NO ADDITIONAL COST TO THE DEPARTMENT.
3. ALL WELDING SHALL BE PERFORMED BY A CERTIFIED WELDER IN ACCORDANCE WITH ITEM 448 "STRUCTURAL FIELD WELDING". SUBMIT CERTIFICATION PAPERS PRIOR TO START OF WORK. RADIOGRAPHIC INSPECTION OF FLANGE WELDS IS REQUIRED. COORDINATE WELDING INSPECTION WITH TXDOT FORT WORTH DISTRICT MAINTENANCE OFFICE. PROVIDE AT LEAST 4 DAYS ADVANCE NOTICE.
4. RESTORE THE PAINT PROTECTION FOR REPAIRED BEAMS WITH SYSTEM I-B PER ITEM 446, "FIELD CLEANING AND PAINTING STEEL". MATCH APPEARANCE COAT WITH THE EXISTING STRUCTURE. ASSUME EXISTING PAINT COATING CONTAINS HAZARDOUS MATERIALS, UNLESS OTHERWISE NOTED. CONTRACTOR IS RESPONSIBLE TO REMOVE AND CONTAIN COATINGS IN ACCORDANCE WITH TXDOT STANDARD SPECIFICATIONS.
5. PAYMENT IS 1 LUMP SUM FOR ALL WORK RELATED TO REPAIRING THE STEEL GIRDER AND RESTORING PAINT TO MATCH ADJACENT UNDAMAGED STEEL.
6. PROVIDE ASTM A709 STEEL WITH MINIMUM GRADE 36 IN ACCORDANCE WITH ITEM 442, "METAL FOR STRUCTURES" FOR NEW FLANGE PLATE REPLACEMENT ALTERNATIVE.

HEAT STRAIGHTENING NOTES:

1. THE OBJECTIVES OF HEAT STRAIGHTENING (HS) ARE:
   A. TO ALIGN THE BOTTOM FLANGE ON TWO SIDES OF FRACTURE TO FACILITATE WELDING.
   B. TO MOVE THE WARPED PORTION OF FLANGE DOWNWARDS TO RESTORE FLANGE STRAIGHTNESS.
2. LIMIT THE HS ONLY TO AREA NECESSARY TO REACH GOALS OF REPAIR. AVOID HS THE AREA NEAR BOLTED AND WELDED CONNECTIONS FOR DIAPHRAGMS.

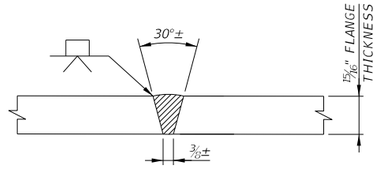


REPAIR THE FRACTURE USING CJP GROOVE WELD. WELD SHALL BE PREFORMED ALONG THE ENTIRE FRACTURE LENGTH AFTER THE TWO SIDES OF FRACTURE ARE ALIGNED USING HEAT STRAIGHTENING. GRIND EDGES TO FORM SINGLE BEVELS AS SHOWN ON CJP GROOVE WELD DETAIL. EXERCISE CAUTION TO NOT INCREASE THE FRACTURE LENGTH DURING EDGE PREPARATION. RADIOGRAPH OF THE FLANGE WELD IS REQUIRED.

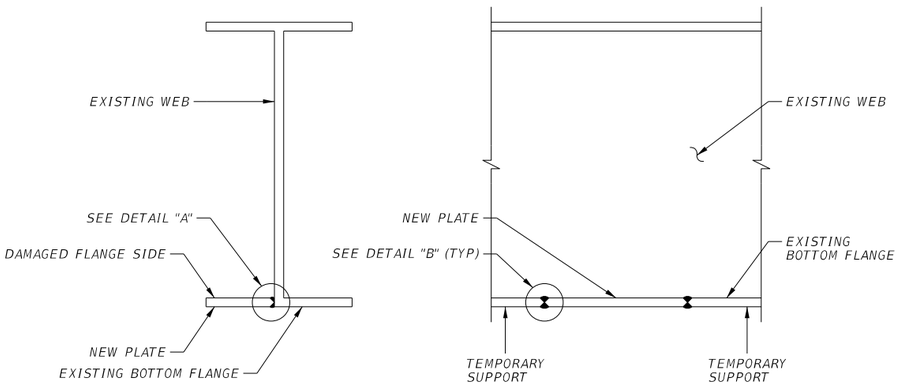
BOTTOM FLANGE REPAIR (S2-B7-D1)

ESTIMATED QUANTITIES

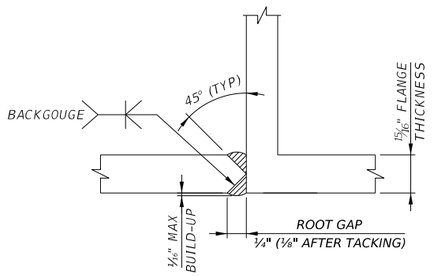
ITEM - CODE	DESCRIPTION	UNIT	TOTAL
0784-7020	REP STL BRIDGE MBR (STRAIGHTEN MEMB)	EA	1
0784-7022	REP STL BRIDGE MBR (WELD REPAIR)	EA	1



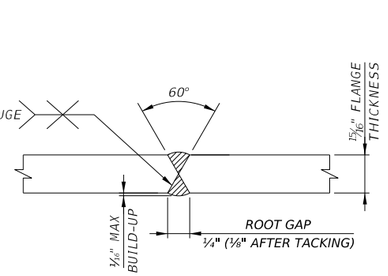
CJP GROOVE WELD DETAIL



BOTTOM FLANGE REPLACEMENT - ALTERNATIVE



DETAIL "A"



DETAIL "B"

BOTTOM FLANGE REPLACEMENT DETAILS

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

9/5/2024

PARSONS
TBPE Registration No. F-1481

STEEL BEAM REPAIRS (HS)
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: 1" = 40'-0"

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	61
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 9/4/2024
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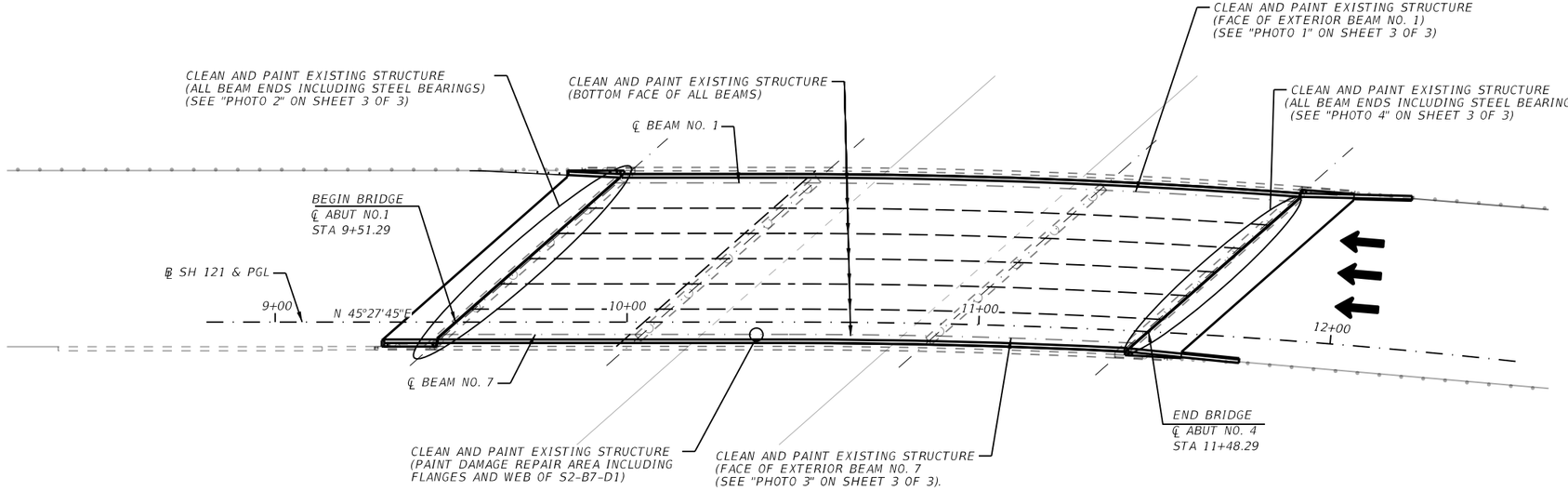

PLAN ~ SHOWING LOCATION OF STEEL BEAM CLEANING AND PAINTING

N.T.S

NOTES:

1. ALL INFORMATION SHOWN BASED ON AS-BUILTS DRAWINGS NORTH LANE SH 121 UNDERPASS (WEST LANE I35W) DATED 08/28/1959. STATIONS ARE FROM AS-BUILT PLANS. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD.
2. PROVIDE PAINT SYSTEM III-B IN ACCORDANCE WITH DMS-8101, "STRUCTURAL STEEL PAINTS-PERFORMANCE". CLEAN AND PAINT IN ACCORDANCE WITH ITEM 446, "FIELD CLEANING AND PAINTING STEEL".
3. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING VEHICULAR TRAFFIC SURROUNDING THE PAINTING OPERATION. PAYMENT FOR PROTECTION SHALL BE CONSIDERED SUBSIDIARY TO PAY ITEM 446.
4. PERFORM STEEL BEAM REPAIR AND WELDING REPAIRS BEFORE APPLYING PAINT TO THE DESIGNATED AREA.
5. PHOTOS ARE FOR CONTRACTORS INFORMATION ONLY. ALL PHOTOS ARE BASED ON BRIDGE CONDITION SURVEY REPORT DATED 12/19/2022 AND ISE SITE VISIT OF 08/04/2023, CURRENT CONDITION MAY VARY.

BRIDGE PAINT AREA

BRIDGE BUILT: 1961
FIELD CLEANING AND PAINTING STEEL FOR EXTERIOR FACE OF EXTERIOR BEAMS: 1200 SF
FIELD CLEANING AND PAINTING STEEL FOR BOTTOM FACE OF ALL BEAMS: 1380 SF
FIELD CLEANING AND PAINTING STEEL FOR END OF ALL BEAMS INCLUDING STEEL BEARING: 500 SF
PAINT FOR DAMAGE REPAIR AREA INCLUDING FLANGES AND WEB OF SPAN 2 BEAM 7 : 5 SF

APPROXIMATE AREA OF STEEL STRUCTURE TO BE CLEANED AND PAINTED: 3085 SF

ESTIMATED QUANTITIES

	DESCRIPTION		TOTAL
0446-7011	CLEAN & PAINT EXIST STR (SYSTEM III-B)	LS	1

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
6/26/2024

PARSONS
TBPE Registration No. F-1481

STEEL BEAM REPAIRS (PAINT) IH 35W SB UNDERPASS AT SH 121 WB

SCALE: NTS SHEET 1 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	62
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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CLEAN AND PAINT EXISTING STRUCTURE
(FACE OF EXTERIOR BEAM NO. 1

PHOTO 1
(SHOWING BEAM #1, LOOKING SOUTH)

CLEAN AND PAINT EXISTING STRUCTURE
(FACE OF EXTERIOR BEAM NO. 7)

PHOTO 3
(SHOWING BEAM #7, LOOKING NORTH)

CLEAN AND PAINT EXISTING STRUCTURE
(BEAM ENDS INCLUDING STEEL BEARINGS)

PHOTO 2
(SHOWING BEAM END AT ABUTMENT #1)

CLEAN AND PAINT EXISTING STRUCTURE
(BEAM ENDS INCLUDING STEEL BEARINGS)

PHOTO 4
(SHOWING BEAM END AT ABUTMENT #4)

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

STEEL BEAM REPAIRS (PAINT) IH 35W SB UNDERPASS AT SH 121 WB

SCALE: NTS SHEET 2 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	63
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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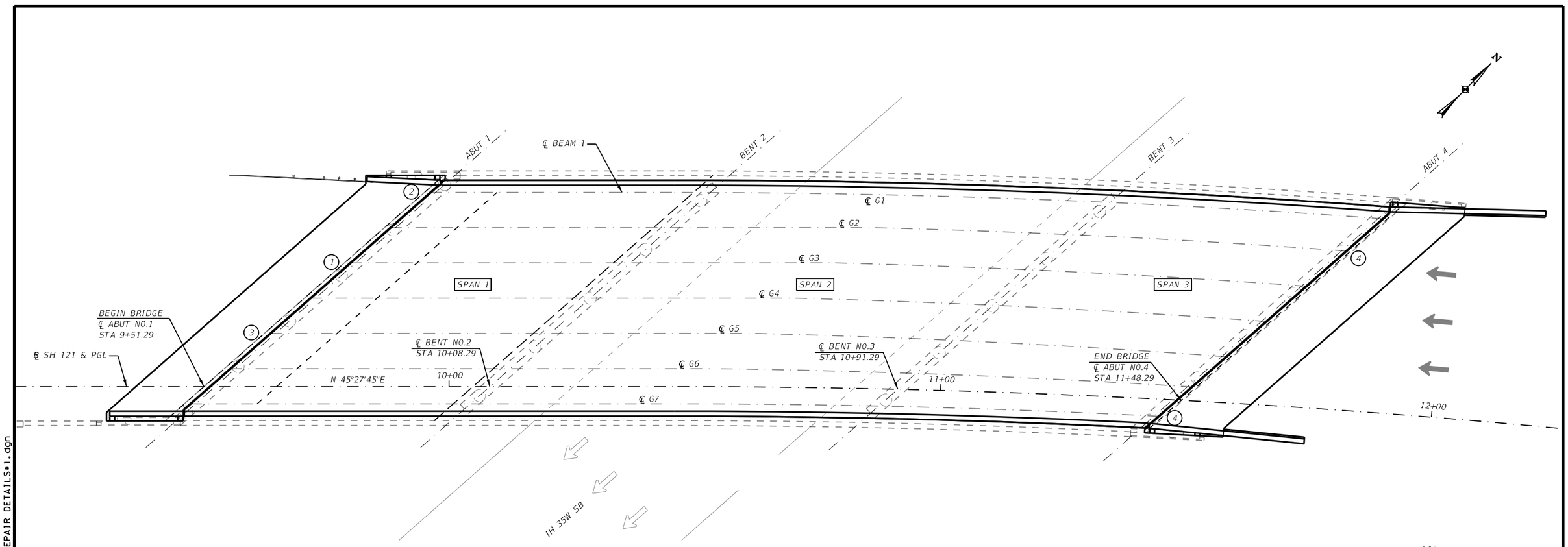

PLAN

SCALE: 1" = 20'

(1) REPLACEMENT BEARING ASSEMBLY AT ABUTMENT 1 GIRDER 3

(2) REPAIR CRACKED WELD - LEFT AT ABUTMENT 1 GIRDER 1

(3) REPAIR CRACKED WELD - RIGHT AT ABUTMENT 1 GIRDER 5

(4) REPAIR CRACKED WELD - LEFT & RIGHT AT ABUTMENT 4 GIRDER 2 & 7

ESTIMATED QUANTITIES

BID CODE	DESCRIPTION	UNIT	TOTAL
0442 - 7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	260
0499 - 7001	ADJUST STL SHOES (RE-WELDS)	EA	6

NOTES:

1. THE ROCKER BEARING AT GIRDER 3 (ABUTMENT 1) NEEDS TO BE REPLACED. SEE SHEET 2 OF 2 FOR MORE BEARING REPLACEMENT INFORMATION.
2. WELD REPAIR:
   (A) ARC-AIR GOUGE AND CLEAN THE ENTIRE WELD IF IT IS CRACKED/DAMAGED EVEN PARTIALLY.
   (B) FIELD WELD THE AFFECTED AREA, PER ITEM "448", "STRUCTURAL FIELD WELDING".
   (C) PAINT THE AFFECTED AREA.
3. NO ACTION NEEDED ONLY AT BEARING ASSEMBLIES MARKED IN PLAN BASED ON FEBRUARY 2024 INSPECTION.
4. THE PROPOSED ROCKER BEARING REPAIR IS BASED ON SITE INSPECTION OF ABUTMENT BEARING ON FEBRUARY 17, 2024.
5. PAYMENT FOR THE TEMPORARY SUPPORT IS SUBSIDIARY TO ITEM 499 ADJUSTING STEEL SHOES AND ITEM 442 METAL FOR STRUCTURES. NO TRAFFIC IS ALLOWED ON THE BRIDGE DURING THE REPAIR WORK. REFER TO TCP FOR LANE CLOSURE WHILE THE BRIDGE IS UNDER REPAIR.
6. FOLLOW TCP PRIOR TO COMMENCEING THE REPAIR WORK.
7. PROVIDE TEMPORARY SHORING TO FULLY SUPPORT/SECURE THE GIRDERS SUBJECT TO BEARING REPLACEMENT AND RE-WELDS.
8. WELD SOUNDNESS SHALL BE ESTABLISHED BY NDT AND WITH WELDS GROUND SMOOTH.

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

PARSONS
TBPE Registration No. F-1481

BEARING REPAIR DETAILS
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: 1" = 20' SHEET 1 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	64
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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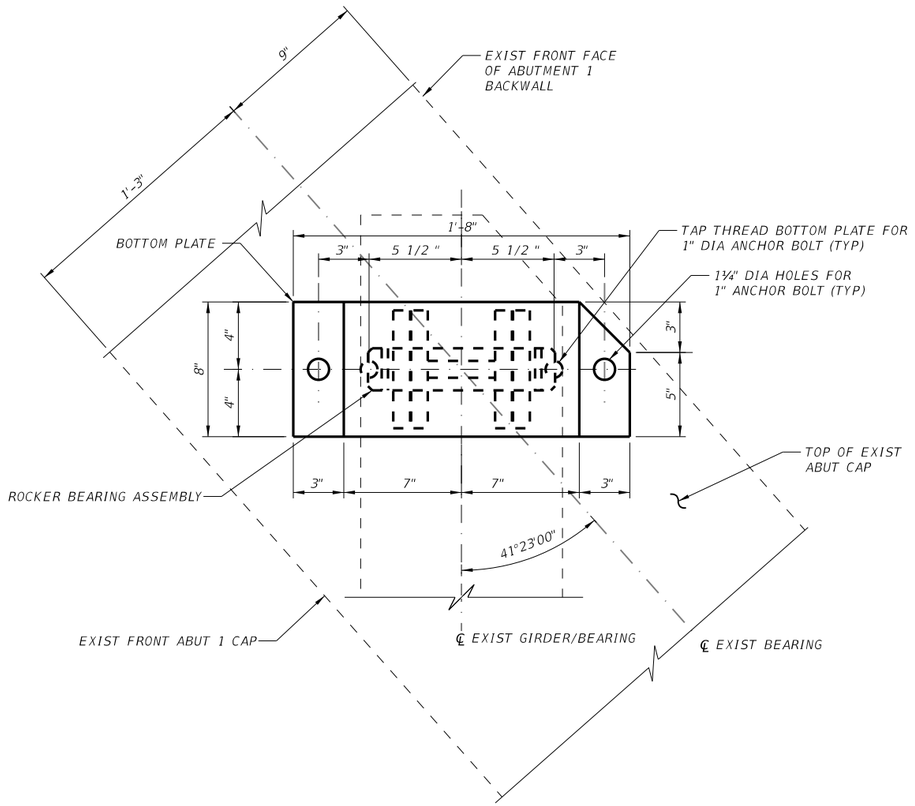
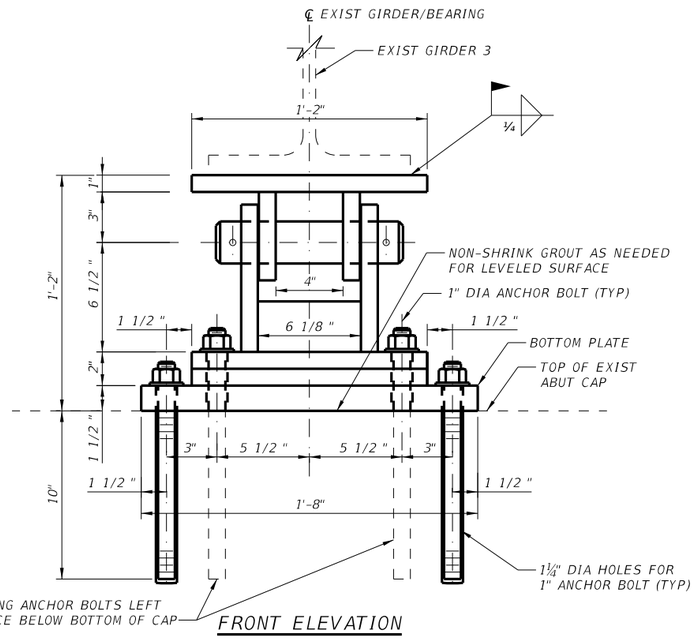
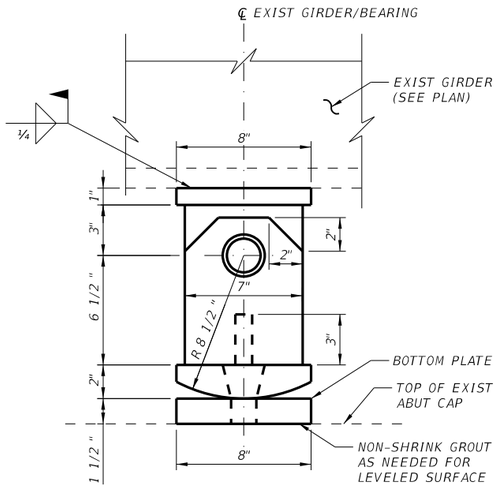


PLAN

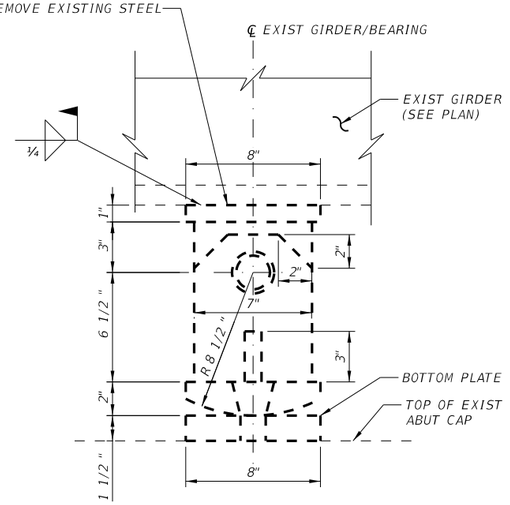
WASHERS AND NUTS NOT SHOWN FOR CLARITY



FRONT ELEVATION



SIDE ELEVATION



BEARING WELD REPAIR

BEARING REPLACEMENT

BEARING DEVICE NOTES:

1. DESIGNED AND SHOWN FOR REPLACEMENT OF ROCKER BEARING, LOCATED AT THE SAME LOCATION AS THE EXISTING ROCKER BEARING.
2. THE REPLACEMENT ROCKER BEARING TO BE A DUPLICATE OF THE EXISTING ROCKER BEARING, EXCEPT FOR THE ANCHOR AND BOTTOM PLATE AS SHOWN IN THIS SHEET. BOTTOM PLATE TO BE ASTM A36 OR EQUIVALENT.
3. THE MAJOR DIMENSIONS OF THE ROCKER BEARING ARE SHOWN IN THIS SHEET. SEE THE AS-BUILT DWG FOR ALL OTHER INFORMATION, DIMENSIONS AND MATERIALS OR EQUIVALENT MATERIALS APPROVED BY THE CLIENT. THE AS-BUILT DRAWING SET WAS DEVELOPED FOR STATE HIGHWAY IMPROVEMENT INTERSTATE HIGHWAY NO 35W TARRANT COUNTY, STATE CONTROL 14-16-32 FROM TWELFTH STREET TO BELKNAP STREET, DTATED JULY 30, 1959.
4. ANCHOR BOLTS MUST CONFORM TO ASTM F 1554 GRADE 105 OR ASTM A 193 GRADE B7. NUTS MUST CONFORM TO ASTM A 563 GRADE DH, HEAVY HEX OR A194 GRADE 2H, HEAVY HEX. WASHERS MUST CONFORM TO ASTM F 436. HOT-DIP GALVANIZE ALL ANCHOR BOLTS (EXPOSED END PLUS 6" MIN), AND NUTS NOT EMBEDDED IN CONCRETE, AS PER ITEM 445, "GALVANIZING".
5. FIELD VERIFY BOTTOM PLATE DIMENSION PRIOR TO PLATE INSTALLATION. INFORM ENGINEER IF DISCREPANCIES ARE FOUND IN THE FIELD.
6. THE CONTRACTOR TO PROVIDE TXDOT THE GIRDER JACKING PLAN FOR APPROVAL PRIOR TO THE GIRDER JACKING AND BEARING REPLACEMENT. THE MAXIMUM ALLOWABLE JACKING VERTICAL MOVEMENT IS ⅛". CONSTRUCTION NEED TO FOLLOW ITEMS 441, 446, 447 AND 448. FIELD WELD ALSO TO FOLLOW AWS WELDING CODE.

CONSTRUCTION SEQUENCE:

1. FIELD SURVEY THE EXISTING ROCKER DIMENSIONS TO BE USED IN CONJUNCTION WITH BEARING AS-BUILT DRAWING INFORMATION TO DUPLICATE THE ROCKER BEARING ASSEMBLY. THE BOTTOM PLATE, AHCOR BOLT/ROD SHALL BE FURNISHED PER THIS DESIGN.
2. LOOSEN THE EXISTING ANCHOR BOLT / ROD AND JACK GIRDER PER THE NOTE AS SHOWN ABOVE. LOCK THE GIRDER AT THE JACKED POSTION.
3. REMOVE THE EXISTING ROCKER BEARING ASSEMBLY, CLEAN ALL THE EXISTING PAINT AND WELD OFF THE GIRDER FLANGE. CLEAN, REPAIR AND LEVEL THE TOP OF THE EXISTING ABUTMENT CAP.
4. DRILL-GROUT THE ANCNOR BOLTS AND INSTALL THE BOTTOM PLATE. REMOVE THE JACKING – LOCKING AND LOCATE THE THE GIRDER BOTTOM FLANGE ONTO TOP PLATE OF THE BEARING ASSMBLY. PERFORM THE MINOR ADJUSTMENT, AS NEEDED, TO THE BEARING ASSEMBLY AND/OR GIRDER TO THE DESIGN POSITION.
5. FIELD WELD THE BEARING TO THE GIRDER FLANGE. PAINT ALL THE EXPOSED STEEL MEMBERS.

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

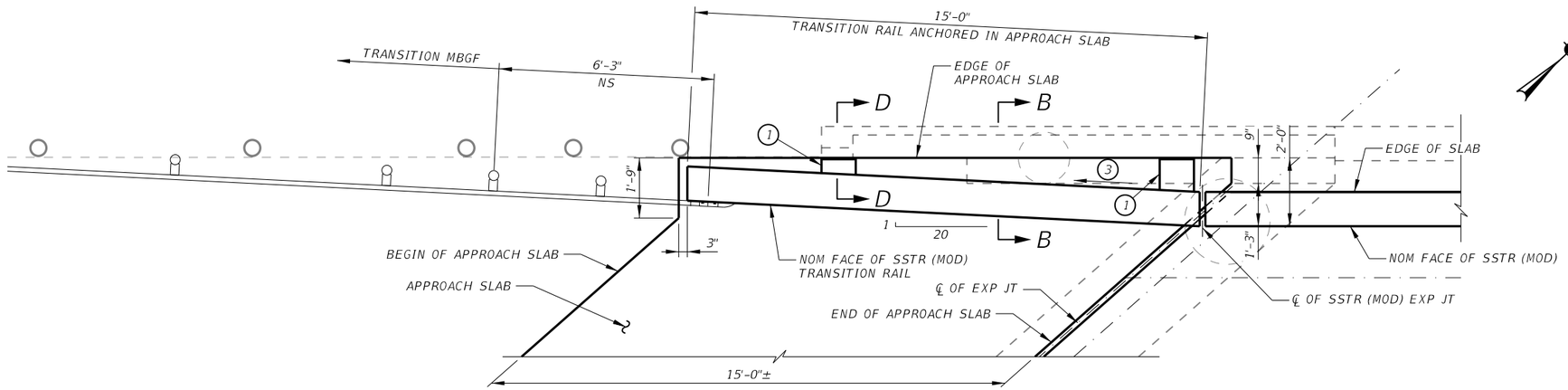
PARSONS
TBPE Registration No. F-1481

BEARING REPAIR DETAILS IH 35W SB UNDERPASS AT SH 121 WB

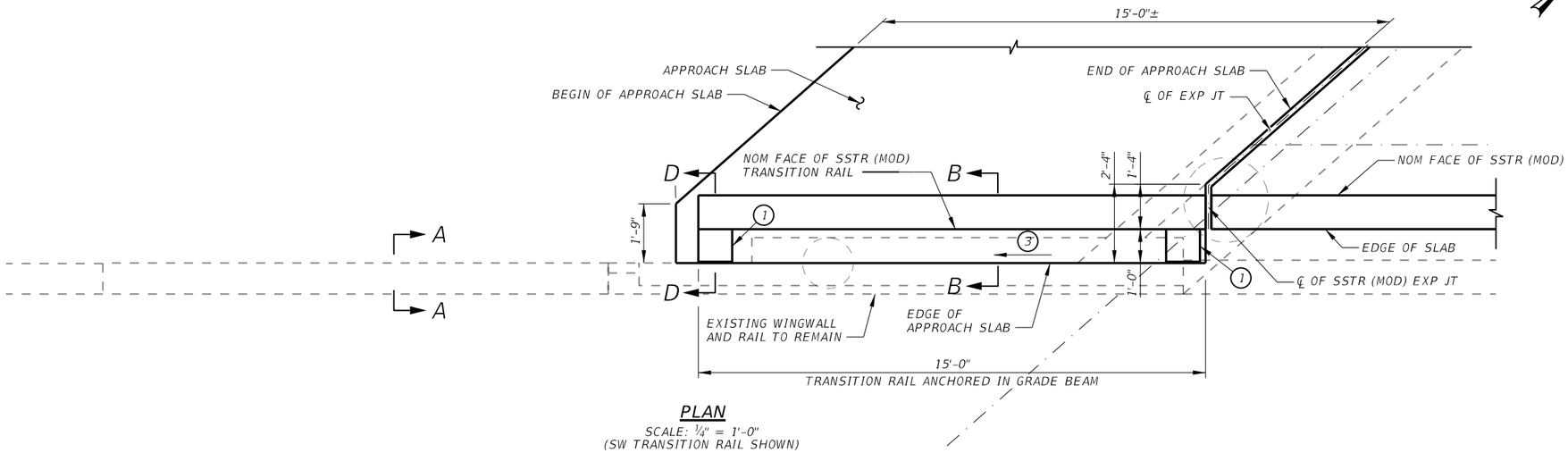
SCALE: N.T.S. SHEET 2 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	65
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
FILENAME: c:\pw\working\texas\parsons\p009206h\d0248781\CEC*Assign4*SH121*BEARING REPAIR DETAILS*2.dgn



PLAN
SCALE: ¼" = 1'-0"
(NW TRANSITION RAIL SHOWN)



PLAN
SCALE: ¼" = 1'-0"
(SW TRANSITION RAIL SHOWN)

GENERAL NOTES:

1. SEE TRAFFIC RAIL FOUNDATION (TRF) STANDARD FOR GRADE BEAM (TRF-GB) GENERAL NOTES, REINFORCEMENT, AND DETAILS NOT SHOWN.
2. SEE SSTR (MOD) STANDARD FOR RAIL ANCHORAGE IN APPROACH SLAB AND GRADE BEAM, TRANSITION RAIL REINFORECEMENT, RAIL AT EXPANSION JOINT, AND DETAILS NOT SHOWN.
3. FIELD TRIM AND BEND BARS AS NECESSARY TO MAINTAIN CLEARANCES SHOWN AND REINFORCEMENT COVER.
4. SEE DETAIL FOR JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."
5. SEE BAS-A (MOD) FOR APPROACH SLAB DETAILS NOT SHOWN.

(1) REINFORCED CONCRETE END RETURN; HOLD TOP ELEVATION IMMEDIATELY BELOW RIPRAP. CAST-IN-PLACE END RETURN CONCRETE SHALL BE SUBSIDIARY TO ITEM 450-7025 - FOR TYPE SSTR (MOD).

(3) RIPRAP, SLOPE AWAY FROM BRIDGE AT A MINIMUM OF 0.5 PERCENT.

ESTIMATED QUANTITIES

BID CODE	DESCRIPTION	UNIT	TOTAL
0432 - 7013	RIPRAP (MOW STRIP) (4")	CY	0.4

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

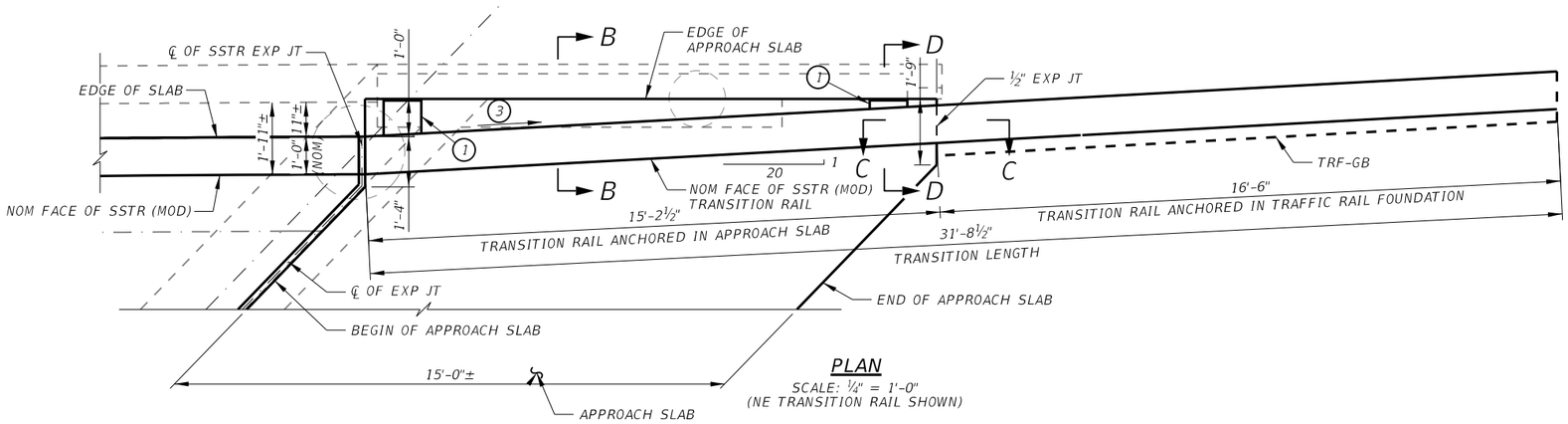
PARSONS
TBPE Registration No. F-1481

TRANSITION RAIL DETAILS
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: 1/4" = 1'-0" SHEET 1 OF 2

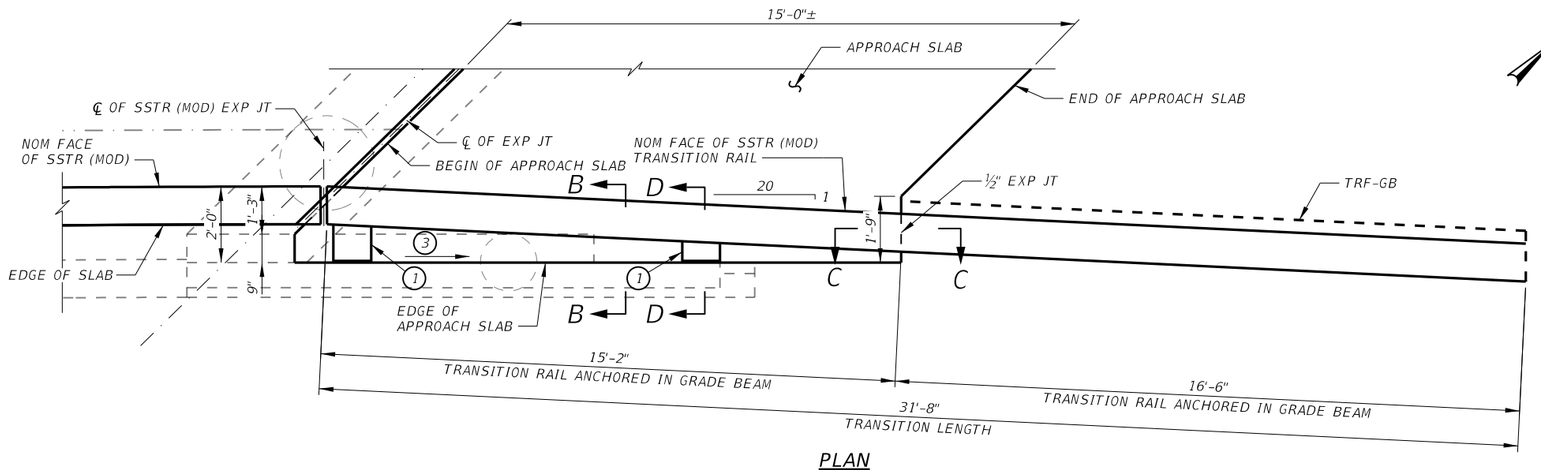
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	66
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
FILENAME: c:\pw\working\texas\parsons\p0092061\d0248781\CEC\Assign4\SH121_TRANSITION RAIL DETAILS.dgn



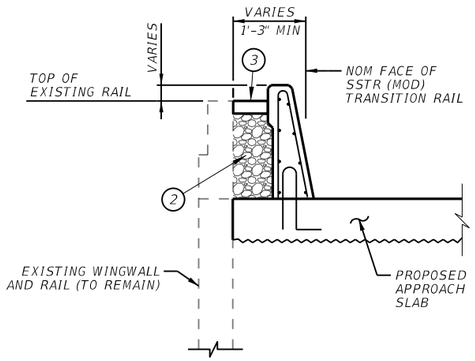
PLAN

SCALE: ¼" = 1'-0"
(NE TRANSITION RAIL SHOWN)



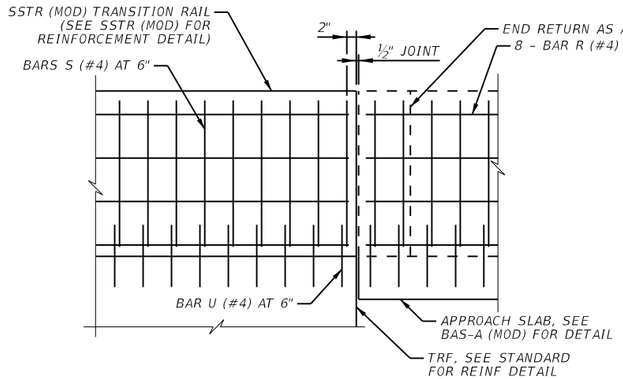
PLAN

SCALE: ¼" = 1'-0"
(SE TRANSITION RAIL SHOWN)

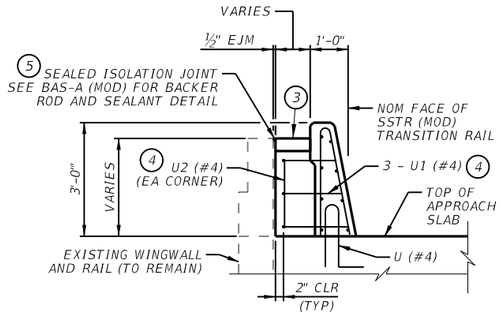


SECTION "B-B"

(PROPOSED STRUCTURE)

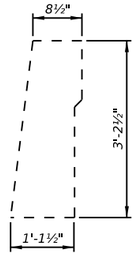


PARTIAL ELEVATION DETAIL "C-C"



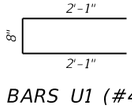
SECTION "D-D"

(END RETURN AT APPROACH SLAB)

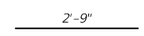


SECTION "A-A"

EXISTING CIP RAIL)



BARS U1 (#4)



BARS U2 (#4)

NOTE:

1. SEE SHEET 1 OF 2 FOR GENERAL NOTES.

(1) REINFORCED CONCRETE END RETURN. HOLD TOP ELEVATION IMMEDIATELY BELOW RIPRAP. CAST-IN-PLACE END RETURN CONCRETE SHALL BE SUBSIDIARY TO ITEM 450-7025 - FOR TYPE SSTR (MOD).

(2) CLEAN COURSE AGGREGATE BACKFILL GRADE 7 (TAMP AND COMPACT REMOVING SETTLEMENT VOIDS PRIOR TO PLACING RIPRAP). AGGREGATE BACKFILL IS SUBSIDIARY TO ITEM 450-7025 FOR TYPE SSTR (MOD).

(3) RIPRAP, SLOPE AWAY FROM BRIDGE AT A MINIMUM OF 0.5 PERCENT.

