SEE SHEET 2 FOR
INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT
FEDERAL AID PROJECT NO. STP 2021(476)HES

US 62
HUDSPETH COUNTY

NET LENGTH OF ROADWAY= 108,514.08FT.= 20.552 MI.
NET LENGTH OF BRIDGE = 180.00FT.= 0.034 MI.
NET LENGTH OF PROJECT= 108,694.08FT.= 20.586 MI.

LIMITS FROM: 3.707 MI W OF FM 1437
TO: CULBERSON CL

DESIGN SPEED = 60 MPH
A.D.T. (2019)=2645
A.D.T. (2039)=3968

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	STP 2021(476)HES		1
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC	US 62

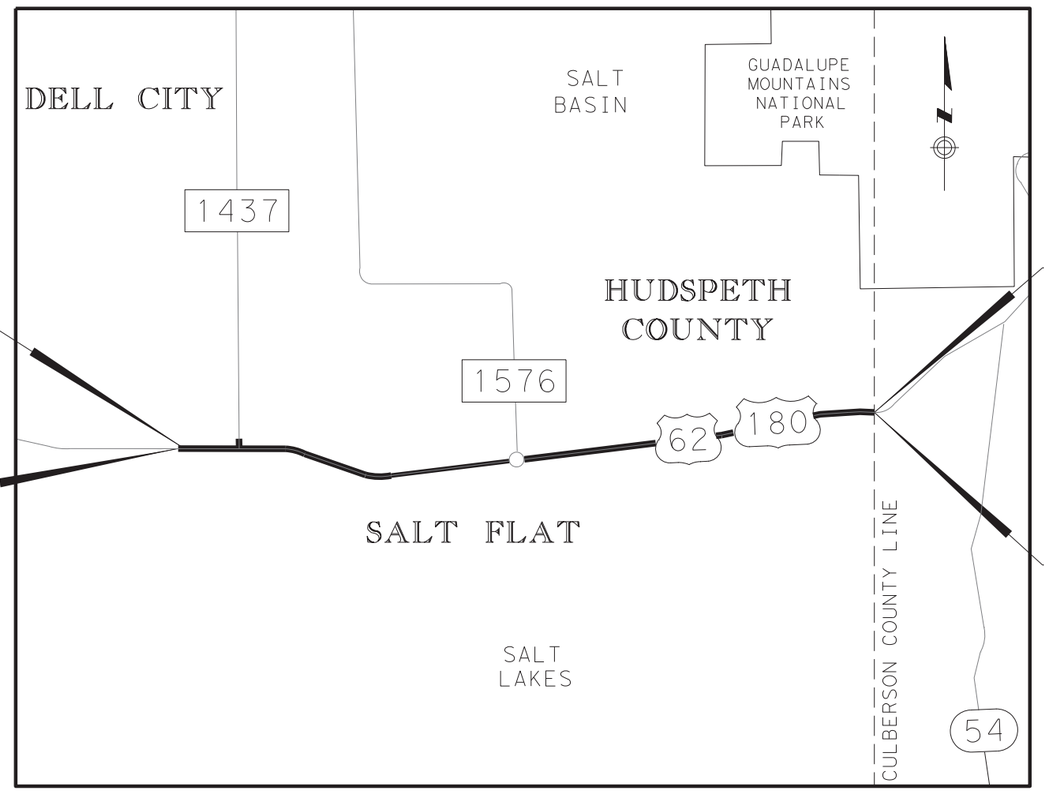
FINAL PLANS

CONTRACTOR: _____
TIME CHARGES BEGAN: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK WAS COMPLETED: _____
DATE WORK WAS ACCEPTED: _____
TOTAL DAYS CHARGED: _____
ORIGINAL CONTRACT AMOUNT: $ _____
AMOUNT OF CONTRACT AMENDMENTS: $ _____
FINAL CONTRACT COST: $ _____

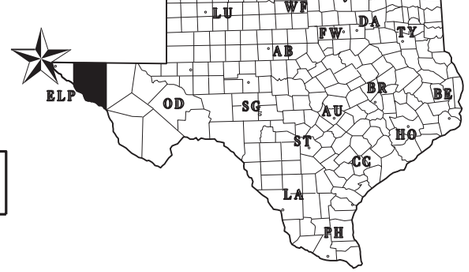
_____ 20 _____

_____
AREA ENGINEER

SAFETY TREAT FIXED OBJECTS, INSTALL PASSING LANES ON 2-LANE ROADWAY AND INSTALL CENTER LINE RUMBLE STRIPS



LOCATION MAP NOT TO SCALE



KEY TO COUNTIES

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

TDLR INSPECTION NOT REQUIRED

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.
02/04/2021

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

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)- 14 THRU BC (12)- 14 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

Texas Department of Transportation

RECOMMENDED FOR LETTING:
DocuSigned by:
Eduardo Perales, P.E.
2778C80AB5F7426...
2/5/2021

RECOMMENDED FOR LETTING:
DocuSigned by:
L. Raul Ortega Jr., P.E.
0F1750B98760474...
PLANNING AND DEVELOPMENT
2/5/2021

APPROVED FOR LETTING:
DocuSigned by:
P.E.
7A68C5EA0D94496...
2/5/2021

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	GENERAL
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7, 7A-7I	GENERAL NOTES
8-9	ESTIMATE AND QUANTITY SHEETS
10	SUMMARY OF ROADWAY QUANTITIES
11	QUANTITY SUMMARY
	TRAFFIC CONTROL PLAN
12	LINE DIAGRAM
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	SIGNING & STRIPING
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85	SOSS
	SIGN STANDARDS
86	SMD(GEN)-08
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88	SMD(SLIP-2)-08
89	SMD(SLIP-3)-08
90-92	TSR (3)-13, TSR (4)-13, TSR(5)-13
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106	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)
	ENVIRONMENTAL ISSUES STANDARDS
107	EC(1)-16

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED PROFESSIONAL ENGINEER

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

Sheetal Patel, P.E. 05/25/2021

NAME DATE

US 62

GENERAL

INDEX OF SHEETS

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		2

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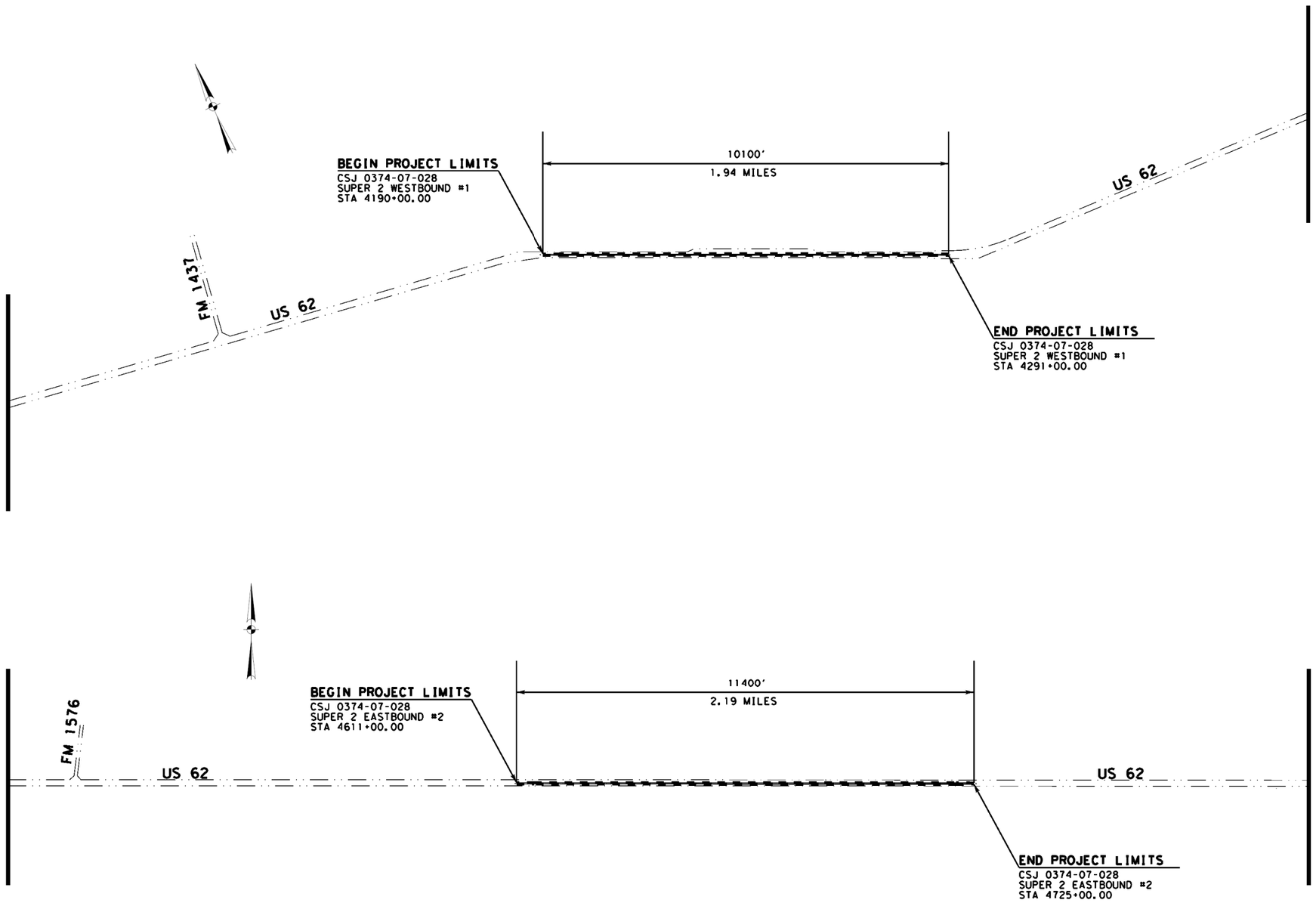

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
2/4/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

SUPER 2 LAYOUT

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			3
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028,ETC.	US 62

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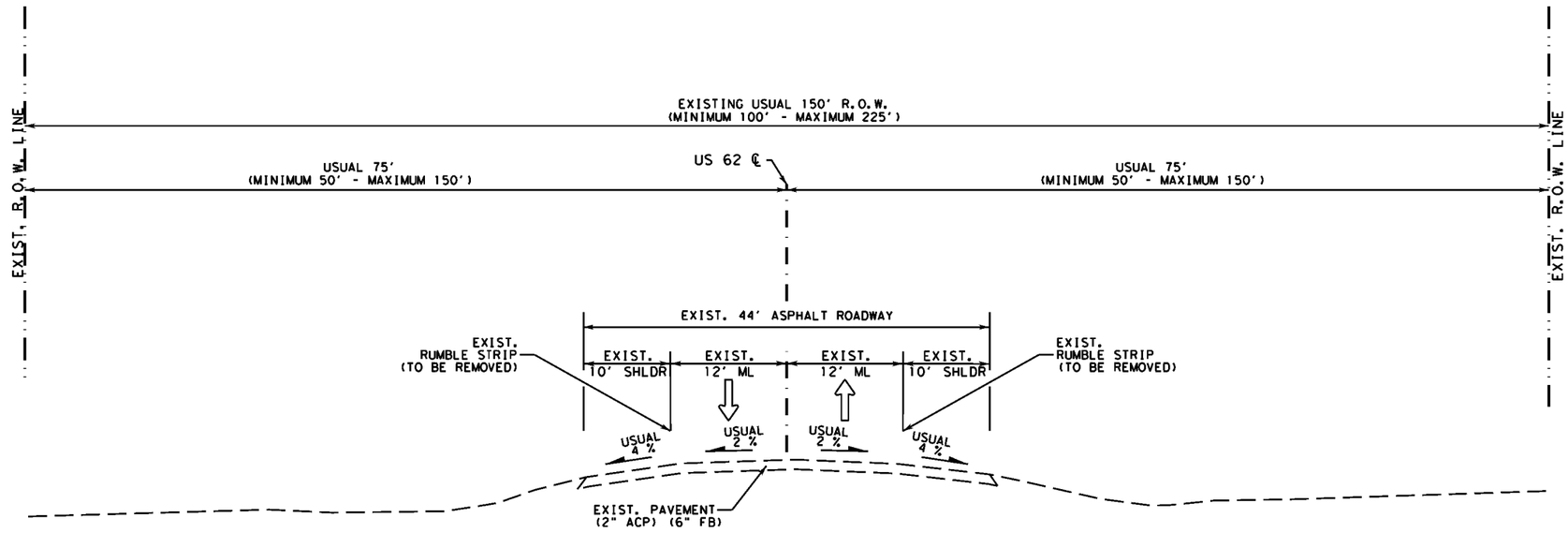

EXISTING TYPICAL SECTION

STA 4190+00.00 TO STA 4291+00.00
STA 4611+00.00 TO STA 4725+00.00

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED
PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639

2/4/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

US 62/180
EXISTING TYPICAL SECTION

SCALE: NTS SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			4
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028,ETC.	US 62

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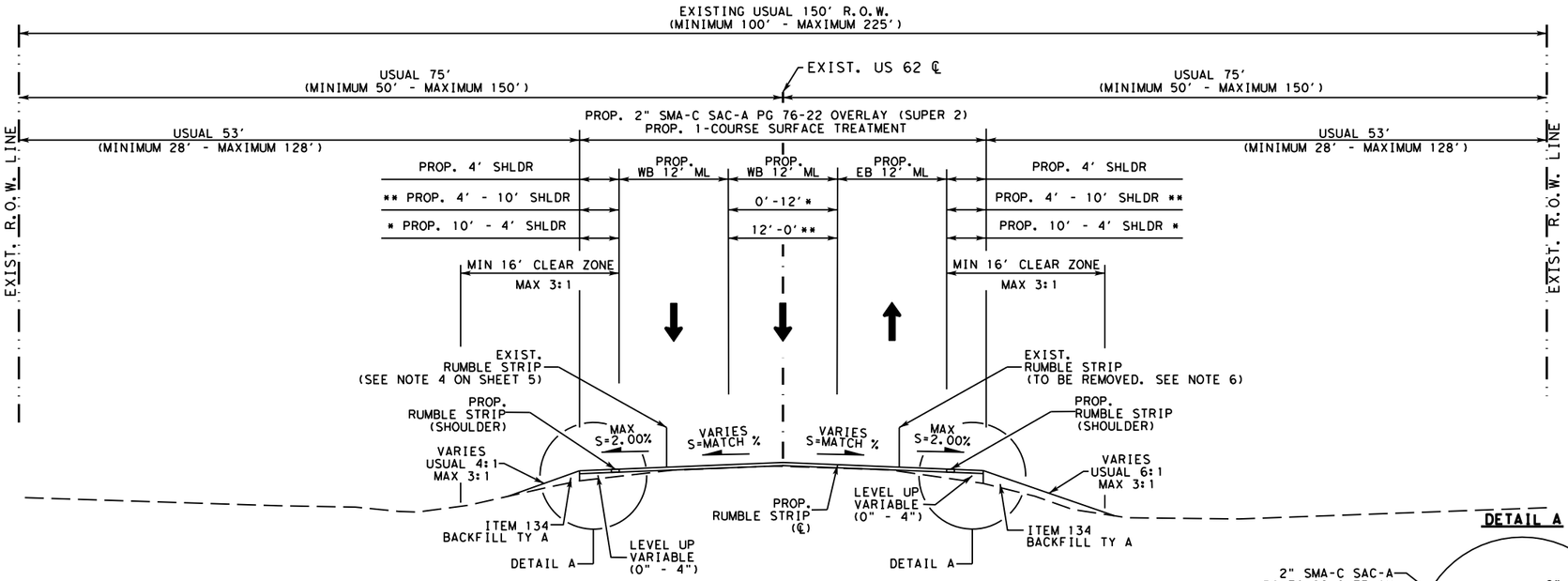
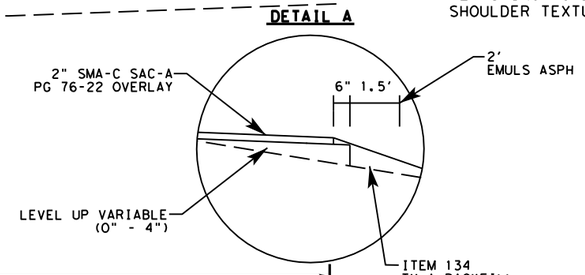
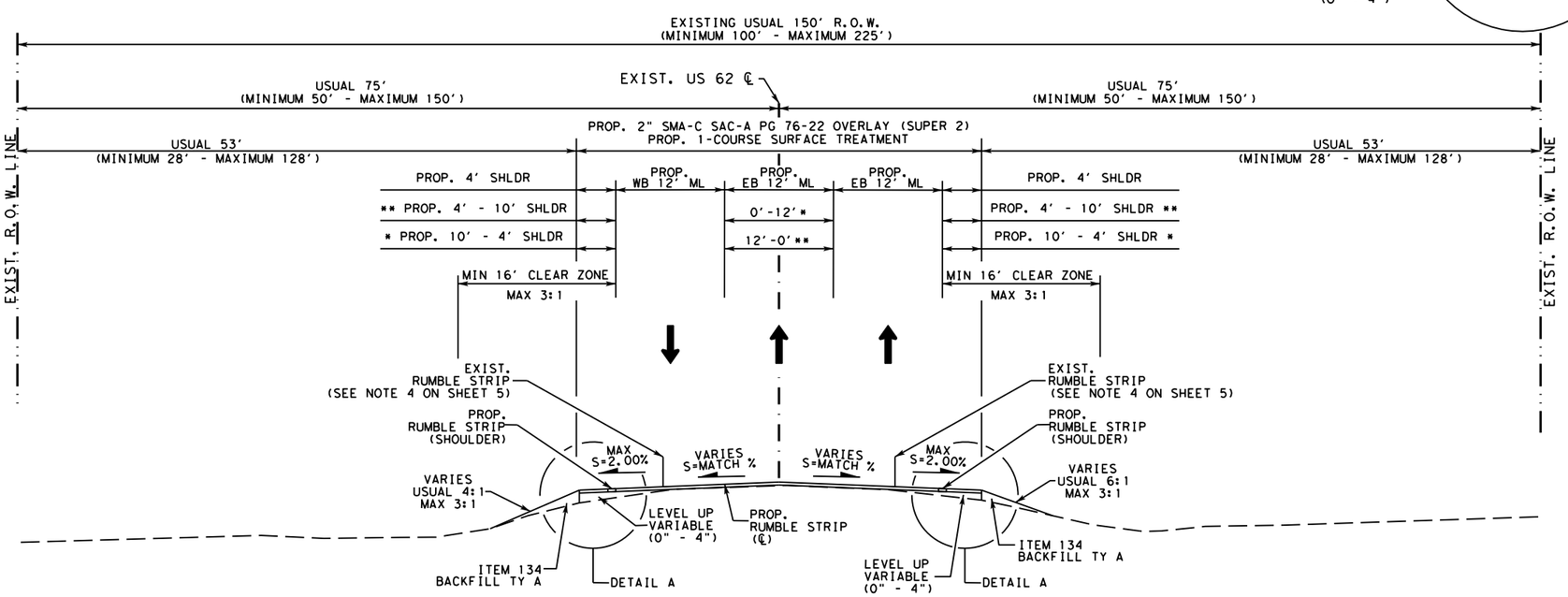


PROPOSED TYPICAL WB OVERLAY & RESTRIPING SECTION

* STA 4190+00.0 TO STA 4194+50.0
STA 4194+50.0 TO STA 4286+50.0
** STA 4286+50.0 TO STA 4291+00.0





PROPOSED TYPICAL EB OVERLAY & RESTRIPING SECTION

* STA 4611+00.0 TO STA 4615+50.0
STA 4615+50.0 TO STA 4720+50.0
** STA 4720+50.0 TO STA 4725+00.0

NOTES

1. AS SHOWN IN DETAIL A, ITEM 314, "EMULSIFIED ASPHALT TRETMENT:, APPLIES TO BOTH PAVEMENT EDGES.
2. REFER TO P&P SHEETS FOR DIP LOCATIONS.
3. FOR LEVEL-UPS AT DIPS WITH MAX. 4" LEVEL-UP, TOP 2" TO BE DONE WITH FINAL OVERLAY COURSE.
4. FOR LEVEL-UPS AT DIPS WITH GREATER THAN 4", THE MIN. THICKNESS OF COURSE SHALL BE 1.25" AND TOP COURSE SHALL BE 2" TO BE DONE WITH THE FINAL OVERLAY COURSE.
5. IF OVERLAY AEARS ARE ENCOUNTERED DUE TO HIGH AREAS WITHIN THE TRAVEL OR SHOULDERS LANES, PRIOR TO REMOVAL OF THE TORN AREA, THE AREA OF REMOVAL SHALL BE APPROVED BY THE ENGINEER. PAVEMENT FOR THE AREAS TO BE REMOVED AND REPAIRED SHALL BE AS PER THE PAVEMENT REPAIR DETAIL PROVIDED IN THE PLANS. TOTAL ESTIMATED PAVEMENT REPAIR IS 1,000 SY AREAS TO BE REMOVED SHALL FIRST BE APPROVED BY THE ENGINEER.
6. PRIOR TO OVERLAY WORK, REMOVE AND REPAIR EXISTING MILLED SHOULDER TEXTURING BY PLANING TO THE WIDTH AND DEPTH OF THE EXISTING TEXTURE. THEN REMOVE LOOSE AND FOREIGN MATERIALS FROM THE PLANED AREAS AND APPLY TACK COAT PRIOR TO PLACING AND COMPACTING ASPHALT MATERIAL, REMOVING AND REPAIRING OF MILLED TEXTURING TO BE PAID UNDER ITEM 3020-6001 REMOVE SHOULDER TEXTURING.

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
2/11/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

US 62/180 PROPOSED TYPICAL SECTIONS

SCALE: NTS SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
06		5

STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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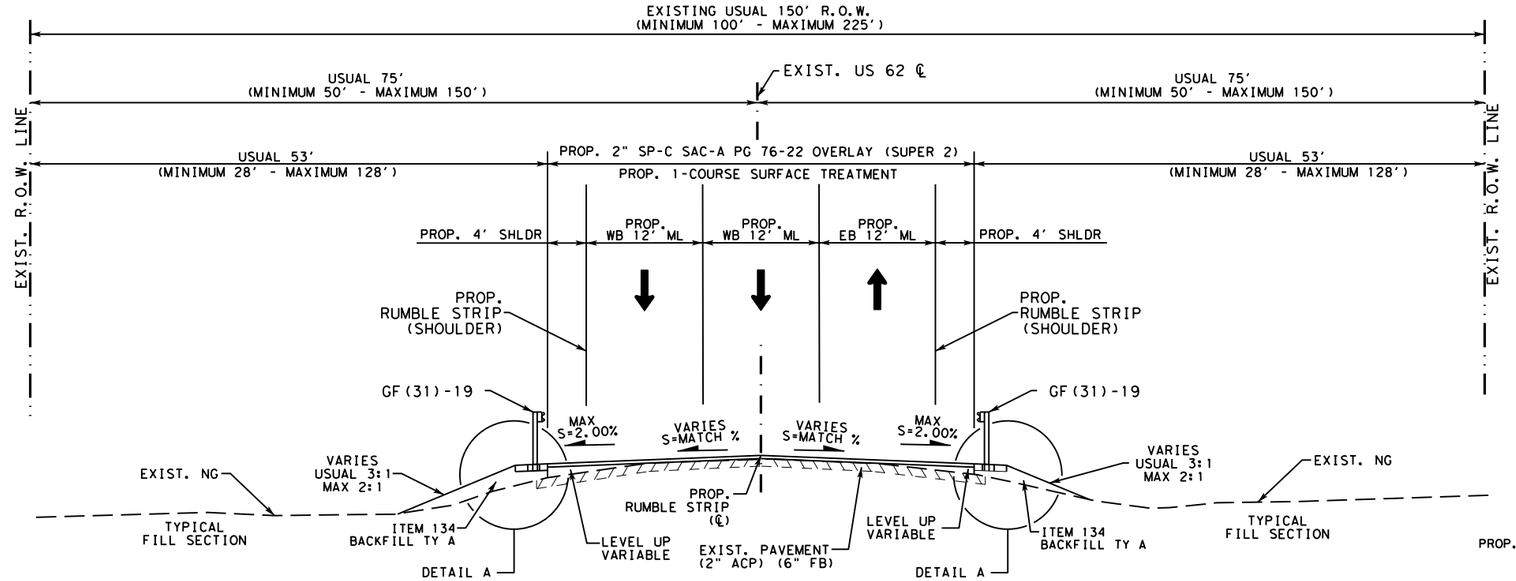
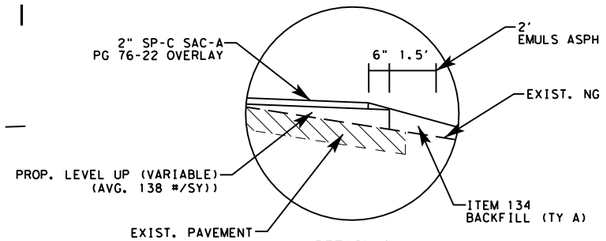
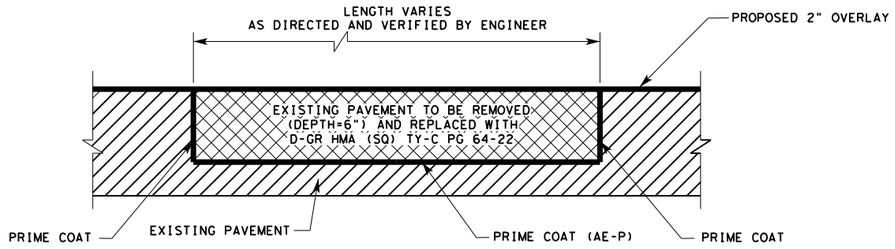


PROPOSED TYPICAL WB OVERLAY & RESTRIPING SECTION W/ MBGF

STA 4226+60.0 TO STA 4245+50.0



DETAIL A



FLEXIBLE PAVEMENT REPAIR DETAIL

1. EXACT LOCATIONS MUST BE VERIFIED WITH THE ENGINEER. QUANTITIES WILL BE ADJUSTED AS DIRECTED BY THE ENGINEER.
2. PROVIDE MATERIALS OF TYPE AND GRADE AS SHOWN BELOW AND IN ACCORDANCE WITH ITEM 340. "DENSE-GRADED HOT-MIX ASPHALT & SMALL QUANTITY. "THE FOLLOWING DATA IS FOR CONTRACTOR'S INFORMATION ONLY AND WILL BE SUBSIDIARY TO ITEM 351, "FLEXIBLE PAVEMENT STRUCTURE REPAIR."

   D-GR HMA (SQ) TY C PG 64-22, 1IN = 110 LBS/SY
   PRIME COAT (AE-P) = 0.15 GAL/SY
   TACK COAT (TRAIL) = 0.15 GAL/SY

3. CONTRACTOR TO PROVIDE CLEAN SAW-CUT EDGES.
4. PLACE 6" OF PROPOSED MIXTURE AND COMPACT TO REQUIRED DENSITY. MATCH THE EXISTING PAVEMENT SURFACE ELEVATION.

NOTES

1. AS SHOWN IN DETAIL A, ITEM 314, "EMULSIFIED ASPHALT TREATMENT:, APPLIES TO BOTH PAVEMENT EDGES.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
2/17/2021
DATE

CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

US 62/180 PROPOSED TYPICAL SECTIONS

SCALE: NTS SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
06		6

STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028,ETC.	US 62

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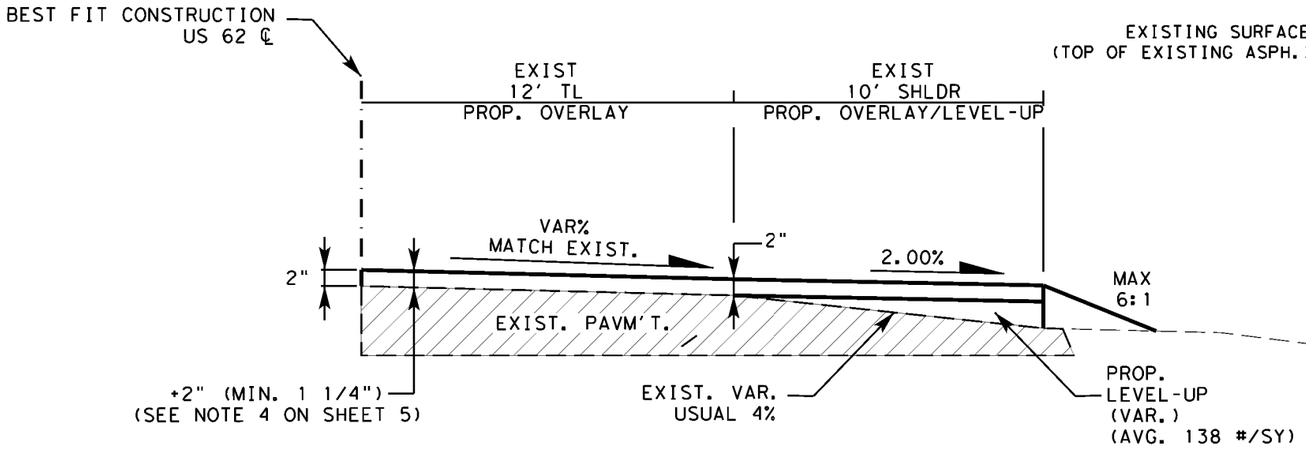
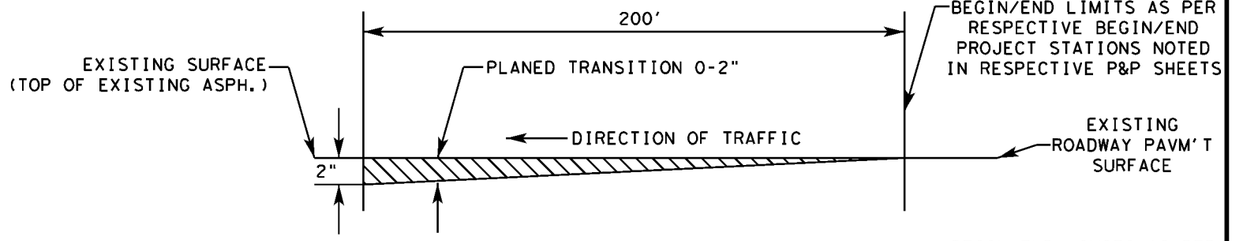
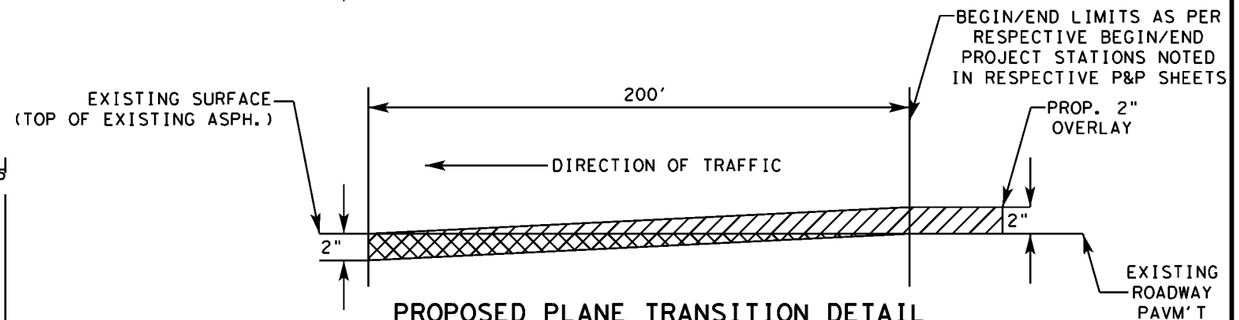
NOTE:
CONTRACTOR TO PERFORM SURFACE TEST TYPE B AS PER ITEM 585 AND TEX-1001-S TO LOCATE AREAS REQUIRING EITHER CORRECTIVE ACTION OR LOCALIZE ROUGHNESS. PLACE D-GR-HMA (SQ) TY-D PG 70-22 (LEVEL UP) TO FILL THE DIPS IDENTIFIED BY SURFACE TEST TYPE B PRIOR TO THE UNDERSEAL AND SMA OVERLAY, AS DIRECTED BY THE ENGINEER. THE QUANTITY MAY VARY.



HALF ROADWAY SECTION OVERLAY WITH SHOULDER LEVEL-UP

LOCATIONS ENCOUNTERED THROUGH OUT PROJECT
LIMITS AND FOR VARIABLE LENGHT (LT & RT SIDE)

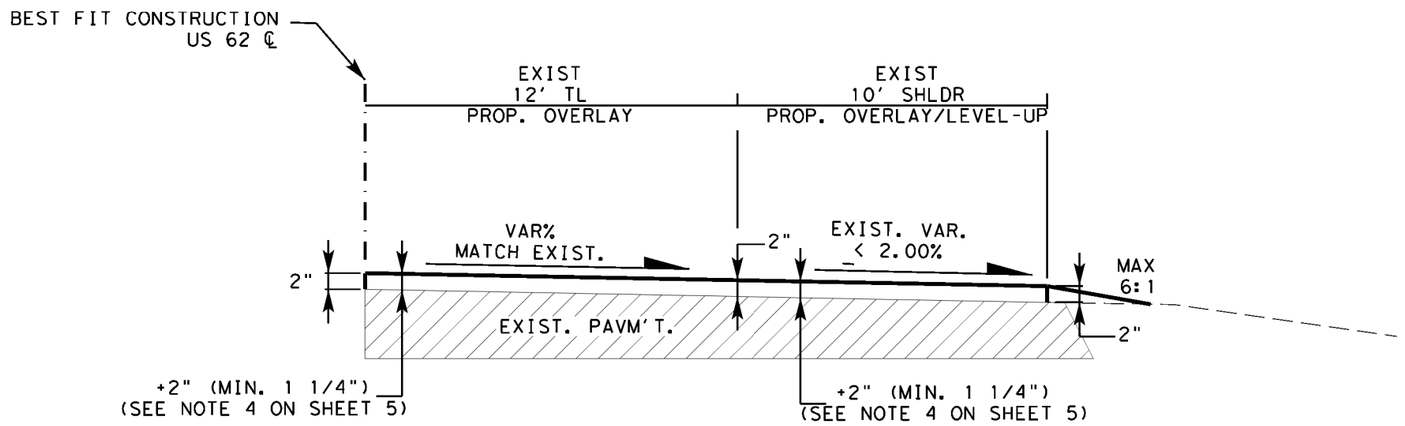




PROPOSED PLANE TRANSITION DETAIL

(PLANE PAVE 0-2")

OVERLAY TAPER DETAIL AT BEGIN & END OF PROJECT



HALF ROADWAY SECTION OVERLAY WITH SHOULDER LEVEL-UP

LOCATIONS ENCOUNTERED THROUGH OUT PROJECT
LIMITS AND FOR VARIABLE LENGHT (LT & RT SIDE)

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
2/12/2021
DATE

CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

US 62/180 PROPOSED OVERLAY DETAILS

SCALE: NTS SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			6A
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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CONTROL: 0374-07-028

COUNTY: HUDSPETH

HIGHWAY: US 62

General Notes:

Tests to be in accordance with the Department's Standard Test Methods

Table 1
Basis of Estimate

Item	Description	Rate
314	EMULSIFIED ASPHALT TREATMENT	9.0 GAL/STA
316	ASPH (AC-20-5TR)	0.35 GAL/SY
316	ASPH (CRS-1P) (cool weather)	0.46 GAL/SY
316	AGGR (TY-PB GR-4 SAC-B)	110 SY/CY
340	D-GR HMA (SQ) TY-D PG 70-22 (LEVEL-UP)	110 LBS/SY/IN.
346	STONE-MTRX-ASPH SMA-C SAC-A PG 76-22	110 LBS/SY/IN.
346	TACK COAT (TRAIL)	0.15 GAL/SY

1. **Deviation from the rates shown will require approval.**
2. **The actual rates used and paid for will be as directed by the Engineer and will be based on the approved mix design.**
3. **Tack Coat to be applied to each layer as directed by the Engineer. Rate shown is based on the desired residual application of 0.10 gal/sy.**

General Requirements

Maintain the entire project area in a neat and orderly manner throughout the duration of the work. Remove all construction litter and undesirable vegetation within the right of way inside the project limits. This work will be subsidiary to the various bid items.

Become familiar with project site prior to submitting bids.

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

Comply with all Occupational Safety & Health Administration (OSHA) and United States Environmental Protection Agency (EPA) regulations as well as all local and State requirements.

Refer to the various traffic control plan project overview sheets for the proposed sequence of work. Changes will not be permitted, except as approved in writing by the Engineer.

Electronic copies of earthwork cross-sections are available for copying, at bidding Contractor's expense, at the Area Engineer's office.

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

For East Area Office:

Ricardo Romero Ricardo.Romero@txdot.gov

Aldo Madrid Aldo.Madrid@txdot.gov

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

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

https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

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

The following standard detail sheet have been modified.

- C-RAIL-R (MOD)

Item 4 – Scope of Work

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

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

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

Maintain all Contract items until final acceptance of the project.

Item 5 – Control of the Work

The Department will furnish horizontal and vertical reference points. Contractor must verify horizontal and vertical reference points with conventional survey methods before proceeding with construction activities. Verification must be submitted for review and approval to the Department's R.P.L.S. prior to start of construction. Any discrepancies not reported will be at no additional cost to the Department.

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

Item 7 – Legal Relations and Responsibilities

Comply with all requirements of the Environmental Permits Issues and Commitments (EPIC) Sheet.

Dispose of all waste materials in compliance with Local, State, and Federal regulations. Submit list of all approved waste sites to the Engineer for review.

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

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

No significant traffic generator events identified.

Item 8 – Prosecution and Progress

Working days will be calculated in accordance with Section 8.3.1.4., “Standard Workweek.”

A bar chart schedule is required for this project conforming to Section 8.5.5.1., “Bar Chart.” Provide updates as directed by the Engineer.

Prior to beginning operations, schedule and attend a preconstruction conference with the Engineer. Provide the Department a written outline of the proposed sequence of work (Bar Chart Schedule) and an estimated progress schedule.

Keep traveled surfaces used in hauling operations clear and free of dirt or other material.

Existing pavement, utilities, structures, etc. damaged as a result of the operations will be repaired at no additional cost to the Department.

Protect from damage and destruction all areas of the right of way, which are not included in the actual limits of the proposed construction areas. Exercise care to prevent damage to trees, vegetation, and other natural features.

Protect trees, shrubs, and other landscape features from abuse, marring, or damage within the actual construction and/or fenced protection areas designated for preservation. Restore any area disturbed or damaged to a condition “as good as” or “better than” prior to start of construction operation. This work will be at the Contractor’s expense.

Item 9 – Measurement and Payment

Submit Material on Hand (MOH) payment requests at least two (2) working days before the end of the month for payment consideration on that month’s estimate.

Item 134 – Backfilling Pavement Edges

Use this Item to backfill pavement edges as shown on typical sections. Reclaimed Asphalt Pavement (RAP) is considered suitable Type “A” material. State-owned RAP will be provided to the Contractor for this project. Coordinate with the Engineer one week in advance to schedule pick-up of the RAP from East Area Office at 1430 Joe Battle Blvd, El Paso, TX 79936. Hauling of RAP material and incidentals to completer this work is subsidiary to this Item. Backfill and compact the edges to produce a smooth surface adjacent to the pavement with no vertical edges.

Item 314 – Emulsified Asphalt Treatment

Apply a 2.0 ft. wide strip of emulsified asphalt at a total rate of 0.80 gallons per square yard as an edge seal along each pavement edge. Lap the pavement edge seal onto the pavement a maximum of 6 in. Dilute the emulsion 3-parts water (0.60 gallons per square yard) to 1-part asphalt (0.20 gallons per square yard). Asphalt rate is 9.0 gallons per station of roadbed. Payment will not be made for water. Use CSS-1H, MS-2, MC-30, AE-P or other asphalt if approved.

Item 316 – Seal Coat

Before applying the seal coat, protect all bridge armor and expansion joints, manhole and valve covers with paper or other suitable materials as directed.

The Engineer will approve rates of asphalt and aggregate application prior to application.

Prepare the roadway surface prior to placing asphalt to the satisfaction of the Engineer. Some areas may require more extensive cleaning than other areas. This work will not be paid for directly but will be subsidiary to pertinent items.

AC-20-5TR will be used during warm weather placement. CRS-1P will be used for cool weather placement, unless otherwise directed by the Engineer.

Do not apply asphalt cement from September 16th to April 30th unless authorized in writing.

Item 340 – Dense-Graded Hot-Mix Asphalt (Small Quantity)

In place of typical tack materials shown in Table 18 under Item 300, use a tracking resistant asphalt interlayer (TRAIL) material as a tack coat. Approved TRAIL products are found on TxDOT’s Material Producer List under Asphalt Interlayer (Tracking Resistant) through http://www.txdot.gov/business/resources/materials.html.

CONTROL: 0374-07-028

COUNTY: HUDSPETH

HIGHWAY: US 62

Supply Warm-Mix Asphalt (WMA) under this Item.

When Reclaimed Asphalt Pavement (RAP) is used in the production of hot-mix asphaltic concrete, use fractionated RAP. Do not exceed 10.0% of Fractionated RAP on surface mixtures.

Use of RAS is not allowed for any mixtures.

Substitute PG Binders (grade dumping) will not be allowed for any mixtures.

Obtain the current version of the templates at http://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/forms/site-manager.html. Submit electronically to the Engineer.

Design the mixture at 50 gyrations (Ndesign).

Place a string line or other suitable marking to ensure smooth, neat lines, or as directed.

Item 346 – Stone-Matrix Asphalt

Use Surface Aggregate Classification "A" material for all surface mixes.

In place of typical tack materials shown in Table 18 under Item 300, use a tracking resistant asphalt interlayer (TRAIL) material as a tack coat. Approved TRAIL products are found on TxDOT's Material Producer List under Asphalt Interlayer (Tracking Resistant) through http://www.txdot.gov/business/resources/materials.html.

Hydrated Lime shall be added as an additive as per Item 301 "Asphalt Antistripping Agents" between the rates of 1.0% minimum and 2.0% maximum by weight. If the Hamburg Wheel Test cannot be met within these limits, Liquid Antistripping agents as approved by the Engineer may be used in conjunction with lime.

Do not dilute the tack coat.

Tack coat shall be applied to each layer as directed by the Engineer.

Supply Warm-Mix Asphalt (WMA) under this Item.

When Reclaimed Asphalt Pavement (RAP) is used in the production of hot-mix asphaltic concrete, use fractionated RAP. Do not exceed 10.0% of Fractionated RAP on surface mixtures.

Use of RAS is not allowed for any mixtures.

Substitute PG Binders (grade dumping) will not be allowed for any mixtures.

Obtain the current version of the templates at http://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/forms/site-manager.html. Submit electronically to the Engineer.

Design the mixture at 50 gyrations (Ndesign).

Do not cover with asphaltic material, any existing survey monuments, manholes, or valve covers, etc. Adjustments will be done in coordination with the respective utility owners.

Place a string line or other suitable marking to ensure smooth, neat lines, or as directed. Provide smooth transitions to existing driveways and intersections.

Place longitudinal joints approximately 6 in. from the broken striping, or as directed, to avoid placing under the wheel path.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed will be slow enough, so that stopping between trucks is not ordinarily required. If the Engineer determines non-uniform delivery of material is affecting the HMA placement, the Engineer may require the paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

Item 351 – Flexible Pavement Structure Repair

Provide six (6) inches of D-GR HMA(SQ) TY C PG 64-22 for all repairs. D-GR HMA(SQ) TY C PG 64-22 will not be measured but will be subsidiary to Item 351, Flexible Pavement Structure Repair".

Exact locations must be verified with the Engineer. Quantities will be adjusted as directed by the Engineer. The minimum area to be repaired will be five (5) square yards.

Contractor to provide clean saw cut edges. Apply prime coat (AE-P) at 0.15 gal/sy to existing base of the repair area, unless otherwise directed. Apply Tack Coat (TRAIL) to all surfaces that will come in contact with the subsequent HMA placement at 0.15 gal/sy, unless otherwise directed. Engineer may adjust the rates based on the existing surface conditions. Tack coat and prime coat will not be paid for directly but will be subsidiary to this Item.

Use of a motor grader will not be permitted unless otherwise directed by the Engineer.

Item 354 – Planing and Texturing Pavement

Perform Surface Test Type B as per Item 585 and Tex-1001-S to locate areas requiring either corrective action or localize roughness. Perform micro-mill at the areas identified by surface Test Type B prior to the Stone-Matrix Asphalt overlay, as directed by the Engineer. The quantity may vary.

Item 502 – Barricades, Signs, and Traffic Handling

Prior to beginning construction, the Engineer will approve the routing of traffic and sequence of work.

Additional signs and barricades, placed as directed, will be considered subsidiary to this Item.

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

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

CRP and CRP alternate must be trained using Department approved training. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 2 for Department approved Training.

Table 2

Contractor Responsible Person and Alternate

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCS	Traffic Control Supervisor	2 days	
National Highway Institute	133112 133113	Design and Operation of Work Zone Traffic Control Work Zone Traffic Control for Maintenance Operations	1 day 1 day	Both courses are required to meet minimum required training.
Texas Engineering Extension Services	133112A	Design and Operation of Work Zone Traffic Control	3 days	
University of Texas Arlington Division for Enterprise Development	WKZ421	Traffic Control Supervisor	16 hours	Contact UTA for training needs.

All contractor workers involved with the traffic control implementation and maintenance must participate and complete a Department approved training course. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 3 for Department approved training.

Table 3

Other Work Zone Personnel

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCT	Traffic Control Technician	1 day	
Texas Engineering Extension Services	HWS002	Work Zone Traffic Control	16 hours	Identical to HWS-410. Counts for 3 year CRP requirement.
National Highway Institute	133116	Maintenance of Traffic for Technicians	5 hours	Web based
National Highway Institute	134109-I	Maintenance Training Series: Basics of Work Zone Traffic Control	1 hour	Free, Web based
University of Texas at Arlington, Division for Enterprise Development	WKZ100	Work Zone Safety: Temporary Traffic Control	4 hours	Note name change. Free, Web based
TxDOT/AGC Joint Development	N/A	Safe Workers Awareness Highway Construction Work Zone Hazards	16 minutes 18 minutes	Videos available through AGC of Texas offices. English & Spanish
AGC America	N/A	Highway Work Zone Safety Training	1 day	
Texas Engineering Extension Service	HWS400	Temporary Traffic Control Worker	4 hours	Contact TEEX, if interested in course

TxDOT/AGC Joint Development	N/A	Work Zone Fundamentals	10 minutes	Videos available through ACT of Texas offices. English & Spanish

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

Existing regulatory signs, route marker auxiliaries, guide signs, and warning signs that must be removed due to widening shall be relocated temporarily and erected on approved supports at locations shown in the plans, or as directed. This work will not be paid for directly, but considered subsidiary to this Item.

Notify the Department officials when major traffic changes are to be made, such as detours. Coordinate with the Department on all traffic changes. Advance notification for the following week's work must be made by 5 P.M. on Wednesdays.

If Law Enforcement Personnel is required by the Engineer, coordinate with local law enforcement as directed or agreed. Complete the weekly tracking form provided by the Department and submit invoices with 5% allowance for Law Enforcement payments by Contractor that agree with the tracking form for payment at the end of each month where approved services were provided.

Provide access to intersecting side roads and driveways at all times, unless otherwise directed.

Any approved change to the sequence of work or TCP, must be signed and sealed by a Contractor's Licensed Professional Engineer assuming full responsibility for any additional barricade signs and devices needed.

Use striping operations to channelize traffic into the newly completed roadway, as directed. Maintain shoulders and median areas in a condition capable of serving as emergency paths, as approved. This work will be subsidiary to this Item.

Use portable changeable message signs (PCMS) to alert public of construction two weeks prior to construction.

Use flaggers when directed. Provide two-way radio communication for all flaggers.

Place and maintain sufficient additional warning signs, beacons, delineators, and barricades to warn and guide the public of all hazards through the construction zone at all times, and as directed.

Use flashing arrow boards on all tapers for each lane closure.

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

Fill any holes left by barricade or sign supports and restore the area to its original condition.

Use Type A flashing warning lights or delineators to mark open excavation, footings, foundations, or other obstructions near lanes that may be open to traffic, as directed.

For additional information pertaining to channelization, signing, spacing details, and flagging procedures required to regulate, warn, and guide traffic through project, refer to the "Barricade and Construction Standards," BC(1)-14 and to the current *Texas Manual on Uniform Traffic Control Devices(TMUTCD).*

Remove or cover signs that do not apply to current conditions at the end of each day's work.

Repair and/or replace all signs damaged by the public or due to weather events.

Safety Contingency

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

Item 506 – Temporary Erosion, Sedimentation, and Environmental Controls

Place Best Method Practices (BMP's) in locations as designated in the plans or as directed to meet field conditions.

The following BMP's shall be followed by the Contractor:

1. **Texas horned lizard** – In addition to implementing the Terrestrial Reptile BMPs from the BMP-PA. TPWD recommends TxDOT avoid harvester ant mounds in the selection of PSLs where feasible.

2. **Plant SGCN:** The Tier I states that there is suitable habitat within the project area for the following plant SGCN that are ranked either S1 or S2 (critically imperiled or imperiled):

Chisos agave – Flowers mid-Spring through early Fall
Desert night-blooming cereus – Flowering synchronized over a few nights in early May to late June when almost all mature plants bloom, flowers last only one day and open just after dark, may flower as early as April
Gypsum scalebroom – Flowers late April through early October, peaking late July through early September
Sand prickly-pear – Flowers May through June
Stebbin's desert dandelion – Flowers March through June
Sticky tansy aster – Flowers Summer through Fall
Texas wolf-berry – Flowers March through October
Villous muhly – Flowers July through October
Watson's false clappiabush – Flowers May through August

TPWD recommends surveying for these species to determine if they occur within the project area, during their respective flowering periods. If plant SGCN are located within the project area either avoid impacting individuals or populations with barrier fencing and contractor education or if impacts cannot be avoided, please contact me as soon as that is determined so I might be able to coordinate a salvage opportunity prior to construction impacts.

3. **Bats:** Since there is work proposed at two culverts and one bridge within the project limits, TPWD recommends implementing the first bullet from the Bat BMPs listed in the BMP-PA (see below). In the BMP-PA structures are defined as bridges, culverts (concrete or metal), wells, and buildings.

   - For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.

     If there are signs of bat occupation within the culverts or bridge that is located within the project limits, then TPWD recommends implementing the rest of the Bat BMPs outlined in the BMP-PA.

4. **Bird BMPs:**
   In addition to complying with the Migratory Bird Treaty Act (MBTA) TxDOT will perform the following BMPs for the Mountain Plover and Western Burrowing Owl:

- Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed.
- Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season;
- Avoid the removal of unoccupied, inactive nests, as practicable;
- Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair;
- Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

5. **Reptile SGCN:** TxDOT will implement Terrestrial Reptile BMPs and Additional Reptile BMPs from the BMP-PA (below) for the Texas horned lizard, gray-checkered whiptail, western box turtle, western hognose snake, and the western rattlesnake.

Terrestrial Reptile BMPs and Additional Reptile BMPs:

- Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, utilize erosion control blankets or mats that contain no netting or contain loosely woven, natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
- For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (I: I) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling.
- Inform contractors that if reptiles are found on project site allow species to safely leave the project area.
- Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible.
- Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
- Due to increased activity (mating) of reptiles during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (April-May) season. Also, timing ground disturbing activities before October when reptiles become less active and may be using burrows in the project area is also encouraged.
- When designing roads with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small animals to get out of roadways.
- If Texas Tortoises are present in a project area they should be removed from the area. After removal of the tortoises, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude tortoises and other reptiles. The exclusion fence should be constructed and maintained as follows:
    a) The exclusion fence should be constructed with metal flashing or drift fence material.
    b) Rolled erosion control mesh material should not be used.
    c) The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.

    d) The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated.

6. **Vegetation:** TxDOT will implement the Vegetation BMPs (as stated below) from the BMP-PA for the plant SGCN with suitable habitat in the project area.

    Vegetation BMPs: The BMP below will be implemented for the Bigelow's desert grass, broadpod twistflower, Chisos agave, dense cory cactus, desert night-blooming cereus, gypsum scalebroom, Havard's standing cypress, sand prickly-pear, stalked rhombopod, Stebbin's desert dandelion, sticky tansy aster, Terlingua brickelbush, Texas wolf-berry, villous muhly, Warnock's water-willow, Waterfall's milkvetch, Watson's false clappia-bush, and Wright's machaeranthera

- Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided to the greatest extent practicable. Wherever practicable, impacted vegetation should be replaced with in-kind on-site replacement/restoration of native vegetation.
- To minimize adverse effects, activities should be planned to preserve mature trees, particularly acorn, nut or berry producing varieties. These types of vegetation have high value to wildlife as food and cover.
- It is strongly recommended that trees greater than 12 inches in dbh that are removed be replaced. TPWD's experience indicates that for ecologically effective replacement, a ratio of three trees for every one (3: I) lost should be provided to the extent practicable either on-site or off-site. Trees less than I 2 inches dbh should be replaced at a I: I ratio.
- Replacement trees should be of equal or better wildlife quality than those removed and be regionally adapted native species.
- When trees are planted, a maintenance plan that ensures at least an 85 percent survival rate after three years should be developed for the replacement trees.
- The use of any non-native vegetation in landscaping and revegetation is discouraged. Locally adapted native species should be used.
- The use of seed mix that contains seeds from only locally adapted native species is recommended.
- Avoid vegetation clearing activities during the general bird nesting season, March through August, to minimize adverse impacts to birds.

7. **Mammal SGCN:** The BMP below will be implemented for the American badger, kit fox, pronghorn, western hog-nosed skunk, and western spotted skunk.
    - Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.

Place a weatherproof bulletin board containing the Texas Commission on Environmental Quality (TCEQ) required information on the project at a site as directed. Post the following documents:

TCEQ “TPDES Storm Water Program” Construction Site Notice; Primary Construction Site Notices from both Contractor and Department, completed and signed.

Place rain gauge(s) at locations, as designated.

The total disturbed area for this project is **1.16** acres. Establish the authorization requirements for Storm Water Discharges for soil disturbed area in this project, all project locations in the Contract, and Contractor Project Specific Locations (PSLs), within one mile of the project limits. Both the Department and the Contractor shall obtain an authorization to discharge storm water from TCEQ for the construction activities shown on the plans. Obtain required authorization from the TCEQ for any Contractor PSLs for construction support activities on or off right of way. When the total area disturbed for all projects in the Contract and PSLs within one mile of the project limits exceeds five acres, provide a copy of the Contractor NOI PSLs on the right of way to the Engineer (to the appropriate Municipal Separate Storm Sewer System (MS4) Operator when on an Off-system State route).

Best Method Practices (BMP’s) may be adjusted to meet field conditions, or as directed. Engineer will verify all locations prior to placement of BMPs. Within the project limits, keep all inlets functional as long as possible to accept storm water as part of the Storm Water Pollution Prevention Plan (SWP3), as directed.

Grading operations will be limited to the catch point of the proposed cross-section.

Preserve any vegetation outside these limits.

Item 512 – Portable Traffic Barrier

Coordinate with the Engineer two weeks in advance to schedule pick-up of the Portable Concrete Traffic Barrier (PCTB) from the following location or as directed.

Maintenance Yard located at 12000 McCombs St. El Paso, Texas (Contact TxDOT El Paso Construction Office for updated pick location).

Contractor to provide connection hardware that are commonly known as metal cages are subsidiary to this Item and shall remain the property of the Department at the end of the project.

Any PCTB furnished by the Department damaged in the process of transporting handling or placement shall be repaired, or replaced at the Contractor’s expense.

Clean, paint or surface-treat any sections of PCTB furnished by the Department before usage, as directed by the Engineer.

Upon termination of the need for the PCTB and connection hardware shall remain the property of the Department. Deliver all materials to the original storage site, or as directed.

Item 533 – Milled Rumble Strips

Ensure all loose or excess material or debris generated by the grinding process is removed and disposed of by vacuum immediately prior to placing pavement markings, unless otherwise directed or approved by the Engineer. Do not dispose of the debris within the right of way.

Item 540 – Metal Beam Guard Fence

Provide composite blockouts for all Metal Beam Guard Fence (MBGF) posts.

Install guardrails in the direction of traffic flow.

Stake the locations for approval prior to beginning the installation of the proposed MBGF.

Remove all delineators and object markers associated with the MBGF. This work will be subsidiary to the various bid items.

Verify MBGF post lengths and heights prior to ordering materials.

Place reflectors, as per Delineator and Pavement Marker Standard sheet D&OM (1)-20 on the metal beam rail element or as directed.

At the end of each work day, protect all untreated, incomplete, MBGF/Rail blunt ends exposed to traffic flow during construction until the permanent end treatment is in place. All work and incidentals are considered subsidiary to this Item.

MBGF not used will become the property of the Contractor.

Item 544 –Guardrail End Treatments

Provide certifications from the approved manufacturer’s online training for all personnel installing end treatments prior to beginning work.

Item 585 – Ride Quality for Pavement Surfaces

Use Surface Test Type B to govern ride quality for finished riding surfaces of travel lanes. Notify the District Laboratory 48 hours prior to conducting Surface Test Type B. Properly mark all starting/ending points, and leave-out sections prior to testing. Deliver test results within 24 hours of testing. Provide all profile measurements in electronic data to ELP-LAB@txdot.gov using the format specified in Tex-1001-S.

“Payment Adjustment, Schedule 2” will be used for the overlayed travel lanes.

An IRI > 95 will require corrective action.

Use diamond grinding or equivalent to correct areas of localized roughness. For flexible pavements, use CSS-1H emulsion to fog seal the corrected areas.

Milling will not be allowed as a corrective action for excessive deviations in the surface layer of hot mix.

Item 644 – Small Roadside Sign Assemblies

Stake all sign locations and receive approval prior to sign placement.

The 2-1/2 inch, Schedule 10 post will meet the following requirements:

- 0.120 in. nominal wall thickness
- Seamless or electric-resistance welded steel tubing or pipe
- Steel will be HSLAS Grade 55 per ASTM A1011 or ASTM A1008

Other steel may be used, if it meets the following:

- 55,000 psi minimum yield strength
- 70,000 psi minimum tensile strength
- 20% minimum elongation in 2 in.
- Wall thickness (uncoated) to be within the range of 0.108 in. to 0.132 in. galvanization per ASTM A123 or ASTM A653 G90

For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metalizing with zinc wire per ASTM B833.

Verify all post lengths to ensure the proper sign height. Remove and replace any sign installed incorrectly. This work will be done at no expense to the Department.

Provide Texas Universal Triangular Slip Base clamp type for all signs as shown on SMD (Slip-1)-08.

As directed, some regulatory and guide signs will be relocated before construction begins. Mark and locate each reference marker perpendicular to the road and along the right of way, or as directed, prior to removal. Re-erect reference markers at their original location upon completion of construction.

All signs removed will remain property of the Department.

Item 658 – Delineator and Object Marker Assemblies

Verify all locations with the Engineer prior to installation.

Removal and proper disposal of all existing delineators, object markers, and any non-standard hardware assemblies are not paid directly, but will be considered subsidiary to pertinent items for payment.

Item 662 – Work Zone Pavement Markings

In those areas where existing pavement markings are to be covered or removed, field locate and record the existing pavement markings by survey or other approved method by the Engineer as directed. Place final striping on these locations.

Remove and properly dispose of tabs upon completion of the final striping. This work is considered subsidiary to various bid items.

Item 666 –Retroreflectorized Pavement Markings

Use a pilot line for final striping and remove pilot line after all striping is complete. Removal will be in accordance with the methods specified in Item 677, “Eliminating Existing Pavement Markings and Markers,” and will be subsidiary to this Item.

Air blasting is required as pavement surface preparation.

In those areas where existing pavement markings are to be covered or removed, field locate and record the existing pavement markings by survey or other approved method by the Engineer as directed. Place final striping on these locations.

Item 672 – Raised Pavement Markers

Use a pilot line for final striping and remove pilot line after all striping is complete. Removal will be in accordance with the methods specified in Item 677, “Eliminating Existing Pavement Markings and Markers,” and will be subsidiary to this Item.

Air blasting is required for pavement surface preparation.

Furnish adhesives that conform to DMS-6100, “Epoxies and Adhesives,” and DMS-6130, “Bituminous Adhesive for Pavement Markers,” for this Item.

Do not place raised pavement markers when the pavement surface temperature is below 60°F.

Removal of all existing raised pavement markers will be considered subsidiary to the various bid items.

Item 3020 – Remove Shoulder Texturing

Prior to overlay work, remove and repair existing rumble strips by planing to the width and depth of the existing rumble strips. Then remove loose and foreign materials from the planed areas and apply tack coat prior to placing and compacting asphalt material. Removing and repairing of milled rumble strips to paid under this Item. Asphalt concrete placed in the planed surface shall be in accordance with Item 340,” Dense-Graded Hot-Mix Asphalt (Small Quantity),” (Type F). Provide D-GR HMA(SQ) TY-F PG64-22 or as directed by the Engineer.

Item 6185 – Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

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

Acquire the TCP and TMA Operator's certificates of completion prior to the authorization to begin work. No time suspension will be granted, and no traffic control work will be allowed without certificates of completion.

Up to two (2) total shadow vehicles with TMA will be required for this type of work. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

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

Basis of Estimate for Stationary TMAs				
		TMA(Stationary)		
Phase	Standard	Required	Additional	TOTAL
Overlay	TCP (1-2)-18	1	0	1
MBGF and Bridge Rail Installation	TCP (2-1)-18	1	0	1

	Basis of Estimate for Mobile TMAs			
		TMA(Mobile)		
Phase	Standard	Required	Additional	TOTAL
Pavement Markings and Rumble Strips	TCP (3-1)-13	2	0	2
RPM Installation	TCP (3-3)-14	2	0	2

QUANTITY SHEET

CONTROLLING PROJECT ID 0374-07-028 **DISTRICT** El Paso **COUNTY** Hudspeth
HIGHWAY US 62

			CONTROL SECTION JOB	**0374-07-028**		**0374-07-029**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00066023**		**A00132352**			
			COUNTY	**Hudspeth**		**Hudspeth**			
			HIGHWAY	**US 62**		**US 62**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL		
	134-6005	BACKFILL TY A	CY	1,009.000				1,009.000	
	314-6009	EMULS ASPH (EROSN CONT)(MULTI)	GAL	1,935.000				1,935.000	
	316-6001	ASPH (MULTI OPTION)	GAL	48,358.000				48,358.000	
	316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	967.000				967.000	
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	TON	1,367.000				1,367.000	
	340-6272	TACK COAT	GAL	2,868.000				2,868.000	
	346-6002	STONE-MTRX-ASPH SMA-C SAC-A PG76-22	TON	11,172.000				11,172.000	
	346-6058	TACK COAT	GAL	15,768.000				15,768.000	
	351-6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	1,000.000				1,000.000	
	354-6021	PLANE ASPH CONC PAV(0" TO 2")	SY	3,912.000				3,912.000	
	354-6134	PLANE ASPH CONC PAV (0" TO 1/2" MICRO)	SY	2,000.000				2,000.000	
	451-6017	RETROFIT RAIL (TY T552)	LF	380.000				380.000	
	500-6001	MOBILIZATION	LS	84.00%		16.00%		100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO			5.000		5.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	300.000				300.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	300.000				300.000	
	512-6017	PORT CTB (DES SOURCE)(F-SHAPE)(TY 1)	LF	1,300.000				1,300.000	
	512-6029	PORT CTB (MOVE)(F-SHAPE)(TY 1)	LF	1,300.000				1,300.000	
	512-6041	PORT CTB (STKPL)(F-SHAPE)(TY 1)	LF	1,300.000				1,300.000	
	533-6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	43,000.000				43,000.000	
	533-6004	RUMBLE STRIPS (CENTERLINE) ASPHALT	LF			108,695.000		108,695.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	1,462.500				1,462.500	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4.000				4.000	
	540-6020	MTL W - BEAM GD FEN (LOW FILL CULVERT)	LF	212.500				212.500	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	925.000				925.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	12.000				12.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	4.000				4.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA			6.000		6.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA			2.000		2.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA			3.000		3.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA			3.000		3.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	6.000				6.000	
	658-6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	8.000				8.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	24.000				24.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	4,320.000				4,320.000	
	666-6005	REFL PAV MRK TY I (W)4"(DOT)(090MIL)	LF			978.000		978.000	
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF			100.000		100.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 0374-07-028 **DISTRICT** El Paso **COUNTY** Hudspeth
HIGHWAY US 62

			CONTROL SECTION JOB	**0374-07-028**		**0374-07-029**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00066023**		**A00132352**			
			COUNTY	**Hudspeth**		**Hudspeth**			
			HIGHWAY	**US 62**		**US 62**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL		
	666-6071	REFL PAV MRK TY I(W)(LNDP ARW)(090MIL)	EA			4.000		4.000	
	666-6146	REFL PAV MRK TY I (Y)24"(SLD)(090MIL)	LF			1,230.000		1,230.000	
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF			43,000.000		43,000.000	
	666-6171	REFL PAV MRK TY II (W) 6" (BRK)	LF			4,190.000		4,190.000	
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF			19,900.000		19,900.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF			74,150.000		74,150.000	
	666-6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF			43,000.000		43,000.000	
	666-6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF			4,190.000		4,190.000	
	666-6311	RE PM W/RET REQ TY I (Y)4"(BRK)(090MIL)	LF			19,900.000		19,900.000	
	666-6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF			74,150.000		74,150.000	
	672-6007	REFL PAV MRKR TY I-C	EA			216.000		216.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA			3,039.000		3,039.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF			182,500.000		182,500.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF			100.000		100.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF			1,230.000		1,230.000	
	3020-6001	REMOVE SHOULDER TEXTURING	LF	48,400.000				48,400.000	
	6185-6002	TMA (STATIONARY)	DAY			63.000		63.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY			36.000		36.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000				1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000				1.000	

SUMMARY OF ROADWAY QUANTITIES

RDWY P & P SHEET NO.	ITEM NO.	134	314	316	316	340	340	346	346	351	354	354	533	3020
	DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6002	6021	6134	6003	6001
	STATION	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP) (SHOULDERS)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	PLANE ASPH CONC PAV (0"-2")	PLANE ASPH CONC PAV (0" TO 1/2" MICRO)	RUMBLE STRIPS (SHOULDER) ASPHALT	REMOVE SHOULDER TEXTURING
	CSJ: 0374-07-028	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(SY)	(SY)	(LF)	(LF)
1 OF 19	STA 4190+00 TO STA 4198+00	8.00	72.00	1,800.00	36.00	7.00	107.00	364.00	587.00	0.00	978.00	75.00	1,600.00	1,600.00
2 OF 19	STA 4192+00 TO STA 4198+00													1,200.00
2 OF 19	STA 4198+00 TO STA 4210+00	55.00	108.00	2,699.00	54.00	63.00	160.00	634.00	880.00	0.00	0.00	112.00	2,400.00	2,400.00
3 OF 19	STA 4210+00 TO STA 4222+00	18.00	108.00	2,699.00	54.00	82.00	160.00	639.00	880.00	0.00	0.00	112.00	2400.00	2400.00
4 OF 19	STA 4222+00 TO STA 4234+00	55.00	108.00	2,699.00	54.00	95.00	160.00	625.00	880.00	0.00	0.00	112.00	2400.00	2400.00
5 OF 19	STA 4234+00 TO STA 4246+00	45.00	108.00	2,699.00	54.00	83.00	160.00	623.00	880.00	0.00	0.00	112.00	2400.00	2400.00
6 OF 19	STA 4246+00 TO STA 4258+00	52.00	108.00	2,699.00	54.00	87.00	160.00	630.00	880.00	0.00	0.00	112.00	2400.00	2400.00
7 OF 19	STA 4258+00 TO STA 4270+00	103.00	108.00	2,699.00	54.00	88.00	160.00	629.00	880.00	0.00	0.00	112.00	2400.00	2400.00
8 OF 19	STA 4270+00 TO STA 4282+00	49.00	108.00	2,699.00	54.00	158.00	160.00	637.00	880.00	0.00	0.00	112.00	2400.00	2400.00
9 OF 19	STA 4282+00 TO STA 4289+00													1400.00
9 OF 19	STA 4282+00 TO STA 4291+00	24.00	81.00	2,024.00	40.00	47.00	120.00	423.00	660.00	0.00	978.00	84.00	1800.00	1800.00
10 OF 19	STA 4611+00 TO STA 4622+00	91.00	99.00	2,474.00	49.00	30.00	147.00	593.00	807.00	0.00	978.00	103.00	2200.00	2200.00
10 OF 19	STA 4613+00 TO STA 4622+00													1800.00
11 OF 19	STA 4622+00 TO STA 4634+00	126.00	108.00	2,699.00	54.00	55.00	160.00	637.00	880.00	0.00	0.00	112.00	2400.00	2400.00
12 OF 19	STA 4634+00 TO STA 4646+00	27.00	108.00	2,699.00	54.00	39.00	160.00	633.00	880.00	0.00	0.00	112.00	2400.00	2400.00
13 OF 19	STA 4646+00 TO STA 4658+00	28.00	108.00	2,699.00	54.00	72.00	160.00	628.00	880.00	0.00	0.00	112.00	2400.00	2400.00
14 OF 19	STA 4658+00 TO STA 4670+00	36.00	108.00	2,699.00	54.00	62.00	160.00	634.00	880.00	0.00	0.00	112.00	2400.00	2400.00
15 OF 19	STA 4670+00 TO STA 4682+00	57.00	108.00	2,699.00	54.00	76.00	160.00	636.00	880.00	0.00	0.00	112.00	2400.00	2400.00
16 OF 19	STA 4682+00 TO STA 4694+00	39.00	108.00	2,699.00	54.00	69.00	160.00	626.00	880.00	0.00	0.00	112.00	2400.00	2400.00
17 OF 19	STA 4694+00 TO STA 4706+00	54.00	108.00	2,699.00	54.00	46.00	160.00	634.00	880.00	0.00	0.00	112.00	2400.00	2400.00
18 OF 19	STA 4706+00 TO STA 4718+00	80.00	108.00	2,699.00	54.00	44.00	160.00	634.00	880.00	0.00	0.00	112.00	2400.00	2400.00
19 OF 19	STA 4718+00 TO STA 4723+00													1000.00
19 OF 19	STA 4718+00 TO STA 4725+00	62.00	63.00	1,575.00	32.00	14.00	94.00	313.00	514.00	0.00	978.00	66.00	1400.00	1400.00
SUPER 2 LIMITS TRAVEL LANE LEVEL-UP						150.00*								
SUPER 2 LIMITS PAVEMENT REPAIR										1000.00**				
TOTAL		1,009.00	1,935.00	48,358.00	967.00	1,367.00	2,868.00	11,172.00	15,768.00	1,000.00	3,912.00	2,000.00	43,000.00	48,400.00

*FOR CONTRACTOR'S INFORMATION. CONTRACTOR TO PERFORM SURFACE TEST TYPE B AS PER ITEM 585 AND TEX-1001-S TO LOCATE AREAS REQUIRING EITHER CORRECTIVE ACTION OR LOCALIZE ROUGHNESS. PLACE D-GR-HMA (SQ) TY-D PG 70-22 (LEVEL UP) TO FILL THE DIPS IDENTIFIED BY SURFACE TEST TYPE B PRIOR TO THE PLACEMENT OF UNDERSEAL AND STONE-MATRIX ASPHALT OVERLAY, AS DIRECTED BY THE ENGINEER. THE QUANTITY MAY VARY.

** FOR CONTRACTOR'S INFORMATION. THE QUANTITY MAY VARY.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED
PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

SUMMARY OF ROADWAY QUANTITIES

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			10
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

0374-07-028: SUMMARY OF ROADWAY ITEMS												
LOCATION	451 6017	506 6038	506 6039	540 6001	540 6006	540 6020	542 6001	544 6001	544 6003	658 6014	658 6062	658 6060
	RETROFIT RAIL (TY T552)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	MTL W - BEAM GD FEN (LOW FILL CULVERT)	REMOVE METAL BEAM GUARD FENCE	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF 2(BI)	REMOVE DELIN & OBJECT MARKER ASSMS
	LF	LF	LF	LF	EA	LF	LF	EA	EA	EA	EA	EA
CULVERT 1		100	100	300		100		4			6	2
CULVERT 2		100	100	300		112.5		4			6	2
8 MILE DRAW BRIDGE	380	100	100	862.5	4		925	4	4	6	12	4
PROJECT TOTALS	**380**	**300**	**300**	**1462.5**	**4**	**212.5**	**925**	**12**	**4**	**6**	**24**	**8**

0374-07-028: SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS				
LOCATION	512 6017	512 6029	512 6041	662 6111
	PORT CTB (DES SOURCE)(F-SHAPE)(TY 1)	PORT CTB (MOVE)(F-SHAPE)(TY 1)	PORT CTB (STKPL)(F-SHAPE)(TY 1)	WK ZN PAV MRK SHT TERM (TAB)TY Y-2
	LF	LF	LF	EA
8 MILE DRAW BEIDGE	1300	1300	1300	
EB & WB SUPER 2 PASSING				4320
PROJECT TOTALS	**1300**	**1300**	**1300**	**4320**

0374-07-029: SUMMARY OF PAVEMENT MARKING ITEMS																	
LOCATION	666 6005	666 6035	666 6146	666 6170	666 6171	666 6071	666 6205	666 6207	666 6302	666 6305	666 6311	666 6314	672 6007	672 6009	677 6001	677 6003	677 6007
	REFL PAV MRK TY I (W)4"(DOT)(090MIL)	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	REFL PAV MRK TY I (Y)24"(SLD)(090MIL)	REFL PAV MRK TY II (W) 4" (SLD)	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY I(W)(LNDPARW)(090MIL)	REFL PAV MRK TY II (Y) 4" (BRK)	REFL PAV MRK TY II (Y) 4" (SLD)	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	RE PM W/RET REQ TY I (Y)4"(BRK)(090MIL)	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (24")
	LF	LF	LF	LF	LF	EA	LF	LF	LF	LF	LF	LF	EA	EA	LF	LF	LF
SHEET 1	339			4000	20	2		4000	4000	20		4000	1	50	8000		
SHEET 2				4800	600			4800	4800	600		4800	30	60	9600		
SHEET 3				4800	600			4800	4800	600		4800	30	60	9600		
SHEET 4				4800	600			4800	4800	600		4800	30	60	9600		
SHEET 5	150			1800	110			1800	1800	110		1800	6	24	3600		
SHEET 6	150			4000	390			4000	4000	390		4000	20	50	8000		
SHEET 7				4800	600			4800	4800	600		4800	30	60	9600		
SHEET 8				4800	600			4800	4800	600		4800	30	60	9600		
SHEET 9				4800	600			4800	4800	600		4800	30	60	9600		
SHEET 10	339			4400	70	2		4400	4400	70		4400	4	55	8800		
SHEET 11 - TABLE 1							19900	21750			19900	21750		2040	87100		
SHEET 11 - TABLE 2		100	1230					9400				9400	5	460	9400	100	1230
PROJECT TOTALS	**978**	**100**	**1230**	**43000**	**4190**	**4**	**19900**	**74150**	**43000**	**4190**	**19900**	**74150**	**216**	**3039**	**182500**	**100**	**1230**

0374-07-029: SUMMARY OF ROADWAY ITEMS	
LOCATION	533 6004
	RUMBLE STRIPS (CENTERLINE) ASPHALT
	LF
EB & WB SUPER 2 PASSING LANES	21600
2 LANE 2 WAY	87095
PROJECT TOTALS	**108695**

0374-07-029: SUMMARY OF SIGNING ITEMS				
LOCATION	644 6001	644 6004	644 6030	644 6076
	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TYS80(1)SA(T)	REMOVE SM RD SN SUP&AM
	EA	EA	EA	EA
	6	2	3	3
PROJECT TOTALS	**6**	**2**	**3**	**3**

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS				
LOCATION	500 6001	502 6001	6185 6002	6185 6005
	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	LS	MO	DAY	DAY
0374-07-028	0.84			
0374-07-029	0.16	5	63	36
PROJECT TOTALS	**1**	**5**	**63**	**36**

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

05/10/2021

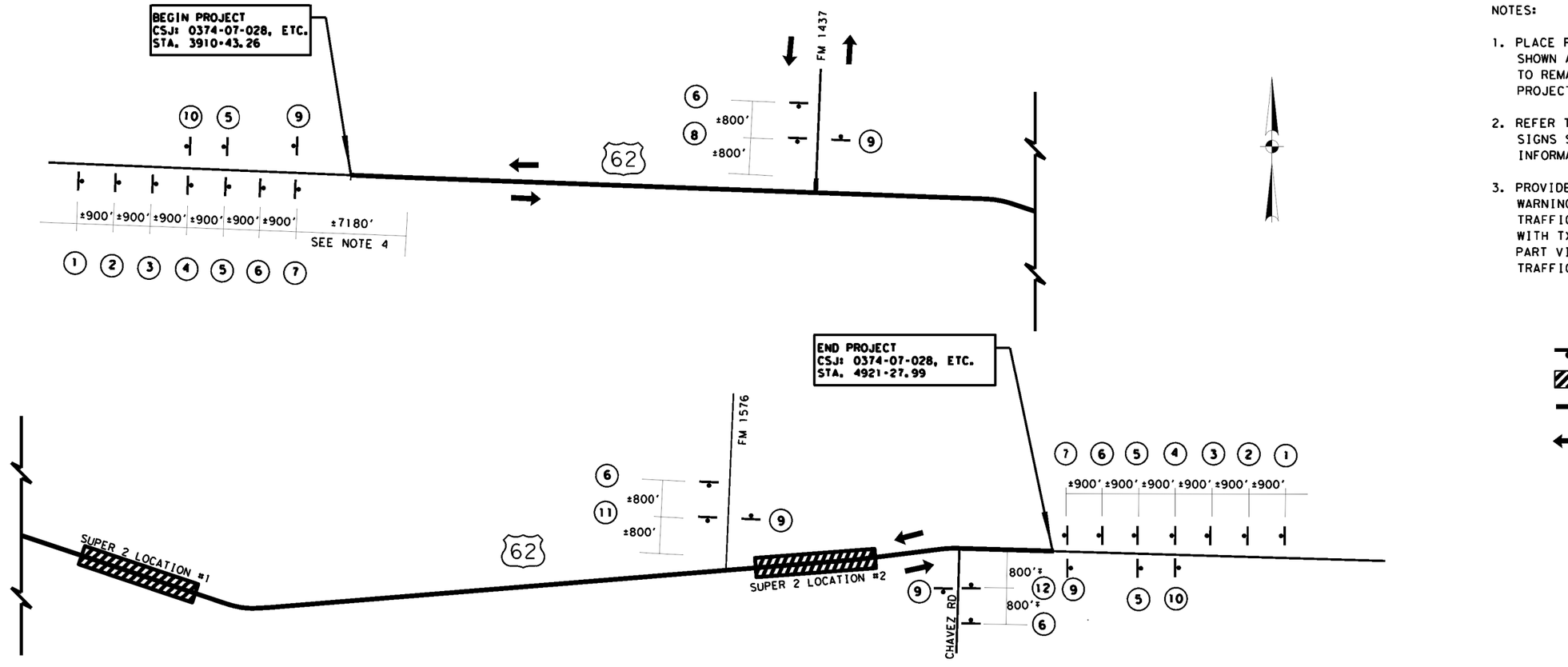
US 62

QUANTITY SUMMARY

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		11



NOTES:

1. PLACE PROJECT LIMITS SIGNS AT LOCATIONS SHOWN AS FIELD CONDITIONS PERMIT. SIGNS TO REMAIN FOR THE DURATION OF THE PROJECT OR AS DIRECTED.
2. REFER TO BC(2) FOR CONSTRUCTION WARNING SIGNS SPACING AND ADDITIONAL SIGNING INFORMATION.
3. PROVIDE AND MAINTAIN ALL BARRICADES, WARNING SIGNS, FLASHING LIGHTS & TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH TXDOT BC AND TCP STANDARDS, AND PART VI OF THE "TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES."