(4) TRIM BAR IN FIELD FOR 2" CLEAR COVER

(5) SEAL TOP AND EXPOSED VERTICAL JOINT

ESTIMATED QUANTITIES

BID CODE	DESCRIPTION	UNIT	TOTAL
0432 - 7013	RIPRAP (MOW STRIP) (4")	CY	0.4

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

Texas Department of Transportation
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PARSONS
TBPE Registration No. F-1481

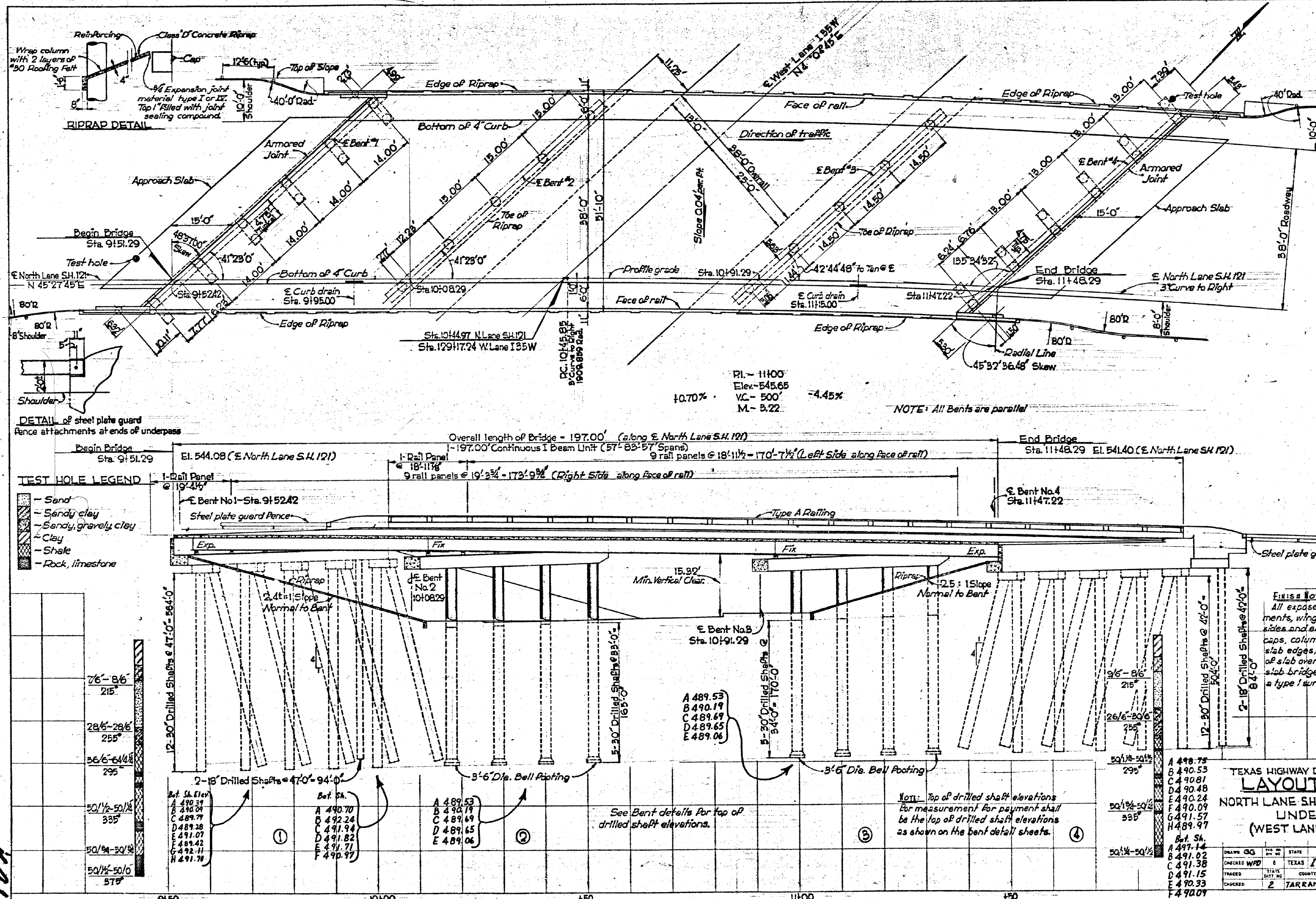
TRANSITION RAIL DETAILS IH 35W SB UNDERPASS AT SH 121 WB

SCALE: AS SHOWN

SHEET 2 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	67
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
FILENAME: c:\pw\working\texas\parsons\p009206h\d0248781\CEC\Assign4\SH121*TRANSITION RAIL DETAILS*2.dgn



ESTIMATED QUANTITIES

Description	Uncl. Stru. Excavation Cu. Yds.	Class 'A' Slab (I Beam) Cu. Yds.	Concrete Bents Cu. Yds.	Reinforcing Steel Lbs.	Struct. Steel Lbs.	Dr. Shafts 18"φ Lin. Ft.	Dr. Shafts 30"φ Lin. Ft.	Railing Type 'A' Lin. Ft.	Riprap Conc. Cl. 'D' Cu. Yds.	Bell Footing Cu. Yds.
2 Abutment Bents	100.0		93.2	15,475		178.0	1068.0		70.3	
2 Interior Bents			57.5	11,463			335.0			1.6
1-197' Continuous I Beam Unit		231.1		41,504	250,483			382.8		
Totals	100.0	231.1	150.7	68,442	250,483	178.0	1403.0	382.8	70.3	1.6

TEXAS HIGHWAY DEPARTMENT

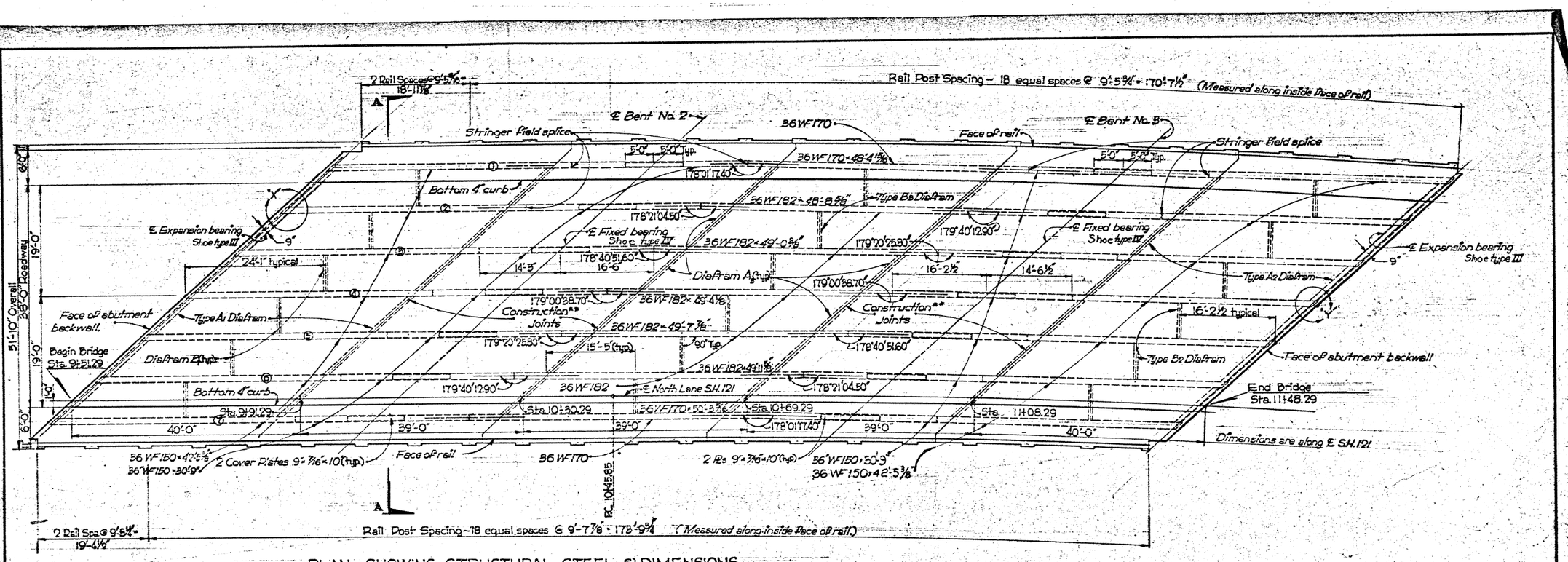
LAYOUT

NORTH LANE S.H. 121 UNDERPASS (WEST LANE I35W)

Drawn	F.P.D. No. / Div. No.	State	Federal Aid Project No.	Highway No.
GG	8	TEXAS	I35W5(11)42C	I35W
Checked WPD	State Dist. No.	County	Control No. / Section No. / Job No.	Sheet No.
Traced / Checked	2	TARRANT	14 / 16 / 32	103

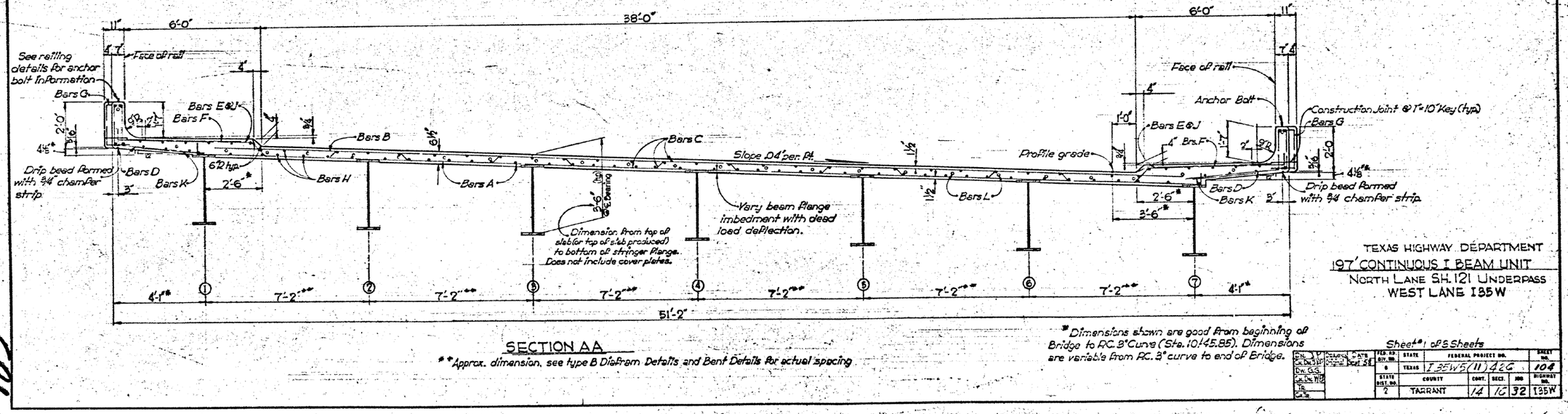
FOR CONTRACTOR'S REFERENCE ONLY

(SH121 WB OVERPASS AT IH 35W SB LANES)
NBI# 02-220-0-0014-16-192



PLAN – SHOWING STRUCTURAL STEEL & DIMENSIONS

** All construction joints are parallel and are parallel to ℄ Bents



SECTION AA

** Approx. dimension, see type B Diaphram Details and Bent Details for actual spacing

* Dimensions shown are good from beginning of Bridge to P.C. 3° Curve (Sta. 10+45.85). Dimensions are variable from P.C. 3° curve to end of Bridge.

TEXAS HIGHWAY DEPARTMENT
197' CONTINUOUS I BEAM UNIT
NORTH LANE SH. 121 UNDERPASS
WEST LANE I35W

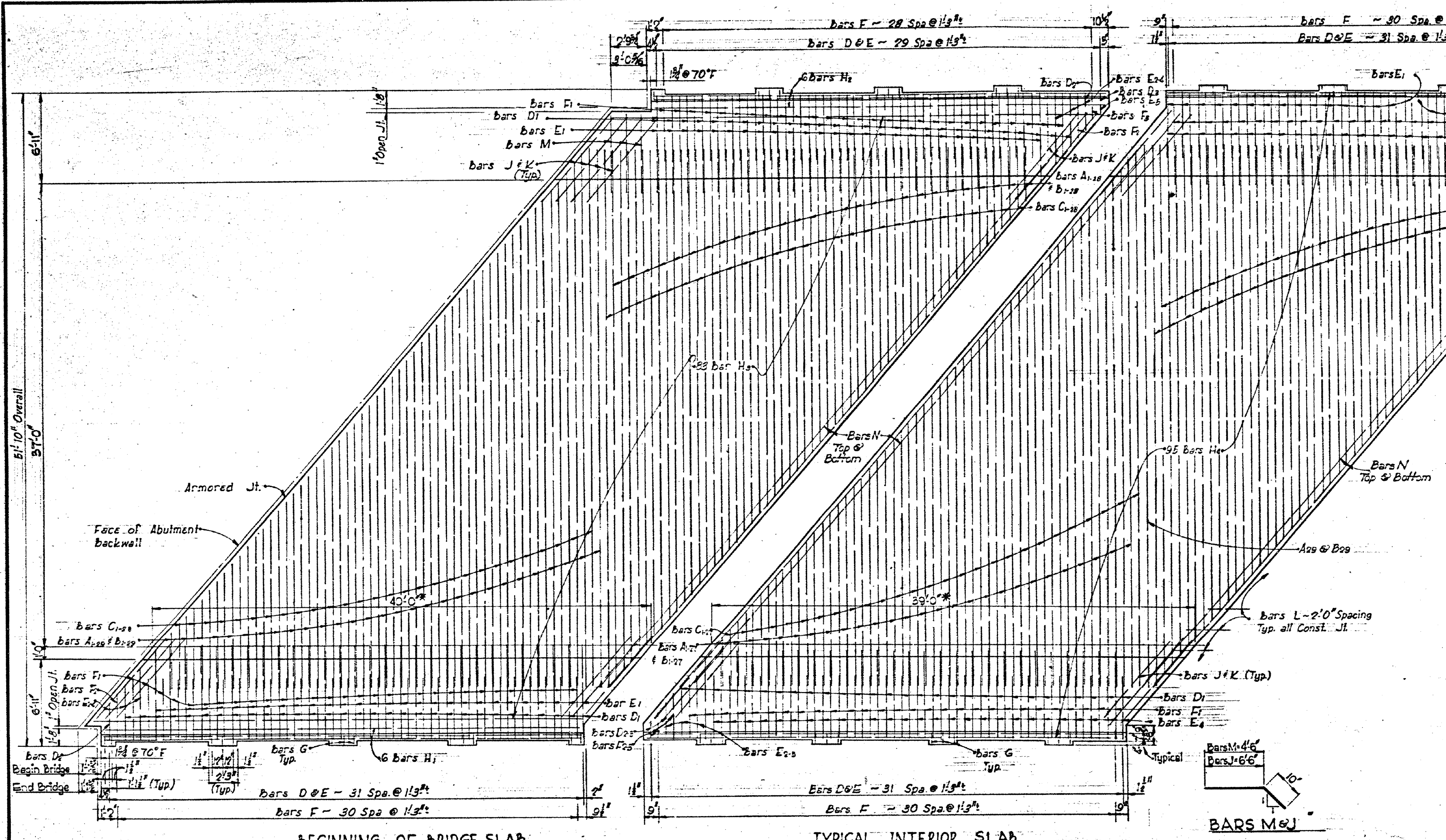
Sheet #1 of 5 Sheets

FED. RD. DIV. NO.	STATE	FEDERAL PROJECT NO.			SHEET NO.
6	TEXAS	I 35W 5(11) 42C			104
STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
2	TARRANT	14	16	32	I35W

105

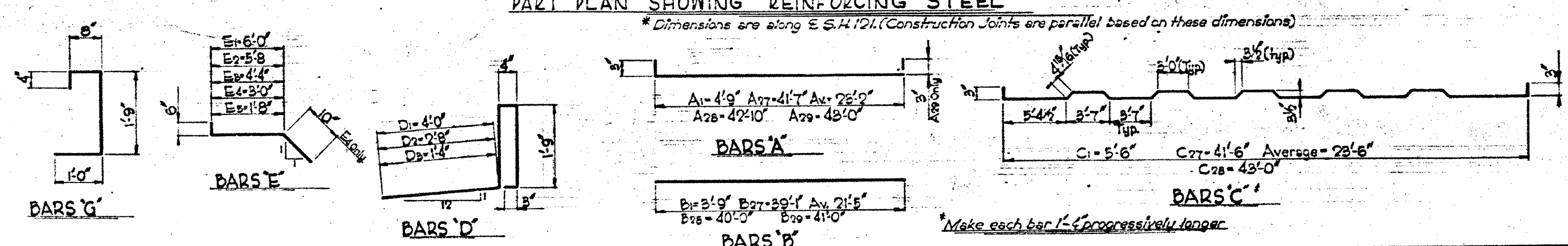
(SH121 WB OVERPASS AT IH 35W SB LANES)
NBI# 02-220-0-0014-16-192

FOR CONTRACTOR'S REFERENCE ONLY



PART PLAN SHOWING REINFORCING STEEL

* Dimensions are along ℄ S.H. 121. (Construction Joints are parallel based on these dimensions)



BILL of REINFORCING STEEL

Bar	No.	Size	Spa.	Length	Weight
A1-27	10 Ea.	#5	15"	25'-5" Av.	6594
A28	4	#5	15"	42'-1"	180
A29	5	#5	15"	43'-6"	227
B1-27*	10 Ea.	#5	15"	21'-5" Av.	6031
B28*	4	#5	15"	40'-0"	167
B29*	5	#5	15"	41'-0"	214
C1-27	10 Ea.	#5	15"	24'-8"	6,946
C28	4	#5	15"	44'-9"	187
D1	298	#4	15"	8'-1"	1,609
D2	10	#4	15"	6'-9"	45
D3	8	#4	15"	5'-5"	29
E1	278	#5	15"	7'-4"	2,126
E2	10	#5	15"	6'-2"	64
E3	10	#5	15"	4'-10"	50
E4	10	#5	15"	3'-6"	37
E5	8	#5	15"	2'-2"	18
F1*	288	#6	15"	4'-11"	2,127
F2*	10	#6	15"	3'-7"	54
F3*	8	#6	15"	2'-3"	27
G	122	#4	Shown	3'-9"	306
H1*	12	#4	"	38'-8"	309
H2*	12	#4	"	36'-6"	295
H3*	166	#4	"	39'-3"	4,352
H4*	285	#4	"	38'-6"	7330
J	62	#5	"	7'-4"	474
K*	62	#4	"	4'-6"	186
L*	112	#5	2'-0"	2'-6"	292
M	6	#5	Shown	5'-4"	33
N*	32	#4	Shown	56'-0"	1,197
Total Pounds of Reinforcing Steel					41,504

* Indicates straight bars

ESTIMATED QUANTITIES

Concrete (Class A)	231.1 Cu.Yds.
Reinforcing Steel	41,504 Lbs.
Structural Steel**	250,483 Lbs.

** Includes Bearing Shoes, Anchor bolts, drains & Armored Joints.

TEXAS HIGHWAY DEPARTMENT

197'-0" CONTINUOUS I-BEAM UNIT

NORTH LANE U.S. 121 UNDERPASS

WEST LANE I35W

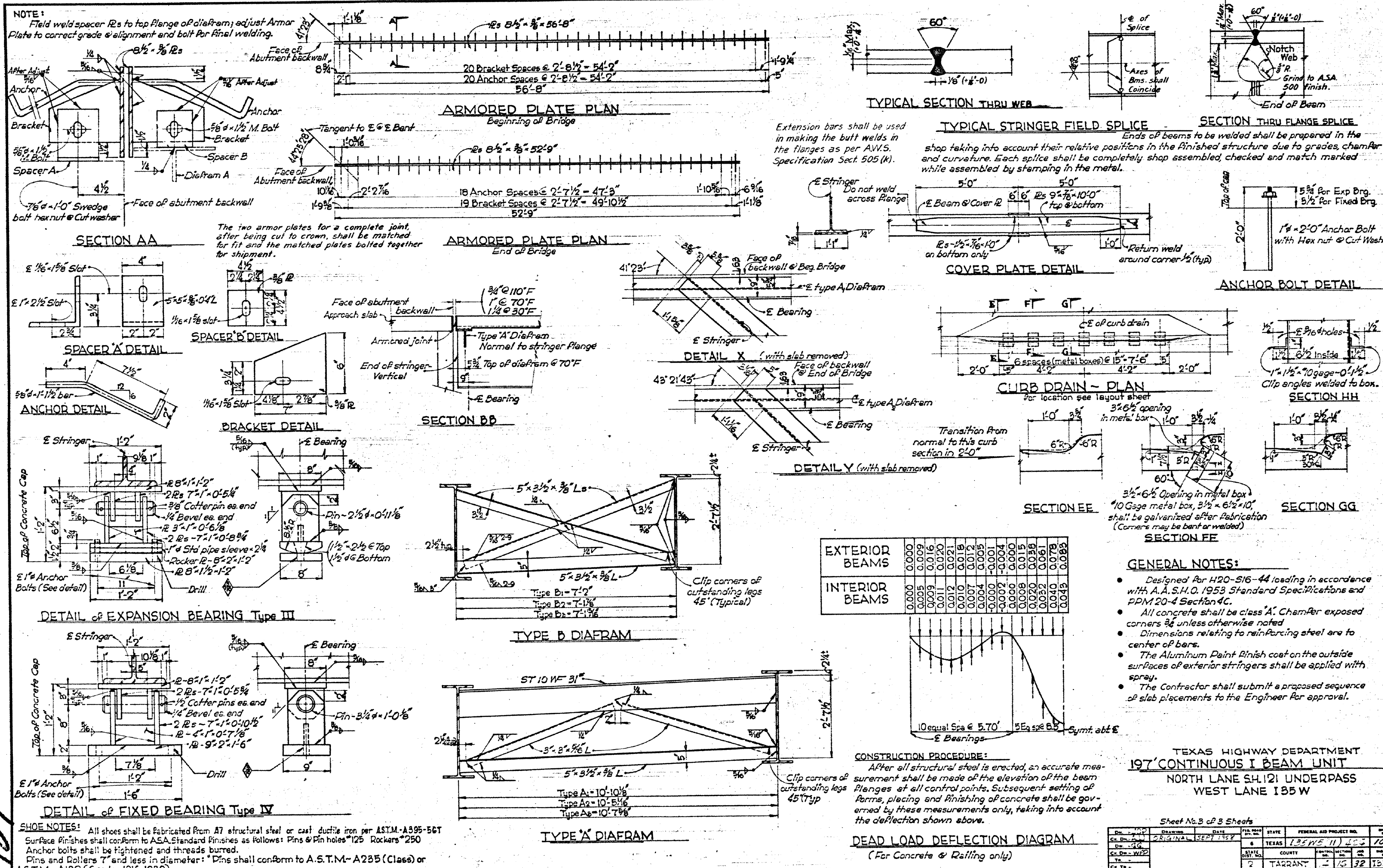
Sheet 2 of 8 Sheets

Dn.	Drawing	Date	Fed. Road Div. No.	State	Federal Aid Project No.	Sheet No.
Ck. Dn.	ORIGINAL	SEPT 1958	6	TEXAS	I35W5 (11) 426	105
Dw.			State Dist. No.	County	Control No. / Section No. / Job No.	Highway No.
Ck. Dw.			2	TARRANT	14 / 16 / 32	I35W
Tr.						
Ck. Tr.						

106

FOR CONTRACTOR'S REFERENCE ONLY

(SH121 WB OVERPASS AT IH 35W SB LANES)
NBI# 02-220-0-0014-16-192



EXTERIOR BEAMS	0.000	0.009	0.016	0.020	0.021	0.018	0.012	0.005	-0.001	-0.004	0.000	0.015	0.038	0.061	0.078	0.083
INTERIOR BEAMS	0.000	0.005	0.009	0.011	0.012	0.010	0.007	0.004	-0.000	-0.002	0.000	0.008	0.020	0.032	0.040	0.043

DEAD LOAD DEFLECTION DIAGRAM
(For Concrete & Railing only)

CONSTRUCTION PROCEDURE:
After all structural steel is erected, an accurate measurement shall be made of the elevation of the beam flanges at all control points. Subsequent setting of forms, placing and finishing of concrete shall be governed by these measurements only, taking into account the deflection shown above.

GENERAL NOTES:
- Designed for H20-S16-44 loading in accordance with A.A.S.H.O. 1953 Standard Specifications and PPM 20-4 Section 4C.
- All concrete shall be class "A". Chamfer exposed corners ¾ unless otherwise noted
- Dimensions relating to reinforcing steel are to center of bars.
- The Aluminum Paint finish coat on the outside surfaces of exterior stringers shall be applied with spray.
- The Contractor shall submit a proposed sequence of slab placements to the Engineer for approval.

SHOE NOTES: All shoes shall be fabricated from A7 structural steel or cast ductile iron per A.S.T.M.-A395-56T
Surface finishes shall conform to A.S.A. Standard finishes as follows: Pins & Pin holes #125 Rockers #250
Anchor bolts shall be tightened and threads burred.
Pins and Rollers 7" and less in diameter: *Pins shall conform to A.S.T.M.-A235 (Class) or A.S.T.M.-A108 (Grades 1016-1030).

TEXAS HIGHWAY DEPARTMENT
197' CONTINUOUS I BEAM UNIT
NORTH LANE S.H. 121 UNDERPASS
WEST LANE I 35 W

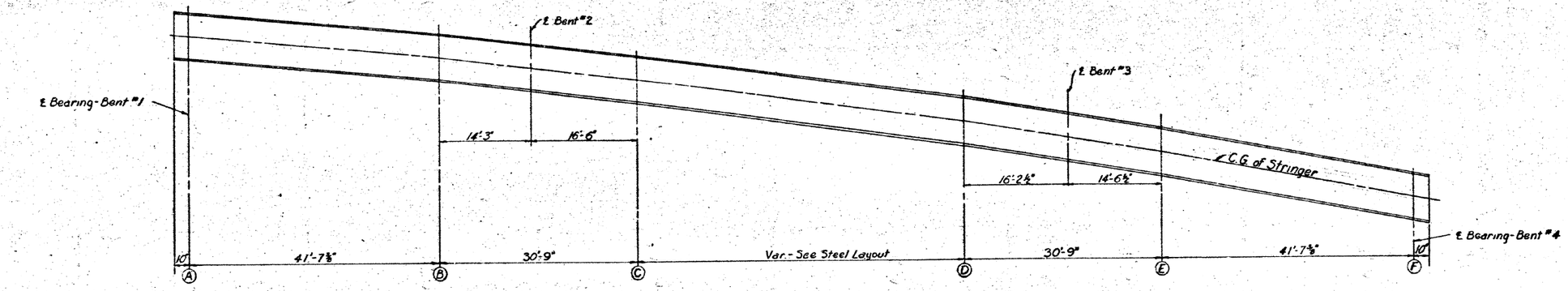
Sheet No. 3 of 3 Sheets

Drawing: ORIGINAL	Date: SEPT 1958	Fed. Road Div. No.: 6	State: TEXAS	Federal Aid Project No.: I 35 W 5 (11) 4 2 3				Sheet No.: 106
		State Dist. No.: 2	County: TARRANT	Control No.: 1	Section No.: 16	Job No.: 32	Highway No.: I 35 W	

107

FOR CONTRACTOR'S REFERENCE ONLY

(SH121 WB OVERPASS AT IH 35W SB LANES)
NBI# 02-220-0-0014-16-192



ELEVATIONS AT C.G. OF STRINGERS

Str.	A	B	C	D	E	F
1	543.389	542.968	542.549	541.677	541.027	540.020
2	543.165	542.779	542.380	541.540	540.905	539.919
3	542.935	542.586	542.208	541.399	540.780	539.814
4	542.697	542.385	542.031	541.254	540.652	539.707
5	542.453	542.176	541.847	541.107	540.521	539.597
6	542.203	541.960	541.657	540.955	540.387	539.485
7	541.945	541.737	541.460	540.800	540.249	539.370

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TEXAS HIGHWAY DEPARTMENT

BLOCKING DIAGRAM

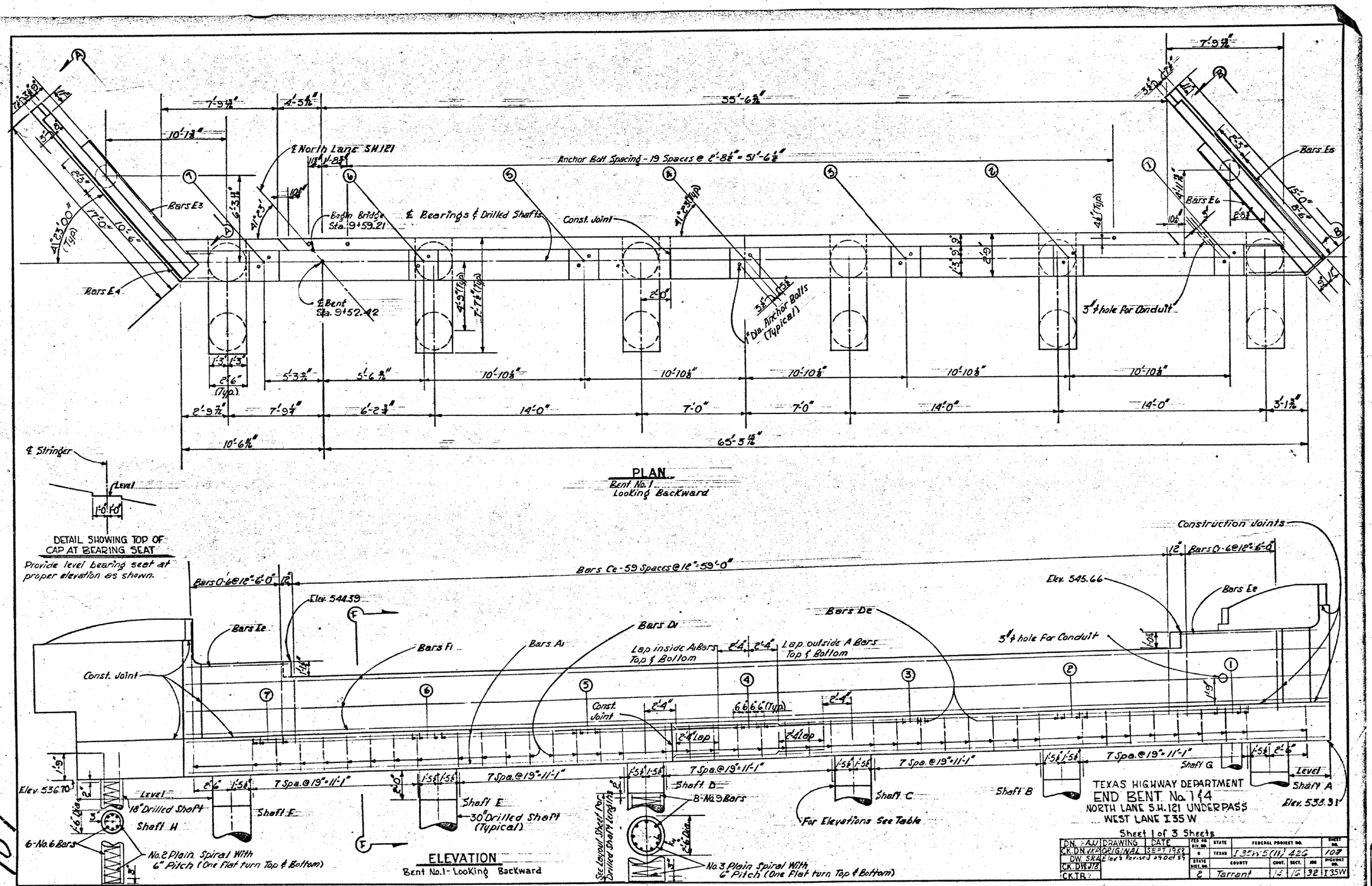
NORTH LANE ~ SH 121 UNDERPASS

WEST LANE - I 35W

Dn: W.C.C.	Drawing	Date	Fed. Aid No.	State	Federal Project No.		Sheet No.
Ck Dn: J.K.P.	Original	Aug 1959	6	Texas	I 35W S (11) 42 C		106 A
Dn RJD			State Dist. No.	County	Cont.	Sect.	Job	Highway No.
Ck Dn W.C.C.			2	Tarrant	14	16	32	I35W

FOR CONTRACTOR'S REFERENCE ONLY

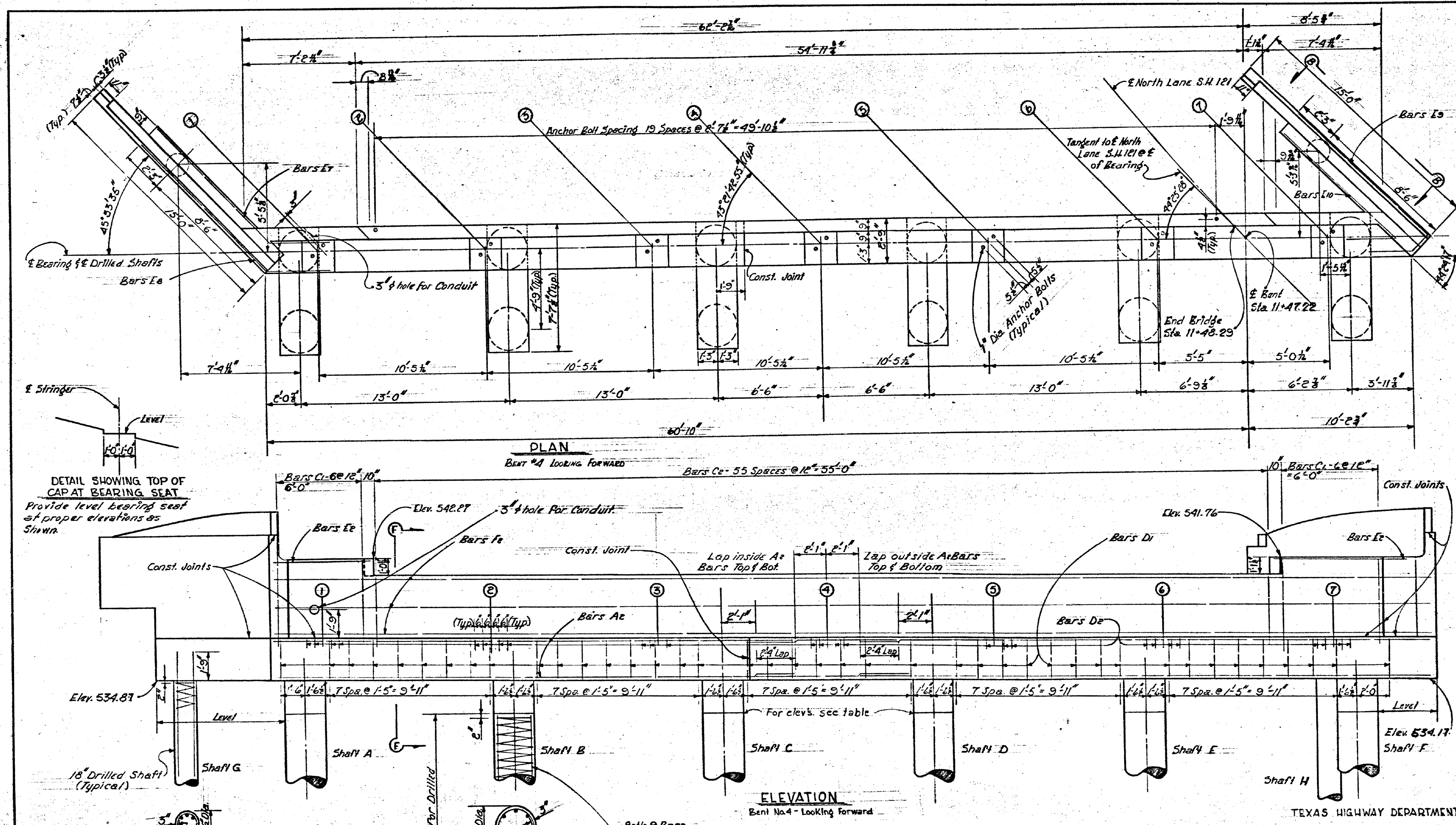
(SH121 WB OVERPASS AT IH 35W SB LANES)
NBI# 02-220-0-0014-16-192



109

(SH121 WB OVERPASS AT IH 35W SB LANES)
NBI# 02-220-0-0014-16-192

FOR CONTRACTOR'S REFERENCE ONLY



BEARING SEAT & TOP OF DRILLED SHAFT ELEVATIONS

Stringer No.	1	2	3	4	5	6	7
Bent No. 1	540.73	540.50	540.27	540.04	539.79	539.54	539.28
Bent No. 4	537.34	537.25	537.15	537.04	536.93	536.82	536.71

Shaft	A	B	C	D	E	F	G	H
Bent No. 1	536.29	535.99	535.69	535.38	535.07	534.72	538.31	536.70
Bent No. 4	532.85	532.73	532.61	532.48	532.34	532.19	534.87	534.17

TEXAS HIGHWAY DEPARTMENT

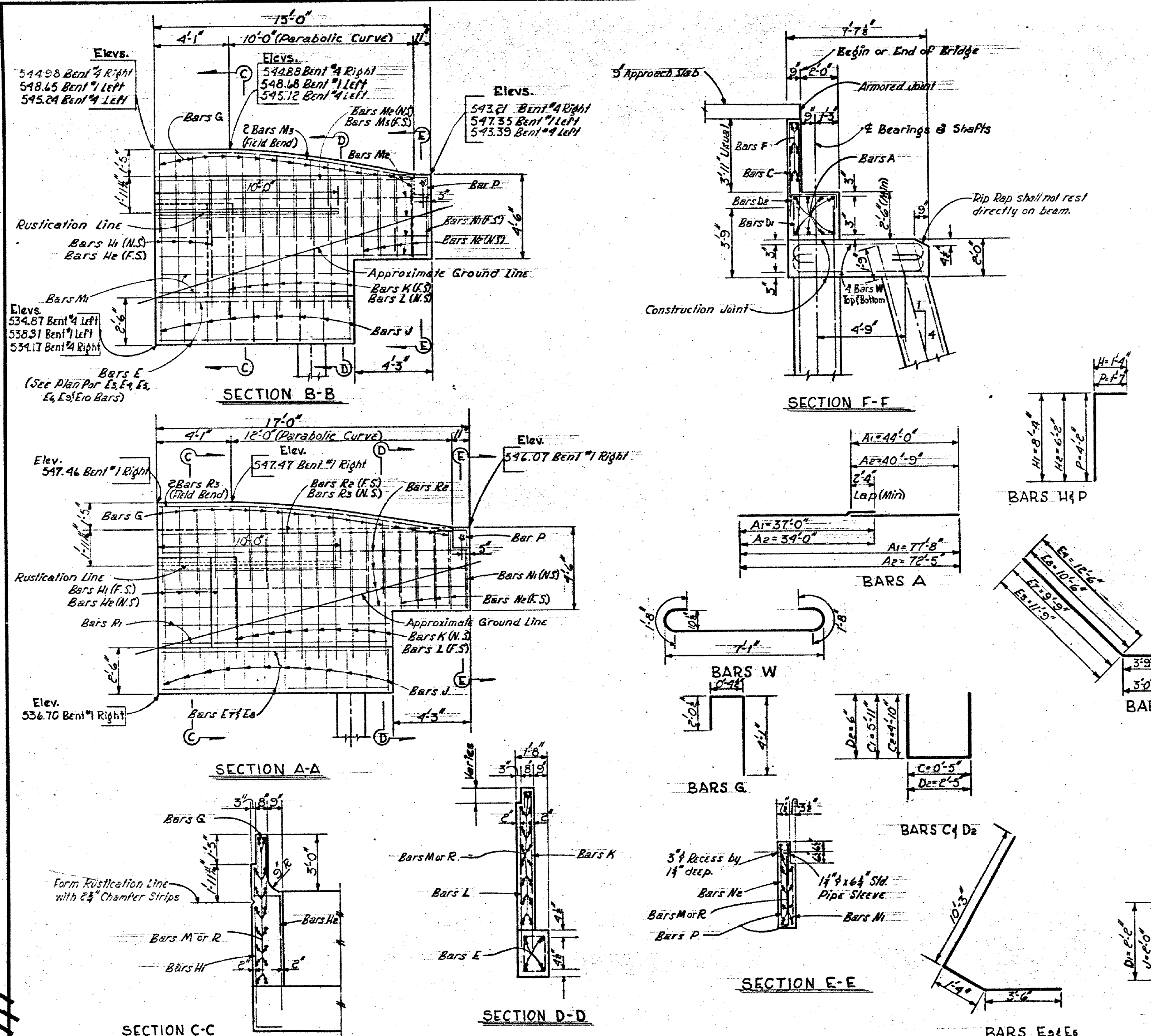
END BENT No. 1 & 4
NORTH LANE S.H. 121 UNDERPASS
WEST LANE I 35 W

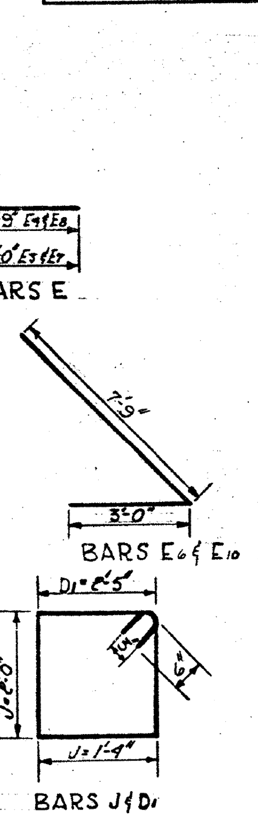
Sheet #2 of 3 Sheet

DN AJJ	DRAWING	DATE	FED. RD. DIV. NO.	STATE	FEDERAL PROJECT NO.				SHEET NO.
CK DN JKP	Original	SEPT 1958	6	TEXAS	I35W5 (11) 426				108
DW SRA	Elev Revised 29 Oct 59		STATE DIST. NO.	COUNTY		CONT.	SECT.	JOB	HIGHWAY NO.
CK DN JTB			2	TARRANT		14	16	32	I35W
TR.									
CK TR.									

FOR CONTRACTOR'S REFERENCE ONLY

(SH121 WB OVERPASS AT IH 35W SB LANES)
NBI# 02-220-0-0014-16-192





BILL OF REINFORCING STEEL FOR BENT No. 1					
Bar	No.	Size	Spac.	Length	Weight
**A2*	8	#11	9"	74'-9"	3177
C1	14	#5	12"	12'-3"	179
C2	60	#5	12"	10'-1"	631
D1	42	#4	19"	10'-3"	288
D2	24	#4	6"	3'-5"	55
*E2	4	#4	Shown	7'-9"	21
E3	2	#11	Shown	14'-9"	157
E4	2	#11	" "	16'-3	173
E5	2	#11	" "	15'-1"	160
E6	2	#11	" "	10'-9"	114
**F1*	6	#4	18"	71'-9"	288
G	34	#4	11"	6'-6"	148
H1	8	#4	11"	9'-8"	52
H2	8	#4	11"	7'-9"	41
J	18	#4	16"	7'-8"	92
*K	18	#4	11"	6'-2"	74
*L	18	#4	11"	7'-0"	84
*N1	2	#4	Shown	3'-2"	4
*N2	8	#4	11"	4'-3"	23
P	4	#5	Shown	5'-9"	24
*R1	4	#4	12"	12'-4"	33
*R2	18	#4	12"	16'-8"	200
*R3	6	#4	Shown	15'-9"	63
W	48	#9	8"±	9'-7"	1,564
					7,645

BILL OF REINFORCING STEEL FOR BENT No. 4					
Bar	No.	Size	Spac.	Length	Weight
*A1***	8	#11	9"	81'-0"	3,443
C1	14	#5	12"	12'-3"	179
C2	56	#5	12"	10'-1"	633
D1	42	#4	19"	10'-3"	288
D2	26	#4	6"	3'-5"	59
*E2	4	#4	Shown	7'-9"	21
E7	2	#11	Shown	12'-9"	135
E8	2	#11	" "	14'-3"	151
E9	2	#11	" "	15'-1"	160
E10	2	#11	" "	10'-9"	114
**F2*	6	#4	18	76'-8"	307
G	32	#4	11"	6'-6"	139
H1	8	#4	11"	9'-8"	52
H2	8	#4	11"	7'-9"	41
J	18	#4	16"	7'-8"	92
*K	16	#4	11"	6'-2"	66
*L	16	#4	11"	7'-0"	75
*M1	4	#4	12"	10'-4"	28
*M2	18	#4	12"	14'-9"	177
*M3	6	#4	Shown	13'-10"	55
*N1	2	#4	Shown	3'-2"	4
*N2	8	#4	11"	4'-3"	23
P	4	#5	Shown	5'-9"	24
W	48	#9	8"	9'-7"	1,564
					7,830

*Indicates Straight Bars
**Includes One 1'-0" Lap (See Detail)
***Includes One 2'-4" Lap

ESTIMATED QUANTITIES FOR BENT No. 1	
Reinforcing Steel	7,645
Class "A" Concrete	47.9 CY

ESTIMATED QUANTITIES FOR BENT No. 4	
Reinforcing Steel	7,830
Class "A" Concrete	45.3 CY

GENERAL NOTES:

Designed for H-20-S-16-44 loading in accordance with A.A.S.H.O. (1953) Standard Specification and P.P.M. 20-4, Section 4c.

All concrete shall be Class "A". Chamfer exposed corners ¾" unless otherwise noted.

Dimensions relating to reinforcing steel are to centers of bars.

The unit price bid for Drilled Shafts shall include the 1'-9" and 3'-9" projection of reinforcing steel into the cap.

Protection for armored joint shall be provided until approach slab is placed.

Maximum calculated footing pressure = 12.1 tons per square foot.

TEXAS HIGHWAY DEPARTMENT

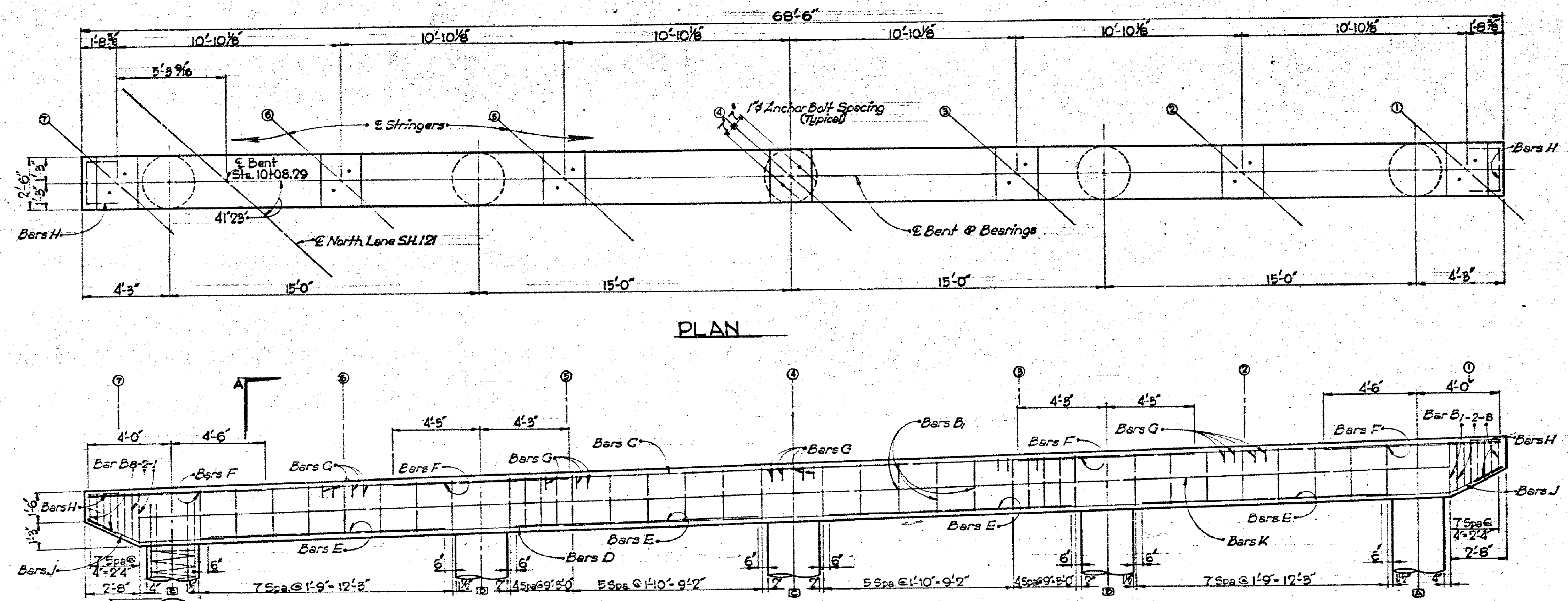
END BENTS No. 1 & 4
NORTH LANE S.H. 121 UNDERPASS
WEST LANE I35W

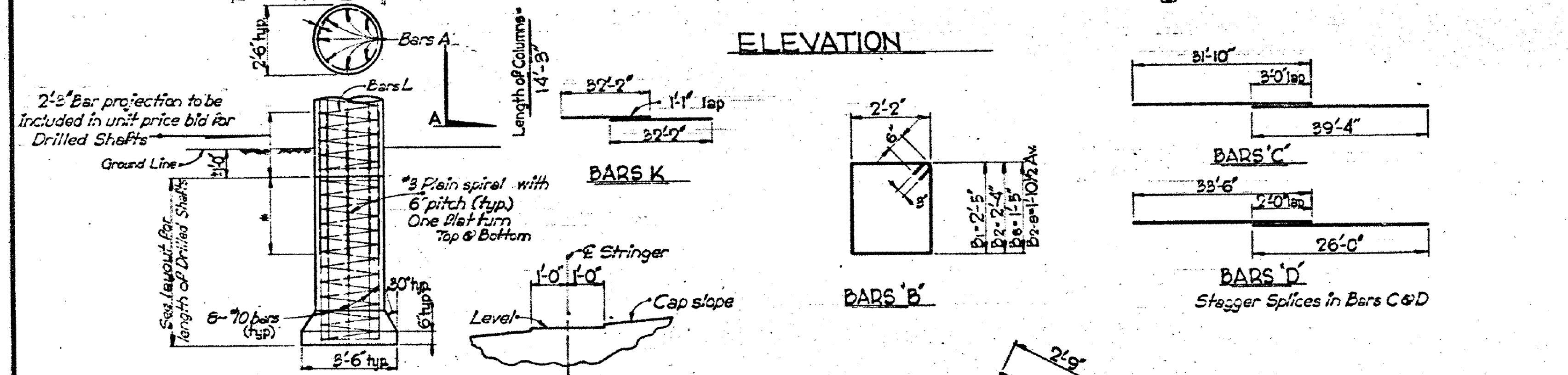
Sheet No. 3 of 3

Dn. - JKP	Drawing	Date	Fed. Road Div. No.	State	Federal Aid Project No.				Sheet No.
Ck. Dn. - JTB	ORIGINAL	SEPT 1955	6	TEXAS	I35W5(11) 436				109
Dw. - SRA	Elev's Revised 29 Oct 59		State Dist. No.	County		Control No.	Section No.	Job No.	Highway No.
Ck. Dw. - JTB			2	TARRANT		14	16	32	I35W
Tr. -									
Ck. Tr. -									

FOR CONTRACTOR'S REFERENCE ONLY

(SH121 WB OVERPASS AT IH 35W SB LANES)
NBI# 02-220-0-0014-16-192

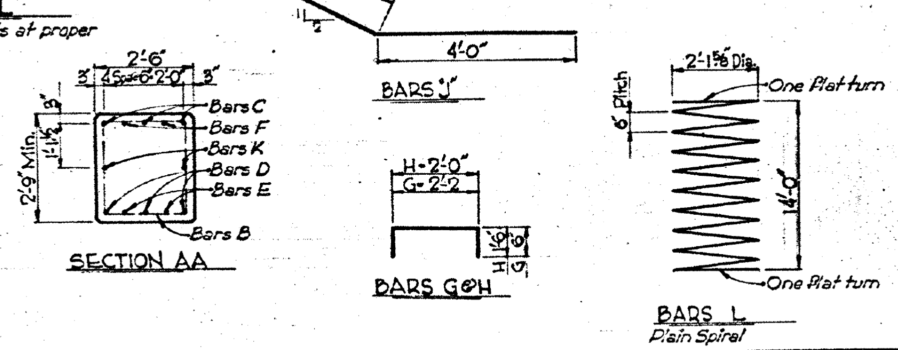




* Columns A&E – 8 Additional #10 bars × 20'-0"
Columns B&D – 8 Additional #8 Bars × 20'-0"
Column C – No Additional Bars

TOP of COLUMN ELEVATIONS	
Column	Elevation
A	537.28
B	537.04
C	536.77
D	536.50
E	536.21

BEARING SEAT ELEVATIONS for BENT No. 2	
Stringer	Elevation
1	540.07
2	539.90
3	539.71
4	539.52
5	539.33
6	539.12
7	538.91



BILL of REINFORCING STEEL

BENT No. 2					
Bar	No.	Size	Length	Spacing	Weight
*A	40	#10	16'-4"	–	2812
B_1	38	#4	10'-4"	Shown	262
B_{2-8}	7 Ea.	#4	9'-3"	4"	87
*C♦	3	#10	71'-2"	1'-0"	919
▵D•	3	#10	59'-6"	1'-0"	768
*E	8	#9	11'-6"	1'-0"	313
*F	8	#11	8'-6"	1'-0"	361
G	18	#4	5'-2"	6"	38
H	4	#6	5'-0"	Shown	30
J	6	#6	6'-9"	1'-0"	61
*K	2	#5	64'-4"	Shown	134
L	5	#3	201'-6"	–	579
Total pounds for Bent No. 2					6164

* Indicates straight bars
♦ Includes 8'-0" lap } See detail
• Includes 1'-1" lap } See detail
▵ Includes 2'-0" lap } See detail

ESTIMATED QUANTITY for INTERIOR BENT No. 2		
Class 'A' Concrete	C.Y.	30.1
Reinforcing Steel	Lbs.	6164
Bell Footings	C.Y.	0.8

GENERAL NOTES:

- Designed for H-20-S16-44 loading in accordance with A.A.S.H.O. (1953) Standard Specifications and R.P.M. 20-4, Section 4-c.
- All concrete shall be class "A". Chamfer exposed corners ¾" unless otherwise noted.
- Dimensions relating to reinforcing steel are to center of bars.
- Maximum calculated footing pressure = 9.7 tons per sq. ft.

TEXAS HIGHWAY DEPARTMENT

INTERIOR BENT No. 2

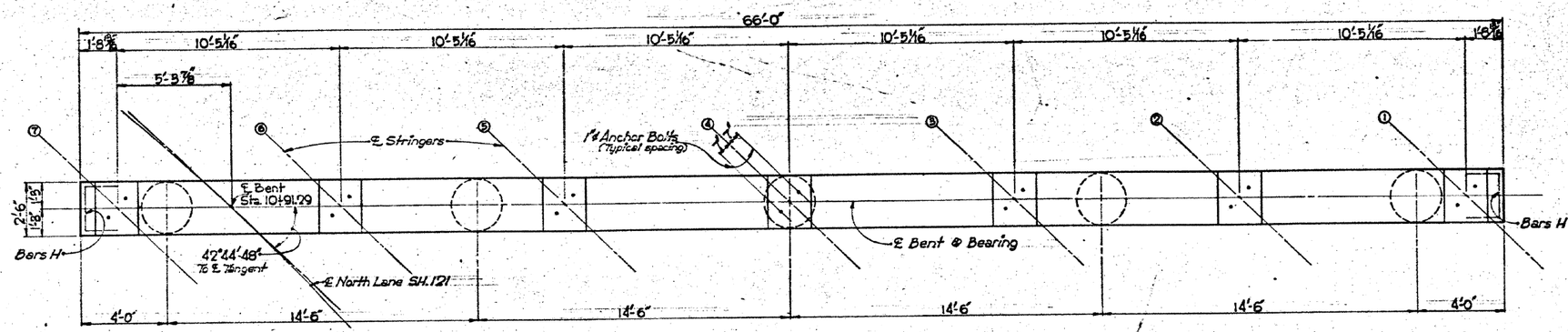
NORTH LANE US 121 UNDERPASS

Drawing	Date	Fed. Road Div. No.	State	Federal Aid Project No.	Sheet No.
Orig.	Sept 1958	6	Texas	I 35W-5(11) 426	110
Elev's Revised 29 Oct 59		State Dist. No.	County	Control No. / Section No. / Job No.	Highway No.
		2	Tarrant	14 / 16 / 32	I 35W

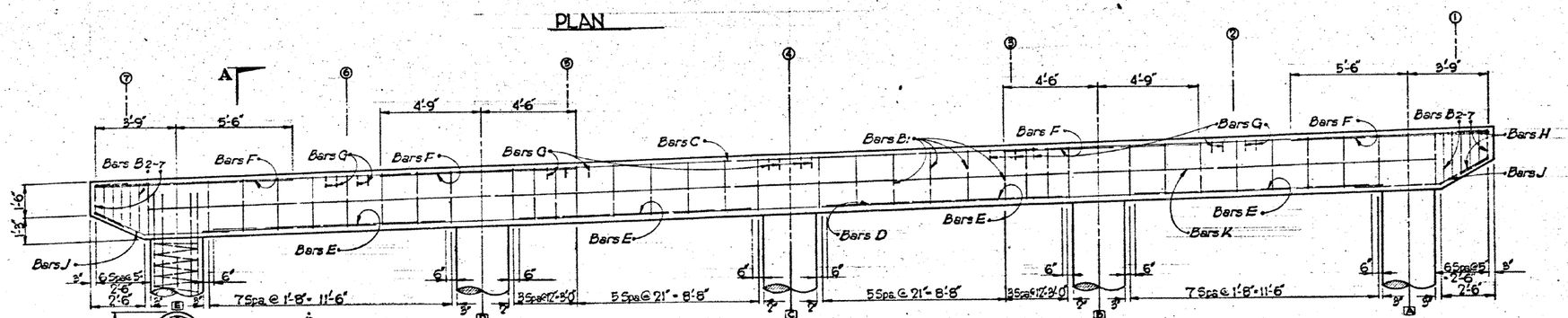
112

FOR CONTRACTOR'S REFERENCE ONLY

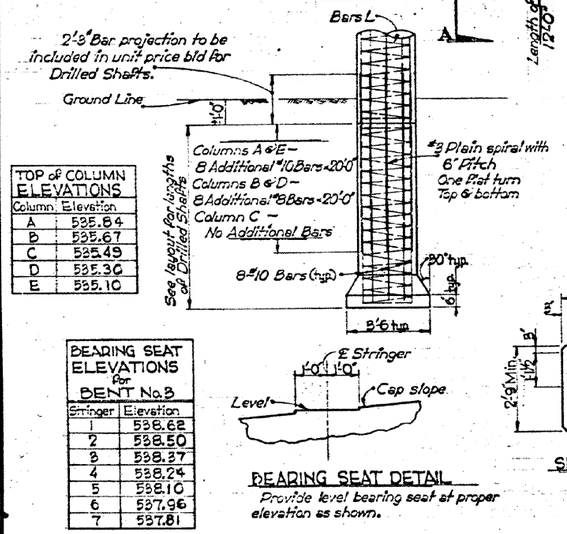
(SH121 WB OVERPASS AT IH 35W SB LANES)
NBI# 02-220-0-0014-16-192



PLAN



ELEVATION

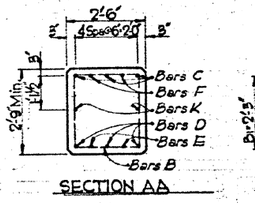


TOP of COLUMN ELEVATIONS	
Column	Elevation
A	535.84
B	535.67
C	535.49
D	535.30
E	535.10

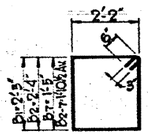
BEARING SEAT ELEVATIONS For BENT No. 3	
Stringer	Elevation
1	538.68
2	538.50
3	538.37
4	538.24
5	538.10
6	537.96
7	537.81

BEARING SEAT DETAIL

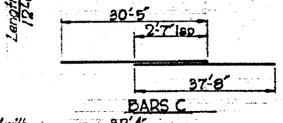
Provide level bearing seat at proper elevation as shown.



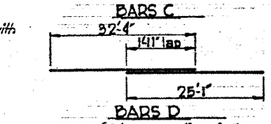
SECTION AA



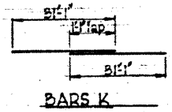
BARS B



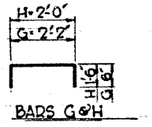
BARS C



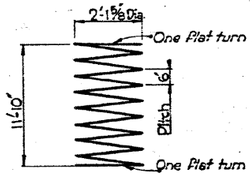
BARS D
(Stagger splices in bars C & D)



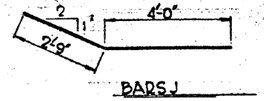
BARS K



BARS G & H



BARS L
Plain Spiral



BARS J

BILL of REINFORCING STEEL
BENT No. 3

Bar	No.	Size	Spacing	Length	Weight
*A	40	#10	—	14'-1"	2424
B1	36	#4	Shown	10'-4"	248
B2-7	7 Ea.	#4	5'	9'-5" Av.	74
C	5	#9	1'-0"	68'-1"	694
D	5	#9	1'-0"	57'-5"	586
*E	8	#9	1'-0"	11'-0"	299
*F	8	#11	1'-0"	9'-8"	593
G	18	#4	6"	3'-2"	98
H	4	#6	Shown	5'-0"	30
J	6	#6	1'-0"	6'-9"	61
*K▲	2	#5	Shown	62'-7"	130
L	5	#3	—	171'-8"	322
Total pounds Per Bent No. 3					5299

* Indicates straight bars
* Includes 2'-7" lap
• Includes 1'-1" lap
▲ Includes 1'-1" lap

See detail

ESTIMATED QUANTITY For INTERIOR BENT No. 3		
Class 'A' Concrete	CY	27.4
Reinforcing Steel	Lbs.	5299
Bell Footings	CY	0.8

GENERAL NOTES:

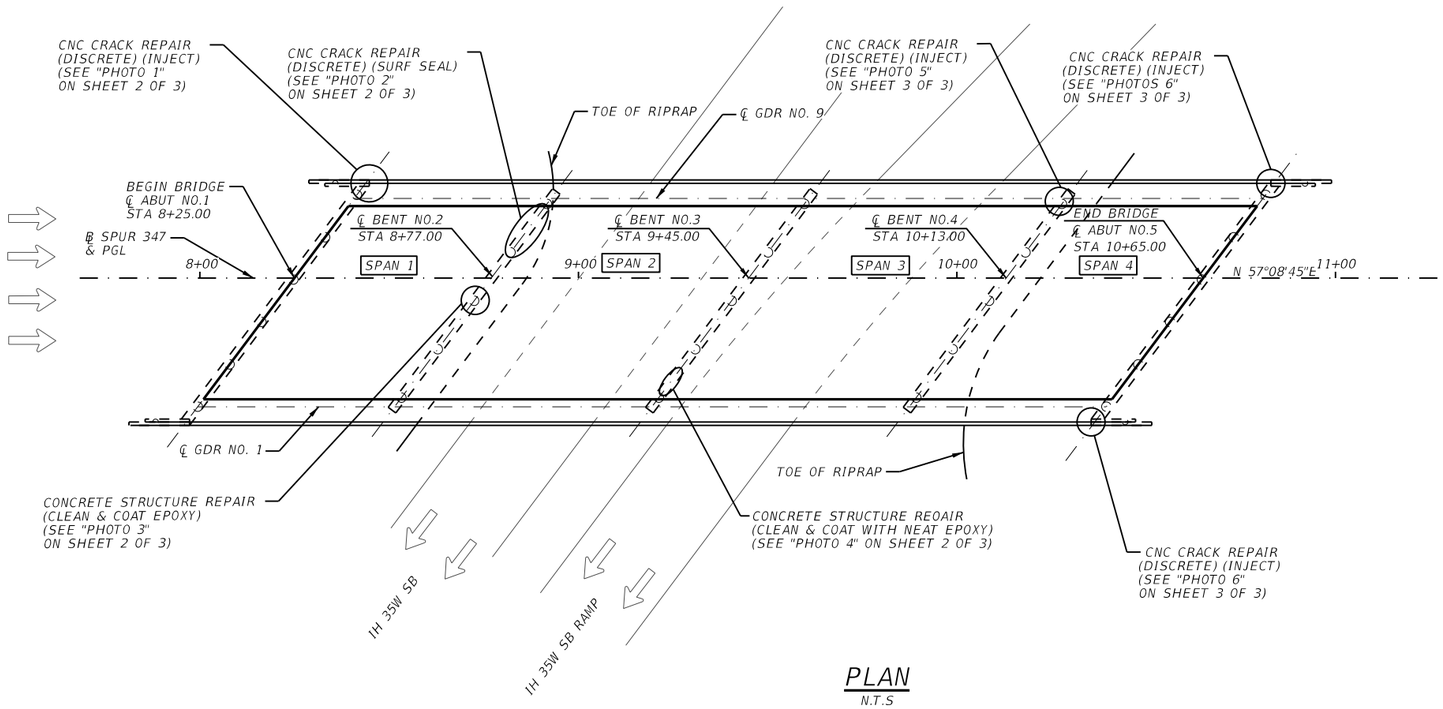
- Designed For H-20-S16-44 loading in accordance with AASHO Standard Specifications (1953) and RRM. 20-4 Section 4-c
- All concrete shall be class 'A'. Chamfer exposed corners ¾" unless otherwise noted
- Dimensions relating to reinforcing steel are to center of bars.
- Maximum calculated footing pressure = 9.7 tons per sq. ft.

TEXAS HIGHWAY DEPARTMENT
INTERIOR BENT No. 3
NORTH LANE U.S. 121 UNDERPASS

Dist.	Drawing	Date	Fed. Road Div. No.	State	Federal Aid Project No.	Sheet No.
Co. Dept.	Original	SEPT 1958	6	TEXAS	[illegible]	111
Div.			State Dept. No.	County	Control	Section	Job	Highway No.
Co. Dept.			2	TARRANT	14	16	32	183W
Co. To								

FOR CONTRACTOR'S REFERENCE ONLY

(SH121 WB OVERPASS AT IH 35W SB LANES)
NBI# 02-220-0-0014-16-192



PLAN
N.T.S

NOTES:

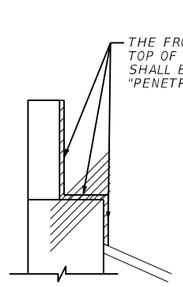
DAMAGED AREAS ARE SHOWN FOR INFORMATION ONLY AND MAY NOT ACCURATE IN SIZE, LENGTH, LOCATION AND AREA. CONTRACTOR TO VERIFY, IN THE PRESENCE OF THE ENGINEER, THE EXTEND OF THE DAMAGES AND REPORT ANY DISCREPANCIES TO EOR BEFORE BEGINNING THE REPAIR.

ALL INFORMATION SHOWN BASED ON AS-BUILTS DRAWINGS SOUTH LANE SH 121 UNDERPASS (WEST LANE I35W) DATED 11/21/1958. STATIONS ARE FROM AS-BUILT PLANS. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD.

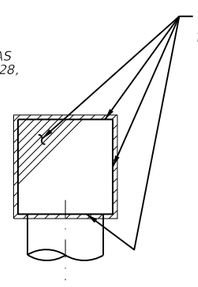
ALL CONCRETE REPAIR SHALL BE IN ACCORDANCE WITH TXDOT CONCRETE REPAIR MANUAL, MARCH 2021.

ESTIMATED QUANTITIES

	DESCRIPTION		TOTAL
0428-7001	PENETRATING CONCRETE SURFACE TREATMENT	SY	358
0429-7001	CONC STR REPAIR (CLEAN & COAT WITH EPOXY)	SF	5
0780-7002	CNC CRACK REPAIR (DISCRETE) (INJECT)	LF	24
0780-7004	CNC CRACK REPAIR (DISCRETE) (SURF SEAL)	LF	6



ABUTMENT
ABUT #1 = 44 SY
ABUT #5 = 44 SY



INTERIOR BENT
BENT #2 = 90 SY
BENT #3 = 90 SY
BENT #4 = 90 SY

PENETRATING CONCRETE SURFACE TREATMENT DETAILS

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED PROFESSIONAL ENGINEER
6/26/2024

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

SUBSTRUCTURE REPAIR DETAILS IH 35W SB UNDERPASS AT SPUR 347 EB

SCALE: N.T.S SHEET 1 OF 3

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	78
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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CNC CRACK REPAIR
(DISCRETE) (INJECT) = 5 LF
(INJECT EPOXY WITH LOW PRESSURE)

PHOTO 1
(SHOWING ABUTMENT #1 WINGWALL, LOOKING WEST)

CNC CRACK REPAIR
(DISCRETE) (SURF SEAL)
= 6 LF

PHOTO 2
(Showing Bent #2, Looking East)

CONCRETE STRUCTURE REPAIR
(CLEAN & COAT EPOXY) = 4 SF

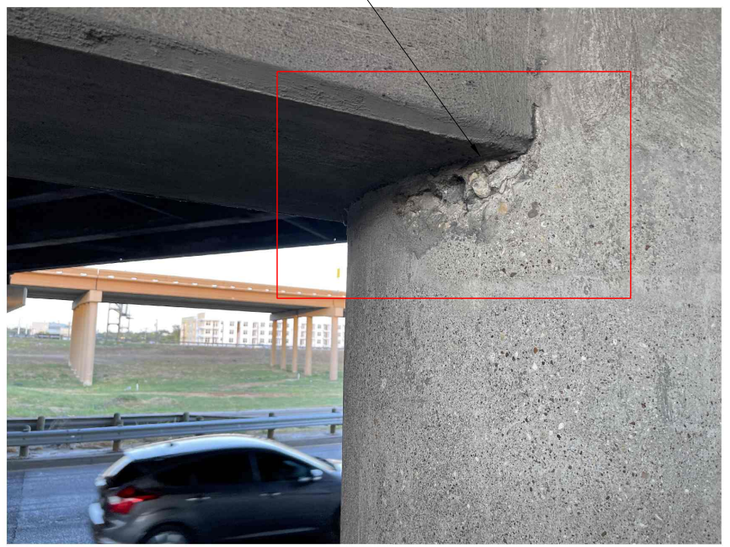

PHOTO 3
(BENT #2, COLUMN #3, LOOKING FROM NORTH SIDE)

CONCRETE STRUCTURE REPAIR
(CLEAN & COAT WITH NEAT EPOXY)
= 1 SF

PHOTO 4
(SHOWING BENT#3, LOOKING EAST)

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
6/26/2024

Texas Department of Transportation
© 2024

PARSONS
TBPE Registration No. F-1481

SUBSTRUCTURE REPAIR DETAILS IH 35W SB UNDERPASS AT SPUR 347 EB

SCALE: N.T.S SHEET 2 OF 3

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	79
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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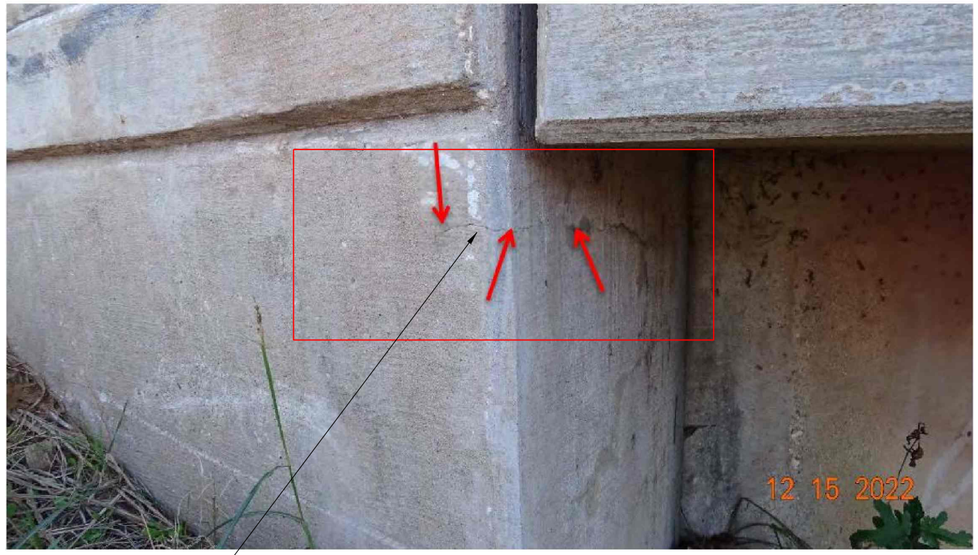
CNC CRACK REPAIR
(DISCRETE) (INJECT) = 9 SF

PHOTO 5

(BENT #4, COLUMN #1, LOOKING FROM NORTH SIDE)



CNC CRACK REPAIR
(DISCRETE) (INJECT) = 10 LF
(BOTH WINGWALL)
(INJECT EPOXY WITH LOW PRESSURE)

PHOTO 6

(SHOWING ABUTMENT #5 WINGWALL, LOOKING EAST)
(HORIZONTAL CRACK (TYPICAL) ON BOTH SIDE OF ABUTMENT 5 WINGWALL)

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
6/26/2024

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

SUBSTRUCTURE REPAIR DETAILS IH 35W SB UNDERPASS AT SPUR 347 EB

SCALE: N.T.S SHEET 3 OF 3

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	80
CONTROL	SECTION	JOB	
0081	01	053,ETC	

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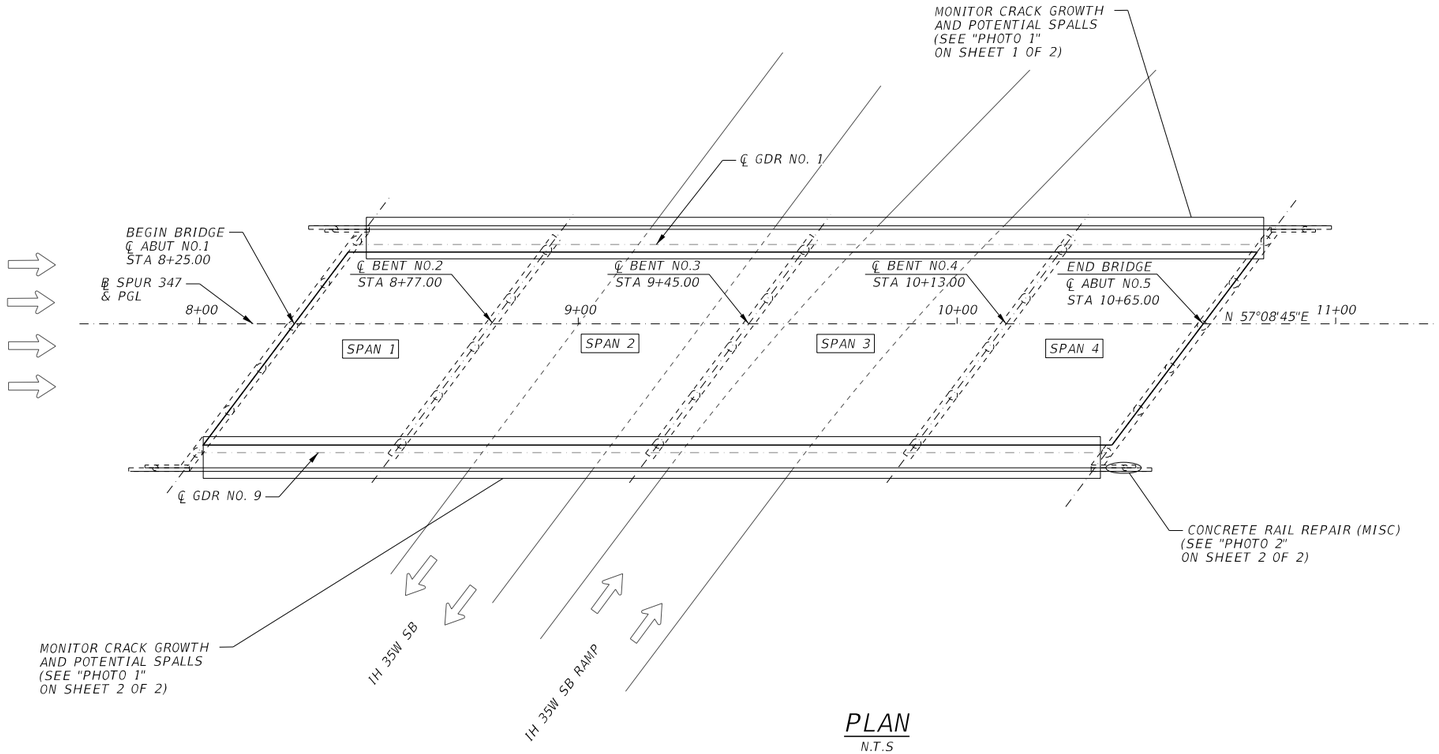


PLAN
N.T.S

NOTES:

ALL INFORMATION SHOWN BASED ON AS-BUILTS DRAWINGS SOUTH LANE SH 121 UNDERPASS (WEST LANE I35W) DATED 11/21/1958. STATIONS ARE FROM AS-BUILT PLANS. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD.

DAMAGED AREAS ARE SHOWN FOR INFORMATION ONLY AND MAY NOT ACCURATE IN SIZE, LENGTH, LOCATION AND AREA. CONTRACTOR TO VERIFY, IN THE PRESENCE OF THE ENGINEER, THE EXTEND OF THE DAMAGES AND REPORT ANY DISCREPANCIES TO EOR BEFORE BEGINNING THE REPAIR.

LEAD-BASED PAINT WAS DETECTED ABOVE THE PERMISSIBLE LEVELS IN THE YELLOW STRIPING OF ROADWAY AND ARE THEREFORE TO BE CONSIDERED REGULATED BY THE EPA, OSHA, AND TELRR.

ONCE A REPAIR IS COMPLETED AND IS ASSOCIATED WITH AN FUA ID, THE AREA OFFICE CONSTRUCTION INSPECTOR SHALL PHOTOGRAPH THE REPAIR AND SUBMIT THE PHOTOGRAPH(S) TO THE TXDOT BRIDGE INSPECTION COORDINATOR (MARK BURWELL) FOR FURTHER PROCESSING. ALL FUAS SHOWN IN THE FUA SUMMARY TABLE SHALL HAVE A PHOTOGRAPH ASSOCIATED WITH IT THAT DISPLAYS THE REPAIRED AREA.

ESTIMATED QUANTITIES

	DESCRIPTION		TOTAL
0778-7002	CONCRETE RAIL REPAIR (MISC)	LF	5

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
6/26/2024

PARSONS
TBPE Registration No. F-1481

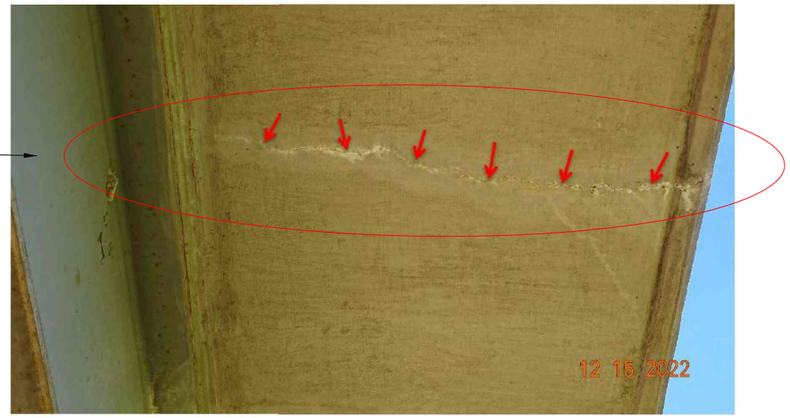
SUPERSTRUCTURE REPAIR DETAILS IH 35W SB UNDERPASS AT SPUR 347 EB

SCALE: N.T.S SHEET 1 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	81
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
FILENAME: c:\pw\working\texas\parsons\p009206h\d0248790\CEC\Assign4\Spur347\SUP-01.dgn

(LOOKING SOUTH)



HAIRLINE TRANSVERSE CRACKS IN EVERY 5 FT IN BOTH SLAB OVERHANG (CONTINUE TO MONITOR CRACK GROWTH AND POTENTIAL SPALLS)

(LOOKING NORTH)

PHOTO 1

(HAIRLINE TRANSVERSE CRACKS WITH EFFLORESCENCE IN DECK OVERHANG)

CONCRETE RAIL REPAIR (MISC) = 5 LF

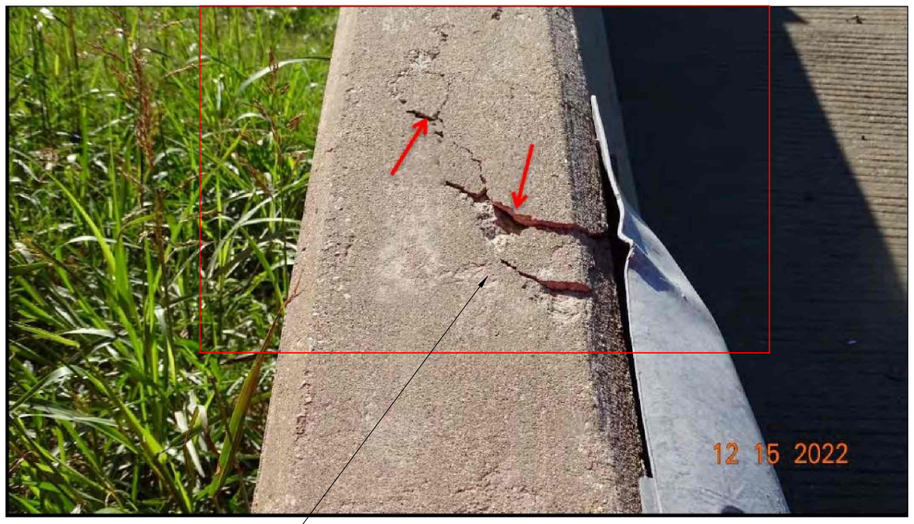


PHOTO 2

(SHOWING ABUTMENT #5 WINGWALL, LOOKING WEST)

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
6/26/2024

PARSONS
TBPE Registration No. F-1481

SUPERSTRUCTURE REPAIR DETAILS IH 35W SB UNDERPASS AT SPUR 347 EB

SCALE: N.T.S SHEET 2 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	82
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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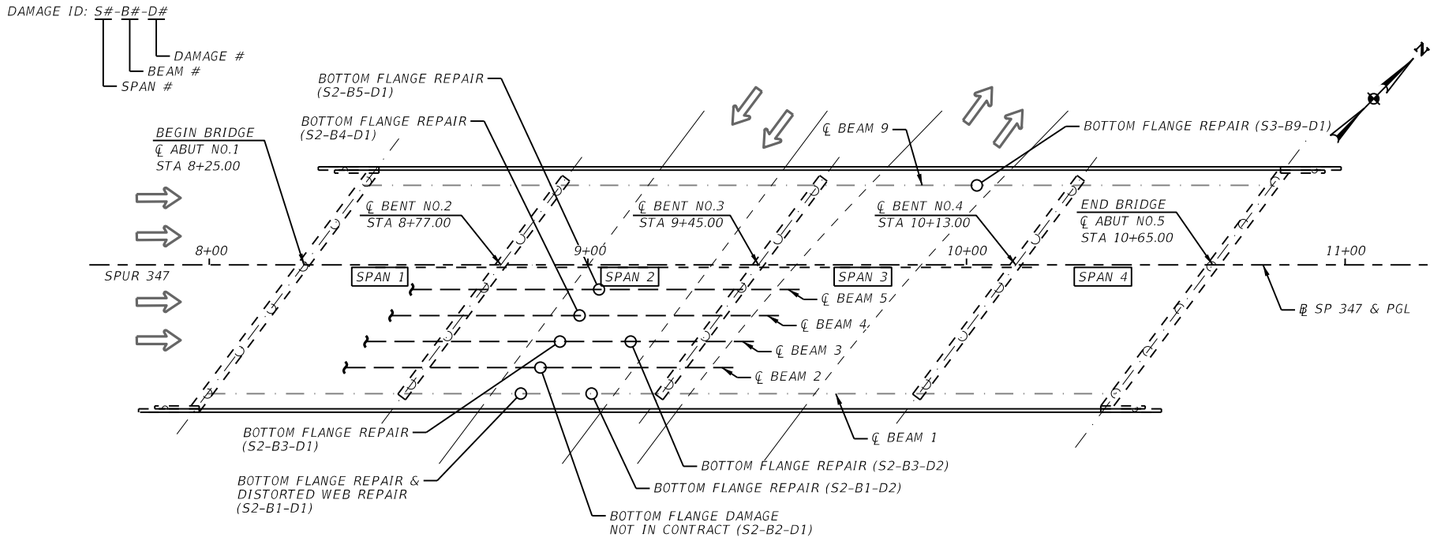


PLAN - STEEL BEAM REPAIR

SCALE: 1" = 40'-0"

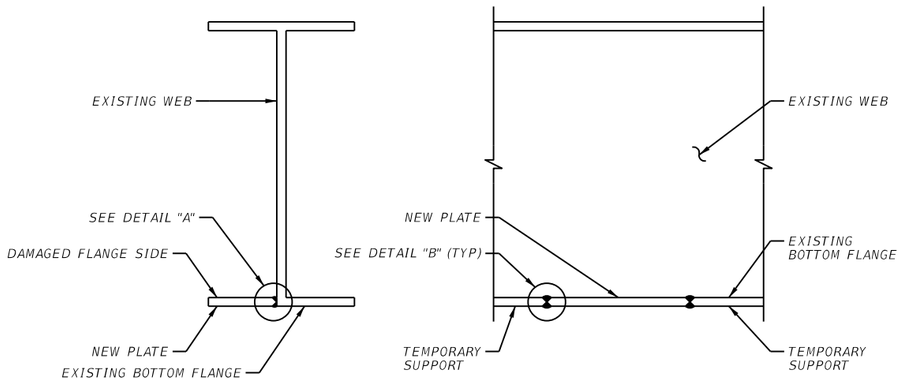
FUA SUMMARY (1)

	FUA ID#	DESCRIPTION
1	686112	BEAMS 1, 2, 3, 4, 5 OF SPAN 2; BEAM 9 OF SPAN 3

(1) ONCE A REPAIR IS COMPLETED AND IS ASSOCIATED WITH AN FUA ID, THE AREA OFFICE CONSTRUCTION INSPECTOR SHALL PHOTOGRAPH THE REPAIR AND SUBMIT THE PHOTOGRAPH(S) TO THE TXDOT BRIDGE INSPECTION COORDINATOR (MARK BURWELL) FOR FURTHER PROCESSING. ALL FUAS SHOWN IN THE FUA SUMMARY TABLE SHALL HAVE A PHOTOGRAPH ASSOCIATED WITH IT THAT DISPLAYS THE REPAIRED AREA.

ESTIMATED QUANTITIES

ITEM - CODE	DESCRIPTION	UNIT	TOTAL
0784-7020	REP STL BRIDGE MBR (STRAIGHTEN MEMB)	EA	7
0784-7022	REP STL BRIDGE MBR (WELD REPAIR)	EA	1



BOTTOM FLANGE REPLACEMENT - ALTERNATIVE

HEAT STRAIGHTENING PROCEDURE:

1. SET TRAFFIC CONTROL. SPUR 347 OVERPASS BRIDGE SHALL BE CLOSED TO TRAFFIC.
2. HEAT STRAIGHTEN DISTORTED BEAMS IN ACCORDANCE WITH ITEM 784 "STEEL MEMBER REPAIR".
3. WELD FLANGE AT INDICATED LOCATIONS IN ACCORDANCE WITH ITEM 448 "STRUCTURAL FIELD WELDING".
4. RESTORE ANY DAMAGE CAUSE BY THE REPAIR PROCEDURE USED AT NO ADDITIONAL COST TO THE DEPARTMENT
5. RESTORE PAINT SYSTEM AND APPLY APPEARANCE COAT TO MATCH.
6. OPEN THE ROADWAYS TO NORMAL TRAFFIC.
7. ATTEMPTS WITH HS SHOULD STOP AT THE POINT WHEN THEY POSE A RISK OF DAMAGING THE MEMBER. PARTIAL SEGMENT REPLACMENT OF BOTTOM FLANGE SECTION MAY BE ALTERNATIVE SOLUTION WHEN HS PROVES UNSUCCESSFUL IN FIELD.

ALTERNATIVE FLANGE REPLACEMENT PROCEDURE

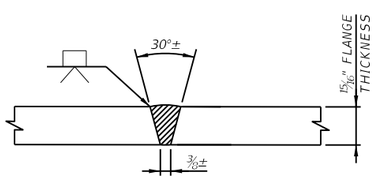
8. PROVIDE TEMPORARY SUPPORTS ON BOTH SIDES OF REPAIR.
9. INSTALL FLANGE SECTION REPLACEMENT MEMBER.
10. REPEAT STEPS 3-6.