LEGEND

- CONSTRUCTION WARNING SIGN
- SUPER 2s LOCATION
- WORK AREA
- TRAFFIC FLOW

(1) Give Us A BRAKE — CW21-1T, 48" X 48"

(2) OBEY WARNING SIGNS STATE LAW — R20-3T, 48" X 42"

(3) STAY ALERT / TALK OR TEXT LATER — G20-10T, 48" X 60"

(4) BEGIN WORK ZONE — G20-9TP, 36" X 30"
TRAFFIC FINES DOUBLE — R20-5T, 36" X 36"
WHEN WORKERS ARE PRESENT — R20-5aTP, 36" X 18"

(5) SPEED LIMIT 75 — R2-1, 36" X 48"

(6) ROAD WORK AHEAD — CW20-1D, 48" X 48"

(7) BEGIN ROAD WORK NEXT 2 MILES — G20-5T, 48"X24"
NAME ADDRESS CITY STATE
CONTRACTOR — G20-6T, 48"X30"

(8) ROAD WORK ⇦ NEXT 17 MILES NEXT 4 MILES ⇨ — G20-1aT, 72"x 36"

(9) END ROAD WORK — G20-2, 48" X 24"

(10) END WORK ZONE — G20-2bT, 48" X 24"

(11) ROAD WORK ⇦ NEXT 10 MILES NEXT 11 MILES ⇨ — G20-1aT, 72"x 36"

(12) ROAD WORK ⇦ NEXT 20 MILES NEXT 1 MILES ⇨ — G20-1aT, 72"x 36"

STATE OF TEXAS
SHEETAL ASHISH PATEL
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PROFESSIONAL ENGINEER

Sheetal Patel, P.E.
02/04/2021

US 62

TRAFFIC CONTROL PLAN

LINE DIAGRAM

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		12

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TCP GENERAL NOTES

1. ALL SIGNS, BARRICADES, WORK ZONE PAVEMENT MARKINGS AND DEVICES SHALL CONFORM WITH THE BC STANDARD SHEETS, TCP SHEETS AND THE LATEST EDITION OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES." ANY DEVIATION FROM THE APPROVED TCP SHALL BE REVIEWED AND APPROVED BY THE ENGINEER.

2. ROADWAY DRAINAGE MUST BE MAINTAINED AT ALL TIMES.

3. ACCESS TO ADJOINING PROPERTY (IF ANY) MUST BE MAINTAINED AT ALL TIMES.

4. DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC.

SEQUENCE OF WORK

THIS PROJECT WILL BE CONSTRUCTED IN TWO PHASES. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS AND BARRICADES AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

DAILY LANE CLOSURES WILL BE USED IN ACCORDANCE WITH TXDOT TCP STANDARDS. FOR OVERLAY OPERATIONS, LANE CLOSURES SHALL BE LIMITED TO THE LENGTH THAT CAN ACTUALLY BE COMPLETED DURING A WORKDAY, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

LANE CLOSURES AND CONSTRUCTION WILL BE LIMITED TO DAYTIME OPERATIONS. ANY NIGHT WORK MUST BE APPROVED IN WRITING BY THE ENGINEER.

AT THE END OF EACH WORKING DAY, UNLESS OTHERWISE DIRECTED BY THE ENGINEER, THE ROADWAY WILL BE OPENED TO TWO-LANES TRAFFIC.

ANY LONGITUDINAL DIFFERENCE IN ELEVATION SHALL BE TAPERED TO MEET A MINIMUM 3:1 SLOPE AND PROVIDE SIGNAGE PER STANDARD WZ(UL)-13 AT LOCATIONS WHERE THIS CONDITION EXISTS.

OVERLAY OPERATIONS SHALL BE PERFORMED IN THE DIRECTION OF TRAFFIC.

PHASE 1A: WB SUPER 2 OVERLAY OPERATIONS FROM STA 4190+00.00 TO 4291+00.00

1. SET UP PROJECT BARRICADES AND SIGNS.

2. INSTALL REQUIRED TEMPORARY EROSION CONTROL DEVICES.

3. CLOSE ONE LANE AND SHIFT TRAFFIC AS SHOWN ON THE TCP TYPICAL SECTIONS AND AS PER TCP (1-2)-18.

4. MILL AND INLAY THE EXISTING SHOULDER RUMBLE STRIPS AS PER ITEM 3020,"REMOVE SHOULDER TEXTURING."

5. LEVEL-UP SHOULDER TO REMOVE THE EXISTING GRADE BREAK ENSURING THAT THE FINAL CROSS SLOPE IS CONSISTENT FROM THE INSIDE EDGE OF THE SHOULDER TO THE OUTSIDE EDGE OF THE SHOULDER.

6. PERFORM MICRO-MILL AND LEVEL UP TO CORRECT RIDE AT THE LOCATIONS IDENTIFIED BY SURFACE TEST TYPE B, AS PER ITEM 585.

7. PERFORM FLEXIBLE PAVEMENT REPAIRS, AS REQUIRED AT THE LOCATIONS VERIFIED BY THE ENGINEER.

8. PLACE ONE COURSE UNDERSEAL SURFACE TREATMENT.

9. PLACE PROPOSED 2" STONE- MATRIX ASPHALT(SMA) TY C AND BACKFILL THE PAVEMENT EDGES. CONTRACTOR TO VERIFY AND MATCH EXISTING SLOPE ON THE LANE. CONTRACTOR TO OVERLAY THE UNDERSEAL AREA WITHIN THE SAME WEEK OF PLACEMENT OF SMA.

10. INSTALL TEMPORARY PAVEMENT MARKING TABS.

PHASE 1B: EB SUPER 2 OVERLAY OPERATIONS FROM STA 4611+00.00 TO 4725+00.00

1. REPEAT PHASE 1A FOR OPPOSITE DIRECTION CONSTRUCTION OPERATIONS.

PHASE 2: INSTALL MISCELLANEOUS ITEMS AND FINAL CLEAN UP

1. INSTALL RUMBLE STRIPS AND FINAL PAVEMENT MARKINGS.

2. INSTALL PERMANENT SIGNS.

3. INSTALL MBGF AND RETROFIT BRIDGE RAIL (T552).

4. PERFORM FINAL CLEAN UP.

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
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PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

02/17/2021

US 62

TRAFFIC CONTROL PLAN

WORK ZONE TCP NARRATIVE

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		13

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DN: CK: DW: CK:

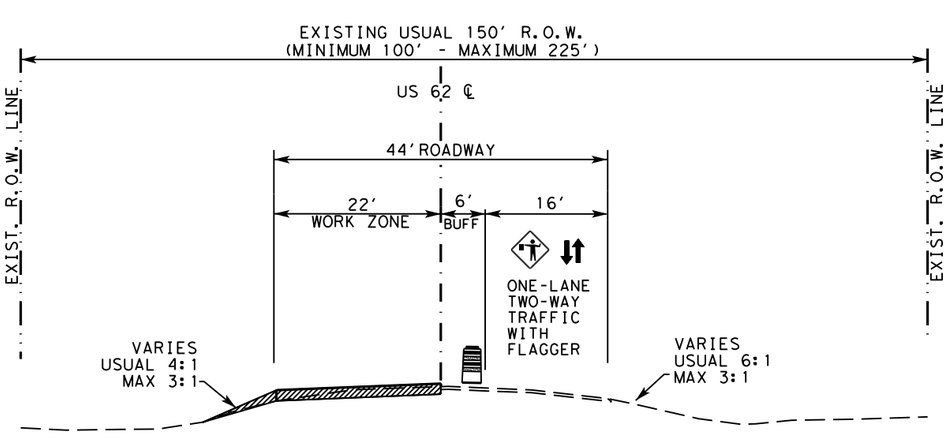
TABLE 1: TCP SELECTION TABLE				
TYPE OF WORK	STANDARD SHEET	SHEET DESCRIPTION	SHEET DIAGRAM	SUGGESTED USE
LEVEL-UP, UNDERSEAL, AND OVERLAY: STA 4190+00.00 TO 4291+00.00	TCP(1-2)-18	ONE LANE TWO-WAY CONTROL	TCP (1-2b)	ONE-LANE TWO-WAY TRAFFIC CONTROL WITH FLAGGERS
MBGF INSTALLATION	TCP(2-1)-18	CONVENTIONAL ROAD SHOULDER WORK	TCP (2-1b) OR TCP (2-1c)	WORK SPACE ON SHOULDEROR OR WORK VEHICLES ON SHOULDERS AS APPLICABLE
BRIDGE T552 RAIL INSTALLATION	TCP(2-1)-18	CONVENTIONAL ROAD SHOULDER WORK	TCP (2-1b)	WORK SPACE ON SHOULDEROR
RUMBLE STRIPS	TCP(3-1)-13	MOBILE OPERATIONS - UNDIVIDED HIGWAYS	TCP (3-1b)	MOBILE OPERATION
PAVEMENT MARKING	TCP(3-1)-13	MOBILE OPERATIONS - UNDIVIDED HIGWAYS	TCP (3-1b)	MOBILE OPERATION
RPM INSTALLATION	TCP(3-3)-14	MOBILE OPERATIONS RPM INSTALLATION/REMOVAL	TCP (3-3a)	MOBILE OPERATION

NOTES:

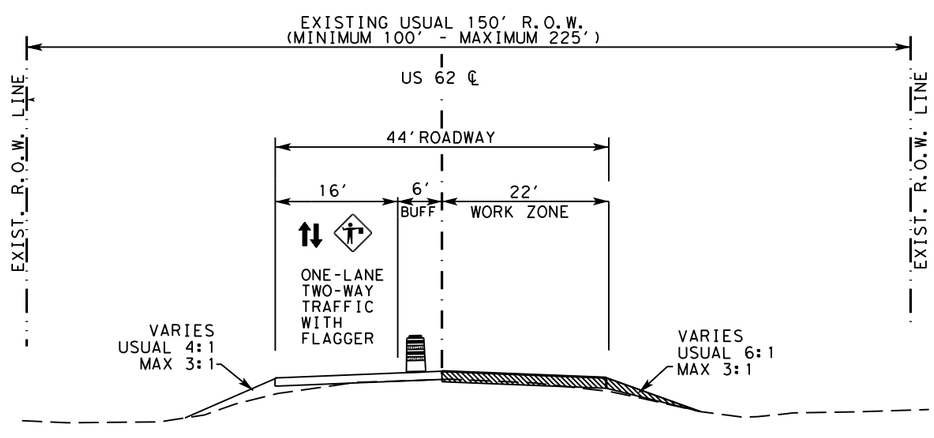
1. USE PILOT CAR TO CONTROL TRAFFIC DIRECTION AND SPEED DURING WORK HOURS.
2. CLOSE ONE LANE AND SHIFT TRAFFIC AS SHOWN ON THE TCP TYPICAL SECTIONS AND AS PER TCP(1-2)-18.
3. ONLY ONE LANE CLOSURE WILL BE ALLOWED AT ANY GIVEN TIME.
4. ONLY WORK AT ONE PASSING LANE LOCATION AT A TIME.
5. PLACE WORK ZONE SHORT TERM TABS AND PERFORM CLEAN- UP OPERATION PRIOR TO MOVING TO A NEW REFERENCE OR PRIOR TO OPENING TO TRAFFIC AT THE END OF THE DAY.
6. AT THE END OF EACH WORKING DAY, UNLESS OTHERWISE DIRECTED BY THE ENGINEER, THE ROADWAY WILL BE OPENED TO EXISTING TWO-LANE TRAFFIC OPERATIONS.

LEGEND

PROPOSED WORK ZONE



PROPOSED TYPICAL WB DURING WORK HOURS
LEVEL-UP, UNDERSEAL AND OVERLAY OPERATION
STA. 4190+00.00 TO 4291+00.00
STA. 4610+00.00 TO 4725+00.00



PROPOSED TYPICAL EB DURING WORK HOURS
LEVEL-UP, UNDERSEAL AND OVERLAY OPERATION
STA. 4190+00.00 TO 4291+00.00
STA. 4610+00.00 TO 4725+00.00

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.
03/03/2021

US 62

TRAFFIC CONTROL PLAN

WORK ZONE TYPICAL SECTIONS SUPER 2'S

SCALE: NTS SHEET 1 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		14

DATE: 3/3/2021 2:16:00 PM
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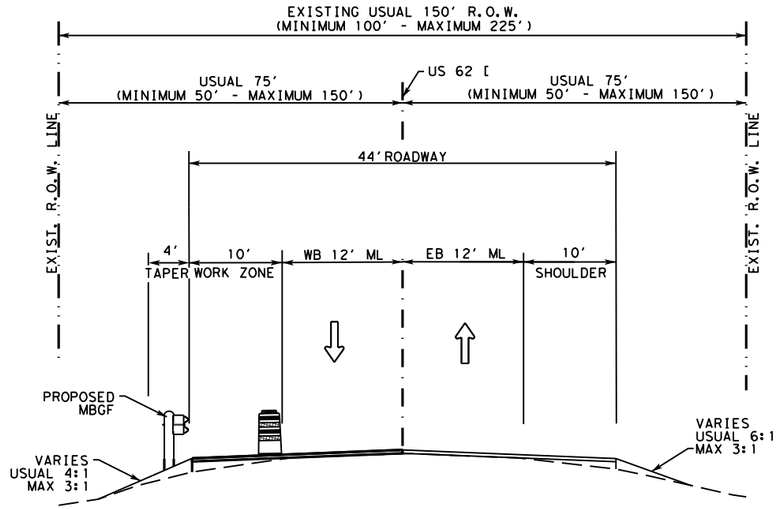
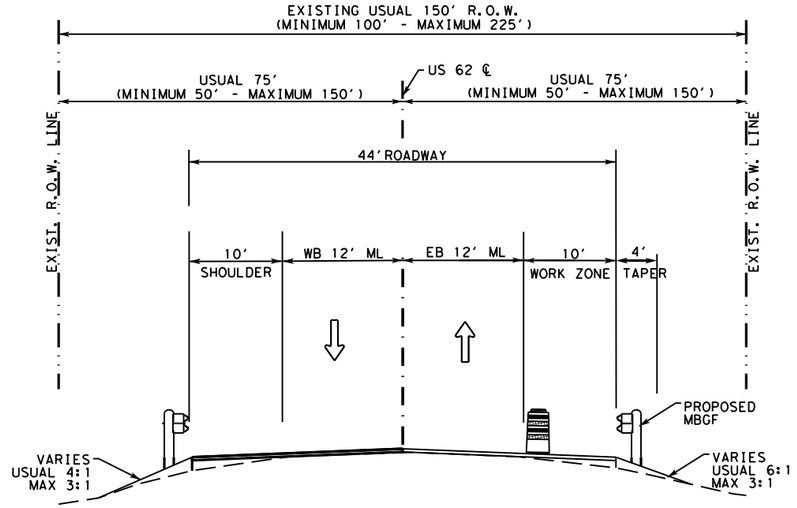


PROPOSED MBGF WB

STA. 4294+25.00 TO 4297+08.66
STA. 4297+08.66 TO 4301+23.00
STA. 4318+00.00 TO 4321+00.00



PROPOSED MBGF EB

STA. 4294+25.00 TO 4297+08.66
STA. 4297+08.66 TO 4301+23.00
STA. 4318+00.00 TO 4321+00.00

NOTES:

1. THE PROPOSED MBGF WILL BE PLACED AT THE EXISTING EDGE OF PAVEMENT.
2. REFER TO THE STANDARD FOR SINGLE GUARDRAIL TERMINAL (SGT) DETAILS.
3. PLACE THE PROPOSED MBGF TO MATCH THE FACE OF RAIL ON BRIDGE, OR AS DIRECTED BY THE ENGINEER.
4. THE REMOVED MBGF SHALL BE REPLACED BY THE END OF EACH WORK DAY.
5. REFER TO TCP STANDARD (2-1)-18 CONVENTIONAL ROAD SHOULDER WORK FOR ADDITIONAL DETAILS.
6. ONE LANE CLOSURE DURING THE DAY IS OPTIONAL AND AT THE DISCRETION OF THE ENGINEER, REFER TO THE APPLICABLE TCP STANDARD.
7. REFER TO GF(31)-14 AND GF(31)TR-14 STANDARDS FOR ADDITIONAL METAL BEAM GUARD FENCE AND THRIE BEAM TRANSITION DETAILS.

LEGEND

TRAFFIC FLOW

PLASTIC DRUM

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

02/04/2021

US 62

TRAFFIC CONTROL PLAN

WORK ZONE TYPICAL SECTIONS MBGF

SCALE: NTS

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		15

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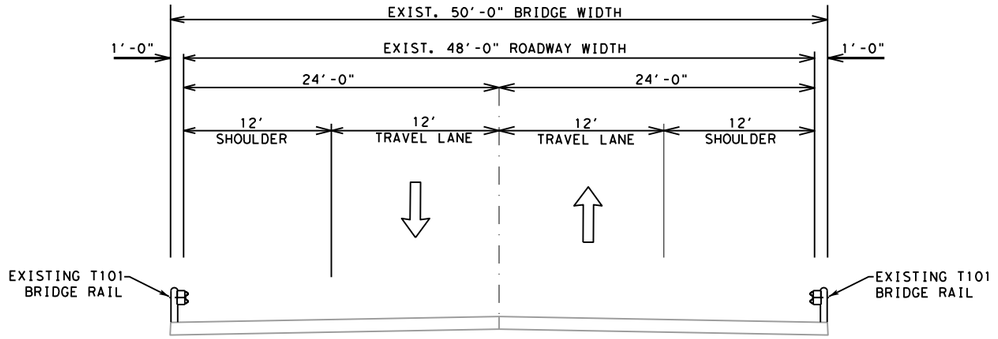


EXISTING TYPICAL BRIDGE SECTION ROADWAY US 62

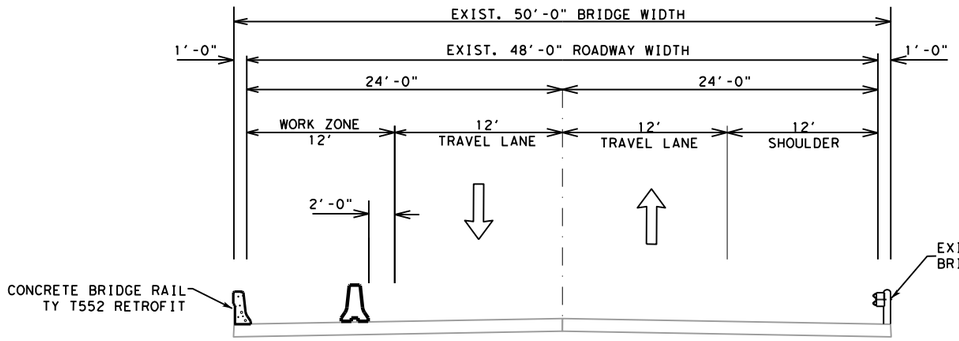
STA. 4297+08.66 TO STA 4298+88.66

NOTES:

1. THE PROPOSED RETROFIT RAIL (T552) WILL BE PLACED AT THE EXISTING EDGE OF PAVEMENT.
2. REFER TO TCP STANDARD (2-1)-18 CONVENTIONAL ROAD SHOULDER WORK FOR ADDITIONAL DETAILS.
3. REFER TO GF(31)-14 AND GF(31)TR-14 STANDARDS FOR ADDITIONAL METAL BEAM GUARD FENCE AND THRIE BEAM TRANSITION DETAILS.
4. REFER TO TRAFFIC RAIL TYPE T552 STANDARD FOR ADDITIONAL DETAILS.
5. REFER TO TCP STANDARD (2-1)-18 CONVENTIONAL ROAD SHOULDER WORK FOR TAPER LENGTH OF PCTB.

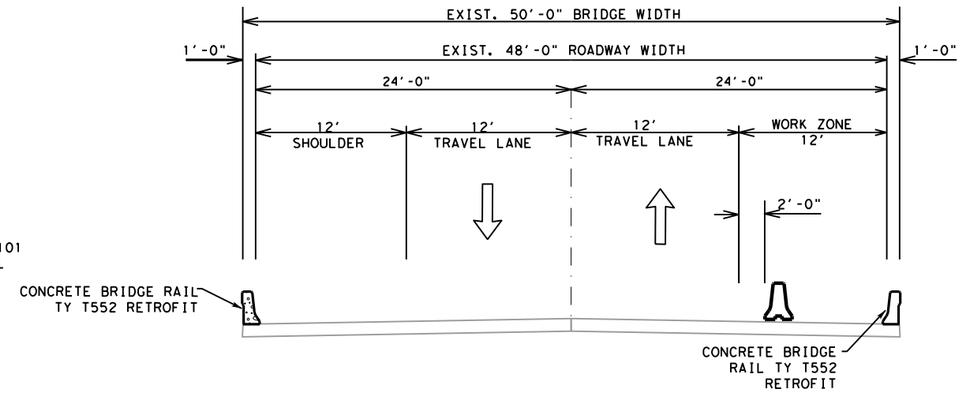
LEGEND

CONCRETE SAFETY BARRIER (F-SHAPE)



PROPOSED RETROFIT RAIL TYPICAL ROADWAY US 62 (WB)

STA. 4297+08.66 TO STA 4298+88.66

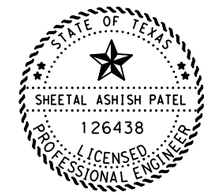


PROPOSED RETROFIT RAIL TYPICAL ROADWAY US 62 (EB)

STA. 4297+08.66 TO STA 4298+88.66

0374-07-028: WORKZONE TRAFFIC CONTROL ESTIMATE QUANTITY

ITEM	CODE	DESCRIPTION	UNIT	QTY
512	6017	PORT CTB (DES SOURCE)(F-SHAPE)(TY 1)	LF	1300
512	6029	PORT CTB (MOVE)(F-SHAPE)(TY 1)	LF	1300
512	6041	PORT CTB (STKPL)(F-SHAPE)(TY 1)	LF	1300



Sheetal Patel, P.E.

02/17/2021

US 62

TRAFFIC CONTROL PLAN

WORK ZONE TYPICAL SECTIONS BRIDGE T552 RAIL

SCALE: NTS SHEET 3 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		16

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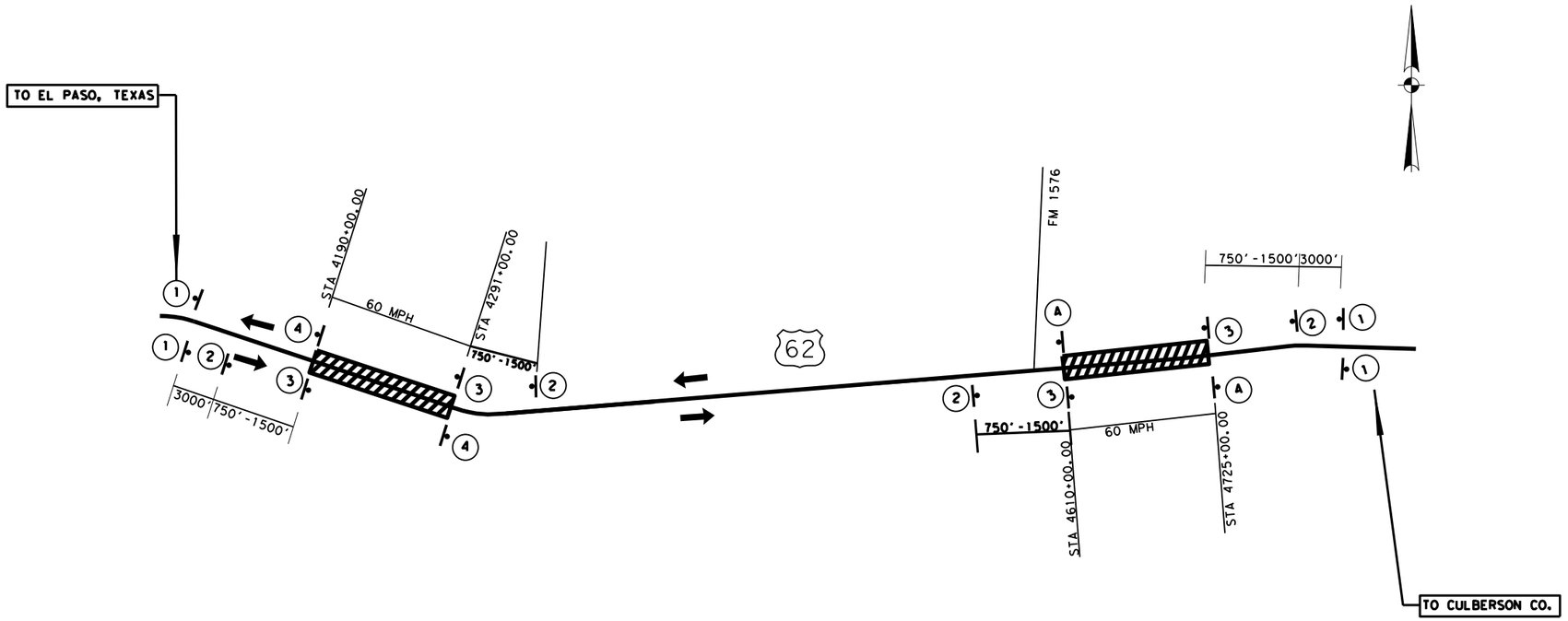
CK: DW: CK:



NOTES:

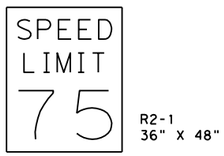
1. RELOCATE SIGNS 2,3,& 4 FOR EACH OF THE REMAINING WORK ZONES ADJUSTING SIGN SPACING APPROPRIATELY AS PER SEQUENCE OF CONSTRUCTION OR DIRECTED. REFER TO TRAFFIC CONTROL LINE DIAGRAM.
2. REFER TO BC(2) FOR CONSTRUCTION WARNING SIGNS SPACING AND ADDITIONAL SIGNING INFORMATION.
3. PROVIDE AND MAINTAIN ALL BARRICADES, WARNING SIGNS, FLASHING LIGHTS & TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH TXDOT BC AND TCP STANDARDS, AND PART VI OF THE "TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES."
4. USE TRUCK-MOUNTED ATENUATOR AS SHOWN ON TCP STANDARDS.

LEGEND

- CONSTRUCTION WARNING SIGN
- SUPER 2s LOCATION
- WORK AREA
- TRAFFIC FLOW

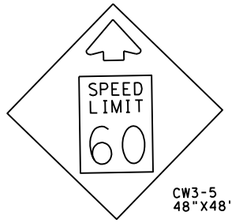
US 62 POSTED SPEED LIMIT = 75 MPH
FM 1576 POSTED SPEED LIMIT = 55 MPH

(1)



R2-1
36" X 48"

(2)



CW3-5
48"X48"

(3)

G20-5aP
36"X24"

R2-1
36"X48"

(4)

R2-1
36" X 48"

Sheetal Patel, P.E.

03/01/2021

US 62

TRAFFIC CONTROL PLAN

TRAFFIC CONTROL SPEED REDUCTION LINE DIAGRAM

SCALE: NTS SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		17

DATE: 3/1/2021 8:41:57 PM
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DATE: 2/4/2021 9:45:51 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\0374070284 - Design\Plan Sets\Standards\TRAFFIC CONTROL PLAN STANDARDS\bc-14.dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

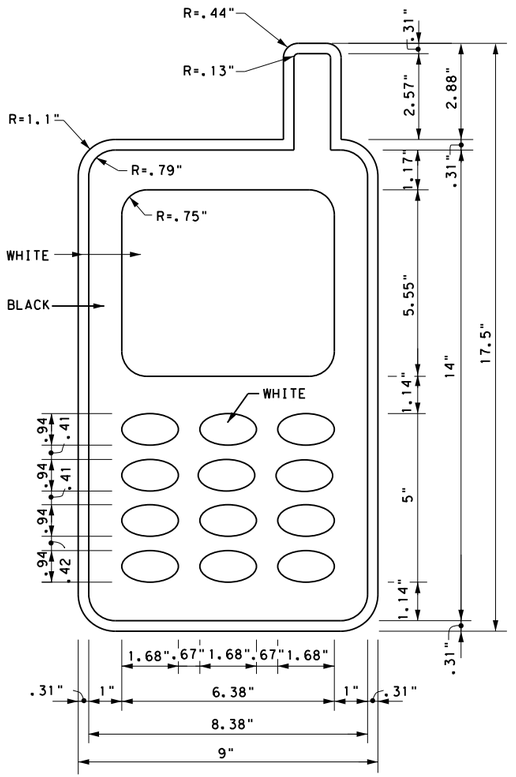
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

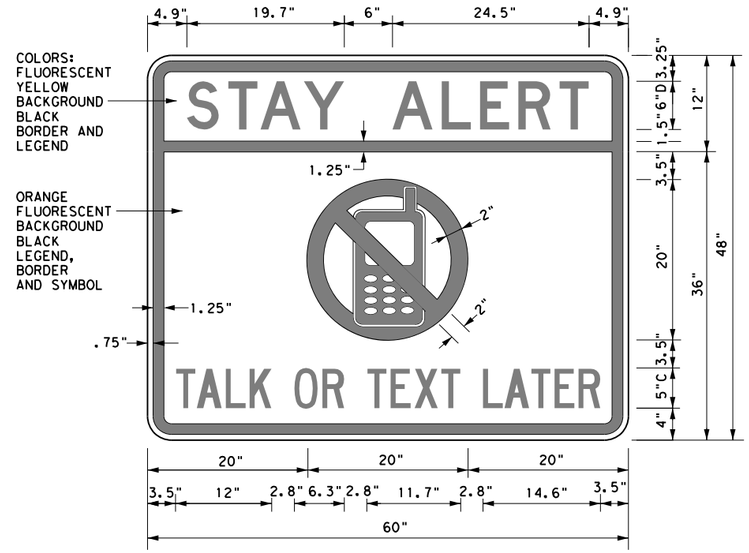
12. The Engineer has the final decision on the location of all traffic control devices.

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

WORKER SAFETY APPAREL NOTES:

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





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

SIGN DETAIL (G20-10T)

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

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

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

Texas Department of Transportation | Traffic Operations Division Standard

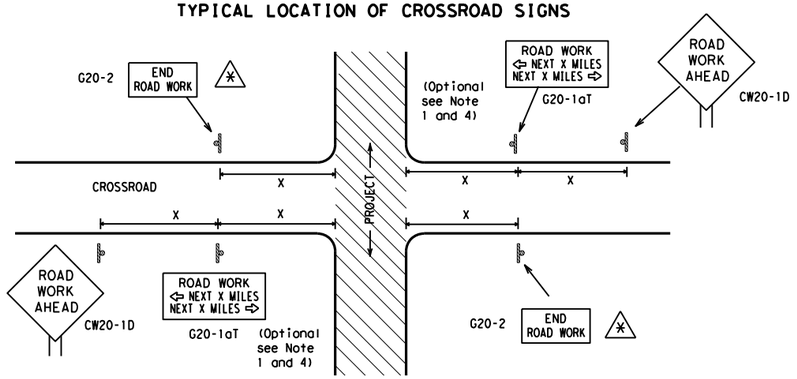
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
4-03 5-10 8-14	DIST	COUNTY		SHEET NO.
9-07 7-13	ELP	HUDSPETH		18

DATE: 2/4/2021 9:45:52 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\037407028\4 - Design\Plan Set\Standards\TRAFFIC CONTROL PLAN STANDARDS\bc-14.dgn

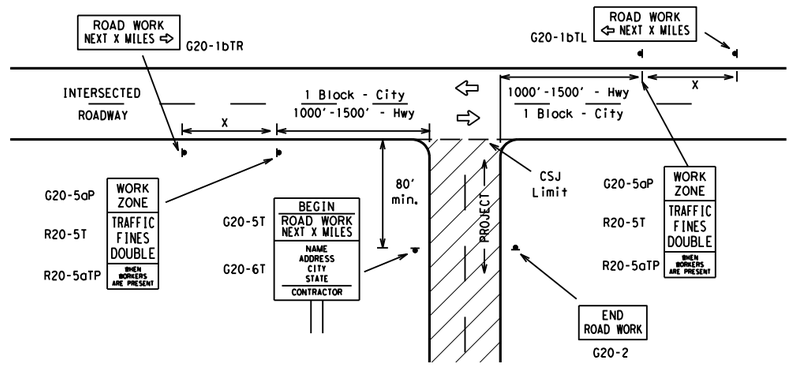
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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]

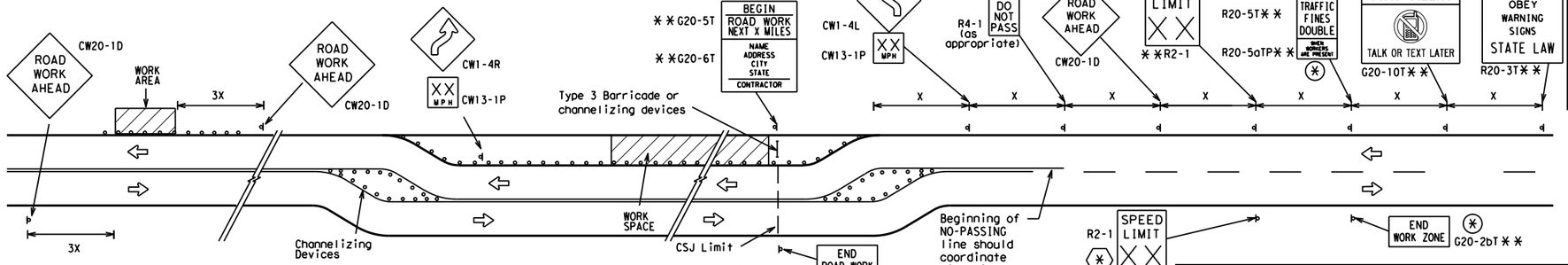
(*) For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

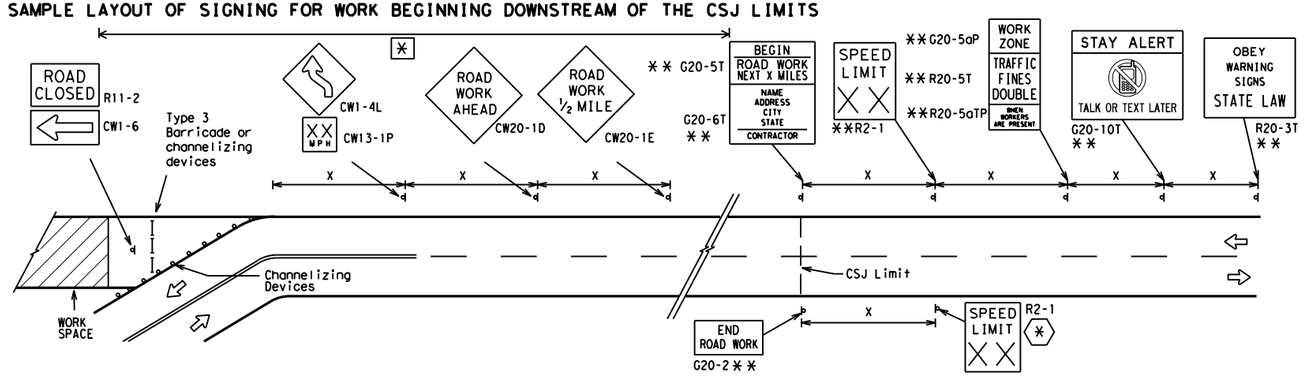
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

LEGEND

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

SHEET 2 OF 12

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

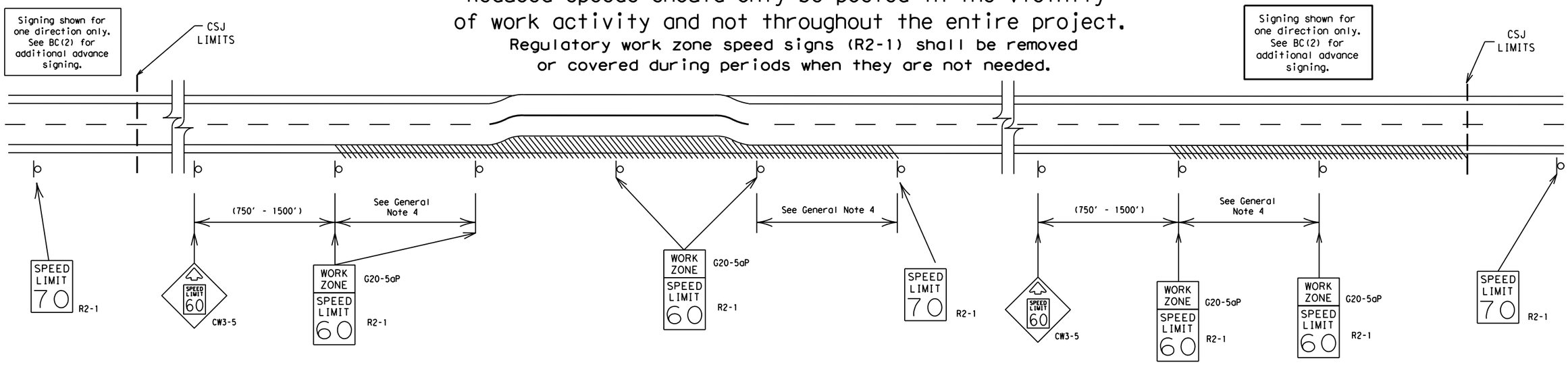
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	HUDSPETH		19

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

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REVISIONS 9-07 8-14 7-13	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
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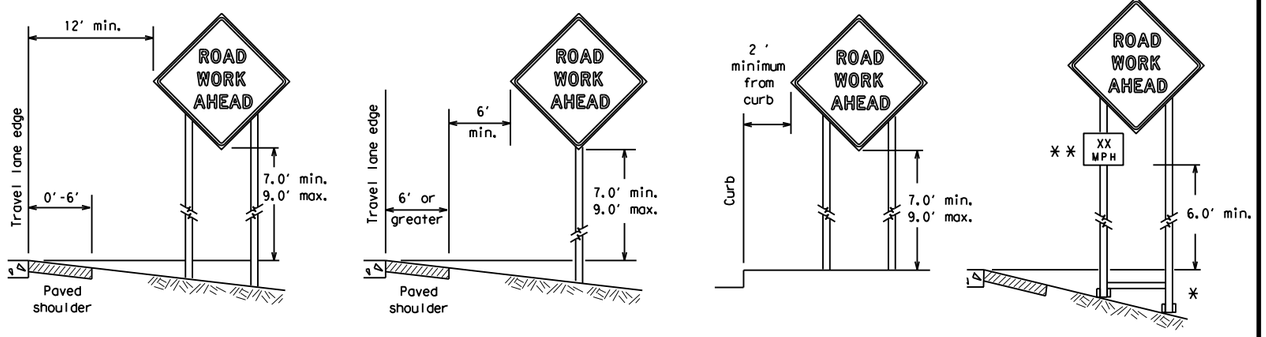
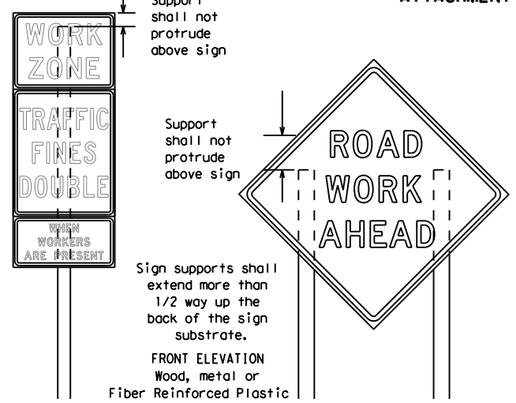
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



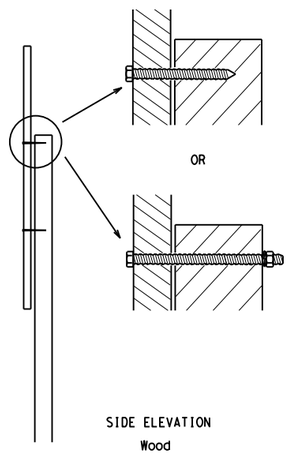
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



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

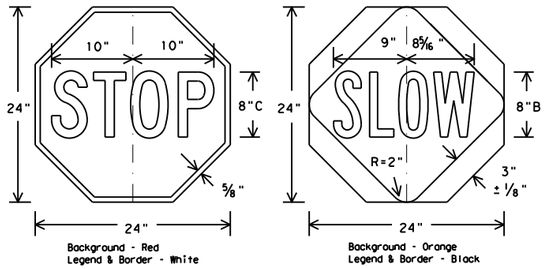


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

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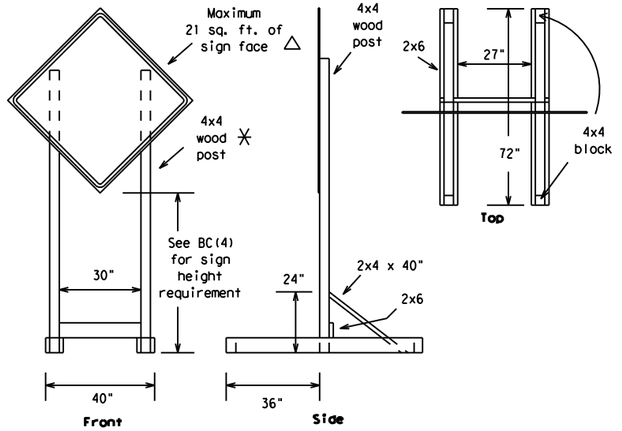
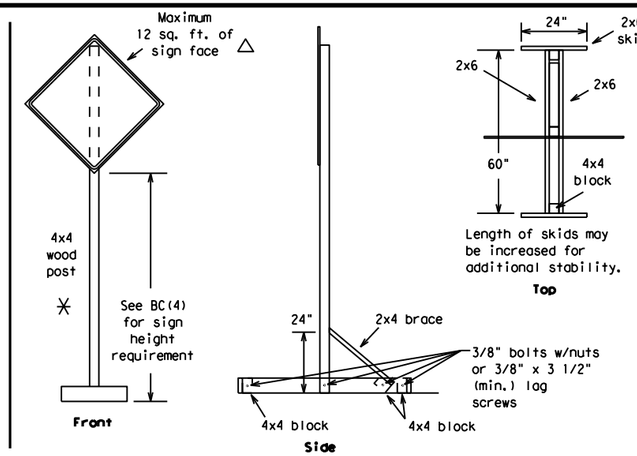
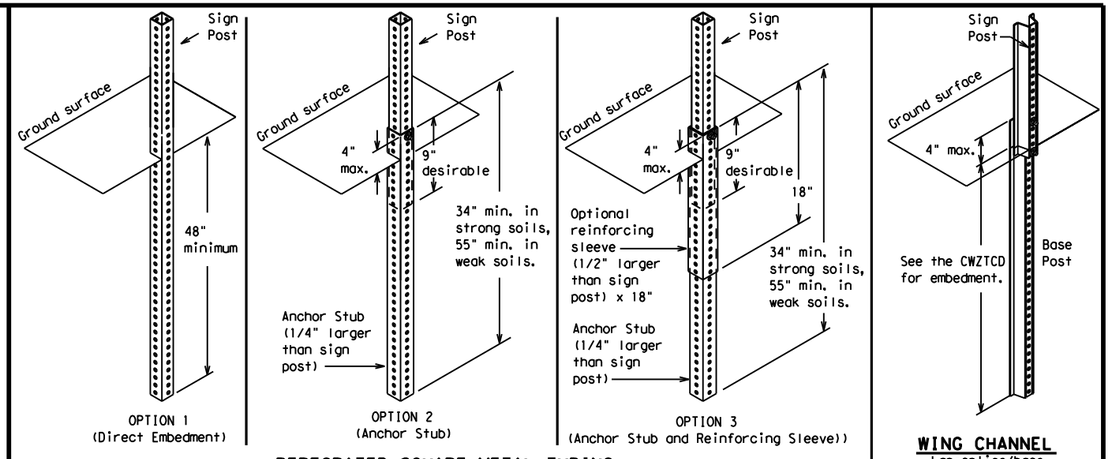




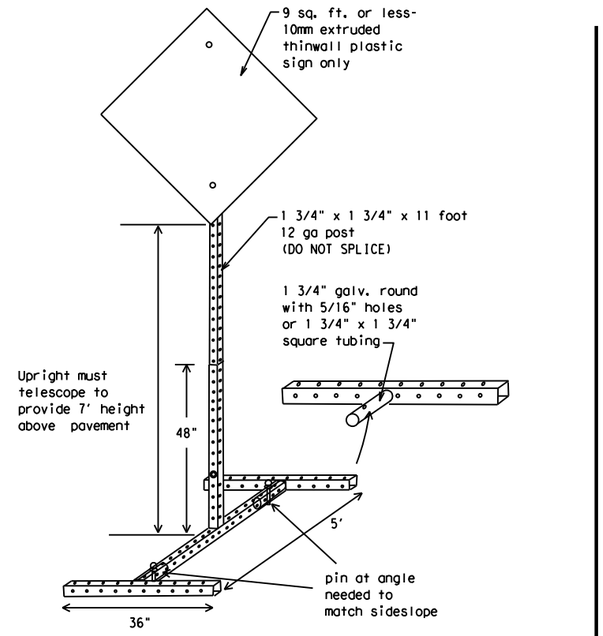
SKID MOUNTED WOOD SIGN SUPPORTS

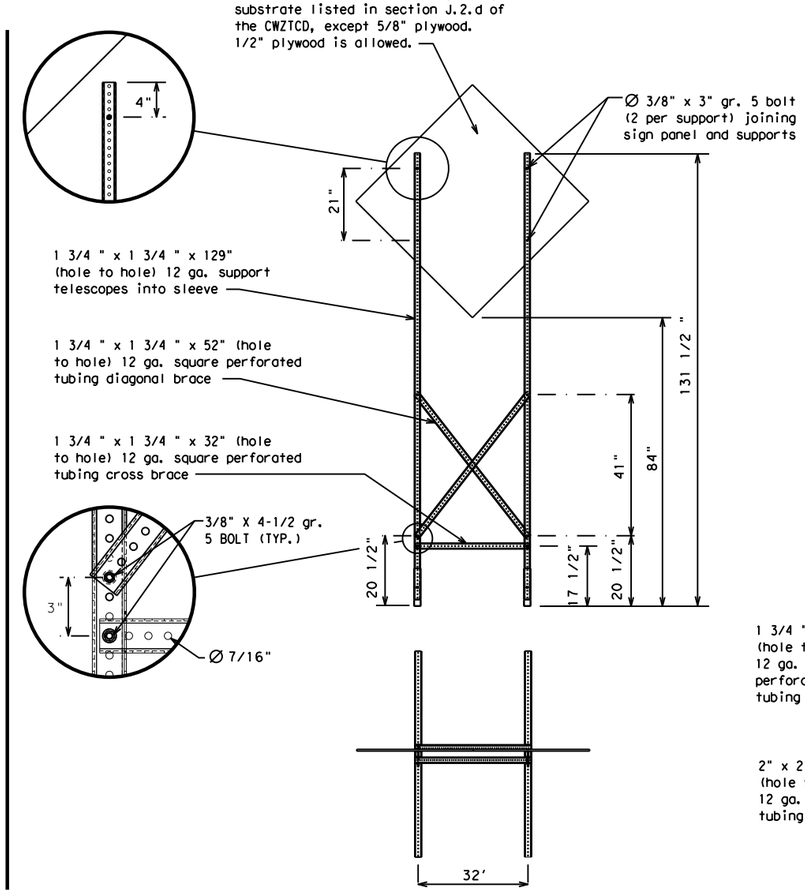
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

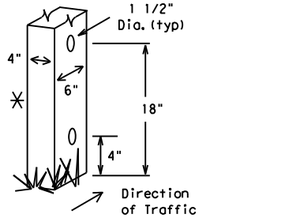


GROUND MOUNTED SIGN SUPPORTS

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.

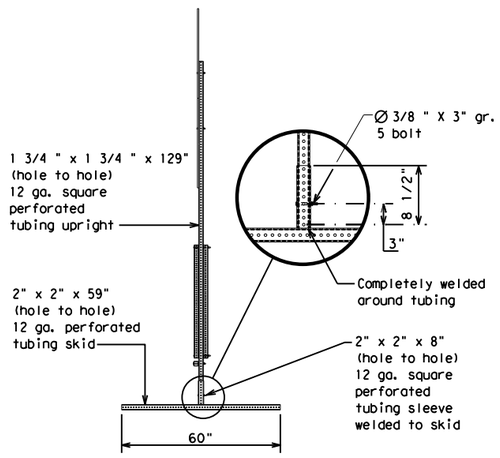






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Operations Division Standard

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

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

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

Phase 2: Possible Component Lists

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	HUDSPETH		23

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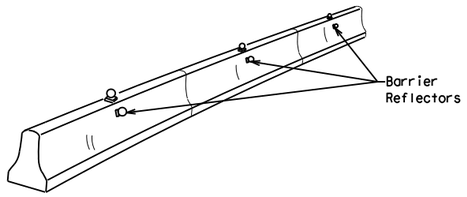
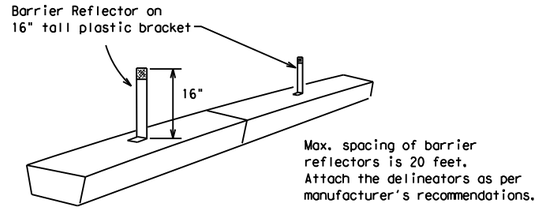
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

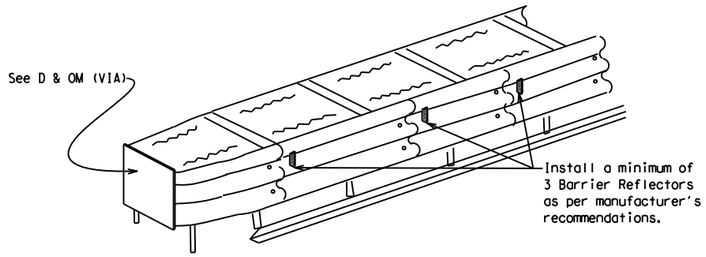


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

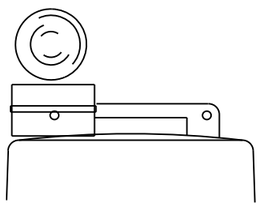


DELINEATION OF END TREATMENTS

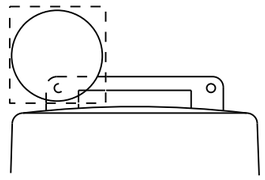
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

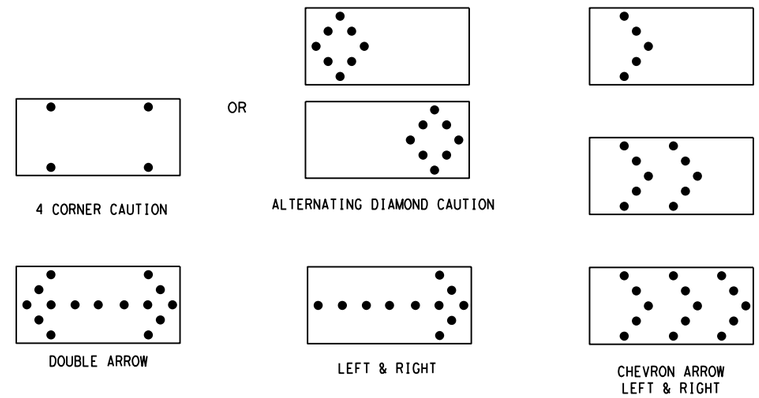
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

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

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Operations Division Standard

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

BC(7)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		24

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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:

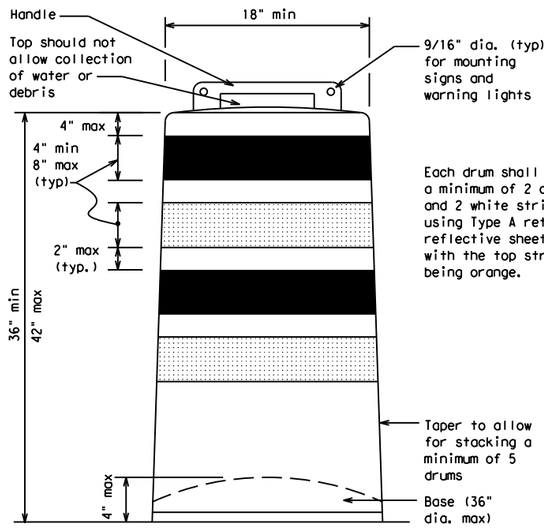
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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.

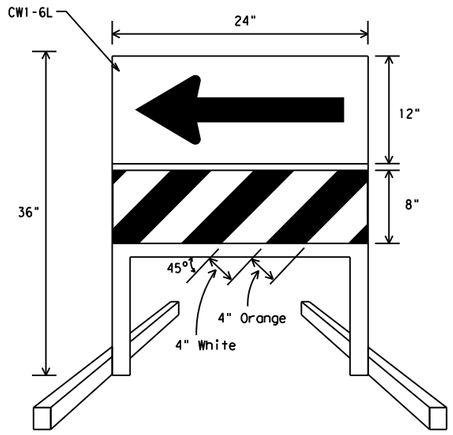
RETROREFLECTIVE SHEETING

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 reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

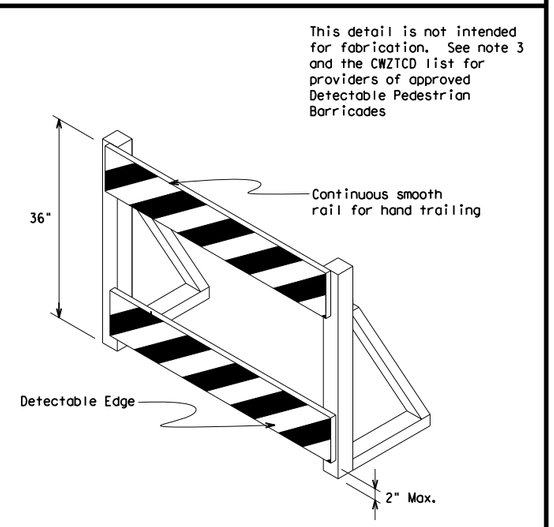
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other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





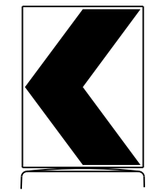
DIRECTION INDICATOR BARRICADE

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

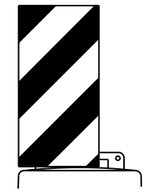


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	ELP	HUDSPETH		25

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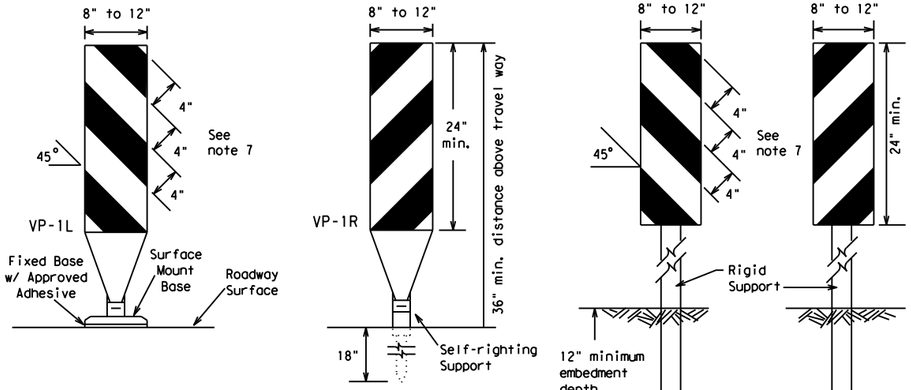
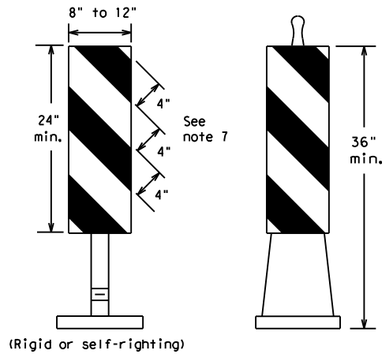


FIXED
(Rigid or self-righting)

DRIVEABLE

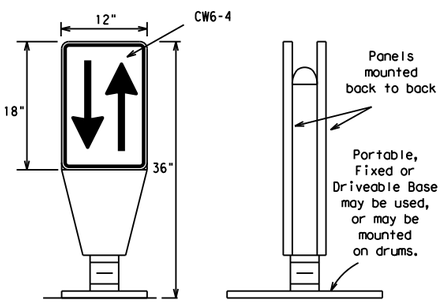


(Rigid or self-righting)

PORTABLE

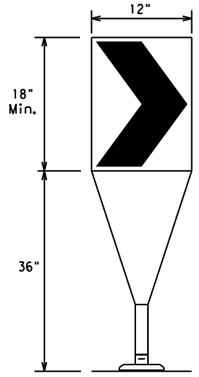
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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)



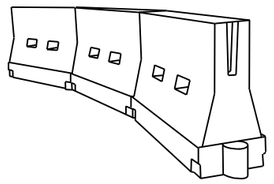
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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) placed near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0374	07	028, ETC	US 62
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	HUDSPETH		26

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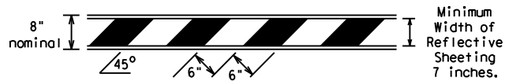
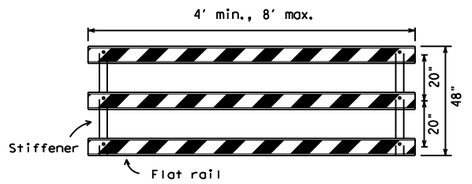
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



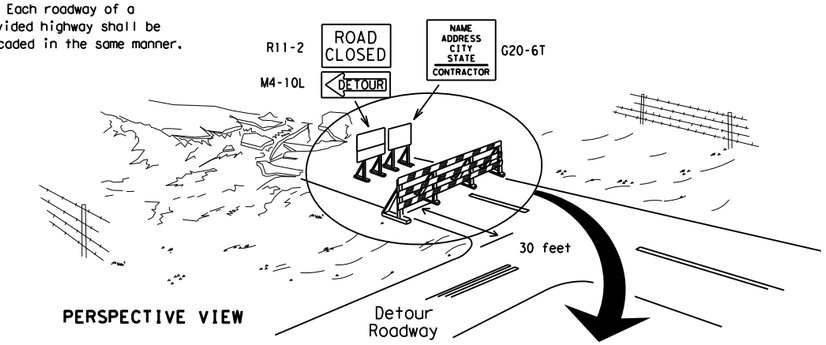
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

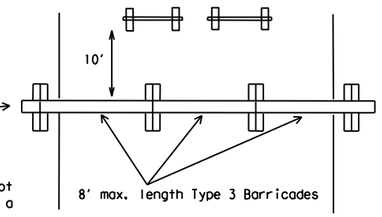
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

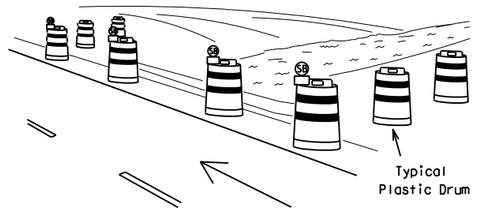
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

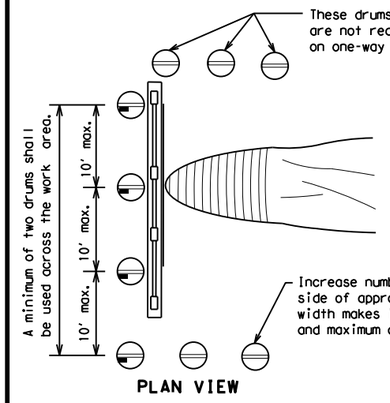
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

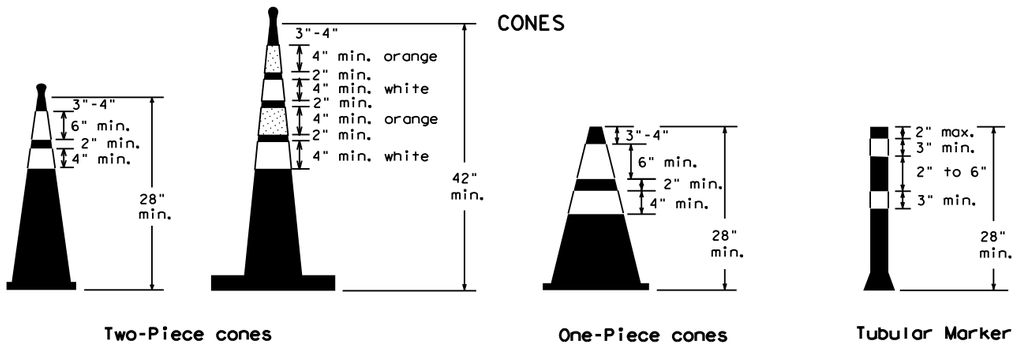
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

PLAN VIEW

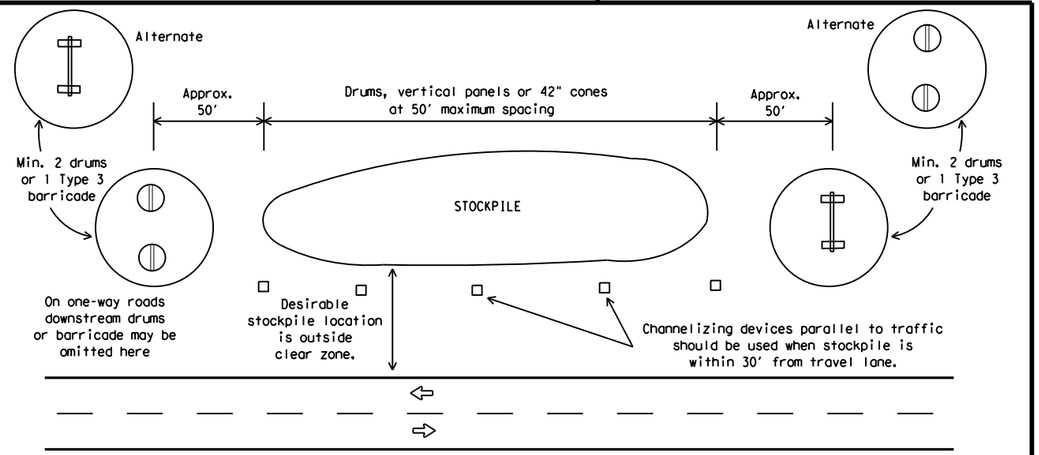
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

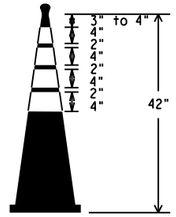
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



EDGELINE CHANNELIZER

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

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

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REVISIONS 9-07 8-14 7-13	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		27

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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.

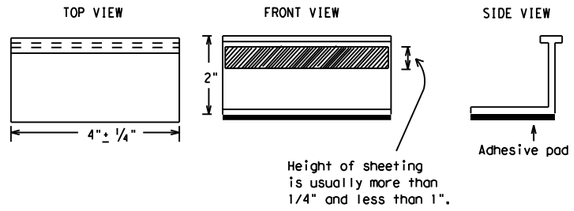
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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).

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BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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1-02 7-13	ELP	HUDSPETH		28
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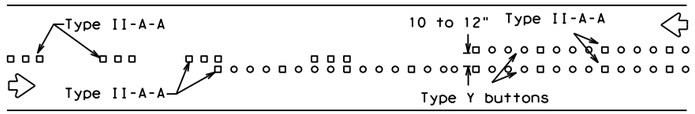
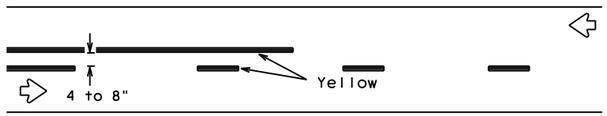
PAVEMENT MARKING PATTERNS

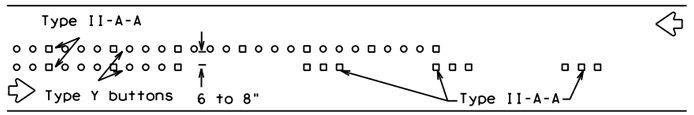
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



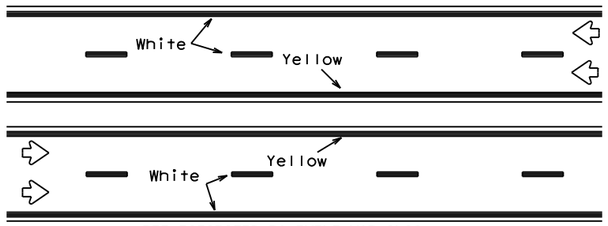
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



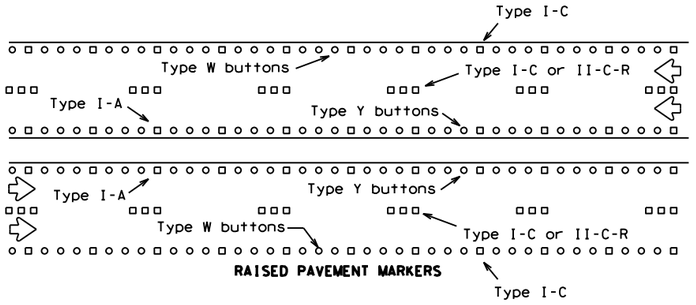
RAISED PAVEMENT MARKERS - PATTERN B

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

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



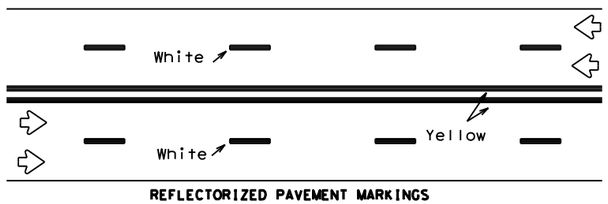
REFLECTORIZED PAVEMENT MARKINGS



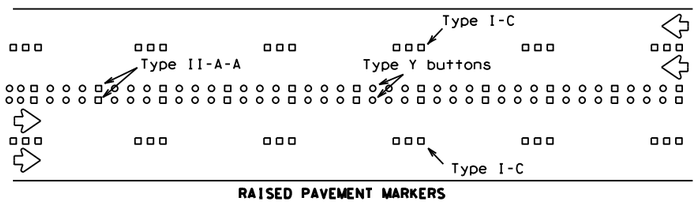
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



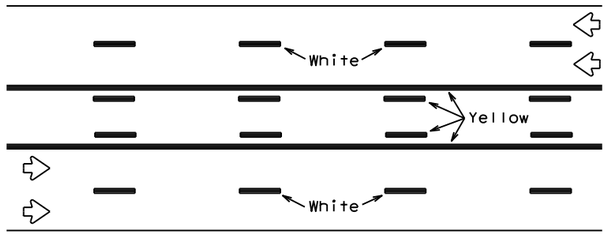
REFLECTORIZED PAVEMENT MARKINGS



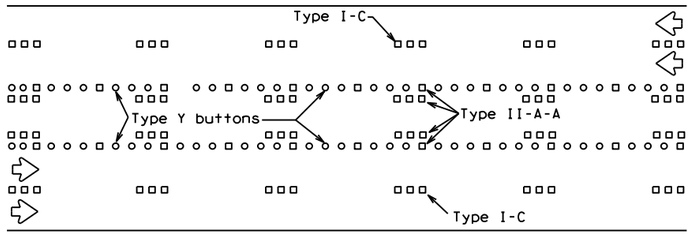
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

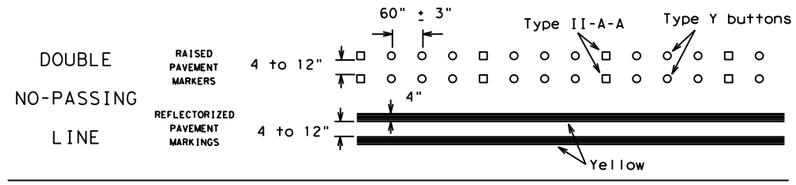
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

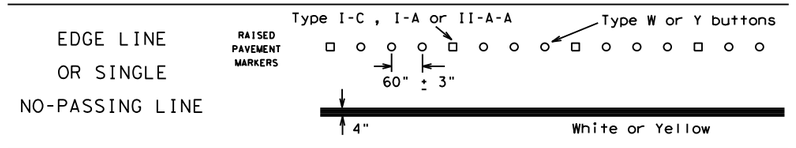
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

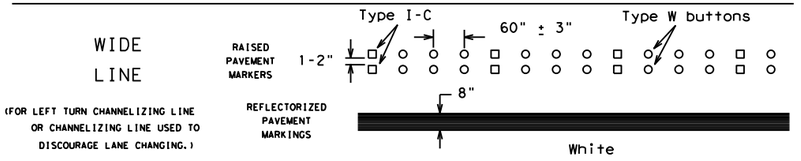


EDGE LINE OR SINGLE NO-PASSING LINE



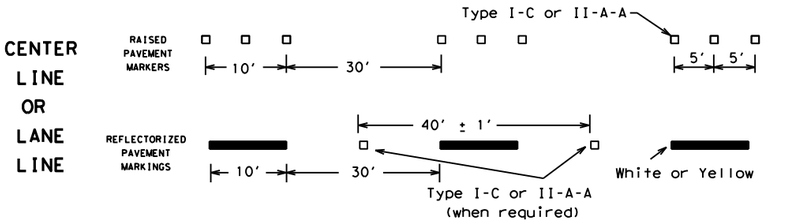
WIDE LINE

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

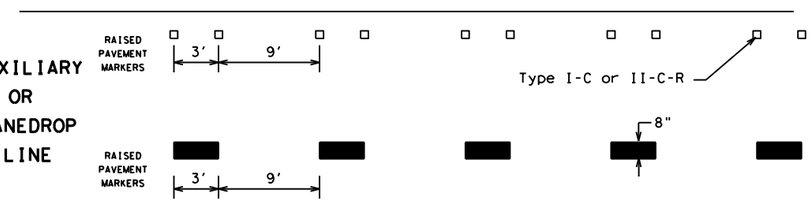


BROKEN LINES

CENTER LINE OR LANE LINE

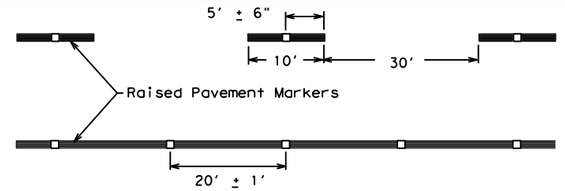


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
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2-98 7-13	ELP	HUDSPETH		29
11-02 8-14				

106

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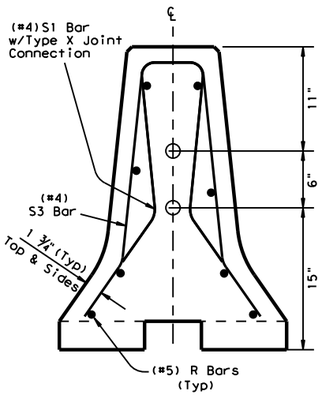
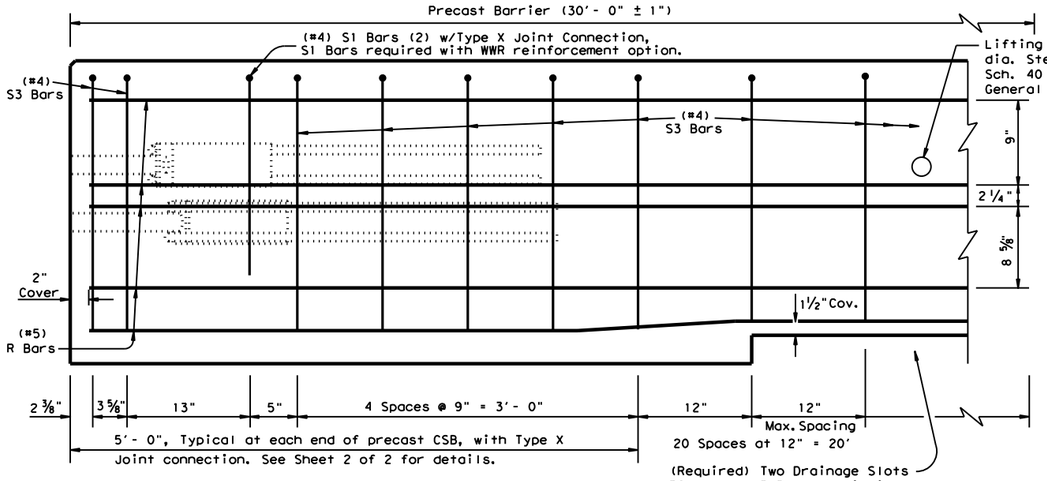


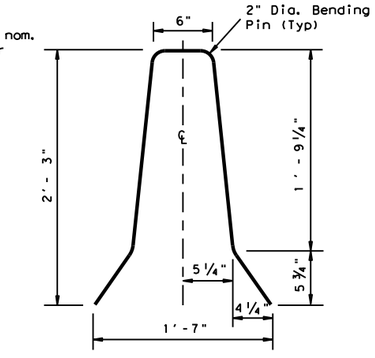
End View Precast Barrier

See sheet 2 of 3 for Joint connection Type X



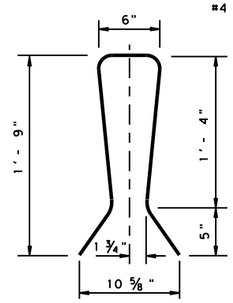
Reinforcement for Precast (CSB) Concrete Safety Barrier (Type 1)

Showing reinforcement for Joint Type X



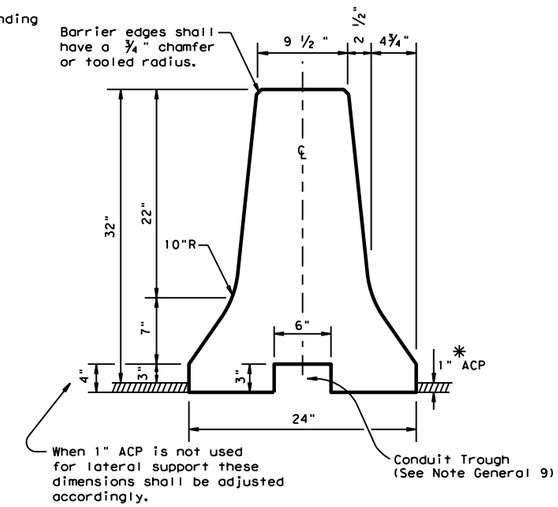
S3 Bar

#4 Bar



S1 Bar

#4 Bar (2) (Joint Type X)

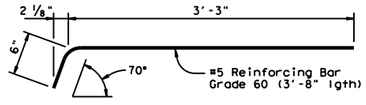


Concrete Safety Barrier

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

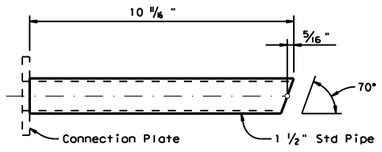
GENERAL NOTES

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



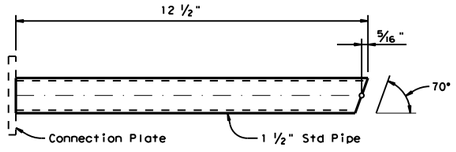
DEFORMED BAR ANCHOR DETAILS

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



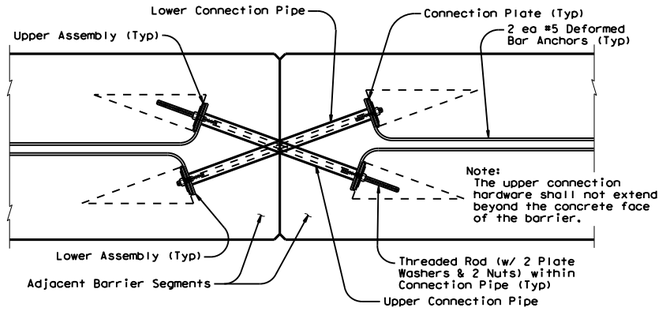
UPPER CONNECTION PIPE DETAILS

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



LOWER CONNECTION PIPE DETAILS

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



TYPE X JOINT INSTALLATION DETAIL

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

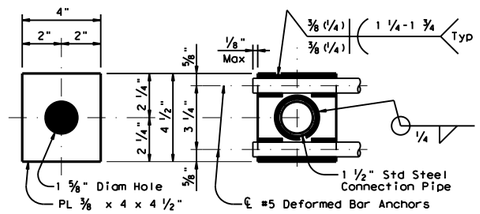
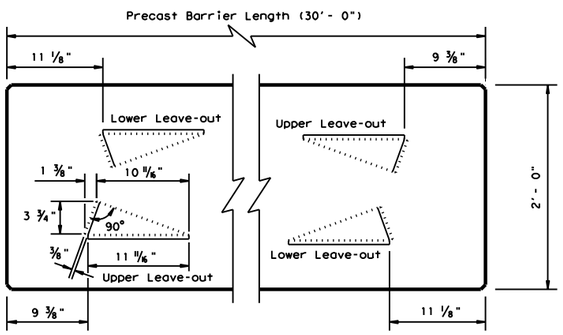


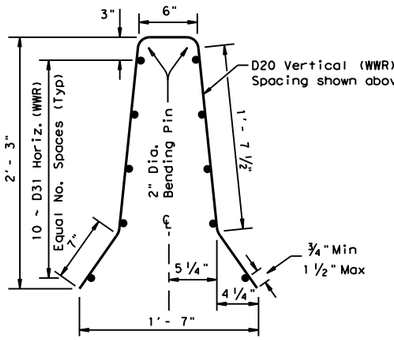
PLATE DIMENSIONS WELDING DETAILS

CONNECTION PLATE DETAILS

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



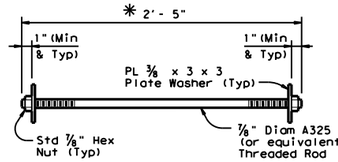
BARRIER PLAN AT END JOINTS



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

(WWR) General Notes

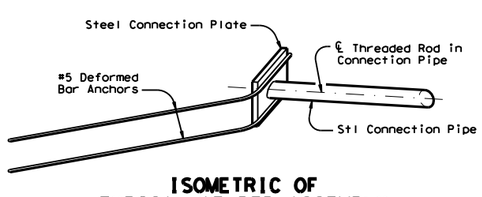
1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
3. All reinforcement shall comply with Item 440, "Reinforcing Steel."
4. Combinations of reinforcing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



CONNECTION BOLT OR THREADED ROD DETAIL

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

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



ISOMETRIC OF TYPICAL WELDED ASSEMBLY

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

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

SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER (TYPE 1)

CSB(1)-10

FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD	CK: VP
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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	ELP	HUDSPETH		30

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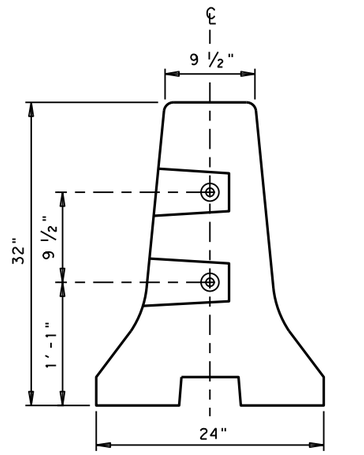
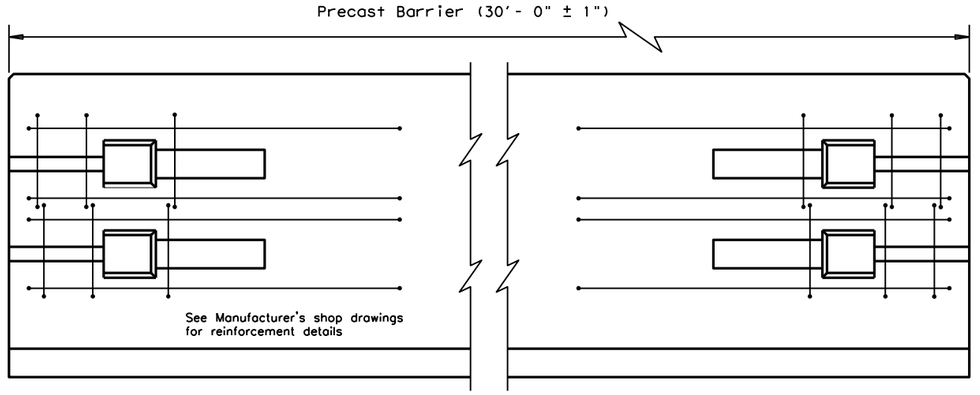
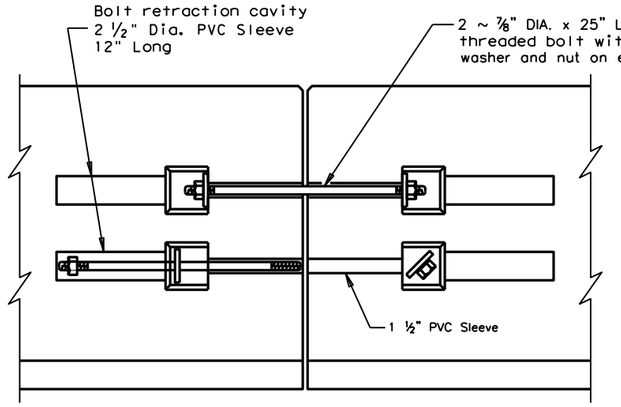


END VIEW (CSB) QUICK-BOLT
QUICK-BOLT POCKET LOCATIONS

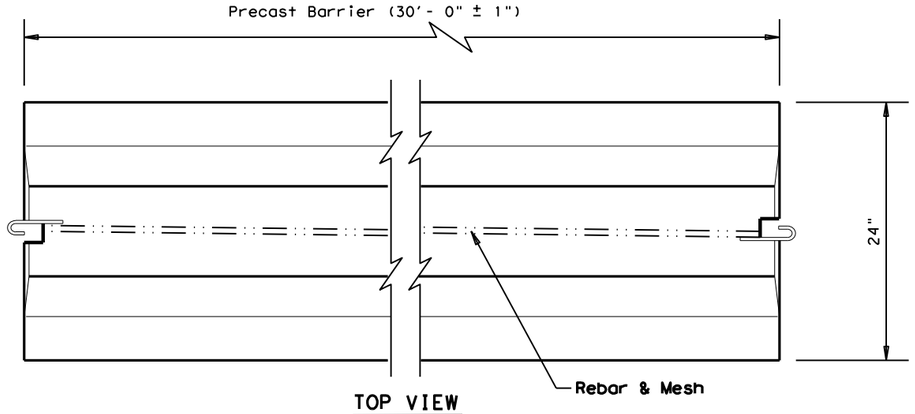


ELEVATION (CSB) QUICK-BOLT
See Manufacturer's shop drawing for additional details

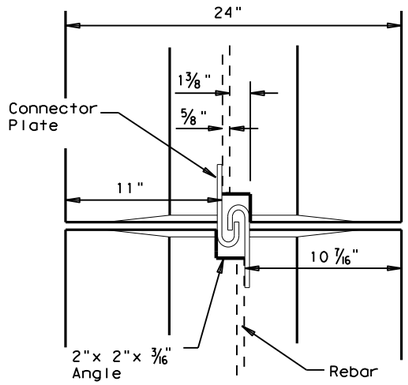


ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

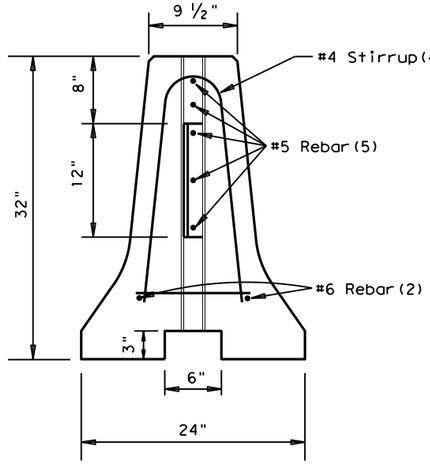
Joint Connection (Type Q)



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



VIEW FROM ABOVE
J-J HOOK CONNECTION



END VIEW
J-J HOOK CONNECTION

Joint Connection (Type J)

Proprietary Joint Connections (CSB)

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

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

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

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER
(TYPE 1)

CSB(1)-10

FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD	CK: VP
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
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	ELP	HUDSPETH		31

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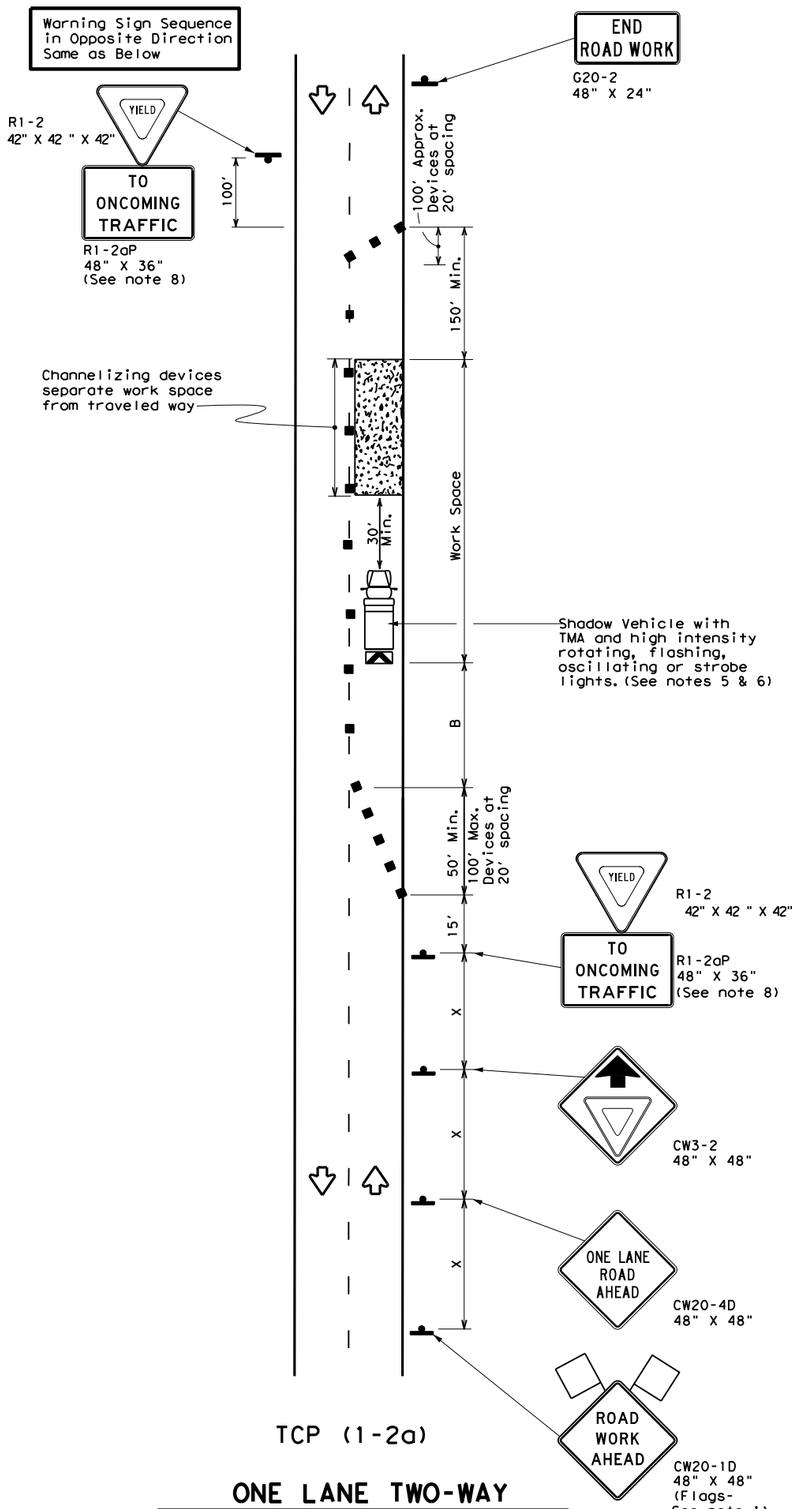
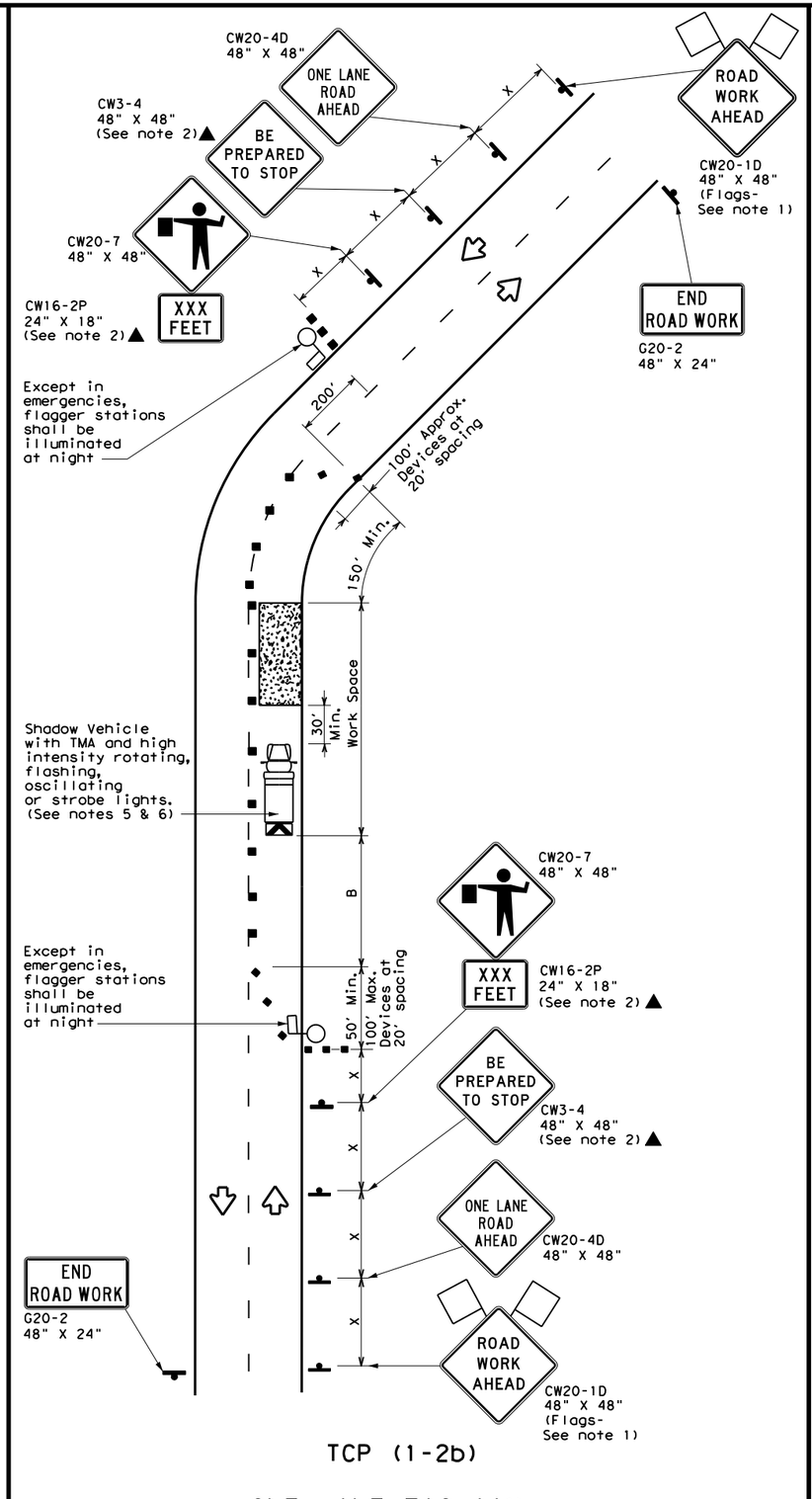


TCP (1-2a)

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



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

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

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

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

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

GENERAL NOTES

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

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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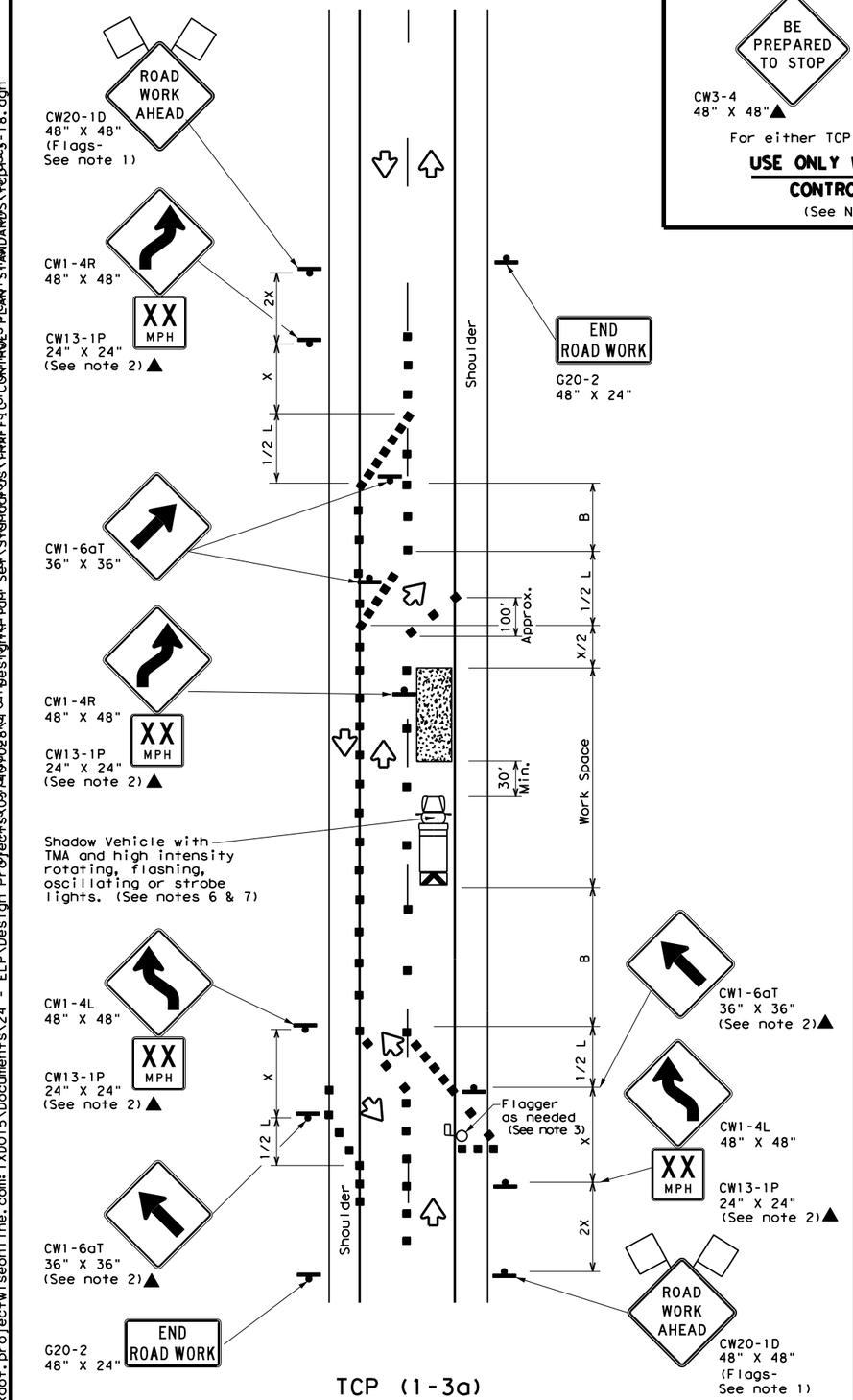
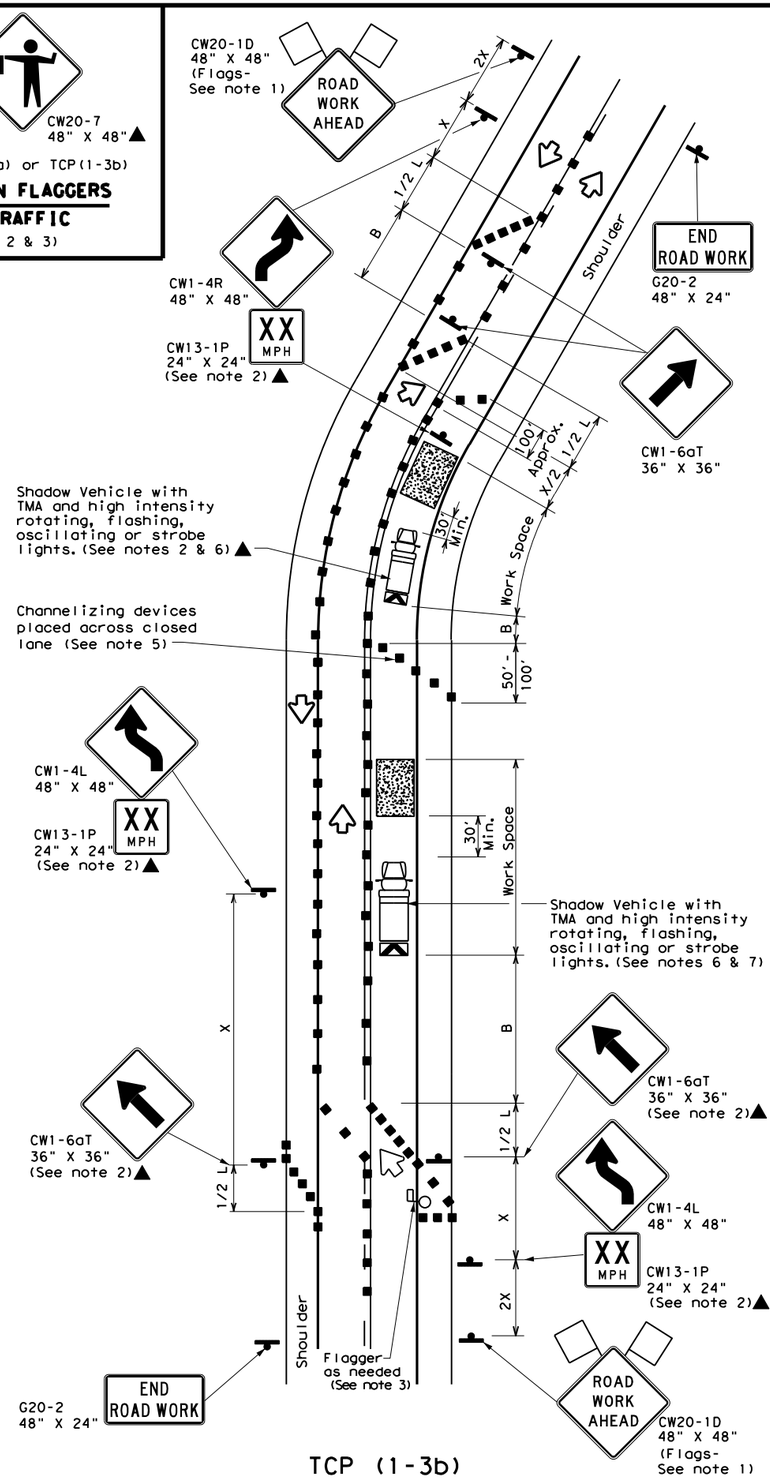


TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW

BE PREPARED TO STOP
CW3-4 48" X 48"
CW20-7 48" X 48"
For either TCP(1-3a) or TCP(1-3b)

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC
(See Notes 2 & 3)



TCP (1-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
4. DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
5. When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
8. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20', or 15' if posted speed are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ELP	HUDSPETH		33
1-97 2-18				

153

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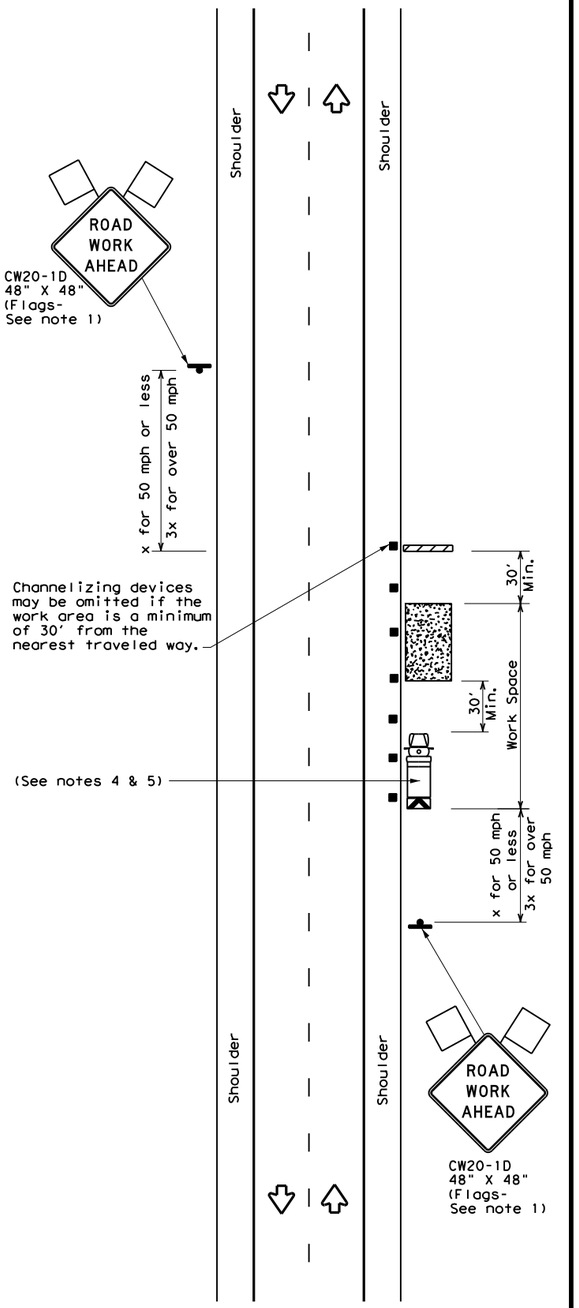
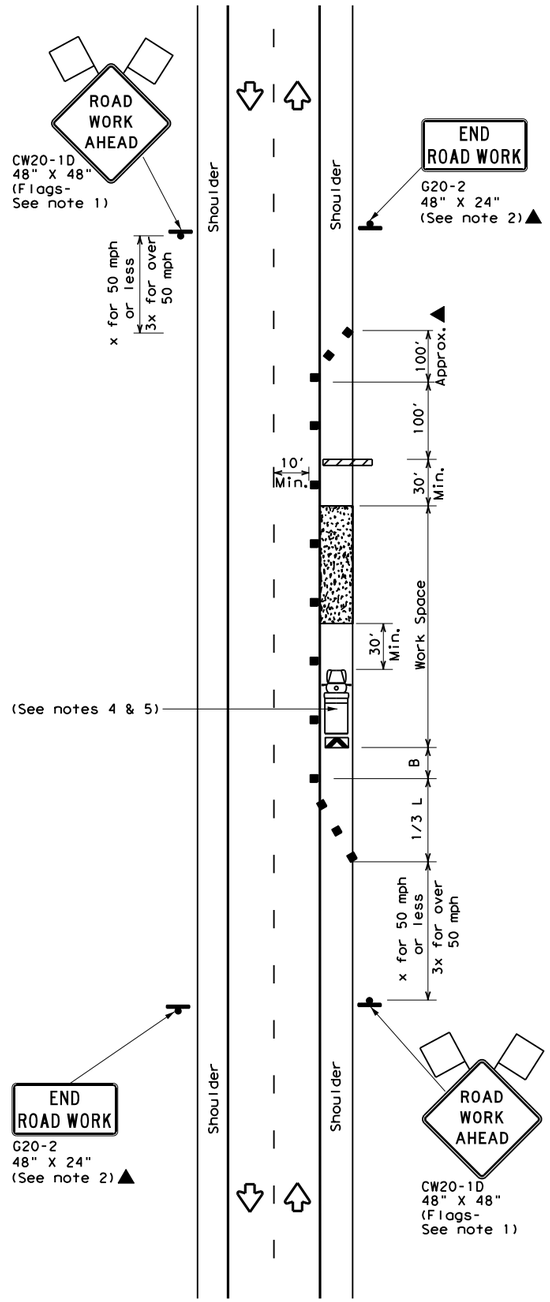


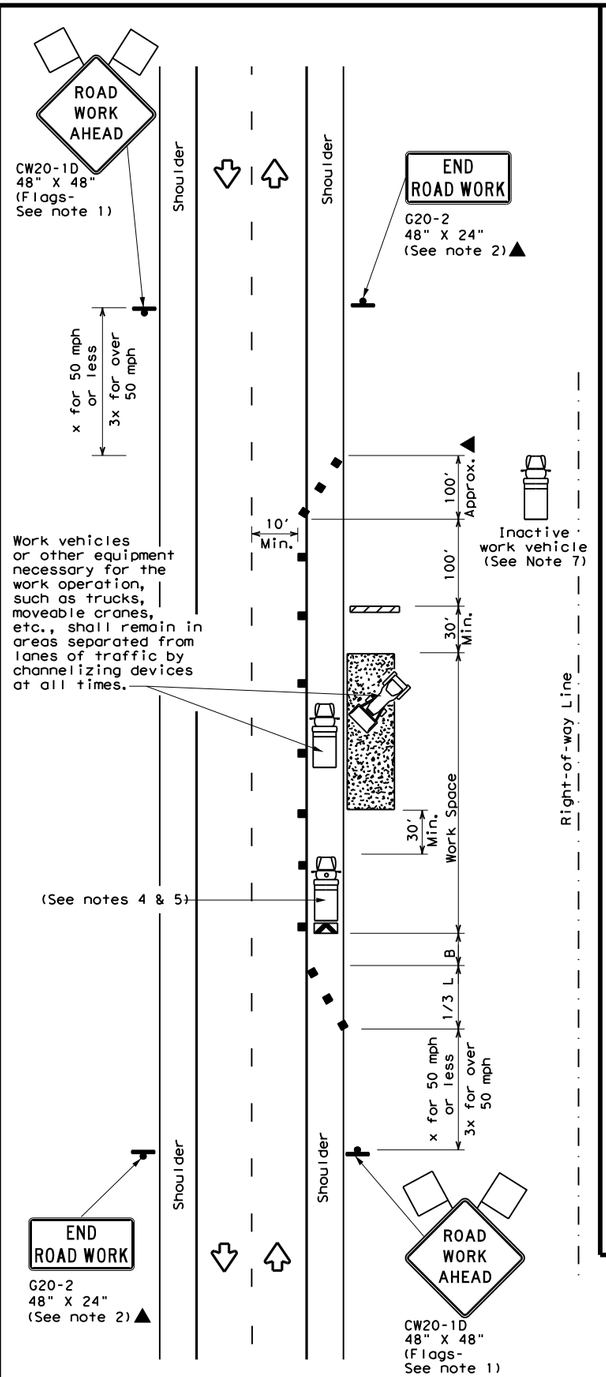
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

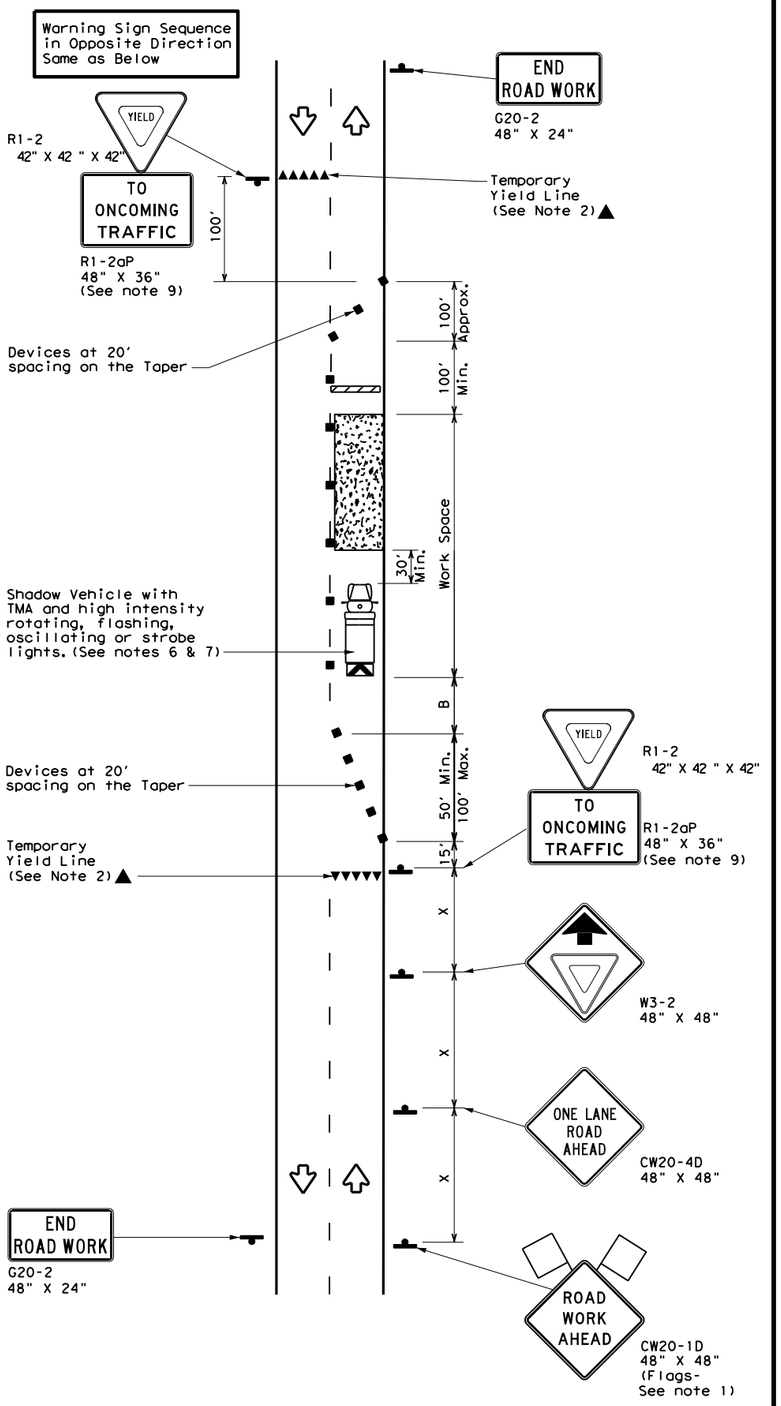
Texas Department of Transportation

Traffic Operations Division Standard

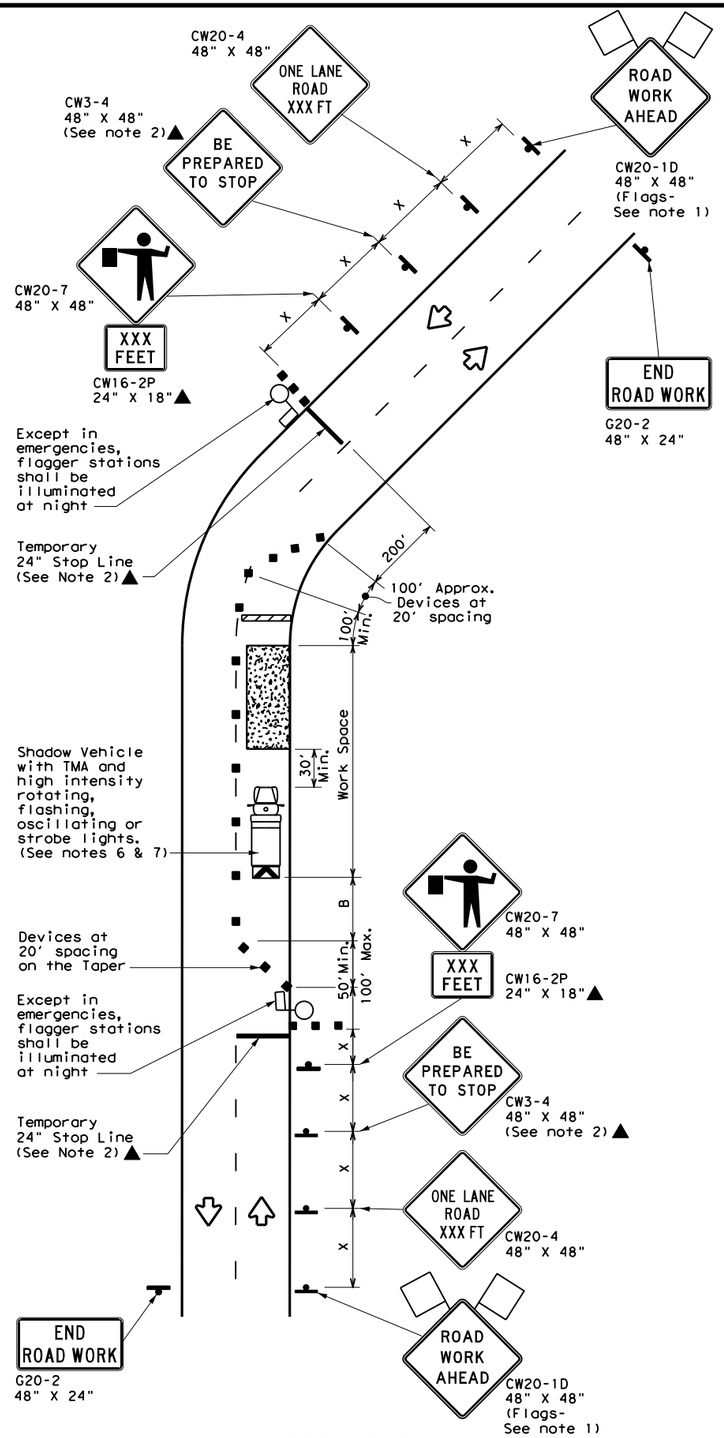
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		34



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



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

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

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

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation | *Traffic Operations Division Standard*

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

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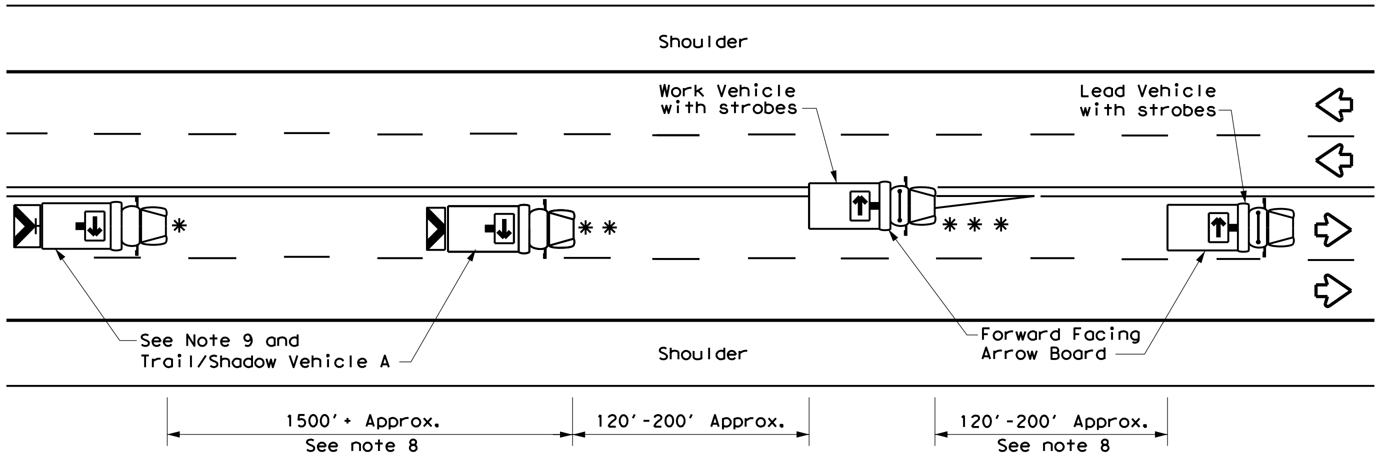
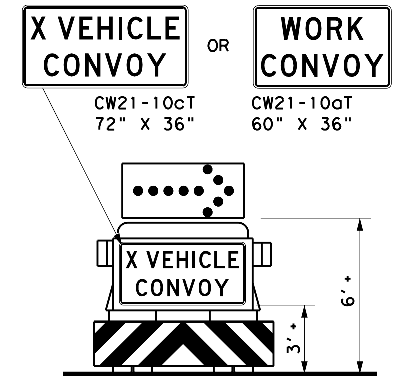
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		35



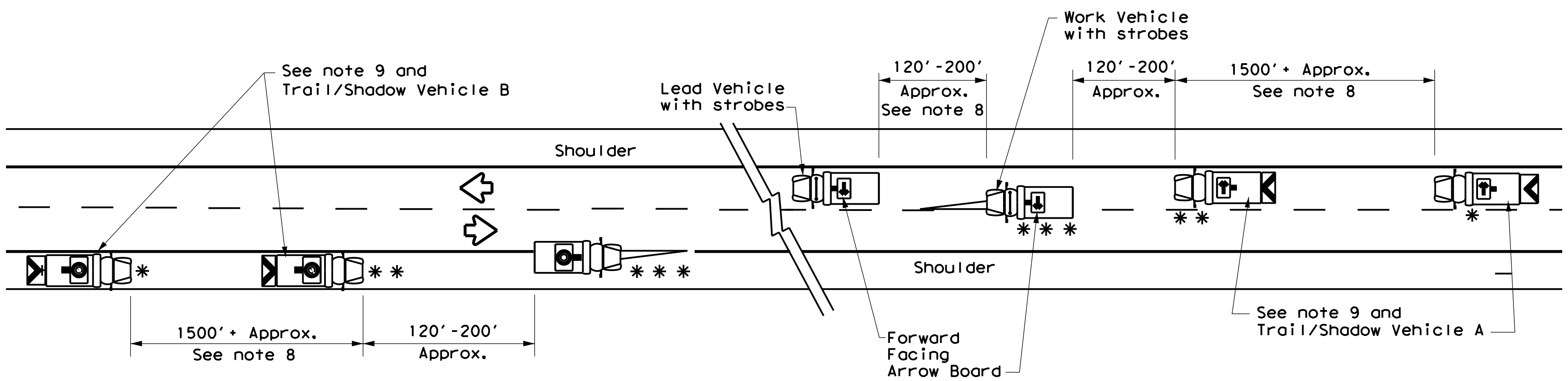
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

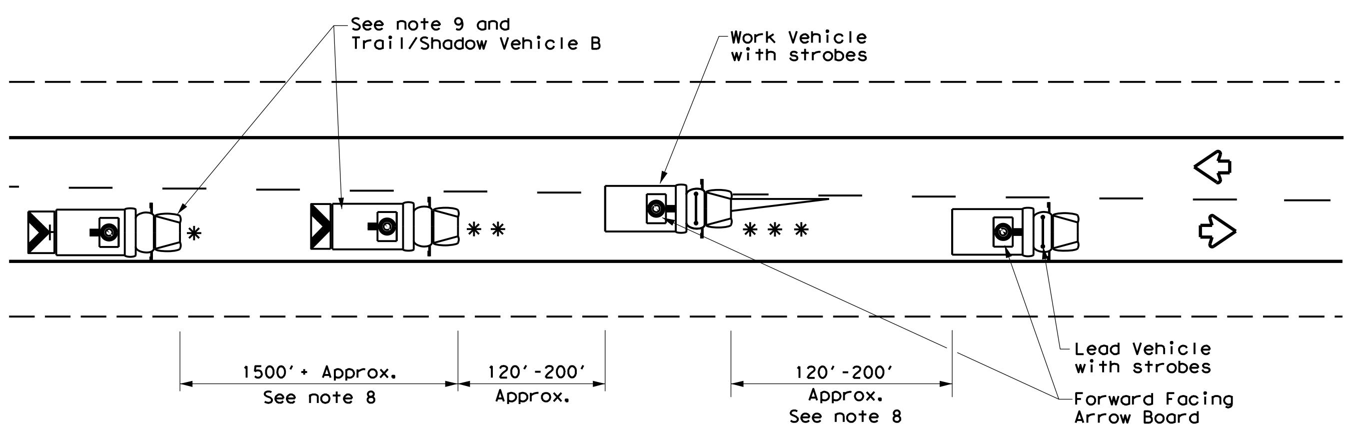


WORK ON SHOULDER

WORK ON TRAVEL LANE

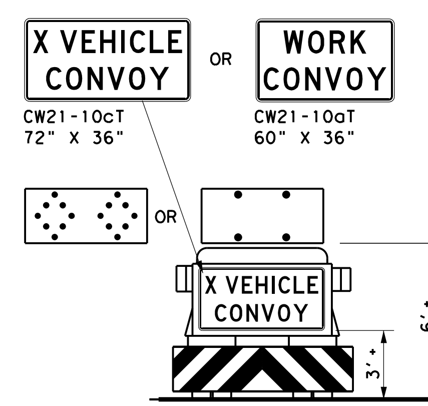
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display

LEGEND

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

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.

2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.

3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.

4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.

5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.

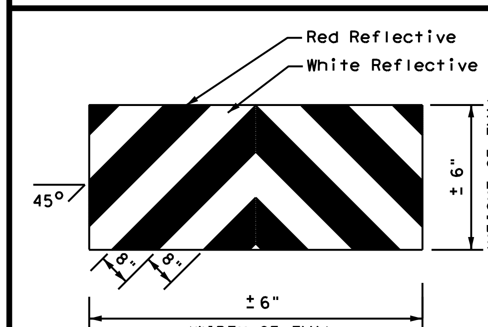
6. Each vehicle shall have two-way radio communication capability.

7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.

8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.

9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.

10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		36

175

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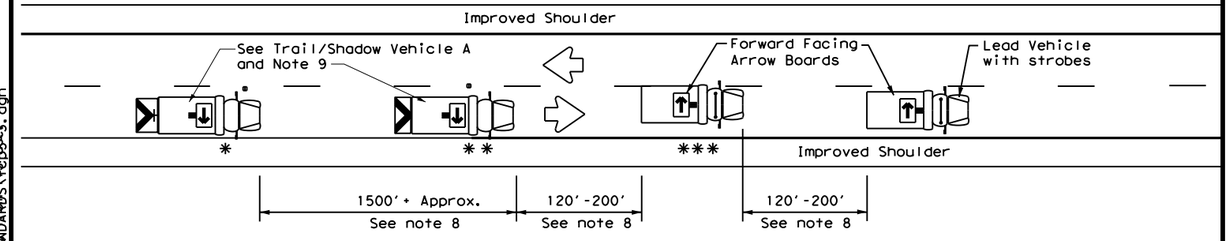
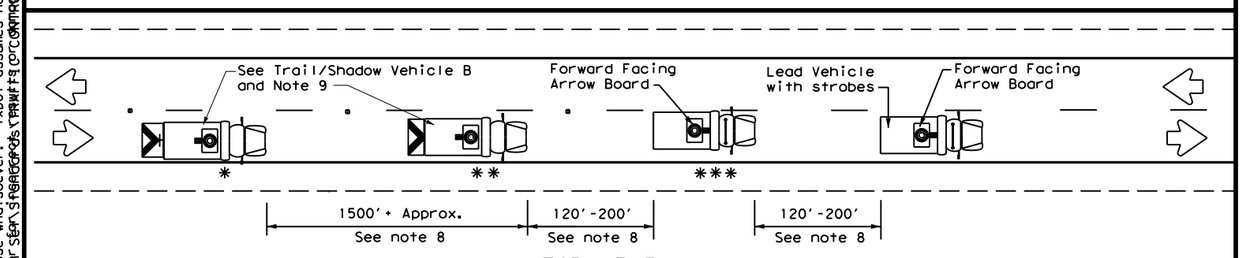


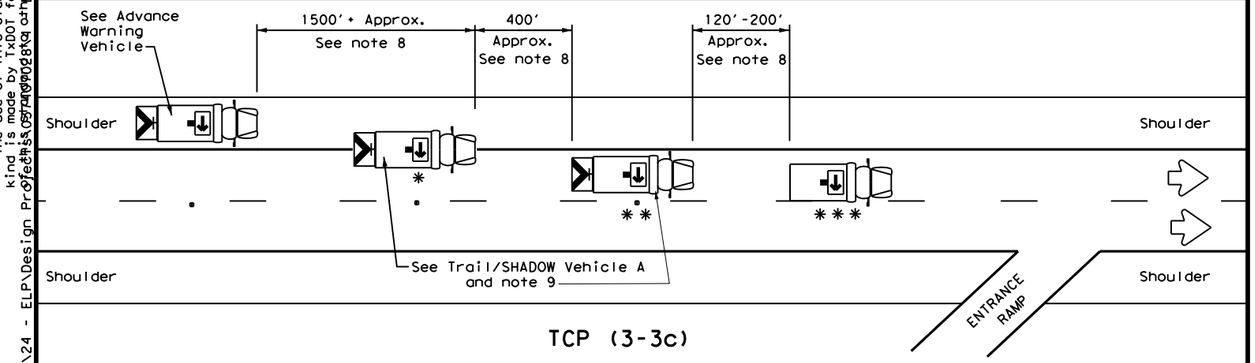
TCP (3-3a)

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



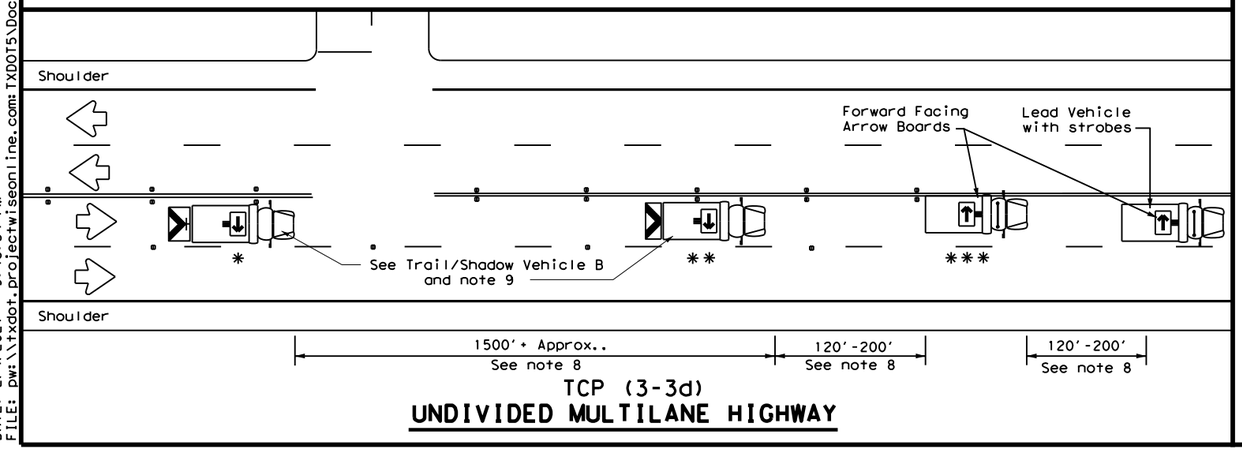
TCP (3-3b)

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



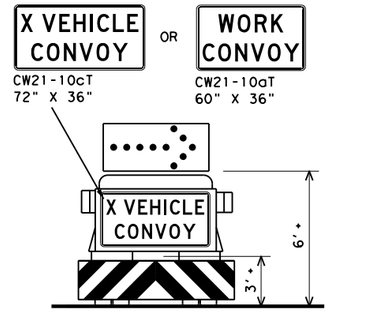
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



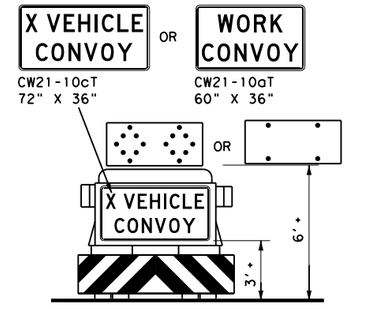
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



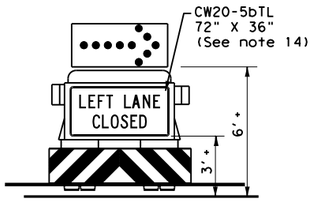
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

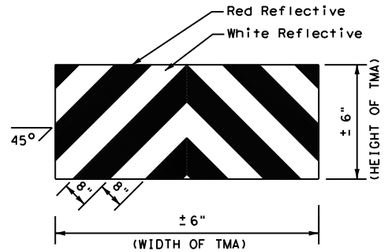


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

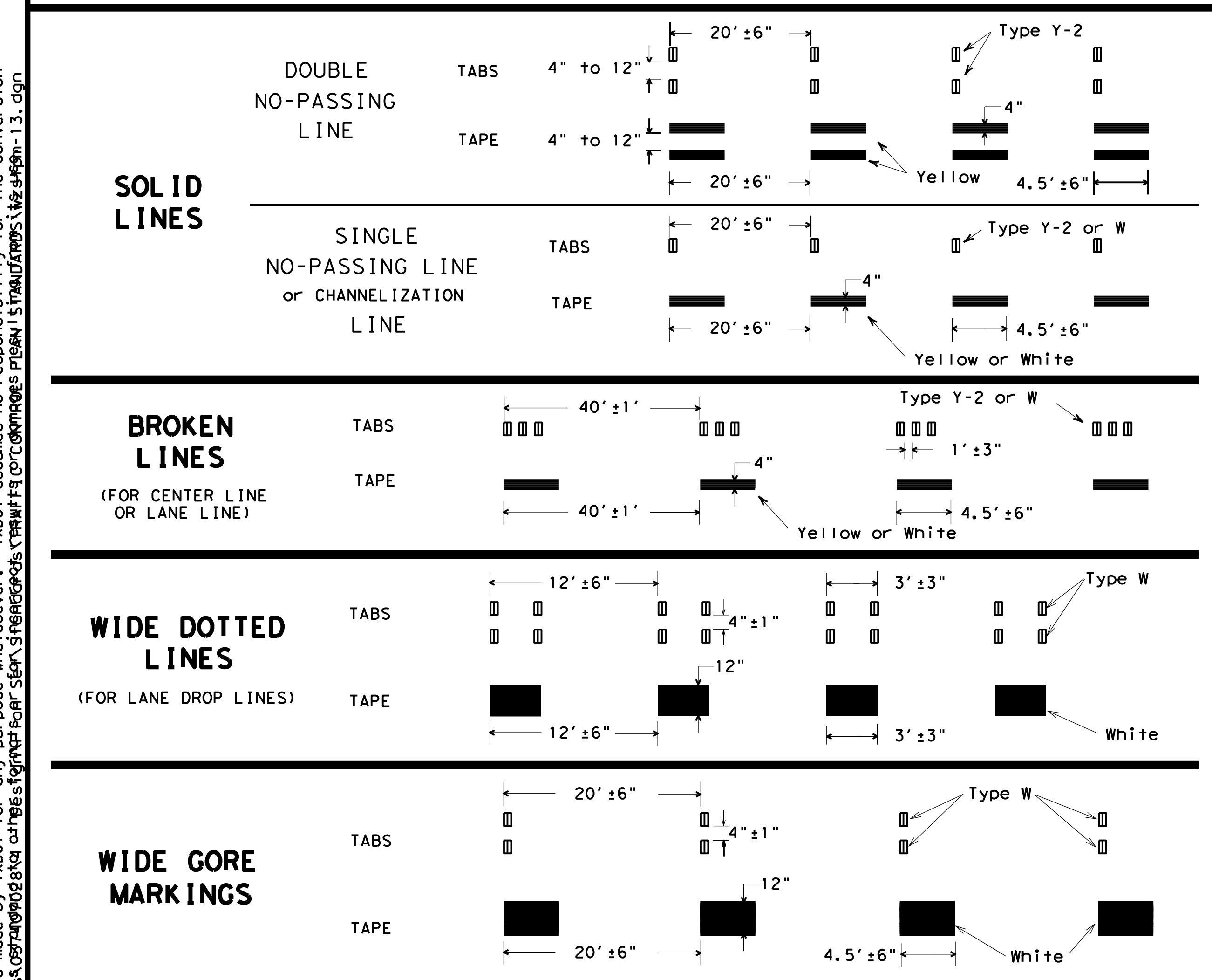
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

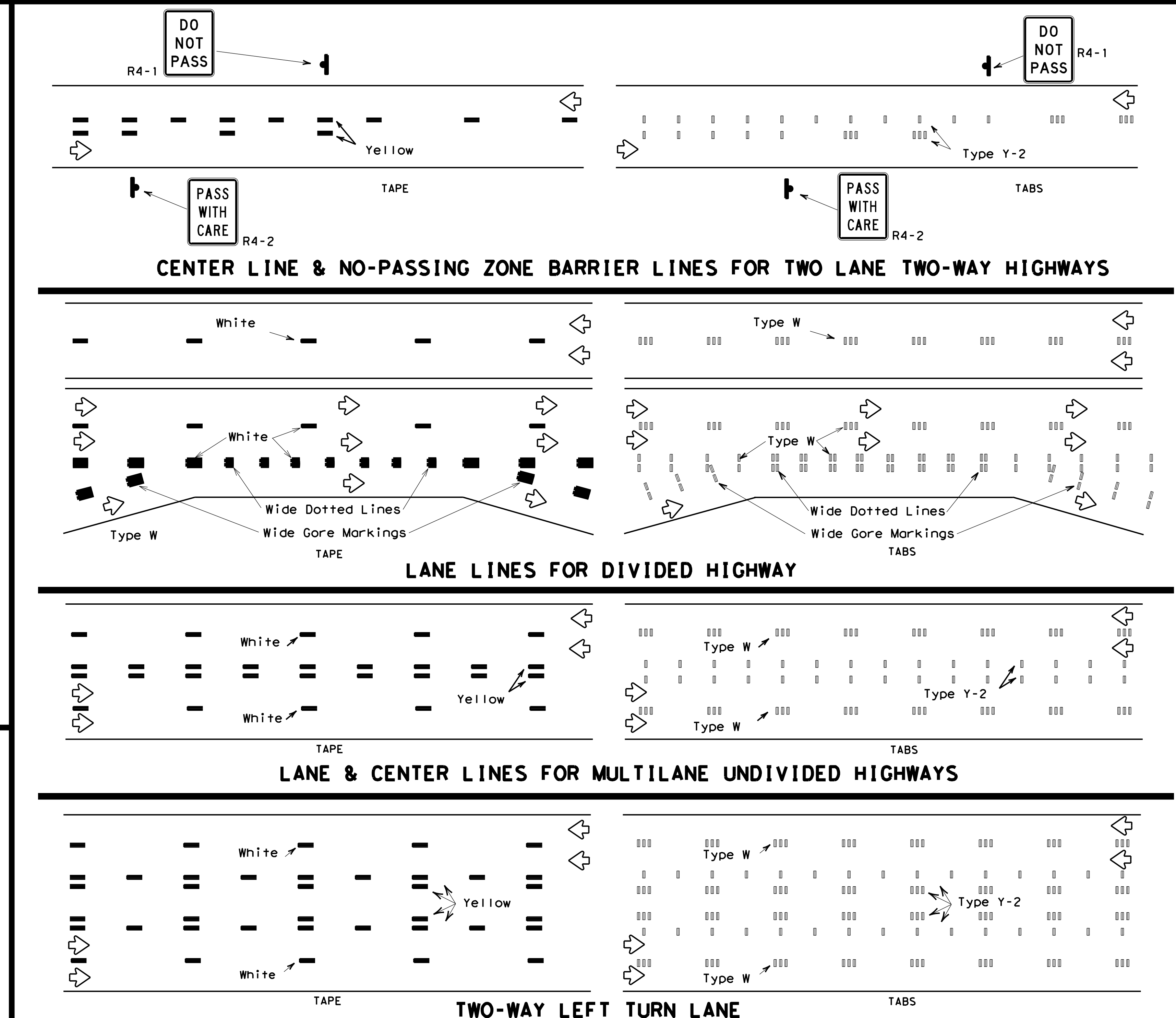
TCP(3-3)-14

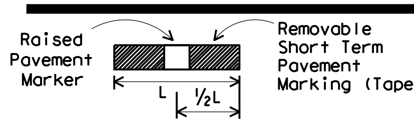
FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	ELP	HUDSPETH		37
1-97 7-14				

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS





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

NOTES:

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

TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

Texas Department of Transportation — Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE: wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
1-97 3-03 7-13	DIST		COUNTY	SHEET NO.
	ELP		HUDSPETH	38

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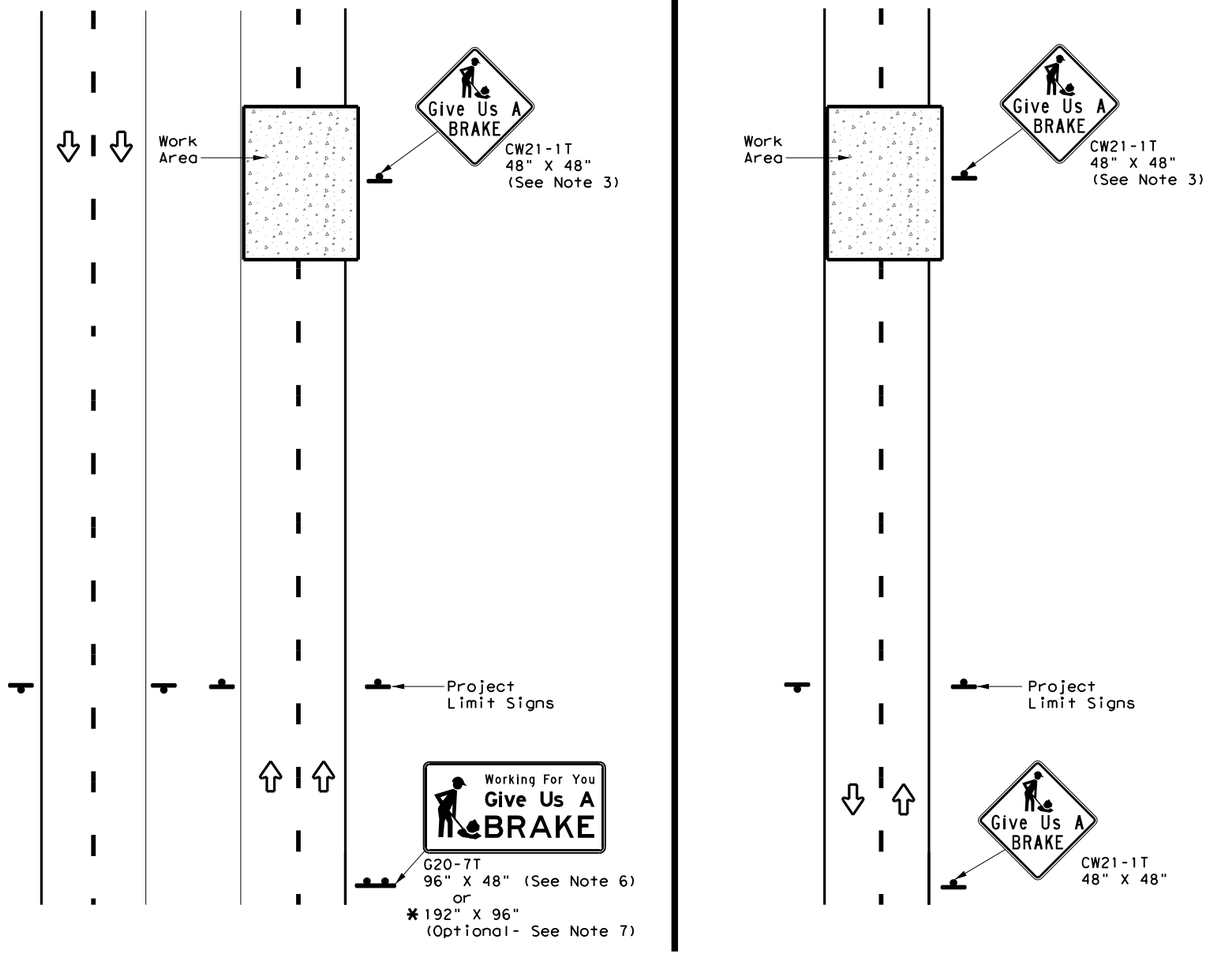

DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	ELP	HUDSPETH		39

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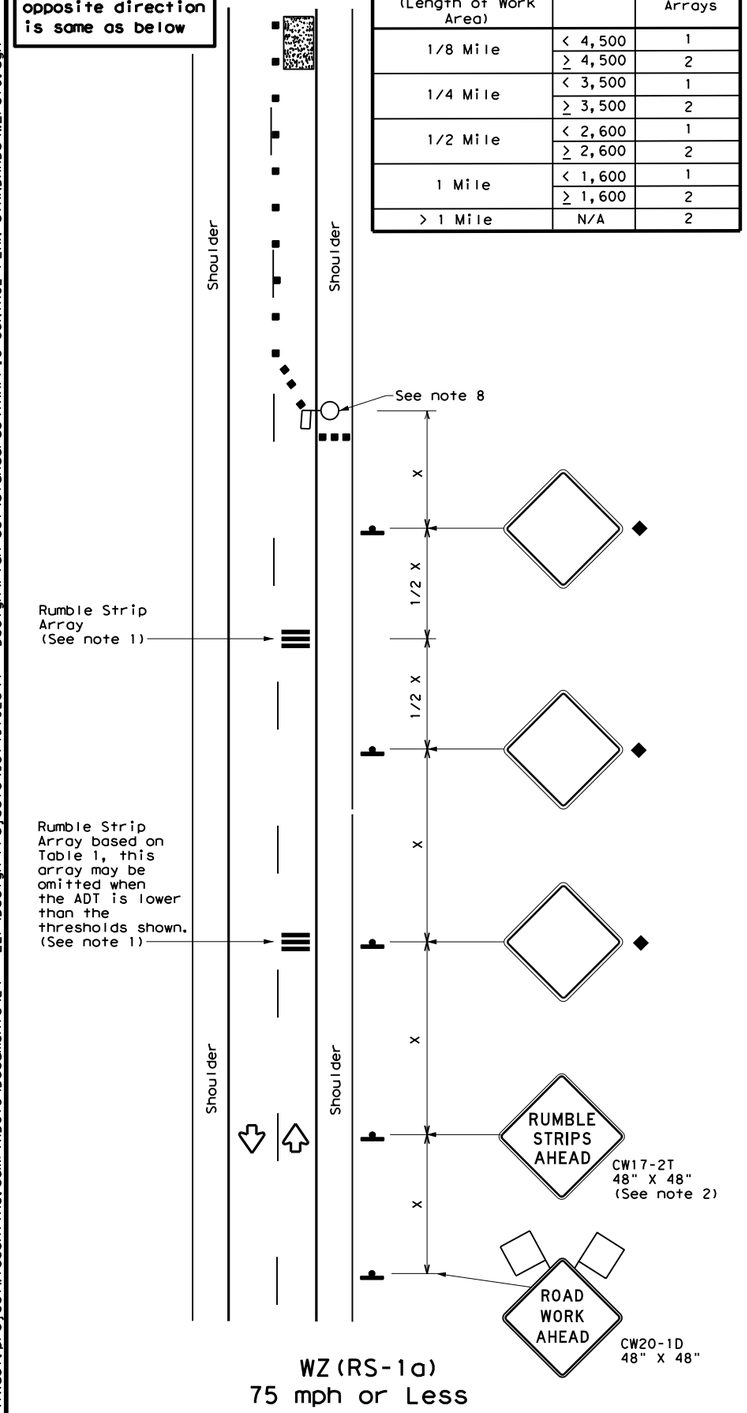
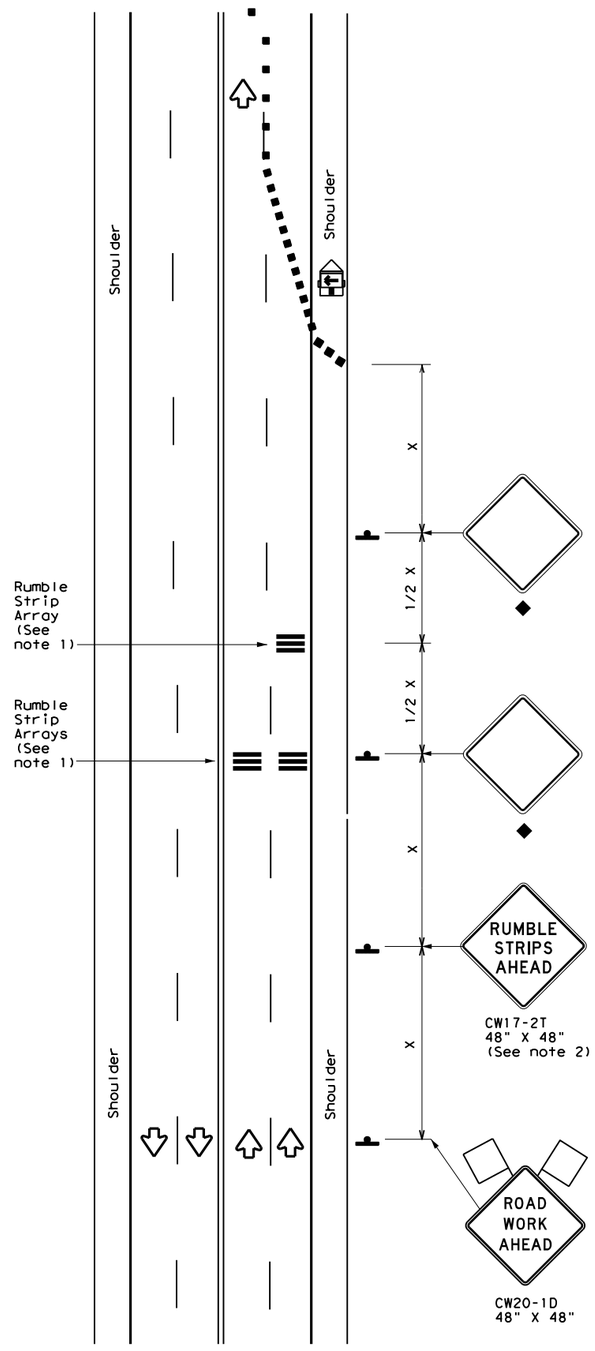
Warning sign and rumble strip sequence in opposite direction is same as below