GENERAL NOTES:

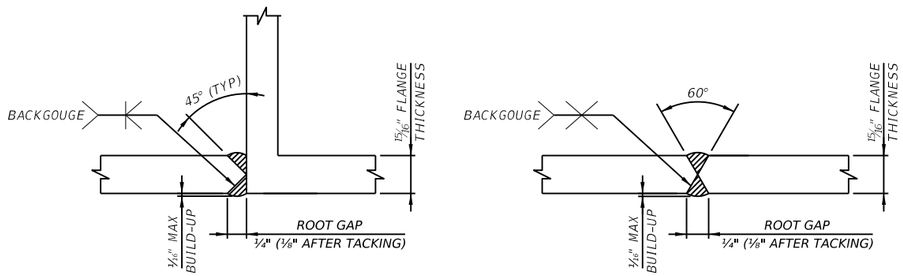
1. NOTIFY TXDOT BRIDGE DIVISION AT LEAST TWO WEEKS IN ADVANCE BY E-MAILING BRG-FO-STL@TXDOT.GOV PRIOR TO BEGINNING WORK TO ALLOW FOR INSPECTION OF REPAIRS BY A BRIDGE DIVISION STRUCTURAL STEEL INSPECTOR.
2. USE HEAT-STRAIGHTENING TO REPAIR AND RESTORE THE SHAPE OF BEAMS. HEAT STRAIGHTEN THE MEMBERS IN ACCORDANCE WITH ITEM 784, "STEEL MEMBER REPAIR". APPLY SUFFICIENT FORCE COMBINED WITH HEAT TO ACCOMPLISH WORK BUT DO NOT FRACTURE MEMBER. REPAIR ADDITIONAL DAMAGE CAUSED BY CONTRACTOR'S OPERATIONS AT NO ADDITIONAL COST TO THE DEPARTMENT.
3. ALL WELDING SHALL BE PERFORMED BY A CERTIFIED WELDER IN ACCORDANCE WITH ITEM 448 "STRUCTURAL FIELD WELDING". SUBMIT CERTIFICATION PAPERS PRIOR TO START OF WORK. RADIOGRAPHIC INSPECTION OF FLANGE WELDS IS REQUIRED. COORDINATE WELDING INSPECTION WITH TXDOT FORT WORTH DISTRICT MAINTENANCE OFFICE. PROVIDE AT LEAST 4 DAYS ADVANCE NOTICE.
4. RESTORE THE PAINT PROTECTION FOR REPAIRED BEAMS WITH SYSTEM I-B PER ITEM 446, "FIELD CLEANING AND PAINTING STEEL". MATCH APPEARANCE COAT WITH THE EXISTING STRUCTURE. ASSUME EXISTING PAINT COATING CONTAINS HAZARDOUS MATERIALS, UNLESS OTHERWISE NOTED. CONTRACTOR IS RESPONSIBLE TO REMOVE AND CONTAIN COATINGS IN ACCORDANCE WITH TXDOT STANDARD SPECIFICATIONS.
5. PAYMENT IS 1 LUMP SUM FOR ALL WORK RELATED TO REPAIRING THE STEEL GIRDER AND RESTORING PAINT TO MATCH ADJACENT UNDAMAGED STEEL.
6. PROVIDE ASTM A709 STEEL WITH MINIMUM GRADE 36 IN ACCORDANCE WITH ITEM 442, "METAL FOR STRUCTURES" FOR NEW FLANGE PLATE REPLACEMENT ALTERNATIVE.
7. GIRDER NUMBERING FOLLOWS AS-BUILT PLANS.

HEAT STRAIGHTENING NOTES:

1. THE OBJECTIVES OF HEAT STRAIGHTENING (HS) ARE:
   A. TO ALIGN THE BOTTOM FLANGE ON TWO SIDES OF FRACTURE TO FACILITATE WELDING.
   B. TO MOVE THE WARPED PORTION OF FLANGE DOWNWARDS TO RESTORE FLANGE STRAIGHTNESS.
   C. TO STRAIGHTEN LATERALLY DISTORTED BEAM.
2. LIMIT THE HS ONLY TO AREA NECESSARY TO REACH GOALS OF REPAIR. AVOID HS THE AREA NEAR BOLTED AND WELDED CONNECTIONS FOR DIAPHRAGMS.



CJP GROOVE WELD DETAIL



DETAIL "A"

DETAIL "B"

BOTTOM FLANGE REPLACEMENT DETAILS

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

9/5/2024

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

STEEL BEAM REPAIRS (HS)
IH 35W SB UNDERPASS
AT SPUR 347 EB

SHEET 1 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	83
0081	01	053,ETC	

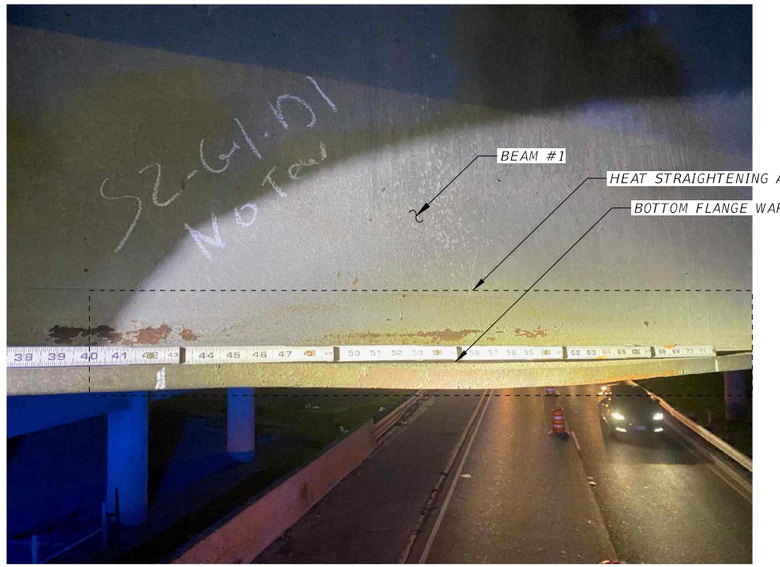
DRAWING DATE: 9/4/2024
FILENAME: c:\pw\working\texas\parsons\p009206h\d0248790\CEC*Assign4*Spur347*SBR*01.dgn

BOTTOM FLANGE REPAIR SIDE 1 (S2-B1-D1) (1 OF 2)

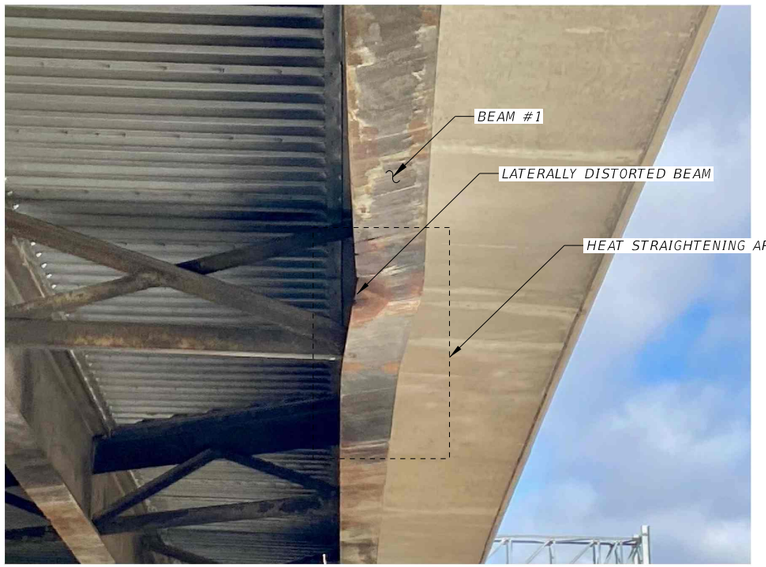
BOTTOM FLANGE REPAIR SIDE 1 (S2-B1-D1) (2 OF 2)

NOTE:

1. FOR GENERAL NOTES AND PROCEDURE SEE SHEET 1 OF 4.



BOTTOM FLANGE REPAIR SIDE 2 (S2-B1-D1)



BOTTOM FLANGE REPAIR UNDERSIDE (S2-B1-D1)

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

PARSONS
TBPE Registration No. F-1481

STEEL BEAM REPAIRS (HS)
IH 35W SB UNDERPASS
AT SPUR 347 EB

SHEET 2 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	84
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
FILENAME: c:\pw\working\texas\parsons\p0009206h\d0248790\CEC\Assign4\Spur347\SBR02.dgn

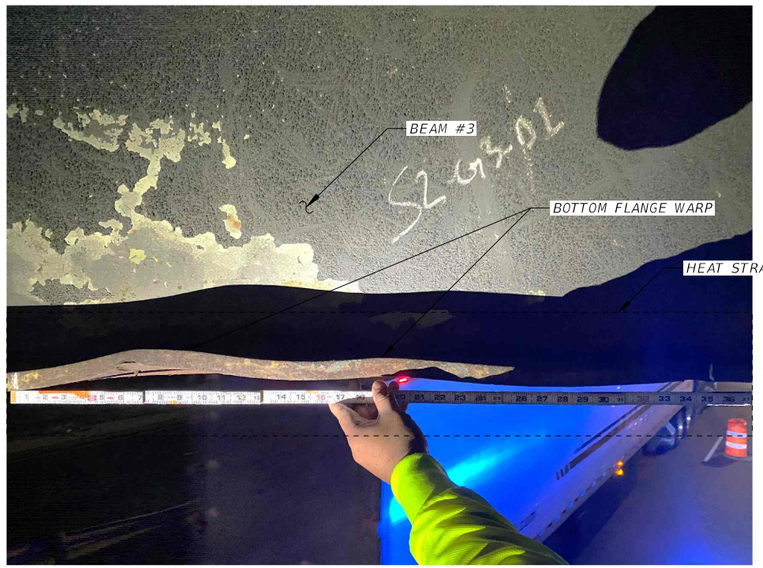
BOTTOM FLANGE REPAIR (S2-B1-D2)

BOTTOM FLANGE REPAIR (S2-B2-D1)
NOT IN CONTRACT

NOTE:

1. FOR GENERAL NOTES AND PROCEDURE SEE SHEET 1 OF 4.

REPAIR THE FRACTURE USING CJP GROOVE WELD. WELD SHALL BE PREFORMED ALONG THE ENTIRE FRACTURE LENGTH AFTER THE TWO SIDES OF FRACTURE ARE ALIGNED USING HEAT STRAIGHTENING. GRIND EDGES TO FORM SINGLE BEVELS AS SHOWN ON CJP GROOVE WELD DETAIL. EXERCISE CAUTION TO NOT INCREASE THE FRACTURE LENGTH DURING EDGE PREPARATION. RADIOGRAPH OF THE FLANGE WELD IS REQUIRED.



BOTTOM FLANGE REPAIR SIDE 2 (S2-B3-D1)

BOTTOM FLANGE REPAIR UNDERSIDE (S2-B3-D2)

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

PARSONS
TBPE Registration No. F-1481

STEEL BEAM REPAIRS (HS)
IH 35W SB UNDERPASS
AT SPUR 347 EB

SHEET 3 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	85
CONTROL	SECTION	JOB	
0081	01	053,ETC	

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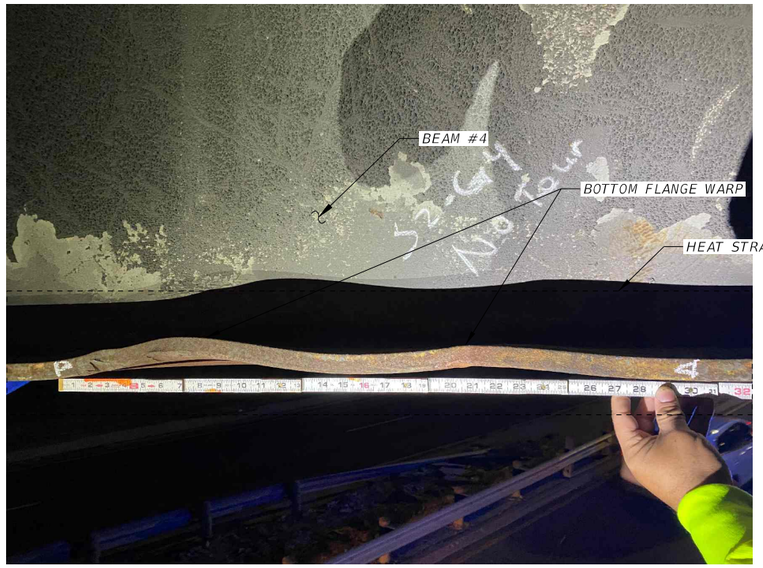
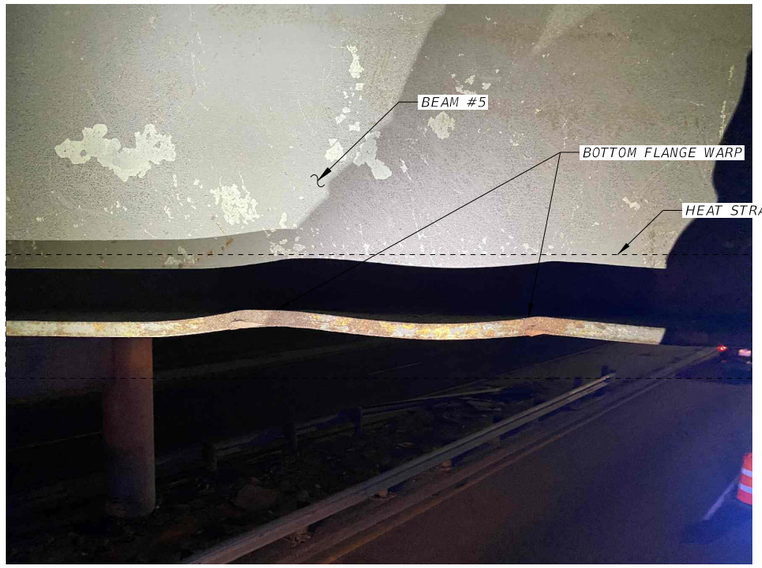


BOTTOM FLANGE REPAIR (S2-B4-D1)



BOTTOM FLANGE REPAIR (S2-B5-D1)

NOTE:

1. FOR GENERAL NOTES AND PROCEDURE SEE SHEET 1 OF 4.

BOTTOM FLANGE REPAIR (S3-B9-D1)

6/26/2024

PARSONS
TBPE Registration No. F-1481

STEEL BEAM REPAIRS (HS)
IH 35W SB UNDERPASS
AT SPUR 347 EB

SHEET 4 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	86
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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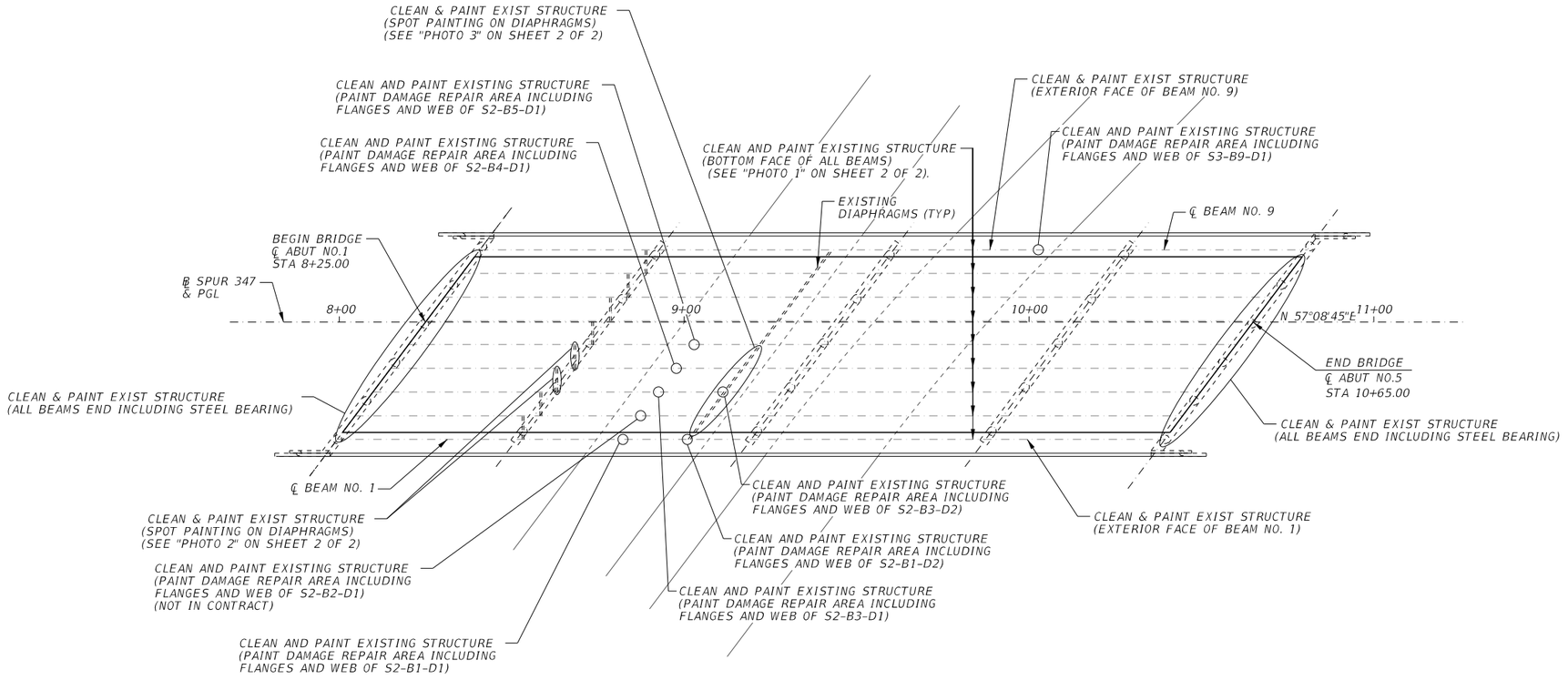

PLAN ~ SHOWING LOCATION OF STEEL BEAM CLEANING AND PAINTING

NOTES:

1. ALL INFORMATION SHOWN BASED ON AS-BUILTS DRAWINGS SOUTH LANE SH 121 UNDERPASS (WEST LANE 135W) DATED 11/21/1958. STATIONS ARE FROM AS-BUILT PLANS. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD.
2. PROVIDE PAINT SYSTEM III-B IN ACCORDANCE WITH DMS-8101, "STRUCTURAL STEEL PAINTS-PERFORMANCE". CLEAN AND PAINT IN ACCORDANCE WITH ITEM 446, "FIELD CLEANING AND PAINTING STEEL".
3. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING VEHICULAR TRAFFIC SURROUNDING THE PAINTING OPERATION. PAYMENT FOR PROTECTION SHALL BE CONSIDERED SUBSIDIARY TO PAY ITEM 446.
4. PERFORM STEEL BEAM REPAIR AND WELDING REPAIRS BEFORE APPLYING PAINT TO THE DESIGNATED AREA.
5. PHOTOS ARE FOR CONTRACTORS INFORMATION ONLY. ALL PHOTOS ARE BASED ON BRIDGE CONDITION SURVEY REPORT DATED 12/19/2022 AND SITE VISIT OF 08/04/2023, CURRENT CONDITION MAY VARY.

BRIDGE PAINT AREA

BRIDGE BUILT: 1960
FIELD CLEANING AND PAINTING STEEL FOR EXTERIOR FACE OF EXTERIOR BEAMS: 1440 SF
FIELD CLEANING AND PAINTING STEEL FOR BOTTOM FACE OF ALL BEAMS: 2160 SF
SPOT PAINTING ON DIAPHRAGMS AND END OF ALL BEAMS INCLUDING STEEL BEARING: 500 SF
PAINT FOR DAMAGE REPAIR AREA INCLUDING FLANGES AND WEB OF SPAN 2 BEAM 1 TO BEAM 5 : 18 SF
PAINT FOR DAMAGE REPAIR AREA INCLUDING FLANGES AND WEB OF SPAN 3 BEAM 9: 2 SF

APPROXIMATE AREA OF STEEL STRUCTURE TO BE CLEANED AND PAINTED: 4127 SF

ESTIMATED QUANTITIES

	DESCRIPTION		TOTAL
0446-7011	CLEAN & PAINT EXIST STR (SYSTEM III-B)	LS	1

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
6/26/2024

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

STEEL BEAM REPAIRS
(PAINT)
IH 35W SB UNDERPASS
AT SPUR 347 EB

SCALE: N.T.S SHEET 1 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	87
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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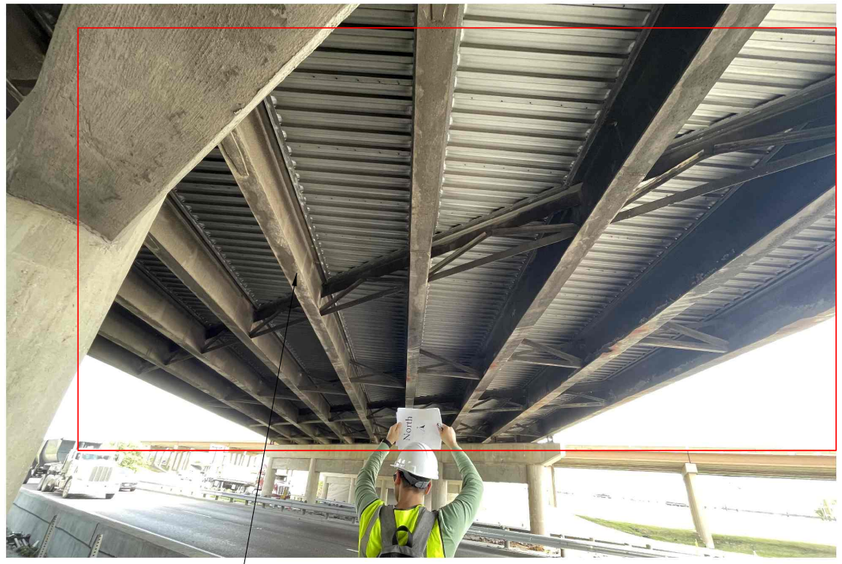
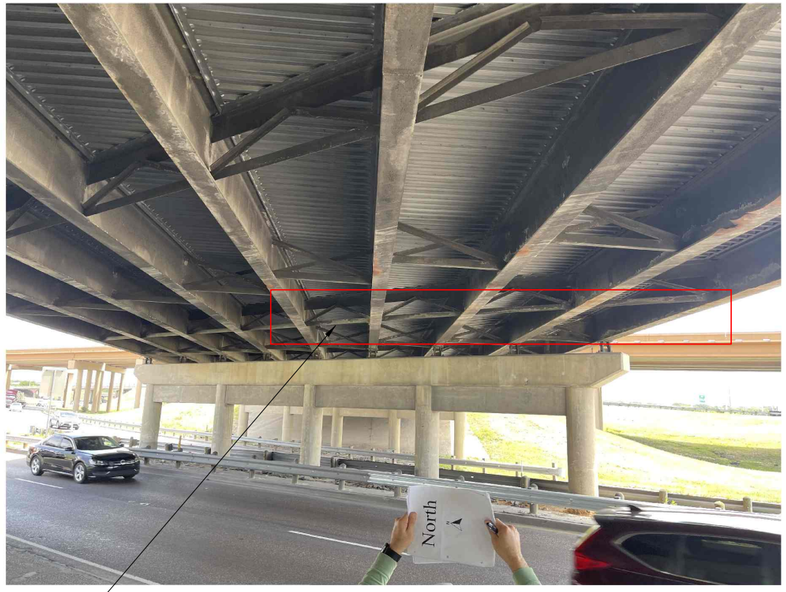


CLEAN AND PAINT EXISTING STRUCTURE
(BOTTOM FACE OF ALL BEAM= 2160 SF)

PHOTO 1

(SHOWING BEAMS, SPAN #2 LOOKING EAST)



CLEAN AND PAINT EXISTING STRUCTURE
(SPOT PAINTING ON DIAPHRAGMS
BETWEEN BEAMS 1 TO 5)

PHOTO 3

(SHOWING SPAN #2, LOOKING EAST)

CLEAN AND PAINT EXISTING STRUCTURE
(SPOT PAINTING ON DIAPHRAGMS
BETWEEN GIRDERS 3 & 4, 4 & 5)

PHOTO 2

(SHOWING BENT #2 DIAPHRAGMS; LOOKING EAST)

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

6/26/2024

PARSONS
TBPE Registration No. F-1481

STEEL BEAM REPAIRS (PAINT) IH 35W SB UNDERPASS AT SPUR 347 EB

SCALE: N.T.S SHEET 2 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	88
CONTROL	SECTION	JOB	
0081	01	053,ETC	

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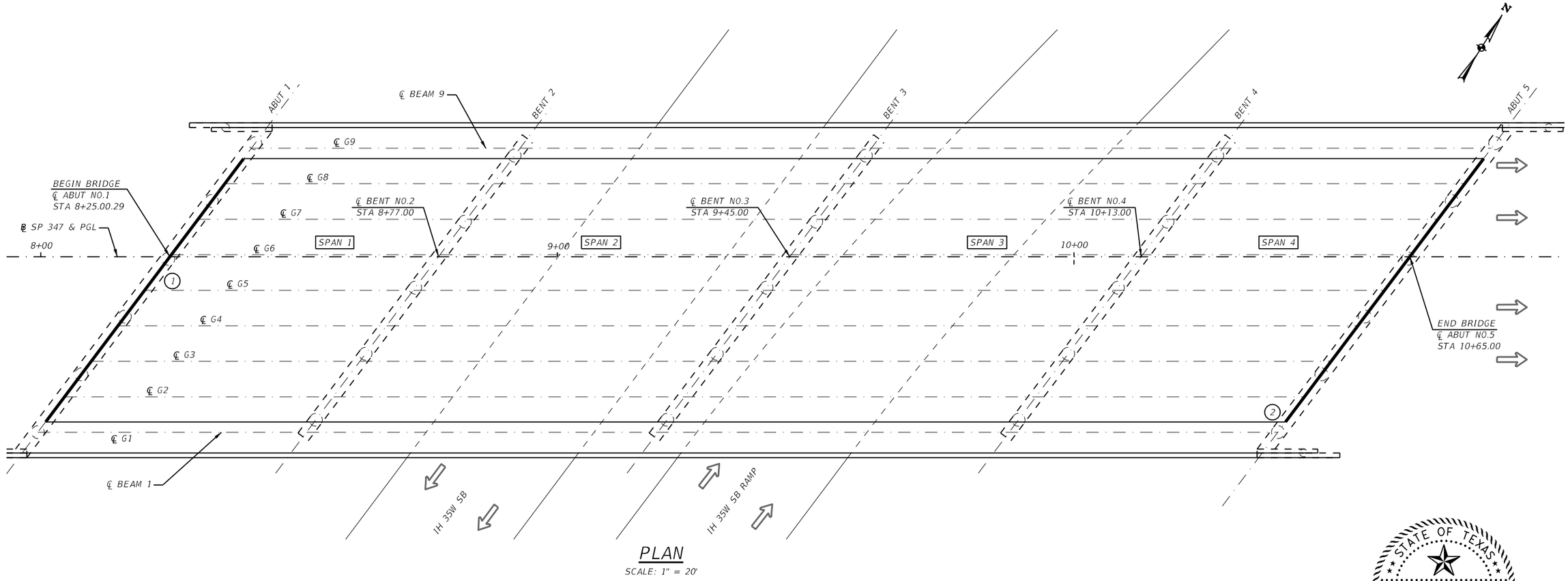

PLAN

SCALE: 1" = 20'

(1) REPLACE BEARING ASSEMBLY AT GIRDER 5

(2) RE-ALIGN FOR VERTICAL OFFSET

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	TOTAL
0442 - 7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	260
0499 - 7001	ADJUST STL SHOES (RE-WELDS)	EA	1

NOTES:

1. THE ROCKER BEARING AT ASSEMBLY FOR GIRDER 5 (ABUTMENT 1) NEEDS TO BE REPLACED.
2. SEE SHEET 2 OF 2 FOR MORE BEARING REPLACEMENT INFORMATION.
3. THE PROPOSED ROCKER BEARING REPAIR IS BASED ON SITE INSPECTION OF ABUTMENT BEARING ON FEBRUARY 17, 2024.
4. ACTION NEEDED ONLY AT BEARING ASSEMBLIES MARKED IN PLAN BASED ON FEBRUARY 2024 INSPECTION.
5. PAYMENT FOR THE TEMPORARY SUPPORT IS SUBSIDIARY TO ITEM 499 ADJUSTING STEEL SHOES AND ITEM 442 METAL FOR STRUCTURES. NO TRAFFIC IS ALLOWED ON THE BRIDGE DURING THE REPAIR WORK. REFER TO TCP FOR LANE CLOSURE WHILE THE BRIDGE IS UNDER REPAIR.
6. FOLLOW TCP PRIOR TO COMMENCING THE REPAIR WORK.
7. PROVIDE TEMPORARY SHORING TO FULLY SUPPORT AND SECURE THE GIRDERS SUBJECT TO BEARING REPLACEMENT AND RE-ALIGNMENT.
8. GIRDER NUMBERING FOLLOWS AS-BUILT PLANS.

6/26/2024

PARSONS
TBPE Registration No. F-1481

BEARING REPAIR DETAILS IH 35W SB UNDERPASS AT SPUR 347 EB

SCALE: 1" = 20' SHEET 1 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	89
CONTROL	SECTION	JOB	
0081	01	053,ETC	

DRAWING DATE: 6/26/2024
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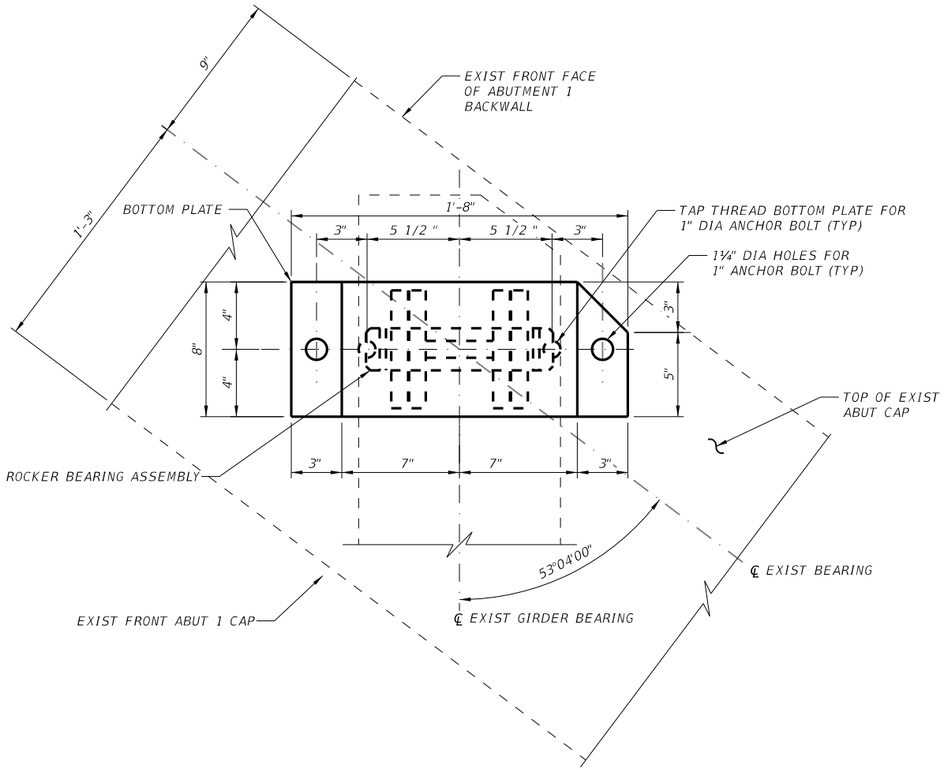
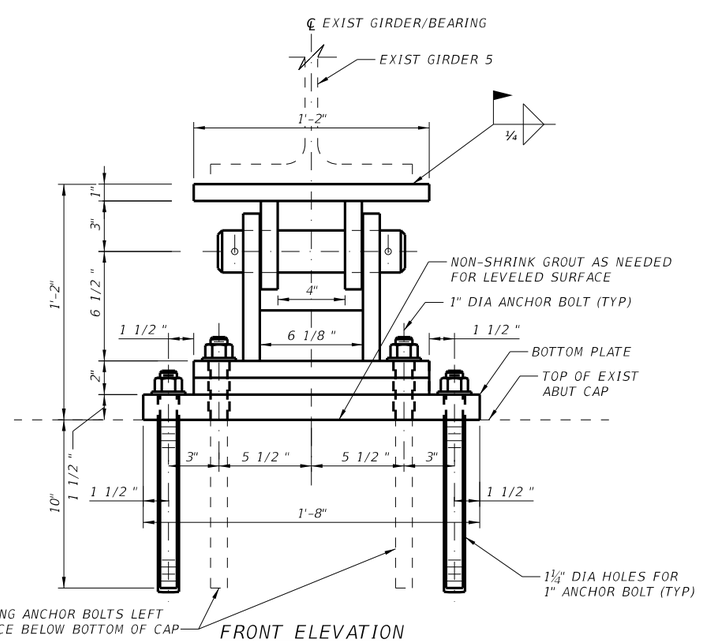
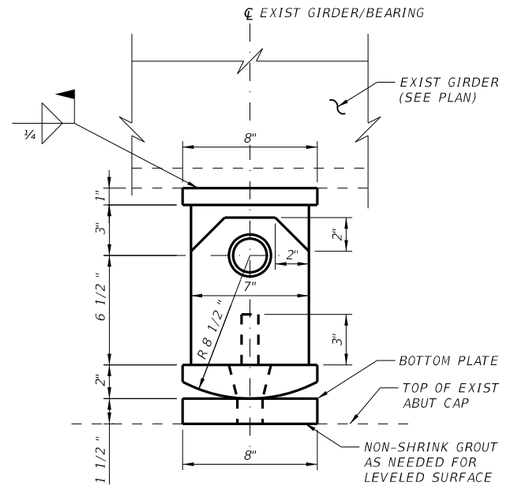


PLAN

WASHERS AND NUTS
NOT SHOWN FOR CLARITY



FRONT ELEVATION



SIDE ELEVATION

BEARING REPLACEMENT

BEARING DEVICE NOTES:

1. DESIGNED AND SHOWN FOR REPLACEMENT OF ROCKER BEARING, LOCATED AT THE SAME LOCATION AS THE EXISTING ROCKER BEARING.
2. THE REPLACEMENT ROCKER BEARING TO BE A DUPLICATE OF THE EXISTING ROCKER BEARING, EXCEPT FOR THE ANCHOR AND BOTTOM PLATE AS SHOWN IN THIS SHEET. BOTTOM PLATE TO BE ASTM A36 OR EQUIVALENT.
3. THE MAJOR DIMENSIONS OF THE ROCKER BEARING ARE SHOWN IN THIS SHEET. SEE THE AS-BUILT DWG FOR ALL OTHER INFORMATION, DIMENSIONS AND MATERIALS OR EQUIVALENT MATERIALS APPROVED BY THE CLIENT. THE AS-BUILT DRAWING SET WAS DEVELOPED FOR STATE HIGHWAY IMPROVEMENT INTERSTATE HIGHWAY NO 35W TARRANT COUNTY, STATE CONTROL 14-16-32 FROM TWELFTH STREET TO BELKNAP STREET, DTATED JULY 30, 1959.
4. ANCHOR BOLTS MUST CONFORM TO ASTM F 1554 GRADE 105 OR ASTM A 193 GRADE B7. NUTS MUST CONFORM TO ASTM A 563 GRADE DH, HEAVY HEX OR A194 GRADE 2H, HEAVY HEX. WASHERS MUST CONFORM TO ASTM F 436. HOT-DIP GALVANIZE ALL ANCHOR BOLTS (EXPOSED END PLUS 6" MIN), AND NUTS NOT EMBEDDED IN CONCRETE, AS PER ITEM 445, "GALVANIZING".
5. FIELD VERIFY BOTTOM PLATE DIMENSION PRIOR TO PLATE INSTALLATION. INFORM ENGINEER IF DISCREPANCIES ARE FOUND IN THE FIELD.
6. THE CONTRACTOR TO PROVIDE TXDOT THE GIRDER JACKING PLAN FOR APPROVAL PRIOR TO THE GIRDER JACKING AND BEARING REPLACEMENT. THE MAXIMUM ALLOWABLE JACKING VERTICAL MOVEMENT IS ⅛". CONSTRUCTION NEED TO FOLLOW ITEMS 441, 446, 447 AND 448. FIELD WELD ALSO TO FOLLOW AWS WELDING CODE.

CONSTRUCTION SEQUENCE:

1. FIELD SURVEY THE EXISTING ROCKER DIMENSIONS TO BE USED IN CONJUNCTION WITH BEARING AS-BUILT DRAWING INFORMATION TO DUPLICATE THE ROCKER BEARING ASSEMBLY. THE BOTTOM PLATE, AHCOR BOLT/ROD SHALL BE FURNISHED PER THIS DESIGN.
2. LOOSEN THE EXISTING ANCHOR BOLT / ROD AND JACK GIRDER PER THE NOTE AS SHOWN ABOVE. LOCK THE GIRDER AT THE JACKED POSTION.
3. REMOVE THE EXISTING ROCKER BEARING ASSEMBLY, CLEAN ALL THE EXISTING PAINT AND WELD OFF THE GIRDER FLANGE. CLEAN, REPAIR AND LEVEL THE TOP OF THE EXISTING ABUTMENT CAP.
4. DRILL-GROUT THE ANCNOR BOLTS AND INSTALL THE BOTTOM PLATE. REMOVE THE JACKING - LOCKING AND LOCATE THE THE GIRDER BOTTOM FLANGE ONTO TOP PLATE OF THE BEARING ASSMBLY. PERFORM THE MINOR ADJUSTMENT, AS NEEDED, TO THE BEARING ASSEMBLY AND/OR GIRDER TO THE DESIGN POSITION.
5. FIELD WELD THE BEARING TO THE GIRDER FLANGE. PAINT ALL THE EXPOSED STEEL MEMBERS.

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

Texas Department of Transportation
© 2024

PARSONS
TBPE Registration No. F-1481

BEARING REPAIR DETAILS
IH 35W SB UNDERPASS
AT SPUR 347 EB

SCALE: N.T.S. SHEET 2 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6	(SEE TITLE SHEET)	SS347, ETC
STATE	DISTRICT / COUNTY	SHEET NO.
TEXAS	FTW / TARRANT	90
CONTROL	SECTION / JOB	
0081	01 / 053,ETC	

DRAWING DATE: 6/26/2024
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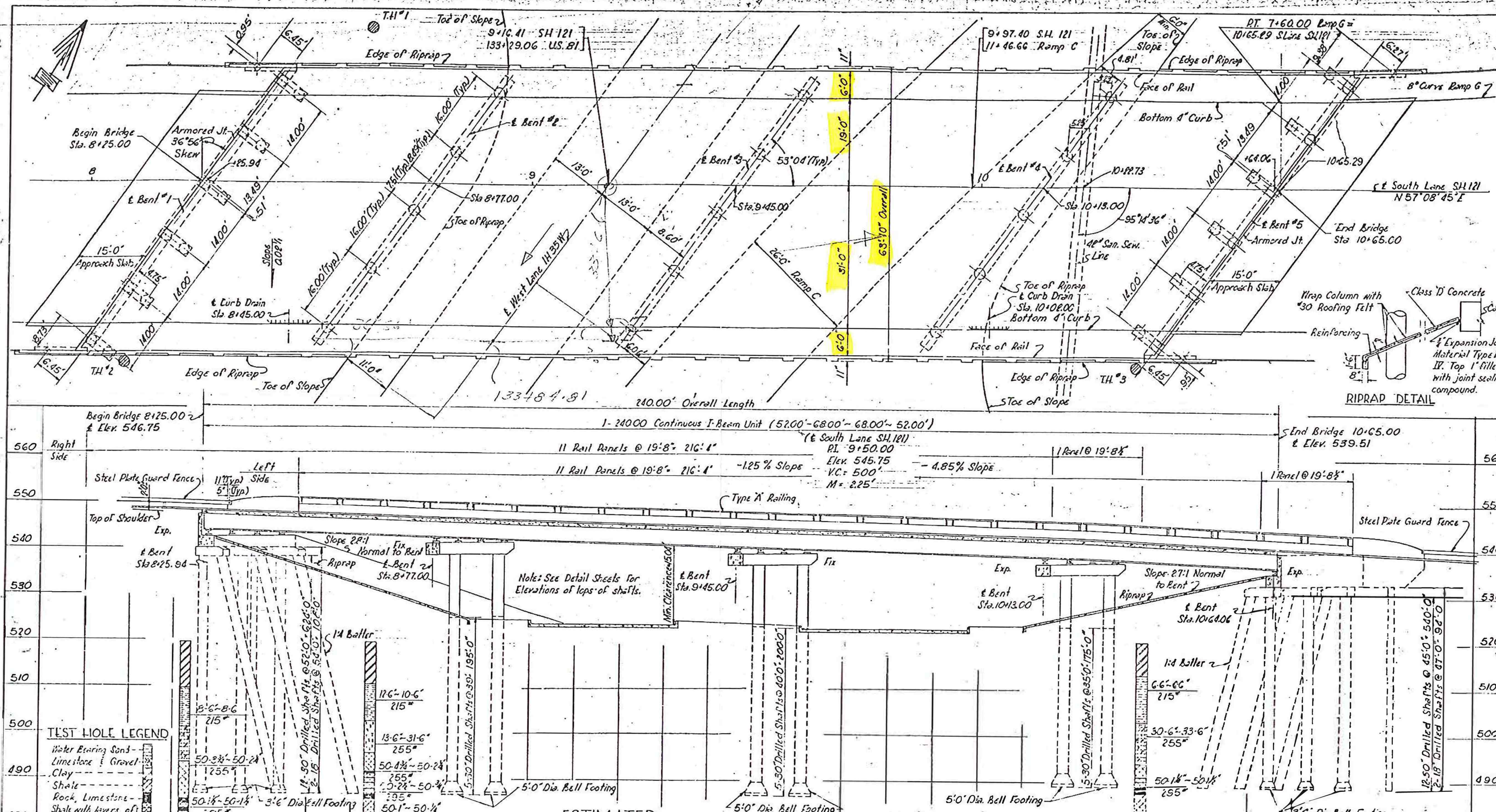


ESTIMATED QUANTITIES

Description	Uncl'd Str. Excavation	Class 'A' Concrete		Reinforcing Steel	Structural Steel	Bell Footing	Drilled Shafts		Railing Type 'A'	Concrete Class 'D' Riprap
		Slabs	Bents				18"	30"		
	Cu. Yds.	Cu. Yds.	Cu. Yds.	Lbs.	Lbs.	Cu. Yds.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Cu. Yds.
2 Abutment Bents	100	~	94.4	16094	~	1.9	200.0	1164.0	~	99.7
3 Interior Bents	~	~	92.0	17849	~	12.0	~	570.0	~	~
F2000 [illegible]	~	334.8	~	61858	343031	~	~	~	472.1	~
Totals	100	334.8	186.4	95801	343031	13.9	200.0	1734.0	472.1	99.7

Final Photographs will be required.

See "Finish Note" on sheet No. 51.