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



WZ(RS-1a)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)
75 mph or Less

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

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

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

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

TABLE 2	
Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
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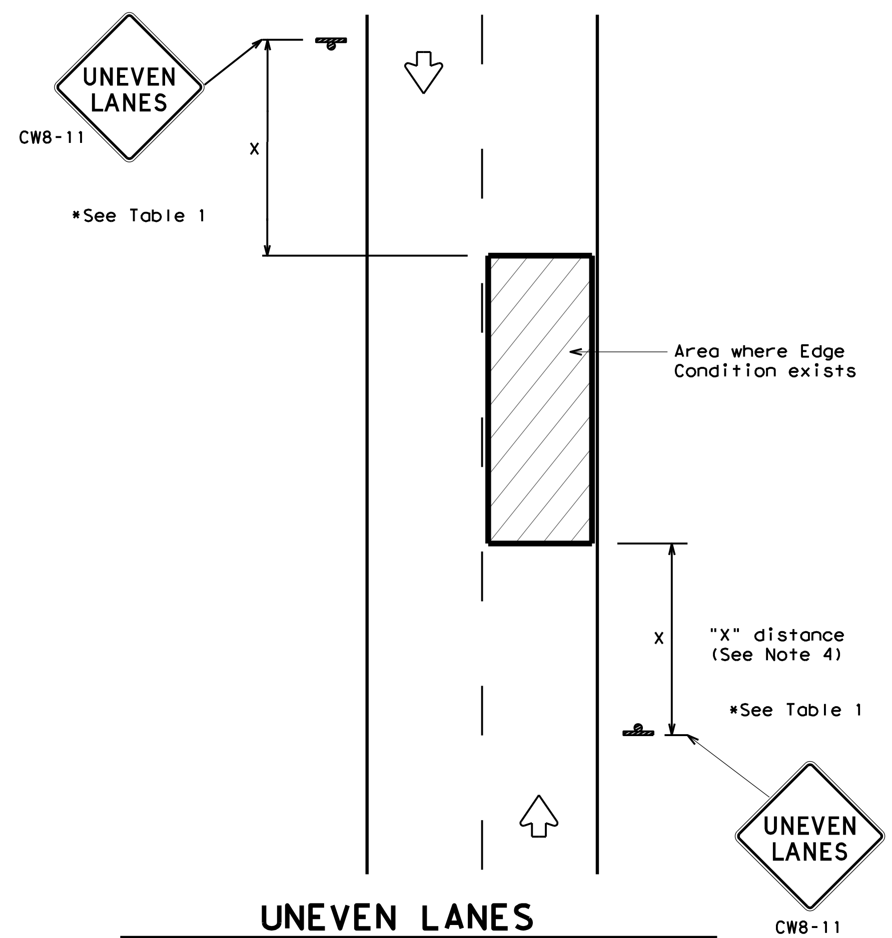
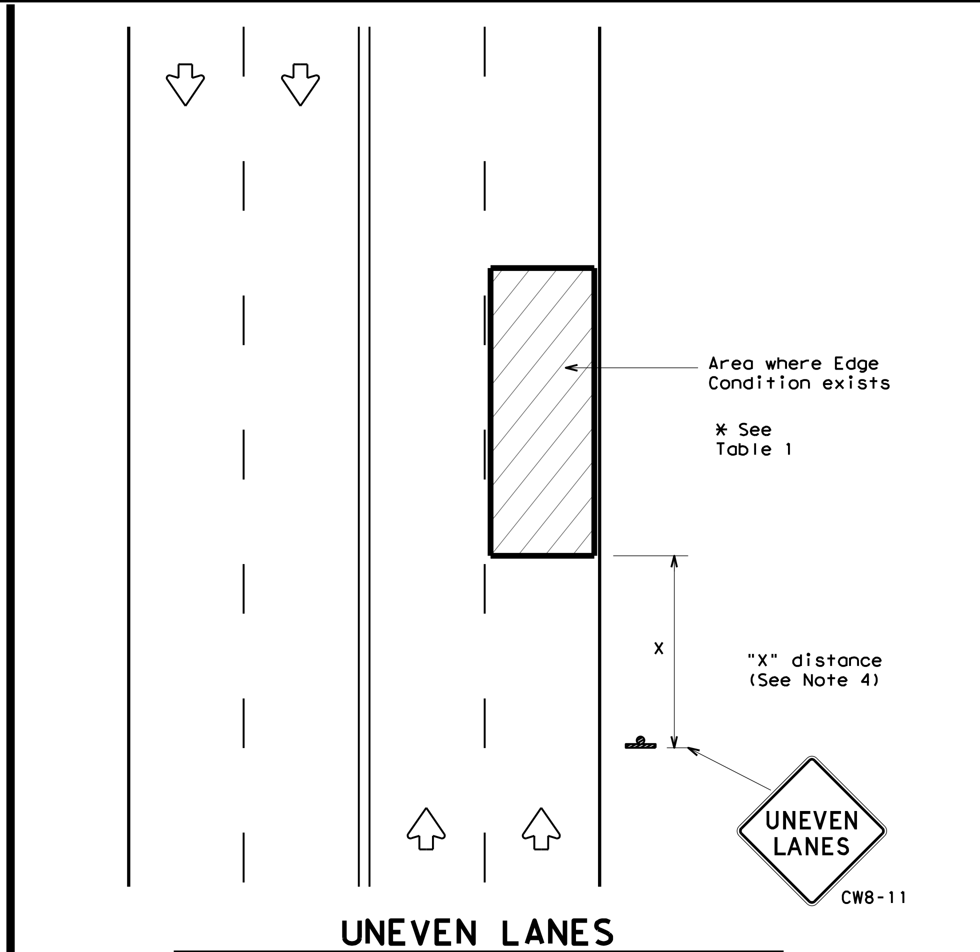
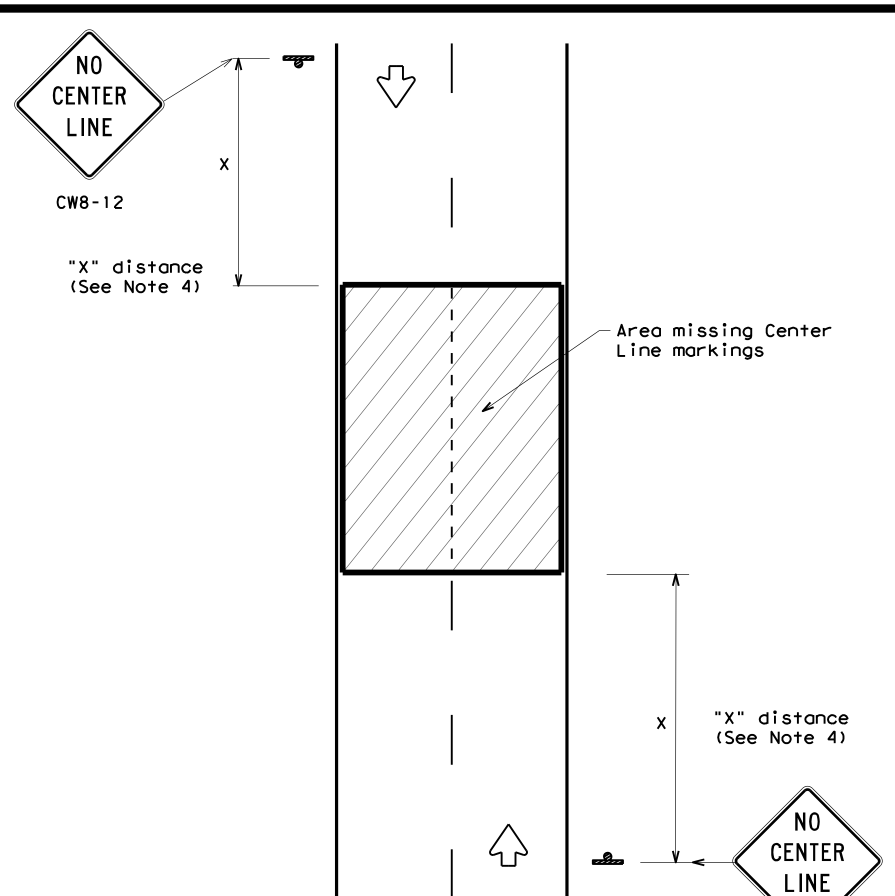
2-14	DIST	COUNTY		SHEET NO.
4-16	ELP	HUDSPETH		40



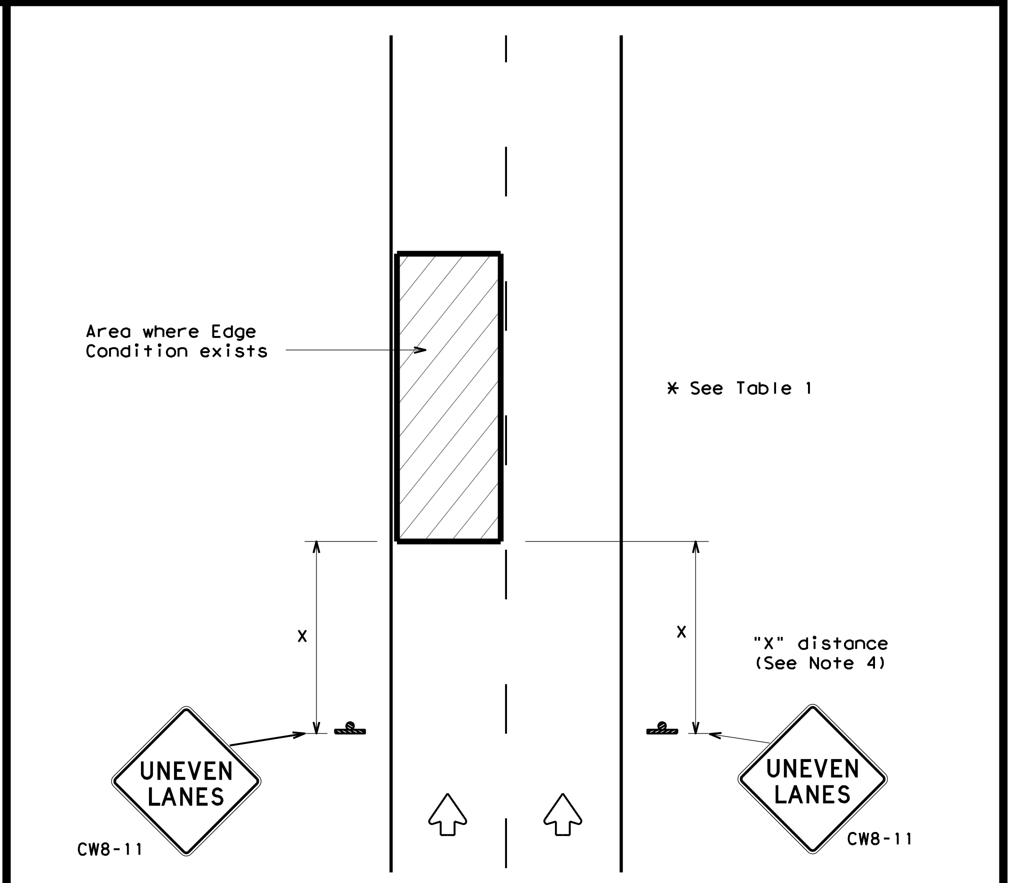
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

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

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

GENERAL NOTES

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

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① (D)	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② (>3, 1, D)	Less than or equal to 3"	Sign: CW8-11
③ (0" to 3/4", D, 12") Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

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

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

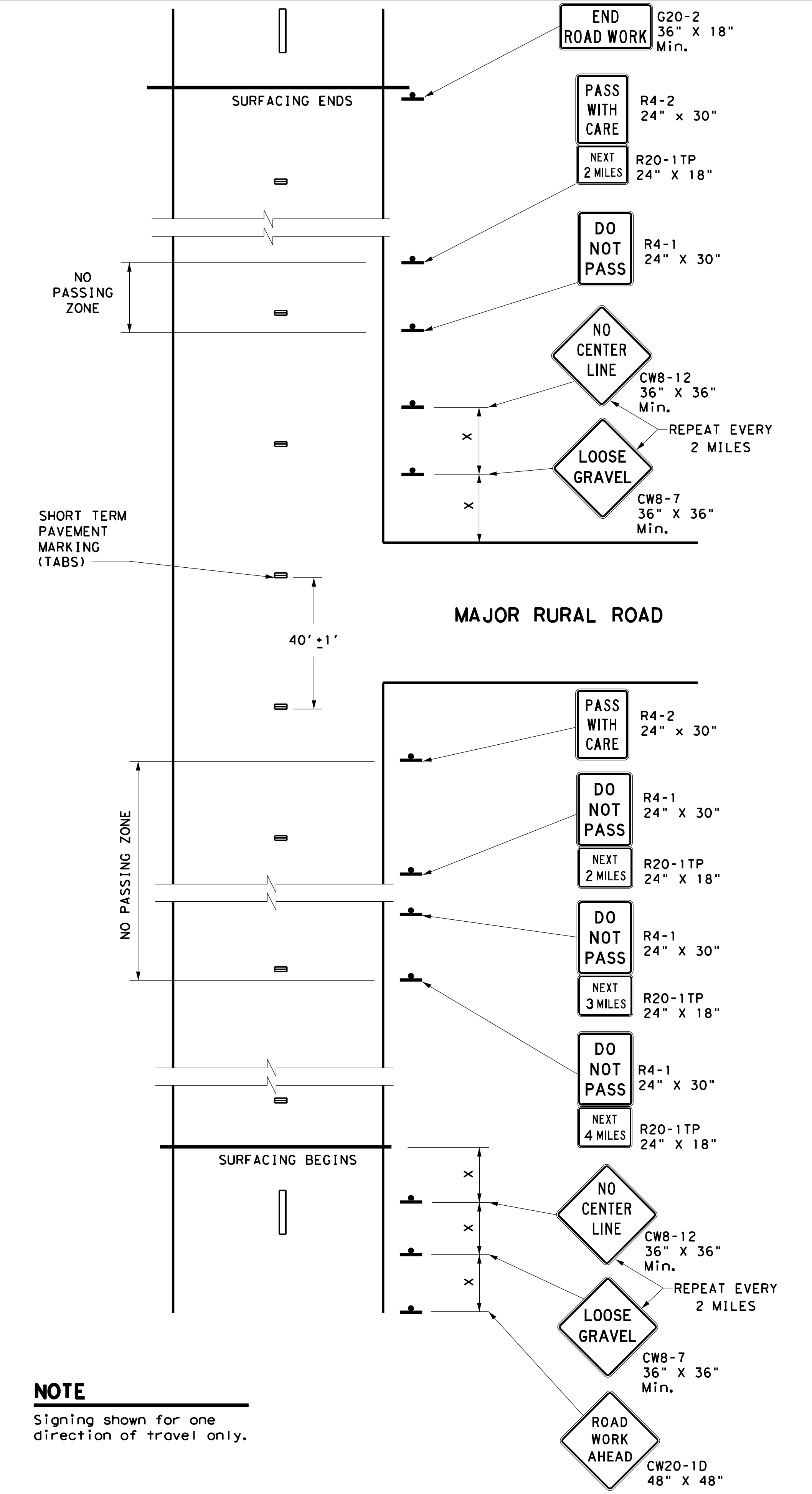
Texas Department of Transportation
Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT 0374	SECT 07	JOB 028, ETC	HIGHWAY US 62
REVISIONS 8-95 2-98 7-13 1-97 3-03	DIST ELP		COUNTY HUDSPETH	SHEET NO. 41

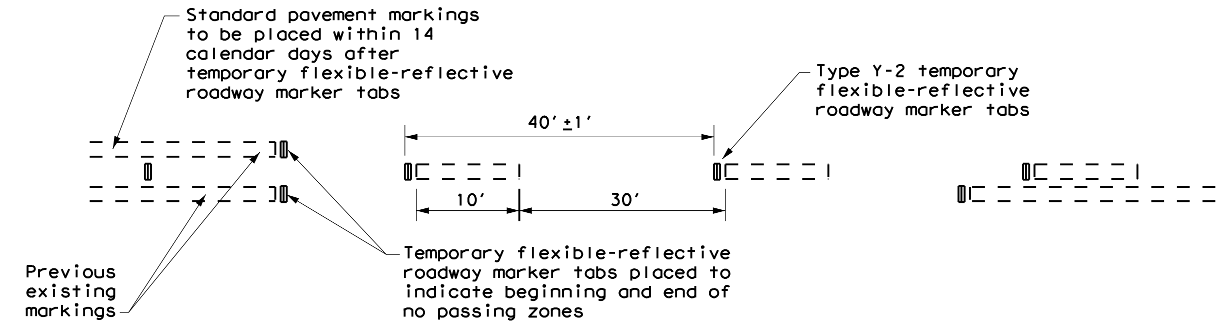
112



NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS

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

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

1. The traffic control devices detailed on this sheet will be furnished and erected as directed by the Engineer on sections of roadway where tabs must be placed prior to the surfacing operation which will cover or obliterate the existing pavement markings.

2. The devices shown on this sheet are to be used to supplement those required by the BC Standards or others required elsewhere in the plans.

3. Signs shall be erected as detailed on the BC Standards or the Compliant Work Zone Traffic Control Devices List (CWZTCD) on supports approved for Long-Term / Intermediate-Term Work Zone Sign Supports.

4. When surfacing operations take place on divided highways, freeways or expressways, the size of diamond shaped construction warning signs shall be 48" x 48".

5. Signs on divided highways, freeways and expressways will be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.

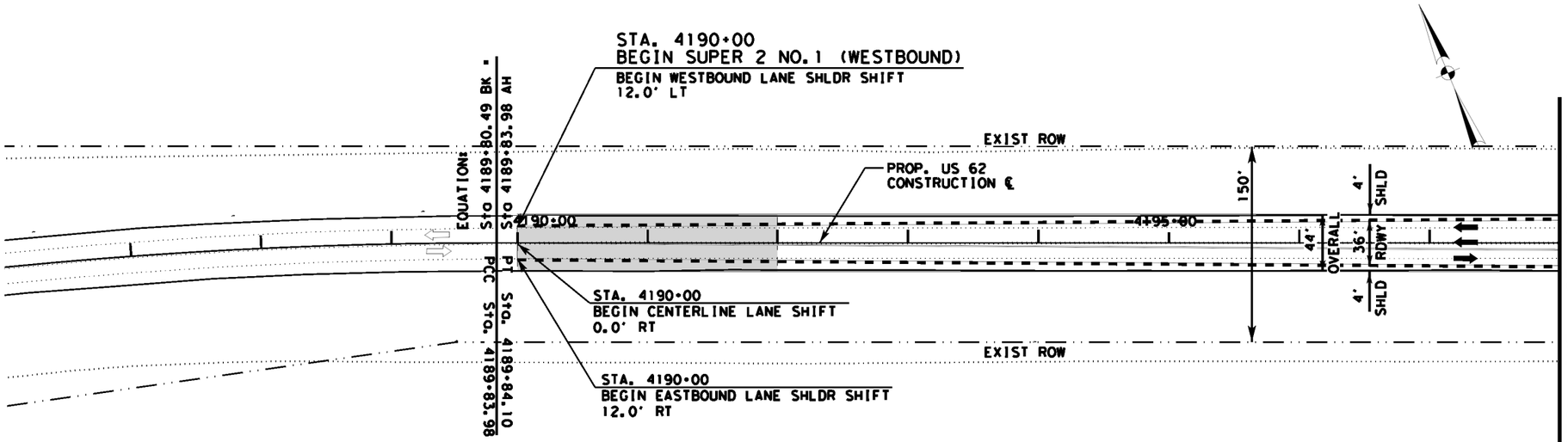
Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

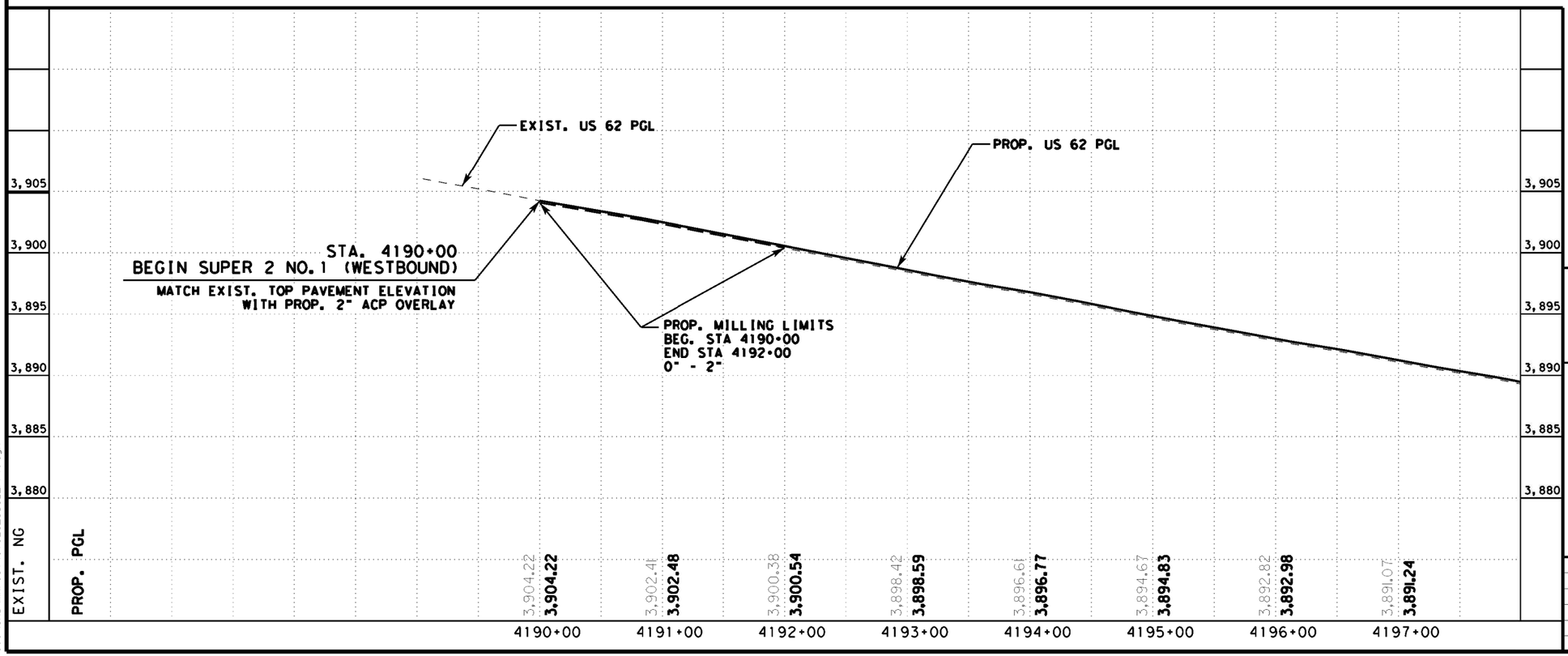
TCP(7-1)-13

FILE: tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 4-98 1-97 7-13	0374	07	028, ETC	US 62
	DIST		COUNTY	SHEET NO.
	ELP		HUDSPETH	42

210



ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
1 OF 19	8.00	72.00	1,800.00	36.00	7.00	107.00	364.00	587.00	978.00	1,600.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE
STA 4190+00
TO
STA 4198+00

SHEET 01 OF 19

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
06		43

STATE	DIST.	COUNTY
TEXAS	ELP	HUDSPETH

CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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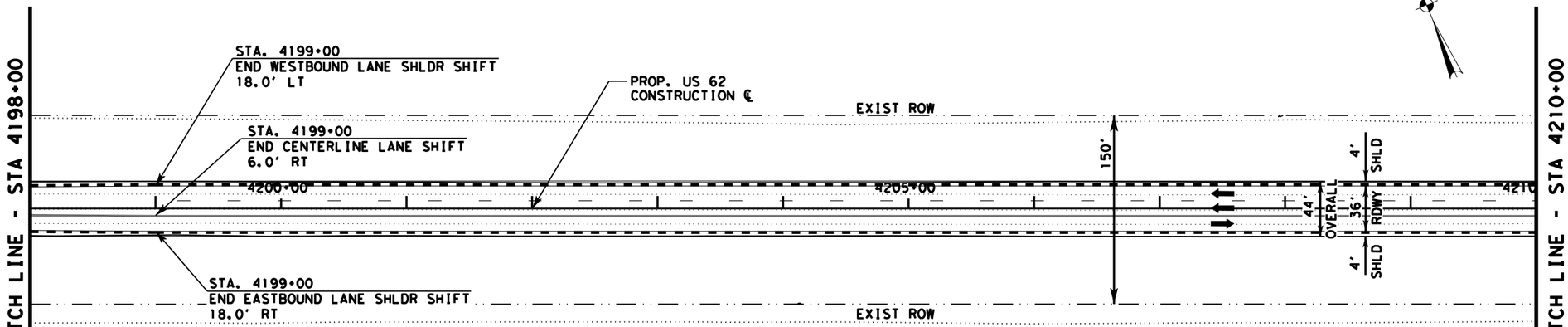
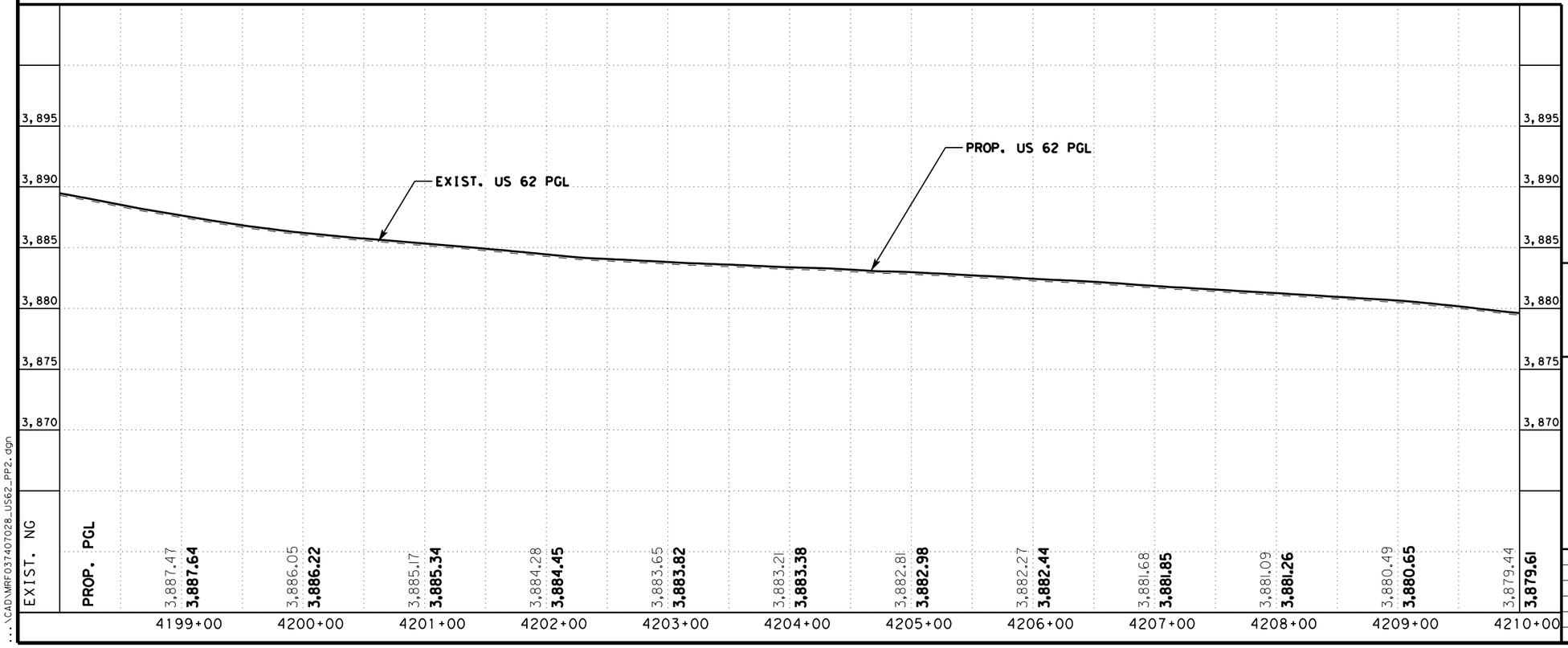


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
2 OF 19	55.00	108.00	2,699.00	54.00	63.00	160.00	634.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

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LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE
STA 4198+00
TO
STA 4210+00

SHEET 02 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			44
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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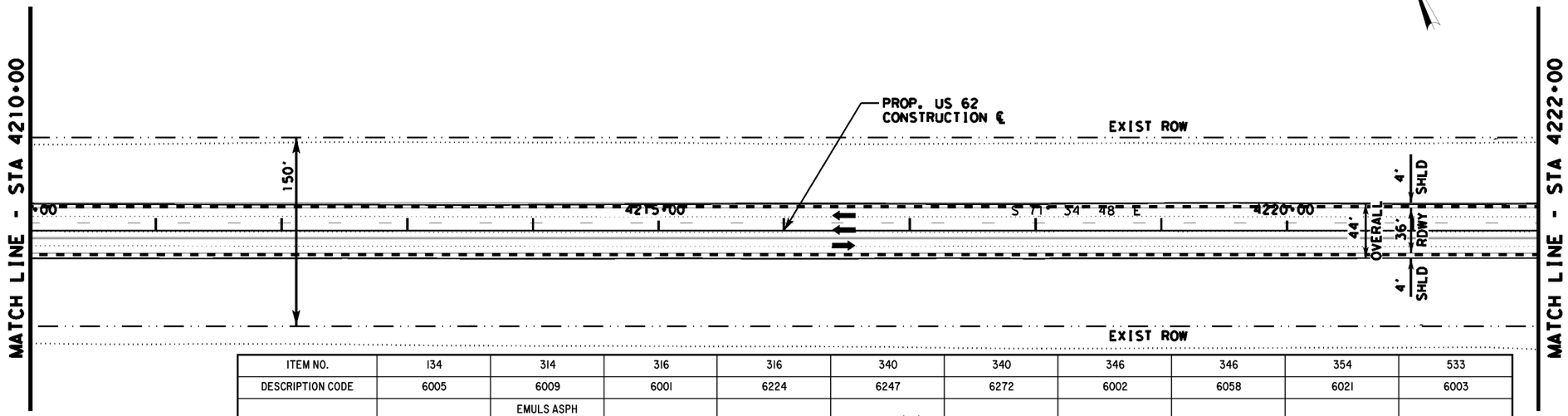
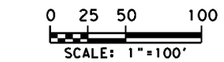




LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

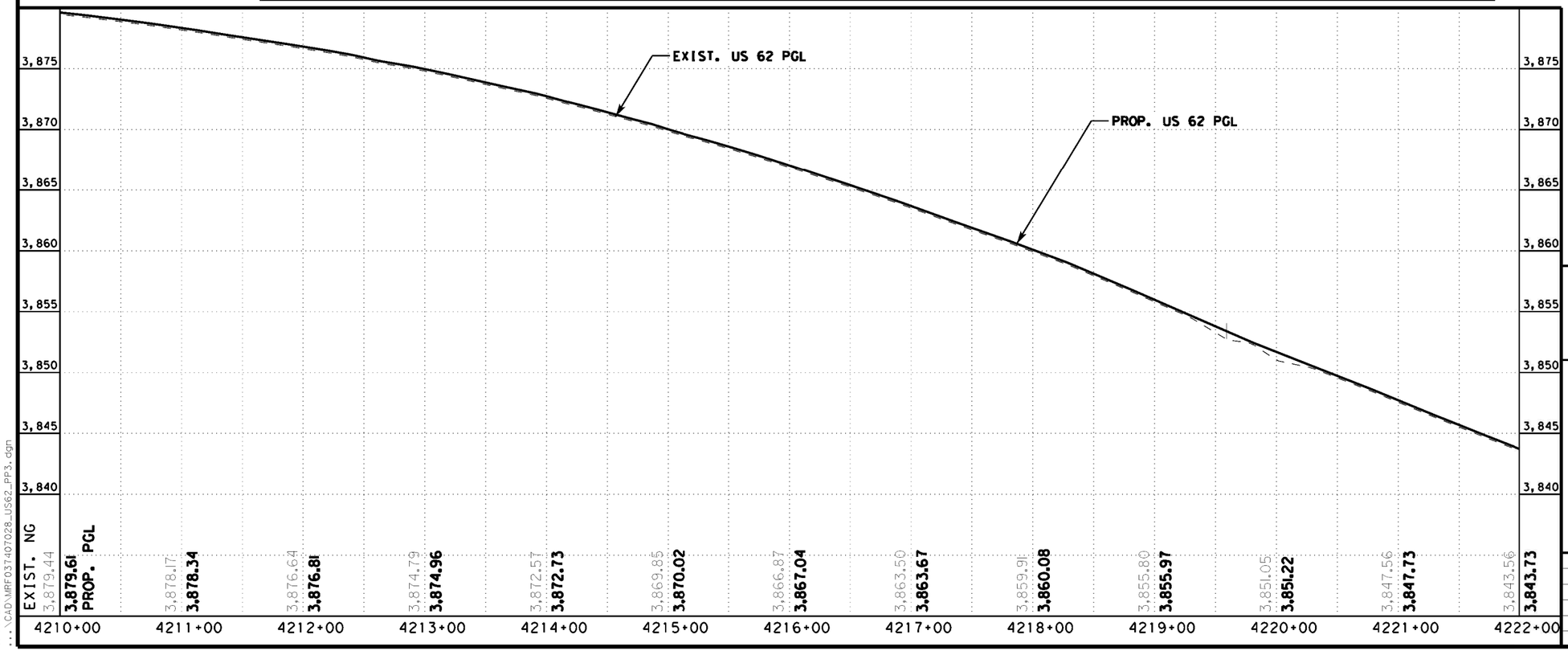
PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
3 OF 19	18.00	108.00	2,699.00	54.00	82.00	160.00	639.00	880.00	0.00	2,400.00



STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE STA 4210+00 TO STA 4222+00

SHEET 03 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			45
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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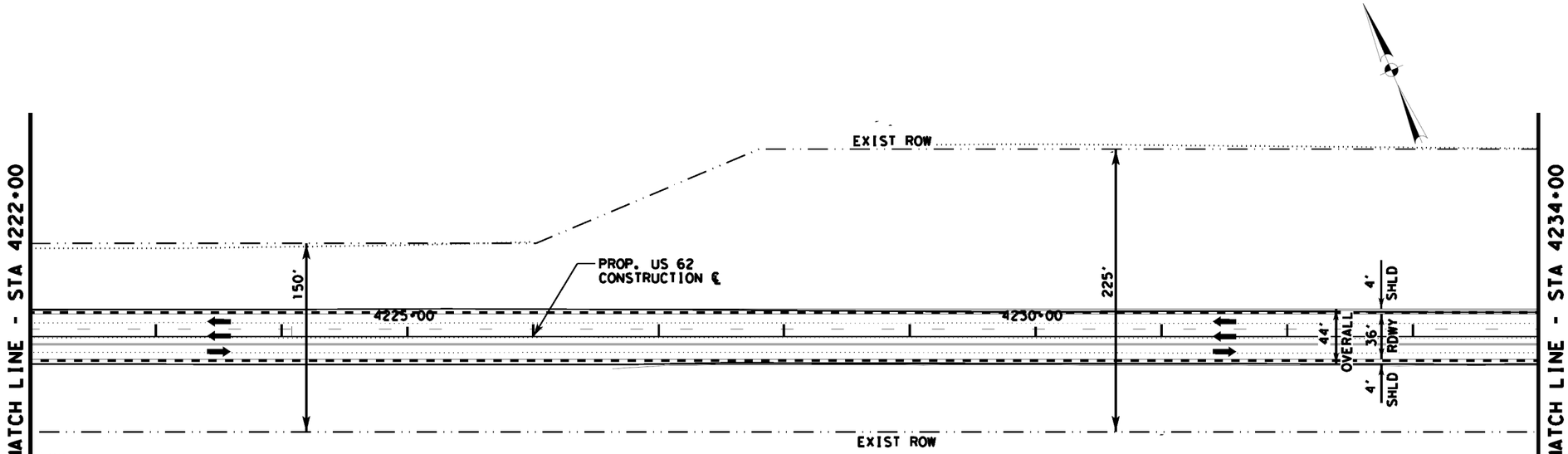
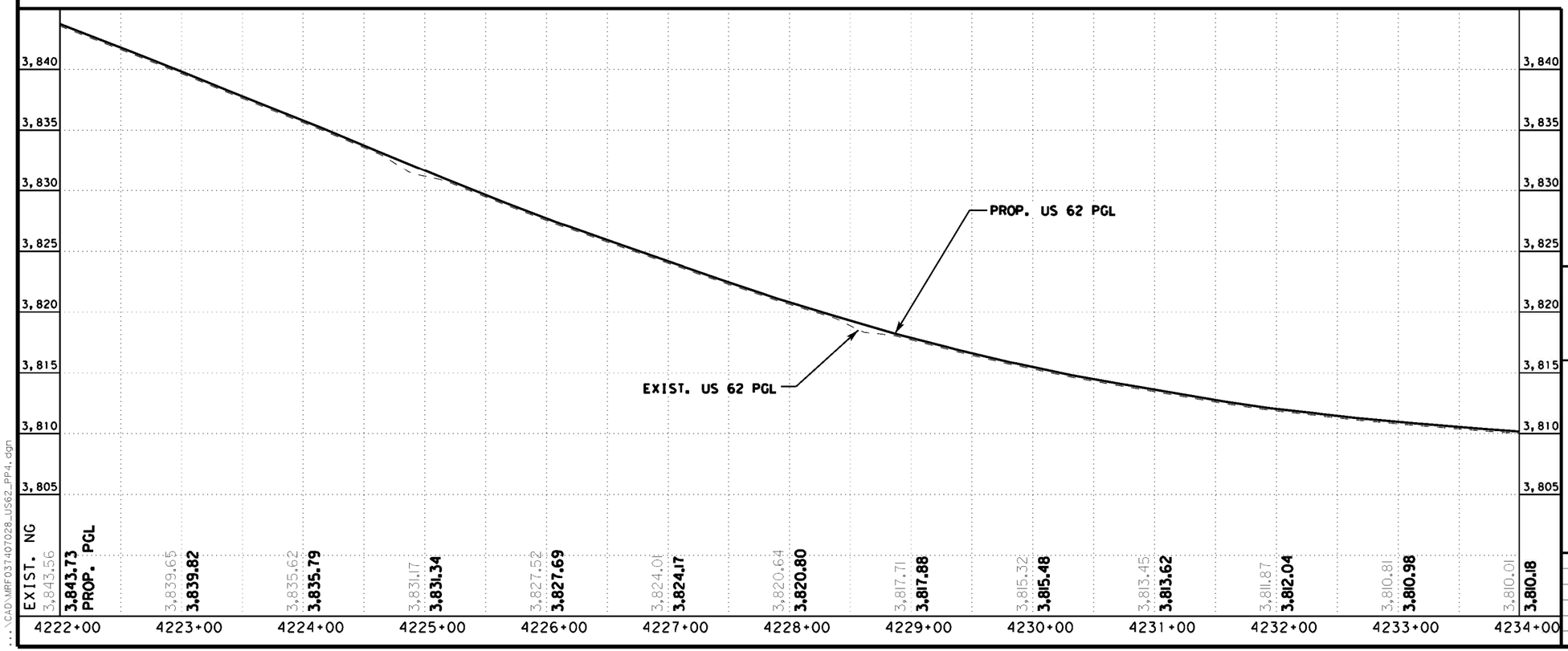


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
4 OF 19	55.00	108.00	2,699.00	54.00	95.00	160.00	625.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED
PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE
STA 4222+00
TO
STA 4234+00

SHEET 04 OF 19

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
06		46

STATE	DIST.	COUNTY
TEXAS	ELP	HUDSPETH

CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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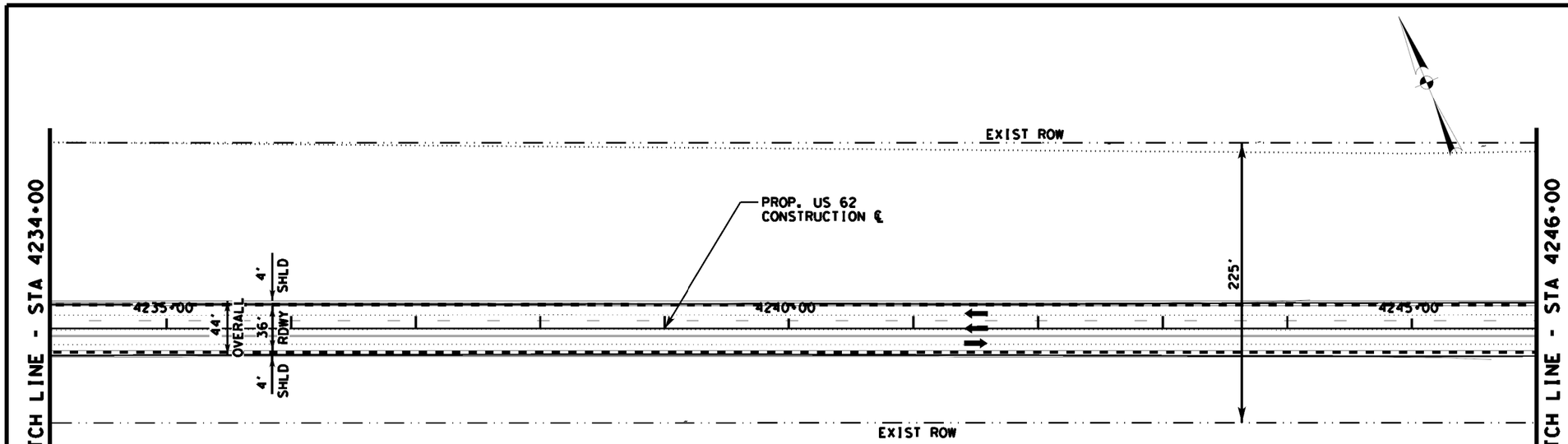
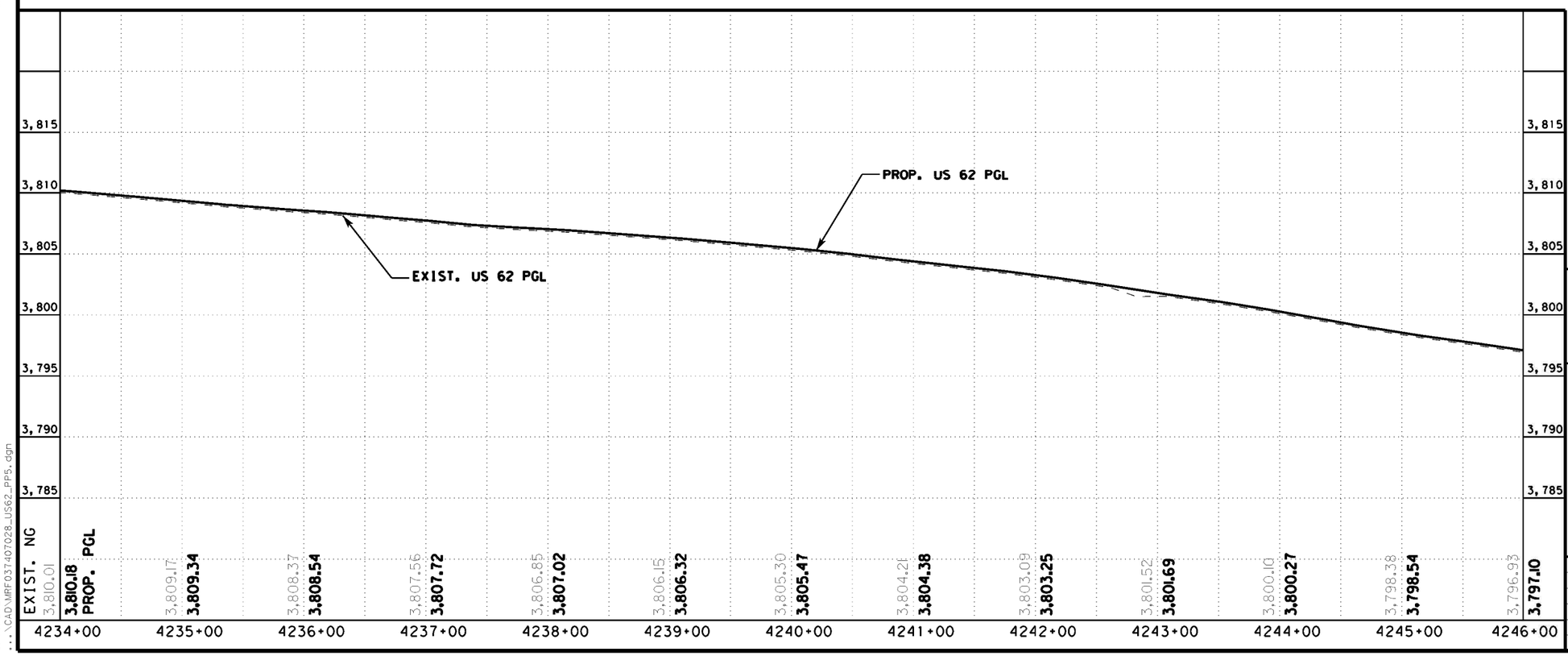


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
5 OF 19	45.00	108.00	2,699.00	54.00	83.00	160.00	623.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

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STATE OF TEXAS
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36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE
STA 4234+00
TO
STA 4246+00

SHEET 05 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			47
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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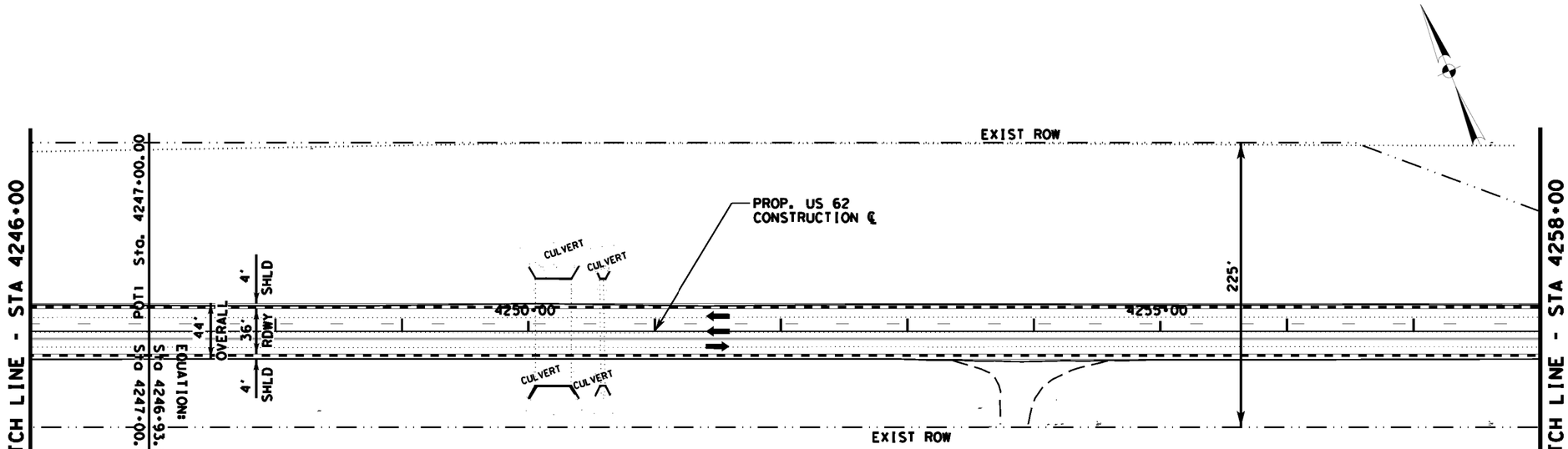
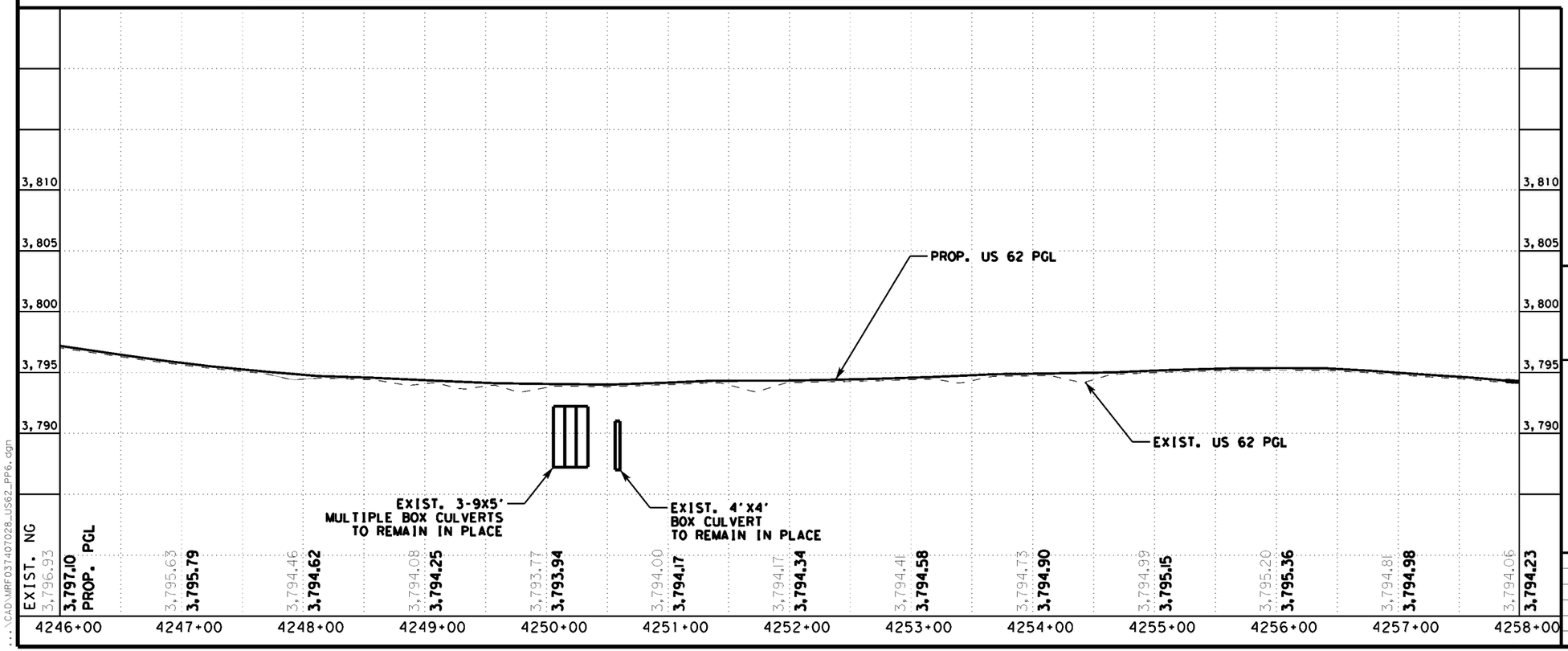


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
6 OF 19	52.00	108.00	2,699.00	54.00	87.00	160.00	630.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED
PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

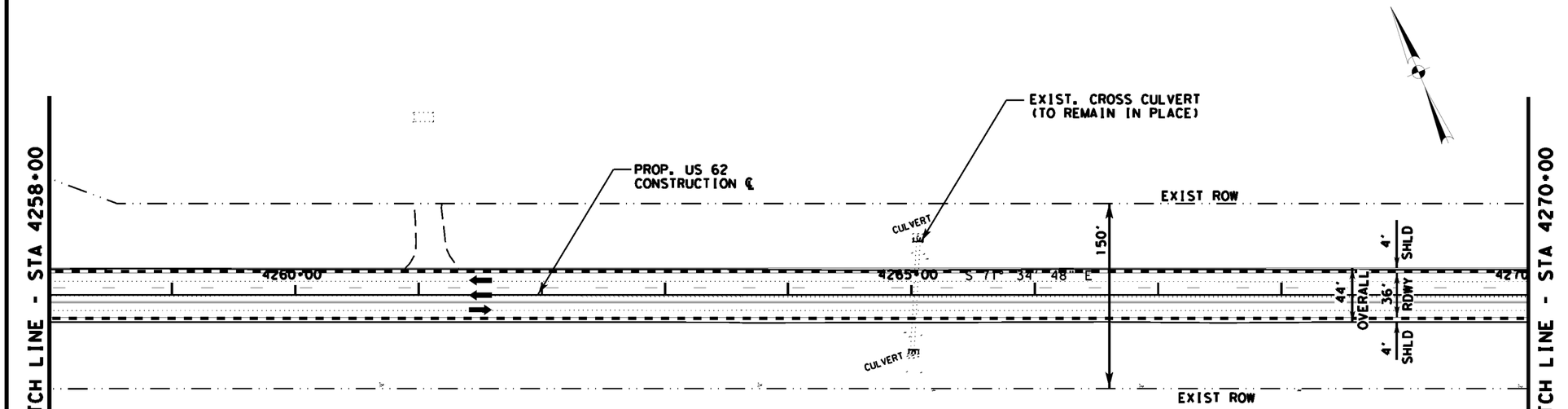
Texas Department of Transportation

PLAN & PROFILE STA 4246+00 TO STA 4258+00

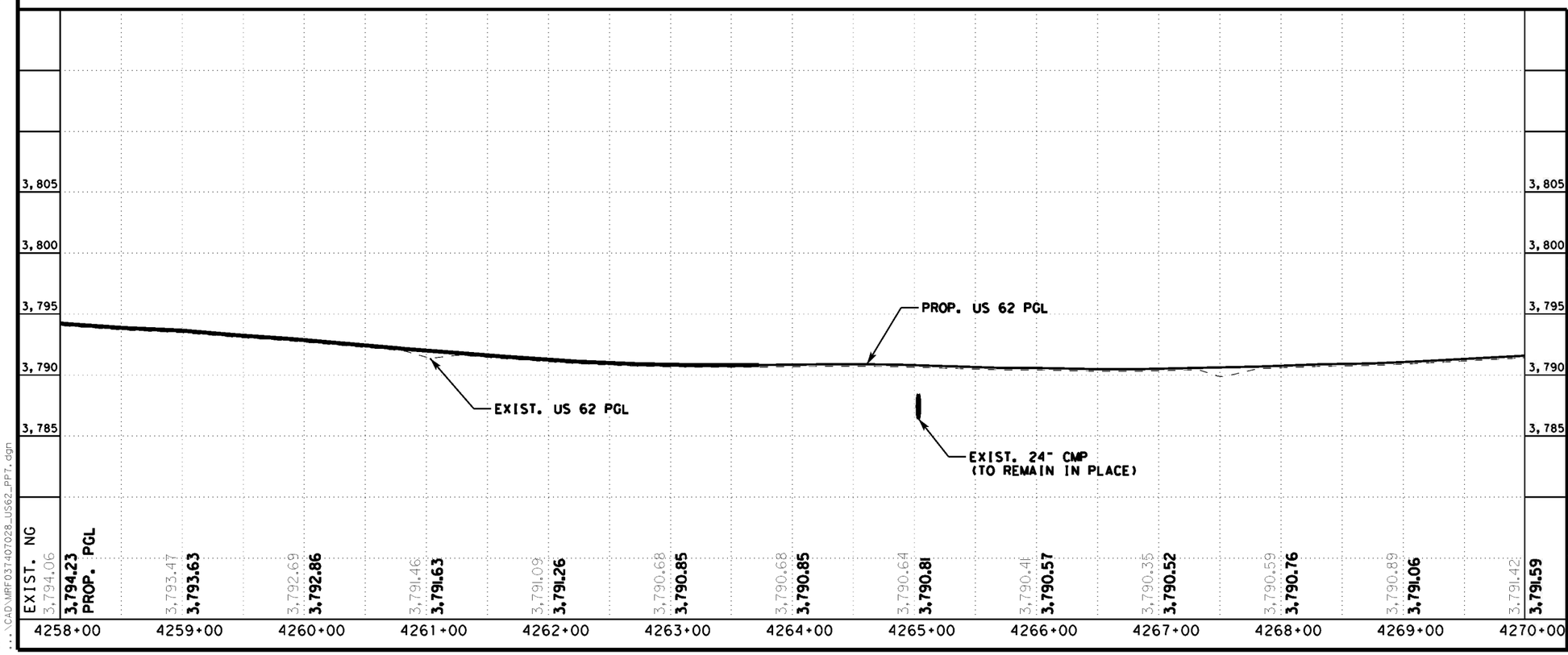
SHEET 06 OF 19

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
06		48

STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62



ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
7 OF 19	103.00	108.00	2,699.00	54.00	88.00	160.00	629.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
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5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE STA 4258+00 TO STA 4270+00

SHEET 07 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			49
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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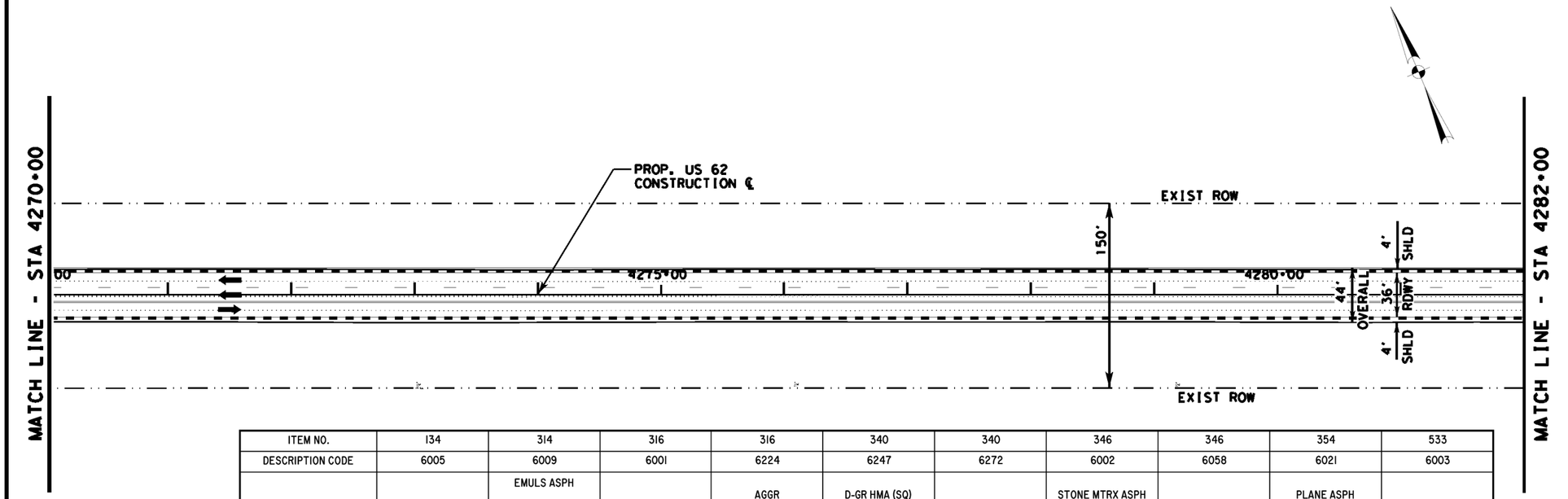
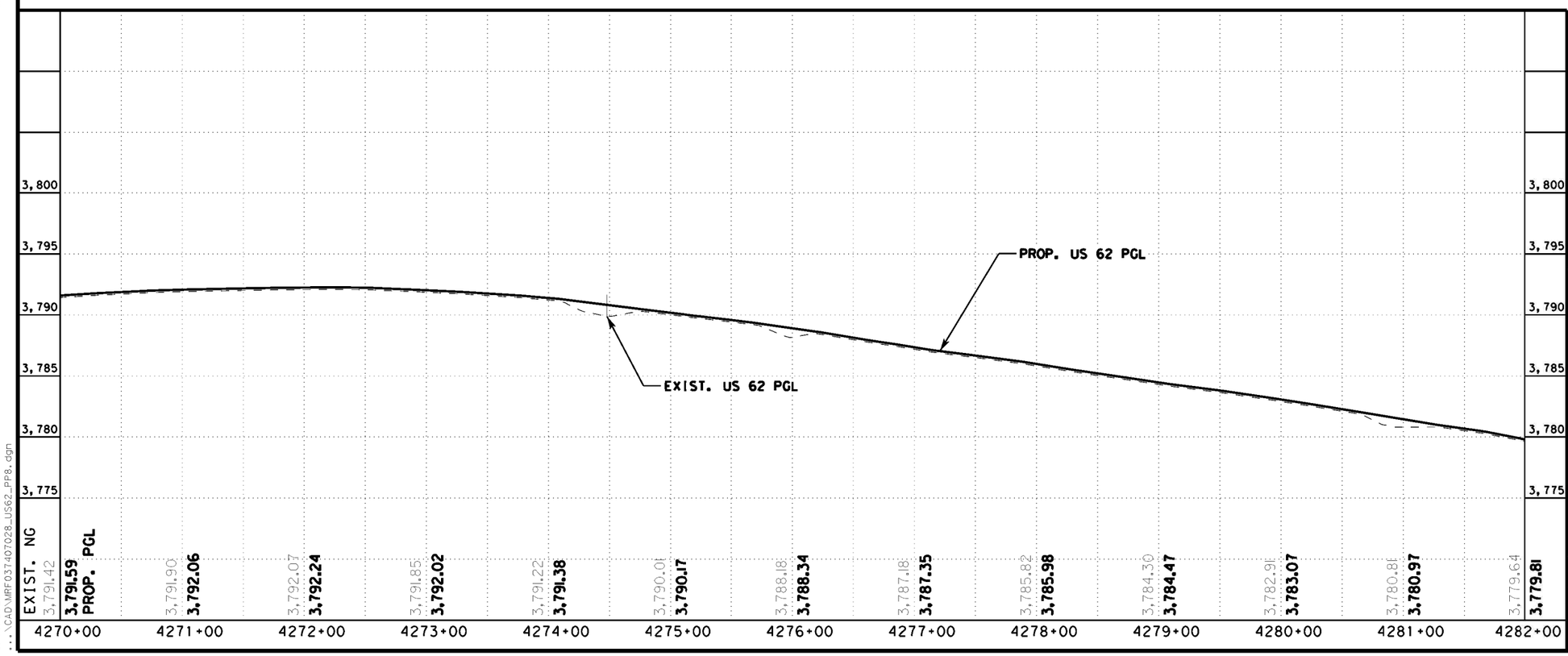


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
8 OF 19	49.00	108.00	2,699.00	54.00	158.00	160.00	637.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
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LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE STA 4270+00 TO STA 4282+00

SHEET 08 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			50
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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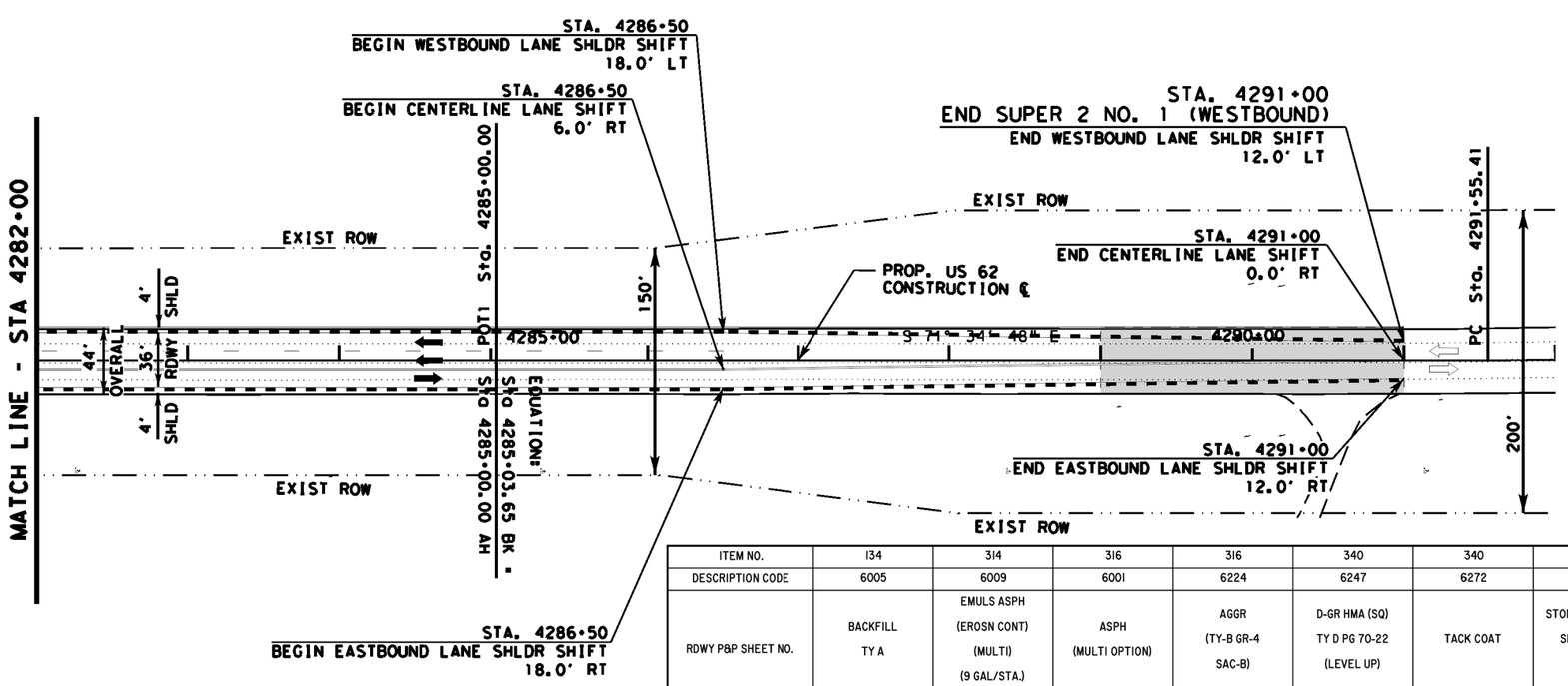
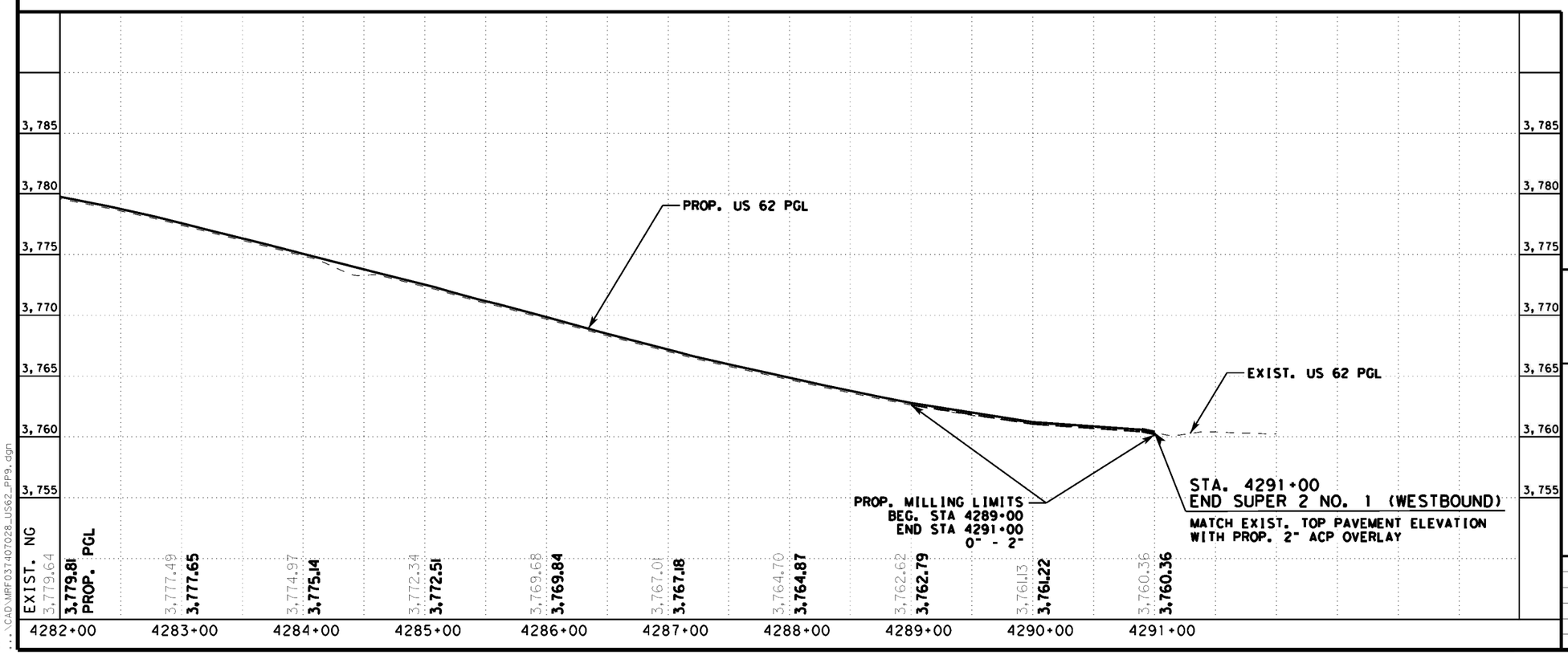


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
9 OF 19	24.00	81.00	2,024.00	40.00	47.00	120.00	423.00	660.00	978.00	1,800.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE
STA 4282+00
TO
STA 4291+00

SHEET 09 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			51
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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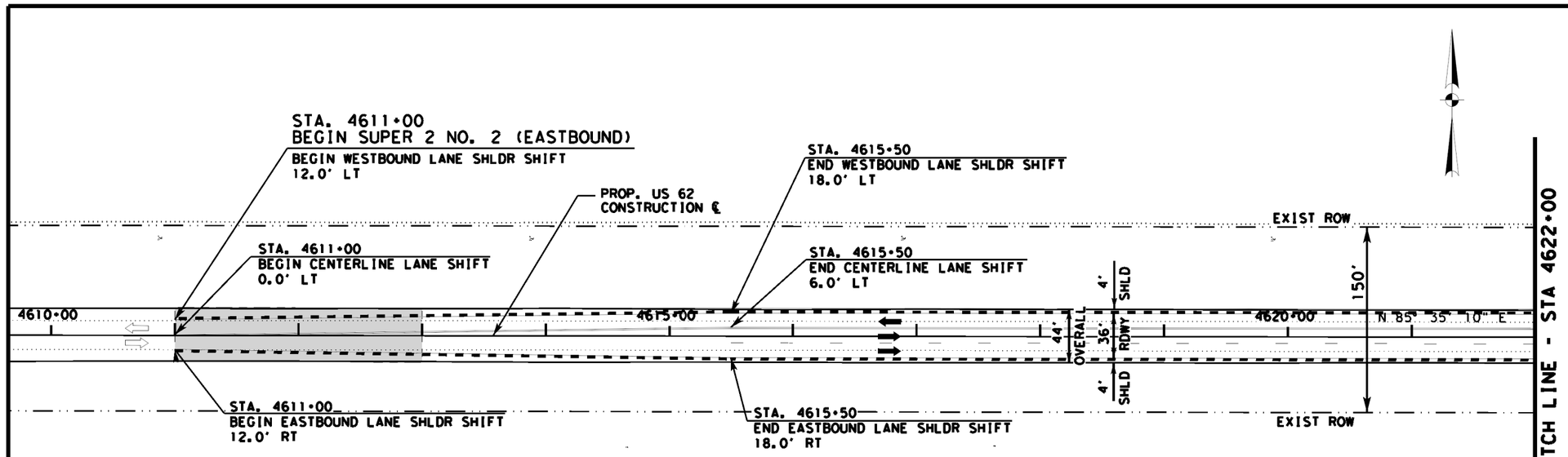
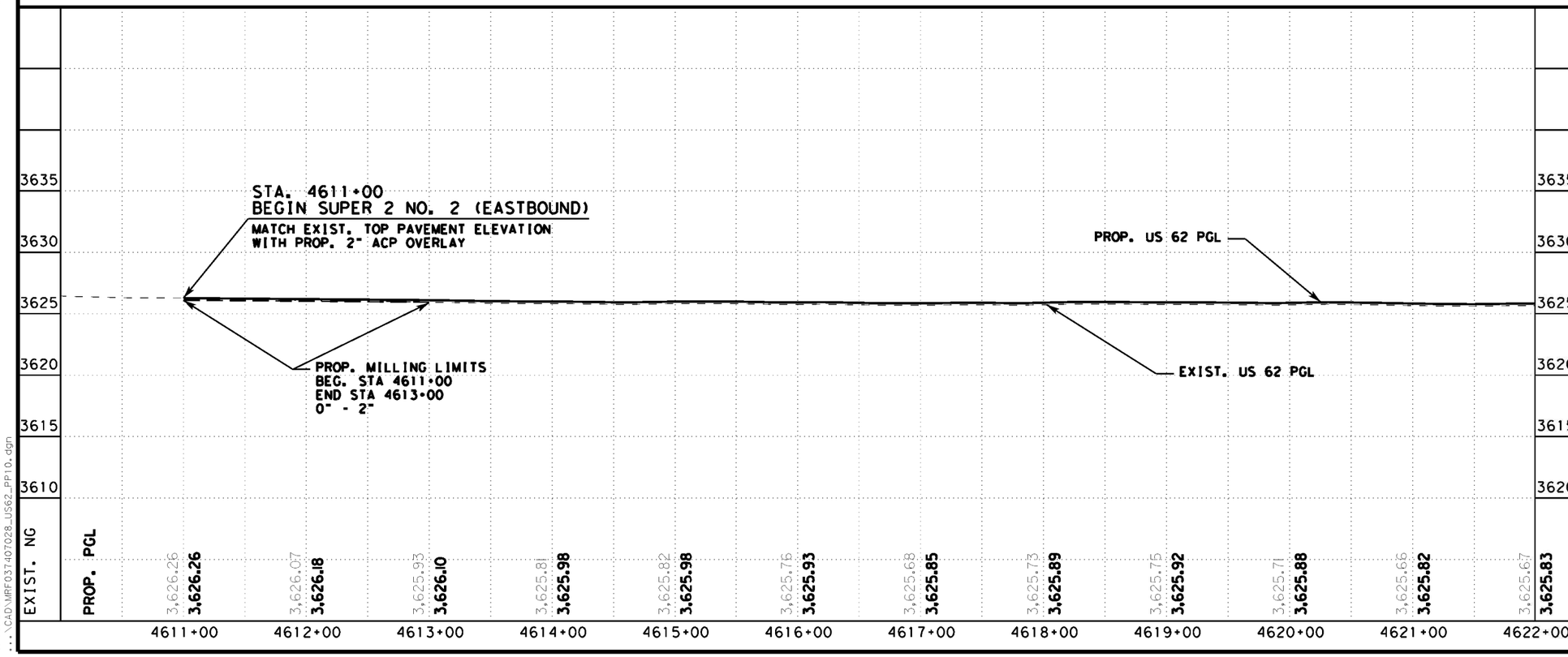


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
10 OF 19	91.00	99.00	2,474.00	49.00	30.00	147.00	593.00	807.00	978.00	2,200.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE
STA 4611+00
TO
STA 4622+00

SHEET 10 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			52
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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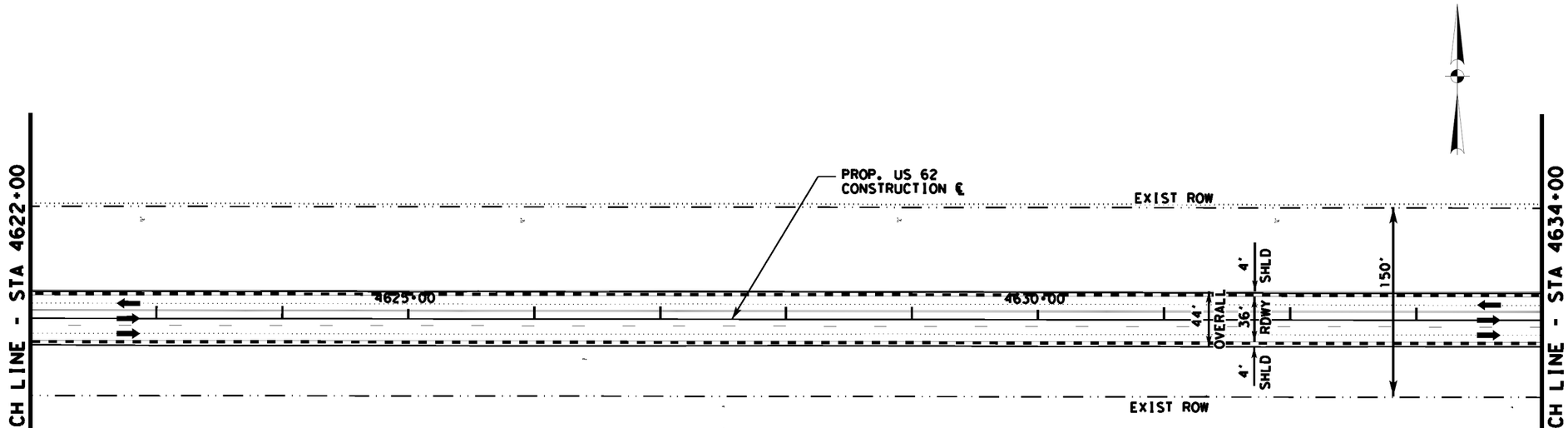
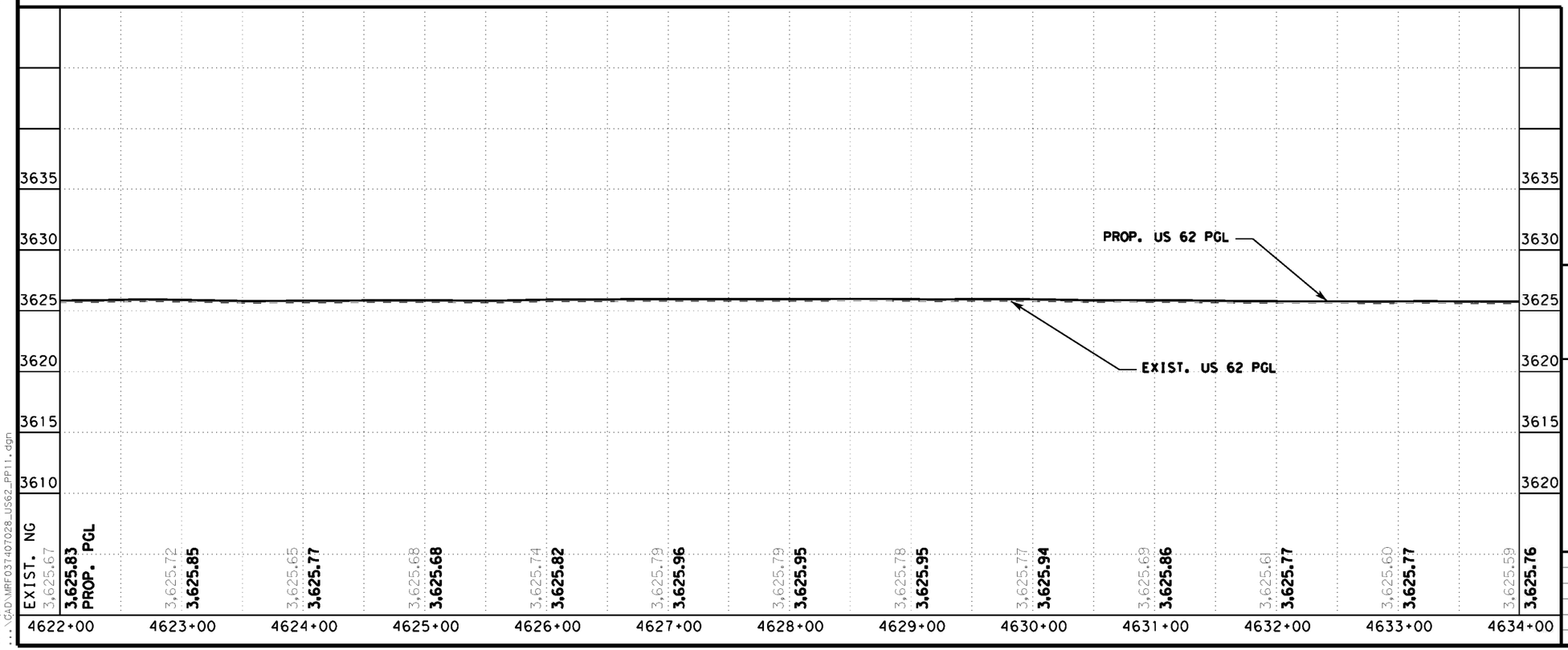


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
11 OF 19	126.00	108.00	2,699.00	54.00	55.00	160.00	637.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED
PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE
STA 4622+00
TO
STA 4634+00

SHEET 11 OF 19

FED.RD. DIV. NO.	PROJECT NO.	SHEET NO.
06		53
STATE	DIST.	COUNTY
TEXAS	ELP	HUDSPETH
CONT.	SECT.	JOB / HIGHWAY NO.
0374	07	028, ETC. / US 62

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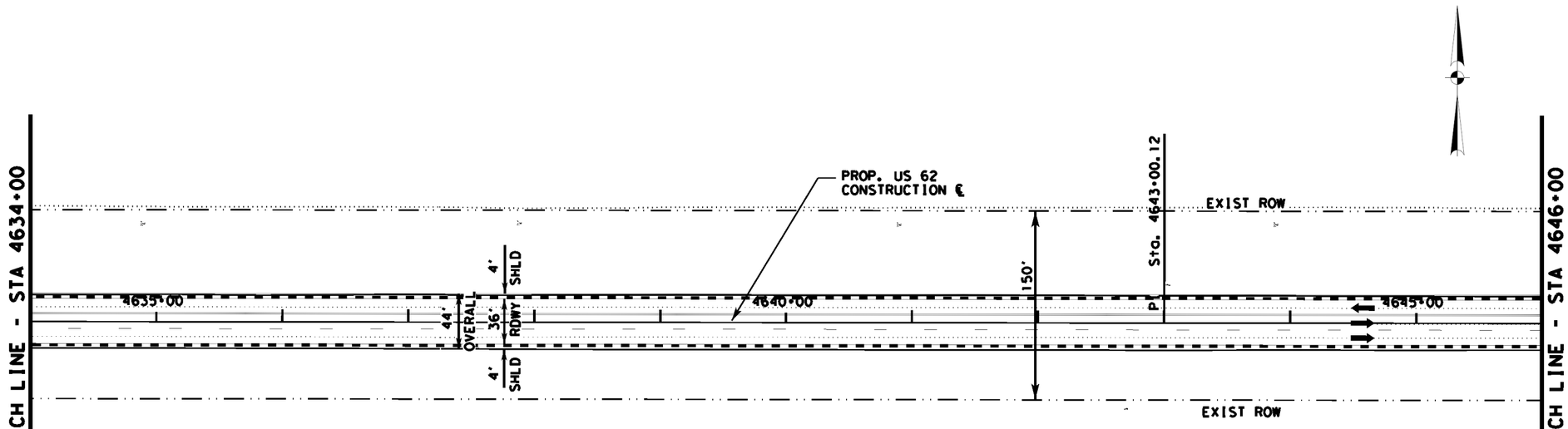


LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

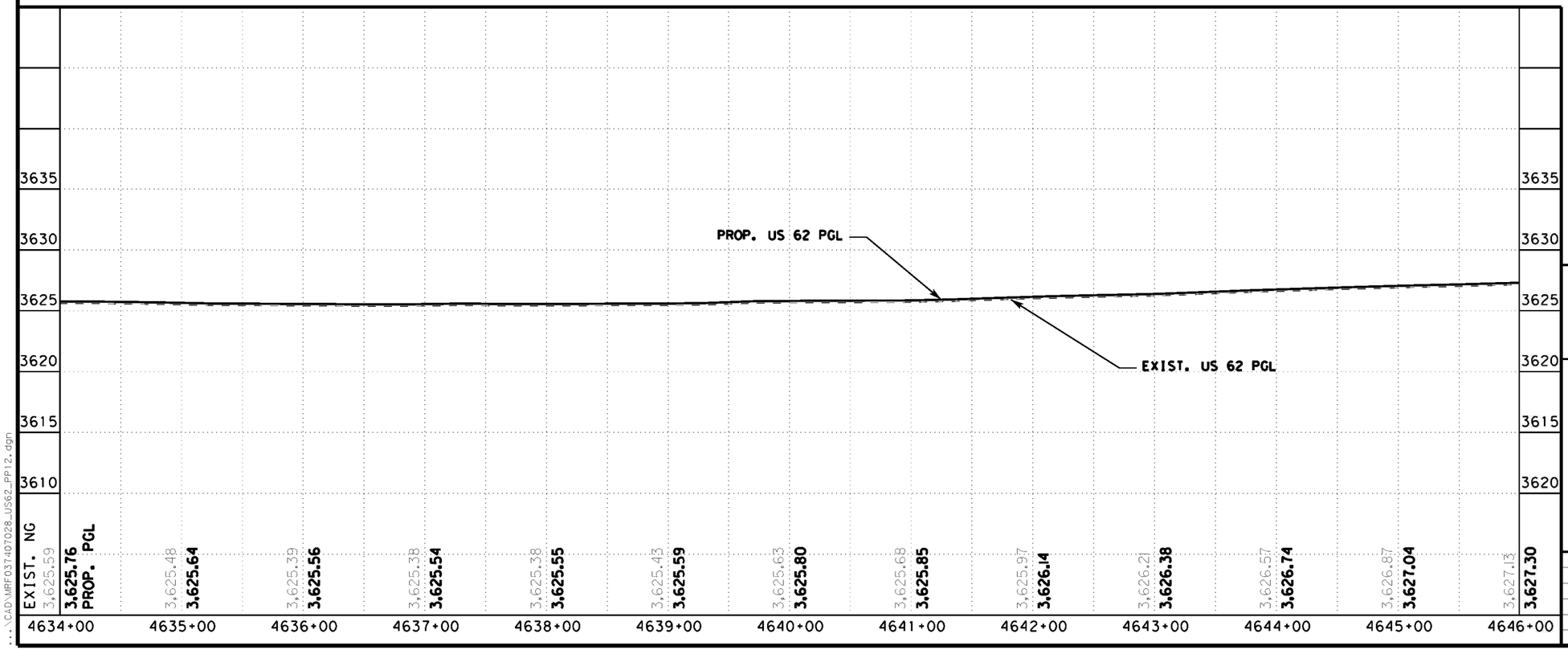
PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
12 OF 19	27.00	108.00	2,699.00	54.00	39.00	160.00	633.00	880.00	0.00	2,400.00



HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

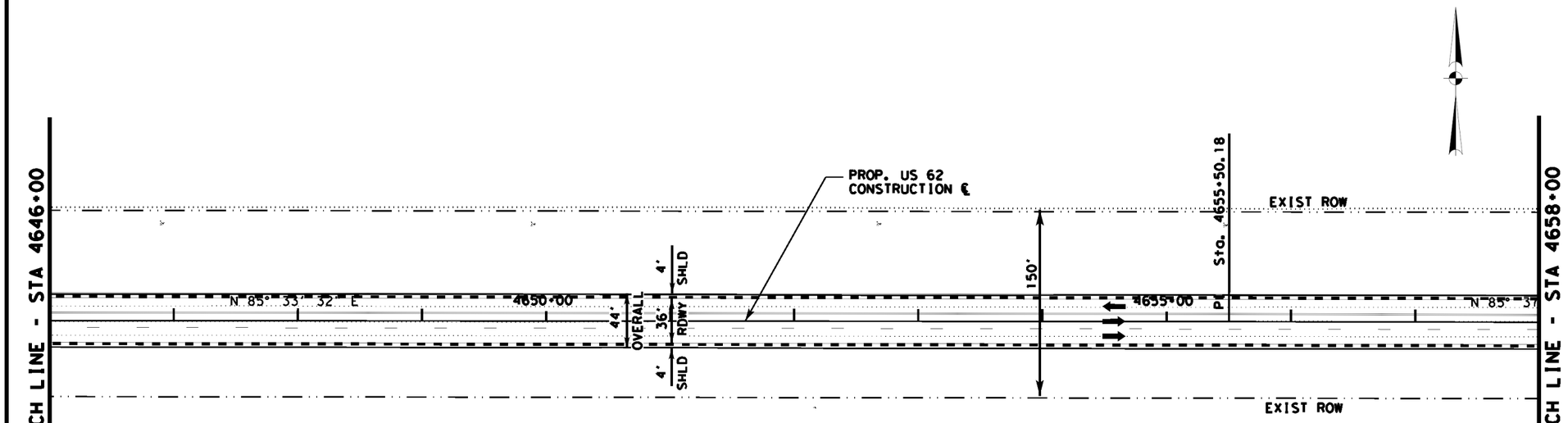
CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

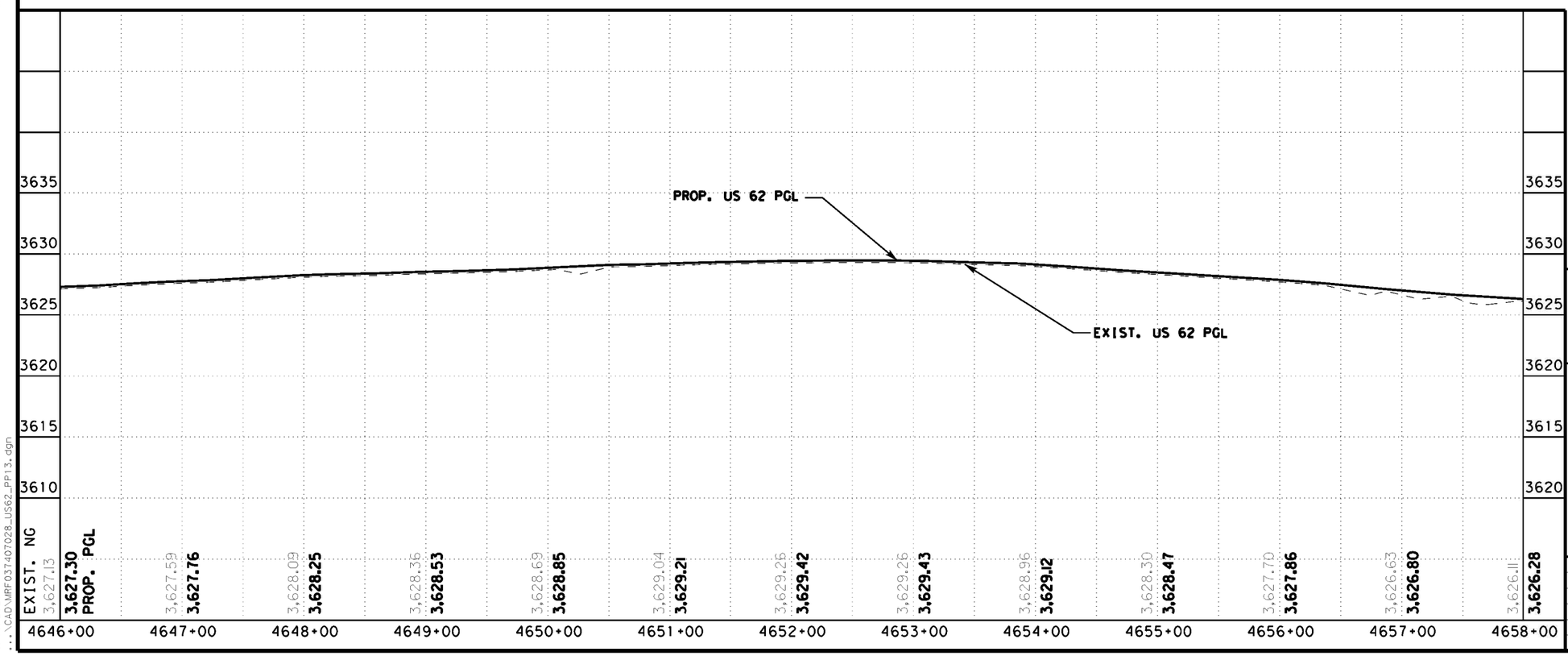
PLAN & PROFILE STA 4634+00 TO STA 4646+00

SHEET 12 OF 19

FED.RD. DIV. NO.	PROJECT NO.		SHEET NO.
06			54
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62



ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
13 OF 19	28.00	108.00	2,699.00	54.00	72.00	160.00	628.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE
STA 4646+00
TO
STA 4658+00

SHEET 13 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			55
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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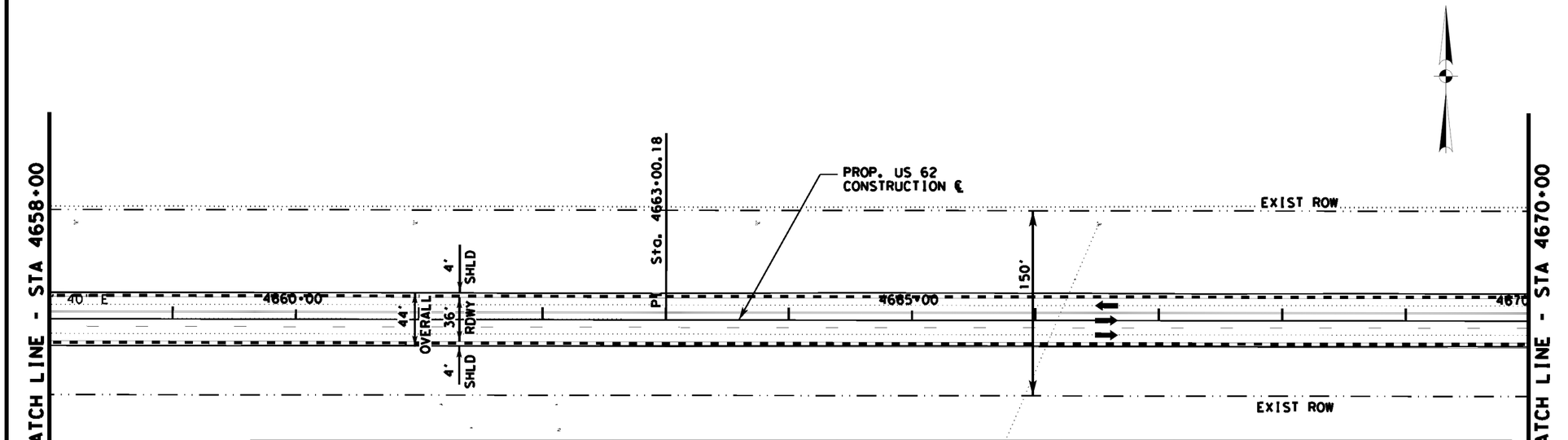
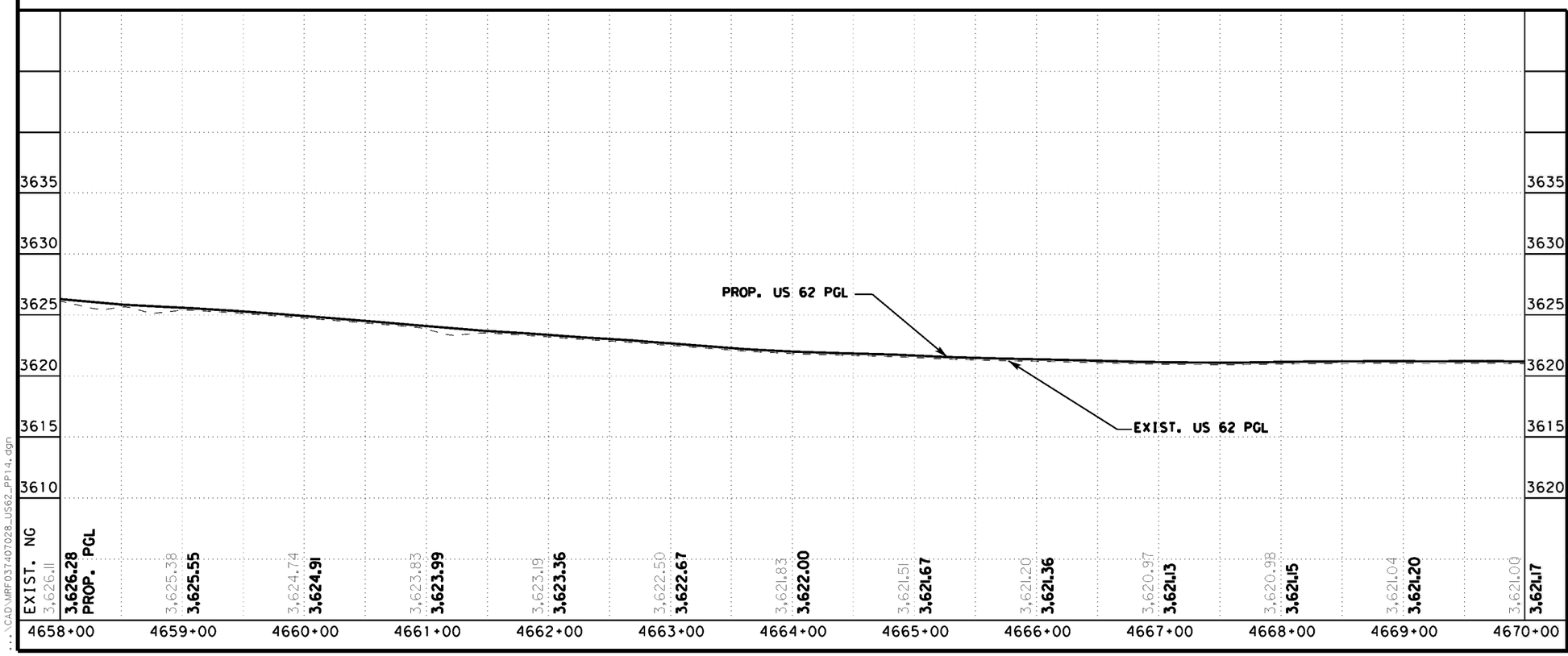


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
14 OF 19	36.00	108.00	2,699.00	54.00	62.00	160.00	634.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE STA 4658+00 TO STA 4670+00

SHEET 14 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			56
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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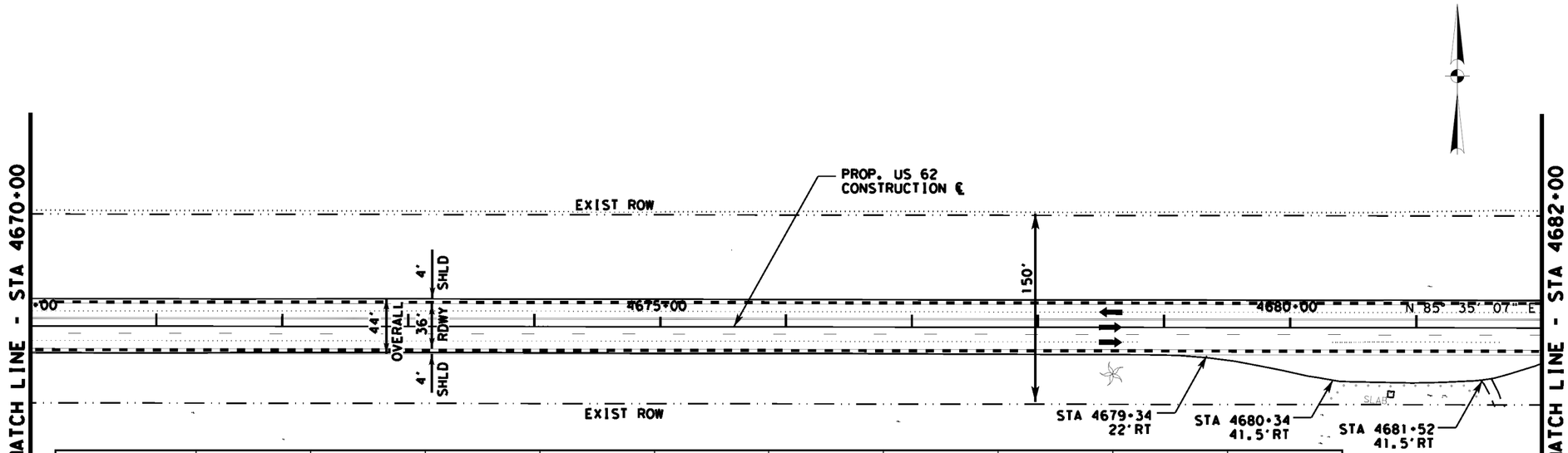


0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

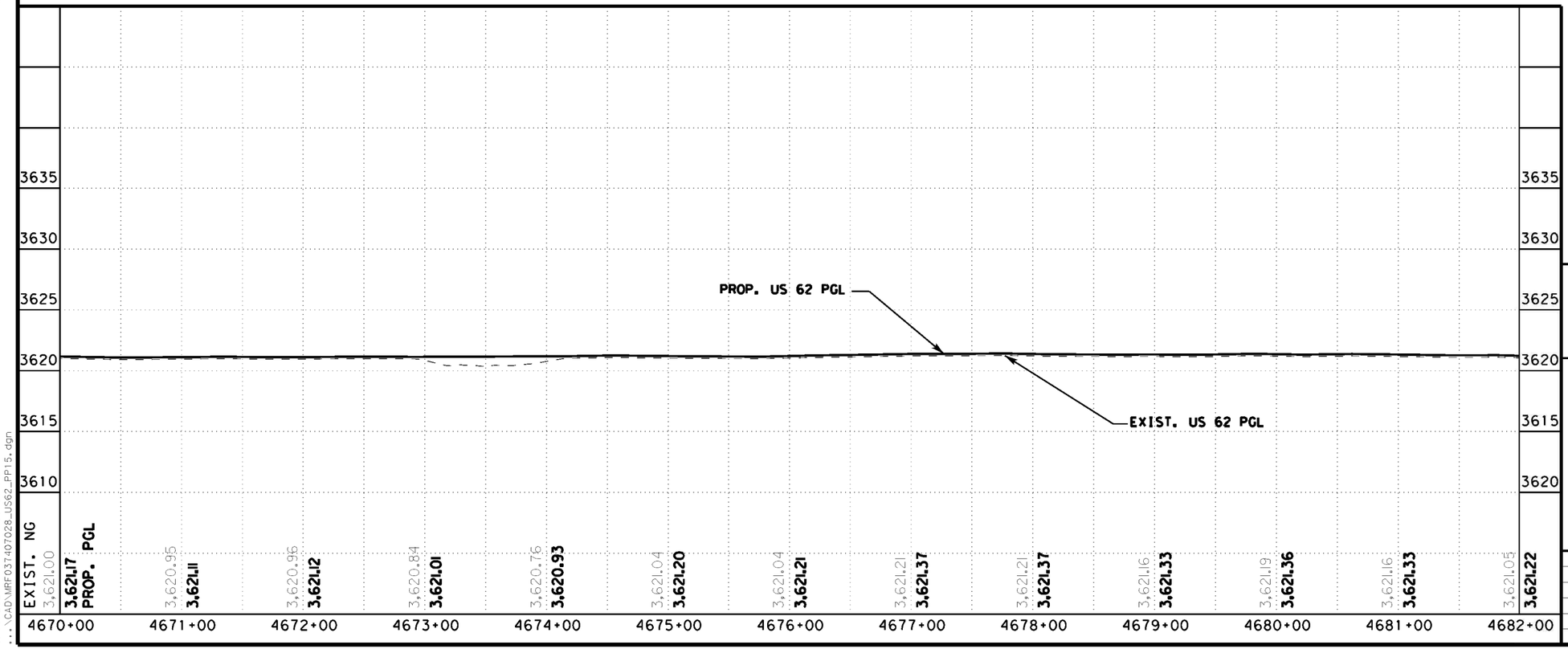
PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
15 OF 19	57.00	108.00	2,699.00	54.00	76.00	160.00	636.00	880.00	0.00	2,400.00



STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE STA 4670+00 TO STA 4682+00

SHEET 15 OF 19

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
06		57

STATE	DIST.	COUNTY
TEXAS	ELP	HUDSPETH

CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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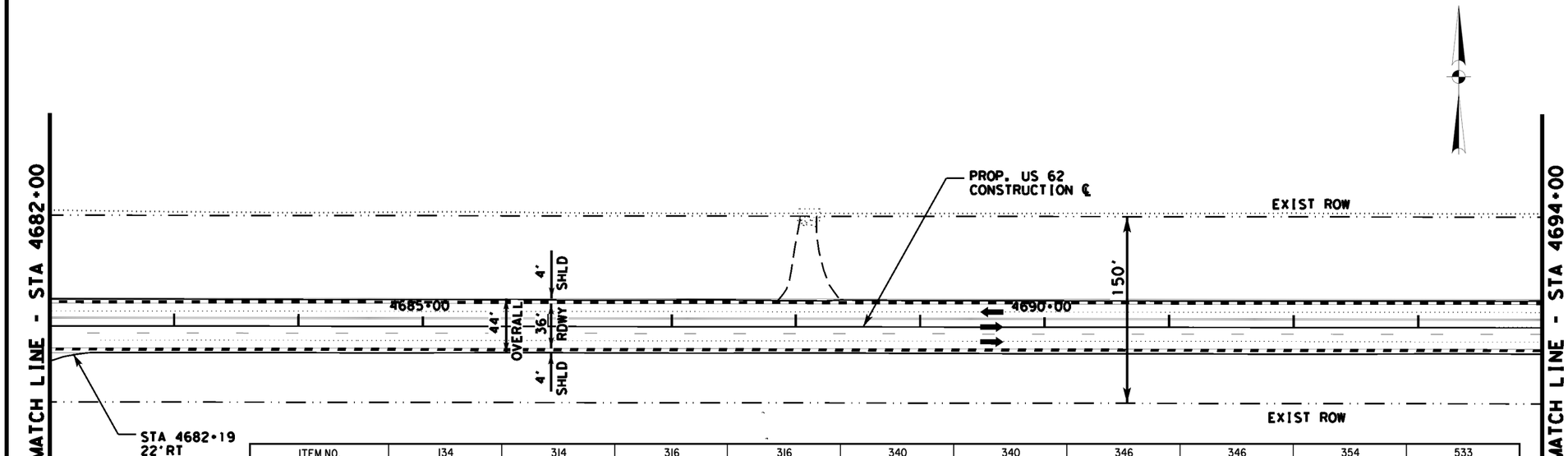
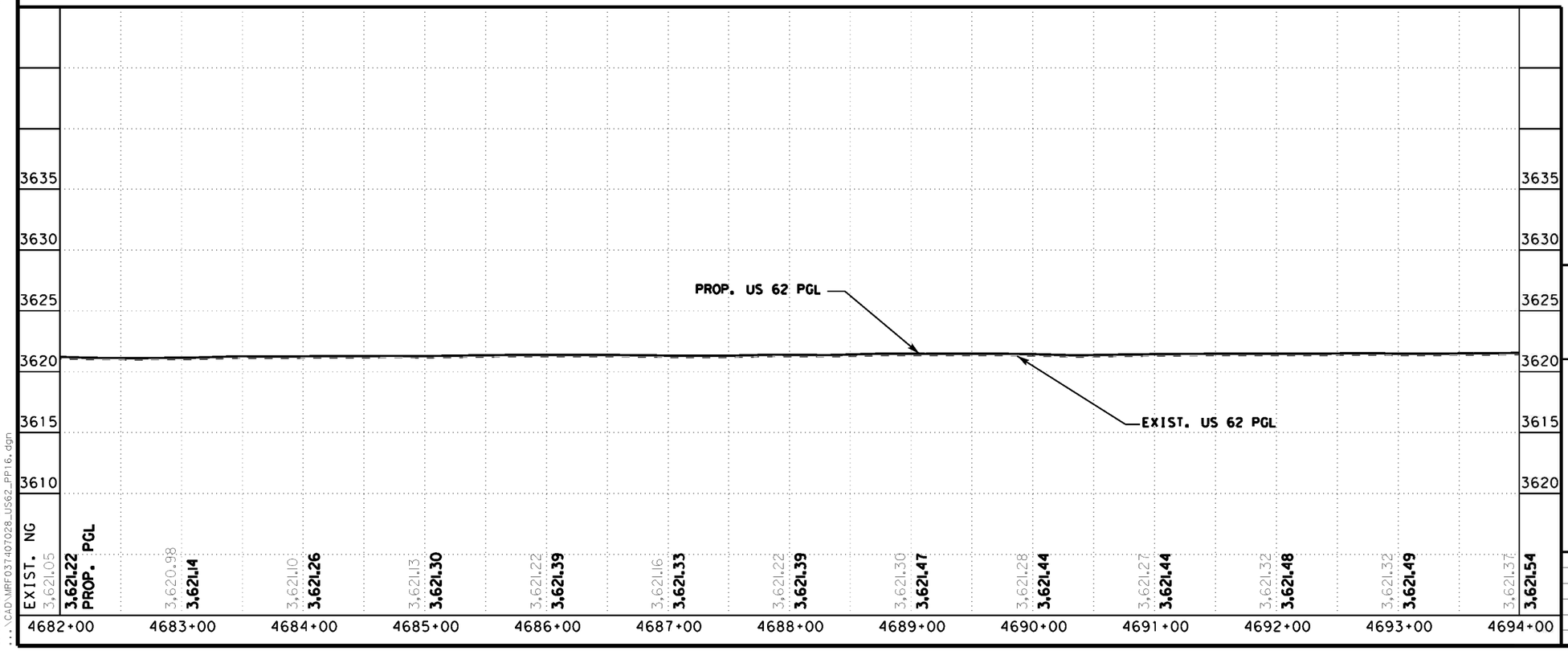


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
16 OF 19	39.00	108.00	2,699.00	54.00	69.00	160.00	626.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE
STA 4682+00
TO
STA 4694+00

SHEET 16 OF 19

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
06		58
STATE	DIST.	COUNTY
TEXAS	ELP	HUDSPETH
CONT.	SECT.	JOB / HIGHWAY NO.
0374	07	028, ETC. / US 62

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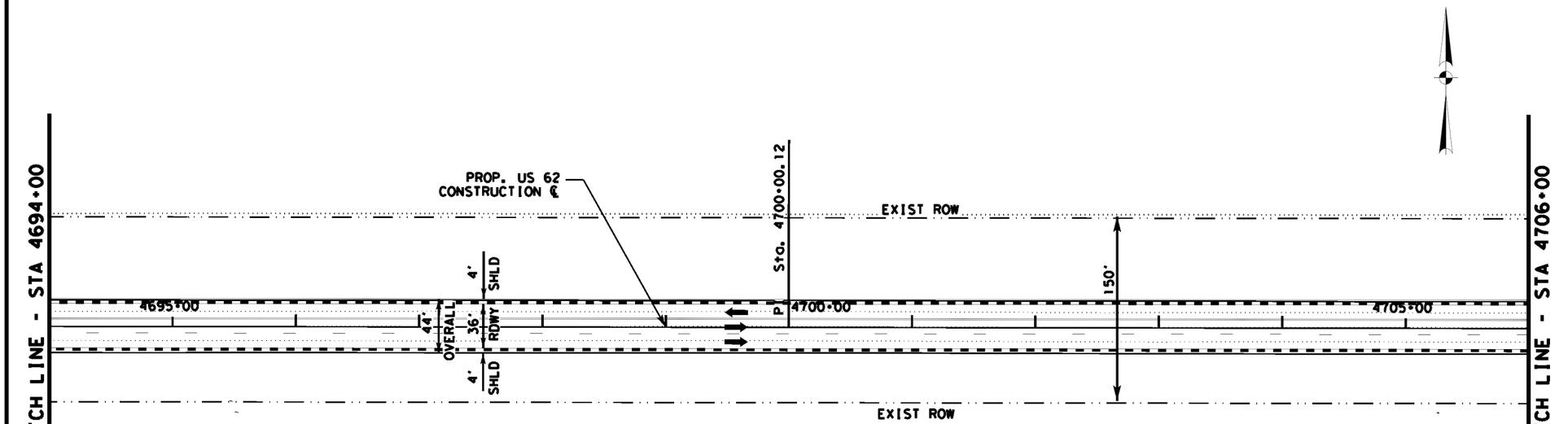
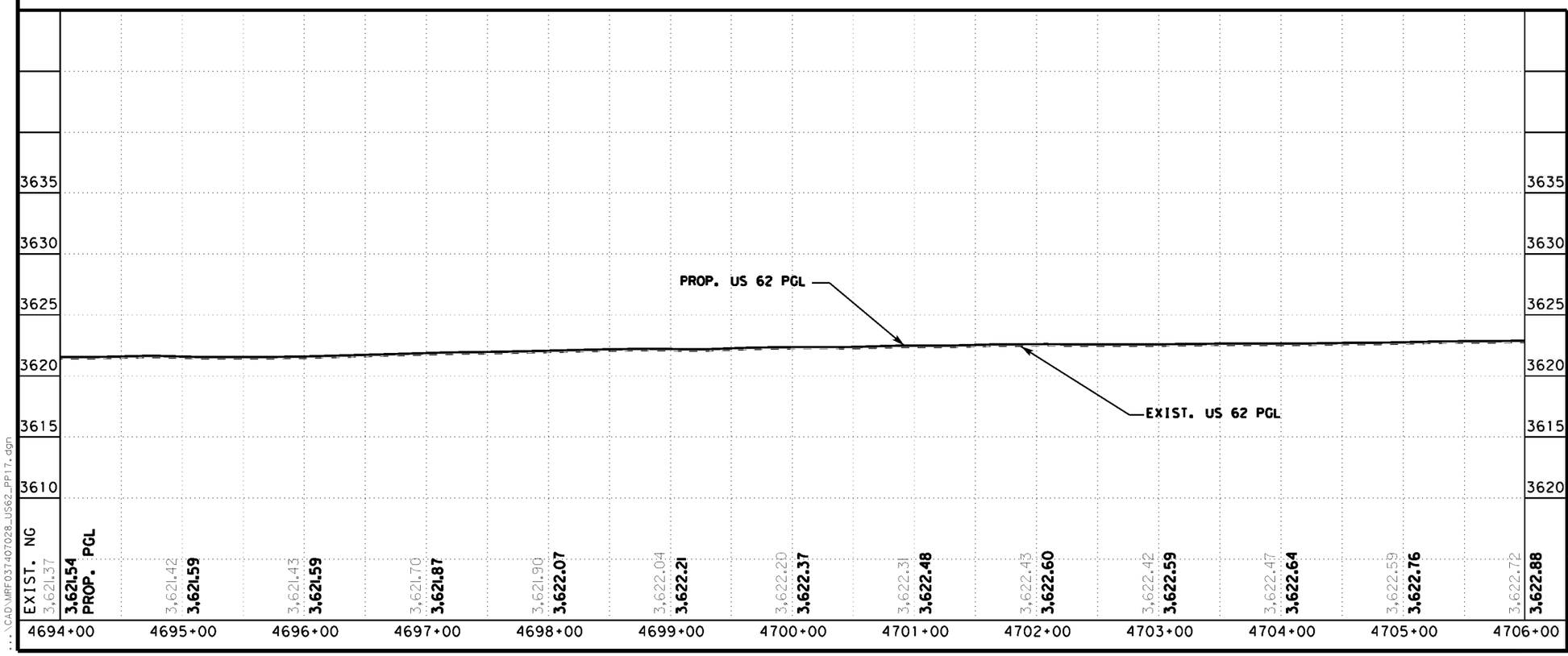


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
17 OF 19	54.00	108.00	2,699.00	54.00	46.00	160.00	634.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE STA 4694+00 TO STA 4706+00

SHEET 17 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			59
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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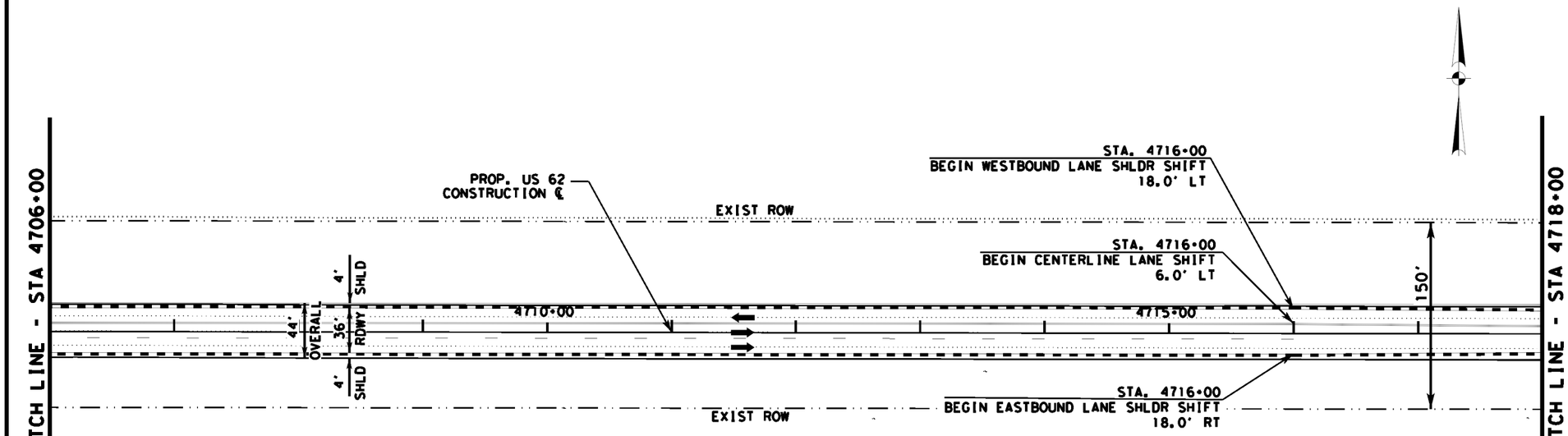
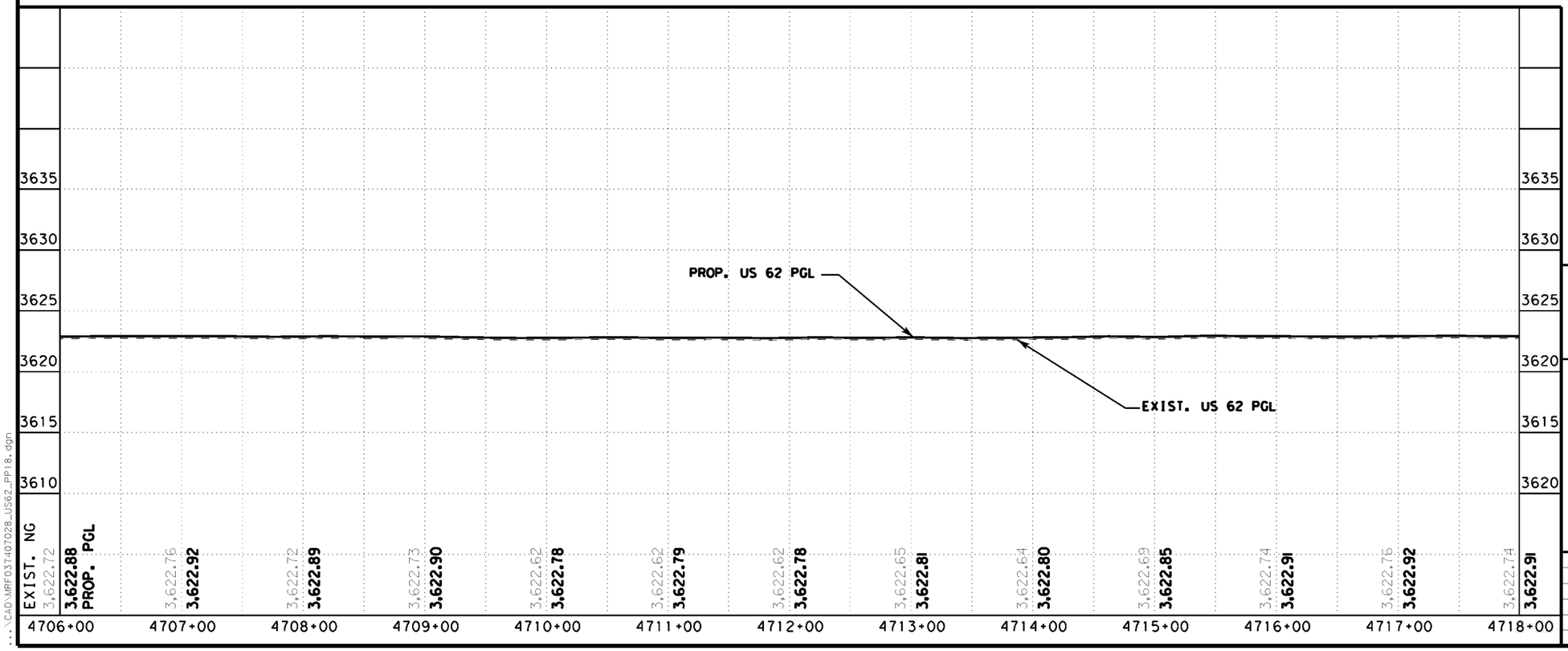


ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
18 OF 19	80.00	108.00	2,699.00	54.00	44.00	160.00	634.00	880.00	0.00	2,400.00



0 25 50 100
SCALE: 1"=100'

LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

STATE OF TEXAS
HOMERO LUIS GUTIERREZ
36639
LICENSED PROFESSIONAL ENGINEER

HOMERO L. GUTIERREZ, P.E.
P.E. 36639
5/18/2021
DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.
TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE STA 4706+00 TO STA 4718+00

SHEET 18 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			60
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC.	US 62

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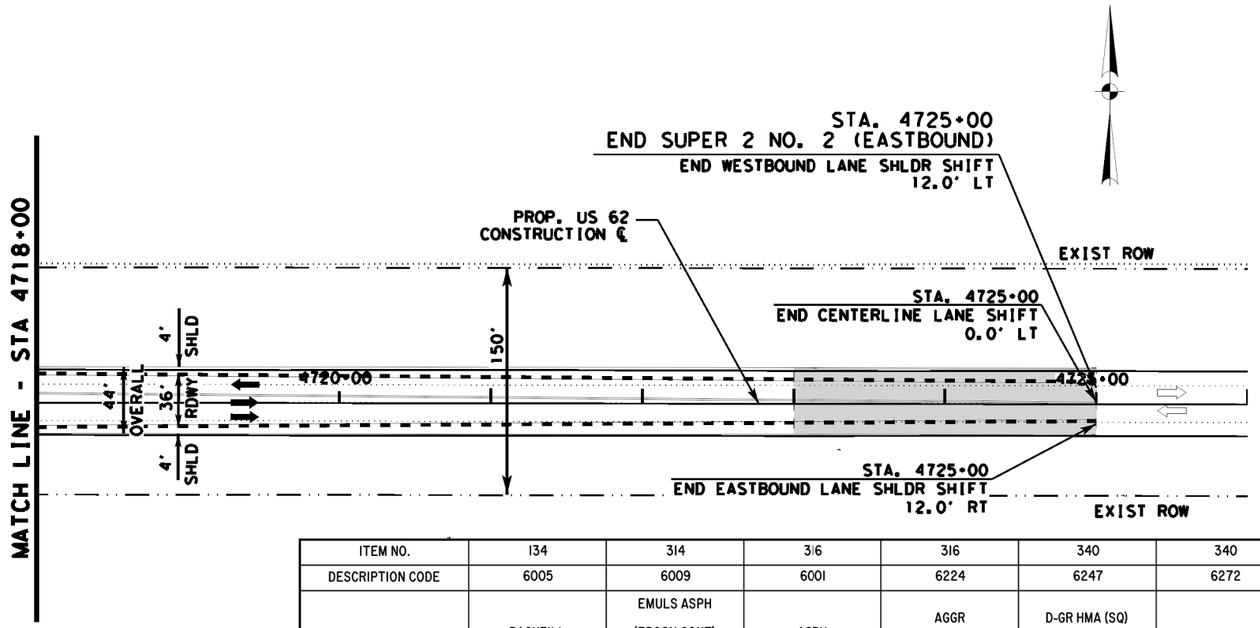


LEGEND:

PROPOSED MILLING (0"-2") (SEE PROP. PLANE TRANSITION DETAIL SHOWN IN THE PROP. OVERLAY DETAIL SHEET)

TRAVEL LANE

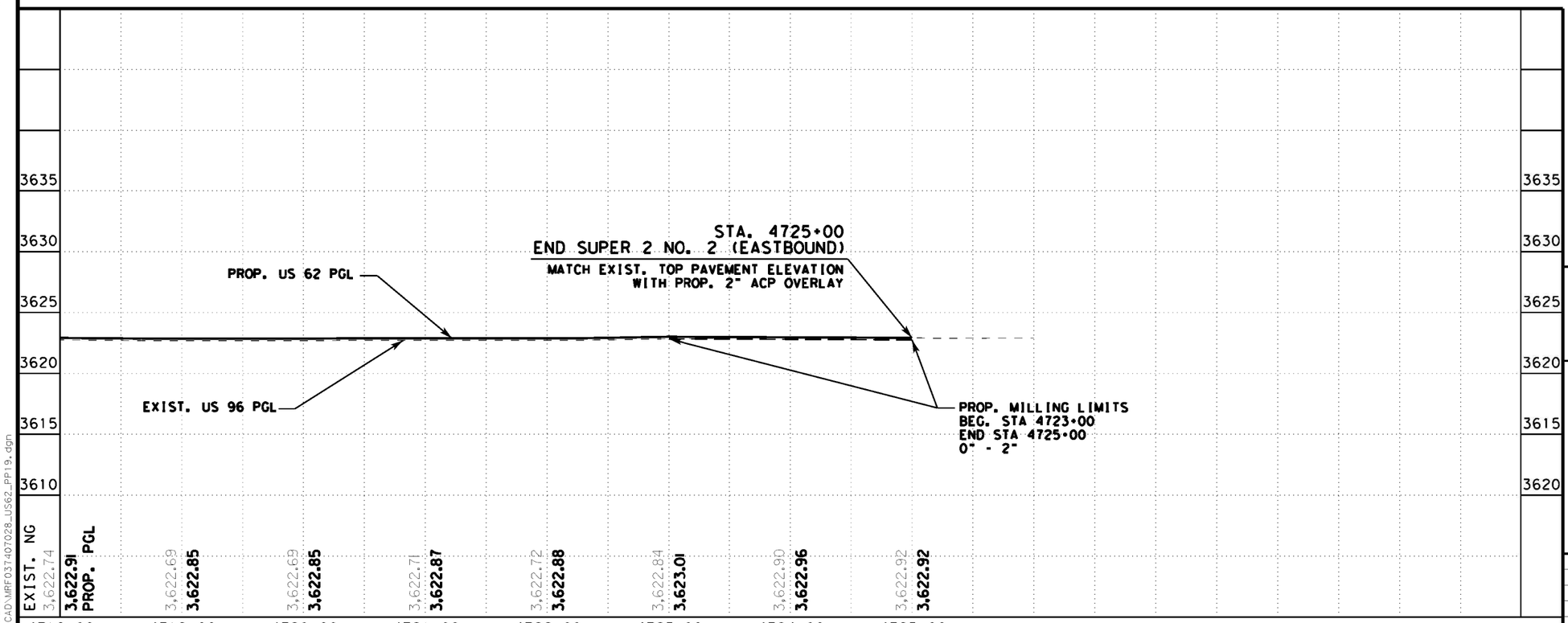
PGL PROFILE GRADE LINE

PROPOSED RUMBLE STRIP (SHLDR)

NOTES:

1. NOTED US 62 ℄ IS THE BEST FIT CONSTUCTION ℄.

ITEM NO.	134	314	316	316	340	340	346	346	354	533
DESCRIPTION CODE	6005	6009	6001	6224	6247	6272	6002	6058	6021	6003
RDWY P&P SHEET NO.	BACKFILL TY A	EMULS ASPH (EROSN CONT) (MULTI) (9 GAL/STA.)	ASPH (MULTI OPTION)	AGGR (TY-B GR-4 SAC-B)	D-GR HMA (SQ) TY D PG 70-22 (LEVEL UP)	TACK COAT	STONE MTRX ASPH SMA-C SAC-A PG 76-22	TACK COAT	PLANE ASPH CONC PAV (0"-2")	RUMBLE STRIPS (SHOULDER) ASPHLAT
	(CY)	(GAL)	(GAL)	(CY)	(TON)	(GAL)	(TON)	(GAL)	(SY)	(LF)
19 OF 19	62.00	63.00	1,575.00	32.00	14.00	94.00	313.00	514.00	978.00	1,400.00



HOMERO L. GUTIERREZ, P.E.

P.E. 36639

5/18/2021

DATE

CSE CIVIL SYSTEMS ENGINEERING, INC.

TBPE REGISTRATION NO. F-5246

Texas Department of Transportation

PLAN & PROFILE STA 4718+00 TO STA 4725+00

SHEET 19 OF 19

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
06			61
STATE	DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028,ETC.	US 62

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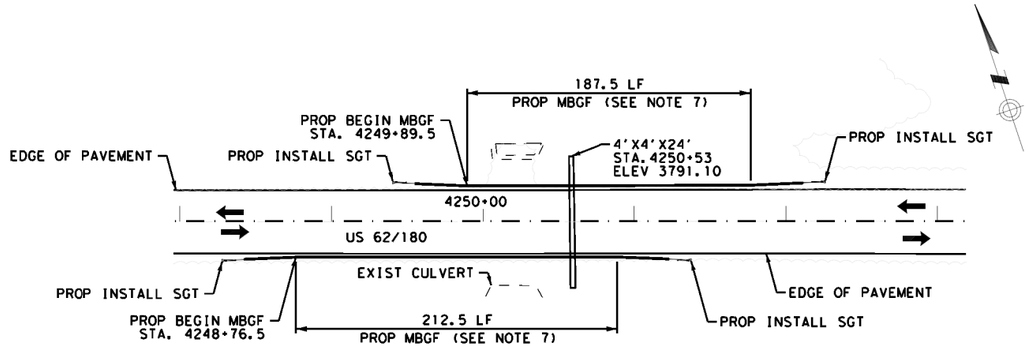
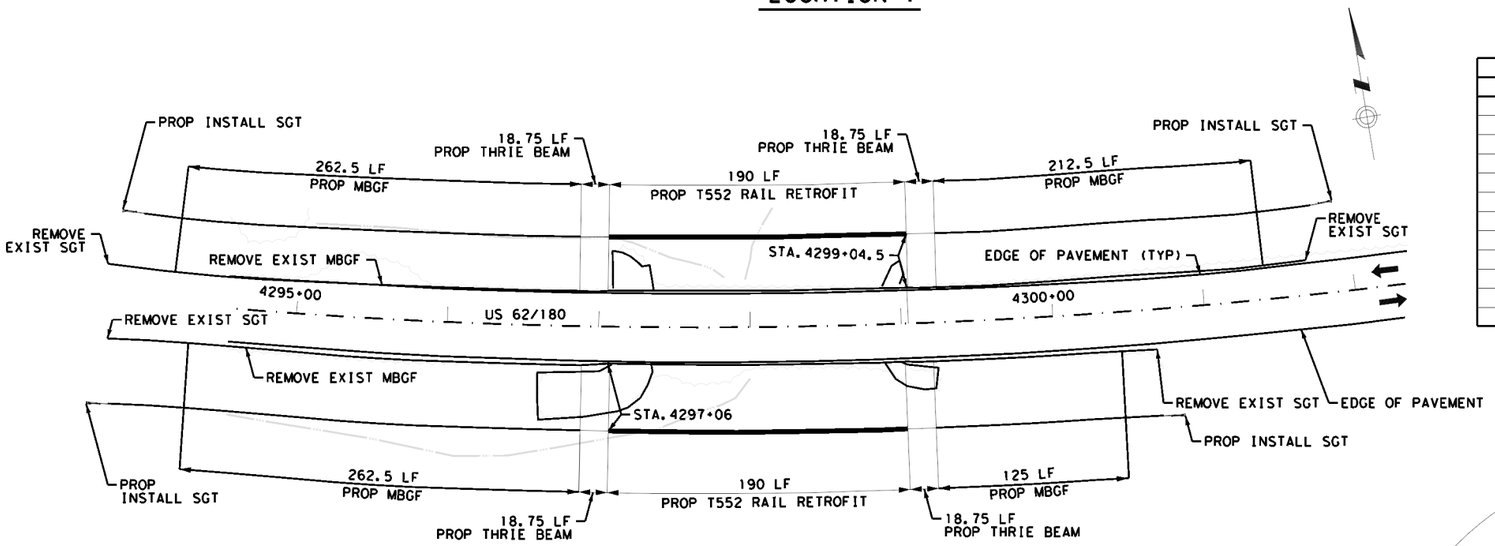
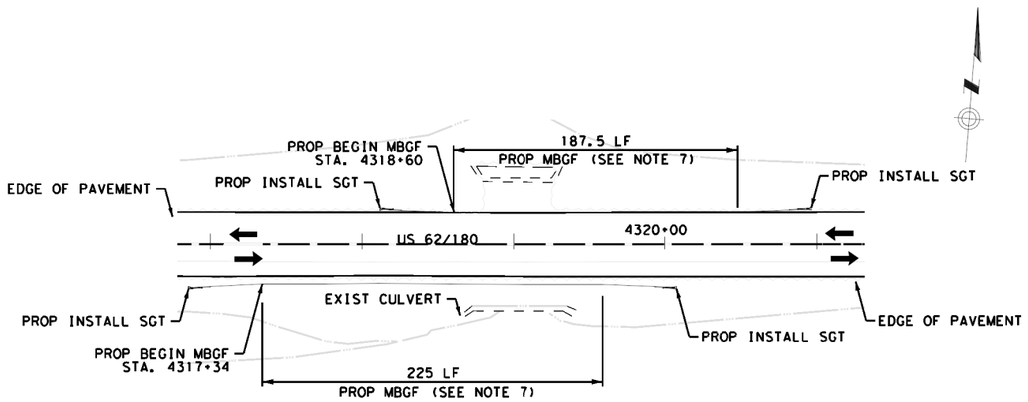


LOCATION 1



LOCATION 2



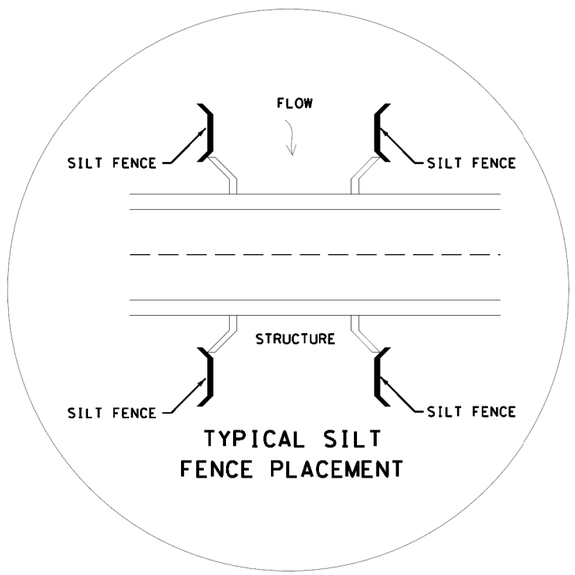
LOCATION 3

NOTES:

1. THE PROPOSED BMG WILL BE PLACED AT THE EXISTING EDGE OF PAVEMENT.
2. REFERENCE MARKERS ARE APPROXIMATE, FIELD VERIFY.
3. REFER TO THE SINGLE GUARDRAIL TERMINAL (SGT) STANDARDS FOR APPROACH GRADING DETAILS. MATERIALS AND LABOR REQUIRED ARE SUBSIDIARY TO ITEM 544, "GUARDRAIL END TREATMENTS."
4. REFER TO G(31)-19 STANDARD FOR ADDITIONAL METAL BEAM GUARD FENCE DETAILS.
5. PLACE THE PROPOSED BMG TO MATCH THE FACE OF RAIL ON BRIDGE, OR AS DIRECTED BY THE ENGINEER.
6. PLACE OBJECT MARKERS AND DELINEATORS AS SHOWN ON D&ROM STANDARDS.
7. SEE BMG PLAN LAYOUT SHEET 2 TO SEE BMG LONG SPAN LIMITS.
8. REFER TO ECM(1-16) STANDARD FOR ADDITIONAL SEDIMENT CONTROL FENCE DETAIL.

0374-07-028: ROADWAY ESTIMATE QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QTY
451	6017	RETROFIT RAIL (TY T552)	LF	380
506	6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	300
506	6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	300
540	6001	MTL W-BEAM GD FEN (TIM POST)	LF	1462.5
540	6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4
540	6020	MTL W - BEAM GD FEN (LOW FILL CULVERT)	LF	212.5
542	6001	REMOVE METAL BEAM GUARD FENCE	LF	925
544	6001	GUARDRAIL END TREATMENT (INSTALL)	EA	12
544	6003	GUARDRAIL END TREATMENT (REMOVE)	EA	4
658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	6
658	6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	24
658	6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	8



TYPICAL SILT FENCE PLACEMENT

LOCATION	NBI #	BEGIN	END	F.L. ELEV
1	24-116-0-0374-07-008	4250+00.00	4250+29.88	3785.34
2	24-116-0-0374-07-009	4297+08.66	4298+88.66	3758.81
3	24-116-0-0374-07-010	4318+68.00	4319+16.50	3754.99

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

02/17/2021

US 62

ROADWAY

MBGF PLAN LAYOUTS

NOT TO SCALE SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		62

DATE: 2/17/2021 1:21:48 PM
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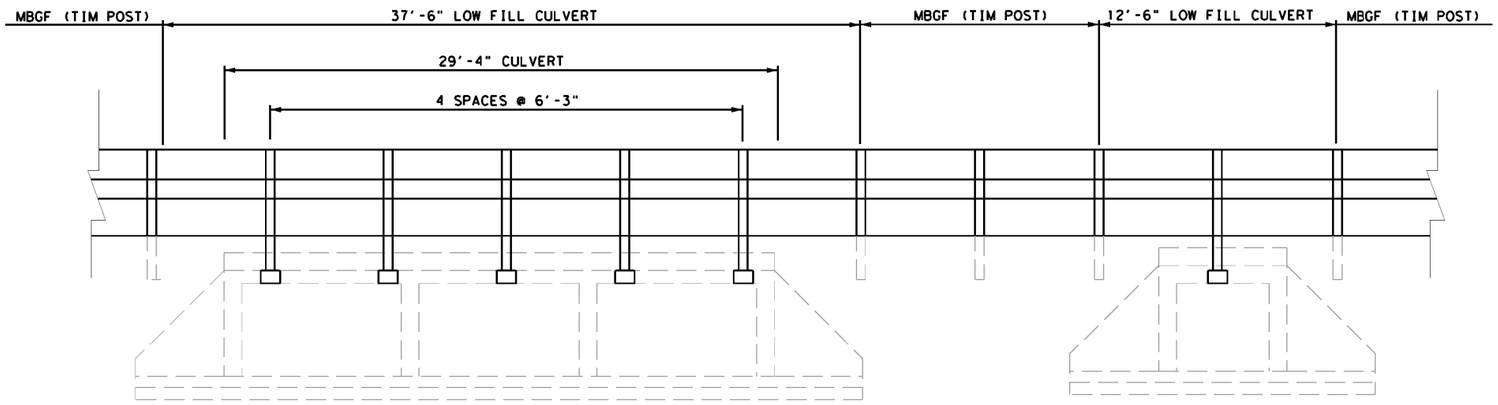


LOCATION1: CULVERT MBGF DETAIL

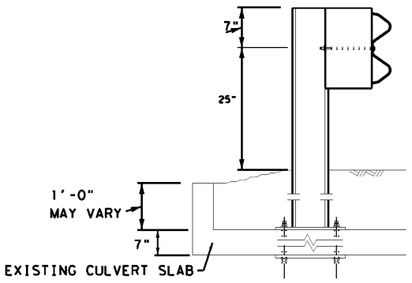
NBI: 24-116-0374-07-008
9'X5'X40'MC 9-1 STA. 4250+29.33
ELEV 3785.34

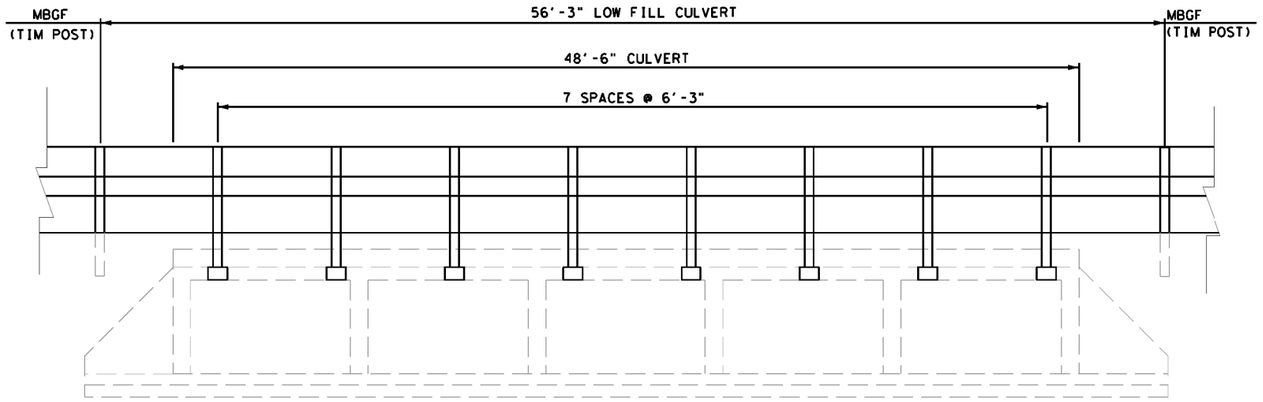
LOCATION 1: CULVERT MBGF DETAIL

4'X4'X24' STA. 4250+53
ELEV 3785.29

NOTES:

1. THE PROPOSED MBGF WILL BE PLACED AT THE EXISTING EDGE OF PAVEMENT.
2. REFERENCE MARKERS ARE APPROXIMATE, FIELD VERIFY.
3. REFER TO THE STANDARDS FOR SINGLE GUARDRAIL TERMINAL (SGT) DETAILS.
4. REFER TO GF(31)-19 STANDARD FOR ADDITIONAL METAL BEAM GUARD FENCE DETAILS.
5. PLACE THE PROPOSED MBGF TO MATCH THE FACE OF RAIL ON BRIDGE, OR AS DIRECTED BY THE ENGINEER.
6. PLACE OBJECT MARKERS AND DELINEATORS AS SHOWN ON D&OM STANDARDS.





LOCATION 3: CULVERT MBGF DETAIL

NBI: 24-116-0374-07-010
9'X5'X40'MC 9-1 STA. 4319+16.50
ELEV 3754.99

LOW FILL CULVERT POST

NOT TO SCALE

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

02/17/2021

US 62

ROADWAY

MBGF PLAN LAYOUTS

NOT TO SCALE SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		63

DATE: 2/17/2021 1:21:57 PM
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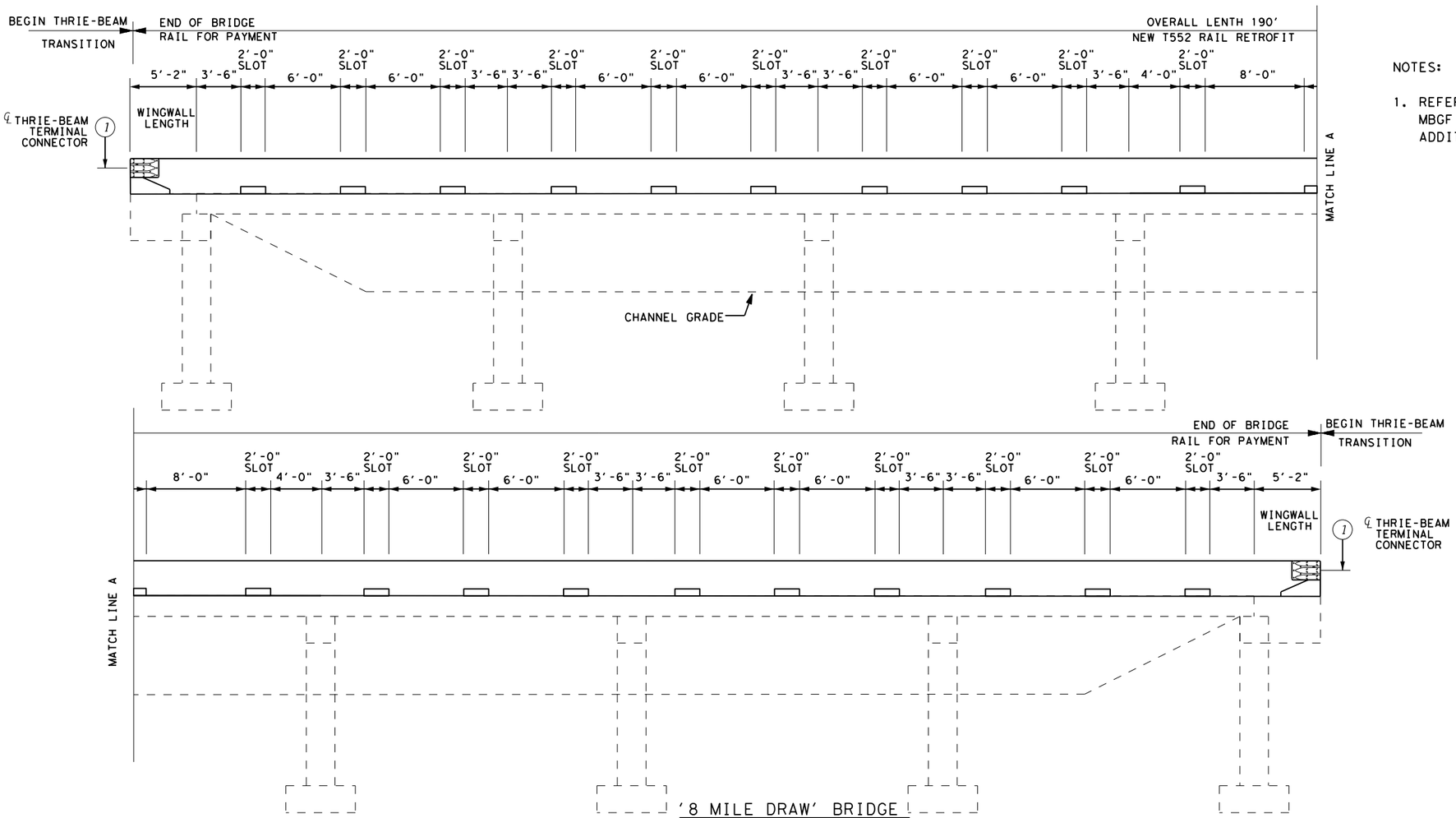
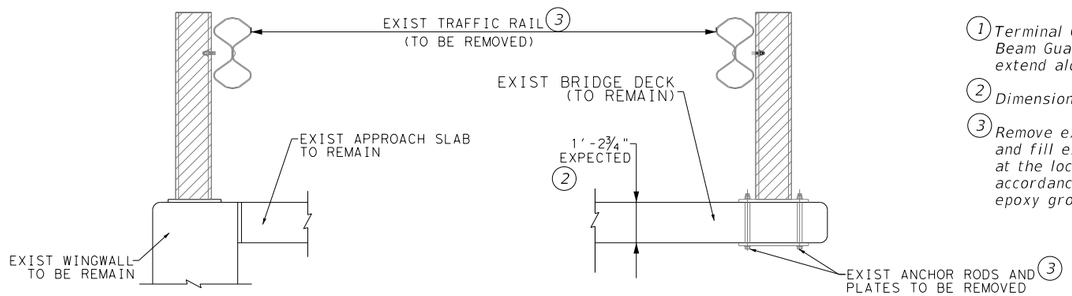


'8 MILE DRAW' BRIDGE

NBI: 24-116-0-0374-07-009
BEGIN: STA. 4297+08.66
END: STA. 4298+88.66
ELEV: 3758.81 FT

NOTES:

1. REFER TO TRAFFIC RAIL STANDARD TYPE T552, C-RAIL-R(MOD) AND MBGF THRIE-BEAM TRANSITION STANDARD GF(31)TR TL3-20 FOR ADDITIONAL DETAILS.



ON EXISTING WINGWALL

ON EXISTING BRIDGE DECK

TYPICAL TRANSVERSE SECTIONS
(SHOWING EXISTING STRUCTURE)

(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) *Dimensions shown are from existing plans and must field verified.*

(3) *Remove existing railing. Remove existing anchor rods and plates and fill existing hole with an epoxy grout. Repair any spalls or cracks at the location of the existing rail posts or at the locations of new rail posts in accordance with Item 429, "Concrete Structure Repair." Payments for repairs and epoxy grout is subsidiary to the Item 451, "Retrofit Railing (TY 552)".*

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

02/17/2021

US 62

ROADWAY

RAIL RETROFIT LAYOUT (T552)

NTS SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		64

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CK: DW:

DATE: 2/4/2021
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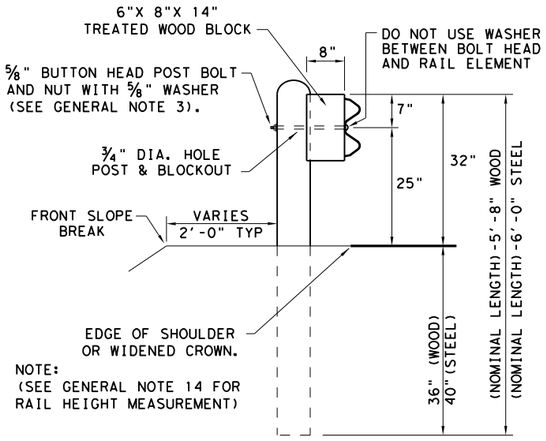
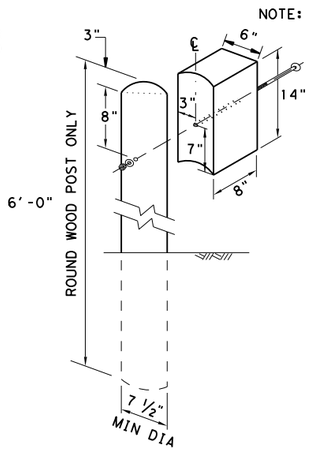
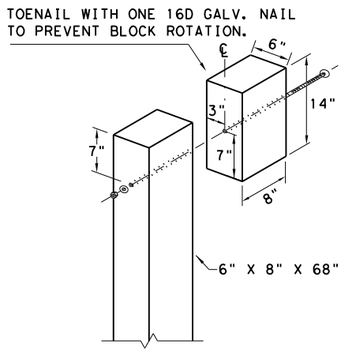


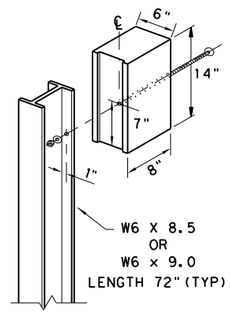
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

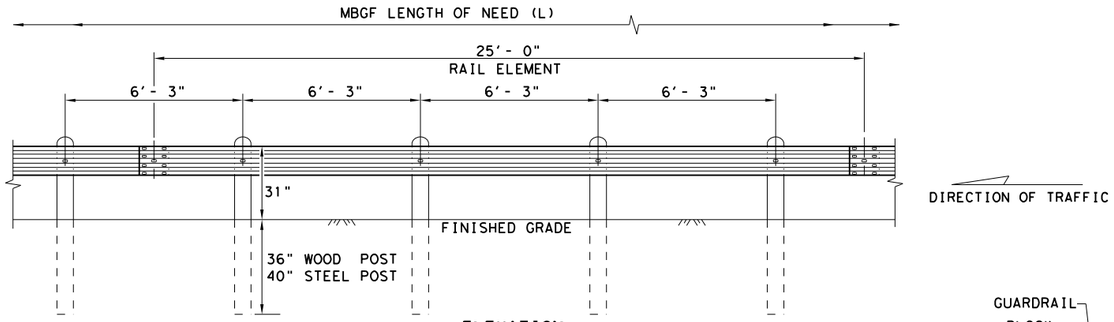


WOOD BLOCK TO RECTANGULAR WOOD POST



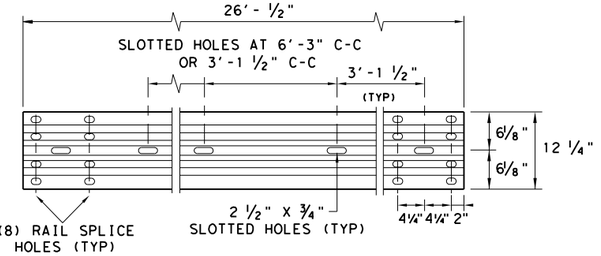
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



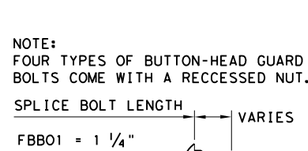
ELEVATION
MID-SPAN RAIL SPLICE

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



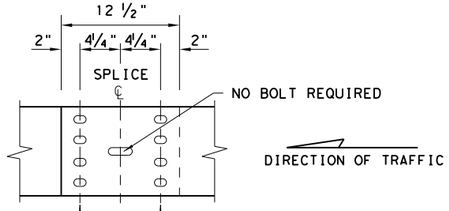
ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

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



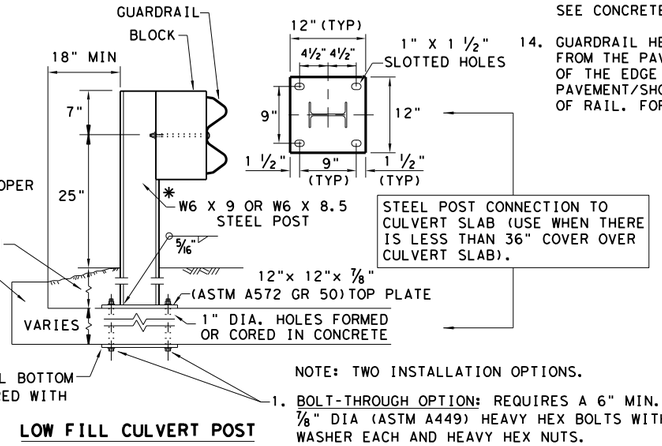
BUTTON HEAD BOLT

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

STEEL POST CONNECTION TO CULVERT SLAB (USE WHEN THERE IS LESS THAN 36" COVER OVER CULVERT SLAB).

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	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		65

DATE: 2/4/2021
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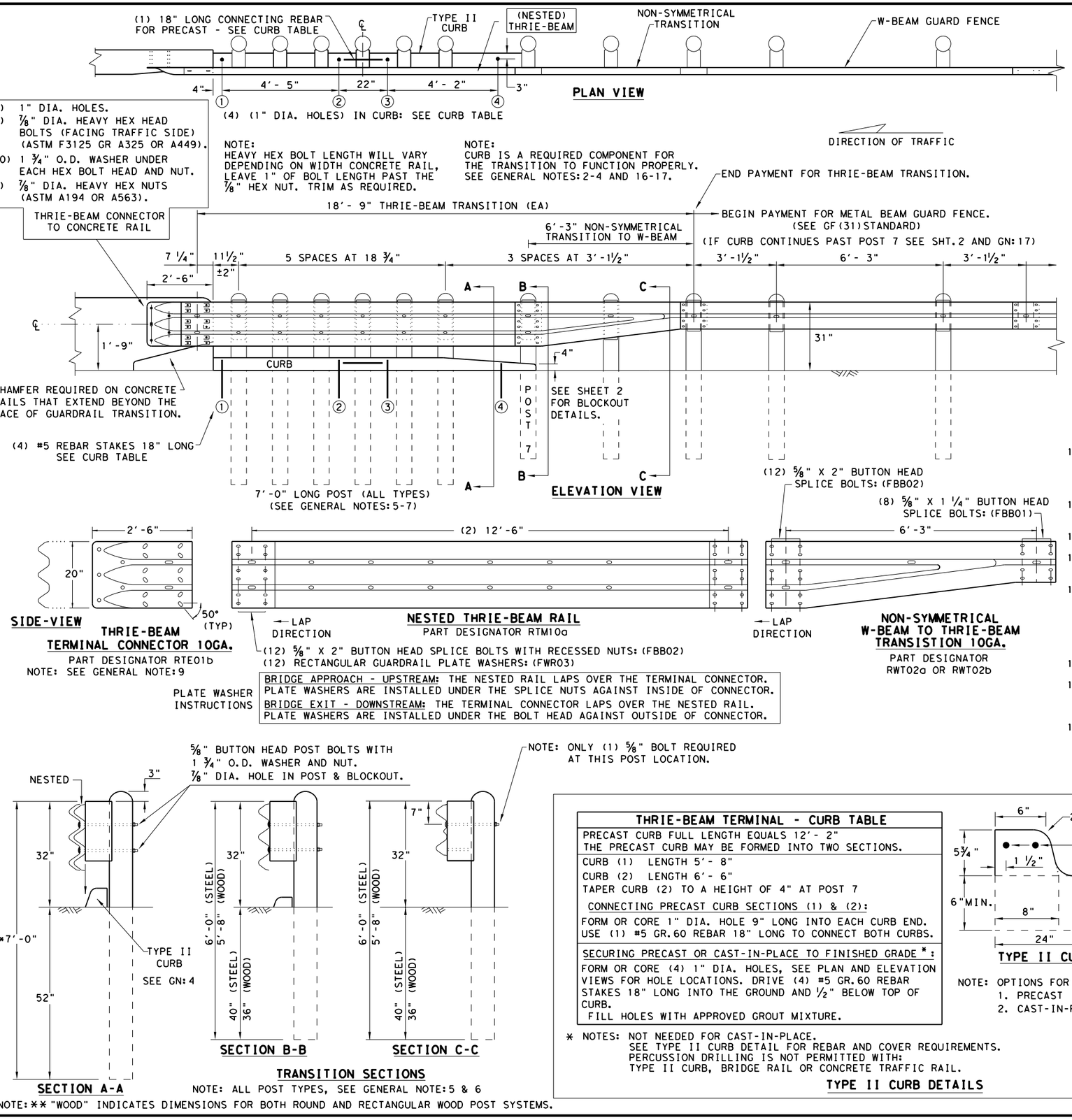


GENERAL NOTES

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

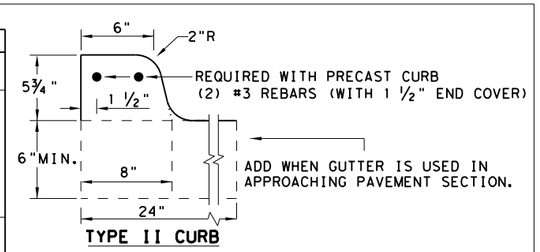
PRECAST CURB FULL LENGTH EQUALS 12'- 2"
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.