TEXAS HIGHWAY DEPARTMENT

LAYOUT

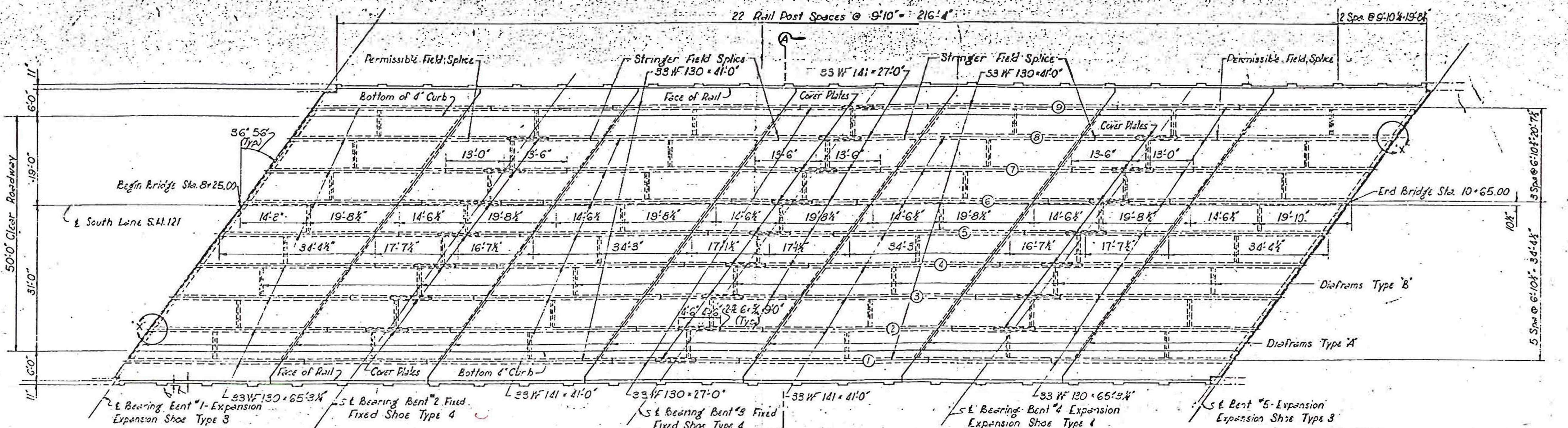
SOUTH LANE SH.121
UNDERPASS (WEST LANE IH 35W)

Sheet 1 of 1 Sheets

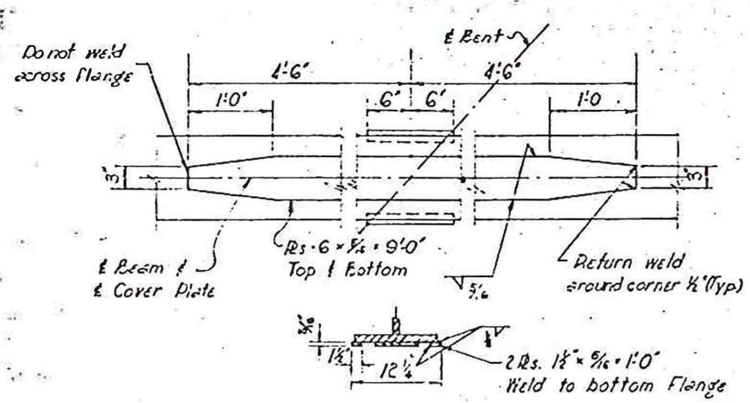
Drawn Lee	Fed. Rd. Div. No.	State	Federal Aid Project No.	Highway No.
Checked MPG	6	Texas	I 35W-5(12)426	IH 35W
Traced	State Dist. No.	County	Control No.	Section No.	Job No.	Sheet No.
Checked	2	TARRANT	14	16	29	59

60

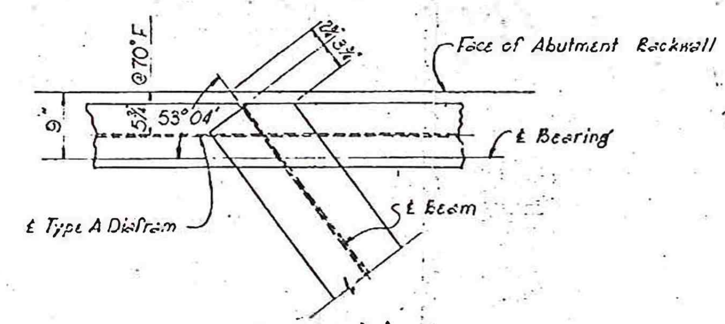
FOR CONTRACTOR'S REFERENCE ONLY
(SPUR347 EB AT IH 35W SB)
NBI# 02-220-0-0014-16-151



PLAN



COVER PLATE DETAIL



DETAIL 'X'

SHAFT & COLUMN DATA

Bent #1 (Vert.)

Shaft	A	B	C	D	E	F	Total Shaft Length
Act. Length	50.70	51.00	50.20	51.00	[illegible]	[illegible]	303.60
Top Elev.	[illegible]	537.68	537.73	537.78	537.63	[illegible]	
Bot Elev.	[illegible]	[illegible]	487.53	[illegible]	[illegible]	[illegible]	Total Col. Length
Col. Length	—	—	—	—	—	—	—

Bent #1 (Bot.)

Shaft	A	B	C	D	E	F	Total Shaft Length
Act. Length	53.00	53.70	54.00	53.90	53.00	[illegible]	322.00
Top Elev.	537.63	[illegible]	[illegible]	537.78	[illegible]	[illegible]	
Bot Elev.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Total Col. Length
Col. Length	—	—	—	—	—	—	—

Bent #2 (Vert.)

Shaft	A	B	C	D	E	Total Shaft Length
Act. Length	38.40	37.40	37.60	37.90	37.10	189.40
Top Elev.	525.11	[illegible]	525.00	525.05	[illegible]	
Bot. Elev.	485.71	[illegible]	487.40	487.15	[illegible]	Total Col. Length
Col. Length	12.94	12.93	13.05	13.00	13.16	65.08

Bent #3 (Vert.)

Shaft	A	B	C	D	E	Total Shaft Length
Act. Length	38.00	[illegible]	37.60	37.70	37.30	183.20
Top Elev.	524.18	524.12	[illegible]	[illegible]	524.1[illegible]	
Bot. Elev.	485.18	[illegible]	[illegible]	[illegible]	[illegible]	Total Col. Length
Col. Length	12.09	12.12	[illegible]	12.12	12.01	60.52

Bent #4 (Vert.)

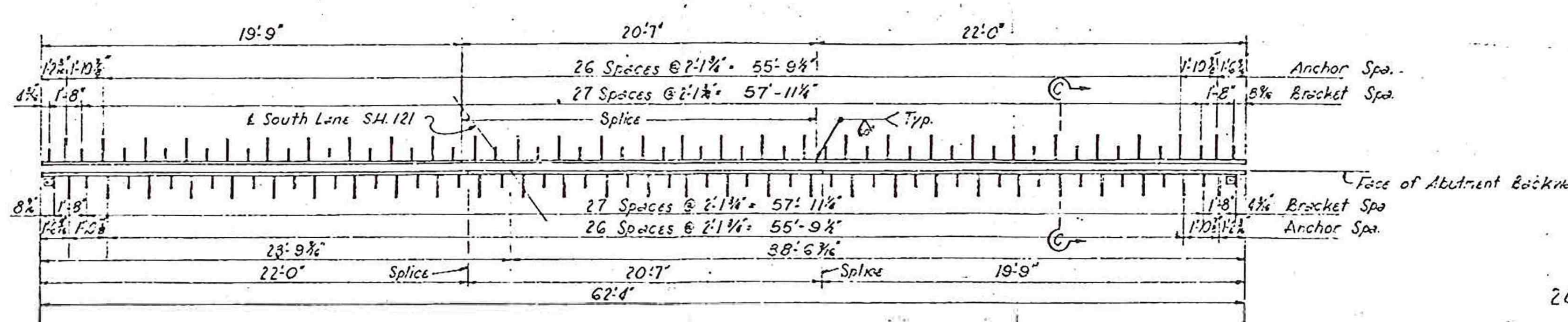
Shaft	A	B	C	D	E	Total Shaft Length
Act. Length	34.40	34.20	34.00	34.90	33.90	171.40
Top Elev.	523.10	[illegible]	[illegible]	[illegible]	522.55	
Bot. Elev.	488.70	[illegible]	[illegible]	[illegible]	[illegible]	Total Col. Length
Col. Length	11.09	11.24	11.26	11.19	11.52	56.10

Bent #5 (Vert.)

Shaft	A	B	C	D	E	F	Total Shaft Length
Act. Length	42.00	43.00	41.80	41.70	42.50	41.70	252.70
Top Elev.	530.92	[illegible]	530.72	530.62	530.52	[illegible]	
Bot. Elev.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Total Col. Length
Col. Length	—	—	—	—	—	—	—

Bent #5 (Bot.)

Shaft	A	B	C	D	E	F	Total Shaft Length
Act. Length	43.40	43.20	42.90	44.70	43.00	44.30	261.50
Top Elev.	[illegible]	[illegible]	530.72	530.62	530.52	[illegible]	
Bot. Elev.	[illegible]	[illegible]	487.10	487.25	488.00	[illegible]	Total Col. Length
Col. Length	—	—	—	—	—	—	—



PLAN OF ARMORED PLATE

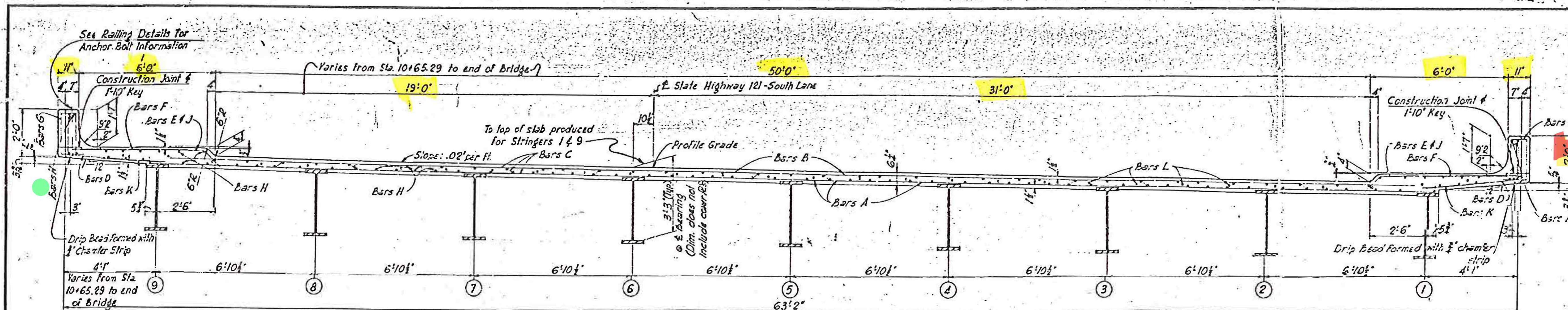
Bent #1 Shown
Bent #5 Opposite
See sheet #3 of 3 for other details.

TEXAS HIGHWAY DEPARTMENT
240'-0" CONTINUOUS I-BEAM UNIT
SOUTH LANE SH 121 UNDERPASS
(WEST LANE IH 35W)

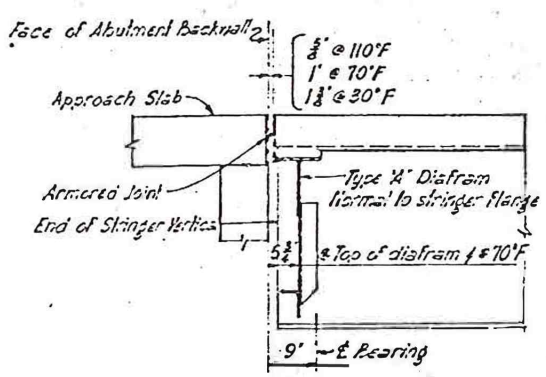
Sheet 1 of 3 Sheets

FOR CONTRACTOR'S REFERENCE ONLY

(SPUR347 EB AT IH 35W SB)
NBI# 02-220-0-0014-16-151



SECTION A-A PAGE 60



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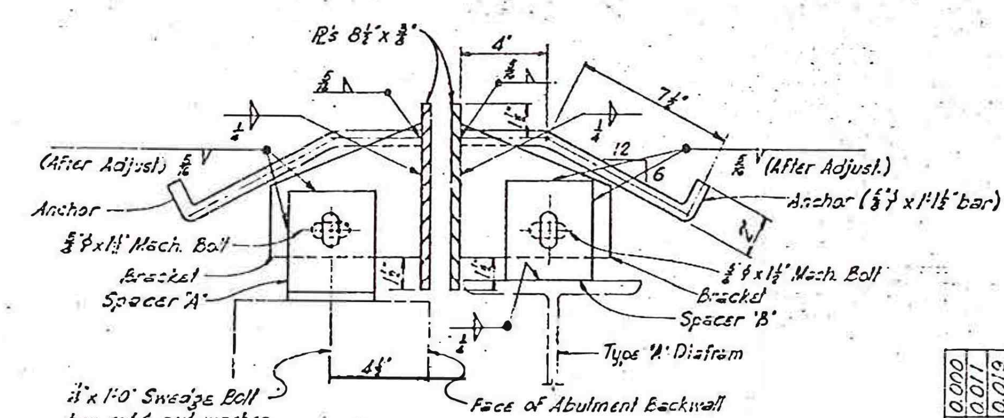
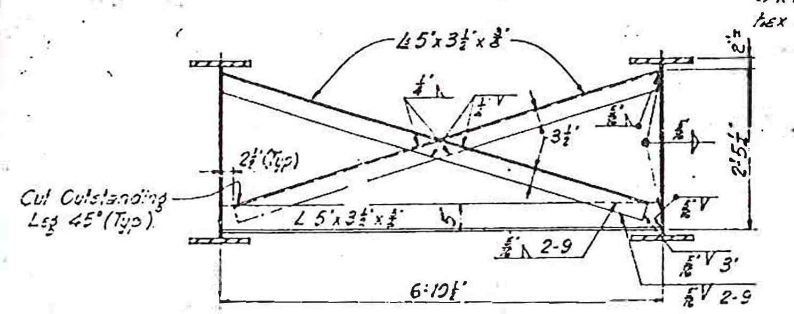


SECTION C-C PAGE 60 (PLAN OF ARMOUR PLATE)



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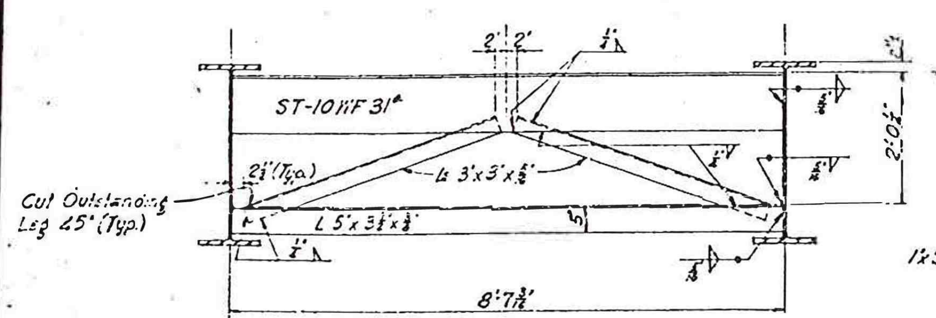
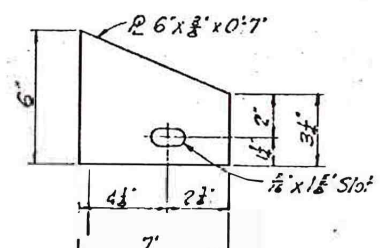
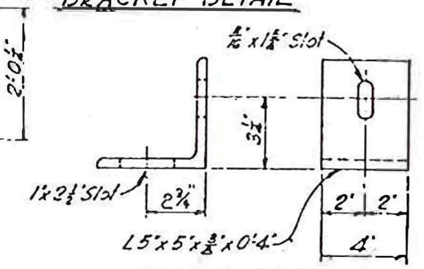


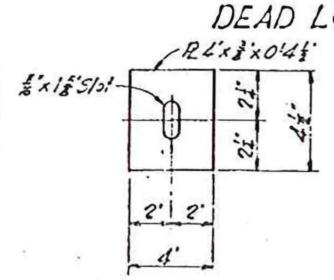
TYPE "A" DIAFRAM



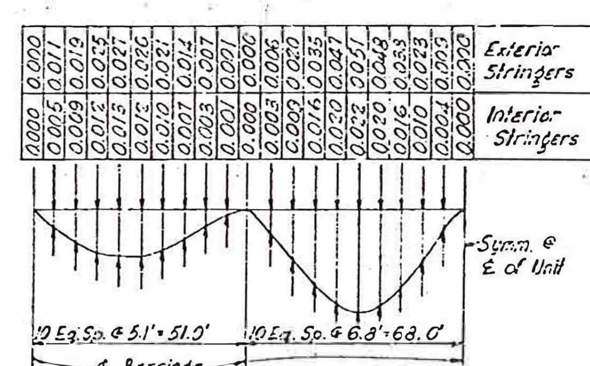
BRACKET DETAIL



SPACER "A" DETAIL



SPACER "B" DETAIL



Construction Procedure:-

After all structural steel is erected, an accurate measurement shall be made of the elevation of the beam flanges at all control points. Subsequent setting of forms, placing and finishing of concrete shall be governed by these measurements only, taking into account the deflections shown above.

DEAD LOAD DEFLECTION DIAGRAMS
(For Concrete and Railing only)

ESTIMATED QUANTITIES		
Class 'A' Concrete	334.8	Cu.Yds.
Reinforcing Steel	61,858	Lbs
Structural Steel *	343,031	Lbs.

* Includes Bearing Shoes, Drains, & Armored Joints.

BILL OF REINFORCING STEEL

Bar	No	Size	Spac.	Length	Weight
A1-27	14 Ea.	#5	14½"	23'6" Av.	9265
A28	49	#5	14½"	45'10"	2342
B1-27 *	14 Ea.	#5	14½"	22'1" Av.	8706
B28 *	49	#5	14½"	45'5"	2313
C1-26	14 Ea.	#5	14½"	23'11" Av.	9030
C27-29	14 Ea.	#5	14½"	47'1"	2063
D	360	#4	14½"	8'1"	1942
D1	12	#4	14½"	6'4"	51
D2	14	#4	14½"	7'10"	73
E	346	#5	14½"	7'2"	2586
E1	12	#5	14½"	1'11"	24
E2-3	14 Ea.	#5	14½"	4'2" Av.	122
F *	346	#6	14½"	5'0"	2593
F1 *	12	#6	14½"	1'3"	23
F2-3 *	14 Ea.	#6	14½"	3'6" Av.	147
G	126	#4	Shown	3'9"	366
H1	817	#4	Shown	34'0"	18556
H2	8	#4	Shown	32'10"	175
H3	8	#4	Shown	31'6"	168
J	83	#5	Shown	6'2"	566
K *	83	#4	Shown	2'8"	157
L *	204	#5	24"	2'6"	532
Total Reinforcing Steel - Pounds					61,858

* Indicates Straight Bars.

GENERAL NOTES:

Designed for H20-S16-44 Loading in accordance with A.A.S.H.O 1953 Standard Specifications and P.P.M. 20-4, Section 4C.

All concrete shall be Class 'A'. Chamfer exposed corners ¾" unless otherwise noted.

Dimensions relating to reinforcing steel are to centers of bars.

The aluminum paint finish coat on the outside surfaces of exterior stringers shall be applied with spray.

The Contractor shall submit a proposed sequence of Slab placements to the Engineer for approval.

For Details of Curb Drains, Stringer Field Splices and Bearing Shoes see Sheet # 85

TEXAS HIGHWAY DEPARTMENT

240'-0" CONTINUOUS I-BEAM UNIT

SOUTH LANE S. H. 121 UNDERPASS

(WEST LANE)

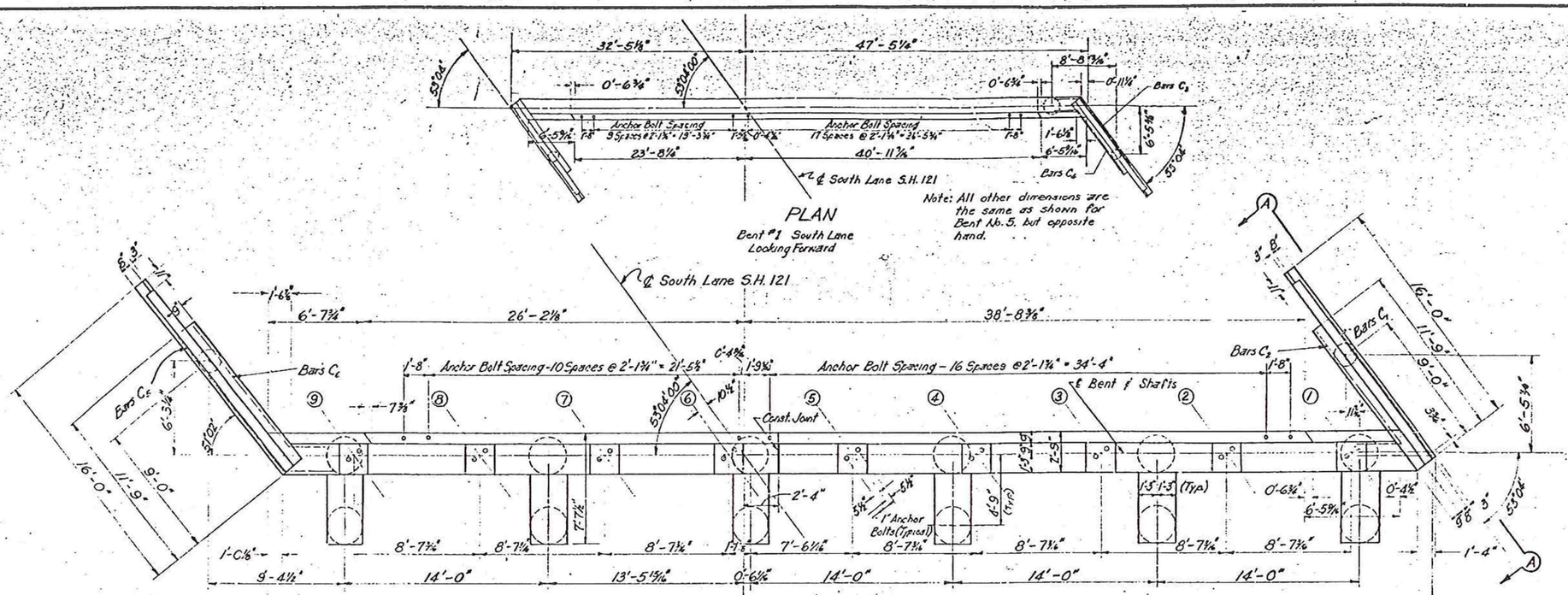
Sheet # 3 of 3 sheets.

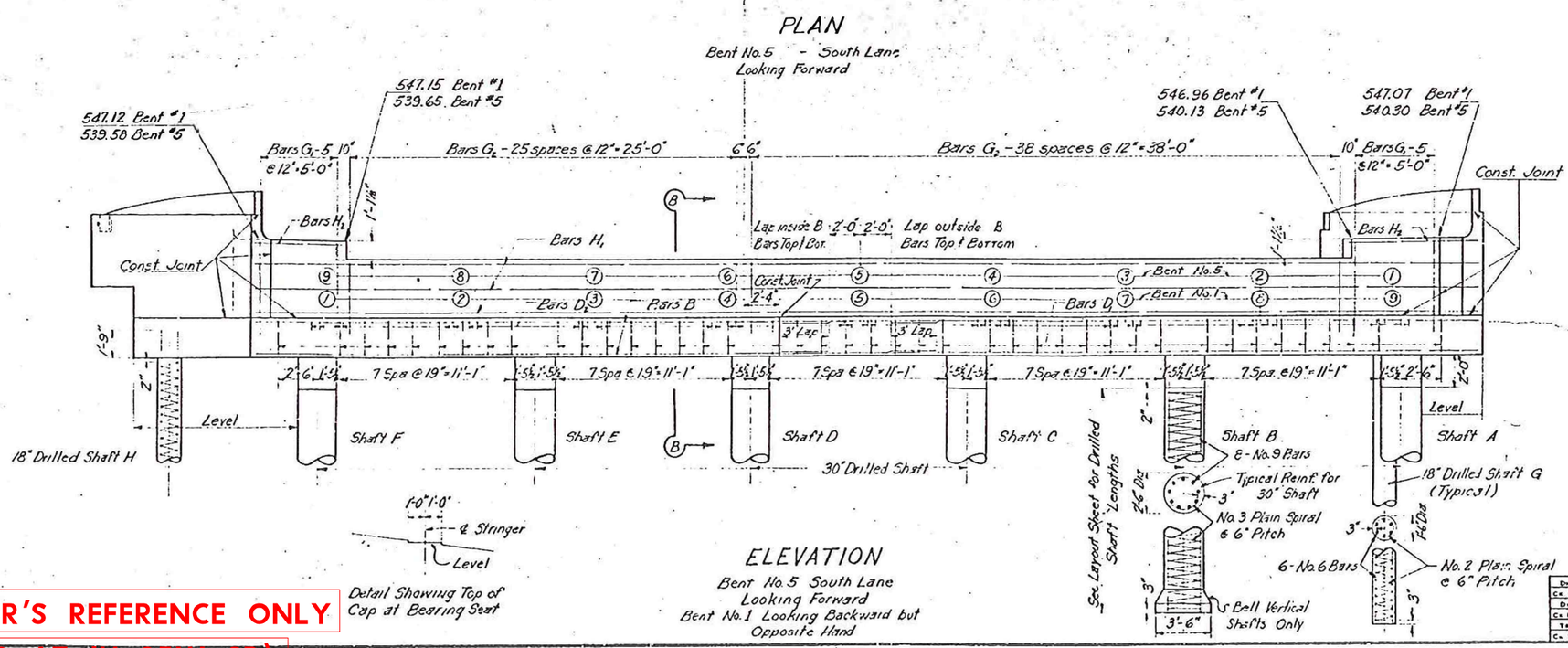
TARRANT

63

FOR CONTRACTOR'S REFERENCE ONLY

(SPUR347 EB AT IH 35W SB)
NBI# 02-220-0-0014-16-151





TOP DRILLED SHAFT ELEVATIONS

Shaft	Bent No. 1	Bent No. 5
A	537.63	530.92
B	537.68	530.82
C	537.73	530.72
D	537.78	530.62
E	537.83	530.52
F	537.88	530.42
G	539.63	532.92
H	539.88	532.42

BEARING SEAT ELEVATIONS

Stringer	Bent No. 1	Bent No. 5
1	542.16	535.42
2	542.20	535.36
3	542.23	535.30
4	542.26	535.25
5	542.29	535.19
6	542.32	535.13
7	542.34	535.07
8	542.36	535.00
9	542.38	534.92

TEXAS HIGHWAY DEPARTMENT

WEST LANE
END BENTS NO. 1 & 5

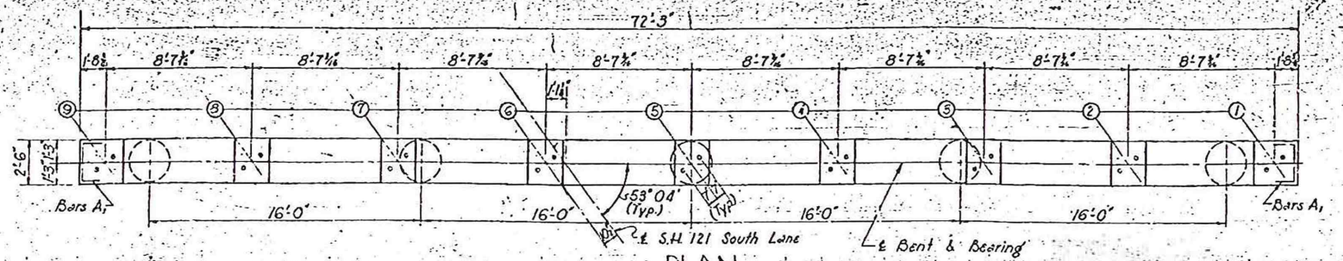
SOUTH LANE S.H. 121 UNDERPASS

Sheet N

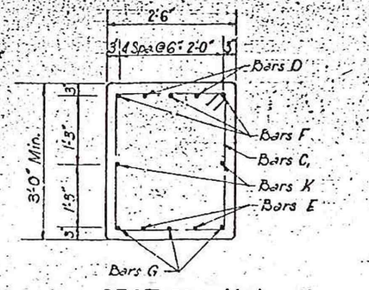
64

FOR CONTRACTOR'S REFERENCE ONLY

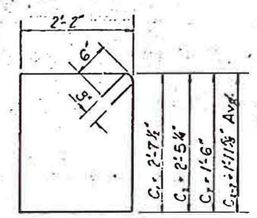
(SPUR347 EB AT IH 35W SB)
NBI# 02-220-0-0014-16-151



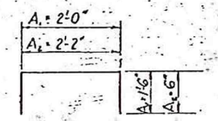
PLAN



SECTION A-A



BARS C_{1-7}



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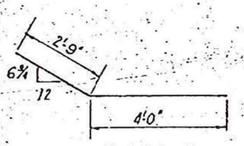

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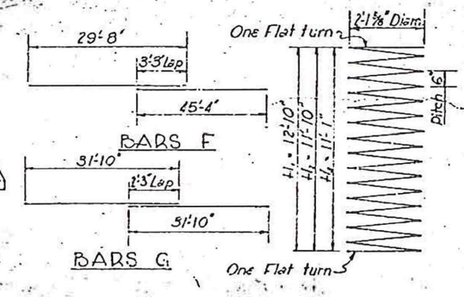
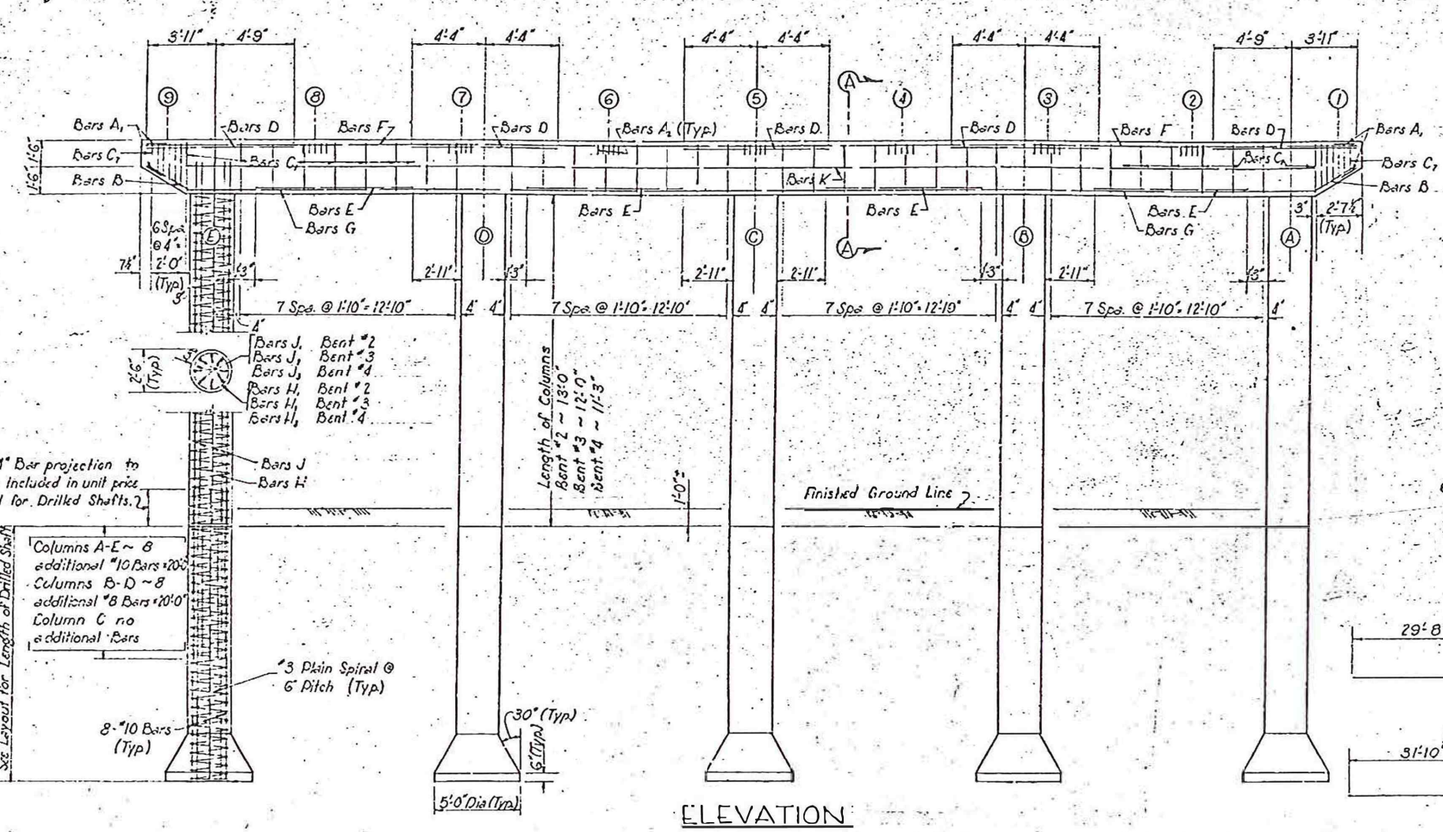
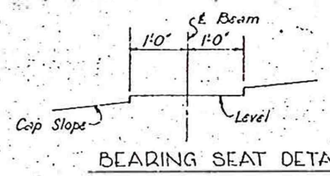




ELEVATION



BEARING SEAT DETAIL

BILL OF REINFORCING STEEL

BAR	No.	SIZE	SPACING	Lt.	
A_1	1	#6	Shown	5'-0	
A_2	35	#8	5"	3'-2"	
B	6	#6	1'-0"	6'-9"	
C	54	#4	1'-10"	10'-8"	2
C_1-C_7	2 Ea.	#4	2'	9'-8" Avg.	75
* D	10	#11	1'-0"	8'-8"	460
* E	8	#10	1'-0"	9'-4"	321
* F	3	#10	1'-0"	75'-0" **	969
* G	3	#10	1'-0"	63'-8" **	822
* K	2	#5	Shown	68'-0" **	142
Total weight of one cap					3196
* J_1	40	#10	~	15'-0"	2552
H_1	5	#3	~	188'-6"	356
Total weight Bent #2					6132
* J_2	40	#10	~	14'-0"	2415
H_2	5	#3	~	175'-6"	330
Total weight Bent #3					5936
* J_3	40	#10	~	13'-3"	2281
H_3	5	#3	~	161'-6"	304
Total weight Bent #4					5781

* Indicates Straight Bars

** Includes: 5'-5" Lap Bars F.; 2'-3" Lap Bars G; 1'-3" Lap Bars K

ESTIMATED QUANTITIES

Item	Unit	Bent #2	Bent #3	Bent #4
Class "A" Concrete	Cu Yds.	31.5	30.6	22.9
Reinforcing Steel	Lbs.	6132	5936	5781
Bell Footing (Cl. A Conc.)	Cu. Yds.	4.0	4.0	4.0

GENERAL NOTES:

Designed for H-20-16-44 loading in accordance with A.A.S.H.O. (1953) Standard Specifications and P.R.M. 20-4, Section 4-c.

All Concrete shall be Class 'A'. Chamfer exposed corners ¾" unless noted.

Dimensions relating to reinforcing steel are to centers of bars.

Maximum calculated footing pressure = 6.00 Tons/sq. ft.

TABLE OF ELEVATIONS

Beam No.	9	8	7	6	5	4	3	2	1
Bearing Seat Bent #2	541.13	541.11	541.11	541.09	541.09	541.07	541.06	541.05	541.06
Bearing Seat Bent #3	539.15	539.17	539.19	539.21	539.23	539.24	539.25	539.27	539.28
Bearing Seat Bent #4	536.87	536.90	536.95	536.99	537.03	537.07	537.11	537.15	537.20

Column No.	E	D	C	B	A
Top Col. Bent #2	538.05	538.05	538.05	538.05	538.05
Top Col. Bent #3	536.15	536.18	536.21	536.24	536.27
Top Col. Bent #4	533.87	533.95	534.03	534.11	534.19

TEXAS HIGHWAY DEPARTMENT

INTERIOR BENTS #2-#3 & #4

SOUTH LANE S.H. 121 UNDERPASS

(WEST LANE IH 35W)

Des. & Ck.	Drawing	Date	Fed. Road Div. No.	State	Federal Aid Project No.	Sheet No.
Des. JKP	Original	Nov. 1957	6	Texas	I 35W-5(12)126	66
Ck. Des. WDC			State Dist. No.	County	Control No.	Section No.	Job No.	Highway No.
Ck. Tr.			2	Tarrant	13	18	24	IH 35W

FOR CONTRACTOR'S REFERENCE ONLY.

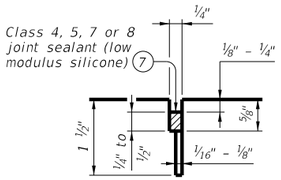
(SPUR347 EB AT IH 35W SB)

NBI# 02-220-0-0014-16-151

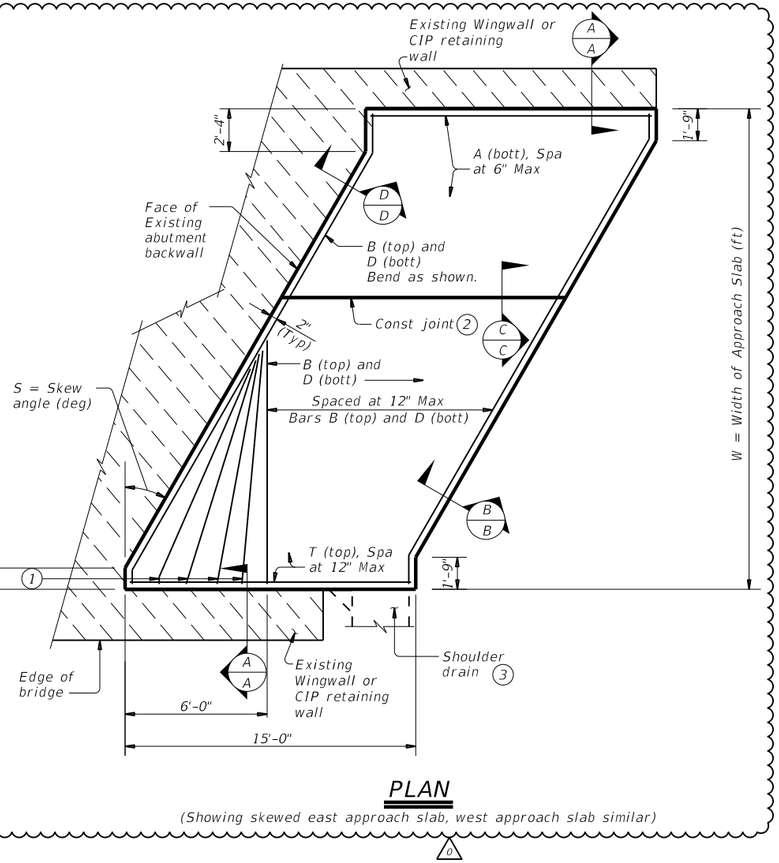
STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

CURRENT P.E. SEAL VALID FOR CLOUDED REVISIONS AND THE EFFECT OF ANY DESIGN RELATIONSHIP BETWEEN THE REVISION AND THE ORIGINAL COMPONENTS ON ALL RELATED PLAN SHEETS.
PARSONS TBPE No. F-1481



LONGITUDINAL SAW CUT JOINT DETAIL



PLAN

(Showing skewed east approach slab, west approach slab similar)

0

BAR TABLE	
BAR	SIZE
A	#8
B	#5
D	#5
T	#5

APPROXIMATE QUANTITIES 4

Reinf steel weight = 8.5 Lbs/SF of Approach Slab

Volume of Appr Slab Conc (CY) = $0.802W + 0.02W^2 \tan S$

W = Width of Approach Slab (ft)

S = Skew Angle (deg)

1. Flare Bars B and D in this region (1'-6" Max Spa, 3" Min Spa). Minimum flared bar length = 2'-6". Bend bars as necessary.
2. Provide longitudinal construction joints that align with longitudinal construction joints in the bridge slab with bridges built in stages. Other longitudinal construction joints must receive approval of the Engineer.
3. See details elsewhere in plans for shoulder drain location and details.
4. For Contractor's information only. Quantities shown are for one approach slab.
5. Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.
6. See details elsewhere in plans for required cross-slope.
7. Place in accordance with Item 438.
8. Provide backer rod that is 25% larger than joint opening and compatible with the sealant.
9. If bridge rail is present at the wingwall or CIP retaining wall, place ½" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.

GENERAL NOTES:

Construct approach slab in accordance with Item 422.

Provide Class "S" (HPC) concrete with a minimum compressive strength of 4,000 psi.

Provide Grade 60 reinforcing steel.

Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between longitudinal construction joints or edges of approach slab exceeds 16 feet. Saw cut joints within 24 hours of concrete placement to a depth of 1 ½" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 ½" vinyl or plastic joint former (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

Provide rebonded recycled tire rubber joint filler that meets the requirements of DMS-6310. "Joint Sealants and Fillers."

See miscellaneous bridge repairs sheet 2 of 8 for the subgrade or subbase away from the bridge prior to the approach slab.

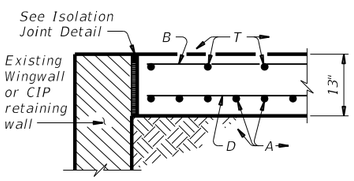
Following removal of existing approach slab, cut grade as required for profile transition and re-compact and backfill the subgrade in accordance with Item 400.

Cure for 4 days using water or membrane curing per Item 422.

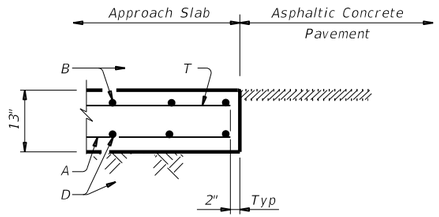
All details shown herein are subsidiary to bridge approach slab.

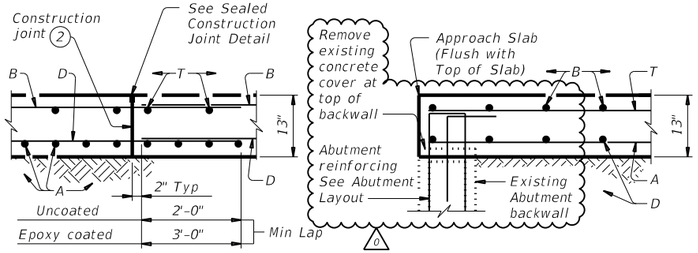
Cover dimensions are clear dimensions, unless noted otherwise.

0



SHOWING WINGWALL OR CIP RETAINING WALL





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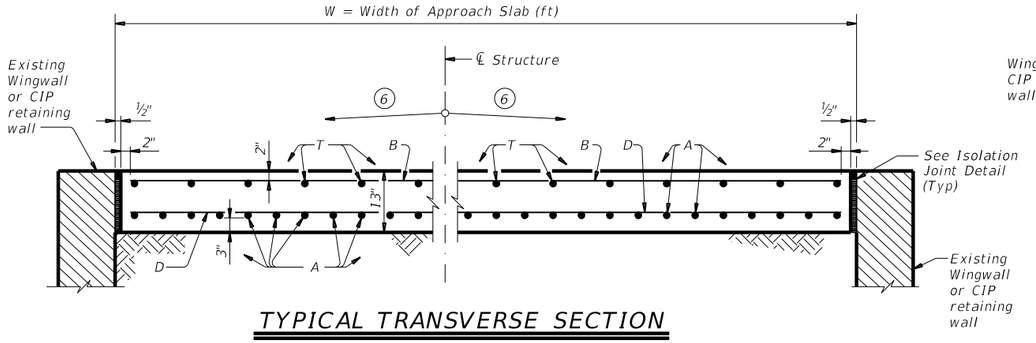
SECTION A-A

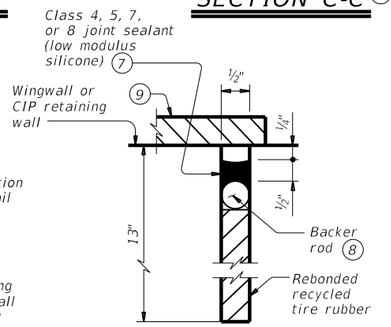
SECTION B-B

SECTION C-C 5

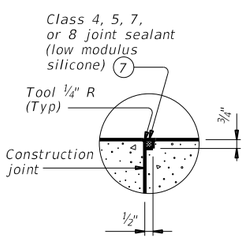
SECTION D-D



TYPICAL TRANSVERSE SECTION



ISOLATION JOINT DETAIL



SEALED CONSTRUCTION JOINT DETAIL

Texas Department of Transportation

Bridge Division Standard

BRIDGE APPROACH SLAB
ASPHALTIC CONCRETE PAVEMENT

0

BAS-A (MOD)

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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
02-20: Removed stress relieving pad.	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		96

DATE: 6/26/2024 3:35:48 PM
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DATE: 6/26/2024 12:13:35 PM
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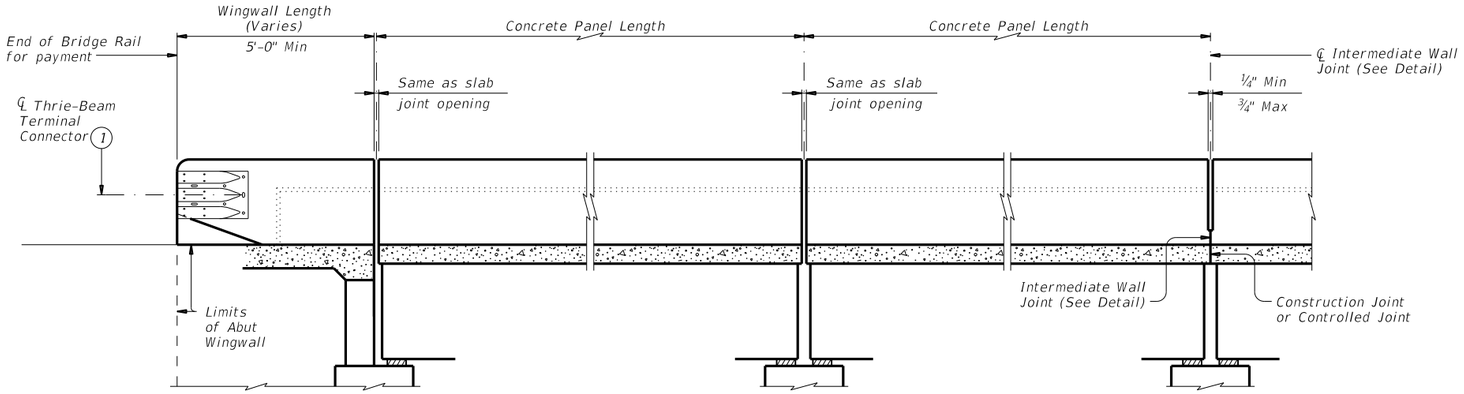
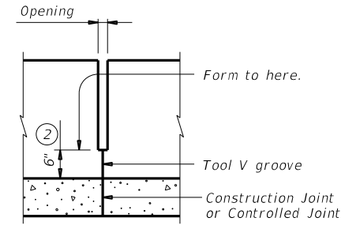


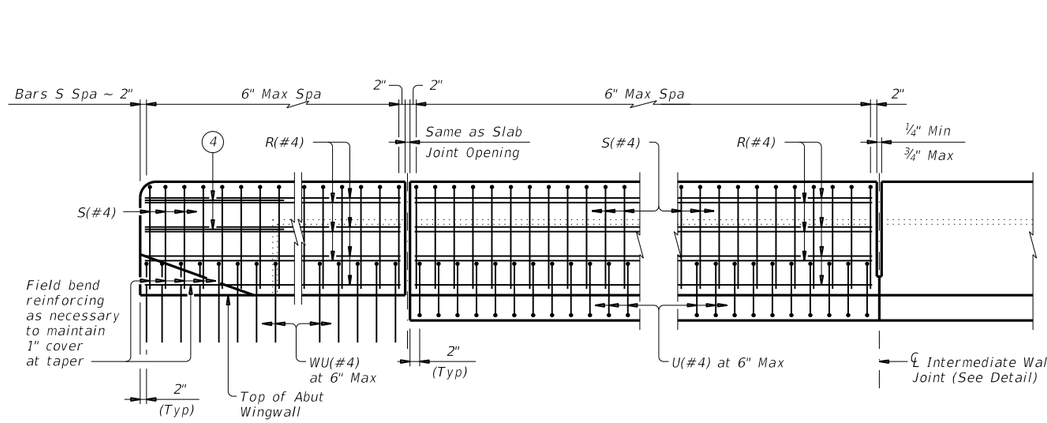
AT ABUTMENTS | AT BENTS WITH SLAB EXP JOINTS | AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL

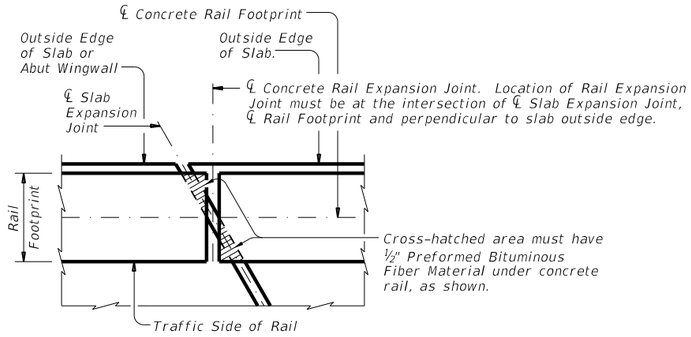


INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.



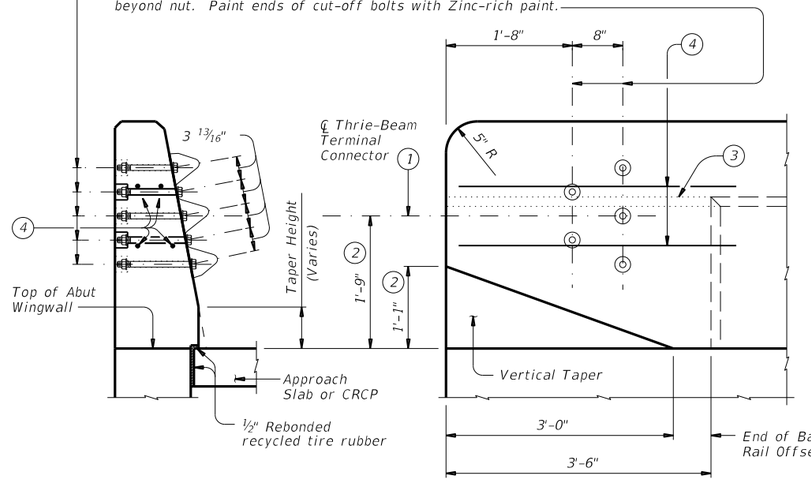
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



PLAN OF RAIL AT EXPANSIONS JOINTS

Example showing Slab Expansion Joints without breakbacks.

℄ 5 ~ 1" Dia holes and 2 ½" Dia x 2" deep recesses. Form or core holes and recesses. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail. Tighten the 5 Terminal Connection Bolts in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the MBGF Transition. Cut bolts off after installation so as to extend no more than ¾" beyond nut. Paint ends of cut-off bolts with Zinc-rich paint.



SECTION | ELEVATION

TERMINAL CONNECTION DETAILS

1. Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence." Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
2. Increase 2" for structures with Overlay.
3. Back of rail offset may, with Engineer's approval, be continued to the end of the railing.
4. Place 4 additional Bars R(#4) 3'-8" in length inside Bars S(#4) and centered 2'-0" from end of rail when Terminal Connections are required.

STATE OF TEXAS
CHRIS M. GILSTRAP
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REGISTERED
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ENGINEER

6/26/2024

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PARSONS TBPE No. F-1481

Texas Department of Transportation | Bridge Division Standard

TRAFFIC RAIL SINGLE SLOPE

TYPE SSTR (MOD) 0

FILE:	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
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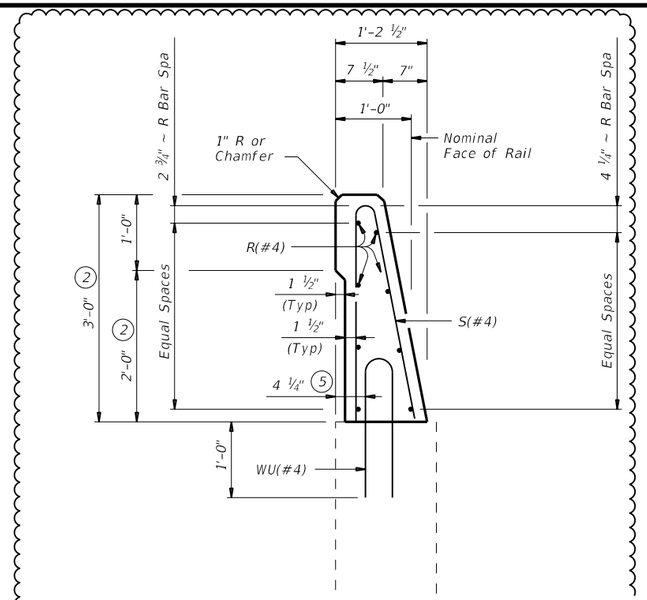
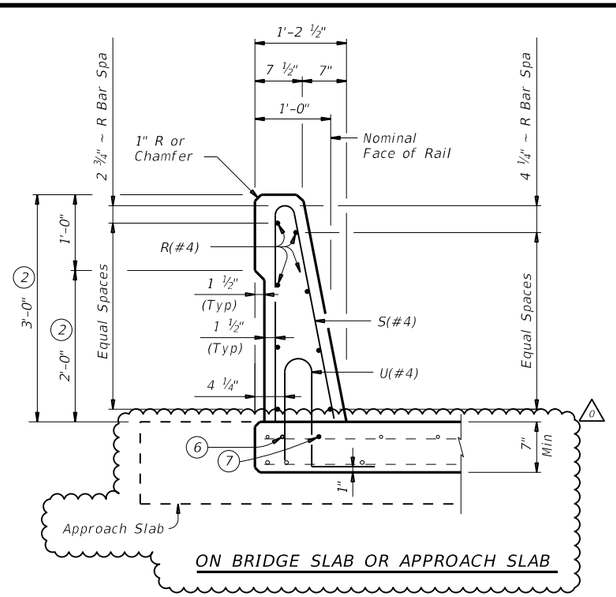




SECTIONS THRU RAIL

(2) Increase 2" for structures with Overlay.

(5) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(6) As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractor's expense.

(7) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(8) No longitudinal wires may be within upper bend.

(9) Bend or cut as required to clear drain slots.

(10) Space U(#4) bars at 4" Max when end region of panel length is less than 6'-0" to side slot drain. Space U(#4) bars at 6" Max when end region of panel length is 6'-0" and greater to side slot drain.

CONSTRUCTION NOTES:

This railing may be constructed by the slipform process when approved by the Engineer, with equipment approved by the Engineer. Provide sensor control for both line and grade. Tack welding to provide bracing for slipform operations is acceptable. Welding may be performed at a minimum spacing of 3 ft between the cage and the anchorage. It is permissible to weld to bars U, WU and S at any location on the cage. If increased bracing is needed, provide additional anchorage devices and weld in the upper two thirds of the cage. Paint welded areas on epoxy coated and/or galvanized reinforcing with an organic zinc rich paint in accordance with Item 445 "Galvanizing".

If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a ⅜" width x ¼" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

The back of railing must be vertical unless otherwise shown in the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" (HPC) concrete.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U and WU unless noted otherwise. Deformed WWR (ASTM A1064) may be substituted for Bars R and S, as shown. Combinations of reinforcing steel and WWR or configurations of WWR other than shown are permitted if conditions in the table are satisfied. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #4 = 1'-7"

Epoxy coated ~ #4 = 2'-5"

GENERAL NOTES:

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

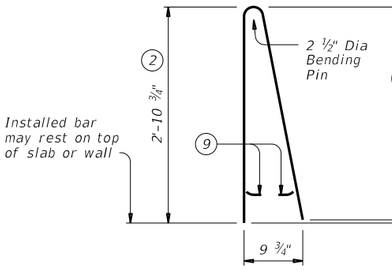
Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Shop drawings will not be required for this rail.

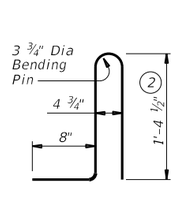
Average weight of railing with no overlay is 376 plf.

Cover dimensions are clear dimensions, unless noted otherwise.

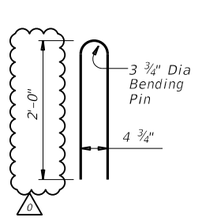
Reinforcing bar dimensions shown are out-to-out of bar.



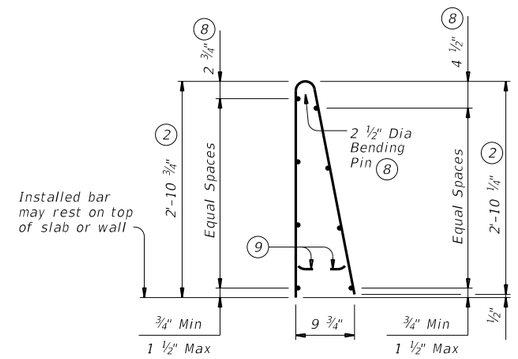
BARS S (#4)



BARS U (#4)

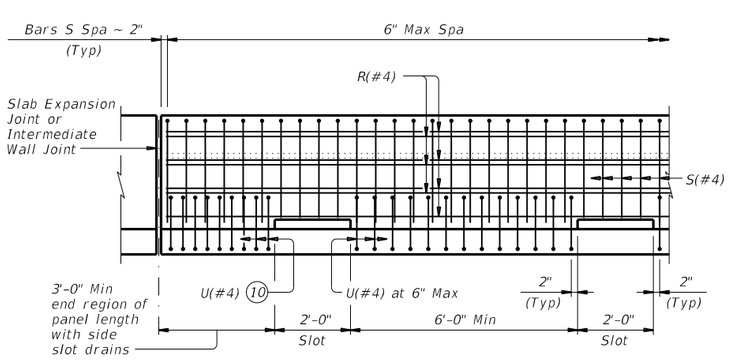


BARS WU (#4)



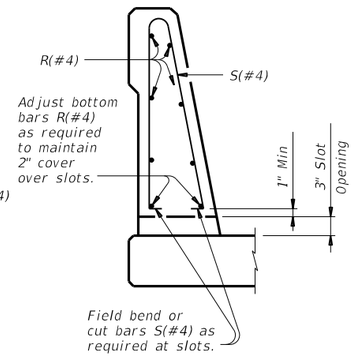
OPTIONAL WELDED WIRE REINFORCEMENT (WWR)

DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.067 Sq In.	0.267 Sq In. per Ft
	No. of Wires	Spacing
Minimum	8	4"
Maximum	10	8"
Maximum Wire Size Differential	The smaller wire must have an area of 40% or more of the larger wire.	



OPTIONAL SIDE SLOT DRAIN DETAIL

Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.



SECTION THRU OPTIONAL SIDE SLOT DRAIN

STATE OF TEXAS
CHRIS M. GILSTRAP
80602
REGISTERED PROFESSIONAL ENGINEER

6/26/2024

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PARSONS TBPE No. F-1481

SHEET 2 OF 2

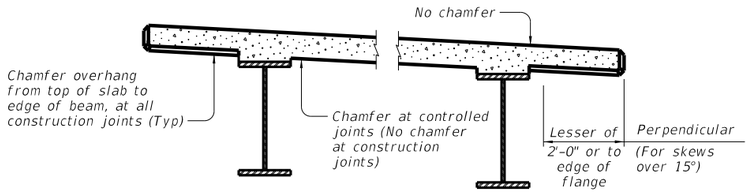
Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL SINGLE SLOPE

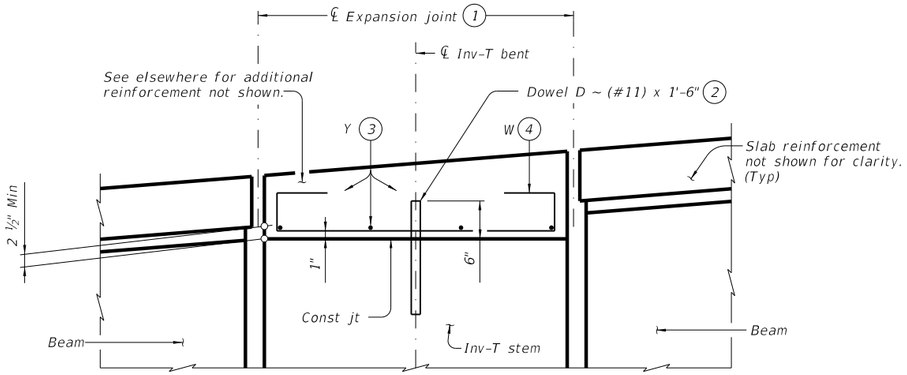
TYPE SSTR (MOD)

FILE:	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		98

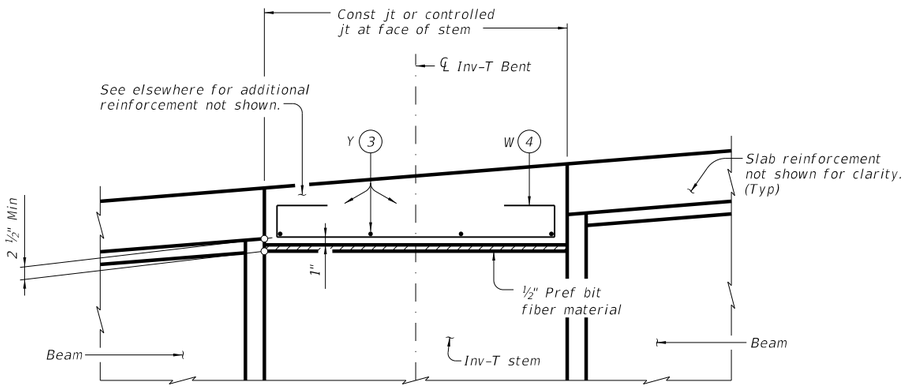


CHAMFER LIMITS DETAILS

Note: See Span Details for construction joint locations.

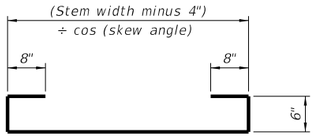


SHOWING EXPANSION JOINTS

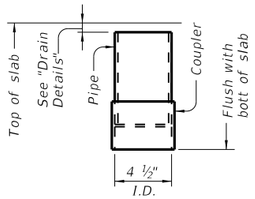


SHOWING CONST JTS OR CONTROLLED JTS

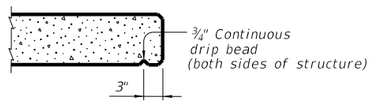
REINFORCEMENT OVER INV-T BENTS



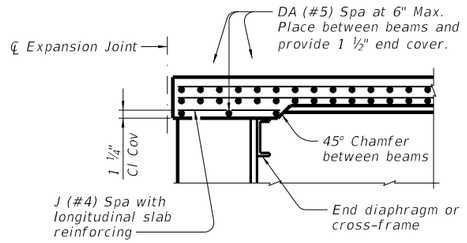
BARS W (#4)



C-I-P DRAIN DETAIL (5)

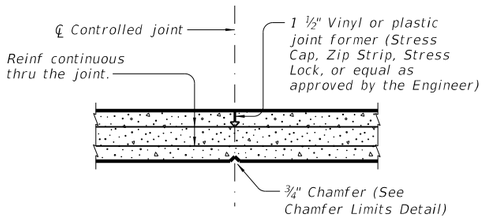


DRIP BEAD DETAIL



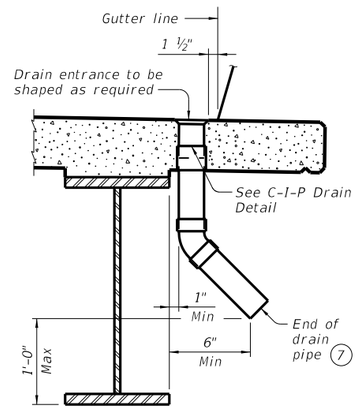
SECTION AT SLAB ENDS

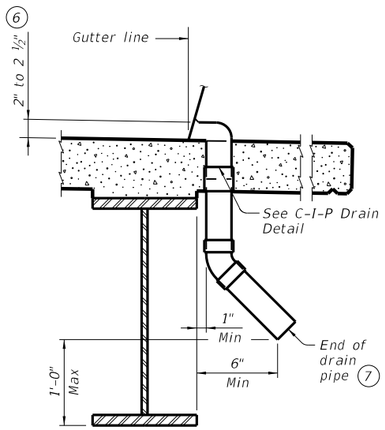
Showing additional required slab reinforcement when thickened slab ends, details, steel beam spans shown on standard SBTS, are not indicated on the Span Details.



CONTROLLED JOINT DETAIL

(Saw-cutting is not allowed.)





DRAIN DETAILS (8)

(1) See Bridge Layout for joint type.

(2) Dowels D (#11) spaced at 5 Ft Max. See Inv-T bents for quantity and location.

(3) Space Bars Y (#4) at 12" Max. Use 2" end cover. Number of Bars Y must satisfy spacing limit. Place parallel to bent.

(4) Space Bars W at 12" Max (3" from end of cap). Tilt if necessary to maintain cover requirements. Place parallel to longitudinal slab reinforcement.

(5) Roughen outside of PVC with coarse rasp or equal to ensure bond with cast-in-place concrete.

(6) Drain entrance formed in rail or sidewalk.

(7) Water may not be discharged onto girders.

(8) All drain pipe and fittings to be 4" diameter (Sch 40) PVC. See Item 481 "Pipe for Drains" for pipe, connections and solvent welding. Bend reinforcing steel to clear PVC 1". Drain length and location is as directed by the Engineer. Drains are not permitted over roadways or railways, or within 10'-0" of bent caps. Degrease outside of exposed PVC, apply acrylic water base primer, then coat with same surface finishing material as used for outside girder face. Variations of the above designs, as required for the type of rail used and its location on the structure, may be installed with the approval and direction of the Engineer.

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.

All items (reinforcing steel, drains, joint formers, etc.) shown on this sheet are subsidiary to other bid items.

Provide grade 60 reinforcing steel.

Cover dimension are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

Texas Department of Transportation

Bridge Division Standard

MISCELLANEOUS SLAB DETAILS STEEL BEAMS

SBMS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2021	CONT	SECT	JOB	HIGHWAY
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	FTW	TARRANT		99

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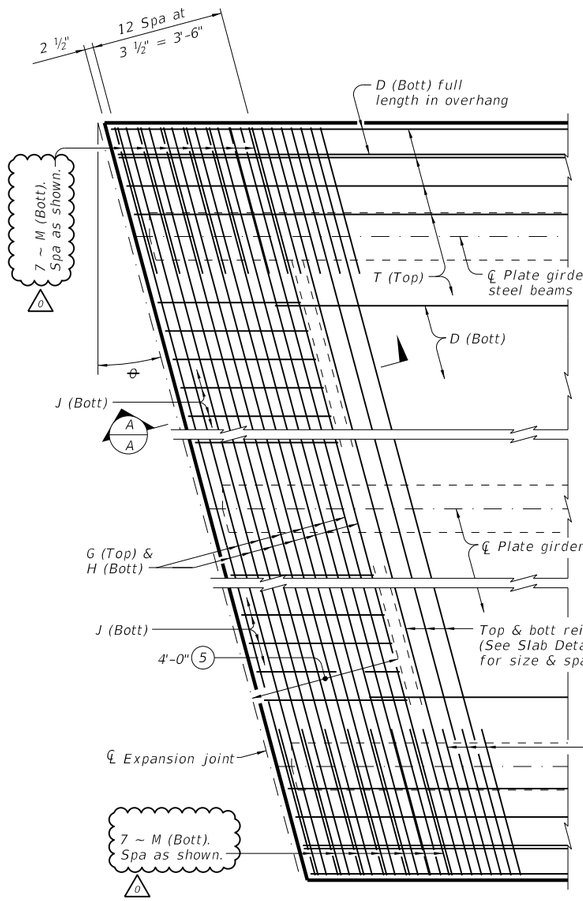
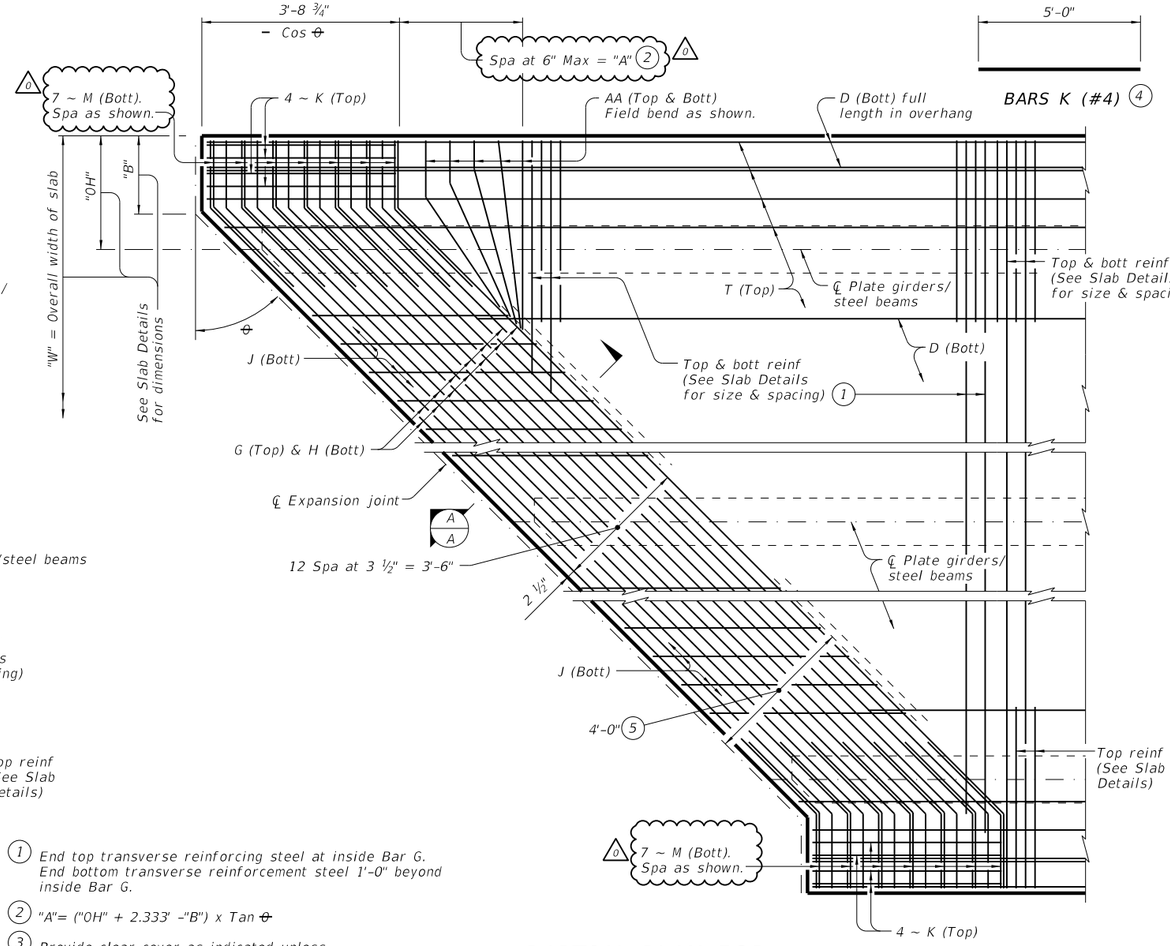
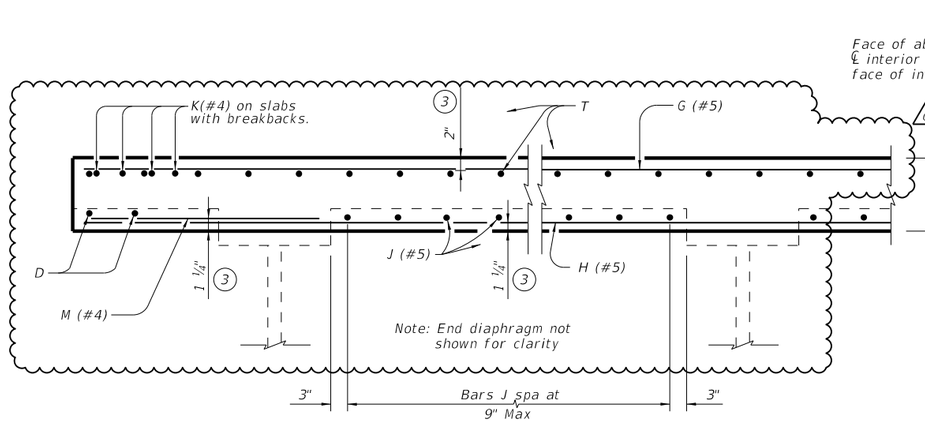


PARTIAL PLAN FOR SLABS WITHOUT BREAKBACK



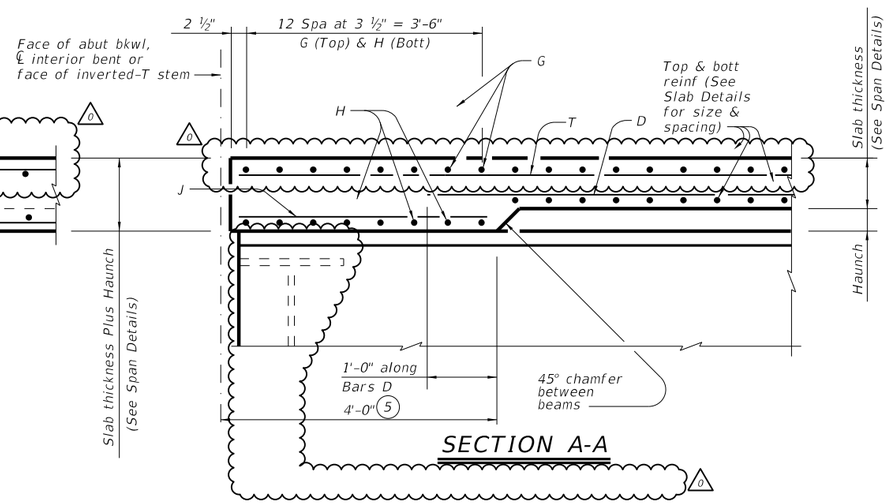
PARTIAL PLAN FOR SLABS WITH BREAKBACK

1. End top transverse reinforcing steel at inside Bar G. End bottom transverse reinforcement steel 1'-0" beyond inside Bar G.
2. "A"= ("OH" + 2.333' -"B") x Tan θ
3. Provide clear cover as indicated unless otherwise shown on Span Details.
4. Only required on slabs with breakbacks.
5. Thickened slab end dimensioned perpendicular to face of bkwl, centerline interior bent or face of inverted-T stem.



TYPICAL TRANSVERSE SECTION

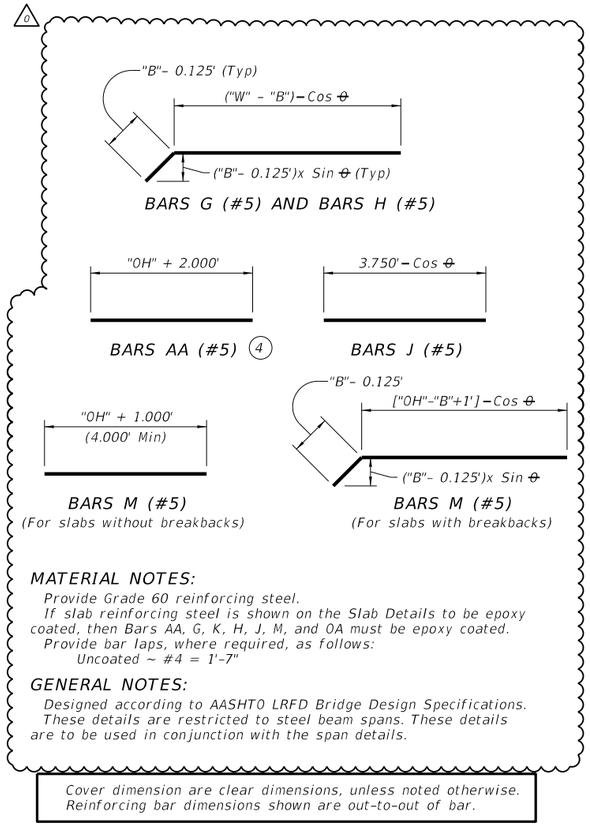
(Showing steel beams at ℄ bearing.)



SECTION A-A

6/26/2024

CURRENT P.E. SEAL VALID FOR CLOUDED REVISIONS AND THE EFFECT OF ANY DESIGN RELATIONSHIP BETWEEN THE REVISION AND THE ORIGINAL COMPONENTS ON ALL RELATED PLAN SHEETS.
PARSONS TBPE No. F-1481



MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
If slab reinforcing steel is shown on the Slab Details to be epoxy coated, then Bars AA, G, K, H, J, M, and OA must be epoxy coated.
Provide bar laps, where required, as follows:
Uncoated ~ #4 = 1'-7"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
These details are restricted to steel beam spans. These details are to be used in conjunction with the span details.

Cover dimension are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

THICKENED SLAB END DETAILS
STEEL BEAM SPANS

SBTS (MOD)

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053, ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		100

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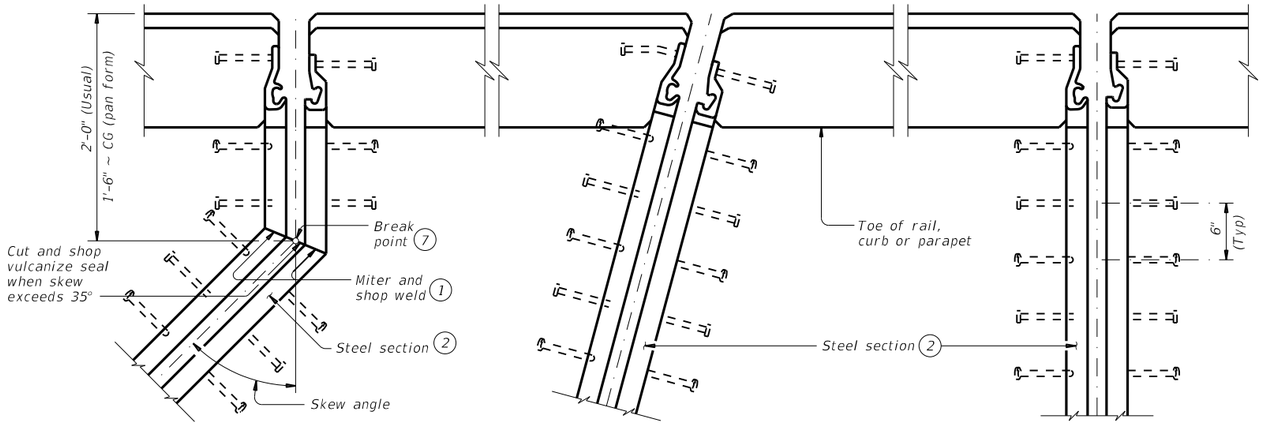
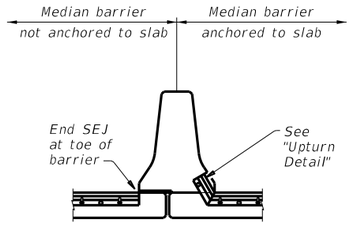
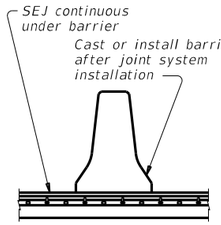


SHOWING SKEWS WITH SLAB BREAKBACKS | SHOWING SKEWS WITHOUT SLAB BREAKBACKS | SHOWING WITHOUT SKEWS AND SLAB BREAKBACKS

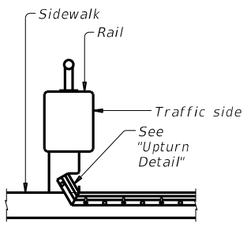
PLANS OF END CONDITIONS



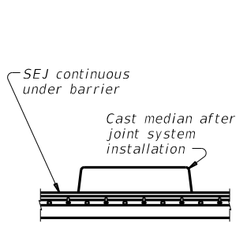
WITH OPEN DECK JOINT BELOW MEDIAN BARRIER



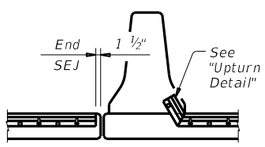
AT MEDIAN BARRIER



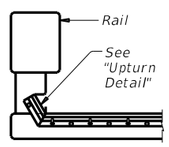
AT SIDEWALK BEHIND BRIDGE RAIL



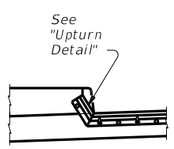
AT RAISED MEDIAN



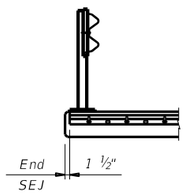
WITH OPEN DECK JOINT ADJACENT TO MEDIAN BARRIER



AT CONCRETE BRIDGE RAIL

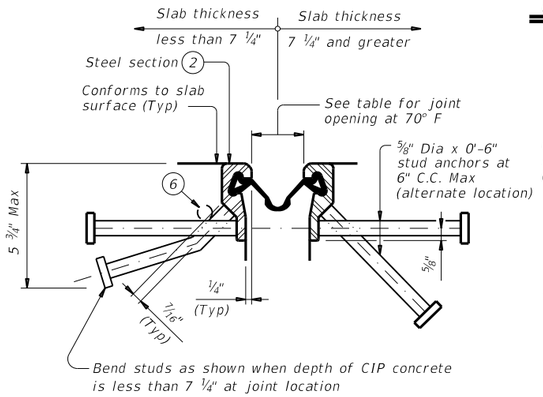


AT SIDEWALK

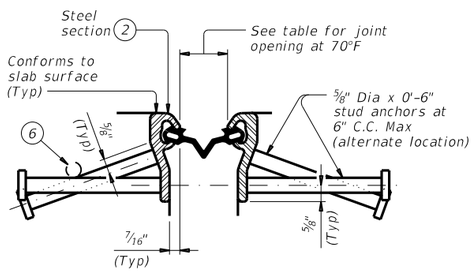


AT STEEL POST BRIDGE RAIL

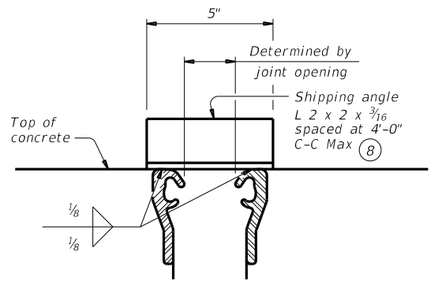
TYPICAL SECTIONS (5)



SECTION THRU WATSON BOWMAN ACME (SE-400 OR SE-500) JOINTS



SECTION THRU D.S. BROWN (A2R-400 OR A2R-XTRA) JOINTS



SHOWING D.S. BROWN (Ty SSCM2)
(All joints are similar.) (Studs are not shown for clarity.)

SHIPPING ANGLE

An alternate method of securing joint sections may be used if approved by the Bridge Division. Erection bolts are not allowed.

TABLE OF SEALED EXPANSION JOINT INFORMATION

MANUFACTURER	STEEL SECTION (2)	STRIP SEAL			
		4" JOINT		5" JOINT	
		Seal Type	Joint Opening (3)	Seal Type	Joint Opening (3)
D.S. Brown	Type SSCM2	A2R-400	1 ¾"	A2R-XTRA	2"
Watson Bowman Acme	Type R	SE-400	1 ¾"	SE-500	2"

REDUCED LONGITUDINAL MOVEMENT RANGE

SKEW (deg)	JOINT SIZE	
	4"	5"
0	4.0"	5.0"
15	4.0"	5.0"
30	3.5"	4.3"
45	2.8"	3.5"

DESIGN NOTES:

Joints installed on a skew have reduced ability to accommodate longitudinal movement. Use table values to determine the correct joint size for skewed installations.

For other skews over 25 degrees, calculate reduced movement range by multiplying joint size by cosine (skew).

(1) Remove all burrs which will be in contact with seal prior to making splice.

(2) Shape of steel section shown is typical. Variations in sections must be approved by the Engineer.

(3) These openings are also the recommended minimum installation openings.

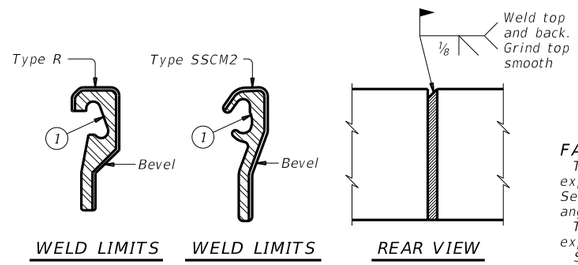
(4) Reduce for sidewalk or parapet heights less than 6".

(5) Other conditions affecting the joint profile should be noted elsewhere.

(6) Move transverse bars that are in conflict with SEJ studs, in either the bridge slab or approach slab, to rest at the junction of the studs.

(7) See Span details for location of break point.

(8) Align shipping angle perpendicular to joint.



WELD LIMITS | WELD LIMITS | REAR VIEW

FIELD SPLICE DETAIL

FABRICATION NOTES:

Temporarily shop assemble corresponding sections of sealed expansion joints (SEJ), check for fit, and match mark for shipment. Secure corresponding sections together for shipment with shipping angle. Do not use erection bolts.

The seal must be continuous and included in the price bid for sealed expansion joint.

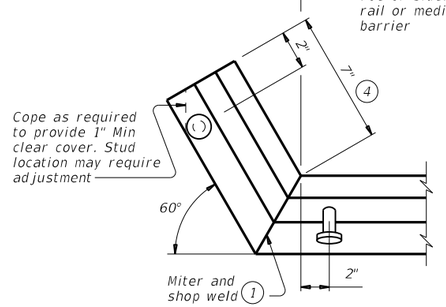
Ship steel sections in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for staged construction or widenings. One shop splice is permitted in each shipping length provided no piece is less than 2'-0" long and sufficient studs are added to limit the stud to shop splice distance to 2" Min and 4" Max.

Weld studs in accordance with AWS D1.1.

Butt weld all shop and field splices and grind smooth areas in contact with seal. Make all necessary field splice joint preparations in the shop.

Paint the entire steel section with System II or IV primer in accordance with Item 446, "Field Cleaning and Painting Steel", unless required to galvanize when shown in the plans. Provide galvanizing in accordance with Item 445, "Galvanizing". Provide paints in accordance with Item 446.2. Prepare steel and apply paint in accordance with Item 446.4.7.3 and 446.4.7.4.

Shop drawings for the fabrication of sealed expansion joints will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.



UPTURN DETAIL

CONSTRUCTION NOTES:

Secure the sealed expansion joint in position and place to the proper grade and alignment by welding braces to adjacent reinforcing steel, to prestressed beam stirrups, or to anchors cast in concrete diaphragms. Include cost of temporary bracing in the price bid for sealed expansion joint.

Remove shipping angle immediately after each joint half is secured in place. Grind smooth, and touch up with organic zinc-rich paint.

Clean and prepare seal cavity for seal installation as per the Manufacturer's installation procedures.

GENERAL NOTES:

Provide sealed expansion joints in the size and at locations shown on the plans.

Minimum slab and overhang thickness required for the use of SEJ-M is 6 ½".