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.

* 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

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

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	0374	07	028, ETC	US 62		
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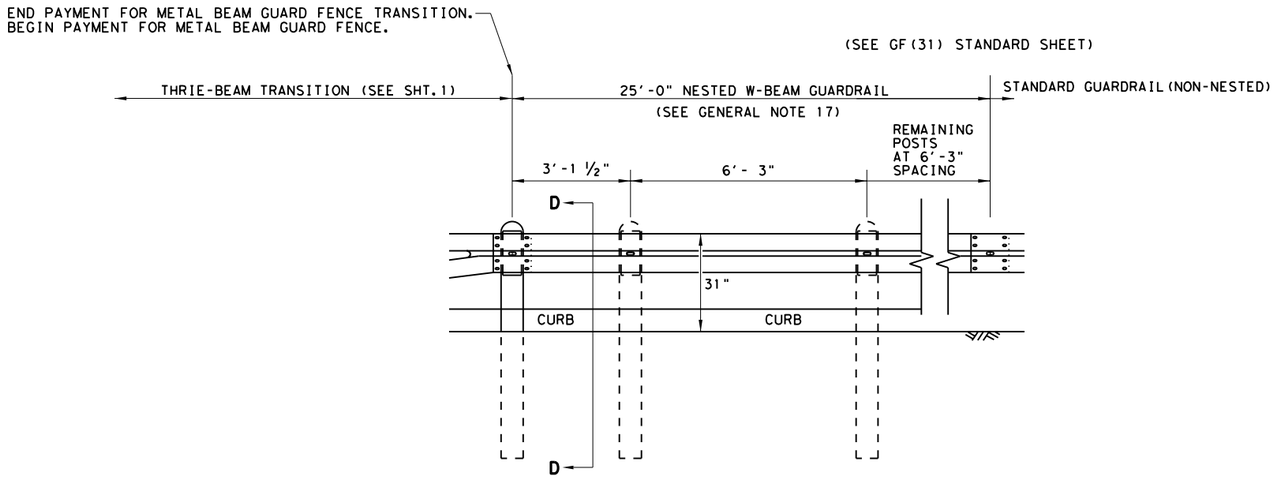
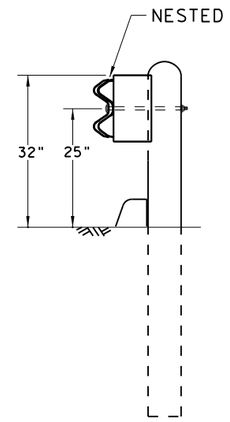
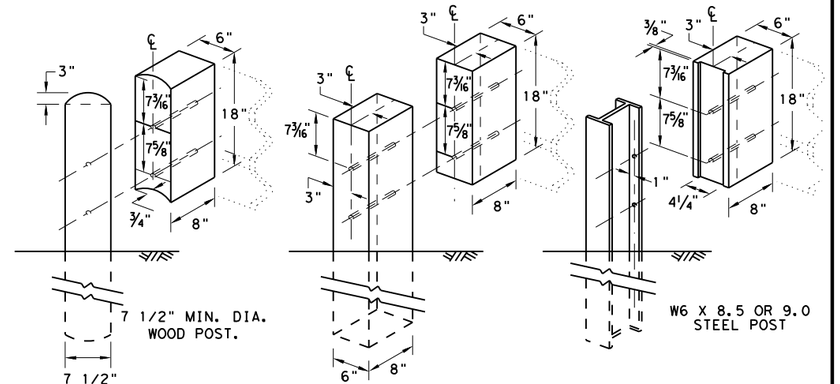
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



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
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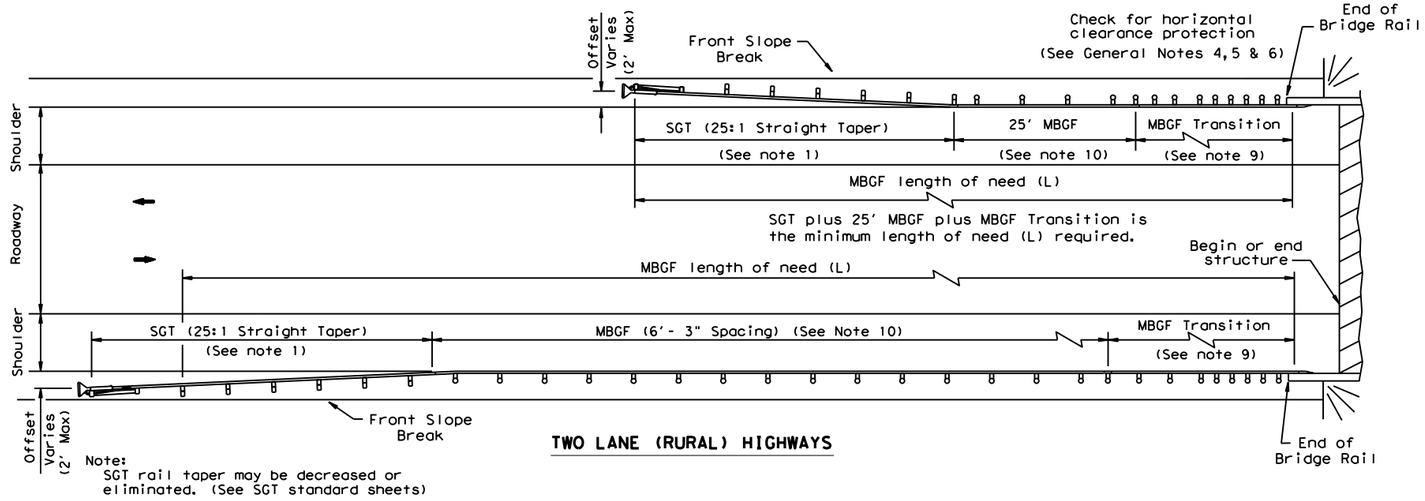
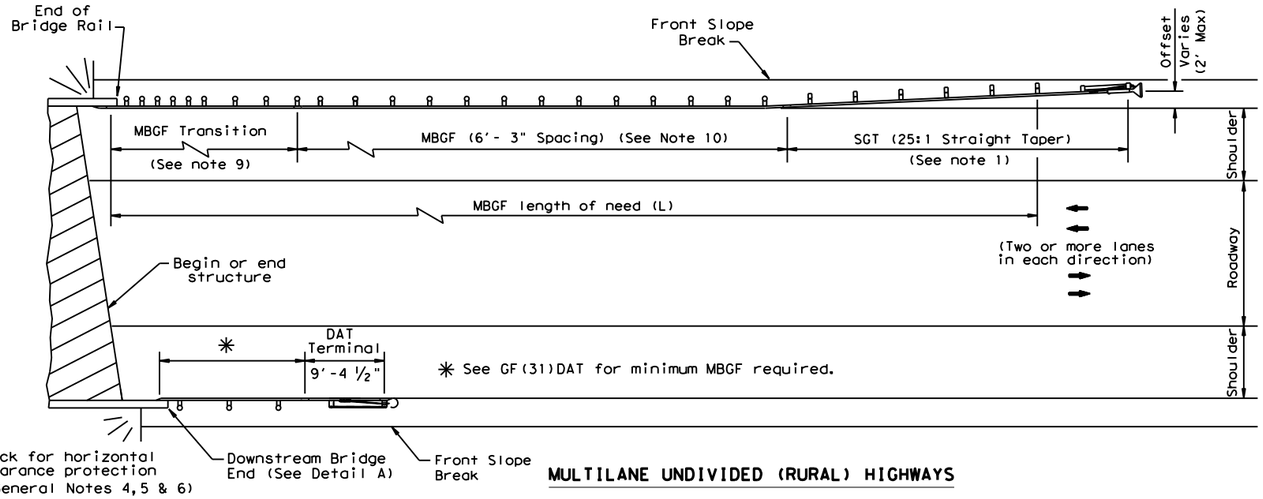
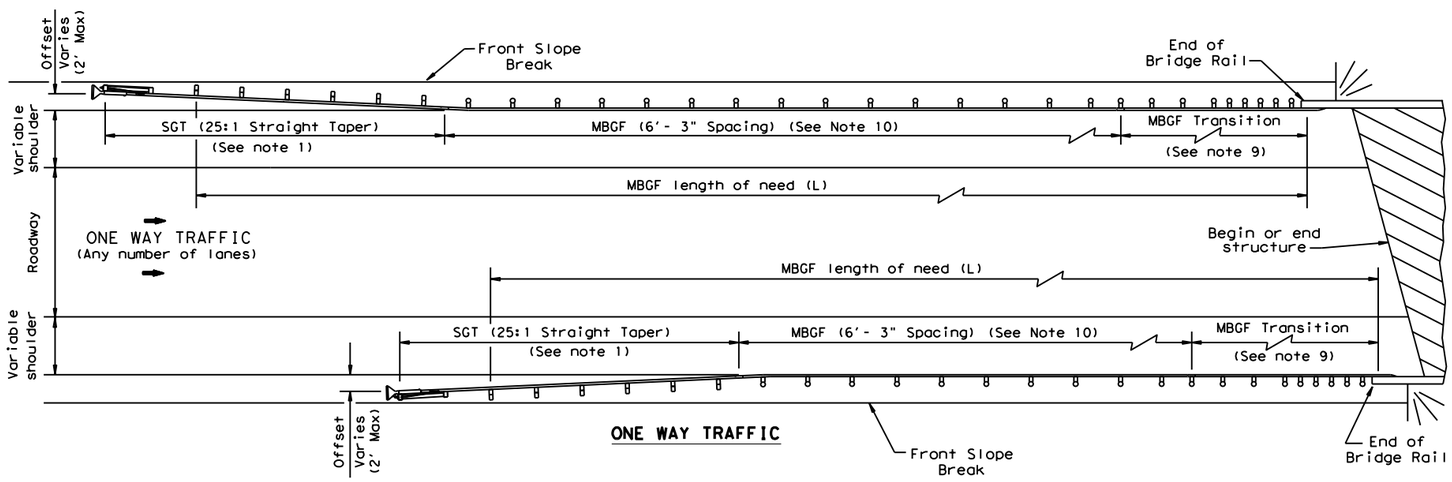


TWO LANE (RURAL) HIGHWAYS

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



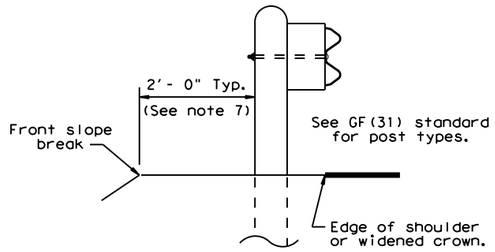
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



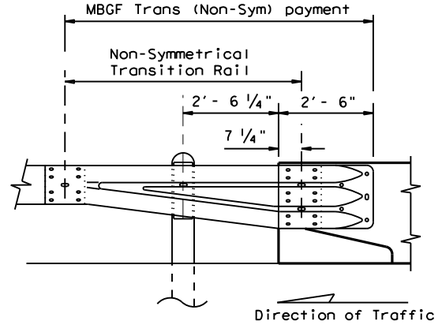
ONE WAY TRAFFIC

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	0374	07	028, ETC	US 62
REVISED APRIL 2014 SEE (MEMO 0414)	DIST	COUNTY		SHEET NO.
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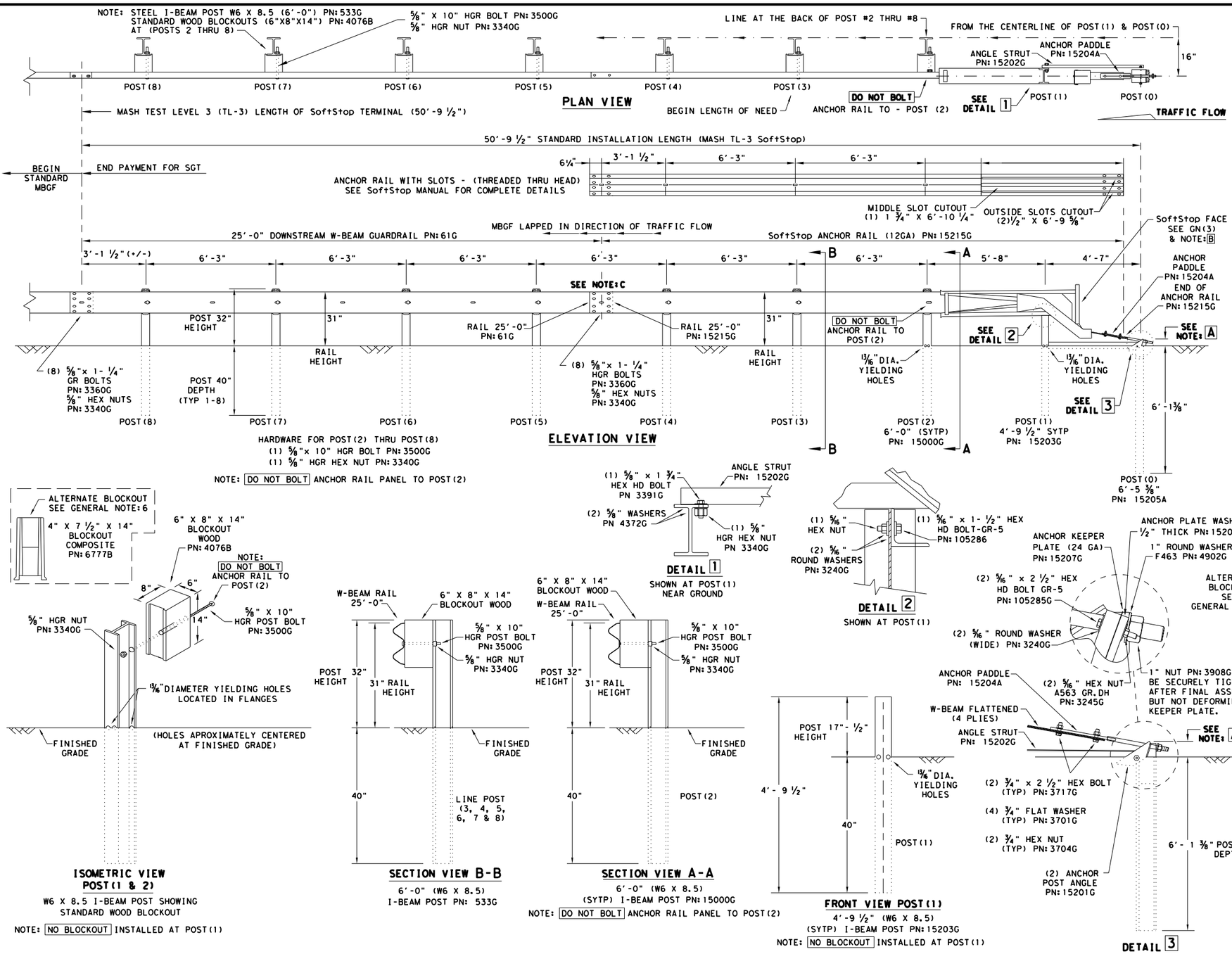

GENERAL NOTES

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	
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
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	ELP	HUDSPETH		69	

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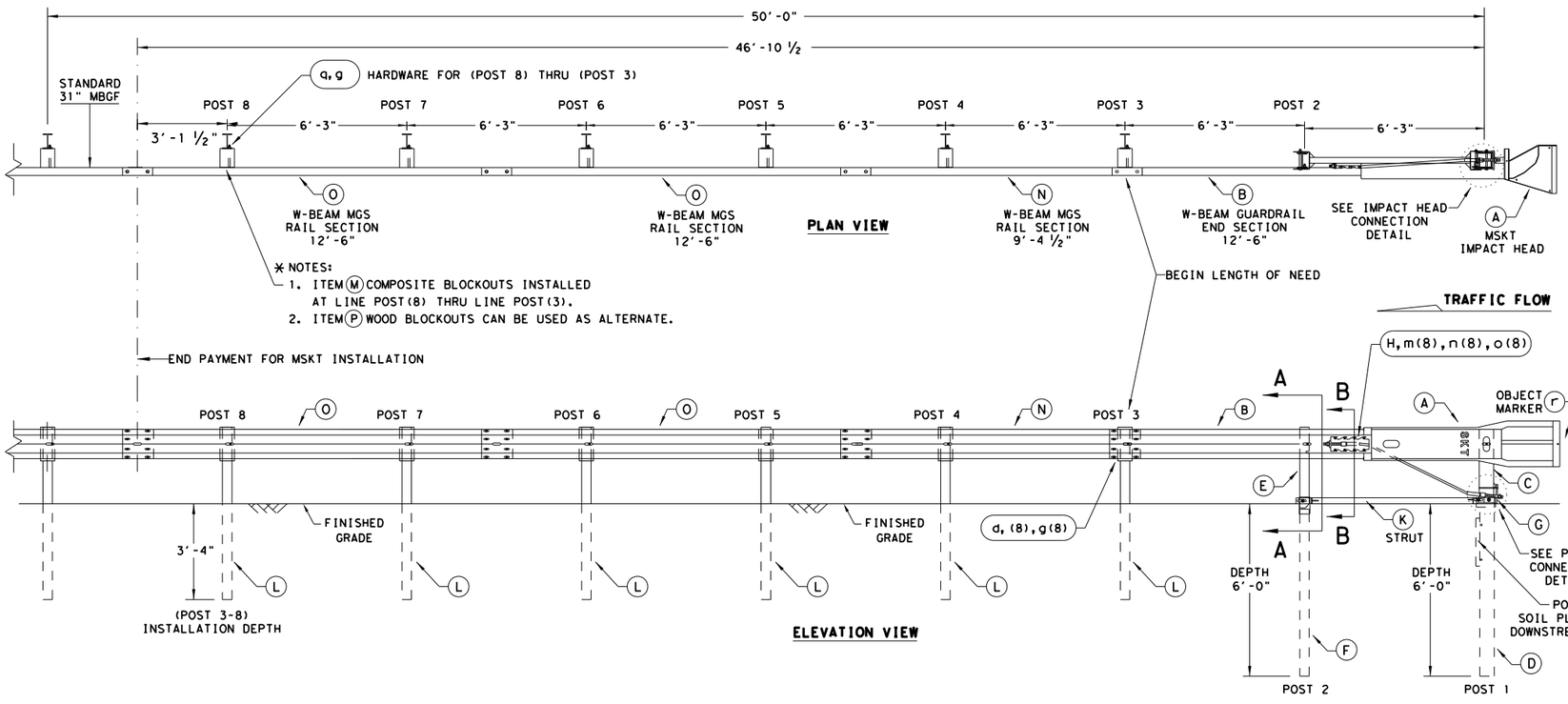
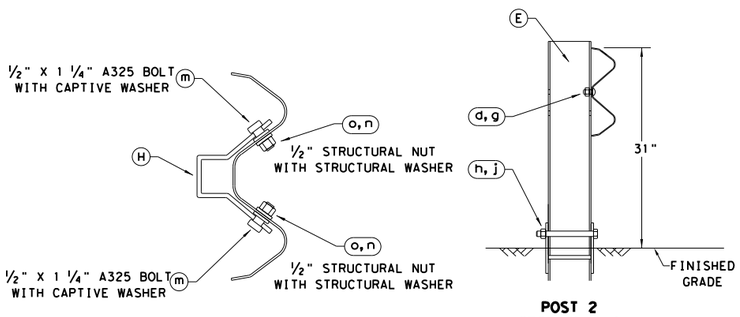
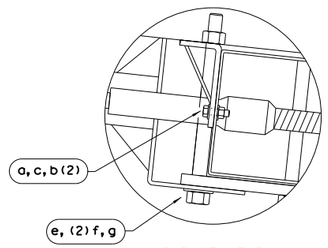


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.

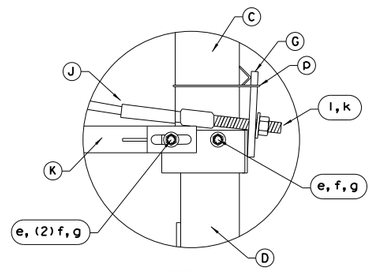


SECTION B-B
ANCHOR BRACKET

POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL

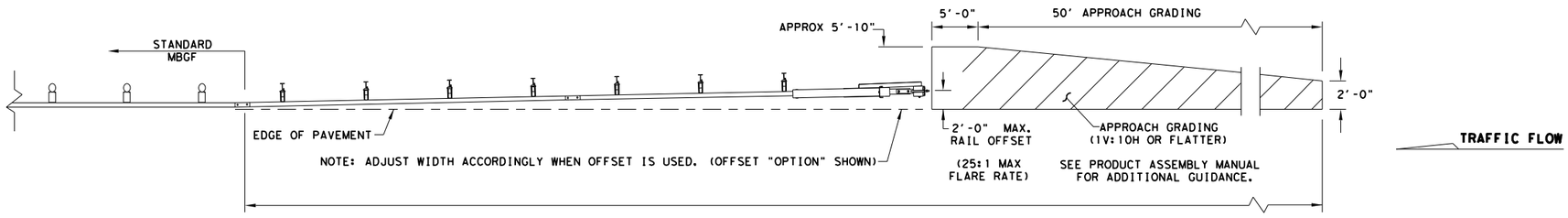
SEE NOTES: *

ALTERNATIVE ITEMS NOT SHOWN. **
* ITEM(P) 8" WOOD-BLOCKOUT
** ITEM(Q) 25'GUARD FENCE PANEL

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
7. A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
13. THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
14. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
		SMALL HARDWARE	
a	2	5/16" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/16" WASHER	W0516
c	2	5/16" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 5/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

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

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL

MSKT-MASH-TL-3

SGT(12S)31-18

FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL	
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0374	07	028, ETC	US 62	
	DIST	COUNTY		SHEET NO.	
	ELP	HUDSPETH		70	

DATE: 2/17/2021 1:23:26 PM
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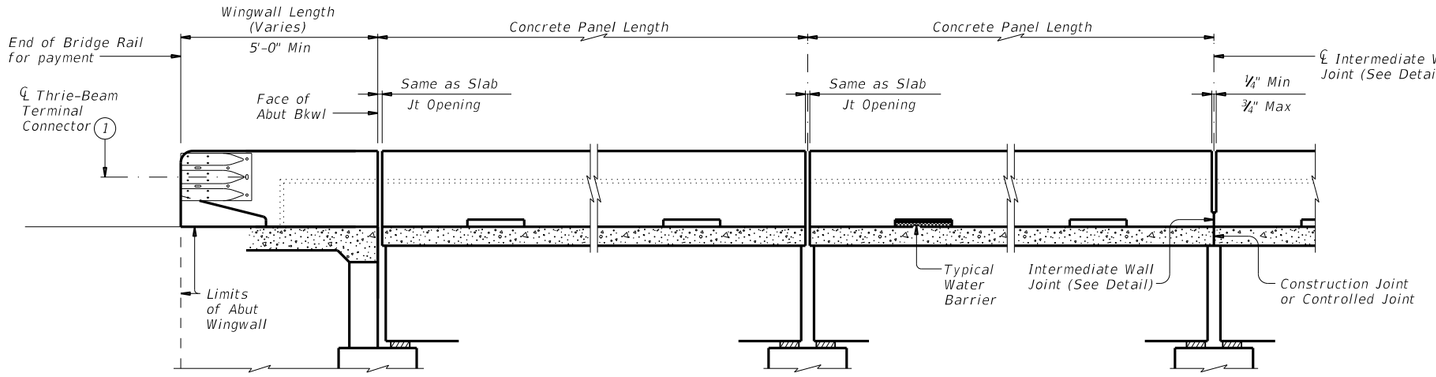
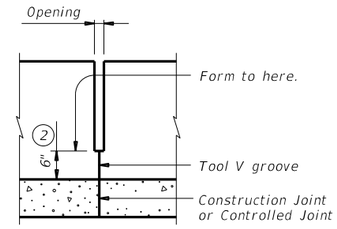


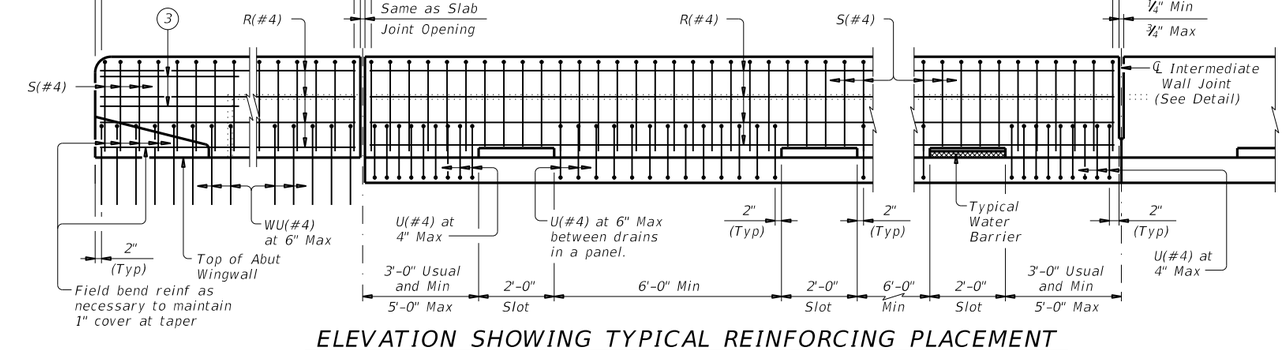
AT ABUTMENTS | AT BENTS WITH SLAB EXP JOINTS | AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL

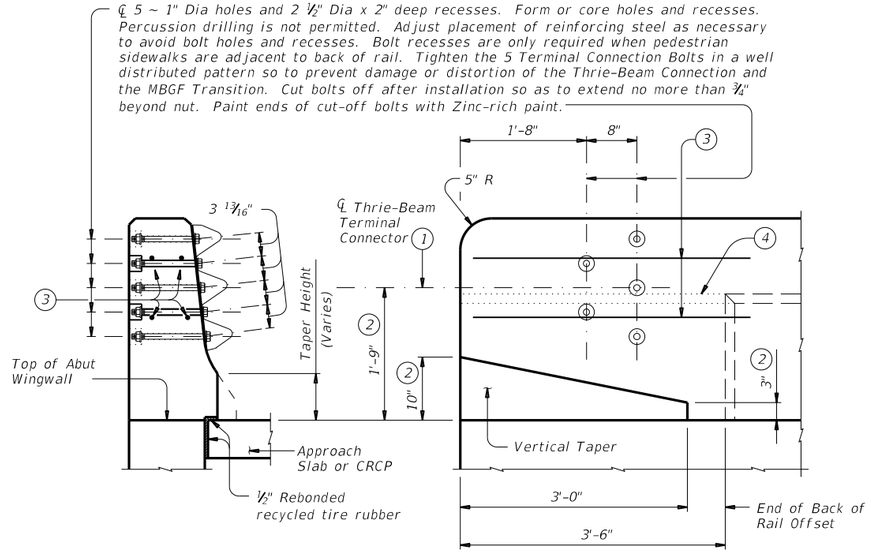


INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.

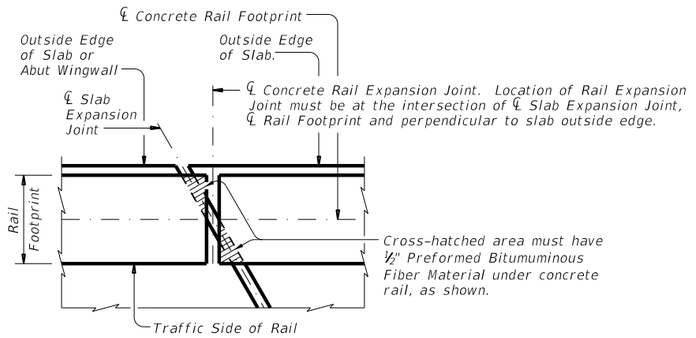


ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



SECTION | ELEVATION

TERMINAL CONNECTION DETAILS



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

(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) *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.*

(4) *Back of rail offset may, with Engineer's approval, be continued to the end of the railing.*

SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

TRAFFIC RAIL

TYPE T552

FILE: rlstd010-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		71

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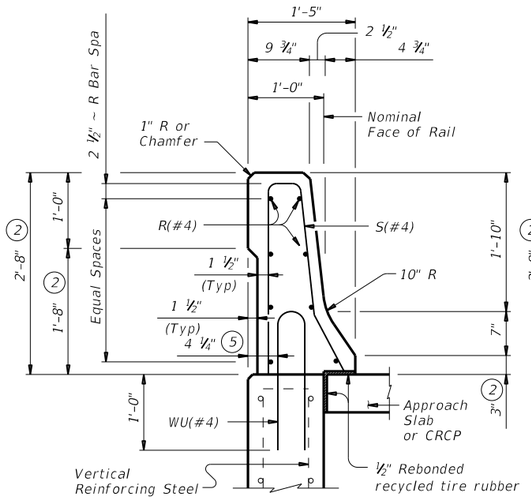
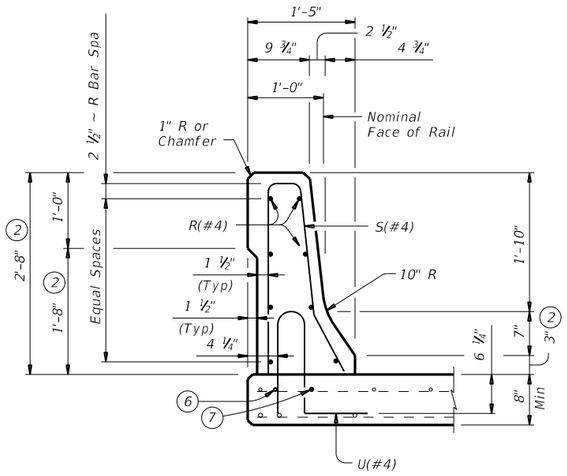
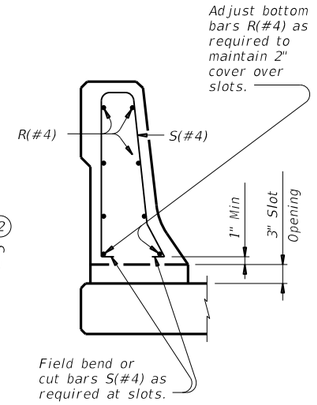


ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



ON BRIDGE SLAB



ON BRIDGE SLAB AT SIDE SLOT DRAIN

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 will be furnished at the Contractor's expense.

(7) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(8) Bend or cut as required to clear drain slots.

(9) No longitudinal wires may be in top center of cage.

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 on the plans or approved by the Engineer.

Water barriers must be provided at openings draining onto railroad tracks, undercrossing roadways and sidewalks. They may be cast in place or precast in convenient length and bonded to the bridge deck with an approved epoxy cement.

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 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 evaluated and accepted to be of equal strength to railings with like geometry, which have been crash tested to meet MASH TL-3 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.

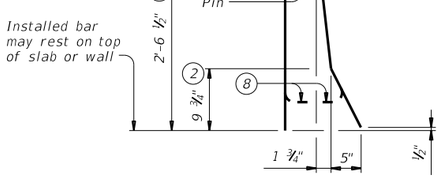
Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Shop drawings will not be required for this rail.

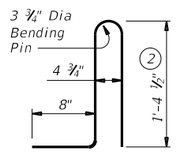
Average weight of railing with no overlay is 370 plf.

Cover dimensions are clear dimensions, unless noted otherwise.

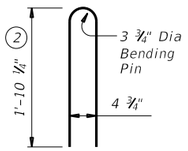
Reinforcing bar dimensions shown are out-to-out of bar.



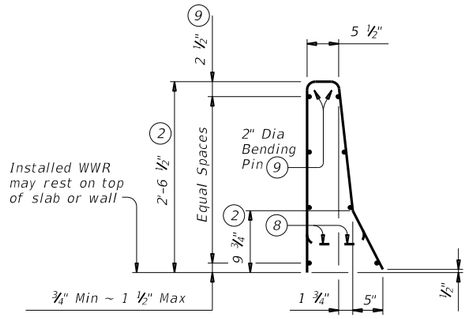
BARS S (#4)



BARS U (#4)

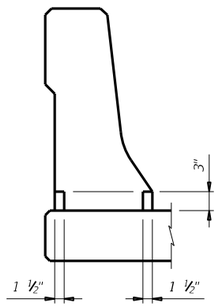


BARS WU (#4)

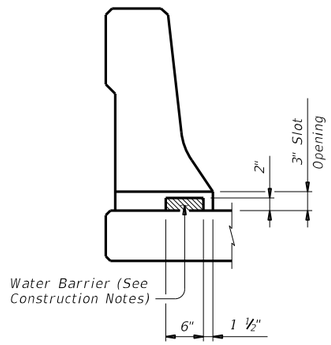


OPTIONAL WELDED WIRE REINFORCEMENT (WWR)

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.	



CAST-IN-PLACE WATER BARRIER



PRECAST WATER BARRIER

OPTIONAL WATER BARRIERS

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T552

FILE: rlstd010-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		72

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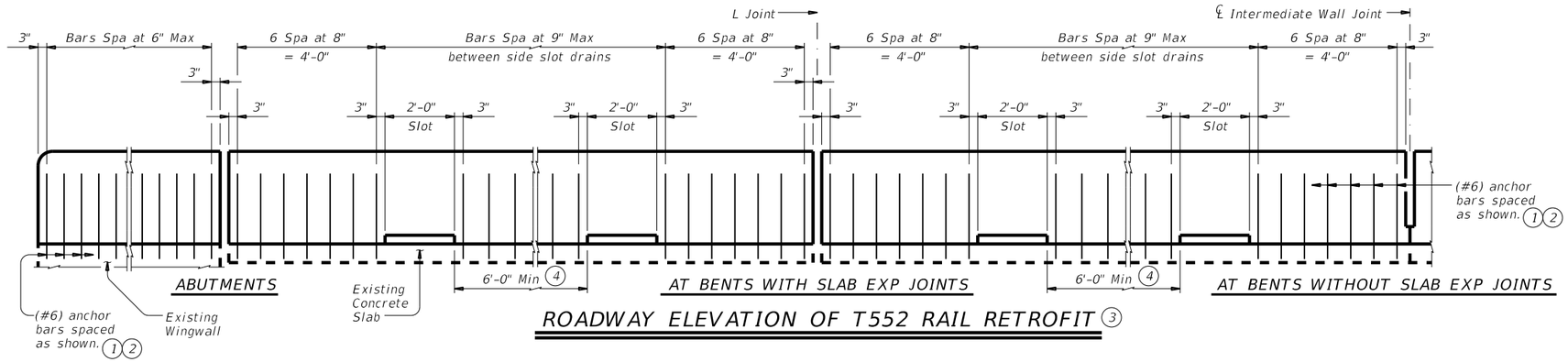
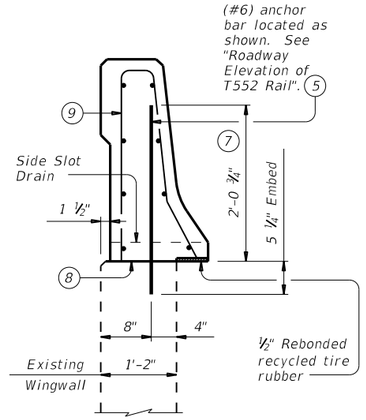
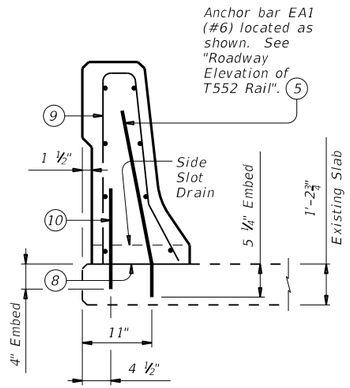


ROADWAY ELEVATION OF T552 RAIL RETROFIT 3

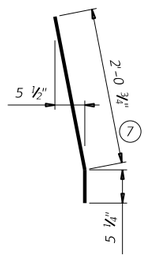


T552 RAIL



T552 RAIL

RAIL RETROFIT SECTIONS ON WING WALL AND CONCRETE SLABS USING ADHESIVE ANCHORS 6



ANCHOR BAR EA1 (#6)

CONSTRUCTION NOTES:

Field verify dimensions before commencing work and ordering materials.

By adding additional anchorage, welding can be performed at a minimum spacing of 3 ft between the cage and additional anchorage. By satisfying additional anchorage requirements slip forming is allowed. Do not weld to the required anchorage.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

(#6) and (#4) anchor bars used for the adhesive anchorage system must not be epoxy coated within the required embedment.

GENERAL NOTES:

Use of these retrofit details will result in a railing acceptable for the MASH Test Level 3.

Removal and replacement of backfill, subgrade, and asphalt or concrete pavement necessary for this installation is considered subsidiary to the retrofit railing.

Payment for a rail retrofit will be as per Item 451, "Retrofit Railing (TY T552)". All details shown herein are subsidiary to rail retrofit.

All material removed from bridge must be properly disposed of off the right of way. All material needed and work performed will not be paid for directly but must be considered subsidiary to the Item 451.

Removal of existing railing and all materials provided are included in payment for Item 451, "Retrofit Railing (TY T552)".

Reinforcing bar dimensions shown are out-to-out of bar.

1 Embed (#6) anchor bars with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 5 ¼". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 20 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

2 See T552 Rail Sections in "Rail Retrofit Section on Wingwalls using Adhesive Anchors" and/or "Rail Retrofit Section on Concrete Slabs using Adhesive Anchors".

3 Showing spacing of (#6) adhesive anchor in a rail retrofit condition. Secondary (#4) adhesive anchor in a rail retrofit not shown for clarity. Reinforcing steel and terminal connections not shown for clarity. See rail standard for details and notes not shown.

4 Place side slot drains as shown. See T552 rail standard for side slot drains, except as noted.

5 Embed (#6) anchor bars with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 5 ¼". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 20 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

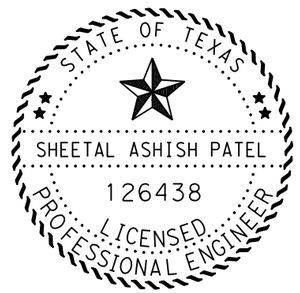
6 Showing location or locations of anchor bars in a rail retrofit condition. See T552 rail standard for details and notes not shown.

7 Increase by amount of existing overlay/seal coat thickness, not to exceed 2". If thickness of existing overlay/seal coat is greater than 2" at toe of rail, taper overlay at a 1:10 or flatter slope over shoulder width to a thickness of 2" or less at toe of rail.

8 Do not cast rails or parapet walls on top of overlays/seal coats.

9 See T552 rail standard for reinforcing steel. Modify length of vertical reinforcing bars as required to fit existing structure. Longitudinal reinforcing bars may be removed only if their position puts them in conflict with un-removed portions of existing structure.

10 Embed secondary (#4) anchor bars 1'-4" in length with a Type III Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 4". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 10 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing". (#4) anchor bars spaced longitudinally along rail at 4 ft Max (Spaced 3" longitudinally from outside edge and edge of side slot drains).



Sheetal Patel, P.E.
02/17/2021

SHEET 1 OF 1

Texas Department of Transportation | Bridge Division Standard

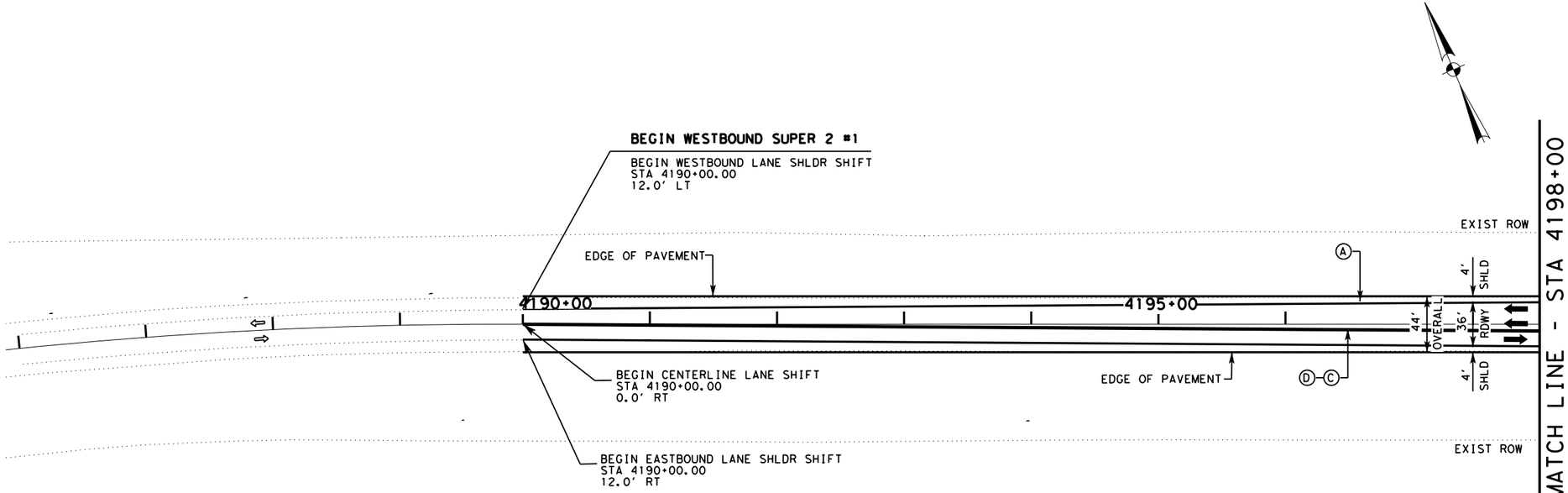
RETROFIT GUIDE FOR CONCRETE RAILS

T552 RAIL RETROFIT

NBI# 24-116-0-0374-07-009

C-RAIL-R (MOD)

FILE: rlstd022-20.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
07-20: Text change from epoxy to adhesive and changed MASH Test Level note.	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		73



NOTES:

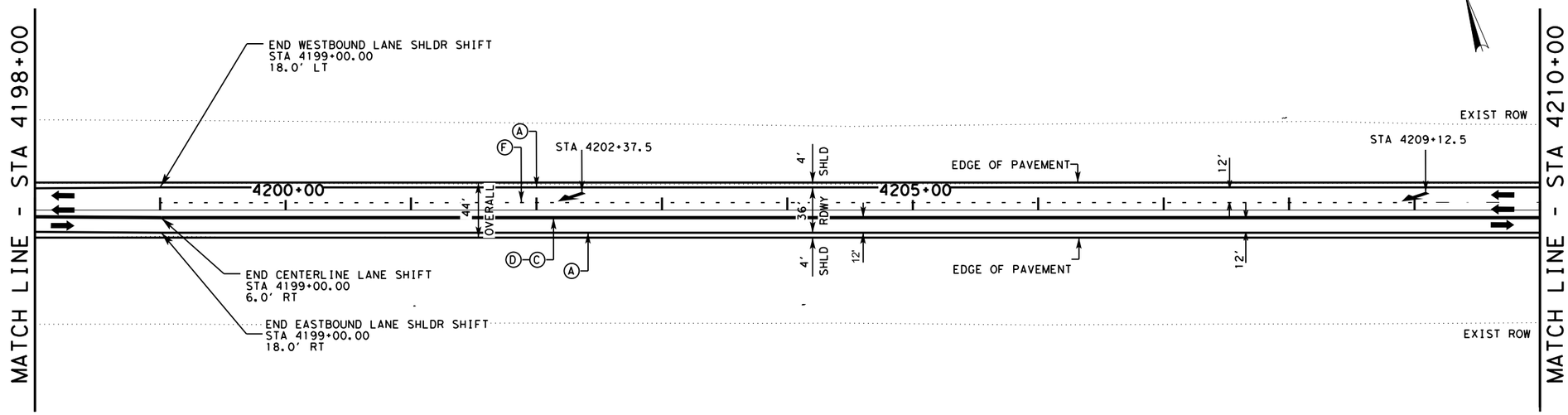
1. MATCH TO EXISTING STRIPING ON BOTH ENDS OF THE PROJECT. REFER TO PM STANDARDS FOR FURTHER DETAILS.
2. PLACE PROPOSED SIGNS IN APPROPRIATE LOCATION DIRECTLY ADJACENT TO EXISTING SIGN UNLESS OTHERWISE INDICATED ON PLANS OR AS DIRECTED.
3. FOLLOW TEXAS SUPER 2 PASSING LANES TS2(PL-1)-18 FOR APPROPRIATE TRANSITION CHANGES AND MARKINGS.

LEGEND

- (A) 4" WHT SLD
- (B) 6" WHT BRK
- (C) 4" YEL DBL SLD
- (D) TY II-A-A @ 40' O.C.
- (E) TY I-C
- (#) PROPOSED SIGNS
- EXISTING SIGNS TO BE REPLACED
- TRAFFIC FLOW
- LANE REDUCTION ARROW
- (F) 4" DOT WHT EXT.

PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6005	REFL PAV MRK TY I (W)4"(DOT)(090MIL)	LF	339
666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	4000
666	6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	20
666	6071	REFL PAV MRK TY I(W)(LNDP ARW)(090MIL)	EA	2
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	4000
666	6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	4000
666	6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	20
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	4000
672	6007	REFL PAV MRKR TY I-C	EA	1
672	6009	REFL PAV MRKR TY II-A-A	EA	50
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	8000



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SCALE IN FEET

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED PROFESSIONAL ENGINEER

Sheetal Patel, P.E.
03/09/2021

US 62

TRAFFIC

SIGNING & STRIPING LAYOUT

BEGIN PROJECT FROM
STA. 4190+00.00 TO STA.4210+00

SHEET 1 OF 11

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		74

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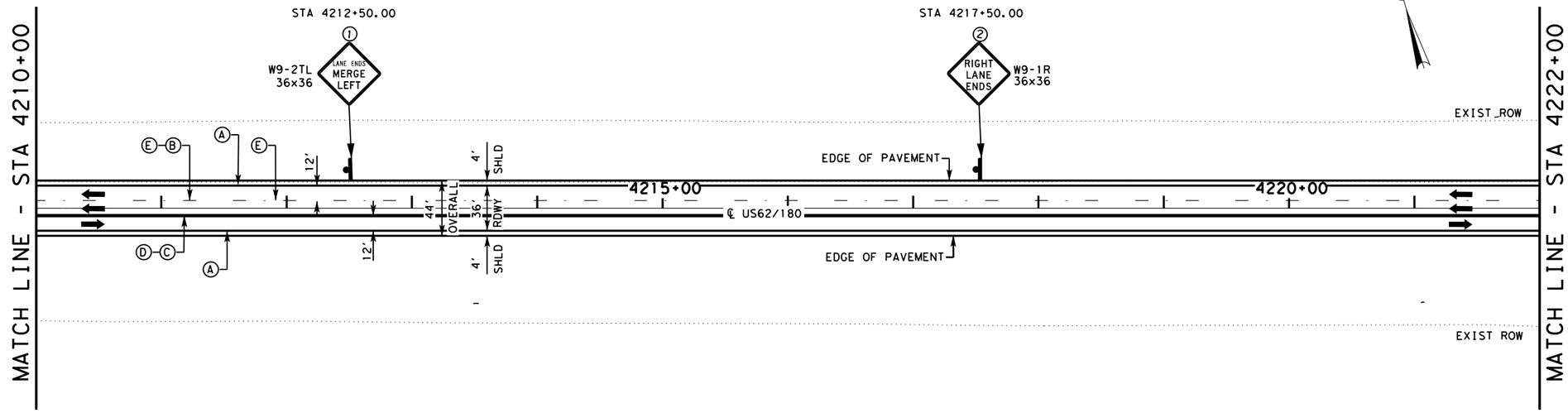


NOTES:

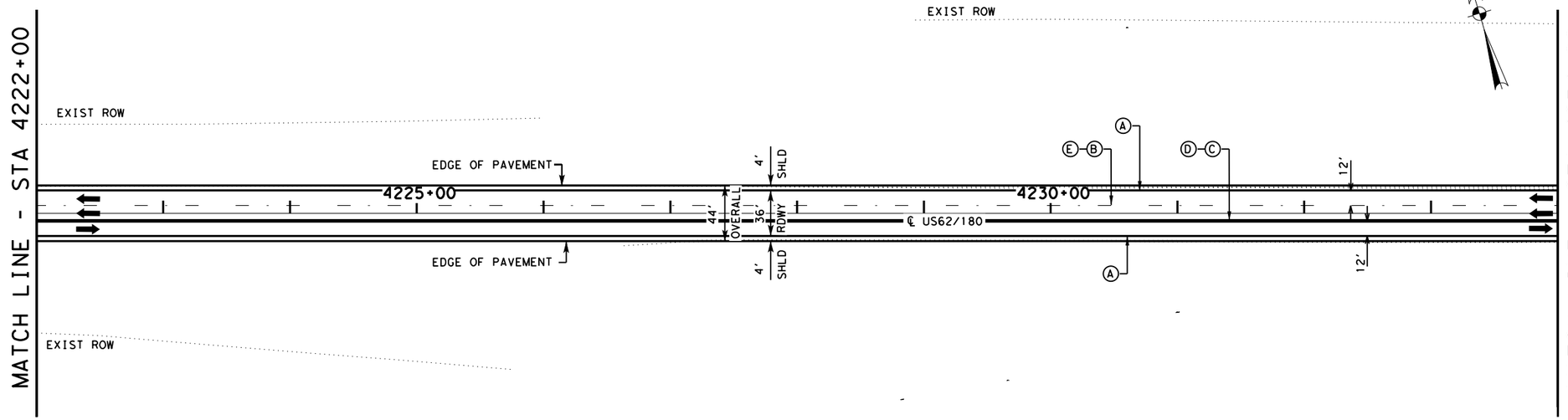
1. MATCH TO EXISTING STRIPING ON BOTH ENDS OF THE PROJECT. REFER TO PM STANDARDS FOR FURTHER DETAILS.
2. PLACE PROPOSED SIGNS IN APPROPRIATE LOCATION DIRECTLY ADJACENT TO EXISTING SIGN UNLESS OTHERWISE INDICATED ON PLANS OR AS DIRECTED.
3. FOLLOW TEXAS SUPER 2 PASSING LANES TS2(PL-1)-18 FOR APPROPRIATE TRANSITION CHANGES AND MARKINGS.

LEGEND

- (A) 4" WHT SLD
- (B) 6" WHT BRK
- (C) 4" YEL DBL SLD
- (D) TY II-A-A @ 40' O.C.
- (E) TY I-C
- (#) PROPOSED SIGNS
- EXISTING SIGNS TO BE REPLACED
- TRAFFIC FLOW
- LANE REDUCTION ARROW

PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	4800
666	6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	600
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	4800
666	6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	4800
666	6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	600
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	4800
672	6007	REFL PAV MRKR TY I-C	EA	30
672	6009	REFL PAV MRKR TY II-A-A	EA	60
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	9600



0374-07-029: SIGNING ESTIMATE QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QTY
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2

0 50 100
SCALE IN FEET

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.
02/17/2021

US 62

TRAFFIC

SIGNING & STRIPING LAYOUT

STA 4210+00 TO STA 4234+00

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		75

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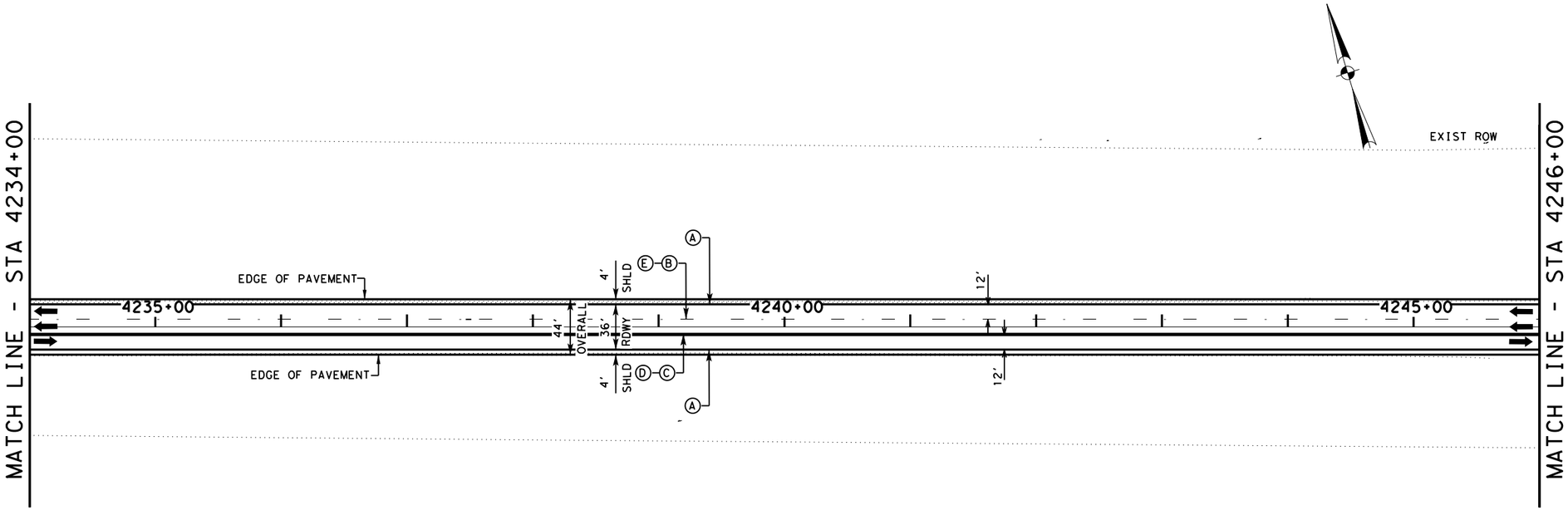


NOTES:

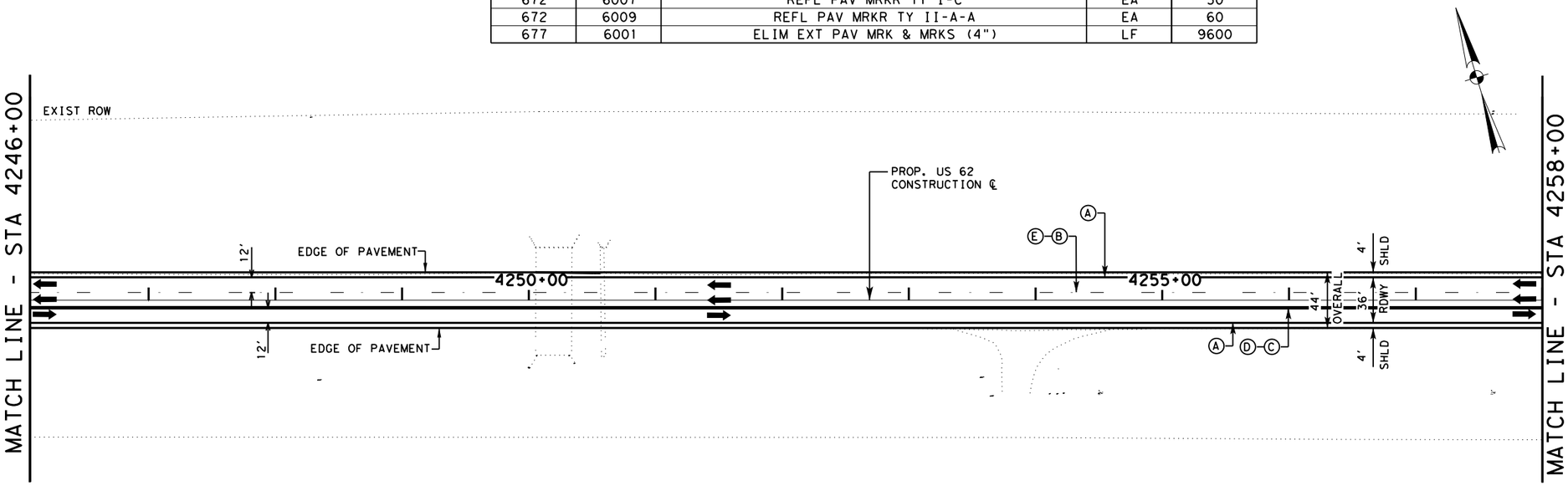
1. MATCH TO EXISTING STRIPING ON BOTH ENDS OF THE PROJECT. REFER TO PM STANDARDS FOR FURTHER DETAILS.
2. PLACE PROPOSED SIGNS IN APPROPRIATE LOCATION DIRECTLY ADJACENT TO EXISTING SIGN UNLESS OTHERWISE INDICATED ON PLANS OR AS DIRECTED.
3. FOLLOW TEXAS SUPER 2 PASSING LANES TS2(PL-1)-18 FOR APPROPRIATE TRANSITION CHANGES AND MARKINGS.

LEGEND

- (A) 4" WHT SLD
- (B) 6" WHT BRK
- (C) 4" YEL DBL SLD
- (D) TY II-A-A @ 40' O.C.
- (E) TY I-C
- (#) PROPOSED SIGNS
- EXISTING SIGNS TO BE REPLACED
- TRAFFIC FLOW
- LANE REDUCTION ARROW

PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	4800
666	6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	600
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	4800
666	6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	4800
666	6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	600
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	4800
672	6007	REFL PAV MRKR TY I-C	EA	30
672	6009	REFL PAV MRKR TY II-A-A	EA	60
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	9600



0 50 100
SCALE IN FEET

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.
02/17/2021

US 62

TRAFFIC

SIGNING & STRIPING LAYOUT

STA 4234+00 TO STA 4258+00

SHEET 3 OF 11

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		76

DATE: 2/17/2021 1:24:07 PM
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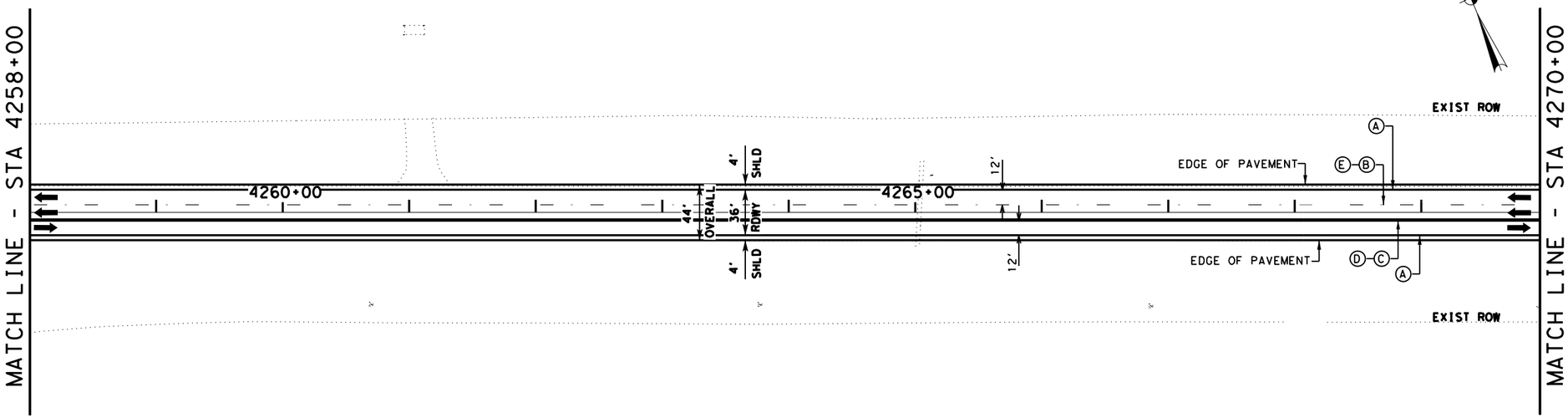


NOTES:

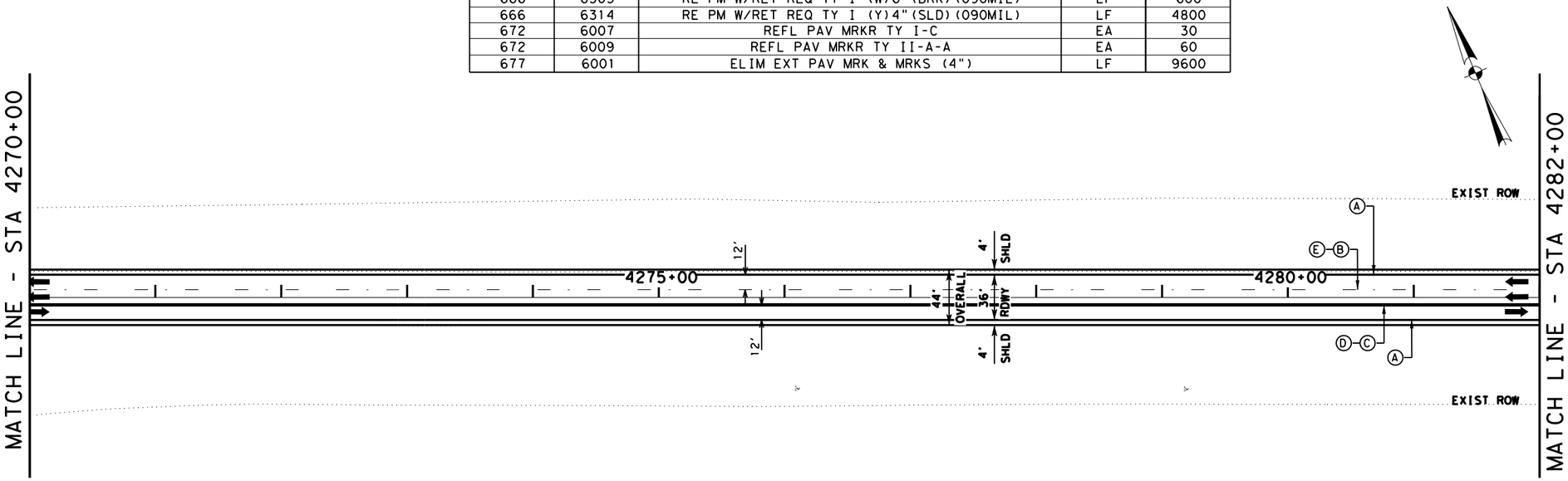
1. MATCH TO EXISTING STRIPING ON BOTH ENDS OF THE PROJECT. REFER TO PM STANDARDS FOR FURTHER DETAILS.
2. PLACE PROPOSED SIGNS IN APPROPRIATE LOCATION DIRECTLY ADJACENT TO EXISTING SIGN UNLESS OTHERWISE INDICATED ON PLANS OR AS DIRECTED.
3. FOLLOW TEXAS SUPER 2 PASSING LANES TS2(PL-1)-18 FOR APPROPRIATE TRANSITION CHANGES AND MARKINGS.

LEGEND

- (A) 4" WHT SLD
- (B) 6" WHT BRK
- (C) 4" YEL DBL SLD
- (D) TY II-A-A @ 40' O.C.
- (E) TY I-C
- (#) PROPOSED SIGNS
- EXISTING SIGNS TO BE REPLACED
- TRAFFIC FLOW
- LANE REDUCTION ARROW

PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	4800
666	6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	600
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	4800
666	6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	4800
666	6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	600
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	4800
672	6007	REFL PAV MRKR TY I-C	EA	30
672	6009	REFL PAV MRKR TY II-A-A	EA	60
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	9600



0 50 100
SCALE IN FEET

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

02/17/2021

US 62

TRAFFIC

SIGNING & STRIPING LAYOUT

STA 4258+00 TO STA 4282+00

SHEET 4 OF 11

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		77

DATE: 2/17/2021 1:24:13 PM
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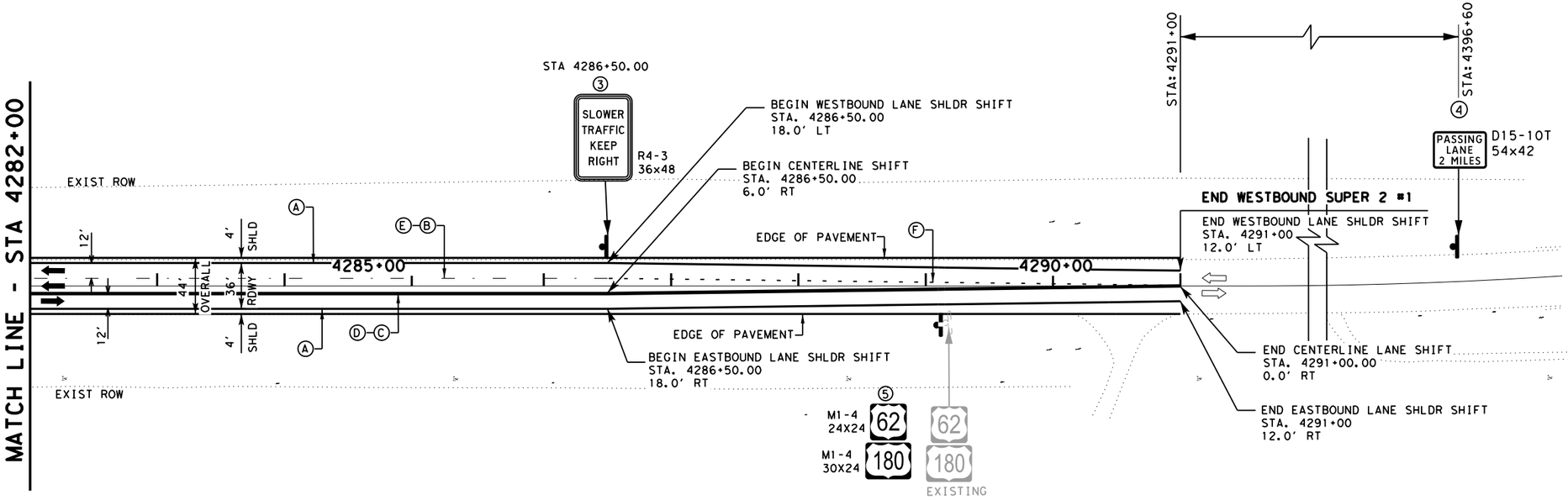
PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029				
ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6005	REFL PAV MRK TY I (W)4"(DOT)(090MIL)	LF	150
666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	1800
666	6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	110
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	1800
666	6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	1800
666	6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	110
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	1800
672	6007	REFL PAV MRKR TY I-C	EA	6
672	6009	REFL PAV MRKR TY II-A-A	EA	24
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	3600



0374-07-029: SIGNING ESTIMATE QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	1

NOTES:

1. MATCH TO EXISTING STRIPING ON BOTH ENDS OF THE PROJECT. REFER TO PM STANDARDS FOR FURTHER DETAILS.
2. PLACE PROPOSED SIGNS IN APPROPRIATE LOCATION DIRECTLY ADJACENT TO EXISTING SIGN UNLESS OTHERWISE INDICATED ON PLANS OR AS DIRECTED.
3. FOLLOW TEXAS SUPER 2 PASSING LANES TS2(PL-1)-18 FOR APPROPRIATE TRANSITION CHANGES AND MARKINGS.

LEGEND

- (A) 4" WHT SLD
- (B) 6" WHT BRK
- (C) 4" YEL DBL SLD
- (D) TY II-A-A @ 40' O.C.
- (E) TY I-C
- (#) PROPOSED SIGNS
- EXISTING SIGNS TO BE REPLACED
- TRAFFIC FLOW
- LANE REDUCTION ARROW
- (F) 4" DOT WHT EXT.

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

02/17/2021

US 62

TRAFFIC

SIGNING & STRIPING LAYOUT

STA 4282+00 TO STA 4294+00

SHEET 5 OF 11

0 50 100
SCALE IN FEET

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		78

DATE: 2/17/2021 1:24:19 PM
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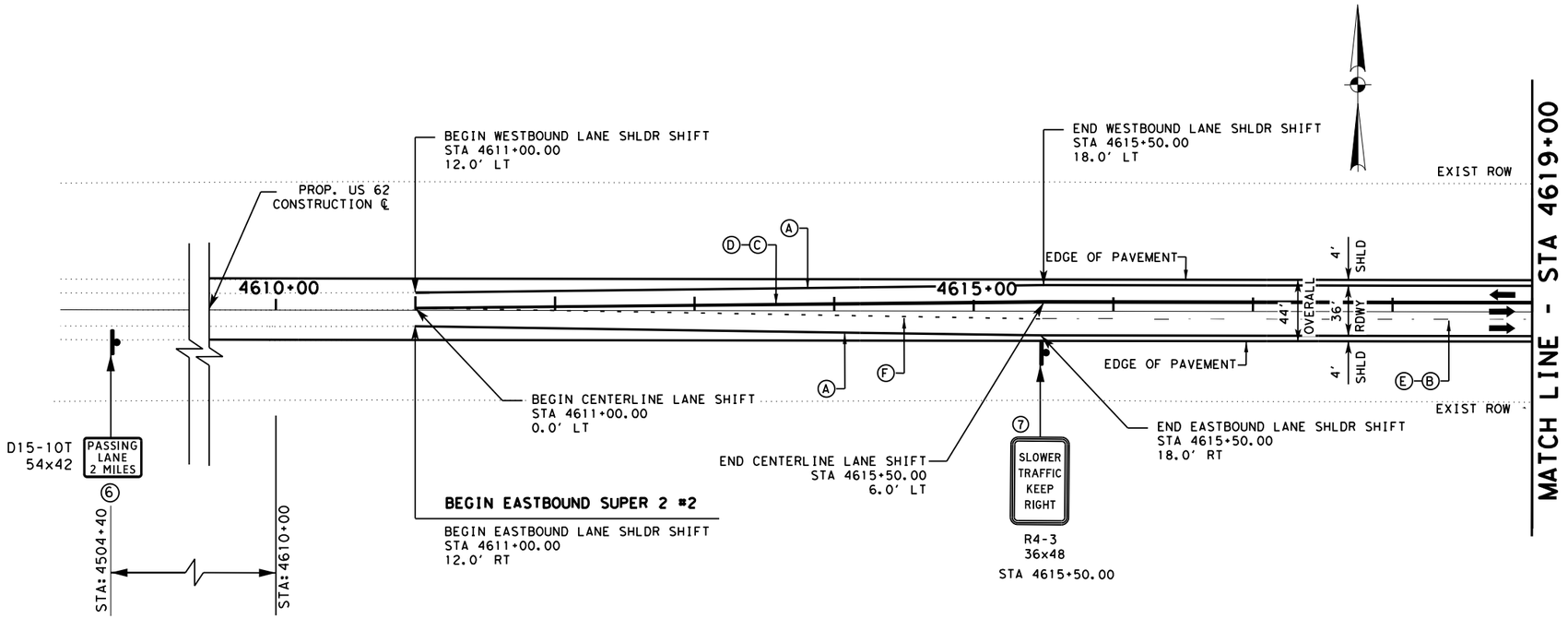


NOTES:

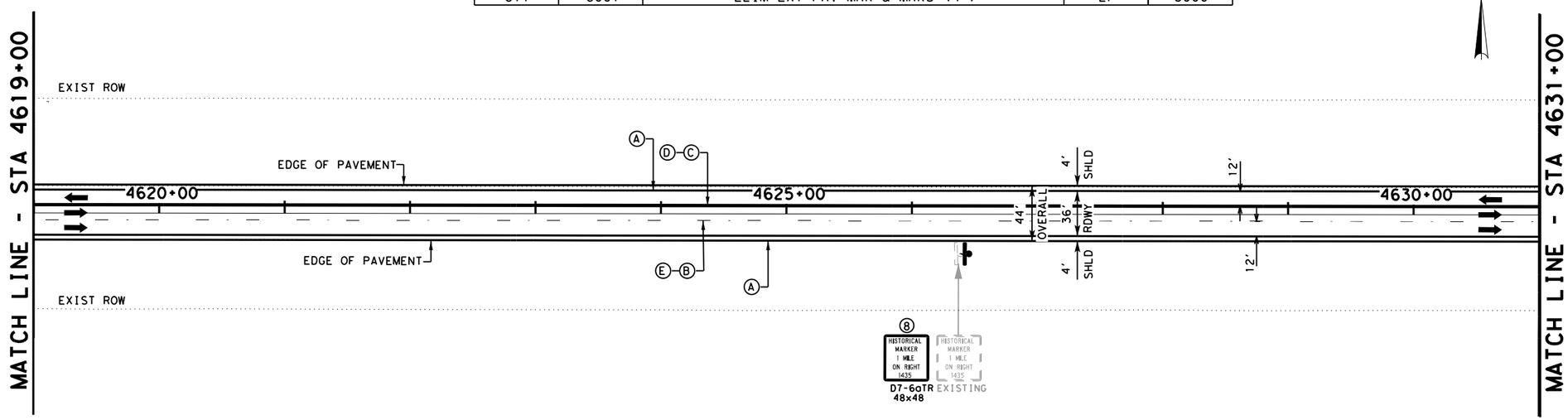
1. MATCH TO EXISTING STRIPING ON BOTH ENDS OF THE PROJECT. REFER TO PM STANDARDS FOR FURTHER DETAILS.
2. PLACE PROPOSED SIGNS IN APPROPRIATE LOCATION DIRECTLY ADJACENT TO EXISTING SIGN UNLESS OTHERWISE INDICATED ON PLANS OR AS DIRECTED.
3. FOLLOW TEXAS SUPER 2 PASSING LANES TS2(PL-1)-18 FOR APPROPRIATE TRANSITION CHANGES AND MARKINGS.

LEGEND

- (A) 4" WHT SLD
- (B) 6" WHT BRK
- (C) 4" YEL DBL SLD
- (D) TY II-A-A @ 40' O.C.
- (E) TY I-C
- (#) PROPOSED SIGNS
- EXISTING SIGNS TO BE REPLACED
- TRAFFIC FLOW
- LANE REDUCTION ARROW
- (F) 4" DOT WHT EXT.

PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6005	REFL PAV MRK TY I (W)4"(DOT)(090MIL)	LF	150
666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	4000
666	6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	390
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	4000
666	6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	4000
666	6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	390
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	4000
672	6007	REFL PAV MRKR TY I-C	EA	20
672	6009	REFL PAV MRKR TY II-A-A	EA	50
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	8000



0374-07-029: SIGNING ESTIMATE QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QTY
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2
644	6076	REMOVE SM RD SN SUP&AM	EA	1

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

02/17/2021

US 62

TRAFFIC

SIGNING & STRIPING LAYOUT

STA 4610+00 TO STA 4631+00

SHEET 6 OF 11

0 50 100
SCALE IN FEET

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		79

DATE: 2/17/2021 1:24:26 PM
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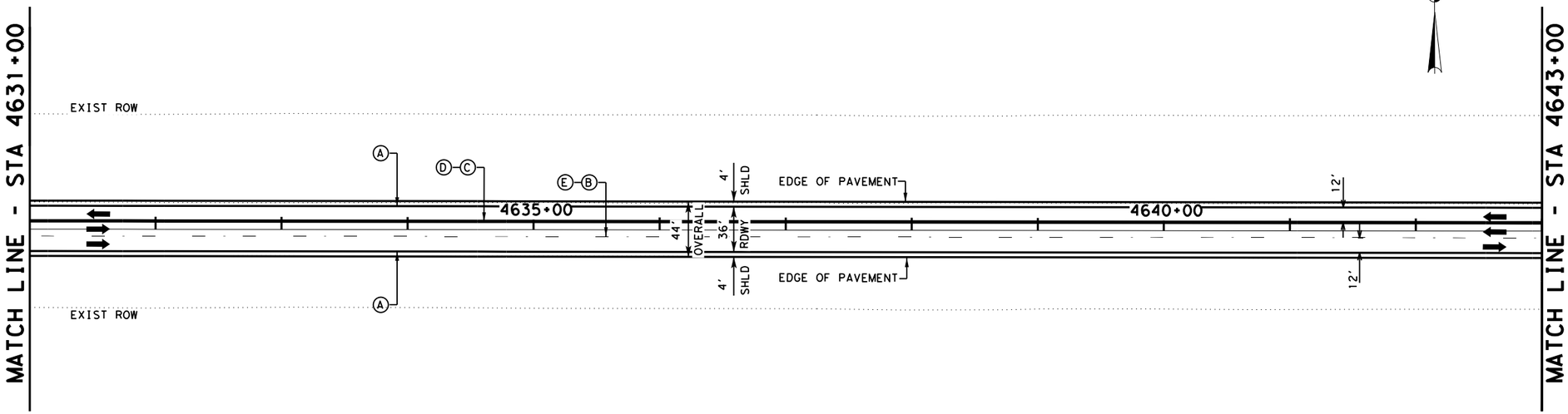

NOTES:

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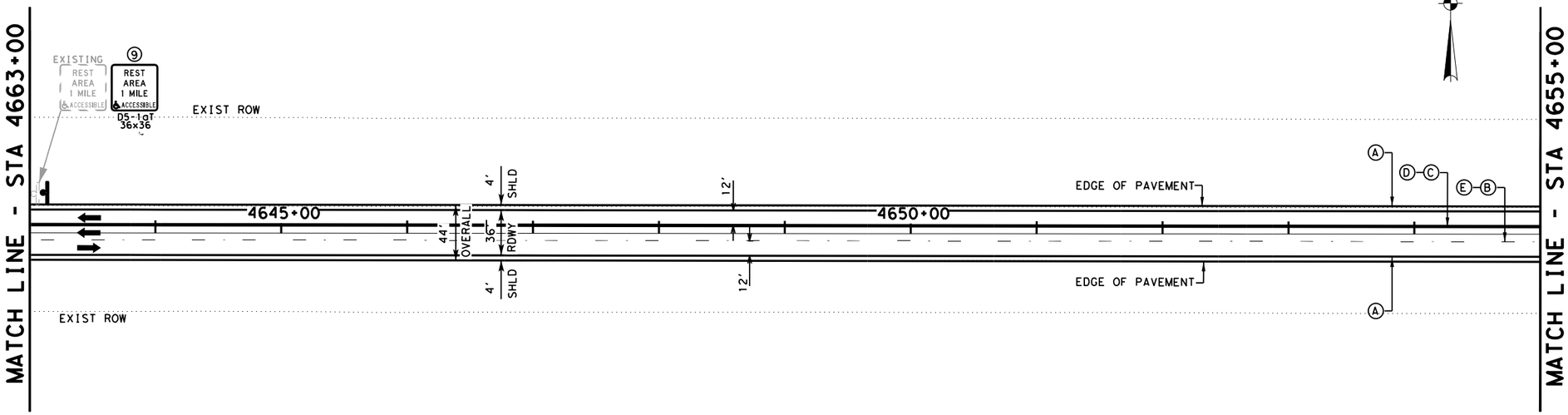
3. FOLLOW TEXAS SUPER 2 PASSING LANES TS2(PL-1)-18 FOR APPROPRIATE TRANSITION CHANGES AND MARKINGS.

LEGEND

- (A) 4" WHT SLD
- (B) 6" WHT BRK
- (C) 4" YEL DBL SLD
- (D) TY II-A-A @ 40' O.C.
- (E) TY I-C
- (#) PROPOSED SIGNS
- EXISTING SIGNS TO BE REPLACED
- TRAFFIC FLOW
- LANE REDUCTION ARROW

PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	4800
666	6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	600
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	4800
666	6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	4800
666	6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	600
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	4800
672	6007	REFL PAV MRKR TY I-C	EA	30
672	6009	REFL PAV MRKR TY II-A-A	EA	60
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	9600



0374-07-029: SIGNING ESTIMATE QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QTY
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	1

0 50 100
SCALE IN FEET

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.
02/17/2021

US 62

TRAFFIC

SIGNING & STRIPING LAYOUT

STA 4631+00 TO STA 4655+00

SHEET 7 OF 11

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		80

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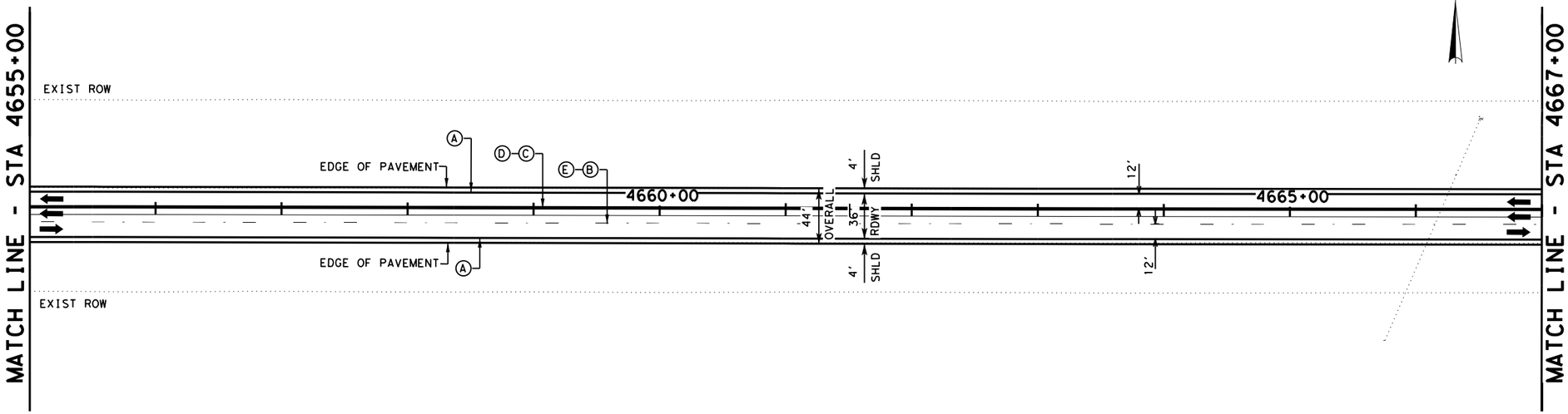

NOTES:

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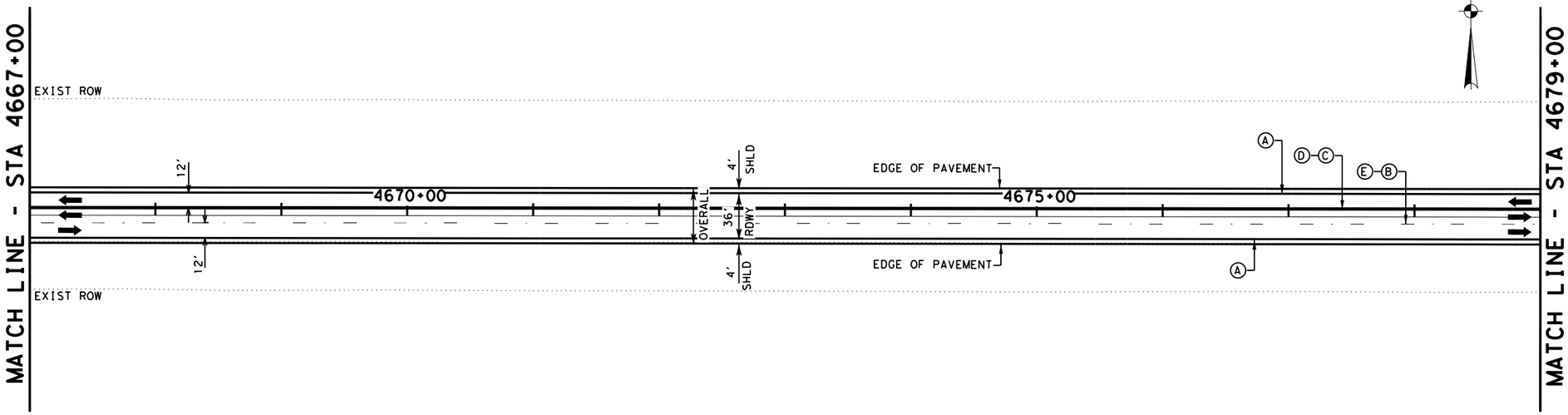
3. FOLLOW TEXAS SUPER 2 PASSING LANES TS2(PL-1)-18 FOR APPROPRIATE TRANSITION CHANGES AND MARKINGS.

LEGEND

- (A) 4" WHT SLD
- (B) 6" WHT BRK
- (C) 4" YEL DBL SLD
- (D) TY II-A-A @ 40' O.C.
- (E) TY I-C
- (#) PROPOSED SIGNS
- EXISTING SIGNS TO BE REPLACED
- TRAFFIC FLOW
- LANE REDUCTION ARROW

PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	4800
666	6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	600
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	4800
666	6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	4800
666	6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	600
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	4800
672	6007	REFL PAV MRKR TY I-C	EA	30
672	6009	REFL PAV MRKR TY II-A-A	EA	60
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	9600



0 50 100
SCALE IN FEET

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED PROFESSIONAL ENGINEER

Sheetal Patel, P.E.
02/17/2021

US 62

TRAFFIC

SIGNING & STRIPING LAYOUT

STA 4655+00 TO STA 4679+00

SHEET 8 OF 11

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		81

DATE: 2/17/2021 1:24:38 PM
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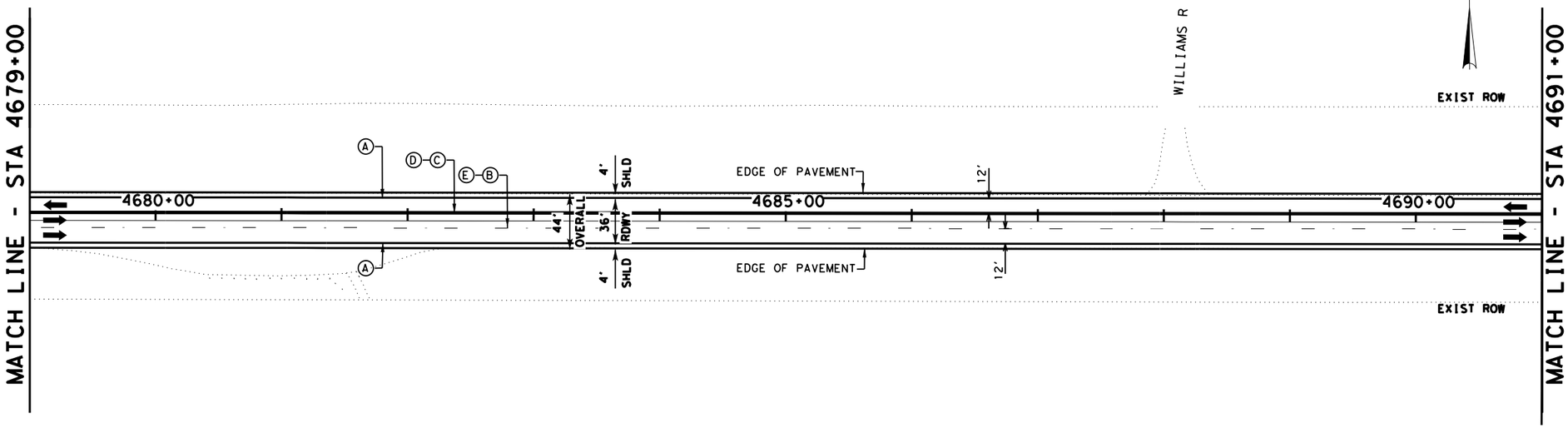


NOTES:

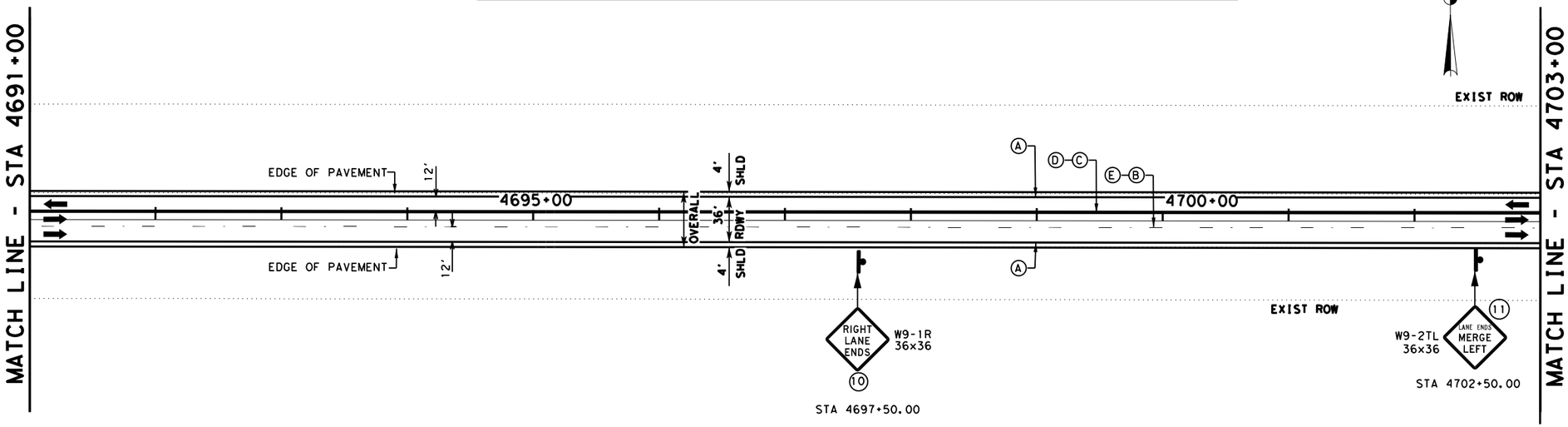
1. MATCH TO EXISTING STRIPING ON BOTH ENDS OF THE PROJECT. REFER TO PM STANDARDS FOR FURTHER DETAILS.
2. PLACE PROPOSED SIGNS IN APPROPRIATE LOCATION DIRECTLY ADJACENT TO EXISTING SIGN UNLESS OTHERWISE INDICATED ON PLANS OR AS DIRECTED.
3. FOLLOW TEXAS SUPER 2 PASSING LANES TS2(PL-1)-18 FOR APPROPRIATE TRANSITION CHANGES AND MARKINGS.

LEGEND

- (A) 4" WHT SLD
- (B) 6" WHT BRK
- (C) 4" YEL DBL SLD
- (D) TY II-A-A @ 40' O.C.
- (E) TY I-C
- (#) PROPOSED SIGNS
- EXISTING SIGNS TO BE REPLACED
- TRAFFIC FLOW
- LANE REDUCTION ARROW

PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	4800
666	6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	600
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	4800
666	6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	4800
666	6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	600
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	4800
672	6007	REFL PAV MRKR TY I-C	EA	30
672	6009	REFL PAV MRKR TY II-A-A	EA	60
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	9600



0374-07-029: SIGNING ESTIMATE QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QTY
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2

SHEETAL ASHISH PATEL
126438
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

Sheetal Patel, P.E.
02/17/2021

US 62

TRAFFIC

SIGNING & STRIPING LAYOUT

STA 4679+00 TO STA 4703+00

SHEET 9 OF 11

0 50 100
SCALE IN FEET

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		82

DATE: 2/17/2021 1:24:45 PM
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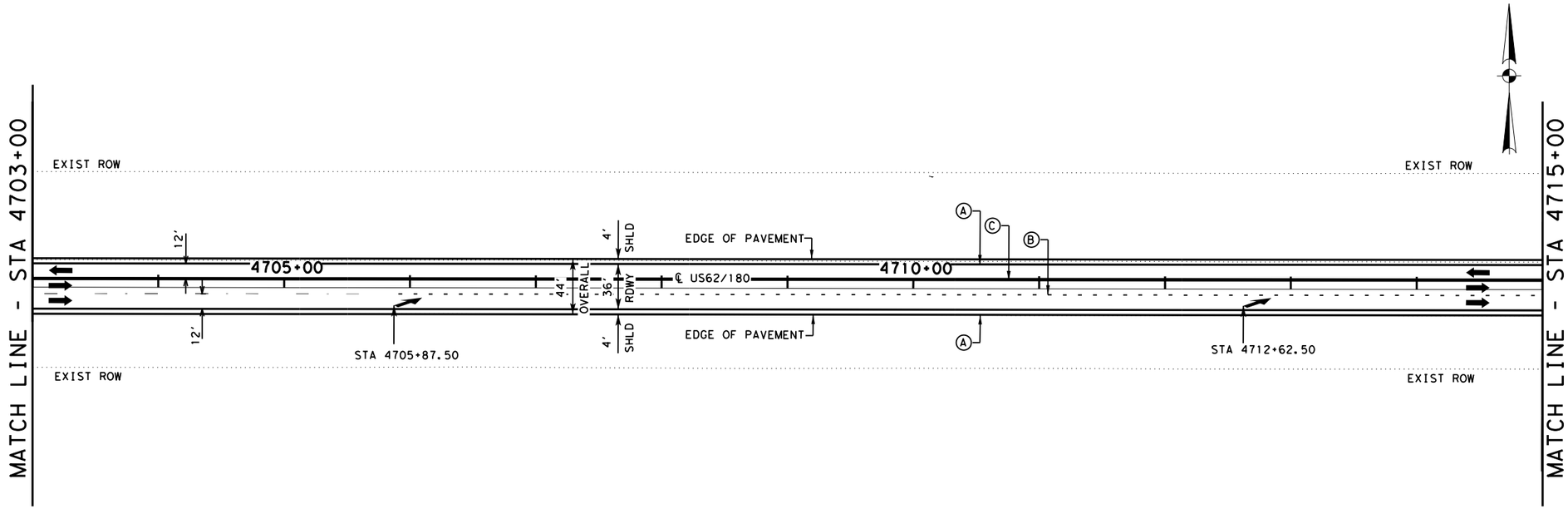


NOTES:

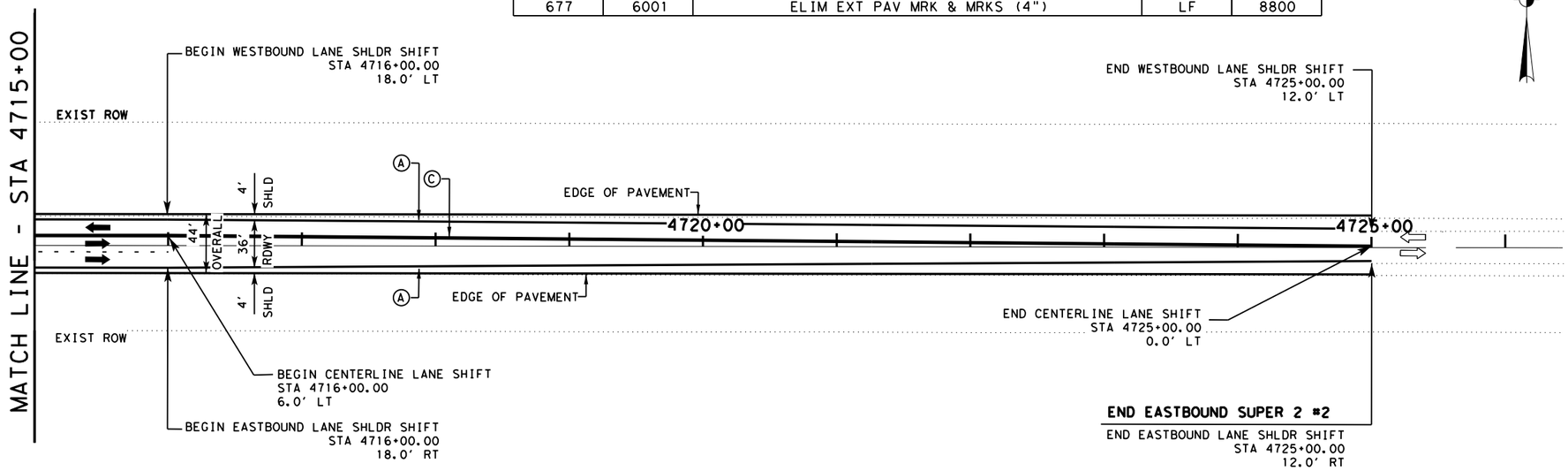
1. MATCH TO EXISTING STRIPING ON BOTH ENDS OF THE PROJECT. REFER TO PM STANDARDS FOR FURTHER DETAILS.
2. PLACE PROPOSED SIGNS IN APPROPRIATE LOCATION DIRECTLY ADJACENT TO EXISTING SIGN UNLESS OTHERWISE INDICATED ON PLANS OR AS DIRECTED.
3. FOLLOW TEXAS SUPER 2 PASSING LANES TS2(PL-1)-18 FOR APPROPRIATE TRANSITION CHANGES AND MARKINGS.

LEGEND

- (A) 4" WHT SLD
- (B) 6" WHT BRK
- (C) 4" YEL DBL SLD
- (D) TY II-A-A @ 40' O.C.
- (E) TY I-C
- (#) PROPOSED SIGNS
- EXISTING SIGNS TO BE REPLACED
- TRAFFIC FLOW
- LANE REDUCTION ARROW
- (F) 4" DOT WHT EXT.

PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6005	REFL PAV MRK TY I (W)4"(DOT)(090MIL)	LF	339
666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	4400
666	6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	70
666	6071	REFL PAV MRK TY I(W)(LNDP ARW)(090MIL)	EA	2
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	4400
666	6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	4400
666	6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	70
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	4400
672	6007	REFL PAV MRKR TY I-C	EA	4
672	6009	REFL PAV MRKR TY II-A-A	EA	55
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	8800



0 50 100
SCALE IN FEET

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

03/09/2021

US 62

TRAFFIC

SIGNING & STRIPING LAYOUT

STA 4703+00 TO STA 4725+00

SHEET 10 OF 11

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		83

DATE: 3/9/2021 9:35:32 PM
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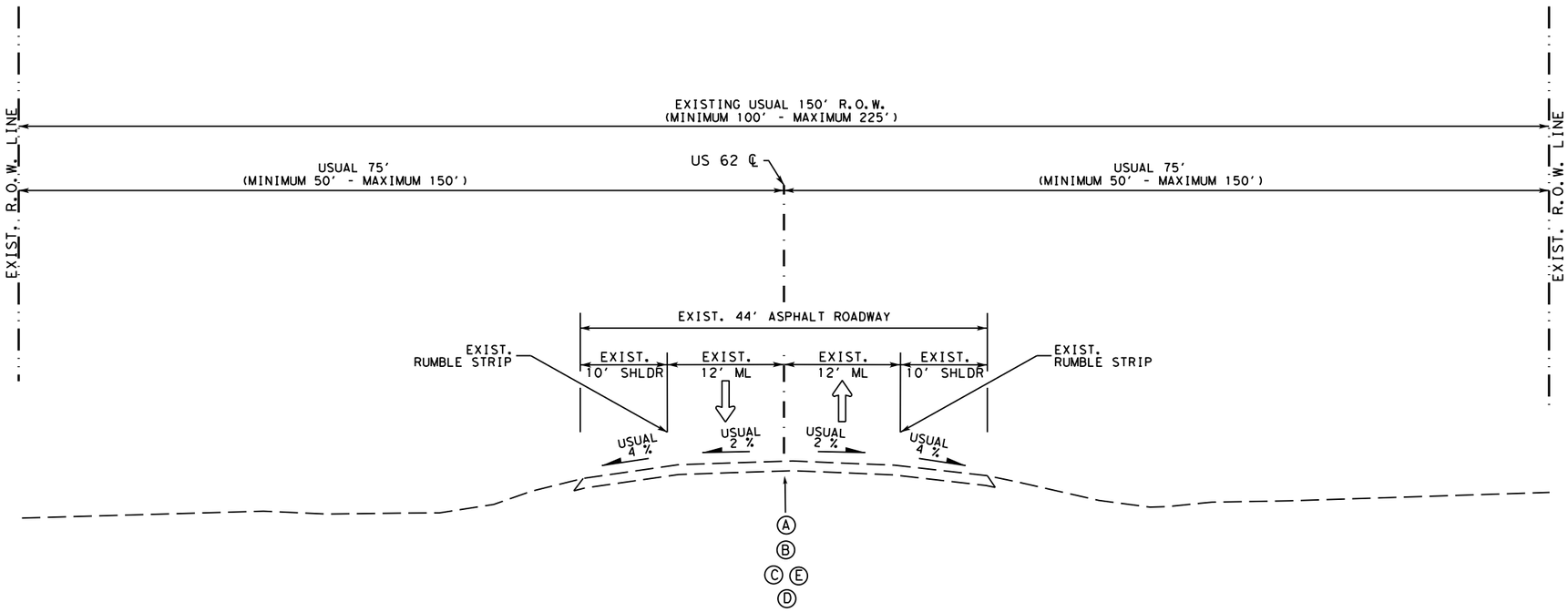

NOTES:

1. RETRACE EXISTING STRIPING USING THE ITEMS IN THE RESPECTIVE QUANTITY TABLES ONLY. TYPICAL SECTION ARE FOR GENERAL INFORMATION ONLY SHALL NOT BE USED FOR QUANTITY CALCULATIONS, OR AS A CONSTRUCTION DETAIL. REFER TO SPECIFIC DETAIL SHEET AND STATE STANDARDS.
2. FIELD VERIFY ACTUAL LOCATIONS AND PAVEMENT DIMENSIONS.
3. REFER TO PM STANDARDS FOR STRIPING, AND RAISED PAVEMENT MARKING STANDARDS.
4. REFER TO TCP SELECTION SHEET FOR APPLICABLE TRAFFIC CONTROL PLAN.
5. REFER TO RUMBLE STRIP STANDARD SHEETS FOR FURTHER INFORMATION ON MILLED RUMBLE STRIPS.

LEGEND

- (A) 8" WHT SLD
- (B) 4" YEL BRK
- (C) 4" YEL DBL SLD
- (D) PROPOSED CENTERLINE RUMBLE STRIPS
- (E) TY II-A-A
- ⇧ TRAFFIC FLOW

PROPOSED TYPICAL RESTRIPING SECTION

STA. 3910+43.26 TO 4093+75.00
STA. 4093+75.00 TO 4117+25.00: FM 1437 INTERSECTION (REFER TO TABLE 2)
STA. 4117+25.00 TO 4190+00.00
STA. 4291+00.00 TO 4611+00.00
STA. 4725+00.00 TO 4921+27.99

TABLE 1: PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF	19900
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	21750
666	6311	RE PM W/RET REQ TY I (Y)4"(BRK)(090MIL)	LF	19900
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	21750
672	6009	REFL PAV MRKR TY II-A-A	EA	2040
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	87100

TABLE 2: FM 1437 INTERSETION PAVEMENT MARKINGS ESTIMATE QUANTITY 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6146	REFL PAV MRK TY I (Y)24"(SLD)(090MIL)	LF	1230
666	6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	100
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	9400
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	9400
672	6007	REFL PAV MRKR TY I-C	EA	5
672	6009	REFL PAV MRKR TY II-A-A	EA	460
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	9400
677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	100
677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	1230

ROADWAY ESTIMATE QUANTITIES 0374-07-029

ITEM	CODE	DESCRIPTION	UNIT	QTY
354	6021	RUMBLE STRIPS (CENTERLINE) ASPHALT	LF	108695

NOTE: CENTER RUMBLE STRIPS TO BE INSTALLED ALONG ENTIRE LENGTH OF PROJECT. SEE NOTE 5.

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED
PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

02/17/2021

US 62

TRAFFIC

SIGNING AND STRIPING
TWO LANE
TWO WAY ROADWAY

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		84

SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U" 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
75	1	W9-2TL	LANE ENDS MERGE LEFT	36" x 36"	✓		10BWG	1	SA	P	
75	2	W9-1R	RIGHT LANE ENDS	36" x 36"	✓		10BWG	1	SA	P	
78	3	R4-3	SLOWER TRAFFIC KEEP RIGHT	36" x 48"	✓		10BWG	1	SA	T	
78	4	D15-10T	PASSING LANE 2 MILES	54" x 42"	✓		S80	1	SA	T	
78	5	M1-4 M1-4	62 180	24" x 24" 30" x 24"	✓		10BWG	1	SA	P	
79	6	D15-10T	PASSING LANE 2 MILES	54" x 42"	✓		S80	1	SA	T	
79	7	R4-3	SLOWER TRAFFIC KEEP RIGHT	36" x 48"	✓		10BWG	1	SA	T	
79	8	D7-6aTR	HISTORICAL MARKER 1 MILE ON RIGHT 1435	48" x 48"	✓		S80	1	SA	T	
80	9	D5-1aT	REST AREA 1 MILE ACCESSIBLE	36" x 36"	✓		10BWG	1	SA	P	
82	10	W9-1R	RIGHT LANE ENDS	36" x 36"	✓		10BWG	1	SA	P	
82	11	W9-2TL	LANE ENDS MERGE LEFT	36" x 36"	✓		10BWG	1	SA	P	

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STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED PROFESSIONAL ENGINEER

Sheetal Patel, P.E.
02/17/2021

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

SHEET 1 OF 1

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
4-16	DIST	COUNTY		SHEET NO.
8-16	ELP	HUDSPETH		85

TB

DATE: 2/4/2021 9:53:01 PM
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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

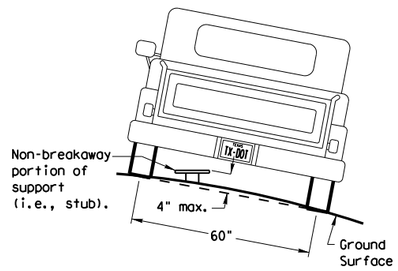
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

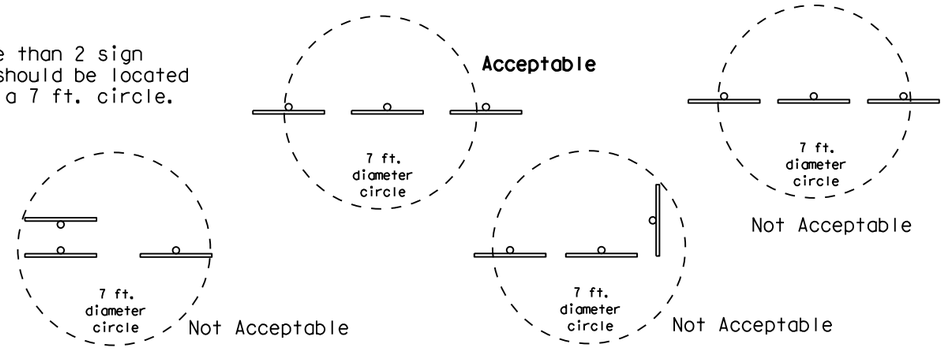
P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1) to (SLIP-3))

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



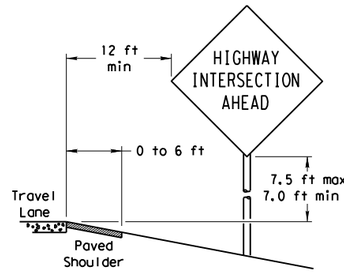
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

No more than 2 sign posts should be located within a 7 ft. circle.



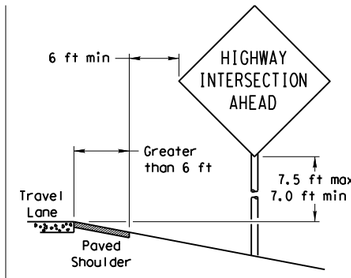
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

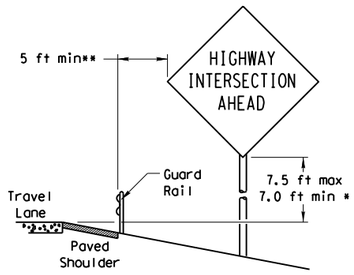
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



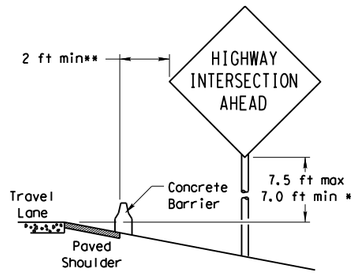
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

BEHIND BARRIER



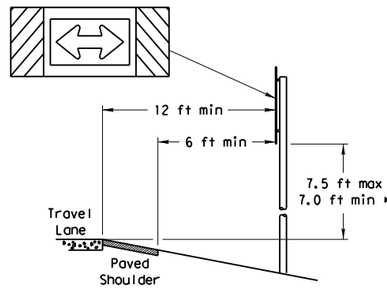
BEHIND GUARDRAIL



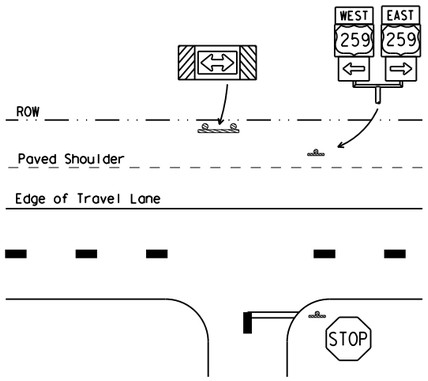
BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

T-INTERSECTION



When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

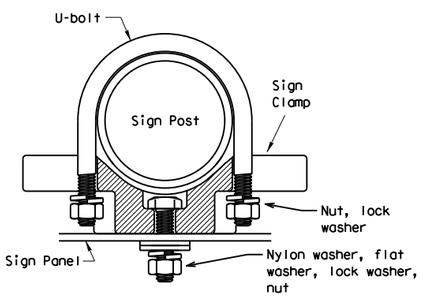
The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

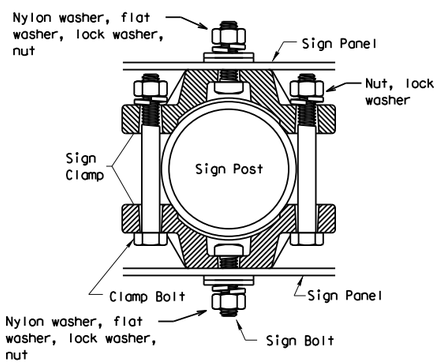


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

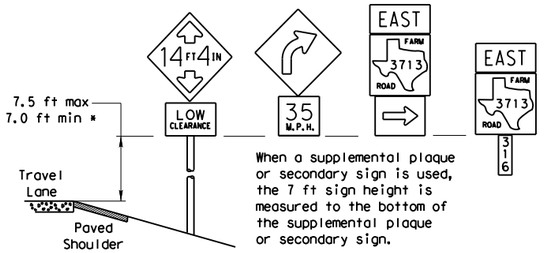
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



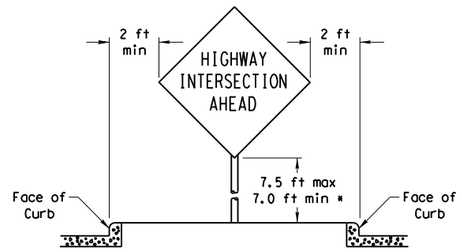
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



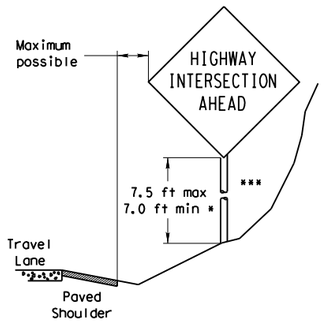
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		86

DATE: 2/4/2021 9:53:08 PM
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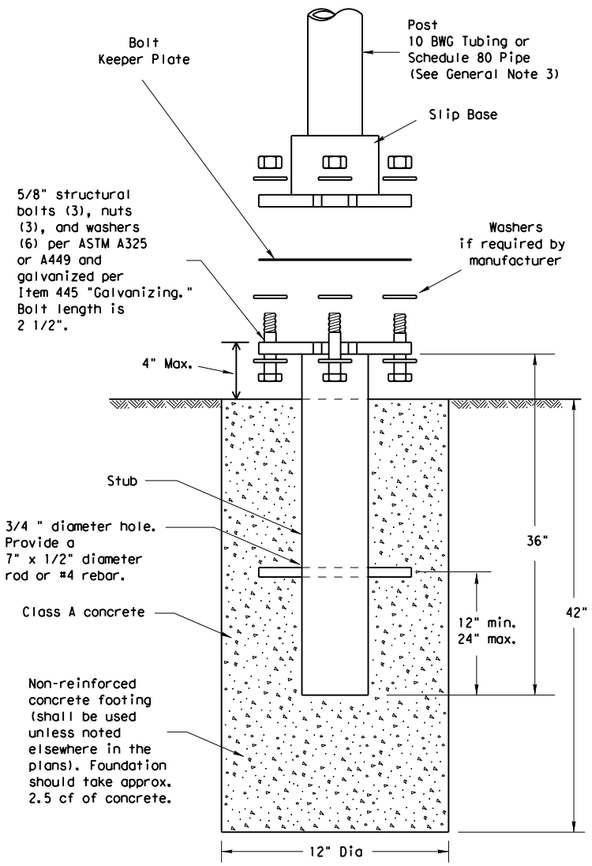
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

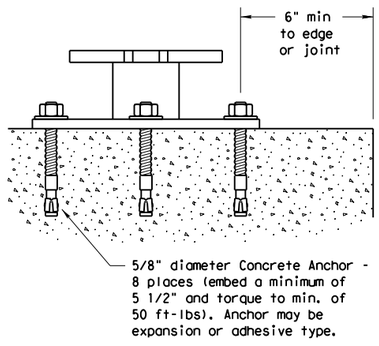
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

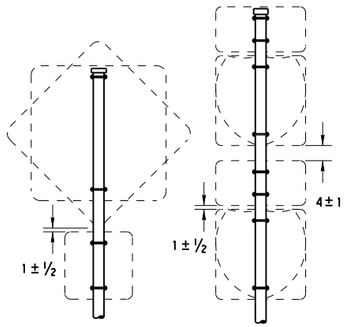
SMD(SLIP-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

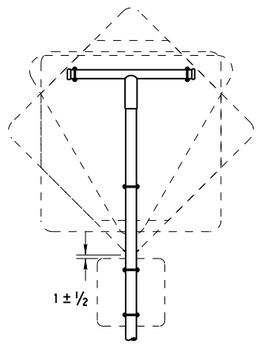
REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		87

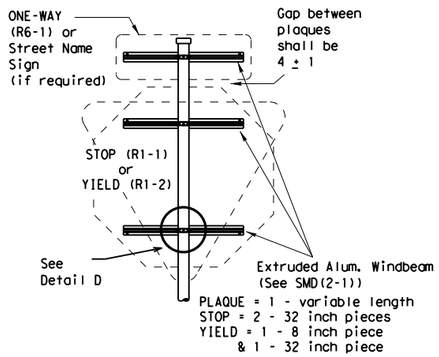
DATE: 2/4/2021 9:53:14 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\0374070028\4 - Design\Plan Set\Standards\SIGNING*AND*STRIPING\smds2.dgn



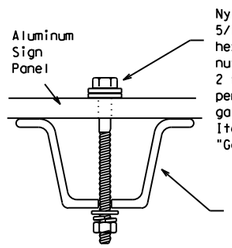
SM RD SGN ASSM TY XXXXX(1)XX(P)



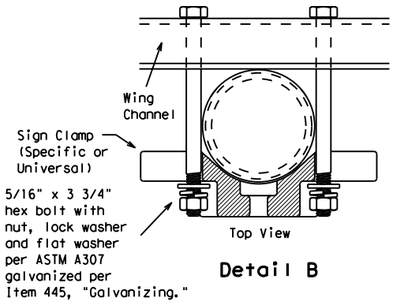
SM RD SGN ASSM TY XXXXX(1)XX(T)



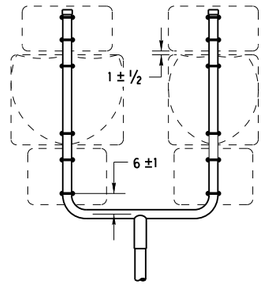
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



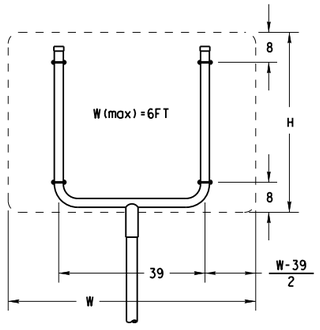
Detail A



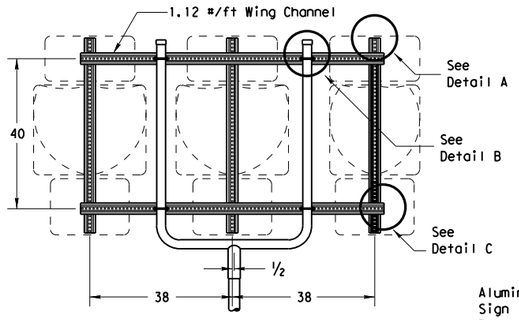
Detail B



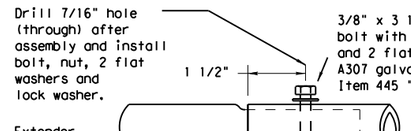
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)

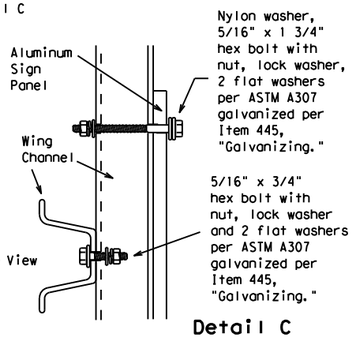


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

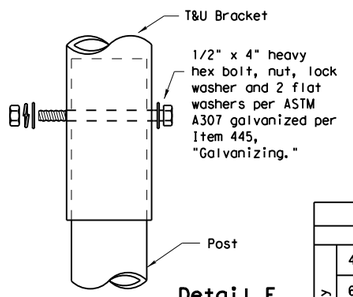


Detail F

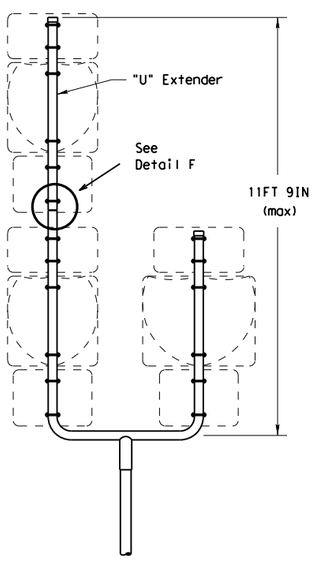
Splices shall only be allowed behind the sign substrate.



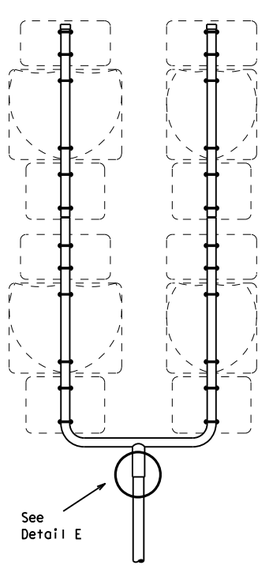
Detail C



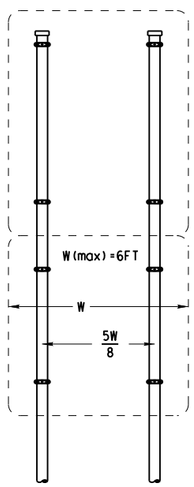
Detail E



SM RD SGN ASSM TY S80(1)XX(U-1EXT)

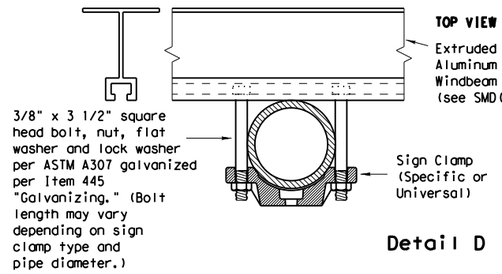


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

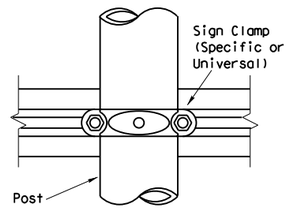


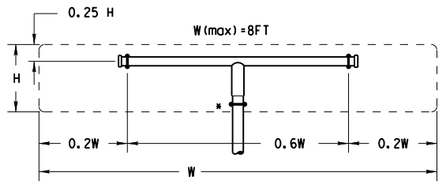
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D

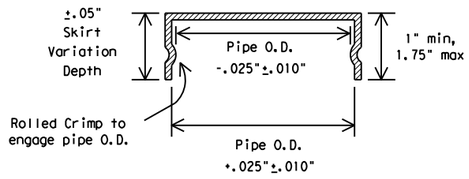




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62

DIST	COUNTY	SHEET NO.
ELP	HUDSPETH	88

DATE: 2/4/2021 9:53:20 PM
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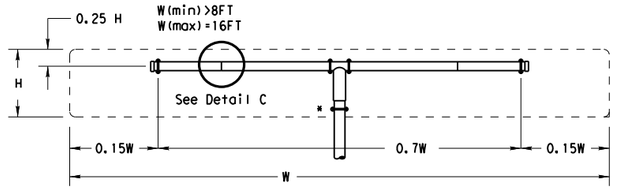
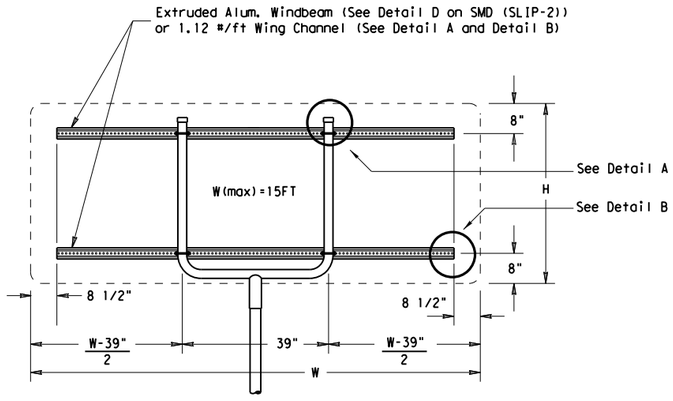
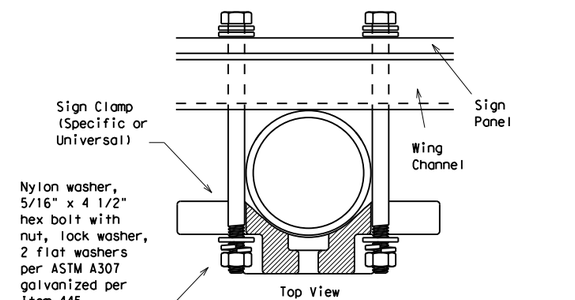


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)

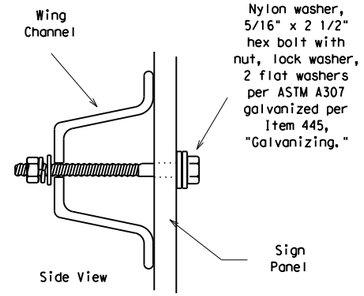


SM RD SGN ASSM TY XXXXX(1)XX(U-XX)

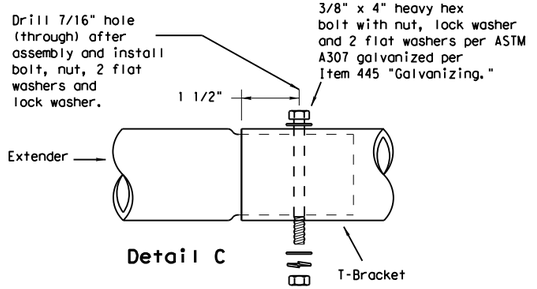


Top View

Detail A



Detail B



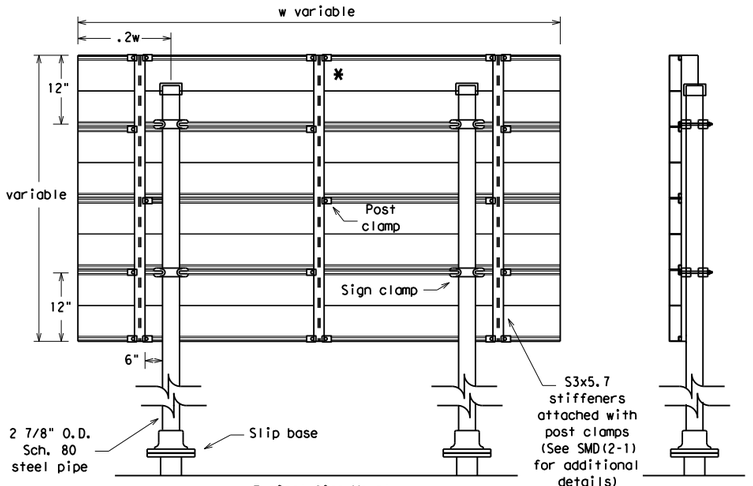
Detail C

Splices shall only be allowed behind the sign substrate.

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
6. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
11. Post open ends shall be fitted with Friction Caps.

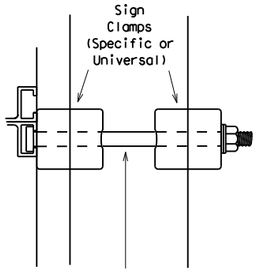


Typical Sign Mount

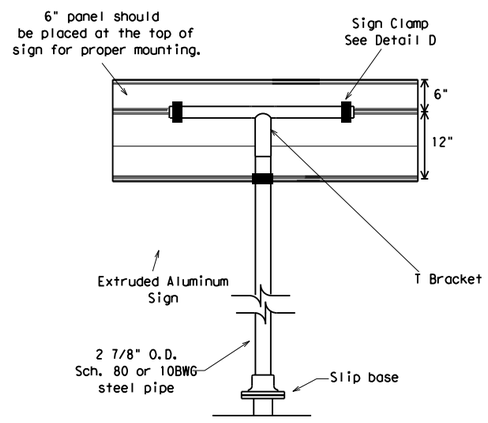
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

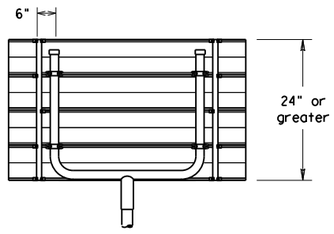
See Detail E
for clamp installation



Detail E



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS
9-08

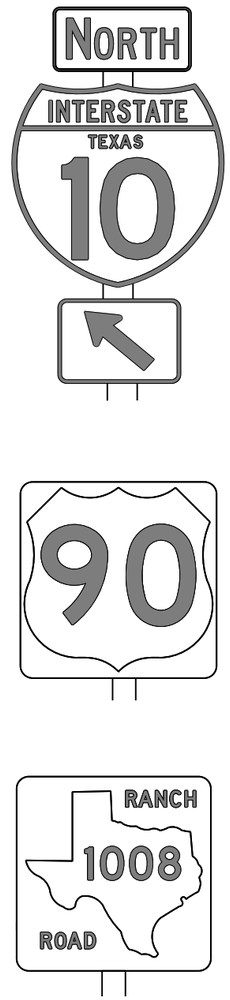
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0374	07	028, ETC	US 62
DIST	COUNTY		SHEET NO.
ELP	HUDSPETH		89

DATE: 2/4/2021 9:53:27 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\PRINCIPAL\TSR3-13.dgn

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

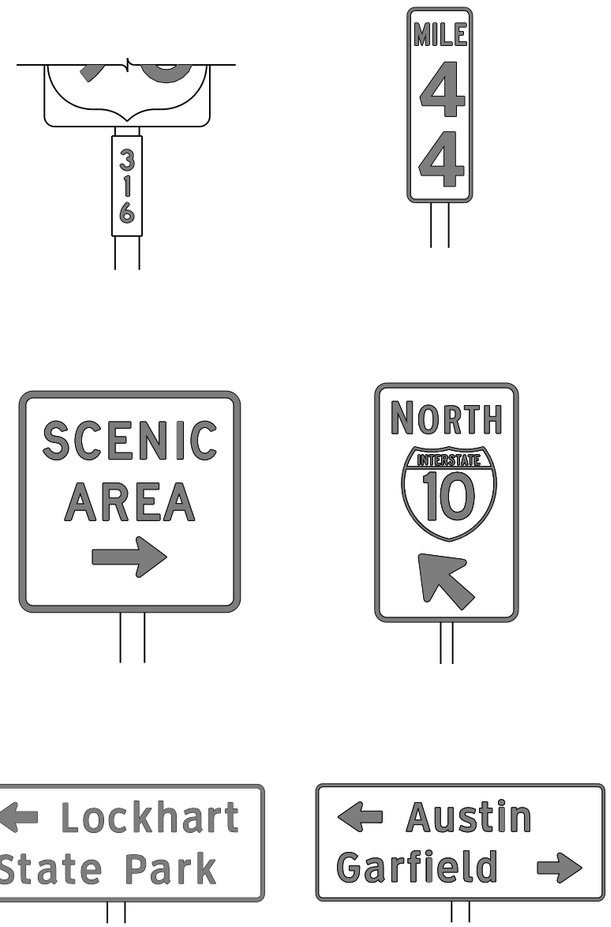
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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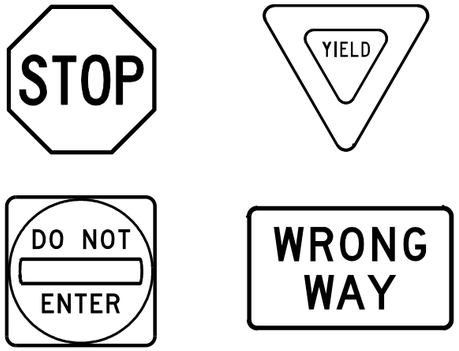
REVISIONS	0374	07	028, ETC	US 62
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	ELP	HUDSPETH		90

DATE: 2/4/2021 9:53:33 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\tsr4-13.dgn

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

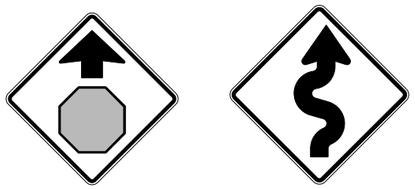
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

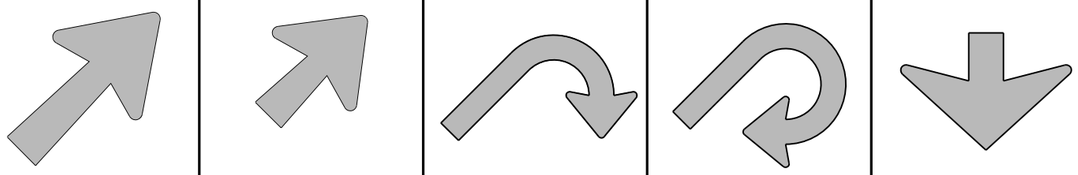
TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		91

4

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

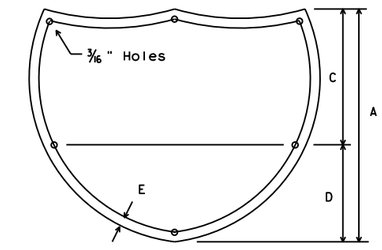
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

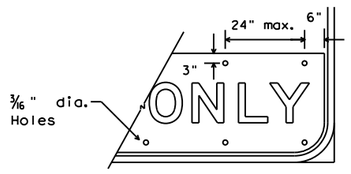
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

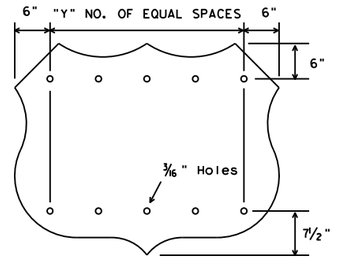


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

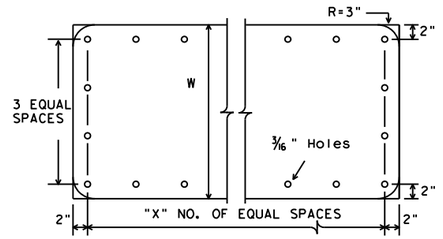


EXIT ONLY PANEL



U.S. ROUTE MARKERS

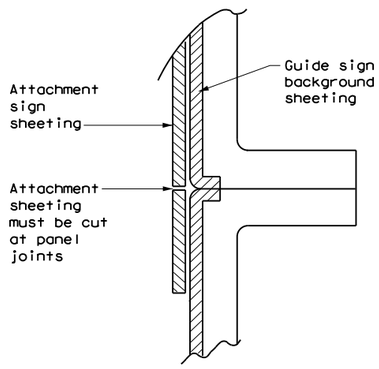
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

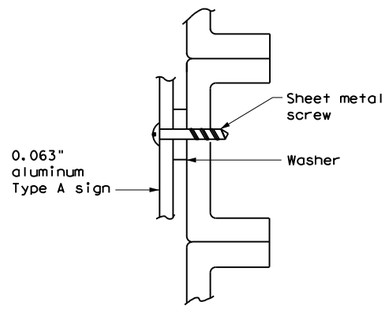
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



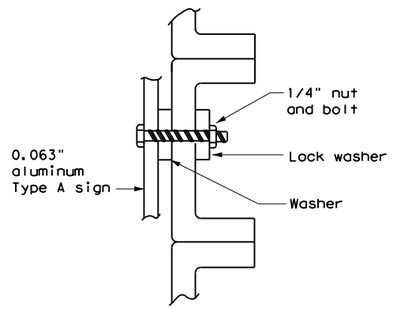
DIRECT APPLIED ATTACHMENT

NOTE:

1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



SCREW ATTACHMENT



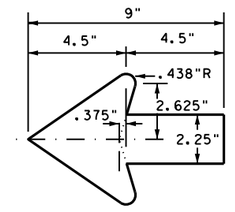
NUT/BOLT ATTACHMENT

NOTE:

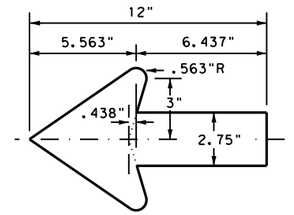
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

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9-08	ELP	HUDSPETH		92

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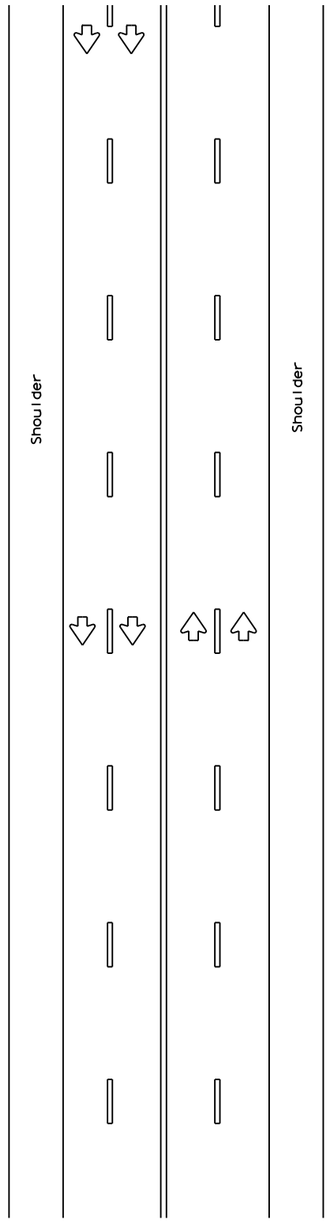
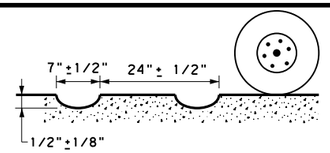
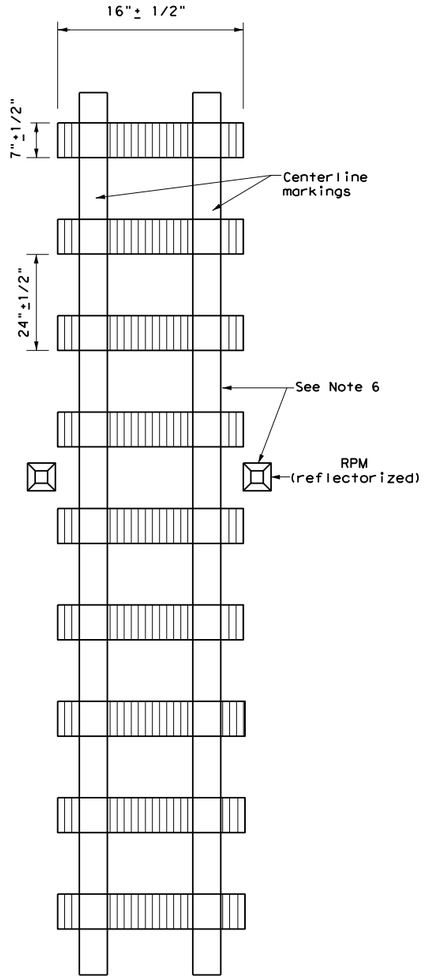


MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

CENTERLINE RUMBLE STRIPS

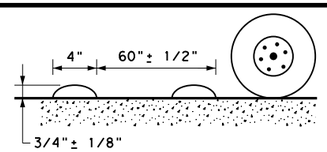


PROFILE VIEW

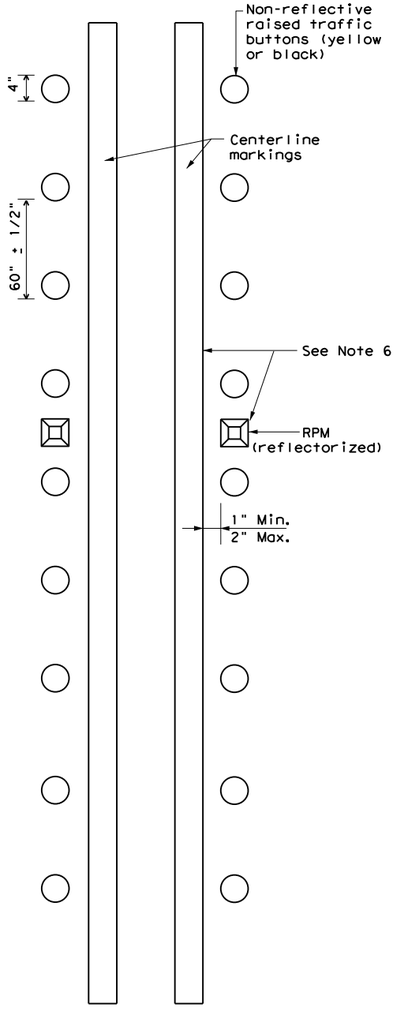


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

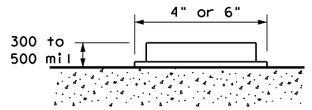


PROFILE VIEW

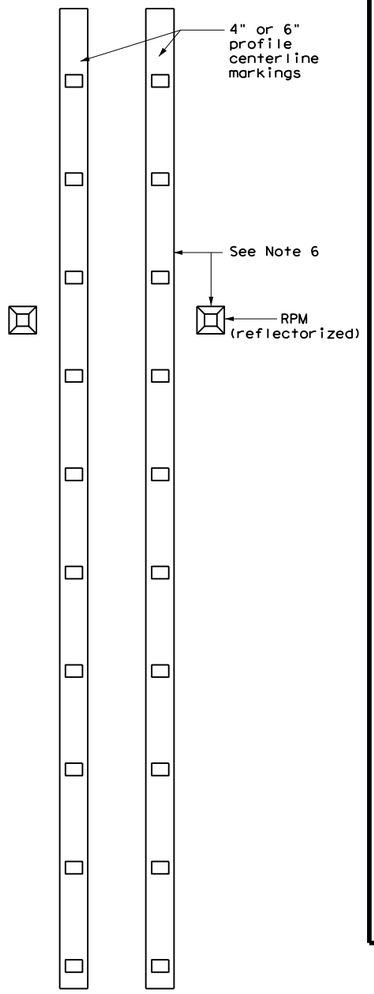


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 3

PROFILE CENTERLINE MARKINGS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.
2. Centerline and edgeline rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks.
6. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips for normal centerline spacing. For wider medians, specify in the plans the exact placement of the rumble strips. Place the rumble strips under each centerline marking or centered in the middle of the median.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The color of the button should be yellow for a continuous no passing roadway. The button will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.

WHEN INSTALLING EDGELINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

11. See standard sheet RS(4).

Texas Department of Transportation®

Traffic Operations Division Standard

CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS

RS(2)-13

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	ELP	HUDSPETH		93

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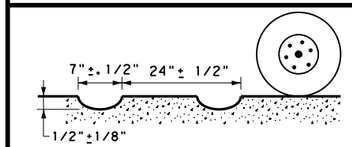
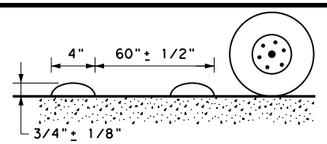
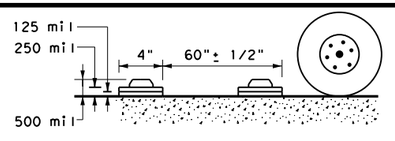
CENTERLINE RUMBLE STRIPS



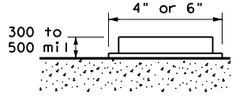
MILLED RUMBLE STRIPS



RAISED TRAFFIC BUTTONS

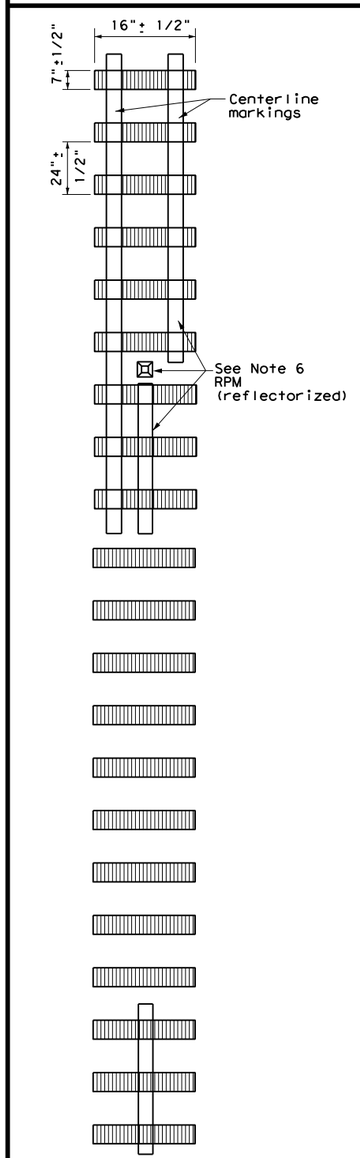


PREFORMED THERMOPLASTIC STRIPS



PROFILE MARKINGS

PROFILE VIEW

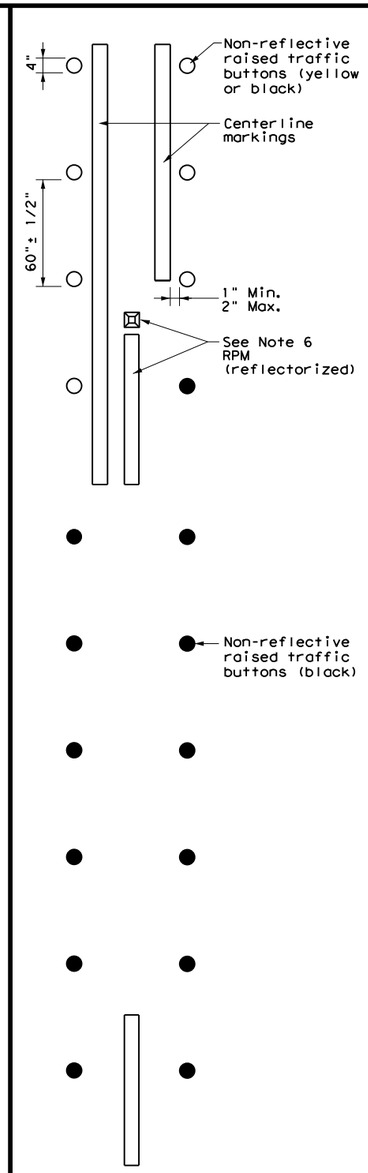


PLAN VIEW
OPTION 1

TWO LANE TWO-WAY ROADWAYS

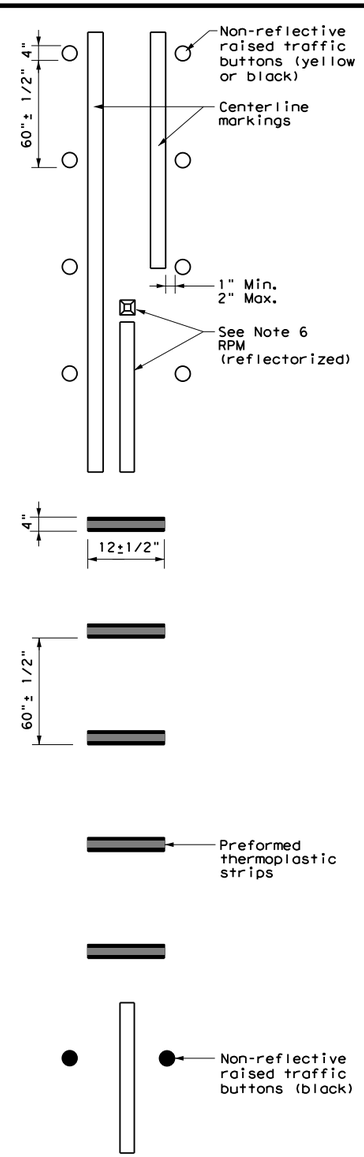
PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS



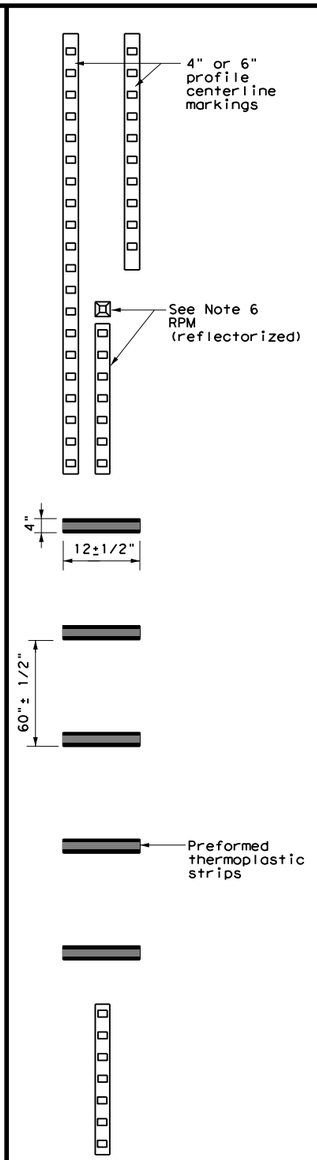
PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS



PLAN VIEW
OPTION 3

RAISED CENTERLINE RUMBLE STRIPS AND PREFORMED THERMOPLASTIC STRIPS



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edgeline rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks.
6. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, and dimensions pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.

WHEN INSTALLING EDGELINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

12. See standard sheet RS(4).

Texas Department of Transportation®
Traffic Operations Division Standard

CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS

RS(3)-13

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	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		94

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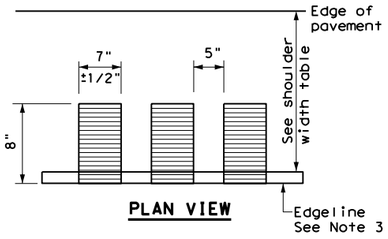
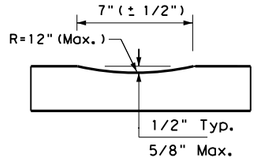
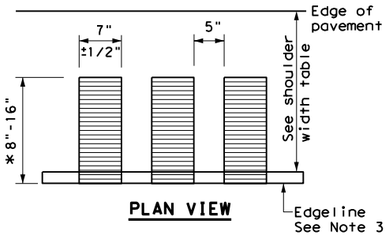


PLAN VIEW

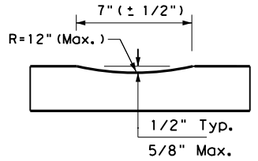


PROFILE VIEW
OPTION 1

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



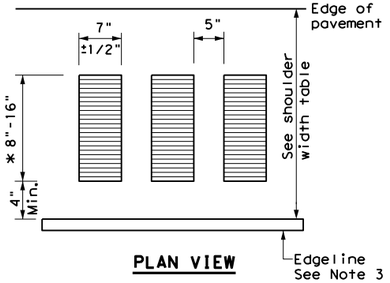
PLAN VIEW



* This distance may vary based on width of shoulder

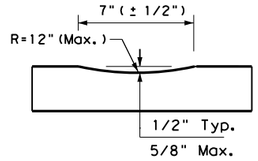
PROFILE VIEW
OPTION 2

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



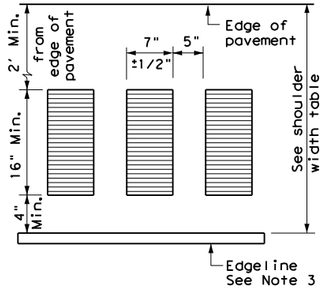
PLAN VIEW

* This distance may vary based on width of shoulder

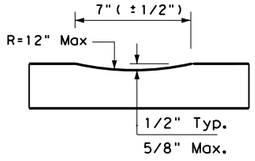


PROFILE VIEW
OPTION 3

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

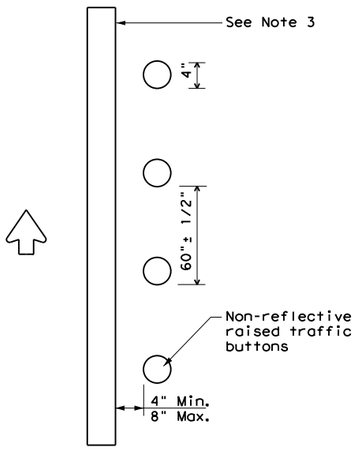


PLAN VIEW



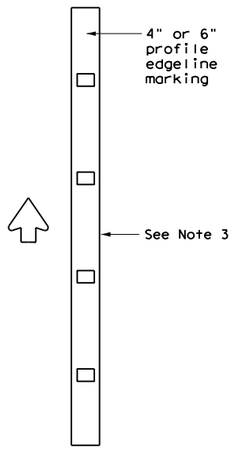
PROFILE VIEW
OPTION 4

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



PLAN VIEW
OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW
OPTION 6

PROFILE EDGELINE MARKINGS

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5 OR 6	Option 1, 2, 3 5 OR 6	Option 2, 4, 5 OR 6

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the table below for determining what options may be used for edgeline rumble strips.

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

5. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
6. Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
7. Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
8. Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
9. Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.
10. On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
15. The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
16. Raised profile thermoplastic markings used as edgelines may substitute for buttons.