Texas Department of Transportation

Bridge Division Standard

SEALED EXPANSION JOINT TYPE M WITHOUT OVERLAY

SEJ-M

FILE:	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		101

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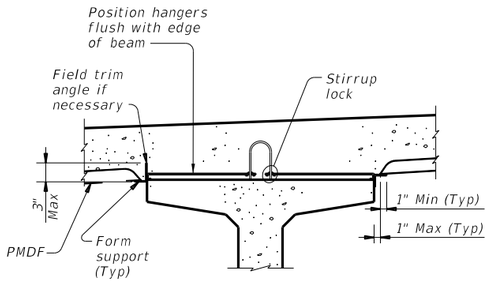
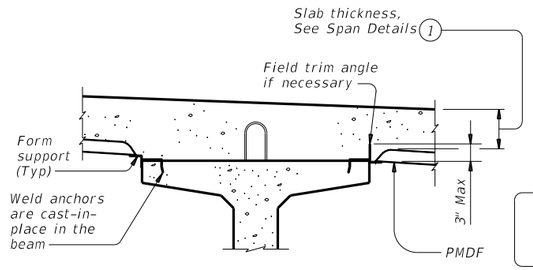
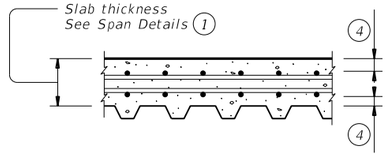


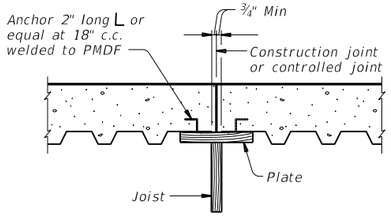
PRESTR CONC I-BEAMS AND I-GIRDERS WITH STIRRUP LOCKS



PRESTR CONC I-BEAMS AND I-GIRDERS WITH WELD ANCHORS

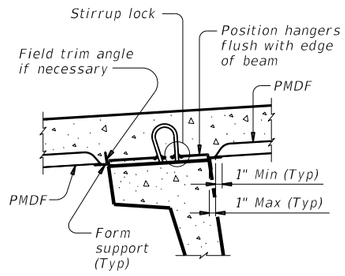


TYP LONGITUDINAL SLAB SECTION

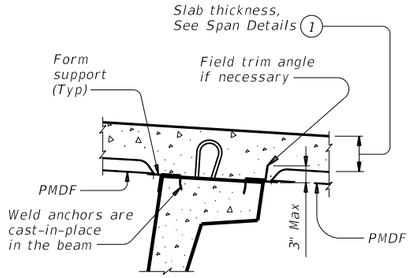


Note: In spans where PMD forms are used, timber forms must be used at construction joints. Adequate provision must be made to support edge of metal form and to provide anchorage of metal form to slab concrete where joined to wood forms.

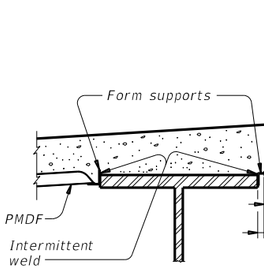
SECTION THRU CONSTRUCTION JOINT



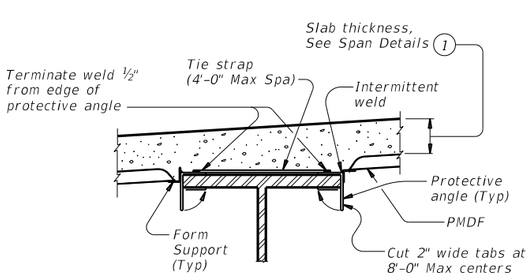
U-BEAMS WITH STIRRUP LOCKS



U-BEAMS WITH WELD ANCHORS

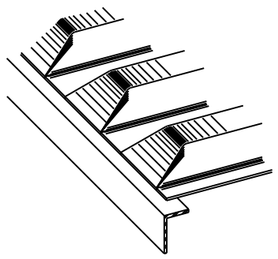


STEEL BEAMS AT COMPRESSION FLANGES



STEEL BEAMS AT TENSION FLANGES (2)

TYPICAL TRANSVERSE SECTIONS



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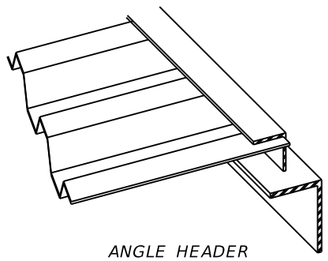
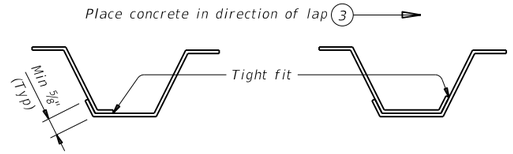


ANGLE HEADER

NOTE: This type is to be used for skewed ends only.

TYPES OF END CLOSURES



SIDE LAP DETAILS

(1) Slab thickness minus 5/8" if corrugations match reinforcing bars.

(2) Welding of form supports to tension flanges will not be permitted. Other methods of providing wind hold down resistance for PMDF in tension flange zones will be considered. At least one layer of sheet metal must be provided between the flange and the weld joint.

(3) The direction of concrete placement will be such that the upper layer of the form overlap is loaded first.

(4) See Span details for cover requirements.

FOR PRESTR CONC U-BEAM AND STEEL GIRDER BRIDGES:
Unless shown elsewhere in the plans, size, spacing, and orientation of bottom mat of slab reinforcement must match the top mat of reinforcing shown on the span details except all bottom mat bars are to be #5. Bottom mat reinforcement and additional concrete is subsidiary to Item 422 "Concrete Superstructures."

FOR PRESTR CONC TX-GIRDER BRIDGES:
See Miscellaneous Slab Details, Prestr Concrete I-Girders (IGMS) standard sheet for bottom mat reinforcing.

GENERAL NOTES:

Steel for Permanent Metal Deck Forms (PMDF) and support angles shall conform to ASTM A653, structural steel (SS), with coating designation G165. Steel must have a minimum yield strength of 33 ksi. Minimum thickness of PMDF is 20 gage and that of support angles and protective angles is 12 gage.

Submit two copies of forming plans for PMDF to the Engineer. These plans must show all essential details of proposed form sheets, closures, fasteners, supports, connectors, special conditions and size and location of welds. These plans must clearly show areas of tension flanges for steel beams and provisions for protecting the tension flanges from welding notch effects by inclusion of separating sheet metal or other positive method. These plans must be designed, signed, and sealed by a licensed professional engineer. Department approval of these plans is not required, but the Department reserves the right to require modifications to the plans. The Contractor is responsible for the adequacy of these plans.

The details and notes shown on this standard are to be used as a guide in preparation of the forming plans.

All material, labor, tools and incidentals necessary to form a bridge deck with Permanent Metal Deck Forms is considered subsidiary to Item 422, "Concrete Superstructures".

DESIGN NOTES:

As a minimum, PMDF and support angles must be designed for the dead load of the form, reinforcement and concrete plus 50 psf for construction loads. Flexural stresses due to these design loads must not exceed 75 percent of the yield strength of the steel. Allowable stress for weld metal must be 12,400 psi.

Maximum deflection under the weight of forms, reinforcement and concrete or 120 psf, whichever is greater, shall not exceed the following:

1/180 of the form design span, but not more than 0.50", for design spans of 10' or less.

1/240 of the form design span, but not more than 0.75", for design spans greater than 10'.

1/240 of the form design span, but not more than 0.75", for all design spans of railroad overpass bridge spans fully or partially over railroad right-of-way, and for all bridge spans of railroad underpass structures.

The form design span must not be less than the clear distance between beam flanges, measured parallel to the form flutes, minus 2".

CONSTRUCTION NOTES:

Form sheets must not be permitted to rest directly on the top of beam flanges. Form sheets must be securely fastened to form supports and must have a minimum bearing length of one inch at each end. Form supports must be placed in direct contact with beam flanges.

All attachments must be made by permissible welds, screws, bolts, clips or other means shown on the forming plans. All sheet metal assembly screws must be installed with torque-limiting devices to prevent stripping. Only welds or bolts must be used to support vertical loads.

Welding and welds must be in accordance with the provisions of Item 448, "Structural Field Welding", pertaining to fillet welds. All welds must be made by a qualified welder in accordance with Item 448.

All permanently exposed form metal, where the galvanized coating has been damaged, must be thoroughly cleaned and repaired in accordance with Item 445, "Galvanizing". Minor heat discoloration in areas of welds need not be touched up.

Flutes must line up uniformly across the entire width of the structure where main reinforcing steel is located in the flute.

Construction joints will not be permitted unless shown on the plans. The location of and forming details for any construction joint used must be shown on the forming plans. Forms below a construction joint must be removed after curing of the slab.

A sequence for uniform vibration of concrete must be approved by the Engineer prior to concrete placement. Attention must be given to prevent damage to the forms, yet provide proper vibration to prevent voids or honeycomb in the flutes and at headers and/or construction joints.

Texas Department of Transportation

Bridge Division Standard

PERMANENT METAL DECK FORMS

PMDF

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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02-20: Modified box note by adding steel beams/girders and subsidiary.	DIST	COUNTY		SHEET NO.
12-21: Updated max deflection for RR.	FTW	TARRANT		102

DATE: 6/26/2024 12:14:21 PM
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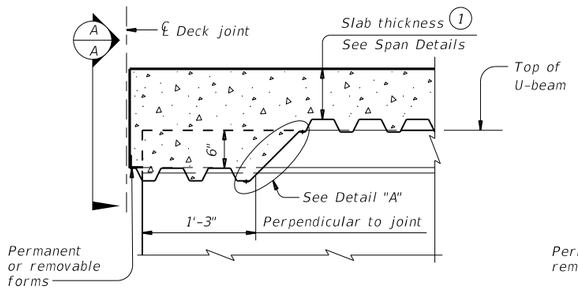
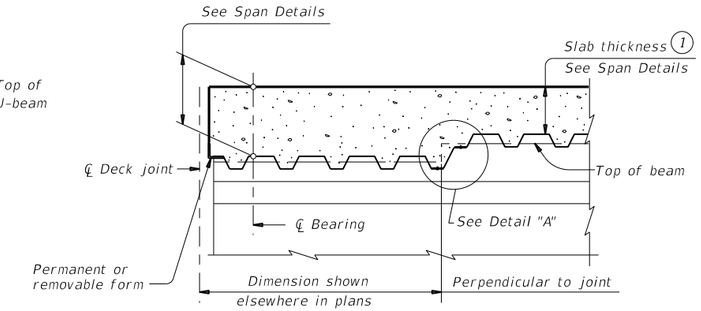
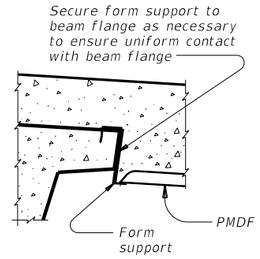


AT THICKENED SLAB END FOR U-BEAMS

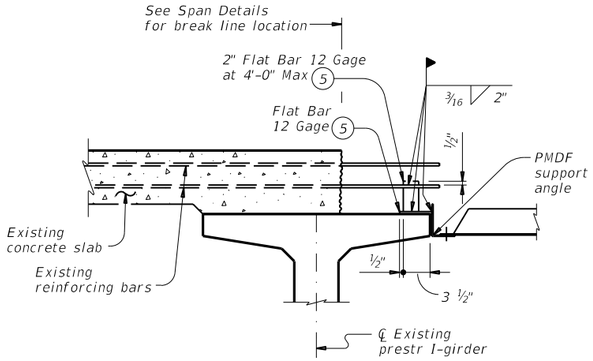


AT THICKENED SLAB END FOR PRESTRESSED I-BEAMS, I-GIRDERS AND STEEL BEAMS

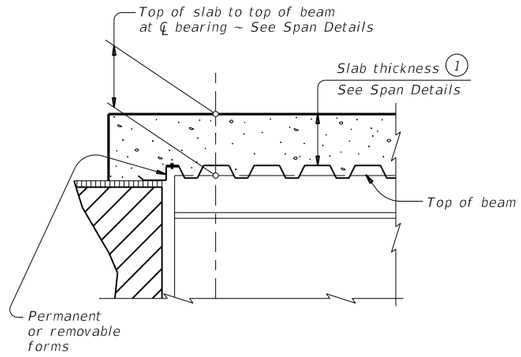
Showing I-beam block-out. No block-out for I-girders or steel beams.



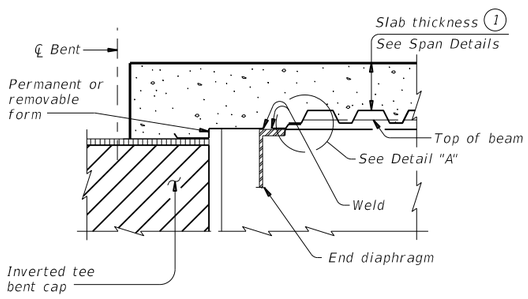
SECTION A-A



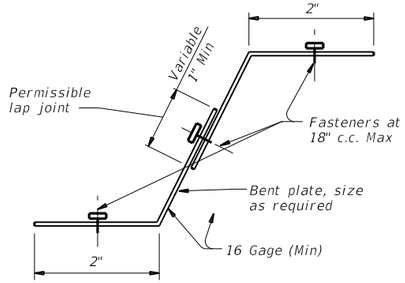
SHOWING PRESTRESSED CONCRETE I-BEAMS, I-GIRDERS AND U-BEAMS



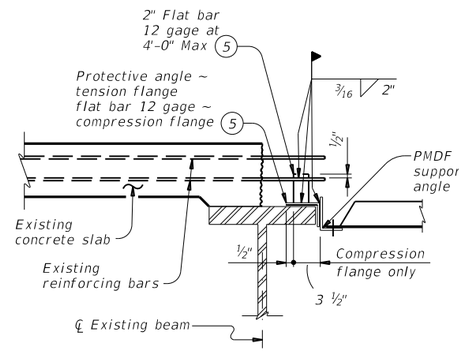
AT SLAB OVER ABUTMENT BACKWALL OR INVERTED-T STEM FOR CONCRETE BEAMS WITHOUT THICKENED SLAB END



AT SLAB OVER INVERTED-T STEM FOR STEEL BEAMS WITHOUT THICKENED SLAB END

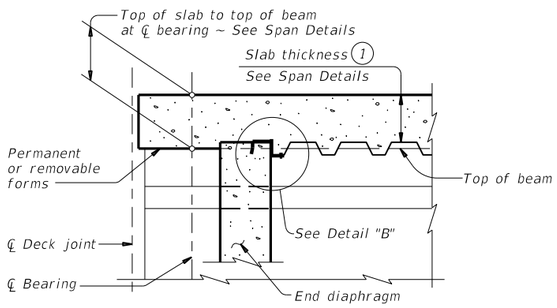


DETAIL "A"

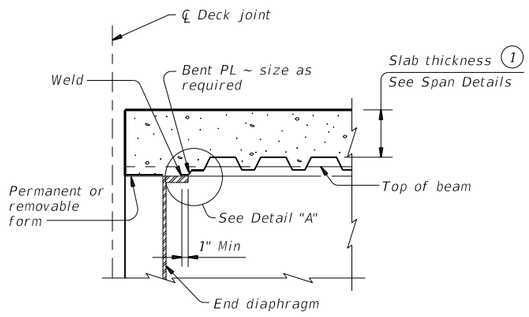


SHOWING STEEL BEAMS

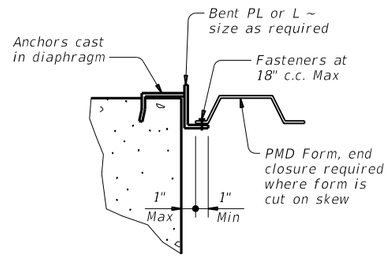
WIDENING DETAILS



AT CONCRETE END DIAPHRAGM FOR PRESTRESSED I-BEAMS AND STEEL BEAMS



AT END DIAPHRAGM FOR STEEL BEAMS WITHOUT THICKENED SLAB END



DETAIL "B"

(1) Slab thickness minus 5/8" if corrugations match reinforcing bars

(5) Minimum yield stress of 12 gage bars shall be 40 ksi

DETAILS AT ENDS OF BEAMS

Texas Department of Transportation

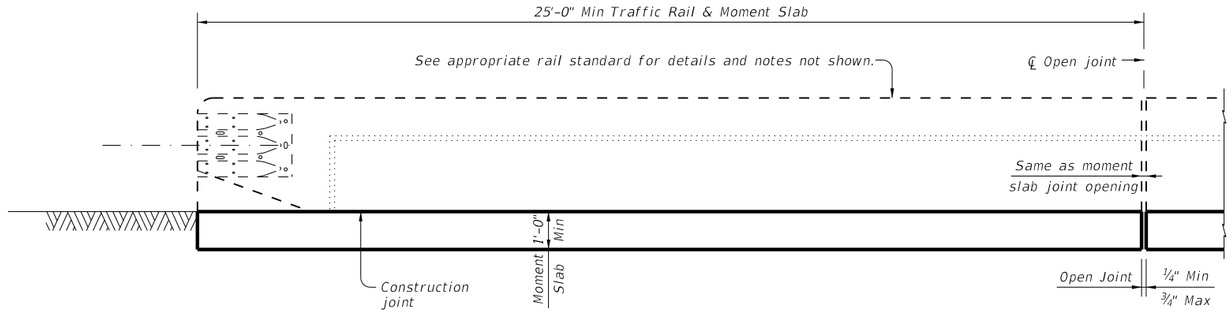
Bridge Division Standard

PERMANENT METAL DECK FORMS

PMDF

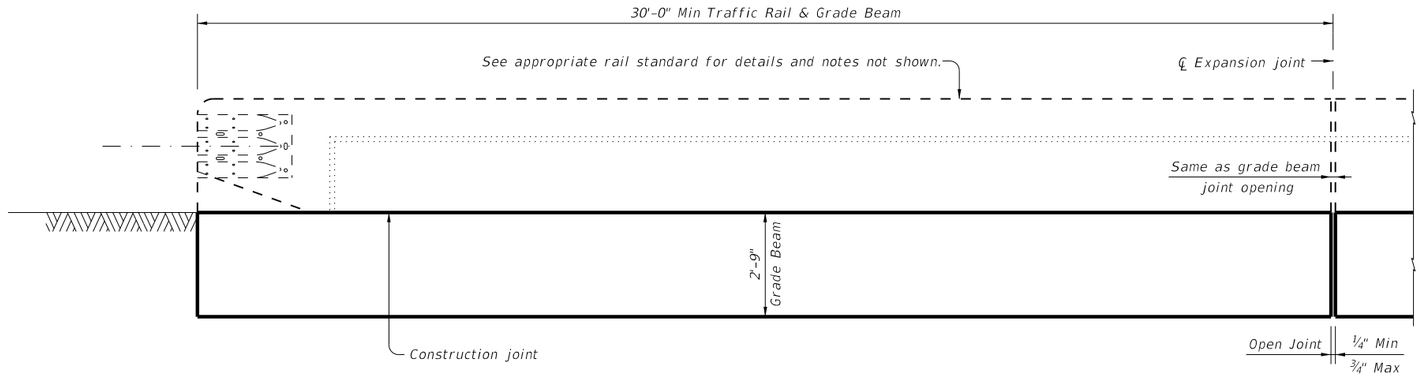
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053, ETC	SS347, ETC
02-20: Modified box note by adding steel beams/girders and subsidiary.	DIST	COUNTY		SHEET NO.
12-21: Updated max deflection for RR.	FTW	TARRANT		103

DATE: 6/26/2024 12:14:28 PM
FILE: c:\pw_working\texas\parsons_p009215\d0253090\RL-TRF-20.dgn



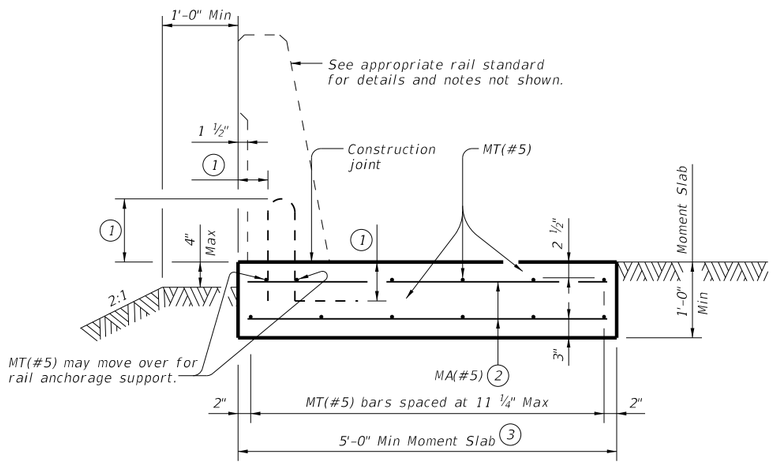
ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



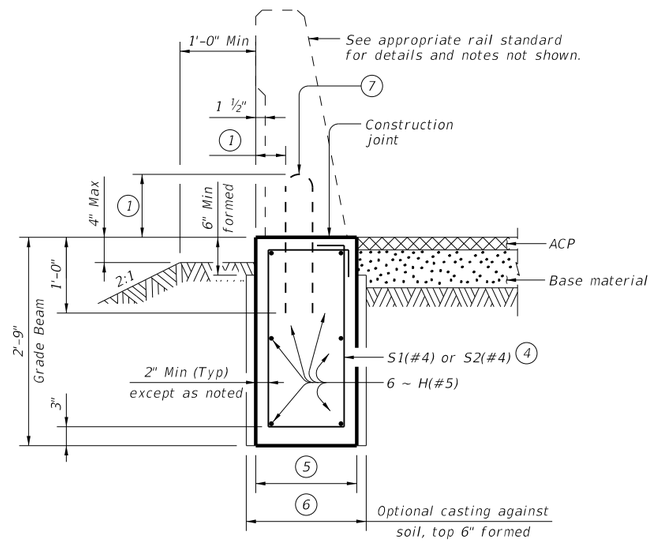
ROADWAY ELEVATION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



SECTION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar.)



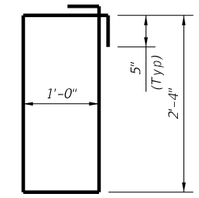
SECTION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar.)

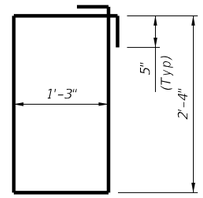
1. See applicable bridge rail standard.
2. MA(#5) space longitudinally along moment slab at 12" Max.
   (Spaced 2 ½" longitudinally from outside edge of moment slab).
3. Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.
4. S1(#4) or S2(#4) spaced longitudinally along grade beam at 8" Max.
   (Spaced 2 ½" longitudinally from outside edge of grade beam).
5. Use bar S1(#4) with 1'-4" grade beam width and bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.
   Approximate grade beam concrete = 0.14 CY/LF and reinforcement = 13.8 LB/LF.

   Use bar S2(#4) with 1'-7" grade beam width and bridge rail types: T66 and C66.
   Approximate grade beam concrete = 0.16 CY/LF and reinforcement = 14.2 LB/LF.
6. 1'-6" for bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.

   1'-9" bridge rail types: T66 and C66.
7. Modify reinforcing on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically into traffic rail



BARS S1(#4)



BARS S2(#4)

CONSTRUCTION NOTES:

Align moment slab (TRF-MS) or grade beam (TRF-GB) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) or grade beam (TRF-GB) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for bars S1(#4), S2(#4) and H(#5) unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-4"
Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:

Use of these details will result in a moment slab (TRF-MS) or grade beam (TRF-GB) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.

See elsewhere in the plans for selected options between moment slab (TRF-MS) and/or grade beam (TRF-GB).

The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.

See appropriate rail standard for details and notes not shown.

This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.

Payment for moment slab (TRF-MS) and/or grade beam (TRF-GB) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.

The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.

Excavation will be subsidiary to other Items.

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

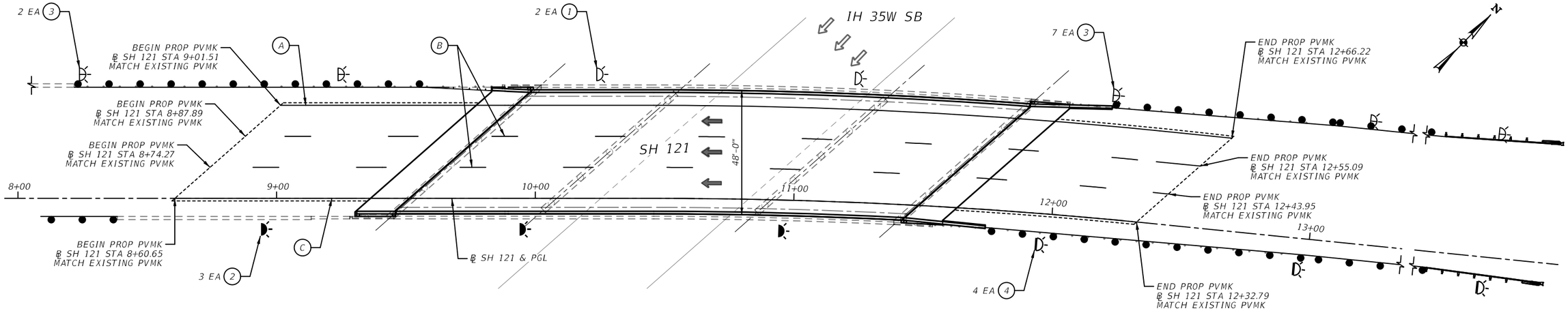
Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL FOUNDATIONS
FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS

TRF

FILE:	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS 07-20: Added moment slab with rail foundation lengths.	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		104



LEGEND:

←	PROPOSED TRAFFIC ARROWS
⇦	EXISTING TRAFFIC ARROWS
A	REFL PAV MRK TY II (W) 6" (SLD)
B	REFL PAV MRK TY II (W) 6" (BRK)
C	REFL PAV MRK TY II (Y) 6" (SLD)
1	DEL ASSM (D-SW) (BRF) CTB
2	DEL ASSM (D-SY) (BRF) CTB
3	DEL ASSM (D-SW) (BRF) GF2
4	DEL ASSM (D-SY) (BRF) GF2

NOTES:

1. ALL PAVEMENT MARKINGS MUST COMPLY WITH THE TXDOT STANDARDS AND TMUTCD, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
07/26/2024

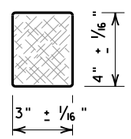
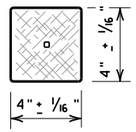
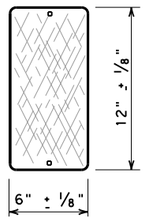
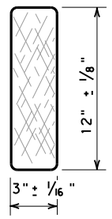
PARSONS
TBPE Registration No. F-1481

PAVEMENT MARKING LAYOUT
IH 35W SB UNDERPASS
AT SH 121 WB

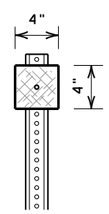
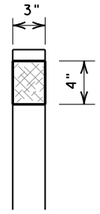
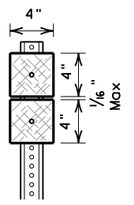
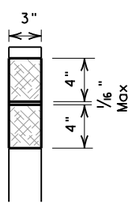
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	105
CONTROL	SECTION	JOB	
0081	01	053, ETC	

DRAWING DATE: $DATE$
FILENAME: $FILE$

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

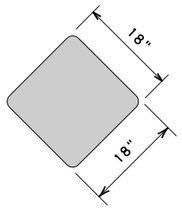
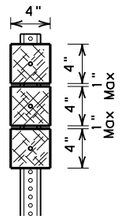
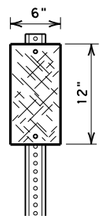
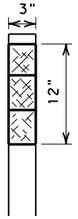
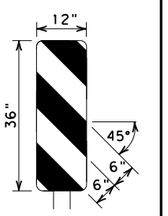
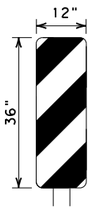
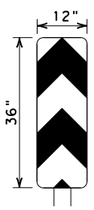
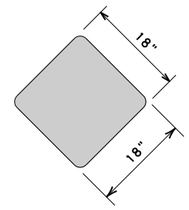
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

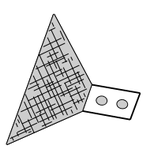
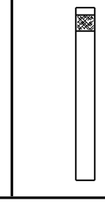
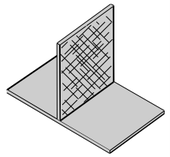
TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

OBJECT MARKERS

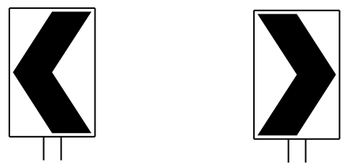
	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE



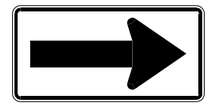
W1-8

SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

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).

ONE DIRECTION LARGE ARROW

DEVICE



W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

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

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	FTW	TARRANT		106

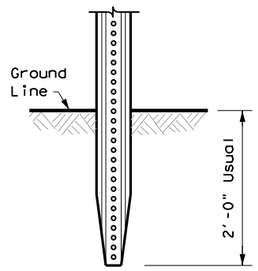
20A

DATE: 7/26/2024 12:44:54 PM
FILE: c:\pw_working\texas\parsons_p009205h\d0268198\dom1-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

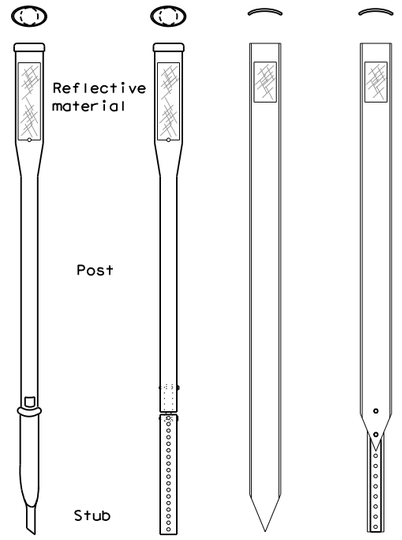


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

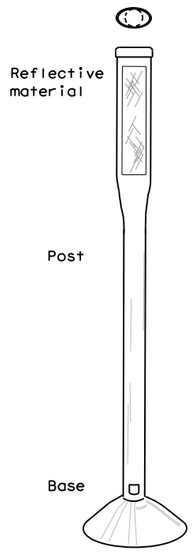
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



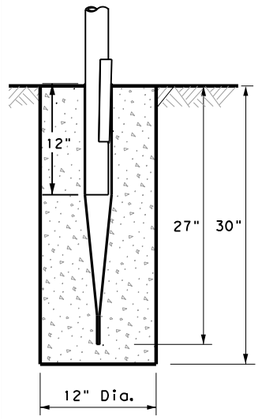
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

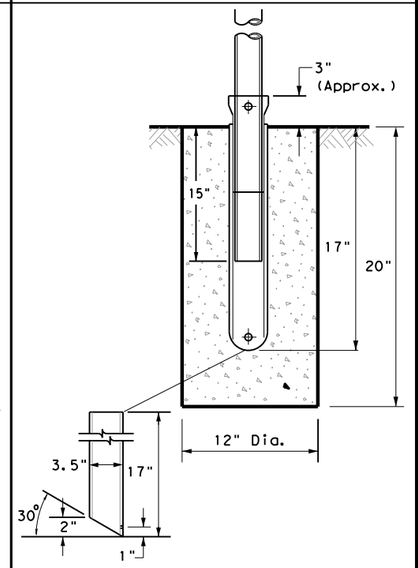
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

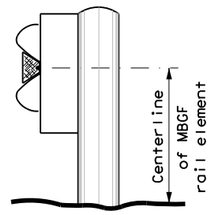
NOTE

1. Install per manufacturer's recommendations.

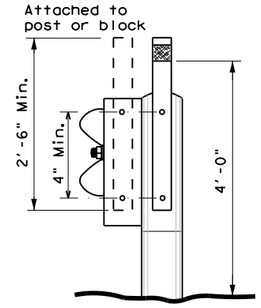
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

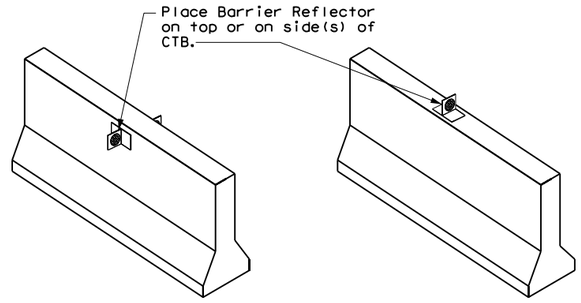
GF1



GF2



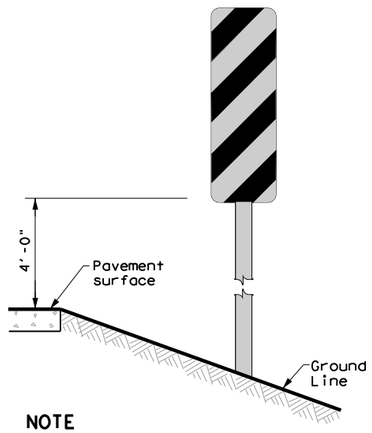
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

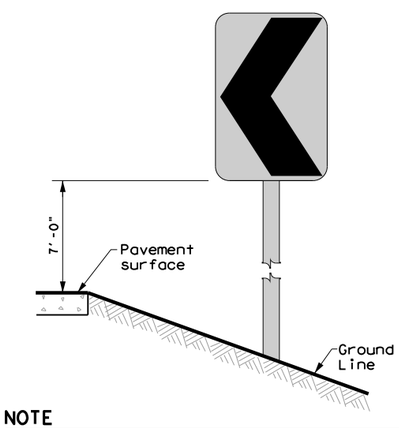
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

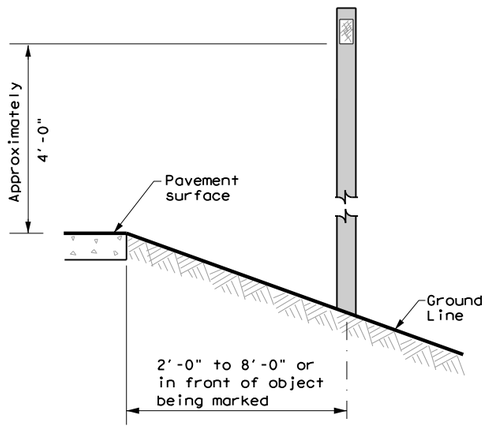
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

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4-10 7-20	FTW	TARRANT		107

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DATE: 7/26/2024 12:44:59 PM
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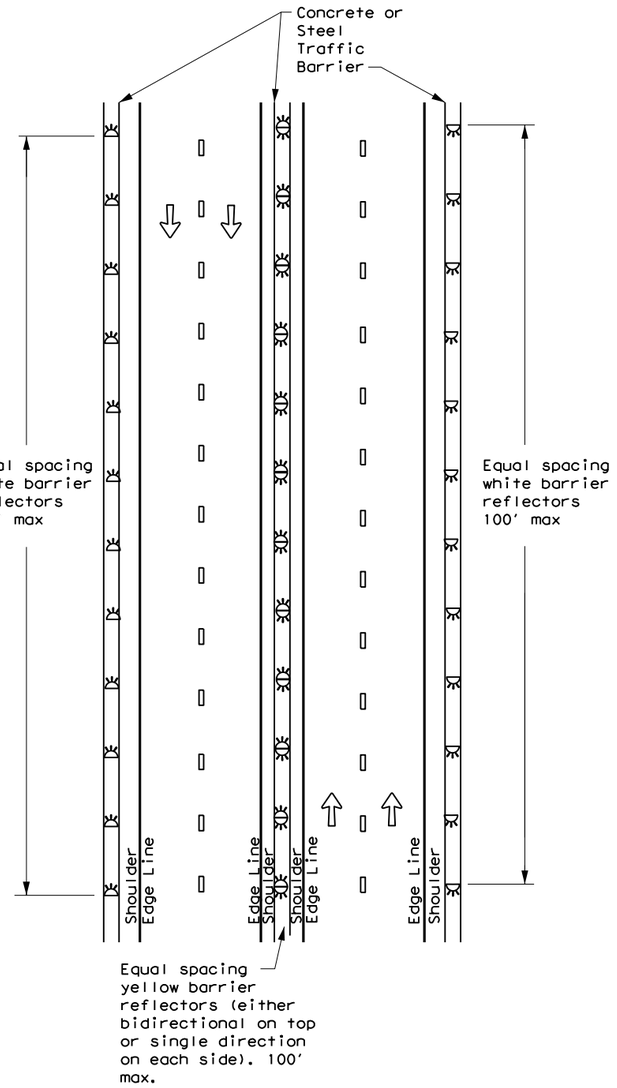
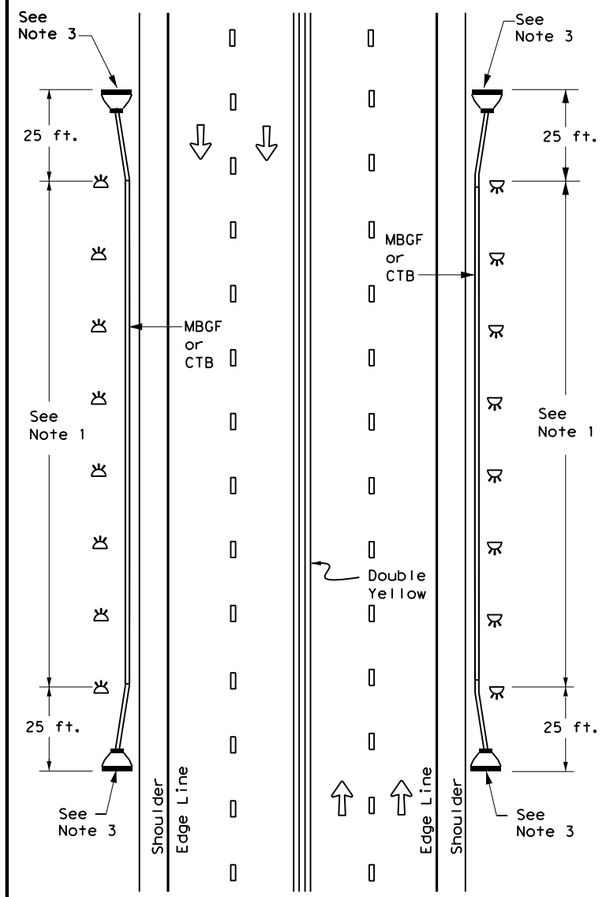
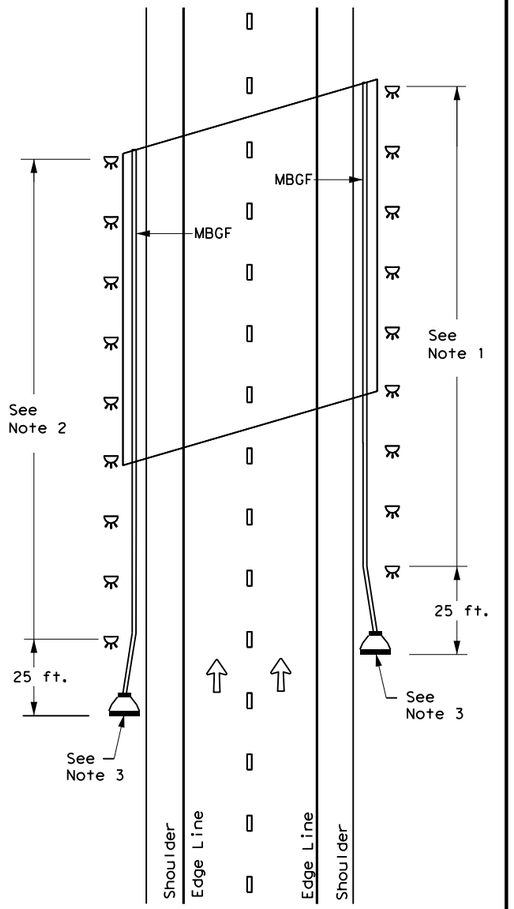
CONTINUOUS CONCRETE OR STEEL BARRIER



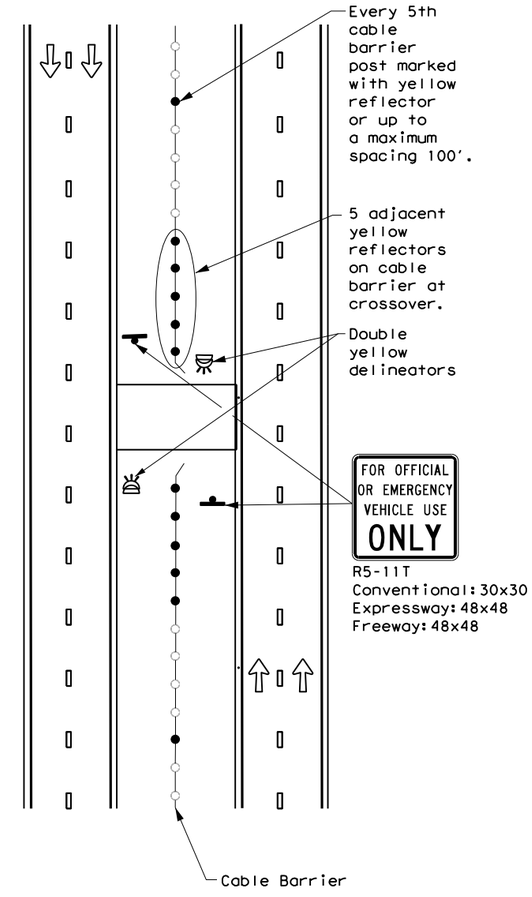
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



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 Continuos 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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

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©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
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	FTW	TARRANT		108

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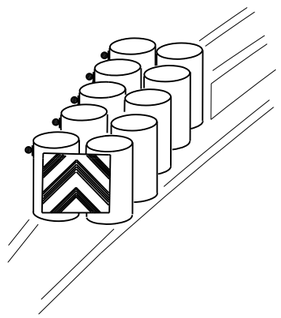
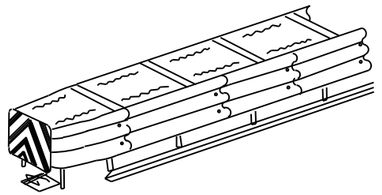
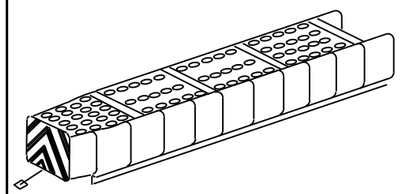
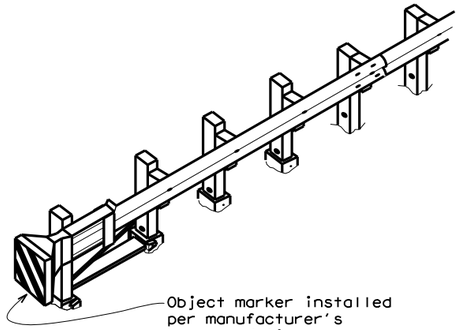
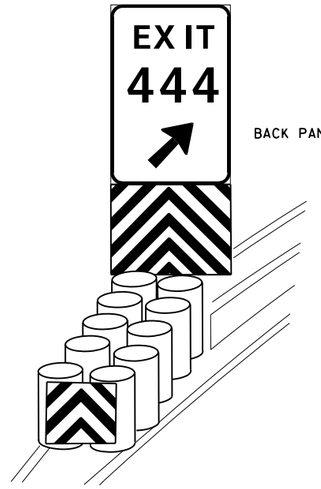
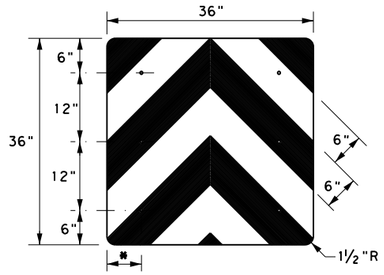


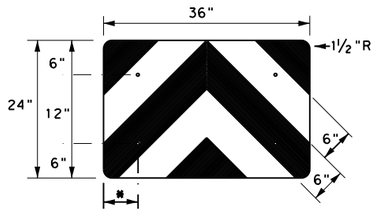




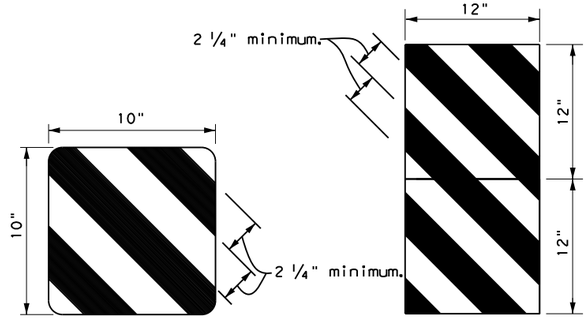




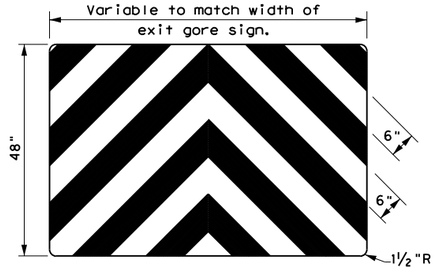


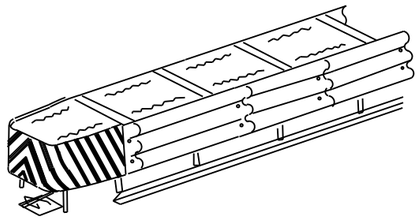


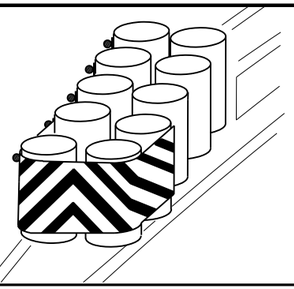
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

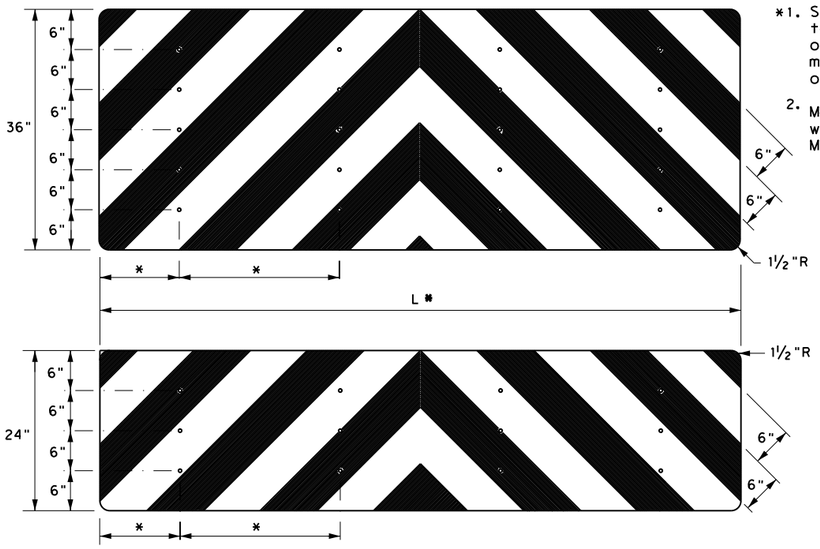


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

*1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. 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.