Texas Department of Transportation

Traffic Operations Division Standard

EDGELINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(4)-13

FILE: rs(4)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		95

DATE: 2/12/2020 9:06:42 PM
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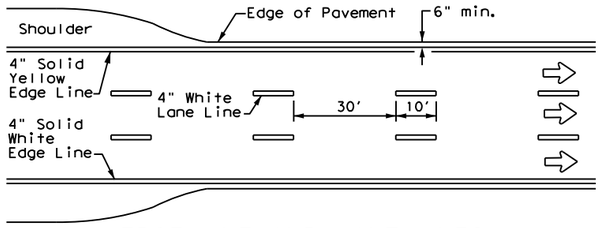
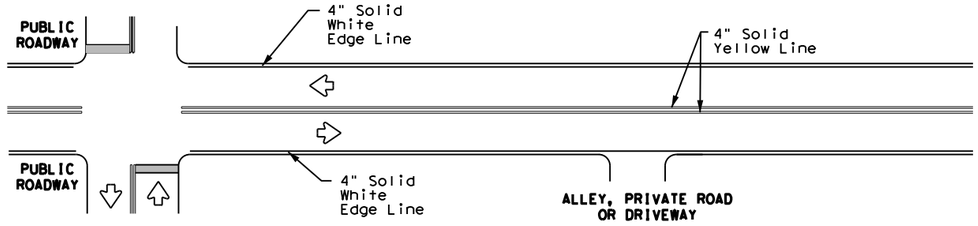
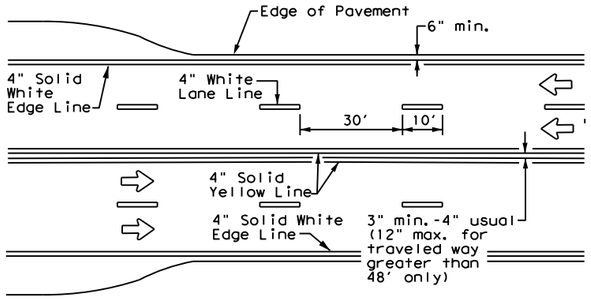


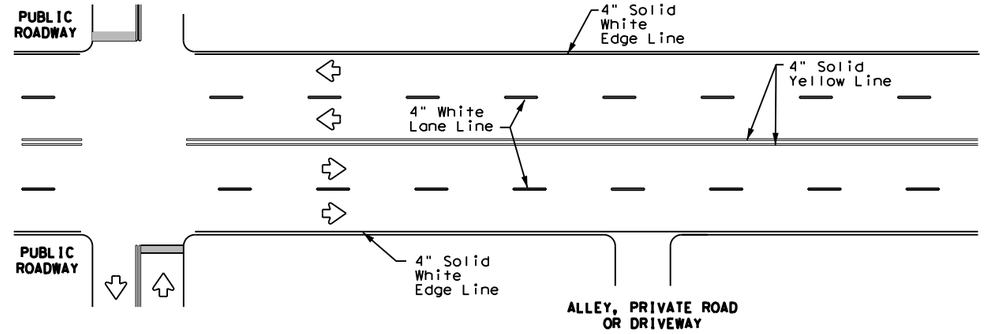
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



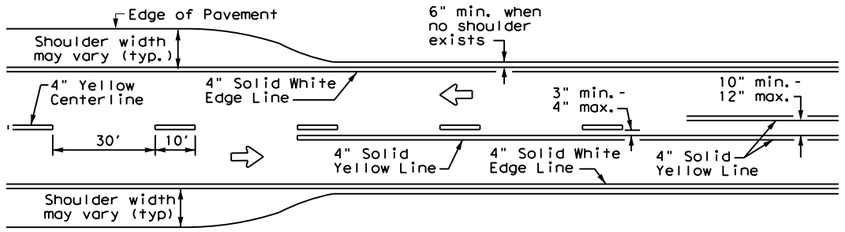
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



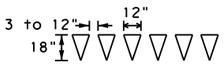
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



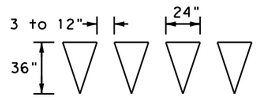
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

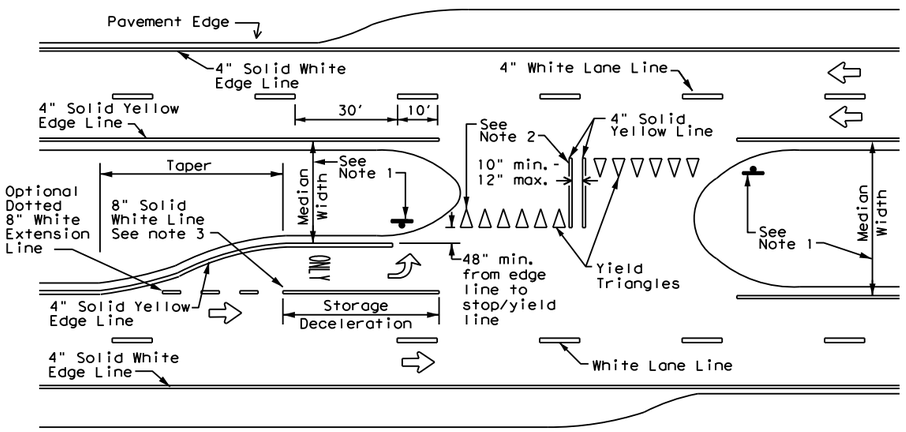


For posted speed on road being marked equal to or less than 40 MPH.



For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

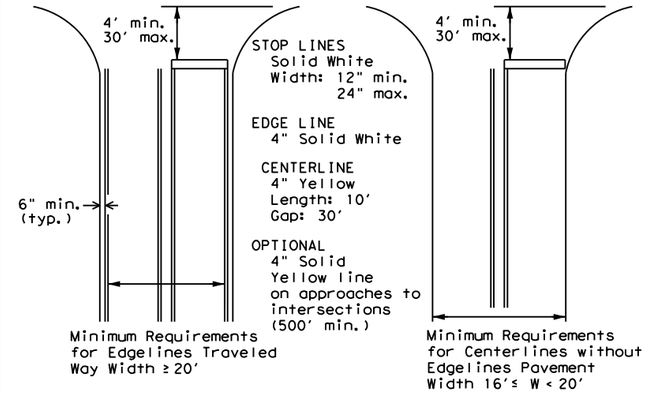
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

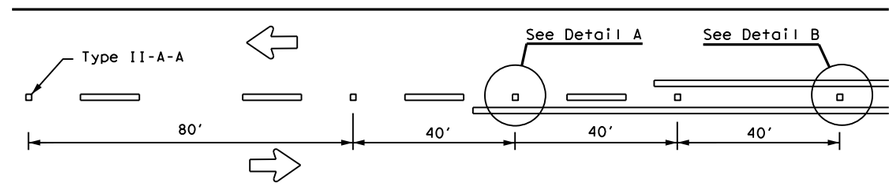
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

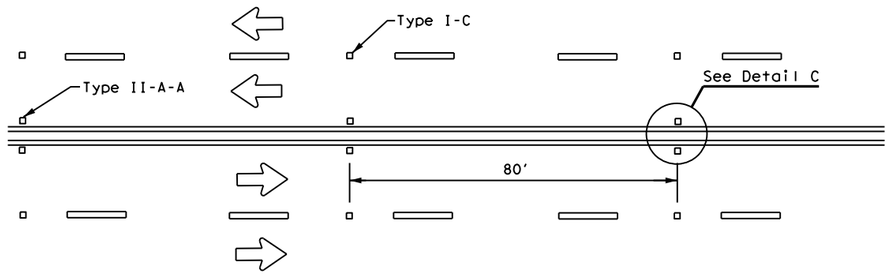
FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0374	07	028, ETC	US 62
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	ELP	HUDSPETH		96

22A

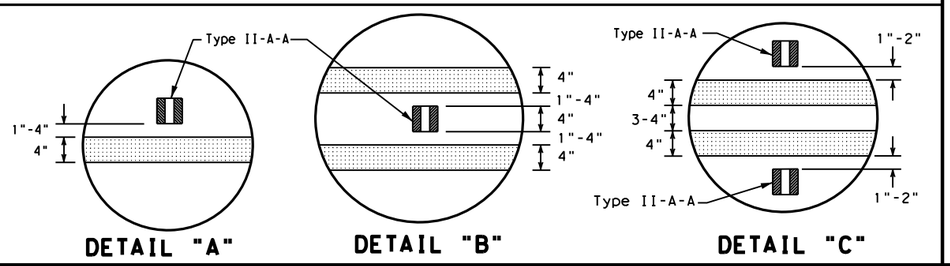
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



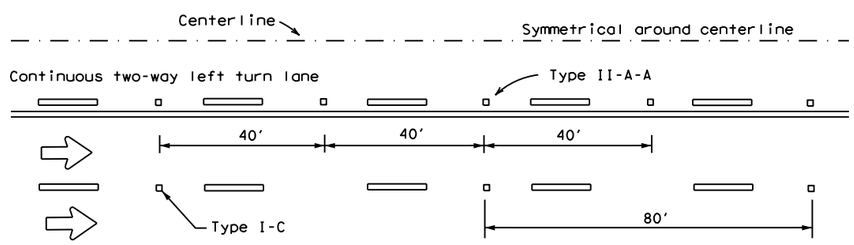
CENTERLINE FOR ALL TWO LANE ROADWAYS



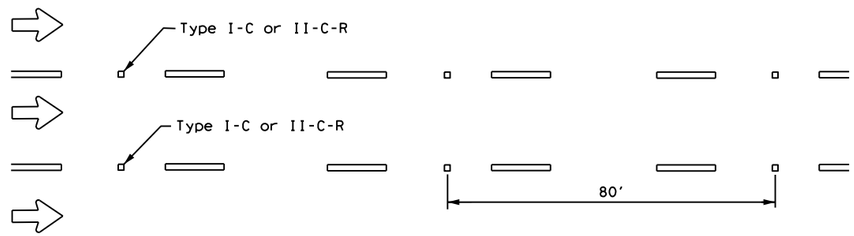
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**

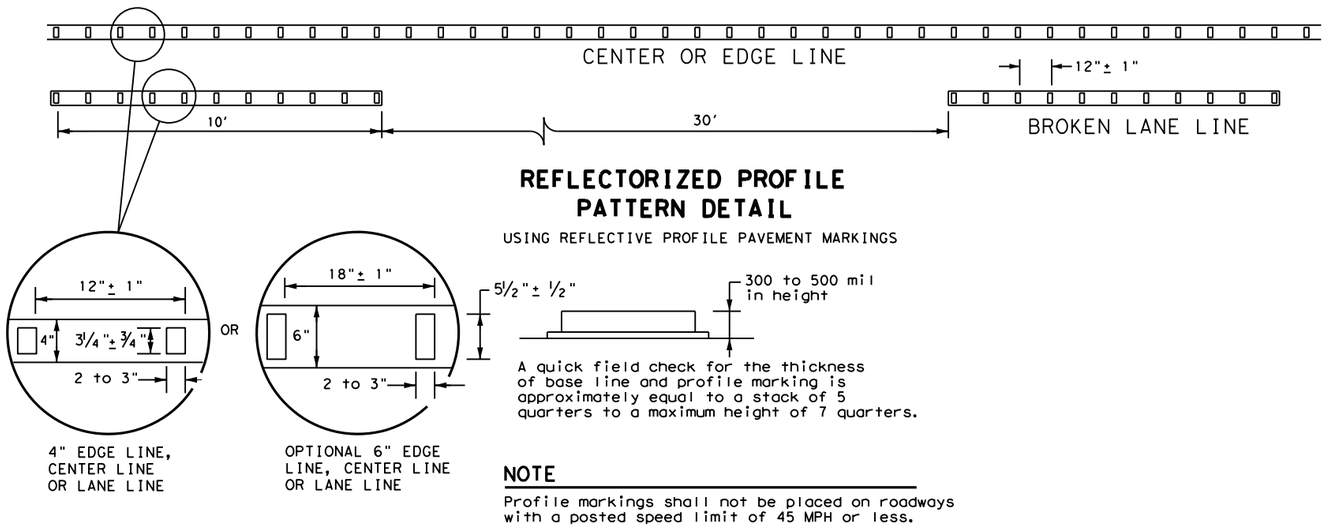


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

NOTE

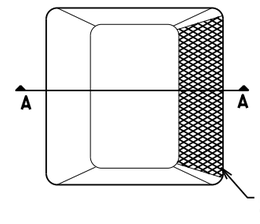
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

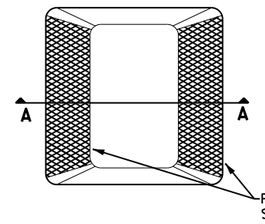
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

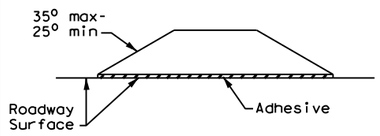
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		97

22B

DATE: 2/4/2021 9:54:27 PM
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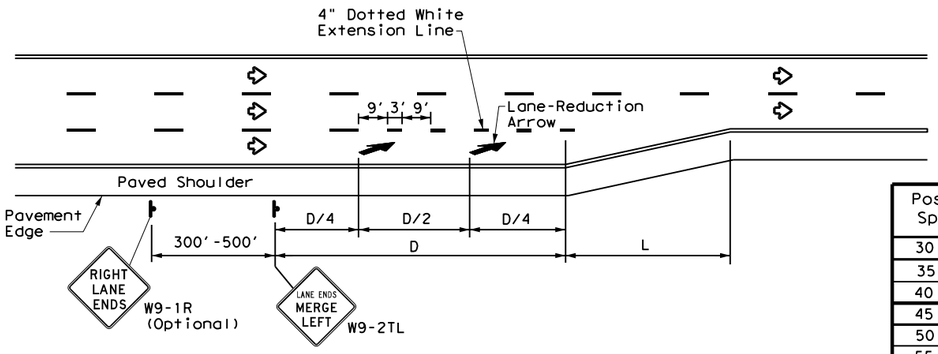
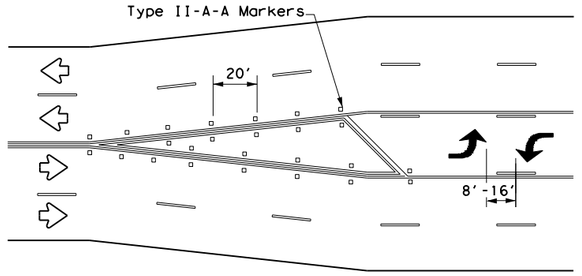


LANE REDUCTION

Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.



A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

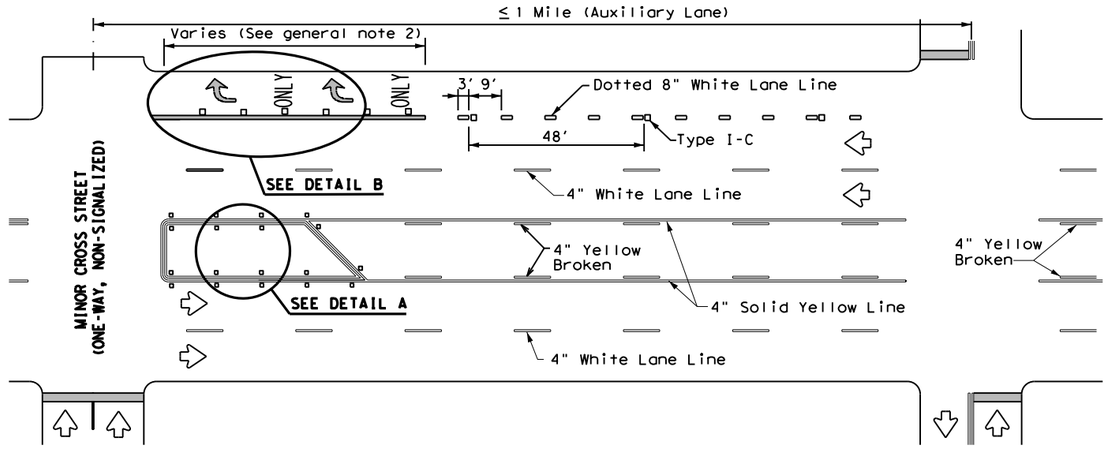
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

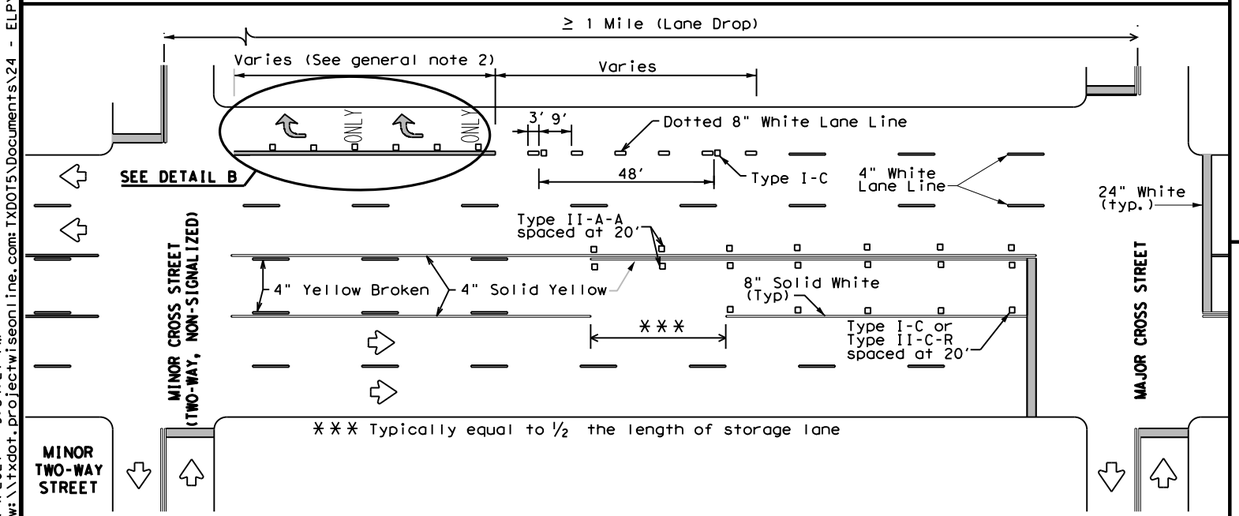
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

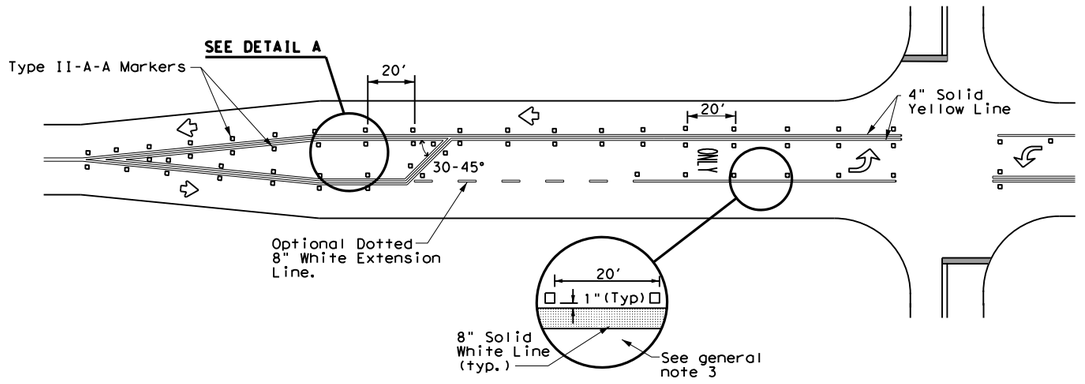
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



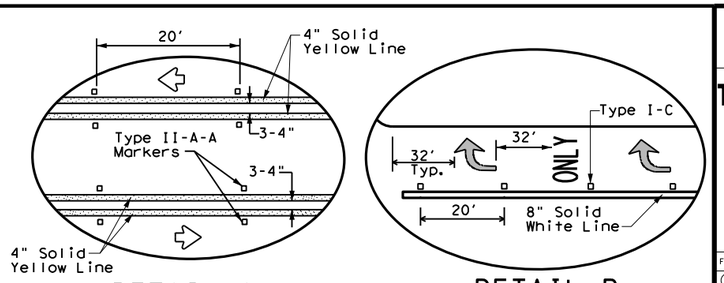
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



Texas Department of Transportation

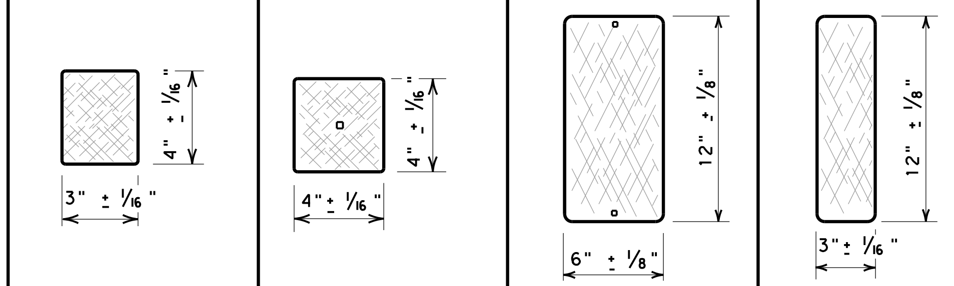
Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

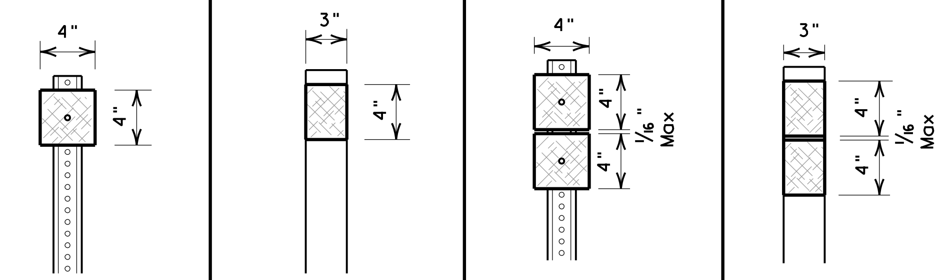
FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	ELP	HUDSPETH		98
3-03 6-20				

220

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE	 1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

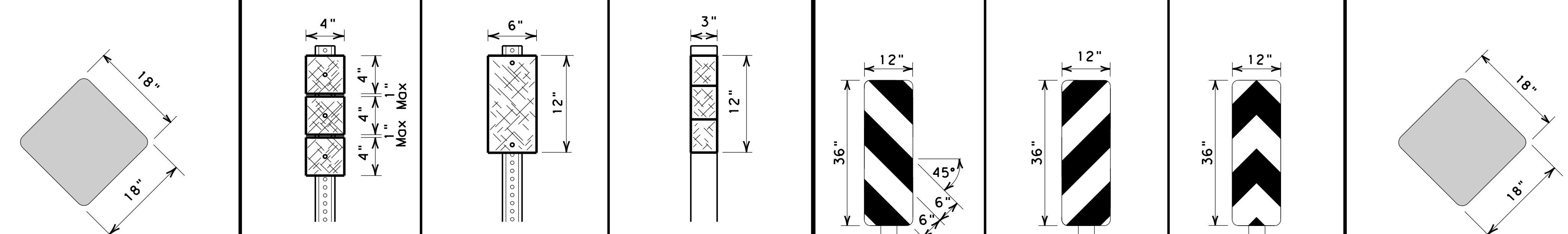
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

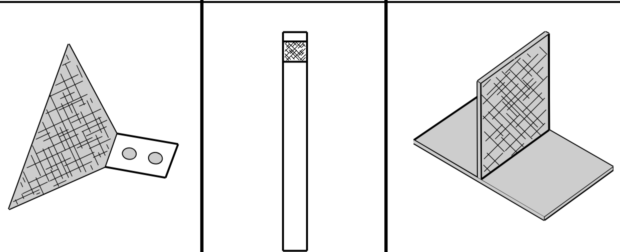
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

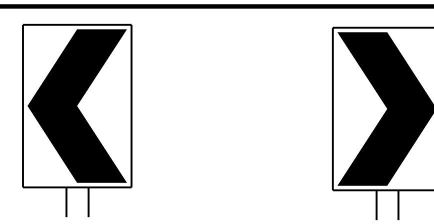
DEPARTMENTAL MATERIAL SPECIFICATIONS

FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

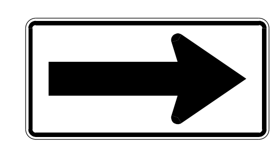
BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE	 W1-8			
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

ONE DIRECTION LARGE ARROW

DEVICE	 W1-6	
SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE

1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

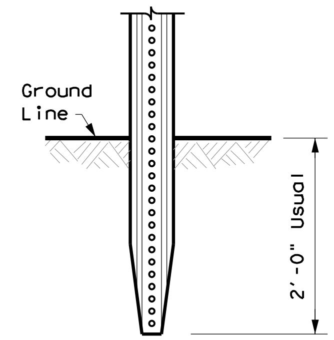
FILE: doml-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT 0374	SECT 07	JOB 028, ETC	HIGHWAY US 62
REVISIONS 10-09 3-15 4-10 7-20	DIST ELP		COUNTY HUDSPETH	SHEET NO. 99

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

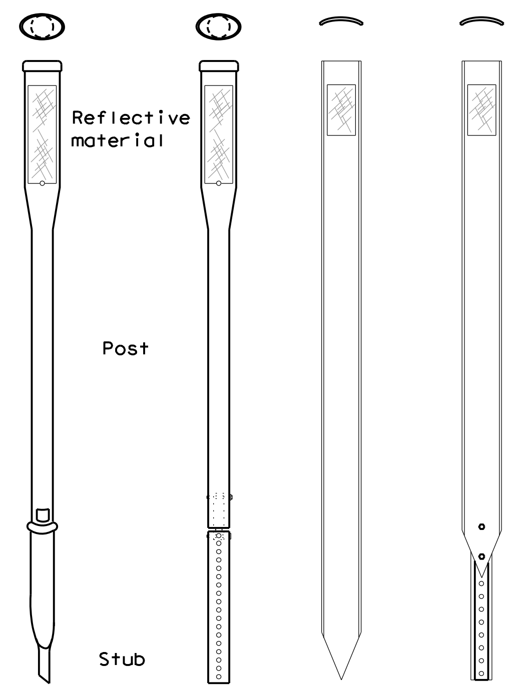


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

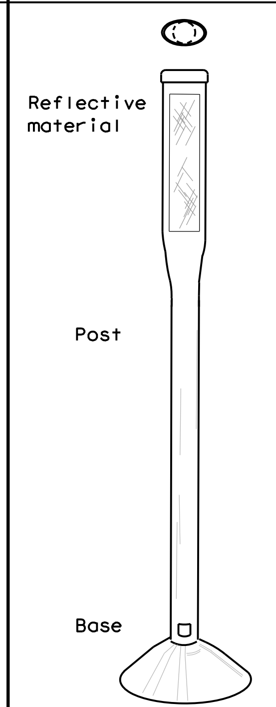
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



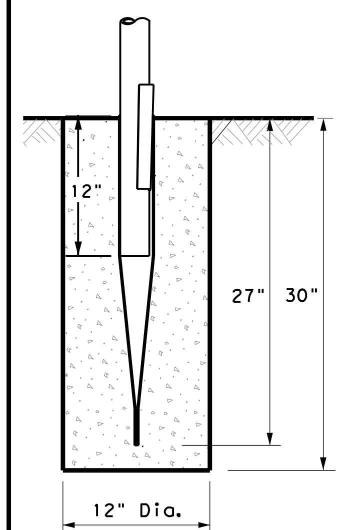
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

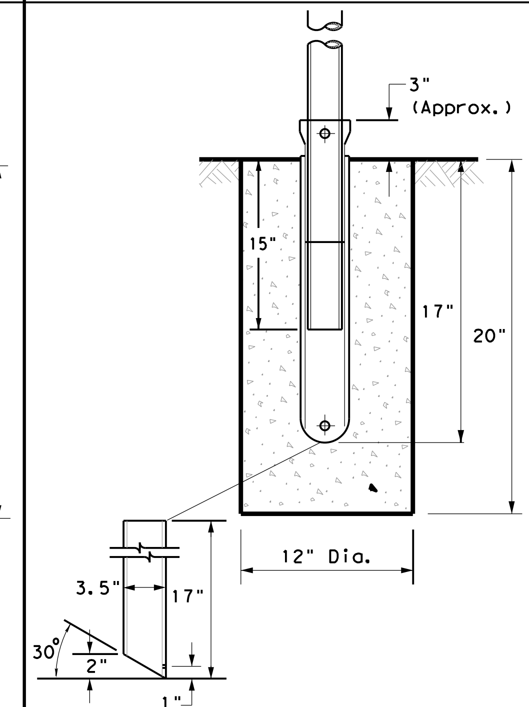
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

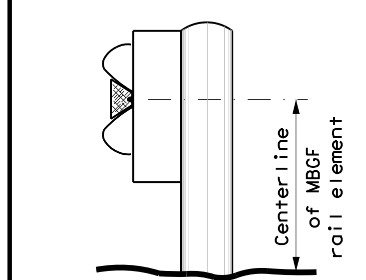
NOTE

1. Install per manufacturer's recommendations.

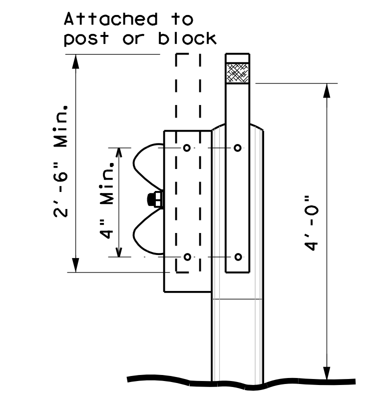
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

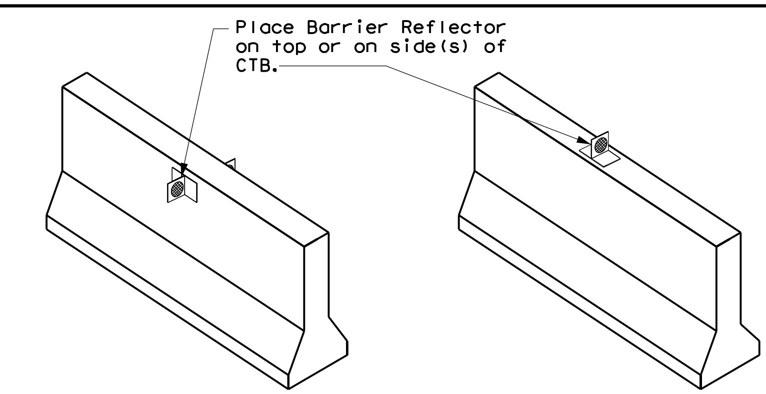
GF1



GF2



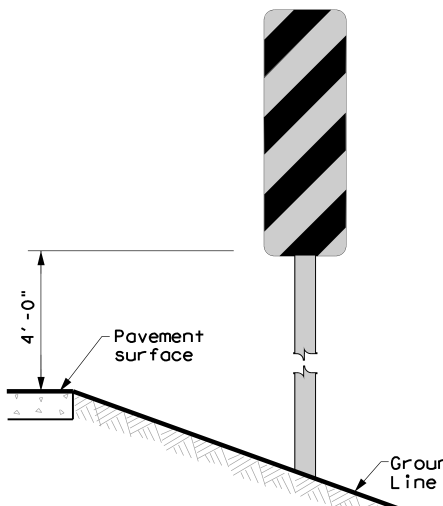
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

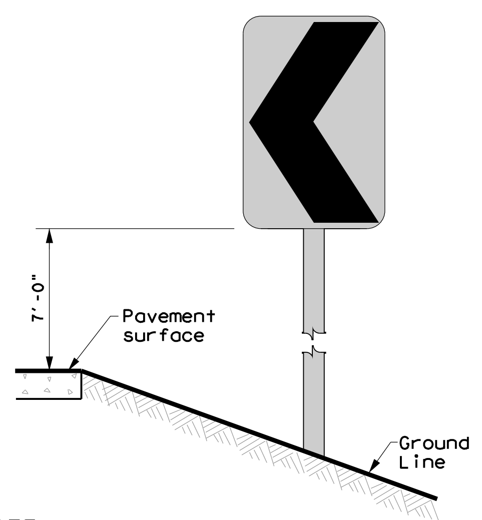
TYPES 1,3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

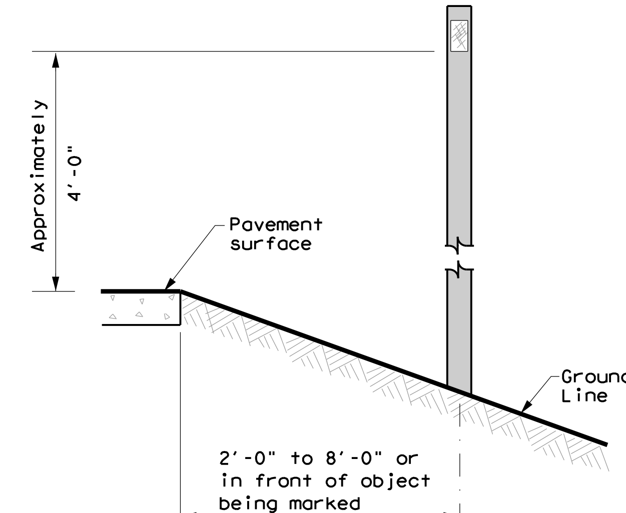
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation | Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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REVISIONS 10-09 3-15 4-10 7-20	DIST ELP		COUNTY HUDSPETH	SHEET NO. 100

20B

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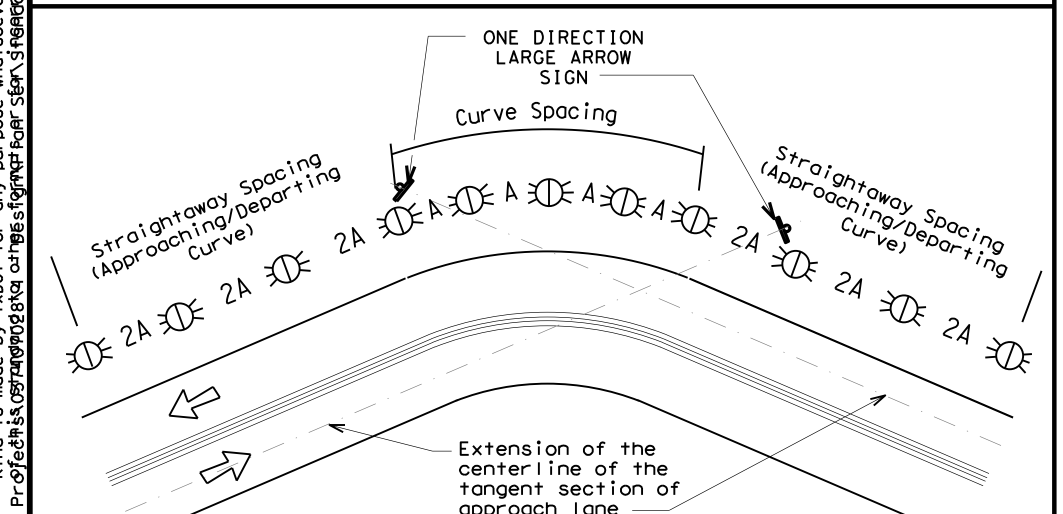
MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

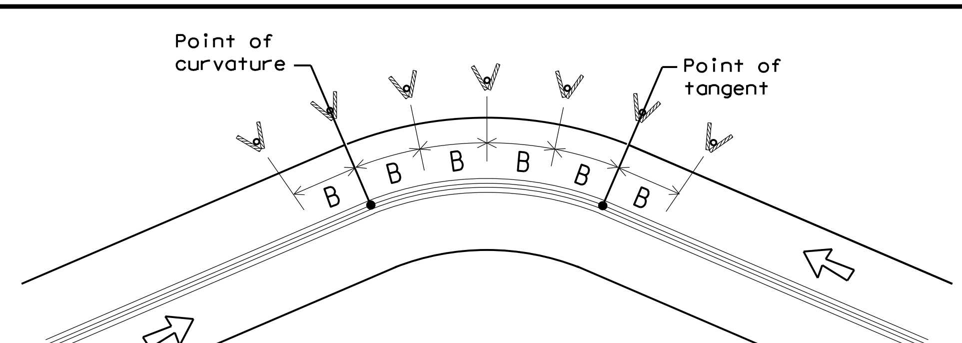
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	Radius of Curve (FEET)	Spacing in Curve (FEET)	Spacing in Straightaway (FEET)	Chevron Spacing in Curve (FEET)
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND

(symbol)	Bi-directional Delineator
(symbol)	Delineator
(symbol)	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 3-15 8-15 8-15 7-20	0374	07	028, ETC	US 62
	DIST	COUNTY		SHEET NO.
	ELP	HUDSPETH		101

20C

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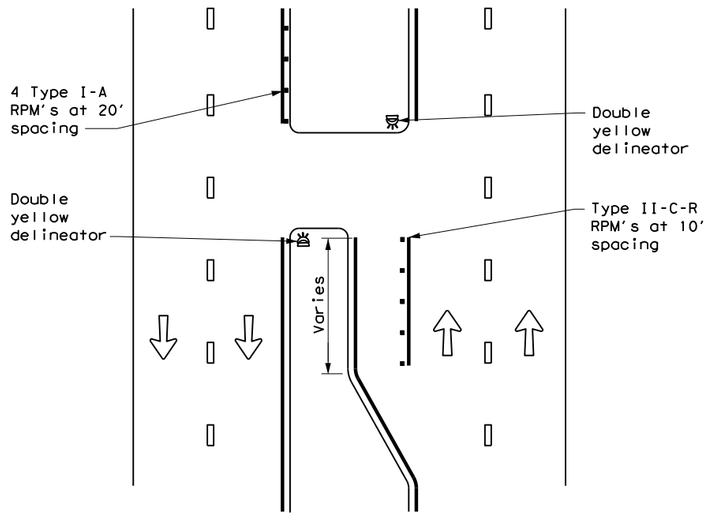
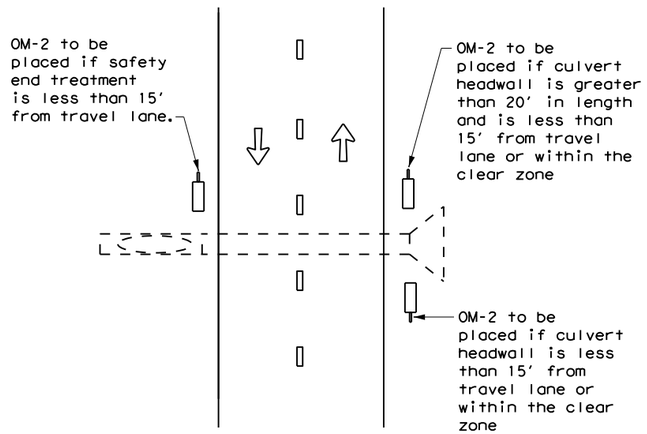
CROSSOVERS



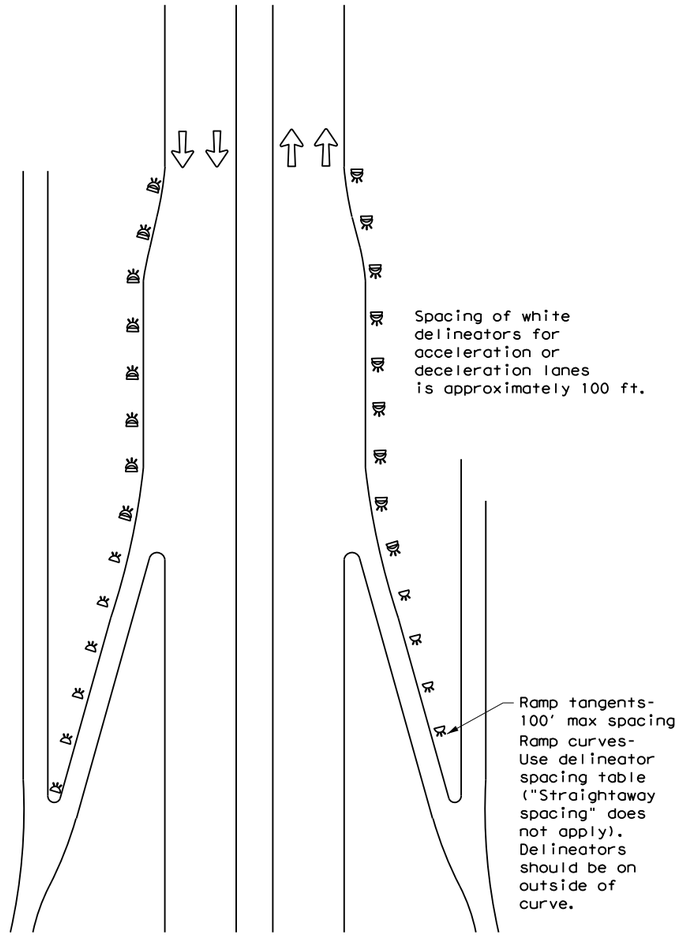
DETAIL 1

FOR CULVERTS WITHOUT MBGF



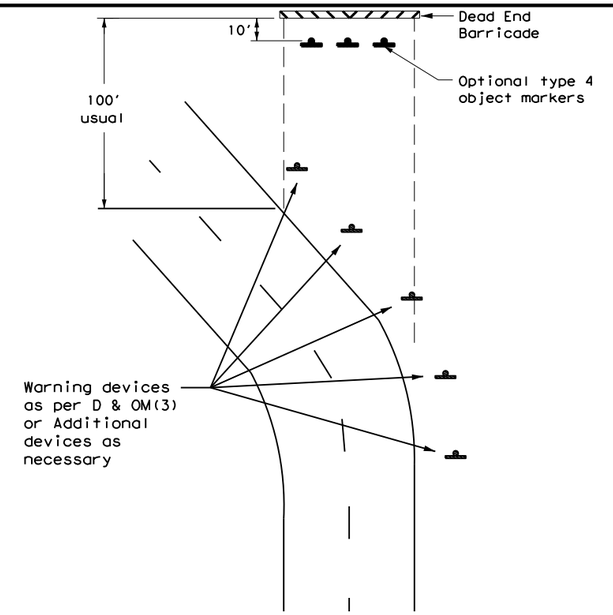
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



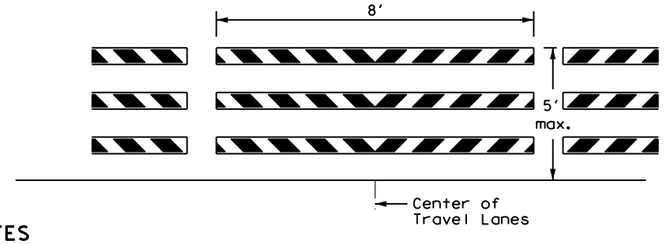
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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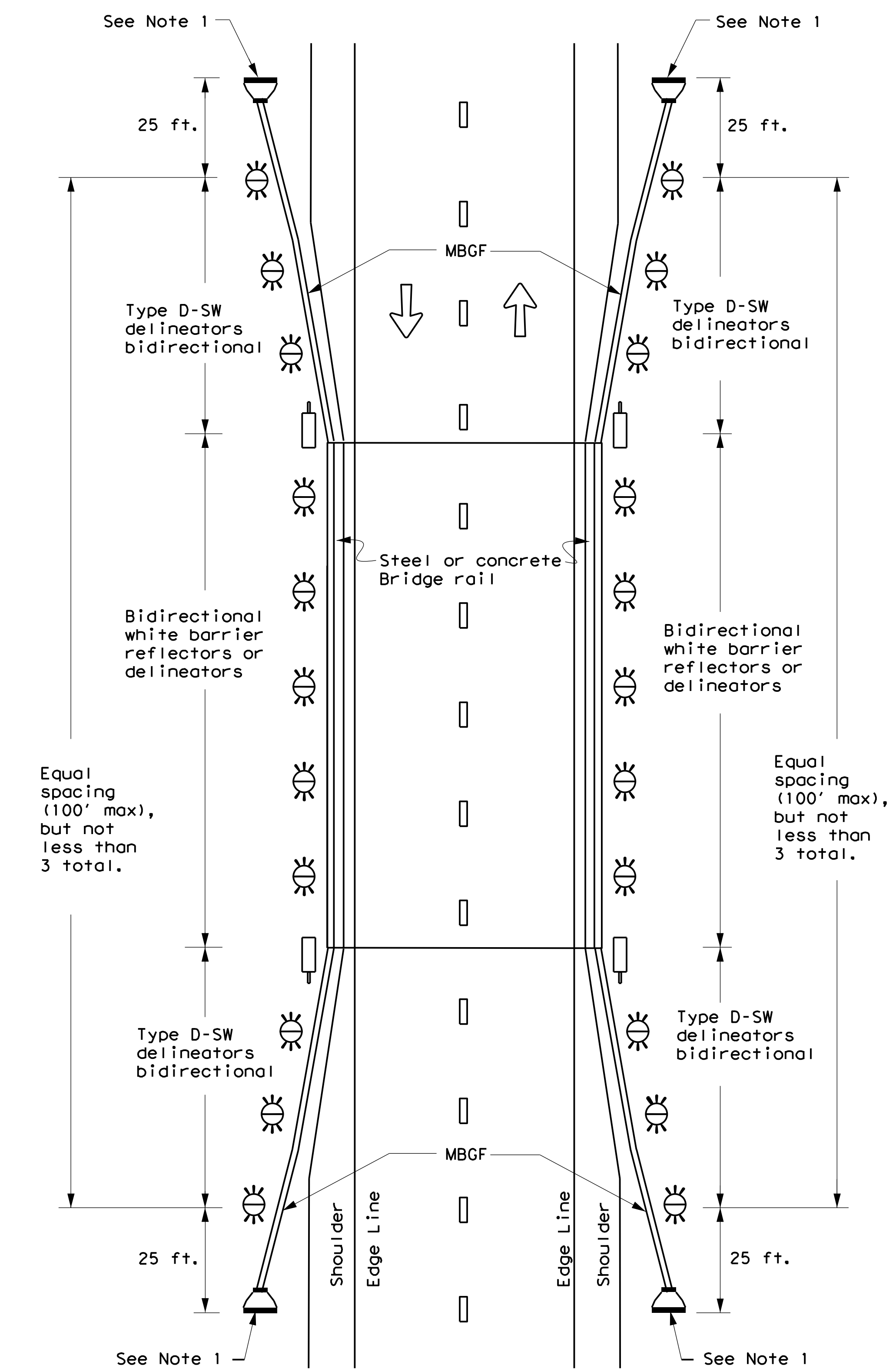
REVISIONS	0374	07	028, ETC	US 62
3-15	DIST	COUNTY		SHEET NO.
7-20	ELP	HUDSPETH		102

20D

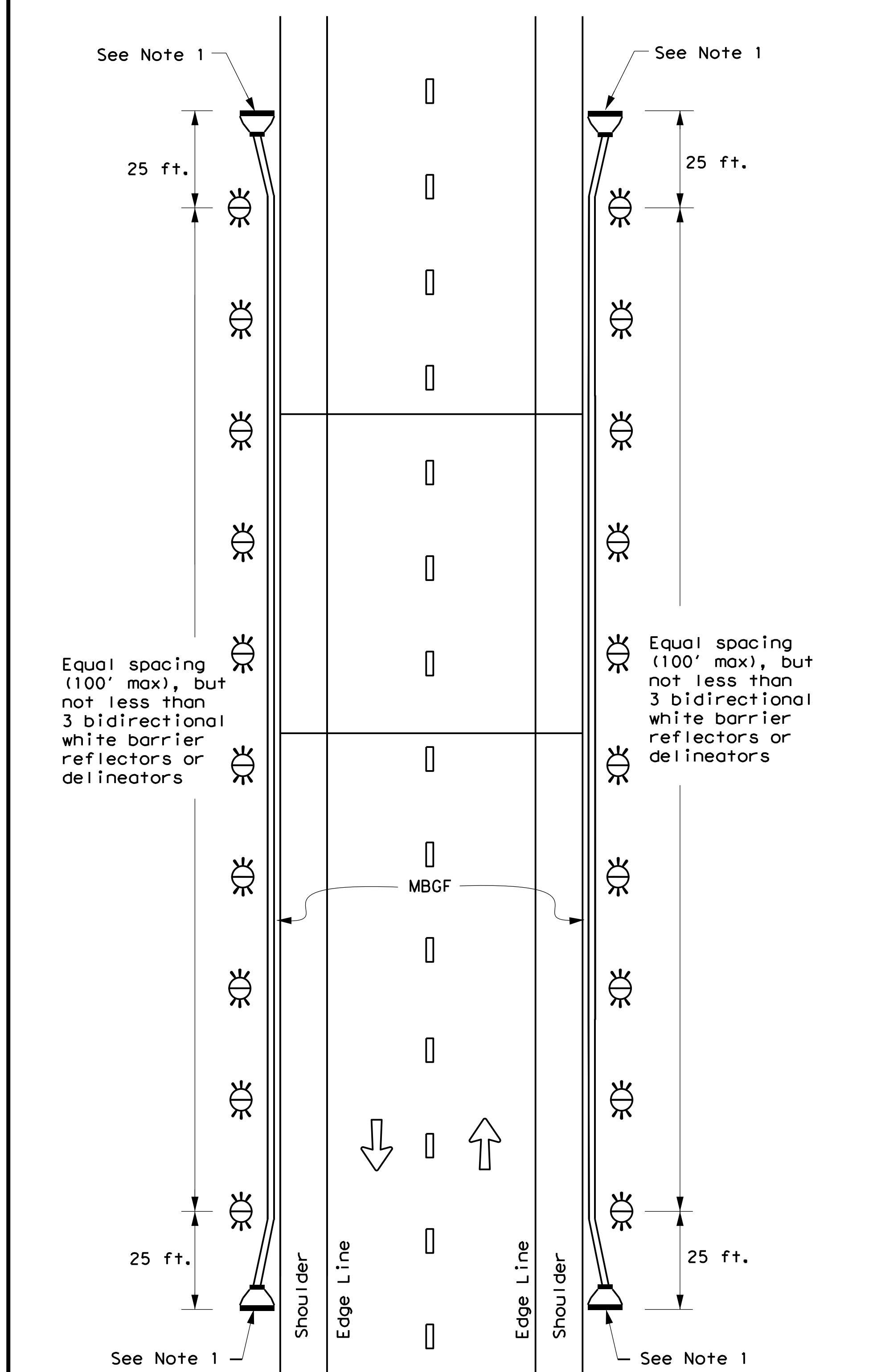
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

1. 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.

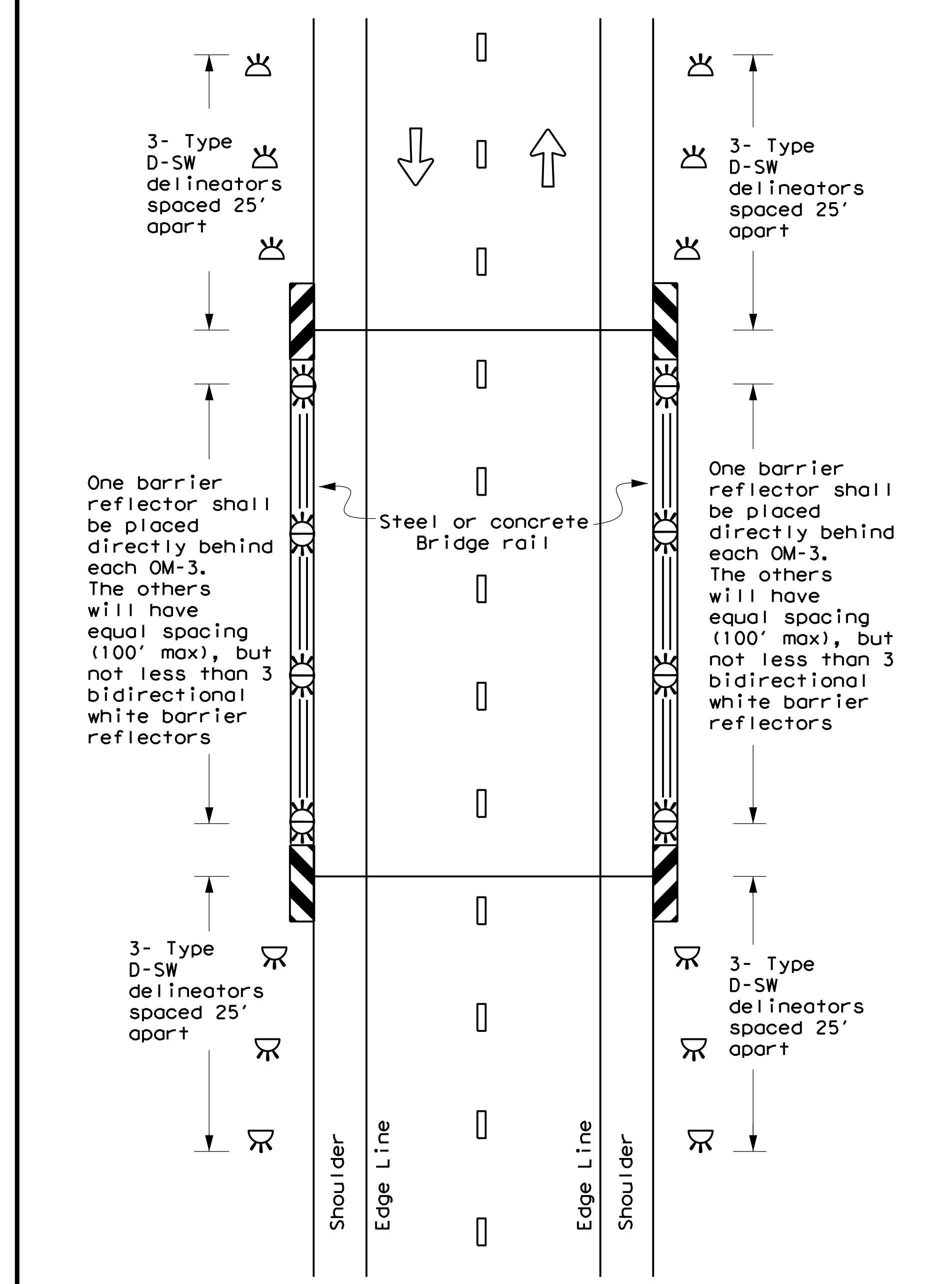
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

1. 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.

TWO-WAY, TWO LANE ROADWAY BRIDGE WITH NO APPROACH RAIL



LEGEND

Symbol	Description
	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

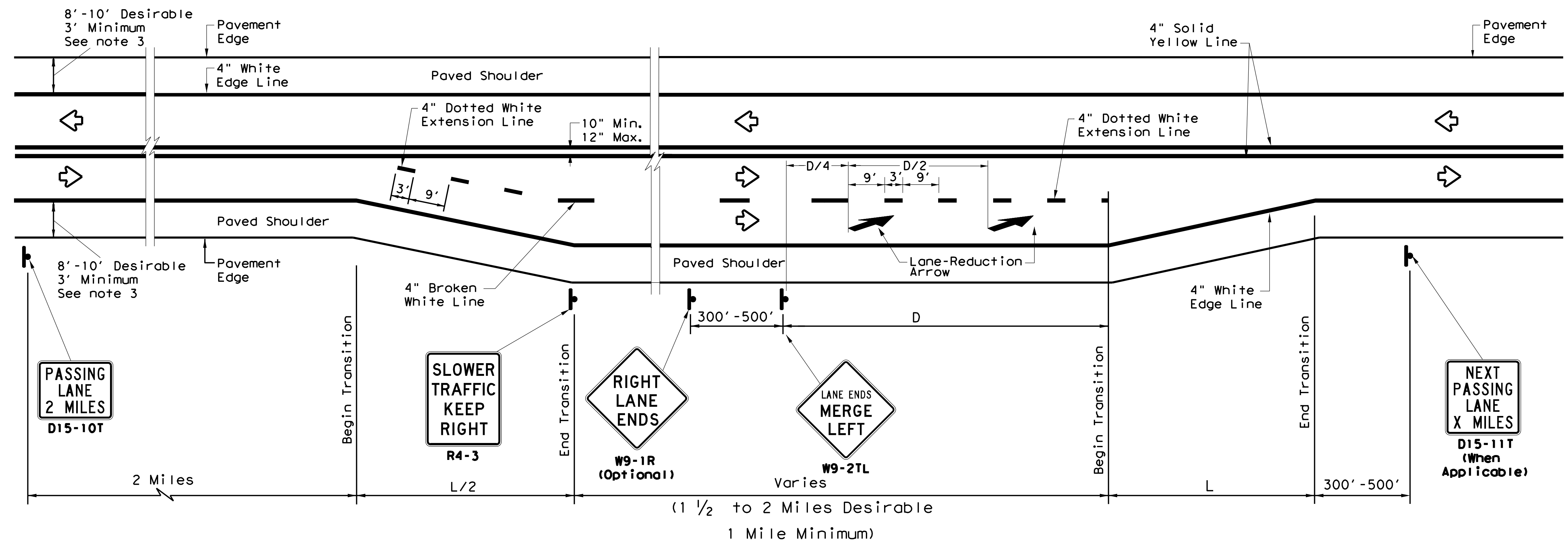
Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

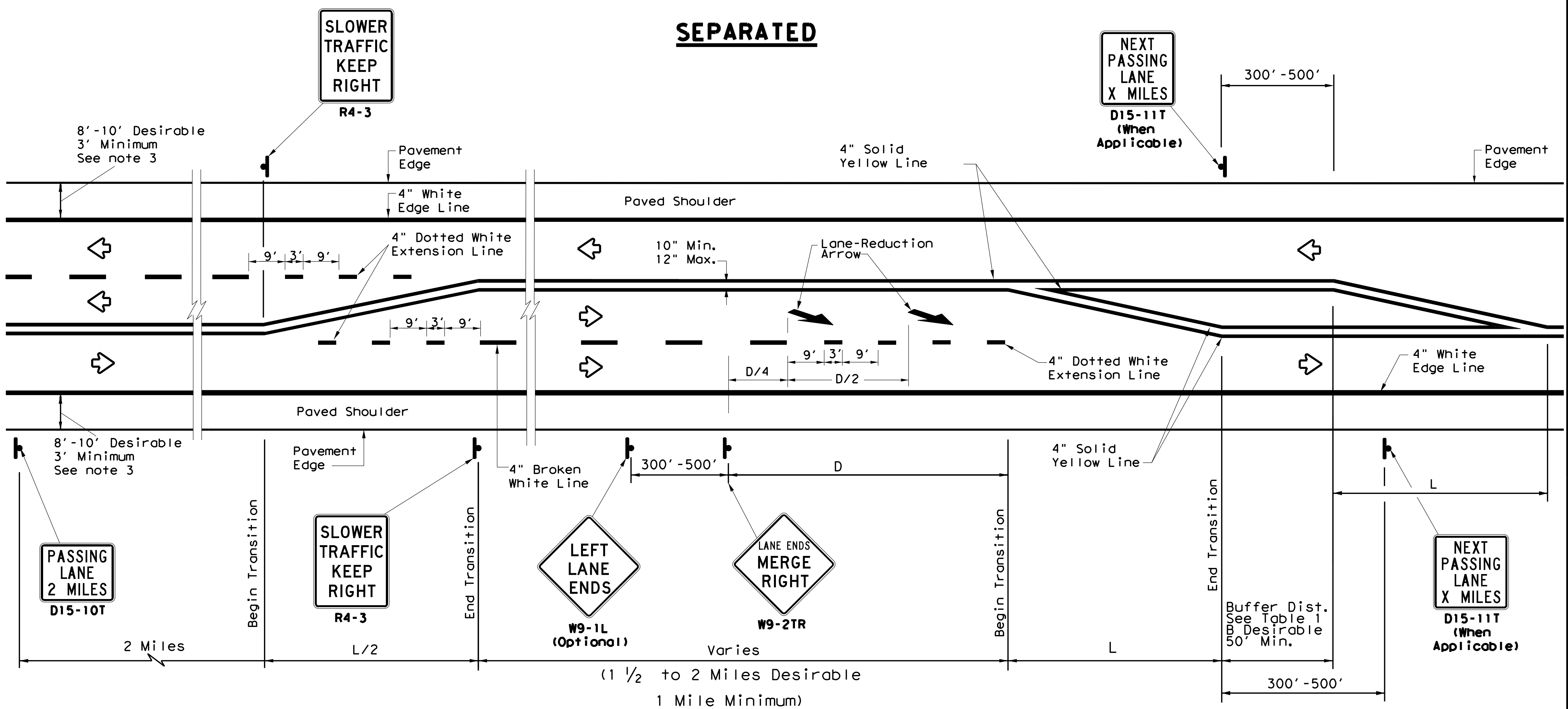
D & OM(5)-20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0374	07	028, ETC	US 62
7-20	DIST		COUNTY	SHEET NO.
	ELP		HUDSPETH	103

20E



SEPARATED



ALTERNATING

LEGEND	
(symbol)	Sign
(symbol)	Traffic Flow

TYPICAL TAPER LENGTH (L)	
Formula *	L = WS

* Transition length should be rounded up to nearest 5 foot increment.

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

EXAMPLE

A 12 foot lane is added on a 70 mph roadway. The length of the transition should be:

L=12x70=840 ft

TABLE 1
ADVANCE WARNING SIGN DISTANCE (D) AND BUFFER DISTANCE (B)

Posted Speed	D (FT)	B (FT)
40	670	305
45	775	360
50	885	425
55	990	495
60	1100	570
65	1200	645
70	1250	730
75	1350	820

GENERAL NOTES

1. For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.
2. For Raised Pavement Markers(RPM)details, see Pavement Markings Standard sheet, PM(2). Note that RPMs are not recommended on the 4" dotted white extension lines.
3. For rumble strip options available for the designed shoulder width, see rumble strip standard sheet RS(4).

Texas Department of Transportation

Traffic Operations Division Standard

TEXAS SUPER 2 PASSING LANES

TS2(PL-1)-18

FILE: ts2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT May 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-12 3-12 3-18	0374	07	028, ETC	US 62
	DIST		COUNTY	SHEET NO.
	ELP		HUDSPETH	104

STORM WATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TPDES General Permit TXR150000. The operator, The Texas Department of Transportation ensures that: Project specifications provide that adequate BMPs have been developed for this project. The contractor shall be the party responsible for implementing the BMPs described herein. The contractor shall implement changes approved by the Project Engineer to the SWP3 within the times specified in the SWP3 or the TPDES General Permit. Operators affected by modifications to specifications will be notified in a timely manner.

1. SITE OR PROJECT DESCRIPTION:

NATURE OF THE CONSTRUCTION ACTIVITY: SEE TITLE SHEET

POTENTIAL POLLUTANTS AND SOURCES:

Sediment laden storm water	*Storm water conveyance over disturbed areas*
Fuels, oils, and lubricants	*Construction vehicles and storage areas*
Construction debris and waste	*Various construction activities*
Sanitary waste	*Restroom facilities*
Trash	*Construction site and Receptacles*

SEQUENCE OF ACTIVITIES THAT WILL DISTURB SOILS:

1. *PLACEMENT OF SILT FENCE.*
2. *REMOVE EXISTING METAL BEAM GUARDFENCE SYSTEMS.*
3. *INSTALL METALBEAM GUARD FENCE AND RETROFIT EXISTING BRIDGE RAIL.*
4. *CLEAN UP PROJECT AREA.*
5.
6.
7.

AREAS:

TOTAL AREA OF PROJECT: 117.58 ACRES

TOTAL AREA OF SOIL DISTURBANCE: 1.16 ACRES

TOTAL AREA OFF-SITE: 0.0

WEIGHTED RUNOFF COEFFICIENT (BEFORE AND AFTER CONSTRUCTION): *N/A*

DATA DESCRIBING THE SOIL:

GENERAL LOCATION MAP: SEE TITLE SHEET

DETAILED SITE MAP: SEE PLAN AND PROFILE LAYOUTS.

THE LOCATION AND DESCRIPTION OF CONCRETE AND ASPHALT PLANTS:

Supporting Concrete Plant Facilities shall be located off site.

Supporting Asphalt Plant Facilities shall be located off site.

NAME OF RECEIVING WATERS:

A COPY OF TPDES CGP TXR150000 IS INCLUDED IN THE SWP3 FILE.

REMARKS: *N/A*

401 WATER QUALITY CERTIFICATION: YES____ NO__X__

2. BEST MANAGEMENT PRACTICES (BMPs):

EROSION AND SEDIMENT CONTROLS: Erosion and sediment controls have been designed to retain sediment on-site. Controls shall be utilized to reduce off site transport of suspended sediments and pollutants if it is necessary to pump water from the site. Control measures shall be installed per specifications or as directed. Sediment must be removed from controls per the plan requirements or manufacturers recommendations, but no later than the time that design capacity has been reduced by 50%. If sediment escapes the site, accumulations will be removed to minimize further negative effects. Controls will be developed to limit the off site transportation of litter, construction debris, and construction materials.

INTERIM(INT), PERMANENT(PER), AND 401 CERTIFICATION BMP'S:

EROSION CONTROLS:	401	INT	PER
☐ *Compaction & Tracking of slopes*	__	__	__
☐ *Diversion Dike*	__	__	__
☒ *Preserve Existing Vegetation*	__	__	__
☐ *Soil Stabilization*	__	__	__
☐ *Permanent Vegetation*	__	__	__
☐ *No Erosion Controls are Required.*			

SEDIMENT CONTROLS:	401	INT	PER
☒ *Silt Fence*	__	X	__
☐ *Erosion Logs*	__	__	__
☐ *Buffer Zones*	__	__	__
☐ *Vegetative Filter Strips*	__	__	__
☐ *Ditch Block*	__	__	__
☐ *No Sediment Controls are Required.*			

POST CONSTRUCTION TSS CONTROL (401 CERTIFICATION ONLY):

- ☐ *Vegetation Lined Drainage Ditch*
- ☐ *Retention/Irrigation*
- ☐ *Erosion Control Compost*
- ☐ *Grassy Swales*
- ☐ *Vegetative Filter Strips*
- ☒ *No Post Construction TSS Control Required.*

SEQUENCE OR SCHEDULE OF IMPLEMENTATION:

1. *Implement best management practices that include silt fence.*
2. *Maintain erosion control measures throughout project.*
3. *Remove silt fence.*
4.
5.
6.
7.

The El Paso District of the Texas Department of Transportation uses Site-Manager, a computer based construction record-keeping system. Documentation describing major grading activities, temporary or permanent cessation of construction, and stabilization measures is a part of this system and is incorporated by reference into this SWPPP.

Stabilization measures must be initiated within 14 days when practicable in portions of the site where construction has temporarily or permanently ceased, if earth disturbing activities will not be resumed within 21 days.

3. STRUCTURAL CONTROL PRACTICES:

Structural control practices for this project are listed elsewhere herein.

4. PERMANENT STORM WATER CONTROLS:

Structural control practices installed during construction will be maintained and inspected after construction has ceased on the site and until final stabilization is attained. Unless specified in the plans, after project acceptance TxDOT will assume maintenance responsibilities for the controls and measures. Other permanent controls include existing and proposed; riprap at culvert inlets and outlets, diversion dikes, swales, retaining walls, and other similar devices.

5. OTHER CONTROLS:

OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST: The off site vehicle tracking of sediments shall be minimized by removal of excess dirt from the road and at entrances to the work site. The generation of dust will be minimized as directed by the Project Engineer by dampening haul roads and covering haul trucks with a tarpaulin.

CONSTRUCTION AND WASTE MATERIALS: The contractor will maintain a clean, orderly construction site. Construction waste including trash, rubble, scrap and vegetation shall be disposed of in lidded dumpsters or in a manner approved by the Project Engineer. Disposal methods must meet Federal, State, and Local waste management guidelines. No construction waste will be buried or burned on site. Spoils disposal, material storage, and materials resulting from the destruction of existing roads and structures shall be stored in areas designated by the Project Engineer and protected from run-off. All waterways shall be cleared of temporary embankment, temporary bridges, matting, false work, piling, debris, or other obstructions placed during construction operations, that are not part of the finished work, as soon as practicable. All excess soil generated by the construction will be collected and disposed of by the contractor. Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, water body, or stream bed.

POLLUTANT SOURCES FROM AREAS OTHER THAN CONSTRUCTION: Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants. If potential pollutant sources are identified after the start of construction, controls and measures shall be implemented as directed by the Project Engineer.

5. OTHER CONTROLS (CONT):

DEDICATED ASPHALT PLANTS: Asphalt or asphaltic material for this project will be produced off site. If the project requires a dedicated asphalt plant and the plant within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer.

DEDICATED CONCRETE PLANTS: Cement or Concrete material for this project will be produced off site. If the project requires a dedicated concrete plant and the plant is within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer. Concrete trucks shall be wasted or washed out in locations designated by the Project Engineer. The locations shall be protected by a berm sufficient to contain all waste and wash water. Wash water shall not be allowed to enter any storm drainage system or waterway. The residual material and contaminated soil shall be collected and disposed of in accordance with Federal, State, and Local guidelines. Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants.

HAZARDOUS MATERIALS AND SPILL REPORTING: The contractor shall take appropriate measures to prevent, minimize, and control the spillage or leakage of hazardous materials and any associated wastes on site and in maintenance and staging areas. hazardous materials shall include but are not limited to paints, acids, solvents, asphalt products, chemical additives, curing compounds, oils, fuels, and lubricants. Hazardous materials shall not be stored, accumulated, or transported in open containers subject to precipitation or spillage, but shall be stored, accumulated, or transported in closed containers of the type recommended by the manufacturer. In the event of a spill the Project Engineer should be contacted immediately. All spills shall be immediately cleaned and any contaminated soil removed and disposed of in accordance with Local, State, and Federal laws. Fuel tanks shall be protected by a secondary containment, such as a lined berm, capable of containing 1.5 times the capacity of the tank, or as approved by the Project Engineer.

OFF SITE PSLs: All off site project specific locations including dedicated asphalt plants, concrete plants, or utility installations, required by the contractor, are the contractor's responsibility. The contractor shall secure all permits required by local, state, or federal laws for off site PSLs. The contractor shall provide diagrams and areas of disturbance for all PSL's within 1 mile of the project.

SANITARY FACILITIES: All sanitary or septic wastes that are generated onsite shall be treated and disposed of in accordance with state and local regulations. Raw sewage or septage shall not be discharged or buried on site. Precaution shall be taken to prevent illicit discharges to storm water. Licensed waste management contractors shall be required to dispose of sanitary waste. Porta johns will be required for the construction site or as directed by the Project Engineer.

VELOCITY DISSIPATION DEVICES: Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as shown in the plans or as directed by the Project Engineer to provide a non-erosive flow velocity from the structure to a watercourse so that the natural physical and biological characteristics and functions are maintained and protected.

6. APPROVED STATE AND LOCAL PLANS:

This SWP3 is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or storm water management site plans or permits approved by federal, state, or local officials.

7. MAINTENANCE:

Control measures shall be properly installed according to specifications. If inspections or other information indicates a control has been installed, used, or is performing inadequately, the contractor must replace or modify the control as soon as practicable after discovery. Control measures shall be maintained in effective operating condition. If inspections determine that BMPs are not operating effectively maintenance will be performed as necessary to continue the effectiveness of the controls. Maintenance must be accomplished as soon as practicable. Controls adjacent to creeks, culverts, bridges, and water crossings shall have priority. Controls that have been disabled, run over, removed, or otherwise rendered ineffective must be corrected immediately upon discovery.

8. INSPECTION OF CONTROLS:

A TxDOT inspector will inspect disturbed areas of the site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Sediment and erosion controls measures identified in the SWP3 will be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site will be inspected for evidence of off-site vehicle tracking. Inspections will be conducted every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. The SWP3 will be modified based on the result of these inspections. Revisions will be completed within 7 Calendar days following the inspection. Revised implementation schedules will be described in the SWP3 and implemented as soon as practicable. Rain gages will be maintained on site for the duration of the project. Reports summarizing the scope of the inspections are included in the SWP3 file.

9. NON-STORM WATER COMPONENTS:

The contractor shall be required to implement appropriate pollution prevention controls and measures for all eligible non-storm water components of the discharge as approved and directed by the Project Engineer.

STATE OF TEXAS
SHEETAL ASHISH PATEL
126438
LICENSED PROFESSIONAL ENGINEER

Sheetal Patel, P.E.

02/05/2021

REV: 07-2014

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SWP3)

Texas Department of Transportation

FED. RD. DIV. NO.			SHEET NO.
6			105
STATE	STATE DIST.	COUNTY	
TEXAS	ELP	HUDSPETH	
CONT.	SECT.	JOB	HIGHWAY NO.
0374	07	028, ETC	105

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DATE: 2/5/2021
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\0374070284 - Design\Plan Set\9. Environmental\US62_ENV_EPIC.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000

2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.

3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.

4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1.

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☒ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Logs	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☐ No Action Required ☒ Required Action

Action No.

1. REFER TO GENERAL NOTES FOR FURTHER DETAILS.

2.

3.

4.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

Action No.

1. REFER TO GENERAL NOTES FOR FURTHER DETAILS.

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)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☒ No Action Required ☐ Required Action

Action No.

1.

2.

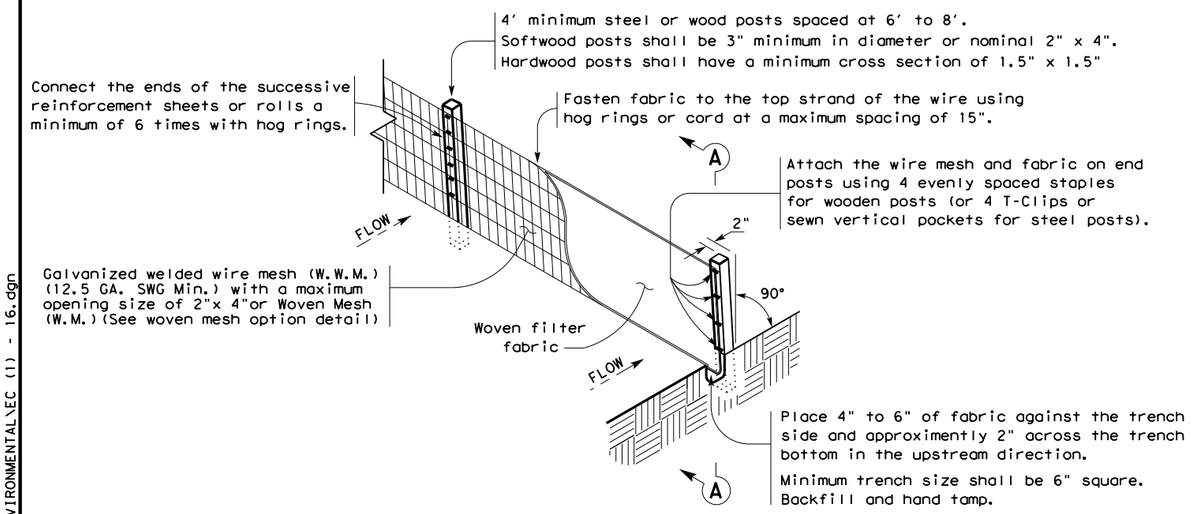
3.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

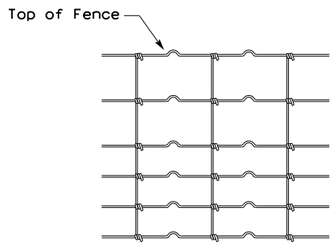
EPIC

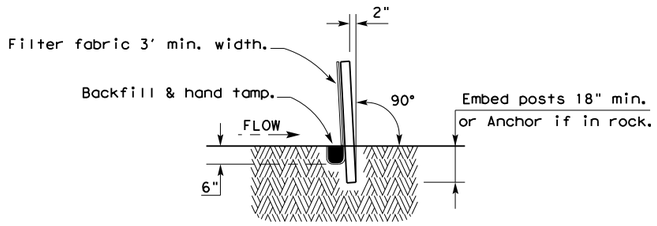
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0374	07	028, ETC	US 62
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	ELP	HUDSPETH		106



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

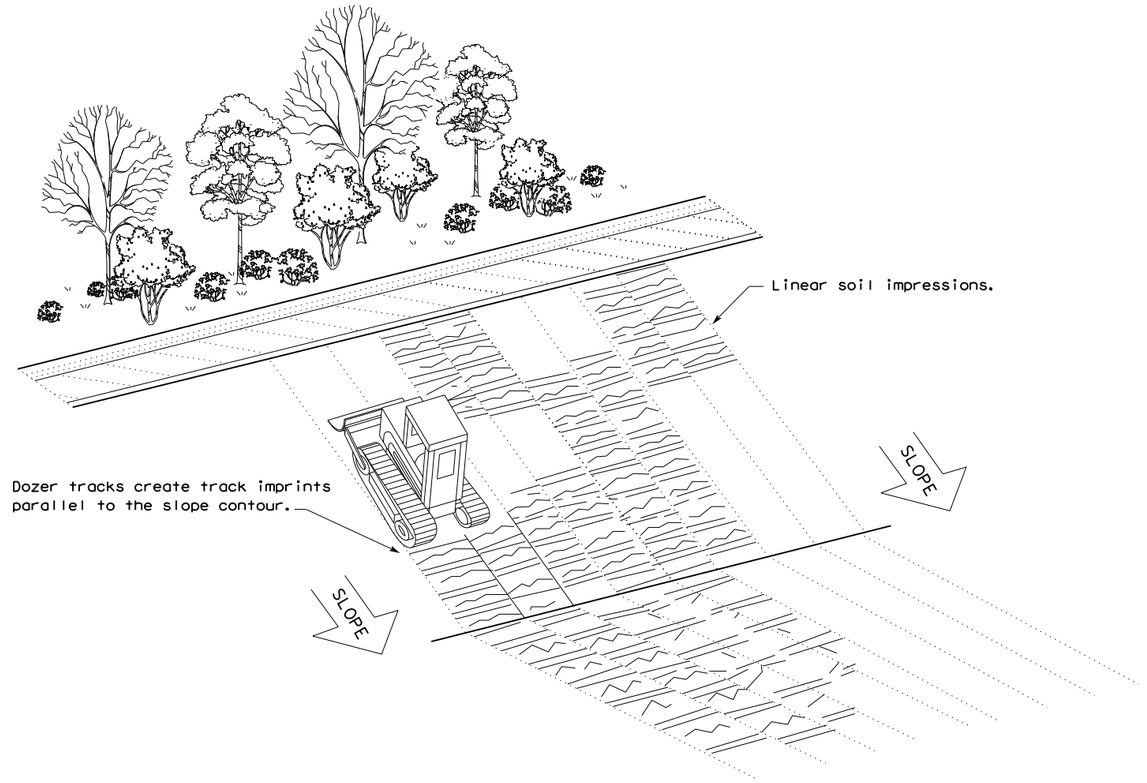
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: VP		DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB			HIGHWAY	
REVISIONS	0374	07	028, ETC			US 62	
	DIST	COUNTY				SHEET NO.	
	ELP	HUDSPETH				107	