2. 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.

3. 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 ¼".

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.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
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4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	FTW	TARRANT		109
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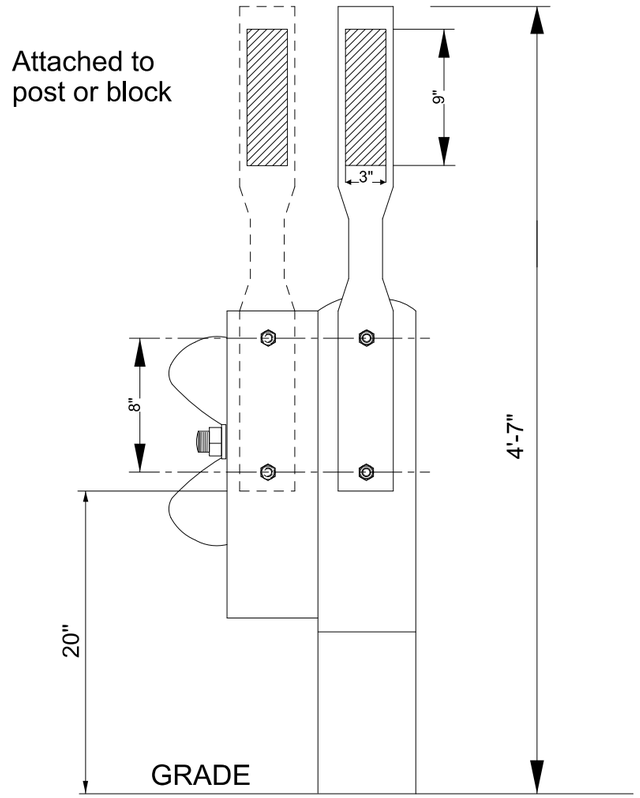
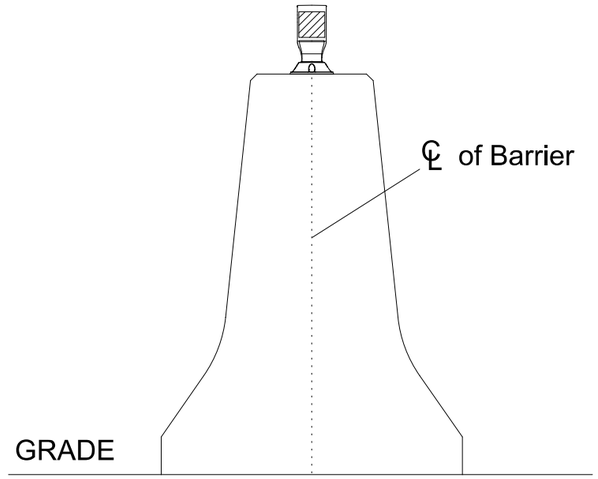
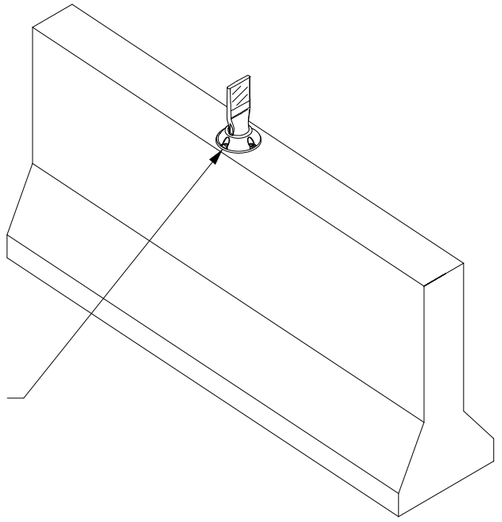
TYPICAL METAL BEAM GAURD FENCE

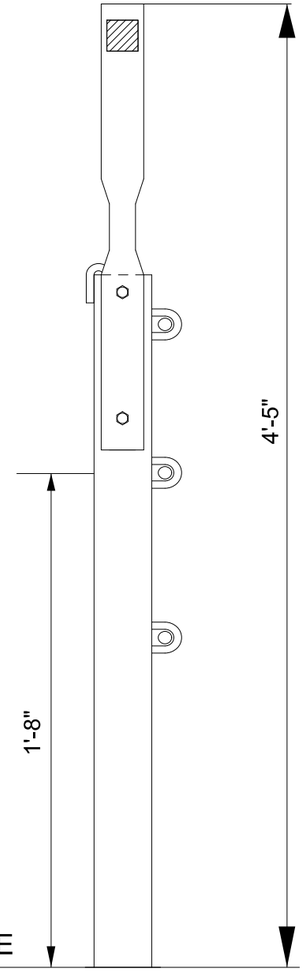


TYPICAL CONCRETE TRAFFIC BARRIER

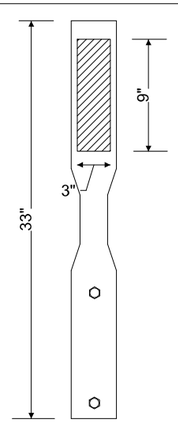
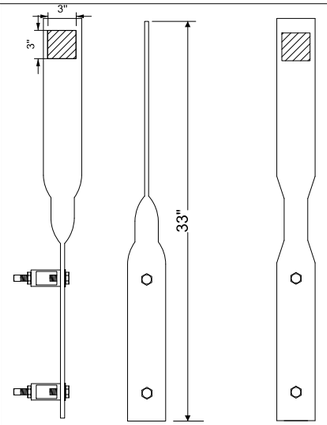
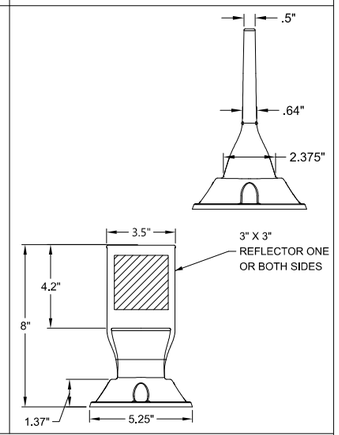




TYPICAL CABLE BARRIER SYSTEM



BARRIER REFLECTORS (BRF)

	MBGF	CBS	CTB
DEVICE			
SHEETING	Yellow, White & Red		

GENERAL NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. When separating opposing direction of travel, such as centerline or median use, the posts shall be yellow.
4. Barrier reflectors shall meet the requirements of DMS 8600.
5. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.
6. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.
7. Posts shall be permanently sealed at the top and have a 3-1/2 wide x 13" flattened surface to accommodate up to a 3" x 12" reflective sheet on both sides.
8. 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.
9. Single red delineators may be mounted on the back side of the delineator posts for wrong way drive applications.

DEPARTMENT 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

Texas Department of Transportation

Fort Worth District Standard

DELINEATOR & OBJECT MARKER

D & OM(ST-FTW)-21

ORIGINAL DRAWING: 10/2021	st-ftw.dgn	FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
DATE	REVISIONS	6	(SEE TITLE SHEET)	110
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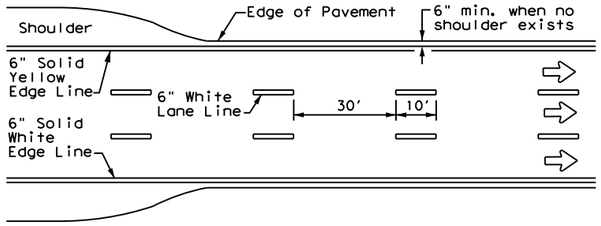
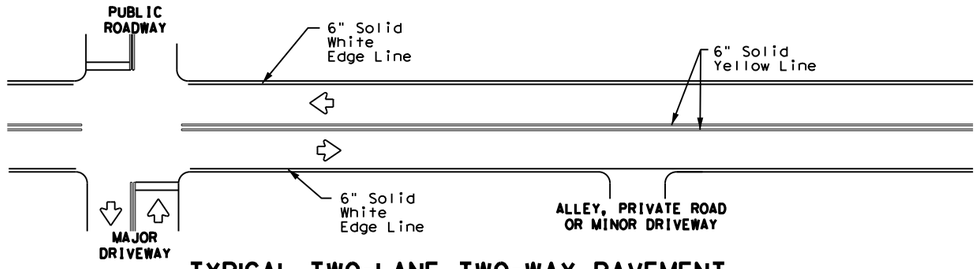
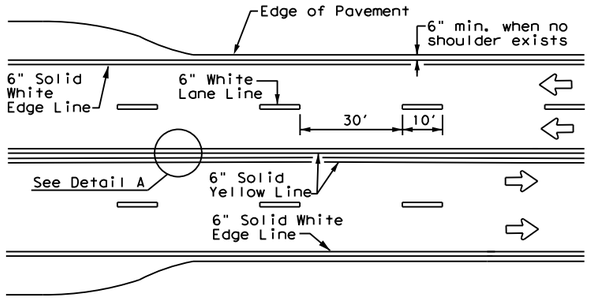
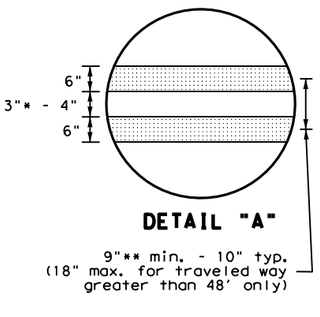


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

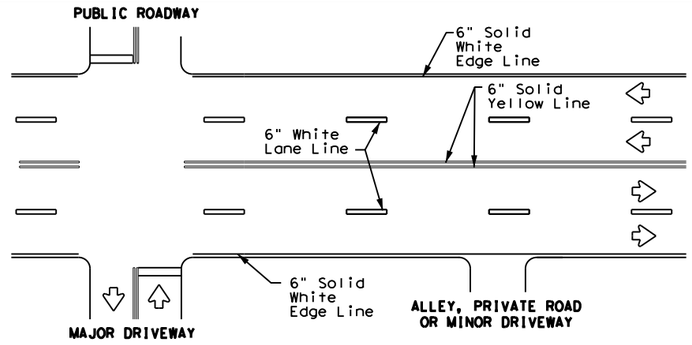




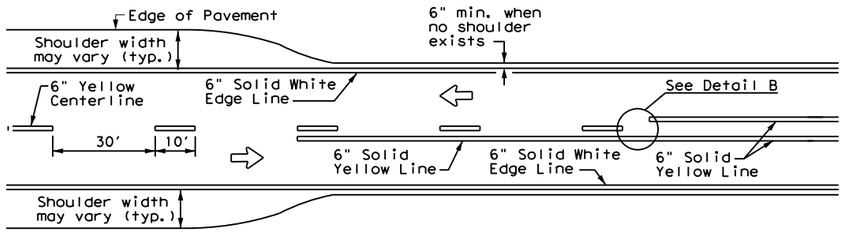
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

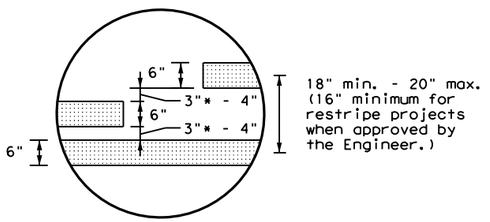
** 8" minimum for restripe projects when approved by the Engineer.



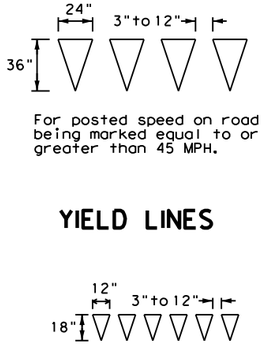
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

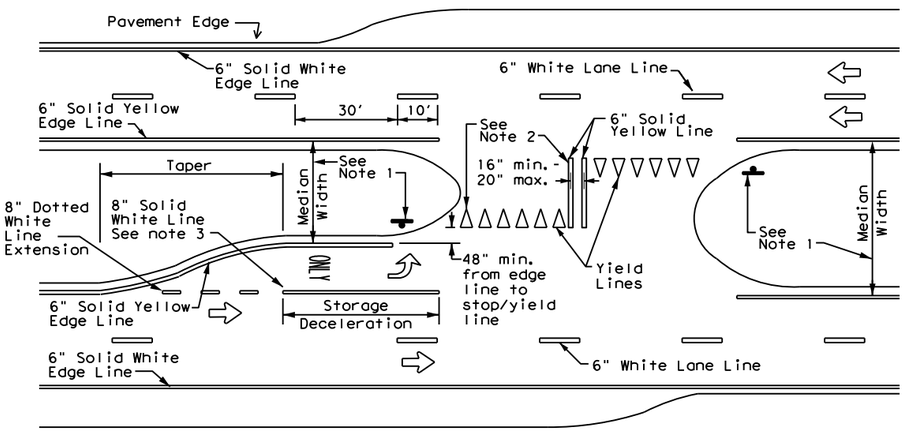


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

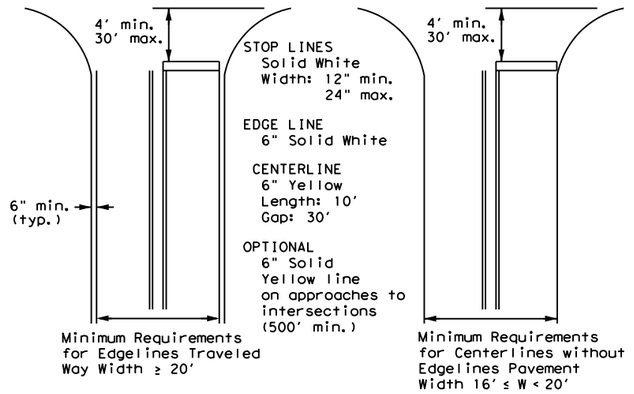
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



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

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20	0081	01	053,ETC	SS347, ETC
8-95 3-03 12-22	DIST	COUNTY		SHEET NO.
5-00 2-12	FTW	TARRANT		111

22A

DATE: 7/26/2024 12:45:15 PM
FILE: c:\pw_working\texas\parsons_p009205h\d0268198\pm1-22.dgn

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0081-01-053, ETC

1.2 PROJECT LIMITS:
From: SH 121 WB @ IH 35W SB

To: SPUR 347 EB @IH 35W SB

1.3 PROJECT COORDINATES:
BEGIN: (Lat)_____,(Long)_____

END: (Lat)_____,(Long)_____

1.4 TOTAL PROJECT AREA (Acres): 0.471

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.078

1.6 NATURE OF CONSTRUCTION ACTIVITY:
BRIDGE MAINTENANCE WORK WHICH INCLUDES DECK REPLACEMENT, JOINT REPAIR, CRACK REPAIR, SPALL REPAIR, PLANGE REPAIR AND WELD REPAIR.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Frio-Urban land complex, 0 to 1 percent slopes	SH 121 STA:9+51 to 11+48 SPUR 347 STA:8+25 to 10+65 Clay Loam, Well Drained

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:

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

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

1.11 RECEIVING WATERS:

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

Tributaries	Classified Waterbody
West Fork Trinity River	West Fork Trinity River Below Lake Worth (0806) Impaired for Dioxin and PCBs

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

STATE OF TEXAS
M. N. MOZAFFAR
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LICENSED
PROFESSIONAL ENGINEER
7/26/2024

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

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			112
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0081	01	053, ETC	SS347, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 DEWATERING:

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

2.9 INSPECTIONS:

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

2.10 MAINTENANCE:

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

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7/26/2024

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

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			113
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0081	01	053, ETC	SS347, ETC

DATE: 6/26/2024
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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. CITY OF FORT WORTH, TARRANT COUNTY, TEXAS

2.

[X] 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):

[X] No Permit Required

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

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

[ ] Individual 404 Permit Required

[ ] Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1.

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
[ ] Temporary Vegetation	[ ] Silt Fence	[ ] Vegetative Filter Strips
[ ] Blankets/Matting	[ ] Rock Berm	[ ] Retention/Irrigation Systems
[ ] Mulch	[ ] Triangular Filter Dike	[ ] Extended Detention Basin
[ ] Sodding	[ ] Sand Bag Berm	[ ] Constructed Wetlands
[ ] Interceptor Swale	[ ] Straw Bale Dike	[ ] Wet Basin
[ ] Diversion Dike	[ ] Brush Berms	[ ] Erosion Control Compost
[X] Erosion Control Compost	[ ] Erosion Control Compost	[ ] Mulch Filter Berm and Socks
[ ] Mulch Filter Berm and Socks	[ ] Mulch Filter Berm and Socks	[ ] Compost Filter Berm and Socks
[ ] Compost Filter Berm and Socks	[ ] Compost Filter Berm and Socks	[ ] Vegetation Lined Ditches
	[ ] Stone Outlet Sediment Traps	[ ] Sand Filter Systems
	[ ] Sediment Basins	[ ] Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

[X] 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.

[X] 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.

[X] No Action Required [ ] Required Action

Action No.

1.

2.

3.

4.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:

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

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

[X] 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)?

[X] 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 [X] Required Action

Action No.

1. TXDOT contractor to remove asbestos prior to start of construction
2.
3.

VII. OTHER ENVIRONMENTAL ISSUES

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

[X] No Action Required [ ] Required Action

Action No.

1.

2.

3.

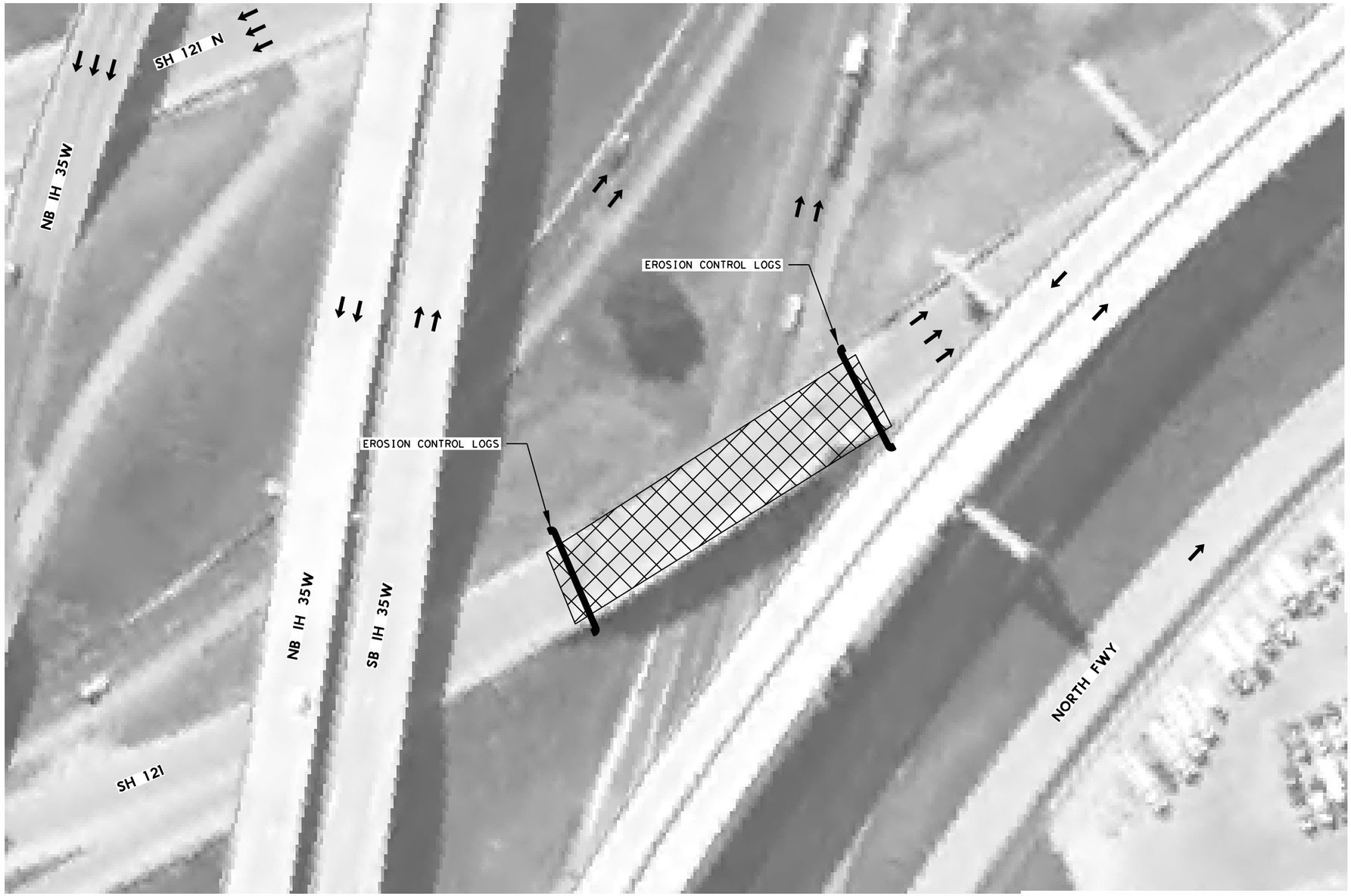
Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		114



LEGEND:

- PROPOSED TRAFFIC FLOW
- 12" BIODEGRADABLE EROSION CONTROL LOGS
- WORK SPACE

NOTES:

1. CONTRACTOR SHALL INSTALL EROSION CONTROL LOG(S) 10'-0" MINIMUM FROM THE EDGE OF ABUTMENTS.
2. FOR MORE INFORMATION ON EROSION CONTROL LOG SEE STANDARD EC (9)-16.

ITEM	506	506
BID CODE	7044	7046
DESCRIPTIONS	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
UNIT	LF	LF
TOTAL	120	120

STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER
6/26/2024

Texas Department of Transportation

PARSONS
TBPE Registration No. F-1481

SWP3 LAYOUT
IH 35W SB UNDERPASS
AT SH 121 WB

SCALE: N.T.S SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	115
CONTROL	SECTION	JOB	
0081	01	053,ETC	

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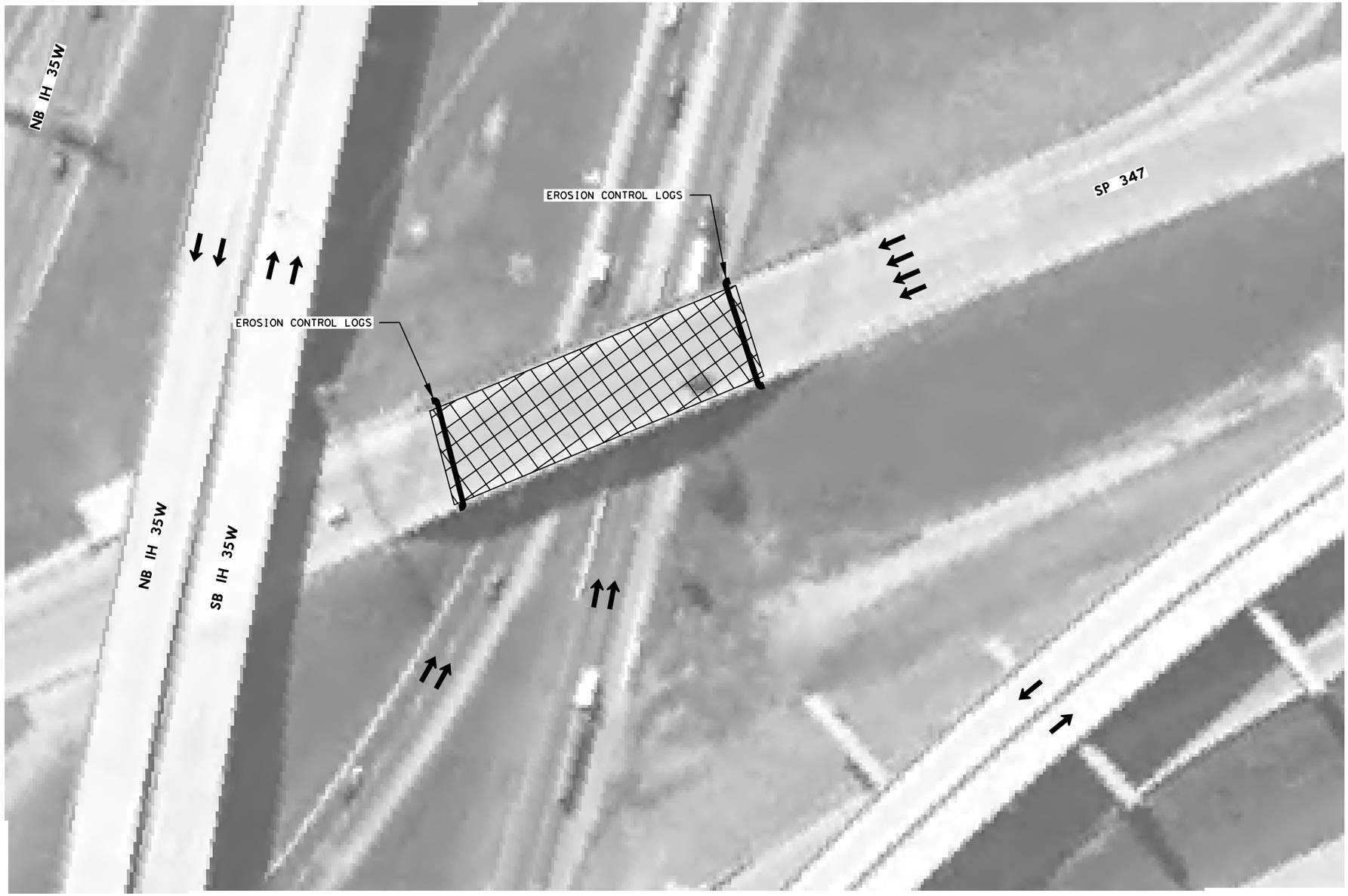

LEGEND:

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STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
6/26/2024

PARSONS
TBPE Registration No. F-1481

SWP3 LAYOUT
IH 35W SB UNDERPASS
AT SPUR 347 EB

SCALE: N.T.S

SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		SS347, ETC
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	116
CONTROL	SECTION	JOB	
0081	01	053,ETC	

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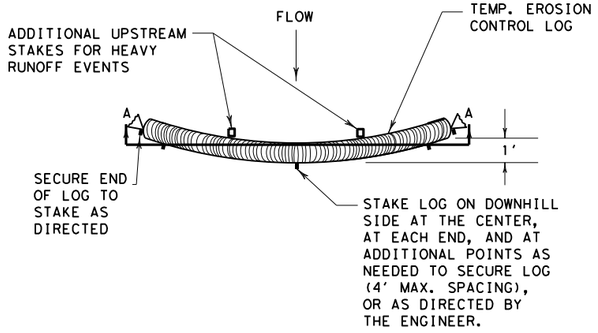
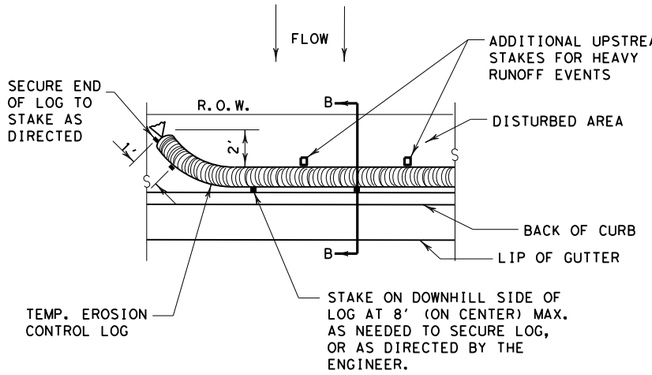
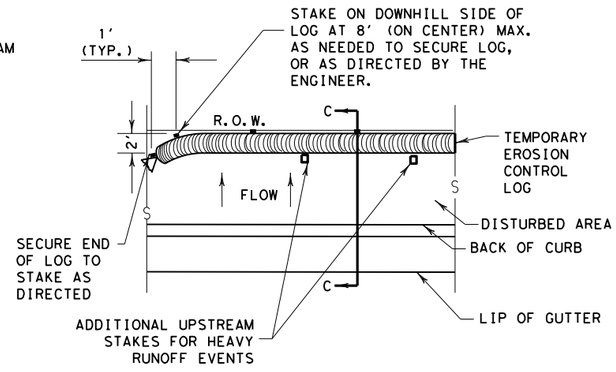


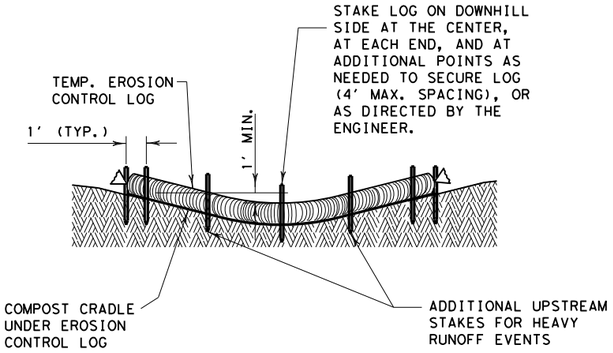
PLAN VIEW



PLAN VIEW



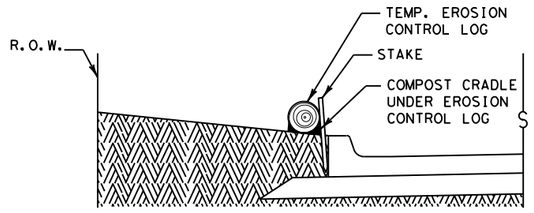
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

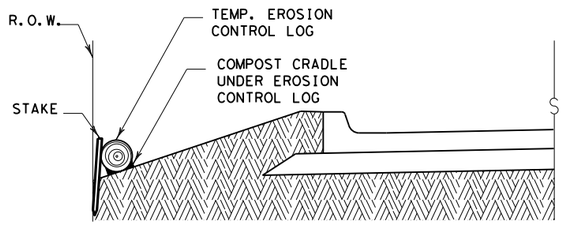
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

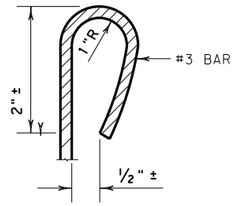
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

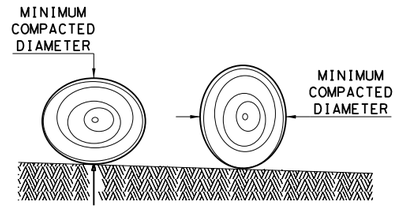
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation

Design Division Standard

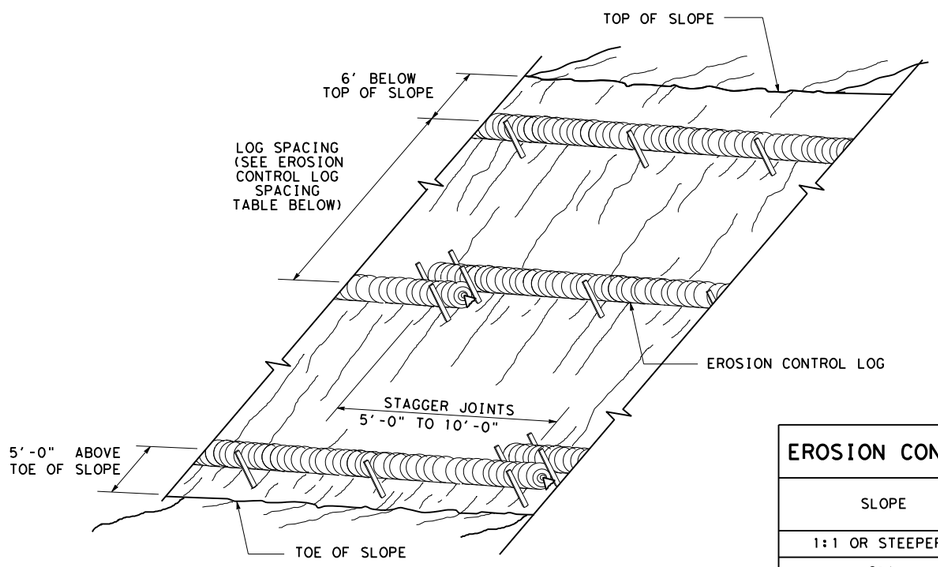
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

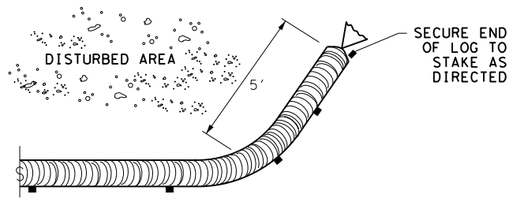
FILE: ec916		DN: TxDOT	CK: KM	DW: LS/PT	CK: LS		
© TxDOT: JULY 2016		CONT	SECT	JOB	HIGHWAY		
REVISIONS		0081	01	053,ETC	SS347, ETC		
		DIST	COUNTY		SHEET NO.		
		FTW	TARRANT		117		

DATE: 7/26/2024
FILE: c:\pw_working\texas\parsons_p009205h\d0268200\ec916.dgn



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

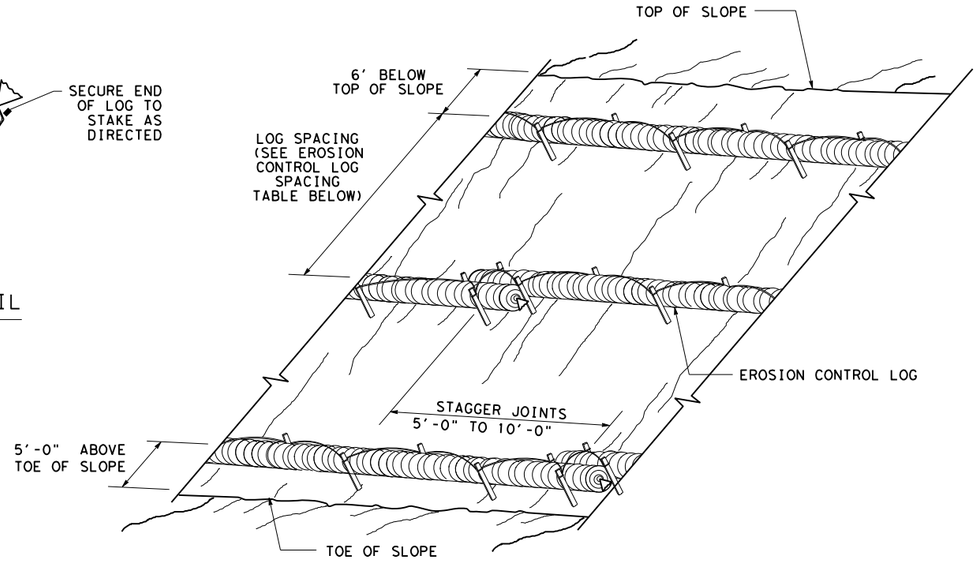
CL-SST



END SECTION RAP DETAIL

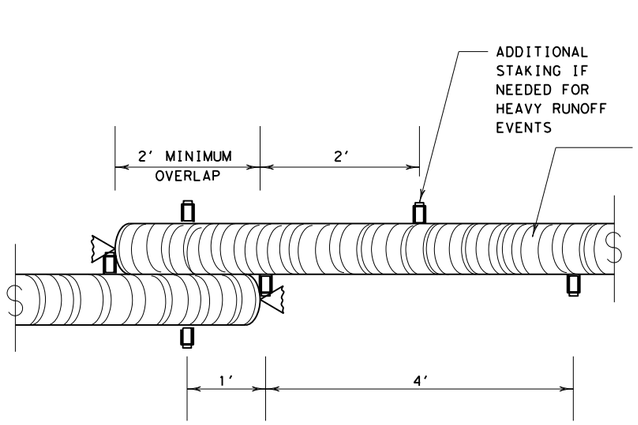
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

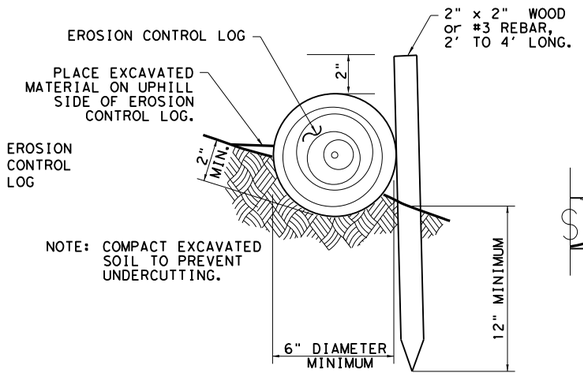
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

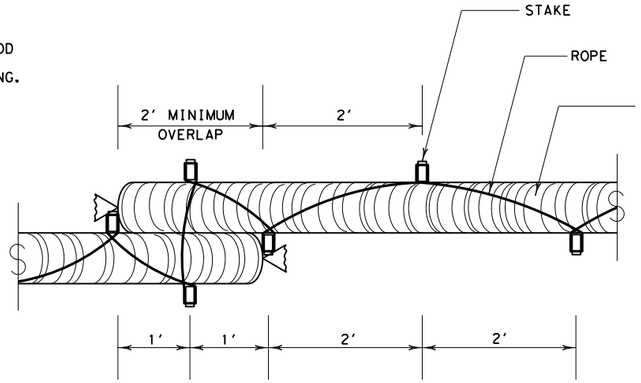


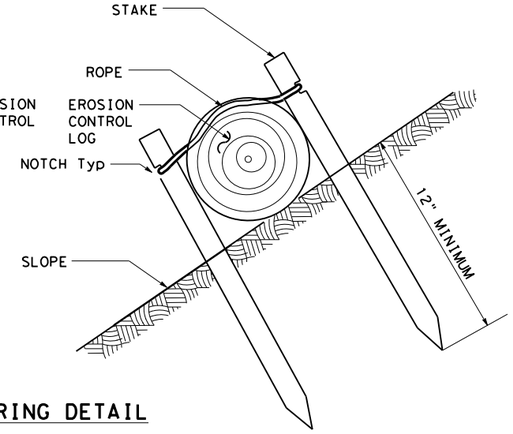


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

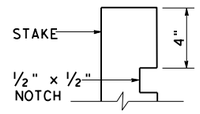
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

Texas Department of Transportation — Design Division Standard

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

FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0081	01	053,ETC		SS347, ETC	
	DIST	COUNTY			SHEET NO.	
	FTW	TARRANT			118	

DATE: 7/26/2024
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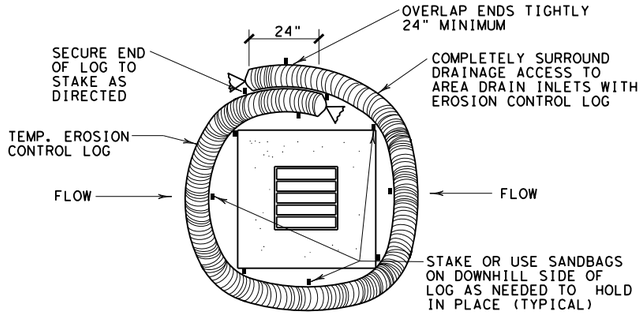
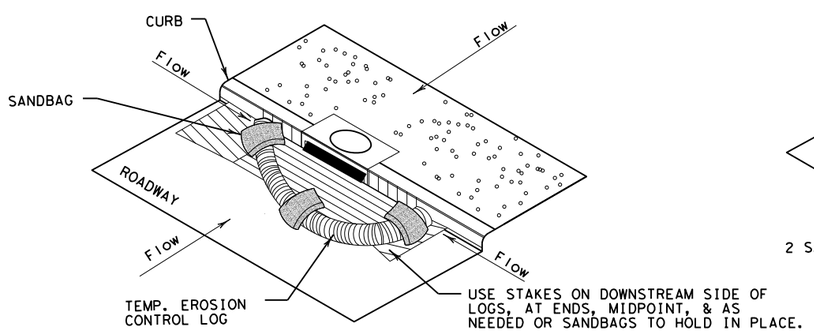


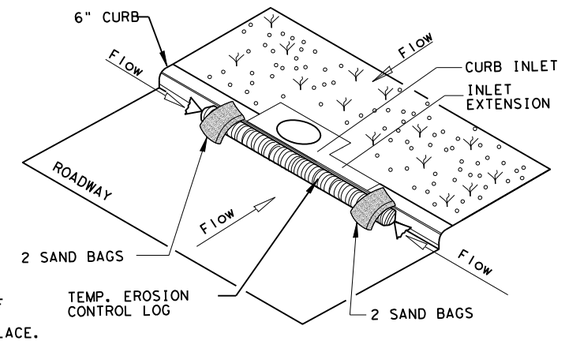
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

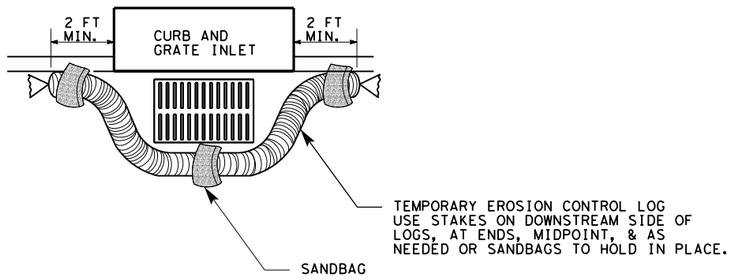
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

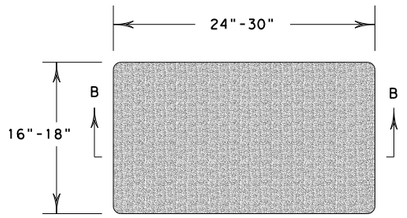
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	053,ETC	SS347, ETC
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		119